MIMIX Availability:

Faster recovery. Stronger data protection. And a smarter way to manage high availability for IBM i.

Executive Overview

Premier Business Partner IBM

VISION SOLUTIONS

Introduction

MIMIX Availability for IBM i is purpose-built for the most demanding enterprises, providing innovative features that minimize administration while ensuring the integrity of your information, applications and systems. MIMIX easily integrates into complex environments and is scalable from SMB to enterprise, providing simplified availability in a complex world.

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The Availability Imperative

"In ten years of using MIMIX, I've seen Vision deliver improved replication speed, data synchronization, and backup protection in every release. MIMIX 7.1 builds on the performance increases we received from MIMIX 7 with additional replication and auditing performance gains for our HA environment. Service and support gave me everything I needed. I couldn't ask for more."

Michael Martin, Systems Administrator, Alex Lee, Inc.

The pace and competitive landscape of global commerce today dictates the need for a flexible, resilient and available IT infrastructure that provides 24 x 7 x 365 access to applications and information. Any interruption or downtime to your data, systems and applications poses a threat to business operations and can have a major cost impact to your organization's bottom line, potentially impacting customers, reputation and revenue. Achieving the new levels of high availability required to support mission-critical systems puts increased demands on IT and data center professionals.

Availability for IBM i: Over 20 Years of Progress

Vision Solutions has provided availability and recovery solutions to the IBM i market for more than 20 years and, during this time, we have learned a great deal about what's required for us to continually lead the way in providing IT with solutions that enable business resiliency. Today, we provide the most advanced software-based availability solutions in the marketplace and MIMIX Availability is our flagship for IBM i; in fact, MIMIX today serves over 2000 customers.

Now, more than ever, Vision Solutions is committed to leading the way in providing innovative, affordable and easy-to-use availability solutions that enable IT and data center professionals to enable business resiliency for competitive advantage.

—Doug Piper, Vice President of Product Strategy, Vision Solutions

MIMIX Availability: Faster recovery. Stronger data protection. And a smarter way to manage high availability for IBM i.

MIMIX Availability for IBM i provides simplified yet robust availability by efficiently replicating business application transactions in real-time while maintaining local and/or remote switch-ready recovery system(s). In the event of a production system failure or unplanned outage, your organization is able to continue business operations on the recovery system 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 is offered in three versions:

- **MIMIX Professional** provides small- and medium-sized business with the full power and capacity of an enterprise high availability solution, with minimum labor and skill requirements.
- **MIMIX Enterprise** delivers all the functionality and flexibility required by large and/or demanding enterprises, while still providing an easy-to-use, easy-to-switch solution.
- **MIMIX Global** simplifies and automates the monitoring and switching of multi-node MIMIX environments and provides full integration with PowerHA for IBM i environments.

Seven Reasons for MIMIX

When evaluating any availability solution for IBM i, there are a handful of critical functions that must be considered. Over the next several pages, we'll provide an overview of seven of the most essential availability functions and how each is addressed by MIMIX Availability:

1. Advanced Replication Technology and Performance
2. Simplified Management
3. Customizable Automation
4. Single Button, Automated Switches
5. Auditing for Data Integrity and Switch Confidence
6. Automated System i Optimization
7. Integrated Control of Hardware HA

1. Advanced Replication Technology and Performance

MIMIX Availability has a strong architectural foundation built upon the remote journaling technology native to the IBM i operating system. This foundation, combined with two decades of performance tuning and stress testing, has resulted in an availability solution that is uniquely optimized for IBM i—one that delivers the highest levels of performance and flexibility. MIMIX's superior replication technology and performance allows for scalability from SMB to enterprise environments and meets the most stringent recovery point and recovery time objectives.

1a. Strong Architectural Foundation

The IBM i operating system provides a data movement capability called "remote journaling." As the name suggests, remote journaling sends all transaction information that is being journaled to a remote target (backup) system. Because remote journaling is a feature of the operating system, the data is replicated at the operating system level, rather than at the application level above the OS. Minimal replication overhead is incurred on the production machine as the majority of the work is done on the target system where replicated changes are applied. Because the replicated journal entries reside on a remote server, they are protected when a failure or disaster occurs on the production system.

Remote journaling in the IBM i operating system is the foundational component of MIMIX Availability's logical replication technology, protecting production environments to backup servers in real time with zero data loss. The use of logical replication technology produces a number of benefits:

- **Rapid, predictable recovery time.** Because remote journaling maintains a fully operational backup system that is ready to become the production server at any time, the time required for MIMIX Availability to switch is dependent only upon the completion of apply processing on the target system. In the event of an outage, MIMIX's optimized apply processing can be monitored as it rapidly works through the backlog, and the time to complete the switch can be predicted.
- **Minimal bandwidth requirements.** MIMIX replicates only changes to objects. This minimizes bandwidth needs and network costs, particularly in comparison to hardware technologies that replicate entire sectors.
- **Support for multi-node enterprise environments.** MIMIX Availability's flexible architecture supports virtually any application deployment, network topology and virtual environment.
- **Access to replicated data on multiple nodes.** Remote journaling allows journal entries to be broadcast to as many as 255 target nodes. Because each target system is fully operational, the replicated data can be used for tape backup (saves to tape), database queries, upgrade testing, patch testing and more with no impact to production systems.
- **Protection from data loss.** Remote journaling technology is application aware, meaning that it sends changed data to the target at the completion of each transaction, guarding against data loss.
- **No propagation of damaged objects.** Remote journaling will not replicate damaged objects to the backup system, unlike hardware replication technologies that will replicate changed sectors without awareness of damage.
- **Protection even when down.** Remote journaling allows MIMIX to maintain data protection even when the backup database is not available. Changes are buffered at the backup system until the backup database is available to apply changes once again.
- **Flexible operating system and storage support.** MIMIX Availability provides flexible support for any combination of IBM i V5R4, 6.1 and 7.1. In addition, it is storage agnostic, supporting different types of internal and external storage hardware at the source and target.

1b. Tuned for performance

Vision's world class staff of software engineers has extensive experience working with the IBM i operating system and its predecessors. As a result, they have deep insight into how to tailor MIMIX Availability's replication technology to the operating system and how to tune it to achieve the highest level of data replication and recovery performance. Among their many innovations are:

- **Multi-processed applies.** The apply process on the target system is accelerated with intelligent multi-processing.
- **Parallel access path maintenance.** Replication performance is enhanced by elegantly managing access path rebuilding without interfering with apply processing.
- **Caching**. Innovative caching schemes are applied at the target side to optimize disk write performance.
- **Commit cycle handling.** Performance in environments with long commit cycles is optimized by handling applies during the commit cycle without waiting for the commit outcome.

Enhanced performance means that MIMIX Availability moves and applies data to the target (backup) system more quickly and with fewer errors. The faster the data is moved to the target, the smaller the window of potential data loss in the event of a system failure. And the smaller the window of data loss, the tighter the Recovery Point Objective (RPO) that can be met.

Also, the faster the data is applied at the target, the smaller the apply backlog that must be processed prior to completing an unplanned switch, and the more aggressive the Recovery Time Objective (RTO) that can be achieved.

Further, better HA performance means increased scalability of the solution – from SMB to the enterprise – as the solution continues to meet ever increasingly stringent recovery point and recovery time objectives.

2. Simplified Management with the Vision Solutions® Portal (VSP)

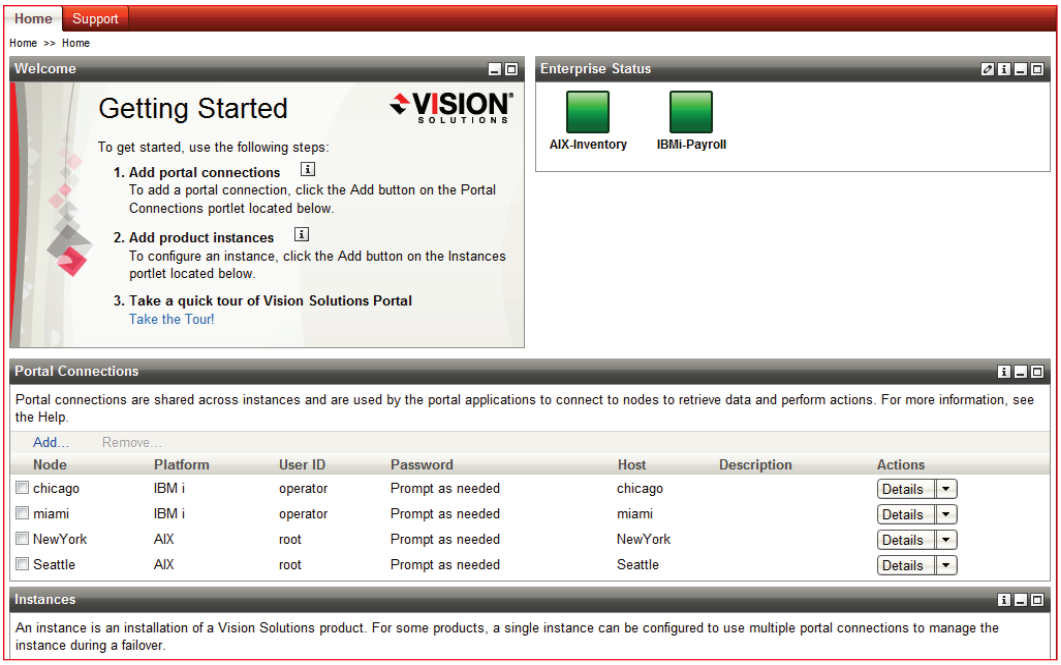
MIMIX Availability is managed through the Vision Solutions Portal (VSP), an easy to use, highly configurable, browser-based user interface. Built on an industry-standard portal architecture, VSP enables user-selected "portlets" to be arranged visually to provide a customized view of the MIMIX environment for monitoring, management and control. With a quick glance at the VSP, administrators have a color-coded overview of system status and alerts.

The VSP is intuitive to use, and its high performance, push technology keeps information in the interface constantly up to date. The VSP also possesses an extensive context sensitive help system with fly-over help notes that puts information at administrators' fingertips and allows them to utilize the interface to its fullest. Alerts and status information are also sorted by highest severity conditions with smart prompting to assist in addressing the steps for resolution.

Administration of multiple Data Groups can also be simplified by combining them into Application Groups in the VSP. Application Groups can be managed and switched with a single command, rather than requiring that each Data Group be switched independently.

Key features of the VSP include:

- Color coded enterprise status display for at-a-glance monitoring
- Customizable views for each user that can be configured to match their style and needs. All logins profiles are integrated with the IBM i OS security profiles.
- Single button start, stop and switch procedures at the Data Group or Application Group level
- Comprehensive audit tab complete with audit schedules and multiple levels of audit results
- A procedures page containing the details of each procedure, procedure history and step status
- An analysis display which includes:
  - Detailed lists of all objects that have been replicated
  - Verification of the audit status of each replicated object
  - Graphs showing transaction volume and apply backlog levels over time
  - Historical reporting capabilities that provide better insight and analysis of audits, switches, procedures and steps



The VSP provides a single, consolidated view of multiple instances of MIMIX Availability as well as multiple products on multiple platforms, including iOptimize, Double-Take RecoverNow for AIX, and PowerHA for IBM i environments (when used with MIMIX Global).

3. Customizable Automation

MIMIX Availability comes with pre-defined HA procedures that are each comprised of a series of steps. For example, MIMIX comes with procedures for common switching operations like planned switch, unplanned switch, switch pre-check, end application group replication, end target processes, and start application group replication. These procedures are managed in MIMIX Availability's "Procedures and Steps" framework. This framework is open to administrators for customizing pre-defined procedures, creating new procedures, or creating new steps within a procedure. Templates for creating new procedures and for creating new steps in a procedure are provided.

MIMIX Availability also provides tracking and reporting on each procedure and step, giving you the capability to track a procedure's progress at a fine level of granularity as well as to obtain reports on past procedure performance.

The automation capabilities of MIMIX Availability are truly powerful, allowing you to increase the reliability and predictability of your availability operations. The use of standardized procedures eliminates human error, and the flexibility to modify and extend them as needed provides administrators with the power to tailor the system to meet their needs.

4. Auditing for Data Integrity and Switch Confidence

It is critical that replicated objects are regularly monitored to identify those that have become out of sync with the production system, and that out of synch objects are brought back to synchronization. Auditing ensures the integrity of the objects on your backup system and allows you to be confident that switches will complete successfully.

MIMIX Availability performs comprehensive, object-level audits on your replicated data. In fact, eight individually scheduled audits are performed on each Data Group for thorough coverage. MIMIX's advanced auditing technology identifies objects that have become out of sync on the target system and automatically corrects or heals them.

MIMIX Availability also includes priority-based auditing features that allow unchanged objects to be audited less frequently, thereby enhancing performance. Administrators have the ability to customize audit frequency for new objects, changed objects, unchanged objects, and objects which have been audited in the past without differences. Priority-based auditing allows audits to complete more quickly and efficiently, an important consideration for very large environments.

In addition to scheduled audits, MIMIX Availability monitors the data on the target system and notifies administrators of unauthorized activity in real time, along with the identity of the user that made each change. Since MIMIX Availability detects target side object changes in real time, it gives you the option to repair these objects based on policy, rather than waiting for the next scheduled audit.

Visibility into the audit process is provided through a detailed history of audit results as well as audit status for each object. With auditing and self healing, real time monitoring of the target system, and detailed visibility into the results of your audits, MIMIX Availability gives you confidence that your target data is in sync and ready to switch.

5. Single Button, Automated Switches

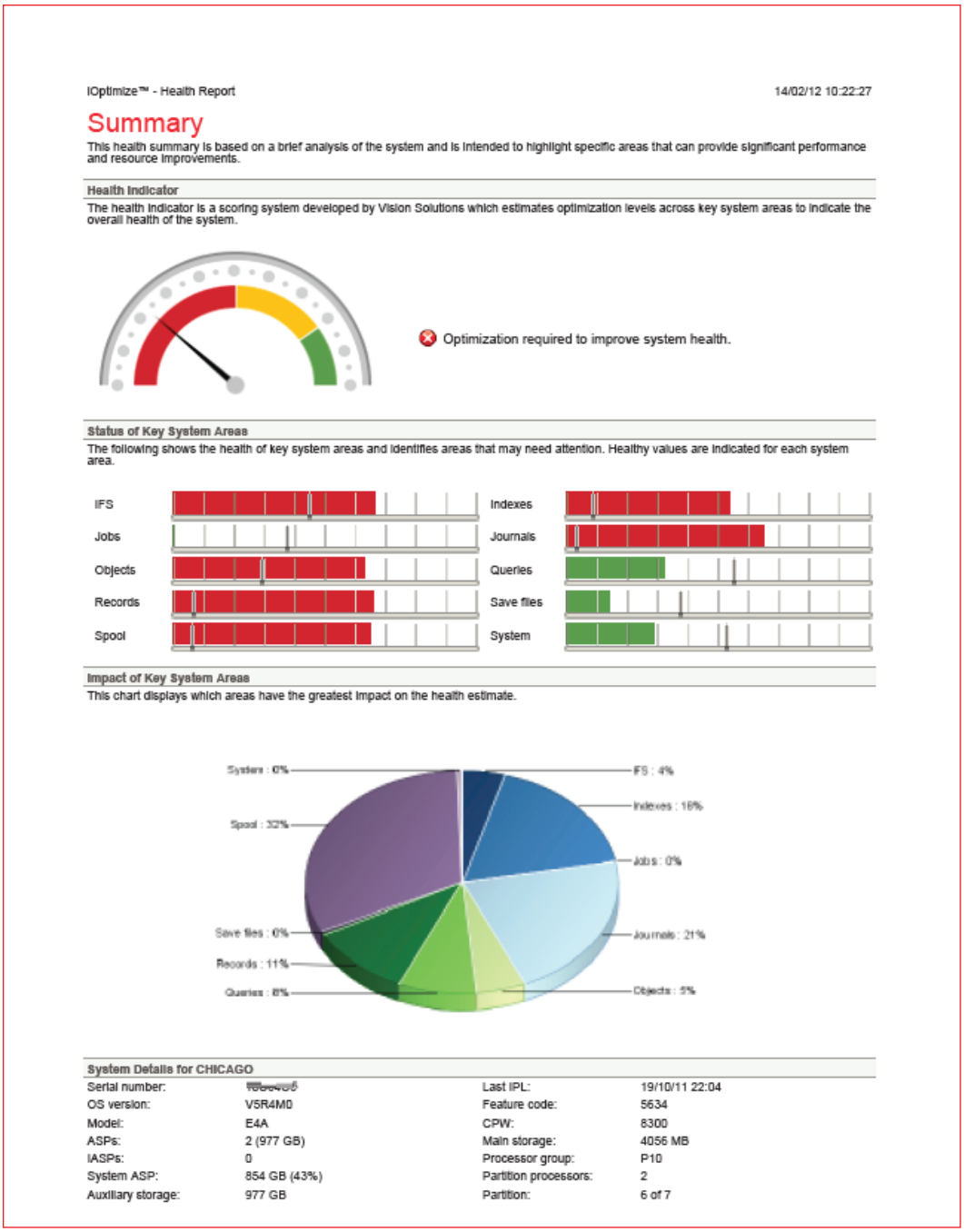
Single button switches are performed thru the VSP with a simple click of a button. The fully-automated switch procedure is built with MIMIX's procedures and steps automation framework, giving you the reliability of a pre-defined and repeatable procedure, the ability to track the steps of the procedure and monitor its progress, and the opportunity to customize the procedure.

MIMIX Availability comes pre-configured with a robust set of procedures that can be customized and enhanced as needed, including common switching operations like planned switch, unplanned switch, and switch pre-check. Using automated procedures ensures a reliable switch and allows historical analysis of past switches at a granular level. Switches can be done on an entire Application Group (a combination of Data Groups) at the click of a button, making switching an easy, seamless process.

6. Integrated, Automated IBM i System Optimization

An optimized, healthy production system is the building block of an efficient, reliable availability environment. MIMIX Availability is the only solution that includes broad platform optimization as a core part of its offering, through its iOptimize feature. iOptimize is an innovative, automated optimization tool that maximizes storage utilization, accelerates performance and enhances system resilience.

iOptimize maximizes storage utilization by cleaning and optimizing DASD as well as proactively and intelligently planning for additional storage. System health is improved and performance is accelerated through automated health analysis with the option to automatically address health issues. Less replication latency, faster journal applies and better storage utilization means a more efficient availability environment.



iOptimize™ - Health Report 14/02/12 10:22:27

Summary

This health summary is based on a brief analysis of the system and is intended to highlight specific areas that can provide significant performance and resource improvements.

Health Indicator

The health indicator is a scoring system developed by Vision Solutions which estimates optimization levels across key system areas to indicate the overall health of the system.

Optimization required to improve system health.

Status of Key System Areas

The following shows the health of key system areas and identifies areas that may need attention. Healthy values are indicated for each system area.

IFS
Jobs
Objects
Records
Spool
Indexes
Journals
Queries
Save files
System

Impact of Key System Areas

This chart displays which areas have the greatest impact on the health estimate.

System : 0%
Spool : 32%
Save files : 0%
Records : 11%
Queries : 6%
IFS : 4%
Indexes : 16%
Jobs : 0%
Journals : 21%
Objects : 5%

System Details for CHICAGO

Serial number:	[redacted]	Last IPL:	19/10/11 22:04
OS version:	V5R4M0	Feature code:	5634
Model:	E4A	CPW:	8300
ASPs:	2 (977 GB)	Main storage:	4056 MB
IASPs:	0	Processor group:	P10
System ASP:	854 GB (43%)	Partition processors:	2
Auxiliary storage:	977 GB	Partition:	6 of 7

iOptimize uses the VSP user interface. Flexible sorting and display capabilities for optimization and monitoring make iOptimize simple to use. In addition, iOptimize provides over 70 localizable, printable health reports. These reports can be used to demonstrate compliance with SLAs.

7. Integrated Control of Hardware HA with MIMIX Global and VSP

Users of hardware replication technologies configured by PowerHA for IBM i can fully integrate those technologies into the VSP for centralized, simplified management and control. The integration of PowerHA technologies under the VSP umbrella allows hardware HA users to receive the benefits of centralized, simplified monitoring and control, including a single point of switch. Support is provided for PowerHA environments alone or for hybrid environments of both PowerHA and MIMIX Availability. MIMIX Global also provides SYSBAS protection, to protect objects that remain in SYSBAS or applications that are not IASP enabled.

MIMIX Global is available as a standalone product or as a companion to MIMIX Professional and MIMIX Enterprise, where it also simplifies the management of multi-node topologies. MIMIX Global comes in three editions:

- **MIMIX Global – Base Edition** provides support for fully switchable MIMIX environments of three or more nodes.

- **MIMIX Global – IASP Edition** provides all the functionality of the Base Edition along with SYSBAS protection and integration with IASP-based hardware HA technologies such as Synchronous Geographic Mirroring, Asynchronous Geographic Mirroring, Single SAN based LUN Level switching, I/O Pool switching, Administrative Domain and IBM StorWize V7000 SVC Global and Metro Mirror.

- **MIMIX Global – SAN Edition** provides all the functionality of the IASP Edition along with integration of SAN technologies such as IBM TotalStorage DS8000 Global and Metro Mirror.

The 8th Reason: Vision's People

Vision Solutions has served the needs of the IBM midrange availability market for over 20 years. At the onset of our involvement in this industry, we pioneered the infrastructure technologies to optimize performance and ensure efficient, reliable replication. For the past two decades, we have leveraged our close relationship with IBM and the insights gathered from working with thousands of customers worldwide to continually enhance our availability offerings. MIMIX Availability—our flagship solution for IBM i—is an enterprise-class solution available in three versions, providing faster recovery, stronger data protection and a smarter way to manage high availability for IBM i. In this paper, we've addressed how MIMIX addresses seven of the most essential availability functions that must be considered when evaluating a solution for IBM i. But Vision Solutions is more than just technology. We are the global availability experts, with a worldwide network of certified partners to help you maximize your availability investment and a CustomerCare team that delivers around-the-clock, around-the-globe support with the most advanced and accessible tools—plus a team of veteran industry professionals with unmatched expertise.

Easy. Affordable. Innovative. Vision Solutions.

With over 25,000 customers globally, Vision Solutions is one of the industry's largest providers of business continuity and information availability solutions for Windows, IBM i (i5/OS), AIX, Linux and Cloud environments. Vision's MIMIX, Double-Take and iTERA 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, customer satisfaction and quality of life.

Vision Solutions oversees a global partner network that includes IBM, HP, Microsoft, VMware, Dell and hundreds of resellers and system integrators. Privately held by Thoma Bravo, Inc., Vision Solutions is headquartered in Irvine, California with development, support and sales offices worldwide.

For more information call 1 (800) 957-4511 or visit visionsolutions.com. Also find us on Facebook, Twitter, YouTube or at the Vision Solutions Blog.

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