

IBM Migrating from Cloud Foundry

Field Guide



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Migrating from Cloud Foundry Field Guide**



<https://ibm.biz/ibm-migrating-from-cloud-foundry-field-guide>

Change is coming. Are you ready?

Over the past few years, there has been growing acceptance of Kubernetes as an industry standard. To support this emerging standard, all major Cloud Service Providers (CSP) have a client offering to manage and support this technology.

THE MARKET HAS SPOKEN. FUTURE-PROOF YOUR ECOSYSTEM

Shift in the industry. Kubernetes brings to market capabilities that enable interoperability, improved scalability, and increased operational efficiency.

Support from the open source community. Kubernetes has gained tremendous support from the open source community. Open source collaboration continues to expand the core capabilities that support other emerging technologies such as edge computing and network functions running as containers.

Rethink future IT investments. Use the automation capabilities of Red Hat® OpenShift® to enable your enterprise to increase operational efficiencies that yield better return on investment (ROI) with reduced total cost of ownership (TCO).

What's inside?

This field guide provides a high-level overview of migrating to IBM's open platform strategy.

LEARN IT

A summary of the concepts.

GET STARTED

Tips to start the journey to shift to an open platform.

Reduce cost. Increase speed and agility.

Business transformation and cloud adoption can yield cost savings, speed, and agility. As you modernize legacy applications, your organization can achieve value and benefit by incorporating Kubernetes as part of your cloud transformation. Red Hat OpenShift is a platform to help you achieve your transformation goals.

CLOUD TECHNOLOGY MUST WORK FOR YOU, NOT VICE VERSA

Move between on-premises and public cloud. With Red Hat OpenShift your organization gains the ability to move between on-premises and public cloud to better manage total cost of ownership (TCO) and return on investment (ROI).

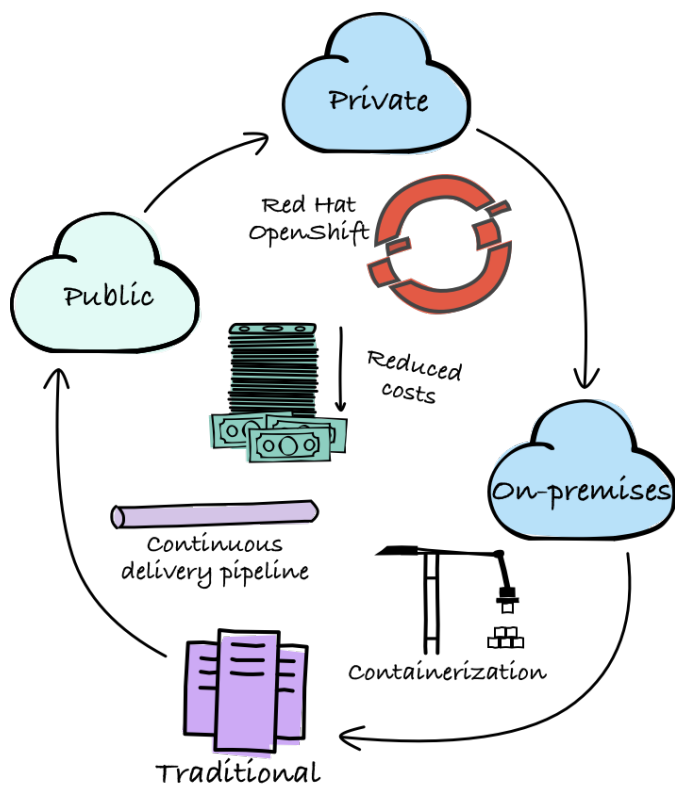
Establish standard processes. Red Hat OpenShift on IBM Cloud® offers unique security and productivity capabilities designed to eliminate time spent on updating, scaling, and provisioning assets. It has the resiliency to handle unexpected surges and protects against attacks that can lead to financial and productivity losses.

Integrate with your delivery pipeline. Reduce disruption to your developer experience and increase speed of delivery by integrating the platform with your existing continuous integration and delivery pipeline.



Why Red Hat OpenShift?
<https://www.openshift.com/>

More and more, organizations that consume Cloud Foundry as their base application development platform are revisiting their cloud transformation strategy. Cloud Foundry has limits when it comes to modernizing some legacy applications. This can pose a substantial setback if you expected to move legacy applications to the cloud without having to refactor them all.

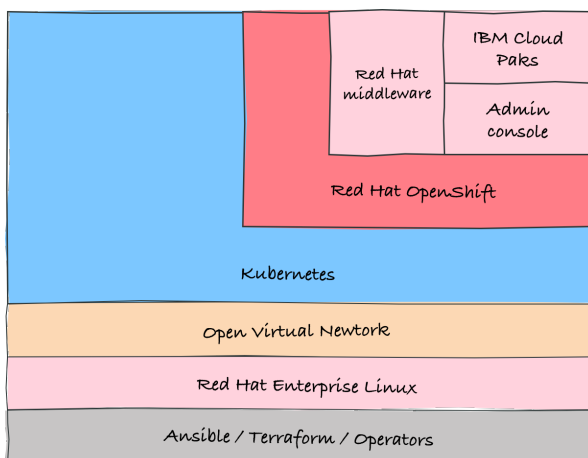


Choose the right platform

You need a platform built on open source technologies that works on multiple public and private clouds, enables integration with the cloud provider platform, and isolates teams from vendor lock-in. Based on these needs, IBM chose Red Hat Enterprise Linux and Red Hat OpenShift as its hybrid multicloud platform.

Red Hat OpenShift on IBM Cloud, an as-a-service offering, is a fully managed Red Hat OpenShift 4 service that uses the enterprise scale and security of IBM Cloud. It provides the best combination of flexibility in choosing where your workloads run and assurance that they will run predictably and securely.

TRANSFORM YOUR WORKLOADS



Learn more

Discover why IBM chose Red Hat OpenShift as its open, hybrid, multicloud platform.

<https://www.ibm.com/cloud/architecture/architectures/open-cloud-platform/>

Built in security. Red Hat OpenShift adds comprehensive security to upstream Kubernetes with built-in authentication and authorization, secrets management, auditing, logging, and an integrated container registry for granular control over resources and user permissions. The platform integrates tightly with Jenkins and other standard CI/CD tools for security-focused application builds.

Enhanced operator support. Red Hat OpenShift 4 automates the installation, updates, and management of the full stack—from the underlying infrastructure (IBM Cloud, Amazon Web Services, VMware® vSphere®, Microsoft® Azure®, Red Hat OpenStack® Platform, etc.), to the Red Hat Linux OS (RHCOS), to the Kubernetes platform and integrated services (Red Hat OpenShift).

Operators enable consistent deployment of services across multiple instances. Updates and security patches can be regularly pushed to machines without requiring intervention by administrators.

Integrated service mesh. Red Hat OpenShift Service Mesh moves the logic governing the service-to-service communication between containers from the individual services and abstracts it to a layer of infrastructure. The Red Hat OpenShift Service Mesh uses components from open source projects Istio, Jaeger, and Kiali. By integrating these tools together in a single package, the service mesh delivers interconnection, tracing, and visualization. This enables rapid troubleshooting of the service mesh and enables operations teams to quickly react to changes.

Support for serverless workloads. Red Hat OpenShift uses Knative to establish a foundation to manage serverless workloads. By targeting the serverless framework to use Knative application programming interfaces (APIs), it is possible to bridge serverless and Kubernetes. When deploying a service, Knative starts and stops the service as needed.

Shift to agile DevOps

As you plan your strategy to transform away from Cloud Foundry to Red Hat OpenShift, you need to integrate the right methodology with the platform, DevOps tools, and practices that will help you accomplish your goals of being faster, stronger, adaptable, and more profitable.

THE RIGHT METHOD FOR YOUR CLOUD TRANSFORMATION

Transform your culture. Build the organizational agility needed to adapt and address the complexity associated with the shift in technology by up skilling development and operations to support the Red Hat OpenShift platform. Enable business, development, and operations to continuously design, deliver, and validate new solutions using Red Hat OpenShift technologies.

Increase velocity and improve quality. Implement the prescriptive guidance in the IBM Garage™ Methodology practices and workflows to enable your cloud adoption and transformation based on reusable migration patterns. Adapt them to your company's specific cloud journey and culture to minimize disruption.

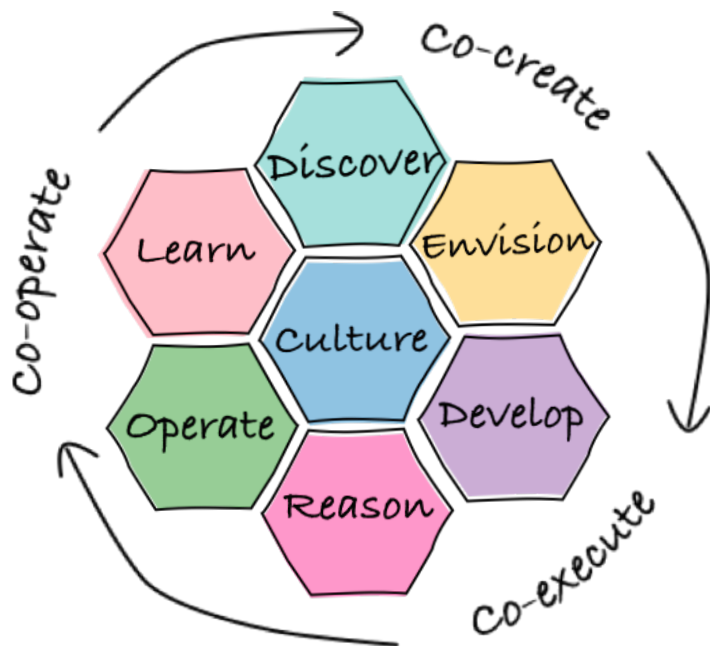
Concentrate on Ops. Incorporate security (DevSecOps), product management (BizDevOps), and infrastructure agility (GitOps) into your DevOps adoption to meet all of your operational needs to support day-2 operations for a Red Hat Open IT ecosystem.



Learn more

Adopt the IBM Garage Methodology.

<https://www.ibm.com/garage/method/cloud>



Adopt the IBM Garage Methodology to ensure system reliability and stability for an “always available” user experience.

Automate your DevOps

Increase your organization's DevOps maturity by defining automated processes that drive applications through the build, test, and deploy pipeline. Defining these repeatable patterns establishes consistent processes and standards and increases your deployment success rate by minimizing human interaction, which can reduce errors during code deployments.

SMARTER, SCALABLE, SHAREABLE AUTOMATION

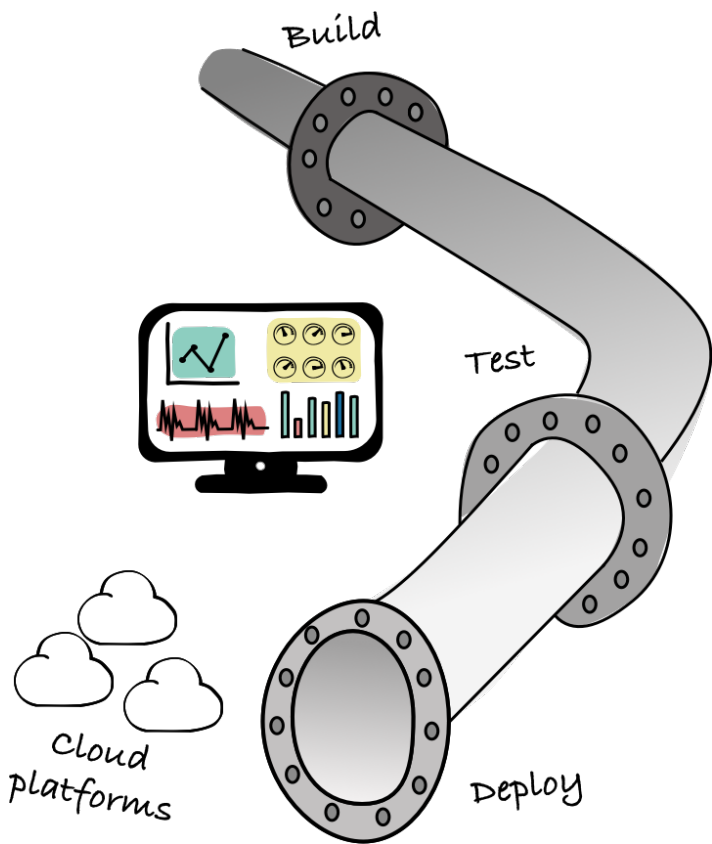
Build a highly available infrastructure. Ensure that your app is always available and meets your service level requirements. By moving to the cloud, DevOps teams don't need to maintain server hardware or operating systems.

Manage your cloud resources. Use auto-scaling to ensure that resources are available at peak times and save costs by reducing the allocated resource required during low usage times.

Automate using pipelines. Easily deploy across multiple cloud providers or hybrid environments by using Red Hat OpenShift Pipelines, a Kubernetes-style CI/CD solution based on Tekton. Using the Tekton open source project, you can quickly create cloud-native CI/CD pipelines. Tekton uses the Kubernetes control plane to run pipeline tasks using the Custom Resource Definitions (CRDs) in Kubernetes.



Learn more about Red Hat Ansible Automation Platform.
<https://www.ansible.com/products/automation-platform>



Harness the power of the cloud.

The developer experience

Give developers the tools to successfully deliver with minimum disruption as they transition from Cloud Foundry to Red Hat OpenShift. Tekton makes it easier to deploy across multiple cloud providers by providing the building blocks and a CI/CD experience through a tight integration with Red Hat OpenShift and developer tools.

GIVE YOUR DEVELOPERS THE TOOLS THEY NEED

Use a robust set of CLIs. Enable developers to concentrate on creating applications without the need to administer a container cluster by using Red Hat OpenShift Do (odo). odo is a fast and easy-to-use CLI tool for creating applications on a container platform.

Implement logging for troubleshooting. Use Red Hat OpenShift Container Platform cluster logging components, based on Elasticsearch, Fluentd, and Kibana (EFK) for problem determination.

Monitor cluster components. Take advantage of the pre-configured, pre-installed, and self-updating monitoring stack that is based on the Prometheus open source project and its wider eco-system. Send problem alerts to the cluster administrator and the Grafana dashboard.

Meter and report resource usage. Gather, analyze, and filter in-cluster metric data using Prometheus with Red Hat OpenShift Container Platform Metering.



Learn about the Tekton Framework.

<https://www.openshift.com/learn/topics/pipelines>

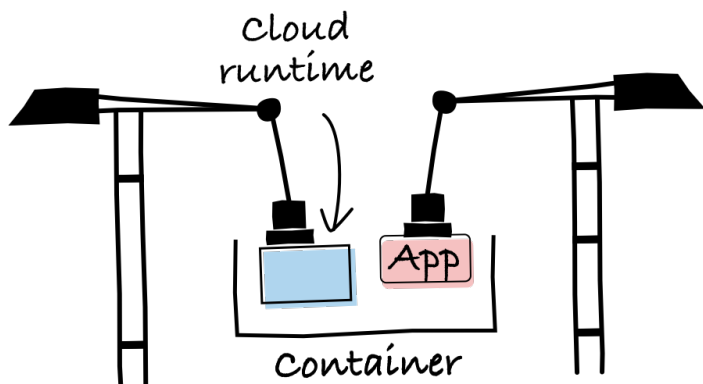


Achieve operational value - don't simply be a science experiment.

Migrate your workloads

You can move your application from Cloud Foundry to Kubernetes by using the Red Hat OpenShift Container Platform. Containerize the application without modifying or making any changes to the existing source code.

READY, SET, MIGRATE!



Learn about the IBM Cloud-native toolkit.
<https://cloudnativetoolkit.dev>

Get your code ready to go. Collect all of the files required to build a Docker container image and run your app in a directory. Deploy the app using a DevOps pipeline.

Create a Docker container image with your app code. Create a Dockerfile that includes your app code and container configuration. Use the Source to Image (S2I) tool, operators, or simple docker files to move the artifacts to their location in the new container.

Move configuration and storage for your app. Make changes to configuration parameters and required storage needed to run your app based on the new environment. If you're using the Spring Cloud Config tool to manage your configuration using GitOps, you can continue to host the microservice on the Red Hat OpenShift Container Platform.

Reconnect your services. From your new environment, reconnect the services that your app depends on. If URL changes are required, configure DNS or change endpoint connections.

Configure your development environment. Use `odo` and other Red Hat OpenShift developer tools to set up the developer environment.

Containerize your applications

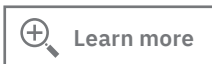
Containerizing your Cloud Foundry applications requires some planning. There are key actions that you must consider before you migrate and optimize your Cloud Foundry applications to run as containers, including application state handling, monitoring, and performance tuning.

MIGRATE TO RED HAT OPENSIFT

Adapt your applications for Red Hat OpenShift. Organize, develop, deploy, and manage applications seamlessly across physical, virtual, and public cloud infrastructures. IBM Cloud Paks® provide pre-built containerized middleware and services to support your journey.

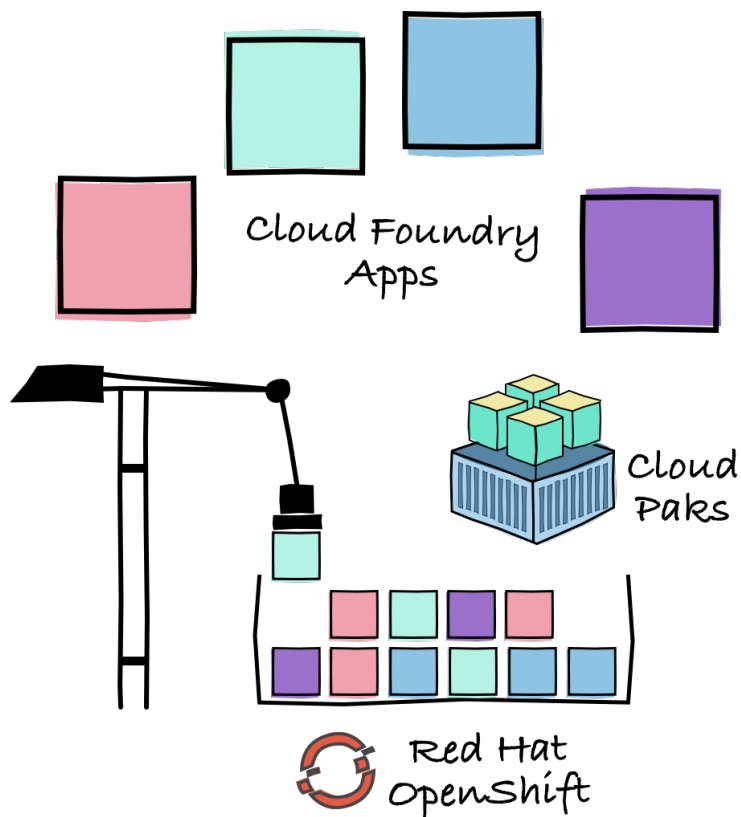
Modernize your DevOps pipeline. Provision, build, and deploy applications and their components in a self-service fashion using the Red Hat OpenShift platform.

Improve operational efficiency. Red Hat OpenShift gives IT operations a secure, enterprise grade environment that provides policy-based control and automation for container-based applications in production.



Read about the Open Cloud Platform architecture.

<https://www.ibm.com/cloud/architecture/architectures/open-cloud-platform>



Containerize your Cloud Foundry applications.

Accelerate development with IBM Cloud Paks

IBM Cloud Paks are enterprise-ready, containerized software solutions that give clients an open, fast, and more secure way to move core business applications to any cloud. IBM Cloud Paks include containerized IBM middleware and common software services for development and management. The Cloud Paks include a common integration layer designed to reduce development time by up to 84 percent and operational expenses by up to 75 percent.

THE TOOLS YOU NEED TO SHIFT YOUR WORKLOADS

Leverage the tools you need. As you modernize your IT ecosystem and move from Cloud Foundry, the Cloud Paks provide developers with an optimal platform for provisioning, building, and deploying existing applications and their components.

Move legacy applications. Take advantage of the IBM Cloud® Transformation Advisor tool to help access your legacy applications to take full advantage of the Cloud Pak capabilities.



Learn more

Check out the IBM Cloud Paks.

<https://www.ibm.com/cloud/paks/>

IBM containerized software

Packaged with Open Source components, pre-integrated with common operational services and secure by design

Complete yet simple

Application, data and AI services, fully modular and easy to consume

Operational services

Logging, monitoring, metering, security, identity access management, image registry

IBM certified

Full software stack support, and ongoing security, compliance and version compatibility

Container platform

Kubernetes-based and portable

Run anywhere

On-premises, on private and public clouds, and in pre-integrated systems

IBM Cloud Paks provide IT operations a secure, enterprise grade environment, including policy-based control and automation for container-based applications.

Migrate operations to Red Hat OpenShift

The problem: A manufacturing company has an expensive and inefficient globally distributed IT infrastructure.

THE RED HAT OPENSIFT SOLUTION

Architect. By using the Red Hat OpenShift container-based platform and IBM Cloud Paks, the manufacturing enterprise developed a hybrid cloud-based architecture to globally manage and distribute their IT assets, while maintaining a centralized control plane to remotely manage environments with minimal local IT support.

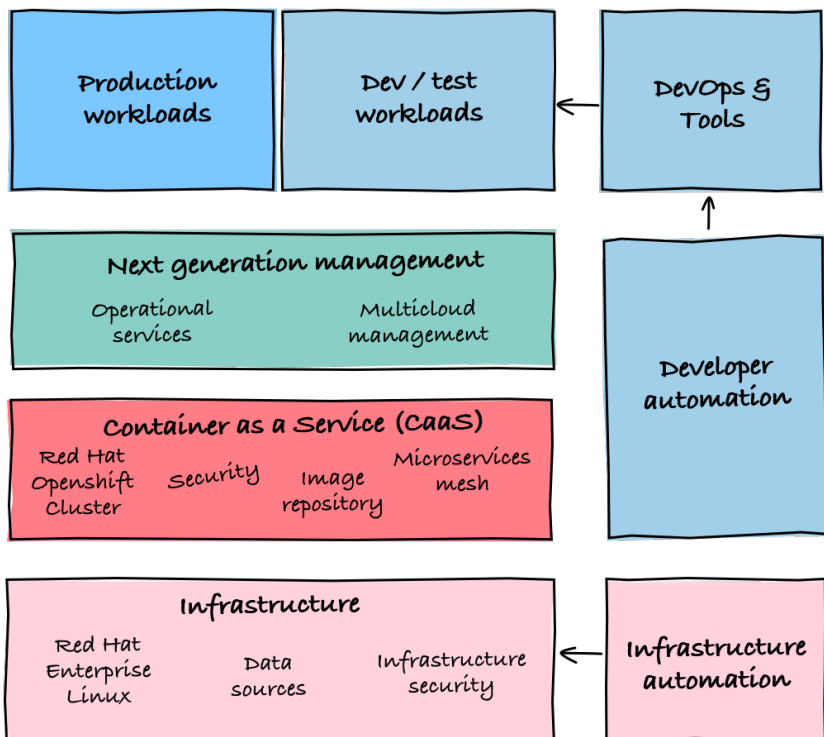
Automate and standardize. The manufacturing company accelerated migration by using the capability in the Cloud Pak to containerize. To improve operational efficiencies, they enabled the core security, monitoring, and logging capabilities of Red Hat OpenShift to institute governance processes and standards. Tekton further enabled improvements by automating repeatable patterns to reduce the probability of human error.

Reduce cost. The manufacturing company was able to reduce costs and improve end user satisfaction by decreasing time to market. By adopting a hybrid cloud strategy, they reduced their existing hardware investment by running targeted workloads in the IBM Cloud. This shifted capital expenditure (CapEx) costs to yield a better return-on-investment (ROI).



Explore the Private Cloud architecture.

<https://www.ibm.com/cloud/architecture/architectures/private-cloud>



Manage and distribute IT assets with a hybrid cloud-based architecture.

Transform with IBM Garage

The IBM Garage™ partners with you by taking a holistic approach to understand your current environment and formulate a transformation strategy to migrate to a Red Hat OpenShift platform.

MOVE FASTER, WORK SMARTER, AND INNOVATE

Zero in on your strategy. Work together with the IBM Garage. As a team, define what is compelling you to migrate, your business drivers, and your goals.

Architect your solution. Define migration patterns and architect a container-based platform architecture across physical, virtual, and public cloud infrastructures.

Empower your team with tools and practices. Enable application development and IT operations teams to modernize applications, deliver new services, and accelerate development processes using the Red Hat OpenShift container platform.

Reduce risk and make your investments count. Work with experienced IBM Garage experts to ensure that you are investing in the right technology at the right time for the right purpose.

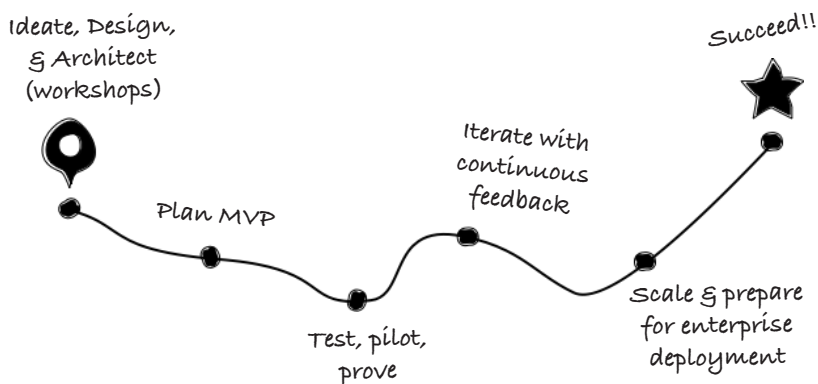


Check out the IBM Garage.

<https://www.ibm.com/garage>

Engage IBM Garage & Expert Labs!

Migrate to Red Hat OpenShift!



**Move faster, work smarter and innovate in a way to
disrupt your competition.**

Notes:

Learn more about Red
Hat OpenShift

<https://www.openshift.com/>

Check out IBM Cloud
Transformation Advisor

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practices/learn/ibm-transformation-advisor](https://www.ibm.com/cloud/garage/practices/learn/ibm-transformation-advisor)

Learn more about IBM Cloud Paks

<https://www.ibm.com/cloud/paks/>

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Architecture Center

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architectures](https://www.ibm.com/cloud/garage/architectures)

check out the IBM Cloud Pak
for Integration

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