American Megatrends - A global leader in BIOS and UEFI firmware, server and remote management tools, data storage products and unique solutions based on the Linux® and Android™ operating systems
Founded in 1985 and known worldwide for AMIBIOS®, American Megatrends Inc. (AMI) supplies state-of-the-art hardware, software and utilities to top-tier manufacturers of desktop, server, mobile and embedded systems. AMI’s industry leading Aptio® V UEFI BIOS firmware, innovative StorTrends® Network Storage hardware and software products, MegaRAC® remote server management tools and solutions based on the popular Android™ and Linux® operating systems continue to garner industry acclaim and awards around the world. In line with the diversity of its technology and product line, AMI is a member of a number of industry associations and standards groups, such as the Unified EFI Forum (UEFI), the Intel® Internet of Things Solutions Alliance and the Trusted Computing Group (TCG). Headquartered in Norcross, Georgia, AMI has locations in the U.S., China, Germany, India, Japan, Korea and Taiwan to better serve its customers.
AMI creates and manufactures key hardware and software solutions for the global computer marketplace, providing the highest quality and compatibility to build today's advanced computing systems.

Established by S. Shankar, AMI’s mission is to design state-of-the-art computer solutions and develop advanced technology for the best computing solutions in the world.

AMI's extensive product line includes BIOS, diagnostic software, remote access controllers, motherboards, backplanes, driver and firmware development, IP-SAN and NAS storage systems and engineering services.

With these product groups, AMI is uniquely positioned to provide all of the fundamental components necessary for the system performance, manageability, and availability required in enterprise computing. AMI is the only company in the industry today offering all of these core technologies.

Founded in 1985, AMI has been a consistent leader in the technology industry, accomplishing a number of firsts:

- First to build motherboards based on the Intel® 386 and 486 processor platforms
- First to use on-board external cache designs for these boards - significantly improving their performance
- First in the world to build and ship a Quad-Xeon® processor system: the MegaPlex®
- As a recognized leader in the BIOS market, AMI was:
  - First to support USB
  - First to create a GUI BIOS interface with mouse support
  - First to integrate diagnostics
  - First to support ACPI
- First to develop a diagnostic product for the Extensible Firmware Interface (EFI) in 2001, and first to market a native diagnostic for the Unified Extensible Firmware Interface (UEFI), AMIDiag® for UEFI in 2008
- AMI's MegaRAC® G2 remote server management card was named as a finalist at the 2002 NetWorld+Interop trade show for outstanding design and superior performance
- AMI’s MegaRAC® G2 was named a 2003 Ultimate Custom Solutions award winner by CRN magazine
- AMI was first to provide 100% remote manageability and KVM for multiple ASICs with its MegaRAC® SP service processor firmware
- AMI was also the first remote management company to create a service processor stack that merged IPMI with Linux-based management features
- In 2007, the StorTrends® 3200i Storage Appliance was selected as a Top Ten Finalist in Storage Magazine's "Product of the Year" Competition in the "Disk and Disk Subsystem" Category
- AMI was first to introduce in 2008 a Serial GPIO enclosure controller chip compliant with the International Blinking Pattern Interpretation (IBPI) specification, the MG9082, which extends the use of SGPIO chips to high-end storage servers
- For over 25 years, AMI has been deeply committed to maintaining its leadership position in the computer industry, with the majority of its employees worldwide directly engaged in the design and development of cutting-edge computer technologies.
About StorTrends

American Megatrends Inc, founded in 1985, has been manufacturing key hardware and software solutions since its inception. Most well known for BIOS firmware, AMIBIOS is the world’s largest BIOS firmware vendor, and is currently deployed in over half of all computers worldwide. AMI’s extensive product line includes StorTrends storage solutions, Aptio and AMIBIOS system software and firmware, and MegaRAC remote software.

By 1995, AMI was also well known for its RAID expertise, and was the largest third-party RAID controller manufacturer in the world. With AMI’s growing reputation as a storage provider, in 2001 AMI sold its RAID assets, including its MegaRAID line, to LSI Logic. The sale enabled AMI to expand and develop its StorTrends line of SAN and NAS solutions - developed by the same engineers who developed the world’s best selling RAID controller. With StorTrends, AMI has once again become a leader in the storage market.

Coming from a company with 30 years of service to the IT community, StorTrends is a truly innovative storage provider. With thousands of installs across dozens of countries worldwide, StorTrends combines “Performance Storage” with “Proven Value”. No matter the industry, StorTrends can fit seamlessly into any IT environment with the best storage solution possible. Most importantly, StorTrends employs an all-inclusive philosophy with each storage appliance, to ensure that each customer gets enterprise-class storage features without an enterprise-class price tag.

StorTrends SAN and NAS storage appliances are used around the globe every day and trusted by companies and institutions in education, energy, finance, healthcare, manufacturing, marketing, retail, research, technology and government. StorTrends meets the challenges and demands of today’s business environments by offering unified storage with simplified management that increases storage efficiency with solutions for business continuity, disaster recovery, and virtualization.

Satisfied StorTrends customers include leading institutions and public services including Walgreens, the U.S. Coast Guard, PGA Tour Superstore, First Option Mortgage, PAM Transport, Lockheed Martin, National Fire and Police Services of the Netherlands, the European Commission and many more.

StorTrends dramatically reduces the time and cost required to manage, maintain and expand a network storage environment. StorTrends customers also benefit from substantial savings on hardware and installation costs, with no “charge by feature” like other vendors. Each StorTrends storage appliance comes pre-installed with a complete suite of enterprise-class features at a competitive and attractive price. Easy to install and manage, StorTrends SAN and NAS appliances combine outstanding value and reliability with cutting-edge performance and versatility.
### STORTRENDS® SAN & EXPANSION PRODUCTS (2U FORM FACTOR)

<table>
<thead>
<tr>
<th>Hardware (Front View)</th>
<th>StorTrends 2610i All Flash SAN Array</th>
<th>StorTrends 2502j Expansion Shelf</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Form Factor</strong></td>
<td>2U, 24 bay</td>
<td>2U, 24 Bay</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>85 lbs (38.6 kg) with drives</td>
<td>70.4 lbs. (32 kg) with 16 drives</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>3.5 x 17.2 x 26.8 in (8.8 x 43.7 x 67.9 cm)</td>
<td>5.2 x 19.0 x 23.2 in (13.1 x 48.2 x 59.0 cm)</td>
</tr>
<tr>
<td><strong>Redundant Power Supply</strong></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Hot Swappable Power Supply</strong></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Drive Bays</strong></td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td><strong>Drive Interface</strong></td>
<td>SAS Solid State Drives (Flash)</td>
<td>SAS Solid State Drives (Flash)</td>
</tr>
<tr>
<td><strong>Hot Swappable Drives</strong></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Number of Processors</strong></td>
<td>4 Intel® QuadCore processors with 2 processors per controller</td>
<td>Dual controller configuration</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>192 GB (96 GB per controller)</td>
<td>--</td>
</tr>
<tr>
<td><strong>Maximum Storage Capacity</strong></td>
<td>256 TB</td>
<td>92 TB</td>
</tr>
<tr>
<td><strong>Available Hard Disk Capacities</strong></td>
<td>240 GB, 480 GB, 960 GB, 1.9 TB, 3.8 TB Solid State Drives (SSD)</td>
<td>240 GB, 480 GB, 1.9 TB, 3.8 TB Solid State Drives (SSD)</td>
</tr>
<tr>
<td><strong>iSCSI Support</strong></td>
<td>Yes (1GbE, 10GbE)</td>
<td>--</td>
</tr>
<tr>
<td><strong>Compression and Deduplication</strong></td>
<td>Yes</td>
<td>--</td>
</tr>
<tr>
<td><strong>Advanced Snapshot Module</strong></td>
<td>Yes</td>
<td>--</td>
</tr>
<tr>
<td><strong>Archiving with Deduplication</strong></td>
<td>Yes</td>
<td>--</td>
</tr>
<tr>
<td><strong>Asynchronous Replication</strong></td>
<td>Yes (Snapshot Assisted)</td>
<td>--</td>
</tr>
<tr>
<td><strong>WAN Data Services (WDS)</strong></td>
<td>Yes - Deduplication, Compression, Encryption, WAN Optimization</td>
<td>--</td>
</tr>
<tr>
<td><strong>Thin Provisioning</strong></td>
<td>Yes</td>
<td>--</td>
</tr>
<tr>
<td><strong>Auto Tiering / ILM</strong></td>
<td>Yes</td>
<td>--</td>
</tr>
<tr>
<td><strong>Capacity Expansion</strong></td>
<td>Yes, StorTrends 2502j Expansion Shelves Available</td>
<td>--</td>
</tr>
<tr>
<td><strong>RAID Support</strong></td>
<td>RAID-RT™ with RAID 1, 5, 10, 50</td>
<td>--</td>
</tr>
<tr>
<td><strong>ManageTrends™ Web-based GUI</strong></td>
<td>Yes</td>
<td>--</td>
</tr>
<tr>
<td><strong>Storage Resource Management Reports</strong></td>
<td>Yes</td>
<td>--</td>
</tr>
<tr>
<td><strong>Universal Power Supply (UPS) Support</strong></td>
<td>Yes</td>
<td>--</td>
</tr>
<tr>
<td><strong>Network Teaming Support</strong></td>
<td>Yes (802.3ad, R.R., A/TLB)</td>
<td>--</td>
</tr>
<tr>
<td><strong>VMware™ vSphere Plug-in</strong></td>
<td>Yes</td>
<td>--</td>
</tr>
<tr>
<td><strong>VAAI Primitives Support</strong></td>
<td>Yes</td>
<td>--</td>
</tr>
<tr>
<td><strong>External Connectivity</strong></td>
<td>--</td>
<td>External SAS (4x SAS Ports)</td>
</tr>
</tbody>
</table>
STORTRENDS 2610i SAN STORAGE ARRAY

The StorTrends 2610i 2U All Flash SAN Storage Array comes pre-installed with AMI’s innovative StorTrends iTX Data Storage Software to provide users with a powerful, easy-to-use solution that can be configured and deployed in a matter of minutes. This enterprise-class 2U appliance is a true All Flash Array (AFA) that uses high-performance SSD disk drives for up to 256 TB of storage capacity.

2U SAN APPLIANCES

The StorTrends 2610i SAN is the perfect All Flash Array for centralized storage, mixed workloads, VDI and high performance applications. Key features of this device include:

• 24 hard drive bays, with expansion capacity up to 256 TB
• True All Flash Array configuration with high performance SSD drives
• Massive capacity expansion capability with StorTrends 2502j expansion shelf systems
• Robust RAID-RT™ Software RAID technology in RAID, 1, 5, 10, 50 configurations
• All-inclusive feature set with Deduplication and Caching for efficient use of storage space
• Includes features that have made StorTrends known and trusted for years, like Auto Data Tiering, Thin Provisioning, WAN Optimized Replication and much more

The 2610i continues to provide the features that StorTrends customers around the world have relied on for years, including thin provisioning, auto data tiering, WAN optimized replication, as well as compatibility with legacy StorTrends solutions without additional costly licensing fees. Delivering on the simple promise of performance, reliability, and affordability, the StorTrends 2610i SAN is an All-Flash Array storage solution that organizations large and small can truly depend on.

Cost-Effective & Simple

StorTrends® appliances featuring StorTrends iTX Data Storage Software provide an economical storage solution that merge SAN black data storage and NAS file storage in the same product. System administration becomes easy with ManageTrends™, a highly secure storage management interface that provides discovery and management to StorTrends appliances through an intuitive web-based GUI.
STORTRENDS® 2502j EXPANSION SHELF SYSTEMS

The StorTrends 2502j is a 24-bay dual-controller SAN expansion unit that can house close to 92TB in a single shelf. The flexibility of the 2502j All Flash expansion shelf easily meets users’ needs for additional capacity and performance.

The StorTrends 2502j can be added to the StorTrends 2610i all-flash array via fully redundant 12Gb SAS cables to deliver additional storage and speed. The 2502j operates with the head unit’s auto-tiering capabilities to intelligently promote and demote data between tiers for optimal performance with mission-critical and frequently accessed data.

STORAGE EXPANSION CAPABILITY FOR STORTRENDS 2502j

Users have a wide range of SSD disk drive options for expanding storage capacity with the 2502j expansion shelf:

- Add an additional 5.7 TB of storage capacity with high-performance 240 GB SSD hard drives
- Add an additional 11.5 TB of storage capacity with high-performance 480 GB SSD hard drives
- Add an additional 45.6 TB of storage capacity with high-performance 1.9 TB SSD hard drives
- Add an additional 91.2 TB of storage capacity with high-performance 3.8 TB SSD hard drives

Simple Capacity Expansion

StorTrends iTX Data Storage Software features native support for the expansion of StorTrends SAN units with the 2502j expansion shelf, for tremendous capacity expansion that allows organizations to keep ahead of exploding data growth.

Users who expand their storage capacity with a StorTrends 2502j can take full advantage of the Auto Tiering / Information Lifecycle Management module featured in StorTrends iTX, along with its ability to migrate data from less expensive shelf storage to front line SAN storage based on the data’s usage and aging history.
STORTRENDS® ITX DATA STORAGE SOFTWARE

StorTrends® iTX Network Storage Management Software from AMI is a full-featured storage management suite designed to leverage the power of dual controller SAN appliances for peak performance and reliability. It easily meets the rigorous demands of today’s data centers and IT departments and is cost-effective, scalable, and suitable for both novice and advanced users. Featuring real platform-independent High Availability and excellent support for virtualized and clustered application servers, StorTrends is the solution of choice for those who want to get the most out of their storage.

StorTrends iTX network storage software is designed to be at home in a data center or server room as frontline storage for high-volume transactions or as part of a tiered storage solution. Its auto-failover capability for dual controller appliances ensures that any disaster or interruption is handled smoothly and makes it a solid candidate for mission-critical data that requires “always on” availability and reliability.

KEY FEATURES OF STORTRENDS ITX:

• 64-bit version of StorTrends iTX network storage software
• Advanced Data Snapshots: Advanced Redirect on Write (ROW) Snapshots
• Auto Tiering: Hierarchical Tiering of Data with Information Lifecycle Management and Zoned Bit Recording (ZBR)
• Data Archiving: Data Deduplication and Compression for Archiving Data Remotely
• Data Replication: Replicate Data to DR (Disaster Recovery) and Remote Sites
• Dual Controller Support: Auto Failover/Failback in Active/Active or Active/Passive Configurations for outstanding reliability and uptime
• Multi-Platform Replication: Lower DR costs by replicating between heterogeneous single and dual controller StorTrends storage appliances
• Near-CDP with Data Snapshots: Advanced Redirect on Write (ROW) Snapshots, with support for large volume snapshot repositories
• Software RAID with RAID-RT™ Technology: Scalability to 256 TB
• Vertical Capacity Expansion: Save hardware and disk costs by expansion with StorTrends Expansion Shelf Appliances, with multipathing for increased performance and reliability
• Virtualization: Support for leading virtualization suites including VMware®, Microsoft® Hyper-V and Citrix® Xen™
• WDS Technology: Compression, Encryption, Data Deduplication and WAN Optimization for fast replication

Highly Available Storage

Customers seeking high performance along with high uptime will find the dual controller StorTrends appliances powered by StorTrends iTX network storage software very attractive, as StorTrends iTX enables the dual controllers to operate in an active/active configuration to increase I/O throughput.

The latest version of StorTrends iTX keeps many of the aspects that users have come to know and love, including the ManageTrends™ GUI for “single pane of glass” storage management, easy-to-use wizards for simple, fast configuration and a host of all-inclusive, enterprise-class features at no added cost.
STORAID™ SUPPORT PLANS FOR STORTRENDS

StorTrends StorAID product support provides customers the flexibility they require to meet their critical business needs. StorAID Support Plans provide Next Business Day (NBD) hardware replacement and 24x7 phone support. StorAID support plans come with StorAID S.O.S. – an automated email alert monitoring system.

StorAID support plans are offered in 1-year, 3-year, and 5-year terms with 1-year extensions available. All StorTrends StorAID plans are supported from AMI headquarters in Atlanta, GA to provide customers with the highest quality and around-the-clock support in the storage industry.

<table>
<thead>
<tr>
<th>StorAID Support Features</th>
<th>Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>24/7 Phone Support</td>
<td>✓</td>
</tr>
<tr>
<td>NBD Onsite Support</td>
<td>✓</td>
</tr>
<tr>
<td>1 Year Term Extensions</td>
<td>✓</td>
</tr>
<tr>
<td>Dedicated Support Reps</td>
<td>✓</td>
</tr>
<tr>
<td>Experienced Support Team</td>
<td>✓</td>
</tr>
<tr>
<td>100% U.S.-based Support</td>
<td>✓</td>
</tr>
</tbody>
</table>

What Our Partners Say:

“In my 14.5 years of IT experience, I have only dealt with one other company that has consistently provided top-notch support, not only from a help desk perspective, but also access to the engineering group for tailoring a workable solution within our company. Support issues were quickly responded to, and support always saw to it that a full incident follow up was made.”

Mike Schmidt
Senior Systems Engineer,
Infrastructure Solutions
Walgreens
SNAPVDI™ VDI SOLUTION: “VDI MADE SIMPLE”

SnapVDI is engineered to provide the best user experience in the industry. High definition performance comes standard with SnapVDI, and the virtual desktops can be booted up in mere seconds. The VDI solution requires only a simple infrastructure to run, as all the virtual machines can operate in a 1 Gb network. Put simply, it will work in your existing infrastructure. Not only can the hassle of reworking your entire office space with complex storage and backend infrastructure be avoided, but the entire VDI will be up and running in just a few hours. Organizations will also significantly reduce power consumption, as SnapVDI thin clients typically use just 5 to 7 watts of power. Finally, all of the manageability software is integrated the solution, so that IT administrators can install, upgrade and refresh hundreds of nodes from a central, remote location.

PRODUCT HIGHLIGHTS:

- Faster than a desktop; entire VDI boots up in seconds
- Instant application launch and access
- Seamless user experience: High fidelity even at HD resolution (1920 x 1080)
- 90% less storage required than a typical VDI solution
- Intelligent, on-the-fly backup and disaster recovery built-in
- Designed for scalability and performance
- Improved productivity with less down time
- 10x more desktops per configuration
- Faster VM provisioning and cloning

SNAPVDI IS SECURE

All user data is stored in the data center instead of locally on each client. Mouse and keyboard actions are returned to the server over a secure channel, which are all encrypted. The entirety of an organization’s data resides in a secure environment on highly redundant systems.

SNAPVDI IS GREEN

Computing environments based on VDI deployments use significantly less power than traditional ones. In fact, SnapVDI uses just 5-7 Watts of power. When transitioning from a traditional infrastructure, over 534 KWh of energy are saved per seat each year with SnapVDI.

SNAPVDI IS CENTRALIZED

SnapVDI eliminates the need for IT administrators to deal with desktops on an individual basis. The administrator can upgrade, install and refresh hundreds of nodes all from one central, remote location. With SnapVDI, the manageability software comes built-in.
MEGARAC® SP-X

MEGARAC® SP-X is a powerful management solution for responsive, high-quality remote management of server systems from anywhere in the world. With MEGARAC SP-X, administrators enjoy complete out-of-band, OS-independent server control including power management, KVM redirection and virtual media.

The latest generation of MEGARAC SP-X provides an even greater level of modularity than previous versions. Core firmware functionality, portability and ease of use are also significantly enhanced. Instead of acquiring just a monolithic software package, developers are now able to easily configure the software by selecting specific features and provide packages to their ODM partners with increased differentiation.

The new Feature Pack architecture allows developers to independently evaluate recently-added or upcoming features, contained in an optional module separate from the main SP-X core. This empowers them to choose the best time to enable these new features in the existing management solution. Since licensing and intellectual property information can be limited to a package, this modular approach ensures intellectual property protection.

MEGARAC SP-X is widely used by the world’s leading server OEMs and ODMs. It supports Baseboard Management Controllers (BMCs) from all major silicon manufacturers, including ASPEED (Emulex), as well as non-x86 server architectures such as IBM POWER8®, Cavium ThunderX®, Applied Micro X-Gene™ and similar 64-bit ARM processors.

HIGHLY MODULAR ARCHITECTURE
- Each feature built as a separate package, source or binary

HTML5 SUPPORT
- Features new, streamlined web interface
- HTML5-based KVM and vMedia; no Java™ applet required

SUPPORT FOR KEY INDUSTRY STANDARDS
- Compliant with DMTF CIM Profiles
- CIM Object Manager (CIMOM)
- Virtual KVM and Virtual Media
- IPMI 2.0, version 1.1 compliant
- DCMII / APML
- Power Management Support
- SMASH/CLP
- WSMAN
- Web 2.0
- IPv6 Support
- SSI Compute Blade Support
- Redfish™ (RESTful API) Support
- MCTP (over I2C) Support
- HPM Support

Integration with DS
MEGARAC SP-X can be greatly enhanced with the MEGARAC Development Studio (DS), creating a revolutionary, easy-to-use integrated development environment. MEGARAC DS gives developers the tools to customize standard features of MEGARAC SP-X, including web pages, platform porting, and IP addresses.
MEGARAC® PM-X IPMI FIRMWARE SOLUTION

MegaRAC PM-X is a highly compact IPMI 2.0 and DCMI 1.5 firmware designed to support the Innovation Engine (IE) from Intel®. This firmware solution enables hardware manufacturers that leverage Innovation Engine to create a comprehensive yet essential manageability solution without adding any glue-logic, SDRAM or other hardware components other than a NIC on the server board.

MegaRAC PM-X is the next generation of compact firmware, which leverages MegaRAC’s well-vetted IPMI stack used by OEMs and ODMs for over a decade. MegaRAC PM-X is fully compliant with the IPMI 2.0 and the DCMI 1.5 specifications. DCMI 1.5 defines a simplified superset of frequently used management commands which introduces powerful management features. By offering support for these specifications, MegaRAC PM-X meets the needs of high density datacenters with large deployments in the order of ten thousand or more volume servers.

INDUSTRY STANDARDS

- Compact code requires minimum RAM
- Side-band manageability over NIC
- Support for IPMI 2.0 specification
- Support for DCMI 1.5 specification
- Support for Node Manager 4.0
- Partial out-of-band via NIC

SYSTEM INTERFACE SUPPORT

- Event Log (SEL)
- Sensor Support
- Detailed System Information, including SDR Repository and FRU Information
- Health Monitoring, Watchdog
- Timer, LAN Alerting, Event Generation, Serial over LAN

REMOTE MANAGEMENT

- Remote Power Control: Reset, Power On/Off, Power Cycle, Graceful Shutdown
- Remote Management Control Protocol with Encryption and Enhanced Authentication

CUSTOMIZATION

- Supports MegaRAC® DS Development Studio with "Drag and Drop" Interface for Sensors

CONFIGURATION

- PDK (Platform Development Kit) for OEM Extensions and Customization
MEGARAC® CM-X CHASSIS MANAGEMENT SOLUTION

The MegaRAC CM-X Chassis Management Firmware Solution implements and is fully compliant with the Open Blade Architecture System Management Specification from the Server System Infrastructure (SSI) Forum, an industry organization promoting design guidelines for blade chassis components and interfaces. This group, which aims to expand the product offering available in the market at a price point that appeals to small and medium-sized businesses (SMBs), gathers support from major industry players such as Asus, Dell, Intel, Quanta and SuperMicro, among others.

MegaRAC CM-X is a robust Linux®-based management stack, including an embedded web server. This solution enables the discovery, health monitoring and management of all modules inside the blade chassis, including compute blades, Baseboard Management Controllers (BMCs), I/O modules, power supplies and cooling devices.

Discovery is based on universal, standard protocols, such as UPnP, RMCP Ping, SNMP, SLP and WS-Discovery. Management of the chassis components is based on AMI's own MegaRAC Service Processor (SP-X) firmware stack and the IPMI 2.0 protocol. MegaRAC CM-X supports the Distributed Management Task Force (DMTF) management standards for interoperability, such as the Common Information Model, WS-MAN for management through web services and SMASH-CLP for text line console and scripting.

MegaRAC CM-X relies on a robust 10/1000 Ethernet vLAN, a private network internal to the chassis for communication between the CMCs and the IMC/BMC within each blade. Virtual BMC technology provides the chassis manager with faster access to blade FRU information. MegaRAC CM-X also features optional support for two redundant chassis management modules in an active-passive fail-over configuration.

This means that one management unit is active all the time, while the second unit, in stand-by, is ready to take service in case of failure of the primary CMC. A Consolidated Chassis Event Log (CEL) registers events for all processor blades and other modules.

MegaRAC CM can be easily customized and extended with AMI’s Integrated Development Environment (IDE) for management, MegaRAC Development Studio (DS), based on the widely-used Eclipse® IDE. MegaRAC DS includes Visual Web Developer (VWD), Software Development Kits for CIM, SMASH and WS-MAN software development and an IPMI PDK for the graphical layout of platform sensors.

Chassis Management

Management functions of MegaRAC CM-X include:
- Power and cooling management
- Chassis initialization
- Blade authentication
- Blade presence hardware detection
- Blade state management
- New blade discovery events
- New Chassis Management Controller(CMC) initialization
- Failover support (optional)
MEGARAC® SOLUTIONS FOR INTEL® RSD

Intel® Rack Scale Design is an open framework that defines the standards for composing logical servers from disaggregated pools of storage, network and compute resources. MegaRAC Rack Scale Design Solutions enable high efficiency for building, managing and improving cloud infrastructure in a software-defined data center. These solutions are fully compliant with Intel Rack Scale Design and DMTF Redfish standards. Included are the fully integrated Pooled System Management Engine (PSME) firmware solutions and the MegaRAC® Composer™ Pod Management Software.

MegaRAC PSME firmware solutions are hardened, production worthy and tightly integrated to function with the MegaRAC manageability firmware stack used by nearly every ODM and within most hyper-scale data centers. These solutions can be deployed in a single image to the popular (BMC) service processors, but are also configurable to run stand-alone on x86 or other architectures, and with custom OEM manageability firmware stacks.

MegaRAC PSME solutions can not only run on compute nodes integrated with the server BMC, but also on Chassis or Rack Management Modules or they can run as a Container under the Pod Manager. These solutions all work under a Redfish Framework, making it easy to add extensions, such as Fabric Management.

KEY FEATURES

• Integrated design within management controller firmware on RSD hardware unit
• Rack Scale intelligence built out of OxM server hardware
• Out-of-band manageability
• Fail-safe architecture with failover design
• Lower TCO in the datacenter
• Flexible rack design due to compliance with industry standards

A Proven Approach

AMI has built a unique value proposition for OEMs and ODMs with its Intel® Rack Scale Design (RSD) solution offerings. The MegaRAC RSD product line enables OEMs and ODMs to build fully integrated, out-of-the-box, out-of-band, fail-safe Rack Scale solutions. Through its state-of-the-art, industry-leading MegaRAC product line, AMI can offer the best in class, most robust RSD solution - together with a solid support model, one that our OxM customers have relied on for decades.
MEGARAC® FP-X FABRIC MANAGEMENT SOLUTION

MegaRAC FP-X Fabric Management Firmware from American Megatrends (AMI) is a powerful firmware/software solution combining the complete functionality to support fabric management, like PCIe switch management and NVMe/drive management, with that of a baseboard management controller (BMC).

A key aspect of MegaRAC FP-X is its inclusion all of the BMC management tasks as defined by Redfish™ and IPMI 2.0, along with Serial over LAN (SOL), complete out-of-band (OOB) connectivity, an extensive web UI and an advanced component management framework to support PCIe Switch based management, NVMe support, RAID/IT support and support for industry-standard drivers.

For remote access to fabric management tasks, MegaRAC FP-X provides a secure embedded web server. It also features Secure-Shell (SSH)-based SOL for remote access, in addition to standard IPMI-based SOL. MegaRAC FP-X support is available on all of the advanced System-On-Chip (SoC) devices from the industry’s leading manufacturers.

MegaRAC FP-X firmware provides a high level of modularity, with the ability to easily configure the complete firmware / software stack by selecting and deselecting features that are available in package form. Many stack components and OEM-level changes can be completely customized and enhanced using MegaRAC® Development Studio (DS), an Eclipse™-based Integrated Development Environment (IDE) for server management that gives developers the ability to customize the stack, build and debug all at once.

KEY FEATURES

- Linux® Development Kit (LDK)
- Support for IPMI, including LAN and serial interface support
- Component Manager: features RAID, SAS/IT support and complete PCI switch management API
- NVMeMI with I2C and MCTP/I2C
- PCI Root Complex support
- Admin-level NVMe drive management via PCI-Express (PCIe) standard
- Web UI now updated with PCI Switch Management, NVMeMI and drive management capabilities
- Remote update capability for BMC and drive firmware

FP-X TECHNOLOGY PACK

- Redfish™ 1.1 support
- Intel® RSD 2.1 support
- MegaRAC® Composer™ Pod Management Software
MEGARAC® COMPOSER POD MANAGEMENT SOFTWARE

Developed to be fully compliant with Intel® Rack Scale Design, MegaRAC Composer™ is a hyperscale pod management software solution that allows users to browse physical configurations of compute, network and storage resources at the rack, chassis, and system level through an intuitive web-based user interface. Administrators can then assign and compose those physical resources to create a logical node, which provides the advantage of demand-driven dynamic scaling to optimize datacenter resource utilization.

MegaRAC Composer also allows for the composition of physical resources based on templates, which can then be stored and reused as a time-saving feature. In addition, MegaRAC Composer gives users the ability to power on, force off, and gracefully shutdown composed nodes.

BENEFITS

Developing with Intel® Rack Scale Design makes it possible to configure hardware to closely match the needs of the software. The MegaRAC Composer interface simplifies the process of configuring hardware workflows by presenting a visual representation of the available hardware. MegaRAC Composer also sends alerts to the operator when it detects poor resource allocation, based on usage and slowdowns. It can also offer alternate recommendations for the allocation of resources.

MAIN FEATURES

- Compliant with Intel® Rack Scale Design v1.2
- WebUI dashboard for hierarchical view
- Logical node composition based on payload templates
- Node provisioning through PXE server

POWER OPERATIONS

- Restore composed node resources on PSME power cycle

WEB USER INTERFACE DASHBOARD

- Composed nodes summary
- Chassis collection summary
- Systems summary
- Critical alerts
- Critical events

PROVISIONING PROCESS

- Physical resource allocation
- Logical node assembly
- Node provisioning
MEGARAC® PM-X IPMI FIRMWARE SOLUTION

MegaRAC PM-X is a highly compact IPMI 2.0 and DCMI 1.5 firmware designed to support the Innovation Engine (IE) from Intel®. This firmware solution enables hardware manufacturers that leverage Innovation Engine to create a comprehensive yet essential manageability solution without adding any glue-logic, SDRAM or other hardware components other than a NIC on the server board.

MegaRAC PM-X is the next generation of compact firmware, which leverages MegaRAC’s well-vetted IPMI stack used by OEMs and ODMs for over a decade. MegaRAC PM-X is fully compliant with the IPMI 2.0 and the DCMI 1.5 specifications. DCMI 1.5 defines a simplified superset of frequently used management commands which introduces powerful management features. By offering support for these specifications, MegaRAC PM-X meets the needs of high density datacenters with large deployments in the order of ten thousand or more volume servers.

INDUSTRY STANDARDS

- Compact code requires minimum RAM
- Side-band manageability over NIC
- Support for IPMI 2.0 specification
- Support for DCMI 1.5 specification
- Support for Node Manager 4.0
- Partial out-of-band via NIC

SYSTEM INTERFACE SUPPORT

- Event Log (SEL)
- Sensor Support
- Detailed System Information, including SDR Repository and FRU Information
- Health Monitoring, Watchdog
- Timer, LAN Alerting, Event Generation, Serial over LAN

REMOTE MANAGEMENT

- Remote Power Control: Reset, Power On/Off, Power Cycle, Graceful Shutdown
- Remote Management Control Protocol with Encryption and Enhanced Authentication

CUSTOMIZATION

- Supports MegaRAC® DS Development Studio with “Drag and Drop” Interface for Sensors

CONFIGURATION

- PDK (Platform Development Kit) for OEM Extensions and Customization
MEGARAC® DS DEVELOPMENT STUDIO

AMI is strongly focused on providing OEMs with best-in-class tools that empower them to design high performance, IP-rich solutions that deliver a clear difference to end-users, while minimizing time to market (TTM). Leveraging MegaRAC® modular architecture, AMI designs tools maximize code reuse, while intuitive graphical interfaces and rich libraries speed up the work of porting engineers, for reduced development cost and duration.

The MegaRAC DS Development Studio is a graphical Integrated Development Environment (IDE) specifically designed to develop and customize the management structure and visual interface for servers integrating the latest generation of MegaRAC Service Processors.

MegaRAC DS offers a number of tools and innovations designed to facilitate platform porting, to provide developers a number of important benefits.

SUSTAINED RETURN ON INVESTMENT

The plug-in structure enables easy addition of tools supporting future technologies and standards. Developers benefit from familiarity with the interface and development methods in MegaRAC DS.

EASE-OF-USE AND FUNCTIONALITY TO IMPROVE TTM

A wealth of purpose-designed tools and wizards support developers in the coding of complex management structures, including CIM and SMASH, which all contribute to the single goal of speeding Time to Market (TTM).

HIGH DEGREE OF CODE RE-USABILITY

All platform information is stored in Device Description and Configuration files and can be easily retrieved and edited for reuse with different platforms.

WIDE USE OF STANDARDS SUCH AS ECLIPSE AND XML

XML is employed to enable a flexible hierarchical representation of data, which is suitable for describing complex structures in a nested fashion.

USES PLUG-INS FOR FEATURE-BASED LICENSING

MegaRAC DS boasts an extensive repertoire of plug-ins that enable a robust feature-based licensing model, including:

- Web Development (WDP)
- Sensor porting and customization (PMCP)
- Sensor Simulation - PMCP Simulator
- CIM Profiles Development - CIM SDK
- SMASH Profiles - SMASH SDK
- MegaRAC SP-X Project Configurator
- MegaRAC SP-X Builder
- MegaRAC SP-X Package Creator

Universal Customization

AMI customization tools are available for AMI or third party IPMI firmware.
AMI BACKPLANE CONTROLLERS

The Backplane Controller series from AMI provides LED and sensor control for SAS/SATA/NVMe drives. They provide exceptional flexibility and require minimal board real estate, making them a perfect fit for numerous applications.

A wide choice of reference designs and development tools are available, along with development boards to speed integration in specific OEM designs. AMI’s Backplane Enclosure chips work with any HBA supporting SGPIO (SFF-8485) and/or SES-2 protocol over I2C. These Backplane Controllers can be flashed or upgraded via SMBus from the motherboard BMC, or USB, depending on the model.

MEGARAC BACKPLANE CONTROLLER FEATURES

<table>
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<tr>
<th>Drives</th>
<th>8 NVMe/SAS/SATA</th>
<th>8 SAS/SATA</th>
<th>8 SAS/SATA</th>
<th>8 SAS/SATA</th>
<th>6 SAS/SATA</th>
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</table>

MG9098 CONTROLLER

- Ultra-compact ASIC design for high performance, low latency NVM Express™ backplanes
- Low cost, true single-chip solution supports up to 32 NVMe/SAS/SATA drives with small QFN-64 package (9mm x 9mm pin outline)
- Hot-plug support with Host Hot-Plug SMBUS aka VPP
- Firmware Upgradable through SMBUS
- Diagnostics and FW upgrade tools for most OSes

MG9094 CONTROLLER

- Ultra-compact ASIC design with the latest features
- SGPIO, IBPI and BMC SMBUS support
- Drives 2 LEDs for up to 8 slots
- SMBUS Firmware Upgrade capability
- Cascade Support for up to 32 drives
MG9081 CONTROLLER
- Supports eight SAS/SATA drives - Scalable configuration up to four chips per bus
- 2 SGPIO / 1 SES-2 channel(s), for up to 8 drives
- IPMI Support
- USB/IPMI Firmware Upgrade
- Cascade Support - up to 32 drives

MG9082 CONTROLLER
- Manage Drive Activity, fail/rebuild and locate LEDs for up to 8 SAS/SATA drives
- Cascade multiple chips to support up to 32 drives
- Drive up to 16 LEDs or up to 24 LEDs through latches; drive up to 18 LEDs directly for 6 drive servers
- Asynchronous handling of 2 SGPIO SFF8485 interfaces
- IBPI (SFF8489) support

MG9085A CONTROLLER
- SGPIO and SES-2 over SMBUS support
- Manage 2 LEDs for up to 6 slots / 3 LEDs for 4 slots
- Improve TTM with AMI’s 996 development board
- Provides drive activity, fail/rebuild and locate signals
- Compact, space-efficient TQFP-48 package (9mm x 9mm)

MG9087 CONTROLLER
- 2 SGPIO / 1 SES-2 Channels for up to 8 drives
- SMBUS Connection to BMC
- USB/SMBUS Firmware Upgrade capability
- Compact, space-efficient TQFP-48 package (9mm x 9mm)
- Cascade Support for up to 32 drives
APTIO® V UEFI FIRMWARE SOLUTION - BEYOND BIOS

A complete Unified EFI (UEFI) solution representing the future of platform firmware, calling on over two decades BIOS experience.

FIRMWARE COMPONENTS

Aptio core drivers and modules conform to the UEFI specification and beyond, providing support for key industry standards and technologies. The Compatibility Support Module (CSM) enables full software compatibility with legacy BIOS.

DEVELOPMENT AND SUPPORT TOOLS

- AMI Firmware Update (AFU) is a scriptable command line utility for DOS, Microsoft Windows®, Linux®, FreeBSD and the UEFI shell. It programs the main BIOS image, boot block or OEM configurable ROM regions.
- ChangeLogo allows developers to easily change and extract logos displayed by Aptio at boot, via the GUI or CLI.
- DMIEdit is a scriptable command line utility for DOS, Microsoft Windows®, Linux® and the UEFI shell that enables customers to embed platform serial numbers, UUID and license keys into the SMBIOS table.
- MMTool allows developers to manipulate Option ROMs and the UEFI DXE drivers embedded in an Aptio ROM image to extract, replace and insert these binary components via the GUI or CLI.
- AMIBCP enables customers to modify parameters in a BIOS ROM without rebuilding from source, including default values for BIOS setup, default boot order, sign-on/setup strings, and SMBIOS string data.
- AMISDE is a CLI tool for exporting BIOS setup parameters and default values from an Aptio ROM image to enhance productivity in testing and manufacturing.
- AMISLP allows the insertion of Microsoft System Locked Pre-Installation (SLP) key files into the BIOS image. SLP keys are used for OEM activation of Microsoft Windows®.
- AMISCE is a command line tool which provides an easy way to extract and update NVRAM variables, allowing for their modification via a text editor or setup program.
- AMIUCP is used to pre-configure the Aptio Flash Utility by exchanging the default command string and ROM image in AFU to create a custom version.

APTIO® TEXT SETUP ENVIRONMENT (TSE)

- Configurable setup look and feel with OEM hot key capability
- POST message display with OEM boot logo support
- Save/restore user configuration, optimal/failsafe default configuration
- Complete remote console support (using standard UEFI console).

APTIO® GRAPHICAL SETUP ENVIRONMENT (GSE)

- Drop-in replacement for the Aptio Text Setup Environment (TSE)
- Supports keyboard, mouse and touch screen interfaces
- Equivalent to standard BIOS setup with full UEFI compatibility

The UEFI Ecosystem

UEFI defines a standard driver execution model to initialize and manage each component of the platform, allowing independent hardware vendors to develop UEFI drivers that initialize and manage their hardware parts.

Broad Processor and Chipset Support

AMI partners with the world’s premier processor manufacturers to ensure support for nearly all upcoming processors and chip sets for mobile, desktop and serve platforms.
VISUAL EBIOS (VEB) FOR WINDOWS® AND LINUX®

Visual eBIOS (VeB) is an Eclipse-based porting and project management application specifically created for product-strength firmware development. VeB provides an advanced graphical environment to speed firmware development, based on its ability to manage, group, and graphically represent logically-related drivers and modules as components. It features tools such as its PCI Wizard to make PCI device configuration and IRQ routing simple.

- Built-in editor with context-sensitive help
- Graphical representation of PCI IRQ routing
- Project management and source control integration
- Integrated Help builder
- Integrated Development Environment (IDE) designed specifically for firmware development

AMIDebug™ FOR UEFI

AMIDebug™ for UEFI eases software development by enabling precise debugging of UEFI source code through a graphical interface. Performs many of the functions of an expensive in-circuit emulator for a fraction of the cost. AMI Debug for UEFI works with Aptio firmware or UEFI drivers and applications to address the two main phases of the Framework: Pre-EFI Initialization (PEI) and Driver Execution Environment (DXE).

- Source-level UEFI code debugging
- Modular, easily included in any project
- UEFI compliant
- IA32 and x64 support
- Works as a standalone program, or integrates with VeB
- Host/Target configuration via serial or USB 2.0 port
- Functionality similar to hardware-based development tools
- PEI and DXE debugging
- SMI Debugging
- Serial and USB interface support
- Also works with AMI’s innovative USB debug product, AMIDebug™ Rx
- Improved target ROM footprint
- Supports Aptio UEFI applications and UEFI drivers

AMI PROVISIONING™

A set of graphical UEFI pre-boot applications (PBA) that simplify system maintenance and configuration

- Replaces the “recovery DVD” included with the computer system
- Launches system diagnostics when the OS cannot boot (for field service or RMA)
- Updates platform firmware from a web or FTP image without booting to the OS
- Supports keyboard, mouse, pen and touch-based input
AMIDiag™ FOR UEFI

AMIDiag® for UEFI is the only comprehensive diagnostic program for UEFI on the market that does not require any dependence on legacy BIOS. AMIDiag for UEFI supports Aptio or Tiano environments, as well as BIOS environments with EDK DUET support. Because all diagnostics are performed directly on the hardware, without the interference of device drivers or interfaces that may alter or hide certain hardware, UEFI-based diagnostic testing provides more reliable and secure test results than OS-based alternatives.

- Supports the latest CPUs from Intel® and AMD, including Intel Core™ i3, i5 and i7, Xeon™, and Atom™ products
- Comprehensive and complete set of hardware diagnostics, including:
  - System CPU and Memory (including multiprocessor systems)
  - Hard Disk Drive and Mass Storage Devices
  - CD / DVD and other Peripherals
  - Keyboard, Video and Mouse
  - Network Interface
  - Standard Protocols such as SCSI, PCI, USB, ACPI and TCP/IP
  - Run integrated with BIOS ROM or as a standalone program
  - Support for IA32 and x64 platforms
  - Support for UEFI-compliant AMI firmware and third-party hardware drivers for device-specific testing
  - Fully integrated with Visual eBIOS
  - Condensed, Scripted, and Batch mode testing
  - Single and Multiple Cycle Batch testing
  - Test Progress Status - Test results logged to viewable / exportable file
  - Customizable log file
  - Exportable configuration summary

AMIDiag for UEFI is based on AMI's award-winning AMIDiag diagnostics, highly regarded in manufacturing, development, testing and repair. AMIDiag for UEFI benefits computer manufacturers, design engineers, technical support personnel, repair technicians and end users alike. AMIDiag is an unbeatable tool for automating the testing process in manufacturing and burn-in, with a variety of execution options.

Innovative features in AMIDiag for UEFI include a batch mode for cycles of repeated testing to implement robust burn-in procedures. The user can also specify the ordering of test execution, set a “wait on error” option that requires user intervention, or instruct the program to stop on an error, along with configurable interactive flags. The Quick Test Mode allows for abbreviated versions of tests, for complete system testing in shorter time. AMIDiag for UEFI includes scripting capability and all errors can be logged and analyzed.

AMIDiag for UEFI also now has the ability to be embedded directly into the BIOS ROM - a powerful feature which can add value and increased functionality to the BIOS. This means that AMIDiag for UEFI can be launched from ROM rather than from external storage, making the diagnostic always available to technicians and end users - even when the system hard disk has failed.
AMIDebug™ FOR UEFI

AMIDebug™ for UEFI is a powerful solution for debugging UEFI projects, offering source-level debugging without the need for an expensive in-circuit emulator (ICE). Using standard RS-232 or USB 2.0 cables, developers have access to source-level debugging and control the debug target hardware through a GUI application for Microsoft Windows®. The latest version of AMIDebug for UEFI is now directly integrated into the Visual eBios (VeB) development environment, allowing developers unprecedented flexibility and convenience to speed up debug and TTM.

AMIDebug for UEFI works with AMI’s Aptio®, projects based on the “TianoCore” EFI Development Kit (EDK) or any UEFI Shell application. Aptio and “TianoCore” developers can debug at the firmware level, while application and driver developers can invoke debugging features at the shell without the need to embed modules in the ROM image. AMIDebug for UEFI provides functionality similar to hardware-based development tools, including:

- Source-level symbolic debugging
- View and edit variables of all types
- Step into / over source or disassembled code
- Trace through code
- Command, Local and Global variables windows
- View and edit any CPU register
- Set, clear, enable and disable breakpoints
- Preserve breakpoints between executions
- View and edit target memory and I/O

Designed for UEFI

- Supports IA32 and x64 build targets
- Multi-function debug plug-in leveraging Microsoft WinDBG interface
- Modular, easily included in any project
- Can be embedded in target firmware or launched from EFI Shell
- Multiple host/target hardware interfaces, including serial and USB
- Debug DXE drivers over any interface
- Debug PEIM & SMM using RS-232 & USB 2.0 Debug Cable interfaces
- Optimized for smaller ROM footprints
- Support for Aptio & “TianoCore” EDK
- Functionality similar to hardware-based debug tools with no specialized hardware requirements
- Redirect remote text console and debug messages via debug transport
- Works with AMIDebug Rx
APTIO® 4

AMI provides scalable BIOS solutions for everything from embedded computing platforms to mission-critical servers. Aptio 4 utilizes Visual eBIOS (VeB), a Windows®-based development environment that dramatically reduces the engineering resources required to build a customized BIOS solution.

ARCHITECTURE

• eModules: true modular BIOS components
• Table driven post
• Single link architecture
• Simplified directory structure, organized by component type

VISUAL EBIOS (VEB)

• Integrated Development Environment (IDE) designed specifically for firmware development
• Built-in editor with context sensitive help
• Graphical representation of PCI IRQ routing
• Project management and source control integration
• Integrated help builder

PROCESSOR AND CHIPSET SUPPORT

Aptio CPU eModules are available for a variety of Intel, AMD and VIA processors. Chipset support is under development for manufacturers such as AMD, Intel, NVIDIA, SiS and VIA. Please contact an AMI sales representative for more information.

APTIO UTILITIES

Aptio source code comes with a complete set of customization utilities for optimum platform design, including the AMIDebug™ BIOS debugger, which provides economical functionality similar to an in-circuit emulator and connects over serial or USB cable for easy configuration.

AMIDEBUG™ FOR APTIO

AMIDebug enables developers to define breakpoints and viewpoints, debug interrupt hardware routines and SMI code, as well as eliminate errors in BIOS Run Services. The host/target configuration can be realized via serial or USB 2.0 debug port, while the addition of a MegaRAC® remote access controller enables all of these operations to be performed from anywhere.

APTIO CONFIGURATION PROGRAM (AMIBCP)

AMIBCP enables system manufacturers to customize BIOS parameters in the ROM image via hard disk or other storage media without rebuilding the BIOS.
AMI PROVISIONING™

AMI Provisioning™ integrates firmware configuration and updates, hardware diagnostics and pre-OS applications in a Unified EFI (UEFI) environment. Combined with Aptio® firmware and AMIDiag™ diagnostics, it greatly simplifies system maintenance and setup. It also replaces the “recovery DVD” with an always available pre-boot management tool that can be executed from the BIOS flash ROM, NAND flash, on-board USB, protected disk partitions and proprietary storage. Additionally, AMI Provisioning allows for simple customization of the pre-OS environment, so developers can replace the standard BIOS look and feel with proprietary branding.

Move away from text-based applications to an intuitive graphical interface and make system diagnostics readily available to the user. Take advantage of UEFI standards to create a framework for integrating new applications that leverage the same GUI and customized themes. Execute BIOS and firmware updates in pre-boot to eliminate OS compatibility issues and enable recovery and full system tests even when the OS cannot boot.

HIGHLIGHTS

• Runs from UEFI pre-boot or UEFI Shell
• Built on AMI Graphical Execution Environment (GEE) technology
• Replaces the “recovery DVD” included with the computer system
• Launches system diagnostics when the OS cannot boot (for field service or RMA)
• Updates and manages platform firmware from a web or FTP image without booting to the OS
• Integrate tests from AMIDiag™ for UEFI
• Can easily be expanded with AMI system recovery and rescue applications, as well as OEM and third-party applications

KEY FEATURES

• UEFI 2.x (IA32 & x64)
• Multiple options to customize the look and feel of the setup interface
• Multi language support
• Context sensitive help
• Network support: CIFS / NFS / FTP / HTTP
• Verify digital signatures to avoid using “tampered” updates
• Firmware Update for all firmware components
• Can update from local file, network share, HTTP or FTP
• Verify the authenticity and compatibility of firmware image
• Smart Battery Management: SMBUS interface for smart or control method batteries
• OEM Customizations
• Broad Hardware Support for all major manufacturers
BIOS UTILITIES FOR UEFI AND LEGACY BIOS

Aptio and AMIBIOS®8 source code come with a complete set of customization utilities for optimum platform design. The AMI Debug BIOS debugger provides functionality similar to an in-circuit emulator at a fraction of the cost, and connects over serial or USB cable for easy configuration.

CHANGELOG

ChangeLogo allows OEM customers to update an existing BIOS logo (splash and small logos) module with a new graphic file; supported formats include AMI, BMP, JPEG and PCX. The utility can also save the original logo in a separate file.

MMTOOL

The BIOS modules contained in an AMIBIOS8 ROM file can be easily managed with MMTool. Developers can insert or extract BIOS modules from the ROM image.

- Insert, Replace, Extract, Delete Module
- Display ROM and NCB Information, display and change ROM Hole content
- Edit CPU Micro Code Patches module

AMISCE

AMISCE is an editor utility for configuration migration and replication. It produces a script file listing all existing BIOS Setup Questions in the host, which can be modified and used to change the BIOS setup values.

- BIOS SETUP values can be edited under operation system by TEXT script file
- Display, save and restore current CMOS contents

AMIUCP

The AMIUCP utility enables developers to configure default behavior of the AMI Flash Utility (AFU), including default flash parameters, the addition of OEM strings, the ability to attach ROM files to the flash utility and more.
AMIDEBUG™ RX

AMIDebug™ Rx is a low-cost handheld debug tool that uses the debug port feature common to today’s USB 2.0 EHCI controllers. AMIDebug Rx is an economical and sensible replacement for the PCI “POST Checkpoint Card” which is becoming less useful in the PC market as newer systems omit the traditional PCI expansion slot.

Perfect for today’s embedded and netbook platforms, this product is targeted at BIOS developers, power users, quality assurance labs and service technicians. Diagnosing small form factor platforms with AMIDebug Rx is non-intrusive, allowing technicians to access checkpoints without opening the case.

AMIDebug™ Rx replaces the POST checkpoint card’s traditional 7-segment LED with a small LCD screen, providing the ability to display more descriptive debugging messages.

KEY FEATURES AND HIGHLIGHTS

• Provides a low-cost alternative to the PCI “POST Checkpoint Card”
• Very useful for platform development or field diagnostics
• Device records checkpoints, UEFI debug messages and timing data for measuring boot performance
• Session data can be captured and stored to one of four “sessions” for later review
• Display descriptive text for each checkpoint: based on AMIBIOS8, Aptio 4.x or a user-provided string table
• AMIDebug™ Rx protocol can be ported into existing AMIBIOS8 and Aptio 4.x BIOS projects
• Works with AMI Debug for UEFI™ to enable source-level BIOS debugging
• Designed for BIOS developers, quality assurance testing and field diagnostics

Handheld Debug via USB

• Low-cost device for development or field diagnostics
• Works with AMIBIOS®8 & Aptio® 4.x firmware
• Powerful debug tool based on USB 2.0 standards
• Features LCD display and simple user interface
• Supplement BIOS POST Codes & UEFI Status Codes with descriptive diagnostic strings
• Store debug data in onboard memory for later use
• Works with AMI Debug for UEFI™ for source level debugging
IOT SOLUTIONS FROM AMERICAN MEGATRENDS

AMI has many years of experience working with OEMs/ODMs and is well-positioned to assist customers in creating the IoT solution they envision. AMI has built a large library of support for sensors, chips, connectivity, RTOS and cloud communication to enable quick development.

IOTBRIX

IoTbrix is a cloud-based IoT firmware development environment that allows developers with little programming experience to create comprehensive IoT solutions centered around their specifications. This solution is a powerful and easy-to-use tool that can create IoT firmware on various silicon platforms.

The IoTbrix interface consists of simple drag-and-drop chips, sensors, actuators and similar components that can be used to bring IoT projects to life in a web-based designed workspace. Users drag and drop the necessary components to their projects, connect the leads by clicking on pinouts they want to use and IoTbrix does the rest by generating the firmware and the code.

The IoTbrix firmware lowers the barriers of entry for everyone because it makes it easy to create customized IoT solutions, quickly create prototypes and take the prototypes to production - coding free.

Key IoTbrix Facts:

- Drag and drop, no coding required
- Cloud-based, nothing to install, always up-to-date
- Intuitive interface
- Manage project settings
- Ability to view source code
- SoC, sensor and actuator library
ANDROID™ AND MOBILE APPLICATION DEVELOPMENT

AMI’s vast experience in mobile platforms led to the creation of a new division - the Mobile Application Group (MAG) - which is at the forefront of AMI’s application development and support activities for clients in the mobile technology space.

Mobile technology is one of the fastest-growing areas of business interest and revenue generation, and many companies are increasing the strength and capabilities of their mobile development teams to tap into the opportunities presented by the expanding mobile work force.

AMI, a leader in BIOS and computing innovations, has been involved in the development of mobile technology for several years, supporting many key customers worldwide in alignment with their business goals. AMI’s vast experience in mobile platforms has provided the impetus to establish a new division within AMI - the Mobile Application Group (MAG) - to spearhead the company’s efforts to expand in the mobile technology space.

AMI’s Mobile Application Group (MAG) focuses on the development of mobile and cloud-based solutions for various mobile platforms. The MAG team is primarily focused on developing everyday Android™ and Windows® applications useful to typical mobile users, such as an Enterprise Email Client, Travel Companion software, and similar tools.

AMI’s MAG Division also supports mobile platform OEMs by providing various solutions and value-added services such as board support packages, device driver development and boot loaders. Finally, the MAG Division also provides custom application development for mobile platforms for OEMs and the secondary market.

Contact an AMI Sales Representative at 1-800-828-9264 to get the conversation started and learn more about how AMI’s MAG Division can support your mobile application development goals.

Design Services

American Megatrends has been providing superior hardware, software and ASIC design solutions for its customers worldwide since the company’s founding in 1985. Thanks to its long history of innovation and industry leadership, AMI understands perfectly how to design superior products for maximum results in minimum time.

For more information about the wide range of Design Services available from American Megatrends, including System Design for Hardware, ASIC, FPGA, Software and Firmware Solutions, IP Core Development, Turnkey ASIC Chip Development, Closed Loop Services including Design, Simulation, Verification, Validation, Synthesis and Timing Closure, Design Customization Support and more, please contact the AMI Sales Department so an AMI Sales Representative can explore your Design Services needs with you in detail.
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