

# Penguin Edge<sup>™</sup> ATCA-7540

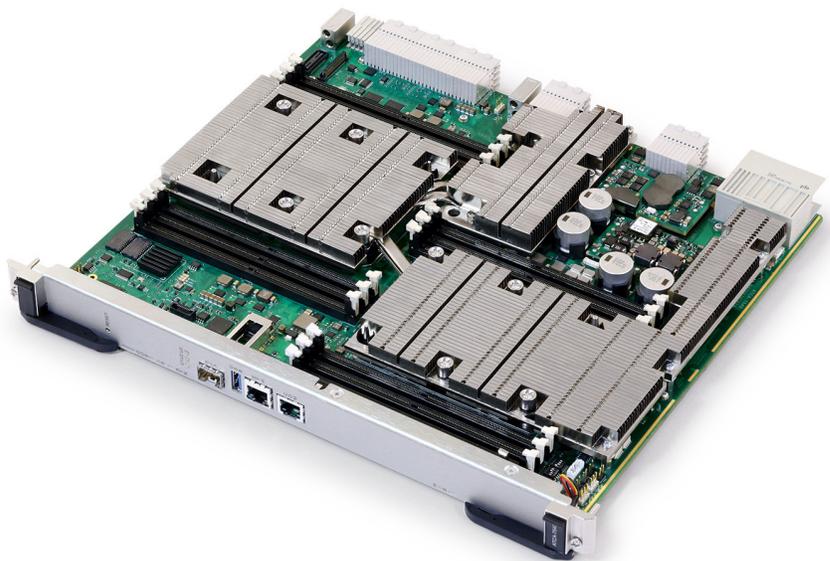
Dual-Star 40G Server Blade

- ▶ Two Intel Xeon Scalable processors (codename Skylake)
- ▶ Scalable performance range/ core count
- ▶ Up to 384GB main memory DDR4 via 12 VLP DIMM sockets with speeds of 2400 MT/s
- ▶ Dual-star 40G Ethernet fabric
- ▶ Choice of compatible rear transition modules for I/O and storage options
- ▶ Dual on-board M.2 SSD sites
- ▶ Option for enterprise-grade, very high-reliability memory
- ▶ Optional configuration with crypto offload
- ▶ Linux support
- ▶ DPDK-ready

ATCA is an open standard under PICMG with a multi-vendor ecosystem. With its rugged design, 5-nines high availability (99.999%) and shallow footprint, ATCA has a strong history of deployment in shipborne and land-based defense applications in addition to telecommunications. The Penguin Edge<sup>™</sup> ATCA-7540 server blade brings the Intel<sup>®</sup> Xeon<sup>®</sup> Scalable processors (codename Skylake) to ATCA, extending both performance and longevity over existing server blades.

## Benefits

- ▶ Use of the Intel Xeon Scalable processors (codename Skylake) provides a performance and longevity improvement over existing blades
- ▶ Adherence to the ATCA specification ensures compatibility with existing infrastructure
- ▶ OS & I/O options help ensure a seamless upgrade path from existing systems and provides the tools & flexibility necessary for new deployments

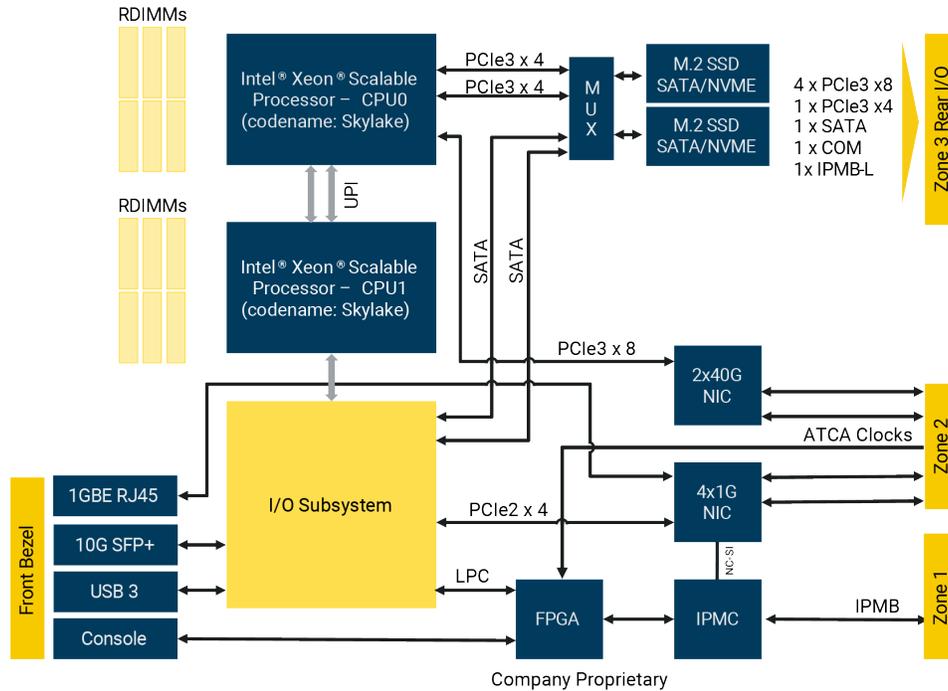


**Advanced TCA<sup>®</sup>**

DESIGNED & ASSEMBLED IN  
**USA**

**PENGUIN**<sup>™</sup>  
EDGE

# Penguin Edge ATCA-7540 Block Diagram



## Software Enablement

The Penguin Edge ATCA-7540 blade can be configured with a variety of software offerings, from firmware-only to fully integrated and verified software operating environments.

### Firmware

The blade has a pre-installed BIOS and IPMC firmware that allows installing operating systems and integrating it into hardware platform management.

BIOS firmware includes support for:

- ▶ Unified Extensible Firmware Interface (UEFI)
- ▶ Power management
- ▶ Multiple boot options including:
  - Local and externally connected hard disks
  - On-board solid-state disks
  - External USB boot media
  - PXE boot via ATCA base and fabric interfaces as well as front panel network interface
- ▶ Serial redirection of the BIOS console
- ▶ Serial over LAN of the BIOS console via ATCA base interface
- ▶ BIOS upgrade via local host

### Intelligent Platform Management Control

The ATCA-7540 features an intelligent platform management controller (IPMC). The IPMC provides interfaces for hardware platform management that allow monitoring status, event logging, and recovery control of the blade. Features include:

- ▶ Compliance with PICMG 3.0 and IPMI 2.0
- ▶ Firmware (BIOS, IPMC, FPGA) upgradable from IPMI interface (LAN, IPMB), PICMG HPM.1 support or via Basic Blade Services (BBS) firmware upgrade utility
- ▶ Firmware rollback capability
- ▶ Support for serial port redirection over LAN interface

### Supported Operating Systems

The Penguin Edge ATCA-7540 is capable of running many different operating systems such as CentOS, Ubuntu, RedHawk and Red Hat Linux.

Penguin Edge provides a CentOS 7 based operating system, DPDK and Basic Blade Services (BBS) for the ATCA-7540. The ATCA-7540 has also been certified with VMware ESXi 6.7 U3/7.0 U3.

BBS provides services that help to integrate the blade into a system context and manage blade resources. The Basic Blade Services include:

- ▶ Hardware Platform Management including local IPMC, LED, E-Keying and blade extraction software
- ▶ Firmware upgrade utility
- ▶ Supervision of optical modules

The ATCA-7540 can be configured for virtualization using Linux KVM. Applications can benefit from the Intel Data Plane Development Kit (DPDK). DPDK enables ways for effectively handling packet processing capabilities by exploiting network silicon, processing resources and hardware off-load engines available to the blade.

## Hardware Specifications

### Processor & PCH

- ▶ Two Intel Xeon Gold or Silver embedded processors
  - Intel Xeon Gold 5119T with 14 cores at 1.9GHz
  - Intel Xeon Silver 4114T with 10 cores at 2.2GHz
- ▶ Optional PCH with Quick Assist Technology (QAT) adding hardware acceleration for network security, routing and storage
- ▶ Enhanced features (Intel AES-NI, AVX/SSE, VT, 64 bit, power management)
- ▶ SMP and HT support

### Memory

- ▶ DDR4-2400 memory controllers integrated into processors
- ▶ Total of six independent memory channels per CPU socket
- ▶ Scalable memory capacity 64, 96, 128, 192 and 384GB
- ▶ Support for memory integrity (ECC)
- ▶ Option for enterprise-grade, very high-reliability memory

### Mass Storage

- ▶ Up to two on-board M.2 SATA/NVME solid state disks (80 or 110mm)
- ▶ Hot-swappable hard disk options on RTM

## Base and Fabric Interfaces

- ▶ PICMG 3.0 base interface compliant, Gigabit Ethernet (1Gbps)
- ▶ Dual star ATCA Fabric Interface with two 40 Gigabit Ethernet (KR4) channels, or PICMG 3.1, Option 9 (10Gbps), Option 1 (1Gbps)

## Counters/Timers

- ▶ Real-time clock
- ▶ Programmable watchdog timer

## External Interfaces

- ▶ Front panel
  - One single-speed 10GbE or multi-speed 1/10GbE SR/LR SFP+
  - One 10/100/1000 Base-T Ethernet via RJ-45
  - Single serial console via RJ-45
  - USB 3.0 (1)
- ▶ Rear transition module
  - See RTM section for product options

## Power Requirements

- ▶ Dual-redundant –48/–60 VDC (SELV) rail
- ▶ Input range: –39 to –60 VDC
- ▶ Designed to meet PICMG 3.0 input power

## Thermal Characteristics

- ▶ Blade variants designed for NEBS L3
  - Operating range: –5°C to 55°C
  - Airflow requirements: CP-TA B.4 or higher depending on configuration options
- ▶ Airflow cooling requirements: CP-TA B.4 or higher depending on configuration options

## Relevant Blade Size

- ▶ 8U form factor, 280 mm X 322.5 mm, single slot

## Relevant Standards

- ▶ PICMG 3.0 (form factor, IPMI, base interface, hot swap, RTM)
- ▶ PICMG 3.1 R2 (fabric interface)

## Supported Rear Transition Modules

Rear Transition Module	Networking Capabilities			Storage	I/O	
	40Gbps Ethernet (QSFP+)	10Gbps Ethernet (SFP+)	1Gbps Ethernet 1000-base-T, RJ-45	Disk bay for hotswap hard disk, 2.5"	SAS I/F on SFF- 8470 connector	USB 2.0 interface
RTM-ATCA-7360	-	-	6	1	2 SAS	1
RTM-ATCA-STOR-1T2	-	-	-	2 (JBOD or RAID)	-	-
RTM-747X-10G-SP	-	6	4	-	-	-
RTM-747X-10G-D	-	4	4	1	2 SAS	-

## Regulatory Compliance

Item	Description
Designed to comply with NEBS, Level 3 (for product variants that are designed for NEBS L3 and ETSI compliance)	Telcordia GR-63-CORE, NEBS Physical Protection
	Telcordia GR-1089-CORE, Electromagnetic Compatibility and Electrical Safety – Generic Criteria for Network Telecommunications Equipment. Equipment Type 2
Designed to comply with ETSI (for product variants that are designed for NEBS L3 and ETSI compliance)	ETSI Storage, EN 300 019-1-1, Class 1.2 equipment, Not Temperature Controlled Storage Locations
	ETSI Transportation, EN 300 019-1-2, Class 2.3 equipment, Public Transportation
	ETSI Operation, EN 300 019-1-3, Class 3.1 (E) equipment, Temperature Controlled Locations
	ETSI EN 300 132-2 Environmental Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 2: Operated by direct current (dc)
	ETSI ETS 300 753, Equipment Engineering (EE); Acoustic noise emitted by telecommunications equipment
CE Conformity	Directive 2004/108/EC, Directive 2006/95/EC
EMC	EN 55022 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement (for product variants that are designed for datacenter environments)
	EN 55024 Information technology equipment - Immunity characteristics - Limits and methods of measurement (for product variants that are designed for datacenter environments)
	ETSI EN 300 386 Electromagnetic compatibility and Radio spectrum Matters (ERM); telecommunication network equipment; ElectroMagnetic Compatibility (EMC) requirements, Telecommunication equipment room (attended) (for product variants that are designed for NEBS L3 and ETSI compliance)
	CFR 47 FCC Part 15 Subpart B, Class A (US); FCC Part 15 - Radio Frequency Devices; Subpart B: Unintentional Radiators
	AS/NZS CISPR 22 (Australia/New Zealand), Limits and Methods of Measurement of Radio Disturbance Characteristics of Information Technology Equipment
	VCCI Class A (Japan), Voluntary Control Council for Interference by Information Technology Equipment
	CISPR 22 Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
	CISPR 24 Information technology equipment – Immunity characteristics – Limits and methods of measurement
Safety	Certified to UL/CSA 60950-1, EN 60950-1 and IEC 60950-1 CB Scheme
	Safety of information technology equipment, including electrical business equipment
RoHS/WEEE compliance	Directives 2011/65/EU / 2015/863 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the restriction of the use of certain hazardous substances in electrical and electronic equipment. (RoHS)
	Directives 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on waste electrical and electronic equipment (WEEE)

## Ordering Information

Part Number	Description
ATCA-7540-0GB	ATCA packet processing blade, dual Intel Xeon server 5119T Gold, 14-core (85W), 1.9 GHz, 12x DIMM sockets, 0GB, 40G, B.4
ATCA-7540-C06	ATCA packet processing blade, dual Intel Xeon server 5119T Gold, 14-core (85W), 1.9 GHz 12x DIMM sockets, 192GB, 40G, B.4, fastener
ATCA-7540-64GB-L	ATCA packet processing blade, dual Intel Xeon server 4114T Silver, 10-core (85W), 2.2 GHz, 8 X 8GB DIMMS, RAID Key, 40G, B.4
ATCA-7540-128GB-L	ATCA packet processing blade, dual Intel Xeon server 4114T SILVER, 10-core (85W), 2.2 GHZ, 8X 16GB DIMMS, 40G, B.4
ATCA-7540-192GB	ATCA packet processing blade, dual Intel Xeon server 5119T Gold, 14-core (85W), 1.9 GHz 12x DIMM sockets, 192GB, 40G, B.4
ATCA-7540-384GB	ATCA packet processing blade, dual Intel Xeon server 5119T Gold, 14-core (85W), 1.9 GHz 12x DIMM sockets, 384GB, 40G, B.4
ATCA-MEM-DDR4-8GB	8GB DDR4 VLP memory module
ATCA-MEM-DDR4-16GB	16GB DDR4 VLP memory module
ATCA-MEM-DDR4-32GB	32GB DDR4 VLP memory module
ATCA-75XX-KIT-M2	ATCA-75XX M.2 Riser kit
NVME-M.2-1TB	1TB NVME M.2 Media
RTM-ATCA-7360	RTM with 6x GbE, 2x SAS, 1x slot for optional HDD
RTM-747X-10G-SP	RTM with 6x 10GbE, 4x GbE (Optical modules are not included)
RTM-747X-10G-D	RTM with 4x 10GbE (SFP+), 4x GbE, 1x slot for optional HDD (Optical modules are not included)
RTM-ATCA-STOR-1T2	ATCA RAID STORAGE RTM, 2 X 1TB U.2 SSD
RAID-KEY	INTEL VROCSTANMOD Hardware RAID License Key for ATCA-7540

## Contact Us

+1 602-438-5720

[info@penguinsolutions.com](mailto:info@penguinsolutions.com)

[www.penguinsolutions.com/edge/](http://www.penguinsolutions.com/edge/)

### About Penguin Solutions

Penguin Solutions accelerates customers' digital transformation with the power of emerging technologies in HPC, AI, and IoT with solutions and services that span the continuum of edge, core, and cloud. The company designs highly advanced infrastructure, machines and networked systems that enable the world's most innovative enterprises and government institutions to build the autonomous future, drive discovery and amplify human potential. The Penguin Edge portfolio covers system on modules, single board computers and application-ready platforms that extend insight, intelligence, and analytical capabilities closer to where the data is generated - optimizing a range of use cases across industries and rugged environments.



Penguin Solutions is a trade name used by SMART Embedded Computing, Inc., a wholly owned subsidiary of SMART Global Holdings, Inc. Penguin Edge is a trademark owned by Penguin Computing, Inc., a wholly owned subsidiary of SMART Global Holdings, Inc. Intel and Xeon are trademarks of Intel Corporation. PICMG, AdvancedTCA, ATCA and the AdvancedTCA logo are trademarks of PICMG. All other logos, trade names, and trademarks are the property of their respective owners. Specifications are subject to change without notice. For full legal terms and conditions, please visit [www.penguinsolutions.com/edge/legal/](http://www.penguinsolutions.com/edge/legal/).

©2022 SMART Embedded Computing, Inc.