ADSL HWICs

The ADSL high speed WAN interface cards (HWICs) feature for Cisco modular integrated services routers provide high-speed ADSL digital data transfer between a single customer premises equipment (CPE) subscriber and a central office (CO). ADSL HWICs are available in the following variations:

- ADSL over POTS (ADSLoPOTS) HWICs
  - HWIC-1ADSL, a 1-port ADSLoPOTS card
  - HWIC-ADSL-B/ST, a 2-port card with a port for ADSLoPOTS and a data-only port for an ISDN BRI S/T connection
- ADSL over ISDN (ADSLoISDN) HWICs
  - HWIC-1ADSLI, a 1-port ADSLoISDN card
  - HWIC-ADSLI-B/ST, a 2-port card with a port for ADSLoISDN and a data-only port for an ISDN BRI S/T connection

Feature History for ADSL HWICs

Release	Modification
12.4(4)T	This feature was introduced.
12.4(6)T	Support was added for 2-port HWIC-ADSL-B/ST and HWIC-ADSLI-B/ST cards.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Restrictions for ADSL HWICs

- ADSL HWICs can be inserted only into onboard HWIC-enabled slots on Cisco routers. Initially, these routers are the Cisco 1800 series (modular), the Cisco 2800 series, and the Cisco 3800 series integrated services routers.
- The ISDN interfaces on HWIC-ADSL-B/ST and HWIC-ADSLI-B/ST are data only.
- ATM adaption layer 2 (AAL2) is not supported.
- ADSL HWICs do not support dual latency. When the ADSL link is intended to support both voice and data traffic simultaneously, the link should be configured for either all fast-path data or all interleave data with an interleave depth of zero to insure that latency is minimized. In addition, the total supported data rate must be reduced to adjust for the reduced coding gain, which is usually present with high-latency traffic.
- The following command is not supported by ADSL HWICs:
  - **clock rate**
- The following ISDN command is not supported by HWIC-ADSL-B/ST or HWIC-ADSLI-B/ST:
  - **leased-line**
- Loop back functionality is not supported.

Information about ADSL HWICs

This section provides information about the ADSL HWICs feature.

ADSL Features

Supported ADSL features are as follows:

- Provides ADSL high-speed digital data transmissions between the customer premises equipment (CPE) and the central office (CO).

- HWIC-1ADSL and HWIC-ADSL-B/ST support ADSL-over-POTS (ADSL, ADSL2, and ADSL2+), complying with Annex A of ITU G.992.1, G.992.3, and G.992.5.
- HWIC-1ADSLI and HWIC-ADSLI-B/ST support ADSL-over-ISDN (ADSL, ADSL2, and ADSL2+), complying with Annex B of ITU G.992.1, G.992.3, and G.992.5. They also support and comply with ETSI 101-388 and the Deutsche Telekom U-R2 specification.
- Supports reach-extended ADSL2, complying with Annex L of ITU G.992.3.
- Complies with ANSI T1.413 issue 2.
- Supports ATM AAL5 services and applications, ATM class of service (constant bit rate [CBR], variable bit rate-nonreal time [VBR-NRT], variable bit rate-real time [VBR-rt], and unspecified bit rate [UBR]) and up to 23 virtual circuits on an HWIC in Cisco routers.
- Provides ATM traffic management and Quality of Service (QoS) features to enable service providers to manage their core ATM network infrastructures.
- Supports Dying Gasp functionality.

ISDN Features

Supported ISDN features on HWIC-ADSL-B/ST and HWIC-ADSLI-B/ST are as follows:

- Provides an industry-standard, full duplex, 2B+D, S/T, data only hardware interface.
- Operates independently of the ADSL interface on the HWIC.

Interface Numbering on Cisco Integrated Services Routers

This section describes the interface numbering scheme for Cisco integrated services routers If an interface card is installed in a Cisco 1800 series (modular), Cisco 2800 series, or Cisco 3800 series router, the interfaces must use a triple-number scheme to identify them. This triple-number assignment is different from the standard interface numbering scheme on other Cisco routers.

Table 1 shows the interface numbering for the onboard Fast Ethernet ports and the interface slots on Cisco 1800 series (modular), Cisco 2800 series, and Cisco 3800 series integrated services routers.

Table 1 Interface Numbering on Cisco Integrated Services Routers

Port/Slot	Interface Numbering	Example
Fast Ethernet ports (onboard)	0/0, 0/1	FE 0/0, 0/1
Slot 0	Slot 0/0/0	FE 0/0/0, 0/0/1, 0/0/2, 0/0/3
Slot 1	Slot 0/1/0	(Serial 2T) Serial 0/1/0, 0/1/1
Slot 2	Slot 0/2/0	FE 0/2/0
Slot 3	Slot 0/3/0	(ADSL) ATM 0/3/0

How to Configure ADSL HWICs

This section describes the ADSL configuration task for this feature.

Note Features configured on the ADSL HWIC must also be configured on the Digital Subscriber Loop Access Multiplexer (DSLAM) located in the CO. See the documentation for the specific DSLAM for information about configuring features.

Configuring the ADSL Port on an ADSL HWIC

To configure the ADSL port on an ADSL HWIC, complete the following steps:

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm** *interface-id*
4. **ip address** *IP-address*
5. **pvc** *[name] vpi/vci*
6. **protocol ip** *IP-address*
7. **vbr-rt** *peak-rate average-rate burst*
8. **encapsulation** {**aal5autoppp** | **aal5ciscoppp** | **aal5mux** | **aal5nlpid** | **aal5snap**}
9. **exit**
10. **dsl operating-mode** {**ansi-dmt** | **auto** | **itu-dmt** | **adsl2** | **adsl2+**}
    or
    dsl operating-mode {**etsi** | **auto** | **itu-dmt** | **adsl2** | **adsl2+**}
11. **no shutdown**
12. **exit**
13. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose

Step 3	`Router(config)# interface atm interface-id`
	
	Example:
	`Router(config)# interface atm 0/1/0`
		Enters ATM configuration mode for the ATM interface in the specified slot and port.

Step 4	`Router(config-if)# ip address IP-address`
	
	Example:
	`Router(config-if)# ip address 192.168.10.25 255.255.255.0`
		Assigns an IP address to the ADSL ATM interface.

Step 5	`Router(config-if)# pvc [name] vpi/vci` **Example:** `Router(config-if)# pvc [name] vpi/vci`	Enters atm-virtual-circuit (interface-atm-vc) configuration mode, and configures a new ATM PVC by assigning a name (optional) and virtual path identifier (VPI)/virtual channel identifier (VCI) numbers. The default traffic shaping is UBR; the default encapsulation is AAL5+LLC/SNAP.

Step 6	`Router(config-if-vc)# protocol ip IP-address`
	
	Example:
	`Router(config-if-vc)# protocol ip 192.168.0.4`
		(Optional) Enables IP connectivity and create a point-to-point IP address for the virtual circuit (VC).

Step 7	`Router(config-if-vc)# vbr-rt peak-rate average-rate burst` **Example:** `Router(config-if-vc)# vbr-rt peak-rate average-rate burst`	(Optional) Configures the PVC for real-time variable bit rate (VBR) traffic shaping. • *Peak rate*—Peak information rate (PIR) • *Average rate*—Average information rate (AIR) • *Burst*—Burst size in cells

Step 8	`Router(config-if-vc)# encapsulation {aal5autoppp | aal5ciscoppp | aal5mux | aal5nlpid | aal5snap}`
	
	Example:
	`Router(config-if-vc)# encapsulation aal5snap`
		(Optional) Configures the ATM adaptation layer (AAL) and encapsulation type.
		• *aal5autoppp*—Cisco AUTO PPP over AAL5
		• *aal5ciscoppp*—Cisco PPP over AAL5
		• *aal5mux*—AAL5+MUX
		• *aal5nlpid*—AAL5+NLPID
		• *aal5snap*—AAL5+LLC/SNAP (the default)

Step 9	`Router(config-if-vc)# exit` **Example:** `Router(config-if-vc)# exit`	Exits from interface-atm-vc configuration mode.

	Command or Action	Purpose
Step 10	`Router(config-if)# dsl operating-mode {ansi-dmt | auto | itu-dmt | adsl2 | adsl2+}`	Configures HWIC-1ADSL or HWIC-ADSL-B/ST to operate in a specified mode: • *ansi-dmt*—ANSI full rate mode per T1.413, Issue 2 • *auto*—Automatic detection mode • *itu-dmt*—ITU full rate mode (ITU G.992.1) • *adsl2*—ADSL 2 mode per ITU G.992.3 • *adsl2+*—ADSL 2+ mode per ITU G.992.5

	or
	`Router(config-if)# dsl operating-mode {etsi | auto | itu-dmt | adsl2 | adsl2+}`
	Example:
	`Router(config-if)# dsl operating-mode auto`
		Configures HWIC-1ADSLI or HWIC-ADSLI-B/ST to operate in a specified mode:
		• *etsi*—Alcatel proprietary ETSI mode
		• *auto*—Automatic selection mode
		• *itu-dmt*—ITU full rate mode (ITU G.992.1)
		• *adsl2*—ADSL 2 mode per ITU G.992.3
		• *adsl2+*—ADSL 2+ mode per ITU G.992.5
		Caution This command is for testing or lab environments only. Using a configuration other than the default configuration for the DSL operating mode can lead to unpredictable behavior on the ADSL line.

Step 11	`Router(config-if)# no shutdown` **Example:** `Router(config-if)# no shutdown`	Activates the ATM interface.
Step 12	`Router(config-if)# exit` **Example:** `Router(config-if)# exit`	Exits from ATM interface configuration mode.
Step 13	`Router(config)# exit` **Example:** `Router(config)# exit`	Exits from global configuration mode.

Configuration Example for ADSL HWICs

This section provides the following configuration example:

- VoIP over ATM (AAL5)

For comprehensive examples of configuring ISDN interfaces on HWIC-ADSL-B/ST and HWIC-ADSLI-B/ST, refer to the following document:

- "Configuring ISDN BRI" chapter of the *Cisco IOS Dial Technologies Configuration Guide*.

VoIP over ATM (AAL5) on the ADSL Interface: Example

The following example shows a Cisco router configured for VoIP over ATM (AAL5) on the ADSL interface with an ADSL HWIC.

```
Router#
version 12.4
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Router
!
boot-start-marker
boot-end-marker
!
no logging buffered
no logging buffered
logging rate-limit console 10 except errors
!
no aaa new-model

resource policy

mmi polling-interval 60
no mmi auto-configure
no mmi pvc
mmisnmp-timeout 180
ip subnet-zero
ipcef
!
no ip domain-lookup
!
!
interface FastEthernet0/0
 ip address 10.0.0.1 255.255.0.0
 duplex auto
 speed auto
!
!
interface FastEthernet0/1
 no ip address
 duplex auto
 speed auto
!
interface ATM0/1/0
 ip address 100.0.0.1 255.255.0.0
 no atm ilmi-keepalive
 dsl operating-mode auto
 pvc 1/100
```

```
  protocol ip 100.0.0.2 broadcast
!
!
ip classless
!
ip http server
no ip http secure-server
!
!
control-plane
!
!
dial-peer voice 10000 voip
 destination-pattern 10000
 session target ipv4:100.0.0.2
!
!
line con 0
 exec-timeout 0 0
line aux 0
line vty 0 4
 login
!
end
```

Additional References

The following sections provide references related to ADSL HWICs.

Related Documents

Related Topic	Document Title
Interface Card Installation	Cisco Interface Cards Hardware Installation Guide
Command Reference in ADSL HWIC Feature Guide on Cisco IOS Release 12.4(4)T	ADSL HWICs

Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFCs	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport

Command Reference

There are no new or modified IOS commands for this feature in Cisco IOS Release 12.4(6)T.