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Prepared by ESSG \ Data Products

Compaq Computer Corporation

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Leveraging Advantages of SCSI and Fibre Channel Interface Technologies

Over the past few years, a debate has raged in the storage marketplace regarding the relative merits of disk drives utilizing Small Computer Systems Interface (SCSI) technology versus Fibre Channel Arbitrated Loop (FC-AL) technology. Unfortunately, this seems to imply that an either-or choice is the best alternative. Compaq strongly believes that this all-or-nothing scenario – SCSI OR Fibre Channel - is not in the best interests of the vast majority of customers, because both technologies have well-defined areas of strengths.

This document outlines the complimentary strengths and trade offs of both Fibre Channel and SCSI interface technologies. A Compaq strategy that leverages the strengths of both interface technologies is summarized.

Note: Unless noted, the term SCSI represents all variants of the parallel SCSI standard. i.e. Ultra-SCSI, Ultra2-SCSI, etc.

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Leveraging Advantages of SCSI and Fibre Channel Interface Technologies
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White Paper

Leveraging Advantages of SCSI and Fibre Channel Interface Technologies

A Coherent Plan for Technology Evolution

Introduction

Over the past few years, a debate has raged in the storage marketplace regarding the relative merits of disk drives utilizing Small Computer Systems Interface (SCSI) technology versus Fibre Channel Arbitrated Loop (FC-AL) technology. Unfortunately, this seems to imply that an either-or choice is the best alternative. Compaq strongly believes that this all-or-nothing scenario – SCSI OR Fibre Channel - is not in the best interests of the vast majority of customers, because both technologies have well-defined areas of strengths.

These strengths are frequently complementary. And while the specific strong points for each technology may change in the future, both will continue to be valuable and effective for some time to come. Therefore, the ideal situation is not to force an artificial choice between SCSI and Fibre Channel technology. Instead, a coherent plan for technology evolution should be based on capitalizing on each technology's strengths now, and as they continue to develop over the next five to ten years.

By reinforcing its commitment to current and future SCSI drive interface technology, while making extensive use of Fibre Channel technology in host interconnects, Compaq has developed such a plan.

WHY SCSI DISK TECHNOLOGY?

Our continued commitment to SCSI for disk technology is based on four key factors**: price, performance, compatibility, and availability/standardization.** These are the areas where SCSI displays impressive strengths. The following sections provide an overview of these specific strengths.

Price

The price advantage is clear in three areas:

- Original purchase price: SCSI components require a lower initial investment than do Fibre Channel components.

- Overall investment: The difference here is even more substantial, since SCSI and Ultra-SCSI require no wholesale changes in the environment. Adoption of Fibre Channel necessitates making a sweeping and extremely costly

infrastructure-wide change which is difficult to justify, given the current performance levels of both technologies.

- Commonality of components: Sharing common components where applicable between internal and external platforms lowers total cost of ownership. Currently, SCSI allows this benefit. Compaq's recently announced "Ultra2 Universal" component strategy leverages this concept. Ultra2 Universal components such as hard drives and tape drives can be deployed between all Ultra2 capable Compaq servers and external storage.

Performance

When SCSI was first introduced, it was done so as an eight bit parallel bus, transferring data at five megabytes per second. In the evolution of SCSI technology, transfer rates have seen a doubling with each successive generation, reaching a rate of 80 MB/second today and 160 MB/second in the very near future. Even higher levels of performance are expected from next generations. Along with the lower price/investment factor, these advancements make it difficult for the vast majority of environments to justify an immediate shift to FC-AL disks.

It is also often inaccurate to base performance judgments or decisions on the specifications of the disk drives alone. For example, HDD interfaces are not a source of performance bottlenecks except in the case of highly sequential large block transfers such as in video streaming. Most business applications are much more sensitive to latency and seek time and are either bottlenecked by the CPU or by the I/O at the hard drive level.

As a result, most of today's environments will not see a performance gain simply by introducing Fibre Channel hard drives. More informed and accurate decisions result from considering the performance of the complete system – disks, connections, etc. In the majority of cases, Ultra-SCSI disks can deliver performance equal to or better than FC-AL disk technology as part of a complete system that is optimized for performance.

Compatibility

SCSI is the proven hard drive interface of choice for both business and enterprise systems. The manageability and high performance of SCSI is well suited for today's demanding, business-critical applications. SCSI provides both backward and forward compatibility for an unequaled level of investment protection. Being an industry-standard, SCSI offers the highest level of interconnect-ability between system components.

On the other hand, the adoption rate of Fibre Channel has been slowed by interoperability problems. To date, there are no industry-wide Fibre Channel

standards, making compatibility among products from various vendors uncertain, if not problematic. Additionally, companies investing in Fibre Channel hard drives today have no guarantee of compatibility with future technology enhancements. A clear lack of investment protection.

Availability/Standardization

There has been and remains tremendous staying power behind the existing SCSI standard, particularly from the open systems manufacturers. These computer and storage manufacturers have large installed bases with working software and hardware.

The Ultra-SCSI interface, which offers higher performance with minimal integration issues has taken the bulk of the drive shipments due to this staying power, outdistancing Fibre Channel as the interface of choice for both device and subsystem connection. In fact, a recent (7/8/99) VARBUSINESS article estimates that Ultra-SCSI shipments surpassed 20 million drives in 1998, compared with 1.5 million Fibre Channel drives.

THE STRENGTHS OF FIBRE CHANNEL CONNECTION TECHNOLOGY

While Ultra-SCSI disk technology continues to hold the edge in many areas, Fibre Channel has proven itself clearly attractive as a connection technology. It offers:

- Cabling that extends to multi-kilometer distances, while SCSI tops out at 25 meters.
- The ability to connect hundreds of devices utilizing FC-AL or switched technology as an enabler for creating SAN (Storage Area Network) environments.
- Higher performance and non-disruptive expansion capabilities.

In fact, Compaq has made a clear commitment to Fibre Channel connection technology. Our FC products such as the RA4000, RA8000, and ESA12000 are robust, thoroughly tested, and ready for deployment. They can support Fibre Channel switched SANs under Windows NT, Compaq Tru64 UNIX and Open VMS and they have been proven reliable in a wide variety of customer sites, from SAP database tiers to large-capacity file and print servers.

This means our customers can deploy heterogeneous Fibre Channel switched fabric-based SANs for the **highest possible availability, scalability, capacity, and performance.**

CONCLUSION: THE BEST OF BOTH WORLDS

By offering storage solutions which utilize the proven strengths of two impressive technologies, we provide customers with exactly what they deserve: top performing systems that deliver the best of both storage technologies.

Our SCSI disk technology provides clear advantages in the areas of price, performance, compatibility, and availability/standardization.

Our commitment to Fibre Channel connection technology ensures that the best technology is also used in the key connection areas.

This combination remains unbeatable for delivering optimum total system performance and investment protection and has become a current strategy of choice. Not just for Compaq, but also for other major open system vendors.

This “best of both worlds” approach is also a flexible one. As technology evolves, we plan to have our solutions evolve gracefully with it, continuing to offer solutions that make the best use of the complementary strengths of SCSI and Fibre Channel technologies. This clearly offers the most graceful, least disruptive, and most effective way to deliver solutions that help our customers achieve their storage and business goals.