



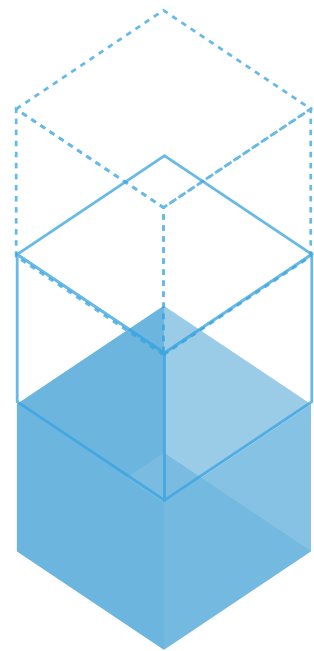
DevOps for IBM Power Workloads in the Cloud



Executive Summary

Enterprises have widely embraced agile methodologies and cloud-based development environments to help their businesses innovate, scale, and become more responsive to their customers' needs. But for companies with core applications that reside on IBM Power Systems running AIX, IBM i, or Linux, which includes the majority of Fortune 500 companies, moving those workloads to the cloud has been a difficult and expensive proposition.

With remote work suddenly becoming the new reality, companies face new pressures to scale. This requires either more hardware in the data center or moving to the cloud, all while keeping business-critical systems running. Learn how your organization can quickly move valuable core applications into the cloud without having to change network configurations, architecture, or code. Take advantage of agile development methodologies and DevOps practices that enable speed and scale, so your business can become more responsive and innovative.



The Cloud: More Important than Ever

Spurring innovation and the ability to embrace new business models and strategies is critical for today's enterprises to remain relevant and competitive. The COVID-19 pandemic has brought to the forefront how important it is for companies to be able to pivot and adapt in the face of unexpected and dramatic business changes. Even before the pandemic, companies had been increasing their focus on digital transformation initiatives and the ability to tap new technologies such as artificial intelligence (AI) to enable business agility.

To illustrate, Blueworx is a provider of Interactive Voice Response (IVR) solutions to major businesses worldwide. Its technology allows enterprises to scale on-demand to handle thousands of incoming and outgoing customer calls every second. The company's solution was originally developed to run on a Power-based data center with a mix of AIX and Linux virtual machines (VMs). As its customer base grew and requirements became more complex, it wanted to be able to integrate with new services in order to innovate and stay competitive.

The company needed the ability to provide developers with concurrent access to multiple copies of the existing system so they could begin to containerize it and move it to a more agile platform. On the existing Power platform, development and test teams were constrained by the expense of spinning up multiple instances of the application.

In addition, the business wanted to use new technologies such as AI, containers, and Platform as a Service (PaaS) to support product innovation, along with incorporating the faster release cycles needed to accelerate time to market. Moving to the cloud was vital to grow the business and be more responsive to customer needs.

Legacy applications can be too monolithic and rigid to allow new features and functionality to be developed fast enough to meet changing business needs. Simply provisioning a

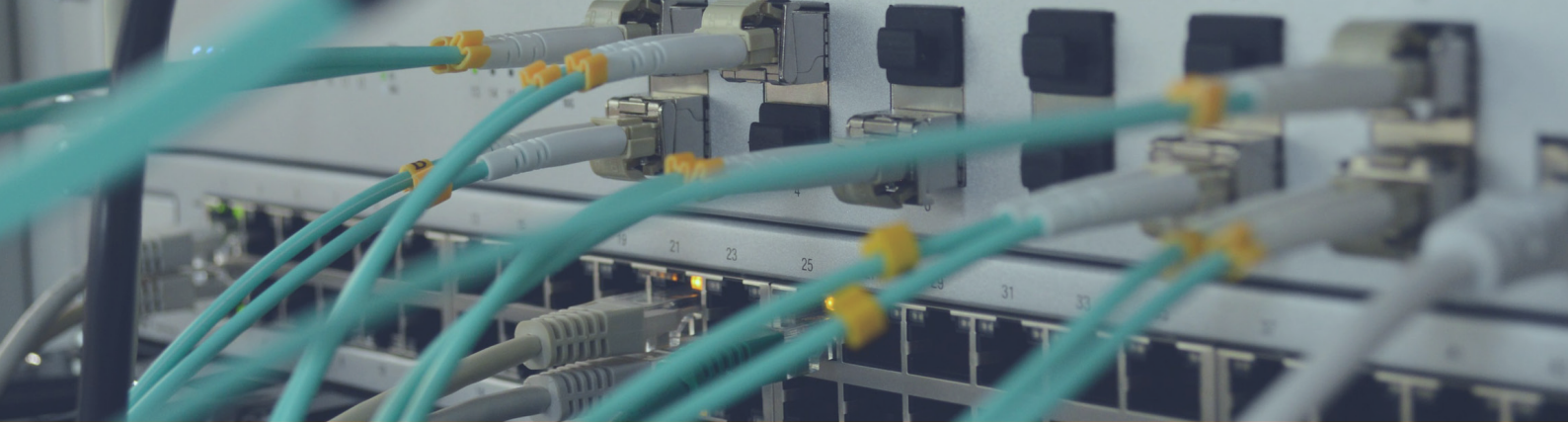
new development environment might take weeks. Testing, which often requires physical test beds and may include hundreds or thousands of regression scenarios, can be such a bottleneck that new releases take weeks or months.

Take the case of a popular global furniture retailer that needed to pivot from brick-and-mortar store sales to building up its online shopping experience to satisfy changing customer buying preferences. This new multichannel strategy required modernization of existing commerce applications. Built on Linux, AIX on IBM Power, and Windows Server 2008 over the course of 15-plus years, these sales, inventory, storefront, product, and pricing applications were critical to business operations.

Using traditional development practices, it was taking the retailer four to 12 weeks to provision a development environment. Standing up and testing a fully integrated environment took from six to nine months. These delays stifled innovation, hindered remediation of issues, and slowed delivery of new functionality. The company realized it needed to adopt agile development approaches to increase release cadence, introduce cloud native services, and containerize applications, all of which would necessitate moving existing applications to the cloud.

Another factor driving cloud migration is that companies may be facing expensive data center upgrades or adding more hardware to scale the business, and they are looking at the cloud to help reduce infrastructure expenses. At the same time, they want to continue to take advantage of the benefits afforded by the Power platform and extend the life of traditional applications, while moving to adopt a multicloud, multiplatform strategy with a combination of platforms, including Power and x86.

Clearly, moving to the cloud is a critical enabler of business agility. But for enterprises whose core applications reside in established Power System data center environments, it's not that simple.



The Power Data Center Dilemma

Most Power data center installations provide critical business applications and services and must maintain continuous uptime and performance. As such, companies have not been able to take advantage of innovative cloud services or the agile development methods and DevOps principles that enable more rapid development and higher quality code for these applications.

Organizations that want to move their Power workloads to the cloud have historically been faced with the choice of either replatforming their applications to a different operating system, or having to refactor, rearchitect, or rewrite their application and codebase to work in a cloud environment. Both approaches require enormous investments in time, resources, and money, and introduce significant levels of risk.

A third option, commonly referred to as “lift and shift”, allows enterprises to migrate their existing native Power applications to cloud-based infrastructure that mirrors existing on-premises or data center infrastructure and doesn’t require fundamental changes to architecture or code.

However, this option is only feasible if the destination cloud can support the application in its native state. Typical cloud infrastructure providers focus on new applications or cloud-native development and, if they do offer support for Power Systems, it is often a limited, single instance, not the complete infrastructure required for most large companies’ core business applications.

The good news is there is a way to run Power workloads in the cloud without any rewriting, preserving the value of traditional applications while enabling the agile development methodologies and DevOps principles required for speed and scale.

Bringing Power to the Cloud

Skytap is the best cloud service to allow traditional Power applications and workloads to run natively in the cloud without rewriting, and without configuring dozens of services. This allows the complex configurations required for these applications, whether Power or x86, to be migrated without change, all the way down to Level 2 networking.

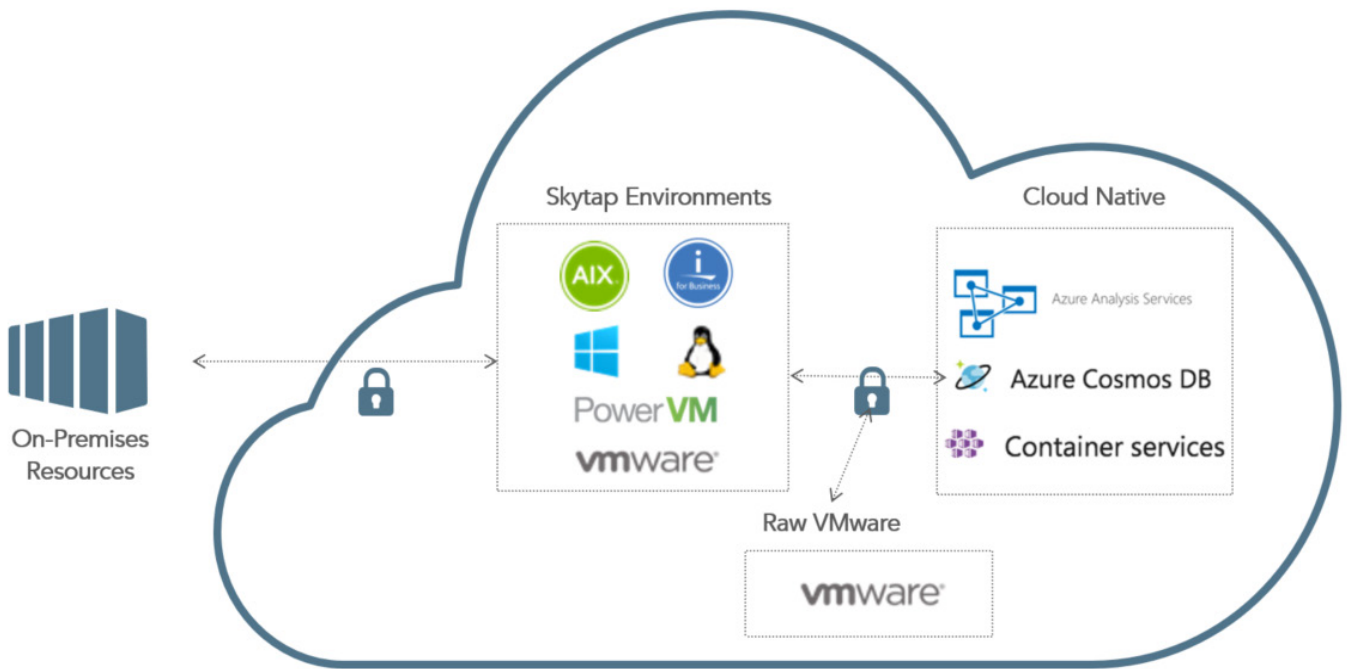
Available for IBM Cloud and Microsoft Azure, Skytap enables a multicloud, multiplatform strategy that brings traditional applications together with the advantages of the cloud through connections to other clouds and cloud native services. It is the only cloud service to run Power workloads and x86 VMs side by side.

After completing a straightforward migration process, IT is able to clone environments, build templates, and share all, or parts, of applications to teams that need them through role-based access. New environments can be provisioned in minutes, rather than days or weeks, improving service levels. IT can give self-service capabilities to developers and test teams, who can replicate as many environments as they need to develop, test, and troubleshoot, then delete them when they are no longer needed.

Multiple environments enable parallel development and testing for increased productivity and strong global collaboration. Developers can start development without waiting for IT to provision environments. They can start testing earlier in the development cycle, moving defect discovery left and decreasing the amount of time spent on rework or resolving reported defects. Global teams, external consultants, and partners can be granted access to environments to accelerate and improve collaboration.

QA teams can set up multiple test environments in minutes, using consistent, production-like clones of environments. This avoids configuration drift and improves test coverage and fidelity. Support for automation with leading Continuous

Integration/Continuous Delivery (CI/CD) tools accelerates testing as well as adoption of DevOps principles. QA testers can snapshot and share environments in their current state so developers can quickly review and resolve defects, improving speed to resolution and collaboration between the QA and dev teams.



Skytap brings Power workloads to the cloud

With their environments in the cloud, teams can enhance the capabilities of traditional applications as they explore innovative methods and approaches using the full array of cloud services such as analytics, Machine Learning, and AI.

In the case of Blueworx, it was able to address the challenges of development and testing environment availability and contention, giving developers access to clones of full application environments to help drive innovation and accelerate iterative modernization. Because Skytap supports both Power and x86 workloads, the company was able to modernize infrastructure by rapidly migrating IVR workloads out of its data center. Once in Skytap, teams could move towards agile development and DevOps, accelerating time to value for business customers.

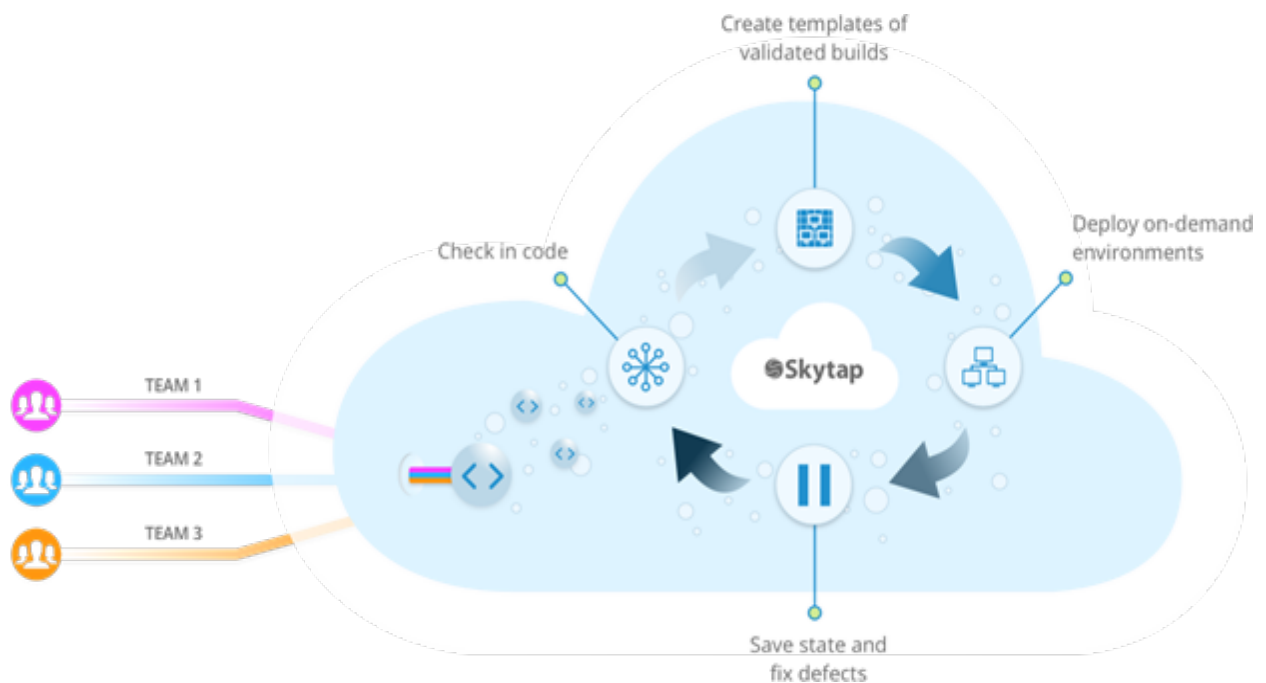
Blueworx modernized its application's architecture by using a multicloud approach to integrate the core IVR application running in Skytap with innovative services from IBM Cloud. This hybrid application connects to IBM Watson services, including Text to Speech, Virtual Agent, and Conversation, so IVR customers can leverage the power of Watson to improve customer experience and insights.

The availability of production-ready development and test resources within Skytap makes it straightforward to begin implementing agile development methods, leveraging existing people, skill sets, and technologies. It also provides an excellent opportunity to adopt DevOps practices.



DevOps Simplified

Building development and test environments entails significant redundant work: cloning the server and OS, installing applications and middleware, and loading data. The process can be complex and prone to error. Skytap acts as a caching layer for this redundant work. Automation tools can be built and refined and then integrated into templates that can be deployed in seconds.

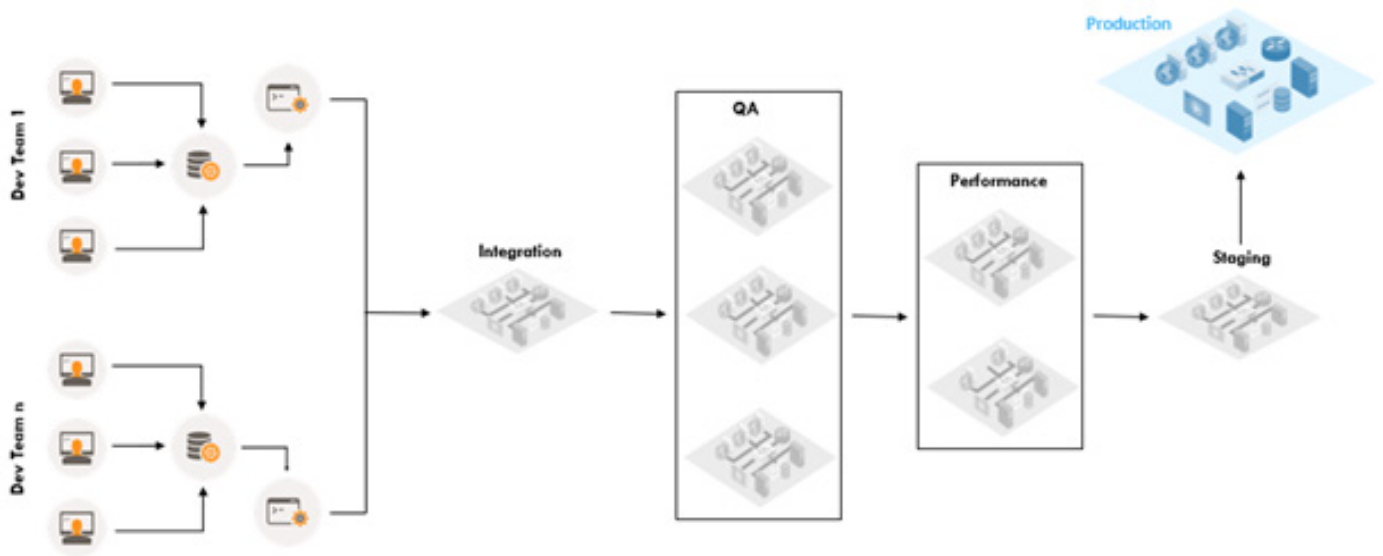


Simplifying DevOps with Skytap

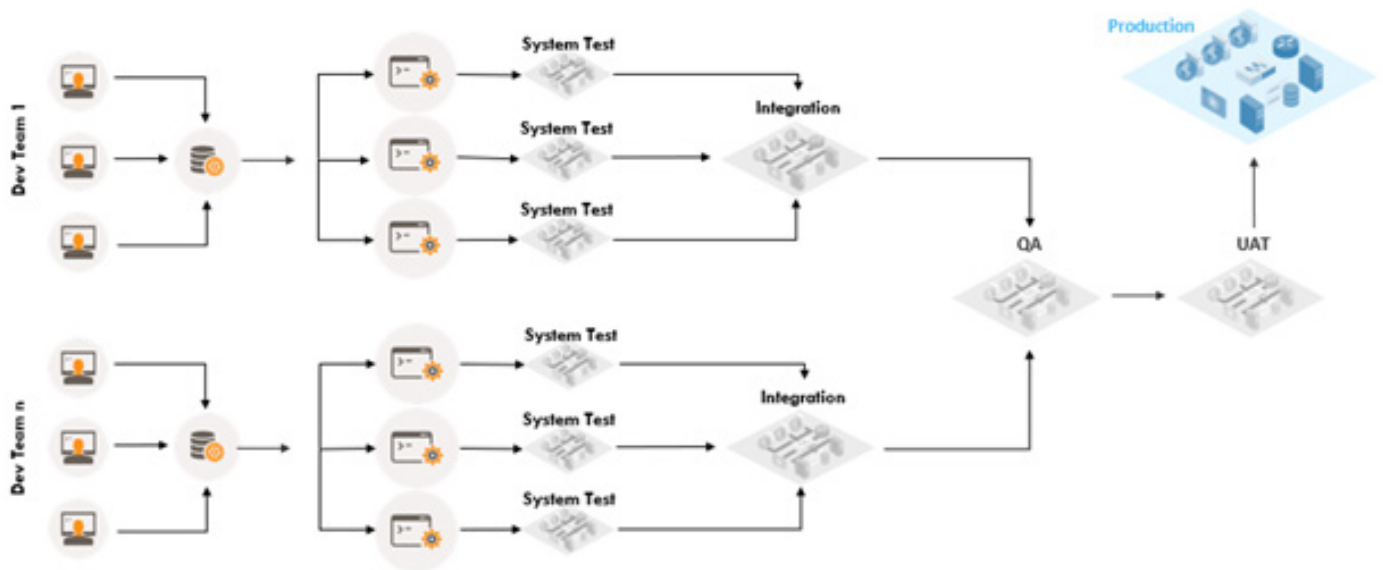
Tools such as Bamboo and Jenkins can incorporate environment deployment from Skytap templates as part of a continuous delivery (CD) pipeline.

Templates provide an easier path to DevOps adoption by eliminating the need to run tools like Chef, Puppet, or UDeploy each time a new environment is needed. This reduces risk through easier technical integration, and allows DevOps initiatives to be executed sooner than expected. The same DevOps principles used for x86 workloads can be applied to Power workloads as well.

Adopting agile development and DevOps practices allows code to be developed faster and checked in more often. The ability to quickly generate clone environments allows each individual developer build to incorporate system test. As processes mature, integration testing can be included even earlier, within individual scrum teams. This shifts defect discovery left, allowing issues to be found and resolved earlier. The result is accelerated delivery to production with higher quality.



Traditional software delivery pipeline



DevOps pipeline with parallel integration testing

For organizations already implementing DevOps, Skytap integrates with existing DevOps tools, including Urban Code, Docker, Ansible, Vagrant, CA Technologies, Puppet, and Kubernetes to accelerate and automate the software development lifecycle (SDLC) from build to deployment.

For the global furniture retailer mentioned previously, once its complex environment had been migrated to Skytap, self-service environments from Skytap's template library, fast copy and cloning, and network isolation provided a foundation for adopting agile and modernizing development and test processes.

For QA, Skytap facilitated fast provisioning of environments and running multiple instances in parallel, where network isolation enabled exact replicas — down to IP and hostnames — running side by side. This resulted in greater test coverage and delivery in hours instead of months. Application development teams were able to evaluate and adopt new agile and DevOps tools and processes, including Jenkins and Ansible, with Docker containers and saved example templates, paving the way for future process and architecture modernization using cloud native tools and services.

Another example of how the availability of easily created test environments can help advance new business models is the case of an organization that hosts a collaborative, multi-terabyte data repository that collects and analyzes data from several electric utility customers' smart meters. Customers can view their meter data and better manage their energy consumption in order to save money or be better environmental stewards.

Built ten years ago as a simple website portal, the environment was a combination of Power and x86 servers with an Oracle database and WebSphere application servers. The organization selected Skytap to expand the database to a secure cloud environment that wouldn't require hardware and systems investment and would be able to scale to support new business models.

The goal was to enable a new industry ecosystem of hundreds of competitive service providers who offer competitive services to help consumers identify the best energy plan, their ideal provider, and possible renewable energy alternatives based on their energy use.

With Skytap templates, the competitive service providers can test their integrations without putting production environments at risk by using clones of production database environment. The collaborative organization can support this new, dynamic business model without infrastructure investments and with the flexibility to scale as the industry ecosystem grows. Utility customers benefit from having a choice of providers who can help tailor and manage their energy consumption.

Skytap is the only cloud service that can provide all of the capabilities that enterprises with Power workloads need, from enabling agile development and DevOps initiatives to making innovative cloud services available for traditional applications, to reap the benefits of the cloud. Even though these workloads can be very complex it is straightforward to get started with Skytap.



Getting Started with Skytap

Due to the complex nature of most Power workloads, each organization's migration strategy will be unique. For many, taking a "lift and shift" approach allows enterprises to migrate Power workloads to the new cloud infrastructure without the need to change architecture or code. At a high level, migrations typically follow a similar progression:

Identify migration goals:

The migration strategy should support organizational objectives. Enterprise initiatives typically fall into four general groups:

Cloud-first initiative

Skytap allows Power workloads to be factored into the enterprise application portfolio for companies going all-in in the cloud.

Data center consolidation or cost reduction

Skytap eliminates the need to refactor or rewrite applications, accelerating the migration journey and decreasing costs and resources.

Improvements to business agility

Skytap's environments-first approach to infrastructure provides teams with instant, self-service access to complete application environments that are maintained and governed by IT.

Modernization or digital transformation

Skytap enables enterprises to incrementally introduce cloud-native functionality, so organizations maximize the ROI on existing investments and modernize at their own pace.

Evaluate requirements:

Thoroughly evaluate existing Power-based workloads and identify their requirements, including all relevant business requirements. Specific areas to consider are the type and amount of on-demand capacity required; cloud and workload requirements such as scalability, network, hardware, and OS configurations; and workload sizing and capacity needs. Companies will also need to plan for licensing and data migration.

Move LPARs:

After requirements have been defined, use standard tools such as PowerVC to export LPARs from existing Power Systems and import them to Skytap using secure FTP.

Create environments:

Create development and test environments using public or custom templates to start sharing resources in Skytap. Entire applications can be encapsulated in a Skytap environment, including x86 VMs, Power LPARs, and even containers.

Start agile and DevOps initiatives:

Once migration is complete, development organizations can begin to adopt agile and DevOps initiatives through the use of self-service access to production-ready environments that encapsulate compute, networking, storage, and software. IT teams manage environments and create templates along with access controls and quotas to ensure usage is authorized and audited. Developers can clone environments as needed to work on new releases, fix bugs, try new ideas, and perform regression testing, all without impacting production code, then delete them when no longer needed, releasing idle infrastructure.

Gradually modernize processes:

Transition from waterfall to agile development, eventually introducing cloud-native architectures and services to traditional applications to add new capabilities and improve business agility. As modernization progresses, expand DevOps practices in step with agile to promote speed and scale of getting development projects into production.



Gain Speed and Agility with Skytap

Regardless of migration journey, enterprises can quickly improve time to market and business agility with Skytap. IT teams gain better control over environments, while increasing their users' satisfaction and service levels by providing self-service access to multiple development and test environments. Developers improve productivity, reduce defects, and collaborate more effectively with other teams. QA teams can perform more comprehensive, accurate testing by having immediate access to consistent, production-like test environments and the ability to quickly share environment snapshots with developers to resolve issues faster.



Straightforward integration with DevOps tools makes it easier to embrace DevOps practices for improvements in development velocity and quality. At the same time, having access to innovative cloud services allows businesses to breathe new life into traditional applications. With Skytap, companies can build on the value of their existing applications while becoming more innovative and responsive to their customers' needs.



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About Skytap

Skytap is a cloud service purpose-built to run specialized workloads in Microsoft Azure and IBM Cloud. As the best cloud service to support AIX, IBM i, and Linux on IBM Power together with x86, Skytap makes it easy to evolve traditional workloads by rapidly migrating them to the cloud. Enterprises around the world use Skytap for production workloads, disaster recovery, virtual training labs, and application development. Skytap's cloud environment simplifies management, reduces IT costs, speeds up application development, and allows organizations of all sizes to modernize at the pace of their business. Skytap is a Kyndryl company. To learn more or schedule a demo, visit www.skytap.com.

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