Integration Technical Conference 2019

P01

Making the leap from APIC 5.0.x to APIC 2018.x

IBM **Cloud**

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- DataPower/API Connect Trainer
- Contributor in API Connect Certification Test V5 & V2018
- Speaker at IBM Conferences
  - InterConnect
  - Think 2018
- Presenter on various Jason Pacini's Friday I & D calls
- Multiple implementations on API Connect V5 ,V2018.x and IBM Cloud Reserve Instance, Azure and AWS

The Leap

API Connect Version 5

In 2018, the latest release of API Connect was made available. Now with implementation container-based with Docker and Kubernetes, these capabilities present new challenges/ questions to existing API Connect customers running on version 5.0.x in OVAs. Customers have many cloud options and understanding the nuances when deploying to these clouds will make the leap easier.

In this session you will learn how to thoughtfully approach the new version and help you prepare to the new opportunities with the latest version.

Lesson Learned

Last year I spent a good deal of time working with customers that have API Connect v5.0.x

What I have learned from these experiences?

1. Test the waters. Understanding the new version.
2. Plan appropriately
3. Prepare for change
4. Assemble the team
   - Get training or do some self study on Kubernetes
   - Re-think previous provisioning estimates
     - Setup takes longer than you think
5. Getting into the swing of things with the new features/updates
6. Prepare for the a migration

1. Understanding v2018

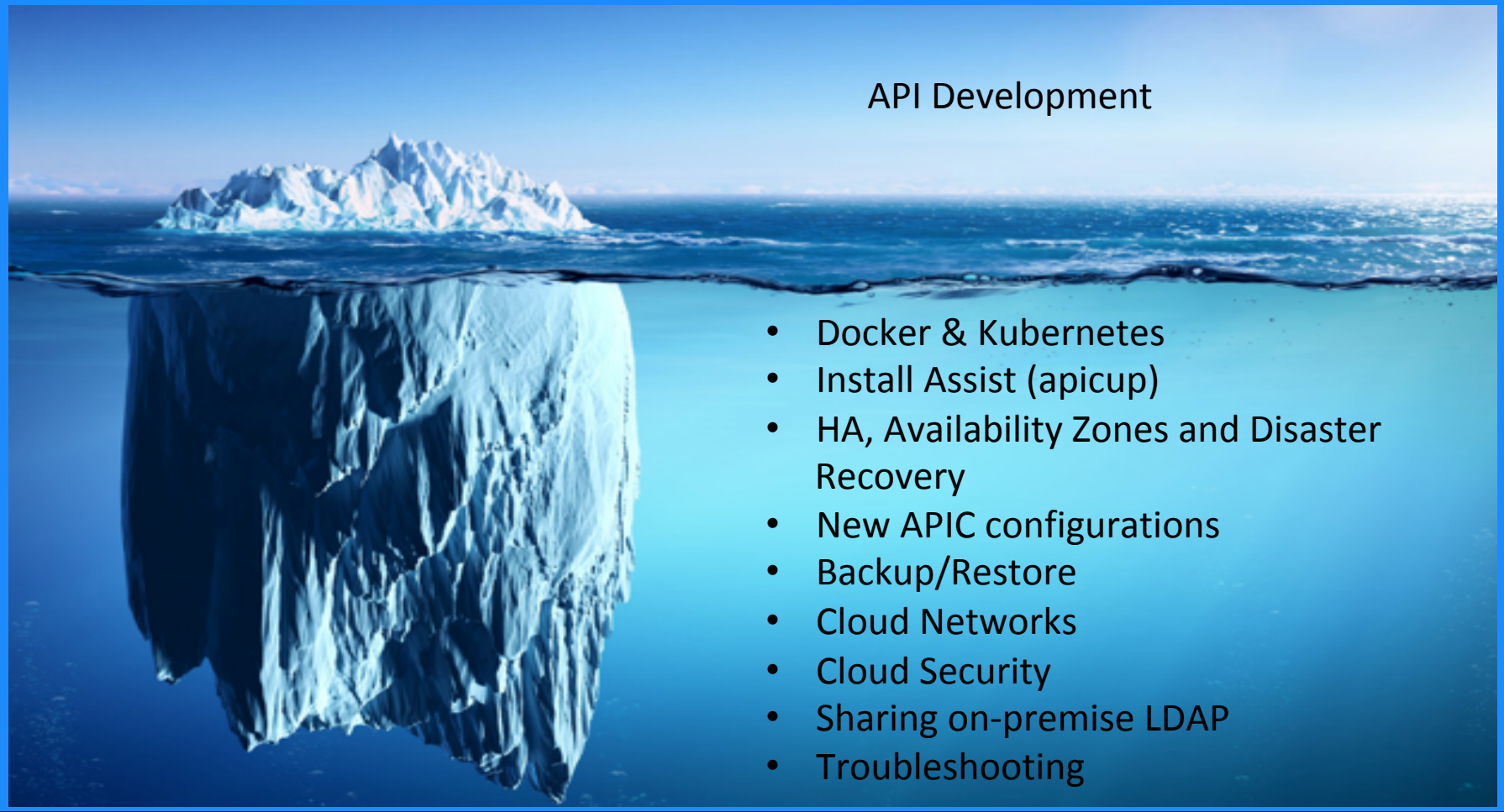
IBM API Connect Version 2018 delivers the following features:
The ability to deploy IBM API Connect micro-services through Docker, and managed with Kubernetes, to take advantage of the Kubernetes auto-scaling capabilities, while still having the option to deploy as an Open Virtualization Format (OVF) package.

Advanced multi-cloud deployment capabilities with the ability to deploy portal, gateway, and analytics services separate from API Manager in various IBM and other cloud environments.
Complete representational state transfer (REST) and command language interpreter (CLI) coverage of API Connect functionality for enhanced DevOps functionality.

Date-based versioning, with year.quarter identifying when the version was released, to help your organization better manage the API Connect support lifecycle. For more information, see IBM API Connect™ v2018.x Support Lifecycle.

The Developer Portal is now based on the Drupal 8 content management system, which enables more advanced, flexible, and powerful customization capabilities. Drupal 8 also enables support for HTTP/2 which, among many benefits, can increase the speed and performance of your site.

Below the surface



2. Plan your v2018 journey

Plan and make considerations for:

- Topology descriptions, performance conditions, and cloud limitations
- Purchase/estimate cloud resources, security and firewall setup
- Procure low latency file storage
- Backup/Restore, HA and DR
- Network segregation, including VNETs and ExpressRoutes etc.
- Working with disparate groups
- Working under Agile sprints

Development

- Initial creation in DEV mode
- How to troubleshoot, getting logs etc.
- Creating non-development environments (Standard mode) and testing in new environment
- Deploying to different gateways
- Moving to Production (hardening and heavy volumes)

3. Preparing for v2018

Get familiar with Kubernetes

- Kubernetes Basics
- Kubectl commands

Learn DataPower for Docker

- Custom DataPower services?
- Enabling the WebGUI

Review What's new and updated in API Connect 2018

Kubernetes

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Learn all this stuff:

- Containers (you can choose Docker, or learn some acronyms and figure out what they mean and how to use them)
- How to actually containerize your code (i.e. write a Docker file or something else)
- Kubernetes basics & how to write a manifest
- Learn how to use kubectl
- Maybe learn how to write a Helm chart
- Understanding Install Assist (apicup)

Example: Must Gather

If deployed via Kubernetes, provide the output of the following commands:

- `kubectl version`
- `helm version`
- Collect Helm release values for each API Connect helm chart that is deployed with: `helm get values $APIC_RELEASE --all`
- `helm ls -a`
- `kubectl get pods -a -n <namespace>`
- `kubectl get endpoints -a -n <namespace>`
- `kubectl get ingress -a -n <namespace>`
- `apicup version --semver`
- `kubectl -n kube-system logs -l component=kube-apiserver > kube-apiserver.out`
- `kubectl -n kube-system logs -l component=kube-controller-manager > kube-controller-manager.out`
- `kubectl -n kube-system logs -l component=kube-scheduler > kube-scheduler.out`
- `kubectl -n kube-system get events > kube-system-events.out`
- `kubectl get pvc -n <namespace>`
- `kubectl describe pods -n <namespace>`

Some advanced references

- Cloud Native DevOps with Kubernetes:
  http://shop.oreilly.com/product/0636920175131.do
- Kubernetes The Hard Way:
  https://github.com/kelseyhightower/kubernetes-the-hard-way
- Kubernetes:
  http://shop.oreilly.com/product/0636920043874.do
- Kubernetes Best Practices:
  https://github.com/arschles/kube-best-practices/blob/master/README.md
- Operating a Kubernetes network:
  https://jvns.ca/blog/2017/10/10/operating-a-kubernetes-network/

What's new and updated

Install/Setup

- 2 flavors both based on Kubernetes
  - Cloud based running on K8S
  - OVA running K8S under the covers
- APICUP (install assist) is required for OVA installations
- New topology setup (Gateway + Analytics)
- New server (Analytics separated from APIM)
- Docker Gateway used in K8S implementations
- Log gathering a tedious task in K8S
- Availability Zones is new concept
- HA Quorum requirements

Development

- LifeCycle changes
- Toolkit Testing is done through APIM
- CLI now supports multiple user registries
- You can no longer upload user-policies via APIM. Update it using CLI
- Access to DataPower not enable OOB
- Provider OAuth2 API has changed.
- Different Gateway (v5 compatibility and API Gateway) assemblies are not exchangeable

DataPower V5 Compatibility versus DataPower API Gateway

- Version 2018 Support Two Gateway modes
  1. DataPower Gateway - v5 compatible
  2. DataPower API Gateway

- V5 Compatibility - This Gateway is compatible with APIC v5, and therefore after the migration from v5 to v2018 there is no further need to modify the API

- DataPower API Gateway - This is a new Gateway available in APIC 2018. It provides many improvements in interface, performance, debug-ability, etc. It is not fully backwards compatible. After migrating from APIC v5 to APIC v2018, you have the option of staying with the v5c Gateway or of porting your API to the DataPower API Gateway

If you choose to move to the new API Gateway there are updates you will need to make your V5 configurations/definitions to take advantage of the new Gateway

Prepping for Migration

- Upgrades will be side by side, not update in place
- Upgrade to latest version of V5. (v5.0.8.6+)
  - Supports new backup that outputs JSON
- Custom DataPower services
  - Identify Non-Custom User Policies that are referenced on DataPower
- Custom CLI calls using APIs
  - API calls may have been updated, no longer exist or replaced with new security and parameters
- In OVA implementation ensure you provision additional resources on your VSphere environment.

4. Assemble your team

- It takes a village when embarking on a Cloud implementation of API Connect with Kubernetes

- Keep in mind that:
  - Your prior operation team may be on-premise and now new team will need to understand the APIs, components and troubleshooting techniques
  - The networking resources may also be different from your on-premise team so there won't be established patterns they can use. They will need to understand the requirements.
  - Security needs to be clearly defined as well as authentication/authorization.
  - Your K8S install resources will need to understand how API Connect using K8S handles ingress, SSL and certificates as well as setting up HA
  - Developers from v5 will need to learn how to troubleshoot, as well as, learn the changes that occurred in v2018

5. Getting into the swing of things

- Adjusting to change
  - API Connect Delivery schedule and Documentation
  - Getting Log information
  - Cloud specific environments
  - Missing capabilities from V5
    - Changes from v5 to v2018
  - DataPower GUI access
  - Custom User Policies additions *
  - OAuth2 updates (OAuth Provider API)

Quote of the day

“The reason that everybody likes planning is that nobody has to do anything.” — Jerry Brown, Former Governor of California

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Migrating

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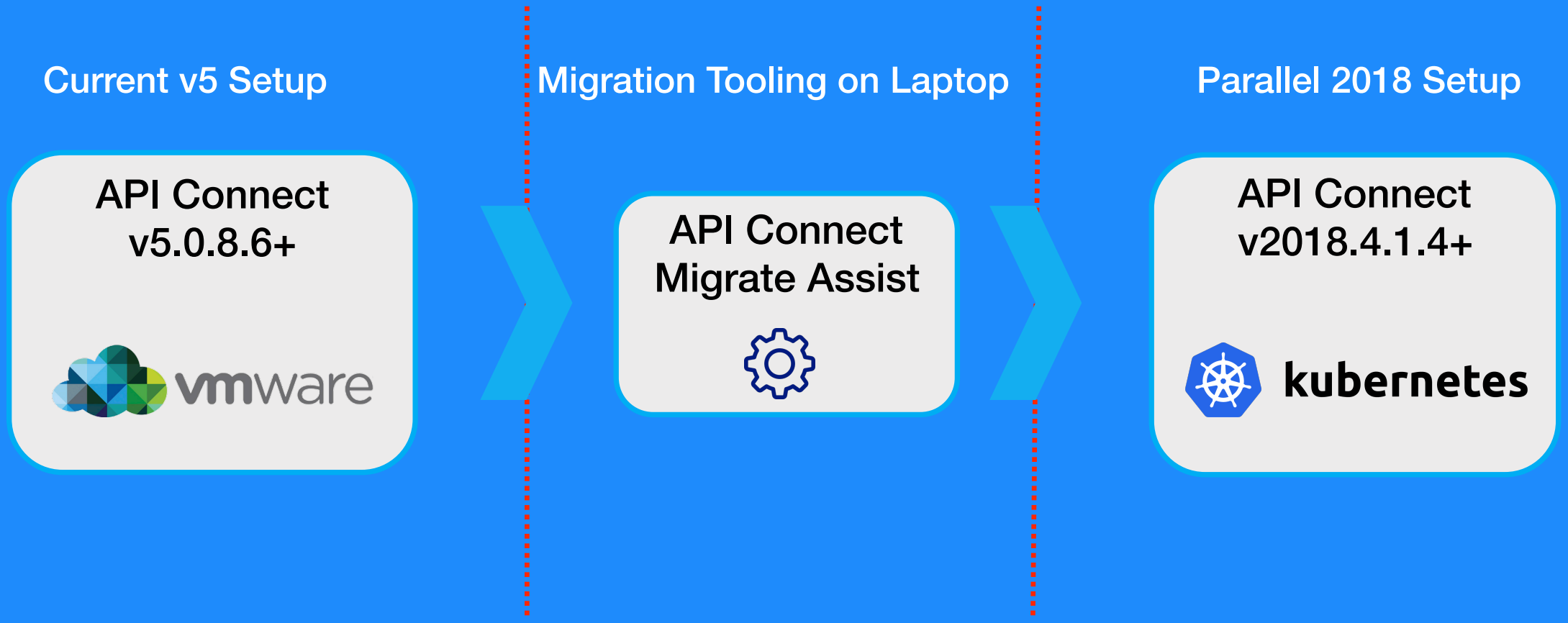
Planning the migration

Things to know and understand

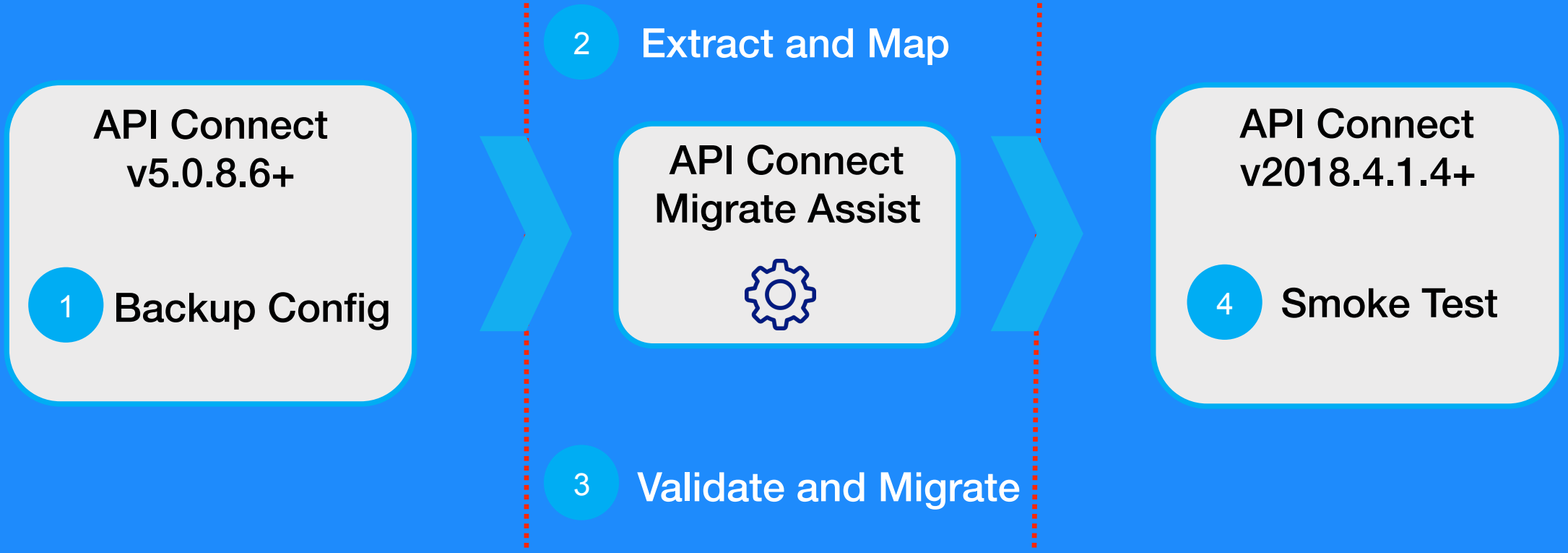
- The migration is a side-by-side migration. Your v5 version continues to run and is unaffected during migration.
- Migration is driven by tooling to extract V5 configuration. You will need an additional workstation to run the tooling.
- You must be version 5.0.8.6+. If not, you need to upgrade to 5.0.8.6+.
- This is your chance to remove unwanted or obsolete configurations.
- Ensure you have appropriate regression testing in Advance (Postman, SOAPUI, IBM API Connect Test and Monitor)

Overview of Migration: OVA to K8s



Clients can migrate from a v5 OVA to a v2018 k8s setup using the migration tooling

Migration Details



Simple 4 step migration process guided through easy to use

Migration tooling with flexibility to map to customer future needs

Migration Steps

Backup

You must backup the configuration

Export configuration on v5.0.8.6+ as a backup including APIs/Products etc. using the enhanced CLI

Config dbextract sftp <host_name> user <user_name> file <file/path>

Note: If using Portal Delegated User Registry (PDUR) see V5 instructions to export the Portal Delegated User Registry

Extract and Map

Unpack using the ***apicm archive:unpack*** command

The extract unpacks the backup into human-readable yaml files using Migrate Assist

Got changes you would like to make? Use the map capability to make updates

Flexibility to map to new resources to reflect any changes on v2018 setup topology through mapping files, if desired

Validate and Migrate

Time to check to ensure everything is ready

- Are your v2018 prerequisites in place?
- Have you map and set prerequisites using Migrate Assist
- Execute the Migration / Load the APIs and the configuration to v2018 setup
  - Utilize the Dry-Run option to find issues.

Smoke Test

Perform regress testing using chosen tooling

- Smoke test the API endpoints to ensure successful migration
- Finalize testing by validating user access, on-boarding etc.

Summary

Brief recap

1. Test the waters. Understanding the new version.
2. Plan appropriately
3. Prepare for change
4. Assemble the team
    1. Get training or do some self study on Kubernetes
5. Learn the differences between V5 and v2018
6. Understand the different Gateway options (V5 compatibility versus API Gateway)
7. When ready, plan your migration
8. Build your regression Test
9. Map any changes you would like to make
10. Issue a Dry-Run to identify issues

Thank You

You can contact Bryon Kataoka (bkataoka@isoagroup.com) with further questions and clarifications.

If you would like to engage iSOA to help you create your own API Connect journey please contact Cheryl Bertini (cbertini@isoagroup.com)