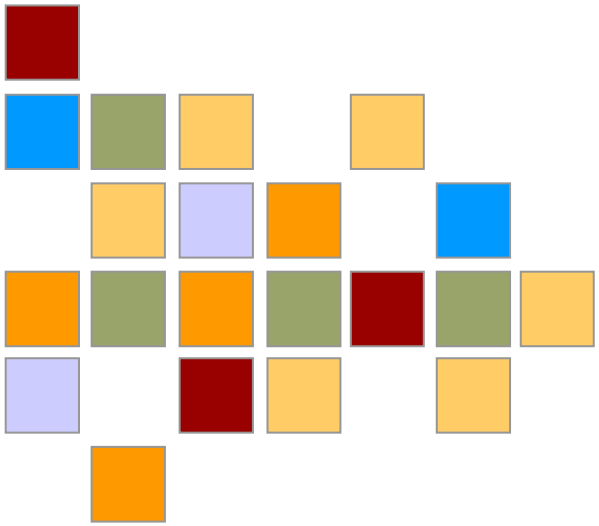
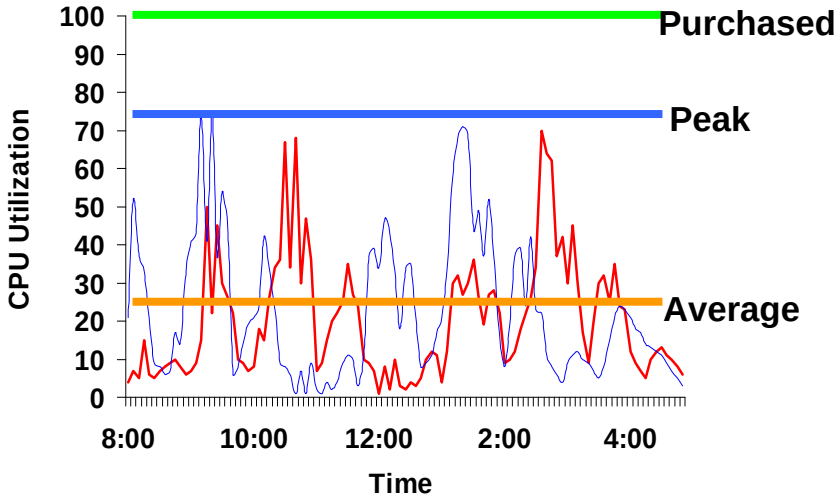
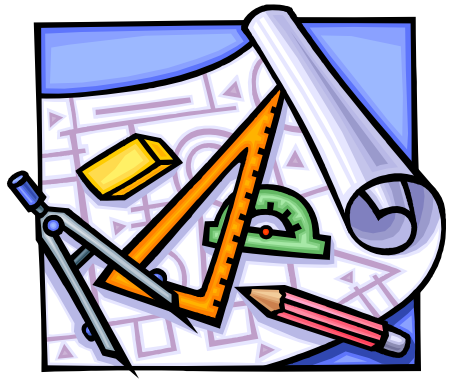


Virtualization Benefits

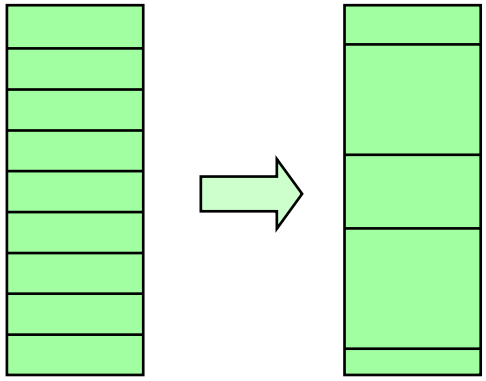
Virtualization Benefits

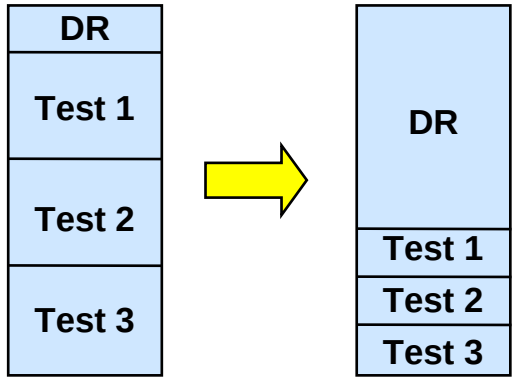




- **Increase Utilization**
  - Non-virtualized servers often run at low average utilizations levels.
  - Idle resources on dedicated servers are often not usable
  - Virtualized servers can run at high utilization levels and can share resources
- **Simplify Workload Sizing**
  - Sizing new workloads is difficult
  - LPARs can be resized to match needs
  - Can over commit capacity
  - Scale up and scale out applications

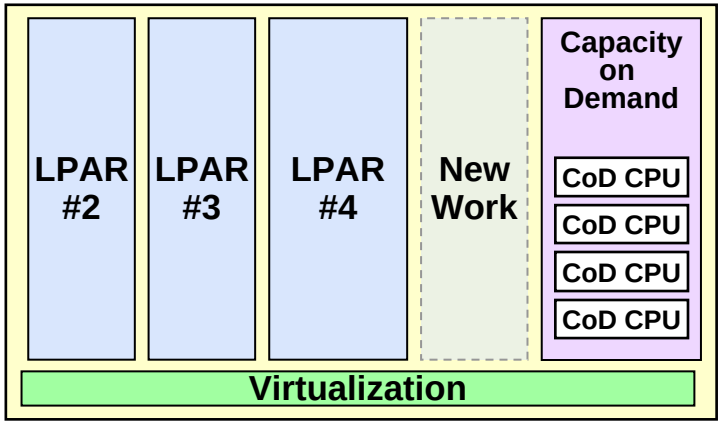
Virtualization Benefits

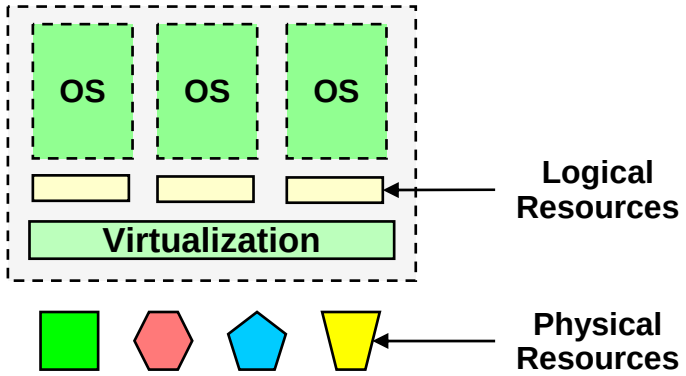




- **Repurpose Assets**
  - Scale out servers are usually architected with a specific application in mind.
  - Virtualized servers can easily be changed to match a different requirement
- **Reduce Limited Use Servers**
  - DR and/or HA can often be combined with other functions on the same server
  - Resizable LPARs allow high volume testing without dedicated equipment

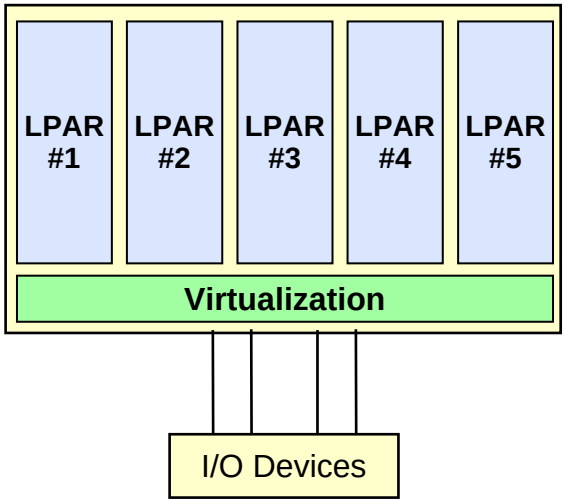
Virtualization Benefits

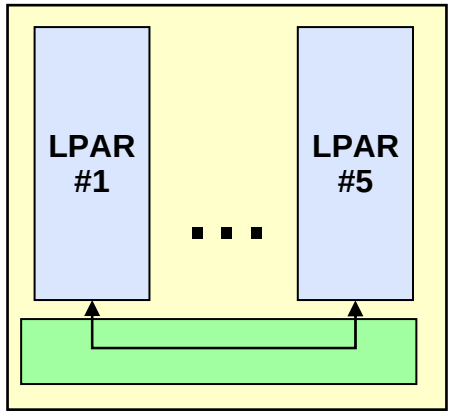




- **Rapidly Deploy New Workloads**
  - New workloads can be added quickly to a virtual pool reducing the time to value
  - LPARs can also be de-provisioned when no longer needed
  - Capacity on-demand can enhance this capability
- **Simplify Provisioning**
  - Virtualized servers have fewer physical dependencies
  - Automated provisioning is easier

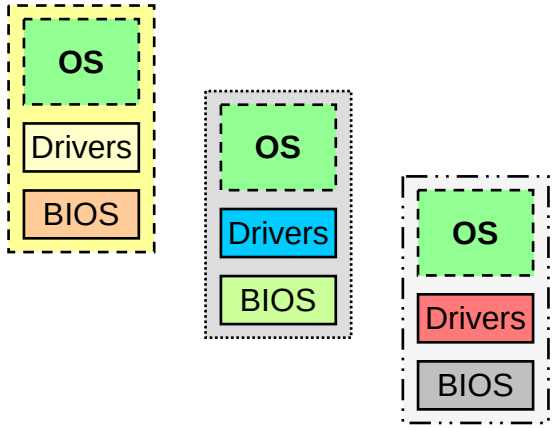
Virtualization Benefits





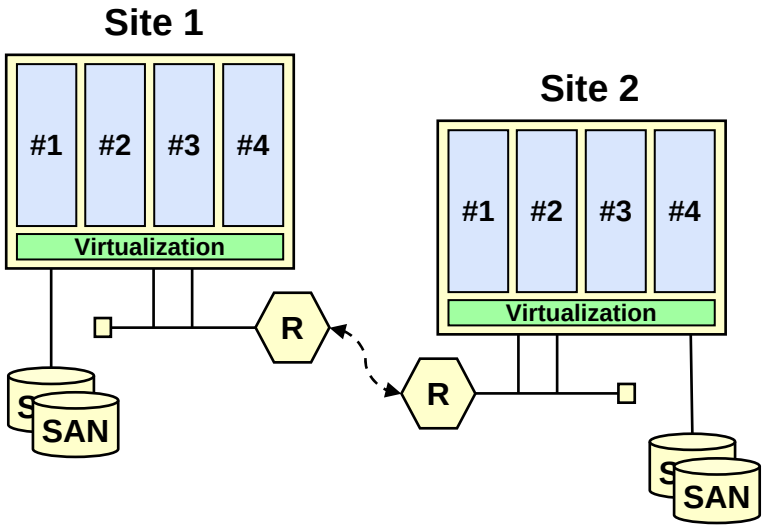
- **Reduce I/O Infrastructure**
  - Shared I/O can reduce the time spent cabling physical servers
  - Virtualized I/O can also reduce adapter, port, and wiring costs.
- **Improve Networking**
  - Low latency in-the-box communications
  - Improved networking security
  - Reduced application response time

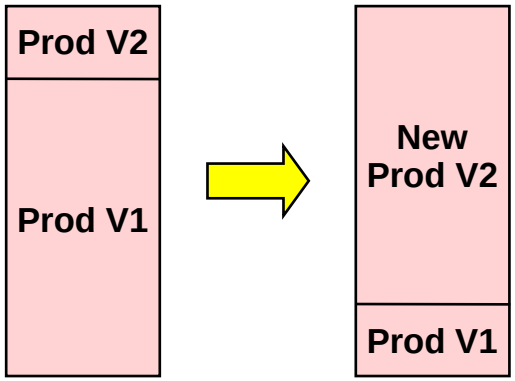
Virtualization Benefits



- **Reduced Asset Management**
  - Fewer servers to order, install, track, maintain, and retire.
  - Reduced floor and rack space
- **Reduced Server Variation**
  - Server technology is changing rapidly
  - It is very difficult to minimize the number of server models, drivers, BIOS levels, etc.
  - Virtualized servers can significantly reduce complexity due to variation

Virtualization Benefits

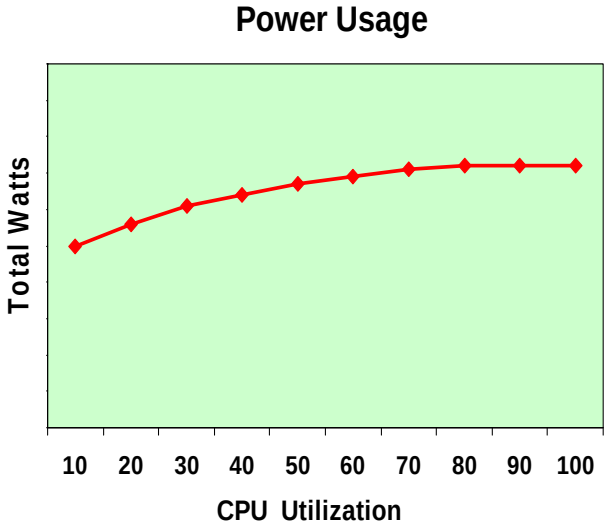




- **Simplify Disaster Recovery**
  - Virtualized images are easier to re-deploy on different physical hardware
  - Non-critical work can be shutdown as required
  - Virtual production and virtual DR servers do not have to match exactly

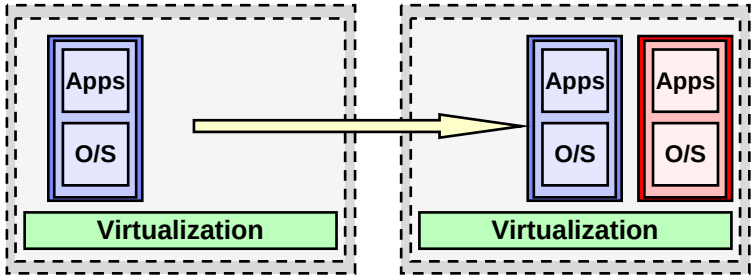
- **. Ease Software Upgrades**
  - New software versions can be loaded on the same hardware
  - When the new version is ready, the LPAR can take over the previous resources
  - Allows rapid upgrade and/or fail back

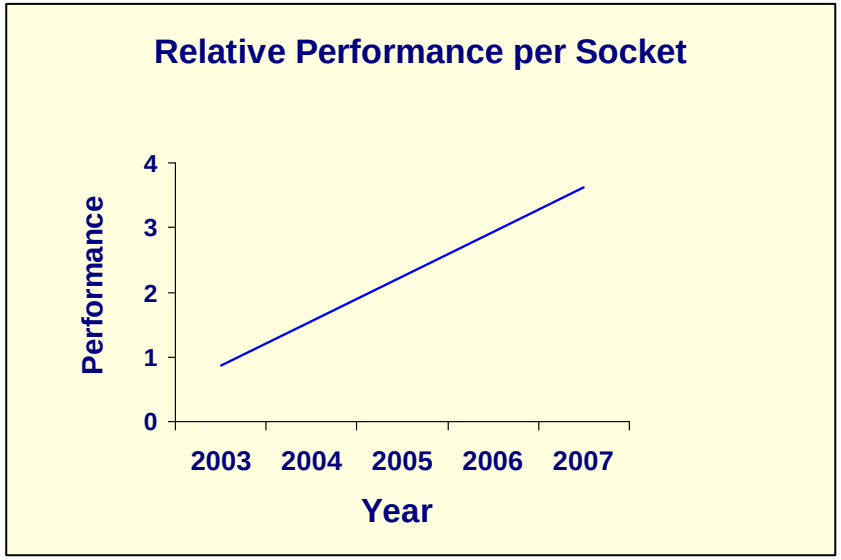
Virtualization Benefits



- **Reduce Power and Cooling**
  - Virtualization allows servers to run at high utilization levels
  - Servers running at higher utilization typically use power more efficiently
  - Power and cooling costs are expected to become the dominating factor for a 5 year
- **Reduce Software Costs**
  - Virtualized servers may lower software costs
  - Running at higher utilizations can translate into fewer CPUs to license

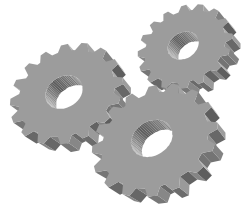
Virtualization Benefits





- **Provide Partition/VM Mobility**
  - Ability to move running LPAR from server to server.
  - Improves application availability
- **Future Directions**
  - Server and network performance continues to grow
  - A dedicated model will continue to put more and more unused assets on the floor.

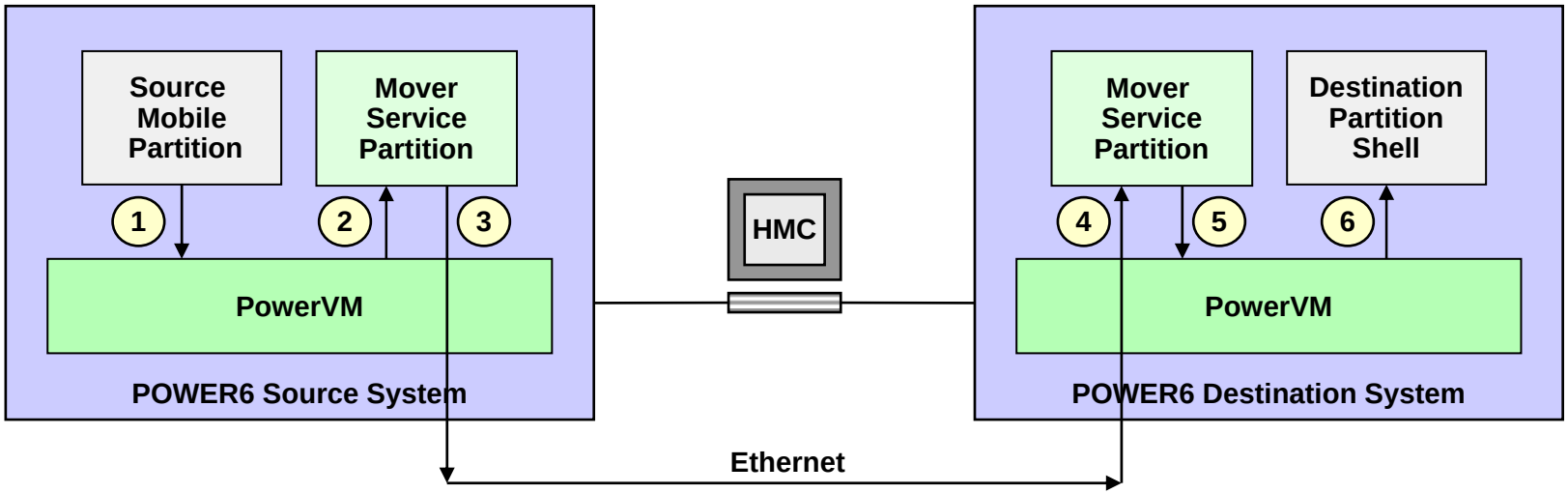
Virtualization - Consider Organizational Changes



- **Virtualization is a significant trend within the computer industry.**
- **Virtualization provides the following benefits:**
  - Reduced costs – hardware, software, people, environmental
  - Reduced time to market for business applications
  - Improved qualities of service – application availability, security, scalability
- **Organizations may need to change how:**
  - Equipment is procured – acquiring/justifying dedicated servers on a project by project basis is not conducive to virtualization.
  - Communication with end users – service needs to be framed in terms such as quality of service, response time, capacity, etc. – not hardware configurations.
  - Assets owned by IT not tied to a project or business unit.
  - Capacity management – capacity needs to be monitored / managed as part of shared organizational resource

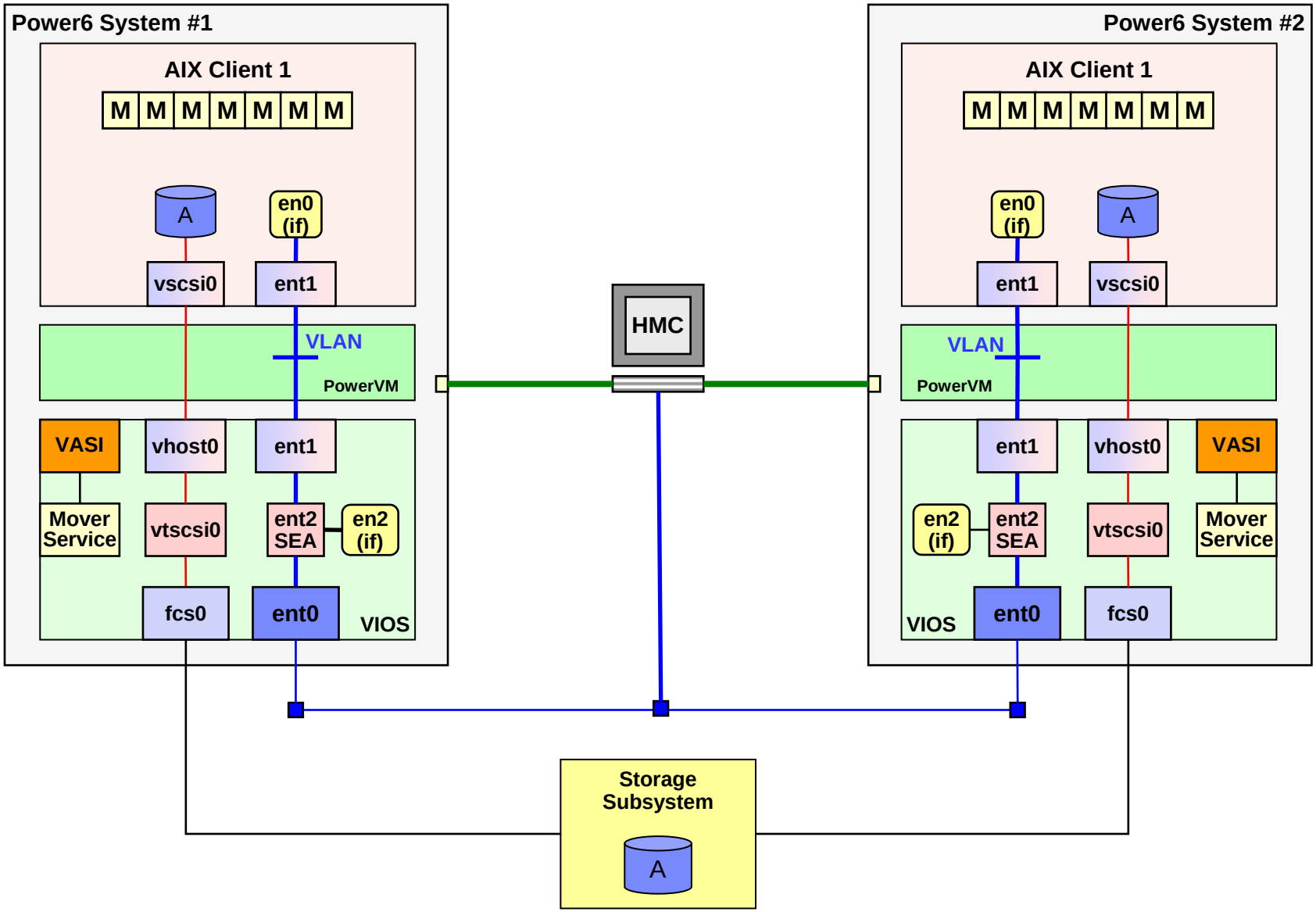
Live Partition Migration

Live Partition Mobility Steps

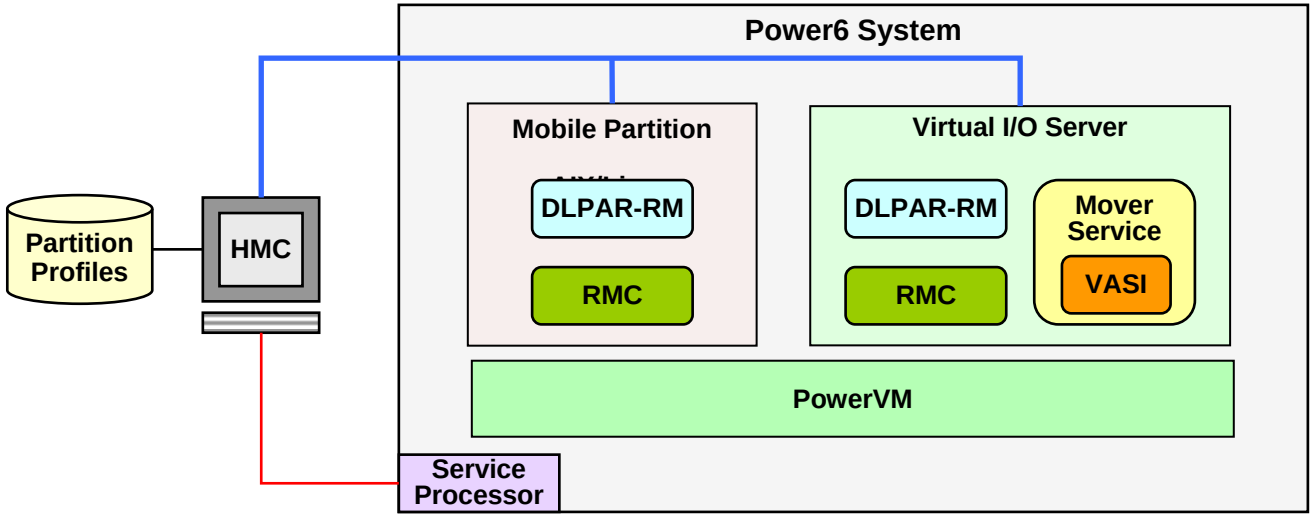


- The HMC creates a compatible partition shell on the destination system
- The HMC configures the mover service partitions on the source and destination systems
- The HMC issues a prepare for migration event to the source operating system
- The HMC creates the necessary virtual SCSI devices in the destination system's VIOSes
- The source mover starts sending partition state to the destination mover
- Once sufficient pages have moved, the Hypervisor suspends the source partition
- During the suspension, the source mover partition continues to send partition state information
- The mobile partition resumes execution on the destination server
- The destination partition retries all pending I/O requests that were not completed
- When the destination mover partition receives the last memory page the migration is complete

Live Partition Mobility



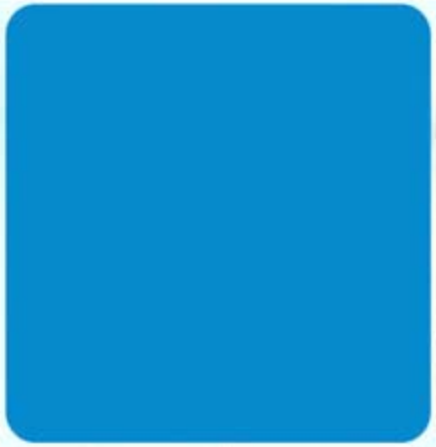
Live Partition Mobility Components



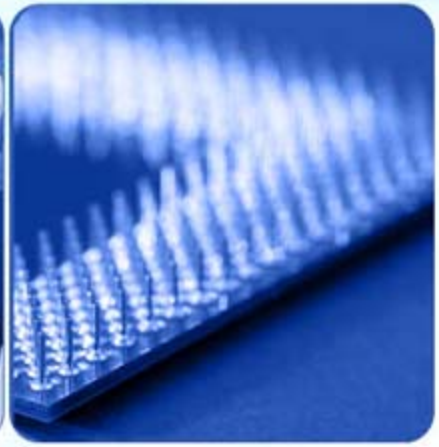
- **Hardware Management Console (HMC)**
  - Central point of control for migration
- **Resource Monitoring and Control (RMC)**
  - A distributed framework and architecture that allows the HMC to communicate with a managed logical partition
- **Dynamic LPAR Resource Manager**
  - HMC uses this capability to remotely execute partition specific commands.
- **Virtual Asynchronous Services Interface (VASI)**
  - Used by the mover service to communicate with the Hypervisor
- **Mover service partition**
  - Function that asynchronously extracts, transports, and installs partition state
  - Not used for inactive migrations
- **Virtual I/O Server (VIOS)**
  - Only virtual devices can be migrated

Live Partition Mobility Requirements

- **Live Partition Mobility Requirements**
  - The source and destination servers must be POWER6
  - The mobile partition must be
    - AIX 5L Version 5.3 Technology Level 7 or later, AIX Version 6 or later
    - Red Hat Enterprise Linux Version 5 (RHEL5) Update 1 or later
    - SUSE Linux Enterprise Services 10 (SLES 10) Service Pack 1 or later.
    - Both the source and destination systems must be at firmware level eFW3.2 or later
    - Virtual I/O Server at release level 1.5 or higher
  - A VIOS must be defined on each system with the move partition attribute set to TRUE and a VASI device defined and configured.
  - Network connectivity to source and destination partitions (via the VIOS), source and destination VIOSes, source and destination mover partitions and HMC must exist.
  - No required or physical I/O devices
  - All disks (O/S and applications) must be defined using external PV-VSCSI disks
  - The logical memory block size must be the same on the source and destination server.
  - The mobile partition must not be using huge pages
  - The mobile partition must not be configured with barrier synchronization registers
  - The mobile partition name must not already be in use on the destination system.
  - Adequate processors, memory, and virtual slots must be available on the destination system
  - The destination VIOSes must have access to all the LUNs used by the mobile partition.





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Thank You!