Web Exclusive

Guide to Novalink and PowerVM 2.2.4

October 2016 | by Jaqui Lynch

In October 2015 IBM announced PowerVM 2.2.4. One of the key updates in that release was the addition of a new LPAR (logical partition) type called NovaLink. The POWER8 hypervisor doesn't have native OpenStack support so it's necessary to provide an interface between the OpenStack management software and the hypervisor. Before v2.2.4, PowerVM didn't have OpenStack support and it used PowerVC as the interface between OpenStack management software and PowerVM.

The term Nova refers to the compute element of the OpenStack cloud controller. Before NovaLink, PowerVC would provide a Nova on each server that would send commands to PowerVC which then sent them through the HMC to the server. This limited scalability due to the number of servers that PowerVC could successfully manage at once. The limit was 30 hosts and 3000 LPARs with PowerVC.

This all changes with NovaLink, which is architected to allow for far greater scalability for PowerVM based systems. PowerKVM does have nova support built in and doesn't require the use of NovaLink LPARs. Using NovaLink, PowerVC can now manage up to 200 hosts and 5000 LPARs: this makes the transition to cloud much easier. NovaLink provides for a Linux LPAR that runs on a POWER8 server that has been virtualized by PowerVM. This LPAR is the Nova compute instance that provides a server management interface and can be used to rapidly provision LPARs on the server. The server can then be managed using the REST API or through the command line (CLI). Additionally, it can integrate with PowerVC or other OpenStack solutions to manage the server.

So what does it look like? NovaLink runs in an Ubuntu Linux LPAR on the POWER8. Version 1.0.0.3 of NovaLink is Ubuntu 16.04 LTS. The LPAR is fully virtualized using resources provisioned from the VIO servers. It comes with a simple installer and provides the core services needed to manage the server, along with OpenStack drivers and plugins used by OpenStack management solutions including PowerVC.

IBM has done a nice job of allowing for migration and integration. The POWER8 servers can be co-managed by NovaLink and an HMC provided they meet the minimum requirements. The HMC can also continue to manage POWER6 and higher servers. In these co-managed environments, you need to select either NovaLink or the HMC as the master environment. The master is the system that will be used for certain tasks such as COD (capacity on demand) and some partition management tasks. However, do note that firmware updates can only be performed by the HMC while it's in master mode. Fortunately, you can switch between the two dynamically. Other restrictions include, for example, if a server is co-managed, then partition profiles and system plans are not supported regardless of who is in master mode. Instead you use the Enhanced mode on the HMC or PowerVC to manage partition configurations. Prior to implementing NovaLink it's important that you determine whether you need to use system plans and partition profiles or not.

Prerequisites for NovaLink

NovaLink requires a POWER8 server with firmware installed at FW840 or higher, however, HMC co-managed systems require FW840.11 or higher and the HMC has to be at v8.4.0SP1 or higher. The NovaLink LPAR needs at least 0.5 for entitlement uncapped with up to 2 VPs (virtual processors) and a

non-zero weight. It also uses 4.5GB of memory which can be reduced once it is installed. And it needs at least 30GB of disk, a network bridged through the SEA (shared Ethernet adapter) and at least 200 virtual slots. It also requires that PowerVM be at 2.2.4 or higher and NovaLink 1.0.0.3 requires PowerVC 1.3.1 or higher.

Installing NovaLink

NovaLink can be installed on a new managed system or on a system that is currently managed by an HMC. The install process is slightly different for each. For a new system you will be using the ASMI, the USB stick or netboot to install the LPAR. You can also use a current NIM server as well. Once you get the install running, the NovaLink installer will create one or two VIO servers and then creates the Linux LPAR to be used for NovaLink.

On an HMC managed system that already has VIO servers installed you will need to create a Linux LPAR for the Nova. You will also need to enable the HMC to be comanaged and you will need to enable the LPAR for NovaLink support. You then activate the LPAR in SMS mode and follow the prompts. Both of these options are well documented on the IBM website.

Additionally, if in the future you decide to go back to just being HMC managed, IBM provides a fairly simple procedure to do so. It's basically four steps:

- set the HMC to be the master
- shutdown and power off the NovaLink LPAR
- 3remove the NovaLink LPAR, and
- release master authority for the managed system.

Updates to NovaLink

In April 2016, IBM announced updates to NovaLink, the HMC and PowerVC. NovaLink updated to v1.0.0.3, PowerVC to v1.3.1 and the HMC to v8.8.5. As of that release, NovaLink adds support for PowerVM simplified remote VM restart, Power Enterprise Pool management, IBM i VM management, LPAR deployment with AME (active memory expansion) enabled and PowerVM multiple shared processor pools. These are significant updates that can now be controlled by PowerVC or various OpenStack applications.

Summary

IBM is constantly updating PowerVM to bring in new and interesting software. NovaLink is one example. Its purpose is to simplify the deployment of OpenStack software with PowerVM with the added benefit of improving performance and scalability for PowerVC. NovaLink provides a highly concurrent and scalable infrastructure to allow PowerVM users to scale up their environments while still allowing them to take advantage of their PowerVC experience. If scalability is a critical issue for your environment then NovaLink and PowerVC may be able to assist with resolving it.

References

PowerVM NovaLink

Installing PowerVM NovaLink

Resetting the System to be HMC only

NovaLink Update

IT Jungle article

IBM Systems Magazine article by Charlie Cler