VIPERSAT NETWORK PRODUCTS

Satellite service providers and users are subject to increasing economic and time constraints to deliver quality products. Comtech EF Data understands that you are dedicated to serving your customers with the most efficient, cost-effective, reliable network available even though capital and operational expenses are scrutinized and budgets are tight. Reliable, bandwidth and capacity management products that can justify their costs are desired to reduce the operational expense of satellite transmissions. Our feature-rich Vipersat Network Products work with our modems to help service providers achieve their technical and commercial availability objectives for IP-based satellite networking. The Vipersat Network Products solutions are server-based and include dynamically managed Single Carrier Per Channel (*dSCPC*) and automatic application switching technologies. All aspects of the satellite network can be configured, controlled and monitored while coordinating and optimizing network bandwidth and capacity. Our solutions increase efficiency and provide real-time, interactive connectivity in fixed and mobile satellite networks.

VIPERSAT MANAGEMENT SYSTEM

The Vipersat Management System (VMS) builds on years of providing our customers with the most advanced automated bandwidth and capacity management system in the industry. VMS is a feature-rich, automated bandwidth, capacity, and network management system with a high degree of configuration automation. It is designed to enable network administrators and satellite service providers to easily configure their networks and rapidly and effectively respond to network anomalies. More than a network monitor and control platform, VMS automates the carrier switching and spectrum management processes within the satellite network. These capabilities allow SCPC carriers to be switched automatically based on application, load, or schedule, providing on-demand services and unparalleled space segment savings.

Key Functionality

- Centralized network and capacity management
- Dynamic SCPC carrier allocation & true bandwidth-on-demand
- Automation of space segment capacity
- User-defined policies for upstream carrier switching
- Star and full mesh capabilities
- Redundancy configurations for hub and remote hardware
- Virtual Network Operation

- Advanced switching leverages multiple modulation/forward error correction (FEC) combinations
- Scalable from small to large networks
- Auto detection of new nodes
- Detailed event logs can be filtered and/or exported
- Simple Network Management Protocol (SNMP) MIB for integration into hierarchal NMS platforms
- Operates over multiple transponders and satellites

Network Map displays the satellite network hardware and IP subnets. Use the scroll mouse to hover over a network element and view its configuration.

Tree View allows the operator to quickly verify element status

Subnet Manager displays the bandwidth configuration of each remote in the network.
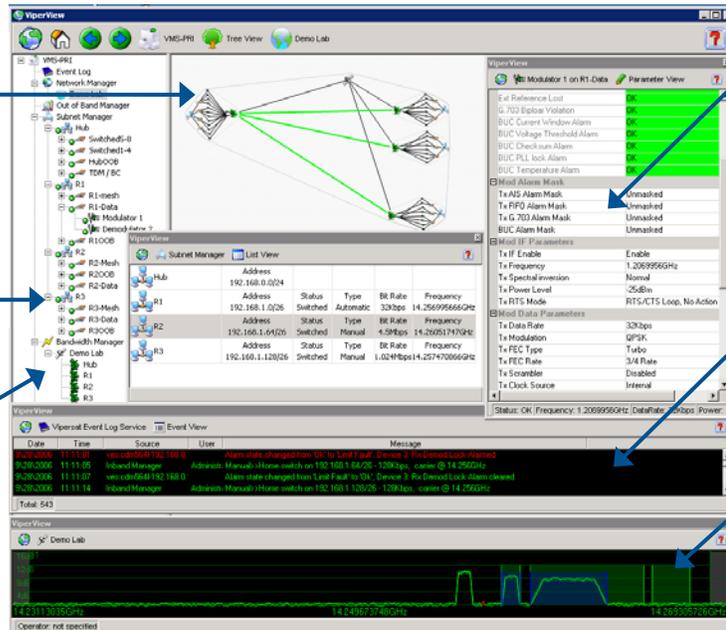
Parameter View provides traditional monitor and control functions such as viewing unit status and configuration changes.

Event log displays all network activity and can be sorted, filtered and exported to an external database.

Bandwidth manager displays dSCPC carriers across all transponders in both frequency and Eb/No.

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VIPERSAT MANAGEMENT SYSTEM

Our efficient satellite modem technologies, combined with our VMS, provide dynamic SCPC capacity management solutions. dSCPC facilitates bandwidth sharing resulting in lower space segment operating costs. Efficient, low latency and low jitter SCPC connections can be established, torn down, and dynamically resized manually or automatically. Our Vipersat dSCPC network solutions are comprised of satellite modulators, demodulators, and modems, which are centrally managed and controlled by the Vipersat Management System. VMS is scalable, designed to anticipate and accommodate future growth, and is capable of managing networks of any size.

A variety of Comtech EF Data devices are manageable by the VMS. Different bandwidth saving features and capabilities are supported depending on the device type. The devices manageable by the Vipersat VMS fall into two categories, in-band or out-of-band management.

In-Band Management
Vipersat-enabled devices that support in-band management are IP-based modems that have the ability to transmit or receive STDMA burst and automatically request dSCPC circuits from the VMS. The VMS manages and controls these modems "In-Band", through the same IP interface that user data is carried. The IP capability of In-Band managed modems allow for a wide variety of dSCPC switching methods.

Out-of-Band Management
Out-of-band managed modems are typically used for point-to-point SCPC circuits that require connections using non-IP G.703, ASI, HSSI, V.35, high speed GiGE interfaces, etc. The VMS has the ability to monitor and control these modems through their 10/100 Base-T M&C interfaces. The management interface is separate from the primary user baseband interface, therefore IP connectivity to the management interface is typically provided "out-of-band" using a separate IP-based connection.

Dynamic SCPC
VMS is the engine that provides *dSCPC* bandwidth management of the space segment. When a remote in the network has an application to transport over the satellite link, *dSCPC* technology provides the mechanism to automatically establish the SCPC carrier for that transmission. *dSCPC* resizes the carrier based on the increase or decrease in applications being sent over the link, and it returns the remote to its home state once the application is completed. *dSCPC* yields true bandwidth-on-demand, giving the user the low-latency, low-jitter dedicated SCPC connection when it is needed for real-time applications, such as Voice over IP (VoIP), video conference, broadcasts and large applications (file or image transfers).

IP-Based Network Control
All management operations and controls are accomplished using standard IP communications protocols. VMS uses a proprietary interface to communicate with the IP-enabled satellite modems that dramatically lowers monitor and control overhead compared to traditional SNMP interfaces. The benefit is less bandwidth required and faster response to control and status messages.

Demand Mesh Connection
Until now, flexible and dynamic switching systems, such as DAMA or multiple transmission link switches, were bandwidth and equipment resource intensive due to the constraints of traditional, proprietary serial modem interfaces. Switching multiple transmission links via satellite meant reducing flexibility for the benefit of lower latency circuit switches.

Demand Mesh Connection technology offers mesh connectivity based on switching at the application level. Demand Mesh Connection provides significant, dynamic, and rapid connectivity between remotes without suffering the high costs associated with multiple carriers and/or 1-to-1 multi-receiver links.

Advanced Upstream Site Switching
Traditional shared platforms, such as TDM/TDMA networks, provide a single type modulation/ FEC scheme for their infrastructure. VMS, in conjunction with our highly efficient satellite modems, provides flexibility in setting modulation/FEC rates when establishing SCPC carriers. This allows users to take advantage of both bandwidth-on-demand and higher order modulation/FEC combinations to further optimize satellite links. For example, a remote can be switched out of its home state of QPSK modulation, into 8-PSK or 16-QAM automatically.
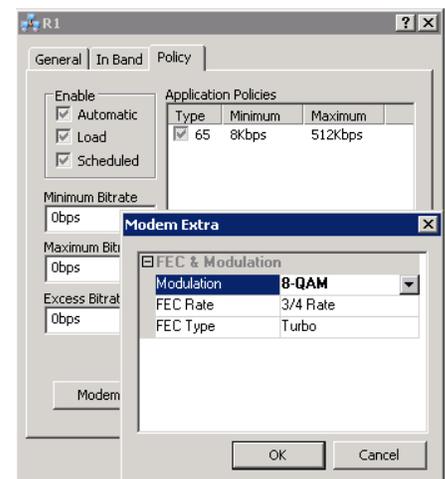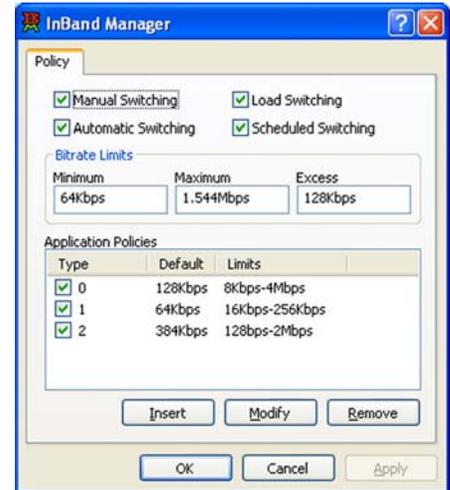
Multi-Transponder Mode (MTM) / Cross-Strap Mode

This MTM function allows unused, fragmented portions of space segment to be allocated across the entire satellite to a network. The allocated space segment can then be used for on-demand SCPC links. Due to the greater bandwidth, MTM only functions with L-band satellite modems.

Cross-strap functionality allows the network implementations on Ku/C, and C/Ku cross-strapped transponders.

Redundant Configurations

We offer fully automated redundant hardware and software for both hub and remote locations. Our solutions can be placed online without personnel intervention, preserving the link and maintaining transmission of your mission critical data.

Architecture

VMS is based on a client/server architecture where a central hub communicates with remote nodes in star or mesh topologies. The server maintains all databases in a centralized location accessible to all clients, so updates can be made in a single location and distributed globally to clients. VMS supports centralized management, control and distribution of data, alarms and events. It also supports multiple clients and network management user applications plus access to all system features simultaneously.

VIRTUAL NETWORK OPERATOR SUPPORT (VNO)

The VNO capability provides remote user access into the VMS via a server software application and a web-based client. VNO allows service providers to selectively expose resources in their primary network to external resellers, customers and/or operators. It utilizes existing web-based technologies and enables flexibility in implementation of key VMS functions.

The manager of the network or network operator with secure access to the VMS can create groups of remote site and hub equipment (the virtual network) that are accessed by each VNO via web interface. The VNO has read and write capabilities to manage modem configurations created by the network operator. The network operator creates and removes modems from the network for the VNO.

The VNO capability allows network operators to increase the size of their target customer base by using hierarchical management techniques. Network operators can allow VNOs to change bandwidth or priority assignments, with no intervention. This frees operators to provide additional revenue generating value added services, such as first and second level help desk support, or network design expertise. The network operator retains full management of the entire network.

The advantages to the VNO are both technical and financial, and appeals to companies that are new to managed service provision of Vipersat products, or wish to expand to new geographic service areas. The VNO approach to managed services has a low barrier to entry. Charges vary by network operator, but typically the cost for hub equipment is minimal, as is the ongoing VNO charges. As network requirements expand, a VNO can easily scale to meet the needs of their customers. VNOs are able to fully manage their partition of the overall network, defining their own service classes and QoS requirements.

ROAMING OCEANIC SATELLITE SERVER (ROSS)

The Roaming Oceanic Satellite Server is an integrated location server that works in conjunction with our VMS and associated remote modems to facilitate on-the-move satellite communications for oceanic vessels. ROSS enables remote modems to interface with stabilized, auto-tracking antennae, maintaining connectivity as vessels transit through footprints of different satellites, change footprints on the same satellite, or switch teleports. ROSS stores the operational and configuration information on-board remote terminals, including satellite footprint maps, shoreline contour vector maps, exclusion areas, link budget information, multiple modem configurations and other administrative information.

The ROSS can store hundreds of satellite footprints, allowing satellite service providers the freedom to create regional, hemispheric, or worldwide service areas using less expensive capacity than that of global beams.

VIPERSAT CIRCUIT SCHEDULER (VCS)

VCS is a web-based satellite circuit scheduler that automates the setup of ad hoc SCPC and mesh connections. Circuits can be scheduled through a browser interface by date/time, circuit type, participating nodes and data. Users can view schedule status (reserved bandwidth slot, real-time link quality) and can generate analysis reports. The VCS service interacts with the VMS for the deployment and execution of circuit scheduling.
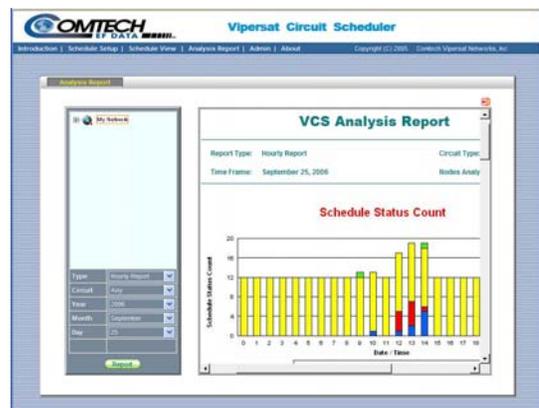
VIPERSAT CIRCUIT SCHEDULER (VCS)

VCS simplifies the network setup process and enables bandwidth sharing capacity management for a variety of applications, including:

- IP video conferencing and collaboration
- News and sporting event video streaming
- High capacity file transfers
- Scheduled broadcasting
- Distance learning
- Telemedicine
- End of day transactions

Architecture

VCS consists of a web-based application and Windows services that share and utilize existing functionality with the VMS. The graphical user interface enables users to view, schedule and generate reports for the various circuit types.

VIPERSAT FILE STREAMER

Vipersat File Streamer (VFS) is a software application used in conjunction with the VMS and our Vipersat-enabled modems to provide efficient and reliable file transfers over satellite networks. VFS overcomes the limitations of TCP/IP over satellite links by implementing an efficient datagram protocol, while at the same time having the ability to request dynamic SCPC satellite bandwidth.

VFS provides for channel utilizations of up to 99% while allowing for file transfers of any size and any format over satellite. VFS performs as well as, if not better, than other TCP/IP-based solutions that include additional hardware acceleration devices. VFS is not a stand-alone product for file transfers; rather it is an optional accessory that integrates with the VMS, augmenting the bandwidth on-demand capabilities of the system.

COMPLETE NETWORK SOLUTION

The combined network-based solution of Vipersat Network Products and our bandwidth-efficient modems offer unique features that minimize operating expenses and maximize transponder utilization. It is flexible, scalable and able to adjust to changing and expanding networks. The solution is deployed worldwide supporting a variety of applications.

We offer the widest range of bandwidth efficient modems available in the satellite industry. When using our satellite modems configured with the IP Module, VMS offers complete IP-based network control. And, a network powered with VMS also provides the switch up control of our non-IP modems that are used in high speed and/or secure transmission environments, such as military/government or native broadcast format applications.

Modem, Modulator, Demodulator	Data Rate	In Band	Out-of-Band	STDMA	dSCPC Switching Methods						
					Automatic	Scheduled	Manual	Load	Application	QoS	ToS
CDM-570 & CDM-570L Satellite Modems	Up to 9.98 Mbps*	●	●	●	●	●	●	●	●	●	●
CDD-562L Dual IP Demodulator	Up to 9.98 Mbps*	●		●	●	●	●	●	●	●	●
CDD-564 & CDD-564L Quad IP Demodulators	Up to 9.98 Mbps*	●		●	●	●	●	●	●	●	●
SLM-5650 Satellite Modem	Up to 155 Mbps		●		●	●	●				
CDM-600 & CDM-600L Satellite Modems	Up to 20 Mbps		●		●	●	●				
CDM-700 High Speed Satellite Modem	Up to 155 Mbps		●		●	●	●				

* Depending on Modulation/FEC combination. Consult user's manual for details.

The chart above details the compatibility of various modem operational modes with the Vipersat Management System at time of publication. For more detail on Vipersat Management System, Vipersat Circuit Scheduler or our satellite modems, refer to the individual datasheets and user manuals available on web site, www.comtechefdata.com.