HP-UX 11i v3 Operating Environment updates

Expanded virtualization and availability, with simplified management and lower TCO

Data sheet

Mission-critical applications are the backbone of every organization's IT, and how well your server environment is equipped to deal with the heavy workload it supports can make or break your business in today's Instant-On world. That's why it's important to implement an operating system with the capability to support your organization's massive IT workload as well as make the most of a converged infrastructure. The operating system must also be flexible and scalable to accommodate anything that may come your way in the future.

The new and improved HP-UX 11i v3 Operating Environment comes with a set of features that can provide more value for your investment. Backed by over 25 years of innovations in the field, it offers advancements in technology that suit users of both HP Integrity systems (based on Intel® Itanium® processors) and HP 9000 systems (based on PA-RISC). What's more, HP-UX 11i v3 also enables and supports the new HP Integrity blades, as well as

HP Integrity Superdome 2, the flagship server in our newest line of Integrity servers. So, now you can amplify your mission-critical advantage in the areas of virtualization, high availability (HA), and simplified management.

Operating system for the mission-critical HP Converged Infrastructure

HP-UX 11i v3 simplifies and unifies IT, and is designed to deliver the always-on resiliency, dynamic optimization of resources, and investment protection and stability demanded in mission-critical computing. It integrates proven UNIX® functionality with advances in HA, security, partitioning, workload management, and instant capacity on demand and delivers it within the industry's first mission-critical converged infrastructure to drive up flexibility while reducing risk and delivering compelling value.

HP-UX 11i v3 Operating Environment: expanded virtualization and availability, and simplified management for mission-critical HP Converged Infrastructure
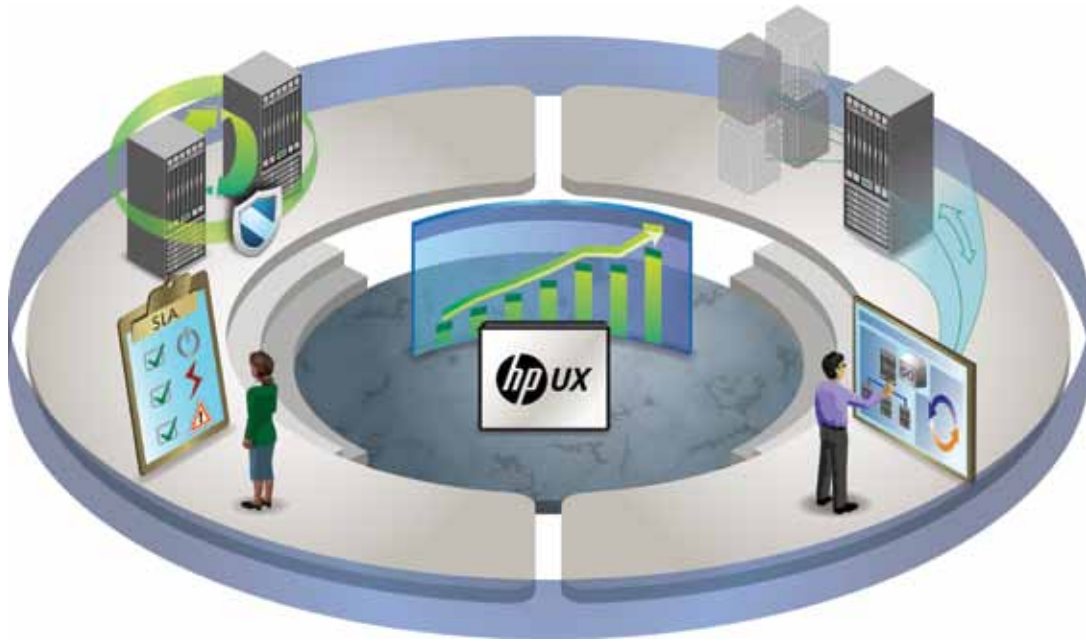
Simplified and unified IT	Always-on resiliency	Dynamic optimization	Investment protection and stability
HP-UX manages seamlessly within your HP Converged Infrastructure.	HP provides a proven operating environment to deliver one of the industry's most resilient UNIX platforms that enables your mission-critical applications to be always on and secure without compromise.	HP-UX delivers built-in integration of virtualization and management software to optimize IT infrastructure dynamically.	HP-UX is a stable operating environment that powers the core of your mission-critical applications today and for many years to come, delivering exceptional value.

Simplified and unified IT

HP helps customers simplify their environments by consolidating applications with the HP mission-critical portfolio, which includes a common modular server and management platform.

The HP strategy to unify management around a single management tool enables IT staff to use one common interface and consistent processes to manage the server and storage infrastructure. HP Insight software is the key element to deliver on the mission-critical HP Converged Infrastructure strategy.

HP Systems Insight Manager (SIM) software provides a common, centralized interface to HP systems management (across Integrity and ProLiant servers, network, and storage). HP SIM is easily extensible, integrating with other HP management products and value-added plug-ins such as the HP Matrix Operating Environment, HP Insight Control management software suites, and the individual HP Insight Foundation products. Individual system management capability is provided through HP Integrated Lights-Out 2 (iLO 2), the HP Insight Display for rack-mounted servers, and the HP System Management Homepage (SMH).

HP software and hardware are based on industry standards to increase integration and compatibility with other HP devices and third-party components.

Always-on resiliency

Downtime happens, whether it's caused by technology, processes, or people. Fortunately, HP provides a proven operating environment to deliver the industry's most resilient UNIX platform[1] that provides your mission-critical applications are always on and secure without compromise.

HP Serviceguard Solutions, a suite of complementary software solutions available for HP Integrity servers running HP-UX 11i, protect your business with uncompromising resiliency—mitigating and managing risks and increasing the availability of IT to drive business results—simply.

HP Serviceguard is the foundation of every HP Serviceguard Solution, and monitors the availability and accessibility of your critical IT services, such as applications, databases, or even custom applications.

Those applications—and everything that they rely on to do their job—are meticulously monitored for any fault in hardware, software, operating system, virtualization, storage, or the network. When a failure or threshold violation is detected, HP Serviceguard automatically and transparently resumes normal operations almost in seconds by restarting the service in the right way and in the right place to enable improved performance.

HP Serviceguard Manager is included at no charge with HP Serviceguard and gives your staff a bird's-eye view of the entire environment with full control from a single console. Its intuitive graphical interface and effortless wizards reduce both the need for expertise and the potential for human error by automating cluster setup and configuration to improve efficiency and the productivity of your IT staff.

In addition, **HP-UX build is one of the most comprehensive security portfolios**, encompassing systems and data protection, role-based access controls, and cross-platform directory integration.

HP-UX has multiple security certifications, and HP is the only UNIX vendor that provides a system-hardening tool with an operating system that is certified by the Center for Internet Security.[2]

Dynamic optimization

To succeed in today's unpredictable marketplace, you need an IT environment that mirrors your dynamic business—one that responds to business demands automatically by supplying computing resources as required.

HP-UX delivers built-in integration of virtualization and management software to dynamically optimize your IT infrastructure.

The Matrix Operating Environment provides infrastructure management at the core of both the HP-UX 11i v3 Virtual Server Environment OE (VSE-OE) and HP CloudSystem Matrix. It is a critical piece of the mission-critical HP Converged Infrastructure solution, which spans servers, storage, and network resources, providing an ideal platform for delivering shared or private cloud services. It provides an automated virtual infrastructure that can dynamically adapt while providing mission-critical reliability. HP Matrix Operating Environment for HP-UX enables you to:

- Provision your infrastructure in minutes[3] with automated activation of servers, storage, and networking
- Optimize infrastructure confidently with built-in capacity planning and rebalancing tools
- Protect continuity of services with automated failover

Through tight integration with virtualization, HA and disaster recovery, and utility pricing, HP Matrix Operating Environment for HP-UX enables you to maintain service levels in the event of downtime, and to pay for spare capacity on an as-needed basis.

Virtualization lowers costs by reducing infrastructure; and by providing: shared, dynamic resourcing; increased utilization; and rapid deployment. Resources can be optimized by choosing the type of HP-UX mission-critical virtualization that best matches your workload requirements, including the right levels of isolation and flexibility. The HP-UX virtualization options vary from: electrically isolated hard partitions to virtual partitions or machines, and for sharing within one OS instance, HP-UX Containers.

With HP-UX integrated virtualization and infrastructure management, you can dynamically enhance your environment and respond to changing business requirements as needed.

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[1] Source: "UNIX Vendor Preference Survey 2010–2011," Gabriel Consulting Group, 2011.

[2] **http://h71028.www7.hp.com/enterprise/w1/en/os/hpux11i-security-overview.html?jumpid=ex_r1533_us/en/large/tsg/go_hpux11isecurity**

[3] Based on HP internal lab testing.

HP-UX March 2012 enhancements (Update 10)

Always-on resiliency	
Focus areas	**Enhancements**

Database enablement	• Enable mission-critical deployments of EnterpriseDB Postgres Plus Advanced Server (PPAS) HA at a lower cost
	  – Reduce need for custom scripts on EnterpriseDB (PPAS)
	  – Easily integrate EnterpriseDB into a Serviceguard cluster
	  – Faster deployment of HA protected configurations
	• Protect all major types of SAP databases
	  – Extend Serviceguard to Sybase ASE 15.7
	  – Use the full easy deployment feature set SGeSAP provides, now with Sybase ASE 15.7

Virtualized environment HA	• Improve uptime in virtualized environments
	  – Easily configure Serviceguard clusters to support vPars v6 failover
	  – Quickly deploy vPars/HP VM 6.1 with Serviceguard toolkit

Storage enablement	• Extend mission-critical HA to lower cost storage
	  – Lower costs and configure mission-critical applications using iSCSI shared storage on HP P4000 G2 SAN storage devices with HP Serviceguard
	  – Simplify cluster management and support single instance DB using HP Serviceguard Enterprise Cluster Master Toolkit (ECMT)

Dynamic optimization	
Focus areas	**Enhancements**
HP-UX Containers	v3.1 (now provided within all OEs) consolidates multiple HP 9000 Containers within one HP-UX instance

Converged virtual partition and virtual machine (v6.1) software	Expand scalability and flexibility capabilities for virtualized environments with enhanced functionality in one software product:
	• vPars and VM v6.1 now support the full range of Integrity i2 servers (i2 blades, rx2800 i2, Superdome 2) (with additional VM support of legacy Integrity servers)
	• Extend vPars to Integrity i2 blades and rx2800 i2, providing greater virtualization scalability, performance, and more efficient resource utilization
	• Increase virtualization I/O efficiency for HP-UX vPars and Integrity VM v6.1
	  – Reduce costs and expand virtualization with shared I/O for virtual partitions
	  – Improve I/O performance: meet high bandwidth needs with dedicated (direct I/O) network devices
	  – Access vast amounts of storage (up to 2,048 LUNs per vPar or VM) with N-Port ID Virtualization (NPIV) of Fibre Channel host adaptors
	• Flex workloads as needed to meet requirements:
	  – Balance workloads by migrating virtual partitions between servers
	  – Transform workloads between virtual partitions and virtual machines

Integrity VM (v4.3) vast storage access	Access vast amounts of storage (up to 2,048 LUNs per VM) with NPIV of Fibre Channel host adaptors—enabled in Integrity VM v4.3 (January 2012 patches)
Logical server migration between physical and virtual servers	• Better meet SLAs – Migrate logical servers between physical and virtual servers—with Matrix OE for HP-UX 7.0 and Integrity VM v4.3 (January 2012 patches)
Infrastructure management	• Matrix OE 7.0 for HP-UX (Web release) – Increase scalability and simplify management for large, diverse sets of cloud users in multi-tenancy environments

Investment protection and stability	
Focus areas	**Enhancements**

I/O	• PCIe SCSI card support now on HP Integrity rx2800 i2 Server SC11Xe
	  – Migrate to the new HP Integrity rx2800 i2 Server while protecting your investments in local SCSI-based data storage infrastructure
	• Deploy HP Integrity Superdome 2 on Cisco networking stack
	  – Added support for the HP Cisco Fabric Extender Interconnect Module on HP Integrity Superdome 2 8s, 16s, and 32s systems

HP-UX 11i v3 November/December 2011 enhancements

New strategic improvements increase server uptime, flexibility, and efficiency. The following table provides information about the firmware, Web, patch, and solution updates.

Dynamic optimization	
Focus areas	**Enhancements**
HP Integrity Superdome 2 dynamic enhancements	• Increase server uptime and flexibility by dynamically flexing Integrity Superdome 2 processor cores between HP-UX Virtual Partitions (vPars) v5 • Reduce costs, mitigate risks, and improve utilization; dynamically activate and deactivate reserve capacity (HP Instant Capacity [iCAP], Temporary Instant Capacity [TiCAP], and Global Instant Capacity [GiCAP]) between partitions, within or across servers • Increase efficiency by dynamically and automatically triggering resource adjustment, for server workloads based on set policies and real-time demand with HP Global Workload Manager, which is enhanced for vPars v5 dynamic cores and iCAP • Increase uptime by dynamically upgrading firmware • Increase server uptime and resiliency with dynamic replacement of failed processors • Increase financing flexibility by paying only for what you use with pay-per-use support of vPars v5 dynamic cores
HP-UX Virtual Partitions (vPars) v6 (for Integrity blades)	Via November 2011 Web release: • Extend highly scalable virtualization to Integrity blades; reduce costs by providing greater virtualization scalability, performance, and more efficient resource utilization • Reduce costs and gain management control with shared I/O; iLO Remote Console and NPIV storage access; and a new, easy-to-use, full-control GUI
HP VirtualSystem for Integrity Superdome 2/HP-UX	Accelerate deployment of virtualized, mission-critical solutions with a proven, highly optimized, and preconfigured solution. Instantly adjust to dynamic business demands and scale to support virtualization of any workload
Investment protection and stability	
Focus areas	**Enhancements**
Java 7	• Java 7 is now optimized for HP-UX for a robust platform for mission-critical applications • Protect your investment in Java applications, supporting the next generation of Java technologies • Gain substantial performance increases on the Java Virtual Machine using support for dynamic languages • HPjmeter software is optimized for Java 7 to identify and diagnose performance problems in Java applications

HP-UX 11i v3 September 2011 (Update 9)

Simplified and unified IT	
Focus areas	**Enhancements**
File systems	Increase performance for file systems mounted on HP Logical Volume Manager (LVM) volumes with OnlineJFS file system version 5.01—now a default within HP-UX: • File system "lock contention" is no longer an issue, thanks to direct and concurrent I/O available in base VERITAS File System (VxFS) and OnlineJFS, respectively
System management	Ease installation with new Web-Based Enterprise Management (WBEM) provider "mega bundle"
Application development	Ease software development with updates to C/C++ compiler and HPjmeter (Java performance optimizer)

Always-on resiliency	
Focus areas	**Enhancements**
HA and disaster recovery (HP Serviceguard)	• Increase availability of IBM DB2 High Availability Disaster Recovery replication with Serviceguard by using HP Serviceguard Toolkit for Database Replication Solutions • Increase availability of HP 3PAR Storage Array data with new HP Serviceguard Metrocluster and Continentalcluster disaster recovery for HP 3PAR, with synchronous data replication and automated failover
HA (HP Serviceguard Extension for SAP—SGeSAP)	Increase availability: • SGeSAP supports "easy deployment" of SAP applications • Keep SAP highly available with SAP Web Dispatcher integration • Simplify SAP deployment using Serviceguard Manager • Enable failover success using SAP cluster verification • Reduce Oracle licenses with SGeSAP and workload containers
Security	• Increase data security with the latest cryptographic libraries and an encrypted network in the latest open source versions of secure shell (SSH) and OpenSSL (OpenSSL 0.9.8q and OpenSSH 5.8) • Reduce security threats with updated security definitions within OpenSSH, Bastille, and IPFilter • Increase the robustness and isolation of HP-UX Containers by adding auditing and HP-UX Host Intrusion Detection System

Dynamic optimization	
Focus areas	**Enhancements**
Infrastructure management	Increase your benefits from private cloud today with HP Matrix Operating Environment 6.3—now included in the HP-UX 11i v3 VSE-OE: • The expanded Matrix Operating Environment enables an existing Matrix environment to also manage virtual machines (VMs) from an Integrity Superdome 2 environment with HP Expanded Matrix Conversion Services • Increase scalability and simplify management for large, diverse sets of cloud users in multitenancy environments • Simplify storage management with HP 3PAR storage integration • Manage utilization of multi-initiator NPIV
HP-UX Containers	3.0 (now provided within all OEs) increases isolation and control: • Enable consolidation of multiple private environments within an HP-UX instance with new system containers • Gain control with per-container administrator domains • Gain enhanced compliance with force-to-wire capability, which sends networking to the wire if external monitoring or auditing is required 3.1 (now Web released) simplifies container manageability: • Easily update HP-UX in a container environment • Replicate containers for faster setup of new containers

Investment protection and stability	
Focus areas	**Enhancements**
Networking (HP X.25)	Enable legacy X.25 software applications to run unchanged on HP Integrity servers over TCP/IP on Ethernet hardware
HP 9000 Containers	Leverage the power of Integrity servers by consolidating multiple HP 9000 environments onto a single Integrity server

HP-UX 11i v3 March 2011 (Update 8)

Dynamic optimization	
Focus areas	**Enhancements**
Infrastructure management	Increase your benefits from private cloud with Matrix Operating Environment 6.3—available in an April 2011 Web release: • Increase provision scalability up to 3,200 nodes (with Federated CMS) • Manage any Virtual Machine host as part of the HP CloudSystem Matrix resource pool (with HP CloudSystem Matrix Extended Infrastructure) • Convert existing HP BladeSystem hardware into Matrix-managed nodes (with HP CloudSystem Matrix Conversion Services) • Simplify storage management with new HP 3PAR storage integration • Reduce costs by managing utilization of multi-initiator NPIV

HP Integrity Virtual Machines	Version 4.3:
	• Double the virtual machine size,[4] supporting larger mission-critical workloads, with up to 16 virtual cores, 128 gigabytes of memory, and 256 HP Integrity Virtual Machine Accelerated Virtual I/O (AVIO) storage LUNs
	• Reduce management costs with new administrative capabilities
	• Quickly manage VM guests wherever they are running with virtual HP iLO Remote Console, which provides a specific IP address for each guest console; this:
	  – Reduces costs and enables network-attached storage with shared NFS storage
	  – Automates deployment with a new tool, which edits Extensible Firmware Interface variables for guest virtual firmware from within a VM host

HP-UX Containers[5] 3.0	HP-UX Containers 3.0 increases isolation and control in an April 2011 Web release; new system containers: • Enable consolidation of multiple private environments within an HP-UX instance • Gain control with per-container administrator domains • Gain enhanced compliance with force-to-wire capability, which sends networking to the wire if external monitoring or auditing is required

Always-on resiliency	
Focus areas	**Enhancements**
HP Serviceguard	A.11.20 Patch A enhancements (released in April 2011): • Simplify and increase availability—with robust replication capabilities of the HP 3 Data Center solution • Ease deployment—with command line and graphical user interfaces in HP Serviceguard Manager • Increase serviceability and manageability—with manual site switching—to further reduce downtime and to validate a cluster configuration • Increase integration and modularity—with simple configuration for partner products
HP Serviceguard Extension for Real Application Clusters (SGeRAC)	Now bundled into the HP-UX 11i v3 HA Operating Environment (HA-OE) and HP-UX 11i v3 Data Center Operating Environment (DC-OE) with no additional cost for licensing or support
HP SGeSAP	Licensing now made consistent with Integrity servers—with per-socket, tiered pricing
HP Serviceguard Storage Management Suites (SMS)	Simplify suites, with or without a cluster file system: • One suite is now targeted for single-instance Oracle customers. • The other suite is targeted for Oracle RAC customers (with the cluster file system). Customers with Serviceguard SMS which will be obsolete, can be migrated to a higher-level bundle.
Security	HP-UX 11i v3 introduces a new capability called HP-UX Whitelisting, which: • Protects all critical system files from being modified • Enables only authorized applications to access protected files and data • Simplifies certifications efforts like PCI Data Security Standard (PCI-DSS) • Seamlessly integrates into current environments: HP Serviceguard clusters, HP Data Protector, and Symantec The SSLCipherSuite, which specifies the suite of encryption ciphers that the server uses to make communications more secure, is now customizable.

Simplified and unified IT	
Focus areas	**Enhancements**
System management	• Dynamic Root Disk (DRD) now synchronizes volume characteristics, reducing the length of planned downtime • HP SMH is now more efficient—you no longer need to refresh your screen to see issues; status icons are auto-refreshed
Application development	• Performance analysis is improved: pinpoint problems more efficiently and exactly with HP Caliper 5.3 • Reduce troubleshooting time with the improved, central WBEM Assist Utility

[4] While Integrity Virtual Machines 4.2 has a maximum of 8 processor cores, version 4.3 has a maximum of 16 processor cores.

[5] Formerly HP-UX Secure Resource Partitions.

HP-UX 11i v3 September 2010 (Update 7)

Simplified and unified IT	
Focus areas	**Enhancements**
A common converged platform	• Consolidate applications on a common platform based on a unified blade architecture from x86 to Integrity Superdome 2 servers • Keep applications up and running using power-on-once technology, which provides a boost to infrastructure reliability[6] by up to 450 percent • Scale up with HP Integrity Superdome 2 Crossbar Fabric featuring fault tolerance in 100 chipset data paths[7] • Improve performance by up to four times and pay an entry price that is up to 40 percent lower[8] • Take advantage of the new bladed HP Integrity Superdome 2, including 100 mission-critical innovations that make it more reliable, affordable, and flexible than ever before

Always-on resiliency	
Focus areas	**Enhancements**
HP Serviceguard Extension for Oracle E-Business Suite (SGeEBS)	• Reduce the time and the cost of clustering Oracle E-Business Suite by 93 percent[9] with the new HP SGeEBS • Reduce 12 hours of planned downtime a month for Oracle E-Business Suite maintenance[10] • Enhance resource utilization and reduce costs by integrating with HP Matrix Operating Environment software • Scale easily with full support for disaster recovery
HP Serviceguard Toolkit for Oracle Data Guard	• Manage databases with HA and zero custom coding • Integrate HP Serviceguard and Oracle Data Guard to achieve HA and disaster recovery for Data Guard • Protect your systems with automatic Data Guard failover and switchover • Provide enhanced resiliency against data corruption
Faster startup for Oracle RAC after failover	• Speed startup time by 90 percent[11] for multi-instance applications such as Oracle RAC, SAP, and cluster file systems • Restart multinode packages simultaneously instead of sequentially

Dynamic optimization	
Focus areas	**Enhancements**
HP 9000 Containers	• Consolidate applications in days, not months, with new HP 9000 Containers that virtualize PA-RISC environments on Integrity servers to reduce resource burn
HP Integrity Virtual Machines	• Enhance resource utilization by running multiple instances of operating systems; use Integrity Virtual Machines to run HP-UX 11i v2 as a guest on an HP Integrity Superdome 2 server that is running HP-UX 11i v3
HP-UX Porting Kit	• Port AIX to HP-UX 80 percent faster[12] with the new AIX to HP-UX Porting Kit (AHPK), which automatically identifies porting issues, accurately estimates effort, and recommends solutions. Reduce porting time by 85–95 percent against manual processes,[13] and achieve 90–95 percent automation[14]—all with a completely free, fully supported product from HP.

[6] Based on testing on mean time between failures in HP engineering labs and HP lab analysis of hardware crash rates, comparing the previous generation of Integrity Superdome with Integrity Superdome 2.

[7] Based on analysis by HP Labs, referring to Integrity Superdome 2 Crossbar Fabric. All data paths within the chipset are fault tolerant, with end-to-end retry and rerouting.

[8] Source: HP performance engineering.

[9] Comparison of time to configure storage and package using the previous release and the new Serviceguard Manager easy package storage enhancement.

[10] Maintenance outages usually take 3–12 hours and may require scheduling planned downtime as frequently as every month, according to information provided by Oracle.

[11] HP Lab comparison of Serviceguard 11.19 with Serviceguard 11.20.

[12] Source: Based on HP experience with the Solaris to HP-UX Porting Kit (SHPK) and customer testimonials, such as from a large European logistics provider that automated about 90 percent of its code with SHPK, reducing its deployment time on HP-UX to weeks from months. Because the AHPK technology is similar to that of SHPK, we assume similar benefits from AHPK.

[13] Source: The European logistics provider estimated 4–5 months of porting effort and was able to complete the porting in 4–5 weeks by using SHPK. We expect similar benefits from AHPK when porting AIX code.

[14] Source: Based on SHPK experience and testimonials.

HP-UX 11i v3 March 2010 (Update 6)

Simplified and unified IT	
Focus areas	**Enhancements**
HP-UX Software Assistant (SWA)	• Faster and more options in generating reports with SWA • Patch flagging in SWA clearly explains why patches are recommended
HP Caliper	Caliper with ktracer delivers improved reliability, expanded support, and ease of use

Always-on resiliency	
Focus areas	**Enhancements**
Security	• The first commercial UNIX to be successfully evaluated against the new commercial common criteria • Commercial off-the-shelf (COTS) compartmentalized operations protection profile • Bastille certified by the Center for Internet Security as providing a system-hardening tool that reflects the best practices across the industry by independent experts • Enhancements to IPFilter firewall • HP Online VM Migration can employ data encryption during migration, an option to paying for expensive private networks to perform online migrations • Secure resource partitions are easier to deploy with new reference architectures for Oracle and SAP

Dynamic optimization	
Focus areas	**Enhancements**
HP Integrity Virtual Machines 4.2	• Delivers automatic memory reallocation and suspend and resume capabilities for guests • LVMove command for Linux Logical Volume Manager (LVM) reduces manual steps when moving logical volumes • New storage reporting tool • Suspend and resume guests with Integrity Virtual Machines 4.2; less interruption in online VM migration • Tighter management of service-level agreements with memory entitlements, which are part of HP Integrity Virtual Machines automated resource allocation • Boot a logical volume in LVM Layout 2 in addition to LVM Layout 1 • Online VM Migration for Integrity Virtual Machines is now included in HP-UX 11i v3 virtualization bundles (VSE-OE, DC-OE, and HP Matrix Operating Environment Suite) and Accelerated Virtual I/O (AVIO) • Drivers are now bundled with Integrity Virtual Machines OpenVMS guest support and are integrated with HP Insight Orchestration • Integrity Virtual Machines 4.2 improves VMs-as-a-Serviceguard-package functionality, including integration with application monitoring
Dynamic Root Disk	• Provides the ability to compare and synchronize a clone with the running system with DRD LVM snapshots

Investment protection and stability
Enhancements
• Latest standards for Java, C++, and Fortran improve quality and speed porting to HP-UX 11i

HP-UX 11i v3 September 2009 (Update 5)

Simplified and unified IT	
Focus areas	**Enhancements**
Locality-Optimized Resource Alignment (LORA)	Performance optimization now includes a new "loratune" command to simplify retuning after a configuration change. Also, the new "parconfig" command simplifies the configuration of nPartitions.
File system I/O	New direct I/O and concurrent I/O make it possible to bypass the typical computing overhead associated with file systems and approach to raw disk performance, which more than doubles the I/O performance for all involved applications and users, compared to the prior release.
Direct I/O in VxFS Lite 5.0.1	• HP delivers direct I/O in VxFS Lite 5.0.1, which is part of the HP-UX 11i v3 Base OE, and concurrent I/O in VxFS Full (OnlineJFS) 5.0.1, which is part of HA, VSE, and DC-OEs. • Compared to the prior release, the new VxFS Lite performance, as a percent of raw disk performance, is more than double, up from about 10–15 percent to 30–50 percent. VxFS Full more than doubles I/O performance also, up from 30–50 percent to 80–99 percent of raw disk performance.
HP Instant Capacity	iCAP version B.11.31.09.02.00 includes the following new features and changes: • Enhanced performance of GiCAP by efficiently using locally available TiCAP (speed up initial activation of cores) • Group Manager is now enabled to accept members with longer passwords (up to 80 characters) • More efficient OE upgrade process
HP Systems Insight Manager 5.3	Update 1 increases management scope with: • The ability to monitor and manage HP ProLiant G6 servers • Support for HP Insight Management WBEM Providers v2.3 as well as WBEM providers for Linux on Integrity servers
Driver updates	• Extended support for PCI Express • Support for tape devices using LTO-5 format • IBX4-00 driver for InfiniBand now includes support for Reliable Datagram Sockets in Oracle RAC installations • Support for USB 2.0 high-speed devices and DVD write capability

Always-on resiliency	
Focus areas	**Enhancements**
HP Serviceguard Manager	• Serviceguard Manager B.02.00.10: Cut cluster management time by half. Utilize the Cluster Topology Map to view cluster status at a glance, drag and drop packages from one node to the other, and view the integration with HP Serviceguard Enterprise Cluster Master Toolkit (ECMT), SGeRAC, Metrocluster, and built-in log viewers for faster troubleshooting. • The industry's only fully IPv6-ready clustering solution: A Serviceguard cluster can now operate on a set of nodes where a single IPv4 address would not be configured and all network traffic must be IPv6 (with no IPv4 traffic at all). IPv4-only and mixed IPv4/IPv6 clusters are also supported. • Auto Port Aggregation (APA) support: HP Serviceguard SMS Suite provides support for APA as a cluster heartbeat, online changes to cluster configuration, and automatic resynchronization between cluster nodes.
Security	• HP helps you achieve new file-level encryption to protect your data in transit. Together with our existing volume encryption, HP-UX 11i provides the granularity of encryption for every business need. • HP-UX 11i is the only UNIX system to offer both levels of encryption services. • HP helps you meet recently heightened auditing requirements for compliance with Sarbanes-Oxley (SOX) and CIS requirements. Update 5 reduces system resources used during security auditing and reporting, and provides PCI/SOX report templates to save you report-creation time. • The HP-UX 11i automation-enhanced system-hardening tool, Bastille, is now aligned with the latest hardening checklist from the CIS—the leading industry-consensus security benchmark organization. • HP-UX 11i comes enabled with new capabilities, including keystroke logging and capturing terminal session logs, an emerging security compliance requirement. • The Disk Scrub capability with mediainit now includes the ability to validate the scrubbed data written during the last pass of the disk scrub process.
HP-UX Software Assistant (SWA)	• Scales further to enable security bulletin analysis and patch maintenance for more systems in a single view when integrated with HP SIM—now up to 100 systems instead of just 10. • SWA software's further integration with SIM leads to additional boosts to productivity, including consolidated logging and option selection. Users no longer have to exit SIM or open a new window to edit the SWA configuration file on the CMS.

Dynamic optimization	
Focus areas	**Enhancements**
Online package maintenance mode	Package can be put into a partially started state for maintenance purposes.
Dynamic Root Disk	HP-UX 11i DRD hot recovery and hot maintenance are now supported for Serviceguard upgrades. Perform Serviceguard upgrades on clones while nodes and cluster continue to run, and use hot recovery to revert back if needed.
Cluster-aware SAN congestion control	HP-UX 11i v3 Update 5 and Serviceguard work together to reduce timeouts and SAN congestion by automatically managing I/O queues to save hours or even days on storage management.
HP Logical Volume Manager and Mirrordisk/UX	Multinode online reconfiguration is available for SGeRAC clusters; vgmove can move LVM volume groups (VG) from one array to another with no application downtime; pvmove can now rebalance all volume groups at the same time; and LVM VG forced deactivation allows faster failover in a Serviceguard clustered environment because nodes can be deactivated without waiting for resynchronization.

Investment protection and stability
Enhancements
• Legacy support: Serviceguard Metrocluster helps provide support for legacy and modular packages and Oracle Automatic Storage Management (ASM) for single-instance databases, dynamic provisioning, and Metrocluster rolling upgrades.

HP-UX 11i v3 April 2009 (Update 4)

Simplified and unified IT	
Focus areas	**Enhancements**
Memory file system	Doubles the performance of temporary file operations in memory, compared to v2
HP System Management Homepage (SMH)	Now includes SMH setup wizards and graphical icon views
HPjmeter 4.0	Features zero preparation analysis: it discovers, monitors, profiles, and troubleshoots Java applications without restarting the applications, with reduced memory and CPU overhead, and achieves results faster
HP Wildebeest Debugger	New release for core file, thread, and memory debugging, with expanded control and increased performance
HP Caliper 5.1	Delivers simpler performance analysis, richer reports, and more efficient storage of the results
HP 9000 servers	Cross-development environment on Integrity servers for development of applications for HP 9000 systems
HP Mixed Mode Translator	• Enables HP 9000 server customers to move native Java applications to Integrity servers, where they can invoke HP 9000 shared libraries and, therefore, Java Native Interface functions on HP 9000 servers • All HP 9000 applications can run on Integrity servers with HP-UX 11i using the HP ARIES Dynamic Binary Translator, a long-proven tool supported by HP

Always-on resiliency	
Focus areas	**Enhancements**
HP Serviceguard 11.19	• 83 percent faster failover; significant reduction of planned downtime associated with cluster maintenance and configuration; and fully integrated advanced resource management to reduce custom scripting, avoid human error, and provide a fully supported environment • SGeSAP reduces recovery time for SAP liveCache from days or hours to two minutes when used in conjunction with the SAP supply chain • Serviceguard ECMT now includes toolkits for IBM DB2, Sybase, and MySQL at no extra charge, and new support for Oracle ASM files speeds up the deployment of ASM into a cluster by 8x • Serviceguard Manager now delivers more virtualization integration, tool tips, and cluster wizards to reduce the time and expertise required for cluster setup and maintenance
HP Mirrordisk/UX	• Increase data and application protection through greater redundancy • The number of mirror copies increased from 3 to 6 • Concurrent clustered node access to mirrors increased from 2 to 16 • Reduce time to resynchronize with improved mirror write cache and parallel resynchronization enhancements • The number of shared cluster nodes with extended distance (100 km) increased from 2 to 4

Dynamic optimization	
Focus areas	**Enhancements**
HP Logical Volume Manager	• Reduce downtime when making a provisioning change to volumes when your requirements grow or shrink • Improve performance up to 88 percent in volume group scan and import operations • Upgrade L1 volume group layouts in place to the highly scalable, modern L2 layout
Dynamic Root Disk	• Enables online upgrades from earlier releases of HP-UX 11i v3 to the Update 4 release and later, with only the reboot time left as planned downtime • Integrity Online VM Migration enables guest migration with no downtime • Enhanced Bastille offers 50 percent more system items, which can be hardened to further reduce the time and expertise required to make your HP-UX 11i v2 and v3 systems more secure and meet security benchmark standards

Investment protection and stability
Enhancements

• New controls to reduce active processor energy use:
  – Go green with the HP-UX v3 environment's savings from power-managed processors, I/O, and cells
• SAN target port congestion management allows for extra workloads on physical systems or more guests in a virtualized system without adding more storage resources
• The disk sanitization tool is built in, for erase-in-place convenience that is compliant with U.S. Department of Defense standards

HP-UX 11i v3 September 2008 (Update 3)

- HP-UX 11i v3 VM Host with AVIO
- More robust and automated cluster failover
- Advanced security integration and automation
- Improved multisystem manageability
- Dynamic power savings
- Faster application deployment and performance

HP-UX 11i v3 March 2008 (Update 2)

- Expanded OE integration
- Enhanced regulatory compliance and data encryption
- Simplified blade management
- Comprehensive capacity planning
- Cluster-wide file system and volume management

HP-UX 11i v3 September 2007 (Update 1)

- Dynamic nPartitions
- Online addition, replacement, and deletion of I/O drivers
- Optimized for Integrity server blades
- Multicore utilization from the compiler

HP-UX 11i v3 February 2007 (Initial Release)

- OS performance improvement of around 30 percent
- Next-generation mass storage stack
- Automatic device discovery and configuration; dynamic handling of SAN changes
- Self-configuring multipathing for automatic load balancing and failover
- Reduction of planned and unplanned downtime reduction
- In-depth security protection that is easier to deploy
- Memory migration included in virtualization
- Accelerated deployment with reference architectures

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To learn more about how the HP-UX 11i v3 Operating Environment can give you increased efficiency at lower costs, and help you make the most of your investments in an Instant-On world, visit **www.hp.com/go/hpux11inow**.

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