Cisco ISR and ISR G2 xDSL

If your company plans to deploy broadband-based services with the Cisco® Integrated Services Routers (ISRs) and Integrated Services Routers Generation 2 (ISR G2) with integrated xDSL technologies, this document can help you avoid potential problems and help you identify the right customer premises equipment (CPE) and firmware version for your deployment.

DSL Chipset-to-ISR Model Mapping

The features and interoperability depend on the chipset used in the CPE. To simplify the documentation, refer to Table 1, which lists which DSL chipsets are used in which series of CPE. The supported types of DSL (very-high-bit-rate DSL [VDSL] and/or asymmetric DSL [ADSL]) are cross references with the annex that they can run on (A, B, M, or J).

Table 1. V/ADSLDSL Chipsets in CPE

ISR Model Part Number	Chipset Vendor	Chipset	V/A DSL Annex Support				Layer 2 Frame Mode	
			A	B	M	J	PTM	ATM
CISCO867	ST Micro	20190P	A					X
CISCO867VAE	Broadcom	6368	V/A				X	X
C867VAE-W	Broadcom	63268	V/A				X	X
CISCO887	ST Micro	20190P	A					X
CISCO887V	Broadcom	6368	V				X	X
CISCO887VA C887VA	Broadcom	6368	V/A				X	X
C897VA	Broadcom	6368	V/A				X	X
EHWIC-VA-DSL-A	Broadcom	6368	V/A				X	X
CISCO866VAE	Broadcom	6368		V/A			X	X
CISCO886	ST Micro	20190P		A				X
CISCO886VA	Broadcom	6368		V/A			X	X
C896VA	Broadcom	6368		V/A			X	X
EHWIC-VA-DSL-B	Broadcom	6368		V/A			X	X
CISCO887M	ST Micro	20190P			A			X
CISCO887VAM C887VAM	Broadcom	6368			V/A		X	X
C897VAM	Broadcom	6368			V/A		X	X
EHWIC-VA-DSL-M	Broadcom	6368			V/A		X	X
CISCO886VA-J	Broadcom	6368				V/A	X	X
C886VAJ	Broadcom	6368				V/A	X	X

Table 2. G.SHDSL Chipsets in CPE

ISR Model Part Number	Chipset Vendor	No. of Pairs	Chipset	G.SHDSL Annex Support				Layer 2 Frame Mode	
				A	B	F	G	EFM	ATM
CISCO888	Conexant (Formerly Globespan)	2	Orion	X	X	X	X		X
HWIC-2SHDSL	Lantiq (Formerly Infineon)	2	SDFE-2	X	X	X	X		X
HWIC-4SHDSL	Lantiq (Formerly Infineon)	4	SDFE-4	X	X	X	X		X
CISCO888E	Conexant	4	CX98124 (Orion Plus)	X	X	X	X	X	
HWIC-4SHDSL-E	Conexant	4	CX98124 (Orion Plus)	X	X	X	X	X	
C898EA	Lantiq	4	SOCRATES-4e	X	X	X	X	X	X
C888EA	Lantiq	4	SOCRATES-4e	X	X	X	X	X	X
EHWIC-4SHDSL-EA	Lantiq	4	SOCRATES-4e	X	X	X	X	X	X
C888	Lantiq	4	SOCRATES-4e	X	X	X	X	X	X

Tables 3 through 8 give information about features for the Cisco ISR and ISR G2 routers with integrated xDSL technologies.

Table 3. Features per Chipset and Firmware - G.HS

Standard	Feature Name	Broadcom		ST Micro
		6368	63268	20190P
G.994.1	Handshake procedures for DSL transceivers	Y	Y	Y

Table 4. Features per Chipset and Firmware - ADSL

Standard	Feature Name	Broadcom		ST Micro
		6368	63268	20190P
ANSI T1.413-1995	ADSL - ANSI (a.k.a. ADSL - Metallic Interface)	Every FW	Every FW	Y
ANSI T1.413-1998	ADSL - ANSI (a.k.a. ADSL - Metallic Interface Issue 2)	Every FW	Every FW	Y
ITU-T G.992.1	ADSL - G.dmt	Every FW	Every FW	Y
ITU-T G.992.1	ADSL - G.dmt with bit swaps	Every FW	Every FW	Y
ITU-T G.992.2	G.lite	Every FW	Every FW	N
ITU-T G.992.3	ADSL2	Every FW	Every FW	Y
ITU-T G.998.4 on G.992.3	ADSL2 with G.INP (Improved Impulse Noise Protection)	Every FW	Every FW	Y
ITU-T G.992.5	ADSL2+	Every FW	Every FW	Y
ITU-T G.992.5	ADSL2+ with SRA	Every FW	Every FW	N
ITU-T G.998.4 on G.992.5	ADSL2+ with G.INP (Improved Impulse Noise Protection)	Every FW	Every FW	Y
Broadcom Proprietary	ADSL2+ with PhyR (a.k.a. L1 retransmission, PMS-TC)	Every FW	Every FW	N
Broadcom Proprietary	ADSL2+ with NITRO - ATM header Compression	Every FW	Every FW	N
Alcatel-Lucient Proprietary	“SmartDSL” a.k.a. Artificial Noise & Virtual Noise (ANVN)	Every FW	Every FW	N
	TCM (Trellis Coded Modulation)	Every FW	Every FW	Y
	TCM (Trellis Coded Modulation) can be enabled/disabled	Every FW	Every FW	Y
	Autonomous loop length estimation			Y
TR-202	ADSL2/ADSL2plus Low-Power Mode L2 & L3	Every FW	Every FW	Y
ITU-T G.992.1, .3, and .5	ADSL(all) - loss-of-power (LPR) detection (a.k.a. “Dying Gasp”)	Every FW	Every FW	N

Table 5. Features per Chipset and Firmware - VDSL*

Standard	Feature Name	Broadcom		ST Micro
		6368	63268	20190P
G.993.1	VDSL	Every FW	Every FW	N
G.993.1	VDSL - Bit swapping	Every FW	Every FW	N
G.993.1	VDSL - Upstream Power Back Off (UPBO) (Reference PSD UPBO)	Every FW	Every FW	N
G.993.2	VDSL2	Every FW	Every FW	N
G.993.2	VDSL2 - Profile 8a/b/c/d, 12a/b, and 17a	Every FW	Every FW	N
G.993.2	VDSL2 - Support of Upstream Band 0 (US0)	Every FW	Every FW	N
G.993.2	VDSL2 - Bit Swapping	Every FW	Every FW	N
G.993.2	VDSL2 - Seamless Rate Adaption (SRA)	Every FW	Every FW	N
G.993.2	VDSL2 - Save Our Showtime (SOS)	Every FW	Every FW	N
G.993.2	VDSL2 - Robust Overhead Channel (ROC)	Every FW	Every FW	N
G.993.2	VDSL2 - Upstream Power Back Off (UPBO) (Reference PSD UPBO)	Every FW	Every FW	N
G.993.2	VDSL2 - Equalized FEXT UPBO	Every FW	Every FW	N
G.993.2	VDSL2 - Impulse Noise Measurement (INM)	Every FW	Every FW	N
G.993.2	VDSL2 - Alternative Electrical Length Estimation Method (ELE-M1)	Every FW	Every FW	N
G.993.2 Annex N	ITU-T G.993.5-friendly ITU-T G.993.2 operation in the downstream direction	38H	38H	N
G.993.2 Annex O	Full ITU-T G.993.5-friendly ITU-T G.993.2 operation	38H	38H	N
G.993.5 on G.993.2	VDSL2 - Self-FEXT cancellation (vectoring) for use with VDSL2 transceivers	38H	38H	N
G.993.2 & .3	VDSL (all) - loss-of-power (LPR) detection (a.k.a. “Dying Gasp”)	Every FW	Every FW	N
ITU G.998.4 on G.993.2	VDSL2 with G.INP (Improved Impulse Noise Protection)	Every FW	Every FW	N
Alcatel-Lucient Proprietary	“SmartDSL” a.k.a. Artificial Noise & Virtual Noise (ANVN)	Every FW	Every FW	N
	TCM (Trellis Coded Modulation)	Every FW	Every FW	N
	TCM (Trellis Coded Modulation) can be enabled/disabled	Every FW	Every FW	N
Temporary Document SI-080	TTCM - Turbo Trellis Coded Modulation			N
	Autonomous loop length estimation			N
Broadcom Proprietary	VDSL2 with PhyR (a.k.a. L1 retransmission, PMS-TC)	Every FW	Every FW	N

* **Note**: Every firmware version from 35J onward is compatible with every router with Cisco IOS® Software Release 15.2(4)M and later.

Table 6. Features per Chipset and Firmware - G.SHDSL

Standard	Feature Name	Conexant	Conexant	Lantiq	Lantiq	Lantiq
		CX98124	Orion	SDFE-2	SDFE-4	SOCRATES-4e
ITU-T G.991.1	High bit rate DSL (HDSL)	Y	Y	Y	Y	Y
ITU-T G.991.2	Single-pair high-speed DSL (SHDSL) transceivers	Y	Y	Y	Y	Y
ITU-T G.991.2 Annex A	Regional requirements - Region 1 (North America)	Y	Y	Y	Y	Y
ITU-T G.991.2 Annex B	Regional requirements - Region 2 (Europe)	Y	Y	Y	Y	Y
ITU-T G.991.2 Annex E	SHDSL - Dynamic Rate Repartitioning (DRR) Application-specific TPS-TC framing	N	N	N	N	N
ITU-T G.991.2 Annex F	Region 1 requirements for payload data rates up to 5696 kbps (G.SHDSL bis)	Y	Y	Y	Y	Y
ITU-T G.991.2 Annex G	Region 2 requirements for payload data rates up to 5696 kbps (G.SHDSL bis)	Y	Y	Y	Y	Y
ITU G. 998.2	Ethernet-based multi-pair bonding - 2 pair	Y	N	N	N	Y
ITU G. 998.2	Ethernet-based multi-pair bonding - 4 pair	Y	N	N	N	Y
ITU-T G.991.2	tcpam16(SHDSL)/tcpam32 (SHDSL.bis)	Y	Y	Y	Y	Y
Lantiq Proprietary	TCPAM 64 and TCPAM128	N	N	N	N	Y
	PATH EFM/PTM -	Y	N	N	N	Y
ATM forum IMA Version 1.1	IMA	N	Y	N	Y	Y*
M-Pair bonding	Physical Layer bonding in ATM	N	Y	N	Y	Y
Cisco Proprietary	ATM auto	N	N	Y	Y	Y
Cisco Proprietary	EFM auto	N	N	N	N	Y

* One exception here is the “C888-K9”, which doesn’t support IMA because of motherboard restrictions.

DSLAMs can manage CPEs with the Embedded Operations Channel (EOC), and all CPEs present the information presented in Table 7.

Table 7. DSLAM Management Features

Information	Chipset						
	G.SHDSL				V/ADSL		
	Conexant		Lantiq		Broadcom		ST Micro
	CX98124	Orion	Socrates-4e	SDFE-2/4	6368	63268	20190P
Modem name	Y	Y	Y	Y			Y
Vendor name	Y	Y	Y	Y			Y
Serial number	Y	Y	Y	Y			Y
Version number	Y	Y	Y	Y			Y
Self-test result	-	-	-	-			Y
DSL annex	Y	Y	Y	Y			Y
Firmware	Y	Y	Y	Y			Y
Line driver	No	No	No	No			Y

During operation the DSL service can be monitored with DELT, and the CPE presents the information given in Table 8.

Table 8. Information from CPE

Information	Chipset						
	G.SHDSL				V/ADSL		
	Conexant		Lantiq		Broadcom		ST Micro
	CX98124	Orion	SDFE-2/4	SOCRATES-4e	6368	63268	20190P
Noise margin	Y	N	Y	Y			Y
Error seconds	Y	Y	N	Y			Y
Severely errored seconds	Y	Y	N	Y			Y
Unavailable seconds	Y	Y	N	Y			Y
Re-Initializations	N	N	N	N			Y
Output power responsePower back-off level for SHDSL attenuation	N	N	N	Y	- (for V/ADSL)		
Maximum attainable bit rate (not applicable for SHDSL)	- (for G.SHDSL)						Y
Current INP value (not applicable for SHDSL)							Y
Interleaving delay (not applicable for SHDSL)							Y
Relative occupation capacity (not applicable for SHDSL)							Y
Code violation (not applicable for SHDSL)							N
Forward error correction (not applicable for SHDSL)							Y
Carrier data (not applicable for SHDSL) • Power spectral density • Carrier load • Signal to noise ratio (per carrier) • Hlog (per carrier) • Quiet line noise (per carrier) • Gain (per carrier)							Y

Firmware Naming Convention

The firmware version is in the format `A2pv6C038k1`, where the last 3 to 4 characters, in this example 38K1, identify the version. The Cisco Download Center shows the firmware file name equal to `vdsl.bin-`<FW - Version>, that is, `vdsl.bin-A2pv6C035l` until Version 35L. After that version the file name contains more information and is of the following format: `VA_A_<Annex-A_FW>_B_<Annex-B_FW>_<Driver>.bin`; that is, `VA_A_38k1_B_38h_24g1.bin`.

How to Determine Which Firmware Version Is Running

For V/A DSL routers, use the following command:

```
Router#show controllers VDSL 0 | include Modem FW
Modem FW  Version:      120306_1254-4.02L.03.A2pv6C035j.d23j.
```

For G.SHDSL routers, use the following command:

```
Router#show controllers SHDSL | include IDC Firmware
  IDC Firmware version: 1.7.5.0.
```

Table 9 lists the firmware embedded in different Cisco IOS Software releases.

Table 9. Firmware Embedded in Cisco IOS Software Releases

Cisco IOS Software Release	Embedded Firmware						
	G.SHDSL				V/ADSL		
	Conexant		Lantiq		Broadcom		ST Micro
	Orion	CX98124	SOCRATES-4e	SDFE-2/4	6368	63268	20190P
15.1.1T	R4.2.1	T-T5: G100	-	REL.3.4.0		-	
15.1.2T	R4.2.1	T0a-T2a: G100 T3: G115 T4: G115.1.7 T5: G115.1.10	-	REL.3.4.0			
15.1.3T	R4.2.1	T: G100 T1: G115 T2: G115.1.7 T3-T4: G115.1.10	-	REL.3.4.0			
15.1.4M	R4.2.1	M: G115 M1: G115.1.7 M2-M5: G115.1.10 M6-M9: G115.1.1	-	REL.3.4.0			
15.2.1T	R4.3.1	T-T1: G115.1.7 T2-T4: G115.1.10	-	REL.3.4.0		-	
15.2.2T	R4.3.1	T-T4: G115.1.10	T-T4: V1.7.2.0	REL.3.4.0	32b.d23f	-	
15.2.3T	R4.3.1	T-T4: G115.1.10	T-T4: V1.7.2.0	REL.3.4.0		-	
15.2.4M	R4.3.1	M-M1: G115.1.10 M2-M7: G115.1.1	M1-2:V1.7.2.0 M3-7: V1.7.2.6	REL.3.4.0	35j.d23j		
15.3.1T	R4.3.1	T-T4: G115.1.10	T: V1.7.2.0 T1 - T4: V1.7.2.6	REL.3.4.0		-	
15.3.2T	R4.3.1	T-T4: G115.1.1	T-T4: V1.7.5.0	NA		-	
15.3.3M	R4.3.1	M-M4: G115.1.1	M-M4: V1.7.5.0	NA		38h/37f2.d24g1	
15.4.1T	R4.3.1	T-T2: G115.1.1	T-T2: V1.7.5.0	NA			
15.4.2T	R4.3.1	T-T1: G115.1.1	T-T1: V1.7.5.0	NA			
15.4.3M	R4.3.1	M: G115.1.1	M: V1.7.5.0	NA			

How to Upgrade DSL Firmware

For G.SHDSL platforms (Cisco 888 and Cisco 898 SHDSL), xDSL firmware is not yet available as an independent image. For VDSL and ADSL platforms (Cisco 860VAE, 880, 880V, 880VA, and 890VA), firmware can be independently upgraded. To do so, go to the download center: http://www.cisco.com/cisco/software/navigator.html?a=a&i=rch.

- Select **Routers**.
- Select **Branch Routers**.
- Select **Cisco 800 Series Routers**.
- Select the model applicable to you.
- Select **Asymmetric Digital Subscriber Line (ADSL) Firmware** or **Very High Bitrate DSL (VDSL) Firmware.**

After you download the firmware file, copy it on Flash and configure the router to use the new firmware:

```
Router#configure terminal
Router(config)#controller VDSL 0
Router(config-controller)#firmware filename flash:VA_A_38k1_B_38h_24g1.bin
```

A reload is required to activate the new firmware.

You should afterward verify that the upgrade was successful:

Before the upgrade:

```
show controllers VDSL 0
<snip>
Firmware        Source          File Name (version)
--------        ------          -------------------
VDSL            embedded        VDSL_LINUX_DEV_01212008 (1)

Modem FW  Version:      120306_1254-4.02L.03.A2pv6C035j.d23j
Modem PHY Version:      A2pv6C035j.d23j
<snip>
```

```
After upgrade:
show controllers VDSL 0
<snip>
Firmware        Source          File Name (version)
--------        ------          -------------------
VDSL            user config     flash:VA_A_38k1_B_38h_24g1.bin (10)

Modem FW  Version:      130208_1314-4.02L.03.A2pv6C038k1.d24g1
Modem PHY Version:      A2pv6C038k1.d24g1
<snip>
```

CPE and DSLAM Interoperability

The Cisco ISR G2 product portfolio supports a diversity of DSL technologies, including very-high-bit-rate DSL 2 (VDSL2), asymmetric DSL (ADSL), ADSL2/2+, multimode VDSL2/ADSL2+, and G.SHDSL. The Cisco ISR G2 CPE described in Tables 9 through 23 has been tested at the Cisco DSL Interoperability Test Lab in San Jose, California, to help ensure interoperability with the DSL access multiplexers (DSLAMs) also specified in these tables.

Multimode VDSL2 and ADSL2+ Platforms and Modules

Table 10. VDSL2/ADSL2+ over ISDN

CPE Part Numbers Tested	Chipset	Firmware	Cisco IOS Software Release
C896VA	Broadcom 6368	B2pv6C035j.d23j	15.2(4)M or later
CISCO866VAE	Broadcom 6368	B2pv6C032b.d23i	15.1(4)M or later

Compatible VDSL2 DSLAMs			
DSLAM Model	**Chipset**	**Line Card**	**Firmware**
ZTE 9806	Broadcom	VSTDC	V1.2.0P4T2
Alcatel ISAM 7302	Ikanos	NVLT-D	L6GPAA40 and 126/L6GPA34.412
Huawei 5603	Broadcom	H565VDEA	320(2007-12-7)/VE_9_3_6
Compatible ADSL2+ DSLAM			
DSLAM Model	**Chipset**	**Line Card**	**Firmware**
Alcatel ASAM7300	Broadcom	ABLT-F	L7D6AA47.174
ECI Hi-Focus 480	Infineon	ATU- ATUC-32	A4_9.00.48
Ericsson ECN320	Broadcom	EDN312xi	132 8112 R2L01 and CXC 132 8113 R2A01
Siemens HiX 5300	Infineon	SUADSL:64IXA	542

Table 11. VDSL2/ADSL2+ over Basic Telephone Service (Annex A)

CPE Part Numbers Tested	Chipset	Firmware	Cisco IOS Software Release
C897VA	Broadcom 6368	A2pv6C035j.d23j	15.2(4)M or later
CISCO867VAE	Broadcom 6368	A2pv6C032b.d23i	15.1(4)M or later
CISCO887VA	Broadcom 6368	A2pv6C030h.d22k	15.1(2)T or later

Compatible VDSL2 DSLAMs			
DSLAM Model	**Chipset**	**Line Card**	**Firmware**
ZTE 9806	Broadcom	VSTDC	V1.2.0P4T2
Alcatel ISAM 7302	Ikanos	NVLT-D	L6GPAA40.126/L6GPA34.412
Alcatel ISAM 7302	Conexant	NVLT-C	L6GPAA40 and 126/L6GPA34.412
Huawei 5603	Broadcom	H565VDEA	320(2007-12-7)/VE_9_3_6

Compatible ADSL2+ DSLAMs			
DSLAM Model	**Chipset**	**Line Card**	**Firmware**
Alcatel ASAM7300	Broadcom	ABLT-D	L7D6AA47.174
Alcatel ISAM 7302	Broadcom	NALT-C	3FE27289AABD
Ericsson EDA2.1	Broadcom	EDN312xp	132 8112 R2L01 and CXC 132 8113 R2A01
ECI Hi-Focus 480	Infineon	ATUC (ATUC-32)	A4_9.00.60
Fujitsu FDX Hub 1000	Infineon	ADSL IV-LCSS-FS	5.2.55.554.0
Fujitsu FDX Hub 1000	Texas Instruments	ADSL IV-LCSS-FS	5.2.55.554.0
Huawei MA5600	Conexant	H563ADGE VER A	322(2007-9-29)
Lucent Stinger	Conexant	ep-hs-gs-adsl2plus-card	E.67.15.1
Nokia D500	Globespan	ADSL2+af	3,5141 and 21:21:47 May 23, 2007

Table 12. VDSL2/ADSL2+ over Basic Telephone Service (Annex M)

CPE Part Numbers Tested	Chipset	Firmware	Cisco IOS Software Release
CISCO887VA-M	Broadcom 6368	A2pv6C032b.d22k	15.1(2)T or later
C887VAM	Broadcom 6368		15.3(3)M2 or later
C897VAM	Broadcom 6368		15.3(3)M2 or later

Compatible VDSL2 DSLAMs			
DSLAM Model	**Chipset**	**Line Card**	**Firmware**
Alcatel ISAM 7302	Ikanos	NVLT-D	L6GPAA40 and 126/L6GPA34.412
Huawei 5603	Broadcom	H565VDEA	320(2007-12-7)/VE_9_3_6
Compatible ADSL2+ DSLAMs			
DSLAM Model	**Chipset**	**Line Card**	**Firmware**
Alcatel ASAM7300	Broadcom	ABLT-D	L7D6AA47.174
Fujitsu FDX Hub 1000	Infineon	ADSL IV-LCSS-FS	5.2.55.554.0
Lucent Stinger	Conexant	stngr-72-gs-adsl-card	E.67.15.1
Alcatel ASAM7300	Broadcom	ABLT-D	L7D6AA47.174
Lucent Stinger	Conexant	stngr-72-gs-adsl-card	E.67.15.1
Fujitsu FDX Hub 1000	Infineon	ADSL IV-LCSS-FS	5.2.55.554.0
Fujitsu FDX Hub 1000	Texas Instrument	ADSL IV-LCSS-FS	5.2.55.554.0

Older VDSL2 Platforms and Modules

Table 13. Older Cisco 887V VDSL2 Router and HWIC-1VDSL Modules

CPE			DSLAM			
CPE Part Number	**Chipset**	**Firmware; Cisco IOS Software Release**	**DSLAM Model**	**Chipset**	**Line Card**	**Software/Firmware**
CISCO887V and HWIC-1VDSL	Broadcom	AvC011b.d21j1; Cisco IOS Software Release 12.4(24)T or later	ZTE 9806	Broadcom	VSTDC	V1.2.0P4T2
			Alcatel ISAM 7302	Ikanos	NVLT-D	L6GPAA40 and 126/L6GPA34.412
			Huawei 5603	Broadcom	H565VDEA	320(2007-12-7)/VE_9_3_6

ADSL and ADSL2 and L2+ Platforms and Modules

Table 14. Older Cisco 886 ADSL-Over-ISDN Routers (Annex B)

CPE			DSLAM			
CPE Part Number	**Chipset**	**Firmware; Cisco IOS Software Release**	**DSLAM Model**	**Chipset**	**Line Card**	**Firmware**
CISCO886	ST Micro 20190P	4.0.15; Cisco IOS Software Release 15.0(1)M or later	Alcatel ASAM7300	Broadcom	ABLT-F	L7D6AA47.174
			ECI Hi-Focus 480	Infineon	ATU-32C	A4_9.00.48
			Ericsson ECN320	Broadcom	EDN312xi	132 8112 R2L01 and CXC 132 8113 R2A01
			Siemens HiX 5300	Infineon	SUADSL:64IXA	542

Table 15. Older Cisco 867 and Cisco 887 ADSL-Over-Basic Telephone Service Routers (Annex A)

CPE			DSLAM			
CPE Part Number	**Chipset**	**Firmware; Cisco IOS Software Release**	**DSLAM Model**	**Chipset**	**Line Card**	**Firmware**
CISCO887 CISCO867	ST Micro 20190P	4.0.15; Cisco IOS Software Release 15.0(1)M or later	Alcatel ASAM7300	Broadcom	ABLT-D	L7D6AA47.174
			Alcatel ISAM 7302	Broadcom	NALT-C	3FE27289AABD
			Alcatel ISAM 7330	Broadcom	EBLT-C	3FE21541AAAB
			Ericsson EDA2.1	Broadcom	EDN312xp	132 8112 R2L01 and CXC 132 8113 R2A01
			ECI Hi-Focus 480	Infineon	ATU-C (ATUC-32)	A4_9.00.60
			Fujitsu FDX Hub 1000	Infineon	ADSL IV-LCSS-FS	5.2.55.554.0
			Fujitsu FDX Hub 1000	Texas Instruments	ADSL IV-LCSS-FS	5.2.55.554.0
			Huawei MA5600	Conexant	H563ADGE VER A	322(2007-9-29)
			Lucent Stinger	Conexant	ep-hs-gs-adsl2plus-card	E.67.15.1
			Nokia D500	Globespan	ADSL2+af	3,5141 and 21:21:47 May 23, 2007

Table 16. Older Cisco 887M ADSL-over-Basic Telephone Service Routers (Annex M)

CPE			DSLAM			
CPE Part Number	**Chipset**	**Firmware; Cisco IOS Software Release**	**DSLAM Model**	**Chipset**	**Line Card**	**Firmware**
CISCO887M	ST Micro 20190P	4.0.15; Cisco IOS Software Release 15.0(1)M or later	Alcatel ASAM7300	Broadcom	ABLT-D	L7D6AA47.174
			Ericsson EDA2.1	Broadcom	EDN312xp	132 8112 R2L01, CXC 132 4220 R10A04, and CXC 132 8113 R2A01
			ECI Hi-Focus 480	Infineon	ATU-C	A4_9.00.60
			Huawei MA 5600	Conexant	ADGE	322(2007-9-29)
			Lucent Stinger	Conexant	stngr-72-gs-adsl-card	E.67.15.1

Table 17. Older Cisco 876 and 1802 ADSL Routers and HWIC-1ADSLI and HWIC-ADSLI-B/ST over ISDN (ADSLoISDN) (Annex B)

CPE			DSLAM			
CPE Part Number	**Chipset**	**Firmware; Cisco IOS Software Release**	**DSLAM Model**	**Chipset**	**Line Card**	**Firmware**
CISCO876, CISCO1802, HWIC-1ADSLI, and HWIC-ADSLI-B/ST	ST Micro 20190	4.0.15; Cisco IOS Software Release 12.4(22)T	Alcatel ASAM7300	Broadcom	ABLT-F	L7D6AA47.174
			ECI Hi-Focus 480	Infineon	ATU-C 32	A4_9.00.48
			Ericsson EDA 2.1	Broadcom	EDN312xi	CXC 132 8112 R2L01
			Siemens HiX 5300	Infineon	SUADSL:64IXA	542

Table 18. Older Cisco 857, 877, and 1801 Routers and HWIC-1ADSL/HWIC-ADSL-B/ST ADSL-over-Basic Telephone Service Modules (Annex A)

CPE			DSLAM			
CPE Part Number	**Chipset**	**Firmware; Cisco IOS Software Release**	**DSLAM Model**	**Chipset**	**Line Card**	**Firmware**
CISCO 857, CISCO 877, CISCO 1801, HWIC-1ADSL, and HWIC-ADSL-B/ST	ST Micro 20190	4.0.15; Cisco IOS Software Release 12.4(22)T	Alcatel ASAM7300	Broadcom	ABLT-D	L7D6AA47.174
			ECI Hi-Focus 480	Infineon	ATU-C 32	A4_9.00.48
			Ericsson EDA 2.1	Broadcom	EDN312xp	CXC 132 8112 R2L01
			Huawei MA5600	Globespan	H563ADGE VER A	MA5600V300R003
			Lucent Stinger	Conexant	ep-72-hs-gs-adsl2plus	E.67.1.36
			Nokia D500*	Globespan	ADSL2+af	3,5141,21:21:47 May 23, 2007
			Siemens HiX 5300	Infineon	SUADSL:64IXA	542

Table 19. Older Cisco 877M ADSL-over-Basic Telephone Service Routers and HWIC-1ADSL-M (Annex M)

CPE			DSLAM			
CPE Part Number	**Chipset**	**Firmware; Cisco IOS Software Release**	**DSLAM Model**	**Chipset**	**Line Card**	**Firmware**
CISCO877M and HWIC-1ADSL-M	ST Micro 20190P	4.0.15; Cisco IOS Software Release 12.4(22)YB3 or later	Alcatel ASAM7300	Broadcom	ABLT-D	L7D6AA47.174
			Ericsson EDA2.1	Broadcom	EDN312xp	132 8112 R2L01 CXC 132 4220 R10A04, and CXC 132 8113 R2A01
			ECI Hi-Focus 480	Infineon	ATU-C	A4_9.00.60
			Lucent Stinger	Conexant	stngr-72-gs-adsl-card	E.67.15.1

Table 20. Older Cisco 877M ADSL-over-Basic Telephone Service Routers (Annex M UK Mask)

CPE			DSLAM			
CPE Part Number	**Chipset**	**Firmware; Cisco IOS Software Release**	**DSLAM Model**	**Chipset**	**Line Card**	**Firmware**
CISCO877M	ST Micro 20190P	4.0.15; Cisco IOS Software Release 12.4(22)YB3 or later	Huawei MA 5300	Conexant	ADGE	322(2007-9-29)

G.SHDSL Platforms and Modules

Table 21. EFM/ATM Multimode G.SHDSL Platforms

CPE Part Numbers Tested	Chipset	Firmware	Cisco IOS Software Release
C888EA-K9	Infineon (bought by Lantiq)	IDC Firmware version: 1.7.2.0 DFE Firmware version: FW_BETA_120111A	15.2(4)M or later
C898EA-K9	Infineon (bought by Lantiq)	IDC Firmware version: 1.7.2.0 DFE Firmware version: FW_BETA_120111A	15.2(4)M or later
EHWIC-4SHDSL-EA	Infineon (bought by Lantiq)	IDC Firmware version: 1.7.2.0 DFE Firmware version: FW_BETA_120111A	15.2(4)M or later

Mode	DSLAM			
	DSLAM Model	**Controller Card**	**Line Card**	**Firmware**
ATM	Alcatel ASAM 7300	SANT-F	SMLT-A	LDP7AA46.030
			SMLT-C	LPR9AA46.029
	Huawei MA5603	SCUB	SHEB	1.4.13
	Lucent Stinger		LIM-SL-72	9.7.4 e21
			LIM-SL-48	9.7.4 e21
	ECI 480		STUC-16A	S3_8.10.16
			STUC-32A	S3_8.10.16
	Alcatel ISAM_7330_FTTN	NANT-A	NSLT-A	1.4.1
			SMLT-J	1.2.42

Mode	DSLAM			
	DSLAM Model	Controller Card	Line Card	Firmware
EFM	AlcatelISAM_7330_FTTN	NANT-A	NSLT-A	1.4.1
	Huawei MA5603	SCUB	SHEB	1.4.13
	Huawei MA5600		SHEB	1.4.18
	Hatteras HN4000			7.1.2
	Actelis ML698			SW: 7.10/35

Table 22. EFM G.SHDSL Platforms

CPE Part Number	Chipset	Firmware	Cisco IOS Software Release
CISCO888E	Conexant	G115	15.1(1)T or later
HWIC-4SHDSL-E	Conexant	G115	15.1(1)T or later
DSLAM			
DSLAM Model	**Chipset**	**Line Card**	**Firmware**
Alcatel 7302	Infineon	NSLT-A	Feature Group 4.0 and firmware Version 1.3.13
Huawei 5603	Infineon	SHEB	1.4.13
Hatteras HN4000e	Infineon	HN4000e	6.2.1

Table 23. Conexant-Based ATM G.SHDSL Platforms

CPE Part Number	Chipset	Firmware	Cisco IOS Software Release
CISCO878-K9	Conexant	R4.3.1	15.0(1)M3 or later
CISCO888-K9	Conexant	R4.3.1	15.0(1)M3 or later
WIC-1SHDSL-V3	Conexant	R4.3.1	15.0(1)M3 or later

DSLAM			
DSLAM Model	**Chipset**	**Line Card**	**Firmware**
Alcatel 7300	Globespan	SMLT-A	LDP7AA46.020
Alcatel ISAM 7302	Infineon	NSLT-A	1.3.13/1.3.5
Alcatel ISAM 7330	Infineon	SMLT-J	1.2.42
ECI 480	Infineon	STU-C 16	S3_8.10.16
Huawei 5600	Globespan	H561SHEA	MA5600V300R003C03B028 (320(2007-9-29))
Huawei 5600	Infineon	SHEB	H569 (336)SHEB
Lucent Stinger	Globespan	STGR-LIM-SL-72	9.7.4e21 (firmware R3.0.5)
		stngr-48-shdsl-card	R3.0.2
Lucent AnyMedia	Conexant	LPS702	01.29.52.05
Nokia D500	Globespan	SHDSL24f	3,5141,21:50:35 May 23 2007
Siemens HiX 5300	Infineon	SUSHDSL:32:PAM16	S50010-M1295-A101-

Table 24. Infineon-Based ATM G.SHDSL Platforms

CPE Part Number	Chipset	Firmware	Cisco IOS Software Release
HWIC-2SHDSL	Infineon	1.6.1_002	15.0(1)M3 or later
HWIC-4SHDSL	Infineon	1.6.1_002	15.0(1)M3 or later

DSLAM			
DSLAM Model	**Chipset**	**Line Card**	**Firmware**
Alcatel 7300	Globespan	SMLT-A	LDP7AA46.030
Alcatel 7300	Globespan	SMLT-C	LPR9AA46.029
Alcatel ISAM 7302	Infineon	NSLT-A	1.3.13/1.3.5
Alcatel ISAM 7330	Infineon	SMLT-J	1.2.42
ECI 480	Infineon	STU-C 16	S3_8.10.16
Lucent Stinger	Globespan	STGR-LIM-SL-72	9.7.4e21 (firmware R3.0.5)
Huawei 5600	Globespan	H561SHEA	MA5600V300R003C03B028 (320(2007-9-29))
Huawei 5600	Infineon	SHEB	H569 (336)SHEB

Table 25. Certified Service Providers

Service Provider	Certified 880VA SKU	DSL Technology	Firmware Version	Modem Setting Requirements*
A1 Telekom Austria	CISCO887VA-K9 CISCO887VA-SEC-K9	VDSL2/ADSL Annex A	A2pvC030h1.d22k (embedded firmware for Cisco IOS Software Releases 15.1(2)T and 15.1(3)T)	CO5
Bell Canada	CISCO887VA-SEC-K9 EHWIC-VA-DSL-A	ADSL/ADSL2/ADSL2+ Annex A	A2pv6C032b.d23b (embedded firmware for Cisco IOS Software Releases 15.1(4)M and later)	-
BT 21CN	CISCO887VA-K9 CISCO887VA-SEC-K9 CISCO887VA-M-K9 EHWIC-VA-DSL-A EHWIC-VA-DSL-M	ADSL/ADSL2/ADSL2+ Annex A, Annex M	A2pv6C035d.d23j	UK feature custom UK Annex M
KPN	CISCO887VA-K9 CISCO886VA-K9	VDSL/ADSL Annex A ADSL/ADSL2/ADSL2+ Annex B	A2pv6C035d.d23j	CO5
Orange Business	CISCO887VA-K9	ADSL/ADSL2/ADSL2+ Annex A	A2pv6C035j.d23j	Hbi feature
Portugal Telecom	CISCO887VA-M-K9	ADSL/ADSL2/ADSL2+ Annex M	A2pv6C033.d23e	-
Swisscom	CISCO887VA-K9 CISCO887VA-SEC-K9 CISCO886VA-K9 CISCO886VA-SEC-K9	VDSL2/ADSL Annex A VDSL2/ADSL Annex B	A2pvC030h1.d22k (embedded firmware for Cisco IOS Software Releases 15.1(2)T and 15.1(3)T releases) B2pvC035d.d23j	CO5
Telecom Italia	EHWIC-VA-DSL-A	ADSL/ADSL2/ADSL2+ Annex A	A2pv6C033c.d23e	-

Links to V/ADSL Firmware Release Notes

Please refer to the following release notes for links to V/ADSL:

- 32B: http://www.cisco.com/c/en/us/td/docs/routers/access/800/firmware/release/notes/VDSL2/fwrnd23b.html
- 35D: http://www.cisco.com/c/en/us/td/docs/routers/access/800/firmware/release/notes/VDSL2/fwrn35d.html
- 35I: http://www.cisco.com/c/en/us/td/docs/routers/access/800/firmware/release/notes/VDSL2/fwrn35l.html
- 38H: http://www.cisco.com/c/en/us/td/docs/routers/access/800/firmware/release/notes/VDSL2/fwrn38h.html
- 38K: http://www.cisco.com/c/en/us/td/docs/routers/access/800/firmware/release/notes/VDSL2/fwrn38k1.html

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