SOLUTION BRIEF

Maximize Virtual Server Deployments

With FlashStack and AMD EPYC™ Processors

The drive for extreme density in virtualized environments continues. With the higher core counts of AMD EPYC processors, organizations have been able to run more virtual machines per server. However, more virtual machines generate more I/O traffic—and not all infrastructure solutions are prepared for that. The FlashStack® solution described in this brief has demonstrated that it can deliver 100 Gpbs of bandwidth from end to end, from the Pure Storage® FlashArray™//XL system to the network.

FlashStack is a software-defined, hybrid-cloud infrastructure solution developed jointly by Cisco and Pure Storage. It provides world-class components that have been integrated, pretested, and validated for the most popular and demanding business workloads. It is AI-managed with the Cisco Intersight™ platform and is designed to scale without disruption as your business needs grow.

With FlashStack, you achieve an excellent balance of resources that can help you deliver more applications and services with the confidence that the entire infrastructure is tuned to maximize business productivity.

Highlights

- Maximize productivity with optimized performance across CPUs and I/O bandwidth
- Simplify with end-to-end provisioning, management, monitoring, and application optimization with Cisco Intersight platform
- Heighten security with features that come with the platform
- Promote sustainability with a smaller footprint and manageable power and cooling requirements

Support for Top Virtualization Platforms

- VMware vSphere
- Microsoft Hyper-V

Cisco Validated Design for FlashStack

This Cisco Validated Design for Virtual Server Infrastructure solution is delivered as infrastructure as code (IaC) to eliminate error-prone manual tasks, allowing quicker and more consistent solution deployments.

- Cisco Unified Computing System™ (Cisco UCS®) C225 M6 or C245 M6 rack servers
- 5th Generation Cisco unified fabric technology including the new Cisco UCS 6536 Fabric Interconnects and Cisco UCS Virtual Interface Cards 1457
- Pure Storage FlashArray// XL170 and //X50

Challenges

Developing a virtual server infrastructure (VSI) that meets all your needs can be challenging. Some of those challenges include:

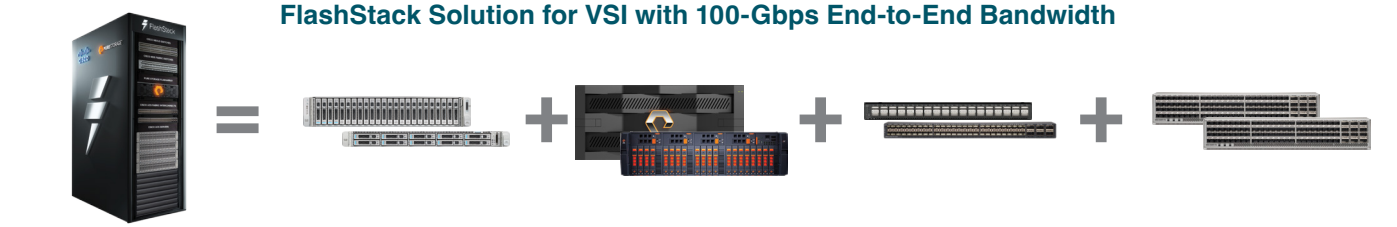
- Maximizing virtual server density to use all resources while also delivering performance to your applications.
- Helping increase security to help keep valuable business data out of the hands of competitors and malicious entities
- Reducing cost and complexity compared to nonstandard and out-of-date infrastructure that requires many different management interfaces.
- Simplifying deployment and management of infrastructure and application resources
- Establishing high scalability so that your infrastructure meets your needs, when you need it
- Controlling data center greenhouse emissions with reduced power, cooling, and data-center floor space requirements

FlashStack Can Help Optimize Your Virtual Infrastructure

This FlashStack solution, comprising Cisco UCS C225 M6 or C245 M6 rack servers with AMD EPYC processors and Pure Storage FlashArray//XL170 or //X50 R3 storage systems, are all managed with the Cisco Intersight platform. With this solution, you can address the challenges outlined in the following ways:

- **Increase density** while balancing resources by supporting more virtual servers per system with exceptional performance that derives from the Cisco UCS servers, AMD EPYC processors with high core counts, and low-latency FlashArray storage. Cisco Intersight Workload Optimizer can strike a balance of resources that propels application performance.
- **Heighten data security** using the state-of-the-art security features built into AMD EPYC processors and virtual interfaces that make it difficult for malicious

FlashStack Solution for VSI with 100-Gbps End-to-End Bandwidth



IDC Business Value Survey of FlashStack Production Users

446%

5-year return on investment.

72%

reduced total cost of operations.

8 months

payback on investment.

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1.AMD Infinity Guard features vary by EPYC™ processor generations. Infinity Guard security features must be enabled by server OEMs and/or cloud service providers to operate. Check with your OEM or provider to confirm support of these features. Learn more about Infinity Guard at https://www.amd.com/en/technologies/infinityguard.GD-183

entities to access virtual machines and their data. Fast snapshot-based backup capabilities give you confidence that your data will be available when you need it.

- **Reduce complexity** with an all FlashStack data center. Simplify provisioning, scaling, monitoring, and management with the Cisco Intersight platform.
- **Help address sustainability goals** with efficient power and cooling as well as reducing the demand on expensive data-center square footage.

Cisco Validated Design for FlashStack

In Cisco Validated Designs, we create your recipe for success with a detailed configuration that leads to results. The Cisco Validated Design that specifies this solution includes the components described in this section.

Cisco UCS Rack Servers with AMD EPYC Processors

The 2RU Cisco UCS C245 M6 Rack Server is well suited for a wide range of storage- and I/O-intensive applications, such as virtual servers and applications. Optimized to deliver uncompromising I/O capacity whether one or two CPUs are installed, the Cisco UCS C225 M6 Rack Server is one of the most versatile in the industry. This high-density, 1RU rack server supports a range of virtual server application workloads. These Cisco servers are available with a variety of AMD EPYC processors with high, medium, or low core counts to fit your business application needs. AMD Infinity Guard[1] features that promote security in virtualized environments include:

- AMD Secure Encrypted Virtualization (SEV) to help safeguard VM privacy and integrity
- AMD Secure Encrypted Virtualization-Encrypted State (SEV-ES) helps protect against a compromised hypervisor being able to view virtual-machine states
- AMD Secure Nested Paging (SEV-SNP) for strong memory-integrity protection capabilities
- AMD Shadow Stack for hardware-enforced stack protection capabilities against malware attacks

Cisco UCS Virtual Interface Card (VIC) technology can present more than 256 PCIe standard-compliant interfaces to the server, and these can be dynamically configured as either network interface cards (NICs) or host bus adapters (HBAs) that help to simplify server virtualization deployment while helping to isolate network connections.

Pure Storage FlashArray//XL170 or //X50 R3

Unified block-and-file storage is designed to be as easy to use as it is powerful. All-flash FlashArray//X is software-driven storage that's optimized to meet your corporate

or enterprise requirements today, with a non-disruptive path for the future. With exceptional performance density, you can consolidate more business services—bigger databases, more applications, and more users—on fewer arrays, which is just the point of a powerful virtualization environment such as this FlashStack solution.

The Pure Storage FlashArray//XL170 and FlashArray//X50 R3 deliver 100 percent NVMe performance, and they include rich data services including global flash management, deduplication efficiency, fabric support, and always-on data protection. Best of all, the Pure Storage systems are integrated into the same management domain through Cisco Intersight so you can accomplish deployment, monitoring, and management tasks through a single interface.

Cisco Networking

Cisco UCS fabric interconnects bring connectivity and management to the Cisco UCS servers. Typically deployed as an active/active pair, the fabric interconnects provide a single access point for all servers, with low-latency, lossless, cut-through switching that supports LAN, SAN, and management traffic using a single set of cables.

Cisco Nexus® 9000 Series Switches offer both modular and fixed 1/10/25/40/100 Gigabit Ethernet capability with scalability up to 60 Tbps of nonblocking performance with less than five-microsecond latency, wire-speed VXLAN gateway, bridging, and routing support.

The Pure Storage FlashArray//XL170 and FlashArray//X50 R3 connect to the Cisco Nexus 93360YC-FX2 Switches using four 100 Gigabit Ethernet ports.

Cisco Intersight Platform

The Cisco Intersight platform is a modular, cloud-based management platform that provides correlated visibility and management across all your FlashStack hardware and application components, helping you to reach the scale and velocity your business demands. Intersight helps your teams efficiently collaborate within and across domains, by automating lifecycle workflows, determining resource allocations, and enabling consistency and governance with extensible, open capabilities that natively integrate with third-party platforms and tools.

Drive Productivity and Competitive Advantage

FlashStack helps you make proactive moves in an ever-changing business world. It delivers the performance, productivity, security, simplicity, and sustainability to support your business needs. FlashStack can help you accelerate your business applications without disruption, improve data center economics, and help you build infrastructure that will serve you well into the future with confidence.