



CENTER7/INC.

BUSINESS IN MOTION | WHITE PAPER
(Storage Services) 7/28/00

CONFIDENTIAL MATERIAL | 2000 © COPYRIGHT CENTER7/INC. ALL RIGHTS RESERVED

Overview

When you turn on a water faucet whether its at your home, in a hotel or even a water fountain at the ballpark, rarely do you stop to consider the infrastructure of pipes, reservoirs, wells and treatment centers that are in place. You simply turn the tap and instantly have water available for any possible use from cleaning to irrigation to recreation. Data storage services should be the same--IT managers and application users should have continuous, uninterrupted access to data storage for any purpose without worrying about the complexities of infrastructure building or storage management.

Center 7 provides a comprehensive and complete selection of data management and storage services for dot.com companies, Internet Service Providers (ISPs) and application service providers (ASPs). Center 7's Storage Services enable any organization to access high volumes of storage, in multiple formats, from any point on the Internet. Uses for online data storage include disaster recovery, data warehousing, testing, data distribution, and data snapshots for point-in-time backups or system migration.

Storage services are extremely reliable, highly scalable and completely secure for any application. Center 7 Storage Services include the following:

- **Block Services** - Raw storage capacity from 50 Gigabytes on up
- **File Services** - Support for standard file formats including CIFS (NT) and NFS (Unix)
- **Database Storage** - Storage support for popular database formats like Oracle
- **Connection Services** - Access to data from any location using any operating system or application
- **Backup Services** - Data archive, storage and retrieval at multiple levels
- **Replication Services** - Replicated data at remote locations for continuous service and disaster recovery
- **Storage Management** - Comprehensive storage service management with sophisticated configuration, monitoring, alerts, and fail-over that enables true service license agreements (SLA)
- **Reporting** - Powerful and accurate end-customer reports for usage and storage analytics
- **Professional Services** - A seasoned and professional team of experts available for design, integration, testing and performance enhancements

Companies using Center 7's Storage Services benefit in several ways including:

- **High Scalability** - Rapidly expanding businesses can incrementally add storage capacity
- **Premium Performance** - Advanced architecture provides superior performance for data access
- **Simplified Management** - Easily add, modify or configure data storage capacity

- **Reduced Time to Market** - Integrate or add storage capacity for immediate access and use
- **Flexibility** - Share data cross platform, using multiple formats in any storage increment
- **High Security** - Enjoy the same levels of security as in-house systems
- **Lower Costs** - Only pay for amount of storage or level of services needed at costs far less than implementing an in-house IT infrastructure
- **Focused Business** - Elimination of IT management gives peace of mind and allows focus on core business

Storage Services is one of several advanced services available from Center 7 for service providers and enterprise companies which enable them to quickly deploy world-class dot.com solutions and hosted enterprise applications. Organizations seeking to quickly deploy e-commerce and Web-based solutions can easily satisfy all current and future storage needs using Center 7's comprehensive selection of hosted services.

Current Situation

Electronic data has become the lifeblood for every type of today's businesses. Whether it's inventory information, financial data, documents, transaction histories or even multimedia files, the use of electronic data is absolutely key to the management and ongoing success of any business. Companies and organizations must be able to easily access and securely store critical electronic information in order to ensure continued operation, even in the event of a natural disaster.

The volume of data now requiring management is also skyrocketing for most organizations. Data storage needs include Web sites, databases, transaction histories, research and analytical data, as well as standard business data such as inventory, financials and customer resource information. The growing dependence on and the increased volume of electronic data has elevated the importance of data storage and management to the highest critical level.

For many companies, the inability to access data or the loss of it can trigger immediate financial losses or even business failure. With information intense companies such as dot.coms or click and mortar businesses, managing the escalating volume of information becomes a complex process and a demanding drain on resources. Adding storage space, performing backups, providing fail-over and redundancy capabilities, accommodating access from remote connections, plus continued monitoring and management are all activities that require attention and resources. The dynamic nature of Internet businesses also requires that configuration and resource requirements constantly evolve.

Data management and storage can become a serious problem for companies when the effort required for storage operations detracts from the core business focus. Data availability problems

that disrupt operations or an IT infrastructure that requires a disproportionate amount of resources should not be allowed to affect the overall success of a business.

To efficiently manage data, companies have traditionally installed or increased data capacity onsite using file servers and storage devices. New storage technology and the Internet are making possible the creation of online, virtual storage repositories. By storing and accessing data through a global storage network that is established and managed by a third-party provider, businesses can cost-effectively satisfy data storage requirements and be free to focus on core competencies.

Analysts estimate that companies will increase their online storage capacities by a factor of ten over the next five years. Successful companies will simplify management and reduce costs by using storage services provided by out-sourced solution providers such as Center 7. Forrester Research predicts that the use of online storage for Global 2,500 companies will grow at a compound annual growth rate of 79% from 1999 to 2003. Gartner Group estimates agree with the total storage services market projected to grow from \$5 billion in 2000 to \$22 billion in 2003. Online storage solutions will ensure that lifeblood data is always available, accessible and secure.

The Center 7 Solution

Center 7 is providing a complete and comprehensive selection of data storage services to assist dot.coms, enterprise companies, ISPs and ASPs in acquiring and managing data storage. C7's approach to storage services goes beyond other storage providers by supplying not only storage space but multiple methods for access and use and various services for management and security. Center 7's list of storage offerings includes *block, file, database, connection, backup, replication, management and reporting services*. In addition, C7 provides *professional services* to assist in storage system design and integration. Center 7's mission is to provide a simple and effective method that allows companies to securely access and add storage from any location at any time for any application without the need to purchase or implement hardware.

Block Services - Block services can be defined as raw storage space. C7 provides raw storage space for any use or application in minimum increments of 50 gigabytes. This space is accessible for use by any file system, from any operating system, using multiple types of connections for any application. As requirements change, storage space can be adapted to accommodate new requirements. Blocks can be configured as part or all of a Storage Area Network (SAN). Information can be stored, moved or manipulated at the block level rather than at the file or application level. Block services allow for the stockpiling and management of data in multiple formats and the consolidation of all data storage on a single, scalable, virtual storage server.

Center 7's Block Services are provided using technically advanced storage hardware. At its foundation are state-of-the-art RAID storage servers. These high-performance systems provide

Fibre Channel and UltraSCSI storage solutions that are compatible with multiple platforms and operating systems.

File Services - Data is most valuable when accessed by all parties that can benefit from its use. Having data available and accessible from any location, using any client or any device significantly increases the value of the data and the processes that it supports. Center 7's file services allow data storage to appear as Network Attached Storage (NAS) directly connected to a LAN or WAN. Clients and applications using Network File System (NFS) or Common Internet File System (CIFS) file sharing protocols can easily access data hosted by Center 7. NFS is the widely accepted file sharing protocol commonly used with UNIX applications and operating systems; CIFS is an Internet version of Microsoft's SMB file sharing protocol for the Internet.

With C7 File Services, data can be shared across different platforms and data can be centrally located in a common storage pool. Storage management becomes much simpler and reallocation can take place quickly.

Database Services - A significant portion of the world's most valuable data is organized in database form. These data organization and reporting repositories provide much of the structure that allows information users to analyze data and extract information value. As part of a complete solution, Center 7 provides data storage organizable in the most popular database formats. Information and media data stored using data structures such as Oracle *8i* allow e-commerce and Web site information to be easily sorted, queried and formatted for widespread access.

Connection Services - Seamless access to online data requires a connection infrastructure compatible with all common access methods. As part of a complete hosted data storage solution, Center 7 provides all of the hardware, software, switches, hubs, routers, firewalls, public and private network connections, etc. to enable this access. Connection Services ensure that data is available through any storage configuration whether it be SAN and/or NAS. Business managers are relieved from deployment, integration and ongoing upgrade and enhancement activities and free to focus on information flow and business benefits.

Backup Services - Backup of information for archival and disaster recovery purposes is mandatory for any type of valuable data. Center 7 provides multiple levels of data backup and guarantees data availability and recovery. C7 backup capabilities not generally available (or used) in traditional corporate data centers include: continuous backup; tiered backup based on time interval or deltas; backup based on blocks, file systems or applications; archive to near-line or off-line storage, etc.

Replication Services - As part of Center 7's 99.999% data availability guarantee (five 9s), services are available for replicating data to distributed locations on a continuous or periodic basis. Customers can determine how many locations to replicate to, what replication intervals to use, and what priority or order replicated data should be accessed in the event of a primary

source failure. Data resiliency--the ability to quickly access data after a failure--is dramatically increased through use of replication.

Replicated data is also valuable for global applications where identical information is distributed to remote geographical locations. Remote clients benefit with reduced response time and timely information to distributed sites.

Storage Management - Storage capacity must be managed and administrators want the ability to manage easily. Center 7 provides a comprehensive management interface that allows users to easily configure, reallocate, and organize storage resources as well as set and modify backup and replication parameters. C7's management framework facilitates installation, configuration, event monitoring, fault isolation, performance tuning and management of storage across the enterprise. With C7's powerful management capability, administrators can also configure alerts and fail-over conditions and automate many of the traditional manual processes.

Reporting - Center 7 Storage Services also include comprehensive reporting capabilities that provide statistics and analytics on storage usage, uptime, pending problems, performance etc. Reports are accessible through multiple interfaces and can be customized for specific audiences or end users. Reports can be integrated with alerts and issued based on user definable rules.

Professional Services - The integration of storage services with any IT application can be complex. For this reason, Center 7 has a seasoned and experience staff of professionals available to assist with data storage design, integration, testing, deployment and ongoing administration and maintenance. Center 7's Discovery Service enables companies to assess in specific detail their current and future storage requirements; Professional Services execute and administer defined storage service plans.

How Center 7's Storage Services Work

Center 7 is providing Storage Services through an innovative implementation of state-of-the-art data storage and management components. By establishing physical storage points of presence (S-POPs) at major co-location facilities around the world and connecting them together with dedicated fiber optic networks, Center 7 provides high speed storage services for ISPs, ASPs, dot.com and established enterprise companies. S-POPs are co-located at facilities operated by hosting companies such as Broadwing, UUNet, Level3 and Inflow and can also be implemented onsite at enterprise companies.

Center 7's complete line of services are made available by combining best-of-breed hardware, software and applications in modular configurations that are scaleable and robust. The C7 offerings include solutions from major partners such as MTI, Computer Associates, Oracle, Foundry, Compaq and others.

At the heart of Center 7's services is HotFramework™ technology that allows businesses to easily scale up to meet any traffic or transaction need. New services, including storage, can be seamlessly or automatically added as traffic volumes or stress loads increase. C7 has also implemented a sophisticated management and monitoring system using Computer Associates' neural agent (Neugent) technology. Neugents intelligently monitor any hardware or software system including storage processes and devices to ensure that information and systems are always online and available at optimum levels of performance.

Summary

The savings and advantages of using online storage from a service provider such as Center 7 can be significant. Companies benefit through simplified storage management, unhindered scalability, and reduced cost of ownership. ISPs, ASPs and hosting facilities can also increase revenues by reselling C7 Storage Services to their customers. Organizations that elect to use C7 Storage Services receive the following benefits:

High Scalability - C7's storage architecture and infrastructure allow for instant and practically infinite scalability. New blocks or file services can be added as the need for extra capacity increases. Management options can automate addition or distribution processes to accommodate high growth conditions. Center 7's distributed S-POP characteristics with multiple locations worldwide not only enable volume growth but geographical expansion as well.

Premium Performance - C7 uses state-of-the-art storage hardware with the best Fibre Channel, UltraSCSI and Internet connections to produce premium levels of access performance. Corporations enjoy the same or better performance levels as having storage equipment located onsite.

Simplified Management - Instead of trying to manage multiple storage solutions using various administration packages in multiple locations, administrators can manage all storage through a single interface. Storage processes such as backup, fail-over, redundancy and adding incremental storage can be automated using customer-defined rules. Storage services from multiple locations and various systems can be managed as a unified logical device.

Reduced Time to Market - The elegance of online storage is that it can be configured and deployed almost immediately. There is no need to construct an adequate environmental facility, purchase and install hardware, configure software or perform testing. Storage space is allocated, often preformatted, and ready for access or data exchange in a matter of minutes. Dot.com companies with dynamic storage needs can satisfy these requirements quickly without adverse affects to the core business.

Flexibility - Rarely does any enterprise, online or otherwise, enjoy the luxury of uniform systems. Mixed IT environments are the norm with different operating systems, file systems and various database applications. C7's virtual management capability enables administrators to view and manage mixed environments in a powerful yet flexible way. Multiple mixed systems can be accommodated and storage space can be added in any increment.

High Security - Center 7's security implementation is built using the best in authentication, encryption, firewall and routing technology. Companies can rest assured that C7's online storage solution is just as secure as any onsite solution would be. In addition, C7's central network operations center and distributed S-POPs are secure 24x7 and are equipped to withstand flood, fire and seismic disasters.

Lower Costs - A direct and immediate benefit is that C7 storage customers only pay for the storage and services that they actually use. There is no need for large upfront hardware or software expenditures and no unnecessary costs for idle excess capacity. The 'pay-per-use' model allows companies to start with a minimum investment and then only pay as capacity is added. The simplified management of a virtual, online storage solution also significantly reduces the cost of administration.

Focused Business - The final and often most significant benefit is that without the hassles of hardware, software and storage management, company resources are free to focus on business rather than IT problems. With Center 7 Storage Services management resources are freed from infrastructure and data plumbing issues and enabled to concentrate on business processes and information flows. The end result is that more strategic and effective resources can be applied to areas that really count.

In summary, Center 7 provides all of the services required for effective storage management. Unlike other providers that offer simple connection services (ping, power, and pipe) or basic storage providers that offer storage only, C7 offers a complete online storage management solution. Backup services, replication, reporting, management and professional expertise are combined to satisfy the most demanding storage service needs of any dot.com or enterprise company. With Center 7's Storage Services there's no need to worry about infrastructure, connections or security. Access to storage can be as simple as tuning on a water faucet--continuous access to online storage from anywhere.

To learn more, please visit www.center7.com

