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IDC VENDOR SPOTLIGHT

Beyond RAID: Pushing the Enterprise Storage Boundaries

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Sponsored by Infortrend Technologies Inc

Despite the challenging economic times in 2009, the slowdown of business, and the reduction in IT budgets, content creation and storage requirements within organizations show no sign of slowing down. Indeed for many businesses, the poor economic climate will result in more internal data being produced in order to further analyze the business (to improve internal efficiencies) and the markets (seeking the growth opportunities or minimizing risk in declining markets). This, too, will place further demands on the availability and timeliness of data within organizations. At the same time, notably for many businesses within the financial services sector, the cause of the economic slump raises the concerns about data management, availability and quality. This will result in some major overhauls in how data is collated, managed, analyzed and archived, placing greater demands upon the IT budget.

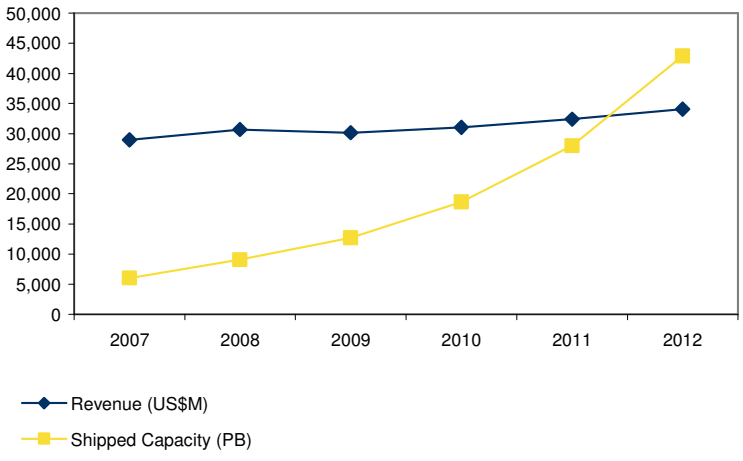
This Vendor Spotlight examines one of the technologies that can help companies achieve some of the strategic imperatives surrounding their storage requirements, availability and security through the use of redundant array of inexpensive/independent disks (RAID) technologies and examines the role Infortrend Technologies has played in providing the market with new hardware offerings in the RAID space along with management tools to help businesses deal with the ever-growing complexities within their storage environments.

Introduction

In 2009, IDC published a revised forecast for worldwide disk storage systems revenue based on the post-crisis data on hand. The outlook for the worldwide disk storage system business is a 3.3% compound annual growth rate (CAGR) between 2007 and 2012, only 0.8% difference from the earlier forecasts published prior to the financial crisis.

FIGURE 1

Worldwide Disk Storage Systems Revenue and Shipped Capacity, 2007-2012



Source: IDC, 2009

IDC expects the worldwide disk storage system market to be among the least impacted segments of IT hardware and, whilst we realize 2009 will be a challenging year for everyone, the longer term view is that storage data growth rates will not slow down and customers will have to keep pace with their storage investments. Indeed the likely outcome from the financial crisis will be more stringent controls and checks on data which, in turn, will result in demand for better storage solutions. The decline in economic activity is already seeing businesses generate vast quantities of new data as they delve deeper into the data they have on hand and acquire, in search of that elusive percentage of growth, or to minimize their exposure to the whims of the financial markets.

Within the storage market, the primary concerns with managing and storing data are availability, reliability and complexity. The most widely used approach to addressing the availability and reliability issues in this requirement (outside of mainframe systems) has been the application of RAID technology. RAID was defined in 1987 and, since then, has been perhaps the most widely used technology to ensure that data is not lost and is available at the speeds that users (applications) demand. Over the following decades, the technology has undergone a series of improvements that address both the performance and security aspects of data storage and, in spite of disruptive technologies entering the market in recent years, it is clear that RAID does still have a place inside many businesses and is not likely to disappear in the near future.

In today's market, there are a number of industries that rely heavily on RAID technology to ensure that they are able to deliver their products and services to the market. Digital imaging and video-on-demand systems are two such industries. Here, the critical requirements are consistently high delivery speed and the absolute accuracy of the data being delivered, and RAID is especially helpful in these areas.

Benefits

RAID is primarily concerned with the following attributes of a data storage system:

- Data Reliability – The information on the disk will still be available and will not be lost even if a disk within the array fails
- Performance – The speed with which the data can be accessed for both read and write operations

The advantages of this within a company's storage systems should be obvious. Legislation is being created across the globe that demands enterprises and government agencies to store data in a secure, reliable and retrievable manner. Whether the data be financial accounts and statements, personal information about customers or corporate email, there is a growing wealth of regulations surrounding these areas and every organization needs to be aware of the penalties for not complying with these laws. RAID contributes to this area by providing a high degree of confidence that the data will not get lost, even in the event of a total disk failure, but ensuring that the information stored within the array is done in a secure manner that the failure of part of the array will not compromise any of the data within the whole array, without any data needing to be restored from backup.

Since disks, by design, can only transfer at limited rates, the RAID array design allows data to be written to and read from multiple disks, the obvious advantage here is that the user is no longer bound by the speed of a single disk but data can be transferred to/from multiple disks, thereby overcoming the mechanical limitations that the design offers. This translates into higher access speeds for end users during normal data transfers.

Trends

The data storage market worldwide is dominated by a handful of multinational vendors, which, through scale and pricing strategies, attempt to provide storage solutions across a varied set of customer storage requirements. In spite of the economic crisis that hit in September 2008, data storage worldwide is still growing at a phenomenal rate driven by the explosion in file-based

content and an increasing requirement, driven largely by legislation, requiring businesses to keep more data for longer.

Addressing the same technical areas that RAID does, many smaller niche players have offered a variety of technologies that can also help organizations with ensuring data availability and reliability.

Due to its configuration, RAID, by its definition, are multiple disks acting as a single environment (the computer system does not see the multiple individual disks, but one single storage environment), which means that somewhere in the system, there needs to be some management for these multiple disks. The other challenge (which is more relevant in 2009 than it was in previous years) is that should a disk fail within the RAID array, the whole array will slow down as the data on the failed disk is "saved" and written to the rest of the array.

Due to the huge increase in data being saved in today's environment and the increases in disk sizes, it is possible that this process could take much longer to complete, essentially slowing the RAID array down for a long time. Regardless of these possible concerns, RAID is a highly reliable and popular approach to ensuring access data speeds are sufficiently fast and that data does not get lost due to disk failures. There are available alternatives to RAID that also address some of the benefits gained from RAID.

Competing with RAID for performance improvements, most recently is solid state disk (SSD) which emerged in 2008 as a potential competitor. Offering much higher throughput than traditional magnetic disks, SSD offerings have been adopted by a number of multinational disk storage systems vendors in spite of the fact that SSD can cost up to 30 times more than magnetic disks and the commonly held belief that there are significant long-term issues with regards to the overall reliability of SSD.

Since 2007, there have been a growing number of commentaries that RAID is a technology that is reaching its limitations. With the data growth rates being seen now and forecast for the future, there is a growing perception that RAID systems will eventually succumb to an unrecoverable read error (URE) as the total size of individual disks grows and the fact that RAID requires multiple striped disks in order to deliver its promises of greater speed and reliability. It is already an accepted aspect of the storage industry that at some point in time a percentage of disk drives will fail, and with the continued massive growth in data being stored, the odds of the likelihood of this happening increase.

Whether or not this concern of the URE becomes a reality, it is a perception that is already being commented upon in a number of journals and publications and ultimately will start to stir apprehension within the decision-making process.

IDC does not expect this to become a short-term issue since storage decision-making processes are generally conservative by nature and customers will tend to stick with what they are used to. In addition, because of the effect of the phantom of the "Y2K bug" that never materialized for many companies, it is one of those "forecast failures" that is likely to be treated with a degree of contempt by the teams being asked to finance new storage solutions based on a "possible technical failure that has yet to happen!"

Another RAID challenge comes from the virtualized storage solution offerings available. To be fair, many of these can (and are) configured to also make use of RAID, but a number of offerings today are proposing a high degree of redundancy for almost every aspect of the hardware, which is essentially offering dual components but critically, the ability to add and expand an organization's storage environment without any interruption. This last benefit can be of significant advantage in the current environment where many applications are expected to offer 24/7 availability and, as mentioned earlier, data retention is forcing customers to constantly expand their storage capacity.

Considerations

For organizations that have to embark on the process of acquiring new storage hardware, it is important that they understand the importance of “storage utilization." It has become apparent that in recent years many organizations have been purchasing incremental storage, without fully understanding their current storage utilization rates. This has led to an over-capacity in the markets, but this capacity is difficult to identify and potentially dangerous to use. For the storage administrator, ensuring sufficient capacity is the fundamental part of system design. For the business unit, ensuring availability, security and reliability of the data is the primary interest; both of these directives make it challenging to free excess, or under-utilized, capacity. This however should be an important consideration when embarking upon a storage system purchase.

Other proactive solutions to improving storage utilizations include:

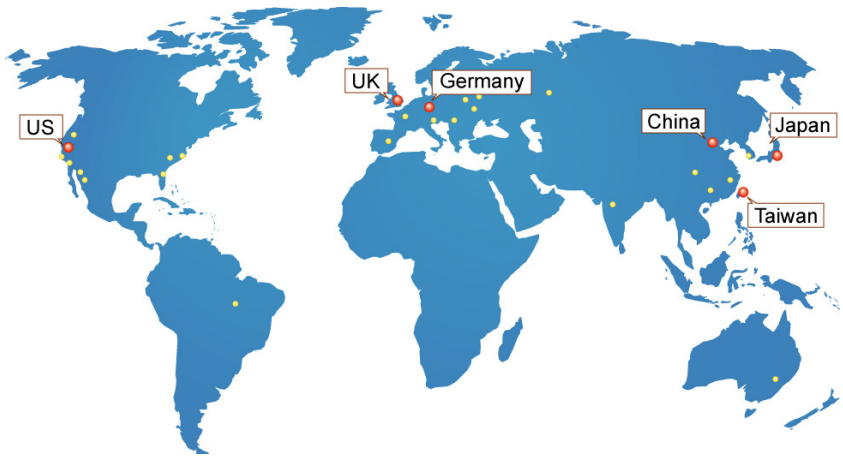
- Thin provisioning – to provide better capacity utilization and provide capacity on-demand
- De-duplication – the ability to extract duplicate copies of the same information, relying on redundancies built into the system
- Storage Virtualization – the ability to “pool” the available storage systems across an organization in order to manage and use them as a single entity

Profile of Infortrend

Founded in 1993, Infortrend is headquartered in Taiwan with offices in United States, Japan, Peoples Republic of China, United Kingdom and Germany. The company first started shipping EISA-to SCSI RAID controllers, and over the past 15 years has gradually developed its product portfolio to the point where today the company ships a wide range of RAID subsystem hardware as well as storage and multipathing software to manage these systems. According to IDC's *Worldwide Disk Storage Systems 2007 Vendor Shares: Year in Review*, Infortrend ranked 7th in terms of external disk storage shipments. IDC's analysis focused on various segments of the disk storage systems market, including external versus internal storage, different installation environments such as storage area network (SAN) and network-attached storage (NAS), and various operating environments.

Figure 2

Infortrend Global Sales Offices



Source: Infortrend

The company extends its global reach through its partner organization. Infortrend operates a 100% through-channel business model and the existing channel partners currently consist of:

- United States: Bell Micro, Condre and Synnex
- Europe: Starline, Bell Micro, Hammer and Zycko
- Taiwan: Silvershine, Systex and Stark
- Hong Kong: Systex
- Korea: Device
- Australia: XSI, DigiStor, and Digicor
- Japan: Oki, Hightech, Soltec, and ComputerDynamics
- China: UDSAFE, Silvershine, Data Fault Tolerance System

The company is certified by the two mainstream virtualization players in the markets, VMWare and Microsoft.

For Infortrend, 2008 was a year of several milestones:

- Released "Dynamic LD Assignment " technology to maintain high performance during data path failure
- Awarded "Best-Choice of Computex 2008" for SFF RAID subsystem
- First to announce SAS-host, 24-bay RAID subsystem
- Released SAS-host, desktop RAID subsystem
- Announced iSCSI-host RAID subsystem providing 8 GbE

Infortrend intends to expand its portfolio into new areas in 2009, with plans to release the following products:

- Infortrend ESVA – ESVA will provide advanced hardware designs and is available with a comprehensive suite of hardware-based data services including replication, mirroring and virtualization. ESVA has been designed to satisfy the most demanding applications to ensure business continuity in a single package.
- Infortrend EonStor G6 – EonStor G6 will incorporate enhanced hardware design, simplified management tools, the latest protocol support, broad OS compatibility and improved energy efficiency.
- Infortrend NAS – Supporting iSCSI and Ethernet Infortrend NAS will feature data replication, two-way cluster, storage virtualization, as well as massive capacity and expansion capability.

Challenges and Opportunities

With high-profile customers such as CERN, the European organization for Nuclear Research, which utilized Infortrend's solution for their well-publicized Large Hadron Collider project, it is clear that the company can meet the demands of some of the most technically challenging projects globally.

Challenges

The Market

Infortrend's products are highly technical and require a strong channel to educate the market of its offerings. In the niche markets, Infortrend may have the head count required to address the local markets (and indeed does already sell direct, although all fulfilment is through the channel). However, the company may need to consider finding suitable channel partners that can also help them enter other markets where RAID can provide appreciable business benefits. A targeted channel expansion program in conjunction with the existing channel partners (in order to provide the necessary differentiation so as to avoid channel-conflict) in the key growth markets could further help Infortrend both gain a much broader reputation as well as the build the revenue stream.

Technology

Infortrend, however, does need to ensure they have either a strong message for the broader market concerning this issue, or indeed are able to develop a technological solution that addresses this issue if the company intends to maintain their focus on RAID systems. IDC recommends that Infortrend expands its product portfolio, over the long term, to reduce its exposure in this space and to be able to address broader markets.

Opportunities

Infortrend has proven itself as a technology innovator and has, on many occasions, been the first to bring a new aspect of RAID technology to the market. Monetizing this technical leadership is something that the company should be looking closely at. Today's storage market landscape is dominated by a few mega vendors that are able to leverage the global reach of their channels, their huge marketing funds, and yet rarely introduce new technology in the same way Infortrend has. This is not unusual in the IT markets worldwide; however, Infortrend has already established offices in all the major global markets and so it really only needs to be more widely acknowledged for their technical expertise.

Partnering with a mega vendor is also something that Infortrend may wish to consider. Since the company has a range of technologies that allow for ease of integration of a wide range of storage interconnect technologies, there is undoubtedly room for Infortrend to provide one of the mega vendors with an opportunity to present an aggressively competitive offering to the market. They may target a competing vendor technology and, at first, connecting to but ultimately, migrating from, the competing technology. Clearly there is an element of coopetition with such a partnership approach, but many of the larger vendors are already embracing such partnerships if they can identify an appreciable market segment that they believe they can profitably pursue. Infortrend should find itself in a preferred category among potential customers since it develops both its own hardware and software, and is able to focus on and address the niche markets that demand the type of technology that it can offer. Their focus in this area and constant attention to product development should result in a technologically superior offering that clearly addresses their customer needs.

Conclusion

In the new market that has emerged since the post-September 2008 economic meltdown, there is still a strong demand from customers of all sizes for simple and efficient storage solutions that can also provide the basic accepted features of availability and security. Data growth is not slowing down significantly and IT budgets are, for the most part, not increasing in any substantial way, leaving IT departments the challenge of managing their corporate physical and digital assets (and in some cases, liabilities) with shrinking budgets and greater demands.

IDC believes that, in spite of the inherent challenges and the potential for new technologies to appear in the market, RAID as a technology will not be displaced for many years to come as the

preferred tool for ensuring data reliability and availability. As such, Infortrend is an emerging challenger for enterprise storage solutions and is well placed to maximize opportunities in this market, assuming they address some of the challenges discussed in this paper with regards to channel expansion and monetizing their intellectual property. Infortrend has demonstrated over the years an ability to bring new technology offerings to the markets and this is something that Infortrend is clearly embarking upon based on its statements to release three new storage products later this year. With this in mind, Infortrend is well-placed to capitalize upon both its technical expertise and the new market dynamics.
