TransPath System Installation Guide

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About This Guide

Purpose

The *Installation Guide* provides instructions for the installation of the TransPath system on a Sun Ultra or Netra PCI-based server running Solaris 2.5.1. This guide also covers procedures for installing the TransPath system on a dual Sun configuration. Included in this guide is information on the hardware and software needed to install the TransPath system. Also included are advanced topics relating to log and system configuration files and installation trouble-shooting.

What You Need To Know

The *Installation Guide* is intended for two different audiences, the System Administrator and the Installation Technician. The System Administrator participates in the installation of the TransPath system software by handling the high-end host administrative prerequisite functions, such as setting the parameters, assigning group privileges, and creating user IDs. Installation Technicians perform both the installation and configuration of the application software. These technicians must, therefore, be familiar with the following:

- How to install computer software
- Meanings of computer terminology and concepts
- Workings of a hierarchical file system
- Executing common UNIX shell commands
- Creating log and system configurations
- *TransPath System Software Operations/Maintenance Guide*

How this Guide is Organized

This Guide is divided into the following sections:

1. Overview of the TransPath System	Describes hardware and software components and environment necessary for installing the TransPath system.
2. Host Computer Preparation	Contains pre-installation hardware and software checklists. This section also describes how to install the TransPath system software from a CD-ROM drive onto a Sun Ultra/Netra PCI-based server.
3. TransPath System Installation Procedures	Describes how to install and un-install the TransPath system.
4. Reference Materials	Lists the manuals necessary to install the TransPath system.

General Conventions

The following type changes and symbols are used in this guide:

Typeface	Description	Examples
`AaBbCc123`	Command names, file and directory names, and on screen computer output	To log on from a remote site use `rlogin` To list all files use `ls -a`
`AaBbCc123`	Entries typed, contrasted with on-screen computer output	`system% su` `Password:`
`AaBbCc123`	Command-line placeholder: replace with a real name or value	To delete a file, type `rm filename`
AaBbCc123	Book titles, new words or terms, or words to be emphasized	Please refer to Chapter 3 of *the TransPath System Configurable Number Manipulation Guide*.
Symbol	**Meaning**	**Example**
%	UNIX C shell prompt	`system%`
$	UNIX Bourne or Korn shell prompt	$
#	Superuser prompt - all shells	#

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1. Overview of the *TransPath* System

The TransPath system product is a software-based *Any to Any* protocol converter. Several possible configurations exist, for different host platforms and adjunct equipment that is a part of the functional installation. This release of the TransPath system software supports either a single or dual Sun Ultra or Netra PCI-based platform, using a non-redundant multiplexer with associated support I/O hardware.

The Sun servers are a UNIX computing platform designed for complex application software. It can be equipped with up to four RISC processors operating at speeds of up to 300 MHz, running the Sun Solaris 2.5.1 operating system. The hardware architecture incorporates a proprietary motherboard that uses dual RS-232 ports and up to ten PCI card slots.

The motherboard based RS-232 ports provide the host computer with asynchronous serial support for interconnection between the Sun and a terminal as well as between the Sun and the Alarm Relay Unit. A third RS232 asynchronous connection is obtained from a serial port extender.

The role of the multiplexer in a TransPath system installation is to facilitate grooming of the control channels from the appropriate timeslot of the interconnected DS1 facilities and to incorporate all such control channels into the timeslots (typically used for bearer channels in traditional use of DS1 facilities) in the E1 facilities that are connected to the I/O cards in the host computer.

The multiplexer or cross connect system should consist of an eleven slot card shelf that can host up to eight peripheral cards and three non-peripheral cards. Because this configuration requires only one of the non-peripheral slots for a System Controller card, the second slot may be used for a bus extender card, allowing interconnection with a second shelf, and the third slot may be used for a General Facilities Card with alarm contacts. This provides a maximum capacity of sixteen (16) dual DS1 Input/Output cards in standard operating configuration.

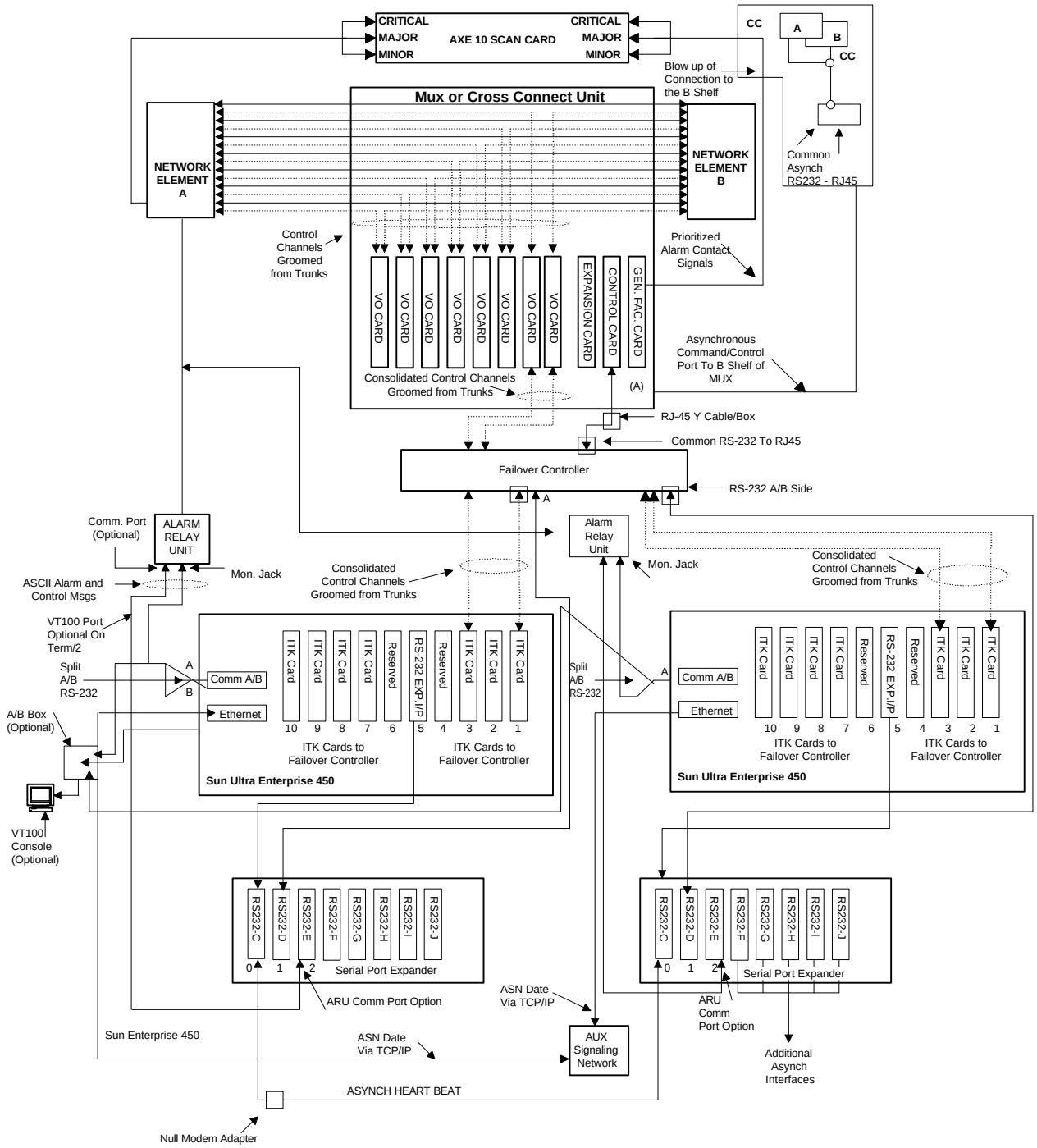
The I/O cards transport the control channels (groomed through E1s by the MUX) between this system and the Sun.

The schematics on the following pages depict the hardware components, using a Sun Ultra Enterprise 450) and their respective interconnection relationships associated with the configurations supported by this release of the TransPath system software.

The illustrated configurations support "through" connection for 7 E1s, representing 210 bearer channels. While this would be well within the capability of a single I/O card on the host computer terminal, two are illustrated to permit splitting between two devices to avoid a single point of failure.

Figure 1-1

TransPath System Configuration For a Dual Sun PCI Installation



2. Host Computer Preparation

Following are the minimum system requirements needed to install and operate the TransPath system.

2.1 Sun Ultra/ Netra Requirements

The minimum Sun system hardware requirements for the installation and operation of TransPath system software include the following:

1. 167 MHz Processor or greater
2. 128 MB of RAM
3. One 4 GB Internal Disk Drives
4. 10 Mbit Ethernet
5. At least two PCI Expansion Slots
6. Two RS232 Asynchronous Ports
7. A CD-ROM drive
8. Solaris 2.5.1 Operating System
9. Installation documentation as provided by Sun

2.2 Operating System Software Requirements

NOTE: *Prior to loading any software, TransPath system or other, the UNIX system must be installed on the target platform. When loading the software, the system will query as to the type of system you want to install. From the list of possible configurations, select the* ***End User****. By choosing this option, UNIX automatically loads all of the files required to run the TransPath system.*

The minimum Sun system software requirements for the installation and operation of TransPath system software include the following:

1. The Sun Solaris 2.5.1 operating system must be correctly pre-loaded before attempting to install the TransPath system software. This includes all of the required peripheral hardware and software for I/O Cards and LAN/WAN connectivity.

2. Prior to software installation, the System Administrator is required to perform the following high-end host administrative prerequisite functions:

    - Setting the minimum parameters
    - Granting Group IDs
    - Granting User IDs

2.3 MUX or Cross Connect Requirements

If the Sun configuration being installed includes a Mux or cross connect, the prerequisites for configuring the unit require that the installation technician have available the appropriate installation manual for that unit.

2.4 ITK PCI E1 I/O Card Preparation

Prior to installing the TransPath system, the I/O cards must be installed and fully operational. For the Sun installation with a PCI configuration, ITK PCI E1 I/O cards are used.

Requirements for Installation

Note: When installing ITK cards in a Sun, do not put the ITK cards in slots 3, 4, or 5.

1. An ITK PCI E1 I/O card for Solaris 2.5 or higher.

2. There should be at least one free slot for the installation of a long PCI board.

3. The installation procedures for the ITK PCI E1 I/O board is found in the ITK PCI E1 I/O Installation Guide Version 1.0, which was enclosed with the boards.

3. One free interrupt (IRQ), assigned by BIOS during the power-up. The ITK PCI E1 I/O card supported the shared interrupt. This technique makes it possible for several ITK PCI E1 I/O cards and cards of other manufacturers to share one hardware interrupt (IRQ).

4. An unused memory area for data exchange between the ITK PCI E1 I/O card and the server.

5. A free I/O area.

7. The software is included on the "ITK PCI E1 Driver" CD-ROM from Cisco Systems. The installation of which is included in Section 3.3 *TransPath System Software Installation*.

2.5 Alarm Relay Unit Preparation

The Alarm Relay Unit must be installed and operational prior to the installation of the TransPath system.

2.5.1 Basic Functionality

The Alarm Relay Unit (ARU) is a general purpose ASCII to Relay closure and Relay closure to ASCII product that works with either locally attached or modem attached devices. For this
release of the TransPath system, Cisco Systems provides an ARU. This device supports the alarming functions required in this version of the TransPath system.

2.5.2 Hardware Configurations

There are two basic configurations. In the first, all alarms from the TransPath system and the MUX are consolidated through the ARU. In the second, the alarms from the MUX bypass the ARU and go directly to the office facility.

Option 1 - Consolidated Alarming from the TransPath system and the MUX

This option provides for consolidated alarm feeds from the TransPath system and the MUX (or other auxiliary equipment).

Option 2 - Bypass Alarming from the TransPath system and the MUX

This option provides for separate alarm feeds from the TransPath system and the MUX or other auxiliary equipment).

Figure 2-1
Option 1 - Consolidated Alarming from the TransPath system and the MUX (or other auxiliary equipment)

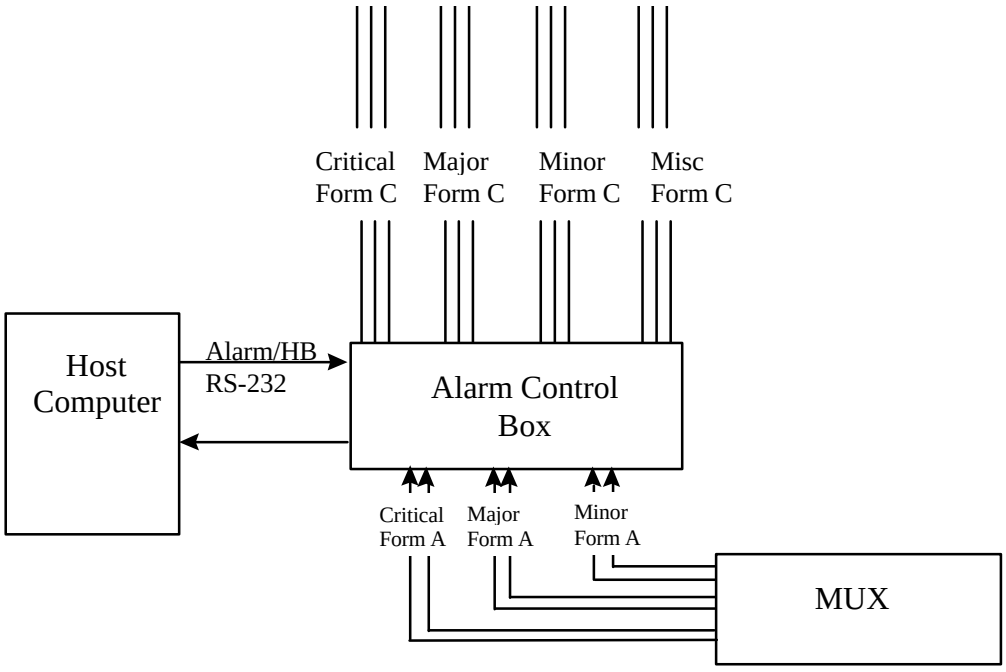
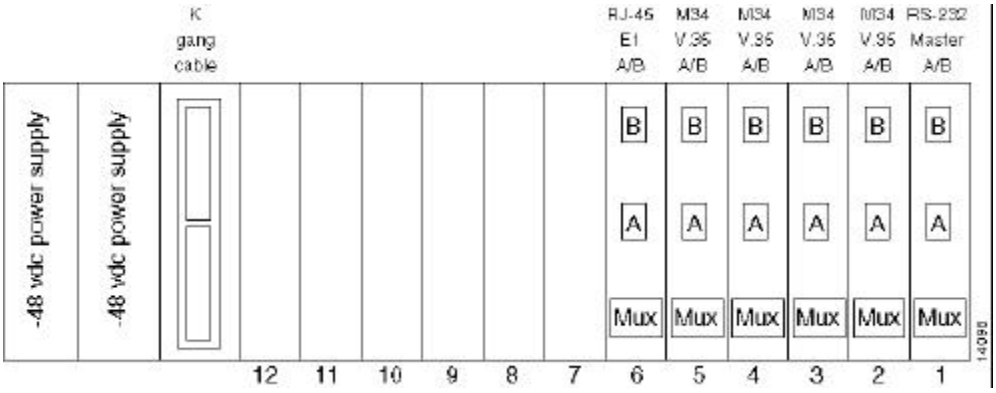


Figure 2-2
Option 2 - Separate Alarm Feeds from the TransPath system and the MUX



2.5.3 Required Hardware

Item	Description
One alarm relay unit	-48VDC (19" rack mount, 1VRU (1.75"), configured by Cisco Systems to support section 3 message protocol.
Asynchronous ports	The TransPath system asynch components (Heartbeat, A/B switch and ARU) can connect to the following positions on the eight port expander: 0 /dev/cua/a000 failover heartbeat connector (to other TransPath system) 1 /dev/cua/a001 A/B switch 2 /dev/cua/a002 ARU MON (ASCII alarm inputs from TransPath system) 3 /dev/cua/a003 ARU COM (ARU Console - programming & monitoring)
Cables	Two 12-ft. RS232 cables for connecting the alarm relay unit with the TransPath system plus INFO. Cables for the physical alarm relay connections.

2.6 Failover System Preparation

If Failover is to be utilized, the Failover System must be installed and operational prior to the installation of the TransPath system.

2.6.1 Basic Functionality

For this release of the TransPath system, Cisco Systems provides various products to implement Failover control and switching of data and control links in a dual computer configuration.

2.6.2 Hardware Configurations

The Failover controller consists of a card cage or nest filled with switching cards. There is a special cable, a971022B part number, required to *gang* together all of the switching cards. Because Cisco Systems uses a RS232 lead sensing A/B switch as a master and either the RJ-45 or M34 (V.35) A/B switches as slaves. If required, additional RS232 (DB25) A/B switches can be configured. The cards are hot-swappable.

The nest is available in either AC, DC, or redundant DC power configurations. The nest has twelve card slots for up to twelve A/B switches. The gang cable sets up the twelve slots as:

Slot 1	Master
Slots 2 -9	Slave (of slot 1)
Slots 10 - 12	Independent

Slot 1 is used to switch slots 1-9 to either A or B.

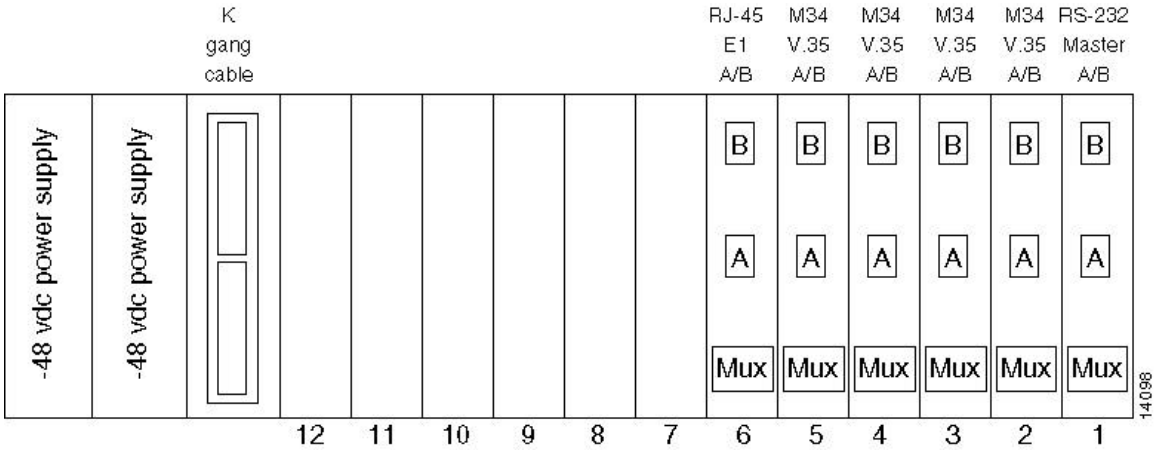
In the Cisco Systems failover controller, the RS232 switching card in Slot 1 provides dual functionality. First, it provides the event monitoring~~in~~ this case serial bus sensing~~th~~at triggers the switchover. Second, it provides switching of the RS232 connection between the MUX and the two host computer platforms.

2.6.3 Sample Configuration Diagram

Each A/B card has a three-position manual control switch that is accessible from the front of the rack mount enclosure. For the Failover functionality to work the Manual control switches, all of the cards must be in the AUTO position.

The following sample configuration illustrates a Dual -48vdc power supplies a Master RS232 Lead Sensing switching card in slot 1; four V.35 connections in slots 2, 3, 4, and 5; and one 120 ohm connection switching card in slot 6.

Figure 2-3



Rear View of Failover Nest

2.6.4 Required Hardware

One Failover controller with 48 vdc (19" rack mount, 5U (8.75")), configured by Cisco Systems to support section 3 message protocol.

Two RJ-45 Switching Cards per E1 (total of four cards)

One RS232 Lead Sensing Switching Card

One RJ-45 Switching Card

Cables (Two 12 ft. RS232 cables for connecting the Failover Controller with the TransPath system and one Gang cable)

3. TransPath System Installation Procedures

3.1 TransPath System Hardware and Software Checklist

The following list applies to both a single or dual SUN configuration. If you have a dual SUN configuration, you need to repeat the following software installation procedures on target SUN server.

1.	Solaris 2.5.1 software (end user option)
2.	A minimum of 2.2 GB of disk space should be allocated for the TransPath system application, related log files, and future release considerations: a) A minimum of 600 MB should be allocated for the TransPath system. b) A minimum of 1 GB disk space should be allocated for log files. Actual amount of space is dependent upon expected usage and can be allocated as needed. c) A minimum of 600 MB should be allocated for release updates to the software.
3.	Make the `/var` directory capable of storing at least 256 MB.
4.	Make the `/opt/transpath` directory capable of storing at least 2.2 GB.
5.	At least one ITK PCI E1 I/O card must be installed prior to any TransPath system software installation.
6.	The ITK PCI E1 I/O card driver software must be installed prior to any TransPath system software installation.
7.	A CD-ROM drive must be set up and operational before installing any TransPath system software on to the system.
8.	Three Cisco Systems, Inc. CD-ROM disks containing the TransPath system Application, I/O Card Drivers, and Utilities software.

3.2 TransPath System Administrator Checklist

Prior to software installation, the System Administrator is required to satisfy high-end host administrative prerequisite functions. They include the following:

1.	Set parameters
2.	Set group ID access privileges
3.	Set user ID access privileges

3.3 TransPath System Software Installation

If at any time during the installation process you encounter problems, please call the Cisco Systems Technical Assistance Center (TAC) at +1.800.553.2447, or at +1.408.526.7209 for international calls.

3.3.1 Installation Preparation

1.	Log in as: `root`
2.	Have the three (3) TransPath system installation CD-ROM disks ready for loading into the CD-ROM drive: Utilities Disk: Utilities Contains the supplemental utilities for TransPath system maintenance and support. This package contains PERL and the GNU libg++ and stdc shared libraries. Drivers Disk: I/O Card Drivers Contains the drivers for the ITK PCI E1 I/O card TransPath system Disk: TransPath system Application TransPath system software contains binary and configuration files.

3.3.2 Installing the Utilities

1.	Load the Utilities CD-ROM, into your CD-ROM drive. The CD will automatically load in `/cdrom` by the UNIX Volume Manager daemon.
2.	Enter the command: `cd /cdrom/cdrom0`
3.	Enter the command: `./install.sh`

4.	The system will respond in a fashion similar to (NOTE: The package names will vary by version):
	`The following packages are available:`
	`1 TransUtil TransPath Utilities`
	`(sparc) version 12FG Build 9`
	`Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]:`
	
	When the prompt appears, enter 1 to process the package.

5.	The system will respond with: `Enter base directory path (default /opt) [?,q]` When this prompt appears, hit the enter key.

6.	The system will respond with: `Do you want to continue with the installation of <TransUtil> [y,n,?]` When the prompt appears, enter y to continue the processing of the package.
7.	Enter the command: `cd /`
8.	Enter the command: `eject cdrom` Remove the TransPath system CD-ROM and place it in a safe place.
9.	Congratulations! You have successfully installed the Utilities disk: Utilities containing the utilities for the TransPath system.

3.3.3 Installing TransPath System Software

1.	Load the TransPath system Application CD-ROM, into your CD-ROM drive. The CD will automatically load in `/cdrom` by the UNIX Volume Manager daemon.
2.	Enter the command: `cd /cdrom/cdrom0`
3.	Enter the command: `./install.sh`

4.	The system will respond with something similar to (NOTE: The package names will vary by version):
	`The following packages are available:`
	`  1 AA00P12FG  TransPath Core System Components (sparc) version 12FG Build 9`
	`Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]:`
	When the prompt appears, enter y to continue the processing of the package.

5.	The system will respond with : `Enter base directory path (default /opt) [?,q]` When this prompt appears, hit the enter key.

6.	The system will respond with :
	
	`This package contains scripts that will be executed with super-user permission during the process of installing this package.`
	
	`Do you want to continue with the installation of <AA00P12FG> [y,n,?]`
	
	When the prompt appears, enter y to continue the processing of the package.
	
	The system will respond with :
	
	`Installation of <AA00P12FG> was successful.`
	
	Note: At this point the system will automatically begin to load the next package in the Installation. Repeat steps 4-6 until you are returned to the system prompt. Also note, that occasionally the installation process will request a change to the UNIX UID/GID. You should respond "Y" to this.

7.	Enter the command: `cd /`
8.	Enter the command: `eject cdrom` Remove the TransPath system Application CD-ROM and place it in a safe place.
Congratulations! You have successfully installed the CD-ROM: TransPath system Application containing the application for TransPath system.	

3.3.4 Installing the Drivers

1.	Load the I/O Card Drivers CD-ROM, into your CD-ROM drive. The CD will automatically load in `/cdrom` by the UNIX Volume Manager daemon.
2.	Enter the command: `cd /cdrom/cdrom0`
3.	Enter the command: `./install.sh`

4.	The system will respond with something similar to (NOTE: The package names will vary by version):
	
	`The following packages are available:`
	`1 ITK12FG ITK PCI E1 Driver`
	`(sparc) version 12FG Build 7`
	
	`Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]:`
	
	When the prompt appears, enter 1 to process the package.

5.	The system will respond with: `Enter base directory path (default /opt) [?,q]` When this prompt appears, hit the enter key.

6.	The system will respond with:
	
	`This package contains scripts which will be executed with super-user permission during the process of installing this package.`
	
	`Do you want to continue with the installation of <ITK12FG> [y,n,?]`
	
	When the prompt appears, enter y to continue the processing of the package.
	
	The system will respond with :
	`Installation of <ITK12FG> was successful.`
	
	***Note**: At this point the system will automatically reboot.*

7.	Log in as: `root`
8.	Enter the command: `eject cdrom` Remove the I/O Card Drivers CD-ROM and place it in a safe place.
9.	Congratulations! You have successfully installed the Drivers disk: I/O Card Drivers containing the I/O card drivers for *TransPath*.

3.3.5 Un-installing TransPath System Software

1.	Load the TransPath system Application CD-ROM, into your CD-ROM drive. The CD will automatically load in `/cdrom` by the UNIX Volume Manager daemon. **Note:** This action will delete all TransPath system components and data files. If you wish to save your site specific configuration data files, you should back them up to a safe location.
2.	Enter the command: `cd /cdrom/cdrom0`
3.	Enter the command: `./uninstall.sh`

4.	The system will respond in a similar fashion to (NOTE: The package names will vary by version):
	
	`The following package is currently installed:`
	` AA00P12FG  TransPath Core System Components (sparc) version 12FG Build 9`
	
	`Do you want to remove this package?`
	When the prompt appears, enter y to continue the processing of the package.

5.	The system will respond with : `## Removing installed package instance <AA00P12FG>`

6.	The system will respond with :
	
	`This package contains scripts that will be executed with super-user permission during the process of installing this package.`
	
	`Do you want to continue with the removal of <AA00P12FG> [y,n,?]`
	
	When the prompt appears, enter y to continue the processing of the package.
	
	The system will respond with :
	
	`Removal of <AA00P12FG> was successful.`
	
	NOTE: At this point the system will automatically begin to load the next package in the Un-Installation. Repeat steps 4-6 until you are returned to the system prompt.

7.	Enter the command: `cd /`
8.	Enter the command: `eject cdrom` Remove the TransPath system Application CD-ROM and place it in a safe place.
Congratulations! You have successfully uninstalled the TransPath system Application.	

3.3.6 Un-Installing the Drivers

1.	Load the I/O Card Drivers CD-ROM, into your CD-ROM drive. The CD will automatically load in `/cdrom` by the UNIX Volume Manager daemon.
2.	Enter the command: `cd /cdrom/cdrom0`
3.	Enter the command: `./uninstall.sh`

4.	The system will respond with something similar to (Remember: The package names will vary by version) :
	
	`The following package is currently installed:`
	`1 ITK12FG ITK PCI E1 Driver`
	`(sparc) version 12FG Build 7`
	
	`Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]:`
	
	When the prompt appears, enter 1 to process the package.

5.	The system will respond with : `## Removing installed package instance <ITK12FG>`

6.	The system will respond with :
	
	`This package contains scripts that will be executed with super-user permission during the process of installing this package.`
	
	`Do you want to continue with the removal of <ITKP12FG> [y,n,?]`
	
	When the prompt appears, enter y to continue the processing of the package.
	
	The system will respond with :
	
	`Removal of <ITKP12FG> was successful.`

7.	Enter the command: `cd /`
8.	Enter the command: `eject cdrom` Remove the I/O Card Drivers CD-ROM and place it in a safe place.
Congratulations! You have successfully uninstalled the Drivers disk: I/O Card Drivers containing the I/O card drivers for TransPath system.	

3.3.7 Un-Installing the Utilities

1.	Load the TransPath system Utilities CD-ROM, into your CD-ROM drive. The CD will automatically load in `/cdrom` by the UNIX Volume Manager daemon. *NOTE: This action will remove everything in the `/opt/TransPath` directory tree.*
2.	Enter the command: `cd /cdrom/cdrom0`

3.	Enter the command: `./uninstall.sh`

4.	The system will respond with something similar to (Remember: The package names will vary by version) :
	
	`The following package is currently installed:`
	`1 TransUtil  TransPath Utilities`
	`(sparc) version 12FG Build 9`
	
	`Select package(s) you wish to process (or 'all' to process all packages). (default: all) [?,??,q]:`
	
	When the prompt appears, enter 1 to process the package.

5.	The system will respond with : `## Removing installed package instance <TransUtil>`

6.	The system will respond with :
	
	`This package contains scripts that will be executed with super-user permission during the process of installing this package.`
	
	`Do you want to continue with the removal of <TransUtil> [y,n,?]`
	
	When the prompt appears, enter y to continue the processing of the package.
	
	The system will respond with :
	
	`Removal of <TransUtil> was successful.`

7.	Enter the command: `cd /`
8.	Enter the command: `eject cdrom` Remove the TransPath system Utilities CD-ROM and place it in a safe place.
Congratulations! You have successfully uninstalled the Utilities disk: Utilities containing the utilities for TransPath system.	

4. Reference Materials

Document	Part Number	Release
Cisco Systems Documentation		
TransPath System Software Operations/Maintenance Guide	78-5435-01	P1.02.00
ITK Documentation		
ix1-primary PCI Installation Guide		Version 1.0
Cheyenne Documentation		
ARCServe for Windows NT User Guide		Version 6

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