

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>

Continuously respond to the rapid pace of change

Champion digital transformation and embrace agile ways of working that fuel growth and keep you competitive. Optimize business operating models within a hybrid cloud strategy to drive cost efficiency, increase productivity, and create opportunities for innovation. To unlock the value of a hybrid cloud approach, IT leaders need architectural flexibility and leading technologies like AI to modernize apps for improved ROI and faster time to market.

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.

Create a future-ready culture. Quickly develop and deliver new applications and services through the adoption of a cloud-native architecture, containerization, and AI accelerators.

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 environment.

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.

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

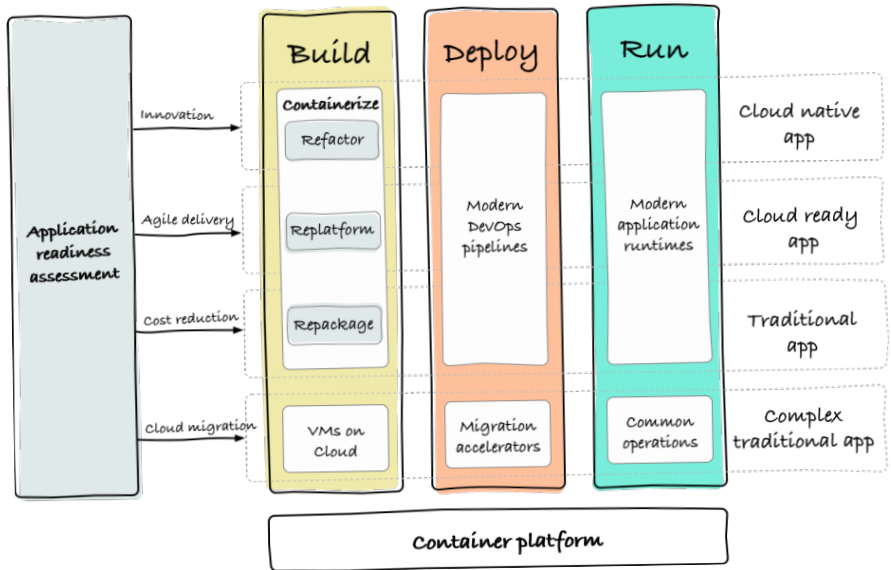


Learn more

Check out the IBM Garage.

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

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



IBM 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 to rearchitect your estate. The IBM Cloud Transformation Advisor helps you select the best entry point to deliver value at each step in your journey. IBM can assist you in understanding the patterns to help you achieve your modernization goals.

CHOOSE THE APPROACH THAT BEST FITS YOUR NEEDS

Containerize the monolith. Reduce costs and simplify operations by moving applications to a cloud runtime. Start with one and then identify sets of applications to move as a wave.

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 based on maturity, modernization objectives and requirements.

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

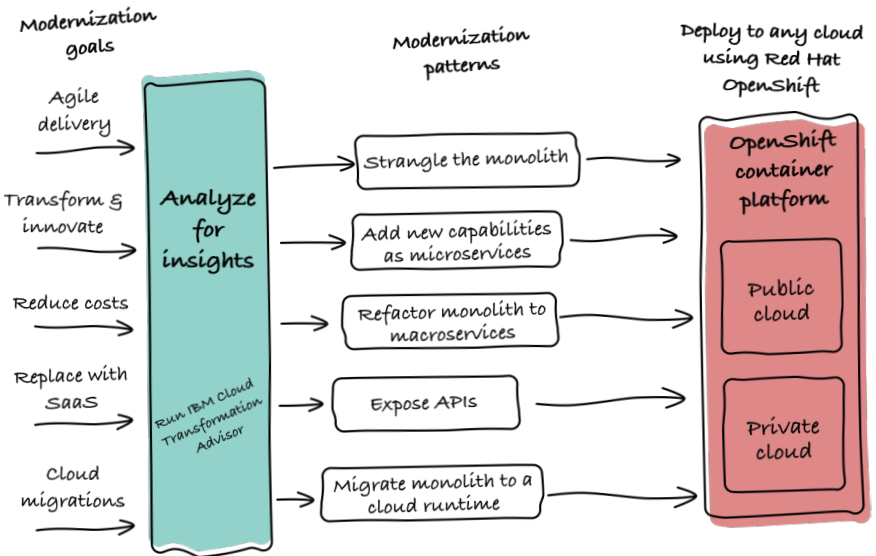
Strangle the monolith. Incrementally sunset the monolith.



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.

REDUCE COSTS & MINIMIZE DISRUPTIONS

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 WebSphere Hybrid Edition

websphere | Liberty | Mono2Micro | Transformation advisor

IBM Cloud Paks

Security | Data | AIOps | Integration
Business automation | Network automation

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.

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.
ibm.biz/cloudta

Advice based on IBM's expertise!

IBM Transformation Advisor

Workspaces
MyData

MyStore

Source environment
IBM WebSphere Application server

Migration target on Cloud Pak
Liberty runtimes

Collections
MyStore

Name	Migration Target	Complexity	Dev. Cost days
emailcomponent.ear	Open Liberty	Simple	0
inventorymain.ear	Open Liberty	Moderate	6
catalog002.ear	WebSphere Liberty	Complex	16

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

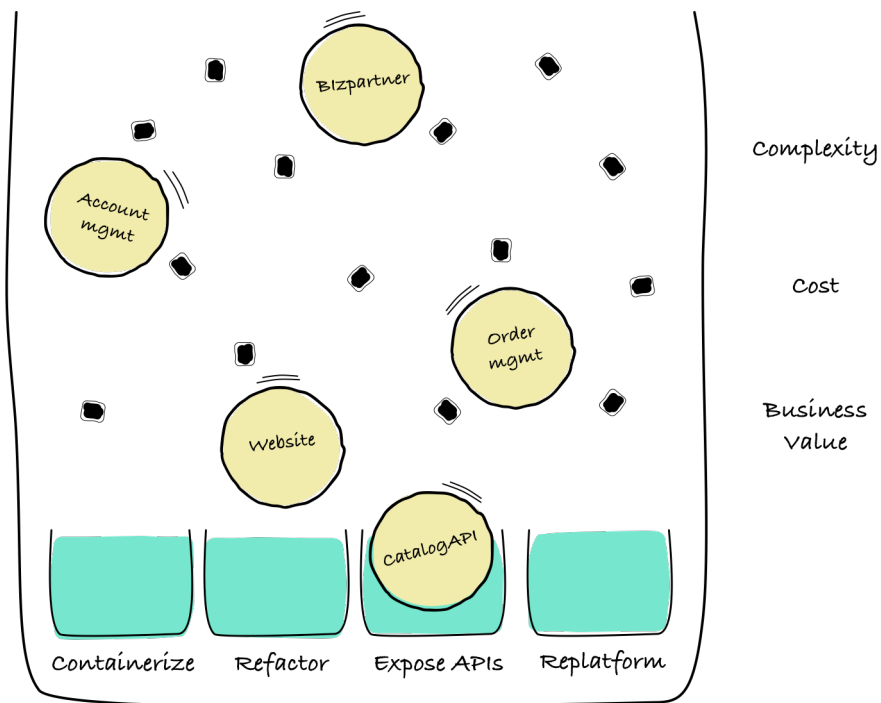
Simplify. Understand where your business needs are driving you to modernize. Run the IBM Cloud Transformation Advisor to gain clarity on your modernization options.

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.
ibm.biz/cloudta



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?

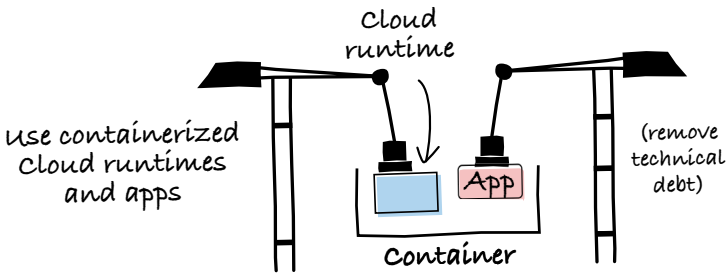
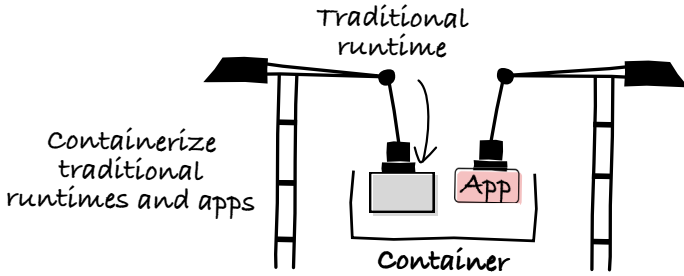
Adapt your applications. If you have existing IBM WebSphere applications from a non-cloud environment, the IBM Cloud Pak product family and IBM WebSphere Hybrid Edition include pre-built containerized middleware and services to support your journey.

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

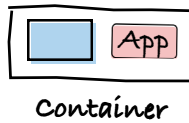
Consolidate and standardize operations. Manage and monitor operations based on open container technologies.



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 IBM WebSphere Hybrid Edition) to facilitate your journey.

A CLOUD-FIRST FRAMEWORK FOR THE FUTURE

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

Extend with new services. Use IBM WebSphere Liberty containers to modernize and extend existing WebSphere applications.

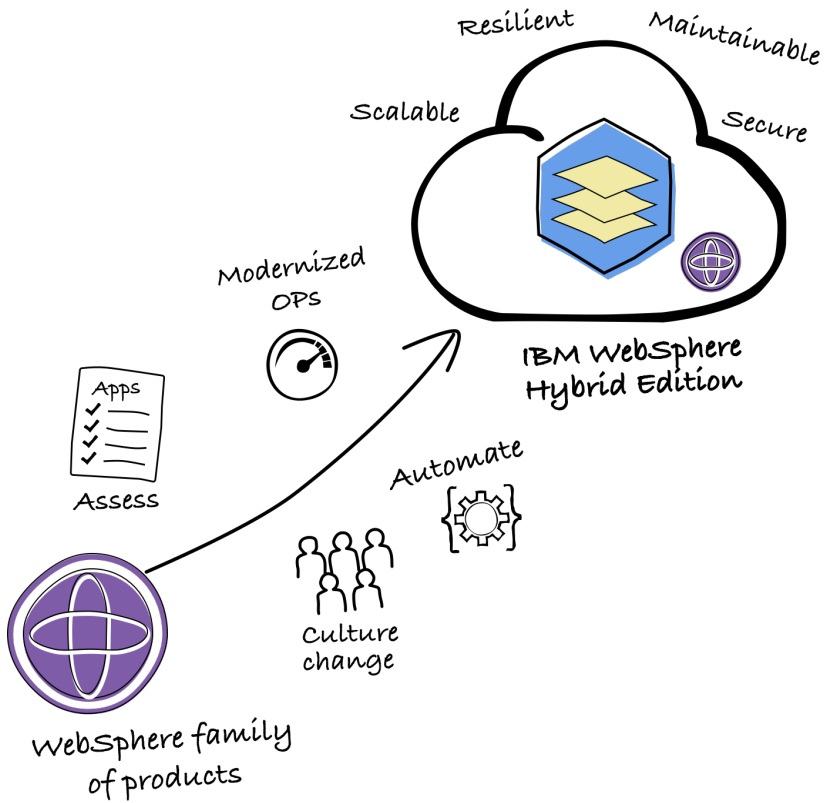
Migrate unchanged apps. Containerize your traditional IBM WebSphere apps and use common operational services, including logging and monitoring.

Adopt standardized operations. Achieve scalability, availability, maintainability, and security with Kubernetes.



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 piecewise way. You “strangle” the old monolith by replacing each business function incrementally.

MODERNIZE INTELLIGENTLY

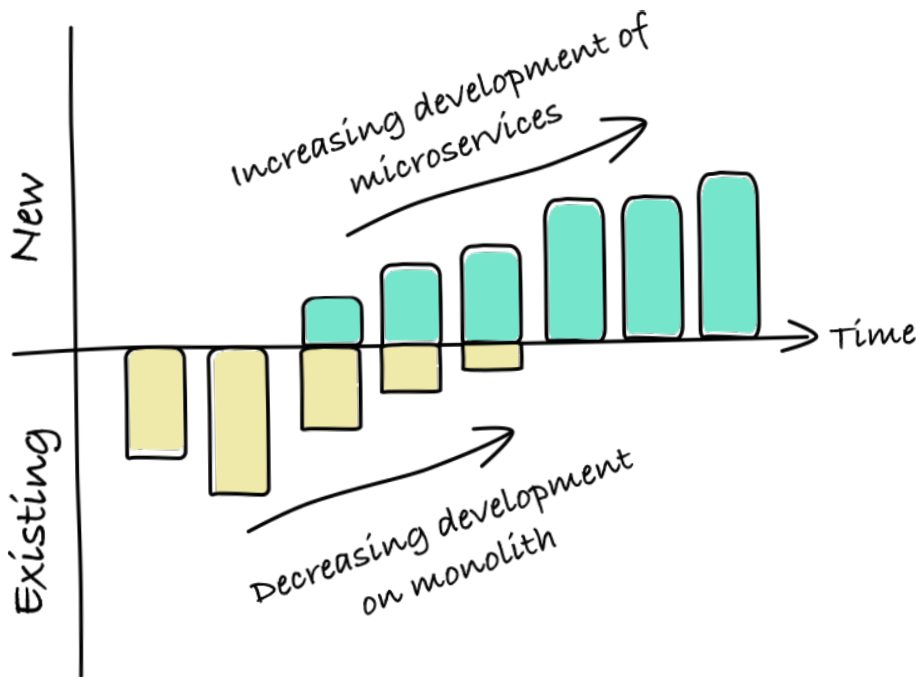
Productivity. Refactoring an application to microservices improves developer productivity and allows you to quickly release more code.

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 an IBM WebSphere Liberty or Open Liberty container. Then add new containers to your solution as you separate business functions into new microservices. Use IBM Mono2Micro to identify optimal microservice candidates.



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.

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.

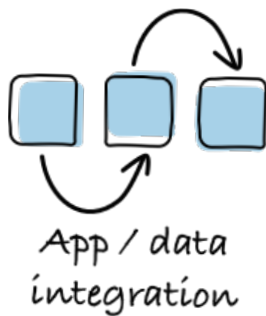
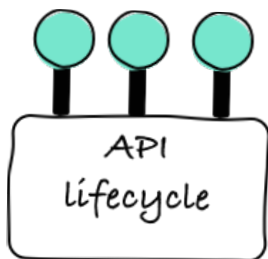
Manage. Place APIs under management control to improve security, performance and visibility.

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

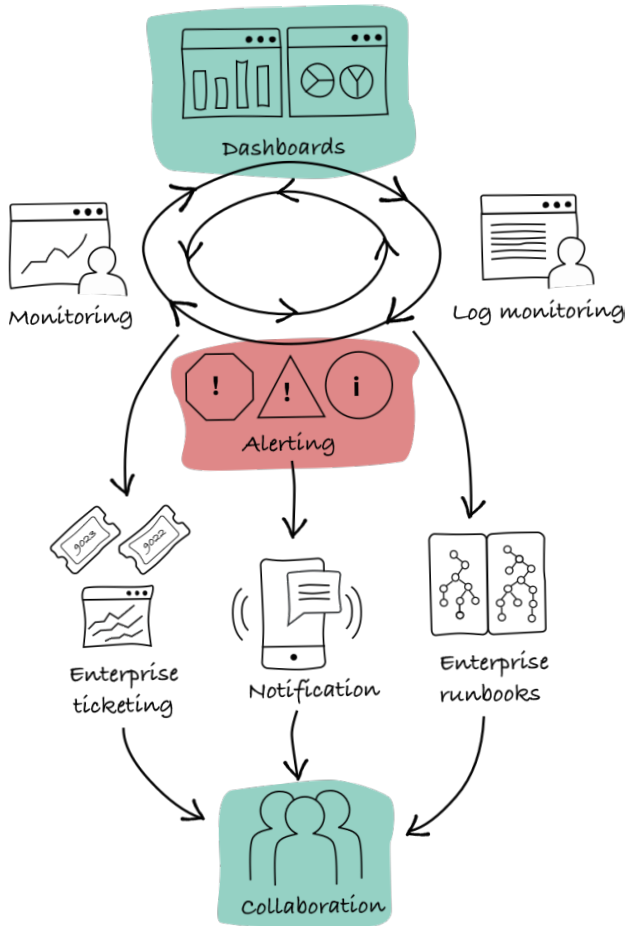
Build to manage. Developers use a set of standards and solutions to make the application manageable and ensure that the application will meet service level objectives.

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)

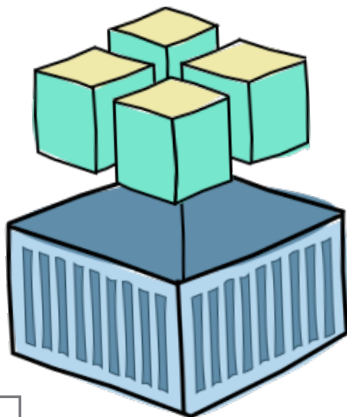


Containerized middleware and applications are key to moving to modern development and operations approaches.

What are IBM Cloud Paks?

IBM Cloud® Paks are AI-powered software for hybrid cloud that can help you fully implement intelligent workflows in your business to accelerate digital transformation. Tap into the power of IBM Watson® to apply AI to your business to predict and shape future outcomes, automate complex processes, optimize your employees' time and create more meaningful and secure customer experiences.

Built on Red Hat® OpenShift®, develop applications once and deploy them anywhere on any cloud, integrate security across the breadth of your IT estate, and automate your operations with management visibility. IBM Cloud Paks have a common foundation of enterprise components that accelerate development, deliver seamless integration, and help enhance collaboration and efficiency.



Check out IBM Cloud Paks.
<https://www.ibm.com/cloud/paks/>

IBM Cloud Pak for Data. Simplify data management, governance, analytics and data science with a fully integrated, containerized cloud-native data and AI platform. Built on Red Hat OpenShift, you can accelerate your journey to AI with an open platform that runs on any cloud or on-premises.

IBM Cloud Pak for Business Automation. Deploy on any cloud, 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 Watson AIOps. Deploy advanced, explainable AI across the ITOps toolchain to confidently assess, diagnose, and resolve incidents across workloads. Improve responsiveness and reduce risk with AI at the core of your IT operations.

IBM Cloud Pak for Integration. Automate integrations to improve application speed and quality. Embed AI and automation across the integration lifecycle by applying AI to real-world operational data to identify issues and recommendations, and drive continuous improvement. Speed integration development, reduce costs, increase operational efficiency and maintain enhanced security, governance, and availability.

IBM Cloud Pak for Network Automation. Transform your network with an AI-powered, Telco cloud platform to enable the automation of network operations, evolve to zero-touch operations, reduce OPEX, and deliver services faster.

IBM Cloud Pak for Security. Uncover hidden threats, make more informed risk-based decisions, and respond to incidents faster. Using an open security platform, connect to your existing data sources for deeper insights and act faster with automation.

Develop apps for today and tomorrow

IBM® WebSphere® Hybrid Edition provides the tools to increase efficiency, reduce costs, and maximize ROI. 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

Optimize existing entitlements. Realign your entitlements based on your current business needs. Migrate cores of IBM WebSphere and IBM WebSphere ND to IBM WebSphere Liberty to increase server capacity and decrease costs.

Modernize applications. Use IBM Cloud® Transformation Advisor and IBM Mono2Micro to help assess the cloud readiness of your applications. Assess the complexity of your migrations and explore the options for using containers and microservices.

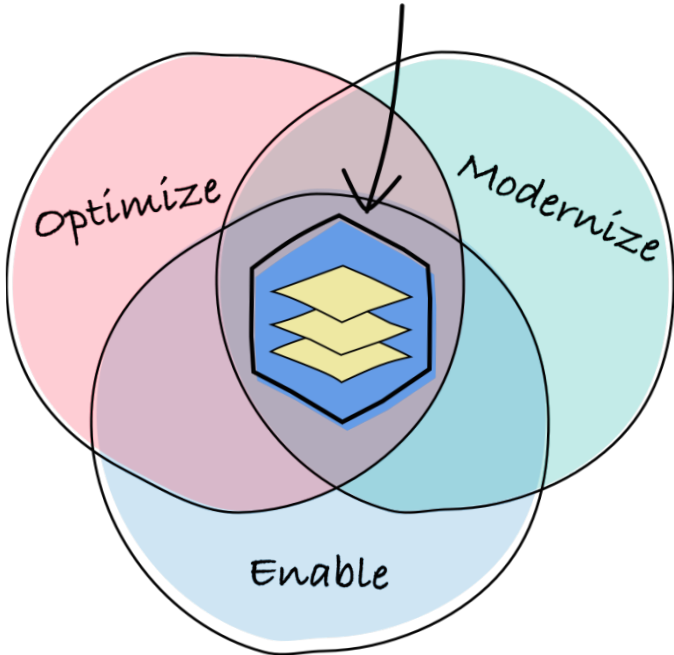
Cloud-enable new applications. Prepare your estate so you can build all new applications directly on the cloud with IBM WebSphere Liberty.



Check out IBM WebSphere Hybrid Edition.

<https://www.ibm.com/cloud/websphere-hybrid-edition>

IBM WebSphere Hybrid Edition



Incremental & continuous modernization

IBM Services offers skills, methods, and tools that can help you continuously modernize, build, and manage applications to achieve your business and IT outcomes.

Build a modernization roadmap. Develop an application modernization roadmap that is underpinned by modernization patterns and solutions, and supported by our application modernization architecture to minimize risk and deliver with speed.

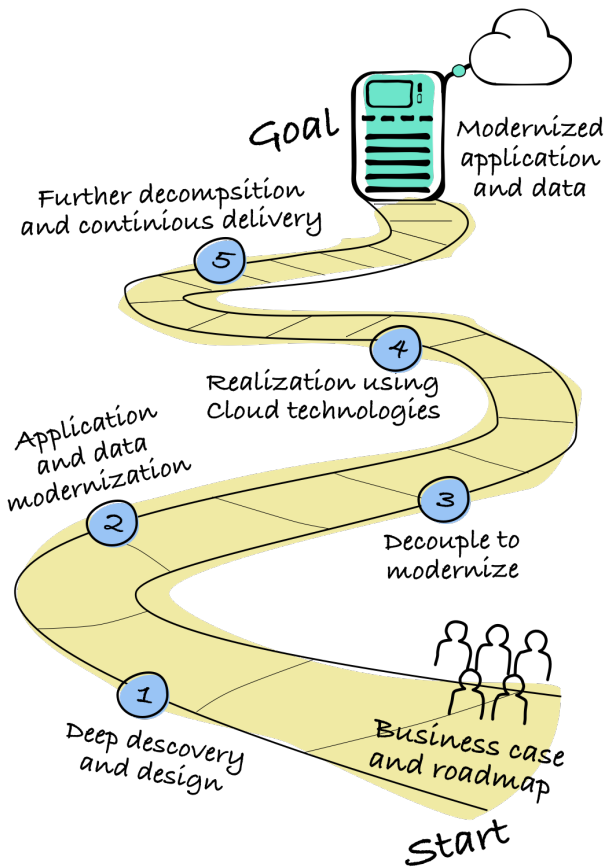
Accelerate your modernization journey with tools and accelerators. Modernize your application portfolio using IBM's tools and accelerators, and DevSecOps principles to improve your time to market and better compete in a changing industry.

Deliver using a new operating model. To sustain value, your modernization program requires change to your operating model. IBM can help you design a flexible platform that meets future-state needs with AI powered tooling that orchestrates and automates your journey to application modernization.



Increase agility with application modernization.

<https://www.ibm.com/services/cloud/modernize-applications>



Modernize your applications with agility, speed, and scale with
IBM Services.

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, continuously modernize, 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.



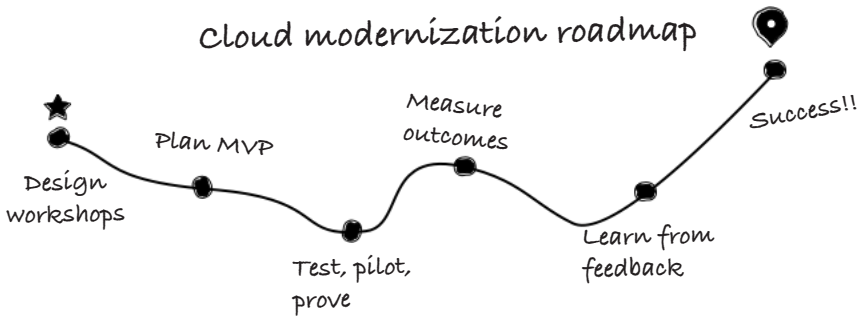
Check out the IBM Garage.

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

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

Engage IBM's Garage experts!

cloud modernization roadmap



IBM Garage offers a unique approach to enable business, development and operations to continuously design and deliver a compelling application modernization strategy.

Notes:

IBM WebSphere Hybrid
Edition: Get started!!

[https://www.ibm.com/cloud/
websphere-hybrid-edition/get-started](https://www.ibm.com/cloud/websphere-hybrid-edition/get-started)

Check out IBM Cloud
Transformation Advisor

ibm.biz/cloudta

Application Modernization architecture

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

check out the Cloud Pak for Integration

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

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<https://www.ibm.com/services/cloud/modernize-applications>

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the Garage Method -- get a
badge!!!

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IBM APPLICATION MODERNIZATION

