Q&A

Cisco IP VSAT Satellite WAN Network Module

FEATURES AND FUNCTIONS

Q. What is the Cisco® IP VSAT Satellite WAN Network Module (NM-1VSAT-GILAT)

A. The Cisco IP VSAT module is a “satellite modem” or “indoor unit” (IDU) on a network module integrated in an integrated services router. It connects to an outdoor unit (ODU), which includes the dish antenna and associated receiver and transmitter, through coaxial cables.

Q. What kind of connectivity does the module provide?

A. The Cisco IP VSAT module provides IP-based two-way broadband WAN connectivity over satellite. It supports both unicast and multicast traffic and appears as any other WAN interface to the Cisco IOS® Software.

Q. Is the Cisco IP VSAT Module compatible with all satellite connections?

A. It is compatible with Ku-band and C-band satellite connections, which represent the vast majority of satellite capacity. It is compatible only with services using Gilat SkyEdge hub systems.

Q. Can multiple VSAT modules be used on the same router in load-balance mode?

A. Multiple VSAT modules are supported on the same router, but packed-based load balancing interferes with the TCP acceleration mechanism. Hence only destination-based load balancing is supported with multiple VSAT modules.

Q. Does the Cisco IP VSAT module support Hot Standby Router Protocol (HSRP)?

A. Yes, HSRP is supported in both the homogenous (across satellite interfaces) and the heterogeneous (between satellite and non-satellite interfaces) setup.

Q. What routing protocols are supported over the satellite connection?

A. All dynamic routing protocols (Routing Information Protocol [RIP], Open Shortest Path First [OSPF], and Enhanced Interior Gateway Routing Protocol [EIGRP]) are supported over the satellite connection. The module itself supports RIPv2 natively, and all the static and directly connected routes are automatically forwarded as RIP routes to the satellite network. This feature can be turned off using the “**no service-module route-redistribute**” command under the satellite interface.

Q. Does the Cisco IP VSAT module support online insertion and removal (OIR)?

A. No. This support could damage the module.

Q. What sort of quality-of-service (QoS) policies should be applied to the satellite interface?

A. The VSAT module applies both queuing and policing on the satellite channel. On the Cisco IOS Software side, the traffic should not be throttled; only classification and marking policies should be applied.

Q. What kind of bandwidth can I get using the Cisco IP VSAT module?

A. It supports speeds of up to 1.5 Mbps inbound (VSAT to hub) and 10 Mbps outbound (hub to VSAT). The speed achievable depends on the size of the antenna, transmitter power, and geographical locations.

Q. What does the bandwidth depend on?

A. The bandwidth depends on the following:

- **Antenna size**—The bigger the antenna, the higher is the bandwidth.
- **Transmitter rating**—It can vary from 1 to 4 watts.
- **Satellite footprint**—Different regions may have different bandwidth available.

Q. Does multicast require special configuration to work?

A. Protocol Independent Multicast (PIM) requires special configuration because some of the hub devices as well as the VSAT module do not support PIM. The satellite service provider needs to configure both the VSAT and Hub protocol server to transparently tunnel the PIM messages. On the VSAT router, PIM mode must be set to sparse and the hub router should be configured as the route processor. There are some IP address requirements too; refer to the "Multicast with NM-1VSAT-GILAT" application note for more information.

Q. Is a special configuration required to support voice over satellite?

A. Because of latency on the satellite link, voice and other real-time traffic need dedicated channel allocation to avoid jitter. Cisco IOS Software can generate a dedicated-access trigger for voice calls that originate on the VSAT router. Dedicated-access triggers are enabled on the VSAT router when you:

- Configure a VoIP gateway solution, such as Cisco CallManager Express (Cisco CME)
- Install a hardware voice-over-IP (VoIP) gateway, such as one of the following voice-enabled modules: High-Density Digital/Analog Voice Network Modules (part numbers NM-HDV, NM-HDA, NM-HD-1V, NM-HD-2V, NM-HD-2VE, or EVM-HD, respectively).
- Enable the Cisco Multiservice IP-to-IP Gateway feature

Q. What are the benefits of using the Cisco IP VSAT module over a standalone IDU?

A. The integrated VSAT module provides several benefits, including:

- Enhanced QoS for VoIP, including the ability to prioritize VoIP calls with a dedicated access satellite channel when a call is initiated (requires Cisco CME or IP-to-IP Gateway in the same router
- Enhanced routing support, including OSPF and EIGRP options, as well as PIM support for transparent multicast deployment
- Enhanced reliability, including support for dial-on-demand routing (DDR) for WAN backup, HSRP with a single or dual ODUs, redundant power supplies (Cisco 3845 Integrated Services Router and Cisco 3745 Multiservice Access Router), and integrated survivability (with Survivable Remote Site Telephony [SRST], local authentication for wireless clients, etc.)
- Enhanced management, including fewer devices to manage, improved visibility to the satellite connection for end customers, simpler configuration of routing paths (with OSPF and EIGRP), and support for PIM

In addition, the VSAT module complements a wide range of networking services delivered by the integrated services routers, including:

- Data networking, including a wide range of WAN connectivity options
- Security, including firewalls, intrusion detection systems (IDSs), Network Admission Control (NAC), and encryption
- IP Communications, including VoIP with Cisco CME and Cisco Unity® Express
- Wireless, including integrated 802.1b/g and 802.11a/b/g wireless LAN (WLAN) access points
- Switching, including integrated 4- to 48-port Layer 2 switch modules and Power over Ethernet (PoE)
- Content networking, including live video streaming, video on demand, etc.
- Land mobile radio over IP, including interoperability between radio systems and other communications devices

HARDWARE AND INSTALLATION

Q. What is ODU? What additional equipment is required for communications over satellite?

A. ODU stands for outdoor unit. It comprises the VSAT antenna, associated transmitter and receiver, the coaxial cable, and the AC power adaptor for the ODU. The VSAT antenna comes in different sizes, from 0.65 to 2.5 meters in diameter. The ODU is supplied by the satellite service provider.

Q. Why is the external power supply required?

A. The external (ODU) AC power supply that is plugged into the module provides power to the transmitter on the antenna through the RF cables.

Q. How long can the Intermediate Frequency (IF) cable from the VSAT to the antenna run?

A. IF cables can run up to 100 feet without the need for an amplifier. Beyond 100 feet, a power amplifier may be required.

SERVICES AND APPLICATIONS

Q. Who is Gilat, what is SkyEdge, and why did Cisco choose compatibility with Gilat-SkyEdge?

A. Gilat is the second largest global supplier of satellite equipment, after Hughes. SkyEdge is the latest family of broadband satellite equipment from Gilat, including hub systems and VSAT IDUs and routers. Cisco chose compatibility with Gilat-SkyEdge systems to:

- Deliver broadband connectivity, with more than 1 Mbps bidirectional throughput and more than 8 Mbps multicast receive capability
- Support existing satellite capacity (Ku-band and C-band) with small dish antennas

Q. Is compatibility with products from other equipment providers planned?

A. Compatibility with standard Digital Video Broadcasting-Satellite (DVB-S) receive-only systems for one-way multicast applications (with terrestrial return path) will be added in Cisco IOS Software Release 12.4(6th)T (Dec. 2006). Compatibility with products from other two-way equipment service providers is not currently planned, but is a future possibility.

Q. Is the Cisco IP VSAT module compatible with all Gilat service providers or systems?

A. No. The Cisco IP VSAT module is compatible with Gilat-SkyEdge hubs. Older hubs supporting Gilat-360E systems can be upgraded to be SkyEdge compatible for simultaneous support of both 360E and SkyEdge VSATs (such as the Cisco IP VSAT module).

Q. Which service providers are certified to offer Cisco IP VSAT Module compatible services?

A. Cisco IP VSAT Module compatible services are available in several regions around the world:

- **Continental United States and portions of Canada**—Spacenet
- **Australia**—Optus
- **India**—HCL Comnet
- **Mexico**—In discussions with GlobalSat
- **Europe**—Satlynx
- **Turkey**—Isnet
- **Kazakhstan**—Aster

Cisco Systems® is working with other service providers around the globe to offer services with the Cisco IP VSAT module.

Q. What is the support model for the Cisco IP VSAT module?

A. The Cisco IP VSAT module comes with standard Cisco Technical Assistance Center (TAC) support for the hardware. The satellite service is negotiated with the satellite service provider. If the network experiences downtime, the first point of contact for support is the satellite service provider.

Q. What are the applications for the Cisco IP VSAT module?

A. The module allows enterprise, commercial, and governmental organizations to enhance business continuity while simultaneously enabling their network for video communications through the use of satellite connectivity:

- Business continuity and network reliability through integrated terrestrial and satellite WAN diversity
- Video, audio, and content distribution through IP Multicast
- Broadband connectivity for remote sites
- Single nationwide or multinational service
- Portable communication kit for disaster recovery and on-the-move network

Further information about the applications is available in the data sheet.

Q. Is the connection over the satellite secure?

A. The satellite connection supports a range of security capabilities, including:

- Frequency-hopping Time Division Multiple Access (FTDMA) scrambling of all traffic from remote VSAT to the hub
- End-to-end encryption (from the remote VSAT through the service provider hub to the headquarters data center) using Cisco IOS Software encryption (software) or a VPN module (hardware) with an external performance enhancement proxy (PEP) to provide TCP and HTTP acceleration before the traffic is encrypted; with Cisco IOS Software Release 12.4(6th)T, the Integrated TCP Acceleration and Encryption (ITAE) feature eliminates the need of the external PEP; the expected release timeline for ITAE is Dec. 2006.
- Secure distribution of multicast information from the hub to the remote sites through the network management system

Q. What costs are associated with satellite service?

A. Two types of costs are associated with a satellite service:

- **Fixed cost**—The cost for the equipment (antenna, cable, etc.) and installation; the total fixed cost can vary from $1000 to $2000, depending on the size of the antenna and availability of installation technicians.
- **Monthly cost**—This cost is the service fee; it can vary based on the bandwidth and service guarantees; usually a 256-kbps link costs about $150 per month.

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