



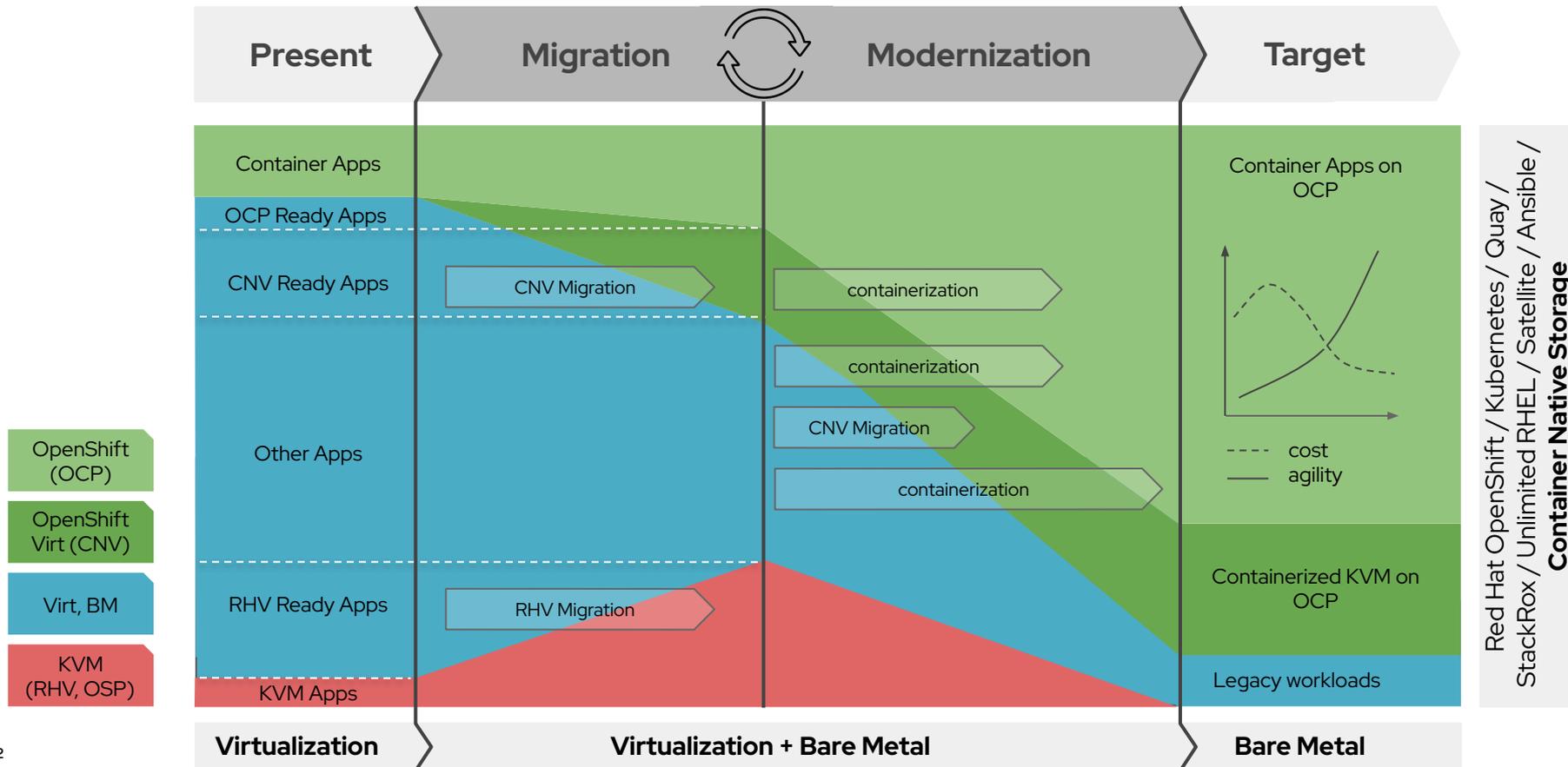
Red Hat
Summit

Application Factory

Foundation for successful digital transformation

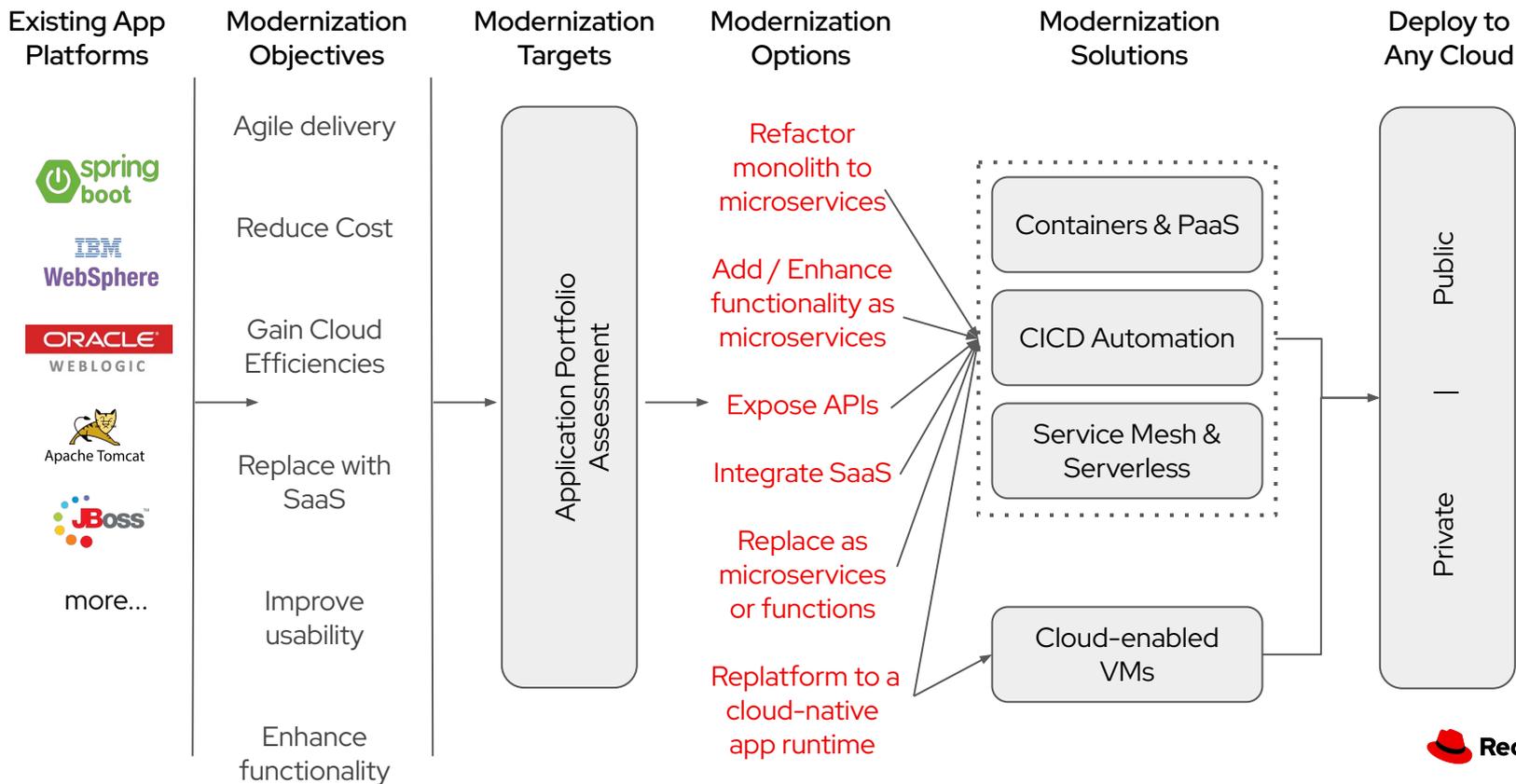
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Apps: Software Infrastructure landscape



Application modernization yields business value

Replatform, refactor, replace, integrate



Application Migration Factory

What, how, and why



Challenge

Slow

Resource availability, subject matter expertise, competing priorities

Risky

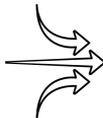
Migrations can be very expensive with hard to justify ROIs.

Realistic Roadmap

The devil is in the details. Broad based assessments can only be so accurate

Business Value

How will migrating platforms add value to your business units when their teams are not innovating



Approach

Standardize

Experienced migration focused team brings standardized approaches

Reevaluate Constantly

Each iteration has an exit plan

Metrics based migration

Each iteration captures metrics based on size, speed and performance

Dedicated Team of migration experts

A dedicated and experienced migration team with process to build internal capabilities



Benefits

Speed

Migration process continually gets refined making faster boilerplate migrations

Flexibility

Captured metrics can help make informed decisions on how to pivot priorities

Predictability

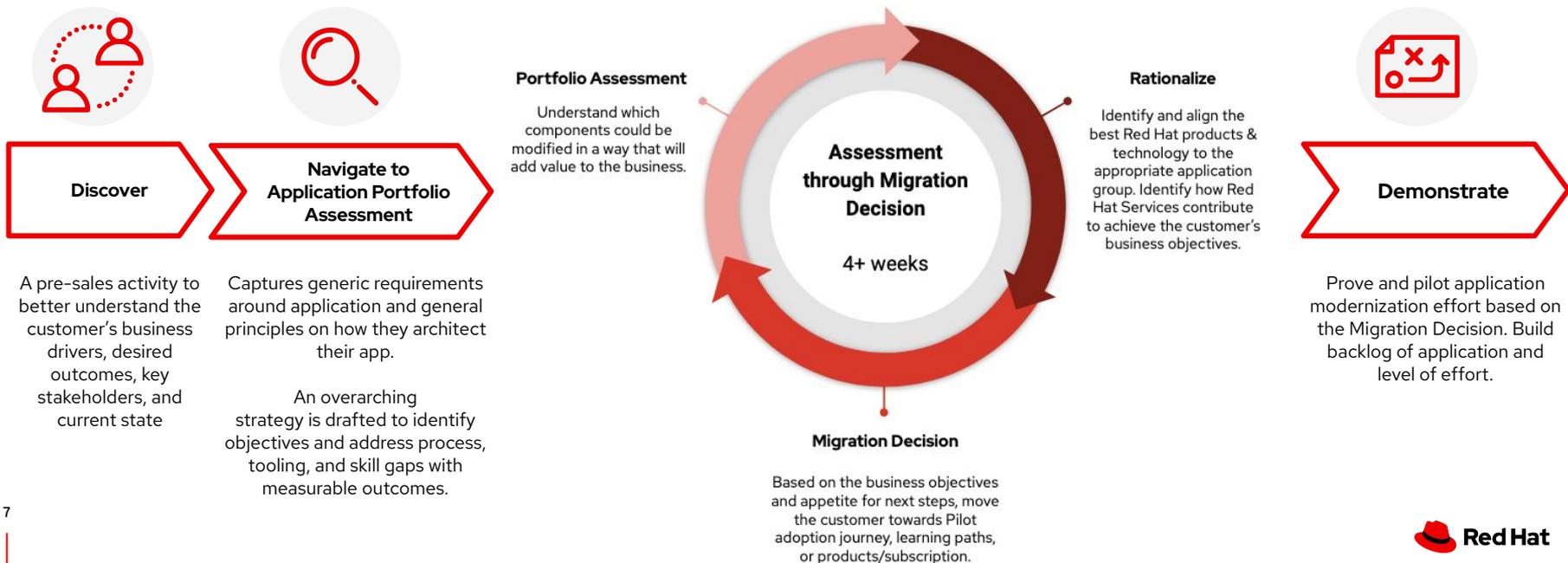
These metrics, along with refined t-shirt sizing enable increasingly intelligent decision making

Modernization Capability

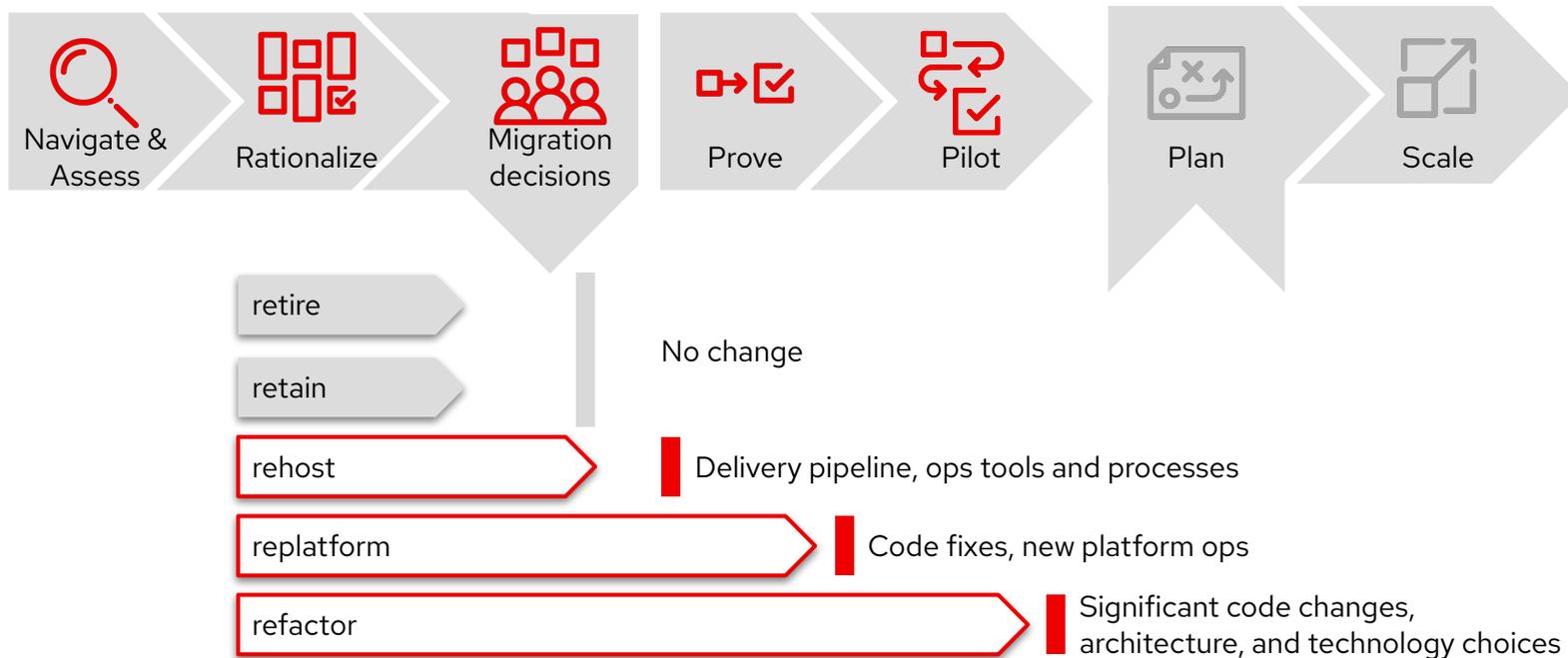
Build culture that embraces continuous modernization and thought leadership

Where do we start

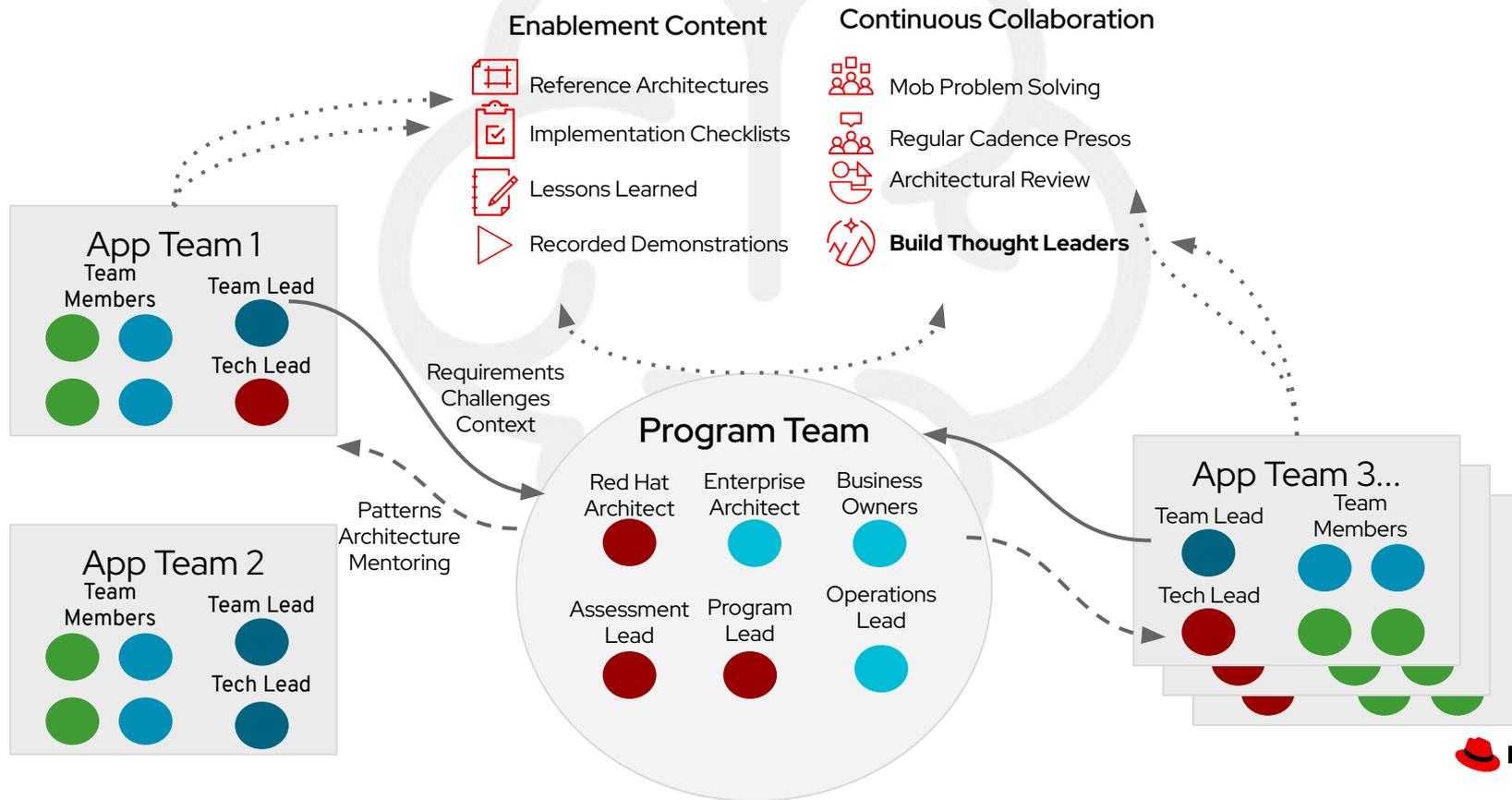
Application Portfolio Assessment will assess a customer's portfolio of applications resulting in application categorization and prioritization. The categorization and prioritization are aligned to the company's desired infrastructure end state and built to assist the customer through the initial stages of their adoption of new platform.



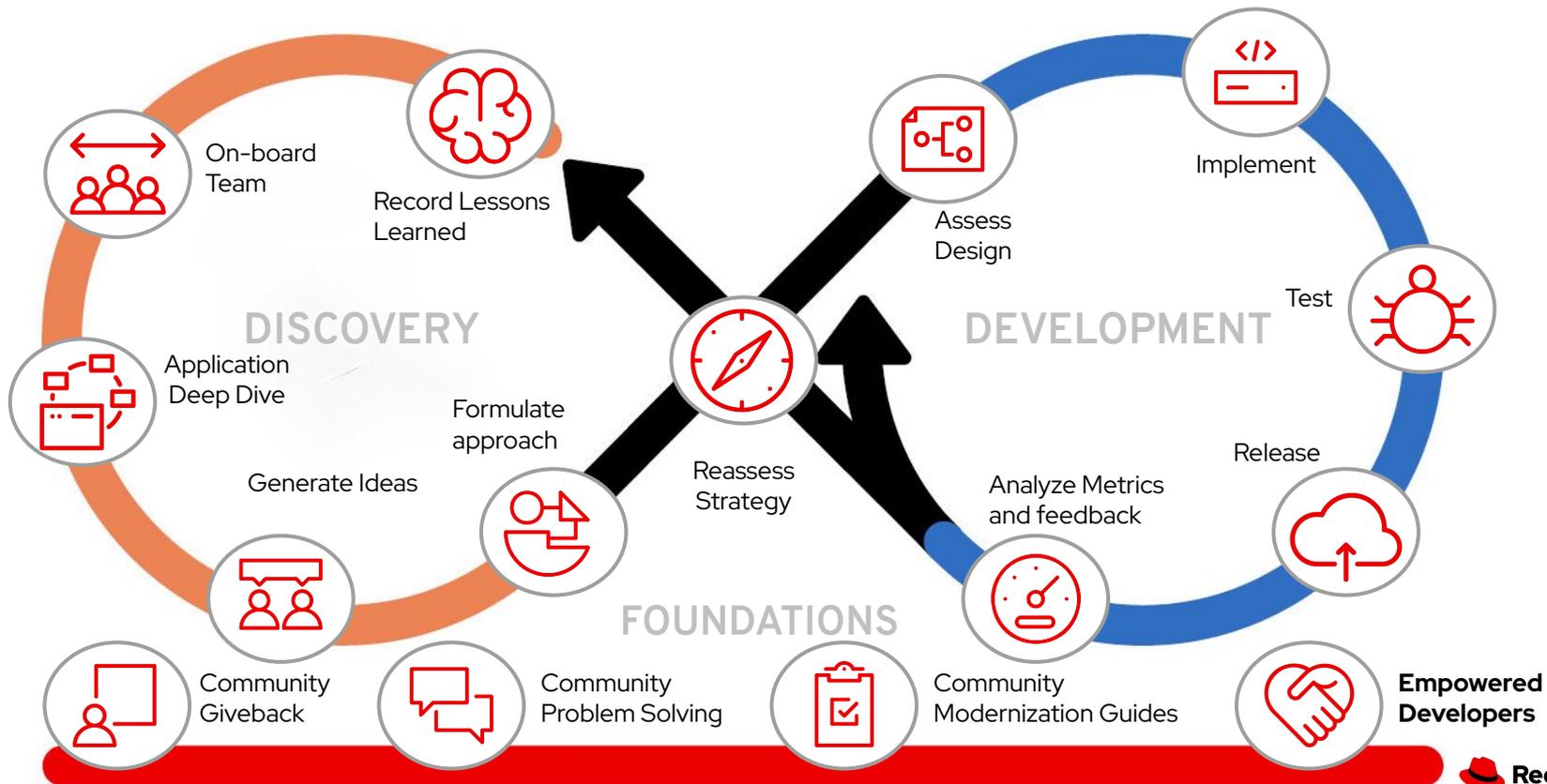
High-levels options following portfolio assessment



Build Community

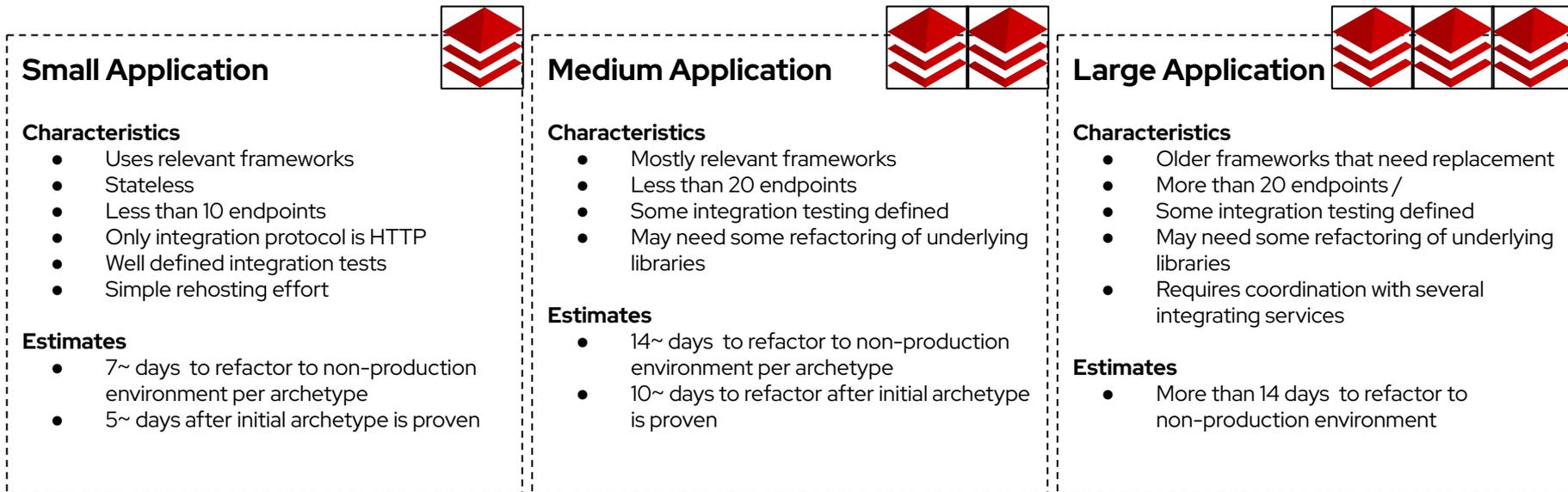


Continuous Discovery & Delivery = Continuous Learning



T-Shirt Sizing for Initial Estimations

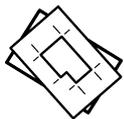
As migrations occur, lessons are learned and level of estimates are adjusted



* An application in this context is a single deployable artifact like a Java war file.

Application Migration Factory

High-level task list



Migration Architectural design:

- Lead architectural **discovery and design workshops** with application SME to validate migration assumptions and solidify approach
- Develop and validate **testing strategy**



Develop, Deploy and Feedback:

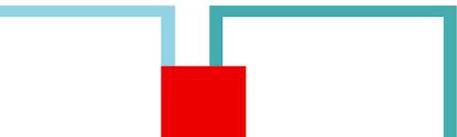
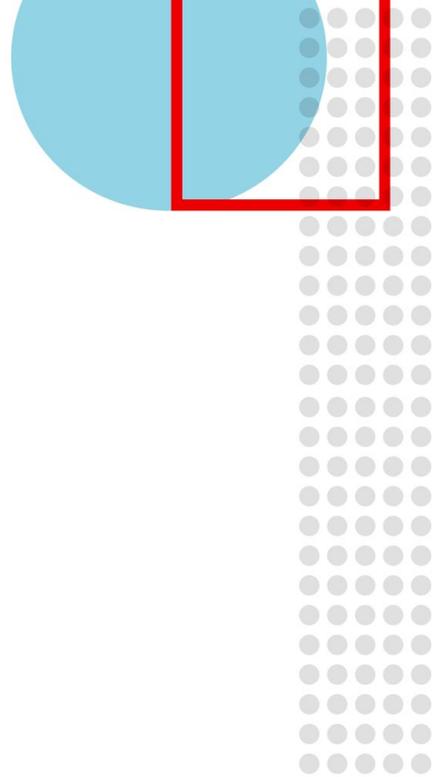
- Containerize application and/or create deployment descriptor for **running on OpenShift**
- Integrate build process into existing **CI/CD pipeline** which deploys to OpenShift
- **Test application deployment** on the Openshift platform and ensure it can gracefully handle pod restarts
- Create and **document repeatable strategies** for future migrations
- **Continuously refine migration strategy** with lessons learned



Enable:

- Provide side-by-side **mentoring with development teams**
- **Foster community for application modernization** through workshops, demos and building channels for better cross-team communication
- Deliver and review **architectural and operational documentation** through each iteration

Modernization tools & techniques



Konveyor Projects



Rehost virtual machines to KubeVirt



Rehost apps between Kubernetes clusters



Replatform applications to Kubernetes



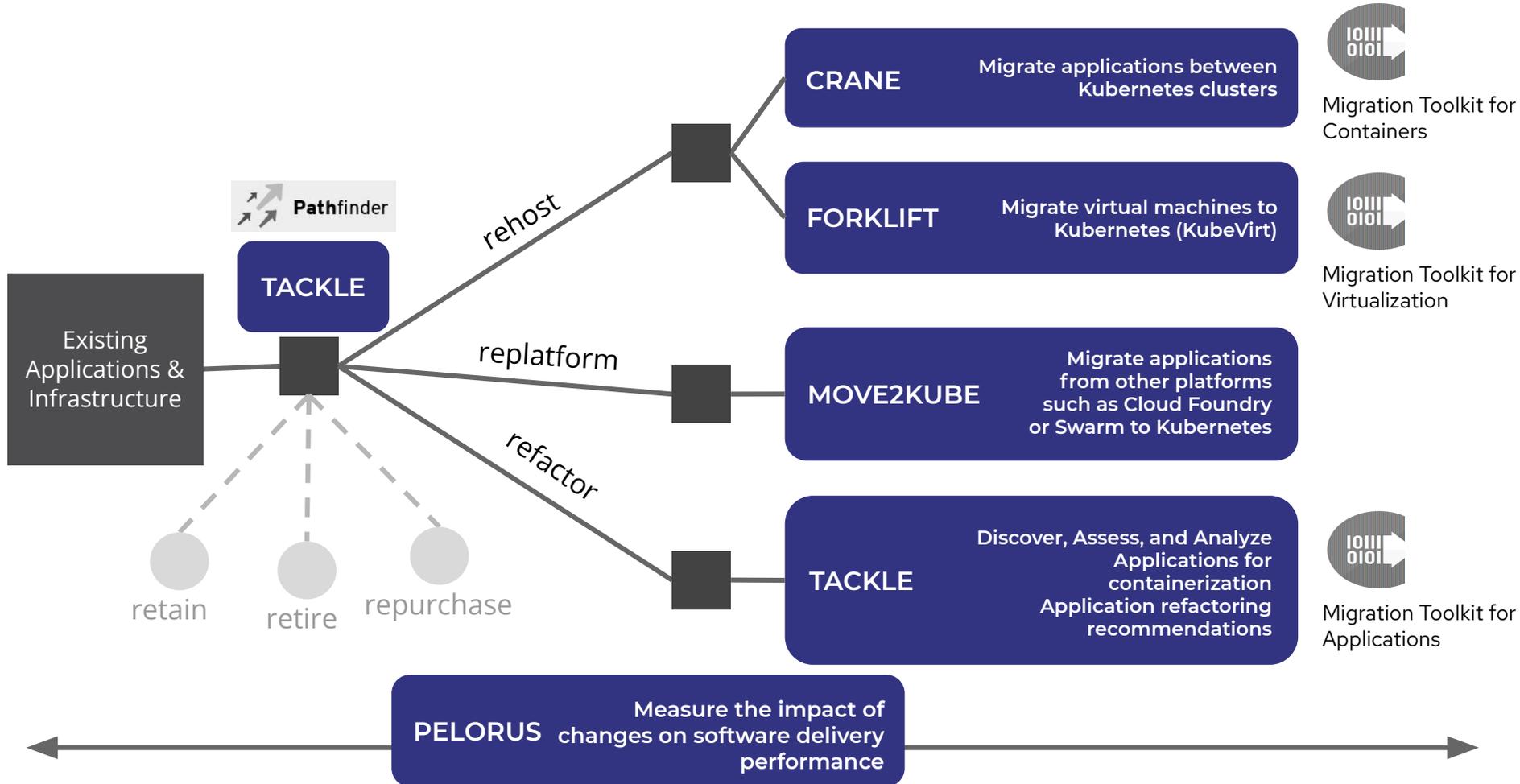
Refactor applications for Kubernetes



Measure software delivery performance

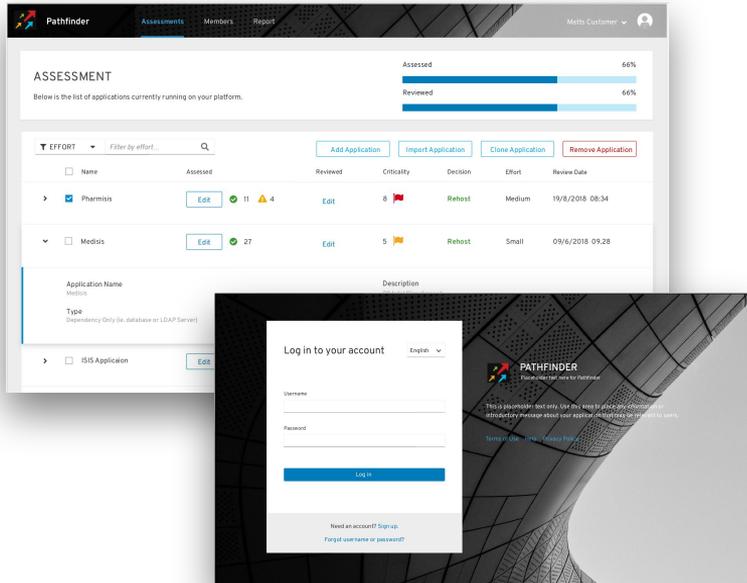


Konveyor Community Projects and Red Hat Supported Tools



Application Portfolio Analysis

Pathfinder



Assess Application Suitability for Containers

Dialogue based assessment across people, process, and technology

Accounts for various aspects

Proposed actions, effort estimates, and business criticality

Reports generated

Cloud Readiness Assessment, Application Dependencies and Adoption plan, Identified risks

Rehost Technical Path

Move the application with as few changes as possible



DockerFile

```
FROM jboss-eap-7:latest
COPY MyApp.war /samplePath/myApp.war
CMD $STI_SCRIPTS_PATH/run
```

Create a build for your application

```
$ oc new-build --strategy docker --binary --docker-image wildfly:latest --name myapp
```

Start a binary build using the local directories content

```
$ oc start-build myapp --from-dir . --follow
```

Deploy the application using new-app, and expose the service

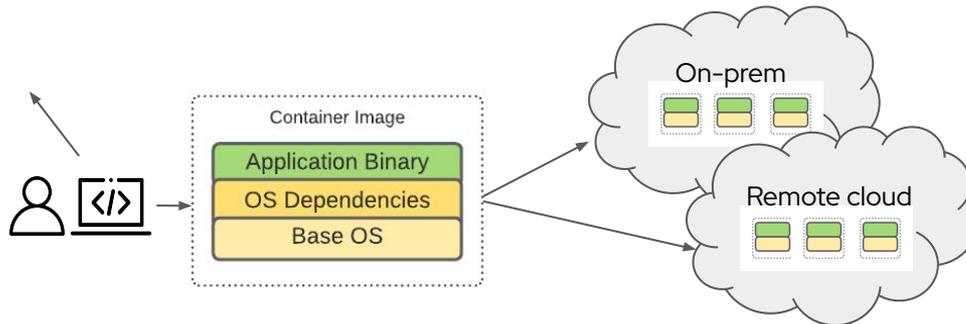
```
$ oc new-app myapp
```

```
$ oc expose svc/myapp
```

Port applications to containers with Binary Builds

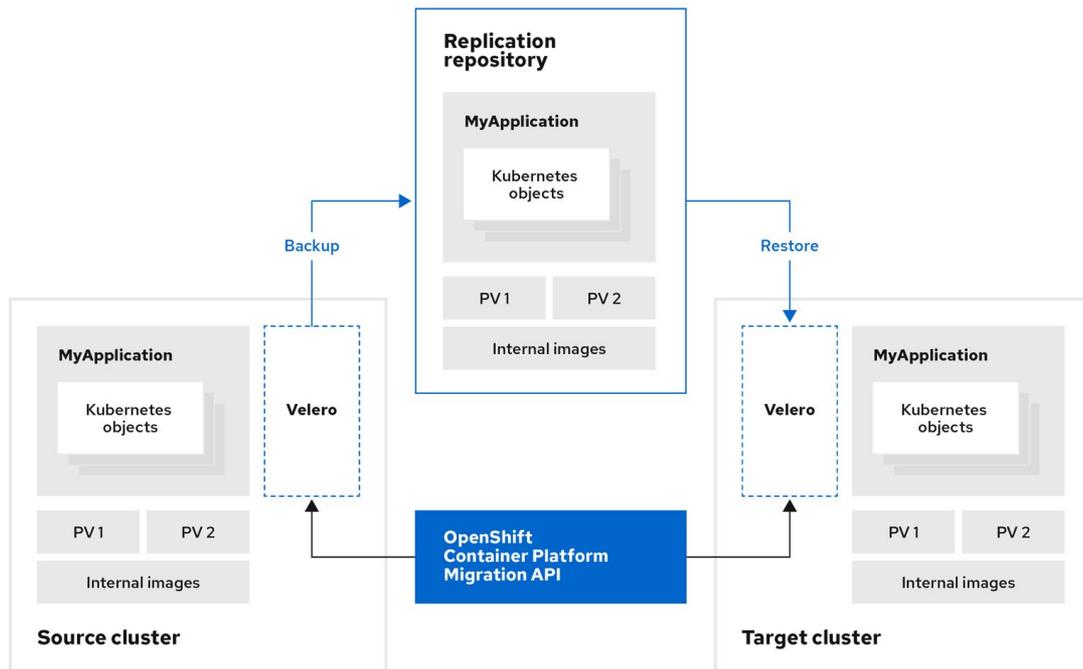
Minimizes risk of development lifecycle by removing disparity between environments

Empowers Developers to have more control over their deployments



Container Migration

Migration Toolkit for Containers



Supported Paths

OpenShift 3.7 to 4.latest
OpenShift 4.x to 4.x

Operator Based

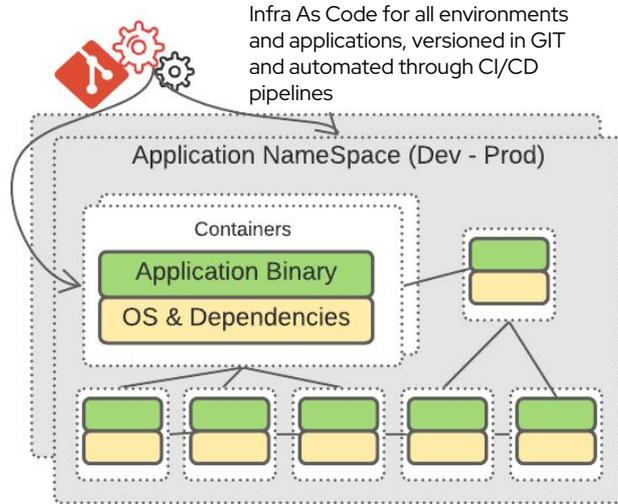
Available in OperatorHub

Types of Migrations Supported

Swing and Copy supported

Rehost Technical Path

Take additional steps to get the most out of your rehosted application



Externalize environment and application configuration

The only difference between your SDLC environments should be size and configuration.

Automate your delivery pipeline

Each step of deployment should be scripted with as little manual intervention as possible for both env staging and app deployment

But what if my application can't run on a container...?

But what if my application requires a Virtual Machine?

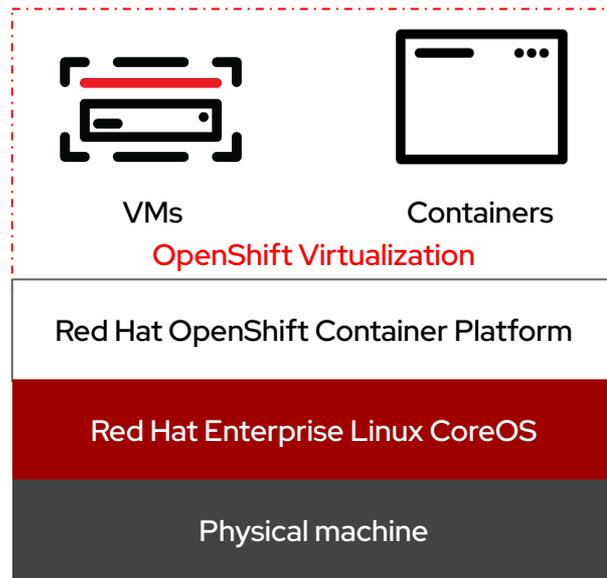
OpenShift 4.5 introduced the general availability of OpenShift Virtualization.



Enabling OpenShift Virtualization in a OpenShift cluster it allows users to deploy virtual machines in their projects side-by-side with their containerized applications.



OpenShift can deploy applications in virtual machines according to the same rules as applications running in containers.

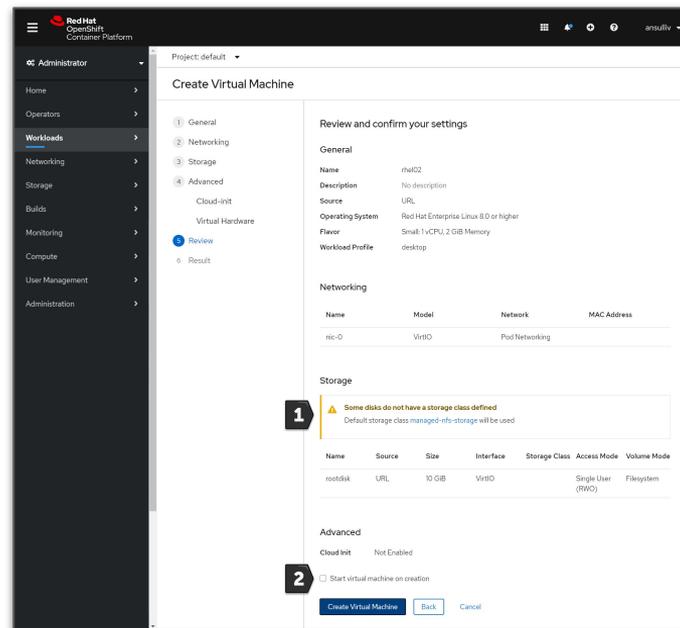
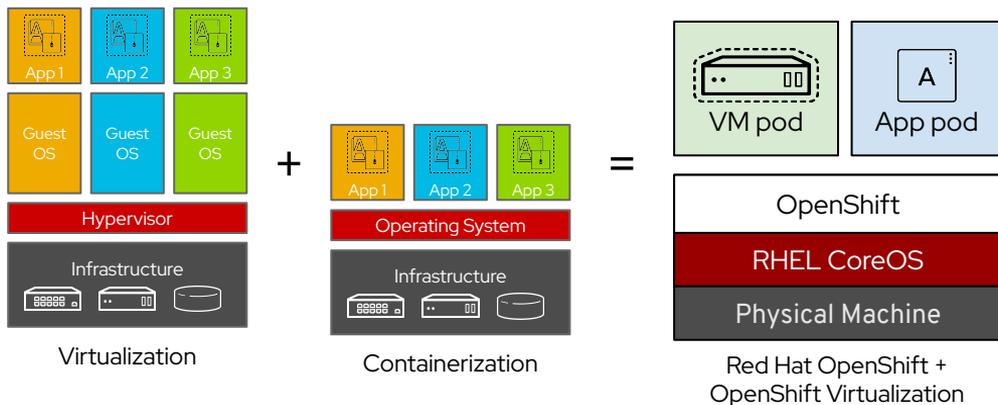


Isn't a Virtual Machine different from a container?

Technical facts:

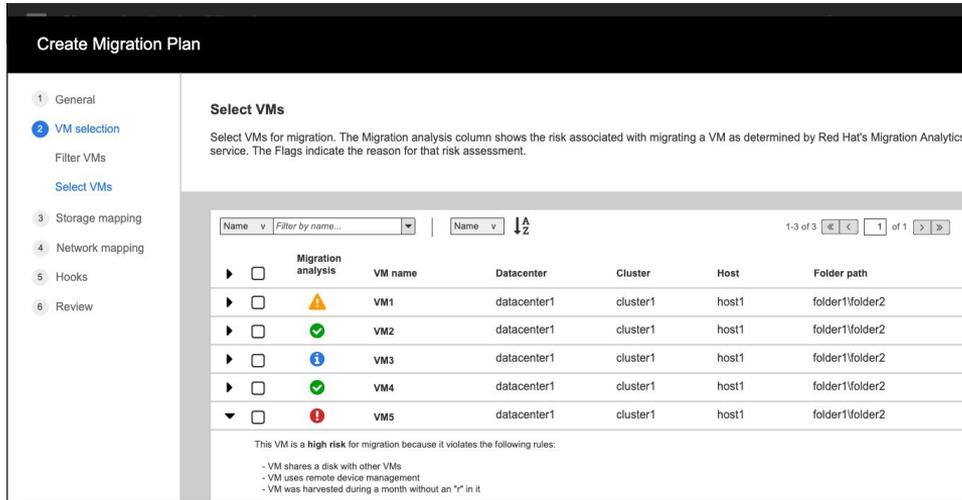
- Containers are methods of process isolation
- A Virtual Machine is a process

Running a Virtual Machine inside a container platform is equal to running a Virtual Machine as a container.



Migration Toolkit for Virtualization (MTV)

Migration at scale of virtual machines to OpenShift



Create Migration Plan

1 General
2 **VM selection**
3 Storage mapping
4 Network mapping
5 Hooks
6 Review

Select VMs

Select VMs for migration. The Migration analysis column shows the risk associated with migrating a VM as determined by Red Hat's Migration Analytics service. The Flags indicate the reason for that risk assessment.

Name	Filter by name...	Name	Sort	1-3 of 3	1 of 1		
<input type="checkbox"/>		Migration analysis	VM name	Datacenter	Cluster	Host	Folder path
<input type="checkbox"/>			VM1	datacenter1	cluster1	host1	folder1/folder2
<input type="checkbox"/>			VM2	datacenter1	cluster1	host1	folder1/folder2
<input type="checkbox"/>			VM3	datacenter1	cluster1	host1	folder1/folder2
<input type="checkbox"/>			VM4	datacenter1	cluster1	host1	folder1/folder2
<input type="checkbox"/>			VM5	datacenter1	cluster1	host1	folder1/folder2

This VM is a **high risk** for migration because it violates the following rules:

- VM shares a disk with other VMs
- VM uses remote device management
- VM was harvested during a month without an "*" in it

Migration Analytics

Detect potential compatibility issues before migrating to ensure a successful migration

Mass Migration of VMs

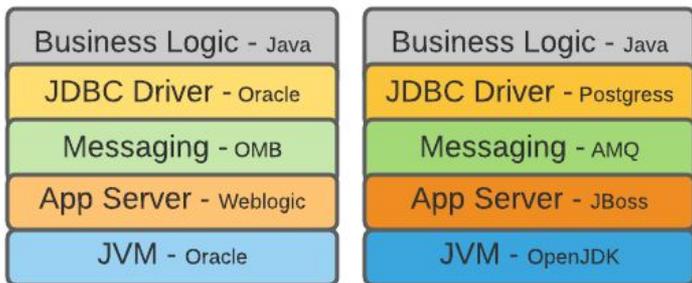
Migrate workloads at scale to OpenShift

- Provide source and destination credentials
- Map infrastructure
- Create migration plans

Replatform Technical Path

Change the underlying platform (runtime, framework, middleware, operating system)

Keep your business logic untouched, but update your commodity middleware to Open Source



Enhance security with vendor container images

Build from supported images where possible - offload base image CVE and security management to provider

Speed up delivery with container-ready middleware

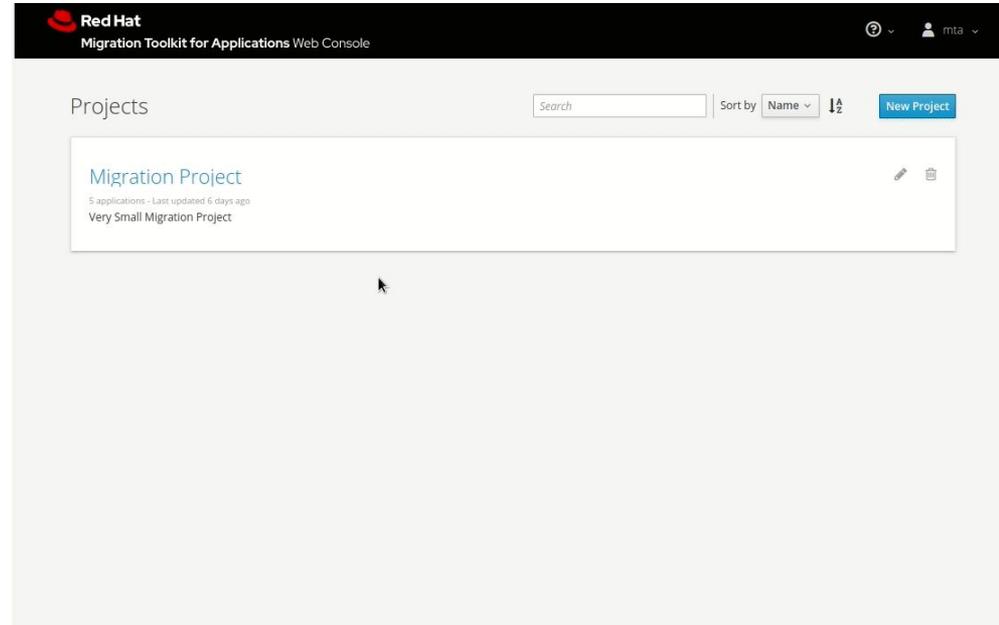
Don't build your own application server image

Be methodical when tackling your portfolio

Categorize your use-cases tackling the broadest reaching hurdles first to gain momentum.

Migration Toolkit for Applications

- **Review Java Apps** - review source code or decompile binaries and find ways to make them more JEE compliant, and container friendly.
- **OpenJDK, Container and Linux rules** - discover fixes to be applied to your app to increase its mobility
- **Camel 2 to 3 Rules** - review your Camel 2 rules and find out how to convert them to Camel 3 (more container friendly).
- **Web,CLI, Maven and IDE** - use the tool in any your preferred context, from CI/CD pipelines , to maven builds and in within your development environment. Easy to deploy on OpenShift.

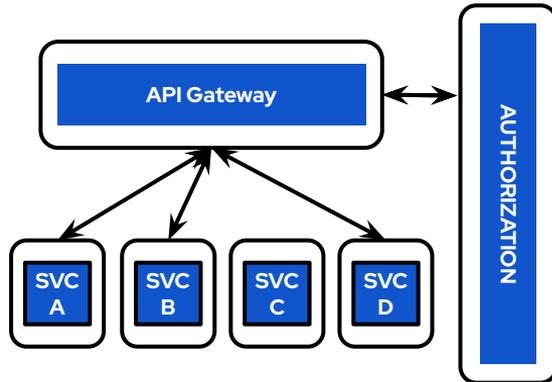


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Refactor Technical Path

Redesign code to take advantage of the new platform (extend, strangle, rewrite).

**Big Ball of Mud Legacy
Monolithic App evolution**



Modularize and decouple high valued services

Monoliths aren't always bad, but should be designed in a modular fashion to enable future decoupling.

Apply Modern API Frameworks

Use a API facade to expose and manage services

Invest Time in Automated Testing

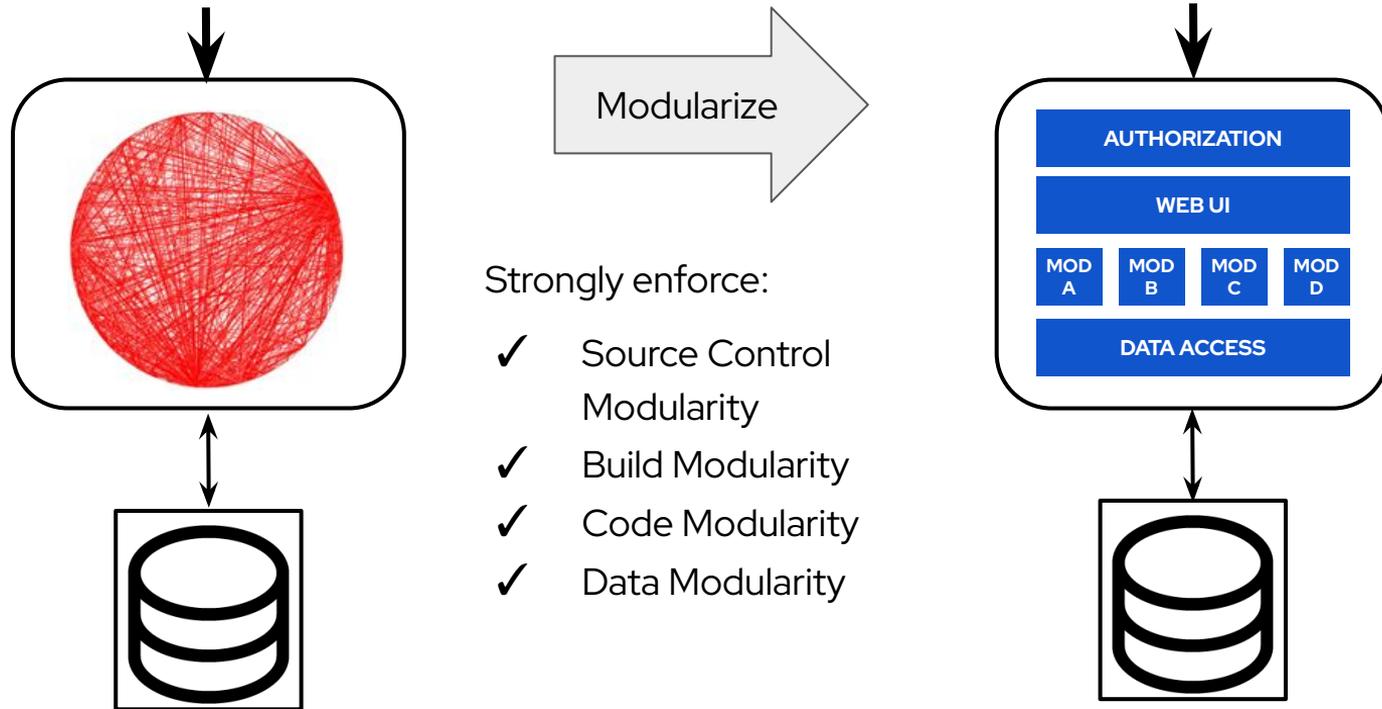
Your team is only as fast as it can test. Make Gherkin a common language between Business, Dev, QA

Leverage Modern Runtimes and Frameworks

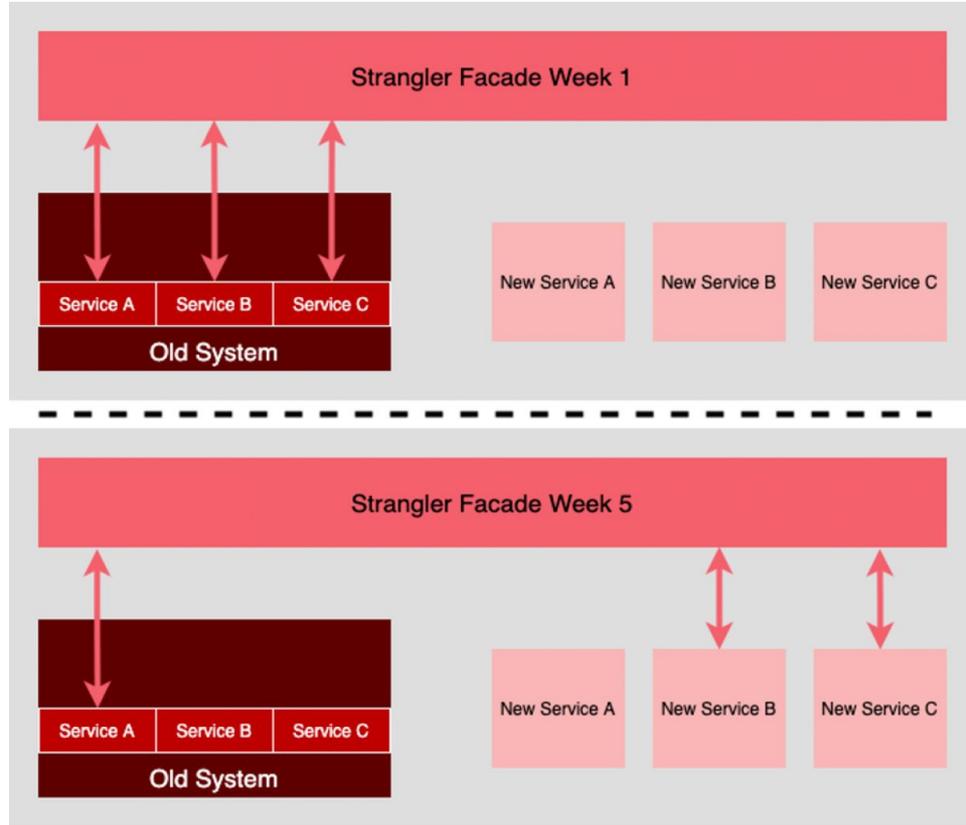
Async and serverless patterns along with a service mesh can improve performance, security and reduce complexity

Do it incrementally

Modularize your “big ball of mud”, then make decisions about decoupling

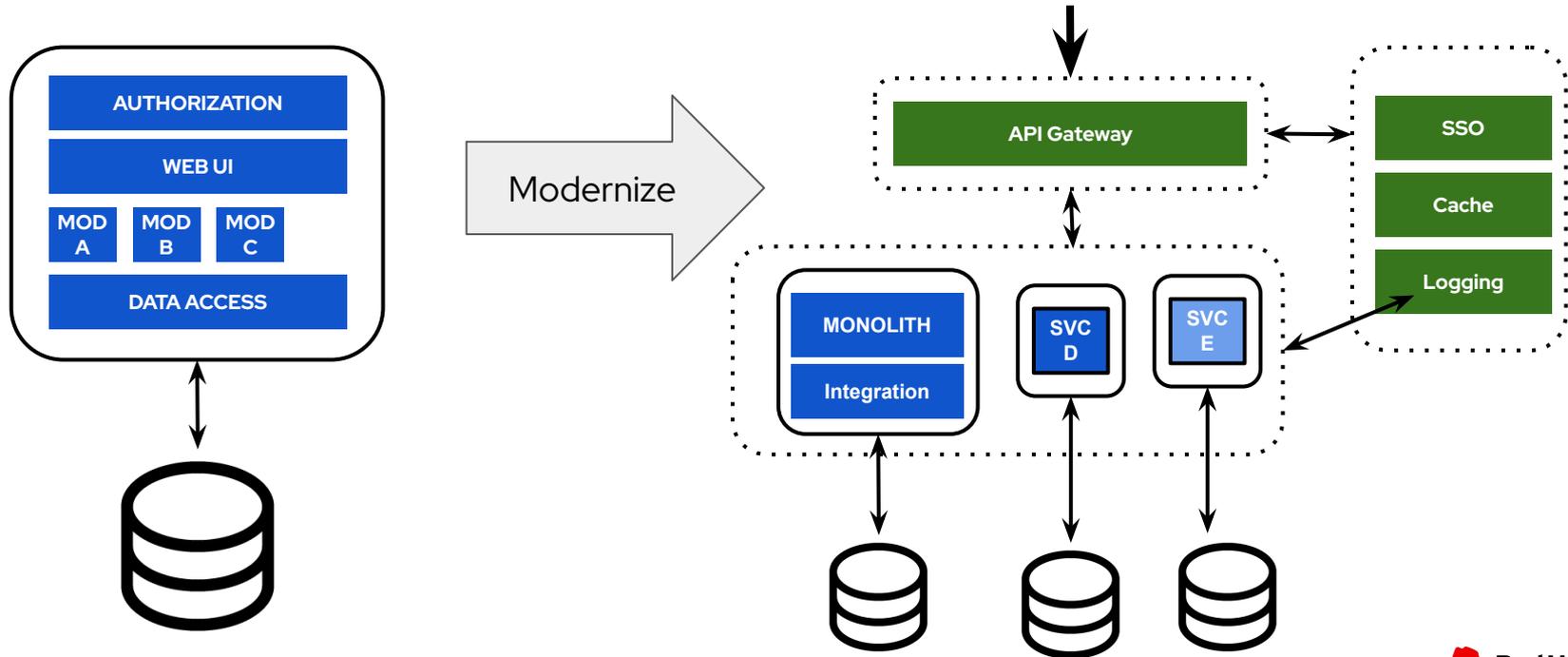


Strangler pattern



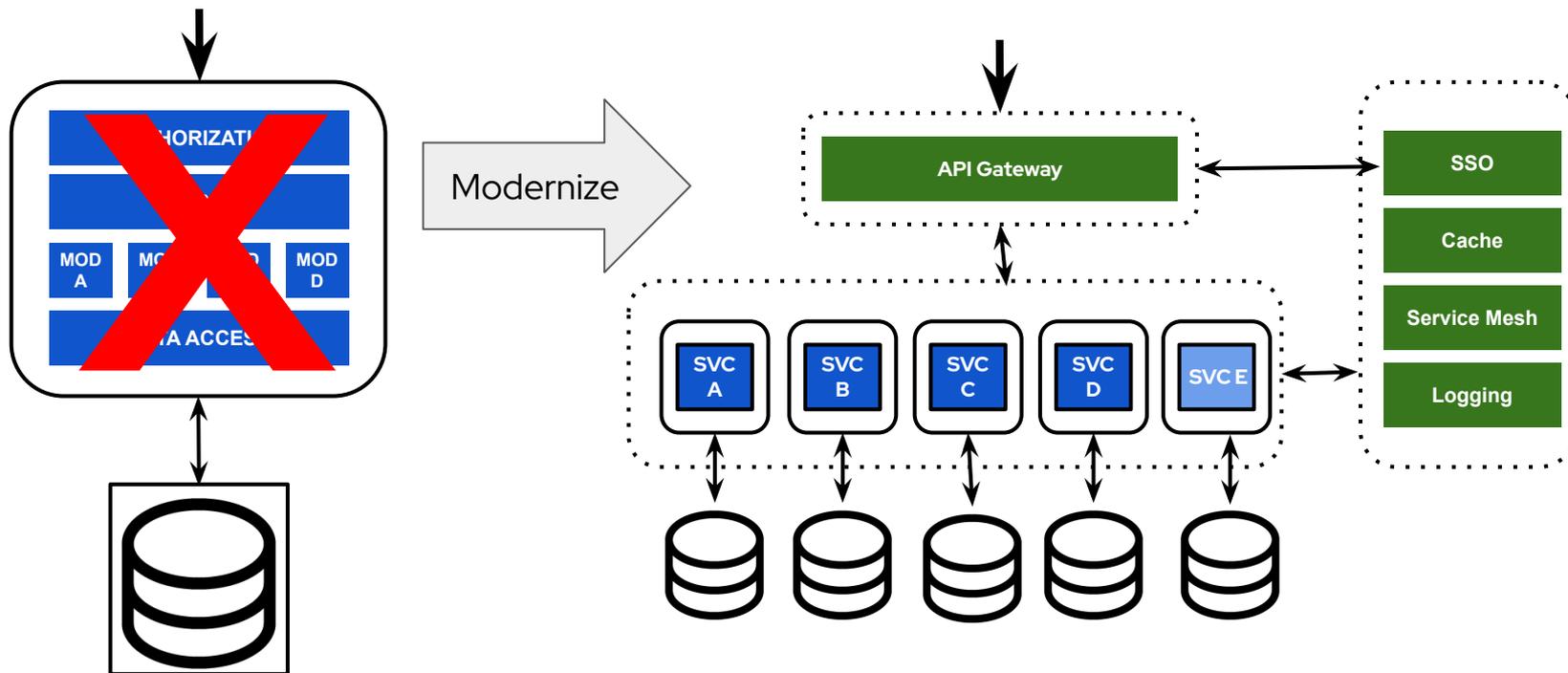
Let new features become new services

Instead of new modules, and continue replatforming



Continue to simplify and speed up the dev process

Abstract more concerns away from the applications so dev teams can focus more on business logic



Red Hat
Summit

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