HP Tru64 UNIX® Technical Overview of 5.1B and its enhancement releases

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Title: Customer Support Consultant, HP

Agenda

Tru64 UNIX® roadmaps

Version 5.1B

Version 5.1B-1

Version 5.1B-2

HP Tru64 UNIX® Technical Overview 2

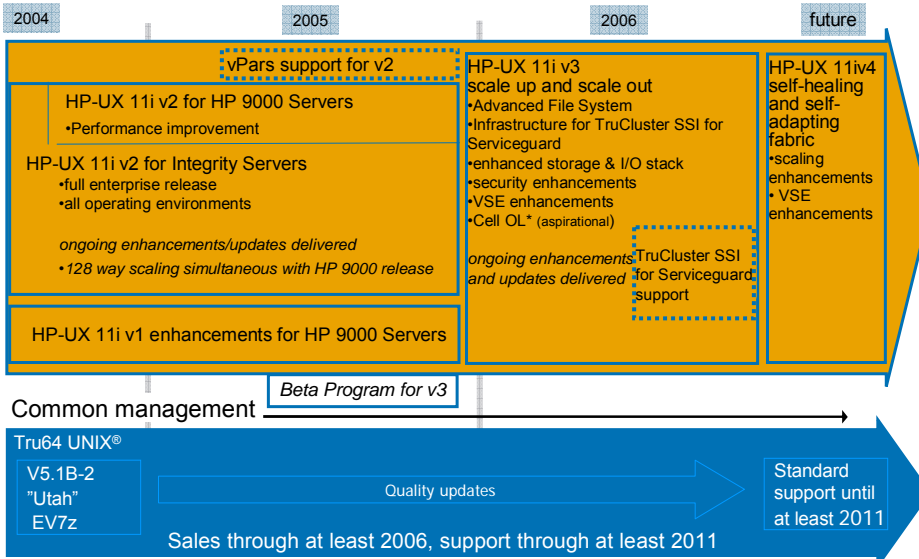# HP reaffirms commitment to its Tru64 UNIX® on AlphaServer systems installed base

✓ Continued enhancements to Tru64 UNIX® ecosystem – roadmap is unchanged.
  - EV7z upgrade for AlphaServer systems
  - Tru64 UNIX V5.1B-2 ("Utah") on schedule
  - ESS Alliances group continues work with ISV partners

✓ Opportunities for transition enhanced through
  - Alpha RetainTrust program, including transition tools, financial assistance, etc. for transitions to HP-UX 11i or other HP platforms.
  - ISV momentum for HP Integrity servers acceleration provided through new roadmap
  - Earlier vPars availability on Integrity systems

✓ HP-UX 11i v3 functionality remains unchanged
  - Functionality roll-out better matches Tru64 UNIX customers' implementation plans, with AdvFS technology available first
  - TruCluster SSI for Serviceguard is planned as an update
  - HP-UX 11i v3 Beta Program will be introduced for early adopters

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HP-UX 11i and Tru64 UNIX® roadmap

| 2004 | 2005 | 2006 | future |

vPars support for v2

HP-UX 11i v2 for HP 9000 Servers
•Performance improvement

HP-UX 11i v2 for Integrity Servers
•full enterprise release
•all operating environments

ongoing enhancements/updates delivered
•*128 way scaling simultaneous with HP 9000 release*

HP-UX 11i v1 enhancements for HP 9000 Servers

HP-UX 11i v3
scale up and scale out
•Advanced File System
•Infrastructure for TruCluster SSI for Serviceguard
•enhanced storage & I/O stack
•security enhancements
•VSE enhancements
•Cell OL* (aspirational)

ongoing enhancements and updates delivered

TruCluster SSI for Serviceguard support

HP-UX 11iv4 self-healing and self-adapting fabric
•scaling enhancements
• VSE enhancements

Common management

Beta Program for v3

Tru64 UNIX®

V5.1B-2 "Utah" EV7z

Quality updates

Standard support until at least 2011

Sales through at least 2006, support through at least 2011

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HP AlphaServer evolution

Sales at least until 2006, with support at least until 2011

Agenda

Tru64 UNIX® roadmaps

Version 5.1B

Version 5.1B-1

Version 5.1B-2

HP Tru64 UNIX® V5.1B "Wildcat"
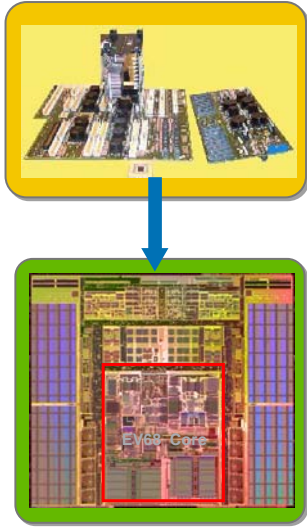
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Version 5.1B EV7 Infrastructure
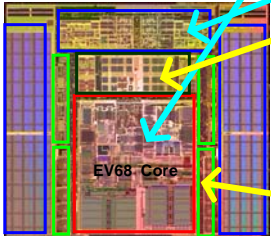
- EV7 platform support 2-8, 16, 32 and 64 CPUs

- Indictment
  - CPU
  - PCI

- On Chip Controllers
  - memory and I/O

- Processor Scheduler
  - mesh scheduler
  - NUMA gravity

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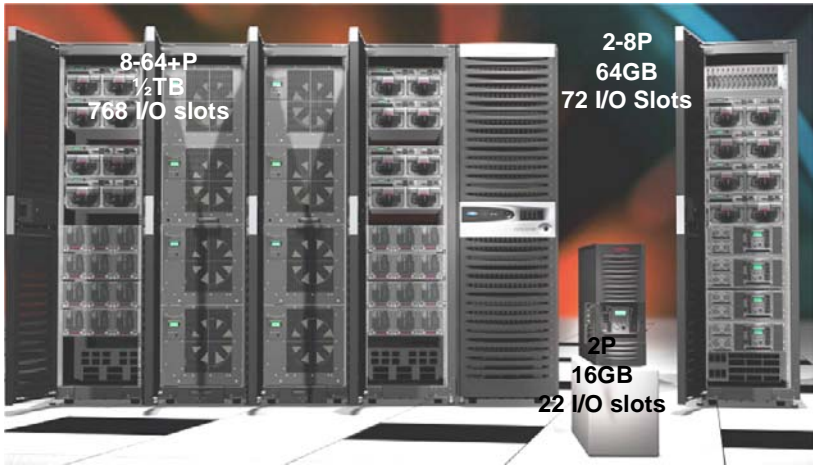
EV7 Design Innovation

- EV6 core processor
  - No changes to compiler or code scheduling
  - Completely transparent to software
- Integrated memory & I/O controllers
  - benefit to HPTC applications
  - Transparent to applications
- NEW CPU interconnects

EV68 Core

HP Tru64 UNIX® Technical Overview

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Absolutely Marvelous!!!!

8-64+P
½TB
768 I/O slots

2-8P
64GB
72 I/O Slots

2P
16GB
22 I/O slots

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EV7 HW support

- Memory Troller
  - For proactive memory failure detection
  - Default value: 4 percent per hour (range can be 1-100)
    - Will Troll all memory in 24hours
  - To discover current Troll rate
    - **# /sbin/sysconfig -q vm vm_troll_percent**
  - Can override default with line in /etc/sysconfigtab file
    - vm_troll_percent=*percent_rate*
  - To enable, disable or change at any time
    - **# /sbin/sysconfig -r vm vm_troll_percent=***percent_rate*
  - Accelerated Trolling: 101 percent
    - Will run Troller in accelerated mode and then disable
    - Good for running at off peak (can do 128 GB in 5 mins)

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Big Memory Pages

- Special Requirement from HPTC
  - Basic functionality in 5.1B
  - Application tunable button in 5.1B-1
  - Support for system page tables 5.1B-2

- Will greatly improve performance of:

  - Memory Intensive Applications (i.e. DB)

  - Finite Element Applications (i.e.Modeling

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TLB or not TLB …..

TLB

	00
	01
	02
	03
	04
	05
	06
	07
	08
	09
	010
	011
	012
.. ..	
.. ..	
	126
	127

8KB PAGE

- What is the TLB?
  - Translation Buffer
  - FIFO Algorithm (First in First Out)
  - 128 address spaces
  - Each address space is 8 Kilobytes in size
  - Bottleneck for instruction plus data retrieval
    - First place which is checked for data
    - If data not in the TLB then has to search VM
    - Slows down system performance
    - Impacts Database/Application performance
  - What if we could reduce TLB misses?
    - Could improve System performance
    - Also improve application performance

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Big Pages Disabled

TLB

8KB PAGE	0
	01
	02
	03
	04
	05
	06
	07
	08
	09
	010
	011
	012
.. ..	
.. ..	
	126
	127

8KB PAGE

Virtual Memory (VM)

8KB PAGE	0
	01
	02
	03
	04
	05
	06
	07
	08
	09
	010
	011
	012
	013
	014
	015
	016
	017

8KB PAGE

	018
	019
	020
	022
	023
	024
	025
	026
	027
	028
	029
	030
	031
	032
	033
	034
	035
	036

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	042
	043
	044
	045
	046
	047
	048
	049
	050
.. ..	
.. ..	
	XXXXXXX
	XXXXXXX

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Virtual Memory (VM)

Big Pages Enabled

TLB

8KB PAGE	0
	01
	02
➤ 01 64KB	03
	04
	05
	06
➤ 017 512KB	07
➤ 080 512KB	08
➤ 700 4MB	09
	010
	011
	012
.. ..	
.. ..	
	126
	127

8KB PAGE

64KB

512MB

4MB BLOCK

8KB PAGE

.. ..
.. ..

XXXXXXX
XXXXXXX

HP Tru64 UNIX® Technical Overview

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Big Memory Pages Continued

- To enable: (Note System comes with this disabled)
  - **vm_bigpg_enable=1**
  - **Then reboot system**
- To disable:
  - **vm_bigpg_enable=0**
  - **Then reboot system**
- Support for pages of 64KB, 512KB and 4096KB.
- Reduces TLB misses thus improves its throughput.
- Kernel chooses optimized page size at runtime in 5.1B
- Application Tunable big pages in 5.1B-1
- System Page tables in a big page in 5.1B-2

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Security Enhancements

- Bundled SSH with 5.1B, 5.1B-1 and 5.1B-2
  - Based on application from SSH Communications Security.
  - Replaces traditional less secure commands
  - Command 'rsh' equivalent ssh2
  - Command 'rlogin' or telnet equivalent ssh2
  - Command 'rcp' or 'ftp' equivalent 'scp2' or 'sftp'
  - root may set `EnforceSecureRutils=Yes` in `/etc/ssh2/ssh2_config`
  - User may set `EnforceSecureRutils=Yes` in `$HOME/.ssh2/ssh2_config`
- Will allow System Admins to force the use of SSH instead of rsh.

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Security Enhancements continued

- Pseudo Random Number Generator.
  - System captures timing of HW interrupts
  - Stores and shuffles timings (like a deck of cards)
  - Produces a random number when requested from deck.
- /dev/random
  - Greater possibility of randomness
  - will stall until it has sufficient entropy to fulfill the request
- /dev/urandom
  - Will always give you a number even it has only a few stored
  - theoretically may not be as random as /dev/random

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Security Buffer Overflow (5.1B PK2)

- **Unprecedented Memory Attack Protection (V.5.1B PK2)**

  - Heap Buffer Overflow Protects <u>Any</u> Area of Program Memory from Executing Malicious Code
  - Even Apps Vulnerable to Heap Buffer Overflows Become Impenetrable
  - Optional Activation

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File Systems and Storage

LSM Vol
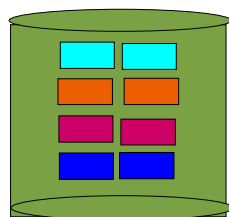
Plex =

- What is LSM?
  - Logical Storage Manager Software
  - Volume mirroring SW
  - SW RAID
- LSM Fast Plex Re-attach

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LSM support for - Fast Plex Reattach

- Reduces re-silvering impact of LSM mirrors
  - Both time spent and I/O load during re-silvering

- Create a 'FPA' capable volume using top-down (TD) or bottom-up (BU) approach
  - `volassist` (TD)
  - `volplex,volsd,volmake,volume` (BU)

- Fast Plex Attach with `volassist`
  - `volassist addfpa volume [attrs]`
    - `.. make volume <len> layout=mirror,fpa [attrs]`
    - `.. make volume <len> loglen=nn [attrs]`
    - `.. make volume <len> nfpalog=nn [attrs]`
    - **`.. snapfast primary_volume secondary_volume`**
    - **`.. snapback secondary_volume primary_volume`**

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LSM – Fast Plex Reattach

- **`volassist snapfast primary_vol sec_vol`**
  - Adds FPA log plex (primary) to the volume
  - Add FPA sub-disk (secondary) to the Active plex
  - Detach Active plex (the migrant plex)
  - Use migrant plex to create secondary (aka snapshot of) volume

- **`volassist snapback sec_vol primary vol`**
  - Detach migrant plex from secondary volume
  - Merge FPA for secondary volume with FPA of primary volume
  - Reattach migrant plex to primary volume and resilver
  - Disable FPA logging (disallow FPA-detach until resilver

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LSM & HW snapshots

- Currently LSM actively rejects hardware generated clones and snapshots
  - Actually, any device that has a mismatched wwid listed in the configuration header for the volume is rejected as a clone/snapshot.
- `volclonedg` will allow hardware clones/snaps to be included in their own disk-group
- **# volclonedg -g dg1 dsk14 dsk15 dsk16**
  - LSM creates the clone disk group and starts its volumes.
- Clone_disk_name: Has to be device, not partition

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Freeze/Thaw of AdvFS & CFS

- Ensuring Metadata Integrity by Freezing Domains
  - /sbin/freezefs [–t 0|time in seconds] /mount_point
  - metadata-consistent state until thawed
  - All of the filesets in the domain are frozen
  - All metadata is flushed to disk and is frozen
  - Operations such as read continue
- Thaw
  - By command /sbin/thawfs /mount_point
  - By timing out
  - by shutting down any cluster node of a frozen file system
  - In the event of a cluster node failure

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AdvFS LUN/UNIT Expansion

- LSM and hardware RAID controllers support dynamic growth of Volumes today.
  - AdvFS does not support this.

- Dynamic growth of LSM or hardware RAID volume is done independently of AdvFS, you must notify the domain when the size of a vol changes, therefore we use the mount command with the –o extend to achieve this:

  - If the fileset is not already mounted, enter:
    - **mount -o extend domain#fileset /mountpoint**

  - If the fileset is already mounted, enter:
    - **mount -u -o extend domain#fileset /mountpoint**

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AdvFS vFast Utility

- vFast: Automatic Background Defragmentation

  - No administrative downtime for defragment operations

  - Negligible Impact to System Load & Performance
  - Automatic Free Space Consolidation
  - Automatic <u>Load Balancing of I/O</u> Across Volumes
  - Improved I/O Performance via Hot File Analysis of Frequently-Accessed Files
  - Command **/sbin/advfs/vfast**

- AdvFS Utilities License required for vFast

  - **/sbin/defragment** enabled as part of base OS license

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Parallel HBA Probe

- New and improved storage bus scan algorithm
  - Scans all HBAs for devices *in parallel*
  - Significantly improves boot time on large configurations
- Large storage configurations took time to boot
  - One problem was serialized device scanning
- Parallel SCSI Bus Probe is ***disabled*** by default
  - To enable
    - **parallel_edt_scan=1**
  - To disable
    - **parallel_edt_scan=0**

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Software Development

- Java SDK 1.3.1 with FastVM as default

- Java SDK 1.4.1
  - Available via APCD on 5.1B-1 update kit.
  - Planning 1.5.1 for future release

- DECthreads V3.20 Optimized for Marvel Support
  - Threads on a Leash Optimize Performance
  - Configurable-Length "Dog Chains" Vary Average Memory & I/O Access Times
- Mozilla LDAP C SDK instead of Netscape
  - Netscape has same APIs as LDAP C SDK
  - Available via APCD on 5.1B-1 update kit.

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General Operating System

- New Printers Supported (ongoing effort)
  - http://h30097.www3.hp.com/printing/printers.html

- Printing Supported via SysMan
  - Configure and monitor print queues
  - Same functionality as is available from CDE
  - Requires X-Server on PC client

- Unicode 3.1 support
  - 44,946 extra char now supports 94,140 char

- Asian Language enhancements for Insight Manager

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Networking

- IPv6 Production Mode

- Continued support of IPv4 Networks

- Dual Stack IPv4 and IPv6

- IPv6 Porting Tools

- IPSEC supported on IPv6

- Update POP and IMAP

- Updated via Internet Express
  - Bind 9 and Sendmail (July 2004)

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Manageability

- OpenView Support

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Tru64 UNIX® Interoperability

- Co-existence Within Heterogeneous Environment
- Cross platform interoperability
- Complementary Tools & Applications

HP-UX	ASU	Internet Express	Open Source Software Collection	Professional Linux Dev SW CD	Portability Tools
UNIX Interoperability & igration assitanc	Windows Interoperability for Tru64 UNIX	Open Source and commercial Internet applications for Tru64 UNIX	Open Source Applications for Tru64 UNIX	Compaq C, C++, Fortran, Ladebug, CPML, CXML, and Code Forge IDE	GNU Pro Portfolio, KDE & GNOME, Linux Binary Emulator, RPM, plus, for Tru64 UNIX
On the APCD Plus whitepapers	On the APCD included with Tru64 UNIX kit	Bundled with Tru64 Unix Alpha Systems	included in Tru64 UNIX Software Kit; Web Download	Web Orderable Download; CD also Available	included in Tru64 UNIX Software Kit; CD Available; Web Download

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Tru64 UNIX® roadmaps

TruCluster 5.1B

Version 5.1B-1

Version 5.1B-2
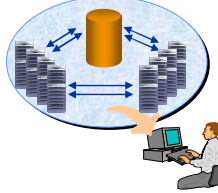
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TruCluster Server V5.1B – CFS Dynamic Load Balancing

- Dynamic rebalancing based on
  - User defined policy and <u>preference</u> / connectivity / memory consumption / failover events / analysis

- Managed by `cfsd`
  - One `cfsd` per member
  - `cfsd` startup
    - Read config file (`/etc/cfsd.conf`)
    - Select leader
    - Ready to track statistics and do the work
  - `kill -HUP <cfsd.pid>` to force re-read of config file

- Results from analysis logged in
  `/var/cluster/cfs/analysis.log`

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TruCluster Server V5.1B – CFS Mount Affinity

- Allows admin specify a cluster member as initial server for a file system.
  - Provides same functionality as the Sierra Cluster's member fstab feature (aka `fstab_member`)

- Most useful for NFS client file systems which cannot be relocated after they've been mounted
- Command
  ```
  # mount -o server=<hostname>
  ```

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TruCluster Server V5.1B – Balancing CAA App resources

- **/usr/sbin/caa_balance -all [-q]**
  - Attempts to find optimal member for all apps
  - -q Suppress output from the command.

- **/usr/sbin/caa_balance -s** *source_member* **[-q]**
  - Optimal placement for apps on current member

- **/usr/sbin/caa_balance** *resource_name* **[...] [-q]**
  - /usr/sbin/caa_balance testapp

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TruCluster Server V5.1B –
Parallel Roll Support

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- Possible to roll more than one member at a time
  - "No" change to roll procedure
    - Order of operations
  - Overlapping "`clu_upgrade roll`" commands
    - Number of nodes rolled is limited by quorum configuration
    - Possible to roll both with and w/o adjusting quorum
      - Number of members that can may "simultaneously" depends on vote configuration
    - Key Issue: reboot of a member *cannot* result in loss of quorum
      - Clu_upgrade will confirm that reboot will not affect quorum
- "`clu_upgrade undo`" is still a serial administrative "event"

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Tru64 UNIX® roadmaps

Version 5.1B

Version 5.1B-1

Version 5.1B-2

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What is Tru64 UNIX ® V5.1B-1

- *"Version 5.1B-1 is a minor, update release of Tru64 UNIX ®, consisting of V5.1B base components, which remain unchanged, and updated components for Version 5.1B-1."*

  From the Read This First for Tru64 UNIX 5.1B-1

- *The Goal of this release was to get minor enhancements together with various Hardware support to our customer base without perturbing the ISV.*

- *We achieved this goal by doing a minor update to 5.1B without revising the base OS CD which is what the majority of ISVs have qualified against.*

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Binary Compatibility with V5.1B

Tru64 UNIX® V5.1B and V5.1B-1 Compatibility

- *"Version 5.1B-1 is a minor, update release of Tru64 UNIX®, consisting of V5.1B base components, which remain unchanged, and updated components for Version 5.1B-1."*

- *"It does not require the 'update installation' procedure of the operating system. As a result this release preserves total binary compatibility with Tru64 UNIX 5.1B and does not require ISV application recertification or recompilation."*

  From the binary compatibility statement for Tru64 UNIX 5.1B

HP Tru64 UNIX® Technical Overview 40

Contents of version V5.1B-1 part I

- <u>Items which remain the same as V5.1B</u>

  - Base OS CDROM is V5.1B the foundation for V5.1B-1

  - V5.1B Doc CDROM

  - V5.1B Release notes and various manuals

  - Open Source SW CDROM

  - Linux Portability Toolkit

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Contents of version V5.1B-1 part II

- <u>Items which are new to V5.1B-1</u>
  - Release notes for V5.1B-1

  - Drop NHD 7 into kit

  - V5.1B Patch Kit 3 CD

  - Sources CD for Open Source components

- <u>Items being refreshed in V5.1B-1</u>
  - APCD 1(Associated Product CDROM 1)

  - APCD 2 (Associated Product CDROM 2)

  - Read This first letters

HP Tru64 UNIX® Technical Overview   42

HP Tru64 UNIX® V5.1B-1

- High Performing Platform for 64 CPU EV7 Systems

- The New DS15 AlphaServer

- Application tunable Big Pages.

- Enhanced Storage Manageability
  - Via support for additional SNMP trap events

- Greater file system scalability
  - Higher LSM I/O throughput
  - AdvFS panic avoidance

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Storage & Data Manageability 5.1B-1

- Broader support of StorageWorks products
  - MSA1000 enhancements
  - EVA array controllers
  - Integration with XP storage array products
  - HP Data Protector
    - Server (media agent) providing robotic control for backup devices
    - Integrates with Oracle Recovery Manager, Informix IDS, and SAP backup & recovery tools
    - Mission critical data backup and recovery in TruCluster Server software

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Agenda

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Tru64 UNIX® roadmaps

Version 5.1B

Version 5.1B-1

Version 5.1B-2

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What is Tru64 UNIX ® V5.1B-2

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- *"Version 5.1B-2 is a minor, update release of Tru64 UNIX ®, consisting of V5.1B base components, which remain unchanged, and updated components for Version 5.1B-2."*
  From the Read This First for Tru64 UNIX 5.1B-2

- *The Goal of this release was to get minor enhancements together with various Hardware support to our customer base without perturbing the ISV.*

- *We achieved this goal by doing a minor update to 5.1B without revising the base OS CD which is what the majority of ISVs have qualified against.*

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Binary Compatibility with V5.1B
Tru64 UNIX® V5.1B and V5.1B-2 Compatibility

- *"Version 5.1B-2 is a minor, update release of Tru64 UNIX®, consisting of V5.1B base components, which remain unchanged, and updated components for Version 5.1B-2."*

- *"It does not require the 'update installation' procedure of the operating system. As a result this release preserves total binary compatibility with Tru64 UNIX 5.1B and does not require ISV application recertification or recompilation."*

From the binary compatibility statement for Tru64 UNIX 5.1B

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Contents of version V5.1B-2 part I

- Items which remain the same as V5.1B

  - Base OS CDROM is V5.1B the foundation for V5.1B-2

  - V5.1B Doc CDROM

  - V5.1B Release notes and various manuals

  - Open Source SW CDROM

  - Linux Portability Toolkit

HP Tru64 UNIX® Technical Overview   48

Contents of version V5.1B-2 part II

- Items which are new to V5.1B-2
  - Release notes for V5.1B-2
  - Drop latest NHD7 plus PK4 into kit
  - V5.1B PK4 Patch CD-ROM (contains fixes & functionality)
  - Sources CDROM for Open Source components

- Items being refreshed in V5.1B-2
  - APCD 1(Associated Product CDROM 1)
  - APCD 2 (Associated Product CDROM 2)
  - Read This first letters et al

HP Tru64 UNIX® Technical Overview   49

Free 3rd party products bundled with 5.1B-2

- HP Data Protector

  - HP OpenView Storage Data Protector 60 Day Trial
  - For HP StorageWorks SSL1016 Tape

- Datadirect (Now owned by Progress Computers)
  - New versions of ODBC and JDBC drivers for Oracle 10g Support
  - Commitment to new drivers for the next 3 years
  - Extended 6 year support

- *EnterpriseSCHEDULE* (TBD)
  - ISE product
  - 60 day trial copy
  - Enterprise Batch Scheduler
  - Same offering with every new HP-UX server today

HP Tru64 UNIX® Technical Overview   50

Updated Migration toolkit

- Appscan – Utility for Scoping Porting Effort to Migrate Tru64 UNIX Application to HP-UX

- Software Transition Kit – Facilitates Transition of Tru64 UNIX Apps to HP-UX (App File Scanners, Scan Wizard, Developers' Documentation)

- HP-UX Man Pages – Enables Viewing HP-UX On-Line Help Files within Tru64 UNIX

HP Tru64 UNIX® Technical Overview 51

V5.1B PK4 Deliverables

- Major Patch Kit Quality Improvement
  - Please note the adoption of Service Pak model for PK4
  - Quicker patching of customer systems (40% approx)
  - All or nothing
  - Can uninstall to back out kit
  - Patch kit 4 contains fixes and functionality
  - Will ship as part of V5.1B-2
    - Should be available on Web within the next 6 weeks.

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Tru64 UNIX® V5.1B-2 deliverables

- Big Pages support for Page Tables

- Improved Large SMP & NUMA System Performance via Unified Buffer Cache Scaling

- Networking Standards Updated
  - Mobile IPv6 Update (PK4) In Line With Latest RFCs

  - IPv6 Advanced API Conforms To Latest Specification (RFC 3542)

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V5.1B-2 TruCluster deliverables part 1

- Faster Problem Diagnosis (hidden from customer)

- Significantly Faster LSM Cluster Boots

- Improved Cluster Efficiency For Bad Disk Detection
  - Ability To Differentiate Path Or Device Failure Reduces Time & Overhead From Devices Gone Bad
- Improved Troubleshooting Efficiency from Cluster Alias Information
  - Enables RT Information Retrieval From Cluster Alias Daemon
- Improved MC Performance During Peak Utilization
  - Configurable MC Input Threads

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V5.1B-2 TruCluster deliverables part 2

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- Faster App or Web Server Responsiveness via Sticky Connection Attribute For Cluster Alias
  - Client Connections To Same Cluster Node Creating *Stickiness* Between Servicing Cluster Member & Specific Client/Port
  - Saves Cost of Specialized Router

- Process Management through Clusterized Commands
  - SYSCONFIG now clusterized

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Summary of version 5.1B-2

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- EV7z support

- Same deliverables as the generic dash release model

- Additional 3rd party deliverables

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General Information

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- Update Paths
  - 5.1A → 5.1B*
  - 4.0F → 4.0G → 5.1 → 5.1B*
  - 4.0F → 4.0G → 5.1 → 5.1B*
  - Note: 5.1B*= 5.1B, 5.1B-1 and 5.1B-2

- Licensing
  - 5.1B →5.1B-1 requires update license
  - 5.1B →5.1B-2 requires update license
  - 5.1A → 5.1B requires update license
  - 4.0x → 5.0x requires update license

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Prior Version Support

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	Start Date	End Date
Tru64 Unix V4.0D	1. Jun 2000	30. Jun 2001
Tru64 Unix V4.0E	--------	-------
Tru64 UNIX V4.0F	1. Oct 2002	30. Sep 2005
Tru64 UNIX V4.0G	1. Oct 2002	30. Sep 2005
Tru64 UNIX 5.0	--------	-------
Tru64 UNIX 5.0A	1. Oct 2002	30. Sep 2003
Tru64 UNIX 5.1	1. Mar 2003	29. Feb 2004
Tru64 UNIX 5.1A	1. Mar 2004	28. Feb 2005
Tru64 UNIX 5.1B		
Tru64 UNIX 5.1B-1		
Tru64 UNIX 5.1B-2		

- no support (PVS & St.) - PVS support - full support until at least 2011

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Some Links

Tru64 UNIX / TruCluster V5.1B
http://h30097.www3.hp.com/unix/v51b.html

Tru64 UNIX V5.1B-1
http://h30097.www3.hp.com/unix/v51b1.html

TruCluster
http://h30097.www3.hp.com/cluster/index.html

OS Support dates
http://www.hp.com/hps/os/os_pvs_eur.html

Porting Tru64 to HP-UX
http://www.hp.com/products1/evolution/customertimes/tru64unix.html
http://h30097.www3.hp.com/transition/apps/index.html?jumpid=/go/tru64appmigration
http://h30097.www3.hp.com/transition/apps/porting_guide.html

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Associated Products V5.1B-1 Vol I

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APCD I	New Version	Updated Version	Unchanged
Advanced Printing SW	●		
Application Transition Tools	●		
Cobol RT Library		●	
Development Enhancements			●
Fortran RT Library			●
Hypersort		●	
Java ™	●		
LDAP Client Utilities	●		
DataDirect (ODBC/JDBC)			●
Mozilla	●		
Multiamedia Services			●
OpenLDAP	●		
Pascal RT Library			●
Worldwide Language Support			●

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Associated Products V5.1B-1 Vol II

hp invent

APCD II	New Version	Updated Version	Unchanged
Advanced Server for UNIX		●	
Collgui			●
DEDevent			●
Exenteded System V			●
GNU Source	●		
Graphical Program TK			●
Legato Networker	●		
Motif 2.1 ADK			●
Porting Assistant			●
Powerstorm Graphics			●
Secure Web Server	●		
Sysman SW Manager ADK			●
TruCluster Server	●		
UniCensus		●	
Visual Threads		●	
WEBES			●
Windows 2000 SSO			●

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Associated Products V5.1B-2 Vol I

APCD I	New Version	Updated Version	Unchanged
Advanced Printing SW		TBD	
Application Transition Tools	●		
Cobol RT Library		TBD	
Development Enhancements			TBD
Fortran RT Library			TBD
Hypersort		TBD	
Java ™	TBD		
LDAP Client Utilities	●		
DataDirect (ODBC/JDBC)	●		
Mozilla	●		
Multiamedia Services			TBD
OpenLDAP	●		
Pascal RT Library			TBD
Worldwide Language Support			TBD
Emacs	●		

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Associated Products V5.1B-2 Vol II

APCD I	New Version	Updated Version	Unchanged
Advanced Printing SW		TBD	
Application Transition Tools	●		
Cobol RT Library		TBD	
Development Enhancements			TBD
Fortran RT Library			TBD
Hypersort		TBD	
Java ™	TBD		
LDAP Client Utilities	●		
DataDirect (ODBC/JDBC)	●		
Mozilla	●		
Multimedia Services			TBD
OpenLDAP	●		
Pascal RT Library			TBD
Worldwide Language Support			TBD
Emacs	●		

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Serviceability & Sys Man

- Environmental monitoring and condition handling
- Collgui enhancements
- SysCheck enhancements
- Kernel Crash Dump enhancements
- SysMan Enhancements
- Better Performance Monitoring pmgrd (PK2)
  - AdvFS, CPU, & Memory Metrics Monitoring via Collect Utility
- Enhanced Manageability
  - Greater Security and More Complete Coverage in Improved Tru64 UNIX Insight Manager Agent

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Tru64 UNIX V5.1B-1 and –B2 Free 3rd party products bundled

- BEA Weblogic from BEA
  - Pointer to BEA Weblogic's site for Tru64 UNIX users
  - Free trial product for 12 months
  - BEA provides support

YOUR FAST TRACK

1-Year Trial License For WebLogic Server For HP Tru64 UNIX

TO DEVELOPMENT

$100 Discount on dev2dev Subscription

SUCCESS.

- Stalker Communigate Pro from Stalker
  - Pointer to Stalker site
  - Free trial of full product
  - Stalker provides support

Benchmarks—CommuniGate Pro running on HP Tru64 UNIX and AlphaServer: http://www.stalker.com/Papers/CGatePro-HP-Alpha-2002.pdf.

Try a fully functional, fully supported evaluation version of CommuniGate Pro. Simply download and install from http://www.stalker.com/download.

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Summary of dash release

Release type	Numbered release e.g. 4.x, 5.x	Lettered release e.g. 5.1A, 5.1B	Dashed release e.g. 5.1B-1
Purpose	Introduce significant new functionality, i.e. wave 3 to wave 4 clustering. It includes APCD updates et al.	Ship a consolidated kit that merges bug fixes and updated functionality. It includes APCD updates et al.	Ship all updated components in an annual updated kit. Updates include fixes and minor functionality within patch kits, updated APCDs, Updated NHD et al.
New functionality	**Major changes**	**Medium changes**	**Minor changes**
Binary compatibility	**ISVs traditionally recertify**	**Some impact**	**No impact**
Support	**Each release has its own support stream**	**Each release has its own support stream.**	**OS support is tied to the patch kit contained therein.**

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