Transaction Encryption Device 3.0

Installation and Operation Guide

Please Read

Important

Please read this entire guide. If this guide provides installation or operation
instructions, give particular attention to all safety statements included in this guide.

Notices

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Contents

Safety Precautions

Read, Retain, and Follow These Instructions

Carefully read all safety and operating instructions before operating this product. Follow all operating instructions that accompany this product. Retain the instructions for future use. Give particular attention to all safety precautions.

Warning and Caution Icons

> ⚠ **WARNING:**
>
> **Avoid personal injury and product damage! Do not proceed beyond any icon until you fully understand the indicated conditions.**

The following icons alert you to important information about the safe operation of this product:

⚠ You will find this icon in the literature that accompanies this product. This icon indicates important operating or maintenance instructions.

⚡ You may find this icon affixed to this product and in this document to alert you of electrical safety hazards. On this product, this icon indicates a live terminal; the arrowhead points to the terminal device.

⏚ You may find this icon affixed to this product. This icon indicates a protective earth terminal.

♨ You may find this icon affixed to this product. This icon indicates excessive or dangerous heat.

☢ You may find this symbol affixed to this product and in this document. This symbol indicates an infrared laser that transmits intensity-modulated light and emits invisible laser radiation and an LED that transmits intensity-modulated light.

Heed All Warnings

Adhere to all warnings on the product and in the operating instructions.

Avoid Electric Shock

Follow the instructions in this warning.

> ⚡ **WARNING:**
>
> **To reduce risk of electric shock, perform only the instructions that are included in the operating instructions. Refer all servicing to qualified service personnel.**

Servicing

> ⚠ **WARNING:**
>
> **Avoid electric shock! Opening or removing the cover may expose you to dangerous voltages.**

Do not open the cover of this product and attempt service unless instructed to do so in the operating instructions. Refer all servicing to qualified personnel only.

Cleaning, Water, Moisture, Open Flame

To protect this product against damage from moisture and open flames, do the following:

- Before cleaning, unplug this product from the AC outlet. Do *not* use liquid or aerosol cleaners. Use a dry cloth for cleaning.
- Do not expose this product to moisture.
- Do not place this product on a wet surface or spill liquids on or near this product.
- Do not place or use candles or other open flames near or on this product.

Ventilation

To protect this product against damage from overheating, do the following:

- This product has openings for ventilation to protect it from overheating. To ensure product reliability, do not block or cover these openings.
- Do not open this product unless otherwise instructed to do so.
- Do not push objects through openings in the product or enclosure.

Placement

To protect this product against damage from breakage, do the following:

- Place this product close enough to a mains AC outlet to accommodate the length of the product power cord.
- Route all power supply cords so that people cannot walk on, or place objects on, or lean objects against them. This can pinch or damage the cords. Pay particular attention to cords at plugs, outlets, and the points where the cords exit the product.
- Make sure the mounting surface or rack is stable and can support the size and weight of this product.

> ⚠ **WARNING:**
>
> **Avoid personal injury and damage to this product! An unstable surface may cause this product to fall.**

When moving a cart that contains this product, check for any of the following possible hazards:

■ Move the cart slowly and carefully. If the cart does not move easily, this condition may indicate obstructions or cables that you may need to disconnect before moving this cart to another location.

■ Avoid quick stops and starts when moving the cart.

■ Check for uneven floor surfaces such as cracks or cables and cords.

> **WARNING:**
>
> **Avoid personal injury and damage to this product! Move any appliance and cart combination with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart to overturn.**

Fuse

When replacing a fuse, heed the following warnings.

> **WARNING:**
>
> **Avoid electric shock! Always disconnect all power cables before you change a fuse.**

> **WARNING:**
>
> **Avoid product damage! Always use a fuse that has the correct type and rating. The correct type and rating are indicated on this product.**

Grounding This Product (U.S.A. and Canada Only)

Safety Plugs

If this product is equipped with either a three-prong (grounding pin) safety plug or a two-prong (polarized) safety plug, do not defeat the safety purpose of the polarized or grounding-type plug. Follow these safety guidelines to properly ground this product:

■ For a 3-prong plug (consists of two blades and a third grounding prong), insert the plug into a grounded mains, 3-prong outlet.

   Note: This plug fits only one way. The grounding prong is provided for your safety. If you are unable to insert this plug fully into the outlet, contact your electrician to replace your obsolete outlet.

■ For a 2-prong plug (consists of one wide blade and one narrow blade), insert the plug into a polarized mains, 2-prong outlet in which one socket is wider than the other.

Note: If you are unable to insert this plug fully into the outlet, try reversing the plug. The wide blade is provided for your safety. If the plug still fails to fit, contact an electrician to replace your obsolete outlet.

Grounding Terminal

If this product is equipped with an external grounding terminal, attach one end of an 18-gauge wire (or larger) to the grounding terminal; then, attach the other end of the wire to an earth ground, such as an equipment rack that is grounded.

20050727 Headend/Rack

FCC Compliance

Where this equipment is subject to U.S.A. FCC and/or Industry Canada rules, the following statements apply.

United States FCC Compliance

This device has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against such interference when this equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

Canada EMI Regulation

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la class A est conforme à la norme NMB-003 du Canada.

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About This Guide

Introduction

This guide describes the Transaction Encryption Device (TED 3.0) server, details what you need to successfully install the TED server, and provides a process overview. This guide also provides hardware installation instructions, and standard instructions for properly powering down, powering up, and rebooting the TED server.

Purpose

Use this guide when you are completing the following tasks:

- Installing a new TED 3.0 server in your network

- Replacing an existing TED server with a new TED 3.0 server

- Initializing a back-up TED 3.0 server

Audience

This guide provides network system administrators, DNCS/ISDS operators, and field engineers with instructions for installing the TED 3.0 server. These administrators should have extensive working experience within their network architecture and with using UNIX text editors.

System Requirements

Your system must have the correct DNCS/ISDS software to use the TED 3.0 in your network. Contact Cisco® Services if you are not sure about the DNCS/ISDS software installed on your system.

Site Requirements

To successfully install the TED 3.0 server in your headend, your site must contain the following specifications:

- A Universal Power System (UPS) back-up power system

- An environment that is air-conditioned with an operating temperature of 0°C (32°F) to 55°C (131°F)

- The TED 3.0 server should be located in a area with restricted access for security

Document Version

This is the fifth formal release of this document. In addition to minor text and graphic changes, the following table provides the technical changes to this document.

Description	See Topic
Added Appendix D to describe the kernel panic feature that allows the TED server to capture crucial troubleshooting information when it encounters an error from which it cannot recover.	*Kernel Panic Feature* (on page 59)

1

Introducing the TED Server

Introduction

This chapter provides an overview of the TED server and diagrams of the front and back panels. In addition, this chapter provides a theory of operation for the TED server, which presents topics such as the encryption process and the PowerKEY® Conditional Access.

In This Chapter

TED Server Overview

This section provides a detailed description of the TED 3.0 server and a diagram of the front and back panels of the TED 3.0 server.

Description

The TED 3.0 is a NEBS-compliant server that provides a security feature for allowing selective access to secured broadcast services, pay-per-view (PPV) services, impulse pay-per-view (IPPV) services, and video-on-demand (VOD) services. This security feature is known as *encryption*, which only allows authorized set-tops access to secured services.

TED Server Front and Back Panels

The following diagram shows the front and back panels of the TED 3.0 server.

TED 3.0 Server Front Panel

TED 3.0 Server Front Panel (Open)

TED 3.0 Server Back Panel

Theory of Operation

To successfully understand how the TED server operates in the network, this section provides a flow chart of the encryption process, describes PowerKEY Conditional Access (CA), and includes a diagram of the network.

Encryption Process Flow Chart

Encryption of a requested service ensures the privacy of the delivered service to the authorized set-top. Once the PowerKEY system secures the service, only an authorized set-top can access the service. The encryption process benefits the service provider by providing a basis for protecting the access of secured services requested by the subscriber.

Process Flow Chart

The following flow chart summarizes the EMM encryption and transmission process.
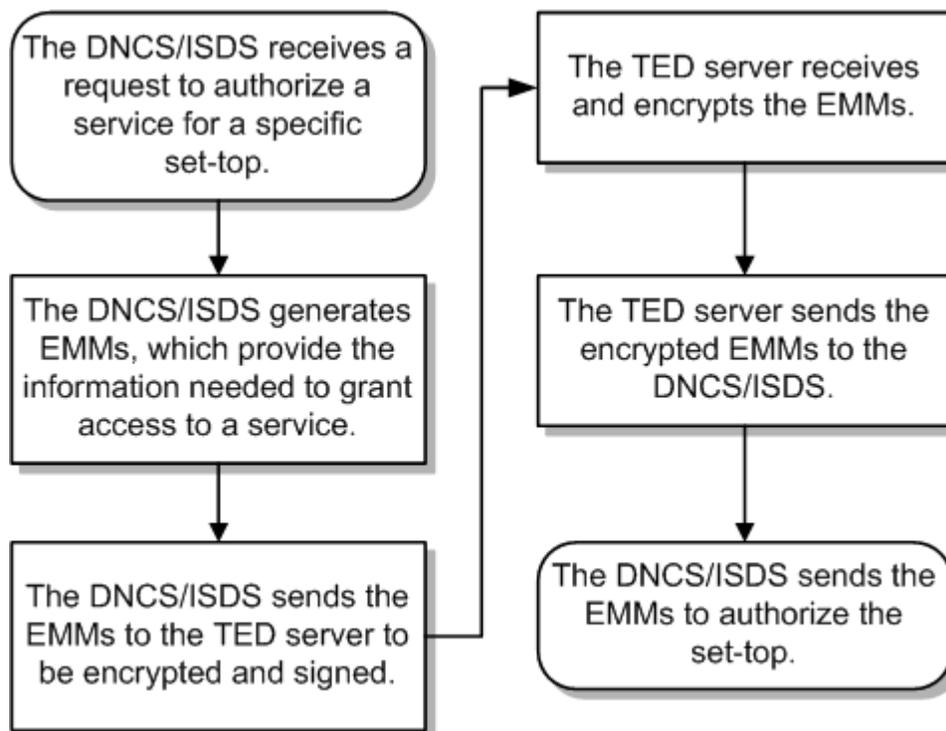
PowerKEY Conditional Access

We use PowerKEY CA software to enhance the encryption and decryption techniques that secure the transmission of applications such as broadcast video, PPV, IPPV, and VOD. PowerKEY CA ensures that only the authorized subscriber can access the secured service in the network by encrypting or protecting the service.

When a subscriber requests a PPV service or orders a premium services (such as HBO), the service is encrypted to secure the transmission of the content throughout the network. PowerKEY CA is initialized on the DNCS/ISDS and the TED 3.0 server to validate access to secured services.

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Getting Started

Introduction

This chapter describes the tasks that you must complete and the requirements your system must meet before you install the TED 3.0 server in your headend. This chapter also provides a process overview of the stages for installing a TED 3.0 server and instructions for unpacking the TED 3.0 server.

In This Chapter

Before You Begin

This section provides a list of tasks that you must complete before installing the TED server. The TED server is a highly secured server and completing each task is essential for successfully installing the TED server.

Preparing for Installation

Before attempting to install the TED server, initial next to each task as you complete the task in the order given.

1 Read all the safety information included in this guide.

2 Ensure that the TED is located in an area with restricted access (for security).

3 Ensure that the installer has extensive working experience with using UNIX text editors.

4 Ensure that a Cisco installer is present to provide the Cisco portion of the Conditional Access Authority (CAA) Pass Phrase.

5 Obtain the **Customer CAA** CD from your network system administrator.

6 Obtain your portion of the CAA Pass Phrase from your network system administrator.

7 Obtain your Entitlement Agent (EA) Pass Phrase from your network system administrator.

Process Overview

This section describes the process for installing the TED server. The subsequent chapters of this guide provide the specific instructions to accomplish each stage.

Process

The following table describes the process for installing the TED server. To successfully install the TED server, you must complete each process listed in the order given.

Stage	Description
1	Unpack the TED server from the carton to verify the parts and the quantity. **Note**: The instructions for unpacking the TED server are located in the next section of this chapter.
2	Install the server in an area with restricted access.
3	Connect the TED server to your DNCS/ISDS to provide communication between the servers.
4	Verify the communications with the TED server from the DNCS/ISDS.
5	Stop the DNCS/ISDS processes.
6	Choose one of the following: ■ Initialize the TED server if the DNCS/ISDS has never been initialized with the PowerKEY Conditional Access software. ■ Re-initialize the TED server if you are completing one of the following tasks: – Replacing an existing TED server – Initializing a DNCS/ISDS that has been previously initialized – Initializing a back-up TED server
7	Restart the DNCS/ISDS processes after completing all previous steps.
8	Store your portion of the CAA Pass Phrase in a secure location (preferably a safe).

Unpack the TED Server

To successfully install the TED server in your headend, you must unpack the TED server from the carton and verify all parts and quantities. This section provides instructions for unpacking the TED server from the carton.

Unpacking the TED Server

Complete these steps to unpack the TED 3.0 server from the carton.

1   Open and remove all packing material from the carton.

2   Initial next to the following items to verify that your shipment includes the parts and quantities listed:

- TED server (1) _____
- Power Cords (2) _____
- RJ-45 (Ethernet) cross-over cable (1) _____
- Rack mounting brackets (2) _____

3   Are any parts missing?

- If **yes**, see *Customer Support* (on page 34) of this guide for contact information.
- If **no**, go to step 4.

4   Inspect all of the parts, including the TED server, for visible damages.

5   Are there any visible damages on any of the parts?

- If **yes**, contact Cisco Services.
- If **no**, go to step 6.

6   Read all the safety and operating instructions accompanied with this product.

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Chapter 3

Installing the TED Server

Introduction

This chapter provides instructions for installing a TED server and verifying that the DNCS/ISDS can communicate with the TED server.

In This Chapter

Install the Rack-Mounted TED Server

This section details the installation of the TED server.

Safety Considerations

> ⚠️ **CAUTION:**
>
> - **Do not tangle or strain interconnecting cables.**
>
> - **Install 1U vent panels above and below the server to prevent overheating.**

Exhaust air management is the key to cooling multiple units in a custom rack configuration. Inlet air temperature should be as cool as possible and should never exceed 122°F (50°C). Exhaust air should have few or no restrictions. Obstructions such as cabling or other devices that block airflow to the side or top of the rack should be avoided.

If you are concerned about inlet air temperature, you should measure the temperature of the inlet air in the actual rack as you plan to use it. You should have all cabling in place and all adjacent units installed and running.

Important: Opening the door on the back panel of the rack can have an *adverse* effect on the managed airflow. If access to the door on the back panel is not controlled, you should take the inlet air temperature with the back panel door open since, in most instances, opening the door will re-direct the airflow in an adverse manner.

Installing the TED Server

1 Install the adjustable rack brackets supplied with the TED server.
2 Place the server in the rack.
3 Insert the mounting screws for the rack brackets into the appropriate mounting positions on the server and firmly tighten each screw.
4 Insert the cross-over RJ-45 (Ethernet) cable into **Ethernet port 2** on the back of the TED server.
5 Connect the AC power cables to the back of the TED server.

Connect the TED Server to the DNCS/ISDS

The TED server must be connected to the DNCS/ISDS to provide secure services throughout the network. This section provides instructions for connecting the TED server to the DNCS/ISDS.

Connecting the TED Server to the DNCS/ISDS

Complete these steps to connect the TED server to the DNCS/ISDS.

1   Verify that the DNCS/ISDS is powered on.

2   Insert the other end of the cross-over RJ-45 (Ethernet) cable into the Ethernet port **<····>** on the back panel of the DNCS/ISDS.

   Note: The Ethernet port **<····>** is port Ø located on the system motherboard of the DNCS/ISDS.

3   Press the power button on the front panel to power on the TED server.

4   Wait 60 seconds before proceeding to the next step.

5   Is the power LED illuminated on the front panel of the TED server?

   ■ If **yes**, go to *Verify Communications with the TED Server* (on page 12).

   ■ If **no**, go to step 6.

6   Verify that the power cords are inserted tightly into the power receptacle on the back panel of the TED server and into a 120 V AC power source.

7   Press the power button on the front panel to power on the TED server.

8   Wait 60 seconds before proceeding to the next step.

9   Is the power LED illuminated on the front panel of the TED server?

   ■ If **yes**, go to *Verify Communications with the TED Server* (on page 12).

   ■ If **no**, contact Cisco Services for assistance.

Verify Communications with the TED Server

The DNCS/ISDS must be able to communicate with the TED server for the TED server to encrypt services in the network. This section provides instructions for verifying the communications link between the DNCS/ISDS and the TED server.

Complete these steps to verify that the DNCS/ISDS can communicate with the TED server.

Note: All UNIX commands are case sensitive.

1   Open an xterm window on the DNCS/ISDS.

2   Type **ping dncsted** and then press **Enter**.

3   Did the message **dncsted is alive** appear?

   ■   If **yes**, you are finished with this procedure.

   ■   If **no**, contact Cisco Services for assistance.

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Initializing the TED Server

Introduction

Initializing the TED server involves completing several steps to ensure that the TED server operates successfully in your headend. This chapter provides instructions for the following tasks:

- Stopping the DNCS/ISDS processes

- Initializing the PowerKEY CA System

- Re-Initializing the PowerKEY CA System

- Restarting the DNCS/ISDS processes

Note: Since this document applies to multiple network types, not all of the procedures in this document will apply to every network. Use the procedures that apply to your network architecture, and ignore the ones that do not.

In This Chapter

Stop System Components

Important: System components must be stopped before you initialize the TED.

Use the procedures in this section to stop system components in the proper order. Failing to stop system components in the order described in this section may cause you to encounter difficulties during the installation.

Stopping the Application Server

Note: Only follow this procedure if you have a Cisco Application Server. Otherwise, follow your Application Server's instructions for this procedure.

1   Press the middle mouse button on the DNCS/ISDS and select **App Serv Stop**.

2   From an xterm window on the DNCS/ISDS, type **appControl** and then press **Enter**. The Applications Control window appears.

3   Type **2** (for Startup/Shutdown Single Element Group), and then press **Enter**. The system displays all Application Server processes.

   Note: The system updates the display periodically, or you can press **Enter** to force an update.

4   When the **Curr Stt** (Current State) field of the Applications Control window indicates that all of the Application Server processes have stopped, follow the on-screen instructions to close the Applications Control window.

5   Type **appKill** and then press **Enter**. The appInitd process stops.

Stopping the RNCS Processes on the DNCS/ISDS

If the RNCS licensed feature is enabled on your DNCS/ISDS, then refer to one of the following to stop the RNCS processes, depending on your type of network:

■ *RNCS Installation and Upgrade Instructions for System Release 2.8/3.8/4.3* (part number 4022447)

■ *RNCS Installation and Upgrade Instructions* (part number 4021167)

Stopping the DNCS/ISDS

1 Press the middle mouse button on the DNCS/ISDS and select **DNCS Stop**. A confirmation message appears.

2 Click **Yes**.

3 From an xterm window on the DNCS/ISDS, type **dncsControl** and then press **Enter**. The Dncs Control utility window opens.

4 Type **2** (for Startup/Shutdown Single Element Group), and then press **Enter**. The system displays all DNCS/ISDS processes.

   Note: The system updates the display periodically, or you can press **Enter** to force an update.

5 When the **Curr Stt** (Current State) field of the utility window indicates that all of the DNCS/ISDS processes have stopped, follow the on-screen instructions to close the Dncs Control window.

Initialize the PowerKEY CA System

PowerKEY CA ensures that only an authorized subscriber can access a secured service. As part of the PowerKEY CA system, the PowerKEY CAA keys, the Entitlement Agent (EA) pass phrase, and the Factory Root Certificate Authorization Key must be initialized. This section provides instructions for initializing the PowerKEY CAA keys, the EA pass phrase, and the Factory Root Certificate Authorization Key.

Important: Only initialize the PowerKEY CA system if your DNCS/ISDS has never been initialized (an initial installation). If your DNCS/ISDS has been initialized, follow the procedures in *Re-Initialize the PowerKey CA System* (on page 19).

Initializing the PowerKEY CAA Keys and the EA Pass Phrase

Complete these steps to initialize the PowerKey CAA Keys and the EA Pass Phrase on the DNCS/ISDS and the TED server.

Important:

■ To ensure the security of your system, a Cisco installer must be present when you are ready to complete these instructions in this section. Only Cisco installers know the other portion of the CAA Pass Phrase that is necessary to complete these instructions.

■ For more information on the pass phrases and on safeguarding your pass phrases, see *Safeguarding Pass Phrases* (on page 35).

■ All UNIX commands are case-sensitive.

1   Open an xterm window on the DNCS/ISDS and log on as the **root** user.

2   Insert the **Customer CAA** CD into the CD-ROM drive on the DNCS/ISDS.

3   In the xterm window, type **camDncsTedInit** and press **Enter**. A menu appears in the xterm window.

4   At the **Enter Choice** prompt, type **1** to select the Initialize DNCS option, and press **Enter**. The **Enter Name of file containing CAA Key [default=floppy]** prompt appears.

5   Type **/cdrom/cdrom0/key.enc** and press **Enter**. The following messages appear:

```
Connecting to TED please wait
Connecting to TED
```

6 At the confirmation prompt, type **yes** to continue and press **Enter**.

   Results:

   - The following message appears:

     `Loading CAA to TED and DNCS. Please wait.`

   - The CD is automatically ejected.

7 Remove the CAA CD from the CD-ROM drive. The **CAA Pass Phrase** prompt appears.

8 Ask the Cisco installer to type the Cisco portion of the **CAA Pass Phrase**.

9 Type your portion of the **CAA Pass Phrase** and press **Enter**. The **Re-enter CAA Pass Phrase** prompt appears.

   Note: If you do not know the CAA Pass Phrase, contact your network system administrator for assistance.

10 Ask the Cisco installer to retype the Cisco portion of the **CAA Pass Phrase**.

11 Retype your portion of the **CAA Pass Phrase** and press **Enter**.

   Important: If the pass phrase is entered incorrectly, the camDncsTedInit displays an error message, deletes the existing key (if any), and exits. If this occurs, repeat this procedure from step 3 and provide the correct pass phrase. If you do not fix this error, the TED will not be able to correctly process EMMs.

   Results:

   - The CAA key, protected by a pass phrase, is stored in the DNCS/ISDS database.

   - The **EA Pass Phrase** prompt appears.

12 Type your **EA Pass Phrase** and then press **Enter**. The **Re-enter EA Pass Phrase** prompt appears.

   Note: The EA Pass Phrase must consist of 10 to 64 alphanumeric characters.

13 Retype your EA Pass Phrase and press **Enter**. The EA and Multi-Session Keys (MSK) are generated and stored in encrypted form in the DNCS/ISDS database.

   Important: If the pass phrase is entered incorrectly, the camDncsTedInit displays an error message, deletes the existing key (if any), and exits. If this occurs, repeat this procedure from step 3 and provide the correct pass phrase. If you do not fix this error, the TED will not be able to correctly process EMMs.

14 When the message **press enter to continue** appears, press **Enter**. The **Enter Choice** prompt appears.

15 At the **Enter Choice** prompt, type one of the following to quit:

   - DNCS: Type **5** and press **Enter**.

   - ISDS: Type **6** and press **Enter**.

   Result: The **dncs** prompt appears.

16 Go to *Initializing the Factory Root Certificate Authorization Key* (on page 18).

Initializing the Factory Root Certificate Authorization Key

The Factory Root Certificate Authorization Key is used by the DNCS/ISDS to verify the key signature on PowerKEY client public key certificates. Complete these steps to initialize the Factory Root Certificate Authorization Key on the DNCS/ISDS.

Notes:

■ The DNCS/ISDS will not generate PowerKEY data for any device with a public key certificate that fails verification.

■ All UNIX commands are case-sensitive.

1   Obtain and insert the **Factory Root Certificate Authorization Key** CD into the CD-ROM drive of the DNCS/ISDS.

2   Type **camDncsTedInit** and press **Enter**. A menu appears on the xterm window.

3   At the **Enter Choice** prompt, type **4** to select the Initialize DNCS with Certificate Authority Key option, and press **Enter**. The **Enter name of file containing Certification Authority Key** prompt appears.

4   Type the following command and press **Enter**:

/cdrom/cdrom0/12345.ca

   Results:

   ■ The message **A root certificate authority key to validate key certificates is installed on the DNCS** appears.

   ■ The CD ejects automatically.

5   Click **OK**, and then remove the Factory Root Certificate Authorization Key CD from the CD-ROM drive. The message **Operation is complete result success** appears.

6   When the message **press enter to continue** appears, press **Enter** to continue. The **Enter Choice** prompt appears.

7   At the **Enter Choice** prompt, type one of the following to quit:

   ■ DNCS: Type **5** and press **Enter**.

   ■ ISDS: Type **6** and press **Enter**.

   Results:

   ■ Error messages may appear from previous typos. For example, an error message may appear if you typed a command incorrectly at first, but then corrected your error during a second attempt. Ignore these messages if each step verified success either by displaying a success message or by displaying the next prompt in the procedure.

   ■ The **dncs** prompt reappears.

8   To close the xterm window, type **exit** and press **Enter**.

9   Go to *Restart System Components* (on page 22).

Re-Initialize the PowerKEY CA System

Re-initializing the PowerKEY CA system involves uploading the PowerKEY CAA keys and the existing Entitlement Agent (EA) pass phrase from the DNCS/ISDS to the TED server. This section provides instructions to re-initialize the PowerKey CA system.

Only re-initialize the PowerKEY CA system if you are completing the following tasks:

■ Replacing an existing TED server

■ Re-initializing a previous initialized TED

■ Initializing a back-up TED server

Important: Only re-initialize the PowerKEY CA system if your DNCS/ISDS has already been initialized. If the DNCS/ISDS has never been initialized, you must initialize the DNCS/ISDS to apply the PowerKEY CAA keys, the Entitlement Agent (EA) pass phrase, and the Factory Root Certificate Authorization Key. If your DNCS/ISDS has never been initialized, follow the procedures in *Initialize the PowerKEY CA System* (on page 16).

Before You Begin

Important:

■ To ensure the security of your system, a Cisco installer must be present when you are ready to complete the instructions in this section. Only Cisco installers know the other portion of the CAA Pass Phrase that is necessary to complete the instructions.

■ For more information on the pass phrases and on safeguarding your pass phrases, see *Safeguarding Pass Phrases* (on page 35).

Re-Initializing the PowerKEY CA System

Complete these steps to re-initialize the PowerKey CAA Keys and the EA Pass Phrase on the DNCS/ISDS and the TED server.

Important:

- To ensure the security of your system, a Cisco installer must be present when you are ready to complete these instructions in this section. Only Cisco installers know the other portion of the CAA Pass Phrase that is necessary to complete these instructions.

- For more information on the pass phrases and on safeguarding your pass phrases, see *Safeguarding Pass Phrases* (on page 35).

- All UNIX commands are case sensitive.

1   Open an xterm window on the DNCS/ISDS and log on as the **dncs** user.

2   Type **camDncsTedInit** and press **Enter**. A menu appears on the xterm window.

3   Type **2** to select **Upload** and then press **Enter**. The CAA Pass Phrase prompt appears.

4   Ask the Cisco installer to type the Cisco portion of the **CAA Pass Phrase**.

5   Type your portion of the **CAA Pass Phrase** and then press **Enter**. The **Re-enter CAA Pass Phrase** prompt appears.

    Note: If you do not know the CAA Pass Phrase, contact your network system administrator for assistance.

6   Ask the Cisco installer to retype the Cisco portion of the **CAA Pass Phrase.**

7   Retype your portion of the **CAA Pass Phrase** and then press **Enter**.

    Results:

    - The CAA key, protected by a pass phrase, is stored in the DNCS/ISDS database.

    - The **EA Pass Phrase** prompt appears.

8   Type your **EA Pass Phrase** and then press **Enter**. The **Re-enter EA Pass Phrase** prompt appears.

    Important: If you do not know your EA Pass Phrase, you must contact your network system administrator. Your network system administrator creates the EA Pass Phrase and then stores it in a secured location. The EA Pass Phrase must consist of 10 to 64 alphanumeric characters.

9   Retype your **EA Pass Phrase** and then press **Enter**. The EA and MSKs are generated and stored in encrypted form in the DNCS/ISDS database

10 When the message **press enter to continue** appears, press **Enter**. The **Enter Choice** prompt appears.

11 At the **Enter Choice** prompt, type one of the following to quit:

- DNCS: Type **5** and press **Enter**.

- ISDS: Type **6** and press **Enter**.

    Result: The **dncs** prompt appears.

12 Close the xterm window and return to the Administrative Console.

13 Go to *Restart System Components* (on page 22).

Restart System Components

After completing the instructions in the previous sections, your next step is to restart the system components. You must complete the procedures in this section to restart the following system components in the order listed:

- DNCS/ISDS processes

- Application server processes (if necessary)

- If using the RCS feature, restart RNCS processes at each remote site

Restarting the DNCS/ISDS

1   Open an xterm window on the DNCS/ISDS.

2   Log on to the DNCS/ISDS as the **root** user (or as yourself) and then type **su - dncs** and press **Enter** to assume the dncs role.

3   From an xterm window on the DNCS/ISDS, type **dncsStart** and press **Enter**. The Informix database, the SOAPServers, and DNCS/ISDS processes start.

4   Click the middle mouse button on the DNCS/ISDS and select **Administrative Console**. The Administrative Console opens.

5   From the Administrative Console Status window, click **Control** for the DNCS/ISDS.

   Results:

   - The DNCS/ISDS Control window opens.

   - Green indicators begin to replace red indicators on the DNCS/ISDS Control window.

6   If any processes continue to display yellow or red after several minutes, try to restart each individually by selecting Process > Start Process on the DNCS/ISDS Control window.

7   Do all processes display green indicators?

   - If **yes**, you are finished with this procedure.

   - If **no**, contact Cisco Services.

Restarting the Application Server

This section provides procedures for restarting the Application Server.

Note: Only follow this procedure if you have a Cisco Application Server. Otherwise, follow your Application Server's instructions for this procedure.

1   Press the middle mouse button on the DNCS/ISDS and select **App Serv Start**.

2   From an xterm window on the DNCS/ISDS, type **appControl** and then press **Enter**. The Applications Control window opens.

3   Select option **2** on the Applications Control window. The system displays a list of Application Server processes and their current status.

   Note: The system updates the display periodically, or you can press **Enter** to force an update.

4   When the Application Control window indicates that the current state (**Curr Stt**) of each process is running, follow the on-screen instructions to close the Applications Control window.

Restarting the RNCS Processes on the DNCS/ISDS

If your DNCS/ISDS is licensed for the RNCS feature, then refer to the one of the following to restart the RNCS processes, depending on your type of network:

■ *RNCS Installation and Upgrade Instructions for System Release 2.8/3.8/4.3* (part number 4022447)

■ *RNCS Installation and Upgrade Instructions* (part number 4021167)

Reboot the TED Server

After you have restarted all the system components, you must reboot the TED server.

Complete this procedure for the primary, secondary and warm spare ISDS.

Rebooting the TED Server

1   Log on to the DNCS/ISDS as **root** user

2   Open an xterm window on the DNCS/ISDS.

3   Type **ssh dncsted -l root** and press **Enter**. A password prompt appears on the screen.

4   Type the **TED root password** and press **Enter**. A status display from the TED server appears on the screen.

5   Type **shutdown -g0 -y -i6** and press **Enter**. The connection is dropped and the following message displays:

```
Read error from network: Connection reset by peer
Connection closed
```

   Important: Wait at least 2 minutes for the TED server to reboot.

System Checks

Network Communications Checks

camTedChecker

The camTedChecker is a process that runs on the DNCS/ISDS. By viewing the camTedChecker on the DNCS/ISDS Control Panel, you can see the status of the communications between the DNCS/ISDS and the TED 3.0 server.

The camTedChecker process indicates whether or not the TED is running as follows:

- Green — the TED is in service and the keys have been initialized

- Yellow — the TED software is running, but the keys have not been initialized

- Red — the TED software is not running

Verify Communications with the TED Server

The DNCS/ISDS must be able to communicate with the TED server for the TED server to encrypt services in the network. This section provides instructions for verifying the communications link between the DNCS/ISDS and the TED server.

Complete these steps to verify that the DNCS/ISDS can communicate with the TED server.

Note: All UNIX commands are case sensitive.

1 Open an xterm window on the DNCS/ISDS.

2 Type **ping dncsted** and then press **Enter**.

3 Did the message **dncsted is alive** appear?

- If **yes**, you are finished with this procedure.

- If **no**, contact Cisco Services for assistance.

Network Performance Checks

After installing or updating the TED 3.0 server, verify that you can receive PPV events, IPPV events, make VOD purchases, and receive encrypted channels on a local set-top.

5

Upgrading the TED Server

Introduction

This chapter contains the procedures you need to follow to upgrade your TED server to a new TED 3.0 server.

In This Chapter

Installing a New TED Server

Powering Down the Existing TED Server

This section contains procedures on powering down your existing TED server. Follow the instructions for your server type (either TED 3.0 or TED FX).

Powering Down the TED 3.0 Server

Complete these steps to properly power down the existing TED 3.0 server.

Note: All UNIX commands are case-sensitive.

1   Open an xterm window on the DNCS/ISDS.

2   Log on to the DNCS/ISDS as **root**.

    Note: If you do not know your password, contact your network system administrator for assistance.

3   Type **ssh dncsted -l root** and press **Enter**. A password prompt appears on the screen.

4   Type the **TED root password** and press **Enter**.

5   Type **shutdown -g0 -y -i0** and press **Enter**.

6   Wait 60 seconds before proceeding to the next step.

7   Press the **Power** button on the front panel of the TED server to turn the power off.

Powering Down the TED FX Server

Complete these steps to properly power down the TED FX server.

Note: All UNIX commands are case-sensitive.

1   Open an xterm window on the DNCS/ISDS.

2   Type **su –** and press **Enter**. The password prompt appears.

3   Type your **password** and press **Enter**.

    Note: If you do not know your password, contact your network system administrator for assistance.

4   Type **rsh dncsted shutdown –h now** and press **Enter**.

5   Wait 60 seconds before proceeding to the next step.

6   Press the **Power** button on the front panel of the TED server to turn the power off.

Stop System Components

Important: System components must be stopped before you power up the new TED.

Use the procedures in this section to stop system components in the proper order. Failing to stop system components in the order described in this section may cause you to encounter difficulties during the installation.

Before continuing with the installation process, follow the instructions in this section to stop the Application Server for your system and the DNCS/ISDS.

Stopping the Application Server

Note: Only follow this procedure if you have a Cisco Application Server. Otherwise, follow your Application Server's instructions for this procedure.

1 Press the middle mouse button on the DNCS/ISDS and select **App Serv Stop**.

2 From an xterm window on the DNCS/ISDS, type **appControl** and then press **Enter**. The Applications Control window appears.

3 Type **2** (for Startup/Shutdown Single Element Group), and then press **Enter**. The system displays all Application Server processes.

    Note: The system updates the display periodically, or you can press **Enter** to force an update.

4 When the **Curr Stt** (Current State) field of the Applications Control window indicates that all of the Application Server processes have stopped, follow the on-screen instructions to close the Applications Control window.

5 Type **appKill** and then press **Enter**. The appInitd process stops.

Stopping the RNCS Processes on the DNCS/ISDS

If the RNCS licensed feature is enabled on your DNCS/ISDS, then refer to one of the following to stop the RNCS processes, depending on your type of network:

■ *RNCS Installation and Upgrade Instructions for System Release 2.8/3.8/4.3* (part number 4022447)

■ *RNCS Installation and Upgrade Instructions* (part number 4021167)

Stopping the DNCS/ISDS

1   Press the middle mouse button on the DNCS/ISDS and select **DNCS Stop**. A confirmation message appears.

2   Click **Yes**.

3   From an xterm window on the DNCS/ISDS, type **dncsControl** and then press **Enter**. The Dncs Control utility window opens.

4   Type **2** (for Startup/Shutdown Single Element Group), and then press **Enter**. The system displays all DNCS/ISDS processes.

   Note: The system updates the display periodically, or you can press **Enter** to force an update.

5   When the **Curr Stt** (Current State) field of the utility window indicates that all of the DNCS/ISDS processes have stopped, follow the on-screen instructions to close the Dncs Control window.

Remove the Existing TED From the Rack

Follow this procedure to replace the primary TED with the new TED in a rack near the DNCS/ISDS.

Removing the TED Server

1   Unplug the AC power cords from the back of the TED server.

2   Remove the cross-over RJ-45 (Ethernet) cable from the back of the TED server.

3   Remove the mounting screws for the rack brackets on the server.

4   Remove the server from the rack.

Install the New TED in the Rack

Safety Considerations

> **CAUTION:**
> - **Do not tangle or strain interconnecting cables.**
> - **Install 1U vent panels above and below the server to prevent overheating.**

Exhaust air management is the key to cooling multiple units in a custom rack configuration. Inlet air temperature should be as cool as possible and should never exceed 122°F (50°C). Exhaust air should have few or no restrictions. Obstructions such as cabling or other devices that block airflow to the side or top of the rack should be avoided.

If you are concerned about inlet air temperature, you should measure the temperature of the inlet air in the actual rack as you plan to use it. You should have all cabling in place and all adjacent units installed and running.

Important: Opening the door on the back panel of the rack can have an *adverse* effect on the managed airflow. If access to the door on the back panel is not controlled, you should take the inlet air temperature with the back panel door open since, in most instances, opening the door will re-direct the airflow in an adverse manner.

Installing the TED Server

1   Install the adjustable rack brackets supplied with the TED server.

2   Place the server in the rack.

3   Insert the mounting screws for the rack brackets into the appropriate mounting positions on the server and firmly tighten each screw.

4   Insert the cross-over RJ-45 (Ethernet) cable into **Ethernet port 2** on the back of the TED server.

5   Connect the AC power cables to the back of the TED server.

Connect the TED Server to the DNCS/ISDS

The TED server must be connected to the DNCS/ISDS to provide secure services throughout the network. This section provides instructions for connecting the TED server to the DNCS/ISDS.

Connecting the TED Server to the DNCS/ISDS

Complete these steps to connect the TED server to the DNCS/ISDS.

1   Verify that the DNCS/ISDS is powered on.

2   Insert the other end of the cross-over RJ-45 (Ethernet) cable into the Ethernet port **<···>** on the back panel of the DNCS/ISDS.

    Note: The Ethernet port **<···>** is port Ø located on the system motherboard of the DNCS/ISDS.

3   Press the power button on the front panel to power on the TED server.

4   Wait 60 seconds before proceeding to the next step.

5   Is the power LED illuminated on the front panel of the TED server?

■   If **yes**, go to *Restart System Components* (on page 30).

■   If **no**, go to step 6.

6   Verify that the power cords are inserted tightly into the power receptacle on the back panel of the TED server and into a 120 V AC power source.

7   Press the power button on the front panel to power on the TED server.

8   Wait 60 seconds before proceeding to the next step.

9   Is the power LED illuminated on the front panel of the TED server?

■   If **yes**, go to *Restart System Components* (on page 30).

■   If **no**, contact Cisco Services for assistance.

Restart System Components

After completing the instructions in the previous sections, your next step is to restart the system components. You must complete the procedures in this section to restart the following system components in the order listed:

- DNCS/ISDS processes

- Application server processes (if necessary)

- If using the RCS feature, restart RNCS processes at each remote site

Restarting the DNCS/ISDS

1 Open an xterm window on the DNCS/ISDS.

2 Log on to the DNCS/ISDS as the **root** user (or as yourself) and then type **su - dncs** and press **Enter** to assume the dncs role.

3 From an xterm window on the DNCS/ISDS, type **dncsStart** and press **Enter**. The Informix database, the SOAPServers, and DNCS/ISDS processes start.

4 Click the middle mouse button on the DNCS/ISDS and select **Administrative Console**. The Administrative Console opens.

5 From the Administrative Console Status window, click **Control** for the DNCS/ISDS.

   Results:

- The DNCS/ISDS Control window opens.

- Green indicators begin to replace red indicators on the DNCS/ISDS Control window.

6 If any processes continue to display yellow or red after several minutes, try to restart each individually by selecting Process > Start Process on the DNCS/ISDS Control window.

7 Do all processes display green indicators?

- If **yes**, you are finished with this procedure.

- If **no**, contact Cisco Services.

Restarting the Application Server

This section provides procedures for restarting the Application Server.

Note: Only follow this procedure if you have a Cisco Application Server. Otherwise, follow your Application Server's instructions for this procedure.

1   Press the middle mouse button on the DNCS/ISDS and select **App Serv Start**.

2   From an xterm window on the DNCS/ISDS, type **appControl** and then press **Enter**. The Applications Control window opens.

3   Select option **2** on the Applications Control window. The system displays a list of Application Server processes and their current status.

    Note: The system updates the display periodically, or you can press **Enter** to force an update.

4   When the Application Control window indicates that the current state (**Curr Stt**) of each process is running, follow the on-screen instructions to close the Applications Control window.

Restarting the RNCS Processes on the DNCS/ISDS

If your DNCS/ISDS is licensed for the RNCS feature, then refer to the one of the following to restart the RNCS processes, depending on your type of network:

■   *RNCS Installation and Upgrade Instructions for System Release 2.8/3.8/4.3* (part number 4022447)

■   *RNCS Installation and Upgrade Instructions* (part number 4021167)

System Checks

Network Communications Checks

camTedChecker

The camTedChecker is a process that runs on the DNCS/ISDS. By viewing the camTedChecker on the DNCS/ISDS Control Panel, you can see the status of the communications between the DNCS/ISDS and the TED 3.0 server.

The camTedChecker process indicates whether or not the TED is running as follows:

- Green — the TED is in service and the keys have been initialized
- Yellow — the TED software is running, but the keys have not been initialized
- Red — the TED software is not running

Verify Communications with the TED Server

The DNCS/ISDS must be able to communicate with the TED server for the TED server to encrypt services in the network. This section provides instructions for verifying the communications link between the DNCS/ISDS and the TED server.

Complete these steps to verify that the DNCS/ISDS can communicate with the TED server.

Note: All UNIX commands are case sensitive.

1 Open an xterm window on the DNCS/ISDS.
2 Type **ping dncsted** and then press **Enter**.
3 Did the message **dncsted is alive** appear?

- If **yes**, you are finished with this procedure.
- If **no**, contact Cisco Services for assistance.

Network Performance Checks

After installing or updating the TED 3.0 server, verify that you can receive PPV events, IPPV events, make VOD purchases, and receive encrypted channels on a local set-top.

6

Customer Information

If You Have Questions

If you have technical questions, call Cisco Services for assistance. Follow the menu options to speak with a service engineer.

Access your company's extranet site to view or order additional technical publications. For accessing instructions, contact the representative who handles your account. Check your extranet site often as the information is updated frequently.

A

Safeguarding Pass Phrases

Introduction

This appendix identifies the key components of an effective storage and retrieval plan for your TED pass phrases.

With an effective plan in place, your pass phrases are secured against accidental loss, yet readily available should the TED require service or replacement.

In This Appendix

Overview

Each service provider has a unique pair of pass phrases that secure the TED. These pass phrases are required when replacing or reinitializing a TED.

The way the service provider uses the pass phrases adds a layer of security to the TED:

■ The first pass phrase applies to Conditional Access Authority (CAA) activity. This pass phrase comes in two parts: one is known only to you, the other is known only by the Cisco installer.

■ The second pass phrase applies to Entitlement Agent (EA) activity. This pass phrase is only known to you.

■ Both the individual in charge of handling the pass phrases at your site and a Cisco installer must be present to enter the two parts of the CAA pass phrase into the TED. Following that, your personnel must enter the confidential EA pass phrase to initialize the TED.

Safeguarding Recommendations

We recommend the following safeguards to secure your pass phrases and your TED server.

Pass Phrase Recommendations

- Always store your pass phrases in a secure location, preferably a safe.

- Retrieve your pass phrases from storage and make sure that they have not been corrupted by a digital virus, transcription error, etc. If the pass phrases have been corrupted, call Cisco Services for assistance.

- As you return your pass phrases to storage, document the return process. Record who stored them (system administrator, manager, etc.), where they are stored (central office disk, local safe, etc.), and how they are stored (encrypted, word processor file, etc.).

- Also determine who to call if the pass phrases must be retrieved during off hours.

- If you lose your pass phrases, call Cisco Services for assistance.

TED Recommendations

We strongly recommend that you set up a spare TED 3.0 server with the same pass phrases as the operational TED 3.0 server.

For optimal results, install a new TED 3.0 server in the headend and store the original TED 3.0 server as a spare in a secure location. The spare can become operational by re-entering both halves of the CAA pass phrase and then the EA pass phrase as described in *Initialize the PowerKEY CA System* (on page 16) and *Re-Initialize the PowerKEY CA System* (on page 19).

An on-site, spare TED 3.0 server, along with the safeguarded pass phrases, provide the fastest possible means of recovery if a TED 3.0 server fails and begins to affect your network.

B

Set Up Redundant TED Servers

Introduction

This appendix contains details on setting up a standby TED 3.0 server. You can set up the TED server for failover in a production network, or have the TED server associated with a backup DNCS/ISDS.

In This Appendix

Overview

A redundant TED is a TED server not normally connected to the DNCS/ISDS.

The redundant TED server contains the same software and pass phrases as the primary TED server. The redundant TED is normally idle, but available if needed if the primary TED server fails.

The procedures in this section detail how to provision the redundant TED so that, when needed, you only need to connect and power on the redundant TED server for use.

Setting Up a Redundant TED Server

Complete these steps to initialize the PowerKey CAA Keys and the EA Pass Phrase on the redundant TED 3.0 server.

Before You Begin

Before you begin, you must make sure you meet the following requirements:

■ The redundant TED server **must be** another TED 3.0 server.

■ To ensure the security of your system, a Cisco installer must be present when you are ready to complete these instructions in this section. Only Cisco installers know the other portion of the CAA Pass Phrase that is necessary to complete these instructions.

■ For more information on the pass phrases and on safeguarding your pass phrases, see *Safeguarding Pass Phrases* (on page 35).

Setting Up a Redundant TED 3.0 Server

Complete these steps to provision the redundant TED 3.0 server.

Note: All UNIX commands are case sensitive.

1 Power off the primary TED 3.0 server by following these steps:

   a Open an xterm window on the DNCS/ISDS.

   b Log on to the DNCS/ISDS as **root**.

   c Type **ssh dncsted -l root** and press **Enter**. A password prompt appears on the screen.

   d Type the **TED root password** and press **Enter**.

   e Type **shutdown -g0 -y -i0** and press **Enter**.

   f Wait 60 seconds before proceeding to the next step.

   g Press the **Power** button on the front panel of the TED server to turn the power off.

2 Disconnect the RJ-45 cross-over cable from the primary TED Ethernet port.

3 Connect the RJ-45 cross-over cable to the redundant TED Ethernet port.

4 Connect the AC power cords on the back of the redundant TED server to AC power.

5 Power on the redundant TED server.

6 After the TED server boots up, open an xterm window on the DNCS/ISDS.

7 Type **ping dncsted** and press **Enter**.

8 Did the message dncsted is alive appear?

- If **yes**, go to step 9.

- If **no**, contact Cisco Services for assistance.

9 Open an xterm window and log on to the DNCS/ISDS as **root** user.

10 In the xterm window, type **camDncsTedInit** and press **Enter**. A menu appears in the xterm window.

11 Type **2** to select **Upload** and press **Enter**. The CAA Pass Phrase prompt appears.

12 Ask the Cisco installer to type the Cisco portion of the **CAA Pass Phrase**.

13 Type your portion of the **CAA Pass Phrase** and press **Enter**. The **Re-enter CAA Pass Phrase** prompt appears.

Note: If you do not know the CAA Pass Phrase, contact your network system administrator for assistance.

14 Ask the Cisco installer to retype the Cisco portion of the **CAA Pass Phrase**.

15 Retype your portion of the **CAA Pass Phrase** and press **Enter**.

Results:

- The CAA key, protected by a pass phrase, is stored in the DNCS/ISDS database.

- The **EA Pass Phrase** prompt appears.

16 Type your **EA Pass Phrase** and then press **Enter**. The **Re-enter EA Pass Phrase** prompt appears.

Important: If you do not know your EA Pass Phrase, you must contact your network system administrator. Your network system administrator creates the EA Pass Phrase and stores it in a secured location. The EA Pass Phrase must consist of 10 to 64 alphanumeric characters.

17 Retype your EA Pass Phrase and press **Enter**. The EA and Multi-Session Keys (MSK) are generated and stored in encrypted form in the DNCS/ISDS database.

18 When the message **press enter to continue** appears, press **Enter**. The **Enter Choice** prompt appears.

19 At the **Enter Choice** prompt, type one of the following to quit:

- DNCS: Type **5** and press **Enter**.

- ISDS: Type **6** and press **Enter**.

Result: The **dncs** prompt appears.

20 Close the xterm window and return to the Administrative Console.

The redundant TED 3.0 server is now provisioned and ready for use. You can continue to use the redundant TED 3.0 server as the primary server, or switch back to the primary TED 3.0 server.

21 Restart your system components. Go to *Restart System Components* (on page 44).

Setting Up a TED Server on a Backup DNCS/ISDS

If you are establishing a backup DNCS/ISDS platform to serve as a failover for a primary system, you must stage the TED 3.0 attached to the backup as you would on the primary system. This is required to ensure that the EMM generation from the backup system is compatible with the devices provisioned from the primary DNCS/ISDS.

Once the primary system is completely initialized, the database from the primary DNCS/ISDS must be replicated to the backup DNCS/ISDS. This procedure is covered in *Installing and Operating the Replicated Database Package on the ISDS Installation and Operation Guide* (part number 4023374).

Once the database replication has been verified, follow the steps detailed in *Re-Initialize the PowerKEY CA System* (on page 19) to initialize the TED 3.0 server on the backup system.

Restart System Components

After completing the instructions in the previous sections, your next step is to restart the system components. You must complete the procedures in this section to restart the following system components in the order listed:

■ DNCS/ISDS processes

■ Application server processes (if necessary)

■ If using the RCS feature, restart RNCS processes at each remote site

Restarting the DNCS/ISDS

1 Open an xterm window on the DNCS/ISDS.

2 Log on to the DNCS/ISDS as the **root** user (or as yourself) and then type **su - dncs** and press **Enter** to assume the dncs role.

3 From an xterm window on the DNCS/ISDS, type **dncsStart** and press **Enter**. The Informix database, the SOAPServers, and DNCS/ISDS processes start.

4 Click the middle mouse button on the DNCS/ISDS and select **Administrative Console**. The Administrative Console opens.

5 From the Administrative Console Status window, click **Control** for the DNCS/ISDS.

   Results:

   ■ The DNCS/ISDS Control window opens.

   ■ Green indicators begin to replace red indicators on the DNCS/ISDS Control window.

6 If any processes continue to display yellow or red after several minutes, try to restart each individually by selecting Process > Start Process on the DNCS/ISDS Control window.

7 Do all processes display green indicators?

   ■ If **yes**, you are finished with this procedure.

   ■ If **no**, contact Cisco Services.

Restarting the Application Server

This section provides procedures for restarting the Application Server.

Note: Only follow this procedure if you have a Cisco Application Server. Otherwise, follow your Application Server's instructions for this procedure.

1 Press the middle mouse button on the DNCS/ISDS and select **App Serv Start**.

2 From an xterm window on the DNCS/ISDS, type **appControl** and then press **Enter**. The Applications Control window opens.

3 Select option **2** on the Applications Control window. The system displays a list of Application Server processes and their current status.

   Note: The system updates the display periodically, or you can press **Enter** to force an update.

4 When the Application Control window indicates that the current state (**Curr Stt**) of each process is running, follow the on-screen instructions to close the Applications Control window.

Restarting the RNCS Processes on the DNCS/ISDS

If your DNCS/ISDS is licensed for the RNCS feature, then refer to the one of the following to restart the RNCS processes, depending on your type of network:

- *RNCS Installation and Upgrade Instructions for System Release 2.8/3.8/4.3* (part number 4022447)

- *RNCS Installation and Upgrade Instructions* (part number 4021167)

Removing the dncsted Entry from the SSH Known Hosts File (Optional)

Occasionally, when you use SSH to log on to the TED after a new upgrade or installation, you may receive an error stating that the remote host identification has changed. Should this occur, complete these steps to correct the error and SSH to the TED.

1 Open an xterm window on the DNCS/ISDS.

2 Log on to the DNCS/ISDS as **root**.

3 Open the **/.ssh/known_hosts** file in a text editor.

4 Locate the **dncsted** entry in the file.

5 Remove the line that contains the dncsted entry.

6 Save the file and log out of the DNCS/ISDS.

Reboot the TED Server

After you have restarted all the system components, you must reboot the TED server.

Complete this procedure for the primary, secondary and warm spare ISDS.

Rebooting the TED Server

1 Log on to the DNCS/ISDS as **root** user

2 Open an xterm window on the DNCS/ISDS.

3 Type **ssh dncsted -l root** and press **Enter**. A password prompt appears on the screen.

4 Type the **TED root password** and press **Enter**. A status display from the TED server appears on the screen.

5 Type **shutdown -g0 -y -i6** and press **Enter**. The connection is dropped and the following message displays:

```
Read error from network: Connection reset by peer
Connection closed
```

Important: Wait at least 2 minutes for the TED server to reboot.

C

TED Server Failover Procedure

Introduction

This appendix contains details on replacing a failed TED 3.0 server with a backup TED 3.0 server.

In This Appendix

Overview

This section describes the steps required to failover from a primary TED 3.0 server to a backup TED 3.0 server. Make sure that you have addressed the issues described in *Preparations* (on page 49) well before any failover needs to occur.

The failover process is as follows:

1   Power down the primary TED server.

2   Remove the primary TED server from the rack (if necessary; according to your internal procedures).

3   Install the backup TED server into the rack (if necessary; according to your internal procedures).

4   Stop the system components.

5   Connect the backup TED server to the DNCS/ISDS (including power up).

6   Restart the system components.

7   Verify communications between the DNCS/ISDS and the TED.

8   Perform system checks to confirm performance.

Preparations

Network Preparation

As part of your failover preparation, you should determine the following:

- Where the backup TED server will be physically located.

- Your internal procedure for a failover to the secondary TED server.

Backup TED Server Preparation

As part of your failover preparation, you need to set up a redundant TED server using the procedures in *Setting Up a Redundant TED Server* (on page 41).

The backup TED server should be initialized with the same keys as the primary TED so you can failover without having to upload the keys from the DNCS/ISDS.

Replacing a Primary TED Server with a Backup TED Server

Stop System Components

Important: System components must be stopped before you power up the new TED.

Use the procedures in this section to stop system components in the proper order. Failing to stop system components in the order described in this section may cause you to encounter difficulties during the installation.

Stopping the Application Server

Note: Only follow this procedure if you have a Cisco Application Server. Otherwise, follow your Application Server's instructions for this procedure.

1 Press the middle mouse button on the DNCS/ISDS and select **App Serv Stop**.

2 From an xterm window on the DNCS/ISDS, type **appControl** and then press **Enter**. The Applications Control window appears.

3 Type **2** (for Startup/Shutdown Single Element Group), and then press **Enter**. The system displays all Application Server processes.

   Note: The system updates the display periodically, or you can press **Enter** to force an update.

4 When the **Curr Stt** (Current State) field of the Applications Control window indicates that all of the Application Server processes have stopped, follow the on-screen instructions to close the Applications Control window.

5 Type **appKill** and then press **Enter**. The appInitd process stops.

Stopping the RNCS Processes on the DNCS/ISDS

If the RNCS licensed feature is enabled on your DNCS/ISDS, then refer to one of the following to stop the RNCS processes, depending on your type of network:

■ *RNCS Installation and Upgrade Instructions for System Release 2.8/3.8/4.3* (part number 4022447)

■ *RNCS Installation and Upgrade Instructions* (part number 4021167)

Stopping the DNCS/ISDS

1   Press the middle mouse button on the DNCS/ISDS and select **DNCS Stop**. A
    confirmation message appears.

2   Click **Yes**.

3   From an xterm window on the DNCS/ISDS, type **dncsControl** and then press
    Enter. The Dncs Control utility window opens.

4   Type **2** (for Startup/Shutdown Single Element Group), and then press **Enter**. The
    system displays all DNCS/ISDS processes.

    Note: The system updates the display periodically, or you can press **Enter** to
    force an update.

5   When the **Curr Stt** (Current State) field of the utility window indicates that all of
    the DNCS/ISDS processes have stopped, follow the on-screen instructions to
    close the Dncs Control window.

Powering Down the Primary TED Server

Complete these steps to properly power down the TED server currently connected to
the ISDS, if necessary.

Note: All UNIX commands are case-sensitive.

1   Open an xterm window on the DNCS/ISDS.

2   Log on to the DNCS/ISDS as **root**.

    Note: If you do not know your password, contact your network system
    administrator for assistance.

3   Type **ssh dncsted -l root** and press **Enter**. A password prompt appears on the
    screen.

4   Type the **TED root password** and press **Enter**.

5   Type **shutdown -g0 -y -i0** and press **Enter**.

6   Wait 60 seconds before proceeding to the next step.

7   Press the **Power** button on the front panel of the TED server to turn the power
    off.

Remove the Primary TED From the Rack

Important: Follow this procedure only if you need to replace the primary TED with the backup TED in a rack near the DNCS/ISDS. Otherwise, you can skip this step.

Removing the TED Server

1 Unplug the AC power cords from the back of the TED server.

2 Remove the cross-over RJ-45 (Ethernet) cable from the back of the TED server.

3 Remove the mounting screws for the rack brackets on the server.

4 Remove the server from the rack.

Install the Backup TED in the Rack

Important: Follow this procedure only if you do not have the backup TED already in a rack near the DNCS/ISDS. Otherwise, you can skip this step.

Safety Considerations

⚠ **CAUTION:**

- **Do not tangle or strain interconnecting cables.**

- **Install 1U vent panels above and below the server to prevent overheating.**

Exhaust air management is the key to cooling multiple units in a custom rack configuration. Inlet air temperature should be as cool as possible and should never exceed 122°F (50°C). Exhaust air should have few or no restrictions. Obstructions such as cabling or other devices that block airflow to the side or top of the rack should be avoided.

If you are concerned about inlet air temperature, you should measure the temperature of the inlet air in the actual rack as you plan to use it. You should have all cabling in place and all adjacent units installed and running.

Important: Opening the door on the back panel of the rack can have an *adverse* effect on the managed airflow. If access to the door on the back panel is not controlled, you should take the inlet air temperature with the back panel door open since, in most instances, opening the door will re-direct the airflow in an adverse manner.

Installing the TED Server

1 Install the adjustable rack brackets supplied with the TED server.

2 Place the server in the rack.

3 Insert the mounting screws for the rack brackets into the appropriate mounting positions on the server and firmly tighten each screw.

4 Insert the cross-over RJ-45 (Ethernet) cable into **Ethernet port 2** on the back of the TED server.

5 Connect the AC power cables to the back of the TED server.

Connect the TED Server to the DNCS/ISDS

The TED server must be connected to the DNCS/ISDS to provide secure services throughout the network. This section provides instructions for connecting the TED server to the DNCS/ISDS.

Connecting the TED Server to the DNCS/ISDS

Complete these steps to connect the TED server to the DNCS/ISDS.

1 Verify that the DNCS/ISDS is powered on.

2 Insert the other end of the cross-over RJ-45 (Ethernet) cable into the Ethernet port **<...>** on the back panel of the DNCS/ISDS.

   Note: The Ethernet port **<...>** is port 2 located on the system motherboard of the DNCS/ISDS.

3 Press the power button on the front panel to power on the TED server.

4 Wait 60 seconds before proceeding to the next step.

5 Is the power LED illuminated on the front panel of the TED server?

   ■ If **yes**, go to *Restart System Components* (on page 54).

   ■ If **no**, go to step 6.

6 Verify that the power cords are inserted tightly into the power receptacle on the back panel of the TED server and into a 120 V AC power source.

7 Press the power button on the front panel to power on the TED server.

8 Wait 60 seconds before proceeding to the next step.

9 Is the power LED illuminated on the front panel of the TED server?

   ■ If **yes**, go to *Restart System Components* (on page 54).

   ■ If **no**, contact Cisco Services for assistance.

Restart System Components

After completing the instructions in the previous sections, your next step is to restart the system components. You must complete the procedures in this section to restart the following system components in the order listed:

- DNCS/ISDS processes

- Application server processes (if necessary)

- If using the RCS feature, restart RNCS processes at each remote site

Restarting the Application Server

This section provides procedures for restarting the Application Server.

Note: Only follow this procedure if you have a Cisco Application Server. Otherwise, follow your Application Server's instructions for this procedure.

1   Press the middle mouse button on the DNCS/ISDS and select **App Serv Start**.

2   From an xterm window on the DNCS/ISDS, type **appControl** and then press **Enter**. The Applications Control window opens.

3   Select option **2** on the Applications Control window. The system displays a list of Application Server processes and their current status.

    Note: The system updates the display periodically, or you can press **Enter** to force an update.

4   When the Application Control window indicates that the current state (**Curr Stt**) of each process is running, follow the on-screen instructions to close the Applications Control window.

Restarting the DNCS/ISDS

1   Open an xterm window on the DNCS/ISDS.

2   Log on to the DNCS/ISDS as the **root** user (or as yourself) and then type **su - dncs** and press **Enter** to assume the dncs role.

3   From an xterm window on the DNCS/ISDS, type **dncsStart** and press **Enter**. The Informix database, the SOAPServers, and DNCS/ISDS processes start.

4   Click the middle mouse button on the DNCS/ISDS and select **Administrative Console**. The Administrative Console opens.

5   From the Administrative Console Status window, click **Control** for the DNCS/ISDS.

    Results:

    - The DNCS/ISDS Control window opens.

    - Green indicators begin to replace red indicators on the DNCS/ISDS Control window.

6 If any processes continue to display yellow or red after several minutes, try to restart each individually by selecting Process > Start Process on the DNCS/ISDS Control window.

7 Do all processes display green indicators?

- If **yes**, you are finished with this procedure.

- If **no**, contact Cisco Services.

Restarting the RNCS Processes on the DNCS/ISDS

If your DNCS/ISDS is licensed for the RNCS feature, then refer to the one of the following to restart the RNCS processes, depending on your type of network:

- *RNCS Installation and Upgrade Instructions for System Release 2.8/3.8/4.3* (part number 4022447)

- *RNCS Installation and Upgrade Instructions* (part number 4021167)

Removing the dncsted Entry from the SSH Known Hosts File (Optional)

Occasionally, when you use SSH to log on to the TED after a new upgrade or installation, you may receive an error stating that the remote host identification has changed. Should this occur, complete these steps to correct the error and SSH to the TED.

1 Open an xterm window on the DNCS/ISDS.

2 Log on to the DNCS/ISDS as **root**.

3 Open the **/.ssh/known_hosts** file in a text editor.

4 Locate the **dncsted** entry in the file.

5 Remove the line that contains the dncsted entry.

6 Save the file and log out of the DNCS/ISDS.

Reboot the TED Server

After you have restarted all the system components, you must reboot the TED server.

Complete this procedure for the primary, secondary and warm spare ISDS.

Rebooting the TED Server

1 Log on to the DNCS/ISDS as **root** user

2 Open an xterm window on the DNCS/ISDS.

3 Type **ssh dncsted -l root** and press **Enter**. A password prompt appears on the screen.

4 Type the **TED root password** and press **Enter**. A status display from the TED server appears on the screen.

5 Type **shutdown -g0 -y -i6** and press **Enter**. The connection is dropped and the following message displays:

```
Read error from network: Connection reset by peer
Connection closed
```

Important: Wait at least 2 minutes for the TED server to reboot.

System Checks

Network Communications Checks

camTedChecker

The camTedChecker is a process that runs on the DNCS/ISDS. By viewing the camTedChecker on the DNCS/ISDS Control Panel, you can see the status of the communications between the DNCS/ISDS and the TED 3.0 server.

The camTedChecker process indicates whether or not the TED is running as follows:

- Green — the TED is in service and the keys have been initialized

- Yellow — the TED software is running, but the keys have not been initialized

- Red — the TED software is not running

Verify Communications with the TED Server

The DNCS/ISDS must be able to communicate with the TED server for the TED server to encrypt services in the network. This section provides instructions for verifying the communications link between the DNCS/ISDS and the TED server.

Complete these steps to verify that the DNCS/ISDS can communicate with the TED server.

Note: All UNIX commands are case sensitive.

1 Open an xterm window on the DNCS/ISDS.

2 Type **ping dncsted** and then press **Enter**.

3 Did the message **dncsted is alive** appear?

- If **yes**, you are finished with this procedure.

- If **no**, contact Cisco Services for assistance.

Network Performance Checks

After installing or updating the TED 3.0 server, verify that you can receive PPV events, IPPV events, make VOD purchases, and receive encrypted channels on a local set-top.

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Kernel Panic Feature

This appendix describes the kernel panic feature that allows the TED server to capture crucial information when it encounters an error from which it cannot recover. This information is helpful in troubleshooting the cause of the error.

In This Appendix

Overview

Should the TED server operating system (OS) encounter an error from which it cannot recover, the OS kernel creates a kernel panic dump file. The kernel panic dump file is similar to a core file in that the file contains information about the cause of the error. The information in this file can be helpful in troubleshooting and recovering from a kernel panic event.

Because sites have a console for the ISDS, but not for the TED server, you should be aware of incidents that point to a kernel panic event as the underlying cause. When troubleshooting the following incidents, keep in mind that a kernel panic event may be the cause for these incidents:

- TED transactions fail.

- The camTedChecker process indicator turns red. See *camTedChecker* (on page 24) for more information.

Retrieving a Kernel Panic Dump File

If routine troubleshooting is unable to uncover the cause for any of the incidents listed in *Overview* (on page 60), you may suspect that a kernel panic event has occurred. When a kernel panic event occurs, the TED server OS creates a kernel panic dump file and places it in this directory on the TED server: **/var/crash**. Each time a kernel panic is dumped, a subdirectory gets created and the actual file is named **vmcore**.

Follow these instructions to locate the kernel panic file so that you can send it to Cisco Services for analysis.

1 On the DNCS/ISDS, open an xterm window and log on as **root** user.

2 Type **ssh dncsted -l root** and press **Enter**. A password prompt appears in the xterm window.

3 Type the TED root password and press **Enter**.

4 Type **ls -al /var/crash** and press **Enter**. The TED lists the files and subdirectories in the /var/crash directory, similar to the following example.

```
total 28
drwxr-xr-x  5 root root 4096 Jan 13 14:08 .
drwxr-xr-x 20 root root 4096 Jan 12 14:39 ..
drwxr-xr-x  2 root root 4096 Jan 12 15:23 127.0.0.1-2010-01-12-15:22:01
drwxr-xr-x  2 root root 4096 Jan 13 13:58 127.0.0.1-2010-01-13-13:56:36
drwxr-xr-x  2 root root 4096 Jan 13 14:10 127.0.0.1-2010-01-13-14:08:35
```

Note: In this example, lines 3–6 (in blue) are used to indicate the subdirectories that contain dump files. When each dump file and subdirectory is created, it is named with the local host IP address and the date and time of the dump.

5 Change directories to the subdirectory whose file you want to retrieve. For example, to change to the last subdirectory listed in the previous step, you would type **cd 127.0.0.1-2010-01-13-14:08:35** and press **Enter**.

6 Type **ls -al** and press **Enter**. The TED lists the files in the current directory, similar to the following example.

```
total 6170884
drwxr-xr-x 2 root root       4096 Jan 13 14:10 .
drwxr-xr-x 5 root root       4096 Jan 13 14:08 ..
-r-------- 1 root root 6312789080 Jan 13 14:10 vmcore
```

Note: In this example, line 4 (in blue) is used to indicate the dump file. All kernel panic dump files contain "vmcore" in the name.

7 Send the kernel panic dump file to Cisco Services for analysis.

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