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The Importance of High Availability

Continuous Applications and Data Recovery

March 2007

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Executive Summary

Companies are under intense pressure to keep their systems running 24/7 and ensure data is continuously available. Since firms are being held to a higher standard of high availability, the challenge for most is to design server and storage systems that are truly *continuous* and that guard against unplanned downtime. That means high availability, long associated with application/system uptime, is evolving to include the *service* of data availability.

Best in Class Performance

Aberdeen used two key performance criteria to distinguish Best in Class (BIC) companies that leverage a high availability strategy: **the overall ability to recover critical applications within a short window** and **year-over-year improvement in ability to recover data**. BIC organizations demonstrated:

- The ability to recover critical application data in less than two hours and
- Year-over-year improvement in the ability to recover critical applications.

Competitive Maturity Assessment

Aberdeen research shows that the firms enjoying BIC performance shared several common characteristics with respect to their high availability strategies, such as:

- **Maturity:** 53% of BIC companies have had high availability strategies for more than three years, and
- **Technology Enablers:** 63% of BIC companies use failover software.

Required Actions

In addition to the specific recommendations in Chapter Three of this report, companies need to take the following actions to achieve Best in Class performance:

- Focus on managing high availability, business continuance, and disaster recovery as a combined initiative;
- Reduce dependency on tape for data recovery needs by deploying disk-based storage to enable quicker data access *and* recovery; and
- Leverage technologies, such as continuous data protection, that enable continuous data recovery.

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Chapter One: Benchmarking the Best in Class

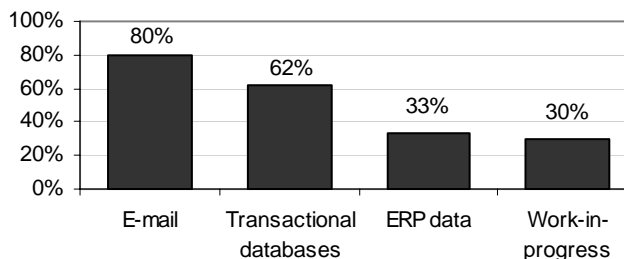
Fast Facts

- **Eighty percent** of end users named **e-mail applications** as the top candidate for high availability.
- Best in Class companies are more than **twice as likely** to use true continuous data protection (CDP) technologies than Industry Average and Laggard organizations.

The business drivers behind most companies' high availability strategies are focused on reducing unplanned downtime (80%), reducing financial risk of data loss (75%) and the need for applications to be up and running 24/7 (65%). It is clear that organizations understand the importance of high availability in ensuring that their applications and data are available continuously. In fact, among the 100 respondents surveyed, not one indicated a lack of plans to adopt a high availability strategy.

But companies are in various stages of sophistication. AberdeenGroup's research found that more than 50% of the BIC companies have been using a high availability strategy for more than three years, compared with fewer than 50% of the Industry Average and Laggard companies. Furthermore, more than one-third of the Laggards are still just *thinking* about adopting high availability plans.

Which is the Critical Data?



Maturity Class Framework

The value of high availability solutions is tied to results, which are becoming increasingly tied to a company's ability to keep applications running continuously and reduce data recovery time. Two key performance indicators (KPIs) distinguished the BIC companies from the Industry Average and Laggard organizations:

- Overall ability to recover its critical applications and
- Year-over-year improvements in the ability to recover critical applications (Table 1).

Maturity Framework Key

The Aberdeen Competitive Framework defines enterprises as falling into one of the three following levels of practices and performance:

Best in Class (20%) —practices that are the best currently being employed and significantly superior to the industry norm

Industry Average (50%) —practices that represent the average or norm

Laggards (30%) —practices that are significantly behind the average of the industry

Table 1: Companies With Top Performance Earn Best in Class Status:

Definition of Maturity Class	Mean Class Performance
Best in Class: Top 20% of aggregate performance	<ul style="list-style-type: none"> • Average recovery time for critical applications 1.5 hours. • Recovery time improved 11% or more year-over-year.
Industry Average: Middle 50% of aggregate performance	<ul style="list-style-type: none"> • Average recovery time for critical applications 4 hours. • Recovery time stayed the same or improved less than 10% this year compared with 2006.
Laggard: Bottom 30% of aggregate performance	<ul style="list-style-type: none"> • Average recovery time for critical application 20 hours. • Data recovery is not measured or takes longer now compared with 2006.

Source: [AberdeenGroup](#), March 2007

Best in Class PACE Model

A Best in Class implementation of a high availability strategy requires more than just technology; it requires a combination of actions, organizational capabilities, and enabling technology that is summarized in Table 2.

Table 2: Best in Class PACE Framework

Pressures	Actions	Capabilities	Enablers
<ul style="list-style-type: none"> • Minimize un-planned downtime • Reduce financial risk of disaster 	<ul style="list-style-type: none"> • Use redundant systems and failover procedures throughout organization • Move away from building and maintaining a home-grown high availability and disaster recovery solution 	<ul style="list-style-type: none"> • Include disaster recovery in overall risk management policy • Include business continuance into overall risk management policy • Designate a job role responsible for high availability and uptime performance 	<ul style="list-style-type: none"> • Deploy disk-based storage such as continuous data protection • Deploy replication software • Deploy server clustering (active/multi-nodal) • Use metrics to measure uptime and service levels of critical applications.

Source: [AberdeenGroup](#), March 2007

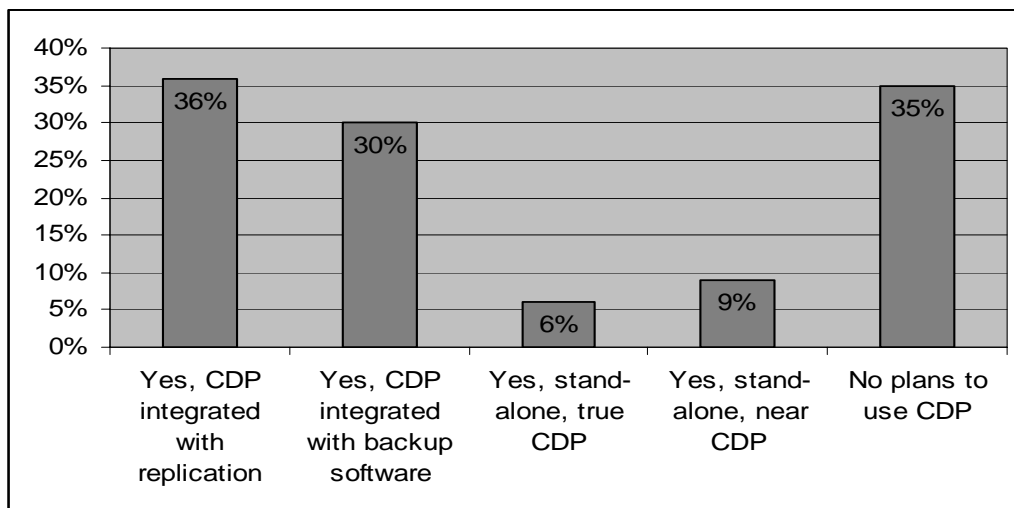
The top two pressures were each cited by 74% of the Best in Class, demonstrating that there is as much at stake operationally as financially when it comes to data availability and keeping critical systems online. Indeed, it is difficult to separate the two. *AberdeenGroup*'s research found that the emerging CDP technology is gaining traction with customers. Looking more closely, use of CDP can take several

“High Availability is like an insurance policy for your business. You have to find a way to protect your applications from disaster, so it makes sense to implement a strategy that will make sure if your systems go down; your clients still have access to the applications and continue working.”-- an IT administrator for a mid-sized insurance firm



forms, each with its own set of challenges and benefits. Of the 65% of survey respondents using or planning to use CDP as part of a high-availability strategy, most indicated integration with replication and/or backup software as a part of the program (Figure 1).

Figure 1: Respondents' Plans to Use Continuous Data Protection



Source: AberdeenGroup, March 2007

High availability would be just a concept were it not for the technologies that enable continuous uptime. The server world has primarily depended on clustering techniques, while the storage world has focused primarily on RAID architectures. But advancements in disk-based technologies (primarily cheaper and more robust Serial ATA drives) are now bringing more promise to high availability.

AberdeenGroup's research has found end users are starting to associate disk-based CDP with their high availability strategies: 37% of BIC respondents have deployed true CDP, while only 10% of the other respondents have deployed the technology. Aberdeen's survey results also show that more end users plan to deploy CDP as part of an overall platform as opposed to a stand-alone product.

Aberdeen Insights – Part 1

Traditionally, high availability is associated with the use of redundant systems and failover software so that applications are available and data is not lost when a system fails. But as companies come under more pressure to keep the business running 24/7, high availability is becoming more about managing the availability of *data as a service*. That makes CDP a natural fit for high availability since it's a technology that enables real-time data recovery and gives end users rapid access to any copy of data they need. The storage industry has been embroiled in a debate about what constitutes "true CDP" vs. "near CDP" (snapshot software with a higher frequency of snapshots). Aberdeen recognizes that true CDP is appropriate for certain applications (such as databases) while near-CDP is good enough for other applications (such as file-based data).

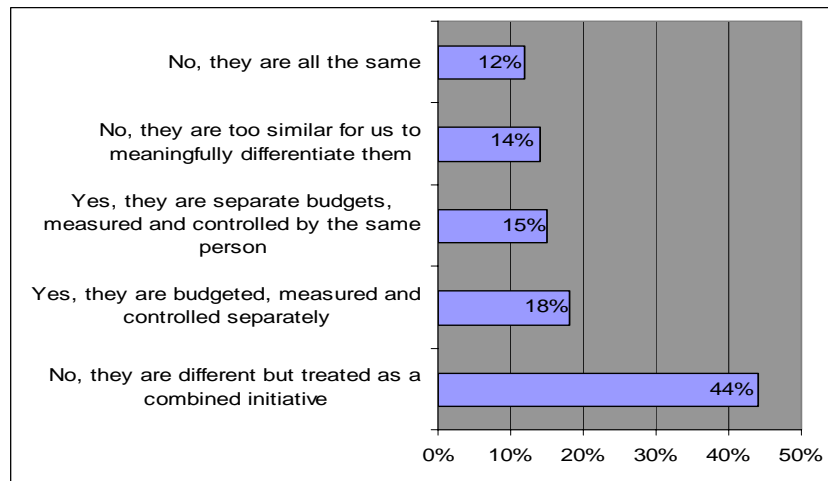
Chapter Two: Benchmarking Requirements for Success

Fast Facts

- Best in Class companies are *more than twice as likely* as Industry Average and Laggards to protect **CRM applications** with high availability technologies.
- Forty-four percent of all respondents consider business continuance, disaster recovery, and high availability as different areas, but treat them as a *combined initiative*.

The once clearly defined differences in high availability, business continuance, and disaster recovery are becoming blurred as more focus is put on keeping businesses running 24/7. Overall results show that more end users are treating the three as a combined initiative (Figure 2). This reduces costs by creating a more efficient infrastructure and preventing potential overlap within the processes. The approach also helps centralize the process of managing data recovery. Ultimately, companies may need to create a new group within IT with a broader skill set that manages those three areas to promote centralized ownership of data recovery.

Figure 2: Do Customers Distinguish among DR, BC, and HA Initiatives?



Source: AberdeenGroup, March 2007

Competitive Maturity Assessment

Survey respondents fell into one of three categories – Laggard, Industry Average, or Best in Class. The root causes of their performance variation are identifiable in five key categories: (1) **process** (ability to leverage outside expertise); (2) **organization** (regular testing of the organization’s ability to handle disasters); (3) **knowledge** (of HA costs and performance); (4) **technology** (ability to leverage evolving products); and (5) **performance management** (ability to measure application uptime). In each of these categories, survey results show that the firms exhibiting Best in Class characteristics also enjoy Best in Class performance (Table 3).



Table 3: Competitive Framework

	Laggards	Industry Average	Best in Class
Process	Engage a third-party services firm for offsite, disk-based backup:		
	15%	17%	26%
Organizational Structure	Conducts periodic disaster recovery drills:		
	46%	59%	74%
Knowledge/ Data Management	Know how much of the IT budget will be spent for high availability in 2007:		
	39%	62%	69%
Technology Usage	<ul style="list-style-type: none"> • 54% deploy disk-based storage such as continuous data protection • 55% deploy failover software for redundant systems • 26% deploy server clustering, active/multi-nodal 		
	<ul style="list-style-type: none"> • 70% deploy disk-based storage such as continuous data protection • 55% deploy failover software for redundant systems • 32% deploy server clustering, active/multi-nodal 	<ul style="list-style-type: none"> • 74% deploy disk-based storage such as continuous data protection • 63% deploy failover software for redundant systems • 42% deploy server clustering, active/multi-nodal 	
Performance Management	Use standard metrics to measure service levels of critical applications		
	34%	41%	42%

Source: AberdeenGroup, March 2007

Organizational Capabilities and Technology Enablers

One essential ingredient of a well-designed high availability implementation strategy is failover software. As previously noted, storage has traditionally focused on various levels of RAID (Redundant Array of Independent Disks) while servers have been focused on clustering technologies. However, there are numerous failover technologies associated with high availability, disaster recovery, and business continuance that bear consideration.

- **95%** of the Best in Class and **91%** of others (Industry Average and Laggards) use **backup software**. While backup software is suitable for archiving data, it alone does not have the fast data recovery ability that companies require for continuous uptime.
- **68%** of the Best in Class and **64%** of others use **replication software**. This is noteworthy considering that until recently replication software was only afford-

“We leverage various technologies for our high availability needs, and Continuous Data Protection is another one of those technologies that will help us become faster in our data recovery abilities”

--a server administrator for a major healthcare provider

able to the large enterprise and only in the last several years it has moved downstream to the small-to-medium market.

- **63% of Best in Class use failover software** as part of their high availability strategies. The one core technology that serves as the foundation for any high availability strategy is failover software. Installing redundant physical systems throughout an organization is pointless unless there is failover software that acts like a switch; enabling critical applications to continue running and handling I/O workload even when a primary system comes down.
- Respondents listed three top attributes they consider important in considering a high availability/disaster recovery solution: **74%** want both *manual and automatic failover capabilities*; **68%** want *failover and switchovers* that are transparent to end users; and **46%** want *continuous monitoring* of the server environment to detect problems in the hardware, the operating system, the network, and applications.

Aberdeen Insights – Part 2

As a stand-alone product, CDP is not making as much headway into customer environments compared with CDP that is integrated with either backup software or replication software. Thirty-six percent of respondents plan to deploy CDP integrated with replication and 30% plan to install CDP integrated with backup software. Vendors are integrating CDP with backup software so that their customers can leverage legacy backup technology. CDP integrated with replication enables end-users to get granular data recovery from both local *and* remote sites without worrying about lost tapes. CDP, integrated with replication, ensures that media containing valuable data is not lost in transit. Our research found customers are **three times more likely** to be satisfied with their high availability solution when CDP is part of the strategy.



Chapter Three: Required Actions

Fast Facts

- **Forty-two percent** of Best in Class firms report that data loss or corruption occurs within their organizations less than once a year, compared with **20%** of Laggards.
- Best in Class companies are **twice as likely** as the Industry Average and **more than five times** as likely as Laggards to have never experienced data loss or corruption.

Whether a company is trying to move its high availability performance from Laggard or Industry Average to Best in Class, the following actions will help spur performance improvements:

Laggard and Industry Average Steps to Success

1. *Make high availability a C-level executive priority*

Many initiatives suffer because they are perceived as IT issues. High availability needs to be a top-down objective to ensure the necessary budget and resources are focused in the right places.

2. *Invest in failover technology*

Our research found that **63%** of Best in Class companies invest in failover technologies compared with **44%** of Laggards, which are satisfied with snapshot software. While the latter is a suitable technology for some applications, it's not considered a true high availability technology.

3. *Implement a single group with broad skills to oversee and centralize management of the company's HA/DR/BC initiative.*

A unified and centralized approach strengthens a company's ability to withstand and recover from a disaster or system crisis, while reducing the potential for inefficiencies and overlap.

Best in Class Next Steps

1. *Start focusing on recovery management as an overall company objective.*

It's not just enough to back up data and archive it to an offsite location for protection. Companies need to become much more proficient in the ability to recover data. The area of recovery management is fairly new but there are various products within the industry that are the beginnings of the foundation for recovery management.

2. *Share your knowledge and experience on tried-and-true high availability practices and technologies by participating in industry standards organizations.*

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Featured Underwriters

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Appendix A: Research Methodology

In March 2007, AberdeenGroup surveyed more than 100 end users regarding their high availability strategies and their particular knowledge and use of the emerging continuous data protection (CDP) technology.

Responding end users, who ranged from C-level executives to IT managers, completed an online survey that included questions designed to determine the following:

- The top business drivers behind most end users' high availability strategies;
- The degree to which end users distinguish among disaster recovery, business continuance, and high availability;
- Current and planned use of CDP for high availability; and
- Whether companies' high availability strategies adequately enable recovery of their critical applications.

Aberdeen supplemented this online survey effort with telephone interviews with select survey respondents. The study aimed to identify emerging best practices for high availability usage and provide a framework by which readers could assess their own data recovery capabilities.

Responding enterprises included the following:

- **Job title/function:** The research sample included respondents with the following job titles: managers (29%); directors (15%); senior management that included CEOs, COOs, and presidents (7%); and CIOs (11%).
- **Industry:** The research sample included respondents from various industries. High technology/software was the largest segment (25%); followed by finance/banking/accounting (18%); computer equipment and peripherals (14%); and health/medical/dental services (9%).
- **Geography:** The majority of respondents (69%) were from North America. Remaining respondents were from the Asia-Pacific region (13%), Europe (14%); Middle East and Africa (2%) and South/Central America and Caribbean (3%).
- **Company size:** About 35% of respondents came from companies that earned less than \$50 million (USD) in revenue. Another 16% worked in firms that earn between \$50 million to \$100 million. Nine percent worked in companies that generate more than \$5 billion.

Solution providers recognized as sponsors of this report were solicited after the fact and had no substantive influence on the direction of the *High Availability Benchmark Report*. Their sponsorship has made it possible for AberdeenGroup to make these findings available to readers at no charge.

Table 4: PACE Framework

PACE Key

Aberdeen applies a methodology to benchmark research that evaluates the business pressures, actions, capabilities, and enablers (PACE) that indicate corporate behavior in specific business processes. These terms are defined as follows:

Pressures — external forces that impact an organization’s market position, competitiveness, or business operations (e.g., economic, political and regulatory, technology, changing customer preferences, competitive)

Actions — the strategic approaches an organization takes in response to industry pressures (e.g., align the corporate business model to leverage industry opportunities, such as product/service strategy, target markets, financial strategy, go-to-market, and sales strategy)

Capabilities — the business process competencies required to execute corporate strategy (e.g., skilled people, brand, market positioning, viable products/services, ecosystem partners, financing)

Enablers — the key functionality of technology solutions required to support the organization’s enabling business practices (e.g., development platform, applications, network connectivity, user interface, training and support, partner interfaces, data cleansing, and management)

Source: AberdeenGroup, March 2007

Table 5: Competitive Framework

Competitive Framework Key

The Aberdeen Competitive Framework defines enterprises as falling into one of the three following levels of FIELD SERVICES practices and performance:

Best in Class (20%) — HA/CDP/DR practices that are the best currently being employed and significantly superior to the industry norm, and result in the top industry performance.

Industry Average (50%) — HA/CDP/DR practices that represent the average or norm, and result in average industry performance.

Laggards (30%) — HA/CDP/DR practices that are significantly behind the average of the industry, and result in below-average performance

Source: AberdeenGroup, March 2007

Table 6: Relationship between PACE and Competitive Framework

PACE and Competitive Framework How They Interact

Aberdeen research indicates that companies that identify the most impactful pressures and take the most transformational and effective actions are most likely to achieve superior performance. The level of competitive performance a company achieves is strongly determined by the PACE choices they make and how well they execute.

Source: AberdeenGroup, March 2007



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