

Hybrid Cloud with Power10

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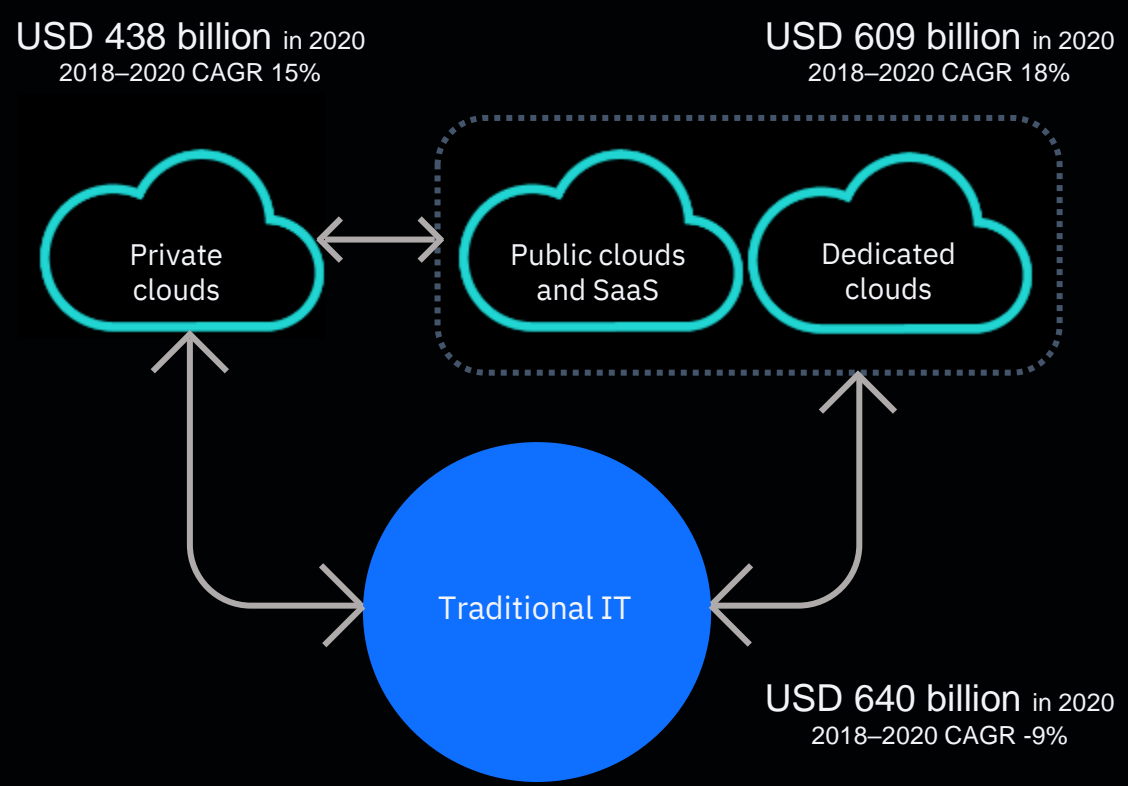
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Agenda

- The big picture – hybrid cloud on Power Systems
- Running Power workloads in the cloud
- Private cloud and automation
- Application modernization

Hybrid multicloud is the new normal



A real-world look at multicloud

90%* of enterprises will be using a mix of cloud models by 2022

50%** of workloads will remain on premises

60%*** of enterprises will utilize flexible consumption models by 2023

Movement between clouds

73% priority concern

Connectivity between clouds

82% priority concern

Consistency of management

67% priority concern

Sources: IDC Cloud Forecast; BCG & McKinsey

* <https://www.idc.com/getdoc.jsp?containerId=prMETA46165020>
** IDC's Cloud Pulse 1Q20, March 2020, n=2000
*** IDC FutureScape: Worldwide Data center 2019 Predictions, IDC #US42582518

IBM Power

Infrastructure built for business with hybrid cloud agility

Consume Infrastructure-as-a-Service

Flexibility in deployment, management, and payment options



IBM Power



Business continuity and agility

Designed for the most challenging business requirements

- Leadership performance and scale
- Industry-leading availability
- Flexibility & agility
- End-to-end security from the processor to virtualization and OS

Power Private Cloud with Dynamic Capacity



Pay only for what you use

Cloud capabilities on-prem. with advanced monitoring



- Flexible consumption options with built-in cost optimization
 - 20-30% lower TCO
 - ~ 50% lower TCA
- Simple agility to respond to business demands
- Cloud-based monitoring, metering by the minute
 - Including RHEL and OCP
- Power10 and POWER9 can co-exist in the same pool

Power Virtual Server with IBM Cloud



Extend to public cloud

Same mission-critical infrastructure as on-prem, for Dev/Test, HA/DR, modernization

- VM-as-a-Service
- Consistent architecture to on-prem infrastructure
- AIX, IBM i and Linux
- Access to other cloud services
- Global footprint
- Quick access to OpenShift to accelerate app modernization



Open Enterprise Hybrid Cloud on IBM Power – Product Offerings Stack

Hybrid Cloud Management



Hybrid Cloud Infrastructure and Application Management

Manage-to and manage-from for VMs + containers; infused with AI;
across Power, Z, x86 private + public cloud



Software Product Portfolio

RH OpenShift + Add-ons

- Kubernetes Orchestration
- CodeReady Workspaces
- Service Mesh
- OpenShift Pipelines (Tekton)
- Serverless
- ODO (CLI for Developers)

Red Hat App Services

- Red Hat Runtimes
- Red Hat Integration
 - Fuse, 3Scale, AMQ Streams
- Red Hat Process Automation
 - Process Automation
 - Decision Manager

Cloud-native ISV SW

- Banking, Retail, Healthcare
- eCommerce
- Databases (Open Source)
- Security
- DevOps
- App/Infra. Mgmt. & Auto.

IBM Cloud Paks

- WebSphere Hybrid Edition
- Cloud Pak for Data
- Cloud Pak for Integration
- Cloud Pak for Watson AIOps (formerly CP4MCM)
- Cloud Pak for Bus. Automation
- IBM Automation Foundation

Power Platform Foundation

Open hybrid multicloud platform



Open Source Software & Developer Community



Power Cloud Infrastructure

Private Cloud (on-prem)



Power Private Cloud – pay as you go

PowerVC
PowerVM
Bare metal

Red Hat CoreOS
Red Hat
Enterprise Linux

AIX
IBM i
Linux

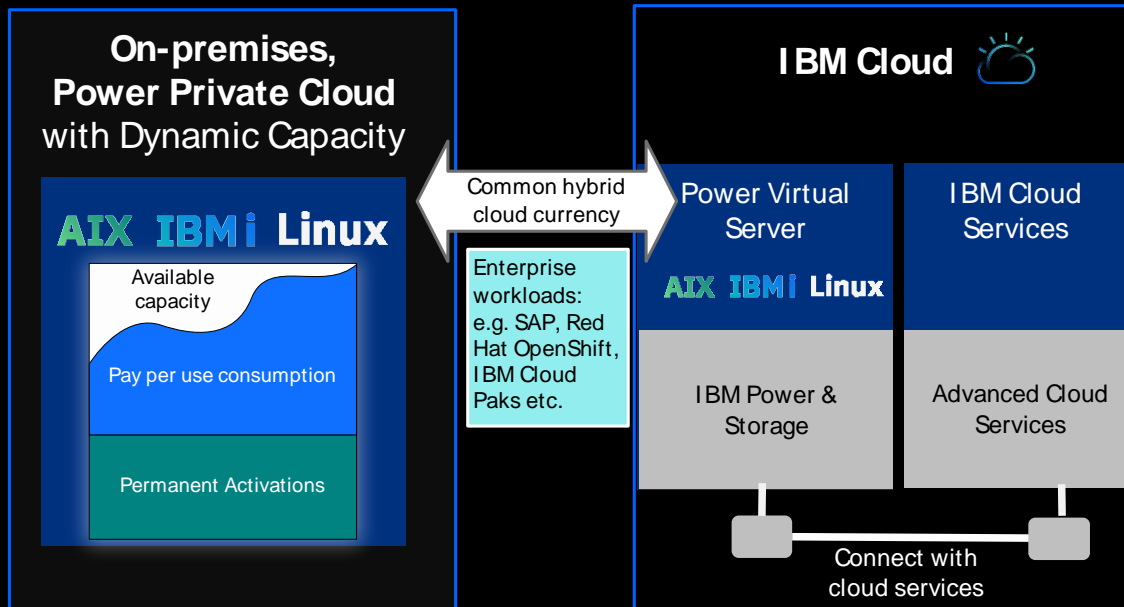
Public Cloud (off-prem)

Power Systems Virtual Server



IBM Power approach to frictionless hybrid cloud

Consistent experience for elastic computing across the IT environment



- Consistent and compatible IT architecture – no additional middleware or application refactoring required
- Extend workloads across on-premises and Power Virtual Server
- Consistent management and automation services across hybrid & heterogeneous architectures
- Common hybrid cloud currency for pay-per-use consumption

Power Virtual Server – Running Power Workloads in the Cloud

Power Virtual Server

14

Data centers
across the globe

125+

Customers deployed prod,
pre-prod, HA/DR use cases

Key solutions

SAP HANA SAP NetWeaver

AIX and IBM i Solutions

Red Hat OpenShift IBM Cloud Paks

Epic (currently in Pilot mode)

Comprehensive Compliance

GDPR

SOC1 Type 1 and Type 2

SOC2 Type 2 (Target 3Q21)

HIPAA

ISO 27K

Power10 in Power Virtual Server Statement of Direction

IBM intends to deploy Power10 in select Power Virtual Server data centers. Power10 in Power Virtual Server is intended to deliver improved performance, scale, security and embedded AI capabilities, allowing clients to further enhance their Power hybrid cloud infrastructure.

Why Power Systems Virtual Server

TCO



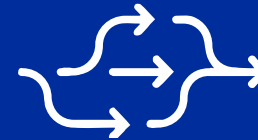
Total Cost of
Ownership Reduced
for operations

Connectivity



Integration between on-
prem value and other
services

OPEX



Consumption-based
Model and to avoid
CAPEX

Refocus



Exit datacenter
ownership
responsibilities

IBM Power Systems Virtual Server

Offering Description:

A user can purchase an AIX, IBM i, and Linux Power VM-based Virtual Machine-as-a-Service

IBM manages up to OS deployment and the client self-manages the OS and up.

Our users can purchase the offering through Cloud consumption-based pricing plans available through IBM Cloud Catalog.

Systems: S922, E980

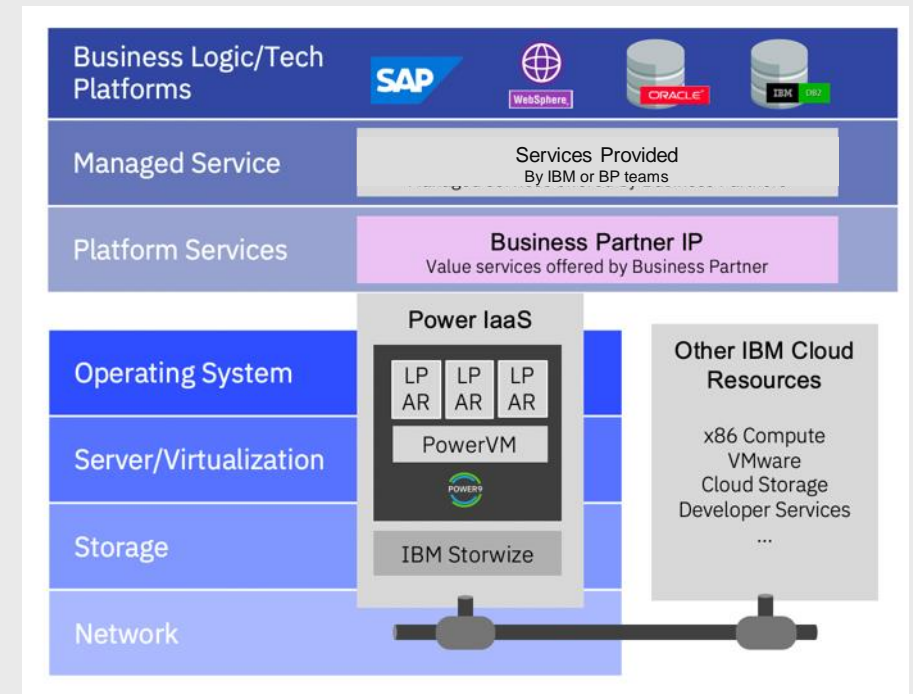
Compute: 0.25-143 cores (15 for S922, 143 for E980),
Shared (capped or uncapped) or Dedicated option

Storage Type: FS9200 all flash: Tier 3 (SSD) or Tier 1 (NVMe)
10 GB minimum / 2 TB maximum per disk, 10 GB increments

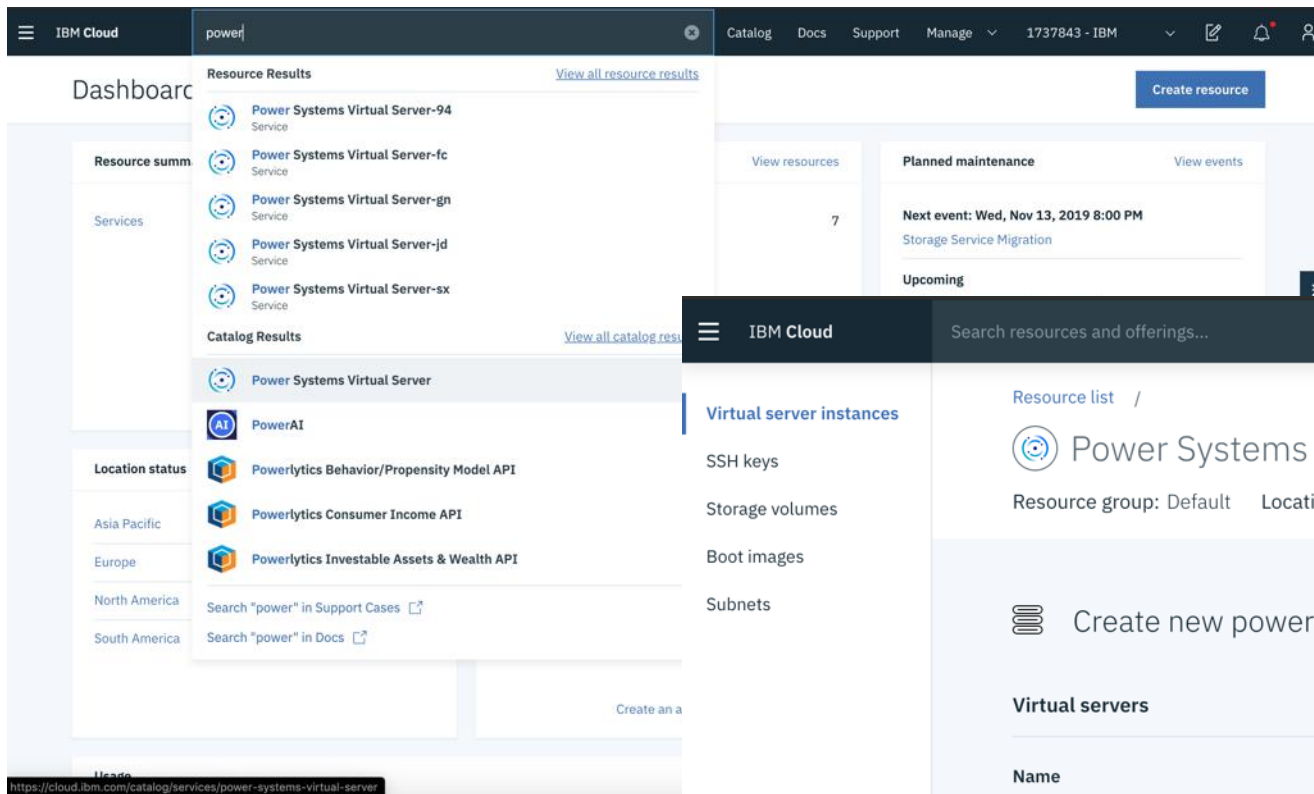
Network: Public and/or Private IP

OS: AIX / IBM i / Linux

Data Centers: DAL, WDC, SAO, FRA, LON, TOR, MON, TOK, OSA, SYD



Multi-tenant, self managed, Power compute as-a-service in IBM Cloud with consumption-based OPEX pricing

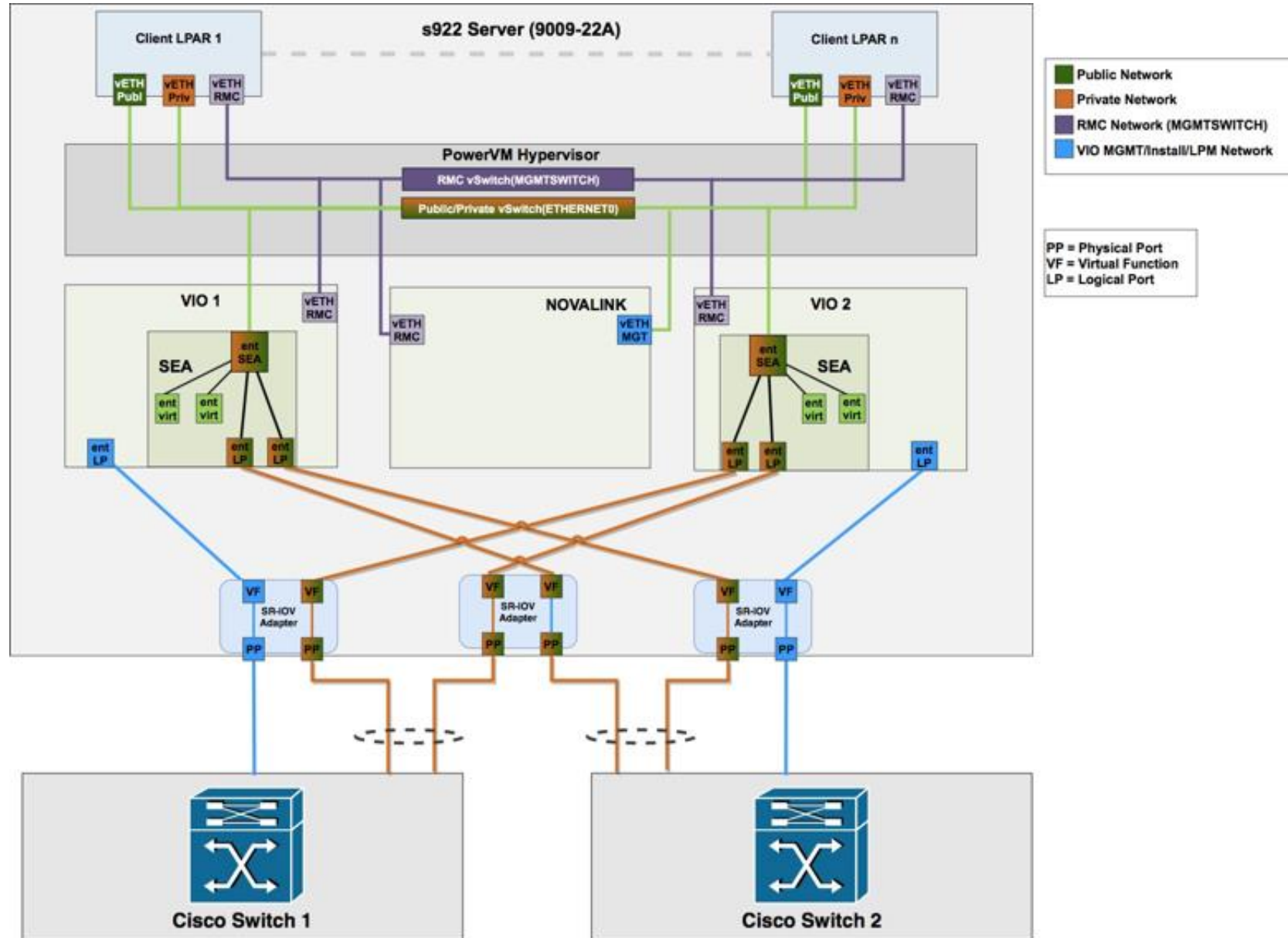


Access the offering from the IBM Cloud Portal cloud.ibm.com and search for Power.

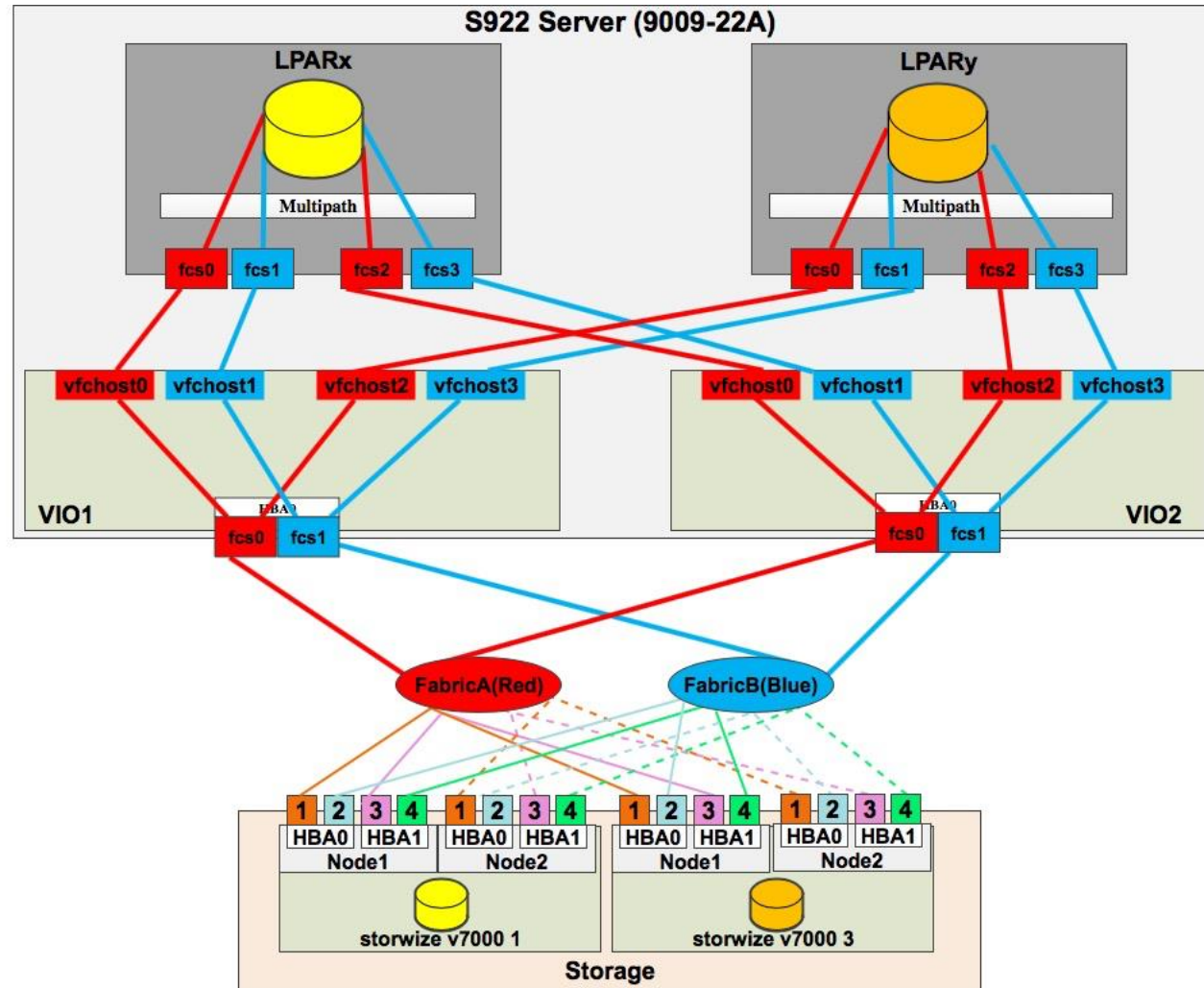
The screenshot shows the 'Create new power virtual server instance' form in the IBM Cloud portal. The form is titled 'Power Systems Virtual Server-ws' and includes a 'Resource group: Default' and 'Location: Washington DC'. The form is divided into several sections: 'Virtual servers', 'SSH keys', 'Profile', and 'Machine type'. The 'Virtual servers' section has a 'Name' field and a 'Number of instances' dropdown set to '1'. The 'SSH keys' section shows 'No SSH keys' and a 'New keys' button. The 'Profile' section has radio buttons for 'Dedicated processor' (selected) and 'Shared processor'. The 'Machine type' section has a dropdown set to 's922'. At the bottom, there are sliders for 'Cores' (set to 1) and 'Memory (GB)' (set to 2). On the right, there's an 'Order summary' section showing the total cost of \$0.00 per month. At the bottom right, there's a 'Create' button.

- Create a resource group in your desired region.
- Customize the LPAR with the amount of cores, memory, storage, and operating system.
- Provision in moments.

S922 LPAR Network Configuration



S922 LPAR NPIV Storage Configuration



Use Case: Development/Test

Problem Statement:

Clients need to do short term work without sacrificing mission critical or up time. Many also want a quick and low-cost way to validate the performance of the latest Power hardware, develop, upgrade and test software for their workloads.

What that means to you:

Use pay-as-you-use billing as you start projects without large, capital budgets; run multiple tests simultaneously; and spin up or down as needed.

PowerVS gives clients the ability to quickly and easily spin up Power Systems resources.

Examples

Software upgrade and development (AIX 7.3, IBM i 7.4)

ISV testing in the new Power platform

Early container work

Why PowerVS?

- Build the same as on-premises Power
- Easy to move to QA and Production
- Flexibility
- Client-paced modernization

Which clients might be interested?

- Current on-premises clients looking to modernize
- Clients reaching software or hardware EoL / EoS
- Clients wanting to develop, upgrade and test new software, as well as hardware performance
- Those with an interest in deploying containers as well as virtual machines

Use Case: Scaling Workloads

Problem Statement:

Many clients have environments that need the flexibility and versatility to meet seasonal or peak time demand. They need the ability to access capacity quickly, when needed, in an affordable way.

What that means to you:

PowerVS offers a monthly billing rate that includes the licenses for your operating systems. The monthly billing rate is pro-rated by the hour based on the resources that are deployed to the Power Systems Virtual Server instance for the month.

Add capacity to on-premises infrastructure when needed. Take advantage of virtual server resources and pay-as-you-use to help deliver peak savings.

Examples

Retail clients with seasonal peaks

Temporary addition of workloads for testing

Unanticipated situations requiring immediate resources

Why PowerVS?

- Pay monthly *only* for what you use on an hourly basis
- Bursting capabilities
- Provision and turn off resources as needed

Which clients might be interested?

- Clients in retail, distribution, and health care who need the availability to scale resources up and down based on demand and peak times
- Existing Power clients wanting to test PowerVS with flexibility
- Clients seeking to run in a hybrid cloud model

Use Case: Backup, HA, and DR

Problem Statement:

Clients run mission critical workloads on Power Systems, so they need high performance and reliable infrastructure plus consistent enterprise stack as on-prem to conduct their business continuity. They seek low-latency connections between on-prem and remote Power infrastructure.

What that means to you:

Create customer confidence to use HA, backup and disaster recovery infrastructure for on and off-premises environments.

Have reliable business continuity without doubling CAPEX

Examples

A Power on-premises customer backing up to a PowerVS data center

Reprioritizing or shutting down data center strategy

Why PowerVS?

- Seamlessly move and manage workloads across cloud and on-premises environments

Which clients might be interested?

- Clients with mission critical workloads that cannot fail or go down
- On-premises clients seeking hybrid solutions
- Clients looking to offload partial data center responsibility to IBM

Use Case: Production

Problem Statement:

Clients are exiting data center or stop CAPEX need a certified Power infrastructure to continue deliver them performance, security, and reliability as well software license saving. Clients realign IT skills with their business mission.

What that means to you:

Consistent architecture across enterprise stack (microprocessors, FW, virtualization management and OS) as on-prem

Frictionless migration

No CAPEX or up-front payment

Cloud flexibility and agility

IBM Cloud compliance and security

Examples

Reprioritizing or shutting down data center strategy

Seek fully managed environment

Why PowerVS?

- SAP certification
- Oracle support
- Deep Power and Cloud skills in IBM

Which clients might be interested?

- Clients with mission critical workloads that cannot fail or go down
- Clients looking to offload data center responsibility to IBM

Private Cloud and Automation

PowerVC

Infrastructure-as-a-Service and Private Cloud Management for IBM Power Systems



Cloud Orchestration Solutions

PowerVC API provides integration with multicloud management and cloud-native management solutions

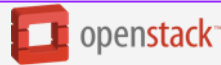


Cloud and Virtualization Management

- Build Power Systems private clouds
- Quickly capture and deploy VMs
- Virtual machine resiliency and more...



Enterprise Storage



IBM
EMC
Hitachi
Pure Storage



Enterprise Power



Fully Automated Cloud Platform

Broad Use Cases



Provisioning



Configuration
Management



Application
Deployment



Continuous
Delivery

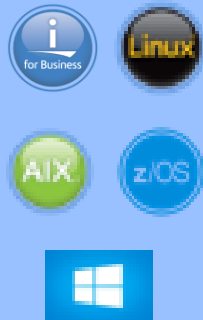


Orchestration



Security
Automation

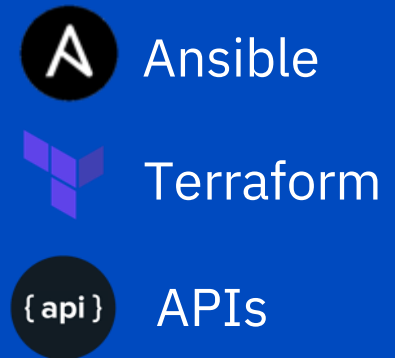
Consistency across OSeS



Consistency across Hybrid Environments

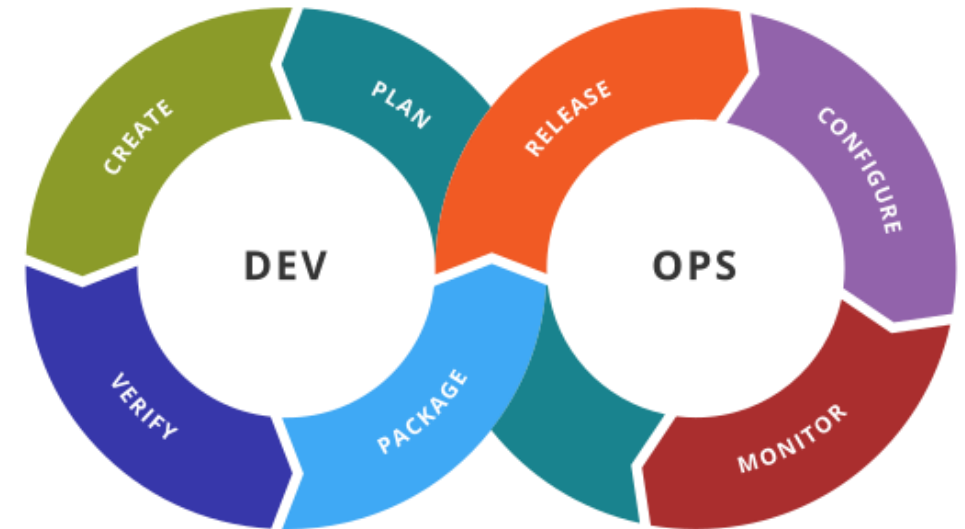


Standard Technologies

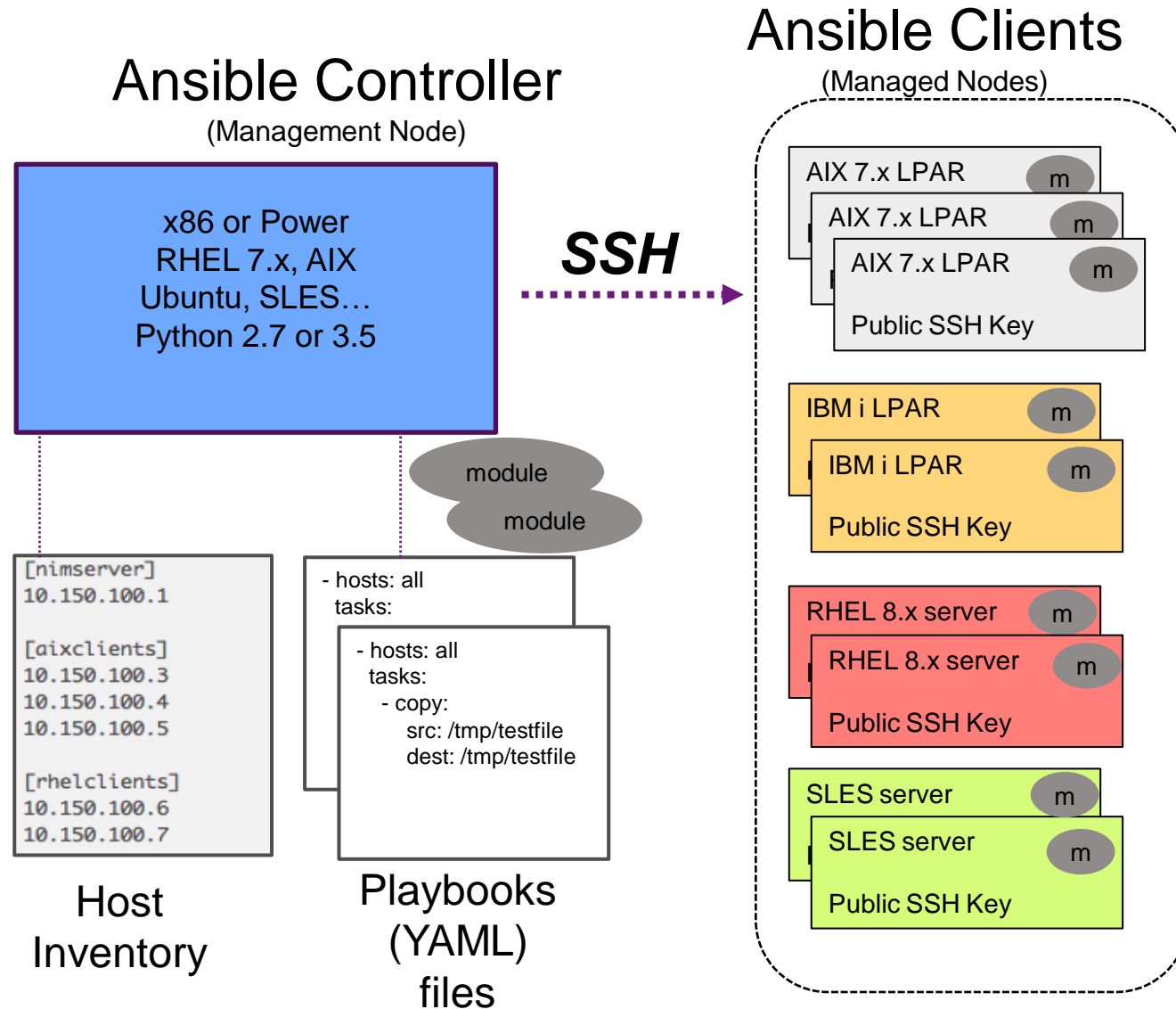


Ansible enables automation on Power Systems

1. Rapidly build new LPARs in a consistent manner
2. Apply appropriate configuration to the new LPARs
3. Deploy and configure s/w packages to the new LPARs
4. Administer existing LPARs:
 - Resize, add storage, restart services etc.
 - Increase filesystems, create users, change file permissions etc.
 - Migrate LPARs, stop/start etc.
 - Monitor usage, availability etc.
 - Upgrade OS, apply patches etc.



Deploying Ansible



General Prerequisites:

- Ansible Controller
 - AIX 7.x, RHEL 8.x, Ubuntu, others
 - Python 2.7 or later / Python 3.5 or later
 - SSH connection
 - Uses **“modules”** to configure the desired end state of a server “inventory”
 - Example: *copy module to copy file*
 - Modules handle the **“state”** of the inventory
 - Example: ***file** module does not create a directory if directory is there*
- Install using
 - OS package manager (yum, apt-get, pkg)
 - Python package manager (pip)
- Ansible Clients:
 - AIX, IBM i, RHEL, Ubuntu, others
 - Python 2.6 or later
 - Controller SSH public key
 - Agentless
 - Can be added or removed from inventory

Ansible Inventory

Inventory Features

Example 1

```
[atlanta]
host1
host2

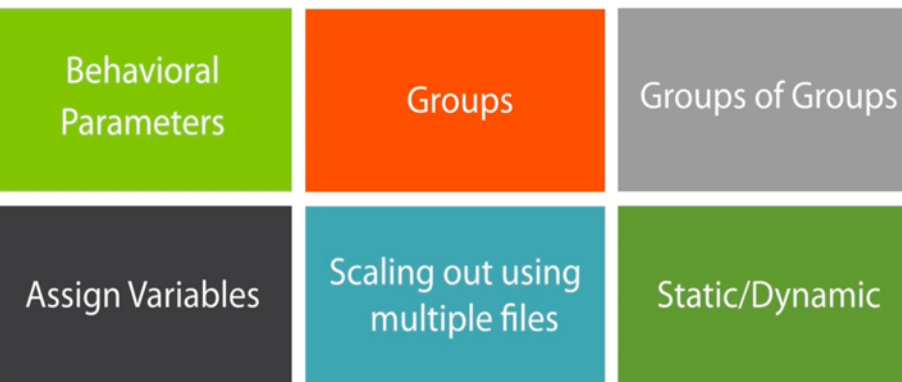
[raleigh]
host2
host3

[southeast:children]
atlanta
raleigh

[southeast:vars]
some_server=foo.southeast.example.com
halon_system_timeout=30
self_destruct_countdown=60
escape_pods=2

[usa:children]
southeast
northeast
southwest
northwest
```

```
pvc_openstack > inventory > ! openstack.yml > ...
1 # file must be named openstack.yml
2 # # Make the plugin behave like the
3 plugin: openstack
4 expand_hostvars: no
5 fail_on_errors: no
6 only_clouds:
7   - pvc143cloud
8
```



```
pvc_openstack > ! clouds.yml > YAML > {} clouds > {} pvc144cloud >
31 pvc144cloud:
32   auth:
33     auth_url: https://10.150.31.50:5000/v3/
34     user_domain_name: default
35     project_domain_name: default
36     project_name: ibm-default
37     tenant_name: ibm-default
38     user_domain_name: Default
39     username: root
40     password: <your pass>
41   compute_api_version: 2.46
42   network_api_version: 2.0
43   image_api_version: 2
44   volume_api_version: 2
45   region_name: RegionOne
46   cacert: ./inventory/pvc144/powervc.crt
47
```

Example 2

```
invocation1.yml Deploy_VMs 2.yml hosts
Ansible > ansible_env > hosts
1 [nimserver]
2
3 [ocp]
4 bp-ocp-m1
5 bp-ocp-n1
6 bp-pvc01
7
8 [ibmi]
9 TESTiAWroot2 ansible_user=QCIUSER
10 TemplateTEST
11
12 [ibmi:vars]
13 ansible_user=QCIUSER
14
15 [aixclients]
16 aix71
17 aix71test
18 multiboot
19
20 [rhelclients]
21 rhelansible
22 jk-ansible-ctl ansible_connection=local
23
24 [powervc]
25 powervc14
```


Ansible Playbooks

- Used for automation and orchestration
- Uses **.YML** files to define automation tasks (prescriptive)
- consist of **series of 'plays'** that define automation across a set of hosts, known as the **'inventory'**.
- Each **'play'** consists of multiple **'tasks'**, that can target one, many, or all of the hosts in the inventory.
- Each **'task'** is a call to an **Ansible module** - a small piece of code for doing a specific task.
 - **Simple tasks:** placing a configuration file on a target machine, or installing a software package.
 - **Complex tasks:** spinning up an entire CloudFormation infrastructure in Amazon EC2.

--- SAMPLE YAML FILE ---

```
- hosts: webservers
  vars:
    http_port: 80
    max_clients: 200
    remote_user: root

  tasks:
    - name: ensure apache is latest version
      yum:
        name: httpd
        state: latest

    - name: write the apache config file
      template:
        src: /srv/httpd.j2
        dest: /etc/httpd.conf
      notify:
        - restart apache

    - name: ensure apache is running
      service:
        name: httpd
        state: started

  handlers:
    - name: restart apache
      service:
        name: httpd
        state: restarted
```

Ansible Modules

- Ansible includes 1000s of modules ranging from:
 - simple configuration management
 - managing network devices
 - modules for maintaining infrastructure on every major cloud provider.
- Core modules for Ansible
 - allow for easy configuration of desired state
 - check if specified task actually needs to be done before executing it.
- modules shipped with Ansible are implemented in Python and PowerShell
- takes JSON as input and produce JSON as output
- Out-of-the-box support for all major cloud providers

Module Index

- All modules
- Cloud modules
- Clustering modules
- Commands modules
- Crypto modules
- Database modules
- Files modules
- Identity modules
- Inventory modules
- Messaging modules
- Monitoring modules
- Net Tools modules
- Network modules
- Notification modules
- Packaging modules
- Remote Management modules
- Source Control modules
- Storage modules
- System modules
- Utilities modules

System modules

- `aix_devices` – Manages AIX devices
- `aix_filesystem` – Configure LVM and NFS file systems for AIX
- `aix_inittab` – Manages the inittab on AIX
- `aix_lvg` – Manage LVM volume groups on AIX
- `aix_lvol` – Configure AIX LVM logical volumes
- `alternatives` – Manages alternative programs for common commands
- `at` – Schedule the execution of a command or script file via the at command
- `authorized_key` – Adds or removes an SSH authorized key

Ansible Collections and Red Hat Automation Hub for AIX and IBM i

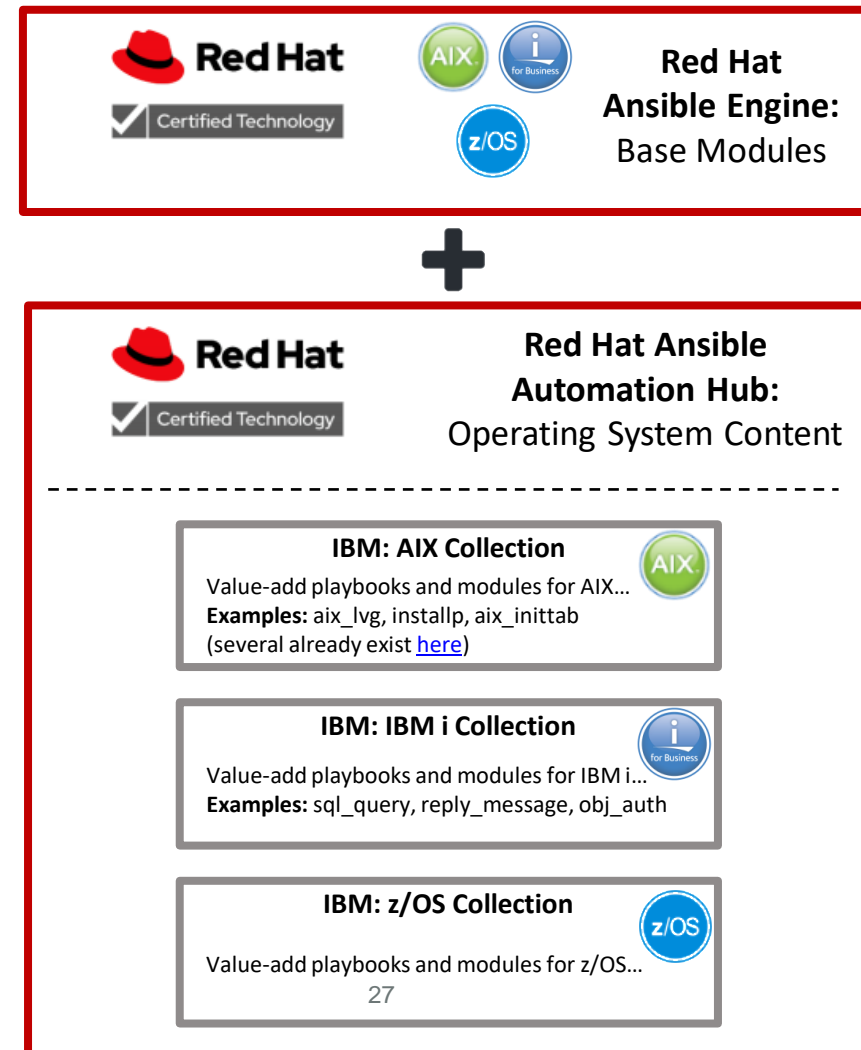
Collections are the standard way to extend and complement base Ansible content—**and now AIX and IBM i content is available**—in both community and commercial form

COMMUNITY ENABLED: NO CERTIFICATION

Collections are distributed via [Ansible Galaxy](#) and are provided with community-level support (i.e., no paid enterprise support subscriptions from Red Hat)

ENTERPRISE READY: CERTIFIED CONTENT FROM RED HAT

Collections can additionally be certified by Red Hat + 3rd parties by certifying them and putting them in [Red Hat Ansible Automation Hub](#); made available via Red Hat subscriptions



Automating IBM i

On Github:

<https://github.com/IBM/ansible-for-i>

On Ansible-Galaxy

https://galaxy.ansible.com/ibm/power_ibmi

```
- name: IBM i apply all loaded ptfs
  hosts: ibmi

  roles:
    - role: apply_all_loaded_ptfs
```

```
- name: IBM i apply all loaded ptfs
  hosts: ibmi

  roles:
    - role: apply_all_loaded_ptfs
      vars:
        temp_or_perm: '*PERM'
        delayed_option: '*NO'
        auto_ipl: true
```

```
1 # Copyright (c) IBM Corporation 2019, 2020
2 # Apache License, Version 2.0 (see https://opensource.org/licenses/Apache-2.0)
3 ---
4
5 - hosts: all
6   gather_facts: no
7
8   tasks:
9     - include: ibmi-install-yum.yml
10
11     - block:
12       - include: ibmi-install-rpm.yml
13         vars:
14           python: "{{python_version}}"
15           with_list: "{{required_rpms}}"
16
17       vars:
18         required_rpms: [itoolkit, ibm_db]
19         python_version: "{{ansible_python_interpreter.split('/')[1]}}"
20
21     - name: Verify 5770DG1
22       command: system "DSPSFWRSC"
23       register: installed_native_products
24
25     - name: Promote message if 5770DG1 is not installed
26       fail:
27         msg: 5770DG1 is not installed
28       when: '"5770DG1" not in installed_native_products.stdout'
29
30     - name: IBM i is now available for being managed by Ansible
31       debug:
32         msg: "The IBM i node is ready for Ansible."
33       when: '"5770DG1" in installed_native_products.stdout'
```

Ansible Modules for AIX

- **aix_devices** – Manages AIX devices
- **aix_filesystem** – Configure LVM and NFS file systems for AIX
- **aix_inittab** – Manages the inittab on AIX
- **aix_lvg** – Manage LVM volume groups on AIX
- **aix_lvol** – Configure AIX LVM logical volumes
- **nstallp** – Manage packages on AIX
- **mksysb** – Generates AIX mksysb rootvg backups.

```
- name: Create a logical volume of 512M
  aix_lvol:
    vg: testvg
    lv: testlv
    size: 512M

- name: Create a logical volume of 512M with disks hdisk1 and hdisk2
  aix_lvol:
    vg: testvg
    lv: test2lv
    size: 512M
    pvs: [ hdisk1, hdisk2 ]

- name: Create a logical volume of 512M mirrored
  aix_lvol:
    vg: testvg
    lv: test3lv
    size: 512M
    copies: 2
```

AIX logical volume operations

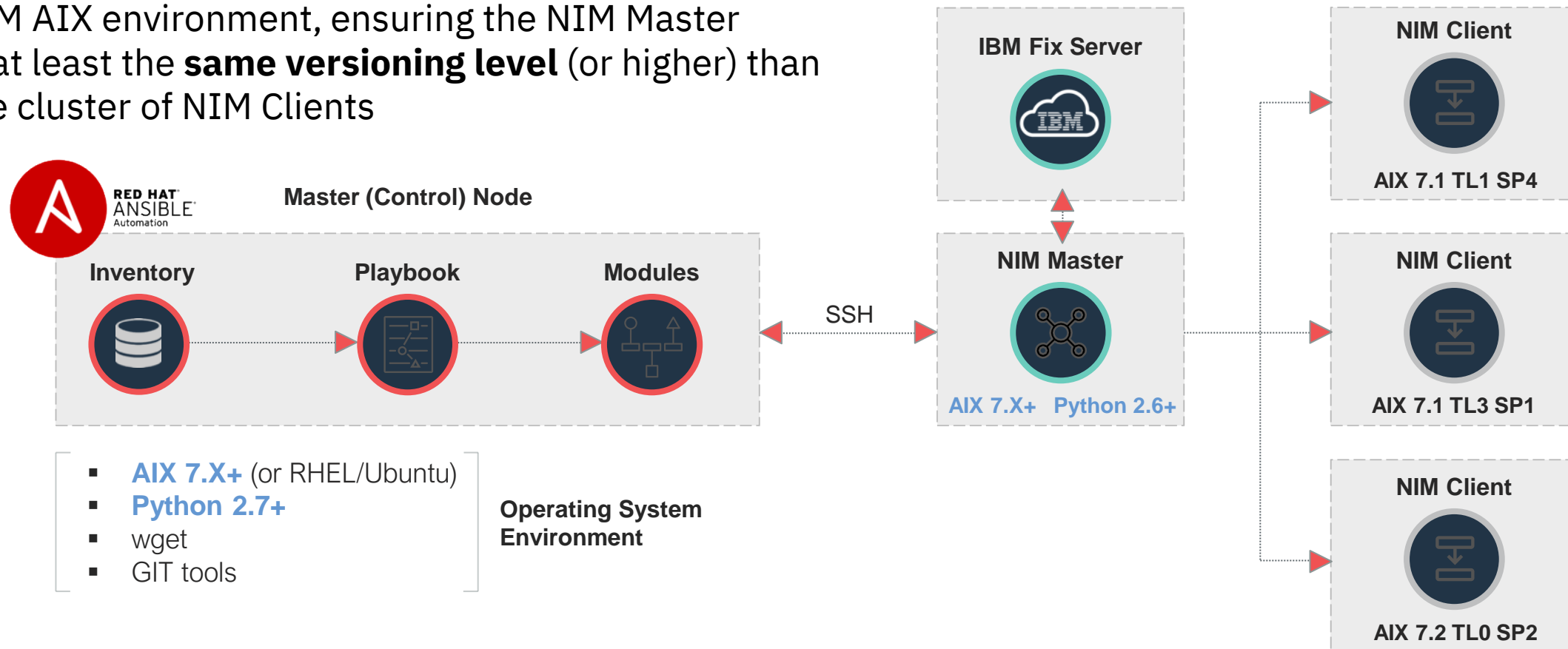
IBM Power Systems AIX collection on Ansible-Galaxy

- **devices** – Configure/Modify/Unconfigure devices
- **emgr** – The interim fix manager installs and manages system interim fixes.
- **filesystem** – Create/Modify/Remove Local and NFS filesystems
- **flrtvc** – Generate FLRTVC report, download and install efix.
- **geninstall** – Generic installer for various packaging formats
- **group** – Create new group or change/remove attributes of group on AIX
- **installp** – Installs and updates software
- **lvg** – Create/Modify/Remove a volume group
- **mktcpip** – Sets the required values for starting TCP/IP on a host
- **mount** – Mounts/Unmounts a Filesystem/Device
- **nim** – Server setup, install packages, update SP or TL.
- **nim_backup** – Use NIM to create, list and restore backup on LPAR and VIOS clients.
- **nim_flrtvc** – Generate flrtvc report, download and install efix
- **nim_suma** – Download fixes, SP or TL on an AIX server
- **nim_updateios** – Use NIM to update a single or a pair of Virtual I/O Servers to latest maintenance level.
- **nim_upgradeios** – Perform a VIOS upgrade with NIM
- **nim_vios_alt_disk** – Create/Cleanup an alternate rootvg disk
- **nim_vios_hc** – Check if a pair of VIOSes can be updated
- **nim_viosupgrade** – Perform an upgrade with the viosupgrade tool
- **suma** – Download/Install fixes, SP or TL on an AIX server.
- **user** – Create new users or change/remove attributes of users on AIX.
- **vios_alt_disk** – Create/Cleanup an alternate rootvg disk on a VIOS

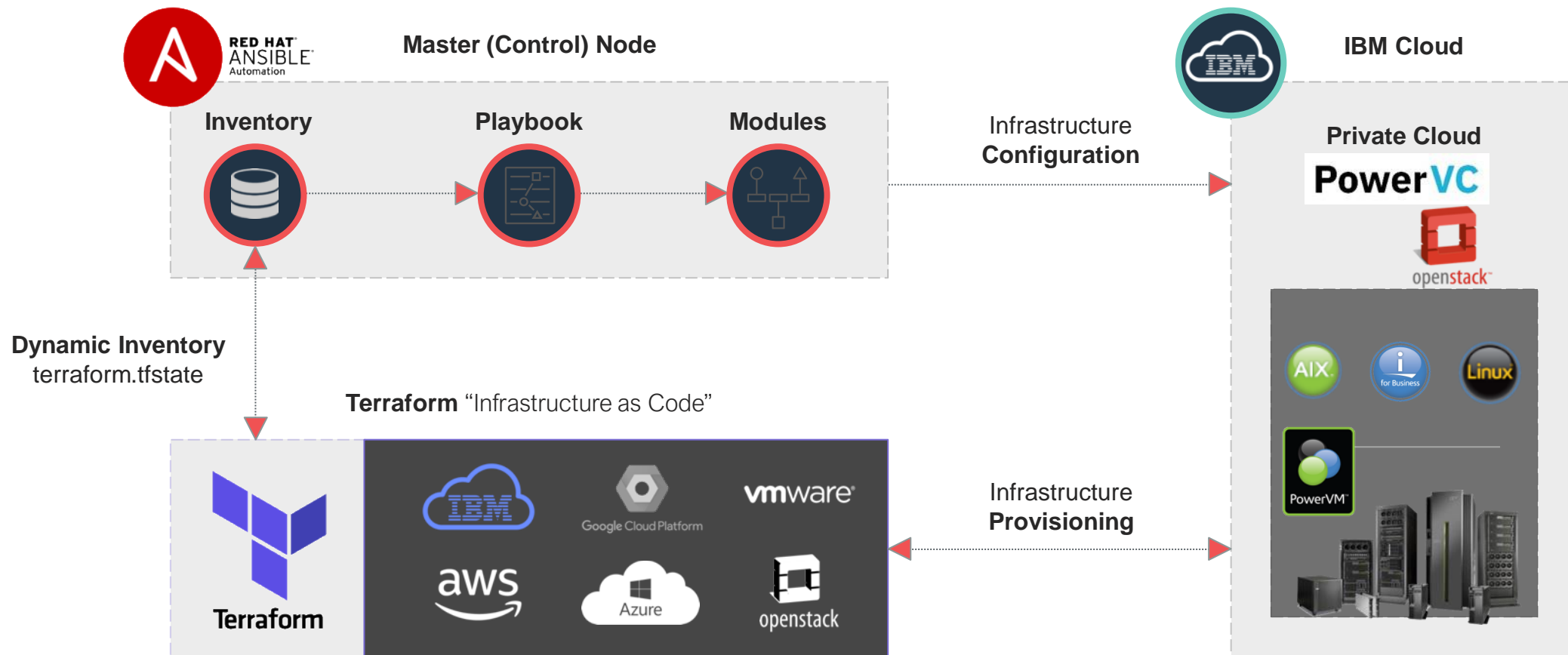
Automated Patching of IBM AIX Servers

Ansible automation makes cloud and infrastructure provisioning and maintenance a breeze

- Deploy workloads to public and private cloud environments, **agnostic to any particular vendor**
- In this example, Ansible automates patching of an IBM AIX environment, ensuring the NIM Master is at least the **same versioning level** (or higher) than the cluster of NIM Clients



Automated Server & Storage Provisioning – Integration with PowerVC via REST APIs

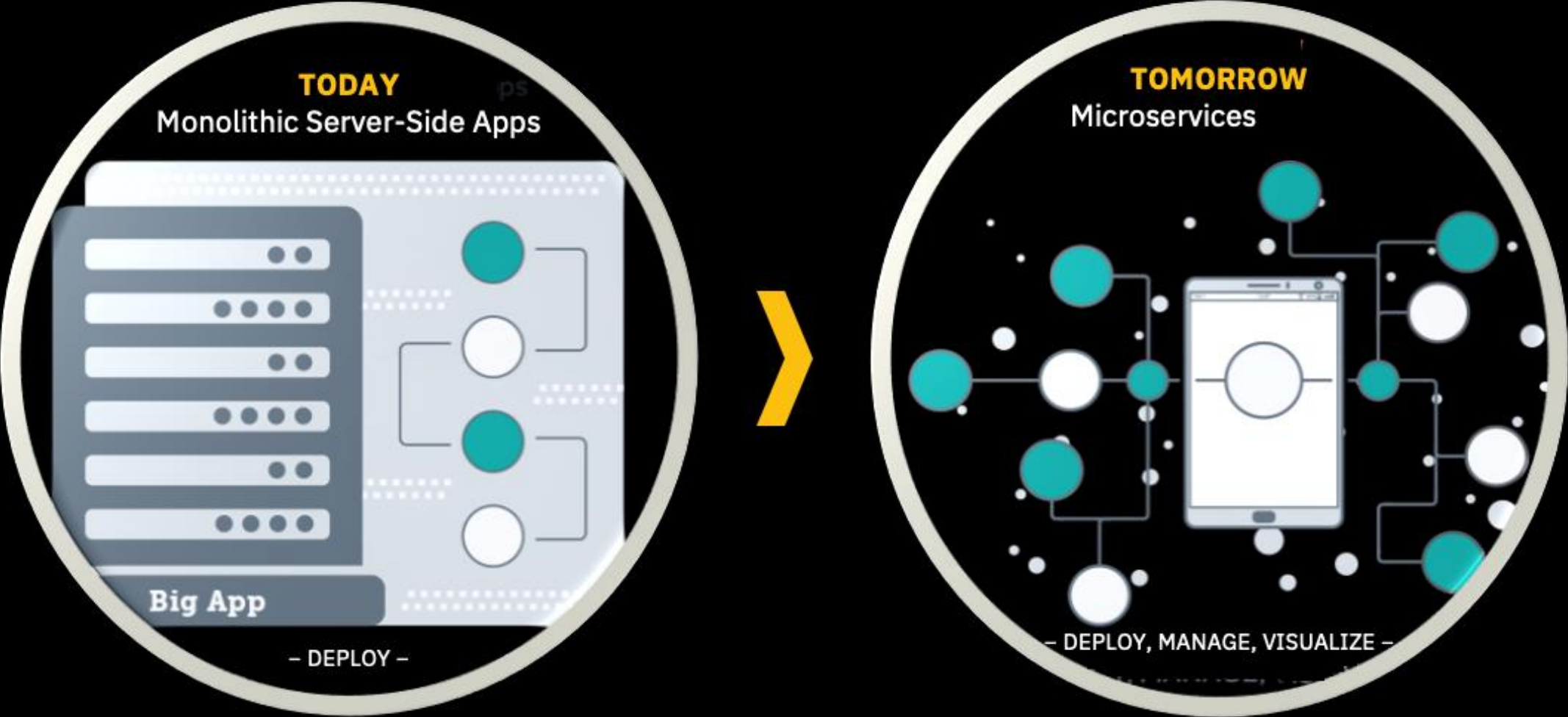


Ansible can also leverage open source technologies like **Terraform** to unlock a **Dynamic Inventory**

Application Modernization

In an approachable and methodical way

Evolving Application Landscapes



Application Modernization

Drive innovation and faster insights with modern apps and infrastructure

Open and integrated approach

VMs and Containers co-reside on a server

Build once, deploy anywhere

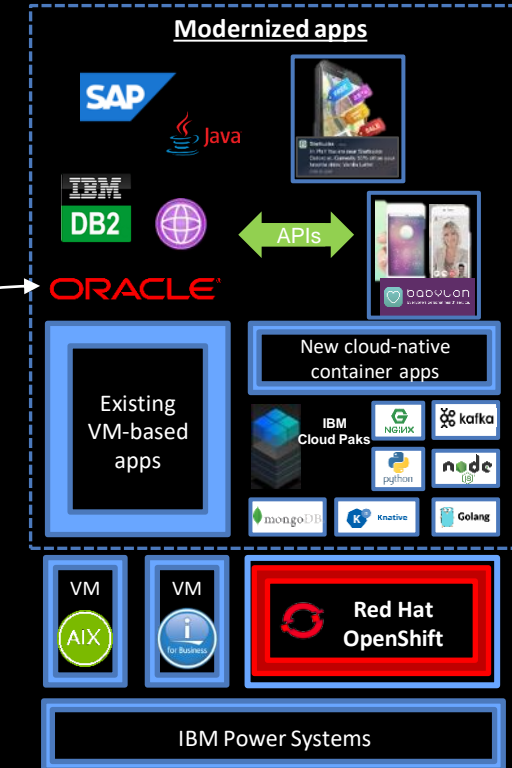
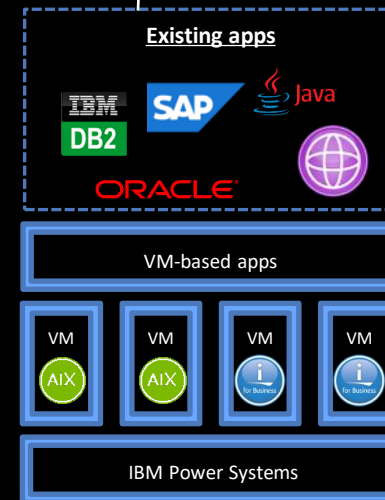
For optimized data and workload placement

Culture and skill transformation

Best practices, proven methods, and tools

1. Accelerate Digital Transformation
2. Accelerate Delivery
3. High(er) Quality
4. Deployment Flexibility for Hybrid Cloud

Incrementally modernize



*Deploy anywhere – on-prem
or in the public cloud*

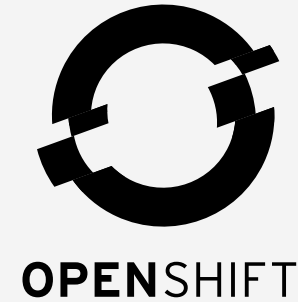
Download the Application Modernization Field Guide
<https://www.ibm.com/downloads/cas/D9POQ3YR>



IBM Systems

What Is Red Hat OpenShift?

[Red Hat OpenShift](#) is a managed **container orchestration platform** built around Kubernetes. Develop containerized applications with enterprise-ready open source technology. Manage deployments across hybrid and multicloud environments using full-stack automated operations.



Red Hat
OpenShift
Release v4.8*

* Current release as of July 2021

Simplify Management On or Off-Premises

Automated installation, lifecycle management, and upgrades for the container stack — with any cloud or vendor.

Build Fast and Deploy Anywhere

Helps teams build with speed, agility, confidence, and choice — wherever your business needs to build.

Build with Kubernetes, Trust with Red Hat

Focused on security at every level of the container stack and throughout the application lifecycle.



{ DEVELOP NEW APPS ON POWER }

with Red Hat Runtimes, CodeReady Workspaces and Open Source software

Red Hat Ecosystem Catalog

Now Available on IBM Power Systems for Red Hat OpenShift Customers



Linux Images

- + Red Hat
- + CentOS
- + SUSE
- + BusyBox
- + AlpineLinux
- + Ubuntu
- + Debian



Web & Middleware

- + WebSphere Liberty
- + Open Liberty
- + Apache Tomcat
- + ActiveMQ
- + JBoss
- + WildFly
- + RabbitMQ
- + WordPress



Cloud & DevOps

- + Jenkins
- + Ansible
- + Kubernetes
- + Red Hat OpenShift
- + Gradle
- + Maven
- + Terraform
- + Travis CI



Languages

- + Python
- + Java
- + PHP
- + GoLang
- + OpenJDK
- + NodeJS
- + R
- + Ruby
- + Rust
- + GCC
- + TensorFlow
- + Erlang
- + AppSody
- + Transform Advisor



Databases

- + MongoDB
- + Redis
- + MySQL
- + Cassandra
- + MariaDB
- + PostgreSQL
- + Memcached
- + IBM Db2
- + CouchDB



Analytics & AI

- + Grafana
- + Kibana
- + Elasticsearch
- + Logstash
- + Fluentd
- + Kafka
- + IBM Watson Studio
- + IBM Watson ML



Storage

- + Container Storage Interface
- + IBM Spectrum Virtualize
- + IBM PowerVC CSI Driver
- + NFS



Networking

- + Prometheus
- + Nginx
- + Apache HTTP Server
- + ZooKeeper
- + HAProxy
- + etcd

1,064 packages
as of 07/28/21



For a complete list of packages, visit:



Seamlessly manage multiple OpenShift clusters. From ONE place.



Multicluster lifecycle management



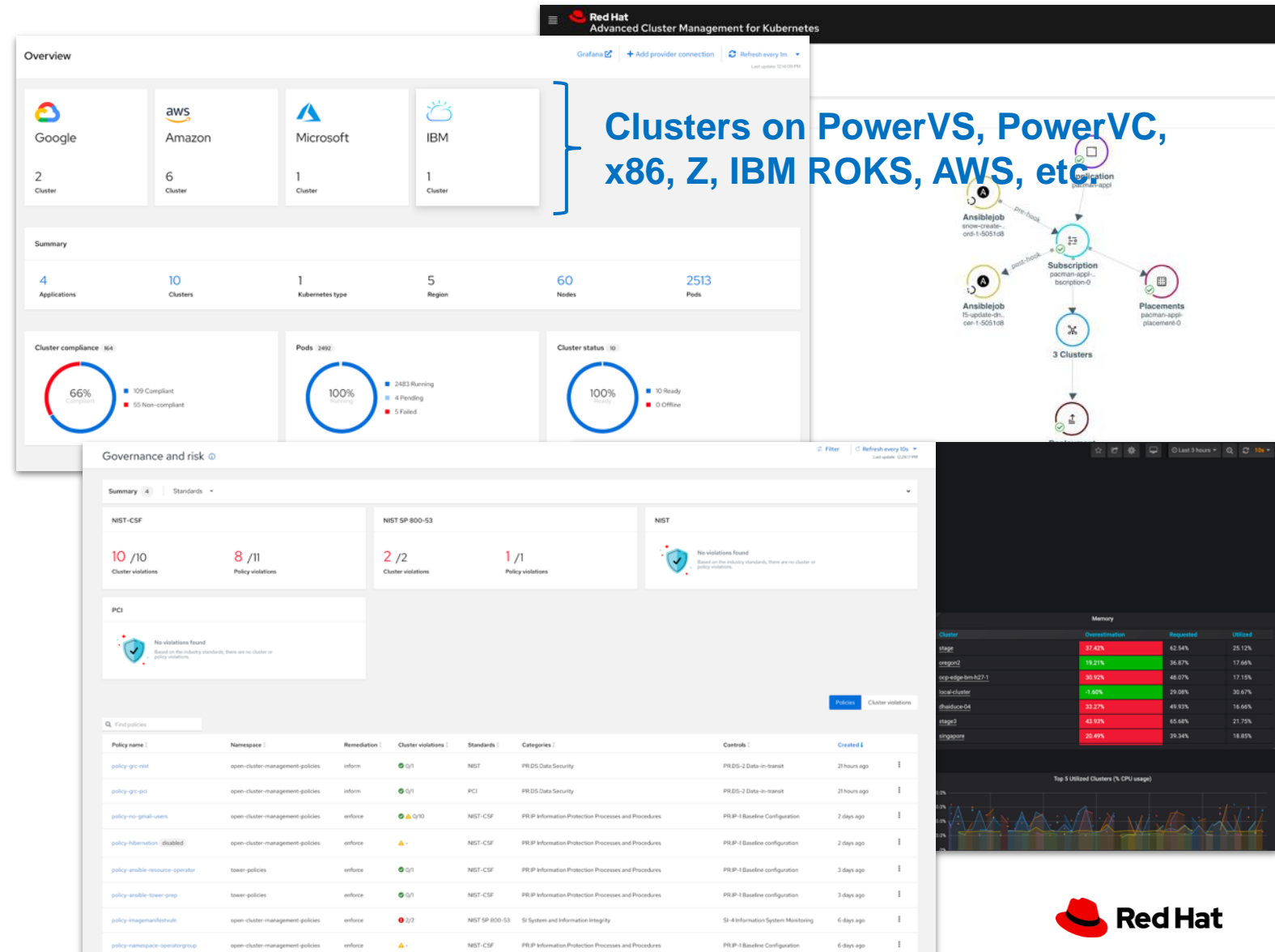
Policy driven governance, risk and compliance



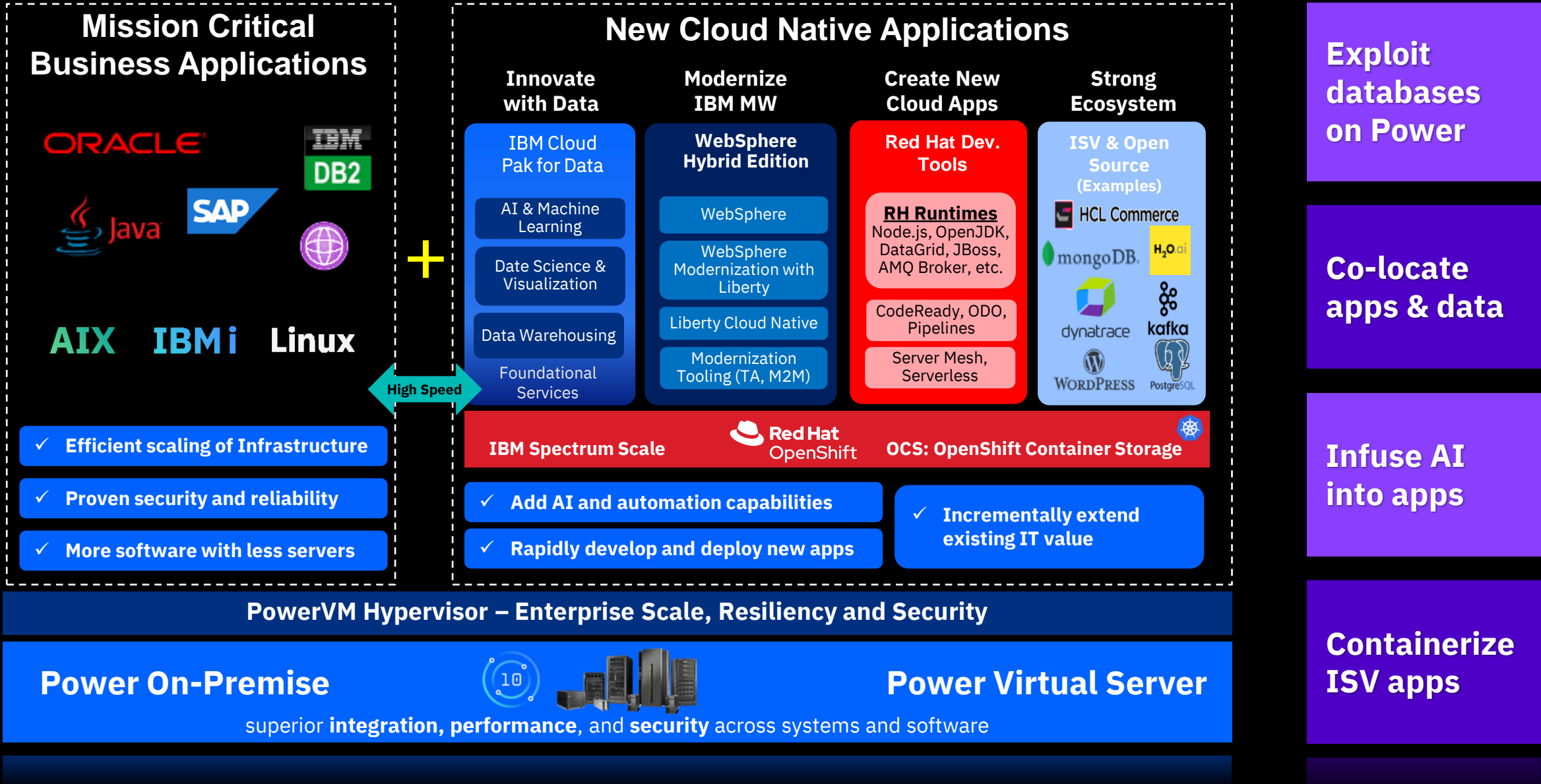
Advanced application lifecycle management



Multicluster observability for health and optimization



IBM Power – One Platform for Digital Transformation



Take the next step



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<https://cloud.redhat.com/openshift/install>



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<https://www.ibm.com/downloads/cas/D9POQ3YR>



Get started with OpenShift on IBM Power Virtual Server. Reference:
<https://developer.ibm.com/series/deploy-ocp-cloud-paks-power-virtual-server/>



IBM Hybrid Cloud on Power white paper
<https://www.ibm.com/downloads/cas/G4DO3DJE>

Accelerate transformation
with IBM Power

ibm.biz/power10



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