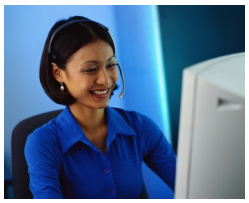
Multimedia Traffic Service Corporate Private Network Application Note

SatPath SkySwitch® is a new generation broadband VSAT satellite communications networking system earmarked for small to medium-sized networks which require flexibility in real-time traffic routing and a high degree of Quality of Service (QoS). SatPath SkySwitch® is an application oriented satellite network solution specifically designed to address:

- Low-OPEX, lower initial capital equipment investment for any network size
- Supports Point-to-Point, Point-to-Multipoint Star, Mesh, and Hybrid Star/Mesh Network topologies
- Broadband traffic information rates from 8 Kbps to 22 Mbps
- Optimum carrier bandwidth efficiency which reduces recurring space segment rental
- Intelligent multimedia traffic networking using a shared transponder bandwidth pool with Demand Assigned Multiple Access (DAMA) carrier assignments and real-time Adaptive Bandwidth-On-Demand (ABOD) information rate adaptability
- State-of-the-Art, high-performance digital modem/channel unit implementation with automatic propagation fading compensation and Turbo Forward Error Correction safeguards the highest available traffic Quality of Service
- Layer 3 routing for IP connections and Layer 2 VLAN Bridging



Corporate communications networks need to address all types of multimedia traffic consisting of voice, Intranet/Internet data, file transfers and video conference between geographically distant locations for private enterprise clients and government agencies. The majority of the network traffic is “Star” between the Hub earth station and the remote community. However, requirements for single satellite hop “Mesh” remote to remote connectivity are also needed for voice and some video conference and data services. An intelligent, highly flexible, low cost satellite network solution which dynamically assigns satellite bandwidth based on actual traffic demand is a key attribute in corporate communication networks to minimize the recurring space segment cost in operating the network.

In the SatPath SkySwitch® product line, all multimedia traffic consisting of voice, data and compressed video traverse the link as IP packets which can be received by any network node given the broadcast capability of satellite communications. Our SkyWeb™ service application is a perfect fit in satisfying all of the “Star” traffic networking requirements. SkyWeb™ features a continuous digital outbound carrier from the Hub. Each remote simultaneously receives and demodulates this broadcast carrier then extracts traffic and control information packets destined to its site address location. Each traffic active remote node uplinks a SCPC-PSMA return carrier back to the Hub to facilitate full duplex networking. The Hub outbound carrier information rate is sized to the remote network size for small to medium size networks. Multiple Hub outbound carriers are utilized for large networks or sub-networks within the network domain. The remote return carriers are provided with Demand Assigned Multiple Access (DAMA) capability to automatically allow return SCPC carrier operation based upon actual traffic activity. SatPath SkyWeb™ also supports dynamic “Adaptive Bandwidth-On-Demand” (ABOD) where each remote return carrier information rate is automatically sized to the real-time traffic demands of each station given the availability of idle network bandwidth on the satellite transponder.

Simultaneous “Mesh” overlay traffic connectivity for remote–to-remote voice and data as well as remote-to-remote videoconference requirements are uniquely supported in the SatPath SkySwitch® solution utilizing the DAMA Multiple Channel Per Carrier (MCPC) capability. Here only one carrier is up linked to the satellite from the remote, however multiple channels of traffic destined for different station locations are multiplexed together using SatPath’s proprietary MCPC-PSMA access technique. The single remote uplink carrier is extremely bandwidth efficient and allows each remote station to be sized to its own peak information rate capacity using the most cost effective RF terminal configuration.

SATPATH
Optimized Bandwidth Efficiency

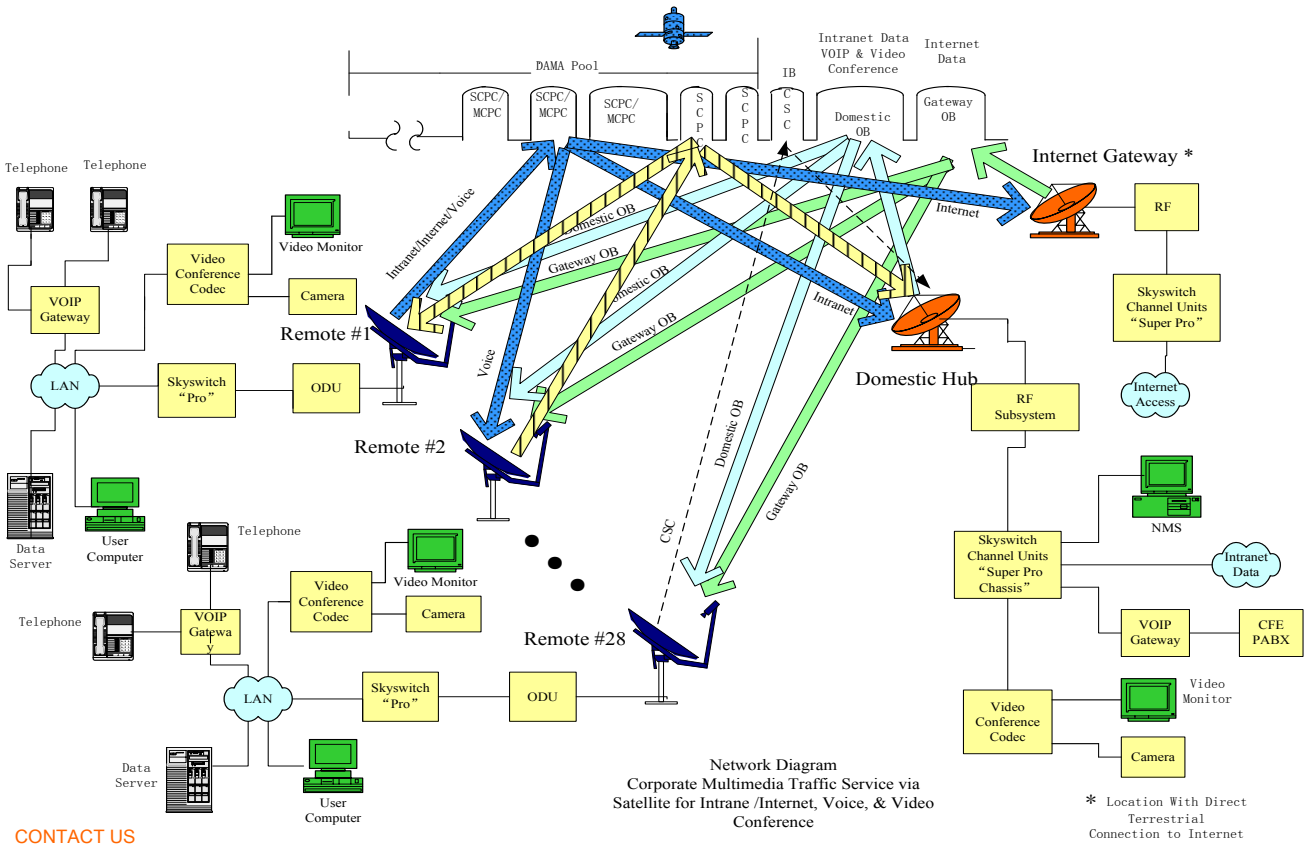
Remote SkySwitch® terminals are available in single and multiple receive configurations where the former is used for “Star-only” networking and the latter is used to support simultaneous, single satellite hop, “Star/Mesh” connection from the Hub as well as other remotes.

The Network Diagram illustrates a Multimedia Traffic Service Corporate Satellite Network Diagram utilizing the SCPC/MCPC-PSMA capabilities of the SatPath SkySwitch® product line. When a remote node has no traffic destined to the hub its SCPC return carrier is assigned to the shared inbound Communications Signaling Channel. When the remote senses traffic destined to the hub it sends a service request to the hub Network Control Server (NCS). The NCS in turn checks the available bandwidth in the transponder DAMA bandwidth pool then assigns a SCPC carrier frequency and information rate back to the respective remote on a control packet over the hub outbound carrier. The remote in turn then tunes its transmit carrier to the assigned SCPC carrier frequency and information rate, then sends multimedia IP traffic to the hub.

Each remote SatPath SkySwitch® terminal continuously monitors its input IP data vs. output satellite carrier using proprietary algorithm to determine if a service request is necessary to increase or decrease the carrier rate to avoid traffic jam. The NCS evaluates each service request based on network QoS policy and available bandwidth, it then sends a message packet back to that respective remote to reassign its SCPC information rate and carrier frequency as necessary to accommodate the service request. By combining DAMA carrier activation and ABOD information rate adaptability in real time to actual station traffic demand, the SatPath SkySwitch® networking solution provides the client with the most bandwidth efficient networking solution possible to minimize the recurring rental cost to transponder space for the network. Traffic control and shaping based on the user’s assigned priority and types of traffic are provided via enhanced QoS support. SatPath SkySwitch’s powerful QoS operation allows any private network user to effectively utilize limited satellite resources to its maximum effect while avoiding the inconvenience of data jamming.

MCPC networking is initiated when a remote detects traffic service to another destination as well as the hub. In this situation, the initiating remote tunes its transmit carrier to the MCPC carrier frequency and information rate as assigned by NCS, and both the destination remote and Hub tune their receivers follow the same channel assignment. As illustrated in the Network Diagram, the Remote #1 Station is transmitting simultaneously to the Remote #2, the hub, and the Internet Gateway using a single MCPC carrier. A unique feature of SatPath SkySwitch’s MCPC capability allows a direct connection to an Internet Gateway, which is not co-located with the hub. This can be a very cost effective advantage in 3rd world applications, where in-country high speed backbone Internet access point may not be cost-effectively available.

C-Band or Ku-Band Satellite Transponder



Network Diagram
Corporate Multimedia Traffic Service via Satellite for Intrane /Internet, Voice, & Video Conference

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