



Why IP storage

It's clear—IP storage is here to stay. With all the advancements in storage technology in the past few years, it's no wonder that the adoption of IP-based storage is happening very quickly. The result—organizations of all sizes are now able to consolidate storage in a cost-effective and efficient manner while still maintaining the availability of Fibre Channel.

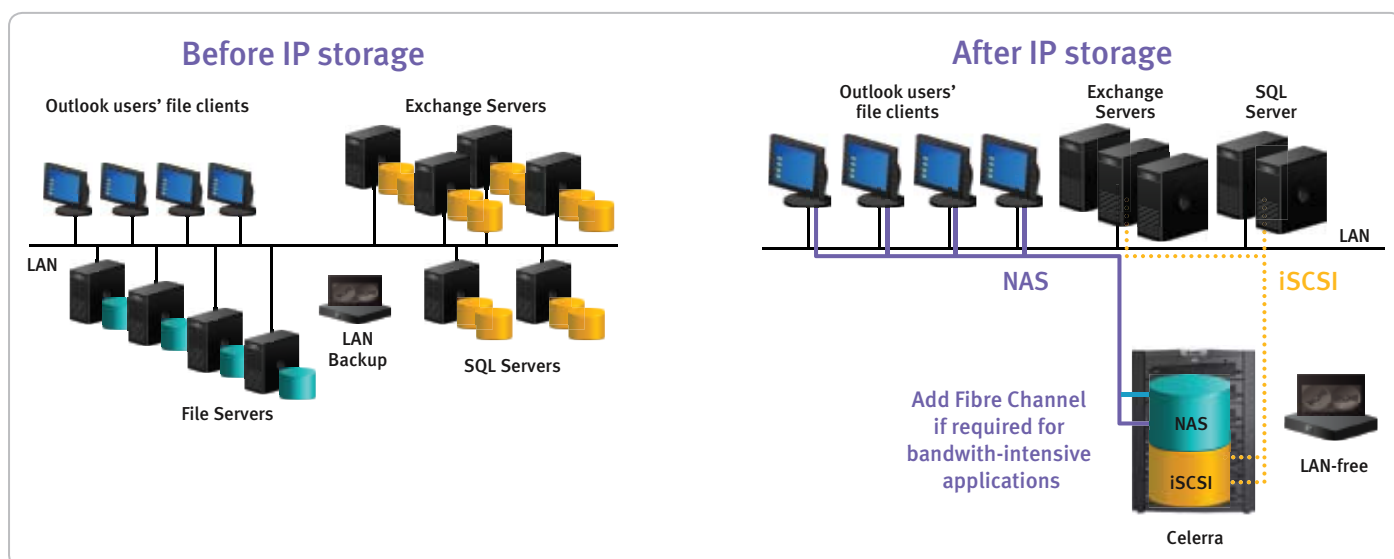
The evolution of networked storage

The evolution of networked storage has come a long way—from direct-attached storage (DAS), which enables storage to be directly attached to a server; to networked storage, which provides the ability for all application servers to be connected to all available storage. There are many benefits of consolidating with networked storage, such as ease of management, high availability, capacity utilization, as well as the foundation for improved backup and restore.

In addition, there are various connectivity options available for storage consolidation. A Fibre Channel network in a SAN is traditionally used to achieve the highest levels of performance. However, specialized switches and skill sets are needed to manage the environment. NAS is another option. Unlike Fibre Channel, NAS utilizes IP over an Ethernet network and the information can be shared. Another difference is that NAS is based on files, compared to SAN which is based on transmitting blocks of data directly to storage. Since not all applications support NAS, both connectivity options are often needed.

So where does IP storage fit? IP storage is networked storage accessed over a TCP/IP network that utilizes the iSCSI and/or NAS protocols. IP storage enables you to build a SAN using your IP networks. It transmits both in blocks like Fibre Channel (SAN) utilizing iSCSI protocols and by files utilizing NAS protocols (NAS), yet it enables customers to use the IP network—offering much of the traditional value of Fibre Channel SAN consolidation along with the benefits of NAS consolidation. IP storage is also a good choice because it leverages existing technology and staffing skill sets.

IP storage has taken off. Organizations around the world deploy IP storage because of the many benefits it provides. Enterprise Strategy Group, a leading industry analyst firm focused on storage and information management, has this to say, “ESG has watched iSCSI evolve from a standard, to a technology, to an architecture that spawns specific products—now a large number of vendors provide iSCSI solutions. More importantly, we are seeing end-user customer adoption of iSCSI growing rapidly.¹



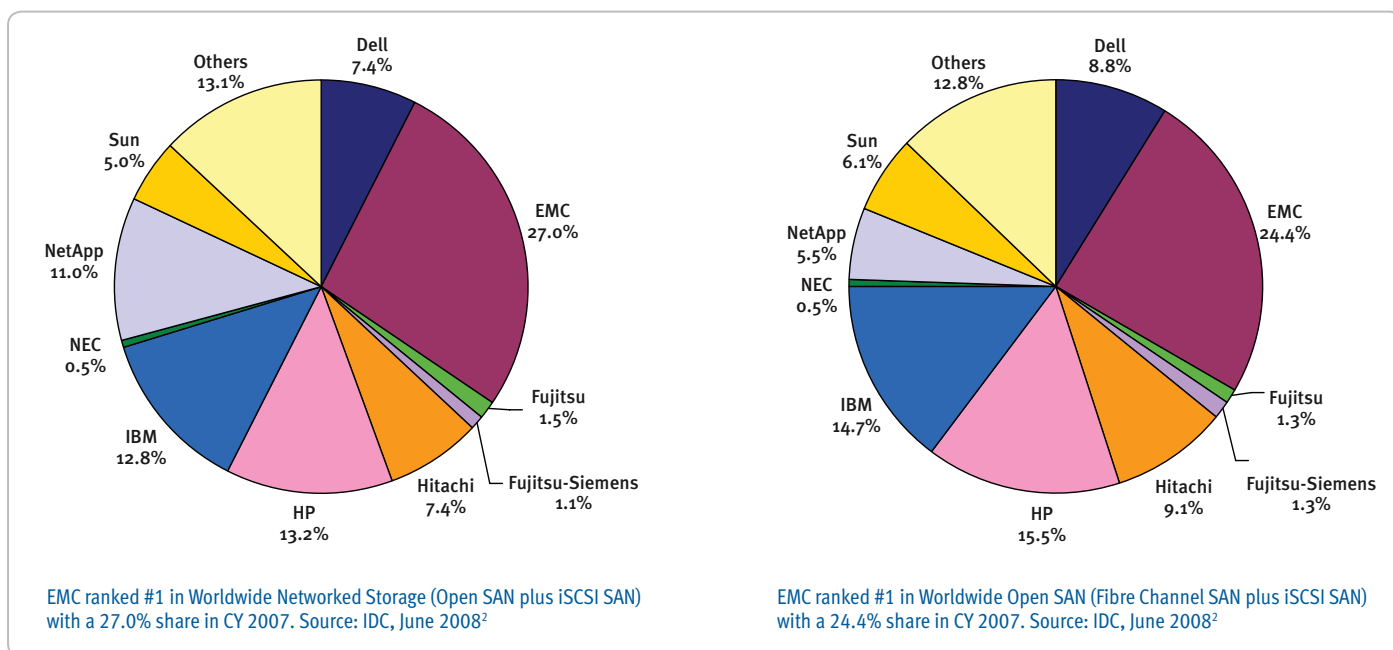
Unified storage takes IP storage to the next level. By offering all three data formats—iSCSI, NAS, and Fibre Channel from one, single, integrated storage system—unified storage allows customers to meet the best practices for each application they have in their environment. For example, use Fibre Channel for storage consolidation, iSCSI for stranded servers, and NAS for file access. Advantages of this approach include reduced hardware requirements and improved ease of management with the same reliability as dedicated file or block storage systems.

¹ESG Report “Building an Information Infrastructure” Focus on iSCSI by Mark Peters October, 2007.

Why EMC for IP storage and simple unified storage

There are many IP storage capabilities that are becoming increasingly critical requirements for all customers. And there are many vendors offering various IP-based storage solutions. So why choose EMC for IP storage? EMC understands the challenges customers are facing, provides advanced functionality in all IP storage platforms, and enables the universal access of information—all to help boost productivity and reduce business costs.

EMC's storage expertise, innovative products, and service capabilities have allowed it to become the market leader in IP storage. According to the IDC research, EMC, along with its wide network of Velocity² Partners, is the revenue leader in IP-based storage solutions. For advanced tiering and consolidation, EMC is the choice for a full portfolio of end-to-end IP storage capabilities. And with storage solutions that span the entire information infrastructure—hardware, software, services, security, and compliance—EMC is prepared to help customers manage their most important asset: information. From unified storage, ease of use, price/performance leadership, to application support, EMC stands out as the leader that provides advanced IP storage capabilities.



Unified Storage. Flexibility and choice are extremely important. For the past three years, EMC has offered the CLARiiON[®] UltraScale[™] series, which features iSCSI and Fibre Channel connectivity built into one system, enabling you to match your storage connectivity with application best practices. For example, customers with CLARiiON can choose IP storage for high I/O applications or Fibre Channel for high-bandwidth applications.

EMC supports iSCSI, NAS, and Fibre Channel in one integrated system with EMC Celerra[®]—it's the ultimate in unified storage. The advantages are clear. Save money with low attachment costs and the ability to leverage existing storage and networking skill sets. Save time with easy-to-use centralized security, management, and backup. Save on infrastructure—unified storage is compatible with all types of clients, applications, and networks.

²Figures from IDC's June, 2008 Worldwide Disk Storage Systems Quarterly Tracker report.

Tom Welch, IT Manager at Process Displays agrees:

“For our file sharing environment, we need a reliable, high performing IP storage platform that provides us with advanced functionality, without burdening our IT staff with cumbersome installation processes or management complexity. The Celerra NS20 was easy to install, and I was equally impressed by the intuitive management tools and robust functionality included with the system at no extra cost. NAS, iSCSI, and Fibre Channel connectivity in a single package gives us the ultimate in flexibility and investment protection. We may find ourselves adding Fibre Channel down the road, so having the ability to put it all on the same box is extremely beneficial.”

Tom Welch
IT Manager, Process Displays

EMC knows that customers come in all different sizes. No matter how big or small, EMC delivers IP storage that is second to none. Offerings span from the small customer consolidating for the very first time with an entry-level, easy-to-use EMC CLARiiON AX4 iSCSI system that starts at \$8,299; the midsize customer updating their storage strategy by deploying a simple unified storage solution with the EMC Celerra NS20; and the large enterprise looking to consolidate outside the data center with the EMC Celerra NS Gateway—allowing IP to be added into existing SAN deployments, such as EMC CLARiiON and Symmetrix® systems.

Reliability and Availability. Leveraging Intel® Xeon® processors, EMC's IP storage UltraPoint™ technology and UltraScale hardware design, combined with unique software features and configuration best practices, delivers the highest reliability and availability—measuring up to five-nines (99.999 percent) availability in real-world customer environments. Keep your information online—no-compromise availability means you continue running at the same performance and service levels even in the event of a failure. EMC's rock-solid IP storage systems provide full redundancy for enterprise requirements at a mid-tier price. EMC leads the industry and delivers the reliability needed to support advanced software and application needs.

Ease of Use. Customers not only demand industry-leading systems and availability, but also ease-of-use, simplified management, and scalability. That's why EMC has made significant advancements to the CLARiiON and Celerra lines of IP storage systems, from the CLARiiON AX4 that scales from a simple wizard-driven GUI to the Celerra NS20 and NS40 with power-up to production in 15 minutes. All EMC IP storage systems provide ease-of-use features that allow you to consolidate storage quickly and effectively. Leverage your existing IP network and IP skill sets. Benefit from a fast installation and setup. Provision new storage in minutes.

Kevin Phoneix, Principal responsible for Operations and Administration from SwervePoint, LLC agrees:

“We're a small but growing company and need a more sophisticated storage solution for our server environment. We don't have an IT staff and have run into limitations with our server-based storage. It was very easy to take the EMC CLARiiON AX4 and plug it into our existing IP network and to configure it using the Navisphere Express interface. We were off and running with an iSCSI SAN within minutes. As a growing company, we also considered what our future needs are going to be and liked the CLARiiON AX4 system's flexibility and software features, which are a little more sophisticated than you'd expect in an entry-level networked storage system.”

Kevin Phoneix
Principal responsible for Operations and Administration, SwervePoint, LLC



Price/Performance Leadership. When compared to alternative solutions, EMC IP storage solutions yield price advantages of up to 50 percent, performance advantages of up to 106 percent, and overall price/performance advantages of up to 413 percent. This performance information is from the Standard Performance Evaluation Corporation (SPEC), a non-profit corporation formed to establish, maintain, and endorse a standardized set of relevant benchmarks that can be applied to the newest generation of high-performance computers (www.spec.org).

VMware virtualization support for IP storage environments

Server virtualization continues to be a top priority for customers worldwide. With VMware®, realize the significant tangible benefits of server consolidation, including increased resource utilization, energy savings, and reduction of operational costs. A storage area network (SAN) featuring IP storage provides powerful VMware benefits by enabling and supporting new functionality, such as VMotion™, DRS, and HA.

All EMC unified storage systems maintain no compromise availability. This means customer VMware applications continue to run at the same performance and service levels even in the event of a failure—with 99.999 percent uptime. Customers of all sizes have successfully deployed an EMC IP storage solution with VMware.

Here's what Jim Overly, Director of IT at Fluid Power Resource, LLC had to say:

“We chose the CLARiiON CX3-10 for its ability to leverage both iSCSI and Fibre Channel connectivity methods simultaneously. This provides us with the flexibility to support all of our data access requirements in a single solution. Our VMware environment is very dynamic and the CLARiiON CX3-10 gives us the flexibility and availability that is required. The combination of VMware and EMC CLARiiON has provided our business with a comprehensive solution and ideal growth path to support future growth and new requirements.”

Jim Overly
Director of IT, Fluid Power Resource, LLC

There are many added benefits that EMC IP storage systems provide in VMware environments:

Ease of Management. Quickly provision, deploy, migrate, or expand volumes associated with your ESX virtual servers. EMC IP storage streamlines and expedites management with metaLUN and virtualLUN technologies. These features allow for realtime, online expansion of LUNs and transparent volume movement, respectively, with no interruption to host I/O.

Non-disruptive Migration. Being able to quickly and non-disruptively deploy new virtual machines on the fly means that additional storage capacity is immediately available to the ESX server without disruption to the application. Also, EMC IP storage makes online non-disruptive moves of your virtual machines between drive types and RAID groups possible. This flexibility lets you move virtual machines within the array based on your performance requirements as they change over time.

Quality of Service. Dynamically allocate IT resources to the highest priority applications with VMware's Distributed Resource Scheduler (DRS) and EMC's Navisphere® Quality of Service Manager. Together, they enable you to create rules and policies to prioritize how resources are allocated to virtual machines and to storage.

Protection. Disaster recovery is rapid, reliable, affordable, and manageable when leveraging the integration of VMware Site Recovery Manager for end-to-end disaster recovery management of virtualized environments and EMC's suite of industry-leading remote replication products to automate disaster recovery across the entire data center.

All EMC and VMware solutions are backed with industry-leading best practices, references architectures, and the strongest investment protection. The bottom line: EMC has a breadth of simple and easy-to-use IP storage solutions for VMware.

Leverage the power of IP storage in mission-critical Microsoft Exchange, SQL Server, and Oracle environments

Given the mission-critical nature of business applications, it is important to ensure your information infrastructure can help you obtain the requisite scalability, flexibility, performance, availability, simplified management, and reduced risk across your core business application environments.

EMC's approach to solutions design and development starts from the customer's perspective—understanding your key pain points as well as the realities of your environment. In defining solutions, EMC starts with a design goal in mind—solving these real-world problems. EMC conducts rigorous tests to prove the validity of its solutions in a customer's environment and shares documented reference architectures and best-practice methodologies to apply the most appropriate technologies—EMC, VMware, and other industry-leading technologies—to solving that customer's pain point. EMC invests in the testing and discovery to know, test, and validate that a given solution solves a customer's specific problem—in a predictable, accelerated manner.

EMC's IP storage solutions enable you to deploy a consolidated, cost-effective infrastructure to address application and DB sprawl—and achieve the results you require. EMC solutions leverage industry-leading technologies from EMC and as well as native application capabilities to help you successfully address the challenges associated with increasing management complexity, inefficient use of resources, and unnecessary cost. EMC solutions deliver cost-effective storage consolidation, flexible tiered storage options, data protection, and disaster recovery for distributed application environments—particularly business-critical applications at the departmental level, as well as mission-critical applications in smaller enterprises.

Microsoft. EMC has developed deep expertise and integrated solutions for multiple Microsoft applications, including Exchange, SQL Server, and SharePoint. EMC's integrated solutions and expertise for Microsoft applications enable increased utilization of infrastructure resources, cost-effective infrastructure design and implementation, optimized performance and scalability, simplified management, increased reliability and availability of mission-critical Microsoft applications, and integrated data protection and recovery.

Oracle. EMC offers a range of cost-effective, IP-based solutions for Oracle environments that address key requirements for infrastructure consolidation, performance and scalability, backup and recovery, simplified management, and information protection. Key to every successful IP solution deployment is your access to our expertise and knowledge on both infrastructure and Oracle. EMC's experience and documented best practices and proven methodologies in Oracle environments help customers get the results they need: predictably, reliably, and with faster implementation.

EMC's solution approach helps customers identify and overcome their business challenges while reducing risk and time-to-value of their information infrastructure implementations. Our objective with our EMC solutions is to help customers accelerate deployment, increase operational efficiency, raise availability, and simplify management across the lifecycle of core business applications

IP storage is here to stay. EMC is qualified to deliver all the support and advanced functionality that you need for your environment in an easy-to-use package. Find the best EMC solution for you today.



EMC Corporation
Hopkinton
Massachusetts
01748-9103
1-508-435-1000
In North America 1-866-464-7381
www.EMC.com

Take the next step

It's simple. Contact your EMC representative or EMC Velocity² Partner to learn more about EMC's industry-leading IP storage solutions and how EMC can solve your information consolidation challenges.