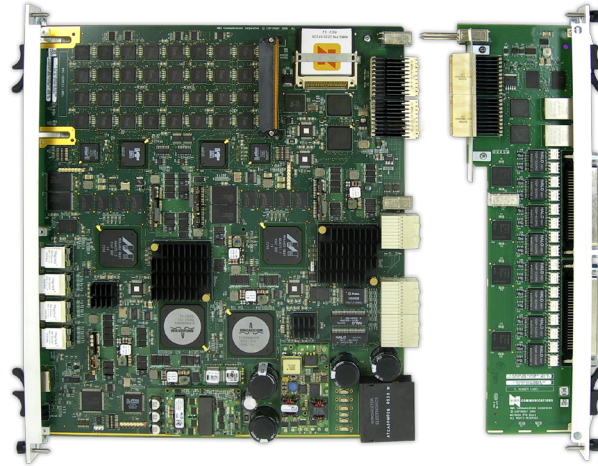


MG 7000A

AdvancedTCA Media Processing Blade

The NMS Communications MG 7000A is the ideal AdvancedTCA® blade for flexible media processing in network-based telephony solutions. High-speed IP packet handling, multiple Gigabit Ethernet interfaces, high-density DSP media processing power, and optional T1/E1 interfaces are combined in the MG 7000A. The result is a complete multimedia resource for a wide range of applications including IP media servers and enhanced service platforms for mobile voice applications. New solutions are rapidly implemented on the MG 7000A using the Natural Access™ MX software development environment. Part of the NMS Open Access™ framework of enabling technology, the MG 7000A is the clear choice for next-generation AdvancedTCA solutions.



APPLICATIONS

- IP media servers
- Enhanced service platforms
- IMS Multimedia Resource Function (MRF)
- IVR, messaging, and conferencing engines
- VoIP gateways
- Wireless/IP gateways

FEATURES

- Single-slot AdvancedTCA solution
- Boots from Ethernet interface or on-board flash memory and runs autonomously
- Powerful Natural Access MX software development environment
- SIP support
- Dual Gigabit Ethernet for AdvancedTCA Switch Fabric
- Dual 10/100/1000-Base-T Ethernet for AdvancedTCA Base Fabric
- Up to 500 bi-directional multi-media sessions
- Supports popular vocoders: G.711, G.723.1, G.726, G.729A/B, AMR
- Dual IPMI bus and shelf manager support

MG 7000A

TECHNICAL DESCRIPTION

The MG 7000A is a carrier-grade blade, based on today's open system AdvancedTCA standards, targeted at in-network deployments, where scalability and reliability are absolute requirements. The MG 7000A complies with PICMG 3.0 R1 and Intelligent Platform Management Interface (IPMI) Version 1.5 specifications. Dual Gigabit Ethernet interfaces support the AdvancedTCA Switch Fabric and dual 1000Base-T Ethernet interfaces support the AdvancedTCA Base Fabric. The MG 7000A supports board-level hot swap and the AdvancedTCA shelf manager through the dual IPMI bus with on-board OAM software. The architecture of the MG 7000A integrates optional PSTN interfaces, with up to 16 T1/E1 connections and ISDN support. This integration results in a cost-effective and scalable blade for network equipment providers building next-generation convergence solutions requiring capacities of hundreds to thousands of ports.

Natural Access MX

The MG 7000A includes the Natural Access MX development and runtime environment. Natural Access MX provides the same functionality as the popular Natural Access development environment but operates over an IP link to the MG 7000A. A "thin" client resides in the host CPU with the Natural Access MX server resident on the MG 7000A. This makes the MG 7000A autonomous and practical for creating a "five-nines" highly available gateway or media server.

A Porting Guide is available for Natural Access developers, which includes example programs. Natural Access MX client library source code and test software are also included. This allows MG 7000A programmers to compile and verify client library software for any POSIX-compliant operating system.

Media Processing, Switching, and Storage

The MG 7000A provides IP media processing, exchanging IP media streams with external sources through the AdvancedTCA Dual Gigabit Ethernet Switch Fabric. TDM media are processed from the 8/16 T1/E1 interfaces made available on the rear transition module (RTM). (Refer to the MG 7000A Block Diagram.)

The voice media are routed within the chassis via the AdvancedTCA Switch Fabric to dual redundant Ethernet switch blades. Media processing functions of the MG 7000A include:

- Audio play and record
- Tone detection and generation
- Audio conferencing
- Fax (T.38)*
- Voice over IP

The MG 7000A supports a wide variety of media types including complex voice and coders for voice over IP. TDM media play and record support includes many voice file formats. An on-board file system with caching and control for remote storage devices is included.

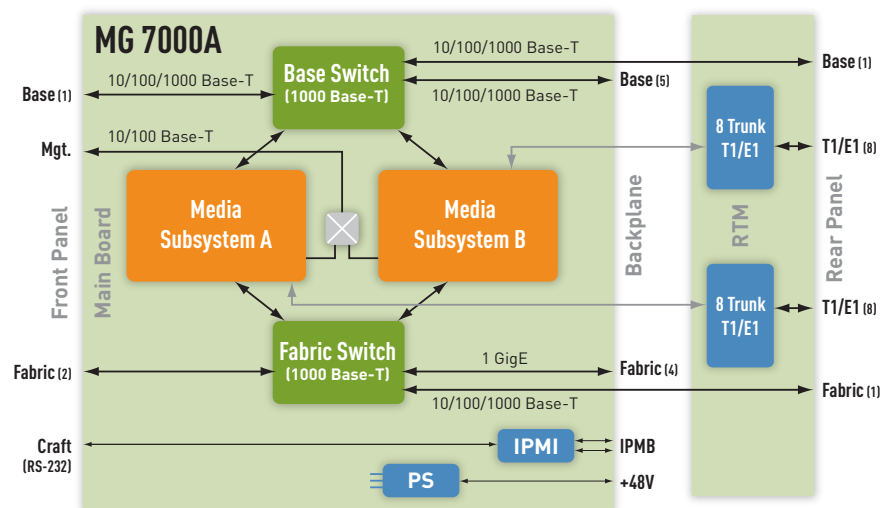
Call Control, Switching, Speech Server Support

The signaling plane includes SIP call control and a SIP User Agent for VoIP network connections. The T1/E1 interfaces include the widely deployed NMS ISDN signaling stacks. NMS provides approvals for PSTN call control throughout the world. For speech server implementations, the MG 7000A supports software based on MRCP v2.0*. Virtually all ASR and TTS technology vendors now provide MRCP-based speech engines.

AdvancedTCA Management and Base Fabric Support

Natural Access MX provides support for the AdvancedTCA shelf manager through the IPMI bus (refer to the MG 7000A Block Diagram). This support includes information on temperature, functional health, power consumption, and identification. It also provides control over power sequencing and hot swapping of the MG 7000A. The MG 7000A has a standalone mode for troubleshooting through the craft port (RS-232).

In addition to IPMI support, Natural Access MX provides management and control support over dual 1000Base-T Ethernet connections via the AdvancedTCA Dual Star Base Fabric to the host application server. Management and control plane communications are separated completely from media processing functions. An on-board database provides health and status information and is supported by various board-level MIBs that are communicated to the application host and network management system by SNMP v2.



MG 7000A Block Diagram

*Future release

TECHNICAL SPECIFICATIONS

General

- Dual Embedded high-performance PowerPC® with 256 MB SDRAM per PowerPC
- Mechanical: PICMG 3.0 R1.0

Application Support

- APIs provided by thin Natural Access MX client
- Natural Access MX server runs on autonomous MG 7000A
- Multiple applications share one or more MG 7000A blades
- MRCP v2 software for speech server support*

AdvancedTCA Switch

Fabric Interface

- Dual 10/100/1000Base-T Ethernet interface
- Front and rear transition module I/O
- Protocols: RTP/RTCP, IPv4, IPv6, NFS
- PICMG 3.1 R1.0 compliant

AdvancedTCA Base Interface

- Dual 10/100/1000Base-T Ethernet
- Front and rear transition module I/O
- Protocols: RTP/RTCP, IPv4, IPv6, SCTP*

Command and Control Interface

- Dual 10/100/1000Base-T Ethernet
- AdvancedTCA Base interfaces or rear transition module (RTM) interfaces
- Protocols: RTP/RTCP, IPv4, IPv6, SNMP, HTTP, SCTP*, RSTP (Ethernet software failover)

PSTN Network Connectivity

- Interface connectors: Two RJ-21 connectors on rear transition module

Digital Trunks

- 16 software-configurable T1 or E1
- For DSX-1 specifications, see PSTN Digital Trunk Support data sheet
- For CEPT E1 G.703 specifications, see PSTN Digital Trunk Support data sheet
- T1 Loopback: Per-channel under software control; automatic remote loopback with CSU option

CONFIGURATIONS

Board Model	Trunks	DSP MIPS
MG 7000A/85-16TE	16 T1/E1	8,512
MG 7000A/170-16TE	16 T1/E1	17,024
MG 7000A/85	none	8,512
MG 7000A/170	none	17,024

APPLICATION

MIPS	8,512	17,024
PSTN Media Gateway ports	240	480
IP Media Server (IVR and conferencing) sessions	250	500

- E1 Loopback: DS0 and E1 level (software control)
- See PSTN Digital Trunk Support data sheet for following specifications:
 - ISDN protocols
 - Tone and pulse dialing
 - DTMF and MF tone detection

ISDN Switch Compatibility

- EuroISDN
- Lucent 5ESS
- Nortel DMS-100, DMS-250

IPMI Interface

- PICMG IPMI R1.5
- Star or bus topology

High Availability

- Autonomous Operation
- OAM&P support via SNMP v2
- Remote boot and configuration
- Support of shelf controller via IPMI
- Hot swap

Control Protocol

- SIP

Client OS Support

- SPARC® Solaris™ 10 (64-bit)
- Red Hat® Enterprise Linux® 4.0
- Windows® Server 2003
- Source software provided

IP Media Processing

- Universal port capability:
 - Vocoding: G.711, G.723.1, G.729A/B, AMR
 - T.38 real-time fax*
- Processors: Up to 32 TI 5441s, each with four 133 MIPS cores
- Capacity: 480 voice ports

Echo cancellation

- Up to 64 ms tails; 480 ports
- G.164, G.165, G.168 (2000)

Audio Play/Record

- Sampling rates: 8 ksamples/sec
- Speech compression (IVR):
 - 11 kHz, 8- or 16-bit linear (.WAV); 16-bit may reduce the number of ports per blade
 - 8 kHz 16-bit linear (.WAV)
 - 64 kbps μ -law or A-law per ITU-T G.711
 - 16, 24, and 32 kbps ADPCM using NMS algorithm with NMS framing and bit packing with up to 2x speedup on play back
 - IMA-compatible ADPCM 32 kbps
 - G.726-compatible ADPCM 32 kbps

Media Storage

- NFS access to remote file server storage

*Future release

Power Requirements

- 2.5 A @ 48 V

Environment

- Operating temperature:
 - Normal: +5 °C to +40 °C @ 200 LFM
 - Short-term: -5 °C to +50 °C
- Storage temperature: -20 °C to +60 °C
- Altitude: -200 ft (-60.96 m) to 15,000 ft (4,572 m)
- Relative Humidity:
 - Operating 5% to 85%
 - Non-condensing 5% to 90%
- Compatible with requirements for NEBS Level 3 system certification
 - All materials UL 94V-1 or better fire resistant
 - Tolerates airborne contaminants
 - When properly packaged or installed in system meets shock and vibration requirements

Regulatory Certification

This product meets EMC, Safety and Telecom requirements for the US, Canada and the EU. Please refer to the Global Approvals section of our web site for a complete list of countries in which we currently hold Telecom approvals. If you need specific details on EMC, Safety, or Telecom approvals, please contact Technical Services at tech_support@nmss.com or +1 508 271 1333.

NMS SERVICES

NMS provides a complete range of services designed to complement your needs at every stage — design, evaluation, development, and deployment. NMS offerings include product support, technical training, logistics, and the best developer support program in the industry. With NMS Services you are able to reduce time-to-market, ensure quality, and focus on your unique competitive advantage.

For the latest information on supported features and operating systems, refer to our web site at www.nmscommunications.com.

NMS Communications
100 Crossing Boulevard
Framingham, MA 01702-5406
Tel: +1 508 271 1000
Tel: +1 800 533 6120
Fax: +1 508 271 1300

24 Quai Gallieni
92150 Suresnes
France
Tel: +33(0) 1 41 38 11 00
Fax: +33 (0) 1 41 38 11 01

1815–16 Concordia Plaza
1 Science Museum Road
Tsim Sha Tsui East
Kowloon, Hong Kong
Tel: +852 2926 1820
Fax: +852 2620 5600

NMS also has offices throughout North America, Europe, and Asia. Visit the NMS web site for a complete listing.

Every effort has been made to ensure the accuracy of this document. However, due to the ongoing improvements and revisions to our products, NMS Communications cannot guarantee the accuracy of the material after the date of publication, or accept responsibility for errors or omissions. Revised documents may be published when deemed necessary by NMS Communications.

NMS Communications, Natural Access, and Open Access are trademarks of NMS Communications Corporation. AdvancedTCA is a registered trademark of the PCI Industrial Computers Manufacturers Group. PowerPC is a registered trademark of IBM Corp. Windows is a registered trademark of Microsoft Corporation in the United States and/or other countries. Solaris is a trademark of Sun Microsystems, Inc. in the United States and/or other countries. SPARC is a registered trademark of SPARC International, Inc. in the United States and other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc. Red Hat is a registered trademark of Red Hat, Inc. Linux is a registered trademark of Linus Torvalds. All other product or corporate references may be trademarks or registered trademarks OCT08