Three Compelling Drivers for Implementing a High Availability Solution on an IBM i Cloud with MIMIX®

The emergence of the IBM i Cloud along with dramatic changes in costs have made downtime-reducing solutions accessible for companies of all sizes.

WHITEPAPER

CONNECTRIA® HOSTING

Introduction

Until recently, high availability solutions for IBM Power Systems servers running IBM i were reserved mostly for larger enterprises with on-premise or dedicated hosting solutions. Given the emergence of the IBM i Cloud, high availability is now dramatically easier to use and a less expensive alternative for organizations of all sizes. Today, just about anyone running an IBM i environment can now afford the “luxury” of real-time, offsite data protection, as well as rapid and complete data recovery in the Cloud.

Fortunately, this shift is occurring just as downtime is causing more of a disruption and expense to businesses than ever before. With technology costs dropping and downtime costs skyrocketing, all organizations have a huge incentive to evaluate high availability technology.

This white paper is a collaborative effort between Connectria Hosting, a pioneer in the development of the IBM i Cloud, and Vision Solutions, the leader in High Availability and Disaster Recovery solutions including MIMIX®, the standard for complete, scalable HA/DR protection for the IBM i. It will provide a review of the core causes and costs of both planned and unplanned downtime and will then provide a detailed discussion of current options for IBM i High Availability and Disaster Recovery in the Cloud. Most importantly, as you read you will learn why true HA and DR protection are now within reach of even the smallest of businesses.

RPO vs. RTO

Before looking more closely at the cost factors of high availability (HA)—and why each has changed so significantly—it is helpful to first understand the concepts of recovery time objectives (RTO) and recovery-point objectives (RPO).

The graph in Figure 1 shows a variety of common IBM i business continuity technologies in which one axis indicates the time it takes to recover data after a failure/disaster (RTO), and the other axis indicates the completeness of data that is ultimately recovered (RPO).

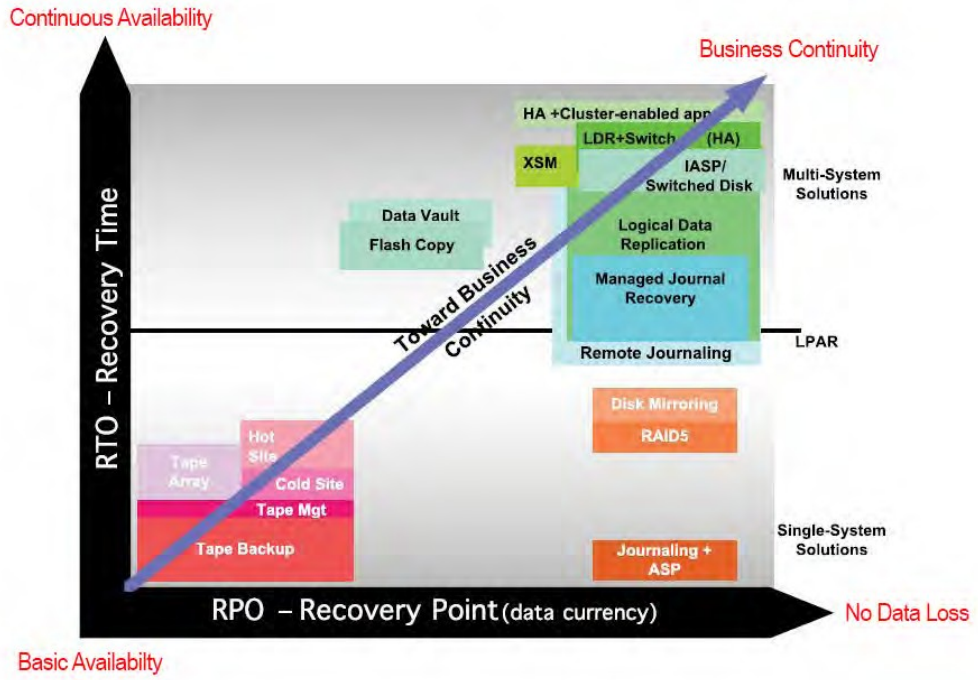

Figure 1 – RPO and RTO and the spectrum of IBM i DR solutions/strategies.

Companies have a huge incentive to evaluate IBM i high availability technology.

At the low end of the disaster recovery (DR) spectrum is tape backup (basic availability) and at the high end is high availability (HA)—a process more technically known as logical data replication-plus-switchover (LDR+Switch), which rapidly moves users and processes to a fully mirrored secondary server in order for it to assume all or most of the functions of the production server.

Unfortunately, the perception of companies is that HA technology is so much more expensive than basic disaster recovery protection that it is considered “out of reach” in terms of both cost and complexity. But, in line with most other computing technologies, the range of options between the most basic DR protection and the high-end, fault tolerant, enterprise-scale solutions has increased, and overall, the cost of all the options has come down, radically in some cases. When introducing the option of an HA solution via a hosted Cloud, the price points become decidedly more attractive.

High Availability Cost Factors

High availability is certainly not "cheap" when you consider all of the components that are needed. What has changed is how the cost of each of these factors—each for its own reasons—has dropped. Here are the major components that contribute to the cost of an HA solution.

Computer system downtime costs American businesses one million dollars per hour.

Hardware—A second IBM Power Systems server is needed, with enough capacity to accommodate the storage of replicated data and potential production demands. For instance, depending on how fully you want to run your applications from your backup environment during planned and unplanned downtime, this server may need to handle the same scale of transaction volumes and devices supported by the production machine. If less than full capability is acceptable during downtime, adjustments can be made. But in the end, a second server, ready to run, is a must.

Communication Bandwidth—If the second Power Systems server is located off site, which is what is necessary to have true disaster recovery protection, then sufficient communication capacity (bandwidth) is needed to accommodate the amount of data flowing to it from the production machine. This includes the I/O processing capacity of the backup server and the communication lines between sites.

High Availability Software—This component executes, manages, and monitors the replication or mirroring of designated business-critical data to the backup server. It also provides the ability to efficiently move users and processes to the backup server during downtime events. In addition to the initial purchase cost for this software, annual maintenance contracts and installation and training costs must be considered.

High Availability Management—As with any other infrastructure software or system, some level of staff time is required each day to monitor and manage the data replication processes to ensure that the mirrored data is accurate and usable when needed. In part, the amount of time needed for this task depends on the scale of your environment. But the self-managing capabilities of the HA software can have an even bigger impact. Even large scale HA environments can be easy to manage, with the right software.

So what has changed? Why should you reconsider whether you can justify investment in a true high availability solution? Here are three reasons:

Reason #1 – Affordable Cloud Solutions

It's no secret Power Systems machines pack a lot of bang for the buck, and the current configurations and pricing models of IBM Power Systems running IBM i make buying a second machine for high availability significantly less costly than it was, even just a few years ago. But purchasing or leasing a 2nd IBM i and housing it in another data center (with management) may still be out of reach for many organizations. A hosted solution is an affordable and proven alternative. The core investments (e.g. hardware, communications, software, management) are absorbed by the hosting company and "rented" by customers at a fraction of the cost of doing it themselves. With the emergence of the IBM i Cloud, organizations may now leverage Power Systems logical (LPAR) and physical partitions (e.g. processing core, memory, disk) in the increments they need.

A hosted IBM i Cloud introduces a number of other advantages as well, including:

- Rapid provisioning
- Scalability
- Flexibility
- Ability to pay for only what you use
- Shifting from a capital expense model to operating costs
- Opportunity to take advantage of the latest IBM technologies
- Allowing your IT staff to focus upon more strategic initiatives, not managing servers

Trends towards reducing costs by eliminating hardware, communication, and management resources, combined with the availability of more flexible HA software models, make hosted Cloud HA/DR solutions an affordable and advantageous option.

A hosting provider may pass along savings from trends attributed to each factor that contributes to High Availability costs:

1. Decreasing cost of hardware

The cost of Power Systems servers are decreasing. Not only can a hosting provider transfer these savings to you in the form of an affordable, fixed monthly cost, they can also leverage the flexibility of an IBM i Cloud solution. A hosted IBM i Cloud can be configured to provide flexible growth options which result in additional costs savings until more resources are needed. They can also configure your IBM i Cloud to best fit your needs, including HA and DR. For instance, if you intend to replicate data only for disaster recovery purposes (not to run applications during downtime on the backup machine but only to be able to retrieve the data from it), an IBM i Cloud provides an economical option with enough power configured to handle replication. This at least keeps your “backup” current and on-disk, not just on tape.

Another alternative is to configure a Cloud with enough capacity to run critical applications for a short amount of time, or for a limited number of high priority users. The hosting provider may leverage the most suitable IBM i Cloud that allows you to run them just as a replication target under normal conditions, but gear up to engage extra processing power when it is needed (i.e. after a switchover).

An IBM i Cloud can be configured with a minimum amount of processing power to keep the costs associated with interactive users down. When needed, the Cloud can be rapidly provisioned for what you need when you need it.

2. Decreasing cost of communications bandwidth

The cost of communications bandwidth has greatly decreased in recent years. A hosting provider can reflect these savings in the bundled, fixed monthly price of its IBM i Cloud solution. A hosting provider may also provide added protection by housing your production and/or backup solution at different locations.

3. More favorable price models of High Availability software

HA software has changed in a number of ways. In general, as the state of the art has moved forward, vendors have begun to offer HA software products in different configurations and pricing models that suit their clients. A hosting provider is able to take advantage of this trend, incorporating new monthly priced HA software models into their monthly-based hosting services for a consistent approach.

Unexpected glitches can arise during almost every routine or periodic maintenance procedure.

HA Core Competencies

For these reasons, though, you need to consider openly and realistically what level of HA and DR capability your company needs and can actually afford. You might be pleasantly surprised when you do the math. When you consider how much downtime is costing you already, the return on your investment, due to savings in planned downtime costs, may put a more capable, complete HA product within your reach. In other words, you have choices. But don't just look at price or just at features. Consider the overall value and ROI, even as you ensure you are getting the necessary HA functionality and support you truly need.

4. Decreasing cost of HA Management

With many software applications, it often costs more to manage the software than to purchase it. The same can apply to high availability software, but just as power and capability are increasing, with some HA products, the management time required is actually decreasing, due to smart and powerful automation of the most time consuming tasks. High Availability products that require an operator to pore through reports and manually find and repair objects that are out of synchronization can tie up staff for 20 or more hours per week. New-generation products with the latest autonomic (self-healing, self-managing, self-configuring) technologies can reduce the amount of labor needed to monitor/manage the product to half an hour or less per day. A hosted IBM i Cloud solution includes managed services performed by expert personnel. Using a hosting provider's staff avoids the high cost of dedicated employees, and a provider's 24/7 support guarantees they are there when you need them.

Reason #2 – The Efficiencies of MIMIX for Cloud Migration and HA

Solutions that are designed to provide high availability (HA) or that are based on HA principles can help you to eliminate downtime during migrations, while also helping you to avoid many of the sources of migration failures. How? Consider how HA solutions work. They monitor your production system and replicate data and object changes to a second system that serves as a hot-backup server. The software also typically provides an easy and fast way to switch users to the backup system when your production server becomes unavailable or you need to take it offline to perform maintenance.

HA and HA-like solutions can maintain system availability during most types of migrations because the replication processes that underlie those solutions usually don't require that the production and backup servers run the same version of an operating system or that the servers be of the same size. This means that you can place an upgraded server into the HA topology without needing to upgrade all servers in the topology simultaneously.

MIMIX Move and MIMIX Availability provide a smooth transition to an IBM i Cloud

Because the replication software keeps the old and new servers continuously synchronized, without impacting production operations, there is no need to shut down operations during the migration process. As a result, replication-based migration tools make it simple and easy to migrate to the cloud even during normal business hours.

MIMIX Move

MIMIX Move, which migrates IBM i servers virtually eliminates the downtime traditionally associated with system upgrades and migrations by using Vision's advanced HA technologies to rapidly copy business-critical data to your new IBM i Cloud and keep it synchronized with your production system in real-time—without downtime. After validating your new environment, you can move users and processes to the new environment in just minutes.

MIMIX Move can keep your old and new systems synchronized indefinitely, allowing you to take your time to validate the new system while users work normally on the old one. While you're performing expert and careful validation, MIMIX Move keeps the new system current by migrating changes from the old system as they happen. Finally, when you're ready to flip the switch, your hosting provider's staff will pick up on the new system exactly where they left off on the old one.

When using manual methods or traditional data copy tools, data and objects that are not transferred to the new system are common points of failure for migrations. MIMIX Move eliminates this risk by mirroring IBM i data, user profiles, authorities, data areas, data queues, IFS files, programs, spool files and all other objects needed for a successful Power Systems upgrade or migration.

Because a virtual machine looks the same as a physical machine to MIMIX Move, migrating from physical systems to partitioned virtual servers, or to a Cloud server, is as easy as migrating between physical systems. Migrations can be trying and complex, but with MIMIX Move, you're not in it alone. From start to finish, your hosting provider's personnel work closely with you to install and configure the software, enable and monitor synchronization, and perform the final switch.

MIMIX Availability

Once migrated, MIMIX Availability for IBM i provides simple, yet robust availability by efficiently replicating business application transactions in real time to maintain a local and/or remote switch-ready recovery server(s).

In the event of a production server failure or any other type of unplanned outage, your organization will be able to continue business operations on the recovery server, without data loss and with minimal downtime.

MIMIX Availability also virtually eliminates downtime caused by planned maintenance activities such as daily backups (saves to tape), upgrades and housekeeping tasks, thereby keeping mission-critical applications running 24 x 7 x 365.

MIMIX Availability's features differentiate it from other products and allow it to meet the requirements of customers with some of the most complex of IBM i environments. It can address the needs of organizations of any size—from small and medium-sized businesses to major global corporations—that require, or may expand to require, the highest level of protection, performance, flexibility and manageability.

Reason #3 – The Rising Cost of Downtime

The Falling Cost of HA Ownership

How it adds up…
Given all of the ways that the cost of high availability has decreased, the total cost of ownership is significantly less than it was just a few years ago:

- In general, a second Power Systems server for HA purposes costs many thousands less than it did just a few years ago.
- The cost of communication bandwidth has plummeted. In 2000, the cost of bandwidth was many times higher than it is today.
- HA software providers have adjusted their pricing models to be more in line with hosting provider services.
- The daily labor cost to monitor and manage HA is now typically only half an hour or less, instead of a half-time to full-time person.
- A hosted IBM i Cloud HA solution provides a turnkey, affordable option for organizations of all sizes, and can be easily implemented with the efficiencies of MIMIX.

Now that you have a better understanding of the how the costs of high availability solutions have changed, let's take a look at the costs and causes of downtime to see how quickly your investment in HA can be recouped.

Time windows when system access can be restricted in order to perform maintenance tasks are shrinking. For many IT shops, the luxury of scheduled downtime has disappeared altogether. This can be primarily attributed to three factors that keep stretching the length of the business day:

1. Economic conditions dictate that companies can't afford to buy additional systems, so new, expanding production and reporting workloads are moved to "off-hours", to maximize the utilization of existing systems. But as a result, the time available for non-production maintenance work, such as software updates and tape backups, is reduced.

2. As business grow, they move from operating regionally to nationally, or from nationally to internationally. Or operations move from one eight-hour shift to two. Or business partnerships and supply chain operations require companies to keep their systems continuously available.

3. To offer Internet-based retail websites, companies must deliver 24 x 7 systems availability, just to be able to stay in business.

In the past, discussions about downtime used to be about planning for site disasters or system failures. In reality, the largest durations of downtime are attributed to system maintenance tasks. In fact, only five to ten percent of downtime is caused by unplanned events and only ten percent of that (about one percent of the total) is due to site disasters.

The other 90+ percent comes from the following:

- Data backups (nightly, weekly, and monthly saves)
- Reorganization of files to reclaim disk space and improve performance
- Vendor software upgrades and data conversions
- IBM OS release upgrades and PTFs
- New application software installations
- Hardware upgrades
- System migrations

Every hour that a system is unavailable—whether from planned or unplanned events— causes significant costs to be incurred by a business…often far more than you think. Plug your numbers into the following back-of-the-envelope formula to get a general idea of the total annual direct and indirect cost of downtime:

1. Take the value of the business lost during an hour of system downtime (whether from planned or unplanned downtime), then add the total hourly wage (including all benefits) of all employees that are idle during that hour of downtime.

2. Now multiply this figure by the estimated number of hours of planned system downtime during a year.

3. Finally, multiply the result by two, to take into account the costs of this lost employee productivity, lost business reputation, and lost business—both now and in the future —from your lost customers.

Despite the fact that the largest cause of downtime is from planned events, and even though the IBM Power Systems server is considered one of the most reliable systems available (some studies have put its reliability at 99.95%), it is vital to put unplanned events into the equation. Simply stated, unplanned events that impede access to business-critical systems for an extended period can cost your business dearly and can even spell doom for a business. According to US Bureau of Labor, 93% of all companies that experience 'significant data loss' are out of business within five years.

Consider the following from the IBM Redbook, *Clustering and iASPs for Higher Availability on the IBM eServer System i Server*, "According to one IBM study, the System i server averages 61 months between hardware failures. However, even this stellar record can be cause for availability concerns. Stated another way, 61 months between hardware failures means that nearly 67 percent of all System i servers can expect some type of hardware failure within the first five years."

Given the above, it is a safe bet that you will face a significant system failure or site disaster more than once during your career. When companies take a realistic look at downtime costs—both planned and unplanned— a high availability solution quickly pays for itself.

Will a competitor take better care of your customer than you did?

Conclusion

Organizations running mission-critical applications in an IBM i environment now have a viable HA solution regardless of their size. A hosted IBM i Cloud with MIMIX can leverage trends of decreased costs for hardware, communications and management, as well as hosting-friendly software models which may be bundled in a single solution with a predictable, budget-friendly monthly price. Migrating your infrastructure, data and applications to a High Availability IBM i Cloud may be done quickly, accurately and without disruption using the industry leading MIMIX products. Companies that used to precariously rely on tape backups as their sole disaster recovery strategy can now easily acquire more robust, full featured HA and DR protection, for far less than ever before.

Easy. Affordable. Innovative. Vision Solutions.

Vision Solutions® is the world's most trusted provider of high availability, disaster recovery, migration and cross-platform data sharing solutions for AIX, IBM Power Systems and cloud computing markets. Our solutions make it easy for organizations to adopt cloud-based disaster recovery strategies, perform near-zero downtime migrations without risk, share data in real-time across platforms and move, protect and restore data, applications and operating systems of any kind on any combination of physical, virtual or cloud servers.

Our Double-Take®, MIMIX® and iTERA™ products eliminate downtime for organizations of all sizes and are backed by multi-lingual customer support and a global partner network.

For more information call: 1.800.957.4511 (toll-free U.S. and Canada)
1.801.799.0300 or visit visionsolutions.com.

Also find us on:

Facebook:	http://www.facebook.com/VisionDoubleTake
Twitter:	https://twitter.com/VSI_DoubleTake
YouTube:	http://www.youtube.com/VisionDoubleTake
Vision Solutions Blog:	http://blog.visionsolutions.com/

VISION® SOLUTIONS

Premier Business Partner IBM™

MIMIX® MOVE™

MIMIX® AVAILABILITY™

Connectria Hosting. No Jerks Allowed®.

Connectria Hosting provides award-winning cloud computing, managed hosting and custom managed hosting solutions for more than 1,000 customers in over 30 countries worldwide. We are experts in complex multi-vendor solutions, and we support the broadest range of technologies, managed services and security in the industry.

At the core of Connectria is our No Jerks Allowed® company philosophy. As The Jerk Free Company®, we've established a unique culture where every individual goes "the extra mile" to take care of our customers. Being The Jerk Free Company® extends beyond our people too. We make it easy to do business with us through flexible terms, scalable solutions and straight-forward pricing to serve the hosting needs of large and small organizations alike.

Connectria has a long history and experience hosting IBM technologies. We're an Advanced IBM Business Partner and 4-time IBM Beacon Award Winner, most recently recognized as the Beacon Award Winner for our HIPAA Compliant Private Cloud, with Disaster Recovery, based upon the IBM PureFlex Platform. Connectria provides a variety of hosting services for IBM i, AIX, DB2, PureFlex, Netezza, Lotus Notes and WebSphere, among others.

Connectria is proud of our track record in supporting a variety of IBM customers with superior managed hosting services. In fact, we're one of the largest IBM hosting providers managing hundreds of IBM environments for customers around the globe.

For more information, visit connectria.com, call 1.800.781.7820, or look for Connectria Hosting on your favorite social media site.

For more information call: 1.800.781.7820 (toll-free U.S. and Canada)
1.314.587.7000 or visit connectria.com.

Also find us on:

Facebook: https://www.facebook.com/ConnectriaHosting
Twitter: https://twitter.com/Connectria
Connectria Blog: https://www.connectria.com/blog/category/ibm-services/

CONNECTRIA® HOSTING
10845 Olive Blvd., Ste 300
St. Louis, MO 63141
800.781.7820
314.587.7000
connectria.com

nojerksallowed.com