IBM System z Virtualization Genetics

Over 40 years of continuous innovation in virtualization
- Refined to support modern business requirements
- Exploit hardware technology for economical growth
- LPAR, Integrated Facility for Linux, HiperSockets
- System z Application Assist Processors
- System z Information Integration Processors

IBM System z – a comprehensive and sophisticated suite of virtualization function
Dynamic virtual processor management

- Allows z/VM guests to expand or contract the number of virtual processors it uses without affecting the overall CPU capacity it is allowed to consume
  - Guests can dynamically optimize their multiprogramming capacity based on workload demand
  - Starting and stopping virtual CPUs does not affect the total amount of CPU capacity the guest is authorized to use
  - Linux CPU hotplug (cpuplugd) daemon starts and stops virtual CPUs based on Linux Load Average value.
  - The cpuplugd daemon is available with SLES10 SP2 and IBM is working with it Linux distributor partners to provide this function in other Linux on System z distributions.

- Helps enhance the overall efficiency of a Linux-on-z/VM environment

Note: Overall CPU capacity for a guest system can be dynamically adjusted using the SHARE setting

<table>
<thead>
<tr>
<th>CPU 0</th>
<th>CPU 1</th>
<th>CPU 2</th>
<th>CPU 3</th>
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<tbody>
<tr>
<td>SHARE=25</td>
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<td>SHARE=25</td>
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Guest SHARE = 100

Reduced Need for Multiprogramming

- Stop 2 CPUs

Guest SHARE = 100

Increased Need for Multiprogramming

- Start 2 CPUs

Dynamic memory upgrade

- z/VM V5.4 exploits dynamic memory reconfiguration
- Users can nondisruptively add memory to a z/VM LPAR
  - Additional memory can come from: a) unused available memory, b) concurrent memory upgrade, or c) an LPAR that can release memory
  - Systems can now be configured to reduce the need to re-IPL z/VM
  - Memory cannot be nondisruptively removed from a z/VM LPAR
- z/VM virtualizes this hardware support for guest machines
  - Currently, only z/OS and z/VM support this capability in a virtual machine environment

Smart economics: Nondisruptively scale your z/VM environment by adding hardware assets that can be shared with every virtual server