

## High-performance mesh traffic concentrator

The Hughes HX MeshGW is a powerful, cost-effective solution for concentrating high volumes of HX260 originated mesh traffic at a regional site, acting as a subsystem to a central HX Gateway. It augments the HX System capabilities for configuring simultaneous mesh, star, and multi-star broadband satellite IP networks for cost-effective delivery of high-quality voice, data, and video services. Ideal for telephony applications as well as private subnetworks, the HX MeshGW provides hub-like interconnection to terrestrial infrastructure and supports single-hop routing into multiple termination points.

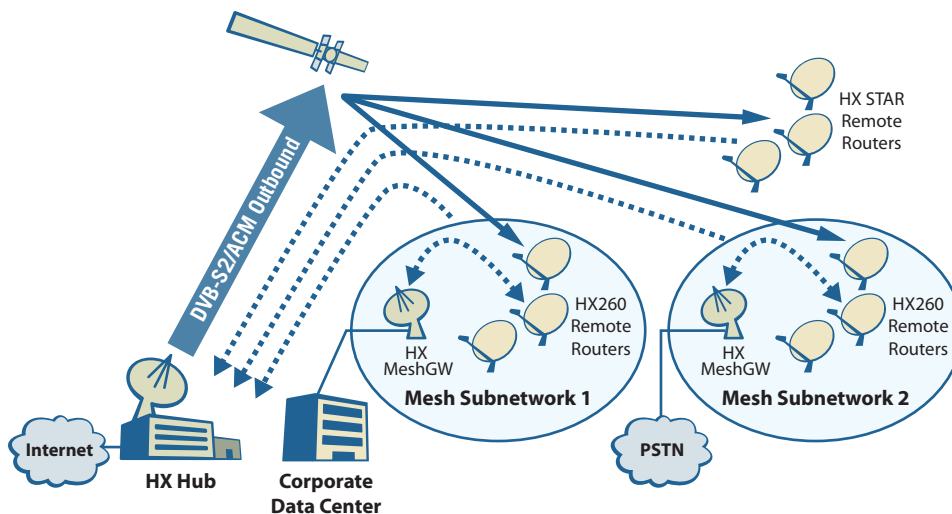
The HX MeshGW is scalable and able to dynamically support a large number of simultaneous mesh connections. Its many features include defining a single IP address to access the entire Gateway by identifying a “master” router and intelligently distributing traffic load across multiple traffic routers. This design avoids the complexity and overhead of inverse multiplexing solutions and enables the traffic routers to dynamically route traffic to various other gateways into the Internet or PSTN. In the case of telephony, this feature enables least-cost routing where the VoIP session is routed into the PSTN terrestrial fabric at the point closest to the destination. With various configurations to support small private data networks, the HX MeshGW is available in a fully redundant configuration for the highest performance and availability.

### Target Markets

- Star within a star network (private subnetworks)
- GSM backhaul, SCPC/MCPC replacement links
- VoIP services

### HX System with Mesh Feature

Efficiency and flexibility in utilizing satellite bandwidth are at the core of the HX System mesh design. Each TDMA link, whether in star or mesh mode, can be configured to provide a QoS tailored for the requirements of each link. This includes such capabilities as defining a minimum CIR (Committed Information Rate) and maximum rate, thereby allowing service providers to tailor services to specific customer requirements. In addition, the HX System bandwidth allocation scheme uses an Aloha channel for initial traffic requests (and only those), which means that remotes are able to release all TDMA channel assignments when they are idle. This frees up unused bandwidth and allows operators to make more efficient use of space segment resources.



The HX System from Hughes, the world leader in broadband satellite networks and services, is designed and optimized for smaller and mobile networks, including maritime and airborne applications, where the provision of high-quality and high-bandwidth links is paramount. Capable of simultaneous mesh, star, and multi-star configurations, the HX System builds upon the capabilities and global success of the high-performance HN System, incorporating many advanced features pioneered by Hughes, including integrated TCP acceleration and advanced IP networking. Its broadband satellite products are based on global standards approved by TIA, ETSI, and ITU, including IPoS/DVB-S2, RSM-A, and GMR-1. To date, Hughes has shipped more than 1.9 million satellite terminals to customers in over 100 countries.

## Features

### HX MeshGW

- Single IP Address
  - HX260 (mesh) routers access the HX MeshGW using a single IP address
- Single radio used for all HX MeshGW routers
- Redundant (optional nonredundant) configuration
- Pre-wired rack including power, LAN, and IF distribution
- External facing router functionality including:
  - Static and dynamic addressing
  - DHCP server or relay
  - DNS caching
  - RIPV1, RIPV2, BGP routing support
  - NAT/PAT
  - VRRP
  - VLAN tagging
  - Firewall support through integrated access control lists
- Software and configuration updates via download from the central HX Gateway
- Configuration, status monitoring, and commissioning via the central HX Gateway
- Embedded Web interface for local status and troubleshooting
- Remote terminal management via the Hughes Unified Element Manager and SNMP agent

### HX System with Mesh Feature

- Star and mesh share inroute bandwidth. The use of dedicated mesh bandwidth is not required and a mesh router can simultaneously transmit and receive star and mesh traffic.
- The QoS settings for star and mesh are independent. So, a mesh router can be using CIR for star and CBR for mesh or even CBR for both with different CBR settings.
- Quality of Service features include:
  - On-demand constant bit rate (CBR) services
  - Adaptive CBR with Min CIR (committed information rate) with max rate
  - Backlog-based dynamic stream with weighted fair queuing
  - Class-based weighted prioritization
  - Multicast data delivery

## System Technical Specifications

### TDMA Demodulators

HX MeshGW (Redundant)	Up to 16 TDMA channels (up to 8 Msps of capacity) Expandable to total of 32 TDMA demodulators (up to 16 Msps of capacity)
HX MeshGW (Nonredundant)	Up to 8 TDMA channels (up to 4 Msps of capacity) Expandable to total of 32 TDMA demodulators (up to 16 Msps of capacity)

### Local Physical Interfaces

10/100 BaseT Ethernet LAN RJ45 port

### Satellite Specifications

Downstream Channel	DVB-S2 with Adaptive Coding and Modulation
Downstream Rate	1-45 Msps (in 1 Msps steps)
Downstream Modulation	QPSK, 8PSK (Adaptive Modulation)
Downstream Coding	BCH with LDPC 3/5, 1/2, 2/3, 3/4, 5/6, 8/9, 9/10 (Adaptive Coding)
TDMA Channel Rate	256, 512, 1024, 2048 kbps
TDMA Channel Coding Rate	1/2, 2/3, 4/5 with TurboCode (Adaptive Coding)
TDMA Receivers	4 simultaneous TDMA receivers per HX MeshGW-R router
Bit Error Rate (Receive)	10 <sup>-10</sup> or better
Bit Error Rate (Transmit)	10 <sup>-7</sup> or better
Interface to RFT	Industry standard BUC (L-band)

### HX MeshGW Mechanical and Environmental

Single 24U Rack

Operating Temperature: +32° F (0° C) to 122° F (+50° C)

- Bandwidth allocation
  - Supports both preassigned (static) traffic assignment and dynamic traffic assignment
  - Idle remotes can be configured to release all network resources
- Supports unicast and multicast IP traffic



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