BEA Tuxedo®

Installing the BEA Tuxedo System

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Installing the BEA Tuxedo System

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About This Document

This document explains how to install the BEA Tuxedo® system software on both Windows and UNIX systems. The BEA Tuxedo system is a framework for distributed online transaction processing applications.

This document includes the following sections:

- Chapter 1, "Preparing to Install the BEA Tuxedo System," covers what you need to know and do before installing BEA Tuxedo.
- Chapter 2, "Installing BEA Tuxedo Using GUI-Mode Installation," describes how to install the BEA Tuxedo software on Windows and UNIX systems using a graphical user interface.
- Chapter 3, "Installing BEA Tuxedo on UNIX Systems Using Console-Mode Installation," discusses how to install BEA Tuxedo on UNIX systems using a text-based interface.
- Chapter 4, "Installing BEA Tuxedo Using Silent Installation," describes how to install BEA Tuxedo without user intervention by using a template file during the installation process.
- Chapter 5, "Upgrading the BEA Tuxedo System to Release 8.0," provides procedures for upgrading your BEA WebLogic Enterprise or BEA Tuxedo application to BEA Tuxedo 8.0 using both simple and hot upgrade procedures.
- Chapter 6, "Performing Post-Installation Tasks," describes the directory structure after you finish the installation. It also explains how to configure the installation, verify the installation, and uninstall the BEA Tuxedo software.
- Chapter 7, "Starting the BEA Tuxedo Administration Console," provides the system requirements for the Console, describes how to set up the environment, and explains how to start and exit the Console.

- Appendix A, “BEA Tuxedo 8.0 Platform Data Sheets,” provides platform-specific information for the platforms on which the BEA Tuxedo system is supported.
- Appendix B, “BEA Jolt 8.0 Preparations,” provides prerequisites and preparatory information for installing the BEA Jolt software components.
- Appendix C, “File and Database Management and Disk Space Allocation,” describes BEA Tuxedo file and database management and provides guidelines for allocating disk space for a BEA Tuxedo application.
- Appendix D, “IPC Resource Configuration on a UNIX System,” describes the interprocess communication (IPC) parameters on a UNIX system and provides guidelines for configuring them.

What You Need to Know

This document is written for system administrators or application developers who are installing the BEA Tuxedo software. It is assumed that readers have a general understanding of the Windows and UNIX operating systems and the workstation platforms on which the BEA Tuxedo system runs.

e-docs Web Site

BEA product documentation is available on the BEA corporate Web site. From the BEA Home page, click on Product Documentation or go directly to the “e-docs” Product Documentation page at http://e-docs.bea.com.

How to Print the Document

You can print a copy of this document from a Web browser, one file at a time, by using the File→Print option on your Web browser.

A PDF version of this document is available on the BEA Tuxedo documentation Home page on the e-docs Web site (and also on the documentation CD). You can open the PDF in Adobe Acrobat Reader and print the entire document (or a portion of it) in book format. To access the PDFs, open the BEA Tuxedo documentation Home page, click Download Documentation, and select the document you want to print.

Adobe Acrobat Reader is available at no charge from the Adobe Web site at http://www.adobe.com.

Contact Us!

Your feedback on BEA documentation is important to us. Send us e-mail at docsupport@bea.com if you have questions or comments. Your comments will be reviewed directly by the BEA professionals who create and update the documentation.

In your e-mail message, please indicate that you are using the documentation for the BEA Tuxedo 8.0 release.

If you have any questions about this version of BEA Tuxedo, or if you have problems installing and running BEA Tuxedo, contact BEA Customer Support through BEA WebSUPPORT at http://www.bea.com. You can also contact Customer Support by using the contact information provided on the Customer Support Card, which is included in the product package.

When contacting Customer Support, be prepared to provide the following information:

- Your name, e-mail address, phone number, and fax number
- Your company name and company address
- Your machine type and authorization codes

- The name and version of the product you are using
- A description of the problem and the content of pertinent error messages

Documentation Conventions

The following documentation conventions are used throughout this document.

Convention	Item
boldface text	Indicates terms defined in the glossary.
Ctrl+Tab	Indicates that you must press two or more keys simultaneously.
italics	Indicates emphasis or book titles.

`monospace text`	Indicates code samples, commands and their options, data structures and their members, data types, directories, and filenames and their extensions. Monospace text also indicates text that you must enter from the keyboard.
	Examples:
	`#include <iostream.h> void main ( ) the pointer psz`
	`chmod u+w *`
	`\tux\data\ap`
	`.doc`
	`tux.doc`
	`BITMAP`
	`float`

`monospace boldface text`	Identifies significant words in code. *Example*: `void` **`commit`** `( )`
`monospace italic text`	Identifies variables in code. *Example*: `String` *`expr`*

Convention	Item
UPPERCASE TEXT	Indicates device names, environment variables, and logical operators. *Examples*: LPT1 SIGNON OR
`{ }`	Indicates a set of choices in a syntax line. The braces themselves should never be typed.

`[ ]`	Indicates optional items in a syntax line. The brackets themselves should never be typed.
	Example:
	`buildobjclient [-v] [-o name ] [-f file-list]...`
	`[-l file-list]...`

`|`	Separates mutually exclusive choices in a syntax line. The symbol itself should never be typed.

`...`	Indicates one of the following in a command line:
	■ That an argument can be repeated several times in a command line
	■ That the statement omits additional optional arguments
	■ That you can enter additional parameters, values, or other information
	The ellipsis itself should never be typed.
	Example:
	`buildobjclient [-v] [-o name ] [-f file-list]...`
	`[-l file-list]...`

. . .	Indicates the omission of items from a code example or from a syntax line. The vertical ellipsis itself should never be typed.

CHAPTER

1 Preparing to Install the BEA Tuxedo System

The following sections provide information that you need to know before installing the BEA Tuxedo product software:

- BEA Installation Program
- BEA Tuxedo Distribution Methods
- BEA Tuxedo Software Components
- Hardware and Software Prerequisites
- Configuring Interprocess Communication Resources
- BEA Home Directory
- Installation Road Map

BEA Installation Program

The BEA Installation program is the BEA standard tool for BEA Tuxedo product installation. Use the BEA Installation program to unpack the BEA Tuxedo archive and install the archive files on the target Windows or UNIX system (machine). The BEA Installation program itself is included with the BEA Tuxedo archive.

Included with the BEA Tuxedo 8.0 install set is the BEA Jolt 8.0 product software, which enables Java clients to call BEA Tuxedo services.

The BEA Installation program supports three installation methods:

- Graphical user interface (GUI) mode installation—for details, see "Installing BEA Tuxedo Using GUI-Mode Installation" on page 2-1.
- Console-mode installation (UNIX systems only)—for details, see "Installing BEA Tuxedo on UNIX Systems Using Console-Mode Installation" on page 3-1.
- Silent installation—for details, see "Installing BEA Tuxedo Using Silent Installation" on page 4-1.

You can use any of these methods to install the BEA Tuxedo 8.0 product software.

BEA Tuxedo Distribution Methods

BEA Tuxedo is distributed on both the Web and CD-ROM.

Web Distribution of BEA Tuxedo

An evaluation copy of BEA Tuxedo 8.0 is available for download from the BEA corporate Web site at the following URL:
`http://commerce.bea.com/downloads/tuxedo.jsp#tuxedo`

When you download BEA Tuxedo, you get a 30-day evaluation license with access for client connections from up to three IP addresses. After the 30-day trial period, you can purchase a development or production license for your BEA Tuxedo product.

BEA Tuxedo 8.0 is distributed as an installer file, which contains the BEA Installation program and the BEA Tuxedo and BEA Jolt archive files. Platform-specific installers for the BEA Tuxedo product software are available for download.

CD-ROM Distribution of BEA Tuxedo

If you purchased BEA Tuxedo from your local sales representative, you will find the following items in the BEA Tuxedo product box:

- Two CD-ROMs:
  - BEA Tuxedo and BEA Jolt product software CD
  - BEA Tuxedo Online Documentation CD
- The following printed documents:
  - "Read-Me-First" card containing an overview of the product box content
  - "Customer Support Quick Reference and Other Important Information" card
  - "BEA Software License and Limited Warranty" pamphlet
  - *BEA Tuxedo Release Notes*
  - *BEA Tuxedo Product Overview*
  - *Installing the BEA Tuxedo System* (this document)

You can also access the BEA Tuxedo Online Documentation at `http://edocs.bea.com/index.html`.

BEA Tuxedo Software Components

BEA Tuxedo 8.0 contains the following components:

- Server components:
  - Application-to-Transaction Monitor Interface (ATMI) server software
  - Common Object Request Broker Architecture (CORBA) C++ server software
  - BEA Jolt 8.0 server software

  - BEA Tuxedo Administration Console software
  - Link-level encryption (LLE) and secure sockets layer (SSL) encryption software

- Client components:
  - BEA Tuxedo Workstation (/WS) client software
  - CORBA C++ client software—includes the C++ client Object Request Broker (ORB) and the environmental objects
  - CORBA Java client software—includes the BEA-branded Java client ORB and the environmental objects
  - BEA Jolt 8.0 client software
  - ActiveX client software for Windows systems—includes the environmental objects and the BEA Application Builder GUI
  - LLE and SSL encryption software

Note: LLE and SSL are available with two levels of encryption: 56-bit and 128-bit. Licenses for the 128-bit client versions of LLE and SSL are available in the United States and Canada. With proper authorization, customers outside the United States and Canada may also acquire licenses with 128-bit encryption enabled. For details, see the BEA Tuxedo *Release Notes*.

Hardware and Software Prerequisites

The BEA Tuxedo software must be installed on each machine that will participate in a BEA Tuxedo application, also known as a Tuxedo domain. A Tuxedo application is a business software program, built on top of the Tuxedo system, that is defined and controlled by a single configuration file: the `UBBCONFIG` file. For more information about BEA Tuxedo applications, see *Setting Up a BEA Tuxedo Application.*

A BEA Tuxedo application consists of one or more clients (local or remote), one or more servers, and one or more machines. In a multimachine BEA Tuxedo application running different releases of the BEA Tuxedo software, the `MASTER` machine—designated in the `RESOURCES` section of the `UBBCONFIG` file—must run the highest release of the BEA Tuxedo software in the application.

Note: We advise against trying to share the BEA Tuxedo system executables across remote file systems; this practice has proven to be unreliable in the past.

System Requirements

The system requirements for BEA Tuxedo 8.0 are given in the following table.

Component	Requirement
Platform*	Any platform identified in Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets."
Hard disk drive	As stated in the data sheet for the target platform in Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets." For additional information about disk space requirements, see Appendix C, "File and Database Management and Disk Space Allocation."
Memory	As stated in the data sheet for the target platform in Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets."

* Microsoft Windows 98 systems support only the BEA Tuxedo Workstation and CORBA client components. They do not support the BEA Tuxedo server components and the BEA Tuxedo Administration Console.

For BEA Jolt preparatory information, see Appendix B, "BEA Jolt 8.0 Preparations."

Note: Before installing BEA Tuxedo software on a UNIX system, we recommend that you repartition your hard disk device in accordance with Appendix C, "File and Database Management and Disk Space Allocation."

Temporary Storage Space Requirements

The BEA Installation program uses a temporary directory in which it extracts the files from the archive that are needed to install BEA Tuxedo on the target system. During the installation process, your temporary directory must contain sufficient space to accommodate the compressed Java Runtime Environment (JRE) bundled with the installer and an uncompressed copy of the JRE that is expanded into the temporary directory. The installation program moves the JRE from the temporary directory to the *BEA Home directory* at the end of the installation process. For information about the BEA Home directory, see “BEA Home Directory” on page 1-8.

The amount of temporary storage space needed depends upon the target system. A minimum of 46 MB is required.

By default, the installation program uses the temporary directories shown in the following table.

Platform	**Directory**
Windows	Directory referenced by the `TMP` system variable
UNIX	`/tmp`

To ensure there is adequate temporary space, you may want to allocate an alternate directory for use as a temporary directory for the installation. To do so, perform the appropriate step in the following table before starting the BEA Installation program.

On this platform . . .	**Perform this Step . . .**
Windows	Set the `TMP` system variable to a directory of your choice.
UNIX	Enter the following command at the shell prompt: `export IATEMPDIR=`*`tmpdirname`* Replace *`tmpdirname`* with the name of a temporary directory of your choice.

Configuring Interprocess Communication Resources

Interprocess communication (IPC) is a capability supported by the Windows and UNIX operating systems that allows one process to communicate with another process. The processes can be running on the same computer or on different computers connected through a network.

On a Windows 2000 system, the BEA Tuxedo system provides an IPC service called the BEA ProcMGR (Process Manager), which facilitates interprocess communications. You use the BEA ProcMGR service to adjust the IPC parameters and maximize the performance of a BEA Tuxedo application.

On a UNIX system, you use methods native to the UNIX system to adjust the IPC parameters and maximize the performance of a BEA Tuxedo application. Because most UNIX systems are shipped with default values that are too low for a BEA Tuxedo application, you need to adjust the IPC parameters, using the methods given in Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets." For the recommended IPC values, see Appendix D, "IPC Resource Configuration on a UNIX System."

After installing the BEA Tuxedo software and creating an application configuration file (`UBBCONFIG` file), you use the `tmloadcf`(1) command to calculate and print a list of the minimum IPC resources needed to support the application. If your BEA Tuxedo application is distributed, the minimum IPC resources must be available on every machine participating in the application. For more information about calculating IPC resources using the `tmloadcf`(1) command, see "Performing Post-Installation Tasks" on page 6-1.

Note: Before installing BEA Tuxedo software on a UNIX system, we recommend that you adjust the IPC parameters on the target machine in accordance with Appendix D, "IPC Resource Configuration on a UNIX System."

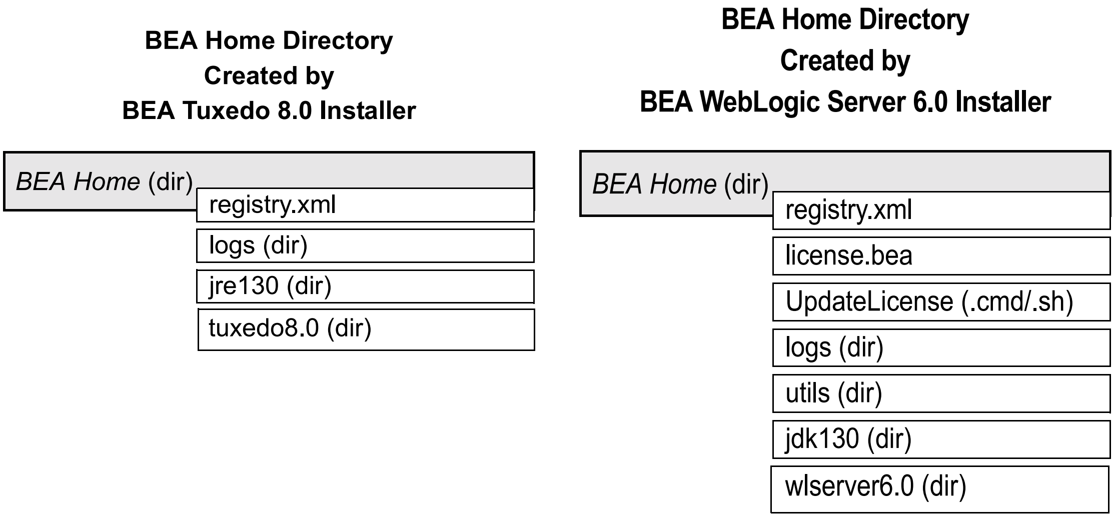
BEA Home Directory

When you install BEA Tuxedo, you are prompted to specify a BEA Home directory. The BEA Home directory is a repository for common files that are used by multiple BEA products installed on the same machine. For this reason, the BEA Home directory can be considered a *central support directory* for the BEA products installed on your system.

The files in the BEA Home directory are essential to ensuring that the BEA software operates correctly on your system. These files perform the following types of functions:

- Ensure that licensing works correctly for the installed BEA products
- Facilitate checking of cross-product dependencies during installation
- Facilitate service pack installation

The following illustration shows the structure of two sample BEA Home directories: one created by the BEA Tuxedo 8.0 installer program and one created by the BEA WebLogic Server 6.0 installer program.



BEA Home Directory Created by BEA Tuxedo 8.0 Installer

BEA Home Directory Created by BEA WebLogic Server 6.0 Installer

Choosing a BEA Home Directory

During the installation of BEA Tuxedo 8.0, you are prompted to choose an existing BEA Home directory or specify a path for a new BEA Home directory. If you choose a BEA Home directory created previously by the BEA WebLogic Server installer, the BEA Tuxedo installer automatically adds the `jre130` directory to the BEA Home directory.

Note: If an administrator installing BEA WebLogic Server 6.0 chooses a BEA Home directory created previously by the BEA Tuxedo 8.0 installer, the BEA WebLogic Server installer automatically adds the following files and directories to the BEA Home directory: `license.bea`, `UpdateLicense`, `utils`, and `jdk130`.

Upon choosing a BEA Home directory, you are prompted to choose a BEA product directory for your BEA Tuxedo installation. You may choose to create your BEA product directory under the BEA Home directory, but there is no requirement to do so.

Understanding the Functions of the BEA Home Directory

The files and directories in the BEA Home directory are described in the following table.

Table 1-1 Files and Directories in a BEA Home Directory

Component	Description
`registry.xml` file	An XML registry file that contains a persistent record of all BEA products installed on the target system. This registry contains product-related information, such as version level, service pack level, and product installation directory.
`logs` directory	A directory containing a BEA Home location file and a history file of installation and uninstallation for the BEA Home directory. For more information about these files, see "Understanding the BEA Tuxedo Shortcuts on a Windows System" on page 2-11.

Table 1-1 Files and Directories in a BEA Home Directory (Continued)

Component	Description
`jre130` directory	A directory containing the 1.3 version of the Java Runtime Environment (JRE). JRE 1.3 provides the Java Virtual Machine, or JVM, required by the BEA Tuxedo installation program. This version of the JRE is included in the BEA Tuxedo 8.0 distribution. It is installed automatically in the BEA Home directory when you install BEA Tuxedo. **Note:** The JRE cannot be used for development. To develop BEA Tuxedo Java client applications, you must ensure that the Java Development Kit (JDK) is installed on your system.
`license.bea` file	Unique to BEA WebLogic Server: an XML-format license file containing the license keys for all BEA WebLogic Server products installed on your system that use the BEA Home directory convention. The first time you install a BEA WebLogic Server product that uses the BEA Home directory convention, the installer program installs a `license.bea` file in the BEA Home directory that you specify during installation. When you install additional BEA products that contain a license file as part of the distribution (such as an evaluation license), the installer program automatically updates the `license.bea` file. To add a permanent license or to update a license file for additional functionality, you must update the `license.bea` file using the `UpdateLicense` utility.
`UpdateLicense` (`.cmd/.sh`)	Unique to BEA WebLogic Server: a command file (Windows) or a shell script (UNIX) that updates the current `license.bea` file with new license sections. The result is a merged license that contains both the existing and new license sections.
`utils` directory	Unique to BEA WebLogic Server: A directory containing utilities that are used to support the installation of BEA WebLogic Server products. The `utils.jar` file contains code that supports the `UpdateLicense` utility.

Table 1-1 Files and Directories in a BEA Home Directory (Continued)

Component	Description
`jdk130` directory	Unique to BEA WebLogic Server: A directory containing the 1.3 version of the Java Development Kit. JDK 1.3 provides the the Java Virtual Machine, or JVM, and tools for compiling and debugging Java applications. This version of the JDK is included in the BEA WebLogic Server 6.0 distribution. It is installed automatically in the BEA Home directory when you install BEA WebLogic Server 6.0.

Creating More than One BEA Home Directory

Although it is possible to create more than one BEA Home directory, we recommend that you avoid doing so. In almost all situations, a single BEA Home directory is sufficient. There may be circumstances, however, in which you prefer to maintain separate development and production environments, each containing a separate product stack. With two directories, you can update your development environment (in a BEA Home directory) without modifying the production environment until you are ready to do so.

Installation Road Map

You are now ready to begin your installation. To install BEA Tuxedo 8.0, see one of the following sections:

- Installing BEA Tuxedo Using GUI-Mode Installation
- Installing BEA Tuxedo on UNIX Systems Using Console-Mode Installation
- Installing BEA Tuxedo Using Silent Installation

If you are upgrading from a 5.1 or pre-5.1 version of BEA WebLogic Enterprise, or from a 7.1 or pre-7.1 version of the BEA Tuxedo system, see "Upgrading the BEA Tuxedo System to Release 8.0."

CHAPTER

2 Installing BEA Tuxedo Using GUI-Mode Installation

The following sections describe how to install BEA Tuxedo by using a graphical user interface (GUI) on both Windows and UNIX systems:

- What Is GUI-Mode Installation?
- Before You Start
- Starting GUI-Mode Installation on a Windows System
- Starting GUI-Mode Installation on a UNIX System
- Running GUI-Mode Installation
- Assigning File Ownership on a UNIX System
- Understanding the BEA Tuxedo Shortcuts on a Windows System
- Understanding the BEA Administration Program on a Windows System
- Reviewing the Windows 2000 Registry Content
- What Do I Do Next?

What Is GUI-Mode Installation?

The graphical user interface mode of installation is the graphics-based method of executing the BEA Installation program. It can be run on both Windows and UNIX systems.

To run GUI-mode installation, the console attached to the machine on which you are installing the software must support a Java-based GUI. All consoles for Windows systems support Java-based GUIs, but not all consoles for UNIX systems do.

Note: To install BEA Tuxedo on a UNIX system with a nongraphics console, see "Installing BEA Tuxedo on UNIX Systems Using Console-Mode Installation" on page 3-1.

Before You Start

If you are upgrading from a 5.1 or pre-5.1 version of WebLogic Enterprise, or from a 7.1 or pre-7.1 version of BEA Tuxedo, see "Upgrading the BEA Tuxedo System to Release 8.0" on page 5-1 and follow the instructions given there. Then return here to continue your BEA Tuxedo installation.

Starting GUI-Mode Installation on a Windows System

To start the GUI-mode installation process on a Windows system, follow these steps:

1. Select a Windows system that meets the hardware and software requirements described in Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets."

   The Windows 98 system supports only BEA Tuxedo client components.

2. Log in to the target machine using the `Administrator` username.

   You need administrative privileges to install BEA Tuxedo server components on a Windows system. If you are going to install only BEA Tuxedo client components, you do not need administrative privileges.

3. Make sure that you have enough free space for the BEA Tuxedo installation.

   For disk space requirements, see Appendix A, “BEA Tuxedo 8.0 Platform Data Sheets.” For important disk space allocation information, see Appendix C, “File and Database Management and Disk Space Allocation.”

4. If you are installing BEA Tuxedo by downloading it from the BEA Web site:

   Go to the directory in which you downloaded the BEA Tuxedo installer specific to your platform and double-click *`filename`*`.exe` file, where *`filename`* is the name of the BEA Tuxedo installer.

   For instructions on completing the installation process, see “Running GUI-Mode Installation” on page 2-5.

5. If you are installing BEA Tuxedo from the CD-ROM:

   a. Insert the BEA Tuxedo CD-ROM into the CD-ROM drive.

   b. Go to the `tux8_new_installer` directory of the mounted CD-ROM.

   c. Double-click *`filename`*`.exe` file, where *`filename`* is the name of the BEA Tuxedo installer specific to your platform. The installation program begins to install BEA Tuxedo.

6. If you are installing on a Windows 2000 machine on which the BEA WebLogic Enterprise software or an older version of the BEA Tuxedo software is installed, the Previous Version Detected! window is displayed. This window contains a message that directs you to exit the installation program and remove the older software before installing BEA Tuxedo 8.0.

   If you choose to remove the older software, see “Additional Upgrade Requirements for Windows 2000” on page 5-4, follow the instructions to remove the older software from your machine, and restart the installation.

   If you prefer not to remove the older software because you want to have two versions installed on your machine, you must observe the guidelines in the following list. (If you do not observe these guidelines, the older software will be rendered unusable and files associated with the older installation, which you may have modified, will be overwritten.)

   a. You must install the BEA Tuxedo 8.0 software in a directory other than the directory in which the BEA WebLogic Enterprise software or the older version of the BEA Tuxedo software is installed.

   b. Before you can use the BEA Tuxedo 8.0 software, you must set the system environment variables to point to the BEA Tuxedo 8.0 software. For instructions about setting environment variables, see "Setting Up Your Environment" on page 6-12.

   c. If you want to revert to using the BEA WebLogic Enterprise software or the older version of the BEA Tuxedo software, you must reset the system environment variables so that they point to the older software.

7. For instructions on completing the installation process, see "Running GUI-Mode Installation" on page 2-5.

Starting GUI-Mode Installation on a UNIX System

To start the GUI-mode installation process on a UNIX system, follow these steps:

1. Select a UNIX system that meets the hardware and software requirements described in Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets."

2. Log in to the target UNIX system using the `root` username.

   You need superuser privileges to mount the BEA Tuxedo CD on a UNIX system. If you are installing BEA Tuxedo by downloading it from the BEA Web site, you do not need superuser privileges.

3. Make sure that you have enough free space for the BEA Tuxedo installation.

   For disk space requirements, see Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets." For important disk space allocation information, see Appendix C, "File and Database Management and Disk Space Allocation."

4. If you are installing BEA Tuxedo by downloading it from the BEA Web site:

a. Go to the directory in which you downloaded the BEA Tuxedo installer specific to your platform.

b. Invoke the installation procedure by entering the following command:

```
sh filename.bin
```

In this command, `filename` is the name of the BEA Tuxedo installer.

For instructions on completing the installation process, see "Running GUI-Mode Installation" on page 2-5.

5. If you are installing BEA Tuxedo from the CD-ROM:

   a. Mount the CD-ROM as a filesystem and insert the BEA Tuxedo CD-ROM into the CD-ROM drive.

   b. Go to the `tux8_new_installer` directory of the mounted CD-ROM.

   c. Invoke the installation procedure by entering the following command:

   ```
   sh filename.bin
   ```

   In this command, `filename` is the name of the BEA Tuxedo installer specific to your platform.

6. For instructions on completing the installation process, see "Running GUI-Mode Installation" on page 2-5.

Running GUI-Mode Installation

The BEA Tuxedo installer program, which is currently available only in English, prompts you to enter specific information about your system and configuration. For instructions on responding to the prompts during installation, see the following table.

In this window . . .	Perform the following action . . .
Introduction	Click Next to proceed with the installation. You may cancel the installation at any time by clicking Exit.

In this window . . .	Perform the following action . . .
License Agreement	Read the BEA Software License Agreement and indicate your acceptance of the terms of the agreement by selecting Yes. The default is No. To continue with the installation, you must accept the terms of the license agreement and then click Next.
Choose Install Set	Select one of four install sets to be installed on your system: Full Installation (the default), Server Install, Client Install, or Jolt Client. For a list of software component for each install set, see "Install Sets" on page A-3. On a Windows 98 system, select either Client Install or Jolt Client from the installation menu. A Windows 98 system cannot be used as a BEA Tuxedo server machine. Select an install set and then click Next to launch the Choose BEA Home Directory window. (Your selection includes the appropriate encryption software for link-level encryption [LLE] and/or secure sockets layer [SSL].) Or select an install set and then click Customize to launch the Customize Install window.

In this window . . .	Perform the following action . . .
Customize Install	Deselect (clear) one or more software components from the selected install set, or choose one of the other three install sets or the Custom Set from the drop-down list menu and customize its software components. Observe the following software component mappings, deselect the software components that you do not want to install, and then click Next to continue with the installation: ■ *Tuxedo Server*—contains ATMI server software; CORBA C++ server software; BEA Jolt server software; and BEA Tuxedo Administration Console software ■ *Tuxedo Client*—contains BEA Tuxedo Workstation (/WS) client software ■ *CORBA Client*—Contains CORBA C++ client software (C++ client ORB), including environmental objects; and CORBA Java client software (BEA-branded Java client ORB), including environmental objects ■ *Jolt Client*—contains BEA Jolt client software ■ *ActiveX Client*—contains the ActiveX client software for Windows systems, including environmental objects and the BEA Application Builder Your selections include the appropriate encryption software for LLE and/or SSL.
Choose BEA Home Directory	Specify the BEA Home directory that will serve as the central support directory for all BEA products installed on the target system. If you already have a BEA Home directory on your system, you can select that directory (recommended) or create a new BEA Home directory. If you choose to create a new directory, the BEA Tuxedo installer program will automatically create the directory for you. For details about the BEA Home directory, see “BEA Home Directory” on page 1-8. Choose a BEA Home directory and then click Next to continue with the installation.

In this window . . .	Perform the following action . . .
Choose Product Directory	Specify the directory in which you want to install the BEA Tuxedo software. You may select the default product directory (`tuxedo8.0`) or create a new product directory. If you choose to create a new directory, the BEA Tuxedo installer will automatically create the directory for you. Choose a product directory and then click Install to start the BEA Tuxedo software installation.
Installing . . .	No user input is required here. The installation program is installing BEA Tuxedo in the user-specified product directory. **Note:** It is normal for the installation progress bar to stop for a fairly long time, especially at the end. The BEA Tuxedo installer is still working when this occurs.
Create Tlisten Password	Enter a `tlisten` password of your choice. Your password must be a string of alphanumeric characters in clear-text format that is no more than 80 characters in length. You use this password to log in to the BEA Tuxedo Administration Console. BEA Tuxedo uses the `tlisten` password to protect the local machine from administrative requests and operations that are *not* authorized. Whenever administrative communications arrive on the local machine through `tlisten(1)` or `wlisten(1)` gateway processes, BEA Tuxedo authenticates them by means of the `tlisten` password. Enter and re-enter a `tlisten` password and then click Next to continue.
SSL Installation Choice	Choose whether or not you want to install SSL support. Choosing to install SSL support is a valid choice only if you have installed CORBA server and/or client software components. ■ If you want to install SSL support, select Yes and then click Next to launch the LDAP Configuration window. ■ If you do not want to install SSL support, select No and then click Next to launch the License Installation Choice window.

In this window . . .	Perform the following action . . .
LDAP Configuration	Enter the Lightweight Directory Access Protocol (LDAP) configuration information needed to support certificate-based authentication when using SSL. BEA Tuxedo 8.0 provides an LDAP-based certificate retrieval mechanism that has been certified for use with the LDAP Directory server included with Netscape Enterprise Server. Enter the following LDAP configuration information and then click Next to continue: ■ Fully qualified domain name of the LDAP server (for example, `pcwiz.mydomain.com`) ■ Number of the port through which the local machine communicates with the LDAP server (for example, `389`) ■ Distinguished name of the base object for search in the LDAP server (for example, `o=beasys.com`) ■ LDAP filter file—By default, this file is *`tux_8.0_prod_dir`*`/udataobj/security/bea_ldap_filter.dat`, where *`tux_8.0_prod_dir`* represents the product directory in which you installed the BEA Tuxedo software
License Installation Choice	Choose whether or not you want to install the BEA Tuxedo product license now: ■ To install the license now, select Yes and then click Next to launch the License File Browser window. ■ To postpone installation of the license until later, select No and then click Next to launch the Install Complete window.

In this window . . .	Perform the following action . . .
Choose License Location Directory	Read the following important information, specify the location of the license file on your machine, and then click Next to continue. ■ There are three types of licenses for the BEA Tuxedo product: a 30-day evaluation license, a development license, and a production license. (When a 30-day evaluation license expires, a customer may decide to buy the BEA Tuxedo product, thus upgrading the evaluation license to a development or production license.) All licenses are delivered with 56-bit encryption enabled by default. Licenses with 128-bit encryption enabled are available but require a separate authorization procedure. ■ After acquiring your license, which is packaged as a file named `lic.txt`, copy the license file to the machine targeted to receive the BEA Tuxedo installation. After you specify the location of the `lic.txt` file during the installation, the BEA Tuxedo installer copies the `lic.txt` file to the *`tux_8.0_prod_dir`*`/udataobj` directory, where *`tux_8.0_prod_dir`* represents the product directory in which you installed the BEA Tuxedo software.
Install Complete	Click Done to exit the installation program.

Congratulations! Your installation of the BEA Tuxedo software is complete!

Assigning File Ownership on a UNIX System

If you installed the BEA Tuxedo software on a UNIX system, we strongly recommend that you create a separate user account for the BEA Tuxedo administrator and give ownership of the BEA Tuxedo files to that account. To change ownership of the BEA Tuxedo software on a UNIX machine, enter the following command:

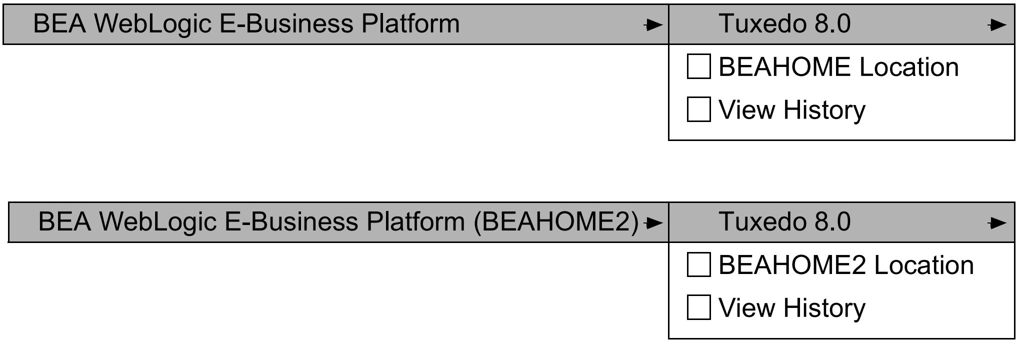
```
chown adm_account full_path_of_tux_8.0_prod_dir
```

Replace *`adm_account`* with the BEA Tuxedo administrator account, and replace *`full_path_of_tux_8.0_prod_dir`* with the full pathname of the product directory in which you installed the BEA Tuxedo software.

Understanding the BEA Tuxedo Shortcuts on a Windows System

When installing the BEA Tuxedo 8.0 software on a Windows system, the installer program automatically uses BEA WebLogic E-Business Platform as the parent folder for BEA Tuxedo 8.0. As additional BEA Home directories are added to the system, the installer program continues to create new BEA WebLogic E-Business Platform folders using the convention shown in the following figure.

Figure 2-1 Tracking Multiple BEA Home Directories on the Same Windows System



Each BEA Home directory has an associated BEA WebLogic E-Business Platform folder. Each BEA WebLogic E-Business Platform folder has an associated Tuxedo 8.0 folder (see note) and two files: BEAHOME*x* Location and View History. The numbers associated with BEAHOME are sequential starting at 2; no number appears if only one BEA Home directory is created on a Windows system.

Note: Because a BEA Home directory may be the home directory for a BEA Tuxedo 8.0 installation, a BEA WebLogic Server 6.0 installation, or both, a BEA WebLogic E-Business Platform folder may contain a Tuxedo 8.0 folder, a WebLogic Server 6.0 folder, or both.

For a given BEA Home directory and BEA WebLogic E-Business Platform folder, the BEAHOME file contains the pathname of the BEA Home directory, and the View History file contains a history of installation and uninstallation for the BEA Home directory. To display the content of either file, double-click the text icon associated with the appropriate file. The BEAHOME and history files contain information extracted from the `logs/log.txt` file located in the BEA Home directory.

The Tuxedo 8.0 folder (Start→Programs→BEA WebLogic E-Business Platform→Tuxedo 8.0) contains the following shortcuts:

- *AppBuilder*—appears even if you did *not* install ActiveX clients. Choosing AppBuilder enables you to enter the full pathname of a BEA Tuxedo IIOP listener. (IIOP is an acronym for *Internet Inter-ORB Protocol*; ORB, for *Object Request Broker*.) For more information about Application Builder, see the appropriate Microsoft documentation.
- *BEAlic*—appears even if you *did* install the BEA Tuxedo product license during the installation. Choosing BEAlic enables you to install the product license (`lic.txt` file) after the installation. For more information about installing the license file, see "Installing the Product License After You Install BEA Tuxedo" on page 6-8.
- *Uninstall Tuxedo 8.0*—choosing Uninstall Tuxedo 8.0 enables you to uninstall the BEA Tuxedo 8.0 software. For more information about uninstalling BEA Tuxedo, see "Uninstalling BEA Tuxedo" on page 6-36.

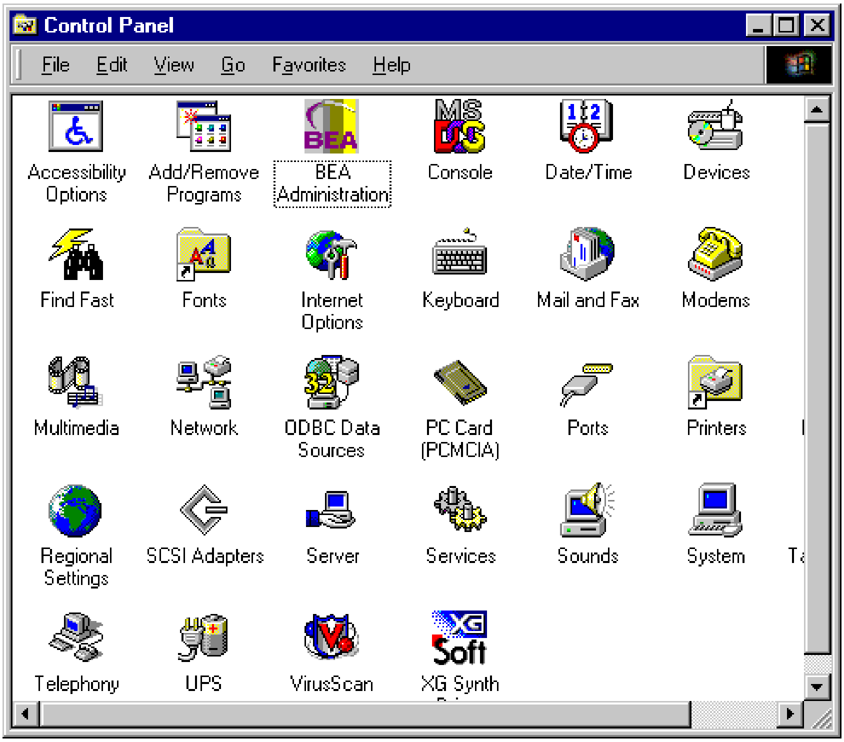
Understanding the BEA Administration Program on a Windows System

In addition to the BEA Tuxedo Administration Console, the BEA Tuxedo 8.0 software for Windows provides a BEA Administration program and two Windows services (Tlisten and BEA procMGR) for configuring the BEA Tuxedo system on a Windows 2000 system. These tools are installed on a Windows 2000 system, however, *only* if the installation included BEA Tuxedo server components.

After you have installed or upgraded the BEA Tuxedo software on a Windows 2000 system, you can use the BEA Administration window to perform the following tasks:

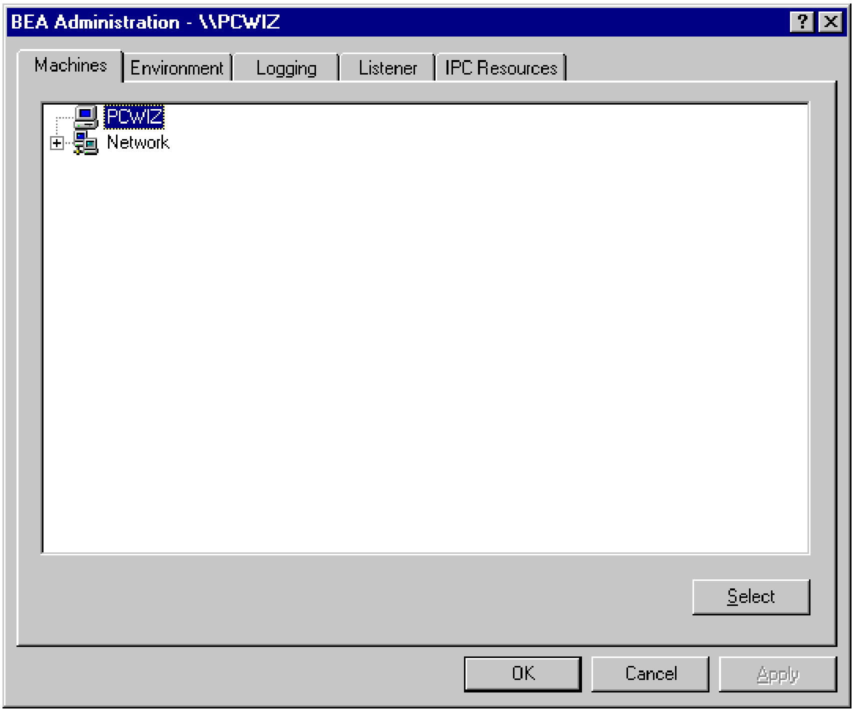
- Accessing Other Machines on the Network
- Setting and Modifying Environment Variables
- Directing System Messages to the Windows 2000 Event Log
- Configuring tlisten Processes to Start Automatically
- Configuring IPC Resources to Maximize System Performance

To access the BEA Administration program, choose Start→Settings→Control Panel to launch the Control Panel.



Then double-click the BEA Administration icon to launch the BEA Administration window.

Figure 2-2 BEA Administration Window with Machines Page Displayed



Accessing Other Machines on the Network

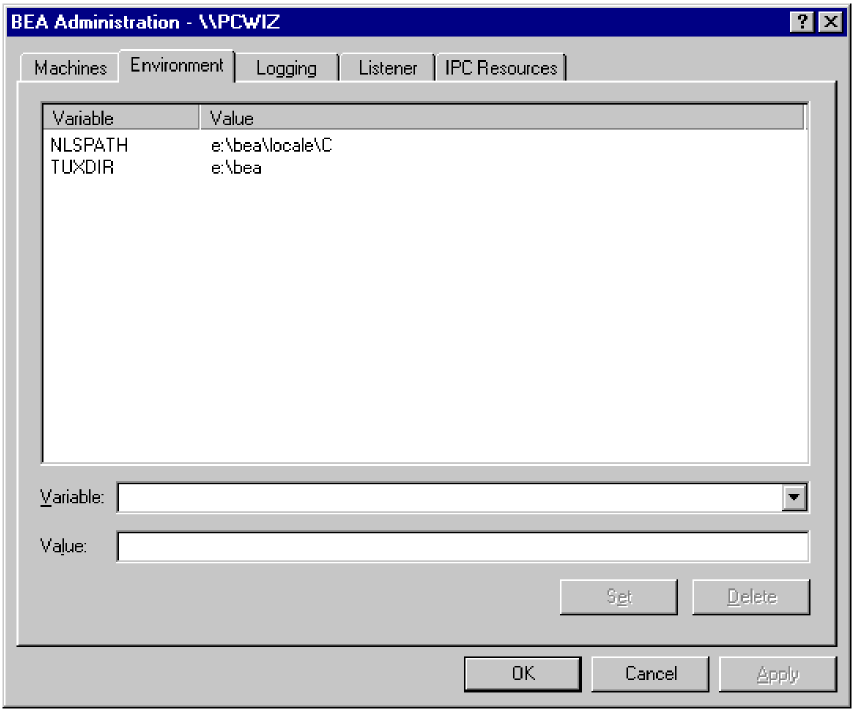
The Machines page enables you, as the BEA Tuxedo system administrator, to access any machine (on which you have login privileges) on the Microsoft Windows Network running Microsoft Windows 2000. You can then perform the following tasks: set environment variables remotely; determine the location of BEA Tuxedo event logging; add, remove, stop, or start `tlisten` services; and tune IPC resources.

To access a remote machine, locate and click the machine's icon on the network tree. If you know a machine's name but not its work group, click Select at the bottom of the Machines page to launch the Enter Machine Name dialog box. Enter the name of the remote machine and click OK. All subsequent actions on other folders in the BEA Administration window will take place on the selected machine.

Setting and Modifying Environment Variables

The Environment page enables you to view, set, or modify BEA Tuxedo environment variables on your Windows 2000 system.

Figure 2-3 BEA Administration Window with Environment Page Displayed



Variable	Value
NLSPATH	e:\bea\locale\C
TUXDIR	e:\bea

Because the BEA Tuxedo installer program does not set or update the system environment during the installation of BEA Tuxedo Release 8.0, no BEA Tuxedo related environment variables initially appear on the Environment page. To find out which environment variables must be set for BEA Tuxedo, see “Setting Up Your Environment” on page 6-12.

To add, modify, or delete environment variables using the Environment page, follow these steps:

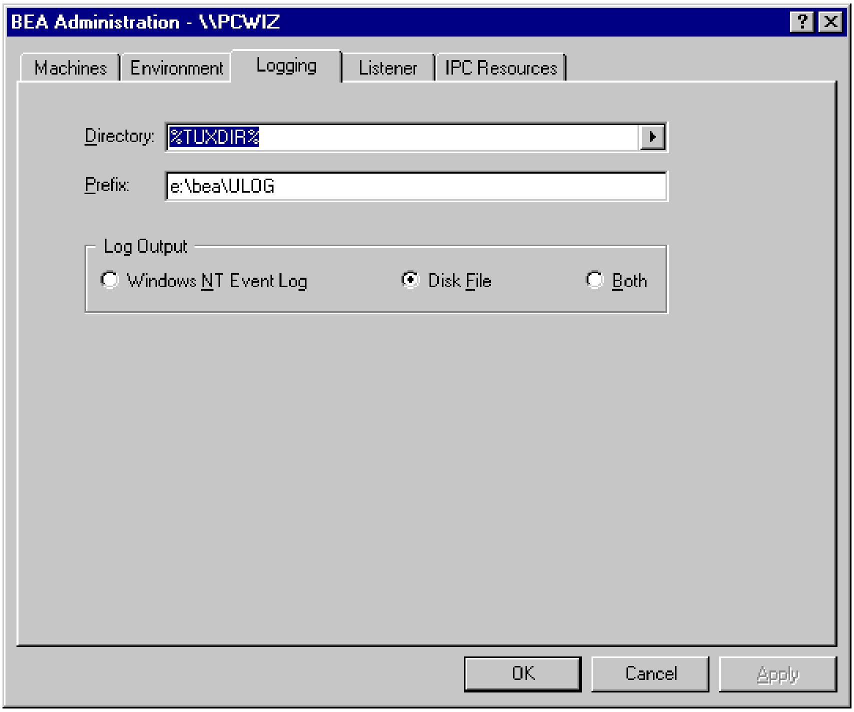
1. To add a variable, enter its name in the Variable field and its value in the Value field, and then click Set.

2. To modify a variable, select the variable, enter its new value in the Value field, and then click Set.
3. To delete a variable, select the variable you want to delete and then click Delete.
4. Click OK or Apply to write your changes to the Windows 2000 Registry.

Directing System Messages to the Windows 2000 Event Log

The Logging page enables you to direct BEA Tuxedo system messages to the Event Log on your Windows 2000 system.

Figure 2-4 BEA Administration Window with Logging Page Displayed



Directory: %TUXDIR%

Prefix: e:\bea\ULOG

Log Output

○ Windows NT Event Log ● Disk File ○ Both

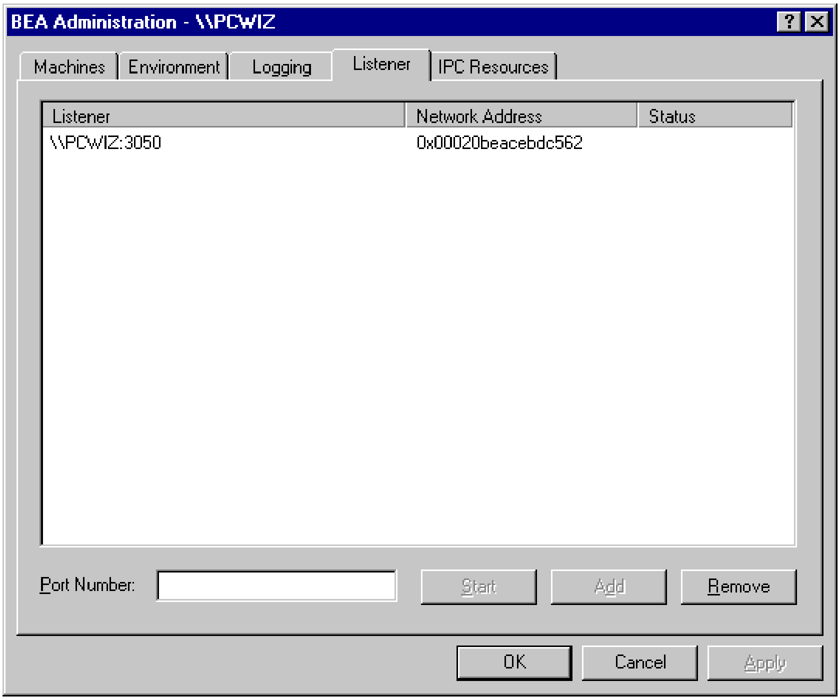
You may select the Event Log option, the traditional user log Disk File option, or both. If you want traditional user log (`ULOG`) messages, select the directory into which `ULOG` messages will be written, as well as the prefix for the filename. The default prefix is `ULOG`, and the default filename is `ULOG.`*`mmddyy`*, where *`mmddyy`* represents the month, day, and year in which the log file was created.

To save your selections to the Windows 2000 Registry, click OK or Apply. To view Event Log entries, click Start→Programs→Administrative Tools→Event Viewer.

Configuring tlisten Processes to Start Automatically

The Listener page enables you to view, create, or modify Tlisten services on your Windows 2000 system.

Figure 2-5 BEA Administration Window with Listener Page Displayed



Listener	Network Address	Status
\\PCWIZ:3050	0x00020beacebdc562	

Port Number:

During the BEA Tuxedo installation, the installer program installed a Tlisten service on your Windows 2000 system. Each time you boot your system, the Tlisten service starts a `tlisten` process on port 3050 of your machine. The password associated with the `tlisten` process is the one you entered during the installation.

A `tlisten` process must be started on each machine of a networked BEA Tuxedo application before the BEA Tuxedo system and application servers can boot. You use the `tlisten` process to perform administrative actions across multiple machines. To learn more about `tlisten` processes, see "Starting the tlisten Process" on page 6-17.

To add, remove, stop, or start Tlisten services using the Listener page, follow these steps:

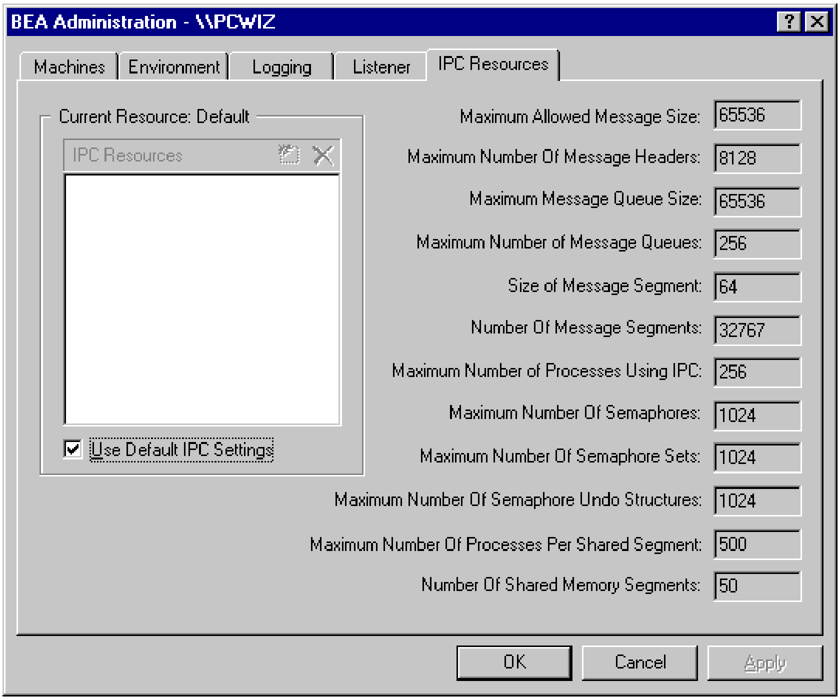
1. To add a Tlisten service, enter a port number in the Port Number field and then click Add. (Generally, you need one `tlisten` process for each BEA Tuxedo application running on your machine.)
2. To remove a Tlisten service, select the Tlisten service you want to delete and then click Remove.
3. To stop a Tlisten service that has been started, select the Tlisten service you want to stop and then click Stop.
4. To start a Tlisten service that has been stopped, select the Tlisten service you want to start and then click Start.
5. Click OK or Apply to write your changes to the Windows 2000 Registry.

In addition to viewing and controlling Tlisten services using the Listener page, you can click Start→Programs→Administrative Tools→Services to launch the Services window and then view and control Tlisten services via the Services window.

Configuring IPC Resources to Maximize System Performance

The IPC Resources page enables you to configure the interprocess communication (IPC) resources on your Windows 2000 system to maximize BEA Tuxedo performance.

Figure 2-6 BEA Administration Window with IPC Resources Page Displayed



Current Resource: Default

☑ Use Default IPC Settings

Maximum Allowed Message Size: 65536

Maximum Number Of Message Headers: 8128

Maximum Message Queue Size: 65536

Maximum Number of Message Queues: 256

Size of Message Segment: 64

Number Of Message Segments: 32767

Maximum Number of Processes Using IPC: 256

Maximum Number Of Semaphores: 1024

Maximum Number Of Semaphore Sets: 1024

Maximum Number Of Semaphore Undo Structures: 1024

Maximum Number Of Processes Per Shared Segment: 500

Number Of Shared Memory Segments: 50

During the BEA Tuxedo installation, the installer program installed a BEA ProcMGR service on your Windows 2000 system. Each time you boot your system, the BEA ProcMGR service configures the IPC resources on your machine to whatever values you set on the IPC Resources page. The values shown in the preceding display are the default IPC values set by the installer program.

On most machines, BEA ProcMGR runs as installed. You have the option, however, of tuning the IPC resources and maximizing performance by using the IPC Resources page. To determine the minimum IPC resource values required for a BEA Tuxedo application, see “Checking IPC Requirements” on page 6-22 and the following table. The following table maps the names of the IPC resources on a Windows 2000 system to the names that are traditionally used on a UNIX system.

Table 2-1 IPC Resource Name Mappings Between Windows and UNIX Systems

Windows 2000 Name	Traditional UNIX Name
Maximum Allowed Message Size	MSGMAX
Maximum Number of Message Headers	*No matching name*
Maximum Message Queue Size	MSGMNB
Maximum Number of Message Queues	MSGMNI
Size of Message Segment	MSGSSZ
Number of Message Segments	MSGSEG
Maximum Number of Processes Using IPC	NPROC
Maximum Number of Semaphores	SEMMNS
Maximum Number of Semaphore Sets	SEMMNI
Maximum Number of Semaphore Undo Structures	SEMMNU
Maximum Number of Processes Per Shared Segment	SHMSEG
Number of Shared Memory Segments	SHMMNI

To modify IPC Resource values using the IPC Resources page, follow these steps:

1. In the Current Resource: Default box, click the Use Default IPC Settings check box to clear it. An insert box appears in the Current Resource: Default box.
2. Click the insert box, enter the name of your Windows 2000 machine, and press Enter.
3. Click the fields next to the IPC resources you want to change and enter the desired values.
4. Click OK or Apply to write your changes to the Windows 2000 Registry.
5. Stop and restart the BEA ProcMGR service to put your changes into effect: click Start→Programs→Administrative Tools→Services to launch the Services window and then stop and restart the BEA ProcMGR via the Services window.

You can view the performance of a running BEA Tuxedo application on the Windows 2000 Performance Monitor. Choose Start→Programs→Administration Tools→Performance Monitor to launch the Performance Monitor window.

Reviewing the Windows 2000 Registry Content

The Windows 2000 Registry is the repository for all hardware, software, and application configuration settings for the Windows 2000 system. During the BEA Tuxedo installation, the installer program writes general installation information as well as IPC Resource values to the Registry. The structure of the Registry relevant to BEA Tuxedo is as follows.

```
HKEY_LOCAL_MACHINE\Software\BEA Systems\Tuxedo\8.0\...
```

- `Developer`
- `Environment`
- `Security`

To view this structure, choose Start→Run to launch the Run dialog box, enter `regEdt32`, and click OK to launch the Registry Editor window.

Developer Key

The Developer key stores product information, including the major and minor version numbers of the release, and user and company names.

Environment Key

The Environment key stores the locations referenced by the BEA Tuxedo environment variables set on your Windows 2000 system. It also stores other values, such as IPC resource settings.

Security Key

The Security key holds the access permissions for BEA Tuxedo processes and services. The following permissions are mandatory:

- Any user who runs `tlisten(1)` must have read access permissions.
- The account under which the BEA ProcMGR service is running must have read access permissions.

We recommend full control permissions for the administrator.

What Do I Do Next?

To configure your BEA Tuxedo software and verify that your software is installed correctly, see “Performing Post-Installation Tasks” on page 6-1.

3 Installing BEA Tuxedo on UNIX Systems Using Console-Mode Installation

The following sections describe how to install BEA Tuxedo using console-mode installation:

- What Is Console-Mode Installation?
- Before You Start
- Starting Console-Mode Installation
- Running Console-Mode Installation
- What Do I Do Next?

What Is Console-Mode Installation?

Console-mode installation is the text-based method of executing the BEA Installation program. It can be run only on UNIX systems and is intended for UNIX systems with nongraphics consoles. Console-mode installation offers the same capabilities as graphics-based installation.

Before You Start

If you are upgrading from a 5.1 or pre-5.1 version of WebLogic Enterprise, or from a 7.1 or pre-7.1 version of BEA Tuxedo, see “Upgrading the BEA Tuxedo System to Release 8.0” on page 5-1, and follow the instructions given there. Then return here to continue your BEA Tuxedo installation.

Starting Console-Mode Installation

To start the console-mode installation process, follow these steps:

1. Select a UNIX system that meets the hardware and software requirements described in Appendix A, “BEA Tuxedo 8.0 Platform Data Sheets.”
2. Log in to the target UNIX system using the root username.

   You need superuser privileges to mount the BEA Tuxedo CD on a UNIX system. If you are installing BEA Tuxedo by downloading it from the BEA Web site, you do not need superuser privileges.
3. Make sure that you have enough free space for the BEA Tuxedo installation.

   For disk space requirements, see Appendix A, “BEA Tuxedo 8.0 Platform Data Sheets.” For important disk space allocation information, see Appendix C, “File and Database Management and Disk Space Allocation.”

4. If you are installing BEA Tuxedo by downloading it from the BEA Web site:

    a. Go to the directory in which you downloaded the BEA Tuxedo installer specific to your platform.

    b. Invoke the installation procedure by entering the following command:

    ```
    sh filename.bin -i console
    ```

    In this command `filename` is the name of the BEA Tuxedo installer.

    For instructions on completing the installation process, see "Running Console-Mode Installation" on page 3-3.

5. If you are installing BEA Tuxedo from the CD-ROM:

    a. Mount the CD-ROM as a filesystem and insert the BEA Tuxedo CD-ROM into the CD-ROM drive.

    b. Go to the `tux8_new_installer` directory of the mounted CD-ROM.

    c. Invoke the installation procedure by entering the following command:

    ```
    sh filename.bin -i console
    ```

    In this command `filename` is the name of the BEA Tuxedo installer specific to your platform.

    For instructions on completing the installation process, see "Running Console-Mode Installation" on page 3-3.

Running Console-Mode Installation

To complete the console-mode installation process, which is currently available only in English, respond to the prompts in each section by entering the number associated with your choice or by pressing Enter to accept the default. To exit the installation process, enter `quit` in response to any prompt. To review or change your selection, enter `back` at the prompt.

<table>
<tr><th>In this section . . .</th><th>Perform the following action . . .</th></tr>
<tr><td>Introduction</td><td>Press Enter to continue with the installation process.</td></tr>
<tr><td>License Agreement</td><td>Read the BEA Software License Agreement and indicate your acceptance or rejection of the terms of the agreement by entering Y or N, respectively, at the prompt. To review the entire agreement, you must press Enter several times. To proceed with the installation, you must enter Y to indicate your agreement with the terms of the license. If you enter N, the following warning is displayed:
<pre>
Warning:
If you do not accept the licensing terms you will not be
allowed to continue with the install.

DO YOU AGREE WITH THE TERMS OF THE LICENSE? (Y/N):
</pre>
If you enter N, the installation process terminates.</td></tr>
<tr><td>Choose Install Set</td><td>Select the install set that you want installed on your system. The following choices are displayed:
<pre>
===

Choose Install Set

Please Choose the Install Set to be installed by this
installer.

  ->1- Full Installation
    2- Server Install
    3- Client Install
    4- Jolt Client

ENTER THE NUMBER FOR THE INSTALL SET, OR <ENTER> TO
ACCEPT THE DEFAULT:

===
</pre>
For a list of software components for each install set, see “Install Sets” on page A-3.
On a Windows 98 system, enter either 3 (Client Install) or 4 (Jolt Client). A Windows 98 system cannot be used as a BEA Tuxedo server machine.
Your selection includes the appropriate encryption software for link-level encryption (LLE) and/or secure sockets layer (SSL).</td></tr>
</table>

<table>
<tr><th>In this section . . .</th><th>Perform the following action . . .</th></tr>
<tr><td>Choose BEA Home Directory</td><td>

Specify the BEA Home directory that will serve as the central support directory for all BEA products installed on the target system. If you already have a BEA Home directory on your system, you can select that directory (recommended) or create a new BEA Home directory. If you choose to create a new directory, the BEA Tuxedo installer program automatically creates the directory for you. For details about the BEA Home directory, see “BEA Home Directory” on page 1-8.

Enter `1` to create a new BEA Home directory or, if you already have a BEA Home directory on your system, enter `2` to select an existing BEA Home directory. Be sure to use the full pathname when specifying a new BEA Home directory.

For example:

```
====================================================

Choose BEA Home Directory
-------------------------
    1- Create a New BEA Home
    2- Use Existing BEA Home
Enter a number: 2
    1- /home3/bea
    2- /home2/beahome
Existing BEA Home: 1

====================================================

Choose BEA Home Directory
-------------------------
```

In this example, we enter `2` to display the BEA Home directories that have already been created on this system. At the `Existing BEA Home:` prompt, we enter `1` to specify `/home3/bea` as the BEA Home directory for this installation. Make sure that you enter the number associated with the BEA Home directory, instead of the directory name.

</td></tr>
</table>

In this section . . . **Perform the following action . . .**

Choose Product Directory

Specify the directory in which you want to install the BEA Tuxedo software. You may select the default product directory (`tuxedo8.0`) or create a new product directory. If you choose to create a new directory, the BEA Tuxedo installer automatically creates the directory for you.

The initial default installs the product directory under the BEA Home directory you specified in the previous section. To accept this default, enter `2` at the prompt.

The choices displayed in this section are as follows:

```
===================================================
Choose Product Directory
-----------------------
    1- Modify Current Selection (/home3/bea/tuxedo8.0)
    2- Use Current Selection (/home3/bea/tuxedo8.0)
Enter a number:

===================================================
```

- Enter `1` to select an alternate directory. The following text is displayed:

  `Specify Product Installation Directory:`

  Specify a product directory, using its full pathname. For example:

  `/home3/mytux8.0`.

  When you press Enter, your modified selection is displayed as the default:

  ```
      1- Modify Current Selection (/home3/mytux8.0)
      2- Use Current Selection (/home3/mytux8.0)
  Enter a number:
  ```

- Enter `2` to accept the current selection.

  If you enter `2` at the initial prompt, you accept the default product directory (`/home3/bea/tuxedo8.0` in this example).

Installing . . .

No user input is required here. The installation program is installing BEA Tuxedo in the user-specified product directory.

Note: It is normal for the installation progress bar to stop for a fairly long time, especially at the end. The BEA Tuxedo installer is still working when this occurs.

In this section . . .	Perform the following action . . .
Create Tlisten Password	Enter a `tlisten` password of your choice. Your password must be a string of no more than 80 alphanumeric characters in clear-text format. Use this password to log in to the BEA Tuxedo Administration Console. BEA Tuxedo uses the `tlisten` password to protect the local machine from administrative requests and operations that are *not* authorized. Whenever administrative communications arrive on the local machine through a `tlisten(1)` or `wlisten(1)` gateway process, BEA Tuxedo authenticates them by means of the `tlisten` password.

Enter Your LDAP Settings	Choose whether or not you want to enter Lightweight Directory Access Protocol (LDAP) configuration settings.
	Note: Choosing to enter LDAP configuration settings is a valid choice only if you have installed CORBA server and/or client software components and you intend to use secure sockets layer (SSL) encryption in your application.
	BEA Tuxedo 8.0 provides an LDAP-based certificate retrieval mechanism that has been certified for use with the LDAP Directory server included with Netscape Enterprise Server.
	To enter LDAP configuration settings, enter `1` and then enter the following configuration information:
	■ Fully qualified domain name of the LDAP server
	■ Port number through which the local machine communicates with the LDAP server
	■ Distinguished name of the base object for search in the LDAP server
	■ LDAP filter file location
	For example:
	`===================================================`
	`Enter Your LDAP Settings`
	`------------------------`
	`    1- Enter LDAP Configuration Information`
	`    2- Do Not Enter LDAP Configuration Information`
	`Enter a number: 1`
	`LDAP Service Name: pcwiz.beasys.com`
	`LDAP PortID: 389`
	`LDAP BaseObject: o=beasys.com`
	`LDAP Filter File Location: /home3/bea/tuxedo8.0/`
	`  udataobj/security/bea_ldap_filter.dat`
	`===================================================`
	If you do not want to specify LDAP settings, enter `2` to proceed to the next section.

In this section . . .	Perform the following action . . .

License Installation Choice	Choose whether or not you want to install the BEA Tuxedo product license now. If you want to postpone installation of the license until later, select `2` to proceed to the next section.
	To install the license now, read the following important information, enter `1`, and then specify the location of the license file on your machine:
	■ There are three types of licenses for the BEA Tuxedo product: a 30-day evaluation license, a development license, and a production license. (When a 30-day evaluation license expires, a customer may decide to buy the BEA Tuxedo product, thus upgrading the evaluation license to a development or production license.) All licenses are delivered with 56-bit encryption enabled by default. Licenses with 128-bit encryption enabled are available but require a separate authorization procedure.
	■ After acquiring your license, which is packaged as a file named `lic.txt`, you copy the license file to the machine targeted to receive the BEA Tuxedo installation. After you specify the location of the `lic.txt` file during the installation, the BEA Tuxedo installer copies the `lic.txt` file to the *`tux_8.0_prod_dir`*`/udataobj` directory, where *`tux_8.0_prod_dir`* represents the product directory in which you installed the BEA Tuxedo software.
	For example:
	`===================================================`
	`License Selection Option`
	`------------------------`
	`    1- Copy License File Now`
	`    2- Copy License File Later`
	`Enter a number: 1`
	`Specify a Path to your License File: /home3/lic.txt`
	`===================================================`

Install Complete	Press Enter to exit the installation program.

Congratulations! Your installation of the BEA Tuxedo software is complete!

What Do I Do Next?

To prepare for tasks that must be performed after you finish installing the software, read the following sections:

- "Assigning File Ownership on a UNIX System" on page 2-10
- "Understanding the BEA Tuxedo Shortcuts on a Windows System" on page 2-11
- "Understanding the BEA Administration Program on a Windows System" on page 2-12
- "Reviewing the Windows 2000 Registry Content" on page 2-21

To configure your BEA Tuxedo software and verify that your software is installed correctly, see "Performing Post-Installation Tasks" on page 6-1.

CHAPTER

4 Installing BEA Tuxedo Using Silent Installation

The following sections describe how to install BEA Tuxedo using the *silent mode* on both Windows and UNIX systems:

- What Is Silent Installation?
- Before You Start
- Using Silent Installation: Main Steps
- Creating a Template File
- Invoking the Silent Installation Process on a Windows System
- Invoking the Silent Installation Process on a UNIX System
- Windows Template File
- UNIX Template File
- What Do I Do Next?

What Is Silent Installation?

When you perform a *silent installation,* the settings for your configuration are read from a text file that you create before beginning the installation, so manual intervention is unnecessary. Silent installation works on both Windows and UNIX systems.

Silent installation enables you to set installation configurations only once and then use those configurations to duplicate the installation on many machines.

Note: Using silent installation implies your consent to the BEA License Agreement. You neither see a copy of the BEA Software License Agreement nor have any means of accepting the terms of the agreement.

Before You Start

If you are upgrading from a 5.1 or pre-5.1 version of BEA WebLogic Enterprise, or from a 7.1 or pre-7.1 version of the BEA Tuxedo software, see “Upgrading the BEA Tuxedo System to Release 8.0” on page 5-1 and follow the instructions given there. Then return here to continue your BEA Tuxedo installation.

Using Silent Installation: Main Steps

To use the silent installation method, you must perform two primary steps:

1. Create a template file that contains configuration settings for items such as the BEA Home directory, the product directory, and the install set appropriate for your installation. For a detailed procedure, see “Creating a Template File” on page 4-3. Two sample template files are provided in “Windows Template File” on page 4-8 and “UNIX Template File” on page 4-10.

2. Invoke the installation process using the values specified in the template files. For a detailed procedure, see "Invoking the Silent Installation Process on a Windows System" on page 4-5 and "Invoking the Silent Installation Process on a UNIX System" on page 4-6.

Creating a Template File

To create a template file for use in the silent installation process, follow these steps:

1. Display the template file specific to your platform in a supported browser. The following templates are available in the online documentation:
   - Windows template file at: `http://edocs.bea.com/tuxedo/tux80/ins_temp/win_tmp.htm`
   - UNIX template file at: `http://edocs.bea.com/tuxedo/tux80/ins_temp/unix_tmp.htm`
2. Copy and save the contents of the template file in a text file named `installer.properties`.
3. In the `installer.properties` file, modify the values for the keywords shown in the following table to create your desired configuration.

Table 4-1 The installer.properties File

For this keyword . . .	Enter the following value . . .
`INSTALLER_UI=`	The mode of installation. The default is `silent`; do not modify this value.
`USER_LOCALE=`	The language of the text displayed during the installation. The default is `en` for English; do not modify this value.
`BEAHOME=`	The full pathname of the BEA Home directory of your choice.
`USER_INSTALL_DIR=`	The full pathname of the product directory of your choice.
`C_ldapName=`	The fully qualified domain name of the Lightweight Directory Access Protocol (LDAP) server of your choice; for example, `pcwiz.mydomain.com`. (See Note after the table.)

Table 4-1 The installer.properties File (Continued)

For this keyword . . .	Enter the following value . . .
`C_ldapPortID=`	The number of the port through which the local machine communicates with the LDAP server; for example, `389`.* (See Note after the table.)
`C_ldapBaseObj=`	The distinguished name of the base object for search in the LDAP server; for example, `o=beasys.com`. (See Note after the table.)
`C_ldapFiltFile=`	The full pathname of the LDAP filter file on your machine; for example, `C:\bea\tuxedo8.0\udataobj\security\bea_ldap_filter.dat`. (See Note after the table.)
`C_tlistenPassword=`	A `tlisten` password of your choice. The password must be a string of alphanumeric characters in clear-text format that is no more than 80 characters in length. You will be prompted to enter this password when logging in to the BEA Tuxedo Administration Console.
`USER_LIC_FILE=`	The full pathname of the BEA Tuxedo 8.0 license file on your machine; the pathname must end with `lic.txt`.
`CHOSEN_INSTALL_SET=`	The chosen installation set. Besides `Full` (the default) for full installation, you can set this value to `Server` for server-only installation, `Client` for client-only installation, or `Jolt` for Jolt-client-only installation.

Note: The keywords `C_ldapName`, `C_ldapPortID`, `C_ldapBaseObj`, and `C_ldapFiltFile` are optional. Include these keywords and their values only if (a) you install CORBA server components and/or client software components on your machine, and (b) you want to use secure sockets layer (SSL) encryption. Otherwise, make each of these lines a comment by inserting a hash mark (#) at the beginning of the line.

Invoking the Silent Installation Process on a Windows System

To invoke the silent installation process on a Windows system, follow these steps:

1. Select a Windows system that meets the hardware and software requirements described in Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets."

   The Windows 98 system supports only BEA Tuxedo client components.

2. Log in to the target machine using the Administrator username.

   You need administrative privileges to install BEA Tuxedo server components on a Windows system. If you are going to install only BEA Tuxedo client components, you do not need administrative privileges.

3. Ensure that you have enough free space for the BEA Tuxedo installation.

   For disk space requirements, see Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets." For important disk space allocation information, see Appendix C, "File and Database Management and Disk Space Allocation."

4. If you are installing BEA Tuxedo by downloading it from the BEA Web site:

   a. Open a command-line shell.

   b. Go to the directory in which you downloaded the BEA Tuxedo installer specific to your platform.

   c. Invoke the installation procedure by entering the following command, making sure to specify the full pathname of the `installer.properties` file:

      ```
      filename.exe -f full_path\installer.properties
      ```

      In this command *`filename`* is the name of the BEA Tuxedo installer, and *`full_path`* is the full pathname of the `installer.properties` file.

   A silent installation requires the same amount of time as a standard installation. During a silent installation, an initial installation program window is displayed briefly, indicating that the installation has started.

5. If you are installing BEA Tuxedo from the CD-ROM:

   a. Insert the BEA Tuxedo CD-ROM into the CD-ROM drive.

   b. Open a command-line shell.

   c. Go to the `tux8_new_installer` directory of the mounted CD-ROM.

   d. Invoke the installation procedure by entering the following command, making sure to specify the full pathname of the `installer.properties` file:

      ```
      filename.exe -f full_path\installer.properties
      ```

      In this command, *`filename`* is the name of the BEA Tuxedo installer specific to your platform, and *`full_path`* is the full pathname of the `installer.properties` file.

   A silent installation requires the same amount of time as a standard installation. During a silent installation, an initial installation program window is displayed briefly, indicating that the installation has started.

Invoking the Silent Installation Process on a UNIX System

To invoke the silent installation process on a UNIX system, follow these steps:

1. Select a UNIX system that meets the hardware and software requirements described in Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets."

2. Log in to the target UNIX system using the root username.

   You need superuser privileges to mount the BEA Tuxedo CD on a UNIX system. If you are installing BEA Tuxedo by downloading it from the BEA Web site, you do not need superuser privileges.

3. Make sure that you have enough free space for the BEA Tuxedo installation.

   For disk space requirements, see Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets." For important disk space allocation information, see Appendix C, "File and Database Management and Disk Space Allocation."

4. If you are installing BEA Tuxedo by downloading it from the BEA Web site:

   a. Go to the directory in which you downloaded the BEA Tuxedo installer specific to your platform.

   b. Invoke the installation procedure by entering the following command, making sure to specify the full pathname of the `installer.properties` file:

   ```
   sh filename.bin -f full_path/installer.properties
   ```

   In this command *`filename`* is the name of the BEA Tuxedo installer, and *`full_path`* is the full pathname of the `installer.properties` file.

   A silent installation requires the same amount of time as a standard installation. During a silent installation, a startup message is displayed, followed by an "`Installing . . .`" message, indicating that the installation has started.

5. If you are installing BEA Tuxedo from the CD-ROM:

   a. Mount the CD-ROM as a filesystem and insert the BEA Tuxedo CD-ROM into the CD-ROM drive.

   b. Go to the `tux8_new_installer` directory of the mounted CD-ROM.

   c. Invoke the installation procedure by entering the following command, making sure to specify the full pathname of the `installer.properties` file:

   ```
   sh filename.bin -f full_path/installer.properties
   ```

   In this command *`filename`* is the name of the BEA Tuxedo installer specific to your platform, and *`full_path`* is the full pathname of the `installer.properties` file.

   A silent installation requires the same amount of time as a standard installation. During a silent installation, a startup message is displayed, followed by an "`Installing . . .`" message, indicating that the installation has started.

Windows Template File

The following sample Windows template file applies to a silent installation of BEA Tuxedo 8.0:

```
###############################################
### Silent Installation Properties File
###############################################
INSTALLER_UI=silent
###############################################
### Locale
###############################################
USER_LOCALE=en
###############################################
### BEA Home Directory
### NOTE: backslashes must be escaped.
###############################################
BEAHOME=C:\\bea
###############################################
### Product Installation Directory
###############################################
USER_INSTALL_DIR=C:\\bea\\tuxedo8.0
###############################################
### LDAP Service Name
###############################################
### C_ldapName=pcwiz.mydomain.com
###############################################
### LDAP PortID
```

```
###############################################

### C_ldapPortID=389

###############################################

### LDAP BaseObject

###############################################

### C_ldapBaseObj=”o=beasys.com”

###############################################

### LDAP Filter File Location

###############################################

### C_ldapFiltFile=C:\\bea\\tuxedo8.0\\udataobj\\security\\
  bea_ldap_filter.dat

###############################################

### Default Listen Port

###############################################

C_serverListenPort=3050

###############################################

### Tlisten Password

###############################################

C_tlistenPassword=abcd1234

###############################################

### User License File

###############################################

USER_LIC_FILE=C:\\myfiles\\lic.txt

###############################################

### Default Install Set

###############################################

CHOSEN_INSTALL_SET=Full
```

UNIX Template File

The following sample UNIX template file applies to a silent installation of BEA Tuxedo 8.0:

```
###############################################
### Silent Installation Properties File
###############################################
INSTALLER_UI=silent
###############################################
### Locale
###############################################
USER_LOCALE=en
###############################################
### BEA Home Directory
###############################################
BEAHOME=/home/rsmith/bea
###############################################
### Product Installation Directory
###############################################
USER_INSTALL_DIR=/home/rsmith/bea/tuxedo8.0
###############################################
### LDAP Service Name
###############################################
### C_ldapName=pcwiz.mydomain.com
###############################################
### LDAP PortID
###############################################
```

```
### C_ldapPortID=389

###############################################

### LDAP BaseObject

###############################################

### C_ldapBaseObj=”o=beasys.com”

###############################################

### LDAP Filter File Location

###############################################

### C_ldapFiltFile=/home/rsmith/bea/tuxedo8.0/udataobj/security/
  bea_ldap_filter.dat

###############################################

### Default Listen Port

###############################################

C_serverListenPort=3050

###############################################

### Tlisten Password

###############################################

C_tlistenPassword=abcd1234

###############################################

### User License File

###############################################

USER_LIC_FILE=/home/rsmith/lic.txt

###############################################

### Default Install Set

###############################################

CHOSEN_INSTALL_SET=Full
```

What Do I Do Next?

To prepare for tasks that must be performed after you finish installing the software, read the following sections:

- "Assigning File Ownership on a UNIX System" on page 2-10
- "Understanding the BEA Tuxedo Shortcuts on a Windows System" on page 2-11
- "Understanding the BEA Administration Program on a Windows System" on page 2-12
- "Reviewing the Windows 2000 Registry Content" on page 2-21

To configure your BEA Tuxedo software and verify that your software is installed correctly, see "Performing Post-Installation Tasks" on page 6-1.

CHAPTER

5 Upgrading the BEA Tuxedo System to Release 8.0

The following sections provide procedures for upgrading your BEA WebLogic Enterprise or BEA Tuxedo application to BEA Tuxedo 8.0, using *simple* and *hot* upgrade procedures:

- Preparing Your Machine for an Upgrade
- Selecting an Upgrade Procedure
- Backing Up Files
- Performing a Simple Upgrade
- Additional Upgrade Requirements for Windows 2000
- Performing a Hot Upgrade
- Upgrading BEA Jolt to Release 8.0
- Rebuilding an Application

Preparing Your Machine for an Upgrade

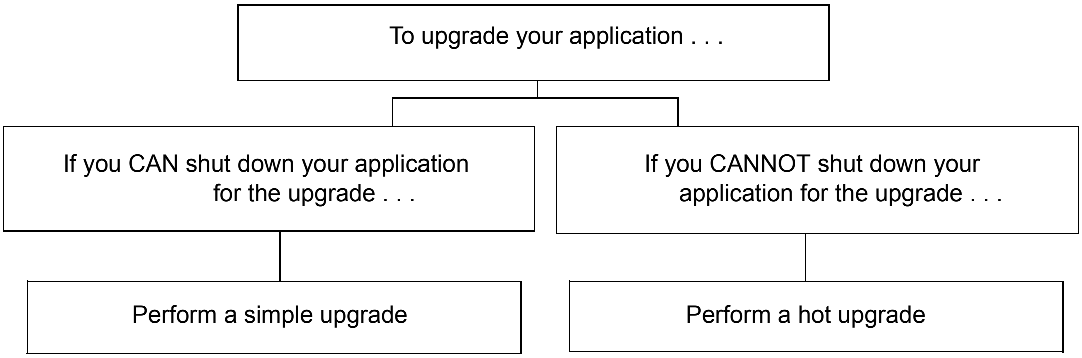
Before you install the BEA Tuxedo 8.0 software on a machine, make sure that the required version of the operating system and the compiler have been installed.

Note: Installing the operating system and compiler may take a significant amount of time.

For operating system and compiler requirements for each supported platform, see Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets."

Selecting an Upgrade Procedure

If you are installing BEA Tuxedo 8.0 on a platform that contains BEA WebLogic Enterprise or an earlier release of the BEA Tuxedo software, be sure to read the following procedures carefully.


To upgrade your application . . .
If you CAN shut down your application for the upgrade . . .
If you CANNOT shut down your application for the upgrade . . .
Perform a simple upgrade
Perform a hot upgrade

If you *can* shut down your application for the upgrade to BEA Tuxedo 8.0, we recommend a simple upgrade. For a simple upgrade on a Windows 2000 system, start by removing the existing BEA WebLogic Enterprise or BEA Tuxedo software by using the Windows Add/Remove (uninstall) program, and then install BEA Tuxedo 8.0. For instructions, see "Performing a Simple Upgrade" on page 5-4.

If you *cannot* shut down your application for the upgrade to BEA Tuxedo 8.0, you can perform a hot upgrade, instead, from any of the following products:

- Versions 4.2, 5.0.1, or 5.1 of BEA WebLogic Enterprise
- Versions 6.3, 6.4, 6.5, or 7.1 of BEA Tuxedo

The hot upgrade process allows you to add the BEA Tuxedo 8.0 software to existing BEA WebLogic Enterprise or BEA Tuxedo domains without first shutting down those domains. It also enables you to add new BEA Tuxedo 8.0 applications to those domains without shutting down the existing applications. For instructions on performing a hot upgrade, see “Performing a Hot Upgrade” on page 5-6.

Backing Up Files

Certain files on your system, such as `RM` and `webgui.ini`, are overwritten when the new BEA Tuxedo software is installed. As a result, any modifications you have made to these files are lost at that time. If you want to preserve your modifications to these files, you must make backup copies of the files before starting the installation process. Then you will be able to restore your versions once installation is complete.

To avoid losing your modifications, complete the following procedure:

1. Back up the `RM` file to a temporary location. The `RM` file contains database vendor-specific settings that are used by commands, such as `buildtms` and `buildXAJS`. It is located in the `%TUXDIR%\udataobj` or `$TUXDIR/udataobj` directory, where `TUXDIR` is the directory in which you installed the BEA WebLogic Enterprise or BEA Tuxedo software.

2. Back up the `webgui.ini` file to a temporary location. The `webgui.ini` file contains customized initialization settings for the BEA Tuxedo Administration Console. It is located in `%TUXDIR%\udataobj\webgui` or in the `$TUXDIR/udataobj/webgui` directory.

3. Move any files that you or your coworkers added to the `%TUXDIR%` directory to a temporary location.

4. After the installation is complete, restore these files to their original locations.

Performing a Simple Upgrade

A simple upgrade consists of the following basic steps:

1. Shut down the application.
2. Back up any files you want to preserve, as described in “Backing Up Files” on page 5-3.
3. Update the text version of the configuration file on the `MASTER` machine by running the `tmunloadcf(1)` command.
4. Back up the old binary version of the configuration file.
5. If you are upgrading the software on a Windows 2000 machine, perform the additional steps specified in “Additional Upgrade Requirements for Windows 2000” on page 5-4.
6. Install the BEA Tuxedo 8.0 software on at least the `MASTER` and backup machines.
7. Reload the text version of the configuration file by running `tmloadcf(1)` on the `MASTER` machine.
8. If necessary, recompile and relink your application programs.
9. Reboot the application.
10. As time permits, shut down and upgrade the other machines in your configuration.

Additional Upgrade Requirements for Windows 2000

For a Windows 2000 machine, to ensure that you are starting with a clean system, perform the following additional steps before installing the BEA Tuxedo 8.0 software.

1. Stop the `TListen` and Tuxedo IPC Helper services. From the Start menu, click Start→Programs→Administrative Services→Services. The Services window appears.

   Note: The Tuxedo IPC Helper service is called BEA procMGR in BEA Tuxedo 8.0.

2. Scroll to the entry for the `TListen` service, select it, and then click the Stop button. The Status value should change from Started to a blank entry. Then scroll to the Tuxedo IPC Helper service, select it, and click the Stop button. In some cases, you may see an error; however, the service's Status value should change from Started to a blank entry. Click the Close button.

3. Run the Windows Add/Remove program to remove the prior BEA WebLogic Enterprise or BEA Tuxedo software version. From the Start menu, choose Start→Settings→Control Panel→Add/Remove Programs. The Add/Remove Programs Properties window is displayed.

4. Scroll to the entry for the prior BEA WebLogic Enterprise or BEA Tuxedo software, select it, and click the Add/Remove button.

   Note: If you have both the C++ and Java components of WebLogic Enterprise 4.2 installed on your machine, you must remove the Java software *before* removing the C++ software.

5. In response to the prompt, confirm that you want to uninstall the software. After the program finishes, the Remove Programs From Your Computer window is displayed.

6. If the uninstall program was not able to remove all directories (usually because the files were added after the original installation), you can click the Details button to find out which directories remain on your system. If the files in those directories contain changes that you made, such as a modified sample file, move them to a temporary location.

7. If the prior version was WebLogic Enterprise 4.2, you may need to uninstall the WebLogic Enterprise Java and WebLogic Enterprise C++ software in separate steps. *Remember:* if you have both the C++ and Java components of WebLogic Enterprise 4.2 installed on your machine, you must remove the Java software *before* removing the C++ software, as shown in step 5.

8. Reboot your system after the uninstall process is completed.

Performing a Hot Upgrade

Before performing a hot upgrade, back up any files that you need to save, as described in “Backing Up Files” on page 5-3.

During the hot upgrade, you must shut down the backup and MASTER machines serially; the remainder of the configuration is unaffected.

Pre-Upgrade Notes

Once you have finished migrating the MASTER to BEA Tuxedo 8.0 (via a hot upgrade), you will not be able to migrate it back to the acting backup until you have upgraded the backup to BEA Tuxedo 8.0. In other words, migrating the MASTER is an irreversible procedure; once you have completed it, you cannot change the MASTER back to the release of the BEA Tuxedo software on which it was running previously.

When you run tmadmin(1) on a BEA Tuxedo 8.0 machine with an old-release MASTER, the UPGRADE file (as shown in the section “Hot-Upgrade Example” on page 5-8) must reside in the current directory. To make sure that the files are in the current directory, you might, for example, run tmadmin from APPDIR.

During migration, keep in mind the following guidelines regarding the BEA Tuxedo data storage areas:

- You will be instructed to remove the old TUXCONFIG file. The TUXCONFIG file is propagated automatically when the backup machine is run; therefore, you do not need to do anything.
- Create the TLOG when you load the software. If you already have a TLOG, remove it.
- Do not do anything with application queue spaces and queues.
- If you have a BDMCONFIG file, leave it as is.

To minimize downtime, we recommend installing BEA Tuxedo 8.0 on the MASTER and backup, and rebuilding all clients and servers in the directory on each machine that is defined by APPDIR, in parallel with the directory in which the old-release clients and servers were created. (In other words, both an old-release application and a BEA Tuxedo 8.0 application should be available on each machine.) *This is not a requirement, but a recommendation.*

When migrating from an old release, you must rebuild your clients and servers. Additionally, you must always rebuild whenever you reinstall the BEA Tuxedo software on HP-UX. Note that the HP-UX shared library loader does not, by default, use the paths specified in the `SHLIB_PATH` environment variable when trying to locate the shared libraries needed by an executable at run time. To enable the `SHLIB_PATH` lookup, the `”W1, +s”` compilation option must be passed to either the C or C++ compiler. (This procedure is not necessary on any other platform supported by the BEA Tuxedo system.) That is, your application programs must be recompiled with the following setting:

```
CFLAGS=Wl,+s
```

This setting causes the compiler to pass the `+s` option to the link editor when the application is recompiled. It changes the program’s default behavior during future upgrades.

Note: The `buildserver`, `buildobjserver`, `buildclient`, and `buildobjclient` commands include the `+s` option of the link editor; you do not need to specify `+s` explicitly. If you are using a different build procedure, however, you must specify the `+s` option.

Hot-Upgrade Procedure

1. Make sure your environment is set up as follows:
   - The configuration must have a backup machine.
   - The `MODEL` option must be set to `MP`.
   - The `MIGRATE` option must be set.
2. If you are upgrading a Windows 2000 machine, perform the additional steps specified in “Additional Upgrade Requirements for Windows 2000” on page 5-4.
3. Shut down the backup machine.
4. Install the BEA Tuxedo 8.0 software on the backup machine and reboot the backup machine.

5. Migrate the `MASTER` running the old release to the backup running BEA Tuxedo 8.0.
6. Shut down the machine that is now acting as the backup.
7. Using BEA Tuxedo 8.0, reboot the machine that you shut down in step 6.

Hot-Upgrade Example

Suppose you have the following two machines on a UNIX platform:

- A machine called `MACH1` that is configured as the `MASTER` and that runs an old release
  - A corresponding application directory called `$APPDIR1`
  - A corresponding configuration file called `$TUXCONFIG1`
- A machine called `MACH2` that is configured as the backup
  - A corresponding application directory called `$APPDIR2`
  - A corresponding configuration file called `$TUXCONFIG2`

Refer to the following instruction sequence to perform a hot upgrade for your application.

```
MACH1> tmshutdown -B MACH2 -l MACH2

MACH1> Run tmconfig to reset the APPDIR, TUXCONFIG, TUXDIR for MACH2

       MACH2> Kill tlisten process

       MACH2> Load System 8.0 if it is not already loaded

       MACH2> cd $APPDIR2

       MACH2> rm $TUXCONFIG2

       MACH2> >UPGRADE    # Indicator that upgrade being done

       MACH2> Reset PATH, LD_LIBRARY_PATH, TUXCONFIG, APPDIR

       MACH2> Rebuild clients and servers, create TLOG

       MACH2> Start System 8.0 tlisten
```

```
MACH1> >UPGRADE    # Indicator that upgrade being done

MACH1> tmboot -B MACH2 -l MACH2

       MACH2> tmadmin

              master

              y

              psr

              q

       MACH2> tmshutdown -B MACH1 -l MACH1

       MACH2> Run tmconfig to reset the APPDIR, TUXCONFIG, TUXDIR for MACH1

MACH1> Kill tlisten process

MACH1> Load System 8.0 if it is not already loaded

MACH1> cd $APPDIR1

MACH1> rm $TUXCONFIG1

MACH1> Reset PATH, LD_LIBRARY_PATH, TUXCONFIG, APPDIR

MACH1> Rebuild clients and servers, create TLOG

MACH1> Start System 8.0 tlisten

MACH1> rm UPGRADE  # Remove indicator that upgrade being done

       MACH2> rm UPGRADE  # Remove indicator that upgrade being done

       MACH2> tmboot -B MACH1 -l MACH1
```

Note: If you are performing the upgrade illustrated in the previous example on a Windows 2000 platform, be sure to stop the BEA Tuxedo IPC Helper (called BEA procMGR in BEA Tuxedo 8.0) service after stopping the `tlisten` process and to start the BEA procMGR service before starting the `tlisten` process.

Upgrading BEA Jolt to Release 8.0

BEA Jolt 8.0 interoperates with BEA Tuxedo 8.0, but Release 1.2.1 and earlier releases of BEA Jolt do not. Therefore, if you are planning to run BEA Jolt with BEA Tuxedo 8.0, you must install BEA Jolt 8.0.

If you have an earlier release of Jolt installed, you must uninstall it and then install Release 8.0; you cannot upgrade directly from an earlier release of BEA Jolt.

Rebuilding an Application

Now that you have successfully installed the BEA Tuxedo software, you need to rebuild all application clients and servers that you want to execute on a system upgraded to BEA Tuxedo 8.0. You should also remove any old `TUXCONFIG` files and reload them using the newly installed `tmloadcf(1)`.

If your BEA Tuxedo system applications are distributed, then the `MASTER` and backup `MASTER` nodes must run the highest release of the BEA Tuxedo software of any nodes in the configuration. Other nodes, including Workstation clients, may continue to use executables from an earlier release. For example, even if your `MASTER` and backup `MASTER` are running BEA Tuxedo 8.0, BEA Tuxedo 6.3 or later may still be used on other machines.

There is one important exception to the *highest release* rule. If you want to install BEA Tuxedo 8.0 only on Workstation clients, and you do not want to upgrade any of your BEA Tuxedo system server machines to BEA Tuxedo 8.0, you may do so. In other words, with any release level beginning with 6.3, Workstation clients may be intermixed freely in a configuration in which the `MASTER` is running release 6.3 or later.

CHAPTER

6 Performing Post-Installation Tasks

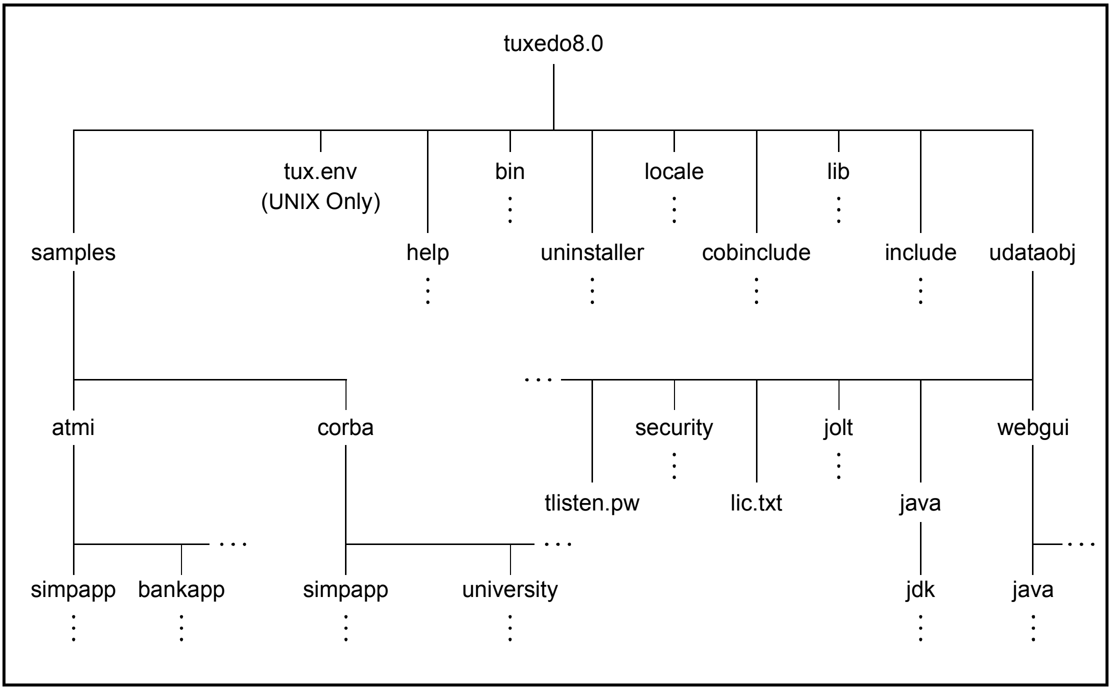
The following sections describe the tasks you must perform after installing BEA Tuxedo:

- Understanding the BEA Tuxedo Directory Structure
- Understanding the BEA Tuxedo Architecture
- Installing the Product License After You Install BEA Tuxedo
- Using the Registry to Further Restrict Access on a Windows System
- Setting Up Your Environment
- Starting the tlisten Process
- Editing a UBBCONFIG File
- Checking IPC Requirements
- Creating the Universal Device List and the Transaction Log
- Running simpapp to Verify Your Installation
- Running buildtms and buildXAJS for BEA Tuxedo Applications that Use XA Resource Managers
- Uninstalling BEA Tuxedo
- Reinstalling BEA Tuxedo

Understanding the BEA Tuxedo Directory Structure

During the BEA Tuxedo software installation, the installer program creates the following directory structure for a *full installation*. A full installation contains all the BEA Tuxedo server and client software components plus the link-level encryption (LLE) and secure sockets layer (SSL) encryption software packages.

Figure 6-1 BEA Tuxedo 8.0 Directory Structure



The product directory shown here, `tuxedo8.0`, is the default for BEA Tuxedo 8.0. You can change the default name during installation.

The top-level directories and files of the BEA Tuxedo directory structure are briefly described in the following table.

Directory Name	Description
`samples`	Contains sample code and resources designed to help you learn how to develop your own applications using BEA Tuxedo. The samples directory contains the following subdirectories: ■ `atmi` A collection of simple applications that demonstrate many features of the BEA Tuxedo Application-to-Transaction Monitor Interface (ATMI) server software. ■ `corba` A collection of simple applications that demonstrate many features of the BEA Tuxedo Common Object Request Broker Architecture (CORBA) C++ server software.
`help`	Contains online help files for the BEA Tuxedo Administration Console.
`bin`	Contains executable programs.
`uninstaller`	Contains code required to uninstall the BEA Tuxedo software.
`locale`	Contains subdirectories to support the localization of system messages. `C` subdirectory contains message catalogs for the default locale (U.S. English).
`cobinclude`	Contains copylib entries for use in COBOL programs.
`lib`	Contains compiled object files, including dynamic shared libraries (for platforms on which BEA Tuxedo uses dynamic shared libraries) and other object files needed to build BEA Tuxedo clients and servers.
`include`	Contains C and C++ language header files, as well as OMG IDL files. May include subdirectories such as `rpc`, depending on the platform.

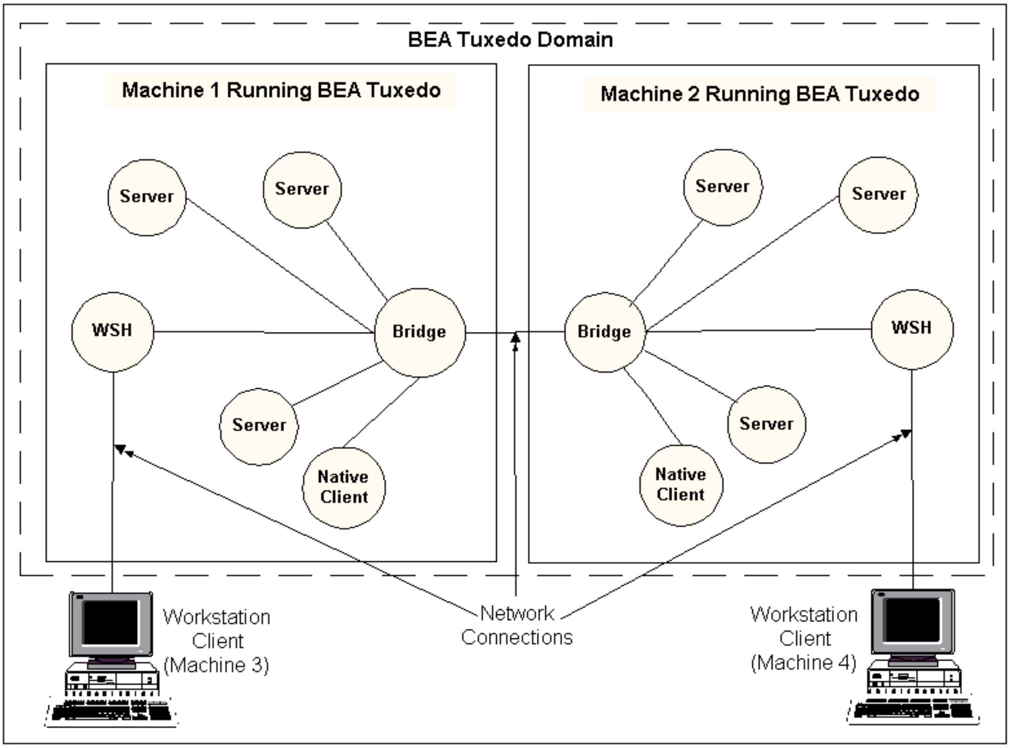
Directory Name	**Description**
`udataobj`	Contains other directories and files required by BEA Tuxedo. The `udataobj` directory contains the following subdirectories and files: ■ `security` Contains the default Lightweight Directory Access Protocol (LDAP) filter file (`bea_ldap_filter.dat`) and LLE and SSL encryption files. ■ `jolt` Contains the files for the BEA Jolt software components that you selected to install. ■ `java` Contains the classes and Java archive files needed to run Java applications. ■ `webgui` Contains the Java and image files for the BEA Tuxedo Administration Console. ■ `tlisten.pw` (file) Contains the `tlisten` administrative password that you entered during the installation. ■ `lic.txt` (file) Contains the BEA Tuxedo product license. The `lic.txt` file is present only if you installed your license during the installation.

Filename	**Description**
`tux.env`	Contains BEA Tuxedo environment variables for UNIX installations and serves as a model for setting those variables.

Understanding the BEA Tuxedo Architecture

Figure 6-2 shows a BEA Tuxedo *domain*, which is the basis of the BEA Tuxedo architecture.

Figure 6-2 Simplified View of BEA Tuxedo Architecture


BEA Tuxedo Domain
Machine 1 Running BEA Tuxedo
Machine 2 Running BEA Tuxedo
Server
Server
Server
Server
WSH
Bridge
Bridge
WSH
Server
Native Client
Server
Native Client
Workstation Client (Machine 3)
Network Connections
Workstation Client (Machine 4)

A Tuxedo domain, also known as a *Tuxedo application*, is a business software program, built upon the BEA Tuxedo system, that is defined and controlled by a single configuration file—the `UBBCONFIG` file. A Tuxedo domain consists of one or more clients (local or remote), one or more servers, and one or more machines. It is administered as a single unit.

The following sections describe other important terms and concepts about BEA Tuxedo with which you need to be familiar before performing post-installation checks:

- "UBBCONFIG File" on page 6-6
- "MASTER Machine" on page 6-6
- "TUXCONFIG File" on page 6-7
- "TUXCONFIG Environment Variable" on page 6-7
- "TUXDIR Environment Variable" on page 6-7

There is no need to fully understand these terms now; rather, use the sections as a reference. As you encounter these terms during the post-installation procedures, you can refer back to these sections to understand exactly what these terms mean. For detailed descriptions of these terms, visit the BEA Tuxedo Online Documentation set at `http://e-docs.bea.com`.

UBBCONFIG File

Each Tuxedo domain is controlled by a configuration file in which installation-dependent parameters are defined. The text version of the configuration file is referred to as `UBBCONFIG`, although the configuration file may have any name, as long as the content of the file conforms to the format described for `UBBCONFIG(5)` in the *File Formats, Data Descriptions, MIBs, and System Processes Reference*. Typical configuration filenames begin with the string `ubb`, followed by a mnemonic string, such as `simple` in the filename `ubbsimple`.

MASTER Machine

The `MASTER` machine, or `MASTER` node, for a Tuxedo domain contains the domain's `UBBCONFIG` file, and is designated as the `MASTER` machine in the `RESOURCES` section of the `UBBCONFIG` file. Starting, stopping, and administering a Tuxedo domain is done through the `MASTER` machine.

In a multimachine Tuxedo domain running different releases of the Tuxedo system software, the `MASTER` machine must run the highest release of the Tuxedo system software in the domain.

TUXCONFIG File

The TUXCONFIG file is a binary version of the UBBCONFIG file. It is created by running the tmloadcf(1) command, which parses UBBCONFIG and loads the binary TUXCONFIG file to the location referenced by the TUXCONFIG environment variable. As with UBBCONFIG, the TUXCONFIG file may be given any name.

The MASTER machine for a Tuxedo domain contains the master copy of the TUXCONFIG file. Copies of the TUXCONFIG file are propagated to all other machines—referred to as non-MASTER machines—in a Tuxedo domain whenever the Tuxedo system is booted on the MASTER machine.

TUXCONFIG Environment Variable

The TUXCONFIG environment variable defines the location on the MASTER machine in which the tmloadcf(1) command loads the binary TUXCONFIG file. It must be set to the absolute pathname for the device or system file in which TUXCONFIG is to be loaded.

The pathname for TUXCONFIG is designated in the MACHINES section of the UBBCONFIG file. It is specified for the MASTER machine *and* for every other machine in the Tuxedo domain. When copies of the binary TUXCONFIG file are propagated to non-MASTER machines during system boot, the copies are stored on the non-MASTER machines according to the TUXCONFIG pathname values.

TUXDIR Environment Variable

The value of the TUXDIR environment variable must be the absolute pathname of the directory in which the BEA Tuxedo software is installed on the MASTER machine. TUXDIR is defined in the MACHINES section of the UBBCONFIG file. It is specified for the MASTER machine *and* for every other machine in the Tuxedo domain.

Installing the Product License After You Install BEA Tuxedo

If you chose not to install your product license when you installed the BEA Tuxedo software, you can install the license now using the procedures given in this section. Until you install a license, you cannot boot any of the BEA Tuxedo system servers.

A sample license is shown in the following listing.

Listing 6-1 Sample Product License File for BEA Tuxedo 8.0

```
# BEA License File
#
# This file contains license tokens to enable BEA TUXEDO and
# optional components.
# Each License begins with a "[section name]" and ends with
# a "SIGNATURE=" line.
#
# New license sections should be appended to this file, and the
# old section, if present, should be deleted.
#
# WARNING: Altering parameters within a section will invalidate
# the license. This is a violation of BEA Systems licensing
# agreement, and may also disable TUXEDO or optional components.
# For Technical Support and to obtain a license, call 888-BEA-SUPT
# (888-232-7878) or 408-570-8070

[BEA TUXEDO]
VERSION=8.0
LICENSEE=BEA Systems
SERIAL=101999651
ORDERID=Internal
USERS=200000
TYPE=SDK
DEVELOPERS=100000
EXPIRATION=2001-04-28
SIGNATURE=TXmtx+AhQdJgr3sjjznBqRB7SP9Jgr3UzAKctjz+e6RmsFSAhUAhStj
   znBQdL9n=

[LINK ENCRYPTION]
VERSION=8.0
```

```
LICENSEE=BEA Systems
SERIAL=101999651
ORDERID=Internal
USERS=200000
TYPE=SDK
DEVELOPERS=100000
STRENGTH=56
EXPIRATION=2001-12-31
SIGNATURE=TX0CFHkaBpKpAlXGEtQqi+/jJvMo1VB9AhUAUAkizwsgYefRwQJDNTF
   0205b1ik=

[SSL ENCRYPTION]
VERSION=8.0
LICENSEE=BEA Systems
SERIAL=101999651
ORDERID=Internal
USERS=200000
TYPE=SDK
DEVELOPERS=100000
STRENGTH=56
EXPIRATION=2001-12-31
SIGNATURE=TX0CiqA5FCAXJFXUEGvAki+gL+i09eRep9hYdshS/8a70MIJQChUAk9
   zIAhUIH4=

[PK ENCRYPTION]
VERSION=8.0
LICENSEE=BEA Systems
SERIAL=101999651
ORDERID=Internal
USERS=200000
TYPE=SDK
DEVELOPERS=100000
STRENGTH=56
EXPIRATION=2001-12-31
SIGNATURE=TXmtx+AhQdJgr3sjjznBqRB7SP9Jgr3UzAKctjz+e6RmsFSAhUAhStj
   znBQdL9n=

[PK SIGNATURE]
VERSION=8.0
LICENSEE=BEA Systems
SERIAL=101999651
ORDERID=Internal
USERS=200000
TYPE=SDK
DEVELOPERS=100000
STRENGTH=56
EXPIRATION=2001-12-31
SIGNATURE=TX0CFHkaBpKpAlXGEtQqi+/jJvtt1VB9AhUAUAkizwsgYefRwQJDNTF
   0205b1ik=
[BEA JOLT]
VERSION=8.0
LICENSEE=BEA Systems
SERIAL=101999651
ORDERID=Internal
EXPIRATION=2001-12-31
SIGNATURE=TX0CFHkaBpKpAlXGEtQqi+/jJvMo1VB9AhUAUzxizwsgYefRwQJDNTF
   0205b1ik=
```

Licenses are delivered with 56-bit encryption enabled by default. Licenses with 128-bit encryption enabled are available but require a separate authorization procedure.

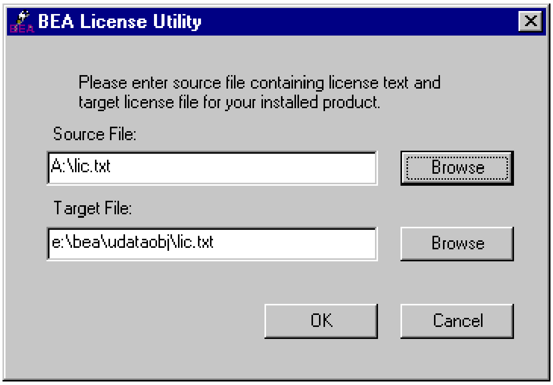
You can acquire a license in either of two ways: from the BEA Web site when you download an evaluation copy of the BEA Tuxedo product, or via e-mail when you buy the BEA Tuxedo product. A license is packaged in a file named `lic.txt`.

License files from previous BEA Tuxedo releases are not valid for BEA Tuxedo 8.0. If you later add BEA Tuxedo Security capabilities or BEA Jolt, you must append license files for those items to the BEA Tuxedo 8.0 license file.

Installing the Product License on a Windows System

To install your BEA Tuxedo product license on a Windows system, follow these steps:

1. Transfer the license file `lic.txt` to your machine.
2. Choose Start→Programs→BEA WebLogic E-Business Platform→Tuxedo 8.0→BEAlic to launch the BEA License Utility window.



BEA License Utility

Please enter source file containing license text and target license file for your installed product.

Source File: A:\lic.txt

Target File: e:\bea\udataobj\lic.txt

3. Enter the drive and location of the `lic.txt` file and click OK. The BEA license utility installs `lic.txt` in the *`tux_8.0_prod_dir`*`/udataobj` directory, where *`tux_8.0_prod_dir`* represents the product directory in which you installed the BEA Tuxedo software.

Note: As an alternative to using the BEA license utility to install your product license, you may manually copy `lic.txt` to the *`tux_8.0_prod_dir`*`/udataobj` directory.

Installing the Product License on a UNIX System

To install your BEA Tuxedo product license on a UNIX system, follow these steps:

1. Transfer the license file `lic.txt` to your machine.
2. Copy `lic.txt` to the *`tux_8.0_prod_dir`*`/udataobj` directory, where *`tux_8.0_prod_dir`* represents the product directory in which you installed the BEA Tuxedo software.

Using the Registry to Further Restrict Access on a Windows System

BEA Tuxedo-provided client programs are run directly by users with the users' own permissions. In addition, when users run native clients (that is, clients run on the same machine on which the server program is running), they have access to the `UBBCONFIG` file and interprocess communication (IPC) mechanisms such as the *bulletin board* (a reserved piece of shared memory in which parameters governing the application and statistics about the application are stored).

To gain access to BEA Tuxedo functionality, native clients join a BEA Tuxedo application using the identity of the application administrator (`tpsysadm`). However, because `tpsysadm` is a trusted user, this setting causes the BEA Tuxedo system to bypass the user authentication process.

To prevent this lapse in security on your Windows 2000 server machine, follow these steps:

1. Choose Start→Run to launch the Run dialog box, enter `regEdt32`, and click OK. The Registry Editor window is displayed.
2. Select `HKEY_LOCAL_MACHINE`→`Software`→`BEA Systems`→`Tuxedo`→`8.0`.
3. Select `SECURITY`→`Permissions`.
4. Disable control for `Everyone` and allow access only to users with administrative privileges.

Setting Up Your Environment

You need to set several environment variables before using BEA Tuxedo to build and run BEA Tuxedo applications. The following tables list and define many of those environment variables.

Table 6-1 BEA Tuxedo Core Environment Variables

Environment Variable	Value
TUXDIR	Absolute pathname of the product directory in which you installed the BEA Tuxedo software on this machine. TUXDIR must be set on both server and client-only machines.
APPDIR	Absolute pathname of the application directory in which application and administrative servers will be booted on this machine. APPDIR may be set to more than one application directory.
TUXCONFIG	Absolute pathname of the device or system file in which the binary TUXCONFIG file is found on this machine. The TUXCONFIG file is created by running the tmloadcf(1) command on the UBBCONFIG configuration file.
WEBJAVADIR	Absolute pathname of the Java and image files for the BEA Tuxedo Administration Console on this machine.

Table 6-2 BEA Tuxedo Client-Only Environment Variables

Environment Variable	Value
WSENVFILE	Tuxedo Workstation (/WS) client: Name of the file in which all environment variables are set for this workstation. There is no default for this variable.
TOBJADDR	Remote CORBA client: Address of the server's listener; must match exactly (including case) the host and port specified in the server's UBBCONFIG file.

Table 6-3 COBOL Environment Variables

Environment Variable	Value
`COBCPY`	Directories that contain a set of the `COBOL COPY` files to be used by the compiler.
`COBOPT`	Arguments that you may want to use on the compile command line.

Table 6-4 Java Environment Variables

Environment Variable	Value
`JAVA_HOME`	Absolute pathname of the Java Development Kit (JDK) 1.3 installation directory on this machine; needed to build and run Java applications on this machine.*
`JDKDIR`	Set to `JAVA_HOME` value.
`CLASSPATH`	Absolute pathnames for classes and Java archive files on this machine; needed to run Java applications on this machine.

* The BEA Tuxedo 8.0 distribution does not include a JDK.

Table 6-5 Oracle Environment Variables

Environment Variable	Value
`ORACLE_HOME`	Absolute pathname of the Oracle database installation directory on this machine.*
`DEF_ORACLE_SID`	System identifier (username/password) for the Oracle database installation on this machine.

* The BEA Tuxedo 8.0 distribution does not include an Oracle database.

Setting Environment Variables on a Windows System

On a Windows 2000 server machine, you need to set the following environment variables to set up your environment:

```
set TUXDIR=pathname_of_BEA_Tuxedo_product_directory
set APPDIR=pathname_of_BEA_Tuxedo_application_directory
set TUXCONFIG=pathname_of_TUXCONFIG_file
set WEBJAVADIR=%TUXDIR%\udataobj\webgui\java
set PATH=%APPDIR%;%TUXDIR%\bin;\bin;%PATH%
```

The following are example settings of `TUXDIR`, `APPDIR`, and `TUXCONFIG`:

- `TUXDIR=C:\bea\tuxedo8.0`
- `APPDIR=C:\home\me\simpapp`
- `TUXCONFIG=%APPDIR%\tuxconfig`

The values of the `TUXDIR`, `APPDIR`, and `TUXCONFIG` environment variables must match the values of the `TUXDIR`, `APPDIR`, and `TUXCONFIG` parameters in the `MACHINES` section of the `UBBCONFIG` file. As an alternative to setting environment variables from a command-line shell, use the Environment page of the BEA Administration program, described in "Setting and Modifying Environment Variables" on page 2-15.

Windows 2000 accesses the required dynamically-loadable library files through its `PATH` variable setting. Specifically, Windows 2000 searches for dynamically-loadable library files in the following order:

1. The directory from which the BEA Tuxedo application was loaded
2. The current directory
3. The Windows system directory (for example, `C:\Win2000\System32`)
4. The Windows directory (for example, `C:\Win2000`)
5. The directories listed in the `PATH` environment variable

For more information about setting environment variables, see "Modifying Environment Variables" in *Using BEA Tuxedo ATMI on Windows*.

Setting Environment Variables on a UNIX System

On a UNIX server machine, set and export the following environment variables to set up your environment:

```
TUXDIR=pathname_of_BEA_Tuxedo_product_directory
APPDIR=pathname_of_BEA_Tuxedo_application_directory
TUXCONFIG=pathname_of_TUXCONFIG_file
WEBJAVADIR=$TUXDIR/udataobj/webgui/java
PATH=$APPDIR:$TUXDIR/bin:/bin:$PATH
```

Note: For Sun Solaris systems only, add `/usr/sbin` as the first directory in your `PATH` and add brackets ({}) to `TUXDIR`, as shown in the following example:

```
PATH=/usr/sbin:${TUXDIR}/bin:$PATH
LD_LIBRARY_PATH=$APPDIR:$TUXDIR/lib:/lib:/usr/lib:$LD_LIBRA
RY_PATH
```

Note: For HP-UX systems only, use `SHLIB_PATH` instead of `LD_LIBRARY_PATH`.

```
export TUXDIR APPDIR TUXCONFIG WEBJAVADIR PATH LD_LIBRARY_PATH
```

The following are example settings of `TUXDIR`, `APPDIR`, and `TUXCONFIG`:

- `TUXDIR=/home/bea/tuxedo8.0`
- `APPDIR=/home/me/simpapp`
- `TUXCONFIG=$APPDIR/tuxconfig`

The `TUXDIR`, `APPDIR`, and `TUXCONFIG` environment variables must match the values of the `TUXDIR`, `APPDIR`, and `TUXCONFIG` parameters in the `MACHINES` section of the `UBBCONFIG` file. A Bourne shell script named `tux.env`, located in the BEA Tuxedo product directory, serves as a model for setting these and other environment variables on a UNIX system.

Starting the tlisten Process

As the application administrator, you must start a `tlisten` process on each machine of a networked BEA Tuxedo application before the application is booted. The `tlisten` process enables you and the BEA Tuxedo software running on the `MASTER` machine to start, shut down, and administer BEA Tuxedo processes running on the non`MASTER` machines. For example, `tmboot(1)` can start BEA Tuxedo system servers on the non-`MASTER` machines. Generally, one `tlisten` process is required for each BEA Tuxedo application running on a server machine.

In addition to the installer program starting a `tlisten` process on port 3050 during the installation of BEA Tuxedo, a `tlisten` process may be started as follows.

On this machine . . .	By this administrator . . .	Using this method . . .
Windows 2000 server	BEA Tuxedo application administrator	Listener page of the BEA Administration program; for details, see "Configuring tlisten Processes to Start Automatically" on page 2-17
		Manually starting a `tlisten` process from a command-line shell
UNIX server	UNIX system administrator	As part of a UNIX initialization (boot) script
	BEA Tuxedo application administrator	As a `cron` job
		Manually starting a `tlisten` process from a command-line shell

tlisten Invocation

In all cases, the same basic syntax is used to invoke `tlisten`.

```
%TUXDIR%\bin\tlisten -l nlsaddr [-u appuid] (Windows)
$TUXDIR/bin/tlisten [-d devname] -l nlsaddr [-u appuid] (UNIX)
```

The `-l` option is required. The argument to `-l` must match the value of the `NLSADDR` parameter in the `NETWORK` section of the `UBBCONFIG` file. For information about determining the value of `NLSADDR`, see `UBBCONFIG(5)` in the *File Formats, Data Descriptions, MIBs, and System Processes Reference*.

The value of *`devname`* is the device name of the network provider; for example, Starlan. If the `tlisten` process is operating with Sockets, the `-d` option is not needed.

The value of *`appuid`* is the user identifier (UID), or login name, of the BEA Tuxedo application administrator. It must match the value of the `UID` parameter in the `RESOURCES` section of the `UBBCONFIG` file.

Note: To obtain the UID on a Windows 2000 or UNIX system, run the `id` command.

On a UNIX machine, use the `-u` *`appuid`* option when the command is part of an installation script run by user `root` to run the `tlisten` process with the effective UID of the owner of the BEA Tuxedo software installation on this machine. If `tlisten` is started by the BEA Tuxedo application administrator, either as a `cron` job or manually, the `-u` option is unnecessary because the job is already owned by the correct account.

For more information about the `tlisten` command, see the `tlisten(1)` reference page in the *BEA Tuxedo Command Reference*. For details about starting the `tlisten` process on a Windows 2000 server machine, see "Configuring tlisten Processes to Start Automatically" in *Using BEA Tuxedo ATMI on Windows*.

tlisten Password

BEA Tuxedo uses the administrative password that you specified during the installation to protect the machine on which BEA Tuxedo is installed from administrative requests and operations (such as `tmboot(1)`) that are not authorized. Whenever administrative communications arrive on this machine through `tlisten(1)` or `wlisten(1)` gateway processes, BEA Tuxedo authenticates them by means of the password.

A `tlisten` password must be a string of alphanumeric characters in clear-text format. It may contain no more than 80 characters.

A common password is required for two machines in a BEA Tuxedo application to communicate successfully. For this reason, you must use the same password whenever you install BEA Tuxedo on multiple machines for a single application. If, during the

BEA Tuxedo installation process, you use a different password for one machine, you must add that password to the `tlisten.pw` file on each machine with which you want that machine to communicate.

For these reasons, you may have more than one administrative password in your `tlisten.pw` file. A single password file may contain no more than 20 passwords, with one password per line. You can use a simple text editor to add passwords to the `tlisten.pw` file.

Editing a UBBCONFIG File

Each BEA Tuxedo application is controlled by a `UBBCONFIG` file in which installation-dependent parameters are defined. The `UBBCONFIG` file for an application usually requires editing before the application can be booted.

Each BEA Tuxedo application is controlled by a configuration file in which installation-dependent parameters are defined. The configuration file for an application usually requires editing before the application can be booted. In the BEA Tuxedo documentation, this file is referred to as `UBBCONFIG`, but you can give your configuration file any name you like. Typical configuration filenames begin with the string ubb, followed by a mnemonic string, such as simple in the filename `ubbsimple`.

As an example, consider `ubbsimple`, the `UBBCONFIG` file for the rudimentary ATMI-based `simpapp` application delivered with the BEA Tuxedo installation. On a Windows system, this application is found in the directory `%TUXDIR%\samples\atmi\simpapp`; on a UNIX system, it is found in the directory `$TUXDIR/samples/atmi/simpapp`.

The following sample listing shows `ubbsimple`. The examples in the sample listing have been modified from the `ubbsimple` file delivered on a Windows or UNIX system to include example pathname values for both Windows and UNIX systems.

Listing 6-2 ubbsimple for the ATMI-based simpapp Application

```
#ident “@(#)apps:simpapp/ubbsimple   $Revision: 1.3 $

#Skeleton UBBCONFIG file for the Tuxedo Simple Application.
#Replace the <bracketed> items with the appropriate values.
```

```
 *RESOURCES
 IPCKEY          <Replace with a valid IPC Key>

 #Example:
 #IPCKEY         123456

 DOMAINID        simpapp
 MASTER          simple
 MAXACCESSERS    10
 MAXSERVERS      5
 MAXSERVICES     10
 MODEL           SHM
 LDBAL           N

 *MACHINES
 DEFAULT:
                 APPDIR=“<Replace with the current directory pathname>”
                 TUXCONFIG=“<Replace with your TUXCONFIG Pathname>”
                 TUXDIR=“<Directory where Tuxedo is installed>”
#Windows
 #Example:
 #               APPDIR=“C:\home\me\simpapp”
 #               TUXCONFIG=“C:\home\me\simpapp\tuxconfig”
 #               TUXDIR=“C:\bea\tuxedo8.0”
 #UNIX
 #Example:
 #               APPDIR=“/home/me/simpapp”
 #               TUXCONFIG=“/home/me/simpapp/tuxconfig”
 #               TUXDIR=“/home/bea/tuxedo8.0”

 <Machine-name>  LMID=simple

 #Example:
 #beatux         LMID=simple

 *GROUPS
 GROUP1
           LMID=simple GRPNO=1 OPENINFO=NONE

 *SERVERS
 DEFAULT:
                 CLOPT=“-A”
simpserv        SRVGRP=GROUP1 SRVID=1

 *SERVICES
 TOUPPER
```

In the configuration file for your application, you must replace the strings enclosed in angle brackets with values specific to your application. The following table provides a sample of the parameters that must be defined in every configuration file.

This parameter . . .	Specifies . . .
`IPCKEY`	A numeric key that identifies the shared memory segment in which the structures used by your application are located. The value must be greater than 32,768 and less than 262,143.
`machine_name`	The node name of the machine. To obtain the node name on a Windows 2000 system, see your system administrator. To obtain the node name on a UNIX system, run the `uname -n` command.
`APPDIR` = *`string`*	A list of one or more directories in which application and administrative servers will be booted on this machine. For Windows, the value of *`string`* is the absolute pathname of one directory, optionally followed by a semicolon-separated list of pathnames for other directories on the machine being defined. For UNIX, the value of *`string`* is the absolute pathname of one directory, optionally followed by a colon-separated list of pathnames for other directories on the machine being defined.
`TUXCONFIG` = *`string`*	The absolute pathname of the device or system file in which the binary `TUXCONFIG` file is to be created on this machine. The `TUXCONFIG` file is created by running the `tmloadcf(1)` command on the `UBBCONFIG` file.
`TUXDIR` = *`string`*	The absolute pathname of the product directory of the BEA Tuxedo software on this machine.

You must define `APPDIR`, `TUXCONFIG`, and `TUXDIR` for every machine in your BEA Tuxedo application. If you need to look up other parameters when editing your `UBBCONFIG` file, see `UBBCONFIG(5)` in the *File Formats, Data Descriptions, MIBs, and System Processes Reference*.

You must edit your `UBBCONFIG` file before running `tmloadcf(1)` to verify the IPC requirements in the section that follows. If you run `tmloadcf` without first editing the `UBBCONFIG` file, the command will fail with syntax errors.

Using the TYPE Parameter in UBBCONFIG

The TYPE parameter in the MACHINES section of a configuration file specifies the invocation of the XDR (EXternal Data Representation) encode and decode routines when messages are passed between unlike machines. The term *unlike* applies even to machines of the same type if the compiler on each machine is different. In such a case, give each machine a unique TYPE string to force every message to go through the encode and decode routines.

Checking IPC Requirements

The BEA Tuxedo system uses interprocess communications (IPC) resources heavily. On many systems, the default values for the parameters that control the size and quantity of the various IPC resources are below the minimums needed to run even a modest BEA Tuxedo application. Therefore, you may need to reset some parameters. After editing your UBBCONFIG file, you should determine whether you have enough IPC resources for your application.

To perform this task, enter the following tmloadcf(1) command, specifying your edited UBBCONFIG file as input:

```
tmloadcf -c UBBCONFIG
```

With the -c option, the tmloadcf program prints a list of the minimum IPC resources required for your application, but it does not create or update the TUXCONFIG file.

The following listing is an output report based on the values in ubbsimple.

Listing 6-3 Output Produced by tmloadcf -c

```
Ipc sizing (minimum /T values only)...
                   Fixed Minimums Per Processor
SHMMIN: 1
SHMALL: 1
SEMMAP: SEMMNI
                   Variable Minimums Per Processor
```

```
        SEMUME,          A                              SHMMAX
        SEMMNU,          *                                *
Node    SEMMNS  SEMMSL  SEMMSL  SEMMNI  MSGMNI  MSGMAP  SHMSEG
------  ------  ------  ------  ------  ------  ------  ------
sftuxe     17       5      12   A + 1      13      26     75K

where 1 <= A <= 8.

The number of expected application clients per processor should be added to each
MSGMNI value.
```

The output report identifies IPC resources by their traditional UNIX names. To map the traditional names to the names specific to a UNIX platform, see the data sheet for that platform in Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets." To map the traditional names to the names specific to the Windows 2000 platform, see the table entitled "IPC Resource Name Mappings Between Windows and UNIX Systems" on page 2-20.

The example output report indicates that to run `simpapp`, your system must have `SEMUME`, `SEMMNU`, and `SEMMNS` set to no less than 17. The value of `SEMMSL` must be at least 5, and that of `SEMMNI` and `SEMMAP`, at least 4 (assuming the value of A is 3). The value of `MSGMNI` must be at least 13, and that of `MSGMAP`, at least 26. Finally, the product of `SHMMAX` and `SHMSEG` must be at least 75K bytes.

The IPC values are application-dependent, and the numbers in this example reflect a very small configuration. If other client or server applications that use IPC resources are running on the same system with a BEA Tuxedo application, then the requirements of both applications must be satisfied. Keep in mind also that every machine participating in an application must have sufficient IPC resources available.

If the current IPC resources are inadequate, you must increase the values of the associated IPC parameters. For instructions on changing the current IPC values for a Windows 2000 system, see "Configuring IPC Resources to Maximize System Performance" on page 2-18. For instructions on changing the current IPC values for a UNIX system, see the data sheet for your platform in Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets."

Creating the Universal Device List and the Transaction Log

You must create a Universal Device List (UDL) and define a UDL entry for the global transaction log (TLOG) on each machine in your application that will use global transactions. The TLOG is a log file in which information about transactions is kept until the transaction is completed.

Defining the TLOG

Before creating the UDL and defining UDL entries for TLOG, you must set the following parameters in the MACHINES section of the UBBCONFIG file for each machine in your application that will use global transactions.

This parameter . . .	Specifies . . .
TLOGDEVICE = *string*	The BEA Tuxedo filesystem containing the distributed transaction processing (DTP) transaction log (TLOG) for this machine. If not specified, it is assumed that this machine has no TLOG.
TLOGOFFSET = *offset*	The numeric offset in pages (from the beginning of the device) to the start of the BEA Tuxedo filesystem containing the DTP transaction log for this machine. The default is 0.
TLOGNAME = *string*	The name of the DTP transaction log for this machine. If a name is not specified, the default, TLOG, is used.
TLOGSIZE = *size*	The numeric size, in pages, of the DTP transaction log for this machine. If a size is not specified, the default, 100 pages, is used.

Because the TLOG seldom needs to be larger than 100 blocks (pages) and because disk partitions are always substantially larger than that, it may make sense to use the same device for both the TUXCONFIG file and the TLOG. If so, the pathname of the device needs to be specified by both the TUXCONFIG and the FSCONFIG environment variables. FSCONFIG specifies the absolute pathname of the application's databases on this machine.

Creating the UDL and UDL Entries for TLOG

You must manually create a UDL entry for the TLOGDEVICE on each machine on which a TLOG is needed. You may create these entries either before or after you have loaded TUXCONFIG, but you must create these entries before booting the application.

To access the create device list command, crdl, invoke tmadmin -c with the application inactive. The -c option invokes tmadmin in configuration mode.

To create the UDL and a UDL entry for TLOG on each machine in your application that will use global transactions, follow these steps:

1. Log in as the application administrator on the MASTER machine.
2. Enter the following command:

   ```
   tmadmin -c
   crdl -z config -b blocks
   ```

   Here -z *config* specifies the full pathname of the device on which the UDL should be created (that is, the device on which the TLOG will reside), and -b *blocks* specifies the number of blocks to be allocated on the device. The value of *config* should match the value of the TLOGDEVICE parameter in the MACHINES section of the UBBCONFIG file. The blocks must be larger than the value of TLOGSIZE. If -z is not specified, the value of *config* defaults to the value of the FSCONFIG environment variable.
3. Log in as the application administrator on each remaining non-MASTER machine that will use global transactions and repeat step 2.

If the TLOGDEVICE is mirrored between two machines, step 3 is not required on the paired machine. To be recoverable, the TLOG should reside on a device that can be mirrored.

Running simpapp to Verify Your Installation

One of the ways to verify that your BEA Tuxedo software is installed correctly is to run one or more of the sample applications included with the installation. The sample applications demonstrate the capabilities of the ATMI and CORBA clients, and the ATMI and CORBA C++ servers.

The following sections provide procedures for verifying both the ATMI and CORBA C++ parts of your BEA Tuxedo installation:

- "Running simpapp to Verify the BEA Tuxedo ATMI Software Installation" on page 6-27
- "Running simpapp to Verify the BEA Tuxedo CORBA C++ Software Installation" on page 6-33

The `simpapp` application is a nondistributed application, meaning that it runs on a single machine. It is designed in such a way that it can be up and running within minutes after the BEA Tuxedo software is installed.

The `simpapp` application offers a single service called `TOUPPER`, which converts strings from lowercase to uppercase. The client is invoked with a single argument: a lowercase string to be converted to uppercase. The server returns the converted string to the client, and the client prints the converted string.

For example, the invocation

```
simpcl “hello world”
```

results in the output

```
Returned string is: HELLO WORLD
```

Two versions of `simpapp` exist: an ATMI version and a CORBA version. The ATMI version consists of an ATMI server, an ATMI client, and a `UBBCONFIG` file. The CORBA version consists of a CORBA C++ server, a CORBA C++ client, and a CORBA Java client. Building and running the CORBA Java client requires the installation of JDK 1.3 on your system.

Running simpapp to Verify the BEA Tuxedo ATMI Software Installation

To verify that you have successfully installed the BEA Tuxedo ATMI software on your system, run the ATMI version of the simpapp application. The pathname for this application on a Windows system is %TUXDIR%\samples\atmi\simpapp; on a UNIX system, it is $TUXDIR/samples/atmi/simpapp. The procedure presented in the following two sections is also provided in the README file in the simpapp directory, and in "Tutorial for Simpapp, a Simple C Application" in *Tutorials for Developing BEA Tuxedo ATMI Applications*.

Running simpapp to Verify the BEA Tuxedo ATMI Software Installation on a Windows System

To configure and run the ATMI version of simpapp on a Windows system, follow these steps:

1. Log in to the target machine using the Administrator username and open a command-line shell.

2. Create a working directory for your sample application and change to it:

```
cd C:\home\me
mkdir atmi
cd atmi
```

3. Set the environment variables used by the BEA Tuxedo system, as explained in "Setting Environment Variables on a Windows System" on page 6-15. Set APPDIR and TUXCONFIG as follows:

```
set APPDIR=C:\home\me\atmi
set TUXCONFIG=%APPDIR%\tuxconfig
```

Note: You do not have to set the WEBJAVADIR environment variable.

4. Copy the simpapp files to your working directory. You will need to edit the configuration file, ubbsimple. Check the permissions on all the files in your working directory and, if necessary, change the permissions to allow full access. For example:

```
copy %TUXDIR%\samples\atmi\simpapp\*.* *.*
attrib -R /S *.*
```

5. Compile the `simpapp` client and server programs by entering the following commands:

   ```
   buildclient -o simpcl -f simpcl.c
   buildserver -o simpserv -f simpserv.c -s TOUPPER
   ```

6. In the sample configuration file, `ubbsimple`, replace the strings shown in angle brackets with values appropriate to your BEA Tuxedo system installation. Comments in `ubbsimple` explain how to customize the file. Set the following parameters in the `ubbsimple` file:

   - Set `IPCKEY` to a valid IPC key. This value must be greater than 32,768 and less than 262,143.
   - Set `APPDIR` to `"C:\home\me\atmi"`.
   - Set `TUXCONFIG` to the literal pathname corresponding to `$APPDIR/tuxconfig` (in our example, `"C:\home\me\atmi\tuxconfig"`).
   - Set `TUXDIR` to the absolute pathname of the product directory of the BEA Tuxedo software on this machine (for example, `"C:\bea\tuxedo8.0"`).
   - Set `machine-name` to the name of your system. To determine the name of your system, see your system administrator.

   Note: The `APPDIR`, `TUXCONFIG`, and `TUXDIR` parameter settings in the `ubbsimple` file must match the settings of the `APPDIR`, `TUXCONFIG`, and `TUXDIR` environment variables.

7. Create the binary version of your edited configuration file by invoking `tmloadcf(1)`, which produces a file named `tuxconfig`. This file, referenced by the `TUXCONFIG` environment variable, provides the BEA Tuxedo system with a description of the application configuration at run time:

   ```
   tmloadcf -y ubbsimple
   ```

8. Boot `simpapp` by typing the following command:

   ```
   tmboot -y
   ```

   If the boot succeeds, output similar to the following is displayed and you can proceed to step 10.

Listing 6-4 Output Produced by tmboot -y

```
Booting all admin and server processes in C:\home\me\atmi\tuxconfig
INFO: BEA TUXEDO(r) System Release 8.0
INFO: Serial #: 000102-9125503751, Maxusers 25
Booting admin processes ...
exec BBL -A:
     process id=24180 ... Started.
Booting server processes ...
exec simpserv -A :
     process id=24181 ... Started.
2 processes started.
```

9. If the boot fails, examine the log named `ULOG.`*`mmddyy`* in your application directory (`%APPDIR%`, `C:\home\me\atmi`). The string *`mmddyy`* is a placeholder for the date (digits representing the current month, day, and year) that will make up the end of the filename. Near the end of the log, you may see a message such as the following:

   ```
   can’t create enough semaphores for BB
   ```

   If such a message is displayed, the interprocess communication (IPC) resources configured in your operating system are not adequate for running `simpapp`.

   To confirm this hypothesis, invoke the BEA Tuxedo system command `tmloadcf(1)` and specify the name of your configuration file, as shown in the following example:

   ```
   tmloadcf -c %APPDIR%\ubbsimple
   ```

   If the current value of any IPC parameter configured in your operating system is less than a minimum (either variable or fixed) listed in the `tmloadcf` output, you must increase the value of that parameter. For instructions on determining and changing the current IPC values for your platform, see “Configuring IPC Resources to Maximize System Performance” on page 2-18.

10. If the boot succeeds, you can invoke the client. For example, enter the following command:

    ```
    simpcl “hello world”
    ```

    The following message is displayed:

    ```
    Returned string is: HELLO WORLD
    ```

11. When you have finished, shut down simpapp with the following command:

```
tmshutdown -y
```

Running simpapp to Verify the BEA Tuxedo ATMI Software Installation on a UNIX System

To configure and run the ATMI version of simpapp on a UNIX system, follow these steps:

1. Log in to the target machine as the BEA Tuxedo application administrator and open a command-line shell.

2. Create a working directory for your sample application and change to it:

```
cd /home/me
mkdir atmi
cd atmi
```

3. Set and export the environment variables used by the BEA Tuxedo system, as explained in "Setting Environment Variables on a UNIX System" on page 6-16. Set APPDIR and TUXCONFIG as follows:

```
APPDIR=/home/me/atmi
TUXCONFIG=$APPDIR/tuxconfig
export APPDIR TUXCONFIG
```

Note: You do not have to set the WEBJAVADIR environment variable.

4. Copy the simpapp files to your working directory. You must edit the configuration file, ubbsimple. Make sure that the client and server files, simpcl and simpserv, are executable, and that the configuration file, ubbsimple, is writable. For example:

```
cp $TUXDIR/samples/atmi/simpapp/* .
chmod 755 simpserv simpcl
chmod 644 ubbsimple
```

5. Compile the simpapp client and server programs by entering the following commands:

```
buildclient -o simpcl -f simpcl.c
buildserver -o simpserv -f simpserv.c -s TOUPPER
```

6. In the sample configuration file, `ubbsimple`, replace the strings shown in angle brackets with values appropriate to your BEA Tuxedo system installation. Comments in `ubbsimple` explain how to customize the file. Set the following parameters in the `ubbsimple` file:

   - Set `IPCKEY` to a valid IPC key. This value must be greater than 32,768 and less than 262,143.
   - Set `APPDIR` to `"/home/me/atmi"`.
   - Set `TUXCONFIG` to the literal pathname corresponding to `$APPDIR/tuxconfig` (in our example, `"/home/me/atmi/tuxconfig"`).
   - Set `TUXDIR` to the absolute pathname of the product directory of the BEA Tuxedo software on this machine (for example, `"/home/bea/tuxedo8.0"`).
   - Set `machine-name` to the name of your system. To determine the name of your system on a UNIX machine enter the command:

     ```
     uname -n
     ```

   Note: The `APPDIR`, `TUXCONFIG`, and `TUXDIR` parameter settings in the `ubbsimple` file must match the settings of the `APPDIR`, `TUXCONFIG`, and `TUXDIR` environment variables.

7. Create the binary version of your edited configuration file by invoking `tmloadcf(1)`, which produces a file named `tuxconfig`. This file, referenced by the `TUXCONFIG` environment variable, provides the BEA Tuxedo system with a description of the application configuration at run time:

   ```
   tmloadcf -y ubbsimple
   ```

8. Boot `simpapp` by typing the following command:

   ```
   tmboot -y
   ```

   If the boot succeeds, output similar to the following is displayed and you can proceed to step 10.

Listing 6-5 Output Produced by tmboot -y

```
Booting all admin and server processes in /home/me/atmi/tuxconfig
INFO: BEA TUXEDO(r) System Release 8.0
INFO: Serial #: 000102-9125503751, Maxusers 25
Booting admin processes ...
exec BBL -A:
     process id=24180 ... Started.
```

```
Booting server processes ...
exec simpserv -A :
     process id=24181 ... Started.
2 processes started.
```

9. If the boot fails, examine the log named `ULOG.`*`mmddyy`* in your application directory (`$APPDIR`, `/home/me/atmi`). The string *`mmddyy`* is a placeholder for the date (digits representing the current month, day, and year) that will make up the end of the filename. Near the end of the log, you may see a message such as the following:

   ```
   can’t create enough semaphores for BB
   ```

   If such a message is displayed, the interprocess communication (IPC) resources configured in your operating system are not adequate for running `simpapp`.

   To confirm this hypothesis, invoke the BEA Tuxedo system command `tmloadcf(1)` and specify the name of your configuration file, as shown in the following example:

   ```
   tmloadcf -c $APPDIR/ubbsimple
   ```

   If the current value of any IPC parameter configured in your operating system is less than a minimum (either variable or fixed) listed in the `tmloadcf` output, you must increase the value of that parameter. For instructions on determining and changing the current IPC values for your platform, see the data sheet for your platform in Appendix A, “BEA Tuxedo 8.0 Platform Data Sheets.”

10. If the boot succeeds, you can invoke the client. For example, enter the following command:

    ```
    simpcl “hello world”
    ```

    The following message is displayed:

    ```
    Returned string is: HELLO WORLD
    ```

11. When you have finished, shut down `simpapp` with the following command:

    ```
    tmshutdown -y
    ```

Running simpapp to Verify the BEA Tuxedo CORBA C++ Software Installation

To verify that you have successfully installed the BEA Tuxedo CORBA C++ software on your system, run the CORBA version of the `simpapp` application. The pathname for this application on a Windows system is `%TUXDIR%\samples\corba\simpapp`; on a UNIX system, it is `$TUXDIR/samples/corba/simpapp`. The procedure presented in the following two sections is also provided in the `Readme.txt` file in the `simpapp` directory, and in “Tutorial for simpapp, a Simple C Application” in *Tutorials for Developing BEA Tuxedo ATMI Applications*.

Running simpapp to Verify the BEA Tuxedo CORBA C++ Software Installation on a Windows System

To configure and run the CORBA version of `simpapp` on a Windows system, follow these steps:

1. Log in to the target machine using the `Administrator` username and open a command-line shell.

2. Create a working directory for your sample application and change to it:

```
cd C:\home\me
mkdir corba
cd corba
```

3. Make sure that the product directory in which you installed the BEA Tuxedo software is set in the `TUXDIR` environment variable. For example, if you installed the software in the `C:\bea\tuxedo8.0` directory, set `TUXCONFIG` as follows:

```
set TUXDIR=C:\bea\tuxedo8.0
```

4. Copy the `simpapp` files to your working directory and change the permissions on all files to allow full access. For example:

```
copy %TUXDIR%\samples\corba\simpapp\*.* *.*
attrib -R /S *.*
```

5. Make sure that `nmake` is included in your path.

6. To run `simpapp` automatically, enter `runme`. The `simpapp` application runs and prints the following messages:

```
Testing simpapp
    cleaned up
    prepared
    built
    loaded ubb
    booted
    ran
    shutdown
    saved results
  PASSED
```

7. To run the sample manually, so you can observe the starting and stopping of the `simpapp` processes, follow these steps:

   a. Enter `results\setenv`.

   b. Enter `tmboot -y`. The application starts several processes.

   c. Enter `simple_client`. The prompt `String?` appears.

   d. Enter a word in lowercase letters. The application converts the word to uppercase and then to lowercase letters.

   e. Enter `tmshutdown -y`. The application shuts down the processes.

8. To restore the directory to its original state, perform these steps:

   a. `results\setenv`

   b. `nmake -f makefile.nt clean`

Running simpapp to Verify the BEA Tuxedo CORBA C++ Software Installation on a UNIX System

To configure and run the CORBA version of `simpapp` on a UNIX system, follow these steps:

1. Log in to the target machine as the BEA Tuxedo application administrator and select the ksh shell.

2. Create a working directory for your sample application and change to it:

```
cd /home/me
mkdir corba
cd corba
```

3. Make sure that the product directory in which you installed the BEA Tuxedo software is set in the TUXDIR environment variable. For example, if you installed the software in the /home/bea/tuxedo8.0 directory, set and export TUXCONFIG as follows:

   ```
   TUXDIR=/home/bea/tuxedo8.0
   export TUXDIR
   ```

4. Copy the simpapp files to your working directory and change the permissions on all files to allow full access. For example:

   ```
   cp $TUXDIR/samples/corba/simpapp/* .
   chmod 777 *
   ```

5. Make sure that make is included in your path.

6. To run simpapp automatically, enter . ./runme.ksh. The simpapp application runs and displays the following messages:

   ```
   Testing simpapp
        cleaned up
        prepared
        built
        loaded ubb
        booted
        ran
        shutdown
        saved results
    PASSED
   ```

7. To run simpapp manually, so you can observe the starting and stopping of the processes, follow these steps:

   a. Enter ksh.

   b. Enter . ./results/setenv.ksh.

   c. Enter tmboot -y. The application starts several processes.

   d. Enter simple_client. The prompt String? is displayed.

   e. Enter a word in lowercase letters. The application converts the word to uppercase and then to lowercase letters and displays the results.

   f. Enter tmshutdown -y. The application shuts down the processes.

8. To restore the directory to its original state, follow these steps:

a. `. ./results/setenv.ksh`

b. `make -f makefile.mk clean`

Running buildtms and buildXAJS for BEA Tuxedo Applications that Use XA Resource Managers

For BEA Tuxedo applications that use distributed transactions and XA-compliant resource managers, you must use the `buildtms` command to construct a transaction manager server load module. This requirement applies to both Windows 2000 and UNIX platforms. When the module has been created, it must reside in `%TUXDIR%\bin` on Windows 2000 systems, and in `$TUXDIR/bin` on UNIX systems.

If you run the CORBA C++ University sample applications, each sample's makefile creates the TMS load module for you and calls it `tms_ora.exe`. Therefore, running `buildtms` as a separate step is necessary only if you do not plan to run any of these sample applications.

For information about the `buildtms` command with BEA Tuxedo applications, see the `buildtms(1)` reference page in *BEA Tuxedo Command Reference*, which is included in the BEA Tuxedo Online Documentation.

Uninstalling BEA Tuxedo

When you uninstall BEA Tuxedo, all components that were installed by the installation process are removed. Configuration and application files that were created after the installation are not removed.

To uninstall BEA Tuxedo, complete the procedure for your platform provided in the following table.

To uninstall BEA Tuxedo on this platform . . .	**Perform the following procedure . . .**
Windows	1. Shut down any BEA Tuxedo servers that are running. For instructions on using the `tmshutdown` command to shut down BEA Tuxedo applications, see the `tmshutdown(1)` reference page in the *BEA Tuxedo Command Reference*. 2. From the Windows Start menu, choose Start→Programs→BEA WebLogic E-Business Platform→Tuxedo 8.0→Uninstall Tuxedo 8.0. The BEA Installation program Uninstaller window appears. 3. Click Uninstall to start the uninstall program. 4. Click Exit in the Uninstall Complete window.

UNIX	1. Shut down any BEA Tuxedo servers that are running. For instructions on using the `tmshutdown` command to shut down BEA Tuxedo applications, see the `tmshutdown(1)` reference page in the *BEA Tuxedo Command Reference*.
	2. Go to the `*tux_8.0_prod_dir*/uninstaller` directory. (*`tux_8.0_prod_dir`* represents the directory in which you installed the BEA Tuxedo software.)
	3. Choose one of two methods for uninstalling the software:
	■ To use the GUI-mode installation program, go to step 4.
	■ To use the console-mode procedure, go to step 5.
	4. (GUI-mode method) At the prompt, enter the following command:
	`sh Uninstall_Tuxedo8`
	In the Uninstaller window, click Uninstall to start the uninstall program, then click Exit in the Uninstall Complete window to complete the uninstallation.
	5. (Console-mode method) At the prompt, enter the following command:
	`sh Uninstall_Tuxedo8 -i console`
	When the uninstall process is complete, press Enter to exit the uninstaller.

Reinstalling BEA Tuxedo

When you start the BEA Installation program on a system on which a copy of BEA Tuxedo 8.0 is already installed, the BEA Installation program detects the existing installation and provides you with the prompts shown in the following table.

Click . . .	To . . .
Continue	Close the warning window and continue with the installation. This option overwrites the previous installation.
Cancel	Return to the Choose BEA Home Directory window. You cannot install multiple copies of BEA Tuxedo 8.0 in the same BEA Home directory. To continue installing the software using a different BEA Home directory, select an existing BEA Home directory that does not contain the release 8.0 software or create a new BEA Home directory.
Exit	Exit the installation program and uninstall the previous installation. You can invoke the uninstall program, as described in “Uninstalling BEA Tuxedo” on page 6-36, and reinstall the software as described in one of the following sections of this document: ■ “Installing BEA Tuxedo Using GUI-Mode Installation” on page 2-1 ■ “Installing BEA Tuxedo on UNIX Systems Using Console-Mode Installation” on page 3-1 ■ “Installing BEA Tuxedo Using Silent Installation” on page 4-1

CHAPTER

7 Starting the BEA Tuxedo Administration Console

The following sections provide the system requirements for the BEA Tuxedo Administration Console and explain how to start and exit the Console:

- Hardware Requirements
- Operating System Requirements
- Server Requirements
- Browser Requirements
- Understanding the BEA Tuxedo Administration Console File Tree
- Setting Up Your Environment for the BEA Tuxedo Administration Console
- Starting the BEA Tuxedo Administration Console
- Exiting the BEA Tuxedo Administration Console

Hardware Requirements

To run the BEA Tuxedo Administration Console, you need a color display device that meets the following requirements:

- Resolution: 800 by 600 or more is required; 1024 by 768 or more is recommended.
- Colors: A minimum of 256 colors is recommended.

Operating System Requirements

Given the broad outlines of an application design, you must verify the availability of the operating system resources needed to support your application. Operating system resources include:

- UNIX system shared resources (IPC)—for control of the maximum message size and maximum queue length
- Resources governed by kernel parameters

For additional information about interprocess communication (IPC) parameters and other system tunables, see the following sections of this document: Appendix A, “BEA Tuxedo 8.0 Platform Data Sheets,” and Appendix D, “IPC Resource Configuration on a UNIX System.”

Server Requirements

The BEA Tuxedo Administration Console server is supported on the following platforms:

- Compaq Tru64 UNIX v5.1 on Alpha Systems
- HP-UX Version 11.0 (32-bit) on HP 9000 Series
- Microsoft Windows 2000 on Intel
- Red Hat Linux 6.2 on Intel IA32 (x86)
- Sun Microsystems Solaris 8 (32-bit) SPARC

Browser Requirements

If used with no encryption (0-bit encryption), the BEA Tuxedo Administration Console is supported on Netscape 4.61 or later.

If used with encryption, the BEA Tuxedo Administration Console requires Java Plug-In 1.3 or higher to be able to run in the browser.

The encryption level for the BEA Tuxedo Administration Console is set with the `ENCRYPTBITS` parameter in the `webgui.ini` file for the Console. This parameter specifies the strength of encryption used in communication between the GUI applet and the BEA Tuxedo Administration Console server. The `ENCRYPTBITS` parameter can be set to 0, 56, or 128. The default value is 128.

The following table lists the browsers and platforms supported when the BEA Tuxedo Administration Console is configured for 56-bit or 128-bit encryption.

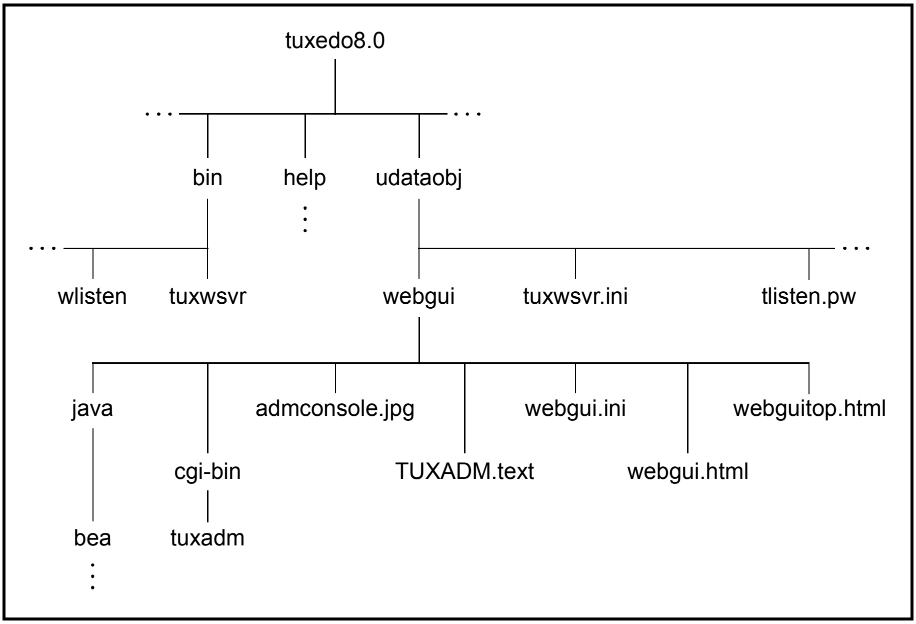
This platform . . .	**Supports these browsers . . .** (See note after the table.)	**And requires the following Java plug-in . . .**
Compaq Tru64 UNIX v5.1 on Alpha Systems	Netscape 4.7 Internet Explorer 4.7 and 5.0	1.3 or higher
HP-UX Version 11.0 (32-bit) on HP 9000 Series	Netscape 4.72 Internet Explorer 4.7 and 5.0	1.3 or higher
Microsoft Windows 2000 on Intel	Netscape 4.7 Internet Explorer 4.7 and 5.0	1.3 or higher
Red Hat Linux 6.2 on Intel IA32 (x86)	Netscape 4.7 Internet Explorer 4.7 and 5.0	1.3 or higher
Sun Microsystems Solaris 8 (32-bit) SPARC	Netscape 4.7 Internet Explorer 4.7 and 5.0	1.3 or higher

Note: While the Microsoft Internet Explorer browser is supported, the Netscape browser is recommended. If you experience any difficulty using the Internet Explorer browser, use Netscape.

Understanding the BEA Tuxedo Administration Console File Tree

During the BEA Tuxedo software installation, the installer program places most of the directories and files for the BEA Tuxedo Administration Console in the `webgui` directory, as shown in the following figure.

Figure 7-1 BEA Tuxedo Administration Console File Tree



The installer program installs the following HTML files:

- An HTML template file named `webgui.html`, which is used by the common gateway interface (CGI) program `tuxadm` as the basis for many screens displayed during a BEA Tuxedo Administration Console session.

- An HTML file named `webguitop.html`, which displays legal notices and warnings when the BEA Tuxedo Administration Console is first brought up on the screen.
- The HTML documentation files for the BEA Tuxedo Administration Console, which are installed in a top-level directory named `help`.

The installer program installs the class files for the Java applet in the `java` directory, and installs the `tuxadm` program in the `cgi-bin` directory. The installer assigns an alias pathname for `tuxadm`, which will be used by Web clients to access `tuxadm`. The alias pathname is `\cgi-bin` on a Windows 2000 system and `/cgi-bin` on a UNIX system.

Setting Up Your Environment for the BEA Tuxedo Administration Console

To run the BEA Tuxedo Administration Console, first set up your environment as described in “Setting Up Your Environment” on page 6-12. (Make sure that your `TUXDIR`, `WEBJAVADIR`, and `PATH` environment variables are set correctly.) Then set up the following two server processes:

- `tuxwsvr(1)`

  A Web server provided with the BEA Tuxedo system software. You are not required to use this server; you may, if you prefer, use your own commercial Web server.

- `wlisten(1)`

  A server required to administer the BEA Tuxedo Administration Console. It must be run on the `MASTER` machine in a multimachine configuration.

After starting the `tuxwsvr` and `wlisten` server processes, you can start the BEA Tuxedo Administration Console to monitor the `tuxwsvr` server and the BEA Tuxedo application.

Starting tuxwsvr

`tuxwsvr` is a World Wide Web server process that can be used to support the BEA Tuxedo Web GUI by customers who do not have a commercial Web server or a public-domain Web server on the machine on which the BEA Tuxedo Web GUI processes are running. When invoked, `tuxwsvr` runs in the background unless otherwise specified. It continues running until the machine shuts down or the `tuxwsvr` process is killed through an operating system command.

To start tuxwsvr on this platform . . .	Enter the following command . . .
Windows 2000 system	`tuxwsvr -l //`*`machine`*`:`*`port`*` -i %TUXDIR%\udataobj\tuxwsvr.ini`
UNIX system	`tuxwsvr -l //`*`machine`*`:`*`port`*` -i $TUXDIR/udataobj/tuxwsvr.ini`

The BEA Tuxedo installer program creates the `tuxwsvr.ini` file. Usually, you do not need to edit this file, but under certain circumstances, you may want to do so. For example, if you decide to move your Java files to a nondefault directory, you must edit the pathnames in the initialization file appropriately. For details, see the `tuxwsvr(1)` reference page in the *BEA Tuxedo Command Reference*.

Starting wlisten

`wlisten` is a listener process that receives incoming connections from Web GUI applets and starts a Web GUI gateway process (`wgated`). All `wlisten` options are taken from an initialization file that is specified by the `-i` option. If the `-i` option is not given, then `%TUXDIR%\udataobj\webgui\webgui.ini` is used as the default initialization file on a Windows 2000 system, and `$TUXDIR/udataobj/webgui/webgui.ini` is used as the default initialization file on a UNIX system.

To start `wlisten`, follow these steps:

1. Check the `webgui.ini` file to make sure that the default values assigned to the parameters during installation are appropriate. If they are not, make the necessary changes.

For example, on a machine called `popeye`, the default port assigned to `wlisten` is 4003. To run `wlisten` with port 6060, edit the `NADDR` parameter as follows:

```
NADDR=//popeye:6060
```

For details about other parameters in the `webgui.ini` file, see the `wlisten(1)` reference page in the *BEA Tuxedo Command Reference*.

2. Enter the following command:

```
wlisten
```

Starting the BEA Tuxedo Administration Console

`tuxadm` is a CGI process used to initialize the Web GUI from a browser. As shown in the "Synopsis" section of the `tuxadm(1)` reference page, this program can be used only as a location, or URL from a Web browser; normally it is not executed from a standard command-line prompt. Like other CGI programs, `tuxadm` uses the `QUERY_STRING` environment variable to parse its argument list.

To start the BEA Tuxedo Administration Console, complete the following four-step procedure:

1. Start the browser.
2. Enter the following URL:

```
http://machine:port/webguitop.html
```

It is assumed that the user of this URL is using `tuxwsvr` with the `tuxwsvr.ini` file.

Note: If you are using a commercial browser on the default port (8080), you can use a URL such as `http://ctomsn:8080/webguitop.html`.

The BEA Tuxedo Administration Console entry page, which includes warranty and license notices, is displayed.

3. To start the BEA Tuxedo Administration Console, select the Click Here to Run the BEA Tuxedo Administration Console prompt at the bottom of the screen. The Login window is displayed.

4. Enter your login name and password in the appropriate fields, and select LOGIN. The password must be one of the entries in the `tlisten.pw` file.

   The main window of the BEA Tuxedo Administration Console is displayed.

   The following table contains instructions for accessing additional information about the BEA Tuxedo Administration Console main window.

Table 7-1 Accessing Information About the BEA Tuxedo Administration Console Main Window

If . . .	Then . . .
The main window is displayed and you want to start working with the GUI	See "Administration Console Tutorial" in the BEA Tuxedo Administration Console online help.
The main window is displayed and you want to read a description of it	See "Installing BEA Tuxedo Using GUI-Mode Installation" in the BEA Tuxedo Administration Console online help.
The main window is not displayed and the `Connect Failed` error message is displayed	1. Enter the `ps` command to verify that the `wlisten` process is running. 2. If `wlisten` is not running, open the `webgui.ini` file and, in the line `NADDR=//lcsol1:4003`, replace the port number (4003) with a valid port number. 3. Enter `wlisten` again with the command appropriate for your platform: ■ On a Windows 2000 platform: `$ wlisten -i %TUXDIR%\udataobj\webgui\webgui.ini` ■ On a UNIX platform: `$ wlisten -i $TUXDIR/udataobj/webgui/webgui.ini` 4. Check that the `tuxwsvr` process is running at the port specified in the URL. 5. Verify that the password matches one of the entries in the `tlisten.pw` file. 6. Return to step 1.

Exiting the BEA Tuxedo Administration Console

To exit the BEA Tuxedo Administration Console, choose Domain→Exit from the menu bar. This menu option closes the current domain and exits the BEA Tuxedo Administration Console applet.

A BEA Tuxedo 8.0 Platform Data Sheets

This topic includes the following sections:

- Supported Platforms
- Compaq Tru64 UNIX Version 5.1 on Alpha Systems
- HP-UX Version 11.0 (32-Bit) on HP 9000 Series
- IBM AIX 4.3.3 on IBM PowerPC 32-Bit
- Microsoft Windows 2000 on Intel
- Microsoft Windows 98 on Intel
- Red Hat Linux 6.2 on Intel IA32 (x86)
- Sun Microsystems Solaris 8 (32-Bit) SPARC
- Platforms Supporting Threads

Supported Platforms

The following table lists the platforms on which the BEA Tuxedo system is supported for Release 8.0.

Vendor	Operating System	Release/Version
Compaq	Tru64 UNIX	5.1 (Alpha)
HP	HP-UX	11.00, 32-bit, plus patches PHKL_21039, PHKL_21684, and PHKL_21778 for the HP 9000 Series
IBM	AIX	4.3.3
Microsoft	Windows 2000	Windows 2000 on Intel
	Windows 98 (clients only)	Windows 98 on Intel
Red Hat	Linux	6.2
Sun Microsystems	Solaris	Solaris 8 SPARC (32-bit)

A data sheet is provided for each platform. Each data sheet includes the following platform-specific information:

- A list of available BEA Tuxedo install sets
- Hardware, software, network, and disk space requirements
- Instructions for mounting and unmounting the BEA Tuxedo software CD
- Tunable parameters

Install Sets

An install set is a bundle of product software components related by function. BEA Tuxedo 8.0 offers the following four install sets:

- *Full install set*—consists of all the BEA Tuxedo 8.0 server and client components
- *Server install set*—consists of all the BEA Tuxedo 8.0 server components:
  - Application-to-Transaction Monitor Interface (ATMI) server software
  - Common Object Request Broker Architecture (CORBA) C++ server software
  - BEA Jolt 8.0 server software
  - BEA Tuxedo Administration Console software
  - Link-level encryption (LLE) and secure sockets layer (SSL) encryption software
- *Client install set*—consists of all the BEA Tuxedo 8.0 client components:
  - BEA Tuxedo Workstation (/WS) client software
  - CORBA C++ client software (C++ client Object Request Broker, or ORB), including environmental objects
  - CORBA Java client software (BEA-branded Java client ORB), including environmental objects
  - BEA Jolt 8.0 client software
  - Windows 2000 and 98 systems only: ActiveX client software, including environmental objects and the BEA Application Builder graphical user interface (GUI)
  - LLE and SSL encryption software
- *Jolt client install set*—consists of the following BEA Tuxedo 8.0 components:
  - BEA Jolt 8.0 client software
  - SSL and LLE encryption software

In addition to selecting an install set during a BEA Tuxedo 8.0 installation, a user can further customize the installation by deselecting (deleting) one or more software components from the install set.

SSL and LLE are available with two levels of encryption: 56-bit and 128-bit. Licenses for the 128-bit client versions of SSL and LLE are available in the United States and Canada. With proper authorization, customers outside the United States and Canada may also acquire licenses with 128-bit encryption enabled. For details, see the BEA Tuxedo *Release Notes*.

Note: BEA Jolt 8.0 supports the same platforms that are supported by BEA Tuxedo 8.0.

Compaq Tru64 UNIX Version 5.1 on Alpha Systems

The following sections list BEA Tuxedo 8.0 requirements for Compaq Tru64 UNIX v5.1 on Alpha systems.

Available BEA Tuxedo 8.0 Install Sets for Compaq Tru64 UNIX Version 5.1

- Full install set
- Server install set
- Client install set
- Jolt client install set

For descriptions of BEA Tuxedo install sets, see “Install Sets” on page A-3.

Hardware Requirements for Tru64 UNIX Version 5.1

- Compaq Alpha processors that support Tru64 UNIX v5.1
- 256 MB of RAM
- 1 additional MB RAM for each BEA Tuxedo application, plus 0.5–1 MB per application server

Software Requirements for Tru64 UNIX Version 5.1

Component	**Requirement**
C/C++ and COBOL compilers	C compiler: Compaq C V6.3-027, C++ compiler: Compaq C++ V6.2-024; Server Express 1.0.0 (COBOL) from Micro Focus; required only for the BEA Tuxedo development environment
Tools for the administration desktop	Netscape 4.7 (see note); needed for BEA Tuxedo Administration Console; Java 2 JRE 1.3.0; needed for Java run-time environment **Note:** Netscape 4.7 is supported if the Administration Console is configured for 40, 56, or 128-bit encryption. If encryption is not configured, Netscape 4.7 or later is supported.
Java 2 JRE for the Java run-time environment	Java 2 JRE 1.3.0-alpha1
Java 2 Software Development Kit (SDK) for the Java development environment	Java 2 SDK 1.3.0-alpha1 **Note:** Before you install BEA Tuxedo Release 8.0, you must install the Java 2 SDK and add its pathname to your `PATH` environment variable.
Non BEA CORBA Java clients	Java 2 SDK 1.3 Interface Definition Language (IDL) ORB (run time)
Database for CORBA C++ applications	Oracle 8.0.5 or 8.1.6.

Component	Requirement
SSL certificate authorities	Verisign Netscape
Lightweight Directory Access Protocol (LDAP) directory servers	Netscape Enterprise Server; needed to retrieve X.509v3 digital certificates for SSL

Additional Notes:

- When using Oracle, Programmer/2000 Pro*C/C++ version 2.2.3.0.0 is required to build the BEA Tuxedo University sample applications.
- ATMI users need a C, C++, or COBOL compiler.
- CORBA C++ users need a C++ compiler and linker.
- CORBA Java IDL users need a C preprocessor. On UNIX systems, the C preprocessor comes with the system.
- For BEA Tuxedo 56-bit or 128-bit encryption:
  - Link-level encryption (LLE) is available for BEA Tuxedo client (/WS) connections to the BEA Tuxedo workstation listener (WSL) or workstation handler (WSH). Secure sockets layer (SSL) is not supported for encryption of these connections and for connections between machines and domains.
  - The BEA Tuxedo 8.0 Internet Inter-ORB Protocol (IIOP) listener (ISL) and IIOP handler (ISH) support SSL 3.0 for IIOP connections.
  - The BEA Tuxedo 8.0 CORBA C++ and CORBA Java clients support SSL 3.0. SSL connectivity between these clients, and the BEA Tuxedo ISL/ISH has been certified.
- To support certificate-based authentication when using SSL, BEA Tuxedo provides an LDAP-based certificate retrieval mechanism. This retrieval mechanism has been certified for use with the LDAP Directory server included with Netscape Enterprise Server.

Network Requirements for Tru64 UNIX Version 5.1

TCP/IP using the Sockets network interface.

Disk Space Requirements for Tru64 UNIX Version 5.1

The disk space requirements for installation on Compaq Tru64 UNIX on Alpha systems depends on which install set and components you select during the installation. Use the estimates in the following table as guidelines. These requirements are approximate and have been rounded up to the nearest megabyte (MB).

Component	Disk Space Requirement
Full install set: all BEA Tuxedo servers, clients and the BEA Tuxedo Administration Console; encryption software space not included	87 MB
Server install set: servers only; encryption software space not included	All servers: 69 MB ATMI server only: 22 MB CORBA C++ server only: 43 MB Jolt server only: 2 MB
Client install set: clients only; encryption software space not included	All clients: 29 MB /WS client only: 8 MB CORBA C++ client only: 20 MB CORBA Java client only: 23 MB Jolt client only: 2 MB
Jolt client install set: BEA Jolt clients only; encryption software space not included	Jolt client: 2 MB
Administration: BEA Tuxedo Administration Console (GUI)	12 MB

Component	Disk Space Requirement
Encryption software: 56-bit and 128-bit	2 MB for LLE only on ATMI server or /WS client system 4 MB for LLE and SSL

Mounting and Unmounting the CD for Tru64 UNIX Version 5.1

Mounting a CD requires the type `CDFS`. Because `CDFS` is a configurable kernel option, the following line must exist in the system configuration file:

```
options CDFS
```

If the system configuration file does not contain this line, modify the file and then rebuild the kernel.

To mount a CD, enter the following commands:

```
su
mkdir /cdrom
/usr/sbin/mount -r -t cdfs -o noversion /dev/rzunit#c /cdrom
```

In the `mount` command line, *`unit#`* is the unit number of your CD-ROM drive; `cdrom` (literal) is the mounting point.

In almost all cases, the unit number of the CD-ROM drive on a new system is 4 (that is, `/dev/rz4c`). However, to ensure that you have the correct unit number of the drive, enter the following commands:

```
su
file /dev/rrz*c
```

The output identifies the CD-ROM drive as an RRD disk. The unit number of the drive is in the far left column. For example:

```
/dev/rrz4c: character special (8/4098) SCSI #0 RRD43 disk #32 (SCSI
ID #4)
```

To unmount the CD, enter the following command:

```
umount /cdrom
```

Tunable Parameters for Tru64 UNIX Version 5.1

You probably need to reconfigure the Tru64 UNIX kernel before running BEA Tuxedo software, because the default values of some tunable parameters are too low.

To adjust the tunable parameters, follow these steps:

1. Determine whether the current values are adequate.

   For instructions about determining whether the current tunable parameter values are adequate, see "IPC Resource Configuration on a UNIX System" on page D-1 and "Checking IPC Requirements" on page 6-22.

2. Reset the tunable parameters as necessary.

   For instructions about reconfiguring, rebuilding, and rebooting, see the following documentation from Compaq: the `doconfig(8)` reference page and *System Tuning and Performance Management*.

The following table shows the default settings for the parameters and the settings used for the BEA Tuxedo University sample applications. Use these settings as a starting point, but keep in mind that your applications may require different settings.

Table A-1 University Sample Application Default Settings for Tru64 UNIX Version 5.1

Compaq Tru64 UNIX Name	Traditional Name	Default Setting	Setting for University Sample Applications
`semmns`	`SEMMNS`	60	(SEMMNI*2)
`semmni`	`SEMMNI`	10	16
`semmsl`	`SEMMSL`	25	25
`semume`	`SEMUME`	10	10
`semopm`		10	10
`semvmx`		32767	32767
`semaem`		16384	16384
`msgmni`	`MSGMNI`	50	84

Table A-1 University Sample Application Default Settings for Tru64 UNIX Version 5.1 (Continued)

Compaq Tru64 UNIX Name	Traditional Name	Default Setting	Setting for University Sample Applications
`msgmax`	`MSGMAX`	8192	8192
`msgmnb`	`MSGMNB`	16384	16384
`msgtql`	`MSGTQL`	40	40
`maxusers`	`maxusers`	varies	32
`maxproc`	`NPROC`	20+8*maxusers	32–72 per user
`maxuprc`	`MAXUP`	64	(NPROC * 9) / 10

The tunable parameters currently set on your system reside in the kernel configuration file located in the `/sys/conf` directory (`/sys/conf/`*`machine_name`*). This file typically has the same name as the machine (node) name.

To display the parameters, log in as user `root` and enter `/usr/bin/x11/dxkerneltuner` at the command prompt.

To change the value of a tunable parameter, follow the instructions for `DMCONFIG(5)` in the *File Formats, Data Descriptions, MIBs, and System Processes Reference*.

To specify the value of a parameter that was previously unspecified, add a line such as the following to the kernel configuration file:

```
semmni 256
```

Here `semmni` is the name of the parameter and `256` is its value.

HP-UX Version 11.0 (32-Bit) on HP 9000 Series

The following sections list BEA Tuxedo 8.0 requirements for HP-UX 11.0 (32-bit) systems.

Available BEA Tuxedo 8.0 Install Sets for HP-UX 11.0 (32-Bit)

- Full install set
- Server install set
- Client install set
- Jolt client install set

For descriptions of BEA Tuxedo install sets, see “Install Sets” on page A-3.

Hardware Requirements for HP-UX 11.0 (32-Bit)

- HP 9000 Series
- 256 MB of RAM
- 1 additional MB RAM for each BEA Tuxedo application, plus 0.5–1 MB per application server

Software Requirements for HP-UX 11.0 (32-Bit)

Component	Requirement
Operating system	HP-UX 11.0 32-bit plus patches PHKL_21039, PHKL_21684, and PHKL_21778. **Note:** The PHKL patches are an enhancement to HP-UX 11.0 that enable it to handle the large message queue sizes produced by BEA Tuxedo 8.0. These patches increase the SysV IPC MSGMNB message queue capacity from a 16-bit (ushort) limit to a 32-bit (int) limit for recompiled applications that are designed specifically to take advantage of this feature. Java users must also apply Java 2 patches, which are available at `http://www.unixsolutions.hp.com/products/java/2_60_software_content.html`.
C/C++ and COBOL compilers	HP aC++ B3910B A.03.13; Server Express 1.0.0 (COBOL) from Micro Focus; required only for BEA Tuxedo development environment
Tools for the administration desktop	Netscape 4.72 (see note); needed for BEA Tuxedo Administration Console; Java 2 JRE 1.3.0; needed for Java run-time environment **Note:** Netscape 4.72 is supported if the Administration Console is configured for 40, 56, or 128-bit encryption. If no encryption is configured, Netscape 4.7 or later is supported.
Java 2 JRE for the Java run-time environment	Java 2 JRE 1.3.0-BETA2 (HotSpot)
Java 2 Software Development Kit (SDK) for the Java development environment	Java 2 SDK 1.3.0-BETA2 (HotSpot)
Non-BEA CORBA Java clients	Java 2 SDK 1.3 Interface Definition Language (IDL) ORB (run time)

Component	Requirement
Database for CORBA C++ applications	Oracle 8.1.6 or later
SSL certificate authorities	Verisign Netscape
Lightweight Directory Access Protocol (LDAP) directory servers	Netscape Enterprise Server; needed to retrieve X.509v3 digital certificates for SSL

Additional Notes:

- When using Oracle, Programmer/2000 Pro*C/C++ version 2.2.3.0.0 is required to build the BEA Tuxedo University sample applications.
- ATMI users need a C, C++, or COBOL compiler.
- CORBA C++ users need a C++ compiler and linker.
- CORBA Java IDL users need a C preprocessor. On UNIX systems, the C preprocessor comes with the system.
- For BEA Tuxedo 56-bit or 128-bit encryption:
    - Link-level encryption (LLE) is available for BEA Tuxedo client (/WS) connections to the BEA Tuxedo workstation listener (WSL) or workstation handler (WSH). Secure sockets layer (SSL) is not supported for encryption of these connections and for connections between machines and domains.
    - The BEA Tuxedo 8.0 Internet Inter-ORB Protocol (IIOP) listener (ISL) and IIOP handler (ISH) support SSL 3.0 for IIOP connections.
    - The BEA Tuxedo 8.0 CORBA C++ and CORBA Java clients support SSL 3.0. SSL connectivity between these clients, and the BEA Tuxedo ISL/ISH has been certified.
- To support certificate-based authentication when using SSL, BEA Tuxedo provides an LDAP-based certificate retrieval mechanism. This retrieval mechanism has been certified for use with the LDAP Directory server included with Netscape Enterprise Server.

Network Requirements for HP-UX 11.0 (32-Bit)

TCP/IP using the Sockets network interface.

Disk Space Requirements for HP-UX 11.0 (32-Bit)

The disk space requirements for installation on HP-UX 11.0 (32-bit) systems depends on which install set and components you select during the installation. Use the estimates in the following table as guidelines. These requirements are approximate and have been rounded up to the nearest megabyte (MB).

Component	Disk Space Requirement
Full install set: all BEA Tuxedo servers, clients and the BEA Tuxedo Administration Console; encryption software space not included	89 MB
Server install set: servers only; encryption software space not included	All servers: 71 MB ATMI server only: 20 MB CORBA C++ server only: 50 MB Jolt server only: 2 MB
Client install set: clients only; encryption software space not included	All clients: 31 MB /WS client only: 7 MB CORBA C++ client only: 22 MB CORBA Java client only: 25 MB Jolt client only: 2 MB
Jolt client install set: BEA Jolt clients only; encryption software space not included	Jolt client: 2 MB
Administration: BEA Tuxedo Administration Console (GUI)	12 MB

Component	Disk Space Requirement
Encryption software: 56-bit and 128-bit	2 MB for LLE only on ATMI server or /WS client system 4 MB for LLE and SSL

Mounting and Unmounting the CD for HP-UX 11.0 (32-Bit)

To mount a CD, enter the following commands:

```
su
mkdir /cdrom
mount -F cdfs -o cdcase /dev/dsk/cdrom_device /cdrom
```

Here *`cdrom_device`* is listed in the output of the `ioscan -f -n` command; `cdrom` (literal) is the mounting point.

To unmount the CD, enter the following command:

```
umount /cdrom
```

Tunable Parameters for HP-UX 11.0 (32-Bit)

You probably need to reconfigure the HP-UX kernel before running BEA Tuxedo software because the default values of some tunable parameters are too low.

To adjust the tunable parameters, follow these steps:

1. Determine whether the current values are adequate.

   For instructions about determining whether the current tunable parameter values are adequate, see “IPC Resource Configuration on a UNIX System” on page D-1 and “Checking IPC Requirements” on page 6-22.

2. Reset the tunable parameters as necessary.

   For instructions about reconfiguring HP-UX, see “Setting Up a System” in the *HP-UX System Administration Tasks Manual*.

The following table lists the default settings for the parameters and the settings used for the University sample applications. Use these settings as a starting point, but keep in mind that your applications may require different settings.

Table A-2 University Sample Application Default Settings for HP-UX 11.0 (32-Bit)

HP-UX Name	Traditional Name	Default Setting	Setting for University Sample Applications
shmmax	SHMMAX	67108864	0x40000000
shmseg	SHMSEG	12	32
shmmni	SHMMNI	100	512
semmns	SEMMNS	128	(SEMMNI*2)
semmni	SEMMNI	64	NPROC*5
semmap	SEMMA	semmni+2	1
semmnu	SEMMNU	30	(SEMMNI / 2)
semume	SEMUME	10	64
msgmni	MSGMNI	50	NPROC
msgmap	MSGMAP	2+msgtql	MSGTQL + 2
msgmax	MSGMAX	8192	32768
msgmnb	MSGMNB	16384	65535
msgssz	MSGSSZ	8	128
msgtql	MSGTQL	40	(NPROC * 10)
msgseg	MSGSEG	2048	(MSGTQL * 4)
maxusers	MAXUSERS	32	200
nproc	NPROC	20+8*maxusers	(MAXUSERS * 3) + 64
maxuprc	MAXUPRC	50	(NPROC * 9) / 10
maxfiles	NFILES	60	15 * NPROC + 2048

The tunable parameters currently set on your system are in the kernel configuration file `tune.h` located in the `/stand/build` directory (`/stand/build/tune.h`).

IBM AIX 4.3.3 on IBM PowerPC 32-Bit

The following sections list BEA Tuxedo 8.0 requirements for AIX 4.3.3 on PowerPC (32-bit) systems.

Available BEA Tuxedo Release 8.0 Packages

- BEA Tuxedo Core System
- BEA Tuxedo Workstation
- BEA Jolt

Note: The BEA Tuxedo Release 8.0 Online Documentation is provided on a separate CD-ROM.

Hardware Requirements

- IBM PowerPC
- 256 MB of RAM minimum
- 1 additional MB RAM for each BEA Tuxedo application, plus 0.5-1 MB per application server

Software Requirements

- IBM AIX 4.3.3 (supports threads)
- IBM AIX XL C Compiler (BEA Tuxedo development environment only)

- MicroFocus Server Express v1.0 Revision 0000 (BEA Tuxedo development environment only)

Notes: JDK 1.3.0 (Class VM with JIT enabled) is provided automatically on WebLogic Server; you do not need to install a Java 2 SDK separately.

For BEA Jolt hardware and software requirements, see Appendix B, “BEA Jolt 8.0 Preparations.”

Network

- TCP/IP, using the Sockets network interface

Disk Space Requirements for IBM AIX 4.3.3 (32-bit)

The disk space requirements for installation on an IBM AIX 4.3.3 system depends on which install set and components you select during the installation. Use the estimates in the following table as guidelines. These requirements are approximate and have been rounded up to the nearest megabyte (MB).

Component	Disk Space Requirement
Full install set: all BEA Tuxedo servers, clients and the BEA Tuxedo Administration Console; encryption software space not included	89 MB
Server install set: servers only; encryption software space not included	All servers: 71 MB ATMI server only: 20 MB CORBA C++ server only: 50 MB Jolt server only: 2 MB

Component	**Disk Space Requirement**
Client install set: clients only; encryption software space not included	All clients: 31 MB /WS client only: 7 MB CORBA C++ client only: 22 MB CORBA Java client only: 25 MB Jolt client only: 2 MB
Jolt client install set: BEA Jolt clients only; encryption software space not included	Jolt client: 2 MB
Administration: BEA Tuxedo Administration Console (GUI)	12 MB
Encryption software: 56-bit and 128-bit	2 MB for LLE only on ATMI server or /WS client system 4 MB for LLE and SSL

Tunable Parameter

No IPC configuration is required for AIX. To change the value of a kernel tuning parameter (`maxuproc` only):

1. Acquire superuser privileges.
2. Determine the values of all tunable parameters.
3. Change the value of the appropriate parameter.
4. Reboot the system.

Mounting and Unmounting the CD for AIX 4.3.3 (32-Bit)

To mount a CD, examine the file `/etc/filesystems` to determine whether there is a standard place in which to mount a CD. If there is, enter the `mount` command and specify the directory named in the `/etc/filesystems` entry.

For example, to mount a CD when an entry in `/etc/filesystems` specifies /cd as the mount point, enter:

```
su
/etc/mount /cd
```

If `/etc/fileystems` does not contain a CD entry, enter:

```
su
mkdir /cd
/etc/mount -v cdrfs -r cd_device /cd
```

In the latter command line, *`cd_device`* represents the name of the CD device file, typically `/dev/cd0`.

Alternatively, you can use the System Management Interface Tool (SMIT) to perform the mount. To use SMIT, enter the following:

```
smit mount
```

To unmount the CD, enter the following command:

```
unmount /cdrom
```

In this command line `cdrom` represents the mount point.

Microsoft Windows 2000 on Intel

The following sections list BEA Tuxedo 8.0 requirements for Microsoft Windows 2000 systems.

BEA Tuxedo 8.0 Install Sets for Windows 2000 (Intel)

- Full install set
- Server install set

- Client install set (includes ActiveX clients)
- Jolt client install set

For descriptions of BEA Tuxedo install sets, see "Install Sets" on page A-3.

Hardware Requirements for Windows 2000 (Intel)

- Pentium processor
- 128 MB of RAM
- 1 additional MB RAM for each BEA Tuxedo application, plus 0.5–1 MB per application server

Software Requirements for Windows 2000 (Intel)

Component	Requirement
C/C++ and COBOL compilers	Visual C++ 6.0 SP4; required for full (development) installations, but not for client-only or server-only installations; Net Express 3.1 (COBOL) from Micro Focus. Also, either Visual C++ 6.0 SP4, Visual Basic 6.0, or another OLE Automation development tool is required for client systems that run ActiveX client applications.
Internet browser for BEA Application Builder Help	Netscape 4.0 or later. This browser is required only for the online help used in the BEA Application Builder. This GUI is installed on your system if you included ActiveX clients in your BEA Tuxedo 8.0 installation.

Component	Requirement
Tools for the administration desktop	Netscape 4.7 (see note) or Internet Explorer 4.7 or 5.0—needed for BEA Tuxedo Administration Console; Java 2 JRE 1.3—needed for Java run-time environment **Note:** Netscape 4.7 is supported if the Administration Console is configured for 40, 56, or 128-bit encryption. If no encryption is configured, Netscape 4.7 or later is supported. **Note:** If you experience problems using the Internet Explorer browser, use the Netcape browser.
Java 2 JRE for the Java run-time environment	Java 2 JRE 1.3.0-C
Java 2 Software Development Kit (SDK) for the Java development environment	Java 2 SDK 1.3.0-C
Non BEA CORBA Java clients	Java 2 SDK 1.3 Interface Definition Language (IDL) ORB (run time)
Database for CORBA C++ applications	Oracle 8.1.6 or later
SSL certificate authorities	Verisign Netscape
Lightweight Directory Access Protocol (LDAP) directory servers	Netscape Enterprise Server; needed to retrieve X.509v3 digital certificates for SSL

Additional Notes:

- When using Oracle, Programmer/2000 Pro*C/C++ version 2.2.3.0.0 is required to build the BEA Tuxedo University sample applications.
- ATMI users need a C, C++, or COBOL compiler.
- CORBA C++ users need a C++ compiler and linker.

- CORBA Java IDL users need a C preprocessor. On Windows 2000, for example, Visual C++ includes a C preprocessor.
- For BEA Tuxedo 56-bit or 128-bit encryption:
  - Link-level encryption (LLE) is available for BEA Tuxedo client (/WS) connections to the BEA Tuxedo workstation listener (WSL) or workstation handler (WSH). Secure sockets layer (SSL) is not supported for encryption of these connections and for connections between machines and domains.
  - The BEA Tuxedo 8.0 Internet Inter-ORB Protocol (IIOP) listener (ISL) and IIOP handler (ISH) support SSL 3.0 for IIOP connections.
  - The BEA Tuxedo 8.0 CORBA C++ and CORBA Java clients support SSL 3.0. SSL connectivity between these clients, and the BEA Tuxedo ISL/ISH has been certified.
- To support certificate-based authentication when using SSL, BEA Tuxedo provides an LDAP-based certificate retrieval mechanism. This retrieval mechanism has been certified for use with the LDAP Directory server included with Netscape Enterprise Server.

Network Requirements for Windows 2000 (Intel)

TCP/IP provided by Microsoft Windows 2000 (32-bit Winsock).

Disk Space Requirements for Windows 2000 (Intel)

The disk space requirements for installation on Windows 2000 (Intel) systems depends on which install set and components you select during the installation. Use the estimates in the following table as guidelines. These requirements are approximate and have been rounded up to the nearest megabyte (MB).

Component	Disk Space Requirement
Full install set: all BEA Tuxedo servers, clients and the BEA Tuxedo Administration Console; encryption software space not included	83 MB
Server install set: servers only; encryption software space not included	All servers: 54 MB ATMI server only: 21 MB CORBA C++ server only: 37 MB Jolt server only: 2 MB
Client install set: clients only; encryption software space not included	All clients: 42 MB /WS client only: 13 MB CORBA C++ client only: 24 MB CORBA Java client only: 24 MB Jolt client only: 2 MB ActiveX client only: 13 MB
Jolt client install set: BEA Jolt clients only; encryption software space not included	Jolt client: 2 MB
Administration: BEA Tuxedo Administration Console (GUI)	11 MB
Encryption software: 56-bit and 128-bit	1 MB for LLE only on ATMI server or /WS client system 3 MB for LLE and SSL

Tunable Parameters for Windows 2000 (Intel)

Before running the BEA Tuxedo software, you may need to reconfigure the interprocess communication (IPC) parameters shown in the figure entitled “BEA Administration Window with IPC Resources Page Displayed” on page 2-19. For instructions about reconfiguring the IPC parameters, see “Configuring IPC Resources to Maximize System Performance” on page 2-18 and “Checking IPC Requirements” on page 6-22.

Microsoft Windows 98 on Intel

The following sections list BEA Tuxedo 8.0 requirements for Microsoft Windows 98 systems.

Available BEA Tuxedo 8.0 Install Sets for Windows 98 (Intel)

- Client install set (includes ActiveX clients)
- Jolt client install set

For descriptions of BEA Tuxedo install sets, see “Install Sets.”

Hardware Requirements for Windows 98 (Intel)

- Pentium processor
- 32 MB of RAM

Software Requirements for Windows 98 (Intel)

Component	Requirement
C/C++ compilers	Either Visual C++ 6.0 SP4, Visual Basic 6.0 SP4, or another OLE Automation development tool is required for client systems that run ActiveX client applications only; otherwise, no additional compiler software is required is required on client-only systems.
Internet browser for BEA Application Builder Help	Netscape 4.0 or later. This browser is required only for the online help used in the BEA Application Builder. This GUI is installed on your system if you included ActiveX clients in your BEA Tuxedo 8.0 installation.
Tools for the administration desktop	Not applicable
Java 2 JRE for the Java run-time environment	Java 2 JRE 1.3.0-C
Java 2 Software Development Kit (SDK) for the Java development environment	Not applicable
Non-BEA CORBA Java clients	Java 2 SDK 1.3 Interface Definition Language (IDL) ORB (run time)
Database for CORBA C++ applications	Not applicable
SSL certificate authorities	Verisign Netscape
Lightweight Directory Access Protocol (LDAP) directory servers	Netscape Enterprise Server; needed to retrieve X.509v3 digital certificates for SSL

Additional Notes:

- For BEA Tuxedo 56-bit or 128-bit encryption:

  - Link-level encryption (LLE) is available for BEA Tuxedo client (/WS) connections to the BEA Tuxedo workstation listener (WSL) or workstation handler (WSH). Secure sockets layer (SSL) is not supported for encryption of these connections and for connections between machines and domains.
  - The BEA Tuxedo 8.0 Internet Inter-ORB Protocol (IIOP) listener (ISL) and IIOP handler (ISH) support SSL 3.0 for IIOP connections.
  - The BEA Tuxedo 8.0 CORBA C++ and CORBA Java clients support SSL 3.0. SSL connectivity between these clients, and the BEA Tuxedo ISL/ISH has been certified.

- To support certificate-based authentication when using SSL, BEA Tuxedo provides an LDAP-based certificate retrieval mechanism. This retrieval mechanism has been certified for use with the LDAP Directory server included with Netscape Enterprise Server.

Network Requirements for Windows 98 (Intel)

TCP/IP provided by Microsoft Windows 98 (32-bit Winsock).

Disk Space Requirements for Windows 98 (Intel)

The disk space requirements for installation on Windows 98 (Intel) systems depends on which client install set and components you select during the installation. Use the estimates in the following table as guidelines. These requirements are approximate and have been rounded up to the nearest megabyte (MB).

Component	Disk Space Requirement
Client install set: clients only; encryption software space not included	All clients: 42 MB /WS client only: 13 MB CORBA C++ client only: 24 MB CORBA Java client only: 24 MB Jolt client only: 2 MB ActiveX client only: 13 MB

Component	Disk Space Requirement
Jolt client install set: BEA Jolt clients only; encryption software space not included	Jolt client: 2 MB
Encryption software: 56-bit and 128-bit	1 MB for LLE only on ATMI server or /WS client system 3 MB for LLE and SSL

Red Hat Linux 6.2 on Intel IA32 (x86)

The following sections list BEA Tuxedo 8.0 requirements for Red Hat Linux 6.2 systems.

Available BEA Tuxedo 8.0 Install Sets for Red Hat Linux 6.2 (Intel)

- Full install set
- Server install set
- Client install set
- Jolt client install set

For descriptions of BEA Tuxedo install sets, see “Install Sets” on page A-3.

Hardware Requirements for Red Hat Linux 6.2 (Intel)

- Pentium III processor or higher
- 256 MB of RAM

- 1 additional MB RAM for each BEA Tuxedo application, plus 0.5–1 MB per application server

Software Requirements for Red Hat Linux 6.2 (Intel)

Component	Requirement
C/C++ and COBOL compilers	gcc version egcs-2.91.66 or 19990314/Linux (egcs-1.1.2 release); Server Express 1.0.0 (COBOL) from Micro Focus; required only for BEA Tuxedo development environment
Tools for the administration desktop	Netscape 4.7 (see notes); needed for BEA Tuxedo Administration Console; Java 2 JRE 1.3.0; needed for Java run-time environment **Note:** Netscape 4.7 is supported if the Administration Console is configured for 40, 56, or 128-bit encryption. If no encryption is configured, Netscape 4.7 or later is supported.
Java 2 JRE for the Java run-time environment	Java 2 JRE 1.3.0
Java 2 Software Development Kit (SDK) for the Java development environment	Java 2 SDK 1.3.0
Non-BEA CORBA Java clients	Java 2 SDK 1.3 Interface Definition Language (IDL) ORB (run time)
Database for CORBA C++ applications	Oracle 8.1.6.
SSL certificate authorities	Verisign Netscape
Lightweight Directory Access Protocol (LDAP) directory servers	Netscape Enterprise Server; needed to retrieve X.509v3 digital certificates for SSL

Additional Notes

- When using Oracle, Programmer/2000 Pro*C/C++ version 2.2.3.0.0 is required to build the BEA Tuxedo University sample applications.
- ATMI users need a C, C++, or COBOL compiler.
- CORBA C++ users need a C++ compiler and linker.
- CORBA Java IDL users need a C preprocessor. On UNIX systems, the C preprocessor comes with the system.
- For BEA Tuxedo 56-bit or 128-bit encryption:
  - Link-level encryption (LLE) is available for BEA Tuxedo client (/WS) connections to the BEA Tuxedo workstation listener (WSL) or workstation handler (WSH). Secure sockets layer (SSL) is not supported for encryption of these connections and for connections between machines and domains.
  - The BEA Tuxedo 8.0 Internet Inter-ORB Protocol (IIOP) listener (ISL) and IIOP handler (ISH) support SSL 3.0 for IIOP connections.
  - The BEA Tuxedo 8.0 CORBA C++ and CORBA Java clients support SSL 3.0. SSL connectivity between these clients, and the BEA Tuxedo ISL/ISH has been certified.
- To support certificate-based authentication when using SSL, BEA Tuxedo provides an LDAP-based certificate retrieval mechanism. This retrieval mechanism has been certified for use with the LDAP Directory server included with Netscape Enterprise Server.

Network Requirements for Red Hat Linux 6.2 (Intel)

TCP/IP using the Sockets network interface.

Disk Space Requirements for Red Hat Linux 6.2 (Intel)

The disk space requirements for installation on Red Hat Linux 6.2 (Intel) systems depends on which install set and components you select during the installation. Use the estimates in the following table as guidelines. These requirements are approximate and have been rounded up to the nearest megabyte (MB).

Component	Disk Space Requirement
Full install set: all BEA Tuxedo servers, clients and the BEA Tuxedo Administration Console; encryption software space not included	87 MB
Server install set: servers only; encryption software space not included	All servers: 69 MB ATMI server only: 22 MB CORBA C++ server only: 43 MB Jolt server only: 2 MB
Client install set: clients only; encryption software space not included	All clients: 29 MB /WS client only: 8 MB CORBA C++ client only: 20 MB CORBA Java client only: 23 MB Jolt client only: 2 MB
Jolt client install set: BEA Jolt clients only; encryption software space not included	Jolt client: 2 MB
Administration: BEA Tuxedo Administration Console (GUI)	12 MB
Encryption software: 56-bit and 128-bit	2 MB for LLE only on ATMI server or /WS client system 4 MB for LLE and SSL

Mounting and Unmounting the CD for Red Hat Linux 6.2 (Intel)

To mount a CD, enter the following commands:

```
su
mkdir /cdrom1
mount -t iso9660 -r /dev/cd_device /cdrom1
```

To determine the value of *cd_device*, execute the following command:

```
dmesg | grep -i cd
```

Linux displays the following output:

```
cd_device device_description
```

The value of *device_description* may contain more than one field. For example, in the following output, the value of device description contains three fields:

```
hd20 Sony CDU-55 ATAPI
```

In this output:

- `hd20` is the value of *cd_device*.
- `Sony CDU-55 ATAPI` is the value of *device_description*.

To unmount the CD, enter the following command:

```
umount /cdrom1
```

Tunable Parameters for Red Hat Linux 6.2 (Intel)

The Red Hat Linux kernel parameters are preconfigured with setting sufficient for running the BEA Tuxedo 8.0 software. If you want to change any parameter settings, refer to the Red Hat Linux documentation.

Sun Microsystems Solaris 8 (32-Bit) SPARC

The following sections list BEA Tuxedo 8.0 requirements for Sun Microsystems Solaris 8 (32-bit) SPARC systems.

Available BEA Tuxedo 8.0 Install Sets for Solaris 8 (32-Bit) SPARC

- Full install set
- Server install set
- Client install set
- Jolt client install set

For descriptions of BEA Tuxedo install sets, see “Install Sets” on page A-3.

Hardware Requirements for Solaris 8 (32-Bit) SPARC

- UltraSPARC
- 256 MB of RAM
- 1 additional MB RAM for each BEA Tuxedo application, plus 0.5–1 MB per application server

Software Requirements for Solaris 8 (32-Bit) SPARC

Component	Requirement
C/C++ and COBOL compilers	Forte C++ 6 (formerly Sun Visual WorkShop C++); Server Express 1.0.0 (COBOL) from Micro Focus; required only for BEA Tuxedo development environment
Tools for the administration desktop	Netscape 4.7 (see note); needed for BEA Tuxedo Administration Console; Java 2 JRE 1.3.0; needed for Java run-time environment **Note:** Netscape 4.7 is supported if the Administration Console is configured for 40, 56, or 128-bit encryption. If no encryption is configured, Netscape 4.7 or later is supported.
Java 2 JRE for the Java run-time environment	Java 2 JRE 1.3.0
Java 2 Software Development Kit (SDK) for the Java development environment	Java 2 SDK 1.3.0
Non BEA CORBA Java clients	Java 2 SDK 1.3 Interface Definition Language (IDL) ORB (run time)
Database for CORBA C++ applications	Oracle 8.1.6 or later
SSL certificate authorities	Verisign Netscape
Lightweight Directory Access Protocol (LDAP) directory servers	Netscape Enterprise Server; needed to retrieve X.509v3 digital certificates for SSL

Additional Notes

- When Oracle is used, Programmer/2000 Pro*C/C++ version 2.2.3.0.0 is required to build the BEA Tuxedo University sample applications.
- ATMI users need a C, C++, or COBOL compiler.

- CORBA C++ users need a C++ compiler and linker.
- CORBA Java IDL users need a C preprocessor. On UNIX systems, the C preprocessor comes with the system.
- For BEA Tuxedo 56-bit or 128-bit encryption:
  - Link-level encryption (LLE) is available for BEA Tuxedo client (/WS) connections to the BEA Tuxedo workstation listener (WSL) or workstation handler (WSH). Secure sockets layer (SSL) is not supported for encryption of these connections and for connections between machines and domains.
  - The BEA Tuxedo 8.0 Internet Inter-ORB Protocol (IIOP) listener (ISL) and IIOP handler (ISH) support SSL 3.0 for IIOP connections.
  - The BEA Tuxedo 8.0 CORBA C++ and CORBA Java clients support SSL 3.0. SSL connectivity between these clients, and the BEA Tuxedo ISL/ISH has been certified.
- To support certificate-based authentication when using SSL, BEA Tuxedo provides an LDAP-based certificate retrieval mechanism. This retrieval mechanism has been certified for use with the LDAP Directory server included with Netscape Enterprise Server.

Network Requirements for Solaris 8 (32-Bit) SPARC

TCP/IP using the Transport Layer Interface (TLI) network interface.

Disk Space Requirements for Solaris 8 (32-Bit) SPARC

The disk space requirements for installation on Solaris 8 (32-bit) SPARC systems depends on which install set and components you select during the installation. Use the estimates in the following table as guidelines. These requirements are approximate and have been rounded up to the nearest megabyte (MB).

Component	Disk Space Requirement
Full install set: all BEA Tuxedo servers, clients and the BEA Tuxedo Administration Console; encryption software space not included	87 MB
Server install set: servers only; encryption software space not included	All servers: 69 MB ATMI server only: 22 MB CORBA C++ server only: 43 MB CORBA Java server only: 68 MB Jolt server only: 2 MB
Client install set: clients only; encryption software space not included	All clients: 29 MB /WS client only: 8 MB CORBA C++ client only: 20 MB CORBA Java client only: 23 MB Jolt client only: 2 MB
Jolt client install set: BEA Jolt clients only; encryption software space not included	Jolt client: 2 MB
Administration: BEA Tuxedo Administration Console (GUI)	12 MB
Encryption software: 56-bit and 128-bit	2 MB for LLE only on ATMI server or /WS client system 4 MB for LLE and SSL

Mounting and Unmounting the CD for Solaris 8 (32-Bit) SPARC

The Solaris Volume Management software automatically mounts CDs on `/cdrom/cdrom0/s0`.

It is not necessary to unmount CDs on Solaris systems. However, it is necessary to issue a command to open the CD reader. To open the CD reader, `cd` to `/` (root) and enter `eject`.

Tunable Parameters for Solaris 8 (32-Bit) SPARC

You probably need to reconfigure the Solaris kernel before running BEA Tuxedo 8.0 software because the default values of some tunable parameters are too low.

To adjust the tunable parameters, follow these steps:

1. Determine whether the current values are adequate.

   For instructions about determining whether the current tunable parameter values are adequate, see "IPC Resource Configuration on a UNIX System" on page D-1 and "Checking IPC Requirements" on page 6-22.

2. Change the tunable parameters as necessary.

   Information regarding kernel configuration is provided in the Solaris `systune(1M)` reference page.

The following table shows the default settings for the parameters and the settings used for the BEA Tuxedo University sample applications. Use these settings as a starting point, but keep in mind that your applications may require different settings.

Table A-3 University Sample Application Default Settings for Solaris 8 (32-Bit) SPARC

Solaris Name	Traditional Name	Default Setting	Setting for University Sample Applications
`shmsys:shminfo_shmmax`	`SHMMAX`	131072	67108864
`shmsys:shminfo_shmseg`	`SHMSEG`	6	100
`shmsys:shminfo_shmmni`	`SHMMNI`	100	300
`semsys:seminfo_semmns`	`SEMMNS`	60	5048
`semsys:seminfo_semmni`	`SEMMNI`	10	5029
`semsys:seminfo_semmsl`	`SEMMSL`	25	2000

Table A-3 University Sample Application Default Settings for Solaris 8 (32-Bit) SPARC

Solaris Name	Traditional Name	Default Setting	Setting for University Sample Applications
semsys:seminfo_semmap	SEMMAP	10	5024
semsys:seminfo_semmnu	SEMMNU	30	1024
semsys:seminfo_semume	SEMUME	10	128
msgsys:msginfo_msgmni	MSGMNI	50	1024
msgsys:msginfo_msgmap	MSGMAP	100	2048
msgsys:msginfo_msgmax	MSGMAX	2048	65535
msgsys:msginfo_msgmnb	MSGMNB	4096	65535
msgsys:msginfo_msgssz	MSGSSZ	8	256
msgsys:msginfo_msgtql	MSGTQL	40	2048
msgsys:msginfo_msgseg	MSGSEG	1024	8192
maxusers	maxusers	32	200
max_nprocs	NPROC	10+16*maxusers	(MAXUSERS*3)+64
maxuprc	MAXUP	max_nprocs-5	(NPROC * 9) / 10
semsys:siminfo	semusz		1024
semsys:siminfo	semvmx		32767
semsys:siminfo	semaem		16384

The tunable parameters currently set on your system are in the kernel configuration file located in the `/etc` directory (`/etc/`*`machine_name`*). This file typically has the same name as the machine (node) name.

Platforms Supporting Threads

The following platforms support threads:

- Compaq Tru64 UNIX Version 5.1 on Alpha Systems
- HP-UX Version 11.0 (32-bit) on HP 9000 Series
- IBM AIX 4.3.3 (32-bit) on IBM PowerPC
- Microsoft Windows 2000 on Intel
- Microsoft Windows 98 on Intel
- Red Hat Linux 6.2 on Intel IA32 (x86)
- Sun Microsystems Solaris 8 (32-bit) on SPARC

Note: If threads are not supported on your platform, your application must either (1) exclude threads or (2) serialize threaded access through all BEA Tuxedo system calls.

B BEA Jolt 8.0 Preparations

The following sections provide prerequisites for installing the BEA Jolt software components, and installation instructions:

- BEA Jolt Server Support
- Supported Web Servers
- BEA Jolt Client Support
- BEA Jolt Release Migration/Interoperability
- ASP Connectivity Prerequisites
- BEA Jolt Pre-Installation Checklist
- Installing and Configuring Jolt 8.0 with BEA Tuxedo 8.0 and WebLogic Server 6.0

BEA Jolt Server Support

The server components of BEA Jolt 8.0 and BEA Jolt Relay can be installed on any system on which the BEA Tuxedo 8.0 product can be installed. Your environment must provide:

- CD-ROM access
- 2 MB of disk space

For BEA Jolt system requirements, including a list of platforms on which BEA Jolt is supported, see Appendix A, “Appendix A, “BEA Tuxedo 8.0 Platform Data Sheets.”

Supported Web Servers

To provide HTTP/HTML-based access to enterprise applications, BEA Jolt supports the Microsoft Internet Information Server (IIS) and the Java Web Server.

BEA Jolt Client Support

BEA Jolt supports Java applets and standalone Java client applications. The client types supported by BEA Jolt 8.0 are listed in the following table.

Table B-1 Client Types Supported by BEA Jolt 8.0

This client type . . .	Is supported on . . .
Java applet in a browser	Microsoft Internet Explorer (IE) 5.0
	Netscape Communicator 4.7 or 4.72
Standalone applications on a desktop	Java Development Kit (JDK) 1.3.0

The HTML-based BEA Jolt client classes run inside a Web server. The Web servers certified with BEA Jolt 8.0 are listed in the following table.

Table B-2 Web Servers Certified with BEA Jolt 8.0

Vendor	Web Server Version	OS Version	BEA Jolt Client Personality	Comments
BEA Systems, Inc.	BEA WebLogic Enterprise 5.1 or BEA WebLogic Server 6.0	Any	BEA WebLogic Connectivity for BEA Tuxedo	Supports servlets. Backward-compatible only—you can have a BEA Jolt 8.0 server with a BEA Jolt 1.2 client.
Microsoft	IIS 4.0 or higher	Windows 2000	ASP Connectivity for BEA Tuxedo	For a description, see the first note after this table.
Any vendor	Java Servlet Engine (Any version)	Any OS running JDK 1.3	JSE Connectivity for BEA Tuxedo	For a description, see the second note after this table.

Note: ASP Connectivity for BEA Tuxedo is the name of the Jolt Web application server that works with the existing Microsoft Internet Information Server (IIS) to provide a gateway for HTML clients into a BEA Tuxedo application environment. ASP (short for *Active Server Pages*) is an open, compile-free application environment in which Visual Basic programmers can combine HTML, scripts, and reusable ActiveX server components to create dynamic Web pages. Interactions between the Web server and Jolt classes are performed through VBScript and VB inside ASP.

Note: JSE Connectivity for BEA Tuxedo is the name of the Jolt Web application server that simplifies the handling of servlets in a BEA Tuxedo application environment. *JSE* is short for *Java Servlet Engine*.

BEA Jolt Client Requirements

BEA Jolt has the following client requirements:

- 574 KB of disk space for client classes

- 1364 KB of disk space for client API documentation
- 190 KB of disk space for client examples
- Java Developer's Kit (JDK) 1.3.0 is certified for BEA Jolt 8.0 application development (`http://java.suncom:80/java.sun.com/products/JDK/index.html`)
- Java-enabled browser (Internet Explorer) or Java Virtual Machine (JVM)

BEA Jolt Client Class Library

Various implementations of Java tend to show minor differences in characteristics. BEA Jolt 8.0 is based on JDK 1.3.0.

The BEA Jolt class library is compatible with the browsers and JDK versions shown in the following table.

Table B-3 BEA Jolt Class Library Compatibility

Vendor	Browser Version	Java Virtual Machine (JVM)	OS Version
Microsoft	Internet Explorer 5.0	MS JVM 4.0	Windows NT 4.0 Service Pack 4
Netscape	Communicator 4.7, 4.72	JDK 1.3.0	Windows NT 4.0

BEA Jolt Release Migration/Interoperability

The BEA Tuxedo system provides increased interoperability between releases. In BEA Jolt 8.0, however:

- If you have BEA Jolt 1.2 applications, only BEA Jolt 1.2 functionality is available to the BEA Jolt 1.2 client, even though new functionality is added to the BEA Jolt server-side components when they are upgraded to BEA Jolt 8.0.

- A BEA Jolt 8.0 client can operate with a BEA Jolt 1.2 server, but the client cannot use the new features available with BEA Jolt 8.0.

If BEA Jolt 1.2 is installed on your system, we recommend uninstalling it before installing BEA Jolt 8.0.

ASP Connectivity Prerequisites

The following components are required before you can install BEA Jolt 8.0 ASP Connectivity for the BEA Tuxedo system:

- Microsoft Windows 2000 server
- Microsoft Internet Information Server (IIS) 4.0 or higher
- BEA Tuxedo 8.0

For details about the Microsoft products listed here, see the online Microsoft 2000 Option Pack product documentation, specifically the documentation about Microsoft Internet Information Server.

Note: Always use the latest version of the Java Virtual Machine (JVM) to ensure that ASP Connectivity for the BEA Tuxedo system works properly.

BEA Jolt Pre-Installation Checklist

BEA Tuxedo 8.0 server software includes BEA Jolt 8.0, so before you start an installation, check the following:

- If an earlier release of BEA Jolt is installed on your system:
  - Back up your existing `jrepository`, `CATNAMES`, and `jrly.config` files.
  - Uninstall any previous releases of BEA Jolt. A single uninstall removes everything associated with the product: files, directories and registry entries.
- Review the BEA Tuxedo *Release Notes* for any new information.

On Windows systems, BEA Jolt 8.0 automatically installs two Microsoft dynamic link libraries (DLLs), `MSVCRT.DLL` and `MFC42U.DLL`, and overwrites older versions of these libraries. Before you begin installation, check whether older versions of these dynamic link libraries already exist. If they do exist and you do not want them to be overwritten, back them up.

Installing and Configuring Jolt 8.0 with BEA Tuxedo 8.0 and WebLogic Server 6.0

This section provides supplementary installation and configuration instructions for customers using BEA Jolt 8.0 with BEA Tuxedo 6.5 or 7.1 and WebLogic Server 6.0. It also offers code for a sample servlet that demonstrates how a WebLogic servlet may connect to BEA Tuxedo and call on a BEA Tuxedo service.

Installation

On this platform . . .	Complete this procedure . . .
UNIX	1. Download the `WLS60_Tux_JoltClient.tar` file. 2. Run the following command: `tar -xvf WLS60_Tux_JoltClient.tar`
Windows NT	1. Download the self-extracting `WLS60_Tux_JoltClient.zip` file. 2. Unzip the file.

The Jolt client consists of two JAR files: `jolt.jar` and `joltwls.jar`. Include both files in your classpath setting.

The client should not get the PoolManager by doing a JNDI lookup (as in an earlier release of Jolt).

For an example of a Jolt client, go to the section titled “Example Servlet” and see the code shown after the comment “Required change for Weblogic 6.0” (highlighted in bold).

Configuration

To configure the Jolt connection pool, open the WebLogic Server Administration Console and complete the following procedure:

1. Under the services entry in the left pane, click Jolt. The Jolt Connection Pools table is displayed in the right pane. It shows all the Jolt connection pools defined in the domain.
2. Click the Create a New Jolt Connection Pool text link. A dialog box is displayed in the right pane showing the tabs on which you can configure a new connection pool.
3. Enter values in the following attribute fields: Name, Minimum Pool Size, Maximum Pool Size, and Recv Timeout.
4. Click Create to create a connection pool instance with the name you specified in the Name field. The new instance is added to the list for the Jolt node in the left pane.
5. On the Config-Addresses tab, review the default values in the attribute fields. Accept or replace them, as necessary. Repeat this procedure with the Config-User tab.
6. Click Apply to save any changes you have made.
7. Select the Targets tab. A list of available servers is displayed. Select the one on which you want to start the JoltConnectionPool.
8. In the left pane, under Deployments, click Startup&Shutdown.
9. The Startup and Shutdown table is displayed in the right pane. All the startup classes defined in your domain are listed in this table.
10. Click the Create a New Startup Class link. A dialog box is displayed in the right pane showing the tabs that you can use to configure a new startup class.
11. In the dialog box:

a. Enter values in the Name, Class Name, and Arguments attribute fields.

b. Click the Abort startup on failure option. (By selecting this option, you ensure that if a failure occurs, startup of WebLogic Server will be aborted.)

c. For the Class Name, enter the following:

   `bea.jolt.pool.servlet.weblogic.PoolManagerStartUp.`

There are no arguments for this startup class.

12. Click Create to create a startup-class instance with the name you specified in the Name field. The new instance is added to the list for the Startup & Shutdown node in the left pane.

13. To restart the connection pool, restart the server.

Example Servlet

The following sample servlet shows how a WebLogic servlet, invoked from `simpapp.html`, connects to the BEA Tuxedo system and calls a BEA Tuxedo service.

Listing 7-1 Example WebLogic Servlet

```
package examples.jolt.servlet.simpapp;

import bea.jolt.pool.servlet.weblogic.PoolManagerStartUp;
import bea.jolt.pool.servlet.*;
import bea.jolt.pool.ApplicationException;
import bea.jolt.pool.SessionPoolException;
import bea.jolt.pool.ServiceException;
import bea.jolt.pool.SessionPoolManager;

import java.util.Hashtable;
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.*;
import javax.servlet.http.*;
import javax.naming.*;
import weblogic.jndi.*;

/**
 * This example demonstrates how a WebLogic Servlet may connect to
 * TUXEDO and call upon one of its services;
 * it should be invoked from the
 * <i>simpapp.html</i> file. The servlet creates a session pool
 * manager, which is used to obtain a session when the
 * <tt>doPost()</tt> method is invoked.
 * This session is used to connect to a service
 * in TUXEDO with a name described by the posted
 * "SVCNAME" argument. In this example the service is called
 * "TOUPPER", which transposes the posted "STRING" argument text
 * into uppercase, and returns the result. This is
 * returned to the client browser within some generated HTML.
 * THIS IS SOURCE CODE PUBLISHED FOR DEMONSTRATION PURPOSES
 *
 * @author Copyright (c) 1998-2000 BEA Systems, Inc. All rights reserved.
 */
public class SimpAppServlet extends HttpServlet {

  /**
   * Private variable to hold the
   * pool manager object.
   */

/* Required change for Weblogic 6.0 */

  private ServletSessionPoolManager b_mgr = (ServletSessionPoolManager)
SessionPoolManager.poolmgr;

/* End Required change for Weblogic 6.0 */

  /**
   * Initializes the servlet. The session pool manager and the
   * simpapp session pool have been established during the startup.
   *
   * @param config            Servlet configuration
   * @exception               ServletException if the servlet fails
   */
  public void init(ServletConfig config) throws ServletException {

    super.init(config);
  }

  /**
   * Destroys this servlet. The ServletSessionPoolManager
   * resource is deallocated.
   */
  public void destroy() {
    b_mgr = null;
  }
  /**
   * Implements the HttpServlet <tt>doPost()</tt> method.
      * This method expects POSTed arguments for:
   * <dl>
   * <dt>"SVCNAME"<dd>The name of the service to be invoked in TUXEDO.
   * <dt>"STRING"<dd>The text to be transposed to uppercase.
   * </dl>
   *
   * <p> See the provided simpapp.html for the HTML form
   * used to submit the data.
   */

  public void doPost(HttpServletRequest req, HttpServletResponse resp)
       throws ServletException, IOException
  {
    ServletResult result;
    ServletOutputStream out = resp.getOutputStream();

    out.println("<html><head><title>Jolt SimpApp Example
Response</title></head>
");
    out.println("<body><font face=\"Helvetica\">" +
                "<h2><font color=#DB1260>" +
                "This is the response from the SimpAppServlet:" +
                "</font></h2>");

/* Begin Required change for Weblogic 6.0 */
    // Get the "demojoltpool" session pool
    ServletSessionPool session = (ServletSessionPool)
      b_mgr.getSessionPool("demojoltpool");

/* End Required change for Weblogic 6.0 */


    if (session == null) {
      out.println("The servlet failed to obtain a SessionPool for simpapp. "+
                  "<br>"+
                  "Possibly the TUXEDO server is not running, "+
                  "or there is a configuration problem."+
                  "</font></body></html>");
      out.close();
      return;
    }
    String svcnm[] = req.getParameterValues("SVCNAME");

    // Invoke a service and get the result. Process the
    // template with input and result if there is no error.
    try {
      result = session.call(svcnm[0], req);
    // No error; present the result page.
    out.println("svcnm[] = " + svcnm[0]);
    out.println("The simpapp service was successfully called, and "+
                "responded with the output string: ");
    out.println("<p><center><font size=+1><b>"+
                result.getValue("STRING", "")+
                "</b></font></center><p><hr width=80%>");
  }
  catch (SessionPoolException e) {
    // All sessions are busy.
    out.println("Your request cannot be completed at this moment.\n"+
                "<p>Diagnostic Message is: "+e.getMessage()+"<p>\n"+
                "<font color=blue>Possible reasons:<br></font><ul>\n"+
                "<li>No sessions are available\n"+
                "<li>The session pool is suspended\n"+
                "<li>The session pool is shutdown</ul>\n"+
                "<p>Please resubmit your request later.");
  }
  catch (ServiceException e) {
    // There is a Service Exception.
    out.println("<dl><dt>Service exception</dt>"+
                "<dd>Error message:"+e.getMessage()+
                "<p>Error number:"+e.getErrno()+
                "</dl>");
  }
  catch (ApplicationException e) {
    // There is an application error.
    result = (ServletResult) e.getResult();

    out.println("<h3>Application error</h3>\n"+\
                "<p>Application code is "+result.getApplicationCode());
  }
  catch (Exception e) {
    out.println("<h3>Unexpected exception</h3>"+
                "<p>Exception is "+
                "<br><font face=\"Courier New\" size=-1"+e+"</font>");
  }

  out.println("</font></body></html>\n");
  out.close();
  }

  /**
   * Implements the <tt>doGet</tt> HttpServlet method. This simply
   * invokes the <tt>doPost</tt> method.
   */
  public void doGet(HttpServletRequest req, HttpServletResponse resp)
      throws ServletException, IOException
  {
    doPost(req, resp);
  }

/* public void service(HttpServletRequest req, HttpServletResponse res)
        throws IOException
  {
    PrintWriter out  = res.getWriter();

    out.flush();
    out.println("<title> SimpAppServlet </title>");
  } */
}
```

APPENDIX

C File and Database Management and Disk Space Allocation

The following sections describe BEA Tuxedo file and database management and provide guidelines for allocating disk space for a BEA Tuxedo application:

- Introduction
- How the BEA Tuxedo System Manages Files
- Arranging for Raw Disk Space
- How the BEA Tuxedo Filesystem Is Organized
- Space for Queue Spaces
- Space for Application Servers

Introduction

With the exception of the guidelines for repartitioning hard disk devices, the following discussions apply, for the most part, to both Windows and UNIX systems. On a Windows system, I/O (input and output) is buffered by default, but BEA Tuxedo sets a certain system-level flag to change the default. Thus, all I/O for BEA Tuxedo processes is *unbuffered*, meaning that you do not need to make any special disk-space arrangements on a Windows system.

How the BEA Tuxedo System Manages Files

The BEA Tuxedo system provides a facility called the Disk Management Interface (DMI), which manages logical files within a single disk device or set of devices. The DMI performs tasks such as storing binary configuration tables and the transaction log. You can use it to create, initialize, or destroy entries in the BEA Tuxedo filesystem. To access the DMI, use the `tmadmin(1)`administrative commands described in the *BEA Tuxedo Command Reference*.

There are two ways that the logical files managed by the DMI can be stored physically:

- Stored on an operating-system (OS) filesystem
- Stored on disk space, set aside for the BEA Tuxedo system, that is outside the control of all OS filesystems

BEA Tuxedo files reside on device special files in the designated space and are managed directly by the DMI disk management software. The DMI supports the notion of a BEA Tuxedo filesystem distinct from any OS filesystem.

Space outside the OS filesystem is usually referred to as *raw disk space*. Not only is I/O faster when done by system calls reading directly from and writing directly to device special files on raw disks, but a physical `write()` is done immediately. When using an OS filesystem, BEA Tuxedo cannot predict or control the precise moment at which a `write()` is done. When using raw disk space, however, BEA Tuxedo has accurate control of the write operation, which is particularly important for entries in the BEA Tuxedo transaction log. Also, when multiple users are accessing the system, being able to control the write operation is important for assuring database consistency.

Arranging for Raw Disk Space

If you decide to use raw disk space for your BEA Tuxedo application, and you are using a UNIX system, you may find that the hard disk devices on your system are fully allocated to filesystems, such as `/` (root) and `/usr`. If that is the case, you must repartition your hard disk device in order to set aside some partitions for use as non-OS filesystems. For repartitioning instructions, see the system administration documentation for your platform.

How the BEA Tuxedo Filesystem Is Organized

A BEA Tuxedo filesystem has a Volume Table of Contents (VTOC), which lists the files residing on the devices named in the Universal Device List (UDL). The UDL contains information about the location of the physical storage space for BEA Tuxedo system tables.

In a BEA Tuxedo application, all system files might be stored together on the same raw disk slice or OS filesystem. While it is possible to use regular OS filesystem files for the configuration tables, we strongly recommend that you store the transaction log, `TLOG`, on a raw disk device. Because the `TLOG` seldom needs to be larger than 100 blocks (51200 bytes, assuming 512-byte blocks), and because disk partitions are always substantially larger than 100 blocks, it may make sense to use the same device for both the configuration files and the `TLOG`.

The following sample listing shows a sample VTOC and UDL diagram for a `bankapp` (sample application) configuration on a single machine.

Listing C-1 VTOC and UDL Diagram

```
Output based on setting FSCONFIG=$TUXCONFIG, and invoking tmadmin:

No bulletin board exists. Entering boot mode.

> livtoc
Volume Table of Contents on /usr2/bank/tuxconfig:
0: VTOC: Device 0 Offset 0 Pages 7
1: UDL: Device 0 Offset 7 Pages 28
2: _RESOURCE_SECT:    Device 0 Offset  35 Pages 6
3: _MACHINES_SECT:    Device 0 Offset  41 Pages 40
4: _GROUPS_SECT:      Device 0 Offset 141 Pages 100
5: _SERVERS_SECT:     Device 0 Offset 241 Pages 150
6: _SERVICES_SECT:    Device 0 Offset 391 Pages 60
7: _ROUTING_SECT:     Device 0 Offset 451 Pages 100
8: _NETWORK_SECT:     Device 0 Offset 551 Pages 20
9: _MIBPERMS_SECT:    Device 0 Offset 571 Pages 2
10: _NETGROUPS_SECT:  Device 0 Offset 573 Pages 2
11: _INTERFACES_SECT: Device 0 Offset 575 Pages 10

# If the TLOG is stored on the same device, there will be an
# entry something like:

12: TLOG:             Device 0 Offset 585 Pages 100
```

The BEA Tuxedo application administrator must make sure raw disk slices are available as needed on each node participating in an application. The following table lists the size of each element in the BEA Tuxedo filesystem.

Table C-1 Size of BEA Tuxedo System Tables

Entity	512-Byte Pages (Blocks)
VTOC	7
TUXCONFIG	550
TLOG	100 (default)
UDL	28
TOTAL	685

The amount of space required for the TUXCONFIG file must be larger if there are more entries in the configuration file, UBBCONFIG, than in the bankapp sample application. The administrator is encouraged to allocate additional space for dynamic reconfiguration and growth of the application. The default block size assumed by the crdl subcommand of tmadmin is 1000 blocks (512000 bytes, assuming 512-byte blocks), which should be adequate for the initial installation.

Space for Queue Spaces

If your BEA Tuxedo application uses /Q for store-and-forward queue management, your queue space can be listed in the same UDL as the one used to store the TUXCONFIG file and the TLOG, and managed by the BEA Tuxedo VTOC.

Space for Application Servers

As you are calculating your space requirements for the BEA Tuxedo system, you should also consider the requirements of the servers that perform the work of the application. These requirements are specified by the application; they are unrelated to the requirements for the BEA Tuxedo system itself (unless otherwise specified).

D IPC Resource Configuration on a UNIX System

The following sections describe the interprocess communication (IPC) parameters on a UNIX system and provide guidelines for configuring them:

- Parameter Sets Controlling IPC Resources
- Shared Memory
- Semaphores
- Message Queues and Messages
- Other Kernel Tunables

Parameter Sets Controlling IPC Resources

On a UNIX system, the BEA Tuxedo system uses the IPC resources provided by the UNIX operating system, which are controlled by the three sets of tunable parameters listed in the following table.

Tunable parameters starting with this prefix . . .	Control the . . .
SHM	Amount of shared memory
SEM	Number of semaphores
MSG	Size of message queues and messages

The settings for these parameters are application-dependent. Most UNIX systems are shipped with default values that are too low for a BEA Tuxedo application.

Because the IPC parameters vary across different versions of the UNIX system, the descriptions provided in the following sections are generic. For exact parameter names and defaults for each platform, and for information about how to change parameter values, see Appendix A, "BEA Tuxedo 8.0 Platform Data Sheets."

If you change a parameter value, you must rebuild the kernel and reboot the operating system, using standard administrative tools. For details, consult your operating system administrator or the system administrator's guide for your platform.

If your BEA Tuxedo application is distributed, the minimum IPC resources must be available on every UNIX platform participating in the application.

Shared Memory

In the BEA Tuxedo environment, shared memory is used for the bulletin board and the control table of the workstation listener (WSL) and the IIOP listener (ISL) processes. An application may also use shared memory for its own purposes.

The following shared memory parameters may need to be adjusted:

`SHMMAX`

Maximum size, in bytes, of a shared memory segment. This number represents the largest shared memory segment that can be allocated. A process can, however, attach to more than one segment of size `SHMMAX`.

`SHMSEG`

Maximum number of shared memory segments per process. For a given configuration, the maximum amount of shared memory to which a process can attach is the product (in bytes) of `SHMMAX * SHMSEG`. A value between 6 and 15 should be adequate.

`SHMMNI`

Maximum number of shared memory identifiers in the system. The BEA Tuxedo system requires one identifier per bulletin board and an additional identifier for each workstation listener (WSL) and IIOP listener (ISL) that is running.

`SHMMIN`

Minimum size, in bytes, of shared memory segment. This parameter should always be set to 1.

Semaphores

Every process that participates in a BEA Tuxedo application requires a *semaphore*. A semaphore is a hardware or software flag used to prevent processes from accessing the same shared memory space at the same time. When a process has control of a shared memory resource, all other processes are locked out of the shared memory resource until the process releases the resource.

When the BEA Tuxedo application is booted, the underlying BEA Tuxedo system checks the number of semaphores configured in the operating system. If the configured number is not high enough, the boot fails.

The following semaphore parameters may need to be adjusted:

`SEMMNS`

Maximum number of semaphores in the system. The minimum requirement for `SEMMNS` is

```
MAXACCESSERS - MAXWSCLIENTS + 13
```

`MAXACCESSERS` is the maximum number of BEA Tuxedo system processes on a particular machine (including servers and native clients) and `MAXWSCLIENTS` is the maximum number of BEA Tuxedo remote clients. Both of these parameters are specified in the `UBBCONFIG` file for the application. For more information about `UBBCONFIG`, see “Creating the Configuration File” in *Setting Up a BEA Tuxedo Application* or `UBBCONFIG(5)` in the *File Formats, Data Descriptions, MIBs, and System Processes Reference*.

SEMMNI

Maximum number of active semaphore sets.

SEMMSL

Maximum number of semaphores per semaphore set. SEMMNI and SEMMSL are commonly chosen so that their product equals SEMMNS. The BEA Tuxedo system does not perform semaphore operations on semaphore sets, but it tries to allocate as many semaphores per semaphore set as possible.

SEMMAP

Size of the control map used to manage semaphore sets. SEMMAP should be equal to SEMMNI.

SEMMNU

Number of undo structures in the system. Because an undo structure is needed for each process that can access the bulletin board, SEMMNU must be at least as large as SEMMNS. (The UNIX operating system uses undo structures to unlock semaphores held by processes that die unexpectedly.)

SEMUME

Maximum number of undo entries per undo structure. The value 1 suffices.

Message Queues and Messages

The BEA Tuxedo system uses UNIX system messages and message queues for client/server communication. Examples of such messages are service requests, service replies, conversational messages, unsolicited notification messages, administrative messages, and transaction control messages.

Every Multiple Servers, Single Queue (MSSQ) set of servers and every individual server has a message queue for receiving requests. Every client has its own queue for receiving replies. Servers that specify the REPLYQ parameter also get individual reply queues.

The adjustment of kernel message parameters is important to the proper tuning of an application. Inappropriate values can lead to an inability to boot, or to severe performance degradation.

Several message queue parameters are available to define various characteristics of the queue space, as indicated in the following table.

This parameter. . .	Specifies the . . .
MSGTQL	Total number of outstanding messages that can be stored by the kernel
MSGMNB	Total number of bytes that can be stored on one queue
MSGMAX	Maximum size of an individual message
MSGSEG	Total number of message segments that can be outstanding at one time
MSGSSZ	Size of each segment

If the limit specified by any of these parameters is exceeded, then a *blocking condition* occurs. There is one exception to this rule: MSGMAX. Messages that exceed 75 percent of MSGMNB, or that are larger than MSGMAX, are placed in a UNIX file. A very small message containing the filename is then sent to the recipient. Because this mode of operation results in a severe reduction in performance, we strongly recommend that you avoid it.

What Is Application Deadlock?

An application deadlock can result if every process is blocked while trying to send a message. For example, when clients fill up the message space with requests, servers that are trying to send replies are blocked. Therefore, no server can read a message and a deadlock results. Occasionally, timeouts can break a deadlock, but no useful work will have been done.

A client that sends its requests with the TPNOREPLY flag is especially troublesome. This practice can fill either individual queues or the system message space, depending on the size of the messages. Such applications may have to implement their own flow control to limit the number of outstanding messages.

To summarize, if clients or servers are blocking on their send operations (requesting services or sending replies), there is potential for trouble. It is usually no problem, though, for a single server request queue to remain full, as long as there is space in the system for more messages on other queues.

Performance Implications of Blocking Conditions

There are performance implications to queue blocking conditions, both on the sending side and the receiving side. When waking up blocked processes, the UNIX operating system wakes up all the processes blocked on a particular event, even if only one can proceed. The other processes go back to sleep. This process scheduling overhead can be expensive.

For example, on an empty server request queue on which more than one server (MSSQ) resides, an arriving message wakes up all the idle (blocked) servers on that queue. In the case of a full server request queue, as each request is read by a server, the system wakes up all the blocked clients. Depending on the size of the messages, zero or more clients can place messages on the queue. The rest go back to sleep. Because there may be hundreds of clients in the system, the mass wakeup of all of these clients every time a service request is processed can severely degrade performance.

Tunable Message Parameters

A properly tuned system rarely fills its queues. Enough slack should be left in the queues to handle the natural variability of the message flow. No exact settings can be recommended. Tuning is very application dependent. The UNIX `ipcs(1)` command provides a snapshot of the queues so you can determine whether they are full. You can try setting the `TPNOBLOCK` flag when sending requests. If you do, clients can tell when queues are full, and they can slow down a bit. It might help to increase the scheduling priority of servers with full request queues.

The following message parameters may need to be adjusted:

`MSGMNI`

Number of unique message queue identifiers. Each process participating in a BEA Tuxedo application on a particular machine typically needs at least one message queue. This number is reduced if MSSQ sets are used, which means that multiple server processes share a single queue. For transaction processing, count an additional queue per server group for transaction manager server (TMS) processes. Thus, the minimum requirement for `MSGMNI` can be determined by the following formula:

```
MSGMNI = MAXACCESSERS + 7
+ (number of servers with REPLYQ)
+ (number of MSSQ sets)
- (number of servers in MSSQ sets)
```

MSGMAX

Maximum message size in bytes. MSGMAX must be big enough to handle any BEA Tuxedo application running on this machine.

MSGMNB

Maximum message queue length in bytes. This number must accommodate the total size of all messages that are on a queue and have not been taken off by the associated processes. The minimum value for MSGMNB is the value of MSGMAX. Messages longer than 75% of MSGMNB are sent to a file instead of a message queue—a situation that should be avoided because it severely degrades performance.

MSGMAP

Number of entries in the control map used to manage message segments. The value of MSGMAP should be the number of message segments (specified in MSGSEG).

MSGSSZ

Size, in bytes, of a message segment. A message can consist of several such segments. The value of MSGSSZ should be such that a multiple of MSGSSZ is equal to the size (including the BEA Tuxedo system header) of the most commonly sent message. By dividing messages into segments in this way, you can avoid wasting space.

MSGSEG

Number of message segments in the system.

MSGTQL

Total number of outstanding messages that can be stored by the kernel. This is the maximum number of unread messages at any given time.

Other Kernel Tunables

Experience with the BEA Tuxedo system has shown that some other UNIX system tunables may need to be set to higher values. These parameters are very application dependent and do not apply to all applications. The section BEA Tuxedo 8.0 Platform Data Sheets includes information on the defaults for each platform and instructions for changing them.

`ULIMIT`

Maximum file size. `ULIMIT` needs to be large enough so that you can install the BEA Tuxedo system and build servers. We recommend 4 MB.

`NOFILES`

Maximum number of open files per process. A BEA Tuxedo server requires a minimum of four file descriptors.

`MAXUP`

Maximum number of processes per non-superuser. The BEA Tuxedo system processes—servers and administrative processes—run with the `UID` specified in the application's `UBBCONFIG` file. `MAXUP` needs to be large enough to allow all of these processes to run.

`NPROC`

Maximum number of processes (system wide).

`NREGION`

Number of region table entries to allocate. Most processes have three regions: text, data, and stack. Additional regions are needed for each shared memory segment and each shared library (including text and data) that is attached. However, the region table entry for the text of a "shared text" program is shared by all processes executing that program. Each shared memory segment attached to one or more processes uses another region table entry.

`NUMTIM`

Maximum number of STREAMS modules that can be pushed by the Transport Layer Interface (TLI). A typical default value is 16; we recommend setting this parameter to at least 256.

`NUMTRW`

The number of TLI read/write structures to allocate in kernel data space. A typical default value is 16; we recommend setting this parameter to at least 256.

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