Administrator's Guide

iPlanet Application Server Enterprise Connector for R/3

Version 6.0

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Preface

The *iPlanet Application Server Enterprise Connector for R/3 Administrator's Guide* explains how to get started with, install, manage, and configure the iPlanet Application Server Enterprise Connector for R/3.

This preface contains information about the following topics:

- Prerequisites
- Supported Platforms
- System Requirements
- What's in This Guide
- Documentation Conventions
- Online Guide
- Related Information

Prerequisites

The *iPlanet Application Server Enterprise Connector for R/3 Administrator's Guide* is written for system administrators who want to install, manage and configure the R/3 connector.

The guide assumes you are familiar with the following topics:

- iPlanet Application Server Programming Concepts

  See the iP*lanet Application Server Enterprise Connector for R/3 Developer's Guide* for more details.

- The Internet and the World Wide Web
- R/3 Programming Concepts
- Java Programming Language

Supported Platforms

The iPlanet Application Server Enterprise Connector for R/3 supports the following platforms:

Vendor	Platform
Microsoft	Windows NT version 4.0 with Service Pack 5
Sun	Sun SPARC running Solaris 2.6

System Requirements

To install the iPlanet Application Server for R/3 your system must have the following:

- iPlanet Application Server Version 6.0 installed
- iPlanet Unified Integration Framework (UIF) Version 6.0 installed
- Available disk space : 200 MB for NT, 400 MB for Solaris
- Memory per CPU: 64MB minimum; 128MB recommended

What's in This Guide

The *iPlanet Application Server Enterprise Connector for R/3 Administrator's Guide* provides the information you need to understand, set up, and administer all aspects of the iPlanet Application Enterprise Connector Server for R/3.

The following table lists a short summary of what each chapter covers:

See this chapter:	If you want to do this:
Chapter 1, "Overview"	Familiarize yourself with general concepts of the iPlanet Application Server Connector for R/3.
Chapter 2, "Installation"	Install the connector.
Chapter 3, "Managing Data"	Manage the data sources and data objects.
Chapter 4, "Configuring the Application"	Configure the system and pooling settings.

Documentation Conventions

File and directory paths are given in Windows format with backslashes separating directory names. For Unix versions, the directory paths are the same, except slashes should be substituted in place of backslashes.

This guide uses URLs of the form:

http://server.domain/path/file.html

In these URLs, *server* is the name of the server on which you run your application; *domain* is your Internet domain name; *path* is the directory structure on the server; and *file* is an individual filename. Italics items in URLs are placeholders.

This guide uses the following font conventions:

- The `monospace` font is used for sample code and code listings, API and language elements (such as function names and class names), file names, pathnames, directory names, and HTML tags.
- *Italic* type is used for book titles, emphasis, variables and placeholders, and words used in the literal sense.

Online Guide

You can find the *iPlanet Application Server Enterprise Connector for R/3 Administrator's Guide* online in PDF and HTML formats. To locate these files, use the following URL:

http://docs.iplanet.com/docs/manuals/

Related Information

In addition to this guide, there is additional information available for administrators, end users and developers. The following lists these documents:

- *iPlanet Application Server Enterprise Connector for R/3 Developer's Guide*
- *iPlanet Web Server Developer's Guide*
- *iPlanet Application Server Administrator's Guide*
- *iPlanet Application Server Installation Guide*
- *iPlanet Application Server Overview Guide*

- *iPlanet Application Server Release Notes*
- *iPlanet Application Server Administrator's Guide*
- *iPlanet Appliation Builder User's Guide*
- *iPlanet Appliation Builder Installation Guide*
- *iPlanet Appliation Builder Release Notes*
- *Unified Integration Framework (UIF) Release Notes*
- *Unified Integration Framework (UIF) Developer's Guide*

Chapter 1

Overview

The *iPlanet Application Server Enterprise Connector for R/3* is used for building and delivering scalable applications that integrate the application server with R/3 ERP (Enterprise Resource Planning) management systems.

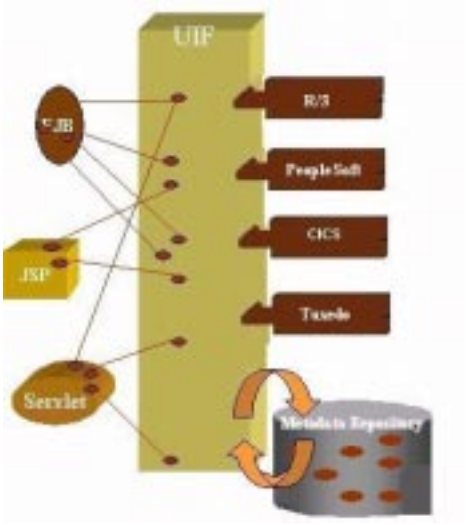
This chapter introduces the *iPlanet Application Server Enterprise Connector for R/3* and describes some fundamental concepts the administrator should be familiar with when setting up the connector for R/3. This chapter contains information about the following topics:

- Unified Integration Framework (UIF)
- Three-tier Application Model
- High-level System Architecture
- Enterprise Connector Tools for R/3
- National Language Support

Unified Integration Framework (UIF)

The UIF is an application programming framework that provides a single Application Programming Interface (API) to access different back-end systems. A connector is developed for each back-end system to allow communication between the UIF API and the back-end system, as seen in Figure 1-1. The UIF API is the only API necessary to access the back-end system.

Figure 1-1 Unified Integration Framework



The UIF enables development of server extensions that integrate with legacy systems, client-server applications, and third-party Internet solutions. These extensions provide a consistent access layer to disparate back-end systems, dramatically reducing development effort. The framework provides support for features such as object-pooling, and distributed state and session management.

A generic data repository is also part of the UIF, which is used to hold metadata parameters and other information about the back-end system. For example, the metadata often describes the physical connection between systems, the data that is available, and methods you can use to process data.

The implementation of each connector is specific to its the back-end Enterprise Information Systems (EIS) since each EIS is different.

UIF Services

The UIF is a component of the iPlanet Application Server. The iPlanet Application Server plays a prominent role in a three-tier application model. See the Three-tier Application Model for a description. The UIF mediates between the iPlanet Application Server application and the EIS (back-end) tier, namely the data sources and databases.

The UIF provides an API to access the following services:

- Runtime
- Data Object Services
- Repository and Metadata Services (not available to users)

Runtime

The UIF runtime services supply core services for resource management, thread management, communication and life cycle management, and exception management. The UIF runtime services understand and interpret metadata repository contents.

Data Object Services

The Data Object Services implements universal data representation common to all connectors. See the *iPlanet Application Server Enterprise Connector for R/3 Developer's Guide* for a description of data objects.

Repository and Metadata Services

The UIF repository and metadata services model a persistent information hierarchy that supports datatype definitions and inheritance. It also manages the instances and reuse of data objects from datatype definitions.

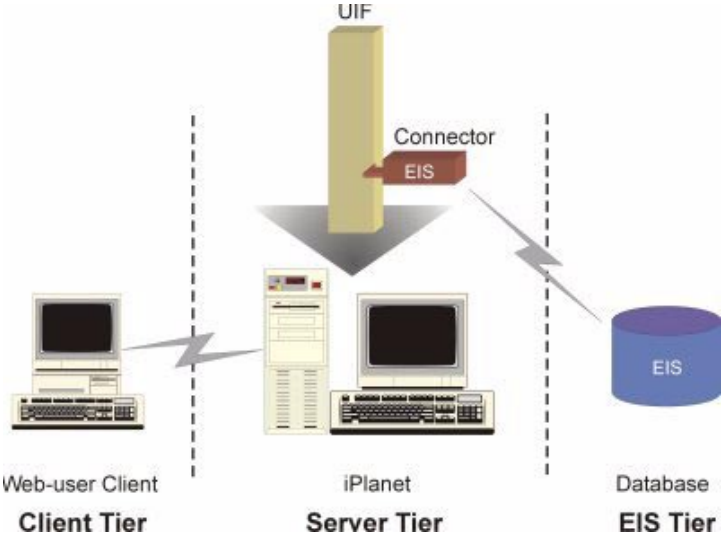
Three-tier Application Model

The machine and software involved are divided into the following three tiers:

- Client Tier
- Server Tier (iPlanet Application Server)
- EIS (Back-end) Tier

The connectors serve as an essential link allowing the server tier to communicate with the EIS tier, as shown in Figure 1-2. Communication between the application server and the back-end EIS is facilitated by the UIF API. This layer of functionality resides as an added layer to the iPlanet Application Server and enables data communication with diverse back-end EIS's in a seamless and uniform manner.

Figure 1-2 Three-tier Web-based Computer Model



Client Tier

The client tier is represented as the user interface. Requests for data originate here, represented by web browsers or rich clients (such as a Java applet).

Server Tier

The server tier is represented by an application server and optionally a web server such as the iPlanet Web Server Enterprise Edition. The server tier houses the business logic (Enterprise Java Beans and / or your application servlets), and provides scalability, high availability load balancing, and integration with a variety of data sources.

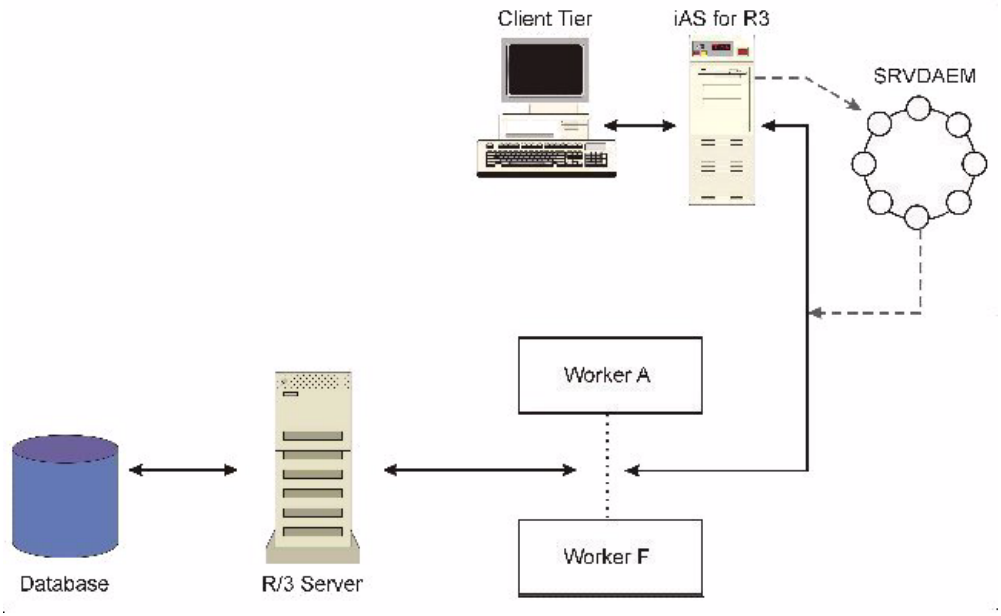
EIS (Back-end) Tier

The back-end tier is represented by an Enterprise Resource Planning (ERP) systems database or another back-end data system such as CICS.

High-level System Architecture

When the iPlanet Application Server startup process begins, the UIF loads the connector into the process. When the client requests data from the back-end system, a daemon process is started manually. The connector notifies the daemon of the request using a proprietary protocol. The daemon either creates a new worker process to process the request or passes on the request to an idle worker. The actual conversation to the back-end system is done by the worker process. The worker returns the results to the connector using the proprietary protocol. Figure 1-3 displays the system flow of the iPlanet Application Server.

Figure 1-3 System Flow



Enterprise Connector Tools for R/3

The Enterprise Connector Tools are as follows:

- Management Console - includes User Mapping and Data Mining Tools

  - User Mapping - allows you to map user IDs for access into the back-end system, and to edit and manage data sources.

    A data source represents the connection to the back-end system.

  - Data Mining Tool - includes capabilities such as determining the available functions in the back-end system, translating and reformatting data, and loading data into the data repository.

- Repository Browser - allows you to browse data in the repository. You can view the available functions (input and output parameters) for the back-end system.

The Management Console

The iPlanet Application Server Enterprise Connector for R/3 has an interactive Management Console Tool. The tool is used by the data source administrator to do the following:

- data mine function objects and data types from the back-end system metadata, and populate the repository with these data-mined definitions
- administer repository contents for creating new data sources, editing settings, and altering pooling settings
- populate user-mapping tables in the data repository

For more information on the Management Console, see The Management Console.

The Repository Browser

The Repository Browser allows the user to explore the repository contents. Repository contents are modified/populated using the *import* function. The import function is also available as a browser function and as a command-line tool, and imports XML under a specified repository node. Additionally, the export function is available as a browser function and as a command-line tool and exports a selected subtree as an XML document. For more information on the Repository Browser, see The Repository Browser.

CAUTION The Repository Browser should not be used for editing even though import, export, and delete actions on repository nodes are enabled. Only advanced administrators should use the available functions.

National Language Support

The iPlanet Application Server Enterprise Connector for R/3 provides full support for building applications that use the prevalent and popular character sets such as ASCII, BIG5, SJIS and others. Chapter 3 describes how to modify a back-end data source for international use.

Chapter 2

Installation

This chapter describes how to install and uninstall the *iPlanet Application Server Enterprise Connector for R/3*. The software components installed include the R/3 Enterprise Connector, which is a shared object, and the R/3 Worker, which is an executable file.

This chapter contains information about the following topics:

- Software Prerequisites
- Hardware Requirements
- Installing the iPlanet Application Server Enterprise Connector for R/3 on Windows NT
- Installing the iPlanet Application Server Enterprise Connector for R/3 on Solaris
- Upgrading or Reinstalling Issues
- Post-Installation Issues
- Troubleshooting

Software Prerequisites

The following software prerequisites are necessary to install the iPlanet Application Server Enterprise Connector for R/3:

- the iPlanet Application Server version 6.0 SP1 must be installed

- the iPlanet Application Server Unified Integration (UIF) version 6.0 SP1 must be installed
- One of the following web browsers should be installed:
  - Netscape Communicator 4.5
  - Microsoft Internet Explorer 4.0 (NT only)

CAUTION The R/3 connector operates with the iPlanet Application Server, therefore it must be installed in the same directory in which the iPlanet Application Server is installed.

Supported Versions of R/3

The iPlanet Application Server Enterprise Connector for R/3 supports R/3 Version 4.5B, and 4.0B.

Hardware Requirements

The following hardware requirements are necessary for installing the connectors.

Computers and Operating Systems

- One of the following operating systems:
  - Microsoft Windows NT version 4.0 with Service Pack 5
  - Sun SPARC running Solaris 2.6

NOTE The Management Console Tools are not supported if running under Exceed.

- Memory Per CPU: 64 MB minimum; 128 MB recommended
- Available disk space: 200 MB for NT, 400 MB for Solaris

Preparing to Install the iPlanet Application Server Enterprise Connector for R/3

Before installing the iPlanet Application Server Enterprise connector for R/3 complete the following steps:

- Verify the R/3 Server connectivity.
- Stop the iPlanet Application Server if it is running.Without stopping the application server, the installation program may not be able to overwrite files currently in use.
- Read the *iPlanet Application Server Enterprise Connector for R/3 Release Notes* for any last minute updates.

Installing the iPlanet Application Server Enterprise Connector for R/3 on Windows NT

The following procedures describe how to install and uninstall the *iPlanet Application Server Enterprise Connector for R/3* on Windows NT.

You must be logged in to Windows NT as the administrator to install the iPlanet Application Server Enterprise Connector for R/3.

To Install the R/3 Connector on Windows NT

1. Read the README.txt file on the CD-ROM.
2. Copy `NT/inssap.zip` from the CD-ROM into a temporary local directory.
3. Unzip `inssap.zip`, then run `setup.exe`.
4. Read the Welcome message and click on the Next button. See Figure 2-1.
5. Follow the instructions on the screen to progress through the introduction.

Figure 2-1 Welcome Message

6. Thoroughly read and understand the licensing information before installing, and accept the license agreement. See Figure 2-2.

Figure 2-2 Software License Agreement

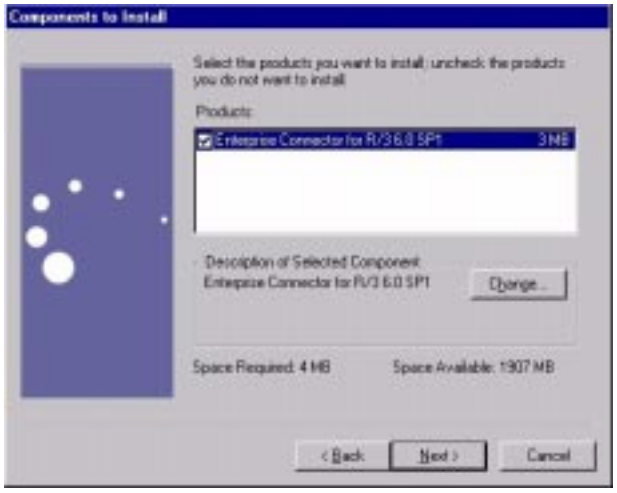
7. Choose your installation directory then click Next, see Figure 2-3.

Figure 2-3 Location of Installation

NOTE You must install the iPlanet Application Server Enterprise Connector for R/3 in the same directory where you installed iPlanet Application Server.

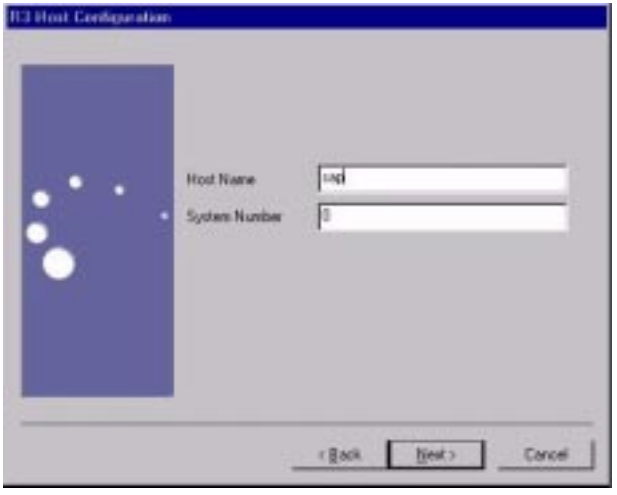
8. The Enterprise Connector for R/3 6.0 SP1 is selected see Figure 2-4. Click Next to continue.

Figure 2-4 Components to Install



9. Type in your R/3 Host Name and System Number, and click Next.

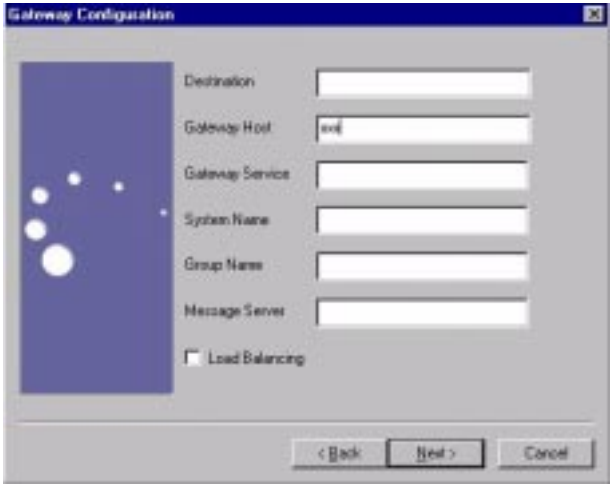
Figure 2-5 R/3 Host Configuration



The Host Name is the R/3 Application Server Host Name.

10. Enter the Gateway Host Configuration Parameters, see Figure 2-6, and click Next.

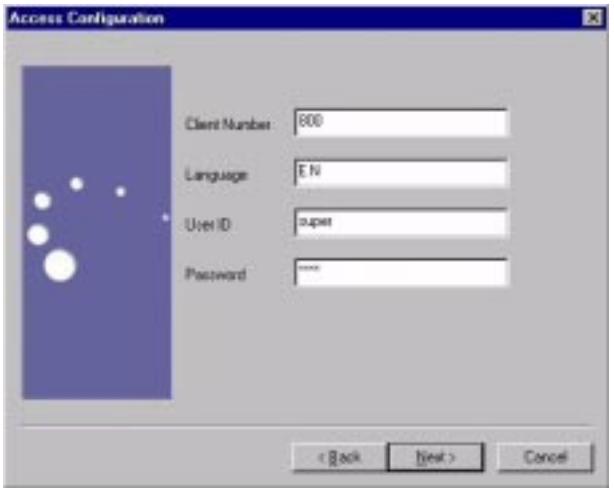
Figure 2-6 Gateway Configuration



Check Load Balancing if the R/3 Server is configured to use Load Balancing. If so, you will need to enter the System Name, Group Name and the Message Server.

11. Enter the R/3 access configuration values and click Next, see Figure 2-7.

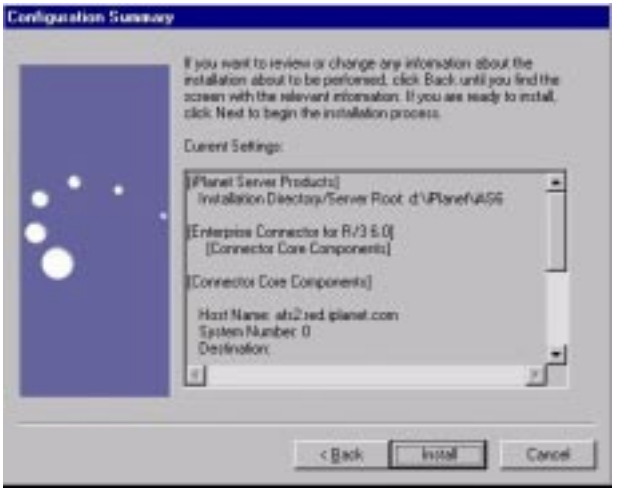
Figure 2-7 Access Configuration



NOTE Consult your R/3 Guide for a list of values for the Language field.

12. Review the configuration summary, see Figure 2-8. If it is correct, click Install.

Figure 2-8 Configuration Summary

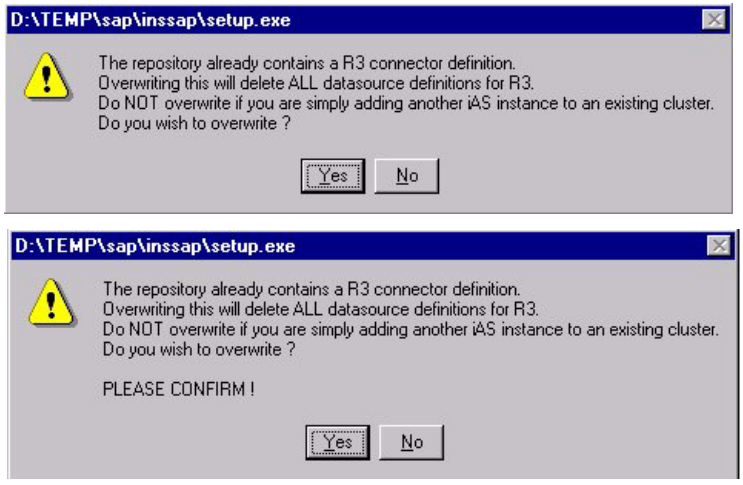


CAUTION You must restart your computer after you complete the installation.

13. (Optional) These are the possible warning window(s) that can appear, if the installer detects that the iPlanet Application Server Enterprise Connector for R/3 is already installed. Choose Yes to overwrite the existing adapter type and all sample data source definitions shipped with the R/3 connector. User defined data sources are not overwritten. Select No if you are simply adding another iPlanet Application Server instance to an existing cluster.

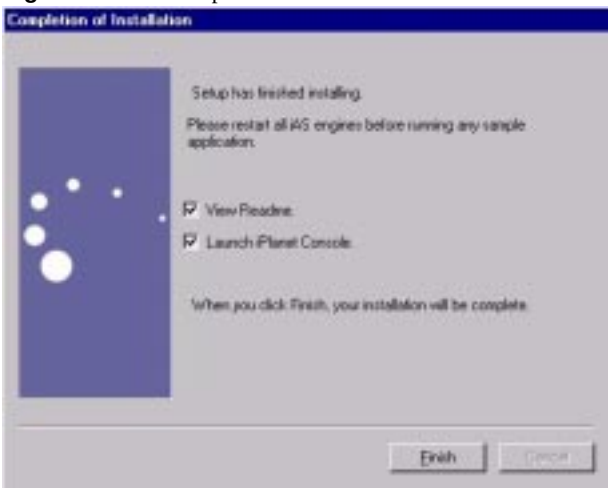
Confirm your decision.

Figure 2-9 Warning Windows



14. Read the Completion of Installation window which is displayed when all files are installed. Click on the Finish button. The iPlanet Application Server Enterprise Connector for R/3 is now installed.

Figure 2-10 Completion of Installation Window

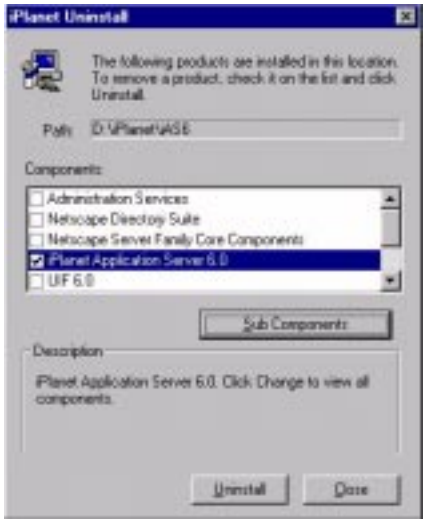


The machine must be rebooted and start the iPlanet Application Server before using the iPlanet Application Server Enterprise Connector for R/3.

To Uninstall the R/3 Connector from Windows NT

1. Select Start > Programs - iPlanet Application Server 6.0 SP1 > Uninstaller. The iPLanet Uninstall Window is displayed. See Figure 2-11.

Figure 2-11 iPlanet Uninstall Window



2. Deselect all components for iPlanet Application Server *except* iPlanet Application Server Enterprise Connector for R/3, then click Uninstall.

   The uninstaller checks for dependencies between subcomponents and the main component. If you try to deselect a component and its subcomponent are toggled on, a warning message appears.

To Deselect the Enterprise Connector for R/3

Deselect items in the following order:

1. Deselect Netscape Server Family Core components.
2. Deselect Administration Services.
3. Deselect Netscape Directory Suite.
4. Deselect UIF 6.0 SP1.

To Deselect the iPlanet Application Server

Deselect items as follows:

1. Highlight the iPlanet Application Server 6.0 SP1 entry.
2. Click the Sub Components button to display the options.

   Deselect options in the following order:
3. Deselect Application Server 6.0 Core Binaries.
4. Deselect Administrator Tool.
5. Deselect Web Connector Plug-in Component.
6. Deselect Deployment Tool.
7. Deselect Core Server Component.

   Click the Continue button to return to the main uninstall menu.

CAUTION If you do not follow the order of deselection above, alert messages are displayed and you may not be able to deselect the desired option

8. Click Uninstall.

   A message is displayed. See Figure 2-12.

Figure 2-12 Uninstall Message

9. Click OK to complete the uninstallation procedure.

Installing the iPlanet Application Server Enterprise Connector for R/3 on Solaris

The following procedures describe how to install and uninstall the iPlanet Application Server Enterprise Connector for R/3 on a Solaris Operating System.

Pre-installation

1. Insert the iPlanet Application Server Enterprise Connector for R/3 Install CD-ROM into the CD-ROM drive.
2. Mount the CD-ROM, for example, `/cdrom/cdrom0`.
3. Read the README.txt file on the CD-ROM.

To Install the R/3 Connector on Solaris

1. Copy the `Solaris/inssap.tar` file from the CD-ROM into a temporary local directory.
2. Untar the `inssap.tar` file.

   For example: `tar -xvf inssap.tar`
3. Run the `./setup` command

   Follow the instructions of the installation program. During installation, press the following key sequences for:

   `CTRL+B` to back up to the previous screen.

   `CTRL+C` to cancel the installation program. This results in an incomplete installation. To install again, rerun the installation program from the beginning.
4. Figure 2-13 is displayed. Either press enter or type Yes to continue.

Figure 2-13 Welcome Message

5. Enter Yes.

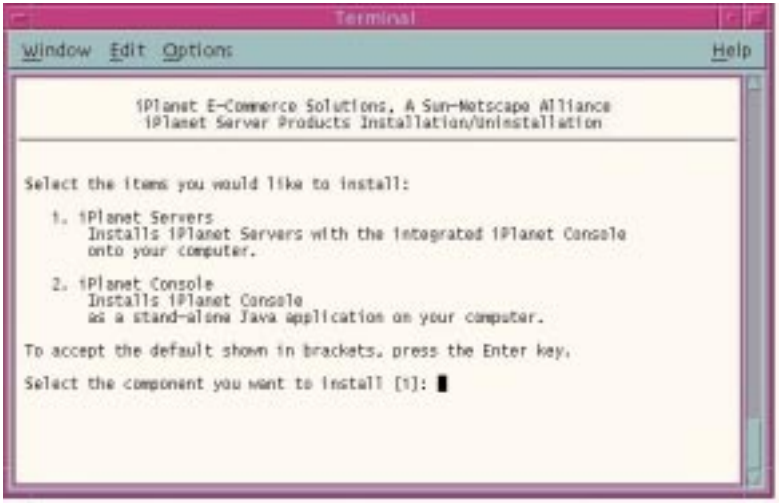
Figure 2-14 is displayed.

Figure 2-14 Software License Agreement

6. Thoroughly read and understand the licensing information before installing, and then enter Yes.

   Figure 2-15 is displayed.

Figure 2-15 Component Selection

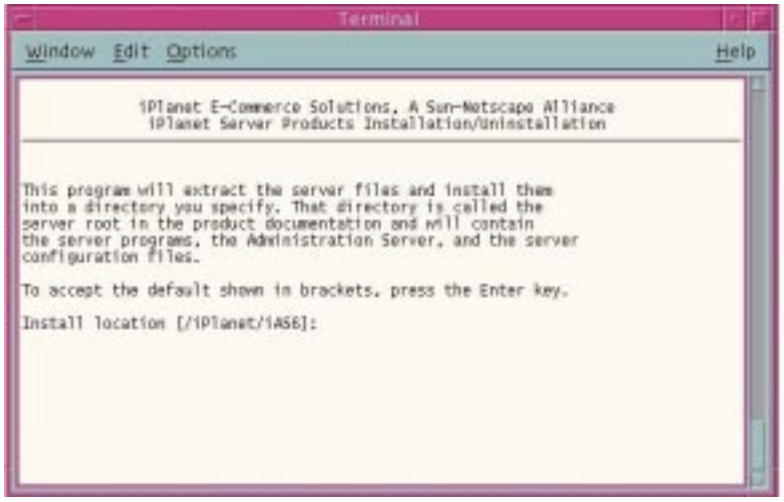


7. Press Enter.

NOTE The iPlanet Application Server and UIF must already be resident on your system. You must perform this step to proceed with the connector installation.

Figure 2-16 is displayed.

Figure 2-16 Location of Installation

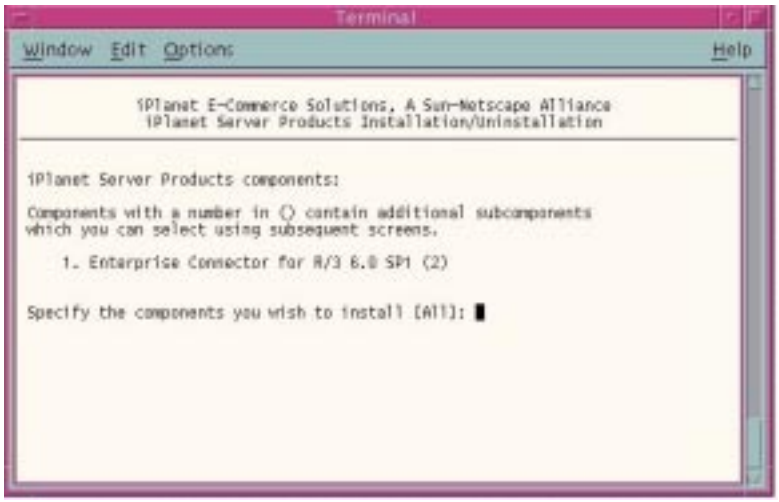


8. To accept the default shown in the brackets, press Enter.

Otherwise, type in the required iPlanet Application Server installation directory, and then press Enter.

Figure 2-17 is displayed.

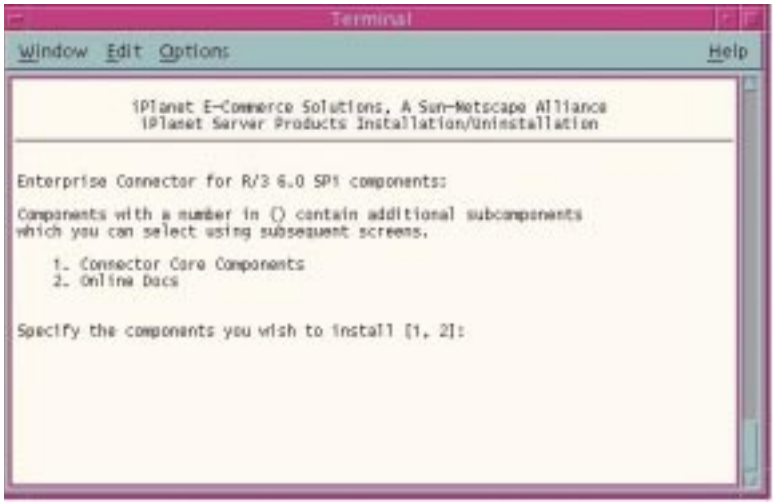
Figure 2-17 Components to Install



9. Press Enter.

Figure 2-18 is displayed.

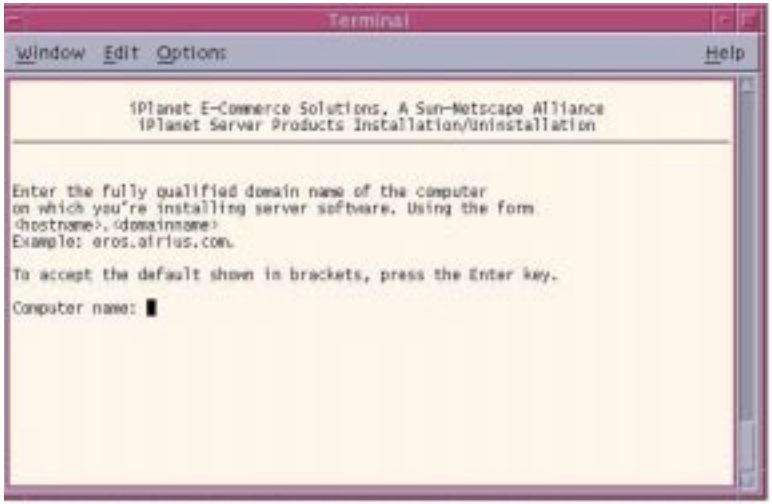
Figure 2-18 Additional Components



10. Press Enter.

Figure 2-19 is displayed.

Figure 2-19 Domain Name Selection



11. Click Enter to accept the default or enter another name `<host.domain.com>`.

Figure 2-20 is displayed.

Figure 2-20 System User Selection

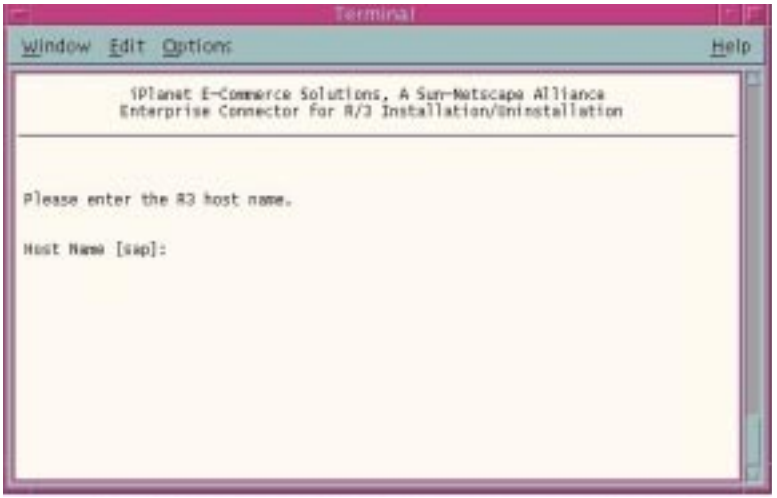
12. To accept the default shown in brackets, press Enter.

Figure 2-21 is displayed.

Figure 2-21 System Group Selection

13. To accept the default shown in brackets, press Enter. Figure 2-22 is displayed. See Table 3-2 in Chapter 3 for a description of the parameters for the following screens.

Figure 2-22 Host Name Selection



14. Enter the Host Name.

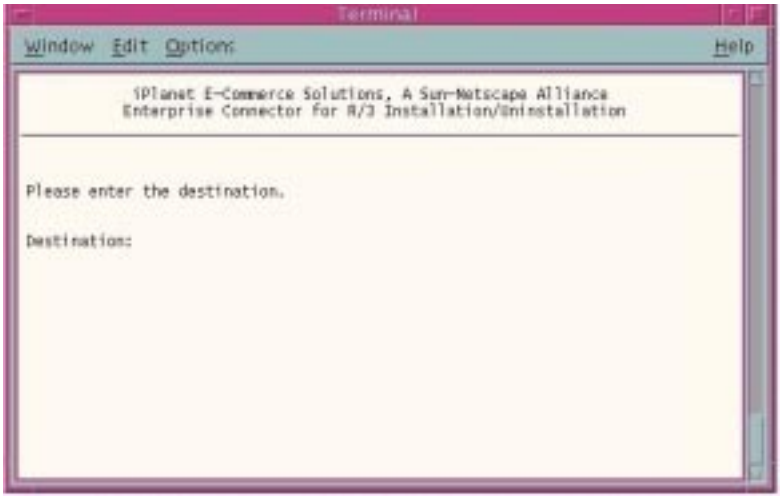
Figure 2-23 is displayed.

Figure 2-23 System Number Selection

15. Type in the System Number.

Figure 2-24 is displayed.

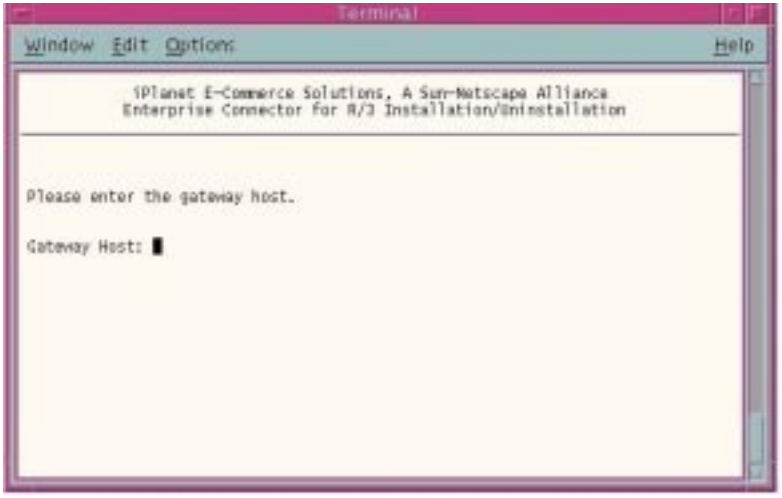
Figure 2-24 Destination Entry



16. Enter the destination.

Figure 2-25 is displayed.

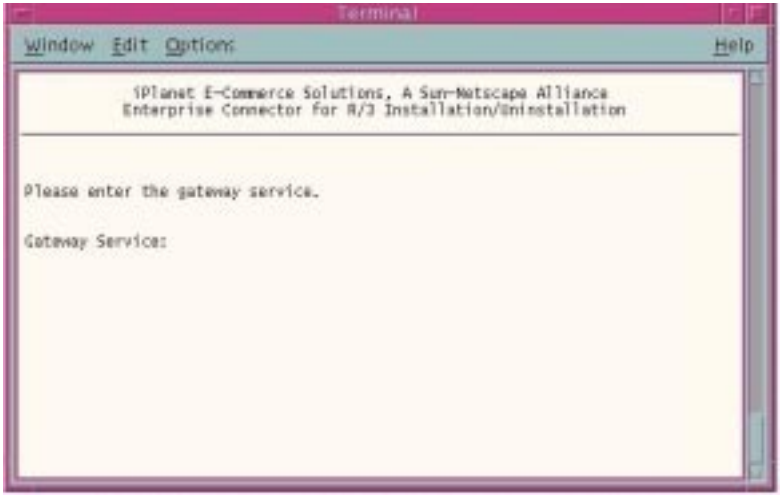
Figure 2-25 Gateway Host Configuration



17. Enter the Gateway Host. The Gateway Host is an optional parameter.

Figure 2-26 is displayed.

Figure 2-26 Gateway Service Configuration



18. Press Enter or enter the Gateway Service.

Figure 2-27 is displayed.

Figure 2-27 System Name Configuration:

19. Enter the System Name. The System Name is used for the Load Balancing option.

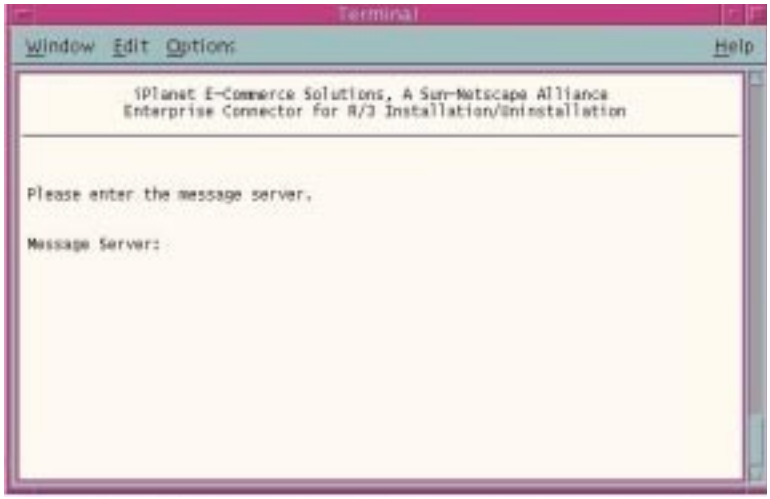
Figure 2-28 is displayed.

Figure 2-28 Group Name Configuration

20. Enter the Group Name. The Group Name is used for the Load Balancing option.

Figure 2-29 is displayed.

Figure 2-29 Message Server Configuration



21. Enter the Message Server. The Message Server is used for the Load Balancing option.

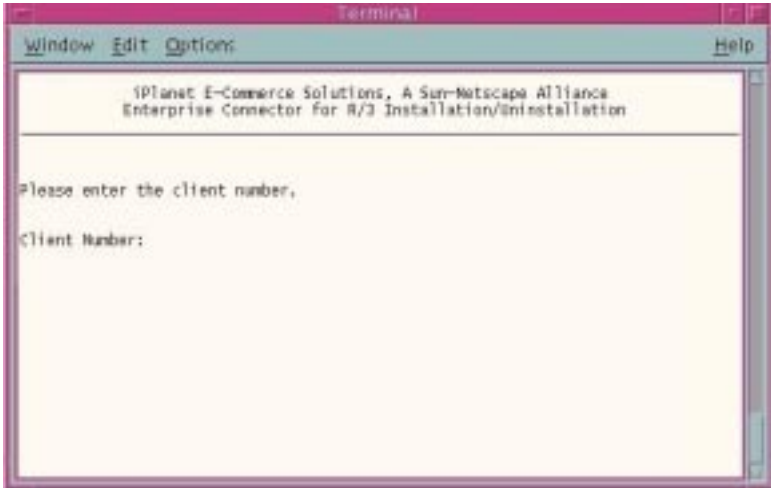
Figure 2-30 is displayed.

Figure 2-30 Load Balancing Option

22. Enter Y for Load Balancing or N for no load balancing.

Figure 2-31 is displayed.

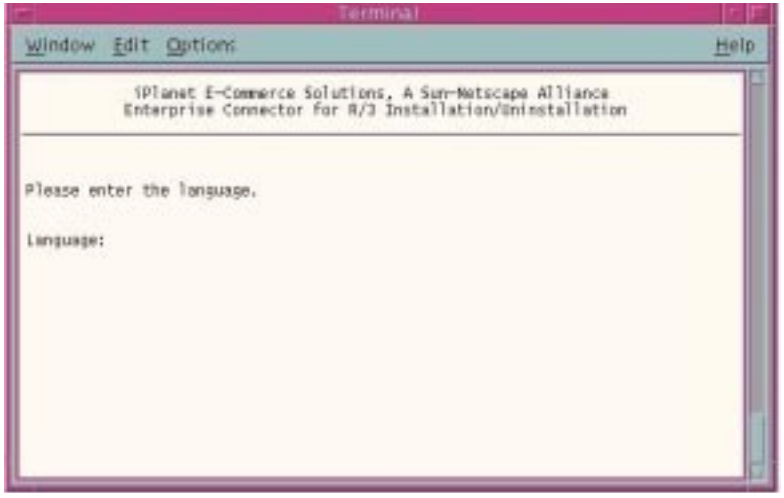
Figure 2-31 Client Number Entry



23. Enter the Client Number.

Figure 2-32 is displayed.

Figure 2-32 Language Selection



24. Enter the R/3 Language Code, for example EN for English.

Figure 2-33 is displayed.

Figure 2-33 User ID Entry

25. Enter the User ID to connect to R/3.

Figure 2-34 is displayed.

Figure 2-34 Password Entry

26. Enter the Password.

Figure 2-35 is displayed.

Figure 2-35 Configuration Termination

27. Press Enter to continue.

NOTE After successful installation you can run the samples. Refer to Chapter 4 in the *iPlanet Application Server Enterprise Connector for R/3 Developer's Guide.*

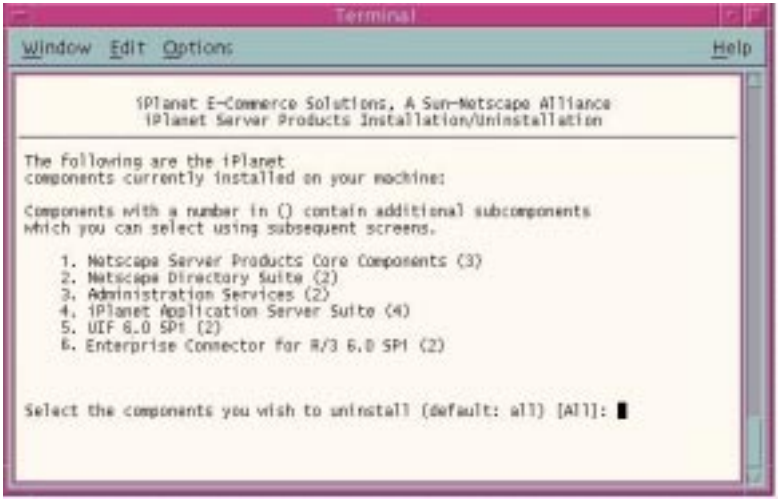
To Uninstall the R/3 Connector from Solaris

1. Go to the installation directory, */user/iplanet/ias6* and enter the following command:

```
./uninstall
```

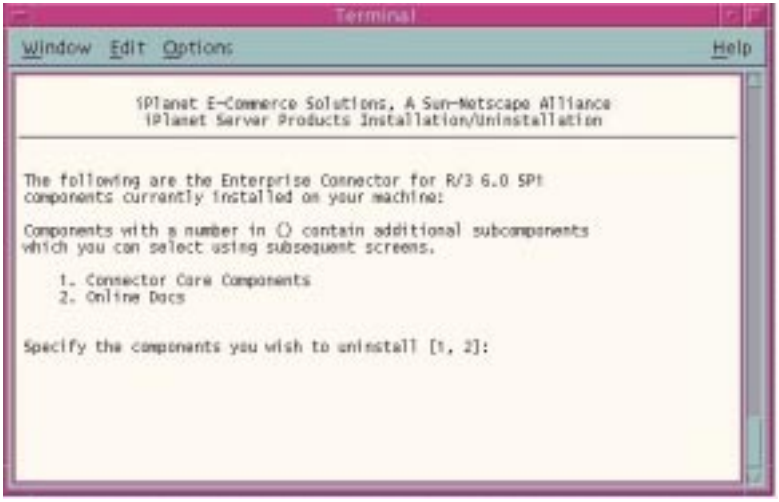
A list of uninstall options appears. Figure 2-36 is displayed.

Figure 2-36 Uninstalling Components.



2. Select the specific product components you want to uninstall and click Enter. Figure 2-37 is displayed. Press Enter to uninstall all R/3 subcomponents.

Figure 2-37 Uninstalling R/3 Subcomponents.



Upgrading or Reinstalling Issues

If upgrading an earlier version or reinstalling the current version of the iPlanet Application Server Enterprise Connector for R/3, the installation procedure overwrites the currently installed files. Uninstalling the current version is not required.

Installation of multiple enterprise connectors for multiple EISs (CICS, Tuxedo, and PeopleSoft) on the same iPlanet Application Server is allowed.

NOTE	To avoid problems with overwriting files in use, close the iPlanet Application Server before installing any new software. Always backup the current files prior to installation including the UIF Repository content.

Post-Installation Issues

The following issues are described:

- Activating the Samples through NT or Solaris
- Copying Files in Webless Installation
- Launching the Daemon

Activating the Samples through NT or Solaris

After installing the iPlanet Application Server enterprise Connector for R/3 you can verify that your installation succeeded and run the R/3 samples provided.

You can activate R/3 programs that access the R/3 management system by entering a series of commands through your operating system. For more information on how to activate and run the R/3 samples, see Chapter 4 of the *iPlanet Application Server Enterprise Connector for R/3 Developer's Guide.*

Copying Files in Webless Installation

In a webless installation, the web server and iPlanet Application Server reside on separate machine. In this configuration mode, the iPlanet Application Server Enterprise Connector for R/3 installation procedure will not automatically copy the index.html file pertaining to connector samples to web server document root directory.

To run the samples shipped with the R/3 Enterprise Connector, an index.html file must be copied manually from the iPlanet Application Server instance to web server instance.

To Copy Files to Run the Program Samples

1. Create the R3Samples directory under the web server document root directory.

   For example, `<iWS installdir>/docs/R3Samples`.

2. Copy the `index.html` file from `<iASrootdir>/ias/APPS/adapters/htmldocs/sap/R3Samples` directory to `<iWS installdir>/docs/R3Samples` directory on web server machine.

Launching the Daemon

To start working with the iPlanet Application Server Enterprise Connector for R/3, you must run the *startR3worker* process. The startR3worker process invokes the daemon. See "High-level System Architecture" on page 21.

To Launch the Daemon

- At the terminal prompt enter the following command line:

  ```
  startR3worker.sh start
  ```

or

- on Windows NT, select Start > iPLanet Application Server 6.0 SP1 > R/3 Connector Server > Start Worker Process.

Troubleshooting

The following problem may occur when installing the iPlanet Application Server Enterprise Connector for R/3 on the Solaris.

Problem

When the system is restarted between the installation of the iPlanet Application Server UIF and the R/3 Enterprise Connector, you may receive a segmentation fault during installation of the core components.

This may happen because the following temporary file is lost during the restart process:

```
/tmp/install.ini.iplanet
```

Workaround

Perform the following tasks:

1. Open the following file:

   ```
   /tmp/install.ini.iplanet
   ```

2. Add the following lines:

   ```
   [BSP]
   ServerRoot    <exact path of the iplanet/ias6 directory>
   ```

Chapter 3

Managing Data

This chapter describes how to use the Management Console and the Repository Browser to manage and view your data.

This chapter contains information about the following topics:

- The Management Console
- The Repository Browser

The Management Console

Each connector has an interactive Management Console Tool. The Management Console is typically used by the data source administrator and consists of two groups of functions:

- Tasks that are used to process and browse data and functions from Enterprise System metadata:
  - data mining
  - browsing archived XML files
  - creating new data sources
- User management that establishes relationships between the web and back-end users.

To Enter the Management Console from Windows NT

- Select Start>Programs>iPlanet Application Server 6.0>R3 Connector 6.0-Management Console.

To Enter the Management Console from Solaris

1. Enter the following directory:

   cd <iPlanet>/ias/APPS/bin

2. Enter the following command:

   R3console.sh

Figure 3-1 R/3 Management Console

Management Console Functions

The Tasks tab is used to perform the following tasks:

- Data Mining
- Browse Archived XMLs
- Create New Data Source
- Edit Data Source

The R/3 User Management tab is used to perform the following task:

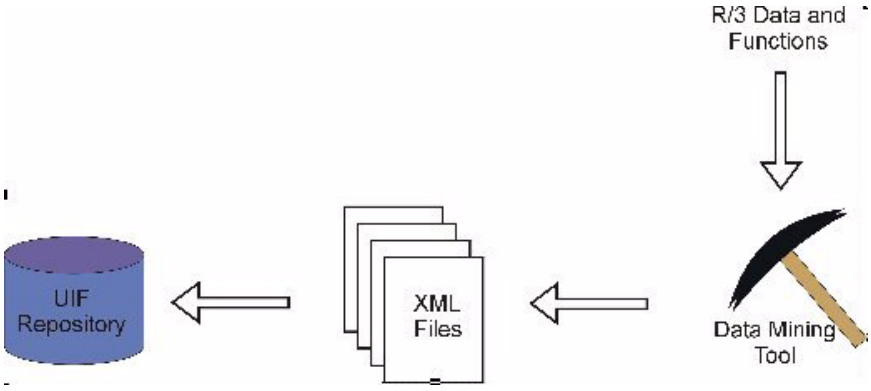
- Mapping User Privileges

The Mapping User Privileges function enables you to group users by mapping web-users to R/3 users.

The Data Mining Tool

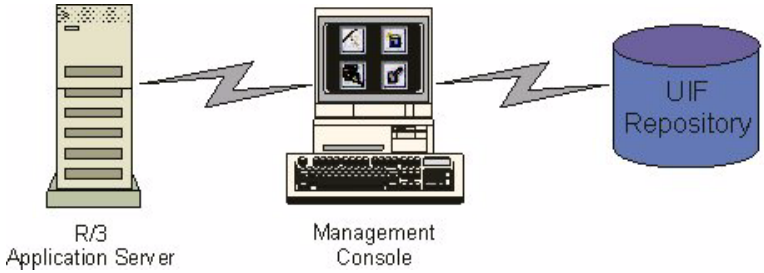
The Data Mining Tool uses a common cross-platform format, eXtensible Markup Language (XML), to populate the repository by taking back-end information and converting it to XML. The XML is then stored in the UIF Repository in a specific structure that can be browsed when necessary. See Figure 3-2.

Figure 3-2 Mining Tool



The Data Mining Tool enables you to examine or analyze data and extract functions and parameters from the back-end system. The iPlanet Application Server user can then utilize (call) these functions. The elements of the Data Mining Tool are shown in Figure 3-3.

Figure 3-3 Data Mining Elements



The Data Mining Tool uses a search criteria to query the R/3 system. You then select a function or multiple functions to be mined. Based on your search criteria, data is extracted from the R/3 system, converted to XML file(s), and loaded into the data repository.

Data Mining Processes

The following lists the processes that are part of the Data Mining Tool:

- Choosing the Data Source
- Inputting Search Criteria
- Choosing R/3 Functions

Accessing the Data Mining Tool

The Data Mining Tool in the iPlanet Application Server Enterprise Connector for R/3 is accessed through the Management Console.

To Enter the Data Mining Tool

1. Enter the R/3 Management Console as described in The Management Console.
2. In the Tasks tab, select the Data Mining icon. Figure 3-4 is displayed:

Figure 3-4 Choose Data Source Window

Choosing the Data Source

The data source contains all the information needed to connect to the R/3 system, and stores all the function objects.

To Choose the Data Source

1. Select the data source from the list.

   For information about the data source that the Data Mining Tool accesses, click Details.

2. If you do not want to view the data source details, continue to Inputting Search Criteria.

Data Source Details

The Data Source Details window contains a description of the data source, as seen in Figure 3-5.

Figure 3-5 DataSource Details Window

The DataSource Details window contains information in read only view about the following:

- Back-end Character Set
- Default User Information
- Connection Parameters
- Pooling Parameters

The Back-end Character Set field is used to specify the character set the R/3 back-end server is using. The Back-end Character Set's default value is ISO_8859-1 (US-ASCII).

If you are running the iPlanet Application Server in International Mode and the back-end server's character set is not ISO_8859-1, set this parameter accordingly, otherwise use the default setting. When editing or creating a new data source, select the appropriate character set from the drop down list provided.

The following tables list and define fields in the DataSource Details Window:

The Default User Information area is used by the Management Console to connect to the R/3 system.

Table 3-1 Default User Information

Variable	Definition
Client	Client number.
User Name	R/3 user name.
Language	Language used by the Management Console. EN is English, DE is German. For other languages, consult the R/3 Guides.

The Connection Parameters area contains information needed to connect to the R/3 system. The system may be set up for Load Balancing (accessing different R/3 Servers) based on load or non-load balancing.

The parameters required for Load Balancing are indicated as such.

Table 3-2 Connection Parameters

Variable	Definition
Host Name	R/3 Application Server Host Name.
System No	System number of the R/3 application server. Zero (0) is the default.
Gateway Host	The Host Name where the gateway services are running.
Gateway Service	The gateway service used by the host.
Msg Server	Host name of the R/3 Message Server as it is known by the iPlanet Application Server Enterprise Connector for R/3, or the R/3 router. (Used for Load Balancing.)
System Name	Name of the primary R/3 system that the iPlanet Application Server Enterprise Connector for R/3 communicates with. The name consists of three alphanumeric characters. (Used for Load Balancing.)
Group Name	Name of thelogon group which consists of a set of R/3 Application Servers for Load Balancing.

Table 3-2 Connection Parameters *(Continued)*

Load Balancing	To enable this parameter, click in the check box.
R/3 Trace	The R/3 Trace parameter is a diagnostic (debugging) tool in the R/3 software. Enabling this parameter influences software reaction intervals and generates a log file (dev_frc.trc). This log file aids in the debugging task. To enable this parameter, click in the check box.

The Pooling Parameters area describe the configuration of the R/3 connection pool. The parameters are set by the system administrator.

Table 3-3 Pooling Parameters

Variable	Definition
Max Pool Size	Maximum number of connections in the pool.
Max Wait	Maximum interval time set that the connection pool waits in between connections.
Monitor Interval	Time period set between monitoring the connection pool.
Steady Pool Size	The desired number of connections available at any one time.
Unused Max Life	Time interval set for an unused connection. When the set time has elapsed, the connection is closed.
Debug Level	Determines type of message logging, as described by the following choices: 0: Logging turned off 1: Logs only callback messages. 2: Logs all messages.

Inputting Search Criteria

The Input window is used to enter in search criteria for choosing function names. You can enter function names with asterisks to be used as wildcards, for example BAPI* as seen in Figure 3-6.

To Input Search Criteria

- In the Input window, type in the search criteria and click OK.

Figure 3-6 Input Window

The Choose R/3 Function window displays. See Figure 3-7. The search criteria begins when you click OK.

Choosing R/3 Functions

The functions list contains all the function objects.

To Choose the R/3 Functions

Select the R/3 function or multiple functions to be activated from the list generated, as seen in Figure 3-7.

You can perform the following Data Mining tasks after you choose the R/3 function:

- Load into Repository (default)
- Save XML
- Archive XML

Figure 3-7 Choose R/3 Function

NOTES When you load a selection(s) into a repository, you must select the Save XML check box to save the generated XML. The operation is finished when the progress indicator disappears.

You can select one or multiple check boxes.

Load into Repository (default)

The Load into Repository option is used to load a function or multiple functions into the repository. An XML file is created and erased in the process. This option is the system default setting.

Save XML

This option is used to store a selected function, or multiple functions, in an XML file. The file can then be loaded into the repository.

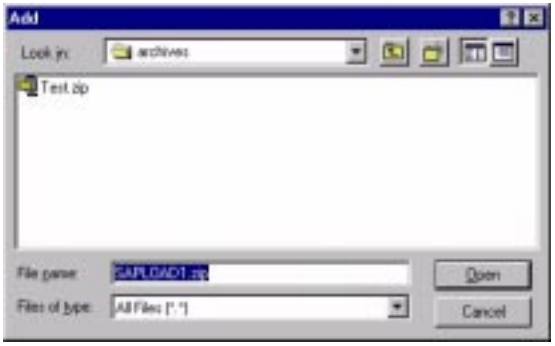
Archive XML

This option is used to store a selected function, or multiple functions, as an XML file in zip format. The file can be loaded into the repository. The name of the default zip file is `<data source name>.zip` and is located under the following path: `<root>/apps/archives`.

To Archive the Functions

- Type in a file name or click Open to accept the default directory. See Figure 3-8.

Figure 3-8 Add Window



Several progress screens appear until the process terminates.

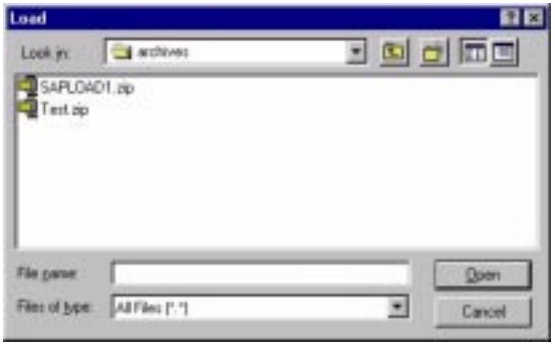
Browsing Archived XMLs

This option is used to view XML files that have been archived (zipped).

To Browse Archived XMLs

1. Click the Browse Archived XMLs icon to display a list of archived functions in zip format. See Figure 3-9.

Figure 3-9 Load Archived Functions Window

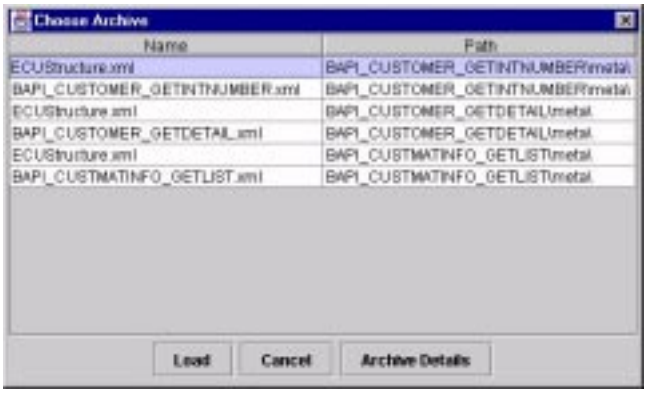


2. Select the required archive.

3. Click Open.

   The Choose Archive window is displayed.

Figure 3-10 Choose Archive Window



The Choose Archive window lists the name of the archived XML file and its path.

To load a function, highlight it and click Load. The function is then loaded into the repository.

Archiving Details

The Archive Details option enables you to view the XML file in a simple viewer.

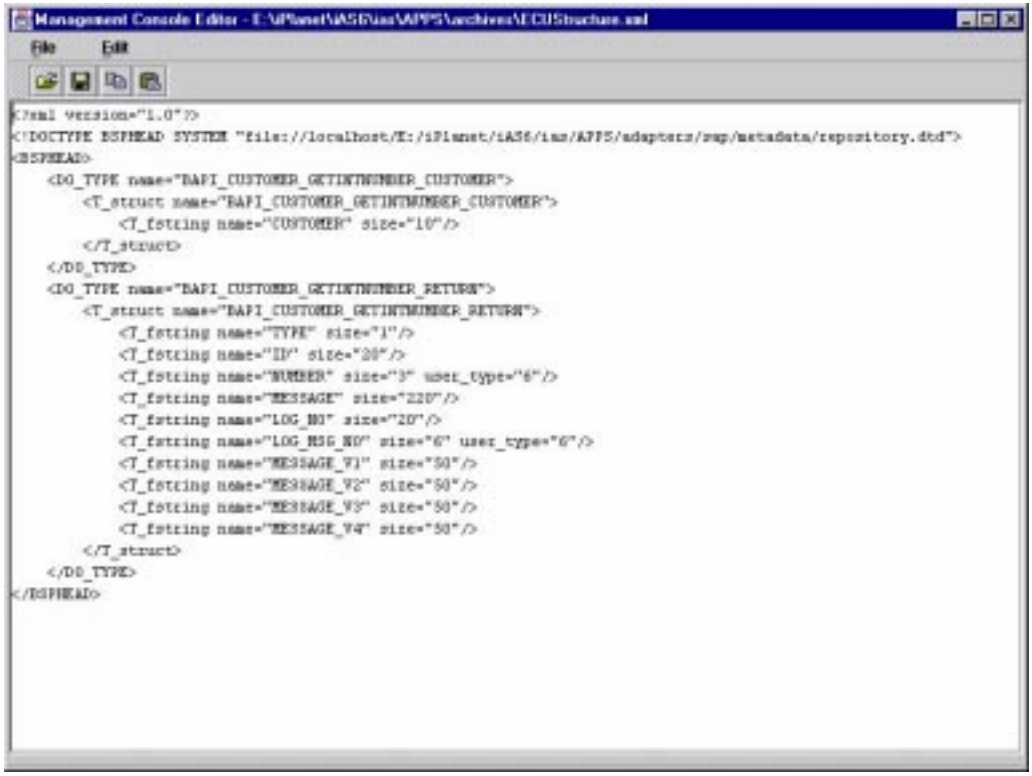
To View an XML File for a Given Function

1. Select the function.

   The name of the XML file is the same as the name of the function.

2. Click Archive Details. The XML file is displayed as shown in Figure 3-11.

Figure 3-11 Typical XML File



Creating a New Data Source

The data source contains all the information needed to connect to the R/3 system, and stores all the function objects. In addition, the data source determines which system to mine, and where to place the function objects.

To Create a New Data Source

1. On the R/3 Management Console, click the Create New Data source icon to display the Create New Data Source details window, see Figure 3-12.

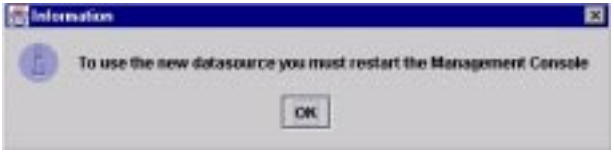
Figure 3-12 Create New Data Source Window

The Create New Data Source window contains fields for entering information about Creating the Data Source, Default User Information, Connection Parameters, and Pooling Parameters. For a description of these parameters see Data Source Details.

2. Enter new values are necessary and click OK.

   The new data source is created and a message displays informing you that must restart the Management Console to use the newly created data source. See Figure 3-13.

Figure 3-13 New Data Source Information Message



3. Click OK, and manually restart the Management Console.

Editing a Data Source

This option is used to edit an existing data source.

To Edit a Data Source

1. Click the Edit Data Source icon to display the Choose Data Source window. See Figure 3-14.

Figure 3-14 Choose Data Source Window

2. Select the data source and click OK to display the Edit Data Source window, see Figure 3-15.

Figure 3-15 Edit Data Source Window

3. Type changes in the text boxes, and then click OK.

   The changes are made in the repository.

4. Restart the Management Console.

Mapping User Privileges

The R/3 User Management function enables the administrator to assign access privileges to the back-end system. There are two separate user identity domains: Web users and Enterprise System users. An incoming request has a specific web user identity associated with it. The web identity needs to be mapped to an R/3 user identity specific to the data source.

The mapped web identity is passed between client and server, which the connector then uses for interaction with R/3.

The user mapping service maintains user mapping tables. There are two distinct tables:

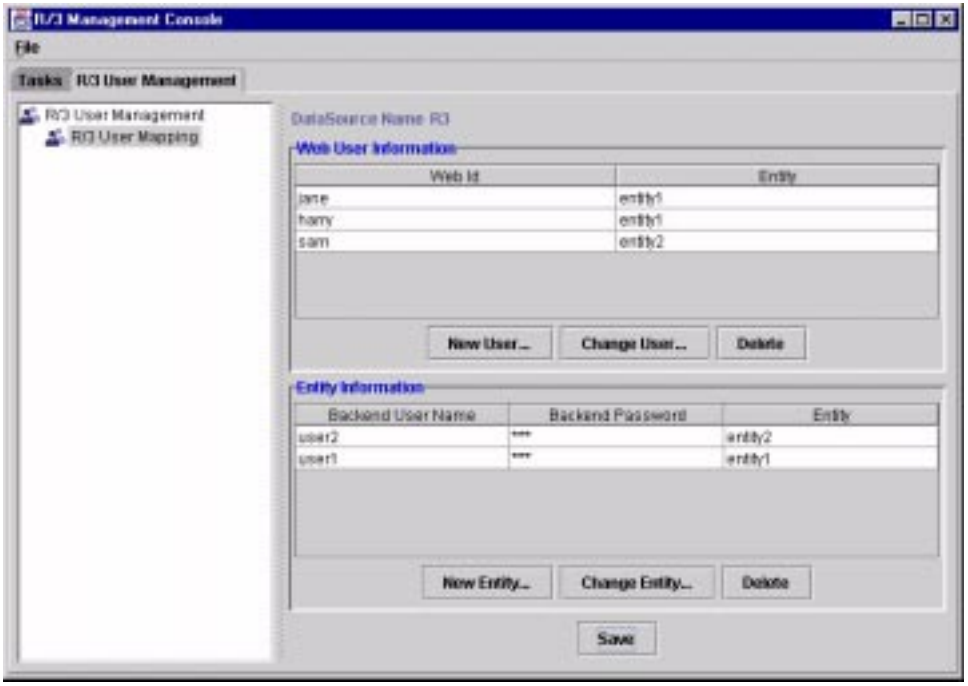
- Enterprise System user identities
- Web to Enterprise System mappings

The mapping service provides the connector with methods to determine the Enterprise System identity, given a web-identity, as per the mapping tables opened using the Management Console. The Enterprise System user table is populated using the Data Mining Tool in the Management Console. The data source administrator can populate the user mapping table interactively, through the Management Console.

To Perform User Mapping

1. From the R/3 Management Console window, click the R/3 User Management tab.
2. Click on the R/3 User Mapping node. Figure 3-17 is displayed.

Figure 3-16 R/3 User Management Tab



The tree view represents the general topics available. The browser view displays the details of the node selected. The Choose Data Source Window is displayed.

3. Select a data source.

   The Web and Entity Information appear for the selected data source.

Using the Web User Information area you can:

- Add a new user
- Change a user
- Delete a user

Using the Entity Information area you can:

- Add a new entity
- Change an entity
- Delete an entity

To save your changes click Save.

Web User Information

The Web User Information area is used to map a web user identity to a back-end user identity. The administrator assigns an entity name for the web users. The Web ID is used by the server to enable users to move freely across multiple systems. The administrator assigns Entity Information prior to the Web User Information, since the web user must be mapped to an entity.

Table 3-4 lists and defines fields in the Web User Information area:

Table 3-4 Web User Information Parameters

Parameter Name	Definition
Web ID	ID assigned to users on the system.
Entity Name	Name of the assigned back-end user. The naming convention is dependent upon the database type used.

To Add a Web User

1. Click New User.

   The Web User Information window is displayed. See Figure 3-17.

Figure 3-17 Web User Information Window

2. Type in the Web ID.
3. Select an Entity Name from the available names.
4. Click OK when finished to return to the main window.

To Change a Web User

1. Click Change User.

2. Edit the desired field.
3. Click OK when finished, to return to the main window.

To Delete a Web User

1. Select the web user.
2. Click Delete.

The web user is deleted and you are returned to the main window.

Entity Information

The Entity Information area is used to list data about back-end entities assigned to the web users, as follows:

Table 3-5 Entity Information Parameters

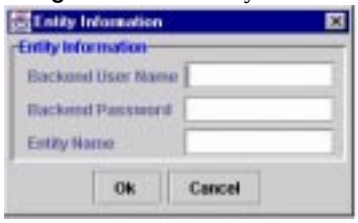
Back-end User Name	Name of the back-end user.
Back-end Password	The Back-end Password, assigned by the user.
Entity	Back-end entity name, assigned by the system administrator.

To Add an Entity

1. To add a new back-end entity, click New Entity.

   The Entity Information window is displayed. See Figure 3-18.

Figure 3-18 Entity Information Window



2. Enter the Entity information.
3. Click OK.

   The new entity information is displayed in the Entity Information area of the window.

To Change Entity Information

1. Click Change Entity.
2. Edit the desired field(s).
3. Click OK.

   The edited entity is displayed in the Entity Information area of the window.

To Delete an Entity

1. Select the entity.
2. Click Delete.

NOTE You cannot delete an entity that has associated web users. Change or delete the web users before trying to delete an entity.

When you have completed all actions in the Entity Information window, click Save. All your additions and changes are saved to the system.

The Repository Browser

All the definitions for the connector using the Management Console are saved in a repository. The Repository Browser is the Graphical User Interface to the repository and is used only for viewing information about the connector. Most management tasks are done using the Management Console.

The Repository Browser contains the following:

- information representing the connection to the back-end system
- all the function objects that you mine from the back-end system
- user mapping information
- connection pools

All of these components are part of a data source.

Although the repository service does not impose any specific organization (schematics) on the repository contents, the UIF runtime requires the contents of the repository to be organized in a specific and well defined way. This organization is the UIF repository schematics. The UIF runtime expects specific information in specific places in the repository hierarchy. Therefore, repository contents are not

supposed to be arbitrarily modified by the user. Contents are modified as part of the specific administration activities controlled by the Management Console, which allows the administrator to use the import and export functions appropriately. In addition, the UIF runtime service runs a consistency check on repository contents at startup.

Repository Browser Functions

The following functions are available in the Repository Browser:

- Import — allows you import XML files into the repository
- Export — allows you export XML files from the repository
- Delete — deletes nodes from the data structure in the repository
- Refresh — refreshes the Repository Browser display
- Import Root — imports an XML file and creates the root node

Loading Data Into the Repository Browser

There are two ways to load data into the Repository Browser. You can either load the data automatically into the Repository Browser via the Management Console, or you can manually load the XML file using the Import function.

To Access the Repository Browser from NT

- Select Start > Programs> iPlanet Application Server > iAS UIF 6.0 SP1 Repository Browser

  The Repository Browser is displayed. See Figure 3-19.

To Access the Repository Browser from Solaris

1. Enter the following command line:

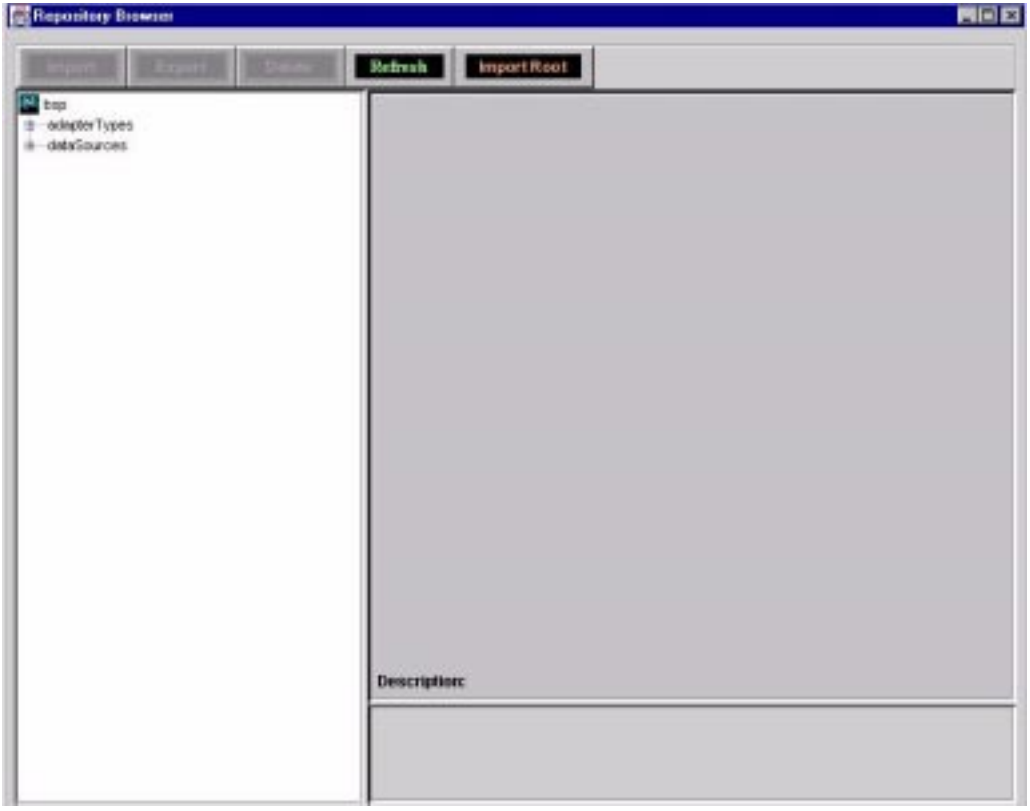
```
cd iplanet/ias6/ias/APPS/bin
```

2. Enter the following:

   ./bspbrowser.sh

   The Repository Browser is displayed. See Figure 3-19.

Figure 3-19 Repository Browser



The Repository Browser is divided into two panes. When you open the browser the left pane displays nodes containing the adapter (connector) types and data sources. These nodes are hierarchical and can be expanded to show details of the data structure and function objects. The right pane displays the properties of the node selected in the left pane.

For a more detailed description of the node contents, refer to the *iPlanet Application Server Enterprise Connector for R/3 Developer's Guide.*

The Repository Data Structure

The Repository Browser contains the following nodes that are installed automatically when you install the UIF:

- root node
- adapterTypes
- dataSources

adapterTypes

The adapterTypes node contains a default data structure for each type of connector that is installed. The adapterTypes section contains one subtree entry per adapter. The entry contains common definitions, which form the basis for defining data sources on the connector.

dataSources

The dataSources node contains a default dataSource structure that is set when you install a connector. You can define several data sources for each adapterType. The dataSource section contains subtree entries, each of which is a logical UIF data source. A data source corresponds to a specific back-end Enterprise System and is supported by the corresponding adapterType.

The data source definition activity is tightly controlled by the Management Console. There are two distinct user roles: the data source administrator and the application developer. The data source administrator is responsible for creating and administering data source entries, while the application developer develops applications that access these data sources.

A data source definition is usually heavily pre configured by the data source administrator. The application developer usually uses pre configured function objects, much like EJBs would be used with the deployment descriptor already set. This substantially isolates the application developer from the back-end specific interaction issues. See the *iPlanet Application Server Enterprise Connector for R/3 Developer's Guide* for more information about programming applications.

To Import XML Files

1. Select Import.

Figure 3-20 is displayed.

Figure 3-20 Import Database Window

2. Enter the XML filename that you want to import and click OK.

To Export XML Files

1. Select Export.

   Figure 3-21 is displayed.

Figure 3-21 Export DataBase Window

2. Enter the XML filename that you want to import and click OK.

To Delete Nodes

1. Select Delete.
2. Select the Node you want to delete

   A warning message is displayed.
3. Click OK.

   The display in the Repository Browser is updated with current data.

To Refresh the Display of Repository Contents

- Click Refresh.

To Import the Root Node into the Repository Contents

1. Click Import Root.

   The Import Database window is displayed as shown in Figure 3-20.

2. Enter the XML filename to import and click OK.

   The root node and its contents are imported into the repository.

Chapter 4

Configuring the Application

This chapter is intended for administrators who configure operational parameters that support the UIF for the iPlanet Application Server Enterprise Connector for R/3. Most configuration parameters are stored in the UIF repository. The R/3 Management Console enables you to modify these parameters.

This chapter describes pooling concepts when you set up a pooling configuration node in the UIF repository.

The chapter contains information about the following topics:

- About Pooling
- Bind Durations
- Pooling Configuration

About Pooling

Pooling enables you to share resources. In the UIF, pools are used to share connections to a back-end system from the iPlanet Application Server. Service providers allocate and reuse connections from pools to avoid unnecessary creation and destruction of connections to the back-end. Pools are defined in the Repository on a per-data-source basis. This means that each data source defines its own connection pool, which can be individually configured.

An object in a UIF pool represents a connection to a back-end system. Each pool contains a specified maximum number of objects to constrain the maximum number of simultaneous connections. A pool typically holds a number of objects that represent the number of connections in a steady state.

When an iPlanet Application Server application enables a service provider, the connector attempts to obtain a connection object from the pool.

If the maximum number has been reached and no object is available after a specified waiting period, the request times out. The time-out period can be configured.

If a pool object remains unused for a period of time, the object is destroyed. You can specify how long to wait before the object is destroyed.

The use and longevity of pool objects are monitored by a thread that executes periodically. You can specify the intervals after which the monitor thread executes. Typically, the thread executes more frequently than the waiting period before an object is destroyed. However, setting the monitor interval too small can degrade performance. You specify the frequency in the `MonitorInterval` node of the pooling connection; for more information see Pooling Configuration.

Bind Durations

A pooled connection is bound to a servlet for a specified period of time, called a bind duration, which is specified in a service provider type. Typically, a bind duration is only for the length of time it takes to execute the method requiring the connection although some operations, such as beginning a transaction, may require a longer bind duration.

UIF supports three bind durations. Table 4-1 lists and describes bind durations.

Table 4-1 Bind Durations

Bind Duration	Description
method-bound-poolable	The pooled connection is bound for the duration of the method call.
sp-bound-poolable	The pooled connection is bound for the life of the service provider; the connection is then returned to the pool.
not-poolable	The connection is not poolable. The connection is bound for the life of the service provider and is destroyed when the service provider is destroyed.

Bind durations are specified in the repository. The following example shows that the <adaptor>Conn service provider type's bind duration is method-bound-poolable:

```
serviceProviderTypes

<adaptor>Conn

bindDuration string method-bound-poolable
```

Bind Duration Escalation

The bind duration may be changed dynamically by the connector. For example, at the beginning of a transaction, a connector may escalate the bind duration from method-bound to sp-bound, and then reset the bind duration to method-bound at the end of the transcation.

Bind Duration Time-outs

An sp-bound connection cannot be used by another service provider until the connection has been released by the first service provider. If the first service provider does not release the connection in a timely manner, a time-out occurs and the connection is forcibly released and returned to the pool. The time-out prevents a "runaway" service provider that failed to call disable() from keeping the connection indefinitely.

Pooling Configuration

You specify the pooling configuration for a service provider by specifying the Pooling configuration characteristics in the repository. Table 4-2 lists and defines Pooling Configuration characteristics.

Table 4-2 Pooling Configuration Characteristics

Variable	Definition
MaxPoolSize	The maximum number of objects allowed in the pool. For example, if the pooled objects are host connections, set this number to the peak number of connections available to the server. If the number of objects is less than MaxPoolSize but exceeds SteadyPoolSize, objects are destroyed 3 seconds after they are returned to the pool.
SteadyPoolSize	The number of unused objects that are kept in the pool until they time out. For example, if the pooled objects are host connections, set SteadyPoolSize to the steady state (RMS) number of connections available from the host server.
MaxWait	The maximum time, in seconds, that a request for a physical object is held in the queue before the request times out and is destroyed.
UnusedMaxLife	The maximum time, in seconds, that a physical object remains unused in the pool. After this time, the physical object is destroyed.

Table 4-2 Pooling Configuration Characteristics *(Continued)*

Monitor Interval	Optional) The time interval, in seconds, after which a thread is executed to monitor the current status of the pool. Default is 30 seconds. Typically, setting this number too low degrades performance, but it should be set to a number less than UnusedMaxLife.
DebugLevel	(Optional) Determines type of message logging, as described by the following choices: 0: Logging turned off. 1: Logs only callback messages. 2: Logs all messages.

The example below is used to show a "generic" pool, for specific information about the connector. The following entries define the pool configuration for the <adapter>Conn service provider:

```
pools
        <adapter>Pool
           sptype reference
           bsp.adapterTypes.<adapter>.serviceProviderTypes.r3Conn
           config:do
              DebugLevel integer 1
              MaxPoolSize integer 20
              MaxWait integer 3
              MonitorInterval integer 10
              SteadyPoolSize integer 10
              UnusedMaxLife integer 300
```

Glossary

API (Application Programming Interface) Software that an application utilizes to carry out and request lower-level services by the operating system. In addition, a set of standard software data formats that application programs use to initiate contacts with other programs, computers, and systems.

Applet A Java program that can be distributed as an attachment in a World Wide Web document and executed in a Java-enabled web browser.

Applications Programmer Responsible for writing servlets or EJBs that call the UIF API. Uses the Repository Browser to determine the available data types and access methods.

Array Object Contains data objects or primitive values as elements in the object. Array elements must be homogeneous. Each element within the array object is referred to by an integer that specifies its position in the array object.

Attribute Field Attributes that describe allowable attributes for the field where the input and output are located.

CICS (Customer Information Control System) An IBM communications program designed to allow transactions entered at a remote site to be processed concurrently by a mainframe host.

Connection Parameters Contains information needed to connect to the R/3 system.

Daemon A program that is not explicitly invoked, and remains idle until summoned (called on).

Data Block Describes the input and output of operations. The data block can only contain two structures: input and output. All input and output structures contain fields that can be only one of the following types: primitive, structure, or array.

Data Object Used by the UIF to represent data or metadata in a generic fashion. Data objects are used to exchange data between a servlet and the UIF, and between the UIF and the connector.

Data Source Contains all the information needed to connect to the R/3 system, and stores all the function objects. In addition, the Data Source determines which system to mine, and where to place the function objects.

Deployment Deploying an application includes installing all of the application's files, and registering all of its components on the destination server. You deploy an application using the Deployment Tool, a separate tool accessible from the iPlanet Application Server. An application must be deployed before it can be used.

EJB (Enterprise Java Beans) A server-side component architecture for writing reusable business logic and portable enterprise applications. They are written entirely in Java and run on any EJB compliant server. They are operating system, platform, and middleware independent, thereby preventing vendor lock-in.

EIS (Enterprise Information System) Referred to as a backend system.

Enterprise Connector The component in iPlanet Application Server Enterprise Connector for R/3, PeopleSoft, Tuxedo, or CICS that enables you to access the appropriate backend system.

ERP (Enterprise Resource Planning) A multi-module software system that supports enterprise resource planning. An ERP system typically includes a relational database and applications for managing purchasing, inventory, personnel, customer service, shipping, financial planning, and other important aspects of the business.

Function Object A group of business methods available for execution on the specific enterprise server. These objects are derived from metadata mined from the enterprise server that share a common state.

Group Name Name of the specific group of application servers. For load-balancing only.

iPlanet Application Server) The iPlanet Application Server provides the most robust e-commerce platform for delivering innovative and leading-edge application services to a broad range of servers, clients, and devices.

iWS (iPlanet Web Server) A web server that is ideally suited to the Java development community for use as the development and test platform for web applications.

Java An object-oriented programming language developed by Sun Microsystems, Inc. to create executable content (i.e, self-running applications) that can be easily distributed through networks like the Internet.

Load Balancing Load Balancing is the configuration of a computer system, network, or disk subsystem to more evenly distribute the data and/or processing across available resources in order to increase the speed and reliability of transmissions.

MsgServer Host name of the message server. For load-balancing connection only.

Operations Directory A directory with operations that contain data blocks and property sets.

Primitive Object A data type that contains a single value of an integer, float, double, fixed-length string, or variable-length string.

Repository A specialized structure where all the module's functions are stored for the use of the iPlanet Application Server Enterprise Connector.

Repository Browser The component that enables you to browse data (content) in the repository, and to view the available functions (input and output parameters) for the backend system.

Runtime Object The entry point into the UIF.

Service Provider Object The logical representation of a connection to a back-end system, which must be enabled before it can be used. Typically, the service provider object is not bound to a physical connection until absolutely necessary.

Server Tier The server tier is represented by an application server and optionally a web server such as the iPlanet Web Server Enterprise Edition. The server tier houses the business logic (Enterprise Java Beans of your application servlets), and provides scalability, high availability load balancing, and integration with a variety of data sources.

Servlet An applet that runs on a server, usually meaning a Java applet that runs on a Web server.

Structure Object Contains other data objects or primitive values whose fields are heterogeneous such as as fields, and whose fields are heterogeneous. Each object within the structure object is referred to by a string that represents the field name. Field names have a maximum length of 32 characters.

System Name The system name used. For load-balancing connection only.

Three-tier Application Model A model of an application system that is composed of the following three tiers: Client, Server, and Backend (EIS).

Type Information Objects Structured objects that contain the type information of a data object; i.e. definition of the fields in a structure and the fields corresponding data types. Instances of data objects can be created of type information objects. Each of these instances contain a reference to a type of information object. Numerous data types can share the same type information object.

UIF (Unified Integration Framework) An application programming framework that provides a single Application Programming Interface (API) to access different backend systems.

URL (Universal Resource Locator) An address for a resource or site (usually a directory or file) on the World Wide Web, and the convention that web browsers use for locating files and other remote services.

XML (eXtensible Markup Language) A common cross-platform format document used to populate a repository.

Worker A worker is an out-of-process unthreaded procedure. The conversation to the backend system is done by the worker process. The worker returns the results to the connector using the proprietary protocol.

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