



Open CloudServer – vNext Generation

Aug 11, 2016
Mark Shaw

Microsoft Cloud + Enterprise



Microsoft's Open CloudServer v1, v2, v3

Three Generations of Contributions

- Specifications, Board Files & Gerbers
- Open Source Code: Management, operations
- Mechanical CAD: Full Chassis, Blade, Mezzanine

Continue to Focus on 19" EIA Rack

- International deployments
- Flexible heights, multiple vendors

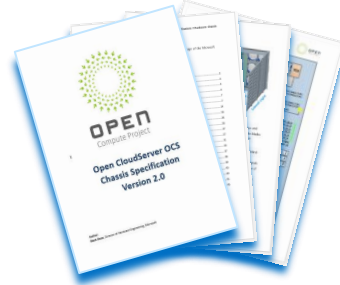
Investigating the future of Open CloudServer



OCS vNext – Design Principles

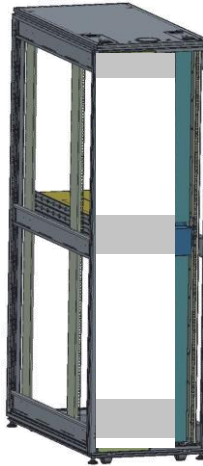
One Design across Suppliers

- One motherboard
- One Firmware image
- One hardware design
- One qualification / certification
- Copy-exact for multi-sourcing



Modular 19" EIA Rack

- Owned and leased data centers world-wide
- Tweaked standard Rack
- 42U & 48U



Cost Reductions

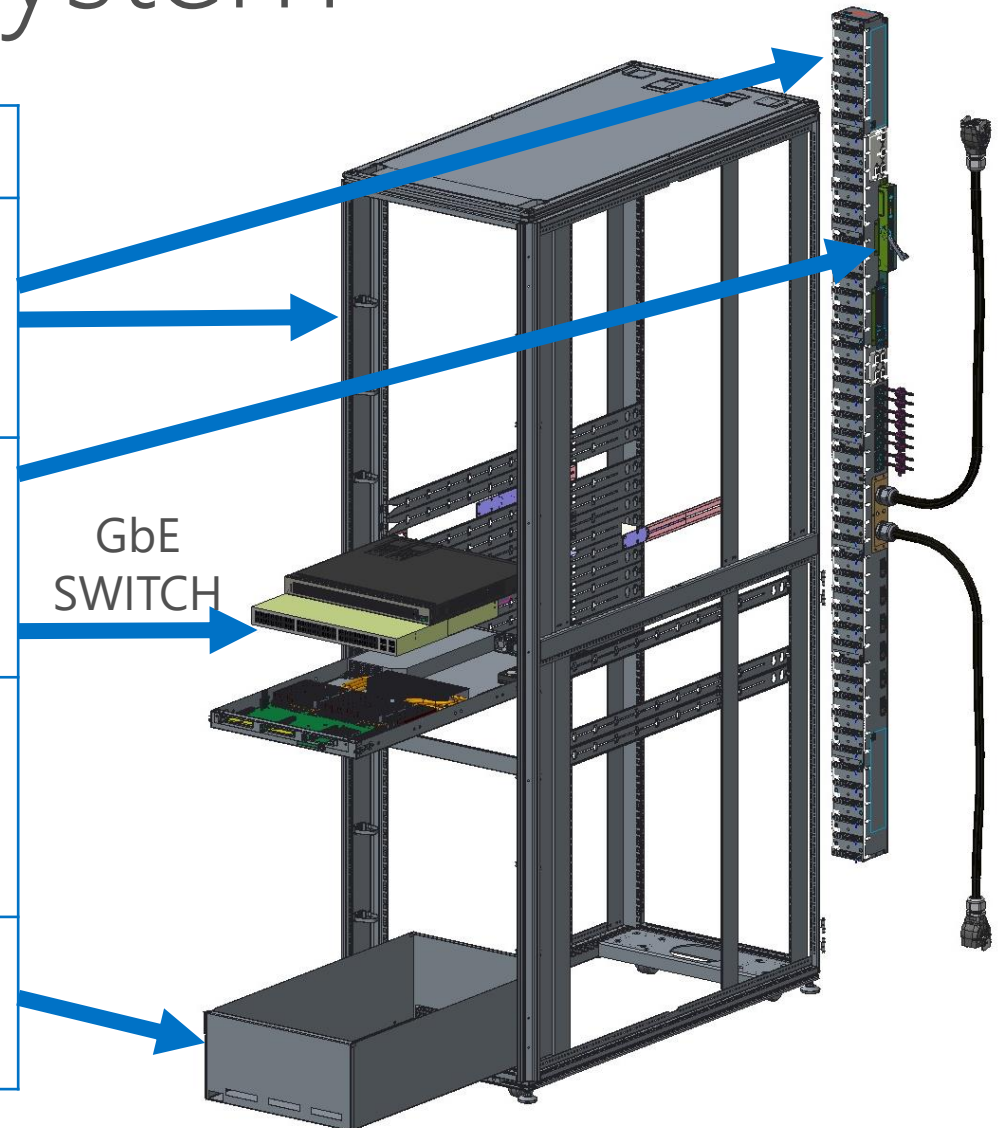
- Simpler Hardware, less metal
- Lower management costs
- Very low cost without servers

Supply Chain

- Enable Microsoft's multiple manufacturers
- Single parts locker
- Fast integration & deployment

OCS vNext – Modular System

| Modules | Features |
|------------------|--|
| Rack / Enclosure | <ul style="list-style-type: none">• 48U and 42U EIA 19", 1200mm depth• 1U granularity, no 12U restrictions• Dual A/C power feeds through PMDU |
| Management | <ul style="list-style-type: none">• Rack Manager integrated into PMDU• Same API as OCS v1 (RestFul or Redfish)• Ethernet to each server's BMC, no serial |
| Server Blade | <ul style="list-style-type: none">• Full-width side-by-side CPUs• Front cabled I/O using standard PCI-e slots• Local high-availability power and fans |
| Storage | <ul style="list-style-type: none">• High density 88-HDD 4U JBOD• Attaches to one, two, or four Servers |



OCS vNext – Server Blade

Optimized for Performance, I/O flexibility

- Standard PCI-Express Gen3 slots, carrier card for OCP Mezzanine
- CloudSSD M.2 NVMe Flash slots on motherboard
- Side-by-side CPU layout lowers fan power

Front Cabled I/O

- Blind mate rear power and management
- Latching at the chassis, pull to release
- Cold aisle service

Embedded PSU and Fans

- PSU Dual-feed, three-phase, N+1 high availability solution
- Six N+2 fans for high-availability, lower per rack CFM



Management Architecture

Rack Management

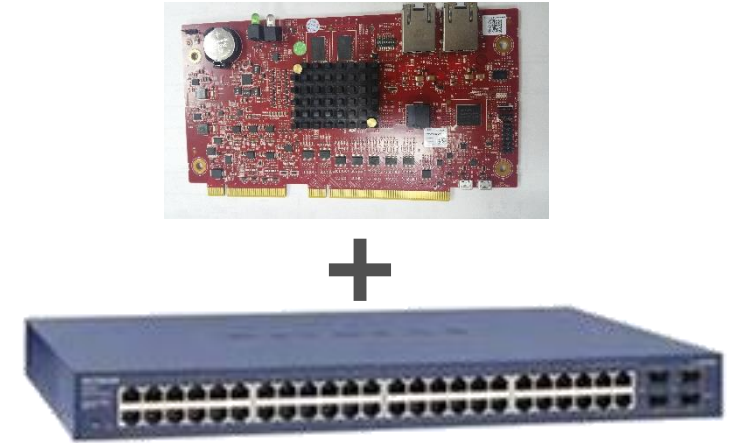
- Restful API I/F – i.e. Redfish via external Ethernet
- Rack Manager (RM) ARM appliance

Blade Management

- GbE I/F to each blade's BMC
- GbE Network switch – front cabled
- NCSI enabled on motherboard with cable to OpenRack Mezz Carrier
- KVM enabled on motherboard

Deployments

- Integrated into PMDU for rack scale deployments
- Standalone version for hardware that is not integrated into PMDU



JBOD – High Density Storage

4U JBOD – 88 HDDs / chassis

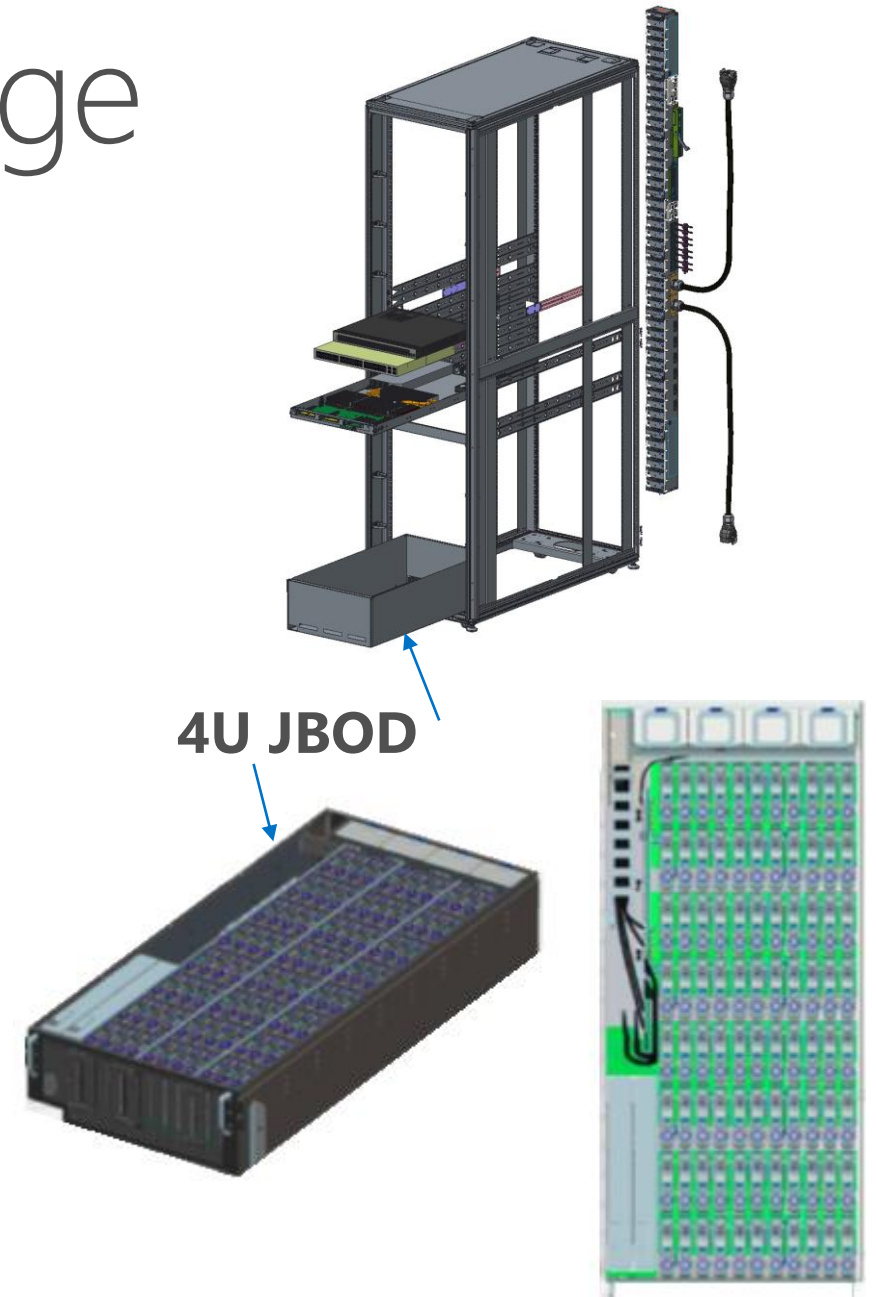
- Drawer design – slide out for repair
- Hot-plug HDDs, hot-serviceable expanders
- Front cabled to compute blade head-node

Robust Feature Set

- BMC gathers HDD temps and status info
- Individual HDD on/off to minimize NTF

Configuration

- One OCS vNext head nodes, 88 HDD each
- Two OCS vNext head nodes, 44 HDD each
- Four OCS vNext head nodes, 22 HDD each



Additional Storage Investigations

Low Density Storage

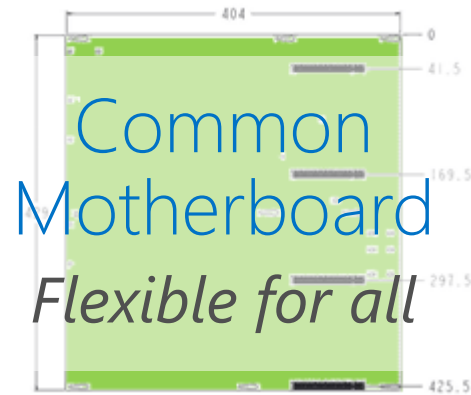
- 8-12 HDDs per 2U server, no hot-plug

Flash Storage

- 48 – 96 NVME Cloud SSD M.2's
- 48TB – 192TB capacity

OCS vNext Motherboard Flexibility

OCS vNext EIA 19" Racks
Microsoft Enabled



EIA 19" 1U/2U Chassis
Open Rack
Community feedback?

