

MaxCore™ Hyperscale Platform High Density Compute and Media for Dell DSS 9000 Racks

Preliminary Product Brief

The Artesyn MaxCore™ scalable PCI compute and I/O platform in Dell DSS 9000 system

- High performance density in Dell DSS 9050 sub-chassis
- Redundant intelligent 100G and more network I/O per sled enables flexible, programmable packet forwarding
- Microserver and switch cards with up to 576 Intel® Xeon® processor D cores per tray
- PCI ExpressFabric built-in infrastructure
- Full SDN/NFV packet forwarding and virtualization support enables seamless scaling
- Designed for Dell DSS 9000 platforms

Today's networks demand higher bandwidth and lower latency than ever before, with more compute capacity serving the edge of the network, including the upcoming 5G mobile network. As an example, new network components like the cloud/virtualized radio access network (c/vRAN) become critical to centralize baseband processing with less expensive network components. Mobile Edge Computing, often co-located with the centralized baseband processing will also play an important role in 4G and 5G network edge with use cases including video analytics, Internet of Things (IoT) and optimized local content distribution, requiring acceleration for optimal performance and density.

Increasingly telecom networks and datacenters are turning to hyperscale platforms such as Dell DSS 9000 for their hardware infrastructure, building on best practices from hyperscale deployments. The MaxCore™ Hyperscale platform is designed to bring PCI Express (PCIe) acceleration to Dell DSS 9000 telecom infrastructure. Built around the Intel® Xeon® D processor family and paired with the Artesyn Silver Lining™ SDN & NFV software platform, it creates an unprecedented level of both density and versatility when building virtualized and accelerated telecom applications.

The MaxCore™ Hyperscale platform has up to 288 processor cores per half-width sled (576 cores per tray) and multiple 100G ingress/egress support. Also supported are a range of media transcoding and optimization PCIe cards. Virtualization techniques, paired with the latest I/O and acceleration capabilities, enable cost-effective and optimized solutions for cloud RAN or Mobile Edge Computing applications.

Benefits:

- Standard PCI Express cards allow the use of a wide range of off-the-shelf acceleration solutions
- Dell DSS 9000 compatibility leverages best practices of hyperscale deployments
- High density minimizes both CapEx and OpEx costs
- Hotswap sled enables easy maintenance



Half-Width MaxCore™ Hyperscale Sled for Dell DSS 9000

Architecture

The versatile MaxCore™ Hyperscale sled provides 9 PCI Express card slots. One card is designated for the Artesyn SharpServer™ dual Intel® Xeon® processor D microserver card, and eight (8) card slots are available for additional microserver cards or any type of PCI Express card. The MaxCore fabric employs an innovative new PCI Express switching technology which now allows many CPUs to be associated with many PCI Express cards, unlike classical server architectures that always assume a single host CPU. The MaxCore user can create several independent server domains in the same shelf or can share individual PCI Express cards between many CPUs. Configurations from a single CPU with eight (8) PCI Express accelerator cards to 16 CPUs with a single PCI Express I/O card can be created. Adding redundancies is also possible for the systems integrator.

Two 10G ports are directly accessible MAC devices connected to the chassis fabric for SR-IOV based device sharing for NFV functions on the hosts.

One microserver CPU takes the role of the chassis host. A second CPU can take over that role in the case of a failure. That CPU function is then responsible for the MaxCore housekeeping and acts as boot server and may also provide file server function for the other microservers. Four SATA drives can be configured to be owned by a redundant pair of chassis host CPUs. In addition, each slot is connected to a pair of M.2 SSDs.

With the system host accompanied by a BMC microcontroller, the MaxCore Hyperscale sled can be individually remote managed like an enterprise class rack mount server. The MaxCore Hyperscale sled is also part of the larger Dell DSS 9000 rack level platform management architecture.

Two hot swappable MaxCore Hyperscale sleds fit in a Dell DSS 9050 sub-chassis. Up to 10 DSS 9050 sub-chassis elements can be installed in a single Dell DSS 9000 frame.



Dell DSS 9000 Rack

Sled Features

- Single sled
 - Two (2) sleds per Dell DSS 9050 sub-chassis, up to 20 sleds per cabinet
- Nine (9) slots per sled
 - 6x PCIe Gen3 x16
 - 3x PCIe Gen3 x8
 - Full length PCI Express slots
- 2x 10G slots with SR-IOV support for shared usage between cards in all slots
- Mass storage
 - 4x 2.5 inch SATA drive bays on two hot swappable carriers for use from chassis hosts in slots 1 and 9
 - Up to 14x M.2 2280 (80mm form factor) SSD slots for direct access with cards in slots 2...8
- Optimal platform cooling
 - Cable-less internal architecture for Artesyn cards
 - Internal connectors for optimally supplying power for PCI Express cards requiring more than 75W
- Shared power through Dell DSS 9000 rack
- Front-to-rear cooling
- Fan replacement from rear
 - Rack-level in Dell DSS 9000
- Optional bezel with air filter
- Alarm and status LEDs
- Reset and power buttons
- Lights Out Management
 - Local BMC for remote management
 - Local 1000BASE-T connection
 - MaxCore Hyperscale sled connected into Dell DSS 9000 platform management system



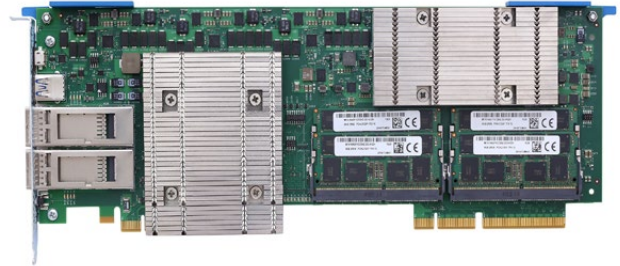
SharpServer™ Card Features

- PCI Express card form factor, single slot
- One or two 8-core Intel® Xeon® processor D-1541 processors
 - Up to 64GB DDR4 per processor
 - Up to 4x PCI Express Gen3 x4
 - 2x 1Gbps Ethernet to optional internal Ethernet infrastructure
 - Local Flash mass storage per processor
- 1x USB per processor
- 1x Reset per processor
- COM port access (serial console) per processor
 - USB connection to simplify debugging
- Software
 - Linux KVM
 - Intel® DPDK support
 - Multi-host PCI Express I/O virtualization support



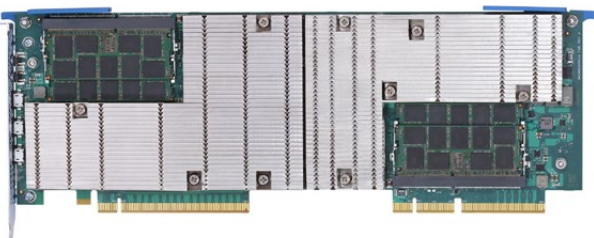
SharpSwitch™ Card Features

- PCI Express card form factor, single slot
- Intel® FM10840 Red Rock Canyon SOC
 - ~100GE aggregated bandwidth (PCIe 3x16)
 - Built-in switch for cut-through traffic and traffic through CPUs
 - Open vSwitch and Stateful Load Balancer via ECMP
 - Integrates with OpenStack
 - I/O: 1x100GE, 8x25GE, or 8x10GE (may require cables)
- Intel® Xeon® D-1541 8-core processor
 - System host capability
 - Up to 64GB DDR4
 - PCI Express Gen3 x8 connection to RRC switch
 - 2x SATA connection
 - 1x USB
 - 1x Reset
 - COM port access (serial console)
- USB connection to simplify debugging
- Software includes Linux KVM, Intel® DPDK support, multi-host PCI Express I/O virtualization support



SharpStreamer™ Pro Card Features

- PCI Express card form factor, single slot
- Up to eight (8) HEVC 1080p30 transcodes
- Dual Intel® Xeon® E3-1578Lv5 GT4e-enabled scalable video processing engines
 - 2x DIMMs per CPU, up to 32GB per CPU
- Up to four (4) HD HEVC transcode streams per card
- Up to two (2) 4KP30 HEVC encode streams per card
- Network bootable reference OS : Centos 7.x
- Intel® MSS, optional transcoding software
- Common hardware for different applications:
 - H.264/AVC & H.265/HEVC transcoding and encoding
 - VDI applications
 - Image processing equipment



Software

Platform Management

The MaxCore™ Hyperscale platform provides remote Lights Out Management (LOM) through its on-board management controller and management software based on industry standards like IPMI 2.0, RedFish 1.0, Restful APIs, Serial-over-LAN (SoL) and virtual media device support. The integrated web server allows for simple web browser based access. Furthermore MaxCore Hyperscale sleds are fully integrated into the Dell DSS 9000 platform management architecture.

Once the chassis host (main CPU) is operating, the Artesyn System Services Framework increases remote management access using XML and HTTP. This software allows full system monitoring, platform configuration, and full system firmware updating of all Artesyn MaxCore PCI Express cards.

Silver Lining Software

Artesyn's Silver Lining™ NFV software is a virtualization framework for next generation networks, based on common open source projects such as OpenStack, OpenFlow, Open Virtual Switch (OVS) and Intel® Data Plane Development Kit (DPDK). Silver Lining software makes use of a KVM hypervisor to enable customers to run multiple virtualized applications across common compute and media processing hardware such as the MaxCore™ HA platform and cards. OpenStack Kilo release services supported within Silver Lining include Nova, Neutron, Ironic, Glance, Cinder, Keystone, and Horizon. These services can be deployed on top of compute, network and controller nodes running on the MaxCore HA server and switch cards running Centos 7.1. The software is bundled with standard Basic Blade Services package coupled with Artesyn's MaxCore HA cards and includes automated installation and configuration scripts for ease of deployment.

SOLUTION SERVICES

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

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