

MIGRATING IBM i SYSTEMS TO THE CLOUD



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Migrating IBM i Servers to the Cloud

IBM i servers usually run on IBM Power system hosts residing in an on-premises Data Center. i servers can also run on Power systems hosted in the cloud. Migrating your IBM i servers to the cloud provides many benefits over managing Power hardware onsite, including:

- Reducing capital budgets
- Lowering Data Center costs
- Reducing IT staffing requirements
- Satisfying auditing, compliance, and insurance requirements
- Providing business continuity during disasters or pandemic-required business closures

This white paper will help you determine whether IBM i cloud migration is right for you. We will discuss the business, staffing, expertise, and technology benefits in moving to the cloud, as well as provide a roadmap for how to make the move.



Business reasons for IBM i Cloud Migration

IBM i cloud migration provides three key benefits to your business

1. Security, Governance, and Availability—Cloud providers will satisfy all physical audit compliance requirements concerning your IBM i applications. Cloud Power system hardware resides in hardened tier 2, tier 3, or tier 4 Data Centers. Cloud DCs provide redundant or fault tolerant systems for power, HVAC, fire suppression, telecommunication lines, and 24x7 security. Data Center availability is also high at 99.671% availability for tier 2 DCs, 99.982% availability for tier 3, and 99.995% for tier 4. Many cloud service vendors provide SLAs where they guarantee minimum availability levels. Cloud security, governance, and availability capabilities exceed what most companies can provide on-premises. These capabilities should satisfy physical infrastructure security and governance requirements for auditors and insurance companies.

2. Lower Data Center operating costs—Data Center (DC) costs shrink or disappear when migrating IBM i systems to the cloud. Many organizations have already migrated Windows-based functions to cloud environments—including migrating email to Office365, personal directories to OneDrive, and Microsoft applications to Azure. Other shops still host multiple Microsoft servers on premises along with IBM I, AIX, and Linux servers on Power hardware. When you are able to migrate all your IBM Power system and Microsoft servers to the cloud, you may be able to convert your Data Center to a Data Closet, where all your users need onsite is Internet connectivity.

See the accompanying sidebar for a list of Data Center savings you can realize when you move IBM i servers and other servers to the cloud. If you are renting rack space at a managed service provider (MSP) to house Power systems, you may be able to eliminate or repurpose that space. Savings will be doubled if you are also running a target IBM i high availability server and migrate your HA setup to the cloud.

3. Transforming Capital Expenditures (CAPEX) into Operating Expenses (OPEX)—A capital expenditure occurs when your business buys or leases an IBM Power System and associated software. CAPEX needs upper-management approval, which can be difficult to obtain, especially in bad financial environments. After purchase, the business can only deduct a portion of its depreciated investment every year.

IBM Power Systems and support have a limited life. Many shops outgrow their Power hardware in three to five years, triggering an upgrade and another CAPEX approval process. If you lease Power hardware, you must renegotiate the lease when it runs out. This upgrade cycle is expensive and capital intensive.

IBM frequently offers one to three years IBM hardware and software maintenance when acquiring a new machine. After expiration, shops must buy extended hardware and software maintenance or lose support. Because older machines are more expensive to maintain, the longer you keep an IBM Power system the more expensive maintenance becomes.

When you move IBM i servers to the cloud, your cloud provider charges you a monthly fee for using their hardware and IBM i software. Your former CAPEX expenditure will transform into an operating expense (OPEX), that can be deducted from the bottom line every year it is incurred. You no longer need to get approval for upgrades or maintenance. The vendor upgrades and maintains the host machine and operating system for you.

Data Center Saving When Moving IBM i and Other Servers to the Cloud

- No longer need a secured onsite location for your servers
- Reduced need for floor space and computer racking
- Reduced need for fire suppression capabilities
- Reduced electricity for powering servers with redundant circuits, UPS units, and generators
- Lower HVAC costs
- Eliminating onsite IBM i and other server backup costs
- Reduced network storage to host applications and data
- Reduced monitoring costs as many cloud vendors offer monitoring services
- Reduced bandwidth for offsite users
- Virtual Private Network (VPN) and mobile connectivity



Staffing & Expertise Reasons

IBM i migration lets you capitalize on the cloud vendor's IBM i operational staffing and expertise. Make sure your cloud provider is a certified IBM i business partner. The cloud provider will handle all Power system and IBM i OS administration and maintenance, including:

- Power system machine configuration
- IBM i, AIX, and Linux partition creation
- CPU, disk, and memory setup and upgrades
- Hardware and OS upgrades, technology refreshes, PTFs, and maintenance

Cloud vendor expertise will take the burden off your IBM i operational staff. You may be able to move that budget to other areas. Your vendor can also attend to your backup, restore, and high availability needs, under separate cloud contracts.

However, IBM i cloud migration will not allow you to totally replace your IBM i operations staff. You will still need an organizational IBM i resource to coordinate business-related configurations on your i servers, including:

- User provisioning
- Production and third-party software setup and configuration
- IBM i printer setups
- Auditing functions
- Work management functions, such as creating subsystems and assigning storage pools
- EDI setups
- Email and fax setups
- Other business-specific configurations

Technology Reasons

Moving IBM i applications to the cloud provides these benefits versus running them on-premises.

- 1. IBM i, AIX, and Linux hosting offered as SaaS or IaaS**—Customers can migrate their IBM i servers as Software as a Service (SaaS) or Infrastructure as a Service (IaaS) installations. Vendors providing SaaS migrations offer an IBM i system and IBM i tools in the cloud, without using the cloud vendor's network infrastructure. IaaS vendors offer IBM i system and tool migrations plus the infrastructure needed for outside users to access the i system (telecom, firewalls, etc.). Since you can also run AIX and Linux servers on IBM Power hardware, cloud providers will be able to host these servers for you, if needed.
- 2. Scalability**—Cloud providers can quickly add disk, memory, or CPU capacity to IBM i servers, on demand. Temporary increases can be activated to meet seasonal demand, such as during the holiday season, and removed when the event is over. In contrast, it can take several weeks to order and install extra disk, memory, or CPU on an on-premises machine.
- 3. Cloud Backup and Recovery**—Backup and restore vaulting services are available for migrated i servers. Cloud backups are encrypted. Redundant backups are stored in at least two different geographically dispersed locations. Local client site backup appliances for faster onsite backup and restore are also available. Customers can manage backup schedules and restore data from any point in time.
- 4. Monitoring**—Some cloud providers provide IBM i 24x7 system monitoring for system health, application errors, and service level agreement (SLA) compliance. Issues can be escalated to client staff. Cloud monitoring services can replace more expensive third-party monitoring packages that require yearly maintenance.
- 5. Quickly create IBM i, AIX, and Linux cloud servers**—Companion servers (such as test systems, quality assurance, and development servers) can easily be migrated and added to your contract.
- 6. High availability (HA)**—Enterprise level host-based and SAN-based replication and role switching are available. Many vendors offer SLAs for RPO and RTO requirements.
- 7. Disaster Recovery as a Service (DRaaS)**— In case of disaster, DRaaS ensures that servers can quickly failover to a cold or hot spare virtual server. System recovery can occur up to ten times faster using DRaaS cloud recovery versus using standard system recovery techniques.

Research Your Migration and Choose Your Vendor

Here is a list of activities for determining which vendor you should choose to migrate IBM i and other servers to the cloud.

Determine your intended server migration list—Which IBM i servers do you want to migrate to the cloud (production, development, test, quality assurance, Web, etc.)? What other servers besides IBM i will you migrate to the cloud (AIX, Linux, Windows)? Each server may not be immediately migrated, but you will want to create a long-term migration list to insure you are selecting a cloud vendor who can handle all your servers. You will want your servers to be hosted in only one vendor's cloud environment, rather than in multiple clouds.

Which cloud providers can handle your intended migrated server list? Some vendors may only host Windows servers in the cloud and not offer hosting for IBM Power servers. Others may specialize in the Power system area and not deal with planned Windows server migrations. Research and find cloud vendors who can host all the servers in your intended migration plan.

THE IBM i CLOUD MIGRATION ROADMAP



What services do you need for your migrated servers? Which cloud services will you need for each hosted IBM i system (SaaS, IaaS, Cloud backup, High Availability, DRaaS, Monitoring)? Migration is the ideal time to implement DRaaS. List out all the services you want to contract for each migrated server.

Inventory your IBM i versions, CPU, memory, and disk needed for each migrated IBM i server—This will be needed to build your cloud servers.

Inventory your IBM i licensed programs and third-party software—Survey each vendor to determine what IBM i versions their software runs on. This inventory will ensure that all of your critical software will be compatible with the IBM i OS version running on your cloud servers. Some vendors may require you to upgrade their software so that it will work under the IBM i OS the cloud vendor will use.

Interview your target vendors, get quotes, evaluate, and make a decision—Select a vendor through your usual vendor selection process. Create and issue RFPs and other necessary documents. Involve your Purchasing department or Project Management Office (PMO) in the contracting process. See our sidebar Things to consider when choosing a cloud hosting provider for more information on choosing a cloud vendor.

Make sure your cloud vendor candidates perform a pre-migration audit and workload sizing for any IBM i servers to be migrated. Check their references. See if you can talk to other customers the vendor is hosting IBM i servers for.

Plan and Prepare Your Migration

Follow these steps to prepare for migrating your IBM i servers to the cloud.

Setting up your network—Your vendor will provide the IP addresses, DNS entries, and other networking information you will need to reach the migrated IBM i servers from your network. You will need to modify your firewall ports, routers, and other equipment to reach the new servers. Depending on requirements, you may need to dedicate a telecom line to the vendor cloud, add them to your WAN, or set up a site-to-site VPN to your cloud vendor.

Firewall and routing changes—You may need to punch holes in your firewall to allow IBM i cloud servers to reach onsite resources, such as printers, scanners, email systems, and other onsite equipment.

Plan for DNS changes and IP changes—Identify any DNS entries that must be changed for the new IP address of your cloud servers. You may also decide to use routing to redirect traffic from an old IP address to the new cloud server IP address.

Prep your licensed programs and third-party software

Perform any software upgrades that are required for running on the new operating system and hardware. Contact your third-party vendors and obtain new license keys for the software to run on new hardware.

Plan for any functions enabled by IBM i hardware to be replaced

If you still have IBM i system cards that enable processing functions, such as a fax card, make plans to replace those functions with software-based processing.

Plan for IBM i access through VPN or site-to-site VPN

Determine how remote users accessing your IBM i through VPN will connect to the new system after cutover. Also determine if there are any outside entity site-to-site VPNs set up to access your IBM i servers and make arrangements to change them after cutover.

THINGS TO CONSIDER WHEN CHOOSING A CLOUD HOSTING PROVIDER

- **Data center setup**—How many data centers does the vendor have? Will your servers be hosted at the closest DC, to cut down on network latency? If there is a disaster at your DC, where will your processing switch to?
- **Security and access**—How will your users reach your system from your central office branch offices, and from outside the network? Will the vendor location become part of your wide area network, will you need to create one or more site-to-site VPNs for cloud access, or another access method? Will users access your hosted servers through VPN, virtual desktops, or another method?
- **Security**—What security measures does the vendor take to protect their systems? Do they have enterprise-grade firewalls and other security infrastructure? Does their network have Intrusion prevention and intrusion protection systems (IDS/IPS)? How is your information being protected?
- **Security auditing capabilities**—Will the new IBM i servers and the network they reside on satisfy all the same audit requirements as the old IBM i servers and network?
- **Uptime guarantees and Service Level Agreements (SLAs)**—Outside of maintenance, what availability metric is the vendor guaranteeing? What SLA items will the vendor offer (e.g., guaranteed uptime, access times, maintenance windows, penalties for failure to meet their SLA)

Go-Live checklist after IBM i migration

1. Verify that databases are in sync with the system databases you migrated from
2. Shut down replaced IBM i server to avoid confusion with new cloud server
3. Change DNS entries referencing your old IBM i servers to new IP address
4. Load new license keys from IBM and third-party vendors onto cloud system
5. Verify IBM i work management functions such as storage pool configuration, subsystems, and job queues, are set up correctly on the migrated system
6. Verify system values are set up correctly
7. Verify all your application software works correctly on the new server
8. Test on-premises devices that connect to your IBM i partition to make sure they are now connecting to the new IBM i cloud server
9. Test VPN connectivity for remote users and anyone else who connects to your system through site-to-site VPN
10. Verify IBM i and third-party software functions correctly
11. Test sending output to any printers and other onsite equipment that connect to your IBM i
12. Configure backup settings and schedule
13. Test critical connections to offsite functions, such as EDI, email, and faxing

Migrate Your Servers

Going live.

When migrating multiple IBM i servers to the cloud, it is best to migrate them one by one. The vendor may start with migrating servers that do not affect production processing and proceed to migrating production servers.

A suggested migration order would be:

- 1. Non-production IBM i servers, such as a sandbox server**
- 2. Testing, development, and quality assurance servers**
- 3. High availability, DRaaS, and any backup servers**
- 4. Production servers affecting order processing, financials, Web serving, credit card processing, and other production functions**

The vendor will need access to your full system backups (whether on tape, VTL backups, or other media) to set up each new server. They will load the server with your last full system backup in preparation for going live. If a server was set up before going live, the vendor will update data that was not migrated in the initial setup, using system backups, high availability replication, or DRaaS.

Verifying Your Installation After Cutover

Before any IBM i cloud server can go live, you will need to perform the activities shown in the Go-Live checklist after IBM i migration. Make any necessary adjustments before production processing can begin on the new server. Do not let your IBM i cloud server run as production until this checklist is finished.

Migration Risk

Most of the risk with migrating an IBM i can be mitigated or avoided by following the process laid out here. Migrating IBM i systems to the cloud is no different than migrating partitions from one IBM Power machine to another. With your cloud vendor's help, your migration should go smoothly.

Settle Into Normal

After migration, expect your cloud IBM i servers to run as normal.

Your cloud vendor will provide system services for your IBM i operating systems and the Power hardware they run on. The vendor can provide system usage reports and statistics on a regular basis or on demand. Contact the vendor when you need to add or remove disk, CPU, and memory or make any other system.

The cloud vendor will also perform any operating system upgrades, and apply technology refreshes and PTFs. They can assist with backup, restore, high availability, and disaster recovery issues. The vendor will coordinate system maintenance windows and planned system outages with you, as necessary.

Your organization will then be free to focus on your IBM i applications and data.

The Next Step

IBM i cloud migration provides a number of business, staffing, auditing, operational, technology, and business continuity benefits for any organization. Migrating IBM i servers to the cloud is not difficult. It takes about as much planning and effort as a typical IBM Power System hardware upgrade.

An experienced business partner like CloudFirst can help your organization easily migrate your IBM i systems to the cloud, in a way that is right for your business, no matter your size or budget. We'll help you:

- Research your migration
- Choose Your Vendor
- Plan and Prepare Your Migration
- Migrate Your Servers
- Verify Your Installation After Cutover

Please feel free to contact CloudFirst, if you have any questions about migrating your IBM i servers to the cloud.

Partner with CloudFirst

It's beneficial to bring in a trusted partner who can objectively look at your IBM i operating system and Power hardware and assess your EOL situation. CloudFirst is an experienced consultant who can identify the risks associated with using EOL products, recommend solutions, and help set up an ongoing end of life management strategy.

Questions about your particular end-of-life infrastructure exposure? Contact the experienced IT management and end-of-life consultants at CloudFirst. We can analyze your situation, create and implement a customized end-of-life management strategy for your organization.



About CloudFirst

CloudFirst provides a highly secure, enterprise-level cloud for IBM i Power systems and Windows, assisting companies in the migration process, while reducing capex and providing flexibility for seasonality with on-demand compute power. Clients have access to an array of solutions including Infrastructure-as-a-Service, Disaster Recovery, Voice and Data, Security, and email compliance and data analytics.

Your business relies on the latest and greatest information technology. Ultimately, you can depend on CloudFirst to keep your systems current, integrated and operating at peak efficiency. CloudFirst has the expertise and knowledge to be your total IT solution provider in the present and future.



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