

IBM Application Modernization

Field Guide



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Application Modernization Field Guide



<https://www.ibm.com/cloud/garage/content/field-guide/app-modernization-field-guide>

It's time to modernize your application portfolio

Business pressures demand faster time to market and app modernization. The best approach to modernization depends on your existing estate. Modernization approaches include refactoring into cloud-native microservices and replatforming traditional apps on container platforms. Accelerate your application modernization journey with the IBM Garage experts.

MODERNIZATION PROVIDES IMMEDIATE BENEFITS

Accelerate digital transformation. App modernization is driven by the need to transform business to build new capabilities and deliver them quickly.

Change the developer experience. Quickly create and deliver new applications and services through adoption of a cloud-native architecture and containerization.

Accelerate delivery. Adopt DevOps best practices to drive a culture of automation and transformation.

Deploy enterprise applications on hybrid cloud platforms. Improve efficiency by automating operations in your hybrid multicloud environments.

What's inside?

This field guide provides a high-level overview of IBM's application modernization approach.

LEARN IT

A summary of the concepts.

GET STARTED

Tips to start the journey to modernize your apps.

Ready your applications for cloud

When you modernize your existing applications, you can ease your move to the cloud with the full promise of cloud technology. With a cloud-native microservices approach, you can capitalize on the scalability and flexibility inherent to cloud. Modernizing your cloud-native applications enables applications to run concurrently and seamlessly connect with your existing investments. Barriers that prohibit productivity and integration are removed to create new user experiences and develop new applications.

BUILD ONCE AND DEPLOY ON ANY CLOUD

Assess your applications. Identify apps that can be readily moved into the cloud platform and those that will require refactoring.

Build applications quickly. Leverage containers as the foundation for applications and services.

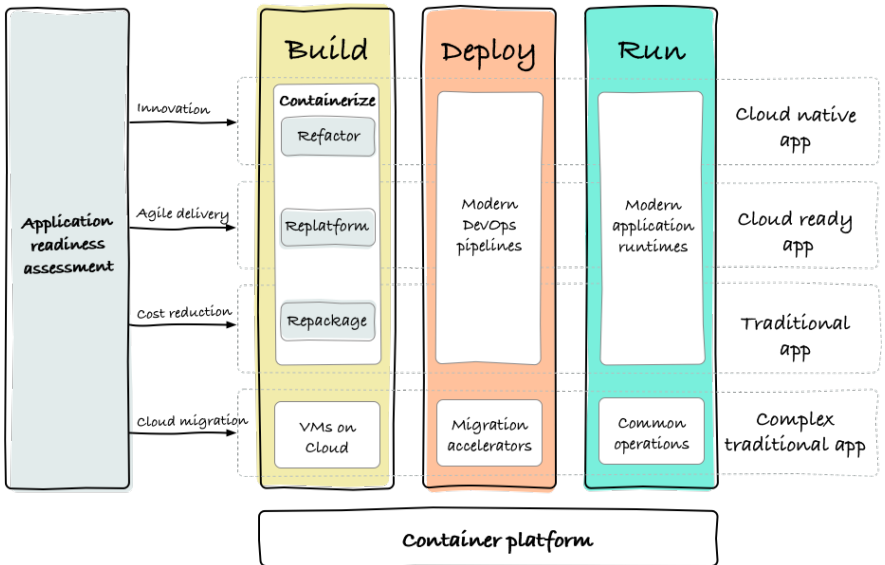
Automate deployments for productivity. DevOps pipelines automate deployments quickly and reliably.

Run and consistently manage. Consolidate operations for all applications into a common management approach to ensure reliability and faster problem resolution.



Check out the IBM Garage.
<https://www.ibm.com/garage>

Modernize your applications quickly and safely using our accelerators and tools.



IBM Garage guides your cloud transformation journey, with leading technology and prescriptive guidance to help you achieve your business outcomes.

Modernization journey

To get started on your modernization journey, you must understand the approaches that are available and appropriate for your estate. The IBM Cloud Transformation Advisor helps you select the best entry point to deliver value at each step in your journey. IBM Garage can assist you in understanding the path that is right for you.

CHOOSE THE APPROACH THAT BEST FITS YOUR NEEDS

Containerize the monolith. Reduce costs and simplify operations by moving applications to a cloud runtime.

Expose on-premises assets with APIs. APIs enable legacy assets that are difficult to enable to the cloud.

Refactor into macroservices. Break down monoliths into smaller deployable components.

Add new microservices. Innovate incrementally, reduce complexity, and establish success early.

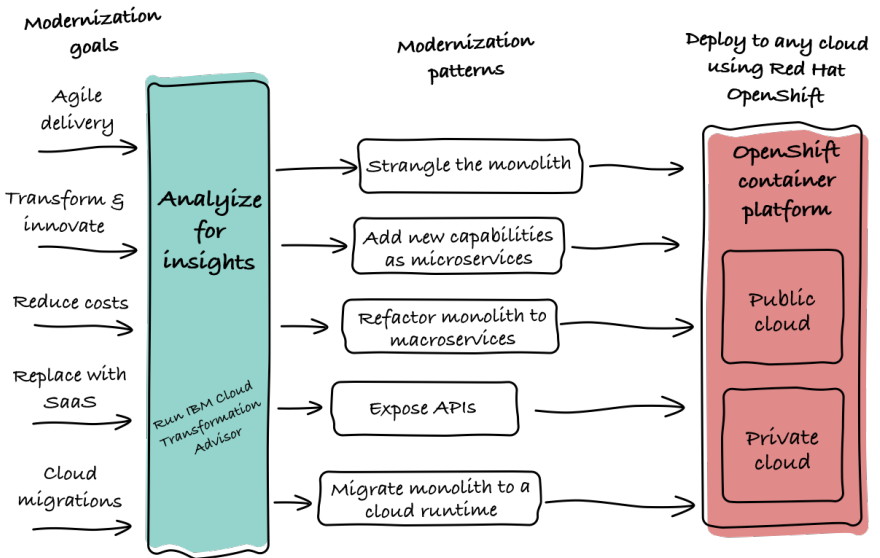
Strangle the monolith. Incrementally sunset the monolith.



Check out the Application modernization architecture.

<https://www.ibm.com/cloud/garage/architectures/application-modernization>

Mix and match your approaches as needed!



Increase your delivery velocity throughout the journey.

Build on a trusted foundation

Container platforms, like Kubernetes, provide the foundation for app modernization. This open source-based container management system targets both development and operations staff. With containerization, developers can treat configuration as code to enable a modern DevOps toolchain. IBM provides a consistent container platform for application modernization across IBM Cloud –both public and private.

CONTAINERS - THE FOUNDATION FOR MODERNIZATION

IBM Cloud Paks. Enterprise-ready, containerized software solution for modernizing existing applications and developing new cloud-native apps that run on Red Hat OpenShift.

Red Hat OpenShift Container Platform. Based on the Kubernetes container orchestration project, OpenShift is the starting point. A strong foundation with resiliency and security in the forefront is essential.

Deploy anywhere. Use any public or private cloud provider.



Check out IBM Cloud Paks.

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

IBM Cloud Paks

Application | Data and AI | Integration
Automation | Multicloud

OpenShift Container Platform

Developer Productivity | Operational Efficiency
Logging | Monitoring | Security | Identity & access management
Open technology | Runs anywhere

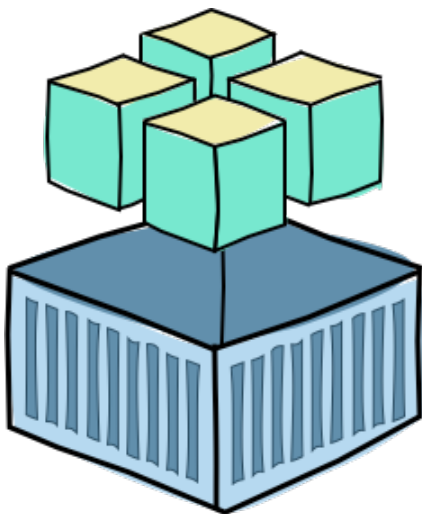
Flexible Choice of Infrastructure

IBM Cloud | AWS | Azure | Google Cloud | Edge | Private | Systems

IBM delivers enterprise software for cloud running on the Red Hat OpenShift Container Platform, based on Kubernetes.

What are IBM Cloud Paks?

Beyond containers and Kubernetes, you need to orchestrate your production topology and provide management, security and governance for your applications. IBM Cloud™ Paks are enterprise-ready, containerized software solutions that run on Red Hat® OpenShift® on IBM Cloud and Red Hat Enterprise Linux. Built on a common integration layer, Cloud Paks include containerized IBM middleware and common software services for development and management.



Learn more

Check out IBM Cloud Paks.

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

IBM Cloud Pak for Applications. Quickly build cloud-native apps by leveraging built-in developer tools and processes, including support for microservices functions and serverless computing.

IBM Cloud Pak for Data. Simplify the collection, organization and analysis of data. Turn data into insights through an integrated catalog of IBM, open source and third-party microservices add-ons.

IBM Cloud Pak for Integration. Achieve the speed, flexibility, security and scale required for all of your integration and digital transformation initiatives, including API lifecycle, application and data integration, messaging and events, high speed transfer and integration security.

IBM Cloud Pak for Automation. Deploy on your choice of clouds, with low-code tools for business users and real-time performance visibility for business managers. Migrate your automation runtimes without application changes or data migration. Automate at scale without vendor lock-in.

IBM Cloud Pak for Multicloud Management. Gain consistent visibility, automation, and governance across a wide range of hybrid, multicloud management capabilities including integration with existing tools and processes.

A faster, more reliable way to move to cloud.

Develop apps for today and tomorrow

IBM Cloud Pak™ for Applications provides a complete and consistent experience to speed development of applications built for Kubernetes using agile DevOps processes. You can modernize your existing applications with IBM's integrated tools and more quickly develop new cloud-native applications for deployment on any cloud.

TOOLS YOU NEED TO SUCCEED

Develop innovative cloud-native apps. Adopt a common model based on containers and microservices. Enable developers to rapidly build and deploy to any cloud, and deliver value in record time.

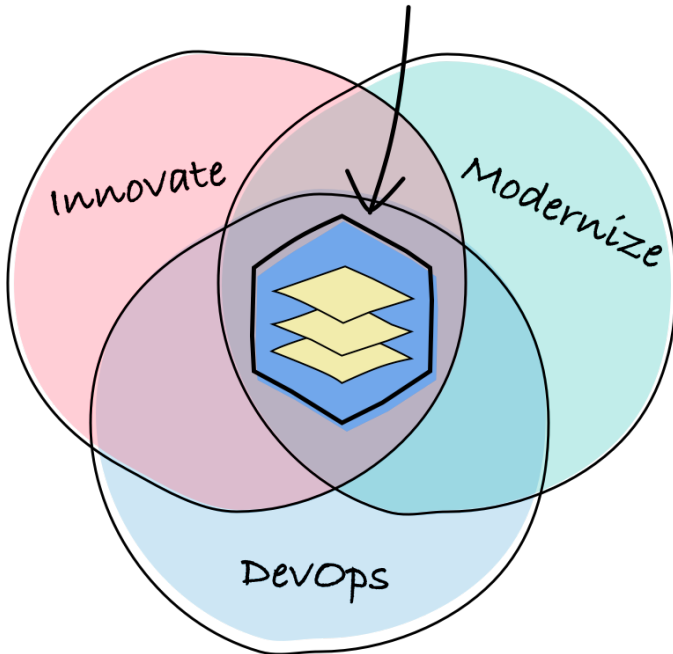
Modernize and leverage investments. Take advantage of modernization tools that make it easier to estimate time and costs associated with modernization. Understand when to refactor, replace, containerize, move or maintain existing apps. The Cloud Pak for Integration has capabilities needed to balance traditional and modern integration styles.

Create an agile DevOps culture. Move to a cloud-native model of app development with modern architectures and change the way you work using agile DevOps practices.



Check out the IBM Cloud Pak for Applications.
<https://www.ibm.com/cloud/cloud-pak-for-applications>

IBM Cloud Pak for Applications



Running on Red Hat® OpenShift®, IBM Cloud Pak for Applications provides a hybrid, multicloud foundation built on open standards, enabling workloads and data to run anywhere.

Assess your app portfolio

Before tackling the job of modernizing your applications, you need to understand your application inventory and how it aligns with business priorities. This will help you determine the best technical path to modernization and evaluate the effort required.

APPLICATION MODERNIZATION IS BUSINESS MODERNIZATION

Align to your business priorities. Understand where your business needs are driving you to modernize.

Take inventory of your apps. Run IBM Cloud Transformation Advisor to collect information from your existing Java environment and recommend modernization activities.

Spend your modernization dollars wisely. Make better decisions by understanding how your application portfolio aligns to your business priorities.



Check out the IBM Cloud Transformation Advisor tool.
<https://www.ibm.com/cloud/garage/practices/learn/ibm-transformation-advisor>

Advice based on IBM's expertise!

Recommendations that reflect your inventory

IBM Cloud Transformation Advisor				
Data Collector	User preferences	<u>Recommendations</u>		
Source environment: IBM WebSphere Application server				
Application	Recommendation		Complexity	Technical match(%)
emailcomponent.ear	Liberty on Private Cloud Cloud Location ✓	✓	Simple	100%
inventorymain.ear	Liberty on Private Cloud Cloud Location ✓	✓	Moderate	80%
catalog002.ear	Liberty on Private Cloud Cloud Location ✓	✓	Complex	100%

Get expert tailored advice about your modernization options.

Align priorities and options

Classify your application modernization portfolio by choosing an optimal combination of modernization techniques and effort required to meet your business goals.

NOT ALL APPLICATIONS ARE CREATED EQUAL

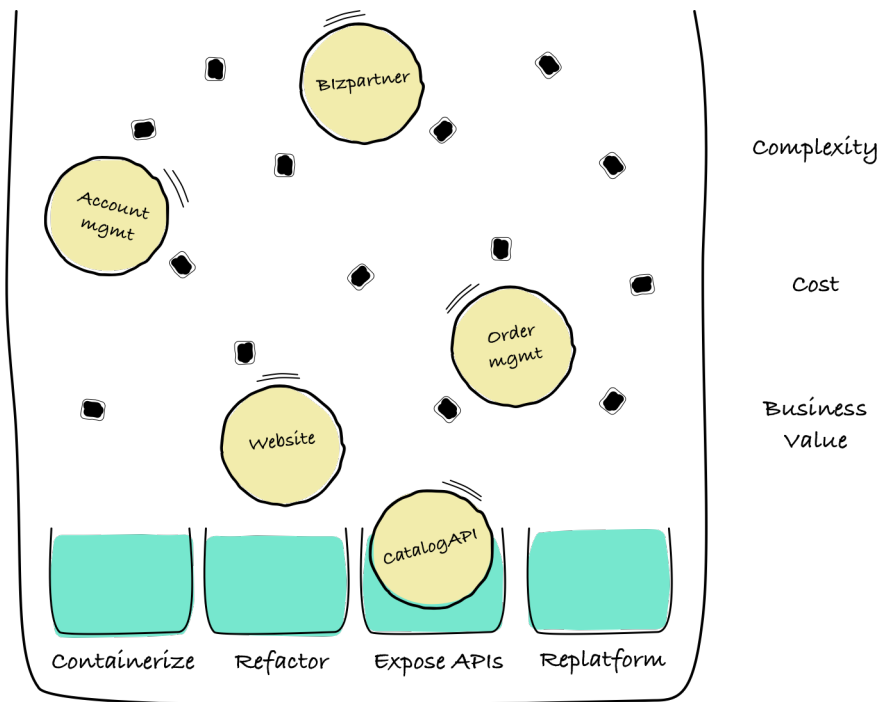
Simplify. Understand where your business needs are driving you to modernize. Run the IBM Cloud Transformation Advisor to gain clarity on your modernization options.

Select the right modernization approach. Evaluate all possible modernization options relative to their complexity, cost, and business value.

Plan and prioritize. Plan your modernization based on matching effort to business priorities. Your first few projects should be both short in duration and high in potential business value.



Check out the IBM Cloud Transformation Advisor tool.
<https://www.ibm.com/cloud/garage/practices/learn/ibm-transformation-advisor>



Choose a modernization approach based on your application code timeline and appetite for risk.

Containerize your apps

Wrapping an application in a container image is a good first step toward modernization, but many applications are not optimized for containers. Load balancing, application state handling, and monitoring are different in containerized applications. As a result, you might need to rewrite portions of your applications. Likewise, performance tuning and DevOps processes must be aligned to containers.

YOU WRAPPED YOUR APP IN A CONTAINER IMAGE - NOW WHAT?

Adapt your applications. You need accelerators to adapt your application to a containerized environment. Cloud Pak for Applications provides pre-built containerized middleware and services to support your journey.

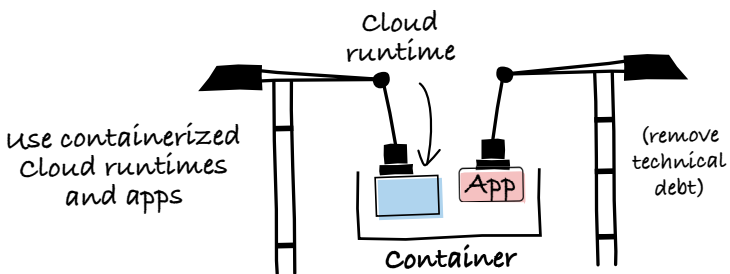
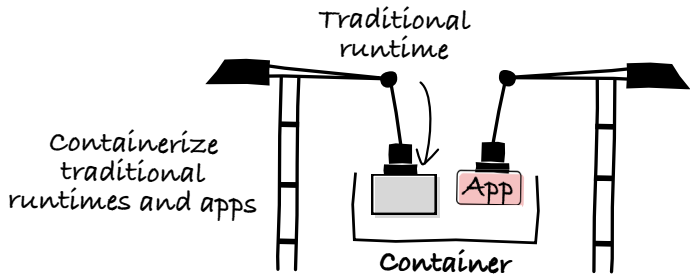
Modernize your DevOps and configuration. Automatically generate pipelines for new applications as well as orchestration tools that automate configuration.

Consolidate and standardize operations. Manage and monitor operations based on open container technologies.

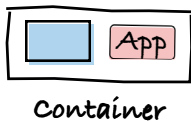


Check out the Application modernization architecture.

<https://www.ibm.com/cloud/garage/architectures/application-modernization>



Adopt DevOps and container platform operations



Containerized middleware and applications are key to moving to modern development and operations approaches.

Adopt a modern application platform

Moving to the cloud can be a large and complex effort. You will need to carefully review your business inventory and prepare infrastructure to determine the best path forward for each application. If you are running on a WebSphere platform, you can use Transformation Advisor (part of the Cloud Pak for Applications) to facilitate your journey.

A CLOUD-FIRST FRAMEWORK FOR THE FUTURE

Build cloud-native microservices. Build new applications with WebSphere Liberty, a light-weight runtime optimized for cloud.

Extend with new services. Use Cloud Pak certified containers to modernize and extend existing WebSphere applications.

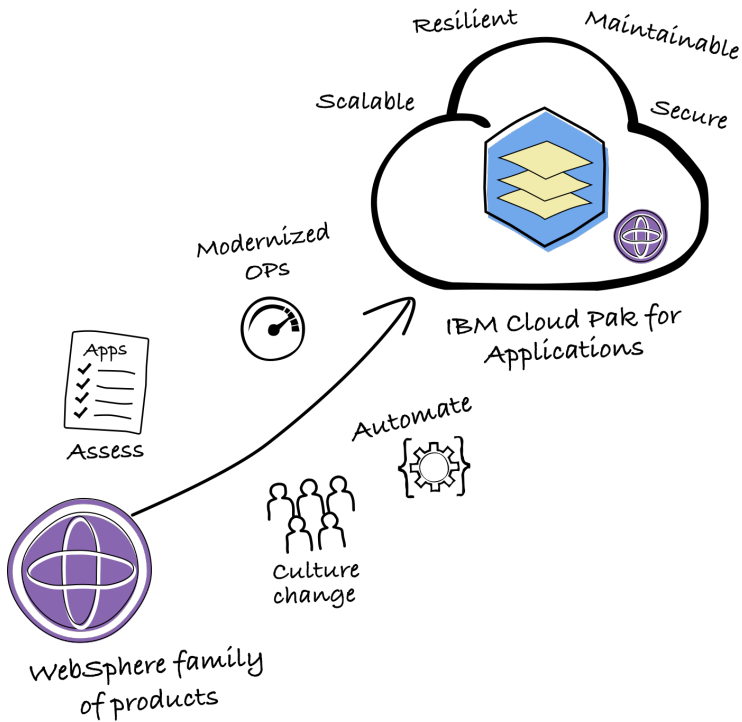
Migrate unchanged apps. Containerize your traditional WebSphere apps and use common operational services, including logging and monitoring.

Adopt standardized operations. Achieve scalability, availability, maintainability, and security with Kubernetes and Red Hat OpenShift Container Platform.



Check out the Application modernization architecture.

<https://www.ibm.com/cloud/garage/architectures/application-modernization>



Your WebSphere app investments have served your business well; migrate them to a cloud-first container platform and extend their reach to new cloud-native apps via APIs.

Refactor

Refactoring is the process of replacing existing, hard to maintain code with new, better code in a piecemeal way. You “strangle” the old monolith by replacing each business function incrementally.

MODERNIZE INTELLIGENTLY

Productivity. Refactoring an application to microservices improves developer productivity and allows you to quickly release more code.

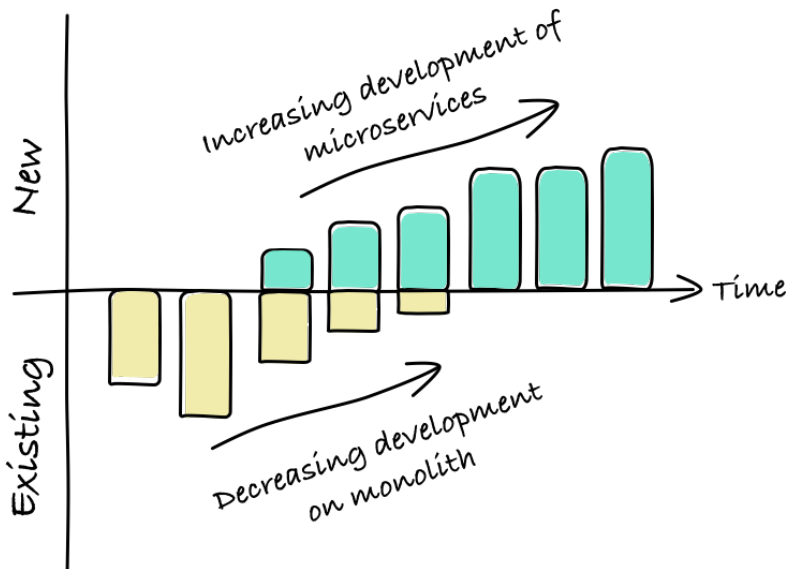
Scalability. Refactoring to a more scalable architecture should be done incrementally. It’s important to provide real business value at each step in the refactoring process.

Containerize. Repackage your monolith as a WebSphere Liberty or Open Liberty container. Then add new containers to your solution as you separate business functions into new microservices.



Check out the Application modernization architecture.

<https://www.ibm.com/cloud/garage/architectures/application-modernization>



When you replace a monolith piecewise, you gain efficiency and business value at each step.

Curated development tools and runtimes

Based on popular open-source projects, the Kabanero project brings together all the tools you'll need to modernize existing applications and develop new microservices-based apps.

STANDARD OPEN TECHNOLOGIES

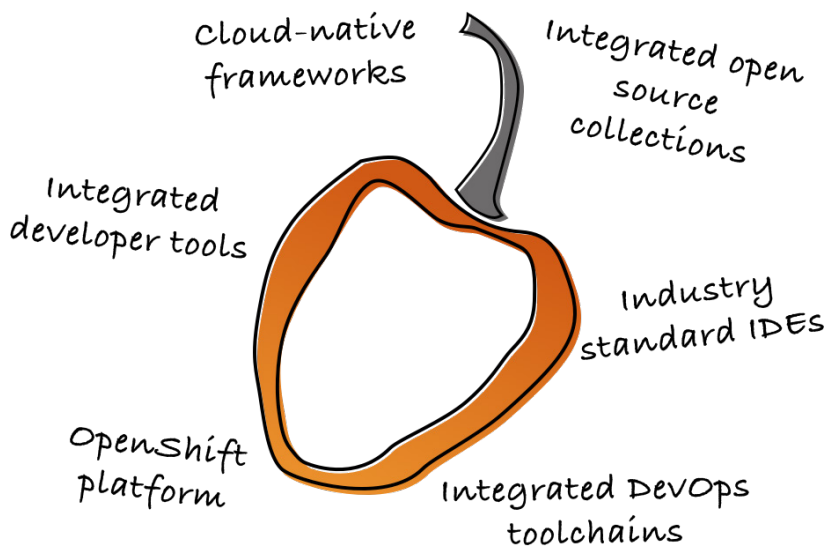
Integrated collections. Start developing applications locally using lightweight containers that match your production environment.

Integrated developer tools. Use your favorite development tools to create apps for Kubernetes faster. Spend more time writing code rather than re-tooling.

Integrated DevOps toolchain. Speed development with a preconfigured DevOps pipeline that can build, test and deploy your application to production.



Check out the open source project Kabanero.
<https://kabanero.io/>



Experience a fast incremental, intelligent, end-to-end development experience with Kabanero.

Expose and integrate

Some existing applications are best exposed as APIs that are easily reused for building new capabilities that augment the existing application. You can then leverage those APIs to integrate future applications into the ecosystem. Running on Red Hat® OpenShift®, the IBM Cloud Pak for Integration gives you agility to deploy and run workloads on-premises and on private and public clouds.

UNLOCK BUSINESS VALUE FROM EXISTING SYSTEMS

Expose. Expose existing value as REST APIs for easy access from any endpoint.

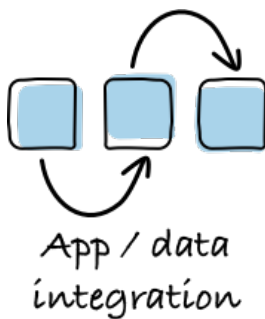
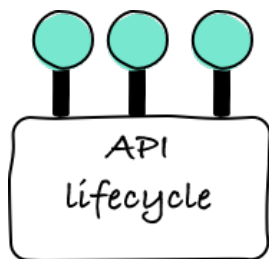
Manage. Place APIs under management control to improve security, performance and visibility.

Leverage. New applications can build on freshly-exposed APIs from existing applications without requiring changes to existing applications.



Check out the IBM Cloud Pak for Integration.

<https://www.ibm.com/cloud/cloud-pak-for-integration>



Messaging

Simplify the management of your integration architecture and reduce cost with the IBM Cloud Pak™ for Integration.

Modernize operations

After an application is pushed to production, it must be managed. Cloud service management and operations addresses the operational aspect of your application and services. Applications are monitored to ensure availability and performance according to service level agreements. As methods to develop, test, and release new functions become more agile, service management must also transform to support this paradigm shift.

REINVENT YOUR CLOUD OPERATIONS

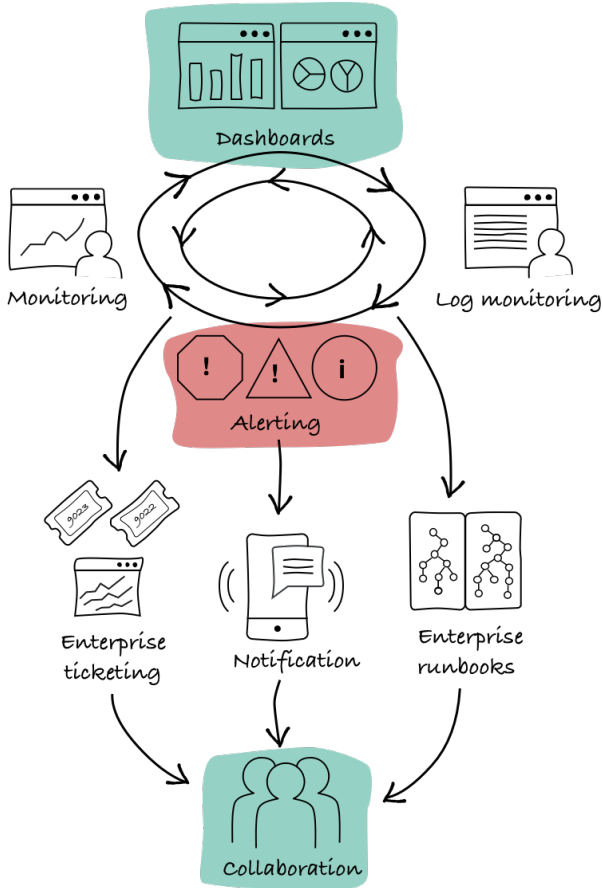
Build to manage. Developers use a set of standards and solutions to make the application manageable and ensure that the application will meet service level objectives.

Monitoring & logging. Leverage container platform tools to monitor metrics and logs to determine application health. Become proactive and fix things before users are aware an issue exists.

Communication & collaboration. Use tools and automation, including chat applications, issue and project tracking systems to keep everyone informed.



Check out the Service management architecture.
[https://www.ibm.com/cloud/garage/architectures/
serviceManagementArchitecture](https://www.ibm.com/cloud/garage/architectures/serviceManagementArchitecture)



Containerized middleware and applications are key to moving to modern development and operations approaches.

IBM Garage - Accelerate your journey

Modernization comes in many flavors and rewriting your entire estate is not feasible. Big bang modernization efforts are risky, so it is best to break large initiatives into smaller projects with measurable impact. Your goal is to accelerate value, deliver frequently, and reduce risk. IBM Garage experts can help.

REFACTOR WHAT'S NECESSARY, BUT DON'T NECESSARILY REFACTOR

Co-create. Identify a business modernization opportunity. Define and build the MVP with your squad, get feedback, and co-create a solution.

Co-execute. Manage risk by choosing the right approach to modernize your current estate. Accelerate your journey through automation and technology.

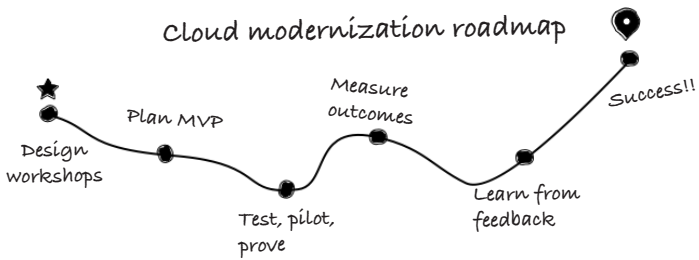
Co-operate. Harden for production, standardize operations, and improve DevOps efficiency across your application estate.



Check out the IBM Garage.
<https://www.ibm.com/garage>

Modernize your applications quickly and safely using our accelerators and tools.

Engage IBM's Garage experts!



IBM Garage is a trusted partner, providing technology and prescriptive guidance to deliver immediate business value.

Notes:

Cloud Pak for Applications:
Get started!!

<https://www.ibm.com/cloud/cloud-pak-for-applications/get-started>

Learn more about Red Hat
OpenShift

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

Check out IBM Cloud
Transformation Advisor

<https://www.ibm.com/cloud/garage/practices/learn/ibm-transformation-advisor>

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Check out the Cloud Pak for Integration

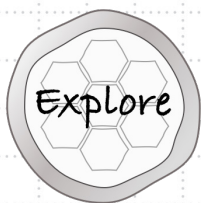
<https://www.ibm.com/cloud/cloud-pak-for-integration>

Read the blog: Build cloud-native apps faster for Kubernetes with Kabanero

<https://developer.ibm.com/blogs/cloud-native-apps-kubernetes-kabanero/>

Visit an IBM Garage

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Take the course: Explore the
Garage Method, and get a
badge!!!

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IBM APPLICATION MODERNIZATION

