Hewlett Packard Enterprise

Nonstop Engineering Update

GTUG 2026

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Forward-looking statements

This is a rolling (up to three year) roadmap and is subject to change without notice.

— This document contains forward looking statements regarding future operations, product development, product capabilities and availability dates. This information is subject to substantial uncertainties and is subject to change at any time without prior notification. Statements contained in this document concerning these matters only reflect Hewlett Packard Enterprise's predictions and / or expectations as of the date of this document and actual results and future plans of Hewlett Packard Enterprise may differ significantly as a result of, among other things, changes in product strategy resulting from technological, internal corporate, market and other changes. This is not a commitment to deliver any material, code or functionality and should not be relied upon in making purchasing decisions.

Agenda

- HPE Nonstop Engineering Updates
- HPE Nonstop Engineering Strategic Direction
  - Converged Nonstop
  - Kernel-Level Threading (KLT) and Security
  - Virtualized Nonstop
  - Nonstop in the Cloud
  - Nonstop AI Factory

HPE Nonstop Engineering Updates

L25.02 highlights

Starship Wave 1

NS5 and NS9 bare metal servers

DCT Limits Expansion

Named process limit increased by 4x to 64K

TNS/X C/C++ Compiler

C and C++ version 17 support

SQL/MX R3.9.1

Support for C++17 embedded SQL and OSS ODBC/MX applications

TMF enhancement

INFO DUMPS command enhanced to display both online and audit entries in the TMF catalog

L25.02 highlights (continued)

Nonstop SQLXPress 3.85

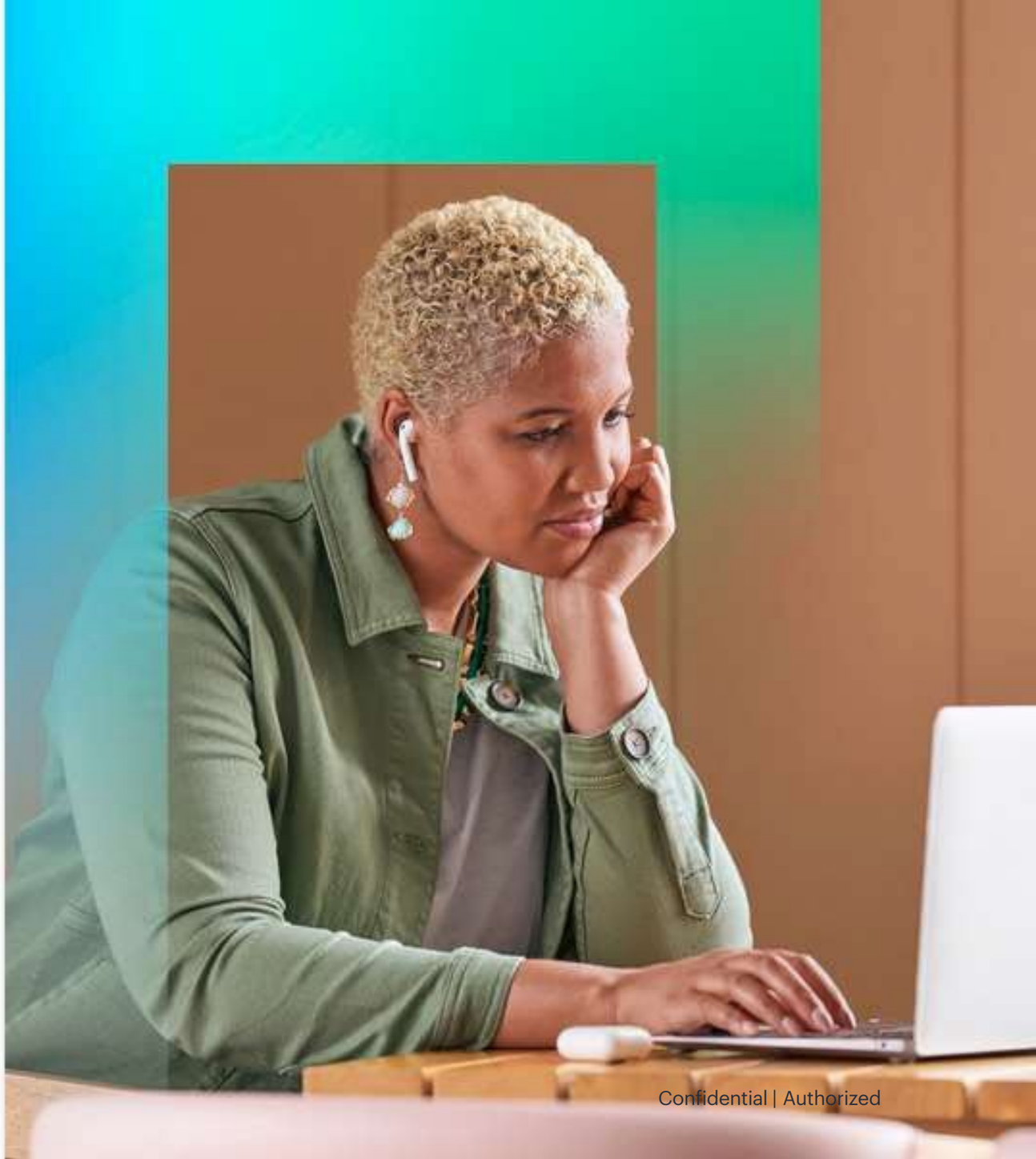
New advanced Workload Management System (WMS) features

Xygate User Authentication (XUA) 2.45:

Added a multi-factor authentication (MFA) connector that enables integration of HPE Nonstop with enterprise authentication providers such as Okta, ADFS, Ping, Windows Hello, and DUO using OpenID Connect (OIDC)

Support for HPE Nonstop BackBox VTC R6

New HPE Nonstop BackBox VTC based on the HPE ProLiant DL380 Gen11 server



L25.09 highlights

Kernel Level Threads (KLT) Wave 1

Provide kernel-level threading support on OSS

Starship Wave 2

NS5 Lite (2-Core Low NS5)

NS9 NCLIM with long range transceiver

SQL/MX 4.0

TDE (Transparent Data Encryption) Phase 1 GA release

Support for KLT (including JDBC T2, T4)

Diagnostics, debug, and performance improvements

Fabric robustness

Fabric resiliency with more diagnostic information

vNS 4.0

vNS on KVM - Release in April 2026 (including validation on Gen12 servers)

Other improvements for VMware

Growing new Nonstop talent

Nonstop R&D centers of excellence in Fort Collins, CO and Bengaluru, India

In 2025, the R&D organization had 18 interns

14 college hires in 2025

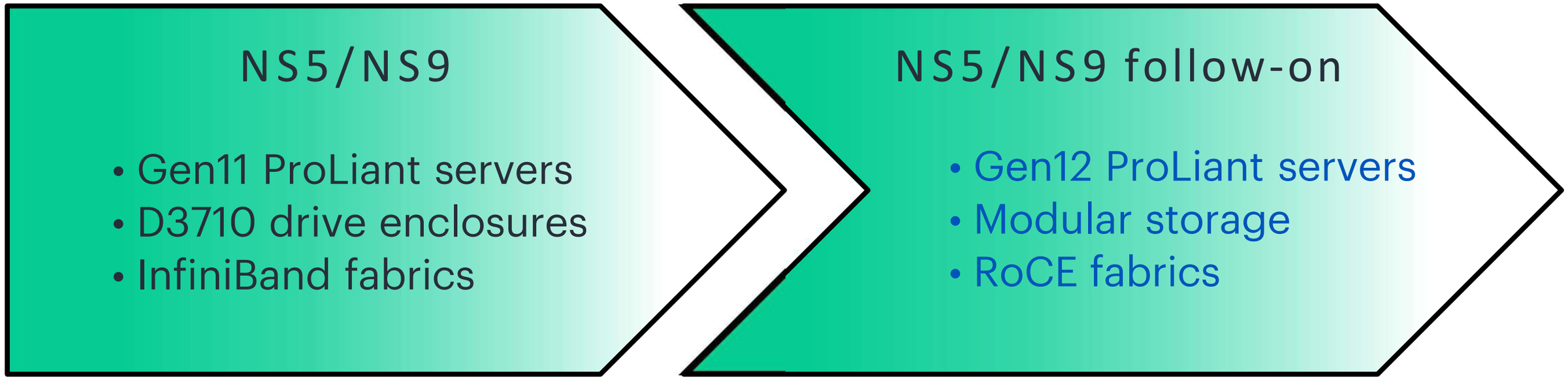
HPE is currently working with Colorado State University to establish a Nonstop cohort program

Currently actively hiring for Nonstop Engineering positions across various teams

HPE Nonstop Engineering Strategic Direction

Converged Nonstop Strategie Roadm p

Converged Nonstop roadmap summary view



Main changes in future Gen12 architecture

New Gen12 servers

— Leverage improved performance and built-in advanced security features

New RoCE (RDMA over Converged Ethernet) fabrics

— Minimize reliance on a single InfiniBand vendor.

— Nonstop has been leveraging this technology for vNS since 2017

New modular storage

— Integrate the next-generation converged Nonstop system with HPE's evolving modular storage technology and roadmap

Subject to change without notice

Gen12 Servers – Cutting Edge Features

Next-Generation Performance

— Gen12 supports the latest 4th Gen Intel Xeon Scalable processors
— Advanced Memory Support
— 1 TB memory per CPU

Advanced Security Features

— Silicon root of trust
  • Hardware-based feature that validates server firmware before the system boots
— Secure boot
  • Software-based feature that validates server only boots using trusted firmware and software
— Chassis Intrusion Detection
  • Built-in sensors detect unauthorized access to the server hardware
— HPE iLO Advanced Security Features
  • Secure erase

RoCE for converged Nonstop

Future proof fabric interconnect technology

— -Avoid dependency on a single InfiniBand vendor

- Multiple vendors available for both RoCE NICs and Ethernet switches

Very high cost of next-generation InfiniBand components beyond 200 Gbps

Ethernet / RoCE system interconnect benefits:

— Partial reuse of the current Nonstop X converged system fabric architecture and drivers

— RDMA capabilities, low latency and high bandwidth

— RoCE achieves latencies that are very close to IB

Modular Storage Arrays

Align the next-generation converged Nonstop system with the HPE modular storage technology evolution and roadmap

Leverage benefits of software-defined storage, such as flexibility to configure volume sizes independently from the actual SSD physical drive sizes

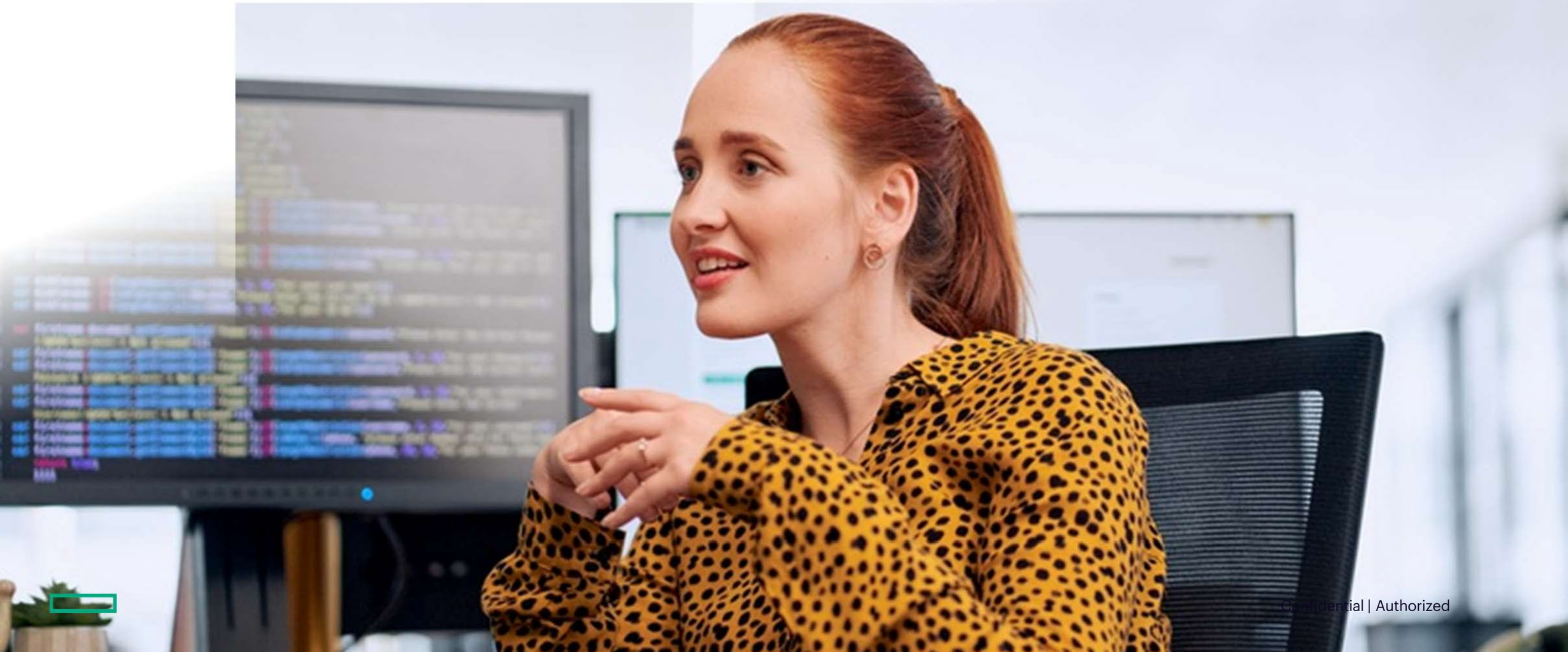
Leverage the HPE MSA-DP+ advanced RAID technology for additional fault tolerance

Nonstop NS5/NS9 vs Future Gen12

High-level comparison

Nonstop system	NS5/NS9	Future Gen12
Processor node hardware	HPE ProLiant DL360 Gen11	HPE ProLiant DL360 Gen12
CLIM hardware	HPE ProLiant DL380 Gen11	HPE ProLiant DL380 Gen12
Intel Xeon microprocessor family	Sapphire Rapids	Granite Rapids
System interconnect (high end)	200 Gbps InfiniBand throughout	Equivalent or better
System interconnect (entry-class)	100 Gbps InfiniBand throughout	Equivalent or better
Fabric adapters	2-port InfiniBand	Equivalent or better
Modular storage	D3710 drive enclosures	HPE Modular storage arrays
CLIM connectivity to modular storage	12 Gbps SAS	Equivalent or better
CLIM Fibre Channel connectivity to HPE XP enterprise storage & tape	32 Gbps FC	

KLT and Security



KLT Wave 2

Performance improvement areas

— Java app – File I/O (disk, pipes/fifo, sockets)

— OSS semaphores with regular files

— Java Order Entry (JOE-T2)

Goal

Match KLT Java apps performance with PUT Java apps performance

TDE Wave 2

Transparent Data Encryption Wave 2

Allow TDE users to utilize network HSMs for encryption key operations

- Comply with PCI DSS 4.0.1 requirements

Provide mechanisms to install HSM vendor packages and perform configuration on CLIM

Define patch release and installation processes

Document hardware configuration for HSM enablement

TFE Wave 1

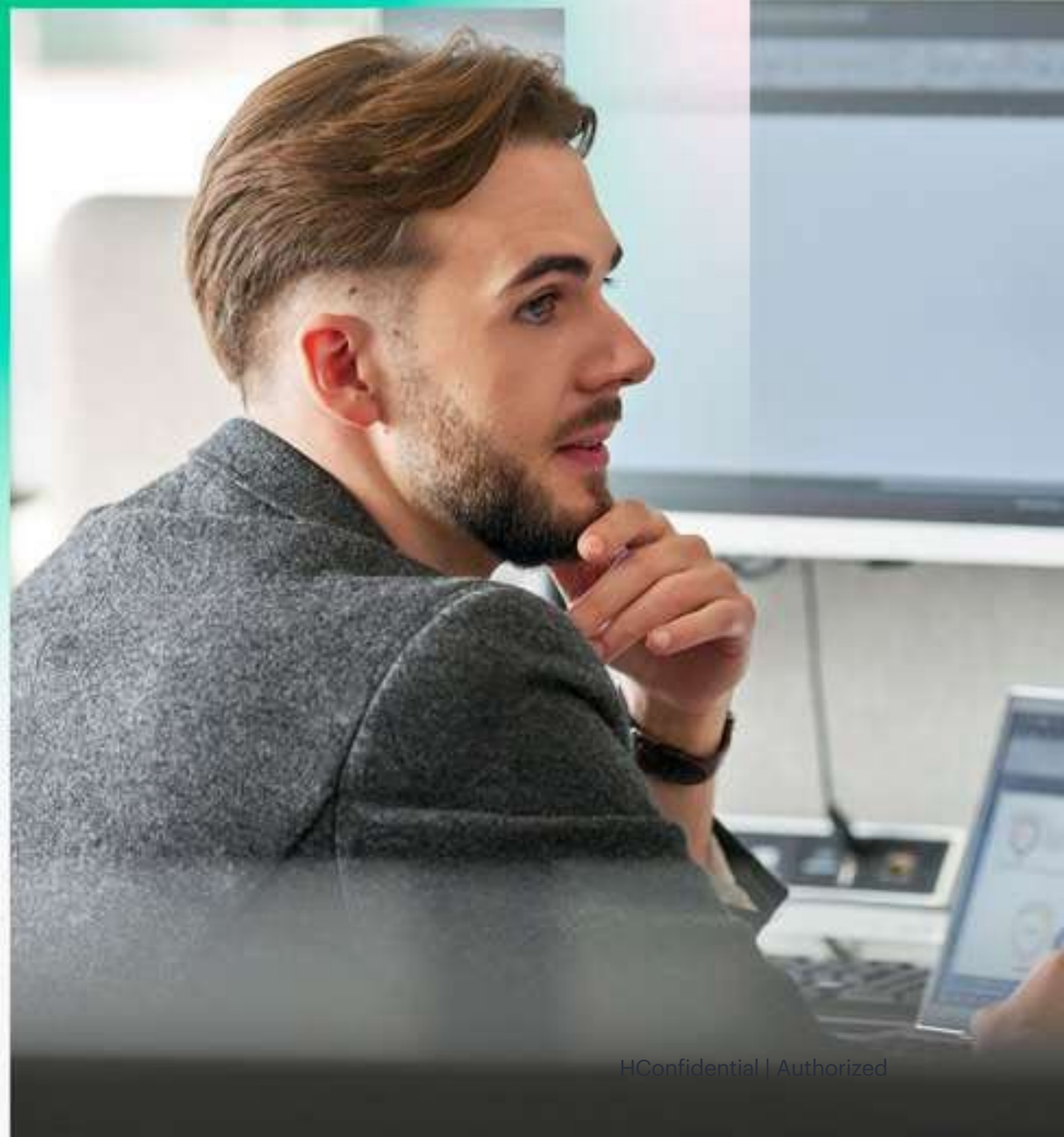
Transparent File Encryption Wave 1

Nonstop solution for PCI-DSS 4.0 data-at-rest compliance

Cyber security, business regulations and compliance

Guardian based regular, Enscribe, SQL/MP files

Future - OSS regular files



Post Quantum Cryptography

PQC Standards
Adopt NIST-approved quantum-safe algorithms (lattice-based, hash-based) for long-term protection.

Hybrid Approach
Combine classical + PQC algorithms for layered security during migration.

Key Actions for Software

Cryptographic APIs: Implement PQC & hybrid options; retire weak algorithms.

Software Integrity: PQC for hashing/signing; phase out legacy algorithms.

Data Protection: AES-256 for storage; ML-KEM for key management.

Protocols: TLS, SSH, IPSec to integrate PQC; monitor IETF standards.

HPE Virtualized Nonstop

vNS on KVM solution

Broadcom acquisition of VMware has led some Nonstop customers to voice a preference for Virtualized Nonstop deployments on Linux KVM

Similar

— Hardware architecture requirements as the current vNS on VMware solution
— RoCE interconnect
— Intel Xeon microprocessors

The solution has been architected to work with many Linux distributions

Nonstop in the Cloud Strategic Roadmap

vNS journey to the cloud

Motivation

— In recent years, several Nonstop customers have shared their plans to migrate workloads to public clouds

NVRDMA (Nonstop Virtual Remote Direct Memory Access) will allow deploying vNS on hosts with industry-standard Ethernet adapters

— NVRDMA removes the requirement for RoCE adapters

Recently achieved NVRDMA milestones:

— Multi-core support for 6 cores

— 6-CPU system brought up on NVRDMA

— Four vNS systems running on AWS

NVRDMA deployments on AWS

Work is currently underway for Proof of Concept (PoC) deployments on AWS

Required AWS infrastructure:

— Bare metal AWS host instances deployed as a cluster placement group to ensure low latency between vNS VMs

— Elastic Block Storage (EBS)

Bare metal instances allow us to use the Linux host OS / KVM hypervisor of our choosing

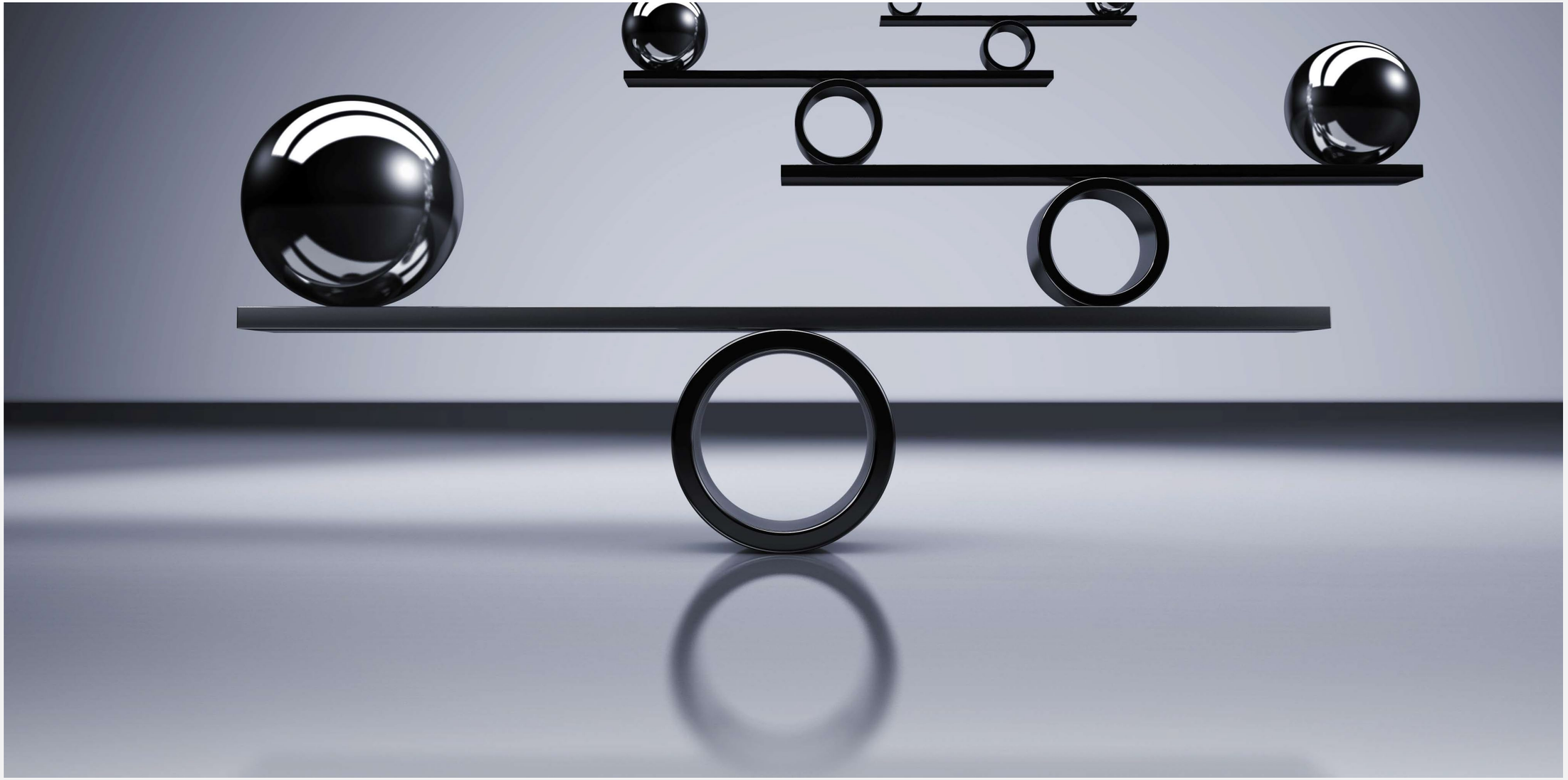
Besides dedicated bare metal instances, additional security and resource isolation is achieved by:

— Configuring isolated VPCs (Virtual Private Clouds) for the vNS bare metal instances and VMs

— Leveraging data-in-transit transparent hardware encryption between the vNS VMs

— Transparent data encryption of storage volumes

Nonstop AI Factory



Nonstop AI Factory

AI in Software

Planning
- Program, project, and defect management

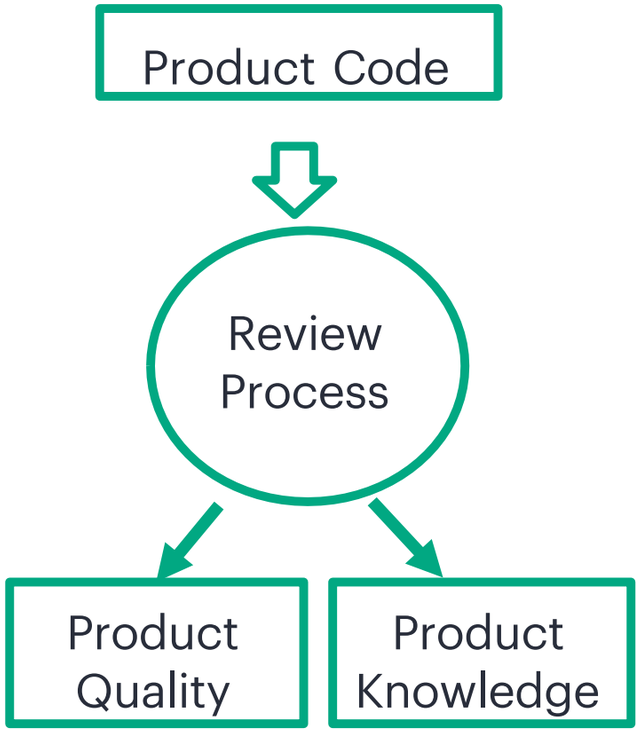
Development
- Agentic Coding and automatic code review
- AI Librarian – knowledge capture

Test Orchestration
- Test plan management, Execution, and analysis

Analysis
- Instant code search across full code base
- Agentic AI analysis of code (including legacy languages)
- AI analysis of rich data from defect

Immersive AI: Rather than bring AI into every tool, bring every tool into the AI

AI in Nonstop Products



Automatic code review as "Knowledge Factory"
- Deep context within system (not just lines changed)
- Learning model (guided by expert developers)

Code review effective even for situations that challenge human reviewers (eg pTAL -> C++ migration)

Questions

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