



**OPEN**  
Compute Project



**OCP U.S. SUMMIT 2017**

Santa Clara, CA



# ENG. WORKSHOP: Specification for OCP - Telecom Sled

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OPEN HARDWARE.



OPEN SOFTWARE.



OPEN FUTURE.





# Agenda

- Who is ADLINK?
- Basis and DNA of OCP CG 19" Openrack OpenSled Specification
- Benefits of OpenSled specification
- OCP CG OpenSled specification overview

OPEN HARDWARE.



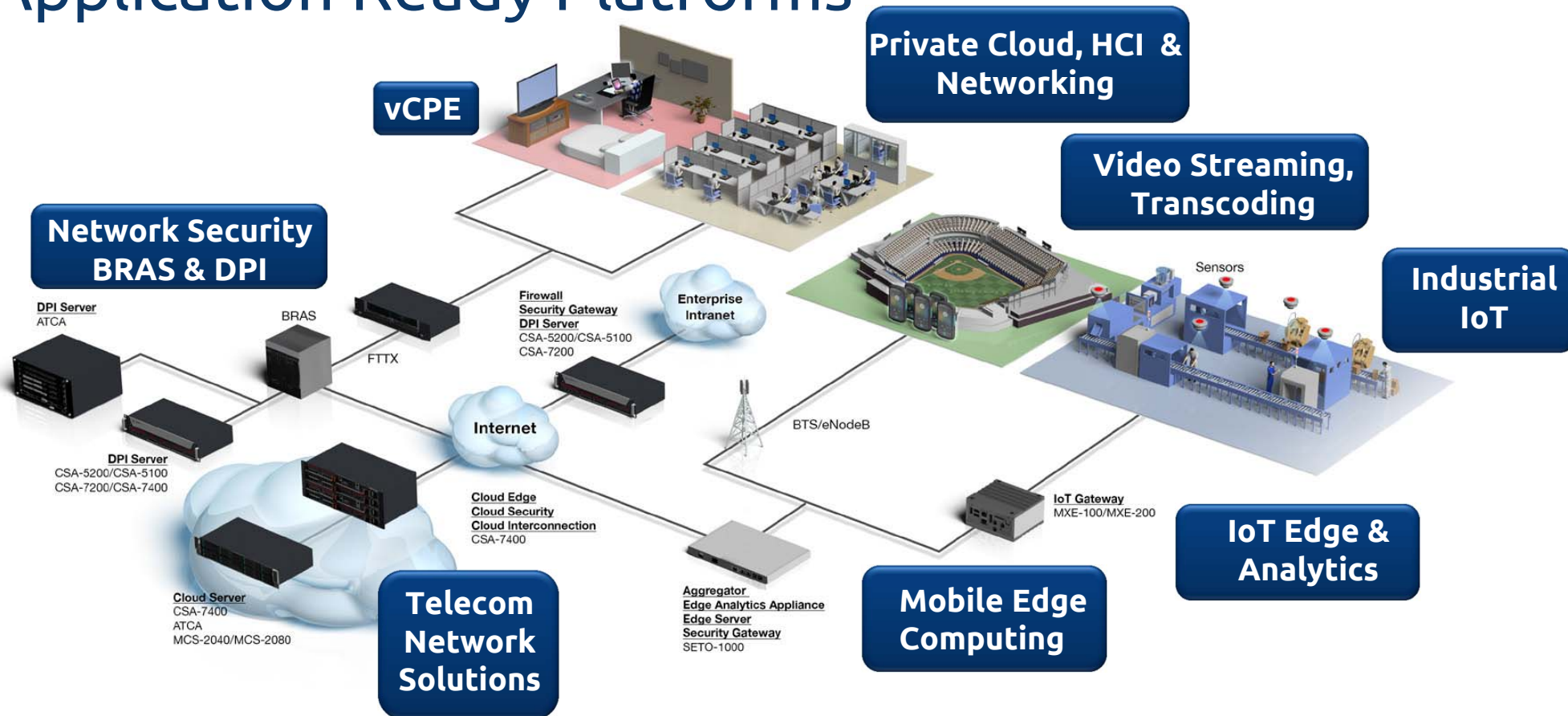
OPEN SOFTWARE.



OPEN FUTURE.



# ADLINK End-to-End Solutions Application Ready Platforms



# Standards Leadership & Technology Partners

We develop and innovate standards; we don't just implement them

- Intel® IoT Solutions Alliance Premier Member
- ETSI MEC & NFV Committee Member
- Wireless Innovation Forum Member
- Open Compute Project (OCP) Member
- Industrial Internet Consortium Member
- OpenFog Consortium Member
- OpenEdge Computing Consortium Member
- TIP Community Member
- Future Airborne Capability Environment (FACE) Consortium Member
- Communications Platform Trade Assoc. Member
- Open NFV Community Member
- PICMG Executive Member
- PC/104 Embedded Consortium Affiliate Member
- SGeT Founding Member
- PXISA Sponsor Member
- AXIe Consortium Strategic Member
- Automated Imaging Association (AIA) Member
- Wind River Hardware/Software Partner
- AMD Premier Embedded Partner
- NXP Partner
- Montavista Partner



# Next Generation Systems for Next Generation Networks



Decomposed of SW & HW  
Decomposed of HW Resource  
(Compute, Storage, Network, I/O)

- Large scale deployed in Cloud ;
- Deployed at network edge
- Many types of systems using common platform sleds

Open Spec, Carrier Grade NFV Platform

- Provide Real-time, High Performance, Reliable NFV Solution
- Built NEBs ready
- Embedded with carrier-grade software options

HW Accelerators to burst virtualization and all kinds of application performance for private cloud infrastructure  
Utilization of multi-host controllers and switches for Cloud/Fog options

**Modular | Industrial | Cloud** Architecture  
Carrier Grade NFV Cloud Platform

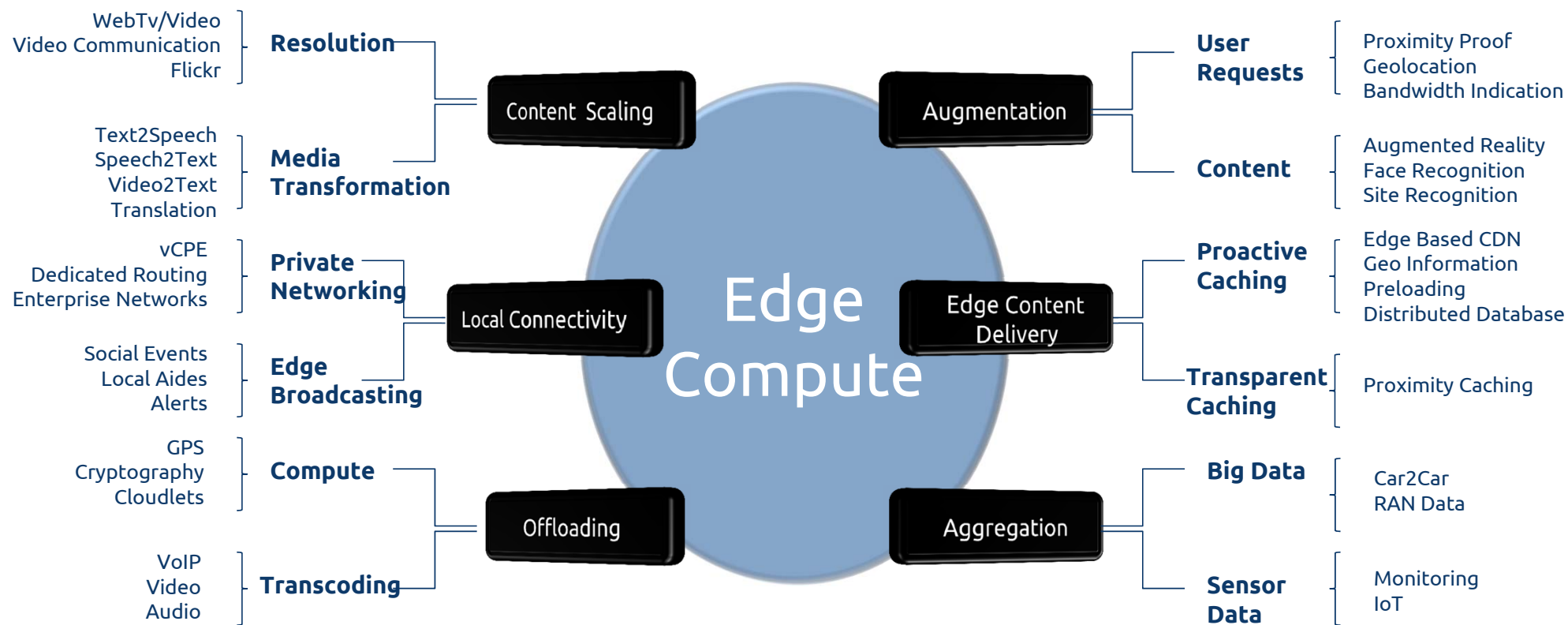
# Committed to Open Standards



- MICA development and strategy is to replace existing ATCA, Proprietary and RMS technology
- ADLINK and our customers recognize the importance of open standards and open architecture.
  - MICA is built on an open architecture with a large eco-system of partners and suppliers
  - ADLINK represents the product as a Open Standard and provide the specifications of the MICA product to customers, partners and standards committees
  - Based on Intel's Open Converged Modular Architecture which was originally developed by Intel as a stepping stone of RSA.
- Currently providing the OCP CG Openrack MICA spec as a specialized sled enabling a multitude of options for custom, specialized solutions
  - Enables HW acceleration, additional silicon options, pre-integrated software, and the ability to reuse common sleds for a multitude of types of systems



# Focusing on Edge Computing Use Cases





# Mix & Match Common Modules: Rich system configuration choices



Common  
Modules

1x MCN-2600  
8x NIMs

4x MCN-2600  
2x MXN-3610/4100

24x 3.5" HDD

2x MCN-2600



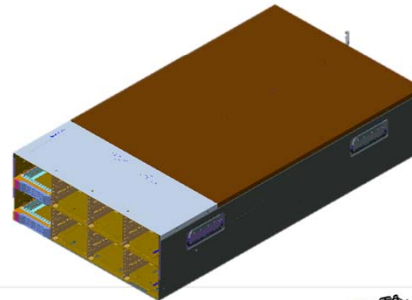
CSA-7200  
8 NIMs,  
128 Eth Ports

Rich I/O



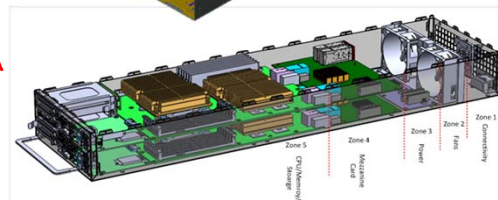
CSA-7400  
4 Compute Nodes,  
360G Throughput

High Compute  
Performance  
& Throughput



CSA-7x00  
24x HDD+  
1x CSA-7400

Large Storage, Storage,  
Compute, Switch Hyper  
Converged



OCP-T Compute Sled  
2 Compute Nodes,

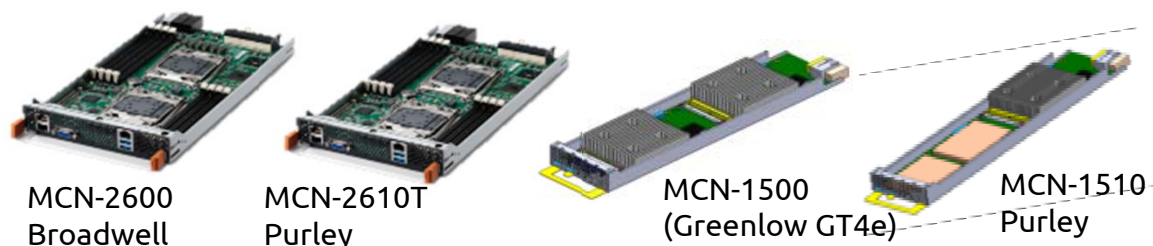
# Next Gen.- Network Communication Platform

Flexible Modular Building Blocks



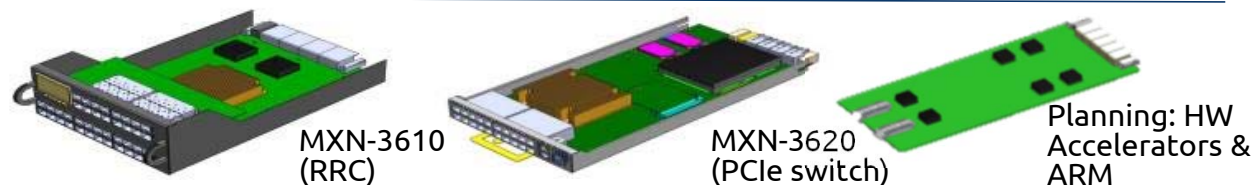
## Compute Nodes

- Broadwell, Skylake, Purley (Skylake + FPGA)
- 1/2 and 1/4 width sleds for needed core density
- Flexibility: mix and match E3 and E5
- Integrated NFVi Software and Platform S/W



## Switching Nodes

- Intel Red Rock Canyon & Broadcom PEX
- Extension trays for flexible I/O configs
- System Management and wide range of SW



## I/O Nodes

- Optional Network Interface Modules
- Optical, copper, w and w/o bypass
- 1/4 width size to support large I/O options



## Complete Systems

- 19" - 2U 4U and OCP-Telecom versions
- Data Center 2U
- AC/DC power, NEBS ready, customizable
- Multiple options based on required solution



# Application Use Cases for MICA



- High CPU/IO needs
- Modular, Flexible, open standard sled & ecosystem,
- cost efficient with RRC features (integrated 100G NIC & switches), high-density
- CSA-7400 or derivatives good fit, scalable & stackable to high-end (to multiple Tbps)



- Low CPU/High IO needs
- Modular, Flexible, open standard sled & ecosystem
- CSA-7200 or derivative a good fit



- High CPU, Flexible configurations
- SW ecosystem like WR TiS integration
- CSA-7400 & the stack-up OCP CG OpenRack a good fit
- Additional Silicon
- CSA-7200 or derivative a good fit



- Hi-density all-in-one box with compute, switch & storage, IO, open standard sled
- CSA-7400C with local storage or with shared/storage sled a good fit



- First high-density GT4e platform capable of H.265/4K transcoding, PCIe expansion for external storage & others (FPGA etc)

# Scope for OCP CG OpenRack 19"



Sled for Frame/appliance layouts

## **Current OCP CG OpenRack 19" Spec:**

- OCP CG OpenRack 19" frame, Power, Interconnect & Sled dimension spec submitted by Radisys:
  - Current spec defines the dimensions of 2 "Sleds", ½ and Full Width 2U Sleds
  - Pre-defines interfaces and DC Power requirements into Frame
  - Does not specify characteristics of the Sled internal component layout

## **ADLINK Proposed OCP CG OpenRack 19" Sled Spec:**

- Specs are used as a guideline for appliance delivery that is based on Modular Industrial Compute Architecture - CPU, Appliance, Future Switching (MR-IOV Pex and Multi-Host controllers as examples)
- Sled spec defines zones, what the zones are for and parameters for zones and use MICA as reference). Power, Mezzanine and interconnections between components are defined
- Both ½ width and Full Width Sled Spec planned

# OCP CG 19" OpenRack OpenSled



## Benefits

- Sets a common structure enabling more than just an X86 Environment on a open Architecture
- Enables a OpenSled design for OCP CG OpenRack 19" suppliers to design and manufacture their own sleds for multi-purpose use cases
- Provides both ½ Width and Full Width Sleds (Q2 Defined) for a multitude of options
- Defines the zones of each Sled for operators to feel confident that the Sled is open, however provides many options for Sled use cases
- Enables the front part of the sled (Zone 5) and the Mezzanine (Zone 4) for Server, ARM, HW acceleration, Front Panel options, Storage, etc.
- Future Mezzanine enables ability to add multi-host controllers, MR-IOV capabilities, switching and HW acceleration for additional capabilities.
- Utilizes Radisys' best in class spec for Frame and Sled interconnection, power and physical dimensions.



# OCP Telecom Standardization based on MICA



**19" OCP CG  
OpenRack 19"  
Frames**



**"Sleds" for OCP CG OpenRack  
19"**

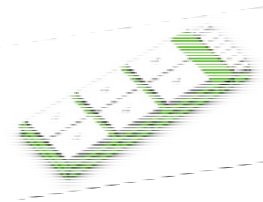
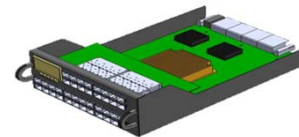


**1/2 Width**



**Full Width**

**Reusable MICA Sleds**



**OCP CG OpenRack 19"  
Specification**



**Sled Spec:**

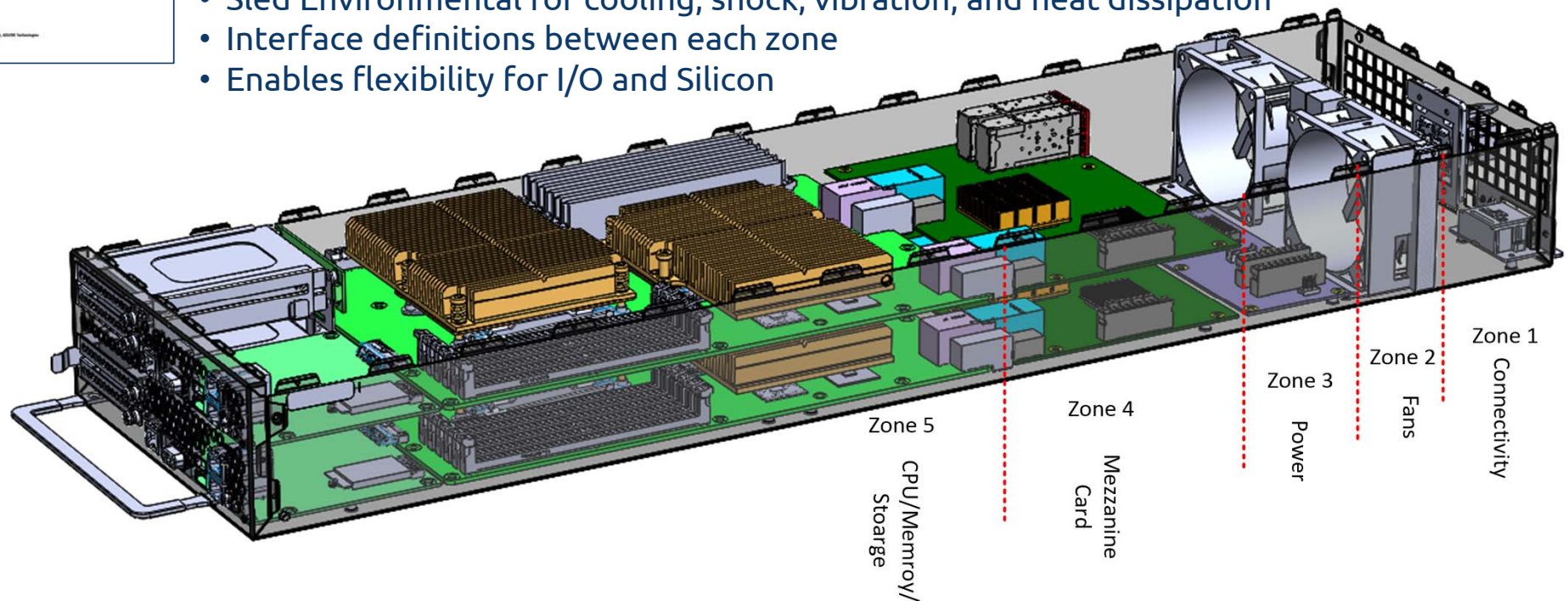
- Sled Zones & Layout
- Sled Power
- Sled I/O
- Sled Environmental

# Open Sled Zone Specification



## ADLINK OCP CG OpenRack 19 Spec Defines to the Industry:

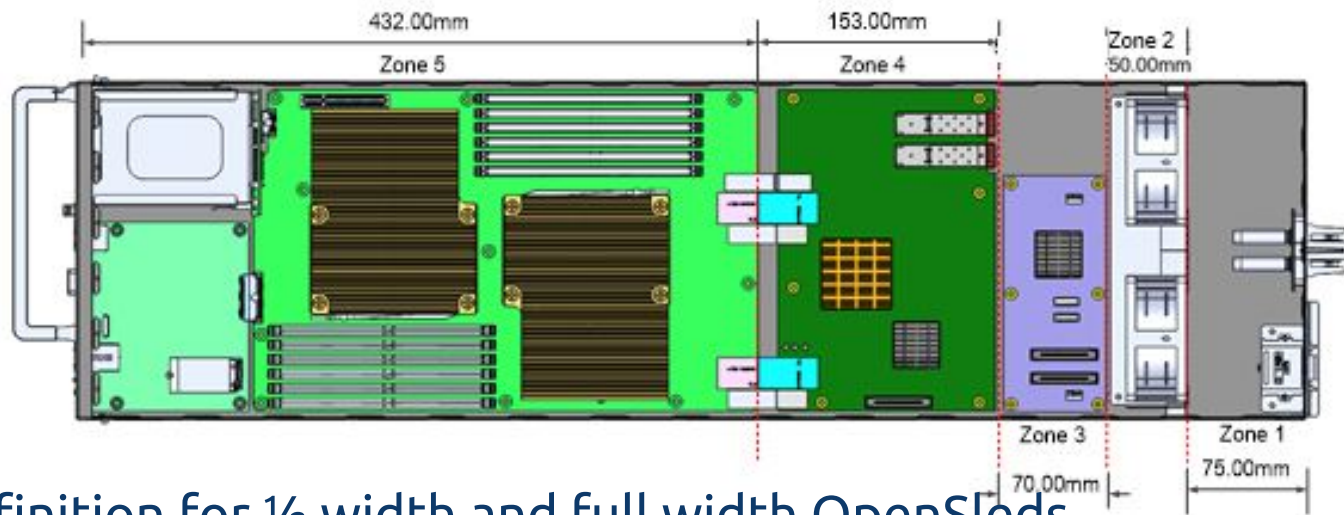
- Sled Zones, Dimensions & Layout for ½ width sleds
- Full Width sled to be defined later in conjunction with Microsoft's current sled spec
- Sled Power requirements
- Sled I/O options for the Mezzanine and NIC
- Sled Environmental for cooling, shock, vibration, and heat dissipation
- Interface definitions between each zone
- Enables flexibility for I/O and Silicon





# Proposed OCP CG OpenRack 19"

## OCP CG OpenRack 19" Sled Zones



### Definition for 1/2 width and full width OpenSleds

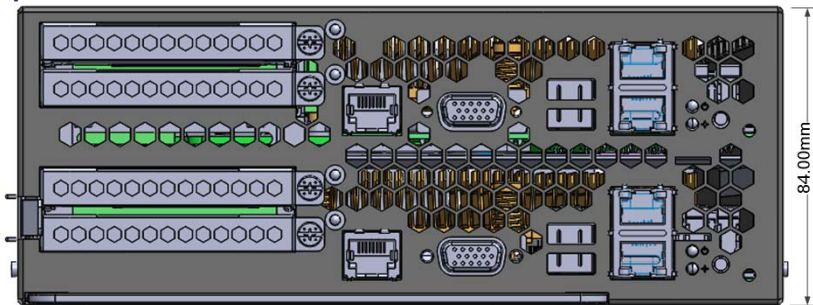
- Zone 1 - Open Air for environmental area
- Zone 2 - Cooling and air flow definitions/requirements
- Zone 3 – Power module specifications and board layout
- Zone 4 – Mezzanine for NIC to ToR, provides additional options for acceleration and custom
- Zone 5 – Server/Memory/Storage and optional front panel definition. 4 CPU's (2 MICA sleds)

# OpenSled Design

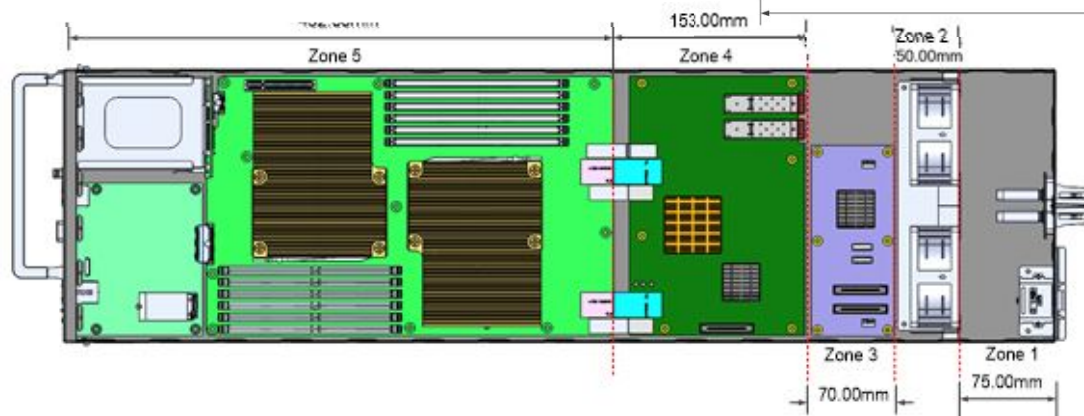
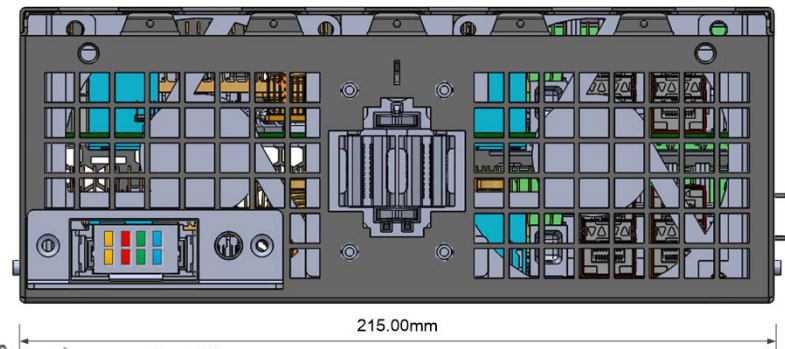


Defining the sled based on CG OpenRack 19 Frame spec

Front view allowing additional/optional connectivity,  
Hot Swappable Storage access – removable or hinged  
front panel



Rear panel is defined by Radisys' CG OpenRack  
19 Frame spec.

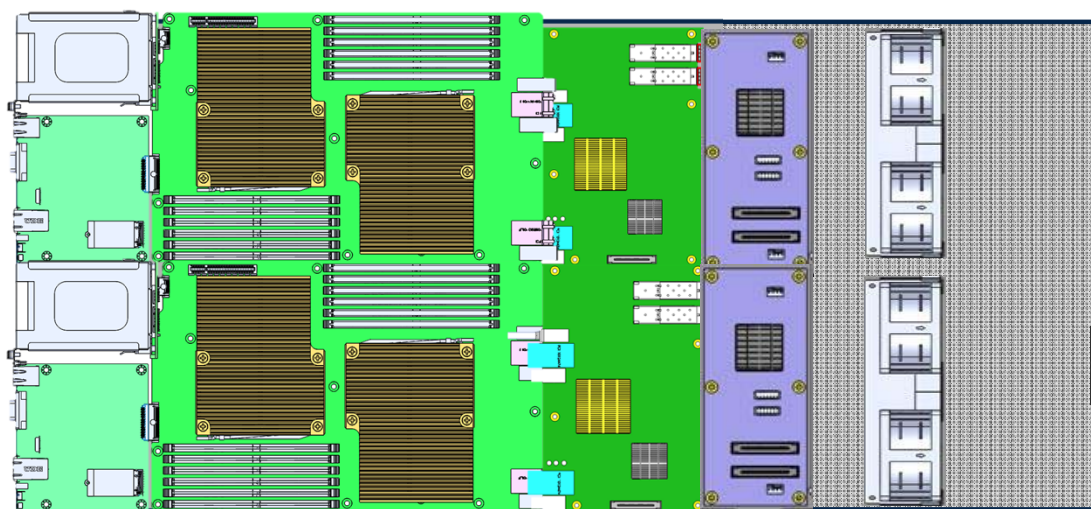


Top view of sled – defines  
internal components

# Full Width (2U) OCP CG OpenRack 19" Tray(TBD)



- Full Mezzanine enabling passive connections for Sled switching. Multi-host controller, PCIe Switching within the Sled as a single appliance
- Could be a complete storage sled as well.
- Working with Microsoft who has defined the Server sled for full width



1x OCP Power Bus Connector

8x Optical Data Port Connector

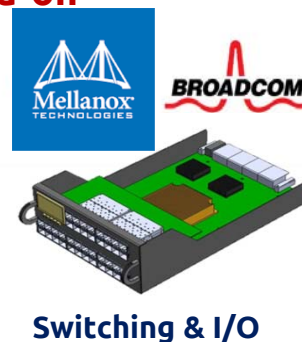
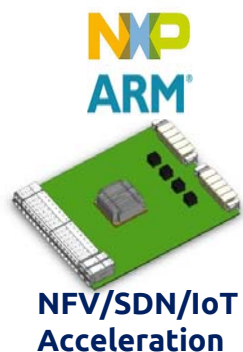
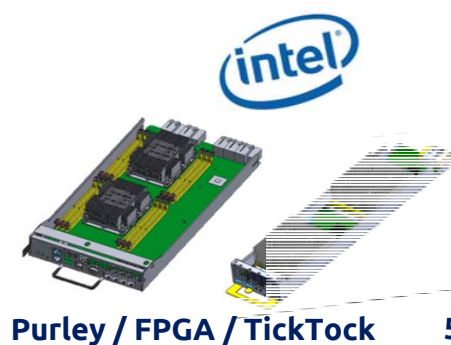
1x OCP Power Bus Connector

8x Optical Data Port Connector

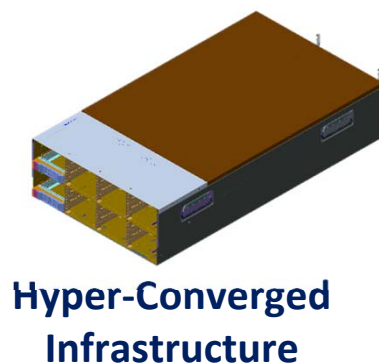
# M.I.C.A. Plan of Intent (2017-2018)

(Subject to change, not committed)

## Sleds & Add-on



## Systems





# Network Alliance program



Industrial leaders as part of our Modular Industrial Compute Alliance

## Alliance

Chassis, Sleds,  
Custom Systems

Application  
Partners

Integration, Testing  
& Support

WIND™

PA PeerApp

Saguna



asis

NETSCOUT.

PENTAIR

Silicom Ltd.  
Connectivity Solutions

CLAVISTER  
WE ARE NETWORK SECURITY

TREND  
MICRO

CertusNet

netElastic  
systems

PRISMTECH

UNICOM

Predixion  
Predict Everything.

NXP

IDT

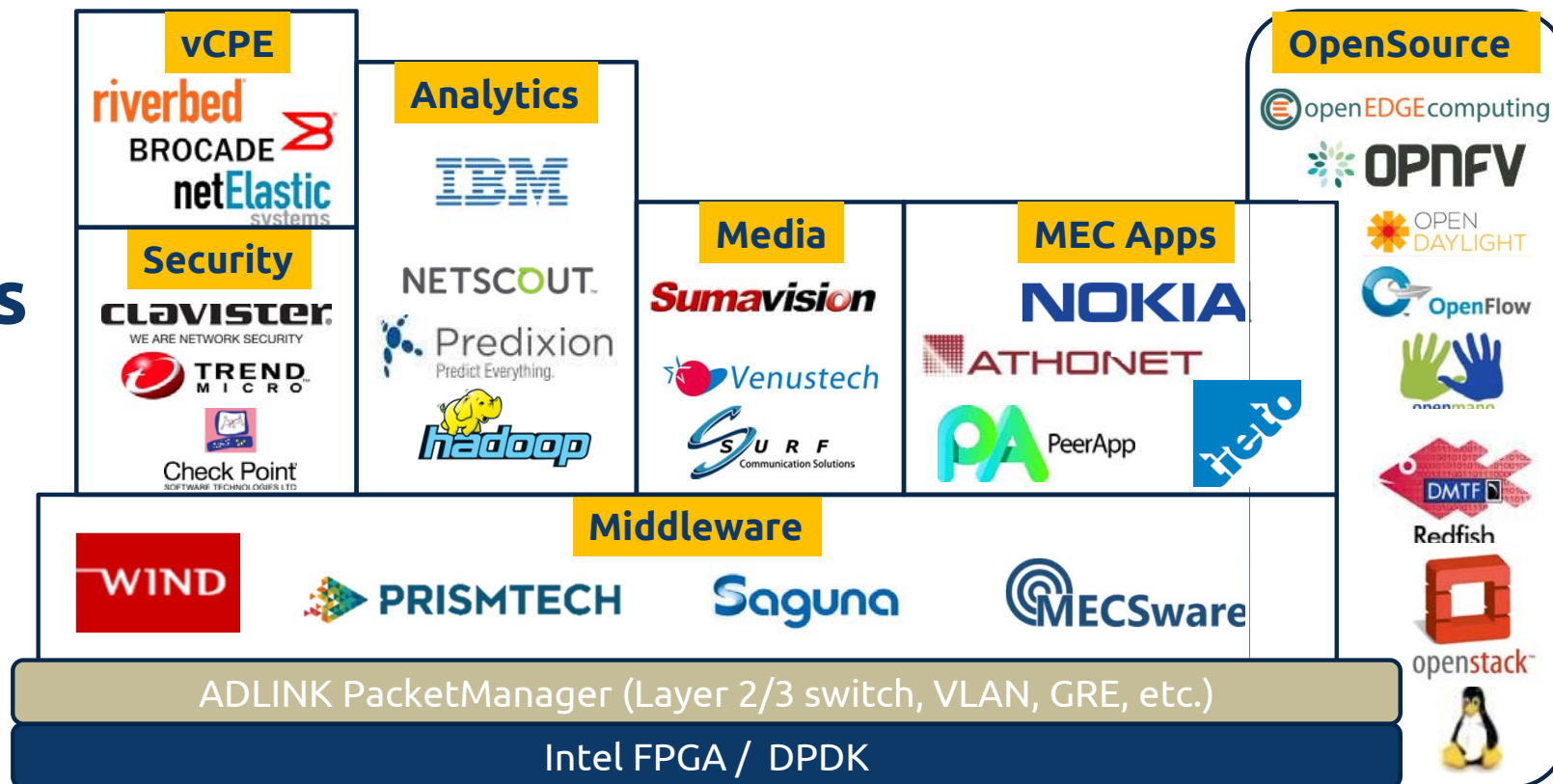
intel

Middleware

# Expansion of Software requirements



VMs



# Conclusion



## Collaborative effort for OCP CG OpenSled

- **Open Architectures:** ADLINK is implementing Open Architectures for Edge Compute technologies
  - Expanding into other Open Architectures for reusability
- **Collaboration:** We believe in collaboration, open architectures while working with industry leading eco-system partners/committees
  - Collaborating with other OCP members on CG full width OpenRack OpenSled
- **Spec Submitted:** OCP CG OpenSled Spec enables an open architecture for multi-silicon, multi-use sleds that support's the OCP CG 19" OpenRack spec
  - Incorporates ADLINK's MICA architecture which can fit into many types of systems (HCI, 19" Appliance, Datacenter/MediaCenter, OCP CG 19" Openrack)
  - OCP CG 19" OpenRack OpenSled is based on deployed technology and integration complete by Q2'17
  - Investing in full width sled with multi-host controller concepts with collaboration with other OCP suppliers





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