Recovery Procedure for Cisco Video Portal 3.x and 4.x

Note This document provides the procedure for recovering from a software failure of Cisco Video Portal 3.5, 4.0, and 4.1.

This document describes the following topics:

Recovery Procedure

This section describes in detail the procedure for performing a Video Portal recovery.

Prerequisites

Before attempting your recovery, you must complete the following tasks:

- Contact Cisco TAC to obtain the recovery CD for your Cisco Video Portal release.
- Create a Backup of the digital media manager (DMM) server appliance on a USB hard drive.
- Note down the network configuration information appropriate for your site, either DHCP or Static (IP address, subnet mask, and gateway).

Cisco Systems

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Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

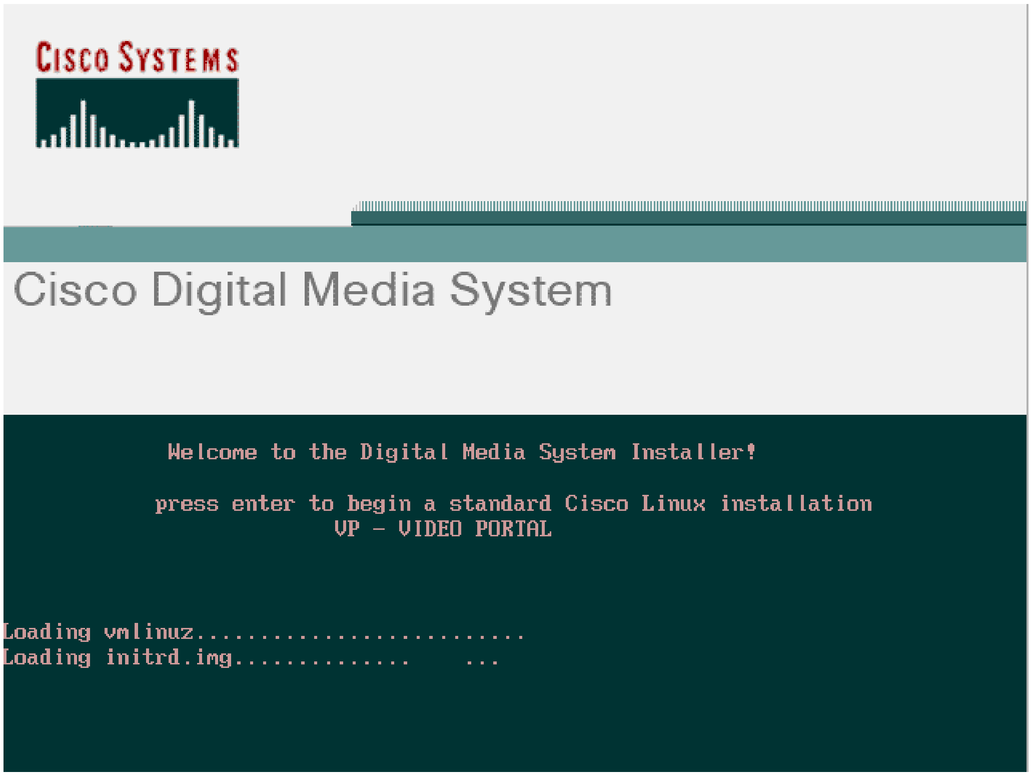
Steps

To recover the Cisco Video Portal version 3.5, follow these steps:

Step 1 Turn the power on to the server Appliance.

Step 2 Insert the recovery CD.

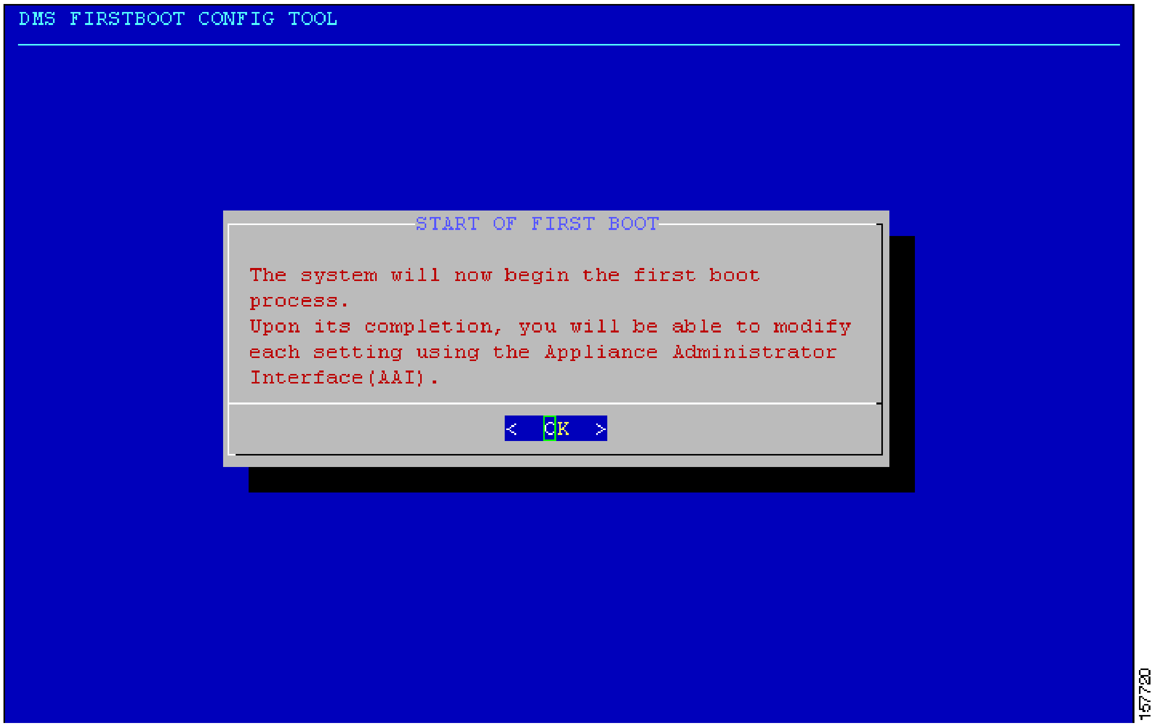
Step 3 If you see the following screen briefly, the server appliance is booting from the recovery CD.



```
            Welcome to the Digital Media System Installer!

           press enter to begin a standard Cisco Linux installation
                         VP - VIDEO PORTAL


Loading vmlinuz.........................
Loading initrd.img.............    ...
```

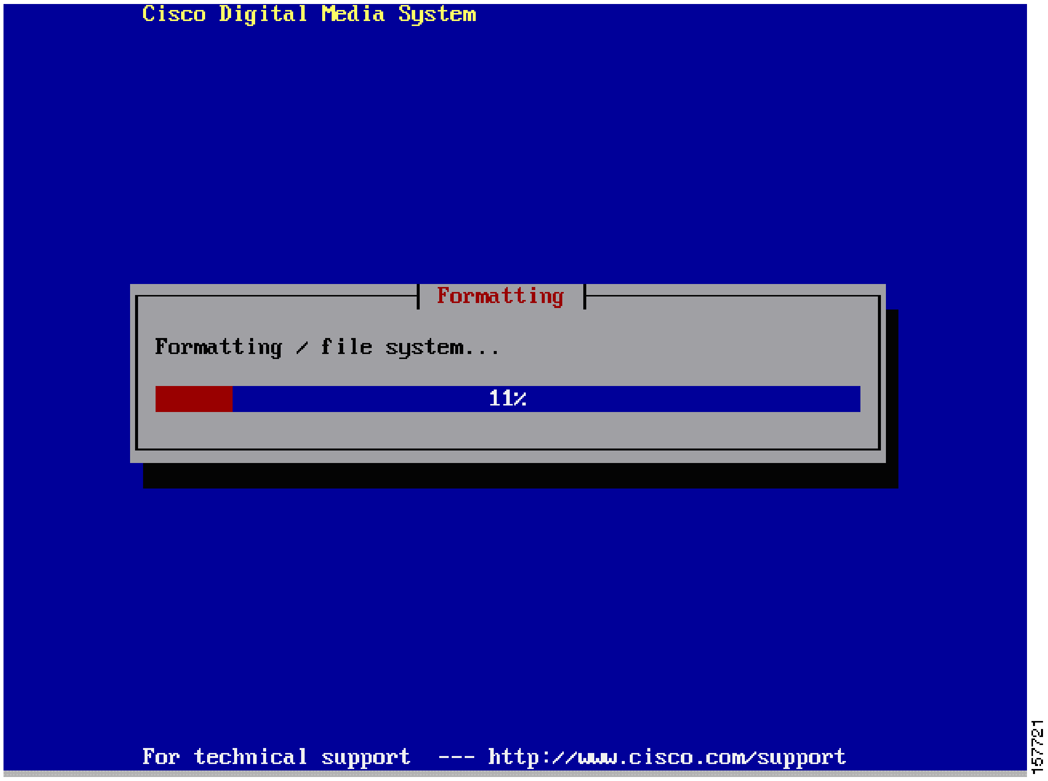
The driver now loads. After approximately two minutes, you are asked for confirmation to overwrite the existing system. This erases all existing data on the DMM server appliance. The Video Portal server appliance does not require backup. By default **No** is selected.

Step 4 Use the **Tab** key to navigate to **Yes** and press **Enter** to proceed.



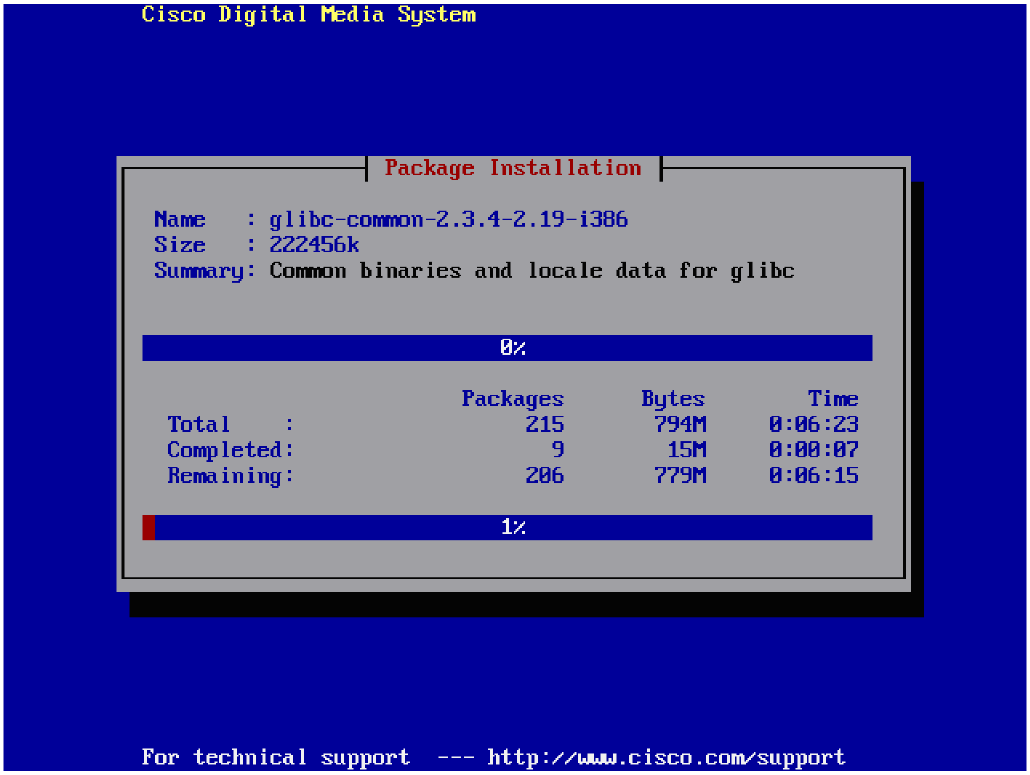
```
DMS FIRSTBOOT CONFIG TOOL

START OF FIRST BOOT

The system will now begin the first boot
process.
Upon its completion, you will be able to modify
each setting using the Appliance Administrator
Interface(AAI).
```

Step 5 You see the following screen, indicating that the file system is formatting:



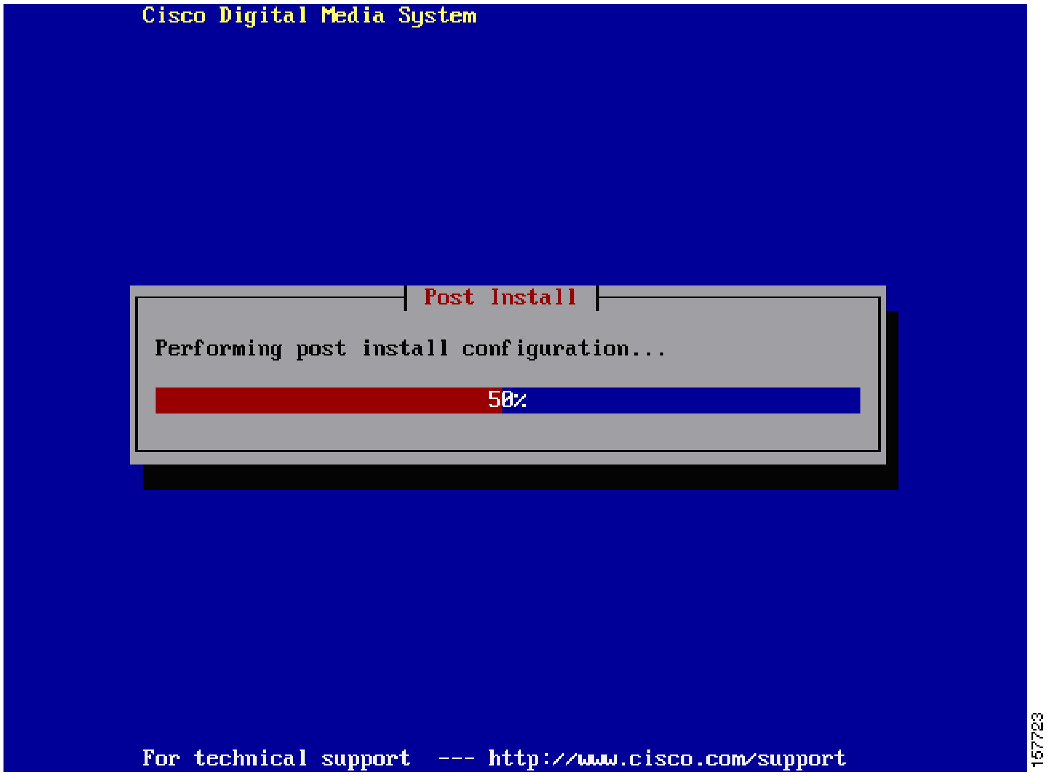
```
Cisco Digital Media System

Formatting

Formatting / file system...

11%

For technical support  --- http://www.cisco.com/support
```

Step 6 You see the following screen, indicating that the packages are being installed.



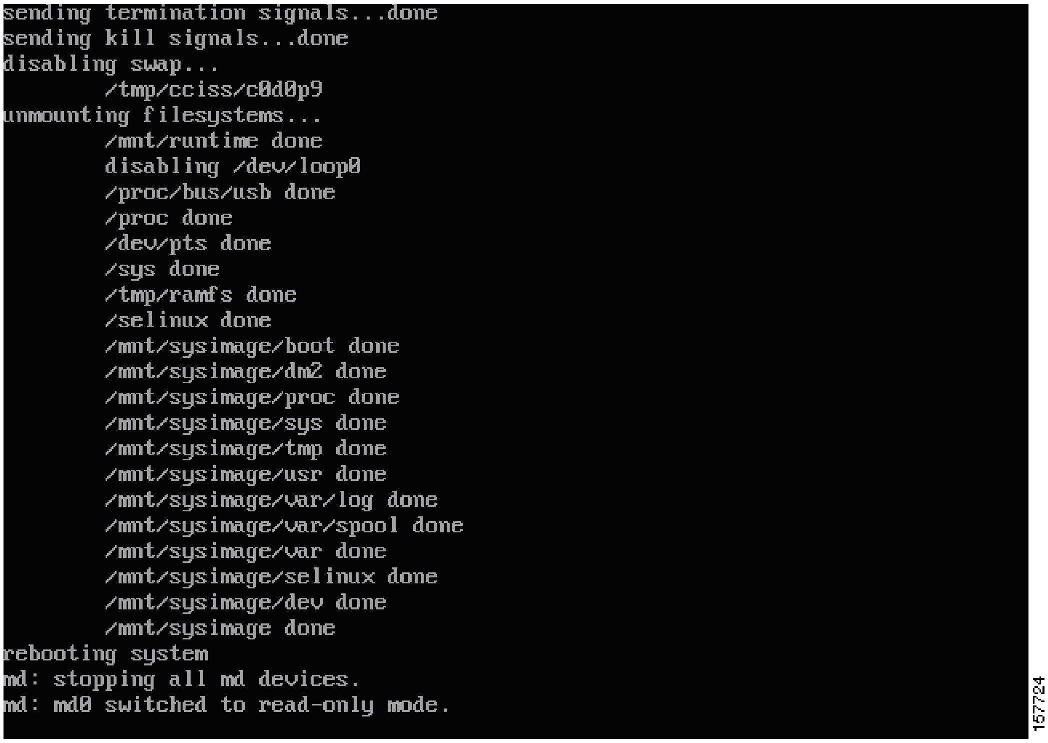
```
          Cisco Digital Media System



               Package Installation

     Name    : glibc-common-2.3.4-2.19-i386
     Size    : 222456k
     Summary: Common binaries and locale data for glibc


                              0%

                              Packages       Bytes        Time
      Total      :                 215        794M     0:06:23
      Completed:                     9         15M     0:00:07
      Remaining:                   206        779M     0:06:15

                              1%




          For technical support  --- http://www.cisco.com/support
```

Step 7 Next, the post-installation screen appears:



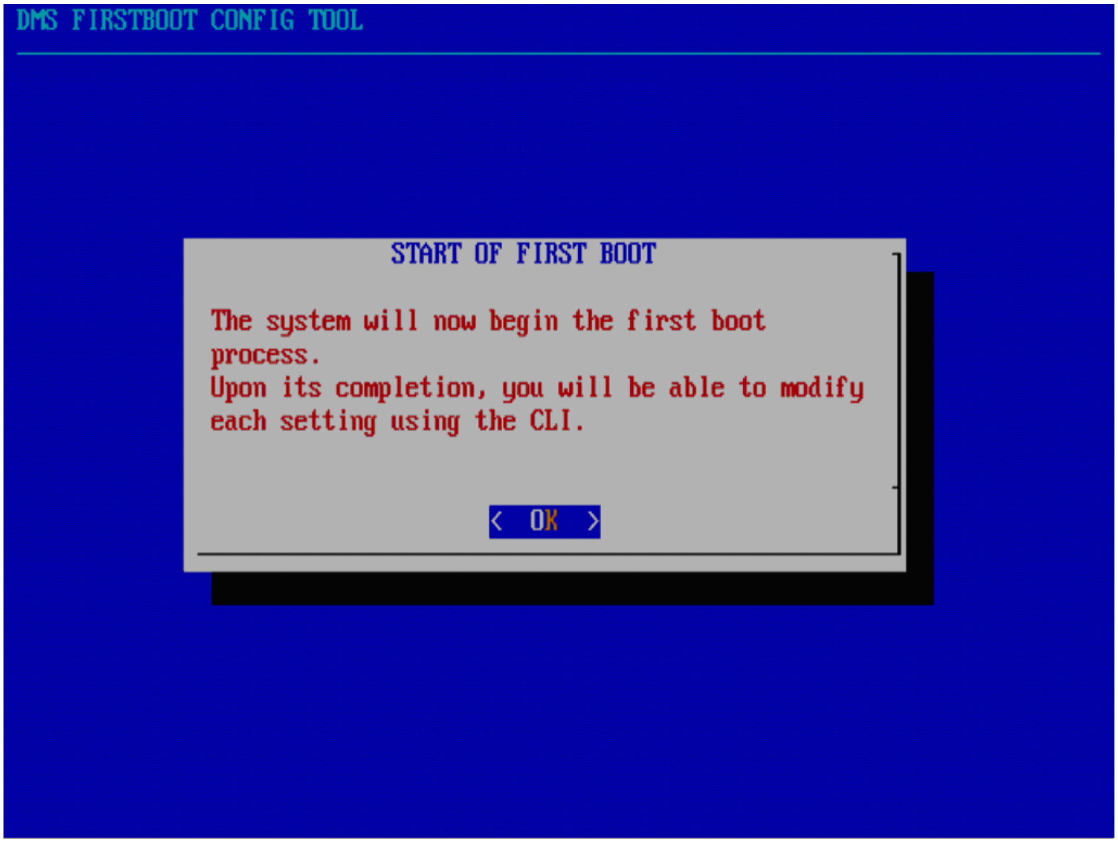
```
Cisco Digital Media System

Post Install

Performing post install configuration...

50%

For technical support  --- http://www.cisco.com/support
```

Step 8 The server appliance now reboots with the following message after the installation is complete:



```
sending termination signals...done
sending kill signals...done
disabling swap...
        /tmp/cciss/c0d0p9
unmounting filesystems...
        /mnt/runtime done
        disabling /dev/loop0
        /proc/bus/usb done
        /proc done
        /dev/pts done
        /sys done
        /tmp/ramfs done
        /selinux done
        /mnt/sysimage/boot done
        /mnt/sysimage/dm2 done
        /mnt/sysimage/proc done
        /mnt/sysimage/sys done
        /mnt/sysimage/tmp done
        /mnt/sysimage/usr done
        /mnt/sysimage/var/log done
        /mnt/sysimage/var/spool done
        /mnt/sysimage/var done
        /mnt/sysimage/selinux done
        /mnt/sysimage/dev done
        /mnt/sysimage done
rebooting system
md: stopping all md devices.
md: md0 switched to read-only mode.
```

Step 9 The boot config tool starts automatically the first time you boot the Cisco Video Portal server appliance, taking you into the DMS appliance administration interface (AAI). When you see the following screen, press **Enter**.

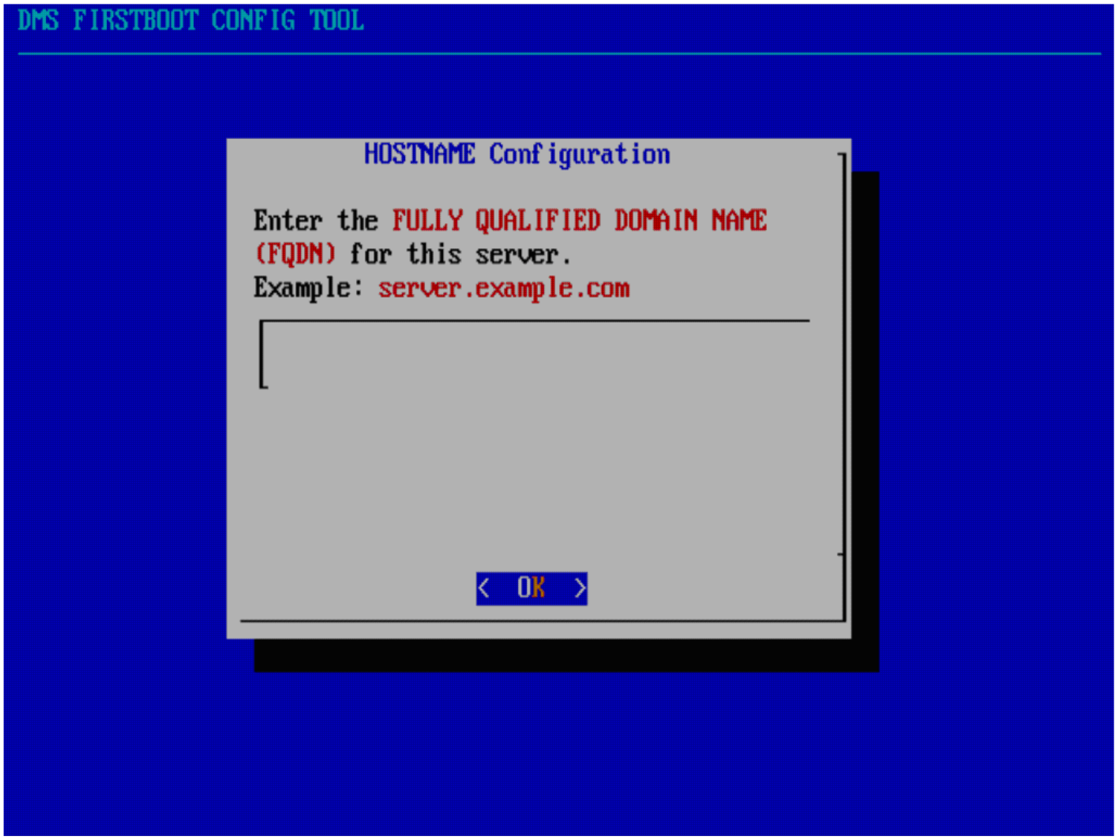


DMS FIRSTBOOT CONFIG TOOL

START OF FIRST BOOT

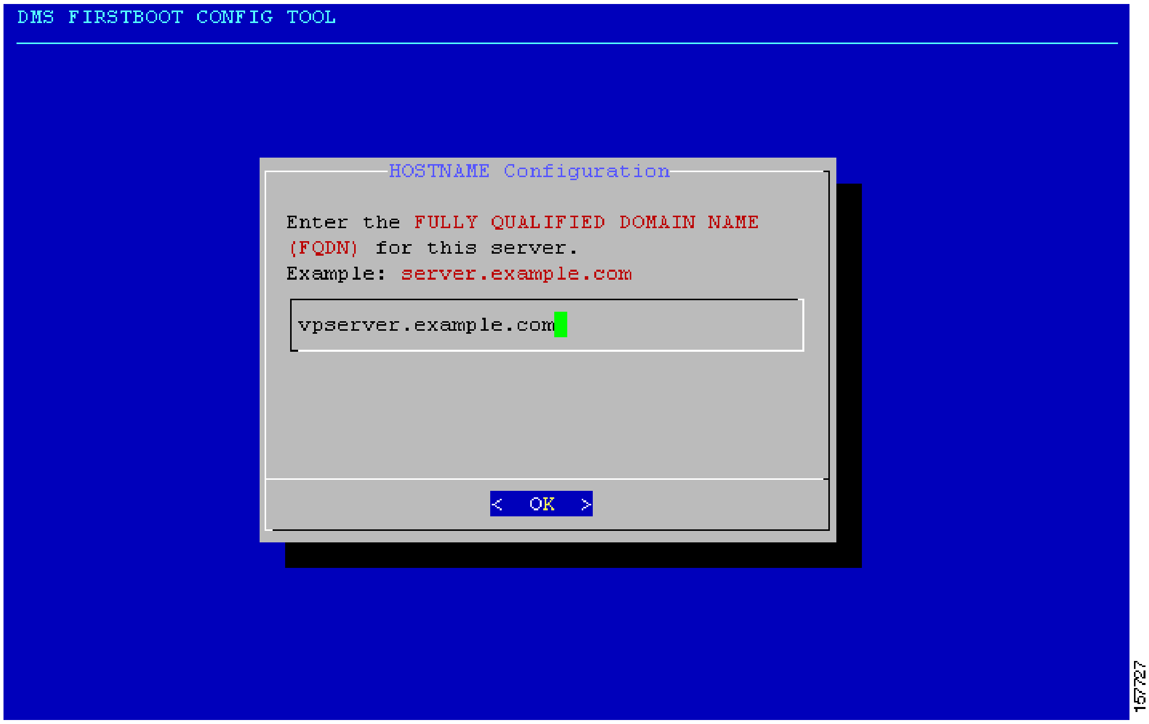
The system will now begin the first boot process.
Upon its completion, you will be able to modify each setting using the CLI.

Step 10 Enter the hostname of the appliance.



```
DMS FIRSTBOOT CONFIG TOOL

HOSTNAME Configuration

Enter the FULLY QUALIFIED DOMAIN NAME
(FQDN) for this server.
Example: server.example.com
```

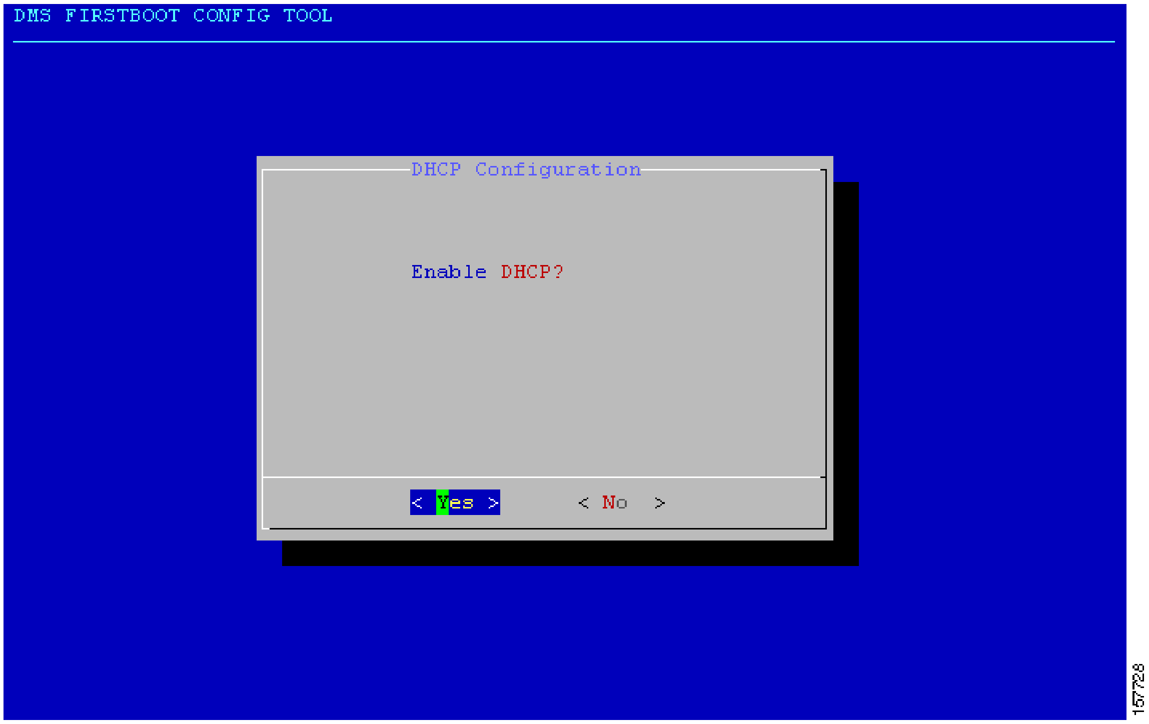
Step 11 The following screen shows an example of the appliance hostname being entered.



```
DMS FIRSTBOOT CONFIG TOOL

                HOSTNAME Configuration

    Enter the FULLY QUALIFIED DOMAIN NAME
    (FQDN) for this server.
    Example: server.example.com

    vpserver.example.com

                    <  OK  >
```

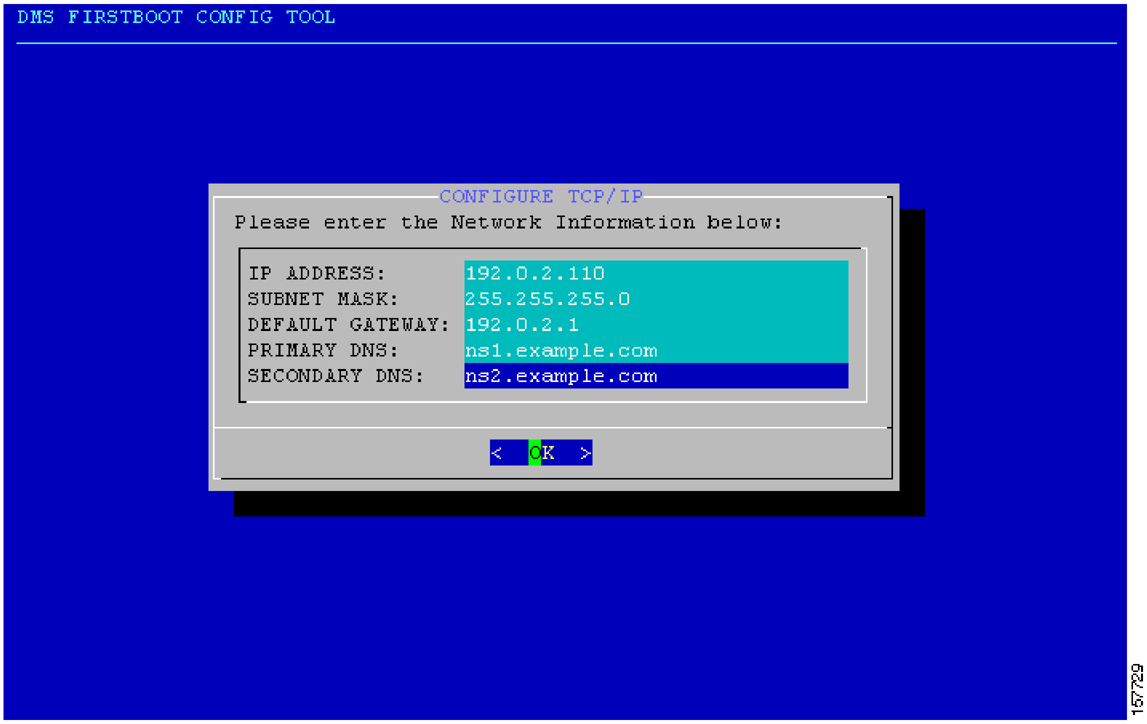
Step 12 The DHCP configuration screen is displayed. If the server appliance gets the IP address automatically from the DHCP server, then select **Yes**.

Note Cisco does not recommend using DHCP; if the IP address of the Video Portal server appliance expires, you must reconfigure the DMM application for successful deployments.



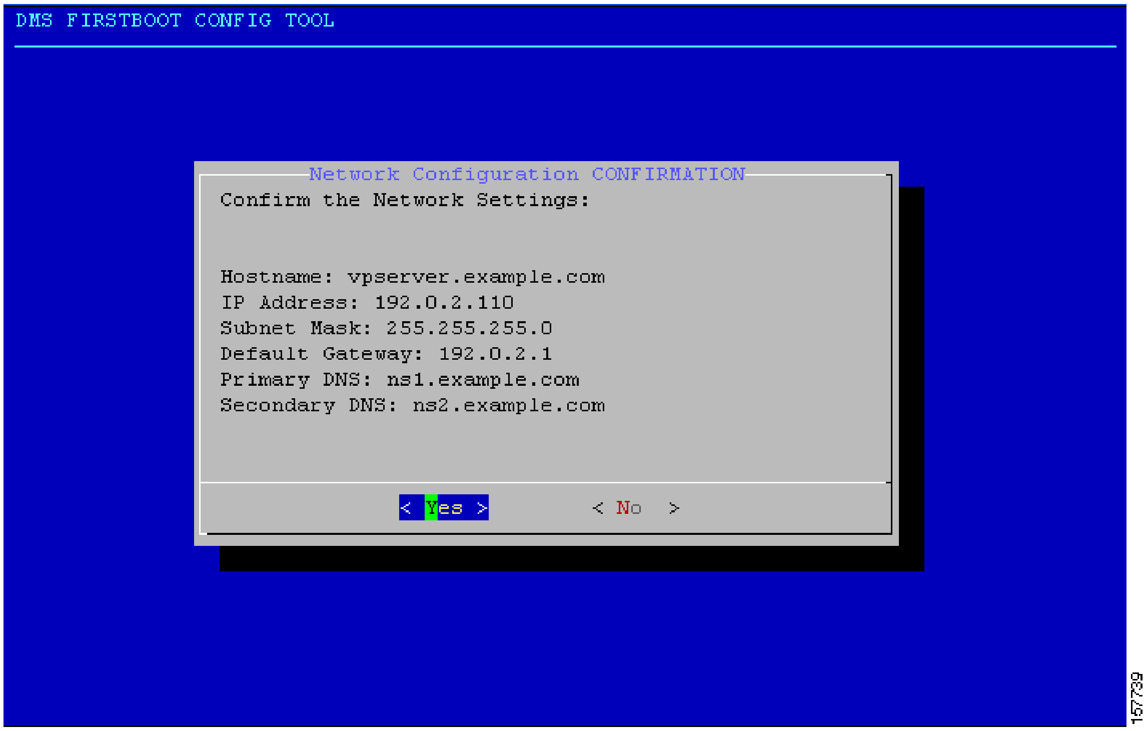
```
DMS FIRSTBOOT CONFIG TOOL

DHCP Configuration

Enable DHCP?
```

Step 13 If DHCP is not enabled, enter the IP address, subnet mask, default gateway, primary dns and, if available, a secondary dns. in the following screen. If DHCP is enabled, skip the following section and go to the time zone configuration (Step 19).



```
DMS FIRSTBOOT CONFIG TOOL

                    CONFIGURE TCP/IP
 Please enter the Network Information below:

   IP ADDRESS:         192.0.2.110
   SUBNET MASK:        255.255.255.0
   DEFAULT GATEWAY:    192.0.2.1
   PRIMARY DNS:        ns1.example.com
   SECONDARY DNS:      ns2.example.com

                      <  OK  >
```

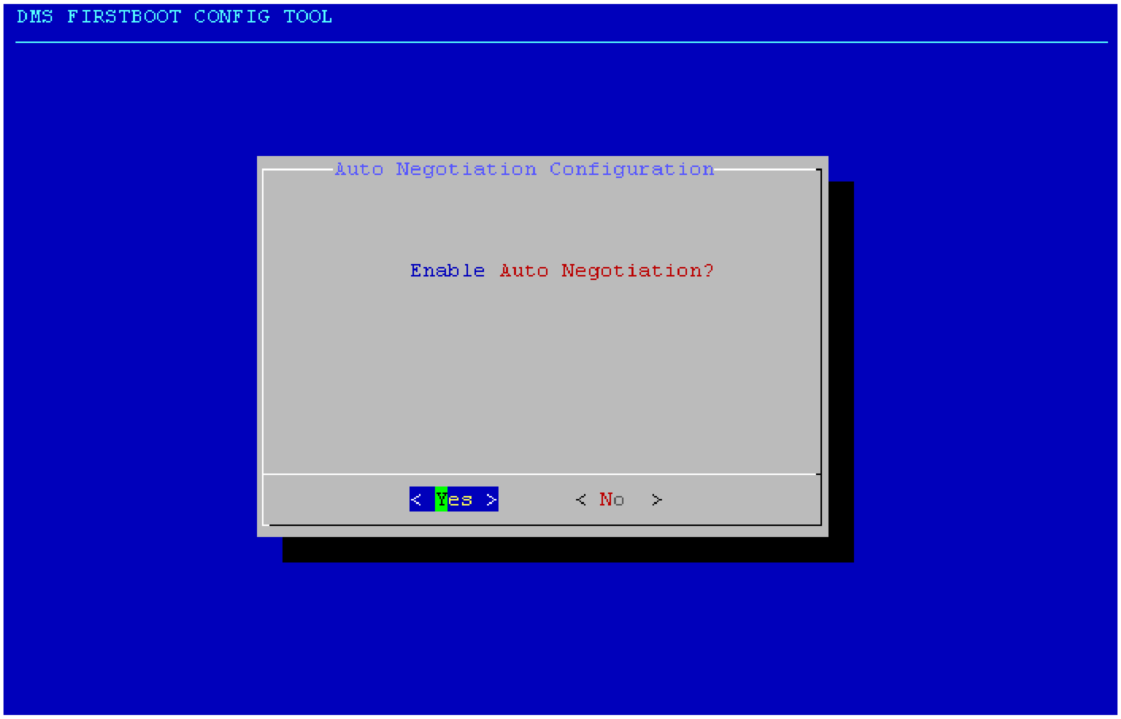
Step 14 Confirm the network settings. The following example reflects the sample configurations specified above. Press **Enter** if all the information is correct. If the information is incorrect, use the arrow keys to navigate to **No** and press **Enter** to re-configure your settings.



```
DMS FIRSTBOOT CONFIG TOOL

Network Configuration CONFIRMATION
Confirm the Network Settings:


Hostname: vpserver.example.com
IP Address: 192.0.2.110
Subnet Mask: 255.255.255.0
Default Gateway: 192.0.2.1
Primary DNS: ns1.example.com
Secondary DNS: ns2.example.com
```

Please standby until the network settings are applied.

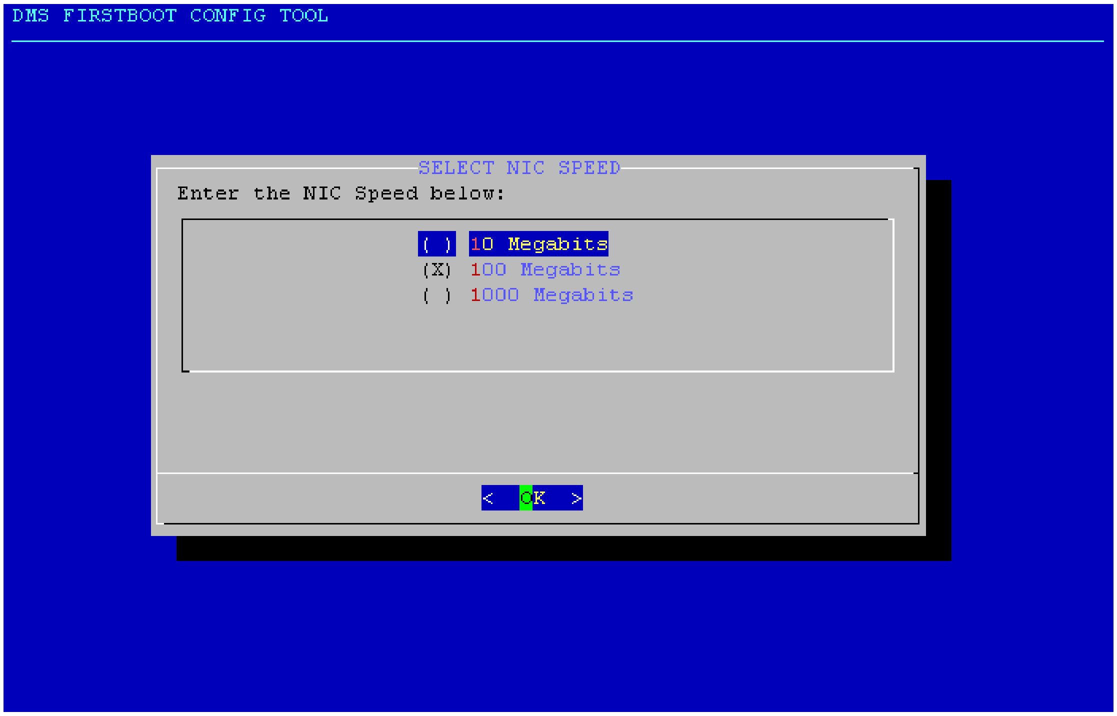
Step 15 If your network infrastructure requires you to manually specify network negotiation settings, select "No".



```
DMS FIRSTBOOT CONFIG TOOL

Auto Negotiation Configuration

Enable Auto Negotiation?

< Yes >        <  No   >
```

200707

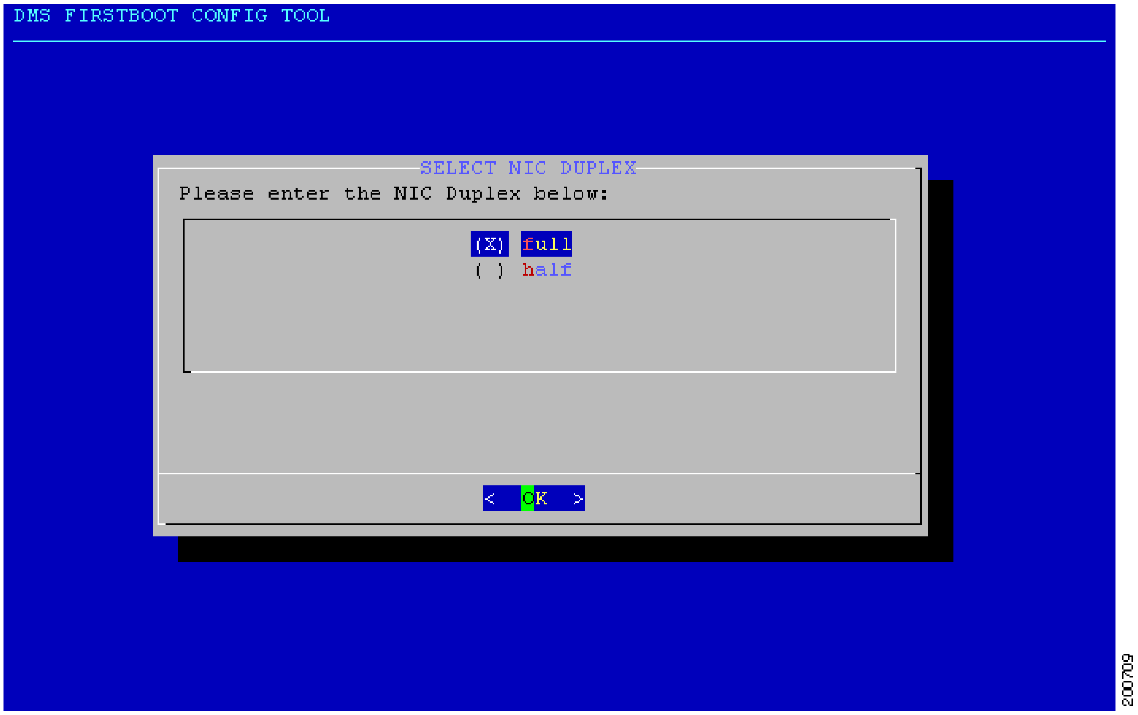
Step 16 If you turned on Auto Negotiation, go to Step 19. Set the NIC speed to 10, 100, or 1000Megabits.



```
DMS FIRSTBOOT CONFIG TOOL

SELECT NIC SPEED
Enter the NIC Speed below:

( ) 10 Megabits
(X) 100 Megabits
( ) 1000 Megabits

<  OK  >
```

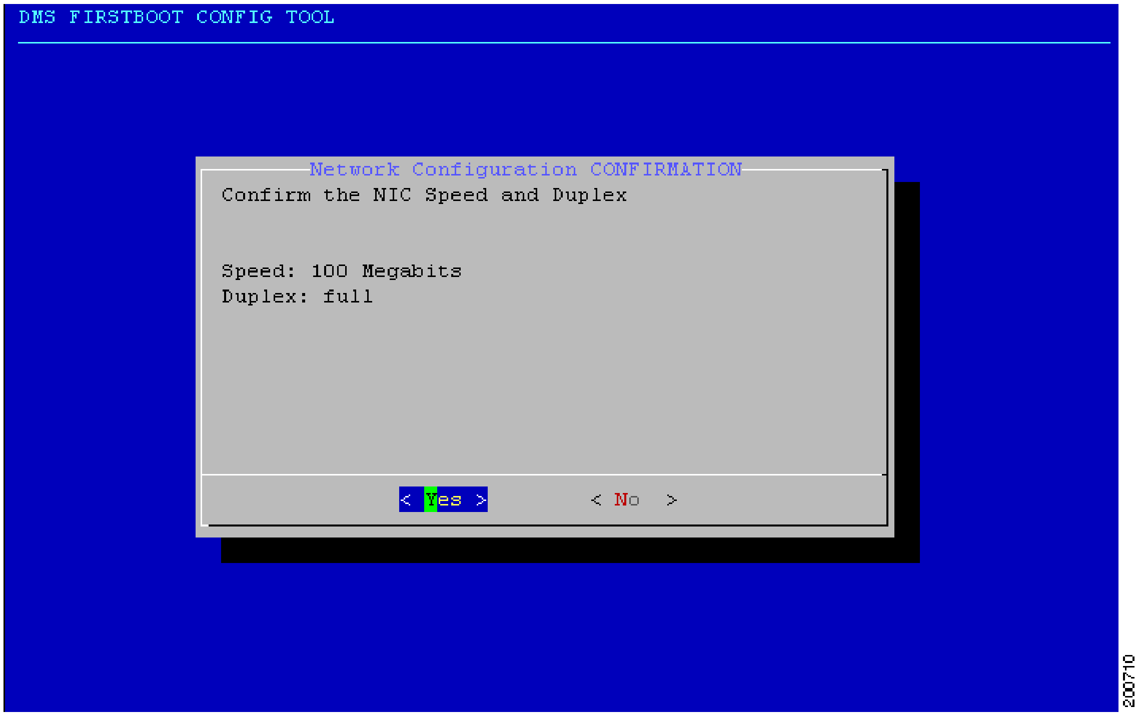
200708

Step 17 Set your NIC to either full or half duplex.



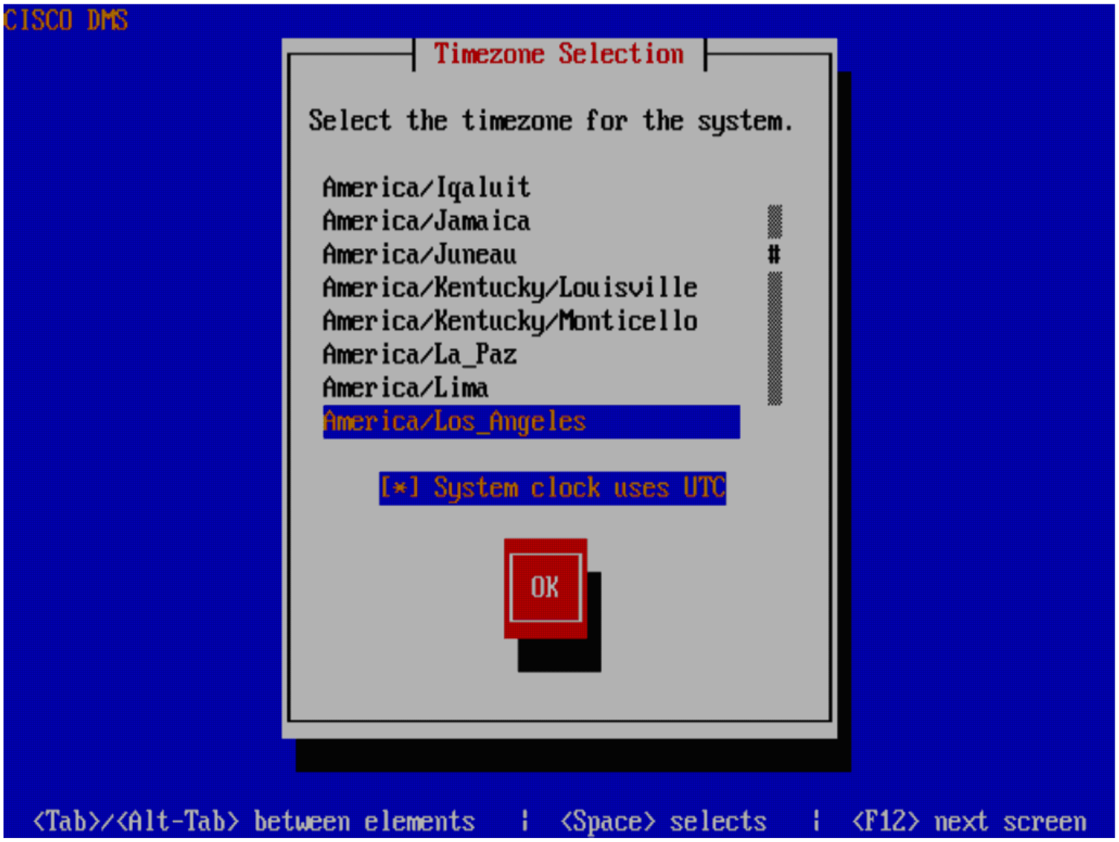
```
DMS FIRSTBOOT CONFIG TOOL

SELECT NIC DUPLEX
Please enter the NIC Duplex below:

(X) full
( ) half

< OK >
```

Step 18 Confirm the NIC speed and duplex.



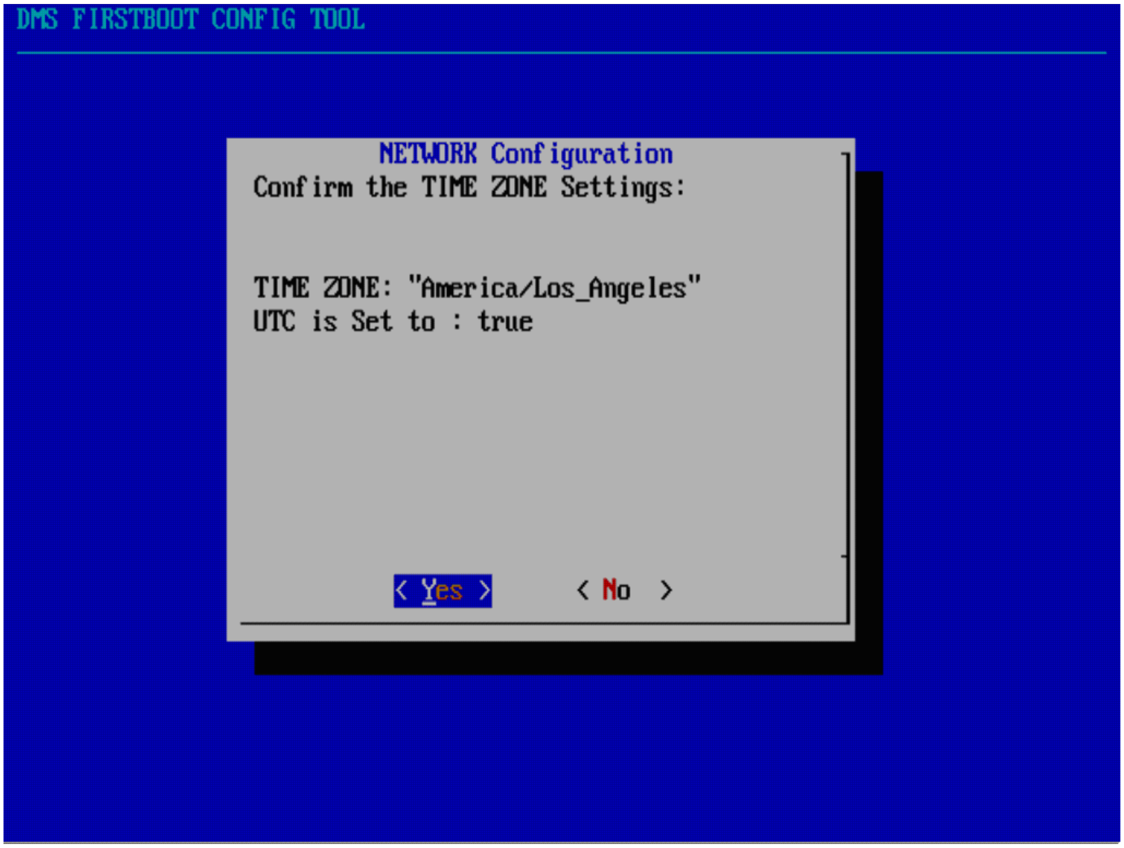
```
DMS FIRSTBOOT CONFIG TOOL

Network Configuration CONFIRMATION
Confirm the NIC Speed and Duplex

Speed: 100 Megabits
Duplex: full

< Yes >          < No  >
```

Step 19 Configure the time zone. Select the timezone using the up and down arrow. Press **Tab** and then press **Space** to select and deselect **System clock uses UTC**. Press **Tab** again to navigate to the **OK** button and press **Enter**.



```
CISCO DMS
                    ┤ Timezone Selection ├

             Select the timezone for the system.

              America/Iqaluit
              America/Jamaica
              America/Juneau                         #
              America/Kentucky/Louisville
              America/Kentucky/Monticello
              America/La_Paz
              America/Lima
              America/Los_Angeles

                 [*] System clock uses UTC

                            OK

  <Tab>/<Alt-Tab> between elements   |  <Space> selects   |  <F12> next screen
```

Step 20 Confirm the time zone setting. Press **Enter** on if all the information is correct. If the information is incorrect, use the arrow keys to navigate to **No** and press **Enter** to re-configure your settings.



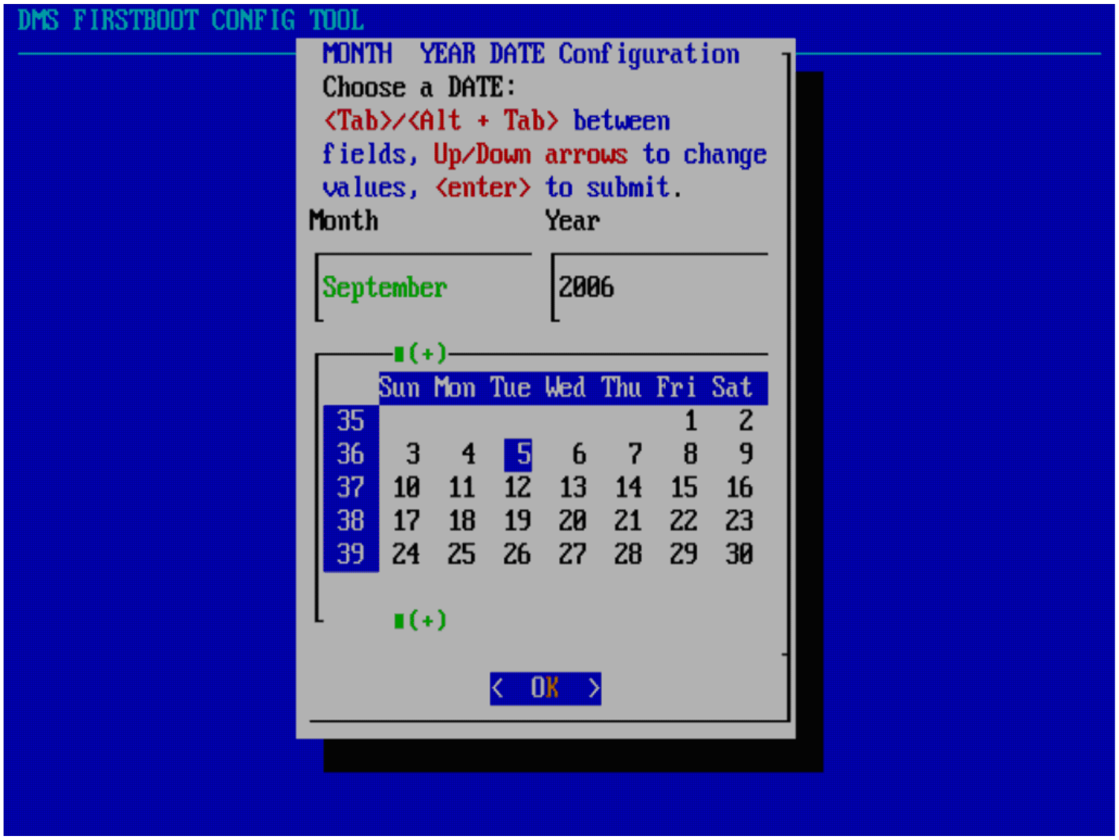
DMS FIRSTBOOT CONFIG TOOL

NETWORK Configuration

Confirm the TIME ZONE Settings:

```
TIME ZONE: "America/Los_Angeles"
UTC is Set to : true
```

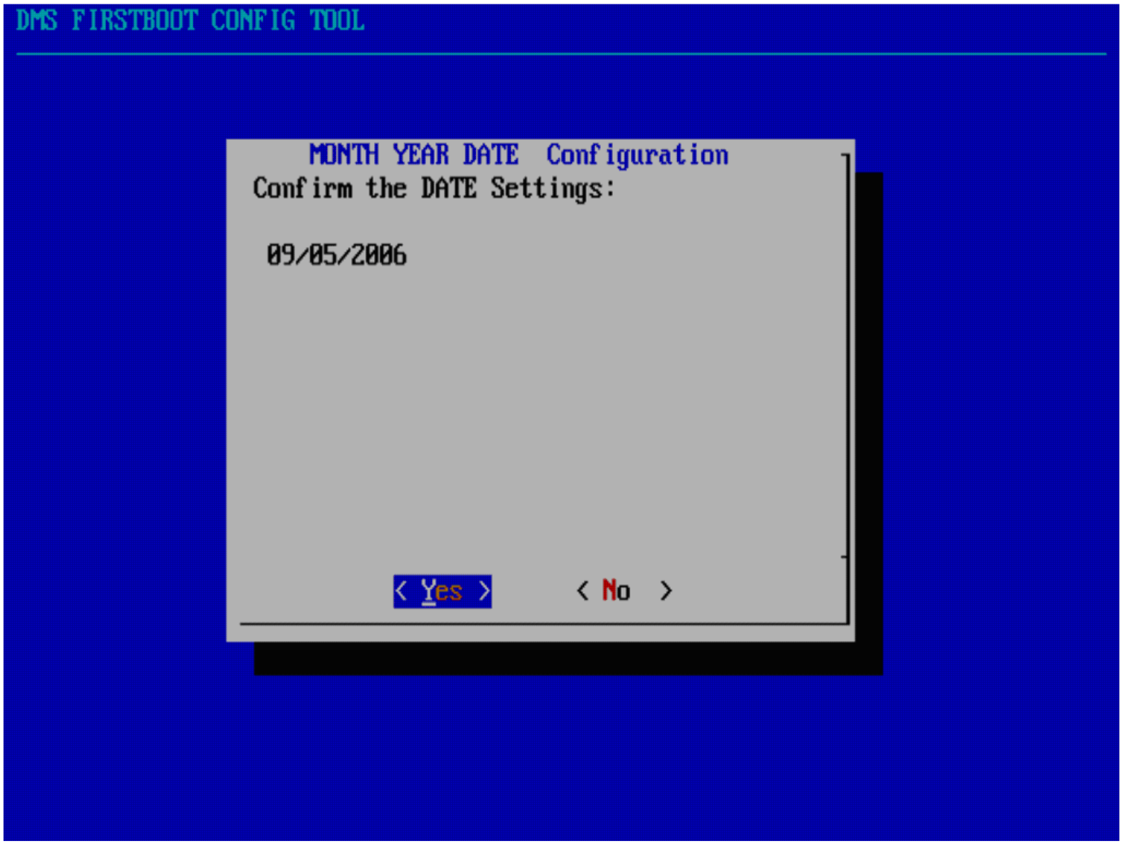
Step 21 Select the date. Press **Tab** and use the up and down arrows to change the month. Press **Tab** and use the up and down arrows to change the year. Press **Tab** and use the up and down arrows and left and right arrows to select day, **Tab** to the **OK** button and press **Enter** to submit the information.



```
DMS FIRSTBOOT CONFIG TOOL
   MONTH  YEAR DATE Configuration
   Choose a DATE:
   <Tab>/<Alt + Tab> between
   fields, Up/Down arrows to change
   values, <enter> to submit.
  Month            Year

   September        2006

        (+)
       Sun Mon Tue Wed Thu Fri Sat
    35                       1   2
    36   3   4   5   6   7   8   9
    37  10  11  12  13  14  15  16
    38  17  18  19  20  21  22  23
    39  24  25  26  27  28  29  30

        (+)

              <  OK  >
```

157742

Step 22 Confirm the date.



DMS FIRSTBOOT CONFIG TOOL

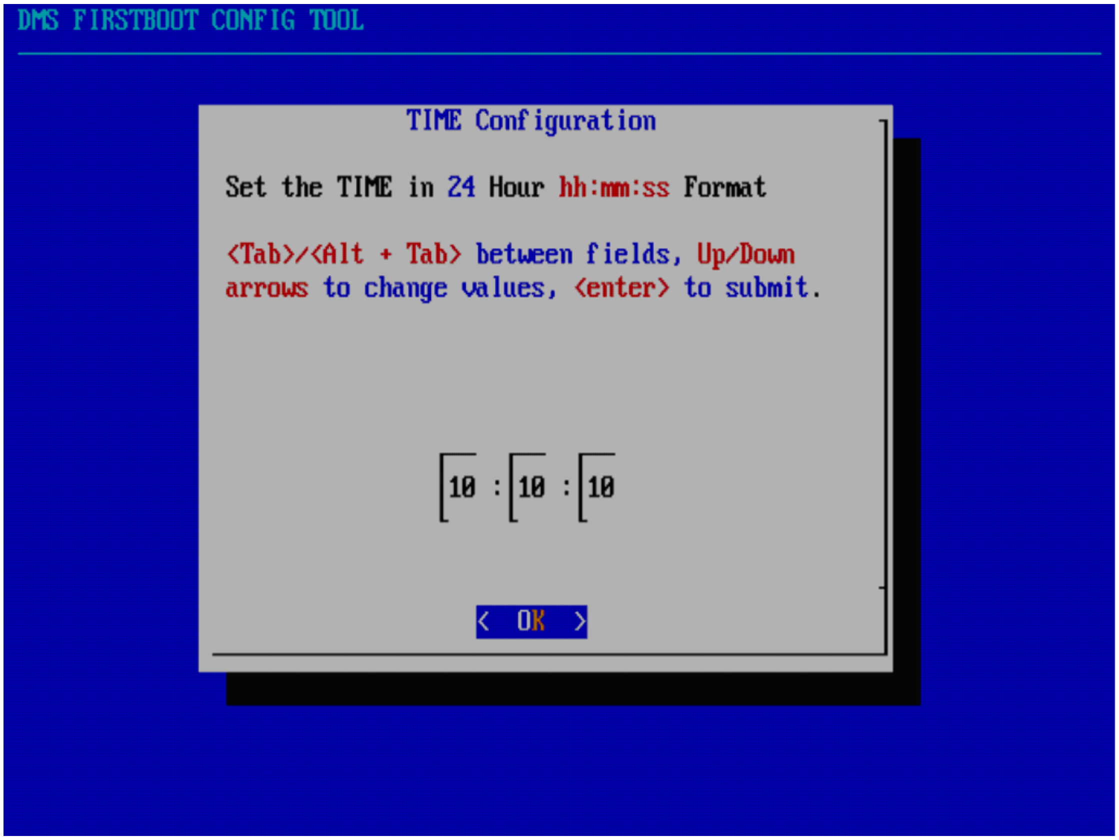
MONTH YEAR DATE Configuration

Confirm the DATE Settings:

09/05/2006

157743

Step 23 Select the time in 24 hour format. Press **Tab** and use the up and down arrows to set the hour. Press **Tab** and use the up and down arrows to set the minutes. Press **Tab** and use the up and down arrows to set the seconds. Press **Tab** and select the **OK** button and press **Enter** to submit the information.



DMS FIRSTBOOT CONFIG TOOL

TIME Configuration

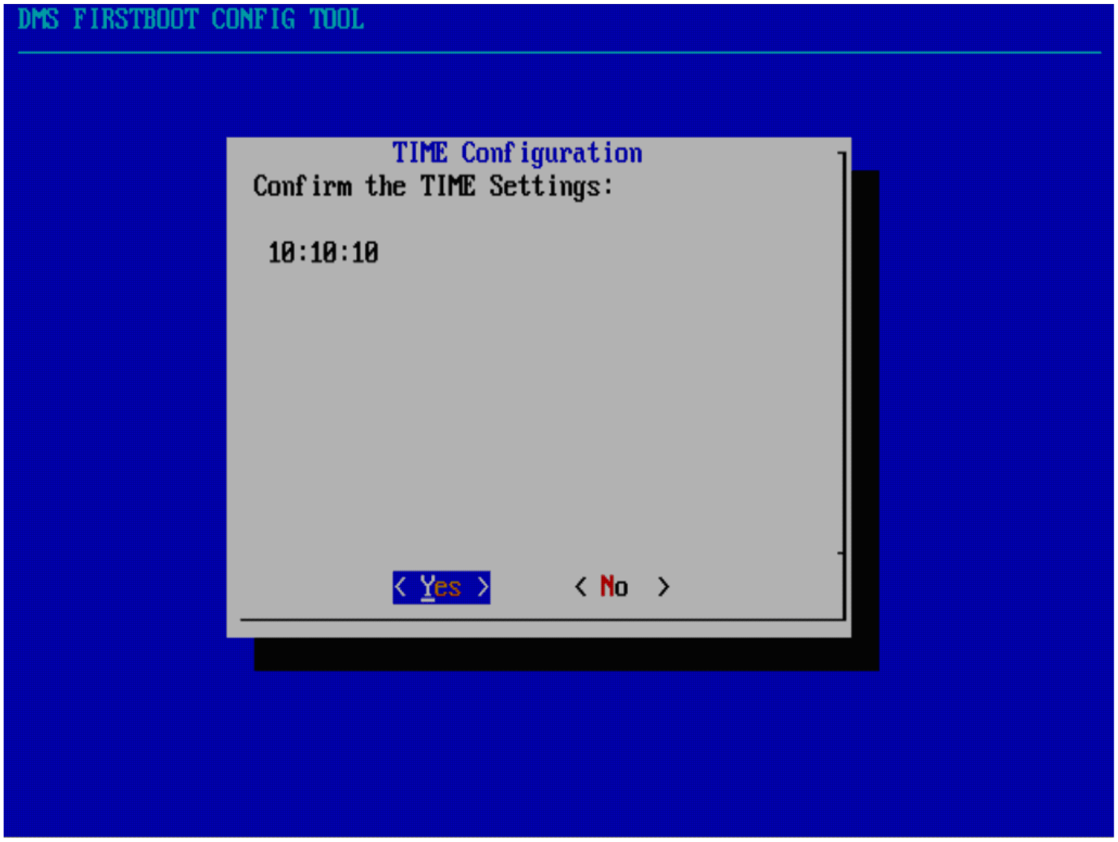
Set the TIME in 24 Hour hh:mm:ss Format

<Tab>/<Alt + Tab> between fields, Up/Down arrows to change values, <enter> to submit.

10 : 10 : 10

157744

Step 24 Confirm the time. Press **Enter** if all the information is correct. If the information is incorrect, use the arrows to navigate to **No** and press **Enter** to reconfigure your settings.



DMS FIRSTBOOT CONFIG TOOL

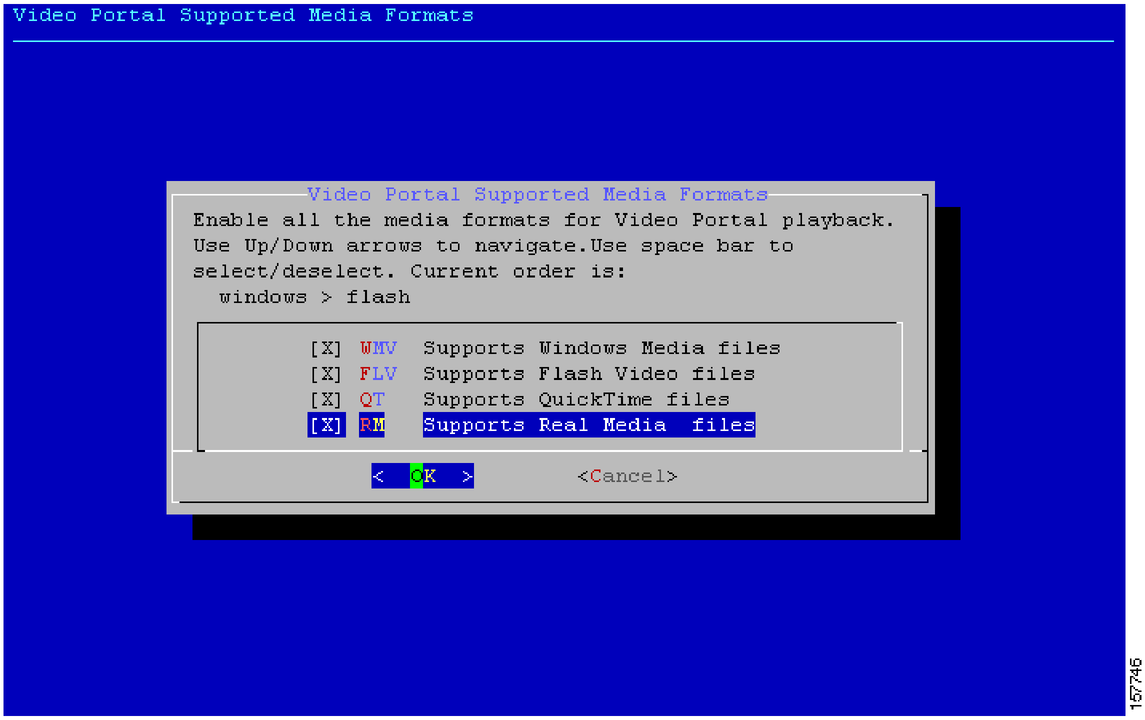
TIME Configuration

Confirm the TIME Settings:

10:10:10

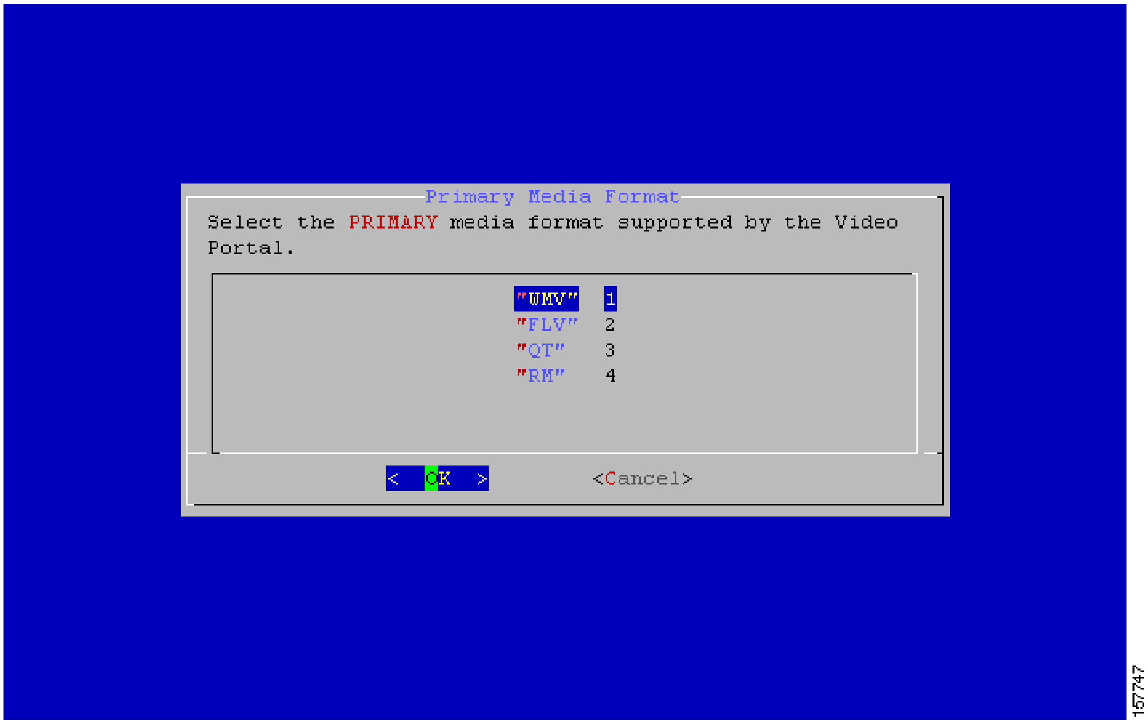
157745

Step 25 Select the video portal supported media formats. These are all the media formats your content will be encoded in, and therefore the Video Portal template you will be supporting. By default, no media format is selected. You must select at least one media format. Use the up and down arrows to highlight the media format. Press Space to select or deselect an item. Press **Enter** to submit.



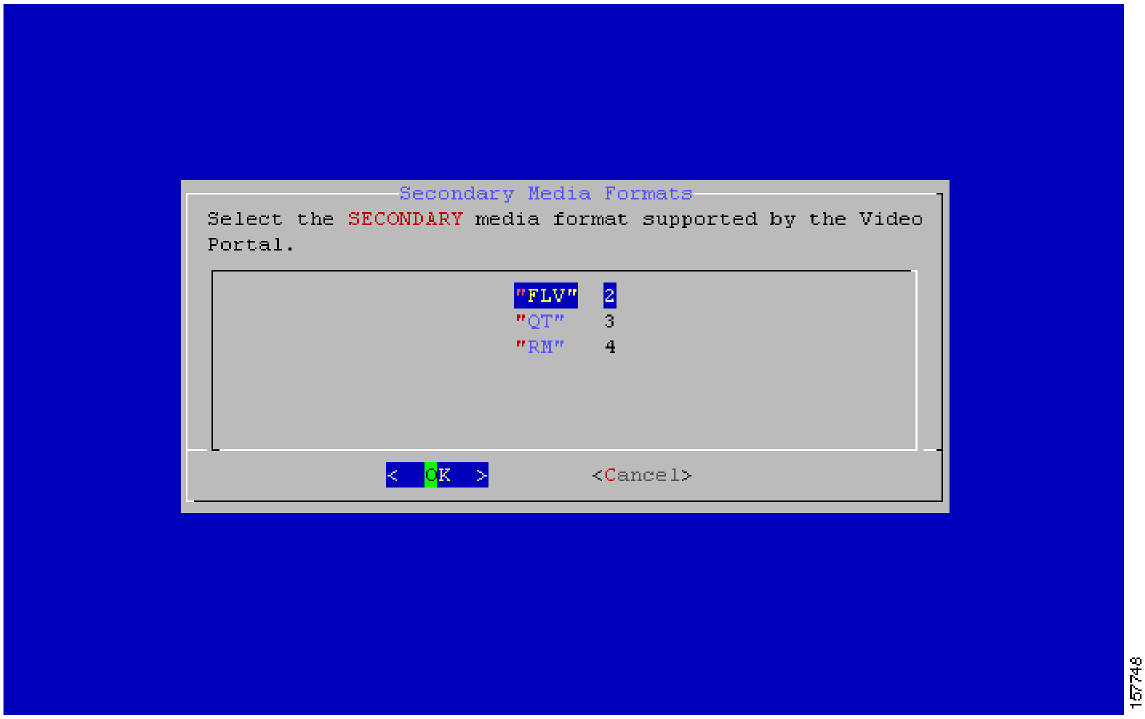
```
Video Portal Supported Media Formats

              Video Portal Supported Media Formats
  Enable all the media formats for Video Portal playback.
  Use Up/Down arrows to navigate.Use space bar to
  select/deselect. Current order is:
    windows > flash

           [X] WMV  Supports Windows Media files
           [X] FLV  Supports Flash Video files
           [X] QT   Supports QuickTime files
           [X] RM   Supports Real Media  files

               <  OK  >         <Cancel>
```

Step 26 If you select two or more media formats to support, you are prompted with a similar screen to the one below. Select the primary media format supported by the Video Portal. If a client machine accessing the Video Portal meets the requirements of all of the media formats you chose to support, highlight the media type you would prefer them to receive by using the up and down arrows, then press **Enter**.



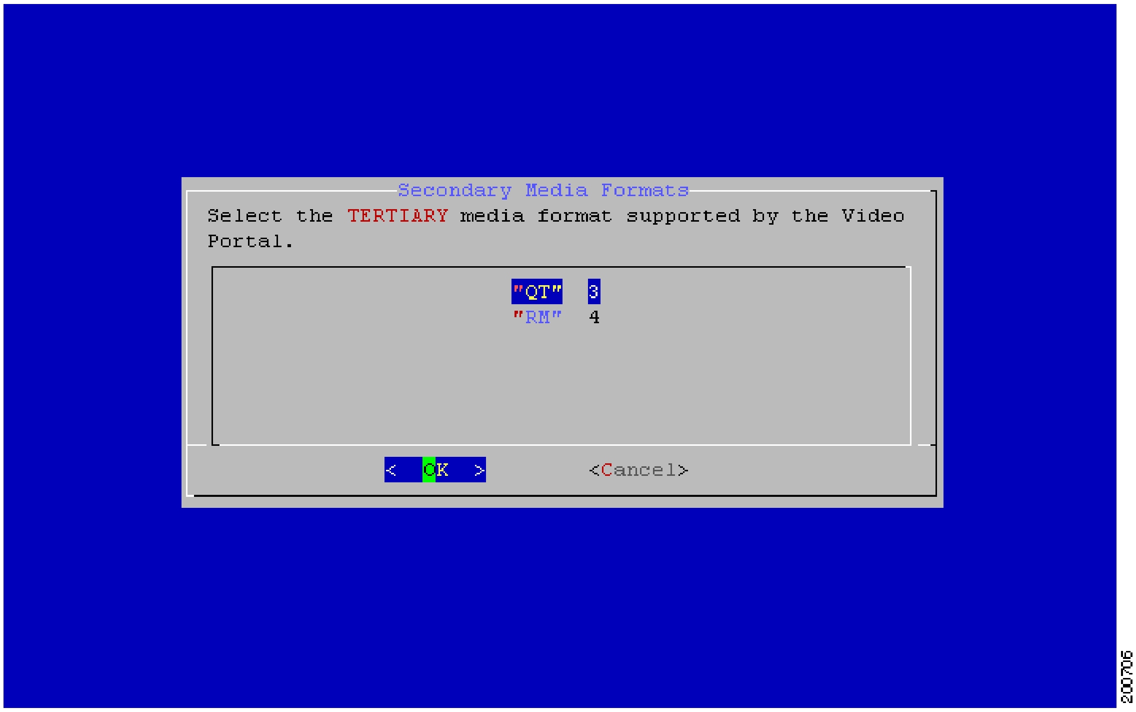
```
Primary Media Format
Select the PRIMARY media format supported by the Video
Portal.

                    "WMV"   1
                    "FLV"   2
                    "QT"    3
                    "RM"    4
```

Step 27 If you select three or more media types to support, you are prompted with the following screen. Select the secondary media format supported by the Video Portal. If a client machine accessing the Video Portal does not meet the requirements for the primary media type but meets the requirements for the two other types of supported media, highlight the media format you would prefer them to receive by using the up and down arrows, then press **Enter**.



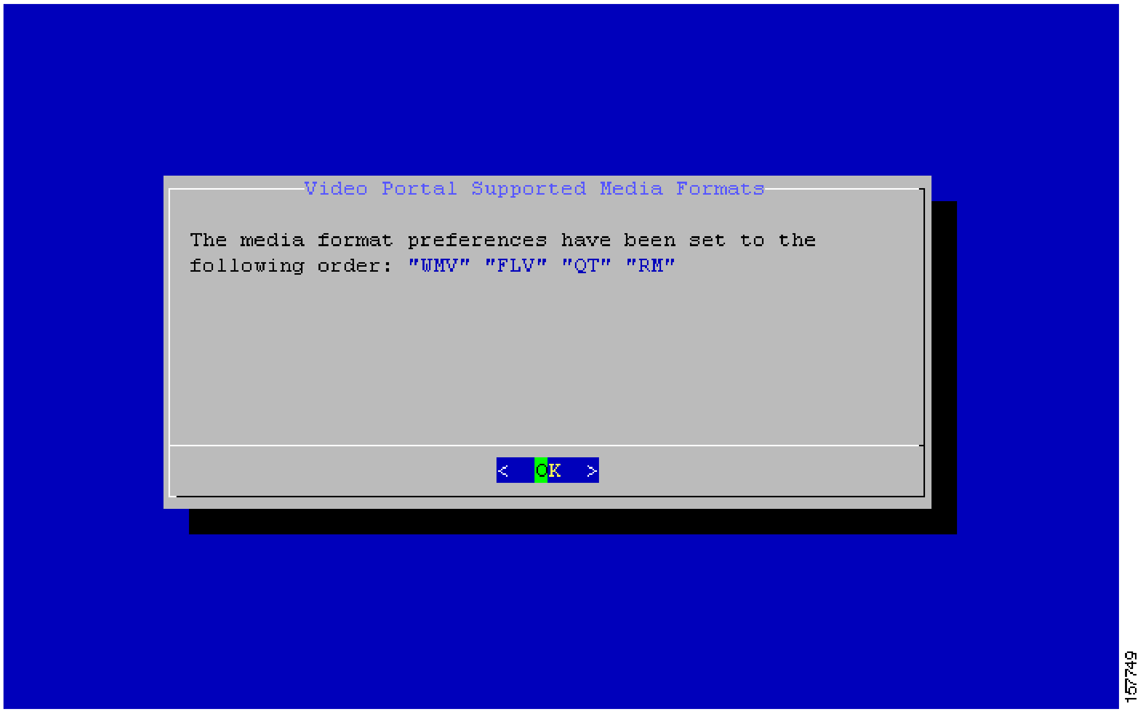
```
Secondary Media Formats
Select the SECONDARY media format supported by the Video
Portal.
```

Step 28 If you select four or more media types to support, you are prompted with the following screen. Select the tertiary media format supported by the Video Portal. If a client machine accessing the Video Portal does not meet the requirements for the primary media type but meets the requirements for the two other types of supported media, highlight the media format you would prefer them to receive by using the up and down arrows, then press **Enter**.



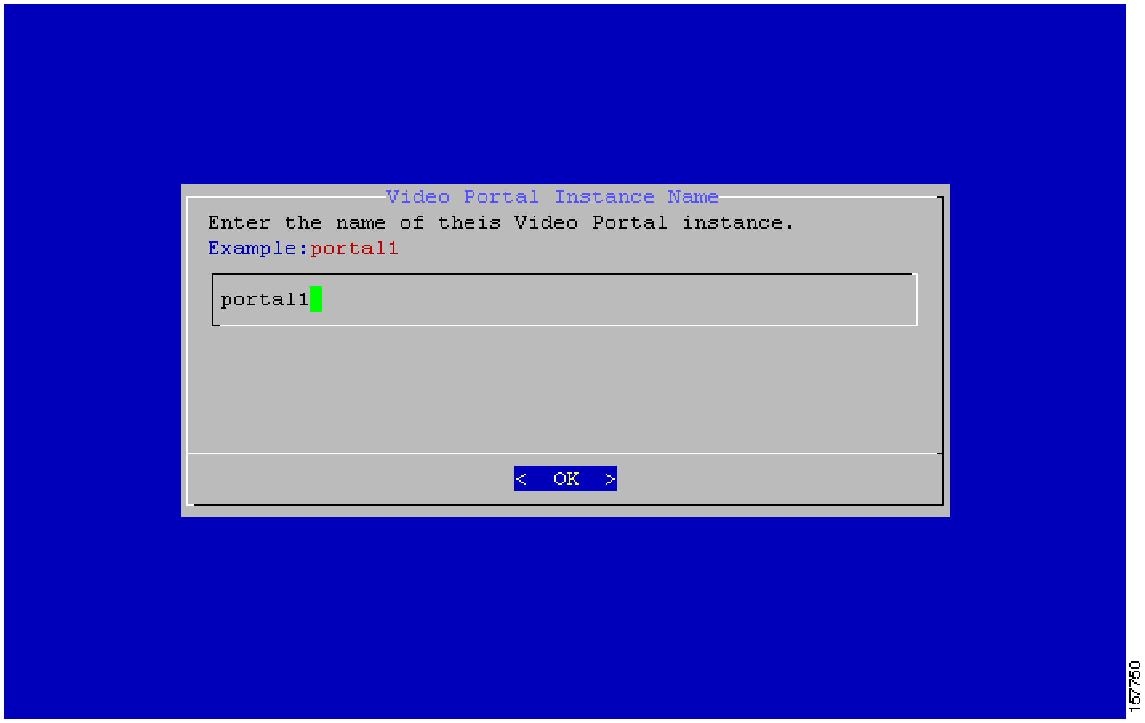
```
Secondary Media Formats
Select the TERTIARY media format supported by the Video
Portal.
```

Step 29 The preferred media format order is now displayed. Press **Enter** to confirm. If you made an error, you can go back into the appliance administrative interface (AAI) after the first boot process to modify these settings.



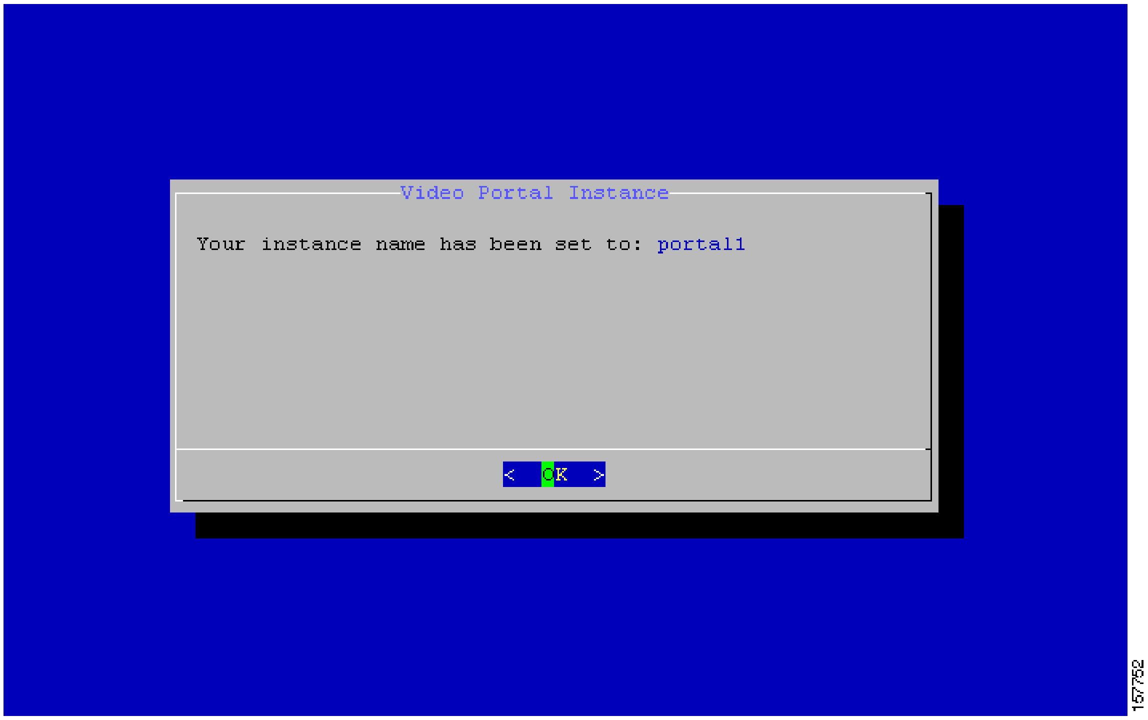
```
Video Portal Supported Media Formats

The media format preferences have been set to the
following order: "WMV" "FLV" "QT" "RM"
```

Step 30 Enter the Video Portal instance name and press **Enter**. This is used to generate a direct URL for to the Video Portal. In the following example, the video portal instance name is **portal1**.



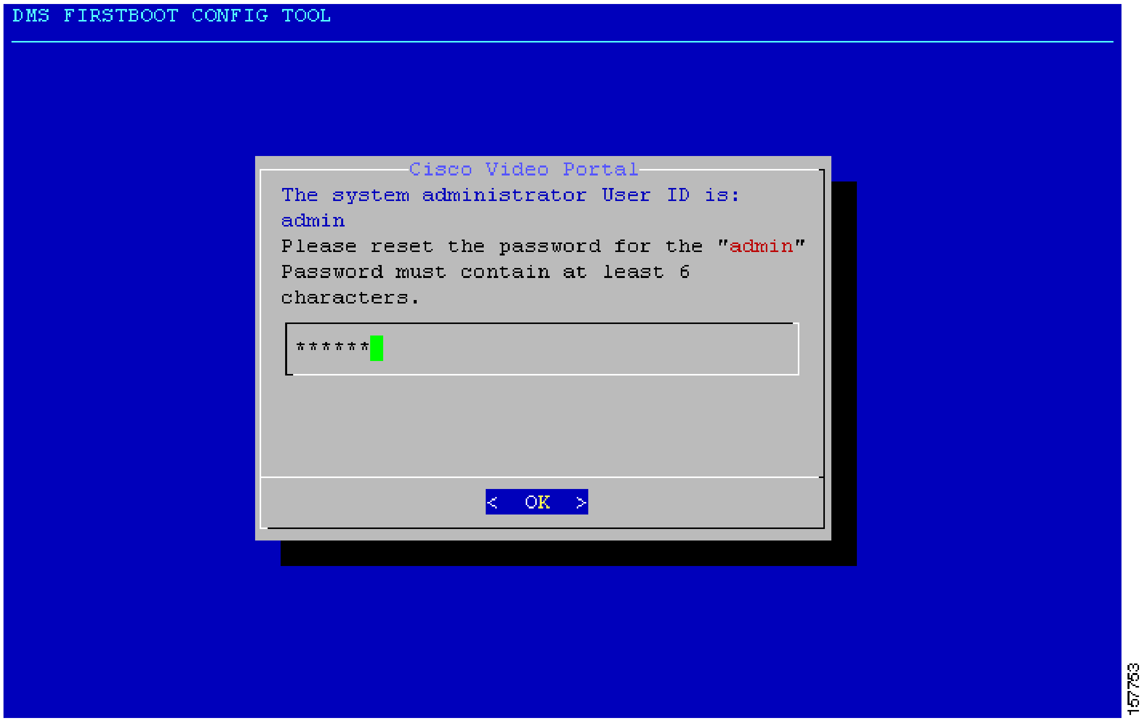
```
Video Portal Instance Name
Enter the name of theis Video Portal instance.
Example:portal1

portal1
```

Step 31 The instance name is displayed for your confirmation. Press **Enter** to continue. If you made an error, you can go back into the appliance administrative interface (AAI) after the first boot process to modify these settings.



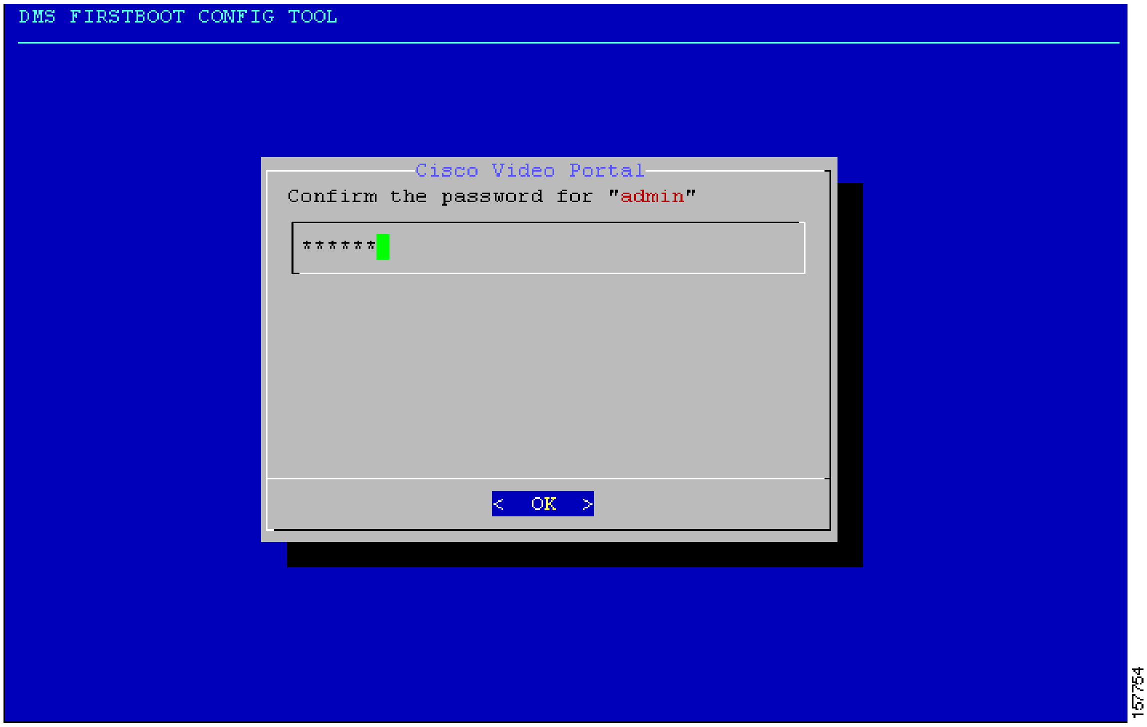
```
Video Portal Instance

Your instance name has been set to: portal1
```

Step 32 Set the password for **admin**. **admin** is the default administrator account for this server appliance. Your password cannot be null. The password should be at least six (6) characters long.



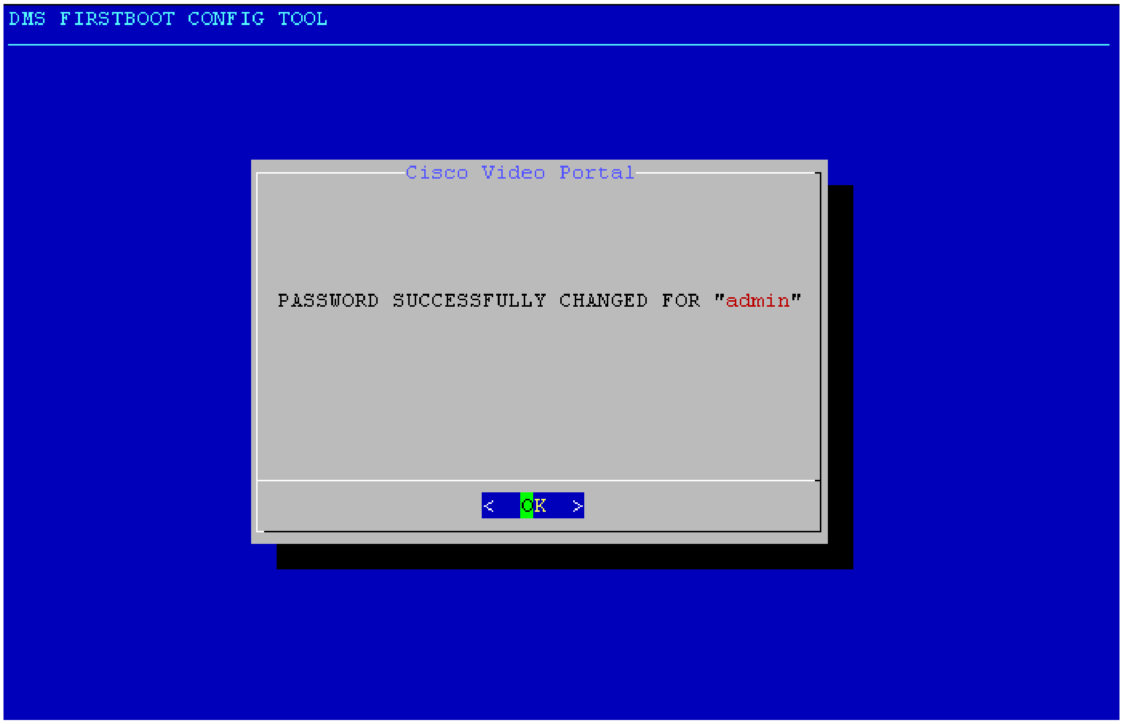
```
DMS FIRSTBOOT CONFIG TOOL

Cisco Video Portal
The system administrator User ID is:
admin
Please reset the password for the "admin"
Password must contain at least 6
characters.

******
```

Step 33 Confirm the password for **admin** user.



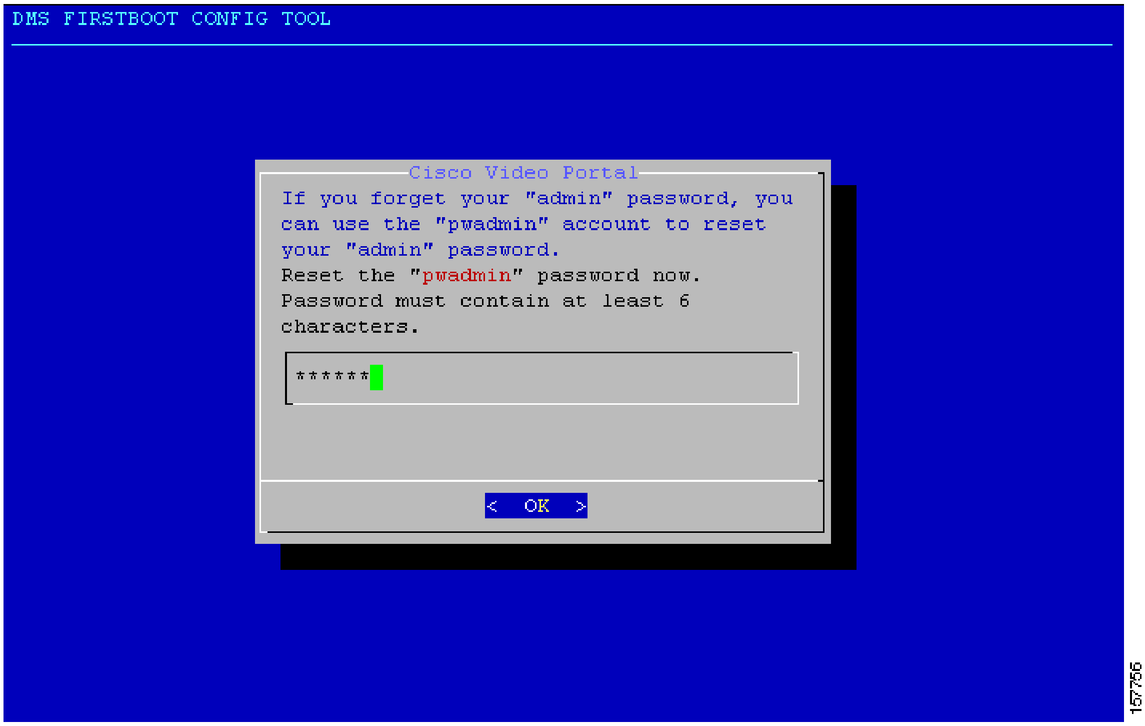
```
DMS FIRSTBOOT CONFIG TOOL

                    Cisco Video Portal
        Confirm the password for "admin"

        ******

                        <  OK  >
```

Step 34 You receive confirmation of your **admin** password change. Press **Enter** to continue.



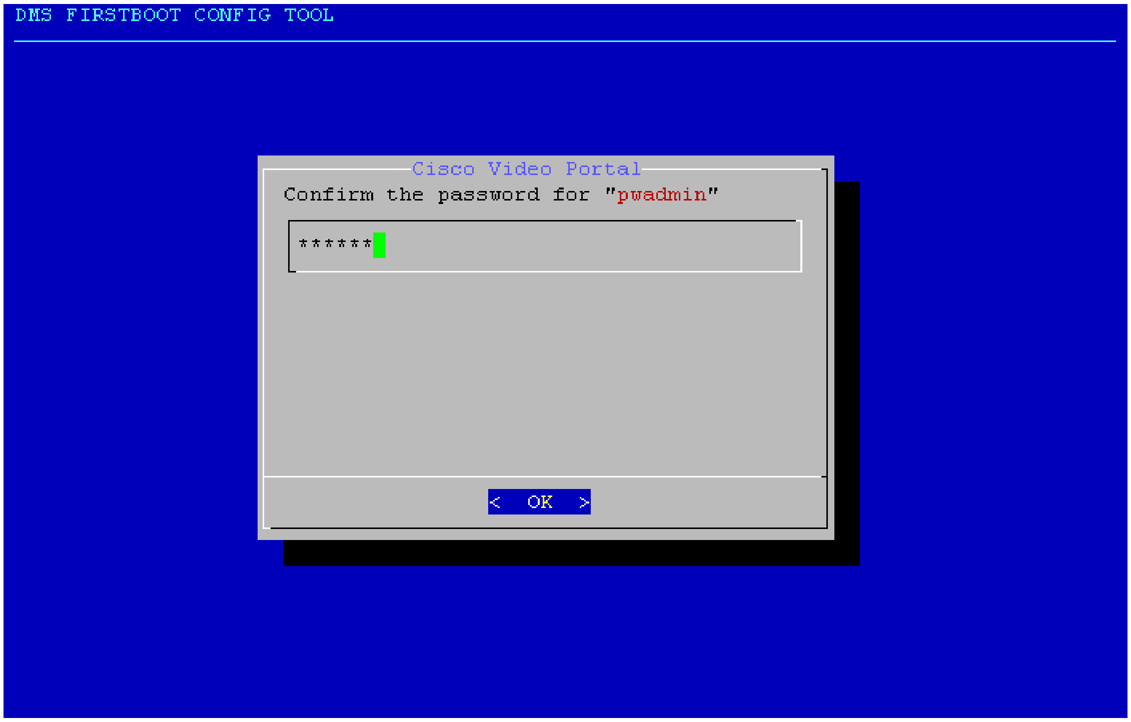
```
DMS FIRSTBOOT CONFIG TOOL

Cisco Video Portal

PASSWORD SUCCESSFULLY CHANGED FOR "admin"

< OK >
```

Step 35 Set the password for **pwadmin** user.The **pwadmin** account allows you to reset your **admin** user password (for example, if you were to forget it). The password cannot be null. The password should be at least six (6) characters long.



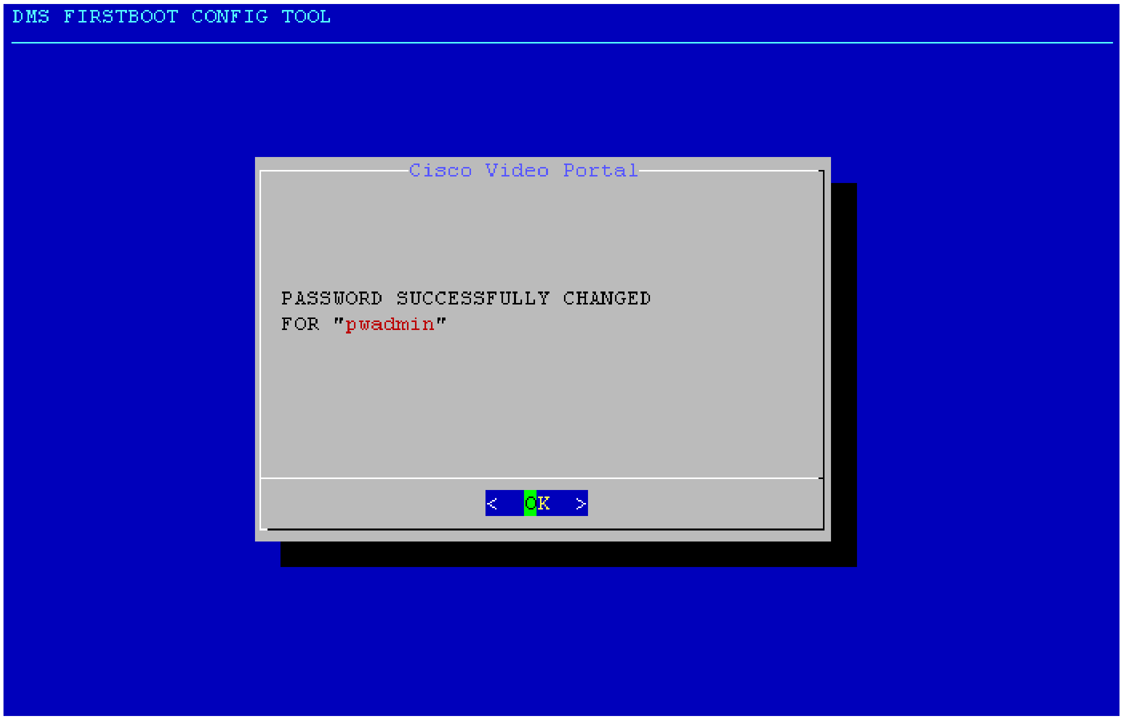
```
DMS FIRSTBOOT CONFIG TOOL

Cisco Video Portal
If you forget your "admin" password, you
can use the "pwadmin" account to reset
your "admin" password.
Reset the "pwadmin" password now.
Password must contain at least 6
characters.

******
```

Step 36 Confirm the password for **pwadmin** user.



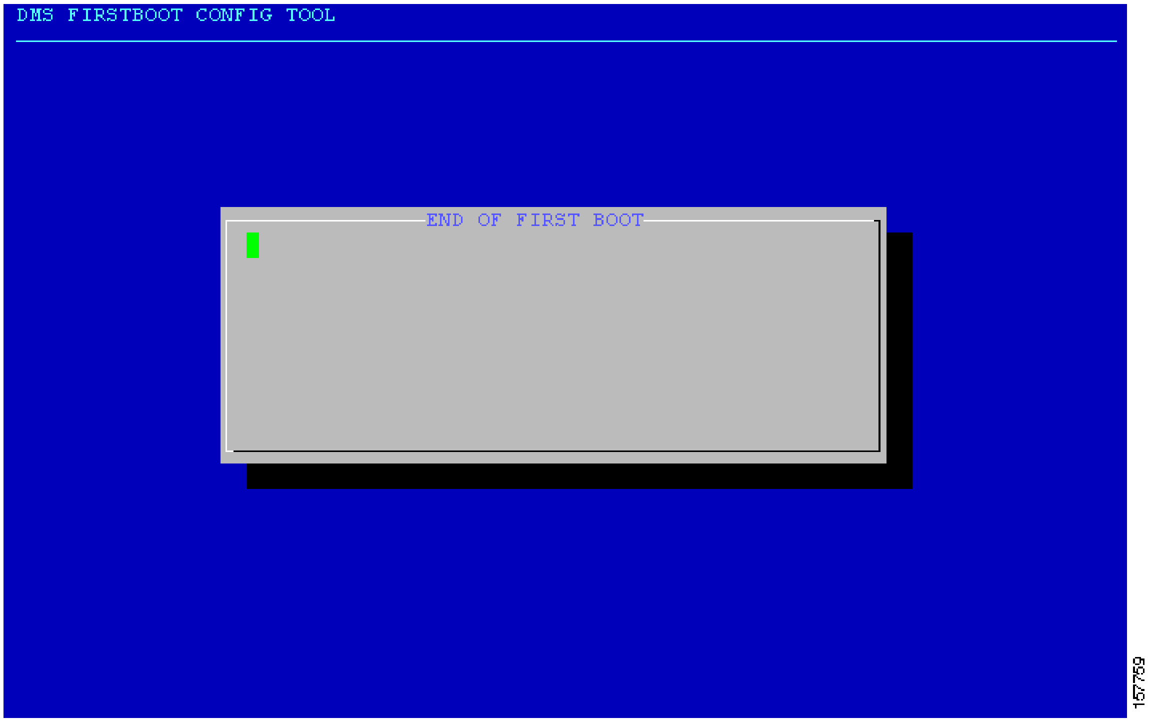
```
DMS FIRSTBOOT CONFIG TOOL

Cisco Video Portal
Confirm the password for "pwadmin"
******
```

Step 37 You receive confirmation of your **pwadmin** password change. Press **Enter** to continue.



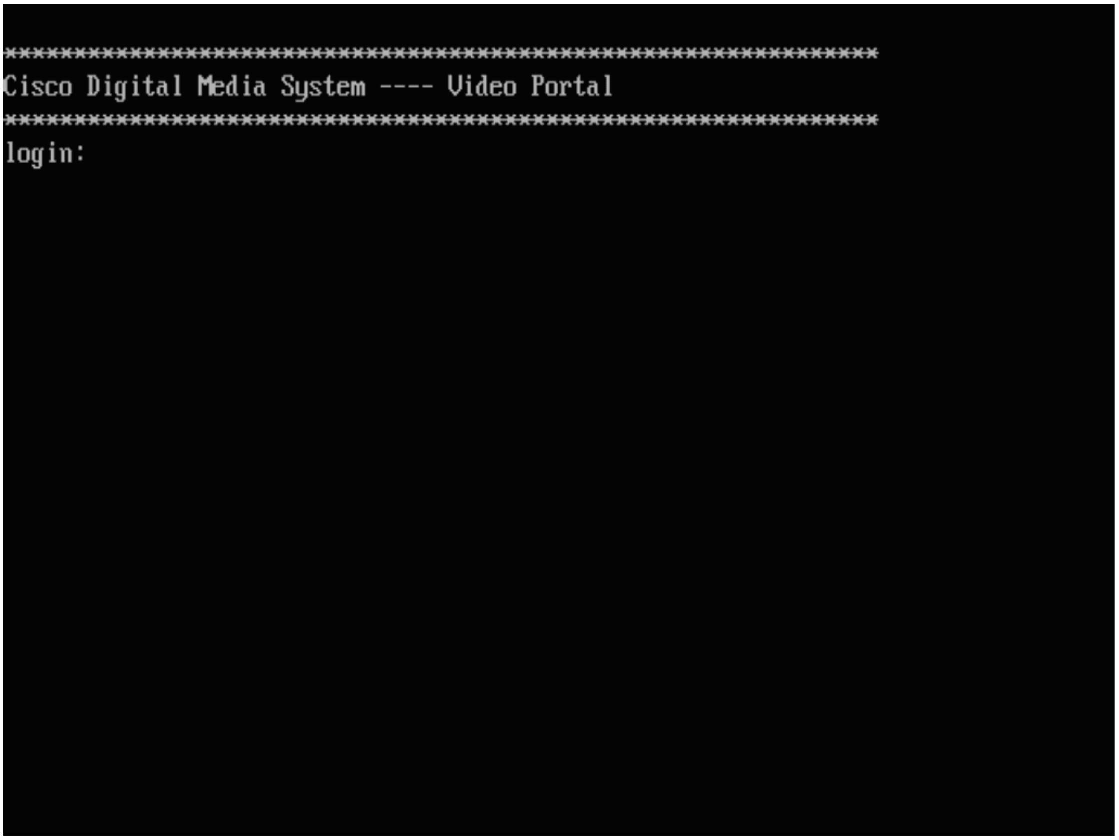
```
DMS FIRSTBOOT CONFIG TOOL

Cisco Video Portal

PASSWORD SUCCESSFULLY CHANGED
FOR "pwadmin"

<  OK  >
```

Step 38 The following screen appears, confirming the end of the first boot.



```
DMS FIRSTBOOT CONFIG TOOL

END OF FIRST BOOT
```

Step 39 You can now login using the AAI as **admin** using the new password, or as **pwadmin** using the new password.



```
****************************************************************
Cisco Digital Media System ---- Video Portal
****************************************************************
login:
```

157760

The recovery is now complete.

Related Documentation

Refer to the Cisco Digital Media System Documentation Roadmap for a list of related documentation: http://www.cisco.com/en/US/products/ps6681/products_documentation_roadmap09186a0080720650.html

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. This section explains the product documentation resources that Cisco offers.

Cisco.com

You can access the most current Cisco documentation at this URL:

http://www.cisco.com/techsupport

You can access the Cisco website at this URL:

http://www.cisco.com

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Product Documentation DVD

The Product Documentation DVD is a library of technical product documentation on a portable medium. The DVD enables you to access installation, configuration, and command guides for Cisco hardware and software products. With the DVD, you have access to the HTML documentation and some of the PDF files found on the Cisco website at this URL:

http://www.cisco.com/univercd/home/home.htm

The Product Documentation DVD is created monthly and is released in the middle of the month. DVDs are available singly or by subscription. Registered Cisco.com users can order a Product Documentation DVD (product number DOC-DOCDVD= or DOC-DOCDVD=SUB) from Cisco Marketplace at the Product Documentation Store at this URL:

http://www.cisco.com/go/marketplace/docstore

Ordering Documentation

You must be a registered Cisco.com user to access Cisco Marketplace. Registered users may order Cisco documentation at the Product Documentation Store at this URL:

http://www.cisco.com/go/marketplace/docstore

If you do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Documentation Feedback

You can provide feedback about Cisco technical documentation on the Cisco Technical Support & Documentation site area by entering your comments in the feedback form available in every online document.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you will find information about how to do the following:

- Report security vulnerabilities in Cisco products
- Obtain assistance with security incidents that involve Cisco products
- Register to receive security information from Cisco

A current list of security advisories, security notices, and security responses for Cisco products is available at this URL:

http://www.cisco.com/go/psirt

To see security advisories, security notices, and security responses as they are updated in real time, you can subscribe to the Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed. Information about how to subscribe to the PSIRT RSS feed is found at this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you have identified a vulnerability in a Cisco product, contact PSIRT:

- For emergencies only—security-alert@cisco.com

  An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- For nonemergencies—psirt@cisco.com

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532

Tip We encourage you to use Pretty Good Privacy (PGP) or a compatible product (for example, GnuPG) to encrypt any sensitive information that you send to Cisco. PSIRT can work with information that has been encrypted with PGP versions 2.*x* through 9.*x*.

Never use a revoked encryption key or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

The link on this page has the current PGP key ID in use.

If you do not have or use PGP, contact PSIRT to find other means of encrypting the data before sending any sensitive material.

Product Alerts and Field Notices

Modifications to or updates about Cisco products are announced in Cisco Product Alerts and Cisco Field Notices. You can receive Cisco Product Alerts and Cisco Field Notices by using the Product Alert Tool on Cisco.com. This tool enables you to create a profile and choose those products for which you want to receive information.

To access the Product Alert Tool, you must be a registered Cisco.com user. (To register as a Cisco.com user, go to this URL: http://tools.cisco.com/RPF/register/register.do) Registered users can access the tool at this URL: http://tools.cisco.com/Support/PAT/do/ViewMyProfiles.do?local=en

Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day at this URL:

http://www.cisco.com/techsupport

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

http://tools.cisco.com/RPF/register/register.do

Note Use the **Cisco Product Identification Tool** to locate your product serial number before submitting a request for service online or by phone. You can access this tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link, clicking the **All Tools (A-Z)** tab, and then choosing **Cisco Product Identification Tool** from the alphabetical list. This tool offers three search options: by product ID or model name; by tree view; or, for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Tip

Displaying and Searching on Cisco.com

If you suspect that the browser is not refreshing a web page, force the browser to update the web page by holding down the Ctrl key while pressing F5.

To find technical information, narrow your search to look in technical documentation, not the entire Cisco.com website. On the Cisco.com home page, click the **Advanced Search** link under the Search box and then click the **Technical Support & Documentation**.radio button.

To provide feedback about the Cisco.com website or a particular technical document, click **Contacts & Feedback** at the top of any Cisco.com web page.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

http://www.cisco.com/techsupport/servicerequest

For S1 or S2 service requests, or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411
Australia: 1 800 805 227
EMEA: +32 2 704 55 55
USA: 1 800 553 2447

For a complete list of Cisco TAC contacts, go to this URL:

http://www.cisco.com/techsupport/contacts

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—An existing network is “down” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operations are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of the network is impaired while most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Quick Reference Guide* is a handy, compact reference tool that includes brief product overviews, key features, sample part numbers, and abbreviated technical specifications for many Cisco products that are sold through channel partners. It is updated twice a year and includes the latest Cisco channel product offerings. To order and find out more about the *Cisco Product Quick Reference Guide*, go to this URL:

  http://www.cisco.com/go/guide

- Cisco Marketplace provides a variety of Cisco books, reference guides, documentation, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

  http://www.cisco.com/go/marketplace/

- Cisco Press publishes a wide range of general networking, training, and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

  http://www.ciscopress.com

- *Packet* magazine is the magazine for Cisco networking professionals. Each quarter, *Packet* delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can subscribe to *Packet* magazine at this URL:

  http://www.cisco.com/packet

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the *Internet Protocol Journal* at this URL:

  http://www.cisco.com/ipj

- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:

  http://www.cisco.com/en/US/products/index.html

- Networking Professionals Connection is an interactive website where networking professionals share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:

  http://www.cisco.com/discuss/networking

- “What’s New in Cisco Documentation” is an online publication that provides information about the latest documentation releases for Cisco products. Updated monthly, this online publication is organized by product category to direct you quickly to the documentation for your products. You can view the latest release of “What’s New in Cisco Documentation” at this URL:

  http://www.cisco.com/univercd/cc/td/doc/abtunicd/136957.htm

- World-class networking training is available from Cisco. You can view current offerings at this URL:

  http://www.cisco.com/en/US/learning/index.html

Any Internet Protocol (IP) addresses used in this document are not intended to be actual addresses. Any examples, command display output, and figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses in illustrative content is unintentional and coincidental.