



Hewlett Packard
Enterprise

Business white paper

Analytics-driven backup and recovery

Hewlett Packard Enterprise enables a unique and adaptive approach





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Introduction

Shifting data center requirements and explosive data growth are forcing today's IT organizations to rethink backup and recovery processes, strategies, and infrastructure. New approaches to deploying IT services such as virtualization and cloud have completely changed how we tackle the challenge of deploying mission-critical applications. In addition, new trends such as mobility and "Bring Your Own Device" (BYOD) and an increasing focus on regulatory compliance have changed how we interact with the data we create.

The reality is that change within today's data center is constant and never-ending. Decisions are made at a point in time and rarely revisited. And the ability to adapt to change is critical to the survival of the IT organization. This means that to reduce risk in meeting service level objectives (SLOs), we require a new approach that supports business resiliency.

Why we need a new approach

Due to the always-on nature of most organizations, we have stretched the boundaries of the typical data center and put new strains on the operations layer. Businesses now expect a 24x7 IT experience, which challenges IT teams large and small.

As a result, the data backup and recovery operation—which is age-old and one of the most critical of all IT services—is susceptible to the following challenges:

- New and dynamic applications within the data center are driving data growth and making traditional, static "set it and forget it" backup and recovery approaches ineffective
- Always-on enterprise—24x7 operations—have completely obsoleted the concept of "backup windows" and scheduled maintenance downtimes
- Increased adoption of cloud and virtualization is creating unintended data silos and additional management complexity
- Existing traditional backup and recovery software solutions are often too rigid, complex, and expensive to handle the demands of the modern data center
- An increasingly mobile workforce is creating and consuming business data through an array of mobile devices, resulting in a sea of dynamic data building at the edge of the organization's IT infrastructure, and often in remote locations with different resources and systems

These challenges are the catalysts driving the need to replace yesterday's reactive and bloated backup models with a progressive approach to data protection that delivers transparency, predictability, and business resiliency.

The New Style of Business demands an adaptive approach that can address the dynamic nature of today's data center, handle the diversity of data that must be protected, and provide a far greater level of business resiliency than yesterday's backup and recovery solution. This approach requires a new way of addressing backup and recovery, one that adapts as it protects at scale, making backup both smarter and more efficient.

Addressing four core capabilities

Traditional data protection approaches lack the capabilities required for operational success within your mission-critical data backup and recovery. These capabilities include prioritization, prediction, recommendation, and automation, and are enabled through real-time analytics. With operational intelligence, your backup and recovery environment will be as agile as your current and future infrastructure, applications, and workloads—enabling you to deliver business assurance to your organization with confidence.

- 1. Prioritization**—enables you to make backup decisions based on application priority and criticality to your business and operations
- 2. Prediction**—leverages real-time operational analytics to drive better decisions on backup resource utilization now and in the future
- 3. Recommendation**—provides actionable suggestions to reduce potential conflicts and enable SLA objectives to be met in an optimal manner
- 4. Automation**—enables automated backup and recovery policy provisioning adjustments based on an organization's SLAs, available resources, and real-time operational analytics

Key observations

- If you can prioritize what you protect, the most critical of applications can gain access and priority to the resources needed to complete backups on time, non-disruptively, and well within the window you are counting on.
- If you could predict where your potential issues are (based on a view of the past and the future), it could provide useful insight into when you may need to incorporate additional backup capacity proactively, instead of reacting to a failure situation. This enables the backup process to run more smoothly.
- You could avoid potential conflicts and achieve your critical service-level objectives if the backup system could recommend how to best optimize itself. This in turn could help you take advantage of additional resources and capacity to improve not only the protection of the data, but also to enhance its long-term retention for compliance.
- With automation, you can reduce the effort within the backup and recovery operation, and enable data protection for all devices under management by automatically applying protection policy and provisioning backup resources. This saves time, money, and headaches.
- With operational analytics, IT can better understand and control backup-related resources. This enables informed decisions regarding future backup capacity and infrastructure needs—proactively addressing current and potential issues within their backup operation.

How analytics can improve backup and recovery

Relevant information is essential to understanding the root cause of a specific problem. For example, when two computers fail to communicate on the same network, it is typical to check the network connections themselves first. Once connectivity has been verified, the IT administrator starts to move up the stack to diagnose the next set of variables that could be causing the problem. This, of course, is a potentially tedious, time-consuming, and frustrating process.

Problem analysis or IT troubleshooting typically requires the collection of system logs, events, alarms, relevant performance data, and other key environmental information. But data collection alone can be a daunting task without the right platform. Even worse, it is hard to figure out where to start looking for the proverbial needle in the haystack, because the majority of the time, the cause of the problem is hidden under terabytes of cryptic statistical data. With no clear way to discern when and how one event relates to the other, it would leave most IT admins guessing.

To avoid confusion and frustration, organizations can rely on analytics to improve their ability to reach higher levels of operational efficiency with a platform that provides hindsight, insight, and foresight.

When analytics are applied to data backup and recovery, you can gain insight into health, resource utilization, potential bottlenecks, and areas of optimization. When analytical data is made easily accessible and presented in a meaningful manner, it can truly empower any organization, while saving costs and reducing risk.

Table 1. Analytics provide hindsight, insight, and foresight

	HINDSIGHT	INSIGHT	FORESIGHT
	A rearview mirror that attempts to use past experiences and situations to provide a reasonable basis to explain the present scenario.	A windshield focusing on understanding various relationships, to help us interpret our current and future situations in light of a changing environment.	Analogous to a GPS with traffic patterns, giving us the ability to model various scenarios. This helps us better prepare for and more rapidly respond to unpredictable events and impacts that future needs will have on our environment today.
Answer	What has happened	How does X relate to Y	What if A or/and B happened
Process	Historical reporting	Monitoring and analysis	Predictive analytics
Technology	Data warehouse and dashboards	KPIs, analytics, and root cause	Predict, what-ifs, and simulate
Value	Back-casting and road-mapping	Business modeling and analytics	Scenario-based decisions

When applied to data backup and recovery, analytics can provide:

- **Hindsight** into what has happened to a running backup job through historical reporting: for example, identifying a failed or missed backup from the night before.
- **Insight** into how conditions relate to each other in the backup process, through monitoring and analysis: for example, how a media failure may have caused a backup to fail to complete.
- **Foresight** into how conditions may affect the future backup operation, through prediction: for example, how a failed or missed backup impacts a desired recovery point objective (RPO) in the future, when required for a disaster recovery scenario.

HPE solutions enabling adaptive backup and recovery

Backup and recovery software solutions should be as dynamic and agile as your IT environment. HPE Data Protector and its companion product HPE Backup Navigator together deliver an innovative approach to data backup and recovery that is based on real-time operational analytics, intelligence, and optimization. Combining intuitive visualization and adaptive intelligence, HPE Data Protector and HPE Backup Navigator enable organizations to reduce the cost of backup operations, continuously meet service level expectations, and improve productivity.

HPE Data Protector

Built on a unified architecture that leverages analytics and automation, HPE Data Protector delivers simple, reliable, intelligent, and cost-effective backup and recovery that is just as agile as your current and future IT environments.

By standardizing the backup and recovery of information spread across locations, applications, formats, storage platforms, operating systems, and hypervisors, HPE Data Protector provides assurance for mission-critical information from the core to the edge, across physical, virtual, and cloud infrastructures.

Simplify your backup and recovery experience with a comprehensive support matrix

HPE Data Protector is a single, unified solution that can centrally manage the backup and recovery process across your entire IT environment, whether it is small and standardized or large, diverse, and distributed. With a comprehensive support matrix eliminating the need for multiple point products, HPE Data Protector protects business data spread across a range of locations, applications, formats, storage platforms, operating systems, and hypervisors to a continuum of backup targets including disk, snapshots, tape, and cloud.

Meet strict recovery and service-level expectations with advanced recovery options

Leveraging advanced policy-based recovery options including Instant Recovery, Granular Recovery Extensions (GRE), and Enhanced Automated Disaster Recovery (EADR), HPE Data Protector enables organizations to meet the strictest levels of service and recovery objectives in both physical and virtual environments, ensuring business resiliency, and compliance.

Optimize backup storage and reduce cost with federated deduplication

HPE Data Protector is powered by HPE StoreOnce—a patented and award-winning deduplication technology. Using smart technologies such as adaptive micro-chunking, sparse indexing, and container matching, HPE StoreOnce is designed to utilize less system resources and efficiently store data, which drives a lower cost of data backup and recovery. Whether a customer has deployed HPE or non-HPE storage infrastructure, HPE Data Protector provides the flexibility to run deduplication at any location in the backup stack helping customers achieve cost efficiency and better utilization of IT infrastructure resources.

Reduce exposure to data loss and improve IT resiliency with automated policy-based data protection for virtual environments

With One Touch Protection, HPE Data Protector software automatically adjusts and applies data protection policies to new virtual machines in rapidly changing virtual data center environments, eliminating the nearly impossible process of tracking virtual server provisioning.

Easily meet shrinking backup window demands with Zero Downtime Backup snapshot protection

The HPE Data Protector Zero Downtime Backup (ZDB) capability automates the orchestration, management, and backup of space-efficient snapshots for both HPE and third-party primary storage arrays, enabling organizations to reliably protect and recover large volumes of application data without impacting application performance and availability.

Optimize the overall cost of backup with a tiered recovery architecture

HPE Data Protector delivers a highly efficient, tiered recovery architecture by centrally protecting, managing, and retaining backup sets on a wide range of recovery targets including primary storage devices, disk-to-disk based backup solutions, tapes, and cloud.

HPE Backup Navigator

HPE Backup Navigator provides IT staff with an intuitive and interactive dashboard and analytical reports based on over 75 key performance indicators related to data backup and recovery operations. Using this dashboard, IT staff can immediately identify inefficiencies within the backup operations and the unbalanced use of backup resources, and uncover failures before they are exposed in the recovery process.

The solution removes the need for IT staff to waste precious time on isolating data protection problems at a point when business needs are centered on the need to recover vital information. Instead, having end-to-end insight into the physical and logical data protection infrastructure, IT staff can make smarter decisions concerning how the backup and recovery process is implemented, and uncover the root causes of issues before the business begins to rely on that process.

HPE Backup Navigator delivers:

Intelligent dashboards

Dashboard reports provide valuable insights into key performance indicators of the backup and recovery process, and more importantly, they're interactive and customizable—allowing the IT administrator to filter, change, and modify views.

Real-time predictive analytics

Visual foresight into the backup and recovery process based on daily use, along with trending and forecasting algorithms reveal future performance, capacity gaps, and requirements specific to your data set characteristics, infrastructure capabilities, and organizational requirements.

Rapid root-cause analysis and problem solving

Proactively detect and address potential resource conflicts and systematic/systemic issues before they cascade into outages and data loss that negatively impact business operations.

Collaboration and cross-system support

Report creation can be automated, scheduled, and shared with stakeholders within the organization, or securely isolated and made available to external customers who rely on the backup and recovery service. The same information can be exported in a variety of formats for inclusion into other organizational systems.

Flexible, personalized reporting

Extensible reports can be customized and tailored to match the specific needs of the operator, organization, or customer relying on the details to enable decision making and trigger appropriate actions.

“What-if” scenario evaluation

Intelligent insights into current backup and recovery operations before new datasets are included in the process. These insights can identify whether or not service-level agreements would remain achievable, identify impacts to the backup infrastructure (physical capacity, network load, device loads, etc.), and reveal the best ways to balance the demands of new datasets within the existing infrastructure.

Conclusion

IT organizations remain under immense pressure to deliver faster responses to the business and adapt to constantly changing and growing workloads. When you consider that these demands must be balanced with budgets that are often flat or only marginally growing, the backup solution you put in place must be predictable and smarter.

Organizations need an intelligent and reliable data backup and recovery software solution that is just as agile as their current and future IT environments; they need to shift from reactive to adaptive.

HPE backup and recovery solutions deliver a fresh and unique approach that combines adaptive intelligence, operational analytics, and application awareness to meet the business resiliency requirements of today's highly dynamic, diverse, and complex data centers.

Learn more at
hpe.com/software/dataprotector

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