BEA Tuxedo

Installing the
BEA Tuxedo System

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Document Edition	Part Number	Date	Software Version
7.1	801-001001-004	May 2000	BEA Tuxedo Release 7.1

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About This Document

This document explains how to install the BEA Tuxedo system software. The BEA Tuxedo system is a framework for distributed online transaction processing applications.

This document covers the following topics:

- Chapter 1, "Preparing to Install the BEA Tuxedo System," covers what you need to do in advance of the actual installation.

- Chapter 2, "Installing the BEA Tuxedo System on a UNIX System," tells how to load the BEA Tuxedo and BEA Jolt packages onto your machine, what the directory structure looks like after the installation is finished, how to verify that the installation completed successfully, and how to remove the software from your system.

- Chapter 3, "Installing the BEA Tuxedo System on a Windows System," explains how to install the BEA Tuxedo system and BEA Jolt on Windows NT, Windows 95, and Windows 98 systems using the standard installation programs and unattended installation, and how to remove the BEA Tuxedo and BEA Jolt software from your system.

- Chapter 4, "Upgrading the BEA Tuxedo System to Release 7.1," provides procedures for upgrading your BEA Tuxedo application to Release 7.1 using simple and hot upgrade procedures.

- Chapter 5, "Starting the BEA Administration Console," provides the system requirements for the Administration Console, describes how to set up your environment, and explains how to start and exit the Administration Console.

- Chapter 6, "Post-Installation Considerations," describes additional steps for configuring the BEA Tuxedo software.

- Appendix A, "Platform Data Sheets," provides platform-specific information for the platforms supported.

- Appendix B, "BEA Jolt 1.2.1 System Requirements," provides the hardware and software requirements for the BEA Jolt components.

What You Need to Know

Readers of this guide are assumed to be system administrators or application developers with a knowledge of the UNIX operating system 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 the PDF files button and select the document you want to print.

If you do not have the Adobe Acrobat Reader, you can get it for free from the Adobe Web site at http://www.adobe.com/.

Contact Us!

Your feedback on the BEA Tuxedo 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 BEA Tuxedo documentation.

In your e-mail message, please indicate that you are using the documentation for the BEA Tuxedo 7.1 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 **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 file names 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`*
UPPERCASE TEXT	Indicates device names, environment variables, and logical operators. *Examples*: LPT1 SIGNON OR

Convention	Item
{ }	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.

1 Preparing to Install the BEA Tuxedo System

- Introduction

- Checking Your Package

- Hardware and Software Prerequisites

- Managing Files and Databases

- Selecting Directories for BEA Tuxedo System Files

- Selecting an Administrative Password

- Configuring the UNIX Operating System for the BEA Tuxedo System

- Preparing to Install BEA Jolt

Introduction

Congratulations on your new BEA Tuxedo system! You are about to embark on an exciting new project that will enhance the performance and reliability of your enterprise. This document will help you take the first step in that project: installing the BEA Tuxedo system on your platform of choice.

Checking Your Package

When you open your BEA Tuxedo system product box, you will find the following items:

- Two CD-ROMs:
    - The BEA Tuxedo System and BEA Jolt product software CD
    - The BEA Tuxedo System Online Documentation CD

- *BEA Tuxedo Release Notes*

- *Installing the BEA Tuxedo System* (this document)

- "Read-Me-First" sheet

- "BEA Software License and Limited Warranty" pamphlet

- "Customer Support Quick Reference and Other Important Information" card

A 3.5" diskette that contains the product license is either mailed to you or attached to the outside of the BEA Tuxedo product box.

For a list of the platforms supported for this release of the BEA Tuxedo system, see Appendix A, "Platform Data Sheets."

For a list of the platforms supported by BEA Jolt, see Appendix B, "BEA Jolt 1.2.1 System Requirements."

BEA Tuxedo Software Components

The BEA Tuxedo software CD contains the following components:

- Core BEA Tuxedo software for UNIX and Windows platforms (includes the BEA Administration Console)

- BEA Jolt, which consists of the following components:
    - Jolt Server

- Jolt Relay

- Jolt Client

- Jolt Client Class Library

Note: BEA Jolt is available with two levels of encryption: 56-bit and 128-bit. The Jolt software provided on the BEA Tuxedo product CD can be licensed for 56-bit encryption (client and server) and 128-bit encryption (server only). The 128-bit client version, available in the United States and Canada, is not provided on the product CD; however, with proper authorization, it can be downloaded from the BEA Web site. Refer to the *BEA Tuxedo Release Notes* for details.

Hardware and Software Prerequisites

The BEA Tuxedo system software must be installed on each machine that will participate in a BEA Tuxedo system 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.

The BEA Tuxedo System Administration Console must be installed in a file system that supports long filenames (that is, those containing more than 14 characters).

Details about the hardware and software prerequisites for all platforms on which the BEA Tuxedo system is supported are provided in Appendix A, "Platform Data Sheets." Please check the data sheet for each platform on which you plan to install the BEA Tuxedo system.

Details about the hardware and software prerequisites for BEA Jolt are provided in Appendix B, "BEA Jolt 1.2.1 System Requirements." Before you can install BEA Jolt, you must first install the BEA Tuxedo system software.

For UNIX Systems

You need the following information and resources before installing the BEA Tuxedo system on a UNIX platform.

- A system that meets the hardware and software requirements described in Appendix A, "Platform Data Sheets."

- The superuser password so that you can mount the CD-ROM as a file system.

- The name of a file system with enough free space for the BEA Tuxedo system packages you wish to install. Disk space requirements are given in Appendix A, "Platform Data Sheets."

For Windows Systems

You need the following resources before installing the BEA Tuxedo software on a Windows system:

- A system that meets the hardware and software requirements described in Appendix A, "Platform Data Sheets."

- Enough disk space for the packages you wish to install. Disk space requirements are given in Appendix A, "Platform Data Sheets."

- Administrative privileges when installing on a Windows NT system.

Note: Microsoft Windows 95 and 98 systems support the BEA Tuxedo Workstation component only. Windows 95 and 98 systems do not support the core BEA Tuxedo system or the BEA Administration Console.

Managing Files and Databases

- Assigning File Ownership on a UNIX System

- Allocating Disk Space

Assigning File Ownership on a UNIX System

If you are installing the BEA Tuxedo system on a UNIX platform, we strongly recommend that you create a separate user account for the BEA Tuxedo system administrator and give ownership of the BEA Tuxedo system files to that account.

Allocating Disk Space

A running BEA Tuxedo application needs disk space for system files and for the application's database(s). You do not use this space until you begin to develop or run your BEA Tuxedo application, but it is important to plan for this space before installing the software. The sections that follow describe how the BEA Tuxedo system handles files.

Note: Additional information on the commands described in these sections can be found in the following documents:

- *Setting Up a BEA Tuxedo Application*
- *BEA Tuxedo Command Reference*

BEA Tuxedo System Disk Management Interface

The BEA Tuxedo system provides a facility that manages logical files within a single disk device or set of devices. This facility is called the Disk Management Interface (DMI). 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 file system. To access the DMI, use the tmadmin(1) administrative commands.

The BEA Tuxedo system disk management software supports the notion of a BEA Tuxedo file system distinct from any operating system file system. (For the rest of this discussion, the term "OS file system" is used to refer to any operating system file system.)

There are two ways the logical files managed by the DMI can be stored physically.

- Physical storage can be on an OS file system.

- Disk space outside the control of all OS file systems can be set aside for the BEA Tuxedo system.

Files reside on device special files in the designated space and are managed directly by the DMI. Space outside the OS file system is usually referred to as raw disk space. Not only is I/O faster when it is done by system calls reading directly from and writing directly to device special files on raw disks, raw disk space is preferred when it is important to know for certain that a physical `write()` has been done. When using an OS file system, you cannot predict or control the precise moment at which a `write()` is done. The BEA Tuxedo system, however, gives you accurate control of the write operation. Such control is particularly important for entries in the 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 platform, you may find that the hard disk devices on your system are fully allocated to file systems 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 file systems. For repartitioning instructions, refer to the system administration documentation for your platform.

Note: On NT platforms, I/O is unbuffered by default; no special arrangements are needed.

How the BEA Tuxedo File System Is Organized

A BEA Tuxedo file system has a Volume Table of Contents (VTOC) that lists the files that reside on a set of 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 file system file. While it is possible to use regular OS file system 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 and because disk partitions are always substantially larger than that, it may make sense to use the same device for both the configuration files and the TLOG. The path name of the device needs to be specified by both the TUXCONFIG and the FSCONFIG environment variables. The following sample listing shows a sample VTOC and UDL diagram for a bankapp configuration on a single machine.

Listing 1-1   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 file system.

Table 1-1 Size of BEA Tuxedo System Tables

Entity	512-byte Pages
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, which should be adequate for the initial installation.

Space for Queue Spaces (If You Are Using /Q)

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 System 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).

Selecting Directories for BEA Tuxedo System Files

During the installation process you are prompted to make decisions about where, in your file system, a number of your BEA Tuxedo directories and files will be installed. This section describes the directories and files for which you must designate a location.

■ "For All Platforms" on page 1-9 should be reviewed by anyone installing the BEA Tuxedo system.

■ "For All Server Platforms Supporting the BEA Administration Console" on page 1-10 should be reviewed by anyone installing the BEA Administration Console to be used for the administration of a BEA Tuxedo application.

For All Platforms

During installation, you are prompted for the path name of the base directory of your BEA Tuxedo system software. There is no restriction on the location of this directory, as long as it meets the following requirements:

■ The directory must be empty.

■ The directory must have read, write, and search (execute) permissions for the BEA Tuxedo system administrator.

Note: Throughout the BEA Tuxedo system documentation, this directory is referred to as $TUXDIR on UNIX platforms and %TUXDIR% on Windows platforms.

For All Server Platforms Supporting the BEA Administration Console

If you are installing the BEA Tuxedo system on a server platform, you are prompted during the installation process to accept or replace the default path names and filenames used for the BEA Administration Console components. These default path names and filenames are based on the value of TUXDIR that you specify.

If you are running a commercial Web server, you may find the default settings inappropriate, especially if your server is handling requests from both the BEA Administration Console and other Web programs on the same port. To accommodate this situation, the BEA Tuxedo software lets you choose between accepting the defaults and assigning your own path names and filenames. You are prompted to make choices for the following.

1. A path name for the HTML files—By default, the following HTML files are installed in the directory $TUXDIR/udataobj/webgui (on UNIX systems) or %TUXDIR%\udataobj\webgui (on Windows systems). You are prompted to supply your own paths for these files if you prefer to have them installed elsewhere. The HTML files consist of:

   - An HTML template file (webgui.html) that is used by tuxadm as the basis for many screens displayed during a BEA Administration Console session.

   - An HTML file (webguitop.html) that displays legal notices and warnings when the BEA Administration Console is first brought up on the screen.

   - The HTML files that make up the BEA Administration Console documentation are installed in $TUXDIR/help (on UNIX systems) or %TUXDIR%\help (on Windows systems).

   EXCEPTION: If you are installing the BEA Tuxedo system on an NT platform and the installation program detects an existing Web server, a default directory appropriate for that Web server is used instead.

2. A path name for the Java and image files—By default, the class files for the Java applet are installed in one of the following directories. You are prompted to supply your own paths for these files if you prefer to have them installed elsewhere.

   - $TUXDIR/udataobj/webgui/java (on UNIX systems) or %TUXDIR%\udataobj\webgui\java (on Windows systems)

- A subdirectory called `java` in the HTML directory you specified in step 1.

3. A directory path name for the CGI program `tuxadm`—Specify one of the following (unless the EXCEPTION described after the following list applies):

   - `$TUXDIR/udataobj/webgui/cgi-bin` (on UNIX systems) or `%TUXDIR%\udataobj\webgui\cgi-bin` (on Windows systems)

   - A sub-directory called `cgi-bin` in the HTML directory you specified in step 1.

   EXCEPTION: If the installation program detects Microsoft's Internet Information Server (IIS) in a standard directory, then it installs `tuxadm` in a sub-directory called `scripts` in the HTML directory you specified in step 1.

   Note: Do not specify `$TUXDIR/bin` (on UNIX systems) or `%TUXDIR%\bin` (on Windows systems) as your CGI directory. If you do, you risk having some other BEA Tuxedo programs executed accidentally by an uninformed user of the Web browser. You may also introduce a security risk.

4. An alias for the path name for `tuxadm`, which will be used by Web clients to access `tuxadm`. The default is either:

   - `/cgi-bin` or `/scripts` (on UNIX systems)

   - `\cgi-bin` or `\scripts` (on Windows systems)

Selecting an Administrative Password

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

You assign an administrative password to the machine on which the BEA Tuxedo system is being installed during the installation process. To do so, enter the password of your choice after the appropriate prompt. The 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 system domain to communicate successfully. For this reason, you must use the same password whenever you install the BEA Tuxedo system on multiple machines for a single domain. As described previously, you are prompted to provide the password during the BEA Tuxedo installation process. If, however, 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.

The administrative password that you enter during installation is collected by the installation script and stored in:

■ $TUXDIR/udataobj/tlisten.pw (on UNIX systems)

■ %TUXDIR%\udataob\tlisten.pw (on Windows systems)

Make sure the permissions on your tlisten.pw file are set such that only the BEA Tuxedo system administrator can read the file.

Configuring the UNIX Operating System for the BEA Tuxedo System

The BEA Tuxedo System uses the Interprocess Communication (IPC) resources provided by the UNIX operating system.

Note: Equivalent services are available for other operating systems. For example, the BEA Tuxedo system provides an NT service called the BEA Tuxedo IPC Helper, which facilitates inter-process communication on an NT platform.

IPC resources are configured by three sets of tunable parameters that control the following.

Tunable Parameters Named with This Prefix . . .	Control the . . .
SEM	Number of semaphores
MSG	Size of message queues and messages
SHM	Amount of shared memory

The settings for these parameters are application dependent. Most UNIX systems, however, are shipped with default values that are too low for a BEA Tuxedo system application.

The following sections describe the IPC parameters and provide guidelines for configuring them. Because these parameters vary across different versions of the UNIX system, the descriptions provided here are generic. Refer to Appendix A, "Platform Data Sheets," for the exact parameter names and defaults for each platform and for information on how to change parameter values. If you change a parameter value, you will need to rebuild the kernel and reboot the operating system, using standard administrative tools. Consult your operating system administrator or the system administrator's guide for your platform for details.

If your BEA Tuxedo application is distributed, the minimum IPC resources must be available on every UNIX platform participating in the application.

Semaphores

Every process that participates in a BEA Tuxedo application requires a semaphore. When the application is booted, the number of semaphores configured in the operating system is checked. The boot fails if the configured number is not high enough.

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

where 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 workstation clients. Both of these parameters are specified in the UBBCONFIG file for the application. For more information about UBBCONFIG, see "Creating the Configuration File" on page 3-1 in *Setting Up a BEA Tuxedo Application* or the UBBCONFIG(5) reference page in the *BEA Tuxedo File Formats and Data Descriptions Reference*.

SEMMNI

Maximum number of active semaphore sets. See SEMMSL.

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; however, it attempts 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.

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 MSSQ set (Multiple Servers, Single Queue) 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.

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 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.

Shared Memory

In the BEA Tuxedo environment, shared memory is used for the Bulletin Board and for the control table of the Workstation Listener process (WSL). 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 if the Workstation Listener (WSL) is running.

SHMMIN

>Minimum size, in bytes, of shared memory segment. This parameter should always be set to 1.

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. Appendix A, "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 four megabytes.

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-super user. 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.

Calculating IPC Requirements

When the BEA Tuxedo system software has been installed and an application configuration file (UBBCONFIG file) is available, use the tmloadcf(1) command to calculate the IPC resources needed to support the application.

See Also

- tmloadcf(1) in the *BEA Tuxedo Command Reference*
- "Verifying IPC Requirements on a UNIX System" on page 6-8

Preparing to Install BEA Jolt

- BEA Jolt Release Migration/Interoperability

- ASP Connectivity Prerequisites

- BEA Jolt Preinstallation Checklist

See Also

- "BEA Jolt 1.2.1 System Requirements" on page B-1

BEA Jolt Release Migration/Interoperability

If BEA Jolt 1.2 is installed on your system, we recommend uninstalling it before you install BEA Jolt 1.2.1.

The BEA Tuxedo system provides increased interoperability between releases. In BEA Jolt 1.2.1, however:

- You must upgrade all server-side components together.

- 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 the server-side components have additional functionality when they are upgraded to BEA Jolt 1.2.1.

- A BEA Jolt 1.2.1 client cannot operate with a BEA Jolt 1.2 server.

See Also

- "BEA Jolt 1.2.1 System Requirements" on page B-1

ASP Connectivity Prerequisites

The following components are required before you can install BEA Tuxedo ASP Connectivity for the BEA Tuxedo system:

■ Microsoft Windows NT Server 4.0 with NT Option Pack

■ Microsoft Internet Information Server (IIS) 4.0

■ BEA Tuxedo Release 7.1

For details about the Microsoft products listed here, refer to the online Microsoft NT Option Pack product documentation, specifically the Microsoft Internet Information Server chapters.

Note: Always use the latest version of the Java Virtual Machine (JVM) to ensure that ASP Connectivity for the BEA Tuxedo system works properly.

See Also

■ "BEA Jolt 1.2.1 System Requirements" on page B-1

BEA Jolt Preinstallation Checklist

Before you install BEA Jolt, 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. Note that you can install all BEA Jolt 1.2.1 components at once or separately, in one or more directories. However, a single uninstall removes everything associated with the product: files, directories and registry entries.

■ Verify that you have BEA Tuxedo Release 7.1 installed.

- Determine the location of the BEA Tuxedo directory in which the BEA Jolt server is to be installed.

- Determine the location of the directory in which the Web server resides and the BEA Jolt client components are to be installed.

- If you are installing BEA Jolt on a UNIX system platform, verify the user ID and group ID:

  - Assigned to BEA Jolt server files

  - To be assigned to BEA Jolt client files

- Review the *BEA Tuxedo Release Notes* for any new information.

Caution: On Windows systems, BEA Jolt 1.2.1 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.

See Also

- "BEA Jolt 1.2.1 System Requirements" on page B-1

2 Installing the BEA Tuxedo System on a UNIX System

■ Installing the BEA Tuxedo System on a UNIX Platform

■ Installing BEA Jolt

■ Installing Your Product License

■ Verifying the BEA Tuxedo Software Installation

■ Removing the BEA Tuxedo Software from Your System

Installing the BEA Tuxedo System on a UNIX Platform

To install the BEA Tuxedo system on a UNIX platform, complete the 9-step procedure provided in this section.

Make sure you install the software in the file system in which the BEA Tuxedo system executables will run. Also, make sure that the person doing the installation and the person who will run `tmboot(1)` set the `LANG` environment variable to the same value in their respective user profiles.

It will take approximately 5 minutes to install each package on a local disk; installation on a remote disk may require as much as 10 minutes.

The documentation is provided on a separate CD-ROM.

Note: Before starting the installation of the BEA Tuxedo System, decide whether you want the GUI files that make up the BEA Administration Console to be installed in their default directories. If you want them installed elsewhere, specify the desired directory. For details, see "Selecting Directories for BEA Tuxedo System Files" on page 1-9.

1. Log in as the administrator of the BEA Tuxedo system.

2. Insert the software CD-ROM into the reader.

3. Mount the CD-ROM as a file system. For platform-specific instructions, see Appendix A, "Platform Data Sheets." On most systems you must acquire superuser privileges to perform a mount.

   Note: If your system does not have a directly-connected CD-ROM reader, you can mount the CD-ROM on a remote system, share (export) the CD-ROM file system, and then mount the remote file system. See Appendix A, "Platform Data Sheets," for detailed instructions for each platform. Alternatively, you can mount the CD-ROM on a remote system, copy the contents of the CD-ROM directory for your platform to the system on which you plan to install the BEA Tuxedo system, and continue with the rest of the installation procedure.

Table 2-1 CD-ROM Directory Names for UNIX System Platforms

Directory	Platform
aldux40f	Compaq Tru64 UNIX v4.0f on Alpha
inmpr302	NCR MP-RAS v3.0.2 on Intel
inlnx61	Red Hat Linux v6.1
pahp1100	HP-UX 11.00 on HP PA-RISC
ppaix432	IBM AIX v4.3.2 on IBM PowerPC
spsol7	Sun Solaris 7 on Sun SPARC

4. Change directory to the root of the mounted CD-ROM.

5. Invoke the installation procedure by entering

   ```
   sh install.sh
   ```

   A series of prompts is displayed.

6. At the initial prompt, enter 1 to install the BEA Tuxedo software.

   Note: You must install the BEA Tuxedo 7.1 software before you can install BEA Jolt. To install BEA Jolt, see "Installing BEA Jolt" on page 2-6.

7. Additional prompts require you to choose between (a) accepting default locations for files being installed, and (b) specifying non-default path names for these files. For details, see "Selecting Directories for BEA Tuxedo System Files" on page 1-9.

   You can cancel the installation at any time by pressing the interrupt key, typically Delete, Break, or Ctrl +c.

   The following listing shows the interactive part of a sample installation. In this example, the BEA Tuxedo system is being installed on a Solaris platform.

```
The following installation options are available:
1    Tuxedo  Install Tuxedo
2    Jolt    Install Jolt 1.2.1 for Tuxedo
Select an option (default: Tuxedo) [?, ??, 1]:1

        1)      Compaq Tru64 UNIX v4.0f
        2)      Linux Redhat v6.1
        3)      NCR MP-RAS v3.0.2
        4)      HP-UX v11.00
        5)      IBM AIX v4.3.2
        6)      Sun Solaris 7


Install which platform's files? [01- 7, q to quit, l for list]: 6

** You have chosen to install software for **

BEA Tuxedo System Release 7.1

This directory contains the BEA Tuxedo System for Sun Solaris 7 on Sun SPARC.


Is this correct? [y,n,q]: y

To terminate the installation at any time
```

```
press the interrupt key,typically <del>, <break>, or <ctrl+c>.

The following packages are available:

  1     tuxcore         BEA Tuxedo System

Select the package(s) you wish to install (or 'all' to install
all packages) (default: all) [?,??,q]: 1

BEA Tuxedo System
(sparc) Release 7.1
Copyright (c) 2000 BEA Systems, Inc.
All Rights Reserved.
Distributed under license by BEA Systems, Inc.
Tuxedo is a registered trademark in the U.S. and other countries.


The following installation options are available:

  1     both            Install the full Tuxedo Core System - client and server
  2     client          Install the client only

Select an option (default: both) [?,??,q]: 1

Directory where Tuxedo files are to be installed [?,q]: /usr/tuxedo

Determining if sufficient space is available ...
66744 blocks are required
11482056 blocks are available to /usr/tuxedo

Using /usr/tuxedo as the Tuxedo base directory

Directory where BEA Administration Console documents and images are to be
installed (default: /usr/tuxedo/udataobj/webgui) [?,q]:
Creating /usr/tuxedo/udataobj/webgui

Using /usr/tuxedo/udataobj/webgui as the BEA Administration Console
document tree

Directory where BEA Administration Console java applets are to be
installed (default: /usr/tuxedo/udataobj/webgui/java) [?,q]:
Creating /usr/tuxedo/udataobj/webgui/java

Using /usr/tuxedo/udataobj/webgui/java as the BEA Administration Console
document tree

Directory where BEA Administration Console CGI programs are to be
installed (default: /usr/tuxedo/udataobj/webgui/cgi-bin) [?,q]:
Creating /usr/tuxedo/udataobj/webgui/cgi-bin
```

```
Using /usr/tuxedo/udataobj/webgui/cgi-bin as the BEA Administration
Console CGI directory

Web server client prefix for CGI directory.  /cgi-bin is a good choice for most
web servers. (default: /cgi-bin) [?,q]:

Using /cgi-bin as the BEA Administration Console CGI prefix

Unloading <cdrom_drive>/Tuxedo/spsol7/tuxcore/WS.Z ...
bin/CBLDCLNT
bin/CBLVIEWC
bin/CBLVIEWC32
bin/uninstall.sh
lib/registry.so
lib/registry.so.71 linked to lib/registry.so
lib/registry.so.71
samples/atmi/secsapp/README
samples/atmi/secsapp/README.as400
samples/atmi/secsapp/cert/TOUPPER.pvk
samples/atmi/secsapp/cert/TOUPPER.x59


.
.  (Files being installed are listed here)
.

39790 blocks
... finished

Changing file permissions...
... finished

Moving BEA Administration Console files to their proper location...
... finished

Processing default license file...
... finished

Install tlisten password? [y/n]: y

Please enter the tlisten password:
Please verify the password:
tlistpwd: INFO: Password appended to file "/usr/tuxedo/udataobj/tlis
ten.pw".

Please don't forget to manually copy the contents of the license file
from the enclosed floppy to '/usr/tuxedo/udataobj/lic.txt'.
```

```
Installation of BEA Tuxedo System was successful

Please consult the Installation Guide and Release Notes for further
information concerning the installation of this software.
```

8. After the installation is complete, you must install your product license. Refer to "Installing Your Product License" on page 2-9 for instructions.

9. You can now either install the BEA Jolt software, or unmount the CD-ROM file system and remove the CD-ROM from the reader. To install BEA Jolt, see "Installing BEA Jolt" on page 2-6. For platform specific instructions for unmounting the CD-ROM file system, see Appendix A, "Platform Data Sheets."

Installing BEA Jolt

To install the BEA Jolt software, complete the following 6-step procedure.

1. Change directory to the root of the mounted CD-ROM.

2. Invoke the installation procedure by entering

   `sh install.sh`

   A series of prompts is displayed.

3. At the initial prompt, enter 2 to install BEA Jolt.

   Note: You must install BEA Tuxedo Release 7.1 before installing BEA Jolt. To install the BEA Tuxedo software, see "Installing the BEA Tuxedo System on a UNIX Platform" on page 2-1.

   The following listing shows the interactive part of a sample installation session. In this example, BEA Jolt is being installed on a Solaris system.

```
The following installation options are available:
1       Tuxedo          Install Tuxedo
2       Jolt            Install Jolt 1.2.1 for Tuxedo
Select an option (default: Tuxedo) [?, ??, q]:2

Installing Jolt 1.2.1 for Tuxedo
01) alpha/dux40/Tux7.x              02) hp/hpux11/Tux7.x
03) ibm/aix43/Tux7.x               04) linux/inlnx61/Tux7.x
05) sun5x/sol26/Tux7.x
```

```
Install which platform's files? [01-5, q to quit, l for list]: 5

** You have chosen to install from sun5x/sol26/Tux7.x **

BEA Jolt Release 1.2.1

This directory contains the BEA Jolt System for
SunOS 5.6 (Solaris 2.6) on SPARC
Is this correct? [y,n,q]: y

To terminate the installation at any time
press the interrupt key,
typically <del>, <break>, or <ctrl+c>.

The following packages are available:

  1    jolt           BEA Jolt

Select the package(s) you wish to install (or 'all' to install
all packages) (default: all) [?,??,q]: 1

BEA Jolt
(sparc) Release 1.2.1
Copyright (c) 1997-1999 BEA Systems, Inc.
Portions * Copyright 1986-1997 RSA Data Security, Inc.
All Rights Reserved.
Distributed under license by BEA Systems, Inc.
TUXEDO is a registered trademark.
BEA Jolt is a trademark of BEA Systems, Inc.
BEA WebLogic Enterprise is a trademark of BEA Systems, Inc.

The following installation options are available:

  1    all            Install Jolt server, relay, rad,and client
  2    server         Install the server only
  3    relay          Install the relay front-end only
  4    rad            Install the relay back-end only
  5    client         Install the client only
  6    compat         Install the Jolt 1.1 Client compatibility classes

Select an option (default: all) [?,??,q]: 1

Note that the jolt server will be installed into an existing
Tuxedo directory.  You MUST have previously installed Tuxedo
version 7.1 to attempt this installation.


Base directory of existing Tuxedo installation [?,q]: /usr/tuxedo
```

```
Determining if sufficient space is available ...
3031 blocks are required
11395220 blocks are available to /usr/tuxedo

Using /usr/tuxedo as the Tuxedo base directory

Unloading <cdrom_drive>/TUXEDO7.1/Jolt/unix/sun5x/sol26/Tux7.x/jolt/joltclt.Z ..
.
. (Files being installed are listed here)
.

1200 blocks
... finished

Please don't forget to manually append the contents of the license file
from the enclosed floppy to '/usr/tuxedo/udataobj/lic.txt'.


Changing file permissions...
... finished

Installation of BEA Jolt was successful

The following packages are available:

1    jolt          BEA Jolt

Select the package(s) you wish to install (or 'all' to install
all packages) (default: all) [?,??,q]: q

Please consult the Installation Guide and Release Notes for further
information concerning the installation of this software.
```

4. After you have installed BEA Jolt, enter q to exit the installation process.

5. Once the installation is complete, you must append the BEA Jolt license to the BEA Tuxedo lic.txt file. Refer to "Installing Your Product License" on page 2-9 for details.

6. Unmount the CD-ROM file system and remove the CD-ROM from the reader. See Appendix A, "Platform Data Sheets," for platform-specific instructions.

Installing Your Product License

Your product license was delivered on the floppy diskette that you received in the box with the software CD-ROM.

Note: License files from previous BEA Tuxedo releases are not valid for BEA Tuxedo Release 7.1. You need to create a new license file for BEA Tuxedo Release 7.1. If you later license additional BEA Tuxedo Security capabilities or BEA Jolt, you can append those license files to the BEA Tuxedo Release 7.1 license file.

The floppy diskette cannot be read on a computer running the UNIX system. To install the license, complete the following 2-step procedure.

1. Install the contents of the floppy diskette onto a Windows machine and transfer the license file to the UNIX machine.

2. Copy your BEA Tuxedo license file to the directory in which the `lic.txt` file resides: `$TUXDIR/udataobj`. To verify that the UNIX system has accepted the file, run the `tmadmin -v` command.

    A sample license file is shown in the following listing.

    ```
    BEA Tuxedo System License File
    This file contains license tokens to enable BEA Tuxedo and
    optional components. Each license begins with "[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 the BEA Systems licensing
    agreement, and may also disable Tuxedo or optional components.

    [BEA Tuxedo]
    VERSION=7.1
    LICENSEE=
    SERIAL=
    ORDERID=
    USERS=
    EXPIRATION=YYYY-MM-DD
    SIGNATURE=

    [LINK ENCRYPTION]
    ```

```
VERSION=7.1
LICENSEE=
SERIAL=
ORDERID=
USERS=
STRENGTH={128, 56}
EXPIRATION=YYYY-MM-DD
SIGNATURE=

[PK ENCRYPTION]
VERSION=7.1
LICENSEE=
SERIAL=
ORDERID=
USERS=
STRENGTH={128, 56}
EXPIRATION=YYYY-MM-DD
SIGNATURE=

[PK SIGNATURE]
VERSION=7.1
LICENSEE=
SERIAL=
ORDERID=
USERS=
EXPIRATION=YYYY-MM-DD
SIGNATURE=
```

Installing Your BEA Jolt License

To license BEA Jolt, make a copy of the BEA Jolt license file provided on the diskette and append it to the existing license file: $TUXDIR/udataobj/lic.txt.

A sample of a BEA Jolt license is shown in the following listing.

```
[BEA JOLT]
VERSION=1.2.1
LICENSEE=
SERIAL=
ORDERID=
USERS=
EXPIRATION=YYYY-MM-DD
SIGNATURE=
```

Note: The encryption level for BEA Jolt is controlled through the BEA Tuxedo license file under the heading [LINK ENCRYPTION].

Verifying the BEA Tuxedo Software Installation

To verify that you have successfully installed the BEA Tuxedo system software on a server platform, check the directory structure added to your system for the BEA Tuxedo system files, and try configuring and executing the sample application provided. This section describes the directory structure and provides instructions for running the sample application.

Checking the Directory Structure After BEA Tuxedo System Installation

When the BEA Tuxedo system is installed, the directories shown in the following diagram are created. This diagram reflects the directory structure when all packages in the BEA Tuxedo development environment are installed.

Figure 2-1   BEA Tuxedo System Directory Structure
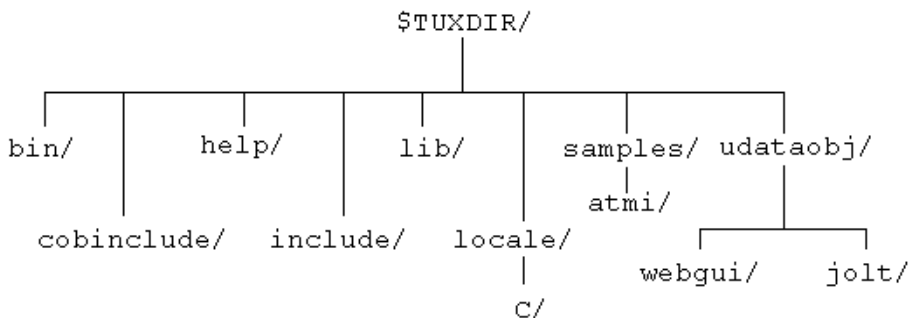
The contents of each directory are described below. $TUXDIR is the base directory for the BEA Tuxedo system software. $TUXDIR must be an empty directory for which you have read, write, and search (execute) permissions.

$TUXDIR/bin
> Contains executable programs.

$TUXDIR/cobinclude
> Contains copylib entries for use in COBOL programs.

$TUXDIR/help
> Contains the on-line help files for the BEA Administration Console.

$TUXDIR/include
> Contains C language header files. May include subdirectories such as rpc, depending on the platform.

$TUXDIR/lib
> Contains compiled object files, including dynamic shared libraries (for platforms on which the BEA Tuxedo system uses dynamic shared libraries) and other object files needed to build BEA Tuxedo system clients and servers.

$TUXDIR/locale
> Contains subdirectories to support the localization of system messages.

$TUXDIR/locale/C
> Contains message catalogs for the default locale (U.S. English).

$TUXDIR/samples
> Contains several subdirectories with sample applications.

$TUXDIR/udataobj
> Contains other files required by the BEA Tuxedo system.

$TUXDIR/udataobj/jolt
> Contains the files for the Jolt software components you selected to install.

$TUXDIR/udataobj/webgui
> Contains the Java and image files for the BEA Administration Console.

Running a Sample Application

To verify that you have successfully installed the BEA Tuxedo system software on a server platform, run the `simpapp` application, which can be found in the directory `$TUXDIR/samples/atmi/simpapp`.

Note: Instructions for setting up and running `simpapp` through the BEA Administration Console are provided in the *BEA Administration Console Online Help*.

`simpapp` is a non-distributed application consisting of a server, client, and configuration file. This "simple application" converts strings from lowercase to uppercase. The server `simpserv` offers a single service called `TOUPPER`. The client `simpcl` is invoked with a single argument, which is a lower-case string to be converted to upper case. The server returns the converted string to the client, which prints it out.

For example, the invocation

```
simpcl "hello world"
```

results in the output

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

Configuring and Running simpapp

To configure and run `simpapp`, complete the following 10-step procedure.

Note: This procedure is also provided in the `README` file in `$TUXDIR/samples/atmi/simpapp`, and in "Tutorial for simpapp, a Simple C Application" on page 2-1 in *Tutorials for Developing a BEA Tuxedo Application*.

1. Set and export the environment variables used by the BEA Tuxedo system. You can do this by executing the Bourne shell script `$TUXDIR/tux.env`.

2. Create a working directory for your sample application and `cd` to it.

```
cd /home/me
mkdir workplace
cd workplace
```

Then set and export an environment variable for your working directory.

```
MYDIR=/home/me/workplace
export MYDIR
```

3. Copy the simpapp files to your working directory. You will need to edit one of them: 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
```

Note: If compiled client and server programs are not available in your simpapp directory, you must compile the source files for them now by entering the following commands.

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

4. 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 the same value as MYDIR.

  - Set TUXCONFIG to the literal path name corresponding to $MYDIR/tuxconfig (in our example, /home/me/workplace/tuxconfig).

  - 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
    ```

5. Initialize and export the TUXCONFIG environment variable, which is used by several BEA Tuxedo system commands.

```
TUXCONFIG=$MYDIR/tuxconfig
export TUXCONFIG
```

6. 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
```

7. 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 9.

Listing 2-1   Output produced by `tmboot -y`

```
Booting all admin and server processes in
/home/me/workplace/tuxconfig
INFO: BEA TUXEDO(r) System Release 7.1
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.
```

8. If the boot fails, examine the log named `ULOG.`*mmddyy* in your application directory (`$MYDIR`). 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. If you see a message such as the following, near the end of the log

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

   then 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 $MYDIR/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, "Platform Data Sheets."

9. If the boot succeeded, you can invoke the client. For example, enter the following command.

   ```
   simpcl "hello world"
   ```

   The following is displayed.

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

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

    ```
    tmshutdown -y
    ```

Removing the BEA Tuxedo Software from Your System

1. Shut down all BEA Tuxedo applications.

2. Make sure your TUXDIR variable is set by executing the Bourne shell script `$TUXDIR/tux.env`.

3. Go to the `bin` directory where you installed the BEA Tuxedo software.

   ```
   cd  $TUXDIR/bin
   ```

4. Enter the following command.

   ```
   sh uninstall.sh
   ```

5. Respond to the prompts displayed during the uninstall process.

3 Installing the BEA Tuxedo System on a Windows System

- Interoperability

- Installing the BEA Tuxedo System on a Windows System

- Invoking the BEA Tuxedo Software Installation Program

- Installing the BEA Tuxedo Release 7.1 Software on a Windows NT System

- Installing the BEA Tuxedo Release 7.1 Software on a Windows 95 or Windows 98 System

- Installing the BEA Jolt Software

- Upgrading an Existing BEA Tuxedo System for Windows NT

- Installing the Product License After You Install the BEA Tuxedo Software

- Installing the BEA Tuxedo System Using Unattended Installation

- Removing the BEA Tuxedo Software from Your System

- Removing BEA Jolt from Your System

Interoperability

BEA Tuxedo Release 7.1 running on a Windows NT platform can interoperate, as either master or non-master, with Release 7.1 running on any other supported platform.

The hardware and software requirements for installing the BEA Tuxedo system on Windows systems are provided in Appendix A, "Platform Data Sheets."

Installing the BEA Tuxedo System on a Windows System

You can install all or part of the BEA Tuxedo software from the CD-ROM, including the following components:

- BEA Tuxedo Core System (including the BEA Administration Console)

- BEA Jolt

- BEA Tuxedo System Workstation only

Note: The only option available for installation on a Windows 95 or Windows 98 system is BEA Tuxedo System WS ONLY.

The documentation is provided on a separate CD-ROM.

You can install the BEA Tuxedo system by using either of two methods:

- Standard installation using the BEA Tuxedo software installation program

- Unattended installation

For most installations, we recommend that you use the standard installation process. Refer to "Invoking the BEA Tuxedo Software Installation Program" on page 3-3 for instructions.

Use the unattended installation process to create a setup file which you can use with Microsoft BackOffice tools to duplicate the BEA Tuxedo system installation on multiple machines with the same configuration. For information on using the unattended installation process, see "Installing the BEA Tuxedo System Using Unattended Installation" on page 3-29.

Invoking the BEA Tuxedo Software Installation Program

To invoke the BEA Tuxedo Software Installation program, complete the following 3-step procedure.

1. Log in to a Windows NT system using the `Administrator` user name.

   To install the BEA Tuxedo system on Windows NT correctly, you need to log in with the user ID of `Administrator`. If you log in from a non-administrator account and install the BEA Tuxedo system on a Windows NT machine, the `TUXIPC` service will not have an entry in the registry. The BEA Tuxedo system will function correctly only until you log off, as the `TUXIPC` runs as a process, and all applications terminate when the user logs off.

   If you are already logged on to the system as the `Administrator`, we strongly recommend that you exit from all Windows applications, including all BEA Tuxedo-related applications, before executing the BEA Tuxedo Software Installation program.

   If you are installing on a Windows 95 or Windows 98 system, you do not need to log in as the `Administrator`.

2. Insert the BEA Tuxedo CD-ROM in the CD-ROM drive.

   Typically, the BEA Tuxedo Software Installation script is invoked automatically and the following screen appears, prompting you to either select a product to install, or exit the installation process.
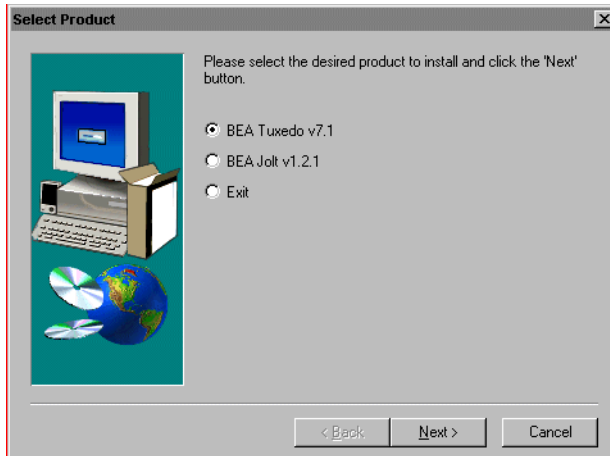
3. If the installation script is not automatically invoked, select
Start→Programs→Windows NT Explorer and double-click on the CD-ROM
icon.

Click on setup_windows. A list of filenames is displayed. Double-click on
Setup.exe in the list.
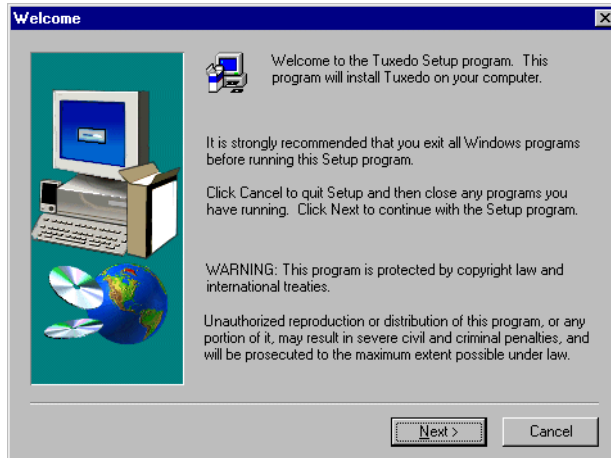
Note: You can exit from the BEA Tuxedo Software Installation process at any time
by selecting the Cancel button.

Installing the BEA Tuxedo Release 7.1 Software on a Windows NT System

To install the BEA Tuxedo Release 7.1 software on a Windows NT system, complete
the following 13-step procedure.
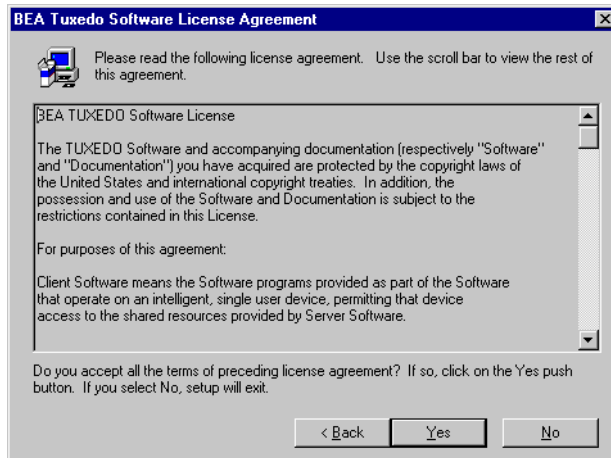
1. Select the BEA Tuxedo v7.1 radio button from the Select Product screen and select
Next.

The Setup screen is displayed, followed by the Welcome screen, which prompts
you to shut down all running Windows processes before proceeding.

If you have not already exited from all Windows programs, we strongly recommend that you select Cancel, exit all Windows programs, and then restart the BEA Tuxedo Software Installation program.

2. Select Next to advance to the BEA Tuxedo Software License Agreement.

3. Review the license agreement and select Yes to accept the terms described.

The BEA Tuxedo User Registration screen is displayed.
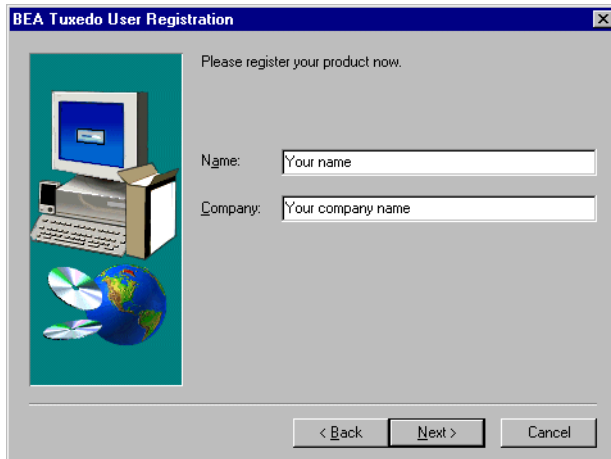
4. Enter your name and company name in the fields provided and select the Next button.

   The Registration Confirmation screen is displayed.

5. Verify that the information is accurate on the Registration Confirmation screen and select Yes.

   The BEA Tuxedo System Installation Selection screen is displayed. From that screen you can select one of the following installation options:

   - BEA Tuxedo Core System
   - BEA Tuxedo System WS ONLY
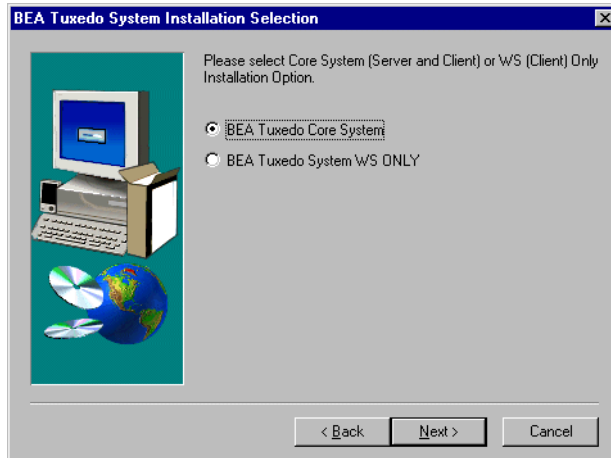
6. If you do not want to install the full BEA Tuxedo system, skip to step 7.

   To install the full system, select the BEA Tuxedo Core System radio button and select Next.

   The BEA Tuxedo Installation Selection screen is displayed, as follows.
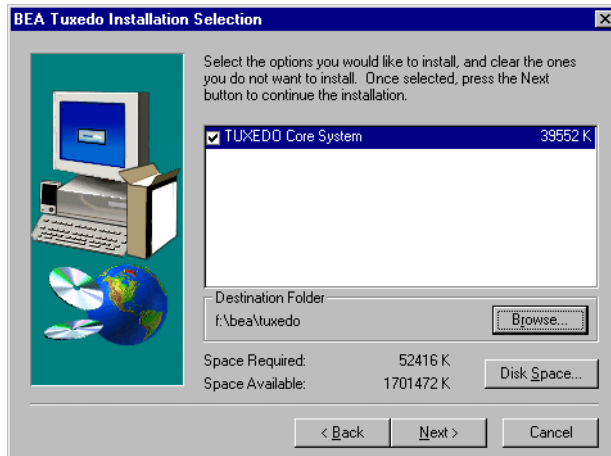
   The only option listed is the Tuxedo Core System, which consists of the BEA Tuxedo core software and the BEA Administration Console. This option is selected by default. Specify the destination folder for the Core System and select Next.

Three Choose Destination Location screens are displayed and you are prompted to specify the destination directory for the BEA Administration Console HTML files, the Java applets, and the CGI programs. The following illustration shows a sample Choose Destination Location screen.
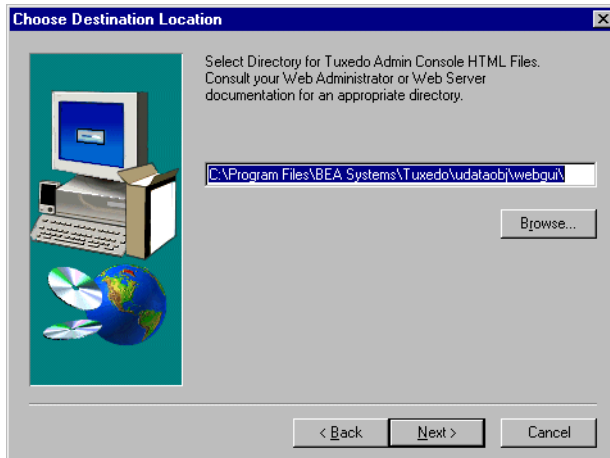
At each prompt, specify the desired destination for each component, and select Next.

The Enter Information screen is displayed, prompting you to select a Web server client prefix for the name of the CGI directory. Enter the appropriate prefix and select Next.
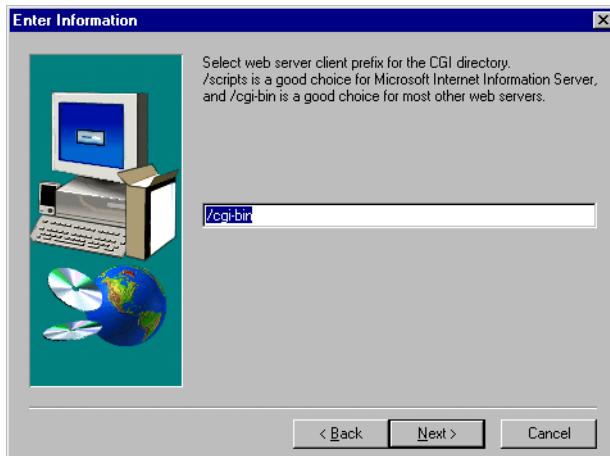
The Select Program Folder screen is displayed. Go to step 8.

7. If you want to install only the BEA Tuxedo System Workstation component, select the BEA Tuxedo WS ONLY radio button and select Next.

   The BEA Tuxedo Installation Selection screen is displayed. Specify the destination folder and select Next.

   The Select Program Folder screen is displayed.
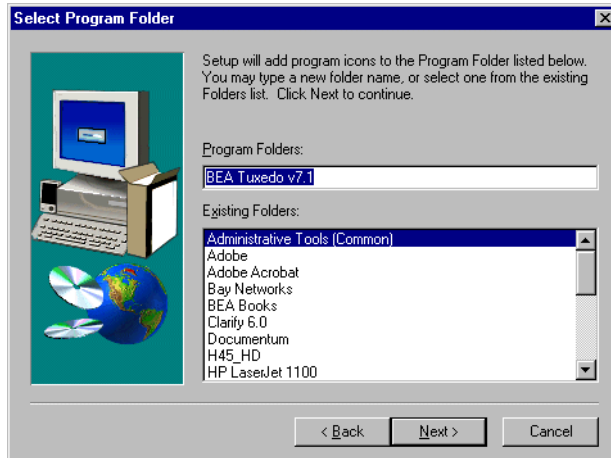
8. Specify the program folder in which you would like the software to be installed and select Next.

   The BEA Tuxedo Software Installation process is started. It prompts you for a `tlisten` password.

9. At the prompt, enter a password and select Next.

   The Install performance monitor screen is displayed. It prompts you to back up your performance data before installing the BEA Tuxedo performance monitor.
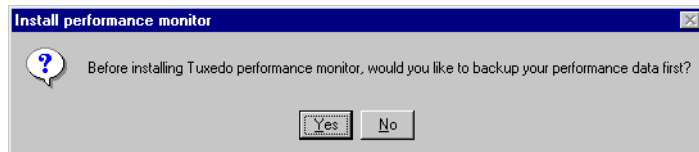
10. Select Yes to back up your data and complete the installation. Select No to complete the installation without first backing up your data.

   Once the installation is complete, you are prompted to install your license.
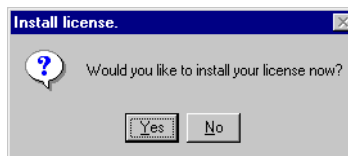
11. Select Yes to install the license. At the prompt, enter the name of the license file and select Next. You can select No to install the license at a later time.

Note: You can install the license at a later time using the BEA License Utility. See "Installing the Product License After You Install the BEA Tuxedo Software" on page 3-28 for details.

The Setup Complete screen is displayed.
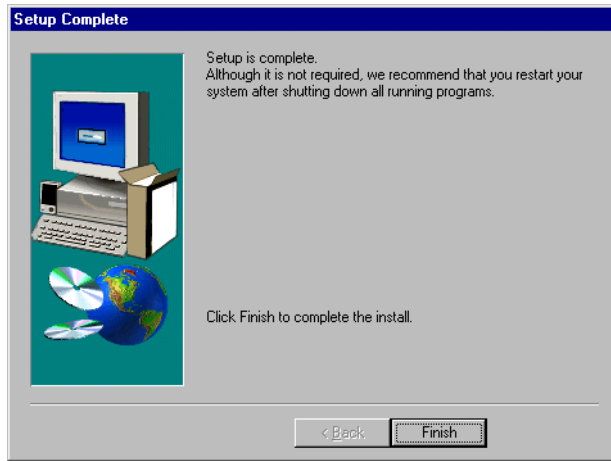
12. Click Finish to complete the installation. The Select Product screen is displayed.
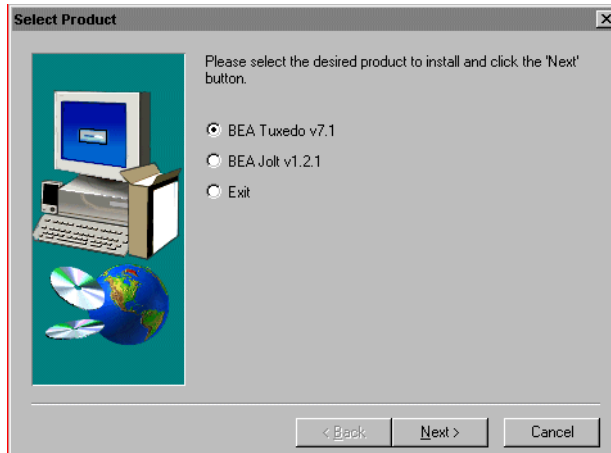
Installation of the BEA Tuxedo Release 7.1 software is complete!

13. If you want to install the BEA Jolt software, select the BEA Jolt v1.2.1 radio button and select Next. See "Installing the BEA Jolt Software" on page 3-19 for details.

    To exit from the BEA Tuxedo Software Installation process, select the Exit radio button and select Next.

Note: If you exit the installation process, we recommend you shut down all running programs and restart your system, although doing so is not required.

Installing the BEA Tuxedo Release 7.1 Software on a Windows 95 or Windows 98 System

To install the BEA Tuxedo Release 7.1 software on a Windows 95 or Windows 98 system, complete the following 14-step procedure.

1. Select the BEA Tuxedo v7.1 radio button from the Select Product screen and select Next.

   The Setup window is displayed, followed by the Welcome screen, which prompts you to shut down all running Windows processes before proceeding.

If you have not already exited from all Windows programs, we strongly
recommend that you select Cancel, exit all Windows programs, and then restart
the BEA Tuxedo Software Installation program.

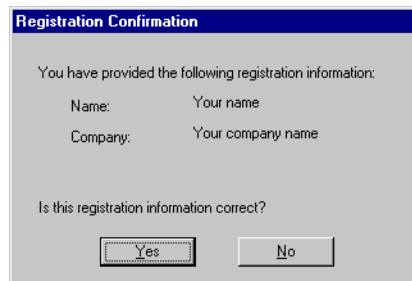2. Select Next to advance to the BEA Tuxedo Software License Agreement.

3. Review the license agreement and select Yes to accept the terms described.

   The BEA Tuxedo User Registration screen is displayed.

4. Enter your name and company name in the fields provided on the User Registration screen and select the Next button.

   The Registration Confirmation screen is displayed.

5. Verify that the information is accurate on the Registration Confirmation screen and select Yes.

   The BEA Tuxedo Installation Selection screen is displayed, as follows.
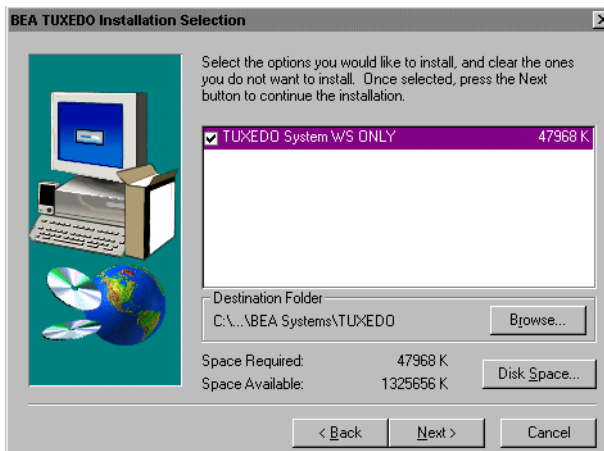
Because the only component that can be installed on a Windows 95 or Windows 98 system is the BEA Tuxedo Workstation component, this component is automatically selected.

6. Select a destination folder in the BEA Tuxedo Installation Selection screen, and select Next.
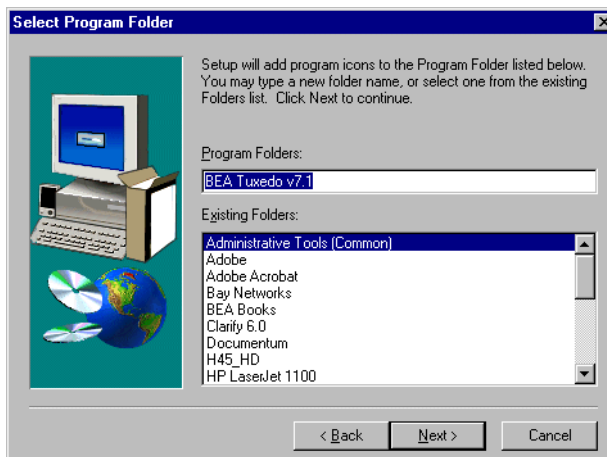
   The Select Program Folder screen is displayed.

7. Specify the program folder in which you would like the software to be installed and select Next.

The BEA Tuxedo Software Installation process is started.

The Update AUTOEXEC.BAT screen is displayed, which prompts you to specify whether or not you want to update the autoexec.bat file with the appropriate system environment variables.

Update AUTOEXEC.BAT.	✕
❓ Would you like to update your AUTOEXEC.BAT file for Tuxedo environment variables?	
<u>Y</u>es <u>N</u>o	
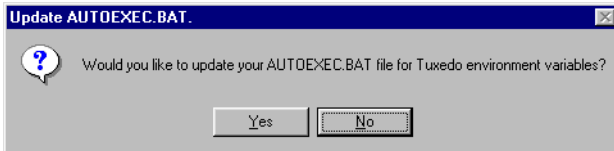
8. At the prompt, select Yes to update the autoexec.bat file.

   The Set APPDIR environment variable screen is displayed, which prompts you to specify whether or not you want to set the APPDIR environment variable.

Set APPDIR environment variable.	✕
❓ Would you like to SET your APPDIR variable now?	
<u>Y</u>es <u>N</u>o	
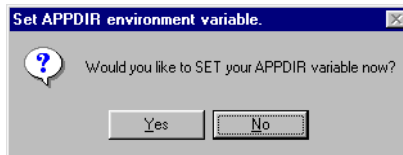
9. If you want to update the APPDIR environment variable, select Yes. Otherwise, select No.

   If you select Yes, the Tuxedo Application Directory screen is displayed and you are prompted to enter the appropriate path name for APPDIR.
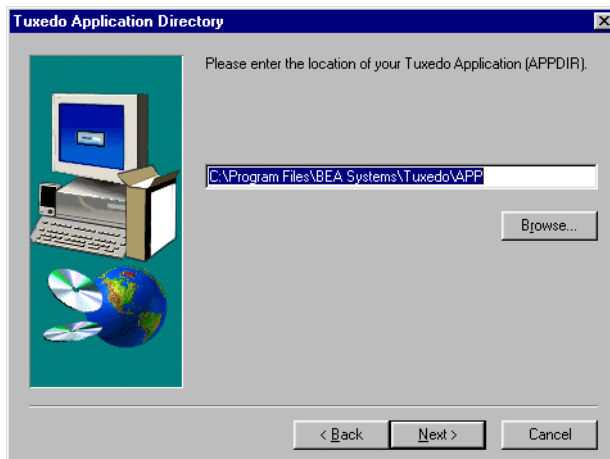
10. Enter the appropriate path name for APPDIR and select Next.

    The Set WSENVFILE environment variable screen is displayed, which prompts you to specify whether or not you want to set the WSENVFILE environment variable.
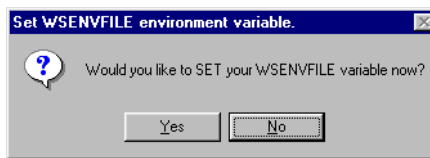
11. If you want to update the WSENVFILE environment variable, select Yes. Otherwise, select No.

    If you select Yes, the Enter Information screen is displayed and you are prompted to enter the appropriate path name for WSENVFILE.
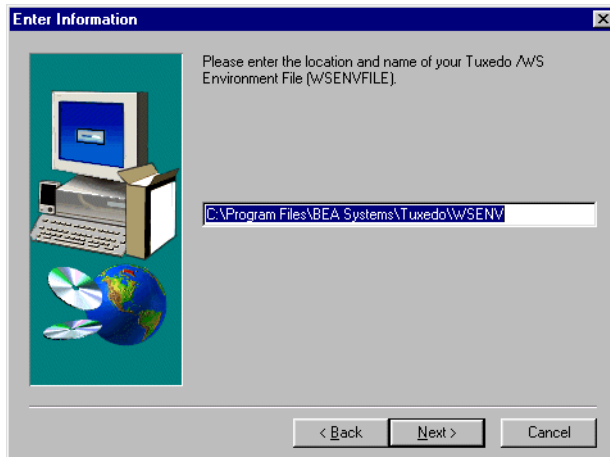
12. Enter the appropriate path name for WSENVFILE and select Next.

    The Setup Complete screen is displayed as follows.
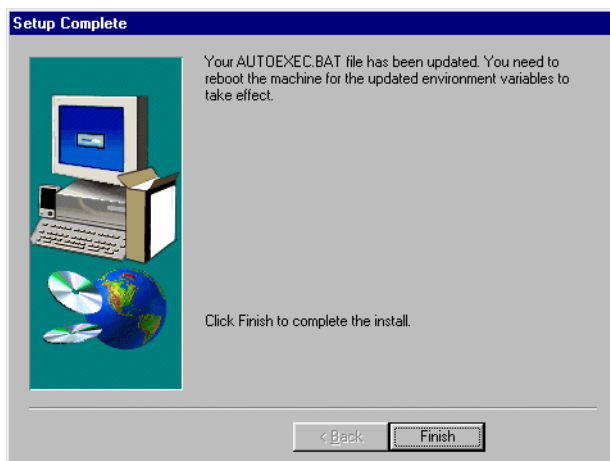
13. Select Finish to complete the installation. The Select Product screen is displayed.
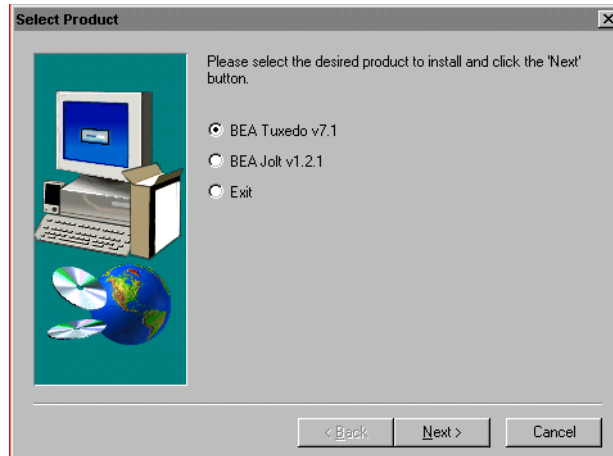
Installation of the BEA Tuxedo Release 7.1 software is complete!

14. If you intend to install the BEA Jolt software, select the BEA Jolt v1.2.1 radio button and select Next. See "Installing the BEA Jolt Software" on page 3-19 for details.

   To exit from the BEA Tuxedo Software Installation process, select the Exit radio button and select Next.

Note: In order to make the updated values of the environment variables effective, you must restart your system.

Installing the BEA Jolt Software

To install the BEA Jolt software, complete the following 16-step procedure.

1. Select the BEA Jolt v1.2.1 radio button from the Select Product screen and select Next.

   Note: If the Select Product screen is not displayed, see "Invoking the BEA Tuxedo Software Installation Program" on page 3-3.

   The Setup screen is displayed, followed by the Welcome screen, which prompts you to shut down all running Windows processes before proceeding.

If you have not already exited from all Windows programs, we strongly recommend that you select Cancel, exit all Windows programs, and then restart the BEA Jolt Software Installation program.

2. Select Next to advance to the Software License Agreement.
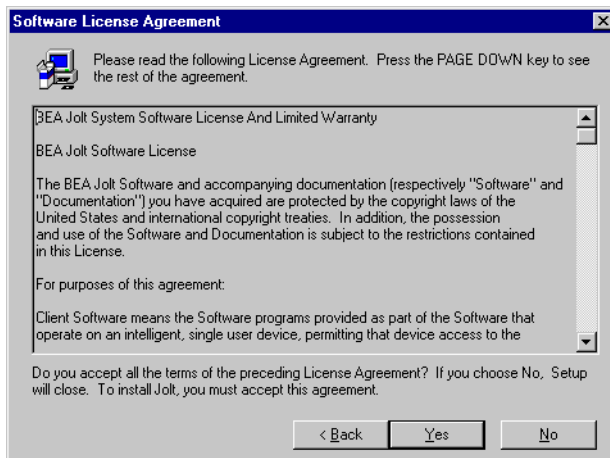
3. Review the license agreement and select Yes to accept the terms described.

   If you are installing BEA Jolt on a server machine, the BEA Tuxedo User Registration screen is displayed. If you are installing BEA Jolt on a client only machine, such as Windows 95/98, you are not prompted to enter registration information. Instead, the Select Components screen is displayed as shown in step 5.

4. Enter your name and company name in the fields provided on the User Registration screen and select Next.

   The Registration Confirmation screen is displayed.

5. Verify that the information on the Registration Confirmation screen is accurate and select Yes.

   The Select Components screen is displayed, as follows.
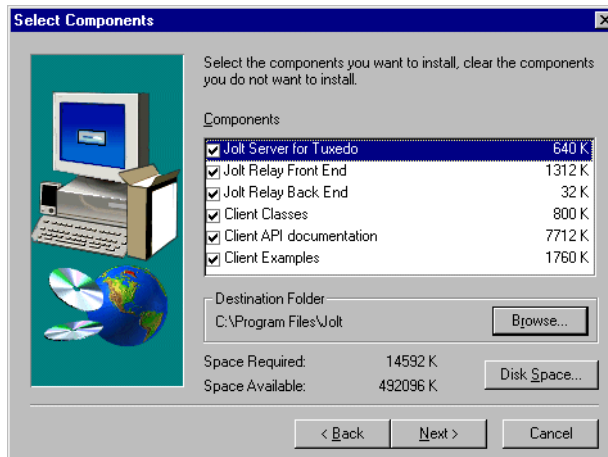
   Note: The Jolt Server for Tuxedo component is displayed only if the BEA Tuxedo Core System is installed on the system on which you are installing BEA Jolt.

6. Select the components that you would like to install and the desired destination folder, and select Next.

7. If you chose to install the Jolt Server for Tuxedo, the Jolt 1.2.1 Server Destination screen is displayed, prompting you for a destination for this component.
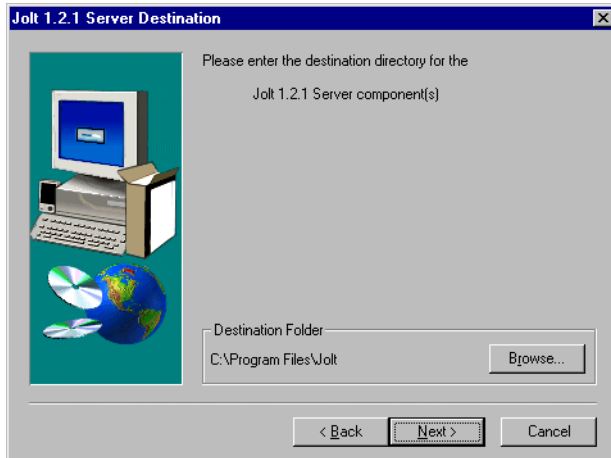
Specify a destination directory for the Jolt Server for Tuxedo component, and select Next.

8. If you chose to install the Jolt Relay Front-End, the Jolt 1.2.1 Relay Front-End Destination screen is displayed, prompting you for a destination for this component.

Specify a destination directory for the Jolt Relay Front-End component and select Next.

9. If you chose to install the Jolt Relay Back-End, the Jolt 1.2.1 Relay Back-End Destination screen is displayed, prompting you for a destination for this component.
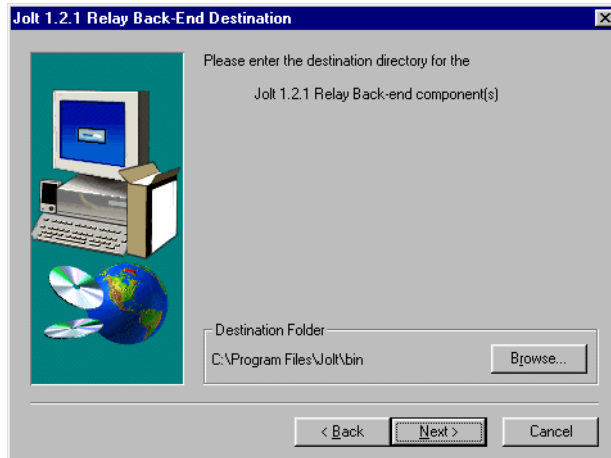
Specify a destination directory for the Jolt Relay Back-End component and select Next.

10. If you chose to install the Jolt Client, the Jolt 1.2.1 Client Destination screen is displayed, prompting you for a destination for this component.
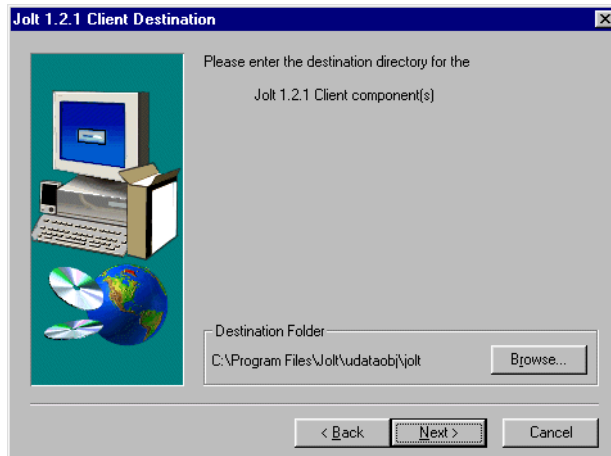
Specify a destination directory for the Jolt Client components and select Next.

11. The installation script asks whether you have Jolt 1.1 applications.
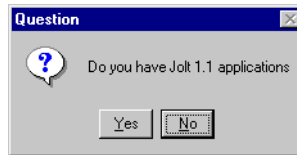
Select Yes if you have Jolt 1.1 applications on your system. In addition to the client class `.jar` files, you get client classes in `.zip` file format and all Jolt client classes in the `classes\bea\jolt` directory. Select No if you do not have Jolt 1.1 applications on your system.

The BEA Jolt software installation process is started.

12. If you have installed the Jolt Server for Tuxedo component, you are prompted to install your BEA Jolt license.
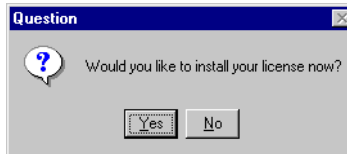
a. Select Yes to install your license. The Insert License Disk screen is displayed, prompting you for the path name for the license file.
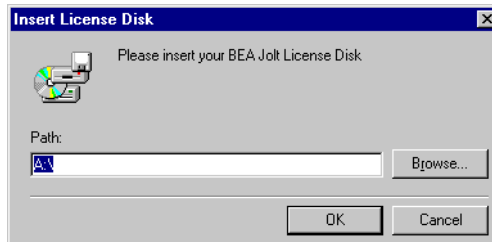
Specify the appropriate path name and select OK.

b. Select No to install your license at a later time. A warning reminds you that your license has not been installed.

Note: You can install your license at a later time using the BEA License Utility. See "Installing the Product License After You Install the BEA Tuxedo Software" on page 3-28 for details.

13. If you chose (in step 6) to install the Jolt Relay Front End, a prompt asks whether you want to install Jolt Relay as a service.
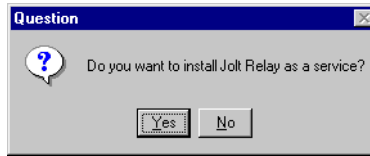
a. Select Yes to install the Jolt Relay as a service.

Note: If you are installing BEA Jolt on a Windows 95/98 platform, select No. Jolt relay is not supported on a Windows 95/98 platform.

The Enter Information screen is displayed, prompting you to specify the full path name of the configuration file.
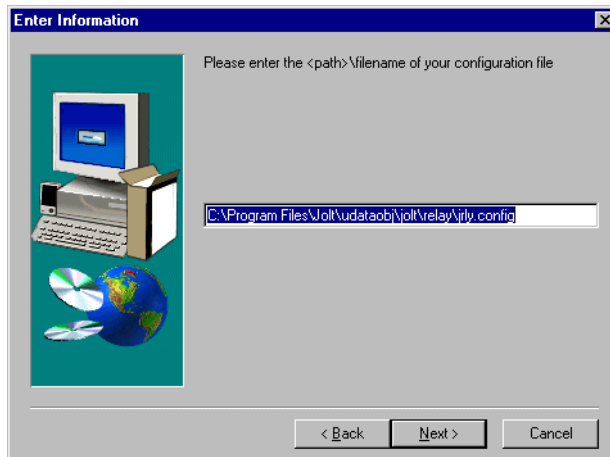
Specify the appropriate path and select Next.

The BEA Jolt Relay process is installed as a service and the installation completes.

b. Select No if you do not want to install Jolt Relay as a service. The installation completes.

14. The installation script displays the Jolt 1.2.1 Setup Complete screen.
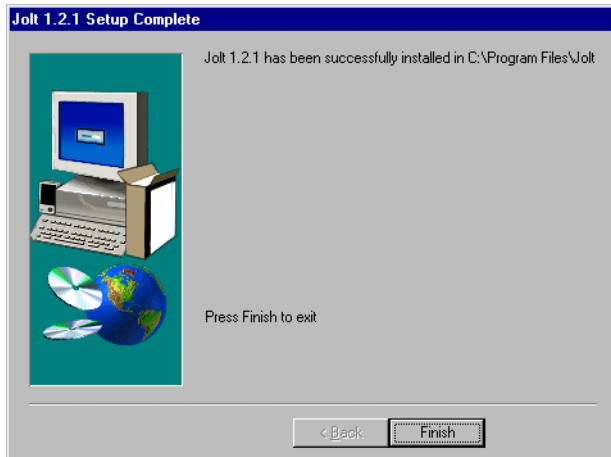
15. Select Finish to end the BEA Jolt Installation process. The Select Product screen is displayed.
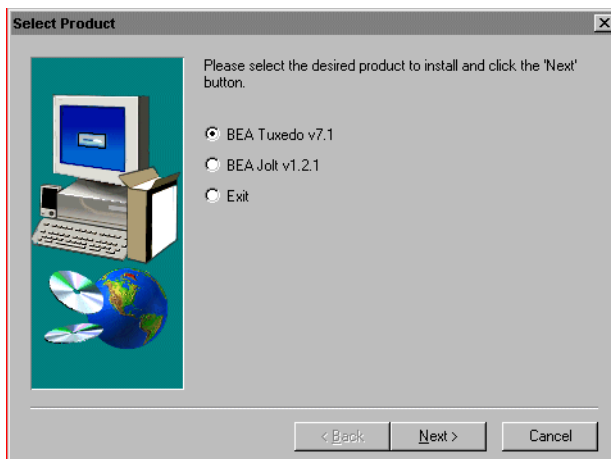
Installation of the BEA Jolt software is complete!

16. To exit from the BEA Tuxedo Software Installation process, select the Exit radio button from the Select Product screen and select Next. Or, to install the BEA Tuxedo Release 7.1 software, refer to "Installing the BEA Tuxedo Release 7.1 Software on a Windows NT System" on page 3-4 or "Installing the BEA Tuxedo Release 7.1 Software on a Windows 95 or Windows 98 System" on page 3-12.

Note: If you have finished installing the BEA Tuxedo Release 7.1 software and have not yet restarted the system, we recommend that you restart the system now.

Upgrading an Existing BEA Tuxedo System for Windows NT

If you are upgrading from an existing BEA Tuxedo system, and are using the BEA Tuxedo IPC Helper Service, you must stop the service before performing the installation.

To stop the BEA Tuxedo IPC Helper Service:

1. Disable the BEA Tuxedo IPC Helper Service by selecting Start→Settings→Control Panel→Services.

2. From the Services dialog box, select Tuxedo IPC Helper and then select Stop.

The IPC Helper Service is now stopped, and you are ready to start your upgrade. To upgrade your system, complete the procedure provided in "Installing the BEA Tuxedo System on a Windows System" on page 3-2. The procedure provided in that section is used for both first-time and upgrade installations of Release 7.1. When the BEA Tuxedo Software Installation script detects a previous version of the software, it prompts you to indicate whether or not you would like to delete it.

Note: To ensure proper operation, once the installation is complete, regenerate any applicable TUXCONFIG files.

See Also

■   "Post-Installation Considerations for a Windows System" on page 6-2

Installing the Product License After You Install the BEA Tuxedo Software

If you chose not to install your software license when you installed your software, you can install the license later, using the BEA License Utility.

Note: Your product license is provided on a 3.5" diskette that is either mailed to you or included in the software box.

To install your product license, complete the following 3-step procedure.

1. Insert the diskette into the disk drive on your machine.

2. From the taskbar click Start→Programs→BEA Tuxedo v7.1→BEA License Utility 7.1.

   The BEA License Utility screen is displayed.
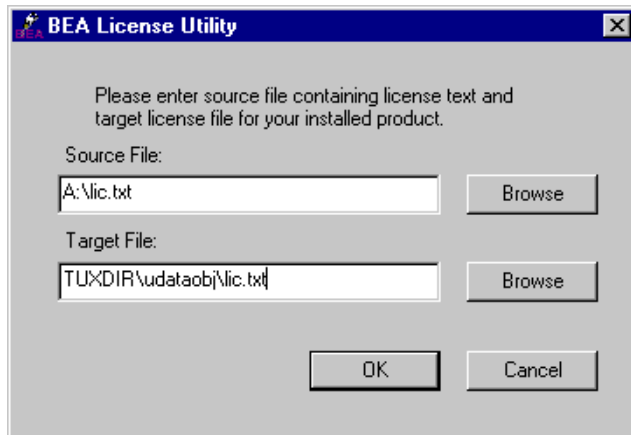
3. If the disk drive containing the diskette is drive A, select OK; otherwise, enter the correct drive and select OK. The license is installed and the License File updated message is displayed.

Installing the BEA Tuxedo System Using Unattended Installation

To install the BEA Tuxedo system and BEA Jolt on multiple machines with the same configuration, create a setup.iss file. This file contains the settings, such as destination directories for software components, required by the BEA Tuxedo system for a successful installation. You can then use the setup.iss file with Microsoft BackOffice tools to install the BEA Tuxedo system on multiple machines with the same configuration.

There are two ways to create the setup.iss file for unattended installation:

- Create a new setup.iss file using the choices you select during the standard installation process, or

- Edit one of the template setup.iss files provided with your software.

Note: We recommend you create a new setup.iss file rather than edit a template file.

Using the Unattended Installation Process

To install the BEA Tuxedo or BEA Jolt software using the unattended installation process, complete the following 9-step procedure.

1. Ensure that there are no previous versions of the BEA Tuxedo or BEA Jolt software installed on the system. If previous versions are installed, you must remove them and reboot the system before proceeding to the next step.

2. Hold down the Shift key and insert the BEA Tuxedo CD into the CD-ROM drive. (By holding down the Shift key, you bypass the Windows autorun feature.)

3. Copy the following directories from the BEA Tuxedo CD-ROM to a directory on your hard drive:

   - *cdrom_drive*\Tuxedo\winnt (for BEA Tuxedo system installation)

   - *cdrom_drive*\Jolt\inwnt40 (for BEA Jolt installation)

   - *cdrom_drive*\unattended_install\templates

   Note: For the remainder of this procedure, we refer to the directory on your hard drive to which you copied the software directories as *SETUPDIR* and the full path name to that directory as *SETUPDIR_PATH*.

4. Create a new setup.iss file or edit one of the template files.

   For details on creating a new setup.iss file, see "Creating a New setup.iss File" on page 3-32. For instructions on editing a setup.iss template file, see "Editing the setup.iss Template Files" on page 3-34.

5. Verify that a new or edited setup.iss file has been copied to the directory in which the BEA Tuxedo or BEA Jolt Setup.exe file resides (*SETUPDIR*).

6. Start the installation process, using either of two methods. If you want to use the Windows NT menus, go to step 7. If you want to use a DOS command, skip to step 8.

7. Execute Setup.exe -s from the *SETUPDIR* directory as follows:

   a. From the task bar select Start→Run.

   b. Enter the following command in the Open box:

      SETUPDIR_PATH\Setup.exe -s

Alternatively, you can locate the `Setup.exe` file by selecting Browse. Be sure to add the `-s` option after the `Setup.exe` filename. The `-s` option indicates there is a `setup.iss` file to be used during this installation.

Note: Installing the software using unattended installation takes the same amount of time as a standard installation. During unattended installation, no windows or prompts are displayed indicating the installation is in progress or has completed successfully. You can verify the successful completion of the installation process by confirming the existence of the `setup.log` file, as described in step 9.

Note: You cannot run `setup.exe -s` directly from the CD-ROM for the following two reasons. First, for `setup.exe -s` to execute properly, both the `setup.iss` and the `setup.exe` files must be located in the same directory. There is no `setup.iss` file in the directory in which the BEA Tuxedo or BEA Jolt `setup.exe` file resides on the CD-ROM. Second, the `setup.log` will not be created since you cannot write to the CD-ROM.

c. Click OK and go to step 9.

8. At the DOS command-line prompt, enter

   SETUPDIR_PATH\setup -s

   The `-s` option indicates there is a `setup.iss` file to be used during this installation.

   Note: Installing the software using unattended installation takes the same amount of time as a standard installation. During unattended installation, no windows or prompts are displayed indicating the installation is in progress or has completed successfully. You can verify the successful completion of the installation process by confirming the existence of the `setup.log` file, as described in the next step.

9. Verify that the installation completed successfully by viewing the `setup.log` file in the *SETUPDIR* directory. To do so:

   a. In a Windows Explorer window, double-click on the `setup.log` file in the *SETUPDIR* directory.

   b. Check the `ResultCode` in the last line of the file. If `ResultCode=0`, the installation was successful. Other possible result codes are listed in the following table.

This Code. . .	Indicates. . .
0	The installation completed successfully.
-3	Setup information (such as directory names) is missing or not defined in the setup.iss file. This situation occurs most often when the setup file being used is an edited template file; it is unlikely to occur if the setup file being used is one that was created during the standard installation process.
-4	There is insufficient memory to complete the installation process.
-5	The setup.iss file could not be found.
-12	The order of information in the setup.iss file differs from the sequence of the installation script.

Creating a New setup.iss File

To create a new setup.iss file, complete the following 7-step procedure.

1. Invoke the standard installation program through either of two methods. If you want to use Windows menus, go to step 2. If you want to use a DOS command, skip to step 3.

2. Invoke the standard installation program as follows:

   a. From the task bar select Start→Run.

   b. Enter the following in the Open box:

      SETUPDIR_PATH\Setup.exe -r

      where *SETUPDIR_PATH* is the directory to which you copied the BEA Tuxedo or BEA Jolt files in step 3 in the procedure provided in "Using the Unattended Installation Process" on page 3-30.

      Alternatively, you can locate the Setup.exe file by selecting Browse. Be sure to add the -r option after the Setup.exe filename.

Note: The -r (record) option is used to generate the setup.iss file.

   c. Click OK and go to step 4.

3. At the DOS command-line prompt, enter

   SETUPDIR_PATH\setup -r

4. The Setup screen is displayed, followed by the Welcome screen for the product
   you are installing. Step through the installation program by responding to each
   prompt. Detailed instructions for using the installation programs can be found in
   "Installing the BEA Tuxedo Release 7.1 Software on a Windows NT System" on
   page 3-4 and "Installing the BEA Jolt Software" on page 3-19.

Caution: The setup.iss file is a record of the choices you enter in response to the
           prompts from the installation program. To create a reliable setup.iss
           file, it is important that you correctly respond to each prompt. If, for
           example, you select the Back key to correct an entry or to verify your
           selections, you will create an extra entry in the setup.iss file. This extra
           entry is not valid for unattended installation. As a result, subsequent
           unattended installations using this setup.iss file will not complete
           successfully. Therefore, if you make a mistake or you accidentally hit the
           Back key when responding to the prompts, you must select Cancel, delete
           the setup.iss file, and restart the installation.

5. After you have completed the installation, find the setup.iss file in one of the
   following directories:

   ● C:\WINNT on a Windows NT system

   ● C:\WINDOWS on a Windows 9x system

6. Copy the setup.iss file to the directory in which the BEA Tuxedo or BEA Jolt
   Setup.exe file resides (*SETUPDIR*).

7. Go to step 7 in the procedure provided in "Using the Unattended Installation
   Process" on page 3-30.

Editing the setup.iss Template Files

BEA provides five `setup.iss` template files for unattended installation.

This Template . . .	Can Be Edited for Use While Installing the . . .
setup.iss_core_w_lic	BEA Tuxedo Core System with a license file
setup.iss_core_wo_lic	BEA Tuxedo Core System without a license file
setup.iss_ws	BEA Tuxedo Workstation Only
setup.iss_win9x	BEA Tuxedo Workstation on Windows 9*x* systems
setup.iss_jolt	BEA Jolt

To edit a template file, complete the following 4-step procedure.

1. Locate the setup.iss_*xxx* template files in the `templates` directory that you created on your hard drive.

   Note: The template files are provided on the BEA Tuxedo software CD. You copied the template files to your hard drive in step 3 in the procedure provided in "Using the Unattended Installation Process" on page 3-30.

2. Copy the appropriate setup.iss_*xxx* file to one of the following directories:

   - *SETUPDIR*\winnt (BEA Tuxedo system)

   - *SETUPDIR*\inwnt40 (BEA Jolt)

   Rename the copy as setup.iss.

   Note: The setup.iss file must be located in the same directory as the setup.exe file.

3. In the setup.iss file replace the strings shown in angle brackets with values appropriate for your installation. You can use any text editor to edit the files. The bracketed items you need to change in each template file are listed in the tables shown after step 4.

4. After you finish editing your setup.iss file, go to step 7 in the procedure provided in "Using the Unattended Installation Process" on page 3-30.

Table 3-1 Editing the setup.iss_core_w_lic File

Replace this bracketed value . . .	With . . .
szName=*<User Name>*	The name of the user to whom the product is registered. For example: szName=John Smith
szCompany=*<User's Company Name>*	The name of the company to which the product is registered.
szDir=*<Destination Directory for Tuxedo>*	The name of the directory in which the core BEA Tuxedo system will be installed. The use of white space in directory names is allowed but not recommended.
szPath=*<Destination Directory for Tuxedo>*\udataobj\webgui\	The path name of the directory in which the HTML files for the BEA Administration Console will be installed. This directory does not need to be the directory in which the BEA Tuxedo core system is installed. See "Selecting Directories for BEA Tuxedo System Files" on page 1-9 for details.
szPath=*<Destination Directory for Tuxedo>*\udataobj\webgui\java\	The path name of the directory in which the Java applets for the BEA Administration Console will be installed.
szPath=*<Destination Directory for Tuxedo>*\udataobj\webgui\cgi-bin\	The path name of the directory in which the CGI programs for the BEA Administration Console will be installed.
szEdit1=*<Tlisten Password>*	A tlisten password of your choice.
szPath=*<Directory of license File>*	The location of the BEA Tuxedo lic.txt file. For example: szPath=A:\ The setup program must be able to find the license file.

Table 3-2 Editing the setup.iss_core_wo_lic File

Replace this bracketed value . . .	With . . .
`szName=<User Name>`	The name of the user to whom the product is registered. For example: `szName=John Smith`
`szCompany=<User's Company Name>`	The name of the company to which the product is registered.
`szDir=<Destination Directory for Tuxedo>`	The name of the directory in which the core BEA Tuxedo system will be installed. The use of white space in directory names is allowed but not recommended.
`szPath=<Destination Directory for Tuxedo>\udataobj\webgui\`	The path name of the directory in which the HTML files for the BEA Administration Console will be installed. This directory does not need to be the directory in which the BEA Tuxedo core system is installed. See "Selecting Directories for BEA Tuxedo System Files" on page 1-9 for details.
`szPath=<Destination Directory for Tuxedo>\udataobj\webgui\java\`	The path name of the directory in which the Java applets for the BEA Administration Console will be installed.
`szPath=<Destination Directory for Tuxedo>\udataobj\webgui\cgi-bin\`	The path name of the directory in which the CGI programs for the BEA Administration Console will be installed.
`szEdit1=<Tlisten Password>`	A `tlisten` password of your choice.

Table 3-3 Editing the setup.iss_ws File

Replace this bracketed value . . .	With . . .
szName=*<User Name>*	The name of the user to whom the product is registered. For example: szName=John Smith
szCompany=*<User's Company Name>*	The name of the company to which the product is registered.
szDir=*<Destination Directory for Tuxedo>*	The name of the directory in which the BEA Tuxedo client will be installed. The use of white space in directory names is allowed but not recommended.

Table 3-4 Editing the setup.iss_win9x File

Replace this bracketed value . . .	With . . .
szName=*<User Name>*	The name of the user to whom the product is registered. For example: szName=John Smith
szCompany=*<User's Company Name>*	The name of the company to which the product is registered.
szDir=*<Destination Directory for Tuxedo>*	The name of the directory in which the BEA Tuxedo client will be installed. The use of white space in directory names is allowed but not recommended.

Table 3-5 Editing the setup.iss_jolt File

Replace this bracketed value. . .	With . . .
szDir=<*Destination Directory for Jolt*>	The name of the directory in which BEA Jolt will be installed. The use of white space in directory names is allowed but not recommended.
szPath=<*Destination Directory for Jolt*>	The path name of the directory in which the Jolt Server component will be installed. The use of white space in directory names is allowed but not recommended.
szPath=<*Destination Directory for Jolt*>\udataobj\jolt\relay	The path name of the directory in which the Jolt Relay Front-end components will be installed. The use of white space in directory names is allowed but not recommended.
szPath=<*Destination Directory for Jolt*>\bin	The path name of the directory in which the Jolt Relay Back-end components will be installed. The use of white space in directory names is allowed but not recommended.
szPath=<*Destination Directory for Jolt*>\udataobj\jolt	The path name of the directory in which the Jolt Client components will be installed. The use of white space in directory names is allowed but not recommended.
szText=<*Destination directory for Jolt*>\udataobj\jolt\relay\jrly.config	The full path name of the configuration file to be used if you are using Jolt Relay as a service.

Removing the BEA Tuxedo Software from Your System

To remove the BEA Tuxedo software from your system, complete the following 4-step procedure.

1. Log on to the system. If you are using a Microsoft Windows NT system, log on as the Administrator or as a member of the Administrator group.

2. Make sure that no BEA Tuxedo client or server applications are running. Use `tmshutdown` to shut down all BEA Tuxedo applications.

3. On the Microsoft Windows taskbar, click Start→Programs→BEA Tuxedo v7.1→Tuxedo UnInstall 7.1. The Confirm File Deletion screen is displayed.
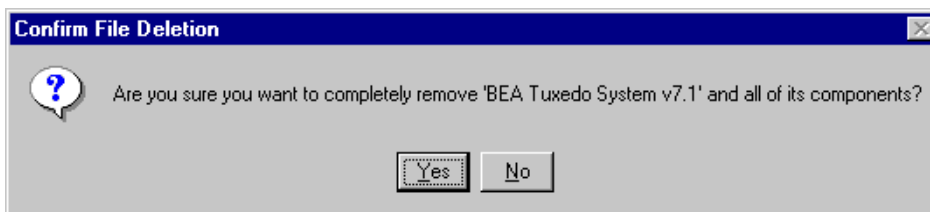
4. Click Yes to confirm the removal and uninstall the BEA Tuxedo software. The Remove Programs From Your Computer screen is displayed.
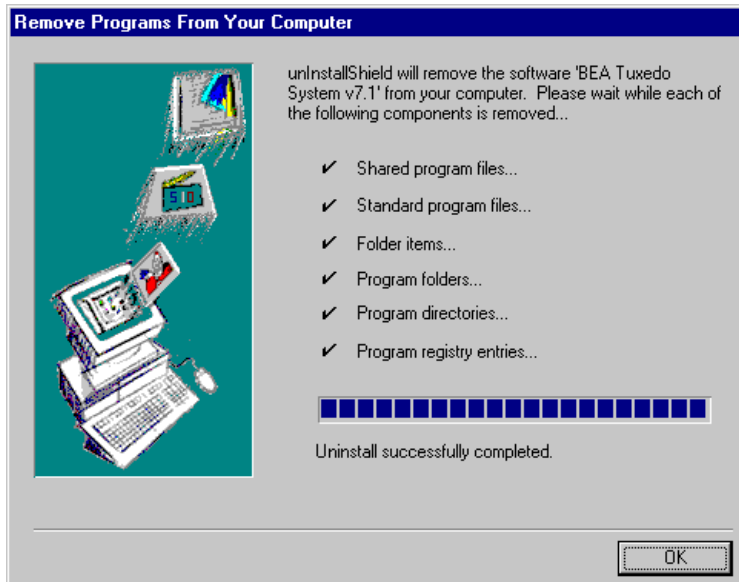
The BEA Tuxedo product is removed from your system and from the Windows Registry.

Removing BEA Jolt from Your System

To remove BEA Jolt from your system, complete the following 4-step procedure.

1. From your Control Panel, double click on the Add/Remove Programs icon.

   The Add/Remove Programs Properties screen is displayed.

2. From the list of programs shown, select BEA Jolt 1.2.1.

3. Select Add/Remove.

4. Select OK.

You have successfully removed BEA Jolt from your system.

4 Upgrading the BEA Tuxedo System to Release 7.1

- Selecting an Upgrade Procedure

- Performing a Simple Upgrade

- Selecting a Hot Upgrade Procedure

- Hot Upgrade from Release 4.x

- Hot Upgrade from Release 5.x, 6.1, or 6.2

- Hot Upgrade from Release 6.3, 6.4, or 6.5 to Release 7.1

- Upgrading BEA Jolt to Release 1.2.1

Selecting an Upgrade Procedure

If you are installing BEA Tuxedo Release 7.1 on a platform that contains an earlier release of the BEA Tuxedo system, be sure to follow these 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
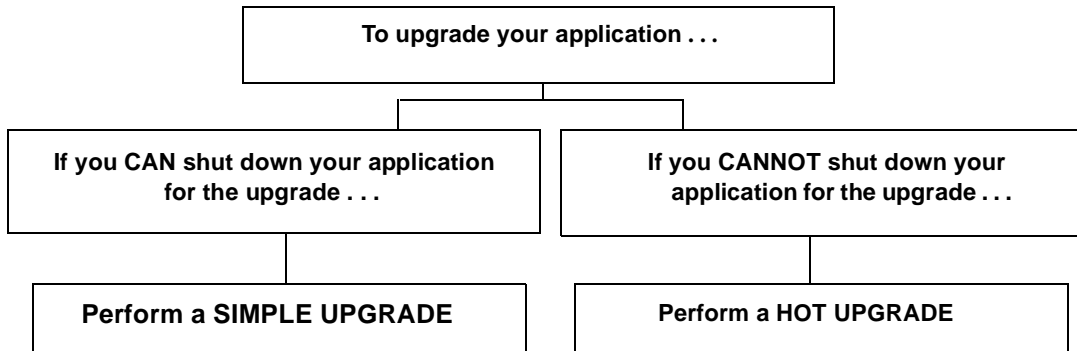
Performing a Simple Upgrade

1. Shut down the application.

2. Update the text version of the configuration file on the master machine by running the `tmunloadcf(1)` command.

3. Back up the old binary version of the configuration file.

4. Upgrade at least the master and backup machines with BEA Tuxedo Release 7.1.

   Note: For specific upgrade instructions for a Windows NT platform, see "Upgrading an Existing BEA Tuxedo System for Windows NT" on page 3-27.

5. Reload the text version of the configuration file by running `tmloadcf(1)` on the master machine.

6. If necessary, recompile and relink your application programs.

7. Reboot the application.

8. As time permits, shut down and upgrade the other machines in your configuration.

Selecting a Hot Upgrade Procedure
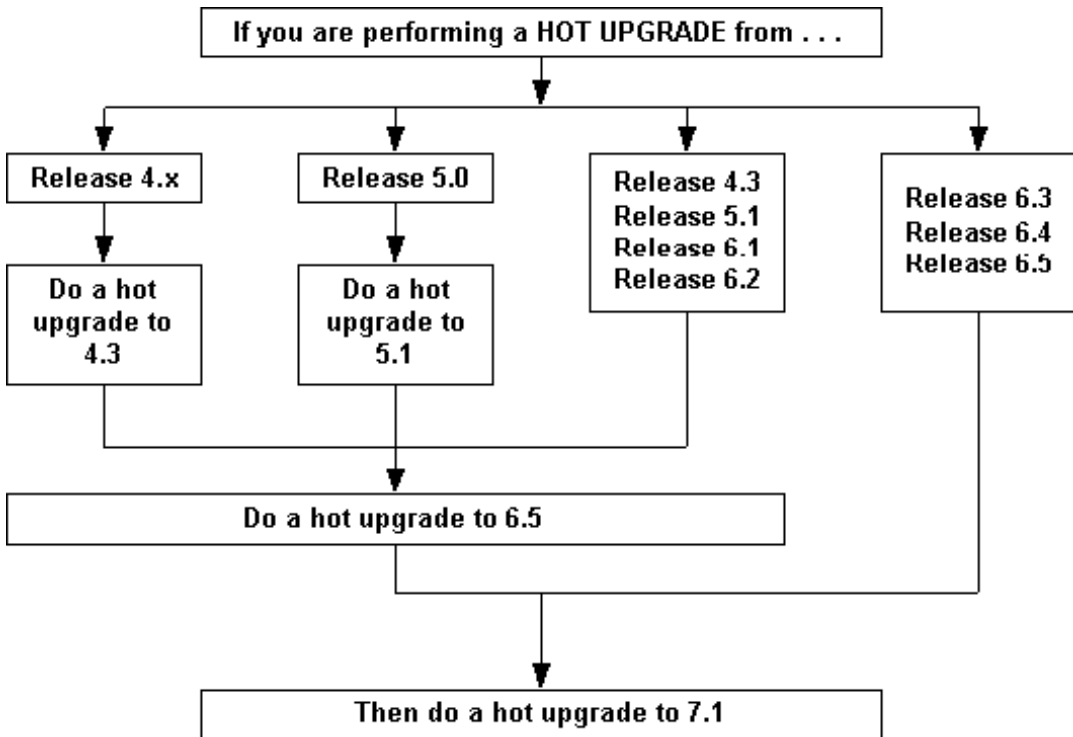
Releases 4.x is defined as Release 4.2.1 (or updates) or Release 4.2.2 (or updates)

Hot Upgrade from Release 4.x

This section is for customers running Release 4.2.1 (or updates) or 4.2.2 (or updates). Interoperation of Release 6.5 with Release 4.2 is not supported.

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

Step 1: Hot Upgrade from Release 4.2.x to Release 4.3

1. Make sure your environment is set up as follows:

   - The configuration must include a backup machine.

   - The MODEL option must be set to MP.

   - The MIGRATE option must be set.

2. Migrate the master to the backup machine.

3. Shut down the configured master.

4. Upgrade the configured master machine to Release 4.3.

5. Relink all application servers and clients.

6. Reboot the configured master.

7. Once the configured master is up, migrate the master control.

Now you have a configuration with the master running Release 4.3.

Step 2: Hot Upgrade from Release 4.3 to Release 6.5

Preliminary Notes

Once you have finished migrating the master to Release 6.5 (via a hot upgrade), you will not be able to migrate it back to the acting backup until you have upgraded the backup to Release 6.5. (In other words, migrating the master is an irreversible procedure; once you've completed it, you cannot change the master back to the release of the BEA Tuxedo system it was running previously.)

Dynamic reconfiguration (which is available during upgrades from Release 5) is not available when you are running a Release 6.5 master and one or more Release 4.3 nodes. The lack of dynamic reconfiguration means:

■ Administrative activities will be restricted until the full application has been upgraded.

■ The values of TUXDIR and APPDIR cannot be changed during a hot upgrade. Therefore you must move the files in the directory defined by the ROOTDIR environment variable to a new location, and install the corresponding files for the new release in that directory. In Release 6.5, the path name for this directory is set with the TUXDIR variable. Similarly, you must move the files in the directory defined by APPDIR to a new location and install the corresponding Release 6.5 files in that directory.

On a UNIX platform, you may simplify these tasks by using symbolic links. For example, you might use the path name /usr/tuxedo as a symbolic link that points to /usr/tuxedo43 and later /usr/tuxedo65.

When you run tmadmin(1) on a Release 6.5 machine with a Release 4.3 master, the UPGRADE and UPGRADE42 files (as shown in "Example" on page 4-6) must reside in the current directory. To make sure that the files are in the current directory, you might, for example, run tmadmin(1) from APPDIR.

To minimize down time, we recommend installing Release 6.5 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 Release 4.3 clients and servers were created. (In other words, both a Release 4.3 application and a Release 6.5 application should be available on each machine.) *This is not a requirement, but a recommendation.*

Procedure

1. Make sure your environment is set up to comply with the following requirements:

   - The configuration must include a backup machine.

   - The MODEL option must be set to MP.

   - The MIGRATE option must be set.

   - MAXGROUPS must be set to 100 and the value of MAXSERVERS must match that of MAXQUEUES in the configuration.

2. Shut down the backup machine.

3. Reboot the backup machine, using Release 6.5.

4. Migrate the master running Release 4.3 to the backup running Release 6.5.

5. Shut down the machine that is now acting as the backup.

6. Using Release 6.5, reboot the machine that you shut down in Step 5.

Example

Suppose you have the following on a UNIX platform:

- A machine called MACH1 that is initially configured as the master and that runs Release 4.3

  - 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

      MACH2> Kill tlisten process

      MACH2> Load System 6.5 if it is not already loaded
```

```
      MACH2> ROOTDIR/APPDIR2 must be the same as the 4.3 directories

      MACH2> cd $APPDIR2

      MACH2> rm $TUXCONFIG2

      MACH2> >UPGRADE     # Indicator that upgrade being done

      MACH2> >UPGRADE42  # Indicator that upgrade done from 4.3

      MACH2> Reset PATH, LD_LIBRARY_PATH, TUXCONFIG, APPDIR

      MACH2> Rebuild clients and servers, create TLOG

      MACH2> Start System 6.5 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

MACH1> Kill tlisten process

MACH1> Load System 6.5 if it is not already loaded

MACH1> ROOTDIR/APPDIR1 must be the same as the 4.3 directories

MACH1> cd $APPDIR1

MACH1> rm $TUXCONFIG1

MACH1> Reset PATH, LD_LIBRARY_PATH, TUXCONFIG, APPDIR

MACH1> Rebuild clients and servers, create TLOG

MACH1> Start System 6.5 tlisten
```

```
MACH1> rm UPGRADE  # Remove indicator that upgrade being done

    MACH2> rm UPGRADE  # Remove indicator that upgrade being done

    MACH2> rm UPGRADE42 # Remove indicator that upgrade being done

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

Hot Upgrade from Release 5.x, 6.1, or 6.2

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

Step 1: Hot Upgrade from Release 5.0 to Release 5.1

1. Make sure your environment is set up as follows:

   - The configuration must include a backup machine.

   - The MODEL option must be set to MP.

   - The MIGRATE option must be set.

2. Migrate the master to the backup machine.

3. Shut down the configured master.

4. Upgrade the configured master machine to Release 5.1.

5. If you are using an SCO platform, you must recompile and relink application servers and clients. (Shared objects are not used on SCO platforms.)

   Note: This step is not necessary on any platforms other than SCO.

6. Reboot the configured master.

7. Once the configured master is up, migrate the master control.

Now you have a configuration with the master running Release 5.1.

Step 2: Hot Upgrade from Release 5.1, 6.1, or 6.2 to Release 6.5

Preliminary Notes

This section is for customers running Release 5.1, 6.1, or 6.2.

Once you have finished migrating the master to Release 6.5 (via a hot upgrade), you will not be able to migrate it back to the acting backup until you have upgraded the backup to Release 6.5. 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 system on which it was running previously.

When you are running tmadmin(1) on a Release 6.5 machine with a Release 5.1, 6.1, or 6.2 master, the UPGRADE file (as shown in "Example" on page 4-10) must reside in the current directory. To make sure that the files are in the current directory, 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 down time, we recommend installing Release 6.5 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 Release 5.1, 6.1 or 6.2 clients and servers were created. (In other words, both a Release 5.1, 6.1 or 6.2 application and a Release 6.5 application should be available on each machine.) *This is not a requirement, but a recommendation.*

When migrating from Release 6.1 or 6.2, you must rebuild your clients and servers. Additionally, you must always rebuild if you are running a BEA Tuxedo application on an HP platform. 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. The HP-UX shared library loader must be turned on. (This procedure is not necessary on any other platform supported by the BEA Tuxedo system.) As a result, once you have upgraded from Release 6.1 or 6.2 to Release 6.5, your application programs will not be able to find the Release 6.5 BEA Tuxedo libraries. These 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.

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. Shut down the backup machine.

3. Reboot the backup machine, using Release 6.5.

4. Migrate the master running Release 5.1, 6.1 or 6.2 to the backup running Release 6.5.

5. Shut down the machine that is now acting as the backup.

6. Using Release 6.5, reboot the machine that you shut down in Step 5.

Example

Suppose you have the following on a UNIX platform:

- A machine called MACH1 that is configured as the master and that runs Release 5.1, 6.1 or 6.2

  - 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 files 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 6.5 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 6.5 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 6.5 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 6.5 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
```

Hot Upgrade from Release 6.3, 6.4, or 6.5 to Release 7.1

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

Preliminary Notes

This section is for customers running Release 6.3, 6.4, or 6.5.

Once you have finished migrating the master to Release 7.1 (via a hot upgrade), you will not be able to migrate it back to the acting backup until you have upgraded the backup to Release 7.1. 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 system on which it was running previously.

When you run tmadmin(1) on a Release 7.1 machine with a Release 6.3, 6.4, or 6.5 master, the UPGRADE file (as shown in "Example" on page 4-14) 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 down time, we recommend installing Release 7.1 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 Release 6.3, 6.4, or 6.5 clients and servers were created. (In other words, both a Release 6.3, 6.4, or 6.5 application and a Release 7.1 application should be available on each machine.) *This is not a requirement, but a recommendation.*

When migrating from Release 6.3, 6.4, or 6.5, you must rebuild your clients and servers. Additionally, you must always rebuild if you are running a BEA Tuxedo application on an HP platform. 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. The HP-UX shared library loader must be turned on. (This procedure is not necessary on any other platform supported by the BEA Tuxedo system.) As a result, once you have upgraded from Release 6.3, 6.4, or 6.5 to Release7.1, your application programs will not be able to find the Release 7.1 BEA Tuxedo libraries. These 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 and buildclient 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.

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. Shut down the backup machine.

3. Reboot the backup machine, using Release 7.1.

4. Migrate the master running Release 6.3, 6.4 or 6.5 to the backup running Release 7.1.

5. Shut down the machine that is now acting as the backup.

6. Using Release 7.1, reboot the machine that you shut down in Step 5.

Example

Suppose you have the following on a UNIX platform:

- A machine called MACH1 that is configured as the master and that runs Release 6.3, 6.4 or 6.5

  - 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 7.1 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 7.1 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 7.1 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 7.1 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 NT platform, be sure to stop the BEA Tuxedo IPC Helper Service after killing the `tlisten` process and to start the BEA Tuxedo IPC Helper Service before starting the `tlisten` process.

Upgrading BEA Jolt to Release 1.2.1

Only Release 1.2.1 of BEA Jolt interoperates with BEA Tuxedo Release 7.1; BEA Jolt Release 1.2 does not. Therefore, if you are planning to run BEA Jolt with BEA Tuxedo Release 7.1, you must have Release 1.2.1 installed.

You cannot upgrade directly from an earlier release of BEA Jolt to Release 1.2.1. If you have an earlier release installed, you must un-install it and then install Release 1.2.1. See "Preparing to Install BEA Jolt" on page 1-20 for details.

5   Starting the BEA Administration Console

- BEA Administration Console Requirements

- Setting Up Your Environment for the BEA Administration Console

- Starting the BEA Administration Console

- Exiting the BEA Administration Console

BEA Administration Console Requirements

This section lists the hardware, operating system resources, server platform, and browser you must provide to support the BEA Administration Console.

Hardware Requirements

To run the BEA 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 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 IPC parameters and other system tunables, see "Configuring the UNIX Operating System for the BEA Tuxedo System" on page 1-12.

BEA Administration Console Server Requirements

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

■ Compaq Tru64 UNIX v4.0f on Alpha

■ HP-UX 11.0 on HP PA-RISC

■ IBM AIX 4.3.2 on IBM PowerPC

■ Microsoft Windows NT v4.0 on Intel

■ NCR MP-RAS v3.02 on Intel IA32(x86)

■ Red Hat Linux 6.1 on Intel IA32 (x86)

■ Sun Solaris 7 on SPARC

BEA Administration Console Browser Requirements

If used with no encryption (0-bit encryption), the BEA Administration Console is supported on any browser that supports Java 1.1.

If used with encryption, the BEA Administration Console requires Java Plug-In 1.1 or higher to be able to run in the browser.

The encryption level for the BEA 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 Administration Console server. The ENCRYPTBITS parameter can be set to 0, 40, 56, or 128. The default value is 128.

The following table lists the browsers and platforms supported when the BEA Administration Console is configured for 40-bit, 56-bit, or 128-bit encryption.

This Platform . . .	Supports These Browsers . . .	And Requires the following Java Plug-In . . .
Microsoft Windows NT 4.0 on Intel	■ Microsoft Internet Explorer 5.0 ■ Netscape Navigator 4.7	1.1 or higher
Microsoft Windows 98 on Intel	■ Microsoft Internet Explorer 5.0 ■ Netscape Navigator 4.7	1.1 or higher
Sun Solaris 7 on SPARC	Netscape Navigator 4.7	1.1 or higher

Setting Up Your Environment for the BEA Administration Console

To run the BEA Administration Console, you need to set up 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 Administration Console. It must be run on the master machine in a multi-machine configuration.

Starting tuxwsvr

To start tuxwsvr on this platform . . .	Enter the following command . . .
UNIX system	`tuxwsvr -l //machine:port -i $TUXDIR/udataobj/tuxwsvr.ini`
Windows NT system (at an MS-DOS prompt)	`tuxwsvr -l //machine:port -i %TUXDIR%\udataobj\tuxwsvr.ini`

The BEA Tuxedo installation procedure 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, you may decide to move your Java files to a non-default directory. In that case, you would need to edit the path names in the initialization file appropriately. For details, see the `tuxwsvr(1)` reference page in the *BEA Tuxedo Command Reference*.

Starting wlisten

To start `wlisten`, complete the following procedure.

1. Check the `webgui.ini` file (located in `%TUXDIR%\udataobj\webgui` on Windows NT and in `$TUXDIR/udataobj/webgui` on UNIX systems) 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 Administration Console

To start the BEA Administration Console, complete the following 4-step procedure.

1. Start the browser.

2. Enter the following URL:

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

   Use of this URL depends on the following assumptions:

   - You are using `tuxwsvr` with the `tuxwsvr.ini` file.

   - The `webgui.ini` file is in the default location,
     `$TUXDIR/udataobj/webgui` on UNIX systems and
     `%TUXDIR%\udataobj\webgui` on Windows NT systems.

   Note: If you are using a commercial browser on the default port (8080), you can use a URL such as the following.

   `http://ctomsn:8080/webguitop.html`

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

3. To start the BEA Administration Console, select the Click Here to Run the BEA 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 in one of the following directories:

   - `$TUXDIR/udataobj` (on UNIX systems)

   - `%TUXDIR%\udataobj` (on Windows NT systems)

   The main window of the BEA Administration Console is displayed.

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

Table 5-1 Accessing Information About the BEA Administration Console Main Window

If. . .	Then. . .
The main window is displayed and you want to start working with the GUI	See the "Administration Console Tutorial" in the BEA Administration Console online help.
The main window is displayed and you want to read a description of it	See Chapter 2, "A Tour of the Main Window," in the BEA 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. $ wlisten -i $TUXDIR/udataobj/webgui/webgui.ini
	4. Check that the tuxwsvr process is running at the port specified in the URL.
	5. Verify the password. It must match one of the entries in the tlisten.pw file in the following directories:
	■ $TUXDIR/udataobj directory (on UNIX systems)
	■ %TUXDIR%\udataobj (on Windows NT systems)
	6. Return to step 1.

Exiting the BEA Administration Console

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

6 Post-Installation Considerations

- Setting Up Your Environment on a UNIX System

- Post-Installation Considerations for a Windows System

- Editing a UBBCONFIG File

- Using the TYPE Parameter in UBBCONFIG

- Verifying IPC Requirements on a UNIX System

- Creating the Universal Device List and TLOG on a UNIX System

- Starting the tlisten Process on a UNIX System

- Rebuilding an Application

Setting Up Your Environment on a UNIX System

Before you can invoke BEA Tuxedo system commands, you need to set several environment variables. This section describes the environment variables that you must set and export on a UNIX system.

Note: If you are using a Windows NT platform, see "Modifying Environment Variables" on page 2-5 in *Using the BEA Tuxedo System on Windows NT*.

The following list provides descriptions and sample settings of the four environment variables required on a UNIX platform. It is assumed that the Bourne shell is being used. A Bourne shell script called `tux.env`, located in the base directory you specified at installation time, serves as a model for setting these variables.

■ `TUXDIR` contains the full path name of the directory in which you installed the BEA Tuxedo system software. For example, if you installed the BEA Tuxedo system in `/var/opt/tuxedo`, you should set `TUXDIR` as follows.

```
TUXDIR=/var/opt/tuxedo; export TUXDIR
```

■ `PATH` is the search path for commands. You should include `$TUXDIR/bin` in your path. For example:

```
PATH=$PATH:$TUXDIR/bin; export PATH
```

■ `LD_LIBRARY_PATH` (on Solaris, Tru64 UNIX, MP-RAS, and Linux), `SHLIB_PATH` (on HP-UX), and `LIBPATH` (on AIX) name the search path for dynamic shared libraries. These environment variables are needed only on platforms that support dynamic shared libraries. You should append `$TUXDIR/lib` to your existing library path. For example, on Solaris, Tru64 UNIX, MP-RAS and Linux, execute the following.

```
LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$TUXDIR/lib; export LD_LIBRARY_PATH
```

■ `TUXCONFIG` contains the full path name of the binary configuration file for a BEA Tuxedo application. Several BEA Tuxedo commands do not run properly unless `TUXCONFIG` is set appropriately. For example, if your application's binary configuration file is located in `/var/opt/tuxapp1/tuxconfig`, you should set and export `TUXCONFIG` as follows.

```
TUXCONFIG=/var/opt/tuxapp1/tuxconfig; export TUXCONFIG
```

Post-Installation Considerations for a Windows System

Once you have installed or upgraded the BEA Tuxedo system software on a Windows system, you can:

■ Verify the system environment variables

- Review the registry contents

- Optionally, use the security key in the registry to restrict user access

For configuration information, refer to "Configuring the BEA Tuxedo System for Windows NT" on page 2-1 in *Using the BEA Tuxedo System on Windows NT*.

Verifying the System Environment Variables

The BEA Tuxedo Software Installation script updates the system environment during the installation of BEA Tuxedo Release 7.1 on Windows NT. For example, the PATH environment variable is updated to point to the appropriate system libraries.

When an application is loaded, the link loader checks the local directory, followed by the system PATH, user PATH, and finally the path set in autoexec.bat (if applicable). Because different versions of a DLL can exist in a system, it is critical to verify that the correct DLL version is loaded.

Note: As an application is loaded, it first attaches to the library in memory. Consequently, if a library is loaded in memory when an application is invoked (which happens, for example, if any BEA Tuxedo processes are running when an application is invoked), then the library may initially attempt to load the incorrect DLL version. To prevent such an attempt, shut down all BEA Tuxedo processes before installing Release 7.1. (Refer to *Microsoft's© Resource Kit for Windows NT* for additional information.)

You can verify that your environment variables are set appropriately by ensuring that the first BEA Tuxedo system-related path name in your system path is the path name for the root directory of the BEA Tuxedo software: %TUXDIR%. To verify that %TUXDIR% is the first path name specified, complete the following 4-step procedure.

1. Select Start→Control Panel→System→Environment.

2. Scroll through system variables to ensure that the first instance of TUXDIR points to BEA Tuxedo Release 7.1.

3. Set Variable and Value as necessary and click OK.

4. Restart the computer.

Reviewing the Registry Contents

As part of the installation process, the BEA Tuxedo IPC Helper Service is installed as an NT Service. General installation information as well as the IPC parameters are installed in the registry. The layout of the registry is as follows.

HKEY_LOCAL_MACHINE\Software\BEA Systems\Tuxedo\7.1\...

- Developer

- Environment

- Security

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

The Environment key stores values for the BEA Tuxedo IPC Helper Service, as well as the locations referenced by the TUXDIR, NLSPATH, ULOGDIR, ULOGPFX, and ULOGOUT environment variables. You can tune the IPC values based on your application needs. (Refer to "Configuring the BEA Tuxedo System for Windows NT" on page 2-1 in *Using the BEA Tuxedo System on Windows NT* for more information on the control panel applet.)

The Security key has the following requirements:

- Any user who runs tlisten(1) must have read access permissions.

- The account under which the BEA Tuxedo IPC Helper is running must have read access permissions.

- We recommend that the Administrator have full control permissions.

Using the Registry Security Key to Restrict Access

To gain access to BEA Tuxedo functionality, native clients should call tpinit(3c) with *cltname* set to tpsysadm. However, because tpsysadm is a trusted user, this setting causes the system to bypass the process of APP_PW/USER_AUTH authentication.

To prevent this lapse in security, we encourage the administrator to perform the following steps:

1. Select Start→Run and enter the following command in the Run dialog box.

    `regedt32`

2. Select the OK button.

3. Select HKEY_LOCAL_MACHINE→Software→BEA Systems→Tuxedo→7.1.

4. Select SECURITY→Permissions.

5. Disable control for `Everyone` and allow access only to users with administrative privileges.

See Also

■   "Configuring the BEA Tuxedo System for Windows NT" on page 2-1 in *Using the BEA Tuxedo System on Windows NT*

Editing a UBBCONFIG File

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(5)`, 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 configuration file for a rudimentary sample application called `simpapp`, that is delivered with the BEA Tuxedo System. On UNIX platforms, this application is found in `$TUXDIR/samples/atmi/simpapp`; on Windows platforms, it is found in `%TUXDIR%\samples\atmi\simpapp`.

The following sample listing shows `ubbsimple` as delivered on a UNIX platform.

Listing 6-1 `ubbsimple` **Configuration File**

```
#ident "@(#)apps:simpapp/ubbsimple    $Revision: 1.1 $

#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>"
#Example:
#               APPDIR="/home/me/simpapp"
#               TUXCONFIG="/home/me/simpapp/tuxconfig"
#               TUXDIR="/usr/tuxedo"
<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 where 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 UNIX system, run the uname -n command. If you are using a Windows NT platform and you do not know the node name of your machine, see your system administrator.
APPDIR = *string*	A list of one or more directories in which application and administrative servers will be booted. The value of *string* is the absolute path name of one directory, optionally followed by a colon-separated list of path names for other directories on the machine being defined.
TUXCONFIG = *string*	The binary version of UBBCONFIG(5) (the text-format configuration file). TUXCONFIG is produced by running the tmloadcf(1) command on UBBCONFIG. The value of *string* is the absolute path name of the TUXCONFIG file.
TUXDIR = *string*	The base directory of the BEA Tuxedo system software. It must be an absolute path name.

If you need to look up other parameters when editing your configuration file, see the UBBCONFIG(5) reference page in the *BEA Tuxedo File Formats and Data Descriptions Reference*.

Note: You must edit the configuration file before running tmloadcf(1) to verify the IPC requirements (see "Verifying IPC Requirements on a UNIX System" on page 6-8). If you run tmloadcf without first editing the configuration 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/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/decode routines.

Verifying IPC Requirements on a UNIX System

The BEA Tuxedo system uses UNIX Interprocess Communications (IPC) resources heavily. On many UNIX system platforms, 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 configuration file, your next step should be to determine whether you have enough IPC resources for your application.

To do this, enter the tmloadcf(1) command, specifying your edited configuration file as input.

```
tmloadcf -c UBBCONFIG
```

An example of the output is shown in the following listing, which is based on the values in ubbsimple.

Listing 6-2   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.
```

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

Of course, the IPC values are application dependent, and the numbers in this example
reflect a very small configuration. If other 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 node 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 determining and changing the current
IPC values for your platform, see the data sheet for your platform in Appendix A,
"Platform Data Sheets."

Note: If you need to tune IPC resources on a Windows NT system, see "Maximizing
System Performance" on page 2-10 in *Using the BEA Tuxedo System on
Windows NT*.

See Also

- "Configuring the UNIX Operating System for the BEA Tuxedo System" on page 1-12

Creating the Universal Device List and TLOG on a UNIX System

The Universal Device List (UDL) serves as a map of the BEA Tuxedo file system that is loaded into shared memory when the application is booted. The TLOG is a file in which information about a transaction is kept until the transaction is completed.

Creating the UDL

To create the UDL, execute the following command before booting the application.

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

Here `-z config` specifies the full path name for the device on which the UDL should be created and `-b` 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.

Creating the TLOG

Several parameters in the MACHINES section of the UBBCONFIG file allow you to define a global transaction log (TLOG). The BEA Tuxedo system administrator must manually create a device list entry for the TLOGDEVICE on each machine on which a TLOG is needed. These entries can be created either before or after TUXCONFIG has been loaded, but they must be created before the system is booted.

To create an entry in the UDL for the `TLOG` device, create the UDL as described above on each node that will be involved with global transactions. If the `TLOGDEVICE` is mirrored between two machines, it is not necessary to perform this step on the paired machine. The BBL initializes and opens the `TLOG` during the boot process.

Starting the tlisten Process on a UNIX System

When used in a distributed environment, the BEA Tuxedo system must be able to start, shut down, and administer processes on remote nodes running BEA Tuxedo system servers. The `tlisten(1)` process provides this capability. Once `tlisten` is running, `tmboot(1)`, for example, can start BEA Tuxedo system servers on remote nodes.

Note: For details on starting the Listener process on Windows NT systems, see "Configuring tlisten Processes to Start Automatically" on page 2-9 in *Using the BEA Tuxedo System on Windows NT*.

`tlisten` is a generic listener process that operates with either of two network interfaces: Sockets or TLI. It runs as a daemon process. `tlisten` can be started by the:

- UNIX system administrator, as part of a UNIX initialization (boot) script

- BEA Tuxedo system administrator, as a `cron` job

- BEA Tuxedo system administrator starting `tlisten` manually from the command line

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

```
TUXDIR=tuxdir; export TUXDIR
LD_LIBRARY_PATH=libpath:$LD_LIBRARY_PATH; export LD_LIBRARY_PATH
$TUXDIR/bin/tlisten [-d devname] -l nlsaddr [-u appuid]
```

Note: If your system uses an environment variable other than `LD_LIBRARY_PATH` for the shared library path, specify that variable, instead.

The -l option is required. The argument to -l should match the value of the NLSADDR parameter in the NETWORK section of the configuration file. For information on determining the value of NLSADDR, refer to the following documentation:

- UBBCONFIG(5) reference page in *BEA Tuxedo File Formats and Data Descriptions Reference*

- tlisten(1) reference page in *BEA Tuxedo Command Reference*

- "How to Create the NETWORK Section of the Configuration File" on page 3-51 in *Setting Up a BEA Tuxedo Application*

Use the -u *appuid* option when the command is part of an installation script run by root. The value of *appuid* is the UID or login name of the BEA Tuxedo system administrator; the numeric version is the same as the value of the UID parameter in the RESOURCES section of the configuration file. This means that even though the tlisten process is started by root, it runs with the effective UID of the owner of the BEA Tuxedo system installation. If tlisten is started by the BEA Tuxedo system administrator, either manually or as a cron job, the -u option is unnecessary, since the job is already owned by the right account.

Rebuilding an Application

Now that you have successfully installed the BEA Tuxedo system, you need to rebuild all application clients and servers that you want to execute on a system upgraded to Release 7.1. 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 system 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 Release 7.1, Release 6.1 or later may still be used on other nodes.

There is one important exception to the "highest release" rule. If you wish to install Release 7.1 only on workstation clients, and you do not want to upgrade any of your BEA Tuxedo system server nodes to Release 7.1, you may do so. In other words, with any release level beginning with 6.1, workstation clients may be intermixed freely in a configuration in which the master is running Release 6.1 or later.

Note: Workstation clients running BEA Tuxedo Release 4.2.2 or higher can interoperate with BEA Tuxedo servers running Release 6.1 or higher.

Threaded Access to Libraries

Before designing applications that use multithreading, verify that the BEA Tuxedo system supports threads on the platform you are using. If threads are not supported, your application must:

- Not use threads, or

- Serialize threaded access through all BEA Tuxedo system calls

The following table specifies which platforms support threads.

This Platform. . .	Supports Threads. . .
Compaq Tru64 UNIX v4.0f on Alpha	Yes
HP-UX 11.0 on HP PA-RISC	Yes
IBM AIX v4.3.2 on IBM PowerPC	Yes
Microsoft Windows NT v4.0 on Intel	Yes
Microsoft Windows 95 and 98 on Intel	Yes
NCR MP-RAS v3.02 on Intel IA32(x86)	No
Red Hat Linux v6.1	Yes
Sun Solaris 7 on SPARC	Yes

A   Platform Data Sheets

- Summary of Supported Platforms

- Compaq Tru64 UNIX v4.0f on Alpha

- HP UX - v11.0 on HP PA-RISC

- IBM - AIX v4.3.2 on IBM PowerPC

- Microsoft Windows NT v4.0 on Intel

- Microsoft Windows 98 on Intel

- Microsoft Windows 95 on Intel

- NCR - MP-RAS v3.02 on Intel IA32 (x86)

- Red Hat Linux 6.1 on Intel IA32 (x86)

- Sun Solaris 7 on SPARC

Summary of Supported Platforms

The following table indicates those platforms on which the BEA Tuxedo system is supported for Release 7.1. Platforms new in Release 7.1 are represented in *italic*. Data sheets are provided for each platform and include the following platform-specific information:

- A list of available BEA Tuxedo packages

- Hardware, software, and disk space requirements

- Tunable parameters and platform-specific notes (if applicable)

A   *Platform Data Sheets*

Vendor	Operating System	Release/Version	BEA Tuxedo Release
Compaq	Tru64 UNIX	*4.0f (Alpha)*	*New for Release 7.1*
HP	HP-UX	11.0	Continues to be supported in Release 7.1
IBM	AIX	*4.3.2 (PowerPC)*	*New for Release 7.1*
Microsoft	Windows NT	4.0 (Intel)	Continues to be supported for Release 7.1
	Windows 98	98	Client only: Continues to be supported for Release 7.1
	Windows 95	95	Client only: Continues to be supported for Release 7.1
NCR	MP-RAS	3.02	Continues to be supported for Release 7.1
Red Hat	Linux	6.1	Continues to be supported for Release 7.1
Sun	Solaris	7 (SPARC)	Continues to be supported for Release 7.1

Compaq Tru64 UNIX v4.0f on Alpha

Available BEA Tuxedo Release 7.1 Packages

- BEA Tuxedo Core System

- BEA Tuxedo System Workstation

- BEA Jolt

Note: The BEA Tuxedo Release 7.1 Online Documentation is provided on a separate CD-ROM.

Hardware Requirements

- Compaq Alpha platform

- 256 MB of RAM

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

Software Requirements

- Compaq Tru64 UNIX 4.0f (supports threads)

- Compaq ANSI C Compiler (BEA Tuxedo development environment only)

- MicroFocus COBOL version 4.1 (BEA Tuxedo development environment only)

Notes: For BEA Tuxedo Administration Console hardware and software requirements, see "BEA Administration Console Requirements" on page 5-1.

For BEA Jolt hardware and software requirements, refer to Appendix B, "BEA Jolt 1.2.1 System Requirements."

Network

- TCP/IP, using the Sockets network interface

Disk Space Requirements

Package	Disk Space Required
BEA Tuxedo software (client and server)	50000 blocks*
BEA Tuxedo Workstation only	9800 blocks*

* One block is equal to 512 bytes

Note: Disk space requirements for the BEA Jolt Server are provided in "Supported Platforms for BEA Jolt Server and BEA Jolt Relay" on page B-2. Disk space requirements for the BEA Jolt Client are provided in "BEA Jolt Client Requirements" on page B-4.

Mounting the CD

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
```

where *unit#* is the unit number of your CD-ROM drive.

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

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

The output will identify the CD-ROM drive as an RRD disk. The unit number of the drive will be in the left-hand column. For example,

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

Tunable Parameters

You will probably need to reconfigure the kernel before running BEA Tuxedo because the default values of some kernel parameters are too low. For instructions about reconfiguring, rebuilding, and rebooting, see the following documentation from Compaq: the doconfig(8) reference page and the *System Tuning and Performance Management* manual. The following parameters may need to be increased.

Tru64 UNIX Name	Traditional Name	Defaults
shmmax	SHMMAX	4194304
shmseg	SHMSEG	32
shmmni	SHMMNI	100
semmns	SEMMNS	60
semmni	SEMMNI	10
semmsl	SEMMSL	25
semume	SEMUME	10
semopm		10
semvmx		32767
semaem		16384

Tru64 UNIX Name	Traditional Name	Defaults
msgmni	MSGMNI	50
msgmax	MSGMAX	8192
msgmnb	MSGMNB	16384
msgtql	MSGTQL	40
maxusers	maxusers	varies
maxproc	NPROC	20+8*maxusers
maxuprc	MAXUP	64

To determine the current value of a tunable parameter, examine the kernel configuration file located in the /sys/conf directory. This file typically has the same name as the system (node) name.

To change the value of a tunable parameter, follow the instructions on the DMCONFIG(5) reference page in *BEA Tuxedo File Formats and Data Descriptions Reference*.

To specify the value of a parameter that was previously unspecified, add a line such as

semmni 256

(where semmni is the name of the parameter and 256 is its value) to the kernel configuration file.

Platform-Specific Notes

On this platform the default thread stack size defined by the operating system is insufficient to support a multithreaded BEA Tuxedo application. When you create your own threads you must increase the thread stack size; if you do not, your program will core dump. Because the operating system default thread stack size is insufficient on this platform, when the BEA Tuxedo system creates threads it uses a default size of 1,024,000 bytes. When you create threads in your programs you must specify a

sufficient thread stack size. We recommend a minimum size of 128,000 bytes. For more information, see "Insufficient Thread Stack Size" on page 10-62 in *Programming a BEA Tuxedo Application Using C*.

HP UX - v11.0 on HP PA-RISC

Available BEA Tuxedo Release 7.1 Packages

- BEA Tuxedo Core System

- BEA Tuxedo System Workstation

- BEA Jolt

Notes: On all UNIX platforms where it is available, Netscape 4.7 is the supported host for the Administration Console applet. However, Netscape currently does not officially support a browser for HP-UX 11.0. Therefore, the client-side components of the Administration Console are not supported on HP-UX.

The BEA Tuxedo Release 7.1 Online Documentation is provided on a separate CD-ROM.

Hardware Requirements

- HP PA-RISC

- 256 MB of RAM

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

Software Requirements

- HP-UX Release 11.0 (supports threads)

- HP-UX ANSI C Compiler (BEA Tuxedo development environment only)

- MicroFocus COBOL 4.1 (certified for 10.X) (BEA Tuxedo development environment only)

Notes: For BEA Tuxedo Administration Console hardware and software requirements, see "BEA Administration Console Requirements" on page 5-1.

For BEA Jolt hardware and software requirements, refer to Appendix B, "BEA Jolt 1.2.1 System Requirements."

Network

■ TCP/IP, using the Sockets network interface

Disk Space Requirements

Package	Disk Space Required
BEA Tuxedo software (client and server)	63500 blocks*
BEA Tuxedo Workstation only	13500 blocks*

* One block is equal to 512 bytes

Note: Disk space requirements for the BEA Jolt Server are provided in "Supported Platforms for BEA Jolt Server and BEA Jolt Relay" on page B-2. Disk space requirements for the BEA Jolt Client are provided in "BEA Jolt Client Requirements" on page B-4.

Tunable Parameters

You will probably need to reconfigure the HP-UX kernel before running BEA Tuxedo because the defaults of some kernel parameters are too low. For instructions about reconfiguring HP-UX, see "Setting Up a System" in the *HP-UX System Administration Tasks Manual*. You may need to increase the following parameters.

HP-UX Name	Traditional Name	Defaults
shmmax	SHMMAX	67108864
shmseg	SHMSEG	12
shmmni	SHMMNI	100
semmns	SEMMNS	128
semmni	SEMMNI	64
semmap	SEMMAP	semmni+2
semmnu	SEMMNU	30
semume	SEMUME	10
msgmni	MSGMNI	50
msgmap	MSGMAP	2+msgtql
msgmax	MSGMAX	8192
msgmnb	MSGMNB	16384
msgssz	MSGSSZ	8
msgtql	MSGTQL	40
msgseg	MSGSEG	2048
maxusers	MAXUSERS	32
nproc	NPROC	20+8*maxusers
maxuprc	MAXUPRC	50
maxfiles	NFILES	60

Mounting the CD

To mount a CD, type the following commands.

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

where *cdrom_device* is listed in the output of the `ioscan -f -n` command.

IBM - AIX v4.3.2 on IBM PowerPC

Available BEA Tuxedo Release 7.1 Packages

- BEA Tuxedo Core System

- BEA Tuxedo System Workstation

- BEA Jolt

Note: The BEA Tuxedo Release 7.1 Online Documentation is provided on a separate CD-ROM.

Hardware Requirements

- IBM PowerPC

- 256 MB of RAM

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

Software Requirements

- AIX Release 4.3.2 (supports threads)

- AIX XL C Compiler (BEA Tuxedo development environment only)

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

Notes: For BEA Tuxedo Administration Console hardware and software requirements, see "BEA Administration Console Requirements" on page 5-1.

For BEA Jolt hardware and software requirements, refer to Appendix B, "BEA Jolt 1.2.1 System Requirements."

Network

- TCP/IP, using Sockets network interface

Disk Space Requirements

Package	Disk Space Required
BEA Tuxedo software (client and server)	57010 blocks*
BEA Tuxedo Workstation only	10252 blocks*

* One block is equal to 512 bytes

Note: Disk space requirements for the BEA Jolt Server are provided in "Supported Platforms for BEA Jolt Server and BEA Jolt Relay" on page B-2. Disk space requirements for the BEA Jolt Client are provided in "BEA Jolt Client Requirements" on page B-4.

Tunable Parameters

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

- Acquire superuser privileges.

- Determine the values of all tunable parameters.

- Change the parameter's value.

- Reboot the system.

Mounting the CD

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

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

mounts a CD if `/etc/filesystems` contains an entry that specifies `/cd` as the mount point for CDs.

If `/etc/filesystems` does not contain a CD-ROM entry, execute

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

where `cd_device` is the name of the CD-ROM device file, typically `/dev/cd0`.

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

```
smit mount
```

Microsoft Windows NT v4.0 on Intel

Available BEA Tuxedo Release 7.1 Packages

- BEA Tuxedo Core System

- BEA Tuxedo System Workstation

- BEA Jolt

Note: The BEA Tuxedo Release 7.1 Online Documentation is provided on a separate CD-ROM.

Hardware Requirements

- x86 (Intel)

- 128 MB of memory

- 50 MB of hard disk space

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

Software Requirements

- Windows NT Workstation or Server Release 4.0, Service Pack 5 (supports threads)

- Microsoft© Visual C++ version 6, Service Pack 2

- MicroFocus NetExpress 3.0 (BEA Tuxedo development environment only)

Notes: For BEA Tuxedo Administration Console hardware and software requirements, see "BEA Administration Console Requirements" on page 5-1.

For BEA Jolt hardware and software requirements, refer to Appendix B, "BEA Jolt 1.2.1 System Requirements."

Network

- TCP/IP provided by Windows NT (32-bit Winsock)

Disk Space Requirements

Package	Disk Space Required
BEA Tuxedo software (client and server)	52 MB
BEA Tuxedo Workstation only	28 MB

Note: Disk space requirements for the BEA Jolt Server are provided in "Supported Platforms for BEA Jolt Server and BEA Jolt Relay" on page B-2. Disk space requirements for the BEA Jolt Client are provided in "BEA Jolt Client Requirements" on page B-4.

Tunable Parameters

Parameter	Value
`TUXIPC_MSG BYTES`	65536
`TUXIPC_MSG_HDRS`	8128
`TUXIPC_MSG_QUEUE_BYTES`	65536

Parameter	Value
TUXIPC_MSG_QUEUES	256
TUXIPC_MSG_SEG_BYTES	64
TUXIPC_MSG_SEGS	32767
TUXIPC_PROC	256
TUXIPC_SEM	1024
TUXIPC_SEM_IDS	1024
TUXIPC_SEM_UNDO	1024
TUXIPC_SHM_PROCS	500
TUXIPC_SHM_SEGS	50

Microsoft Windows 98 on Intel

Available BEA Tuxedo Release 7.1 Packages

- BEA Tuxedo System Workstation

- BEA Jolt Client

Note: The BEA Tuxedo Release 7.1 Online Documentation is provided on a separate CD-ROM.

Hardware Requirements

- Intel 80486 processor or later

- 32 MB of RAM

Software Requirements

- Microsoft Windows 98

- Microsoft Visual C++ Version 6.0, Service Pack 2 (BEA Tuxedo development environment only)

- MicroFocus NetExpress 3.0 (BEA Tuxedo development environment only)

Note: For BEA Jolt hardware and software requirements, refer to Appendix B, "BEA Jolt 1.2.1 System Requirements."

Network

- TCP/IP provided by Windows NT (32-bit Winsock)

Disk Space Requirements

Package	Disk Space Required
BEA Tuxedo System Workstation	28 MB

Microsoft Windows 95 on Intel

Available BEA Tuxedo Release 7.1 Packages

- BEA Tuxedo System Workstation

- BEA Jolt Client

Note: The BEA Tuxedo Release 7.1 Online Documentation is provided on a separate CD-ROM.

Hardware Requirements

- Intel 80486 processor or later

- 32 MB of RAM

Software Requirements

- Microsoft Windows 95

- Microsoft Visual C++ Version 6.0, Service Pack 2 (BEA Tuxedo development environment only)

- MicroFocus NetExpress 3.0 (BEA Tuxedo development environment only)

Note: For BEA Jolt hardware and software requirements, refer to Appendix B, "BEA Jolt 1.2.1 System Requirements."

Network

- TCP/IP provided by Windows NT (32-bit Winsock)

Disk Space Requirements

Package	Disk Space Required
BEA Tuxedo Workstation	28 MB

NCR - MP-RAS v3.02 on Intel IA32 (x86)

Available BEA Tuxedo Release 7.1 Packages

- BEA Tuxedo Core System

- BEA Tuxedo System Workstation

Note: The BEA Tuxedo Release 7.1 Online Documentation is provided on a separate CD-ROM.

Hardware Requirements

- NCR System 3000

- 256 MB of RAM

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

Software Requirements

- NCR UNIX SVR4 (MP-RAS 3.02) (no threads support)

- NCR High Performance C Compiler R3.0 (SCDE 3.03.00) (BEA Tuxedo development environment only)

- MicroFocus COBOL Version 4.1 (BEA Tuxedo development environment only)

Note: For BEA Tuxedo Administration Console hardware and software requirements, see "BEA Administration Console Requirements" on page 5-1.

Network

■ TCP/IP, using the Sockets network interface

Disk Space Requirements

Package	Disk Space Required
BEA Tuxedo software (client and server)	64500 blocks*
BEA Tuxedo Workstation only	13100 blocks*

* One block is equal to 512 bytes

Mounting the CD

To mount a CD, enter the following commands.

```
su
mkdir /cdrom
/etc/mount -F cdfs -r -o nmconv=m cd_device /cdrom
```

where `cd_device` is the name of the CD-ROM device file, such as `/dev/dsk/c0t0d0s0`.

Tunable Parameters

You will probably need to reconfigure the kernel before running the BEA Tuxedo system because the default values of some IPC parameters are too low. For instructions on reconfiguring, rebuilding, and rebooting, see the *UnixWare System Performance Administration Guide* and the `idtune`(1) and `idbuild`(1) entries in a UNIX system reference manual. You may need to increase the following parameters.

UnixWare Name	Traditional Name	Defaults
shmmax	SHMMAX	524288
shmseg	SHMSEG	6
shmmni	SHMMNI	100
semmns	SEMMNS	60
semmni	SEMMNI	10
semmsl	SEMMSL	25
semmap	SEMMAP	10
semmnu	SEMMNU	30
semume	SEMUME	10
msgmni	MSGMNI	50
msgmap	MSGMAP	100
msgmax	MSGMAX	2048
msgmnb	MSGMNB	4096
msgseg	MSGSEG	8
msgtql	MSGTQL	40
msgseg	MSGSEG	1024
nproc	NPROC	200
maxup	MAXUP	60

To change the value of a tunable parameter, complete the following procedure.

1. Acquire superuser privileges.

   ```
   su root
   ```

2. Determine (by running the idtune command) the current default value of the tunable parameter to be changed.

```
/etc/conf/bin/idtune -g param
```

The output of idtune lists current, default, minimum, and maximum valid values.

3. Change the parameter's value:

```
/etc/conf/bin/idtune param new-value
```

4. If idtune fails because *new-value* exceeds the maximum allowed value, you must increase the maximum. (The maximum values of some parameters are set unnecessarily low in some releases of UnixWare.) To do this, edit /etc/conf/mtune.d/*type*, where *type* is shm, sem, or msg. Change the maximum value (in the last column) to the desired maximum.

5. Rebuild the operating system and reboot:

```
/etc/conf/bin/idbuild -B
cd /
shutdown -y -g0 -i6
```

6. Execute idtune again and supply the desired *new-value*.

7. Run idbuild to build a new kernel.

```
/etc/conf/bin/idbuild -B
cd /
shutdown -y -g0 -i6
```

8. Reboot your system.

Red Hat Linux 6.1 on Intel IA32 (x86)

Available BEA Tuxedo Release 7.1 Packages

- BEA Tuxedo Core System

- BEA Tuxedo System Workstation

- BEA Jolt

Note: The BEA Tuxedo Release 7.1 Online Documentation is provided on a separate CD-ROM.

Hardware Requirements

- Pentium III processor or later

- 128 MB of RAM

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

Software Requirements

- Red Hat Linux Release 6.1 (supports threads)

- ANSI C Compiler (BEA Tuxedo development environment only)

Notes: For BEA Tuxedo Administration Console hardware and software requirements, see "BEA Administration Console Requirements" on page 5-1.

For BEA Jolt hardware and software requirements, refer to Appendix B, "BEA Jolt 1.2.1 System Requirements."

Network

- TCP/IP, using Sockets network interface

Disk Space Requirements

Package	Disk Space Required
BEA Tuxedo software (client and server)	20500 blocks*
BEA Tuxedo Workstation only	3500 blocks*

* One block is equal to 512 bytes

Note: Disk space requirements for the BEA Jolt Server are provided in "Supported Platforms for BEA Jolt Server and BEA Jolt Relay" on page B-2. Disk space requirements for the BEA Jolt Client are provided in "BEA Jolt Client Requirements" on page B-4.

Platform-Specific Notes

To mount a CD, execute the following from the command line.

```
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.

```
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
```

where

- `hd20` is the value of *cd_device*.

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

Sun Solaris 7 on SPARC

Available BEA Tuxedo Release 7.1 Packages

- BEA Tuxedo Core System

- BEA Tuxedo System Workstation

- BEA Jolt

Note: The BEA Tuxedo Release 7.1 Online Documentation is provided on a separate CD-ROM.

Hardware Requirements

- UltraSPARC uniprocessor

- 256 MB of RAM

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

Software Requirements

- Sun Solaris 7 (supports threads)

- SparCompiler C 4.0 (BEA Tuxedo development environment only)

- MicroFocus COBOL Version 4.1 with 13.03a update from MicroFocus (BEA Tuxedo development environment only)

Notes: For BEA Tuxedo Administration Console hardware and software requirements, see "BEA Administration Console Requirements" on page 5-1.

For BEA Jolt hardware and software requirements, refer to Appendix B, "BEA Jolt 1.2.1 System Requirements."

Network

- TCP/IP, using the Sockets network interface

Disk Space Requirements

Package	Disk Space Required
BEA Tuxedo software (client and server)	66500 blocks*
BEA Tuxedo Workstation only	15400 blocks*

* One block is equal to 512 bytes

Note: Disk space requirements for the BEA Jolt Server are provided in "Supported Platforms for BEA Jolt Server and BEA Jolt Relay" on page B-2. Disk space requirements for the BEA Jolt Client are provided in "BEA Jolt Client Requirements" on page B-4.

Tunable Parameters

You will probably need to reconfigure the kernel before running the BEA Tuxedo system because the default values of some kernel parameters are too low. Information regarding kernel configuration is provided in the `systune` (1M) entry in a UNIX system reference manual. You may need to increase the following parameters.

Solaris Name	Traditional Name	Defaults
`shmsys:shminfo_shmmax`	SHMMAX	131072
`shmsys:shminfo_shmseg`	SHMSEG	6
`shmsys:shminfo_shmmni`	SHMMNI	100
`semsys:seminfo_semmns`	SEMMNS	60

Solaris Name	Traditional Name	Defaults
semsys:seminfo_semmni	SEMMNI	10
semsys:seminfo_semmsl	SEMMSL	25
semsys:seminfo_semmap	SEMMAP	10
semsys:seminfo_semmnu	SEMMNU	30
semsys:seminfo_semume	SEMUME	10
msgsys:msginfo_msgmni	MSGMNI	50
msgsys:msginfo_msgmap	MSGMAP	100
msgsys:msginfo_msgmax	MSGMAX	2048
msgsys:msginfo_msgmnb	MSGMNB	4096
msgsys:msginfo_msgssz	MSGSSZ	8
msgsys:msginfo_msgtql	MSGTQL	40
msgsys:msginfo_msgseg	MSGSEG	1024
maxusers	maxusers	32
max_nprocs	NPROC	10+16*maxusers
maxuprc	MAXUP	max_nprocs-5

Mounting the CD

The Volume Management software automatically mounts CDs on
/cdrom/cdrom0/s0.

B BEA Jolt 1.2.1 System Requirements

■ BEA Tuxedo System Prerequisite

■ Supported Web Servers

■ Supported Platforms for BEA Jolt Server and BEA Jolt Relay

■ BEA Jolt Client Support

BEA Tuxedo System Prerequisite

BEA Tuxedo Release 7.1 must be installed before you can install BEA Jolt 1.2.1 server components. All of the BEA Jolt client components and BEA Jolt API documents can be installed on machines that do not have the BEA Tuxedo core system installed.

Supported Web Servers

To provide HTTP/HTML-based access to enterprise applications, BEA Jolt supports the Microsoft Internet Information Server (IIS) or Java Web Server.

Supported Platforms for BEA Jolt Server and BEA Jolt Relay

BEA Jolt server platform support depends upon BEA Tuxedo release support. The BEA Jolt server also requires:

■ CD-ROM access

■ 500K of disk space

The following table shows the supported platforms for the BEA Jolt server.

Table B-1 Supported Platforms for BEA Jolt Server

Operating System Vendor	Operating System	Operating System Version	BEA Tuxedo Release Supported
Compaq	Compaq Tru64 UNIX	4.0f (Alpha)	7.1
HP	HP-UX	11.0	7.1
IBM	AIX	4.3.2	7.1
Microsoft	Windows NT	4.0 (sp5)	7.1
RedHat	Linux	6.1	7.1
Sun	Solaris	7 (SPARC)	7.1

The following table shows the supported platforms for BEA Jolt Relay.

Table B-2 Supported Platforms for BEA Jolt Relay

Operating System Vendor	Operating System	Operating System Version
Compaq	Compaq Tru64 UNIX	4.0f(Alpha)
HP	HP-UX	11.00

Table B-2 Supported Platforms for BEA Jolt Relay

Operating System Vendor	Operating System	Operating System Version
IBM	AIX	4.3.2
Microsoft	Windows NT	4.0 (Intel) (sp4)
Red Hat	Linux	6.1
Sun	Solaris	7 (SPARC)

BEA Jolt Client Support

BEA Jolt 1.2.1 supports Java applets and standalone Java client applications for the BEA Tuxedo system. The following table shows the client types supported by BEA Jolt 1.2.1.

Table B-3 Client Types Supported by BEA Jolt 1.2.1

Client Type	Supports	Version Supported
Java Applet in a Browser	Microsoft Internet Explorer	Internet Explorer (IE) 4.0.1, 5.0
	Netscape	Netscape Communicator 4.5.1
Standalone Applications on a Desktop	Java	JDK 1.1.7, JDK 1.2

The HTML-based BEA Jolt Client Classes run inside a Web server. The following Web servers are certified with BEA Jolt.

Table B-4 Web Servers Certified with BEA Jolt

Vendor	Web Server Version	OS Version	BEA Jolt Client Personality	Comments
Microsoft	IIS 4.0x	Windows NT 4.0	ASP Connectivity for Tuxedo	Supports VB or VBScript-based applications inside ASPs.
BEA WebXpress	WebLogic (WLX and/or WLS) 4.0x	Any	WebLogic Connectivity for Tuxedo	Supports servlets. Backward-compatible only - You can have a BEA Jolt 1.2.1 server with a BEA Jolt 1.1 client.
Any	Java Servlet Engine (Any version)	Any OS running JDK 1.1.7	JSE Connectivity for Tuxedo	Supports servlets.

BEA Jolt Client Requirements

BEA Jolt has the following client requirements:

- 574K of disk space for client classes

- 1364K of disk space for client API documentation

- 190K of disk space for client examples

- Java Developer's Kit (JDK) 1.1.7 or 1.2 is certified for BEA Jolt 1.2.1 application development (`http://java.sun.com: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 1.2.1 is based on JDK 1.1.7 . The BEA Jolt 1.2.1 class library is compatible with JDK versions 1.1.7 and 1.2 on the following operating systems:

■ Solaris 2.5.1, Solaris 2.6, and Solaris 7

■ Windows NT 4.0

■ Windows 95 OSR2

■ Windows 98

The BEA Jolt class library is compatible with the browsers and JDK versions shown in the following table.

Table B-5 BEA Jolt Class Library Compatibility

Vendor	Browser Version	Java Virtual Machine (JVM)	OS Version
Microsoft	Internet Explorer 4.0.1 (sp1)	MS JVM 4.0	Windows NT 4.0 Service Pack 4
Microsoft	Internet Explorer 5.0	MS JVM 4.0	Windows NT 4.0 Service Pack 4
Netscape	Communicator 4.5, 4.6.1	JDK 1.1.5	Windows NT 4.0