Communicating With Sam

Enterprise Storage Strategies for Homogenous Operations Includes iSeries

Sam Johnston

Question

Our company has multiple iSeries and while the iSeries still remains an important part of our strategy, it is clearly not the largest or the fastest growing part of our IT organization. We have significant system and storage requirements on other platforms. We are in the process of consolidating multiple storage islands into a corporate SAN, and from an operational skill perspective we do not want to differentiate between server platforms. Our goal is a homogenous approach to managing heterogeneous platforms. What recommendations can you make on how we take advantage of these investments by including the iSeries.

Answer

The question: "Should I include my iSeries into a SAN environment" has been around for some time now and the answer still is the same "It depends". It depends on a number of issues including what kind of SAN disk storage device you are using and whether you have an iSeries or an AS/400. The best SAN disk storage integration results come with the combination of the iSeries with fibre channel attachment to the IBM Enterprise Storage Server (Shark).

Since the iSeries has a robust integrated disk sub system the question of where to keep your data is not easy. It depends on where your core skills set are and how you manage the IT systems from an enterprise wide perspective. The fundamental basis for most SAN solutions is to provide some consolidation, and a centralized management structure.

To support these objectives iSeries customers do have the choice of an integrated or shared solution environment. iSeries disk units in an ESS will report to StorWatch, the ESS management system not the iSeries. This includes the iSeries into a common management framework so the management goals are achieved.

Many of the speed and distance limitations of SCSI architecture on an AS/400 have been eliminated. With the iSeries models 270 and 8XX , and OS/400 V5R1 two new fibre channel adaptors are now available. They are the 2765 fibre channel adaptor for tape and the 2766 fibre channel adaptor for disk. They offer much improved disk performance over the previous SCSI connection methods available on the AS/400. Now disk and tape storage SANs are practical from a performance view. The fibre channel support has been further improved in V5R2 as follows:

- The Adaptor speed is improved to support 2Gbps.
- The topology now has full switch support instead of just QuickLoop.
- More than one tape device can be attached to a single adaptor.

The Fibre Channel adaptors are auto sensing and will run at either 1Gbps or 2Gbps. Of course all the SAN elements need to be enabled for 2Gbps in order to achieve the increased performance. The IBM 2109 F16 or the 3534 F08 switches, the ESS 800, 3582 and 3583 library will support a 2Gbps fabric.

SAN strategies should also include tape and this is an area where there is more choice and flexibility in the IBM product line for the iSeries customer. The iSeries tape storage in a Fibre Channel SAN environment is supported on the LTO tape drive format incorporated into 3582, 3583 & 3494 tape libraries or the 3590 tape format in the 3494 library. **(See Figure 1.)**

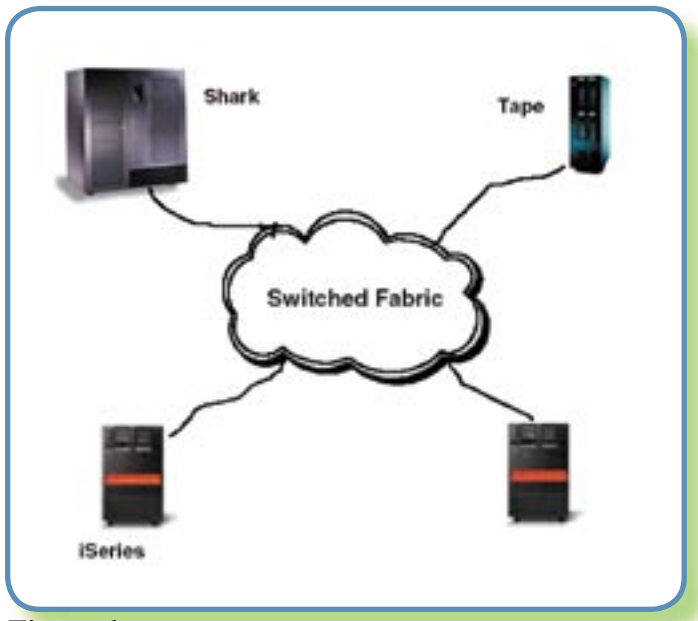

Figure 1.

Moving Forward

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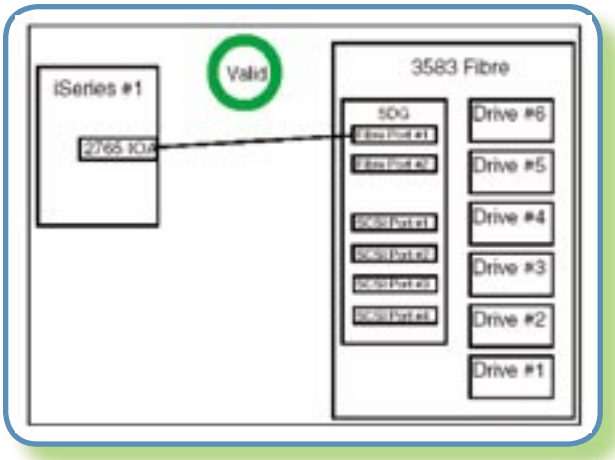

Figure 2.

If you are considering attaching more than one tape device to the 2765 controller then you need to determine the maximum number of devices your system can support. Actual tape performance can be much different than published statistics. You may find that your system and the attached drive only backup at a rate of 20MB/s depending on your mix of data. In this case attaching 4 drives should be no problem for the adaptor. The key point is that you must understand the actual throughput your system is achieving before you can properly determine the maximum number of drives that can be effectively driven by a single adaptor.

There is one other important consideration unique to tape in the SAN environment. This is the alternate IPL device function. For years every system had a tape drive adaptor in a card slot on the first system bus. If the system couldn't IPL from disk you could IPL from the alternate IPL device and savsys tape. As tape drives became faster and faster many people wanted to move the tape to another bus to avoid contention so the Alternate Install Device concept was created. The fibre channel adaptor does not support the alternate IPL function however it does support the alternate install device function. In order to use an alternate install device you must define it and enable the device. If you install a fibre channel based tape solution you need to record and retain the logical address of the device in order to use it. This is not a huge drawback but it requires redefining the recovery processes.

Figure 2 shows the 3583 LTO library with the integrated SAN data gateway feature installed. Although this is a valid configuration, IBM points out that performance will be bottlenecked by the 2765 if it tried to use all 6 drives.

While SAN technology makes it possible for multiple heterogeneous systems to attach to a drive, we would recommend zoning to prevent other types of systems accessing iSeries storage devices. In multiple iSeries environments it creates the need for appropriate software and operating system functions to control the sharing.

Using the default OS/400 parameters OS/400 will perform the 'reserve / release' when drives are varied on and off preventing other systems from stealing the drive and writing their data on your tape. These functions are passed on to BRMS. Tivoli Storage Manager also uses reserve/release. You need to ensure this function is supported if using other software packages. **Figure 3** shows a SAN zone where multiple iSeries have access to multiple drives and shows why this is an important function.

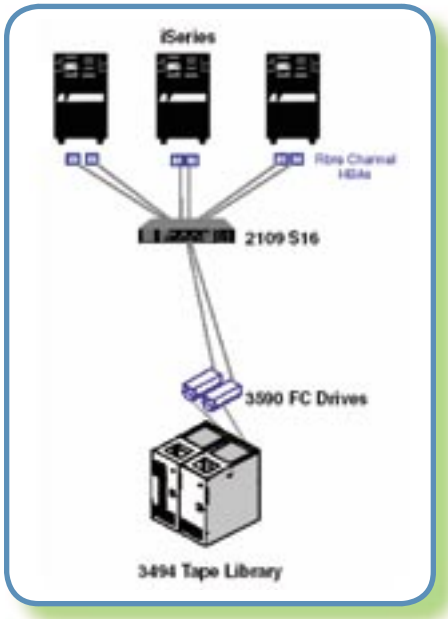

Figure 3.

The iSeries is certainly able to participate in your corporate SAN and deliver the same benefits of SAN achieved on other platforms. Including your iSeries in the SAN would benefit the SAN ROI. The focus so far has been on iSeries functionality, as older AS/400s have limitations in supporting the appropriate fibre channel technology necessary. However, if you have an older AS/400 model, there are cost effective strategies that deliver two benefits: better SAN ROI, and justification for moving to newer iSeries technology. The key is to upgrade to the newer iSeries, but minimize the investment with a minimum amount of disk space and tape features in the production iSeries versus the specification that would be necessary as a standalone server, while leveraging the SAN capabilities to provide the disk and tape capacity normally included in a standalone server.

The bottom line is that there is no longer any need to segregate the operational approaches associated with the iSeries versus other servers in your data centre. While the iSeries continues to have unique features in its architecture that we appreciate as IT managers and dedicated members of the "iSeries nation", the reality is that the platform has evolved to open standards. The key is to leverage these open standards and to integrate the operational activity of all your servers into a single environment. Not only does this make good sense from a technical design perspective, but it will also ensure that you cross pollinate the skills of your resources by transplanting AS/400 operations disciplines to other aspects of your environment. TUG

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