FalconStor
Software

TOTALLY Open™ Disaster Recovery

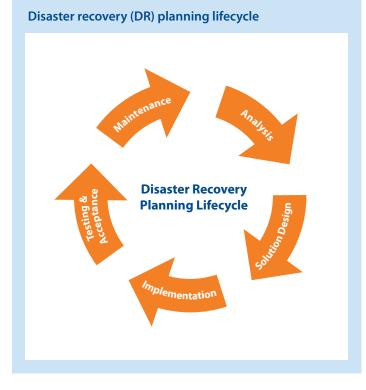The New Paradigm of Optimized, Cost-effective Disaster Recovery

Abstract: The ability to recover quickly and completely from any site failure is of paramount importance to organizations of all sizes – yet complexity and high costs prevent many from adequately protecting themselves. FalconStor solutions are flexible and TOTALLY Open™, integrating into any storage environment without any expensive "vendor lock-in," and can be tailored to meet recovery time objectives (RTOs) and recovery point objectives (RPOs) for data centers and remote sites. With bandwidth-saving technologies, any-to-any replication, efficient storage, instant recovery, and fast failover, FalconStor Software offers TOTALLY Open Data Protection that is complete – and saves you time and money.

A Cost-Effective Insurance Policy for Business Data

There is no question about the importance of disaster preparedness. Organizations understand the imperative nature of implementing a well-thought-out and cohesive disaster recovery (DR) strategy to help them recover from natural or human-induced disasters. The DR process – a subset of the business continuity plan – is most effectively implemented using a lifecycle that includes analysis, solution design, implementation, testing and acceptance, and maintenance.

The DR process should include all policies and procedures needed to restore operations that are critical to the resumption of business. That includes restoring access to business data, all critical applications, and means of communication including electronic messaging, telephones, and fax, as well as workspace access and other business processes.

As you will see in the following pages, the technologies you select for DR can significantly impact the costs and risks you undertake in the DR process.

Disaster recovery (DR) planning lifecycle

Maintenance — Analysis — Solution Design — Implementation — Testing & Acceptance

Disaster Recovery Planning Lifecycle

Adding Flexibility to a DR Strategy

The deployment complexity and ongoing costs of DR implementations have often forced organizations to discard, postpone, or limit their DR plans, resulting in the adoption of less expensive and less effective data protection tactics. Similarly, the necessary operational disruption during DR rollout hinders and delays many DR deployments – sometimes until it is too late.

Effective DR solutions should be open and flexible, easily fitting into an organization's existing IT infrastructure and minimizing risk, implementation time, and cost. DR solutions should provide high returns while ensuring minimum operational disruption and no data loss in the event of a primary site failure.

After analyzing business needs and identifying and prioritizing the various business processes necessary to continuing business oper-ations, it is essential that organizations analyze the infrastructure enabling those business processes, and the capabilities (and limitations) of underlying technologies.

Downtime costs continue to rise as businesses increasingly depend on electronic transactions and the ability to access digital data. Consequently, organizations should select a DR-enabling solution that can be non-disruptively deployed while meeting all other DR requirements.

The FalconStor portfolio of data protection solutions enables non-disruptive DR strategy deployment by offering **hardware independence** and **flexibility**. Its storage virtualization platform integrates seamlessly into existing environments, and its support for Fibre Channel (FC), iSCSI, and InfiniBand enables organizations to consolidate all storage resources regardless of hardware configurations or networking protocols. This flexibility not only significantly simplifies the DR implementation process, but also reduces deployment costs by shrinking implementation time and allowing organizations to use their current infrastructure and storage resources.

Commonly, a DR implementation requires matching hardware at the primary and remote sites – because platforms at both sites need to communicate intelligently. The hardware independence enabled by the FalconStor data services platform allows for **heterogeneous hardware deployments between primary and remote data centers.** While it is important to have high-performance storage resources at the primary site that could be relatively expensive, remote sites do not always require the same level of performance since their purpose is to provide data access only in case of a primary site outage, and for a limited time period.

FalconStor solutions can be deployed in different models, enabling the deployment of DR strategies that include remote sites and branch offices. This same flexibility enables smaller organizations to implement cost-effective DR solutions. For instance, gateway deployments can leverage the existing storage infrastructure, self-contained appliances can be utilized for new deployments, or virtual appliances can leverage remote server infrastructures.

Keeping DR Costs Under Control

Bandwidth costs

While storage infrastructure and deployment costs can be reduced by implementing flexible, hardware- and protocol-independent solutions, bandwidth requirements are another major cost factor. Data replication and communication between sites generally accounts for 30% of all recurring DR costs. Therefore, replication should be optimized to minimize bandwidth requirements and reduce the overall cost of DR.

FalconStor offers **embedded WAN-optimized replication** as part of its virtualization platform. FalconStor® MicroScan™ is a patented data deduplication technology that minimizes the amount of data transferred during replication by eliminating inefficiencies at the application and file system layer. Data changes are replicated at the smallest possible level of granularity, reducing bandwidth and associated storage costs for DR – or any time data is replicated from a source to a target.

In addition to minimizing the amount of data sent across the wire between sites, **data compression** and **bandwidth utilization management** capabilities included in FalconStor solutions further reduce bandwidth requirements, offering greater flexibility and control of bandwidth utilization. FalconStor solutions provide WAN-optimized data replication capabilities that can reduce bandwidth needs by up to 90% compared to traditional array-based replication solutions.

Equipment and power costs

The dramatic proliferation of servers and applications through many organizations is the result of the continually increasing demand for data and process automation. As an unfortunate byproduct, islands of computing and storage resources abound, many of which are barely used. Utilization rates of 20% are common, demonstrating significant waste. These under-utilized resources also consume energy: Power and cooling are another major data center cost factor.

As DR implementations by definition require more than one data center, these equipment and power costs become important in DR planning. New server and storage management technologies are helping to reduce the data center hardware footprint and maximize physical resource utilization. Server and storage virtualization technologies were developed to help consolidate physical resources and increase utilization rates across all available physical resources in the data center – which in turn reduces power and cooling requirements for additional cost savings.

In addition to providing **storage virtualization**, FalconStor solutions feature **Thin Provisioning**. By reducing the physical storage requirements to the minimum needed to store application data, Thin Provisioning enables organizations to allocate physical storage capacity only as needed by applications. This not only reduces the storage hardware footprint at the data center, it reduces storage hardware acquisition costs.

Storage capacity costs

FalconStor technology helps organizations reduce storage capacity requirements by offering **capacity-efficient data protection**. Application-aware **snapshots** and **continuous data protection** features benefit from the same granularity as its replication technology, recording only the smallest data iterations at the sector level. This efficient data protection model often eliminates the need for frequent full data copies, thus reducing storage hardware requirements.

As for duplicate backup data copies, FalconStor offers enterprise-class **scalable deduplication** technology that eliminates data redundancy and creates a global deduplication repository, resulting in the highest data reduction rates across the enterprise. Tight integration with backup and tape vendors allows for fully automated and seamless long-term archiving without increasing storage capacity.

Beyond Hardware Cost Savings

Minimizing downtime after a primary site failure

Naturally, the primary goal of a DR strategy is to provide a quick operational failover to the DR site in case of complete or partial primary site failure. The speed of operational failover defines the extent of business exposure – fast failover limits the impact on revenue, customer satisfaction, and corporate reputation. Defining the organization's RTOs should help guide the selection of the DR-enabling technology. Automating site failover can dramatically reduce failover time and minimize the risks in what is usually a very complex and error-prone procedure built from multiple time-consuming, manual steps.

FalconStor technology provides **full integration with physical and virtual environments** to enable DR process automation. The FalconStor Storage Replication Adapter (SRA) for VMware Site Recovery Manager allows for complete automation of the site failover process, streamlining this complicated process and significantly accelerating recovery time.

Of course, the speed of failover also depends on the readiness of the remote site to take over primary operations. If business applications are not integrated with the data replication service, data integrity problems will delay recovery time. When the transactional integrity of application data is not maintained during the data copying, the application must complete a lengthy data cleanup effort in case data recovery is needed. This can significantly delay recovery. FalconStor provides a full range of **application integration** solutions that keep replicas and snapshots readily available for quick and seamless data and system recovery. This application integration reduces recovery time and minimizes the risk of data damage or loss.

An important – but often overlooked – part of DR is the process of failing back to the primary site when it resumes operation. While site failover is cumbersome, failback can be even more complex. The failback procedure must ensure that all data changes accumulated

during the failover period are fully replicated back to the primary site. Automation of the failback process is essential to streamlining and accelerating operational return while minimizing exposure.

Minimizing data loss during site failover

Data at the remote site is only as current as the last complete replication from the primary site – therefore, frequency of replication defines the amount of potential data loss. Required RPOs should be taken into consideration when selecting a data replication model. The adopted technology should be flexible enough to meet different service level agreements (SLAs) for different applications; some applications may only tolerate losing an hour of data, while others may tolerate a day or more.

FalconStor software enables a flexible data protection environment, allowing the deployment of **both synchronous and asynchronous** replication. In addition to these remote protection options, **local snapshots** of application data can provide instant recovery capability from any localized data corruption or loss. This range of options enables users to tailor data protection parameters across the enterprise.

Save Time and Money While Saving Your Business

The FalconStor portfolio of TOTALLY Open Data Protection solutions offers hardware-independent DR that ensures the highest levels of data availability and business continuity for physical, virtual, and hybrid environments. This hardware independence provides freedom from expensive vendor lock-in and the ability to seamlessly transition between physical and virtual environments. FalconStor software's embedded WAN-optimized replication keeps bandwidth costs to a minimum and accelerates data replication processes between sites for better data recovery points. Application-aware data protection features ensure fast and accurate recovery from data center failures. Only a flexible, TOTALLY Open solution can meet all of your DR needs, now and in the future.

About FalconStor

FalconStor Software, Inc. (NASDAQ: FALC), the provider of TOTALLY Open™ Data Protection solutions, delivers the most comprehensive suite of products for data protection and storage virtualization. Based on the award-winning IPStor® platform, products include the industry-leading Virtual Tape Library (VTL) with deduplication, Continuous Data Protector™ (CDP), File-interface Deduplication System (FDS), and Network Storage Server (NSS), each enabled with WAN-optimized replication for disaster recovery and remote office protection. Our solutions are available from major OEMs and solution providers and are deployed by thousands of customers worldwide, from small businesses to Fortune 1000 enterprises.

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