The Hughes JUPITER System is a high performance and high efficiency satellite broadband platform designed to support a wide range of applications across all market sectors, from consumer to enterprise, government, and mobility. Powering the world’s largest satellite broadband service—HughesNet®—in North America, the JUPITER System has been deployed by leading operators around the world, on both High-Throughput Satellites (HTSs) and conventional satellites, making it the preferred technology choice for delivering advanced broadband services.

**Next-generation, high-throughput platform for satellite broadband networks**

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**Industry-Leading Performance**

Powered by the JUPITER System on a Chip (SoC), a powerful multicore ASIC, every HT terminal is able to achieve more than 100 Mbps of throughput. This throughput enables the JUPITER System to be effectively used for a wide variety of applications and markets including:

- Broadband Internet access
- Enterprise networking
- Cellular backhaul
- MPLS extension
- Videoconferencing
- Mobility

Committed Information Rate (CIR), on-demand Committed Bit Rate (CBR), Adaptive CBR (outbound and Inbound), and backlog-based assignment.
JUPITER System Gateways

The JUPITER System gateways are architected on powerful and scalable data center technologies including blade chassis and blade servers. The power of these devices enables a Satellite Modem Cluster (SMC) to be configured as a single blade server mated with a modulator and demodulator. One SMC, occupying two slots in a blade chassis, is able to support all of the traffic—both forward and return—for a 250 MHz forward channel. There is no need for multiple devices to scale to the largest possible network.

Recognizing that networks operating over conventional satellites using 36 or 72 MHz transponders are different from HTS networks, the JUPITER System has a gateway configuration that is designed and optimized for conventional satellite operations. The HG220 gateway comes with a single chassis that can support up to four SMCs. An integrated L-band matrix switch enables a redundant SMC to come online to take the place of the primary SMC, allowing the HG220 to support 1:N redundancy. The Hughes-developed L-band matrix can connect the SMCs to different transponders or satellites. The HG220 also comes equipped with integrated IF distribution, timing system, NMS with firewall, Gigabit LAN switch, and intelligent power distribution. All components are 1:N redundant with automatic fault detection and switchover.

For multigateway, multibeam HTS applications, a high-density JUPITER System Gateway can be configured to support a virtually limitless amount of capacity. Typically included with the high-density gateway are deep packet inspection and traffic shaping devices.

The advanced JUPITER System Gateway architecture features autonomous design and “lights out” operation where the gateways can be operated independent of other network elements.
JUPITER System HT Remote Terminals

At the heart of every JUPITER System HT remote terminal is the advanced JUPITER SoC, a powerful multicore ASIC. The JUPITER SoC enables every HT terminal to achieve up to 200 Mbps of throughput. In addition to sharing the same throughput performance, the family of remote terminals also shares the same powerful IP routing feature set so that any terminal can be used for virtually any application.

The HT2XXX series of remote terminals includes the following:

**HT2000**
- Operates in either Ku-band or Ka-band
- Equipped with a single GigE LAN port
- Supports a single cable IFL for interface to the Outdoor Unit (ODU).
- Well suited for home or small-office applications

**HT2000W** (Future)
- Equipped with 4GigE LAN ports and an integrated Wi-Fi 802.11 ac/n access point

**HT2200**
- Operates in either Ku-band or Ka-band
- Equipped with four GigE LAN ports
- Supports a single cable IFL for interface to the outdoor unit (ODU).
- Well suited for small/medium enterprise (SME) and distributed enterprise applications

**HT2300**
- Operates in C-, Ku-, or Ka-band with a variety of power amplifiers
- Equipped with four GigE LAN ports
- Well suited for home/small-office and small/medium enterprise (SME) applications.
- Supports a dual-cable IFL that enables use of industry-standard L-band interface radios

JUPITER System Network Management System (NMS)

The JUPITER System Gateway is integrated with the powerful and full-featured NMS. The NMS platform provides a single, intuitive, easy-to-use Graphical User Interface (GUI) and advanced diagnostic capabilities through which operators can easily manage and monitor multiple networks on multiple satellites. The NMS GUI provides detailed graphical views of both real-time status and historical performance of all gateway components and managed terminals. The NMS is available in different configurations including a single gateway NMS configuration as well as a large-scale multigateway configuration with a manager of managers.

An extensive and powerful RESTful Application Programming Interface (API) enables easy integration with an existing OSS/BSS. The API enables an external system to perform virtually any operation that can be performed through the NMS GUI.

The NMS includes a fully automated provisioning and remote terminal commissioning system. Remote terminals can be provisioned in bulk electronically or manually via the GUI. The commissioning process is performed without any manual intervention at the gateway or NMS. An optional automatic cross-polarization test process can be used to confirm proper operation of the remote terminal.

The NMS includes an integrated set of Host Network Operator (HNO) and Virtual Network Operator (VNO) capabilities. The HNO/VNO capabilities enable an HNO to establish and operate multiple independent VNOs, each of whom can be provided with a logical partition of network resources including bandwidth. VNOs can be weighed relative to one another so as to enable high-value VNOs to be provided resources at a higher rate relative to lower value VNOs.

JUPITER System with DVB-S2X
Technical Specifications

Forward Channel
DVB-S2X with Adaptive Coding and Modulation (ACM)
Modulation: QPSK, 8PSK, 16APSK, 32APSK
Code blocks: Normal and short frames
Encapsulation: GSE
Symbol rates: Up to 235 Msp/s
Frequency: C-, Ku-, and Ka-band

Return Channel
Modulation: OQPSK and 8PSK
Symbol rates: 256 kbps – 12 Msp/s
Encoding: LDPC FEC with efficient variable block/burst sizes
Access Scheme: MF-TDMA
Aggregate inroute capacity per SMC: Up to 96 Msp/s

Gateway Architecture
Hardware platform: Blade servers with virtualization
Redundancy: Fully redundant with 1:N for most subsystems

Gateway Interface
RFT input/output: L-band
WAN Interface: 10/100/1000 Ethernet, optical interface optional

Optional Elements
Deep packet inspection and traffic shaping
WAN router
Web Acceleration Server (WAS)

Security
Hardware-based 256 bit AES encryption (bidirectional)

Remote Terminals Supported
HT2000
HT2000W*
HT2200
HT2300
HT2500
* Future

For more information, please visit www.hughes.com or email globalsales@hughes.com.