

iSCSI Turns The Corner

By Tony Asaro

Remember Token Ring? For those younger IT managers, I am not referring to JRR Tolkien's the Lord of the Rings (even though the proponents for Token Ring were living in a fantasy land). Remember Arcnet? I barely do. The debate of iSCSI versus FC brings back old memories. The reason that Ethernet became the dominant LAN protocol was greatly in part because of economic advantages, which also is what makes iSCSI compelling compared to FC and the momentum is building every day. ESG is seeing iSCSI adoption growing this year in greater numbers by customers and we are aware of over 2,500 production iSCSI SAN deployments and the implementations are accelerating.

The majority of iSCSI deployments are new SAN implementations in small and medium sized business, and departmental applications in larger organizations. However, there are customers that have replaced their three year old FC SANs with iSCSI and are extremely pleased with their decision. These customers have seen no negative impact on performance and in many cases have experienced an improvement over their last generation FC SANs. And the cost savings are extremely compelling. As one customer put it, "I paid less for my entire iSCSI SAN than I would have paid for the maintenance fees of the comparative FC SAN I was looking at". The cost savings provided by an iSCSI SAN also allows these customers to do more while paying less. A number of customers told me that they are now going to implement disaster recovery using remote replication to another site, which they would not have been able to afford with the FC SAN implementations they were considering.

iSCSI skeptics will say that the so-called experts have been hyping iSCSI for years now and that the percentages of SAN implementations is still very low. Like any technology there is an adoption cycle that takes years before it becomes part of the mainstream. However, there are a number of factors that are converging that indicate that the momentum for iSCSI is growing with no end in sight, including:

- Customer implementations are increasing rapidly
- More vendors are supporting iSCSI including HBA, switch and storage systems
- Additional native drivers are being developed on different operating systems and Microsoft continues to be a major proponent of iSCSI
- The large and dominant storage vendors will soon be offering iSCSI support for multiple products

Economics

As mentioned earlier, the reason that Ethernet won out over Token Ring and Arcnet was partly due to economics. iSCSI has the potential to become the dominant storage protocol for the same reason. Customers can install iSCSI SANs using existing LAN infrastructure without the need for FC host bus adapters (HBAs) or switches. It is one thing to spend a couple of thousand dollars on FC HBAs for a 50 thousand dollar server but companies typically cannot justify this cost with a three thousand dollar Intel-based server. This is why a large portion of Windows servers are not connected to FC SANs. And the market is also beginning to deploy Linux clusters replacing high-end Unix servers. Each 1U or 2U Linux server in a cluster would require a FC HBA and a port on a SAN switch and the economics of a FC SAN do not add up in this emerging computing environment. On the other hand, iSCSI host drivers (initiators) are free and work with Ethernet

ports included with Intel-based servers, and customers can use low cost Ethernet switches or carve out VLANs on their existing switches.

Ease of Management

The good news is that managing storage is becoming progressively easier (relatively speaking) but still poses challenges with rapid storage growth and extended retention periods. Most of the storage vendors realize that ease of management is actually a competitive advantage (or disadvantage) and are focusing efforts on simplifying their products. Additionally, these vendors are cooperating with one another and trying to make it easier to manage the FC SAN from end-to-end. But in the end iSCSI is inherently easier because customers can use the internal Ethernet ports within their servers and LAN switches that they already have experience with.

Performance

ESG Lab conducted our own hands on testing of different iSCSI storage solutions. The results were extremely good. As seen below, in Figure 1, iSCSI performed nearly as well as FC and better than DAS.

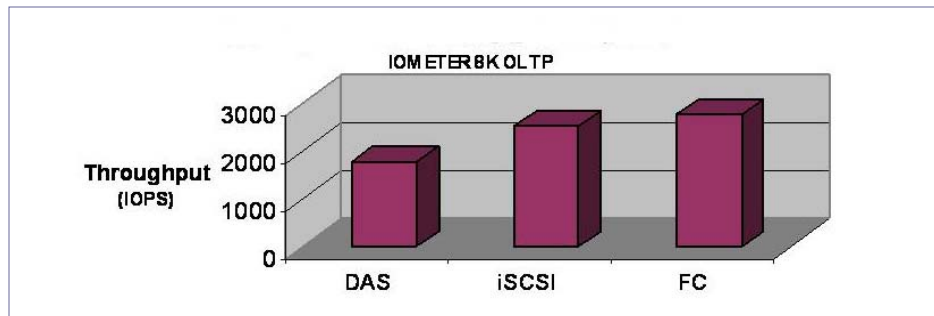


Chart 1: IOP Performance

Chart 1 illustrates a real apples-to-apples comparison. ESG Lab tested the exact same storage system for DAS, iSCSI and FC. To further prove the performance capabilities of iSCSI, ESG Lab simulated a mixed workload of OLTP, Lotus Notes and SAS queries with the following results:

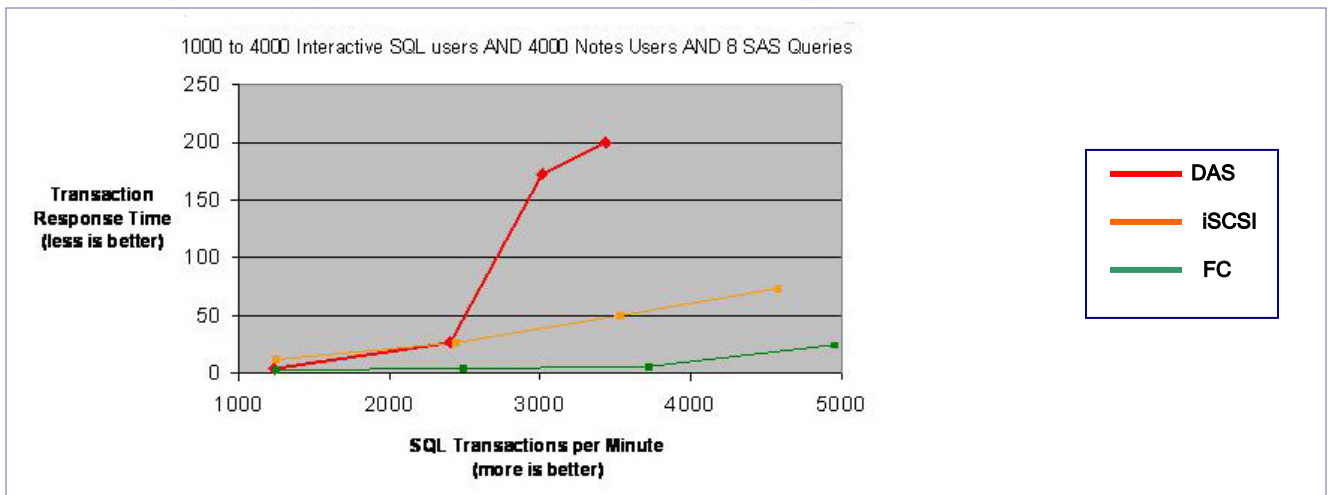


Chart Two: Mixed Workload

The performance numbers show that iSCSI can scale even with mix workloads and keeps up with FC in response time and transactions per minute. Again, this was an apples-to-apples comparison. These performance numbers are by no means the last word on whether iSCSI can scale to every environment but they show that iSCSI is holding its own. More importantly, ESG has spoken to different iSCSI customers and they are quite satisfied with their application performance. In some cases these customers found that upgrading their three year old FC SANs to iSCSI actually improved performance.

Bottom Line

ESG Research did a recent study of small and medium sized businesses (SMB) surveying over 130 IT managers to find out about their storage buying plans. Today, only 17% of these customers had deployed iSCSI. However, over 42% of SMB customers are planning on implementing iSCSI SANs by mid-2006. This is strong indicator that iSCSI is becoming mainstream.

ESG estimates that there are over 2,500 deployments of iSCSI as of the writing of this article and customer implementations should gain even greater traction in 2005. The economics of iSCSI are too compelling to ignore and once the major storage vendors support iSCSI throughout their product lines more conservative customers will begin to embrace it. Today iSCSI is being used in small, medium and large enterprises supporting a wide range of applications. Over time, iSCSI may very well eclipse FC and could potentially eliminate it entirely. If we use history as a guide then we can certainly see the parallels between Ethernet/iSCSI and its past rivals with FC today. The most important thing is that iSCSI offers a compelling price/performance alternative to FC. It's real and it works. iSCSI has turned a critical corner and is beginning its long battle for being the dominant storage protocol of tomorrow.

Tony Asaro is a senior analyst for the Enterprise Strategy Group and runs ESG Lab, a hands-on service that performs analysis and testing storage technologies.