z/VM Platform Update

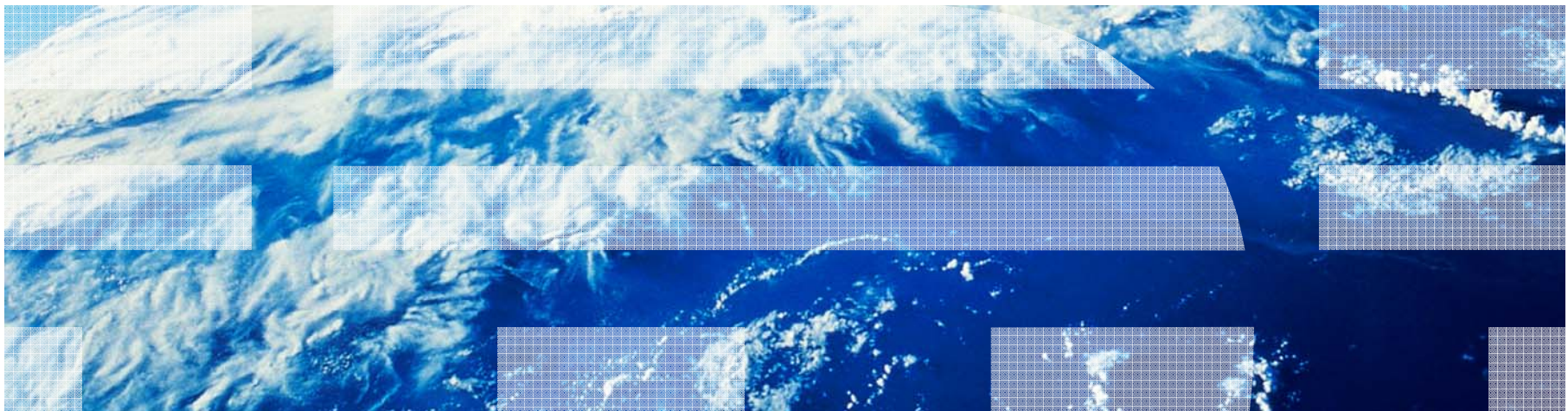## Session IS03

Alan Altmark
IBM Lab Services

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z/VM Platform Update

Alan Altmark
z/VM and Linux on System z IT Consultant
IBM STG Lab Services and Training

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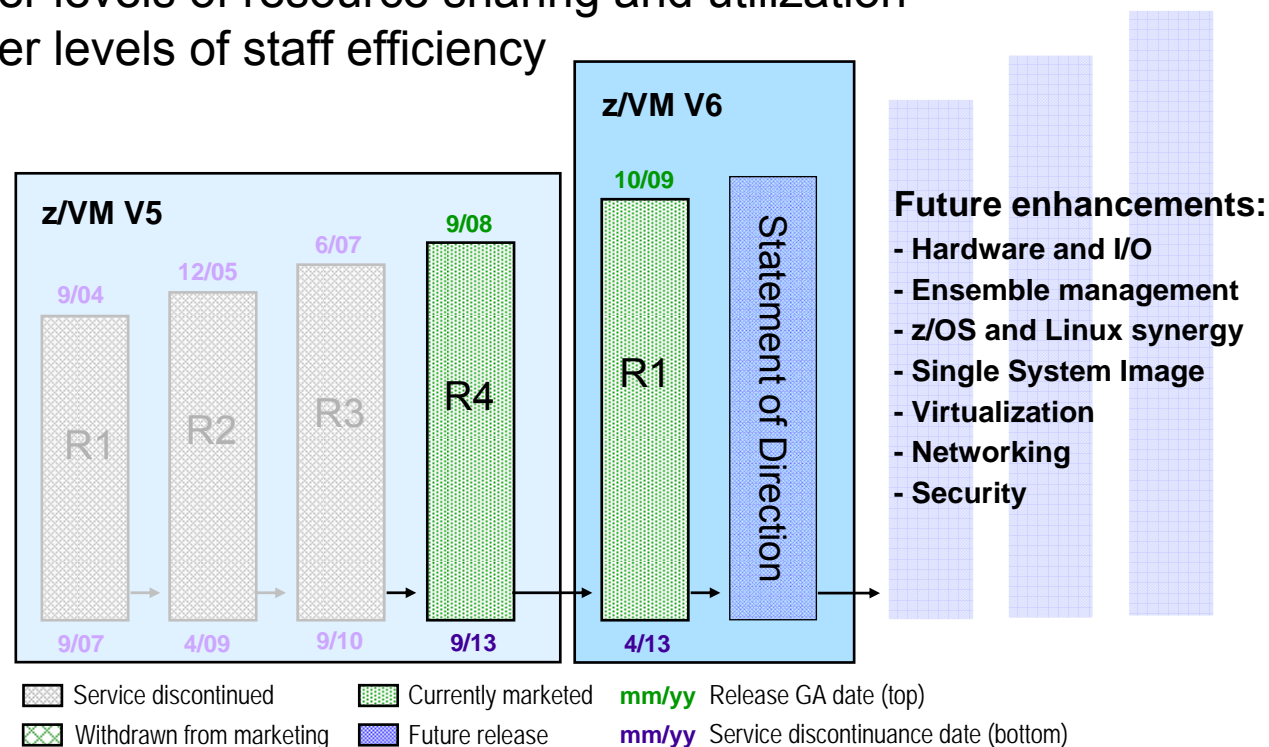
z/VM Platform Update

Agenda

- z/VM Timeline

- z/VM Version 5
  - Enhancements

- z/VM Version 6
  - Enhancements
  - Statement of Direction

z/VM Platform Update

z/VM Release Status

z/VM: helping clients "do more with less"

- ★ Higher core-to-core consolidation ratios
- ★ Higher levels of resource sharing and utilization
- ★ Higher levels of staff efficiency

z/VM V6

z/VM V5

9/04

12/05

6/07

9/08

10/09

R1

R2

R3

R4

R1

Statement of Direction

9/07

4/09

9/10

9/13

4/13

Future enhancements:
- **Hardware and I/O**
- **Ensemble management**
- **z/OS and Linux synergy**
- **Single System Image**
- **Virtualization**
- **Networking**
- **Security**

Service discontinued   Currently marketed   **mm/yy** Release GA date (top)

Withdrawn from marketing   Future release   **mm/yy** Service discontinuance date (bottom)

IBM received EAL 4+ certification of z/VM V5.3 from the German Federal Office of Information Security (Bundesamt für Sicherheit in der Informationstechnik) for conformance to the Controlled Access and Labeled Security protection profiles (CAPP and LSPP) of the Common Criteria standard for IT security, ISO/IEC 15408. While z/VM V5.4 was not officially evaluated for conformance, but is designed to meet the same standards. z/VM 6.1 is in evaluation for conformance to OSPP with Labeled Security extension, at EAL 4+.

z/VM Version 5
Marketing and Service Updates

- End of Service for z/VM V5.3 was September 30, 2010

- End of Service for z/VM V5.4 has been extended to September 30, **2013**

- z/VM V5.4 is still marketed and available
    - z/VM V5.4 and z/VM V6.1 are available concurrently
    - Clients with System z9 or prior generations should acquire z/VM V5.4

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z/VM Version 6.1
The Foundation for System z Virtualization Growth
Previewed July 7, 2009; Available October 23, 2009

- **Architectural Level Set establishes a new z/VM technology base on IBM System z10**
  - z/VM V6 operates only on z10 EC, z10 BC, and z196

- **Allows optimization of z/VM function for greater business value on newer hardware**
  - Prefetch Data instruction improves performance of streaming network connections between guests on a VSWITCH

- **Multi-system virtualization support (future release support)**
  - z/VM clustering and guest mobility statements of direction
  - A more manageable ecosystem for cloud computing
    - add hardware to the workload
    - move workload to hardware
  - Helps clients avoid the virtual machine sprawl challenges of x86 systems: fewer real systems hosting thousands of server images

z/VM Platform Update

New Function for z/VM 5.4 and z/VM 6.1
Delivering now through December

- XRC timestamps

- z/OS R11 upgrades

- SSL Server: Scalability and FIPS

- Memory Management

- VSWITCH uplink ports

- zEnterprise

z/VM Platform Update

XRC Timestamps
- VM64814 Beta customers only
- VM64816 Everyone, December

- Limited support for STP
    - CP will sync with STP at IPL (no need to deactivate LPAR)
    - CP will, optionally, obtain time zone and leap seconds from STP
    - Time will be placed in all host and guest I/O
    - Time sync checks will be observed by CP
        - No change to the host or guest TOD
        - Delta applied to I/O only
    - Enabled via SYSTEM CONFIG
    - Option to skip timestamp or delay I/O if CP is unable to sync with STP

- Does NOT include STP virtualization
    - Can be configured to allow use by 2nd level systems
        - No STP synchronization
        - Cannot be used 1st level

z/OS R11 Upgrades - z/VM 6.1 only

- PM08418: Upgrade System SSL to z/OS R11
- VM64751: Upgrade Binder to z/OS R11
- PM10616: System SSL enablement of FIPS

- System SSL
  - FIPS capability
  - FIPS validation under consideration

- Binder
  - FIPS enablement for System SSL

SSL Server

- PK97437: SSLADMIN, TCPRUN and Related Packaging Changes
- PK97438: SSLSERV Module Updates
- PK75662: TCPIP Module Updates
All available now

- Major rewrite

- Multiple SSL servers with 'resume' cache manager and shared database
  - Can balance total number of sessions against number of sessions per server

- Significant performance improvements
  - Interactive workloads such as telnet
  - Session establishment costs, particularly during mass 'reconnect'

- Migration required
  - http://www.vm.ibm.com/related/tcpip/tcsslspe.html
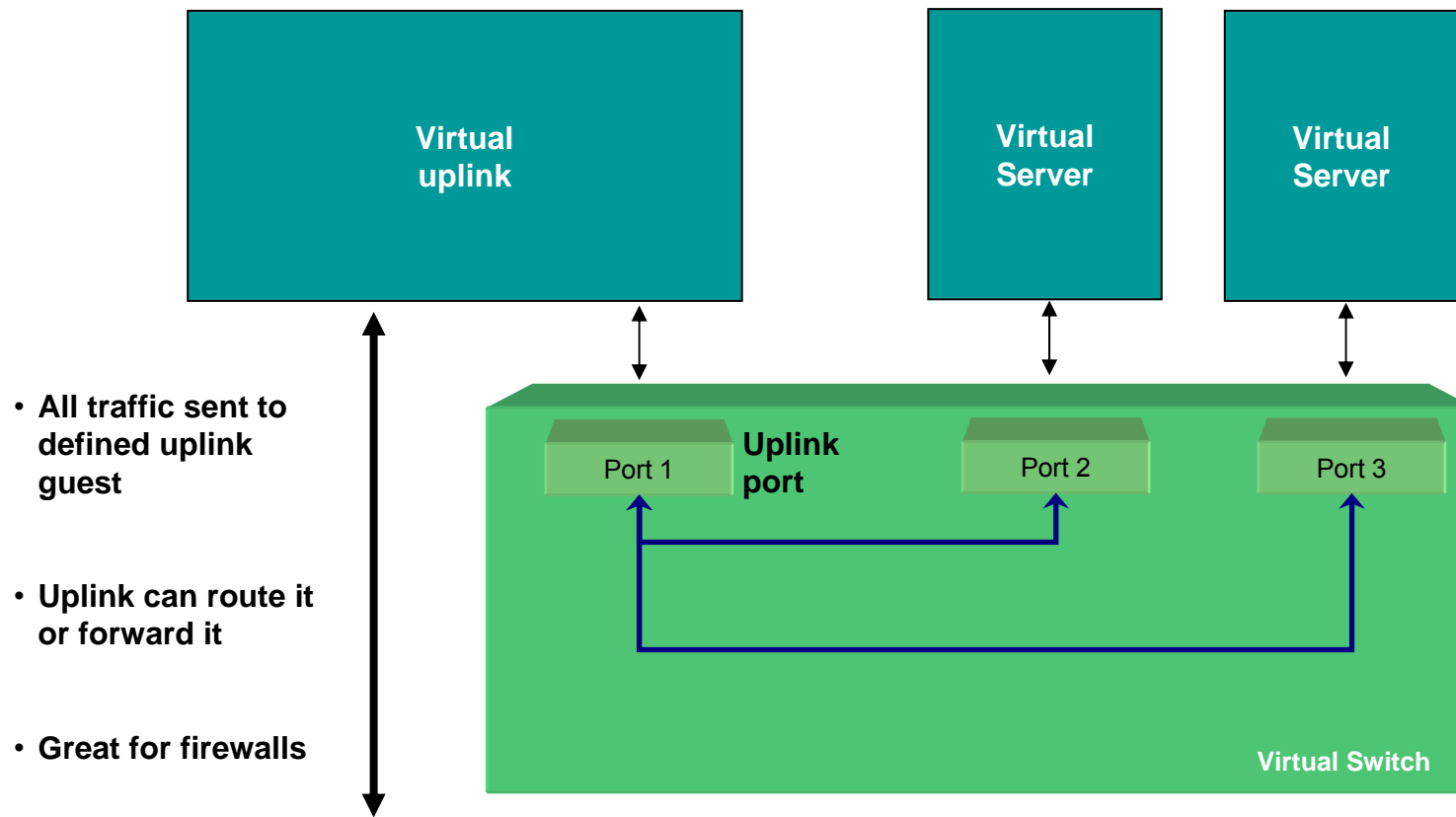
- Updates to TCPIP as well

Memory Management Updates

- VM64795: Coalesce free frames
- VM64714: Page release improvements
- VM64774: Set / Query Reorder (available now)

- Coalesce adjacent free frames
  - Solves contiguous frame problem for functions like virtual SIE that require multiple pages

- Guest Page Release (diagnose 0x10)
  - Reduced contention data structures the stop guest from running

- SET / QUERY REORDER
  - CP periodically reorders resident guest pages in case CP needs to trim
  - Every 8 GB of resident memory results in 1 second of guest purgatory
  - Reorder can occur frequently in systems with high paging rate and a lot of guest CPU consumption
  - Can turn off reorder for any or all users
  - Recommended only at the direction of IBM support
    - Not all performance problems are Reorder problems!

z/VM Platform Update

Virtual Switch Uplink Ports – "It's not your grandfather's VSWITCH!"

- VM64780: CP VSWITCH
- PM06209: TCP/IP Controller

Virtual uplink

Virtual Server

Virtual Server

- **All traffic sent to defined uplink guest**

- **Uplink can route it or forward it**

- **Great for firewalls**

Uplink port

Port 1

Port 2

Port 3

Virtual Switch

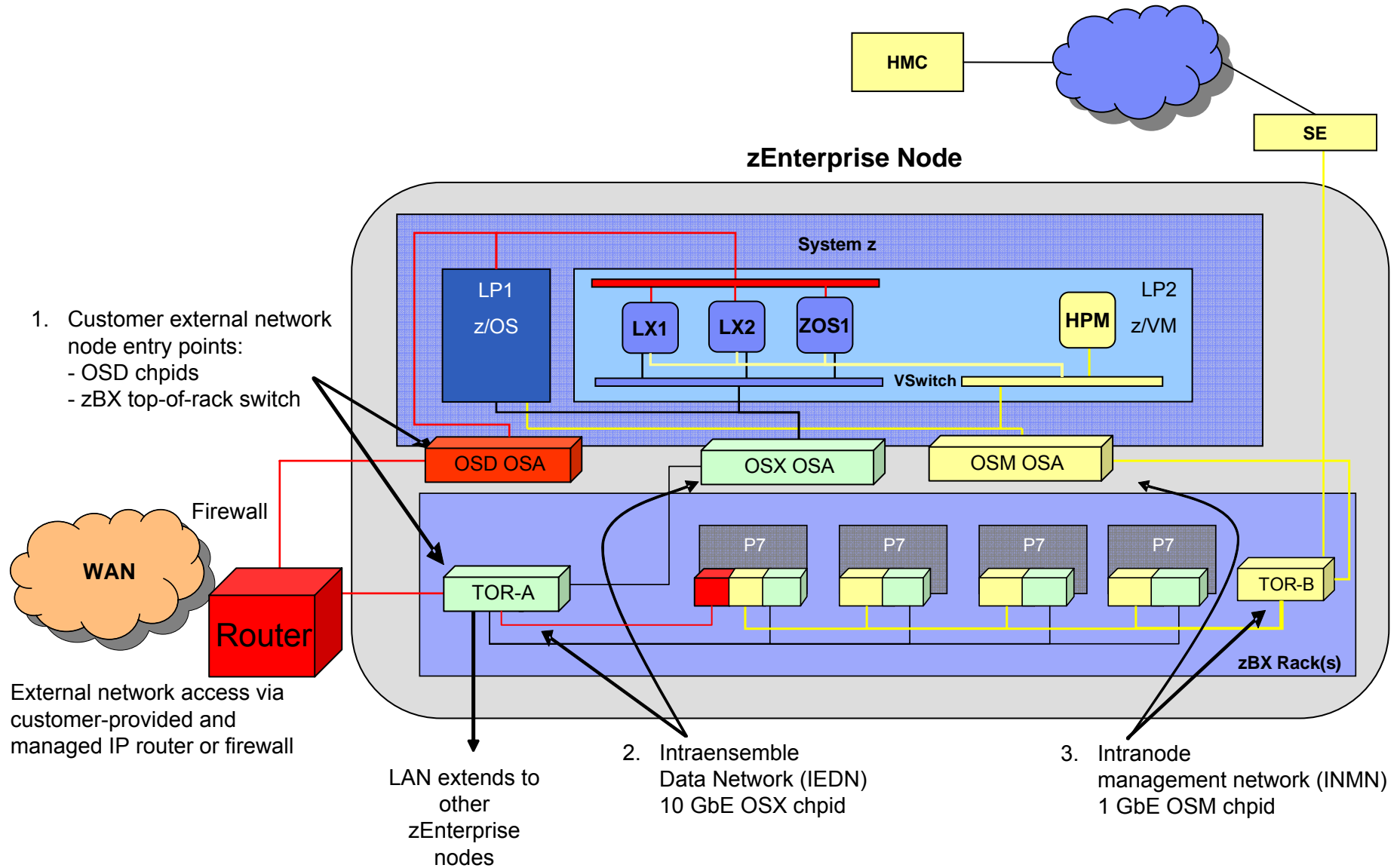# zEnterprise System Ensemble Management via zManager
- VM64813: SMAPI enablement for zManager
- VM64794: OSM / OSX chpid recognition
- VM64797: DirMaint

- Provides management of z/VM V6.1
  - Virtual server configuration
  - Disk storage management
  - Virtual network management
  - Performance monitoring

- Virtual networks are really real…
  - Intraensemble data network – IEDN – OSX chpid type (you)
  - Intranode management network – INMN – OSM chpid type (IBM)
- …and really virtual
  - z/VM guest access via dedicated OSX
  - OSX and OSM VSWITCH
- Seamless administration

- Traditional network connections via OSD

z/VM Platform Update

zEnterprise Network interconnect

HMC

SE

zEnterprise Node

System z

LP1
z/OS

LP2
z/VM

LX1   LX2   ZOS1

HPM

VSwitch

1. Customer external network
   node entry points:
   - OSD chpids
   - zBX top-of-rack switch

OSD OSA

OSX OSA

OSM OSA

Firewall

WAN

Router

P7   P7   P7   P7

TOR-A

TOR-B

zBX Rack(s)

External network access via
customer-provided and
managed IP router or firewall

LAN extends to
other
zEnterprise
nodes

2. Intraensemble
   Data Network (IEDN)
   10 GbE OSX chpid

3. Intranode
   management network (INMN)
   1 GbE OSM chpid

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z/VM Virtual Switch Configuration in support INMN (OSM)

z/VM Platform Update

Networking in an Ensemble - OSA

- When z/VM is not part of an ensemble, OSX and OSM chpids will not come online
    - Their use requires active participation of OSA firmware

z/VM Platform Update

z/VM Statement of Direction
Clustered Hypervisor with Guest Mobility

- Clients can cluster up to four z/VM systems in a **Single System Image** (SSI)
- Provides a set of shared resources for the z/VM systems and their hosted virtual machines
- Users can run z/VM system images on the same and/or different System z10 servers
- Simplifies systems management of a multi-z/VM environment
  - Single user directory
  - Cluster management from any system
    - Apply maintenance to all systems in the cluster from one location
    - Issue commands from one system to operate on another
  - Built-in cross-system capabilities
  - Resource coordination and protection: network and disks
- Dynamically move Linux guests from one z/VM system to another with **Live Guest Relocation**
  - Reduce planned outages; enhance workload management
  - Non-disruptively move work to available system resources **and** non-disruptively move system resources to work
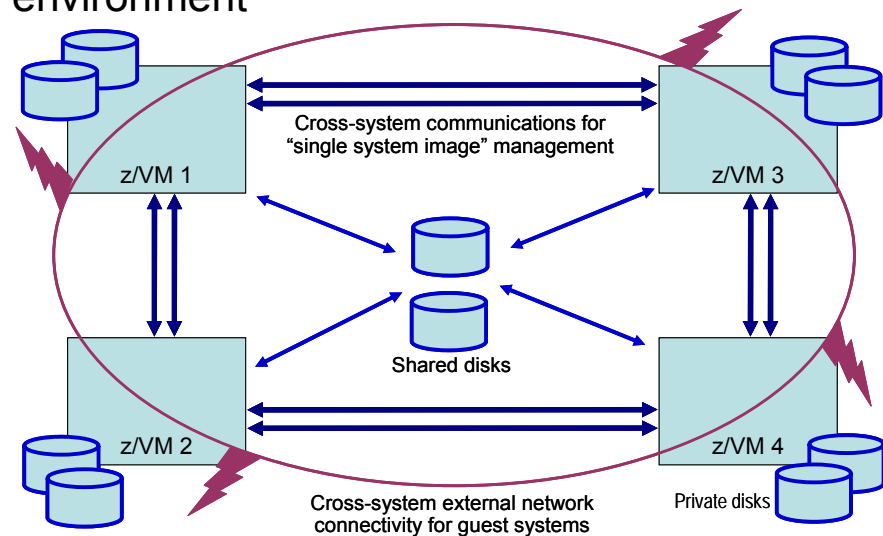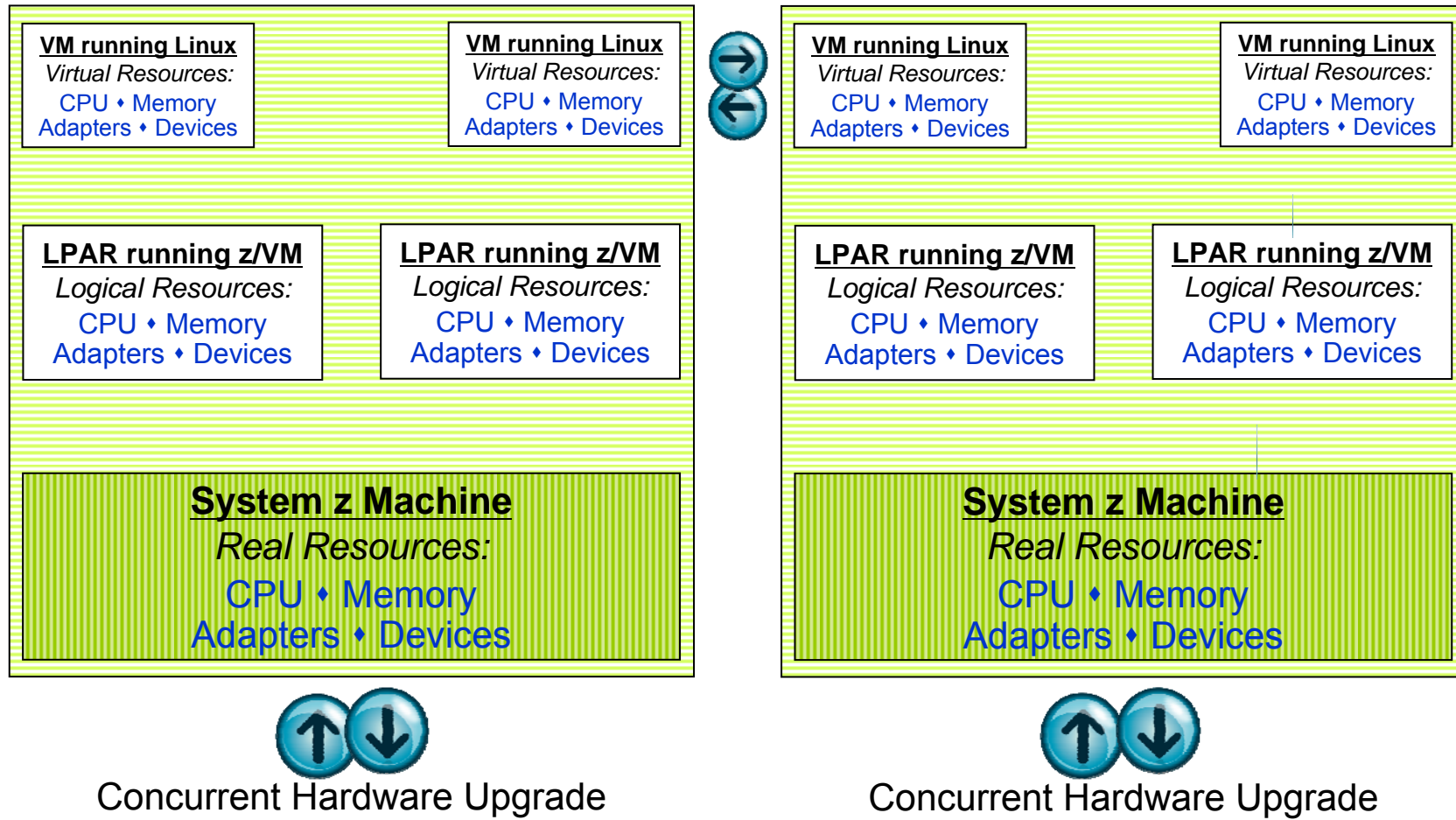

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z/VM and System z Virtualization Leadership
Multi-Level Workload and Resource Management
Dynamically Add Resources to Workload <u>and</u> Move Workload to Resources

Notes: a) z/VM shutdown required to remove LPAR memory, b) virtual machine mobility requires Live Guest Relocation support (planned)

z/VM Platform Update

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IBM Operations Manager for z/VM 1.4
New Functions

- Scheduling support for *n*th weekday of the month
    - E.g. every 3rd Monday

- Customizable profile prefix for RACF facility classes used by Operations Manager
    - Prefix specified in configuration file will have "GOM"prefix
        - E.g. Prefix of "KP" results in profile prefix of "GOP.KP".
    - Enables different authorizations for different instances

- Share state information or data between action processing servers via a DCSS
    - No need to write data to disk or send all actions to the same server (and use GLOBALV)

- Support for IPv6 for communications configured with DEFTCPA

IBM Operations Manager for z/VM 1.4
Usability Enhancements

- Create a file using VIEWSPL, VIEWCON, and VIEWLOG commands
    - Sends a file to your reader instead of opening a full screen view
    - Allows you to use PEEK, XEDIT, BROWSE to view, navigate, and manipulate the file

- Option to display function key assignments in VIEWSPL, VIEWCON, and VIEWLOG

- Option to disable autoscroll on initial display of VIEWCON or VIEWLOG

IBM Tape Manager for z/VM V1.3
Improved Catalog Management

- Support for one tape catalog across multiple z/VM systems
  - One *catalog node* responsible for the tape catalog contents
  - Multiple *request nodes*
    - Manage requests on the local system
    - Communicate with catalog node to read or update catalog data
  - One catalog used by multiple z/VM systems
    - No longer need to create a catalog on each z/VM system, each with its own range of volsers

- Utility to regularly back up the tape catalog

- Migration of Tape Manager catalog will be required
  - Utility provided to migrate the catalog automatically at Tape Manager startup
  - Includes automatically backing up existing catalog before migration begins

IBM Tape Manager for z/VM V1.3
RACF Support

- Use z/VM RACF Security Server feature to control:
    - Access to tape pools
    - System Administrator and Operations authority
    - Authorization to various Tape Manager commands
    - Pool administrator authority for private tape pools
    - Access to the system free pool from private tape pools

IBM Tape Manager for z/VM V1.3
Support for STK Silos

- Support for Oracle StorageTek silos

- Requires
  - Oracle StorageTek VM/Host Software Component V6.1
  - APAR PM20384 for Tape Manager V1.3

IBM Tape Manager for z/VM V1.3
Usability Enhancements

- Allow continuation characters in configuration file

- Tape volser description field in catalog expanded from 16 to 32 characters

- Specify Data Security Erase (DSE) when a tape volume is added to the catalog
  – Will be erased prior to placement in the scratch pool

- Warning when scratch tapes getting low for each media type in system free pool

- Improved configuration file management
  – Data previously in SYS MEDIA now in main configuration file (SYS CONFIG)
  – SYS CONFIG can be on any accessed disk
    • Recommend R/O by TMTMM so admins can update it while server is running
    • Shut down and restart server to pick up changes

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IBM Tape Manager for z/VM V1.3
Migration from prior releases

- Migration of Tape Manager catalog will be required
  - Utility provided to migrate the catalog automatically at Tape Manager startup
  - Includes automatically backing up existing catalog before migration begins

- Several other changes required to configuration data, CP directory entries, etc.
 - Details in the Program Directory

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Year	Value
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2009	3756
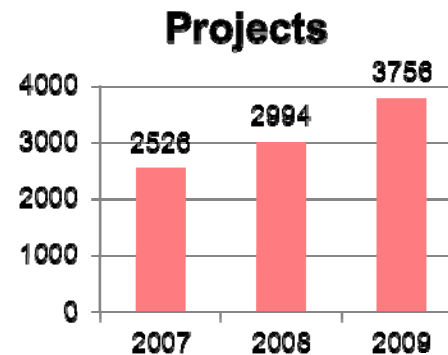
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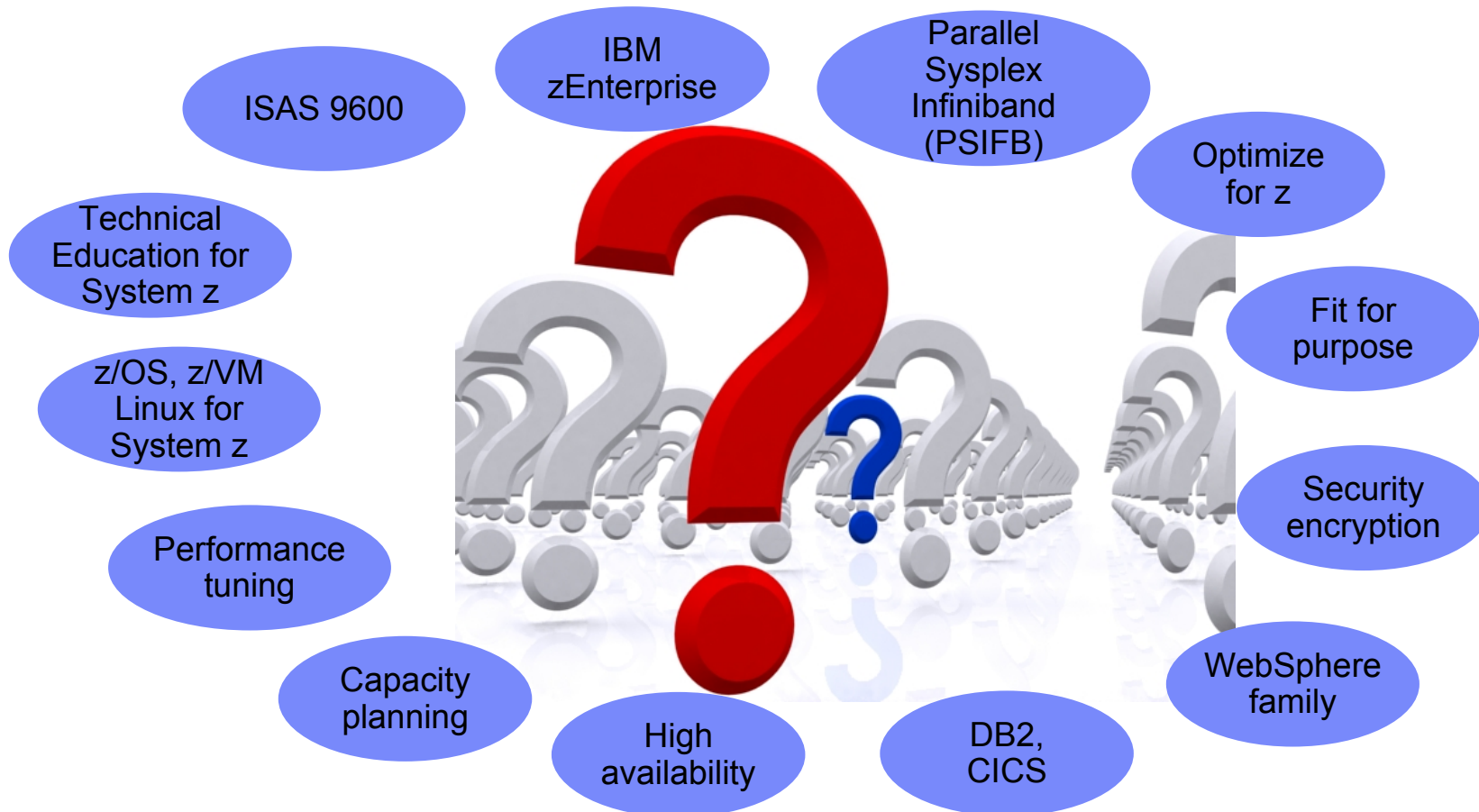
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Tack så mycket
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תודה רבה
Hebrew

Obrigado
Brazilian Portuguese

谢谢
Chinese

Dankon
Esperanto

Thank You

ありがとうございます
Japanese

Trugarez
Breton

Danke
German

Tak
Danish

Grazie
Italian

நன்றி
Tamil

děkuji
Czech

ขอบคุณ
Thai

go raibh maith agat
Gaelic