Sun Update Connection -Enterprise 1.0 Quick Start Guide: Getting Started



Sun Microsystems, Inc. 4150 Network Circle Santa Clara, CA 95054 U.S.A.

Part No: 819–6766–13 November, 2006 Copyright 2006 Sun Microsystems, Inc. 4150 Network Circle, Santa Clara, CA 95054 U.S.A. All rights reserved.

Sun Microsystems, Inc. has intellectual property rights relating to technology embodied in the product that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more U.S. patents or pending patent applications in the U.S. and in other countries.

U.S. Government Rights - Commercial software. Government users are subject to the Sun Microsystems, Inc. standard license agreement and applicable provisions of the FAR and its supplements.

This distribution may include materials developed by third parties.

Parts of the product may be derived from Berkeley BSD systems, licensed from the University of California. UNIX is a registered trademark in the U.S. and other countries, exclusively licensed through X/Open Company, Ltd.

Sun, Sun Microsystems, the Sun logo, the Solaris logo, the Java Coffee Cup logo, docs.sun.com, SunSolve, Java, and Solaris are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and other countries. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the U.S. and other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc. Mozilla is a trademark or registered trademark of Netscape Communications Corporation in the United States and other countries.

The OPEN LOOK and Sun^{TM} Graphical User Interface was developed by Sun Microsystems, Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a non-exclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees who implement OPEN LOOK GUIs and otherwise comply with Sun's written license agreements.

Products covered by and information contained in this publication are controlled by U.S. Export Control laws and may be subject to the export or import laws in other countries. Nuclear, missile, chemical or biological weapons or nuclear maritime end uses or end users, whether direct or indirect, are strictly prohibited. Export or reexport to countries subject to U.S. embargo or to entities identified on U.S. export exclusion lists, including, but not limited to, the denied persons and specially designated nationals lists is strictly prohibited.

DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

Copyright 2006 Sun Microsystems, Inc. 4150 Network Circle, Santa Clara, CA 95054 U.S.A. Tous droits réservés.

Sun Microsystems, Inc. détient les droits de propriété intellectuelle relatifs à la technologie incorporée dans le produit qui est décrit dans ce document. En particulier, et ce sans limitation, ces droits de propriété intellectuelle peuvent inclure un ou plusieurs brevets américains ou des applications de brevet en attente aux Etats-Unis et dans d'autres pays.

Cette distribution peut comprendre des composants développés par des tierces personnes.

Certaines composants de ce produit peuvent être dérivées du logiciel Berkeley BSD, licenciés par l'Université de Californie. UNIX est une marque déposée aux Etats-Unis et dans d'autres pays; elle est licenciée exclusivement par X/Open Company, Ltd.

Sun, Sun Microsystems, le logo Sun, le logo Solaris, le logo Java Coffee Cup, docs.sun.com, SunSolve, Java et Solaris sont des marques de fabrique ou des marques déposées de Sun Microsystems, Inc. aux Etats-Unis et dans d'autres pays. Toutes les marques SPARC sont utilisées sous licence et sont des marques de fabrique ou des marques déposées de SPARC International, Inc. aux Etats-Unis et dans d'autres pays. Les produits portant les marques SPARC sont basés sur une architecture développée par Sun Microsystems, Inc. Mozilla est une marque de Netscape Communications Corporation aux Etats-Unis et ? d'autres pays.

L'interface d'utilisation graphique OPEN LOOK et Sun a été développée par Sun Microsystems, Inc. pour ses utilisateurs et licenciés. Sun reconnaît les efforts de pionniers de Xerox pour la recherche et le développement du concept des interfaces d'utilisation visuelle ou graphique pour l'industrie de l'informatique. Sun détient une licence non exclusive de Xerox sur l'interface d'utilisation graphique Xerox, cette licence couvrant également les licenciés de Sun qui mettent en place l'interface d'utilisation graphique OPEN LOOK et qui, en outre, se conforment aux licences écrites de Sun.

Les produits qui font l'objet de cette publication et les informations qu'il contient sont régis par la legislation américaine en matière de contrôle des exportations et peuvent être soumis au droit d'autres pays dans le domaine des exportations et importations. Les utilisations finales, ou utilisateurs finaux, pour des armes nucléaires, des missiles, des armes chimiques ou biologiques ou pour le nucléaire maritime, directement ou indirectement, sont strictement interdites. Les exportations ou réexportations vers des pays sous embargo des Etats-Unis, ou vers des entités figurant sur les listes d'exclusion d'exportation américaines, y compris, mais de manière non exclusive, la liste de personnes qui font objet d'un ordre de ne pas participer, d'une façon directe ou indirecte, aux exportations des produits ou des services qui sont régis par la legislation américaine en matière de contrôle des exportations et la liste de ressortissants spécifiquement designés, sont rigoureusement interdites.

LA DOCUMENTATION EST FOURNIE "EN L'ETAT" ET TOUTES AUTRES CONDITIONS, DECLARATIONS ET GARANTIES EXPRESSES OU TACITES SONT FORMELLEMENT EXCLUES, DANS LA MESURE AUTORISEE PAR LA LOI APPLICABLE, Y COMPRIS NOTAMMENT TOUTE GARANTIE IMPLICITE RELATIVE A LA QUALITE MARCHANDE, A L'APTITUDE A UNE UTILISATION PARTICULIERE OU A L'ABSENCE DE CONTREFACON.

Contents

 Installation Overview	9 9
 Installation Flow Charts	
 Installation Planning	11
System Requirements Operating System Requirements Register With Vendors for Authentication ▼ To Change User Name and Password for Authentication	.17
Operating System Requirements Register With Vendors for Authentication ▼ To Change User Name and Password for Authentication	17
Register With Vendors for Authentication ▼ To Change User Name and Password for Authentication	19
▼ To Change User Name and Password for Authentication	22
	23
Gathering Information Before Installation	24
3 Installing the System Dependency Server and Knowledge Base	.27
Installing the System Dependency Server	27
Navigating Through the ezinstaller Screens	27
Unpacking Sun Update Connection – Enterprise Applications and Files	28
$ildsymbol{ abla}$ To Unpack the Installation Archive	29
Installing the Sun Update Connection – Enterprise System Dependency Server	29
$ildsymbol{ abla}$ To Install the System Dependency Server	.29
Installing the Proxy System Dependency Server	35
▼ To Install a Proxy System Dependency Server	35
Adding Solaris Software to the Knowledge Base	36
$ildsymbol{ abla}$ To Upload Solaris Software to the Knowledge Base	36

4	Installing the Agent, Console, or CLI	39
	Installing Sun Update Connection – Enterprise Components	39

5

Installing the Agent, Console, or CLI	
$ildsymbol{ abla}$ To Install the Agent, Console, or CLI	40
Installing the Console for Windows	
▼ To Install Console for Windows	
Uninstalling Sun Update Connection – Enterprise Components	45
Uninstalling Sun Update Connection – Enterprise	

Α	ezinstaller and Installer Commands	.49
	Agents and Console Install Commands	.49

Index	,	51
-------	---	----

Preface

The Sun Update Connection - Enterprise 1.0 Quick Start Guide: Getting Started provides information to system administrations about how to install and configure the SunSM Update Connection – Enterprise 1.0.x software. This software manages software updates to systems that run the SolarisTM Operating System (Solaris OS) or Linux distributions.

Note – This Solaris release supports systems that use the SPARC[®] and x86 families of processor architectures: UltraSPARC[®], SPARC64, AMD64, Pentium, and Xeon EM64T. The supported systems appear in the *Solaris Hardware Compatibility List* at http://www.sun.com/bigadmin/hcl. This document cites any implementation differences between the platform types.

In this document these x86 related terms mean the following:

- "x86" refers to the larger family of 64-bit and 32-bit x86 compatible products.
- "x64" points out specific 64-bit information about AMD64 or EM64T systems.
- "32-bit x86" points out specific 32-bit information about x86 based systems.

For supported systems, see the Solaris Hardware Compatibility List.

Who Should Use This Book

This book is intended for system administrators who manage software updates in enterprise environments.

Before You Read This Book

To effectively use this book, you should be familiar with the hardware systems and network of your organization.

Specifically, understand the following:

- Your client and host operating systems
- Basic Linux and Solaris commands and dependency issues
- Common X Windows actions and the use of applications in X Windows

Related Books

In addition to this book, find more information in the following publications.

TABLE P-1 Related Information

Information	Description
Sun Update Connection – Enterprise Release Notes	Describes any bugs and known problems. This book includes late new features and platform support.
Sun Update Connection – Enterprise Bare Metal Installation Guide	Describes the steps needed to install the software for a bare metal server.
Sun Update Connection - Enterprise 1.0 Administration Guide	Provides procedures for customization, backup and restore, support of Shared Resources, and advanced configurations. This book also includes explanations of solutions for Linux and Solaris technology, security, and an overview of how the servers work together.
Sun Update Connection – Enterprise 1.0 User's Guide	Provides information to system administrators about how to use the Sun Update Connection – Enterprise software to manage software updates to systems that run the Solaris Operating System or Linux distributions.

Documentation, Support, and Training

The Sun web site provides information about the following additional resources:

- Documentation (http://www.sun.com/documentation/)
- Support (http://www.sun.com/support/)
- Training (http://www.sun.com/training/)

Sun will provide a technical FAQ in a read only format at

http://forum.sun.com/jive/forum.jspa?forumID=334. The URL is subject to change and may be removed at Sun's discretion.

Typographic Conventions

The following table describes the typographic conventions that are used in this book.

Туреface	Meaning	Example
AaBbCc123 The names of commands	The names of commands, files, and directories,	Edit your . login file.
	and onscreen computer output	Use ls -a to list all files.
		<pre>machine_name% you have mail.</pre>

TABLE P-2 Typographic Conventions

IABLE P-2 Typographic Conventions (Continuea)		
Typeface	Meaning	Example
AaBbCc123	What you type, contrasted with onscreen	machine_name% su
	computer output	Password:
aabbcc123	Placeholder: replace with a real name or value	The command to remove a file is rm <i>filename</i> .
AaBbCc123	Book titles, new terms, and terms to be	Read Chapter 6 in the User's Guide.
	emphasized	A <i>cache</i> is a copy that is stored locally.
		Do <i>not</i> save the file.
		Note: Some emphasized items appear bold online.

Shell Prompts in Command Examples

The following table shows the default UNIX[®] system prompt and superuser prompt for the C shell, Bourne shell, and Korn shell.

TABLE P-3 Shell	Prompts
-----------------	---------

Shell	Prompt
C shell	machine_name%
C shell for superuser	machine_name#
Bourne shell and Korn shell	\$
Bourne shell and Korn shell for superuser	#

◆ ◆ ◆ CHAPTER 1

Installation Overview

This book provides step-by-step instructions for setting up the Sun Update Connection – Enterprise 1.0.*x* system dependency server, agents, console, and command-line interface (CLI), as well as a proxy system dependency server.

This chapter describes the local site architecture and provides an overview of several component installations.

Site Architecture

The Sun Update Connection – Enterprise software consists of a number of components that are installed on different systems. These components make up the local site architecture. A universal server resides at Sun Microsystems and provides updates to the system dependency server. Figure 1–1 shows the Sun Update Connection – Enterprise components on the local site and the universal server.



FIGURE 1-1 Sun Update Connection – Enterprise Architecture

- The universal server is maintained at Sun. This web server contains the master knowledge base and the software components for the various distributions. This server also maintains signature files and other security measures.
- The system dependency server resides at the local site. This server is the proxy for the universal server. The server contains the following components:
 - An embedded web server that pulls certified updates from the universal server.
 - The knowledge base that is the repository for downloadable packages and their deployment rules.

- The dependency manager that manages the agents and is sometimes called the engine. The dependency manager also manages communications between agents, consoles, the CLI, and an API.
- An agent is a managed host. The agent runs the dependency resolver application. This software finds the most cost-effective solution for jobs. Every managed host finds the best solution for their own software configuration.
- The console provides a graphical user interface.
- A CLI can be installed on any system.
- The API is an optional, customer-built interface.

Installation Flow Charts

The following flowcharts provide an overview of installing the Sun Update Connection – Enterprise components.

Figure 1–2 and Figure 1–3 describe the steps necessary to install the system dependency server.

Install System Dependency Server



FIGURE 1-2 Installing the System Dependency Server



Install System Dependency Server (contd.)

FIGURE 1-3 Installing the System Dependency Server (continued)

Figure 1–4 describes uploading Solaris packages to the system dependency server.

Add Solaris Software to Knowledge Base



FIGURE 1-4 Adding Solaris Packages to the Knowledge Base

Figure 1–5 describes the steps necessary to install either an agent, a console, or the CLI.



Install an Agent, Console, or CLI Do the following steps for each system:

FIGURE 1-5 Installing an Agent, Console, or CLI

Figure 1-6 describes the steps to install the console for Microsoft Windows.

Install Console for Windows



FIGURE 1–6 Installing the Console for Microsoft Windows

◆ ◆ ◆ CHAPTER 2

Installation Planning

This chapter provides system requirements for the server, agents, console, and the operating systems (OS). Also, instructions on registering with vendors is given. An installation checklist provides a list of important information that you might need to know before you begin the installations.

The following topics are covered in this chapter:

- "System Requirements" on page 17
- "Register With Vendors for Authentication" on page 22
- "Gathering Information Before Installation" on page 24

System Requirements

This section provides information about the system requirements that must be met before Sun Update Connection – Enterprise is installed.

The following requirements are covered in this section:

- Table 2–1, System Requirements for System Dependency Server
- Table 2–2, System Requirements for Console
- Table 2–3, System Requirements for Agents

The latest requirements can also be found at http://www.sun.com/service/sunupdate/enterprise/specs.html.

Requirement Type	Size	
Platform and OS Environment	z/OS and S/390 : Any IBM zSeries or S/390 environment supporting Linux ¹	
	32-bit x86: Intel Pentium IV or equivalent	
	AMD64, including EM64-T	
Disk Space Requirements	Installation: 512 MB minimum free in the file system that serves /usr/local	
	Software Components: 500 MB minimum	
	SWAP: 500 MB minimum	
Memory	z/OS and S/390: 256 MB minimum ¹	
	32-bit x86 : 512 MB minimum	
	AMD64 and EM64-T: 512 MB minimum	

 TABLE 2-1 System Requirements for System Dependency Server

¹ Support for this mainframe environment will be part of a future release.

 TABLE 2-2 System Requirements for Console

Requirement Type	Requirements
Platform	Intel Pentium IV or equivalent
Presentation Environment	 One of the following: UNIX* environment with terminal emulator. Execute the console remotely and re-direct your display to a local server. X Windows on a Linux environment. Microsoft Windows with X Emulator for example CGWIN, EXCEED, or similar. Note - On SUSE 9.0 Professional, set resolution to 1024 x 768.
Disk Space Requirements	256 MB, plus 20 MB for each additional channel
Memory	512 MB
Access	IP connectivity to the system dependency server

Requirement Type	Requirements
Platform and Operating System	z/OS and S/390: Any IBM zSeries or S/390 environment supporting Linux ¹
Environment	32-bit x86: Intel Pentium IV or equivalent
	Solaris: SPARC
	AMD64, including EM64–T
	POWER: OpenPower server, JS Blade server, pSeries, iSeries mainframe
Memory	128 MB minimum, 256 MB recommended
	Note – Memory requirements for a mainframe are generally lower.
Disk Space Requirements	256 MB minimum
Access	Superuser access and IP connectivity to the system dependency server

 TABLE 2-3 System Requirements for Agents

Operating System Requirements

The following tables show the Linux and Solaris distributions that are supported by each application and listed by hardware platform.

The following requirements are covered in this section:

- Table 2–4, Supported Channels for the 32-bit x86
- Table 2–5, Supported Channels for 32-bit S/390 Systems
- Table 2–6, Supported Channels for 64-bit S/390 Systems
- Table 2–7, Supported Channels for AMD64
- Table 2–8, Supported Channels for 64-bit on POWER
- Table 2–9, Supported Channels for the 64-bit x86 (Itanium)
- Table 2–10, Supported UNIX Versions on SPARC
- Table 2–11, Supported Microsoft Windows Versions

Note – The bare-metal installation (BMI) server automates Linux distributions and operating system installation on a bare-metal system. For more information, see *Sun Update Connection - Enterprise Bare Metal Installation Guide*.

Distributions that support an application are marked with a plus sign (+), while distributions that do *not* support an application are marked with a minus sign (–).

A channel is a combination of distributions and architecture.

For example, a channel would be one of the following:

- A Solaris 10 distribution on the SPARC architecture
- A Solaris 10 distribution on the x86 architecture
- A Linux RHEL WS 3.0 distribution on the AMD64 architecture

The latest list can also be found at

http://www.sun.com/service/sunupdate/enterprise/knowledge.html.

TABLE 2-4 Supported Channels for the 32-bit x86

Operating System or Channel	Operating System Version	System Dependency Server	Agent	Console	BMI Server	BMI Provision
Red Hat	7.2, 7.3, 8.0, or 9.0	Not Recommended	+	+	_	-
Fedora Core	2	Not Recommended	+	+	_	-
Red Hat Enterprise Linux	2.1	+	+	+	-	+
Advanced Server	3.0	+	+	+	+	+
	4.0	+	+	+	-	-
Red Hat Enterprise Linux	2.1	+	+	+	-	+
Enterprise Server	3.0	+	+	+	+	+
	4.0	+	+	+	-	-
Red Hat Enterprise Linux	2.1	+	+	+	-	-
Workstation Server	3.0	+	+	+	+	+
	4.0	+	+	+	-	-
SUSE Professional	9.0 or 9.1	+	+	+	+	+
	9.2	+	+	+	-	+
SUSE Linux Enterprise Server	8 or 9	+	+	+	-	+
Novell Linux Desktop	9	+	+	+	-	+
Novell SLSS	8	-	+	-	-	-
Solaris Operating System	10	-	+	-	-	-

Operating System /Channel	Operating System Version	System Dependency Server	Agent	Console	BMI Server	BMI Provision
SUSE Linux Enterprise Server ¹	7, 8, 9, \$390	+	+	-	_	-
Red Hat Enterprise Linux Advanced Server ¹	4.0	+	+	-	-	-

 TABLE 2-5 Supported Channels for 32-bit S/390 Systems

¹ Support for this mainframe environment will be part of a future release.

TABLE 2-6 Supported Channels for 64-bit S/390 Systems

Operating System /Channel	Operating System Version	System Dependency Server	Agent	Console	BMI Server	BMI Provision
Red Hat Enterprise Linux Advanced Server ¹	3.0 or 4.0	+	+	-	-	-
SUSE Linux Enterprise Server ¹	8 or 9	+	+	-	-	-

TABLE 2-7 Supported Channels for AMD64

Operating System /Channel	Operating System Version	System Dependency Server	Agent	Console	BMI Server	BMI Provision
Red Hat Enterprise	3.0	+	+	+	-	+
Linux Advanced Server	4.0	+	+	+	-	-
Red Hat Enterprise	3.0	+	+	+	-	+
Server	4.0	+	+	+	-	-
Red Hat Enterprise Linux Enterprise Server	4.0	+	+	+	-	-
SUSE Professional	9.0	+	+	-	-	+
	9.1	+	+	-	-	-
SUSE Linux Enterprise Server	8 or 9	+	+	-	-	+

TABLE 2-8 Supported Channels for 64-bit on POWER

Operating System /Channel	Operating System Version	System Dependency Server	Agent	Console	BMI Server	BMI Provision
Red Hat Enterprise Linux Advanced Server	3.0	-	+	-	-	-

Operating System /Channel	Operating System Version	System Dependency Server	Agent	Console	BMI Server	BMI Provision
SUSE Linux Enterprise Server	9	-	+	-	-	+

TABLE 2-8 Supported Channels for 64-bit on POWER(Continued)

TABLE 2-9 Supported Channels for the 64-bit x86 (Itanium)

Operating System /Channel	Operating System Version	System Dependency Server	Agent	Console	BMI Server	BMI Provision
Red Hat Enterprise Linux Workstation Server	3.0	-	+	-	-	-

TABLE 2-10 Supported UNIX Versions on SPARC

Operating System /Channel	Operating System Version	System Dependency Server	Agent	Console	BMI Server	BMI Provision
Solaris Operating Environment	8	-	+	-	-	+
	9	-	+	-	-	-
	10	-	+	-	-	+

TABLE 2–11 Supported Microsoft Windows Versions

Operating System /Channel	Operating System Version	System Dependency Server	Agent	Console	BMI Server	BMI Provision
Windows	2000	-	-	+	-	-
	ХР	-	-	+	-	-

Register With Vendors for Authentication

Sun Update Connection – Enterprise enables you to download software components from vendor sources. For example, if your environment includes managed hosts that run the Solaris OS or a Linux distribution, you need to be able to retrieve software from the appropriate vendor source. Sun Update Connection – Enterprise determines which software distributions apply to your environment by evaluating the agents that you have installed on your managed hosts. Sun Update Connection - Enterprise needs authentication information for each distribution that is associated with vendor web sites.

To download software components from some of the vendor sources, you must first register with that source. The registration process sets up an account with a user name and password. Then the Sun Update Connection – Enterprise software can successfully access binaries from this source. To access software components from these sources, you must have a valid account. For example, you must be registered with Sun Update Connection to obtain Solaris updates and baselines.

If you have distribution sources without the appropriate authentication information, you can add the user name and password the next time you log in to the console. You must log in to the console as the admin user or as a user with full permissions. After you log in the Authentication window opens. For example, if you have a Solaris agent installed and no authentication information has been supplied, the Authentication window automatically opens so that you can specify the user name and password you created when you registered with SunSolveSM. Another example is if you later install an agent on a Red Hat Linux system, the Authentication window opens to request authentication information for that source the next time you log in to the console. If the console is already started, you can edit the Authentication window. See "To Change User Name and Password for Authentication" on page 23.

Not all distributions require authentication to access binaries from the vendor source. Sun Update Connection – Enterprise contacts the following vendor sources to obtain binaries. Table 2–12 provides registration sites and addresses for vendor sources.

Vendor Source	Authorization Required?	Registration Sites
Solaris update and baselines are available from SunSolve.	Yes	http://sunsolve.sun.com
Red Hat Linux binaries are available from the Red Hat Network.	Yes	http://rhn.redhat.com
SUSE Linux Enterprise Server binaries	Yes	http://sdb.suse.de//download
SUSE binaries	No	Obtain from ftp://ftp.suse.com

TABLE 2-12 Authenticating and Registering With Vendor Sources

To Change User Name and Password for Authentication

This procedure provides steps to change the user name and password to match those you registered with at the vendor web sites. Use this procedure if you are logged in to the console.

1 In the console window, choose Authentication from the Tools menu.

The Authentication window is displayed.

- 2 To open the Authentication Editor window, select the source and click Edit.
- 3 Type the user name and password.

The Authentication Editor does not verify that the information you supply is correct. Therefore, ensure that you specify the exact user name and password that the vendor source needs, or the software download fails.

Gathering Information Before Installation

Use the following checklist to gather the information you need to install the Sun Update Connection – Enterprise components.

TABLE 2–13 Checklist for Installing the System Dependency Server

System	Information for Installation	Description	For More Information
	Sun Online Account	A Sun Online Account is used to download Solaris updates. If you have Solaris software installed on systems that you plan to manage with the Sun Update Connection – Enterprise solution, you must provide a Sun Online Account user name and password.	To get a Sun Online Account, go to http://www.sunsolve.sun.com
System dependency server	Choosing ezinstaller options	 You can choose a standard, secure, or a predefined channels installation. Standard - Installs the system dependency server. Secure - Installs the system dependency server and provides a secure installation with a secure password. 	
		 Predefined channels - Installs the system dependency server and provides an opportunity to activate channels. Use this option if you plan to add systems of different distributions later and want to create multidistribution profiles that include those systems when they are added to your environment. You can activate any channel from a list of all supported channels from the universal server. 	
System dependency server	Configuring Web proxies	 If Internet security is set up when you install the system dependency server, you can configure a web proxy at installation time. If Internet security is set up or changed after installation, you can configure the web proxy. 	 To configure a web proxy during installation, see "Installing the Proxy System Dependency Server" on page 35
			 To configure a web proxy after installation, see Chapter 6, "Configuring Web Proxies and Firewalls," in Sun Update Connection - Enterprise 1.0 Administration Guide

System	Information for Installation	Description	For More Information
System dependency server	Determining the host name or IP address	During installation, you must verify the local host name and domain or IP address.	
System dependency server	Deciding where to install the console files	You can keep the default path or type another directory name.	
System dependency server	Deciding which information to use for the SSL certificate	Sun recommends that you provide information about your organization, but you can use the provided Sun information.	
System dependency server	Setting ports between the universal server and components	 The default port between the following components and the universal server is 8002. Agent Console CLI API 	See "Reconfiguring Agent, Console, CLI, and APIParameters" in <i>Sun Update Connection -</i> <i>Enterprise 1.0</i> <i>Administration Guide</i>
		If port 8002 is not free on the local site, ports ranging from 8000 to 8100 are searched. You can set a different default.	
Console	Registering with vendors	Sun Update Connection – Enterprise enables you to download software components from vendor sources. You must register with most of these vendors. Authentication can be set up with the Authentication window on the console.	Table 2–12
Proxy system dependency server	Installation limitations	 You must have IP connectivity to the system dependency server. A system dependency server cannot be already installed on the proxy. 	

 TABLE 2-13 Checklist for Installing the System Dependency Server
 (Continued)

To define managed hosts before the systems are set up and the agent is installed, see Chapter 1, "Application Administration," in *Sun Update Connection - Enterprise 1.0 Administration Guide*.

Installing the System Dependency Server and Knowledge Base

This chapter explains the system dependency server installation process by using the ezinstaller screens. Step-by-step procedures are provided for the system dependency server and the proxy system dependency server. This chapter also provides step-by-step instructions to add packages to the Solaris knowledge base of the system dependency server. For information about ezinstaller commands, go to Appendix A.

The following topics are covered in this chapter:

- "Installing the System Dependency Server" on page 27
- "Installing the Proxy System Dependency Server" on page 35
- "Adding Solaris Software to the Knowledge Base" on page 36

Installing the System Dependency Server

The following procedures explain how to install the Sun Update Connection – Enterprise system dependency server or the proxy system dependency server with ezinstaller.

Navigating Through the ezinstaller Screens

Use the following keystrokes to navigate through the ezinstaller interface.

Task	Keystroke	
To exit	Press Esc.	
	 In the screens, select Cancel. Use Space to move between OK and Cancel. Select Cancel and then press Enter. 	

Task	Keystroke
To stop a process	Ctrl-s
To restart a process	Ctrl-q
To select an option	Space
To confirm a step in the process and continue to the	Press Enter
next window	Note – Do <i>not</i> press Enter more than one time per screen. If you confirm the screen too early, you might confirm configuration values you did not choose.
To scroll up and down, left and right	Arrow keys
To correct typed text on a screen	Use the arrow key to move to the end of the text. And then use the Backspace key
	Note – Do NOT use the Delete key. The Delete key exits the ezinstaller.

Unpacking Sun Update Connection – Enterprise Applications and Files

From the Sun Update Connection – Enterprise CD, the ezinstaller installs the following software. Expand the UCE-1.0.1-*number*.tgz file to access the ezinstaller application.

Note – In the tgz file name, *number* indicates a release build number.

Software	Description
Three applications in the system dependency server	 Server – Embedded web server that pulls certified updates from the universal server. The web server is installed in the /usr/local/uce/ server directory.
	 Knowledge base – Cache for downloadable packages and their deployment rules. The knowledge base is installed in the /usr/local/uce/ server directory.
	 Dependency manager – Agent management and database. The dependency manager is installed in the /usr/local/uce/engine directory.

1)

Software	Description	
Other files needed for	 An installation log. 	
installation, support, and backing up and restoring	 Installation tar files for the agent, console, CLI, and proxy system dependency server software. 	
	 Scripts to back up and restore system dependency server content. 	
	 Support tools. 	
	This software is installed in the /usr/local/uce/install directory.	

The following procedure provides step-by-step instructions on installing the system dependency server.

To Unpack the Installation Archive

- 1 Log in as superuser.
- 2 **Copy the** UCE-1.0.1-*number*.tgz file to a directory where you want to work.
- 3 Expand the contents of the tar file, for example:

```
# tar xPfzv UCE-1.0.1.165.tgz
```

The UCE-1.0.1-number directory is created. This directory contains all the files needed for installation.

Change to the UCE-1.0.1-number directory. 4

Installing the Sun Update Connection – Enterprise System Dependency Server

When an agent of a managed host with a new distribution registers on the system dependency server, channels are activated for distribution.

To Install the System Dependency Server

Before You Begin

Review Table 2–13 for information that you might need before installing. This table includes a description of installation options.

- Log in as superuser. 1
- 2 Change to the product directory where you expanded the tar file.
- 3 Decide how to start the installation.

For a standard installation, type:

./ezInstall

For a secure installation, type:

```
# ./ezInstall -s
```

Access to the universal server is verified first. Then you type your secure password twice.

Note – Correct mistakes by selecting Cancel and then selecting No. You are returned to a blank screen and can start over.

To predefine channels, type:

./ezInstall -channels

After you have entered information on the following screens regarding the license, a supported channels screen is displayed. This screen provides a list of all supported channels that you can activate.

The License Agreement screen is displayed.



4 To accept the terms of the license, select Accept.

The install installation screen is displayed.



5 Select Install Sun Update Connection – Enterprise.

The Preparing Installation screen is displayed.

p Enter full path to the	reparing I license f	nstallation ile:	 †
/tmp/license.lic∎ +			
< (K >	<cancel></cancel>	1

6 Type the full path name to the license file and select OK.

A screen is displayed that shows the progress of the retrieval of channel configuration information is displayed.



Caution – If ezinstaller could not connect to the universal server, you see the following message:

```
Failed to connect to Universal Server.
If you have a web proxy, configuring it might solve this problem.
Would you like to set up proxy settings?
```

If your local network has an HTTP web proxy server, the connection fails. You must configure your web proxy to pull the necessary files. In the screens, fill in the name of the web proxy server and the open port. After you have provided the information, ezinstaller configures Sun Update Connection – Enterprise to work with the proxy servers and tests the connections. After successfully accessing the universal server, the installation continues.

- For the standard installation, the Sun Online Account screen is then displayed. Continue with Step 7.
- For a predefining channels installation, a Preinstall Phase screen is displayed. This screen prepares the installation files. Then a Supported distributions screen is displayed.

Supported distributions	
[] Red Hat 7.2 IA-32	(not activ
[] Red Hat 7.3 IA-32	(not activ
[] Red Hat 8.0 IA-32	(not activ
[] Red Hat 9.0 IA-32	(not activ
[] Fedora Core 2 IA-32	(not activ
[] Red Hat EL 2.1 Advanced Server IA-32	(not activ
[] Red Hat EL 2.1 Enterprise Server IA-32	(not activ
[] Red Hat EL 2.1 Workstation Server IA-32	(not activ
[] Red Hat EL 3.0 Advanced Server IA-32	(not activ
[] Red Hat EL 3.0 Enterprise Server IA-32	(not activ
[] Red Hat EL 3.0 Workstation Server IA-32	(not activ
[] Red Hat EL 4.0 Workstation Server IA-32	(not activ
+	+
< OK > <cancel></cancel>	

a. Select one or more distributions to activate. You must activate at least one.

b. To apply your choices, press Enter. Continue with Step 8.

7 Specify the Sun Online Account user name.

The Sun Online Account information is used to download Solaris updates. Provide this information only if you plan to have Solaris manage hosts in your Sun Update Connection – Enterprise solution.

- If you do not support Solaris managed hosts, leave the field blank.
- If you specified your Sun Online Account user name, a screen prompts you to supply your Sun Online Account password.

The Preinstall Phase screen is displayed that prepares files for the installation. Then the Preparing Installation screen is displayed. This screen shows the local host name or IP address.



8 Ensure that the host name or IP address of the system dependency server is correct. If the default localhost.localdomain is incorrect, type the correct local host name and domain, or IP address.

The host name or IP address of the system dependency server is automatically included in the configuration files of the agents and consoles.

Note – If you need to correct typed text on a screen, do not use the Delete key. The Delete key exits the ezinstaller. Use the right arrow key to move to the end of the text and use Backspace.

The screen with the path to the console on Windows is displayed.

- 9 Decide to keep or change the default path on Windows where the console should be installed. The default path is C:\uce console.
 - To keep the default path, press Enter.
 - To change the path, use the Backspace to clear the default path and then type the new path.

The ezinstaller searches for matching SSL certificates.

Note – You might see a cursor under the ezinstaller screen for a moment. Do not press Enter or exit from ezinstaller. Wait for the command to return to the application after a few seconds.

The SSL certificate screen is displayed.



10 Specify information about your organization for the SSL certificate.

You can use the Sun information for the certificate that is displayed, but for your own security, you should provide information about your organization.

- If you select Yes, answer the questions for the SSL certificate. None of your information is released outside your network or to Sun Microsystems.
- If you select No, your SSL certificate is filled with Sun Microsystems information.

Note – The cursor appears at the bottom of the screen. Do not press Enter. Wait until the next screen is displayed.

The Preparing Installation screen that configures ports is displayed. This screen checks your connection from the local system to the universal server and configures the ports.

Note – If ezinstaller cannot find a direct outbound connection, you are offered various solutions.

The Installing System Dependency Server screen shows the progress of installation for the system dependency server. More screens are displayed that install the server components and prepare files for the agent, console, CLI, and proxy system dependency server.



The last screen notifies you that the Sun Update Connection – Enterprise software has been successfully installed.



- 11 To exit ezinstaller, press Enter. ezinstaller returns the terminal window to its default settings. After ezinstaller exits, a few second's delay might occur before the terminal is ready to accept input.
- **See Also** The system dependency server begins automatically, but if needed you can restart or check status, see Chapter 1, "Application Administration," in *Sun Update Connection Enterprise 1.0* Administration Guide.
 - If you need to balance network traffic or want to install other applications, see the following installations.
 - "Adding Solaris Software to the Knowledge Base" on page 36.
 - "Installing the Proxy System Dependency Server" on page 35.
 - "Installing the Agent, Console, or CLI" on page 39.

Installing the Proxy System Dependency Server

To balance your network traffic and server load, you can install the proxy system dependency server. Install the proxy on any system other than the one where the system dependency server is installed. Installation procedures of the proxy system dependency server are similar to the installation of the system dependency server.

To Install a Proxy System Dependency Server

Before You Begin

You must have successfully installed the system dependency server. The software has prepared the installation files that you use in this task. You must use the files prepared during the latest installation.

Note – The proxy system dependency server must have IP connectivity to the system dependency server system. The proxy must not have a system dependency server already installed.

- 1 On the system where you put the original tar file, log in as superuser.
- 2 Change to the directory that contains the Sun Update Connection Enterprise files. Then change to the UCE-1.0.1-number directory, for example.
 #cd UCE-1.0.1-165

The proxy-*date*.tar.gz file is in the list of files.

- 3 On the system where you intend to install the files, copy the proxy-date.tar.gz file.
- 4 Expand the tar file.

#tar xPfzv proxy-date.tar.gz

The file is expanded and creates the director_proxy subdirectory.

- 5 Change to the newly created subdirectory. #cd director_proxy
- 6 Start the installer.

#./Install

The installation screen is displayed.

Select opti	n: Install Sun Update Connection - Enterprise	+ .
+ 2	Uninstall Sun Update Connection - Enterprise	1
	Cancel>	+

7 Select Install Sun Update Connection – Enterprise.

The Preparing Installation screen is displayed.

Prep Enter full path to the li	o <mark>aring Installat</mark> i cense file:	on +
//tmp/license.lic +		
<mark>< 0K</mark>	> <cano< td=""><th>cel></th></cano<>	cel>

8 Continue with Step 6 in the procedure, "To Install the System Dependency Server" on page 29.

After the installer program exits, the proxy system dependency server is installed in /usr/local/uce/proxy.

- **See Also** The proxy system dependency server begins automatically, but if needed you can restart or check status, see Chapter 1, "Application Administration," in *Sun Update Connection Enterprise 1.0 Administration Guide*.
 - If you need to balance network traffic or want to install other applications, see the following installations.
 - "Adding Solaris Software to the Knowledge Base" on page 36.
 - "Installing the Agent, Console, or CLI" on page 39.

Adding Solaris Software to the Knowledge Base

You must add the Solaris software to the system dependency server for automated deployment and system management. This procedure adds the packages to the Solaris knowledge base of the system dependency server.

Repeat this procedure for each directory you have that contains Solaris subdirectories.

To Upload Solaris Software to the Knowledge Base

Before You Begin

Begin Ensure that the following steps have been taken.

• You must have NFS or direct access to the CD media. This procedure does not support FTP or HTTP.

The directories and files to be uploaded must be readable by the nobody user.

1 Open a browser.

2 In the Address field, type:

https://system-dependency-server-name-or-IP-address:8002/upload.html

The Solaris package upload window is displayed.



3 In the Package path text box, type the full path to the directories that contain the Solaris software.

Note – No recursive search exists, so the upload path must be only one level above the software directories.

In the following example, the /tmp/tmpdsol directory contains all the directories and contents copied from the Products directory on the CD or in the network installation image.

/tmp/tmpdsol

The Products directory contains subdirectories that contain packages such as the following:

- SUNWcg6.m
- SUNWeeuox
- SUNWgssx
- SUNWiiimu

4 Click Upload.

The packages are added to the Solaris knowledge base of the Sun Update Connection – Enterprise system dependency server. The browser window shows the automated actions: reading packages, adding packages, and searching for missing packages.

Repeat this procedure for each directory you have that contains Solaris subdirectories.

See Also To install other applications, see "Installing the Agent, Console, or CLI" on page 39.

♦ ♦ ♦ CHAPTER 4

Installing the Agent, Console, or CLI

This chapter provides step-by-step instructions to install an agent, the console for Linux, or the CLI. A separate procedure provides step-by-step instructions to install the console for Windows.

Installing Sun Update Connection – Enterprise Components

Use the following procedures to install an agent, a Linux console, or the CLI or install the console for Windows.

- "Installing the Agent, Console, or CLI" on page 39
- "Installing the Console for Windows" on page 42

Installing the Agent, Console, or CLI

In this procedure, you copy the installation files that were prepared when you ran ezinstaller and then use the installation scripts to install the following:

- The agent on every Linux or Solaris system that you intend to manage with Sun Update Connection Enterprise.
- The console on a Linux or Solaris system that you intend to use as the control center of Sun Update Connection – Enterprise.

Note – For enterprises that prefer to reserve the power of Linux or Solaris for servers only, a desktop console is designed for Microsoft Windows. See "Installing the Console for Windows" on page 42.

• The CLI on any system you choose.

▼ To Install the Agent, Console, or CLI

Before You Begin

You must have successfully installed the system dependency server. The software has prepared the installation files that you use in this task. You must use the files prepared during the latest installation. Agents and consoles that were installed earlier have noncompliant encryption keys.

- 1 Log in as superuser.
- 2 On the system where you placed the original tar file, change to the directory that contains the files. Then change to the UCE-1.0.1-number directory.

#cd UCE-1.0.3-185

The following files are in this directory:

- agent-date.tar.gz
- console-*date*.tar.gz
- cli-date.tar.gz

Note - In the tar.gz file, *date* indicates the month and day that the software was installed.

Perform the following steps for each system where you want to install the files.

3 On the system where you intend to install the files, copy one of the previous tar files.

4 Expand the file.

```
# gunzip agent-date.tar.gz
# tar xPfzv agent-date.tar
```

The file is expanded and creates one of the following subdirectories, depending on the tar file that you selected.

- agent-date
- console-date
- cli-date

Note - The date indicates the month and day that the software was installed.

5 Change to the newly created subdirectory and the directory to which you want to install, as in the following example.

#cd agent-date
cd uce_console

6 Start the installer.

#./Install

The installation screen is displayed.

7 Select the installation.

The installation begins and a progress bar is displayed.

When the installation is completed, a screen is displayed that indicates the installation is successful.



8 To exit the installation program, press Enter.

The installer program exits. The component that you installed is in the appropriate directories.

- Agent is installed in: /opt/local/uce/agent-date.
- The console is installed in: /usr/local/uce/console-date. Console configuration files that are specific to each user when a user first logs into the console are installed in ~/.uce_console/.
- The CLI is installed in: /usr/local/uce/cli-date. The CLI configuration files that are specific to each user are installed in ~/.uce_cli/.
- 9 The agent starts automatically. To start the console, type the following command on the console system:

uce_console

- 10 Use predefined jobs to check your systems for dependencies and withdrawn patches and update the system, as needed.
 - Check Systems Checks for missing or conflicting dependent components, according to the rules
 of the Knowledge Base of the selected distribution.
 - Check Withdrawn Patches (Solaris only) Checks installed patches against the Knowledge Base of the selected Solaris distribution, to see if Sun has withdrawn the patch.

Depending on the policy that you select, you can deploy, or simulate deployment, of predefined profiles in jobs. For information about defining a policy, see "Policies for Predefined Profiles" in *Sun Update Connection – Enterprise 1.0 User's Guide*

For information about using predefined profiles, see "Predefined Profiles in Jobs" in *Sun Update Connection – Enterprise 1.0 User's Guide*

See Also To start, stop, restart or check status of the agent, console, CLI, or SDS, see Chapter 1, "Application Administration," in Sun Update Connection - Enterprise 1.0 Administration Guide.

• To configure a broswer on the console, see Chapter 1, "Application Administration," in *Sun Update Connection - Enterprise 1.0 Administration Guide*.

- For automated deployment and system management, add the Solaris software to the system dependency server . See "To Upload Solaris Software to the Knowledge Base" on page 36.
- To install the console on a desktop, see "Installing the Console for Windows" on page 42.

Installing the Console for Windows

The following procedure installs the console control center on a desktop system running Microsoft Windows.

The following limitations pertain to a Windows console:

- You cannot upload local software through Windows. If this is the only console you are using, you can upload software with the CLI on a Linux system.
- The command to log in as a different user is not supported in the Windows console.

To Install Console for Windows

- 1 Log in as superuser.
- 2 On the system where you put the original files, change directories to the UCE-1.0.1-number directory.
- 3 Copy the console*.zip file to your Windows system.
- 4 Expand the zip file to the C: drive.

5 To start the installation, type:

C:\console\bin\uce_console.exe

A DOS window is displayed. Then the Sun Update Connection - Enterprise window is displayed.

Note – The login window might take some time to display. The time to display the window depends on how many channels you activated for the system dependency server and the network configuration.

Now configure the Windows browser for the console.

6 To see Incidents from the Component Information window, from the Tools menu, choose Preferences.

The Preferences window is displayed with the console Preferences open to the Files page.

7 Type the Path to the browser exe file and the browser exe file name.

The following example is for Microsoft Internet Explorer:

Path: c:\Program Files\Internet Explorer Browser: IEXPLORE.EXE

The following example is for Mozilla[™] Firefox:

Path: c:\Program Files\Mozilla Firefox
Browser:firefox.exe

8 Click Submit.

The Preferences Confirmation screen is displayed.

- 9 In the Preferences Confirmation screen, click Submit again. Then close the Preferences window.
- **10** To start the console, type the following command on the console system: # uce console
- **See Also** For the commands to start, stop, restart or check status of an application, see Chapter 1, "Application Administration," in *Sun Update Connection Enterprise 1.0 Administration Guide*.

• • • CHAPTER 5

Uninstalling Sun Update Connection – Enterprise Components

This chapter provides step-by-step procedures for uninstalling the system dependency server, agent, console, or CLI.

Uninstalling Sun Update Connection – Enterprise

Separate procedures uninstall the Sun Update Connection – Enterprise software:

- "To Uninstall the System Dependency Server" on page 45
- "To Uninstall Sun Update Connection Enterprise Agent, Console, or CLI" on page 46

To Uninstall the System Dependency Server

In this task, you uninstall the system dependency server and all libraries. When you uninstall the system dependency server, the software uninstalls both the knowledge base and the dependency manager.

1 Log in as superuser.

Start ezinstaller from the product directory where you expanded the tar file.

- 2 Start ezinstaller
 - # ./ezInstall

The Uninstall screen is displayed.

Select + +	opti	on: Install Sun Update <mark>Uninstall Sun Updat</mark>	Connection - Enterprise <mark>e Connection - Enterprise</mark>	
·		K DK >	<cancel></cancel>	

3 In the screen, select Uninstall.

A confirmation screen is displayed.

The complete Sun Update Connection - Enterprise suite and all files and libraries are removed.

4 To begin uninstallation, press Enter.

Uninstallation might seem to take a long time to begin. To avoid database corruptions, the system dependency server completes active tasks before ezinstaller shuts down the applications, then begins uninstalling the software.

When the process is complete, the Success screen is displayed.

5 To exit this screen, press Enter.

The Install or Uninstall option screen is displayed.

A confirmation screen appears.

6 To exit ezinstaller, press Enter.

A confirmation screen is displayed.

7 Select Yes.

The ezinstaller ends.

To Uninstall Sun Update Connection – Enterprise Agent, Console, or CLI

With this procedure, you can uninstall any of the following the Sun Update Connection – Enterprise components:

- Agent If you uninstall the agent, the agent's host system is disconnected from Sun Update Connection – Enterprise management
- Console
- Command-line interface from a non-system dependency server system

- 1 Log in as superuser.
- 2 Decide how to begin uninstalling the files.
 - If the original ezinstaller program is still on the managed host, start uninstalling.
 - # ./ezInstall
 - If the tar.gz file is not on this system, copy it and then start the installer.

a. Copy the tar.gz file from the system dependency server system and expand the files. To copy and expand the files, review Step 2 through Step 5 in "Installing the Agent, Console, or CLI" on page 39.

b. Start the installer.

./ezInstall

3 In the screen, select Uninstall.

A confirmation screen is displayed.

4 Press Enter.

When the process is complete, the Success screen is displayed.

5 To complete uninstalling, press Enter.

The Install or Uninstall option screen is displayed.

6 To exit ezinstaller, press Enter.

A confirmation screen is displayed.

7 Select Yes.

The ezinstaller ends.

◆ ◆ ◆ APPENDIXA

ezinstaller and Installer Commands

Agents and Console Install Commands

The following table lists commands needed to run the agent and console install programs.

Operation	Syntax
To expand Sun Update Connection – Enterprise tar file	tar xPfz UCE-version-release.tgz
Torunezinstaller	./UCE-version-release/ezInstall
To expand agent archive	tar xPfz agent- <i>mmdd</i> .tar.gz
To run installer for agent	./UCE-version-release/agent/Install
	(for command-line installation, add -i flag for install or -u flag for uninstall)
To expand console archive	tar xPfz console- <i>mmdd</i> .tar.gz
To run installer for console	./UCE-version-release/console/Install
	(for command-line installation, add -i flag for install or -u flag for uninstall)
To expand CLI archive	tar xPfz cli- <mmdd>.tar.gz</mmdd>
To run installer for CLI	./UCE-version-release/cli/Install
	(for command-line installation, add -i flag for install or -u flag for uninstall)
To expand Proxy SDS archive	tar xPfz proxy-mmdd.tar.gz
To run installer for Proxy SDS	.UCE-version-release/uce_proxy/Install

TABLE A-1 ezinstaller and Installer Program Commands

Index

A

agent flowchart, 14 installation, 39 system requirements, 19 uninstalling, 46

С

CLI, see command-line, 39 command-line (CLI) flowchart, 14 installation, 39 uninstalling, 46 console flowchart, 14 installation, 39 uninstalling, 46 console for Windows flowchart, 15 installation, 42

D

disk space system requirements, 18, 19

F

files, unpacking, 28

I

installation, system requirements, 18installation overview, 9installing Solaris software, knowledge base, 36

Κ

knowledge base installation, 28, 36 uploading Solaris packages, flowchart, 13

Μ

memory requirements, 18

0

overview, installation, 9

Ρ

platforms, system requirements, 18, 19 proxy system dependency server, installation, 35

S

S/390 requirements, 18, 19

site architecture, overview, 9 system architecture, requirements, 18 system dependency server files list, 28 flowchart, 11 installation, 29 installing knowledge base, 36 uninstalling, 45 uploading knowledge base, flowchart, 13 system dependency server, proxy, 35 system requirements disk space, 18, 19 memory, 18 Operating System, 19 platform, 18 agents, 19 system architecture, 18

U

uninstalling agent, 46 command-line (CLI), 46 console, 46 dependency manager, 45 knowledge base, 45 system dependency server, 45 universal server, detect connection, 34 unpacking files, 28

Χ

X Emulator, 18