RED HAT CONSULTING SOLUTION:
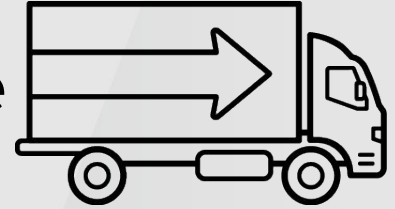A holistic approach to advanced cloud migration

More Than Just Moving VMs

Bill Helgeson – Principal Domain Architect - Cloud
Global Emerging Technologies

Lan Chen – Service Delivery Manager
Red Hat Consulting North America

The Challenge

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Implementing an Infrastructure Change

Success Requires…

1. **Building a new platform**

2. Discovering needed workload requirements as it relates to the new platform.

3. New **platform** Management needs. How are you going to manage the new requirements and processes?

4. A well-designed infrastructure **well managed** is the **goal**: security, governance, reporting, self service, planning, remediation.

5. Enabling the **people and process** to effectively manage change

How Complex can it be ?

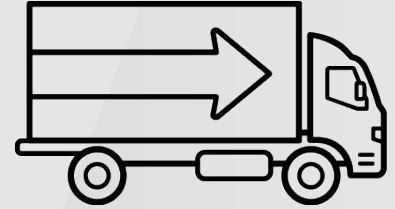redhat.

MORE THAN JUST MOVING VMs

Migration Success Requires...
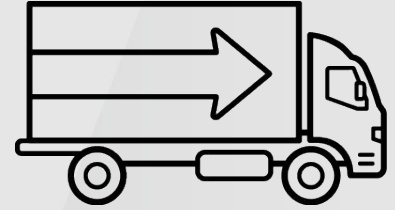
1. **Understanding current and future-state architecture**, even when current-state is not fully documented

2. Mapping **applications** to migration and modernization patterns

3. A **platform** to orchestrate the migration, preserving VM relationships and application ordering

4. A well-designed **infrastructure**, capable of processing the effort at scale

5. Enabling the **people and process** to effectively manage change

Apply the portfolio to the challenge

Red Hat Infrastructure and Management Portfolio

Infrastructure - Red Hat Virtualization, Red Hat Openstack, Red Hat Insights

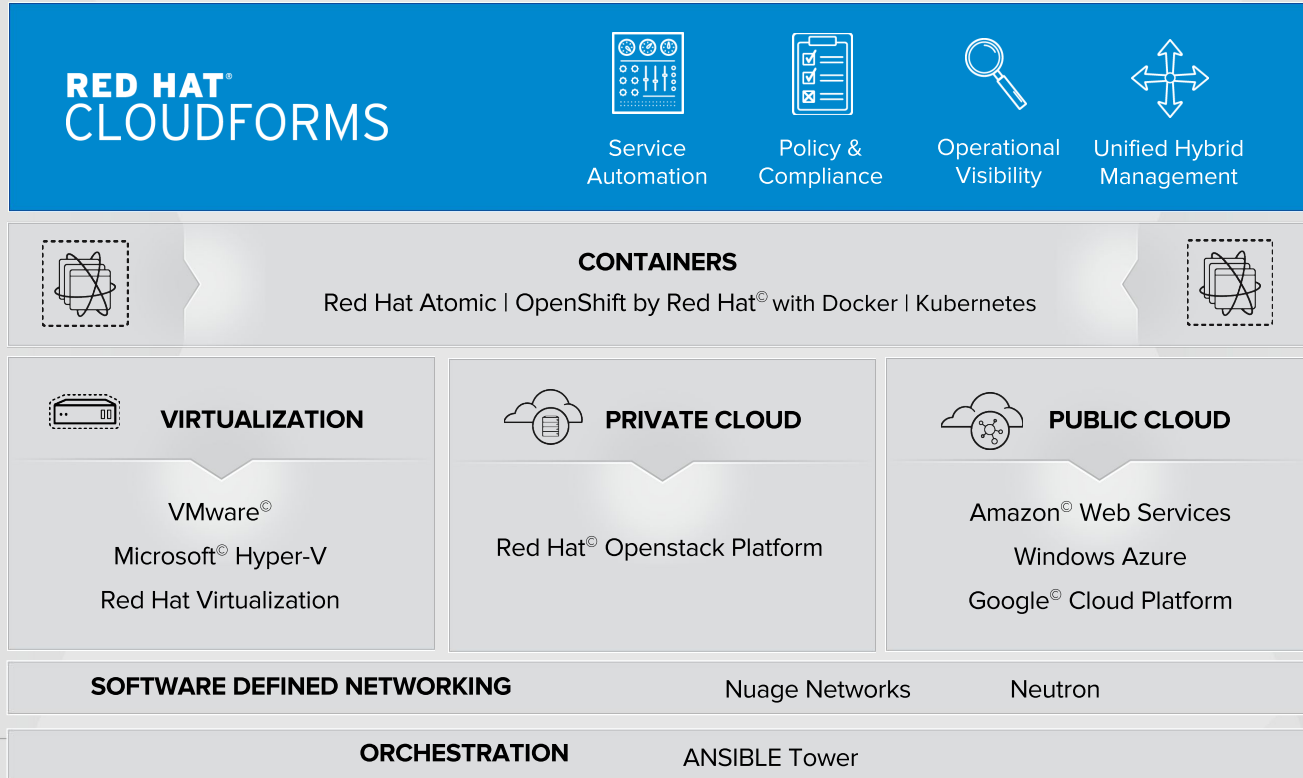**Management Portfolio - Cloudforms, Ansible Tower, Red Hat Satellite**

Cloudforms - Cloud Management Platform and Orchestration

Ansible Tower - Configuration Management and Automation

Red Hat Satellite - RHEL licensing and configuration management

Achieving a managed infrastructure using Cloudforms and Ansible

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AN EVOLUTIONARY PATH TO HYBRID CLOUD

RED HAT®
CLOUDFORMS

Service Automation

Policy & Compliance

Operational Visibility

Unified Hybrid Management

CONTAINERS
Red Hat Atomic | OpenShift by Red Hat© with Docker | Kubernetes

VIRTUALIZATION

VMware©

Microsoft© Hyper-V

Red Hat Virtualization

PRIVATE CLOUD

Red Hat© Openstack Platform

PUBLIC CLOUD

Amazon© Web Services

Windows Azure

Google© Cloud Platform

SOFTWARE DEFINED NETWORKING   Nuage Networks   Neutron

ORCHESTRATION   ANSIBLE Tower

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CloudForms is an Advanced Cloud Management Platform & Automation Engine designed for managing Private/Public clouds for multi-regional deployments
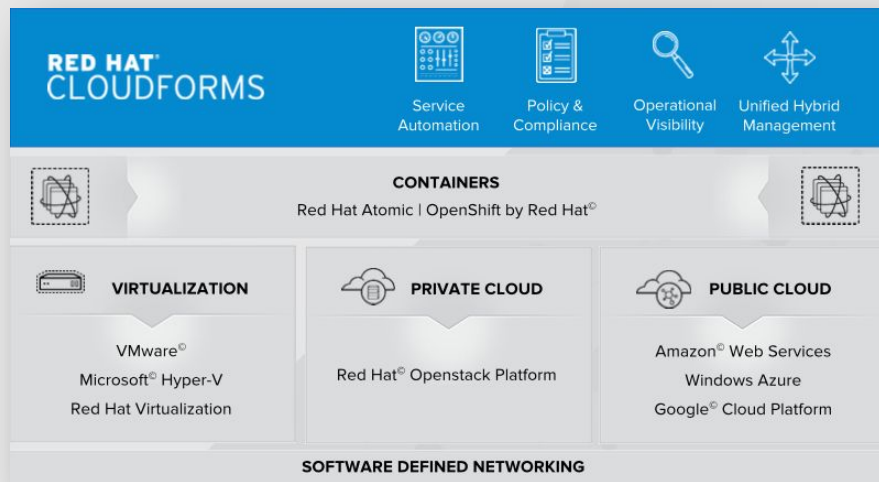
Key Cloud Management Benefits:

✓ **Service Automation** – Streamline complex service delivery processes for workloads with application business logic

✓ **Operational Visibility** – Complete lifecycle and operational management across Clouds for both IaaS & PaaS silos

✓ **Policy & Compliance** – Draws on continuous monitoring and deep insights to raise alerts and remediate issues

✓ **Unified Management** – Reduce VM & Container sprawl across Private & Public Clouds in a federated ecosystem
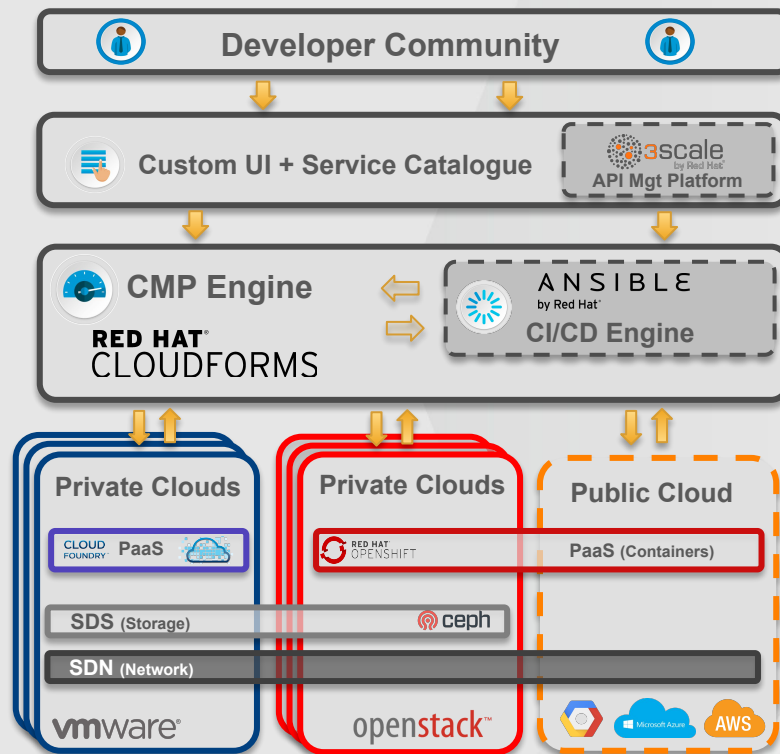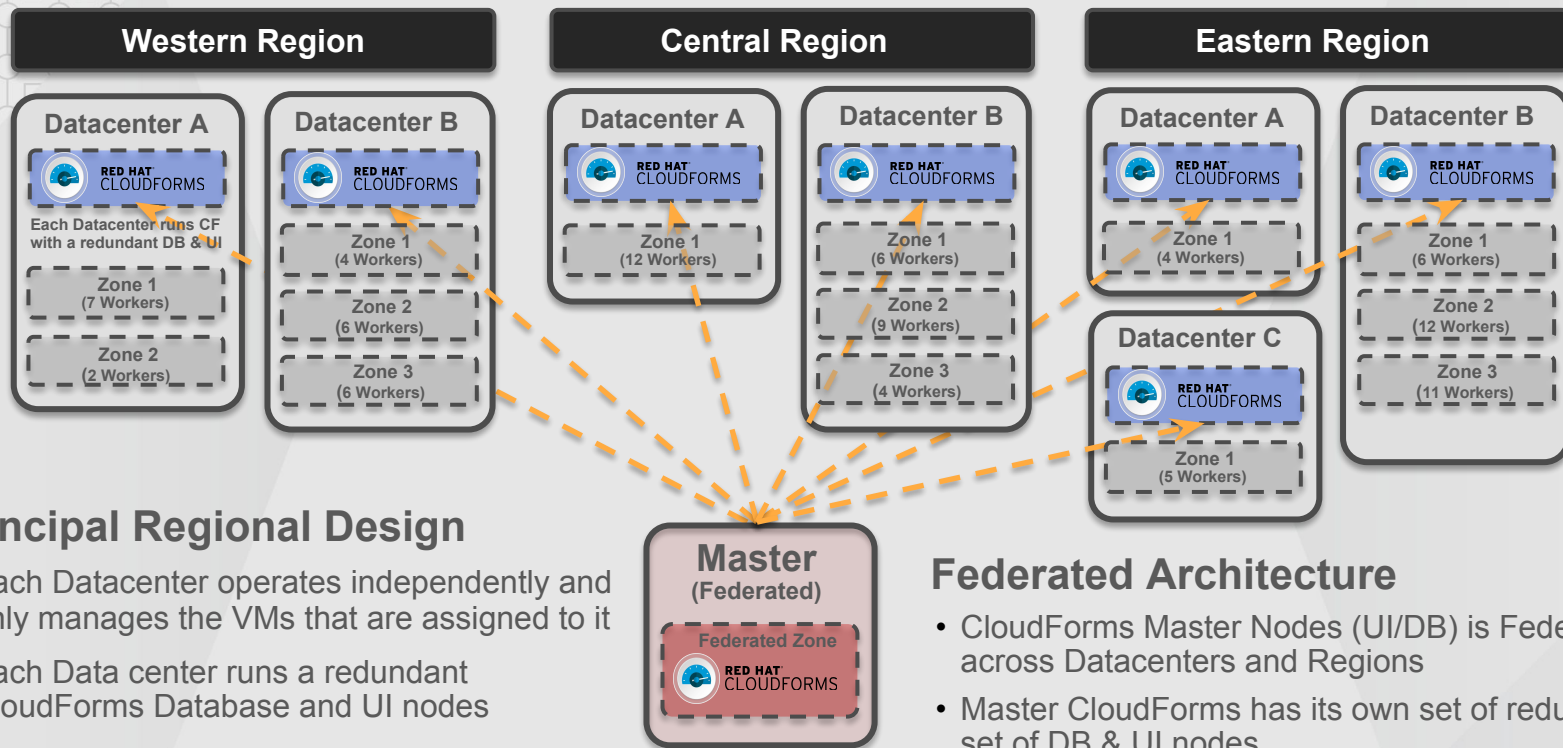
WHY CLOUDFORMS IS A PERFECT MATCH FOR MOST ORGs

- **Agentless** – Built to support hyperscale deployments (>100K) in a Federated regional deployments

- **100% Open Source** – based on ManageIQ Open Source Project; Google 2nd largest contributor

- **Proven Track Record** – Runs the largest Financial sector & Telco cloud environments

- **Supports Everything** – Supports all major VMs, Physical and Virtual; Top 3 Public Clouds (AWS, Azure, Google)

- **Containers & Kubernetes –** Ability to manage Containers natively with complete insight into Kubernetes

- **Deploys Fast, Virtually + Auto-Discovers Assets Continuously –** continuously discovering assets that are added or deleted in the cloud environment

- **Strong Automation & Governance Engine –** Tags everything, manages migration and integrates easily in existing CI/CD tool chain **with** role-based access control, multi tenancy, identity integration for LDAP; SCAP and STIG hardened

- **Integrates Simply in Existing Management Framework** – Protect your investment, CLOUDFORMS contains a full reporting engine that can be used to report on any data that is available and/or can integrate easily (API) into existing reporting and services framework

RED HAT® CLOUDFORMS

Service Automation | Policy & Compliance | Operational Visibility | Unified Hybrid Management

CONTAINERS
Red Hat Atomic | OpenShift by Red Hat©

VIRTUALIZATION
VMware©
Microsoft© Hyper-V
Red Hat Virtualization

PRIVATE CLOUD
Red Hat© Openstack Platform

PUBLIC CLOUD
Amazon© Web Services
Windows Azure
Google© Cloud Platform

SOFTWARE DEFINED NETWORKING

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CLOUDFORMS – FEDERATED DEPLOYMENT

Western Region

Datacenter A

RED HAT CLOUDFORMS

Each Datacenter runs CF with a redundant DB & UI

Zone 1 (7 Workers)

Zone 2 (2 Workers)

Datacenter B

RED HAT CLOUDFORMS

Zone 1 (4 Workers)

Zone 2 (6 Workers)

Zone 3 (6 Workers)

Central Region

Datacenter A

RED HAT CLOUDFORMS

Zone 1 (12 Workers)

Datacenter B

RED HAT CLOUDFORMS

Zone 1 (6 Workers)

Zone 2 (9 Workers)

Zone 3 (4 Workers)

Eastern Region

Datacenter A

RED HAT CLOUDFORMS

Zone 1 (4 Workers)

Datacenter C

RED HAT CLOUDFORMS

Zone 1 (5 Workers)

Datacenter B

RED HAT CLOUDFORMS

Zone 1 (6 Workers)

Zone 2 (12 Workers)

Zone 3 (11 Workers)

Master (Federated)

Federated Zone

RED HAT CLOUDFORMS

Principal Regional Design

- Each Datacenter operates independently and only manages the VMs that are assigned to it

- Each Data center runs a redundant CloudForms Database and UI nodes

- Datacenters with multi-zones share CloudForms DB and UI nodes

Federated Architecture

- CloudForms Master Nodes (UI/DB) is Federated across Datacenters and Regions

- Master CloudForms has its own set of redundant set of DB & UI nodes

- Master CloudForms Nodes provides centralized reporting

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WHAT CLOUDFORMS CAN DELIVER FOR YOU
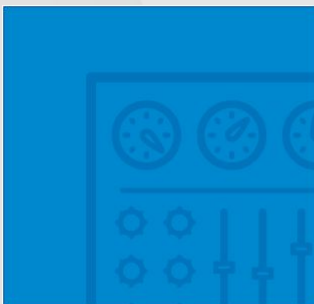
SERVICE AUTOMATION

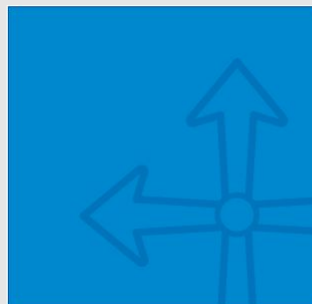Streamline complex service delivery processes, saving time and money.
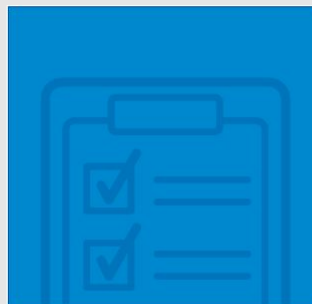
POLICY & COMPLIANCE

Draws on continuous monitoring and deep insights to raise alerts or remediate issues.

OPERATIONAL VISIBILITY

Complete lifecycle and operational management that allows IT to remain in control.

UNIFIED HYBRID MANAGEMENT

Deploy across virtualization, private cloud, public cloud and container-based environments.

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CLOUDFORM DESIGN POINTS

MULTI-CLOUD AGILITY

FREEDOM OF CHOICE

SINGLE PRODUCT, SINGLE CODE

EASY TO DEPLOY AND OPERATE

PRACTICAL, OPERATIONAL SECURITY

SEGMENT USER ACCESS AND DRIVE COMPLIANCE, CONTROL AND REPORTING

INTEGRATE VS. REPLACE
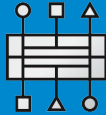
VALUE TODAY AND AUTOMATE FOR TOMORROW

MANAGE DIVERSE WORKLOADS

MODE 1, MODE 2, MODE N

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CLOUDFORMS FEATURES

AGENTLESS, VIRTUAL APPLIANCE

NON-INVASIVE, EASY MAINTENANCE

WEB-BASED, SELF-SERVICE, ADMIN AND OPERATIONS

ACCESS FROM ANY BROWSER

MULTI-TENANT AND MULTI-LOCATION

SECURELY SHARE INFRASTRUCTURE

PLUGABLE API FRAMEWORK
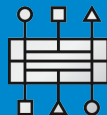
EASY TO INTEGRATE AND EXTENSIBLE TO OTHER PLATFORMS

HORIZONTALLY SCALABLE, LOAD-BALANCED
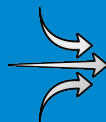
HIGHLY SCALABLE, HIGHLY AVAILABLE WITH FAILOVER AND FALLBACK

ROLE-BASED ACCESS CONTROL AND ENTITY TAGGING

SEGMENT USER ACCESS AND DRIVE COMPLIANCE, CONTROL AND REPORTING

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ANSIBLE TOWER by Red Hat®

TOWER EMPOWERS TEAMS TO AUTOMATE

CONTROL
Scheduled and centralized jobs

KNOWLEDGE
Visibility and compliance

DELEGATION
Role-based access and self-service

SIMPLE
Everyone speaks the same language

POWERFUL
Designed for multi-tier deployments

AGENTLESS
Predictable, reliable, and secure

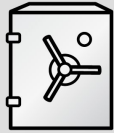AT ANSIBLE'S CORE IS AN **OPEN-SOURCE** AUTOMATION ENGINE

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Now that are managed, let's leverage the CMP to migrate the old to the new – CloudForms Migration Solution

redhat.

RED HAT CONSULTING: CLOUD MIGRATIONS

Radically simplify the process of migrating workloads from legacy platforms to build out a robust, flexible cloud computing infrastructure to reduce operational costs and provide better agility to stakeholders. Red Hat Consulting helps you:
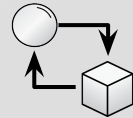
| Eliminate vendor dependency | Mitigate risk | Reduce TCO | Accelerate provisioning | Deliver services faster | Streamline processes | Migrate Workloads |

RED HAT CONSULTING: CLOUD MIGRATIONS

DISCOVERY SESSION
Review and capture infrastructure requirements, processes, workload, and environment details as it pertains to developing a cloud migration strategy.

WORKSHOPS
Provide a target-state architecture for a Cloud Migration Solution based on Red Hat products with an implementation roadmap identifying levels of effort and timelines for organizational adoption.

IMPLEMENTATION
Deploy the target architecture to the client environment(s). Develop, test, and deploy automated workload migration. Operationalize cloud management and mentor client organization.

CLOUD MIGRATION PHILOSOPHY

Successful Migrations Require a Holistic Approach
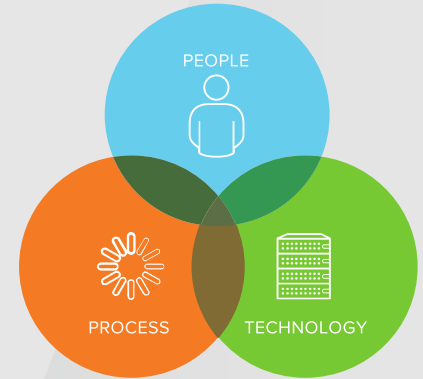
- **People**
  - Drive collaboration across the organization
  - Put the right people in position to create positive change
  - Apply mentoring throughout to enable internal capabilities
- **Process**
  - Engage a repeatable 'migration factory' approach to iterate through workloads
  - Establish a continuous improvement atmosphere to evolve across iterations
- **Technology**
  - Unique migration tooling/templates help organize, automate, and orchestrate
  - Open-source solutions maximize cost savings and eliminate lock-in

THE PEOPLE

Building the Partnership

- Successful migrations require the engagement of the right people
  - **Business Owner:** Align the migration goals with the business strategy
  - **Architect:** Design an architecture that moves the business forward
  - **Operations:** Address the long-term success of the solution
  - **Development:** Enhance the developer experience
  - **Testing:** Streamline the migration validation process
  - **Security/Compliance:** Comply with business policies and standards
  - **User:** Understand and address the end-user experience
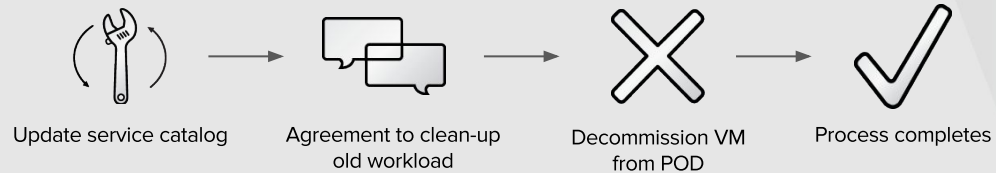
THE PROCESS

Cloud Migration in Action

Pre-Migration
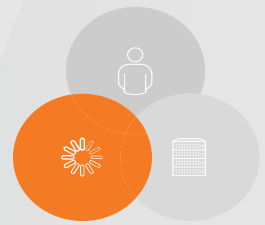
Team identifies and groups migration workloads → Application owner creates validation plan → Create network and check quota on POA → vMotion VMs to NFS storage → Tag VMs for migration

Migration Day

Stop VMs → Submit request to migrate selected group → Migration state machine converts workload to new platform → Post-migration configuration & application startup → Application owner validates and approves migration

Post-Migration

Update service catalog → Agreement to clean-up old workload → Decommission VM from POD → Process completes
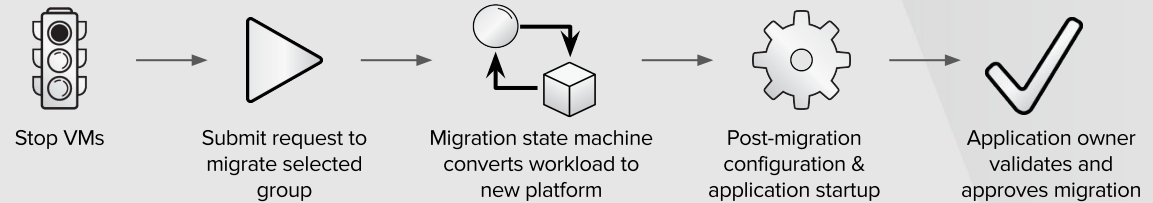
THE TECHNOLOGY

Powered by Red Hat Cloud Infrastructure

- Host workloads in Red Hat Enterprise Virtualization and/or OpenStack and Amazon Web Services

- Manage, automate, and orchestrate with Red Hat CloudForms and Ansible
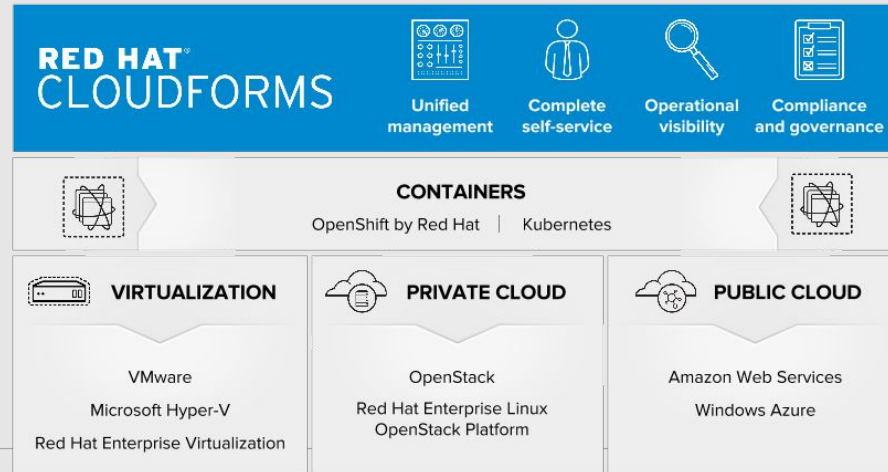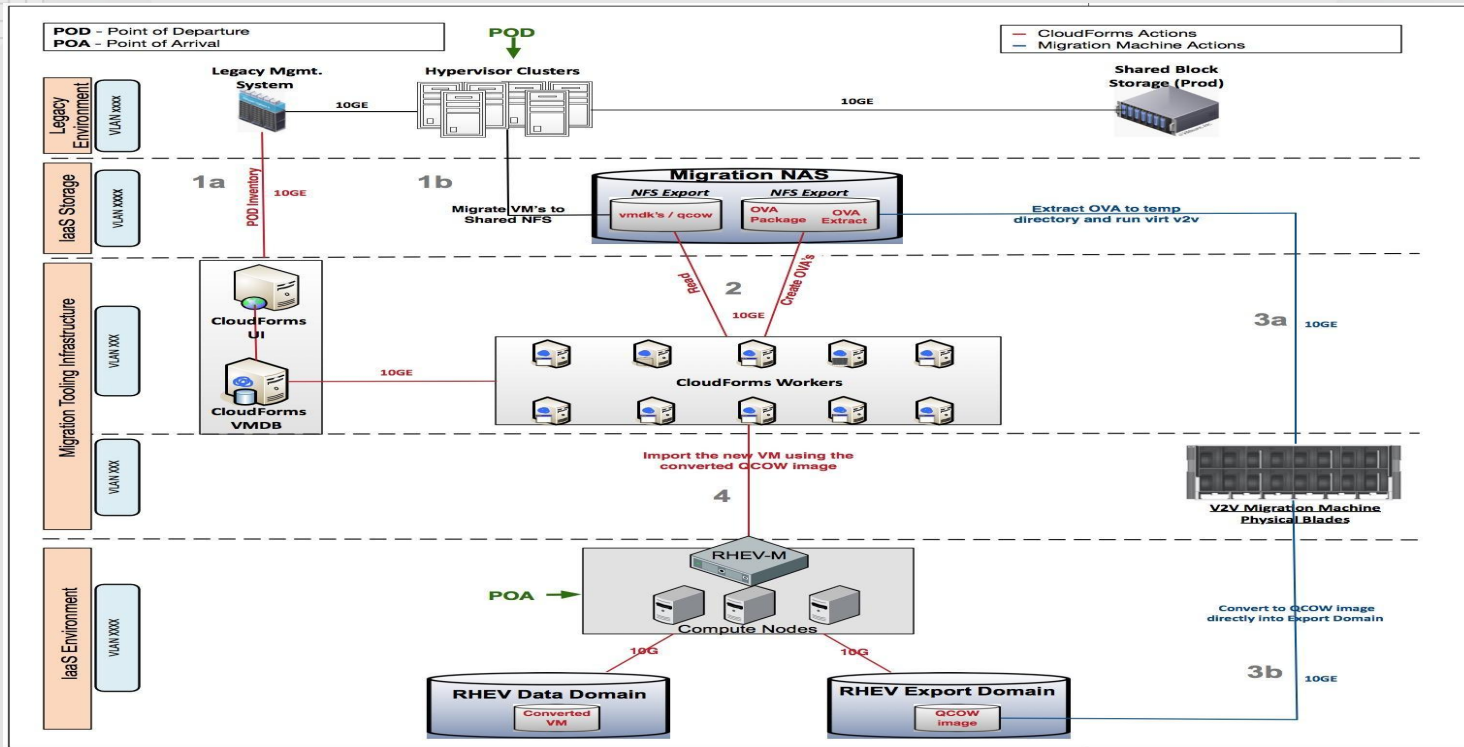
THE TECHNOLOGY

Executing the Migration

- Configure **state machine templates** to orchestrate the migration
  - Create repeatable migration paths, error handling, and rollback paths, to ensure migrations are managed uniformly
  - Define a migration window to ensure VM ordering and dependencies are properly managed
- Implement **push-button self-service** catalogs to perform migrations
  - Migrations can be automated at the push of a button, and parallelized, leveraging state machine workflows
- **Monitor** the migration process in real-time
  - Report predictable outcomes to stakeholders
  - Validate migration and notify owners

Example architecture/data flow - POA Openstack
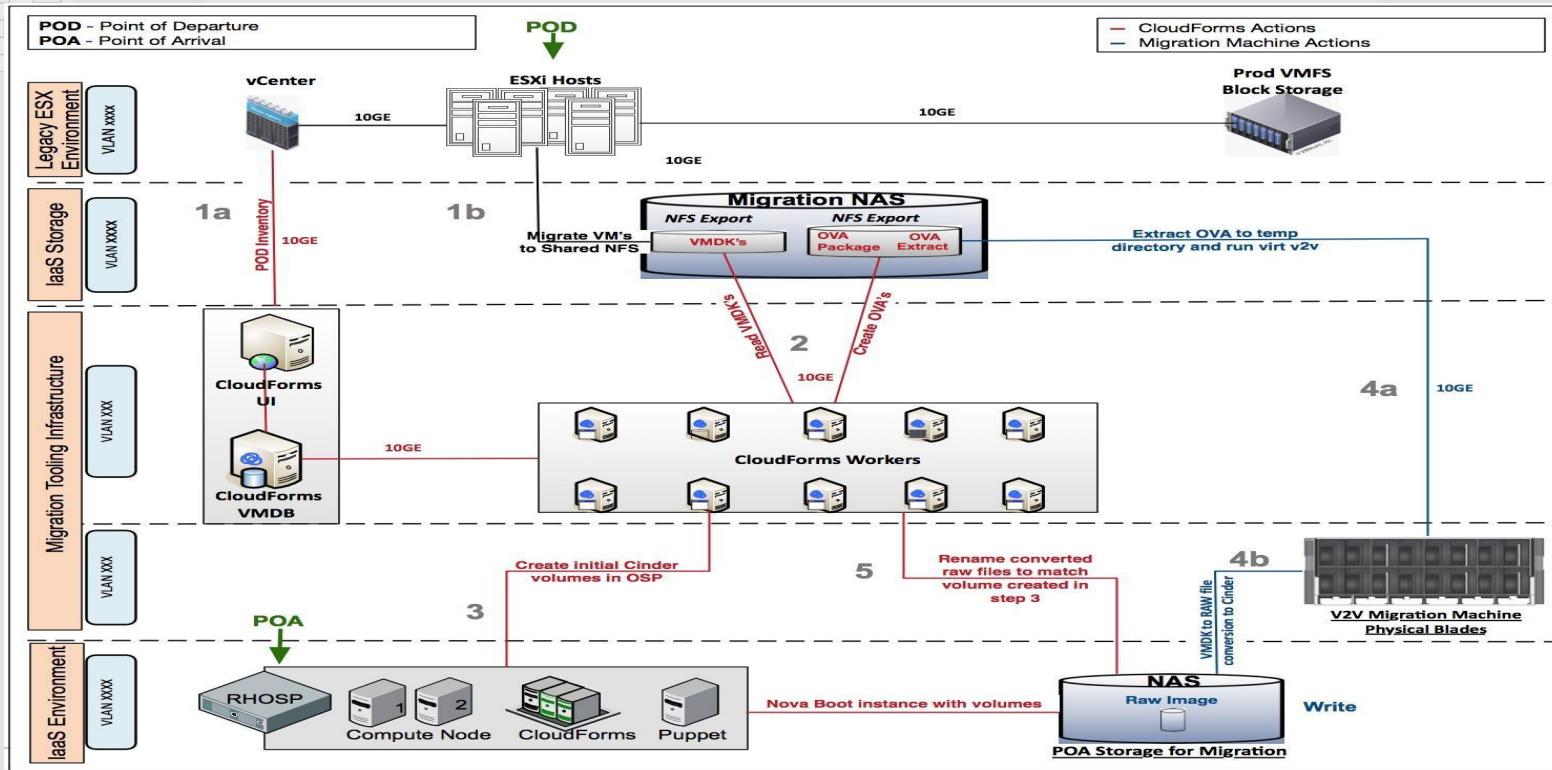
Example architecture/data flow - POA RHEV

Migration Demonstration

# The Way Forward with Red Hat Consulting

RED HAT CONSULTING

What We Do

- Bring **subject matter expertise** around open source and Red Hat products and technologies into your organization
- Establish industry standards and **best practices** within your organization to improve process efficiencies and productivity
- **Mentor your staff** on Red Hat technologies and relevant concepts
- **Mitigate product and open source adoption risks** during enterprise migrations, modernization, and cutting-edge initiatives
- Get **direct access** to Red Hat business units and roadmaps

RED HAT SOLUTION DELIVERY FRAMEWORK
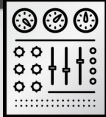
How We Deliver Value
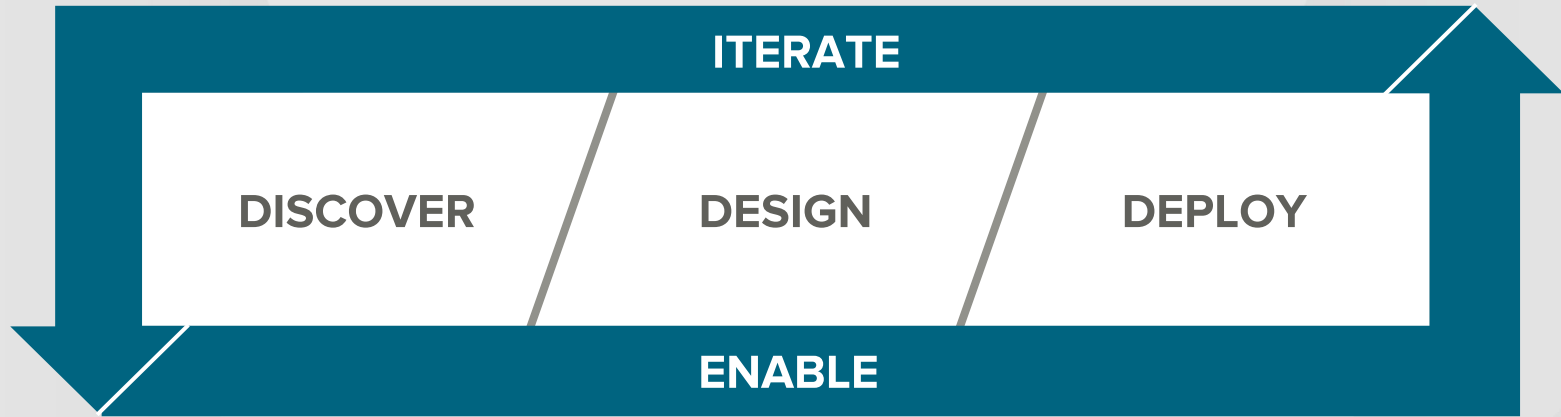
THE BIG PICTURE

A Reference Implementation - Future Iterations

Iteration 1 Design and Pilot		Iteration 2 Enhance and Deploy	Future Iteration(s) Migrate and Operationalize
Discovery session	Target environment infrastructure	Workload analysis and preparation	Environment and tooling updates
Design workshop	Migration tooling infrastructure		Standard Operating Procedures
Workload analysis	Migration factory state machines	Environment and tooling updates	Migrate additional workloads
Target architecture	**Migrate and Validate**	Migrate first workload group	**Mentoring and Knowledge**
		Pilot Go Live	**Transfer**
Discover / Design	**Deploy**	**Discover / Design / Deploy**	**Discover / Design / Deploy**

RED HAT SUMMIT

LEARN. NETWORK.
EXPERIENCE
OPEN SOURCE.

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