

Media Links **Case Studies**

Long Term Strategic Partnership with Major North American Telecom Customer Case Study

MEDIA LINKS[®]
Media Defined Networking[®]

www.medialinks.com

Media Links **Case Studies**

Background and History

Carrier class video transport, contribution quality compression, & IP encapsulation solutions for global Media Service Providers & Broadcasters

Emmy® Award Winning Technology

Patented Video Delivery Methods

Leadership in Industry Standard-Setting Organizations

Global Company with offices in US, Australia, Europe and Japan

Publicly traded on the JASDAQ stock exchange and based in Kawasaki, Japan

- Media Links offers broadcasters and network providers leading edge transport technology, enabling them to move all types of professional media including 4K UHD/HD/SD SDI video, SMPTE ST 2110, audio signals as well as high bandwidth data- across multi-service Ethernet/IP networks.
- Today, Media Links is best known for providing its media over IP transport and switching solutions for the world's most watched sporting, entertainment and news events.
- The company's solution portfolio is used for broadcasting the Winter & Summer Olympics, World Cup Soccer, Professional/Amateur American Football, Baseball and Basketball games, political conventions, entertainment showcases and much more by customers across the globe.

MEDIA LINKS®

Media Defined Networking®

- 1993** ● **1993 Media Global Links Co. Ltd. established**
Kanagawa Science Park, Kawasaki, Japan
Video & Audio Broadcast equipment (MPEG-2 Encoders) and manufacturing
Long haul and short haul video transport
- 1997** ● **Media Links LSI Lab Co. Ltd. established**
Kanagawa Science Park, Kawasaki, Japan
LSI, Software Design, HD up/down conversion
ATM switches, IP routers
- 2002** ● **Media Links Co. Ltd.**
Kanagawa Science Park, Kawasaki, Japan
Deploys MD6000 Transport Platform
- 2005** ● **Media Links, Inc.**
Windsor, CT, USA
Sales, Marketing and Customer Support for The Americas
- 2011** ● **Media Links AU Pty Ltd.**
Melbourne, Australia
Sales, Marketing and Customer Support for Australia, New Zealand
- 2015** ● **Media Links EMEA**
London, United Kingdom
Sales, Marketing and Customer Support for Europe, Middle East, Africa (EMEA)
- 2020** ● **Media Links 100Gbps Ecosystem**
Introduced to address growing demand for 100G edge connectivity

Introduction

Since 2010, Media Links has been the media transport solution provider of choice for this major North American Telecom.

Media Links was initially invited to demonstrate its JPEG 2000 video compression capability in an early lab evaluation as this telecom contemplated addressing the carriage of higher quality video over their existing SONET OC-3 infrastructure. Their 'initial' SONET media network was quite limited and mainly composed of simple point to point links.

Over the next few ensuing years, they gradually expanded their video-focused optical network(s) in terms of coverage and bandwidth. The long range goal was to ultimately establish a nationwide media network for the transport of live content for high profile media events such as entertainment, news & sports, interconnecting venues, broadcasters, and media outlets to each other. Also, and of significant importance was the challenge of migrating to an IP-based core architecture from their legacy SONET infrastructure.

Striving to be at the top of this media/broadcast industry value chain where pristine video signals are sent to potentially millions, if not billions of viewers requires mission critical design, implementation and performance. Therefore exhaustive vendor vetting and selection was and continues to be an ongoing process.

In evaluating Media Links, not only has video processing quality been painstakingly scrutinized, but attributes of its entire solution portfolio and underlying IP architecture have also been thoroughly examined and characterized.

Why Media Links

Key considerations for the continued selection & endorsement of the Media Links solution portfolio by this major North American Telecom include:

- Scalability, Flexibility, Breadth of Capabilities
- Operational Robustness, Redundancy
- IP Design and Application Experience
- Rigorous Quality and Reliability
- Enhanced Network Management Software
- Exceptional Support / Professional Service Capabilities
- Overall Price/Performance

Fast forwarding to today, this telecom has in fact realized its goal of a nationwide IP-based media network with close to 500 deployed Media Links chassis in most major cities, supporting thousands of media services. Not content to rest, they continue to implement enhanced/expanded capabilities and service offerings. Their relationship with Media Links has grown to much more than a typical customer-supplier association, but rather a strategic partnership where both companies collaborate and plan for the future as well as operationally support each other on a 24/7/365 basis.

In the pages to follow, more specific detail is presented on the key aspects of this partnership.

Strategic Partnership with Major North American Telecom Business Challenges Addressed over the last decade

Business Challenges	How Media Links Solved
Expand basic video transport business from point-to-point to point-to-multipoint	Scalable solution family of integrated switching & transport products, MD8000, MDP3000, MDX100G
Provide pricing tiers for higher margin premium services	MD8000, MDP3000, MDX100G with many features, including formats, channels, bandwidths and resiliency options
Support increasingly more data services on expanding media network	Multiport 8 port Gigabit Ethernet data interfaces with seamless protection switching
Interconnect with private customer IP networks	Media Exchange Gateway with various Network Address Translation (NAT) modes
Address price sensitive, lower BW, low latency network edge market needs	MDP3000 Series of IP media gateways with TICO & JPEG compression
Accommodate surging demand for greater numbers of video services from network core to the edge	MDX100G series switches including MD8000-100G edition
Improve SLA performance - Faster provisioning & assurance of media services with fault detection	Integrated ProMD-EMS Enhanced Management System spanning all product families
Educate, train & support telco-centric employees as they transition to video services & IP networks	Media Links Professional Services and LifeCycle Support
Further grow/expand media transport business into Local/Metro Markets	Packaged, turn-key, LAN/WAN scalable network solutions with edge gateways, aggregation routing and control software

Media Links Case Study: **Strategic Partnership with Major North American Telecom**

Technology advances provided over the last decade

Video Services

Started with auto selection of SD/ASI/HD services with JPEG2000 coding
 Added 3Gbps 1080P support & higher density (4 port) video line cards
 Added 1080P HDR support
 Added 4K video support
 Upgrading to low latency JPEG-XS coding
 Evolving toward synchronous delivery for remote production applications

Network Trunking

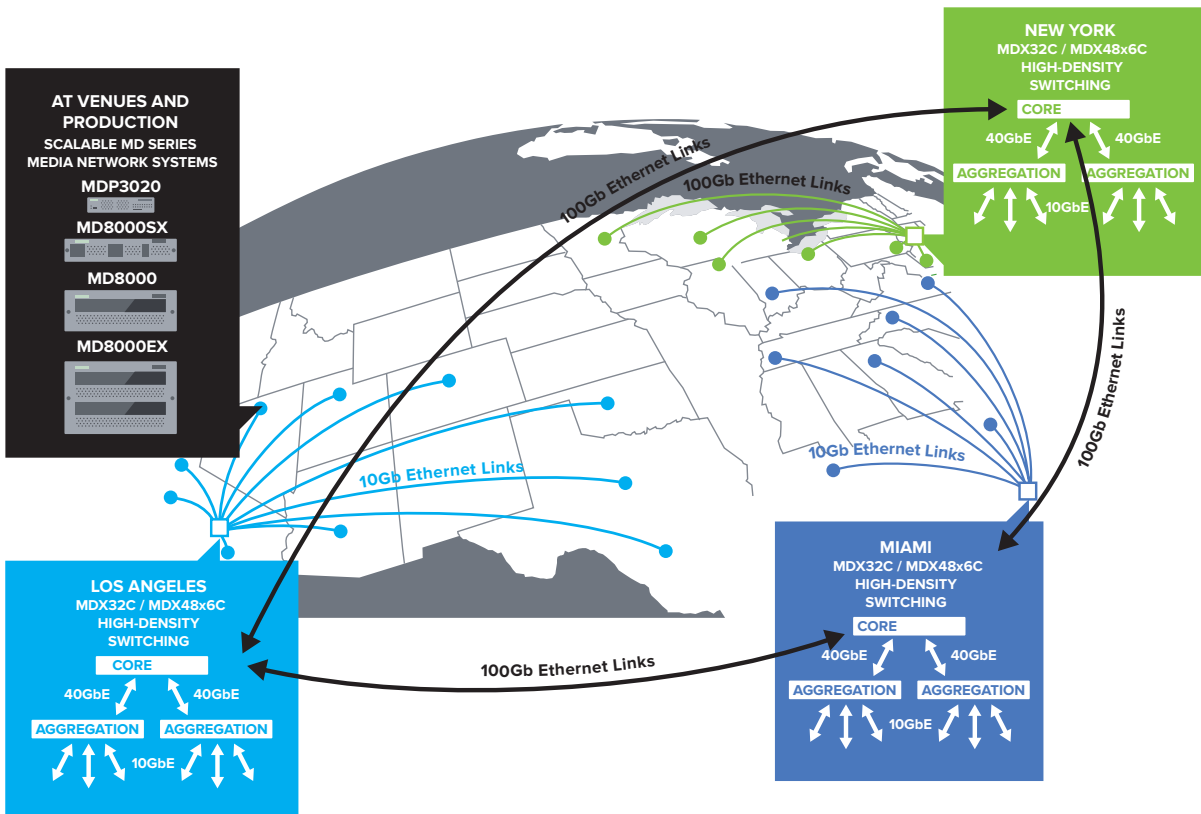
Originally with SONET/SDH OC3/STM1, OC12/STM4, OC48/STM16, 10Gb WAN-PHY /STM64
 Transitioned to 10GbE, 40GbE, and now 100GbE

Data Services

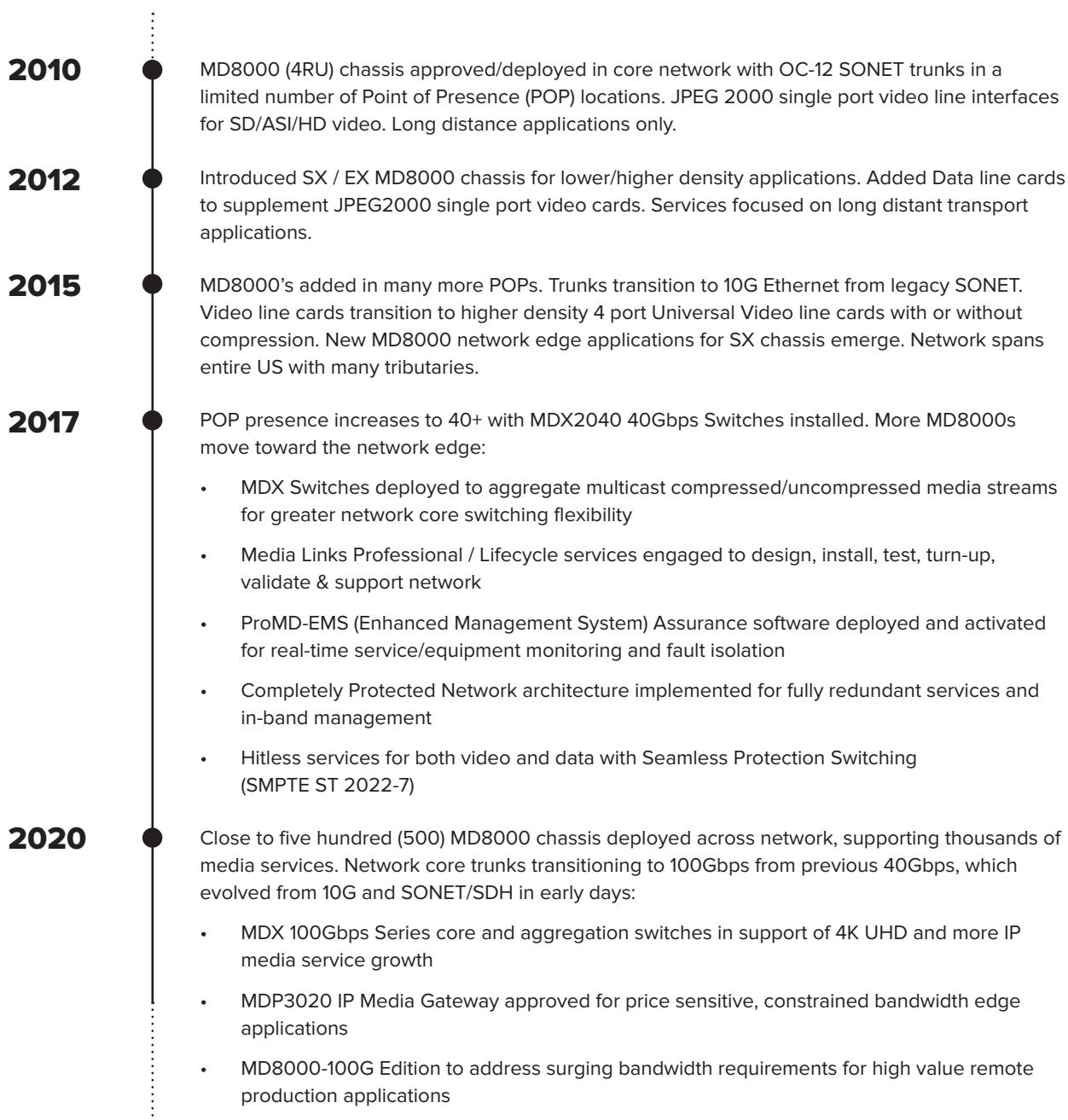
Began with 10/100 Base T
 Added 1Gbps
 Added 10Gbps
 Added RTP Hitless Data

Network Switching

Small scale SONET/SDH based grooming
 SDN based 1/10G Switching
 Added 40Gbps
 Adding 100Gbps
 Positioning for 400Gbps



Chronology of Key Milestones over the last decade

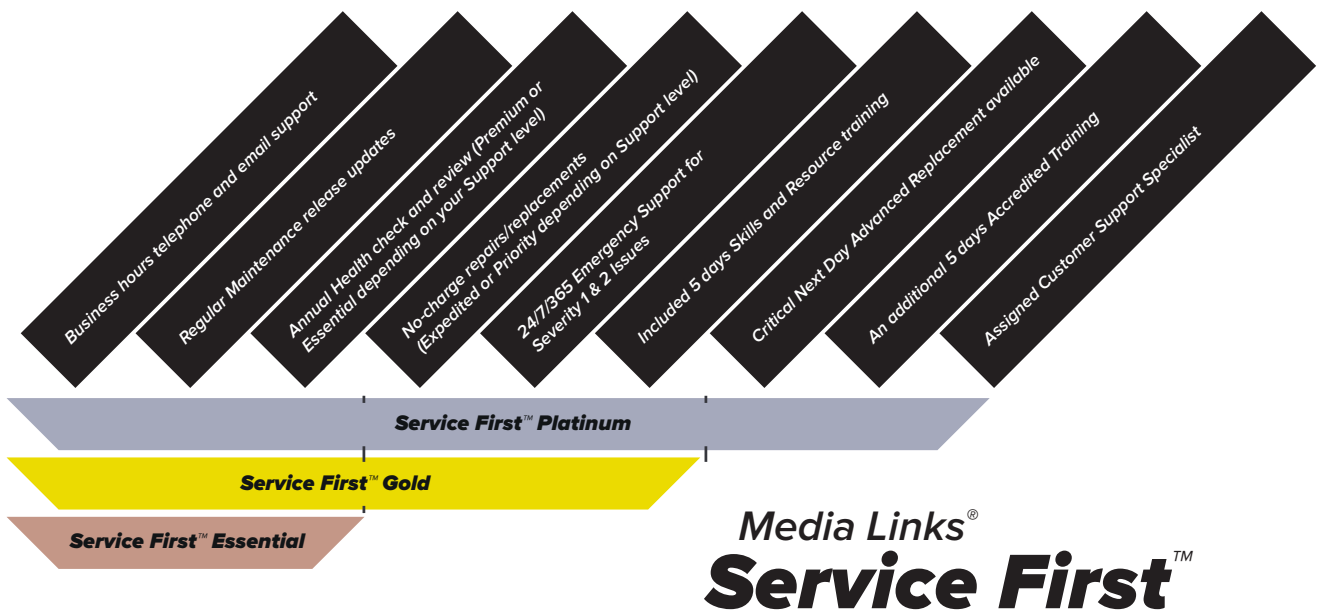


Professional / LifeCycle Services Provided

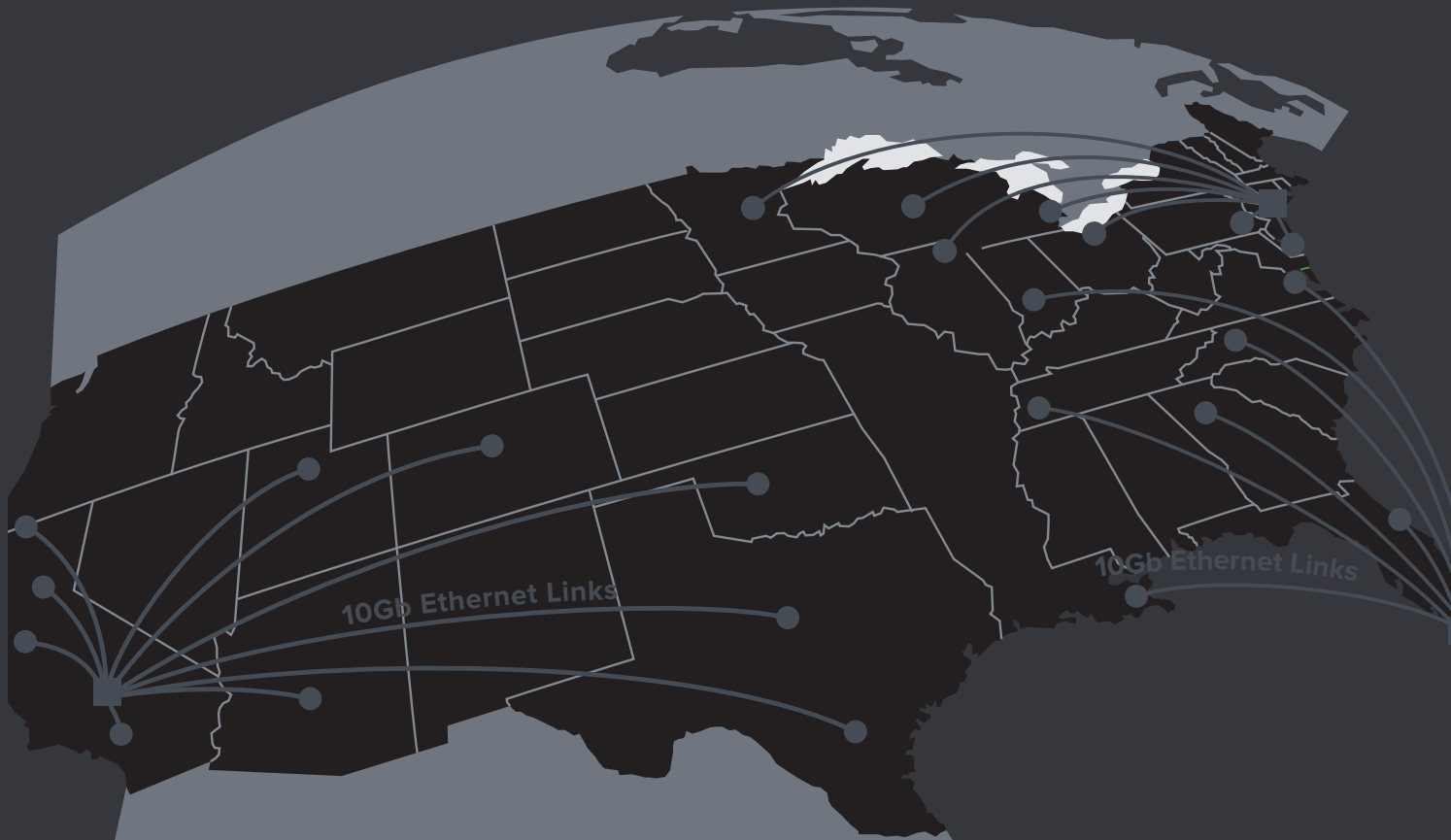
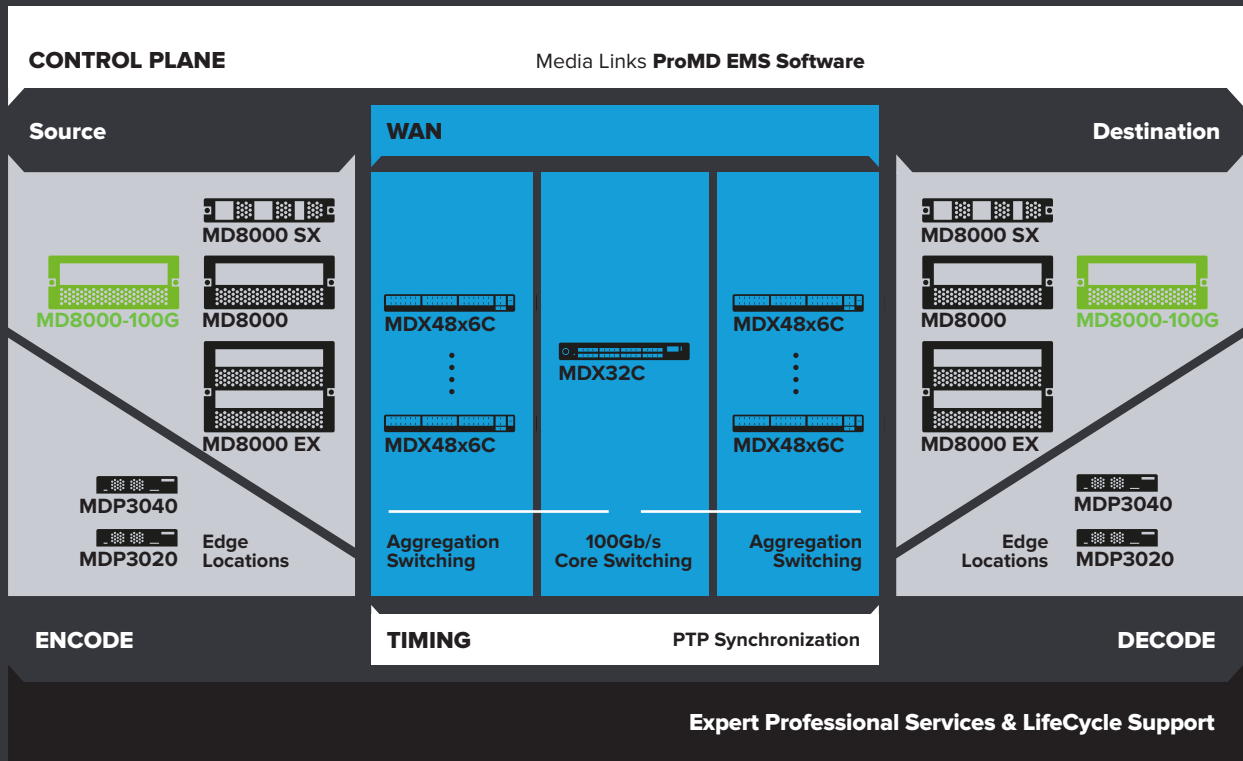
- 24/7/365 Support
- Network Operations Center – Design/ Construction/Turn-up/Operational Staffing
- Planning and Use case definition of new technologies/equipment/service offerings
- Key Event on-site venue support
- Hardware/Software Installation, coordination and maintenance
- Education and Training on new capabilities/ value proposition
- Support for new development and services
- Test planning, support and certification
- Qualification and first launch

All types of media workflows are undergoing rapid changes. Not only are all-IP production and distribution growing to become dominant, but other key trends such as all-cloud production, DVB/ATSC evolution and 5G mobile networks are having a disruptive effect on media organizations. Staying current with these innovations while maintaining a 24/7 operation can be extremely challenging for engineering and operations staffs at all levels throughout the industry.

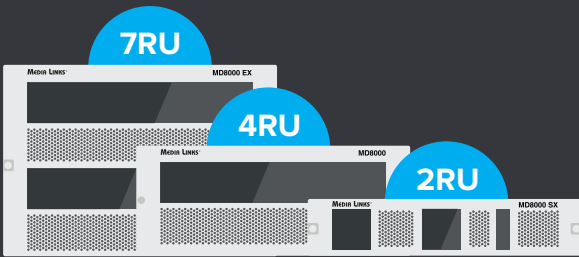
Fortunately, Media Links is ready to help, by offering a broad range of highly-skilled professionals supporting multiple technology areas. Architects, engineers and technicians are available to support every phase of a media project, from initial concept on through to ongoing operation and maintenance. The following types of project activities can be supported:



Our technology deployed



MD8000 IP Transport System



MD8000 EX, MD8000, and MD8000 SX

The MD8000 Media over IP Transport platform is Media Links' flagship solution for transporting 4K, 3G/HD/SD-SDI, and/or DVB-ASI video as well as audio and data over IP networks. Scalable and modular, three chassis versions are available to suit the application at hand. Each accepts one or more 10G trunk cards providing the high-speed IP network core interface, as well as interchangeable line cards that support a variety of user signal interfaces.

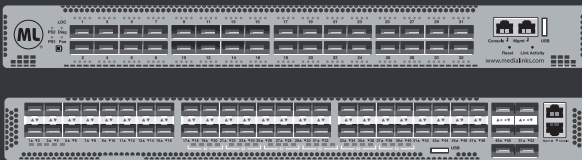


MD8000-100G

The MD8000-100G Edition is designed to address the increasing need for more bandwidth at the network edge, in particular for remote production applications. It delivers a 10X bandwidth increase to 100G when compared to the standard MD8000 and is fully backward compatible with the platform's line card portfolio.

MDX Switching

Proven Transport Switching up to 100Gb/s

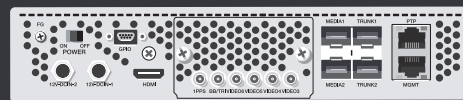


MDX32C + MDX48x6C Core and Aggregation Switches

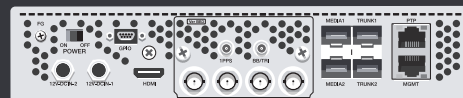
Optimized to handle compressed and uncompressed video/audio streams as well as bidirectional TCP-over-IP data traffic, the MDX Series is designed with a non-blocking architecture that assures no packet loss at full bandwidth rates.

MDP Series IP Media Gateways Agile Edge Encoders and Decoders

The MDP3000 Series of highly-configurable edge devices provide compact, economical interfaces to adapt media signals into IP network formats. Built to occupy a small footprint, these units are easy to deploy in any location where a signal needs to be originated or delivered. To reduce signal bandwidths, these units also support various video compression formats.



MDP3020 Video, Audio and Data



MDP3040 4K with TICO compression

ProMD-EMS 2.0



Comprehensive software application that provides network assurance monitoring, service scheduling/provisioning along with performance management.

More Regional Highlights across the Globe

Regional Highlights across the Globe

Region	Customer	Solution	Critical Need	Media Links Product Lines
Americas	Major North American Telecom	National media contribution & distribution network, interconnecting major cities and sporting venues	Centralized management of highly synchronized, distributed network incorporating 100's of nodes for country-wide media transport & exchange between broadcasters	MD8000, MDP3020, MDX Switches, ProMD-EMS
Americas	Major broadcaster with global reach	Trans-Atlantic, trans-Pacific media transport for Olympic events.	Mission critical reliability, hitless protection switching, low latency, multi video format with large data carriage for remote production sports applications	MD8000, MDP3020, MDX Switches, ProMD-EMS
Americas	Global Service Provider	High density IP Switching Broadcast Network	Eliminate legacy baseband video routing. Implement customer controlled, non-blocking IP switching across 90+ high end media customers for content exchange	MD8000, MDX Switches, ProMD-EMS with scheduling software
Europe	Major Iberian telecom	Contribution network of 12+ interconnected nodes, transporting high value media content	Faultless quality, seamless protection switching (hitless) for robust, resilient performance	MD8000
Europe	Major Eastern European telecom	Contribution network spanning a dozen football stadiums, transporting close to one hundred video and data services per venue to & from the broadcast center	Maximum video quality, signal integrity and robustness for media feeds eventually distributed to millions of viewers	MD8000 & MDP3020, including hundreds of UV Tx/Rx line cards, 10G Network trunks, and dozens of Multiport Gigabit Ethernet data cards. ProMD-EMS management
Asia Pacific	Global Service Provider (major Australian telecom) with focus on Asia Pacific Region	Nationwide, high performance IP media network with wide range of broadcast services. Part of this network includes numerous transmitter sites providing SFN services	Robust, resilient, multi-video and data service capability incorporating multi-hundreds of chassis and services	MD8000 and MDX switches
Asia Pacific	Major Korean broadcasters	High contribution quality, mission critical video transport with support for 4K-UHD rollout	Reliable, multi-format platform with ability to accommodate emerging 4K UHD resolutions	MD8000 platform
Asia Pacific	Major Japanese broadcaster	IP Video router utilizing Media Links' switching and edge gateway solutions, providing a graceful SDI to IP migration to support higher bandwidth video as well as data services. Installed in multiple studios throughout country	Transition to IP studio environment supporting SDI legacy services as well as accommodate higher bandwidth (4K) video. Replace traditional SDI router with IP router, combining with data services to optimize workflows	MDX Switches, MDP3000 Series family, MD8000 derivative products

Media Links has a long, rich history of innovation in IP media transport systems. As an Emmy Award winning pioneer, technologies such as JPEG compression over IP and Hitless Protection Switching were fundamental to the company's early growth and success in critical applications such as sporting events with world-wide audiences.

MD Series ecosystem solutions have earned a well-deserved reputation for reliability and high availability. Media Links continues to innovate by introducing new features and products, including the MD8000-100G Edition along with the MDX Series of 100G switches.

MEDIA LINKS[®]
Media Defined Networking[®]

www.medialinks.com

Media Links (Headquarters)
Kawasaki Tech Center 18F
580-16 Horikawa-cho,
Saiwai-ku, Kawasaki-shi,
Kanagawa 212-0013 Japan
Phone: +81 44-589-3440
query@medialinks.co.jp

Media Links Americas
431-C Hayden Station Road
Windsor, CT 06095
USA
Phone: +1 860-206-9163
info@medialinks.com

Media Links Australia
2-12 Rokeby Street,
Collingwood, VIC 3066,
Australia
Phone: +61 3-9017-0175
info@medialinksaustralia.com.au

Media Links EMEA
Suite 18242
PO Box 6945
London W1A 6US
United Kingdom
Phone: +44 (0)20 7096 9569
emea_info@medialinks.com