Unmatched Global Market Coverage

ATCA World

Advanced Telecom & Computing Architecture

ATCA - AMC - MicroTCA

Hi-end Embedded Computing Boards & Rack Scale Systems
Modular Multi-vendor Standardized HA Redundant Platforms

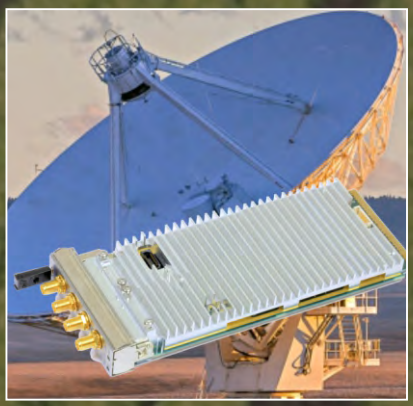
Best for Sophisticated & Critical Applications and Telecom
Communication - Military/Aero - Industrial - Physics - Research

ATCA World is a Global Publication of e2mos

Jul-Aug 2020

New Website ATCA World To be launched Sep, 2020

Discover why ATCA & MicroTCA
are offering the Best CAPEX - OPEX & TCO
All you need to know Explained in 50 pages
with Graphics & Pictures



High Performance Blade Computers
Redundant and Non-redundant
High Availability Operation - Five Nines 99,999 %
Open Modular Multi-vendor Standardized
Many I/O Standard Options & Connectivity
Make-or-Buy Application-ready Systems and Boards

For Sophisticated & Critical Applications including:

- Telecom Large Network & DCs (ETSI and NEBS)
- Military / Aerospace / Government / Geomatics
- Industrial, incl. Semiconductor Mfg Equipment
- High Energy & Nuclear Physics
- Research ...

ATCA stands for Advanced Telecom Computing Architecture but is also used in volume in many Critical Applications
ATCA is the ONLY Standardized Platform for Carrier Grade Telecom Systems
ATCA is for Hi-end, MicroTCA is smaller size - MORE: www.atcaworld.com and www.picmg.org

Special Edition - Introducing the New Website of ATCA World To be launched Sep, 2020

ATCA - AMC - MicroTCA Explained with Graphics & Pictures

Site equivalent to 50 pages A4 of information
5 pages are shown in this magazine
For review on-line anytime anywhere
For your favorites: www.atcaworld.com

Topics include:

- Welcome - Who is making what
- Introduction to ATCA - AMC - MicroTCA
- Specifications: Open, Modular, Standard, Multi-vendor « Not Locked in ONE Vendor »
- High Performance Embedded Computers
- High Availability: the Five Nines 99,999 %
- Redundant Systems
- No Single Point of Failure
- Best for Critical & Sophisticated Applications
- ATCA Overview
- AMC Overview
- MicroTCA Overview
- Success Stories Volume
- Success Stories Prestigious Projects
- Top 30 Global Mobile Networks using ATCA
- Resources
- Archives
- Free Subscription
- About us

ATCA Deployment Today

Mainly Redundant Applications & Complex Systems
Telecom Large Network Datacenters (ETSI and NEBS)
Military & Aero: Mobile Networks, Multi-mission Aircraft
Government, Geomatics
High-Energy & Nuclear Physics
Semiconductor Manufacturing Equipment
Research

MicroTCA Deployment Today

Communication - Industrial - Medical
Mobile Edge Computing (MEC)
Network Packet Analyzers
Oil & Gas Exploration
Geomatics
Automation • Production Control
Digital Imaging/Video Processing
Enterprise/Industrial Data Processing
Transportation: Rail & Others
Test & Measurement • Telemetry • IoT
Military & Aerospace: Land, Air, Sea, Underwater
Signal Processing
RADAR / SONAR Systems
SIG-INT / COMINT/ELINT Systems
C4ISR
Electronic Warfare Systems
High Energy Physics
Particle Accelerators
Colliders

Dear Reader,

Here is your Free Copy of:
ATCA World One of our Six Global High-Tech e-magazines

We keep you up-to-date with our 6 e-magazines covering the Key Hi-Tech Markets Worldwide

Semi Update World
Semiconductors - Sensors - Tools - Cooling

aiworld

IoT World

Embedded Systems World

Telecom COTS World
Broadband Broadcast IoT AI Convergence

ATCA World
Advanced Telecom Computing Architecture

- Subjects: Original Sources
- Content to Reader's Preferences
- Many Direct Links included

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About e2mos
Global Business Progress Services

- New Customers Discovery and MEETING Setup Worldwide
- Massive Global Market Reach with our PREMIER Database and our 6 e-magazines
- Coaching - Filling the gaps, Upgrade your Customer Database, More Design-wins

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Daniel Dierickx
CEO & Co-founder at e2mos
40 Years Business & Market Expertise in Chips, Embedded Computing & Software
Global Customer Relationship

Market Positioning
Comparison of Architectures
Standard versus NON-Standard

Huawei Press Releases and Publications about the Global Success of ATCA

ATCA Platforms were Key for Huawei to become the dominant #1 in Telecom Equipment Worldwide.

Huawei Total Sales reached $Billion 129 in 2019, more than the Total of Ericsson, Nokia (incl. Alcatel-Lucent) & Cisco.

ATCA offers by far the Best CAPEX - OPEX and TCO - Many Success Stories published about ATCA Technical & Financial Advantages by Huawei.

Press Releases in abundance from Huawei and their Customers the Service Providers stating the **ATCA Key Success Factors**, also published in the Huawei company magazines **« Huawei COMMUNICATE »** (copies in our archives)

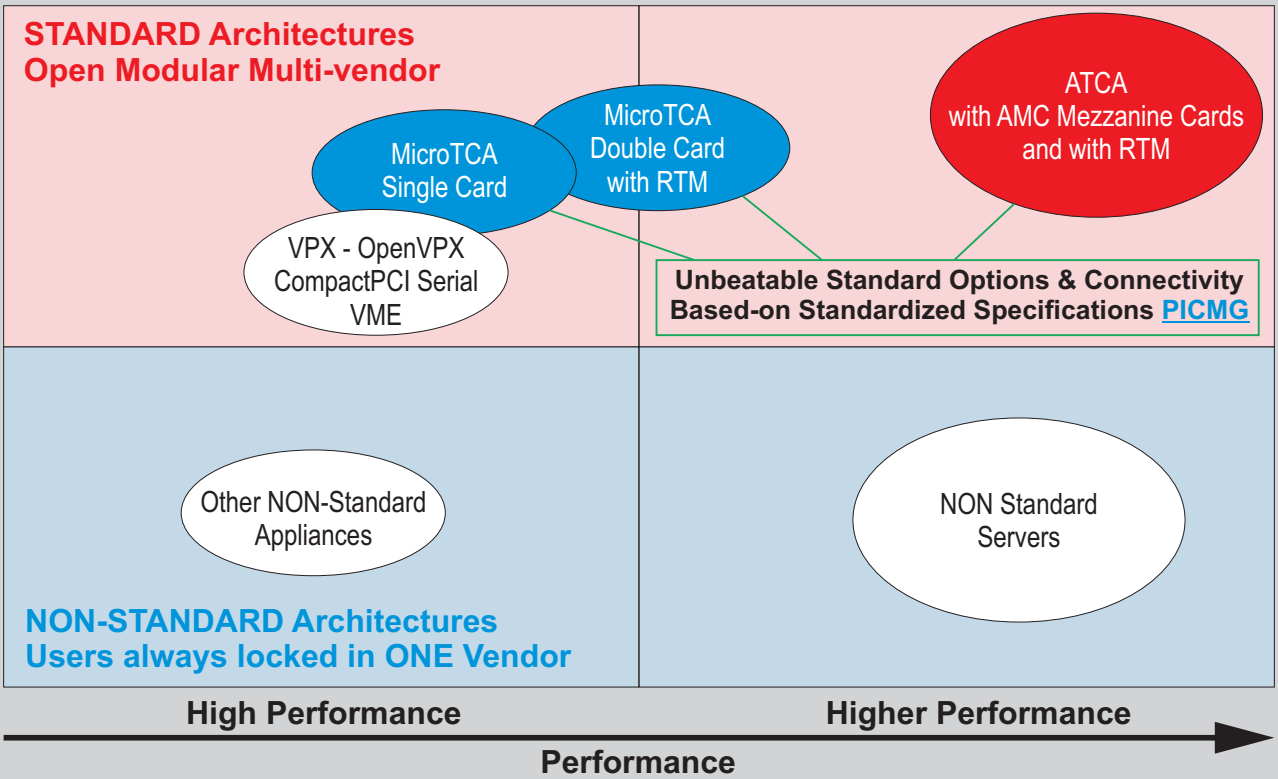
ATCA Key Success Factors published by Huawei include:

- Standardized
- Modular
- Multi-vendor
- Reduces Power Consumption by more than 70%
- Much Smaller Footprint
- Larger Capacity
- High Integration
- Higher Throughput
- Redundant « No Single Point of Failure »
- High Availability: Five Nines 99.999 %
- Easily Upgrading the Existing Platform through New Blade Cards while the Systems are in Operation
- and so much more.

HUAWEI

Huawei ATCA Telecom Platform

20 Pages Success Stories about ATCA & MicroTCA in the Next Edition of ATCA World Sep-Oct 2020



Top view of the xTCA Family - ATCA - AMC - MicroTCA

AdvancedTCA - ATCA

ATCA Computers are mainly used for
Large, Sophisticated, Complex
and Critical Applications

Redundant Systems (6 & 16-Slots)
Non-redundant (1 to 6-slots)

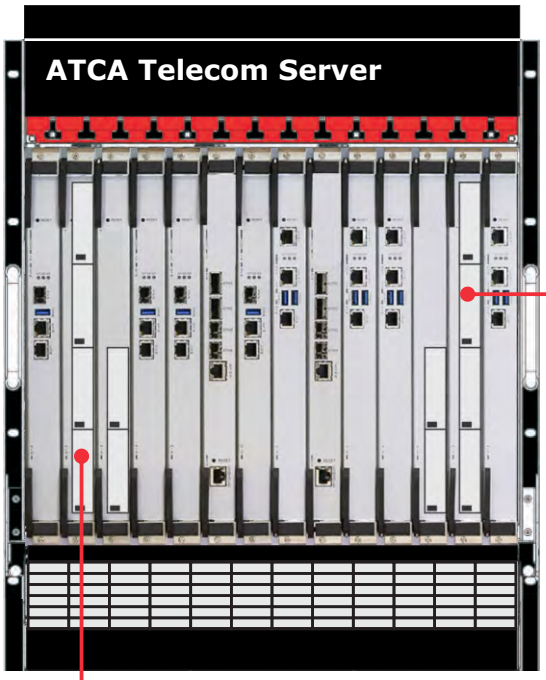
Key Applications: Large & Medium
Telecom Networks (ETSI & NEBS)
Data Centers, Military-Aero-Government,
Physics, Research,
Semiconductor Mfg Equipment

MicroTCA - µTCA

High Performance Modular
Open Standard Computers
Smaller than ATCA
From 1U to 8U Chassis

MicroTCA Systems
are based-on Single or Double AMC's
for the basic computing and
I/O building blocks
100% same as Mezzanines
used in ATCA

Commercial and Military Ruggedized
Redundant & Non-redundant



ATCA
Carrier Board
for 4 AMC's
Many Functions
incl. Storage

AMC
AdvancedMC

Advanced
Mezzanine Card
are used as:

- **Mezzanine Cards for ATCA**
- **System & IO Cards for µTCA**

500+ Functions from 20+ Vendors

More Connectivity & I/O Options
on the Rear of Chassis with RTMs
(RTM = Rear Transition Modules)

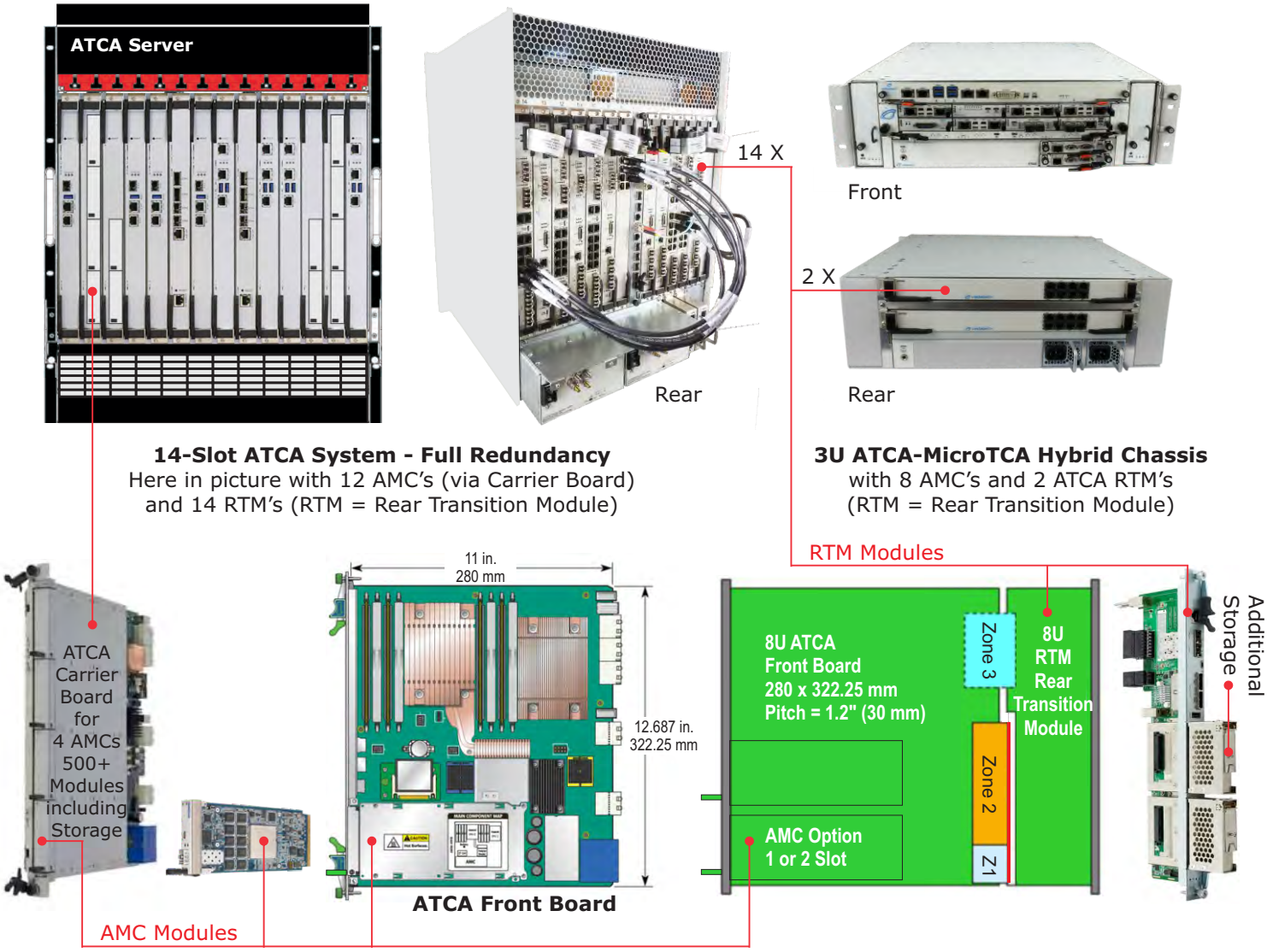
see next page

Operating Systems	Linux & Co. - Windows RTOS: Wind River VxWorks - ENEA OSE	Linux & Co. - Windows - Solaris RTOS: Wind River VxWorks - ENEA OSE
Processors	Intel Xeon - Intel Core i7 - Cavium - TI DSP - ARM Freescale /NXP QorIQ - Nvidia - PPC - Tilera	Intel Xeon - Cavium TI DSP - Octasic DSP
MicroTCA with Single AMC Cards 1U - 2U up to 12 AMC Slots Redundant & Non redundant Standard Spec - PICMG	**MicroTCA with Single & Double AMC and RTM (Rear Transition Module) 1U - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 11 Redundant & Non redundant Standard Spec - PICMG**	**ATCA-based Systems Redundant & Non Redundant 2 - 4 - 6 - 14 or 16 Slots Options: AMC & RTM Standard Spec - PICMG**

Increasing drastically the I/Os and Connectivity with Mezzanines Cards and Rear Transition Modules (RTM)

I/O Options and Connectivity for « ATCA Systems » (MicroTCA see next page)

- RF, Analog, Large FPGA, Specials ... and more
  All-based on ATCA and/or AMC Standardized Architectures
- Connectivity includes: Ethernet (10-40-100), Fiber Channel, Infiniband, StarFabric, PCI Express, Serial Rapid IO - AdvancedTCA now supports IPv6 Addressing Protocols



14-Slot ATCA System - Full Redundancy
Here in picture with 12 AMC's (via Carrier Board) and 14 RTM's (RTM = Rear Transition Module)

3U ATCA-MicroTCA Hybrid Chassis
with 8 AMC's and 2 ATCA RTM's (RTM = Rear Transition Module)

ATCA Systems - Example of Vendors

- Radisys
- SMART Embedded Computing
- Vadatech

ATCA Boards (CPU - Switch - I/O) - Example of Vendors

- Radisys
- SMART Embedded Computing
- Telco Systems: 100G Switch and Line Cards
- Vadatech

AMC Cards - Example of Vendors

- Vadatech : Many Functions CPU - I/O - Storage, 350+ Cards
- CommAgility : RF and DSP Specialist
- Concurrent Technologies
- N.A.T.
- Pentek : DSP, SW Radio, Data Acq., RF, High Speed Digital, Analog

MORE: please visit www.atcaworld.com

500+ Standard AMC Cards
Available from 20+ Global Vendors
including:

- CPU: Intel, Cavium, Freescale /NXP QorIQ, Nvidia, TI, Tilera
- Digital Processing (TI DSP)
- RF LTE PHY/stack SW for 4G & 5G
- MCH & Shelf Management
- FPGA / FMC Carriers
- Analog: A/D & D/A
- Graphics
- Network Interface
- CAN
- Storage
- Digital and Serial I/O
- Clock and GPS
- Power Modules ...

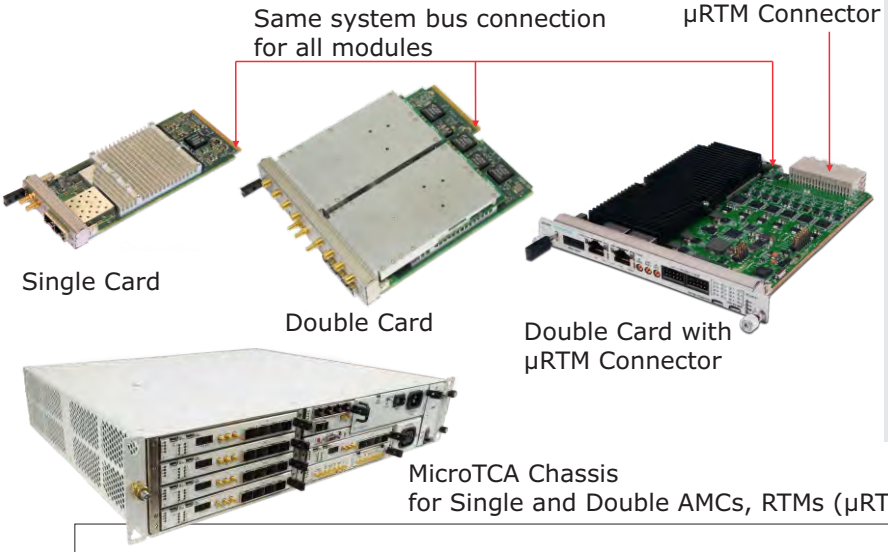
... and CUSTOM but on a STANDARDIZED AMC Card Single or Double

Increasing drastically the I/Os and Connectivity with Mezzanines Cards and Rear Transition Modules (RTM)

I/O Options and Connectivity for « MicroTCA Systems » (ATCA see previous page)

- RF, Analog, Large FPGA, Specials ... and more
  All-based on AMC Standardized Architectures
- Connectivity includes: Ethernet (10-40-100), Fiber Channel, Infiniband, StarFabric, PCI Express, Serial Rapid IO - AdvancedTCA now supports IPv6 Addressing Protocols

Three AMCs Types for MicroTCA Systems
In addition to the Single and Double AMC Card there is a Double with a µRTM connector/interface to be used with the correspondent µRTM Card, see graphic below



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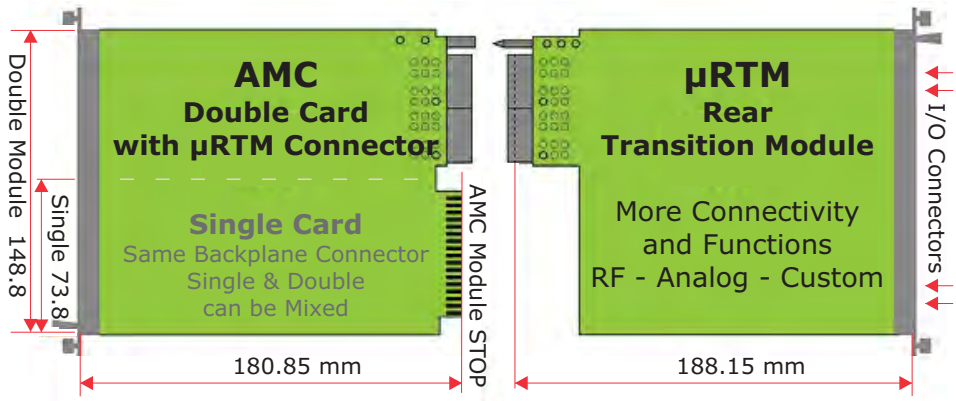
- Analog: A/D & D/A
- Graphics
- Network Interface
- CAN
- Storage
- Digital and Serial I/O
- Clock and GPS
- Power Modules ...

... and CUSTOM but on a STANDARDIZED AMC Card Single or Double

µRTM - Rear Transition Module for more Connectivity and Options
Chassis for Double AMC Cards can accommodate µRTM 's offering unlimited options including custom



Example
AMC Card 10-Channel ADC
Vadatech AMC520

Example
µRTM Card for AMC520
Vadatech MRT520

Front

Rear

AMC Cards - Example of Vendors

- Vadatech : Many Functions CPU - I/O - Storage, 350+ Cards
- CommAgility : RF and DSP Specialist
- Concurrent Technologies
- N.A.T.
- Pentek : DSP, SW Radio, Data Acq., RF, High Speed Digital, Analog

NOTE: AMC's are used in MicroTCA & ATCA
- MicroTCA: for Basic Computing & I/O
- ATCA: as Mezzanines via a Carrier Card

Redundant Systems - No Single Point of Failure
HA High Availability Five Nines 99,999 %

Those Features are included in the ATCA & MicroTCA Specifications and mandatory for ANY Critical, Sophisticated & Complex Applications like for example in:

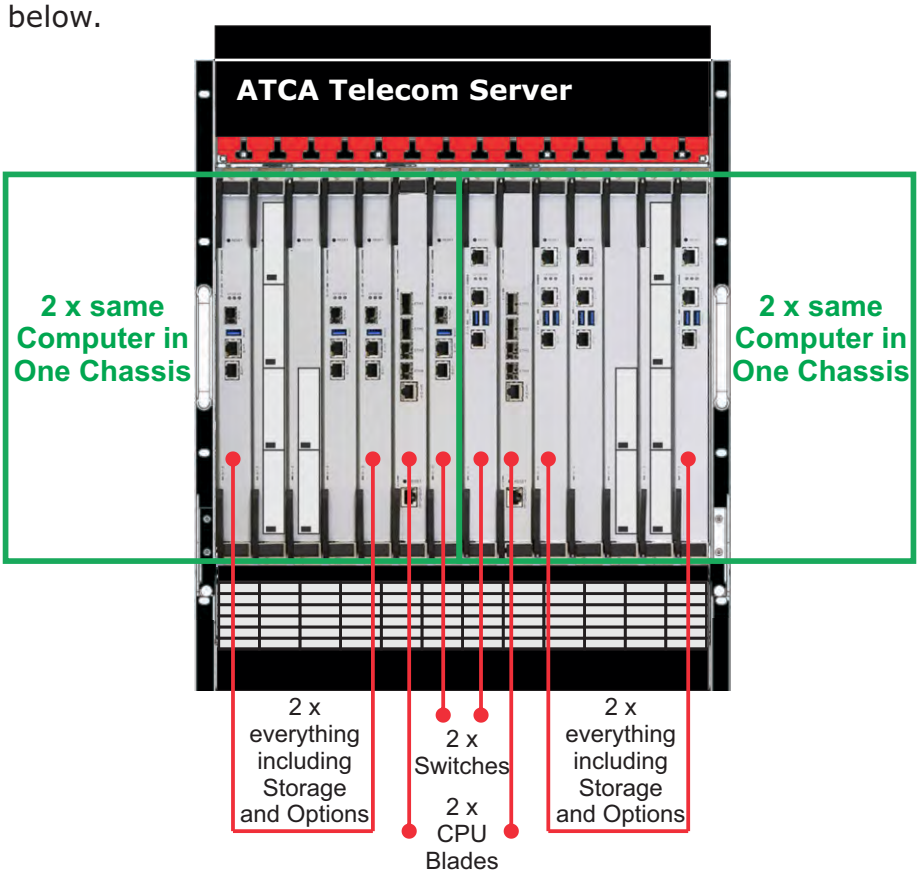
- Telecom Large Networks and Data Centers (ETSI and NEBS)
- Military - Aerospace - Government - Geomatics
- Hi-end Industrial, e.g. Semiconductor Manufacturing Equipment
- High Energy and Nuclear Physics
- Research ...

ATCA illustration of a Redundant Systems - No Single Point of Failure
Two of de complete computer including all options in ONE Standard Chassis

In a Redundant Systems (ATCA and MicroTCA) all electronic and electrical parts are double. The Power Supplies and the Fan Units are double, triple or quadruple.

An HW & SW system called Shelf Manager (ShMM) controls the entire shelf and is switching from one set to the other immediately in case of failure.

All together ATCA & MicroTCA are offering High Availability Operation at the Five Nines level, see below.



STANDARD Specifications from PICMG

ATCA (AdvancedTCA) - Overview
ATCA - ECN001 for PICMG 3.0
ATCA - ECN001 for PICMG 3.7
ATCA - Family of Specifications
AMC (AdvancedMC) - Overview
AMC - Family of Specifications
MicroTCA - Overview
MicroTCA - Family of Specifications

This series of specifications incorporates the latest trends in high speed interconnect technologies, next generation processors and improved reliability, manageability and serviceability.

In Service HW & SW Upgrade

Outstanding feature to reduce drastically the CAPEX, OPEX & TCO. Upgrade to New CPU is just an easy Board swop.

HA - High Availability a must for Communication Systems - See the Five Nines
Availability is usually expressed as a percentage of uptime in a given year

Availability %	Downtime/Year	Downtime/Month	Downtime/Week
90% "one nine"	36.5 days	72 hours	16.8 hours
99% "two nines"	3.65 days	7.20 hours	1.68 hours
99.9% "three nines"	8.76 hours	43.2 minutes	10.1 minutes
99.99% "four nines"	52.56 minutes	4.32 minutes	1.01 minutes
99.999% "five nines"	5.26 minutes	25.9 seconds	6.05 seconds
99.9999% "six nines"	31.5 seconds	2.59 seconds	0.605 seconds

Radisys
Open Telecom Solutions
ATCA-based

SMART Embedded Computing
ATCA Boards & Systems

VadaTech
ATCA Boards & Systems
350+ AMC Cards - MicroTCA

Intel
New Intel® Xeon® Scalable Processors for Mission-Critical Business

Telco Systems
100G ATCA Switch
SDN/NFV, MPLS, IP, Ethernet

CommAgility
AMC: Embedded Signal Processing
RF, LTE PHY/stack SW for 4G & 5G
Mobile Network and Related App 's

Concurrent Technologies
AMC: Defense, Security, Aerospace
Telecommunications, Transportation
Medical and Industrial

Comtel Electronics
ATCA 100 GB PER SECOND
ATCA & MicroTCA
Backplanes - Chassis - Services

ENEA
Software: Telecom & Cybersecurity
High Availability 99.999% for ATCA

Wind River
Real-time OS
VxWorks - Linux

ELMA
MicroTCA - ATCA Backplanes
Chassis - System Solutions

nVent - Schroff
ATCA MicroTCA Cabinets,
Chassis, Backplanes,
Power Supplies, Cooling

Pentek
40+ AMC Boards
DSP, SW Radio, Data Acq., RF
High-speed Digital, Analog, FPGA

Here is a selection of 13 Vendors offering:

- ATCA Application-ready Systems
- MicroTCA Application-ready Systems
- Boards: ATCA, MicroTCA, AMC
- Many Options: Mezzanines and Rear Transition Modules
- Chassis, Backplanes, Power Supplies & Fan Trays
- Software: Linux, RTOS, Communications, Tools
- Integrators
- Consultancy Services
- and more

You can find them directly on the Homepage of ATCA World including a Direct Link to their site.

Just Click Here https://www.atcaworld.com/index.html