Regional Service & Customization Centers

China
Kunshan
86-512-5777-5666

Taiwan
Taipei
886-2-2792-7818

Netherlands
Eindhoven
31-40-267-7000

Poland
Warsaw
48-22-33-23-740 / 741

USA
Milpitas, CA
1-408-519-3898

Worldwide Offices

Greater China

China	800-810-0345
Beijing	86-10-6298-4346
Shanghai	86-21-3632-1616
Shenzhen	86-755-8212-4222
Chengdu	86-28-8545-0198
Hong Kong	852-2720-5118
Taiwan	0800-777-111
Rueiguang	886-2-2792-7818
Yang Guang	886-2-2792-7818
Xindian	886-2-2218-4567
Taichung	886-4-2378-6250
Kaohsiung	886-7-229-3600

Asia Pacific

Japan	0800-500-1055
Tokyo	81-3-6802-1021
Osaka	81-6-6267-1887
Korea	080-363-9494
Seoul	82-2-3663-9494
Singapore	
Singapore	65-6442-1000
Malaysia	1800-88-1809
Kuala Lumpur	60-3-7724-3555
Penang	60-4-397-3788
	60-4-397-4188
Indonesia	
Jakarta	62-21-769-0525
Thailand	
Bangkok	66-2-248-3140
India	1800-425-5070
Bangalore	91-80-2337-4567
Australia	1300-308-531
Melbourne	61-3-9797-0100
Sydney	61-2-9476-9300

Europe

Europe	00800-2426-8080
Germany	
Münich	49-89-12599-0
Hilden	49-2103-97-885-0
France	
Paris	33-1-4119-4666
Italy	
Milano	39-02-9544-961
Benelux & Nordics	
Breda	31-76-5233-100
Roosendaal	31-165-550-505
UK	
Reading	44-0118-929-4540
Poland	
Warsaw	48-22-33-23-740/741
Russia	8-800-555-01-50
Moscow	7-495-232-1692

Americas

North America	1-800-866-6008
	1-888-576-9668
Cincinnati	1-513-742-8895
Milpitas	1-408-519-3898
Irvine	1-949-420-2500
South America	
Mexico	52-55-6275-2777
Brazil	0800-770-5355
São Paulo	55-11-5592-5355

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More Information

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Next Generation AdvancedTCA Solutions

Accelerating Network Platform Evolution with ATCA Blades, Systems and Services

- AdvancedTCA Systems
- AdvancedTCA Blades
- AdvancedMCs
- Fabric Mezzanine Modules
- Design & Integration Services
- Global Services

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Empowering Breakaway ATCA Innovation

Advantech provides business critical hardware to the world's leading networking equipment providers and telecom equipment manufacturers.

Our standard and customized products are embedded in OEM equipment that the world's datacommunications network and telecommunications infrastructure depend upon.

Table of Contents

History

Advantech was founded in 1983 and has become the world's largest embedded manufacturer with a turnover of nearly 1B US$ thanks to the global trust placed in us by our customers. Advantech Networks & Communications Group began AdvancedTCA development in 2006 and now serves many of the world's leading networking OEMs with standard and customized ATCA blades, as well as fully integrated systems.

AdvancedTCA at Advantech

Advantech's ATCA business has grown significantly since the introduction of our Intel® Xeon® 5500 series blades in 2009 and we now offer a solid portfolio of products designed, manufactured and wholly owned by Advantech, augmented by specialized integration capabilities to meet the stringent needs of business critical networking applications.

Our Customers

Our closest customers are network and telecom equipment providers targeting a broad range of markets where performance, flexibility and scalability are fundamental to maintaining their technology leadership. They know they can gain outstanding time-to-market advantages by embedding Advantech blades and systems in their products. This drives the evolution of their systems in response to rapidly changing customer needs in fast-evolving networking markets.

In concert with our ecosystem partners we enable our customers with early access to the latest technology which accelerates their next generation product designs. It allows them to apply new technology sooner to gain first mover advantage and leapfrog competition.

For some OEMs, we are an integrated extension of their R&D team. For others we actually are their R&D team. In fact we're also their global logistics operation. Imagine how that can scale for you.

Our ATCA design teams partner with the world's smartest silicon and mechanical experts to design and build blades, boards and systems which reduce OEM equipment design cycles more than ever before. Through our close engagement with strategic software partners, OEMs can start developing and testing at the earliest possible stages.

Your Network Platform Innovation Partner

Enabling Industry Leading Solutions

Companies that provide market leading solutions have learned that working with smart partners who help them create value is one of the most critical contributors to continued leadership. Great partners provide expertise, access to technology and time-to-market benefits that every innovator can benefit from. Key to being a great partner is having the technology, products and resources that add value to the customer's solution. Also critical are development and manufacturing strategies that encourage innovation, delivering complex ATCA products uniquely tailored to the customer's needs without sacrificing the economy of scale offered by standard off the shelf products.

Advantech's broad range of products and services allows us to adapt to the level of integration and customization appropriate to each customer's requirements and business model. We provide the:

- FLEXIBILITY to differentiate your product with both Customized COTS and unique design impact
- SCALABILITY to future-proof your solutions to grow with market needs and accommodate new technology – the result is lower capital expense
- TIME TO MARKET leadership with a wide choice of standard products based on latest silicon from the world's most recognized vendors

"Our customers know they can rely upon our track record , openness and financial stability as a foundation for a strong partnership. We then add innovation, performance, flexibility and scalability into our products as the ingredients for long term success."

Franz Wei, Advantech VP R&D

Customized COTS: A Mass Customization Approach

All OEMs want to build uniqueness into their solutions. This especially holds true for high performance, powerful platforms such as ATCA. Advantech understands this need for differentiation and plans for it: our design, development, integration, logistics and manufacturing processes have been honed over the years to allow customers to choose the level of customization appropriate to their differentiation strategy. Advantech's approach is based on mass customization concepts adapted to standard ATCA platforms where:

- All solutions start with OEM-ready platforms that provide the foundation for customer solutions
- Base platforms are configured using COTS technologies for the customer's target markets such as reference systems and blades (x86, DSP, NPU, Switch)
- Application-specific customization and configuration of off-the-shelf building blocks are based on standard AMC products or Advantech's unique Fabric Mezzanine Modules (FMMs)
- Custom designed AMCs, FMMs and Rear Transition Modules (RTMs) provide the ultimate in differentiation

Advantech calls this approach Customized COTS. We start by using off-the shelf technology to personalize a system solution, and then customize its more modular elements to meet unique customer needs without the costly overhead of an entire ATCA blade redesign. In addition, our modular design approach to platform management software makes customer-specific changes simpler and easier to maintain. All this allows us to deliver tailored solutions that approach the cost-effectiveness, time-to-market advantages and low risk of off-the-shelf solutions whilst retaining the flexibility to apply ODM-like customization, 3rd party IP integration and branding.

The flexibility of our Customized COTS strategy enables a broader range of market and application specific systems topologies for our customers whilst offering the economies of scale of our standard building blocks. Even better, Advantech's strong commitment to its COTS product roadmap allows Customized COTS users to enjoy timelier technology upgrades at minimum cost.

ATCA System Integration Capabilities

Bringing It All Together

Teamwork

By establishing a close relationship with our customer's team based on trust and mutual understanding, we create a highly collaborative environment which is essential for the success of complex system level programs.

Advantech System Integration Services Team

Advantech's ATCA Systems Integration Team (SIT) unites products engineered by our own hardware and software designers with trusted and tested ecosystem partner building blocks. Our customer focused architects work closely with networking and telecom OEMs to design systems from pre-tested ATCA elements with proven product interoperability. As technology evolves and markets move faster than ever, our integration teams facilitate the delivery of innovative solutions more rapidly to help network equipment OEMs overcome the capacity challenges they are facing and respond more effectively to ever increasing customer demand. By reducing project risk and complexity at the system level, our customers get to market faster and more affordably, with tested and dependable solutions. Moreover, Advantech's SIT covers the whole system life cycle, not just the engineering phase.

The Local Program Manager is your front line interface applying our engineering resources to your project . He's your main operational conduit to the Advantech team and organizer handling resources, schedule and budget. Based on system engineering inputs he'll claim and chase the resources. He facilitates the integration process and he's critical for the project timing.

The System Architect will work closely with your team on system concepts, requirements and feasibility. From the outset he will be helping make sure your system design does what its meant to do and help optimize costs. He oversees requirements and acts as a cross function engineer with all the involved parties – his knowledge also allows him to play the systems engineer and system integrator role as he's the overall guiding consultant. This role relates all the critical system performance parameters to design and to test and is the foundation of the integration schedule. Meeting your schedule is then a joint effort between the Local Program Manager and Systems engineering.

System Engineers deliver locally tested and working components, functions or subsystems. However, the responsibility of the engineers continues into the integration effort. They participate in integration tests, help in troubleshooting and consult with the Architect when needed.

Finally, the SIT is supported by a wealth of corporate resources that provide building block detailed knowledge to the last bit, covering behind-the-scenes logistics, administration and supply chain management. The SIT team will handle all the complexities to reduce your resource requirements and work like an extension of your own organisation to deliver quality product on time.

ATCA System Integration Services

Architecture Consulting	• System architecture, building block and software selection	Qualification	• Compliance and Certification testing • Internal, external or customer selected test houses
System Engineering	• Building block integration • 3rd party Software Integration • Validation • System Diagnostics and Configuration	Logistics	• Integration, Shipment, Stocking, Warehousing • RMA and Field Service
Customization	• Branding • Software, BIOS, Firmware, Bootloaders • Hardware Modification, Custom board design	Life Cycle Management	• Upgrade • Engineering Changer Order • End Of Life (Last time buy)

Main Project Phases

Project Engagement starts with a set of product needs and ideas, and results in a system that meets the customer's needs. The main project phases are:

Engineering Phase

During the engineering phase many activities take place: feasibility studies, requirements capturing, design, engineering, contracting suppliers, testing and so on. Work is decomposed into manageable sub-tasks for easier distribution and to allow concurrent execution. Then the subtasks are integrated again to obtain the desired result. Integration is an ongoing flow of activities which shifts over time. Early in the project, technologies or components are integrated, while at the end of the project, the final system is built and verified.

The first phase of a project is definition, where a dedicated System Architect works with the customer's team on ideas, requirements and feasibility. Later, a Local Program Leader participates in the System Architect's definition of specs and requirements. This results in a statement-of-work; the golden thread of all ensuing activities. If Advantech reference systems can 't be utilized as Proof of Concept platforms, such platforms are built early on so customers can start porting and evaluating fast. These units are an important part of the customer feedback loop during the definition phase.

Implementation is where the main system engineering work takes place. The integration and test activity here is where the team searches for unknowns and resolves uncertainties. Testing is the activity where they operate a system or a part of it in a predefined manner and verify its behaviour. A test passes if the result fits the specified behaviour and performance, otherwise it fails.

When ready, the systems engineers will run an entire system level test suite. Often this still reveals unknowns and problems. The system test verifies both the external specification, as well as the internal design and when sufficient stability of system test is achieved the process moves from problem solving to verification and finishing.

Qualification really begins when the first overall verification test is performed by the product definition team itself to verify the original system spec. The beta test can then be started by unbiased internal stakeholders. Finally the external stakeholders, such as the customer's customer test the product. Certification can start when all parties agree.

Deployment Phase

The deployment phase is critical and requires interaction with many different services and functions. This is where the local program manager plays a more active role than the system architect. Documentation and operating procedures are put into place as well as manufacturing test procedures and test runs. Logistics concepts and services are agreed upon before deployment begins. Advantech's flexibility allows us to work out a tailored logistic process that adapts to customers' needs and can grow as our customers' business grows.

For repair, Advantech maintains a world class eRMA system for on-line repair requests. A centralized database links to our global bar-code tracking system while back-end systems offer a knowledge base to customers plus access to first line support people. Customers apply for RMA before returning products to the closest service center.

Sustaining Phase

Finally the sustaining phase takes care of life cycle management for deployed systems and new deliveries. Revision management administers changes, including timely customer notification and qualification of product upgrades, as well as performance upgrades and en d of life replacements. Again, Advantech's services can be tailored to meet a customer's needs and support them to fulfill their service level agreements with their customers.

ATCA Reference Systems - The NeTarium Series

Systems Overview

Advantech's Netarium™ series of ATCA reference systems are specifically targeted to help network equipment providers reach superior levels of performance over traditional rackmount servers or appliances and extend their product range at the high end. The series represents a new generation of systems which offer superior performance, scalability and flexibility with the latest 40 Gigabit Ethernet (40G) backplanes, switches and application blades. We optimize the systems to achieve the highest possible density at the rack level, with a maximum number of payload blades, network ports and switching capacity.

Each system is tailored for customers to rapidly deploy in data communication markets for applications which require faster and deeper packet processing such as policy and charging enforcement, network security, real-time traffic monitoring, load balancing, subscriber analytics and content optimization among others. As ATCA was designed to meet the carrier-grade constraints of the telecom industry, the systems integrate the chassis, cooling, power distribution and shelf management into an off-the-shelf platform solution capable of superior 5 NINES availability and reliability.

High Performance Systems

Rising volumes of data traffic, media-rich applications and data center consolidation are driving the need for increased bandwidth scalability and high-speed connections. To meet these challenges, Advantech's flagship NeTarium-14 targets the high-end market where equipment providers require superior performance, scalability and deployment flexibility for their large enterprise, managed security service provider or carrier customers.

Mid Range Requirements

NeTarium-6 focuses on the high performance needs of large enterprise customers with a cost effective system loaded with four MIC-5333 dual Intel® Xeon® E5-2600 blades and 40G switches in a dual-star configuration. The system provides up to 1.28 Tbps switching capacity and each MIC-5333 blade with RTM can accommodate up to 4 FMMs for over 100Gbps egress per blade with high-speed encryption using FMM-based acceleration modules. The system is an ideal platform for cloud-based security services in private or data center clouds.

Entry-Level Flexibility

NeTarium-2 is the ultimate in entry level flexibility. This 2-slot platform allows OEMs to redeploy common platform hardware which scales when needed. Based on the MIC-5333 it packs more processing power than previous generation 6-slot systems. With an increase in miniaturization and performance at the blade level it is accompanied by a new concept at the mezzanine level to bring more I/O and acceleration closer to the processing cores. With four FMM sites on each ATCA blade and RTM, the MIC-5333 offers the broadest flexibility in entry level system performance on ATCA.

AdvancedTCA®

192 Intel® Xeon® E5-2600 Cores
1.28 Tbps Switching Capacity

Netarium™-14

- 14-SLOT, 19 " wide 13U high AdvancedTCA Shelf fully integrated
- Up to 12 MIC-5333 or MIC-5332 Dual Intel® Xeon® blades
- Dual-Star backplane with 40G Switches for non- blocking base and fabric switching
- 300W+ per slot power distribution and cooling capability

64 Intel® Xeon® E5-2600 Cores
1.28 Tbps Switching Capacity

Netarium™-6

- 6-SLOT 19" wide, 6U high, AdvancedTCA Shelf fully integrated
- 4 MIC-5332 or MIC-5333 Dual Intel® Xeon® blades
- Dual-Star backplane with 40G Switches for non-blocking base and fabric switching
- 300W+ per slot power distribution and cooling capability.

Up to 32 Intel® Xeon® E5-2600 Cores
Up to 20 10GbE Ports

Netarium™-2

- 2-SLOT, 19" wide, 3U high, AdvancedTCA Shelf fully integrated with 2 MIC-5333 Dual Intel® Xeon® blade and RTM-5104

Configurable ATCA Systems

Configuration Flexibility

We know that each of our OEM customers is different which is why we built out ATCA Systems Integration Team (SIT) to create customized ATCA platforms and meet the application-specific needs of network solution providers. The team is geared to building fully tested, cost-optimized platform solutions utilizing blade and platform technology from Advantech and integrating it with 3rd party hardware and software. Advantech's proven expertise in developing ATCA platforms is made available to equipment providers who need to outsource hardware integration in order to focus R&D investment on application value-add – or simply look at ATCA as an integrated networking platform like a high end appliance.

Advantech SIT delivers fully integrated and certified platforms which not only reduce your development time, but allow you to allocate a larger percentage of R&D budget to vertical market value-added development. We work closely with a strong global ecosystem of hardware and software vendors, including chipset, board, chassis, operating system and middleware in addition to our own product development. Ecosystem partners are selected based upon project, technology, logistic and geographic requirements and managed by the SIT team to provide highly optimized customer-specific solutions.

Our SIT Team offers the broadest choice of multi-core products for networking applications. With the ability to deliver x86, NPU, DSP and Switching technologies developed in-house, Advantech has full control over all the major building blocks for system level design. These services allow our customers to successfully face the challenges of converging networks and increasing bandwidth demand through improved time to market and a reduction of total cost of ownership as result of reduced maintenance and test efforts.

System Configuration Examples

Integrating powerful, high performance ATCA systems has its constraints and can be a complex and lengthy process that's not as simple as plug and play. ATCA requires many levels of expertise from platform software and hardware engineering, system, reliability and availability engineering, and from compliance and regulatory specialists. The ATCA standard and pre-established rules from PICMG along with their interoperability test suites certainly help to shorten the integration process, but functional teams have to ensure that software and hardware integration starts very early in the system design cycle to ensure timely and solid product rollout. With a multitude of component level permutations possible, each hardware payload needs to be carefully defined and tested to ensure it can meet final application software needs. Depending on the final operating environments, AC or DC powered systems may be required and shelf management software may be different.

The table below shows several examples of payloads which can be integrated into systems and configured to address many leading industry applications. These examples reveal what is possible with Advantech ATCA systems and serve as a basis for defining more precise application-specific solutions.

2-slots

Application	Blades
Media Gateway	1 x MIC-5332 dual Intel® Xeon® blade
	1 x DSPA-8901 DSP blades
Packet Generation & Test	1 x MIC-5332 dual Intel® Xeon® blade
	2 x ATCA-7310 NPU blades
Single-box EPC	1 or 2 x MIC-5333 dual Intel® Xeon® blades

14-slots

Application	Blades
Video Transcoding	2 x MIC-5332 dual Intel® Xeon® blades
	Up to 10 DSPA-8901 DSP blades
QoS / Policy Control	8 x MIC-5333 dual Inte® Xeon® blades
	4 x ATCA-7310 NPU blades

6-slots

Application	Blades
LTE Network Test	1 x MIC-5332 dual Intel® Xeon® blade
	1 x DSPA-8901 DSP blade
	2 x Customer I/O blades
Lawful Intercept Probe	2 x MIC-5333 dual Intel® Xeon® blades
	2 x ATCA-7310 NPU blades
Media Server	2 x MIC-5333 dual Intel® Xeon® blades
	2 x DSPA-8901 DSP blades
100Gbs UTM	4 x MIC-5333 dual Intel® Xeon® blades

Leading the Way with 40G ATCA Blade Innovation

Advantech's ATCA blades are designed in unison with the leading silicon suppliers enabling OEMs with the earliest possible access to new technology.

The cornerstones of our ATCA product line are the blades designed in our own labs and manufactured on our own production lines. That way we manage the entire life cycle and control all our costs to give customers the best service at the right price. Our X86, NPU, DSP and switch blades are designed in unison with the leading silicon suppliers to give you early access to the very latest technology to accelerate your next generation product design and give you first mover advantage.

Application and Networking Blades

Our Intel® Xeon® blades are the application powerhouses. With 10 blades in 14-slots connected to four 40 Gigabit Ethernet switches across a dual dual-star backplane you can't get faster network traffic in and out of an x86 blade. Today only Advantech can provide 160 Gigabits per second of aggregated bandwidth spread over four 40 Gigabit ports from a dual Intel® Xeon® blade. What's more, our MIC-5333 with its modular FMM concept adds flexibility to personalize the blade with more I/O ports, acceleration and offload. You can configure it precisely for your application workload – so you get what you want and you pay only for what you need.

Network Processor Blades

Our NPU blade based on Cavium's Octeon II processor integrates application acceleration engines for DPI, compression/decompression and new security standards such as SNOW 3G. This makes it ideally suited for enterprise apps and 4G networks.

DSP For Media Processing

Our DSPA-8901with twenty C6678 DSPs provides 160 cores of processing power to reach performance densities for the highest capacity media gateways. It reduces system cost and frees up slots in gateway elements for extra subscriber capacity and throughput. It adds outstanding image processing performance to solutions in Mobile, Web and IP TV markets.

40G Switching

Finally, our ATCA-9112 40 Gigabit switch is the backplane orchestra leader. Complemented by the T-HUB4 switch from Telco systems and their BiNOX™ load balancing and carrier class switch management suite, we offer high speed, managed solutions with up to 640 Gigabits-per-second of switching capacity per switch blade.

MIC-5332

- Two Intel® Xeon® E5-2600 Processors and Intel® C600 Series PCH server class chipset
- Eight DDR3 VLP DIMMs up to 256 GB with ECC support
- Up to four XAUI ports on Fabric interface and two 1000BASE-T ports on Base interface
- One Fabric Mezzanine Module (FMM) support with front I/O support (type II)
- Two CFast / one 2.5" SSD storage device

MIC-5333

- Two 8-Core Intel® Xeon® E5 Series processors
- Future Intel® chipset code name Cave Creek
- Eight DDR3 VLP DIMMs up to 256 GB with ECC support
- Up to four 40GBaseKR4 ports on FI to support Dual-Dual Star Topology
- Other fabric configurations supported via two Fabric Mezzanine sites (type I)
- Two 10/100/1000BASE-T front panel ports
- One FMM (type II) for front IO or acceleration
- Hot swappable RTM with 36 PCIe gen.3 lanes

ATCA-7310

- Dual Cavium Octeon II CN6880 1.0 GHz with 32 MIPS™ II processor cores
- Up to 64 GB DDR3 1066 MHz DIMMs; 32 GB for each CN6880
- 40 GbE (KR4) and four 10 GbE (KR) FI with Dual Star routing support
- Eight 10GbE SFP+ and four 1GbE SFP Rear I/O support
- Switch management support on L2, QoS, Multicast (SW options)

DSPA-8901

- 20 Texas Instruments C6678 DSPs
- 512MB/1GB DDR3 memory per DSP
- BCM56321 10GbE switch for both Fabric Interface and Base Interface
- Freescale QorIQ™ P2020 for Local Management Processor (LMP)
- IDT Tsi577 Serial RapidIO switches

ATCA-9112 & T-HUB4

- 40GbE switch blade provides 10/40GbE switching for 16 slots and eight 10GE uplinks
- Fabric interface bandwidth up to 640Gbps
- Separate base and fabric interface switching for enhanced security and protection
- BiNOX™ switch management suite

ATCA-9112

- Adds a mid-size AMC site for host application processing, acceleration or offload functions

Processor AMCs – Application Blades on a 40G Switch

ATCA-9112

The ATCA-9112 switch blade provides 10/40GbE switching for up to 16 slots and 8 front panel uplinks with a 640Gbps non-blocking fabric switch from Broadcom.

Designed for network security, LTE and DPI-centric applications, the ATCA-9112 offers the highest aggregate switching bandwidth within an ATCA chassis enabling support for up to 16-slot systems. A Broadcom BCM56846 ensures seamless integration through open standard hardware supporting 40GbE or 10GbE ATCA node blades. A Broadcom BCM56321 provides ATCA base interface connectivity.

The switch offers a flexible approach to hub blade functionality via a mid-size AMC site to host control plane, application processing, acceleration or offload functions. Advantech's Freescale QorIQ™ P5020-based AMC-4202, P4080-based AMC-4201 or x86-based MIC-5603 PrAMC can be used to consolidate processing requirements.

Main Features

- 40GbE switch blade provides 10/40GbE switching for up to slots
- 10/40GE fabric interface with eight 10GE uplinks
- Fabric interface bandwidth up to 640Gbps
- Separate base and fabric interface switching for enhanced security and protection
- Mid-size AMC site for host application processing, acceleration or offload functions

MIC-5603
Intel® Xeon® 3rd Generation Core-i7 AMC

AMC-4201
Freescale QorIQ P4080 AMC

AMC-4202
Freescale QorIQ P5020 AMC

FMMs Bring Unprecedented Flexibility

Designing with Fabric Mezzanine Modules

The FMM concept is one of the key elements in Advantech's Customized COTS (C^2OTS) strategy. FMMs are a new denominator for personalizing a common platform at the blade level and they scale extremely well for both I/O and acceleration functions. The MIC-5333 ATCA blade based on Intel® next generation communications platform codename Crystal Forest houses three FMM sites on the front blade and between one and four FMM sites on the rear transition module enabling a wide variety of solutions.

FMMs also facilitate fabric interface flexibility allowing equipment providers to deploy the MIC-5333 into 40G or 10G topologies:

- A double-sized FMM carrying four i82599's provides two fabric interfaces with four 10GBaseKR ports each.
- For designers requiring 40GBaseKR4 interfaces, a Mellanox CX-3 FMM supports two 40G ports enabling dual dual-star backplane architectures with two FMM modules for four times 40Gbps in and out of the blade.
- Finally a single i82599 FMM makes it possible to adapt MIC-5333 with 10GbE in order to upgrade legacy systems in the field.

FMM-5001B
Intel® 82599EB with
2 x 10GBaseKX4 FI

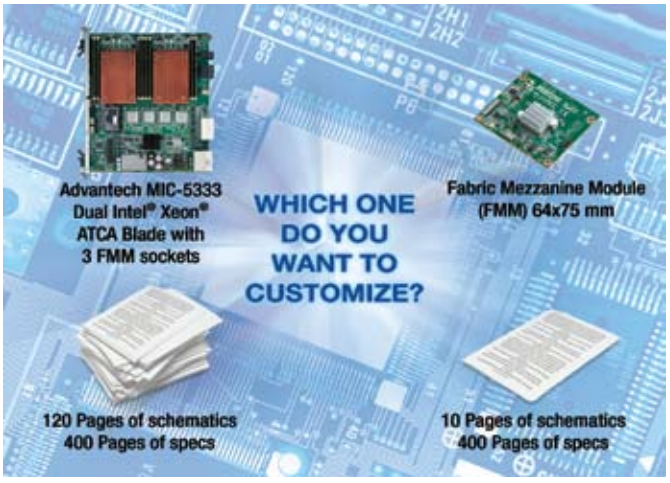
FMM-5001F
Intel® 82599ES for 2 x
10GbE with dual SFP+

FMM-5001Q
Quad Intel® 82599ES
8 x 10GBaseKR FI

FMM-5002
Server Graphics Controller
with VGA connector

FMM-5004M
Mellanox CX3 with 2
x 40GBaseKR4 FI

FMM-5006
Intel® QuickAssist Accelerator



The FMM specification defines the high speed interfaces and associated FRU management. In addition the specification supports a zone 2 connector interface for custom fabric connectivity like SRIO. Signal integrity between FMMs and the Fabric Interface on ATCA blades is ensured via a re-driver between the zone 2 connector and the FMM. A FRU EEPROM on the FMM describes its thermal & power requirements and zone 2 interface information, while all other aspects are managed by a BMC on the ATCA blade.

FMMs are compact, just 6.4 x 7.5 cm^2s and use FMC compliant connectors for high speed differential I/O. In fact, there is adequate space to fit 40mm BGA ASICs and FPGAs and associated components with a thermal budget < 20W. The I/O area provides overhang for connector support on front panels or rear transition modules (RTM) making FMMs a good fit for specialized processing close to the application I/O.

With a common platform for workload consolidation like the MIC- 5333, up to 4 FMM sites provide a wide choice of PCIe I/O and acceleration:

- MIC-5332 1 FMM to Front Panel
- MIC-5333 3 FMMs (2 Fabric, 1 Front Panel)
- RTM-5104 1 FMM to Rear Panel

For example, there are sufficient FMMs to turn the MIC-5333 common platform into a 100G line card with crypto acceleration.

By adopting an FMM approach for standard and custom designs, OEMs can effectively redeploy them across form factors scaling from appliances to ATCA systems for functions such as:

- Proprietary acceleration hardware
- Specialized coding and transcoding algorithms
- Signal & image processing
- Military & commercial cryptography

Enabling Superior ATCA System Throughput

The FMM has become an essential element in ATCA system design flexibility, enabling node blade connectivity for 20, 40, 80 and 160Gbps connectivity to the backplane.

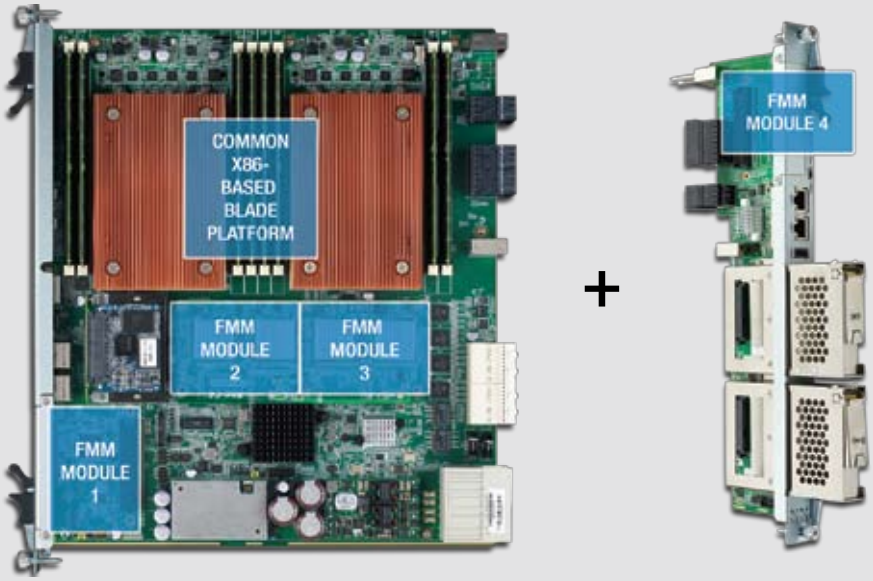
For customers that invest in the Intel path to workload consolidation, the FMM enables a common platform capable of unprecedented throughput. System platform solutions which may have been deployed across several blades are rapidly being consolidated onto just one. Today, there's more packet processing power on our latest MIC-5333 ATCA blade, based on the Intel® Xeon® E5-2600, than in a fully-loaded 6-slot system of 5-years ago. Advantech is enabling customers in this miniaturization process by introducing a breakaway technology at the small mezzanine level in order to bring more I/O and acceleration closer to the processing core and enable flexible fabric connectivity to match increasing interconnect bandwidth demands.

ATCA System Topologies

Most standard ATCA systems incorporate two switch blades. Each of the node blades connects to each of the switch blades. This places the switch blades at the center of a star network connected to each of the node blades. The two switch blades form two stars, hence the name "dual star". For many applications the improved packet and processing performance offered by Advantech's MIC-5332 and MIC-5333 node blades starts to create the opportunity to leverage a new performance paradigm. In the past the ATCA system bottleneck was attributed to the iA-based node blades but now it's shifting to the switch blades. Advantech's Intel® Xeon® E5-2600 –based node blades are able to handle 40Gbps of traffic and more.

With ten blades in a system, applications requiring 400Gbps of system throughput are constrained by the lack of switching capacity in a dual-star ATCA topology. As state-of-the-art switching silicon saturates at around 600Gbps, the ATCA system's switching capacity is limited to 1.2Tbps. For a 400Gbps system that means that packets can hop through the switches a maximum of three times. As two hops are typically consumed for ingress and egress traffic, three hops total presents an important performance challenge. Fortunately, the ATCA specification provides for the ability to use four switch blades to create four fabric networks known as a dual dual-star topology. Four times 600Gbps yields 2.4Tbps switching capacity which allows an average of 6 hops for a packet in a 400Gbps system. The challenge, though, is that the node blades are now required to connect four network ports, one to each hub blade.

Many x86 blades available today have been designed for telecom networks with lower throughput rates, but datacom customers need this higher throughput enabled by dual-dual star topologies right now. To satisfy their needs Advantech has built dual-dual star capabilities in to its MIC-5332 and MIC-5333 blades to support four backplane network ports via FMMs. The MIC-5322 has one dual 10GbE controller down on the blade supporting two 10GE ports to the backplane. An FMM-5001B can be used to drive two additional 10GbE backplane ports. On the MIC-5333, the backplane ports are connected to two FMM sites allowing the widest choice of 10GbE or 40GbE dual-dual star fabric interfaces available today.



FMMs are a new denominator for personalizing a common platform at the blade level. They scale extremely well for both I/O and acceleration functions. When coupled with the workload consolidation capabilities of the MIC-5333, they provide customers with a wider choice of flexible and scalable solutions for their next generation platform designs.

A Common Platform Approach to IPMI for xTCA Platform Managment

Advantech Code Base

Advantech's IPMI adaptation is a cornerstone of our Customized COTS program. Most major customers require us to develop special features beyond the standards. Advantech's approach makes it easier to maintain multiple versions and offer branding options and differentiation to customers.

Advantech provides a flexible, modular solution using a hardened RTOS which is:

- Easy-to-customize for faster development of customer specific or value-added features
- Easy-to-maintain for improved life-cycle management and faster bug fixes in the field
- Provides a common value add feature set to customers using ATCA and AMCs
- Ensures higher reliability through broader cross-platform use and testing, leading to faster time-to-maturity

ARM-based Design

Our IPMI implementation is built on a single platform based on Cortex-M. This allows us to source multiple vendors, offering a wider choice of devices for the product range. Several SKUs of Cortex-M3 are supported, providing enhanced scalability to balance cost and features while leaving sufficient headroom for future requirements or customization. Implementation of a slim and reliable RTOS provides us with all the essentials needed, such as timers, semaphores, tasks, and so on, and liberates us from previous code dependencies.

Customizable Code

PICMG 3.0, AMC.0, and MTCA.0 base their hardware management on IPMI 1.5 with PICMG-specific extensions. However, OEMs often require special features for legacy compatibility or management service enhancements for their customers. IPMI message handling and other key elements of our IPMI solution are designed to maximize flexibility. This allows us to add more features without rewriting a lot of code and makes custom feature implementation much easier.

As we share code across different products and projects, it rapidly matures. If we implement a new feature on an ATCA blade, it is a fraction of the effort to port it to an AMC, meaning more features in less time across a wider range of products. Rolling out new features, updates, and bug fixes has become simpler as testing efforts have significantly decreased.

Customers enjoy faster update cycles and benefit from resolutions in other projects. Advantech's IPMI core has been tested against a variety of third-party Shelf Managers in our labs and during PICMG Interoperability Workshops using industry standard compliance test suites from Polaris. All of our products carry a "Polaris Tested" stamp on their datasheet.

HPM.1 Support and Customized COTS Features

We support HPM.1-compliant updates for programmable components such as BIOS, firmware, FPGAs, and so on. Most firmware images are fully redundant, for example for dual BIOS chips, dual BMC firmware, and FPGA images; IPMI handles automatic rollback in case of update failures or integrity issues.

For advanced remote configuration, Advantech-specific features can remotely modify BIOS settings or switch between sets of customer-defined settings. Serial-over-LAN also allows remote IPMI-based access to the system console. For maximum reliability we support automatic BIOS failover in case of startup problems with BIOS POST sensors logging the POST code where the board hangs. This information can be used to debug boot-up issues. We also implement features to improve crash analysis, for example, by dumping the last few KBs of system console output over IPMI for post-mortem debugging, accelerating debugging significantly.

We also have added Advantech's time sync feature to allow options for system time synchronization between OS, BMC, and other components like the ATCA Shelf Manager. For example, individual blades can run without battery (NEBS compliance) but acquire the time from the Shelf Manager upon startup.

Our robust and flexible IPMI offering is fully deployed in mission-critical rollouts worldwide. Advantech's ability to adopt new features rapidly helps customers achieve their platform management goals for improved uptime and services, providing greater reliability in HA platforms. As we actively engage with more players in Security and Enterprise space, we'll be introducing enhancements to simplify their approach to ATCA systems.

ATCA Ecosystem

Advantech provides its customers access to the latest technology through our strategic partnerships and extensive ATCA alliances.

In today's world of rapidly advancing technology, no single vendor has the all the resources necessary to deliver innovative platforms to the market for a broad range of applications. Leveraging an industry ecosystem of suppliers is essential to the timely, cost-effective delivery of leading edge solutions. And Advantech's strategic partners are the best in the industry.

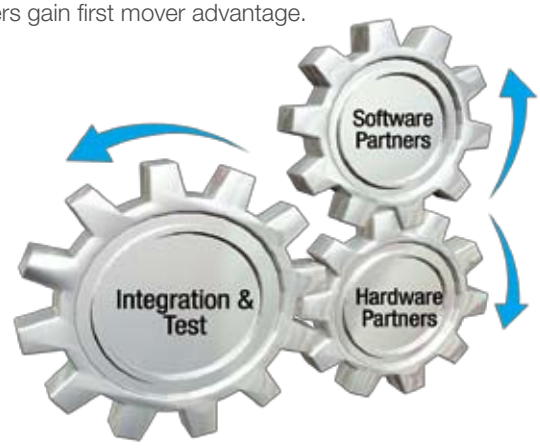
Rapid Development Leveraging Interoperable Technology

Proven product interoperability means Network Equipment Providers and Telecom Equipment Manufacturers can readily integrate tested combinations of hardware and software components with total confidence. In a fast-paced market this allows them to evaluate, test and deliver innovative solutions more rapidly and respond more effectively to emerging customer needs.

Interoperability at Advantech starts with our ATCA ecosystem alliance program and our participation in key industry organizations like PICMG. Both are essential elements in our ATCA systems strategy. We collaborate with our alliance partners to meet customers' application-specific needs by integrating selected leading-edge technologies into early access reference platforms and proof-of-concept systems. Together we run industry-standard interoperability tests then pre-load application-specific software packages to facilitate customer bring-up and enable the evaluation of new technology more efficiently.

When customers need fast access to the latest software tuned for new processor silicon, Advantech and its partners deliver the most comprehensive early reference platforms. Our Deep Packet series, for example, targets developers who want to consolidate workloads on x86-based architectures including Deep Packet Inspection and Network Intelligence. This reference platform series is based on the latest Intel® Xeon® processors and Intel's Data Plane Developers Kit (DPDK). Our Intel DPDK enabled platforms incorporate acceleration software from our OS, middleware and network stack partners. The payloads are finely tuned to optimize packet processing throughput and enable the fastest packet movement in Deep Packet Inspection (DPI) applications. Moreover, the seamless scalability between our appliances and ATCA systems means customers can start their development and evaluation work on simpler turnkey appliances and later move to ATCA target platforms with ease.

Advantech continues to build its alliance of strategic partners made up of leaders in each of their respective areas of expertise. Together, these companies provide all of the essential components for developing, verifying, integrating and building high performance products to help network equipment customers gain first mover advantage.



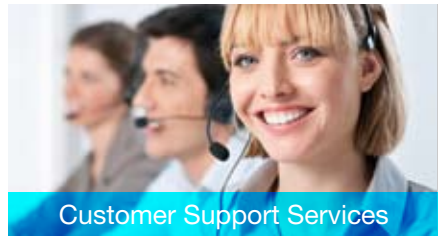
Advantech Ecosystem Alliance Members

Processors	Boards	Chassis	Operating Systems	High Availability	Networking
• Intel • Cavium • NetLogic • Freescale • Texas Instruments	• CommAgility • Telco Systems • Interphase	• Elma • ASIS • Comtel • Schroff	• WindRiver • ENEA	• ENEA	• 6WIND • Aricent • Qosmos • WindRiver • Polaris

ATCA Global Services


Manufacturing Services

Logistics Services


Customer Support Services

The foundation of our ATCA systems business is built on world-class manufacturing, quality and integration processes that enable our customers to deploy reliable business-critical solutions worldwide with total confidence.

Deploying standards-based ATCA products that enable our OEM customers to create highly differentiated solutions requires a full suite of ATCA products, advanced customization technology, an extensive ATCA ecosystem and a full complement of life-cycle services. Advantech's ATCA system and blade products, Customized COTS technology, ATCA Ecosystem and ATCA Global Services organization meet these needs perfectly. Advantech Global Services provide a comprehensive service package that integrates our key service models into a complete transaction process, from the manufacturing and system integration phase, global logistics and after-sales support. In order to create the maximum value for our customers, Advantech Global Services is the shortcut for transforming our customer's ideas into reality.

Manufacturing Capabilities

Our world-class manufacturing centers in Taiwan and China both maintain precise quality control, and offer a full range of cost-effective, state-of-the-art production capabilities. To maximize the efficiency of operational procedures, we have implemented a cluster manufacturing system within our segmented manufacturing service units. This unique approach enables a direct, simplified, and highly streamlined design-to-manufacturing process. Our manufacturing centers utilize a customer-driven Enterprise Resource Planning (ERP) system to achieve high flexibility and just-in-time response. We pride ourselves on our:

- In-house board, chassis, and system production capabilities
- Dual world-class manufacturing centers which minimize business risks
- Advanced production capabilities and customizable processes
- Rigid quality assurance system
- Complete ISO standard coverage

We Build It Exactly as You Imagine It

Advantech provides full customization and branding services to integrate our innovative platforms with existing product lines and give them customers' look and feel. With our Configure-To-Order-Services (CTOS) we provide cost efficient services to build different system SKUs in our logistic centers around the world. Through these services we bring our clients the benefits of greater flexibility, lower inventory, shorter lead times and global reach with local touch at work.

International Quality Standards

The Group Quality system is audited and compliant with ISO 9001. The Quality system covers all aspects of product design, component selection, design verification, manufacturing, quality control and customer satisfaction. From the board of directors down, each member takes pride in providing our customers with the highest level of quality in products and services. We also hold global certifications of ISO 13485, TL 9000, ISO 14001, OHSAS 18001 and IECQ QC 080000.

Global Logistics Services

With strong integrated ERP and SAP supply chain solutions, our worldwide logistics network offers a wide range of flexibilities to bring out different delivery models including local and global solutions that meet your unique needs and budget requirements. Advantech's Logistics Service gives you the flexibility to simplify your logistical networks, bring your products to market on time, and enjoy a timely return on your investment.

- Optimized and flexible shipping solutions
- Integrated ERP and SAP supply chain solution with global distribution network
- Centralized plants with local delivery

Customer Support Services

Our global presence provides localizable, customizable, and reliable customer support services. We can create an optimized maintenance and support plan, leveraging the full power of our service portfolio to help reduce costs and proactively mitigate business risks to best meet your needs. In addition to our complete technical and repair support, we provide a variety of customizable after-sales services, including extended warranty, advance replacement, upgrade, fast repair, etc. With our knowledgeable local support groups, we enable a consistent support experience around the world and help keep your investment at peak performance and within your budget. Our local support centers are dedicated to supporting your high-value ATCA systems deployed in business-critical installations across the world.

- 24/7 technical support: hotline AE & online chat support
- Global deployment with local full-line repair capability
- Easy-to-use web-based repair and tracking system
- Various other value-added, after-sales support services

Networks & Communications

Accelerating Network Platform Evolution

ADVANTECH

Enabling an Intelligent Planet

Securing and Connecting the Network

Specifically designed to meet the requirements of network security OEMs and equipment providers, Advantech's network application platforms offer the highest performance and widest scalability with throughputs ranging from 10Gbps in 1U to over 1 Tbps of switching capacity in a 14-slot ATCA system.

From Intel® Atom™ to Intel® Core™ i7 and Intel® Xeon® processors, OEMs can choose from the latest generation silicon, the fastest and most reliable LAN access devices, and specialized hardware accelerators to respond to their customers' growing needs for performance and application consolidation.

With OEM-readiness in mind, Advantech offers a complete range of customization options from branding, packaging and global logistics to hardware customization and design services for a differentiated OEM offering, providing first mover advantages with fastest time to market.

FWA-3210

1U Intel® Xeon® E3-1200 processor-based Network Application Platform

- Intel® Xeon® processor E3-1200 v2 product family and 3rd generation Intel® Core™ processor family
- 4 x DDR3 Un-buffered 1066/1333 DIMMs, up to 32 GB (FWA-3210A)
- 6 x GbE ports, 1 x 3.5" or 1 x 2.5" SATA HDD / SSD
- 2 NMC slots for additional 1/10GbE ports

FWA-6510

2U Intel® Xeon® processor E5-2600 based Network Application Platform

- 2 x Intel® Xeon® processor E-2600
- DDR3 1333/1600 ECC registered memory, up to 384 GB
- PCIe gen3 support
- Up to 8 NMC-based 10GbE ports
- 8 NMC slots for additional 1/10GbE ports
- Supports up to 64 x GbE ports or 16 x 10GbE ports

2 to 14-slot Systems

1 to 12 MIC-533X ATCA Blades with Intel® Xeon® processor E5-2600

- 2 x Intel® Xeon® processor E5-2600 with future Intel® chipset (code name Cave Creek)
- DDR3 1333/1600 DIMMs with ECC support, up to 256 GB

www.advantech.com/nc

intel Intelligent Systems Alliance Premier

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