



Recovering the Cisco uBR905 Cable Access Router After Loading a Cisco uBR925 VoIP Image

Feature History

Release	Modification
12.1(3a)XL1, 12.2(2)XA	The Cisco uBR905 cable access router was introduced.
12.2(2)XA1	Support was added for the Cisco uBR925 cable access router. Both the Cisco uBR905 and Cisco uBR925 used the same Cisco IOS images.
12.2(8)YJ, 12.2(11)T1	Separate images were introduced for the Cisco uBR905 and Cisco uBR925 cable access routers because the voice-enabled images are too large for the Cisco uBR905 router.

This document describes how to reload a Cisco uBR905 cable access router with a valid Cisco IOS software image, after you have attempted to load a Cisco IOS software image for Cisco uBR925 Voice over IP (VoIP) operations that produces an “insufficient memory” error on the Cisco uBR905 cable access router.

This document includes the following sections:

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Problem Overview

Starting with Cisco IOS Release 12.2(8)YJ, Cisco IOS Release 12.2(11)T1, and later releases, the Cisco uBR905 cable access router will fail to boot, displaying an “insufficient memory” error, if you upgrade its software to a Cisco IOS image that enables Voice over IP (VoIP) operations for the Cisco uBR925 cable access router. The following paragraphs describe why this situation occurs.

The Cisco uBR905 and Cisco uBR925 cable access routers share the same basic hardware for DOCSIS operation and hardware-accelerated encryption. The Cisco uBR925 cable access router, however, adds support for a Universal Serial Bus (USB) interface and two Voice over IP (VoIP) ports.

When the two routers were first introduced, they used the same Cisco IOS software images. On the Cisco uBR925 router, these images automatically enabled the USB and voice ports, but the Cisco uBR905 router ignored this part of the software code.

However, starting with Cisco IOS Release 12.2(8)YJ and Cisco IOS Release 12.2(11)T1, the software images became too large for the Cisco uBR905 router to load. Therefore, these releases began issuing separate software images for the two models of router: the Cisco uBR905 cable access router now uses non-voice images, and the Cisco uBR925 cable access router uses voice-enabled images.

**Tip**

Voice-enabled images contain a “v” in the image name (for example, “ubr925-k9sv4y5-mz”). Images with a “v4” were produced before Cisco IOS Release 12.2(8)YJ and can be booted on the Cisco uBR905. However, images with a “v9” (for example, “ubr925-k9o3sv9y5-mz”) cannot be used on the Cisco uBR905 router.

If you upgrade a Cisco uBR905 router with a voice-enabled image intended for the Cisco uBR925 router, the Cisco uBR905 router fails to boot the Cisco IOS software and instead boots to the ROM monitor prompt. The following is a typical example of a Cisco uBR905 router that fails to boot because its software image is too large for its memory:

```

program load complete, entry point: 0x80008000, size: 0x867780
Self decompressing the image:
#####
#####
##### [OK]

                Restricted Rights Legend

Use, duplication, or disclosure by the Government is
subject to restrictions as set forth in subparagraph
(c) of the Commercial Computer Software - Restricted
Rights clause at FAR sec. 52.227-19 and subparagraph
(c) (1) (ii) of the Rights in Technical Data and Computer
Software clause at DFARS sec. 252.227-7013.

                cisco Systems, Inc.
                170 West Tasman Drive
                San Jose, California 95134-1706

Cisco Internetwork Operating System Software
IOS (tm) UBR925 Software (UBR925-K9O3SV9Y5-MZ), Release Version 12.2(11)T1
Copyright (c) 1986-2002 by cisco Systems, Inc.
Compiled Fri 28-August-02 18:12 by ravestx
Image text-base: 0x80008124, data-base: 0x80F89A5C

SYSTEM INIT: INSUFFICIENT MEMORY TO BOOT THE IMAGE!

System Bootstrap, Version 12.1(3a)XL1, RELEASE SOFTWARE (fc1)
TAC Support: http://www.cisco.com/tac
Copyright (c) 2002 by cisco Systems, Inc.
UBR905 platform with 24576 Kbytes of main memory

rommon 1 >

```

Because the memory onboard the Cisco uBR905 router is fixed and cannot be increased or upgraded, you must now load a new software image for the Cisco uBR905 router. See the following sections in this document for instructions on how to load a new software image from the ROM monitor.

Related Documents

- [Cisco uBR905 Hardware Installation Guide](#)
- [Cisco uBR925 Hardware Installation Guide](#)
- [Cisco uBR905/uBR925 Software Configuration Guide](#)
- [Cisco uBR905 Cable Access Router Subscriber Setup Quick Start Card](#)
- [Cisco uBR925 Cable Access Router Subscriber Setup Quick Start Card](#)
- [Cisco uBR925 Quick Start User Guide](#)
- [Cisco Broadband Cable Command Reference Guide](#)
- [DOCSIS CPE Configurator Help](#)

Supported Platforms

The instructions in this document support the following platform:

- Cisco uBR905 cable access router

Determining Platform Support Through Feature Navigator

Cisco IOS software is packaged in feature sets that support specific platforms. To get updated information regarding platform support for this feature, access Feature Navigator. Feature Navigator dynamically updates the list of supported platforms as new platform support is added for the feature.

Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image.

To access Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions at <http://www.cisco.com/register>.

Feature Navigator is updated regularly when major Cisco IOS software releases and technology releases occur. For the most current information, go to the Feature Navigator home page at the following URL:

<http://www.cisco.com/go/fn>

Downloading the Software Image

You can upgrade the software image using three different procedures, depending on the type of network connectivity the router currently has. If possible, use the following procedures in the following order to download the new software image to the Cisco uBR905 cable access router:

- [Downloading Through a DOCSIS Cable Network, page 4](#)—Use this procedure if the router is connected to a working DOCSIS cable network.
- [Downloading Manually Through the Ethernet Interface, page 5](#)—Use this procedure if the router cannot download the software image using the DOCSIS procedures, but you can set up a TFTP server through the Ethernet interface.

- [Downloading Manually Through the Serial Interface \(ROMMON Mode\)](#), page 8—Use this procedure as a last resort if the router has no connectivity to a TFTP server over either the cable or Ethernet interfaces.

Downloading Through a DOCSIS Cable Network

If the Cisco uBR905 router can successfully boot its boot flash software image, and if the router is connected to a working DOCSIS cable network, use the following procedure to download the software image from your TFTP server to the router.

-
- Step 1** Create a direct console connection with the Cisco uBR905 cable access router. Use the console cable that shipped with the router and connect the console port on the router to an available serial port on a PC or workstation. Start a terminal program and configure it for the appropriate serial port and for the following settings:
- Speed = 9600 bits per second
 - Databits = 8
 - Parity Bits = 0
 - Stop Bit = 1
 - Flow Control = None

- Step 2** Verify that the router is able to boot into the boot flash software image by connecting a terminal to the router's console port. If the router is running the boot flash image, you will see the word "boot" as part of the prompt, such as the following:

```
Router(boot)>
```

If the router shows a ROM monitor prompt (such as "rommon 1>"), try to boot the boot flash image by giving the following commands:

```
rommon 1> confreg 0x2101
```

```
You must reset or power cycle for new config to take effect
```

```
rommon 2> reset
```

If you cannot display either the boot prompt or ROMMON prompt, press and hold the router's reset button for at least 30 seconds, which will force the router to boot into its boot mode.

If the router still cannot boot the boot flash image, you will have to use the method given in the ["Downloading Manually Through the Serial Interface \(ROMMON Mode\)"](#) section on page 8.

- Step 3** Download a proper Cisco IOS software image for the Cisco uBR905 cable access router to the TFTP server. Typically, this image should be put into the same directory that contains the other Cisco IOS software images. To download a Cisco IOS software image, go to the [IOS Upgrade Planner](#) at the following URL:

<http://www.cisco.com/cgi-bin/Software/Iosplanner/Planner-tool/iosplanner.cgi>



Note You must be logged in as a registered user on Cisco.com to access the [IOS Upgrade Planner](#) site and to download Cisco IOS software images.

- Step 4** Create a DOCSIS configuration file that instructs the Cisco uBR905 router to download the new software image. This information is contained in the following configuration file options:
- Software Upgrade Filename (Option 9)—Specifies the filename and path for the software image, as it exists on the TFTP server.
 - TFTP Server IP (option 21)—Specify the IP address for the TFTP server for the cable modems.



Note You can create this file using a DOCSIS configuration file editor such as the [Cisco DOCSIS CPE Configurator Tool](#) (release 3.7 or later).

- Step 5** Copy this DOCSIS configuration file to your TFTP server.
- Step 6** Configure your DOCSIS cable provisioning software (such as a DHCP server or Cisco Network Registrar) so that it sends this DOCSIS configuration file as the DHCP bootfile during the initial provisioning.
- Step 7** Reload the Cisco uBR905 router, either by turning it off and then on, or by giving the **reload** command in Privileged EXEC mode:

```
Router# reload
Proceed with reload? [confirm] yes
```

The Cisco uBR905 router will then download the DOCSIS configuration file, which will force the router to download the new Cisco IOS software image. Then router then reloads and boots the new software image, displaying a series of status messages on the console port.

Downloading Manually Through the Ethernet Interface

If the Cisco uBR905 router can successfully boot its boot flash software image, but the router cannot successfully connect to a working DOCSIS cable network, use the following procedure to set up a TFTP server on a PC connected to the router's Ethernet interface.

- Step 1** Install a TFTP Server on a PC or workstation that has an Ethernet card installed.
- Step 2** Download a proper Cisco IOS software image for the Cisco uBR905 cable access router to the PC or workstation that is acting as the TFTP server. Typically, this image should be put into the same directory that contains the other Cisco IOS software images. To download a Cisco IOS software image, go to the [IOS Upgrade Planner](#) at the following URL:

<http://www.cisco.com/cgi-bin/Software/Iosplanner/Planner-tool/iosplanner.cgi>



Note You must be logged in as a registered user on Cisco.com to access the [IOS Upgrade Planner](#) site and to download Cisco IOS software images.

- Step 3** Connect a PC or workstation so that it has Ethernet connectivity to the Cisco uBR905 router. The simplest way to do this is to directly connect the two pieces of equipment by connecting the Ethernet port on the PC or workstation to one of the Ethernet hub ports on the Cisco uBR905 router, using a straight-through Ethernet cable.

- Step 4** Create a direct console connection with the Cisco uBR905 router. Use the console cable that shipped with the router and connect the console port on the router to an available serial port on a PC or workstation. Start a terminal program and configure it for the appropriate serial port and for the following settings:
- Speed = 9600 bits per second
 - Databits = 8
 - Parity Bits = 0
 - Stop Bit = 1
 - Flow Control = None
- Step 5** Verify that the router is able to boot into the boot flash software image by connecting a terminal to the router's console port. If the router is running the boot flash image, you will see the word "boot" as part of the prompt, such as the following:

```
Router(boot)>
```



Note If the router shows a ROM monitor prompt (such as "rommon 1>"), try to boot the boot flash image by using the **confreg 0x2101** and **reset** ROM monitor commands. If the router cannot boot the boot flash image, you will have to use the method given in the "[Downloading Manually Through the Serial Interface \(ROMMON Mode\)](#)" section on page 8.

- Step 6** Configure the Cisco uBR905 router so that its Ethernet interface has an IP address in the same subnetwork that the PC or workstation is using. For example, if the PC or workstation is configured for an IP address of 10.10.10.91 and a subnet mask of 255.255.255.0, you could configure the router with a compatible address using the following commands:

```
Router(boot)> enable
Password: <password>
Router(boot)# configure terminal
Router(boot)(config)# interface e0
Router(boot)(config-if)# ip address 10.10.10.92 255.255.255.0
Router(boot)(config-if)# exit
Router(boot)(config)# exit
Router(boot)#
```

- Step 7** Use the **ping** command to verify connectivity with the PC or workstation that is running the TFTP server:

```
Router(boot)# ping ip-address
```

where *ip-address* is the IP address of the PC or workstation. For example, if the IP address for the PC or workstation is 10.10.10.91, you would give the following command:

```
Router(boot)# ping 10.10.10.91
```

A successful ping would show the following, indicating that you have connectivity with the PC or workstation:

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.10.91, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/2/4 ms
Router(boot)#
```

An unsuccessful ping would show the following, indicating that you do not have connectivity with the TFTP server:

```
Type escape sequence to abort.
```

```

Sending 5, 100-byte ICMP Echos to 10.10.10.91, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
Router(boot)#

```

If you do not have connectivity with the PC or workstation, check the cabling between the router and the PC or workstation. Also check to make sure the PC or workstation is configured for the proper IP address. If on a Windows workstation, you can do this by opening the Network control panel and examining the properties for the TCP/IP protocol for the Ethernet card.

- Step 8** If you still cannot access the PC or workstation, use the **ping** command with the broadcast address (255.255.255.255) to request all hosts that are listening to reply. The following example shows a typical result of a successful ping of the broadcast address:

```

Router(boot)# ping 255.255.255.255

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 255.255.255.255, timeout is 2 seconds:

Reply to request 0 from 127.0.0.71, 1 ms
Reply to request 0 from cnr (10.10.10.16), 992 ms
Reply to request 0 from 10.10.10.3, 12 ms
Reply to request 0 from 10.10.10.4, 12 ms
Reply to request 0 from 10.10.10.1, 12 ms
Reply to request 0 from 10.10.10.2, 12 ms
Reply to request 0 from 10.10.10.71, 12 ms

Router(boot)#

```

If you cannot access any hosts except the router's loopback interface (it will have an IP address in the 127.0.0.0 network), check the cabling and configuration on both the router and the PC or workstation. If you get more than one successful reply, doublecheck those IP addresses to see that you have the right IP address for the PC or workstation.

- Step 9** (Optional) Copy your current configuration to the TFTP server as a backup, using the **copy startup-config tftp** command. This is optional but highly recommended. For example:

```

Router(boot)# copy startup-config tftp
Address or name of remote host [10.10.10.1]?
Destination filename [startup-config]?
!!
676 bytes copied in 0.100 secs

Router(boot)#

```

- Step 10** Begin downloading the software image by using the **copy tftp flash** command. You will be prompted for the complete path and filename for the Cisco IOS software image on the TFTP server, the IP address for the TFTP server, and the destination filename. See the following for a typical example:

```

Router(boot)# copy tftp: flash:
Source filename []? ios-images/ubr925-k9o3sy5-mz.122-11.T
Address or name of remote host []? 10.10.10.1
Destination filename [ubr925-k9o3sy5-mz.122-11.T]?
Accessing tftp://10.10.10.1/ios-images/ubr925-k9o3sy5-mz.122-11.T...
Erase flash: before copying? [confirm]
Erasing the flash filesystem will remove all files! Continue? [confirm] yes
Erasing device... eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
ee ...erased
Erase of flash: complete
Loading ubr925-k9o3sy5-mz.122-11.T from 10.10.10.1 (via Ethernet0): !!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

```

```

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
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!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!
[OK - 3802992/7605248 bytes]

Verifying checksum... OK (0x1ABC)
3802992 bytes copied in 58.236 secs (65568 bytes/sec)

Router(boot)#

```

- Step 11** Enter the following commands to set the configuration register to 0x2102 and to reload the router, so that the router will boot the new Cisco IOS software image:

```

Router(boot)# configure terminal
Router(boot)(boot)(config)# config-register 0x2102
Router(config)# exit
Router(boot)# reload

System configuration has been modified. Save? [yes/no]: no
Proceed with reload? [confirm] yes

System Bootstrap, Version 12.2(1r)XA, RELEASE SOFTWARE (fc1)
TAC Support: http://www.cisco.com/cgi-bin/ibld/view.pl?i=support
Copyright (c) 2001 by cisco Systems, Inc.
UBR905 platform with 24576 Kbytes of main memory
...

```

- Step 12** After the router boots, use the **show version** command to display the currently-loaded version of the Cisco IOS software, to verify that the correct version has been loaded. The following example shows a typical display after a reload:

```

...
cisco uBR905 CM (MPC850) processor (revision 3.e) with 24064K/1536K bytes of memory.
Processor board ID VDE91610XBS
Bridging software.
1 Ethernet/IEEE 802.3 interface(s)
1 Cable Modem network interface(s)
8192K bytes of processor board System flash (Read/Write)
3200K bytes of processor board Boot flash (Read/Write)

Press RETURN to get started!

Router> show version | include IOS
IOS (tm) 925 Software (UBR925-K903SY5-M), Version 12.2(11)T, RELEASE SOFTWARE (fc1)

Router>

```

Downloading Manually Through the Serial Interface (ROMMON Mode)

When all other situations fail, you can download a new Cisco IOS software image to the router through the console port's serial interface. Because this file transfer uses the slow XModem protocol, and because the router's serial port is fixed at 9600 bps, this procedure should be done only in a disaster-recovery situation, where the following conditions apply:

- You cannot complete the provisioning process over a DOCSIS cable network.

- You cannot manually access a TFTP server over either the cable or Ethernet interface.
- The router boots only into the ROM monitor (ROMMON).

If all of the situations apply, use the following procedure to download the software image over a serial interface to the Cisco uBR905 cable access router.

- Step 1** Download a proper Cisco IOS software image for the Cisco uBR905 cable access router to a laptop or other PC that will be used to transfer it to the router. To download a Cisco IOS software image, go to the [IOS Upgrade Planner](#) at the following URL:

<http://www.cisco.com/cgi-bin/Software/Iosplanner/Planner-tool/iosplanner.cgi>



Note You must be logged in as a registered user on Cisco.com to access the [IOS Upgrade Planner](#) site and to download Cisco IOS software images.



Tip Select the smallest available image for the Cisco uBR905 router. This will result in the minimum download time over the serial interface. Then after you complete the initial download and reboot the router, you can use the working software image to connect to the DOCSIS network and upload a more comprehensive image, if desired.

- Step 2** Create a direct console connection with the Cisco uBR905 cable access router. Use the console cable that shipped with the router and connect the console port on the router to an available serial port on the laptop or other PC.

- Step 3** Start a terminal program that supports the Xmodem protocol, and configure the program for the appropriate serial port and for the following settings:

- Speed = 9600 bits per second
- Databits = 8
- Parity Bits = 0
- Stop Bit = 1
- Flow Control = None



Note The console port on the Cisco uBR905 router is fixed at 9600 bps and cannot be changed.

- Step 4** If the router is not currently in ROM monitor (ROMMON) mode, reset the configuration register to 0x00 and reload the router. If the router is currently at the Cisco IOS prompt, do this by giving the following set of commands:

```
Router# configure terminal
Router(config)# config-register 0x00
Router(config)# exit
Router# reload
```

```
System configuration has been modified. Save? [yes/no]: yes
Proceed with reload? [confirm] yes
11:03:20: %SYS-5-RELOAD: Reload requested
```

```
System Bootstrap, Version 12.1(3a)XL, RELEASED SOFTWARE
Copyright (c) 1994-2000 by cisco Systems, Inc.
```

```
CM processor with 24576 Kbytes of main memory
```

```
rommon 1 >
```

- Step 5** Give the **xmodem** command at the ROMMON prompt to start the file transfer. If your terminal program supports the 16-bit cyclic redundancy check (CRC-16) version of the XModem protocol, use the following command:

```
rommon 2> xmodem -c flash:destination-filename
```

If your terminal program supports only the checksum version of the XModem protocol, use the following command instead:

```
rommon 2> xmodem flash:destination-filename
```

In either case, *destination-filename* is the filename that should use for the Cisco IOS software image when it saves the file to its Flash memory.



Note Whenever possible, use the CRC-16 version of XModem protocol, because the CRC-16 checksum provides significantly greater insurance against the file being corrupted during the transfer.

For example, to specify that the router should use the CRC-16 version of the XModem protocol to download a file named `ubr905-k9sy5-mz.bin`, give the following command:

```
rommon 2> xmodem -c flash:ubr905-k9sy5-mz.bin
```

- Step 6** The router then displays the current contents of the Flash memory and asks you to confirm that it should delete the existing files and begin downloading the new file:

```
Do not start the sending program yet...
      File size      Checksum  File name
6030912 bytes (0x5c0640)  0x661f  ubr925-k9o3sv9y5-mz.12.2.8T
```

```
WARNING: All existing data in flash will be lost!
Invoke this application only for disaster recovery.
Do you wish to continue? y/n [n]:
```

Answer **yes** to begin the file transfer.

- Step 7** The router will erase the current contents of the Flash memory and signal that it is ready to receive the new file:

```
Erasing device... eeeeeeeeeeeeeeee ...erased

Ready to receive file ubr905-k9sy5-mz.bin
```

- Step 8** Instruct your terminal program to begin sending the file using the appropriate version of the XModem protocol. The router will begin receiving the file from your PC. When the download completes, the router will verify its checksum or CRC value, print the appropriate status message, and return to the ROMMON prompt:

```
Verifying checksum... OK (0x5DE8)
Download complete!

rommon 3>
```

- Step 9** Set the configuration register to `0x2102` so that the router boots the new Cisco IOS software image:

```
rommon 4 > confreg 0x2102
```

You must reset or power cycle for new config to take effect

Step 10 Reset the router using the **reset** command:

```
rommon 5 > reset

System Bootstrap, Version 12.1(3a)XL, RELEASED SOFTWARE
Copyright (c) 1994-2000 by cisco Systems, Inc.
CM processor with 24576 Kbytes of main memory

Program load complete, entry point: 0x8004000, size: 0x1da2ed
Self decompressing the image : #####

/boot process continues)

Press RETURN to get started!

Router>
```

■ Downloading the Software Image