The One Essential Guide to Disaster Recovery:
How to Ensure IT and Business Continuity

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Start Here: Basic DR

"Only six percent of companies suffering from a catastrophic data loss survive, while 43 percent never reopen and 51 percent close within two years."
— University of Texas

For today's small and mid-sized businesses, the risk and effects from any unplanned outage (downtime) grow with each additional critical application, network enhancement or system upgrade. We don't have to look back very far to see the consequences of sudden or unexpected disasters affecting the IT infrastructure of major cities and businesses of every description.

Consequently, IT managers have been—or soon will be tasked—to find ways to mitigate, eliminate or minimize as cost-effectively as possible the risks and effects of unplanned outages on the business. And, even more important, their executives will want assurances that information assets—data and applications—can remain available no matter what happens.

This white paper will help you ensure business continuity and survival by leading you through three essential steps—from understanding the concepts of disaster recovery and information availability to calculating the business impact of downtime.

We will discuss in general terms the concepts of business continuity and disaster planning. We will focus primarily on specific IT strategies you can easily and affordably implement.

Bottom line: Disaster recovery plans and data replication alone are not enough. You will want to look for the most effective way to ensure the optimum level of business uptime for your organization. This white paper will help you match your specific optimum uptime objectives with the best availability choice.

Step 1: Getting Started

Before you begin reviewing the available technologies that support disaster recovery, you first must consider the business. You need to identify which business processes are most important to keeping your business operational.

Once you have identified the most critical business processes, work with the business units to determine their availability requirements for each process. Document the requirements in an internal SLA that specifies the availability goals for each process and articulates the costs of not meeting the goals. For example:

> At company A, the order entry and shipping departments require that their information infrastructure processes must be functional 24 hours every day of the year except corporate holidays. If this requirement is not met, the company loses 80 percent of its productivity, which translates to $10,000 (US) per hour plus penalties of $100,000 per hour for every hour the processes are unavailable.
>
> At company B, the payroll department requires that their information infrastructure processes must be functional from 8 a.m. to 6 p.m. Monday through Friday. Not meeting this requirement costs the company 50 percent of their productivity, which translates to $1,000 (US) per hour of downtime.

Another organization, company C has the need to comply with strict information availability requirements due to government regulations and has made it imperative that its applications remain available even during routine backup processes.

Documenting the cost of not meeting availability requirements helps you determine the value of a software investment used to improve availability. This information also helps you prioritize the processes to analyze. After documenting the service levels required, you can start analyzing the availability needs of each business process technology by technology.

Understanding Downtime and Availability

"Gartner estimates that only 35 percent of SMBs have a comprehensive disaster recovery plan in place."

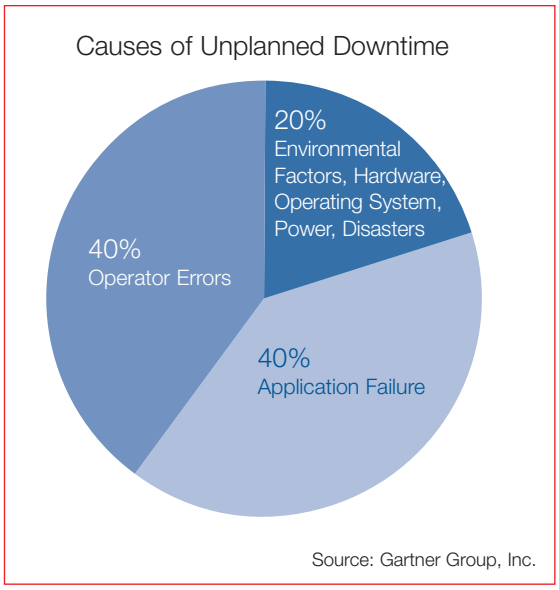
Most organizations define "availability" somewhere along a continuum between multiple hours of downtime with significant data loss to real-time 24/7 uptime with zero data loss. Your definition depends on your business needs, your data and application requirements and your organizational structure. The goal, however, should be to prevent the inevitable system downtime from affecting business uptime.

There are two types of downtime: unplanned and planned.

Unplanned Downtime

Surprisingly, unplanned downtime represents less than 5-10 percent of all downtime. These events include security violations, corruption of data, power outages, human error, failed upgrades, natural disasters and the like.

Some forms of unplanned downtime, such as hardware failure, pose a lessening threat to availability as most servers today offer exceptional reliability. For example, IBM Power System servers running IBM i provide more than 99.9 percent documented reliability and average 61 months between failures—more than five years of server uptime.



Unplanned downtime can strike at any time from any number of causes. Although natural disasters may appear to be the most devastating cause of IT outages, application problems are the most frequent threat to IT uptime. According to Gartner, people and process problems cause an estimated 80 percent of unexpected application downtime. Human error, such as not performing a required task, performing a task incorrectly (such as mis-configuring software), overburdening a disk drive or deleting a critical file, play havoc with applications.

Planned Downtime

While unplanned events tend to attract the most attention, planned downtime actually poses a bigger challenge to business uptime. Routine daily/weekly maintenance to databases, applications or systems usually lead to interrupted services. Studies show that system upgrades, performance tuning and batch jobs create more than 70-90 percent of downtime.

Although companies must be concerned about natural disasters, the inherent daily threat posed by application problems and human error should be a major focus of your efforts. This is especially true when the exposure of software applications to unplanned downtime is aggravated by a host of other business and IT issues such as:

- The need to retain, protect and audit email, financial and other records under regulatory compliance mandates.
- The acceleration of security risks from both inside and outside the business including viruses, worms, hacker attacks and industrial espionage.
- Distributed applications that are accessed, maintained and updated by different classes of users and business partners.
- Multiple platform IT environments in which applications operate interdependently to accomplish business critical business tasks.
- Fewer IT personnel and labor hours available to maintain and troubleshoot increasingly complex and data intensive IT environments.

Step 2: Assess the Financial Impact— Calculate the Cost of Downtime

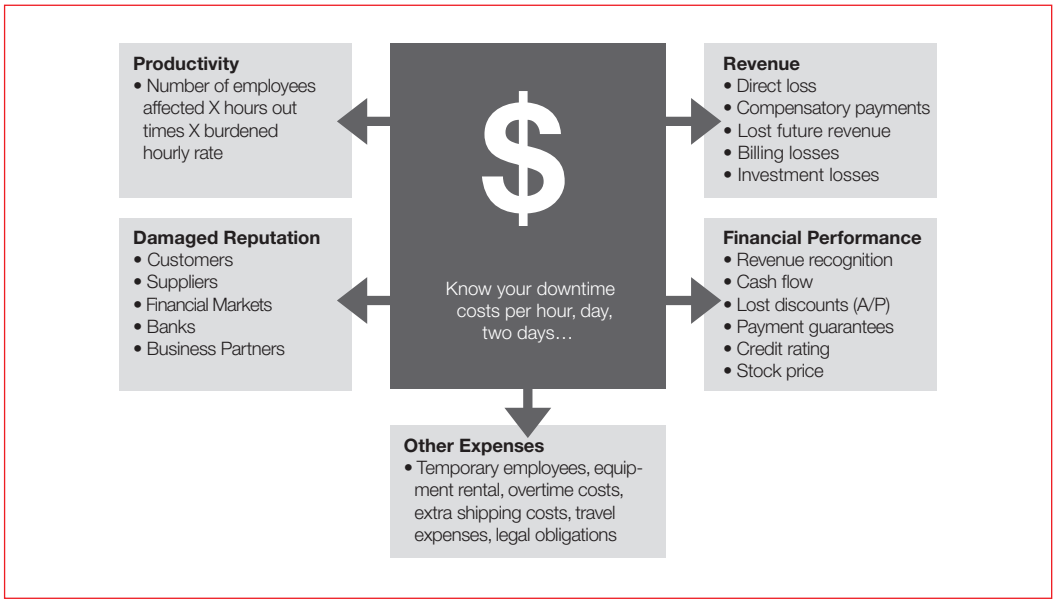
"International Data Corp. estimates that companies lose an average of $84,000 for every hour of downtime. Strategic Research puts the figure closer to $90,000 an hour. Yet many enterprises put off implementing enterprise-wide DR plans until it is too late."

— SearchStorage.com"

How much does downtime cost your business? The answer may not be as obvious as you think. Unexpected IT outages can unleash a procession of direct and indirect consequences both short term and far reaching. These costs include:

Tangible/Direct Costs	Intangible/Indirect Costs
Lost transaction revenue	Lost business opportunities
Lost wages	Loss of employees and/or employee morale
Lost inventory	Decrease in stock value
Remedial labor costs	Loss of customer/partner goodwill
Marketing costs	Brand damage
Bank fees	Driving business to competitor
Legal penalties	Bad publicity/press

The dollar amount that can be assigned to each hour of downtime varies widely depending upon the nature of your business, the size of your company and the criticality of your IT systems to primary revenue generating processes. For instance, a global financial services firm may lose millions of dollars for every hour of downtime, whereas a small manufacturer that uses IT primarily as an administrative tool would lose only a margin of productivity. Also, government agencies would find it very difficult to promise services to citizens.



Source: Gartner Group, Inc.

However, studies show that most U.S. businesses cannot function without computer support, and most businesses that suffer catastrophic data loss or an extended IT outage go out of business. On average, enterprises lose between $84,000 and $108,000 (US) for every hour of IT system downtime according to estimates from studies and surveys performed by IT industry analyst firms. In addition to financial services, telecommunications, manufacturing and energy are also high on the list of industries with a high rate of revenue loss during IT downtime. Here is a brief sampling of typical U.S. dollar downtime costs per hour by industry:

Industry	Downtime cost
Brokerage Service	$ 6.48 million
Energy	2.8 million
Telecom	2.0 million
Manufacturing	1.6 million
Retail	1.1 million
Health Care	636,000
Media	90,000

Sources: Network Computing, the Meta Group and Contingency Planning Research. All figures U.S. dollars.

Consequences of Downtime

No matter what the cause, downtime impacts more than day-to-day interactions. It can impact the integrity of your databases and the applications that use them. For example, a disaster recovery strategy that relies on once-a-day, nightly tape backups risks a whole day's worth of data should an unplanned event occur and crash IT systems a few hours or minutes before a backup process kicks off.

Some businesses could survive that kind of data loss. Others, dependent on electronic data interchange, required to archive information for legal reasons, deploying a global workforce expected to collaborate around the clock, or using eCommerce to make sales and deliver customer service 24/7 will suffer the effects for a long time into the future.

Five Signs Downtime May Be a Major Threat

Many organizations may believe that they remain unaffected by downtime issues. After all, few users complain; customers seem happy. Some important signals, however, may indicate that your current situation or availability solution may need re-evaluation.

1. **Shrinking Backup Windows**—eBusiness and supply-chain processes are putting the squeeze on backup windows. The Gartner Group reports a 66 percent per year decline in the available time for quality backups.
2. **Expanded Internet Dependence**—As you exploit the internet to improve customer satisfaction and reduce costs, your dependence on internet-enabled availability grows exponentially. When email is integrated into business functions to improve customer communications, your dependence becomes even greater. And the risk that downtime poses to the business increases.
3. **Globalized Computing**—Access to critical data from anywhere in the world improves collaboration and enables faster, more informed decisions. Such dependence requires continuous access to information and applications; therefore the impact of downtime will be enormous.
4. **Distributed Applications**—New applications are now running across multiple servers simultaneously, enabling them to capitalize on the servers' varying strengths; however, should one server experience downtime, the entire critical application may go down.
5. **Server Consolidation**—Server, storage, and data center consolidation projects drive down IT and application costs, but with fewer points of failure a consolidated environment poses a greater downtime risk.

Don't Forget the Added Burden of Compliance

Many regulations require companies to support more stringent availability standards. Several new acts and regulations, directed at specific industries or a broad cross-section of companies, mandate the protection of business data and system availability. Businesses may incur financial or legal penalties for failing to comply with these data or business availability requirements.

- **Health Insurance Portability and Accountability Act (HIPAA)**—ensures that only properly authorized individuals have access to confidential patient health data and provides long-term guidelines to secure confidential information. HIPAA mandates a fiveday maximum turnaround on requests for information.

- **Sarbanes-Oxley Act of 2002**—stipulates that CEOs and CFOs attest to the truthfulness of financial reports and to the effectiveness of internal financial controls. Sarbanes-Oxley mandates a required timeframe in which to report financial results—each quarter and at year-end. Failure to make these deadlines can result in financial penalties.

- **New Basel Capital Accord (Basel II)**—requires financial institution capital reserves to include operational and credit risks and includes IT security risk as a principal operational risk. Basel II also requires business resiliency standards for any financial institution doing business in the EU.

- **Gramm-Leach-Bliley Financial Services Modernization Act of 1999**—limits access to non-public information to those with a "need to know" and requires safeguarding of customer financial information. Loss of important data can lead to penalties for the financial institution.

- **Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism (USA PATRIOT ACT) Act of 2001**—defines what information can be made available to federal and local authorities for those suspected of terrorism or terrorist-related activities. This act requires contacted institutions to respond within a specific timeframe to requests for information from databases.

Cost of Downtime Calculator: How Much Will Downtime Cost Your Business?

"Any application that plays a role in developing, creating, manufacturing, supporting, or distributing a product or service to buyers will significantly impact the organization during an outage event."

— META Group, Inc.

To determine how much an hour of unplanned downtime will cost your business, you need to ask a series of questions regarding the real world impact it will have on your customers, partners, employees and your ability to process transactions, such as:

- How many transactions can you afford to lose without significantly impacting your company?
- Do you depend upon one or more mission critical applications such as ERP or CRM software?
- How much revenue will you lose for every hour your critical applications are unavailable?
- What will the productivity costs be for the loss of available IT systems and applications?
- How will collaborative business processes with partners, suppliers and customers be affected by an unexpected IT outage?
- What is the total cost of lost productivity and lost revenue during unplanned downtime?

Step 3: Uptime and Business Resiliency—It's All About Recovery

Determine the RPO and RTO Requirements for Your Business

Following any unplanned outage, how quickly must you have the organization up and running as close to normal business operations as possible? Remember, every minute costs you—take a look at your downtime cost per hour.

Your recovery will depend on two objectives: your recovery time and your recovery point. These two measures will determine the optimum availability your organization will need.

1. **Recovery Time Objective (RTO).** RTO defines how quickly you need to restore applications and have them fully functional again. The faster your RTO requirement, the closer you move to zero interruption in uptime and the highest availability requirements.

2. **Recovery Point Objective (RPO).** RPO defines the point at which the business absolutely cannot afford to lose data. It points to a place in each data stream where information must be available to put the application or system back in operation. Again, the closer you come to zero data loss and continuous real-time access, the higher availability you will require.

You may have different RTOs and RPOs for each of your business critical applications. For example, a supply chain application that feeds a production plant may require a recovery time of only a few minutes with very minimal data loss. A payroll system that is updated weekly with only a few records may only require a recovery time of 12 hours and a recovery point of 24 hours or more before the impact will affect the business.

Matching Uptime Requirements to Availability Solutions

How do you best meet the availability requirements of each system in your organization and achieve the optimum RTO and RPO appropriate for your organization? Some organizations or some particularly critical applications within an organization may require an exceptionally high level of availability.

Any availability solution you select must ensure that information and applications remain as accessible and available as needed to continue to drive revenue, profitability and productivity at acceptable levels no matter what planned or unplanned events occur. The availability solution you choose should:

- Protect your data, applications, and systems to a level that meets your business requirements and RTO and RPOs.
- Manage business uptime as automatically as possible to streamline operations and save time.
- Assure the integrity and quality of your environment during interruptions and when it returns to full operations.

Small and mid-sized businesses that face the potentially devastating consequences of unplanned downtime can protect themselves against the loss of time and money with an information availability solution. Depending upon their particular business and IT needs.

Small to mid-sized businesses can implement information availability in several different ways, including replicating data to a secondary server to maintain continuous application availability or frequently backing up data to a server at a remote location for disaster recovery in the event of a total facility loss at the production site.

Let's look at some of the options to protect your business from the consequences of downtime.

Tape Backup/Archiving Solutions
Tape-based backup and recovery solutions are the oldest form of disaster protection. Tape solutions offer relatively low cost and high portability. You probably rely on tape for a once-a-day backup of your data now. Because it represents a relatively low-cost way to archive information for the long term, tape will no doubt play some role in the IT infrastructure for some years to come. For example, even in high RTO and RPO businesses, where more advanced availability solutions are also used, tape can still play a role in protecting and backing up non-critical applications. Due to its own limitations, however, tape will be unable by itself to provide RPOs or RTOs of seconds, minutes or even a few hours. Since many organizations have a substantial investment in tape storage solutions, an information availability software solution should act as a complement to your tape strategy, making it much more flexible to use.

Disk-Based Backup and Practical Availability
Provides readily available access to and protection of your business data with RTOs and RPOs in the range of hours. By performing frequent data backups to a secondary server or partition, it provides businesses with the ability to efficiently recover from an unexpected outage without the loss of large amounts of data or days or weeks of labor restoring the production environment. When the backup server is placed in a remote location, it also serves as a disaster recovery solution.

Continuous Data Protection
Continuous data protection, or CDP, is a flexible disk-based technology that enables businesses to quickly and easily recover their data to any point-in-time. For example, it's not uncommon for a user to accidentally delete a critical file. Or for a virus to corrupt business data. These actions render the data unusable, even though the server or other hardware resources continue to work as expected. CDP enables you to recover a version of your data to a point-in-time just prior to the accidental deletion or virus corruption. This earlier version of the data can then be restored to the production environment.

High Availability
Delivers continuous uptime with zero data loss so your applications and business data are always available when you need them. A backup server with a current replica of your application environment is always available to failover or switchover to replace your production server with an RTO of seconds to minutes and an RPO of zero. High availability dramatically reduces the risks and costs of business interruptions. In addition, recent innovations in automation and the inclusion of CDP capabilities make it an increasingly agile and easy-to-manage strategy for ensuring business continuity.

Multi-Platform Protection
Because separate business-critical applications may be running simultaneously (and interdependently) on different operating systems, some organizations require a multiplatform information availability solution. For instance, a vital ERP application may reside on an IBM Power System servers running IBM i, while business email is processed by an MS Exchange® server. Both need protection from unplanned outages to keep the business functioning and reduce the risk of lost revenue and productivity.

Take the Next Step: Ensure IT and Business Survival

When the real world costs of unplanned downtime are taken into account, an information availability solution is a cost-effective strategy for protecting businesses from serious injury. In particular, small to mid-sized businesses can benefit significantly from information availability solutions because they are generally more vulnerable to severe damage from unexpected outages and have fewer resources to stage a recovery.

"The information protection requirements in the Disaster Recovery regulatory demands will allow only short gaps of missing data or information due to an event. This means that doing daily back-up to tape is no longer sufficient."
— Availability.com

An information availability solution shouldn't be hard work or beyond your budget. They are affordable, easy-to-manage solutions that provide significant benefits to small and midsized businesses by minimizing the risks and consequences posed by unexpected IT outages. An information availability solution:

- Lowers the risk of significant costs to business such as lost revenue, productivity, legal penalties and brand damage caused by unplanned downtime.
- Protects business relationships with customers, partners and suppliers by ensuring that applications and data will be available to satisfy their needs and unique schedules.
- Enforces service level agreements by maintaining predictable RTOs and RPOs in the event of an IT outage.
- Enhances ROI on existing resources by assuring they will be available to generate revenue and support business processes.
- Ensures compliance with government and trade regulations by securing email and record retention requirements and protecting the availability of business data and reporting processes.

About Vision Solutions

"… it is no longer acceptable to have system problems that impact the quality or availability of key data and information."

— Availability.com

With over 25,000 customers globally, Vision Solutions is one of the industry's largest providers of business continuity and information availability solutions for IBM® i, Windows®, Linux®, AIX®, and Cloud environments. Vision's trusted MIMIX®, iTERA® and Double-Take® brands keep business-critical information continuously protected and available. With an emphasis on affordability and ease-of-use, Vision products and services help customers achieve their IT protection and recovery goals, which in-turn improves profitability, productivity, regulation compliance and customer satisfaction. Vision Solutions also offers the tools and competency needed to migrate complex, multi-layered computing environments. These solutions are designed to eliminate the strain on resources, dramatically reduce server downtime, and offset the risks associated with migrations. Regardless of OS or hypervisor, Vision Solutions offers the technology needed to make every migration a success.

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