

Recovery in Perspective – Ensuring Access to Enterprise Data

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Management Summary

Sometimes a change in perspective helps solve a difficult problem. Imagine walking down a forest path with dense foliage and dim light. It feels like being in a tunnel, and there are only two ways to move – forward and back. If you are not sure that your direction is right, confusion and apprehension may set in. Now, imagine standing on a high hill and surveying the surrounding terrain. You have a clear view of the forest, hills, valleys, and where paths lead. With this clarity, you gain a sense of which path takes you to your destination. All you needed was a change in perspective.

Enterprises face numerous challenges with current backup procedures: the growth and distribution of data, stricter availability requirements, regulatory pressures, greater IT accountability, and backup job failures. Add in a dazzling array of complementary technologies for data protection, like mirroring, snapshot copy, and automated data migration, and it paints a formidable picture. ***What is the best way to handle enterprise data protection?***

A change in perspective is helpful. First, place the emphasis on what an enterprise really wants – business recovery instead of data backup. In other words, it is about *business continuity*. The enterprise needs to restore access to data and continue its operations after a failure or disruption. All of the tools and techniques, including backup, are means to that end. Looking even more broadly, recoverability is a component of the service levels that IT delivers to the business. In turn, the service levels support the business processes that ultimately deliver on the objectives of the enterprise. In this light, recovery is primarily a business issue, and the technology mechanics are enablers of the business objectives.

Recovery systems, to have value, must target specific recovery point objectives (RPO) and recovery time objectives (RTO) in the distinct areas of operational (logical error), disaster (system failure), and archive recovery. Moreover, enterprises have to be smart about deploying recovery technologies, which are evolving steadily toward greater capability, integration, and eventually convergence.

In short, the hilltop perspective is a top-down instead of bottom-up view. It highlights recovery within the broader context of the enterprise and the specific ways to apply it. From here, the way to deliver recovery services that meet the enterprise's various requirements becomes more apparent. Read on for details.

IN THIS ISSUE

➤ The Data Protection Dilemma	2
➤ Recovery in Perspective.....	2
➤ Recovery Services Journey	5
➤ Conclusion.....	5

The Data Protection Dilemma

Backup is the most common means of protecting data, and enterprises face numerous challenges with it (*see graphic, below*).

- **Data is everywhere** – It resides on servers, NAS appliances, desktop, and laptop PCs, and handheld devices that can number in the hundreds, thousands, or more in an enterprise. They are geographically distributed among data centers, workgroups, and remote offices. Network access may be by SAN, LAN, or WAN. These platforms run a variety of different operating systems and applications, each of which requires specific backup integration. Backup systems and procedures must accommodate all of this complexity.
- **Stricter requirements** – Regulatory pressures, globalization, e-commerce, and increased executive awareness of the need for business continuity translate into stricter requirements for data availability and retention.
- **IT accountability** – “Yes, we back up” is no longer sufficient. Enterprises increasingly hold IT departments accountable for specific, measurable service levels of availability. Meanwhile, a high failure rate of backup jobs is still common.
- **Data never stops growing** – The backdrop of this drama is never-ending data growth.

Backup must contend not only with complexity but with a moving (growing) target as well.

- **New technologies** – Backup to disk, synthetic backups, snapshot integration, backup compression, and other innovations can address some of these issues. Which, if any, should one adopt?

Furthermore, backup is not the only technology deployed for data protection. Remote mirroring, clustering, automated failover, point-in-time copies, automated data migration (archiving), wide-area file services, and continuous data protection are complementary and often necessary to meet enterprise requirements.

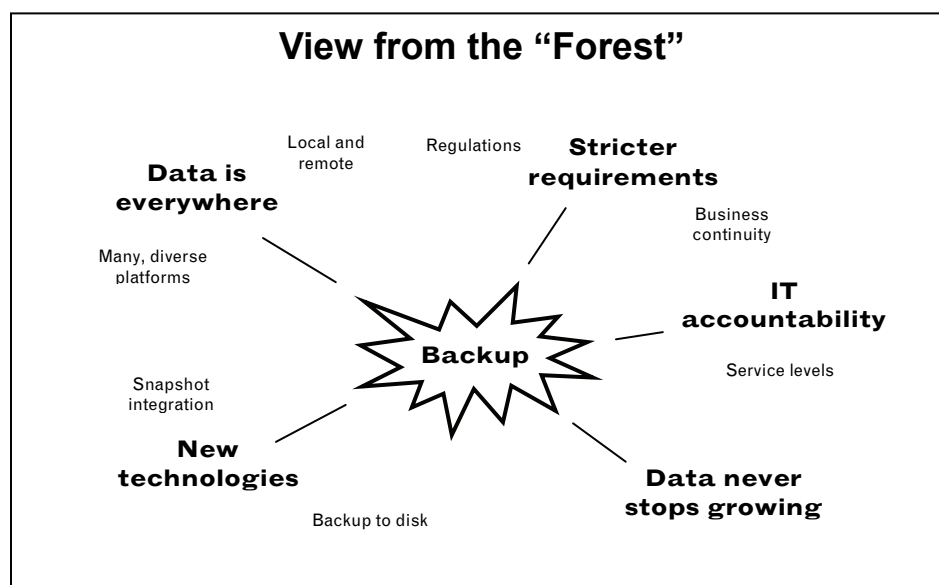
Sorting through the mechanics of backup and data protection can be confusing, like walking down a forest path without a clear sense of direction.

Recovery in Perspective

However, a view from the hilltop brings some clarity. By looking at data protection from the broader enterprise perspective, the backup and other details that loomed so large fall into perspective. They no longer seem so chaotic and formidable. In fact, the path forward becomes more apparent.

Service Levels to the Business

The first thing one sees is that data protection primarily is not a technical issue. It is a business issue with technical underpinnings. The purpose of an enterprise is to serve the interests of its stakeholders through customer satisfaction, profitability, employment opportunities, and revenue growth. The storage infrastructure supports the enterprise by storing, protecting, and providing access to its valuable information. Like a pillar under a



roof, it supports IT applications and business processes in the attainment of enterprise objectives. See the graphic on the right.

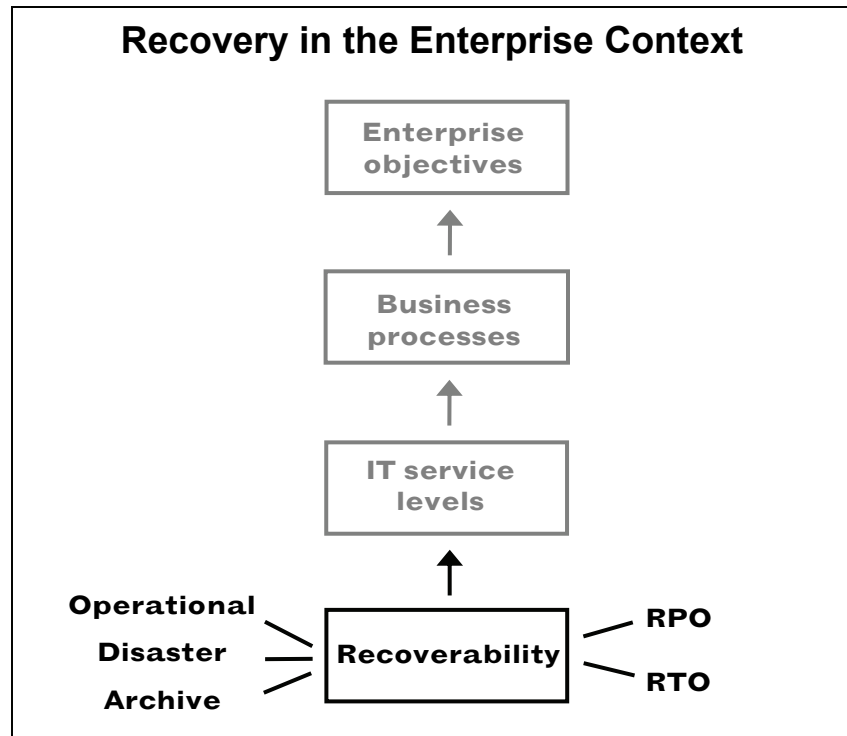
In this broader context, the common ground where business and IT meet is the *service level*. This is, essentially, a contract or commitment that describes what IT will provide to the business at what cost – quid pro quo, if you will. Service levels should be specific and measurable, like any good contract, and reflect what business actually needs and IT can deliver.

The relevant characteristics of storage service levels include capacity, performance, availability, recoverability, archiving and data retention policies, and cost. A service level applies to specific data sets. An enterprise uses multiple service levels because not all data has the same value or storage requirements, even within a single application. An e-mail application might use midrange storage with Fibre Channel disks for its primary database. Periodic snapshots to low-cost ATA disks allow for quick recovery from data corruption and enable non-disruptive backup to tape. The application also indexes and archives messages to low-cost disk for a period of years for regulatory compliance. Altogether, three or four storage service levels are involved in this example.

Recovery as a Service

Data protection enters the picture as the means of delivering recoverability, one component of a storage service level. Recoverability describes how quickly and fully access to data can be restored after a failure or disruptive event. Two metrics characterize it.

- **Recovery point objective or RPO** – The degree of restoration; in other words, how up-to-date the recovered data is.
- **Recovery time objective or RTO** – The allowable time to restore; in other words,



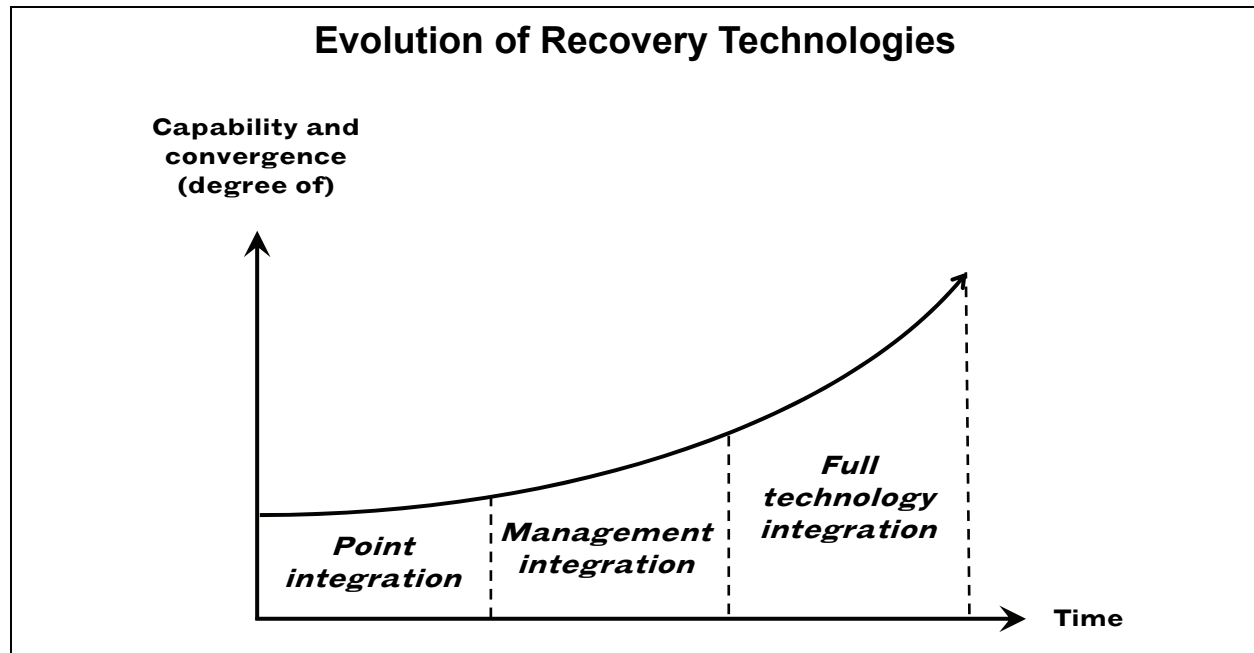
how long it takes to get the system back up and running.

Data recovery¹ also applies to three separate areas:

- **Operational** – Recovery from a logical fault, such as database corruption, viruses, or accidentally deleted or modified files.
- **Disaster** – Recovery from a physical system failure, requiring failover to an alternate system often at a remote site.
- **Archive** – Recovery of or recalling data that has been migrated to secondary storage for long-term retention.

To close the loop, recovery and business continuity go hand in hand. When information is unavailable, enterprise activities stop. Without it, one cannot process a transaction, communicate with coworkers, customers, suppliers, and partners via e-mail, or bill clients. **The continuity of business operations depends on information access, and information access depends, in part, on effective recovery. Therefore, recovery is more than a necessary cost; it is an investment in business productivity.**

¹ Recovery is *the act*, while recoverability conveys *how well it is done*.



Evolution of Recovery Technologies

In addition to the enterprise context, there is also a technology context that shapes the landscape, *as the graphic above depicts*. Recovery technologies are becoming more capable and integrated over time and will eventually converge.

- **Point integration** – Specific integration points between discrete technologies are available now. Examples include backup applications that initiate snapshot copies for non-disruptive backup and server clustering software that coordinates with remote mirroring for site failover.
- **Management integration** – A master console that controls and coordinates multiple, even heterogeneous technologies, such as backup, point-in-time copy, remote mirroring, storage resource management, continuous data protection, and automated data migration.² Centralized management simplifies the environment and significantly lowers recovery management costs. Such consoles of limited scope are starting to appear on the market.
- **Full technology integration** – A combination of management integration with tech-

nology integration at many points. There will be much more power and value when technologies work together synergistically. Such solutions will be ideal for delivering the best possible recoverability at multiple service levels with minimal management overhead.

The point is that recovery technologies probably have improved since you last studied them. In the future, you can expect that they will deliver greater capabilities through integration.

Takeaways

To summarize, the hilltop view clarifies several points.

- Be primarily concerned with recovery and how it should serve the business. The mechanics of backup and data protection are secondary and consequential, not an end in itself.
- Define business requirements and the IT service levels, including recoverability, before deciding on technology implementation and practices.
- Define recovery services specifically (RPO, RTO) and apply them comprehensively (operational, disaster, and archive).
- Leverage new technologies smartly and build with an eye toward how technologies will evolve in the future.

² For specifics about many of these technologies, see *Data Copying – A Toolbox of Business Solutions* in the issue of **Clipper Notes** dated March 10, 2007, available at <http://www.clipper.com/research/TCG2007039.pdf>.

Recovery Services Journey

After enjoying the hilltop view comes the hard work of implementation. In this case, it is to deliver effective data recovery services to the enterprise. Here are a few practical suggestions toward that end.

- **Assess your enterprise's need for recovery.** Understand the business processes and their level of sensitivity to disruption. In other words, how important and valuable is continuity of operations?
- **Define recovery service levels.** The enterprise will need different service levels (RPO, RTO) to meet its various requirements. Be sure to consider the three areas of operational, disaster, and archive recovery.
- **Classify data according to its service level requirements.** Not all data has the same value or availability requirements, nor can an enterprise afford to provide the best service to all data. Classifying it and applying appropriate service levels is the smart way to balance capability and cost. This falls under the broader trends of tiered storage³ and information lifecycle management.⁴
- **Involve both business and IT.** All stakeholders should have a hand in defining recovery services. Functional personnel have the best sense for what business processes need, the IT department knows best what technology can deliver, and executives control the purse strings. There will be practical tradeoffs between capability and cost. Cooperation and consensus should be the modus operandi.
- **Assess your enterprise's current recovery capabilities.** Take inventory of the existing systems and policies. What service levels do they deliver? How does this differ from what the enterprise needs?
- **Bridge the gap.** Make a plan to renovate the recovery infrastructure to meet your enterprise's service level requirements. This

includes technologies, policies, and processes. Integration of the various technology components is more important than an individual best-of-breed product. The whole system working together delivers service levels to the business.

- **Stay abreast of the technology evolution.** You may be surprised at what the latest technologies can do.

Conclusion

A change in perspective is helpful to surmount the challenges of data protection and recovery management. In short:

- Think recovery, not just backup,
- Think of recovery as a contributor to business productivity, not just a necessary expense,
- Think of recovery as a service, not as just hardware and software,
- Think of data in classes, not all data as the same, and
- Think of how to bridge the gap between the recovery services your enterprise needs and what it currently has.

Recovery management plays an important role in the continuity and success of an enterprise. It is worth taking the time to do it well.



³ See *Tiered Storage Classes Save Money – Getting The Most Out Of Your Storage Infrastructure* in the issue of **Clipper Notes** dated March 1, 2007, available at <http://www.clipper.com/research/TCG2007032.pdf>.

⁴ See *Top 10 Things You Should Know About Information Lifecycle Management* in the issue of **Clipper Notes** dated March 10, 2007, available at <http://www.clipper.com/research/TCG2007039.pdf>.

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