HP OpenVMS Technical Update and Roadmaps

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Hewlett Packard Company

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Agenda

- OpenVMS Roadmap Highlights
- OpenVMS Promotion Activities
- HP Support Policies
- Version 8.3 Technical Update
- OpenVMS Technical Futures
HP Integrity Servers: OpenVMS Madison9 support

New rx2620
Office Friendly Conversion kit

rx1620
1u
2P/2C
OpenVMS V8.2, V8.2-1, V8.3

rx2620
2u,
2P/2C
OpenVMS V8.2, V8.2-1, V8.3

rx4640
4u
4P/4C or with MX2 8P/8C
OpenVMS V8.2, V8.2-1, V8.3

rx7620
9u
2 cell (8P/8C) OpenVMS V8.2-1, V8.3

rx8620
17u
4 cell (16P/16C) OpenVMS V8.2-1, V8.3

Superdome
Max 4 cell
(16P/16C) partition
OpenVMS V8.2-1, V8.3

OpenVMS supports the sx1000 chip set with only MAD9 processors on the rx7620, rx8620 and Superdome.

New rx2620
Office Friendly Conversion kit

rx2620
2u,
2P/2C
OpenVMS V8.2, V8.2-1, V8.3

rx4640
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OpenVMS supports the sx1000 chip set with only MAD9 processors on the rx7620, rx8620 and Superdome.
HP AlphaServer Roadmap

<table>
<thead>
<tr>
<th>System</th>
<th>CPU</th>
<th>Memory Options</th>
<th>Storage Options</th>
<th>Network Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS1280</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>ES80/ES47</td>
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<tr>
<td>ES45</td>
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<tr>
<td>DS25</td>
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<tr>
<td>DS15</td>
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</tr>
</tbody>
</table>

Support at least through 2011

Subject to change without notice
License Trade In Rules to Integrity

- License transfer from AlphaServer or VAX
  - Services contract (with license to use)
    - Even swap at no charge for “equivalent product”
    - Parallel usage for a set period
    - Must purchase at least one year of support
  - No services contract
    - 60% discount on new license price
    - Parallel usage for a set period
    - Must purchase at least one year of support
New Montecito Processor Systems

HP Integrity Servers: OpenVMS V8.3 Montecito support

- rx4640 4u, 4P/8C
  - OpenVMS V8.3
- rx7640 9u
  - 2 cell (8P/16C)
  - OpenVMS V8.3
- rx8640 17u
  - 4 cell (16P/32C)
  - OpenVMS V8.3

OpenVMS supports the sx2000 chip with only Montecito processors rx7640, rx8640 and Superdome.

- rx2660 2u, 2P/4C
  - OpenVMS V8.3+
- rx3600 4u, 4P/8C
  - OpenVMS V8.3+
- rx6600 7u, 4P/8C
  - OpenVMS V8.3+
- rx7640 9u
  - 2 cell (8P/16C)
  - OpenVMS V8.3
- rx8640 17u
  - 4 cell (16P/32C)
  - OpenVMS V8.3

Superdome Max 4 cell (16P/32C) partition

- rx2620 2u, 2P/4C
  - OpenVMS V8.3
- rx4640 4u, 4P/8C
  - OpenVMS V8.3

System board upgrade

- H107 low cost server

- rx3600 4u
  - 2P/4C
  - OpenVMS V8.3+

Processor upgrade

- rx4640 4u, 4P/8C
  - OpenVMS V8.3
Configuration Equivalent: High End Alpha to Integrity Mid-range (Montecito)

Alpha server GS1280
- Full Cab
- 16 Alpha CPUs
- EV7 1.15GHz/1.75MB
- 128 GB memory

Integrity Server: rx7640
- 9u
- 2 cell (8 Processors/16 Cores)
- Montecito 1.6 GHz/18MB
- 128 GB memory

Free O/S License transfer
Configuration Equivalent: Mid-Range Alpha to Integrity Entry-class (Montecito)

AlphaServer ES47
4u
4 Alpha CPUs
EV7 1.15GHz/16MB
32 GB memory
5 PCIX slots

Integrity Server rx3600
4u
(2 Processors/4 Cores)
1.6 GHz/18MB Cache
48 GB memory
8 PCIX slots

Free O/S License transfer
OpenVMS Clusters Facilitate Integrity Adoption

NOTE: Support for VAX and Integrity mixed environment is supported for migration purposes only.
**OpenVMS V8.3**
*General Availability:*
H2 2006

Platform: Alpha and Integrity

- Dual-core Intel® Itanium®2 processor support
- rx2620 & rx4640 upgrades
- VLAN support
- Performance & Scalability enhancements
- Industry Standards: Web Services, Java, Security, UNIX/Linux interoperability
- Virtualization: iCAP, TiCAP and PPU

**OpenVMS V8.3-1H1**
*General Availability:*
H2 2007
Platform: Integrity only

- HP c-Class Integrity Blades support
- Dual-core Intel® Itanium® 2 processor upgrades
- New I/O option support (PCI Express)

**OpenVMS V8.4**
*General Availability:*
2008
Platform: Alpha and Integrity

- Storage performance and connectivity
- Performance & Scalability enhancements
- Industry Standards: Security, Integration software, Web Services, Java, UNIX/Linux Interoperability
- Virtualization: VSE Manager

**OpenVMS V8.n**
*General Availability:*
+18-24 months
Platform: Alpha and Integrity

- New Integrity systems
- Industry standards
- Performance & Scalability enhancements
- Virtualization

**OpenVMS releases continue...**

- HPVM – HP Integrity Virtual Machine
OpenVMS Virtual Server Environment Virtualization Roadmap

2006
• Global Workload Manager V1.1, Integrity and Alpha

2007
• PPU – Pay Per Use V8.0 Active CPU & Percent CPU, both with OpenVMS 8.3
• iCAP - Instant Capacity V8.0 and TiCAP with OpenVMS 8.3

2008
• GiCAP - Global Instant Capacity V8.0
• VSE Manager - Capacity Advisor, Virtual Machine Manager, Visualization (Vman), GiCAP Mgmt
• VSE Management Server on Windows, HP-UX and Linux

2009
• HPVM – HP Virtual Machine V3 on Montecito chipset
OpenVMS Storage HW Roadmap

**General Storage Support**
- U320 RAID (SmartArray) (Alpha and Integrity – Now Supported)
- 4gb FC (Integrity Server Only, H2 2006) (Ships with OpenVMS V8.3)
- iSCSI (Integrity Only, Software w/existing LAN) (Post V8.3)

**Tape Library/Drive Support by OpenVMS** (not necessarily backup applications)
- Ongoing support - MSL, ESL/eSeries (Including partitioning support), VLS, EML Libraries
  - Support of LTO2, LTO3, and SDLTx drives in these libraries
- 1/8 Autoloader Support (direct-attach only, Alpha and Integrity)

**XP Storage Family (Alpha and Integrity)**
- Support of XP12000/XP10000 (Now Supported!)
- Enhanced XP CA Support (ongoing)

**EVA Storage Family (Alpha and Integrity)**
- EVA 4000/6000/8000 (Now Supported!)
- Enhanced EVA CA support (2007)

**HSG80 Support (Alpha and Integrity)**
- Support for ACS 8.8x final firmware update

**MSA Storage Family (Alpha and Integrity)**
- MSA1500 Q2 2006
Operating environments for OpenVMS on HP Integrity servers

OpenVMS I64 Mission Critical Operating Environment (MCOE)

OpenVMS I64 Enterprise Operating Environment (EOE)

OpenVMS I64 Foundation Operating Environment (FOE)
- OpenVMS Operating System
- OpenVMS Unlimited User Licensing
- CDSA
- DCE RPC Runtime
- DECnet-Plus for OpenVMS End System
- DECnet IV
- DECprint Supervisor (DCPS)
- DECwindows Motif for OpenVMS
- Distributed NetBeans, including plugins for C/C++, Fortran, EDT keypad, and CMS
- Enterprise Directory
- Java™ Platform, Standard Edition, Development Kit (JDK)
- Kerberos
- NetBeans IDE, including plugins for C/C++, Fortran, EDT keypad, and CMS
- Performance Data Collector
- Secure Web Server (SWS) (based on Apache server), including Tomcat, mod_PHP, mod_Perl, and Perl
- Secure Web Browser (SWB) (based on Mozilla)
- Simple Object Access Protocol (SOAP) Toolkit (based on Apache Axis)
- Secure Socket Layer (SSL) (based on OpenSSL)
- TCP/IP Services for OpenVMS
- Universal Description, Discovery, and Integration (UDDI) Client Toolkit (based on UDDI4J)
- (Web) Management Agents (for operation with HP Systems Insight Manager)
- Web Based Enterprise Management (WBEM)
- XML Technology (based on Apache Xerces and Xalan)

Add to Foundation:
- RMS Journaling
- VolumeShadowing
- DECram
- OpenVMS Management Station
- Availability Manager

Add to Enterprise:
- OpenVMS Clusters
- OpenVMS RTR Backend

Easier to order
Easier license management
Straight forward installation of OE’s from a single DVD
Simpler support contracts ➔ higher customer satisfaction

One DVD media for all 3 OE’s

Subject to change
## OpenVMS Integrity Operating Environment

Per-processor Core License (PCL) Pricing

<table>
<thead>
<tr>
<th>Tier 1 - up to 2 socket systems</th>
<th>US$ List Price</th>
<th>PCL Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation OE</td>
<td></td>
<td>$895</td>
</tr>
<tr>
<td>Enterprise OE</td>
<td></td>
<td>$6,160</td>
</tr>
<tr>
<td>Mission Critical OE</td>
<td></td>
<td>$10,410</td>
</tr>
</tbody>
</table>

| Tier 2 - 2 to 4 socket systems  |               | $1,195   |
| Foundation OE                   |               | $6,160   |
| Enterprise OE                   |               | $10,410  |
| Mission Critical OE             |               | $10,410  |

| Tier 3 - unlimited socket systems|               | $2,970   |
| Foundation OE                   |               | $7,940   |
| Enterprise OE                   |               | $12,170  |
| Mission Critical OE             |               | $12,170  |

Operating Environments (OE’s) are sold per core. One OE license is required per active core.
OpenVMS Integrity Layered Product Phase Rollout Plan

<table>
<thead>
<tr>
<th>Available Now!</th>
<th>2006</th>
<th>Not Porting</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Compilers:</td>
<td>• ACMS (including TP Web &amp; TP Desktop Connectors)</td>
<td>• Advanced Server</td>
</tr>
<tr>
<td>• BASIC</td>
<td>• BaseStar Family</td>
<td>• Storage Library System (SLS)</td>
</tr>
<tr>
<td>• C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• C++</td>
<td>• BASEstar Open Server</td>
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<tr>
<td>• COBOL</td>
<td></td>
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</tr>
<tr>
<td>• Fortran</td>
<td>• Omni API</td>
<td></td>
</tr>
<tr>
<td>• Pascal</td>
<td>• Omni MMS</td>
<td></td>
</tr>
<tr>
<td>• DECset tools</td>
<td>• DECoasp/H1</td>
<td></td>
</tr>
<tr>
<td>• DCE</td>
<td>• DECoasp/AP</td>
<td></td>
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<tr>
<td>• DQS</td>
<td>• Siemens S7</td>
<td></td>
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<tr>
<td>• FMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• OpenView OVO Agent</td>
<td></td>
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<tr>
<td>• RAID Software</td>
<td></td>
<td></td>
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<tr>
<td>• Archive Backup System</td>
<td></td>
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<tr>
<td>• Data Cartridge Server</td>
<td></td>
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<tr>
<td>• Disk File Optimizer</td>
<td></td>
<td></td>
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<tr>
<td>• Hierarchical Storage Manager</td>
<td></td>
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<tr>
<td>• Media Robot Utility</td>
<td></td>
<td></td>
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<tr>
<td>• Reliable Transaction Router</td>
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<td></td>
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<tr>
<td>• Save Set Manager</td>
<td></td>
<td></td>
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<tr>
<td>• X.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• HP OpenVMS Migration Software</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

November 13, 2006
OpenVMS IBM SNA Solutions

Support for HP OpenVMS SNA product set on OpenVMS Version 8.2 Alpha available now

IBM SNA product port to Integrity
Supporting OpenVMS V8.2-1 November CY2006
- HP SNA 3270 Terminal Emulator for OpenVMS
- HP SNA Remote Job Entry for OpenVMS
- HP SNA Application Programming Interface for OpenVMS
- HP SNA 3270 Data Stream Programming Interface for OpenVMS
- HP SNA APPC/LU6.2 Programming Interface for OpenVMS
- HP SNA Printer Emulator for OpenVMS
- HP SNA Data Transfer Facility "Client & Server" for OpenVMS

Support for HP OpenVMS SNA product set on OpenVMS V8.3 H2 2006
File/Print Servers & Common Internet File System (CIFS) - Samba

- **Advanced Server V7.3a ECO4 for OpenVMS V8.2 Alpha – Available Now!**
- **Advanced Server V7.3”n” OpenVMS V8.3 Alpha – H2 CY2006**
- **Common Internet File System (CIFS) Evaluation Release (Based on Samba V3) available now for both Integrity & Alpha**
- **CIFS Production release (Based on Samba V3) Alpha & Integrity H2 2006**
- **CIFS V.Next Based on Samba V4**
- **PATHWORKS for OpenVMS V6.1**
  - Support for OpenVMS V7.3-2 release
  - No Integrity support planned
- **PATHWORKS 32 – V7.4 Continued support for MS Pack releases for Win 2000, Windows XP & Win Server 2003**
BEA MessageQ for OpenVMS on Integrity

- BEA MessageQ Version 5.0 has been ported to OpenVMS 8.2 on Integrity.
- Availability – July 2006
- Customers running MessageQ under OpenVMS Alpha with a current Service Contract will receive a 100% trade-in credit for the license to run MessageQ under OpenVMS on Integrity.
- Questions: Contact Gene Spadi at gene.spadi@hp.com
HP Support Policies
HP Support Policy

• Unless otherwise agreed to by Hewlett-Packard Company (HP), HP provides HP Support Services only for the current and immediately preceding versions of HP software, and only when the software is used with hardware that is included in HP-specified configurations. A version is defined as a release of a software product that contains new features, enhancements, and maintenance updates."

Enhanced OpenVMS Service Support Roadmap

<table>
<thead>
<tr>
<th>Year</th>
<th>VAX</th>
<th>Support</th>
<th>V6.2</th>
<th>Support</th>
<th>V7.3</th>
<th>Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td></td>
<td>w/24 mo. Notice**</td>
<td></td>
<td>w/24 mo. Notice**</td>
<td></td>
<td>w/24 mo. Notice**</td>
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<tr>
<td>2007</td>
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<td>2008</td>
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<td>2009</td>
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<tr>
<td>2010</td>
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</tr>
<tr>
<td>2011</td>
<td></td>
<td>Guaranteed Support at least through 2011*</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

* Prior Version or Standard support will be provided on these versions at least through 2011.
** w/24 mo notice: A 24-month notification will be provided before support is ended.
Enhanced OpenVMS Service Support Roadmap

**Alpha**
- V6.2x: Prior Version Support guaranteed through 2011
- V7.3-2*: Standard Support, Prior Version Support guaranteed through 2011
- V8.2: Standard Support
- V8.3: Standard Support

**Integrity**
- V8.2: Standard Support
- V8.2-1: Standard Support, 18 month PVS-SE
- V8.3: Standard Support

- Prior Version or Standard support will be provided on these versions at least through 2011.
- ** w/24 mo.Notice**: A 24-month notification will be provided before support is ended.
- *Standard support ends when the 2nd subsequent release ships. HP supports the current version and one back. Future version shipment dates are estimates.*

Subject to change without notice

November 13, 2006
# OpenVMS Cluster Support Matrix

<table>
<thead>
<tr>
<th>Integrity server Releases</th>
<th>AlphaServer Releases</th>
</tr>
</thead>
<tbody>
<tr>
<td>V8.2</td>
<td>Warranted</td>
</tr>
<tr>
<td>V8.2-1</td>
<td>Warranted</td>
</tr>
<tr>
<td>V8.3</td>
<td>Migration</td>
</tr>
</tbody>
</table>

### AlphaServer Releases

<table>
<thead>
<tr>
<th>V7.3-2</th>
<th>V8.2</th>
<th>V8.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranted</td>
<td>Warranted</td>
<td>Migration</td>
</tr>
<tr>
<td>Warranted</td>
<td>Warranted</td>
<td>Migration</td>
</tr>
<tr>
<td>Migration</td>
<td>Migration</td>
<td>Warranted</td>
</tr>
</tbody>
</table>

### Notes:
- Same platform/version pairings are always warranted
- Alpha V7.3-2 and V8.2 are warranted together
- Alpha V7.3-2 goes into Prior Version Support 31-Dec-2006
- Integrity V8.2 goes EOSL 31-Dec-2006

### VAX Release

<table>
<thead>
<tr>
<th>V7.3</th>
<th>V8.2</th>
<th>V8.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranted</td>
<td>Warranted</td>
<td>Warranted</td>
</tr>
</tbody>
</table>

### Note:
- VAX and Integrity Servers can ONLY exist in the same cluster for temporary migration purposes
OpenVMS V8.3 (Nemo)

• Shipment date = September 2006

• Highlights:
  _ New Integrity platform support
  _ New Hardware option support
  _ General User enhancements
  _ UNIX Portability features
  _ Security Enhancements
  _ Virtualization: iCAP, TiCAP and PPU
  _ Continued Java, web services updates
  _ Performance improvements
Hardware and Option support

- Dual-core Intel® Itanium® 2 based systems
  - Maximum 32 cores
  - Maximum 4 cells
- 10gb Ethernet NIC
- 4gb Fibre channel
- DVD Record: easily record locally mastered volumes/files onto optical media
- USB MUX serial terminal connections
- VLAN: Reduces the number of NICs required for connectivity

Integrity only
General User Features V8.3

- LMF terminology update – Integrity only
- AES encryption support in BACKUP
- Performance improvements to BACKUP, Queue Manager & Copy
- New lexical functions
- Queue job limit increased to 65535 jobs!
- "Live view" of Process Quota consumption
- Cluster satellite boot for Integrity
Unix Portability (UP) V8.3

*OpenVMS will be like any other “UNIX flavor” for easy application portability*

- POSIX style pathname processing brings
  - system-wide root
  - mount points
  - current working directory
- Symbolic Links
- Byte range locking
- Encryption routines
- GNV update
Security Enhancements

- Secure Software Delivery
  - Verification/authenticity of software kits installed on OpenVMS with cryptographic signature

- ACME Login (real external authentication!)
  - LDAP ACME
  - Kerberos ACME

- AES Encryption
  - Industry standard, stronger encryption included in the base operating system

- SSL as a SIP
  - Automatically part of operating system installation script
TCP/IP Version 5.6

Highlights:
- NFS Server support for Integrity
- SSH upgrades now with Kerberos support
- SCP/SFTP preserves OpenVMS file attributes
- TCP/IP$CONFIG.COM enhancements (failSAFE IP)
- DNS/BIND 9 Resolver and v9.3 Server
- DNSSEC
- NTP Security Update (SSL), NTP AutoKey
- SMTP Multi-Domain Zone (Mail improvements)
- TELNET Server Device Limit
- IPv6 support for LPD and TELNETSYM
- FTP Performance Boost
- Improved Management Utilities (ifconfig etc.)
V8.3 Performance & Scaling Enhancements

- RMS Global Buffers in P2 Space
- File not found errors perform much faster on Integrity
- Reduced alignment faults in the OS and numerous components
- Installed Resident Images now have code in S2 space
- Support for shared address data for installed images
- Improvements in the code to Probe access to virtual address
- Improvements for PEDRIVER Block Transfers
- Reduced the time to write an Integrity crash dump
- Lock Manager improvements for computing group grant mode (available in remedial kits too!)
- Eliminate usage of the SCHED spinlock for PFW and PFC upcalls affects POSIX threads apps
Performance – hardware

• The Integrity Processors are fast
  - Future processors will continue to increase the performance over current Alpha processors

• I/O performance is comparable between Alpha and Integrity
  - Integrity has an edge in CPU cost per I/O and in cached and DECramp I/O

• The rx46xx and rx26xx systems have great memory bandwidth and good memory latency
  - In most cases, these systems perform similar or better than comparable Alpha systems today

• The larger Integrity servers have slower memory latency
  - If your application taxes a large GS1280, we recommend testing on larger Integrity servers before moving performance critical applications
  - Even so, RAD support is off on Integrity because the difference between local and remote access is too small
Performance - software

- The OpenVMS operating system performs well on Integrity servers with just a few caveats
  - alignment faults – apps as well as OS need to eliminate them
  - exception handling – we are working on significant improvements
- Each OpenVMS release shows performance improvements over the previous – 8.0, 8.1, 8.2, 8.2-1, 8.3……
- We expect most applications to perform well on Integrity servers today and even better in the future
  - If you port an application and are disappointed in performance, we want to know.
- Please contact:
  Gregory.Jordan@hp.com
Integration and System Management

- Web Services Integration Toolkit (WSIT) 1.1
  - additional ease of use features and JSP support

- Java releases:
  - Java 1.4.2 update on Integrity
  - Java 5.0 release on Alpha
  - Java 5.0 release on Integrity

- Certification of BEA WebLogic Server 8.1 SP3 on Integrity

- OpenView Performance Agent
OpenVMS Future Directions
Version 8.4 New Feature Potentials

- >32 core support on Integrity
- 2TB LUN file system support
- iSCSI support
- Shared Stream I/O (SSIO)
- Cluster communication over IP
- Virtualization tools – Capacity Advisor, Virtualization Manager
- Performance enhancements – signaling and condition handling improvements, Threads, I/O, system service dispatching
- New TCP/IP release featuring IPSEC

Version 8.3-1H1:
- Montvale upgrade support
- New I/O option support (PCI Express)
- Next Generation Integrity Blade support