

## NETWORK STORAGE SERVER

### FREEDOM OF BUSINESS CONTINUITY & FLEXIBLE STORAGE VIRTUALIZATION

The FalconStor® Network Storage Server (NSS) product enables storage virtualization and optimized efficiency across heterogeneous storage and networks, providing centralized management, consolidation, and continuous, active-active availability of primary data for business continuity.

### CHALLENGES OF STORAGE MANAGEMENT

#### Exploding data growth

- Increasing data volume
- Mixed physical & virtual server environments

#### Storage inefficiencies & costs

- SAN or network vendor constraints
- Poor disk capacity utilization
- Hardware constraints
- Software & storage function license fees
- Poor correlation between capacity performance & application needs
- Replication bandwidth

#### Service Level Agreements (SLAs)

- Need for continuous, always-on access to data
- Requirements to meet RTO, RPO
- Must restore business-critical applications & services

### TODAY'S BUSINESS CONTINUITY ISSUES & CONCERNS

Customers today are struggling to provide storage capacity for growing data volumes and increasing numbers of servers. This challenge is further complicated by the proliferation of storage resources from multiple vendors, including servers, networking, disk types (SSD, SATA, SAS, FC), SANs with varying functionality and licensing, and management tools. In addition, cost control is an uphill battle, with wasted capacity utilization and limited, if any, integration of SANs across locations.

### FREEDOM OF STORAGE VIRTUALIZATION

FalconStor NSS was designed as a massively scalable, highly available storage virtualization solution. Supporting existing third-party disk arrays, FalconStor NSS eliminates data boundaries and vendor lock-in, providing fast and easy data provisioning, mirroring, migration, snapshots, and replication. With integrated support for Fibre Channel (FC), iSCSI, and FCoE protocols, FalconStor NSS provides the benefits of storage virtualization across heterogeneous networks, with deployment options fitting any environment or budget.

#### FREEDOM TO MEET DATA GROWTH NEEDS

As data volumes grow along with application-generated data, corresponding storage volumes must grow as well. Additionally, as the proliferation of virtual servers increases, the need to centrally store multiple virtual machine data follows. FalconStor NSS gives customers freedom to meet current and future data volume provisioning needs. Moreover, because virtual machine density is a critical factor in financial and economic justification for hypervisor deployments, 64TB LUN support makes these deployments possible and practical.

#### FREEDOM TO MOVE DATA WITHOUT DOWNTIME

One of the biggest recurring storage challenges is moving data to new disk arrays as old models become obsolete or reach the end of their lease cycle. Often, costly professional services are required to migrate between devices, particularly if they are devices from different vendors. FalconStor NSS simplifies this process with a simple point-and-click procedure through the use of synchronous data mirroring between disk arrays. There is no application downtime during this process.

#### FREEDOM OF PHYSICAL & VIRTUAL SERVER PROTECTION

Virtualization technology from providers such as VMware, Microsoft, and Citrix is gaining popularity among businesses for its ability to consolidate servers, maximize space utilization, and streamline management. However, virtual servers require the same level of protection and storage provisioning as physical servers. FalconStor NSS provides the same comprehensive capabilities to physical and virtual servers alike.

## FALCONSTOR NSS PROVIDES...

### INCREASED DISK CAPACITY UTILIZATION; REDUCED COSTS

Often, requests are made to provision volumes larger than necessary to avoid re-provisioning of storage when space runs short. Through thin provisioning technology, FalconStor NSS optimizes capacity utilization, using less physical storage than what is represented by the virtual disks. The result is maximized disk utilization efficiency and reduced storage costs.

#### HOW IT WORKS

FalconStor NSS provides thin provisioning of virtual volumes, which allocates physical storage space on an as-needed basis. In this way, requests for large volumes can be accommodated without allocating a corresponding amount of physical disk resources.

### APPLICATION-CONSISTENT SNAPSHOTS

Critical and valuable data is most often derived from a particular business application, such as a database, ERP, CRM, or financial/accounting system. Without application awareness, protection and recovery of these data volumes can be crash-consistent, resulting in data loss or corruption. FalconStor NSS provides application-aware snapshot agents for most popular business applications. Up to 1,000 snapshots are available per protection volume, for the most flexible and comprehensive up-to-the-moment recovery points.

#### HOW IT WORKS

Snapshots can be instantly mounted in an application consistent state for recovery of individual files and database objects, or for entire volumes. FalconStor NSS offers up to 1,000 snapshots per volume, enabling true disk-to-disk (D2D) backup. Intelligent snapshot scheduling and retention policies provide tape backup functionality for weeks, months, or years. Larger environments can simplify multiple snapshot operations by leveraging a consistency group feature, which allows multiple data protection operations to be performed simultaneously.

### WAN-OPTIMIZED REPLICATION

As organizations grow either organically or via merger or acquisition activities, they often amass disparate hardware and networking resources. In addition, monthly bandwidth costs increase significantly with each higher telecommunication link (T1, T3, OC3, OC12, and others). FalconStor NSS enables efficient and robust replication between sites, leveraging storage from any vendor at any office location. FalconStor NSS provides built-in WAN-optimized replication with compression for improved bandwidth efficiency and cost reduction, and encryption (at rest or in-flight) for optimal data security.

#### HOW IT WORKS

MicroScan™, a patented FalconStor technology, minimizes the amount of data transmitted by eliminating redundancies at the application and file system layers. Rather than arbitrarily transmitting entire blocks or pages (as is typical of other replication solutions), MicroScan technology maps, identifies, and transmits only unique disk drive sectors (512 bytes), reducing network traffic by as much as 95%, in turn reducing remote bandwidth requirements. Meanwhile, adaptive replication automatically switches between continuous and periodic data transmission in the

event of temporary bandwidth link outage or throughput degradation. Periodic replication queues data for subsequent transmission, while preserving write-order fidelity.

### AUTOMATED DR FOR FAST, SIMPLE RECOVERY

When a disaster or failure strikes, a number of complex procedures are required in order to fully recover IT business operations. FalconStor NSS provides a unique tool, RecoverTrac™, which automates disaster recovery operations, allowing all associated applications and services to be brought back online remotely as quickly as possible. In addition, RecoverTrac technology facilitates non-intrusive disaster recovery testing, allowing organizations to identify potential recovery issues before actual disasters occur.

#### HOW IT WORKS

RecoverTrac technology maps the logical relationships between applications, servers, and associated data volumes at a primary site with corresponding applications, servers, and data volumes at a recovery site. A broad range of capabilities includes dependencies, such as 'order of start,' to ensure proper resumption of business operations at the remote site.

### INTEGRATION WITH TAPE; ACCELERATED TAPE BACKUP

A FalconStor® HyperTrac™ Backup Accelerator option automatically mounts snapshots from FalconStor NSS to a backup server. This allows users to back up data to physical tape or to a virtual tape library using FalconStor® Optimized Backup & Deduplication. Because backup occurs directly from storage to the tape, applications are not impacted.

#### HOW IT WORKS

The HyperTrac Backup Accelerator provides a centralized, LAN-free, serverless backup methodology that eliminates the backup software's clients and accelerates backup speeds.

### VMWARE VCENTER SITE RECOVERY MANAGER CERTIFIED

FalconStor NSS enables heterogeneous SAN deployments of VMware vCenter Site Recovery Manager. With heterogeneous replication, customers can use SANs of different vendors at primary or remote data centers. This flexibility reduces VMware vCenter Site Recovery Manager deployment constraints and helps control costs.

#### HOW IT WORKS

FalconStor NSS supports VMware vCenter Site Recovery Manager and is certified for VMware vCenter Site Recovery Manager 5, offering both failover and failback operations. Failback ensures data consistency at the primary data center prior to restoration of IT operations after the failure cause has been resolved.

### HIGH AVAILABILITY (HA)

When deployed in high availability (HA) IO optimized two or four node active-active clusters, FalconStor NSS offers flexible HA functionality SAN acceleration and flash optimized performance capable of providing over one million IOPS with very low latency. Clustering is not limited to the same data center; FalconStor NSS Metro clusters support distances of up to 100 kilometers.

#### HOW IT WORKS

Each NSS node can be configured in an IO Cluster to allow for increased performance, throughput, and reliability. Utilizing an active-active, inter-cluster link, data paths

## FALCONSTOR NSS PROVIDES...

are continuously synchronized, allowing the loss of a node without the need to fail over ownership to nodes in the remaining cluster keeping data access local. A special communication link between FalconStor NSS nodes (storage cluster intralink) continuously synchronizes I/O and metadata between the cluster of FalconStor NSS appliances. Each HA cluster tolerates node failures or temporary upgrades with minimal disruption to primary storage volumes.

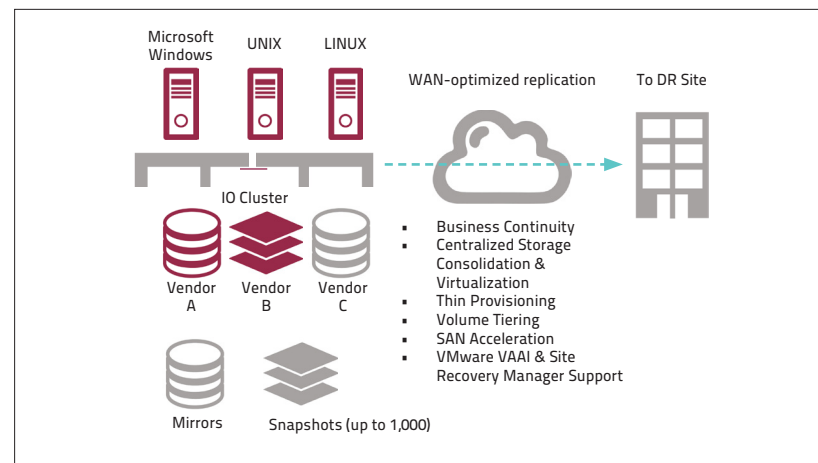
### IMPROVED READ/WRITE PERFORMANCE: HOTZONE® AND SAFECACHE™

Business application storage performance depends on READ/WRITE latency. FalconStor NSS includes READ-specific (HotZone) and WRITE-specific (SafeCache) acceleration technology.

#### HOW IT WORKS

As READ I/O differs from WRITE I/O, FalconStor NSS offers both READ-cache and WRITE-cache. Each caching algorithm is designed according to the particular behavior of READ and WRITE operations; therefore it is natively optimized to accelerate that operation's performance. These functions allow definition of high-speed storage capacity (cache memory or solid-state disk [SSD]) for these functions. The result is drastically reduced latency and accelerated I/O performance.

## STORAGE VIRTUALIZATION & BUSINESS CONTINUITY



### ELIMINATE I/O BOTTLENECKS

From an application READ perspective, READs are more critical than WRITES (latency). Additionally, multiple client hosts may attempt to READ from the same volume simultaneously; such as databases or email storage groups. FalconStor NSS eliminates this challenge with alternate-READ-mirror volumes.

#### HOW IT WORKS

Alternate-READ-mirror is a duplicate mirror volume that mitigates READ contention. This eliminates any I/O bottlenecks of a single target READ I/O volume, allowing simultaneous READ access to two identical volumes. Alternate-READ volumes can be configured within a single FalconStor NSS server or across a two-node FalconStor NSS cluster.

## FLEXIBLE DEPLOYMENT OPTIONS

Designed with an organization's unique needs in mind, FalconStor NSS is available in several form factors, each including expansion options for additional scalability:

- **Software Only:** Provides the flexibility to choose the hardware and configuration appropriate for the level of protection and recovery required.
- **FalconStor NSS Virtual Appliance for ROBO:** For virtualized remote/branch office (ROBO) environments leveraging VMware technology.
- **FalconStor NSS Gateway for Midmarket and Enterprise:** Gateways that integrate with the existing third-party storage of midmarket and enterprise organizations.
- **FalconStor NSS VS Series Appliance for Midmarket and Enterprise:** High-availability (HA) appliances for midsize organizations, enterprises, and large enterprises.