Roundtable Total Software Management System

Roundtable User's Guide

Windows Edition

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Contents

Preface

1. Purpose

This book provides the Roundtable user with in-depth information about the Roundtable Total Software Management System.

2. Audience

This book is intended for OpenEdge developers, Managers of OpenEdge developers and staff responsible for quality assurance and deployment of OpenEdge applications.

3. Organization of This Guide

- Chapter 1, “Software Configuration Management”

  Provides a high-level overview of the configuration management discipline and explains how to use Roundtable to achieve effective Software Configuration Management.
- Chapter 2, “The Tabletop”

  Provides an overview of the Roundtable Tabletop and demonstrates the integration between the OpenEdge ADE and Roundtable.
- Chapter 3, “Roundtable Administration”

  Discusses each area that must be addressed before you set up your system.
- Chapter 4, “Workspaces”

  Introduces you to Workspaces and presents detailed information about utilizing Workspaces in your development environment.
- Chapter 5, “Task Management”

  Explains Task management in depth.
- Chapter 6, “Objects”

  Explains each of the Object Types available in the Roundtable system.
- Chapter 7, “Tools”

  Documents a number of useful tools provided in the Roundtable environment.
- Appendix A, “Interfaces”

Provides examples of how to access Roundtable data directly and how to add your own interface routines.

4. Typographical Conventions

This guide uses the following typographical conventions:

- Bold typeface indicates: Commands or characters that the user types
- That a word carries particular weight or emphasis Italic typeface indicates:
  - OpenEdge variable information that the user supplies
  - New terms
  - Titles of complete publications
- Monospaced typeface indicates:
  - Code examples
  - System output
  - Operating system filenames and pathnames

The following typographical conventions are used to represent keystrokes:

- Small capitals are used for OpenEdge key functions and generic keyboard keys.

  END-ERROR, **GET**, **GO**, **ALT**, **CTRL**, **SPACEBAR**, **TAB**

When you have to press a combination of keys, they are joined by a dash. You press and hold down the first key, then press the second key:

CTRL-X

When you have to press and release one key, then press another key, the key names are separated with a space.

ESCAPE H

ESCAPE CURSOR-LEFT

5. Notices

UNAUTHORIZED MODIFICATION OF ROUNDTABLE® REPOSITORY DATA PROHIBITED

The Roundtable® TSMS repository database contains complex data relationships that

must be maintained to ensure the proper functioning of Roundtable products.

In order to preserve the referential integrity of repository data, the Roundtable repository data must NOT be altered outside of the Roundtable application, unless specifically directed to do so by Roundtable Technical Support personnel. Any unauthorized modification to repository data can result in an unusable repository and may render the installation unsupportable by Roundtable Technical Support.

1

Software Configuration Management

1.1. Introduction

The Roundtable product is a team-oriented extension for the OpenEdge development environment that provides extensive Software Configuration Management (SCM) and programming productivity tools. This chapter provides a high-level overview of the configuration management discipline and explains how to use Roundtable to achieve effective SCM.

SCM is the discipline of managing the entire life cycle of a software project. While the term is often used to describe change control systems, just implementing a change control system does not mean that a organization is practicing SCM.

Practicing SCM requires the application of business and engineering policies and procedures to ensure an appropriate level of control and auditability throughout a software project. Implementing SCM involves introducing tools to help manage the many aspects of both the business and engineering domains of the software project.

SCM is comprised of four well-defined activities: Configuration Identification, Configuration Control, Configuration Auditing, and Configuration Status Accounting.

An organization that implements SCM usually focuses on the tools that the SCM software provides rather than on the SCM discipline. A key issue in implementing SCM is identifying the roles and responsibilities of the individuals involved in the software project. A primary concern of the SCM discipline is how teams work together to build systems. The organization that implements SCM can realize enormous benefit from implementing strong engineering and business management policies in support of the team process, regardless of the tools provided by the SCM software. An organization that effectively implements SCM unifies business and engineering management disciplines.

Just about everyone in the software industry has a horror story about the project that doubled or tripled in cost and failed to do anything useful. Most of these failures could have been avoided if the organizations had implemented SCM. SCM's control of and visibility into the software development process would have made it possible for management to adjust, redefine, or cancel the project before it ran aground.

The most difficult issue facing the business manager of a software development effort is auditability. It is extraordinarily difficult to know, with any degree of certainty, what the state of a software project is at any given time. Additionally, the trend is toward more complex software tools, and business systems of increasingly larger scope.

The ideal SCM system allows you to simplify, streamline, and seamlessly integrate the management of the software life cycle into the development environment so that business managers can play an active and meaningful role in the process of software definition, development, and maintenance. The challenge is to introduce the management principles of control, auditability, and status accounting in a way that engages the software engineer, designer, and quality assurance staff in the cooperative effort.

Software engineers often resist introducing management practices into the software development process. They are concerned that management practices will cramp creativity and increase paperwork. To deal with these issues and maintain the morale of the group, the new tools must do at least as much for the software engineer as they do for the business manager. The Roundtable system can and has accomplished this!

When you present engineering personnel with an SCM implementation, the main reason for their resistance is that they see the system as extra work and an affront to their abilities. Telling the software engineer that the SCM system will allow management to manage them better will not get engineers excited. To get their attention, you show them new tools that improve communication among the engineering staff, reduce meeting time, allow decisions on change requests to be made quickly, and keep management out of their hair. Roundtable tools integrate with the development environment and fill the needs of software, quality assurance, and support engineering as well as the needs of management.

Roundtable allows management to become more involved in the software development process without compromising or inhibiting the creativity or productivity of the engineering staff.

1.2. Exploiting the Opportunity

Roundtable makes it possible for everyone involved in the SCM process to communicate and share information electronically. Roundtable's task management paradigm provides engineers and managers with almost immediate response to action item requests throughout the project. Additionally, it puts much of the project information at the fingertips of both managers and engineers right inside the development environment.

One of the most difficult steps in implementing SCM is choosing the correct SCM model for your organization. Roundtable allows your organization to design and implement an SCM model that achieves a high degree of concurrence between the capabilities of the system and the needs of the project being managed. The essential issue in designing the model is how much of the configuration auditing process to apply and how many workspaces to implement.

1.3. Principal SCM Activities

An SCM system is comprised of tools that support the four basic activities of SCM:

- Configuration Identification [1–3]

- Configuration Control [1–12]
- Configuration Auditing [1–15]
- Configuration Status Accounting [1–18]

1.3.1. Configuration Identification

Configuration identification is simply the identification of a relative arrangement of software system components. An important part of configuration identification is the realization that a software project is comprised of much more than source code. A software project might include:

- Contract or marketing specifications
- Functional requirements documentation
- Architectural design documents
- Quality assurance guidelines
- Coding standards documentation
- Component analysis documents
- Component design documents
- Source code/binary code
- Tool configurations used to produce system builds
- Test data suites
- User documentation (including on-line help)

The configuration identification framework must provide an intellectual and mathematical basis for describing the relative arrangement of these system components at a specific point in the development process. Over time, software systems undergo an iterative, incremental evolution that can be described as a series of baselines. The following table lists some commonly used SCM baselines. The terms provide a good starting point for a discussion of which baselines a given product development effort needs.

Abbreviation	Description
FB	Functional baseline (often called requirements specification)
AB	Allocated baseline (often called functional specification)
DB	Design baseline (often called engineering baseline)
Alpha	Alpha baseline
Beta	Beta baseline
PB	Product baseline (golden masters)

The following table lists system components and indicates the baselines with which they are usually associated:

System Components	FB	AB	DB	Alpha	Beta	PB
Contract or marketing specifications	Yes	Yes	Yes	Yes	Yes	Yes
Functional requirements documentation	Yes	Yes	Yes	Yes	Yes	Yes
Architectural design documents		Yes	Yes	Yes	Yes	Yes
Quality assurance guidelines		Yes	Yes	Yes	Yes	Yes
Coding standards documentation		Yes	Yes	Yes	Yes	Yes
Component analysis documents		Yes	Yes	Yes	Yes	Yes
Component design documents			Yes	Yes	Yes	Yes
Source code/binary code				Yes	Yes	Yes
Tool configurations used to produce system builds				Yes	Yes	Yes
Test data suites				Yes	Yes	Yes
User documentation (including on-line help)					Yes	Yes

Your system may require more or fewer baselines, and some of the system components belong in different baselines. Your objective in identifying a baseline is to define what should be in the system at a given point in time.

Baselines are often incorrectly referred to as milestones. However, milestones identify points in the project schedule where you reach specifically identified goals. Often, there are many project milestones within each project baseline. Configuration auditing is the process of ensuring that a system does contain everything implied by its baseline status.

1.3.1.1. SCM and the Development Cycle

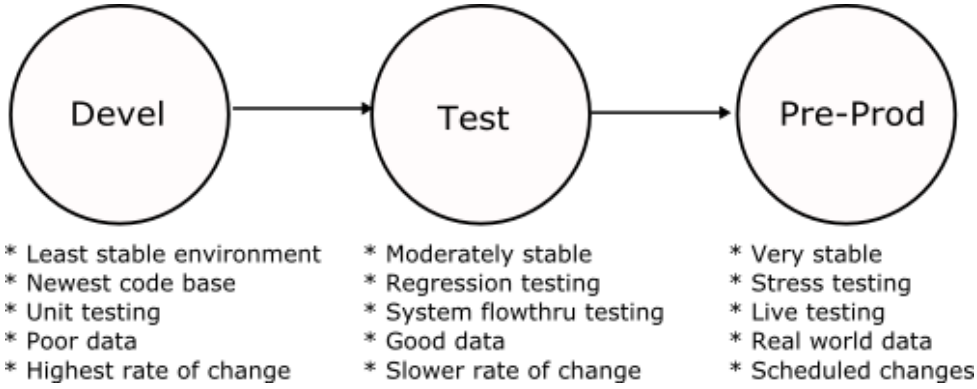
Early SCM efforts saw the waterfall development cycle entrenched in the policies, procedures, and tools used to implement the SCM discipline. Modern software development incorporates an iterative development process that includes rapid prototyping, JAD sessions, and component-oriented system construction. These and other factors make the waterfall development cycle a poor model around which to construct project- and software-management policy and procedures. If SCM is to be a natural and intuitive part of the software development process, its policies, procedures, and tools must accurately record and model the activities of the process. The SCM discipline must support iterative development and the management of parallel activities.

Iterative development involves the incremental improvement of a baseline through a series of measure, cut, and fit cycles. The underlying theory is that it is not possible to completely define the problem domain of a given application without the experience of trying to build some parts of it. Design methodologies are based on the concept of decomposition. You must break down a large system into smaller parts in order to understand the relationships of objects in the problem domain.

The relationships of components in a complex software system are not always obvious until the development process is underway. Changes in system design often occur as a result of issues that surface during the development process. Often, decision makers for a project are not technically oriented and can be reluctant to make decisions based on design abstractions. Instead, they want to see major portions of the system functionality surfaced before they make these decisions.

Roundtable provides an answer to this iterative development process by allowing multiple instances of the software system to exist concurrently. These instances are called workspaces. These workspaces support an incremental development cycle that is fully controllable under the SCM disciplines.

Refer to the three workspaces in the following diagram:



The arrows indicate a flow of new and updated system components from workspace to workspace. This flow is controlled by you, the developer, and generally occurs when a self -consistent set of changes is completed in one workspace and is ready for importation into the next (target) workspace. The important issue in this promotion of changes from one workspace to another is that all modified components are promoted together as a unit, and that comprehensive documentation of the impact of the modifications on the target workspace is available.

A workspace is defined primarily by its use, while a baseline defines the expected content of a workspace. Because you are in control of how many workspaces exist in your

development environment and how they are used, Roundtable has no strict rules regarding the relationship between workspaces and baselines. However, here are some general guidelines based on the simple workspace example previously shown:

- Development workspace — Primary development area
- Functional baseline
- Allocated baseline
- Design baseline
- Test workspace — Primary testing, limited changes (mostly bug fixing)
- Alpha baseline
- Beta baseline
- Pre-prod workspace — Primary deployment
- Production baseline

In some environments, there is a tendency to think of the Test and Pre-prod environments as builds of a system. This approach is clumsy and less than satisfactory for larger development efforts as it precludes the opportunity for maintenance or emergency patch activities in any workspace except Development. If there is significant change in the development environment after the build that represents the Test workspace, it may not be possible to produce a patch for the test environment in a timely way.

Roundtable provides extensive support for identifying potentially dangerous concurrent changes to software system components in different workspaces. This conflict is called orphan change management. For more detail, see Section 4.6, “Object Variants” [4–21]. This support for orphan change management allows parallel development to occur in two or more workspaces simultaneously with an appropriate level of control and visibility.

Your business model drives your decision to allow changes outside the Development workspace. Consider the following situation.

You oversee the development of an in-house MIS system of significant size. Management demands that some, but not all, of the system become operational as soon as possible. Your team members code these early deliveries first and promote them from the Development workspace into the Test workspace, where testing begins.

In the meantime, programmers working on the new system components make changes to some of the previous components to accommodate the interface and shared-data requirements.

In the Test workspace, the testers discover bugs and other problems in the system components. The programmers, working on the system in the Development workspace, inform you that while they can make the changes requested by the testers, they cannot

deliver the changes into the Test workspace because the system components in question have been modified to work with the new system components. However, management still wants the system components that are in the Test workspace.

This situation presents a compelling argument for making the bug fixes and required changes in the Test workspace. The Roundtable orphan change management functionality makes this possible with minimum risk.

Parallel development occurs when there are many variations (or flavors) of a system. For example, a core business system might be modified for different clients or for vertical markets. Roundtable maintains each variant in a separate workspace and manages the promotion of code.

A later section in this chapter addresses more advanced issues of workspace management for a variety of situations.

1.3.1.2. Configuration Item Identification

In Roundtable, the basic configuration item is called an object. Each object is stored in a repository, which is a OpenEdge database. You can query information on these objects using the OpenEdge ABL.

The repository stores a version ancestry for each object, which is comprised of each version of the object. Rather than store the full content of each object, most object versions are in a delta format which lists only the changes from the previous version.

Objects are stored in the repository using a unique key with the following components:

- Object type
- Product module
- Object name
- Version code

Any configuration of your system can be expressed as a list of object versions, with each object version specified by the four component values required to extract the object from the repository. When you specify the contents of a workspace, Roundtable extracts the appropriate objects from the repository and writes the contents of the object to OS files or, as in the case of schema objects, into the OpenEdge database schema.

The object types supported by Roundtable include:

- PDBASE: A database definition.
- PFILE: A table definition.
- PFIELD: A field (column) definition.

- PCODE: A general file container, usually source code or binary resources.
- DOC: A document file.

The other components of the key are described in the following sections.

1.3.1.3. Configuration Hierarchy—Product Modules and Workspaces

Configuration identification of a system involves decomposition of the system into smaller, more manageable, modules. Roundtable supports the mapping of a logical configuration hierarchy to a physical configuration hierarchy.

The logical configuration hierarchy is the hierarchy of the objects in the repository. Each object belongs to a product module, and each product module belongs to a product. This defines a three-level, logical view of the object stored in the repository:

- Product
- Product module (one or more per product)
- Object (one or more per product module)

The logical configuration hierarchy provides a way to define the logical relationships of objects quickly. It also serves as a form of documentation for your system design. Generally, it is a good practice to define your product modules along the functional boundaries of your system. For example, if you develop a general accounting application, you may have product modules for general ledger, accounts payable, and accounts receivable.

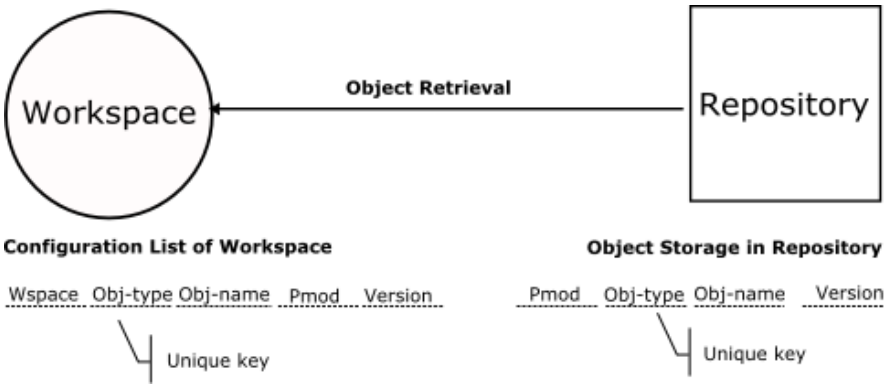
The physical configuration hierarchy is the definition of workspace contents, down to the specific directories in which to store objects. Each workspace represents a collection of object versions. Roundtable manages a table of these object versions, called the configuration list. The following fields define the unique key for objects in this table:

- Workspace ID (Wspace-id)
- Object type (PDBASE, PFILE, PFIELD, PCODE, or DOC)
- Object name

In conjunction with the object type and object name above, the following fields are included in the configuration list, allowing the unique identification of the object version contained in the workspace:

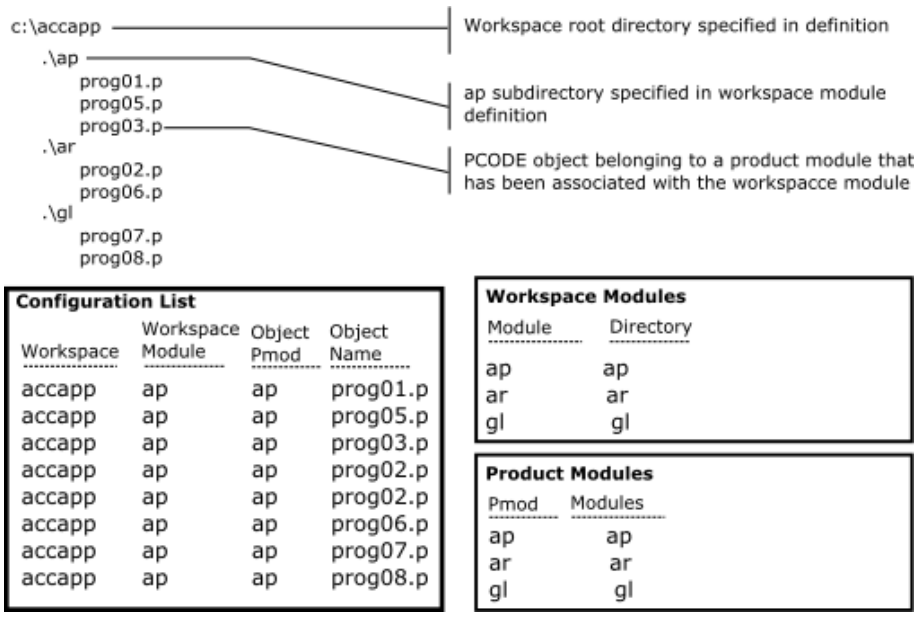
- Object Version
- Object Pmod

Refer to the following diagram:



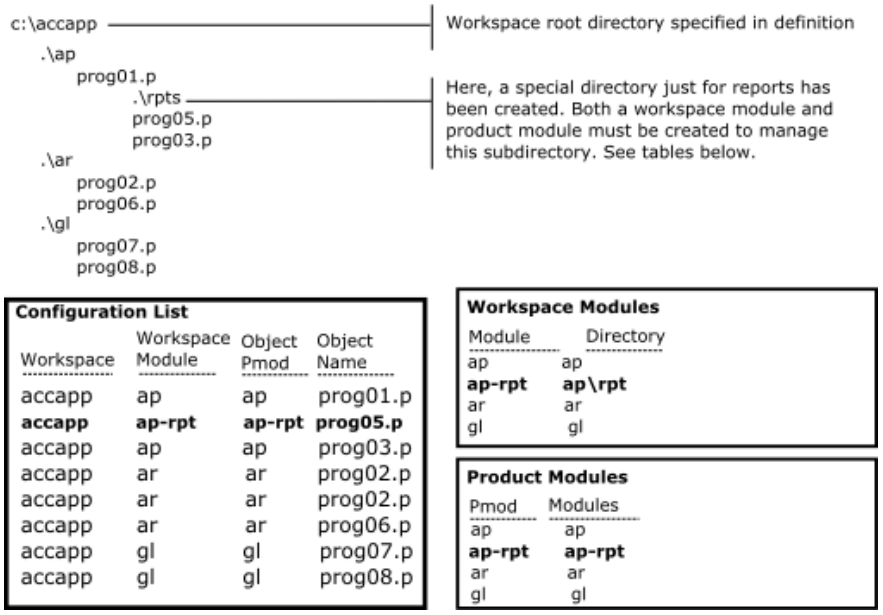
Each entry in the configuration list also specifies a workspace module. Workspace modules map objects belonging to a product module, associated with the workspace module, to a specific directory structure. (The directory structure is always specified relative to a root directory for the workspace.) Each product module is associated with only one workspace module, but many product modules can be associated with that workspace module. This allows objects from multiple product modules to coexist in the same directory if necessary. This functionality allows the effective management of custom systems.

The following diagram illustrates a simple system:



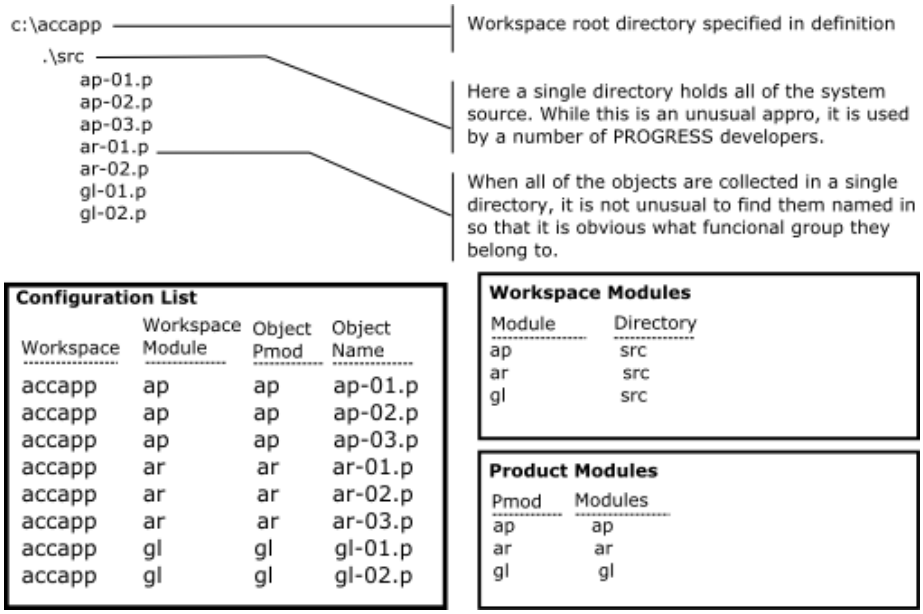
There is a one-to-one correspondence between the workspace module name and the directory name associated with the workspace module. In addition, there is a simple one-to-one correspondence between the workspace module name and the product module name. When you design a new system, you should retain these simple relationships.

The following diagram demonstrates a slightly more complex system:



The subdirectory aprpt contains accounts payable reporting procedures. This example illustrates the need to create a workspace module and product module for each subdirectory in the system.

You might want to map objects that appear in the same physical directory to different product modules. The following diagram shows this approach:



So you can see by these examples, it is possible to map any level of directory structure to workspace modules in the Roundtable environment.

1.3.2. Configuration Control

The Configuration Control Board (CCB) plays a central role in the configuration control process. It is often comprised of both buyer and seller representatives and is responsible for making decisions about the changes to be made to the system definition during the course of the project. The CCB approves, monitors, and controls:

- The conversion of design objects into system (software) configuration items
- Changes to the system

To ensure the success of an SCM effort, it is important to adopt a formal SCM plan. A typical Configuration Management Plan contains the following checklist:

1. System Description
   - An overview of the system being built
   - Configuration management (CM) organization
   - The CCB
   - Identification

- Control
- Auditing
- Status accounting
- Other product assurance disciplines

2. CM Tools
   - Identification tools and labeling conventions
   - Control tools
   - Auditing tools
   - CM procedures
   - Design stages
   - Development stage
   - Deployment stage
   - Operational/maintenance stages
3. CM Resources
   - Budget dollar
   - Budget staffing
   - Budget other

There are many good texts on SCM that provide information on how to implement a full SCM plan and define and assign the responsibilities of the CCB. A common-sense approach to implementing a CCB is usually enough, unless the software project is huge or is for the military. For work done under government contract, find out which of the many SCM standards documents the contract requires and implement those standards. The standards cover every phase of the software project life cycle, and even provide sample forms and report formats to facilitate communication during the project.

1.3.2.1. Task Management

Roundtable provides a task paradigm for assigning and tracking work performed in a software project. No changes may be made to objects under Roundtable control without an active task to perform the work. Use the Roundtable security system and tasks together to implement a variety of controlled workflow policies. These policies can vary by workspace.

As the system director, you determine who can create, use, and complete tasks. In a loosely managed environment, it is not unusual for programmers to have this authority. When you require complete control over the changes made in a system, you can set security permissions so that only you can create a task, check out an object under the task,

and complete the task. In other words, the programmer can only work on objects you provide under the task. Roundtable security is set up by function and user, so you can achieve a balance between control and flexibility.

Tasks also provide an effective reporting mechanism. You can generate a report that describes the task and each of the objects being created or modified under the task. This report provides information to team members who are interested in your work because it overlaps theirs, and to managers who need to track the progress of the project.

On smaller projects, the CCB may directly authorize all tasks, even if the tasks are actually created and entered by the programming staff.

1.3.2.2. Change Control

Configuration control requires that your SCM system provide at least the following three simple version control capabilities:

- Protection from lost changes
- Version identification
- Version retrieval

Roundtable provides protection from lost changes as a check-in/check-out process that essentially grants write access to a single user for a system component in a workspace. Version identification tracks current and previous versions of a file using a unique numeric identifier. Version retrieval allows a user to request a copy of some previous version of a file.

Roundtable provides the following enhanced change control features:

- Version branching (parallel development/orphan change management)
- Variant identification and management (management of custom variants having independent version ancestries)
- Shared and private workareas (sometimes called sandboxes)

The Roundtable workspace management functionality provides another level of change control not found in most SCM systems, a form of version merging at the system-configuration level.

Roundtable provides a sophisticated mechanism for both protecting and sharing work being performed by team members. When you want work in progress to be completely isolated from other users, you may check source objects out to a task directory that is not visible to other users of the workspace. The previously completed version of the source object remains in the workspace directory structure so that other users can continue to use the older version of the object. (Remember, all work done within a Roundtable-controlled

workspace is done under an assigned task. You may specify a task directory when you create the task. The task belongs to the programmer to whom it is assigned, and the task directories should be unique to the task, if possible.)

When two or more programmers must work closely together on part of the system, Roundtable can copy the source objects being worked on by a programmer into a group-directory that is associated with one or more tasks. Roundtable sets up the PROPATH with paths in the following order:

- Task directory
- Group directories
- Workspace directory

This capability allows you to make a source object that is not yet completed available to other programmers. This is useful when you need to modify a common include file or procedure.

You may also want to make a source object that is not yet completed available to all of the users of a workspace. Roundtable can copy a source object from the task directory into the workspace directory on demand. Roundtable can also reverse this decision and restore the previously completed version of the object into the workspace directory. This functionality makes it possible for everyone to test modifications before an object is complete.

Roundtable manages the placement of a source object in the task, group, and workspace directories based on the share status of the source object version. The share status of an object can be changed as necessary, and Roundtable performs all association housekeeping for you. This housekeeping includes recompilations to ensure accurate system views for each user.

1.3.3. Configuration Auditing

Configuration auditing is the process of confirming that all system components that should be in a given baseline are in the baseline. The checklists in the next few sections illustrate some of the questions asked during the audit process for sample baselines. When a baseline audit is completed, the baseline is said to be sanctioned. Roundtable provides workspace, product, and task reports that identify the status of each registered component (object). It also provides textual information describing the component and its version identification. Use these reports to address some of the questions on the configuration audit checklists.

Configuration auditing is the mechanism management uses to ensure that a software project is on track and building what is actually required. Some argue that a given software project has so much R&D content that configuration auditing is not useful. This is not the case at all. If the team must use exploratory engineering to refine the product definition, this should usually be done without the overhead of full configuration auditing. However,

it is dangerous and foolhardy to commit to the development of a product if its required concepts, design, and implementation strategies cannot be stated at the level of detail required by the configuration audit process.

1.3.3.1. Functional Baseline Audit Checklist

The functional baseline (FB) describes the system on a top-level functional basis. The FB is the first baseline produced. An SCM audit of the functional baseline should answer the following questions:

- Is there is a clear trace between system requirements and software requirements?
- Is it possible to sort out software from system requirements?
- Is there a system concept that is consistent with stated operational requirements?
- Is the functional design of subsystems consistent with stated system requirements?
- Do the user, seller, and buyer agree on the content of the functional baseline?

1.3.3.2. Allocated Baseline Audit Checklist

The allocated baseline (AB) is the mapping of system design to functional components. It is important to know what parts of the system provide the functionality identified in the FB. An SCM audit of the AB should answer the following questions:

- Is there clear traceability of the functional specification in the FB and the allocated functional items in the AB. In other words, is it clear which parts of the system provide each function identified in the FB?
- Are all functions that are identified in the FB mapped to functional items in the AB?
- Are models and algorithms that define functions to be performed logically and mathematically correct and consistent in both a verification and validation sense?
- Does the AB clearly separate hardware, off-the-shelf software components, and new software functions?
- Are all questions concerning technical options, trade-offs, operation requirements, etc., that may impact subsequent detailed design, answered or at least identified?
- Do the user, seller, and buyer agree on the content of the AB?

1.3.3.3. Design Baseline Audit Checklist

The design baseline (DB) is comprised of detailed designs for each functional component of the system. An SCM audit of the DB should answer the following questions:

- Does each detailed design item correlate with a functional component?

- Is the DB complete enough to be used in a design review process?
- Has a design review process been completed and all resulting issues resolved?
- Does the DB fulfill product assurance requirements (including design standards, procedures, and facilities for testing)?
- Is the overall architectural and design approach clear?
- Do the user, seller, and buyer agree on the content of the DB?

1.3.3.4. Alpha Baseline Audit Checklist

The alpha baseline should define the first cut of some or all of the system that can be examined as a working software system and used to gather information from potential users and do proof-of-concept testing. An SCM audit of the alpha baseline should answer the following questions:

- Are the screens and processes in the system a direct expression of the specifications in the AB and the design in the DB?
- Does the alpha baseline contain enough functionality to allow meaningful comments by the software reviewers?
- Has the alpha baseline satisfied product assurance requirements? (Note that these requirements may be greatly relaxed from those applied to the product baseline, described later.)
- Have provisions been made for the support of the alpha release?
- Has a plan been developed for incorporating alpha baseline comments into the system?
- Do the user, seller, and buyer agree on the content of the alpha baseline?

1.3.3.5. Beta Baseline Audit Checklist

The beta baseline should define the first cut of some or all of the system that can be examined as a working software system used in an actual production setting and used to gather information from potential users and do proof-of-concept testing. An SCM audit of the beta baseline should focus on establishing answers to the following questions:

- Are the screens and processes in the system a direct expression of the specifications in the AB and the design in the DB?
- Does the beta baseline contain enough functionality to allow its use in a production setting?
- Has the beta baseline satisfied product assurance requirements? (Note that these requirements may be marginally relaxed from those applied to the product baseline, described later.)
- Have provisions been made for the support of the beta baseline release?

- Has a plan been developed for incorporating beta baseline comments into the system?
- Does an expedite mechanism exist for reporting critical bugs discovered in the beta baseline?
- Are the appropriate processes in place to develop and deliver patches to beta baseline users?
- Have adequate policies and procedures been developed to track and manage beta baseline users?
- Do the user, seller, and buyer agree on the content of the beta baseline?
- Do the user, seller, and buyer concur that the beta baseline is complete and free of any defects that prohibit establishing the beta baseline?

1.3.3.6. Product Baseline Audit Checklist

The product baseline (PB) is comprised of the completed system. It defines the system and is often referred to as the "as-built" definition. An SCM audit of the PB should answer the following questions:

- Are the source code and data structures of the PB a direct translation of the DB?
- Do the FB, AB, DB, and PB correspond? In other words, is it possible to state with certainty that what was contracted to be built was in fact built?
- Has the PB satisfied product assurance requirements?
- Are all of the deliverable components that comprise the system registered as part of the PB?
- Does the PB fulfill all known and specified operational requirements?
- Have standards and good programming practices been met and approved by the product assurance department?
- Do the user, seller, and buyer concur that the PB is complete and free of any defects that prohibit establishing the PB?

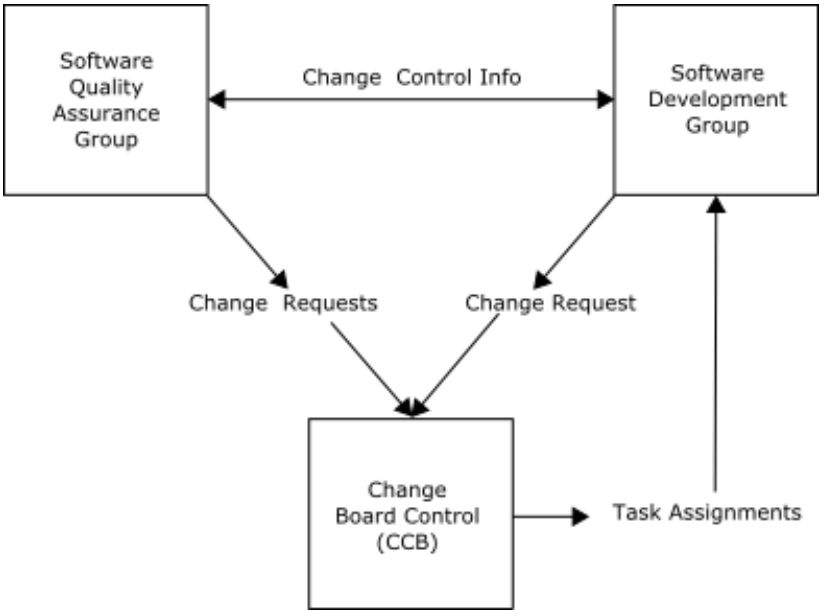
1.4. Configuration Status Accounting

Configuration status accounting ensures that a complete and accessible record of the changes to a software system and reasons for such changes are available. Most programmers do configuration status accounting without knowing they do it, by keeping a programmer's notebook and inserting comments in the source code. The objective in configuration status accounting is to record why, when, and by whom a change is made. Configuration status accounting is often a reporting function that pulls the required information out of data stores created and managed by the configuration control tools in the SCM system.

Roundtable provides extensive configuration status accounting through the implementation of task and workspace management. Essentially, no change can be made to the software without it being tracked as part of a task in a specific workspace.

1.5. SCM Information Flow

You should develop a formal information flow among the groups involved in the SCM effort. A simple example of this information flow follows:



This simplified model places the CCB in a role of direct, day-to-day involvement in the development process through the creation of task assignments. In Roundtable, all work is performed under the auspices of a task assignment, and changes can be tracked back to that task. It is normal practice to enter a description of the change request or design reference into the task assignment so that changes to the system made under a given task can be tracked back to an original specification document. This example uses change request as a general term covering all types of change notification documents. Change notification documents are not directly managed in the Roundtable system, although there is an indexed userref# field in the task record that you can use to tie the task record to a user-supplied defect record or group of records.

1.6. Benefits of SCM

SCM illustrates the development process and provides better information for management

and more predictable delivery schedules. The goals of SCM are to:

- Improve profitability
- Save time
- Reduce the amount and improve the quality of communication between management and programmers
- Reduce the cost of producing software
- Achieve a net increase in productivity
- Shorten the development cycle time from design to delivery
- Improve the accuracy of the estimating process
- Improve the project management information flow within the development, testing, and deployment cycles
- Make the version control process as transparent as possible
- Make higher-quality information quickly available to each team member
- Make accessing system configuration information a natural and simple part of the development process

1.7. Workspace Networks

You implement SCM policy by defining what work should be done in each Roundtable workspace and by defining the flow of changed objects allowed between workspaces. The Roundtable importation process searches source workspaces for objects that should be imported into the current target workspace. You define networks of workspaces by specifying a list of source workspaces for each workspace, and by providing the additional product configuration information that allows Roundtable to determine which objects in the source workspace are candidates for importation. The definition of source workspaces is part of the setup for a new workspace and does not have to be repeated for every importation.

1.8. SCM for Product Releases

SCM policies and procedures for managing a software development effort depend on the kind of software development being undertaken. It is common for software development to result in a product release.

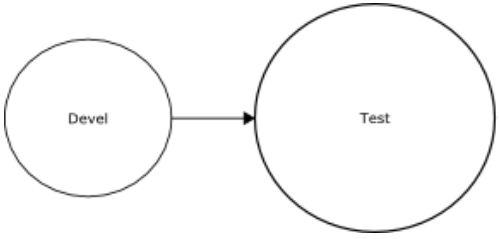
Product releases are generally deployed to large numbers of users and packaged for installation, by the user at the user's site, with little or no involvement by the software developer. The ongoing development of the OpenEdge ABL is a good example of a product-release-oriented development effort.

Product releases occur at well-defined intervals and often contain significant advances in

system functionality. It is not unusual for a year or more to pass between major releases of such a product.

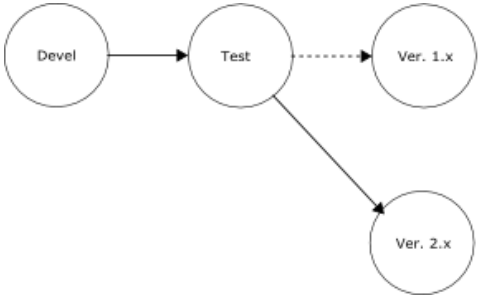
Many justifications exist for pursuing the product release strategy. One of these is the tooling time required to manufacture everything from written documentation to packaging. Another reason is that as the complexity of a system grows, it becomes very difficult to predict the indirect impact of changes made to the system. Therefore, the system must be tested thoroughly, as a complete and stable entity, several times prior to release.

The following sequence of diagrams depicts the evolution of a product managed by the Roundtable system:



When work in Devel workspace reaches the point where some parts of the system can be tested with reasonable coverage. These parts of the system are imported into the Test workspace.
The contents of the Test workspace progress through Alpha and Beta baselines. Work on new development continues in Devel workspace.

When the product baseline is established for this version (1.0) of the software system, a third workspace is created and sofware from Test is imported into it. It is from Ver 1.x workspace that deployment packaging is created. The workspace is named Ver 1.x because future interim releases, Ver 1.1, Ver 1.2, etc. may be deployed from this workspace.



At some point in the future, a new FB, AB, and DB for Version 2.0 of the system are developed in the Devel workspace. These new baselines are, generally, evolutionary decendants of the systems 1.x baselines.

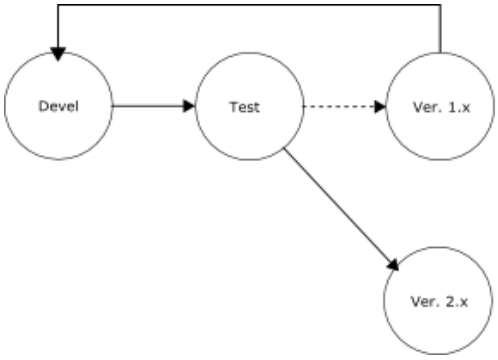
Note that both the Devel and Test workspaces are now devoted to generating a new Ver 2.x product and that a new Ver 2.x workspace is created for the deployment of the new 2.x family of software.

Roundtable retains a complete evolutionary development history of the system in the Devel workspace. The Ver 1.x workspace contains configuration histories for that generation of the software system. It is not unusual for maintenance efforts to be active in the Ver 1.x workspace to provide some level of support for the older software after the Ver 2.x generation is released. While it is possible to import new or modified software from

the Test workspace, this is usually a very selective and infrequent occurrence.

The strategy presented provides continued support of older generation products. Roundtable allows you to manage on-going development in any of the workspaces above and then merge the completed work into other workspaces. For example, if a bug is fixed in the Ver 1.x workspace and the modified procedure is unchanged in the Devel workspace, Roundtable informs you that you can bring the newer code into the Devel workspace so the bug can be eliminated from the Ver 2.x product.

Refer to the following diagram:



The arrow from Ver 1.x workspace to Devel workspace indicates importation of code changes (because of maintenance in Ver 1.x) into the Devel workspace. From there, they can flow through the Test workspace and then into the Ver 2.x workspace. The flow of changes from Ver 1.x to Devel is managed safely by Roundtable, and you remain in complete control of the process.

In general, it is possible to establish a flow between any two workspaces at any time. The key to effective workspace management lies in having clear policies for workspace promotions and understanding how these workspace promotion activities relate to the versions of your system.

1.8.1. SCM for Incremental Deployment

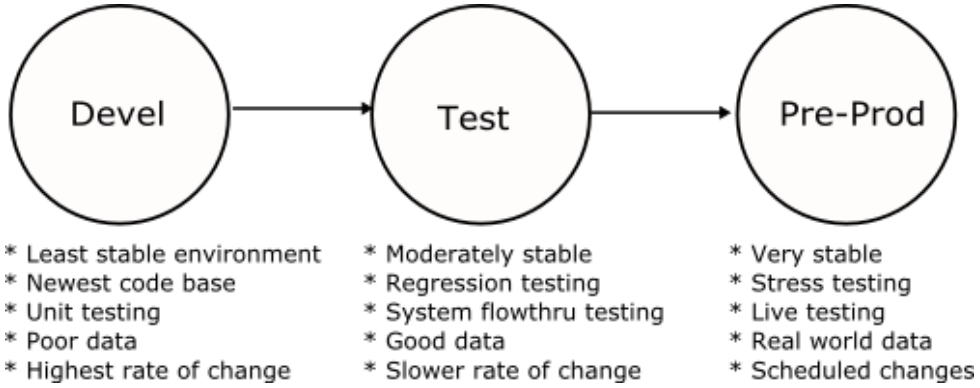
Another common software development life cycle involves the incremental deployment of an application as various components are completed. This is common in IS environments where the developers have a relatively small audience and a high degree of involvement with end users. This kind of development life cycle is also common where custom business systems are being developed and the user wants to see the progress of the application.

It is not unusual for development to commence before there is a firm and complete understanding of the scope and specific functionality to be included in the system. While many would argue that the answer to this problem is to insist on defining specifications before work begins, there are many pressures that lead to a compromise.

Regardless of what circumstance leads to implementing an incremental deployment strategy, Roundtable provides tools that allow you to manage this approach effectively,

according to accepted SCM practices.

Refer to the following diagram:



Each Roundtable workspace is a complete instance of your software application. Because Roundtable makes it possible to manage multiple workspaces easily, you can manage incremental deployment successfully.

You must be aware of some troublesome problems with incremental deployment, and you must develop policies and procedures to ensure effective management of your incremental deployment strategy. These problems involve the unavoidable parallel development that occurs in, at least, the Development and Test workspaces. Parallel development occurs whenever a change is made to the same object in two different workspaces at the same time. Roundtable, of course, ensures that each of these concurrent modifications results in different version numbers, but it is possible for changes in one of the versions to be lost. The version whose change would be lost is called the orphan version.

Consider the following situation:

1. An object is created in the Development workspace and completed with the version number 01.00.00.
2. The object is promoted into the Test workspace. Testing of the object begins.
3. The object is checked out into the Development workspace and work begins on major modifications that will take two weeks to complete.
4. A bug is discovered in the object in the Test workspace. The bug must be repaired before the remaining tests can be performed. Since the object in the Development workspace is now broken because of the new work being done on it, you need to fix the bug in the Test workspace.
5. You check out the object in the Test workspace. Since Roundtable knows that the object is checked out in the Development workspace, the system warns you that a

possible object orphan condition exists. You fix the bug in the object you have checked out in the Test workspace. You inform the programmer who is working on the object in the Development workspace of the changes you made so the fix can be incorporated into that version.

6. You check in the object in the Test workspace and choose to increment the revision number, so the version code of the object in the Test workspace is 01.01.00. This object, and other completed changes in the Test workspace, can then be imported into the Pre-Prod workspace.
7. The programmer checks in the object in the Development workspace and chooses to increment the version number, so the version code of the object is 02.00.00. Roundtable provides a report that the programmer can run before a check in or task completion process that reports on any orphan conditions that exist.
8. When you choose to import objects from the Development workspace into the Test workspace, the object (discussed in this exercise) version 01.01.00 in the Test workspace is replaced by the object version 02.00.00 completed in the Development workspace.

The most important action of this process is informing the programmer in the development area that a change was made to the same object in the Test workspace. Otherwise, the programmer may not catch the bug that was found in the original procedure and it will resurface when the new version 02.00.00 is imported into the Test workspace.

Roundtable warns the user when orphan conditions exist that could lead to lost changes.

Another potential problem area with an incremental life cycle occurs when preparing updates to system installs in the field. The Roundtable deployment system makes this simple. You can define one or more sites to be updated from a given workspace. For each of these sites, you can track each deployment sent to the site. Roundtable tracks the content of each deployment, so there is never any doubt about which objects are at a site and what the version of each object is.

Roundtable creates incremental deployments after the first deployment. An incremental deployment consists of only the objects that have changed since the last deployment, and a list of those procedures that must be recompiled because of the changes being delivered. Because only the changes in the system are being delivered, the size of the update package is usually very small compared to the size of the whole system. This often means that the update can be sent by modem rather than by tape or on a number of disks.

1.9. SCM for Custom Variant Deployment

implementation of SCM. It is important to recognize the difference between customizing a core application and simply building custom systems from scratch. If you are building custom systems from scratch, each system can, and should, be treated as a separate configuration, thus avoiding any complications in the application of the SCM discipline. However, if you have a core application to which you add or change functionality,

enormous benefits come from managing the core application and each custom variant so that changes in the core application can be easily promoted into selected custom systems.

For example, customers who want to purchase your application with custom enhancements are often concerned about the difficulty of getting updates to your core application and to the custom enhancements. In fact, many of these customers may be abandoning their current systems because they can no longer get cost-effective updates from an existing vendor. Roundtable provides an effective solution to this problem.

The objects managed in the Roundtable system are stored in the repository by the following unique key:

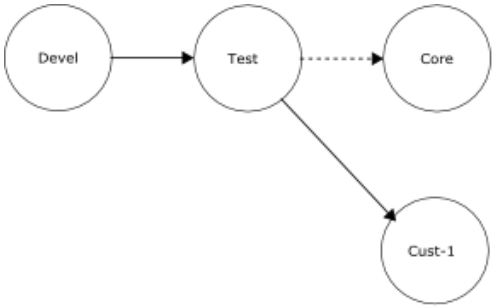
- Object type
- Product module (Pmod)
- Object name
- Version code

The pmod component of this key allows Roundtable to store two objects with the same object type and name in the repository. Refer to the following table:

Object Type	Product Module	Object Name	Version
PCODE	core_ap	menu.p	01.00.00
PCODE	core_ap	menu.p	01.01.00
PCODE	cust1_ap	menu.p	01.00.00
PCODE	cust1_ap	menu.p	02.00.00

This table shows that the object menu.p exists under both a core_ap and cust1_ap product module. The menu.p object belonging to the cust1_ap is a custom variant. It represents a replacement for the menu.p object belonging to the core_ap module.

The ability to store two objects of the same type and name, but with a different product module, allows Roundtable to track custom variant objects in a workspace. Refer to the following diagram:



This development workspace shows a development, test, and core workspace for the core application. A workspace in which custom development will occur is shown as well.

The sample object, order.p is associated with a different product module in cust-1 workspace.

Assignment of order.p object in each workspace

Workspace	Workspace Module	Product Module	Object Type	Version
Core	ar	core-ar	PCODE	01.00.00
Cust-1	ar	cust1-ar	PCODE	01.00.00
Devel	ar	core-ar	PCODE	01.01.00
Test	ar	core-ar	PCODE	01.00.00

To manage the development of a custom system, begin by creating a workspace in which the custom system will be developed (Cust-1 in the example). Then create one or more product modules to contain the custom objects for the system (cust1-ar in the example). You can now completely replace an object with a custom variant of the object (order.p in the example).

Objects with different product modules have completely separate version ancestries. For example, a version 01.00.00 exists for order.p under each product module. This makes it obvious that the object is a complete replacement for the core object and not simply a branch version.

The Roundtable importation process is custom variant smart. It will not unwittingly overwrite your custom work when you import changes from the core system into your custom workspace. The rule that Roundtable applies is very simple: if the object in the target workspace is not from the same product module found in the source workspace, Roundtable overwrites it only when specifically instructed to do so.

1.10. Distributed Development

It is sometimes necessary to coordinate and manage related development activities occurring at locations not directly connected to a central repository of configuration information. This situation might occur because of geographic separation, the involvement of separate organizations, or the use of incompatible tools in the development process.

Roundtable provides the ability to transfer configuration information among repositories to facilitate distributed development. Each of these repositories is identified by a site number

and is often referred to as a site. The following sections discuss the basic issues involved when doing distributed development and offer specific approaches to common distributed development scenarios.

This discussion about distributed development focus on implementation strategies. Use the references to chapter topics provided to supplement the materials in this overview.

1.10.1. Sites and Ownership

Each distributed development group runs its own copy of the Roundtable system and has an independent repository where configuration information is stored. Each repository is identified by a unique site number. A site number of 0 is allowed. It is treated in a special manner and is the default value on first-time installations of the Roundtable system. The site designated with the number 0 is called the central site.

Each additional site in the distributed development network of repositories will have unique site numbers in the range of 1 to 999. A site with a number other than 0 is called a partner site. The site numbers can be assigned in any order but cannot be changed once assigned.

Site numbers are used to provide a unified naming convention for information belonging to each site. This is accomplished by using the site number as a separate key field in some repository tables and by using the site number as a code prefix for other tables. This identification of information by site provides the foundation for the sharing of information among distributed repositories.

Much of the information you place in the configuration repository must be identified by a user supplied code. The format of this code is important and is validated to conform to the following rules:

- If entering a code on the central site (site 0), then the code must not begin with a numeric character.
- If entering a code on a partner site (site number other than 0), then the code must begin with three numeric digits that identify the partner site.

Using this strategy, the system is able to identify the originating site of each record in the distributed network. The system allows only the originating site to modify a record.

The names of products, product modules, and subtypes are examples of items in the Roundtable system that are affected by site numbering rules.

1.10.2. Deployments and Partner Site Loads

The system provides the ability to do a special form of deployment to partner sites. Deployments to partner sites include selected repository information dumped to text file

format. A utility called the Partner Site Load utility reads this repository information into the partner site repository.

The process of deploying to a partner site is no different that deploying to a customer as discussed earlier, but the type of site must be set to "partner". Partner sites can deploy to other partner sites and to the central site. The central site can deploy to any partner site.

A site receives the deployment package and runs the partner site load utility to update the repository with the new information. The receiving site will usually manage a receipt workspace that represents the latest configuration received. When a receipt workspace is used it must also be updated from the deployment.

1.10.3. Receipt Workspace

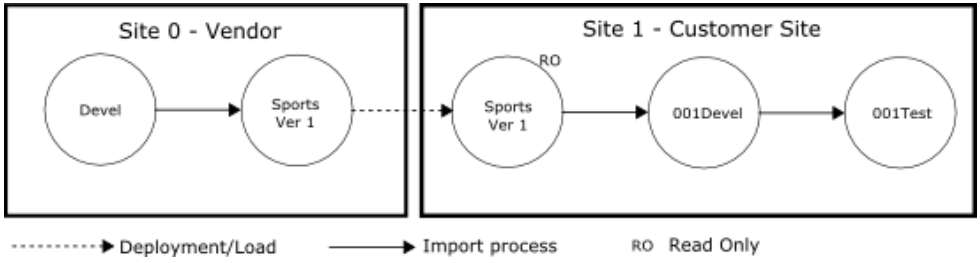
Deployments represent the configuration of a workspace at a given release level. A deployment to a partner site is comprised of two components:

- A source deployment containing a full or incremental update for the remote site
- Additional repository information sufficient to manage the delivered configuration as a workspace at the partner site

A receipt workspace is a read-only copy of the workspace that exists at the sending site. It cannot be altered at the receiving site. However, information can be imported from the receipt workspace into a local workspace. Importing objects from a receipt workspace into locally managed workspaces is performed by the import process.

1.10.4. Customers Doing Development

Many vendors provide source to customers so that the customer’s development staff can enhance and extend the vendor's application. When the customer also has the Roundtable system, it is possible for the vendor to deliver partner site deployments to the customer. Partner site deployment facilitates the integration of application upgrades to the customer in a controlled and managed way. Refer to the following diagram:

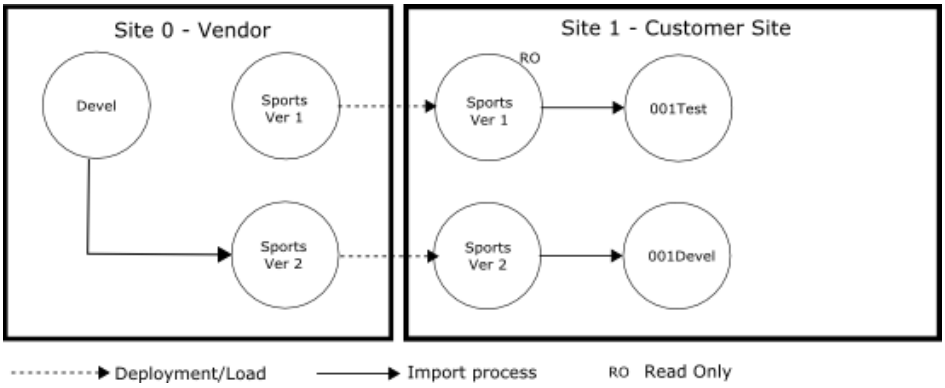


As the vendor develops new enhancements to the Sports product, they are delivered to the

customer as partner site deployments. Partner site deployments contain both repository information and the normal remote site update package.

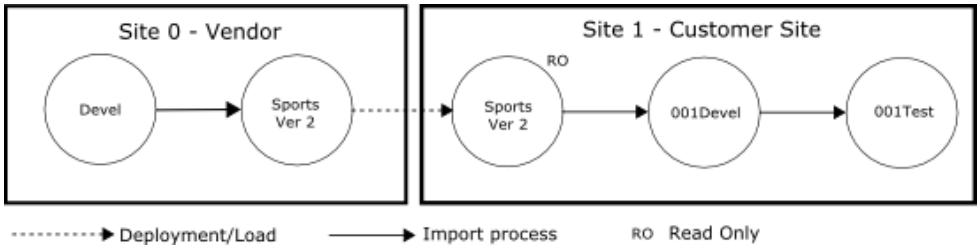
At site 1, the customer imports from the Sports Ver1 workspace into the 001Devel workspace. Where necessary, the customer can replace objects in the application with customized objects (variants) to modify the vendor's application. These custom objects are protected from overwrite in future importation processes. The customer can also extend the functionality of the application by adding new objects to the application.

The diagram shows the vendor's application deployment workspace with a name of Sports Ver 1. This is done to emphasize that the releases received by a remote site in this manner are usually incremental releases, often called dot releases. When a vendor wants to distribute a new major version of a software application, it is sometimes necessary for both the vendor and the customer to manage a legacy system for a period of time. The following diagram shows how this might be done:



In the preceding diagram the new Sports Ver 2 application is delivered to the customer in a new receipt workspace, and the workspace promotion strategy is changed at the customer's site to do integration and development with the new application. Legacy systems generally require minor maintenance and modifications, and this can be done in the 001Test workspace. The major work of integrating the new functionality of Sports Ver 2 is performed in the 001Devel workspace.

When the integration of the new system is completed, the legacy system can be dropped as shown in the following diagram:



1.10.5. Custom Product Modules

In the preceding section you saw how it is possible for an application system to be delivered into a receipt workspace at the customer site. Objects are then imported from the receipt workspace into the customer's development workspace. Note that the customer can replace objects in the application system with custom objects (variants) as required in the development workspace without fear that these will be overwritten during future imports.

This protection from overwrite is accomplished by creating custom products and product modules that belong to the customer site. The new objects created to replace an object in the vendor's application are created under a product module belonging to the customer's site. The import process will not overwrite an object in the target workspace when the object's product module is different from that found in the source workspace. This protects the custom objects from being overwritten.

To replace an object with a custom object in the application:

1. Create a custom product and product module that will own the new custom object if necessary. You might already have custom products and product modules from some previous modification.
2. Assign the custom product and product module to the customer's development workspace sources if they are not already assigned. This is done through Roundtable's Workspace Sources Window.
3. Add a new object as usual, but use the name of the existing object, and use your custom module for the new object. The existing object source is provided as a starting point for your new object.

1.10.5.1. Distributed Development Scenario # 1

One simple form of distributed development occurs when a single organization has two development sites that cannot be connected to a central configuration repository. For this example, assume that a cooperative software development effort is pursued by two development teams separated geographically. Team A is located in India and team B is located in California.

Each team has one configuration repository and one or more workspaces relating to their different responsibilities. The teams have the following responsibilities:

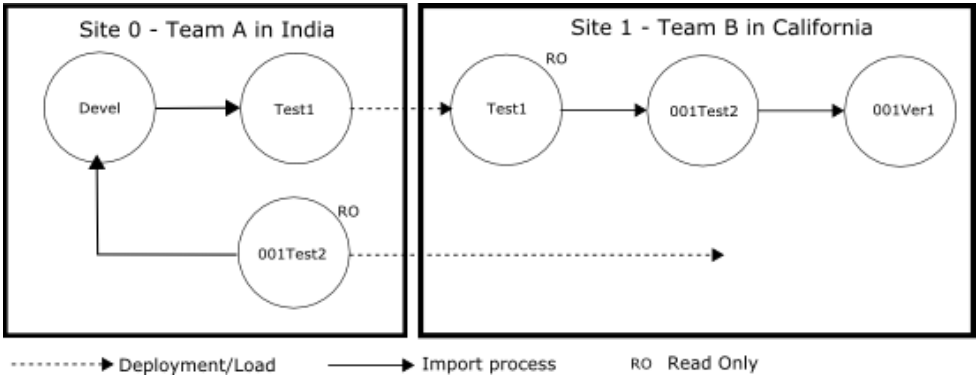
Team A - India

- Primary Development
- Unit Testing

Team B - California

- System Testing
- Deployment to Customers
- Support

The following diagram describes the distributed development process with a workspace network map:



The preceding workspace network map shows six workspaces. The objects in the Devel and Test1 workspaces at site 0 can be modified by the members of team A at site 0. The objects in the 001Test2 workspace at site 0 cannot be modified by team A, Instead, only the partner site load utility can modify the contents of the 001Test2 workspace because it is a receipt workspace. A receipt workspace is always a read-only workspace as indicated by the RO designation in the diagram.

The objects in the Test1 workspace at site 1 cannot be modified by team B. Again, only the partner site load utility can modify the contents of the Test1 workspace because it is a receipt workspace.

The purpose of each of these workspaces is defined by the workflow of the teams:

Workspace	Work Performed
Devel	Primary development area.
Test1	Updates are imported from Devel into Test1. Unit testing is performed in this area. Deployments to the partner site in India are performed from this workspace.
001Test2	Updates are imported from Test1 into 001Test2. System testing and emergency fixes are performed in this workspace. Objects fixed in this workspace begin as a copy of the object imported from Test1. These object copies belong to a product module that is owned by site 1. Deployments for site 0 are made out of the 001Test2 workspace. This makes it possible for the development team at site 0 to see any fixes made to the software application by team B at site 1. By using the visual difference facility team A can identify what changes should be incorporated into the system.
001Ver1	Deployments to create product packaging are made from this workspace.

1.10.5.2. Distributed Development Scenario # 2

A more complex form of distributed development occurs when a single organization has two development sites that cannot be connected to a central configuration repository and primary development is shared. For this example, assume that a cooperative software development effort is pursued by two development teams separated geographically. Team A is located in India and team B is located in California.

Each team has one configuration repository and one or more workspaces relating to their different responsibilities. The teams have the following responsibilities:

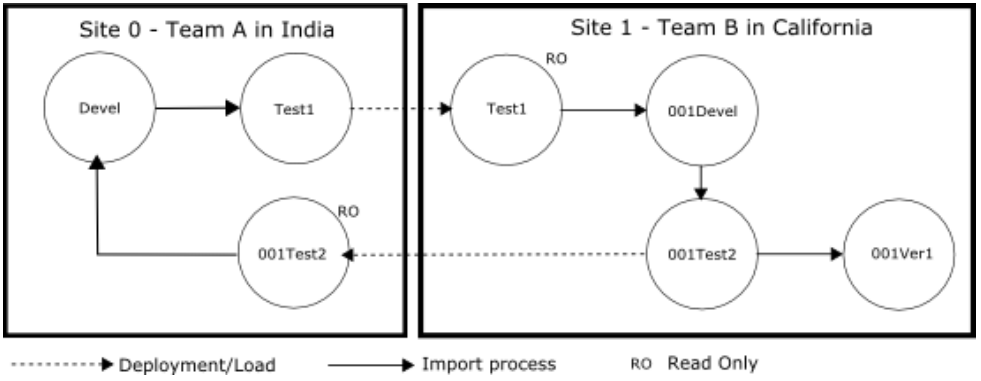
Team A - India

- Primary Development Accounting
- Unit Testing Accounting

Team B - California

- Primary Development Operations
- Unit Testing Operations
- System Testing for full system
- Deployment to Customers
- Support

The best way to describe the distributed development process is with a workspace network map as shown below:



The workspace network map above shows seven workspaces. The objects in the Devel and Test1 workspaces at site 0 can be modified by the members of team A at site 0. The objects in the 001Test2 workspace at site 0 cannot be modified by team A. Instead, only the partner site load utility can modify the contents of the 001Test2 workspace because it is a receipt workspace. A receipt workspace is always a read-only workspaces as indicated by the RO designation in the diagram.

The objects in the Test1 workspace at site 1 cannot be modified by team B. Again, only the partner site load utility can modify the contents of the Test1 workspace because it is a receipt workspace.

The purpose of each of these workspaces is defined by the workflow of the teams:

Workspace	Work Performed
Devel	Primary development area for Accounting. Used by team A at site 0. The Operations code developed by team B at site 1 is imported from the workspace 001Test2 into the Devel workspace. Thus the Devel workspace contains the entire system. Members of team A can only modify objects that belong to product modules owned by site 0.
Test1	Updates are imported from Devel into Test1. Unit testing is performed in this area. Deployments to the partner site 1 are performed from this workspace.
001Devel	Primary development area for Operations. Used by team B at site 1.
001Test2	Updates are imported from Test1 into 001Test2. System testing and emergency fixes are performed in this workspace. Objects fixed in this workspace begin as a copy of the object imported from Test1. These object

Workspace	Work Performed
	copies belong to a product module that is owned by site 1. Deployments for site 0 are made from the 001Test2 workspace. This makes it possible for the development team at site 0 to see any fixes made to the software application by team B at site 1. By using the visual difference facility team A can identify what changes should be incorporated into the system.
001Ver1	Deployments to create product packaging are made from this workspace.

2

The Tabletop

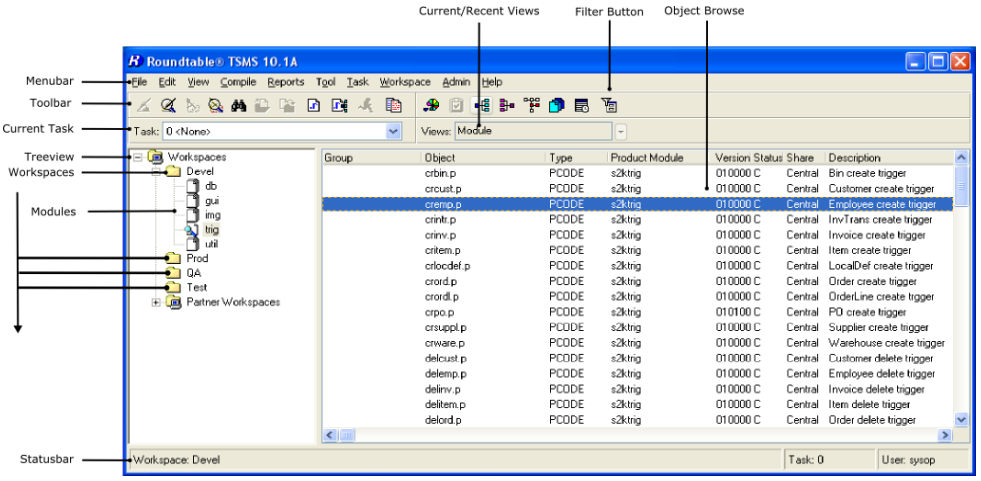
2.1. Introduction

Roundtable manages the collection of objects that make up a software application in a Workspace. The Roundtable Tabletop provides you with an organized view of this Workspace and places a number of important productivity tools within easy reach.

This overview of Roundtable Tabletop demonstrates how Roundtable is tightly integrated with the OpenEdge ADE.

2.2. Roundtable Tabletop

Welcome to the Roundtable Environment! You access most of the functions in the Roundtable system through the Tabletop window shown below:



The contents of the Tabletop Object Browse change based upon the selected view. If the Object Properties window (see Section 2.5, “Object Properties Window” [2–12]) is open, the contents of the window change as you select an object in the Object Browse.

The Tabletop is the main window you use to perform work. It consists of the following user interface elements:

Tabletop Area	Description
Menu bar	A group of menus that provide access to many Roundtable functions, such as adding new objects, searching for objects, changing the view, and accessing other windows in the system.
Toolbar	The toolbar contains buttons that execute commonly required operations.
Current Task	A drop-down list from which you select a WIP Task. If a Workspace is selected, only WIP Tasks for the selected Workspace appear in the list.
Workspaces	TreeView nodes by which you select the current Workspace. Workspaces are represented by a file folder icon. Roundtable connects the application databases for the selected Workspace.
Modules	TreeView nodes by which you select a Workspace Module. An icon resembling sheets of paper represents Modules. The currently selected Module is represented by a magnifying glass over a sheet of paper.
Object Browse	The Object Browse is for you to select an object or object component to view or edit. Objects are the configuration items that comprise your software application. The kinds of objects in a OpenEdge application include program source files, binary bitmap files, text files, documentation files and the schema objects that define your database. The information shown in the Object Browse varies with the currently selected view.
Status Bar	Indicates the current Workspace, Task and User.
Filter Button	Displays a window that allows you to filter the objects shown in the Object Browse for the currently selected Module. The **Filter Button** Button is only enabled in Module view.
Current/Recent Views	A drop-down list that indicates the current view, and allows you to return to a recent view. The recent views list contains up to 20 most-recent views.

2.3. Views

You control the content of the Tabletop by selecting a view. The views provided include:

- Module: Shows objects belonging to current Workspace Module and group.
- Task: Shows objects modified under current Task
- Xref: Shows all objects used by a specified object.
- Where Used: Shows all objects using a specified object.

- Version List: Shows all versions of selected object in any Workspace.
- Informal Xref: Shows all objects that use an informal object.
- Object History View: Shows Workspace event history for a specified object

2.3.1. Module View

In Module View, the Object Browse contains objects belonging to the Module selected from the TreeView. By default, Roundtable uses Group codes (user defined values that can be entered for each object) to sort the objects in the Object Browse. You can assign the same Group code to a set of closely related objects so they appear together in the Object Browse.

Follow these steps to use Module View.

1. Choose View → Objects in Module View or **Module View** button.
2. Use the TreeView to select a Module in the Workspace. Only those objects in the selected Module appear in the Object Browse.
3. (Optional) Use the **Filter Button** Button to specify a filter that restricts objects. You can filter my object Group, Type, object name, and Product Module.

The Object Browse contains the following fields:

Field	Description
Group	The object Group.
Object	The object name.
Type	The object Type.
Product Module	The object#s Product Module.
Version	The object Version.
Status	Displays object status as either C (complete) or W (work in process).
Share	The object#s Share Status.
Description	The object description.

2.3.2. Task View

The Task View fills the Object Browse with objects belonging to the Task specified in the Task drop-down list. Only work-in-process tasks can be viewed in this manner. You must use the Roundtable Tasks window to see the list of objects associated with completed tasks.

Follow these steps to use Task View.

1. Choose View → Objects in Task View or **Task View** button.
2. If the Task is not already selected, use the Task drop-down list to select a Task.

The Object Browse contains the following fields:

Field	Description
Version	The object version.
Object	The object name.
Status	Displays object status as either C (complete) or W (work in process).
PModule	The object#s Product Module
Prev. Ver	The previous version of the object.
Task #	The object version#s Task (i.e. the current Task).

2.3.3. Xref View

The Xref View is useful for examining the architecture of your application and navigating through the architecture quickly. You may go through your application hierarchy recursively by selecting Xref on an object shown in the Object Browse presented by a previous Xref.

Follow these steps to use Xref View.

1. Select an object in any other view.
2. Choose View → Object Xref View or the **Xref View** button. The Object Browse displays with all objects used by the selected object.

The Object Browse contains the following fields:

Field	Description
Object	The name of the object.
Actions	The types of actions performed on the referenced object by a compiled procedure: A - Accessed C - Created

Field	Description
	D - Deleted E - Executed I - Included N - New P - Published, Subscribed or Unsubscribed R - Referenced S - Searched U - Updated W - Whole Index Search X - External Reference
Xref Type	The type of cross reference: ANNOTATION - Code Annotation CLASS - Class created or cast CONSTRUCTOR - Constructor defined DATA-MEMBER - Data-member accessed or defined DBASE - Database DESTRUCTOR - Destructor defined DLL - Windows DLL defined EVENT - Published, Subscribed, or Unsubscribed event FIELD - Database Field FILE - Database File FUNC - Function Defined GVAR - Global Variable

Field	Description
	IMPLEMENTATION - Interface Implementation INCLD - Include file used INDEX - Index INTERFACE - Interface Defined INTPROC - Internal Procedure METHOD - Method invoked or defined PART - Object part included PROG - Program PROPERTY - Class Property SDS -Shared Dataset SEQ - Database Sequence SFRM - Shared Frame SOREF - SmartObject Reference SUBCLASS - Class Inheritance SVAR - Shared variable SWF - Shared Workfile TFLD - Temp-table Field WFLD - Shared Workfile Field XINCLD - External include _FILE - Metaschema _File _FIELD - Metaschema _Field _INDEX - Metaschema _Index
Ref Text	Referenced object name or reference text. In most cases, this will be identical to the object name. In some cases, the text provides additional

Field	Description
	information about the usage of the referenced object.

2.3.4. Where Used View

From the Where Used View, you can ensure that a change in the selected object is compatible with each of its users. For example, when you change the arguments of an include file, you can select the include file object, and use the Where Used View to navigate to each of the procedures that use the include file.

Follow these steps to use Where Used View.

1. Select an object in any other view.
2. Choose View → Object Where Used View or the **Where Used View** button. The Object Browse displays with all objects that use the selected object.

The Object Browse contains the following fields:

Field	Description
Object	The name of the object.
Actions	The types of actions performed on the referenced object by a compiled procedure: A - Accessed C - Created D - Deleted E - Executed I - Included N - New P - Published, Subscribed or Unsubscribed R - Referenced S - Searched U - Updated

Field	Description
	W- Whole Index Search X - External Reference
Xref Type	The type of cross reference: ANNOTATION - Code Annotation CLASS - Class created or cast CONSTRUCTOR - Constructor defined DATA-MEMBER - Data-member accessed or defined DBASE - Database DESTRUCTOR - Destructor defined DLL - Windows DLL defined EVENT - Published, Subscribed, or Unsubscribed event FIELD - Database Field FILE - Database File FUNC - Function Defined GVAR - Global Variable IMPLEMENTATION - Interface Implementation INCLD - Include file used INDEX - Index INTERFACE - Interface Defined INTPROC - Internal Procedure METHOD - Method invoked or defined PART - Object part included PROG - Program

Field	Description
	PROPERTY - Class Property SDS -Shared Dataset SEQ - Database Sequence SFRM - Shared Frame SOREF - SmartObject Reference SUBCLASS - Class Inheritance SVAR - Shared variable SWF - Shared Workfile TFLD - Temp-table Field WFLD - Shared Workfile Field XINCLD - External include _FILE - Metaschema _File _FIELD - Metaschema _Field _INDEX - Metaschema _Index
Source Type	The type of source reference: CLASS - Class DBASE - Database FILE - Database File INTERFACE - Interface PROG - Program
Ref Text	Referenced object name or reference text.

2.3.5. Version List View

In the Version List View of an object, the Object Browse is filled with all versions of the selected object regardless of the Workspace in which the versions were created. Each row in the Object Browse shows a different version of the object. This makes it possible to quickly review the changes made to the object in all Workspaces.

Follow these steps to use Versions List View.

1. Select an object in any other view.
2. Choose View → Object Version List View or **Version View** button.

The Object Browse contains the following fields:

Field	Description
Version	The version number.
Object	The object name.
Status	Displays object status as either C (complete) or W (work in process).
Pmodule	The object version#s Product Module.
Prev. Ver	The version from which a version was created.
Task#	The Task under which the version was created.
Update Notes	The update notes for the version.

2.3.6. Version Ancestry View

In the Version Ancestry View of an object, the Object Browse lists the object version currently assigned to the Workspace, followed by the ancestry for the selected version - regardless of the Workspace or Product Module in which the ancestor versions were created. The ancestry is displayed in reverse order (the selected version, followed by its immediate ancestor, followed by that version's immediate ancestor, and so forth).

Follow these steps to use Versions Ancestry View.

1. Select an object in any other view.
2. Choose View → Version Ancestry View or **Version Ancestry** button.

The Object Browse contains the following fields:

Field	Description
Version	The version number.
Object	The object name.
Status	Displays object status as either C (complete) or W (work in process).
Pmodule	The object version#s Product Module.
Prev. Ver	The version from which a version was created.
Task#	The Task under which the version was created.
Update Notes	The update notes for the version.

If the object has been moved from another Product Module using Roundtable 9.1A or later, the versions of the object in the other Module appear in red.

2.4. Object History View

In the Object History View, the browse table is filling with a complete history of each action taken on the selected object in the current Workspace.

Follow these steps to use the Object History View:

1. Select an object in any other view.
2. Choose View → Object History View or chose the **Object History** button.

The Object History View contains the following fields:

Field	Description
Event#	The counter for the event
Date	The date the action occurred
Action	The type of action performed
Version	The object version on which the action was performed
User Id	The user who performed the action
Product Module	The Product Module in which the object resides
Release Info	The first Release in which this action appeared

2.4.1. Informal Object Xref

The Informal Object Xref is a cross-reference that shows each informal object used by a selected object. Informal objects include items that are not explicitly tracked as objects by Roundtable.

Follow these steps to use Informal Object Xref.

1. Choose View → Informal Object Xref . The Select Informal Xref Parameters dialog box appears.
2. Select an object type from the Referenced Object Type drop-down list.
3. Type a name in the Referenced Object Name field, then choose the **OK** button.

2.4.2. Recent Views

In the Recent Views List, the Object Browse displays a history of the navigation you have performed in a Workspace through the selection of various views on various objects.

Follow these steps to use Recent View.

1. Choose the **Down-arrow** button to the right of the Views box above the Object Browse. A popup menu of recent views appears.
2. To switch to any of these previous views, select an item from the popup menu.

Entries are created in the recent list each time you change the current view. The list can contain up to 20 views.

2.5. Object Properties Window

You can view information about the select object by viewing the Object Properties window. To view the Object Properties window, choose View → Object Properties from the Tabletop menu.

As you select an object in the Object Browse, the contents of the folders of the Object Properties window are filled with information about the selected object or object component. Choosing the folder tab brings the contents of the folder to the top so that you can see what it contains. There folder types available vary with the current type of object and view selected. The folders provided include:

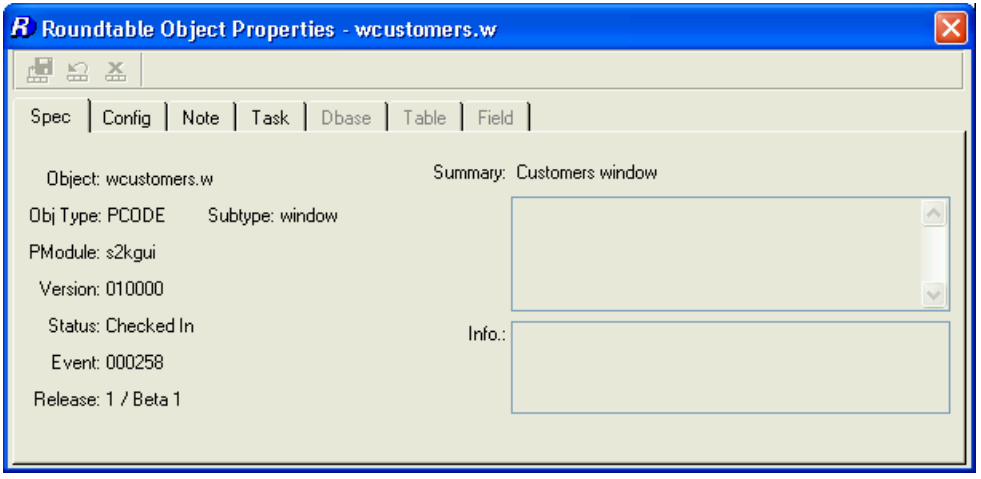
Spec	Object version information for selected object version
Config	Configuration of object in Workspace
Note	Description of change made for selected object version

Spec	Object version information for selected object version
Task	Task information for selected object version
Dbase	Database connection parameters for PDBASE object and DBase menu
Table	Table header definition for PFILE object and table menu
Field	Field attributes defined for PFIELD object and field menu

The following sections provide a brief description of each folder available in the system. More detailed descriptions of these folders appear in the section Objects.

2.5.1. Spec Folder

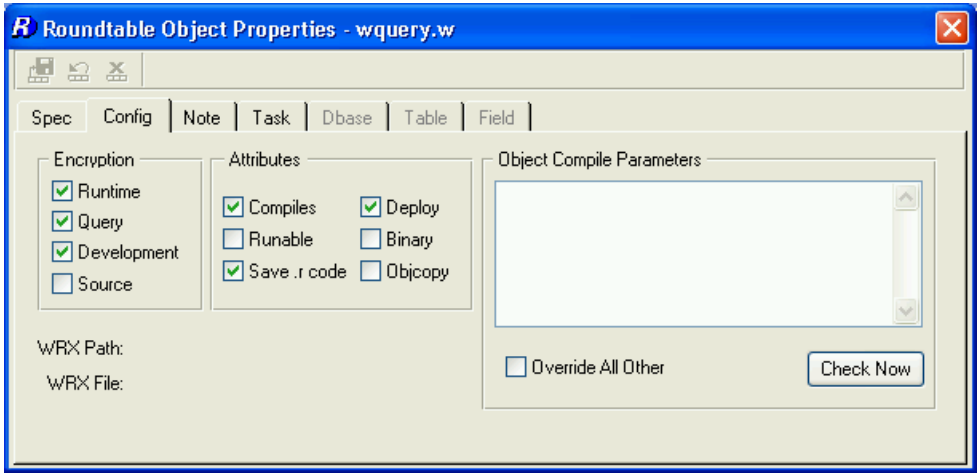
The Spec folder contains the specification of the object version selected in the Object Browse. The specification information includes the object's version information, a brief synopsis of the object's function and the status of the object. The Spec Tab is available for all objects.



For more detailed information, see Section 6.3.1, “Spec Folder Description” [6–2].

2.5.2. Config Folder

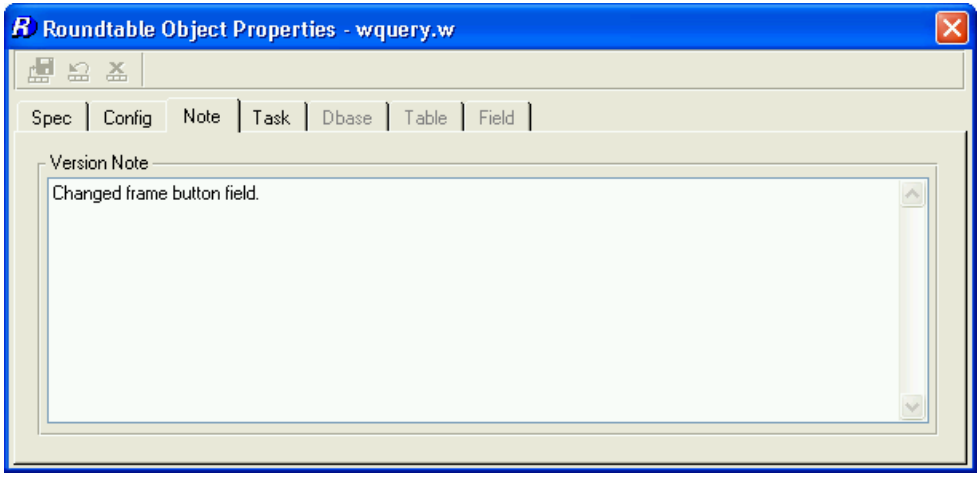
The Config folder contains the configuration of the object currently selected in the Object Browse. This configuration information determines how operations on the object are handled in the Workspace. This folder is only shown for PCODE and DOC type objects. Most of the fields are not enabled for DOC type objects.



For more detailed information, see Section 6.4.1, “Config Folder Description” [6–6].

2.5.3. Note Folder

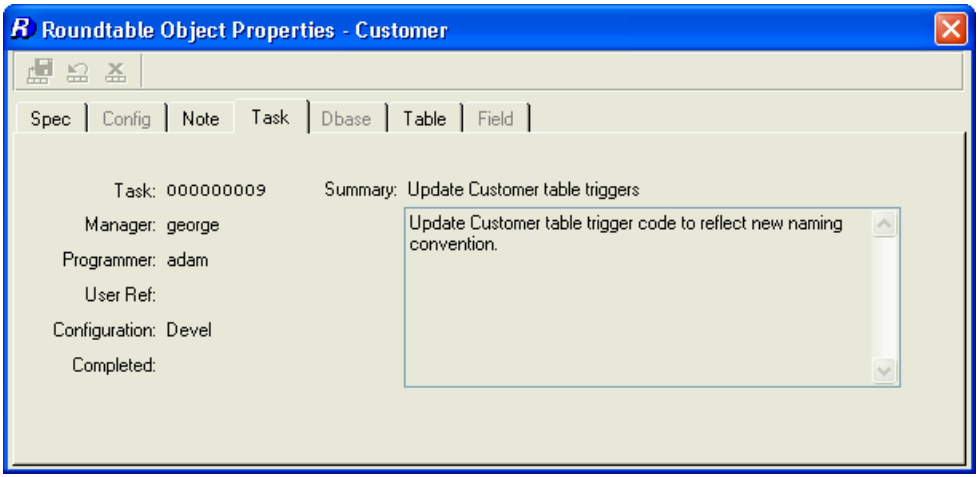
The Note folder contains the update history note of the object version selected in the Object Browse. Each time you close a file you have modified, Roundtable prompts you for this note. This tab is available for all objects.



For more detailed information, see Section 6.3.3, “Note Folder Description” [6–4].

2.5.4. Task Folder

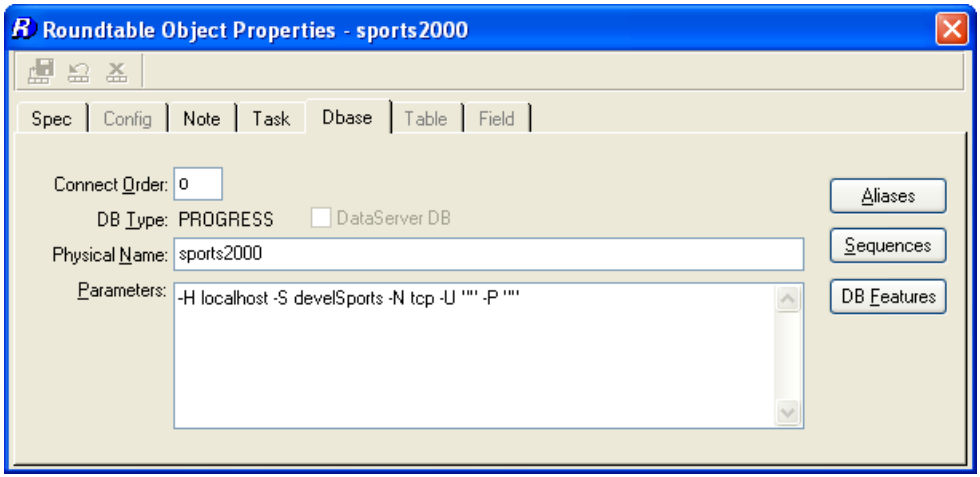
The Task folder contains information about the Task under which the object version selected in the Object Browse was created. This tab is available for all objects.



For more detailed information, see Section 6.3.2, “Task Folder Description” [6–3].

2.5.5. Dbase Folder

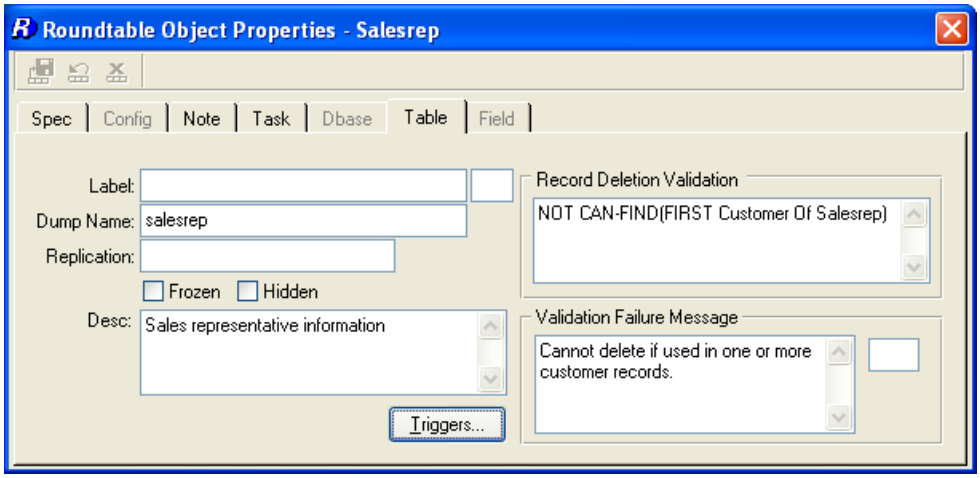
The Dbase folder associates a physical database with the PDBASE object selected in the Object Browse. The information in this folder specifies where the database resides and the connection parameters required to connect to the database. The Connect Order field allows you to specify the order in which multiple databases in a Workspace are connected. The first application database connected in a Workspace is connected with the DICTDB *alias*.



For more detailed information, see Section 6.7.1, “Dbase Folder Description” [6–15].

2.5.6. Table Folder

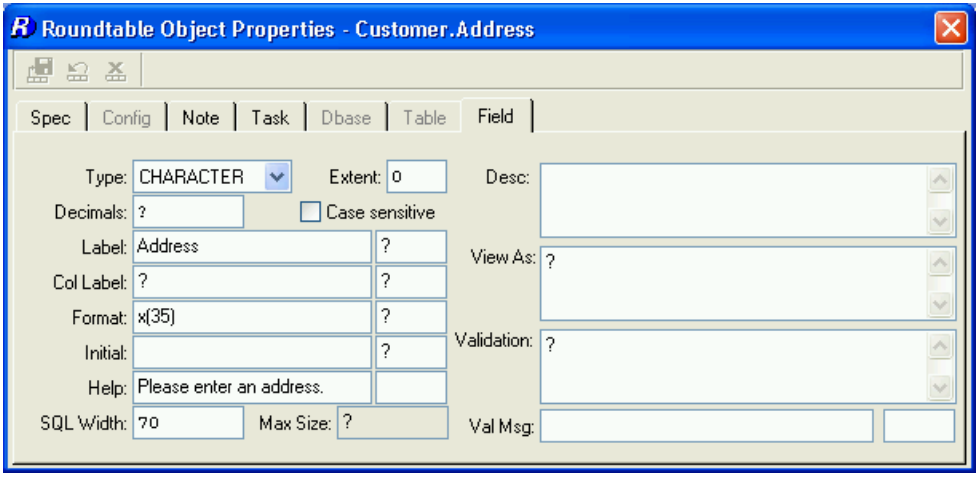
The Table folder contains the PFILE associated with the PFILE object selected in the Object Browse.



For more detailed information, see Section 6.8.1, “Table Folder Description” [6–27].

2.5.7. Field Folder

The Field folder contains the attributes of a field defined by a PFIELD object. This folder is available when a PFIELD object is selected in any view.

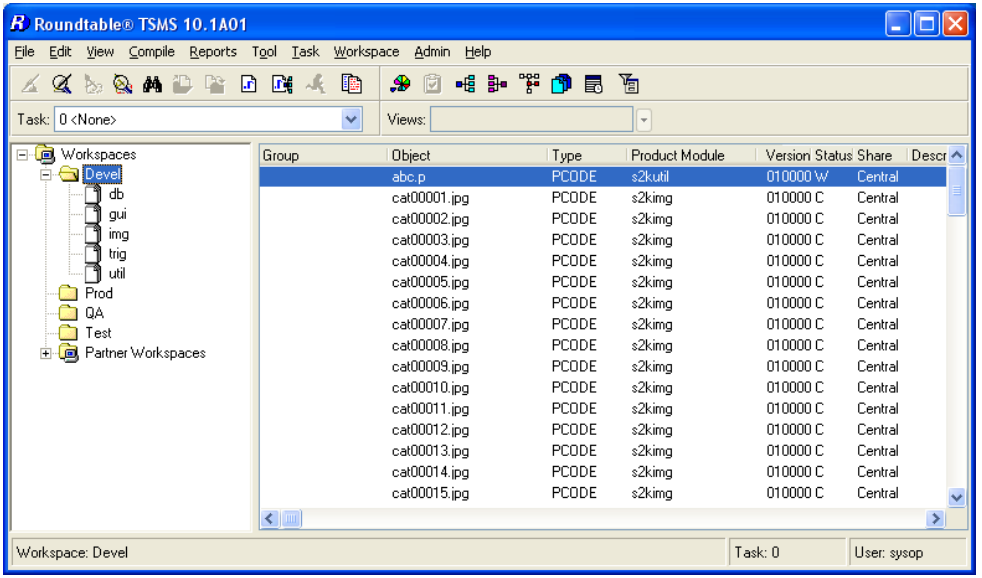


For more detailed information, see Section 6.9.1, “Field Folder Description” [6–33].

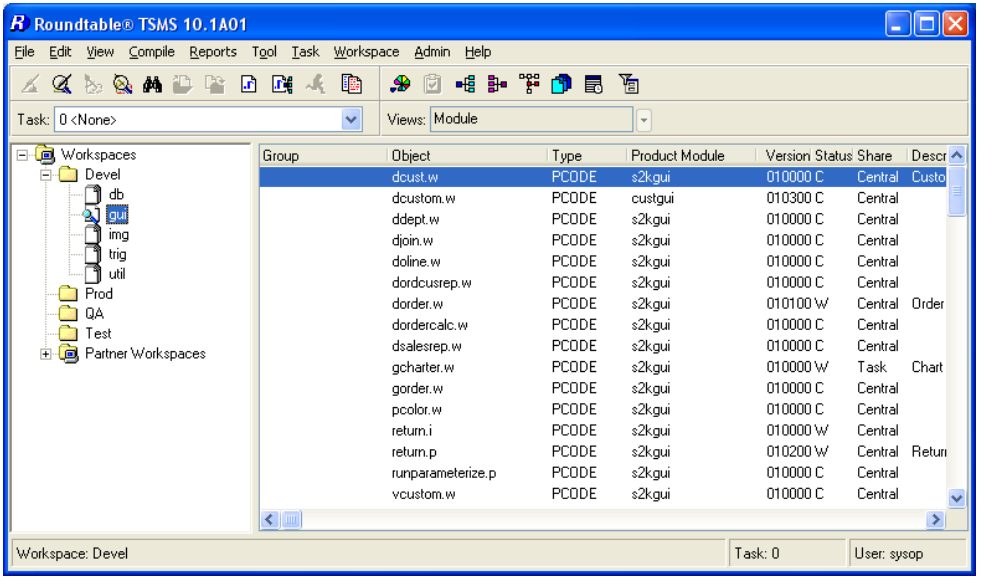
2.6. Common Operations from the Tabletop

The first action you take after entering the Roundtable environment is to select a Workspace from the TreeView on the Tabletop. Selecting a Workspace causes Roundtable to setup your environment so that you can view the contents of the Workspace.

Here is the result of selecting the "Devel" Workspace in the TreeView. Note that the Tabletop defaults to a Module View.



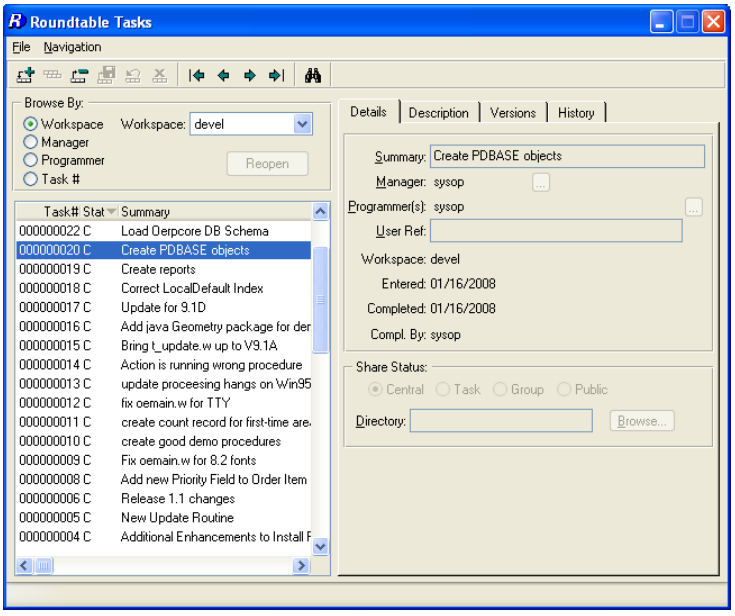
You select Modules from the child nodes of the Workspace folders in the TreeView list. Here is the result of changing the selected Module to the Module "gui":



The Object Browse now contains those objects belonging to the gui Module of the Devel Workspace.

2.6.1. Creating a Task

Before you can modify objects in the Workspace you must check out the object under a work-in-process Task. To create a Task you choose Task → Task Maintenance from the Tabletop menu and then create the Task using the Tasks Window shown below.

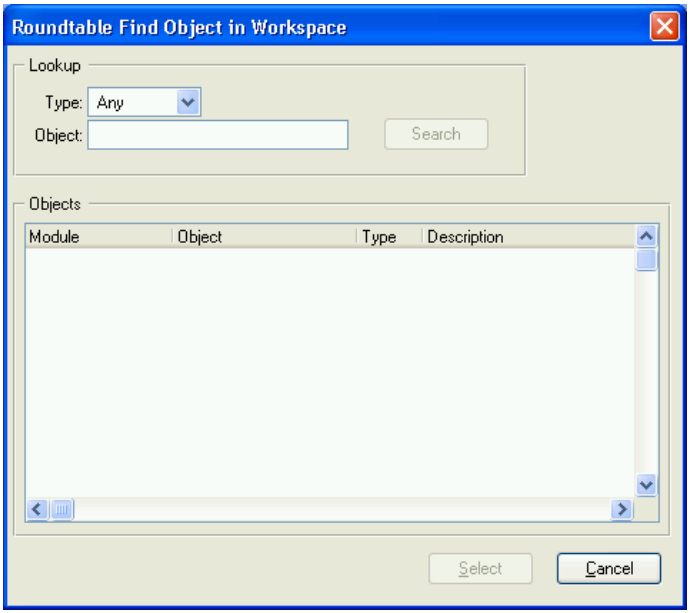


For detailed instructions on creating tasks, see Section 5.3.4, “Adding a Task” [5–5].

2.6.2. Finding an Object

From the Tabletop, you can search for any type of object or object group. Roundtable even locates objects not in the current Workspace Module and allows you to change to their Workspace Modules automatically.

1. Choose Edit → Find Object from the Tabletop menu bar. The Find Object in Workspace dialog box appears:



2. Optionally select an Object Type using the Type drop-down list.
3. Enter a partial or full search pattern in the Object field. The pattern can contain wildcard characters * (multiple characters) and ? (single character).
4. Choose the **Search** button. Roundtable searches for objects that match the Type that you selected and the pattern and that you entered.
5. If Roundtable finds one or more objects matching your search criteria, those objects are displayed in the Objects browse on the lower portion of the dialog. Otherwise, a message appears.
6. To select a found object, select the object in the Objects browse on the lower portion of the dialog and choose the **Select** button or double-click on the object.

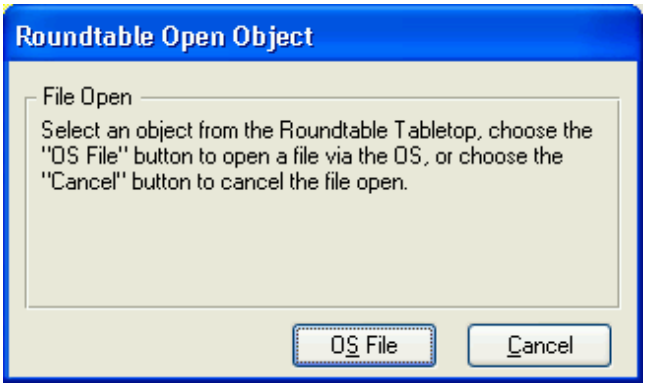
2.6.3. Loading an Object into AppBuilder Directly from the Tabletop

1. Ensure that AppBuilder is running.
2. Select an object in the Object Browse.
3. Choose either the Edit in **Object History** button or View in **Object History** button on the Tabletop toolbar. Optionally, if the object is formatted for AppBuilder, you can instead double-click on the object to open it in AppBuilder.

You cannot open an object for editing if it is not WIP under the currently selected Task.

2.6.4. Loading an Object from AppBuilder

When Roundtable is running, the OpenEdge AppBuilder redirects all of its file open, save, save-as, and close activities to the Tabletop. For example, when you choose File → Open from the AppBuilder menu bar, the Roundtable Open Object window appears as shown below.



Also, the caption of the title bar of the Tabletop window changes to "ADE FILE OPEN". Select an object as described in "Loading an Object into AppBuilder Directly from the Tabletop". If necessary you can check out the object before choosing to open it.

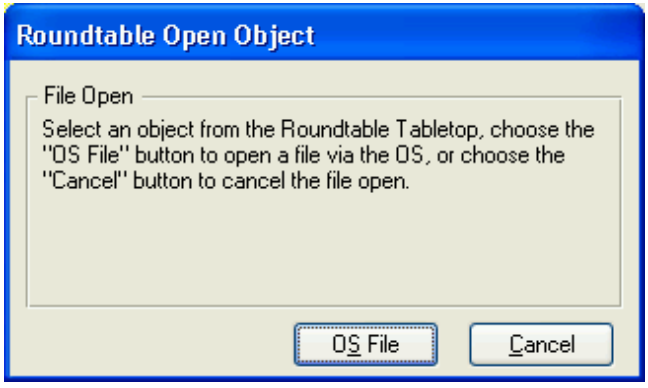
2.6.5. Loading an Object into a Procedure Editor Window Directly from the Tabletop

1. Select an object in the Object Browse.
2. Choose either the **Object History** button or **View in Procedure Editor** button on the Tabletop toolbar. Optionally, if the object is not formatted for AppBuilder, or AppBuilder is not running, you can instead double-click on the object to open it in a Procedure Editor window.

You cannot open an object for editing if it is not WIP under the currently selected Task.

2.6.6. Loading an Object from a Procedure Editor Window

When Roundtable is running, the OpenEdge Procedure Editor redirects all of its file open, save, save-as, and close activities to the Tabletop. For example, when you choose File → Open from the Procedure Editor menu bar, the Roundtable Open Object window appears as shown below.



Also, the caption of the title bar of the Tabletop window changes to "ADE FILE OPEN". Select an object as described in "Loading an Object into a Procedure Editor Window Directly from the Tabletop". If necessary you can check out the object before choosing to open it.

2.6.7. Opening Non-ABL Objects

Often, an application includes non-ABL source files. Bitmaps are a good example of this. You must have defined a Subtype that uses an ABL procedure, such as rtb/p/rtb_open.p, to launch an appropriate editor for the file based on the file#s extension. This procedure queries the Windows registry to check what application is associated with files having the extension of the file selected and then launches that application against the selected file.

1. Select a non-ABL object in the Object Browse.
2. Open the object by double-clicking. The application associated with file#s extension is launched. If the object is not checked out under your current Task, a dialog box opens warning you that the object is read-only. This means that you cannot save any changes you make to the object in the procedure window.
3. When finished viewing/editing the object, close the associated application.
4. If the object was checked out then choose File → Unlock Object to clear the lock on the object. Any locks will be cleared when you exit your Roundtable session as well.

External applications launched by Roundtable can write changes to the files loaded into them even if these files are not checked out! This can lead to problems for other users in the system and possible loss of the changes made to the file. Do not save changes made to read-only objects in external applications.

3

Roundtable Administration

3.1. Introduction

This chapter discusses the following administrative tasks:

- Starting and exiting Roundtable
- Customizing Roundtable using the Windows registry
- Mapping your current OpenEdge application
- Adding and maintaining products and Product Modules
- Adding and maintaining Subtypes
- Setting up your system parameters
- Setting up security
- Dumping and loading your repository database
- Configuring Roundtable, with a step-by-step summary
- Loading your application, with a step-by-step summary

3.2. Shortcut Properties

When adding a shortcut the following properties should be used:

- Description: Roundtable
- Target Location:

Prowin32.exe [database connection parameters] -p [fully qualified path to _rtb.r]

- Start in (example): c:\rtbwork

Each user must have their own working directory (Start in). Working directories cannot be shared.

3.3. Starting Roundtable

Follow these steps to start Roundtable:

1. Run Roundtable using the Roundtable application shortcut. The Roundtable Login dialog box appears.

2. Type your user ID and password.
3. If no users have been defined in the Roundtable repository, the sysop user must be created. For information on creating user accounts, see Section 3.13, “Security” [3–?].
4. Choose the **OK** button. The Roundtable Tabletop and OpenEdge startup procedure (the OpenEdge Desktop by default) appear.

3.4. Logging Out of Roundtable

You can logout of Roundtable by choosing File → Logout from the Roundtable Tabletop menu. When you logout of Roundtable, your Roundtable session ends, and the Tabletop remains open, with no Workspaces displayed or selected. You can login to Roundtable again by choosing File → Login from the Roundtable Tabletop menu. To completely exit Roundtable, please see Section 3.5, “Exiting Roundtable” [3–2] below.

If you need to quickly perform an activity as another user account (such as sysop), and you know the password for that account, simply logout of your current session, login as the other user, perform the activity, logout, and then log back in using your own user name and password. This way, you don't have to completely exit the Tabletop to quickly perform the necessary activity.

3.5. Exiting Roundtable

Choose File → Exit from the OpenEdge startup procedure (the OpenEdge Desktop by default) to close Roundtable along with your OpenEdge session.

If you choose File → Exit Roundtable from the Tabletop, then you can re-start Roundtable

at any time by choosing Tools → Roundtable from AppBuilder.

3.6. Roundtable in the Windows Registry

Roundtable stores workstation-specific information in the Windows Registry, in the key:

HKEY_CURRENT_USER/Software/Roundtable/<version number>

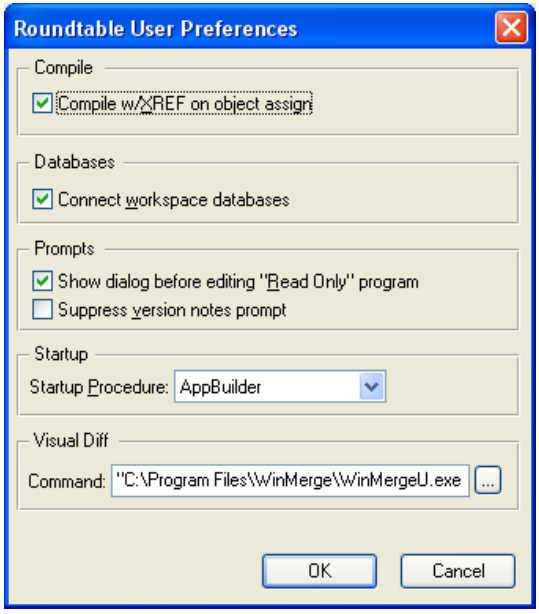
There is no need to edit this information manually as all of this information is stored by Roundtable as necessary. The following table lists each value stored for the workstation:

Key	Value Name	Value Data
Compile	FullComp	This logical value of yes or no indicates whether an object should compile with xref when it is assigned to a Workspace. Set this option using the menu selection Admin → Preferences .
Database	ConnnectWorkspaceDBs	This logical value of yes or no indicates whether to connect the Roundtable client to the Workspace database(s) when a Workspace is selected. Set this option using the menu selection Admin → Preferences .
Paths	<AS Partition Name>	The remote path entered for the specified AppServer partition for uploading Workspace objects to an AppServer partition. These values are set when you enter a remote path using the Roundtable Server Upload tool.
Startup	StartupProcedure	Indicates the OpenEdge procedure (AppBuilder, Desktop, or Procedure Editor) to startup when initializing the Roundtable session. . Set this option using the menu selection Admin → Preferences .
UserPrompts	ReadOnlyPrompt	Logical value. A value of No indicates that an edit action on an object in the Object Browse table will display a message box that explains to the user that it is necessary to checkout the object before it can be edited. Set this option in the dialog box reached through the menu selection Admin → Preferences .
VisDiff	CommandLine	Specifies the command for starting your visual difference application for

Key	Value Name	Value Data
		comparing object sources. Set this option using the menu selection Admin → Preferences .
Window Size	Tabletop	Width, Height size (pixels) of the Tabletop. Stored when you exit the Tabletop.
WindowPosition	Tabletop	X, Y (pixels) position of the Tabletop. Stored when you exit the Tabletop.

3.7. User Preferences

You use the User Preferences dialog a to specify a number of Roundtable settings that affect Roundtable. To change these Roundtable settings, choose Admin → Preferences from the Tabletop menu. The Roundtable User Preferences dialog appears:



The following fields can be found in the Properties Dialog:

Item	Description
Compile w/XREF	Activate to compile objects with xref when prompted to compile an

Item	Description
on object assign	object on assignment to a Workspace.
Connect Workspace databases	Activate to connect the Roundtable session to the Workspace database(s) when a Workspace is selected. Normally, this option should be activated. However, if you are developing remotely, with via an AppServer connection to the Roundtable repository, you may wish to deactivate this option.
Show dialog before editing "Read Only" program?	Activate to display a message box that explains to the user that it is necessary to checkout the object before it can be edited.
Suppress version notes prompt	Activate to suppress the prompt for version notes after closing an object opened for edit.
Startup Procedure	Specifies the OpenEdge procedure (AppBuilder, Desktop, or Procedure Editor) to run when starting Roundtable.
Visual Diff Command	Specifies the command line for running you visual differencing application. The command line should include numbered parameters that will be substituted at runtime as follows: "%1" - Pathname to first file "%2" - Pathname to the second file "%3" - Title for first file "%4" - Title for second file

3.8. Configuration Hierarchy

The first and perhaps most difficult step in setting up the Roundtable system is defining your current configuration hierarchy. The configuration hierarchy is a map of the contents of your application and usually corresponds closely to the architecture of your system.

If you are building a system from scratch, then defining an application architecture that is intuitive and simple to manage in Roundtable can be accomplished by following these rules:

- Divide your system into products that are more or less independent of one another. Often one central product provides general services to other products, which are dependent on those services, but the central product should not be dependent on any other product. For example, consider a suite of applications consisting of General Ledger (GL), Accounts Payable (AP), Accounts Receivable (AR), Pawnshop Point of Sale, and Furniture Store Management. All of these applications may need a set of

general services, such as menu management, security, and telecommunications. An effective way of defining products is to group GL, AP, and AR into a product called Accounting. Make the Pawnshop Point of Sale and Furniture Store Management separate products and make the general services into a product called Core System. Because these products are defined separately, it will be easy to package them individually for deployment later.

- Divide each product into Product Modules that are well-defined subsets of the functional content of the product. In the previous example, the Accounting product has at least three modules: GL, AP, and AR. Both the Pawnshop Point of Sale and the Furniture Store Management product may have many modules.
- Associate a directory with each Product Module by assigning Workspace Modules.

Roundtable provides three logical levels of configuration hierarchy: product, Product Module, and object. If you have an existing physical configuration hierarchy expressed as a deep set of subdirectories, these can be mapped using Workspace Modules. Before loading an existing configuration hierarchy, you must understand it. Then you develop a strategy for mapping these subdirectories to Product Modules.

There are three common methods of organizing file systems to express a configuration hierarchy:

- Application group directories
- Directories by component type
- Application group and component type

3.8.1. Application Group Directories

The most common way of organizing system components is to group source files by Product Module definitions. This is common because structured design methodologies involve the top-down decomposition of a software application by function. The functional hierarchy translates naturally into a hierarchical directory structure. For example, in an accounting package with an accounts payable Product Module and an accounts payable Workspace Module, your directory structure might look like this:

Directory	Directory Content
/abc_system	ABC accounting and POS system directory
/abc_system/ar	Accounts Receivable
/abc_system/ap	Accounts Payable
/abc_system/gl	General Ledger
/abc_system/pos	Point of Sale

This simple configuration hierarchy easily maps into the three-level configuration hierarchy provided by Roundtable. The /abc_system directory becomes the Workspace root path and each subdirectory is then mapped as shown below:

Product	Prod Module	Workspace Module	Subdirectory
Accounting	AR	AR	ar
	AP	AP	ap
	GL	GL	gl
POS	POS	POS	pos

3.8.2. Directories by Component Type

Another common way to arrange directory structures is by the types of components found in the system. This organization is typical when many discrete components are reused across functional boundaries in a software application system. A directory structure organized by component type might look like this:

Directory	Directory Content
/abc_system	ABC accounting and POS system directory
/abc_system/edit	Data entry procedures
/abc_system/rpt	Reporting procedures
/abc_system/batch	Batch procedures

This configuration hierarchy maps into the product and Product Module configuration hierarchy provided by Roundtable, as shown below:

Product	Prod Module	Workspace Module	Subdirectory
Accounting	AR-Edit	Edit	edit
	AP-Edit	Edit	edit
	GL-Edit	Edit	edit
	AR-Rpt	Rpt	rpt
	AP-Rpt	Rpt	rpt
	GL-Rpt	Rpt	rpt
	AR-batch	Batch	batch
	AP-batch	Batch	batch
	GL-batch	Batch	batch
POS	POS-Edit	Edit	edit

Product	Prod Module	Workspace Module	Subdirectory
	POS-Rpt	Rpt	rpt
	POS-batc	Batch	batch

In this mapping, objects that belong to multiple Product Modules coexist in the same subdirectory. If you are developing your system from scratch, do not use this type of directory hierarchy in your application. Instead, use a functional hierarchy if possible.

3.8.3. Directories by Application Group and Component Type

It often makes sense to combine a functional hierarchical system architecture with one based on component types. A combined directory structure may look like this:

Directory	Directory Content
/abc_system	ABC accounting and POS system directory
/abc_system/ar/edit	Accounts Receivable data entry procedures
/abc_system/ar/rpt	Accounts Receivable report procedures
/abc_system/ar/batch	Accounts Receivable batch procedures
/abc_system/ap/edit	Accounts Payable data entry procedures
/abc_system/ap/rpt	Accounts Payable report procedures
/abc_system/ap/batch	Accounts Payable batch procedures
/abc_system/gl/edit	General Ledger data entry procedures
/abc_system/gl/rpt	General Ledger report procedures
/abc_system/gl/batch	General Ledger batch procedures
/abc_system/pos/edit	Point of Sale data entry procedures
/abc_system/pos/rpt	Point of Sale report procedures
/abc_system/pos/batch	Point of Sale batch procedures

This configuration hierarchy can be mapped into Roundtable as shown below:

Product	Prod Module	Workspace Module	Subdirectory
Accounting	AR-Edit	AR-Edit	ar/edit
	AP-Edit	AP-Edit	ap/edit
	GL-Edit	GL-Edit	gl/edit
	AR-Rpt	AR-Rpt	ar/rpt
	AP-Rpt	AP-Rpt	ap/rpt

Product	Prod Module	Workspace Module	Subdirectory
	GL-Rpt	GL-Rpt	gl/rpt
	AR-batch	AR-Batch	ar/batch
	AP-batch	AP-Batch	ap/batch
	GL-batch	GL-Batch	gl/batch
POS	POS-Edit	POS-Edit	pos/edit
	POS-Rpt	POS-Rpt	pos/rpt
	POS-batc	POS-Batch	pos/batch

3.8.4. Using Subtypes to Extend the Configuration Hierarchy

If you have an especially complex configuration hierarchy, use Subtypes to model some subdirectory organization rules. You define Subtypes to ascribe attributes to PCODE objects. One of the attributes you can define is a subdirectory in which a file associated with the PCODE object will be stored.

Consider again the directory structure from the previous section:

Directory	Directory Content
/abc_system	ABC accounting and POS system directory
/abc_system/ar/edit	Accounts Receivable data entry procedures
/abc_system/ar/rpt	Accounts Receivable report procedures
/abc_system/ar/batch	Accounts Receivable batch procedures
/abc_system/ap/edit	Accounts Payable data entry procedures
/abc_system/ap/rpt	Accounts Payable report procedures
/abc_system/ap/batch	Accounts Payable batch procedures
/abc_system/gl/edit	General Ledger data entry procedures
/abc_system/gl/rpt	General Ledger report procedures
/abc_system/gl/batch	General Ledger batch procedures
/abc_system/pos/edit	Point of Sale data entry procedures
/abc_system/pos/rpt	Point of Sale report procedures
/abc_system/pos/batch	Point of sale batch procedures

This configuration hierarchy can be mapped into Roundtable more simply with the use of Subtypes as shown below:

Product	Prod Module	Workspace Module	Sub-Directory
Accounting	AR	AR	ar
	AP	AP	ap
	GL	GL	gl
POS	POS	POS	pos

Subtype	Sub-Directory
EditProc	edit
EditIncld	edit
BatchProc	batch
BatchIncld	batch
RptProc	rpt
RptIncld	rpt

When you create a new PCODE object in a module, Roundtable constructs part of the path to the object based on the Product Module assignment. It then constructs the rest of the path based on the Subtype you assigned to the object. For example, if you created a new data entry program called order.p for the AR Product Module and assigned it a Subtype of EditProc, Roundtable performs the following logic to decide what directory to put it in:

1. Given the assignment of the AR Product Module, Roundtable finds the AR Workspace Module.
2. The directory associated with the AR Product Module is "ar", so Roundtable adds this to the Workspace root path to create "/abc_system/ar".
3. Roundtable finds the Subtype EditProc and adds its associated directory, "edit", to the directory path to create "/abc_system/ar/edit".

Using Subtypes in this manner can be useful when it is necessary to map an existing configuration hierarchy. However, you should avoid this style of configuration hierarchy because it leads to duplication in the Subtypes. In the example above, there might be no difference between the EditProc and BatchProc Subtype specifications except for their associated subdirectories.

For more detailed information on Subtypes, see Section 3.11, “Subtypes” [3–20].

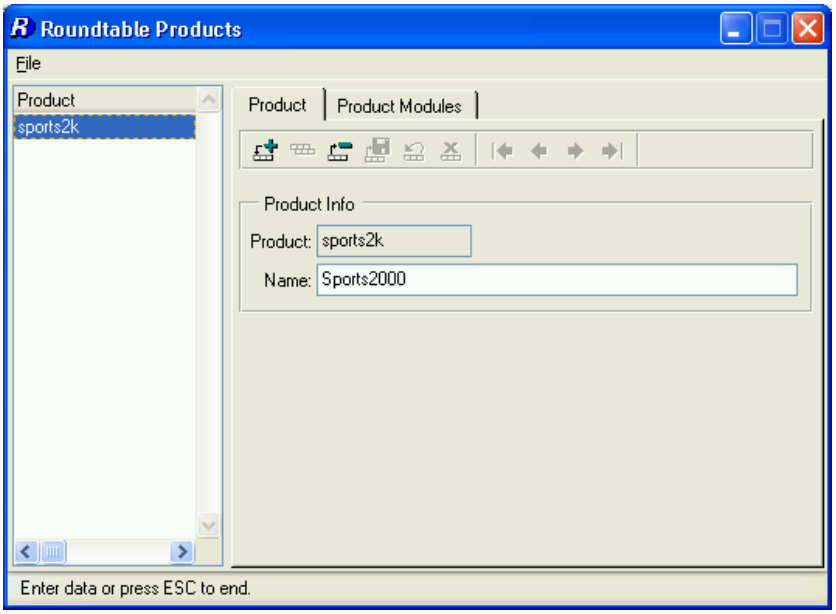
3.9. Products

Once you have defined a strategy for mapping your existing or new system into

Roundtable, you must create the necessary products and Product Modules. This section provides detailed instructions for adding this information to the Roundtable repository.

3.9.1. Products Window Description

Products and Product Modules are managed in the Roundtable Products window:



Item	Description
Product Browse	A browse listing the currently defined Products.
Product	A fill-in for the Product code. Product codes can be up to 8 characters long.
Name	A fill-in field for the product description. It can be up to 40 characters long.
Product Modules	A tab folder that displays each Product Module defined for the current product code.

3.9.2. Adding a Product

Follow these steps to add a new product:

1. Choose Admin → Products from the Tabletop menu. The Roundtable Products window appears.

You must be logged in as the sysop user to perform Product maintenance.

2. Choose the **Add Record** button.
3. Type the code for the new product. The alphanumeric code should describe the major function of the product (acct for accounting, ops for operations, etc.). If your site number is not 0, you must enter the three-digit site number as a prefix for the code. If your site number is 0, you cannot begin your code with a number.
4. Type the name or a description of the new product in the Name field.
5. Choose the **Save Record** button. The new product appears in the Product browse in the Roundtable Products window.
6. Add Product Modules belonging to the new product. For information on how to add Product Modules, see Section 3.9.6, “Adding a Product Module” [3–14]. You may add Product Modules at a later date if necessary.
7. Choose File → Exit to leave the window.

3.9.3. Editing a Product Description

You can only change the product description field for a product. If you want to change the product code, delete the product and re-add it.

Follow these steps to edit a product description.

1. Choose Admin → Products from the Tabletop menu. The Roundtable Products window appears.

You must be logged in as the sysop user to perform Product maintenance.

2. From the Product browse, select the product that you want to edit.
3. Edit the Name of the product, and then choose the **Save Record** button.
4. Choose File → Exit to leave the window.

3.9.4. Deleting a Product

You must delete all Product Modules within a product before you delete the product itself.

Follow these steps to delete a product.

1. Choose Admin → Products from the Tabletop menu. The Roundtable Products window appears.

You must be logged in as the sysop user to perform Product maintenance.

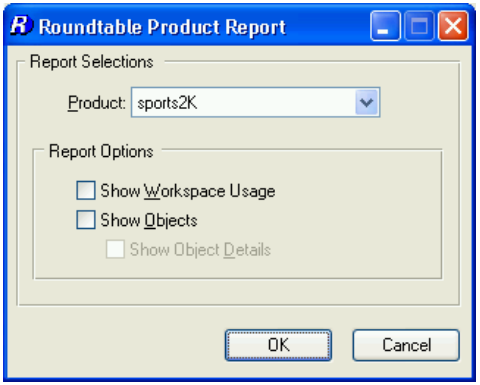
2. From the Product browse, select the product that you want to delete.
3. Choose the **Delete Record** button. A Warning dialog box appears.
4. Choose the **Yes** button to delete the product or the **No** button to cancel this operation.
5. Choose File → Exit to leave the window.

3.9.5. Product Report

The Product Report prints a list of the contents of the product.

Follow these steps to print the report:

1. Choose Reports → Product → Product Report from the Tabletop menu. The Product Report window appears.



2. Select the report options that you want, and then choose the **OK** button.
3. The report appears in a text viewer window.
4. Close the text viewer window to close the report.

The following fields are found in the Product Report window:

Field	Description
Product	A drop-down list to select the Product that you want to report on.
Show Workspace Usage	Prints a list of the workspaces that include the Product Modules in this product.
Show Objects	Prints the latest object version defined in each Product Module.
Show Object Details	Prints the object version description.

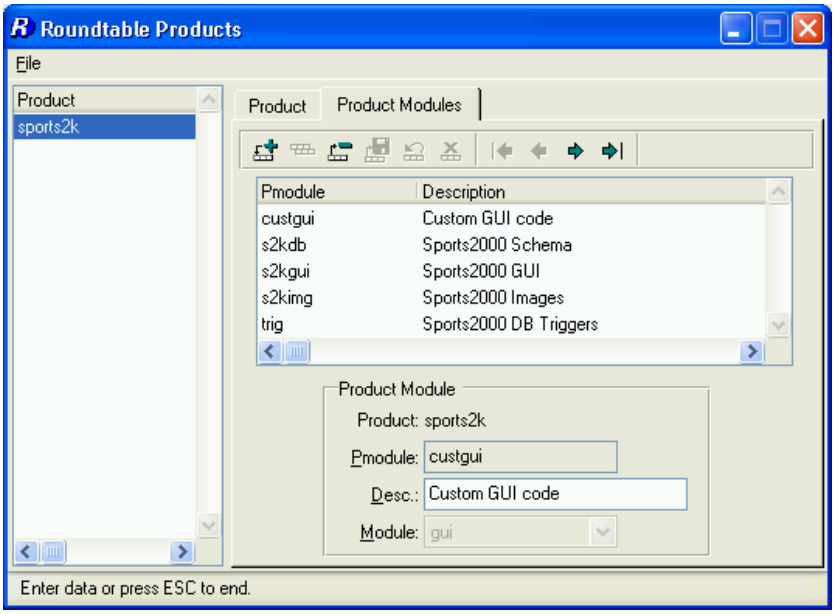
3.9.6. Adding a Product Module

After you create a product, follow these steps to add the Product Modules:

1. Choose Admin → Products from the Tabletop menu. The Roundtable Products window appears.

You must be logged in as the sysop user to perform Product maintenance.

2. From the Product browse, select the product that you want to add a Product Module to.
3. Select the Product Modules tab folder. The Product Modules form appears.



4. Choose the **Add Record** button.
5. Type the code for the new Product Module. This alphanumeric code should describe the function of the module. If your site number is not 0, you must enter the three-digit site number as a prefix for the Product Module. If your site number is 0, you cannot begin your code with a number.
6. Fill in the Product Module Description field for the Product Module.
7. Select an existing Workspace Module definition to associate with the new Product Module. If no existing Workspace Module definition is appropriate for the new Product Module you will first have to create one. For instructions on Workspace Module definitions, see Section 3.10, “Workspace Module Definitions” [3–18]. The primary purpose of the Workspace Module definition is to specify the physical location of code belonging to the Product Module associated with the Workspace Module definition.
8. Choose the **Save Record** button. The new Product Module appears in the Product Modules browse on the folder.
9. Choose File → Exit to leave the window.

3.9.7. Editing a Product Module Description

You can change the Product Module description field but not the Product Module code. To

change a Product Module code, delete the Product Module and re-add it with the new code. You cannot delete a Product Module if any objects have been assigned to it.

Follow these steps to edit a Product Module description.

1. Choose Admin → Products from the Tabletop menu. The Roundtable Products window appears.

You must be logged in as the sysop user to perform Product maintenance.

2. From the Product browse, select the product that contains the Product Module that you want to edit.
3. Select the Product Modules tab folder. The Product Modules form appears.
4. From the Product Modules list, select the Product Module to edit.
5. Change the fields for the Product Module as necessary.
6. Choose the **Save Record** button.
7. Choose File → Exit to leave the window.

3.9.8. Deleting a Product Module

If you have ever used the Product Module, you cannot delete it (even if you aren't using the Product Module now).

Follow these steps to delete a Product Module.

1. Choose Admin → Products . The Roundtable Products window appears.

You must be logged in as the sysop user to perform Product maintenance.

2. From the Product browse, select the product that contains the Product Module that you want to delete.
3. Select the Product Modules tab folder. The Product Modules form appears.
4. From the Product Modules list, select the Product Module to delete.
5. Choose the **Delete** button. A warning dialog box appears.
6. Choose the **Yes** button to delete the Product Module.

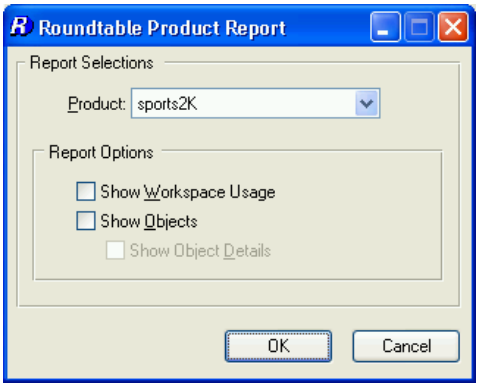
7. Choose File → Exit to leave the window.

3.9.9. Product Module Report

The Product Module Report prints a detailed report of the objects in a Product Module, including the object code, description, version number, status, Subtype, and additional notes for each object.

Steps to print the Product Module Report:

1. Choose Reports → Products → Product Modules Report from the Tabletop menu. The Product Module Report window appears.



2. Select the report options that you want, and then choose the **OK** button.
3. The report appears in a text viewer window.
4. Close the text viewer window to close the report.

The following fields are found in the Product Report window:

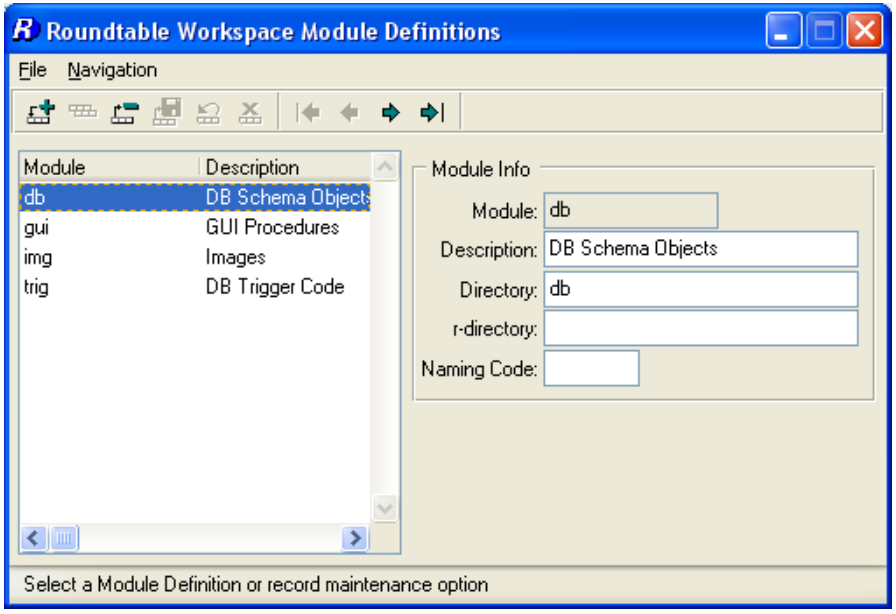
Field	Description
Product	The Product that contains the Product Module that you want to report on.
Pmodule	The Product Module that you want to report on.
Show Workspace Usage	Prints a list of the workspaces that include this Product Module.
Show Objects	Prints the latest object version defined in each Product Module.
Show Object	Prints the object version description.

Field	Description
Details	

3.10. Workspace Module Definitions

The primary purpose of Workspace Module definitions is to specify the physical location of code relative to the Workspace root directory. Essentially they contain a relative subdirectory that is concatenated to the Workspace root directory to render a full path to location of objects in the system. Workspace Module definitions allow you to map an arbitrarily deep level of directory structures to the two-level configuration hierarchy provided by Roundtable. While the Workspace root directory is always different among the workspaces managed by the system, Workspace Module definitions are consistent across all workspaces. Workspace Module definitions are associated with Product Modules in a one-to-many relationship. A single Workspace Module definition can be associated with zero or more Product Modules. Unassigned Workspace Module definitions are ignored by the system.

Use this window for maintaining Workspace Module definition records:



Field	Description
Module	The Workspace Module name.

Field	Description
Description	This is a long description of the Workspace Module is used in reports.
Directory	This is a relative directory path that is appended to the Workspace root path to specify a subdirectory in the Workspace in which objects are stored. The objects stored in this subdirectory are those that belong to Product Modules associated with the Workspace Module definition.
r-directory	This is a relative directory path that is appended to the Workspace root path to specify a subdirectory in the Workspace in which compiled objects are stored. The compile objects stored in this subdirectory are those that belong to Product Modules associated with the Workspace Module definition. If this field is left blank, compiled objects will reside in the same directory as the source object.
Naming Code	This is an optional value that is used by a user-specified naming routine for Subtypes assigned to objects created in Product Modules associated with this Workspace Module definition. See Section 3.11.10, “Name Programs” [3–28] for more information on naming programs.

3.10.1. Adding a Workspace Module Definition

You can access the Workspace Module Definitions window using the following steps:

1. Choose Admin → Workspace Modules Definitions from the Tabletop menu. The Roundtable Workspace Module Definitions window appears.
2. Choose the **Add Record** button.
3. Enter values for the Name, Description, Source Directory, .r Code Directory, and Naming Code fields.
4. Choose the **Save Record** button.
5. Choose File → Exit to leave the window.

3.10.2. Editing a Workspace Module Definition

You may edit any of the fields in the Workspace Module definition except the name of the module. However, Roundtable will not rename directories or move objects to accommodate your changes. A Workspace Module definition defines the physical location of objects under the Workspace root directory. If you change the source directory specification you will have to manually move any affected source code in each Workspace

that contains a module defined by the Workspace Module definition. If you change the .r Code Directory you should delete the affected .r code and then re-compile the affected module. Use of the Naming Code field is optional and the affect of changing it application specific.

You may safely change the Description of the Workspace Module definition.

You may access the Workspace Module Definitions window by choosing the **Maintenance** button in the Products Window as shown in the following steps:

1. Choose Admin → Workspace Modules Definitions from the Tabletop menu. The Roundtable Workspace Module Definitions window appears.
2. Select a Workspace Module definition in the browse table.
3. Edit the Description, Source Directory, .r Code Directory, and Naming Code fields as necessary.
4. Choose the **Save Record** button.
5. Choose File → Exit to leave the window.

3.10.3. Deleting a Workspace Module Definition

You can delete a Workspace Module definition that has not been assigned to any Product Module.

You can access the Workspace Module Definitions window by choosing the **Maintenance** button in the Products Window as shown in the following steps:

1. Choose Admin → Workspace Modules Definitions from the Tabletop menu. The Roundtable Workspace Module Definitions window appears.
2. Select a Workspace Module definition in the browse table.
3. Choose the **Delete Record** button. A warning box appears.
4. Choose the **Yes** button. The Workspace Module definition is deleted.
5. Choose File → Exit to leave the window.

3.11. Subtypes

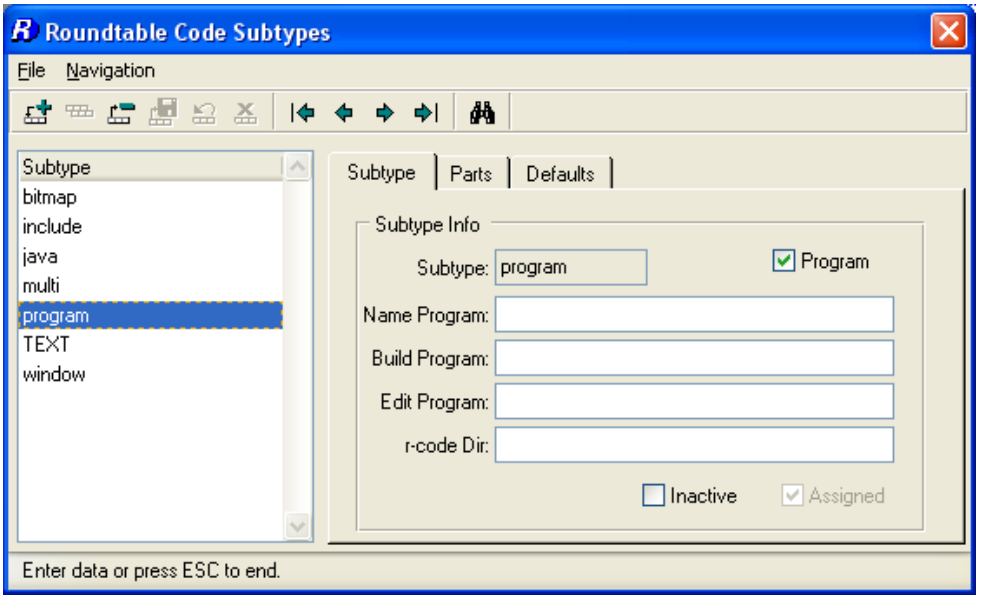
Subtypes control the naming, management, creation, and storage of PCODE objects. Using Subtypes can help enforce coding standards and reduce the number of objects tracked in your system. They can also make training new programmers on your system much easier since Roundtable provides reminders about the requirements of each Subtype. By using Subtypes, you reduce the number of repetitive steps necessary for creating new

PCODE objects. When creating a Subtype, you can:

- Specify a naming program, which tests the naming convention of the object to ensure consistency.
- Specify a build program to run when creating an object, like a screen generator.
- Specify a template to use when Roundtable builds an object.
- Specify up to nine parts (individual files), related by a predefined naming convention, that Roundtable will treat as one object. Then, when checking out objects, you check out only one object instead of nine. This ensures that an object with multiple parts is treated as a single entity.

3.11.1. Code Subtypes Window Description

Use the following Code Subtype window to define Code Subtypes:



The following fields are found in the Subtype Window:

Tab	Field	Description
Subtype	Subtype	The Code Subtype name.
	Assigned	A toggle box that indicates whether an object with the currently selected Subtype exists. Once a Subtype has been assigned to an

Tab	Field	Description
		object, the Subtype cannot be deleted and some editing operations are disallowed.
	Inactive	A toggle box that indicates whether the selected Subtype is inactive. Inactive Subtypes can no longer be used as a Subtype when creating new Objects.
	Name Program	A fill-in for the pathname of a naming program. The use of a naming program is entirely optional. See Section 3.11.10, “Name Programs” [3–28] for more information on naming programs.
	Build Program	A fill-in for the name of the build program that creates source files for objects of this Subtype. The build program can be simple or complex. For example, a build program can be a full-blown screen generator or it can copy a template into the source file. The use of a build program is entirely optional. See Section 3.11.11, “Build Programs” [3–29] for more information on build programs.
	Edit Program	A fill-in for the name of the edit program. For example, if objects of this Subtype are to have a specific format, the edit program can be a custom editor. See Section A.2, “Edit Program: rtb/p/rtb_open.p” [A–1] for an example of an edit program. See Section A.3, “Managing Application Data with the Edit Program” [A–1] for a full description of the edit program.
	Program	A toggle box that indicates whether objects of this Subtype are OpenEdge-compilable programs (Include files are not considered programs).

	r-code Dir	The relative r-code directory for the Subtype. The path for r-code is determined as follows:
		
		1. If r-code directory defined for Workspace Module only:
		
		`<wspace-path>/ \`
		`  <module-rcode-path>/ \`
		`  object.r`
		
		2. If r-code directory defined for Subtype only:
		
		`<wspace-path>/ \`
		`  <subtype-rcode-path/ \`
		`  object.r`
		
		3. If r-code directory for both Workspace Module AND Subtype:

Tab	Field	Description

		<pre><wspace-path>/ \
		<module-rcode-path>/ \
		<subtype-rcode-path>/ \
		object.r</pre>
		 
		Roundtable will not move .r code for you if you change the value of the .r code directory for this Subtype. If you change this value, you will have to move any Subtype .r code manually, or recompile programs of this Subtype.

Parts	Subtype Parts	A Subtype may be comprised of up to ten system files. The first nine of these files are called parts and are user-defined. The tenth file is used for the .wrx generated by the OpenEdge AppBuilder for window procedures that use OCX controls.
	Description	A fill-in for the description of the Subtype part.
	Directory	A fill-in for the directory, relative to the Workspace Module directory, where the part file is stored. Leave this field blank if the part is stored directly in the Workspace Module directory.
	Template	A fill-in for the full path and filename of a template file used to build the part file. This optional field is used only in conjunction with the build program. See Section 3.11.11, “Build Programs” [3–29] for more information on build programs.
	Suffix	A fill-in for the suffix added to the end of the part filename (prior to the extension). If left blank, no suffix is added to the object's name.
	Extension	A fill-in for the extension of the part (for example, "p" for a program). This optional field is commonly used to enforce a naming convention. For instance, a .p extension is used for most OpenEdge procedures created with the Procedure Editor and a .w extension is used for most procedures generated by AppBuilder.
Defaults	All	These toggle-boxes correspond to the object properties on the Config tab of the Object Properties window. When new objects of the Subtype are created, the object's properties will default to the properties defined here For more detailed information, see Section 6.4.1, “Config Folder Description” [6–6].

3.11.2. Subtype Theory

In pre-version 9 OpenEdge programming environments, multiple code parts are not commonly used. Typically, you define Subtypes with only one part each. Possible Subtype definitions Include:

Subtype	Program	Part
Window	Yes	W
Program	Yes	P
Include	No	I

It is not necessary to define a secondary Subtype part to store WRX files as part of your windows programs. Roundtable can automatically find and store WRX files as a part of your PCODE object without requiring you to define a multi-part Subtype. See Section 6.4.7, “WRX Files” [6–11] for a more complete description of how this works.

3.11.3. Subtype Example - Part I

OpenEdge code (PCODE) objects are assigned a user-defined Subtype that controls the naming, management, creation, and storage of one to nine text files (parts) belonging to the object. Consider the following simple Subtype definition:

Subtype: Program

Program: Yes

Part #	Description	Suffix	Ext.
1	Simple program		p

This Subtype describes programs that consist of a single text file with a ".p" extension.

3.11.4. Subtype Example - Part II

In the following example, a simple include file Subtype is defined:

Subtype: Include

Program: No

Part #	Description	Suffix	Ext.
1	Simple include		i

3.11.5. Subtype Example - Part III

Multi-part objects require a bit more complex definition. In this example, an ADM2 SmartDataObject is defined:

Subtype: SDO

Program: Yes

Part #	Description	Suffix	Ext.
1	Main program		w
2	Field definitions include		i
3	Client Proxy	_cl	w

Without the SDO Subtype, the three files that comprise an SDO would have to be separate objects, making them cumbersome to manage. By formalizing the relationship among these text files, Roundtable can treat them as a single object.

Using Code Subtypes can help enforce coding standards and vastly reduce the number of objects tracked in your system. They can also make training new programmers on your system much easier because Roundtable reminds them of the requirements of each Subtype.

Suffix naming is less flexible than extension naming because the length of the suffix may reduce the length of the base name usable by the programmer. For example, a two-character suffix of "-d" leaves only six characters available for the base name if you want to conform to the eight-character DOS naming convention.

When you add a PCODE object, Roundtable tests the naming conventions based on these fields. For example, if you designate ".p" as the extension for the program Subtype part, you cannot create a Program part with a suffix of ".u". Roundtable displays an error message until you enter the correct suffix.

Code Subtypes should be created before you set up the Workspace sources or add PCODE objects to your OpenEdge application. After creating the Code Subtypes, use them to create PCODE objects. You can also edit and delete Subtypes (until assigned) and print the Code Subtypes Report.

3.11.6. Adding a Subtype

First, follow these steps to enter the basic information for the Subtype.

1. Choose Admin → Code Subtypes from the Tabletop menu. The Roundtable Code Subtypes window appears. You must be logged in as the sysop user to perform Code Subtype maintenance.
2. Choose the **Add Record** button.
3. Enter the new alphanumeric Subtype code. If your site number is not 0, you must enter the three-digit site number as a prefix for the code. If your site number is 0, you cannot begin your code with a number.
4. Fill in the information in the Subtype Info panel.
5. Choose the **Save Record** button.
6. Next, enter the information required for Subtype parts.
    a. Choose the **Add** button.
    b. In the Subtype Parts panel, edit the parts information for the Subtype part.
    c. Choose the **Save Record** button.
    d. Repeat these steps for each part required in the Subtype.

Optionally, edit the Subtype Defaults as required. Choose File → Exit to close the window.

3.11.7. Editing a Subtype or Subtype Part

You can edit some of the fields of a Subtype after it has been created.

Follow these steps to edit a Subtype.

1. Choose Admin → Code Subtypes from the Tabletop menu. The Roundtable Code Subtypes window appears. You must be logged in as the sysop user to perform Code Subtype maintenance.
2. From the Subtype list, select the Subtype you want to edit.
3. When you begin to make changes, the **Save Record** and **Cancel Record** buttons are enabled.
4. Choose the **Save Record** button to complete your changes.
5. Choose File → Exit to close the window.

3.11.8. Deleting a Subtype

Note that you cannot delete a Subtype after it has been assigned to one or more objects. The Assigned toggle box at the top of the Subtypes window indicates whether the Subtype has been assigned.

Follow these steps to delete a Subtype:

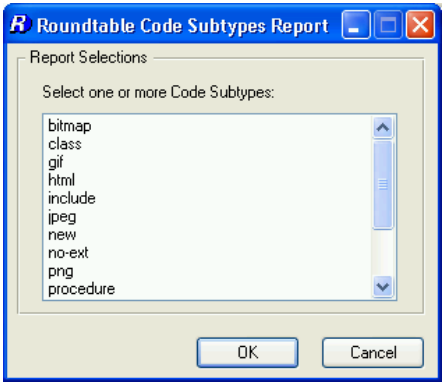
1. Choose Admin → Code Subtypes from the Tabletop menu. The Roundtable Code Subtypes window appears. You must be logged in as the sysop user to perform Code Subtype maintenance.
2. From the Subtype list, select the Subtype to delete.
3. Choose the **Delete Record** button. A warning box appears.
4. Choose the **Yes** button to delete the Subtype or the **No** button to cancel this operation.
5. Choose File → Exit to close the window.

3.11.9. Code Subtypes Report

The Code Subtypes Report provides a detailed review of each Code Subtype. The report includes all the fields listed on the Roundtable Code Subtypes window.

Follow these steps to print a Code Subtypes report:

1. Choose Reports → Code → Subtypes from the Tabletop menu. The Code Subtypes Report window appears.



2. Select one or more Code Subtypes from the list. Use Control-Click to select multiple items.

3. Choose the **OK** button to run the report.
4. The report appears in a text viewer window.
5. Close the text viewer window to close the report.

3.11.10. Name Programs

A specialized naming program can be associated with a Subtype. The sample program below takes the naming code defined in the module definition and appends a four-digit number to it.

For example, if the module naming code was ord then the default names for objects created in the module would be ord0001.p, ord0002.p, etc. Naming programs provide only default names; the user always gets a chance to modify the object name. The sample program works by finding the object with the highest value, then increments that value by one. This is helpful if you want to leave gaps in the number scheme. For example, if you manually named an object ord0100.p, the next object name supplied by the naming program would be ord0101.p.

Any name program that you use must define the input and output parameters illustrated in the sample program below.

```
/*
Sample Name Program --
 Generate new object name using module counter
Input Parameters:
 pcPmod - Product module.
 pcObjectType - Object type (PCODE).

Output Parameters:
 pcObject - Object name generated by build program.
 pcError - Non-blank on error.
*/

DEFINE INPUT PARAMETER pcPmod AS CHARACTER NO-UNDO.
DEFINE INPUT PARAMETER pcObjectType AS CHARACTER NO-UNDO.
DEFINE OUTPUT PARAMETER pcObject AS CHARACTER NO-UNDO.
DEFINE OUTPUT PARAMETER pcError AS CHARACTER NO-UNDO.

DEFINE VARIABLE iNum AS INTEGER NO-UNDO.
DEFINE VARIABLE iIdx AS INTEGER NO-UNDO.
DEFINE VARIABLE cLastObject AS CHARACTER NO-UNDO.
DEFINE VARIABLE lNoCount AS LOGICAL NO-UNDO.
DEFINE VARIABLE cName AS CHARACTER NO-UNDO.

FIND rtb.rtb_pmod
 WHERE rtb.rtb_pmod.pmod = pcPmod NO-LOCK.
```

```
FIND FIRST rtb.rtb_moddef
 WHERE rtb.rtb_moddef.module = rtb.rtb_pmod.module NO-LOCK.

FIND FIRST rtb.rtb_ver
 WHERE rtb.rtb_ver.obj-type = pcObjectType
  AND rtb.rtb_ver.object BEGINS rtb.rtb_moddef.naming-code
 NO-LOCK NO-ERROR.
 ASSIGN iNum = 0
  cLastObject = "".

OBJECT-PASS:
DO WHILE AVAILABLE rtb.rtb_ver:
 cLastObject = rtb.rtb_ver.object.
 cName = rtb.rtb_ver.object.
 cName = ENTRY(1,cName,"."). /* strip any extension */
 lNoCount = FALSE.
 DO iIdx = 4 TO LENGTH(cName):
  IF NOT CAN-DO("0,1,2,3,4,5,6,7,8,9",
        SUBSTRING(cName,iIdx,1)) THEN DO:
   lNoCount = TRUE.
   LEAVE.
  END.
 END.
 IF NOT lNoCount THEN iNum =
        MAX(INTEGER(SUBSTRING(cName,4)),iNum).
 FIND NEXT rtb.rtb_ver
  WHERE rtb.rtb_ver.obj-type = pcObjectType
   AND rtb.rtb_ver.object BEGINS rtb.rtb_moddef.naming-code
   AND rtb.rtb_ver.object <> cLastObject
  NO-LOCK NO-ERROR.
END. /* OBJECT-PASS */
iNum = iNum + 1.
pcObject = SUBSTRING(rtb.rtb_moddef.naming-code,1,3) +
        STRING(iNum,"9999").
IF iNum > 9999 THEN
 pcError = "Counter limit exceeded.".
ELSE
 pcError = "".
```

3.11.11. Build Programs

A specialized build program can be associated with a Subtype. A build program creates the source file parts of an object being created for the first time.

A simple build program can be commands that copy a template specified in a code Subtype into the new object part files. If you are ambitious, you could tie a build program to your own program generator.

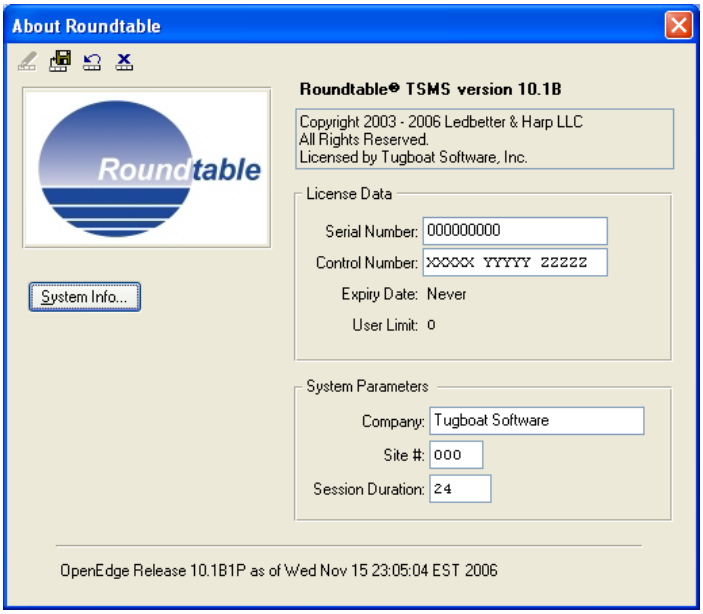
Because a build program needs to know quite a bit about the Workspace, task, and specific object you are working with, Roundtable provides the following input parameters:

Parameter	Data-Type	Description
Object Name	Character	The object name.
Parts List	Character	Comma-delimited list of part identifiers.
Part Descriptions	Character	Comma-delimited list of part descriptions.
Part Pathnames	Character	Comma-delimited list of full pathnames to parts.
Part Names	Character	Comma-delimited list of part names (no paths).
Part Templates	Character	Comma-delimited list of part templates.
Number of Parts	Integer	Number of parts for specified object.
Code Subtype	Character	Code Subtype of specified part.
User ID	Character	User ID of calling session.
Task Number	Integer	Selected task number.
Task Summary	Character	Summary of specified task.
Roundtable PROPATH	Character	Roundtable startup PROPATH.
Workspace Path	Character	Selected Workspace path.
Workspace Module Directory	Character	Workspace module source directory.

Optionally, if you have build programs that were developed for releases of Roundtable prior to 9.1D that use the Urtb* shared variables, you may use them by changing the LEGACY preprocessor value in rtb/p/rtb_runbuildprog.p. This procedure is used by Roundtable to run your build program(s) and is distributed as unencrypted source.

3.12. Site Information

You can use the Help → About dialog box to enter your Site Information (license information, site number, and session duration).



The following table describes the fields found on the About Roundtable dialog box:

Field	Description
Serial Number	The serial number provided on your license agreement.
Control Number	The control number provided on your license agreement.
Company	Optional. Organization name of the licensee.
Expiry Date	Display only. The date that the license expires.
User Limit	Display only. The number of users granted for the license.
Site #	The Site Number value is used only when you have more than one Roundtable repository and must move information from one repository to another. Using multiple repositories is an advanced feature of the Roundtable system. See Section 1.10, “Distributed Development” [1–26].
Session Duration	The number of hours a user's sessions should persist. During login, if the user has any prior sessions older than the specified number of hours, those sessions will be terminated. Enter 0 (zero) to disable automatic session termination.

Follow these steps to set the site information:

1. Choose Help → About form the Tabletop menu. The About Roundtable dialog box appears.
2. Choose the **Update Record** button to enable the Site Information fields.
3. Fill in the values, and then choose the **Save Record** button.

3.13. Security

Roundtable provides a complete security framework to allocate responsibility for activities to different users of the system. A user may have different security access privileges in each Workspace. Roundtable security is managed through the following windows:

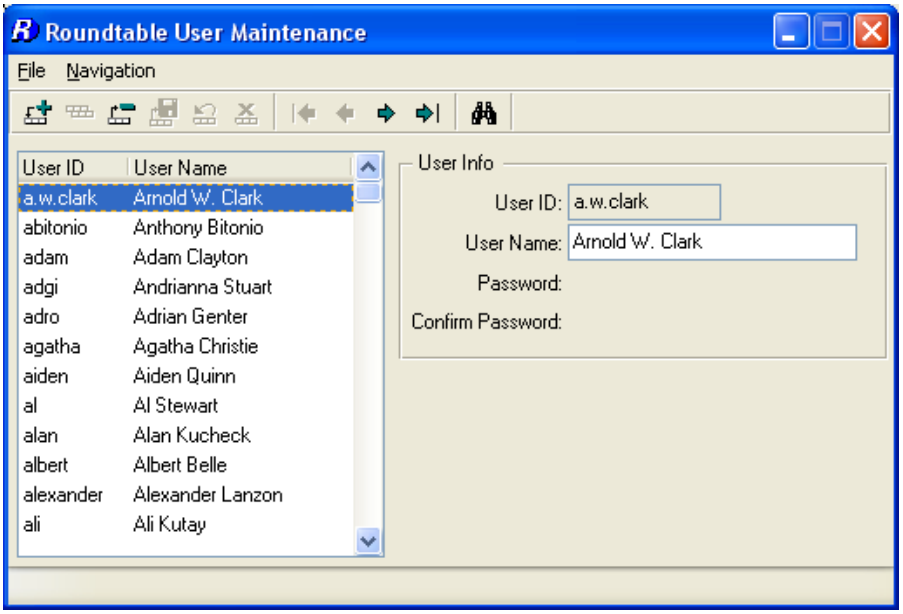
- User Maintenance Window
- Group Access Window
- Workspace Users Window (for access assignments)

When you first install Roundtable, security is not active. Activate security by adding Roundtable users in the User Maintenance window. After adding the users, you can add group access records. Each group access record consists of a group access code you provide and a list of system activities. Use the Workspace Group Assignments window to associate one or more users with one or more group access records within a specified Workspace.

Users registered in Roundtable are recorded in the _user file of the Roundtable database. These users are not recorded in your application databases by Roundtable. When connecting to your application databases, Roundtable passes your Roundtable user ID and password as part of the database connection process. You can set up your database connection parameters to pass alternate values using the -U and -P connect options. For more information about database connection parameters, see Section 6.7, “PDBASE Objects” [6–14].

3.13.1. User Maintenance Window Description

Maintain users in the User Maintenance window:



This window allows you to add or delete users, and edit user names. The sysop user is a special user found in every Roundtable system. A user with the ID "sysop" is special user. The sysop user has unlimited access to all system functions and exclusive access to many important system functions. The sysop user must be created first.

3.13.2. Adding a User

Follow these steps to add a user.

1. Choose Admin → Security → Users from the Tabletop menu.

   You must be logged in as the sysop user to perform Code Subtype maintenance. If this is the first time you have accessed this function, you must first create the sysop user account. Even though you must have logged in as sysop to access user maintenance, the actual sysop user account must be created to implement security.
2. Choose the **Add Record** button.
3. Fill in the appropriate data for the new user.
4. Choose the **Save Record** button.
5. Choose File → Exit to close the window.

3.13.3. Editing a User

Follow these steps to edit a user.

1. Choose Admin → Security → Users from the Tabletop menu.

   You must be logged in as the sysop user to perform Code Subtype maintenance.
2. Edit the user Name.

A user must change his/her own password (the Changing Your Password section). To reset a user password, the user account must be deleted and then re-added.

3. Choose the **Save Record** button.
4. Choose File → Exit to close the window.

3.13.4. Deleting a User

Follow these steps to delete a user.

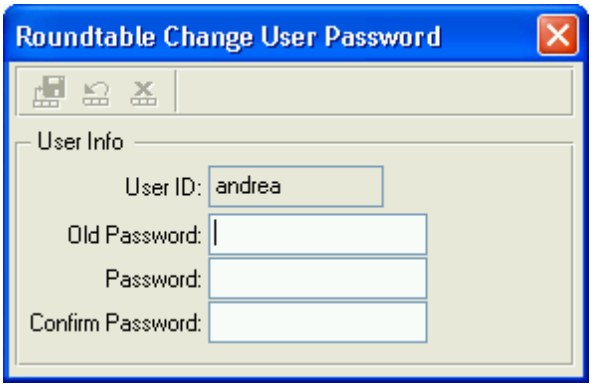
1. Choose Admin → Security → Users from the Tabletop menu.

   You must be logged in as the sysop user to perform Code Subtype maintenance.
2. Choose the **Delete Record** button. A warning box appears.
3. Choose the **Yes** button to delete the user or the **No** button to cancel this operation.
4. Choose File → Exit to close the window.

3.13.5. Changing Your Password

You can only change your password if users have been defined in Roundtable. Follow these steps to change your password:

1. From the Tabletop menu, choose Admin → Security → Change User Password. The following dialog box appears:

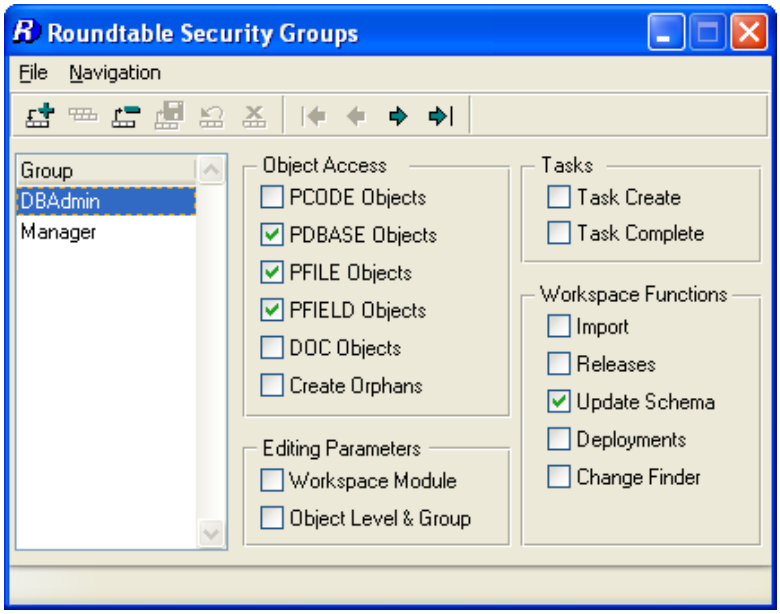


2. Your password does not show when you type it. You must type your old password and your new password in both the Password and Confirm Password fields to confirm that you did typed it correctly.
3. Choose the **Save Record** button to save your change.

3.13.6. Group Access Window Description

Use this window to define a group access record that you will later assign to one or more users in specified workspaces. Each group access record contains a group access code that you provide and a list of allowable system activities.

Use the following window to maintain security groups:



The browse contains a single column displaying each of the currently defined group access codes. When you select a group access code, the data to the right of the selection list indicates the security privileges defined for that code. The following table describes the meaning of each toggle box:

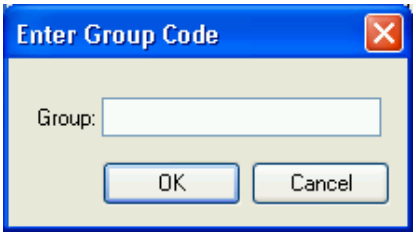
Field	Description
PCODE Objects	Users are allowed to work on PCODE Objects.
PDBASE Objects	Users are allowed to work on PDBASE Objects.
PFILE Objects	Users are allowed to work on PFILE Objects.
PFIELD Objects	Users are allowed to work on PFIELD Objects.
DOC Objects	Users are allowed to work on DOC Objects.
Create Orphans	Users are allowed to create orphan versions.
Workspace Module	Users are allowed to modify Workspace Module parameters.
Object Level & Group	Users are allowed to edit object group and level.
Task Create	Users are allowed to create new Tasks.
Task Complete	Users are allowed to complete Tasks.
Import	Users are allowed to perform the Workspace Import process.
Releases	Users are allowed to manage Workspace Releases.

Field	Description
Update Schema	Users are allowed to perform the schema update process.
Deployments	Users are allowed to manage Workspace Deployments.
Change Finder	Users are allowed access to Group Checkout and the Change Finder.

3.13.7. Adding a Group Access Code

1. Choose Admin → Security → Groups from the Tabletop menu. The Group Access window appears.

   You must be logged in as the sysop user to perform Group Access Code maintenance.
2. Choose the **Add Record** button. The following dialog box appears:



3. Enter a code for the group access record and choose the **OK** button.
4. To edit allowed activities, see Section 3.13.8, “Editing a Group Access Code” [3–37].
5. Choose File → Exit to close the window.

3.13.8. Editing a Group Access Code

1. Choose Admin → Security → Groups from the Tabletop menu. The Group Access window appears.

   You must be logged in as the sysop user to perform Group Access Code maintenance.
2. Select the Group Access Code that you want to edit from the list on the left side of the window.
3. Click the toggle boxes to indicate which activities users with that group access code can perform.
4. Choose the **Save Record** button.
5. Choose File → Exit to close the window.

3.13.9. Deleting a Group Access Code

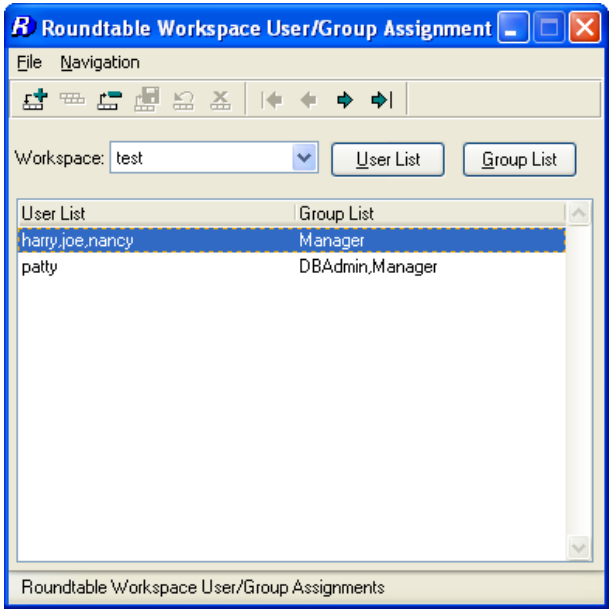
1. Choose Admin → Security → Groups from the Tabletop menu. The Group Access window appears.

   You must be logged in as the sysop user to perform Group Access Code maintenance.
2. The Group Access window appears.
3. Select the Group Access Code that you want to edit from the list on the left side of the window.
4. Choose the **Delete Record** button. A warning box appears.
5. Choose the **Yes** button to delete the Subtype or the **No** button to cancel this operation.
6. Choose File → Exit to close the window.

3.13.10. Workspace Security Window Description

Use the Workspace Security window to associate one or more users with one or more access groups for a specific Workspace. In short, the user access assignments are done with this window. In the following window, the users harry, joe, and nancy have the access privileges defined by the access group Manager. The user patty has the cumulative access privileges granted by the access groups DBAdmin and Manager.

Use the following window to maintain Workspace security:



The first column contains a comma-delimited list of users, and the second column contains a comma-delimited list of group access codes.

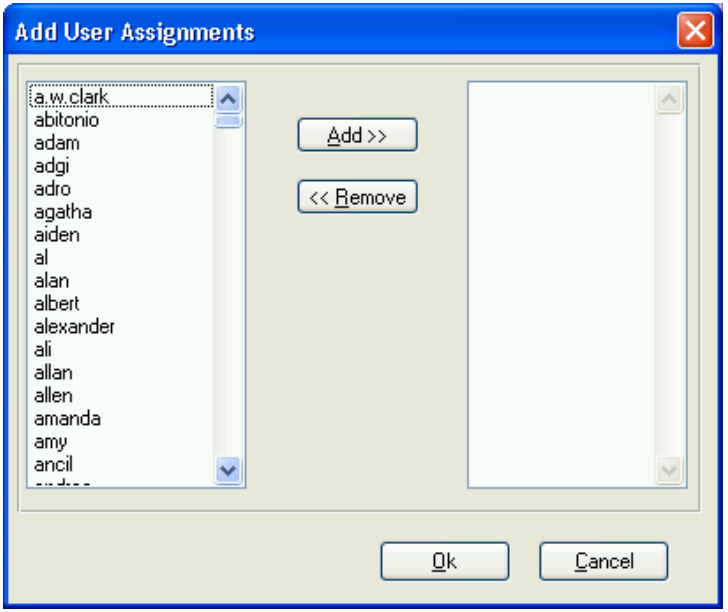
Do not include the sysop user in your assignments because the sysop user always has full access privileges.

3.13.11. Adding Workspace User Access Assignments

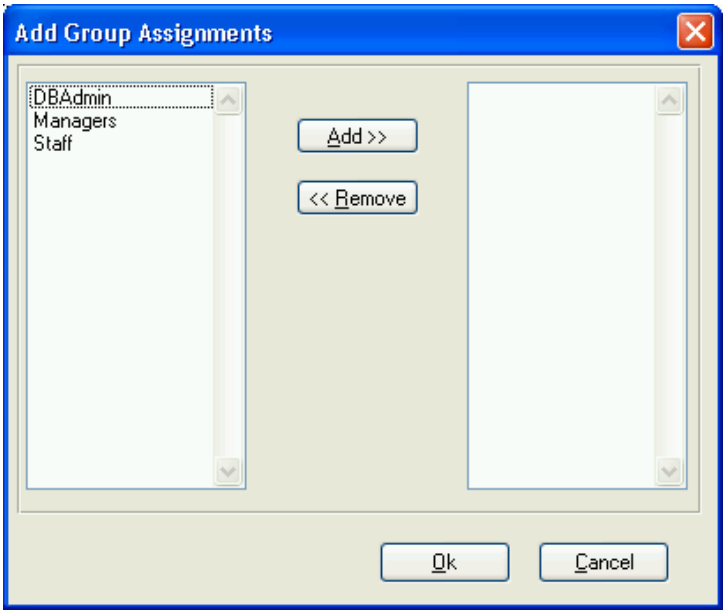
Follow these steps to add a new Workspace user access assignment:

1. Choose Admin → Security → Workspace User/Group Assignment from the Tabletop menu. The Workspace User/Group Assignment window appears.

   You must be logged in as the sysop user to perform Workspace Users maintenance.
2. Choose the **Add Record** button. The Add User Assignments dialog box appears.



3. Select a user from the users selection list, and then choose the **Add** button to move the user into the user-list selection list.
4. Choose the **OK** button. In the Workspace User/Group Assignments window, a row containing the newly defined user list appears in the browse.
5. Choose the **Group List** button. The Add Group Assignments dialog box appears.



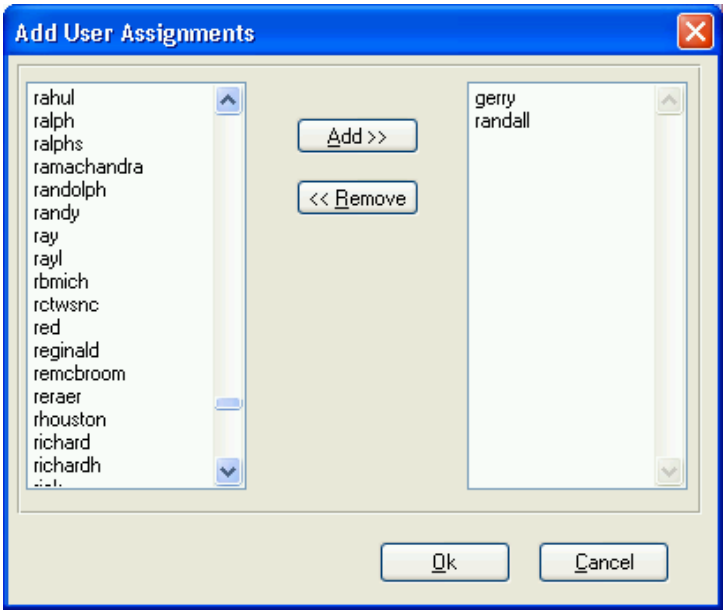
6. Select the group access code to add from the groups selection list. Choose the **Add** to move the selected group into the group-list selection list.
7. Choose the **OK** button. In the Workspace User/Group Assignments window, the current row containing the Workspace user assignment is updated with the new group list.
8. Choose File → Exit to close the window.

3.13.12. Editing Workspace User Access Assignments

Follow these steps to edit a new Workspace user access assignment:

1. Choose Admin → Security → Workspace User/Group Assignment from the Tabletop menu. The Workspace User/Group Assignment window appears.

   You must be logged in as the sysop user to perform Workspace Users maintenance.
2. Select the Workspace user access assignment to edit from the browse.
3. To edit the user list, choose the **User List** button. The Add User Assignments dialog box appears.



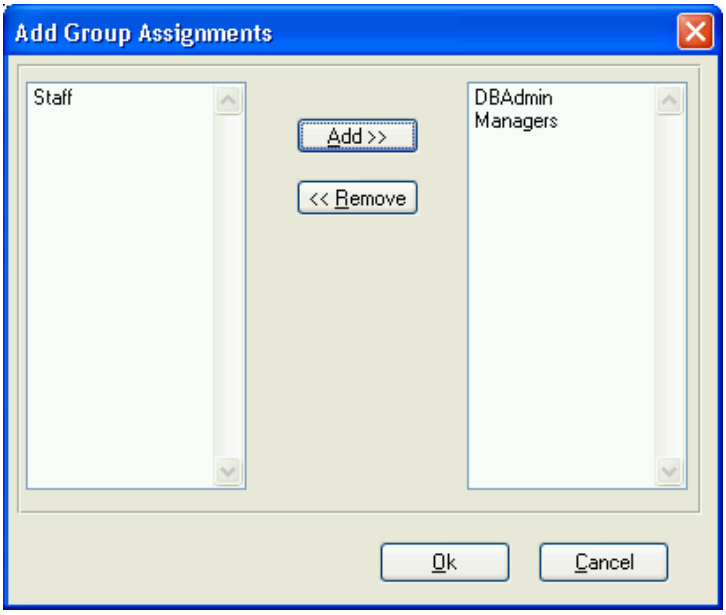
4. Select a user in the users selection list, and then choose the **Add** button to move the user into the user-list selection list.

   OR

   Select a user in the user-list selection list, and then choose the **Remove** button to remove the user from the user list.

5. Choose the **OK** button. In the Workspace User/Group Assignments window, the current row containing the Workspace user assignment is updated with the new user list.

6. To edit the Group list, choose the **Group List** button. The Add Group Assignments dialog box appears.



7. Select the group to add to the group list from the groups selection list, and then choose the **Add** button to move the group into the group-list selection list.

   OR

   Select the group to remove from the group-list selection list, and then choose the **Remove** button.

8. Choose the **OK** button. In the Workspace User/Group Assignments window, the current row containing the Workspace user assignment is updated with the new group list.
9. Choose File → Exit to close the window.

3.13.13. Deleting a Workspace User Access Assignment

Follow these steps to delete a Workspace user access assignment.

1. Choose Admin → Security → Workspace User/Group Assignment from the Tabletop menu. The Workspace User/Group Assignment window appears.

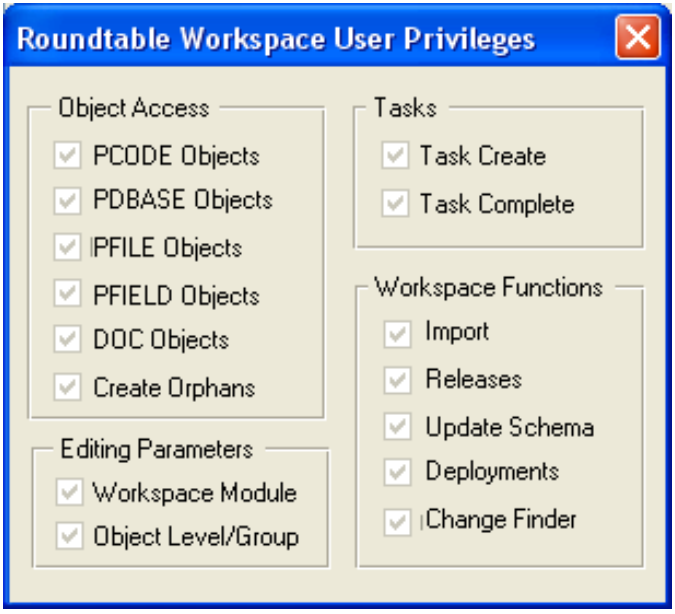
   You must be logged in as the sysop user to perform Workspace Users maintenance.

2. Select the Workspace user access assignment to delete in the selection list.
3. Choose the **Delete Record** button. A warning box appears.
4. Choose the **Yes** button to delete the Subtype or the **No** button to cancel this operation.
5. Choose File → Exit to close the window.

3.13.14. Viewing Current Privileges

If you are logged into the system as anyone other than the sysop user you may view your access privileges for the currently selected Workspace by following these steps:

1. Choose Admin → Security → View User Privileges . The User Privileges dialog box appears.



2. Choose the **Close** button to close the dialog box.

3.14. Repository Dump and Load

Do not use the OpenEdge database administration utilities to dump and load a Roundtable repository database. The Roundtable repository database stores many RECID values and if you use the OpenEdge database administration utilities to dump and load your Roundtable

repository database, the RECID values will be lost. Also, your new Roundtable repository database will be unusable.

Roundtable comes with its own tools for dumping and loading the repository database. These tools preserve the RECID values.

Follow these steps to dump and reload the Roundtable repository database:

1. Ensure that adequate disk space is available to accommodate a database dump. It is difficult to predict how much space this should be, but dumps often require between half to three quarters the size of the original database.
2. From the OpenEdge editor of a Roundtable session, run rtb_dmp1.p to dump the Roundtable repository data to ASCII ".d" files in the current directory. This program is located in the rtb_util subdirectory of the Roundtable installation procedure and makes calls to a second program in that directory, rtb_dmp2.p, expecting the same relative path (that is, RUN rtb_util/rtb_dmp2.p).
3. Use the OpenEdge data dictionary tools to dump the user table of contents.
4. Use the OpenEdge data dictionary tools to dump the Roundtable repository database schema to an ASCII ".df" file in the current directory.
5. If the new Roundtable repository database will be in a different location, change to that new location and move in or copy in the ASCII ".d" and ".df" files created earlier.
6. Use the OpenEdge prodb command to create a new Roundtable repository database from the OpenEdge empty database.
7. From the OpenEdge editor of a OpenEdge session on the new Roundtable repository database, use the OpenEdge data dictionary tools to load the schema from the ASCII ".df" file in the current directory.
8. From the OpenEdge editor of a OpenEdge session on the new Roundtable repository database, use the OpenEdge data dictionary tools to load the user table of contents.
9. From the OpenEdge editor of a OpenEdge session on the new Roundtable repository database, run rtb_lod1.p to load the Roundtable repository data from the ASCII ".d" files in the current directory. Like rtb_dmp1.p, this program is located in the rtb_util subdirectory of the Roundtable installation and makes calls to a second program in that directory, rtb_lod2.p, expecting the same relative path (that is, RUN rtb_util/rtb_dmp2.p).

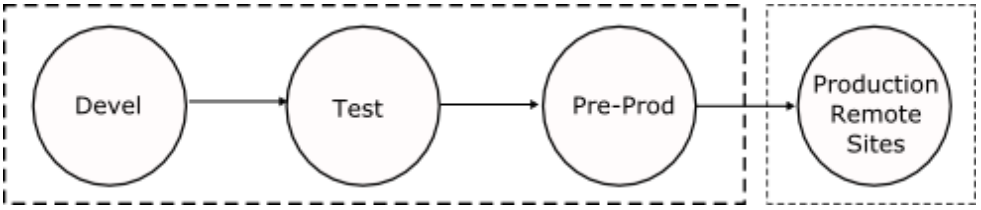
3.15. Defining Your Application

There are a number of steps required to set up Roundtable. The following list provides you with an outline of these steps. At each step, you should review the manual for detailed instructions and descriptions.

1. Create Module Definitions. See Section 3.10.1, “Adding a Workspace Module Definition” [3–19].
2. Create a Product. See Section 3.9.2, “Adding a Product” [3–11].
3. Create Product Modules. See Section 3.9.6, “Adding a Product Module” [3–14].
4. Create Subtypes. See Section 3.11.6, “Adding a Subtype” [3–26].
5. Create a Workspace. See Section 4.2.4, “Adding a Workspace” [4–6].
6. Associate Products with the Workspace. See Section 4.4.2, “Adding a Workspace Source” [4–19].
7. Back up your Roundtable database (rtb.db). Do this so that you can easily change your mind about the previous configuration steps, and then re-run the steps that follow.
8. Create a Task for loading schema. See Section 5.3.4, “Adding a Task” [5–5].
9. Create a PDBASE object. See Section 6.7.2, “Adding a PDBASE Object” [6–16].
10. Load the application database schema. See Section 7.8, “Load Schema” [7–18]
11. Complete the Task. See Section 5.3.8, “Completing a Task” [5–7].
12. Create a Task for loading application source files.
13. Register objects using Module Load. See Section 7.4, “Module Load” [7–8].
14. Complete the Task.
15. Create a Release. See Section 4.8.2, “Adding a Release” [4–37].

3.16. Loading Multiple Workspaces

If you have a chain of existing workspaces, you might want to capture the status of each of the workspaces in Roundtable. Refer to the following diagram, which describes a typical development environment:



Different versions of the application source and schema exist in each of these workspaces. Assume you want to capture the different object versions that exist in each Workspace. To do this, you define and load the contents of the Pre-Prod, Test, and Devel workspaces into Roundtable.

3.16.1. Pre-Prod

You start by loading the Pre-Prod Workspace first because it contains the earliest version of the system. Assuming that you have already defined your Subtypes, products, and Product Modules, follow these steps. See Section 3.15, “Defining Your Application” [3–44].

1. Create a Workspace named Pre-Prod.
2. From Workspace Sources, add the Pre-Prod Workspace as the primary Workspace source to itself for each product and Product Module.
3. Create a new task for loading your Pre-Prod schema.
4. For each of the databases in your Pre-Prod Workspace, create a new PDBASE object and run Load Schema.
5. Complete your task.
6. Create a new task for loading your Workspace source.
7. Run Module Load for each of the modules in your Pre-Prod Workspace.
8. Complete your task. If any of the programs in your task fail to compile, flip their compile flags to 'No'.
9. Create a Release in the Pre-Prod Workspace. This is Pre-Prod Release 1.

3.16.2. Test

Follow these steps to create a Test Workspace in Roundtable and populate it:

1. Create a Workspace named Test. Specify R-code = 'No' and S-Code = 'No'.
2. Use Workspace Sources to specify Pre-Prod as a Workspace source for Test and then include all products and Product Modules available in the Pre-Prod Workspace.
3. Use the Import process to copy object definitions from Pre-Prod to Test. Note that you are only copying the definitions of the objects. You specified S-Code = 'No' for the Workspace, so no source will be copied into the Test Workspace directory. This is necessary so that you do not overwrite the source that is already in the Test Workspace.
4. Edit the Workspace definitions so that R-code = 'Yes' and S-code = 'Yes'.
5. Create a task for loading new and modified schema definitions.
6. For each of the databases in your Test Workspace, run the Load Schema process. This will find any new and modified schema, and bring your Roundtable schema object definitions in sync with your physical Test Workspace schema.
7. Complete your task.

8. Create a task for loading new and modified source.
9. Run the Global Change Finder to find all source files in the Test Workspace that are different from those you loaded into the repository for the Pre-Prod Workspace. The Global Change Finder works by comparing the source in the file system with the source registered in the Roundtable repository. The Global Change Finder allows you to create new object versions for each of the different source files found.
10. Run Module Load for each of the modules in the Test Workspace. This will find any new programs in the Test Workspace that do not exist in the Pre-Prod Workspace.
11. Complete your task. If any of the programs in your task fail to compile, flip their compile flags to 'No'.
12. Create a Release in the Test Workspace. This is Test release 1.

3.16.3. Devel

Follow the same steps as outlined in the Test Workspace, except that you copy object definitions from the Test Workspace into the Devel Workspace.

3.16.3.1. Setting Up the Workspace Flow

Now that you have the Devel, Test, and Pre-Prod workspaces registered into Roundtable's repository, you can specify the normal flow of system changes. This is done from Workspace Sources.

1. Add the Test Workspace as a source to the Pre-Prod Workspace. Include all products and Product Modules.
2. Delete any records specifying Pre-Prod as a primary source.
3. Add the Devel Workspace as a source to the Test Workspace. Include all products and Product Modules. It is not necessary to remove Pre-Prod as a source Workspace to the Test Workspace. It might be useful to have it as a source for Test if you want to have a quick way of moving patches made in Pre-Prod back into Test.
4. For each product and Product Module, add the Devel Workspace as the primary source to itself. It is not necessary to remove Test as a source Workspace to the Devel Workspace. It might be useful to have it as a source for Devel if you want to have a quick way of moving revisions made in Test back into Devel.

4

Workspaces

4.1. Introduction

Roundtable provides a secure development and testing environment by managing configurations of your software application in Workspaces. A Workspace is a view of your application at a given point in the development lifecycle. A Workspace can contain an entire copy of your application or an independent subset of your application. The creation, deletion, and modification of objects (code, databases, tables, fields, and text) are managed within the Workspace.

This introduction to Workspaces presents detailed information about utilizing Workspaces in your development environment. Specifically, this chapter discusses:

- Workspace Maintenance
- Workspace Sources
- Object Variants
- Database Schema Updates
- Releases
- Imports
- Workspace Populate Process
- Build Names Table
- Deployments
- Procedure Updates and Compiles on Remote Sites
- Database Schema Updates on Remote Sites

4.2. Workspace Maintenance

As part of your software development process, Roundtable keeps copies of objects in isolated areas called Workspaces. You can have multiple Workspaces for a single development project, with each Workspace representing a different stage of development. Changes made within a Workspace do not affect other Workspaces. Typically, you create Workspaces that parallel the different development stages of your product, such as development, testing, and deployment.

When creating the first Workspace for a project, you develop the objects and databases from scratch. After that, you can create Workspaces by importing objects from other Workspaces. Roundtable compares the objects in the target and source Workspaces, and then imports the objects with differences into the target Workspace.

To help you understand how to use Workspaces, the following scenario describes four common Workspaces for one base product. Each description includes how to create the Workspace, what the Workspace includes, and what type of quality assurance testing is best for that Workspace. Remember, this is only one scenario; tailor Workspaces to your products and development cycle, as described in the Introduction section in Software Configuration Management.

- **Development Workspace:** Use the development Workspace to create, modify, and delete new objects and data. Since this Workspace is volatile, it is only suitable for limited, informal testing, usually done by programmers.
- **Test Workspace:** Create the application in the Test Workspace by importing objects and data from the Development Workspace. Although this Workspace changes less frequently than the Development Workspace, some changes are necessary to complete the testing process. This Workspace is stable enough for significant quality assurance Alpha testing.
- **Pre-production Workspace:** After testing, objects and data are imported from the Test Workspace into the Pre-production Workspace. Since this Workspace should function with few or no major problems, you can release it to sophisticated users for Beta testing and evaluation. Typically, you should require approval to make changes in this Workspace.
- **Production Workspace:** Import objects and data from the Pre-production Workspace into the Production Workspace. This Workspace is a "live" system that must function flawlessly under real-world conditions. You should typically require approval to make changes in this Workspace.

4.2.1. Guidelines for Workspace Planning

Roundtable can manage many Workspaces. For example, quality assurance, testing, and development should be done in different Workspaces. Multiple Workspaces can aid in the quality assurance strategy, but more is not necessarily better. Consider the timing impact of each additional Workspace when planning your overall development and quality assurance strategy. Use the following guidelines:

- Organize your work into logical categories, such as research and development, product development, custom development, or maintenance.
- Use a consistent naming convention. For example, always use the abbreviation DEV when referring to development Workspaces, such as BASEDEV, CUST1DEV, CUST2DEV, etc.

- Do not create more Workspaces than you have resources to manage. In most circumstances, separate Test and Deployment Workspaces, along with the necessary development Workspaces, are sufficient to complete your product.

4.2.2. Workspaces in a Distributed AppServer Configuration

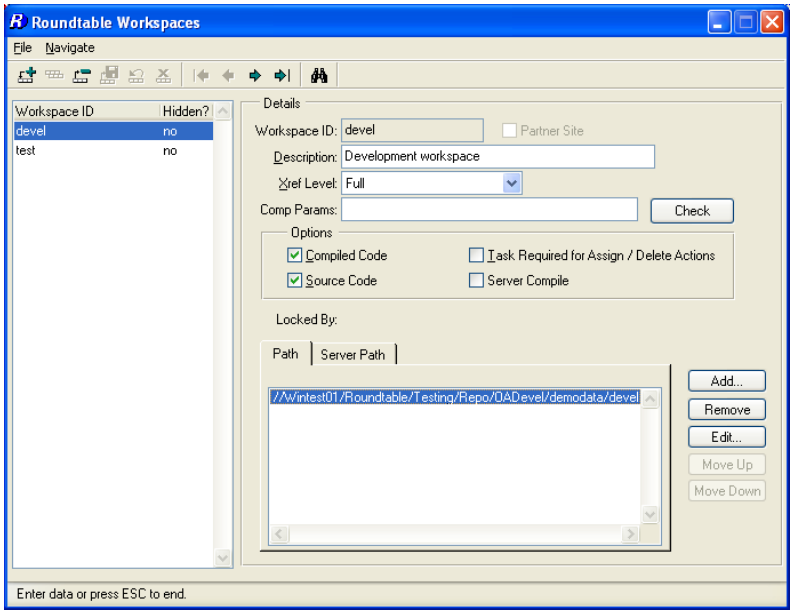
When running Roundtable in a distributed AppServer configuration, it is possible that the AppServer process in which the Roundtable server is running cannot access the physical Workspace directory via the same path as the Roundtable client.

For example, your physical Workspace directory may exist on a Unix machine in /u2/devel that you access via a mapped SMB share (//unixshare/devel) from your client machine.

To run the Roundtable server in an AppServer session on the Unix machine, the Roundtable server must be able to read from and write to the physical Workspace directory. To accomplish this, Roundtable allows you to override the default Workspace path and specify an alternate server Workspace path. In the example above, the Roundtable client would access the physical Workspace directory via the default path (//unixshare/devel), while the Roundtable sever would access the physical Workspace directory via the alternate server path (/u2/devel).

4.2.3. Workspace Window Description

Roundtable Workspaces are defined in the Workspaces window:



The following fields can be found in the Workspace Window:

Field	Description
Workspace ID	A fill-in for the Workspace name.
Partner Site Workspace	A toggle-box indicating that the Workspace is a receipt Workspace for a Partner Site.
Description	A fill-in for the Workspace description, up to 40 characters.
Xref Level	A fill-in for the cross-reference level. Enter one of the following five, depending on the amount of info needed: 1 - No Cross-reference — No integrity checking is possible. (Not a good idea for Development Workspaces.) No cross-reference navigation except for field-to-file relationships. Roundtable recommends a full compile of the Workspace to ensure the integrity of the application. 2 - Partial Cross-reference — Roundtable only creates cross-references for PFILE

Field	Description	
		and PCODE objects.
	3 - Robust 1	Roundtable creates cross-references for PFILE, PCODE, and PFIELD objects only.
	4 - Robust 2	Roundtable creates cross-references for PFILE, PCODE, and Informal objects only. (Informal objects include Shared Variables, Frames, Workfiles, etc.)
	5 - Full Xref	Xref Full cross-reference.
	6 - No Schema	Xref everything except for schema objects. This allows you to more easily manage an application in Roundtable when you do not want to or are not able to have Roundtable directly manage the schema. For example, if your application uses dataservers then you can use this Xref level so that Roundtable will only manage your application source code. Roundtable cannot manage schema for dataservers.
Compiled code	A toggle box that determines whether Roundtable keeps compiled R code in the Workspace. It has no effect on deployments made from this Workspace. Activate this box to keep R-code in the Workspace.	
Source code	A toggle box that determines whether Roundtable keeps source code in the Workspace. It has no effect on deployments made from this Workspace. Activate the toggle box to keep source code in the Workspace. If you change the S-code value, you can use the Workspace populate option to move code into or out of the Workspace directories.	
Task Required for Assign / Delete	A toggle box that determines whether an active Task is required to perform Assign or Delete actions on Workspace objects.	
Server Compile	A toggle box that specifies whether or not compilations for objects assigned to this Workspace happen on the client or the server. *Used*	

Field	Description
	when Running Roundtable in a distributed AppServer configuration.
Locked By	A field that indicates the current lock status of the Workspace. A Workspace is locked when schema updates and other major Workspace management activities are performed.
Compile Parameters	Compile statement parameters for objects compiled in the Workspace. Normally, this field can be left blank. It is most often used for compiling modules with support for multiple languages. Module compile parameters or individual PCODE object compile parameters can override Workspace compile parameters.
Path	The pathing components which are added to the session PROPATH when the Workspace is selected. The first entry of the Workspace path should always be the physical root directory to the Workspace. When running in a distributed AppServer environment, the Roundtable client will always reference the physical Workspace directory via this path. *It is recommended that no two Workspaces share the same root directory.*
Server Path Override	A toggle box that specifies whether or not the Roundtable server should use an alternate path to the physical Workspace directory. *Used when running Roundtable in a distributed AppServer configuration.*
Server Path	Similar to the 'Path' specification, but an alternate path to the physical Workspace directory. *Used when running Roundtable in a distributed AppServer configuration where the physical path to the Workspace directory cannot be accessed by the server via the 'Path' specification above.*

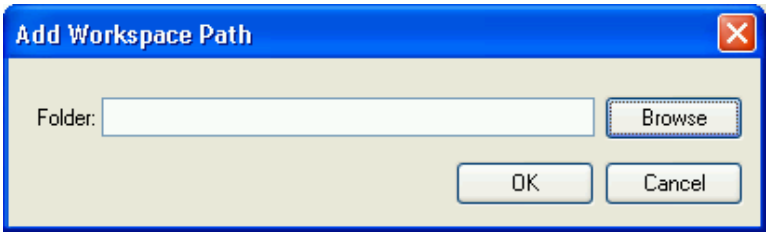
4.2.4. Adding a Workspace

Follow these steps to create a new Workspace:

1. Choose Workspace → Workspace Maintenance from the Tabletop menu. The Workspaces window appears. You must be logged in as the sysop user to perform Workspace maintenance.
2. Choose the **Add Record** button.
3. Fill-in the appropriate information for the new Workspace. Make sure the New Workspace ID describes the product and its stage of development. Try to name your Workspaces consistently. For example, if you have one base product and two custom products, name your Development Workspaces something like BASEDEV, CUST1DEV, and CUST2DEV. The Workspace ID can be up to 16 characters long. If your site number is not 0, then you must enter the three-digit number as a prefix for

the Workspace name. If your site number is 0, you cannot begin your code with a numeric character. By default, your site number is zero. Only partner sites are normally assigned a site number.

4. Choose the **Add** button next to the Workspace Paths tab folder. The Add Workspace Path dialog box appears.



5. Enter the path required by your Workspace. The Workspace path tells Roundtable where to store the Workspace and its components. The first Workspace path should always be the root directory to your Workspace. No two Workspaces should share the same root directory. Roundtable uses the other specified paths to locate your source code.

The UNIX-style forward slash (/) is used in Roundtable instead of the backward slash (\ ) used in Windows. This is because the forward slash is portable in the OpenEdge environment, while the backward slash is not. You can use network drive mapping letters (eg: "W:/directory"), and you can also use Universal Naming Conventions (eg: "//computer/share/directory").

6. Choose the **OK** button.
7. Repeat steps 4-6 for each path required for the Workspace.
8. Choose the **Save Record** button.
9. Choose File → Exit to close the window.

To specify an alternate path to the physical Workspace directory, select the Server Path tab folder, check the 'Server Path Override' toggle and repeat the previous steps.

4.2.5. Editing a Workspace

You can change the description, Xref Level, R-code, or S-code fields for a Workspace at

any time; however, you cannot change the Workspace ID.

Changing the Xref Level, R-code, or S-code after you have assigned and compiled an object has no immediate effect on objects in the Workspace. You must recompile for the Xref Level and R-code to take effect.

Follow these steps to edit a Workspace:

1. Choose Workspace → Workspace Maintenance from the Tabletop menu. The Workspaces window appears. You must be logged in as the sysop user to perform Workspace maintenance.
2. Select the Workspace to edit from the Workspace browse.
3. Edit the Description, Xref Level, R-code, and S-code fields for the Workspace and modify the Workspace Paths as necessary.

Changing the Workspace root directory in this screen will not cause the contents of the physical directories to move. You are responsible for moving or renaming directory structures to match the specifications present in this window.

4. Choose the **Save Record** button.
5. Choose File → Exit to close the window.

4.2.6. Deleting a Workspace

You can delete a Workspace if you have sufficient security access and no one else is currently working in the Workspace. Note that deleting a Workspace does not delete any completed objects from the repository. A Workspace is simply a list of object versions that defines a configuration of your software application and a related set of application components in the directories specified in the Workspace paths. However, once you delete the Workspace, the configuration is lost and cannot be reclaimed. Although tasks done under the Workspace are not deleted, they may be far less available for casual review if the Workspace to which they belong is deleted. In addition, all Release, deployment, and general histories of the Workspace are deleted.

Deleting a Workspace removes all source code at the operating system level. Work-in-process code may be deleted and will not be recoverable.

Follow these steps to delete a Workspace.

1. Choose Workspace → Workspace Maintenance from the Tabletop menu. The Workspaces window appears. You must be logged in as the sysop user to perform Workspace maintenance.
2. From the Workspaces browse, select the Workspace to delete.
3. Choose the **Delete Record** button. A confirmation dialog box appears with any warnings to consider.
4. Choose the **Continue** button to complete your Workspace delete.
5. Choose File → Exit to close the window.

4.2.7. Hiding a Workspace

Marking a Workspace as hidden removes it from the Workspace list on the Tabletop in GUI and the Workspace Selection screen in TTY.

Follow these steps to hide a Workspace:

1. Choose Workspace → Workspace Maintenance from the Tabletop menu. The Workspaces window appears. You must be logged in as the sysop user to perform Workspace maintenance.
2. From the Workspaces browse, select the Workspace to hide.
3. Choose File → Hide Workspaces from the Workspaces window menu. A warning dialog box appears.
4. Choose the **Yes** button to hide the selected Workspace. The menu item appears with a check mark to indicate that the Workspace is hidden.
5. Choose File → Exit to close the window.

4.2.8. Archiving a Workspace

Marking a Workspace as archived removes it from the Workspace list (hidden Workspace) and removes all source from the Workspace directory. Since the Workspace is archived and not deleted, all Xref information is retained in the repository.

Follow these steps to archive a Workspace:

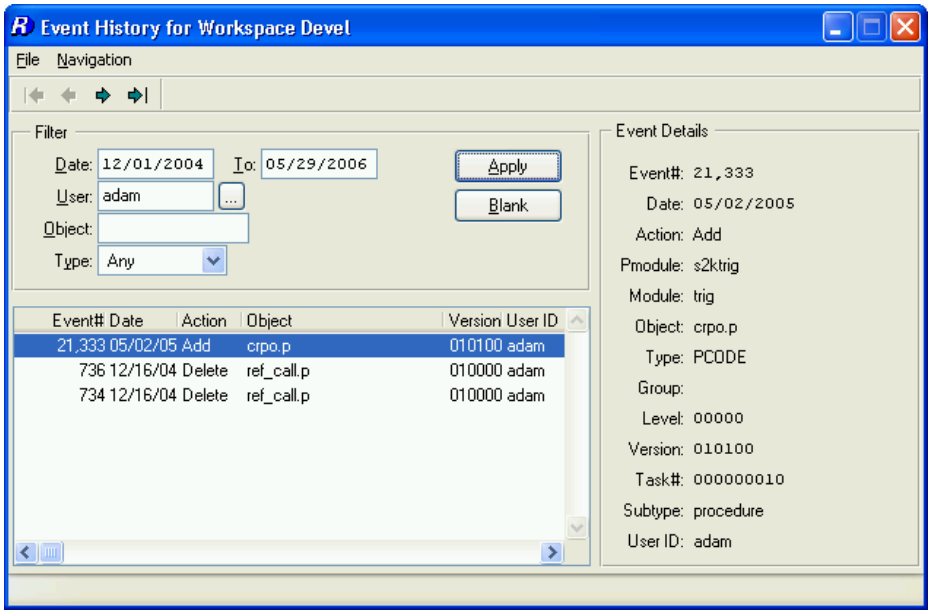
1. Choose Workspace → Workspace Maintenance from the Tabletop menu. The Workspaces window appears. You must be logged in as the sysop user to perform Workspace maintenance.
2. From the Workspaces browse, select the Workspace to archive.
3. Choose File → Archive Workspace from the Workspaces window menu. A warning

dialog box appears.

4. Choose the **Yes** button to archive the selected Workspace. The menu item appears with a check mark to indicate that the Workspace is archived.
5. Choose File → Exit to close the window.

4.2.9. Viewing Workspace Event History

Use the Event History window to view all events that have occurred in a Workspace.



The following fields can be found in the Event History Window:

Field	Description
Event Number	Event numbers for object that are checked out are always 99,999,999. When the object is checked in the final event number is assigned.
Date	The date on which the final event number is assigned. This is the date that the action was taken on the completed (checked in) object.
Action	The action code describes what action was taken on the object in the Workspace. Action codes include:

Field	Description
	Add - New object version was added. Delete - Object assignment was deleted. Assign - Object assignment was created.
Pmodule	The Product Module the affected object belongs to.
Module	The Workspace module the affected object appears in.
Object	The name of the object affected by the action.
Type	The type of object: PCODE, DOC, PDBASE, PFILE, PFIELD.
Group	The object group code assigned to the object assignment at the time of the action.
Level	The object level code assigned to the object assignment at the time of the action.
Version	The version of the object affected by the action.
Task#	The task number associated with the Workspace history event.
Subtype	The Subtype of the object affected by the action.
User ID	User that produced the event.

4.3. Workspace Reports

Roundtable offers a number of reports about your Workspaces. The following table describes the Workspace reports:

Report	Definition	Benefit
Changes Report	A list of the changes in a Workspace across a range of events.	Provides testers and/or customers with extensive information about what has changed in a Workspace between any two events.
Event History Report	The history of a Workspace between two events, sorted from newest to oldest event.	Traces the history of individual objects or groups of objects belonging to a Product Module.
Release Report	A detailed list of the changes in a Workspace between two releases.	Useful for testers and/or customers when receiving new releases. Use the Object Details and Show Update History fields for this purpose.
Unapplied Changes Report	A list of all schema changes that have been entered but not updated.	Verifies the status of the schema in the Workspace.

Report	Definition	Benefit
Workspace Report	A complete list of the objects in a Workspace ordered by Workspace module.	Provides a hard copy of the current Workspace configuration.
Workspace Differences Report	A list of the differences between the two Workspace configuration lists.	Useful when integrating a base Release to custom Workspaces.

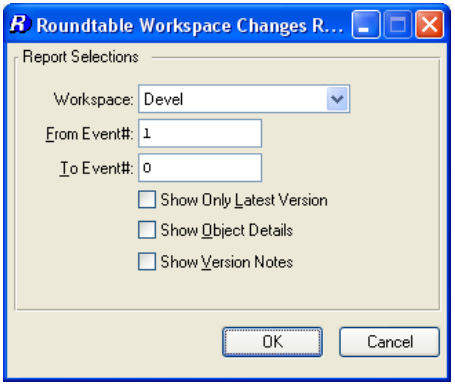
4.3.1. Printing Reports

Follow these steps to print a Workspace report.

1. Choose Reports → Workspace from the Tabletop menu.
2. From the Reports → Workspace submenu, choose the report you want to print. Roundtable displays a report options window for many of the reports. These options are explained in the following sections.
3. If a report options window appears, choose the report options you require, then choose the **OK** button. The Print Destination dialog box appears.
4. The report appears in a text viewer window.
5. When finished viewing and/or printing the report, close the text viewer window.

4.3.2. Changes Report

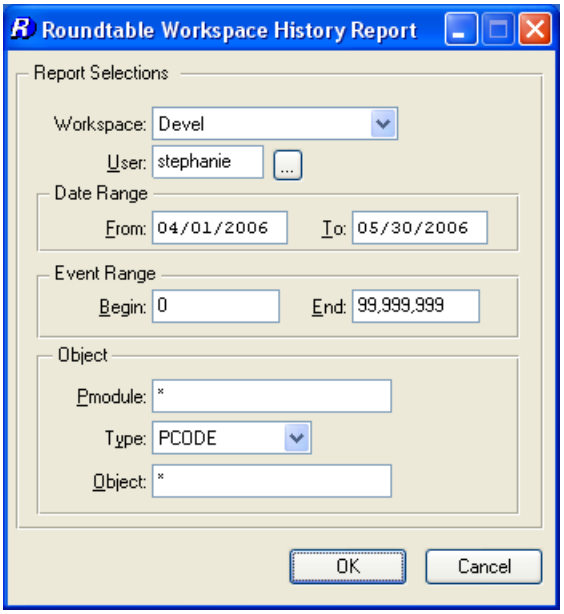
The Workspaces Changes Report shows changes in a Workspace between to events (inclusive). The following window allows you to specify the information to include in the Report:



Field	Description
Workspace	The Workspace to report on.
From Event#	Fill in the first event number to include in the report.
To Event#	Fill in the last event number to include in the report.
Show Only Latest Version	Toggle on to print only the latest changes to an object made between the two event numbers.
Show Object Details	Toggle on to print the object description.
Show Version Notes	Toggle on to print the programmer's notes.

4.3.3. Workspace Event History Report

The Workspace Event History Report shows events that match the criteria that you specify in the following window:

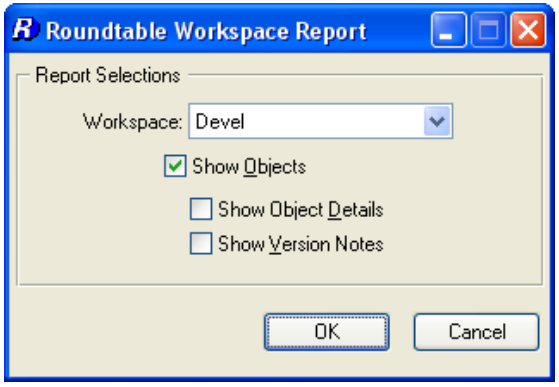


Field	Description
Workspace	The Workspace to report on.
User	Fill-in a specific user or leave blank for all users. A **Lookup** button

Field	Description
	is provided to find a user by ID or name.
Date Range	Specify the From and To dates to include in the report.
Event Range	Fill in the beginning and ending event numbers to include in the report.
Pmodule	Fill in the Product Module number. Use an asterisk (*) to denote any Product Module number.
Object Type	Select the type of object (PCODE, PFILE, PDBASE, etc.). Use the asterisk (*) to denote any object type.
Object	Fill in the name of the object (menu.p, cust.p, etc.). Use an asterisk (*) to denote any object.

4.3.4. Workspace Report

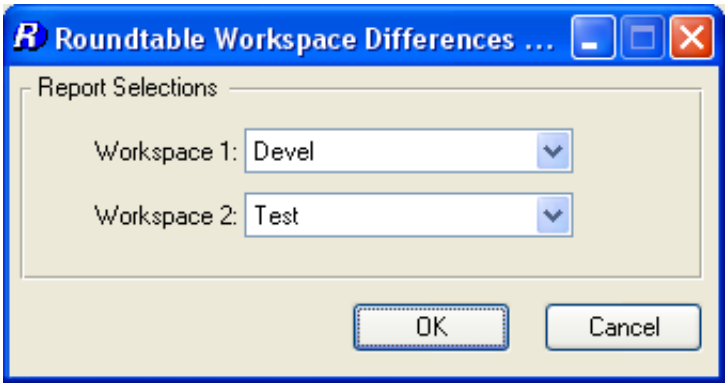
The Workspace Report shows information about a Workspace and, optionally, objects assigned to the Workspace. The following window allows you to specify the information to include in the Report:



Field	Description
Workspace	The Workspace to report on.
Show Objects	Toggle on to print the objects in the Workspace or off to print configuration information only.
Show Object Details	Toggle on to print the object description.
Show Version Notes	Toggle on to print the notes the programmer entered when changing the objects.

4.3.5. Workspace Differences Report

The Workspace Differences Report shows the differences between the contents of any two Workspaces. The Workspace Difference Report window appears as follows:



The following fields can be found in the Workspace Differences Report dialog box:

Field	Description
Workspace 1	Select the first Workspace to compare from the drop down list.
Workspace 2	Select the second Workspace to compare from the drop down list.

4.4. Workspace Sources

After you create a Workspace, you define its contents by assigning product modules to it. This assignment of product modules is the configuration hierarchy of the software system managed in the Workspace.

After you assign product modules to the Workspace configuration, you can create new objects in the Workspace, each of which belongs to one of the product modules. When you are loading objects into the system for the first time, you can use the Module Load utility to create many new objects quickly. For a detailed description of this utility, see Section 7.4, “Module Load” [7–8].

You can also assign existing objects from the Roundtable repository to the new Workspace. This assignment is done one object at a time or by using the Roundtable import process.

The import process examines a source Workspace to determine what objects need to be assigned to or deleted from a target Workspace to make the Workspaces' configurations, where these configurations coincide, as similar as possible. The following simplified

explanation of the import process shows why Workspace sources are necessary and useful:

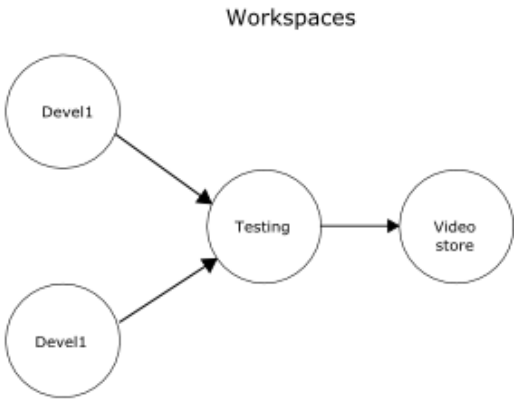
1. The import process compares the configuration hierarchy of each Workspace. When the source Workspace contains a Product Module that is also contained in the target Workspace, it does an object-by-object comparison within that Product Module to see if objects in the target Workspace have the same object versions as objects in the source Workspace. If they are different, the import process places a reference to the object version found in the source Workspace in the import control table with an action code of Assign.
2. If a Product Module in the source Workspace contains objects that do not exist in the corresponding Product Module in the target Workspace, references to these new objects are placed in the import control table with an action code of Assign.
3. If an object has been deleted from the source Workspace, but still appears in the target Workspace, a reference to the deleted object is placed in the import control table with an action code of Delete. With your permission, the import process can remove the object from the target Workspace.
4. If you accept the suggestions supplied by the import process, it assigns the specified object versions from the Roundtable repository to the target Workspace. It is important to remember that these object versions are being extracted out of the repository, not simply copied from the source Workspace(s) to the target Workspace. One reason for this is that the import process considers only the latest completed objects in the source Workspace(s). If the import process copied from the source Workspace(s) to the target Workspace, it might copy a work-in-process version of the object.

The import process is actually more sophisticated than the example implies. For more detail on the import process, see Section 4.9, “Imports” [4–40].

When assigning product modules to Workspaces, it is necessary to specify a source Workspace. When there is no source Workspace, such as when you assign Workspace modules to your first Workspace, specify the name of the current Workspace as the source Workspace. Roundtable automatically marks each Product Module assigned in this way as PRIMARY to the current Workspace. This is a way of saying that the current Workspace is the headwater of the flow of objects for the specified Product Module.

Refer to the following example:

Workspace	Source	Product	Pmodule
Devel1	Devel1	Acct	A/P A/R G/L
Devel2	Devel2	Ops	Invent Orders
Testing	Devel1	Acct	A/P A/R G/L
	Devel2	Ops	Invent Orders
Videostore	Testing	Acct	A/P A/R G/L
		Ops	Invent Orders
	Videostore	Video	Video



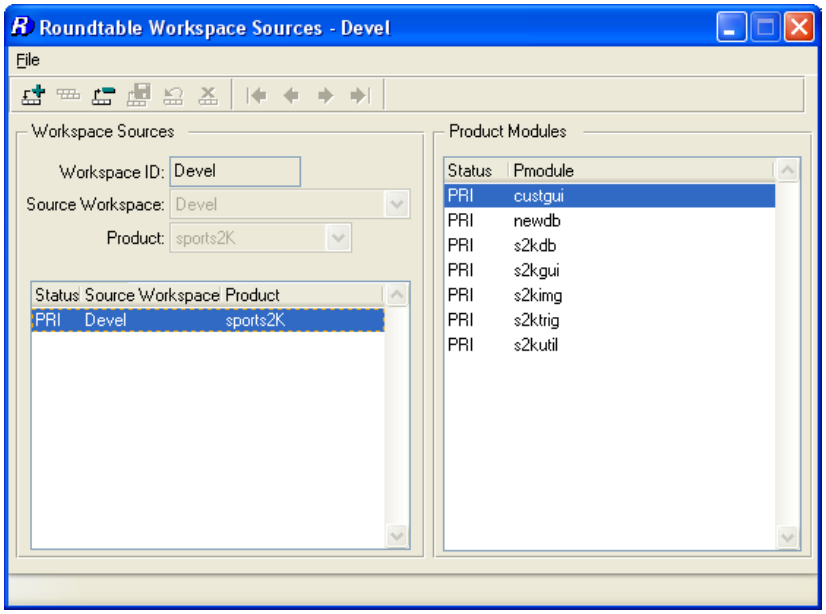
The first two columns contain the names of each Workspace and its Workspace sources. The Devel1 and Devel2 Workspaces are primary Workspaces because their Workspaces are identical to their sources. The third and fourth columns list the products and the product modules (within those products) that are assigned to the Workspace.

The Testing Workspace has Devel1 and Devel2 designated as its Workspace sources. Unless specifically excluded, Roundtable imports all objects belonging to the products and product modules assigned to Devel1 and Devel2 into the Testing Workspace.

The Videostore defines Testing as its source Workspace. Note that another product, Video, has been added to the Videostore Workspace. Therefore, objects in this Workspace are both created and imported. The import process imports all objects in the Testing Workspace unless otherwise specified or blocked by object variants belonging to the Video product. For more information on object variants, see Section 4.6, “Object Variants” [4–21].

4.4.1. Workspace Sources Window Description

After you create a Workspace, you define its contents by assigning product modules to it. Assign product modules using the Workspace Sources window.



Field or Menu Item	Description
Status (for Product)	Contains one of the following values: PRI - Source Workspace is the current Workspace. INC - Product will be included in imports. EXC - Product will be excluded from imports.
Source Workspace	Contains the name of a source Workspace
Product	Contains the Product-ID belonging to the source Workspace.
Source Workspace	Workspace ID for the Workspace Source.
Add Source	Add a Workspace Source.
Delete Source	Delete a Workspace Source.
Include Source	Toggle the status from EXC to INC. This button has no effect on PRI status.
Exclude Source	Toggle the status from INC to EXC. This button has no effect on PRI status.

Field or Menu Item	Description
Status (for Product Module)	Contains one of the following values: PRI - Source for Product Module is the current Workspace. NEW - Newly assigned. User must change to INC or EXC. INC - Product Module will be included in imports. EXC - Product Module will be excluded from imports.
Pmodule	Contains the Product Module code.
Description	Contains the description of Product Module.
Include Product Module	Toggle the status of the currently selected Product Module from EXC to INC, or from EXC to PRI (for primary Workspace sources).
Exclude Product Module	Toggle the status of the currently selected Product Module from INC to EXC, or from PRI to EXC (for primary Workspace sources).

4.4.2. Adding a Workspace Source

Follow these steps to add a Workspace source.

1. On the Tabletop, select the Workspace for which you want to configure Workspace sources.
2. Choose Workspaces → Workspaces Sources . The Workspace Sources window appears. You must be logged in as the sysop user to maintain Workspace Sources.
3. Choose the **Add Record** button.
4. In the Source Workspace drop-down list, select the source Workspace.
5. In the Product drop-down list, select the source product.

To add sources for all the products sourced as Primary or Include in the selected Workspace, select 'All' in the Product drop-down list.

6. Choose the **Save Record** button. Roundtable adds the source Workspace/Product. Each Product Module that belongs to the specified source is inserted into the Product Modules for Source Workspace table with a status of INC (or PRI if the current and source Workspace are the same).
7. If you want to exclude a Product Module, select the appropriate Product Module, and

the either double-click the entry, or choose File → Exclude Product Module from the window menu. The Product Module status changes to EXC. Repeat this step as necessary.

8. Choose File → Exit to close the window.

4.4.3. Deleting a Workspace Source

Follow these steps to delete a Workspace source.

1. On the Tabletop, select the Workspace for which you want to configure Workspace sources.
2. Choose Workspaces → Workspaces Sources . The Workspace Sources window appears. You must be logged in as the sysop user to maintain Workspace Sources.
3. From the Workspace Sources browse, select the Workspace/Product source to delete.
4. Choose the **Delete** button to delete the Workspace source.

Roundtable deletes Workspace/Product source and all entries in the Product Modules table for the source. It does not remove the objects from the Workspace.

5. Choose File → Exclude to close the window.

4.5. Editing Workspace Module Parameters

Compiled code, Source code, Server Compile, Xref Level, and Compile Parameter values may be set for each Workspace module independently. These Workspace module values override the Workspace level specifications for these values you have entered in the Workspaces window. See Section 4.2.3, “Workspace Window Description” [4–3] for a detailed description of the Compile code, Source code, Xref level, Server Compile and Compile Parameters fields.

Changing these values after you have assigned and compiled an object has no effect on the object. You must recompile for the new values take effect.

Follow these steps to edit Workspace module values:

1. On the Tabletop, select the Workspace for which you want to configure Workspace Modules.

2. Choose Workspaces → Workspace Modules . The Workspace Modules window appears.
3. Select the Workspace module to edit in the browse table.
4. Set the Xref column to 0 to default to the Workspace's Xref level, or set it to another number to override the Workspace Xref level.

   Enter Yes or No in the Rcode column to specify whether .r code is stored in the module, or set this field to ? (question mark) to default to the Workspace R-code value.

   Enter Yes or No in the Scode column to specify whether source code is stored in the module, or set this field to ? (question mark) to default to the Workspace S-code value.

   Enter Yes or No in the Server Comp column to specify if compilations happen on the server, or set this field to ? (question mark) to default to the Workspace Server Compile value.

   In the Comp Params column, enter any compile syntax parameters to be used when compiling objects in this Workspace module. Normally, this column can be left blank. It is most often used for compiling modules with support for multiple languages. If you enter compile parameters for a module, then the Workspace compile parameters are ignored. Leave column field blank to default to the Workspace's compile parameters.

You can check the syntax of the compile parameters by choosing the **Check Params** button.

1. Choose the **Check Params** button to complete your edit.
2. Choose File → Exit to close the window.

4.6. Object Variants

Roundtable allows you to create more than one variation of the same object called variants. Variants have the same name and type but belong to different product modules. For example, you may need three variations of an install program, one each for UNIX, DOS, and Windows. Each of these is a variant. You use variants when you need support for:

- Custom system development
- Vertical markets
- Different hardware platforms

See Section 6.14, “Creating an Object Variant” [6–56] for instructions on creating an object variant.

4.6.1. Object Repository

Roundtable keeps objects in the Roundtable repository. The repository stores all of the objects in the system and their definitions. The unique key for the object definition includes the following fields:

- Object type (PDBASE, PFILE, PFIELD, PCODE, or DOC)
- Product module (Pmodule) code (base_ap, cust_ap)
- Object name (menu.p, cust.p, etc.)
- Version code (01.00.00, 01.01.00, etc.)

The object definition allows an object of the same type, name, and version to exist in two different product modules, creating an object variant. Although Roundtable stores all object variants in the repository and objects can exist in more than one Product Module, only one variation of an object can be assigned to any given Workspace. Each Workspace represents a collection of object versions. Roundtable manages a table of these object versions called the configuration list. The following fields define the unique key for objects in this table:

- Workspace ID (Wspace-id)
- Object type (PDBASE, PFILE, PFIELD, PCODE, or DOC)
- Object name

4.6.2. Versions vs. Variants

The difference between versions and object variants can be confusing at first. Consider the table below:

Object Type	Product Module	Object Name	Version
PCODE	core_ap	menu.p	01.00.00
PCODE	core_ap	menu.p	01.01.00
PCODE	cust1_ap	menu.p	01.00.00

All of the objects in this table are stored together in the object repository. The first two show two versions of an object named menu.p. Remember that the unique key on objects stored in the repository includes the object type, Product Module, object name and version code. The last object is an object variant that belongs to a Product Module named

cust1_ap. You must always remember to consider the Product Module when looking at an object version.

4.6.3. Example of Object Variations

This example shows how you can use object variants. Assume you are creating an invoice-printing program for many different types of businesses. Most of these businesses can use your core (or generic) program, but the Videostore application needs a special variation. To handle this, you need to create two variations of the same program.

You begin by creating the core program, invprnt.p, in the development Workspace (refer to line 1, below). Then, import the core program into the Testing Workspace (line 2). After testing, import the program into two Workspaces, a core pre-production Workspace (line 3) and a Videostore Workspace (line 4). In the Videostore Workspace, you can create a custom variant of invprnt.p using the video_ap Product Module. You now have two variations of the same program (lines 3 and 4).

#	Object Type	Workspace	Product Module	Object Name	Version
1	PCODE	Devel	core_ap	invprnt.p	01.00.00
2	PCODE	Testing	core_ap	invprnt.p	01.00.00
3	PCODE	Preprod	core_ap	invprnt.p	01.00.00
4	PCODE	Video	video_ap	invprnt.p	01.00.00

4.7. Database Schema Updates

Relational database schemas are defined by PDBASE, PFILE, and PFIELD objects in the Roundtable repository - the schema objects assigned to a Workspace are called the logical schema. The OpenEdge databases managed by a Workspace also contain schema definitions - these are called the physical schema. When you modify the logical schema objects, Roundtable does not immediately update the physical schema. This allows you to make extensive changes to the database schema definitions while others continue to use the databases managed by the Workspace. You run the update schema process to post changes to the OpenEdge schema when it is convenient for all users of the Workspace.

A complete on-line history is kept of every change made to the logical schema. This allows the update schema process to determine which changes must be made in the physical schema due to changes in the logical schema. Because the system tracks both the committed and edited state of the logical schema it is not necessary to check in schema objects after each update schema process. Instead you can edit the logical schema and update these changes to the physical schema many times before completing the schema objects.

Roundtable provides data preservation capabilities for schema operations that would normally delete data from the database. For instance, Roundtable allows you to specify a change of data type for a field. The only way to post a change of this nature to the physical schema is to delete the fields and then add it back with a new data type. Using Roundtable, you specify a data transformation routine to convert the old data to the new data type. The data transformation will occur as part of the update schema process. See Section 4.7.10, “Data Procedures” [4–33].

Follow these steps to update the schema objects:

1. Build the Schema Update List. See Section 4.7.5, “Building the Schema Update List” [4–28].
2. Set the Deactivate Indexes flag where necessary. See Section 4.7.7, “Toggle Index to Activate/Deactivate” [4–30].
3. Create and Edit Data Procedures. See Section 4.7.10, “Data Procedures” [4–33].
4. Update Physical Schema. See Section 4.7.12, “Updating Physical Schema” [4–35].
5. Delete the Schema Update List. See Section 4.7.13, “Deleting the Schema Update List” [4–35].

4.7.1. Database Integrity Check Report

If changes are made to a physical database schema outside of Roundtable, difficulties may arise. Check that the physical database schema matches the definition managed by Roundtable by performing the Database Integrity Check Report. You do not need to run this report often. However, if you have any reason to believe that someone may have made changes to a database managed in a Roundtable Workspace directly, then you should run this report. The report lists all differences between what Roundtable believes the physical schema should be and what it actually is.

Follow these steps to run the Database Integrity Check Report:

1. Select the PDBASE object associated with the database you want to check in the object browse in the Tabletop.
2. Choose Reports → Object → Database Integrity Check Report . The Database Integrity Check Report appears.
3. Verify that the Workspace and PDBASE object values are correct, and then choose the **OK** button.
4. Choose Reports → Workspace → Unapplied Changes Report .
5. The report appears in a text viewer window.
6. When finished viewing and/or printing the report, close the text viewer window

4.7.2. What to Do when the Physical Schema Is Out of Synchronization

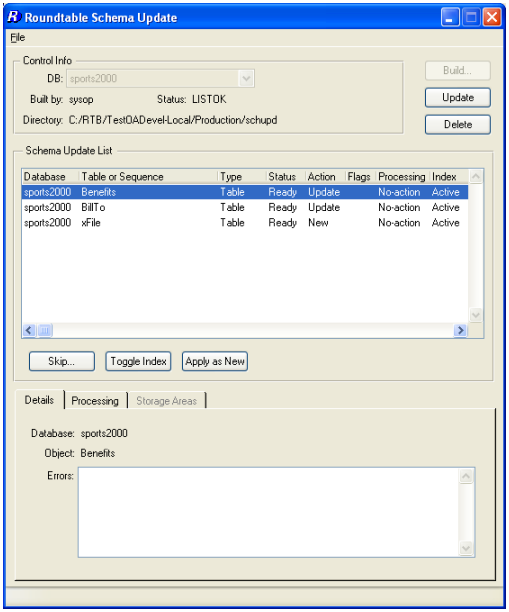
If you find that the physical schema of a database is no longer synchronized with the Roundtable you should resolve the differences as quickly as possible. This can be done in one of two ways.

If the changes in the physical schema are ones you want to keep, then run Load Schema. See Section 7.8, “Load Schema” [7–18]. This process will load the physical schema differences into Roundtable, and bring Roundtable's schema object definitions in sync with your physical Workspace database schema.

If the changes in the physical schema are not correct or will conflict with changes already made in the logical schema but not yet updated to the physical schema, then edit the physical schema using the OpenEdge Data Dictionary to remove the differences. Ensure that you have removed all of the differences by running the Integrity Check Report again.

4.7.3. Schema Update Window Description

The Schema Update window is used to manage the schema update process.



The following table describes the controls on the Schema Update Window:

Control	Description
DB drop-down list	Selects the Workspace database to update.

Control	Description
Build... button	Builds a Schema Update List. (See Section 4.7.5, “Building the Schema Update List” [4–28]).
Update button	Applies the Schema Update List to the selected database(s). (See Section 4.7.12, “Updating Physical Schema” [4–35]).
Delete button	Deletes the Schema Update List. (See Section 4.7.13, “Deleting the Schema Update List” [4–35]).
Skip... button	Skips the update one or more list items. (See Section 4.7.8, “Skipping a List Item” [4–31]).
Toggle Index button	Toggles indices for selected table between Active and Inactive. (See Section 4.7.7, “Toggle Index to Activate/Deactivate” [4–30]).
Apply as New button	Causes the selected table to be applied as "New", resulting in a drop and add of the table. (See Section 4.7.9, “Applying a Table as "New"” [4–32]).
Details tab	Displays information for selected list item, including any Build errors.
Processing tab	Used to define before and after schema update processing for the selected list item. (See Section 4.7.10, “Data Procedures” [4–33]).
Storage Areas tab	Used to assign storage areas for new tables, indices, and LOB fields.

The following table describes the columns in the Schema Update List:

Column	Description
Table or **Sequence**	The table name or sequence name in the OpenEdge dictionary.
Type	Indicates if entry is a Table or a Sequence.
Status	BldErr: Error while building Schema Update List Ready: Ready to be updated Intermediate Status (Not normally seen by user): DelIdx: Delete index ModFld: Modify field NewIdx: New index ModFil: Modify table FixDat: Fix data Compl: Update is complete

Column	Description
Action	New: Table or sequence is new Update: Table or sequence has been modified Delete: Table or sequence has been deleted Replace: Table definition has been replaced by a table definition from a different Product Module
Flags	Indicates particular table changes. You can use these flags to guide your before and/or Processing strategies. C: Field case-sensitivity change(s) D: Deleted field(s) E: Field extent change(s) I: Unique index change L: Field decimal places change(s) N: Field name change(s) O: Field order change(s) T: Field datatype change(s)  Any of these changes will modify the CRC of the table and necessitate a recompilation of referencing PCODE objects.
Processing	Used to indicate before and/or after update processes to preserve data across schema changes. See Section 4.7.10, “Data Procedures” [4–?]. No-action: No procedures are generated. Purge only: A purge procedure is generated. Dump only: Only a before-update procedure is generated. Load only: Only an after-update procedure is generated.

Column	Description
	Transform: Both before and after update procedures are generated.
Index	Indexes are toggled as Active or Inactive.

4.7.4. Unapplied Changes Report

The Unapplied Changes Report lists each schema object in the Workspace that has changed since the last Update Schema process. It is a good idea to run this report before updating the schema as a documentation tool and confirm that the changes about to be made to the OpenEdge database are correct.

Follow these steps to print the report:

1. Choose Reports → Workspace → Unapplied Changes Report from the Tabletop menu. The Unapplied Changes Report window appears.
2. Select the report options, and then choose the **OK** button.

4.7.5. Building the Schema Update List

The first step in updating the physical schema is to build the schema update list. The Build function locates all logical schema objects that have changed since the last time that the schema was updated and creates the schema update list.

Because a PFIELD can be assigned to several PFILE objects, a change to a single PFIELD object might affect the update of multiple tables.

After Roundtable generates the list of database tables and sequences that must be updated, it checks schema integrity. The integrity check looks for missing information such as a missing dump-name or primary index. It also checks for missing objects and other problems that would cause the table definition update to fail.

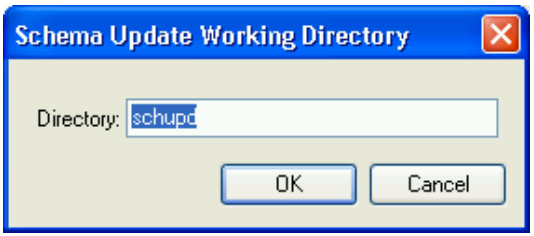
To see which schema objects need to be updated before building the Schema Update List, print the Unapplied Changes Report. For more information on this report, see Section 4.7.4, “Unapplied Changes Report” [4–28].

Sometimes tables are shown in the schema update list that do not actually need updating. These extra tables are sometimes included because Roundtable cannot resolve all cross-references to changes in the PFILE and PFIELD objects related to the table. Including these tables will not cause any

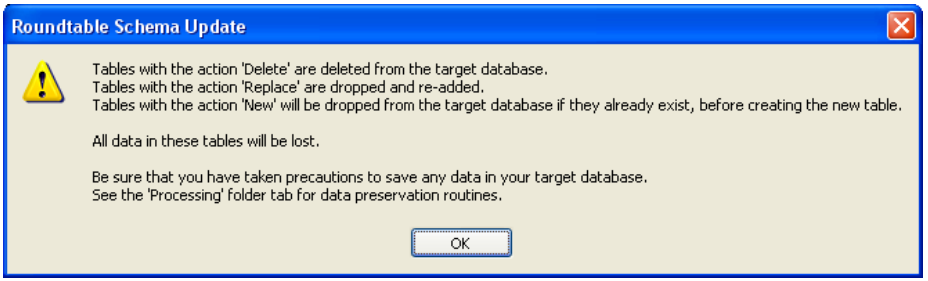
problems in the schema update process.

Follow these steps to build the schema update list:

1. Choose Workspace → Update Schema . The Schema Update window appears.
2. Choose the **Build** button. The Schema Update Working Directory dialog box appears.



3. Accept the default directory schupd unless large amounts of data are being preserved and it is necessary to specify a different schema update directory to store temporary data. Enter a different directory path if necessary.
4. Choose the **OK** button to generate the schema update list.
5. If any tables have been dropped, replaced, or newly added, then the following dialog box appears:



This dialog box warns you about the potential for data loss in your target database. If this dialog box appears, be especially careful that you review the schema update table to see which tables will be dropped. If any of the tables being dropped or dropped and re-added contain data that you will need later, then be sure that their data has been saved or that you are using some update processing to preserve their data. See Section 4.7.10, “Data Procedures” [4–33] for a description of Roundtable's data preservation hooks.

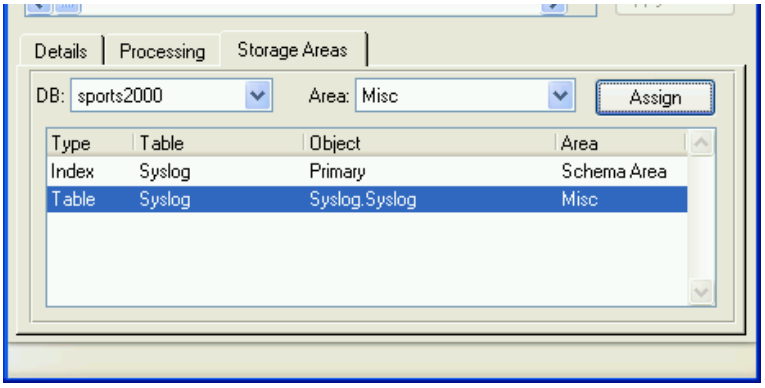
4.7.6. Database Storage Areas

You can choose to assign new tables or indexes to existing storage areas in the physical database by selecting the Storage Areas folder. This folder is only active when a new table, index, or LOB field is being added to the database.

Table assignments, field assignments, and indices that already have named storage areas (via the Logical Schema Manager) will not appear as candidates for storage area assignment (See Section 6.10, “Logical Schema Manager Window” [6–37]).

Follow these steps to assign the target storage area for new tables and indices:

1. Select the Storage Areas tab. The storage areas folder appears.



2. Select the appropriate database in the DB drop-down list. New tables and indices for the selected database appear in the browse.
3. Select the target storage area in the Area drop-down list.
4. Select one or more objects in the browse that you want to store in that area.
5. Choose the **Assign** button to assign the select area to the selected objects.
6. Repeat these steps as required.

4.7.7. Toggle Index to Activate/Deactivate

You can choose to deactivate the indexes on a table during the update schema process. This is necessary when making changes to the table that will result in non-unique index entries. The Index column shows the current status for a table.

Follow these steps to toggle indices:

1. Select the table in the schema update list.
2. If the Index is "Active" then choose the **Toggle Index** button.

   OR

   If the Index is "Inactive" then choose the **Toggle Index** button.
3. The Index status is changed in the schema update list.

You must manually re-index those tables for which the indexes have been deactivated after the schema update process. Use OpenEdge utilities to re-index the database tables affected.

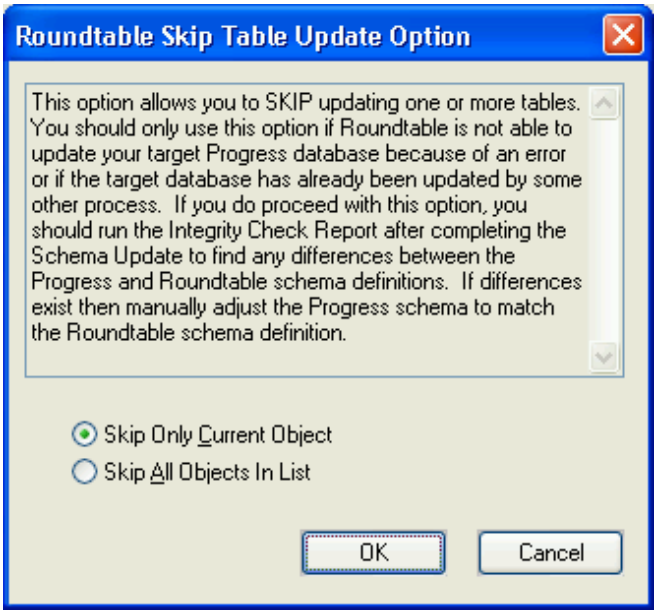
4.7.8. Skipping a List Item

You can skip the update of one or all of the items on your schema update list. This is useful if the database schema has already been updated in some other manner. When skipping a table, the status of the list item becomes Compl. Once skipped, the changes are assumed to have been made in the physical schema by some other means than the schema update process. Skipped tables and sequences will not show up on a subsequent build.

After skipping the update of one or more tables, choose the **Update Schema** button for final processing to occur.

Follow these steps to skip the update of a table in the schema update list:

1. Select the table to skip in the schema update list.
2. Choose the **Skip** button. The Skip Table Update Option dialog box appears.



3. Select the skip option. Choose Skip Only Current Object to skip the highlighted item or choose Skip All Objects in List.
4. Choose the **OK** button. The status of a skipped object is changed to Compl.

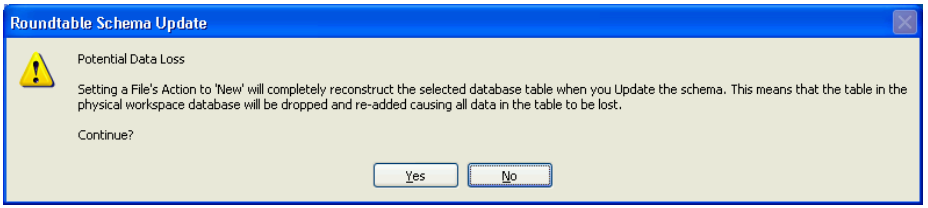
Remember to choose the **Update Schema** button even if all tables and sequences are skipped.

4.7.9. Applying a Table as "New"

When a table appears with an "Update" action in the Schema Update List, you can change the action to "New", causing the table to be dropped from the physical database and re-added. This can be useful if a previous "New" table update was skipped, causing the physical Workspace database to be out of synchronization with the logical Workspace schema.

Follow these steps to set the action of a table in the Schema Update List to "New":

1. Select the appropriate table in the Schema Update List.
2. Choose the **Apply as New** button. The following warning appears:



3. If you wish to proceed, then choose the **Yes** button to proceed with change.

When you apply the update, the table will be dropped form the database and re-added. If you need to preserve data in the Workspace database, define the appropriate data procedures before updating the schema Also, with the table's action set to "New", you will be able to assign storage areas for the table's indices and LOB fields.

4.7.10. Data Procedures

The update schema process can perform three functions on each table it updates:

- Run Before Schema Update Data Procedure
- Update Physical Schema
- Run After Schema Update Data Procedure

The first and third processes are optional and performed only if specified for the table. These procedures are used to preserve data across data type or extent changes, to a field definition, or when unique indexes are changed.

For example, if modifying the extent of a field, the Before Schema Update Data Procedure is used to dump the data from the field and the record ID of each record in the table being updated. This is necessary because OpenEdge forces the deletion of the field when an extent change is performed during the Update Physical Schema step. The After Schema Update Data Procedure is used to read the dump file and import the dumped data back into the table.

Roundtable generates templates for the Before and After Schema Update Data Procedures for each table based on the following options:

- **No-action:** No procedures are generated
- **Purge only:** A purge procedure is generated
- **Load only:** Only an after update process procedure is generated
- **Dump only:** Only a before update process procedure is generated

- **Transform:** Both before and after update processes are generated

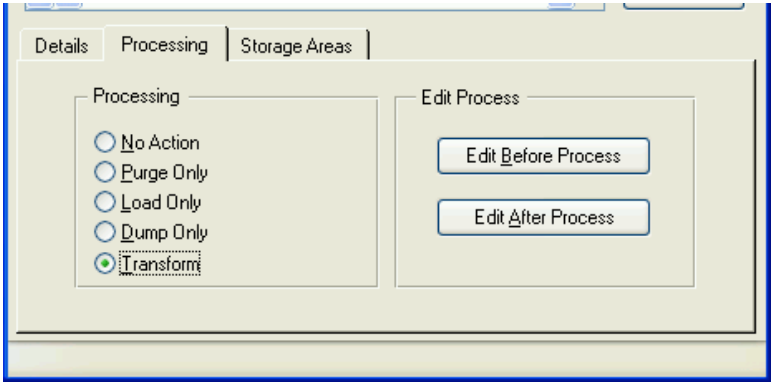
Editing the generated procedures must be done to include logic for data transformations. For example, if the data type of a field is changing from Character to Integer, the After Schema Update procedure must provide an algorithm that converts the character values (imported from the dump file) to integer values to assign to the field.

When modifying a unique index, you can use the Before and After Schema Update Data Procedures to ensure that unique records exist in the database after the update. The Before Schema Update Data Procedure can save the record ID of each record in the table. During the schema update the index can be deactivated. Then the After Schema Update Data Procedure can find the records that the Before Schema Update Data Procedure saved and delete or modify those records to meet the requirements of the modified index. You need to manually re-activate the index using the OpenEdge utility after the schema update is complete.

4.7.11. Creating Data Procedures

Follow these steps to create and edit data procedures:

1. Select the table in the schema update list.
2. Choose the Processing tab. The Processing folder appears.



3. Choose the Processing option appropriate for the table.
4. Choose the **Edit Before Process** button to edit the procedure generated to handle the Purge Only, Dump Only, or Transform option. A procedure window appears with the procedure in it.

   OR

   Choose the **Edit After Process** button to edit the procedure generated to handle the

Load Only or Transform options. A procedure window appears with the procedure in it.

5. Edit the procedure and then close the procedure window.

4.7.12. Updating Physical Schema

Follow these steps to update the physical schemas of the application databases managed in the Workspace:

1. Choose the **Update** button.
2. A warning dialog appears. Choose the **Yes** button to continue with the update. A status window appears while the updates are applied.
3. After the update completes, each updated table has a status of Compl.

4.7.13. Deleting the Schema Update List

After updating the schema, delete the schema update list. Roundtable will not allow using any of the schema objects as long as the list exists.

Follow these steps to delete the schema update list:

1. Choose the **Delete** button. A warning dialog box asks you to confirm list deletion.
2. Choose the **Yes** button. Another warning dialog box asks you to confirm deletion of the update process programs (dump and load programs).
3. Choose the **Yes** button to delete the data procedures, or choose the **No** button if you want to preserve them.
4. Choose File → Exit to close the Schema Update window.

4.8. Releases

A Workspace is a collection of object versions that define a configuration of the application. Roundtable tracks each change as an event and assigns a sequential event number to it. These events are collectively known as the event history of the Workspace. The actions that create events include:

- The assignment of an existing object version to the Workspace. This is commonly done by the Workspace import process. The Workspace import process quickly moves many object versions from a source Workspace into a target Workspace according to Workspace update rules. Object versions can also be individually assigned to the Workspace.

- The deletion of an object version from the Workspace configuration. This is commonly done by the Workspace import process, but can also be done individually.
- The check-in of an object. This results in a new object version in the Workspace.

A Release is a record of a specific event number in a Workspace. It can be used to re-create the exact contents of the Workspace configuration that existed as of that event.

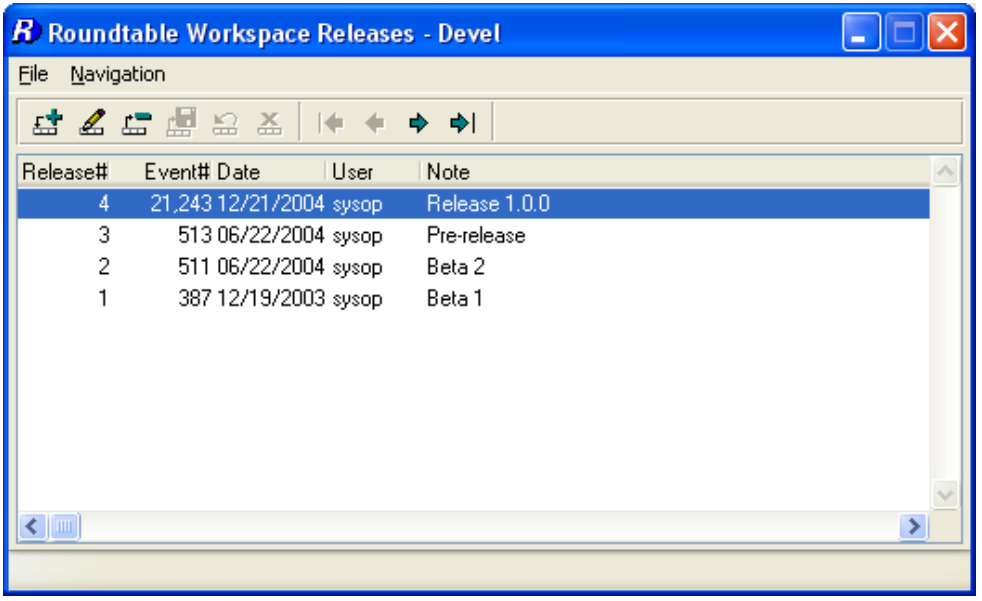
Each Release record has a sequential Release number that uniquely identifies it in the Workspace. Release records also contain a text label that describes the configuration of the system at the time the Release record was created. For example, Release number 23 from the Test Workspace might have a descriptive label like "Beta Release 2.1a".

Release records are used by the Workspace import process to control what can be pulled from a Workspace. See Section 4.9, “Imports” [4–40].

Release records are used to control the content of deployments created by the system. See Section 4.12, “Deployments” [4–46].

4.8.1. Releases Window Description

The Release Window contains a list of each Release that has been created in the current Workspace. A Release is a label identifying the state of the Workspace as of the latest event count.



The following fields can be found in the Releases Window:

Field or Button	Description
Release#	The Release number is generated automatically.
Event#	The latest Workspace event number when Release was added.
Date	The date the Release record was created.
User	The user who created the Release.
Note	A user specified description of the currently selected Release.

4.8.2. Adding a Release

Before adding a Release, ensure that all schema objects in the Workspace have a status of complete. Other types of objects may remain work-in-process.

Checked out objects have a work-in-process status and the special event number 99,999,999. When the object is checked in, a real event number for the new object version is assigned to the event record.

When you create a Release record in a Workspace that has work-in-process object versions, the configuration represented by the Release includes the last completed object version of each work-in-process object. Work-in-process objects are never included in a configuration identified by a Release record.

Follow these steps to add a Release:

1. Choose Workspaces → Releases from the Tabletop. The Releases window appears.
2. Choose the **Add Record** button. A new Release is inserted into the browse.
3. Enter a note in the Note column. Use this note field to describe the current configuration of the application in the Workspace (for example, 4.0a).
4. Choose the **Save Record** button.
5. Choose File → Exit to close the window.

4.8.3. Editing a Release

Once a Release is created, only the Note field can be changed.

Follow these steps to edit a Release:

1. Choose Workspaces → Releases . The Releases window appears.

2. Select the Release.
3. Change the text in the Note column as necessary.
4. Choose the **Save Record** button.
5. Choose File → Exit to close the window.

4.8.4. Deleting a Release

Roundtable only allows the deletion of a Release record if it is not referenced by a completed deployment and if it is the last Release created for the Workspace.

Follow these steps to delete a Release.

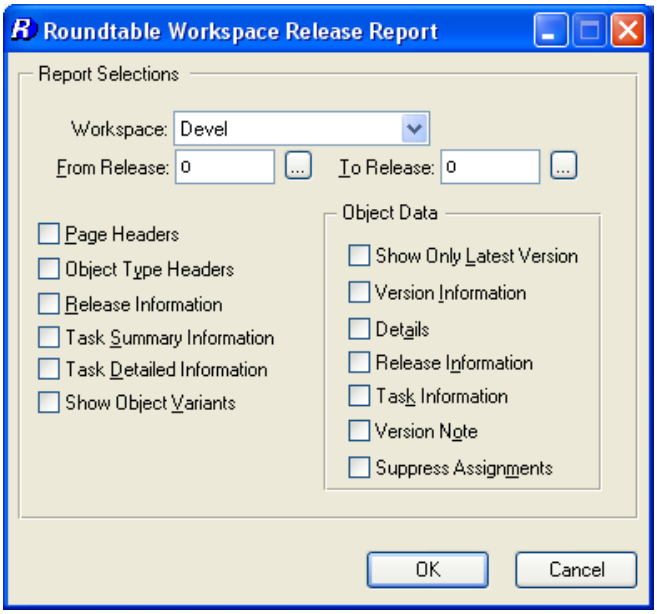
1. Choose Workspaces → Releases . The Releases window appears.
2. Select the Release.
3. Choose the **Delete Record** button. A warning dialog box appears.
4. Choose the **Yes** button.
5. Choose File → Exit to close the window.

4.8.5. Release Report

The Release Report provides a detailed list of the changes that have occurred in a Workspace between any two releases. Roundtable allows a comparison between specified releases.

Follow these steps to print the report:

1. Select a Workspace on the Tabletop.
2. Choose Reports → Workspace → Releases from the Tabletop menu. The Release Report window appears.



3. Enter the report options.

The following table describes the fields in the Release Report Submission dialog box:

Field	Description
From Release	Type the Release number to report from, or type 0 to report on all releases.
To Release	Type the Release number to report to, or type 0 to include the current Workspace contents.
Page Headers	Use this toggle box to print a report header at the top of each page.
Object Type Headers	Use this toggle box to show an object type header at the beginning of each object type.
Release Information	Use this toggle box to show Release information at the top of the report.
Task Summary Information	Use this toggle box to show summary task information at the top of the report.
Task Detailed Information	Use this toggle box to show detailed task information at the top of the report.
Show Only Latest	Use this toggle box to show only the latest version of each modified

Field	Description
Version	object.
Version Information	Use this toggle box to show the object version information (version and product module).
Details	Use this toggle box to show a detailed description of the latest object version.
Release Information	Use this toggle box to show the Release number that the object version was first included in.
Task Information	Use this toggle box to show the task number that the object version was created in.
Version Note	Use this toggle box to show the version note for each object.

4.9. Imports

To synchronize the currently selected Workspace configuration with the configurations of one or more source Workspaces, use the import process. This process is the primary means of managing the flow of object versions among Workspaces. See Section 1.1, “Introduction” [1–1] for an overview of how these Workspaces allow the management of various development cycles.

The import process reads the latest Release configurations of one or more source Workspaces and compares the object versions found in those source Workspace configurations with the current configuration of the currently selected (target) Workspace. Where the object versions in the source Workspaces differ from those in the target Workspace, the object versions are added to an import control list with an appropriate action code.

Optionally, objects can be filtered by Task Number, or by Workspace/Release across all or selected Workspaces when building the import control list.

Optionally, objects can be filtered by Task Number, by Workspace/Release, or by Product Module across all or selected Workspaces when building the import control list.

You then review the import control list and manually exclude or include items as necessary. Usually it is not necessary to do more than a quick review of this import control list. The Sort feature allows users to sort objects listed by Status, Object, Product Module, Module, Object Group, or Task Number. The list can be sorted by clicking on the column titles.

After reviewing the import control list, you launch the import process. The import process assigns objects from the repository to the target Workspace to bring the configuration of the target Workspace into agreement with the list of object versions included in the import control list. This import process might also remove objects from the Workspace if

necessary.

Follow these steps to perform an import:

1. Build the import control table. See Section 4.9.1, “Building the Import Control Table” [4–41].
2. Edit the contents of the import control list, if necessary. See Section 4.9.3, “Toggling the Import Status” [4–43].
3. Perform the import processing to assign or delete objects in the target Workspace. See Section 4.9.5, “Import” [4–44].
4. Delete the import control list. See Section 4.9.6, “Deleting the Import Control Table” [4–44].
5. Perform the update schema process if any schema object versions have changed. See Section 4.7, “Database Schema Updates” [4–23].
6. Perform a selective compile on the Workspace. See Section 7.3.4, “Selective Compiles” [7–6].

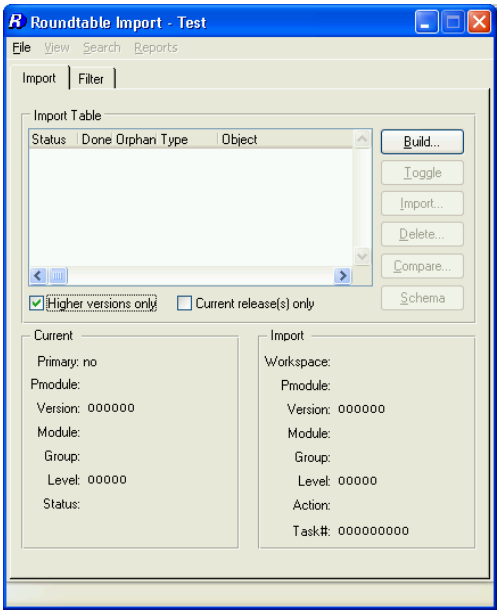
4.9.1. Building the Import Control Table

Setup the source Workspaces prior to building the Import Control Table. See Section 4.4, “Workspace Sources” [4–15].

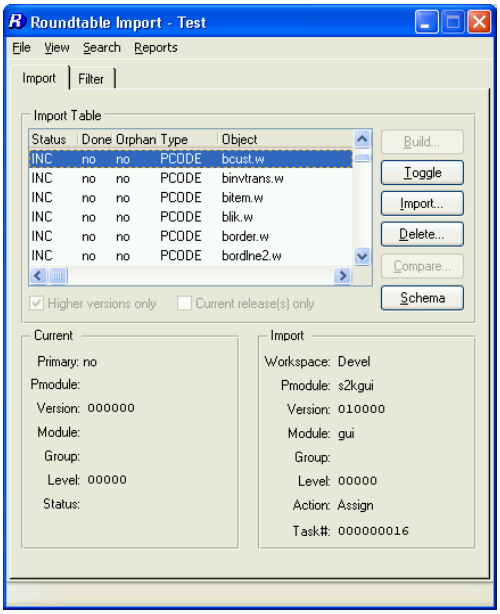
Once the Import Control Table is built, Roundtable locks the Workspace and will not allow others to work in the Workspace. If other users are working in the Workspace when Roundtable tries to lock it, the build process stops. Once the import process is complete and the Import Control Table is deleted, Roundtable removes the lock. This Workspace lock is not a OpenEdge record lock and survives system shutdown and restart.

Follow these steps to build the contents of the import control table:

1. Choose Workspace → Import . The Roundtable Import window appears.



2. (Optional - Recommended for advanced users only). To use filtering when building the import control list, select the Filter tab. The Filter folder appears. Select the type of Filter (Task or Workspace/Release), then select the desired items from the list(s) presented.
3. By default the "Higher versions only" toggle box is checked. This means that if the version of an object in the source Workspace(s) is lower (earlier) than the version already assigned to the target Workspace, it will be given a status of EXC (Exclude). If you wish to consider earlier versions for import, then uncheck the toggle box.
4. By default, the "Current Release(s) only" toggle box is not checked. This means that all differences between the current Workspace configuration and the source Workspace(s) will be considered for import. When this toggle box is checked, only those objects in the latest (or filter-selected) Release(s) will be considered for import.
5. Choose the **Build** button. A warning dialog asks if you want to build the list based upon you selection(s). Choose the **Yes** button to build the list.



6. You can sort the import control by clicking on the column headings.

4.9.2. Import Analysis Report

The Import Analysis Report lists all of the import objects found during the build process along with information on each object currently in the Workspace.

Follow this step to print the report:

- Choose Reports → Import Analysis Report from the Import Control window's menu bar.

4.9.3. Toggling the Import Status

The status of the objects in the Import Control Table can be either INC (Include) or EXC (Exclude). Only object versions with the INC status are processed during the import process. Use the **Toggle** button to change the status of any object. If you wish to include all of the objects, choose File → Include All . To exclude all the objects, choose File → Include All .

Follow these steps to selectively toggle an object's import status:

1. Select the object version in the import control list.
2. Choose the **Toggle** button. The status changes to either EXC or INC, depending on the previous status.
3. Repeat Steps 1 and 2 for each object you want to change.

4.9.4. Compare button

When you are not certain whether to include or exclude an object, you have the option of visually comparing the version selected in the import list with the version currently assigned to the Workspace using the **Compare** button.

Clicking on the **Compare** button opens the visual difference tool specified in User Preferences.

4.9.5. Import

The import process assigns or deletes objects in the current Workspace that appear in the import control list with a status of INC (Include). The assign process first removes any source code belonging to an existing object version and then exports the source from the repository for the new object version. As each object is successfully assigned, its Done field value is changed to Yes.

If the import process is interrupted, it can be restarted. If uncertain of a PCODE object due to an interruption, you can manually assign it to the Workspace. This forces the system to update the source code in the Workspace from the Roundtable repository. See Section 6.11, “Assigning an Object” [6–51] for more information.

After importing an object, Roundtable sets the object's update status in the Workspace to New. This ensures the object is processed in the next update schema or selective compile process.

Follow these steps to import the contents of the import control table:

1. Choose the **Import** button. A warning dialog box appears.
2. Choose the **Yes** button. Roundtable assigns objects to the Workspace.

4.9.6. Deleting the Import Control Table

When Roundtable built the import control table, it placed a lock on the Workspace to prevent others from working in the Workspace during the import process. To remove the lock, you delete the import control table.

Follow these steps to delete the import control table:

1. Choose the **Delete** button. A warning dialog box appears.
2. Choose the **Yes** button to delete the import control table contents.
3. Choose File → Exit to close the Workspace Import window.

4.10. Workspace Populate Process

Use the Workspace populate process to restore or remove source from a Workspace directory. A Workspace is a configuration of object versions defined by the configuration list stored in the repository. This makes it possible to restore the source of a Workspace by extracting the appropriate object version's files from the repository.

There are two common situations where it is necessary to use the populate process. The first is disaster recovery. For example, if a Workspace directory was deleted, the populate process can be used to restore its contents. Only the latest completed version of each object is restored. If work-in-process objects existed and had a status of Central, this work would be lost. In fact, the populate process does not even try to restore work-in-process objects to ensure that they are not overwritten in the populate process.

The second situation involves the use of the Workspace and Workspace module S-code flag. This flag indicates whether source (and other object files as well) should be stored in the Workspace. Set this flag to No, then run the populate process to remove source from the Workspace. Set this flag to Yes, then run the populate process to restore source in the Workspace.

A short cut can remove the source from a Workspace if no work-in-process objects exist. Change the S-code flag to No, then delete the source manually. This is a quick way to free disk space when a Workspace has not been used for some time and you want to keep the configuration of the Workspace indefinitely.

Follow these steps to run the Workspace populate process:

1. Choose Workspace → Workspace Maintenance from the Tabletop menu bar. The Workspace Maintenance window appears.
2. Choose File → Populate Workspace from the window's menu.
3. Choose the module to populate from the drop-down list or choose the special value of "All" to process all modules.

4.11. Build Names Table

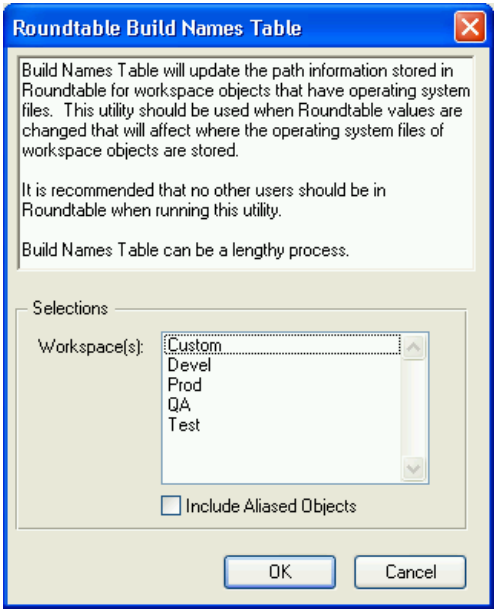
This option rebuilds the physical names table for any Workspace in the repository. This utility is rarely needed. Run this utility only when you believe that Roundtable has become confused about the physical names of objects in a Workspace. When you run this utility,

ensure that no one is using the Workspace (s) in which the utility is run.

Optionally, you can process aliased objects during the Names Table build. The paths for aliased object parts are specified when the object is created and are stored with the object. Including aliased objects will set their paths according to the corresponding module and Subtype paths. Do not include aliased objects if you wish to preserve the paths that were entered for them when they were created.

Follow this step to run the build names table utility:

1. Choose Admin → Build Names Table from the Tabletop menu. The Build Names Table dialog appears.
2. (Optional) Check the Include Aliased Objects toggle box to process aliased objects.



3. Select Workspace and then choose OK.

4.12. Deployments

Deployments provide a mechanism for packaging software changes for delivery to remote sites. It is not necessary for these remote sites to be running Roundtable to receive updates, but some Roundtable utility procedures must be delivered with your update. Sites that have the Roundtable system can be updated with information directly from the repository

if desired. Sites that receive updates packaged by Roundtable are called remote sites. Sites having the Roundtable system and receiving repository information are called partner sites. Each site is designated to be of one of the following types:

- R: Runtime License
- Q: Runtime Query License
- D: Development License
- S: Source License
- P: Partner License

Roundtable automatically encrypts source files based on the type of site and the content of the Encrypt field in each object record. Roundtable automatically includes repository information in export format for partner sites.

To create an encrypted-source deployment, xcodproc.dll must be in your DOS PATH or in DLC\BIN. The xcodproc.dll dynamic link library comes with OpenEdge Software's Toolkit product, and it is normally installed into the DLC\BIN directory. If you do not have the Toolkit from OpenEdge Software, you will only be able to create deployments where the deployment's Type field (license type) is set to Source or Partner.

Each Workspace can own one or more remote sites. Each of these sites has one or more sequential deployments. Each deployment, except for the first, is packaged as an incremental update of just the changes made in the system since the previous deployment to the site.

Each deployment record is numbered sequentially by site. Each deployment contains a Release number field into which the Workspace Release number to be deployed is entered. A Release number defines a specific configuration of the Workspace. See Section 4.8, “Releases” [4–35].

The content of a deployment is determined by comparing the Release number of the current deployment with the Release number in the previous deployment. Given these two Release numbers, Roundtable can use the event history of the Workspace to find the changes that occurred in the Workspace between the two releases. These changes are packaged as the incremental update.

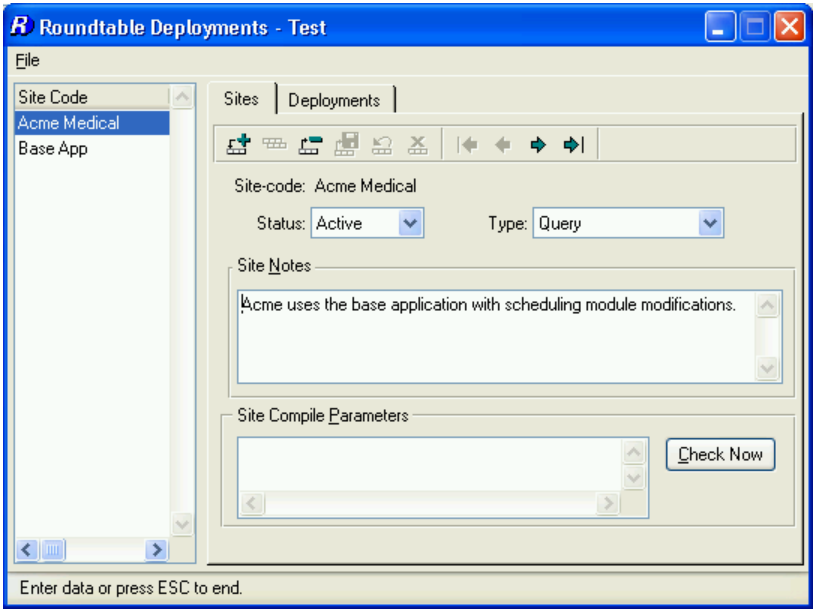
Roundtable creates incremental updates for both the source files and database schema content of your application. Roundtable utilities for the update or creation of the application databases and for the compilation of procedures are supplied in source form and can be customized and delivered with your application.

Deployments can be made from any Workspace. Usually, you deploy from the last Workspace in the quality assurance cycle. Follow these steps to deploy to a remote site:

1. Ensure the correct Release is available.
2. Select or add a remote site.
3. Add a deployment for that remote site.
4. Build a schema control table list.
5. Create schema data procedures as required.
6. Make update directories.
7. Package and deliver the contents of the update directories to the remote site.
8. Install the deployment at the remote site.
9. Complete the deployment.

4.12.1. Roundtable Deployments Window Description

Remote sites receive packaged updates of the application system. Each site can receive multiple sequential deployments. Each deployment is a software update consisting of the incremental changes in the software system since the previous deployment to the site. Remote sites and deployments are managed in the Roundtable Deployments window shown.



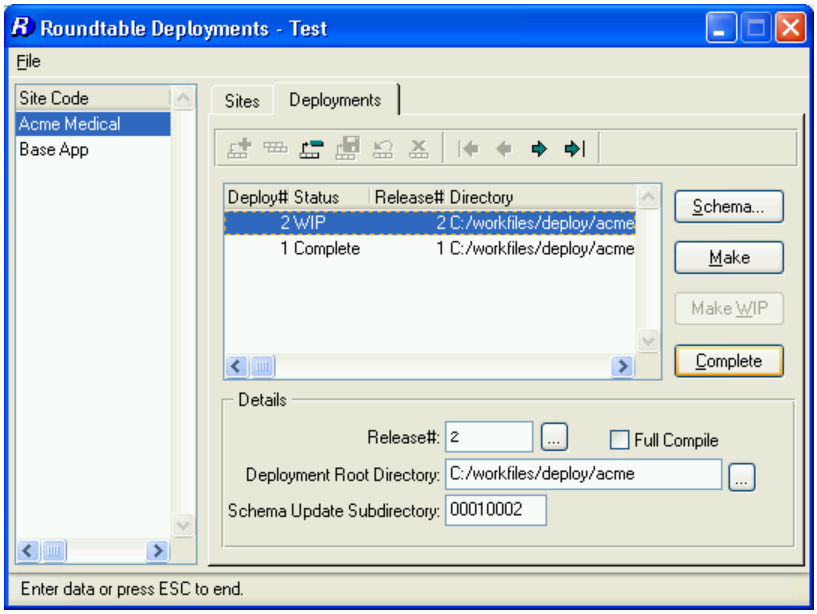
This window contains a browse table that listing remote sites and two tab folders.

The Site folder contains general information about the site selected in the browse table.

Field or Button	Description
Site-code	Deployment site identifier.
Status	The status of a site can be active or inactive. The status is shown in both the Site table and Site folder.
Type	Type of deployment: Runtime, Development, Query, Source, or Partner. The type of deployment determines the content of the deployment, including whether or not the source is encrypted.
Site Notes	User notes about the site.
Site Compile Parameters	This editor contains one or more compile parameters that should be added to the compile statements for procedures compiled at the remote site. Workspace and module compile parameters are ignored when building a deployment. You cannot have module-by-module control of your site's compile parameters. If a PCODE object's compile parameters are set to override the Workspace compile parameters, then they also override the site compile parameters. The site compile parameters are ignored. Otherwise, the PCODE object's compile parameters are used in addition to the site compile parameters.
Check now button	This button checks the contents of the Site Compile parameters editor to ensure that the parameters are valid OpenEdge compile statement parameters.

4.12.2. Roundtable Deployments Window Deploy Folder

The Deploy folder contains information about each sequential deployment made to the remote site.



Field or Button	Description
Deploy#	You make one or more sequential deployments to each site. Each of these is identified by a sequential number starting at a value of 1 and incrementing with each deployment by 1.
Status	The Status of the deployment is either WIP (Work In Process) or Complete.
Release#	Each deployment is associated with a Release number. Release numbers identify a particular state of the Workspace. You can deploy any Release level.
Full Compile	This toggle box controls whether a full compilation is performed at the remote site when the deployment is received. If it is not selected then only those routines that need to be compiled because of the newly delivered system components are compiled.
Deployment Root Directory	The root directory to build your deployment in.
Schema Update Subdirectory	The name of the subdirectory that will contain the deployment's schema information. This subdirectory will reside under the rtb_dbup subdirectory of your deployment root directory. The name of this subdirectory is important as it represents your 4-digit schema version number, or an 8-digit incremental schema update number. See Section 4.14.3, “Schema Release Rules” [4–65] for details.

Field or Button	Description
Schema button	Choose the **Schema** button to generate the schema information for the deployment.
Make button	Choose the **Make** button to generate the deployment package.
Edit Before Process or **Complete** button	Choose this button to toggle the status of the deployment between Complete and WIP. A Complete deployment record cannot be modified or deleted. Also, a new deployment record cannot be added until the latest one has its status set to Complete.

4.12.3. Adding a Remote Site

Follow these steps to add a remote site:

1. Choose Workspace → Deployments . The Roundtable Deployments window appears.
2. Choose the **Add Record** button.
3. Enter the new site code and select the license type. Site codes must be unique throughout the system. The same site code cannot be defined under two different Workspaces. Roundtable matches the license type against the Encrypt field in the PCODE object definition to determine whether it should encrypt the PCODE objects being deployed. The Encrypt field defaults to a value of "RQD", which means that if the license type is Run-time, Query, or Development, Roundtable should encrypt the PCODE object.
4. Edit the fields in the site folder as necessary. The Status is either A (Active) or I (Inactive).
5. Choose the **Save Record** button.
6. Choose File → Exit to close the window.

   OR

   Choose the Deployments tab and create a deployment. See Section 4.12.7, “Adding a Deployment” [4–53].

4.12.4. Editing a Remote Site

Once the remote site is created, the site notes and status of the site can be changed.

Follow these steps to edit a remote site:

1. Choose Workspace → Deployments from the Tabletop menu. The Roundtable Deployments window appears.

2. Select the site to edit from the Site browse.
3. Choose the Site tab. The Site folder displays.
4. Edit the site folder.
5. Choose the **Save Record** button to complete the edit.
6. Choose File → Exit to close the window.

4.12.5. Deleting a Remote Site

Once a remote site is no longer in use, it can be deleted.

Follow these steps to delete a remote site:

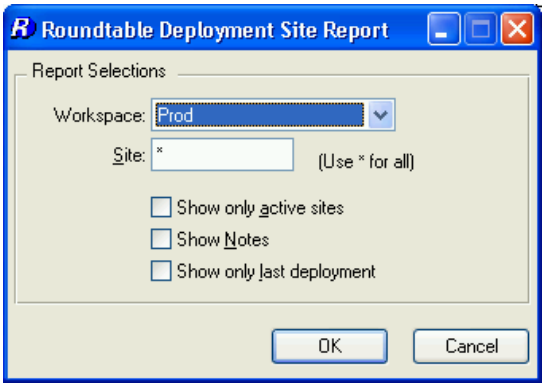
1. Choose Workspace → Deployments from the Tabletop menu. The Roundtable Deployments window appears.
2. Choose the site to delete from the Site browse.
3. Choose the **Delete Record** button. A warning dialog box appears. Choose the **Yes** button to delete the site.
4. Choose File → Exit to close the window.

4.12.6. Printing the Site Report

The Site Report gives site information, including the site notes and status, for each remote site.

Follow these steps to print the report:

1. Choose Reports → Workspace → Sites Report from the Tabletop menu. The Sites Report window appears.



2. Specify the report selections, and then choose the **OK** button.

4.12.7. Adding a Deployment

Once a remote site is created and set up, the software can be deployed. See Section 4.12.3, “Adding a Remote Site” [4–51]. When creating a deployment, Roundtable determines what the last update to the remote site was, then determines what needs to be deployed.

After adding a deployment, you can change both the release number and deployment directory. See Section 4.12.8, “Editing a Release Number and Directory” [4–54].

Follow these steps to add a deployment:

1. Choose Workspace → Deployments . The Roundtable Deployments window appears.
2. Choose the Site to deploy from the Site browse.
3. Choose the Deployments tab. The Deployments folder opens.
4. Choose the **Add Record** button.
5. To select the release used, choose the Release# field's **Lookup** button. The Release Lookup dialog box appears. Select the release number to use and choose the **OK** button. The Release Lookup dialog box closes.
6. Choose the **Save Record** button to save the deployment.
7. Choose File → Exit to exit the window.

   OR

   Continue with other steps in the deployment process:

See Section 4.12.8, “Editing a Release Number and Directory” [4–54].

See Section 4.12.10, “Building a Schema Update List” [4–55].

See Section 4.12.11, “Making an Update Directory” [4–56].

See Section 4.12.12, “Updating at a Remote Site” [4–57].

See Section 4.12.14, “Completing a Deployment” [4–61].

4.12.8. Editing a Release Number and Directory

After creating a deployment, you can change the Release number or deployment directory. The deployment directory is where Roundtable writes the update package for the deployment.

Follow these steps to edit the Release number and directory.

1. Choose Workspace → Deployments from the Tabletop menu. The Roundtable Deployments window appears.
2. Choose the site from the Site browse.
3. Choose the Deployments tab. The Deployments folder appears.
4. Select the deployment to change (only WIP deployments can be altered).
5. Choose the Release field's **Lookup** button. The Release Lookup dialog box appears.
6. Select Release, and then choose the **OK** button.
7. Change the directory, if necessary, in the Directory field.
8. Choose the **Save Record** button to save the changes.
9. Choose File → Exit to exit the window.

OR

Continue with other steps in the deployment process:

See Section 4.12.10, “Building a Schema Update List” [4–55].

See Section 4.12.11, “Making an Update Directory” [4–56].

See Section 4.12.12, “Updating at a Remote Site” [4–57].

See Section 4.12.14, “Completing a Deployment” [4–61].

4.12.9. Deleting a Work-in-process (WIP) Deployment

Once a deployment is created, it has a work-in-process (WIP) status. Change this status to complete after confirming that the deployment is successful. Roundtable ensures that only WIP deployments can be deleted.

Follow these steps to delete a WIP deployment.

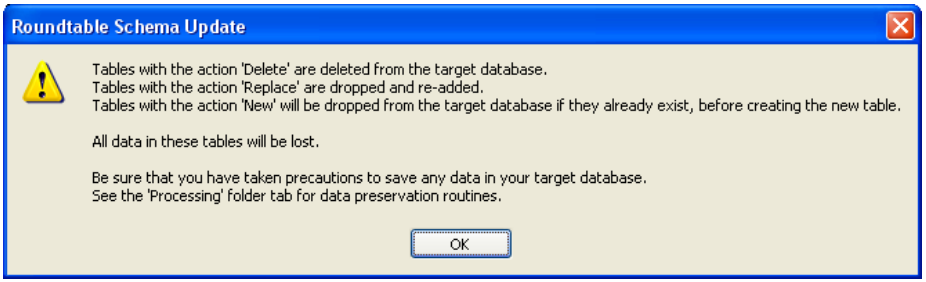
1. Choose Workspace → Deployments from the Tabletop menu. The Roundtable Deployments window appears.
2. Choose the site from the Site table.
3. Choose the Deployments tab. The Deployments folder opens.
4. Select the deployment to delete.
5. Choose the **Delete Record** button. A warning dialog box appears. Choose the **Yes** button to delete the deployment.
6. Choose the **Done** button to close the window.

4.12.10. Building a Schema Update List

A schema update list is similar to the one used when updating schema objects. To build the list for regular schema updates, Roundtable examines all of the changes made to schema objects in the system and determines their impact on the physical schema tables in the OpenEdge Data Dictionary. To build the schema update list for a deployment, Roundtable compares the schema objects in the Workspace with the last version of the schema objects delivered to the remote site. After Roundtable builds a list of tables changes to be delivered to the remote site, it performs an integrity check on these tables. The integrity check ensures that all PFILE and PDBASE relationships are valid.

Follow these steps to build the schema update list:

1. Choose Workspace → Deployments from the Tabletop menu. The Roundtable Deployments window displays.
2. Choose the site from the Sites browse.
3. Choose the Deployments tab. The Deployments folder opens.
4. Choose the **Schema** button. The Update Schema window displays.
5. Choose the **Build** button to generate the schema update list.
6. If any tables have been dropped, replaced, or newly added, then the following dialog box appears:



This dialog box warns you about the potential for data loss in your target database. If this dialog box appears, be especially careful that you review the schema update table to see which tables will be dropped. If any of the tables being dropped or dropped and re-added contain data that you will need later, then be sure that their data has been saved or that you are using some update processing to preserve their data. See Section 4.7.10, “Data Procedures” [4–33] for a description of Roundtable's data preservation hooks.

7. Close the Schema Update window.
8. Continue with other steps in the deployment process: See Section 4.12.11, “Making an Update Directory” [4–56]. See Section 4.12.12, “Updating at a Remote Site” [4–57]. See Section 4.12.14, “Completing a Deployment” [4–61].

4.12.11. Making an Update Directory

The make update process writes the contents of the deployment into a directory of your choice. Install support tools are also placed in the directory automatically. These support tools are discussed in the next section.

Follow these steps to create an update directory:

1. Choose Workspace → Deployments from the Tabletop menu. The Roundtable Deployments window appears.
2. Choose the site from the Sites browse.
3. Choose the Deployments tab. The Deployments folder opens.
4. Choose a WIP deployment.
5. Choose the **Make** button to generate the deployment directory.
6. Choose the **Done** button to exit the window.

OR

Continue with other steps in the deployment process:

See Section 4.12.12, “Updating at a Remote Site” [4–57].

See Section 4.12.14, “Completing a Deployment” [4–61].

4.12.12. Updating at a Remote Site

Roundtable provides a set of OpenEdge-specific utilities necessary for installing the software at a remote site. These utilities do not include a packaging utility to create install disks or utilities to automate the installation from distribution media onto a computer. There are a variety of Windows install utilities available that perform these functions very well.

The utilities provided by Roundtable perform:

- Schema update processing
- Selective and full compile processing

When Roundtable creates a deployment directory, it also creates three subdirectories to support the install utilities. These are the rtb_inst, rtb_idat and rtb_dbup directories:

<table>
<tr><th>Directory</th><th colspan="2">Directory Description</th></tr>
<tr><td>rtb_inst</td><td colspan="2">Contains the generic utility programs and data files for the installation and compilation of the changes copied to the remote site. This directory should remain on the remote site permanently to support future incremental updates.</td></tr>
<tr><td></td><td>
<table>
<tr><th>File</th><th>File Description</th></tr>
<tr><td>Compctrl</td><td>Text file contains a list of compilable procedures & compile options.</td></tr>
<tr><td>schupd.p</td><td>Schema update procedure, part 1.</td></tr>
<tr><td>schupd2.p</td><td>Schema update procedure, subroutine for part 1.</td></tr>
<tr><td>schupdp2.p</td><td>Schema update procedure, part 2.</td></tr>
<tr><td>compobj.p</td><td>Procedure for compiling a deployed Roundtable Object.</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Directory</th><th colspan="2">Directory Description</th></tr>
<tr><td>rtb_idat</td><td colspan="2">Contains temporary files that can be deleted from the remote site after the update installation is complete.</td></tr>
<tr><td></td><td>File</td><td>File Description</td></tr>
<tr><td></td><td>objctrl</td><td>A list of new or modified objects delivered in the deployment. The _update.w procedure posts these changes in the rtb_inst\compctrl file.</td></tr>
<tr><td></td><td>delctrl</td><td>A list of files to delete from a previously installed configuration of the system. The _update.w procedure performs this task.</td></tr>
<tr><td></td><td>selcomp</td><td>A list of selected objects to compile. The _update.w procedure reads this list and marks corresponding objects in the rtb_inst\compctrl file for compilation. Roundtable creates this list of objects requiring compilation automatically.</td></tr>
<tr><td></td><td>objcopy.ful, objcopy.sel</td><td>The _update.w procedure allows you to designate an alternate root directory for the R-code of compiled object to be placed. The objcopy files contain a list of additional files or directories that should be copied into the root directory. The objcopy.ful file is used for full compiles, and the objcopy.sel file is used for selective compiles. These files are created automatically for objects that have their Objcopy attribute turned on.</td></tr>
</table>

Directory	Directory Description
rtb_dbup\dbver	Contains the database schema update files required to update the application databases at the site. During the update schema process, the files in this directory are copied into rtb_idat where they are processed. The dbver subdirectory name is usually generated by Roundtable.

Directory	Directory Description	
	File	**File Description**
	schctrl	Schema update control file. This file contains a list of each database table to be updated in each database used by the application.
	*.df	Files for updating database schema.
	*d.p	Programs for pre-update file processing.
	*f.p	Programs for post-update file processing.

To provide install support for Roundtable deployments into your application, take a copy of the _update.w procedure supplied within the top Roundtable source directory and modify it to suit your needs. The _update.w procedure should become part of your application and be located in the root directory of your application. This will ensure that the rtb_inst, rtb_idat and rtb_dbup directories will be immediately below the directory where _update.w is stored. Additionally, _update.w calls the DB Areas function that allows you to assign new tables and indices, during the product installation, to existing storage areas in the physical database.

The following files are created at the remote site by the installation control procedure or manually by the user. These files are not automatically created by the installation support procedures supplied by Roundtable.

File	Description
Schema.pf	A OpenEdge parameters file contains the database connection parameters used during the remote site schema update process. This file must connect all of the databases to be updated at the remote site. See ??? [4–58] for more information on how this parameter file is processed. The _update.w procedure has support for creating and maintaining the schema.pf file.
Compile.pf	A OpenEdge parameters file contains the database connection parameters to be used during the compile process. The _update.w procedure has support for creating and maintaining the compile.pf file.

During execution of _update.w, various log and error files are created in a directory called

rtb_ilog. Normally, these files can be ignored.

The following log files are created in the rtb_ilog directory when the schema update procedures are compiled:

File	Description
schcomp.srt	Created by _update.w during the OS-COMMAND when executing schcomp.p. From this file you can determine if execution of schcomp.p began.
Schcomp.log	Created by schcomp.p. Contains the names of the schema update files being compiled.
Schcomp.err	Created by schcomp.p. Contains any compile errors that occur during the compile of the schema update programs. This file is empty if no compile errors occur.

The following log files are created in the rtb_ilog directory during the pre-schema and schema update:

File	Description
Schupd.srt	Created during the OS-COMMAND when executing schupd.p. From this you can determine if schupd.p execution began.
Schupd.log	Created by schupd.p. Contains information about what table is being updated in the pre-schema and schema update.
Schupd.err	Created by schupd.p. Contains any errors that occur during pre-schema and schema update.
Schema.log	Created by schupd.p. Contains detailed log information about the pre-schema and schema update.

The following log files are created in the rtb_ilog directory during the post-schema update:

File	Description
Schupdp2.srt	Created during the OS-COMMAND when executing schupdp2.p. From this you can determine if schupdp2.p execution began.
Schupdp2.log	Created by schupdp2.p. Contains information about what table is being processed by the post-schema update.
Schupdp2.err	Created by schupdp2.p. Contains any errors that occur during post-schema update.

The following error file is created in the rtb_ilog directory when updating the compctrl

file:

File	Description
objctrl.err	Created by _update.w when updating the compctrl file. If any errors occur during the creation of the comctrl file, they appear here.

4.12.13. The Update Process

Follow these steps to perform a sample update process:

1. Shut down databases if this is not a first time installation.
2. Back up the databases and application directories if this is not a first-time installation.
3. Copy the installation package into the application directories. This means that the rtb_inst, rtb_idat, and rtb_dbup directories will exist in your application's root directory. The use of a windows install utility is highly recommended.
4. Place an icon in the application's program group to launch _update.w. Ensure that the working directory is your application root directory. The _update.w procedure is your own copy of Roundtable's _update.w procedure, which we supply with Roundtable to manage the Roundtable compilation and installation process. You should modify _update.w to reflect your own application's installation requirements. At the very least, you should change it so that it displays your own application's name, rather than "Roundtable". For a more detailed discussion of the schema update process and the options available to you, see Section 4.14, “Database Schema Updates on Remote Sites” [4–62].
5. After completing the remote site update process you should complete the deployment. See Section 4.12.14, “Completing a Deployment” [4–61].

4.12.14. Completing a Deployment

Before you complete a deployment, it is good practice to confirm that the remote site successfully received and installed that deployment. That way, if the remote site update did not work properly, you can modify the Workspace and restart the deployment process. Once the deployment is complete, the Status field toggles between WIP and Complete.

Follow these steps to complete a deployment:

1. Choose Workspace → Deployments from the Tabletop menu. The Roundtable Deployments window appears.
2. Choose the Site in the Site browse.
3. Choose the Deployments tab. The Deployments folder opens.

4. Choose the **Complete** button.
5. Choose File → Exit to close the window.

A new deployment cannot be created until the last deployment has been completed.

4.13. Procedure Updates and Compiles on Remote Sites

Procedure updates and compiles are performed by the _update.w procedure. This procedure performs maintenance on the rtb_inst/compctrl file. The compctrl file contains a list of each application procedure that can be compiled by your application. _update.w updates the compctrl file when a new update package is received by reading the contents of the rtb_idat/objctrl file and inserting and deleting items from compctrl.

The _update.w procedure deletes unused application files by reading the list of files to be deleted from the rtb_idat/delctrl file.

Use the R-code directory fill-in in the _update.w procedure to specify the destination root directory of the R-code in the application. Make this field blank if your R-code will remain in the same directory as the source. If an rtb_idat/objcopy file exists, items specified in it are copied into the R-code destination as well. This is very useful if you have bitmaps and other files that must be in your application R-code directory structure.

4.14. Database Schema Updates on Remote Sites

Remote site database schemas are updated by the _update.w procedure with calls to the rtb_inst/schupd.p, rtb_inst/schupd2.p and rtb_inst/schupd2p.p procedures. These procedures read information in a OpenEdge database parameters file. _update.w finds and connects to one or more databases that will be updated with the schema update package delivered in the rtb_dbup directory.

If the databases specified in the schema.pf file are local to the client running _update.w, the databases can be connected in single user mode for the update. This is the preferred connection mode for schema update processing. If the databases do not yet exist but can be created by the OpenEdge client session with the DATABASE CREATE statement, _update.w can create the databases for you. See your OpenEdge documentation to determine if your OpenEdge client software can create a database. For example, it is not possible for a 16-bit OpenEdge NT client to create a 32-bit NT server database even if both the OpenEdge NT server and OpenEdge NT client are installed and running on the same machine. In all cases, a OpenEdge client cannot create a database on a database server. If the OpenEdge client can access the platform providing database server services and the platform is also available as a file server, it might be possible to connect in either a database server or single user mode.

If the databases have not yet been created and the OpenEdge client cannot create them, you must create the database manually from the empty.db supplied with the server

platform's copy of OpenEdge before updating its schema from the client running _update.w.

A OpenEdge client running _update.w can update the schema of a database connected by a networking protocol. However, you must start the database servers before running the _update.w procedure on the client machine. The schema.pf file should contain all of the required connection information for the client.

The _update.w procedure uses the schema.pf file to manage the client connection to the databases when these databases are located on database servers. The creation, startup and shutdown of the database servers cannot be managed by the OpenEdge client running the _update.w procedure. Again, if you are installing in a client/server environment, you must ensure that the database servers are available for connection by the OpenEdge client running the _update.w procedure.

Because it is important that the OpenEdge client running _update.w have uncontested access to database servers during a schema update, please ensure that the servers are started with a -n 1 argument to allow only a single client connection.

4.14.1. Schema Update Process

The schema update process is the most complex process performed during the update at the remote site. It performs the following functions:

- Runs any Before Schema Update Procedures to dump selected data from the database that would otherwise be destroyed by the schema change.
- Applies the schema updates contained in the *.df files delivered with the deployment.
- Runs any After Schema Update Procedures to restore data into the database that was dumped in the first stage of update processing.

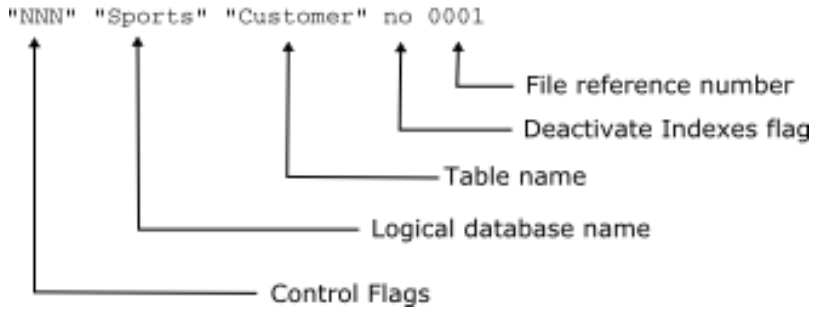
The schema update process reads a control file, called schctrl, to manage the three-stage update of each of the connected databases. As the operations specified in the schctrl file are completed, the schctrl file is modified to record these completed steps. This allows the update schema process to be restarted if it is interrupted.

The schctrl file is a simple text file with one line per database table to be updated. Each line in the schctrl file contains the following fields in OpenEdge export format:

- Control flags: Three characters representing the status of the three update stages. Each character is either Y or N, indicating whether the operation has been completed. The stages are Before Schema Update, Schema Update and After Schema Update.
- Database name: The name of the logical database in which the file being updated is located.
- Tablename: The name of the table to update.

- Deactivate indexes?: The option for deactivating the indexes, either Yes or No.
- File reference number: A four-digit number used to identify the *.df, *d.p and *f.p files to use during the schema update process. The *.df file contains the schema change information, the *d.p procedures are those procedures run during the first stage, and the *f.p procedures are those procedures run during the third stage of update processing.

Here is a sample line from a schctrl file:



Because the control flags for the sample line above are "NNN", each of the three processing actions are taken on the file. This means that there will be two procedure files and a schema update file for this table. These files will be named 0001d.p, 0001f.p, and 0001.df. The 0001d.p procedure file is responsible for dumping any data that would otherwise be deleted during the schema update process. The 0001.df, file contains OpenEdge data definition language statements describing the schema update to be performed on the table. The 0001f.p procedure is responsible for loading any data back into the database that was dumped by 0001d.p.

4.14.2. Creating and Editing the schema.pf File

The schema.pf file is a OpenEdge parameters file containing the startup parameters necessary to connect to the application databases being updated. In addition to the normal database connection parameters, the schema.pf file must contain a comment line with a Release number that indicates the Release level of the current database schemas. Here is a sample schema.pf file:

```
#Schema.pf file -used for the update of database schema
#release=0021
-db sports.db -ld sports -1 -U "" -P ""
```

OpenEdge considers lines beginning with # in a parameters file to be comments. The _update.w procedure uses the #release= token to establish the current Release level of the

database so it can select the correct database update package from the rtb_dbup directory.

If the schema.pf file is created by the _update.w procedure, it contains the following default values:

```
#Schema.pf file -used for the update of database schema
#release=empty
```

Enter the database connection parameters manually or choose the **pf Entry** button. The pf **Entry** button presents a series of dialog boxes that construct database connection parameters for you and write the parameters into the editor widget containing the parameters file. After creating the database connection parameters, the contents of the editor widget should resemble the following example:

```
#Schema.pf file -used for the update of database schema
#release=empty
-db sports.db -ld sports -1 -U "" -P ""
```

The "#release=empty" line indicates that the database has not yet been updated with any schema. As part of the schema update process the "#release=empty" line is replaced with a line containing the Release level of the update. For example:

```
#Schema.pf file -used for the update of database schema
#release=empty
-db sports.db -ld sports -1 -U "" -P ""
```

4.14.3. Schema Release Rules

The release name specified on the #release line in the schema.pf file is derived from the name of the subdirectory in rtb_dbup that was used to process the schema update. The rules governing the selection of the subdirectory to use in the update are simple:

1. If #release=empty, then find and use the subdirectory in rtb_dbup that has a name four characters long. If more than one such directory exists, use the one with the highest value. The new #release=value line contains the name of the directory selected.
2. If #release=xxxx, then find a subdirectory in rtb_dbup that is eight characters long and begins with the value "xxxx". If more than one such subdirectory exists, then

select the one with the highest value. The new #release=value line contains the last four characters of the eight-character subdirectory name selected.

By default, the subdirectories created in the rtb_dbup directory are named using the Release number associated with the deployment being made and the previous Release. Consider the following example:

Deploy	Rel	Schema Changes?	rtb_dbup/subdir	Before install #release=	After install #release=
1	12	Yes-full schema	0012	empty	0012
2	13	Yes	00120013	0012	0013
3	14	No		0013	0013
4	15	Yes	00130015	0013	0015

When no schema updates are included in a deployment, no schema update package directory is created as is shown in deployment 3 above. Then the _update.w program can determine that no update was delivered and skip the schema update process.

You override the naming of the schema update package directory created during a deployment by specifying it in the deployment directory fill-in in the Roundtable Deployments window. Remember that these schema update directories must be either four or eight characters long and have collation values that follow the rules stated above to participate in the update process.

4.14.4. Updating Database Schemas Dialog Box

When you update the schema of a database at a remote site, the Updating Database Schemas dialog box appears. This dialog box contains an editor widget in which each step of the database schema processing is displayed.

Each possible step in the processing is audited by this dialog box. The steps include:

1. Scanning the rtb_dbup directory for schema update packages. The Release number in the schema.pf file is used to identify which schema update package should be used in the update process. The contents of the selected schema update directory are copied into rtb_idat. This step is skipped if an rtb_idat/schlock file exists (see step 3).
2. Expanding the rtb_idat/schctrl file for database "copies" identified in the schema.pf file. See Section 4.14.5, “Database Copies” [4–67]. This step is skipped if an rtb_idat/schlock file exists.
3. Writing a process lock file named rtb_idat/schlock.
4. Compiling the schema update subroutine procedures.

5. Running the database dump procedures to preserve the data that would be lost because of the schema updates.
6. Updating the schema for each database.
7. Running the database load procedures to restore dumped data.
8. Removing the process lock file rtb_idat/schlock.
9. Removing the temporary files copied from the schema update package directory into rtb_idat.

4.14.5. Database Copies

In many OpenEdge applications, it is useful to create copies of the application database. For example, each department in a company might have a separate application database but use the same application code. Each of these database copies must have the same cyclical redundancy check (CRC) stamp to use the same compiled application code. The update process can keep the CRC in each of these databases in sync by applying schema updates against each database in exactly the same order.

To update these database copies, the installation process must know about each database copy created at the site. This is done by adding a line in the schema.pf file that identifies the database copy. Consider this schema.pf example:

```
#Schema.pf file -used for the update of database schema
#release=0004
-db sports.db -ld sports -1 -U "" -P ""

#dbcopy=sports sports2 sports2
-db sports2.db -ld sports2 -1 -U  "" -P ""
```

This schema.pf file contains two database connections and a special #dbcopy= line that instructs the schema update process to treat the sports2 database as if it has the same schema as the sports database. When the two databases start out with the same CRC stamp, the install process keeps them CRC compatible by applying schema updates to each in exactly the same order.

The #dbcopy= line requires three values.

- First, the logical database name of the database whose schema is duplicated in the database copy.
- Second, the logical name of the database copy.
- Third, the name of a temporary directory into which data dumped from the dbcopy database should be placed in stage one update schema processing. This prevents the data

dumped from the first database and that dumped from the second database from being confused.

The schema update process performs an additional step when multiple database copies exist. This additional process expands the content of the rtb_idat/schctrl file to include entries for each of the files requiring update in each database copy. An additional line is added to the top of the rtb_idat/schctrl file with the token EXPANDED so that the rtb_idat/schctrl file never expands twice. This makes it important to register all database copies in the schema.pf file before running the update schema process.

If the database copy is created sometime after the first installation of your application, the new copy must be created from a copy of an existing database. There are strategies for accomplishing this:

- Maintain at least one copy of the application database at each site that is never populated with data. This database can be used as the source database when creating a new database.
- Make a copy of an existing database and then purge data from it. This is generally a bad idea because OpenEdge does not shrink the footprint of a database on disk. This can be circumvented by a dump and reload of data for the source database.

4.14.6. Deploying Both a Full and Incremental Schema Update

A single schema update package directory is created when you create a deployment. However, the _update.w process can recognize and process more than one database update package directory if they exist. This allows the user to assemble a multi-release deployment.

A multi-release deployment is useful if you must send a deployment to sites that may be at different Release levels of your software. You create a multi-release deployment by combining the contents of one or more deployments into a single deployment package.

For example, if the latest release of your system is 9.1A and you want to distribute the same package to both existing 9.0C clients and completely new clients, you would need to create a multi-release deployment.

Follow these steps to create a multi-release deployment containing the full source and schema for the latest release level, as well as the schema update information to bring an existing application database from a previous schema release level to the latest schema release level.

1. Create a new site.
2. Create a deployment in your new site using the desired release level. Name the schema update directory with the four-character name of the latest schema release level.

3. Build the schema update table and make the deployment directory.
4. Create a second new site.
5. Create a deployment in the second new site with the release level from which you want this package to upgrade existing clients.
6. Complete the deployment described in the previous step. It is not necessary to build that deployment.
7. Create a second new deployment in the second new site. The schema update directory must have an eight-character name. The first four characters must be the name of the previous schema release level. The last four characters must be the name of the latest schema release level.
8. Build the schema update table and make the deployment directory.
9. Copy the eight-character schema update subdirectory from the second deployment's rtb_dbup directory. Copy that directory into the rtb_dbup subdirectory of the first deployment.

The first deployment directory is now a multi-release deployment directory. The rtb_dbup directory contains a four-character subdirectory named with a complete definition of the latest schema release level. The rtb_dbup directory also contains a subdirectory with an eight-character name, which contains the schema update information necessary to update an existing application database from the previous schema release level to the latest schema release level.

It is not necessary to retain the Roundtable site records created in these steps. Also, it is not necessary to keep the second deployment directory on disk. It was only created so that you could copy the incremental schema update directory from it.

5

Task Management

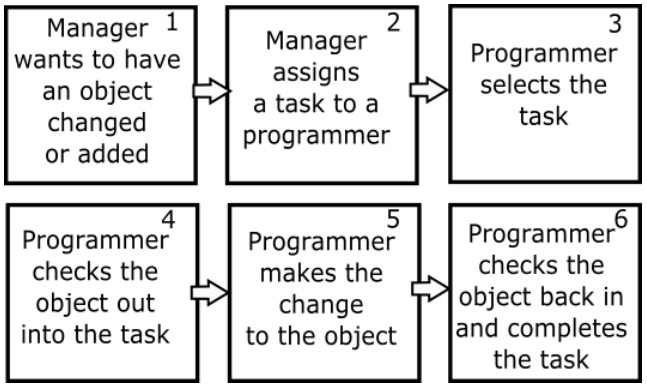
5.1. Introduction

After you set up your system and create your products, Product Modules, and workspaces, you should be ready to begin programming. The first step is to create Tasks. A Task defines work to be done in a Workspace.

An object is a component of your OpenEdge application: a piece of code, a file, a field, a piece of text, or a part of your database schema definition. Objects are created and modified under the current Task. This chapter explains both Tasks and objects in depth.

5.2. What Is Task Management?

Task management is the process of changing or adding objects. The following flow chart illustrates the Task management process:



5.2.1. Benefits of Task Management

Task management is useful because it:

- Helps programmers track work done in logical units (Tasks)
- Facilitates check-in of many objects at once
- Gives managers access to important information about the work being performed in the

Workspace

- Allows the programmer to keep track of many concurrent Tasks
- Allows programmers and managers to see quickly what others are doing in the Workspace

5.2.2. How Objects Relate to Task Management

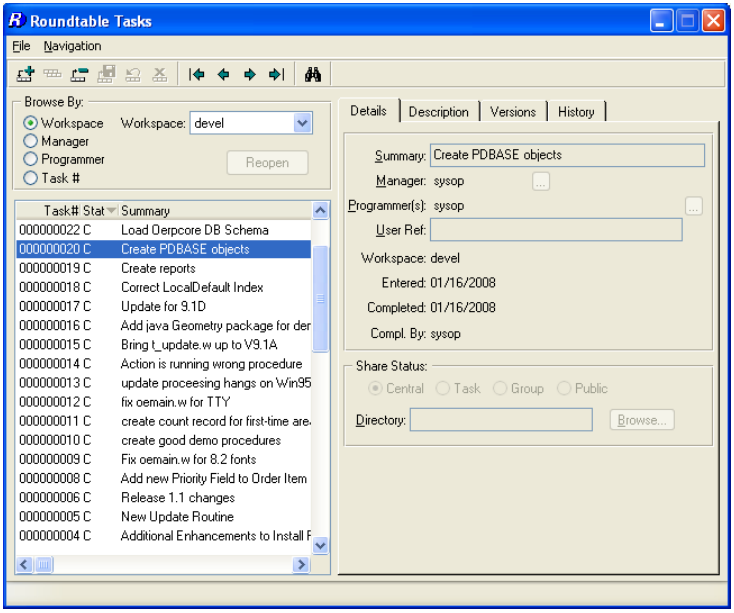
You can add different types of objects to your Workspace and use different views to show the objects assigned to your Workspace and how they interrelate. For example, the Modules view shows which objects are assigned to your Product Module, and the Task view shows which of those objects are checked out into your Task. You can see where and how an object is used in your system and print several object reports.

5.3. Task Maintenance

After you set up your Roundtable system, you are ready to begin work. If you have many programmers working on one project, control and track this work by dividing it into Tasks. Task maintenance covers adding Tasks, editing Tasks, deleting Tasks, selecting Tasks, completing Tasks, and printing Task reports.

5.3.1. Tasks Window Description

The Tasks window displays a selection list showing all the Tasks. The selection list shows the Task number, status, and summary of each Task. Each Task has a status of either W (work-in-process) or C (complete). You can filter the Tasks by selecting options in the Browse By panel.



Field	Description
Browse By	Selects the display filter (Workspace, Manager, Programmer) for the Tasks list below.
Task #	Displays the Task number assigned to each Task by the system.
Status	Displays each Task's status: Work-In-Process (W) or Completed (C).
Summary	A fill-in for the Task's description.
Manager	A fill-in for the ID of the manager assigning the Task.
Programmer	A fill-in for the ID of the programmer responsible for the Task.
User Ref	A fill-in for your own use. This field is indexed, but unused by Roundtable. You can build your own reports to get information from the repository quickly using your own key values.
Workspace	Displays the Workspace ID code.
Entered	Displays the date the Task was created.
Completed	Displays the date the Task was completed.
Compl. By	Displays the ID of the person who completed the Task.
Share Status	A radio button set that allows you to choose the Share Status for the Task.

Field	Description
	See Section 5.3.2, “Share Status” [5–4] below for an explanation of this field.
Directory	A fill-in for the full path to a Task directory. See Section 5.3.3, “Task Directory” [5–5] for an explanation of this field.
Description tab	Notes on why selected Task was created.
Versions tab	Object versions created in the Task.
History tab	Workspace history events associated with the Task. History events are associated with a Task when a version created under the Task is checked-in to the repository, and - if the Workspace is configured to require a Task for Assign and Delete actions - when an object version is assigned to or deleted from the Workspace. Actions performed with Roundtable versions prior to 10.1C will not have Task-associated history events.

5.3.2. Share Status

The Roundtable Share Status feature allows multiple programmers to work in the same Workspace, isolating each programmer's work so that other programmers are not affected. Depending on the Share Status, the other programmers might see objects that are currently being worked on. The Share Status determines the location of the source files modified under the Task.

Roundtable automatically modifies the OpenEdge PROPATH so that directories are always searched in this order:

- Task directory (if one is defined for the current Task)
- Group directories (if the current Task belongs to any groups)
- Workspace directory

You can change the Share Status of a WIP object or a Task at any time. When you change the Share Status of WIP objects, Roundtable moves the objects to and from the Workspace directory as required. It is possible to have some objects in a Task with a different Share Status than that of the Task. However, if a Task has no Task directory assigned, then all objects in that Task must have a Share Status of Central.

The Share Status of the Task dictates the Share Status for objects when they are checked-out to the Task. As objects are checked out under a Task, they are given the Share Status specified for the Task by default.

- **Central:** Programmer modifies objects in the Workspace directory. Others can see changes made immediately. No Task directory is necessary if all objects under a Task have this status.
- **Task:** Roundtable checks out objects to a Task directory where the programmer modifies them. Others do not see the changes. The last completed version of the checked-out object remains in the Workspace directory for others to use.
- **Group:** Roundtable checks out objects to a Task directory where the programmer modifies them. Others do not see the changes until the programmer executes the Update Group/Public Source option, which copies the modified objects into a group directory. Other programmers can choose to execute the changes by attaching one of their Tasks to the group. The last completed versions of the objects remain in the Workspace directory.
- **Public:** Roundtable checks out objects to a Task directory where the programmer modifies them. The changes are not viewed or executed by others until the programmer executes the Update Group/Public Source option, which copies the changes into the Workspace directories.

5.3.3. Task Directory

If you specify a Share Status other than Central you must supply a full path to a Task directory. Objects from the Workspace, checked-out under the Task, populate this directory structure. In the Task directory, Roundtable creates the portion of the Workspace directory hierarchy in which the object is stored. For example, if an object is stored in a subdirectory named .\ar in the Workspace, then the .\ar subdirectory is created in your Task directory when you check out the object under the Task.

You can use the same Task directory for one or more Tasks. This makes all changes in each Task sharing that directory visible to each other without having to define groups. Tasks belonging to different programmers should never share the same Task directory.

5.3.4. Adding a Task

In your role of manager, you parcel out work by assigning Tasks to programmers. Each Task is specific to one Workspace, one manager, and one programmer. Each Task has a summary that should be descriptive of the entire Task. You can enter more detailed information in the note field at the bottom right corner of the window.

Follow these steps to add a Task in Roundtable:

1. Choose Task → Task Maintenance from the Tabletop menu. The Tasks window

appears.

2. Choose the **Add Record** button. You must be browsing Tasks by Workspace in order to add a new Task.
3. Enter a brief description of the Task in the Summary field.
4. To change the Manager and Programmer(s) fields from the default (your user ID) enter the correct IDs. Use the **Lookup** button on the Programmer(s) field to assign more than one programmer to the Task.
5. OPTIONAL. Fill in the User Ref field. The User Ref field is an indexed field. Roundtable does not use this field. It is for your reference only and can be used to tie Tasks to other tools and systems.
6. Change the Share Status if necessary. If the Share Status is Task, Group, or Public, you must assign a Task directory in the Directory field.
7. Choose the **Save Record** button. The Task is created.
8. Select the Description tab to enter a more detailed description of the Task. Choose the **Save Record** button when finished entering the description.
9. Choose File → Exit to exit this window.

5.3.5. Editing a Task

Although you can never change the Task number, you can change the Summary, Manager, Programmer, Share Status, and User Ref fields, and the notes for a Task you manage.

1. Choose Task → Task Maintenance from the Tabletop menu. The Tasks window appears.
2. Select the Task that you want to edit in the browse table.
3. Edit the Task information.
4. Choose the **Save Record** button to complete your update.
5. Choose File → Exit to exit this window.

5.3.6. Deleting a Task

You cannot delete a Task if objects are checked out or have been checked in under the Task. If you change your mind about needing the Task right after you add it, you can delete it.

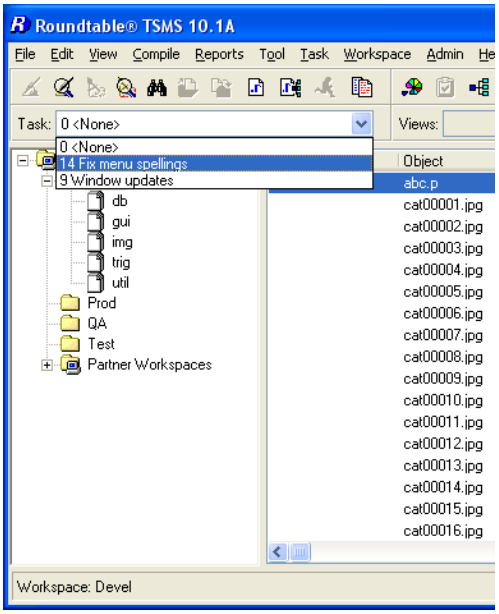
1. Choose Task → Task Maintenance from the Tabletop menu. The Tasks window appears.

2. Select the Task that you want to delete in the browse table.
3. Choose the **Delete Record** button. A warning dialog box appears.
4. Choose the **Yes** button to delete the Task.
5. Choose File → Exit to exit this window.

5.3.7. Selecting a Task

Once a Task has been assigned to you as a programmer, you must select it before you can add or edit objects in the Workspace.

To select a Task, choose it from the Task drop-down list on the left side of the Tabletop:



5.3.8. Completing a Task

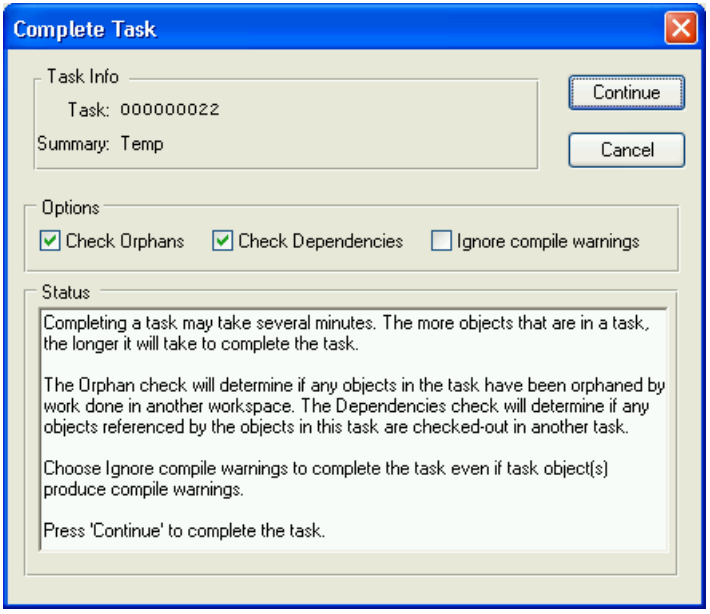
After you have made all the necessary changes, you can complete the Task. Completing the Task gives all objects in the Task a C (complete) status. Before completing the Task, ensure that:

- All objects have a Share Status of Central
- The schema changes are updated to the databases

- All objects compile correctly

If Roundtable finds an object with a Share Status other than Central, use the Versions tab folder to change the Share Status to Central. See Section 5.4.5, “Changing the Share Status of Objects” [5–13]. If Roundtable finds an object that does not compile, you must fix the problem before completing the Task.

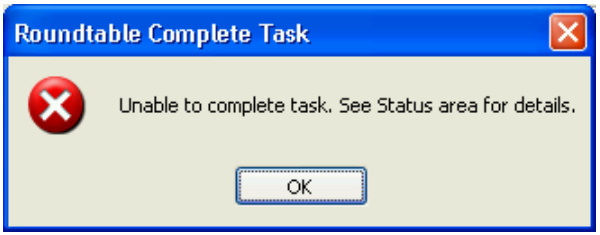
1. Choose Task → Task Maintenance from the Tabletop menu. The Tasks window appears.
2. Select the Task to complete in the selection list.
3. Choose the **Complete** button. The Complete Task dialog box appears.



By default, the Orphans and Dependencies toggle boxes are checked. Leave these Pre-compilation checks enabled unless you have a specific reason to disable them.

4. Choose the **Continue** button to complete the Task.

If Roundtable cannot compile one or more of the objects, the following error message box appears. The errors are detailed in the status area of the Complete Task dialog.



5. Choose File → Exit to exit the Tasks window.

5.3.9. Reopening a Task

When a completed Task is selected in the Tasks Window, it may be reopened by the manager or programmer of the Task with Task Complete permission in the Task's Workspace.

To reopen a selected Task, perform the following steps:

1. Choose Task → Task Maintenance from the Tabletop menu. The Tasks window appears.
2. Locate and select the completed Task to be reopened.
3. Choose the **Reopen** on the Tasks Window.
4. When prompted, choose Yes to reopen the selected Task.

5.3.10. Task Reports

5.3.10.1. Task Report

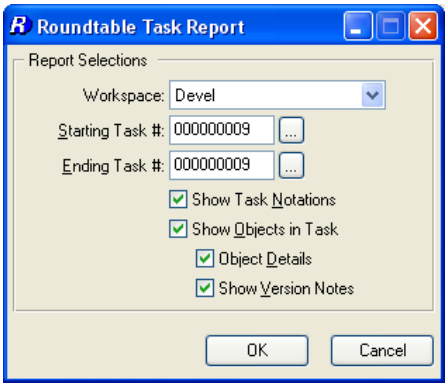
The Task Report option provides information on each of the object versions created under the selected Task. This report groups the objects by object type and provides the following information for each object:

- Object name
- Description of the object
- Version number
- Current status
- Subtype (for PCODE objects)

For PFIELD objects, the report also lists the type, extent, number of decimals, label, location, format, initial value, and other field information.

Follow these steps to print the Task report:

1. Choose Reports → Task → Task Report from the Tabletop menu. The Task Report window appears.



2. Select the desired report options:

   - This report can be based on a range of Tasks. Enter the starting Task number to report on.
   - Enter the ending Task number to report on.
   - Enter the Workspace ID to report on, or enter "*" to report on Tasks from all workspaces.
   - Select Show Task Notations to print the Task notations. Task notations are not available in the GUI version of Roundtable, but if you print a Task created with the character mode client, you can print them under the GUI version.
   - Select Show Objects in Task to print all the object versions created by this Task.
   - Select Object Details to print details about the object.
   - Select Show Version Notes to print the programmer's notes.

3. Choose the **OK** button.

5.3.10.2. Object Orphans in Task Report

The Object Orphans in Task Report gives you the name and number of any orphan records relating to objects under the Task. Follow these steps to print the Object Orphans in Task

Report:

1. Choose Reports → Task → Object Orphans in Task Report from the Tabletop menu. The Object Orphans in Task Report window appears.
2. Verify the Task number for the report and choose the **OK** button.

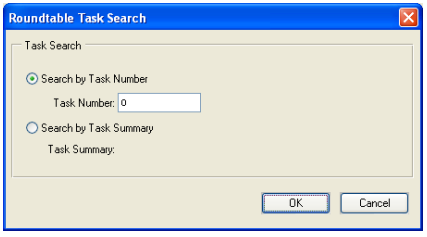
5.4. Task Activities

Now that you know the basic procedures for working with Tasks, you can explore more ways to work with Tasks.

5.4.1. Finding a Task

If you know a Task number, you can use the Find feature on the Tasks window to select the Task quickly.

1. Choose Task → Task Maintenance from the Tabletop menu. The Tasks window appears.
2. Choose **Search** button. The Task Search dialog box appears.



3. Select to search by Task Number or by Task Summary.
4. Enter the desired search value and choose the **OK** button. If searching by Task Number, and the Task is found, Roundtable selects the Task in the Tasks browse table. If searching by Task Summary, the Tasks browse will only show those Tasks with a summary including your search word(s). If no Tasks match your search word(s), no Tasks are displayed.

To refresh the Tasks browse, re-select the "Browse By" value.

5.4.2. Listing Versions in a Task

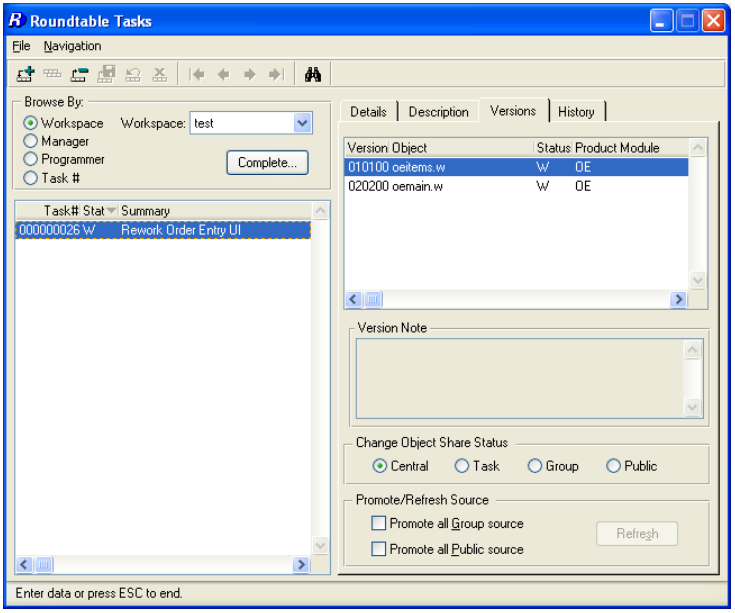
Each time an object is checked out from the Workspace into a Task, it is assigned a new version number. The Versions folder of the in Tasks window displays a table that lists all the versions created in a Task. The table displays the object name, object type, version number, and status for each object version created under the specified Task.

From this window, you can also:

- Change the Share Status of one of the object versions
- Change the Share Status of all of the object versions
- Promote all object versions with a Share Status of Group from the Task directory to the group directories for each group with which the Task is associated
- Promote all object versions with a Share Status of Public from the Task directory to the Workspace directory

Follow these steps to display the object versions created under a Task:

1. Choose Task → Task Maintenance from the Tabletop menu. The Tasks window appears. Select the Versions tab.



2. This folder contains all the object versions created under this Task. For each object version, the table lists the Version, Object, Status, Product Module and Type. The radio buttons below the list show the Share Status for the selected object version.

5.4.3. Comparing a Task Version with Its Previous Version

You can quickly compare an object version created in the selected Task with its immediately previous version using the configured visual difference application. Follow these steps to visually compare the Task version with the immediately previous version:

1. Choose a version in the browse on the Versions folder of the Task window.
2. Right-click the browse to show the context menu.
3. Choose Compare with Previous Version from the context menu. If the object has more than 1 part, you are prompted for the part that you want to compare.

For details on configuring the visual difference application, see Section 7.6, “Visual Difference” [7–13].

5.4.4. Moving a WIP Object to Another Task

If you have checked-out an object to the incorrect Task, or decide that work begun in one Task should be moved to another, you can move a WIP object version from one Task to another WIP Task in the same Workspace - as long as you are a member (Manager or Programmer) of both Tasks.

Follow these steps to move a WIP object from one Task to another WIP Task in the same Workspace:

1. Choose Task → Task Maintenance from the Tabletop menu. The Tasks window appears. Select the Versions tab.
2. Select the WIP object version to move.
3. Right-Click to display the popup context menu.
4. Choose Move to Task... from the context menu. The **Roundtable Task Lookup** dialog appears.
5. Select the target Task and choose the **OK** button.

5.4.5. Changing the Share Status of Objects

Follow these steps to change the Share Status of WIP objects in a Task.

If you want to change the Share Status of an object in the Task to something other than Central, the Task must have a Task directory defined.

1. Choose Task → Task Maintenance from the Tabletop menu. The Tasks window appears. Select the Versions tab.
2. Select one or more (using **Ctrl**-Click) object versions for which to change the Share Status.
3. Choose one of the Share Status radio buttons: Central, Task, Group, or Public. A warning dialog box appears.
4. Choose the **Yes** button to confirm the operation.
5. Choose File → Exit to close the window.

5.4.6. Promoting Task Objects

When an object has a Share Status of Group or Public, the work performed on the object is visible only in the Task directory until it is promoted. The promotion process copies the source files of the object to group and/or Workspace directories as necessary. You choose when this promotion occurs. This intermittent update of the shared group directories or Workspace directories can be very helpful when you have not finished working on a given object, but it is necessary for others to use or review that work.

1. Choose Task → Task Maintenance from the Tabletop menu. The Tasks window appears. Select the Versions tab.
2. Check the Promote all Group Source and/or Public all Source toggle box(es).
3. Choose the **Refresh** button. A warning dialog appears.
4. Choose Yes to promote the Public/Group source.
5. Choose File → Exit to close the window.

5.5. Task Groups Maintenance

Task Groups allow the changes in one or more Tasks to be seen at the same time. For example, use Task Groups when two programmers are working on different Tasks but must see each other's work.

Task Groups are useful only with Tasks that do not have a Central Share Status because work done under a Task with a Central Share Status is visible to all users of the Workspace. Remember that Roundtable sets the PROPATH so that code is seen first in any local Task directory, then in any group directories, and finally in the Workspace directory.

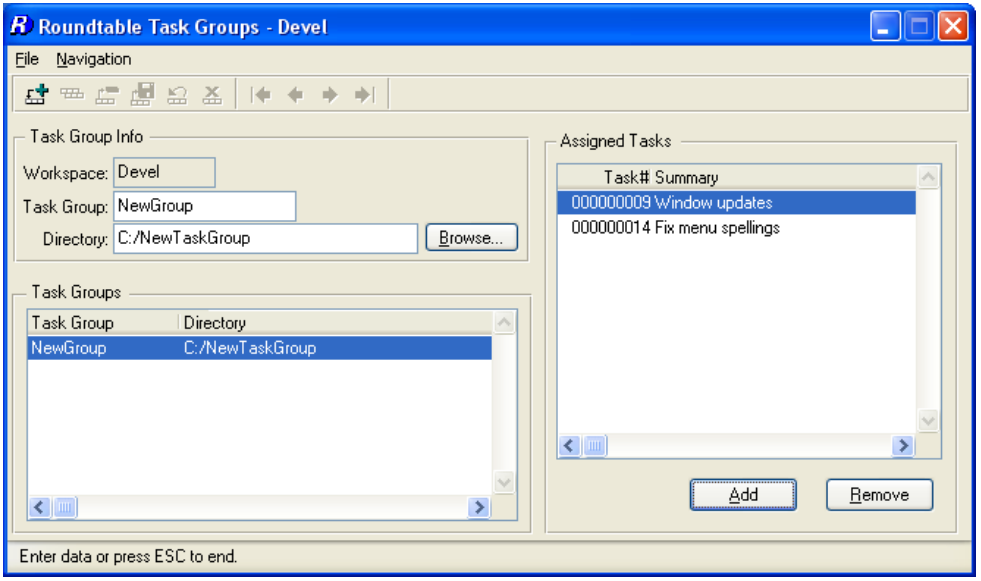
Task Group directories must reside on the same drive as the Workspace and use the same drive mappings as the Workspace to which they belong.

A Task Group is assigned a group directory, which is never accessed directly by a programmer. Instead, the Task promotion process copies the source from the Task directories into the group directory at the request of the programmer owning the Task.

A Task assignment associates a Task with a group. A Task can be associated with up to nine Task Groups. All of these Task Groups are updated when the Task promotion process is executed.

5.5.1. Task Groups Window Description

This window contains two lists: Task Groups and Assigned Tasks. Select a Task Group to see the Tasks assigned to it.



The following table describes the fields and buttons in the Task Groups panel:

Field or Button	Description
Workspace	The Workspace that the Task Groups belong to.
Task Group	You supply a Task Group code when you add a new Task Group.
Directory	This is the path to the directory under which code from Tasks belonging to the Task Group will be placed when promoted by the owners of the Tasks.

The following table describes the fields and buttons in the Assigned Tasks panel:

Field or Button	Description
Task#	The Task number of a Task associated with the group.
Summary	The summary description of the Task.
Add button	Choose this button to add a Task to the Task Group.
Remove button	Choose this button to remove a Task from the Task Group.

5.5.2. Adding a Task Group

Follow these steps to add a new Task Group:

1. Choose Task → Task Groups from the Tabletop menu. The Task Groups window appears.
2. Choose the **Add Record** button. Fill in the Task Group and Directory fields, and then choose the **Save Record** button.
3. Add one or more Task Group assignments in the Assigned Tasks panel. For detailed instructions, see Section 5.5.5, “Adding a Task Group Assignment” [5–17].
4. Choose File → Exit to close this window.

5.5.3. Editing a Task Group Directory

When you edit a Task Group directory, the files in the old directory are moved to the new directory.

Follow these steps to edit a Task Group directory:

1. Choose Task → Task Groups from the Tabletop menu. The Task Groups window appears.

   You must be logged in as the sysop user to perform Task Groups maintenance.
2. From the selection list in the Task Groups panel, select the Task Group to edit.
3. Edit the Task Group Directory field, and then choose the **Save Record** button.
4. Choose File → Exit to close this window.

5.5.4. Deleting a Task Group

Before you can delete a Task Group, you must delete each Task that is assigned to it.

Deleting Task assignments does not affect the associated Tasks in any way.

Follow these steps to delete a Task Group:

1. Choose Task → Task Groups from the Tabletop menu. The Task Groups window appears.

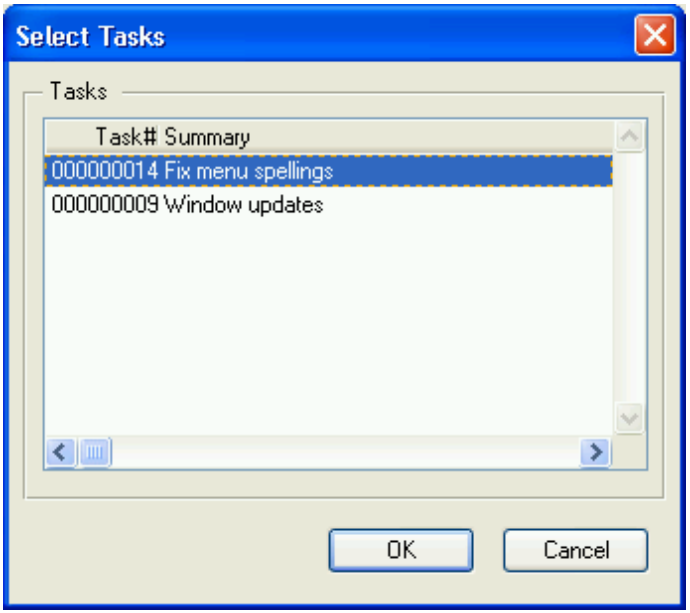
   You must be logged in as the sysop user to perform Task Groups maintenance.
2. From the selection list in the Task Groups panel, select the Task Group to delete.
3. Choose the **Remove** button in the Assigned Tasks panel if any Task assignment exists. A warning dialog box appears. Choose the **Yes** button.
4. Repeat step 3 for each Task assigned to the selected Task Group.
5. Choose the **Delete Record** button. A warning dialog box appears. Choose the **Yes** button.
6. Choose File → Exit to close this window.

5.5.5. Adding a Task Group Assignment

Follow these steps to add a Task Group assignment:

1. Choose Task → Task Groups from the Tabletop menu. The Task Groups window appears.

   You must be logged in as the sysop user to perform Task Groups maintenance.
2. From the selection list in the Task Groups panel, select the Task Group to which assignments are to be added.
3. Choose the **Add** button in the Assigned Tasks panel. The Select Tasks Assignment dialog box appears.



4. Select one or more tasks, and hen choose the **OK** button. In the Assigned Tasks panel, the Task appears as a new Task assignment.
5. Choose File → Exit to close this window.

5.5.6. Deleting a Task Group Assignment

Follow these steps to delete a Task Group assignment.

1. Choose Task → Task Groups from the Tabletop menu. The Task Groups window appears.

   You must be logged in as the sysop user to perform Task Groups maintenance.
2. From the selection list in the Task Groups panel, select the Task Group from which an assignment is to be deleted.
3. Select the Task assignment to delete in the Assigned Tasks panel.
4. Choose the **Remove** button in the Assigned Tasks panel to delete the Task assignment. A warning dialog box appears. Choose the **Yes** button.
5. Repeat steps 3-4 for each Task assignment to delete.
6. Choose File → Exit to close this window.

5.6. Task Notations

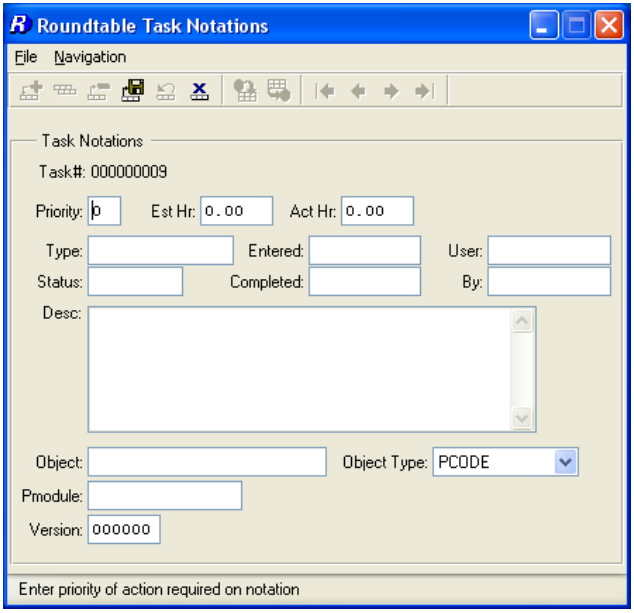
Roundtable provides a simple screen in source form (rtb/w/rtb_tnot.w) for maintaining additional Task information. The table maintained by this screen is called rtb_tnot (Task Notes). Any number of rtb_tnot records can be related to a Task. This table includes a number of free-form fields, and fields for tracking such things as estimated and actual hours.

rtb_tnot.w is intended to be modified to fit your own Task information needs. How you use the fields in the rtb_tnot table is entirely up to you.

Roundtable does not use the rtb_tnot table except in these three places:

- rtb_tnot.w - Task Notes maintenance screen.
- The Task report. It shows Task notations for the Tasks being reported on.
- When a WIP Task is deleted, any rtb_tnot records associated with it are deleted.

This is what the Task Notations screen looks like as provided with Roundtable:



To access Task notations for your current Task, choose Task → Task Notations from the Tabletop menu.

6

Objects

6.1. Introduction

All workspaces are comprised of collections of Roundtable objects. These objects are of one of the following types:

- PCODE: A collection of up to 10 files that define a component of the software application
- PFIELD: A database schema definition for a field
- PFILE: A database schema definition for a table
- PDBASE: A database schema definition for a database
- DOC: A special type used for documentation objects

6.2. The Repository

Objects are stored in the Roundtable repository. The Roundtable repository can store many different versions of the same object. When you add a new object, you create the first version of that object, which is numbered 01.00.00. This version code has three parts: Version Level, Revision Level, and Patch Level. All objects are created in a Workspace with an initial status of Work-In-Process (WIP). When you create an object, you assign it a Name, Type, and Product Module. The Product Module, Type, Name, and Version Code constitute the unique key of the object in the repository.

An object does not become a permanent part of the repository until you check it in. Checking it in changes the object's status from WIP to Complete. It is not possible to delete an object from the Roundtable repository once it has been completed. However, you can remove the object from the Workspace. Remember that a Workspace is a collection of objects that represents a configuration of your software application. Deleting an object removes the object version from this configuration.

One last point about deleting object versions: if you delete the first version of an object while it still has a WIP status it does not become a permanent object in the repository. So, if you inadvertently create an object that you really do not want, you can delete it.

You may assign any object version available in the repository to any Workspace. Since the object already exists, such assignments are not considered part of your current task.

6.2.1. Object Versioning and Tasks

Before you can create or modify any object you must have a current task . It is not unusual to create or modify multiple objects under the same task. The task number, under which the object version was created, is stored in the object. This provides traceability between the object version and the task. For information on using tasks, see Section 5.2, “What Is Task Management?” [5–1].

When you want to modify an existing object, you must check out the object under a task. This creates a new version of the object and gives the object a work-in-process (WIP) status (checked-out). While you have the object checked out, no other programmer, in the current Workspace, can check it out. If the object is subsequently checked out in some other Workspace, Roundtable warns the user that an object orphan condition exists.

When you check out the object, you choose whether to increment the Version Level, Revision Level, or Patch Level of the version code. The new object version becomes a permanent resident of the repository, and the object's status changes to complete (checked-in).

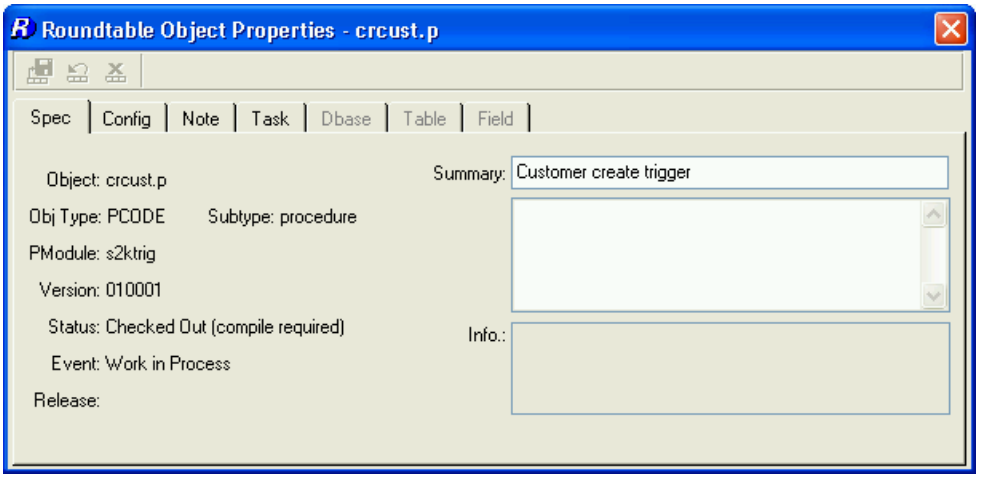
6.3. Object Properties Window Folders

Each object type is associated with one or more folders of information. These folders are displayed in the Object Properties window, which is viewed by choosing View → Object Properties from the Tabletop menu. Alternately, you can view the Object Properties window by right-clicking on an object displayed in the Object browse, and then selecting Properties from the popup menu. This chapter describes how to add each object type and the contents of their folders.

All objects share the Spec, Task, and Note folders.

6.3.1. Spec Folder Description

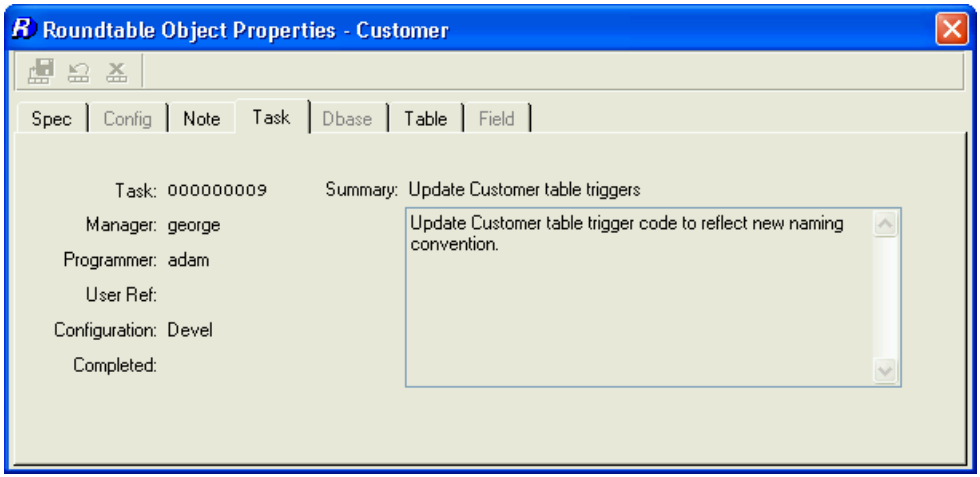
The Spec folder displays general repository information about the currently selected object.



Field	Description
Obj Type	The object type assigned when created.
Subtype	The object Subtype value you assigned to the object when created .
Pmodule	The Product Module value you assigned to the object when you created the object.
Version	The version the selected object.
Status	The object status as either Checked in or Checked out. A note will also be here displayed if the object needs to be compiled.
Event	The Workspace Event History number for the latest action taken on the selected Object.
Release	The first Release in which the above event appeared.
Summary	Displays a brief description of the object.
Synopsis (no label)	A synopsis can be entered describing the function of the object.
Info	Area for notification of later versions.

6.3.2. Task Folder Description

This folder displays a brief description of the task under which the currently selected object was created.



Field	Description
Task#	Displays the task number.
Manager	Displays the user who assigned the task.
Programmer	Displays the programmer who performed the task.
User Ref	Displays a user-defined reference value associated with the task. This field is indexed but is not used for any purpose by Roundtable.
Workspace ID	Displays the Workspace where the task was performed.
Completed	Displays the date on which the task was completed.
Summary	Displays a short description of the purpose of the task.
Synopsis (Below Summary)	A more detailed description of the work done under the task.

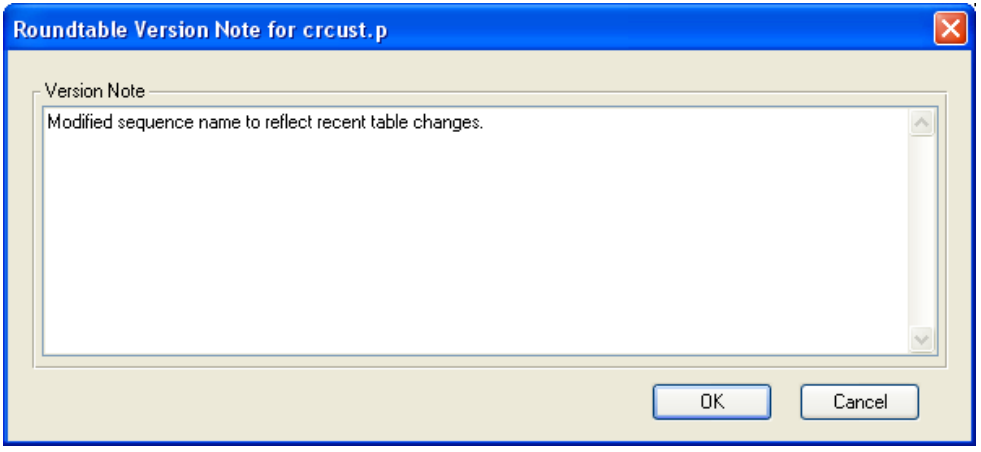
6.3.3. Note Folder Description

The Note folder contains comments that the programmer entered when working on the object version. This note should explain why the changes were made to the object to create this object version.

6.3.4. Version Note Dialog

Each time you make an edit to any object in the system you are presented with the Version Note dialog after you complete your edit (unless disabled in Preferences). The entries you make in this dialog are an important tool in communicating with other team members about the changes you have made in the object. The information you enter in this dialog appears in the Note folder. Later you will find it helpful to scroll through object versions and see the progression of changes made in each version without having to dig into the code. Use these notes to summarize the changes you have made.

Enter notes about your changes in the Version Notes dialog box:



6.4. PCODE Objects

You can use PCODE objects to store almost any kind of data in the Roundtable repository by defining custom Code Subtypes that tell Roundtable how to process the data when it is stored into and retrieved from the repository.

PCODE objects are maintained in the Config folder. You can run the procedure editor from Roundtable to edit a PCODE object.

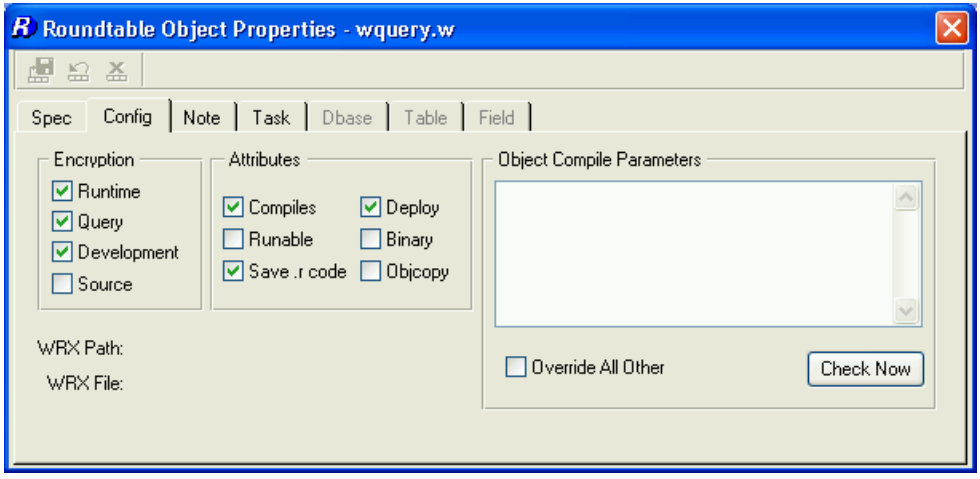
PCODE objects store program or include files and, if necessary, other text files such as shell scripts. PCODE objects can also store binary data like bitmaps. The PCODE definition records the:

- Compile time parameters of programs
- Deployment options
- Documentation entered by the programmer about the purpose of the object

You must assign a Subtype to each PCODE you create. The Subtype defines the type of source the PCODE object represents (window, program, form, etc.). Subtypes allow you to track up to nine related text files as a single object. For more information on subtypes, see Section 3.11, “Subtypes” [3–20].

6.4.1. Config Folder Description

The Config Folder contains information about how Roundtable should process the object in the Workspace configuration.



The Config folder contains the following fields:

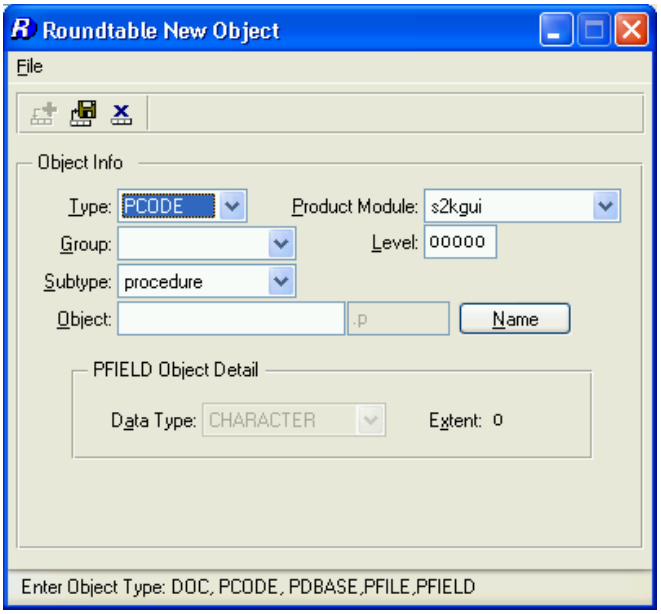
Field & Buttons	Description
Encryption	A set of toggle boxes that designate which type of remote sites should receive encrypted code. The type of remote site is determined when creating deployments. See Section 4.12, “Deployments” [4–46].
Compiles?	A toggle box that indicate whether Roundtable should compile this procedure.
Runable	A toggle box that indicates that the PCODE object is a procedure that you can run directly from Roundtable. A procedure that expects parameters to be passed cannot be run from Roundtable.
Save .r code	A toggle box that indicates that Roundtable should produce R-code for the object during compile. Note that this flag might be overridden by the R-code flag in the Workspace Modules window or the Workspace Maintenance Window.
Deploy	A toggle box that indicates if this object is to be included in deployments of your application.
Binary	A toggle box that indicates if the file is a binary file (ex: a bitmap file). Roundtable for MS-Windows automatically detects whether or not the file is binary. Binary files receive special handling for storage in the repository. Roundtable does not store deltas for binary files; the entire file is stored for each new version.
Objcopy	A toggle box that indicates that the object should be copied to the alternate r-code directory if an alternate r-code is specified during the installation of a deployment at an end-user site. This attribute is typically used for images and other non-compilable objects that are required for proper functioning of the application.
WRX Path and WRX File	Roundtable can manage the versioning, migration, and deployment of WRX files for you. See Section 6.4.7, “WRX Files” [6–11] for a complete description of how Roundtable does this. If Roundtable finds that you have used an OCX in the current PCODE object, then the name of the WRX file and the directory that it was found in are both displayed. If the current PCODE object does not reference a WRX file, then these fields are left blank.
Object Compile Parameters	Compile syntax parameters to be used when compiling this object. Normally, this field can be left blank. It is most often used for objects with support for multiple languages.
Override All Other	Does this object's compile parameters override the Workspace or Workspace Module compile parameters? Use this field to have Roundtable ignore Workspace or Workspace Module compile parameters when compiling this object. Only the object's compile parameters will be used. If this field is toggled off, then the object's compile parameters are used in addition to the Workspace or

Field & Buttons	Description
	Workspace Module compile parameters. (If there are compile parameters defined for the module, then the Workspace compile parameters are ignored. Only the module and object compile parameters will be used.)
Check now button	Choose this button to check the syntax for the compile parameters for this object.

6.4.2. Adding a PCODE Object

Follow these steps to add a new PCODE object:

1. Select a Workspace and Task on the Tabletop.
2. Choose File → New Object from the Tabletop menu. The New Object window appears.



3. Select PCODE from the Type drop-down list.
4. From the Product Module drop-down list, select the Product Module that the object will belong to. Only those Product Modules associated with the current Workspace Module are available.

5. Type in or select the object Group, and type in the Level. These fields are used to sort objects in the Workspace Module, and are part of the configuration list, not part of the object version record in the repository.
6. Select a Code Subtype from the Subtype drop-down list. The corresponding file extension is automatically provided.

   Enter an object name in the Object field. Alternately, if a name program has been defined for the selected Subtype, you may choose the **Name** button to have the Object field populated automatically by the name program. See Section 3.11.10, "Name Programs" [3–28] for more information on naming programs.

   Do not type a file extension for the object name if one is provided by the selected Subtype.
7. Choose the **Save Record** button. A warning dialog appears showing the object details.
8. Choose the **Yes** button to create the new object.
9. If you have no more objects to create, choose File → Exit to close the New Object window.

Roundtable tests the naming conventions by checking the fields entered on the Roundtable Code Subtypes window against the information entered in the New Object dialog box. For more information, see Section 3.11, "Subtypes" [3–20].

6.4.3. Object Name Aliasing

Within a Workspace, two objects cannot have the same name, even if they are in different subdirectories. If you must have two objects with the same name in a Workspace, use the object name aliasing feature.

Roundtable has reserved the @ character for the object name aliasing feature. Use the @ character in the first position in an object name. When you enter an object name using the @ character, Roundtable prompts you for filenames for each of the Subtype part files associated with that object. For example, if you must have a post.p program in both the ap and ar subdirectories, use object name aliasing to name the second object @post.p.

Generally, you should not use this feature unless your existing OpenEdge application has duplicate filenames. Try to assign a unique name to each object in your application.

Object name aliasing is only available for PCODE object types. It cannot be used with schema objects or DOC objects.

6.4.4. Editing the Config Folder

You can only edit an object's configuration information if you have it checked out under your current task. Follow these steps to edit the Config folder:

1. From the object browse on the Tabletop, select a PCODE object. If the Object Properties window is not visible, choose View → Object Properties from the Tabletop menu.
2. Choose the Config folder tab. The Config folder opens.
3. Edit the fields in the folder. On your first change to any field in the folder, the **Save Record** buttons are enabled.
4. Choose the **Save Record** button.

6.4.5. Editing a PCODE Object

You can open an editor to edit a PCODE object from inside Roundtable. If a PCODE object includes more than one Subtype part, a dialog box lists the parts of the object. You choose which parts to edit.

Follow these steps to edit a PCODE object:

1. From the object browse on the Tabletop, select a PCODE Object. If you don't have the object checked out, Roundtable limits you to read-only access.
2. Choose the appropriate **Edit** or **View** button. The **Edit** buttons (Edit in Procedure Editor, Edit in AppBuilder) are enabled only if the object is checked out under your current task. If an edit procedure is defined for the object's Subtype, any of the **Edit**/**View** buttons will run the defined edit procedure.
   - If there is only one part to edit, the part is loaded into the selected editor.
   - If the object has more than one part, the Select Parts to Edit dialog box appears. Continue with Step 3.
3. Select the parts to edit or view.

To edit one or more parts, highlight the parts to edit and choose the **OK** button. The editor windows open with each selected part loaded.

6.4.6. Unlocking Objects

When you edit WIP (Work In Process or checked-out) objects, Roundtable places a lock on the object to prevent two Roundtable users from trying to edit an object at the same time. When you edit a PCODE object using an editor other than AppBuilder or Procedure

Editor, Roundtable can not release this object lock automatically because it has no way of knowing when the external editor is finished with the object. These object locks are automatically cleared when you exit your Roundtable session or when you manually remove the lock. Follow the steps below to remove an object lock manually.

1. Choose the object to be unlocked in the browse table.
2. Choose File → Unlock Object from the Tabletop menu.

The 'sysop' user may unlock objects locked by other users. All other users can only remove object locks created using their user ID.

6.4.7. WRX Files

Roundtable does the following to help you manage WRX files in your application:

- Before an object is committed to the repository, Roundtable scans the source file for a WRX reference. If a WRX file reference is found, it stores the name and directory of that WRX file. The WRX file's name and directory are displayed on the Config folder for that PCODE object.
- When you check in your PCODE object, the WRX file is checked in along with it. The WRX file is actually stored as the 10th object part. Since WRX files are binary, Roundtable always handles the 10th file part as a binary file. See Section 3.11, “Subtypes” [3–20] for a description of Subtype parts. Part 10 of a PCODE object is only available for the storage of WRX files.
- Because the WRX file is now stored as a part of your PCODE object, the WRX file is automatically managed for you with all of Roundtable's source management functions, such as version control, imports, and deployments.

6.5. DOC Objects

A DOC object is a simple binary object managed by Roundtable. DOC objects by default are not included in deployments except to partner sites. DOC objects are always stored in a subdirectory called DOC off of the subdirectory associated with the Workspace Module the object is assigned to. If any of these restrictions is a problem, create a Subtype for PCODE objects that behave exactly the way you want.

6.5.1. Adding a DOC Object

Follow these steps to add a DOC object:

1. Select a Workspace and Task on the Tabletop.

2. Choose File → New Object from the Tabletop menu. The New Object window appears.
3. Select DOC from the Type drop-down list.
4. From the Pmodule drop-down list, select the Product Module to which the object will belong. The list only contains Product Modules associated with the current Workspace Module.
5. Enter the group and level.
6. Enter the object name and a short description.
7. Choose the **Save Record** button. A warning dialog appears showing the object details.
8. Choose the **Yes** button to create the new object.
9. If you have no more objects to create, choose File → Exit to close the New Object window.

6.6. Schema Objects

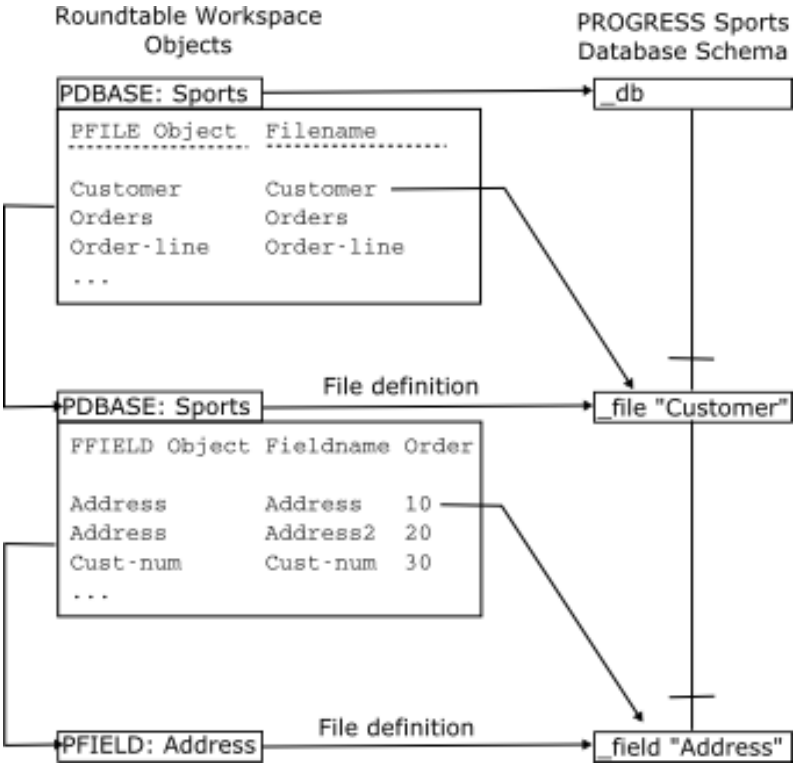
Roundtable provides a complete schema management system that includes full version control. In addition, field and file domains have been implemented to increase the consistency of your overall database schema and reduce the amount of maintenance required for some types of database schema changes.

Roundtable provides version control on the database schema by maintaining the database schema information in three object types:

- PDBASE: Database information and file assignments
- PFILE: Table definition and field assignments
- PFIELD: Field definitions

PFILE and PFIELD objects are reusable definitions, often called domains. A database is defined by a PDBASE object to which one or more PFILE objects are assigned. Each of these PFILE object assignments defines a table in the database. Each PFILE object contains information about the table and one or more PFIELD assignments. Each PFIELD object assignment defines a field in the table.

Refer to the following diagram that shows how Roundtable objects are translated into the _(schema) tables of the OpenEdge database:



Roundtable manages the OpenEdge database schema by taking the database, table, and field definitions in the configuration specified by a Workspace and updating the OpenEdge schema tables in the application database associated with the Workspace so that it conforms to the schema definition contained in the Roundtable objects. Roundtable allows any number of databases to be managed in any number of workspaces up to the limit on database connects allowed by OpenEdge itself.

6.6.1. Domains

Both table and field domains are supported by Roundtable.

The idea behind a domain is that you create a single definition that is used in a number of different places. For example, you can define a single PFIELD object called Address and use this field definition in a number of different tables, or even many times in the same table. Each use of the field definition is a field assignment. This assignment establishes a field in the table with name and order specified in the assignment. This can be advantageous when you need to change some attribute of the field definition. You can make the change in a single place, and Roundtable makes sure that all of the tables that use

the field definition are updated properly. This ensures consistency in your application and reduces the time spent on database maintenance.

Table domains are similar to field domains except that you are assigning a table definition (PFILE object) to two or more databases. Any change to the table definition is updated in each database by Roundtable. There is a limitation in the current release of Roundtable that precludes the assignment of a PFILE to two or more tables in the same PDBASE. It is possible to assign the same PFILE to two or more tables if these tables belong to different PDBASE objects.

6.6.2. Schema Object Versions

Schema objects are versioned like other objects in the Roundtable system. However, some differences do exist. Schema objects, PDBASE, PFILE, and PFIELD, are not stored as incremental versions. A complete copy of the data structure defining the schema object is stored in the repository for each version of the object. This does not lead to excessive growth in the database because creating a new object version of a PFIELD does not necessarily require new object versions of the PFILEs to which it may be assigned.

In addition, Roundtable maintains internal buffers for checked out schema objects to track the last updated content of the schema objects. In this way, it can track the changes you make to schema objects while they are WIP. You do not have to check in (complete) your schema objects with each schema update process. Instead, you can make changes and update the schema into your application database in an iterative manner. You only check in the schema objects when you have finalized the database schema content.

It is usually a good idea to do your schema changes in a separate task from that used for creating and modifying programs. It is necessary to complete all schema objects before a Release can be created in a Workspace.

6.7. PDBASE Objects

PDBASE (database) objects record a list of PFILE assignments that link a PFILE with the PDBASE object. When a PDBASE object is assigned to a Workspace, additional information is required to allow connection of the physical database. This connection information is part of the assignment of the object to the Workspace. It is not part of the PDBASE object. It is possible to change this database connection information without checking out the PDBASE object. The connection information for a database is contained in the Dbase folder.

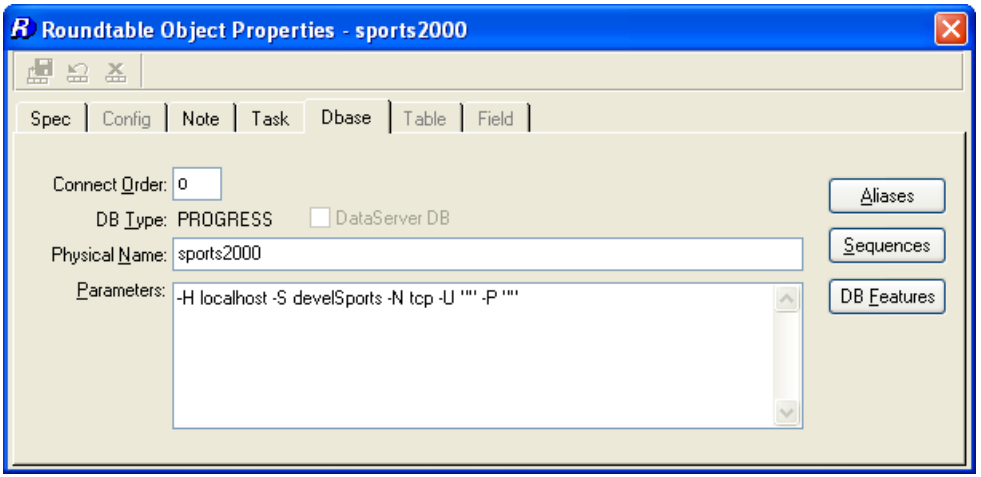
There are two things to be aware of when creating a PDBASE object:

- Naming a PDBASE object is important because Roundtable uses the PDBASE object name as the logical database name. Roundtable requires this for cross-referencing purposes.
- Unless you specify -U and -P connection parameters for the database, Roundtable uses

the same user ID and password for the Workspace database as you used for logging into Roundtable. To avoid this, use -U "" -P "" as part of your Workspace database's connection parameters.

6.7.1. Dbase Folder Description

The Dbase folder contains the Workspace database parameters of the PDBASE object.



The Dbase folder contains the following fields:

Field or Button	Description
Connect Order	A fill-in that controls the order in which Roundtable connects to multiple databases.
DB Type	(Display only) Type of database (PROGRESS, ORACLE, ODBC, etc.)
DataServer DB	Checked if the database is a DataServer schema holder. Only enabled for a new PDBASE object.
Physical Name	A fill-in for the full name of the database, including the directory in which it is stored. If you leave this field blank, Roundtable does not attempt to connect to the database when the Workspace is connected.
Parameters	A set of fill-in fields for the OpenEdge connection parameters. When connecting to an application database, Roundtable supplies the user ID and password you used to log into Roundtable. To avoid this, you specify a user ID and password using the -U and -P options. It is possible to pass a blank user ID and password with a connection parameter specification of -U "" -P "".

Field or Button	Description
Aliases	Sets up database aliases.
Sequences	Creates and manages database sequences. See Section 6.7.8, “Adding a Database Sequence” [6–21] in this chapter.
DB Features	Launches the Database Features dialog, for designating features supported by the database, including 64-bit sequences.

6.7.2. Adding a PDBASE Object

Before you add a PDBASE object, the database should exist in the system and be available for connection. A connect is attempted during the PDBASE object add process to verify the database connection parameters you enter.

Follow these steps to add a PDBASE object:

1. Choose File → New Object from the Tabletop menu. The New Object window appears.
2. Select PDBASE from the Type drop-down-list.
3. From the Pmodule drop-down list, select the Product Module to which the object will belong. Only Product Modules that are associated with the currently selected Workspace Module appear in the list.
4. Enter the object group and level in the Group and Level fields.
5. Enter an object name in the Object field. The object name that you enter for the new PDBASE object will be used as the logical database name when it Roundtable connects to it.
6. Choose the **Save Record** button. The following dialog box appears with the object name that you entered:

7. Choose Yes if the object name that you entered is the correct logical name for the database. A warning dialog box appears to confirm creation of the new PDBASE object.
8. Choose Yes to create the PDBASE object.
9. Open the Object Properties window.
10. On the Dbase folder of the Object Properties window, enter the connect order priority number, DataServer DB status, the physical name of the database, and the database connection parameters.
11. Choose the **Save Record** button to complete your edit of the folder.

6.7.3. PDBASE for DataServer Database

In order to utilize DataServer schemas with Roundtable, PDBASE objects must be defined in specific ways. First, there must be a PDBASE object defined for each database with its schema managed by Roundtable. This is the case, even if one physical OpenEdge database contains schemas for more than one database (such as both its own native schema and the schema of foreign database).

Second, the name of the PDBASE object must be identical to the name of the database used to manage the schema. If the PDBASE object corresponds to a foreign database, the name of the PDBASE object must be the same as the name of the foreign database as it was when it was connected to populate the DataServer schema holder database (stored in the _Db-name field of the corresponding _Db record). The physical database specified for these objects, however, will be the name of the OpenEdge database that serves as the schema holder for the foreign database. If the PDBASE corresponds to a native OpenEdge schema, the PDBASE name will serve as the logical name for that database (unless an -ld value is supplied in the connection parameters for that PDBASE object).

Consider the following sample PDBASE object definitions:

PDBASE definition for ORACLE DataServer schema holder and database. Notice that the physical name specified is for the OpenEdge schema holder. A connection to the ORACLE database is made using the additional connection parameters supplied in the definition (See the OpenEdge Oracle DataServer Guide for appropriate connection parameters).

Property	Value	Description
Object Name	ORCL	Name of ORACLE database.
Physical Name	C:/rtb/project/devel/orahold.db	Pathname of OpenEdge schema holder.

Property	Value	Description
Connection Parameters	-ld orahold -RO -db ORCL -dt ORACLE -U user_1@ORACLE.SERVICE.NAME -P passwd	Logical name for schema holder. Connection parameters for ORACLE database.

PDBASE definition for ODBC DataServer schema holder and database. Notice that the physical name specified is for the OpenEdge schema holder. A connection to the ODBC database is made using the additional connection parameters supplied in the definition (See the OpenEdge ODBC DataServer Guide for appropriate connection parameters, and DSN setup).

Property	Value	Description
Object Name	MS-Demo	Name of ODBC database.
Physical Name	C:/rtb/demo/devel/demohold.db	Pathname of OpenEdge schema holder.
Connection Parameters	-ld demohold -RO -db MS-Demo -dt ODBC	Logical name for schema holder. Connection parameters for ODBC database.

PDBASE definitions for OpenEdge a database used for both native schema and as a DataServer schema holder for an ORACLE database. The first PDBASE definition is for the native schema, and the second for the ORACLE database. Note the read-only (-RO) parameter in the second definition. Without this, you will get an error message when Roundtable attempts a second connection to a single database.

Property	Value	Description
Object Name	Prodemo	Name of OpenEdge database.

Property	Value	Description
Physical Name	/usr/rtb/demo/devel/prodemo.db	Pathname of OpenEdge database.
Connection Parameters		Only as required per installation.

Property	Value	Description
Object Name	Orademo	Name of ORACLE database.
Physical Name	/usr.rtb/demo/devel/prodemo.db	Same pathname as before.
Connection Parameters	-RO -db orademo -dt ORACLE -U user_1@ORACLE.SERVICE.NAME -P passwd	Required. Connection parameters for ORACLE database.

6.7.4. DataServer Schema Change Restrictions

Since OpenEdge DataServer schema holders are designed to be only recipients of foreign schema (using utilities provided in the OpenEdge Data Administration tool), Roundtable also limits one-way update of DataServer schema. This allows you to load in the schema changes from a OpenEdge schema holder for impact analysis and selective compiling. The Load Schema utility finds any change to the physical schema holder and reads it into Roundtable (versioning objects if necessary).

Schema for a DataServer database can only be added and/or updated in Roundtable using Roundtable's Load Schema feature. Schema assigned to a PDBASE object that corresponds to a DataServer database cannot be manually checked out, nor can a user directly modify the properties of the objects.

As with loading native OpenEdge schema using the Load Schema feature, schema objects for DataServer schema will be checked out automatically as required. Even though schema objects assigned to a PDBASE object corresponding to a DataServer database remain WIP until they are checked in, users will not be able to change any of the properties (local table name, data type, etc.) for these objects.

Roundtable does not support the use of a DataServer for the Roundtable repository.

6.7.5. Editing the Dbase folder

Follow these steps to edit the Dbase folder:

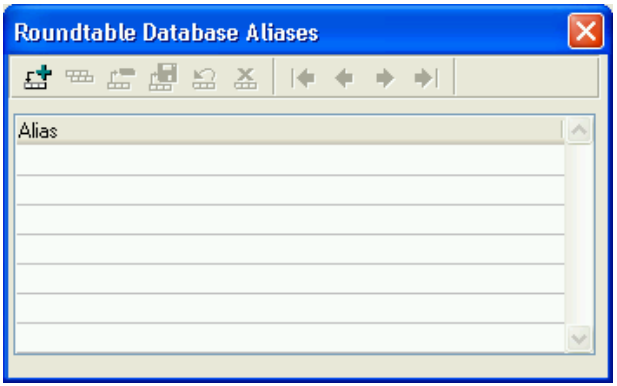
1. From the object browse on the Tabletop, select the PDBASE object to edit.
2. Open the Object Properties window, and then choose the Dbase folder tab. The Dbase folder opens.
3. Edit the database parameters in the folder as necessary. Since the Dbase folder only contains workspace-specific connection parameters for the database, you can edit the contents of the folder even if the PDBASE object is not checked out.
4. Choose the **Save Record** button to complete your edit of the folder.

6.7.6. Adding an Alias

The database aliases defined for the database are created for you when Roundtable connects to the database. Otherwise, code that expects these aliases to be available cannot compile. Roundtable does not provide automatic alias support on deployment. Instead, your deployed application will connect to the appropriate databases and create the required aliases.

Follow these steps to add an alias:

1. From the object browse on the Tabletop, select the PDBASE object to add an alias to. The PDBASE object must be checked-out to add an alias.
2. Open the Object Properties window, and then choose the Dbase folder tab. The Dbase folder opens.
3. Choose the **Aliases** button. The Aliases dialog box appears.



4. Choose the **Add Record** button. A new row is enabled in the browse.
5. Enter the alias name and choose the **Save Record** button.
6. Repeat steps 5-7 for additional aliases.
7. Close the Alias dialog box.

6.7.7. Deleting an Alias

Follow these steps to delete an alias:

1. From the object browse on the Tabletop, select the PDBASE object to add an alias to. The PDBASE object must be checked-out to add an alias.
2. Open the Object Properties window, and then choose the Dbase folder tab. The Dbase folder opens.
3. Choose the **Aliases** button. The Aliases dialog box appears.
4. Select the alias to delete.
5. Choose the **Delete Record** button. A warning dialog box appears. Choose the **Yes** button to delete the alias.
6. Close the Alias dialog box.

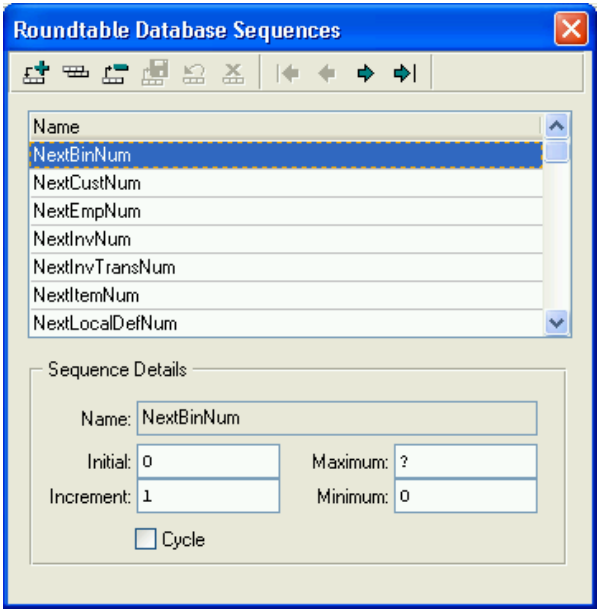
6.7.8. Adding a Database Sequence

Follow these steps to add a database sequence:

1. From the object browse on the Tabletop, select the PDBASE object to add a sequence

to. The PDBASE object must be checked-out to add a sequence.

2. Open the Object Properties window, and then choose the Dbase folder tab. The Dbase folder opens.
3. Choose the **Sequences** button. The Database Sequences dialog box appears.



4. Choose the **Add Record** button. The Name field is enabled in the Sequence Details panel.
5. Enter the name for the sequence along, with these values for the new sequence:

   - **Initial:** The first number to use when assigning numbers.
   - **Maximum:** The highest number to assign before stopping or starting over.
   - **Increment:** The amount by which to increment each consecutive number.
   - **Minimum:** The lowest number that OpenEdge should use when assigning numbers and is only used with negative increments.
   - **Cycle:** Check here to have OpenEdge start over assigning numbers once the maximum number is reached.

6. Choose the **Save Record** button to complete your new sequence entry.
7. Close the dialog box.

Values will be validated against 32-bit or 64-bit limits as determined by the 64-bit sequences property for the PDBASE object. See Section 6.7.11, “Setting Database Features” [6–23] in this chapter.

6.7.9. Edit a Database Sequence

Follow these steps to edit a database sequence:

1. From the object browse on the Tabletop, select the PDBASE object to edit a sequence for. The PDBASE object must be checked-out to edit sequences.
2. Open the Object Properties window, and then choose the Dbase folder tab. The Dbase folder opens.
3. Choose the **Sequences** button. The Database Sequences dialog box appears.
4. Select the sequence to edit from the browse. Edit the sequence fields as necessary. On your first change to any of these fields, the Save Record and **Reset** buttons are enabled. Choose the **Save Record** button to complete your edit.
5. Close the dialog box.

6.7.10. Delete a Database Sequence

Follow these steps to delete a database sequence:

1. From the object browse on the Tabletop, select the PDBASE object to delete a sequence for. The PDBASE object must be checked-out to edit sequences.
2. Open the Object Properties window, and then choose the Dbase folder tab. The Dbase folder opens.
3. Choose the **Sequences** button. The Database Sequences dialog box appears.
4. Select the sequence to delete from the browse.
5. Choose the **Delete Record** button. A warning dialog box appears. Choose the **Yes** button to delete the sequence.
6. Close the dialog box.

6.7.11. Setting Database Features

Database features correspond to OpenEdge database features and determine the attributes that can be defined for a PDBASE object. Currently, only the 64-bit Sequences feature can be set, which determines if sequences for the PDBASE object can contain 64-bit values.

Follow these steps to set database features:

1. From the object browse on the Tabletop, select the PDBASE object to edit the features of. The PDBASE object must be checked-out to edit features.
2. Open the Object Properties window, and then choose the Dbase folder tab. The Dbase folder opens.
3. Choose the **DB Features** button. The Database Sequences dialog box appears.
4. Set the desired database feature(s).

6.7.12. Load OpenEdge Schema

The Load OpenEdge Schema utility loads the schema of an existing database into Roundtable. The utility creates PFILE and PFIELD objects for each of the file and field definitions found in the OpenEdge database. The Utility can load changes made to the OpenEdge database schema so that the logical schema object definitions in Roundtable are brought in sync with the physical OpenEdge database schema.

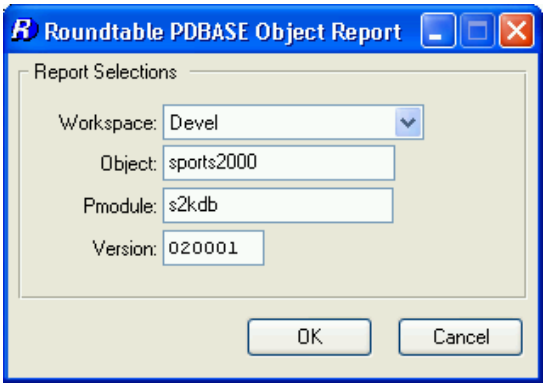
See Section 7.8, “Load Schema” [7–18] for a complete description of this utility.

6.7.13. PDBASE Object Report

The PDBASE Object Report reports the definition of a PDBASE object. It does not report on the definitions of the PFILE assigned to the PDBASE. If you want a complete schema definition, use the Database Definition Report instead. See Section 6.7.14, “Database Definition Report” [6–25].

Follow these steps to print the report:

1. From the object browse on the Tabletop, select the PDBASE object to report on.
2. Choose Reports → Object → PDBASE Object Report from the Tabletop menu. The PDBASE Object Report window appears.



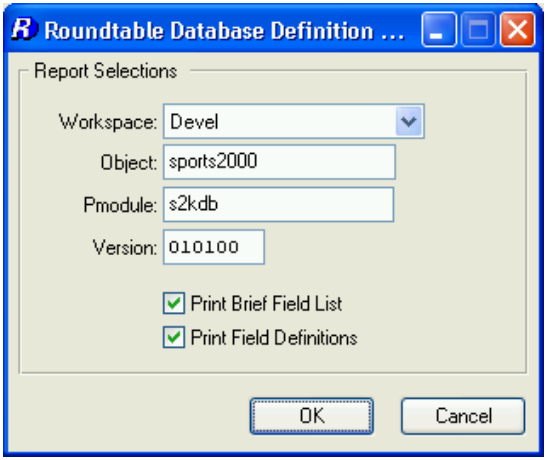
3. Confirm or modify the report selections, and then choose the **OK** button.

6.7.14. Database Definition Report

The Database Definition Report provides the full definition of the database from the contents of the Roundtable schema.

Follow these steps to print the report:

1. From the object browse on the Tabletop, select the PDBASE object to report on.
2. Choose Reports → Object → Database Definition Report from the Tabletop menu. The Database Definition Report window appears.



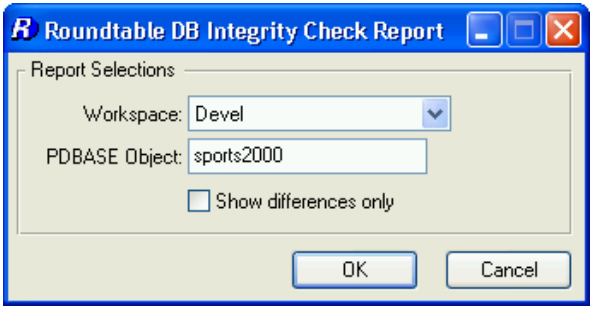
3. Select report options: Activate the Provide Brief Field List toggle box to print brief field descriptions for the fields defined in each table. Activate the Print Field Definitions toggle box to print the full detailed definition of each field. The Brief Field List and Field Definitions options are not mutually exclusive. The report produces both sections if both options are selected.
4. Choose the **OK** button to run the report.

6.7.15. Integrity Check Report

The Database Integrity Check Report compares the Roundtable schema definition with the schema definition in the physical OpenEdge database. This report is useful for finding out if someone has modified the OpenEdge database schema manually.

Follow these steps to print the report:

1. From the object browse on the Tabletop, select the PDBASE object to report on.
2. Choose Reports → Object → Database Integrity Check Report from the Tabletop menu. The DB Integrity Check Report window appears.



3. Confirm the PDBASE specification and then choose the **OK** button to print the report.

6.8. PFILE Objects

A PFILE object defines the contents of a OpenEdge table. It contains:

- Schema information related to the table as a whole
- Index and table header definitions for the table
- A list of PFIELD assignments that include local field names, field order, and mandatory status

Define the fields of a table through assignment of existing PFIELD objects to the PFILE object. In addition to the contents of the PFIELD definition, table fields are further defined by a local field name, a field order, and mandatory status values. The table field name and the PFIELD object name are usually (but do not have to be) the same.

Roundtable shows the content of a PFILE object definition in the Table folder. You perform the following activities to manage a PFILE object:

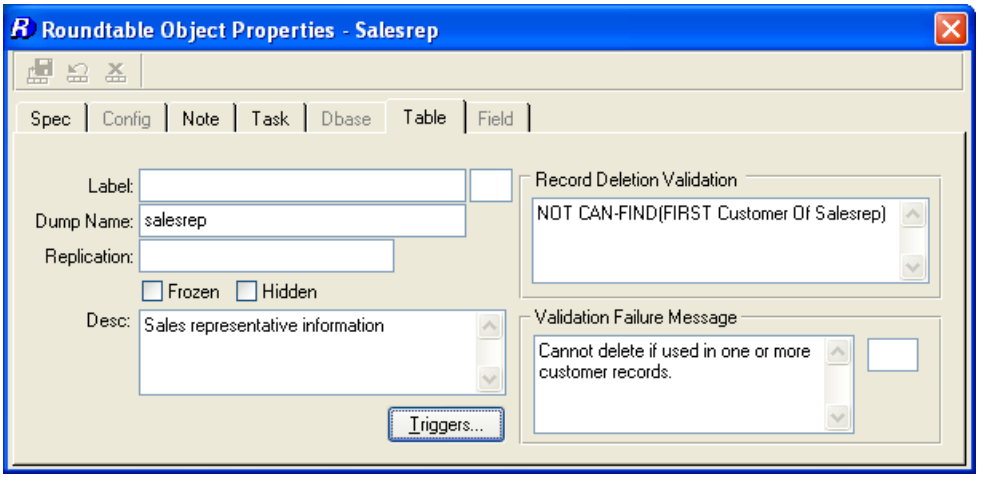
- Edit header properties (Label, Dump Name, Validation, etc.)
- Define table triggers
- Assign PFIELD objects to the PFILE (Using Logical Schema Manager)
- Define indices and index fields for the PFILE (Using Logical Schema Manager

The PFILE reports available are:

- PFILE Object Report, which provides the definition of a PFILE object
- File Definition Report, which provides the full PFILE definition

6.8.1. Table Folder Description

The Table folder contains a PFILE object definition.



The File folder contains the following items:

Field or Button	Description
Label	The fill-ins for the label of the table and its string attribute.
String Attribute (Unlabeled)	A fill-in for the string attribute for the Label.
Dump name	A fill-in for the dump name of the table.
Replication	A fill-in for the Replication table attribute. This field was added to the OpenEdge data dictionary in version 8.1A. See the OpenEdge System Administration Guide for more details.
Frozen	A toggle box that sets the OpenEdge File _frozen attribute. Roundtable can update files that have the Frozen attribute set. Use this attribute to prevent others from making changes to the file using the OpenEdge Data Dictionary.
Hidden	A toggle box that sets the OpenEdge File _hidden attribute. Use this attribute to prevent users from seeing this table.
Desc.	An editor widget for the description of the table's use in the system.
Record Deletion Validation	An editor widget for the statement that must be true before deleting a record.
Validation Failure Message	An editor widget for the message OpenEdge displays if a record deletion validation fails. Also enter String Attributes.
String Attribute (Unlabeled)	A fill-in for the string attribute for the Validation Failure Message.
Triggers	Button to define database triggers for the table.

6.8.2. Adding a PFILE Object

Follow these steps to add a PFILE object:

1. Choose File → New Object from the Tabletop menu. The New Object window appears.
2. Select PFILE from the Type drop-down-list.
3. From the Pmodule drop-down list, select the Product Module to which the object will belong. Only Product Modules that are associated with the currently selected Workspace Module appear in the list.
4. Enter the object group and level in the Group and Level fields.
5. Enter an object name in the Object field.
6. Choose the **Save Record** button.
7. A dialog appears with the new object details for confirmation.

8. Choose the **Yes** button to create the PFILE object.

For instructions on adding fields to the table, see Section 6.10.2.1, “Assigning a Field” [6–?].

6.8.3. Editing the Table Folder

Follow these steps to edit the Table folder:

1. From the object browse, select a PFILE object that has a WIP status.
2. Open the Object Properties window, and then select the Table folder tab.
3. Edit the fields in the folder as desired.
4. Choose the **Save Record** button to save your changes.

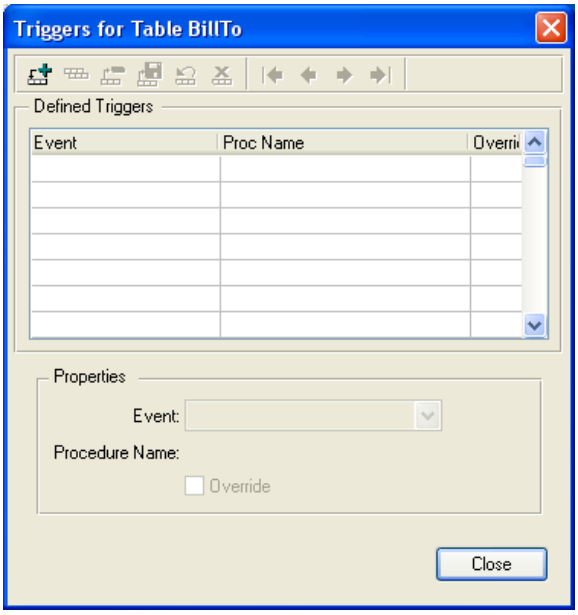
6.8.4. Adding Table Triggers

Roundtable allows you to manage database table triggers. For a description of database triggers, refer to your OpenEdge manuals.

Roundtable does not support CRCs on triggers because it makes deployment of schema information difficult or impossible in many situations. See the OpenEdge documentation for more information on CRC checks on triggers.

Follow these steps to add a table trigger:

1. From the object browse, select a PFILE object that is checked out.
2. Open the Object Properties window, and then choose the Table folder tab.
3. Choose the **Triggers** button. The Triggers for Table dialog box appears.

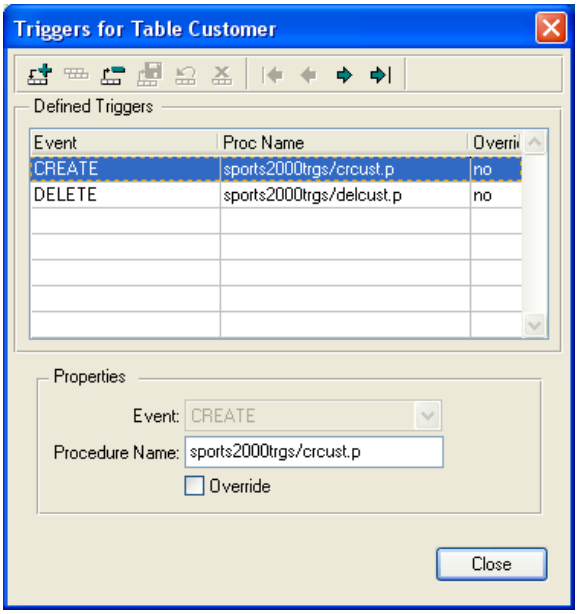


4. Choose the **Add Record** button.
5. Select the trigger event from the Event drop-down list.
6. Enter the name of the procedure associated with the event.
7. Activate the Override toggle box if the application code can override this trigger specification. Choose the **Save Record** button to complete trigger entry
8. Close the dialog box.

6.8.5. Deleting a Trigger

Follow these steps to delete a table trigger:

1. From the object browse on the Tabletop, select a PFILE object that is checked out.
2. Choose the Table folder tab. The Table folder opens.
3. Choose Triggers from the pop-up menu. The Triggers for Table dialog box appears.



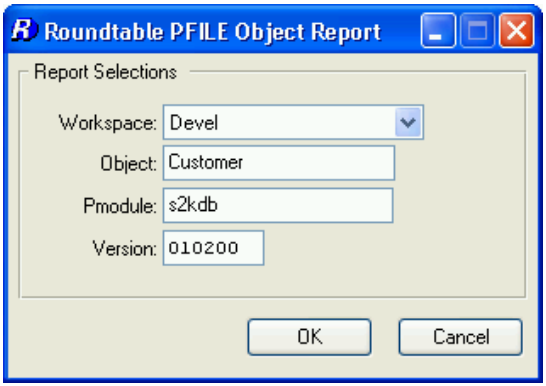
4. Select the trigger event from the browse.
5. Choose the **Delete Record** button. A warning dialog appears to confirm the deletion.
6. Choose the **Yes** button to delete the trigger. The trigger record is deleted, but Roundtable does not delete the procedure source code.
7. Close the dialog box.

6.8.6. PFILE Object Report

The PFILE Object Report prints the definition of a selected PFILE object.

Follow these steps to print the report:

1. From the object browse on the Tabletop, select the PFILE object.
2. Choose Reports → Object → PFILE Object Report from the Tabletop menu. The PFILE Object Report window appears.



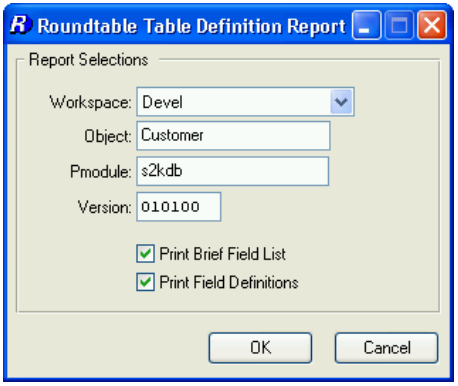
3. Confirm or modify the object specifications, and then choose the **OK** button.

6.8.7. Table Definition Report

The Table Definition Report prints a full file definition from the contents of Roundtable schema.

Follow these steps to print the report:

1. From the object browse on the Tabletop, select the PFILE object.
2. Choose the Reports → Object → Table Definition Report from the Tabletop menu. The Table Definition Report window appears.



3. Confirm or modify the object specifications, and select from the report options:

- Activate the Print Brief Field List toggle box to print a brief list of all the fields in the file.
- Activate the Provide Full Detail toggle box to print the full details of each field in the file.

The Brief List and Full Detail options are not mutually exclusive. The report produces both sections if both options are selected.

4. Choose the **OK** button.

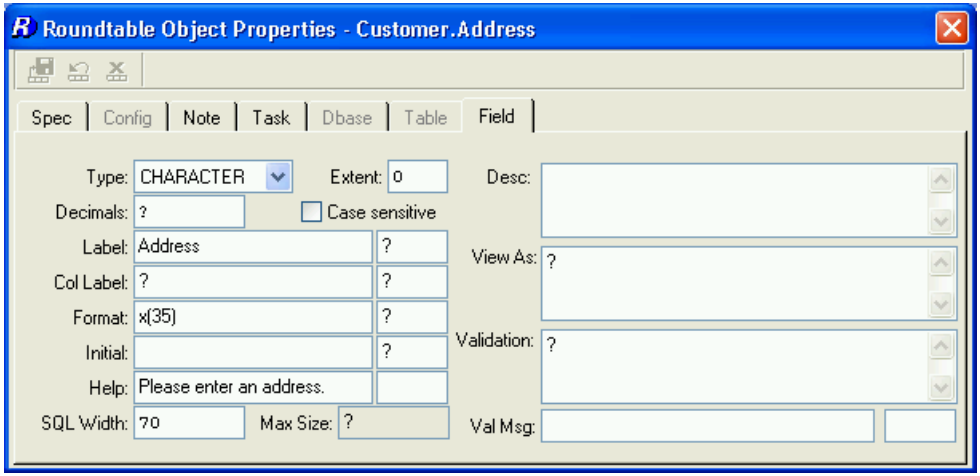
6.9. PFIELD Objects

PFIELD definitions in Roundtable are similar to the field definitions found in the OpenEdge Data Dictionary. However, unlike OpenEdge field definitions, PFIELD objects can be used in one or more field assignments in PFILE table definitions.

For example, you can define a single PFIELD object called Address and assign this definition to one or more PFILE table fields. This allows for global changes, such as changing the length of the Address field. You make only one change in the PFIELD definition. Roundtable updates the table's field definition wherever a field is assigned to a table.

6.9.1. Field Folder Description

The Field folder contains the PFIELD definition. You can change most of the fields in this folder, except the data type or extent of the field. To change the data type or extent of a field, see Section 6.9.4, “Changing the Data Type or Extent of a Field” [6–36]. You can change the decimal field only if the field is a decimal data type.



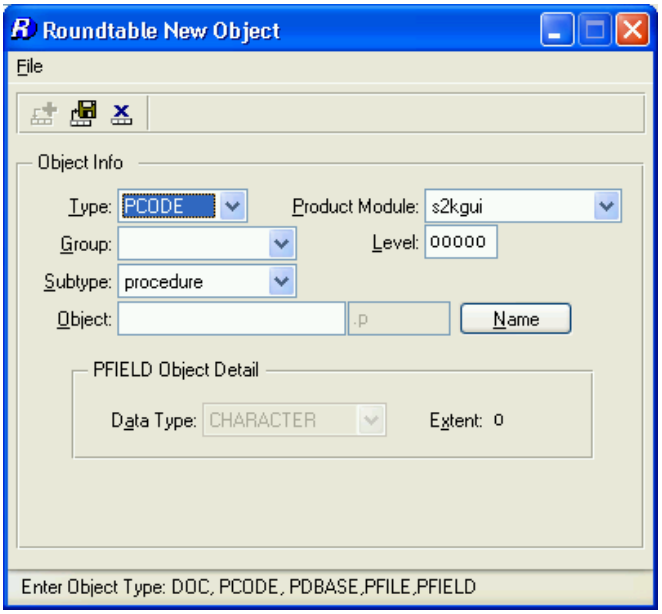
The fields in the Field folder include:

Field	Description
Type	Display only field. This shows field's data type.
Extent	Display only field. Defines the number of elements in an array field.
Decimal	Display only field. Indicates the number of stored decimal digits for a decimal field.
Case Sensitive	A toggle box that indicates whether to regard uppercase and lowercase letters as differences in a field.
Label	Fill-ins for the field label and string attribute.
Col-label	Fill-ins for the column label and string attribute.
Format	Fill-ins for the format phrase for the field and string attribute.
Initial	Fill-in for the initial value of the field and string attribute.
Help	Fill-ins for the field's help line and string attributes.
SQL Width	Field width for SQL-92 clients.
Max Size	Fill-in for the maximum size of a BLOB or CLOB field.
Desc.	An editor widget for the field's description.
View As	The View As expression for the field.
Validation	The validation expression for the field.
Val Msg	The validation message and string attribute for the field.

6.9.2. Adding a PFIELD Object

Follow these steps to add a PFIELD object:

1. Choose File → New Object from the Tabletop menu. The New Object window appears.



2. Select PFIELD from the Type drop-down list.
3. From the Pmodule drop-down list, select the Product Module to which the new PFIELD object belongs. Only Product Modules associated with the current Workspace Module appear in the list.
4. Enter the object group, level, object name, data type and extent.
5. Choose the **Save Record** button. A warning dialog appears to confirm the object creation.
6. Choose the **OK** button to complete the addition of the PFIELD object. The new PFIELD object appears on the Tabletop's object browse.
7. Close the New Object window if you have no more PFIELDs to add.

6.9.3. Editing the Field Folder

Follow these steps to edit the Field folder:

1. From the object browse, select a PFIELD object that is checked out.
2. Open the Object Properties window, and then choose the Field folder tab. The Field folder opens.
3. Edit the folder as desired. Choose the **Save Record** button to complete your entry in the folder.

6.9.4. Changing the Data Type or Extent of a Field

The PFIELD must be checked-out in order to be modified. If you have used the field in an index, you cannot change the extent of the field.

Changing the data type or extent of a field might cause loss of data in your application database. Roundtable does provide a mechanism for transforming the data from one type to another during the schema update process, but you often have to write your own data conversion routines. See Section 4.7, “Database Schema Updates” [4–23].

Follow these steps to change the data type or extent of a field.

1. From the object browse on the Tabletop, select a PFIELD object.
2. Open the Object Properties window, and then choose the Field folder tab. The Field folder opens.
3. Change the data type and/or extent of the field, as desired.
4. Choose the **Save Record** button to complete the data type and extent change.

6.9.5. Editing a Field Validation

A field validation is an expression that must be true before you can leave the field. The PFIELD object must be checked out for its validation to be changed:

Follow these steps to edit a field validation:

1. From the object browse on the Tabletop, select a PFIELD object.
2. Open the Object Properties window, and then choose the Field folder tab. The Field folder opens.
3. Edit the validation expression and message as desired.
4. Choose the **Save Record** button to complete your changes.

6.9.6. Editing a Field View As Phrase

The View As phrase provides a default expression used to display the field as a GUI widget.

Follow these steps to edit a view-as phrase:

1. From the object browse on the Tabletop, select a PFIELD object.
2. Open the Object Properties window, and then choose the Field folder tab. The Field folder opens.
3. Edit the view-as phrase as desired.
4. Choose the **Save Record** button to complete your changes.

6.9.7. PFIELD Object Report

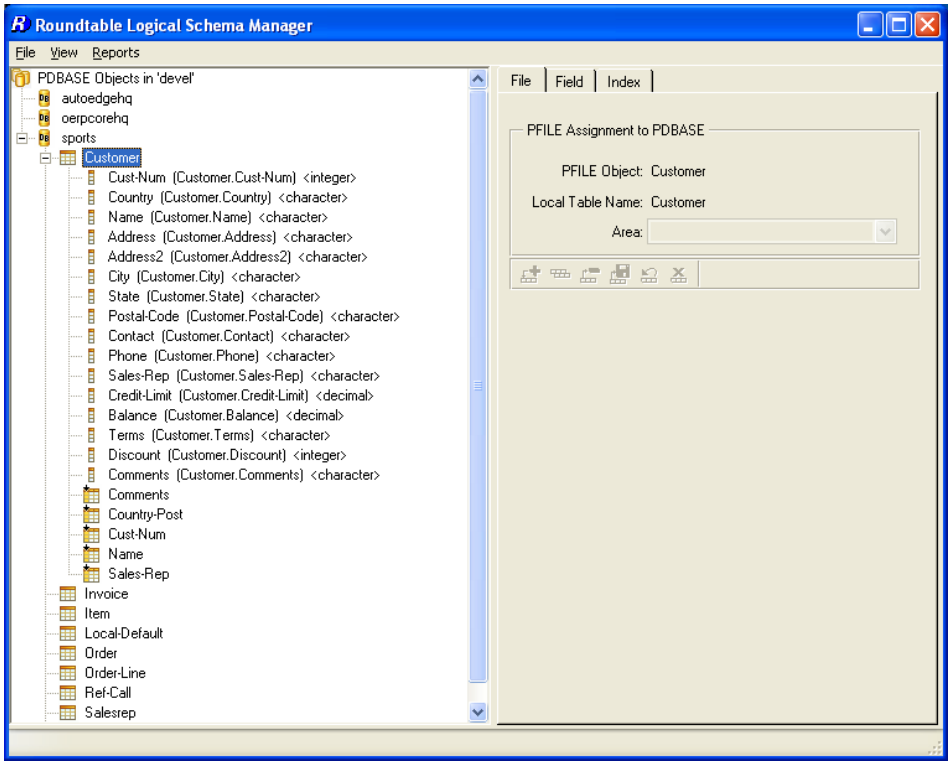
The PFIELD Object Report prints the field definition information for a selected field.

Follow these steps to print the report:

1. From the object browse on the Tabletop, select the PFIELD object.
2. Choose Reports → Object → PFIELD Object Report from the Tabletop menu. The PFIELD Object Report window appears.
3. Confirm or modify the object specification, and then choose the **OK** button.

6.10. Logical Schema Manager Window

In order to apply the definitions provided by PDBASE, PFILE, and PFIELD objects to a physical Workspace database, the objects must be assembled into a logical database schema. Logical database schemas are constructed using the Logical Schema Manager window.



The following items are on the Logical Schema Manager window:

Item	Description
TreeView	A hierarchical tree showing databases, tables, fields and indices that form a database schema. Database schemas are represented with the following icons:
	Root node. Represents all PDBASE objects in the selected Workspace.
	Workspace database. The label displays the logical database name. Expand to view tables assigned to the database.
	Table assigned to the database. The node label displays the local table name with the PFILE object name in parentheses. Expand to view assigned fields and defined indices.
	Field assigned to a table. The node label displays the local field

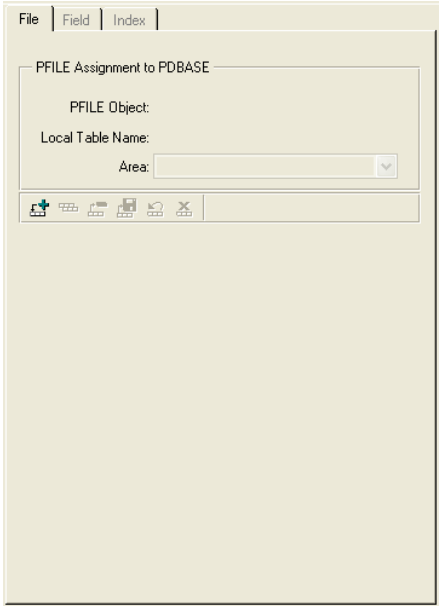
Item	Description
	name with the PFIELD object name in parenthesis.
	 Index defined for a table.
File folder	Manages the assignment of a PFILE objects to a PDBASE object.
Field folder	Manages the assignment of PFIELD objects to a PFILE object.
Index folder	Manages the definition of indices for a PFILE object.

The nodes of the Logical Schema Manager TreeView are expanded, collapsed and selected as in similar applications, such as Windows Explorer.

6.10.1. Table Assignments

A database is comprised of one or more tables. Define these tables by assigning PFILE objects to the PDBASE object that defines the database. To see the tables in a database, expand the database's node in the Logical Schema Manager's TreeView. If the PDBASE object is checked out, you can create, edit, or delete table assignments.

The details of table assignments are shown on the File folder of the Logical Schema Manager window.



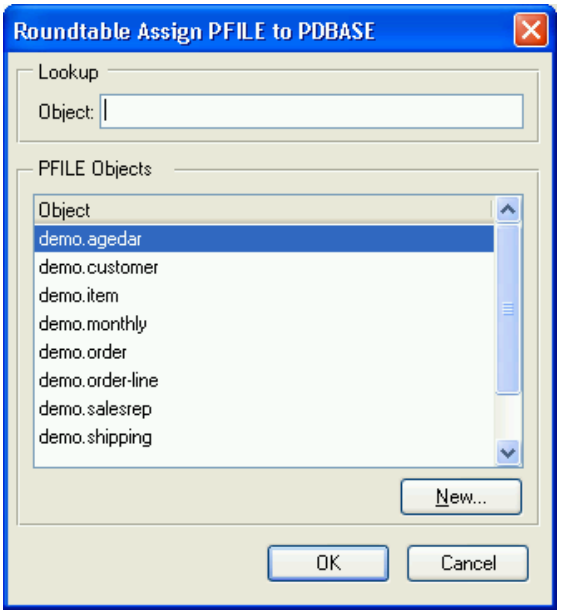
Field	Description
PFILE Object	Displays the name of the PFILE object definition.
Local Table Name	A fill-in for the name of the table in the database. The local table name may be different than the name of the PFILE object. For example, the PFILE object name may be "sports.customer" while the local table name is "customer".
Area	The database storage area name for the table. You may select an existing name from the drop-down list, type in any name, or leave this value blank.

Follow these steps to add tables to a database by assigning one or more existing PFILE objects to the PDBASE object:

1. Choose Workspace → Schema Manager from the Tabletop menu. The Logical Schema Manager window opens.
2. In the Logical Schema Manager TreeView, select the database to assign a table to.

The PDBASE object associated with the database must be checked-out to your current task.

3. Choose the File folder tab. The File folder appears.
4. Choose the **Add Record** button on the File folder's toolbar. The Assign PFILE to PDBASE dialog box appears.



5. Select one or more PFILE objects to assign. You can add a new PFILE object to the list by choosing the **New** button. After selecting the desired PFILE object(s), choose the **OK** button.
6. If adding a single PFILE assignment, the cursor is placed on the Local Table Name field. The Local Table name will be the name of the table in the physical database schema. Enter an appropriate name, and then choose the **Save Record** button. When adding multiple PFILE assignments, the Local Table Name for each PFILE assignment defaults to the unqualified object name. To change the Local Table Name of a PFILE assignment, see Section 6.10.1.3, “Changing Local Table Name” [6–43].
7. (Optional) Enter or select a database storage area for the table.

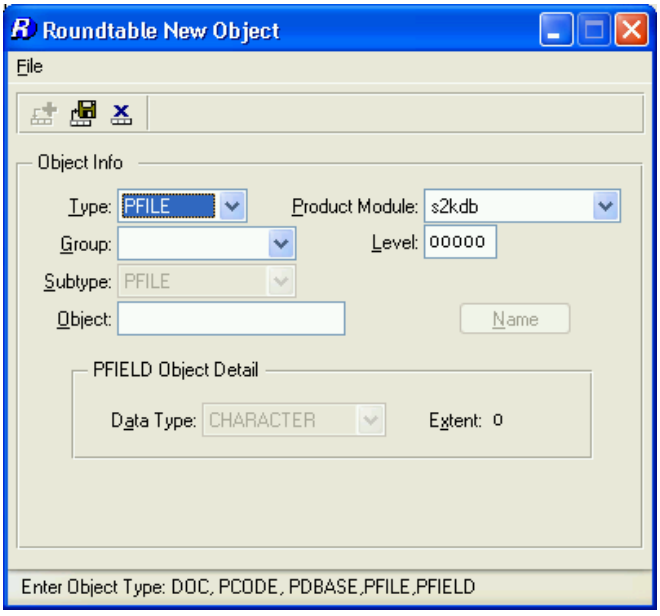
The table will be placed in the specified area only when it is newly added to a database during a schema update, and the named storage area exists in the target database. If no area is named, or the named area does not exist in the target database, the table will be placed in the default Schema Area.

6.10.1.1. Creating a New Table Object

Using the **New** button on the Assign PFILE to PDBASE dialog, you can create a new PFILE object from within the Logical Schema Manager.

To create a new PFILE object, perform the following steps:

1. Choose the **New** button on the Assign PFILE to PDBASE dialog. The New Schema Object Dialog appears:



2. Complete the New Schema Object dialog by selecting the proper Product Module, and object Group, and providing an object name.
3. Choose the **OK** button. The newly added PFILE object appears in the browse on the Assign PFILE to PDBASE dialog.

Although you are able to add a new table from within the Logical Schema Manager Window, you should set the particular properties (such as Dump Name and Validation properties) for the table using the Object Properties Window, that is opened via the Roundtable Tabletop.

6.10.1.2. Deleting a Table Assignment

You can delete a table from your database by removing the PFILE assignment that defines the table. Deleting the PFILE assignment does not delete the PFILE object.

Follow these steps to delete a table:

1. Choose Workspace → Schema Manager from the Tabletop menu. The Logical Schema Manager window opens.
2. In the Logical Schema Manager TreeView, select the table to remove.

The PDBASE object associated with the database must be checked-out to your current task.

3. Choose the File folder tab. The File folder appears.
4. Choose the **Delete Record** button on the File folder's toolbar. A warning dialog box appears.
5. Choose the **Yes** button to remove the table assignment. Roundtable deletes the table from the database but does not delete the associated PFILE object.

6.10.1.3. Changing Local Table Name

The local table name is the name of the table seen in the OpenEdge database. When you assign a PFILE object to a PDBASE object to create a table, you specify the local table name.

To change the local table name of a PFILE assigned to a PDBASE follow these steps:

1. Choose Workspace → Schema Manager from the Tabletop menu. The Logical Schema Manager window opens.
2. In the Logical Schema Manager TreeView, select the table to rename.

The associated PFILE object must be checked-out to your current task.

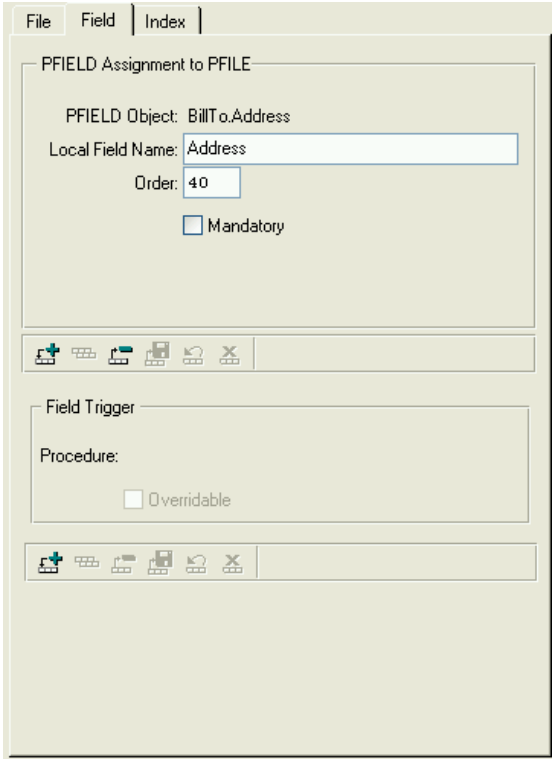
3. Choose the File folder tab. The File folder appears.
4. Enter the new Local Table Name in the field provided.
5. Choose the **Save Record** button to save your change.

6.10.2. Field Assignments

A table is comprised of one or more fields. Define these fields by assigning PFIELD objects to the PFILE object that defines the table. To see the fields in a table, expand the Table's node in the Logical Schema Manager's TreeView. If the PFILE object is checked

out, you can create, edit, or delete PFIELD object assignments to change the field definitions of the table.

The details of field assignments are shown on the Field folder of the Logical Schema Manager window.



Field	Description
PFIELD Object	A fill-in for the name of the PFIELD object definition.
Local Field Name	A fill-in for the name of the field in the file. The local field name may be different than the name of the PFIELD object. For example, the PFIELD object name may be customer.name while the local field name is "name".
Order	A fill-in for the field ordering value.
Mandatory	A toggle box that indicates whether this field is required.
Code Page	When assigning a CLOB field, use this drop down list to select the appropriate code page for the field in the selected database. The list

Field	Description
	appears only when assigning a CLOB field.
Collation	When assigning a CLOB field, use this drop down list to select the appropriate collation for the field in the selected database. The list appears only when assigning a CLOB field.
Area	When assigning a LOB field, the database storage area name for the LOB field. You may select an existing name from the drop-down list, type in any name, or leave this value blank.
Trigger Procedure	A fill-in for the name of a field trigger procedure.
Overridable	A toggle box that indicates whether applications using the database can override the specified field trigger.

6.10.2.1. Assigning a Field

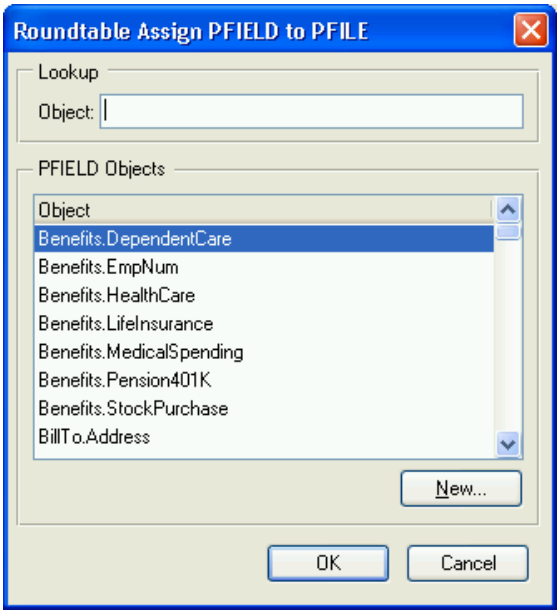
You can add fields to the table by assigning an existing PFIELD definition. The PFILE object must be checked out for new fields to be added.

Follow these steps to assign an existing PFIELD object:

1. Choose Workspace → Schema Manager from the Tabletop menu. The Logical Schema Manager window opens.
2. In the Logical Schema Manager TreeView, select the table to assign a field to.

The associated PFILE object must be checked-out to your current task

3. Choose the Field folder tab. The Field folder appears.
4. Choose the **Add Record** button on the toolbar beneath the PFIELD to PFILE Assignment panel. The Assign PFIELD to PFILE dialog appears.



5. Select one or more PFIELD objects to assign to the PFILE object. You can add a new PFIELD object to the list by choosing the **New** button. After selecting the desired PFIELD object(s), choose the **OK** button.

   If you selected multiple PFIELDs, default values for Local Field Name, Order and Mandatory data are supplied. To change these values, see Section 6.10.2.3, “Editing a Field Assignment” [6–48].

   If you selected a sinlge PFIELD, continue with the steps below:

6. Enter the appropriate Local Field Name, Order, and Mandatory data on the Field folder.
7. (Optional) When adding a CLOB field, you may also select a Code Page and Collation from the drop-down lists for those fields.
8. (Optional) When adding any LOB field, you may also specifiy a database storage area, either by selecting an area name in the drop down from the Area field, or typing in another name.

The LOB field will be placed in the specified area only when it is newly added to a database during a schema update, and the named storage area exists in the target database. If no area is named, or the named area does not exist in the target database, the LOB field will be placed in the

default Schema Area.

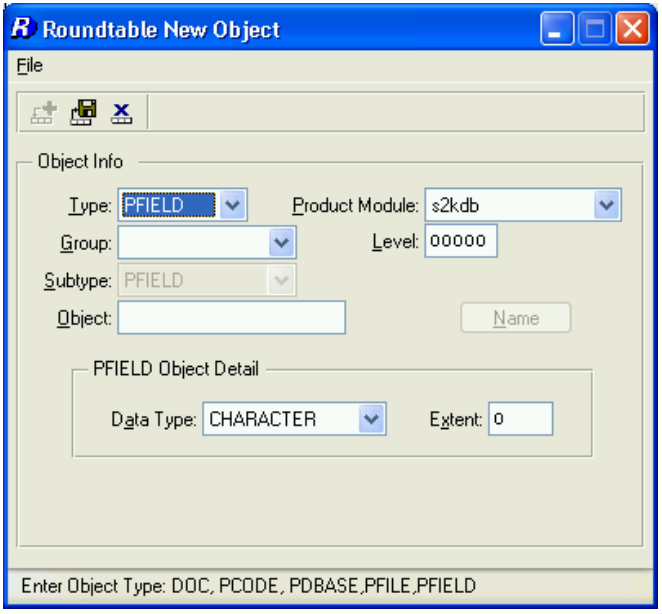
9. Choose the **Save Record** button to complete the field assignment.

6.10.2.2. Creating a New Field Object

Using the **New** button on the Assign PFIELD to PFILE dialog, you can create a new PFIELD object from within the Logical Schema Manager.

To create a new PFIELD object, perform the following steps:

1. Choose the **New** button on the Assign PFIELD to PFILE dialog. The New Schema Object Dialog appears:



2. Complete the New Schema Object dialog by selecting the proper Product Module, Data Type, and object Group, and providing an object name and proper field extent.
3. Choose the **OK** button. The newly added PFIELD object appears in the browse on the Assign PFIELD to PFILE dialog.

Although you are able to add a new field from within the Logical Schema Manager Window, you should set the particular properties (such as Label and View-As properties) for the field using the Object Properties Window, that is opened via the Roundtable Tabletop.

6.10.2.3. Editing a Field Assignment

Follow these steps to edit a PFIELD assignment:

1. Choose Workspace → Schema Manager from the Tabletop menu. The Logical Schema Manager window opens.
2. In the Logical Schema Manager TreeView, select the field to edit.

The associated PFIELD object must be checked-out to your current task.

3. Edit the Field folder data as necessary.
4. Choose the **Save Record** button to complete the field assignment changes.

6.10.2.4. Deleting a Field Assignment

When you delete a PFIELD assignment from a PFILE object, you are not deleting the PFIELD object from the Workspace, only its assignment to the PFILE.

Follow these steps to delete a PFIELD assignment.

1. Choose Workspace → Schema Manager from the Tabletop menu. The Logical Schema Manager window opens.
2. In the Logical Schema Manager TreeView, select the field to delete.

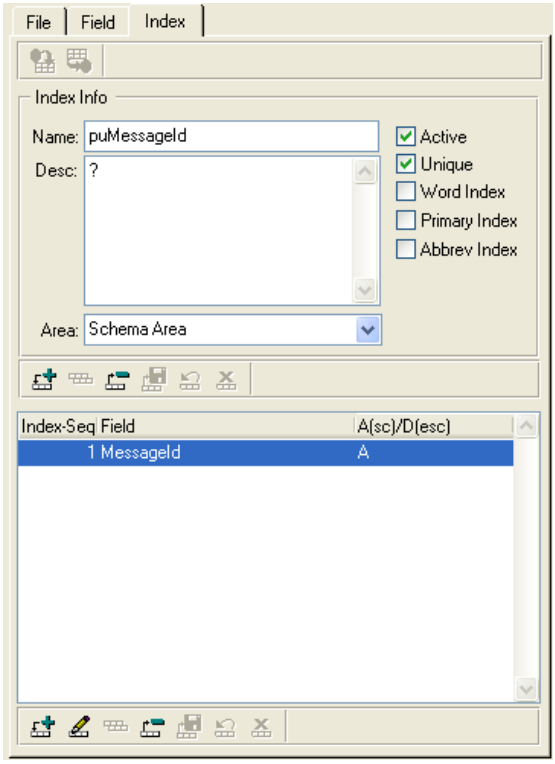
The PFILE object for the associated table must be checked-out to your current task.

3. Choose the **Delete Record** button on the toolbar beneath the PFIELD Assignment to PFILE panel on the Field folder. A warning dialog box appears. Choose the **Yes** button to delete the field assignment.

6.10.3. Indices

A table can have multiple indices. Define these indices through the Index folder. To see the indices in the table, open the Logical Schema Manager window, and then expand the associated table node in the TreeView. If the PFILE object is checked out, you can create, edit or delete indices for the table.

The details of an index are shown on the Index folder of the Logical Schema Manager window described below:



Field	Description
Name	A fill-in for the name of the index.
Desc	An editor widget for the description of the index.
Area	The database storage area name for the index. You may select an existing name from the drop-down list, type in any name, or leave this value blank.
Active	A toggle box that indicates the Active status of the index. This allows you to deactivate the indices on the table during an update schema process. Note that you would then need to manually re-index. See

Field	Description
	Section 4.7.7, “Toggle Index to Activate/Deactivate” [4–30] for more information
Unique	A toggle box that indicates whether duplicate keys are allowed.
Word Index	A toggle box that indicates whether the index is to be a word index.
Primary Index	A toggle box that indicates that the index is the primary index for the table.
Abbrev Index	A toggle box that indicates whether the last description field can be abbreviated.
Fields in index (unlabeled)	A table that displays the fields in the index. Each index must have at least one field.

6.10.3.1. Adding an Index

Follow these steps to add an index:

1. Choose Workspace → Schema Manager from the Tabletop menu. The Logical Schema Manager window opens.
2. In the Logical Schema Manager TreeView, select the table to add an index to.

The associated PFILE object must be checked-out to your current task.

3. Choose the Index folder tab. The Index folder appears.
4. Choose the **Add Record** button on the toolbar beneath Index Info panel.
5. Edit the Index Info (Name, Description, Active, Unique, Word Index, Primary Index, Abbreviated Index, and Stroage Area) to define the new index.

The index will be placed in the specified area only when it is newly added to a database during a schema update, and the named storage area exists in the target database. If no area is named, or the named area does not exist in the target database, the index will be placed in the default Schema Area.

6. Choose the **Save Record** button. You can now add fields to the new index.
7. Choose the **Add Record** button on the toolbar beneath the index fields browse on the lower portion of the Index folder. A new row appears in the index fields browse.
8. Verify or edit the field sequence number, then position the cursor to Field column

9. Type in the local field name of the field to be added to the index.
10. Choose the **Save Record** button to complete the field addition.
11. Repeat steps 7-10 for each field to be added to the index.
12. Choose the **Commit** button to complete the index addition.

6.10.3.2. Deleting an Index

Follow these steps to delete an index.

1. Choose Workspace → Schema Manager from the Tabletop menu. The Logical Schema Manager window opens.
2. In the Logical Schema Manager TreeView, select the index to delete.

The PFILE object for the associated table must be checked-out to your current task.

3. Choose the **Delete Record** button on the toolbar beneath Index Info panel. A warning dialog box appears to confirm the index deletion.
4. Choose the **Yes** button to delete the index.

6.10.3.3. Renaming an Index

Follow these steps to rename an index:

1. Choose Workspace → Schema Manager from the Tabletop menu. The Logical Schema Manager window opens.
2. In the Logical Schema Manager TreeView, select the index to rename.

The PFILE object for the associated table must be checked-out to your current task.

3. Enter a new index name in the Index Info panel on the Index folder.
4. Choose the **Save Record** button to complete your index rename.

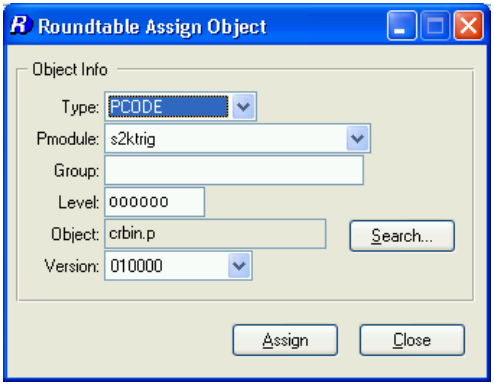
6.11. Assigning an Object

The assign process allows you to extract any completed version of any object from the

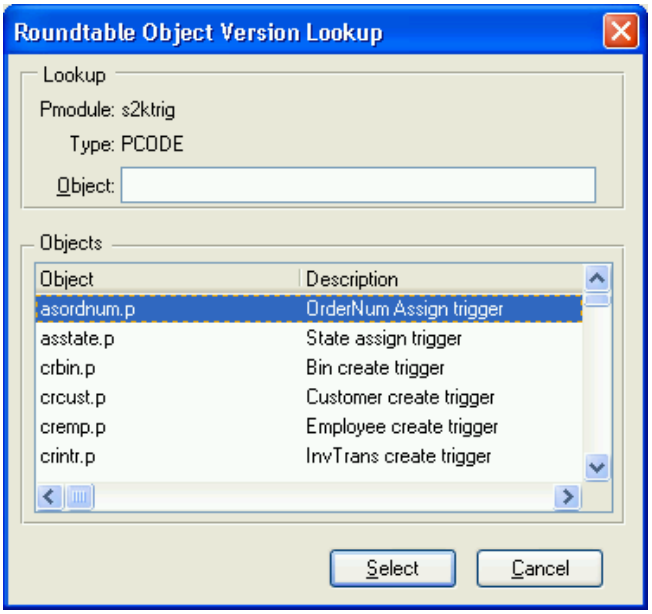
Roundtable repository and assign it to the current Workspace. It becomes available in the Workspace Module that is associated with the Product Module to which the object belongs. If the object already exists in the Workspace, the current object version is overwritten by the newly assigned object version.

Follow these steps to assign an object version to the current Workspace:

1. Choose File → Assign Object from the Tabletop menu. The Assign Object dialog box appears.



2. Fill in the values in the dialog box to specify the object version to assign.
3. To lookup an object, choose the **Search** button. The Object Lookup dialog box appears.



As you type in the Object field, the Objects list shows objects matching your entry. Highlight the object you want then choose the **Select** button.

4. From the Version drop-down list on the Assign Object dialog, select the version number of the object to assign.
5. Choose the **Assign** button to complete the assignment. Roundtable assigns the selected object to the Workspace.

6.12. Deleting an Object

Deleting an object allows you to remove an object version assignment from the Workspace. Deleting a completed object only removes the reference to the object from the current Workspace. It does not remove it from the repository.

Follow these steps to delete an object.

1. Choose the object to delete from the object browse table in the Tabletop.
2. From the Tabletop menu, choose File → Delete Object. The Delete Object dialog box appears.

3. The Delete Object dialog contains the Object name, Object Type, Product Module and Version of the selected object.
4. Choose the **Delete** button.

If the object to be deleted has a status of W (work in process), you will be warned of lost changes before proceeding.

If another version of the object was previously assigned to the Workspace, you will be prompted to revert to the previously assigned version.

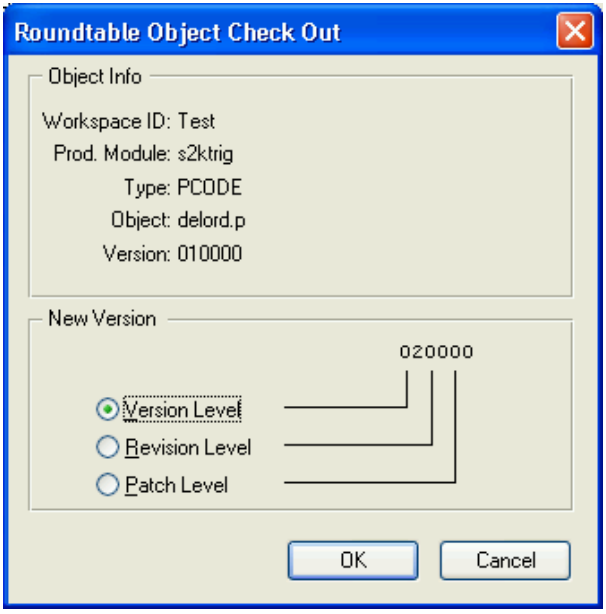
6.13. Checking-out an Object

Checking-out an object allows you to edit the version currently assigned to the Workspace, and associates the new version with the active Task.

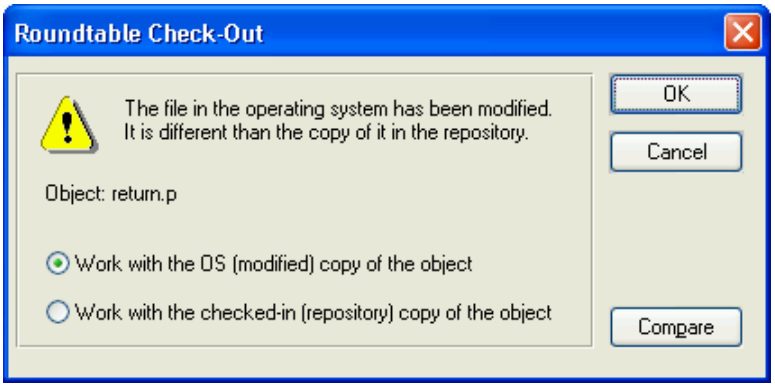
You cannot check out an object that already has a W (work in process) status because it is already checked out by another Roundtable user.

Follow these steps to check out an object.

1. Choose the object to check out from the object browse table in the Tabletop.
2. Choose the **Check Out** button. The Check Out dialog box appears.



3. The Check Out dialog box contains the Product Module, object name, and current version number for the selected object.
4. Choose whether you want to increment the Version Level, Revision Level, or Patch Level number by selecting the respective radio button.
5. Determine the level according to your company's policy. A patch might be used for a minor change, a revision for a major change, and a version for a complete overhaul.
6. Choose the **Increment** button. The selected level increases by one. For example, if the version number was 010000 and you choose to increment the revision level, the new version number would be 010100.
7. If the source of the OS file in the Workspace directory differs from the source in the repository, when an object is checked out, a warning dialog appears. You may select one of the two files to work with or cancel the operation.



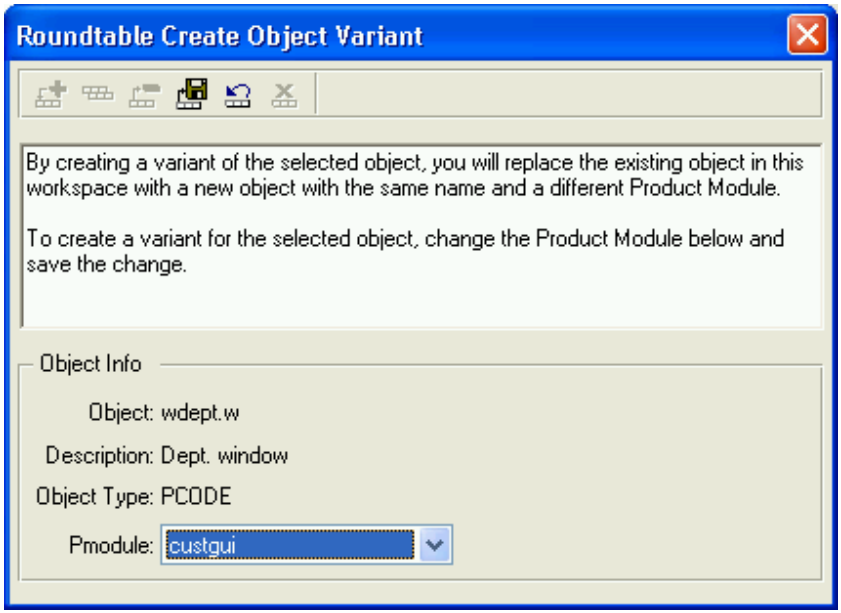
8. This resolves the discrepancy, or if there is none, and the object is now checked out into your Task.

6.14. Creating an Object Variant

Roundtable allows you to create more than one variation of the same object called a variant. Variants have the same name and type but belong to different Product Modules. See Section 4.6, “Object Variants” [4–21].

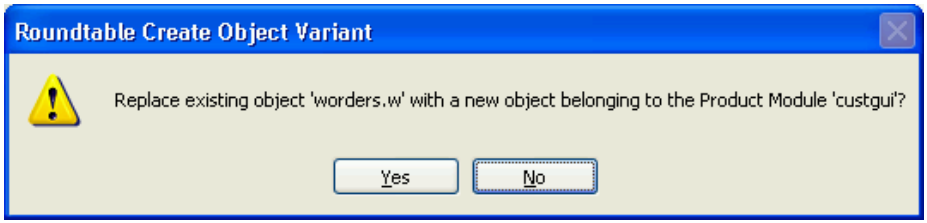
Follow these steps to create an object variant. When you create an object variant, it will be Version 1.0.0, with a Work In Process (WIP) status. The original object cannot be WIP when you are creating a variant of it.

1. From the Tabletop menu, choose File → Create Object Variant. The Create Object Variant dialog box appears.



You must have a Module selected in the Tabletop TreeView to enable the Create Object Variant menu item.

2. Select the new Product Module that your new object variant will be assigned to. This must be a different Product Module than the one that the original object is assigned to.
3. Choose the **Save Record** button. The following dialog box appears:



4. Choose Yes. The object variant is created and displayed, and you are returned to the Tabletop. You can see that your new object variant is Version 1.0.0, and its status is WIP. You can also see that this object's Product Module is the one that you specified in the previous step. Your new custom variant is now a part of your Workspace. The

original object variant is no longer assigned to this Workspace.

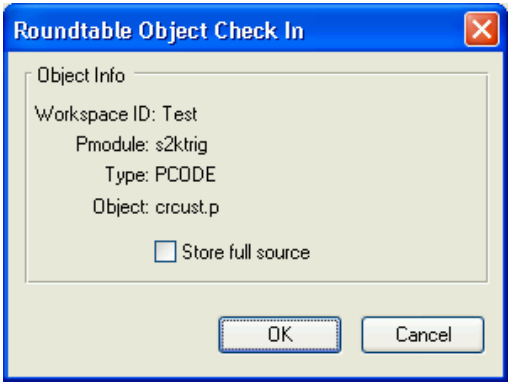
6.15. Checking-in an Object

Checking-in an object commits the changes made to the selected object version to the repository.

You cannot check in an object until it has an update status of Current. A PCODE object's update status is changed to Current when the object has a Share Status of Central and a successful compile with xref has been performed. A schema object's update status is changed to Current after a successful schema update process. The check in process changes the object's status to C (complete) and permanently stores the contents of the object version in the repository.

Follow these steps to check in an object:

1. From the object browse table in the Tabletop, select the object you want to check in.
2. Choose the **Check In** button. The Object Completion dialog box appears.



3. (Optional) Toggle Store Full Source on to store the full source code or off to store just the changes in the repository. This option is not shown for schema objects or PCODE objects that track binary files because these objects are not stored as incremental differences.
4. Choose the **OK** button. The object version is stored permanently in the repository and the Status of the object is changed to C (complete).

6.16. Object Reports

There are a number of reports you can access to provide information on the objects managed by Roundtable. The available reports include:

- **Version in Product Module Report:** Shows the history of the development of object versions for the currently selected object in specified Product Module.
- **Version in Workspace Report:** Shows the history of the development of object versions for the currently selected object in specified Workspace.
- **Cross-reference reports, including:**
  - **Xref Report:** Shows what other objects the selected object uses.
  - **Where Used Report:** Shows where a selected object is used in the system.
  - **Object Usage Report:** Provides a diagram of the call sequences to a selected program.
  - **Call Diagram Report:** Provides a diagram of the calls between the programs in your system.
  - **Informal Xref:** Provides a list of each object that uses a specified informal object. Informal objects include shared variables, shared workfiles, etc.
  - **Unused Object Report:** Shows the registered objects in your system that aren't being used by other objects.
  - **External Objects Report:** Shows the objects that are referenced by objects in the Workspace, but aren't defined in the Workspace as objects.
- **Index Usage Report:** Provides a list of all programs that use a specified table index.
- **Class Details Report:** Shows the details for a specified class, including class hierarchy, implemented interfaces, direct known subclasses, methods, and data members.

6.16.1. Versions in Product Module Report

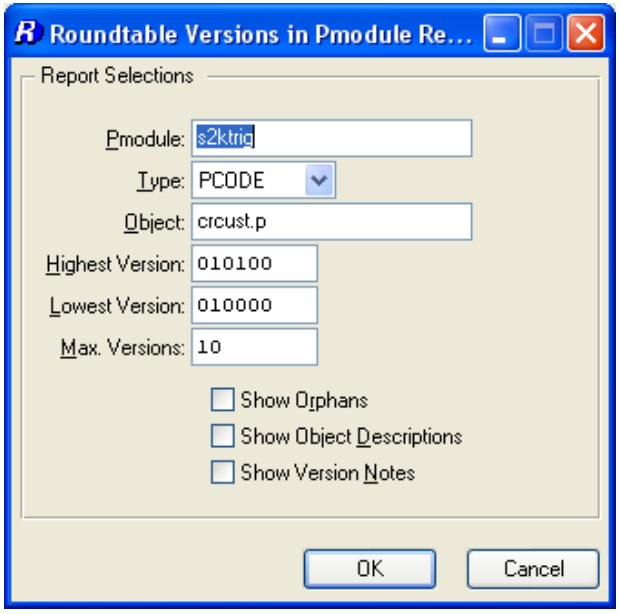
The Versions in Product Module Report provides a history of the development of an object's versions for a selected Product Module. This report helps to identify and integrate changes made to an object in different workspaces.

The report provides:

- Object
- Versions of the object
- Status of the object
- Notes

6.16.2. Versions in Product Module Report Window

The Versions in Product Module Report window identifies the scope of the report.



Field	Description
Product Module	A drop-down list to select the Product Module.
Object type	A drop-down list from which you select the type of object.
Object	Enter the name of the object.
Lowest Version	Enter the starting version.
Highest Version	Enter the ending version.
Max Versions	Enter the maximum number of versions printed. This prevents excessive numbers of versions from being printed when you are not sure how many versions exist across the version range specified.
Show Orphans	A toggle box to print orphans. Orphans exist when you create a version of an object based on a version that is not the most recent version in the repository.
Show Object Descriptions	A toggle box to print full details for each object.
Show Version Notes	A toggle box to print the history notes for the object.

6.16.3. Printing the Versions in Product Module Report

Follow these steps to print the Version Ancestry Report:

1. Choose Reports → Object → Versions in Product Module Report from the Tabletop menu. The Report window appears.
2. Enter report criteria, and then choose the **OK** button.

6.16.4. Versions in Workspace Report

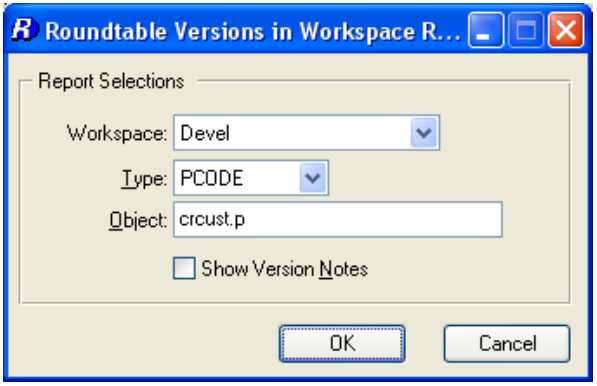
The Versions in Workspace Report will display the version notes for all versions of an object in any Product Module of the current Workspace. This report shows the development of an object across one or more Product Modules

The report provides:

- Object
- Versions of the object
- Product Module
- History Notes

6.16.5. Versions in Workspace Report Dialog Box Description

The Version Workspace Report dialog box allows user to identify object to examine.



Field	Description
Object type	A drop-down list to select the object type.
Object	Enter object name.

Field	Description
Show Version Notes	A toggle box to print the version notes for the object.

6.16.6. Printing the Versions in Workspace Report

Follow these steps to print the Versions in Workspace Report:

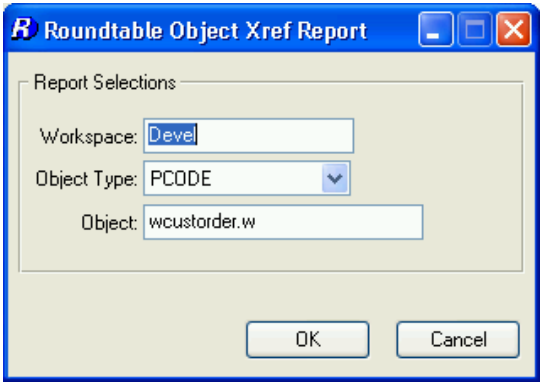
1. Choose Reports → Object → Versions in Workspace Report from the Tabletop menu. The Report dialog box appears.
2. Enter report criteria into the dialog box fields. Choose the **OK** button.

6.16.7. Xref Report

The Xref Report prints the cross-references for the selected object. For example, to see all the fields used in a PFILE object, print the Xref Report for that PFILE.

Follow these steps to print the Xref Report:

1. Choose Reports → Object → Xref Report from the Tabletop menu. The Xref Report dialog box appears.



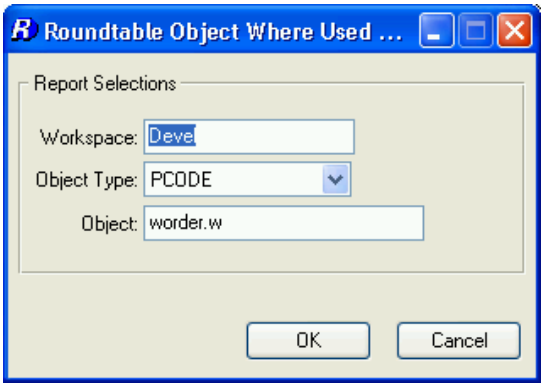
2. Enter the Product Module, type of object, and name of the object in the dialog box, and then choose the **OK** button.

6.16.8. Where Used Report

The Where Used Report shows where a selected object is used in the system. For example, a Name field might be used in a number of different tables, including an invoice table, a mailing label table, etc.

Follow these steps to print the Where Used Report:

1. Choose Reports → Object → Where Used Report from the Tabletop menu. The Where Used Report dialog box appears.



2. Enter the report options in the dialog box, and then choose the **OK** button.

6.16.9. Object Usage Report

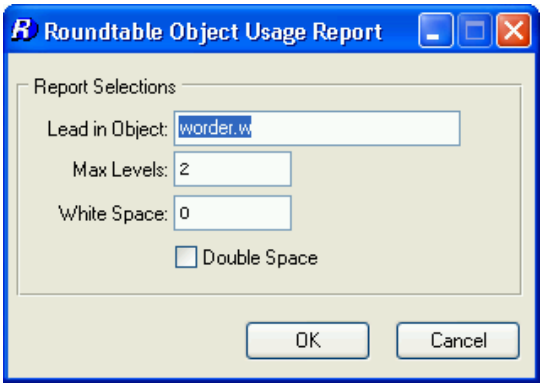
The Object Usage Report provides a diagram of the call sequences to a given program. This report is used to:

1. Find the call sequences that lead to a program or include a file's usage
2. Find all of the programs that are passed through to reach the specified program

Use this report to ensure that shared buffers and variables are set in the programs that lead to the specified program.

Follow these steps to print the Object Usage Report:

1. Choose Reports → Object → Object Usage Report from the Tabletop menu. The Object Usage Report window appears.



2. Enter the report options in the window:

   - Enter the name of the program or include file for which to run the report in the Lead in Program field.
   - Enter the maximum number of levels to include in the report in the Max Levels field.
   - Enter the number of white spaces to use as indents for each level in the White Space field.
   - Activate the Extra line toggle box to double-space the report.

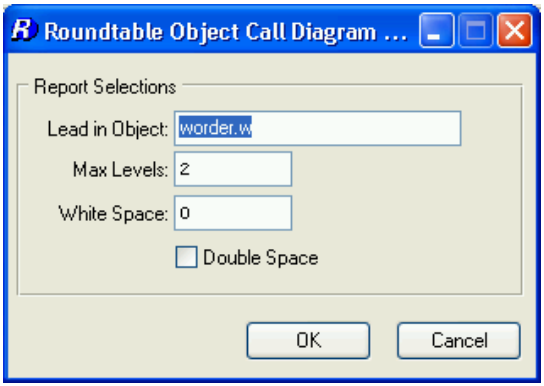
3. Choose the **OK** button.

6.16.10. Call Diagram Report

The Call Diagram Report provides a diagram of the calls to identified Lead in Program.

Follow these steps to print the Call Diagram Report:

1. Choose Reports → Object → Call Diagram Report from the Tabletop menu. The Call Diagram Report window appears.



2. Enter the report options in the window:

   - Enter the name of the program or include file for which to run the report in the Lead in Program field.
   - Enter the maximum number of levels to include in the report in the Max Levels field.
   - Enter the number of white spaces to use as indents for each level in the White Space field.
   - Activate the Extra line toggle box to double-space the report.

3. Choose the **OK** button.

6.16.11. Unused Objects Report

The Unused Objects Report provides a list of objects that are not referenced by any object in the Workspace. Use this report to track down code that is no longer used in the system.

Some objects that are no longer used in - but assigned to - the Workspace appear on this report. For example, a menu.p program might appear on this report, if it is the root program for entering the system and is not referenced by other objects in the system.

Any objects that are only called via RUN VALUE() statements also appear in the report.

To print the Unused Objects Report:

- Choose Reports → Workspace → Unused Objects Report from the Tabletop menu.

6.16.12. External Objects Report

The External Objects Report identifies objects that are referenced in the Workspace, but are not defined in the Workspace as objects.

To print the External Objects Report:

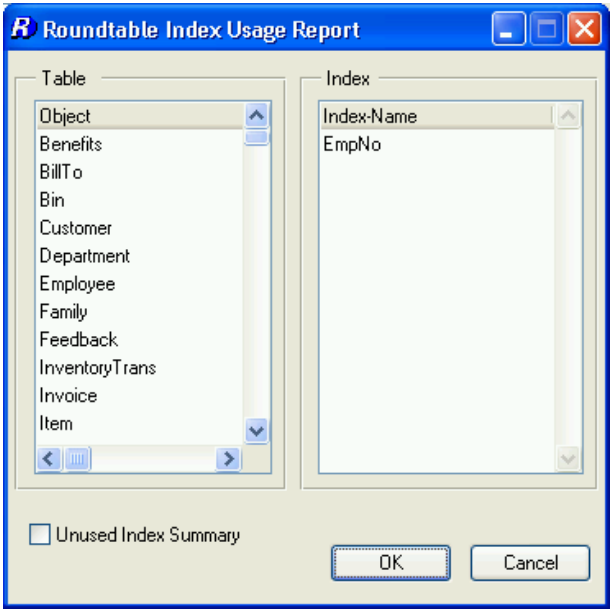
- Choose Reports → Workspace → External Objects Report from the Tabletop menu.

6.16.13. Index Usage Report

The Index Usage Report shows where a selected index is used in the system.

Follow these steps to print the Index Usage Report:

1. Choose Reports → Workspace → Index Usage Report from the Tabletop menu. The Index Usage Report window appears.



2. Select the tables and/or indices for the report. If you select multiple tables, all indices in the tables will appear on the report. Selecting the Unused Index Summary toggle box shows all unused indices in the system.
3. Choose the **OK** button.

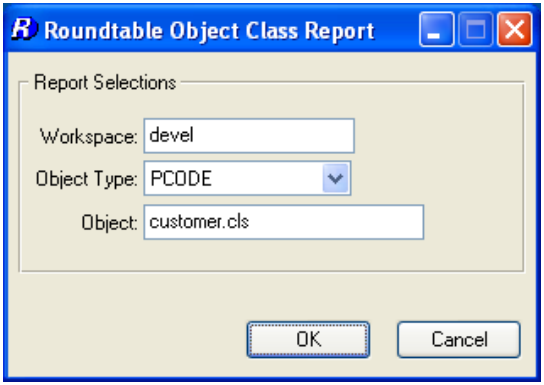
6.16.14. Class Details Report

Provides details for a specified class object, including the following:

- Class hierarchy
- Data members in the class
- Methods in the class
- Interface implementations (if any)
- Direct known subclasses

Follow these steps to print the Class Details Report:

1. Choose Reports → Object → Class Details Report from the Tabletop menu. The Object Class Report window appears.



2. Enter the report options in the dialog box, and then choose the **OK** button.

7

Tools

7.1. Introduction

This chapter documents a number of useful tools provided in the Roundtable environment. These include:

- Group Check out: Search for and select objects for check out into a current Task
- Compiling Tools: Compilation rules and utilities available in the system
- Module Load: Registers objects into Roundtable quickly
- Visual Difference: Compare different versions of file-based objects quickly
- Deploying Roundtable Objects to AppServer partitions and WebSpeed brokers using the Server Upload tool.
- Repository Check Report: Identify problems in the Roundtable repository database.

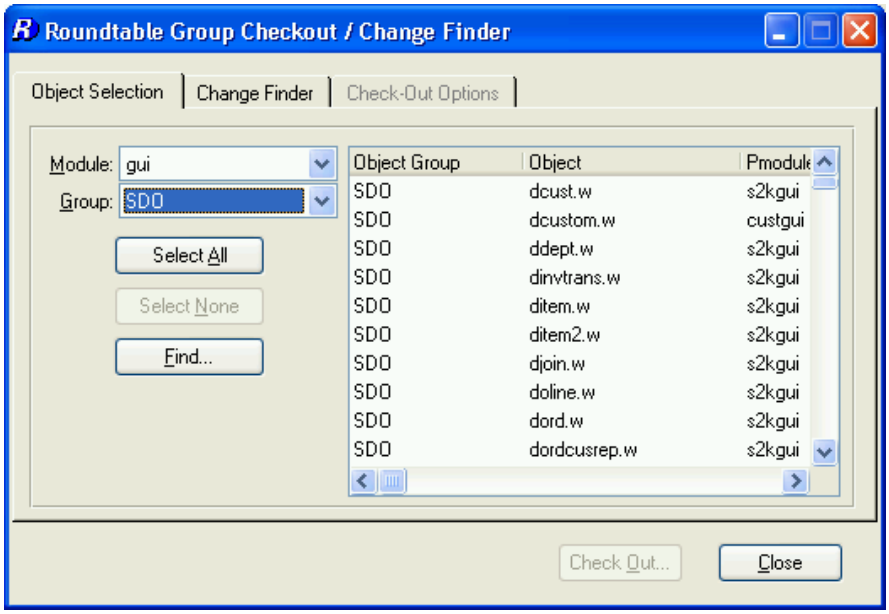
7.2. Group Checkout Utility

The Group Checkout utility provides a flexible way of selecting numerous objects for a quick check-out. Use Workspace module and object group selection criteria to locate a specific group of objects in the Workspace, and then select one or more of the objects to be checked out. Use either a group or individual check-out process to assign new version code values and an initial update note.

The Change Finder utility compares the source files of the objects in the selected Workspace Module(s) with the image of those files in the repository. The objects whose files differ are appear in a list. This makes it easy to search for changes in the Workspace that were made outside of Roundtable's control and bring them under version control.

7.2.1. Group Checkout Window

This section explains the various components of the Group Check out window that is available from the Tools → Group Checkout menu option. The window has two folders: Object Selection and Check-Out Options.



The following table lists the elements of the Object Selection folder:

Element	Description
Module	A drop-down list from which you select the Workspace module. Only objects belonging to the specified module appear in the object browse list. Use the Any value to include all of the workspace's modules.
Group	A drop-down list from which you select the Workspace module group code. Only objects belonging to the specified group appear in the object browse list. Use the Any value to include all objects in the selected module.
Object browse list	This is a multiple-select browse list. Objects selected from this browse list will be checked out when you choose the **Check Out** button.
Select All button	A button that forces all of the objects in the object browse list to be selected.
Select None button	A button that deselects any selected objects in the object browse list.
Find	This button allows you to reposition the object browse list to an object with the name that you specify.
Check Out	Choose this button when you are ready to check out the selected objects.

Element	Description
Close	Closes the window.

The following table lists the elements of the Change Finder folder:

Element	Description
Module	A drop-down list from which you select the Workspace module. Only objects belonging to the specified module appear in the object browse list. Use the Any value to include all of the workspace's modules.
Object browse list	This is a multiple-select browse list. Objects selected from this browse list will be checked out when you choose the **Check Out** button.
Select All button	A button that forces all of the objects in the object browse list to be selected.
Remove Deleted	A button that removes objects from the Workspace whose source files have been deleted from disk (as indicated by delete in the Action column).
Compare	Invokes the configured visual diff application to compare the repository image and source file(s) for the selected changed object.

The following table lists the elements of the Check-Out Options folder:

Element	Description
Individually	A radio button that indicates that each selected object will be checked out individually. This allows you to choose different version, revision, or patch-level increments for each object.
As a Group	A radio button that indicates that the selected objects will be checked out as a group. All the objects are checked out with the Increment Level and Version Note specified.
Level	A radio set that allows you to specify whether to increment the version, revision, or patch level of each object being checked out.
Version Note	An editor widget for the version update note to attach to each checked out object.
Move to	A drop-down list that allows you to move selected objects from one product module to another. Choose <No Change> to simply check objects out without moving them from one Product Module to another. If you choose to move objects to a different Product Module, then a new WIP version of the selected object(s) will be

Element	Description
	created in the selected Product Module. Increment Level is ignored if you choose to move objects to a different Product Module.

7.2.2. Change Finder

The Change Finder folder of the Group Checkout utility is used to initiate the Global Change Finder routine. This initiates the comparison of the files in the Workspace that belong to an object with the image of those files stored in the repository. The objects whose files differ are displayed in the object browse on the folder.

After comparing the content of the directory contents of specified Workspace Module(s) with the repository, any object differences are displayed in the object browse. The Action column of the browse indicates one of two values for each object: **changed** or **deleted**. The changed action indicates that there are internal differences between the source on disk and the object's repository image. The **deleted** action indicates that there is no source on disk for the object.

7.3. Compiling Tools

Roundtable provides sophisticated tools for compiling Workspace objects.

Roundtable provides the following compilation options:

- Compile
- Compile with Xref
- Selective Compile

The compile rules are discussed below. These rules are especially important to understand if you are using the Share Status option. When you use a Share Status other than Central, two copies of the same object exist, one in the Workspace and one in the Task directory. The object in the Workspace is the previously completed version and the object in the Task directory is the work-in-process version. For more information on the Share Status option, see Section 5.3.2, “Share Status” [5–4].

7.3.1. Compiling Rules

All the compile options in Roundtable follow the same set of rules. The compile actions taken on an object are governed by the following values:

- Selected Task
- Object Share Status

- R-code, S-code and Server Compile flags specified for the Workspace or Workspace Module
- Xref option

When the Share Status of an object is not Central, two copies of the object source exists: one in the Workspace directory structure and the other in the Task directory structure. This makes the impact of some of the following rules rather subtle, so read them carefully.

- Compilation of source in a Task directory is always done with the PROPATH precedence of Task directory path, Task Group directory path(s), and then Workspace directory path.
- Compilation of source in a Workspace directory is always done with the PROPATH including only the Workspace directory path.
- Compilation of source in a Task directory only occurs when the Task owning the directory is selected.

Compilation of source in a Task directory will not occur when running in a distributed AppServer configuration and the Workspace or Workspace Module server-compile flag is Yes.

- R-code is never generated for the source in Task Group directories.
- When an object with a non-Central Share Status is compiled with xref, both the source in the Task directory and Workspace directory will be compiled.

The generation of r-code for the Workspace directory source is dictated by the 'Save R-Code' attribute for the version of the source assigned to the Workspace directory.

- Xref data is only generated for source in the Workspace directory.
- Xref data is never generated for the source a Task directory.

7.3.2. Compile Object

Follow these steps to compile an object:

1. From the object browse table in the Tabletop, select the object you want to compile.
2. Choose Compile → Compile Object Without Xref from the Tabletop menu.

Roundtable performs a compile for the selected object. If Roundtable finds errors, a

procedure window is opened with the error report in it.

7.3.3. Compile Object with Xref

Follow these steps to compile an object with xref:

1. From the object browse table in the Tabletop, select the object you want to compile.
2. Choose Compile → Compile with Xref from the Tabletop menu.

Roundtable performs a compile for the selected object and stores xref data in the repository.

Upon successful compilation with xref, the update status of an object will change from Modified to Complete.

Optionally, you can choose to compile with xref and listings. When this option is selected, the xref and listing output from the OpenEdge compiler is preserved in the Workspace Module directory.

7.3.4. Selective Compiles

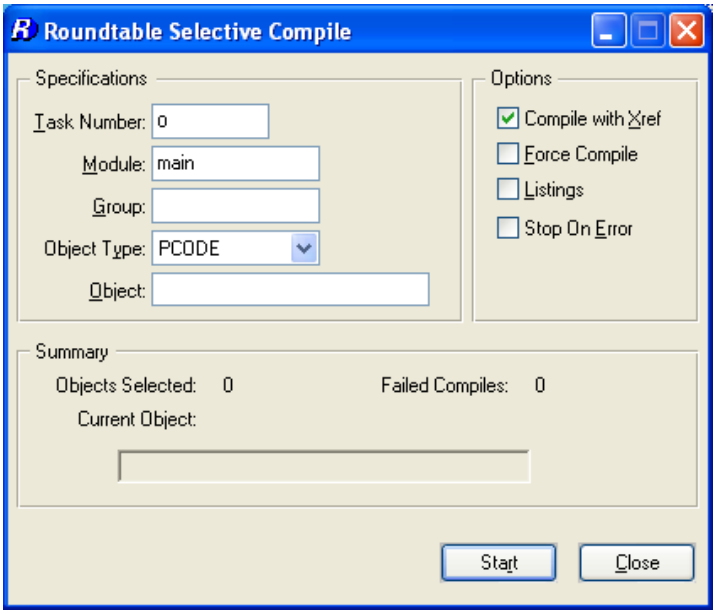
Selective Compile allows you to selectively compile many Workspace objects at once. Based on given criteria, the Selective Compile process intelligently selects objects that need to be compiled based on the object update status, or if an object references a modified object.

Follow these steps to selectively compile objects in your Workspace:

1. Choose Compile → Selective Compile from the Tabletop menu to display the Compile dialog box.
2. Enter your selective compile options in the Compile dialog box.
3. Choose the **Start Compile** button.
4. Choose the **Close** button to close the window.

7.3.5. Selective Compile Dialog Box Description

The Selective Compile dialog box allows you specify criteria for a selective compile. For all fields except the Task number, you can enter an asterisk (*) to signify all (such as all object types, all object names, etc.).



The following table describes the fields in the Selective Compile window:

Field	Description
Task Number	A fill-in for the Task number for the compile. If you enter a Task number, Roundtable restricts its search for objects to those included in the specified Task. If you enter a value of 0, the search is not restricted to any Task.
Module	A fill-in for the Workspace Module for the compile or an asterisk (*). If you enter a specific module, Roundtable restricts its search for objects to that module.
Object Group	A fill-in for the group to compile or an asterisk (*). If you enter a specific group, Roundtable restricts its search for objects to that group.
Object Type	A fill-in for the specific type of object or an asterisk (*). Roundtable restricts its search for object to objects of the specified type.
Object	A fill-in for the object name or a match expression using an asterisk (*) placeholder (wildcard). For example, you could specify a value of "ar*.p" to restrict Roundtable to searching for objects that begin with "ar" and end with ".p".
Compile with Xref	Activate this toggle box to create a compile with cross-references.
Force Compile	Activate this toggle box to force each selected object to compile,

Field	Description
	even if Roundtable doesn't think the object needs compiling. Normally, Roundtable keeps track of which objects should be recompiled.
Listings	Activate this toggle box to print the fully expanded code (with the include files). This is the Listing parameter in the OpenEdge COMPILE statement. Roundtable saves the listing file as list*.l. An Xref listing is also generated if a full compile was performed.
Stop On Error	Activate this toggle box to stop the compile process whenever a selected object generates a compile error.

7.4. Module Load

Module Load is a utility program that loads large numbers of PCODE objects into a Workspace managed by Roundtable. To load the objects, Roundtable scans a directory specified by a Workspace module for files that have not already been defined as PCODE objects in your Workspace. By browsing through this table, you can choose the files needed to create PCODE objects.

Prior to using Module Load, you must define your subtypes and products. In addition, you must create the Workspace where the PCODE objects exist.

You can customize Module Load to some extent. This is done by modifying the program rtb/w/rtb_modload.w. If you modify this program, be sure to keep a copy of your modified program in another directory so that future updates to Roundtable do not overwrite your copy.

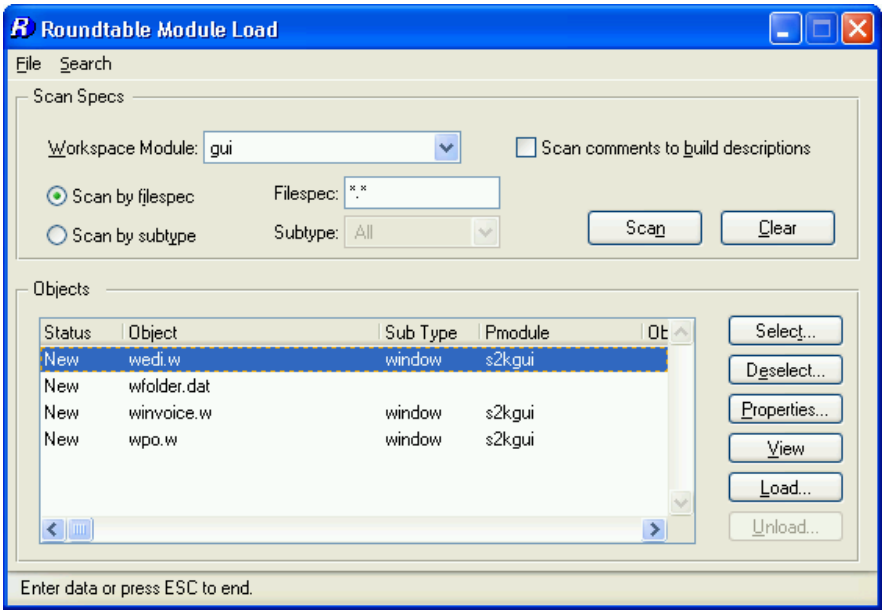
7.4.1. Starting Module Load

Before using Module Load, you need to:

1. Define Code Subtypes and Products. See Section 3.8, “Configuration Hierarchy” [3–5], Section 3.11, “Subtypes” [3–20], and Section 3.9, “Products” [3–10].
2. Create the Workspace where the PCODE objects exist. See Section 4.2.4, “Adding a Workspace” [4–6].
3. Assign Workspace Sources. See Section 4.4, “Workspace Sources” [4–15].
4. Create and select a Task. See Section 5.3.4, “Adding a Task” [5–5] and Section 5.3.7, “Selecting a Task” [5–7].

7.4.2. The Module Load Window

The Module Load window has a multiple-select browse of the files found in the module's directory. This allows you to select an arbitrary number of files to change their attributes before loading them.



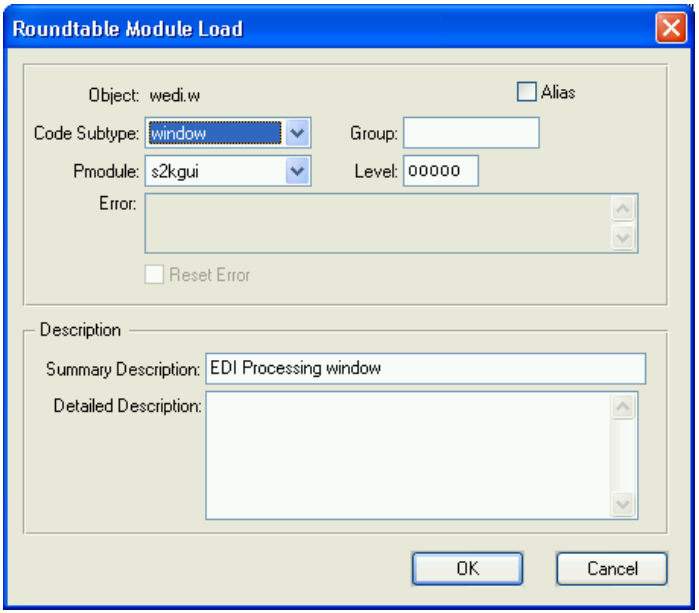
The following table lists the Module Load window fields and buttons:

Field or Button	Description
Workspace Module	Select the Workspace Module to scan and load from this drop-down list.
Scan comments to build descriptions.	Activate this toggle box to build object descriptions from comments in the source file(s).
Scan by Filespec	Select this radio button to scan the Workspace Module directory for files matching the filespec that you provide.
Scan by Subtype	Select this radio button to scant the Workspace Module directory for objects of the selected Code Subtype.
Filespec	Filespec used when scanning by filespec.
Subtype	Code Subtype used when scanning by Subtype.
Scan	Choose this button to scan the Workspace Module directory using the selected scan criteria.
Clear	Clears the object browse of unloaded objects matching the selected

Field or Button	Description
	scan criteria.
Select	Choose this button to select browse objects matching a specified pattern.
Deselect	Choose this button to deselect browse objects matching a specified pattern.
Properties	Opens the Module Load propeties dialog, that allows you to change the properties of selected files.  You can also view load error messages for the selected file using the properties dialog.
View	Choose this button to view the contents of the selected object.
Load	Choose this button to create Roundtable object records for the selected unloaded object(s). Files that have been loaded are indicated by a status of "Done".
Unload	Deletes the Roundtable object records created by the load process for the selected source files. Choose Unload if you change your mind about some files that you loaded. Only files with a status of "Done" can be unloaded.
Browse Fields	
Status	New indicates that the PCODE object has not been created. "Done" indicates that a PCODE object was created for the source file.
Object	The name of the source file.
Sub Type	The name of the Subtype to assign to the new PCODE object The Subtype can be changed through the Properties dialog box. This field is blank if the Subtype has not been assigned yet. A file cannot be loaded until a Subtype has been assigned to it.
Pmodule	The Product Module that the PCODE object will be assigned to. The Pmodule can be changed through the Properties dialog box. This field is blank if the Subtype has not been assigned yet. A file cannot be loaded until a Subtype has been assigned to it.
Object Group	Used for sorting objects within a module. The Object Group can be changed through the Properties dialog box.
Level	Used for sorting objects within a module. The level can be changed through the Properties screen.
Fullpath	The fully qualified path and name of the source file.

7.4.3. Changing Code Properties

To change the properties of one or more selected objects, choose the **Properties** button. The Roundtable Code Properties dialog box appears.



Some of these fields are not editable if you have select more than one file. Any changes that you make in the Properties dialog box will affect all of the selected files.

The following table lists the Properties dialog box fields:

Field	Description
Object	The object name (display only).
Alias	Activate this toggle box to create an alias object record.
Code Subtype	Edits the name of the Subtype to assign to the new PCODE object
Group	Edits the group name used for sorting objects within a module.
Pmodule	Edits the Product module that the PCODE object is assigned to.
Level	Edits the level field used for sorting objects within a module.
Error	Any error message encountered during attempted load of the object. (Display only)
Reset Error	Activate the toggle to clear the Error status of an object that failed to load.

Field	Description
Summary Description	Provides a short description of the PCODE object. This is used often in reports.
Detailed Description	Provides an additional description of the PCODE object.

7.4.4. Loading the Source Files

Choose the **Load** button to start the process of creating PCODE objects for the selected files. Only selected files with defined Code Subtypes and Product Modules can be loaded. Files that have been loaded are indicated by a status of "Done". Objects that could not load due to an error are indicated by a status of "ERROR".

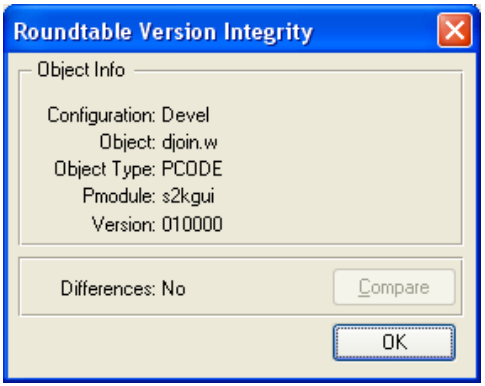
You can unload files by choosing the **Unload** button. Only the selected files with a status of "Done" can be unloaded. The PCODE objects created by the load process are deleted.

7.5. Test Version Integrity

Use the test version integrity utility to determine if a file in the Workspace directory had been modified outside of Roundtable. This tool performs a CRC check on the contents of the object in the operating system directory and then compares it with the CRC generated when the object was stored in the repository. If these CRC values do not match then the object has been modified outside of Roundtable. WIP objects cannot be checked in this manner.

Follow these steps to check the version integrity of a PCODE Object:

1. Select the object to test in the object browse table.
2. Choose File → Test Version Integrity from the Tabletop menu. The Version Integrity dialog appears:



Differences are indicated by "Yes" in the Differences field.

- Choose the **OK** button to close the dialog.

7.6. Visual Difference

Roundtable provides access to a visual difference application. A visual difference application is a program that allows you to compares two versions of the same file by displaying them in adjacent windows. Typically, these programs tell you which lines of code have been added, deleted, or modified. The added, deleted, and modified content is color-coded for easy identification.

For example, you might need to compare the latest copy of a file to an earlier version to see what changes have been made. Roundtable allows you to compare the two versions using the configured visual difference application.

The visual difference application is a separate program from Roundtable, but you can open it from inside Roundtable. You can configure Roundtable to use the visual difference application of your choice.

7.6.1. Configuring the Visual Difference Application

Roundtable allows you to use the visual difference application of your choice to compare versions of objects. The visual difference application to use is configured on a user-by-user basis and stored in the Windows system registry. Follow these steps to configure the visual difference application.

1. Choose Admin → Preferences from the Tabletop menu. The User Preferences dialog

box appears.

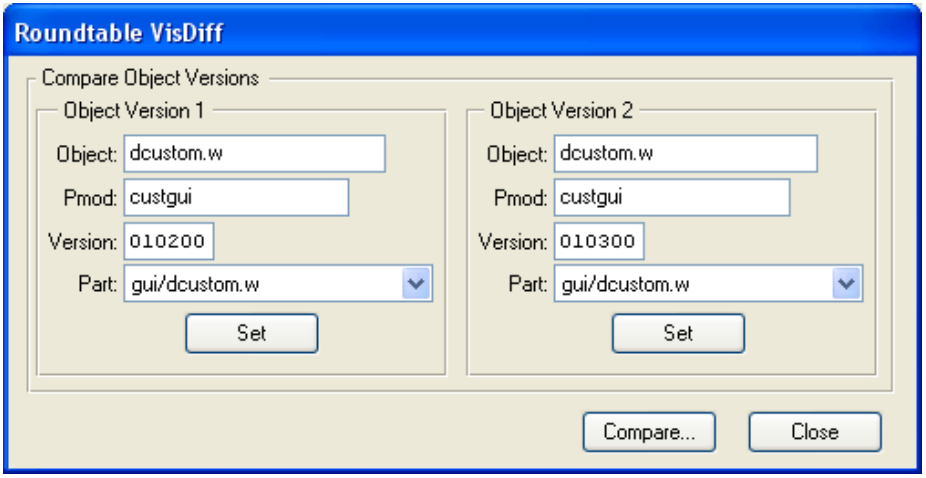
2. In the Visual Diff field, enter the command to start your visual difference application. You may choose the **Lookup** button to locate the application on disk.
3. The command that you enter should be followed by up to four parameters: "%1", "%2", "%3", and "%4". At runtime these parameters will be substituted as follows:

```
%1 - Pathname to first file
%2 - Pathname to second file
%3 - Window title for the first file
%4 - Window title for the second file
```

Put these parameters in the order required by your application.

7.6.2. Comparing Files with Visual Difference

1. Select a PCODE object from the Tabletop object browse.
2. Choose the **VisDiff** button from the Tabletop toolbar. The VisDiff dialog appears.



The First Object to Compare panel defaults to the object version that is currently selected in the Tabletop. The Second Object to Compare defaults to the previous version of the object.

If either of the object versions is a multi-part object, you can select the part to

compare from the respective Part drop-down-list.

If you want to compare different objects or different versions other than the defaults, select the different object or version (using Versions view) on the Tabletop object browse and choose the corresponding **Set** button (Object Version 1 or Object Version 2) to select that object version for comparison. Alternatively, you can manually enter the version of the Object and choose the **OK** button.

3. Choose the **Compare** button. Roundtable runs the configured visual difference application, passing the files to compare.

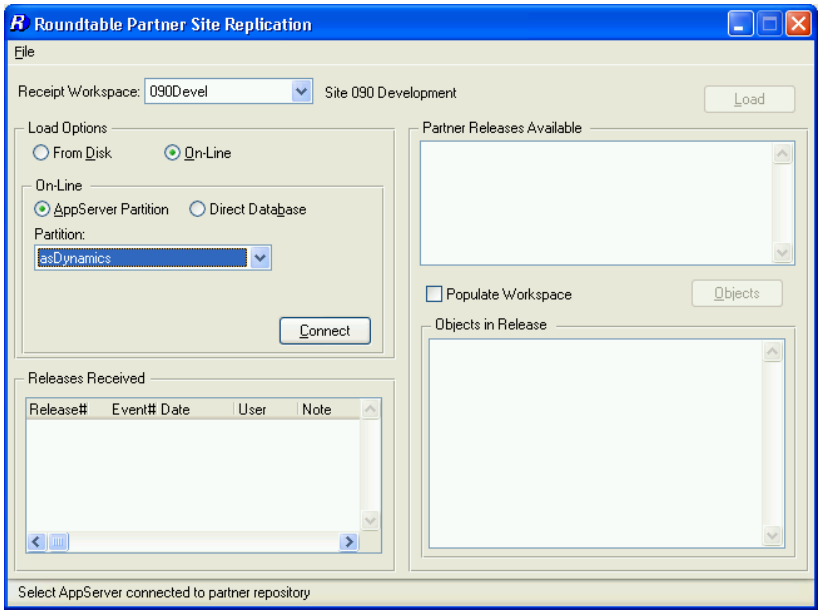
7.6.3. Comparing Versions via the Tasks Window

When viewing the versions of a Task via the Versions folder of the Tasks window, you can quickly compare an object version created in the selected Task with its immediately previous version using the configured visual difference application. Follow these steps to visually compare the Task version with the immediately previous version:

1. Choose a version in the browse on the Versions folder of the Task window.
2. Right-click the browse to show the context menu.
3. Choose Compare with Previous Version from the context menu. If the object has more than 1 part, you are prompted for the part that you want to compare.

7.7. Partner Site Replication Window

The Partner Site Replication window provides a visual interface for loading Workspace information from a partner development site. Use the Partner Site Replication window to load Partner Site receipt workspaces from Partner Site deployments on disk, or directly from the release data in a partner repository, either by connecting to the partner repository database, or by connecting to the Partner Site via an AppServer partition. For an explanation of Partner Sites, see Section 1.10, “Distributed Development” [1–26]



Field or Button	Description
Receipt Workspace	A drop-down list of Workspaces identified as Partner Site receipt Workspaces.
Load Options	Choose the source for the Partner Site data: • From Disk - The data will be loaded from a Partner Site deployment on disk. • On-Line - The data will be received over a network either through an AppServer connection or through a direct connection to the remote repository database.
AppServer Partition	Choose this option to connect to the AppServer partition selected in the Partition drop-down-list. The list is populated from the AppServer partitions defined for the current OpenEdge session using the OpenEdge Service Parameter Maintenance PRO*Tool.  For information on preparing a Partner Site AppServer partition see Section 7.7.1, “Preparing a Partner Site AppServer Partition” [7–17].

Field or Button	Description
Direct Database	Choose this option to connect to a remote repository database using the connection parameters that you supply.
Connect	Initiates a connection to the specified AppServer/database.
Releases Received	A browse table listing the Partner Site releases already loaded by the local site.
Load	Loads the selected Release into the local repository.
Partner Releases Available	A browse table listing the releases that are available at the Partner Site (AppServer only).
Populate Workspace	Activate this toggle box to populate the Partner Workspaces after the data transfer is complete (On-Line transfers only).
Objects	Displays the objects in the selected available Release (On-Line only).
Load Workspace button	Starts the Partner Site Replication process.

7.7.1. Preparing a Partner Site AppServer Partition

If you will be retrieving Partner Site data via an AppServer partition, follow these steps to prepare the AppServer partition for transfer of Roundtable repository data:

1. Ensure that the same version of Roundtable TSMS is installed at the remote partner site.
2. Ensure that compatible OpenEdge AppServer software is installed at the remote partner site.
3. Create a stateless OpenEdge AppServer Broker and Agent at the remote partner site, according to OpenEdge instructions.
4. Configure the remote OpenEdge AppServer Agent to connect to the remote Roundtable repository database, and include the Roundtable TSMS installation in the Agent's PROPATH. For example: `\\server\apps\rountable;@{WinChar Startup\PROPATH};@{WorkPath}`.
5. Use the OpenEdge Service Parameter Maintenance PRO*Tool in the local client session to define an AppServer partition that connects to the AppServer Broker defined above.

7.7.2. Loading a Partner Site Release

Follow the steps below to load a partner site Release:

1. Choose Tools → Partner Site Replication from the Tabletop menu. The Partner Site Replication Window appears.
2. Select the Partner Site Workspace to load from the Receipt Workspace drop-down list.
3. Select the source of the Partner Site data (Disk or On-Line). If loading from disk, skip to step 8.
4. Select AppServer or Direct Database as appropriate.

Your session must be connected to your own site's repository database in order to connect a remote site via AppServer. You cannot make an AppServer connection to a remote repository if your Roundtable session is connected via AppServer to your own site's repository.

5. If loading via AppServer, select the appropriate AppServer partition from the drop-down list.
6. If loading via a direct database connection, supply the connection parameters in the space provided.
7. Choose the **Connect** button to connect to the on-line data source.
8. Choose the **Load** button to begin the Workspace information load process. A status dialog appears while the information in loaded into the repository.
9. Close the Partner Site Replication window.
10. If the Workspace has not been loaded before you will have to find each PDBASE object managed by the Workspace and specify the connection parameters for the Workspace's databases.
11. If cross reference information is being maintained for the Workspace you must do a full Workspace compile to ensure that it is up to date after the load process.

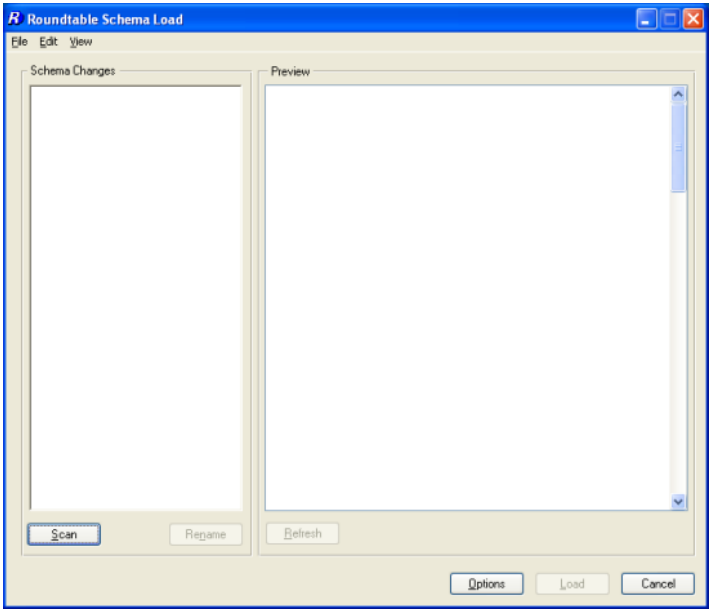
7.8. Load Schema

The Load OpenEdge Schema utility loads the schema of an existing database into Roundtable. This utility creates PFILE and PFIELD objects for each of the file and field definitions found in the OpenEdge database.

Load Schema can load changes made to the OpenEdge database schema. If changes were made to the physical database schema by some tool other than Roundtable (such as the OpenEdge Data Dictionary), then you can use Load Schema to bring Roundtable's logical schema object definitions in sync with the physical OpenEdge database schema.

7.8.1. Schema Load Window

When you run Load Schema, the following window appears:



The following table lists the controls on the Schema Load window:

Control	Description
Schema Changes TreeView	Displays schema changes identified in the selected database in a hierarchical tree.
Scan Button	Scans the selected database for schema changes.
Rename Button	When one added item and one deleted item of the same type and parent are selected in the Schema Changes TreeView, identifies that the added item is a new name for the deleted item, rather than a deletion of one item and the addition of another.
Preview Browse	Displays the Workspace object versions that will result when the selected change(s) is/are loaded.
Refresh Button	Refreshes the Preview Browse.
Options Button	Opens the Schema Load Options dialog (See description below).
Load Button	Load the selected schema changes into the Workspace.
Cancel Button	Closes the Schema Load window.

The options for a schema load can be set at any time prior to choosing the Load button.

The following table lists the fields in the Schema Load Options dialog box:

Field	Description
Fully Qualify Names	Causes new schema objects to be created with fully-qualified names, such that PFILE objects will be named using the format *database.table*, and PFIELD objects will be named using the format *database.table.field*. If you do not choose this option, then new PFILE object names will contain only the name of the corresponding table, and new PFIELD objects will be named using the format table.field.
Product Module	Selects the Product Module for new schema objects. Normally, this should not be changed. If you select a specific Product Module, then new schema objects are created in that Product Module. Modified schema objects that already exist in the Product Module that you specified are checked out normally. Modified schema objects that already exist, but in a different Product Module than the one you specified, are replaced by an object variant with the product module that you specified. See Section 4.6, “Object Variants” [4–21] for a complete description of object variants.
Checkout Level	Sets checkout level (Version, Revision, or Patch) for modified schema objects.
Automatic Check-In	Causes modified objects to be automatically checked-in after the load is complete.
Automatic Notes	Causes version notes to automatically be added for modified schema objects. Example: Added field Customer.LastContact.
Automatic Delete	Automatically deletes unused schema objects (such as a dropped table) after the load is complete.

7.8.2. How to Run the Load Schema Function

Follow these steps to run the Load Schema function:

1. Create and select a Task.
2. Make sure that there are no WIP schema objects in the Workspace belonging to another Task. (The Load Schema process performs this check for you before it gets started.)
3. The Load Schema process locks the Workspace while it is running. Nobody can modify objects in the Workspace while you are running Load Schema.
4. Find and select the PDBASE object whose schema you want to load.
5. From the Tabletop menu, choose Workspace → Load Schema . The Schema Load window appears.
6. Choose the Scan button. If changes are found, they appear in the Schema Changes TreeView, and pending object versions are displayed in the Preview browse.
7. Make any necessary modifications to the change selections:

   - To deselect changes, uncheck the toggle boxes next to the changes. If changes not selected, they will not be loaded, and the Workspace schema will not match the database schema.

     Deselecting a field that participates in an index will automatically deselect the index that it participates in.

   - To identify a renamed item, select the added item, **Ctrl**-Click the corresponding deleted item, and then choose the **Rename** button. The tree changes to show an update of the previously deleted item. If a table or field was chosen as a rename, the object version preview will change accordingly.

     If you choose to rename any tables or fields, then only the "local" table or field name is changed in the Roundtable schema object assignment records. The name of the Roundtable object does not change. This can cause some minor confusion, because the PFILE or PFIELD object name will not match the physical name of the corresponding table or field. For example, if you rename a table from "Cust" to "Customer", then you will still have a PFILE object named "Cust", but it will be represented as a table with the name "Customer" in the physical database schema.

     This is not a problem for sequences or indices, because sequences are represented as attributes of the PDBASE object; and indices as attributes of the PFILE object. There is no such thing as a "sequence"

object, nor an "index" object in Roundtable. If data loss in target workspaces or deployment sites is not an issue, or the version history of the object is not essential, you can ignore the rename option. The original PFILE or PFIELD will be dropped, and a new one added. The new object name will match the physical table or field name.

If tables, fields or sequences have been renamed in the physical database, but they are not identified as renames during the load, objects with the old names will be deleted from the logical schema and new objects added. Consequently, when the logical schema is applied to other physical databases through a schema update, the physical items with the old names will be dropped from the database and new items added, potentially resulting in data loss - unless you define data transformation procedures for the schema update.

7.8.3. How to Check for a Successful Load Schema Completion

Once the Load Schema is done and your Task is completed, check the following:

- The Section 6.7.15, “Integrity Check Report” [6–26] should indicate no differences, if all changes were selected for the load.
- The Section 4.7.5, “Building the Schema Update List” [4–28] should not find any schema that requires updating.

7.8.4. How to Handle a Canceled or Crashed Load Schema

If the Load Schema process is interrupted, you have one of two options:

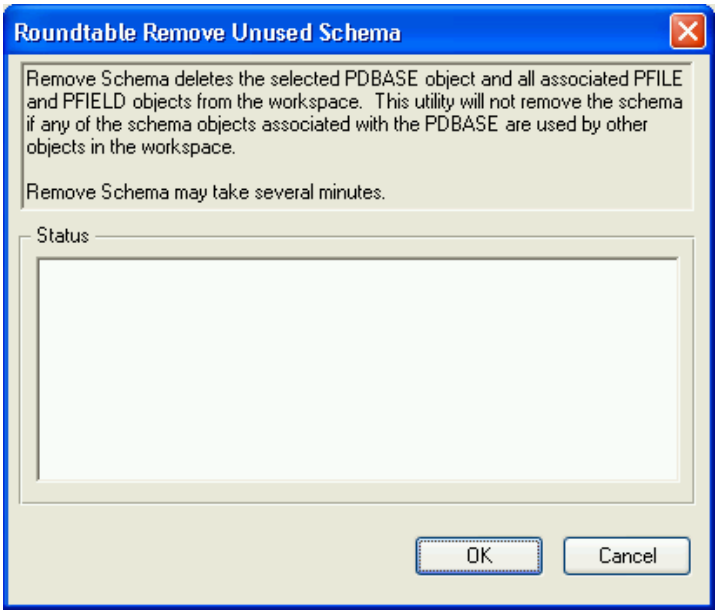
1. Simply re-run Load Schema to complete the partially loaded schema, or
2. Remove the partially loaded schema, and then re-run Load Schema.

7.8.4.1. How to Remove Partially-loaded Schema

Follow these steps to remove the partially loaded schema:

Removing partially loaded schema should only be done for the initial load of a database, as it removes from the Workspace the PDBASE object and all of its PFILE and PFIELD objects. Removing schema at any other time can cause several problems.

1. Select the PDBASE object with partially loaded schema from the Tabletop object browse.
2. Choose Workspace → Remove Schema from the Tabletop menu. The Remove Schema dialog box appears.

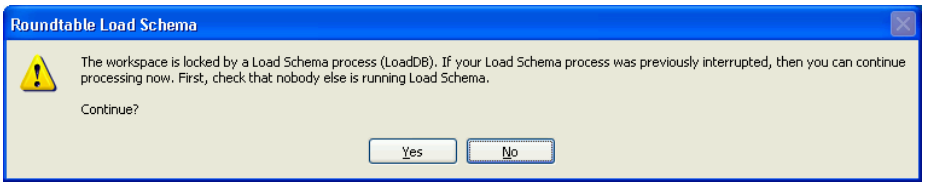


3. Choose the **OK** button to remove the selected database schema from the Workspace. The PDBASE and all of its PFILE and PFIELD objects are removed from the Workspace.

Once you have corrected the error(s) that interrupted the Load Schema process, follow these steps to complete the process:

1. Select the Task created for Load Schema.
2. From the Tabletop menu, choose Workspace → Load Schema . The following

warning appears:



3. Make sure that no one else is running Load Schema in the Workspace, and then choose the **Yes** button to continue.

7.8.5. Load Schema and Object Domains

Load Schema only reads one physical database, and it makes changes to logical object definitions as appropriate. Table and field domains present potential problems. However, with a little care, these problems can be avoided entirely.

If a PFIELD object definition is used more than once within a database, then Load Schema sets the attributes of the PFIELD object based on the last physical field definition that it looks at. This means that you are not guaranteed that your field domains will all be in sync by just running the Load Schema process.

If you use field domains and changed your schema outside of Roundtable, make sure you run the Database Integrity Check Report after running Load Schema. You will have to manually re-synchronize any fields that fell out of step.

To avoid this problem, do not make changes to field domains outside of Roundtable's schema management.

If a PFILE or PFIELD object definition is used in more than one database, Roundtable and your schema might fall out of step if you make changes to one of those databases outside of Roundtable's schema management.

The following steps might cause this problem:

1. Use a PFIELD or PFILE object definition in more than one of your Workspace databases. (Call the databases "A" and "B".)
2. Use a tool other than Roundtable (for example: OpenEdge Data Dictionary) to change the related object's definition in just one of the databases (database "A").
3. Run Load Schema against database "A".

Database "A" and Roundtable are in sync, but database "B" and Roundtable are now out of

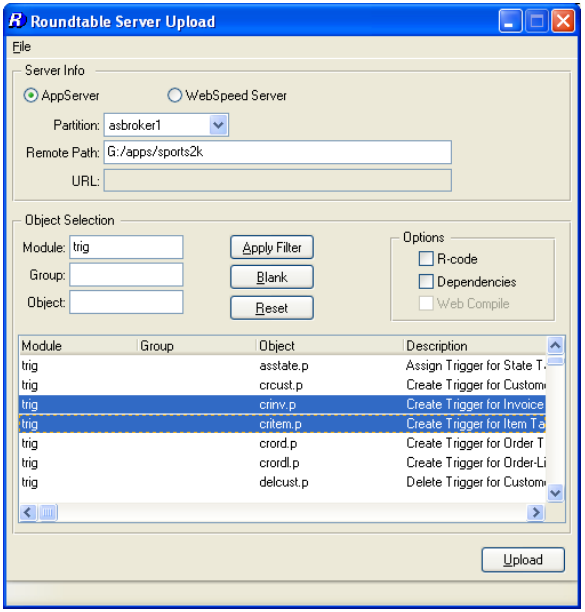
sync.

If you use field or table domains, and have changed your schema outside of Roundtable, be sure to run the Database Integrity Check Report on all of your databases after running Load Schema. You will have to manually re-synchronize any fields or tables that fell out of step. Depending on the number of schema objects that are out of sync, it might be easier to use the OpenEdge Data Administration tools to dump a .df between the two databases, and then apply the necessary parts of the .df file to the database to bring it back in step.

To avoid this problem, do not make changes to field domains or table domains outside of Roundtable's schema management.

7.9. Server Upload Window

The Server Upload window enables you to deploy objects from a Workspace to a remote WebSpeed or AppServer host using the transfer facilities provided by those products. The Server Upload utility eliminates the need for other access to these servers, such a FTP or shared directories, for deploying server-side code from Roundtable Workspaces.



The following table lists the Server Upload window fields and buttons:

Field or Button	Description
AppServer	Choose this radio button to upload objects to an existing AppServer

Field or Button	Description
	partition.
WebSpeed Server	Choose this radio button to upload objects to an existing WebSpeed broker.
Partition	Used for AppServer uploads. Drop-down list of defined AppServer partitions.
Remote Path	Used for AppServer uploads. The target root directory on the AppServer file system. Uploaded objects will be written to the AppServer file system relative to this directory.
URL	Used for WebSpeed uploads. URL to the target WebSpeed broker. Defaults to the WebSpeed broker URL defined in AppBuilder Preferences.
Module	Used to filter the object list by Workspace Module.
Group	Used to filter the object list by Object Group.
Object	Used to filter the object list by Object name.
Apply Filter	Filters the object list using supplied Module, Group, and Object values.
Blank	Blanks the Module and Group fill-ins.
Reset	Resets the Module and Group fill-ins to pre-edit values.
R-Code	Used for AppServer uploads. Activate this toggle box to transfer r-code instead of source files.
Dependencies	Used for AppServer uploads. Activate this toggle box to transfer objects necessary to compile code on the AppServer partition. For example, if you select to upload a .p file that references an include file, the include file will also be uploaded.
Web Compile	Used for WebSpeed uploads. Activate this toggle box to compile embedded SpeedScript after deploying objects to the WebSpeed broker.
Upload	Choose this button to upload selected object to the selected server.

7.9.1. Deploying Web Objects

Use the following steps to move web objects to the web server:

1. Choose Tools → AppServer/WebSpeed Upload from the Tabletop menu. The Server Upload window appears.
2. Choose the **WebSpeed Server** Server radio button in the Server Info panel.

3. Verify or edit the WebSpeed broker URL.
4. Optional. Use the Module, Group and Object filter to narrow the query results that appear in the object browse.
5. Optional. Activate the Web Compile toggle to compile embedded SpeedScript on the broker.
6. From the objects displayed in the browse, range select or highlight individually (using **Ctrl**-Click) the objects to move to the web server.
7. Choose the **Upload** button to deploy the selected objects to the specified web server.
8. Close the Server Upload window.

7.9.2. Deploying Objects to an AppServer

When developing distributed applications with Roundtable, a Workspace may contain some client-side code objects and some server-side code objects. Although Roundtable allows workspaces to be contained on remote systems using UNC paths and mapped network drives, developers may wish to place server-side objects on an AppServer partition that is not accessible through the Workspace path for testing or local deployment purposes.

Sites that require access to AppServer partitions from Roundtable that do not have a means of accessing a remote directory through the Workspace path need a way to move objects from Roundtable Workspace to an AppServer partition.

This release of Roundtable provides a means for copying objects (both source and/or r-code) from a Workspace to an AppServer partition using AppServer itself, rather than using FTP, NFS or other file transfer methods. Copying an object to an AppServer partition depends upon Roundtable connecting to an AppServer broker (defined using the OpenEdge AppServer Partition Deployment Tool). Then sending the object to a server-side program to place the object on the AppServer partition.

If you can access your AppServer partition through the Workspace path (i.e. The AppServer partition directory is the same as the Workspace path, or a subdirectory under the Workspace path as defined by a Workspace module and/or code Subtype), there is no need to move objects from a Roundtable Workspace to a remote location. These instructions are intended for sites where the AppServer partition is not accessible through the Workspace path.

Enabling Roundtable to copy objects to an AppServer partition using Roundtable's Server Upload window requires these setup steps:

1. Setup an AppServer according to OpenEdge documentation.
2. Manually copy the Roundtable programs rtb/p/rtb_asio.p, rtb/p/rtb_fileio.p and

rtb/p/rtb_fileloadwrite.p, located under the Roundtable installation directory, to the AppServer partition(s). These programs may be placed anywhere on the AppServer partition, so long as they are in the AppServer Agent's PROPATH.

3. Compile the above programs on the remote system.

Follow these instructions to move objects from a Workspace to an AppServer partition, once the setup has been done:

1. Choose Tools → AppServer/WebSpeed Upload from the Tabletop menu. The Server Upload window appears.
2. Choose the **AppServer** radio button in the Server Info panel.
3. Select the target AppServer partition from the Partition drop-down list.
4. Verify or edit the remote path.

The entire path of the remote object will consist of: - remote path - subdirectories indicated by Workspace Modules and/or code subtypes - object name

5. Optional. Use the Module, Group and Object filter to Object filter to narrow the query results that appear in the object browse.
6. Optional. Activate the R-Code toggle to deploy only r-code to the AppServer partition.
7. Optional. Activate the Dependencies toggle to deploy dependent objects along with the selected objects.
8. From the objects displayed in the browse, range select or highlight individually (using **Ctrl**-Click) the objects to move to the web server.
9. Choose the **Upload** button to deploy the selected objects to the specified AppServer partition.
10. Close the Server Upload window.

7.9.3. Repository Check Report

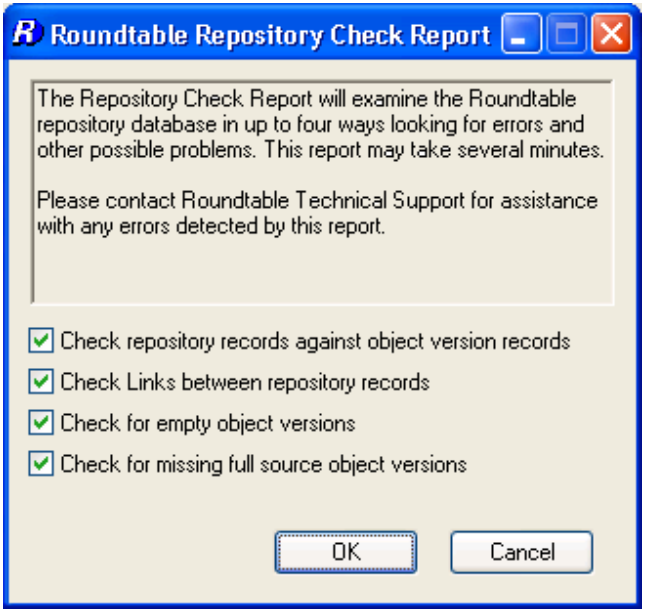
The Repository Check Report is used to identify problems in the Roundtable repository database. Typically, this report is run only at the request of Roundtable Technical Support. This process can evaluate four different areas:

- Check repository records against object version records
- Check links between repository records

- Check for empty object versions
- Check for missing full source object versions

Follow these steps to print the Repository Check Report:

1. Choose Tools → Repository Check Report from the Tabletop menu. The Repository Check window appears.



2. Select the processes that you would like to be reported.
3. Choose the **OK** button.
4. Contact Roundtable Technical Support for assistance with any errors detected by this report.

A

Interfaces

A.1. Introduction

This appendix describes the entry points into the Roundtable environment that you can use to customize your environment and a thorough description of PROPATH management in Roundtable.

- Edit Program: rtb/p/rtb_open.p
- Managing Application Data with the Edit Program
- Report Source File Locations
- Task Record Access Using the Ref-num Field
- Roundtable PROPATH Management
- Roundtable Interfaces with the ADE
- Hooks and Application Programming Interfaces

A.2. Edit Program: rtb/p/rtb_open.p

A specialized edit program can be associated with a Subtype. The name of your edit program is stored in your PCODE Subtype's Edit Program field. See Section 3.11, “Subtypes” [3–20]. When you instruct Roundtable to edit an object, your specialized edit program runs. There is a specific programming interface required for the edit program that includes a Pmode parameter. This Pmode parameter is used to instruct edit programs to do specialized tasks like import, export, and delete on the data in the managed objects.

The rtb_open.p procedure is provided as source for your examination. As provided, rtb_open.p runs rtb_winopen.p, also provided as source, which launches applications that edit files based on the filename extension.

A.3. Managing Application Data with the Edit Program

Sometimes it is necessary to keep track of versions of data in an application. This data could be static code tables, menu content, program generation data, or seed data to be delivered with an application. It is possible to manage this data by developing user-defined edit programs specific to the application data on which version control is desired. The name of your edit program is stored in your PCODE Subtype's Edit Program field. See Section 3.11, “Subtypes” [3–20].

A.3.1. Edit Program Guidelines

The only way to run one of these programs should be from the Roundtable environment. This will prevent making untracked changes in the application data.

Each program should have Edit, View only, Import, Export, and Delete modes:

- Edit Mode should allow the entering or editing application data. Roundtable will run the program in Edit Mode when the object is WIP and owned by the current task.
- View Mode should allow only viewing application data. Roundtable will run the program in View mode when the object is not WIP or belongs to a task other than the current task.
- Import mode should delete current data (if any) in the application database and then load the object by reading in new content from one or more text files formats specific to the type of managed data. Roundtable will run the program in Import mode when the All PCODE Data Imports option is chosen from the WS-config menu or just prior to the first Edit of the program after a recent assignment of the object to the Workspace. The Import process assigns objects to a Workspace. It is also possible to manually assign a version of an object to the Workspace.
- Export mode should create one or more text files containing the data stored in the application database. This process is run prior to the completion of the object and the registration of the object's text files into the repository.
- Delete mode should delete data associated with the object from the application database.
- An optional View Hist mode can be supported by the application edit program if desired. This mode would allow the view of a prior version of the object. When you select a previous version of an object and choose the Edit option off the PCODE Object Menu, Roundtable creates one or more temporary files by retrieving the requested version from the repository. The edit program in View Hist mode should allow the user to review this earlier version of the object without corrupting the current application database. This mode is optional.
- An optional Xref mode can be supported by the application edit program if desired. This mode allows the program to generate Roundtable Xref entries. This option can be especially useful for applications where the application menus are driven by tables in the application database. This mode is optional.

A.4. Sample Edit Program Application

Here is a sample Menu Manager application to illustrate how an edit program interface can be implemented.

This edit program allows the Roundtable system to manage menu tables in an application database.

The application menus are contained in two tables in the application database:

menu_header Describes the menu and its placement on the screen

```
menu name x(32)
menu title x(76)
menu row integer
menu col integer
```

menu_item Describes each menu item

```
menu name x(32)
item seq integer
item type P)rogram, M)enu
item name x(32)
item desc x(76)
```

A PCODE Subtype called menuman is created in Roundtable. An edit program named menuman.p is specified. This program has the following prototype definition:

```
/* menuman.p MENU MANAGER */
DEFINE INPUT PARAMETER Pmode AS CHARACTER NO UNDO.
DEFINE OUTPUT PARAMETER Perror AS CHARACTER NO UNDO.

/* Shared variable definitions passed by Roundtable */
DEFINE SHARED VARIABLE Urtb object AS CHARACTER NO UNDO.
DEFINE SHARED VARIABLE Urtb part AS CHARACTER EXTENT \
 10 NO UNDO.
DEFINE SHARED VARIABLE Urtb part desc AS CHARACTER EXTENT \
 10 NO UNDO.
DEFINE SHARED VARIABLE Urtb path AS CHARACTER EXTENT \
 10 NO UNDO.
DEFINE SHARED VARIABLE Urtb name AS CHARACTER EXTENT \
 10 NO UNDO.
DEFINE SHARED VARIABLE Urtb tmpl AS CHARACTER EXTENT \
 10 NO UNDO.
DEFINE SHARED VARIABLE Urtb num parts AS INTEGER NO UNDO.
DEFINE SHARED VARIABLE Urtb sub type AS CHARACTER NO UNDO.
DEFINE SHARED VARIABLE Urtb userid AS CHARACTER NO UNDO.
DEFINE SHARED VARIABLE Urtb task num AS INTEGER NO UNDO.
DEFINE SHARED VARIABLE Urtb task desc AS CHARACTER NO UNDO.
DEFINE SHARED VARIABLE Urtb PROPATH AS CHARACTER NO UNDO.
DEFINE SHARED VARIABLE Urtb ws PROPATH AS CHARACTER NO UNDO.
DEFINE SHARED VARIABLE Urtb mod dir AS CHARACTER NO UNDO.

IF Pmode = "Edit" THEN
```

```
DO: /* Allow user to update data related to object in \
 application database */
END.
ELSE IF Pmode = "View" THEN
DO: /* Allow user to view data related to object in the \
 application database */
END.
ELSE IF Pmode = "Import" THEN
DO: /* Delete current data. Load new data from text files. */
END.
ELSE IF Pmode = "Export" THEN
DO: /* Export data from application database to text files */
END.
ELSE IF Pmode = "Delete" THEN
DO: /* Delete data related to object from the application \
 database */
END.
ELSE IF Pmode = "View Hist" THEN
DO: /* Allow user to view data placed in temp text files \
 retrieved from repository */
END.
ELSE IF Pmode = "Xref" THEN
DO: /* Create rtb_xref records based on content of the \
 object's data in app database */
END.
ELSE Perror = "Unknown Mode".
RETURN.
```

A.5. Report Source Files Locations

All of the reports in the Roundtable system are generated in report library procedures that are provided in source form for your convenience. The library and procedure that produced a report are shown in the report header.

If you decide to modify a report, copy the modified report library procedure to a new directory with a new name so that your modifications are not overwritten by future updates of Roundtable.

The following table shows the report library procedures and the reports that they produce:

Report Library	Contained Reports
rtb/p/rtb_rpt_product.p	• Product Report • Product Modules Report • Versions in Product Module Report

Report Library	Contained Reports
rtb/p/rtb_rpt_repo.p	• Repository Check Report
rtb/p/rtb_rpt_schema.p	• Database Definition Report • Database Integrity Check Report • PDBASE Object Report • PFIELD Object Report • PFILE Object Report • Table Definition Report • Unapplied Changed Report • Unapplied Changes for PDBASE Report • Unapplied Changes in PFIELD Report • Unapplied Changes in PFILE Report
rtb/p/rtb_rpt_subt.p	• Code Subtypes Report
rtb/p/rtb_rpt_task.p	• Task Report • Object Orphans in Task Report
rtb/p/rtb_rpt_wspace.p	• Versions in Workspace Report • Workspace Report • Workspace Changes Report • Workspace Differences Report • Workspace Event History Report • Workspace Import Report • Workspace Release Report • Workspace Deployment Sites Report
rtb/p/rtb_rpt_xref.p	• External Objects Report • Index Usage Report • Informal Xref Report

Report Library	Contained Reports
	• Call Diagram Report • Object Usage Report • Where Used Report • Xref Report • Unused Objects Report

A.6. Task Record Access Using the Ref-num Field

Tasks are a significant part of managing work with the Roundtable system. Often customers want to retrieve information on tasks in the Roundtable system using a key field value that is meaningful to their support and management staff. A field called user-task-ref is included in the task record and indexed by rtb_task07.

Since the Roundtable repository is a OpenEdge database, you can use standard OpenEdge 4GL commands to access the task records in the database.

Be careful to find records NO-LOCK in your reporting routines to avoid competing with Roundtable for locks on these important records.

A.7. Roundtable PROPATH Management

Roundtable has a set of rules that it follows regarding PROPATH management so that it can provide an environment that makes it easy for you to switch from task to task, or even from Workspace to Workspace. Of course, it also has to ensure that its own programs can be found in the PROPATH.

A.7.1. Roundtable in the PROPATH

The Roundtable startup program, _rtb.p, adds <RTB> and <RTB>/rtb to the front of your OpenEdge default session PROPATH, where <RTB> is the Roundtable install directory.

It will only prefix the PROPATH with <RTB> if it is not already there. <RTB> is already in your PROPATH if you have installed the compiled Roundtable programs into <DLC>/gui.

It will prefix the PROPATH with <RTB>/rtb regardless of whether or not it has already been defined in your PROPATH. This ensures that <RTB>/rtb always comes before <DLC>/gui so that the Roundtable version of some ADE programs are found first. See Section A.8, “Roundtable Interfaces with the ADE” [A–7].

A.7.2. Workspace Directories in the PROPATH

When you select a Workspace, your Workspace directories are added to the front of your PROPATH. You define your Workspace directories in the workspaces maintenance screen. Note that if you have special tokens defined in your Workspace directories, then these will be expanded and added to your PROPATH.

A.7.3. Task Groups and Task Directory in the PROPATH

When you select a task, Roundtable checks to see if it belongs to any task groups. If it does, then these are added to the front of your PROPATH.

Finally, if the task is not Central, then the task directory is added to the very front of your PROPATH.

Here is the order of the directories that Roundtable may add to your PROPATH (where <RTB> is the Roundtable install directory):

```
<task directory> + <group directories> \
 + <Workspace directories> + <RTB/rtb> \
  + <RTB> + <the default PROPATH defined \
    for your session>
```

A.7.4. The PROPATH During Roundtable Wait States

Any time that a wait state is set in Roundtable, the Roundtable directories are automatically moved to the very front of your PROPATH. This improves Roundtable's execution speed. If a long string of directories is built up in your PROPATH in front of the Roundtable directories, then every RUN statement executed within Roundtable becomes very slow. OpenEdge would have to look through your task, group, and Workspace directories before it could finally find the Roundtable programs in its PROPATH.

As soon as the wait state has completed, then the Roundtable directories are moved back down to their original position in the PROPATH.

A.8. Roundtable Interfaces with the ADE

So that Roundtable can be a tightly integrated part of the OpenEdge Application Development Environment, various intercepts and hooks have been added to GUI Roundtable. This section presents a summary description of some of these intercepts and hooks.

A.8.1. ADE Intercepts

Roundtable has its own version of the following programs, which are found in the <RTB>/rtb subdirectory (where RTB is the Roundtable install directory):

- adeedit/_dlggetf.p - This is the File Open and File Save As dialog box used by the OpenEdge Procedure Editor.
- adecomm/_getfile.p - This is the File Open and File Save As dialog box used by the OpenEdge Procedure Windows and the UIB.
- adecomm/_chosobj.p - This is the Choose Object dialog that the UIB uses for selecting a SmartObject for insertion into your current SmartContainer.
- adeweb/_webfile.w – For remote objects, this accesses the File Open and File Save As dialog boxes used by the OpenEdge Procedure Windows and the UIB.

These programs run before the OpenEdge version of them because <RTB>/rtb is found in your PROPATH in front of the OpenEdge subdirectories.

For all three of these programs, the Roundtable version simply passes its parameters to the main Roundtable persistent procedure. This triggers the Roundtable Tabletop to become the active file selection window. From the Tabletop, you can choose to Open or Save As by the OS. When you do that, these procedures call their counterparts found in the OpenEdge subdirectories, so that you can select files through the regular file selection dialog boxes outside of the object management framework of Roundtable.

Roundtable also has its own version of adecomm/_adeevnt.p. All of the hooks described in the next section go through this program.

Roundtable’s intercept programs are provided in source form.

A.8.2. ADE Hooks

OpenEdge provides adecomm/_adeevnt.p as a primary source for hooks into the ADE. Please see the comments in that program (as provided by OpenEdge) for a detailed description of how it works and what you can do with it.

Roundtable’s version of _adeevnt.p passes most of the hook events straight through to the main persistent Roundtable procedure. This section describes the hooks Roundtable watches, and how they are used:

- p_event = "Open"

Roundtable uses this event to finalize object locking and to keep track of which objects are being viewed in read-only mode.

- p_event = "Close"

Roundtable uses this event to delete the object lock or to delete the entry out of the table that it uses to keep track of which objects are marked read-only.

- p_event = "Before-Save"

Roundtable uses this event to check that the object is not marked read-only. If it is marked read-only, then Roundtable cancels the save operation.

- p_event = "Save"

Roundtable uses this event to handle the complexities involved if you do a "Save As" on one Roundtable object to another Roundtable object.

A.9. Hooks and Application Programming Interfaces (API)

If you would like to be able to write your own programs that interact with Roundtable, the following section will describe some of the options available.

A.9.1. Event Hooks

Roundtable PUBLISHes an event, evRtbUserEvent, for several actions during a Roundtable session. The parameters passed by the event indicate the action performed by Roundtable. You can SUBSCRIBE to this event to extend and customize the functionality of Roundtable.

Roundtable provides a program called rtb_events.p, which can be found in the directory where you installed Roundtable. This program SUBSCRIBEs to evRtbUserEvent and documents the parameters PUBLISHed by the event. Additionally, the program provides backward compatibility for earlier versions of Roundtable that used the rtb_evnt.p procedure.

By modifying rtb_events.p, you can intercept or filter various events that occur in a Roundtable session. Below you will see a list of supported event hooks. Most of the event hooks have a corresponding "Before" event, which is published immediately before the indicated action. Please see the documentation inside the rtb_events.p program code for more information.

Event Hook	When Published
AddObject	Creation of a new object.
deleteObject	Deletion of an object from a Workspace.
createObjectVariant	Creation of an object variant.

Event Hook	When Published
assignObject	Assignment of an object to a Workspace.
compileObject	Compile of an object.
checkinObject	Check-in of an object to the repository.
checkoutObject	Check-out of an object from the repository.
makeDeployment	Workspace deployment is made.
createRelease	Creation of a Release.
updateSchema	Update Schema processing.
newTaskRow	Adding a Task (before edit of new record).
createTask	Creation of a task.
modifyTask	Modification of a task.
completeTask	Completion of a Task.
createSite	Creation of a deployment site.
processImport	Workspace Import processing.
changeWorkspace	Selection of a Workspace.
moveToWeb	Upload of objects to WebSpeed broker.
changeTask	Selection of a Task.
loadPartner	Load of Partner Site data.
changePropath	Change of PROPATH.
changeObjectShareStatus	Change of an object’s share status.

Event Hook	When Published
roundtableStartup	Startup of Roundtable.
roundtableShutdown	Shutdown of Roundtable.
sessionStartup	Startup of Roundtable session.
sessionShutdown	Shutdown of Roundtable session.

A.9.2. Application Programming Interfaces (API)

Roundtable provides a number of procedure and function calls that allow you to automate many Roundtable activities. These functions and procedures are accessed through the SmartDataObjects (SDOs) that Roundtable is built upon. While each SDO primarily represents a single table in the Roundtable repository, their API functions and procedures access other tables as needed for query and update operations.

Roundtable SDOs may be used via a SmartContainer, or initialized in 4GL using the include file provided for the SDO. These include files are located in the <RTB Install>/rtb/i directory, and named similarly to the SDO. Since the many of the table have both a query SDO and an update SDO, the SDO initialized by the include file is controlled by the use of a preprocessor definition, START-SDO.

All of the API functions and procedures must be executed in the context of a valid Roundtable session. That is, you must first login to the Roundtable repository before running any of the SDO APIs. Many of the API functions require your Session ID (obtained at login) as an input parameter.

Please see detailed documentation inside the rtb/p/rtb_api.p procedure. It contains a description of input parameters and required coding (before calling certain API procedures).

A.9.3. Legacy API

For backward compatibility with earlier versions, Roundtable is distributed with a program called rtb/p/rtb_api.p that translates earlier-version API calls to the current API methods.

Please see detailed documentation inside the rtb/p/rtb_api.p procedure. It contains a description of input parameters and required coding (before calling certain API procedures).

Glossary

Alias	An alternate name for a database.
Aliased Object	A PCODE object that has an object name that is different from its physical operating system filename. Object aliases are normally used when two files in different directories have the same filename.
Assigning an Object	To add to a workspace an object that has already been created.
Central Object Repository	Roundtable keeps objects in the Central Object Repository (COR). The COR stores all of the objects and their definitions in the system.
Changes Report	A list of changes in a workspace across a range of events. Provides testers and/or customers with extensive information about what has changed in a workspace between any two events.
Check In	To copy a checked out version of an object into the Central Object Repository. Checking in an object completes the object and allows others to see the changes and use the new version.
Check Out	To create a new version of an object by copying the object and assigning it to a new version number. The new version is used for a specific task and can only be used by one programmer.
Completing a Task	An activity processed once the work is finished in the task. Completing the task gives all the objects in the task a C (complete) status.
Configuration	A map of the contents of your application at a given time.
Configuration Hierarchy	A map of the contents of your application that usually corresponds closely to the architecture of your system.
Configuration Level	Application software systems under configuration control are mapped into a configuration hierarchy. The

	configuration level refers to the depth of the hierarchical tree where an object is found.
CRC	See CRC.
Cross Reference	A cross reference (Xref) is generated for many kinds of relationships among objects in a workspace. These cross references are generated when a full compile is performed on a compilable object. Database schema objects are also cross referenced automatically by the system.
CRC (Cyclical Redundancy Check)	This is a calculated value that is generally unique for any given piece of data. Roundtable calculates a CRC value for each file loaded into the repository. When required, this CRC value can be compared with a CRC calculation on a file at the operating system level to determine if the repository file and OS file are the same.
Data Type	The OpenEdge data type determines what kind of data can be stored in a variable or database field.
Deployment	Roundtable manages the process of packaging a release of an application system from a workspace for delivery to a remote site. The process of packaging the release is called the deployment process, and the update package created is called a deployment.
Development Workspace	A workspace used to create, modify, and delete new objects and data. Since this workspace is unstable, it is only suitable for limited, informal testing, usually done by the programmers.
DOC	An object that normally contains documentation and is always stored in a type directory called doc off of the objects' workspace module directory. You can also use the PCODE object to store documentation objects. Check out a DOC object to modify the document it contains.
Domains	Occur when you create a single definition that is used in a number of different places. For example, you might define a single PFIELD object called Address and use this field definition in a number of different tables, or even many times in the same table.

Event	Each completed change that results in a change to the contents of a workspace is recorded as a sequential event in the workspace event history.
Event History Report	The event history of a workspace sorted from newest to oldest between two events. Traces the history of individual objects or groups of objects belonging to a product module.
Field Assignment	A PFIELD object contains attributes that describe a field (column) and are referenced by field assignments in PFILE objects. The collection of attributes in the PFIELD object and PFILE field assignment completely define a field in a table. A field assignment contains the product module and name of the PFIELD object, local field name, field order, mandatory status, and triggers of the field.
Force Compile	A compile that occurs even if Roundtable does not think the object needs compiling.
Full Compile	A compile with cross references. Leave blank to just compile and save.
Group Access	You define a collection of security privileges and name them with a group access code. You assign one or more group access codes to one or more users in a workspace. Security privileges accumulate based on each group access code assigned to a user in a workspace.
Group Access Code	A code that identifies a set of security privileges that can be enjoyed within the Roundtable environment. You create access groups and then specify what security privileges belong to the group. You can then associate one or more access groups with one or more users by workspace.
Group Code	User-defined values entered when the user defines objects. The group code is used to sort objects in the object browse table.
Group Directories	Roundtable checks out objects to a task directory where the programmer modifies them. The changes are not seen by others until the programmer executes the Update Group/Public Source option, which copies the modified objects into a group directory. Other

	programmers might choose to see the changes by attaching one of their tasks to the group. The last completed version of the objects remains in the workspace directory.
Listings	Check to print the fully expanded code (with the include files). This is like the Listing parameter in OpenEdge. Roundtable saves the listing file as *.lis file.
Module Load	A Roundtable utility used to search for objects in the operating system directory associated with a selected workspace module. The user is able to quickly create new objects for the new source code.
Object	Any field, table, database, document, or piece of code that you want Roundtable to manage. It is the lowest level of configuration management.
Object Group	User-defined values entered when the user defines objects. The group code is used to sort the objects in the object browse table.
Object Types	All workspaces are comprised of collections of Roundtable objects. These objects are of one of the following types: PCODE: A collection of optimized files whose purpose is specified by assigned subtype PFIELD: A database schema definition for a field PFILE: A database schema definition for a table PDBASE: A database schema definition for a database DOC: A special type used for documentation objects
Object Variants	Variations of the same object in a system.
Object Version	Created each time you check in an object. Object versions are stored in the repository. You can see a list of all versions of an object by selecting the object in a workspace and then choosing View. Object versions are permanent. They are never deleted from the repository.
Orphan	When the same object is checked out in two workspaces at the same time, an object version orphan is created. The term indicates that the changes made in one of the object versions will be lost in some future promotion process among workspaces. For instance, suppose you have a development and test workspace,

	that you check out the same object in both workspaces, and then you check in both objects. If you then import the object from the development workspace into the test workspace, the object version imported from development replaces the object version created in test. The changes made in test are lost. Roundtable warns you of object orphan conditions wherever possible.
Partner Site	A Roundtable installation that receives repository information from another Roundtable installation. You perform a partner site deployment at the sending site and a partner site load at the receiving site to move repository information among sites. Each site must have a different site number.
PCODE	An object that encapsulates up to nine files that together define a system component. These system components can contain textual or binary data, and you assign a subtype code to each PCODE object to describe these files. These files are called parts and their attributes are specified in the subtype definition. Check out a PCODE object when you need to modify the system component it encapsulates.
PDBASE	An object that contains the topmost components of a database schema definition. PDBASE (database) objects record a list of table assignments that relate PFILE objects with the PDBASE object. Check out a PDBASE object when you need to add, delete, or change the name of a database table or sequence.
PFIELD	An object that contains attributes that describe a field (column) and are referenced by field assignments in PFILE objects. The collection of attributes in the PFIELD object and PFILE field assignment completely define a field in a table. A field assignment contains the product module and name of the PFIELD object, local field name, field order, mandatory status, and triggers of the field. The PFIELD object contains the remainder of attributes that define a field in a table.
PFILE	An object that contains attributes that describe a table. PFILE objects are referenced by table assignments in PDBASE objects. The collection of attributes in the PFILE object and PDBASE table assignment

	completely define a database table. Check out a PFILE object when you need to add, delete, or change a PFILE assignment or an index definition.
Pre-production Workspace	After testing, objects and data are imported from the testing workspace into the pre-production workspace. Since this workspace should function with few or no major problems, you can release it to sophisticated users for Beta testing and evaluations. Normally you would require approval to make changes in this workspace for load testing of the application.
Product	Roundtable provides three logical levels of configuration hierarchy: product, product module, and object. Products own one or more product modules, and product modules own one or more objects. This hierarchy provides a logical view of an application system and is useful for implementing promotion and deployment strategies for the application system.
Product Module	Roundtable provides three logical levels of configuration hierarchy: product, product module, and object. Products own one or more product modules, and product modules own one or more objects. This hierarchy provides a logical view of an application system and is useful for implementing promotion and deployment strategies for the application system.
Production Workspace	A "live" system that must function flawlessly under real-world conditions. You normally require approval to make changes in the workspace.
Promote	The process of importing objects from one or more source workspaces into a target workspace.
PROPATH	A comma-delimited string that contains the operating system directory paths that will be searched by OpenEdge for source code during the compile process.
R-code	OpenEdge-compiled procedures have an extension of .r. Any compiled OpenEdge procedure is referred to as r-code.
Release	A record of a specific event number in a workspace. It is used to re-create the exact contents of the workspace configuration that existed as of that event for purposes of promotion and deployment from a workspace. A

	release labels a version of a workspace.
Release Record	A record that features a sequential release number that uniquely identifies it in the workspace. Release records also contain a text label that describes the configuration of the system at the time the release record was created. For example, release number 23 from the Test workspace might have the descriptive label "Beta Release 2.1a."
Release Report	A detailed list of the changes in a workspace between two releases. Useful for testers and/or customers when receiving new releases.
Remote Site	A site that receives updates packaged by Roundtable.
RTBSETUP File	The Roundtable parameters file that contains workstation-specific options.
Runtask.p	A program used to set up your task environment if you need to work with your task outside of Roundtable.
Run-time, Query, or Development	OpenEdge products types.
S-code	OpenEdge source code.
Schema Objects	PFILE, PFIELD, and PDBASE objects.
Selective Compile	Provides you with a number of options for your compile. You can enter a specific task to compile or you can enter a 0 to disregard the task number. If you specify a task number, Roundtable compiles only the objects within the selected task that have changed.
Share Status	Checked out objects have a share status of Task, Public, Group, or Central. The share status controls where the object is edited and the visibility of the edits on the object to the rest of the users in a workspace.
Source Workspace	The promotion of code through a development cycle is defined by assigning source workspaces to each workspace in the system. The import process build searches each specified source workspace for objects that should be imported into a selected target workspace. For instance, if you have a development workspace and a testing workspace, you specify that the development workspace is a source workspace for

	the testing workspace. The import process pulls completed object versions included in the latest source workspace release level into the target workspace.
Subtype	Controls the naming, management, creation, and storage of PCODE objects. Up to nine file parts are used to define a system component. These system components can contain textual or binary data. In addition to file parts, you specify edit, naming, and procedure generation services for a subtype, as required.
Syntax Check	A compile that does not create R-code. It ensures the source code will compile without actually compiling.
Table Trigger	A database table might have a table trigger. The trigger specifies the name of a procedure file to execute when a trigger condition occurs. The trigger conditions include: FIND, CREATE, WRITE, and DELETE.
Target Workspace	The destination of objects in an import process. The import process is executed in the target workspace, and objects are imported into it from one or more source workspaces.
Task Directories	Created where checked out objects are copied. This makes it possible to isolate your work from others until it is ready to be checked in or promoted for review into the group or central workspace directories. The use of task directories is optional.
Task Number	The number you specify for a task. If you enter a task number, Roundtable compiles only the objects that have changed in that task. If you enter 0, Roundtable disregards the task numbers and compiles everything that needs compiling.
Task Management	The management of units of work performed on the application system managed by Roundtable. All work done on individual objects in the Roundtable system is performed under a task. Usually, managers assign tasks and programmers check out one or more objects under the task. Completing a task checks in all objects that were checked out under the task. Various task reports are available.

Testing Workspace	Where the application is created after importing objects and data from the development workspace. Although this workspace changes less frequently than the development workspace, some changes are necessary to complete the testing process. This workspace is stable enough for significant quality assurance Alpha testing.
Trigger	An event, such as reading, writing, deleting, or updating a record, that causes another procedure to execute.
Update Status	An attribute of an object's assignment to a workspace. The update status attribute can have a value of Current, Modified, or New. This update status attribute is one of the attributes used to determine if the object needs to be compiled or updated.
Unapplied Changes Report	A list of all schema changes that have been entered but not updated. Verifies the status of the schema in the workspace.
User Access Assignments	Specify what security privileges a user enjoys in a specified workspace. A user access assignment consists of a user paired with a group access privilege in a workspace. Users can be given different security privileges in each workspace.
User Maintenance	The process of adding, editing, or deleting users in the Roundtable system.
Variant	Roundtable allows you to create more than one variation of the same object to create variants. Variants have the same object name and type but belong to different product modules. For example, you might need three variations of an install program, one each for UNIX, DOS, and Windows. Only one of the variants of an object can appear in a workspace at the same time. Variants are often created in custom workspaces that are specific to customers or vertical markets.
Version Control	The ability to manage concurrent changes by multiple programmers by creating new object versions.
WIP	See WIP.

WIP (Work-in-process)	The status of an object when it is checked out or when a task is being worked on.
Workspace	A copy of your application programs and related databases, the content of which is known and managed by Roundtable. Roundtable manages the creation, deletion, and modification of objects (code, databases, tables, fields, and text) within the workspace. A workspace is a configuration of object versions.
Workspace Directories	A workspace has a root directory under which the subdirectories and files that make up the software application exist. The root directory is specified as an absolute path in the Workspace Maintenance screen. Subdirectories are defined as part of workspace module definitions and subtype definitions.
Workspace Event History	Roundtable maintains a record of every change to object versions within a workspace. Roundtable records these changes–called events–in the event history file. Roundtable assigns event numbers to object versions when you complete, assign, or de-assign an object. You can view the event history of a workspace or an object in a workspace at any time.
Workspace Module	The contents of each workspace is broken up into one or more workspace modules. Unlike a file system where many levels of nested subdirectories can be seen, only one level of workspace modules exists. Each workspace module points to a single relative subdirectory under the workspace root directory. This subdirectory is defined in the workspace module definition. The contents of a workspace module are defined by the assignment of workspace module definitions to one or more product modules.
Workspace Module Definition	Names a workspace module, provides a description for the workspace module, and specifies a file system subdirectory relative to any workspace's root directory. You assign a workspace module definition to product modules. You assign product modules to workspaces to define the logical content of your application. Roundtable creates a workspace module and associated subdirectory in the workspace based on the workspace module definition associated with the assigned product module. You specify a product

	module when creating a new object. The object is stored in the subdirectory specified in the workspace module definition, and the object is listed in the workspace module.
Workspace Path	Tells Roundtable the directory where you want to store the workspace and its components. The first workspace path should always be the root directory to your workspace. No two workspaces should share the same root directory. Roundtable uses the other specified paths to locate your source code.
Workspace Releases	Consist of changes or events that have occurred in a workspace since the last release. Roundtable allows you to create two types of releases, a developmental release and a formal release. The developmental release is an internal release distributed to other workspaces within the system, while a formal release is a release distributed to users. Normally, you create releases in conjunction with the quality assurance process.
Workspace Report	A complete list of the objects in a workspace ordered by a workspace module. Provides a hard-copy of the current workspace configuration.
Workspace Source	The import process promotes code from one or more workspaces (source workspaces) into the current (target) workspace.
Workspace Target	The import process promotes code from one or more workspaces (source workspaces) into the current (target) workspace.
Xref Level	The amount of cross reference information maintained in a workspace is defined by the user-specified Xref level. A level of 1 means that no cross reference information will be maintained.