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Release Notes for Release 4.1(1) Feature Packs for Cisco 700 Series Routers

This release note describes the features and provides other information for Cisco 700 Router software Release 4.1(1) and earlier. For complete Cisco 700 software documentation, refer to the *Cisco 700 Series Command Reference* publication.

This document includes the following sections:

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System Support

Software Release 4.1(1) supports the following routers:

Cisco 760 Series	CPA760 Series	Cisco 770 Series
Cisco 761	CPA761	Cisco 771
Cisco 762	CPA762	Cisco 772
Cisco 765	CPA765	Cisco 775
Cisco 766	CPA766	Cisco 776

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Image Names

Table 1 and Table 2 list the filenames and memory requirements for each image. Images named C760 are for both Cisco 760 and Cisco 770 routers.

Table 1 Image Filenames and Memory Requirements for Internet Ready Feature Pack (CD076-IR-4.1=)

UNIX Filename	DOS Name	Description	Flash Memory Required	DRAM Required
c760-in.b-US.41-1.bin	80146203	C760/770 Series Internet Ready Feature Set, U.S.A. ¹	0.25 MB	1.5 MB
c760-in.b-NET3.41-1.bin	80146303	C760/770 Series Internet Ready Feature Set, Europe	0.25 MB	1.5 MB
c760-in.b-1TR6.41-1.bin	80146403	C760/770 Series Internet Ready Feature Set, Germany	0.25 MB	1.5 MB
c760-in.b-INS.41-1.bin	80146603	C760/770 Series Internet Ready Feature Set, Japan	0.25 MB	1.5 MB
c760-in.b-TPH.41-1.bin	80146503	C760/770 Series Internet Ready Feature Set, Australia	0.25 MB	1.5 MB

1. The U.S. image supports the following switch types: 5ESS, DMS, and NI-1.

Note Internet Ready images do not support IPX routing.

Table 2 Image Filenames and Memory Requirements for Remote Office Feature Pack (CD076-RO-4.1=)

UNIX Filename	DOS Name	Description	Flash Memory Required	DRAM Required
c760-in.r-US.41-1.bin	80147203	C760/770 Series Remote Office Feature Set, U.S.A. ¹	0.25 MB	1.5 MB
c760-in.r-NET3.41-1.bin	80147303	C760/770 Series Remote Office Feature Set, Europe	0.25 MB	1.5 MB
c760-in.r-1TR6.41-1.bin	80147403	C760/770 Series Remote Office Feature Set, Germany	0.25 MB	1.5 MB
c760-in.r-INS.41-1.bin	80147603	C760/770 Series Remote Office Feature Set, Japan	0.25 MB	1.5 MB
c760-in.r-TPH.41-1.bin	80147503	C760/770 Series Remote Office Feature Set, Australia	0.25 MB	1.5 MB
c760-in.bx-NET3.41-1.bin	80206501	C760/770 Series Internet Ready Feature Set, BT Only	0.25 MB	1.5 MB
c760-in.rx-NET3.41-1.bin	80209301	C760/770 Series Remote Office Feature Set, BT Only	0.25 MB	1.5 MB

1. The U.S. image supports the following switch types: 5ESS, DMS, and NI-1.

Loading the Software

To save the router configuration file on your PC, load new software, and then reload the configuration to the router, refer to the “*Getting Started with Cisco 700 Series Software*” CD booklet shipped with your software feature pack.

Cisco 700 Software Release 4.1(1) Enhancements

These are the enhancements for Cisco 700 series router software Release 4.1(1).

Three-Way Call Conferencing/Call Transfer

Cisco 700 series routers support three-way calling and call transfer. The required feature activation code, previously a fixed value, is now configurable for different central office switches. This feature activation code is available only for DMS/NI-1 ISDN switch types.

Automatic Configuration From BOOTP

The automatic configuration feature allows the Cisco 700 series router to obtain a configuration file from a remote server using BOOTP protocol. Upon power-up, the router examines the Auto_Config flag stored in NVRAM. If the Auto_Config flag is false, the router initiates the BOOTP to request an IP address from the server. If the server finds a matching MAC address, the server returns a client profile that includes an IP address and a configuration filename. The Cisco 700 series router then initiates TFTP to download the configuration file.

The Service Profile Identifiers (SPIDs) and switch types for U.S. software images must be entered or autodetected before the router can run automatic configuration and download the configuration file. After successfully loading the configuration file, the router sets the Auto_Config flag to true in NVRAM. In the subsequent power-up operation, if the Auto_Config is true, the router does not initiate BOOTP. The **set default** command resets the Auto_Config flag to false.

If the router does not receive a BOOTP response from the server within 5 seconds of the first BOOTP request, the router gives up.

SPID and Switch Autodetection

The SPID and switch autodetection feature simplifies the use of ISDN terminal equipment and makes the equipment easier to use with fewer parameters to enter. With this feature, you only have to enter the local directory numbers with area codes. No SPID number or switch type is required. The command used is **set autodetection**.

The autodetection feature only applies to ISDN switches in the United States and Canada, which are usually 5ESS custom, DMS100 custom, NI-1, or NI-2 switches. The autodetection mechanism might not work with any other switch, such as a Siemens switch. The autodetection feature is only implemented in the Cisco software image for the United States.

Bandwidth Allocation Control Protocol and Bandwidth Allocation Protocol

The Bandwidth Allocation Control Protocol (BACP) and the Bandwidth Allocation Protocol (BAP) define a set of rules to gracefully control dynamic bandwidth allocation by managing the number of links in a multilink Point-to-Point Protocol (PPP) bundle. The BACP is a network control program that negotiates once per multilink PPP bundle, and BAP defines packets, parameters and negotiation procedures to allow two end points to negotiate adding and dropping links from a multilink bundle.

The current release of Cisco 700 software already supports dynamic management of both B channels with the demand feature. The implementation of BACP and BAP allows Cisco 700 series routers to coordinate and negotiate the actual allocation and deallocation of the second channel.

Use of the negotiation features of BAP makes it unnecessary to require a common algorithm for determining when to add or remove a link in a multilink bundle. The parameters are set using the **demand** command and the **timeout** command.

The BACP is only implemented on the BRI interface. The multilink PPP protocol has to be enabled for BACP to be functional.

If a data call is bumped to accommodate a voice call and if BAP negotiation is enforced, you might experience a short audio idle period before a B channel becomes available. You might not be able to connect the voice call if the peer declines to give up the link. This happens when the **set ppp bacp linkdrop negotiation** command is set to on.

IPX SAP Filtering

This filtering scheme controls which services are added to the Cisco 700 series router Service Access Point (SAP) table. You can specify filters by type range or socket range. Before a service is added to the SAP table, the service type and socket number for the service is checked against the existing filters. If the type and socket ranges match any of the existing filters, service is permitted or denied based on the action specified in the action field of the filter. Otherwise (no filter matches the incoming service), the service is blocked. The parameters are set using the **set ipx filter sap** command. The maximum number of SAP filters is 20.

Route Summarization

Version 4.0 of Cisco 700 software provides route summarization on IP RIP Version 2 (Version 2 provides the required subnet mask information). Version 4.1(1) of Cisco 700 software provides route summarization on IP RIP Version 1. IP RIP Version 1 learns and propagates Version 2 routes on destinations connected to the WAN for destinations connected to the LAN. When the route summarization is set to auto, the router summarizes routes that cross the classful boundary to a single route based on the classful boundary. When the route summarization is set to off, the router uses the normal RIP Version 2 routes with variable-length subnet masks (VLSMs). The default setting for RIP summarization is off. Use the **set ip rip summarization** command to control this feature.

Profile-Based User Name and Password

Remote users often have multiple service providers. To connect to different service providers, remote users can have different user names and passwords. Previous releases of Cisco 700 software used the same user name and password for all profiles when making outgoing PPP connections. Software Release 4.1(1) allows different profiles to have different user names and passwords.

In previous releases, the **set systemname** command set the system prompt and the router identity when making outgoing PPP connections. In software Release 4.1(1), different profiles can use different identities, such as different user names, when dialing out. A new profile level command, the **set ppp clientname** command, has been created for this purpose.

Increased Name and Password Length

The length of a character string for the user name and system name have been increased from 20 to 64 characters. The length of the password and secret character strings has been increased to 30 characters.

TFTP Client

Cisco 700 series routers use a TFTP client to increase TFTP file transfer efficiency and reliability. However, TFTP, as a simple protocol for software download, is rarely used during system run time. The **swl** command loads the TFTP client software from the console port.

NetBIOS Over TCP/IP Packet Filter

A generic filter capability on the TCP/UDP packets allows users to filter NetBIOS packets generated by any application programs. Use the **set ip filter** command to control this feature.

NetBIOS Name Spoofing

When a WINS client sends out a NetBIOS Name query, if the router has the answer for the query, the Cisco 700 series router replies with response packets in place of the WINS server. Otherwise, the router forwards the query packets to the server and when the answer comes back, it forwards the response to the client. The router keeps a local database of up to 100 data name service name entries and ages out the out-of-date entries.

NetBIOS Scope

The NetBIOS Scope option is implemented in Cisco 700 series router software Release 4.1(1) during configuration of the DNP server. NetBIOS Scope, also known as TCP/IP Scope, provides a method for adding a second element to the single-element NetBIOS computer name. The scope ID is a character string value that is appended to the NetBIOS name. The NetBIOS name is used for all NBT (NetBIOS over TCP/IP) communications from that computer.

Removal of Combinet Packet Protocol (CPP)

Point-to-Point connections are made by using Point-to-Point Protocol (PPP). CPP is no longer supported by Cisco 700 software. Connections made by remote login are supported by PPP bridging.

Known Limitations

This section describes the known limitations of software Release 4.1(1).

- The Cisco 700 series products do not support Battery Reversal or Open Service Interval for answering machines. This means a telephone answering machine connected to the Cisco 700 (models Cisco 765, Cisco 766, Cisco 775, and Cisco 776) does not hang up after the calling party finishes a message. The answering machine might continue recording until it reaches the end of its recording capability.

Newer answering machines or voice-mail systems provide a feature known as *silence detection* that stops recording when the calling party hangs up.
- If you are using the Cisco 700 (models Cisco 765, Cisco 766, Cisco 775, and Cisco 776) with a voice-mail system, you must wait 3 seconds before using the star (*) key. Using the star key in less than 3-second intervals puts the router into a command state in which it expects system configuration commands. This limitation will be removed in a future software release.
- When using IPX SAP filtering, you must turn the user-defined profile off and then on for IPX SAP filtering to take immediate effect.
- If your ISDN line is connected to a 5ESS NI-1 switch (United States) and you want multiple directory numbers, you can request additional provisioning changes. See the "ISDN Support Services" section of this publication for information.
- IP routing is on by default in the Standard profile. Bridging does not work for the Standard profile when routing is on.

SPID Autodetection Limitations

This feature assists in the installation of a Cisco 700 series router in North America. It determines the service profile identifier (SPID) and the switch protocol that connects the router to the network. This is done by following a prescribed SPID and switch type table search, followed by a test call. You must enter the primary directory numbers (with the area code) and invoke the detection feature for the router to find the SPIDs.

The following limitations are inherit in SPID autodetection.

- If the service provider has assigned SPIDs that cannot be generated by the search table, the feature does not work.
- The test call does not work if other router features are attempting to make calls while detection is in progress. For this reason, it is recommended that the LAN not be connected to the router while detection is in progress.
- You must not attempt to make a voice call while detection is in progress.
- An incoming call can cause the feature to fail or to incorrectly determine that the test call was successful.
- The detection procedure requires approximately 30 seconds for each table entry. The current table size suggests a maximum time of approximately 12 minutes to complete the detection process.
- The SPID autodetection procedure places a burden on the switch connected to a Cisco 700 series router. Therefore, the feature disables itself after it has finished the process. It is recommended that the feature is used only during installation and that it be invoked sparingly.

Example Autodetection Sessions

The following are example SPID autodetection sessions. The following is a multipoint detection example:

```
> set 1 dn 4088950533
> set 2 dn 4088950534
> set autodetection on
> 01/01/1995 00:00:06 L73 1 Auto SPID Detect Started
> 01/01/1995 00:00:06 L74 1 Auto SPID Detect Attempting 5ESS
> 01/01/1995 00:00:06 L75 1 8950534 Auto SPID Detect Test Call
> 01/01/1995 00:00:06 L05 1 8950534 Outgoing Call Initiated
> 01/01/1995 00:00:06 L19 1 Terminal Identifier Unassigned
> 01/01/1995 00:00:06 L13 1 Disconnecting Call
> 01/01/1995 00:00:06 L19 2 Terminal Identifier Unassigned
> 01/01/1995 00:00:06 L27 1 Disconnected
> 01/01/1995 00:00:16 L75 1 8950534 Auto SPID Detect Test Call
> 01/01/1995 00:00:16 L05 1 8950534 Outgoing Call Initiated
> 01/01/1995 00:00:16 L18 1 Terminal Identifier Assigned
> 01/01/1995 00:00:16 L13 1 Disconnecting Call
> 01/01/1995 00:00:19 L19 1 Terminal Identifier Unassigned
> 01/01/1995 00:00:19 L13 1 Disconnecting Call
> 01/01/1995 00:00:19 L27 1 Disconnected
> 01/01/1995 00:00:19 L18 1 Terminal Identifier Assigned
> 01/01/1995 00:00:19 L75 1 8950534 Auto SPID Detect Test Call
> 01/01/1995 00:00:19 L05 1 8950534 Outgoing Call Initiated
> 01/01/1995 00:00:19 L12 1 Disconnected Remotely
Cause 50 Requested Facility not Subscribed
> 01/01/1995 00:00:19 L17 1 Retrying Call At 56kb
> 01/01/1995 00:00:19 L05 1 8950534 Outgoing Call Initiated
> 01/01/1995 00:00:19 L12 1 Disconnected Remotely
```

```

Cause 50 Requested Facility not Subscribed
> 01/01/1995 00:00:19 L27 1 Disconnected
> 01/01/1995 00:00:19 L75 1 98950534 Auto SPID Detect Test Call
> 01/01/1995 00:00:19 L05 1 98950534 Outgoing Call Initiated
> 01/01/1995 00:00:19 L12 1 Disconnected Remotely
Cause 50 Requested Facility not Subscribed
> 01/01/1995 00:00:19 L17 1 Retrying Call At 56kb
> 01/01/1995 00:00:19 L05 1 98950534 Outgoing Call Initiated
> 01/01/1995 00:00:19 L12 1 Disconnected Remotely
Cause 50 Requested Facility not Subscribed
> 01/01/1995 00:00:19 L27 1 Disconnected
> 01/01/1995 00:00:19 L74 1 0189505330 Auto SPID Detect Attempting 5ESS
> 01/01/1995 00:00:19 L22 1 0189505330 Sending SPID
> 01/01/1995 00:00:19 L23 1 0189505330 SPID Accepted
> 01/01/1995 00:00:19 L73 2 Auto SPID Detect Started
> 01/01/1995 00:00:19 L74 2 0189505340 Auto SPID Detect Attempting 5ESS
> 01/01/1995 00:00:19 L22 2 0189505340 Sending SPID
> 01/01/1995 00:00:19 L18 2 Terminal Identifier Assigned
> 01/01/1995 00:00:19 L22 2 0189505340 Sending SPID
> 01/01/1995 00:00:20 L23 2 0189505340 SPID Accepted
> 01/01/1995 00:00:20 L75 2 8950534 Auto SPID Detect Test Call
> 01/01/1995 00:00:20 L05 0 8950534 Outgoing Call Initiated
> 01/01/1995 00:00:20 L11 2 Call Requested
> 01/01/1995 00:00:20 L14 2 Accepting Call
> 01/01/1995 00:00:20 L08 2 Call Connected
> 01/01/1995 00:00:20 L13 2 Disconnecting Call
> 01/01/1995 00:00:20 L08 1 8950534 Call Connected
> 01/01/1995 00:00:20 L76 1 0189505330 Auto SPID Detect SuccessFul
> 01/01/1995 00:00:20 L76 2 0189505340 Auto SPID Detect SuccessFul
> 01/01/1995 00:00:20 L77 1 Auto SPID Detect Completed
> 01/01/1995 00:00:20 L78 2 Auto SPID Detect Disabled
> 01/01/1995 00:00:20 L13 1 Disconnecting Call
> 01/01/1995 00:00:21 L27 2 Disconnected
> 01/01/1995 00:00:21 L27 1 Disconnected

```

The following is a Point-to-Point detection session:

```

> set 1 dn 4085763234
> set autodection on
> 01/01/1995 00:01:15 L74 0 Auto SPID Detect Attempting 5ESS
> 01/01/1995 00:01:15 L18 1 Terminal Identifier Assigned
> 01/01/1995 00:01:15 L73 1 Auto SPID Detect Started
> 01/01/1995 00:01:15 L74 1 Auto SPID Detect Attempting 5ESS
> 01/01/1995 00:01:15 L75 1 5763234 Auto SPID Detect Test Call
> 01/01/1995 00:01:15 L05 1 5763234 Outgoing Call Initiated
> 01/01/1995 00:01:16 L11 2 4085763234 Call Requested
> 01/01/1995 00:01:16 L14 2 Accepting Call
> 01/01/1995 00:01:17 L08 2 4085763234 Call Connected
> 01/01/1995 00:01:17 L13 2 Disconnecting Call
> 01/01/1995 00:01:17 L08 1 5763234 Call Connected
> 01/01/1995 00:01:17 L76 1 Auto SPID Detect SuccessFul 5ESS
> 01/01/1995 00:01:17 L76 1 Auto SPID Detect SuccessFul Point to Point
> 01/01/1995 00:01:17 L77 1 Auto SPID Detect Completed
> 01/01/1995 00:01:17 L78 1 Auto SPID Detect Disabled
> 01/01/1995 00:01:17 L13 1 Disconnecting Call
> 01/01/1995 00:01:17 L27 2 Disconnected
> 01/01/1995 00:01:17 L27 1 Disconnected

```

Cisco 700 Software Release 4.1(1) Caveats

This section describes suggestions for optimum use of Cisco 700 software Release 4.1(1). Each item includes the Cisco DDTS tracking number, if applicable.

- The **swl tftp config** command should only be used for loading configuration files. If the image file is loaded, the original configuration data is deleted. The maximum configuration file size is 8 KB. If the file size is larger than 8 KB, the command fails.
- Bridging from the Standard profile only works once after the router is rebooted. Every time the connection goes down, a new connection number is assigned. As a result, when the connection is terminated and reestablished, you cannot ping through this connection because all the addresses learned in the previous connection used a different connection number. To correct the problem, set the forwarding mode to WAN ANY (as opposed to the default of WAN ONLY).

Another way to allow ping is to log in to the remote unit using the MAC address and ping from either direction. If you do not log in with the MAC address, you cannot ping until you reboot the router.

- ClickStart assumes native subnets. If you are using subnets that are not class A, B, or C, it is likely that the connection will fail because ClickStart only recognizes classful boundaries.
- The following applies to Microsoft Windows NT Workstation versions 3.5, 3.51, and 4.0 and Microsoft Windows NT Server versions 3.5, 3.51, and 4.0 that are multi-homed or have remote access server installed. The workstation and server might refresh their names with the WINS server every 10 minutes instead of using the time-to-live value returned by the WINS server. Name refreshing can cause overloaded WINS servers to respond slowly to name registration or name refresh attempts. For additional information, see <http://www.microsoft.com/kb/articles/q164/3/08.htm>.
- The following applies to Microsoft Windows NT Workstation versions 3.5, 3.51, and 4.0 and Microsoft Windows NT Server versions 3.5, 3.51, and 4.0. Your ISDN TCP/IP router telecommunication connection costs might be very high. This problem occurs if all of the following are true:
 - Your network spans two or more sites.
 - You use ISDN TCP/IP routers.
 - You use an ISDN service that charges you based on connection time.

This problem frequently occurs in Germany where ISDN TCP/IP routers are popular and the ISDN connection time is measured in a time interval called Gebuehreinheit (GBE). The length of the time interval for a GBE shortens with greater distances between the sites. For additional information, see <http://www.microsoft.com/kb/articles/q134/9/85.htm>.

- When the IP filter is set to type TCP and port 21 (FTP), the FTP session fails because any TCP packet with destination port other than 21 is filtered. To ensure the FTP session will complete successfully, do not specify the FTP port when setting an IP filter, for example:

```
> set ip filter TCP out destination a.b.c.d/32 accept
```
- When autodetect fails, there is no indication on the ClickStart browser to indicate manual intervention is required. ClickStart displays "Congratulations you have successfully configured your router." [CSCdj34162]
- If there is a data call on CH1, and a voice call comes on the same number as the directory number that the channel is set to, the CH1 light shuts off if the call is not answered. However, the data call is still in progress with the CH1 light off. The voice call priority is selected when the ACO is on or only the B1 channel is in use. [CSCdj41094]

- If the EzSetup form is submitted with incomplete entry fields for the directory numbers, EzSetup will return an “ISDN_remote_name error is setting remote name” message. [CSCdj30540 (s4)]
- At the bottom of the page in C|Clicks~1/D700/DOCS/TECH2.htm, the links to “Return to ClickStart Technical Details” and “Return to ClickStart Home Page” are missing. [CSCdj34865]
- Pressing the make-break switch on a Cisco 770 disconnects a telnet session through the LAN interface. [CSCdj38823]
- When setting the IPX SAP filter within a profile when IPX routing is on and the SAP table is not empty, the old SAP entry should not remain in the table after SAP updates. The filter will take effect only if the SAP table is not empty. The workaround is to set IPX routing off and then turn IPX routing on or reboot the unit. [CSCdj40197]

Cisco 700 Software Release 4.0(2) Enhancements

Cisco 700 software Release 4.0(2) contains the following software enhancements to Cisco 700 software Release 4.0(1):

- To improve performance, only the services defined in Novell IPX Router Specification 107-000029-001 are supported, and a maximum of 400 IPX route entries and 200 good IPX SAPs are allowed. If you need larger route and SAPs entries, software Release 4.1(1) supports **set ipx sap helper** and **set ipx route** commands.
- ConnectPro is no longer supported.
- As a Dynamic Host Configuration Protocol (DHCP) relay agent, the Cisco 700 series router relays DHCP requests and responses between DHCP clients and a specified DHCP server. Use the **set dhcp relay ip_address** command, where *ip_address* is the address of the server to which DHCP requests will be forwarded.
- A limited DHCP server implementation is provided in the Cisco 760 and Cisco 770 routers (not in the Cisco 750 series software). When this server function is enabled and configured, it assigns and manages IP addresses from a specified address pool to DHCP clients. The options supported by this server are sufficient for Windows 95 clients. If more IP addresses or options are required, a commercial DHCP server (for example, Windows NT) should be used. The **set dhcp server** command enables the DHCP server.
- The router can be assigned an IP address from the remote device by using Internet Protocol Control Protocol (IPCP) address negotiation. The implementation is based on RFC-1332. It supports IPCP options 1 and 3. (It does not support option 2, Van Jacobson (VJ) TCP/IP Header Compression.) IP unnumbered is supported. IPCP address negotiation is on by default in any profile configured for IP routing. This feature does not support assigning addresses to remote devices.
- The Port Address Translation (PAT) feature enables local hosts with designated private IP addresses to communicate with the outside world. Basically, the router translates the source address of the IP header into a global, unique IP address before the packet is forwarded to the outside world. Likewise, IP packets on the return path go through address translations to the designated private IP addresses. When PAT is enabled, the transmission of RIP packets is

automatically disabled to prevent leaking private IP addresses to the outside world. To set up a port handler for one of the IP applications defined by the mnemonics or for a decimal port number defined by port number, use the **set ip pat porthandler** command.

- The Enhanced Supplementary Voice Services/ISDN feature provides two supplementary services, call transfer and three-way call conferencing. Call transfer is the ability to transfer an active call to another number. Three-way call conferencing is the ability to add another party to an active call. Up to three people can be connected. (It is a known limitation that only two Cisco 700 series routers can link for conferencing.)
- The Fee Pulse Mode feature is available for NET3 (same as ETSI) switch types only and requires that you subscribe to the “Advice of Charge-D” supplementary service. When the idle timer expires, the router determines how much time is left in the current unit. If the time left is more than the time required to terminate and disconnect the call, the call remains connected until the end of the paid period is reached. If the idle time expired too close to the end of the paid period, the connection is extended to the end of the next paid period.
- Permanent connections are supported by two new switch types, PERM64 and PERM128. For the Japanese (INS) switch type, switch types SD64 and HSD128 are no longer supported; use PERM64 and PERM128.
- IPX default routes are now supported using the **set ipx gateway** command. IPX packets are routed to the default gateway if no learned or static route can be found for the destination in the routing table (assuming a default gateway is set and a connection interface exists). The default route is also returned in response to a RIP request if no route for the network is found. Refer to the *Cisco 700 Command Reference* publication for more information.
- When a Service Access Point (SAP) Helper is set, all the SAP Get Nearest Server service request packets received by the router are forwarded to the helper as unicast packets. The router does not look through its own SAP table to try to answer the request.
- Route Summarization is provided on IP RIP Version 2 (only Version 2 provides the required subnet mask information). When the route summarization is set to auto, the router summarizes routes across the classful boundary to a single route based on the classful boundary. When the route summarization is set to off, the router uses the normal RIP Version 2 routes with VLSMs.
- The IPX ping feature allows you to determine if the specified IPX node is alive and reachable. Cisco 700 series routers only generate Novell IPX format ping packets. A response by Cisco 700 series routers to Novell IPX ping packets generates a response in Novell IPX format. A response by Cisco 700 series routers to Cisco IPX ping packets generates a response in Cisco IPX format. (If a Novell NetWare server is pinged, the specified server must be running IPXPING.NLM to respond to the ping. This NLM (NetWare Loadable Module) is part of an IPX upgrade (IPXRTR.EXE) to NetWare servers.)
- For interfaces or profiles with IP multicast turned on, an IP multicast packet received from one interface is forwarded to the other interfaces.
- The IP RIP Update Linkup option for IP RIP enables better interoperability between the router and Cisco 700 software. If the IP RIP update is set to link up for a WAN profile, the IP RIP data is sent as soon as a connection is established and again every 30 seconds for as long as the connection exists. If the connection does not exist, no RIP data is sent. This prevents the line from being brought up by RIP packets where the update is periodic.
- When a call to the primary outgoing number fails, Second Number Fail-Over causes the associated backup number for that link to be used. If this backup number is not present or is in use, the backup number associated with the other link (if present) is used. This feature applies to both manual and auto data calls.

- The Internet Ready version of this software does not support IPX. This version does not allow the **set ipx routing on** command.
- The default encapsulation is Point-to-Point Protocol (PPP), not Combinet Packet Protocol (CPP), to enhance default interoperability with Cisco IOS software.
- The default PPP authentication outgoing is set to none.
- Software Release 4.1(1) might not interoperate with the existing Connection Manager releases and has not been tested with any of the Connection Manager releases.
- For the Cisco 770 series routers, use the **set button** command to assign a profile to the **call make** | **break button** command. The ISDN number in the profile will be used to make the call.
- For the NET3 switch type (Europe), the **set alawvoice** command can be used to change the voice encoding to Mu-Law for countries such as Taiwan.
- Distinctive Ringing Feature provides up to three distinctive ring cadences that can be assigned to directory numbers. Use the **set phone** command to set the ring cadence.

Upgrading the DRAM in a Cisco 700 Series Router

Cisco 760 series and Cisco 770 series routers require 1.5 MB of dynamic random-access memory (DRAM) to run software Release 4.0(1) and higher. If it is necessary to upgrade the DRAM in your router, see the *Adding Additional Dynamic Random-Access Memory in Cisco 760 Series and CiscoPro CPA760 Series Routers* publication for instructions.

The Cisco 770 series routers are shipped with 1.5 MB of DRAM. The Cisco 761, Cisco 762, Cisco 765, and Cisco 766 shipped after September, 1996, contain 1.5 MB of DRAM. You do not need to add DRAM to these routers to install software Release 4.0(1) and higher. The Cisco models 765-US, 765-CA, 765-CE, 765-NL, 765-UK, 766-US, and 766-CA shipped before September, 1996, contain 1 MB of DRAM. You must add at least 0.5 MB of DRAM to these router models to run software Release 4.0(1) and higher.

If you are running Cisco 700 software Release 3.2(4) or greater, use the **show memstat** command to find the total memory installed in your Cisco 700 series router. The following shows a typical **show memstat** command output:

```
Host> show memstat
ID 0: Size: 10 Avail: 8 Max: 8 Used: 1 Addr: 0x000DDBA8
ID 1: Size: 30 Avail: 69 Max: 80 Used: 16 Addr: 0x000DDDE2
ID 2: Size: 18 Avail: 35 Max: 35 Used: 0 Addr: 0x000DE5A8
ID 3: Size: 4 Avail: 36 Max: 36 Used: 0 Addr: 0x000DE850
ID 4: Size: 8 Avail: 220 Max: 220 Used: 1 Addr: 0x000DE908
ID 5: Size: 32 Avail: 223 Max: 400 Used: 180 Addr: 0x000E0650
ID 6: Size: 268 Avail: 20 Max: 20 Used: 1 Addr: 0x000E2238
ID 7: Size: 20 Avail: 80 Max: 80 Used: 2 Addr: 0x000E3764
ID 8: Size: 14 Avail: 124 Max: 200 Used: 76 Addr: 0x000E41E0
ID 9: Size: 54 Avail: 38 Max: 50 Used: 17 Addr: 0x000E629A
ID 10: Size: 8 Avail: 1 Max: 2 Used: 1 Addr: 0x000EEC40
ID 11: Size: 54 Avail: 6 Max: 6 Used: 0 Addr: 0x000EEC70
ID 12: Size: 462 Avail: 4 Max: 4 Used: 0 Addr: 0x000EF588
ID 13: Size: 134 Avail: 2 Max: 2 Used: 0 Addr: 0x000F00C0
ID 14: Size: 68 Avail: 5 Max: 5 Used: 1 Addr: 0x000F0BB8
ID 15: Size: 96 Avail: 5 Max: 6 Used: 2 Addr: 0x000F0DA0
ID 16: Size: 112 Avail: 2 Max: 2 Used: 0 Addr: 0x000F0FA8
NVStore Used: 1203, Remaining 6989 (Deleted 77 + Unused 6912), Total 8192
RamStore Used: 0, Remaining 10000, Total 10000
RAM Size = 0x180000

Available memory=517088, Allocs=119, Frees=0
MbufAllocs=0x5, MbufFrees=0x5, MbufFail=0x0
```

```
IbufAllocs=0x0, IbufFrees=0x0, IbufFails=0x0  
MlenMax=0xe0, MlenAvail=0xe0, MlenLow=0xdf, MlenAllocs=0x5, MlenFails=0x0  
ZeroMax=0x0, ZeroAvail=0x0, ZeroLow=0x7fff, ZeroAllocs=0x0, ZeroFails=0x0
```

The RAM Size entry indicates the amount of DRAM installed, reported in hexadecimal. Table 3 lists the RAM size hexadecimal values reported by the **show memstat** command and the corresponding RAM size in megabytes.

Table 3 Show memstat Command RAM Sizes

RAM Size (hex)	Memory
0x100000	1 MB
0x180000	1.5 MB
0x200000	2 MB

If you do not have at least 1.5 MB of DRAM in your Cisco 700 series router, you cannot run software Release 4.0(1) or higher. You can install another 0.5 MB of DRAM, or if you downloaded software Release 4.0(1) and the device will not boot because you do not have enough DRAM, you can reload Cisco 700 software Release 3.2(5).

To reload Cisco 700 software Release 3.2(5):

- Step 1 Power up the router.
- Step 2 As soon as the boot banner appears, press the ESC key.
- Step 3 Read and follow the **software load** command instructions in the *Cisco 700 Series Command Reference* publication if you are loading from a floppy disk or the instructions in the CD booklet if you are loading from a CD.
- Step 4 Read and follow the **set defaults** command instructions in the *Cisco 700 Series Command Reference* publication.

Complete the following tasks to upgrade to software Release 4.1(1):

- Use the **upload** command to save the present configuration settings in the Cisco 700 series router to a file before you install the new software. (See the **upload** command in the *Cisco 700 Series Command Reference* publication for instructions.)
- Use the **software load** command to load the new software into the Cisco 700 series router. (See the **software load** command in the *Cisco 700 Series Command Reference* publication for instructions.)

National ISDN Capability Packages

A capability package is a set of standardized BRI line features that simplifies the process of configuring an ISDN line. The capability package ordering codes described in this section apply to NI-1 ISDN lines.

Note The Cisco 765, Cisco 766, Cisco 775, and the Cisco 776 require two SPIDs for the analog telephone ports to operate correctly.

Capability Package S

Package S provides alternate voice and circuit-switched data with no additional features. Package S is the preferred NI-1 capability package for Cisco 765, Cisco 766, Cisco 775, and Cisco 776 routers when a minimum feature set is needed.

Capability Package EZ-1

Package EZ-1 provides alternate voice and circuit-switched data with all the features and capabilities of the router enabled. Package EZ-1 is the preferred NI-1 capability package for the Cisco 765, Cisco 766, Cisco 775, and Cisco 776 routers when a full feature set is needed. The features include flexible calling (conference calling, call transfer, hold and retrieve), ACO (call waiting), and Call Forward Busy (CFB).

If you have any problems with your ISDN NI-1 provisioning, contact Cisco ISDN Support Services (United States only). To access this service or to obtain more information, call (800) 553-NETS (6387) and select the Customer Service option, or visit the Cisco ISDN web site at www.cisco.com/isdn.

ISDN Support Services

ISDN Support Services are available in only the United States, effective May 27, 1997. To access this service or to obtain more information, call 800 553-NETS (6387) and select the Customer Service option, or visit the Cisco ISDN Web site at www.cisco.com/isdn.

Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

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CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

- WWW: <http://www.cisco.com>
- WWW: <http://www-europe.cisco.com>
- WWW: <http://www-china.cisco.com>

- Telnet: cco.cisco.com
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

This document is to be used in conjunction with the *Cisco 700 Series Command Reference* publication.

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