COMMUNICATING WITH SAM

Efficient Communication Between Partitions and Systems

Sam Johnston

Question

We have a large multi system environment and are considering consolidating multiple separate systems onto a new logically partitioned iSeries. Our objective is to reduce the number of separate systems on our floor by 50%. What recommendations can you make on how to take advantage of this opportunity and improve the data centre network architecture.

Answer

A big part of your task will be to determine where to place the mission critical applications, files and communication interfaces. The answers to these questions are usually determined by the processing capacity limits, distribution of users and storage limitations of the available systems. As the iSeries has evolved, the support for a variety of communication environments has significantly improved. There are now several different types of inter-system communications in use today. Due to the large number of overall factors in creating a consolidated solution we will limit our discussion to the two inter-system and inter-partition communication options, OptiConnect and Virtual Ethernet.

OptiConnect for OS/400 can help resolve many of the placement issues by allowing you to create a shared database cluster in a local environment. Opti-Connect is a system area network that enables high-speed communications between separate systems or partitions. A cluster of partitions or systems has the advantage of being able to provide more computing capacity than a single environment. A cluster of systems can also achieve higher levels of availability. OptiConnect can also help reduce the total storage requirements by eliminating the need to replicate data across systems.

OptiConnect can be implemented using the following methods:
- HSL Loop to connect separate systems supporting HSL.
- Virtual OptiConnect using internal Memory to Memory communications in LPAR situations.
- SPD Bus hardware on older systems.

Participating HSL systems need to be cabled as part of the HSL loop. The number of systems and OptiConnect loops available varies by model. On LPAR systems no hardware is required since all the resources are internal to the system. SPD systems require receiver cards and dedicated expansion towers.

All three methods require OptiConnect for OS/400 software, which is a separate feature of the operating system. This provides the following functions:
- Additions to the operating system to allow fast path Distributed Data Management across the interface.
- A connection manager to manager the resources.
- An agent job that runs on the server.
- Objects to control the manager and agent.

OptiConnect has two compelling advantages over traditional wide area or inter-system communication methods. It takes advantage of the high-speed I/O bus and memory to connect partitions or systems. Secondly with the fast path method of routing data requests OptiConnect uses an I/O driver imbedded in the operating system to enable application access to data on the remote partition or system. This allows data access anywhere within the cluster through a much shorter code path than other methods, and as a result it provides excellent performance. ▶

Figure 1.
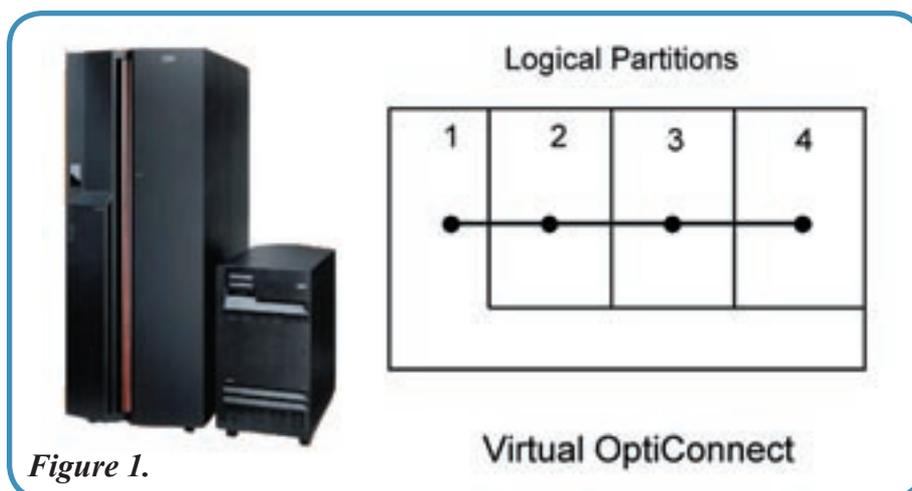
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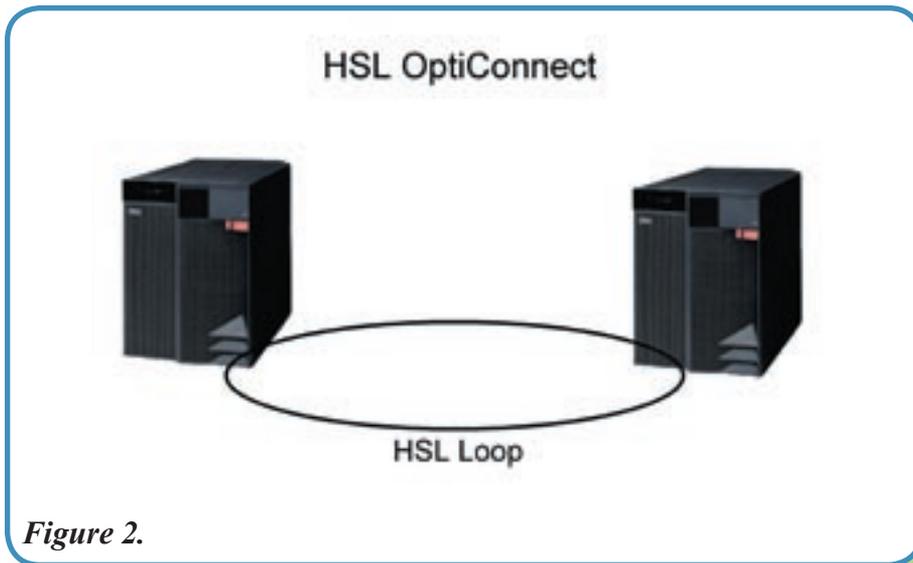
HSL OptiConnect

HSL Loop

Figure 2.

As well, the result of LPAR may be to increase the openness of communication within your environment, so be sure that you do not ignore network security, as more communication equals greater risk and vulnerability.

Regardless of the number of systems and partitions you eventually require, the IBM iSeries has the robust architecture, and efficient operating system features to create a high performance and highly secure communications solution for clustered and multi-partition environments. This architecture, when combined with a well planned overall network strategy, will assist in creating a more efficient and open computing platform. Just remember, the key is to do a comprehensive analysis of your business to ensure that the technology decision you make is the best fit for your situation environment.　　TUG

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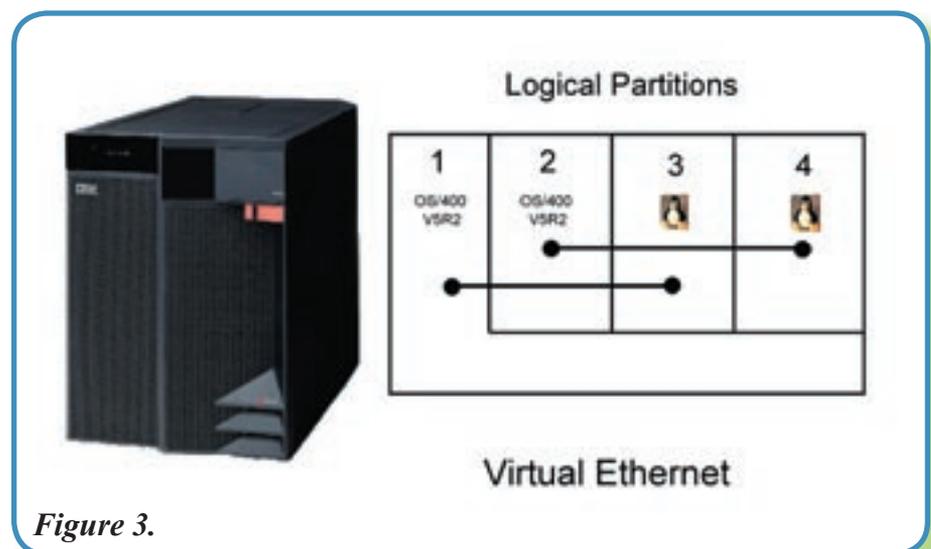
OptiConnect has the ability to support a variety of different communications types and protocols. This includes DDM, DRDA, SNADS, SQL, & TCP IP. In addition, OptiConnect contains APIs that can be used by HA software to provide mirroring over OptiConnect connections.

The second method of communications to consider for your new LPAR system is Virtual Ethernet. This type of communication became available in version V5R1 to communicate between Linux and OS/400 Partitions. This function has been enhanced in V5R2 to include Windows servers. If you're computing environment contains Integrated Windows Servers or Integrated xSeries Adaptors, Linux partitions and OS/400, you should use the virtual ethernet LAN method of communications. This is a base feature of the operating system and it allows you to create up to 16 ethernet LANs with no additional adaptor, or switch hardware. The virtual ethernet provides a 1Gbps connection for TCP IP communications between partitions, or integrated Windows servers.

Lastly, once you have determined the right overall strategy for your LPAR deployment, you should re-visit your overall network strategy. It is important to understand who connects to what in order to review key elements of your LAN.

This includes ensuring that key users have redundant paths to the AS/400, and perhaps either the introduction of or fine tuning of your VLAN deployment to mirror the LPAR strategy. If you are consolidating systems, whether it is multiple AS/400s, or moving a Linux server to an LPAR, there is the possibility that your architecture was designed based on a distributed computing strategy, and this may not be efficient in a consolidated centralized model.

This is your chance to eliminate any anomalies such as isolated network segments for that department that just had to have Linux!

Logical Partitions

1	2	3	4
OS/400 V5R2	OS/400 V5R2		

Virtual Ethernet

Figure 3.