

Always, always, always coming through



Net Insight The Nimbra™ Platform



Media-rich transport solutions for Broadcast,
IP Media, TV Distribution and Broadband TV networks.





The Nimbra™ product family makes up the world's most efficient and scalable media-rich transport solution. Encompassing a full range of multiservice transport equipment, the Nimbra platform enables **Broadcast, IP Media, TV Distribution and Broadband TV networks** to deliver video and media services from the core backbone to the end customer. Always with the industry's highest bandwidth utilization, and always with **100% Quality of Service. Guaranteed.**

Media network and telecom operators worldwide use the Nimbra platform to expand and differentiate their video, voice and data service offerings. In addition to helping attract and retain subscribers, the platform allows operators to serve the professional media industry by transporting real-time sensitive video and IP data with guaranteed 100% QoS.

The Nimbra platform uses channelized bandwidth in steps of 0.5 Mbps to ensure the necessary capacity for each service throughout the network. This makes it possible to guarantee – i.e. transport without data or packet loss – the delivery of IP data and all types of video- and audio-related services including streaming media, Video-on-Demand and Digital TV. In addition, all Net Insight products provide the highest transmission performance in terms of jitter,

wander and latency together with advanced layer 2 multicast capabilities for all services. A built-in control plane automatically sets up services end-to-end across any network topology and automatically restores services in case of failure. The result is increased quality of service along with significantly reduced operating costs.

All products have the unique ability to work over any existing fiber, microwave or IP infrastructures, as well as with SDH/SONET products. Our unique QoS-enabled IP transport solution also offers significant advantages over traditional MSPP and packet-based solutions. Whichever Nimbra platform is best suited to your network, it will provide better utilization of existing capacity while supporting comprehensive revenue-generating video services.

NIMBRA 600 SERIES

The Nimbra 600 series includes an array of carrier-class network switches that typically form the high-capacity backbone layer of a Nimbra network, aggregating and switching traffic from Nimbra 300 series or Nimbra One access nodes. The Nimbra 680 features up to 80 Gbps redundant, non-blocking switching and 8 interface slots for traffic modules, as

well as 2 interface slots for each optionally redundant switch plane, control plane and power supply module. The Nimbra 688 uses the same set of interface modules as the Nimbra 680 and is the most powerful switch available, offering twice the access and trunk port count of Nimbra 680 with up to 160 Gbps non-blocking switching.

NIMBRA 300 SERIES

Nimbra 340, Nimbra 340-HD and Nimbra 360 are super-charged multiservice access and switching devices for demanding video and data applications. The compact 2RU solution and the wide selection of multiservice access interfaces make the Nimbra 300 series ideal for use at customer premises or in co-location POPs. The products are particularly suited

for Digital Terrestrial TV and professional media applications. The Nimbra 300 series combines the flexibility of two general-purpose slots for access and trunk interfaces with the cost-effectiveness of fixed ports for Gigabit Ethernet (all models) and DVB-ASI ports (Nimbra 340), HD-SDI (Nimbra 340-HD) or multi-rate SONET/SDH and IP trunk ports (Nimbra 360).

NIMBRA ONE

Nimbra One is a high-performance, multi-service, modular edge and access switch designed to meet the demands of broadcasters and service providers in the Professional Media, Digital Terrestrial TV, Mobile TV and Cable TV network sectors. It offers 7 interface slots that support all of our Nimbra One/300

service and access interfaces and one slot for a Control Module. Nimbra One is ideally suited for installation in network head-end facilities and is often used as aggregation nodes for networks that incorporate our Nimbra 340/340-HD and Nimbra 360 units at the edge. Nimbra 300 includes the unique Time Transfer functionality.

NIMBRA 120

Nimbra 120 is a compact and easy-to-deploy CWDM multiplexing solution that provides scalability and cost-effectiveness for service providers and professional media network operators. Together with CWDM SFP or XFP

modules in the Nimbra family of multiservice switches, the Nimbra 120 forms a scalable and highly flexible optical networking solution. A DWDM version is also available on request.

NIMBRA VISION

Nimbra Vision completes the multiservice Nimbra network, with management capabilities that result in a superior and cost-effective network for demanding applications. Nimbra Vision allows the operator to provision services end-to-end across the network with full graphic support and unmatched

scalability and reliability. The server functionality may be distributed among multiple hosts to improve performance in large networks and to increase the number of simultaneous users. Nimbra Vision provides full FCAPS functionality over standard SNMP interfaces.



KEY FEATURES

100% QoS – Guaranteed

The Nimbra platform guarantees full quality video and other mission-critical traffic throughout the network, even at full network load. Separation rather than prioritization of services ensures that traffic on different channels never interferes. Similarly, traffic from different end customers or different service providers can be reliably separated.

Highest network utilization

The Nimbra platform further increases network utilization by including enhanced functionality with non-hierarchical, fine granular switching. Channels have configurable size, unsurpassed granularity and can be symmetric or asymmetric as desired.

Any service over any network

All Nimbra products offer comprehensive multiservice support for video, audio, data and voice, delivered over any type of network including IP/Ethernet, SDH/SONET, PDH, wavelengths or dark fiber. This is the most versatile media transport platform on the market.

Flexible topologies for step-by-step build-out

Link topologies can be configured to build ring, bus, mesh and point-to-point structures, thereby simplifying network planning and allowing a build-as-you-grow strategy. This freedom to choose the best topology to match the actual traffic pattern matrix is key to high resource utilization in a network.

Signaled end-to-end provisioning and restoration

Channels, whether unicast or multicast, automatically find their optimal paths through the network during provisioning, requiring only identification of endpoints. An in-band signaling protocol with similar features as GMPLS

handles the setup through the network, and services are automatically rerouted in case of failures. Restoration options include hop-by-hop fast rerouting, predefined source routing and dedicated 1+1 protection in any network topology. Equipment protection options range from duplicated power supply to full hardware redundancy.

Comprehensive Ethernet functionality

The Nimbra platform includes complete Ethernet functionality. Using port and VLAN (802.1Q) information, Ethernet traffic from the same port can be mapped onto separate channels for effective E-Line, E-Tree and E-LAN services as specified by Metro Ethernet Forum. Integrated layer 2 switching increases networking flexibility and bandwidth efficiency. All Ethernet boards also support 802.1p and IP DiffServ to ensure that prioritized traffic always accesses the channels first.

Multicast

Nimbra products support multicast transport for all services, such as Ethernet, ASI, 3G/HD/SD-SDI, AES/EBU, SONET/SDH, and PDH. This feature allows, e.g., hundreds of IP MPEG channels to be sent securely without interfering with other traffic on the same link, ensuring fast response times, constant delay and fast protection. Multicasting is supported in any network topology and for any level of forking with uncompromised QoS.

Time and synchronization capabilities

The Nimbra platform features a unique solution for both network synchronization and for transport of 1 PPS / 10 MHz absolute time, facilitating telecom synchronization as well as GPS free Single Frequency Network (SFN) synchronization of Digital/Mobile TV applications and remote studios.

FEATURE HIGHLIGHTS

100% QoS – Guaranteed
top quality video, even at full network load.

Highest network utilization
configurable channel size and non-hierarchical switching.

Any service over any network
comprehensive multiservice support for video, audio, data and voice.

Flexible topologies
build as you grow with ring, bus, mesh and point-to-point structures.

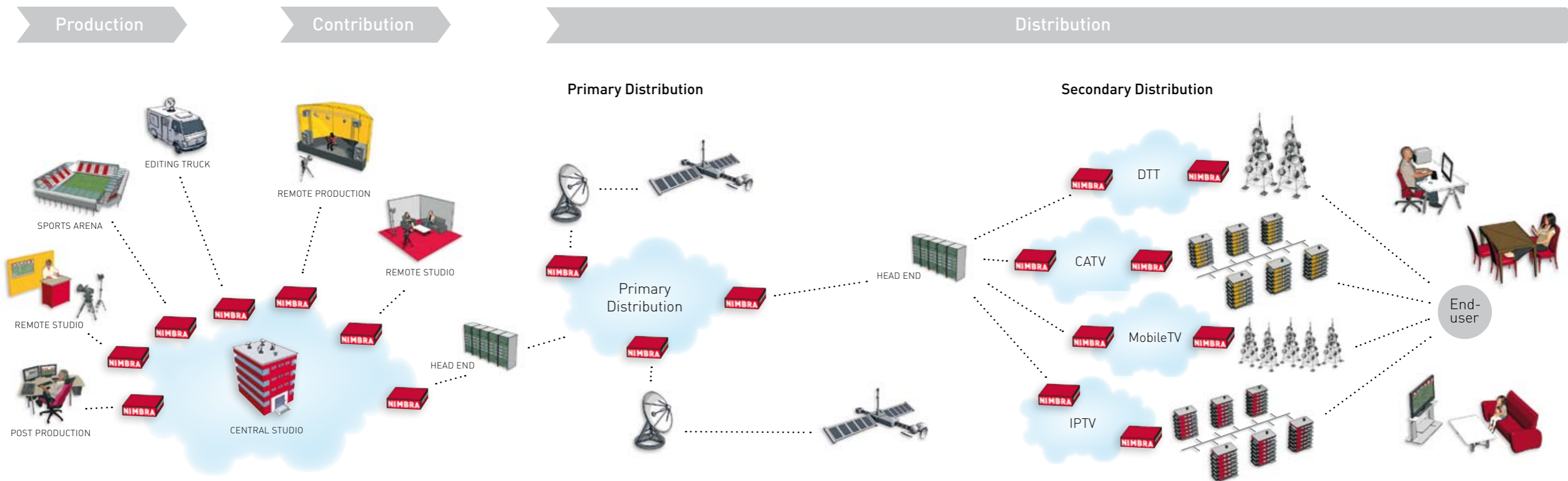
Signaled end-to-end provisioning/restoration
automatic channel routing and restoration.

Comprehensive IP and Ethernet functionality
with increased networking flexibility and bandwidth efficiency.

Multicast transport
in any network topology, for any service, for any level of forking.

Time and synchronization capabilities
unique solution for time and sync distribution.

Full performance monitoring
comprehensive monitoring on a per-service level.



The Nimbra platform – Delivering media services, from production to end-users.

BROADCAST AND MEDIA NETWORKS

Broadcast and media companies worldwide rely on Nimbra-based networks for production and editing in real time. Using industry formats such as uncompressed 3G/HD/SD-SDI, SDTI, DVB-ASI, and AES/EBU, the Nimbra platform supports both SDTV and HDTV video transport with high quality and with very high network utilization. In addition, Net Insight provides a guaranteed IP/Ethernet transport to ensure that the rigorous QoS requirements of the professional media industry are met at all times.

Traditionally, each MPEG service has allocated capacity equivalent to a DS3/E3 or a full STM-1/OC-3. This results in very low network utilization and high network costs. With the Nimbra platform, each service can be set up in steps of 0.5 Mbps, enabling a dramatic increase in network utilization and reduction in cost.

- Produce and transport studio-quality video over large terrestrial networks in real time.
- Replace costly conversion equipment by connecting studio equipment and servers directly into Nimbra's standard interfaces.

DIGITAL TERRESTRIAL TV (DTT) AND MOBILE TV NETWORKS

Digital Terrestrial TV (DVB-T, ATSC, DMB-T, ISDB-T) has started to be launched in many countries across the world and many have already chosen the Nimbra platform for its unique DTT capabilities.

Net Insight's Nimbra platform features a 100% QoS core with powerful multicasting and an extremely bandwidth-efficient resource management, making it the preferred transport solution for Digital Terrestrial TV networks. Native ASI signals are inserted directly into the Nimbra products at the head-end and are multicast across the network to the transmitter sites, eliminating the need for network-to-ASI adapters.

DTT and Mobile TV often require a Single Frequency Network (SFN) in which the transmitter stations must be synchronized in order to send their signals at exactly the same time. The Nimbra platform includes a unique Time Transfer capability that allows highly accurate distribution of real time over the same network that carries the video signals. This eliminates the need for costly and potentially insecure GPS receivers in the network.

TV operators deploying digital terrestrial TV based on Net Insight's Nimbra platform not only gain a DTT network but a multi-service transport infrastructure that opens up new business opportunities. Digital radio can easily be distributed by adding E1 cards and the unique E1 multicast, while the addition of higher-speed backbone and SDI, HD-SDI, 3G-SDI, ASI, and AES-EBU cards transform the network into a powerful media contribution platform. The same platform can be used for mobile TV distributed over IP or ASI MPEG.

- Exceptionally low transport overhead, compared with ATM networks.

- Increase revenue potential with up to 20% more TV channels via OC-3/STM-1 networks.
- Reduce total infrastructure cost by transporting IP data and voice traffic over the same network used for DVB distribution.
- Maximize utilization by sending only the payload of the ASI signal over your network.
- Built-in GbE and Ethernet multicast for optimal IPTV distribution or WiFi/Wimax aggregation.

IP CONTENT DISTRIBUTION NETWORKS

The Nimbra platform allows telecom operators, xDSL or Ethernet broadband providers to deliver high-quality video, voice and data services at competitive prices. Originally built to handle demanding real-time video services, the Nimbra platform is perfectly suited for IPTV content distribution networks. It offers an end-to-end transport solution integrating broadband traffic, IPTV, Video-on-Demand (VoD), Voice-over-IP, and legacy TDM services in a single platform scalable to millions of subscribers.

- Efficiently distribute hundreds of IPTV channels with no packet loss and full protection, using Ethernet multicast.
- Faster response times and maximal utilization with unmatched video quality.
- Build on any topology or infrastructure.
- Unlimited number of hops without compromising QoS and protection times.

- Integrated Ethernet switching for efficient aggregation of data services.

CATV NETWORKS

Several of the world's leading cable TV networks trust the Nimbra platform to deliver high-quality triple-play services. MSOs gain a competitive edge from the combination of efficient Ethernet functionality for broadband, IPTV, VoIP, VoD and VPN services. The end result is a multiservice IP network delivering the same high video quality as with SDH.

When transporting IPTV and VoD with IP/MPLS routers, a typical operator is forced to decentralize content to reduce the number of packet hops and preserve quality. A Net Insight network eliminates this problem by reducing delay and guaranteeing QoS over any number of hops. This makes it possible to centralize the TV head-end and content servers. While packet-based solutions typically deploy separate switches and routers for IPTV, VoD and data, Net Insight's Nimbra solution integrates all services into a single box with guaranteed QoS. This gives MSOs a compact and scalable triple-play solution offering faster time-to-market and simplified operations.

- Head-end redundancy for disaster recovery.
- Integrated time transfer capabilities to enable a distributed QAM function from the CMTS router.
- Flexible network architecture allows for regional insertion or local VoD servers anywhere in the network.

Interface Modules

3G/HD/SD-SDI VIDEO ACCESS

The SDI Access Modules offer transport of pristine quality uncompressed SDI video over wide area networks, and support protected multicast distribution in any network topology. The Nimbra One/300 series features a board with two bi-directional SDI ports, while the eight-port versions for the Nimbra 600 series optionally

support HD- and 3G-SDI with each port being configurable for signal type and as Input, Output or Monitor. The outstanding synchronization features of the Nimbra networks yield very good jitter and wander characteristics. Options for JPEG200 compression are available in the Nimbra 600 series.

ASI TRANSPORT ACCESS

The ASI Transport Access Modules enable point-to-point transport as well as multicasting of high-density MPEG compressed video over telco circuits with 100% Quality of Service and extraordinarily high bandwidth utilization. The 8 ports are individually

configured as Input or Output and transport MPEG transport streams ranging from 2 to 212 Mbps in secured logical channels. The modules feature a built-in 1+1 network protection option for high service availability.

AES/EBU AUDIO ACCESS

Digital audio is efficiently carried with minimum overhead using these 8-port modules supporting a wide range of sample rates from 32 to 192 kHz. Customers around the world use them in audio and video production, post-production, contribution and distribution en-

vironments that require superb quality audio. In addition to transport of AES3 standard audio signals, the modules also support compressed formats like Dolby® E and Dolby® Digital. Built-in 1+1 protection allows for <50 ms recovery from loss of signal.

ETHERNET ACCESS

Fast and Gigabit Ethernet interfaces offer enhanced channelization with 512 kbps granularity in unicast and multicast configurations. The modules support VLAN separation allowing each VLAN to be forwarded on dedicated channels, and prioritization of packets. 1-port and 8-port versions are available, where the

latter also features optional switching functionality to deliver an unprecedented level of flexibility by allowing you to switch traffic between the 8 ports and a user-defined number of logical channels. Options for 10 Gbps Access are available in the Nimbra 600 series.

SDH/SONET ACCESS

The OC-3/STM-1 Access Module provides seamless service integration and migration for metro networks. It offers 4 channelized in-

terfaces for transport of any OC-3/STM-1 compatible services. Multiplexing and switching of embedded STS-1 streams is fully supported.

PDH ACCESS MODULE

These modules offer transparent PDH transport service for E1/DS1 traffic providing 8, and for E3/DS3 traffic providing 4 independent bi-directional G.703 compatible ports. Each

circuit is independently switched and carries its own timing derived from the source. The board features optional 1+1 channel protection per port.

IP/ETHERNET TRUNKS

IP/Ethernet Trunk Modules enable the use of cost-effective IP/Ethernet links for interconnection of Nimbra nodes and provide the same comprehensive management and networking features for the Nimbra platform as for PDH and SDH/SONET trunk modules. The trunk modules allow for multiser-

vice operation over standard 1000BASE-T or 1000BASE-SX/LX (SFP) interfaces using UDP/IP/Ethernet mapping. They also feature comprehensive protection options and advanced clock recovery. Options for 10 Gbps IP/Ethernet are available for the Nimbra 600 series.

SDH/SONET TRUNKS

- The 10 Gbps STM-64/OC-192 Trunk Module is used for high-capacity interconnection of Nimbra 680/688 nodes. The board supports mixing of traffic from Nimbra 600-series access modules combined with other types of services from underlying Nimbra One and 300 series access nodes.
- 2.5 Gbps STM-16/OC-48 Trunk Modules are available in a 2-port X-ADM version for Nimbra One/300, providing on-board add-drop switching functionality. These modules are especially optimized for the Nimbra One and Nimbra 300 series in protected-ring networks. The 4-port module for the Nimbra 600

series offers a cost-effective, high-density trunk solution.

- 622 Mbps STM-4/OC-12 Trunk Modules are available in a 2-port version for Nimbra One/300 with an on-board switch matrix that will maximize the availability of through traffic, and a 4-port version for the Nimbra 600 series typically used for aggregation of traffic from underlying Nimbra One and Nimbra 300 series access nodes.
- 4-port 155 Mbps STM-1/OC-3 Trunk Modules carry up to 147 Mbps payload per port, yielding a link overhead of only 1.5% as compared to the ATM cell tax of 10%.

PDH TRUNKS

A DS3/E3 Trunk Module offering four 45 or 34 Mbps PDH compatible trunk interfaces for the Nimbra One/300 series. It enables

multi-service operation over standard DS3/E3 connections or leased lines.





Net Insight's Network OS, **NimOS**, providing an automated control plane with signaled end-to-end provisioning and rerouting, is included in all hardware platforms together with a **web-based element manager**. It is possible to further enhance the functionality of the network elements with the software packages and feature licenses below.

DYNAMIC ROUTING

- Automatically populates and updates the routing tables used by the optical control plane.
- Provides plug-and-play network provisioning and ensures that path information is always up-to-date after topology changes.

MULTICAST

- Facilitates flexible point-to-multipoint distribution of any service supported by the Nimbra platform.

ETHERNET SWITCHING

- Add-on for the 8 x Gigabit Ethernet Access module for Nimbra 600.
- Enables Ethernet switching with up to 8 forwarding functions.
- Allows the module to operate in Bridged or Transparent mode.

FRAME STORE

- Feature license enabling Frame Store functionality on the Nimbra 600 Video modules.
- Allows for alignment of outgoing asynchronous video frames to a common reference.

HD-SDI ACCESS

- Optional firmware package enabling the High Definition mode of the 8-port Video Access module for the Nimbra 600 series.
- Allows configuration of each port for HD, SD SDI or ASI video with HD support at 1.485 and 1.485/1.001 Gbps bit rates.

GPS-INDEPENDENT TIME TRANSFER

- Value-added firmware option for the Nimbra 360.
- Used for distribution of timing information, 1 PPS and 10 MHz, with high accuracy over a Nimbra network.
- Key applications include SFN enabling in DVB-T, DVB-H and DAB networks over the same infrastructure that provides distribution of traffic signals to the transmitters.
- Eliminates the need for costly and potentially insecure GPS receivers.

OC-3/STM-1 FWD ERROR CORRECTION

- Upgrade for the Nimbra One/300 OC-3/STM-1 Trunk Module.
- Provisions Forward Error Correction (FEC) to improve transmission performance over unreliable media such as microwave links.

TECHNICAL SPECIFICATION NIMBRA SWITCHES

Series	Capacity:	Nimbra 680: 40 or 80 Gbps switching capacity, non-blocking in redundant configuration Nimbra 688: 80 or 160 Gbps switching capacity, non-blocking in redundant configuration
Nimbra 600 series	Shelf (HxWxD):	Nimbra 680: 267x445x240mm/10.5"x17.5"x9.4"; 12 slots (8 for traffic modules) Nimbra 688: 445x445x240mm /17.5" x 17.5" x9.4"; 22 slots (16 for traffic modules)
	Electrical Options:	Nimbra 680: -48 VDC or 115/230 VAC redundant Nimbra 688: -48 VDC; additional external AC option available
	Synchronization:	1.544 or 2.048 MHz G703.13 input, 2.048 MHz output; Holdover stratum 3, G.813 option 1
	Control port:	Serial port RS232C; Ethernet port 10/100 BASE-T; USB port Optional control board redundancy
	Nimbra 300 series	Capacity:
Nimbra 300 series	Shelf (HxWxD):	88x445x240mm/3.5"x17.5"x9.4"; 2 slots
	Built-in traffic ports:	Nimbra 340: 1 x GigE and 2 in + 2 out ASI Nimbra 340-HD: 1 x GigE and 1 in + 1 out HD-SDI Nimbra 360: 1 x GigE and 4 x Multirate IP/Eth or SONET/SDH trunk
	Electrical Options:	-48 VDC with built-in redundancy; additional external AC options available
	Synchronization:	1.544 or 2.048 MHz G703.13 input, 2.048 MHz output; optional 1PPS and 10 MHz dual in our out
	Control port:	Serial port RS232C; Ethernet port 10/100 base-T
Nimbra One	Capacity:	Up to 17.5 Gbps switching capacity, with average non-blocking capacity of 5 Gbps
	Shelf (HxWxD):	445x445x260mm/17.5"x17.5"x10.2"; 8 slots
	Electrical Options:	-48 VDC with optional redundancy; additional external AC options available
	Synchronization:	1.544 or 2.048 MHz G703.13 input, 2.048 MHz output; external clock reference on control module
	Control port:	Serial port RS232C; Ethernet port 10/100 base-T
Nimbra 120	Capacity:	8 x 2.5 or 10 Gbps CWDM multiplexing capacity, 16 x 10 Gbps DWDM option
	Shelf (HxWxD):	44x433x277mm/1.75"x17.1"x10.9"
	Electrical Options:	N/A, passive device

TECHNICAL SPECIFICATION INTERFACE MODULES

	Service	Interface option	Nimbra 680 & 688 Characteristics	Nimbra One & 300 Characteristics
SDI Video Access	Switched SDI uncompressed video or SDTI data	BNC 75 ohms	8 ports (in / out / monitoring per port) 3G/HD/SD/Auto configurable per port < 40W	4 ports (2 in, 2 out) + 2 monitors < 25W (plug-in unit) 1 in, 1 out, 1 monitor port (Nimbra 340-HD fixed)

TECHNICAL SPECIFICATION INTERFACE MODULES

	Service	Interface option	Nimbra 680 & 688 Characteristics	Nimbra One & 300 Characteristics
ASI Transport Access	Switched DVB-ASI video for MPEG transport streams Bandwidth 2-212 Mbps 1+1 protection	BNC 75 ohms	8 ports (in / out / monitoring per port) Transparent mode over SDI Same module supports HD/SD-SDI or AES/EBU	8 ports (in or out per port) + 1 monitoring port < 20W
AES/EBU Audio Access	Switched digital audio to AES3 standard. Bit rate 2-12 Mbps, sample rate 32-192 kHz. 1+1 protection	BNC 75 ohms	8 ports (in or out per port) Same module supports ASI MADI support < 35W	8 ports (in or out per port) + 1 monitoring port < 20W
Gigabit Ethernet Access	Ethernet Transport Service (ETS) with VLAN separation and user priority Bandwidth 0.5-1000 Mbps	SFP modules: 1000BASE-T (100m); MM/SX (500m); SM/LX (10km); SM/ZX (70km)	8 ports Ethernet Switching support 10G Ethernet option < 40W	1 port < 25W
Fast Ethernet Access	Ethernet Transport Service (ETS) with VLAN separation and user priority Bandwidth 0.5-100 Mbps	RJ 45 10/100 Mbps full duplex utosensing	N/A	8 ports < 25W
OC-3/STM-1 Access	155 Mbps OC-3/STM-1 1+1 protection	SFP modules: Coax (100m); MM (2km); IR-1/S-1.1 (15km); LR-1/L-1.1 (40km); LR-2/L-1.2 (80km)	N/A	4 ports VC-4/STS-3c/STS-1 handling < 12W
PDH Access	Switched PDH, 45, 34, 2 or 1.5 Mbps 1+1 protection	RJ 48 120 ohms/100 ohms BNC 75 ohms	N/A	8 ports RJ 48 for E1/T1 4 ports BNC for E3/DS3 < 12W
IP / Ethernet Trunk	10/100/1000 Mbps Ethernet	SFP modules: 1000BASE-T (100m); MM/SX (500m); SM/LX (10km); SM/ZX (70km)	8 ports 10G Ethernet option	3 ports plug-in unit 2 ports (Nimbra 360 fixed)
OC-192/STM-64 Trunk	OC-192c/STM-64c 9437 Mbps payload	XFP modules: SR-1/l-64.1 (2km); IR-2/S-64.2b (40km); LR-2/L-64.2 (80km); DWDM (40/80km)	1 port < 40W	N/A
OC-48/STM-16 Trunk	OC-48c/STM-16c 2359 Mbps payload	SFP modules: SR-1/l-16 (2km); IR-1/S-16.1 (15km); LR-1/L-16.1 (40km); CWDM (80km); DWDM (80km)	4 ports < 40W	2 ports On-board add-drop switch < 15W; 2 ports (Nimbra 360 fixed)
OC-12/STM-4 Trunk	OC-12c/STM-4c 589 Mbps payload	SFP modules: IR-1/S-4.1 (15km); LR-1/L-4.1 (40km); LR-2/L-4.2 (80km); CWDM (80km)	4 ports < 40W	2 ports < 15W; 4 ports (Nimbra 360 fixed)
OC-3/STM-1 Trunk	OC-3c/STM-1 147 Mbps payload	SFP modules: Coax (100m); MM (2km); IR-1/S-1.1 (15km); LR-1/L-1.1 (40km); LR-2/L-1.2 (80km)	4 Ports < 40W	4 ports < 12W; 4 ports (Nimbra 360 fixed)
DS3/E3 Trunk	PDH 45 or 34 Mbps 42 or 33 Mbps payload	BNC 75 ohms	N/A	4 ports < 10W



GENERAL TECHNICAL SPECIFICATIONS

Regulatory Compliance	EMC: FCC 15 Class A, ETS 300 386 CE Mark: EN 300 386-2, 93/68/EEC Electrical safety: UL 1950, EN/IEC 60950 NEBS: GR-63-CORE, GR-1089-CORE
Environmental Conditions	Operating temp: 5 to 40 °C / 41 to 104 °F - short term: -5 to 55 °C / 23 to 131 °F Storage temp: -40 to 70 °C / -40 to 156 °F Relative humidity: 10% to 90%, non-condensing
Performance Monitoring:	All ITS services based on ITU-T G.826 Ethernet packet statistics, RMON

NETWORK MANAGEMENT

Element Manager	Built-in Web GUI with full FCAPS functionality CLI interface SNMP v1, v2c, v3; Support for third party NMS In-band management channel or out-band management via control port
Nimbra Vision™ NMS	Auto-discovery of devices, Topological maps, Fault Management, Network database, Service Provisioning, Channel Trace, Centralized backup, Link Management, Performance Management, and Security Management.

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