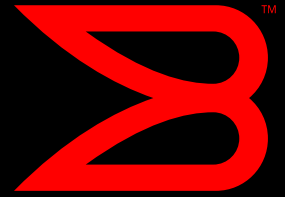


EMC INVISTA ON BROCADE



STORAGE AREA NETWORK

Network-Based Storage Virtualization with EMC Invista and the Brocade Application Platform

Enterprise computing environments are larger and more complex than ever. As organizations grow, the demand on IT to meet business information requirements grows accordingly. Businesses also require continuous information availability and are unwilling to endure infrastructure downtime that can impact critical business needs.

In addition to unplanned events such as natural and man-made disasters, planned downtime is an IT reality today, accounting for 60 to 75 percent of all downtime. The cost to the enterprise of downtime can be debilitating.

EMC® Invista™ uses an unique split path architecture to enable storage virtualization. This dramatically reduces the amount of downtime associated with the movement of data across storage tiers in support of Information Lifecycle Management (ILM) strategies. Invista leverages the specialized processing power in Brocade's Application Platform for deployment of network-based storage virtualization at wire-speed. Delivering intelligence in SAN fabrics, the Brocade Application Platform is a high-performance, highly available network device that can be seamlessly connected to existing SAN infrastructures.

Deploying Invista involves both hardware and software. EMC Invista software runs on a Control Path Cluster (CPC)—a dual-node cluster, which configures and interacts with the Brocade Application Platform.

Invista on Brocade allows hosts and storage to connect anywhere in the fabric. Hosts can connect directly to the Brocade Application Platform or connect through a standard Layer 2 (non-intelligent) front-end fabric for fan-in. Storage arrays can be connected to the intelligent platform directly and/or via a back-end fabric. This implementation is designed to require minimal changes to most standard SAN configurations, making EMC Invista on Brocade easy to deploy.

A network-hosted virtualization solution, such as EMC Invista, can be greatly enhanced through close integration with an underlying layer of network intelligence and capability.

One key benefit of providing a SAN-based application using the Brocade Application Platform, is that I/Os are managed by purpose-built components at line-speed, rather than general-purpose processors. The Brocade Application Platform supports many other intelligent features that contribute to the overall value and effectiveness of the solution. These include:

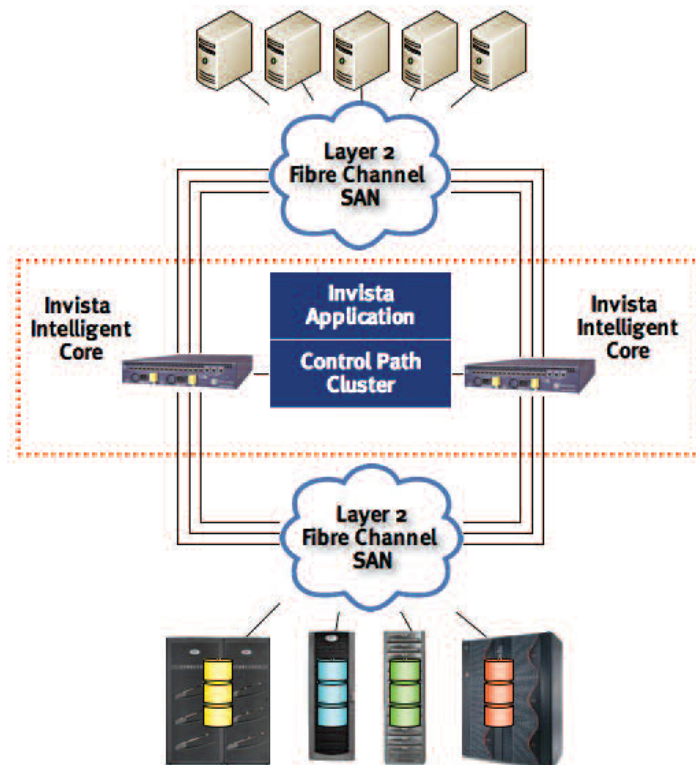
- Brocade Storage Application Services (SAS) API—an implementation of the T11 FAIS standard—for reliable, scalable, and highly available storage applications
- Fully pipelined, multi-CPU RISC and memory system, providing in-line processing capabilities for optimum performance and flexibility architectures

- Partitioned port processing that utilizes distributed control and data path processors for wire-speed data transfer
- A compact and cost-effective deployment footprint
- Investment protection through interoperability with existing SAN fabrics and non-disruptive deployment

Networked storage virtualization solutions can aggregate capacity from many different types of storage arrays. Users choose which volumes from any arrays they wish to virtualize and then dedicate that capacity to a storage pool. Invista-based volume management reduces the need to deal with individual hosts or to load host-based software. Today, administrators can spend 20 to 30 percent of their time on volume management-related tasks. By centralizing volume management in the network, IT organizations can significantly reduce the amount of time spent on these types of tasks, freeing up resources to focus on other areas that are more critical to the business.

Network-based volume management offers storage management simplicity and efficiency. Network-based volume management facilitates on-demand storage provisioning. EMC Invista on Brocade enables storage administrators to create and configure Invista storage volumes from a heterogeneous storage pool and present them to hosts.

Figure 1. The illustration presents a logical view of EMC Invista deployed on Brocade intelligent switches in a SAN. This is accomplished by creating a new “intelligent core” within the network where the Brocade Application platform resides connected to the Invista Control Path Cluster (CPC) and the metadata storage.



Dynamic volume mobility

Once the foundation of a storage volume with a virtual address is in place, additional high value services are layered on top to take advantage of the flexibility that is offered. One such service is dynamic volume mobility. Dynamic volume mobility allows storage administrators to move volumes from one location to another without application disruption.

To move a storage volume, Invista on Brocade performs a re-direction of I/O (copy is made in the background) from one physical location to another. While the I/O is physically redirected to a new location, the address of the virtual volume presented to the host never changes. This is accomplished through virtual LUN addressing. This allows the process to be transparent and non-disruptive to the host. Additionally, since Invista on Brocade performs the I/O copy, no host processing cycles are required.

Dynamic volume mobility enables non-disruptive operations

There are a number of valuable real-world uses for dynamic volume mobility to include:

- Lease rollovers or technology refreshes
- Data movement across multi-tiered heterogeneous environments to support the implementation of information lifecycle management strategies
- Data movement to respond to rapidly changing I/O performance needs

Network-based local replication increases flexibility across tiered storage infrastructures

Network-based local replication provides additional flexibility and choice. With EMC Invista on Brocade, businesses can create heterogeneous local point-in-time copies of their production data. For instance, a business could copy data from their tier-one to their tier-two storage to create an additional copy for backup, data warehousing, or other secondary uses. Since the data is replicated via the network, data can be copied to and from any supported array platform (for example, Hitachi to EMC CLARiiON®).

As your business requirements grow, EMC Invista on Brocade will grow with you. The solution's scalability, reliability, and performance are unparalleled. And EMC's globally acclaimed service and support ensure you will get the maximum value from your information at the lowest total cost, at every point in its lifecycle.

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