

ATCA-7490

100/40G Packet Processing/Server Blade

Data Sheet

Ideal networking platform with flexible I/O connectivity and ultimate processing performance

- High bandwidth Ethernet switching between CPU complex, I/O and backplane
- Local load balancing and filtering
- Hardware off-loading functions for en-/decryption and compression
- Choice of network I/O options supporting multiple 10, 40 and 100G interfaces
- Four independent 40G network interfaces four uncompromised throughput into the backplane
- Two Intel® Xeon® processors, E5-2600 v4 family
- Max. 512GB DDR4 memory
- On-board solid state disk with large capacity
- Suitable for open source and commercial Linux derivatives
- Intel DPDK ready
- Designed for NEBS and ETSI compliance (configuration dependent)

The Artesyn Embedded Technologies ATCA-7490 blade is the ideal work load unit for meeting demanding performance and network requirements in commercial, governmental and defense communications networks. Compute-intensive tasks like DPI, firewalls, intrusion prevention and data en-/decryption can greatly benefit from the on-board capabilities including local load balancing and filtering functions, hardware accelerated crypto engines and powerful server CPUs. The local network switch provides multiple high bandwidth data paths between the CPU complex, the system fabric network and the connected Ethernet I/O. Integrated into a system such as the Artesyn Centellis® 8840, the many Ethernet interfaces allow to place the platform in-between multiple networks. With over 200Gbit of aggregated ingress/egress data paths per ATCA-7490 blade, the platform supports scalable high throughput and line-rate performance. Serving as a powerful security gateway, it can protect sensitive data and resources as they exist inside defense and commercial networks. By combining an open source OS such as CentOS with OpenStack, the ATCA-7490 resources become accessible and sharable in cloud environments.

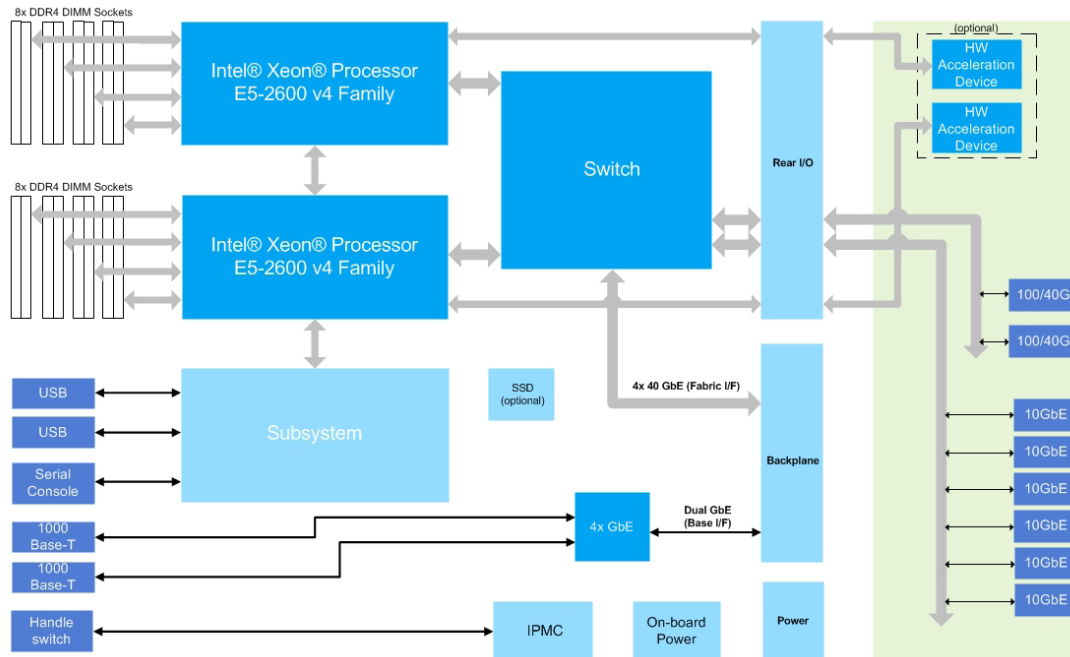
The bladed architecture follows the Modular Open Systems Approach (MOSA) and features commercial off-the-shelf (COTS) technologies. With scalable performance, ease of maintenance, reduced cabling and multivendor interoperability, the ATCA-7490 is well positioned for defense applications in air/shipborne data centers, ground control stations, network data analytics, ad hoc cellular networks and other C4ISR tasks.

The board design has been optimized for unmatched computational performance featuring two Intel® Xeon® E5-2600 v4 family processors. Data paths to main memory and I/O are highly optimized by the use of DDR4 and PCIe Gen 3 protocols. Memory capacity can scale up to 512GB allowing for cost optimized configurations as well as for applications with demanding memory requirements as needed in routing decisions or pattern matching. The blade can be combined with optional hardware accelerators directly connected to the CPUs. The accelerators are optimized for assisting encryption/decryption algorithms and can greatly enhance throughput of encrypted data in security applications.



Advanced TCA®

ATCA-7490 Block Diagram



The ATCA-7490 features two Intel® Xeon® E5-2600 v4 family processors with high bandwidth data paths to all memory and I/O resources. The board power and cooling design has been optimized for processor derivatives supporting highest core count per socket and highest available clock frequencies. Depending on the applications needs, derivatives with lower core count and frequency selections can be used.

The Artesyn Centellis® 8000 family is the optimal platform for enabling highest performance in both NEBS L3 and data center environments. The ATCA-7490 can also be integrated into CP-TA B.4 compliant shelves and operated at excellent performance under NEBS L3 conditions. With a total of 16 DIMM sockets the board is prepared for hosting memory capacities of up to 512GB. By populating two DIMMs per memory channel, cost efficient modules with lower capacity can be used for achieving capacities of 128 GB or 256 GB. Eight memory channels featuring DDR4 technology allow for highest data throughput at reduced power consumption. Furthermore the ATCA-7490 can be equipped with solid state disks for large mass storage at an interface bandwidth of 6Gbps for optimal system throughput.

The ATCA-7490 hosts an Ethernet switch that connects the CPU complex with the fabric interface at the system backplane and optional I/O modules installed at the rear side of the shelf. High speed data paths allow for unmatched bandwidth with up to 200Gbps bandwidth from the CPU complex, 160Gbps into the fabric interface and a maximum of 260Gbps to the rear I/O. The fabric interface provides four 40G Ethernet channels allowing for QuadStar™, dual-dual star and dual star configurations. System integrators can select from a variety of topologies including 4+0,

3+1 and 2+2 redundancy exploiting connectivity of four installed hub blades such as the Artesyn ATCA-F140. Applications like DPI can greatly benefit from 80, 120 or even 160 Gbps unconstrained bandwidth between the ATCA-7490 and the hub blades, resulting in 50 or even 100% bandwidth improvement compared against competitive solutions. The blade is also well suited for applications that require a single active 40Gb interface (dual-star) with a set of two hub blades.

Optionally available rear I/O enables two 100G/40G Ethernet (QSFP28/QSFP+) and six 10G Ethernet interfaces (SFP+) per blade. The Ethernet I/O options allow a high degree of flexibility to connect to multiple networks. For example security appliances for mobile networks can connect to edge and core with an aggregated bandwidth of up to 130Gb to each network for every installed ATCA-7490 in the system.

The switching complex supports traffic routing from/to the I/O into the CPU complex as well as directly into the systems backplane to other installed payload blades. Load balancing and filtering inside the switch offloads the local CPUs from this tasks and can greatly enhance the overall latency and throughput. The switch can also load balance traffic into locally available CPU cores to further optimize system throughput. Offloading the CPU from load balancing can free up CPU cores, which can provide 10% to 20% more CPU performance to the application.

The CPUs can also be offloaded with the help of crypto hardware acceleration featuring two Intel® Communications Chipset 8955. This option can significantly boost encryption/decryption throughput as required in security applications.

Software Enablement

The ATCA-7490 blade can be configured with a variety of software offerings, from firmware-only to fully integrated and verified software operating environments.

FIRMWARE

The board is preinstalled with BIOS and IPMC firmware that allows combining the board with 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 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-7490 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
- FW rollback capability
- Support for serial port redirection over LAN interface

SUPPORTED OPERATING SYSTEMS AND APPLIANCES

The ATCA-7490 is designed to operate with:

- Open source Linux operating systems
- Commercial available Linux operating systems
- Intel Data Plane Development Kit

Linux derivatives are combinable with Basic Blade Services (BBS) provided by Artesyn. BBS provides services that help to integrate the board into a system context and manage board resources. The Basic Blade Services include:

- Hardware Platform Management including local IPMC, LED, E-Keying and blade extraction software
- Firmware upgrade utility
- Local management access (CLI)
- Supervision of optical modules

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 board.

Hardware Specification

PROCESSOR

- Two Intel® Xeon® processors E5-2600 v4 family
- Dual QuickPath Interface (QPI) – 9.6 GT/s max.
- Max. 50M L3 cache, 2.5MB per available core
- Enhanced features (Intel AES-NI, AVX/SSE, VT, 64-bit, power management)
- SMP and HT support

MEMORY

- DDR4-2133/2400 memory controllers integrated into processors
- Total of four independent memory channels per CPU socket
- Scalable memory capacity 64, 128, 256 GB, prepared for 512 GB
- Support for memory integrity (ECC)

MASS STORAGE

- Up to three on-board solid state disks at 6Gbps SATA
- 1.4TB max capacity

BASE AND FABRIC INTERFACES

- PICMG® 3.0 base interface compliant, Gigabit Ethernet (1Gbps)
- QuadStar™ ATCA Fabric Interface with four (4) 40 Gigabit Ethernet (KR4) channels, or PICMG 3.1, Option 9 (10Gbps)
- Fabric Interface configurable as 3+1, 2+2, 1+1 (redundant) or 4+0, 3+0, 2+0, 1+0 (non-redundant)

HARDWARE OFF LOADING

- Dual Intel® Communications Chipset 8955 with integrated hardware off-load engines on optional RTM
- TPM 1.2

COUNTERS/TIMERS

- Real-time clock
- Programmable watchdog timer

EXTERNAL INTERFACES

- Front panel
 - 10/100/1000Base-T Ethernet (2), RJ-45
 - Serial console (1), RJ-45
 - USB 3.0 (2)
- Rear transition module
 - 100/40Gb Eth (2), QSFP28/QSFP+
 - 10Gb Eth (6), SFP+

POWER REQUIREMENTS

- Dual-redundant –48/–60 VDC (TNV-2) rail
- Input range: –39 to –72 VDC

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)

THERMAL CHARACTERISTICS

- Board variants designed for NEBS L3
 - Operating range: –5 °C to 55 °C
 - Airflow requirements: CP-TA B.4 or higher depending on configuration options
- Board variants designed for data center environments
 - Operating range: 0 °C to 35 °C (depending on available cooling)
 - Airflow cooling requirements: CP-TA B.4 or higher depending on configuration options

Ordering Information

<i>Part Number</i>	<i>Description</i>
ATCA-7490-0GB-HF	ATCA packet processing blade with dual 14-core Intel Xeon processors, E5-2680 v4 (2.4 GHz), 16X DIMM sockets, 0GB, QuadStar™ 40G support, for shelves with enhanced power & cooling capabilities. Designed for NEBS L3/ETSI. See Note 1.
ATCA-7490-0GB-HE	ATCA packet processing blade with dual 14-core Intel Xeon processors, E5-2658 v4 (2.3 GHz), 16X DIMM sockets, 0GB, QuadStar™ 40G support, for shelves with enhanced power & cooling capabilities. Designed for NEBS L3/ETSI. See Note 1.
ATCA-7490-0GB-HEL	ATCA packet processing blade with dual 14-core Intel Xeon processors, E5-2658 v4 (2.3 GHz), 16X DIMM sockets, 0GB, QuadStar™ 40G support, low power version. Designed for NEBS L3/ETSI. See Note 1.
ATCA-7XMEM-2133-8G	8GB DDR4-2133 VLP memory module for the ATCA-748X and ATCA-749X product series
ATCA-7XMEM-2133-16G	16GB DDR4-2133 VLP memory module for the ATCA-748X and ATCA-749X product series
ATCA-7XMEM-2400-8G	8GB DDR4-2400 VLP memory module for the ATCA-749X product series
ATCA-7XMEM-2400-16G	16GB DDR4-2400 VLP memory module for the ATCA-749X product series
ATCA-7XMEM-2400-32G	32GB DDR4-2400 VLP memory module for the ATCA-749X product series
ATCA-748XMOD-KIT	SLIM SATA (MO-297) MODULE CARRIER KIT, 3 SSD sites, 0GB
ATCA-7XMMOD-SATA3	128GB Slim SATA (MO-297) MLC Module for ATCA-737X and ATCA-747X product series, 3Gb SATA I/F
ATCA-7XMMOD-SATA5	256GB Slim SATA (MO-297) MLC Module for ATCA-748X product series, 6Gb SATA I/F
RTM-ATCA-749X-100G	RTM for ATCA-749X product series, 2x 100/40GbE for QSFP28/QSFP+, 6x 10GbE for SFP+. See Note 2
RTM-ATCA-749X-100GHA	RTM for ATCA-749X product series, 2x 100/40GbE for QSFP28/QSFP+, 6x 10GbE for SFP+, 2x crypto HW accelerators. See Note 2
CABLE-COP-QSFP28-1M	100G QSFP+ DIRECT ATTACH, MOLDED CABLE - 1 METER
CABLE-A-OPT-QSFP28-5	100G QSFP28 ACTIVE OPTICAL CABLE – 5 METER
QSFP28-100G-SR4-MOD	100G QSFP28 module - 100GBASE-SR4 – 850nm – for multimode fiber - MTP (MPO) connector
QSFP-40G-SR4-MODULE	40G QSFP+ module - 40GBASE-SR4 – 850nm – for multimode fiber - MTP (MPO) connector
SFP-10G-MM-SR-LC	10G SFP+ module – 10G short range – 850nm, LC connector

Note 1: No memory is installed

Note 2: Optical modules are not included

Regulatory Compliance

<i>Item</i>	<i>Description</i>
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	DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS).
	DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on waste electrical and electronic equipment (WEEE)

SOLUTION SERVICES

Artesyn Embedded Technologies provides a portfolio of solution services optimized to meet your needs throughout the product lifecycle. Design services help speed time-to-market. Deployment services include global 24x7 technical support. Renewal services enable product longevity and technology refresh.

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