IBM Systems Lab Services

PowerVM LPM and Simplified Remote Restart (SRR) Automation Tool

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PowerVM LPM and SRR Tool

• This tool was released in 4Q2014. Over 160 customers worldwide have already adopted it. There is very high customer satisfaction with this tool.

• This tool is the fastest growing ever in lab-services and is used on every continent and sub-continent (other than Antarctica).

• With the new SRR feature of Power8 servers, this tool is becoming a must for any customer wanting to use SRR.

• Customers current use of LPM
  – Customers are using LPM more and more as part of their daily tasks (workload balancing) and planned maintenance procedures
  – The HMC GUI only allows a single partition to be selected at at time
  – Some customers are writing scripts to move many partitions at a time
  – Imagine having to move 100 partitions from a server (esp using the GUI -(that’s a lot of clicks!)
PowerVM LPM and Remote Restart Tool

• Automated use of LPM
  – This tool was developed to allow a customer to quickly move one or many partitions from a server using LPM to other servers (as few as 4 clicks)
  – It can also return the partitions back to the original server with the original mappings (HBA/virtual slot id) (again, as few as 4 clicks)
  – You can build a plan(s) in advance and execute the plans during maintenance windows
  – You can schedule LPM operations

• Automated use of Simplified Remote Restart (SRR)
  – Use of SRR on the HMC is only thru command line (CLI). There is no GUI for the SRR function and you can only move 1 partition at a time via the HMC CLI.
  – The tool works similar to both LPM and SRR, you can use a GUI to quickly SRR many or all of the partitions to one or more destination servers.
  – You can build a plan(s) in advance and execute the plans during an outage.
  – A huge benefit of the tool is that once the server is repaired, the tool can move all the partitions back to the original server with just a few clicks using LPM.
New features in Version 8.5

- The tool version numbering is changed to match the features of the highest HMC version it can exploit.
- For example, HMC V8.5 can specify vfc mappings and shared proc pools when doing SRR. V8.5 of the tool supports those features.
- The tool still supports older HMC levels.
- New features are –
  - Specifying new Vswitch mapping during LPM
  - Specifying sr-iov vnic mappings during LPM
  - Increasing number of vfc mapping support from 63 to unlimited
  - Subdividing partitions into different groups of concurrent LPMs
  - Specifying concurrency performance levels on a per partition basis
  - Returning SRR partitions back to original server with original settings
  - Remote HMC support for SRR
  - Use of ssh keys instead of HMC passwords
  - Enabling SRR during LPM operations
This icon gets you to this screen
LPM Away – Choose servers

One click will select all the partitions or select/deselect individual partitions

Can choose one or many destination servers

Notice: You can choose a entire Server or a set of LPARs within a Server.

Notice: The source Server and the destination Server cannot be the same.

This icon gets you to this screen
Notice how each partition was validated to both possible destination servers.
As dest server is changed, the Remaining values change

Change dest server
**LPM Away – MSP and Shared Proc Pool**

**APPLY** will only change this one partitions LPM settings (MSP Config and ProcPool Config)

**APPLY TO ALL** will use these value for all partitions MSP Configs going to the same Dest Server (MSP Config)
LPM Away – Vswitch support in V8.5

APPLY will only change this one partition’s Vswitch

APPLY TO ALL will use this value for all partitions
In HMC V8.5.5., the number of threads per LPM can be set via the concurrency performance level parameter. 4 is default (1 thread per partition). If you need to move a large partition over a >30 Gbit network, you can set this to 1 and then 4 threads in a VIOS will be used to transfer data for that 1 partition.
Ability to change partition LPM order

Click and drag a partition name up or down. 1 goes first, then 2, etc.
• This new feature in V4 allows a customer to move the LPARs one way and not have the LPAR show up on the LPM Return Panel.
• This is useful if you are migrating LPARs from a P7 server to a P8 server and don’t ever plan on returning the LPAR back to the P7 as the P7 will be decommissioned.
• This is also useful for customers who are just doing Workload Balancing and won’t move it back later (or if they do, it will be part of another workload balancing operation).
• When you click this box, the LPAR will be moved but its source server and all its original mappings will not be saved in the tool’s database for a later Return.

• If you are uncertain if an LPAR will be returned, don’t check this box. Then if you decide to not return it, you can Delete it from the tool’s database by clicking Delete on the LPM Return screen (more on that later).
This new feature in V4 allows a customer to schedule the LPM operation for a later time.

You manage Schedule Operations on another panel (more on that later).
The tool will intermix LPMs to different servers depending on the LPM order and concurrency. Generally 8 or less LPMs at a time is recommended. More that 8 requires more planning.

To do more than 8 at a time, you’ll want to export the plan and then set up the MSP pairings to use 2 VIOS on both the source and destination servers and change the order of the LPMs.

Then when you import the changed plan, change the Concurrent Count on the Placement Panel.
• So the tool supports different concurrency performance levels and the number of concurrent migrations to be performed.
• In Version 8.5 of the tool, there is a new option to subdivide partitions into different groups so that all the partitions in 1 group will be moved before the tool starts moving partitions in the next group.
• This feature is supported via the spreadsheet/plans option. There is a new column called “GROUP ID” which uses integers for group ids.
• A customer may want to move 3 partitions first and not start others till after those 3 complete. So even though the concurrent migrations count is set to 8 (default value), only 3 partitions will be moved concurrently in that group. If another group has 20 partitions in it, and the concurrency count is 8, the tool will start 8 LPM operations and then as 1 completes, another will be started to keep 8 going at one time.
• With this new feature, you can pre-plan a complex migration as follows.
• Let’s say you have a 40 Gbit Link Aggregation between your MSPs.
• You can move your app servers in one group and use the default concurrency performance level and the partitions will be transferred up to your concurrent migrations count (default of 8).
• Then when you want to move the DB server which has a much larger memory footprint and you want it to move as quickly as possible, you put it into its own Group ID, and set the concurrent performance level to 1 (4 threads in a VIOS will be used to move the memory footprint as quickly as possible).
• The VIOS/MSP is capable of transferring data at near line speeds in this case…..40 Gbits/second. So a 500 Gbyte partition can be moved in less than 2 minutes.
## LPM Away – migration in progress

### PowerVM LPM Automation Tool

#### Current Task: LPM Away

**Perform LPM**

<table>
<thead>
<tr>
<th>LPAR Name</th>
<th>Mem</th>
<th>Source Server</th>
<th>LPAR ID</th>
<th>Dest Server</th>
<th>Remote LPAR</th>
<th>LPM State</th>
<th>Last Time</th>
<th>Time Remainin</th>
<th>Percent</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>lpmclient17</td>
<td>4352</td>
<td>thoradfp1</td>
<td>22</td>
<td>jupe4dfp1</td>
<td>22</td>
<td>running</td>
<td>95 seconds</td>
<td>59 seconds</td>
<td>75%</td>
<td>Stop</td>
</tr>
<tr>
<td>lpmclient19</td>
<td>3328</td>
<td>thoradfp1</td>
<td>20</td>
<td>jupe4dfp1</td>
<td>20</td>
<td>running</td>
<td>95 seconds</td>
<td>22153 seconds</td>
<td>1%</td>
<td>Stop</td>
</tr>
<tr>
<td>lpmclient4</td>
<td>3072</td>
<td>thoradfp1</td>
<td>18</td>
<td>jupe4dfp1</td>
<td>18</td>
<td>running</td>
<td>95 seconds</td>
<td>194 seconds</td>
<td>28%</td>
<td>Stop</td>
</tr>
<tr>
<td>lpmclient11</td>
<td>4352</td>
<td>thoradfp1</td>
<td>8</td>
<td>jupe4dfp1</td>
<td>8</td>
<td>running</td>
<td>95 seconds</td>
<td>45 seconds</td>
<td>80%</td>
<td>Stop</td>
</tr>
<tr>
<td>lpmclient8</td>
<td>3328</td>
<td>thoradfp1</td>
<td>19</td>
<td>jupe4dfp1</td>
<td>19</td>
<td>running</td>
<td>81 seconds</td>
<td>81 seconds</td>
<td>46%</td>
<td>Stop</td>
</tr>
<tr>
<td>lpmclient15</td>
<td>4352</td>
<td>thoradfp1</td>
<td>12</td>
<td>jupe4dfp1</td>
<td>12</td>
<td>running</td>
<td>95 seconds</td>
<td>328 seconds</td>
<td>21%</td>
<td>Stop</td>
</tr>
<tr>
<td>lpmclient10</td>
<td>3328</td>
<td>thoradfp1</td>
<td>16</td>
<td>jupe4dfp1</td>
<td>16</td>
<td>running</td>
<td>95 seconds</td>
<td>728 seconds</td>
<td>11%</td>
<td>Stop</td>
</tr>
<tr>
<td>lpmclient18</td>
<td>4096</td>
<td>thoradfp1</td>
<td>24</td>
<td>jupe4dfp1</td>
<td>24</td>
<td>waiting...</td>
<td></td>
<td></td>
<td></td>
<td>Stop</td>
</tr>
<tr>
<td>lpmclient16</td>
<td>3328</td>
<td>thoradfp1</td>
<td>26</td>
<td>jupe4dfp1</td>
<td>26</td>
<td>waiting...</td>
<td></td>
<td></td>
<td></td>
<td>Stop</td>
</tr>
<tr>
<td>lpmclient20</td>
<td>4352</td>
<td>thoradfp1</td>
<td>23</td>
<td>jupe4dfp1</td>
<td>23</td>
<td>waiting...</td>
<td></td>
<td></td>
<td></td>
<td>Stop</td>
</tr>
<tr>
<td>lpmclient12</td>
<td>4352</td>
<td>thoradfp1</td>
<td>5</td>
<td>jupe4dfp1</td>
<td>5</td>
<td>waiting...</td>
<td></td>
<td></td>
<td></td>
<td>Stop</td>
</tr>
</tbody>
</table>

---

**Action**

- Stop

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**Details**

- View 1 – 14 of 14

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**Stop View Reload**

- Page 1 of 1

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**Welcome Admin**
LPM Return – return partitions to original server

This screen will show servers with partitions that haven’t been returned to their source server. If the partitions were moved to multiple servers, this operation will bring them back from all the servers.

If multiple plans were used to move partitions off of this server, you have 2 options. Let the tool bring all the partitions back at once or you can import the plans one by one to restore the server.

When moving the partitions back to the original managed system, the tool will restore the virtual adapter numbers and shared proc pools and HBA mappings that were originally being used before the managed system was evacuated.
You don’t have to return all partitions at once. Default is ALL partitions. Just check the LPARs that you want to do an Action on.
Cancel Button – leave this screen and go back to HOME screen
Next Button – for the LPARs you selected, go to Validation screen and then go to Placement Screen
Delete Button – for the LPARs you selected, Delete these LPARs source server and mappings and all remnants from the tools database (you don’t want to return this LPAR to the source server)
Perform LPM – for the LPARs you selected, skip the Validation step and the Placement panel and just start the LPM. This is a huge timesaver if you are returning lots of LPARs and a validation will be done as part of the LPM anyways.
### LPM Return Validate Panel

#### Current Task: LPM Validate

<table>
<thead>
<tr>
<th>LPAR Name</th>
<th>Source Server</th>
<th>Dest Server</th>
<th>Validation State</th>
<th>Last Time</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>lpmclient14</td>
<td>jupe4bfp1</td>
<td>thoracfp1</td>
<td>Success</td>
<td>17 seconds</td>
<td>Details</td>
</tr>
<tr>
<td>lpmclient10</td>
<td>jupe4bfp1</td>
<td>thoracfp1</td>
<td>Success</td>
<td>12 seconds</td>
<td>Details</td>
</tr>
<tr>
<td>lpmclient11</td>
<td>jupe4bfp1</td>
<td>thoracfp1</td>
<td>Success</td>
<td>18 seconds</td>
<td>Details</td>
</tr>
<tr>
<td>lpmclient19</td>
<td>jupe4bfp1</td>
<td>thoracfp1</td>
<td>Success</td>
<td>19 seconds</td>
<td>Details</td>
</tr>
<tr>
<td>lpmclient13</td>
<td>jupe4bfp1</td>
<td>thoracfp1</td>
<td>Success</td>
<td>13 seconds</td>
<td>Details</td>
</tr>
<tr>
<td>lpmclient15</td>
<td>jupe4bfp1</td>
<td>thoracfp1</td>
<td>Success</td>
<td>16 seconds</td>
<td>Details</td>
</tr>
<tr>
<td>lpmclient12</td>
<td>jupe4bfp1</td>
<td>thoracfp1</td>
<td>Success</td>
<td>9 seconds</td>
<td>Details</td>
</tr>
<tr>
<td>lpmclient18</td>
<td>jupe4bfp1</td>
<td>thoracfp1</td>
<td>Success</td>
<td>17 seconds</td>
<td>Details</td>
</tr>
<tr>
<td>lpmclient4</td>
<td>jupe4bfp1</td>
<td>thoracfp1</td>
<td>Success</td>
<td>15 seconds</td>
<td>Details</td>
</tr>
<tr>
<td>lpmclient20</td>
<td>jupe4bfp1</td>
<td>thoracfp1</td>
<td>Success</td>
<td>18 seconds</td>
<td>Details</td>
</tr>
<tr>
<td>lpmclient2</td>
<td>jupe4bfp1</td>
<td>thoracfp1</td>
<td>Success</td>
<td>11 seconds</td>
<td>Details</td>
</tr>
<tr>
<td>lpmclient17</td>
<td>jupe4bfp1</td>
<td>thoracfp1</td>
<td>Success</td>
<td>18 seconds</td>
<td>Details</td>
</tr>
</tbody>
</table>

**Actions:**
- After errors are resolved, click **Validate**
- **Revalidate Errors only**
- Export
- Save results to XLS

*After Validate is successful, click Next*
A subset of the options on the LPM Away screen as those options aren’t applicable to LPM Return (i.e. Packing/Striping…there’s only 1 source server).
The tool is designed so that a customer can create plans, **MODIFY** them outside of the tool, and import those changed plans into the tool.

The plan is an Excel spreadsheet where many of the fields can be modified and imported back into the tool.

The plan includes both the LPM Away functionality and the LPM Return functionality on a different worksheet.

You can import plans on either the LPM Away GUI or the LPM Return GUI. It will read the appropriate worksheet ("LPM Away" or "LPM Return") and load that into the tool.
Advanced LPM and SRR features

- Designing GUls for the many advanced features of LPM and SRR would be challenging so the tool uses plans to expose these advanced features to customers.
- While many customers are happy with just the GUI panels, some customers need a lot of control when performing LPM and SRR.
- The spreadsheet is a superset of the GUI capabilities.
- Anything on the GUI can be changed in the spreadsheet.
- Items that are not on the GUI but can be modified in plans are –
  - Vfc mappings (both LPM and SRR)
  - Vscsi mappings (only LPM)
  - SR-IOV VNIC mappings (only LPM)
  - Group IDs (only LPM)
Advantages of LPM Plans

- The customer can build stages of plans. For example, they want to do some moves on Monday (one set of application LPARs) and then Tuesday (another set of application LPARs), etc. They build a plan for each day and can import those plans the following week.
- Since each plan can stand on its own, you can execute them in any order.
- You can make many changes in the plan with Excel and then import those changes back into the tool.
- The HMC Command Line (CL) that is executed for each LPM operation is shown in the plan.
  - This can be useful if someone wants to extract the HMC CL and build their own scripts.
  - It can also be used to perform the moves in the unlikely event the tool fails. The customer can save the plan. Then if there is a problem, can manually execute those commands on the HMC console.
- When you import a plan, the LPM validation is done with the specific parameters/values you specified in the plan (i.e. slot numbers, msp, etc) and if you have an incorrect value, the validation fails.
For those advanced virtual adapter customers

- The spreadsheet now supports unlimited virtual fibre channel adapters and vs CSI adapters in V8.5. It used to support 63 VFC adapters in the spreadsheet.

- The tool also now will move and return virtual fibre channel adapters that are mapped to a vfchost but do not have a FCS port specified. This case has come up with a couple of customers that will dynamically map virtual tapes to vfchosts.
Yellow Columns can be changed and be imported into tool
### LPM Away command syntax

**HMC Command Line syntax…could use in scripts**

<table>
<thead>
<tr>
<th>NAME</th>
<th>COMMAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>POK HMC</td>
<td><code>migrpar -o -m 'thoradfp1' -t 'jupe4bfp1' -p 'lpmclient4' -i [&quot;shared_proc_pool_name=DefaultPool&quot;,&quot;virtual_fc_mappings=21/oregonp02/29/fcs0,22/oregonp02/23/fcs0,11/oregonp01/138/fcs0,12/oregonp01/139/fcs0&quot;]&quot;</code></td>
</tr>
<tr>
<td>POK HMC</td>
<td><code>migrpar -o -m 'thoradfp1' -t 'jupe4bfp1' -p 'lpmclient15' -i [&quot;virtual_fc_mappings=21/oregonp02/25/fcs0,22/oregonp02/26/fcs1,11/oregonp01/138/fcs0,12/oregonp01/139/fcs1&quot;]&quot;</code></td>
</tr>
<tr>
<td>POK HMC</td>
<td><code>migrpar -o -m 'thoradfp1' -t 'jupe4bfp1' -p 'lpmclient5' -i [&quot;virtual_fc_mappings=21/oregonp02/19/fcs0,22/oregonp02/20/fcs1,11/oregonp01&quot;]&quot;</code></td>
</tr>
<tr>
<td>POK HMC</td>
<td><code>migrpar -o -m 'thoradfp1' -t 'jupe4bfp1' -p 'lpmclient5' -i [&quot;virtual_fc_mappings=21/oregonp02/231/fcs0,22/oregonp02/32/fcs1,11/oregonp01&quot;]&quot;</code></td>
</tr>
<tr>
<td>POK HMC</td>
<td><code>migrpar -o -m 'thoradfp1' -t 'jupe4bfp1' -p 'lpmclient19' -i [&quot;shared_proc_pool_name=DefaultPool&quot;,&quot;virtual_fc_mappings=21/oregonp02/246/fcs0,22/oregonp02/247/fcs1,11/oregonp01&quot;]&quot;</code></td>
</tr>
<tr>
<td>POK HMC</td>
<td><code>migrpar -o -m 'thoradfp1' -t 'jupe4bfp1' -p 'lpmclient14' -i [&quot;shared_proc_pool_name=DefaultPool&quot;,&quot;virtual_fc_mappings=21/oregonp02/24/fcs0,22/oregonp02/293/fcs1,11/oregonp01&quot;]&quot;</code></td>
</tr>
</tbody>
</table>
LPM Return Excel worksheet

These columns can be changed:

<table>
<thead>
<tr>
<th>LPAR NAME</th>
<th>SOURCE SERVER</th>
<th>DEST SERVER</th>
<th>SOURCE MSP VIOS</th>
<th>DEST MSP VIOS</th>
<th>SOURCE MSP IP</th>
<th>DEST MSP IP</th>
<th>SOURCE PROC POOL</th>
<th>DEST PROC POOL</th>
<th>SOURCE LPAR ID</th>
<th>HMC IP</th>
</tr>
</thead>
<tbody>
<tr>
<td>lpmclient4</td>
<td>jupe4bfp1</td>
<td>thordfp1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DefaultPool</td>
<td>DefaultPool</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>lpmclient15</td>
<td>jupe4bfp1</td>
<td>thordfp1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>DefaultPool</td>
<td>17</td>
<td></td>
</tr>
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<td>thordfp1</td>
<td></td>
<td></td>
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<td></td>
<td>DefaultPool</td>
<td>DefaultPool</td>
<td>7</td>
<td></td>
</tr>
<tr>
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<td>thordfp1</td>
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<td></td>
<td></td>
<td></td>
<td>DefaultPool</td>
<td>DefaultPool</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>lpmclient14</td>
<td>jupe4bfp1</td>
<td>thordfp1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DefaultPool</td>
<td>DefaultPool</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>lpmclient11</td>
<td>jupe4bfp1</td>
<td>thordfp1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DefaultPool</td>
<td>DefaultPool</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>lpmclient17</td>
<td>jupe4bfp1</td>
<td>thordfp1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DefaultPool</td>
<td>DefaultPool</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>lpmclient13</td>
<td>jupe4bfp1</td>
<td>thordfp1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DefaultPool</td>
<td>DefaultPool</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

Ready
### LPM Return command syntax

<table>
<thead>
<tr>
<th>L</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMC</td>
<td>NAME</td>
</tr>
<tr>
<td>1</td>
<td>POK HMC</td>
</tr>
<tr>
<td>2</td>
<td>POK HMC</td>
</tr>
<tr>
<td>3</td>
<td>POK HMC</td>
</tr>
<tr>
<td>4</td>
<td>POK HMC</td>
</tr>
<tr>
<td>5</td>
<td>POK HMC</td>
</tr>
<tr>
<td>6</td>
<td>POK HMC</td>
</tr>
<tr>
<td>7</td>
<td>POK HMC</td>
</tr>
<tr>
<td>8</td>
<td>POK HMC</td>
</tr>
</tbody>
</table>
You can specify the one or all of the values for a VNIC adapter:

- virtual-slot-number
- vios-lpar-ID
- sriov-adaptet-ID
- sriov-physical-port-ID
- capacity
What are Power Enterprise Pools

Mobile processor and memory activations may be re-allocated to any system within a defined pool

– Systems with different clock speeds can coexist in the same pool
– Activation assignment and resource movement is controlled by the HMC

POWER8 systems may interoperate in the same pool with POWER7 systems

– High-end pool for POWER7+ 780, Power 795 & Power E880 systems
– Midrange pool for POWER7+ 770 systems & Power E870

Activations can be moved within a pool at any time, without contacting IBM

– No limit to the number of times activations can be moved

Movement of activations is instant, dynamic and non-disruptive

– Ideal for workload balancing and optimizing application availability

The tool can do placement based on Power Enterprise Pools and move the mobile processor/memory as part of the LPM operations.
Live Partition Mobility has made the Power platform stand out for its functionality to help customers to do planned maintenance and easy migrations and workload balancing.

But if you have an “unplanned outage” (IBM speak for your server crashed), you can get those partitions back up and running on another server.

No waiting for IBM to get the server back online, no waiting for IBM support to get back to you, just no waiting.

You restart the workload on other servers and get your business back up and running in minutes!!!
• SRR is Simplified Remote Restart

• This PowerVM Enterprise Edition feature allows you to restart your LPM-capable LPARs on another server.

• You can restart it on a server in your data center, or if configured for cross-site LPM, you can restart it on a server in another data center with the first data center completely offline!

• **How hard is it to implement?** Click a box on the HMC and its implemented.
• Unplanned outage using P8 Enterprise Edition - scenario 1
• Admin calls Boss...the conversation is as such
• Admin - Hello Boss....we just lost a P8 frame...it crashed and I've called IBM Support and they are on their way.
• Boss – Which applications are affected and how long does IBM think the server will be down?
• Admin – Well, I've already Remote Restarted our most critical partitions and now am restarting the lower priority partitions....shouldn't be long now.
• Boss - Remote Restarted - I thought we could only LPM when the server is up.
• Admin - Yep...This SRR is like LPM but for when the system is crashed
• Boss - okay.....once the IBM SSR fixes the server...call me and then we can start to move those running partitions back to the failed server
• Admin - No problem

• This is how we would like an unplanned outage to go!
Admin - Hello Boss....we just lost a P8 frame...it crashed and I've called IBM Support and they are on their way.

Boss – Which applications are affected and how long does IBM think the server will be down?

Admin - Well that server hosted some web servers for or Social Media sites and our payment system and our new Samsung launch app developers and repair time is TBD.

Boss - OMG - we can't pay folks and our new cell phone launch is only 1 week away....we need this up fast as the developers are already behind

Let's now go forward in time…next slide please
A few days later and it's now the Post Crit Sit phone call with IBMers and customers including a VP in charge of IT.

- IBM - We've done the analysis of the failure and understand its nature and it won't happen again.
- Customer VP - We need to have some way to mitigate this in the future.
- IBM - You could have enabled SRR and just moved those workloads to your other servers
- Customer VP - What do I need to get this SRR?
- IBM - You have had this capability on your boxes since day 1.
- Customer VP - Hummm...interesting....okay what do I need to do enable this?
- IBM - Shutdown all your partitions again and set this bit on each lpar and restart...
- Customer VP - I HAVE TO SHUTDOWN ALL MY WORKLOADS AGAIN THAT CRASHED EARLIER THIS WEEK TO DO THIS....
- The rest of the conversation is left to your imagination.
Why customers don’t think they need SRR

- All my production LPARs are clustered so failover will work.
  - Yes, you should have clustered prod LPARs, but sometimes the failover doesn’t work…
  - app developers have hard-coded ip addresses or other config information that is only exposed when a failure occurs
  - Failover hasn’t been tested
- My non-prod workload can be down during an unplanned outage.
  - Many customers tell me their “non-prod is the new prod”
  - Many developers are working 24x5 WW on the non-prod lpars
  - Non-prod is rarely clustered in customer environments
- I don’t have enough spare resources to SRR a failed server
  - You don’t have to restart all the LPARs from a failed server
  - You can shutdown non-important LPARs on other servers and move the important LPARs from the failed server
What is Simplified Remote Restart

• Remote Restart
  – High availability option for partitions to recover from a server outage
  – Preserves Partition’s resource configuration, partition restarted with most recent configuration
  – Faster re-provisioning of partitions upon server outage
  – Prevents configuration loss & saves time & effort in re-creating the original configuration
  – Reduced downtime for workloads

• Simplified Remote Restart (SRR)
  – Introduced with HMC V8 R8.2.0, Firmware 820 & VIOS 2.2.3.4
  – Removes the requirement of reserved storage device for each partition.
  – Reduced complexity in setting up environment & usage
Simplified Remote Restart Configuration

Note: Partition should use Virtual IO only
How to enable SRR

- SRR can be enabled the following ways

  - **At partition creation time**
    - Classic GUI has checkbox on first panel of Create Partition Wizard (all HMC versions)
    - Enhanced GUI has partition templates with SRR enabled (HMC 8.8.5 version)
    - Enhanced GUI can capture SRR partition and create new template (HMC 8.8.5 version)

  - **When partition is powered off**
    - Enhanced GUI has checkbox on Partition Properties (HMC 8.8.5 version)
    - Via HMC Command line (all HMC versions)
      - `chsycfg -r lpar -m managed-system -i "name=partition name, simplified_remote_restart_capable=1"`

  - **During LPM operations – as partition is moved (between P7/P8 or P8/P8)**
    - Via HMC Command line (HMC 8.8.5 version)
      - `migrlpar --requirerr 2 -o m -m src_system -t dest_system`

- The tool will enable SRR during LPM by default. This is a user controlled feature.
### All the different types of RR

#### Partition Remote Restart – deprecated so you may ignore this capability

#### PowerVM Partition Remote Restart – this is the complicated RR

#### This is SRR and its for P8 and this is the one you want to use

<table>
<thead>
<tr>
<th>Capability</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inactive Partition Mobility Capable</td>
<td>True</td>
</tr>
<tr>
<td>IBM i Partition Mobility Capable</td>
<td>True</td>
</tr>
<tr>
<td>Partition Processor Compatibility Mode Capable</td>
<td>True</td>
</tr>
<tr>
<td>Partition Availability Priority Capable</td>
<td>True</td>
</tr>
<tr>
<td>Electronic Error Reporting Capable</td>
<td>True</td>
</tr>
<tr>
<td>Active Partition Processor Sharing Capable</td>
<td>True</td>
</tr>
<tr>
<td>Firmware Power Saver Capable</td>
<td>True</td>
</tr>
<tr>
<td>Hardware Power Saver Capable</td>
<td>True</td>
</tr>
<tr>
<td>Virtual Switch Capable</td>
<td>True</td>
</tr>
<tr>
<td>Virtual Fibre Channel Capable</td>
<td>True</td>
</tr>
<tr>
<td>Active Memory Expansion Capable</td>
<td>True</td>
</tr>
<tr>
<td>Hardware-Accelerated Active Memory Expansion Capable</td>
<td>True</td>
</tr>
<tr>
<td>Partition Suspend Capable</td>
<td>True</td>
</tr>
<tr>
<td>Partition Remote Restart Capable</td>
<td>True</td>
</tr>
<tr>
<td>PowerVM Partition Remote Restart Capable</td>
<td>True</td>
</tr>
<tr>
<td>Virtual Trusted Platform Module Capable</td>
<td>True</td>
</tr>
<tr>
<td>SR-IOV Capable</td>
<td>True</td>
</tr>
<tr>
<td>Dynamic Platform Optimization Capable</td>
<td>True</td>
</tr>
<tr>
<td>Virtual Server Network Phase 2 Capable</td>
<td>True</td>
</tr>
<tr>
<td>PowerVM Partition Simplified Remote Restart Capable</td>
<td>True</td>
</tr>
</tbody>
</table>
Simplified Remote Restart Enhancements

- Cross MC Remote Restart
  - Source & Target systems managed by different HMCs
- Remote Restart with no connection to system
  - Complete server outage with FSP also not available
- Live Partition Mobility Override
  - Migrating Simplified RR capable partitions between P7 & P8
- Manage Partition UI & Template
  - Templates for creating partition with Simplified RR capability
  - Manage Partition (Enhanced UI) to enable/disable Simplified RR capability
- Auto cleanup on source system after successful remote restart
- User Specifications/Overrides
  - Shared Processor Pool
  - Virtual FC Mappings
This option is only shown on the Create Partition wizard. If you don't set it now, you will have to change shutdown the LPAR and change this value and then reboot the LPAR.
• New options in Manage Partition UI (Enhanced+ Login)
  – SRR capability can be enabled/disabled when partition is not active
    o If system supports Simplified RR, only Simplified RR option is shown in the UI even if the partition is enabled with Remote Restart.
  – Remote Restart State is displayed
  – Option to refresh configuration data stored for SRR.
Partition Templates – Enhanced HMC GUI

• Starter/Pre-defined partition template with Simplified Remote Restart Enabled
• Capture a partition enabled with Simplified RR as a template
• Deploy Partition with Simplified RR capability from templates
  – Enabled
    o Partition is deployed with SRR capability if system supports Simplified RR
    o Template Deploy fails if system doesn’t support Simplified RR
  – Disable
    o Partition is deployed without SRR capability
  – Enable If Possible
    o Partition is deployed with SRR capability if system supports SRR.
    o Partition is deployed without SRR capability if system doesn’t support SRR
**Templates and OS Images**

Use templates to configure the managed system or partitions that are connected to the managed system. You can also manage installation resources for the management console.

*What is a Template?*

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Partition templates contain details about partition resources, such as physical adapters, virtual networks, and storage configuration. Click on the template name to see the details about the template. Select a partition template from the following list.

<table>
<thead>
<tr>
<th>Template Name</th>
<th>Description</th>
<th>Partition Type</th>
<th>Processors</th>
<th>Network</th>
<th>Storage</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>QuickStart_Lpar_IBMi_3</td>
<td></td>
<td>IBM i</td>
<td>Dedicated</td>
<td>None</td>
<td>None</td>
<td>Simplified Remote Restart</td>
</tr>
<tr>
<td>QuickStart_Lpar_rpa_1</td>
<td></td>
<td>AIX Or Linux</td>
<td>Dedicated</td>
<td>None</td>
<td>None</td>
<td>Suspend Resume</td>
</tr>
<tr>
<td>QuickStart_Lpar_rpa_2</td>
<td>without Virtualization capabilities</td>
<td>AIX Or Linux</td>
<td>Dedicated</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>QuickStart_Lpar_rpa_3</td>
<td></td>
<td>AIX Or Linux</td>
<td>Dedicated</td>
<td>None</td>
<td>None</td>
<td>Simplified Remote Restart</td>
</tr>
</tbody>
</table>
Auto Cleanup

• Automatic cleanup of a remote restarted partition on source system
• Auto Cleanup is performed when
  – Source system state comes back be operating state
  – Partition remote restart status is “Remote Restarted”
  – RMC for the VIOS partitions serving the clients is active
• Auto Cleanup is done without force
• User can trigger the manual cleanup as well using the rrstartlpar command
• When PowerVC is used to orchestrate Remote Restart
  – Auto cleanup can be disabled
  – By default, auto cleanup is enabled
  – Setting is maintained across upgrades, but not on fresh install.
  – CLI:
    o rrstartlpar –o set -r mc –i “auto_cleanup_enabled=0|1”
    o lsrrstartlpar –r mc
      auto_cleanup_enabled=0|1
LPM Automation tool also supports SRR

One click will select all the partitions or select/deselect individual partitions

Can choose one or many destination servers

This icon gets you to this screen
Remote/Restart – Placement

Change dest server with Drop down

As dest server is changed, the Remaining values change
Ability to change partition remote/restart order

Click and drag a partition name up or down. 1 goes first, then 2, etc
Creating Plans – changes for V8.5

• After you are done with the Placement Panel, you can Export that plan and continue to edit it further.
• Currently only the Destination Server can be edited in the plan

• Version 8.5 will allow you to specify vfc_mappings and shared processor pool settings
Remote Restart Completed
Cleaning up after Remote Restart

- After the tool has Remote Restarted the LPARs on other servers, the old LPARs configurations need to be cleaned up on the failed server.
- Once the failed server is repaired and is back up running, the LPARs will still be on the server but you won’t be able to activate them. You can view their configurations/profiles/VIOS mappings but you must use the RR Cleanup button to remove them from that repaired server.
- The tool has a GUI to do the cleanup named “RR Cleanup” (see next page for screen shots)
These URLs are case-sensitive
ibm.biz/SRR_benefits
ibm.biz/LPM_overview
ibm.biz/LPM_scheduler
ibm.biz/SRR_tool
ibm.biz/LPM_PEP
Ibm.biz/SRR_bikeride  fun video of an Admin performing SRR during lunch
Getting support and updates

- This tool is delivered as-is. You can email me for any problems/enhancements you would like.
- The goal is to fix any issues as quick as possible but depending on our availability, it may take some time.
- However, with the Excel Plans, even if the tool is broken, you should be able to complete a maintenance window by using the HMC commands in the Excel spreadsheet.
- The tool will be loaded into Resource Link which IBM customers have access to.
- Updates to the tool will be loaded into Resource Link
- The customer can subscribe to updates on the web site.
- The customer has unlimited use of the tool throughout their enterprise without maintenance or license fees
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