Terraform and Ansible on IBM Z / LinuxONE

zExpertenforum H2 2026

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Topics

- Infrastructure as Code Overview
- Terraform Overview
- Ansible Overview
- Infrastructure Management for Z and LinuxONE
- Bringing all together

Infrastructure as Code Overview



What is IaC?

Describe Infrastructure like VM’s, networks, Firewalls, Storage, OS’s, Applications as Machine readable text.

This will make your Infrastructure better **reusable**.

It will be easier to **manage** and **secure** your environments.

You will be able to **track**, **record** and **revert** changes.

And **restore** and **recovery** of apps and services can be easily automated

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Community vs Enterprise

Community/Free:

- Ansible or Terraform running on a single Workstation
- Ansible Collections
- Most Terraform providers

Enterprise/Paid:

- Some Terrafrom providers (IBM Z/LinuxOne)
- Ansible Automation Platform
- HCP Terrafrom (cloud)
- Terraform Enterprise (self-hosted)

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Terraform Overview



HashiCorp
Terraform

A foundation for scaling hybrid cloud and AI

HashiCorp Cloud Platform

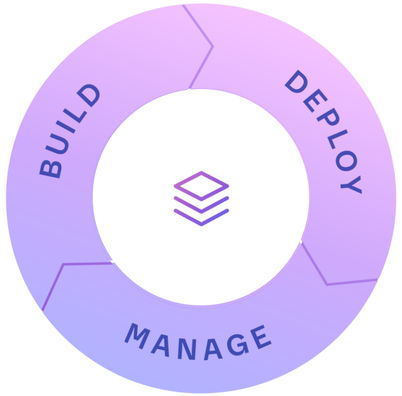
Infrastructure
Lifecycle Management

Terraform
Infrastructure as code provisioning

Packer
Build and manage images as code

Waypoint
Automated developer services

Nomad
Scheduling and orchestration



Infrastructure as code to build, deploy, and manage the lifecycle of infrastructure and applications

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HashiCorp
Terraform

Terraform Basics I



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Terraform

Terraform Basics II

```
provider "aws" {
  region = "us-west-2"
}

data "aws_ami" "ubuntu" {
  most_recent = true

  filter {
    name = "name"
    values = ["ubuntu/images/hvm-ssd-gp3/ubuntu-noble-24.04-amd64-server-*"]
  }

  owners = ["099720109477"] # Canonical
}

resource "aws_instance" "app_server" {
  ami           = data.aws_ami.ubuntu.id
  instance_type = "t2.micro"

  tags = {
    Name = "learn-terraform"
  }
}
```

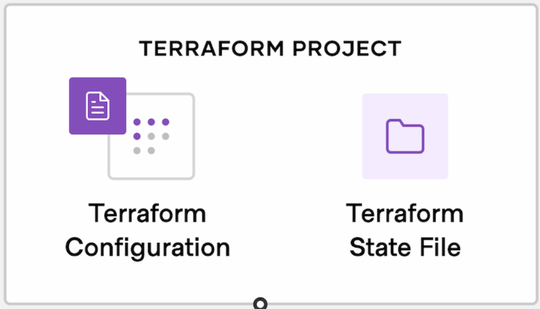

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Terraform Basics III

Write

Define infrastructure in configuration files



Plan

Review the changes Terraform will make to your infrastructure

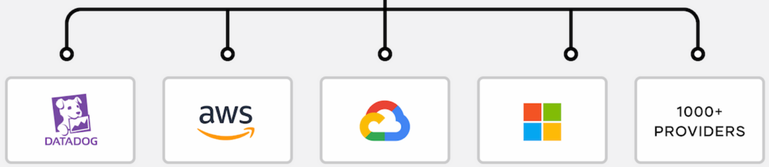
```
$ terraform plan

...

Terraform will perform
the following actions
```

Apply

Terraform provisions your infrastructure and updates the state file.



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Why commercial Terraform

Deliver enterprise-ready, simplified IaC

Reuse vetted infrastructure components

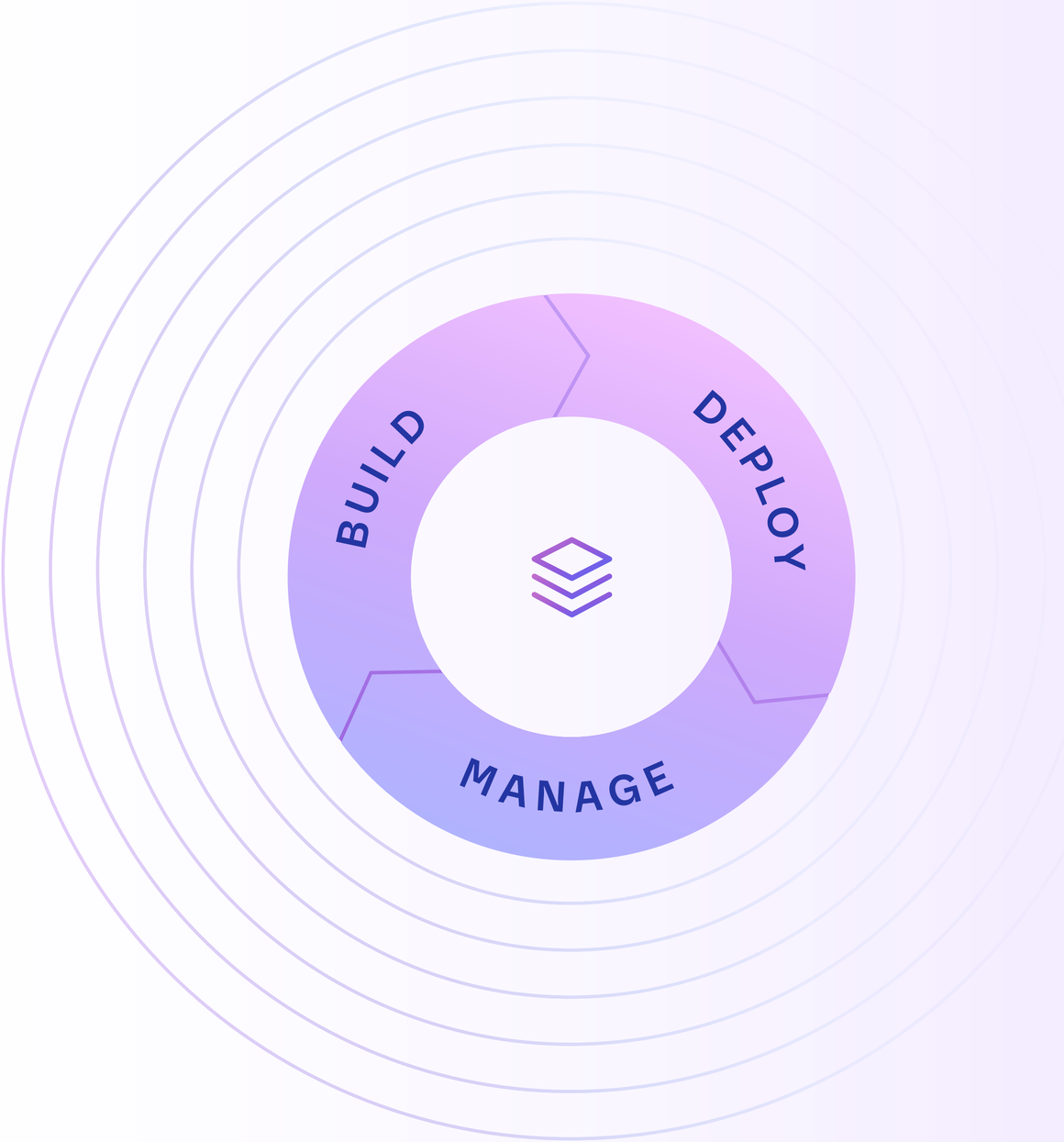
Enable a producer and consumer model with reusable, approved, and compliant infrastructure components

Enforce guardrails automatically

Automatically apply policies to limit risk and maintain security and efficiency

Manage infrastructure lifecycle at scale

Programmatically scale infrastructure, enable self-service, and monitor health over time



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Terraform

Use infrastructure as code (IaC) to provision and manage all infrastructure across your organization

Speed

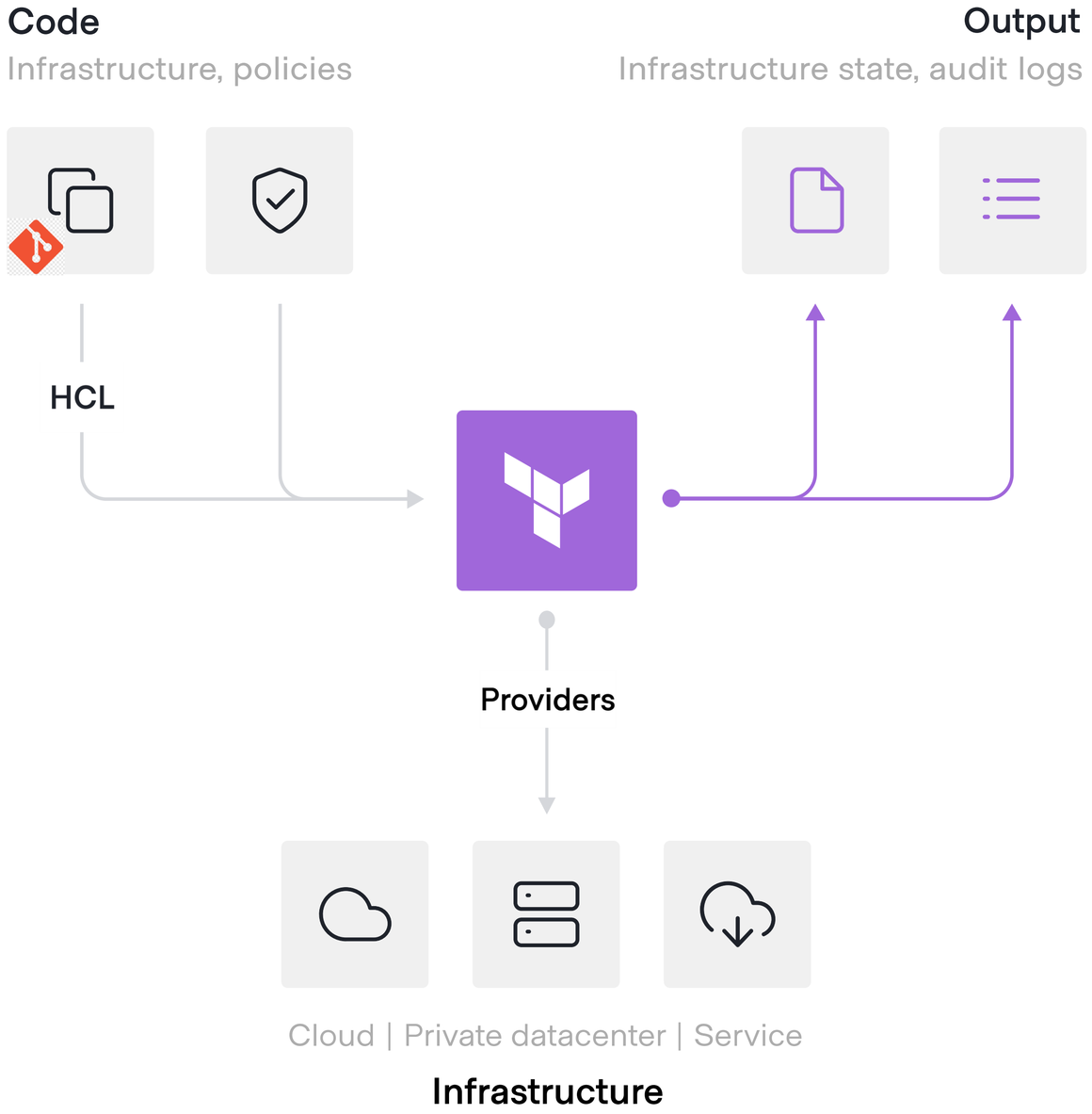
Deliver faster with reusable modules and centralized controls for self-service

Risk

Enforce security and compliance policies automatically *before provisioning* happens

Cost

Eliminate overprovisioning and cloud waste with automated policies and time-to-live controls

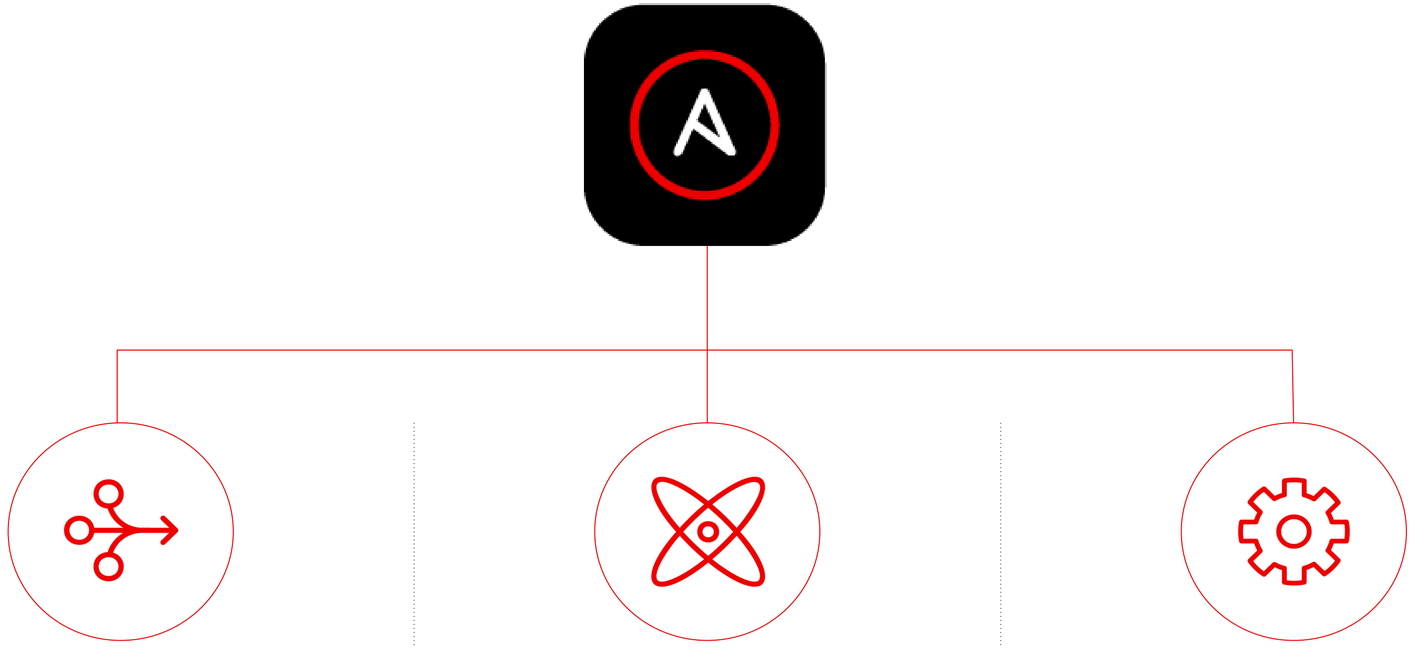


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Ansible Overview



Ansible is the de facto automation language.



Simple

Human-readable language with quick adoption

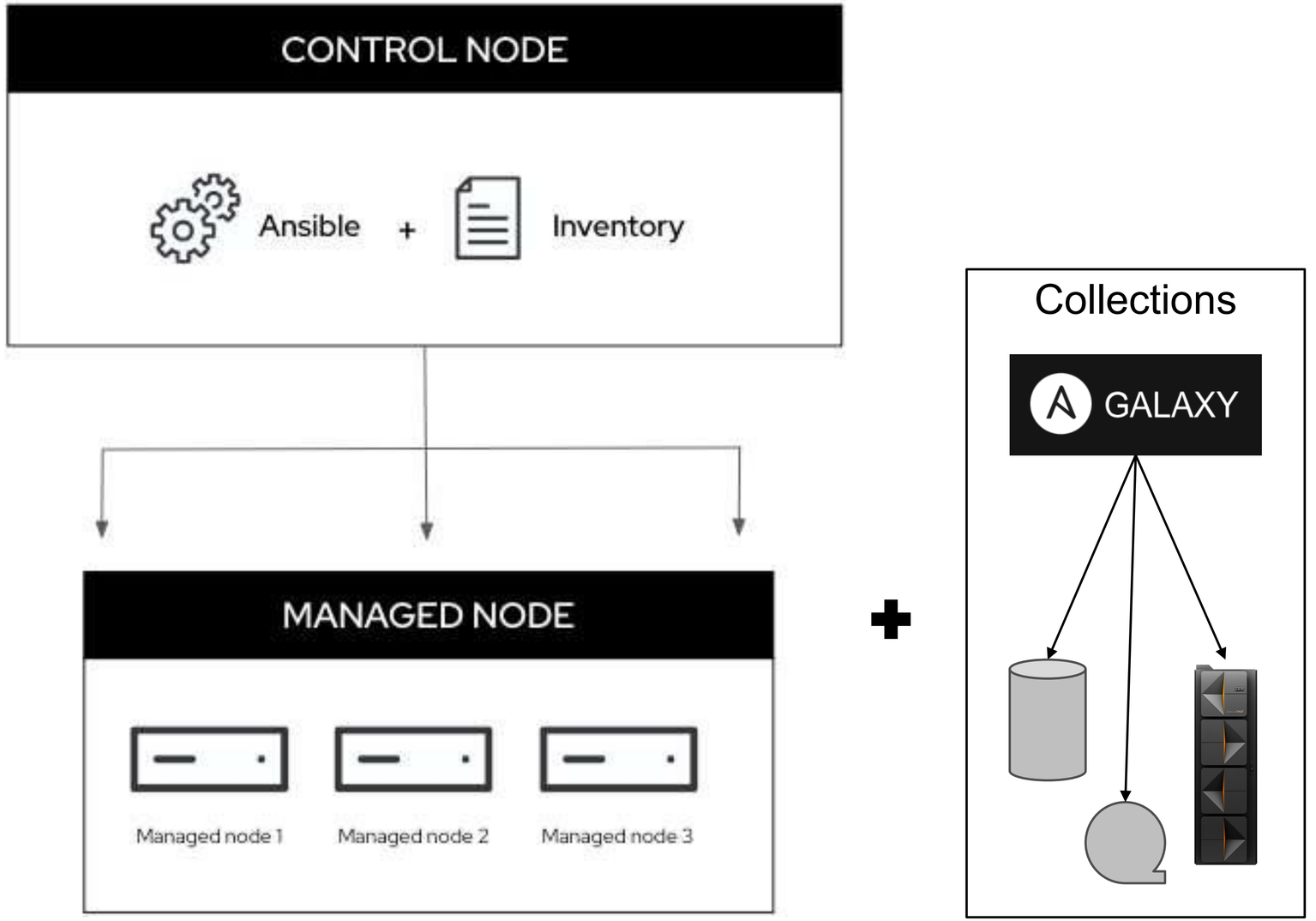
Powerful

Universal language spanning multiple IT domains

Agentless

Easily integrate with hybrid environments

Ansible Basics I



Ansible Basics II

```yaml
---
- name: Update web servers
  hosts: webservers
  remote_user: root

  tasks:
    - name: Ensure apache is at the latest version
      ansible.builtin.yum:
        name: httpd
        state: latest

    - name: Write the apache config file
      ansible.builtin.template:
        src: /srv/httpd.j2
        dest: /etc/httpd.conf

- name: Update db servers
  hosts: databases
  remote_user: root

  tasks:
    - name: Ensure postgresql is at the latest version
      ansible.builtin.yum:
        name: postgresql
        state: latest

    - name: Ensure that postgresql is started
      ansible.builtin.service:
        name: postgresql
        state: started
```

```yaml
ungrouped:
  hosts:
    mail.example.com:
webservers:
  hosts:
    foo.example.com:
    bar.example.com:
dbservers:
  hosts:
    one.example.com:
    two.example.com:
    three.example.com:
```

```
~$ ansible-playbook playbook.yml -i inventory.yaml
```

Red Hat

What is the value of the Ansible Automation Platform?



Speed

Reduce the number of manual steps and GUI-clicking, enable the orchestration of multiple tools and accelerate their interaction with each other

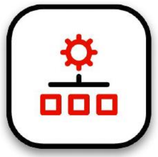
Reduce human error

Minimize risks with automated workflows, avoid human operator errors in time-sensitive, stressful situations

Consistency

Enable auditable and verifiable deployment processes by using a single tool and common language

One Subscription. One integrated platform.



Automation controller
Automation control plane



Automation execution environments
Scalable packaging and runtime execution plane



Automation mesh
Connectivity across diverse enterprise automation environments



NEW

Event-Driven Ansible
Automatic response to environment changes based on environment intelligence



`Ansible-builder`
Ansible containerized execution environment builder



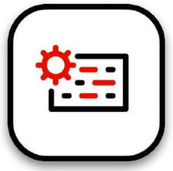
Automation analytics & Red Hat Insights
Visibility, predictive analytics, and more



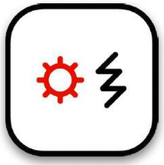
Ansible Content Collections
100+ certified content collections



Automation hub
Hosted certified content repository.



`Ansible-navigator`
Execution environment orchestration tooling



Ansible Platform Operator
Package, deploy and manage this platform on Red Hat OpenShift



Microsoft VS code plugin
Write and manage Ansible code with Visual Studio



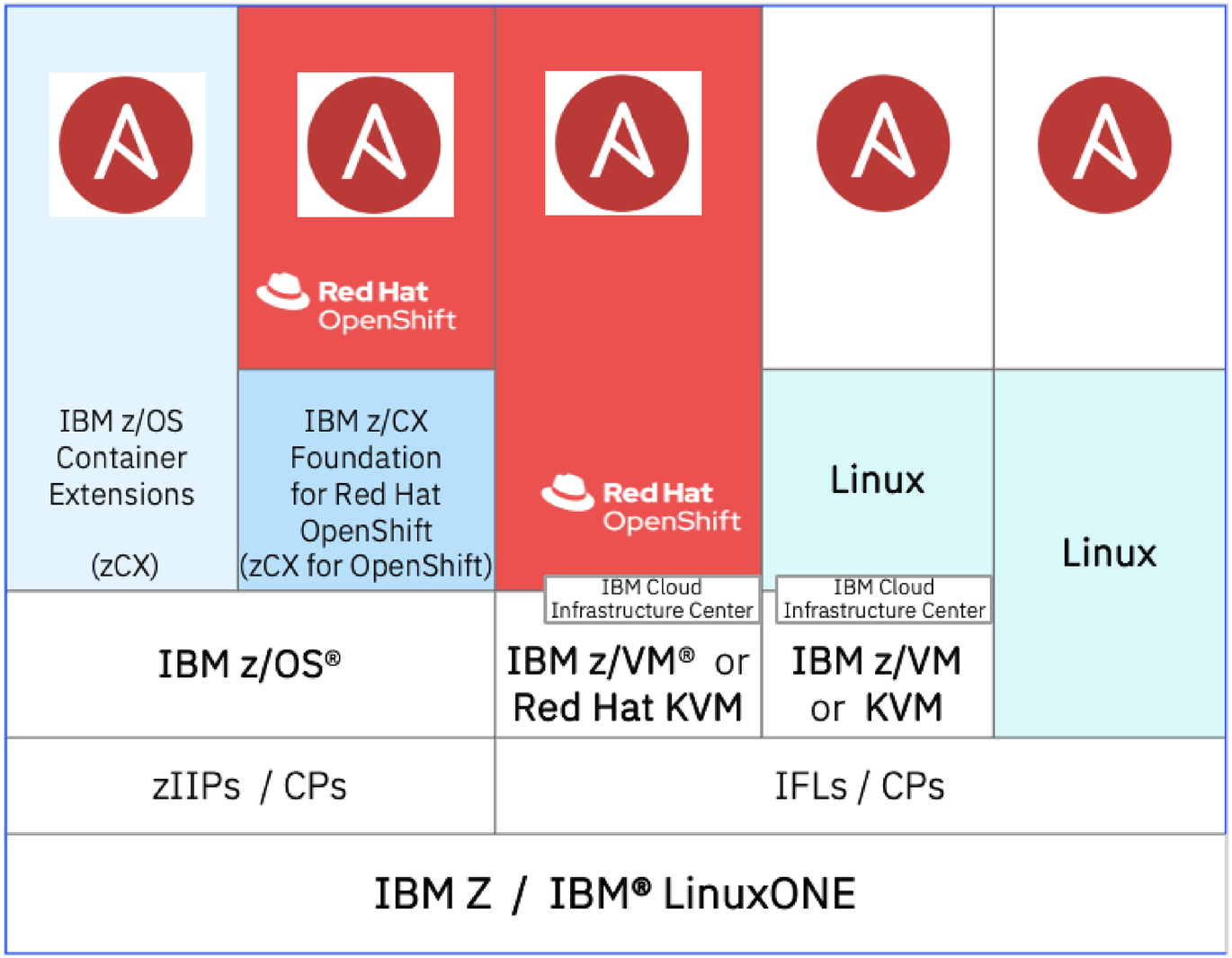
Red Hat
Ansible Automation Platform

Red Hat

Red Hat Ansible Automation Platform (AAP)

Deployment options on IBM Z / IBM LinuxONE

- Linux (native LPAR, z/VM, KVM, and/or ICIC)
- Red Hat OpenShift Container Platform
- IBM zCX Foundation for Red Hat OpenShift
- IBM z/OS Container Extensions (zCX)

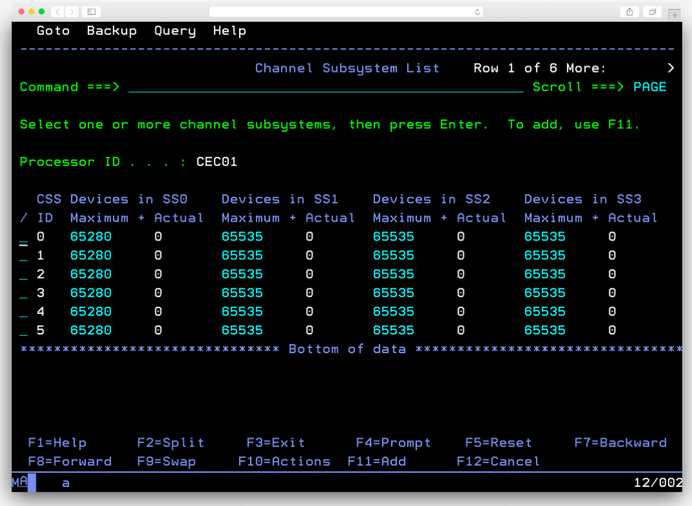


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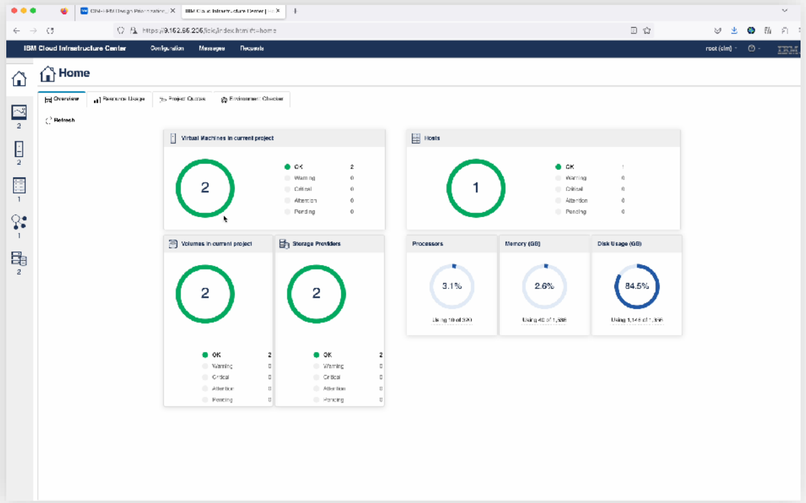
Infrastructure Management for Z and LinuxONE

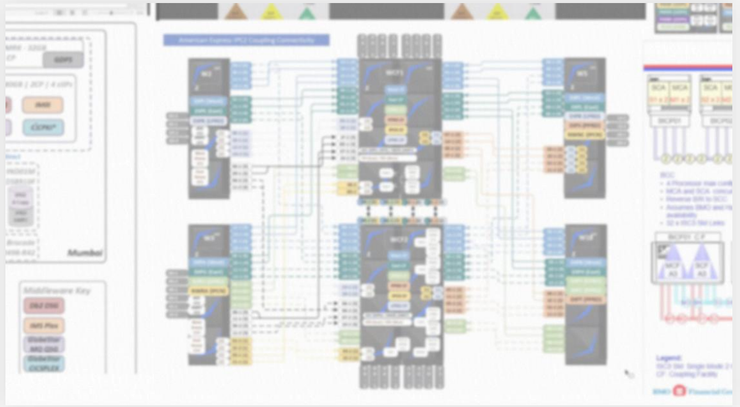


We are moving from this...

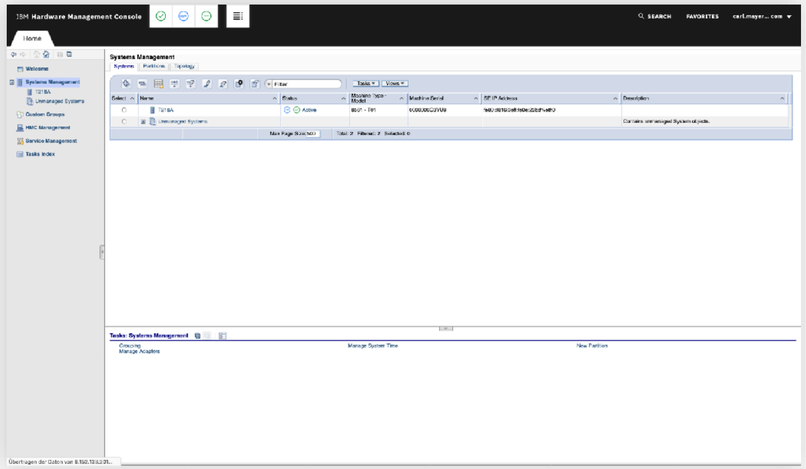


Hardware Configuration and Definition





Manual documentation and planning



Platform and workload management



Reporting and change-log

To this...

A unified, API-driven platform that centralizes configuration across compute and I/O resources, partition and virtual machine lifecycle management into a single, consistent control plane. This enables organizations to simplify operations, improve consistency, and accelerate automation across hybrid cloud environments.

Simplify. Automate. Scale.

→ Reducing complexity through a unified control plane and streamlined operations.

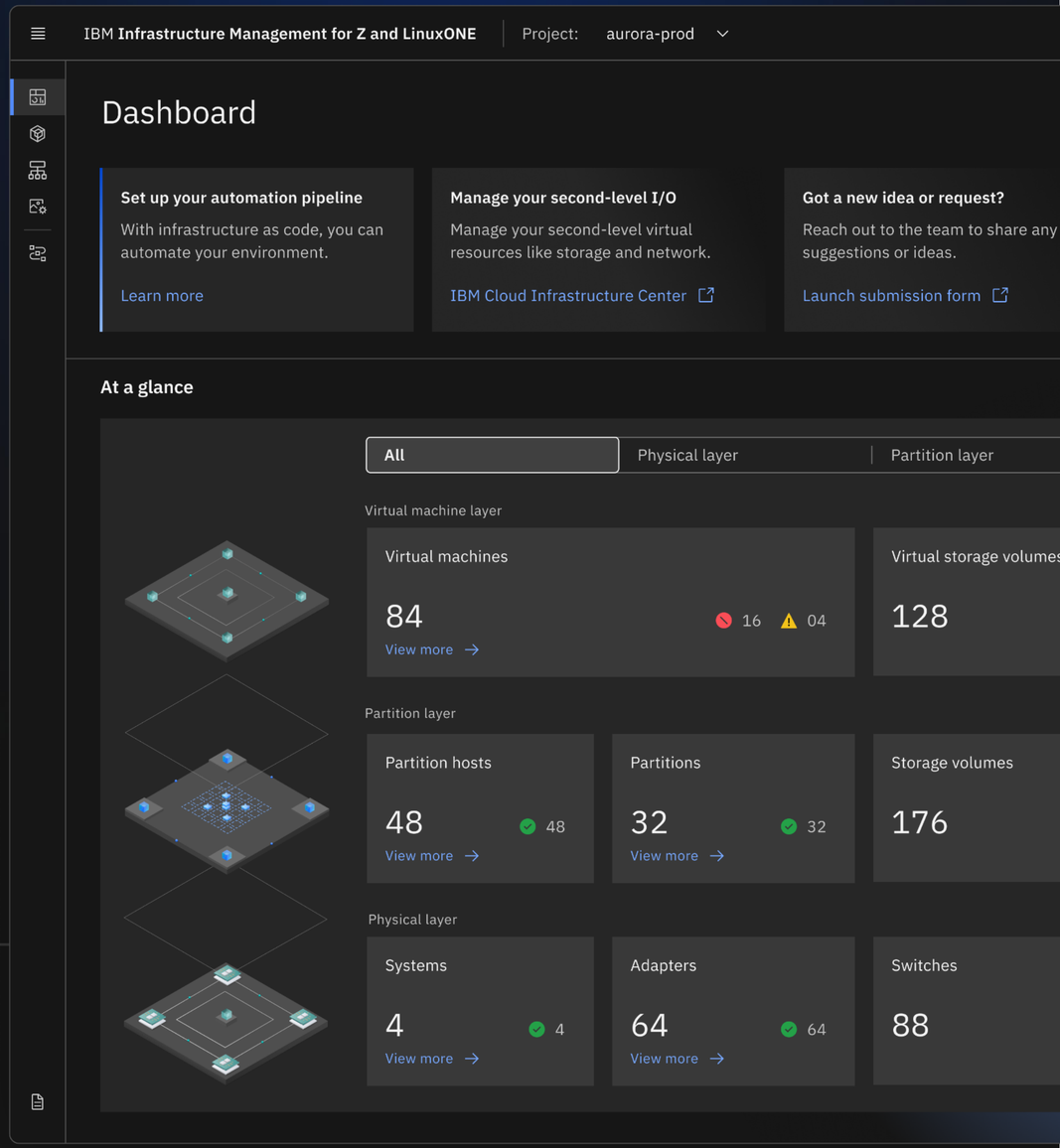
→ A single source of truth providing real-time system insights to the topology for storage and network resources

→ API-driven infrastructure management

→ Infrastructure-as-Code with IBM Terraform for Z and LinuxONE

→ Faster, more consistent operations through automation

→ AI-ready platform for future autonomous operations



One platform, three core capabilities

PILLAR 1

INFRASTRUCTURE AS CODE

- Manage partition, VMs, network, storage, crypto
- Ansible for Day 2 operations
- Same workflows as public cloud
- Terraform for IBM Z & LinuxONE (separately available)

PILLAR 2

I/O TOPOLOGY VISUALISATION

- Real-time end-to-end connectivity map
- Logical & physical view in one place
- Single source of truth - no spreadsheets
- Storage and network topology live

PILLAR 3

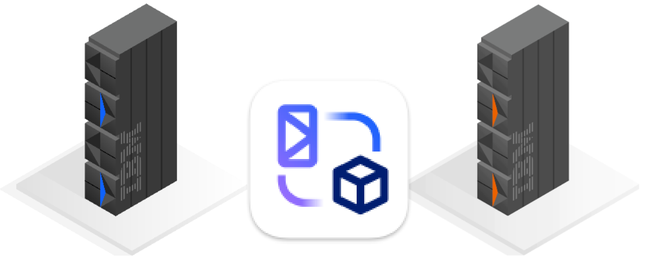
UNIFIED CONTROL PLANE

- ONE API + ONE UI across Z & LinuxONE
- Replaces IBM Cloud Infrastructure Center
- Partition + VM guest management
- Available since August 2026 as a non-separately charged offering, entitled via IBM ShopZ

Statement of general direction July 7th, 2026

Infrastructure Evolution for IBM Z and LinuxONE

https://www.ibm.com/docs/en/announcements/z17-single-frame-rack-mount-systems-expand-ai-security-operational-simplicity-enterprise-workloads?region=US



IBM | Documentation | Search IBM Documentation

Statement of general direction

New SODs

Infrastructure management evolution

IBM intends to deliver a unified platform management experience for configuration and control of IBM Z infrastructure through IBM Infrastructure Management for Z.

IBM intends for the next IBM Z system to be the final system to support the following capabilities:
- Hardware Configuration Definition (HCD) for hardware I/O configuration tasks
- Hardware Management Console (HMC) Classic mode
- Hardware Management Console (HMC) Dynamic Partition Manager (DPM) mode

IBM plans to converge HMC management capabilities into a single, unified operating mode. IBM Infrastructure Management is intended to serve as the strategic platform for infrastructure configuration and lifecycle management, providing a modernized and consistent management experience across IBM Z environments. As part of this direction, IBM plans to withdraw IBM Cloud Infrastructure Center following the availability of IBM Infrastructure Management. IBM Cloud Infrastructure Center capabilities are being incorporated into IBM Infrastructure Management, reflecting a consolidation of functionality. IBM plans to provide guidance to support a transition while retaining existing configurations.

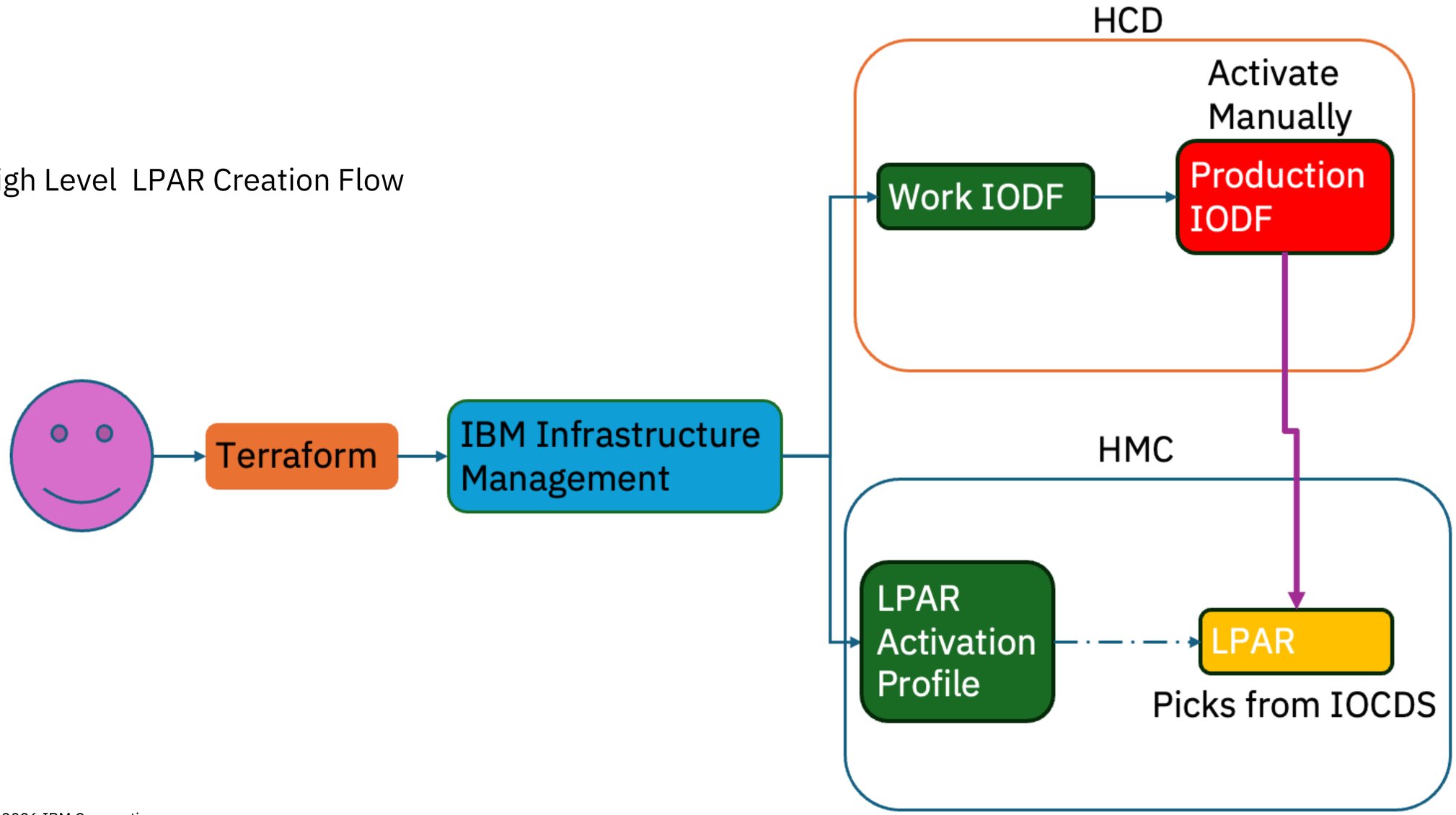
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Enable Create/Delete Partition

Re-engineering LPAR creation

High Level LPAR Creation Flow



I/ O Topology

Visual Representation

Solution

A visual topology representation across network and storage, covering both logical and physical end-to-end connectivity. Deliver real-time system insights to validate changes quickly and confidently. Eliminate manual documentation and maintenance through automated, accurate, and continuously updated views.



Key value for customers

Intuitive UI → simplifies interaction and integration with existing workflows

Optimized resource utilization → improves efficiency through visibility

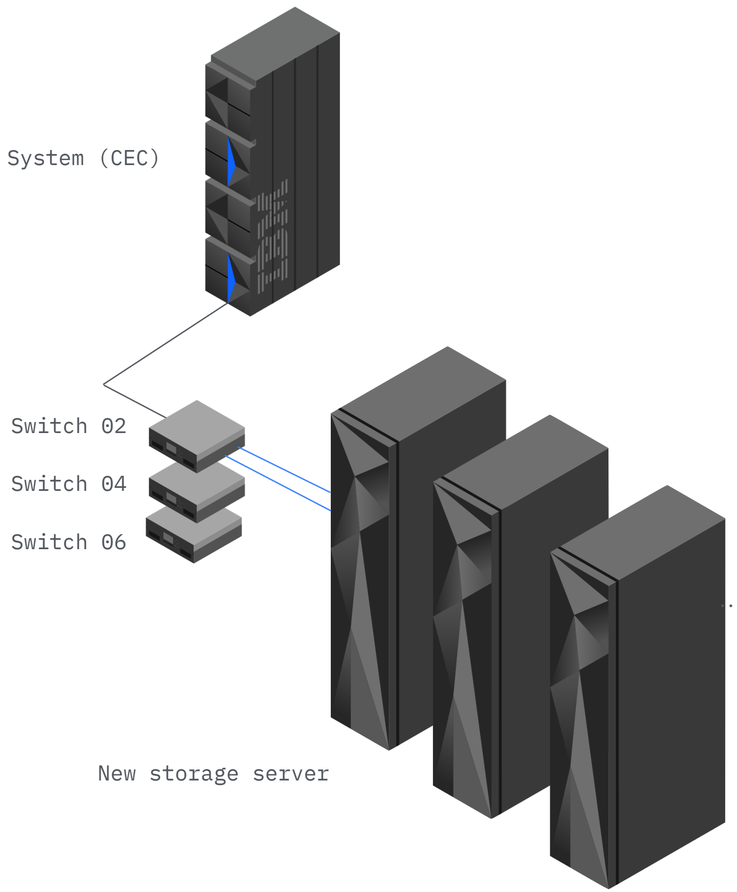
Single source of truth → reduces inconsistencies and minimizes manual errors

Real-time system insights → enables faster, more informed decision-making

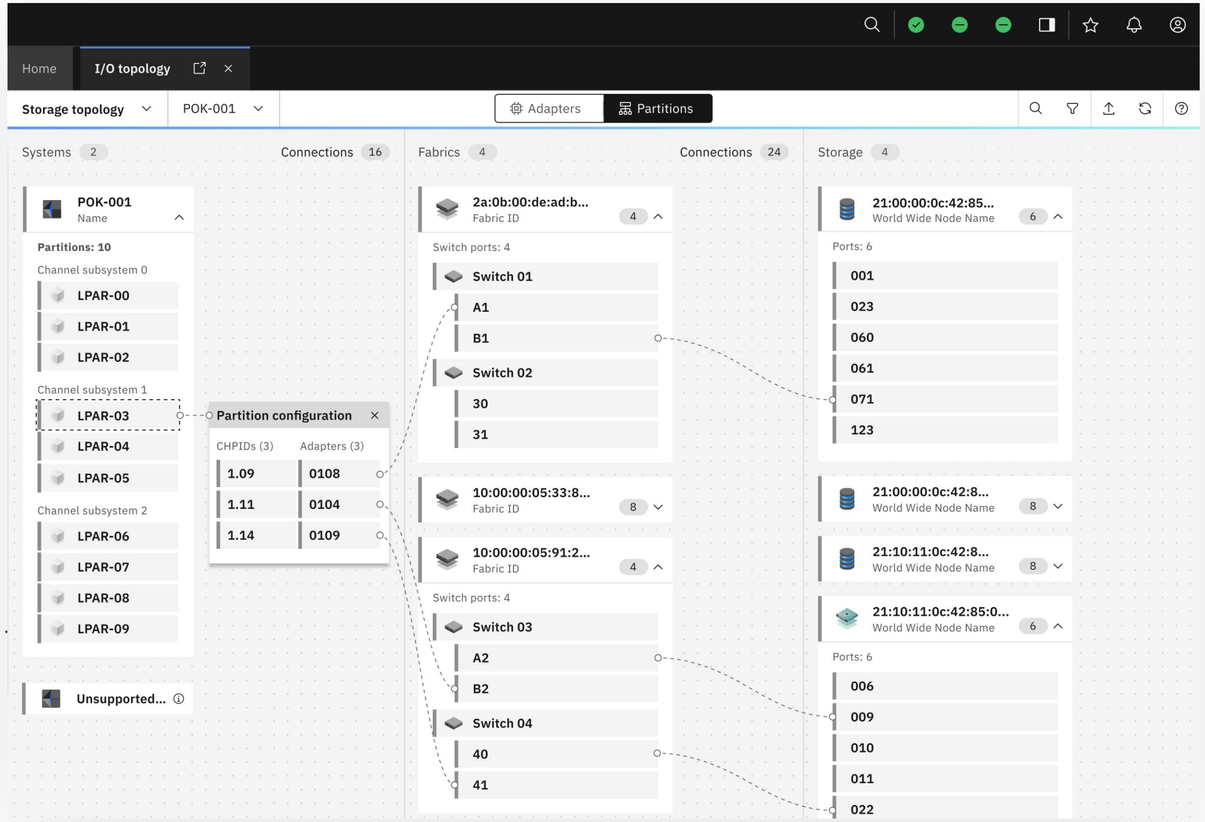
Reduced manual effort → eliminates manual documentation and lowers operational overhead

Note: Sourced through IODF and adapter real-time sensing

Sensing of existing environments to provide visualization of I/O Topology



Sensing...



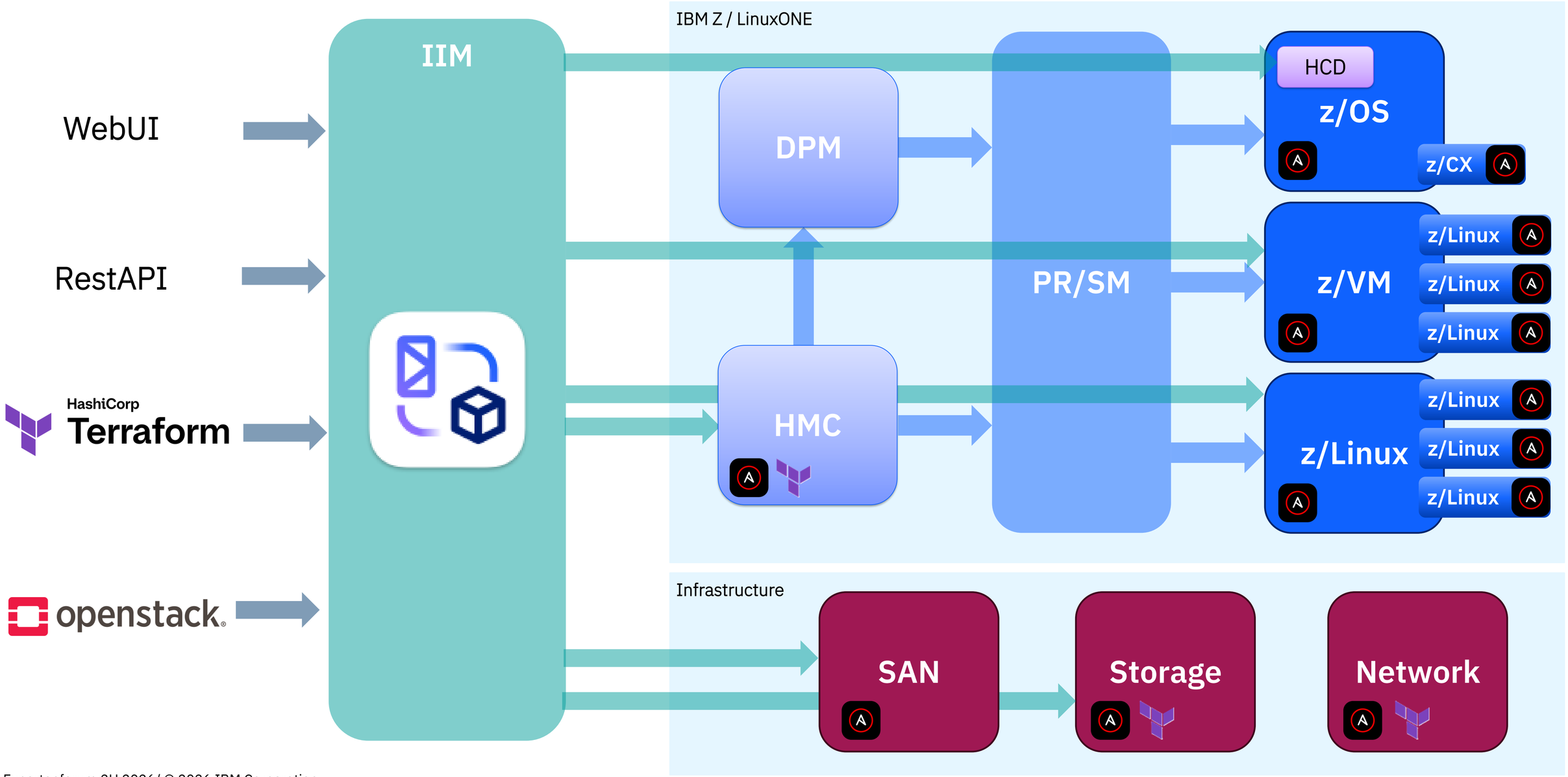
Note: Sourced through IODF and adapter real-time sensing

Bringing all together

HashiCorp Terraform



Which Tool should I use?



BUT Which tool shoul I use?

DAY 0

Infrastructure

Initial definition and provisioning

Users: Platform engineering, Cloud/IT Ops, SRE, and CIO/CTO

- Use efficient products for agile infrastructure processes/workflows that are responsive to the needs of the business
- Manage cloud costs
- Self-service availability with built-in security and compliance

DAY 1

Configuration

Application configurations and tuning

Users: AppDev teams, platform engineering, IT Ops, and CIO/CTO

- Increase consistency and reduce human error
- Self-service access to increase business agility

DAY 2

Operational

Ongoing management activities

Users: IT Ops, SRE, AppDev teams, and CIO/CTO

- Improved service availability and reduced outage
- Self-service access to improve security and compliance

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Red Hat Ansible Certified Content for IBM Z: Collections

Available on Ansible Galaxy here and on Automation Hub			
IBM z/OS® Core		ibm_zos_core Provided by ibm 23 Modules 0 Roles 26 Plugins 0 Dependencies mvs z data_set 9 more	308,000 Downloads
IBM z/OS® CICS®		ibm_zos_cics Provided by ibm 15 Modules 0 Roles 35 Plugins 0 Dependencies z zos cics 4 more	19,000 Downloads
IBM z/OS IMS™		ibm_zos_ims Provided by ibm 8 Modules 0 Roles 9 Plugins 1 Dependency mvs zos_ims z 11 more	50,000 Downloads
IBM z/OSMF		ibm_zosmf Provided by ibm 3 Modules 13 Roles 4 Plugins 0 Dependencies mvs liberty_provisioning_template z	6,000 Downloads
IBM Z® Hardware Management Console		ibm_zhmc Provided by ibm 28 Modules 0 Roles 1 Plugin 0 Dependencies z hmc ibm 2 more	100,800 Downloads
IBM zSystem Automation		ibm_zos_sysauto Provided by ibm 0 Modules 2 Roles 0 Plugins 0 Dependencies z zos ibm 6 more	3,700 Downloads

Collectively

- 77 Modules
- 15 Roles