SOLUTION BRIEF

Migrate and Accelerate Oracle Database 19c on FlashStack

RELIABLE HIGH PERFORMANCE

NVMe over fabric moves data from storage directly into server memory, speeding performance

LOWER TCO

Having fewer cores reduces capital, software licensing, and maintenance costs

MIGRATION SUPPORT

Cisco Validated Designs deliver recipes for success

Support is ending for older versions of Oracle Database software. Oracle is giving incentives to move to its cloud solutions or Oracle Database 19c. This increases the pressure to develop a migration plan—now.

Moving your business-critical data to the cloud imposes new risks. First, governmental regulations can prohibit storing customer or patient data in the cloud. Second, cloud infrastructure has an unknown performance profile that can increase business risk and costs. These reasons—plus the long-term support commitment by Oracle behind Oracle 19c—make FlashStack™ infrastructure the best choice for your organization.

Cisco and Pure Storage can help you continue your journey with an on-premise solution. We can help you design a migration plan for Oracle Database 19c onto the fastest and latest FlashStack solution.

FlashStack

FLASHSTACK CONVERGED INFRASTRUCTURE

FlashStack, a Cisco® and Pure Storage® solution, is converged infrastructure that integrates best-in-class server, networking, storage, and management components to provide a high-performance, reliable, and scalable foundation for your business-critical Oracle Database 19c workloads (Figure 1).

Unified System

Cisco Unified Computing System™ (Cisco UCS®), powered by Intel® Xeon® Scalable processors, delivers best-in-class performance and reliability, availability, and serviceability (RAS) with exceptional data security for mission-critical applications. Although other servers may also incorporate the latest Intel processors, only Cisco integrates them into a unified system that includes computing, networking, management, and storage access to deliver scalable performance to meet business needs.

Unified Fabric

Within Cisco UCS the same network brings LAN, SAN, and management connectivity to each blade and rack server using *Cisco SingleConnect technology*. Now every server—rack or blade—has equal access to all network resources. This eliminates the need to support three physical networks, each with its own cabling and switching. This solution uses NVMe over fiber to transfer data directly from storage to server memory, speeding I/O without the cost of dedicated cabling.

SingleConnect technology helps eliminate silos because software—not cabling—determines how each server connects to the network, making every server ready to support any workload at a moment's notice through automated configuration.

Storage

The Pure Storage FlashArray™ is an all-flash, 100-percent NVMe storage solution that can accelerate your Oracle data accesses while delivering up to 3 petabytes (PB) of capacity in six rack units. It has proven 99.9999 percent availability to keep your

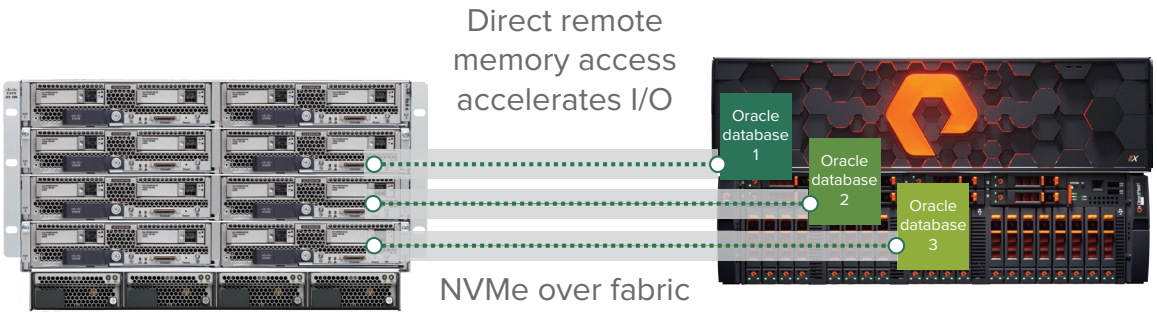

Figure 1. This solution uses NVMe over fabric to speed the flow of data directly from storage into server memory.

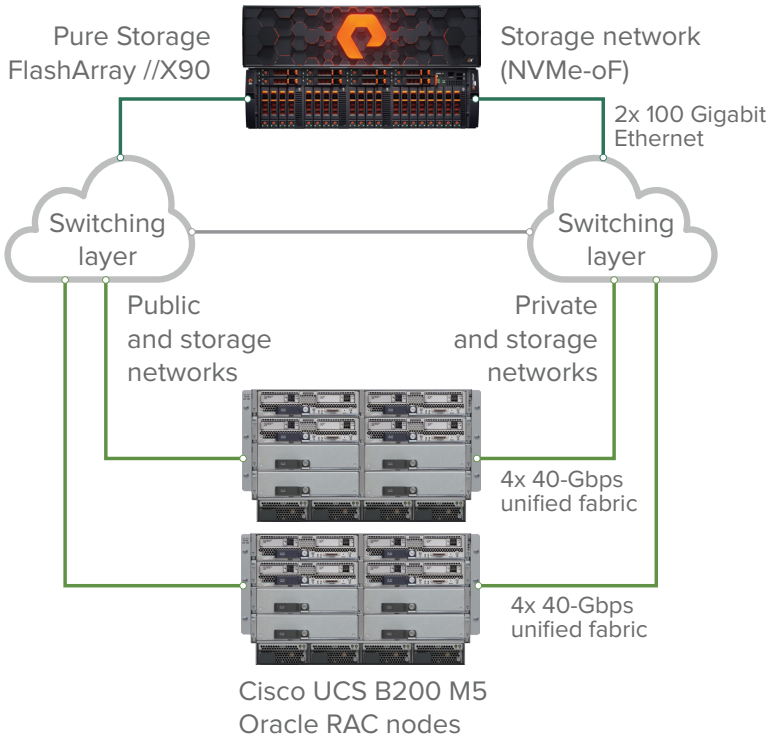

Figure 2. Architectural view of the FlashStack Solution for Oracle Database 19c.

data available to your business applications. It supports best-in-class data reduction to further accelerate performance.

If you are concerned that technology is moving quickly and it will cost you to keep up, the *Evergreen™ subscription model* helps you to take advantage of Pure Storage innovations by offering seamless and rapid upgrades and expansion without disruption.

If capacity planning is a challenge, *Pure-as-a-Service™* is an on-premise storage-as-a-service offering that delivers storage capacity on demand and helps you manage your total cost of ownership.

NVMe Over Fabric

Cisco virtual interface cards (VICs) securely support multiple network modalities including Remote Direct Memory Access (RDMA) over Converged Ethernet (RoCE) v2. This technology supports NVMe over fabric, acting as a memory channel that transmits data directly between the Pure Storage all-flash arrays into server memory. This has the benefit of reducing latency and increasing the number of IOPS the storage can deliver. It has the added benefit of offloading the server CPUs from managing the I/O, freeing them up to deliver more database performance.

STREAMLINED MANAGEMENT

With FlashStack you can deploy a foundational platform using the best practices and recipe-like instructions of a Cisco Validated Design. Or you can turn to one of our implementation partners to deploy the solution for you. Once your FlashStack infrastructure is configured, you can now monitor and control your servers, networking, and FlashArrays through Cisco Intersight™ software-as-a-service (SaaS) management.

"It's astoundingly effortless. You just set it once and leave it alone. It just sits there and runs without any need for attention."

STEVE BERRYMAN

Infrastructure Manager, Colorado Department of Education

READ THE CASE STUDY

Cisco Intersight

Cisco Intersight software as a service is a lifecycle management platform for your infrastructure, regardless of where it resides. It unifies and simplifies the experience of managing your infrastructure. Remediation and problem resolution are supported with automated upload of error logs for rapid root-cause analysis.

Intersight Workload Optimizer

Cisco Intersight Workload Optimizer provides the visibility, real-time analytics, and the automation needed to optimize your Oracle Database 19c to deliver the best application performance. This real-time decision engine drives continuous health in your environment by analyzing workload consumption, costs, and compliance constraints and matching them to available resources to prevent performance bottlenecks. The software can determine when, where, and how to move and resize workloads. It allocates and reallocates resources as needed, and can elastically scale to assure that your workloads always perform as expected.

PERFORMANCE YOU CAN RELY ON

FlashStack solutions can be configured to address all your database workloads. Using the same foundational components and management for all of your database workloads simplifies your data center and reduces TCO. These solutions deliver:

- **CONSISTENT PERFORMANCE.** Sub-millisecond latency and increased IOPS is accomplished with the combination of NVMe over fabric combined with 100-percent flash storage.
- **REPEATABLE GROWTH.** You can nondisruptively increase both capacity and performance by scaling with additional storage, servers, or FlashStack infrastructure as your data grows.
- **OPERATIONAL SIMPLICITY.** Fully tested, validated, and documented recipe-like guides help you successfully and rapidly deploy.
- **REDUCED MANAGEMENT COMPLEXITY.** Intersight management helps you manage servers and storage.

SINGLE OR MULTITENANT

FlashStack infrastructure has supported multitenant configurations since its inception. It has achieved this with the use of virtualization and containers, virtual LANs over the Cisco Unified Fabric, and storage sharing.

Oracle Multitenant is an option starting with Oracle Database 12c Enterprise Edition. It helps you reduce your IT costs by enabling and simplifying workload consolidation, provisioning, and upgrades. The Oracle Multitenant architecture allows a container database to hold many pluggable databases and it fully complements other options, including Oracle Real Application Clusters (RAC) and Oracle Active Data Guard.

COST EFFECTIVE

The lightweight RoCEv2 and NVMe-OF protocols use roughly 20 to 25 percent of the CPU power as opposed to Fibre Channel which uses about 35 percent. This frees CPU power to perform workload processing so that fewer cores are needed to get the work done. Oracle Database is licensed and maintenance costs are charged on a per-core basis. If you can reduce the number of cores you can reduce your hardware, software licensing and maintenance costs.

REDUCE YOUR RISK

Cisco Validated Designs help you simplify and accelerate deployment and migration of Oracle environments to FlashStack infrastructure running Oracle Database 19c. Our verified, lab-tested architectures provide detailed design and implementation guidance that reduces guesswork by giving your IT architects and administrators a guidebook for implementation.

Cisco's own IT organization runs on Oracle so we are faced with the same choices and challenges you are. This informs our solutions and designs so that you may benefit.

FOR MORE INFORMATION

For more information visit *www.flashstack.com*

Read the Cisco Validated Design for *FlashStack running Oracle RAC 19c*

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