IBM Application Modernization

Field Guide

IBM

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Application Modernization Field Guide ↓

App modernization is inevitable

Business pressures demand faster time to market and app modernization. Your existing estate determines the best approach to modernization. Containers, Kubernetes, and microservices are proven to deliver speed and simplicity, and are being adopted rapidly. IBM can make this easy for you.

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.

Improve developer productivity. Enabling self service for developers through adoption of cloud native and containerization.

Improve operational efficiency and standardization. DevOps enablement drives a culture of automation and transformation of operations.

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.

IBM's unique approach

Rewriting your entire estate is a pipe dream. Modernization comes in many flavors. IBM's skills and experience in middleware provide unique insights and approaches to modernize your existing estate with speed, confidence, and reduced risk. View your development investments as an asset, not a liability.

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

Think. More than a simple, one-size-fits all approach, IBM provides flexible guidance you can trust.

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

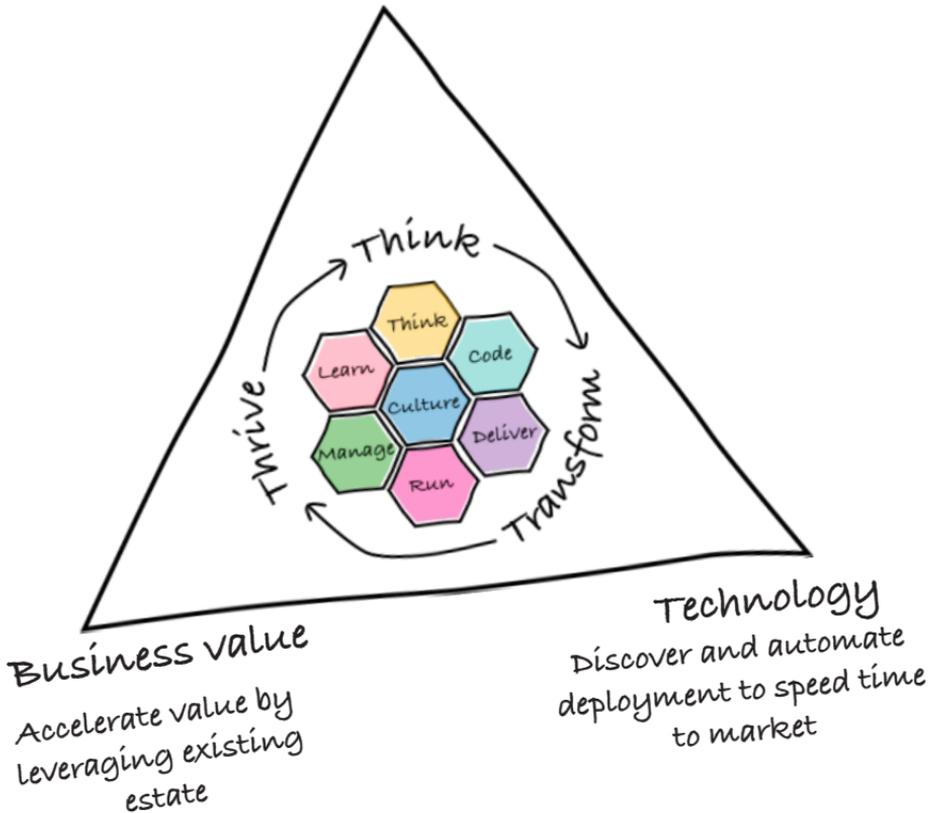**Thrive.** Get ahead of your competition by improving your DevOps efficiency.

⊕ **Learn more**
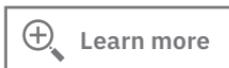
Check out the IBM **Cloud** Garage Method website.
https://www.ibm.com/cloud/garage

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

Prescriptive Guidance
An approach you can trust based on a proven method

Business value
Accelerate value by leveraging existing estate

Technology
Discover and automate deployment to speed time to market

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

Modernization journey

To get started on your modernization journey, you must understand the approaches that are right for your inventory. The IBM 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 path that is right for you.
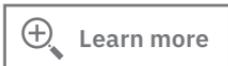
CHOOSE THE APPROACH THAT BEST FITS YOUR NEEDS

Containerize the monolith. Reduce costs and simplify operations.

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

Refactor into macroservices. Break down monoliths into deployable components.

Add new microservices. Innovate incrementally and establish success early.

Strangle the monolith. Incrementally sunset the monolith.
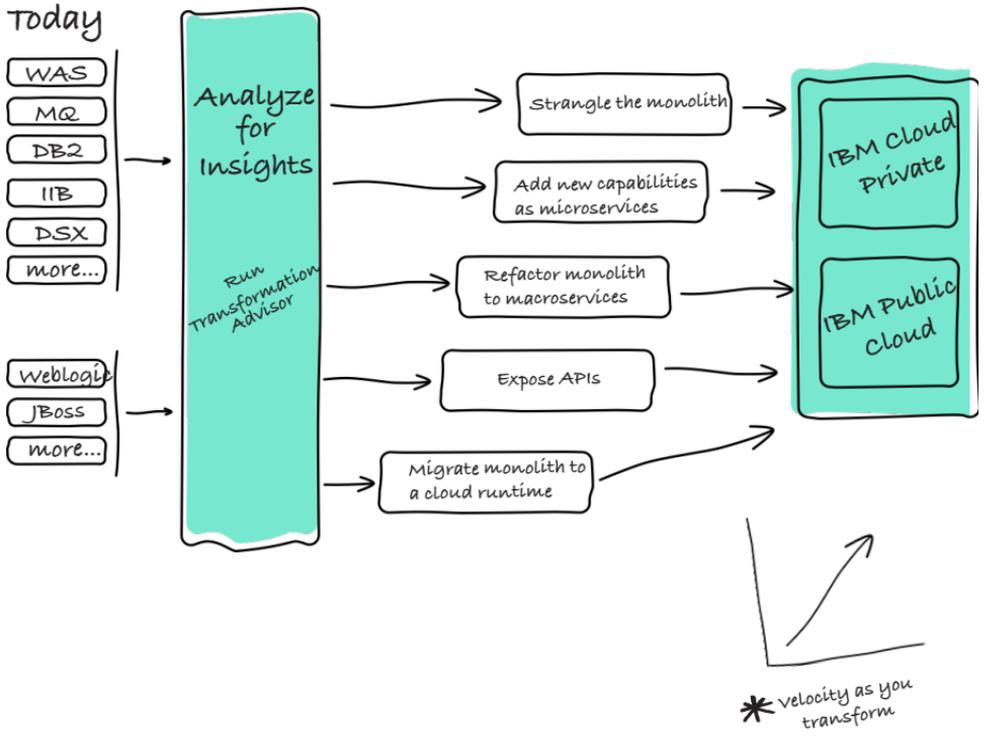
⊕ **Learn more**

Check out the IBM **Transformation Advisor tool.**
https://developer.ibm.com/app-modernization

Mix and match your
approaches as needed!

Transformed

Today

- WAS
- MQ
- DB2
- IIB
- DSX
- more...

- Weblogic
- JBoss
- more...

Analyze for Insights

Run Transformation Advisor

Strangle the monolith

Add new capabilities as microservices

Refactor monolith to macroservices

Expose APIs

Migrate monolith to a cloud runtime

IBM Cloud Private

IBM Public Cloud

✳ Velocity as you transform

Increase your delivery velocity along the journey.

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 Transformation Advisor to collect information from your existing environment and recommend modernization activities.

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

⊕ **Learn more**

Check out the IBM Transformation Advisor tool.
https://developer.ibm.com/app-modernization

Advice based on IBM's expertise!

Recommendations that reflect your inventory

IBM Transformation Advisor

Data Collector   User preferences   **Recommendations**

Source environment: IBM WebSphere Application server

Application	Recommendation	Complexity	Technical match (%)
emailcomponent.ear	Liberty on IBM Private Cloud ✓ Cloud location ✓	Simple	100%
inventorymain.ear	Liberty on IBM Private Cloud ✓ Cloud location ✓	Moderate	80%
catalog002.ear	Liberty on IBM Private Cloud ✓ Cloud location ✓	Complex	100%

Get expert tailored advice about your modernization options.

Classify your app portfolio

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

NOT ALL APPLICATIONS ARE CREATED EQUAL

Simplify. Run the IBM Transformation Advisor to gain clarity on your modernization options.

Understand effort, cost and outcomes. Evaluate all possible modernization options.

Classify your modernization portfolio with confidence. The secret sauce behind Transformation Advisor recommendations is a built-in cognitive engine based on real life IBM modernization experience.

⊕ **Learn more**

Check out the IBM Transformation Advisor tool.
https://developer.ibm.com/app-modernization
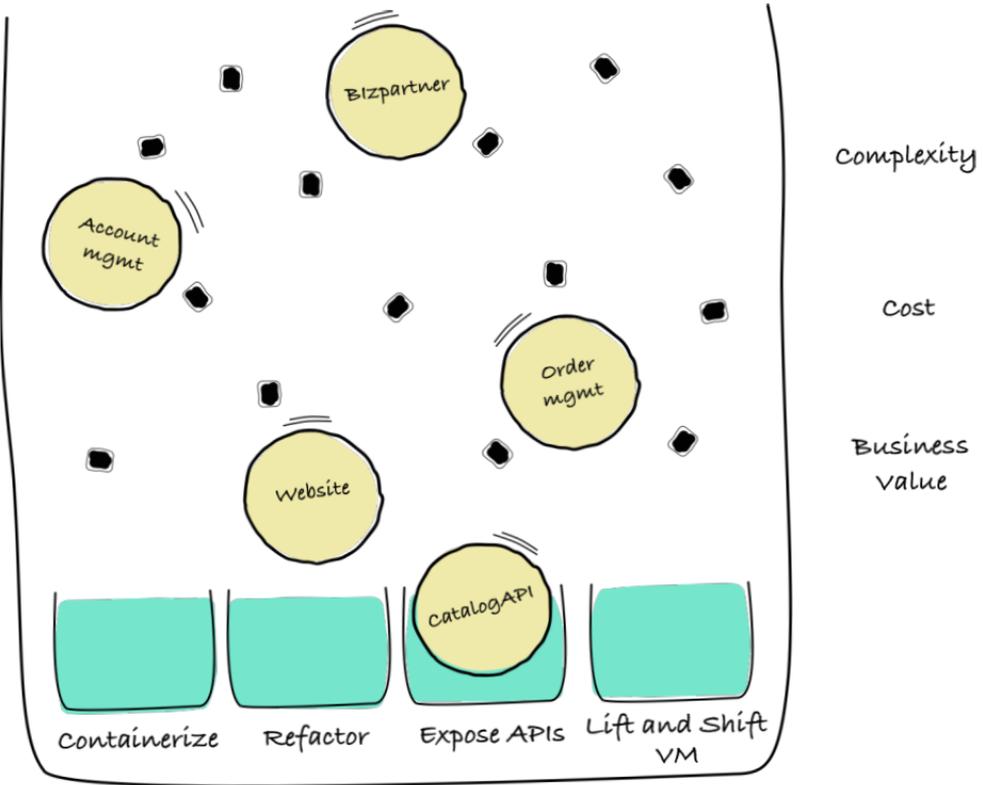
Modernization approach depends on your application code timeline and appetite for risk.

Plan & prioritize

Plan your modernization based on matching effort to business priorities. Identify quick wins that are shovel-ready to move immediately. Choose the right modernization strategy driven by your business needs.

"IF YOU FAIL TO PLAN, YOU ARE PLANNING TO FAIL!"
- BENJAMIN FRANKLIN

Prioritize. You must balance both time and business priority. Low priority projects are good learning vehicles, but might not drive as much real business value.

Quick wins. Quick wins are important to reassure stakeholders and justify investment for longer-term projects.

Perfect match. Your first few projects should be both short in duration and high in potential business value. Starting with the longest, hardest project can lead to a loss of confidence about the overall outcome before value is realized.

⊕ **Learn more**

Check out the **IBM Cloud Adoption & Transformation Consultancy.**
https://www.ibm.com/cloud/garage/adoption/cloud-adoption-and-transformation

Show success early with quick wins! Start small and expand.

Apps	complexity	cost	Business value	Plan order
Website main	5	3	2	2
Account management	3	2	4	3
Catalog API	1	1	1	1
Order management	9	7	3	4
Business partner	7	5	5	5

✳ Quick Win!!!!

Modernize with a plan.

Establish the 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

Kubernetes-based platform. Container orchestration is the starting point. A strong foundation with resiliency and security in the forefront is essential.

Containerized middleware and services. Prebuilt container images and Helm charts can greatly accelerate your containerization.

Automate. You need capabilities to orchestrate existing VMs, new finer grained deployment pipelines, and new operations stacks.

⊕ **Learn more**

Check out IBM **Cloud Private**.
https://www.ibm.com/cloud-computing/products/ibm-cloud-private/

Integrated DevOps & Management

Open DevOps Toolchain | Hybrid Cloud Management

Cloud Optimized Software & Services

Microservices | Cloud Foundry | Middleware

Data | Analytics | Machine Learning | Blockchain

Kubernetes-based Platform

Developer Productivity | Operational Efficiency

Catalog | Built-in Elasticity | Multi-tenant | Consistent Management

Open Technology | Runs anywhere

Flexible Choice of Infrastructure

VMware | OpenStack | Hardware

Foundation for App Modernization

IBM realizes containerization through the IBM Container Service and IBM Cloud Private, based on Kubernetes.

Containerize your apps

Wrapping an application in a Docker 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 DOCKER IMAGE - NOW WHAT?

Adapt your applications. You need accelerators to adapt your application to a containerized environment. IBM provides prebuilt containerized middleware and services and prescriptive guidance.

Modernize your DevOps and Configuration. IBM provides tools that automatically generate pipelines for new applications as well as orchestration tools that automate configuration.

Modern Operations. IBM provides out of the box management and monitoring based on open technologies.

⊕ **Learn more**

Check out the microservices architecture.
https://www.ibm.com/cloud/garage/architectures/microservices
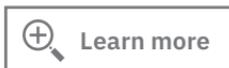
Before

Existing middleware

WAS

Existing operations

Containerized middleware

WAS on Docker

Pre-integrated DevOps

Jenkins urban(code) deploy

After

Refactor to Microservices

Integrated Dashboard

Nodes	Storage	Apps
89%	91%	91%

CPU   Memory   GRU
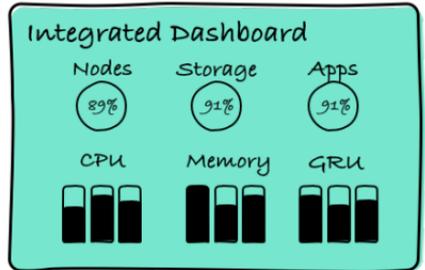
IBM Cloud Private and IBM Cloud

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

An integrated, container-native operations and DevOps platform is a requirement.

Expose and integrate

Some existing applications are best exposed as APIs. They then become reusable assets that are easily leveraged for building new capabilities that augment the existing application. Integrate other applications into the ecosystem by leveraging those APIs.

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 leverage API's from existing applications without requiring changes to existing applications.

$\oplus$ **Learn more**
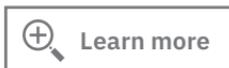
Check out the API architecture.
https://www.ibm.com/cloud/garage/architectures/apiArchitecture

New Microservices App

uService uService uService

uService uService

Leverage existing capability in new app via API Gateway

API Gateway

Expose current app via APIs

Existing Monolithic Application
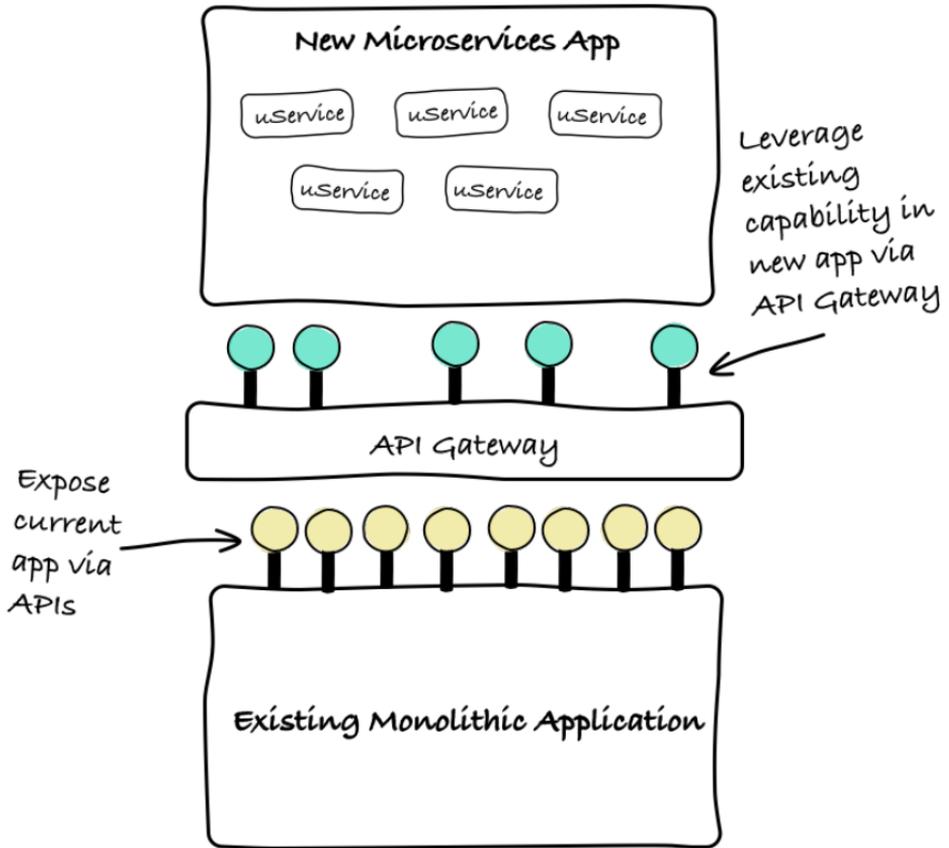
Create new capabilities by leveraging APIs.

APIs allow incremental creation of value to extend current application ecosystems.

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. It 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 a refactoring while improving operational efficiency.

Containerize. You can begin with repackaging your monolith as a container with Liberty, then add new containers to your solution as you separate business functions into new microservices.

⊕ **Learn more**

Check out the microservices architecture.
https://www.ibm.com/cloud/garage/architectures/microservices
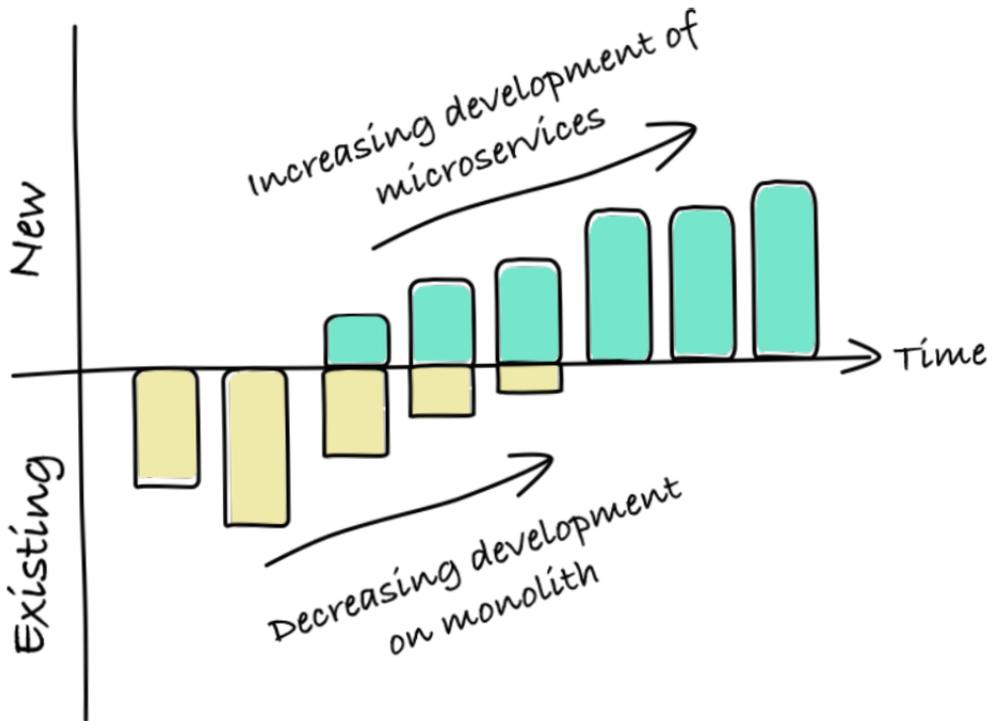
Incremental Value is delivered at every point in the process.

When you replace a monolith piecewise, you gain additional efficiency and improvements at each step.

Place selected apps on VMs

Not every application is easily landed on containers.   In some cases, parts of an overall solution might need to be executed on VMs.   This is a valid and complementary choice as part of the overall modernization journey.

ROUNDING OUT A MODERNIZATION SOLUTION

Fit for purpose. Some existing application infrastructure is optimized for working within VMs. These apps should remain within a VM.

Standardized services. VMs can leverage IBM Cloud Private services to reduce overall management cost.

Container integration. Clear obstacles inhibiting modernization by enabling new container based services to interact with existing apps on VMs.

⊕ **Learn more**

Check out the infrastructure architectures.
https://www.ibm.com/cloud/garage/architectures/infrastructure

Manage VMs and
containers together.

Hybrid orchestration

Hybrid management

| New Microservices

Cloud enabled apps

Middleware services

Developer services | VM

WAS
ND as
an App | VM

IBM
BPM as
an App | VM

Other
legacy
App (too
hard to
move) |

IBM Cloud
Private services

Virtualization / IaaS layer
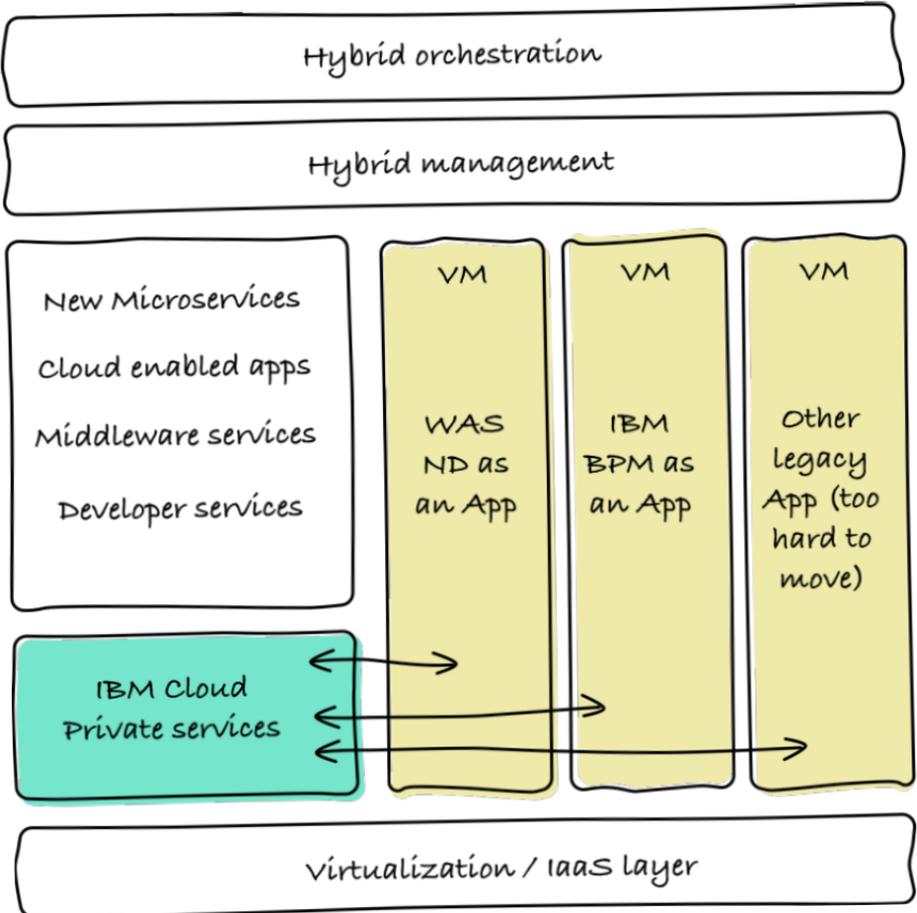
**VM based assets are part of an overall modernization
solution.**

Cloud Adoption and Transformation Consultancy

The Cloud Adoption and Transformation Consultancy helps you balance your current and future technology needs with an understanding of the integrated set of decisions that need to be made. Work with us to align the talent and capabilities you'll need, the management systems you'll use, and the business goals on which you will be measured with your organization's adoption and transformation vision.

A STRATEGIC ROADMAP

Think. Assess your current state, and ideate on and prioritize future state goals.

Transform. Get guidance to help you adopt cloud, build confidence, and realize your initial set of business outcomes.

Thrive. Work together to adjust and expand your plan to build on your success and amplify your new agile culture.

⊕ **Learn more**

Check out the IBM **Cloud** Garage Method website (Adoption).
https://www.ibm.com/cloud/garage/adoption

Engage IBM's Cloud adoption experts!

Cloud adoption roadmap

★ Design workshops

Plan MVP

Test, pilot, prove

Measure outcomes

Learn from feedback

Success!!
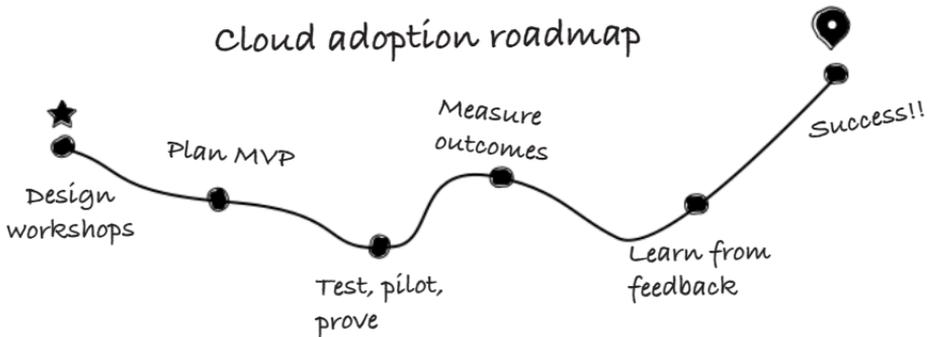
ibm.com/cloud/garage/adoption/cloud-adoption-and-transformation

Establish a cloud strategy to adopt, transform, and deliver value—then turn it into a roadmap you can follow.

Notes:

Visit an IBM Cloud Garage

ibm.com/cloud/garage/get-started

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

ibm.com/cloud/garage/course/explore_garage_method

✱

Get Book:

"The Cloud Adoption Playbook",
available on amazon.com
ibm.biz/cloud-adoption-playbook

Download IBM Cloud Private
community edition, it's FREE!!

https://www.ibm.com/account/reg/us-en/
signup?formid=urx-20295

Explore the Private Cloud
Architecture and take the
10-minute guided demo!!

ibm.com/cloud/garage/
architecture/private-cloud

My cloud!!

Use the Transformation Advisor tool to get started!!!

https://developer.ibm.com/app-modernization

Notices

IBM APPLICATION MODERNIZATION