OpenVMS Networking Updates

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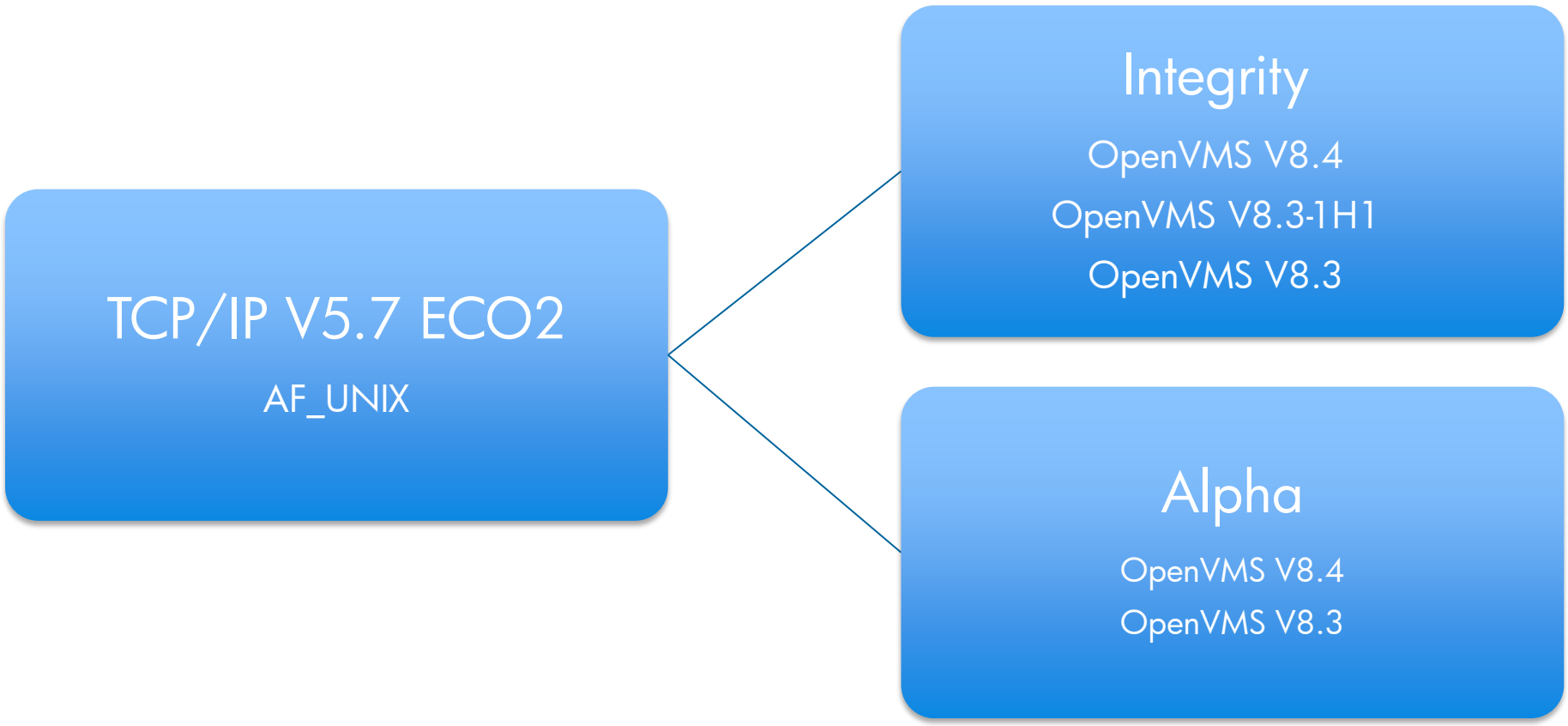
Agenda

- TCP/IP Services V5.7 for OpenVMS update
- NFS enhancements
- CIFS enhancements
- LAN update
- DECnet Plus update
- Q & A

TCP/IP Services V5.7 for OpenVMS update

HP TCP/IP Services V5.7

Support Matrix



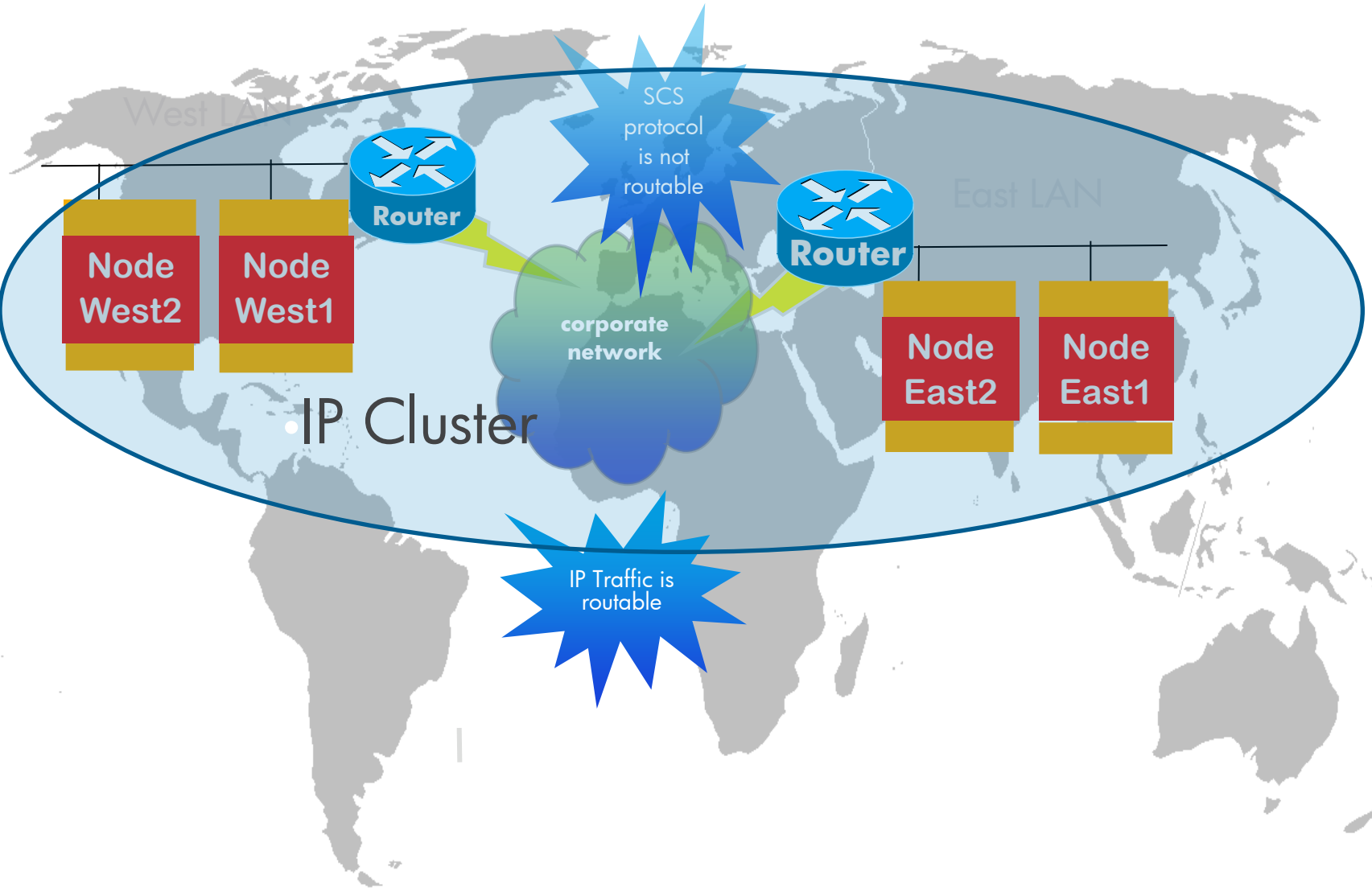
HP TCP/IP Services V5.7

Enhancements

- Cluster Over IP Enablement
- Packet Processing Engine
- Stream Control Transmission Protocol
- Enhanced FTP
- LPD Enhancements
- Mail Enhancements

CLUSTER OVER IP ENABLEMENT

Why Cluster Over IP



IPCI Benefits

LAN Bridging

- No dependency on Vendors for LAN bridging
- No extra license/cost for LAN bridging (Layer 2 service)

IP Benefits

- Lower infrastructural and operational costs
- Leverage the benefits from the improvements in IP and LAN interconnect technology

Ability to co-exist in a modern datacenter without special setting

Cluster Over IP

TCP/IP Support

- OpenVMS V8.4 and TCP/IP V5.7
  - IPv4 only
  - Requires static IP addresses and IP Unicast
  - Coexists with LAN interconnect for Cluster communication

TCP/IP changes

- Boot time loading and Initialization
  - Existing boot sequence; LAN,PE driver, TCP/IP
  - Boot Sequence with IPCI ; LAN,TCP/IP, PE driver
  - Ability to make use of boot time configuration information.

IPCI configuration

- Ability to modify permanent database of other cluster Members
- Support for IPCI addresses

PACKET PROCESSING ENGINE -- PPE

Packet Processing Engine

Dedicates a CPU for TCP/IP processing

Without PPE

- TCP/IP runs on a standard CPU
- CPU reaches saturation, TCP/IP may become bottleneck

With PPE

- No more sharing
- PPE maybe enabled/disabled dynamically

Modeled on the OpenVMS Dedicated Lock Manager

Packet Processing Engine

Configuration Requirements

Hardware

- Requires more than one active CPU
- Will become dormant if only one CPU is left active
- Wake-up when more than one CPU becomes available
- Better suited to systems with many CPUs

Software

- Configure the BG0: as the only driver on the nominated CPU
- i.e. all other fast-path drivers must be moved to other CPUs

Example

```
$ show fastpath
Fast Path preferred CPUs on TEST 1-OCT-2010 10:25:10.80
HP BL860c (1.59GHz/9.0MB) with 4 active CPUs
Device:       Fastpath CPU:
EWA0                  0
EWC0                  2
FGA0                  0
FGB0                  3
PKA0                  1
OpenVMS TCP/IP is currently running on CPU 1
$set dev FGB0/pref=1
$set dev bg0/pref=3
```


Example

```
$ show fastpath      ! ensure no other drivers on CPU3
Fast Path preferred CPUs on TEST 1-OCT-2010
10:27:05.64
HP BL860c (1.59GHz/9.0MB) with 4 active CPUs
Device:       Fastpath CPU:
EWA0                  0
EWC0                  2
FGA0                  0
FGB0                  1
PKA0                  1
OpenVMS TCP/IP is currently running on CPU 3
```


Packet Processing Engine

Dynamically

- sysconfig –r inet ppe_enable=1 ! 0 to disable
- sysconfig –q inet ppe_enable

Permanently

- TCPIP$ETC:SYSCONFIGTAB.DAT

TCPIP$INETPPE process

- Started automatically when PPE is enabled
- Runs at Priority 63
- Hibernates when PPE is disabled

STREAM CONTROL TRANSMISSION PROTOCOL (SCTP)

SCTP Concepts

- Features of both TCP and UDP
- Association and streams
  - Address Head-Of-Line blocking
- Multihoming
  - Network resilence
  - Dynamic reconfiguration of IP addresses
  - Mix of v4 and v6 addresses
- Partial Reliability (How much reliablity)
  - When should I retry transmission and when do I give up ?
- Security
  - 32 bit verificiation tag (vtag) exchanged during association setup
  - Needed to send / receive packets

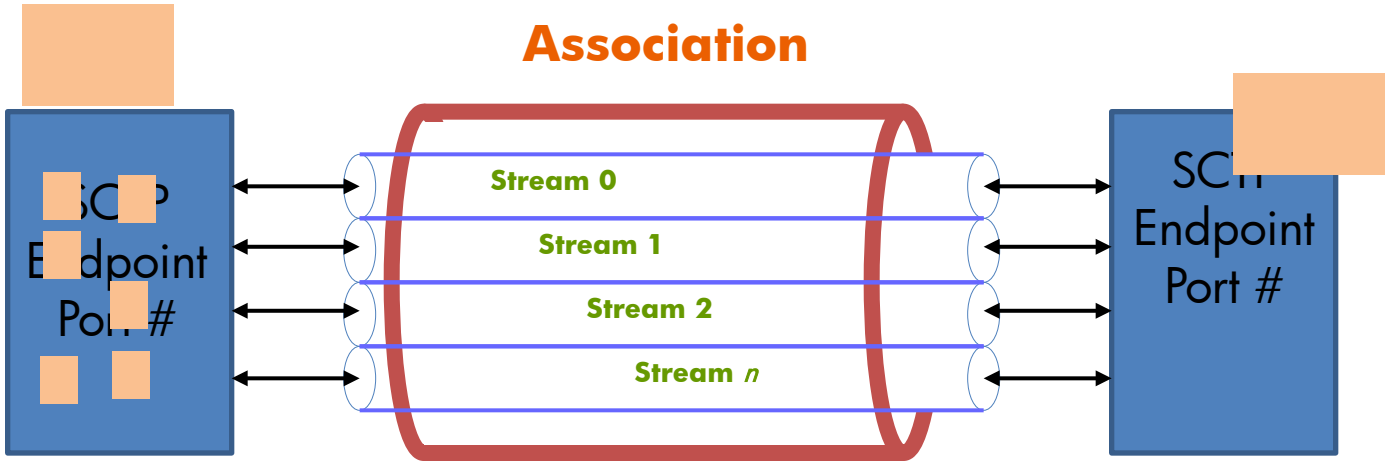
Comparision – SCTP, TCP and UDP

Service/Features	SCTP	TCP	UDP
Message-Oriented	yes	no	yes
Byte-Oriented	no	yes	no
Connection-Oriented	yes	yes	no
Full Duplex	yes	yes	yes
Reliable data transfer	yes	yes	no
Partially-Reliable data transfer	opt	no	no
Ordered data delivery	yes	yes	no
Unordered delivery	yes	no	yes
Flow control	yes	yes	no
Congestion Control	yes	yes	no
ECN Capable	yes	yes	no
Selective Acknowledgments	yes	opt	no
Path MTU discovery	yes	yes	no
Application PDU fragmentation	yes	yes	no
Application PDU bundling	yes	yes	no
Multistreaming	yes	no	no
Multihoming	yes	no	no
Dynamic Multihoming	opt	no	no
SYN flooding attack prevention	yes	no	n/a
Allows half-closed state	no	yes	n/a
Reach-ability check	yes	opt	no
Pseudo-header for checksum	no	yes	yes
Time wait state	no	yes	n/a
Authentication	opt	opt	no
CRC based checksum	yes	no	no

SCTP

Associations and Streaming

- Transport level (RFC 2960) protocol like TCP and UDP
- Streams created within a single SCTP association
- Each stream delivers data independently
- Avoids head-of-line blocking



SCTP

OpenVMS implementation

Based on Free-BSD

- Well written code and mature code base
- Compiled with TCPIP$INTERNET_SERVICES

ENHANCED FTP

Enhanced FTP

Configurations

ANONYMOUS FTP LIGHT

- Enabled via user-based logical TCPIP$FTP_ANONYMOUS_LIGHT
- Restricts the user's FTP access to directories defined by TCPIP$FTP_ANONYMOUS_DIRECTORY

FTP Over SSL

- Compliant with RFC 4217
- FTPS is about 2.5 times faster than SFTP

Line Printer Driver (LPD)

Line Printer Driver

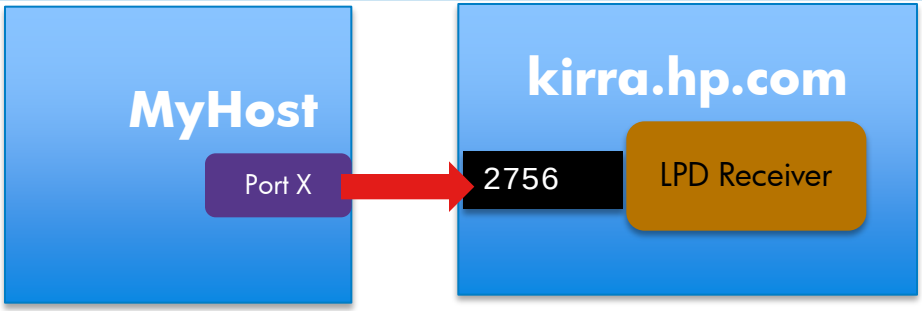
Configurable Port

LPD default port is 515 (RFC 1179)

TCPIP$PRINTCAP.DAT configuration file

- e.g., Assume LPD listens on remote host:
  port = "KIRRA:2756".
  Then on the local host, add an entry to TCPIP$PRINTCAP.DAT

```
PRINTER1: \
:rm=kirra.hp.com: \
:rt=2756: \   <etc>
```



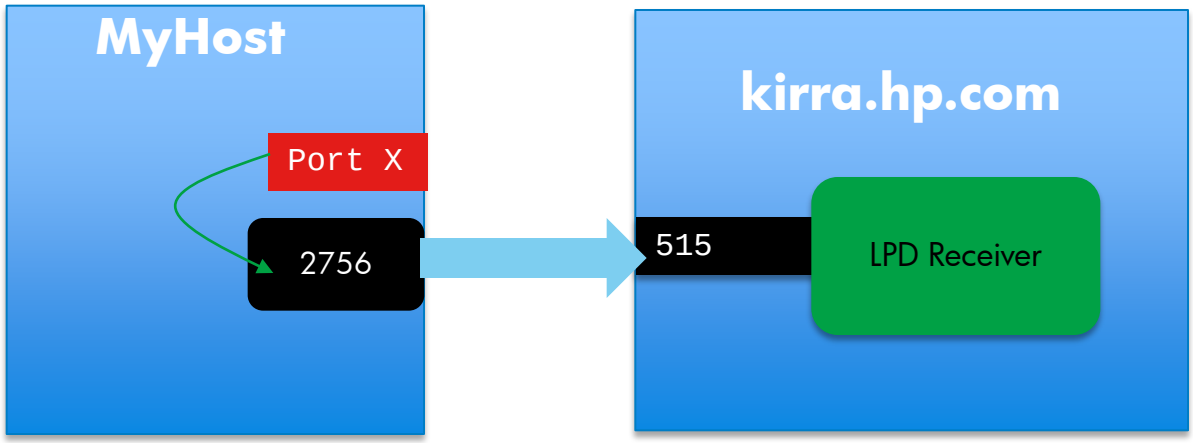
Line Printer Driver

Secure Printing

In TCPIP$PRINTCAP.DAT set ":rm=localhost:"

- Forward port 2756 over an SSH tunnel to remote port 515, or wherever the remote print server is listening

  MYHOST$ SSH -"L"2756:localhost:515 kirra.hp.com



Mail Enhancements

SMTP

Changes in TCP/IP v5.7

Cluster-aware SMTP

- Load balancing and high availability
- SMTP files/folders - disk visible to all nodes in the cluster.

TCPIP$SMTP.CONF

- Configuration based on logical names is obsolete
- Roll-over tool ; TCPIP$SMTP_V57_ROLLOVER.EXE

SMTP Persistent Receiver

Changes in TCP/IP v5.7

TCPIP$PEERNAME Utility

Displays end-point information

- e.g.,
  $ peername bg1630
  Local address: 10.11.12.13, port: 22
  Remote address: 10.11.22.210, port: 49573

  $show sym TCPIP$peername*
  TCPIP$PEERNAME_LOCAL_ADDRESS = "10.11.12.13"
  TCPIP$PEERNAME_LOCAL_PORT = "22"
  TCPIP$PEERNAME_REMOTE_ADDRESS = "10.11.22.2"
  TCPIP$PEERNAME_REMOTE_PORT = " 49573"

NFS Updates

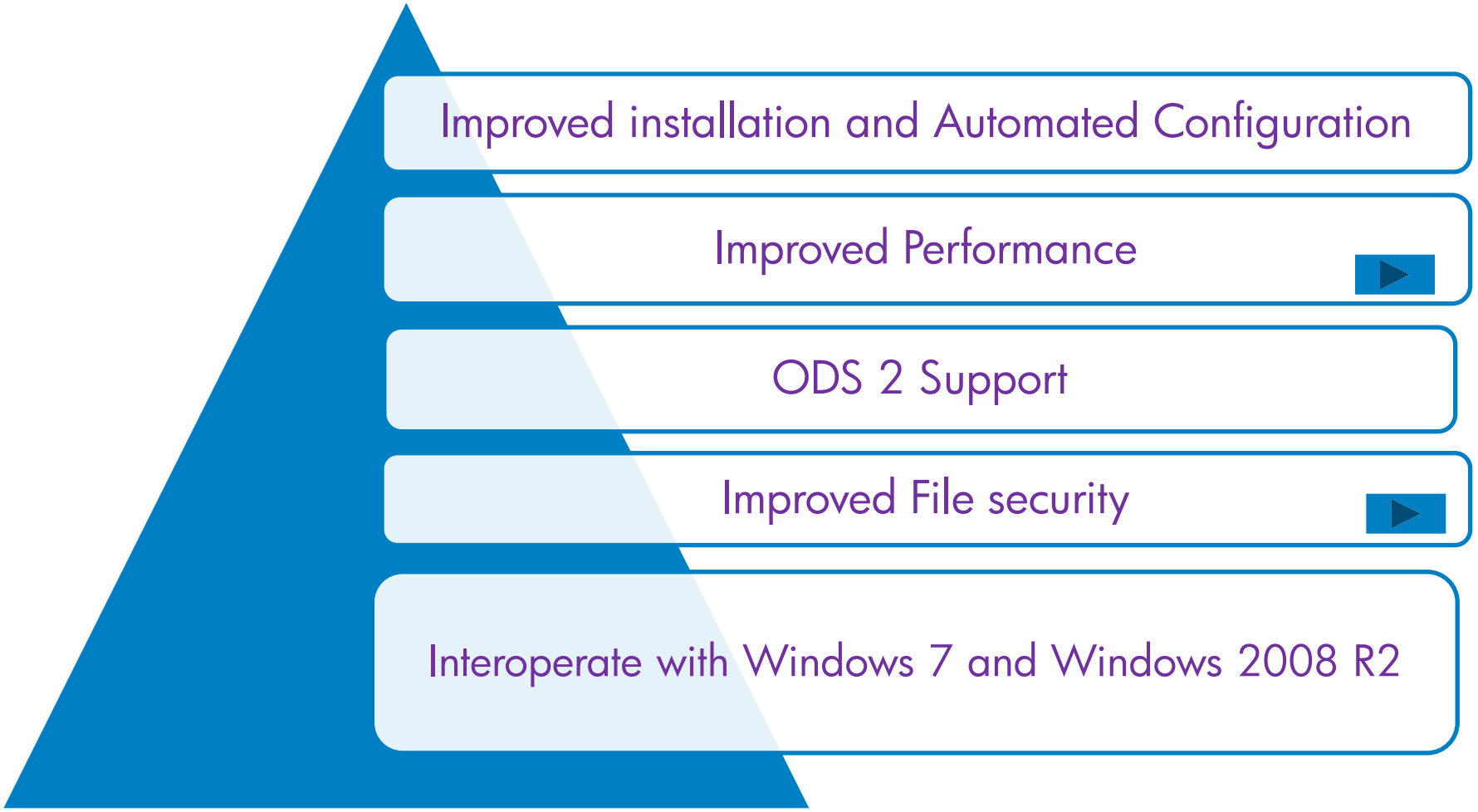
NFS V3 Client on TCP/IP

•NFS V3

Compliant with RFC 1813
Support for larger file sizes (>4GB)
Larger data transfer size (32 KB)
Asynchronous writes to the NFS V3 server using UNSTABLE writes followed by COMMIT requests
Released with TCP/IP 5.7 ECO 2 kit

CIFS Updates

CIFS V1.2+PS001 Enhancements



CIFS enhancements

Performance enhancements

- Storing file size in an ACE/ACL for non stream format files
- Utility to automatically update file length hint values for Sequential VAR and VFC files
- Open File Caching

CIFS enhancements

File security improvements

- Simplify the use of mask and mode SMB.CONF parameters
- Support for DELETE protection bit with mask and mode SMB.CONF parameters
- Ability to set DELETE protection bit from Windows for OWNER/GROUP/WORLD RMS protection mask

LAN Updates

LAN Update

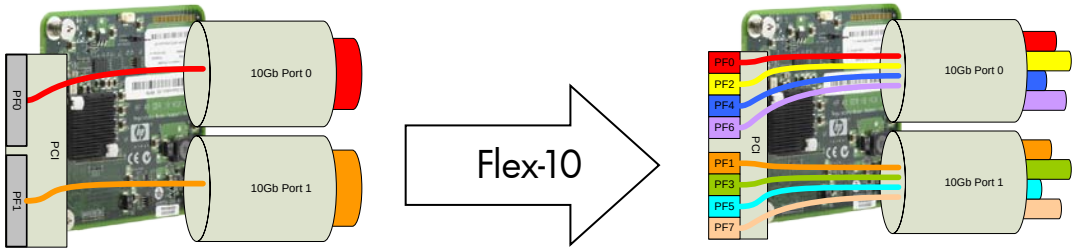
10Gig

LAN on Motherboard (LOM)

- BL860c i2/BL870c i2/Bl890c i2
- Broadcom 57711e
- SYS$EW57711.EXE driver
- Support for Flex-10 (Virtual Connect Flex-10 10Gb Ethernet Module for c-Class BladeSystem (455880-B21) and DCC

Standup Cards

- HP NC532m PCIe 2-Port 10GbE NIC
- Flex-10 Capable



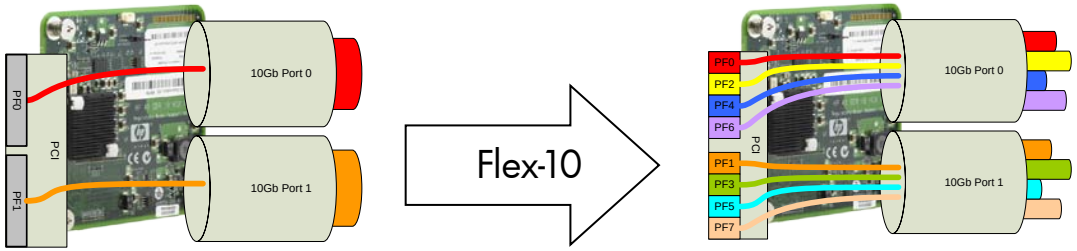
LAN Update

Flex10

Flex-10 technology is a hardware-based solution that enables users to partition a 10 gigabit Ethernet (10GbE) connection.

Regulate data speed for each partition

Flex-10 technology lets you configure a single 10 Gb Ethernet port to represent four FlexNICs

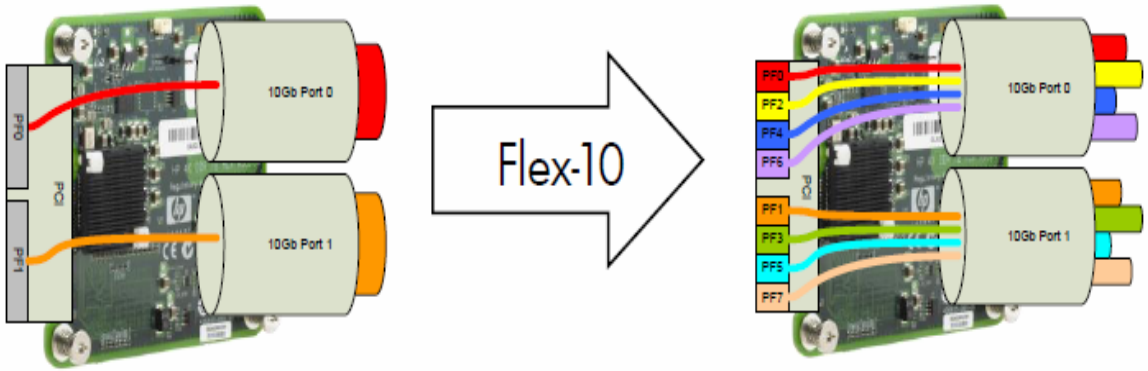


Flex-10 LAN-on-Motherboard

- Each BL860c i2 motherboard integrates two Broadcom 57711E dual port 10GbE controllers
  - Total of four physical 10GbE ports per motherboard
- With a Flex-10 VC module, the resulting built-in FlexNIC counts are:
  - 16 FlexNICs in a BL8**6**0c i2 server
  - 32 FlexNICs in a BL8**7**0c i2 server
  - 64 FlexNICs in a BL8**9**0c i2 server

Need more?

Add Flex-10 capable mezz cards (like the NC532m)



LAN Update

1Gig

Mezz cards

- HP NC364m PCIe 4-Port 1GbE (Intel)
- HP NC360m PCIe 2-Port 1GbE (Intel)
- BL860c i2/BL870c i2/BL890c i2
- SYS$EI1000.EXE

HP Integrity rx2800 i2 server

- Core i/o card (LOM)
- AD221A, AD222A, AD393A
- AD337A, AD338A, AD339A

DECnet Plus

DECnet Plus

Enhancements

DECnet/IP communication through SSH – On V8.4

- Uses port forwarding feature of SSH
- Enabled by DECNET_IP_PORT_FORWARD logical

Latest ECO's

Questions / Comments

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Thank You