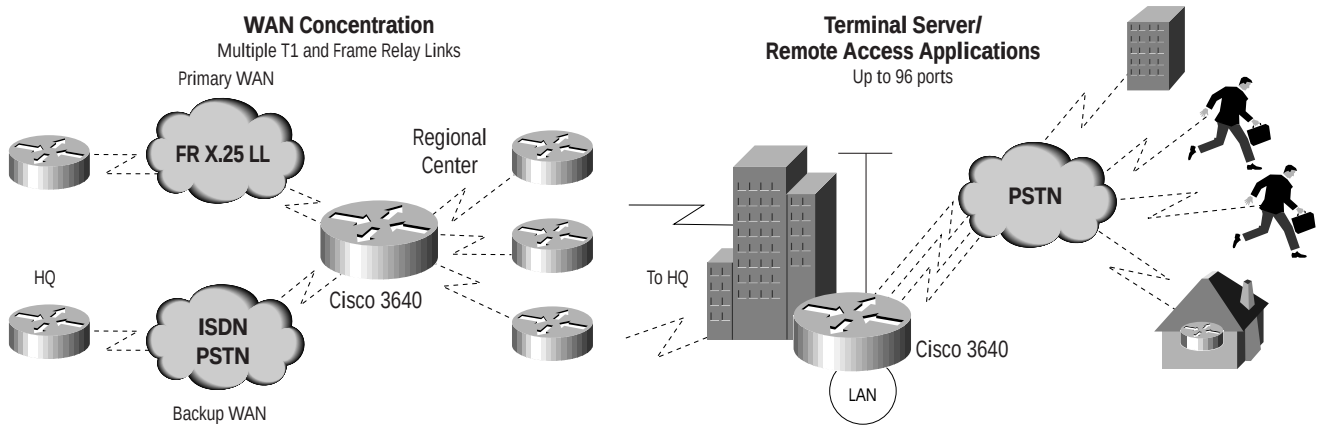
Cisco 3600 Series Serial Connectivity Modules (NM-1HSSI, NM-4T, NM-4A/S, NM-8A/S, NM 16A, NM-32A, WIC-1T, WIC-1DSU-56K4)

THE CISCO 3600 PLATFORM OFFERS A WIDE VARIETY OF SERIAL CONNECTIVITY MODULES TO ACCOMMODATE THE RANGE OF APPLICATION NEEDS IN CUSTOMER NETWORKS. THE SERIAL NETWORK MODULE FAMILY FOR THE CISCO 3600 SERIES ASSURES CUSTOMERS THAT THEY CAN CHOOSE A SERIAL CONNECTIVITY SOLUTION THAT FITS THEIR REQUIREMENTS. AVAILABLE AS NETWORK MODULES OR WAN INTERFACE CARDS, SERIAL CONNECTIVITY OPTIONS OFFER SEVERAL PORT DENSITIES, SYNCHRONOUS AND ASYNCHRONOUS ALTERNATIVES, AND INTEGRATED CHANNEL SERVICE UNIT/DATA SERVICE UNIT (CSU/DSU). AS MODULAR COMPONENTS, THEY ARE EASILY AND INEXPENSIVELY FIELD UPGRADABLE AS CUSTOMER REQUIREMENTS CHANGE.

Figure 1 Serial Applications



Available serial connectivity components for the Cisco 3600 series include:

Network Modules

- NM-1HSSI - One-port High Speed Serial Interface (HSSI)
- NM-4T - Four-port serial
- NM-4A/S - Four-port asynchronous synchronous serial
- NM-8A/S - Eight-port asynchronous /synchronous serial
- NM-16A - High-density asynchronous
- NM-32A - High-density asynchronous

WAN Interface Cards

- WIC-1T - One-port synchronous serial
- WIC-1DSU-56K4 - One-port, four-wire 56-kbps CSU/DSU

Figure 2 High Speed Serial Interface (HSSI) Network Module NM-1HSSI

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The NM-1HSSI is a single port, high speed network module, that provides connectivity to a Wide Area Network. Demand for high capacity corporate backbones, high speed Internet access, Virtual Private Networks (VPNs), and trunking connections for service provider internetworking has led to an increase demand for clear channel DS3 and E3 connections.

The NM-1HSSI Network Module supports speeds up to 52Mbps on a 3640 and 3620. The 3640 is capable of supporting up to 3 NM-1HSSI in a single chassis with the restriction that the maximum bi-directional throughput of the 3640 is 45Mbps. The 3620 supports only one NM-1HSSI network module. The NM-1HSSI also supports fractional T3/E3 speeds from 56kbps to 52Mbps.

Cables for NM-1HSSI	Cable Description
CAB-HSI1=	HSSI Cable, male-to-male connector, 10ft.
CAB-HNUL=	HSSI Cable, male-to-male null modem cable, 10ft.

Four-Port Serial Network Module (NM-4T)

Figure 3 NM-4T, NM-4A/S, NM-8A/S, WIC-1T, WIC-1DSU-56K4

The NM-4T serial network module has four synchronous serial interfaces. The network module supports a total full-duplex throughput of 8 megabits per second (Mbps), which can be realized over one port (at 8Mb/s) or across all four ports (at 2Mb/s on each port).

The NM-4T module in any network environment delivers very low price per port and provides higher performance than comparable third-party solutions. For instance, a small or medium-sized Internet service provider (ISP) with high serial density requirements may find this solution very cost-effective per subscriber.

Cabling--No cables included; optional cables include:

Cables for the 4T Network Module	Cable Type	Product Number	Length	Male/Female
T1/E1	V.35 DTE	CAB-V35MT	10 ft.	Male
T1/E1	V.35 DCE	CAB-V35FC	10 ft.	Female
T1/E1	EIA/TIA -232 DTE	CAB-232MT	10 ft.	Male
T1/E1	EIA/TIA -232 DCE	CAB-232FC	10 ft.	Female
T1/E1	EIA/TIA -449 DTE	CAB-449MT	10 ft.	Male
T1/E1	EIA/TIA -449 DCE	CAB-449FC	10 ft.	Female
T1/E1	X.21 DTE	CAB-X21MT	10 ft.	Male
T1/E1	X.21 DCE	CAB-X21FC	10 ft.	Female
T1/E1	EIA/TIA-530 DTE	CAB-530MT	10 ft.	Male
Led--Network module status indicator, five Status LEDs for each serial port, including data send/receive indication				
Network interfaces--four serial interfaces				

Four- and Eight-Port Asynchronous/Synchronous Serial Network Modules (NM-4A/S, NM-8A/S)

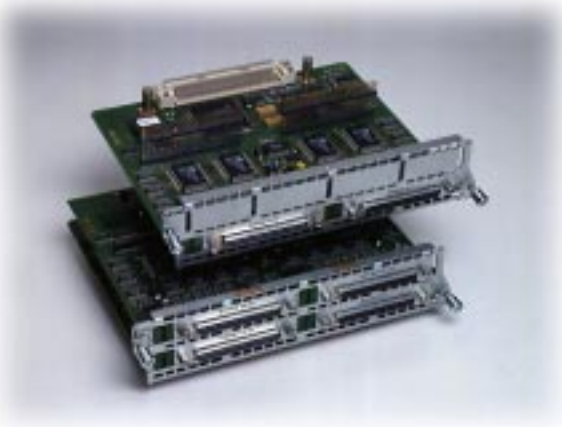
The two asynchronous/synchronous serial network modules available for the Cisco 3600 series provide flexible dial support, with each port configurable in synchronous or asynchronous mode, offering mixed-media dial support in a single chassis. In a typical WAN aggregation application, the Cisco 3640 platform can support up to 24 low-speed (up to 128 kbps) synchronous or asynchronous (up to 115.2 kbps) serial lines.

Cabling--Not included; optional cables include:

Cables for the 4/8 A/S Network Module	Cable Type	Product Number	Length	Male/Female
T1/E1	V.35 DTE	CAB-V35MT	10 ft.	Male
T1/E1	V.35 DCE	CAB-V35FC	10 ft.	Female
T1/E1	EIA/TIA -232 DTE	CAB-232MT	10 ft.	Male
T1/E1	EIA/TIA -232 DCE	CAB-232FC	10 ft.	Female
T1/E1	EIA/TIA -449 DTE	CAB-449MT	10 ft.	Male
T1/E1	EIA/TIA -449 DCE	CAB-449FC	10 ft.	Female
T1/E1	X.21 DTE	CAB-X21MT	10 ft.	Male
T1/E1	X.21 DCE	CAB-X21FC	10 ft.	Female
T1/E1	EIA/TIA-530 DTE	CAB-530MT	10 ft.	Male
LEDs--Network Module status indicator, five status LEDs for each serial port, including data send/receive indication				
Network Interfaces--Four low-speed serial interfaces				

High-Density Asynchronous Network Modules

Figure 4 NM-16A and NM-32A



The NM-16A and NM-32A network modules provide flexible, high-density asynchronous connectivity at a competitive price per port and higher performance than comparable third-party solutions. The modules support V.34 speeds at up to 4x compression (134.4 kbps) over the asynchronous connection. Three examples where this module can be deployed follow:

- Small to medium-sized power branch offices where remote users require modem dial access; a fully configured Cisco 3640 chassis with three async network modules connected to the modem rack (with optional custom cables) enables connectivity for up to 96 dial-in users
- Medium branch offices that require a high-density terminal server; a fully configured Cisco 3640 chassis with three async network modules connected to the modem rack (with optional custom cables) enables connectivity for up to 96 terminal connection

• Telemetry applications, connecting a NM-32A module to private branch exchange (PBX) serial ports, data collection equipment, or router consoles.

Cabling--The NM-16A and NM-32A modules include two or four custom "octopus" cables. Each cable terminates eight ports, with optional physical endpoints of RJ-45 or DB-25. A NM-16A module requires two custom cables, and the NM-32A requires four custom cables.

Cables

• CAB-OCTAL-ASYNC (requires end connectors)
• CAB-OCTAL-MODEM
• CAB-OCTAL-KIT

End Connectors

• CAB-25AS-MMOD (for modems)
• CAB-25AS-FDTE (for terminals)

Special cables are available from U.S. Robotics and Microcom to connect NM-16A and NM-32A network modules to their modem racks.

Cisco alarm status monitors (ASM) owners who are seeking to replace older terminal servers with a Cisco 3600 platform will require an available adapter cable to convert from RJ-12 to RJ-45 connections.

LEDs--Network module status indicator, status LEDs for each serial port

Network interfaces--16/32 low-speed asynchronous interfaces per network module

Single-Port Serial WAN Interface Card (WIC-1T)

The single-port serial WIC-1T provides low-density, high -speed remote or branch office connectivity without sacrificing an entire network module slot. Compatible with a Cisco 1600, the WAN interface card is configured within a mixed-media network module (NM-1E2W, NM-2E2W, NM-1E1R2W) in the Cisco 3600.

The WAN interface card enables true multifunction configurations within a single Cisco 3600 chassis. For example, a Cisco 3620 platform configured for dial aggregation may have eight Integrated Services Digital Network Basic Rate Interface (ISDN BRI) ports, two Ethernet LAN ports, and two high-speed serial links via WIC-1T cards.

Cabling--Not included; optional cables include:

Cables for the WIC-1T	Cable Type	Product Number	Length	Male/Female
T1/E1	V.35 DTE	CAB-V35MT	10 ft.	Male
T1/E1	V.35 DCE	CAB-V35FC	10 ft.	Female
T1/E1	EIA/TIA -232 DTE	CAB-232MT	10 ft.	Male
T1/E1	EIA/TIA -232 DCE	CAB-232FC	10 ft.	Female
T1/E1	EIA/TIA -449 DTE	CAB-449MT	10 ft.	Male
T1/E1	EIA/TIA -449 DCE	CAB-449FC	10 ft.	Female
T1/E1	X.21 DTE	CAB-X21MT	10 ft.	Male
T1/E1	X.21 DCE	CAB-X21FC	10 ft.	Female
T1/E1	EIA/TIA-530 DTE	CAB-530MT	10 ft.	Male
LED--WAN interface card status indicator and connection indicator				
Network interfaces--One serial interface				

Single-Port, Four-Wire, 56-kbps DSU/CSU WAN Interface Card (WIC-1DSU-56K4)

The single-port, four-wire, WIC-1DSU-56K4 card combines a DSU/CSU into a single card with 64-kbps maximum throughput speed. DSU/CSU interface devices are always required to interface between the synchronous serial ports of a router and the telco/Post, Telephone, and Telegraph (PTT)-supplied data communications circuit. A DSU is a device used in digital transmission for connecting data terminal equipment to a digital transmission service. A CSU is a digital interface device that connects end-user equipment to a local digital telephone loop.

The four-wire DSU WAN interface card performs CSU/DSU functions for both dedicated (DDS) and four-wire switched 56-kbps data networks. Compatible with the Cisco 1600 series, this WAN interface card module provides an all-rate synchronous interface to any dedicated DDS point-to-point or multipoint network compatible with the AT&T Publication 62310 standard. This WAN interface card module also supports four-wire switched 56 data services (such as AT&T Accunet 56 or Sprint VPN-56), plus many switched data services offered by local exchange carriers.

This WAN interface card provides a compact, self-contained unit without the clutter of external devices and cables. Intelligent DSU/CSU modules are remotely manageable from a centralized location using Cisco's built-in Simple Network Management Protocol (SNMP) to speed problem resolution and reduce onsite visits. These benefits make the WIC-1DSU-56K4 in Cisco 3600 series routers an ideal solution for unattended remote sites or sites without an information systems (IS) or telecommunications professional.

Cabling--RJ-45 male cable (not included)

LEDs--WAN interface card status indicator, five Status LEDs, including send/receive data, loopback, alarm, and carrier

Network interfaces--One switched 56 /64-kbps interface

Summary: Serial Network Connectivity for the Cisco 3600 Series

Table 1 Physical Limitation of Serial Modules per Chassis

Physical Characteristics		
Type of Module	**Cisco 3640**	**Cisco 3620**
NM-1HSSI	Three	One
NM-4T	Three	One
WIC-1T	Eight	Four
WIC-1DSU-56K4	Eight	Four
NM-4A/S, NM-8A/S	Four	One
NM-16A,NM-32A	Three	One
Requirements--WIC-1T and WIC-1DSU-56K operate in conjunction with a mixed-media network module (NM-1E2W, NM-2E2W, NM-1E1R2W)		

Table 2 Cisco IOS Software Release Requirements for Serial Connectivity Modules

Module Model	Cisco IOSTM Release Number
NM-1HSSI	11.3(3)T or later
NM-4T	11.2.(5)P or later
NM-4A/S, NM-8A/S	11.1.(8)AA or later
NM-16A,NM-32A	11.2.(7A)P or later
WIC-1T	11.1.(8)AA or later
WIC-1DSU-56K4	11.2.(5)P or later

Table 3 Technical Specifications

-	NM-4T	NM-4A/S, NM-8A/S	NM-16A	NM-32A	NM-1HSSI
Dimensions (H x W x D)	1.55 x 7.10 x 7.2	1.55 x 7.10 x 7.2	1.55 x 7.10 x 7.2	1.55 x 7.10 x 7.2	1.55 x 7.10 x 7.2
Weight	2 lbs. Max	2 lbs. Max	2 lbs. Max	2 lbs. Max	2 lbs. Max
Environmental Conditions	Op. temp. 32-104˚F (0-40˚C),	Op. temp. 32-104˚F (0-40˚C),	Op. temp. 32-104˚F (0-40˚C),	Op. temp. 32-104˚F (0-40˚C),	Op. temp. 32-104˚F (0-40˚C),
	Non. Op temp -13-158˚F (-2 -70˚C)	Non. Op temp -13-158˚F (-2 -70˚C)	Non. Op temp -13-158˚F (-2 -70˚C)	Non. Op temp -13-158˚F (-2 -70˚C)	Non. Op temp -13-158˚F (-2 -70˚C)
Relative Humidity	5-95%	5-95%	5-95%	5-95%	5-95%
EMI	Class B EMI	Class B EMI	Class B EMI	Class B EMI	Class B EMI
Protocols Supported	Full Cisco IOS support by release 11.2 and 11.3				

Supported Features of Serial Network Modules

Network Module	Synchronous	Asynchronous	Full Duplex	Half Duplex	Bisync
NM-1HSSI	Yes	No	Yes	No	No
NM-4T	Yes	No	Yes	No	No
WIC-1T	Yes	No	Yes	Yes	Yes
WIC-1DSU-56K4	Yes	No	Yes	No	No
NM-4A/S, NM-8A/S	Yes	Yes	Yes	Yes	Yes
NM-16A,NM-32A	No	Yes	Yes	No	No

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