# AlphaServer News

**DECUS 2004**
**20.-22. April 2004**

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# Agenda

- AlphaServer Roadmap
- HP AlphaServer DS15
- EV7 und EV7z Prozessor
  - CPU Building Blocks 2P / 8P
- I/O Building Blocks
- HP AlphaServer ES47/ES80/GS1280 Overview
- AlphaServer Options – News
- Transition to Integrity Server

# HP AlphaServer Roadmap

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

**GS80**
**GS160**
**GS320**

**GS1280**
**8p, 16p**

**GS1280**
**32p**

**GS1280**
**64p**

**CPU:** EV7 1.15GHz
**Type:** new-box
**OS:** HP Tru64 UNIX®, HP OpenVMS

**CPU:** EV7z
**Type:** in-box
**OS:** HP Tru64 UNIX, HP OpenVMS

**CPU: Itanium® next gen**
**Type: new box**
**OS: OpenVMS**
**HP-UX 11i v3**
**Linux**
**.NET**

**HP Integrity**
**Superdome**

**HP Integrity**
**rx86xx**

**CPU: Itanium next gen**
**Type: new box**
**OS: OpenVMS**
**HP-UX 11i v3**
**Linux**
**.NET**

**ES45**

**ES80**

**CPU:** EV7 1GHz
**Type:** new-box
**OS:** Tru64 UNIX, OpenVMS

**ES47**

**CPU:** EV7 1GHz
**Type:** new-box
**OS:** Tru64 UNIX, OpenVMS

**CPU:** EV7z
**Type:** in-box
**OS:** Tru64 UNIX, OpenVMS

**HP Integrity rx76xx**

CPU: Itanium next gen
Type: new box
OS: OpenVMS
HP-UX 11i v3
Linux
.NET

**DS10, DS10L**
**DS20E**
**DS20L**
**DS25**

**DS15**

**CPU:** EV68 1GHz
**Type:** new-box
**OS:** Tru64 UNIX, OpenVMS

**HP Integrity rx2600**

CPU: Itanium next gen
Type: new box
OS: OpenVMS, Linux HP-UX 11i v2, .NET

CPU: Itanium next gen
Type: in-box
OS: OpenVMS
HP-UX 11i v3
Linux
.NET

2003 2004 2005

subject to change without notice

# AlphaServer DS15

New

Enhanced replacement for AlphaServer DS10 system

## 3U Rackmount system

- 1GHz EV68 w/ 2MB Cache
- 512MB to 4GB Memory
- Embedded I/O
  - Dual Ethernet
  - Dual Ultra3 SCSI
- 4 Drive Bays
  - 2 internal
  - 2 front access
- RW/CD-ROM
- 2 - 4 PCI Slots
- Telco DC/NEBS Variant

# AlphaServer DS15

| | DS10 | DS15 |
|---|---|---|
| Processor | • 1 x 617MHz EV67 | • 1 x **1GHz EV68CB** |
| Dimensions | • 5.1 x 17.6 x 19 inches<br>• 13 x 45 x 48 cm | • 5.1 x 17.6 x 19.65 inches<br>• 13 x 45 x 48 cm |
| SPECint2000 | • 364 – EV67/600 | • **592** |
| SPECfp2000 | • 411 – EV67/600 | • **813** |
| Cache | • 2MB LW 205MHz | • 2MB **DDR 250MHz** |
| Memory | • 2GB Maximum<br>• 77MHz – 1.2GB/sec. | • **4GB** Maximum<br>• **125MHz – 2GB/sec.** |
| I/O | • 4 PCI slots<br>• 64-bit/33MHz<br>• Embedded IDE internal<br>• External SCSI needs PCI card<br>• 2 Embedded 10/100 | • 4 PCI slots @ 64-bit/33MHz **or** 2 slots @ 64-bit/**66MHz**<br>• Embedded IDE for **CD only**<br>• **Embedded dual U3 SCSI**<br>• Embedded dual Ethernet |
| Ports | • 2 Ethernet (10/100)<br>• Keyboard, mouse<br>• 2 Comm ports<br>• Parallel port | • 2 Ethernet (10/100)<br>• Keyboard, mouse<br>• 2 Comm ports<br>• **No** Parallel port<br>• **1 External SCSI port** |
| Storage | • Internal storage cage or front access cage | • **4** bays max. with front access card cage<br>• CD-ROM |
| O/S Min. Rev. | • Tru64 UNIX V4.0f<br>• OVMS V7.1-2 | • Tru64 UNIX V5.1A/5.1B via NHD7<br>• OVMS V7.3-1 |
| Enclosure | • 3U – Top Gun blue | • 3U – Carbon Black |

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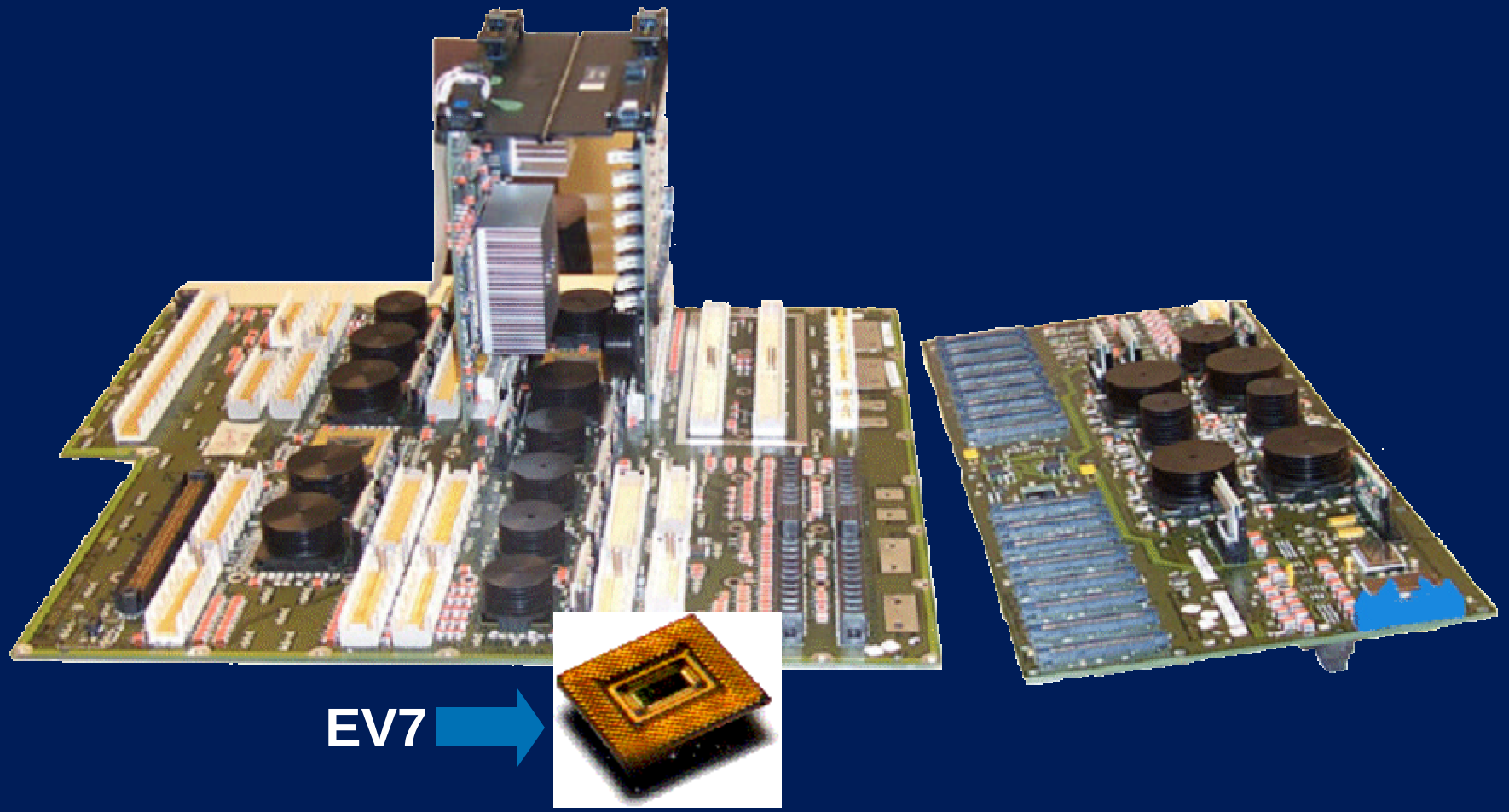
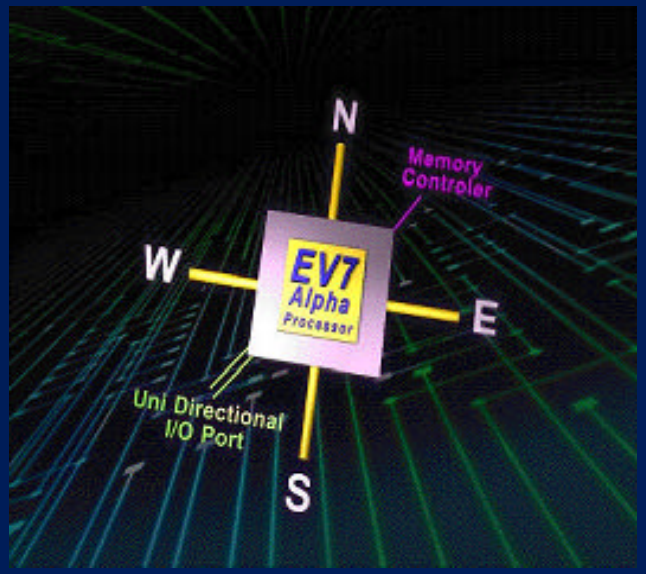
# Der EV7 Chip
## The System is the Silicon




**Ein EV7 Chip ersetzt alle diese Komponenten eines AlphaServer GS160/320**

# EV7 — the system is the silicon

- Integrated Memory Controller
  - Direct Rambus
  - High data capacity per pin
  - 12 GB/s read or write bandwidth
  - ECC SECDED single error correction, double error detect,
  - Optional RAID in memory
- Integrated Mesh Interface
  - Direct processor-to-processor interconnect
  - 4 links 24.6 GB/s per processor (1.150 GHz)
    - Hop Latency: <40ns
    - Worst Latency <400ns
  - ECC , per hop
  - 3 GB/s I/O interface per processor




- Integrated L2 Cache
  - 1.75 MB
  - 7-way set associative
  - 20 GB/s total read/write
  - 9.6 ns load to use latency

# Der EV7z
# Ab August 2004


New

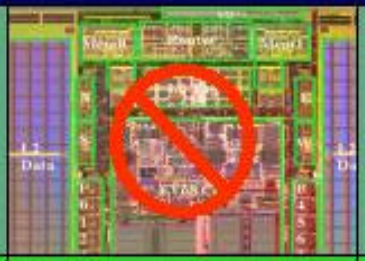
EV7: 1,0 GHz bei ES47,ES80

1,15 GHz bei GS1280

EV7z: 1,15 GHz bei ES47, ES80 ( ca. 15% Performance St. )

1,30 GHz bei GS1280 ( ca. 13% Performance St.
neue Memory Module erforderlich!)

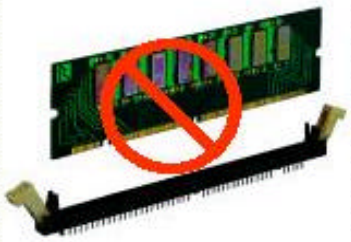
# EV7z ab August 2004

| System | EV7 Speed | Jan 2003 to July 2004 | August 2004 | Mixing CPU Speeds |
|---|---|---|---|---|
| GS1280 | 1.3 GHz |  | ☑ | Different CPU speeds can co-exist in one system, but must be separated into hard partitions where all the CPUs have the same speed. |
| | 1.15 GHz | ☑ | ☑ | |
| ES47/80 | 1.15 GHz |  | ☑ | Different CPU speeds can co-exist in one system, but must be separated into hard partitions where all the CPUs have the same speed. |
| | 1.0 GHz | ☑ | ☑ | |

# EV7z
## Performance-Vergleich zu EV7

| System | EV7 CPU, Speed | Memory, max speed specification | Relative System Performance (based on tests to date for SPEC CPU and STREAMS) |
|---|---|---|---|
|  | 1.3 GHz | 1066 MHz | 113% +/- 2%<br>0% to 2% gain attributable to memory |
| | **1.15 GHz** | **800 MHz** | **100%** |
|  | 1.15 GHz | 800 MHz | 99% +/- 1% |
| | 1.0 GHz | 800 MHz | 87% +/- 2% |

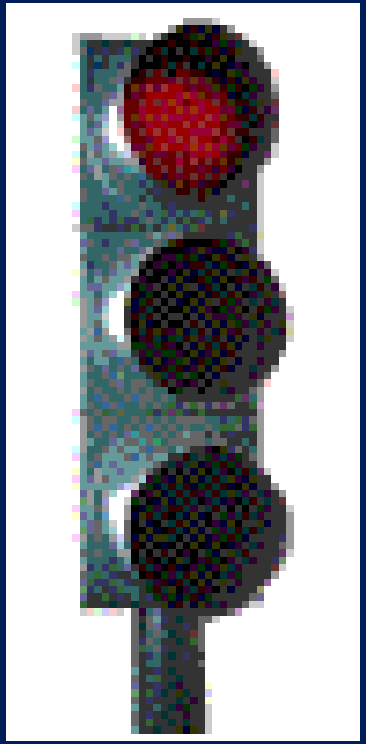
# EV7z und neue Memory Module

| | | Jan 2003<br>July 2004 | August 2004 | |
|---|---|---|---|---|
| | | RDRAM Memory, max speed specification | | |
| | | 800 MHz | 1066 MHz | 800 MHz |
| EV7 CPU Speed | 1.3 GHz |  | ☑ | Works, but support not planned because memory must be run at a lower bus speed, cutting system performance gain from ~13% to~11% |
| | 1.15 GHz | ☑ | Would operate below the speed spec for the part | ☑ |
| | 1.0 GHz | ☑ | Would operate below the speed spec for the part | ☑ |

# EV7 upgrade …what to know

- **No** !, not anymore any change of
  - Clock Module
  - QBB
  - Cache limitations

- Just plug it in and it works with all its advantages
- No additional HW to change
- No hours of down time because of HW part change
- Leave your toolbox at home…
- Yes, for more performance you need performant Memory. (1.3GHz CPU)

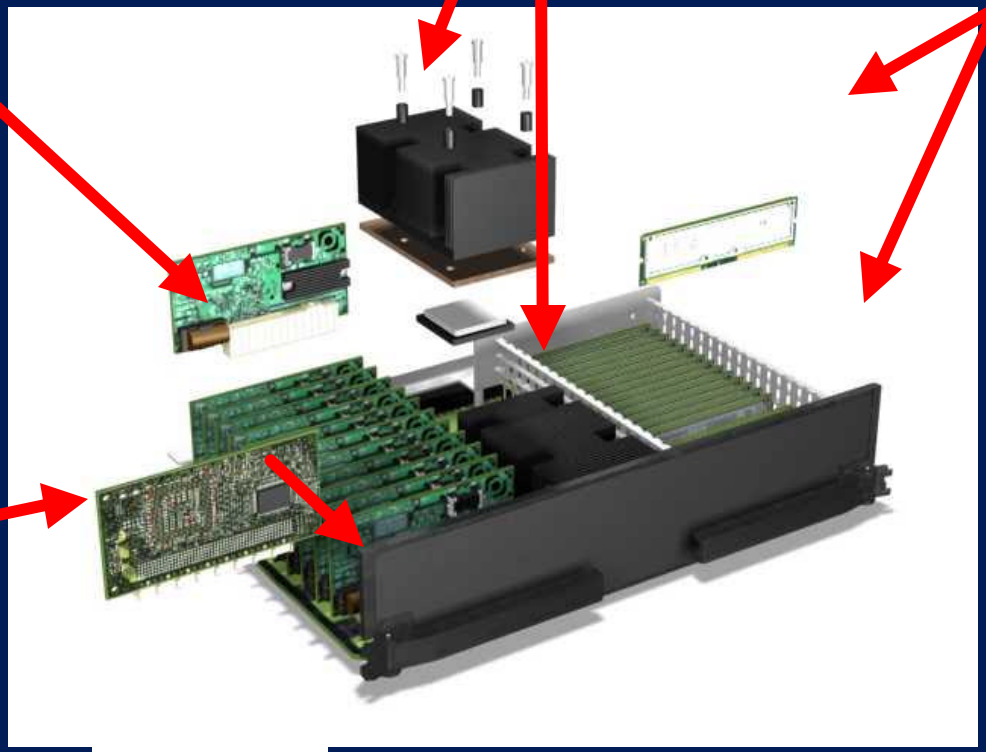


# Dual Processor Building Module

Dual EV7 & EV7z CPU's & Heatsink

N+1 Voltage Regulator Modules

Rambus Memory Modules (RIMM's) 8GB/CPU @FRS 32 GB/CPU Later Raid 3 Funktionalität



CPU Management Module (CMM)

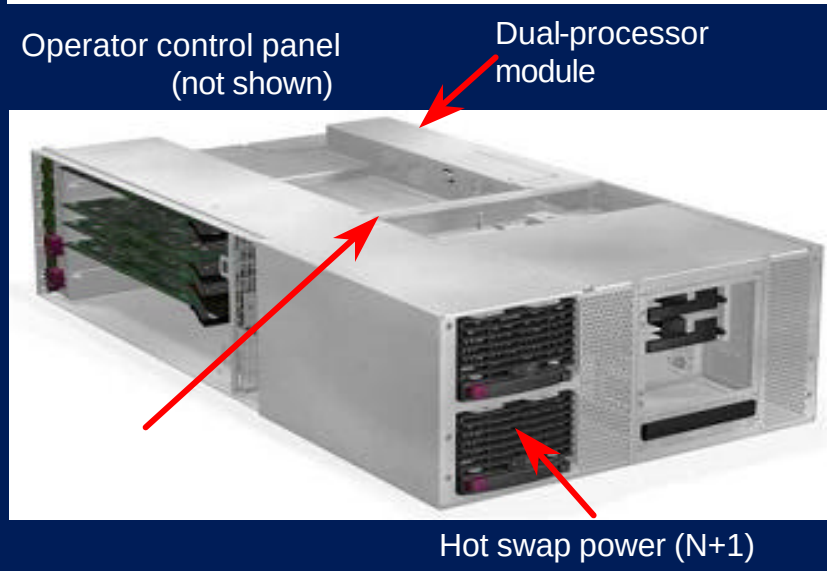
External Connections:

CPU Interconnect

(2) IO7 Connections

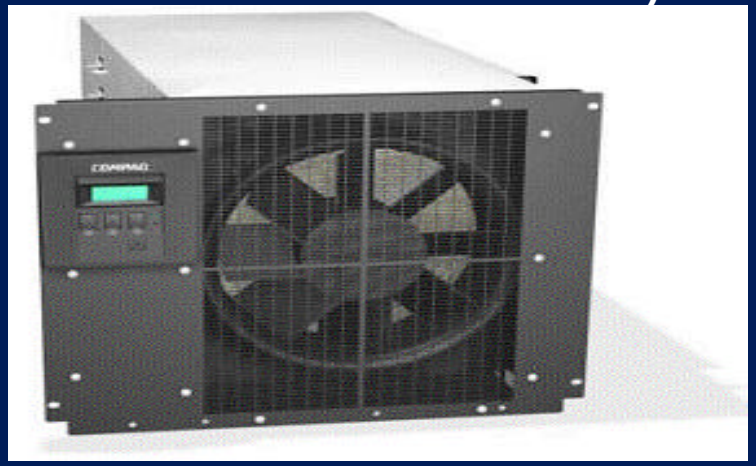
# 2P Building Block Drawer

- Same enclosure for ES47 and ES80
- One dual CPU module
- 8 GB/CPU memory capacity (design limit 32 GB/CPU)
- Three PCI-X/PCI buses
  - Five slots (two hot-plug slots)
  - One AGP 4X slot
- I/O port for external I/O expansion
- Integrated server management module
- Two hot swap SCSI disk drives
- Hot swap redundant fans
- N+1 hot swap power
- 4U height

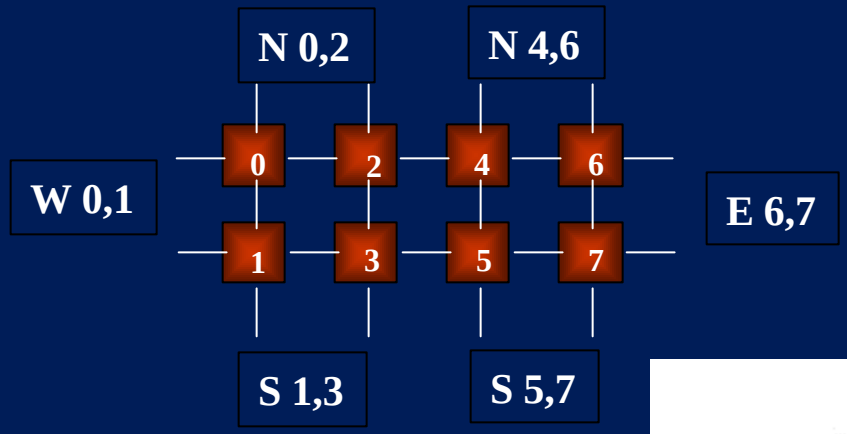


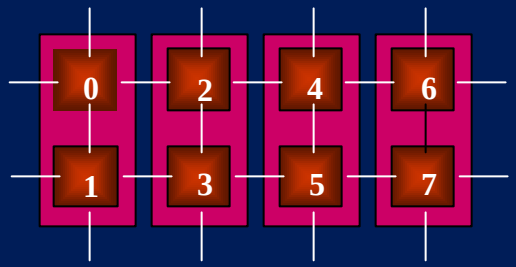
# 8P building block drawer

- Supports up to four dual CPU building block modules
- 16 GB maximum memory per CPU (4 GB at FRS)
- Up to eight I/O expansion drawers can be supported per 8P drawer
- Four 8P building block drawers fit into a standard 2M rack
- Integrated server management module
- N+1 cooling
- N+1 48 V power supplies power the 8P drawer

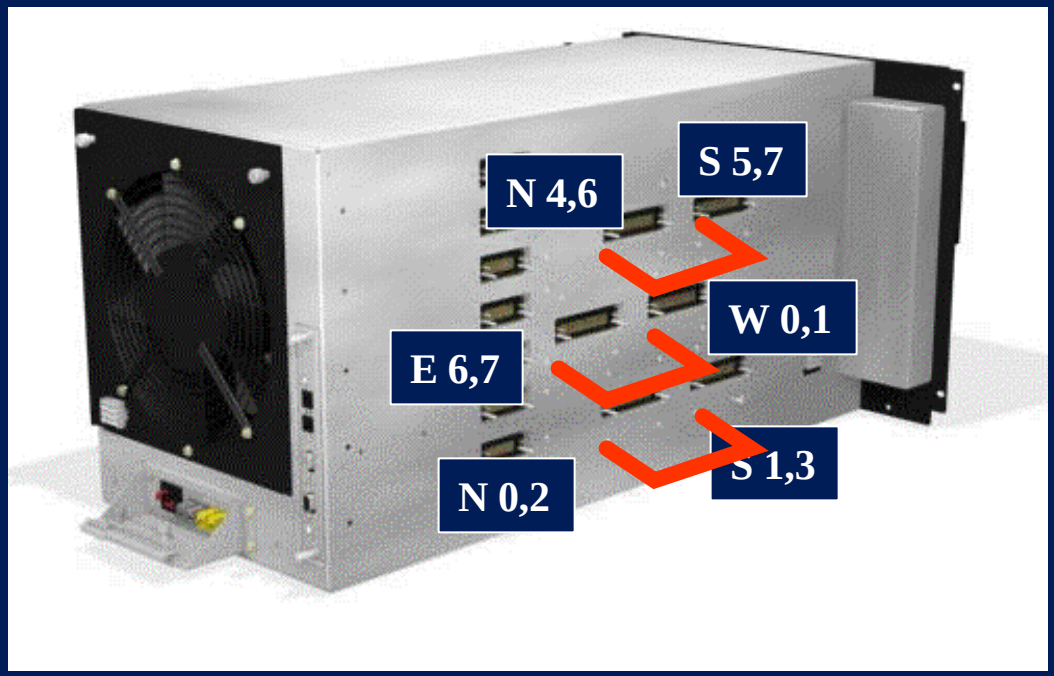



# 8P Building Block Drawer




**Heute: 4 dual CPU Module**




**Cabled as an 8P partition**

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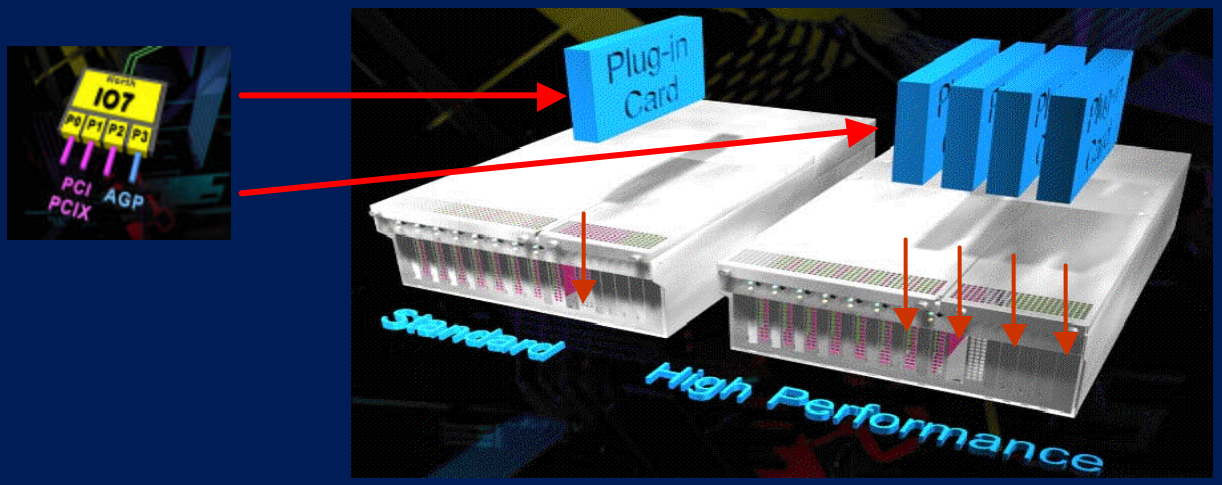
# External I/O Building Blocks (Drawers)




- Standard I/O building block drawer
  - Single I/O riser module
  - Optimized for PCI slot connectivity
  - **Three** PCI-X buses / 11 slots
    - Six PCI-X 66 MHz
    - Two PCI-X 133 MHz
    - Three non hot-plug PCI
  - One AGP 4X bus slot for graphics
- High performance I/O building block drawer
  - Up to 4 I/O riser modules
  - Optimized for bandwidth and density
  - **Eight** PCI-X buses (133 MHz) / eight slots (Single slot per bus design maximizes bandwidth)
  - Attachment to four processors, up to four separate partitions

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# AlphaServer ES47 / ES80 / GS1280
## Gemeinsame Systemkomponenten

gemeinsame Komponenten…

EV7 / EV7z CPU Module

2P und 8P System Drawers

I / O Drawers: PCI-X & AGP 4X

System Management

**EV7…für unglaubliche Möglichkeiten**

# HP AlphaServer ES47 systems

Workgroup

- Configuration flexibility
  - 2 - 4 1 GHz processors
  - Up to 32 GB memory
  - 6 - 36 I/O slots
  - Tru64 UNIX v5.1B, OpenVMS v7.3-1, v7.3-2 and Linux
- Reliability enhancements
  - Redundant components
  - Optional "RAID" memory
  - Family-wide RAS features
- Flexibility & manageability
  - "Cluster worthy" partitions
  - Embedded server management
- Complementary product to HP AlphaServer DS25 and ES45 systems

# HP AlphaServer ES80 system

Departmental

- Configuration flexibility
  - 2 - 8  1 GHz processors
  - Up to 64 GB memory
  - 6 - 72 I/O slots
  - Tru64 UNIX v5.1B, OpenVMS v7.3-1, v7.3-2 and Linux
- Reliability enhancements
  - Redundant components
  - Optional “RAID” memory
  - Family-wide RAS features
- Flexibility & manageability
  - “Cluster worthy” partitions
  - Embedded server management

# HP AlphaServer GS1280 system

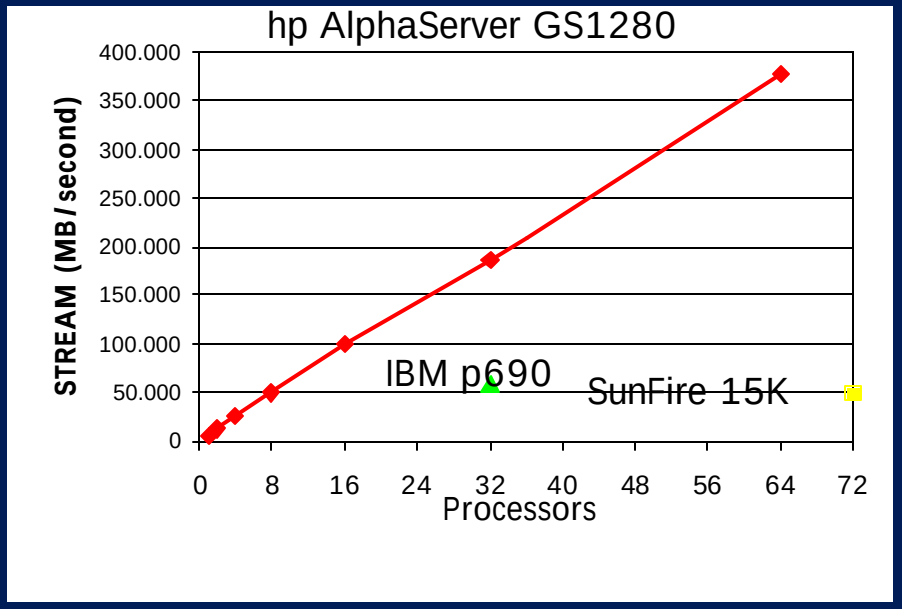
Enterprise

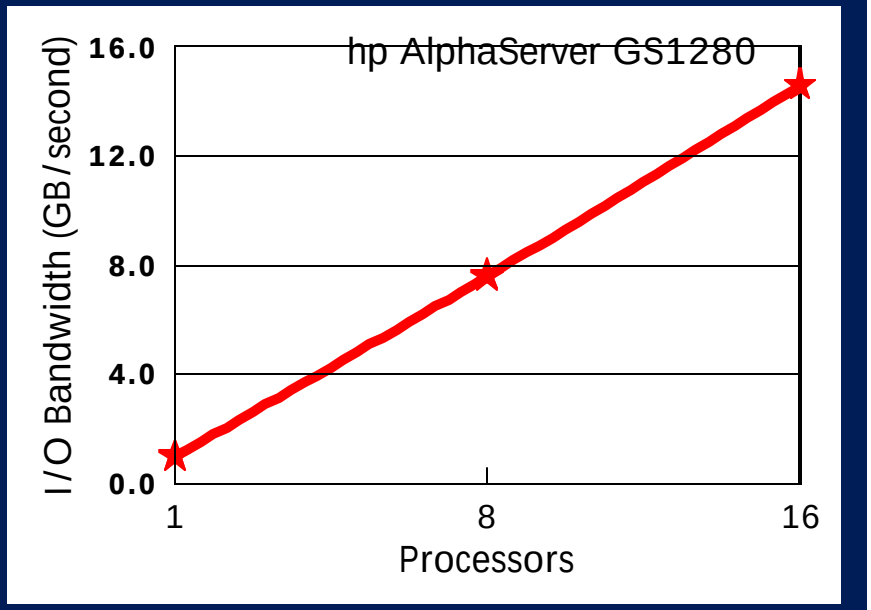
- Configuration flexibility
  - 2 - 64 1.15 GHz processors
  - Up to 512 GB memory
  - 12 - 768 I/O slots
  - Tru64 UNIX v5.1B, OpenVMS v7.3-1 and OpenVMS v7.3-2
- Reliability enhancements
  - Redundant components
  - Optional “RAID” memory
  - Family-wide RAS features
- Flexibility & manageability
  - “Cluster worthy” partitions
  - Embedded server management
- Replacement offering for AlphaServer GS80, GS160 and GS320 systems

# Scaleable Infrastructure with excellent Throughput

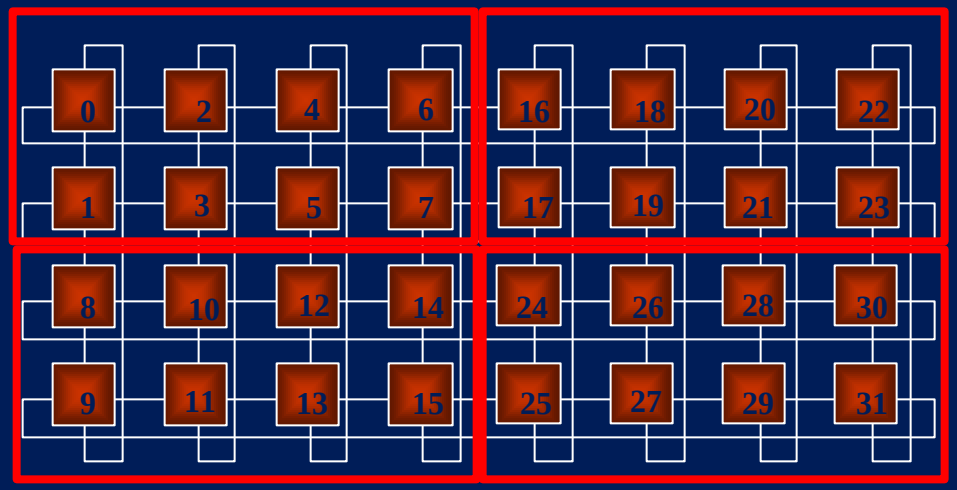
scalable infrastructure to support your most demanding application requirements

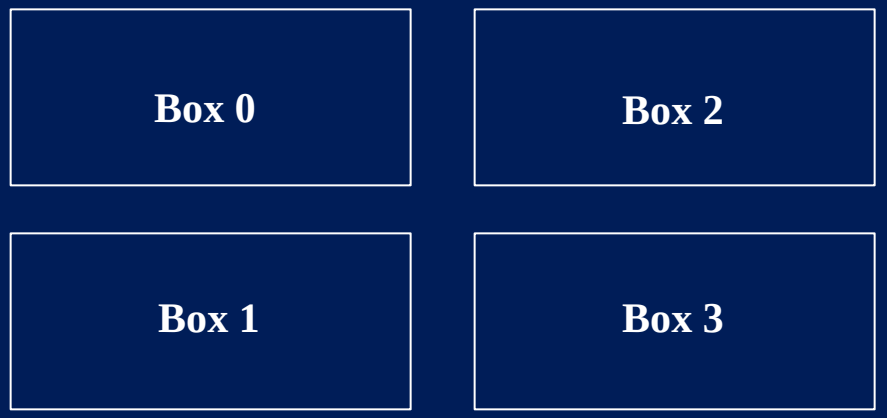
- Implementing scalable memory and I/O bandwidth
- Delivering scalable application performance and headroom for both Tru64 UNIX® and OpenVMS

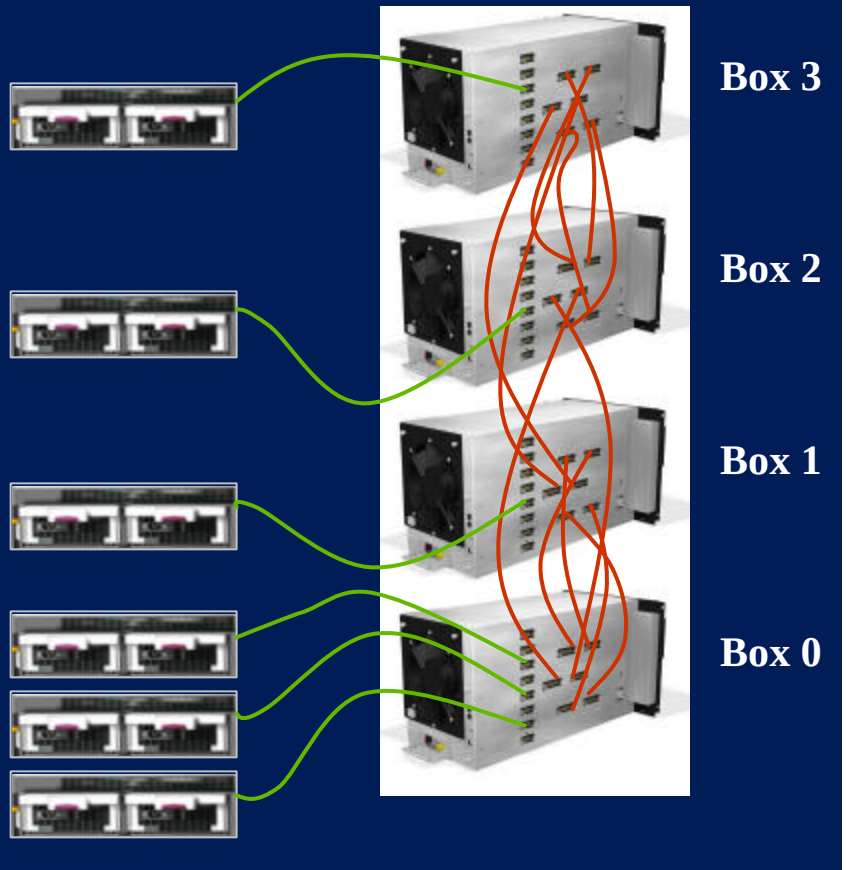


# AlphaServer GS1280
# Fast grenzenlose Skalierbarkeit

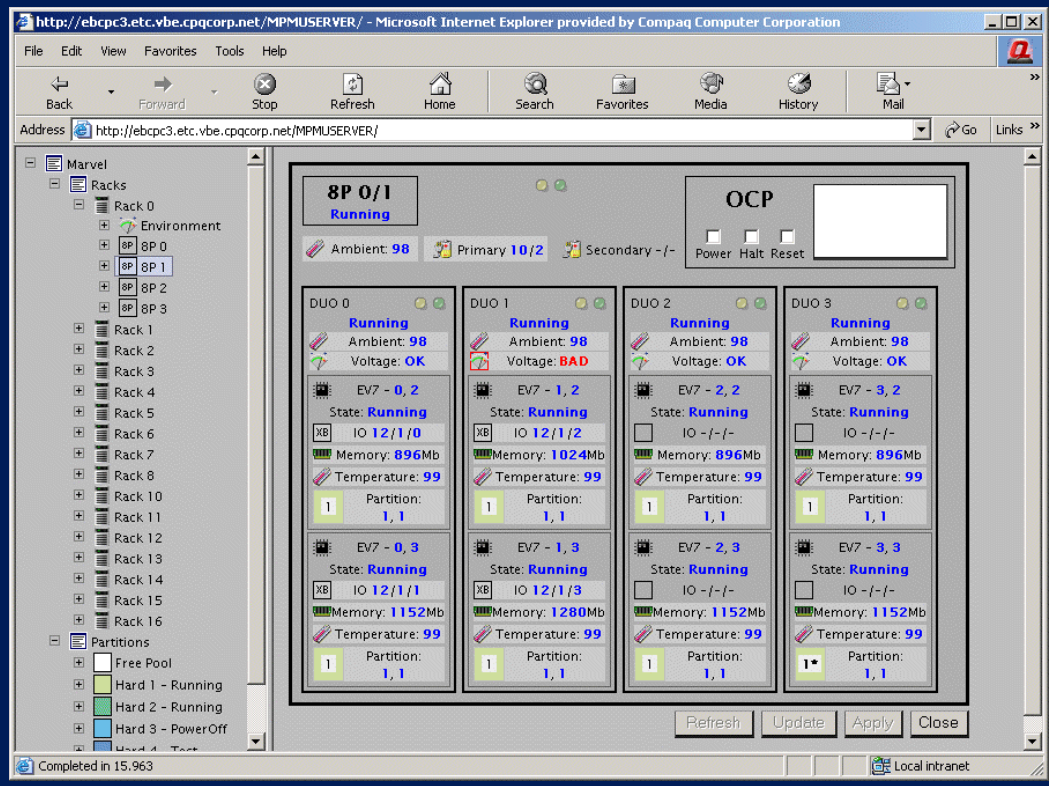


# Server platform management MPMU

- Configuration & installation management
- Controls power-up sequencing
- Remote software upgrades
- Platform error log management
- Integration with HP Analyze, for remote servicing capability
- Monitors system status
  - Voltages
  - Fan speeds
  - Temperature
  - CPU status
  - Memory status
  - I/O status
  - Management utility parameters



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# There's more to come from HP AlphaServer systems!

## 2003: delivered a new family

- AlphaServer ES47/80 M2 to M8
- AlphaServer GS1280 M8 to M64
- Standard and High Performance I/O Drawers
- 8GB memory/CPU
- Hard Partitions & Galaxy

## 2004: increase capacity

- GS1280 Processors -- Aug
  - 1.3 GHz at same price as 1.15GHz today
  - 1.15 GHz price reduced
- ES47/80 Processors -- May
  - 1.15 GHz at same price as 1.0 GHz today
  - 1.0 GHz price lowered
- Memory increase to 16GB/CPU – Q4
- New I/O Adapters
  - 1 Gb/s Ethernet, Dual Channel, Jan
  - 2 Gb/s Fiber Channel, Dual and Single, Feb
  - Backplane RAID U320, Aug
  - 10 Gb/s Ethernet, Q4

# AlphaServer Options - News

Single-port/Dual-port Fiber Channel HBA 2GBit PCI-X
Qualification: May/June 2004
Supported systems: DS15,DS25,ES45,ES47/80,GS1280
Operating Systems:
OpenVMS V7.2-2, V7.3-1, V7.3-2
Tru64 Unix V5.1B

U320 PCI RAID controller
Qualification: September 2004 – OpenVMS
October 2004 – Tru64 UNIX

MSA30 shelf runs in U160 SCSI Mode with U320 drives
No U320 HBA planned!

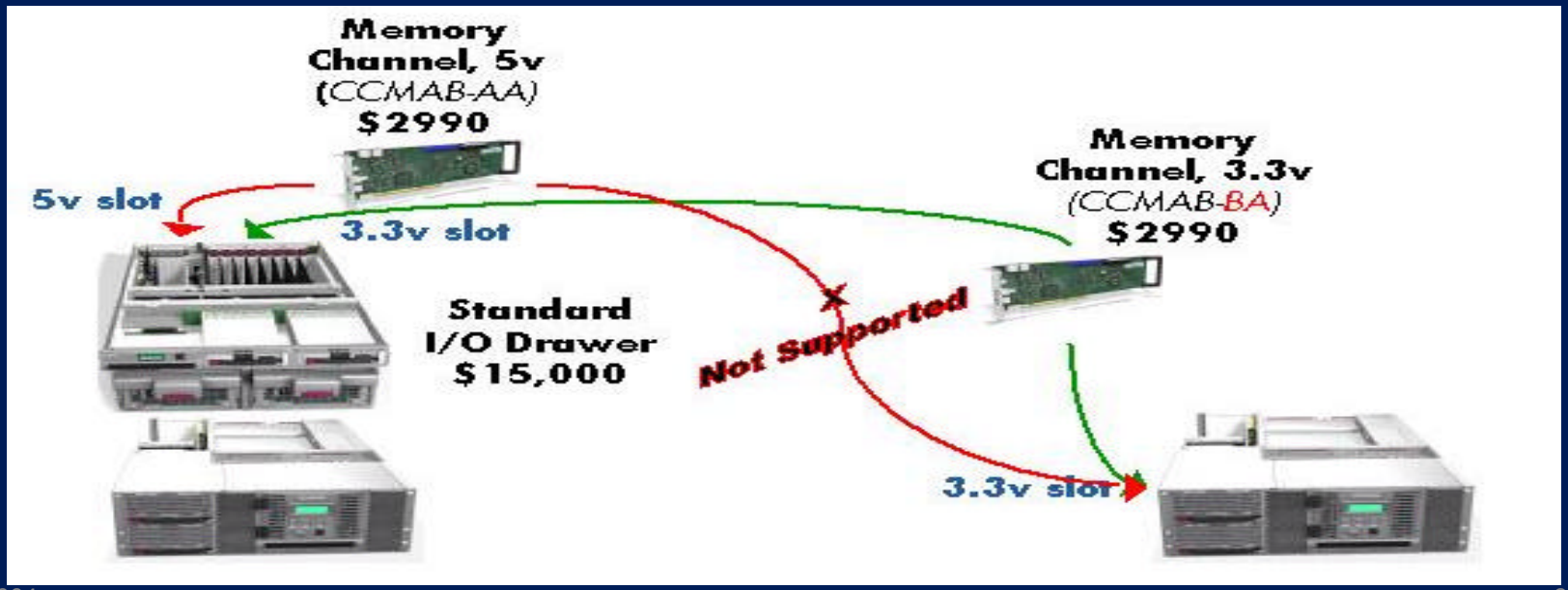
# Memory Channel II Adapter

The CCMAB-BA & CCMFB-BA are modified versions of the existing

CCMAB-BA MEM CHNL ADPTR PCI 5.0 VOLT /3.3 VOLT COMPATIBLE

CCMFB-BA MEM CHNL FIBER-OPTIC/COPPER CNVTR PCI 5.0 VOLT /3.3 VOLT COMPATIBLE

Maximum allowed per system and Hard Partition: 2
Maximum allowed per PCI-X/PCI bus segment: 1



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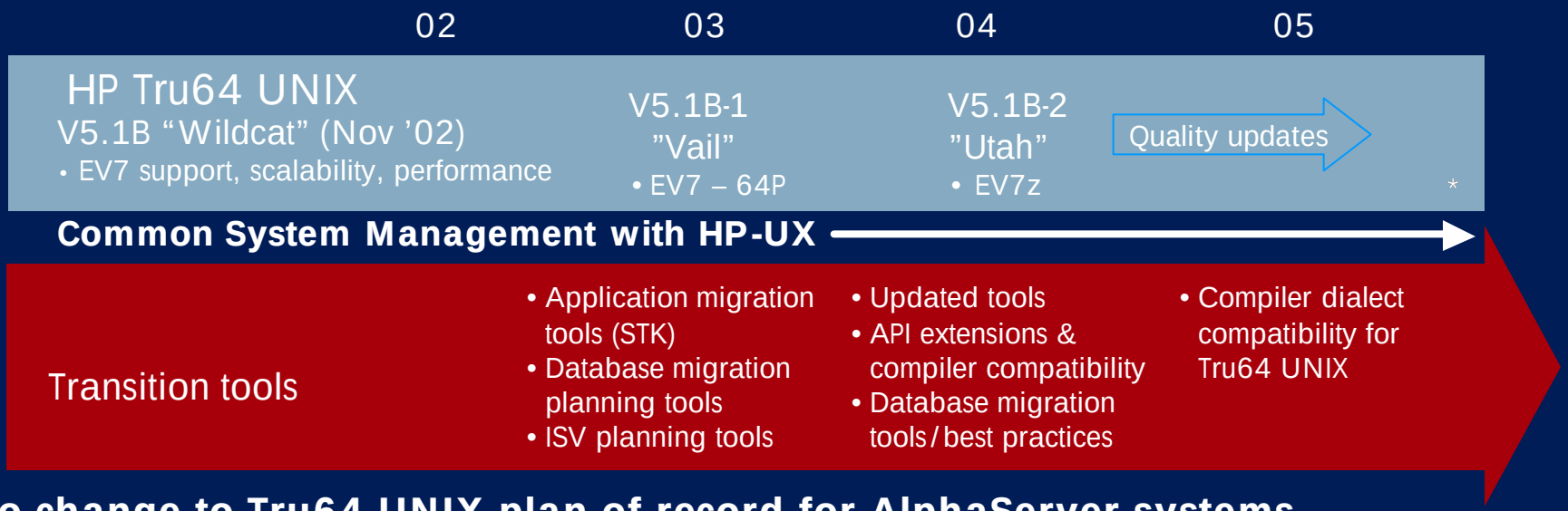
# Transition to Integrity Server
## Tru64 UNIX -> HP-UX




**No change to Tru64 UNIX plan of record for AlphaServer systems**

- Continued enhancement, full support for EV7 and EV7z systems including 32P and 64P Server
- Sales at least until 2006, with support at least until 2011

**Tru64 UNIX**

- Customer support extensions, including Tru64 UNIX v5.1B with enhancements, through 2011
- Storage offerings extended to maximize investment protection

**Services and business practices**

- Tools now available to assist ISVs and customers in transition to HP-UX
- Free** Tru64 UNIX license trade-ins in transition to HP-UX or OpenVMS

* Sales thru at least 2006, support thru at least 2011

** For those with active Rights to New Version software support


hp
invent