



**Hewlett Packard  
Enterprise**

Technical white paper

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# LEVERAGE THE VALUE OF HP-UX 11i V3

For workloads vital to your enterprise



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# BECAUSE YOUR BUSINESS IS ALWAYS ON

## INTRODUCTION

In today’s business climate, in order to compete effectively and meet the increasing demands of your end customers, companies must maintain nearly continuous operations. Now that our global economy operates 24x7, consumers expect access to products and services at any time and from any place. In response, your enterprise must make sure that the core business processes driving your end-customer interactions are always on and available. This requires a proven, reliable infrastructure you can trust to keep your critical workloads up and running while providing you the flexibility and scalability to meet increased demands.

When you need nearly continuous computing for operational workloads that are vital to your enterprise, HP-UX is the answer. HP-UX is the industry’s most resilient and integrated UNIX® system, ideal for environments requiring mission-critical availability and predictable performance. The built-in resiliency and self-healing features of the hardware and operating system improve the uptime of your core applications. And with more than three decades delivering proven value, HP-UX provides the stability your critical environment demands. HP-UX is ideal for data-driven, core enterprise workloads such as enterprise resource planning (ERP), billing, and databases.

### Leverage the value of the latest HP-UX 11i v3 releases

This white paper provides an overview of the HP-UX 11i v3 operating environment release updates, starting with the most recent updates first.

## HP-UX 11I V3 MAY 2021 UPDATE RELEASE

### Enhanced security

**Security updates** OpenSSL 1.1.1 is now integrated with HP-UX Media. For complete list of products supported with OpenSSL, refer to the Release notes. Support for CIFS Server 4.12

**Open Source Updates** Apache Web Server 2.4.41, Tomcat 9 and PHP 7.4.

### Higher availability

**Serviceguard** Increase Oracle® 19c application availability with Serviceguard solutions for both Single Instance & RAC configuration. HA Support for XP8, MSA2060.

**Serviceguard Storage Management Suite A.05—certified with Oracle RAC 19c** Deploy Serviceguard Storage Management Suite (SG SMS) A.05.00, based on Veritas 6.1 and certified with Oracle RAC 19c.

**New Storage** Support for XP8 & MSA2060.

### Application interoperability

**Java** Security updates and defect fixes through Java CPU updates for Java 7, Java 8 & Java 11.

**64-bit Support** 64-bit support for “pax” command.

**Other enhancements**

- System Management Homepage now supports SHA-256 certificates.
- Updated Quality Pack consolidating proven defect fixes.

## HP-UX 11I V3 MAY 2020 UPDATE RELEASE

### Increased performance

**NVMe**

- Integrity VM support for NVMe
- Support for NVMe as Read Cache I/O acceleration for read oriented workload

### Enhanced security

**OpenSSL** New OpenSSL 1.1.1 release

**Lot 9 compliance** Integrity servers are EU Lot 9 compliant

### Higher availability

**Serviceguard** HA & DR Support Enablement for HPE Primera Storage

**I/O enhancements** 12 Gb SAS adapter P441 are enabled with HBA and multi-initiator mode

### Application interoperability

**Java 11** Advanced monitoring and analytical capabilities for Java applications running with JDK 11, enhanced performance for Java applications, and flexibility to reduce consumption of system memory and storage

### Improved compatibility

**Storage management and other enhancements**

- VxFS-6.1 and VxVM-6.1 are supported and installable on all supported Itanium® platforms
- Update locale for Japanese 2019 Era name



## HP-UX 11i V3 MAY 2019 UPDATE RELEASE

### Consumption-based operational services

<b>HPE GreenLake for Integrity and HP-UX</b>	<ul style="list-style-type: none"> <li>• Pure "as-a-service" model: on-premises service with remote monitoring</li> <li>• Consumption based billing: pay-per-use<sup>1</sup> consumption with monthly billing</li> <li>• Optionally operated for you: to free your teams for more valuable contribution</li> </ul>
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### Availability

<b>HPE Serviceguard Smart Quorum surviving node enhancement</b>	Consider health of server heartbeat network for surviving node
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### Performance

<b>NVMe 3D XPoint adapter (P4800X)</b>	Accelerate workload I/O and support Oracle ASM, and integration with HP-UX manageability & debugging tools
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### Virtualization

<b>Online VM migration upgrades support from i2 to i6 servers</b>	To ease upgrade migration
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### Security

<b>CIFS v4.9 release</b>	Increase security
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<b>HP-UX Auditing System Extensions</b>	Increase security
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### I/O and storage

<b>Improve I/O and storage</b>	MSA 2050/2052 FC & SAS; HPE Primera; 400 & 800 GB SSD for rx2800 i6 & BL8x0c i6; tape support with MSL3040 and LTO-8
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## HP-UX 11i V3 MAY 2018 UPDATE RELEASE

### Efficiency

Focus areas	Enhancements
<b>Non-Volatile Memory (NVMe) 3D XPoint (P4800) workload accelerator adapter</b>	<p>Increase HP-UX/Integrity i6 DSS workload performance up to 150%<sup>2</sup> with Non-Volatile Memory (NVMe) 3D XPoint (P4800) workload accelerator adapter for Integrity i6 rx2800 and Superdome 2 servers. Also, lower total cost of ownership up to 55%<sup>3</sup> for DSS database applications.</p> <p>Support for Intel® 3D XPoint workload accelerator with rx2800 i6 and SD2 i6 (HPE 750 GB PCIe x4 Lanes Write Intensive HHHL SKU# 878038-B21)</p> <ul style="list-style-type: none"> <li>• Provides orders of improvement in performance, esp. with mixed I/Os</li> <li>• Low latency response even at lower Q depths</li> <li>• Good response times under load</li> <li>• Very good IOPS numbers, for random/sequential workloads</li> <li>• Support for Secondary Swap</li> <li>• Serviceguard support</li> </ul>
<b>Other new I/O adapters</b>	<ul style="list-style-type: none"> <li>• Increase storage scalability while continuing SAS JBOD disks and tape connectivity options with the HPE Smart Array 12 Gb SAS Controller (P441), available for Integrity i4 and i6 rx2800 rackmount servers running HP-UX 11i v3. Also increase high availability with RAID mode, and increase ROI with a longer lifecycle with support of the next generation D3610 and D3710 disk enclosures, tape drives and MSA devices that HP-UX supports.</li> <li>• HPE 10GbE Pass-Thru Module II for (for c-Class BladeSystem), that includes: 16 uplink ports, a non-blocking, one-to-one connection between each server and the network, supporting both 1 Gb and 10 Gb connections on a port-by-port basis.</li> </ul>
<b>New storage</b>	<ul style="list-style-type: none"> <li>• Low-cost, high capacity tiered external storage system with next generation disk enclosures D3610/D3710 JBOD ideal for small application environments, remote offices and departmental locations and flexible, modular solutions to simplify capacity expansion.</li> <li>• Take advantage of powerful, performant, automated, available SAN storage over Fibre Channel that can grow flexibly into the future with fifth generation HPE Mass Storage Arrays (MSA 2050 and MSA 2052). This serious flash storage that remains low cost and easy to use.</li> </ul>

<sup>1</sup> Minimum commitment may apply.

<sup>2,3</sup> For specific workloads, and based on internal micro-benchmark tests in April 2018 in HPE Bangalore, India.



## HP-UX 11i V3 MAY 2018 UPDATE RELEASE (CONTINUED)

<b>OpenStack® Cloud management for HP-UX (release 1.2)</b>	<p>Expand HP-UX private cloud with OpenStack manageability and service levels with release 1.2 (based on Helion OpenStack 8.0):</p> <ul style="list-style-type: none"> <li>• Hassle-free and disruption-proof Integrity VM migration to OpenStack-based management; import existing Integrity VMs into OpenStack management of Integrity VM and vPar instances</li> <li>• Guarantee performance, high availability and unsurpassed scale with service support for your HP-UX cloud infrastructure; HPE 3PAR Cinder block storage and volume support for third-party storage (IBM, Dell EMC, and Hitachi)</li> <li>• Deploy metering services, monitor alarms, and report events for HP-UX virtual instances with Telemetry support for HP-UX guests</li> <li>• Expand virtual machine management options with: support for VLAN (Type-1/2) based management; multi-IP assignment through post-provision scripts; support for HPE 3PAR multipath block storages and allocation of storage from volume groups</li> </ul>
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### Availability

Focus areas	Enhancements
<b>Veritas File System and Veritas Volume Manager (6.1 defaulted into OE)</b>	<p>Optimize storage utilization with Veritas File System and Veritas Volume Manager 6.1 (web-released in 2016 and previously an alternative file system and volume management in the HP-UX Operating Environments), which has now become the default installed file system in the HP-UX 11i v3 2018 Operating Environment Update Release. (Note this release works with Integrity i4 and i6 servers.)</p> <p>NOTE: If you have Integrity i2 or earlier servers and are installing the HP-UX 11i v3 2018 Operating Environment Update Release, explicitly de-select Base-VxFS-6.1, Base-VxVM-6.1 &amp; B3929IB for a successful OE update, and instead utilize the latest OE associated with the currently installed Veritas version. For information on creating a customized depot, please see the white paper "Installation of non-default VxFS and VxVM software version on HP-UX 11i v3 2018 Operating Environment Update Release" at <a href="http://support.hpe.com/hpsc/doc/public/display?sp4ts.oid=5372858&amp;docLocale=en_US&amp;docId=emr_na-a00051292en_us">support.hpe.com/hpsc/doc/public/display?sp4ts.oid=5372858&amp;docLocale=en_US&amp;docId=emr_na-a00051292en_us</a>.</p>

<b>Serviceguard Storage Management Suite A.05—certified with Oracle RAC 12c R2</b>	Deploy Serviceguard Storage Management Suite (SG SMS) A.05.00, based on Veritas 6.1 and certified with Oracle RAC 12c R2.
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### Proven stability

Focus areas	Enhancements										
<b>Java</b>	<p><b>Java CPU update releases for HP-UX, based on the Oracle JDK April 2018 CPU release:</b></p> <table border="1"> <thead> <tr> <th>Update release</th> <th>Based on</th> </tr> </thead> <tbody> <tr> <td>• Java 8.0.14 for HP-UX</td> <td>Oracle JDK 8 update 172, Apr 2018</td> </tr> <tr> <td>• Java 7.0.24 for HP-UX</td> <td>Oracle JDK 7 update 181, Apr 2018</td> </tr> <tr> <td>• Java 6.0.37 for HP-UX</td> <td>Oracle JDK 6 update 191, Apr 2018—the final release of Java</td> </tr> <tr> <td>• Java 7.0.02 PA for HP-UX</td> <td>Oracle JDK 7 update 181, Apr 2018</td> </tr> </tbody> </table>	Update release	Based on	• Java 8.0.14 for HP-UX	Oracle JDK 8 update 172, Apr 2018	• Java 7.0.24 for HP-UX	Oracle JDK 7 update 181, Apr 2018	• Java 6.0.37 for HP-UX	Oracle JDK 6 update 191, Apr 2018—the final release of Java	• Java 7.0.02 PA for HP-UX	Oracle JDK 7 update 181, Apr 2018
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<b>Open Source Security (SSH, SSL SHA-2) updates</b>	Refresh security with: updates for SSH, SHA-2 and more SSL 1.0.2 products. Perl v5.8.8.0 is now qualified with OpenSSL v1.0.2
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<b>Open Source software and networking updates</b>	<p>Harness the latest version of Open Source products. New versions of Open Source networking products are supported on HP-UX:</p> <ul style="list-style-type: none"> <li>• PHP v7.2 (based on latest Open Source version, PHP 7.2.1 &amp; recently web-released) now includes advanced debugging and cryptography-related features and more. Also, PHP v7.2 includes new extensions that enhance the functionality of PHP scripts.</li> <li>• BIND 9.11, CIFS Server v4.5 and Apache Web Server v2.4 have been updated to address security vulnerabilities and product defects.</li> <li>• New networking versions: NTP v4.2.8, SNMP v17.3, Tomcat v7, Apache v2.4, FTP v2.6.</li> </ul>
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<b>Capping warning for uncapped vPar instances running Oracle</b>	Avoid increased Oracle licensing with uncapped vPars, (as noted in changes to the Oracle Partitioning policy from April 2017), by capping Integrity vPars running Oracle with the maximum core value. For more information, please refer to the customer advisory at <a href="http://support.hpe.com/hpsc/doc/public/display?docId=emr_na-a00021592en_us">support.hpe.com/hpsc/doc/public/display?docId=emr_na-a00021592en_us</a> .
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<b>HP-UX 11i v1 and v2 support extended to end of 2021</b>	Extend Prior Version Support (without sustaining engineering) of HP-UX 11i v1 and v2 with an extension of the support date from end of 2019 to end of 2021.
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## HP-UX 11i V3 MAY 2017 UPDATE RELEASE

### Proven stability

Focus areas	Enhancements
<b>New Integrity i6 servers with Intel Itanium 9700 series processor</b>	<ul style="list-style-type: none"> <li>• Up to 2.66 GHz frequency</li> <li>• With a later end of support date</li> <li>• Support for i2, i4, and i6 processors in same enclosure</li> </ul>
<b>8 TB memory single instance</b>	To scale for high-end workloads
<b>Software deployment (Ignite-UX)</b>	<ul style="list-style-type: none"> <li>• Ignite-UX golden image, backup and recovery support for Veritas-sold 6.0 versions</li> <li>• Ignite-UX boot support with LTO-7 tape drives</li> </ul>



## HP-UX 11I V3 MAY 2017 UPDATE RELEASE (CONTINUED)

<b>Strengthen HP-UX security</b>	<ul style="list-style-type: none"> <li>Continue interoperability with Windows with HPE CIFS Server v4.5.3 (based on Samba v4.5.3)</li> <li>Avoid modified data with SSL SHA-2 encryption support</li> <li>Open Source Refresh with: OpenSSL 1.0.2, Sendmail and Apache</li> </ul>
<b>Increased efficiency</b>	
<b>Focus areas</b>	<b>Enhancements</b>
<b>Non-volatile memory (NVMe) P3700 workload &amp; I/O accelerator card support</b>	<ul style="list-style-type: none"> <li>Increase application performance up to 70% for select workloads, as well as responsiveness, with NVMe I/O and workload accelerator</li> <li>Support:                             <ul style="list-style-type: none"> <li>Intel NAND Flash-based P3700 Write Intensive (800 GB and 1.6 TB) capacity cards</li> <li>With rx2800 i6 servers (up to 4 cards) and Superdome 2 i6 platforms (up to 8 cards)</li> <li>With LVM (Mirroring and Striping) and VxFS file system</li> </ul> </li> </ul>
<b>Latest HPE 3PAR &amp; XP7 support</b>	<ul style="list-style-type: none"> <li>Boost workload performance 30% with Integrity i6 over Integrity i4 with HPE 3PAR 8450 or XP7 all-flash storage with higher return-on-investment and lower costs</li> </ul>
<b>HPE (Helion) OpenStack support for managing HP-UX Cloud</b>	<ul style="list-style-type: none"> <li>Where HPE Helion leverages industry-standard Open Source-based solution</li> <li>In order to provision and manage HP-UX Integrity servers with the same Open Source management infrastructure as for the rest of the modern heterogeneous data center</li> </ul>
<b>vPars v6 online migration</b>	<ul style="list-style-type: none"> <li>Reduce downtime for virtualized workloads to: patch or update vPar Host software/firmware, or move a workload in response to predictive failure alerts</li> <li>Achieve the migration flexibility of VMs while retaining the near physical performance of vPars to: balance server workloads, separate workloads that peak simultaneously, and migrate workload to another hardware with more resources (I/O cards or memory)</li> <li>Available on Integrity i4 servers; supports HP-UX guests for March 2016 release or later</li> </ul>

### Availability

<b>Focus areas</b>	<b>Enhancements</b>
<b>Veritas File System and Veritas Volume Manager 6.1 (alternative installed FS)</b>	<p>Increase availability and flexibility with version 6.1 (alternative installed FS):</p> <ul style="list-style-type: none"> <li>Highly scalable with exponential data growth and usage with: 512 TB file systems, &gt;2 TB boot disks, &gt;32K directories, data de-duplication, space-optimized snapshot, multithread thin reclamation</li> <li>Business continuity by minimizing downtime with fault tolerant and online operations with: CVM I/O shipping, secure deletion of disks, rolling upgrades, boot time improvements, DMP persists through power loss and tolerance against multiple hardware failures</li> <li>Ease of use through simplicity and reduced manual intervention with: dynamic reconfiguration tool, improve free space fragmentation, and command completion</li> <li>Improve performance when compared to earlier releases through: improvements for 256 core systems, administrative I/O throttling, FMR4 support, and faster and better reclaim speeds</li> </ul>
<b>Serviceguard SMS</b>	<ul style="list-style-type: none"> <li>Deploy Serviceguard Storage Management Suite (SG SMS) A.05.00 based on Veritas 6.1 which is certified with Oracle 12c R1 and Oracle 12c RAC</li> </ul>
<b>Serviceguard Smart Quorum feature</b>	<p>Increase availability for workloads with new quorum logic based on workload priority rather than node membership in Disaster Recovery Setup:</p> <ul style="list-style-type: none"> <li><b>Increase uptime:</b> prevent expensive unnecessary failover of critical workloads when handling split brain</li> <li><b>Reduce cost:</b> configure uneven number nodes across sites in a disaster recovery setup</li> </ul>

## HP-UX 11I V3 MARCH 2016 UPDATE RELEASE

### Availability

<b>Focus areas</b>	<b>Enhancements</b>
<b>Serviceguard</b>	Increase Oracle 12c application availability with Serviceguard solutions. This is for Single Instance only
<b>Auto Port Aggregation</b>	Enhance link failure detection with a better mechanism, improve load distribution with a new algorithm and increase LACP card limit from 4 to 8
<b>Virtualization (vPars &amp; VM v6)</b>	Increase virtualization availability with memory online add/delete/replace capabilities now for direct I/O
<b>Efficiency</b>	
<b>Focus areas</b>	<b>Enhancements</b>
<b>Software deployment (Ignite-UX)</b>	Enhance software deployment with Ignite-UX support for the latest Veritas File System and Veritas Volume Manager 6.1



## HP-UX 11i V3 MARCH 2016 UPDATE RELEASE (CONTINUED)

<b>Virtualization (vPars &amp; VM v6)</b>	<p>Enhance Virtualization efficiency with:</p> <ul style="list-style-type: none"> <li>• HP-UX vPars and Integrity VM v6 performance and scalability Improvements</li> <li>• VM migration across disjoint NPIV fabrics</li> <li>• UDP traffic supported over multiqueue infrastructure for vPar guests</li> <li>• Bandwidth management (aka Quality of Support [QoS]) for NPIV Host Bus Adapters enabling:                             <ul style="list-style-type: none"> <li>– A specified share of the physical Fibre Channel port's bandwidth guaranteed to be available for a NPIV vFC</li> <li>– Safeguards for critical workloads within the vPar or VM, by assigning virtual Fibre Channel with bandwidth entitlements</li> <li>– Support for HPE Integrity SN1000Q 16 Gb Fibre Channel Host Bus Adapters</li> </ul> </li> </ul>
<b>Manageability (HPE Operations Agent)</b>	<p>New version of HPE Operations Agent, 12.00, enables monitoring of a system by collecting metrics that indicate the condition, performance, and availability of the system. This release also includes significant enhancements to the installer program. New features such as Agent Health View, Metric Datastore, and SNMP Trap Interceptor are introduced</p>
<b>HPE 3PAR All-Flash Storage</b>	<p>Increase performance with Storage HPE 3PAR All-Flash 8000 and 20000 series</p>
<b>Networking drivers</b>	<ul style="list-style-type: none"> <li>• Improve CPU workload distribution and efficiency with 10GigEthr-02 multiple transmit queue support</li> <li>• Update networking drivers &amp; firmware with multi-Tx support for iexgbe driver</li> </ul>
<b>Proven stability</b>	
<b>Focus areas</b>	<b>Enhancements</b>
<b>Security (extended solutions)</b>	<p>Refresh Open Source with new support for:</p> <ul style="list-style-type: none"> <li>• LDAP-UX 5.02 support of Active Directory Server Windows 2012 R2</li> <li>• Apache B.2.2.29.02</li> <li>• Bind C.9.9.4.5.0</li> <li>• CIFS server A.03.02.04</li> <li>• Kerberos Client E.1.6.2.10 is now also supported with Microsoft Windows 2012 R2 server</li> <li>• NTP C.4.2.6.7.0</li> <li>• OpenSSL 1.0.1p</li> <li>• PHP 5.6.x</li> <li>• SNMP C.17.3.2</li> <li>• Tomcat 7 (D.7.0.59.03)</li> </ul>
<b>Tape drive support</b>	<ul style="list-style-type: none"> <li>• Support for LTO-7 tape drives</li> </ul>
<b>Keystroke logging</b>	<ul style="list-style-type: none"> <li>• Keystroke logging enhancements</li> </ul>

## HP-UX 11i V3 MARCH 2015 UPDATE RELEASE

Focus areas	Benefits
<b>Always-on availability</b>	
<b>Virtualization</b>	<p>Increase uptime by utilizing virtual I/O delete to:</p> <ul style="list-style-type: none"> <li>• Increase uptime with dynamic online adjustment within a guest or vPar</li> <li>• Dynamically maximize virtualized I/O resources to all virtual machines (VMs) and vPars in the Virtualization Services Platform (VSP)</li> <li>• Respond dynamically to changes in workload I/O demand</li> </ul>
<b>Soft reboot</b>	<p>Extend the option of faster reboots with soft reboot (which eliminates hardware reboot time, when possible) by adding support for: instant capacity (iCAP), HP-UX vPars and Integrity VM VSP, and removing restrictions on active USB and graphics</p>
<b>Serviceguard</b>	<p>Increase uptime with support for the latest virtualization (HP-UX vPars and Integrity VM v6)</p>
<b>Built-in efficiency</b>	
<b>Java 7 and 8</b>	<p>Improve Java real-world performance and usage with:</p> <ul style="list-style-type: none"> <li>• Optimized Java virtual machine with a profile-based optimization build</li> <li>• Tuned kernel and garbage collection</li> <li>• Effective load balancing</li> <li>• Improved Java application programming interfaces (APIs)</li> <li>• Updated performance analysis tools</li> </ul>





## HP-UX 11i V3 MARCH 2015 UPDATE RELEASE (CONTINUED)

<b>Virtualization</b>	<p>Improve efficiency by:</p> <ul style="list-style-type: none"> <li>• Significantly reducing memory overhead-for your large vPar and VM v6 configurations<sup>4</sup></li> <li>• Improving performance for your applications running in large Integrity VM v6 configurations<sup>5</sup></li> <li>• Ensuring your critical virtualization workloads operate on the best resources by leveraging SAN isolation to retain your I/O allocations throughout online VM migrations</li> </ul>
<b>HPE Matrix OE Capacity Advisor</b>	<p>Improve capacity planning by:</p> <ul style="list-style-type: none"> <li>• Identifying physical servers greater than five years with: old OS versions, less than 1 GB RAM, one core per socket, slow processors, old processor model strings, or old chassis serial numbers</li> <li>• Identifying physical servers with poor power consumption-to-performance ratios</li> <li>• Improving support of vPars and Integrity VM v6.2</li> </ul>
<b>Virtualization and workload management</b>	<p>Simplify management by providing:</p> <ul style="list-style-type: none"> <li>• GUI support for mobility and transformation via virtual server manager (vsmgr) (web-released July 2014)</li> <li>• Full global workload management for vPars v6</li> </ul>
<b>Proven stability</b>	
<b>Security</b>	<p>Protect against vulnerabilities, such as Heartbleed, CCS, and others, meet latest NIST requirements with more secure TLS 1.2 and 1.1 protocols, and receive the latest features such as: new ciphers (Camellia, SEED) and digests (whirlpool) with the latest security standards included in the:</p> <ul style="list-style-type: none"> <li>• Port of OpenSSL version 1.0.1j to HP-UX</li> <li>• Application conformance to latest FIPS 140-2 standards</li> </ul>
<b>Ethernet blade switch</b>	<p>Refresh your Superdome 2 infrastructure with the new HPE 6125XLG Ethernet Blade Switch (released January 2015), which:</p> <ul style="list-style-type: none"> <li>• Increases performance with: reduced latency, faster convergence times, and increased network bandwidth</li> <li>• Improves resiliency and reliability with Intelligent Resilient Framework (IRF)</li> </ul> <p>Simplifies management with HPE Intelligent Management Center and fully converged fabric support</p>
<b>Ethernet 10 GB card</b>	<p>Refresh your infrastructure with the new HPE Ethernet 10 Gb 2-port 561T Adapter for Integrity Servers (released February 2015) by:</p> <ul style="list-style-type: none"> <li>• Future-proofing your copper-based 10G RJ45 infrastructure, featuring Online/Offline Firmware upgrades (new HP-UX driver) with increased I/O performance and reduced latency</li> <li>• Utilizing unmatched features for virtualization, scalability, increased I/O performance, and reduced I/O latency</li> </ul> <p>Lowering costs and power consumption, designed for use in HPE Integrity servers</p>
<b>Long support life</b>	<p>Gain peace-of-mind with HP-UX 11i v3 and Integrity standard support extended to at least 2025</p>

## HP-UX 11i V3 MARCH/APRIL 2014 UPDATE RELEASE

<b>Available</b>	
<b>Soft reboot</b>	<ul style="list-style-type: none"> <li>• Increase uptime by reducing reboot time up to 50% via soft reboot for Integrity i4 Blade servers, also with Dynamic Root Disk support.</li> </ul>
<b>Dynamic I/O for virtualization</b>	<ul style="list-style-type: none"> <li>• Avoid reconfiguration downtime by dynamically adding I/O to virtualized workloads; and, when replacing Superdome 2 PCI I/O, dynamically replacing it in the virtualization pool.</li> </ul>
<b>Dynamic VM mobility</b>	<ul style="list-style-type: none"> <li>• Ease upgrades between Integrity i2 and i4 server families with zero-downtime, dynamic VM workload mobility.</li> </ul>
<b>Global instant capacity</b>	<ul style="list-style-type: none"> <li>• Reduce disaster recovery failover time to less than two seconds when using global instant capacity. (Delivered in WEB1312 release.)</li> </ul>
<b>Storage availability</b>	<ul style="list-style-type: none"> <li>• Enable high-availability configuration of SAS D2600/D2700 disk enclosures (JBOD) with multiple paths to the host, as well as multihost configurations with SAS multi-initiator support.</li> </ul>
<b>Auto port and link aggregation</b>	<ul style="list-style-type: none"> <li>• Increase availability with Auto Port Aggregation across different card vendors, and Active-Active aggregation across multiple switches.</li> <li>• Protect against switch failures by aggregating links on separate switches with distributed trunking.</li> </ul>
<b>C/C++</b>	<ul style="list-style-type: none"> <li>• Increase availability by hot swapping C/C++ shared libraries without system downtime.</li> </ul>
<b>Dynamic</b>	
<b>HP-UX vPars and Integrity VM v6.3</b>	<ul style="list-style-type: none"> <li>• Increase scalability for Integrity VM workloads with: 2x the virtual cores (up to 32), 2x the memory (up to 256 GB), greater storage scalability for large guests, and receive multiqueue support for VM guests.</li> <li>• Simplify management of vPar and VM transformation and vPar migration through the Virtual Server Manager graphical user interface.</li> </ul>
<b>Matrix OE Capacity Advisor</b>	<ul style="list-style-type: none"> <li>• Improve data center performance by identifying the typical 10% of VMs and servers running an infinite loop processes.</li> <li>• Simplify capacity planning by improving reports with a new CPU trend, CPU growth rate.</li> <li>• Monitor memory and I/O for virtualized workloads running within HP-UX vPars and Integrity VM v6.</li> </ul>

<sup>4</sup> Comparing HP-UX vPars and Integrity VM v6.3.5 to v6.3 through internal HPE testing, Bangalore, India, February 2015.

<sup>5</sup> For specific workloads, and based on internal micro-benchmark tests in April 2018 in HPE Bangalore, India.





## HP-UX 11i V3 MARCH/APRIL 2014 UPDATE RELEASE (CONTINUED)

<b>Matrix OE infrastructure orchestration</b>	<ul style="list-style-type: none"> <li>• Increase scalability of private cloud workloads by provisioning larger virtualized workloads running within vPars v6.</li> <li>• Strengthen security and performance of private cloud workloads by provisioning direct I/O networking support.</li> <li>• Simplify management by easing upgrade of Integrity i2 to i4 servers by managing vPars offline migration with Matrix OE.</li> </ul>
<b>Serviceguard clustering</b>	<ul style="list-style-type: none"> <li>• Increase resource flexibility to meet service-level agreements (SLAs) with improved workload balancing across a cluster.</li> <li>• Utilize HPE Serviceguard's best-fit, load-sensitive package placement to determine the target nodes with the highest remaining or least used capacity (April 2014 patch release).</li> </ul>
<b>Global instant capacity</b>	<ul style="list-style-type: none"> <li>• Improve resource flexibility by increasing the number of members allowed in a GiCAP group by 76% (from 13 to 23).</li> </ul>
<b>Unified</b>	
<b>Ignite-UX (C.7.18.63)</b>	<ul style="list-style-type: none"> <li>• Streamline deployment with easier creation of Golden Images for server clients.</li> <li>• Increase flexibility when configuring root- and data-disk groups with cold installation and archive/restore support, with Veritas File System/Volume Management 5.1 SP1 software.</li> <li>• Enhance the secure development lifecycle by supporting signature verification in a signed depot.</li> </ul>
<b>HPE OnlineJFS/Veritas File System (VxFS) 5.1 SP1</b>	<ul style="list-style-type: none"> <li>• Simplify storage management and reduce backup times with new individual file backup capability provided by Veritas File System 5.1 SP1.</li> <li>• Improve business application efficiency and transaction performance (for write-intensive applications) with new partition directory mechanism.</li> </ul>
<b>Dynamic Root Disk (A.3.13.1660)</b>	<ul style="list-style-type: none"> <li>• Increase deployment security with support for root disks that are configured and utilizing the features provided by Veritas File System/Volume Management 5.1 SP1 software.</li> </ul>
<b>Storage</b>	<ul style="list-style-type: none"> <li>• Boost flexibility by using solid-state drives in storage configurations with low latency and high input/output per second (IOPS) requirements.</li> </ul>
<b>Insight Remote Support 7.0.8</b>	<ul style="list-style-type: none"> <li>• Increase automated remote support of the Integrity i4 servers and HP-UX 11i v3 with Insight RS 7.0.8.</li> </ul>
<b>Enduring</b>	
<b>HP-UX vPars and Integrity VM</b>	<ul style="list-style-type: none"> <li>• Lasting virtualization solution for HP-UX vPars and Integrity VM v6.3 with five-year support life.</li> </ul>
<b>Glance Plus</b>	<ul style="list-style-type: none"> <li>• Enable accurate performance management and data integrity for large servers with 64-bit support for Glance Plus (April 2014 web release).</li> </ul>
<b>HP-UX kernel</b>	<ul style="list-style-type: none"> <li>• Increase flexibility for customer language preferences with localization support for the Hong Kong Character Set-2008.</li> </ul>

## HPE INTEGRITY AND HP-UX 11i V3 2-3Q 2013

<b>Dynamic</b>	
<b>Integrity Fibre Channel I/O</b>	<ul style="list-style-type: none"> <li>• Increase performance and optimization in Integrity i4 server hardware, with 2x the IOPS in high-transaction environments and 2x the bandwidth in applications requiring larger block sizes, compared to the previous generation—via HPE Integrity 16 Gb Fibre Channel Host Bus Adapters.</li> </ul>
<b>Integrity Superdome 2 i4 memory</b>	<ul style="list-style-type: none"> <li>• Increase application performance on Superdome 2 i4 servers with 2x memory capacity (8 TB) of low-voltage 16 GB DIMMs.</li> </ul>
<b>Blade port NPIV enablement</b>	<ul style="list-style-type: none"> <li>• Decrease I/O costs and increase security isolation utilizing new NPIV technology for the FlexFabric ports on HPE Integrity i4 server blades, with the newly enhanced HP-UX Fibre Channel over Ethernet driver for Emulex-based CNA (FlexFabric) embedded or Host Bus Adapters (HBAs). (October 2013).</li> </ul>
<b>CloudSystem Matrix</b>	<ul style="list-style-type: none"> <li>• Lower the cost of deploying a mission-critical private cloud with the new entry-level, two-per-socket license for the <a href="#">CloudSystem Matrix with HP-UX solution</a>. (June 2013)</li> </ul>
<b>Blade upgrades</b>	<ul style="list-style-type: none"> <li>• Easily scale up <a href="#">Integrity server blades</a> to meet growing business demands with the Integrity Blade Link 2 Upgrade Kit. (July 2013)</li> </ul>
<b>Unified</b>	
<b>Java development (third-party application)</b>	<ul style="list-style-type: none"> <li>• Improve Java development productivity for mission-critical environments with JBoss EAP 5.2 and 6.0.1 availability on HPE Integrity servers running HP-UX 11i v3.</li> </ul>
<b>Matrix OE infrastructure management</b>	<ul style="list-style-type: none"> <li>• Simplify server manageability with Matrix OE 7.2 NPIV storage orchestration and support of Integrity VM Online Migration across the whole SAN. (June 2013)</li> </ul>
<b>Integrity firmware management</b>	<ul style="list-style-type: none"> <li>• Simplify Integrity firmware updates with HPE Smart Update Manager (SUM) v6, and its updated GUI and new command line scripting.</li> </ul>



## HP-UX 11i V3 MARCH 2013 UPDATE RELEASE

### Always on

<b>High availability (single system)</b>	<ul style="list-style-type: none"> <li>Reduce planned downtime of Superdome 2 system maintenance and updates with faster soft reboot, supported by Dynamic Root Disk.</li> </ul>
<b>High availability (SAP® integration)</b>	<ul style="list-style-type: none"> <li>Increase availability with HPE Serviceguard SAP Integration and Certification with SAP NetWeaver®.</li> </ul>
<b>Disaster tolerance (storage support)</b>	<p>Simplify disaster recovery with HPE 3PAR storage:</p> <ul style="list-style-type: none"> <li>Speed deployment of Metrocluster HPE 3PAR disaster recovery solution with easy deployment.</li> <li>Ensure proper failover of Metrocluster HPE 3PAR even after cluster modifications with cluster verification.</li> <li>Increase failover capabilities for HPE 3PAR with increased Metrocluster and Continentalclusters package count.</li> </ul>
<b>Security (development)</b>	<ul style="list-style-type: none"> <li>Strengthen security with HPE Secure Development Lifecycle Code Signing for guaranteed verification of authentic HPE software.</li> </ul>
<b>Security (OpenSSL and HP-UX Directory Server)</b>	<p>Enhance your protection profile with the latest Open Secure Sockets Layer (OpenSSL A.00.09.08x):</p> <ul style="list-style-type: none"> <li>Increase security with enhancements to HP-UX Directory Server (B.08.10.04).</li> <li>Improve throughput of complex regex searches.</li> <li>Simplify usage by allowing renaming of a subtree to another parent node.</li> <li>Utilize a new configuration attribute named nsslapd-require-secure-binds, when enabled, a simple bind will only be allowed over a secure transport (SSL/TLS or a SASL privacy layer).</li> <li>Protect access based on the security strength of the connection.</li> </ul>
<b>Security (network) and performance</b>	<ul style="list-style-type: none"> <li>Prevent external attacks with improved BIND 9.7.3 security enhancements.</li> <li>Improve security and benefit from NTP v4 integration with IPv6.</li> <li>Achieve high performance of socket-based networking applications by reducing latency with SDP on InfiniBand.</li> </ul>
<b>Security (system management) (SIM 7.2 web release)</b>	<ul style="list-style-type: none"> <li>Tighten SIM security with 2x the encryption (2,048 bits) of previous versions.</li> <li>Simplify setup of SIM security authentication with configurable cyphers and proxy authenticator.</li> </ul>
<b>Security (HP 9000 Containers) (3.1.4 web release)</b>	<ul style="list-style-type: none"> <li>Transition secure HP 9000 environments: Consolidate HP 9000 servers with enhanced security onto HPE Integrity servers with new "trusted mode" support for HP 9000 Containers.</li> </ul>
<b>Dynamic</b>	
<b>Converged virtualization software (HP-UX vPars and Integrity VM v6.2)</b>	<ul style="list-style-type: none"> <li>Increase virtualization workload availability with vPars v6.2 dynamic memory reconfiguration and by doubling the VM access paths to your storage.</li> <li>Reduce costs and increase flexibility by running vPars and VMs on same server or nPartition (nPar), at same time.</li> <li>Reduce costs by flexing and sharing I/O with Emulex Fibre Channel cards that support virtualizing Fibre Channel adapters (through N-Port ID Virtualization [NPiV]).</li> </ul>
<b>File system and boot disk storage</b>	<ul style="list-style-type: none"> <li>Fully utilize the disks of HPE Integrity servers as they grow in capacity, with up to 16 TB of boot disk storage, and retain user experience of related components including Ignite-UX and Logical Volume Manager.</li> </ul>
<b>Unified</b>	
<b>System, infrastructure and CloudSystem management (Matrix OE 7.2 web release)</b>	<ul style="list-style-type: none"> <li>Enable infrastructure management of latest technologies: latest Integrity servers, N-Port ID Virtualization (NPiV), direct I/O, and performance virtualization (vPars v6).</li> </ul>
<b>Cloud Maps</b>	<ul style="list-style-type: none"> <li>Accelerate high availability app deployment via the cloud with Oracle database and Fusion middleware Cloud Maps, now featuring Serviceguard support.</li> </ul>
<b>Matrix OE capacity planning (7.2 web release)</b>	<ul style="list-style-type: none"> <li>Easily identify and plan ongoing capacity needs: predict capacity outgrowth within a specific number of weeks or months with three new queries for the Capacity Analysis Dashboard.</li> </ul>
<b>HP-UX System Fault Management</b>	<ul style="list-style-type: none"> <li>Easier troubleshooting during boot-up with monitoring and notification of IPMI events logged before boot-up is completed.</li> </ul>
<b>Deployment (Ignite-UX)</b>	<p>Simplify deployment with enhancements to Ignite-UX:</p> <ul style="list-style-type: none"> <li>Restore older Veritas File System (VxFS) Disk Layout Versions with newer versions of the file system.</li> <li>Enable volume groups configured with cluster device special files to be archived (via network/tape).</li> </ul>
<b>System management (installation)</b>	<p>Simplify installation with the mega bundle for System Management home page web applications.</p>
<b>Development tools</b>	<p>Ease application development with enhanced tools:</p> <ul style="list-style-type: none"> <li>Ease security vulnerability detection with C/C++ Code Advisor Enhancements.</li> <li>Identify memory leaks faster and analyze heap reports with C/C++ HPE Application Debugger (WDB) Enhancements.</li> <li>Support WW localization with new Asia/Europe/Africa characters supported by Unicode 6.1.</li> <li>Improve performance and memory consumption with PHP 5.4.x dynamic webpage development.</li> <li>Support latest Open Source app server with Tomcat 7.x app server.</li> </ul>



## HP-UX 11i V3 SEPTEMBER 2012 UPDATE RELEASE

### Unified

<b>Systems management</b>	<p>Reduce administrative time:</p> <ul style="list-style-type: none"> <li>• Improve performance of tools such as ioscan, with Ignite-UX and Dynamic Root Disk (DRD) now supporting agile-only Device Specific Files environments.</li> <li>• For Systems Insight Management:             <ul style="list-style-type: none"> <li>– Improve search capabilities for Federated CMS</li> <li>– Automate quiesce operations for unattended backups</li> <li>– Enable selective suspend/discovery of virtual machines</li> </ul> </li> </ul>
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### Always on

<b>High availability (database support)</b>	Increase high availability by protecting the latest IBM DB2 10.1 and EnterpriseDB PPAS 9.1 versions with HPE Serviceguard Enterprise Cluster Master Toolkit (ECMT).
<b>Disaster tolerance (storage support)</b>	Avoid data loss and help minimize recovery time when using HPE 3PAR Remote Copy with HPE Serviceguard Metrocluster (utilizing [periodic] asynchronous replication and automatic failover).
<b>Security (performance)</b>	<p>Speed security processing:</p> <ul style="list-style-type: none"> <li>• Double the IPFilter performance vs. (previous HP-UX 11i v3 versions).<sup>6</sup></li> <li>• Improve the AAA server detection speed (up to 10 times) by consolidating similar threats across various instances per server (with a common log file).<sup>7</sup></li> </ul>

<b>Security (enhancements and latest updates)</b>	<p>Fortify your environment:</p> <ul style="list-style-type: none"> <li>• Reduce identity breakthrough for SIM with two-factor authentication.</li> <li>• Reduce vulnerabilities and defects: with the latest Secure Shell (SSH) and Open Secure Sockets Layer (OpenSSL).</li> <li>• Enable AAA server one-time password authentication to support the popular Protected Extensible Authentication Protocol.</li> <li>• Improve security key strength with IPsec support for DH Group 24.</li> <li>• Gain cross-platform directory integration: for HPE Directory Server.</li> <li>• Utilize quick “start”/“stop” confirmation button for HP-UX Containers.<sup>8</sup></li> </ul>
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### Dynamic

<b>HP-UX vPars and Integrity VM v6.1.5</b>	<p><b>Increase virtualization I/O efficiency</b>—Increase scalability of virtualized Fibre Channel, with N-Port ID Virtualization, by:</p> <ul style="list-style-type: none"> <li>• Doubling the virtual ports to be created per physical Fibre Channel port (to 32).</li> <li>• Improving network throughput performance when combining Auto Port Aggregation with direct I/O.</li> <li>• Extending flexibility of network switches during VM migration.</li> </ul> <p><b>Ease deployment with factory integration option</b>—With this option (available for all Integrity servers in current production), the virtualization server platform is installed, which is then customized by the customer to provide VM or vPars as required. You can order factory integration with the HP-UX 11i v3 VSE-OE and DC-OE media, or with the standalone HP-UX vPars and Integrity VM v6.1 product (BBO68AA).</p>
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<b>Matrix OE Capacity Advisor</b>	<p>Accelerate performance debugging and capacity planning:</p> <ul style="list-style-type: none"> <li>• Reduce the time for debugging performance problems with up-to-date utilization information retrieved in about half the time.<sup>9</sup></li> <li>• Easily reduce IT spend by a few % by identifying idle hardware with monthly viewing of the new capacity analysis tab.<sup>10</sup></li> </ul>
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<b>Matrix OE Global Workload Manager (gWLM)</b>	<p>Simplify workload management, with Global Workload Manager support for:</p> <ul style="list-style-type: none"> <li>• HP-UX vPars v5 with the Microsoft Windows Central Management Station.</li> <li>• HP-UX vPars and Integrity VM v6.</li> </ul>
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### Enduring

<b>Development tools</b>	<p>Extend development tool support:</p> <ul style="list-style-type: none"> <li>• Support standard compliance with C/C++11 and improve GNU compatibility.</li> <li>• Include Java 7.0 in the HP-UX 11i v3 operating environment.</li> </ul>
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<b>Legacy OS support</b>	<p>Continue support for legacy HP-UX 11i v2 applications:</p> <ul style="list-style-type: none"> <li>• Support HP-UX 11i v2 guests within HPE Integrity VM v6.1.5.</li> </ul>
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<sup>6</sup> HP-UX Security Lab testing, August 2012.

<sup>7</sup> For specific workloads, and based on internal micro-benchmark tests in April 2018 in HPE Bangalore, India.

<sup>8</sup> Formerly HP-UX Secure Resource Partitions.

<sup>9</sup> ISS Manageability Lab estimate, May 2012.

<sup>10</sup> ISS Manageability Lab estimate, based on customer discussions, May 2012.



## HP-UX 11i V3 MARCH 2012 UPDATE RELEASE

### Always on

#### Database enablement

- Enable mission-critical deployments of EnterpriseDB Postgres Plus Advanced Server (PPAS) high availability at a lower cost.
  - Reduce need for custom scripts on EnterpriseDB (PPAS).
  - Easily integrate EnterpriseDB into a Serviceguard cluster.
  - Faster deployment HA-protected configurations for high availability.
- 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 high availability

- Improve uptime in virtualized environments.
  - Easily configure Serviceguard clusters to support vPars v6 failover.
  - Quickly deploy vPars/Integrity VM 6.1 with Serviceguard toolkit.

#### Storage enablement

- Extend mission-critical high availability to lower cost storage.
  - Lower costs and configure mission-critical applications using iSCSI shared storage on HPE P4000 G2 SAN storage devices with HPE Serviceguard.
  - Simplify cluster management and support single instance database using HPE Serviceguard ECMT.

### Dynamic

#### 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 NPIV of Fibre Channel host adapters.
  - 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 adapters—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 multitenancy environments.

### Enduring

#### I/O

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

## HP-UX 11i V3 NOVEMBER/DECEMBER 2011

Increase server uptime, flexibility, and efficiency with strategic enhancements, provided in: firmware, web, patch, and solution updates.

### Dynamic

#### HPE Integrity Superdome 2 dynamic enhancements

- Increase server uptime and flexibility by dynamically flexing Integrity Superdome 2 processor cores between HP-UX vPars v5.
- Reduce costs, mitigate risks, and improve utilization dynamically activate and deactivate reserve capacity (HPE 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 HPE gWLM, 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 11i V3 NOVEMBER/DECEMBER 2011 (CONTINUED)

<b>HP-UX vPars v6 (for Integrity blades)</b>	<p>Via November 2011 web release:</p> <ul style="list-style-type: none"> <li>• Extend highly scalable virtualization to Integrity blades; reduce costs by providing greater virtualization scalability, performance, and more efficient resource utilization.</li> <li>• 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.</li> </ul>
<b>HPE VirtualSystem for Integrity Superdome 2/HP-UX</b>	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.
<b>Enduring</b>	
<b>Java 7</b>	<ul style="list-style-type: none"> <li>• Java 7 is now optimized for HP-UX for a robust platform for mission-critical applications.</li> <li>• Protect your investment in Java applications, supporting the next generation of Java technologies.</li> <li>• Gain substantial performance increase on the Java Virtual Machine using support for dynamic languages.</li> <li>• HPjmeter software is optimized for Java 7 to identify and diagnose performance problems in Java applications.</li> </ul>

## HP-UX 11i V3 SEPTEMBER 2011 UPDATE RELEASE

<b>Unified</b>	
<b>File systems</b>	Increase performance for file systems mounted on HPE Logical Volume Manager (LVM) volumes with OnlineJFS file system version 5.0.1—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.
<b>System management</b>	<p>Ease installation with web-based enterprise management (WBEM) provider Mega Bundle application deployer.</p> <p>Ease software development with updates to C/C++ compiler and HPjmeter (Java performance optimizer).</p>
<b>Always on</b>	
<b>High availability and disaster recovery (HPE Serviceguard)</b>	<ul style="list-style-type: none"> <li>• Increase availability of IBM DB2 High Availability Disaster Recovery replication with Serviceguard by using HPE Serviceguard Toolkit for Database Replication Solutions.</li> <li>• Increase availability of HPE 3PAR Storage Array data with new HPE Serviceguard Metrocluster and Continentalclusters disaster recovery for HPE 3PAR, with synchronous data replication and automated failover.</li> </ul>
<b>High availability (HPE Serviceguard Extension for SAP—SGeSAP)</b>	<p>Increase availability:</p> <ul style="list-style-type: none"> <li>• SGeSAP supports “easy deployment” of SAP applications.</li> <li>• Keep SAP highly available with SAP Web Dispatcher integration.</li> <li>• Simplify SAP deployment using Serviceguard Manager.</li> <li>• Enable failover success using SAP cluster verification.</li> <li>• Reduce Oracle licenses with SGeSAP and workload containers.</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>• Increase data security with the latest cryptographic libraries and an encrypted network in the latest Open Source versions of SSH and OpenSSL (OpenSSL 0.9.8q and OpenSSH 5.8).</li> <li>• Reduce security threats with updated security definitions within OpenSSH, Bastille, and IPFilter.</li> <li>• Increase the robustness and isolation of HP-UX Containers by adding auditing and HP-UX Host Intrusion Detection System.</li> </ul>
<b>Dynamic</b>	
<b>Infrastructure management</b>	<p>Increase your benefits from private cloud today with HPE Matrix Operating Environment 6.3—now included in the HP-UX 11i v3 VSE-OE:</p> <ul style="list-style-type: none"> <li>• Enable an existing Matrix OE environment to also manage virtual machines from an Integrity Superdome 2 environment with HPE Expanded Matrix Conversion Services.</li> <li>• Increase scalability and simplify management for large, diverse sets of cloud users in multitenancy environments.</li> <li>• Simplify storage management with HPE 3PAR storage integration.</li> <li>• Manage utilization of multi-initiator NPIV.</li> </ul>
<b>HP-UX Containers</b>	<p>3.0 (now provided within all OEs) increases isolation and control:</p> <ul style="list-style-type: none"> <li>• Enable consolidation of multiple private environments within an HP-UX instance with new system containers.</li> <li>• Gain control with per-container administrator domains.</li> <li>• Gain enhanced compliance with force-to-wire capability, which sends networking to the wire if external monitoring or auditing is required.</li> </ul> <p>3.1 (now web released) simplifies container manageability:</p> <ul style="list-style-type: none"> <li>• Easily update HP-UX in a container environment.</li> <li>• Replicate containers for faster setup of new containers.</li> </ul>
<b>Enduring</b>	
<b>Networking (HPE X.25)</b>	Enable legacy X.25 software applications to run unchanged on HPE Integrity servers over TCP/IP on Ethernet hardware.
<b>HP 9000 Containers</b>	Leverage the power of Integrity servers by consolidating multiple HP 9000 environments onto a single Integrity server.



## HP-UX 11i V3 MARCH 2011 UPDATE RELEASE

### Dynamic

<b>Infrastructure management</b>	<p>Increase your benefits from private cloud with Matrix Operating Environment 6.3—available in an April 2011 web release:</p> <ul style="list-style-type: none"> <li>• Increase provision scalability up to 3,200 nodes (with Federated CMS).</li> <li>• Manage any VM host as part of the HPE CloudSystem Matrix resource pool (with HPE CloudSystem Matrix Extended Infrastructure).</li> <li>• Convert existing HPE BladeSystem hardware into Matrix-managed nodes (with HPE CloudSystem Matrix Conversion Services).</li> <li>• Simplify storage management with new HPE 3PAR storage integration.</li> <li>• Reduce costs by managing utilization of multi-initiator NPIV.</li> </ul>
<b>HPE Integrity Virtual Machines</b>	<p>Version 4.3:</p> <ul style="list-style-type: none"> <li>• Double the virtual machine size,<sup>11</sup> supporting larger mission-critical workloads, with up to 16 virtual cores, 128 gigabytes of memory, and 256 HPE Integrity virtual machine.</li> <li>• Accelerated Virtual I/O (AVIO) storage LUNs.</li> <li>• Reduce management costs with new administrative capabilities.</li> <li>• Quickly manage VM guests wherever they are running with virtual HPE iLO Remote Console, which provides a specific IP address for each guest console.</li> </ul> <p>This helps to:</p> <ul style="list-style-type: none"> <li>• Reduce costs and enable network-attached storage with shared NFS storage.</li> <li>• Automate deployment with a new tool, which edits Extensible Firmware Interface variables for guest virtual firmware from within a VM host.</li> </ul>
<b>HP-UX Containers 3.0</b>	<p>HP-UX Containers 3.0 increases isolation and control in an April 2011 web release; new system containers:</p> <ul style="list-style-type: none"> <li>• Enable consolidation of multiple private environments within an HP-UX instance.</li> <li>• Gain control with per-container administrator domains.</li> <li>• Gain enhanced compliance with force-to-wire capability, which sends networking to the wire if external monitoring or auditing is required.</li> </ul>
<b>Always on</b>	
<b>HPE Serviceguard</b>	<p>A.11.20 Patch A enhancements (released in April 2011):</p> <ul style="list-style-type: none"> <li>• Simplify and increase availability with robust replication capabilities of the HPE 3 Data Center solution.</li> <li>• Ease deployment with command line and graphical user interfaces in HPE Serviceguard Manager.</li> <li>• Increase serviceability and manageability with manual site switching to further reduce downtime and to validate a cluster configuration.</li> <li>• Increase integration and modularity with simple configuration for partner products.</li> </ul>
<b>HPE Serviceguard Extension for Real Application Clusters (SGeRAC)</b>	<p>Now bundled into the HP-UX 11i v3 HA-OE and HP-UX 11i v3 DC-OE with no additional cost for licensing or support.</p>
<b>HPE SGeSAP</b>	<p>Licensing now made consistent with Integrity servers—with per-socket, tiered pricing.</p>
<b>HPE Serviceguard Storage Management Suite (SMS)</b>	<p>Simplify suites, with or without a cluster file system:</p> <ul style="list-style-type: none"> <li>• One suite is now targeted for single-instance Oracle customers.</li> <li>• The other suite is targeted for Oracle RAC customers (with the cluster file system). Customers with Serviceguard SMS can be migrated to a higher-level bundle.</li> </ul>
<b>Security</b>	<p>HP-UX 11i v3 introduces a new capability called HP-UX Whitelisting, which:</p> <ul style="list-style-type: none"> <li>• Protects all critical system files from being modified.</li> <li>• Enables only authorized applications to access protected files and data.</li> <li>• Simplifies certification efforts like PCI Data Security Standard (PCI-DSS).</li> <li>• Seamlessly integrates into current environments: HPE Serviceguard clusters, HPE Data Protector, and Symantec.</li> <li>• The SSLCipherSuite, which specifies the suite of encryption ciphers that the server uses to make communications more secure, is now customizable.</li> </ul>
<b>Unified</b>	
<b>System management</b>	<ul style="list-style-type: none"> <li>• DRD now synchronizes volume characteristics, reducing the length of planned downtime.</li> <li>• HPE SMH is now more efficient—you no longer need to refresh your screen to see issues; status icons are auto-refreshed.</li> </ul>
<b>Application development</b>	<ul style="list-style-type: none"> <li>• Performance analysis is improved: pinpoint problems more efficiently and exactly with HPE Caliper 5.3.</li> <li>• Reduce troubleshooting time with the improved, central WBEM Assist Utility.</li> </ul>

<sup>11</sup> While Integrity Virtual Machines 4.2 has a maximum of eight processor cores, version 4.3 has a maximum of 16 processor cores.



## HP-UX 11i V3 SEPTEMBER 2010 UPDATE RELEASE

### Unified

#### 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 of more than 4.5 times to infrastructure reliability.<sup>12</sup>
- Scale up with HPE Integrity Superdome 2 Crossbar Fabric featuring fault tolerance in 100 chipset datapaths.<sup>13</sup>
- Improve performance by up to four times and pay an entry price that is up to 40% lower.<sup>14</sup>
- Take advantage of the new bladed HPE Integrity Superdome 2, including 100 mission-critical innovations that make it more reliable, affordable, and flexible than ever before.

### Always on

#### HPE Serviceguard Extension for Oracle E-Business Suite (SGeEBS)

- Reduce the time and the cost of clustering Oracle E-Business Suite by 93%<sup>15</sup> with the new HPE SGeEBS.
- Reduce 12 hours of planned downtime a month for Oracle E-Business Suite maintenance.<sup>16</sup>
- Enhance resource utilization and reduce costs by integrating with HPE Matrix Operating Environment software.
- Scale easily with full support for disaster recovery.

#### HPE Serviceguard Toolkit for Oracle Data Guard

- Manage databases with high availability and zero custom coding.
- Integrate HPE Serviceguard and Oracle Data Guard to achieve high availability 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%<sup>17</sup> for multi-instance applications such as Oracle RAC, SAP, and cluster file systems.
- Restart multinode packages simultaneously instead of sequentially.

### Dynamic

#### 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.

#### HPE 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 HPE Integrity Superdome 2 server that is running HP-UX 11i v3.

#### HP-UX Porting Kit

Port AIX to HP-UX 80% faster<sup>18</sup> 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% against manual processes,<sup>19</sup> and achieve 90%-95% automation<sup>20</sup>—all with a completely free, fully supported product from HPE.

<sup>12</sup> Based on 2010 testing on mean time between failures in HPE BCS Hardware and Systems Technology with analysis of hardware crash rates, comparing the previous generation of Integrity Superdome with Integrity Superdome 2.

<sup>13</sup> Based on 2010 analysis by Hewlett Packard Labs, referring to Integrity Superdome 2 Crossbar Fabric. All datapaths within the chipset are fault tolerant, with end-to-end retry and rerouting.

<sup>14</sup> HPE performance engineering 2010 testing.

<sup>15</sup> Comparison of time to configure storage and package using the previous release and the new Serviceguard Manager easy package storage enhancement (as of testing by HPE Availability Clusters Solutions Lab [ACSL], 2010).

<sup>16</sup> Maintenance outages usually take 3–12 hours and may require scheduling planned downtime as frequently as every month (according to information provided by Oracle, 2010).

<sup>17</sup> HPE ACSL 2010 comparison of Serviceguard 11.19 with Serviceguard 11.20.

<sup>18</sup> Based on HPE experience with the Solaris to HP-UX Porting Kit (SHPK) and customer testimonials (as of 2010), such as from a large European logistics provider that automated about 90% 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.

<sup>19</sup> The European logistics provider estimated (in 2010) four to five months of porting effort and was able to complete the porting in four to five weeks by using SHPK. We expect similar benefits from AHPK when porting AIX code.

<sup>20</sup> Based on 2010 SHPK experience and testimonials.





## HP-UX 11i V3 MARCH 2010 UPDATE RELEASE

### Unified

- HP-UX Software Assistant (SWA)**
- Faster and more options in generating reports with SWA.
  - Patch flagging in SWA clearly explains why patches are recommended.

- HPE Caliper** Caliper with ktracer delivers improved reliability, expanded support, and ease of use.

### Always on

#### Security

- The first commercial UNIX to be successfully evaluated against the new commercial Common Criteria.
- Commercial off-the-shelf 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.
- HPE 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

- HPE Integrity Virtual Machines 4.2**
- Delivers automatic memory reallocation.
  - Lvmmove command for Linux® 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 SLAs with memory entitlements, which are part of HPE 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 HPE Matrix Operating Environment Suite) and AVIO.
  - Drivers are now bundled with Integrity Virtual Machines OpenVMS guest support and are integrated with HPE 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.

### Enduring

- Enhancements**
- Latest standards for Java, C++, and Fortran improve quality and speed porting to HP-UX 11i.

### Unified

- 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 nPars.

- 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**
- HPE 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 high availability, VSE, and DC-OEs.
  - Compared to the prior release, the new VxFS Lite performance, as a % of raw disk performance, is more than double, up from about 10%-15% to 30%-50%. VxFS Full more than doubles I/O performance also, up from 30%-50% to 80%-99% of raw disk performance.

- HPE 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.

- HPE Systems Insight Manager 5.3** Update 1 increases management scope with:
- The ability to monitor and manage HPE ProLiant G6 servers.
  - Support for HPE 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.
  - IBX400 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.



## HP-UX 11i V3 MARCH 2010 UPDATE RELEASE (CONTINUED)

### Always on

<b>HPE Serviceguard Manager</b>	<ul style="list-style-type: none"> <li>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 HPE Serviceguard ECMT, SGeRAC, Metrocluster, and built-in log viewers for faster troubleshooting.</li> <li>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.</li> <li>Auto Port Aggregation (APA) support. HPE Serviceguard SMS Suite provides support for APA as a cluster heartbeat, online changes to cluster configuration, and automatic resynchronization between cluster nodes.</li> </ul>
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### Security

- HPE 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.
- HPE 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.
- The disk scrub capability with mediainit now includes the ability to validate the scrubbed data written during the last pass of the disk scrub.

### HP-UX SWA

- Scales further to enable security bulletin analysis and patch maintenance for more systems in a single view when integrated with HPE 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.

## HP-UX 11i V3 SEPTEMBER 2009 UPDATE RELEASE

### Dynamic

<b>Online package maintenance mode</b>	Package can be put into a partially started state for maintenance purposes.
<b>Dynamic Root Disk</b>	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 if needed.
<b>Cluster-aware SAN congestion control</b>	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.
<b>HPE Logical Volume Manager and MirrorDisk/UX</b>	Multinode online reconfiguration is available for SGeRAC clusters; vgmove can move LVM volume groups (VGs) 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.

### Enduring

<b>Enhancements</b>	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.
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## HP-UX 11i V3 APRIL 2009 UPDATE RELEASE

### Unified

<b>Memory file system</b>	Doubles the performance of temporary file operations in memory, compared to v2.
<b>System management</b>	Includes SMH setup wizards and graphical icon views.
<b>HPjmeter 4.0</b>	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.
<b>HPE Wildebeest Debugger</b>	New release for core file, thread, and memory debugging, with expanded control and increased performance.
<b>HPE Caliper 5.1</b>	Delivers simpler performance analysis, richer reports, and more efficient storage of the results.
<b>HP 9000 servers</b>	Cross-development environment on Integrity servers for development of applications for HP 9000 systems.
<b>HPE Mixed Mode Translator</b>	<ul style="list-style-type: none"> <li>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.</li> <li>All HP 9000 applications can run on Integrity servers with HP-UX 11i using the HPE ARIES Dynamic Binary Translator, a long-proven tool supported by HPE.</li> </ul>



## HP-UX 11i V3 APRIL 2009 UPDATE RELEASE (CONTINUED)

### Always on

#### HPE Serviceguard 11.19

- Eighty-three percent faster failover; significant reduction of planned downtime associated with cluster maintenance and configuration.
- 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 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 delivers more virtualization integration, tool tips, and cluster wizards to reduce the time and expertise required for cluster setup and maintenance.

#### HPE MirrorDisk/UX

- Increase data and application protection through greater redundancy.
- The number of mirror copies increased from three to six.
- Concurrent clustered node access to mirrors increased from two 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 two to four.

### Dynamic

#### HPE Logical Volume Manager

- Reduce downtime when making a provisioning change to volumes when your requirements grow or shrink.
- Improve performance up to 88% in volume group scan and import operations.
- Upgrade L1 volume group layouts in place of 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% 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.

### Enduring

#### Enhancements

- New controls to reduce active processor energy use:
  - Go green with the HP-UX 11i 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 RELEASE

- 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 RELEASE

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- Expanded OE integration
  - Enhanced regulatory compliance and data encryption
  - Simplified blade management
  - Comprehensive capacity planning
  - Cluster-wide file system and volume management
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## HP-UX 11I V3 SEPTEMBER 2007 UPDATE RELEASE

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- 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)

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- OS performance improvement of around 30%
  - 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
  - In-depth security protection that is easier to deploy
  - Memory migration included in virtualization
  - Accelerated deployment with reference architectures
- 

## BECAUSE YOUR BUSINESS IS ALWAYS ON

To support your most vital workloads, [HPE Integrity](#) and [HP-UX](#) have been engineered to provide business continuity. For more than three decades, HPE has been consistently delivering mission-critical availability and proven stability, plus predictable real-world performance to core business functions and applications. That's a good reason why HPE Integrity and HP-UX provide a robust platform that ensures your business is always on, and delivers the foundational values for mission-critical compute.



## LEVERAGE THE VALUE OF THE LATEST HP-UX 11i V3 RELEASES TODAY

Featuring the latest Intel Itanium 9700 processor, HPE Integrity servers running HP-UX—from blades to Superdome 2 servers—offer considerable performance improvements over its predecessors. What's more, you can avoid needing to do major upgrades, since the ongoing web and media releases can be easily added on to your environment without the need to re-certify the operating system or other applications.

For more general information about HP-UX 11i v3, please see the brochure stay always on: [HPE Integrity servers and HP-UX 11i v3](#).

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