Design choices

FlexPod

NetApp
June 03, 2021

This PDF was generated from https://docs.netapp.com/us-en/flexpod/express/express-direct-attach-design_design_choices.html on October 13, 2021. Always check docs.netapp.com for the latest.

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Design choices

The following technologies were chosen during the process of architecting this design. Each technology serves a specific purpose in the FlexPod Express infrastructure solution.

NetApp AFF A220 or FAS27xx Series with ONTAP 9.5

The solution uses two of the newest NetApp products, NetApp FAS 2750 or FAS 2720 and AFF A220 systems with ONTAP 9.5.

FAS2750/FAS2720 system

The NetApp FAS2700 series is designed to support more of your IT needs, the NetApp FAS2700 hybrid storage arrays offer more value than other systems in their class. The FAS2700 running NetApp ONTAP storage software simplifies the task of managing growth and complexity by delivering high performance, providing leading integration with the cloud, supporting a broader range of workloads, and seamlessly scaling performance and capacity.

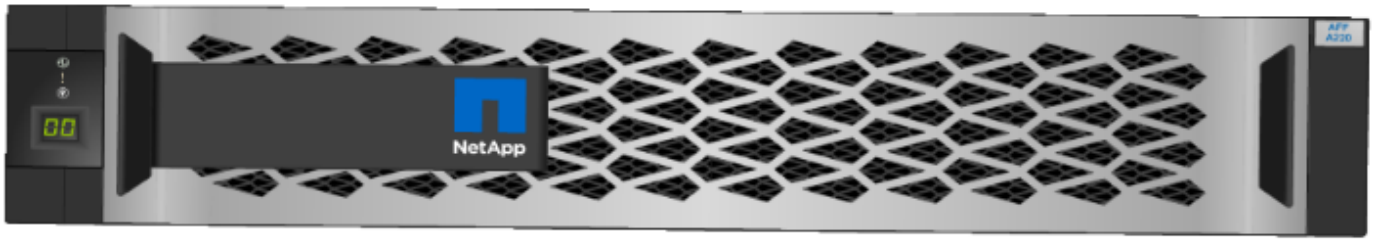
For more information about the FAS2700 hardware system, see the FAS2700 Hybrid Storage System product page.

AFF A220 system

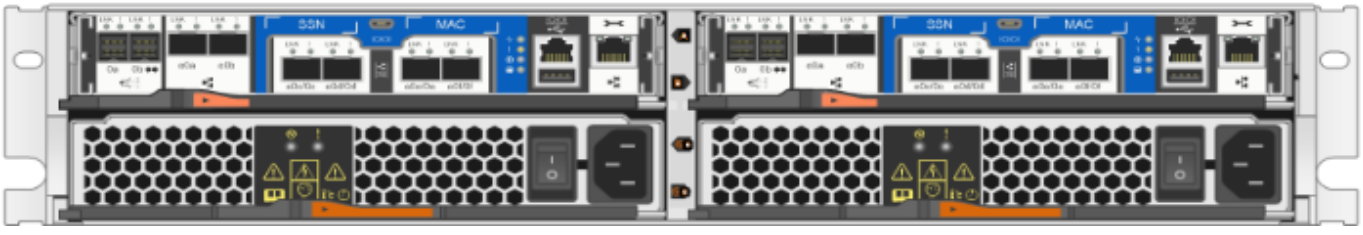
The newly refreshed AFF A220 platform for small and medium enterprise environments delivers 30% more performance than its predecessor to continue NetApp leadership in this segment.

NetApp AFF systems help you meet your enterprise storage requirements with industry's highest performance, superior flexibility, and best-in-class data management and cloud integration. Combined with the industry's first end-to-end NVMe technologies and NetApp ONTAP data management software, AFF systems accelerate, manage, and protect your business-critical data. With an AFF system, you can make an easy and risk-free transition to flash for your digital transformation.

AFF A220 Front view



AFF A220 Rear view



For more information about the AFF A220 hardware system, see the NetApp AFF Datasheet.

ONTAP 9.5

The new NetApp ONTAP 9.5 software features several significant enhancements aimed at making the management of data from the data center to the cloud seamless.

ONTAP 9.5 allows a hybrid cloud to be the foundation of a data fabric that spans from on the premises to the cloud and back again.

ONTAP 9.5 has several features that are suited for the FlexPod Express solution. Foremost is the NetApp commitment to storage efficiencies, which can be one of the most important features for small deployments. The hallmark NetApp storage efficiency features such as deduplication, compression, compaction, and thin provisioning are available in ONTAP 9.5 with the new addition of NetApp Memory Accelerated Data, NVMe support. Because the NetApp WAFL system always writes 4KB blocks, compaction combines multiple blocks into a 4KB block when the blocks are not using their allocated space of 4KB.

These are just a few key features that complement the FlexPod Express solution. For details about the additional features and functionality of ONTAP 9.5, see the ONTAP 9 Data Management Software datasheet.

For more information about ONTAP 9.5, see the NetApp ONTAP 9 Documentation Center, which has been updated to include ONTAP 9.5.

Cisco Nexus 3000 series

The Cisco Nexus 31108PC-V, shown in the following figure, is a robust, cost effective switch offering 1/10/40/100Gbps switching. It offers 48 1/1-Gbps ports, and 40/100-Gbps uplinks that enable flexibility.

Because all the various Cisco Nexus series models run the same underlying operating system, NX-OS, multiple Cisco Nexus models are supported in the FlexPod Express and FlexPod Datacenter solutions.

The Cisco Nexus 31108 provides a comprehensive layer-2 feature set that includes virtual LANs (VLANs), IEEE 802.1Q trunking, and the Link Aggregation Control Protocol (LACP). Additional layer-3 functionality is available by adding licenses to the system.

For more information about the Cisco Nexus 3000 series, see the Cisco Nexus 31108PC-V Switch product information.

Cisco UCS B-Series

The Cisco UCS 5108 blade server chassis revolutionizes the use and deployment of blade-based systems. By incorporating unified fabric and fabric-extender technology, the Cisco Unified Computing System enables the chassis to:

- Contain fewer physical components

- Require no independent management
- Be more energy efficient than traditional blade-server chassis

This simplicity eliminates the need for dedicated chassis management and blade switches, reduces cabling, and allows scalability to 20 chassis without adding complexity. The Cisco UCS 5108 blade server chassis is a critical component for delivering simplicity and IT responsiveness for the data center as part of the Cisco Unified Computing System.

The Cisco UCS B-Series B200M5 server, shown in the following figure, was chosen for FlexPod Express because its many configuration options allow it to be tailored for the specific requirements of FlexPod Express deployment.

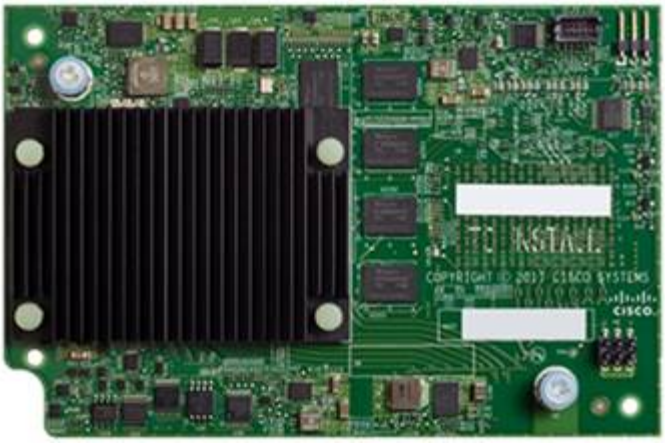
The enterprise-class Cisco UCS B200 M5 blade server extends the capabilities of the Cisco UCS portfolio in a half-width blade form factor. The Cisco UCS B200 M5 blade server harnesses the power of the latest Intel Xeon processor scalable family CPUs with up to 3072GB of RAM (using 128GB DIMMs), two solid-state drives (SSDs) or HDDs, and up to 80Gbps throughput connectivity.

For more information about Cisco UCS B200 M5 blade server, see Cisco UCS B200 M5 Blade Server Spec Sheet.

Cisco UCS Virtual Interface Card 1440/1480

The Cisco UCS VIC 1440 is a dual-port 40Gbps or dual 4x10Gbps Ethernet/FCoE capable modular LAN on motherboard (mLOM) designed exclusively for the M5 generation of Cisco UCS B-Series blade servers. When used with an optional port expander, the Cisco UCS VIC 1440 capabilities are enabled for two 40Gbps Ethernet ports. The Cisco UCS VIC 1440 enables a policy-based, stateless, agile server infrastructure that can present to the host PCIe standards-compliant interfaces that can be dynamically configured as either NICs or HBAs.

The Cisco UCS VIC 1480, shown in the following figure, is similar to the VIC 1440 except that it is mezzanine card.



For more information about Cisco VIC 1440/1480, see Cisco UCS Virtual Interface Card 1400 Series Data Sheet.

VMware vSphere 6.7U1

VMware vSphere 6.7U1 is one hypervisor option for use with FlexPod Express. VMware vSphere allows organizations to reduce their power and cooling footprint while confirming that the purchased compute capacity is used to its fullest. In addition, VMware vSphere allows hardware failure protection (VMware high availability, or VMware HA) and compute resource load balancing across a cluster of vSphere hosts (VMware Distributed Resource Scheduler, or VMware DRS).

VMware vSphere 6.7U1 features the latest VMware innovations. The VMware vCenter Server Appliance (VCSA) that is used in this design adds a host of new features and functionality, such as VMware vSphere Update Manager integration. The VCSA also provides native vCenter high availability for the first time. To add clustering capability to hosts and to use features such as VMware HA and VMware DRS, VMware vCenter Server is required.

VMware vSphere 6.7U1 also has several enhanced core features. VMware HA introduces orchestrated restart for the first time, so virtual machines restart in the proper order in case of an HA event. In addition, the DRS algorithm has now been enhanced, and more configuration options have been introduced for more granular control of compute resources inside vSphere.

The vSphere Web Client is the management tool of choice for VMware vSphere environments. Several user enhancements have been made to the vSphere Web Client, such as the reorganization of the home screen. For example, inventory trees are now the default view upon login.

For more information about VMware vSphere, see vSphere: The Efficient and Secure Platform for Your Hybrid Cloud.

For more information about the new features of VMware vSphere 6.7U1, see What's New in VMware vSphere 6.7.

For ONTAP 9.5 with VMware HCL support, see VMware Compatibility Guide.

VMware vSphere and NetApp integration

There are two main integration points for VMware vSphere and NetApp. The first is the NetApp Virtual Storage Console (VSC). The Virtual Storage Console is a plug-in for VMware vCenter. This plug-in enables virtualization administrators to manage their storage from the familiar vCenter management interface. VMware datastores can be deployed to multiple hosts with just a few clicks. This tightly coupled integration is key for

branch offices and smaller organizations for which administrative time is at a premium.

The second integration is the NetApp NFS Plug-in for VMware VAAI. Although VAAI is supported natively by block protocols, all storage arrays require a VAAI plug-in to provide the VAAI integration for NFS. Some NFS VAAI integrations include space reservation and copy offload. The VAAI plug-in can be installed by using VSC.

For more information about the NetApp VSC for VMware vSphere, see the NetApp Virtual Infrastructure Management product page.

Next: Solution verification.

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