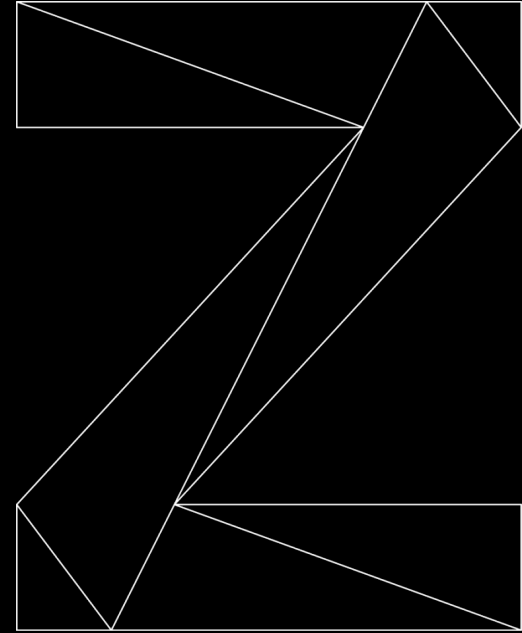


z/OS Cloud Provisioning and Management

—

Hiren Shah (hiren@us.ibm.com)



Open up the Mainframe!!

Customers have indicated a **desire to have a self-service model for z/OS resources.**

We continue to hear that as clients are modernizing their environments with **Cloud and DevOps** initiatives of their own, that they **would like to see integration with the z/OS Platform.**

Automation and modernization at both Application Programmer and System Programmer levels will be needed for agile DevOps and Cloud environment



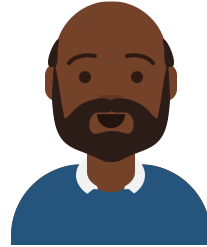
z/OS Cloud Provisioning & Management primary personas



Zach

Senior Systems Programmer
with 30+ years of experience

Creates and maintains high availability z/OS environments and is involved with his company's IT planning and strategy.



Stanley

Middleware Systems Programmer

Organizes and leads his team to address strategic, tactical, and emergency requirements with the Z middleware infrastructure



Zoey

Application Developer

Creates new applications and enhances, debugs, maintains, and tests existing applications on top of the Z middleware stack

AS-IS scenario for provisioning middleware

User Roles



Zoey

Application Developer



Stanley

Middleware Systems Programmer



Zach

System Programmer



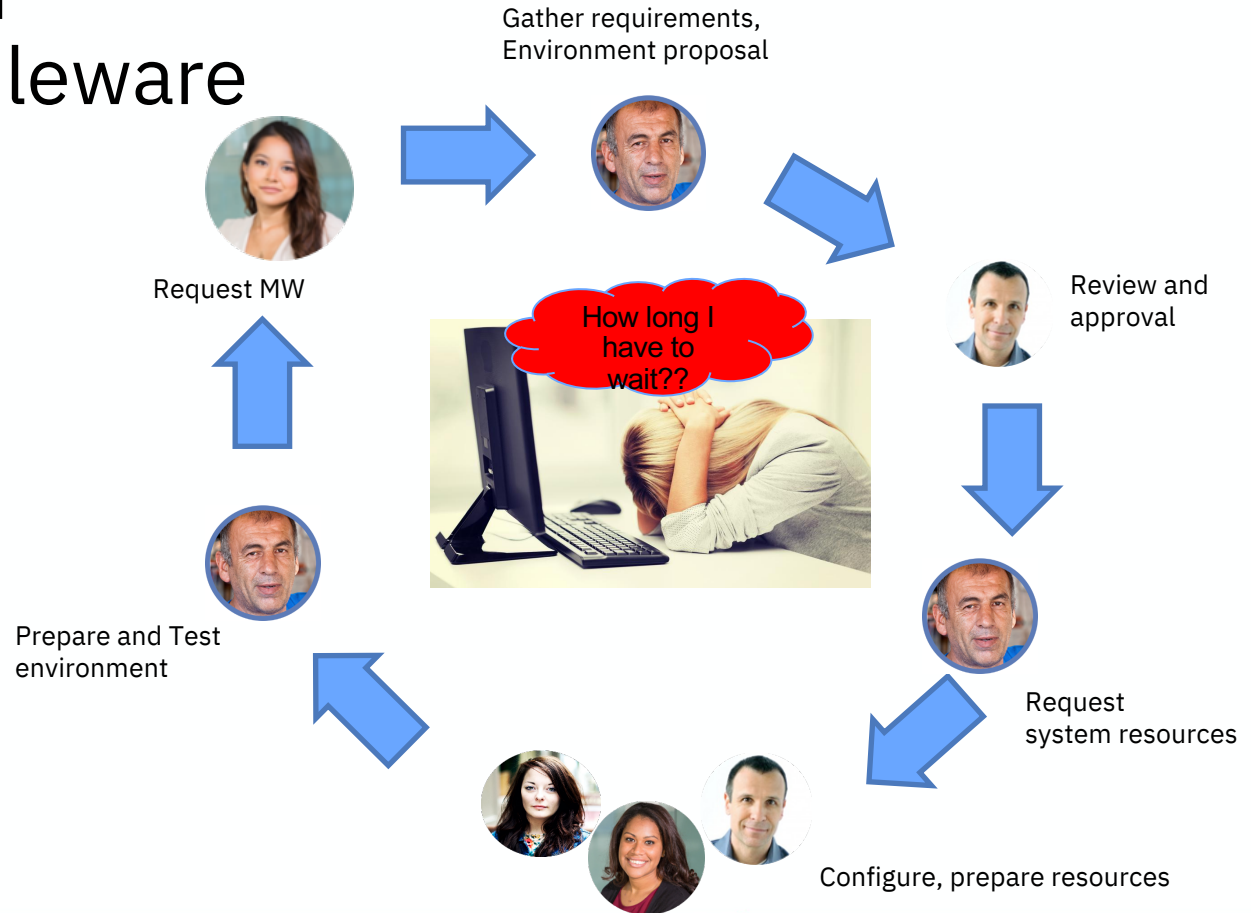
Nancy

Network Administrator



Sarah

Security Administrator



State of the Practice for Provisioning

- A potential customer
 - Comes to a web site
 - Creates an ID
 - Provides a credit card
 - Selects from a menu of services
- Obtains access to what they purchased
- Manages it through a Web browser
- At some point they delete the service
- The interface is typically a web facing portal



z/OS Cloud Provisioning and Management

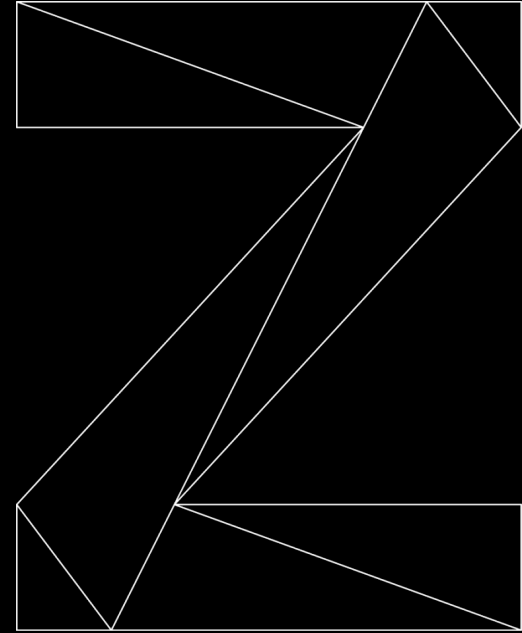
- What if we gave you a toolkit that allowed you to provision z/OS software as a Service?
 - That is what we have done and it is available on z/OS 2.2 and above
- You can provide a self service portal or use IBM Cloud Private for z/OS Services
- Might not be something you use for production, but what about for development and test
 - Allow an application developer to request a CICS region at 2AM when they are awake and you might be asleep... you don't need to be there...



Cloud Provisioning And Management Demo



Zoey
Application Developer



What is the Cloud Provisioning & Management and why is it important?

What

- Enables clients to provide agile dev/ops platform on z/OS with automated and repeatable processes
- Automation and orchestration is provided with **z/OSMF Workflow** technology
- **Rapidly provision** application development environments for application deployment in a self-service manner
- **Enhancement built into z/OS Management Facility (z/OSMF)**

Why

Organizations are rethinking how they engage end-users, how they provide services, and how they conduct business. As they are **challenged** to keep up with **new demands of digital business**, Cloud Provisioning & Mgmt. empowers organizations to operate with the **agility and flexibility necessary to compete** with challenging speed to market requirements.

Value

Attract new skills, developers, and applications to leverage the strengths of the z/OS platform ... as well as to facilitate self-service acquisition of z/OS resource for mainframe application developers.

Exploit the trusted differentiating z/OS platform capability and the experience of established operational teams

- High Availability with Sysplex
- Secure multi-tenant platform

Primary use cases

DevOps – Attract and exploit new talent and improve time to market

Providing z/OS application developers self-service access to z/OS environments and resources

Service Provider – Less burden on Ops in a secure environment

Centralization and automation of operations to provide z/OS services to agencies or clients in a self-service model.

Benefits



Maintain 100% control and security of z/OS assets.



Leverage experience and trust in existing IT investments.



Provide world-class services to partners.

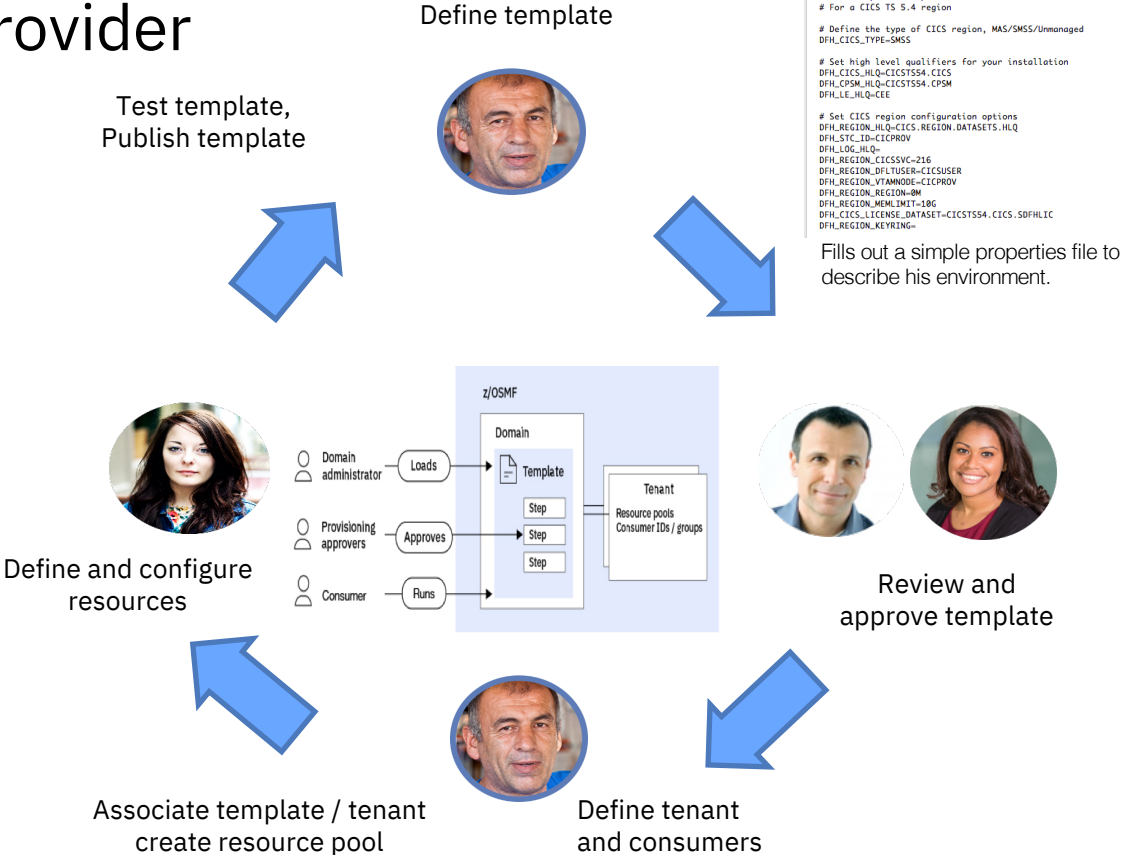


Integration with other services and tools.

Cloud Provisioning and Management: Service Provider Flow

User Roles

- Zoey**
Consumer Application Developer
- Stanley**
Domain Administrator
Middleware Systems Programmer
- Zach**
Landlord System Programmer
- Nancy**
Network Administrator
- Sarah**
Security Administrator



```

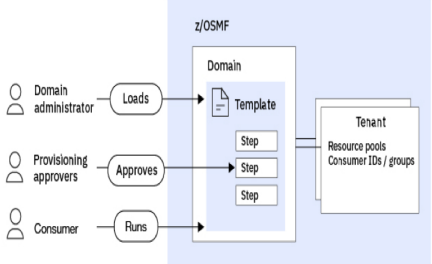
*U/webster/zospt/templates/cics_54/cics.properties
# CICS Template Example Variables
# For a CICS TS 5.4 region

# Define the type of CICS region, MAS/SMSS/Unmanaged
DFH_CICS_TYPE=SMSS

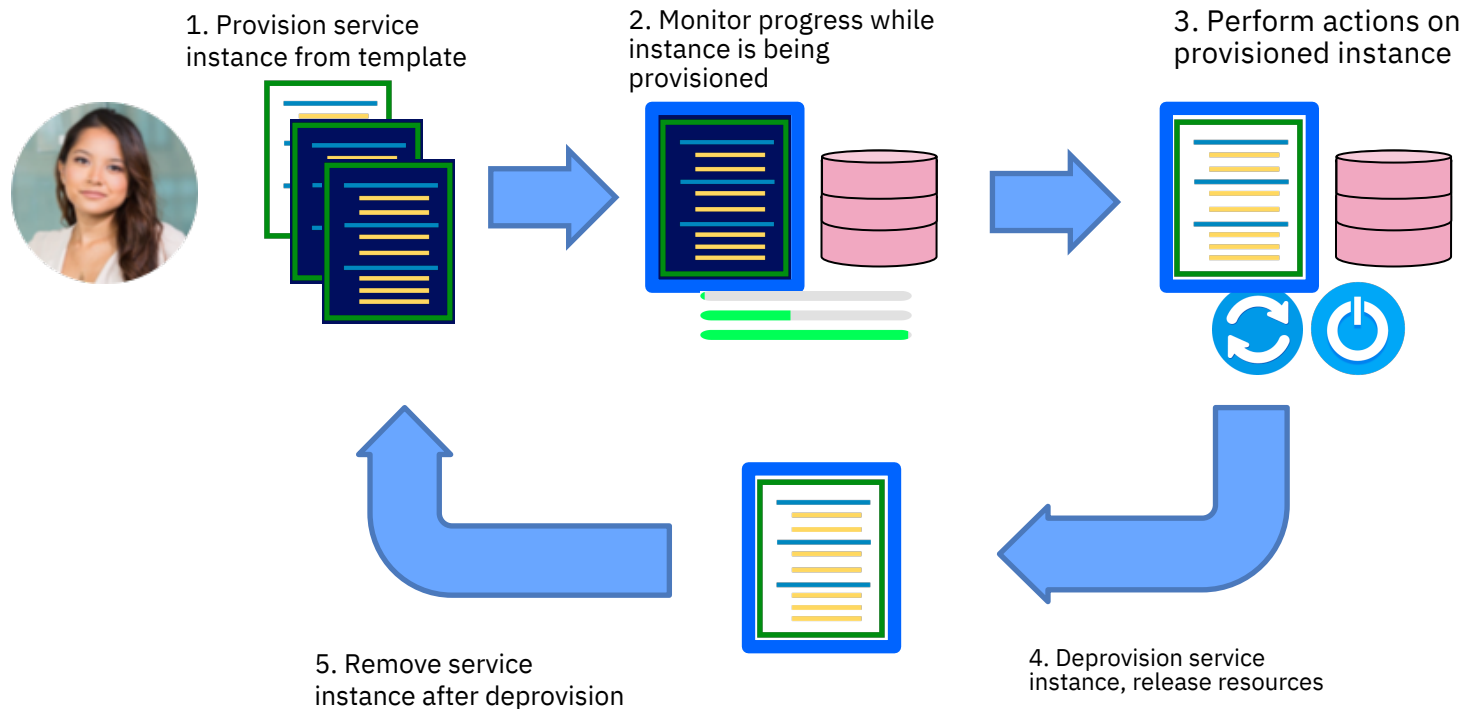
# Set high level qualifiers for your installation
DFH_REGION_HLQ=CICSTSS4.CICS
DFH_CPSM_HLQ=CICSTSS4.CPSM
DFH_LE_HLQ=CEE

# Set CICS region configuration options
DFH_REGION_HLQ=CICS_REGION.DATASETS.HLQ
DFH_STC_ID=CICPROV
DFH_LOG_HLQ=
DFH_REGION_CICSSVC=216
DFH_REGION_DFLTUSER=CICSSUSER
DFH_REGION_VTAMMODE=CICPROV
DFH_REGION_REGION=0M
DFH_REGION_MEMLIMIT=10G
DFH_CICS_LICENSE_DATASET=CICSTSS4.CICS.SDFHLIC
DFH_REGION_KEYRING=
    
```

Fills out a simple properties file to describe his environment.



Cloud Provisioning & Management: Consumer Flow



z/OSMF Workflow – Core technology for orchestration

- Ensures that the **correct steps are performed in the correct order**
- Ensures that any **dependencies are enforced** as the steps are performed
- **Codifies an organization’s tribal knowledge and “way of doing things”** so that processes are executed in a consistent way
- Makes processes **more easily repeatable**, especially when multiple technologies are involved

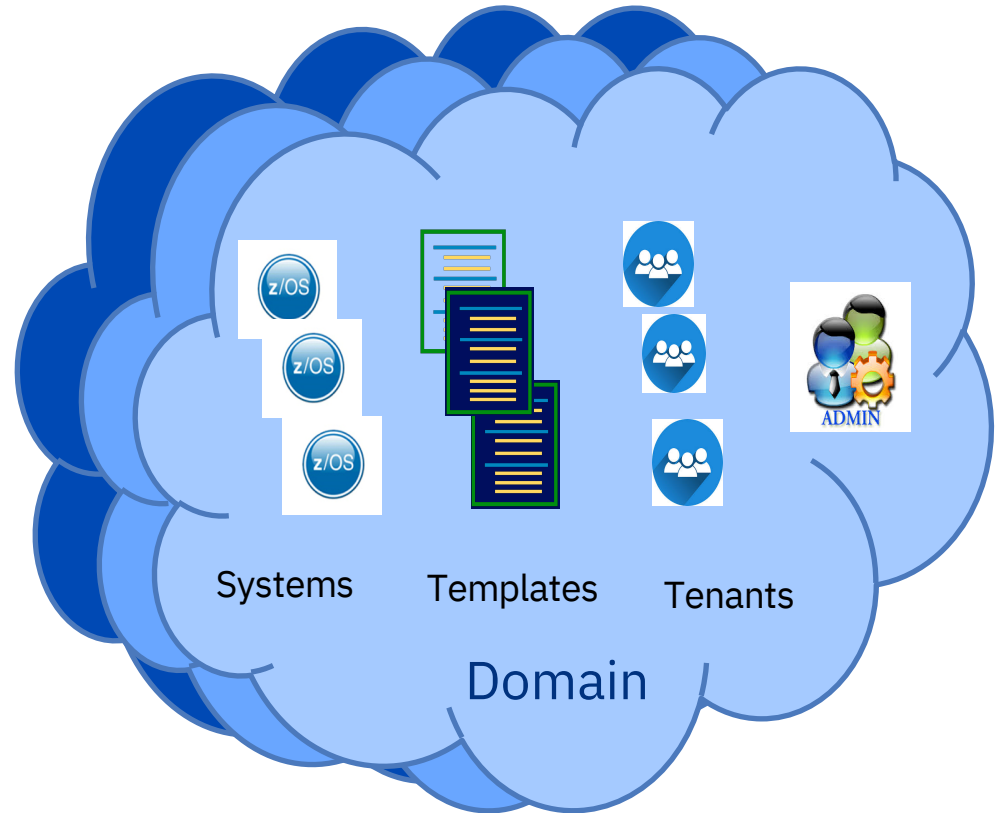
Cloud Provisioning & Mgmt : Available Templates

Db2	CICS	z/OS- Connect	IMS	MQ	WLP
Services to provision / deprovision Db2 subsystems, schemas, and databases + <i>snapshot / restore</i>	Services to provision / deprovision CICS regions	Services to provision / deprovision z/OS Connect Server	Services to provision / deprovision IMS TM/DB systems	Services to provision / deprovision MQ Queue Manager subsystem	WLP server provisioning (with option to connect to Db2 data source with type 2 or type 4 connectivity) Liberty

Cloud Provisioning & Mgmt : Our Capabilities

- Scalable and Secure Multi-Tenant Environment

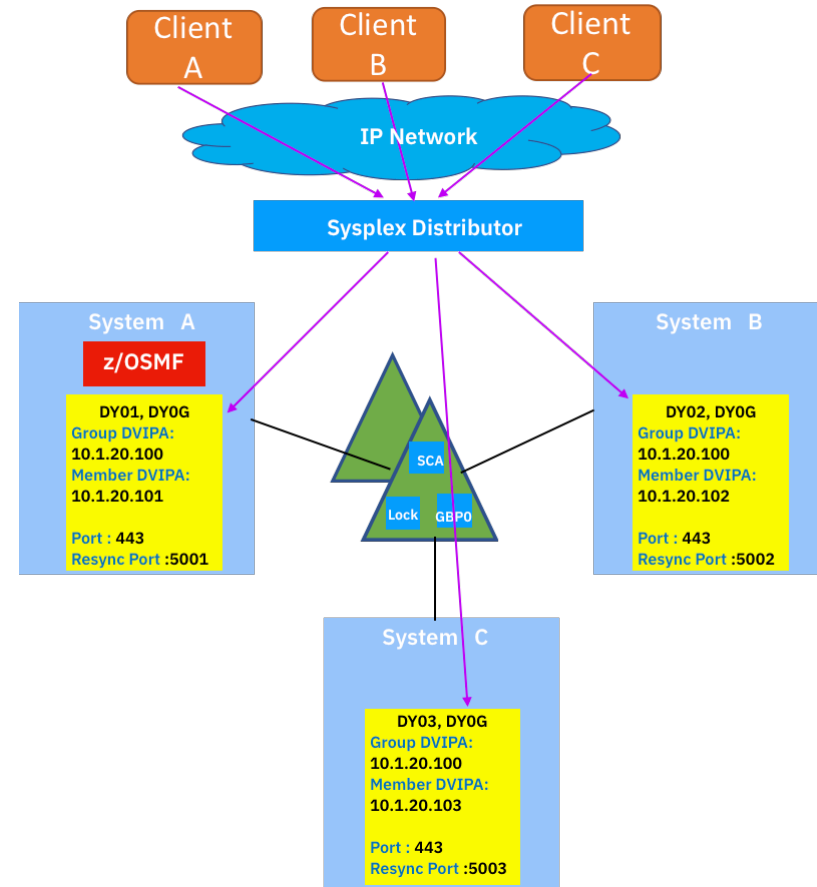
- Supports large number of z/OS System pools (multi-sysplex scope)
- Flexible yet highly secure provisioning platform
 - Strict control over who can provision what service and how many instances
- Isolates pool of system resources across teams and allows sharing of resources within team



Cloud Provisioning & Mgmt : Our Capabilities

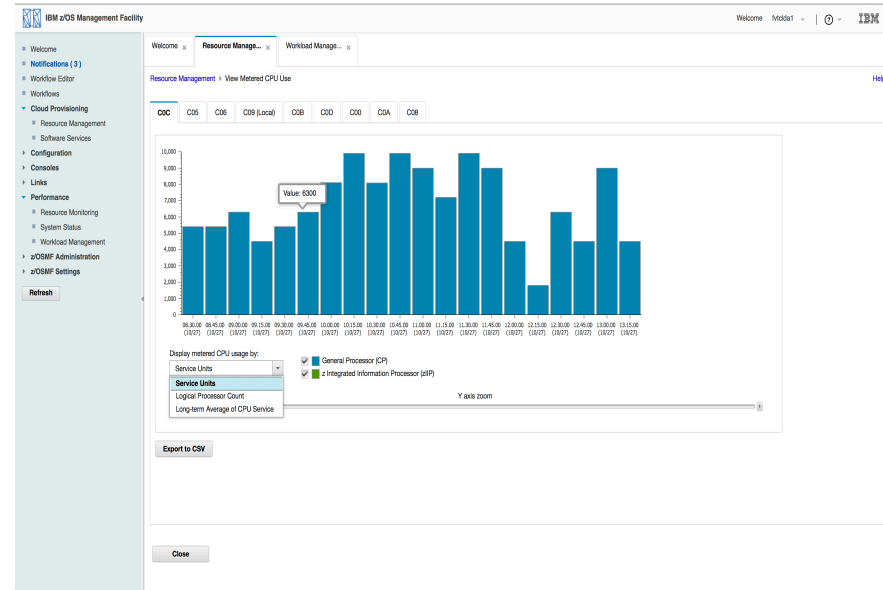
- Sysplex Capabilities

- Provisioning on any system in a Sysplex
- Move provisioned instance to different system to provide continuous availability
- Provision cluster of MW instances to provide high availability
 - For example, Db2 Data Sharing Group



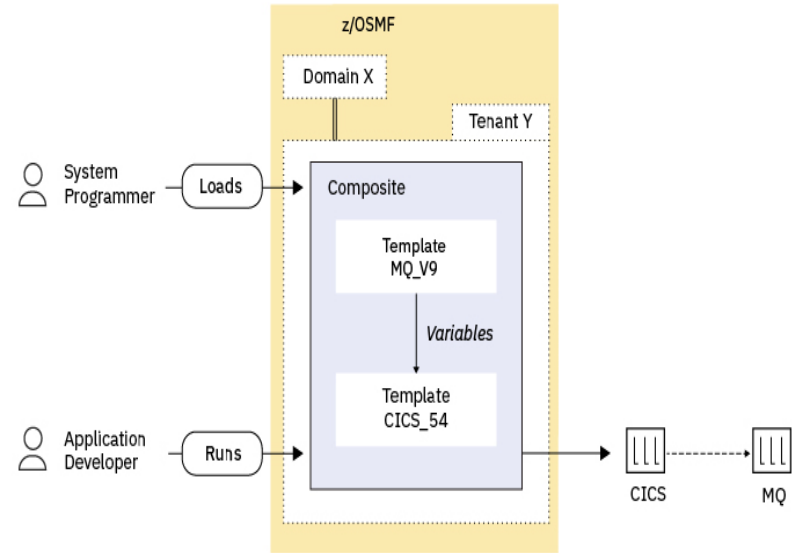
Cloud Provisioning & Mgmt : Our Capabilities

- Metering and Capping
 - Capability that allows you to **measure CPU/Memory utilization** for a specific tenant
 - The CPU/Memory metering function provides data that you can use to charge back line of business
 - Capability that allows you to **control how much CPU/Memory** can be consumed by a specific tenant.
 - The CPU/Memory capping function can be used to prevent application developers from consuming too much CPU/Memory and limit the cost for a tenant



Cloud Provisioning & Mgmt : Our Capabilities

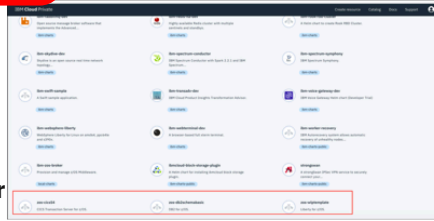
- Composite Template
 - Capability that will enable Application Developers to provision connected instances of multiple middleware in a single provisioning action in matter of minutes.
 - For example, a composite template that would provision CICS and MQ with a single provisioning action



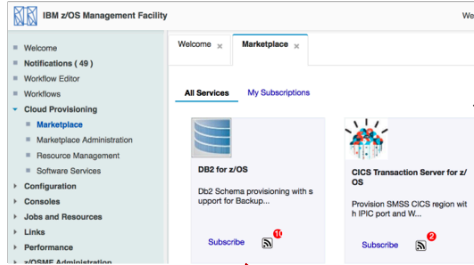
Cloud Provisioning & Mgmt : Eco System



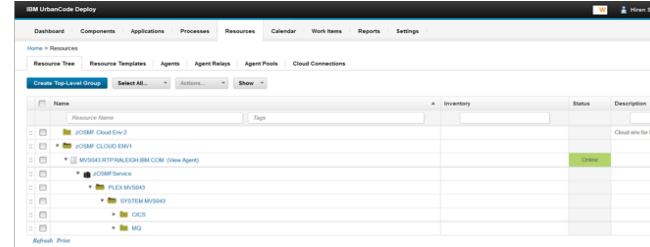
z/OS Cloud Broker



z/OSMF Market Place



Urban Code Deploy (UCD)



z/OS Provisioning Toolkit (zOSPT)

```

2x240N01.L91S02.ZU.V191ee2/zospt/zbin -> zospt image
2018-10-04 14:35:29 IBM z/OS Provisioning Toolkit V1.0.3
IMAGE NAME      CREATED      SIZE
lcs_52          2018-02-28T00:13:20 10240B
lcs_53          2018-02-28T00:13:20 10240B
lcs_54          2018-02-28T00:13:20 10240B
lcs_54-jeon    2018-02-28T00:13:20 10240B
lcs_54-liber ty 2018-02-28T00:13:20 10240B
lcs_54-soap    2018-02-28T00:13:20 10240B
lcs_54-zosconnect_v3r0 2018-02-28T00:13:20 20480B
lcs_lcp        2018-10-02T07:17:20 10240B
zosconnect_v2r0 2018-02-28T00:13:20 10240B
zosconnect_v3r0 2018-02-28T00:13:20 10240B
    
```

Zowe CLI

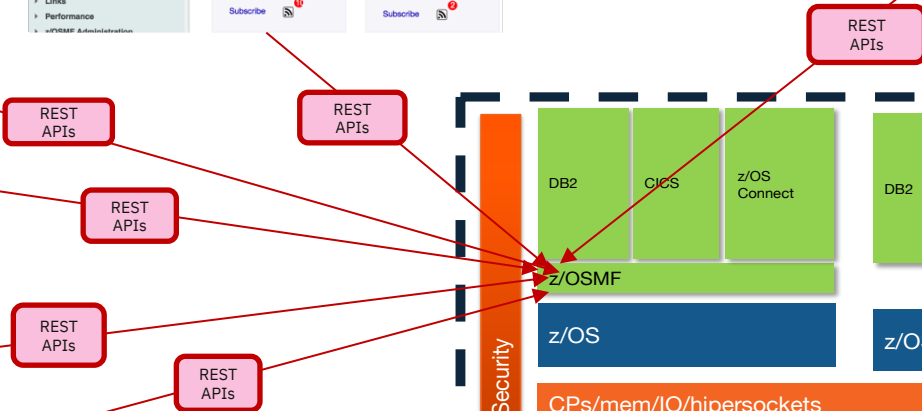
```

zowe provisioning -h
    
```

Ansible

```

hiren$ ansible-playbook CICS-Provision.yml
    
```



z/OS Cloud Broker highlights



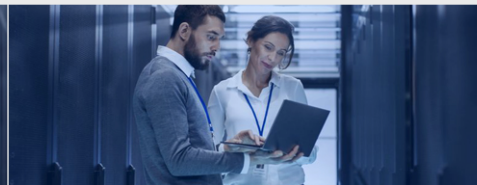
Self-service consumption model for z/OS middleware using DevOps and application life-cycle management patterns

- Integration of z/OS with RedHat Openshift for service discovery and management
- Improved developer experience and time to value through self-service provisioning



Lifecycle Management of z/OS services using Open Service Broker API and z/OSMF

- z/OS back end services are published in z/OSMF Software Services catalog using IBM Cloud Provisioning and Management for z/OS



IBM Z shops functioning as Cloud services providers

- Provide world-class services internally to partners
- Data center and workload consolidation

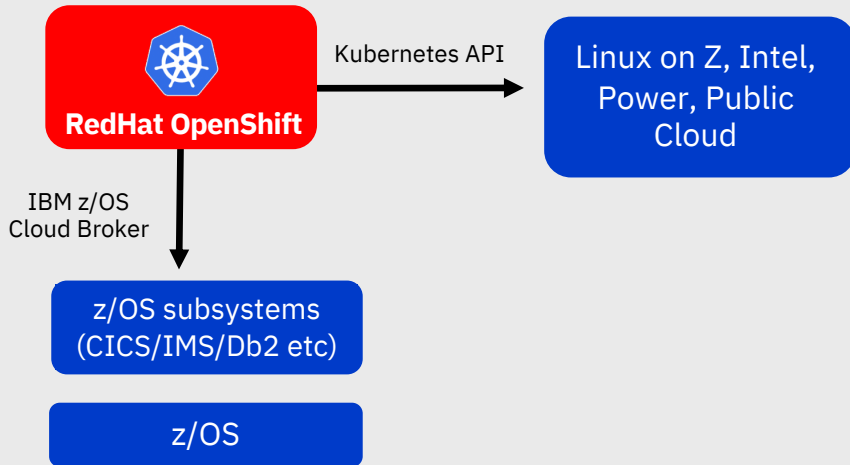


Visualize IT as a Value vs. Cost

- Improve time to value with self-service provisioning, data center consolidation, efficiencies in deployment, workload balancing and much more

Use case: z/OS Cloud Broker

Integrate z/OS environment to central enterprise control plane



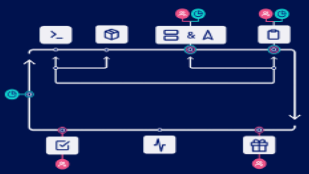
Challenge

Business critical applications running on z/OS are isolated, and installation of any Cloud platform will not integrate my z/OS subsystem within same control planes. Will require multiple control planes and integration tools.

Client Value

- z/OS subsystem can be deployed leveraging z/OSMF and standardized Service Broker implementation and Open Service Broker APIs
- Single control plane across z/OS, Linux on Z, x86, Power, and public cloud
- Protect existing investment, optimize management efficiencies, and achieve speed for innovation

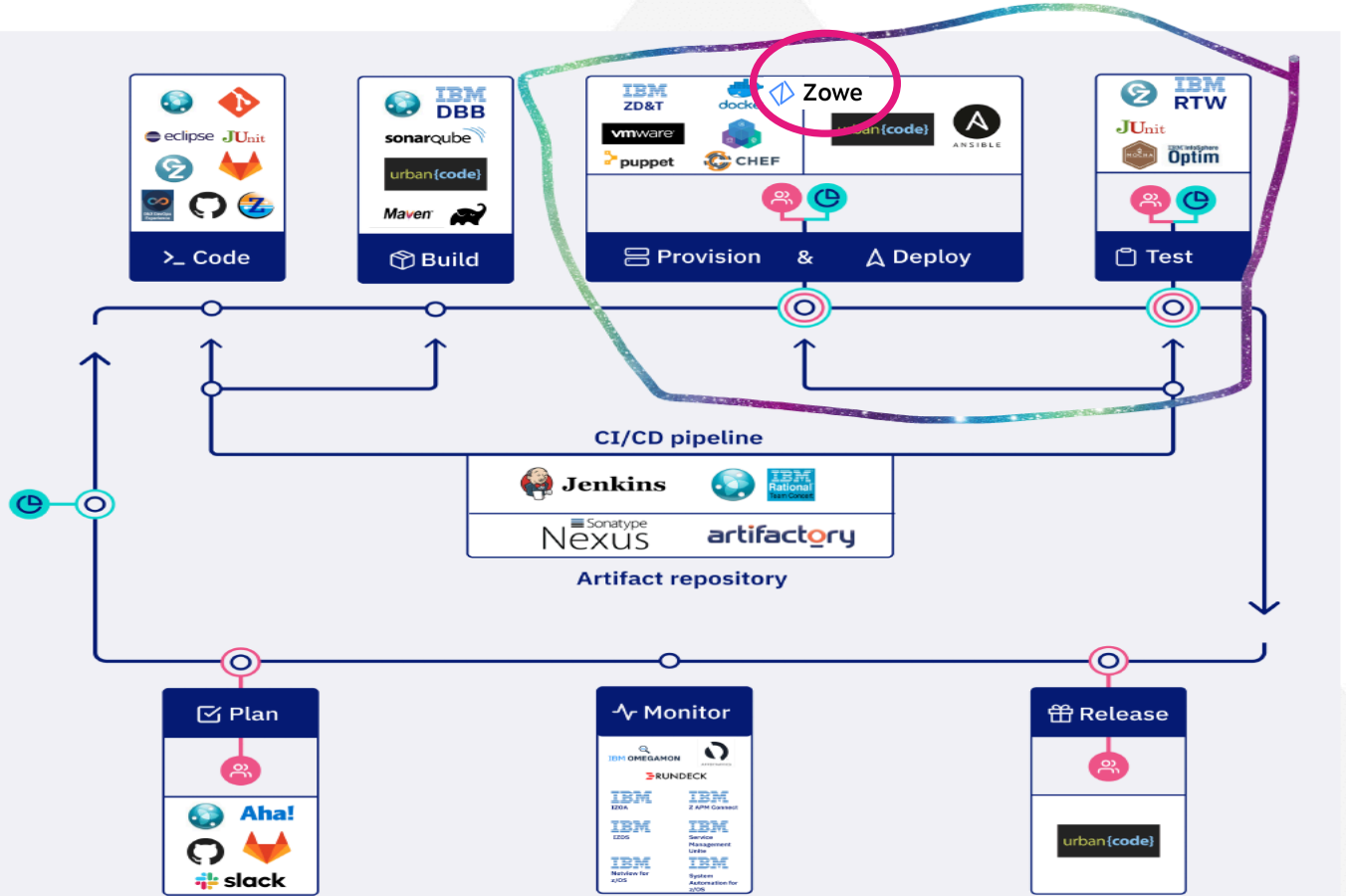
CI/CD pipeline with Zowe CLI



IBM DevOps Pipeline

Legend

- Analyze**
 - IBM ADDI
 - splunk>
 - urban(code)
- User feedback**
 - SurveyMonkey
 - surveygizmo



Summary

- CP&M for z/OS provides Self-Service, Consumer driven provisioning of MWaaS
 - Ease of provisioning
 - Automation with repeatable processes
 - Security controls and automated provisioning of new security definitions
 - Entitlement management, controlling number of dynamically provisioned instances
 - Automatic provisioning of z/OS resources with appropriate isolation
- CP&M for z/OS removes barriers-of-entry and make z/OS platform more attractive for DevOps
- CP&M for z/OS enables customers to integrate



Cloud Provisioning & Mgmt. : z Trial

Cloud/API integration trials

IBM Cloud Provisioning and Management for z/OS

Rapidly provision z/OS software subsystems using automated processes.

[→ Register now](#)

What's in the trial?

Your trial environment includes hands-on tutorials that explain how to:

- Provision and deprovision a CICS region by using a cloud provisioning marketplace.
- Create a CICS region service and publish it to facilitate self-service provisioning.
- Provision and deprovision an MQ queue by using a cloud provisioning marketplace.

IBM