Building Forward Together | ADLINK

End-to-End Application Ready Communication Platforms

Communications & Networking

AdvancedTCA
Extreme Outdoor Servers
Network Appliances
Media Cloud Servers



www.adlinktech.com
2016

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A Global Company



ADLINK, a manufacturer of embedded computing technology, leads the field with integration of computing power, rugged design, high availability, and industrial I/O. Dedicated to test & measurement, industrial automation, defense and aerospace, gaming, communications, medical, and transportation applications, ADLINK has made a name for itself providing reliable products of superior quality for cost-effective solutions, allowing our customers around the world to significantly reduce time-to-market burdens while increasing their competitive edge.

By providing leading-edge application-ready platforms and industrial building blocks, ADLINK empowers our customers, allowing them to minimize total cost of ownership (TOC) with customization and system integration advantages, keeping manufacturing costs low and extending product lifecycles.

ADLINK is a Premier Member of the Intel® Internet of Things Solutions Alliance and is active in several standards organizations, including the PCI Industrial Computer Manufacturers Group (PICMG), the PXI Systems Alliance (PXISA), and the Standardization Group for Embedded Technologies (SGET).

ADLINK is a global company with headquarters in Taiwan; manufacturing in Taiwan and China; R&D and integration in Taiwan, China, the US, and Germany; and an extensive network of worldwide sales and support offices. ADLINK is ISO-9001, ISO-14001, ISO-13485 and TL9000 certified and is publicly traded on the TAIEX Taiwan Stock Exchange (stock code: 6166).ADLINK products are currently available in over 40 countries across 5 continents, supported by worldwide distribution networks and offices and over 1600 employees.






Products and Services

Modular Computing

With the combined experience and technical knowledge of ADLINK, Ampro Computers and LiPPERT Embedded Computers, ADLINK is able to provide a wide range of Computer-on-Modules and Small Form Factor (SFF) Single Board Computers. Our Extreme Rugged product lines have wide operating temperature ranges and meet MIL-STD shock and vibration specifications.

- Computer-on-Modules:
  COM Express | SMARC | Qseven | ETX
- SFF Single Board Computers :
  PCI/104 | PC/104-Plus |PCI/104-Express | Mini-ITX

Being a holistic solution, ADLINK's SEMA cloud offers users the entire infrastructure required. Customers do not need to develop their own cloud solution, avoiding laborious checking of hardware compatibility, finding a suitable cloud server, implementing data encryption or developing proprietary communication protocols.

In addition to individual devices, it includes encrypted data transfer to our cloud infrastructure and an intuitive graphical user interface (GUI) to monitor and/or control devices from any location at any time via the Internet.

- Industrial Grade Cloud Solution : SEMA Cloud



Display & Computing

ADLINK's display and computing product segment (DCPS) is committed to providing our customers the best user experience with products for Medical, Industrial, and Logistics applications, including panel PCs, touchscreen monitors, and tablets that meet the demanding requirements of these industries and provide ease of use and protection from extreme environmental hazards.

- Ndustrial Monitors and Panel Computers | Medical Monitors and Panel Computers | Rugged Tablets



Embedded Computing

ADLINK works closely with Intel® to ensure that we develop and introduce innovative computing technologies by implementing embedded computing roadmaps and selecting computer solutions that best fit our target markets. This enables ADLINK to provide the highest quality and performance products with the long life cycles required by our embedded computing customers.

Our range of products includes:

- Network Appliances
- Extreme Outdoor Servers
- Media Cloud Servers
- AdvancedTCA
- 6U/3U CompactPCI Platforms
- VPX Blades and Development Kits
- Extreme Rugged Systems
- Embedded Flash Storage



Measurement & Automation

ADLINK's is dedicated to providing reliable, top quality products for industrial I/O control, motion control, digital imaging, data acquisition, and modular instrument applications. Our comprehensive portfolio of measurement and automation products, application ready platforms, and easy-to-use software packages, with integrated value-added service, continually meet and exceed customer requirements for industrial automation systems, machine vision systems, and automated test and measurement equipment.

- PXI & Modular Instruments | Data Acquisition | Machine Vision | GPIB & Bus Expansion | Motion Control | Distributed I/O | Fanless Embedded Computers | Handheld computers



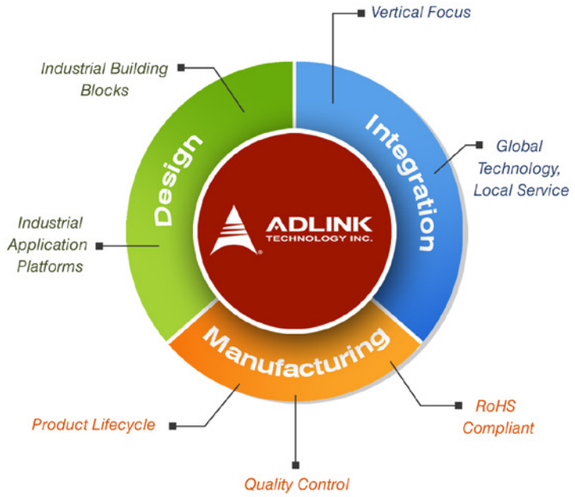
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Design and Manufacturing Services

To fulfill your requirement of high quality, cost-effective products, with quick time to market in product development, ADLINK has established and assembled a Design and Manufacturing Services team to cater to the specific demands that off-the-shelf products could not meet.

From embedded computers, data acquisition cards, and CompactPCI systems to related software packages, our DMS design team has the expertise to rapidly prototype upon the approval of finalized specifications. In addition, the winning of ISO-9001 certification ensures the exactitude of our research and development procedures with the highest product quality.

ADLINK owns and operates the manufacturing facilities in our Asia headquarters. Complete capabilities include our own PCB layout teams, SMT lines, system integration, and test capabilities. In short, ADLINK controls the whole manufacturing process, from layout and design to prototyping and volume production.









Customer Services

ADLINK is not only devoted to providing local service worldwide, but also to providing convenient online service. The following services are available around the clock on the Internet.

eRMA

ADLINK customers can send their RMA requests via our eRMA system. After obtaining an RMA number, you can track your RMA status online at any time.

Partner Center

The ADLINK Partner Center is specifically designed for worldwide sales and marketing support to allow our global sales representatives and distributors access to real-time product and marketing information and materials as soon as they are released at ADLINK headquarters. More than a resource database, the ADLINK Partner Center will also facilitate your business in serving customers.

Ask An Expert

This is the place to get help for ADLINK products. 'Ask an Expert' provides answers to commonly asked questions, or you can click on the 'Ask a Question' tab to contact ADLINK's knowledgeable staff about a specific product or issue. ADLINK AAE (Ask an Expert) is available 24/7 online and is staffed by dedicated professionals who are available to address customers' needs and answers question. All issues and comments are recorded into a database and can be tracked/reviewed at anytime. ADLINK customers are invited to access the AAE system at: http://www.adlinktech.com/AAE.

Environmental Protection Policy

ADLINK implemented a Green Product Policy in May 2004 to align the purchasing and use of green products meeting requirements from international environment protection statutes. Environmental protection is a top priority for the management at ADLINK. Measures have been taken to ensure that our products have little impact on the environment. In addition to planning a leadless process, the affect on the environment of components and raw materials will also be reduced. The Green Product concept has been built into our new product development system to ensure protection of the environment and continued business success.

RoHS Compliant Computing

ADLINK is committed to fulfill its social responsibility to global environmental preservation through compliance with the European Union's Restriction of Hazardous Substances (RoHS) directive, which restricts the use of harmful substances such as lead, mercury and cadmium in new equipment.

Most end-user applications in which ADLINK products are used do not require RoHS compliance. However, ADLINK will actively work with customers whose products are not RoHS exempt under category 8 or category 9 classifications. Our lead-free production line and process, including solder paste, solder bar and process control parameters, has been developed and standardized in our manufacturing system.

Conflict Free Minerals Policy

ADLINK will not knowingly procure material supplies and components that contain minerals that directly or indirectly finance or benefit armed groups in the Democratic Republic of Congo (DRC) or an adjoining country.

We urge our suppliers to support this policy in their own procurement guidelines and provide us with accurate country of origin information.

ADLINK shall:

- Comply fully with requests from EICC-GeSI.
- Conduct a reasonable country of origin inquiry to clarify the origins of the Gold, Tantalum, Tungsten and Tin used in our products.
- Establish reasonable objectives and targets with a goal of ascertaining and minimizing ADLINK's risk. With a goal of continuous improvement for our Conflict Free Minerals Program, develop a means to measure objectives and targets. ADLINK will also review, revise and report these measures, and overall program updates, on an annual basis.
- Empower all employees, suppliers, vendors and contractors to take ownership in complying with the Conflict Free Minerals Policy and to escalate risks in the supply chain to management's attention.
- Effectively communicate to all employees this Conflict Free Minerals Policy and our Conflict Free Minerals Program.

Management Flow

The management flow of ADLINK's Green Policy begins during the development stage of a product. Only parts and raw materials that meet RoHS requirements are sourced. Our engineers specifically design products using only qualified components. A lead-free process ensures that manufactured products are "green." Green products do not contain environmentally hazardous elements and can easily be recycled.

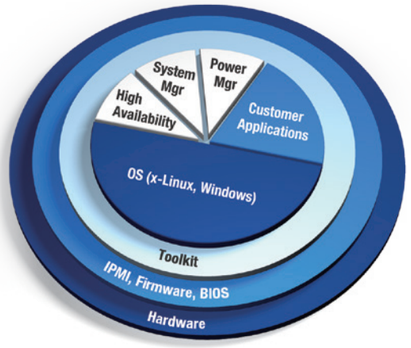
REACH Declaration

The Registration, Evaluation, Authorization and Restriction of Chemicals Regulation 1907/2006, commonly referred to as "REACH", is Europe's new chemicals legislation. The products that we supply are non-chemical products and under normal and reasonable use, they will not release harmful substance. Furthermore, we will immediately inform you in correspondence to REACH-Article 33 if any substance of content (as from a content of >0.1%) in our products will be classified alarming by the European Agency for Chemicals ECHA.

Application Ready Intelligent Platforms (ARiPs)



Commercial Off-The-Shelf (COTS) products have become commonplace in many domains, including telecom, networking and defense, as they can provide standardized functionality and shorter time-to-market at lower cost than custom made solutions. In response to this industry trend, ADLINK Application Ready Intelligent Platforms (ARIPs) meet the various needs of demanding customers. ADLINK ARIPs are a set of validated integratable building blocks, including hardware, OS, and software components (firmware & middleware).



ADLINK ARiPs provide hardware level integration and validation using building blocks from ADLINK's standard product lines and OS validation, performance tuning, and virtualization certification; as well as MediaManager and PacketManager to assist the customer in developing applications quickly with less effort compared to modern processor/ASIC architectures. ADLINK ARiPs also provide a variety of intelligent software including Embedded Power Management Agent (EPMA), Platform Management software (IPMC/ShMC, BMC/CMM, System Manager), and Diagnostic and Service Availability Framework (SAF), enabling ADLINK products to be energy-efficient, intelligent and robust platforms.

With ADLINK's proven platforms and solutions, customer applications can reduce dependence on lower level services, and enable self-forming and self-healing capabilites of final products, thus saving valuable resources to support innovation of new products and solutions.

What are the benefits?

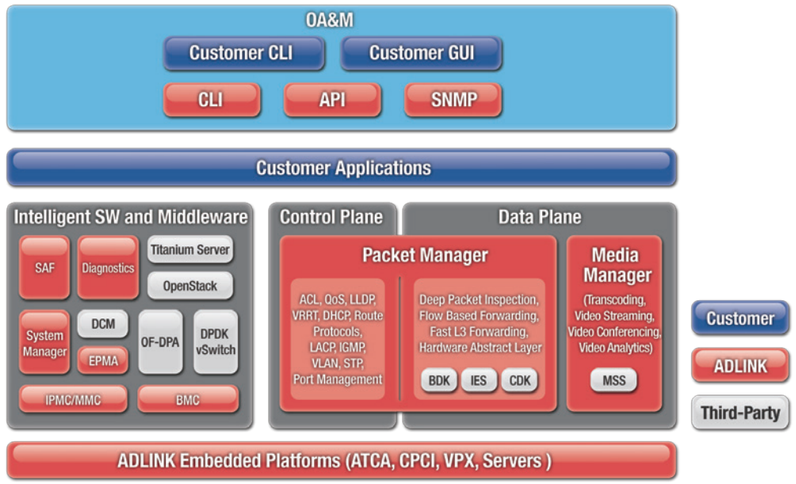
- Shorter time-to-market (TTM)
- Reduced total cost of ownership (TCO)
- Mitigate technical risks
- Provide performance benchmarks and optimization

Proofs-of-Concept

ADLINK proofs-of-concepts validate our platforms for customers' end-applications, ensuring performance and capacity requirements are met and reducing development time.

Network Function Virtualization	• Integrates latest virtual technologies • Integrates popular NFV middleware	• High performance and throughput • Carrier grade design
Telecom DPI/ High-end Security	• Cloud interconnection, cloud security • High performance DPI/policy	• LTE and next gen security • Gateways- SBC, security, PCRF
Mobile Edge Computing	• NFV ready platform • Indoor and outdoor form factors	• High performance computing • Remote system management
Media Cloud Server	• Hardware assisted transcoding • HEVC/VP9 encoding & decoding	• Big data video analytics • WebRTC conferencing

ARiPs Software Architecture



ARiPs Software

MediaManager	Provides video/audio multiplexing/de-multiplexing, RTP stream sending/receiving, video composition, and application prototypes for video streaming on demand, video conferencing and video analytics. Helps customers take advantage of GPU hardware acceleration capabilities.
PacketManager	Supports layer 2 and layer 3 control plane protocols and features such as port management, routing protocols, and ACL. Provides Hardware Abstract layer to support chipsets from multiple vendors, such as Broadcom, Intel and Cavium. Supports data plane routines such as fast layer 3 forwarding, flow-based forwarding, and deep packet inspection.
Service Availability Framework (SAF)	Based on Service Availability Framework middleware to support redundancy management, session context synchronization, heartbeat, and failure notification.
Embedded Power Management Agent (EPMA)	Intel® Node Manager based active power management. Reports board-level power consumption, inlet/outlet thermal statistics. Limits power consumption via policy triggers.
Diagnostics	Diagnoses hardware performance and health status, then reports the results as requested by local and remote users. Diagnostic hardware targets include CPU, BIOS, memory, storage and Ethernet interfaces.
Virtualization	VMware certified, supports live migration to avoid service interruption during software upgrades, improves service and facilitates easier maintenance. Integrates and validates NFV middleware OpenStack and Wind River Titanium Server.
Operations, Administration & Maintenance (OA&M)	Provides CLI, SNMP, API client library for customers to develop and integrate software management into their own OA&M system.

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ADLINK Telecom and Networking Solutions

End-to-End Application Ready Communication Platforms

In order to reduce infrastructure expenditures (CapEx/OpEx) and accelerate the deployment of new services, network operators and communications service providers (CSPs) are calling for more infrastructure solutions based on the principles outlined by Network Functions Virtualization (NFV). The core of this architectural approach is the decoupling of network functions from hardware through abstraction and virtualization. The end result is software workloads that can be run on a common pool of hardware resources, allowing them to be deployed dynamically throughout the network as needed.

Recent advances in Intel® processor performance and ADLINK's software libraries enable operator solutions capable of handling increased network workloads, thus taking the telecom industry closer to the NFV design objectives. ADLINK's ATCA blades and system products, Network Appliances , Media Cloud Servers and Extreme Outdoor Servers exceed the performance, reliability and availability criteria of network infrastructure requirements as the industry transitions to an NFV model. ADLINK communications solutions support critical networking functions, including policy enforcement, control-plane acceleration, media optimization, deep packet inspection (DPI), load balancing, switching and security.

Communications service providers have stringent timing constraints for their mission-critical applications and services, such as voice, video and billing. In many cases, open-source software components must be enhanced in order to satisfy associated real-time requirements.

Video Streaming, Transcoding

ADLINK Media Cloud Server is an Application Ready Intelligent Platform (ARiP) for advanced video applications with high density computing performance that is designed from the ground up to meet the technical considerations specific to media servers while being cost-effective and easy to maintain.

Network Security

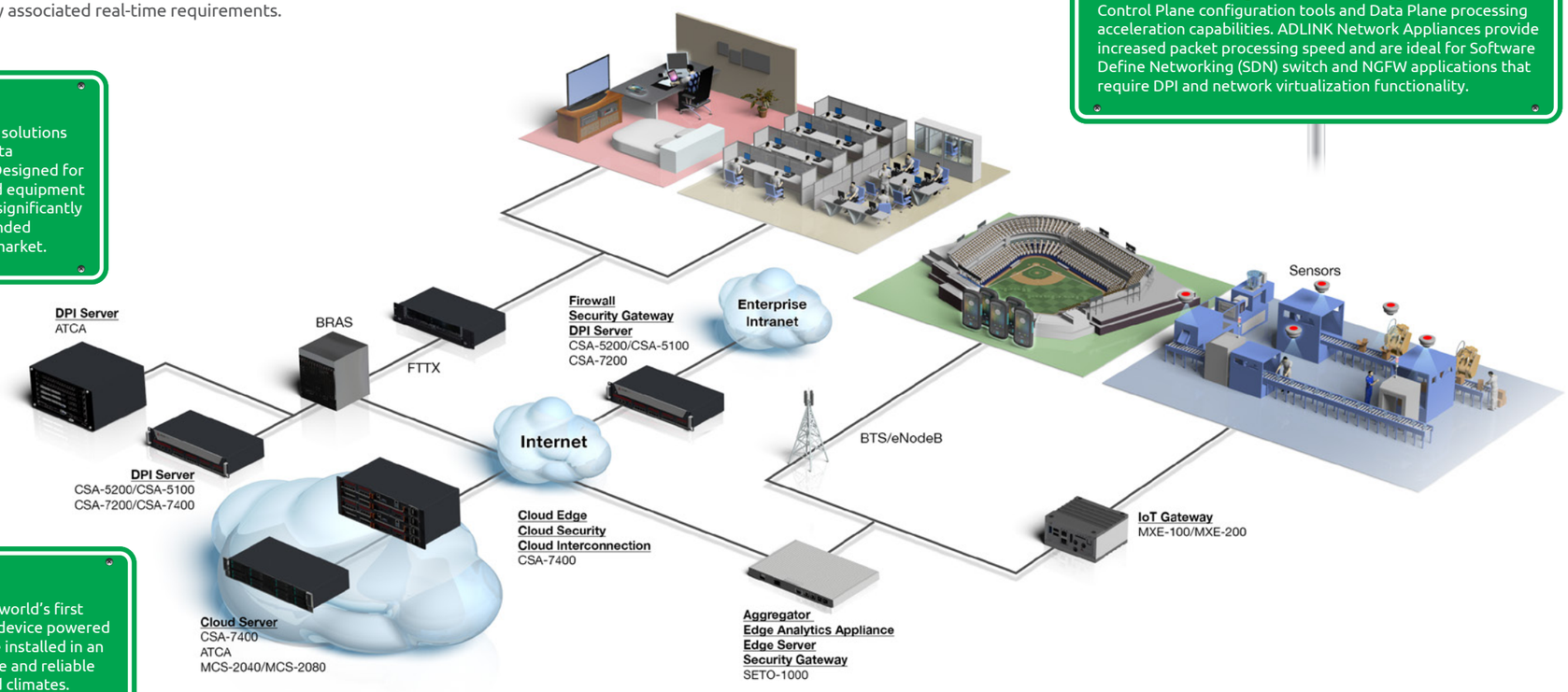
ADLINK Network Appliances are accompanied by the ADLINK PacketManager, a software package which includes Control Plane configuration tools and Data Plane processing acceleration capabilities. ADLINK Network Appliances provide increased packet processing speed and are ideal for Software Define Networking (SDN) switch and NGFW applications that require DPI and network virtualization functionality.

Telecommunication

ADLINK provides complete AdvancedTCA platform solutions that offer high-density processing power, faster data throughput, and intelligent system management. Designed for next-generation telecom, datacom, networking and equipment manufacturers, ADLINK's AdvancedTCA platforms significantly reduce overall development costs, come with extended operating lifecycles, and speed up critical time-to-market.

Mobile Edge Computing

ADLINK Extreme Outdoor Server is the world's first compact server-grade edge computing device powered by Intel® Xeon® processors that can be installed in an outdoor environment and provide stable and reliable performance in all types of weather and climates.



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PacketManager



Consolidate the Packet Processing Performance for Telecom and Networking Applications

Due to the exponential growth of data traffic, service operators need increased levels of switching and fast forwarding bandwidth to keep up with rapidly growing operational demands. ADLINK has developed PacketManager to help customers to develop network packet processing related applications by providing the conventional layer 2 and layer 3 features, as well as functionality for flow based forwarding, load balancing, and compression/decompression and encryption/decryption of a network packet.

Designed to support different hardware architectures, including x86 generic processors, Broadcom switches, Intel® Ethernet Multi-host Controllers (formerly "Red Rock Canyon"), and Cavium network processors, ADLINK PacketManager provides a hardware abstraction layer (HAL), to make transparent the differences in hardware between platforms. In addition to HAL, ADLINK PacketManager also includes a variety of L2/L3 protocols and features, as well as flow handling routines that allow customers to develop their own applications for both data and control planes with less effort.

Control Plane Software

Built using the Linux operating system as a foundation, the ADLINK PacketManager control plane includes the most commonly used Layer2/3 protocols and features, including Port Manager, VLAN, LACP, IGMP, STP, LLDP, Route Protocols, VRRP, QoS, and ACL. The control plane also takes ownership of updating the protocol state/information, including port state/statistics, ARP/routing tables, and relative protocols states, and then synchronizes the data with the data plane.

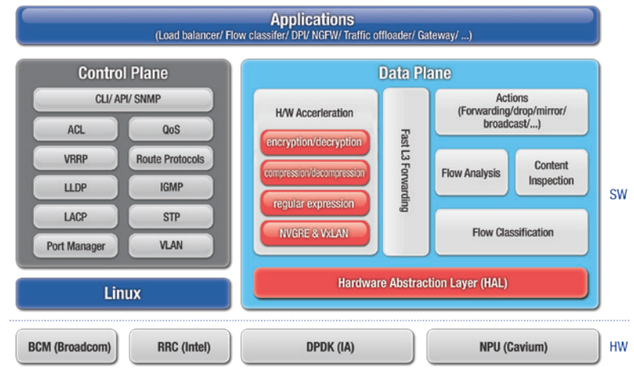
For easy deployment and management, ADLINK PacketManager not only provides a friendly command line interface (CLI), but also includes client APIs to allow further customization and integration with the customers' management systems.

Data Plane Software

In contrast to the control plane, the ADLINK PacketManager data plane provides a fast path to process packets using pre-defined routines, without extra protocol interaction. Generally, with the exception of protocol packets which are sent to the control plane for further processing, the data plane can process most packets at a linear rate relative to that of the physical interfaces.

ADLINK PacketManager provides a range of customizable data plane routines to classify the incoming packets based on traditional destination IP as well as innovative flow tuples, then perform deeper checking and processing such as flow analysis and content inspection, and finally execute predefined actions on the matched packets, such as forward, drop, mirror or broadcast.

The data plane also includes hardware acceleration components including data encryption/decryption, compression/decompression, as well as regular expression and NVGRE/VXLAN processing to help offload valuable CPU resources that can be used for other packet processing tasks.



ADLINK PacketManager Software Architecture

Features

- Layer 2 Features
  - Port manager to provide the state and statistics of each physical interface
  - VLAN configuration, management, monitoring
  - Support for STP/LACP/LLDP protocols
  - ARP & Neighbor Discovery update and sync
- Layer 3 Features
  - Support for IPv4/IPv6 dynamic routing protocols
  - IPv4/IPv6 route table update and sync
  - Support for VLAN interface and VRRP protocol
  - IGMP snooping and IGMP proxy
- Flow-based Features
  - Flow classification based on n-tuple and flow status management
  - Flow analysis to identify a flow based on application recognition
  - Content inspection to identify a flow based on RegEx-based rules
  - Miscellaneous flow actions, including drop, forward, load-balance, speed-limit
- Miscellaneous
  - Access Control List (ACL) for flow classification & forwarding control
  - Quality of Service (QoS) for differentiated service
  - Sync of ARP and routing information between control and data planes
  - Hardware acceleration for encryption/decryption, compression/decompression, regular expression and NVGRE/VxLAN processing
- Configuration & Management
  - Command-line interface (CLI)
  - Client API library for remote calling
  - SNMP MIB for remote management
  - Robust logging mechanism for easy debug

Applications

ADLINK PacketManager can be easily used by customers to develop and deploy mainstream applications, especially for applications which require high performance packet processing ability and a wide range of protocol support, such as:

- L2/L3 switching/routing
- L4/L7 load balancing
- Deep Packet Inspection (DPI)
- Next-generation firewall, security gateway
- 3G/LTE/C-RAN network traffic offloader/accelerator
- Mobile Edge Computing
- SDN/NFV solutions

Supported Products

- AdvancedTCA switch blades, processor blades
  - aTCA-3710/3430
  - aTCA-9300/62xx/97xx
  - aTCA-N700
- CompactPCI switch blades
  - cPCI-6S10
- Network Appliances
  - CSA-5100/5200/7200/7400
- Extreme Outdoor Server
  - SETO-1000

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MediaManager



Enhances Intel® Media Server Studio to Provide End-to-End Functionality

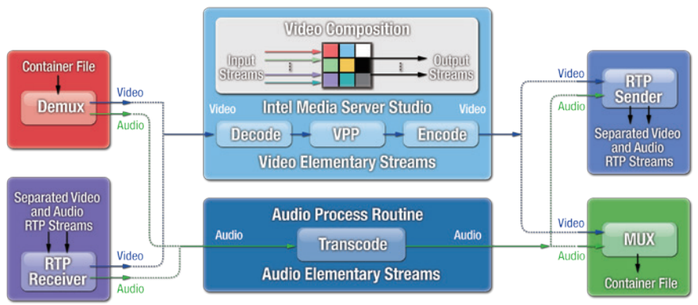
Intel® Media Server Studio (Intel® MSS) is a cross-platform (Windows and Linux) application suite for developing professional media applications, including video transcoding, video streaming, video conferencing, and video analytics.

Intel® MSS is designed to provide the best possible video processing performance on Intel® processors supporting Intel® Quick Sync Video hardware encoding and decoding. Intel® MSS effectively uses the GPU to offload video processing tasks from the CPU, significantly accelerating video processing speed and reducing CPU resource loading. Intel® MSS supports current Intel processors as well as those that will be available in the future. Applications will not need to be redesigned to run over new processors as they emerge.

Intel® MSS has extensive video processing capabilities, but it does not provide a comprehensive end-to-end solution for media processing tasks. ADLINK MediaManager fills this gap and provides the following functionality: container file operations (mux and demux), Real-Time Transport Protocol (RTP) receiving/streaming, video composition, and processing of audio elements. Customers developing fully functional media applications will no longer need to write software from scratch to perform these operations.

Features

The ADLINK MediaManager expands on the functionality of Intel® MSS by providing additional modules to handle common media processing tasks not natively supported by the Intel® MSS, including mux/demux of media container files, RTP receiving and streaming, video composition, and audio processing.



ADLINK MediaManager architecture.

- **Demux/Mux Module:** Demuxes/muxes the video and audio elements from/into a container file. The common video formats H.264/MPEG2 and audio formats AAC/MP3 are supported.
- **RTP Receiver/Sender Module:** Receives video and audio elements from separate RTP streams. Streams video and audio elements with respective RTP streams to a destination over the network. The streaming format for video and audio are H.264 and AAC, respectively.
- **Video Composition:** Compositing of from 2 to 16 input video streams into a video mosaic. The composition module can assist with development of a multipoint control unit (MCU) within a conference server (supports WebRTC).
- **Audio Processor Routine:** Audio transcoding between AAC and MP3, and audio playback.

The ADLINK MediaManager also includes application prototypes for video streaming on demand, video conferencing and video analytics. These software packages can help customer take maximum advantage of GPU hardware acceleration capabilites, and develop video applications on Media Cloud Servers more easily and quickly.

Applications

Media applications have experienced explosive development in recent years with more and more smart devices connected to the Internet, Video capture devices have become easily affordable, and significant portion of the increase in Internet use originates from the popularity of smart phones and tablets. As shown in the following table, the ADLINK Media Cloud Server plus MediaManager can be used to accelerate the development of popular media applications on the server side, helping both traditional media service providers and new over-the-top (OTT) content providers to meet the video processing challenges presented by today's usage models.

Application	Challenges	ADLINK Solutions
Video Analytics	Real-time video analysis; Video searching from massive video achieves	Supports OpenCL to accelerate video analytics; validated with Intel big data solution on Apache Storm.
Streaming Transcoder	High-density multiscreen and multi-rate transcoding; Ultra-HD transcoding	Uses GPU to increase video processing speed and capabilities; supports hardware assisted 4K video transcoding
Conferencing MCU	High-quality video delivery at low bandwidths; HEVC encoding and decoding; product differentiation	Supports 60fps encoding and dynamic bitrate control; supports hardware assisted HEVC encoding and decoding; enables finer control of the encoding pipeline.
WebRTC MCU and Gateway	VP8/VP9 video transcoding; WebRTC software stack.	Supports hardware assisted VP8/VP9 transcoding; fully validated with Intel® Collaboration Suite for WebRTC.

Applications supported by ADLINK MediaManager

Supported Products

MCS-2040

The ADLINK MCS-2040 is a cost-effective 2U 19" 4-node Media Cloud Server with redundant 1600W power supply. Each node supports the following:



- Two independent systems communicate through built-in GbE
- Dual CPU sockets (LGA1150), support 4th Generation Intel® Core™ i7/i5/i3 and Xeon® Processor E3 v3
- 4x DIMMs, up to 32GB DDR3 memory, 16GB/system
- 4x hot-swappable 2.5" SATA drive bays
- 4x GbE RJ-45 per node, two per system
- PCIe x16 expansion slot for 10G or Fibre Channel add-on cards
- Intel® AMT based remote system management

MCS-2080

The ADLINK MCS-2080 is a high-density 2U 19" Media Cloud Server with modular compute and switch nodes. The MCS-2080 supports the following features:



- 16 systems (MCN-1500 compute node) or 4 systems (MCN-2600T compute node), hybrid combinations supported
- Supports Intel® Quick Sync Video (GT4e graphics) with hardware assisted H265/VP9 transcoding
- Onboard 2x mSATA slots, supports SSD modules up to 512GB
- Dual redundant switch nodes, each providing 16x 1G internal links to compute nodes and 4x 10G uplinks
- 8x PCIe x8 slots to meet expansion requirements
- IPMI 2.0 with SOL and web-based management interface

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Modular Industrial Cloud Architecture (MICA)

Enable resource allocation on-demand to meet key requirement of cloud computing

Cloud computing forces a transformation of ICT equipment

With the recent technical advancements of the mobile Internet, data centers and big data processing, cloud computing is becoming the mainstream service delivery model of the future, causing the traditional Information and Communication Technologies (ICT) market to experience a huge transformation. The construction of traditional ICT equipment was usually based on old design methodology which packaged the computing, storage and IO resources into a single physical entity according to the initial maximum demands. This often necessitated a redesign of existing equipment to adapt to the requirements of a new application appliance, sometimes with only a small hardware change. A fundamental requirement of cloud computing is "resources on demand", meaning that computing, storage and IO resources can be combined flexibly to meet an application's requirements. This requires the computing, storage and IO to be decoupled into different functional modules in the early design phase. Then, based on the requirements of a concrete application, these independent functional modules are chosen in the necessary proportions, and then combined into a specific hardware entity. The Modular Industrial Cloud Architecture (MICA) from ADLINK Technology was created to realize this concept.

Enabling the transformation of ICT computing infrastructure and a smooth evolution to OCP

At its core, the Modular Industrial Cloud Architecture (MICA) has assimilated the latest technologies from Internet data centers, particularly the latest advancements in NFV and SDN. At the same time, MICA has also integrated the aspects of traditional industrial computing equipment, such as modular architectures, hardware-assisted acceleration and carrier-grade design standards.

In the first column of the following table lists the key requirements of industrial ICT equipment, particularly those for video and network security processing. It is readily apparent that these requirements reflect the latest advancements of Internet data centers, while also having a strong relationship with traditional industrial computing requirements. MICA makes it possible to apply the latest NFV and SDN technologies to industrial computing while preserving the key features of traditional industrial computing, allowing video, network security and telecom equipment providers to make the step into the cloud era with ease and efficiency.

Industrial computing requirement	MICA implementation
Big data processing, mass data transmission, rich IO interfaces	High-density design, providing at least twice the computing density of traditional industrial equipment; Built-in switch or IO expansion cards providing high bandwidth and rich IO
NFV and SDN support	Compute nodes supporting the latest virtual technologies (e.g. Intel® VT-x, VT-d and VT-c); Switch nodes supporting hardware based OpenFlow acceleration; GPU virtualization for cloud video services
HEVC and 4K transcoding, acceleration for video analytics	Integration of the latest hardware acceleration technology for video processing; Support for HEVC/4K transcoding and GPU-based video analytics
WebRTC support, massive DPI parsing	Integrated mainstream open source software and third-party commercial software to create application-ready MICA platforms
Dynamic expansion, high availability, flexible extension	2U, 4U and 10U platforms with scalable computing capacity; Carrier-grade redundancy and hot-plug support; Open architecture and modular design providing rich expansion capability

Industrial cloud computing requirements and the corresponding MICA implementation

The Open Compute Project (OCP) aims to create open source hardware to accelerate the pace of innovation in data centers. The intrinsic modular concept of MICA makes it possible to combine compute and switch nodes, storage, and IO modules based on specific industrial computing requirements, package them into an OCP tray, and run the system in a standard OCP open rack. The built-in scalable design of MICA allows users to easily add additional storage and hardware acceleration units, even in an OCP tray. The MICA open architecture allows customers a smooth path to full adoption of OCP in the future, with compute nodes and other main modules that can be reused in the OCP framework, offering protection for hardware and software investment.

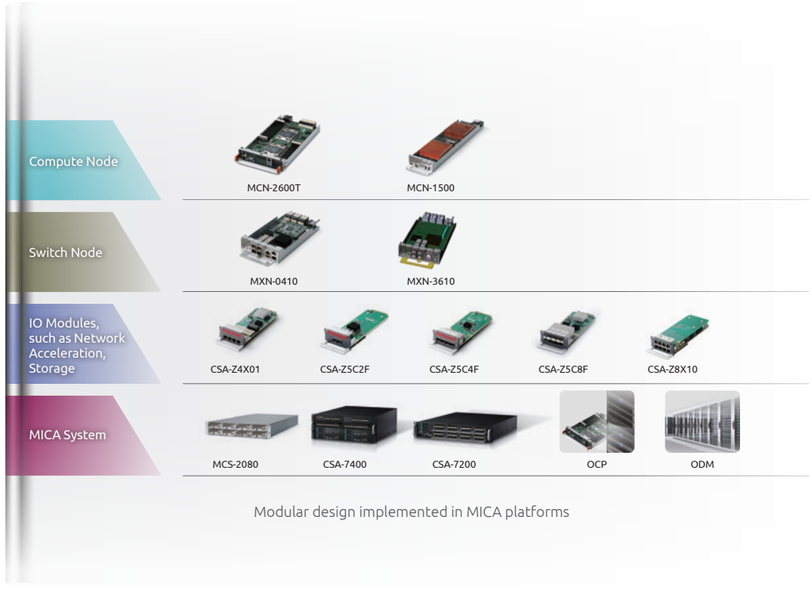
The winning advantage of MICA computing platforms

The three key characteristics of MICA are already implied in its name: modular design, industrial features, and NFV and SDN support for a next generation cloud computing infrastructure. In addition, MICA also integrates the necessary hardware acceleration units for hardware processing.

Flexible modular design: compute, storage, network resources and IO modules can be deployed as needed

MICA adopts an innovative modular and scalable design that allows the user to combine different modules to create a computing platform based on a specific application's needs (see the following figure). ADLINK Technology provides the commonly-used compute nodes, switch nodes, storage and IO modules that form the basis for a range of MICA platforms for video and network security applications. As an open architecture, if existing MICA modules do not meet a particular application's requirements, the customer can specify a customized MICA framework module and have ADLINK or a partner for ODM handle the design and manufacture.

MICA also provides an innovative hybrid capability in its modular design by allowing the use of compute nodes with different processors in the same platform, as well as letting customers mix and match between 1/4 and 1/2-width compute nodes in order to scale the number of independent systems in the platform as required by the application. The ability to mix and match compute nodes means computing resources can be utilized more efficiently.



Modular design implemented in MICA platforms

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Industrial grade design enables reliable MICA platforms

MICA is designed to meet industrial cloud computing requirements, in addition to supporting the latest data center technologies, and taking the specific requirements of carrier grade ICT equipment into consideration. For example, all compute nodes, switch nodes and storage modules are designed to be redundant and hot-swappable. Combined with appropriate high availability middleware, Hot standby and fail-over can be achieved for the “five nines” requirement of telecommunications. MICA IO modules support advanced LAN bypass features, and the bypass modes of each IO module can be set independently through BIOS or an IPMI interface.

For the high bandwidth requirements of network security and DPI-based applications, each MICA compute node can support 64G dual channel communication links to redundant switch nodes, and additional bandwidth requirements can be achieved through the use of network IO cards. A single MICA compute node can support a maximum communication bandwidth of up to 480G. MICA also provides a wide range of network interface modules supporting 1G/10G communications with both optical and electrical interfaces.

NFV and SDN support to meet the core requirements of cloud computing

NFV technology can divide one physical appliance into multiple virtualized machines that are logically separated from each other, meeting the requirements for equipment rental scenarios in a cloud environment. In addition to supporting Intel® VT-x, VT-d and VT-c technologies, MICA also includes support for GPU virtualization for video processing, enabling the sharing of GPU resources among multiple virtual machines and assisting in the deployment of subscription-based video services, such as video conferencing, Internet set-top boxes, and virtual desktops.

SDN technology, used to separate the control plane and forwarding plane, can improve data flow manageability in a cloud environment. Together with NFV technology, SDN can help implement the allocation of network resources on demand, enabling flexible network deployment, imposing finer QoS control of the service data flow, meeting the requirements for a satisfying end-to-end service experience and efficient network operation. MICA switch nodes adopt the latest switch chipset technology using a larger TCAM table and can implement L2/L3/L4 forwarding based on OpenFlow protocol, meeting the requirements for software defined flow forwarding.

Hardware acceleration design allows MICA to use computing resources more efficiently

MICA is designed for industrial ICT computing and can speed up network packet and video processing using the latest hardware acceleration technologies. For NFV, MICA switch nodes support hardware-based acceleration for the processing of Network Virtualization using Generic Routing Encapsulation (NVGRE) and Virtual Extensible LAN (VXLAN), benefiting the construction of a large layer 2 network in a cloud.

For network packets, MICA compute nodes use the acceleration engine in the network controller to implement load balancing and packet filtering against the input data flow without taking up CPU resources. By integrating IO modules that use chipsets with Intel® Quick Assist Technology, MICA can also offload compression/decompression, or encryption/decryption processing tasks to the IO module. For video processing, MICA can take advantage of the Intel® Quick Sync Video acceleration unit embedded inside supporting processors, boosting video encoding/decoding and video analytics performance.

MICA platform applications

Originally, MICA was intended to provide a new hardware architecture for the next generation of video servers and network security appliances. However, with its carrier-grade design and SDN/NFV support, MICA is also a good candidate for building the next generation of elements in LTE-Advanced or 5G networks.

- Video Processing: The ADLINK MCS-2080 Media Cloud Server puts first priority on video processing capability and are well suited for building next generation cloud-based video applications such as video streaming on demand, intelligent video analytics, high definition video conferencing and rich media social networking.
- Network Security and DPI Processing: The ADLINK CSA-7200 and CSA-7400 are designed specifically for network packet processing capability and IO density, and are well suited for building next generation network security appliances for high-performance firewalls, DDoS attack prevention, web service firewalls, multiple service getaways, APT security protection and BYOD security protection. In addition to security, applications requiring enhanced processing, low latency and I/O options can greatly benefit from ADLINK CSA series MICA systems.
- Telecom Computing: MICA platforms can support telecom network elements to handle big data processing, deploy virtualized network functionality, and provide mobile edge computing.

Media Cloud Servers



Network Appliances









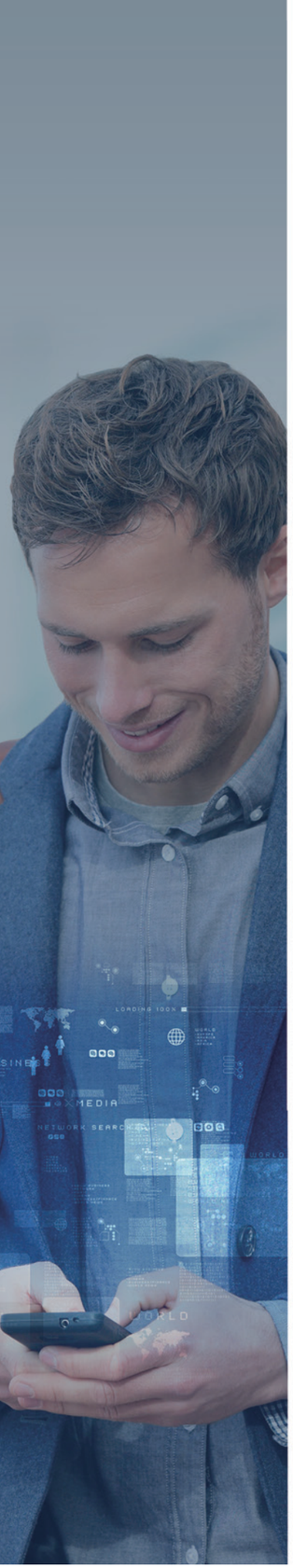








Mobile Edge Computing



To prevent the mobile carrier network from becoming a pipeline, international standards organizations for telecommunications are investigating how to increase bandwidth value by deeply bonding the carrier network with the mobile Internet and the Internet of Things (IoT). The Mobile Edge Computing (MEC) initiative by the European Telecommunications Standard Institute (ETSI) is a network architecture that is based on the evolution to 5G and comprehensively fuses the mobile access network with Internet services. By moving computing power to the mobile edge node and providing third-party application integration at the network edge, MEC creates a high performance, low latency, high bandwidth, and carrier grade service environment that is in close proximity to the mobile user and helps accelerate download speeds of content, services and applications, and provide a better customer experience to the mobile user.

As the transition to 5G approaches, the two competing architectures, Centralized/Cloud Radio Access Network (C-RAN) and Distributed Radio Access Network (D-RAN), are receiving more and more attention. Whether C-RAN or D-RAN deployment mode is adopted for 5G networks, MEC will be definitely introduced into the network to open up more opportunities for application innovation.

MEC Server Requirements

The main requirements of MEC servers are listed below.

NFV and SDN

NFV technology transforms the MEC hardware computing infrastructure into a virtualized computing platform, making it easier to deploy various wireless applications on the platform. By using NFV and SDN in combination, network resources can be allocated as required to achieve a flexible network deployment with more precise control of Quality of Service (QoS) of data flow, improving end-to-end user experience and achieving high-efficiency network operation.

Edge Computing and Storage

C-RAN deployment requires an MEC server to have characteristics similar to that of one used in an IT data center, and it also has some additional requirements in order to provide the required carrier-grade service availability, including hot-swap support and redundant communication links. D-RAN requires outdoor deployment capabilities, and requires MEC servers to be heat and cold resistant, waterproof, and dust-tight.

Bandwidth and Connectivity

The MEC servers deployed at the mobile edge will not only provide higher bandwidth, but also a richer set of network interface types, including 1/10 GbE copper/optical and 40GbE optical.

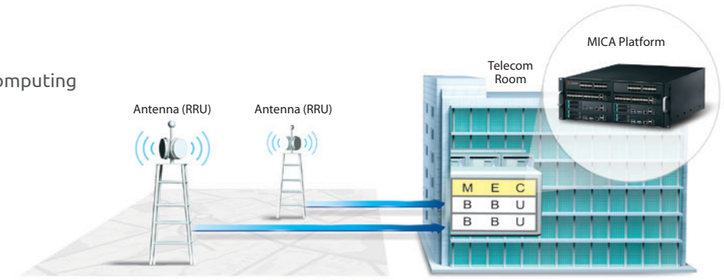
ADLINK Solutions for MEC

To provide the required deployment flexibility and high performance for 5G mobile edge computing, ADLINK provides not only Modular Industrial Cloud Architecture (or “MICA”) platforms for C-RAN deployment that offer high-density computing resources, but also the rugged SETO-1000 server for D-RAN deployment that can endure the extreme conditions of harsh outdoor environments.

Modular Industrial Cloud Architecture (MICA)

The driving philosophy behind MICA platforms is to introduce the latest technologies of IT data centers into industrial telecom computing.

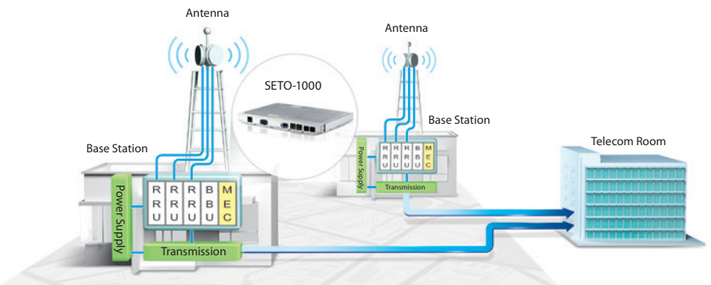
- Innovative modular design
- Carrier grade
- Designed for industrial cloud computing



Centralized Radio Access Network (C-RAN)

Rugged Server for Outdoor Deployment

The ADLINK SETO-1000 high performance server for Edge Computing can operate in a temperature range of -40 °C to +55 °C with self-heating main components for safe start-up in ultra-low temperature environments. The SETO-1000 has an IP65 ingress rating for dust and liquids and is also resistant to shock and vibration, making it an ideal computing device for deployment in extreme outdoor environments. Furthermore, the SETO-1000 has a fanless design and features high speed connectors (fiber or copper). Robust and reliable for reduced maintenance costs, the SETO-1000 is ideally implemented as an MEC server to perform content caching, thus reducing transmission bandwidth demands and decreasing transmission delay.



Distributed Radio Access Network (D-RAN)

Related Products



SETO-1000

Extreme Outdoor Server with Intel® Xeon® Processor E5-2400 v2 Series



CSA-7400

Telecom COTS platform with high-density computing capability



CSA-7200

Multiple security service platform with rich IO interfaces

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Network Security

Industry Trends and Challenges

With the development of the Internet and cloud computing, the manifestation of network security is constantly changing, requiring processing technologies for network security to continually keep pace with progress. Take firewalls for example, which are the most widely used network security devices in the enterprise environment. Traditional firewalls use the port and protocol fields to identify an application and perform attack detection and security protection based on the characteristics of the transport layer. Internet usage has continually evolved since the coining of the term "Web 2.0", with mainstream Internet applications adopting the “Web” architecture, resulting in a large of number of applications using a small number of ports for transmission (such as port 80 or 443. For this reason, the next-generation firewall must provide high-density computing and high-bandwidth to handle Deep Packet Inspection (DPI) tasks to accurately identify applications to execute the appropriate security policy.

The network Access Control List (ACL) is widely used in a traditional firewall, with IP packet filtering technology requiring by-packet inspection. The ACL rule size significantly affects firewall performance. To improve the performance of next-generation firewalls, it is necessary to adopt a flow status monitoring technique to boost firewall performance. This involves first identifying a service packet using DPI technology, and then determining whether the packet can pass through the firewall and a flow action enforced on it. Subsequently, when packets belonging to the same service flow arrive at the firewall, the same flow action will be enforced on them directly.

Advanced persistent threats (APTs) are a great concern in the network security industry, as they are extremely stealthy, have diverse means of attack over long durations, and uncertain behavioral modes. All of these characteristics render traditional forms of security methods ineffective in dealing with APTs. However, the good news is that big data processing techniques provide new opportunities in facing these difficult security issues.

Software defined security is derived from SDN and it uses a logical hierarchical model similar to that of SDN. In the underlying layer, the physical network security appliance is virtualized to a security resource pool. In the upper layer, the business model is implemented by loading different virtualized network security appliances into the security resource pool. When working in the field, software defined security will use SDN to forward the targeted service flow to a virtualized network application, achieving the logically deployment and usage of the virtualized security appliances. Therefore, a network security appliance that is suitable for cloud computing needs to have full NFV and SDN support in order to effectively realize network security.



The development trends and new requirements for network security equipment

MICA-Based Network Security Appliance

The Modular Industrial Cloud Architecture (MICA) from ADLINK is intended to provide a new hardware architecture for the next generation of network security appliances. The three key characteristics of MICA are implied in its name: modular design, industrial features, and NFV and SDN support for building cloud computing infrastructures.

At its core, MICA has assimilated the latest technologies from Internet data centers, particularly the latest advancements in NFV and SDN. At the same time, MICA has also integrated the aspects of traditional industrial computing equipment, such as modular architectures, hardware-assisted acceleration and carrier-grade design standards. As a result, MICA can bring high performance to the cloud while meeting the network security computing requirements for rich IOs, hardware acceleration, and high availability.

Advantages and Benefits for Customers

- **High-density and high bandwidth**

  In addition to adopting the latest high-performance Intel® Xeon® processors to provide high-density computing performance, MICA compute nodes support 64G dual channel communication links to redundant switch nodes, and additional bandwidth requirements can be achieved through the use of network IO cards.

- **SDN & NFV Support**

  To support SDN, ADLINK integrates Intel® DPDK vSwitch on MICA compute nodes. To support NFV, ADLINK integrates OpenStack and Wind River Titanium Server software into its MICA platforms, giving customers a choice between open source and commercial virtualization middleware.

- **High availability design**

  In MICA-based network security appliances, all compute nodes, switch nodes and storage modules are designed to be redundant and hot-swappable. Combined with appropriate high availability middleware, hot standby and fail-over can be achieved for the “five nines” requirement of telecommunications.

- **Advanced LAN bypass**

  MICA IO modules support advanced LAN bypass features, and the bypass modes of each IO module can be set independently through BIOS or an IPMI interface.

- **Hardware acceleration design**

  For network packets, MICA compute nodes use the acceleration engine in the network controller to implement load balancing and packet filtering against big data flow. By integrating IO modules that use chipsets with Intel® Quick Assist Technology, MICA can also offload compression/decompression, or encryption/decryption to the IO module to handle big data processing tasks.

Related Products



CSA-7400

Telecom COTS platform with high-density computing capability



CSA-7200

Multiple security service platform with rich IO interfaces



CSA-5200

2U Rackmount Network Appliance with Intel® Xeon® Processor E3-1200 v3 Family



CSA-5100

1U Rackmount Network Appliance with Intel® Xeon® Processor E3-1200 v3 Family

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Video Streaming



Industry Trends and Challenges

With the rapid developments in telecommunications, broadcast television networks and Internet video traffic in recent years, the network carriers have been devoting greater efforts in building networks and transmission devices with large-scale increases in bandwidth including 4G mobile network facilities that have been deployed and put into commercial application in many regions. Video transmission modes are evolving from one-way broadcasting to multi-screen interactive usage models. IPTV, over-the-top content (OTT), Internet TV, and mobile TV are in full bloom with capital pouring into the mass media market on a large scale, giving the media industry unprecedented opportunities for development as well as challenges.

In response to these changes, video service providers must make efforts to improve the quality of their existing video services through introduction of new technologies and introduce new video services such as 4k video and self-adaptive streaming video which can react to changes in available bandwidth and smoothly switch between multiple devices.

In the past, the only way to broadcast video (other than over-the-air) was by cable TV network. Today, media service providers must cater to customers viewing video content on televisions via traditional broadcast networks, as well as those using desktop computers, smart phones and tablets via wired and wireless Internet and mobile telecom networks. Serving such a wide range of screen resolutions for users with different bandwidth availability and changing network transmission conditions mean great challenges for the media service providers. The key to meeting the challenges described above is efficient encoding, decoding and transcoding of media to meet the resolution, bandwidth and codec requirements of the end user.

Until recently, most media processing workloads, such as real-time encoding, transcoding and pre- and post- processing of media streams, have been performed by a range of dedicated hardware based on General Purpose Graphics Processing Units (GPGPUs), or fixed function hardware (e.g., ASIC or DSP). In order to accommodate new codecs and formats, or improve quality by adjusting the encoding pipeline for a customized solution based on GPGPU or ASIC, the user generally needs to invest additional resources to upgrade media software because a dedicated chip and SDK often see significant changes from generation to generation when compared with a general purpose processor.

To overcome the disadvantages and drawbacks of traditional video processing equipment, the industry is migrating to the use of general purpose processors for functions previously handled by dedicated chipsets. In order to provide sufficient video encoding/decoding processing power, these platforms are based on the latest generations of Intel® Core™ and Xeon® processors with Intel® Quick Sync Video to support hardware video encoding and decoding.

Media Solution	Performance	Power	Flexibility	Development Cost
General Purpose GPU	Low	High	High	Medium
Fix Function HW	High*	Low	Low	High
Flexible Intel® Quick Sync Video	High	Low	Balanced	Low

Comparison of media hardware solutions

ADLINK Media Cloud Server

In order to help service providers deal with the challenges of video processing in the multi-screen mobile media age, ADLINK's Media Cloud Server has leveraged Intel's processors that integrated CPU and GPU in single-chip solutions with Intel® Quick Sync Video hardware encode/decode acceleration, as well as the accompanying Intel® Media Server Studio which supports Windows and Linux operating systems and provides a unified development interface for different generations of processors. Application software developed by users on Intel® Media Server Studio will be able to run on future generations of Intel processor platforms, making their solutions future-proof.

Advantages and Benefits

A video transcoding server based on the high performance ADLINK Media Cloud Server hardware platform is an industry-leading media processing product to meet the needs of today's broadcasting and multi-screen interactive usage models.

- **Extreme Processing Performance**

  Media Cloud Servers support hardware based video transcoding and video pre/post-processing with the equivalent video transcoding capability of 8 to 10 traditional rack mount servers using the CPU to handle video transcoding tasks, giving them the lead in performance among similar products on the market.

- **High Processing Density**

  Media Cloud Servers combine the processing capability of either 8 or 16 independent systems in a 2U platform, which is 4 or 8 times the density of traditional 2U dual processor servers. This high processing density allows for easy scalability of performance and minimizes use of valuable floor space.

- **GPU Acceleration**

  The integrated graphics acceleration solution of the Media Cloud Server provides a more competitive video transcoding solution for today's multi-screen and multiple-bitrate video distribution requirements.

- **High Availability and Low Maintenance Costs**

  The Media Cloud Server provides high availability and supports Intel® Active Management Technology or IPMI, allowing for remote boot, shutdown and reset, simplifying maintenance and reducing operating costs.

- **Reduced Time-to-Market**

  In addition to the hardware performance advantages of the Media Cloud Server, ADLINK's MediaManager software greatly assists in preliminary evaluation of the platform and provided the core video/audio processing modules for building of the final application software, saving on research and development costs and reducing time-to-market.

Related Products



MCS-2080
2U 19" Media Cloud Server with Modularized Compute and Switch Nodes



MCS-2040
2U 19" 4-node Media Cloud Server



Intelligent Video Surveillance

Industry Trends and Challenges

Video surveillance creates a massive volume of data that is beyond human capacity to deal with. Filtering out unimportant data and preserving significant information is critical to achieving effective security. Intelligent video analytics (IVA) is an effective mechanism for raising alerts and alarms to prevent dangerous events before they occur and raises the value and efficiency of video surveillance.

IVA is a combination of computer vision, image analysis and artificial intelligence technologies, aimed at creating relational mapping between monitored scenes and pre-defined events. The relational mapping process involves video decoding, image processing and analysis algorithms. IVA needs to compute and process huge volumes of data in order to:

- Decode video streams acquired from cameras
- Render decoded images before analysis, including image enhancement, scaling, and color space conversion
- Re-encode video for storage to facilitate future searches and replays

The decoding and encoding necessary for IVA video management consume significant computing resources on their own, not to mention the resources required for image rendering tasks and intelligent video analytics. Another important consideration for IVA platforms is how to effectively share the large volumes of decoded data with video analytics and re-encoding modules.

There are currently three major categories of IVA solutions on the market: digital signal processor (DSP), general purpose graphics processing unit (GPGPU) and general purpose CPU-based software transcoding. The following table summarizes and compares their characteristics.

- Currently DSP solutions are mainly used for front-end processing deployment. Compared with general-purpose CPUs, DSP is always disadvantageous in the number of computing cores and clock frequency and low flexibility among DSP solutions from different vendors result in high development cost.
- IVA solutions based on general purpose GPUs (typically NVIDIA chipsets) adopt parallel architectures consisting of thousands of computing cores and can process massive amounts of data at high speed. However, shared memory bottlenecks, higher cost and power consumption are negatives.
- CPU-based IVA solutions (typically Intel® Core™ or Xeon® processors) have advantages in development convenience and flexibility. However, general purpose CPUs are not optimized for video processing, using software solutions that have difficulty achieving high video data throughput even at high CPU usage.

IVA Solution	Processing Capability	Power Consumption	Flexibility	Development Cost
DSP (1)	Medium	Low	Low	High
GPGPU (2)	High	High	Low	Medium
CPU-based Software Transcoding (3)	Low	High	High	Low

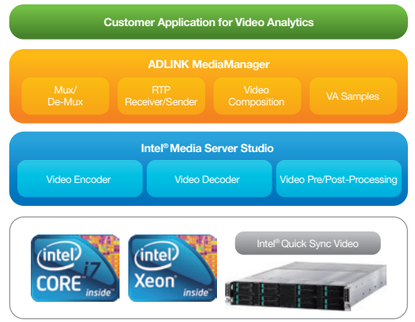
Comparison of media hardware solutions

ADLINK Media Cloud Server IVA Solution

Video analytics service providers need IVA solutions with high processing capability, lower power consumption and better flexibility to tackle the challenges of video analytics in the cloud media era.

ADLINK Media Cloud Servers based on Intel® Quick Sync Video technology are designed for high-performance video processing, enabling optimum use of specialized encoding/decoding modules and the programmable Execution Unit Array provided by the GPU. The encoding/decoding modules ensure fast processing of defined encoding/decoding tasks, while the programmable Execution Unit Array provides more flexibility by allowing users to run video analytics algorithms for much faster IVA processing.

Media Cloud Servers also benefit from the use of commercial Intel processors, providing the advantages of convenient debugging and smooth upgradeability. In addition to the benefits provided by Intel's hardware developments and the Intel® Media Server Studio, ADLINK provides its MediaManager software package to make the MCS-2040 an Application Ready Intelligent Platform for video processing.



ADLINK ARiP for Video Analytics

Advantages and Benefits for Customers

ADLINK Media Cloud Servers provide a highly expandable and flexible system architecture which allows users operating cloud computing platform based on IVA technologies to realize higher efficiency and cost-effectiveness.

- **High Performance & High Density**

  Media Cloud Servers combine the processing capability of either 8 or 16 independent systems in a 2U platform, which is 4 or 8 times the density of traditional 2U dual processor servers. Video processing tasks are offloaded to the GPU, performing the video en/decoding tasks using less than 20% of CPU resources, leaving ample reserve processing power for efficient execution of video analysis algorithms.

- **High-efficiency CPU/GPU Memory Sharing**

  A common practice in the IVA industry is to build a primary module for running analysis algorithms on the CPU, and move the tasks that are more suited to it to the GPU, thus allowing the CPU and GPU to share video data during analysis. ADLINK MediaManager helps to improve data sharing efficiency between the CPU and GPU and minimize data sharing latency.

- **Big Data Support and Cloud Deployment**

  The retrieval of valuable information by mining and analyzing big data is a main focus of the video surveillance industry. ADLINK Media Cloud Servers use the cluster computing approach to provide analysis capabilities many times more powerful than that of traditional servers. To provide better support for big data processing, Media Cloud Servers have undergone a full range of tests using the most commonly used big data processing solutions such as Hadoop and Storm, ensuring that ADLINK customers can use Media Cloud Servers to integrate these solutions more smoothly and conveniently.

Related Products



MCS-2080
2U 19" Media Cloud Server with Modularized Compute and Switch Nodes



MCS-2040
2U 19" 4-node Media Cloud Server

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AdvancedTCA

ADLINK provides complete AdvancedTCA platform solutions that offer high-density processing power, faster data throughput, and intelligent system management. Designed for next-generation telecom, datacom, networking and equipment manufacturers, ADLINK's AdvancedTCA platforms significantly reduce overall development costs, come with extended operating lifecycles, and speed up critical time-to-market.

ADLINK is one of the world's leading companies in providing carrier-grade blade servers and has participated in the development of the AdvancedTCA specification (designated PICMG 3.x), The core specification, PICMG 3.0, defines the mechanical, power, thermal, interconnect, and system management aspects of the AdvancedTCA family of specifications. A series of subsidiary specifications overlay a transport onto the interconnect defined in the core specification. In essence, the PICMG 3.0 specification defines the point-to-point connections used for boards to communicate and the subsidiary specifications define the protocols used over those interconnects.

ADLINK's expertise and extensive experience in industrial computing has supplied numerous Tier 1
TEMs and NEPs with off-the-shelf and customized products for their telecom and networking solutions.

Features

Outstanding Computing Power

Leveraging the high performance of Intel® Xeon® processors, Cavium NPUs, and Broadcom switches, ADLINK AdvancedTCA blades provide server-grade, 40G/10G communications capability. The AdvancedTCA specification incorporates the latest trends in high speed interconnect technologies, next generation processors and improved reliability, manageability and serviceability, all within a standardized form factor for ease of system integration and maintenance.

High Density and Compact System Size

Compared with traditional 1U servers, AdvancedTCA systems save space in network server rooms for future expansion needs. Supporting Intel® QuickPath Interconnect Technology, a highspeed, packetized, point-to-point interconnect, ADLINK's AdvancedTCA processor blades with dual processors offers high bandwidth with lower latency, providing an efficient architecture for high interconnect performance in real world situations.

Hot-Swappable

For mission critical applications, the mean time to repair (MTTR) is one of the most important considerations. The AdvancedTCA specification, with blade form factor and hot-swappable design, allows systems to be repaired immediately without powering down and opening the chassis. Instead of swapping out an entire standalone server, only the inoperative component needs to be replaced. In telecom applications such as video streaming and Wi-Fi access points, not one second of downtime can be tolerated. AdvancedTCA was conceived and targeted to the specific requirements of the telecommunications industry.

Application-Ready Intelligent Platforms

ADLINK Application-ready Intelligent Platforms (ARiPs) provide hardware level integration and validation using building blocks from ADLINK's standard product lines; OS validation, performance tuning, and virtualization certification; as well as a variety of toolkits for system & power management and application control for data plane and signaling process functions, such as the ADLINK Data Plane Development Kit, Media SDK, and System Management Toolkit. ADLINK ARiPs also integrate Active Power Management, System Management, and Service Availability Framework to enable ADLINK products to be "Green", "Smart", and "Robust" platforms.

Applications

Software-Defined Network (SDN)

As server virtualization and cloud computing becomes the mainstream, Software-Defined Network (SDN) was developed to simplify traditional network architectures. SDN accomplishes this by separating black-box switches or routers into a centralized controller (a.k.a., OpenFlow controller) and a switch plane, known as an OpenFlow switch or server node. Based on Intel® QuickAssist Technology and Intel® Data Plane Development Kit (Intel® DPDK) based Open vSwitch enablement, the ADLINK DPDK Toolkit allows ADLINK hardware platforms to be deployed as SDN controllers and server nodes, improving encryption/decryption computing performance and networking I/O throughput for SDN solutions.

Deep Packet Inspection (DPI)

The ADLINK Deep Packet Inspection (DPI) Platform provides traffic awareness, control and protection for complex networks, Layer 2 and Layer 3 fast forwarding functions, and manages differences in hardware architecture to support both ADLINK Intel x86 architecture blades with DPDK, as well as NPU blades such as the aTCA-N700. Open DPI software modules are enabled in the platform for reference design and performance benchmark testing purposes. The fully programmable platform provides customers with the ability to rapidly and flexibly add features and update their network packet processing solution. With integrated hardware accelerators, the ADLINK DPI platform provides approximately 20Gbps throughput per blade with regular expression, crypto and compress functions.

Video Transcoding

The ADLINK Video Transcoding (VT) Platform supports high density, 3D video streaming services by dispatching streamed data to service blades according to streaming-based load balancing strategy. The streaming service blade provides high performance video transcoding without increased CPU resource loading.

A Rear Transition Module (RTM) provides two mini-SAS interfaces to provide storage for video content, and two 10Gbps Ethernet ports to deliver video content to end users over the Internet. Each blade can also support up to three storage drives for configuration data, software images and end user data with RAID functionality and database enabled.



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AdvancedTCA Blades



Processor Blades						
Model Name		**aTCA-9715**	**aTCA-9710**	**aTCA-9700D**	**aTCA-9700**	**aTCA-N700**
CPU	Processor	Dual/Single 12-core Intel® Xeon® E5-2600 v4 family @2.2GHz	Dual/Single 12-core Intel® Xeon® E5-2600 v3 family @2.2GHz	Dual 10-core Intel® Xeon® E5-2600 v2 family @2.4GHz	Dual 10-core Intel® Xeon® E5-2600 v2 family @2.4GHz	Cavium OCTEON II CN6880 32 cnMIPS cores processor @1.2 GHz Max
	FSB	9.6GT/s (Intel® QPI)	9.6GT/s (Intel® QPI)	8.0 GT/s (Intel® QPI)	8.0 GT/s (Intel® QPI)	-
Chipset		Intel® C612	Intel® C612	Intel® C604	Intel® C604	-
PICMG Spec.		PICMG 3.0 R3.0 PICMG 3.1 Option 9-KR (40GBASE-KR4)	PICMG 3.0 R3.0 PICMG 3.1 Option 9-KR (40GBASE-KR4)	PICMG 3.0 R3.0 PICMG 3.1 Option 9-KR (4oGBASE-KR4)	PICMG 3.0 R3.0 PICMG 3.1 Option 9-KR (4oGBASE-KR4)	PICMG 3.0 R3.0 and PICMG3.1 R2.0 PICMG 3.1 Ethernet Over PICMG 3.1 Option 1 and Option 9 40G Base-KR4
Memory	DIMM Slots	16x DDR4-2133 240-pin VLP RDIMM	16x DDR4-2133 240-pin VLP RDIMM	8x DDR3-1866 240-pin	8x DDR3-1866 240-pin	8x DDR3-1600 240-pin VLP RDIMM
	Max. Capacity	256GB	256GB	128GB	128GB	128GB
	REG/ECC	REG/ECC	REG/ECC	REG/ECC	REG/ECC	REG/ECC
Display	Graphics Controller	Silicon Motion SM750	Silicon Motion SM750	Silicon Motion SM750	Silicon Motion SM750	-
Data Transport		2x 10/100/1000BASE-T Base channels	2x 10/100/1000BASE-T Base channels	2x 20G/40GBASE-KR Fabric channels	2x 10/100/1000BASE-T Base channels	2x 10/100/1000BASE-T Base channels
		4x 10G/40GBASE-KR Fabric channels	4x 10G/40GBASE-KR Fabric channels	4x 10G/40GBASE-KR Fabric channels	4x 10G/40GBASE-KR Fabric channels	2x 40G BASE-KR4 Fabric channels
		2x 10GbE SFP+ on front panel	2x 10GbE SFP+ on front panel	2x 10/1001000BASE-T Egress ports	2x 10/1001000BASE-T Egress ports	4x SFP+ (10G/1G) Egress ports
		1x Intel® Communications Chipset 8950	1x Intel® Communications Chipset 8950	1x Intel® Communications Chipset 8920	1x Intel® Communications Chipset 8920	-
Storage		Onboard 16GB mSATA Flash (up to 128GB)	Onboard 16GB mSATA Flash (up to 128GB)	Onboard 16GB SATA Flash (up to 64GB)	Onboard 16GB SATA Flash (up to 64GB)	-
		-	-	2x channels SAS to RTM	2x channels SAS to RTM	
Front Panel I/O		2x LAN, 2x COM, 1x VGA, 3x USB 2.0	2x LAN, 2x COM, 1x VGA, 3x USB 2.0	2x LAN, 2x USB 2.0, 2x COM (mini-USB), 1x VGA	2x LAN, 2x USB 2.0, 2x COM (mini-USB), 1x VGA	1x USB 2.0, Serial port: 1x for LMP or IPMC & 2x for NPs

AdvancedTCA Blades



Processor Blades					
aTCA-9310	**aTCA-9300**	**aTCA-6250**	**aTCA-6200A**	**aTCA-6105/6155**	
4-core Intel® Xeon® Processor E3-1200 v5	4-core Intel® Xeon® E3 1275/1225 v2, Core i3 3220S @ 3.5GHz/ 3.2GHz	8-core Intel® Xeon® E5-2658/2648L @ 2.1 GHz / 1.8GHz	8-core Intel® Xeon® E5-2648L	Intel® Xeon® L5518/L5638/ E5645	
-	-	8.0 GT/s (Intel® QPI)	8.0 GT/s (Intel® QPI)	5.86 GT/s (Intel® QPI)	
Intel® C236 Chipset	Intel® C216	Intel® C604	Intel® C604	Intel® 5520	
PICMG 3.0 Advanced Telecommunications Computing Architecture R3.0 PICMG 3.1 Ethernet/Fiber Channel over PICMG 3.0 R2.0, Option 9-KR	PICMG 3.0 R3.0 PICMG 3.1 Option 9 (10G Ethernet) PICMG AMC.0: Advanced Mezzanine Card Specification R2.0 PICMG AMC.1: PCI Express and Advanced Switching R1.0 PICMG AMC.3: Storage Interfaces R1.0	PICMG 3.0 R3.0 PICMG 3.1 Option 9 (10G Ethernet)	PICMG 3.0 R3.0 PICMG 3.1 Option 9 (10G Ethernet) AMC.0 AMC Base Specification, R2.0 AMC.1 AMC PCI Express R1.0 AMC.2 AMC Gigabit Ethernet R1.0 AMC.3 AMC Storage R1.0	PICMG 3.0 R2.0 ECN002 PICMG 3.1 Option 9 (10G Ethernet) AMC.0: Advanced Mezzanine Card Specification R2.0 AMC.1: PCI Express and Advanced Switching R1.0 AMC.2: Gigabit Ethernet R1.0 AMC.3: Storage Interfaces R1.0	
2x DDR4-2133 VLP DIMM	4x DDR3-1600 240-pin VLP UDIMM	8x DDR3-1600 240-pin	8x DDR3-1600 240-pin	6x DDR3-1066/1333* 240-pin VLP RDIMM	
64GB	32GB	128GB	128GB	48GB	
ECC	ECC	REG/ECC	REG/ECC	REG/ECC	
-	Intel® HD Graphics P4000	Silicon Motion SM750	Silicon Motion SM750	ATI ES1000	
2x 10/100/1000BASE-T Base channels, 1 port with SOL function	2x 10/100/1000BASE-T Base channels	2x 10/100/1000BASE-T Base channels	2x 10/100/1000BASE-T Base channels	2x 10/100/1000BASE-T Base Interface channels	
2x 10GBASE-KR Fabric channels	2x 10G BASE-KX4/ 1000BASE-BX Fabric channels	2x 10G BASE-KX4/ 1000BASE-BX Fabric channels	2x 10G BASE-KX4/ 1000BASE-BX Fabric channels	2x 10GBASEKX4/ 1000BASE-BX Fabric Interface channels	
2x SFP+ 10GbE ports or 2x SFP+ 40GbE ports by module 5x Copper (RJ-45) GbE ports, 1 port with SOL function	6x 10/100/1000BASE-T Egress ports	4x 10/100/1000BASE-T Egress ports	2x 10/100/1000BASE-T Egress ports	2x 10/1001000BASE-T Egress ports	
-	-	1x Intel® Communications Chipset 8920	1x Intel® Communications Chipset 8920	2x GbE ports to RTM	
1x SATA 6GB/s by mSATA socket onboard, up to 256GB	On board bootable CFast Socket	Onboard 16GB SATA Flash (up to 32GB)	CFast card socket	AMC.3 SAS/SATA 3 Gb/s ports (optional)	
			1x SATA 6GB/s connector onboard with 1x 2.5" SATA drive bay onboard	Onboard 2.5" SATA drive (optional)	
2 channels SATA 6GB/s to RTM	2x channels SATA to RTM	2x channels SAS to RTM	2x SAS channels to RTM	On-board bootable 4 GB USB flash memory	
Onboard 2.5" SATA drive (optional)	Onboard 2.5" SATA drive (optional)		Onboard 2.5" SATA drive (optional)		
5x LAN, 2x SFP+ 1x USB 2.0 1x USB 3.0 2x UART (Mini-USB) 1x VGA (DB-15)	1x AMC,1x VGA, 6x LAN1/2/3/4/5/6, 2x USB, 1x COM	4x LAN, 2x USB 2.0, 2x COM (Mini-USB), 1x VGA	2x LAN,1x COM (RJ45), 3x USB 2.0,1x VGA, 1x AMC	1x AMC (optional), 1x VGA, 3x USB, 2x LAN, 1x COM	

AdvancedTCA Blades





Switch Blades			
Model Name		**aTCA-3710**	**aTCA-3430**
Control Plane	Processor	Freescale QorIQ P2041 (quad core) @ 1.2GHz	Freescale QorIQ P2040 (quad core) @ 1.0GHz
	Memory	DDR3 4GB SDRAM	DDR3 4GB SDRAM
	Storage	Boot image: 2x 1MB (SPI Flash, redundant) OS storage: 2x 8GB (Micro SSD card, redundant) Optional: 1x 2GB (microSD card)	Boot image: 2x 1MB (SPI Flash, redundant) OS storage: 1x 8GB (microSD card)
	Management	Serial console port to LMP or IPMC, front panel RJ-45 10/100/1000BASE-T, front panel RJ-45 USB 2.0, front panel	Serial console port to LMP or IPMC, front panel RJ-45 10/100/1000BASE-T, front panel RJ-45 USB 2.0, front panel
Data Plane	Fabric Switch	Broadcom BCM56846 640Gbps bandwidth multilayer switch	Broadcom BCM56842 320Gbps bandwidth multilayer switch
	Base Switch	Broadcom BCM56334 24-port Gigabit Ethernet switch with 4-port 10GbE HiGig2	Broadcom BCM56334 24-port Gigabit Ethernet switch with 4-port 10GbE HiGig2
Base Interface	Channels	13x GbE interface to backplane for 14-slot system	13x GbE interface to backplane for 14-slot system
	Egress	2x 10GbE HiGig2 6x GbE RJ-45 front panel	2x 10GbE HiGig2 6x GbE RJ-45 front panel
	ShMC Port	2x 10/100BASE-TX ShMC ports compliant to PICMG 3.0 R2.0 ECN002	2x 10/100BASE-TX ShMC ports compliant to PICMG 3.0 R2.0 ECN002
Fabric Interface	Channels	13x 40GbE interface to backplane for 14-slot system (aTCA-3710/640G only)	13x 10GbE interface to backplane
	Egress	12x 10GbE SFP+, front panel	10x 10GbE SFP+, front panel
Front I/O Interfaces	10GB Interface	14x 10GbE SFP+	12x 10GbE SFP+
	1GB Interface	6x GbE RJ-45	6x GbE RJ-45
	10/100/1000BASE-T Management	1x RJ-45 from LMP	1x RJ-45 from LMP
	Serial Console (UART)	1x RJ-45 serial port to LMP or IPMC	1x RJ-45 serial port to LMP or IPMC
	USB	1x USB 2.0 port	1x USB 2.0 port
	Reset Button	Recessed push button for blade reset	Recessed push button for blade reset
PICMG Standards		PICMG 3.0 R3.0 PICMG 3.1 R2.0 Option 3/9/9-KR/3-KR	PICMG 3.0 R3.0 PICMG 3.1 R2.0 Option 3/9/9-KR/3-KR
Expansion		-	-
Software	BSP	ADLINK BSP (LMP)	ADLINK BSP (LMP)
	Operating System	Open Linux	Open Linux
	Development Environment	Broadcom SDK running under Open Linux on LMP	Broadcom SDK running under Open Linux on LMP

AdvancedTCA Platform and RTM

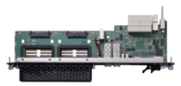






Model Name		aTCA-H8314	aTCA-8214	aTCA-H8606C
Mechanical	Height	13U	12U	6U
	Slots	14	14	6
	Topology	Dual-Star/Full-Mesh/40G	Dual Dual-Star/10G	Full-Mesh/40G
Shelf Manager		• Dual hot-swappable Pigeon Point Systems ShMM-500 based ShMCs • Active/Standby mode for high availability applications	• Dual hot-swappable Pigeon Point Systems ShMM-500 based ShMCs (aCMM-2100) • Active/Standby mode for high availability applications	• Dual hot-swappable Pigeon Point Systems ShMM-500 based ShMCs • Active/Standby mode for high availability applications
	Management Interfaces	• Remote Management Control Protocol (RMCP) • Command Line Interface (CLI) • 2x 10/100BASE-T Fast Ethernet ports and one serial console • Telco Alarm port	• Remote Management Control Protocol (RMCP) • Remote Procedure Call (RPC) • Simple Network Management Protocol (SNMP) • Command Line Interface (CLI) • 2x 10/100BASE-T Fast Ethernet ports and one serial console • Telco Alarm port	• Remote Management Control Protocol (RMCP) • Command Line Interface (CLI) • 2x 10/100BASE-T Fast Ethernet ports and one serial console • Telco Alarm port
Cooling System		Hot-swappable IPMC controlled fan trays	Hot-swappable IPMC controlled fan trays	Dual hot-swappable IPMC redundant fan trays
Backplane	Base Interface	Dual-Star	Dual-Star/Full-Mesh	Dual-Star
	Fabric Interface	Dual-Star/Full-Mesh	Dual Dual-Star	Dual-Star/Full-Mesh
	IPMB	Dual-bussed	Dual-bussed	Dual-bussed
Power	Power Input	• -36 VDC to -72 VDC • Nominal -48 VDC / -60 VDC • Dual redundant power entry modules • 105 A @ 48 VDC	• -40 VDC to -72 VDC • Nominal -48 VDC • Dual redundant power entry modules • Each supplies up to 3000 W (A + B)	• DC model: -48 VDC (dual redundant power entry modules) • AC model: -48 VDC output (90-264 VAC input, up to 4x 850W output)







Model Name	aTCA-RN710	aTCA-R6155	aTCA-R6270
Data Transport	12x 10GbE SFP+ ports	2x 1000BASE-SX/LX SFP, 2x USB 2.0 ports	2x 10GbE SFP+ ports, 2x USB 2.0 ports
Serial I/O	-	1x 16C550 compatible COM port (RJ-45)	1x 16C550 compatible COM port (RJ-45)
Storage	-	USB 2.0 flash module (optional) 2x SAS/SATA drive bays	2x SAS/SATA drive bays (hot swap)
Rear Panel I/O	12x 10GbE SFP+ ports	1x RJ-45 serial port 2x USB 2.0 ports 2x SFP GbE ports 2x 2.5" drive bays	1x RJ-45 serial port 2x USB 2.0 ports 2x SFP+ 10GbE ports 2x 2.5" drive bays
Compatible ATCA blades	aTCA-N700	aTCA-6105, aTCA-6155A	aTCA-6250, aTCA-6200A







Model Name	aTCA-R6270/C	aTCA-R6280	aTCA-R9700
Data Transport	2x USB 2.0 ports	2x 10GbE SFP+ ports	6x 10GbE SFP+ ports
Serial I/O	1x 16C550 compatible COM port (RJ-45)	-	-
Storage	2x SAS/SATA drive bays (hot swap)	2x mini-SAS (SFF 8088) ports 1x SAS/SATA drive bay (hot swap)	1x SAS/SATA drive bay (hot swap)
Rear Panel I/O	1x RJ-45 serial port 2x USB 2.0 ports 2x 2.5" drive bays	2x 10GbE SFP+ ports 2x mini-SAS (SFF-8088) 1x 2.5" drive bay	6x 10GbE SFP+ ports 1x 2.5" drive bay
Compatible ATCA blades	aTCA-6250, aTCA-6200	aTCA-6200, aTCA-9300, aTCA-9700	aTCA-9700, aTCA-9710

Network Appliances



ADLINK meets the network security requirements of e-businesses, enterprises, and service providers with Network Appliances that allow security solution providers to integrate next generation firewall (NGFW), virtual private network (VPN), intrusion detection system (IDS), traffic shaping, content filter, Deep Packet Inspection (DPI), Unified Threat Management (UTM) and anti-virus applications with industry leading performance, scalability, serviceability and manageability, all in one comprehensive security solution.

ADLINK Network Appliances are accompanied by the ADLINK PacketManager, a software package which includes Control Plane configuration tools and Data Plane processing acceleration capabilities. ADLINK Network Appliances provide increased packet processing speed and are ideal for Software Define Networking (SDN) switch and NGFW applications that require DPI and network virtualization functionality.

Features

Accelerated Packet Processing and Application-Readiness

The ADLINK PacketManager leverages the Intel® Data Plane Development Kit to let ADLINK Network Appliances brings breakthroughs in packet processing capabilities, with 11 times faster Layer 3 forwarding performance and 4 times faster DPI performance compared to that of native Linux. With our performance-enhanced application-ready platforms, ADLINK provides system integrators with the functional and reliable hardware platforms with integrated application software they need to build high performance networking solutions.

High I/O Density and Scalability

The ADLINK Network Appliance family features an I/O intensive architecture of up to 32x GbE, SFP or SFP+ ports, using flexible combinations of Network Interface Modules (NIM) to provide connectivity to monitored systems. Onboard SATA and mSATA drive bays and SATADOM and CFast sockets are provided for scalable storage.

LAN Bypass Functionality

In case of system failure, network connectivity is maintained by an automatic LAN bypass function.

Flexible Storage Types

- 2.5”/3.5” SATA drive
- mSATA SSD
- M.2 SSD
- SATADOM
- CFast

Applications

Next Generation Firewall

Modern threats such as web-based malware attacks, targeted attacks, application-layer attacks are quickly changing the threat landscape from bad to critical. A next-generation firewall (NGFW) is a hardware- or software-based network security system that is able to detect and block sophisticated attacks by enforcing security policies at the application level, as well as at the port and protocol level. ADLINK Network appliances provide reliable operation, high performance and high security functions including firewall, VPN gateway, anti-spam, L2/L3 routing.

Deep Packet Inspection

Deep Packet Inspection (DPI) provides traffic awareness, control and protection for complex networks. ADLINK’s DPI platform provides Layer 2 and Layer 3 fast forwarding functions and manages hardware architecture. Open DPI software modules are enabled in the platform for reference design and performance benchmark testing purposes. The fully programmable platform provides customers with the ability to rapidly and flexibly add features and update their network packet processing solution.



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Network Appliances







Model Name			CSA-7400	CSA-7200	CSA-5200
Form Factor			4U 19" rackmount 4x CPU Nodes (MCN-2600T) 2x Switch Nodes (MXN-3610)	2U 19" rackmount	2U 19" rackmount
CPU Node	System Core	CPU Support	Intel® Xeon® E5-2680 v3 (12C/24T) Intel® Xeon® E5-2630 v3 (8C/16T) Intel® Xeon® E5-2620 v3 (6C/12T)	Intel® Xeon® E5-2680 v3 (12C/24T) Intel® Xeon® E5-2628L v3 (10C/20T) Intel® Xeon® E5-2630 v3 (8C/16T) Intel® Xeon® E5-2620 v3 (6C/12T)	Intel® Xeon® E3-1275 v3 (4C/8T) Intel® Xeon® E3-1225 v3 (4C/4T) Intel® Core™ i3-4330 (2C/4T)
		Chipset	Intel® C610 Chipset	Intel® C610 Chipset	Intel® C226 Chipset
	Memory		12x DDR4-1600/1866/2133 DIMM socket, ECC, up to 192GB	12x DDR4-1600/1866/2133 DIMM socket, ECC, up to 192GB	DDR3 1066/1333/1600 non-ECC UDIMM, 4 DIMMs (2 DIMMs/channel), up to 32GB
	Storage	SATA Drive Bays (hot-swappable)	2x 2.5" bays	3x 2.5" bays	4x 2.5"/3.5" bays
		SATADOM	N/A	N/A	1x (shares SATA port with drive bays)
		CFast	N/A	N/A	1x
		mSATA SSD	N/A	N/A	N/A
		M.2 SSD	2x M.2 SSD per CPU node	2x M.2 for SATA/PCIe SSD	N/A
	I/O	Expansion Slots	N/A	8x Network Interface Module (NIM) Slots	4x Network Interface Module (NIM) slots
		Ethernet	2x RJ-45 10/100/1000BASE-T Ethernet ports	2x RJ-45 10/100/1000BASE-T Ethernet ports	2x RJ-45 10/100/1000BASE-T Ethernet ports
		Console	1x RJ-45 serial port	1x RJ-45 serial port	1x RJ-45 serial port
		USB	2x USB 3.0	2x USB 3.0	2x USB 3.0
		Graphics	1x VGA	1x VGA	1x VGA
	PCIe		1x PCIe x8 Gen3 slot	1x PCIe x8 Gen3 slot	1x PCIe x4 Gen2 slot for acceleration card
	LAN Bypass		NA	Support RJ-45 only	Supports RJ-45 only
Switch Node	System Core	Switch Support	Intel RRC switch (FM-10840) with 900Mbps bandwidth & 4x PCIe G3 x8	N/A	N/A
		CMM	Chassis management module with ADLINK BMC solution	NA	N/A
	COMe Module (Type 6 interface, for local management - optional)		Intel® Core™ i7-4700EQ 2.4GHz, 4cores/GT2 Intel® Core™ i5-4400E 2.7GHz, 2cores/GT2 Intel® Core™ i3-4102E 1.6GHz, 2cores/GT2 Intel® Celeron™ 2002E 1.5GHz, 2cores/GT1	N/A	N/A
	Memory		2x SODIMM 1600/1333MHz DDR3, up to 16GB	N/A	N/A
	Storage		2x mSATA as local storage	N/A	N/A
	I/O	SFP+	20x 10G SFP+ ports (front panel) NIM-1610: Switch I/O extension card with 16x 10G SFP+ /4x 40G QSFP (optional)	N/A	N/A
		Ethernet	2x RJ-45 ports	N/A	N/A
		Console	1x RJ-45 serial port	N/A	N/A
		USB	2x USB 2.0 (one can be console port)	N/A	N/A
system	Temperature	Operating	0°C to +40°C		
		Storage	-40°C to +70 °C		
		Short-Term Operating	-5°C to +45°C, 5% to 90% Relative Humidity		
	Relative Humidity		Operating: 10% to 85% @40°C non-condensing Storage:5% to 90% non-condensing		
	Shock		20G peak-to-peak, 11ms duration, non-operating	Operating: Half-sine 2G, 11ms pulse, 100 pulses in each direction on each of the three axes Non-operating: Trapezoidal, 25G, 170 inches/sec delta V, three drops in each direction on each of the three axes	
	Vibration		Non-operating: 1.88Grms, 5-500Hz each axis; Operating: 0.5Grms, 5-500Hz each axis	Non-operating: 2.2Grms, 10 minutes per axis on all three axes	
	Dimensions (W x H x D)		440mm x 176mm x 600mm	440mm x 88mm x 600mm	440mm x 88mm x 460 mm

Network Appliances



CSA-5100
1U 19" rackmount
Intel® Xeon® E3-1275 v3 (4C/8T) Intel® Xeon® E3-1225 v3 (4C/4T) Intel® Core™ i3-4330 (2C/4T)
Intel® C226 Chipset
DDR3 1066/1333/1600 non-ECC UDIMM, 4 DIMMs (2 DIMMs/channel), up to 32GB
1x 2.5" bays
1x
1x
2x
N/A
4x Network Interface Module (NIM) slots
2x RJ-45 10/100/1000BASE-T Ethernet ports
1x RJ-45 serial port
2x USB 3.0
1x VGA
1x PCIe x4 Gen2 slot for acceleration card
Supports RJ-45 only
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
N/A
0°C to +40°C
-40°C to +70 °C
-5°C to +45°C, 5% to 90% Relative Humidity
Operating: 20% to 90% @40°C, non-condensing Storage: 5% to 90%, non-condensing
Operating: Half-sine 2G, 11ms pulse, 100 pulses in each direction on each of the three axes Non-operating: Trapezoidal, 25G, 170 inches/sec delta V, three drops in each direction on each of the three axes
Non-operating: 2.2Grms, 10 minutes per axis on all three axes
440mm x 44mm x 460 mm

Network Interface Modules (NIM)



Model Name	NIM1 CSA-Z4X01	NIM2 CSA-Z5C4F	NIM3 CSA-Z8X10
Chipset	1x Intel® I350-AM4	1x Intel® I350-AM4	2 x Intel® I350-AM4
Function	4-port GbE copper	4-port GbE SFP	8-port GbE copper
LAN Bypass	Yes	-	Yes



Model Name	NIM4 CSA-Z5C2F	NIM5 CSA-Z5C8F	NIM6 CSA-Z5C8F+
Chipset	1x Intel® 82599	1x Intel® I350-AM4	1x Intel® XL-710
Function	2-port SFP+	8-port GbE SFP	8-port GbE SFP+
LAN Bypass	-	-	-

Extreme Outdoor Servers



To curb soaring network operating costs and increasing equipment outlay to cope with the explosion in data bandwidth required by cloud computing and the new generation of mobile services, telecom carriers and network service providers around the world are deploying high-performance edge servers to improve "last mile" performance and user experience, an initiative known as Mobile Edge Computing.

Edge servers deployed at distribution nodes act as cache servers in a content delivery network (CDN), which uses geographical proximity as a criteria for delivering web content and reduces back-haul costs for ISPs and telecom carriers. For application providers, edge servers provide distributed application hosting platforms that allow them to deliver applications faster and more efficiently. Most importantly, these servers can help to improve user experience by providing intelligent access that enables faster upload and download speeds.

The ADLINK Extreme Outdoor Server is the world's first compact server-grade edge computing device powered by Intel® Xeon® processors that can be installed in an outdoor environment and provide stable and reliable performance in all types of weather and climates. The ADLINK Extreme Outdoor Server takes the innovation of edge computing a step further by saving on the installation and operating costs of server rooms at base stations, thus maximizing the economic benefits.

Features

Extreme Rugged™

ADLINK Extreme Outdoor Servers are built with our proven Extreme Rugged™ technologies that allow them to support a wide operating temperature range with fanless design, anti-shock and vibration capabilities, and IP65 water/dust protection, allowing them to operate reliably in harsh outdoor environments around the clock. Outdoor installation without the need for climate control saves on the cost and space required for a server room and allows more flexibility in deployment locations.

High Performance

The first server-grade products powered by single/dual Intel® Xeon® processor E5-2400 v2 that can be directly installed in an outdoor setting, ADLINK Outdoor Rugged Servers provide robust edge computing and ample networking capabilities and feature up to 96GB DDR3 VLP-RDIMM and dual 10GbE SFP + optical ports.

Application Ready

ADLINK Extreme Outdoor Servers are Application-Ready Intelligent Platforms (ARiPs) with full software support, including operating system, IPMI-based remote management tools, and ADLINK PacketManager that provides packet processing acceleration and allow customers to configure, manage and monitor the device. The Extreme Outdoor Servers hardware-software bundle helps to reduce development time and accelerate deployment.

Applications

Mobile Edge Server

The ADLINK Extreme Outdoor Servers can act as a localized cache server in a CDN, giving users faster access to frequently downloaded data. Cached data can also be contextualized for the specific environment, such as at a major sports or entertainment event or for augmented reality content delivery. Edge servers enable the creation of innovative services that can leverage proximity and location to speed up content delivery, provide lower latency and higher throughput, and transform the "big pipe" into "smart pipe".

Deep Packet Inspection

Deep Packet Inspection (DPI) provides traffic awareness, control and protection for complex networks. ADLINK's DPI platform provides Layer 2 and Layer 3 fast forwarding functions and manages hardware architecture. Open DPI software modules are enabled in the platform for reference design and performance benchmark testing purposes. The fully programmable platform provides customers with the ability to rapidly and flexibly add features and update their network packet processing solution.

Augmented Reality Content Delivery

One application that can leverage active device location tracking and mobile edge computing is augmented reality (AR), which takes local images, such as those from a smartphone camera, and overlays AR content from a nearby content server onto those images to enrich user experience. With locally hosted and delivered content, users get an improved quality of experience and benefit from overall efficiency. AR applications can provide new consumer or enterprise propositions, such as interactive tourist information, enhanced sporting event experiences, and real-time contextual advertisements.

Active Device Location Tracking

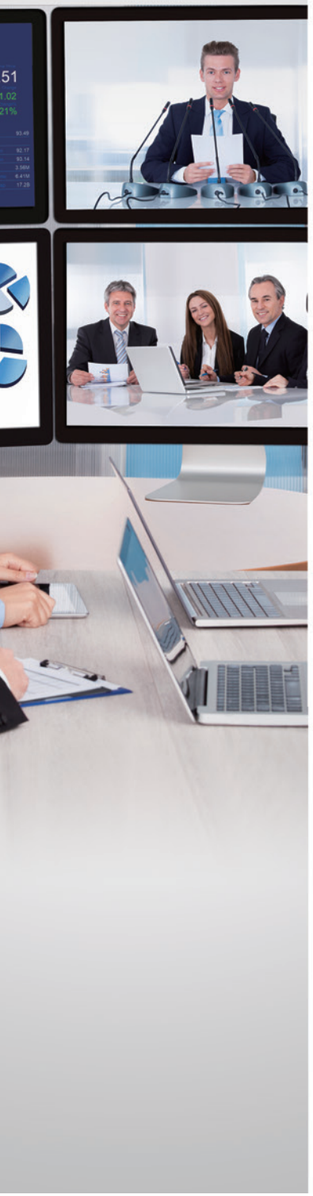
ADLINK Extreme Outdoor Servers are ideal for deployment as Mobile Edge Computers (MECs) that provide direct access to real-time radio network information such as mobile subscriber location and cell load, enabling innovative applications that utilize active device location tracking, such as mobile advertizing, sports analysis, campus management and "smart city"-related innovations.



Model Name		SETO-1000
Form Factor		Fanless system with aluminum conduction-cooled enclosure
System Core	CPU	Single/Dual Intel® processor E5-2400 v2
	Chipset	Intel C604 Chipset
	Memory	6x DDR3-1600/1866 240-pin VLP RDIMM sockets, up to 96 GB (max. 48GB for single CPU SKUs)
I/O Interfaces	Ethernet	2x 10/100/1000BASE-T RJ-45 ports 2x 10GbE SFP+ interfaces
	USB	2x Mini USB 2.0 ports
	Serial Port	1x COM port
Storage	SATA	2x 2.5" SATA drive bays (externally accessible)
	mSATA	Onboard bootable 32GB SATA flash (optionally up to 256GB)
IPMI	Chipset	Smart Fusion A2F500
	Functions	IPMI v2.0 based intelligent system manager & power manager. Supports temperature management for platform power manager: cold start heating, overheating, lower performance, shutdown & auto recover, self & remote diagnostic capability.
Expansion		Mini PCIe socket onboard; PCIe x16 signals via proprietary onboard connector (max. 15W)
Packet Processing Acceleration		Intel® Communications Chipset 8920 (optional)
Power Input		36-72 VDC power input (supports -48VDC for telecom applications)
Power Consumption		400~500W
OS		Linux 6.x
Dimension		340 mm x 440 mm x 44 mm (L x W x H)
Weight		10 kg
Operating Temp.		-40 ˚C to +55 ˚C
Storage Temp.		-40 ˚C to +70 ˚C
Humidity		5% to 95%, non-condensed
Vibration	Non-operating	1.88Grms, 5-500Hz each axis
	Operating	0.5Grms, 5-500Hz each axis
Shock		20G peak-to-peak, 11ms duration, non-operating
Rating		IP65
Certifications		FCC, CE, UL, NEBS Level 3 (design)

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Media Cloud Servers



The increasing prevalence of high-bandwidth multimedia applications in use over the network, such as video streaming and conferencing, remote education, remote medical services and real-time video analytics, requires providers to upgrade media server performance in order to deliver a high quality user experience. However, general purpose rack servers currently available on the market were not specifically designed for media applications, lacking the required levels of performance and compute density.

In contrast to general purpose rack servers which usually have at most two CPUs and perform software video transcoding, the ADLINK Media Cloud Server is an Application Ready Intelligent Platform (ARiP) for advanced video applications with high density computing performance that is designed from the ground up to meet the technical considerations specific to media servers while being cost-effective and easy to maintain.

Features

Application-Ready with MediaManager

The ADLINK Media Cloud Server is an integrated hardware-software ARiP, complete with ADLINK MediaManager that contains modules to handle common media processing tasks not natively supported by the Intel® Media SDK API, including mux/demux of media container files, RTP receiving and streaming, video composition, and audio processing. This ARIP bundle mitigates technical risks on the part of application developers and accelerates their time to market.

Transcoding Performance

With 16 processors in one 2U/4U 19” system the ADLINK Media Cloud Server provides high density computing power with integrated GPU engines. Combined with the ADLINK MediaManager, the ADLINK Media Cloud Server provides significantly improved transcoding performance over that of conventional rack servers as well as the added benefit of a reduced CPU load, allowing more resources to be used for other applications.

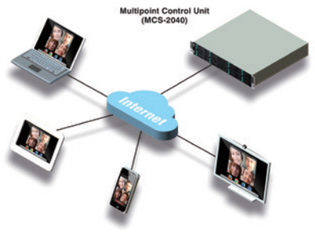
Reduced Costs

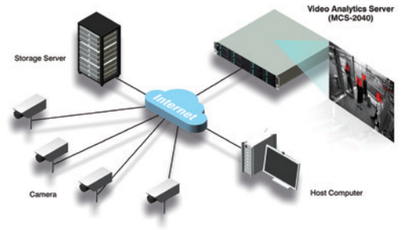
The ADLINK Media Cloud Server is expected to reduce half of our The ADLINK Media Cloud Server will reduce customers’ capital expenditures by providing increased performance with higher compute density, as well as reducing development effort and time to market.

Applications

HD Video Conferencing

The ADLINK Media Cloud Server is ideal as a multipoint control unit (MCU) for video conferencing, delivering excellent video transcoding and transizing capabilities that allow for optimization of video output quality. Web Real-Time Communication (WebRTC) applications are also well served.



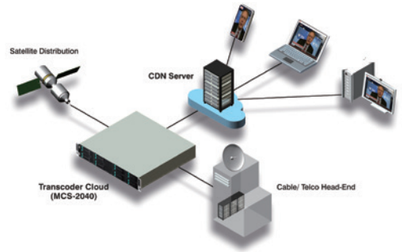


Video Analytics

The ADLINK Media Cloud Server provides a compelling platform for implementing real time or delayed video analytics. For example, analysis of visitor movements in a shopping mall provides demographic intelligence for mall operators to aid in setting rental prices of retail space.

Transcoding Server for Content Delivery Network

The ADLINK Media Cloud Server functions ideally as a transcoding server in content delivery network applications such as cable TV and IPTV networks. It is able to automatically detect the type of output devices it is serving and optimize video output quality depending on available bandwidth.







Model Name		MCS-2080		MCS-2040
		MCN-1500	MCN-2600T	
Form Factor		2U rackmount system, 8 hot-pluggable compute nodes (2 systems per node)	2U rackmount system, 4 hot-pluggable compute nodes (1 system per node)	2U rackmount system, 4 hot-pluggable compute nodes (2 systems per node)
System Core (per node)	CPU	Dual 6th Gen Intel® Core™ i7/i5/i3 Processor (BGA), or Dual Intel® Xeon® Processor E3-1500 v5 (BGA)	Dual Intel® Xeon® Processors E5 v3 (LGA)	Dual 4th Gen Intel® Core™ i7/i5/i3, or Dual Intel® Xeon® Processor E3 v3 (LGA1150)
	Graphics	Intel® GT4e integrated GPU	N/A	Intel® HD Graphics P4600
	Chipset	Intel® C236/C232/CM236 Chipset	Intel® C612 Chipset	Intel® Q87/H81 Chipset
	Memory	4x DDR4-2133 SODIMM, up to 64GB	12x DDR4-2133 DIMM, up to 384GB	4x DDR3-1600 DIMM, up to 32GB
BIOS	Chip	AMI BIOS on SPI flash memory		
	Features	Intel® PXE pre-boot, Remote Console, ACPI 1.0/2.0 support, UEFI		
I/O Interfaces (per node)	Ethernet	4x 10/100/1000BASE-T Base Interface channels Supports IPMI SOL, remote power on/off/reboot	2x 10/100/1000BASE-T Base Interface channels Supports IPMI SOL, remote power on/off/reboot	4x 10/100/1000BASE-T Base Interface channels Supports Intel® AMT, remote power on/off/reboot
	Storage	Onboard: 2x mSATA slots, supports SSD modules up to 512GB	Onboard: 2x M.2 slots, supports SSD modules up to 512GB Internal: 2x 2.5" SATA 6Gb/s drive bays	Onboard: 2x mSATA slots, supports SSD modules up to 512GB External: 4x 2.5” SATA 6Gb/s hot-swappable drive bays
	USB	2x USB 2.0 ports on front panel (1 port per system)	2x USB 2.0 ports on front panel (1 port per system)	2x USB 2.0 ports on rear panel (switchable between systems) 2x USB 2.0 ports internal (1 port per system)
	Display	2x HDMI ports on front panel (1 port per system)	1x VGA port on front panel	1x VGA on front panel (switchable between systems)
	Expansion	1x PCIe x8 expansion slot to rear of chassis	2x PCIe x8 expansion slots to rear of chassis, 1x PCIe x8 expansion slot (internal)	1x PCIe x16 expansion slot (internal)
Power Modules		2x hot-swappable 2200W/1600W high-efficiency redundant power modules		2x hot-swappable 1600W high-efficiency redundant power modules
Dimensions (W x H x D)		438mm x 88mm x 900mm		438mm x 88mm x 733mm
Cooling		6x fans with fan speed control on chassis		3x fans per node with speed control (PWM)
Operating Temp.		0°C to +40°C		0°C to +30°C
Storage Temp.		-40°C to +70°C		
Humidity		5% to 95%, non-condensing		
Certifications		FCC, CE, UL, NEBS Level 3 (design)		
RoHS		RoHS compliant		

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