



Red Hat Ansible Automation Platform for VMware

**A distinct guide for making the best
choices on your automation journey**

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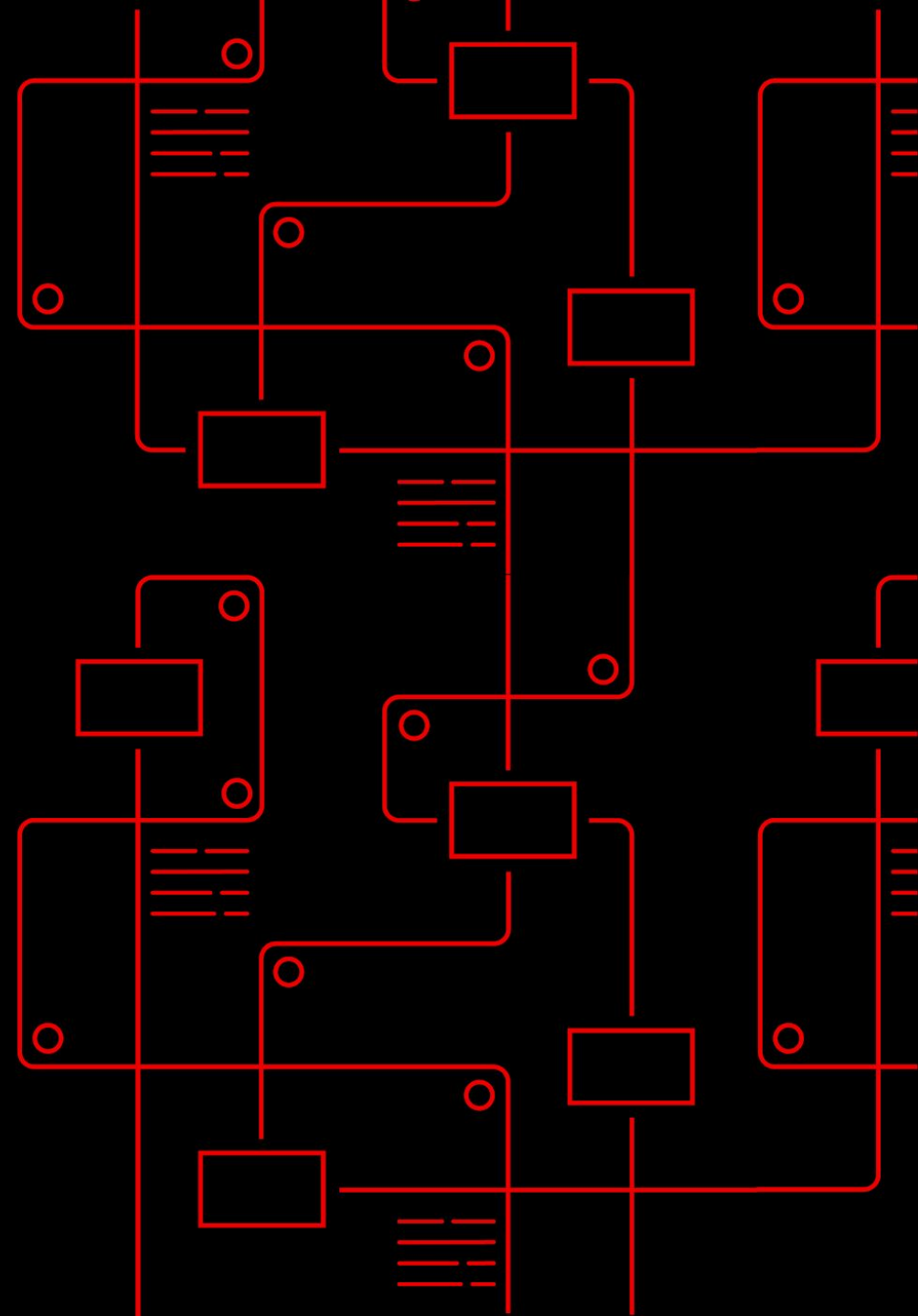


Red Hat Ansible Automation Platform for VMware

- 01 Introducing VMware automation
- 02 What do I need to know?
- 03 Use cases
- 04 Next steps



Introducing VMware automation



What is Ansible Automation Platform for VMware?

A unified platform for hybrid cloud infrastructure



Ansible Automation Platform for VMware

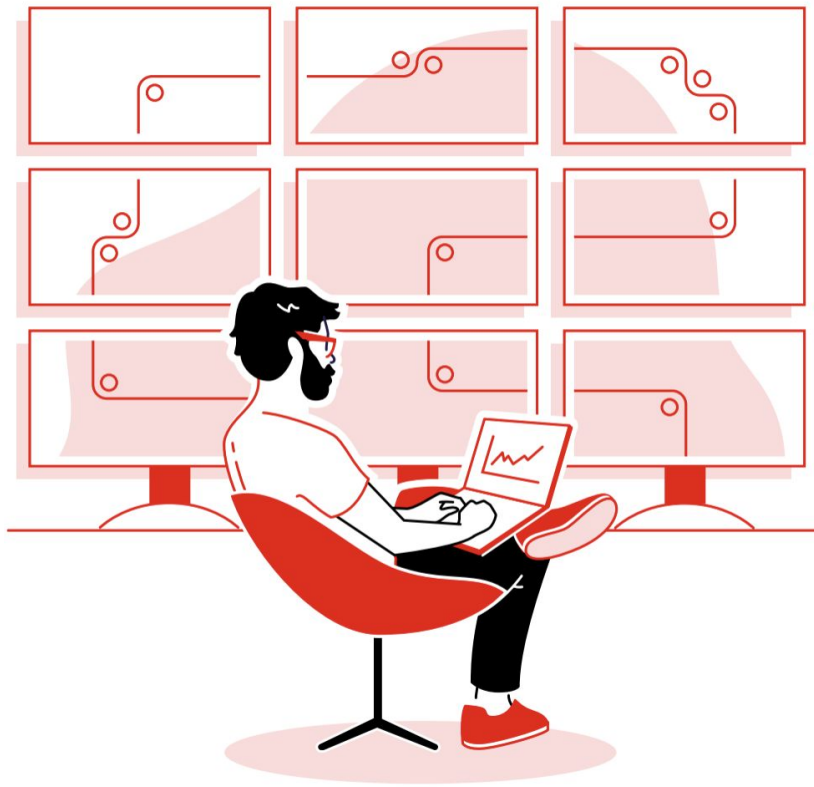


An integration with VMware's self-hosted, on-premise virtualization tools, such as VMware ESXi and vSphere



Supported set of Ansible® Automation Platform content designed to operationalize hybrid cloud management

What is the value of Ansible Automation Platform?



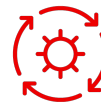
Speed

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

Ansible Automation Platform Partners



Ansible Automation Platform certified content

Where do I download the Ansible Automation Platform collections?



Supported

Ansible automation hub

vmware.vmware_rest
red.ht/ansible_vmware ▶

Example

namespace.collection
red.ht/link_to_collection ▶



Community

Ansible Galaxy

vmware.vmware_rest
red.ht/g_ansible_vmware ▶

What's your VMware automation journey?

What is the difference between these collections?



community.vmware

Easy to adopt
Provides value from the start

- ▶ Community support only
- ▶ Based upon SOAP API interface
- ▶ Requires Python SDK pyVmomi
- ▶ Certain modules may also require vSphere Automation Python SDK or vSAN Management Python SDK
- ▶ No Red Hat[®] testing performed



vmware.vmware_rest

Aimed to long term viability
Enables operationalization

- ▶ Fully supported with Red Hat subscription
- ▶ Based upon VMware REST API interface
- ▶ Python 3 only
- ▶ Latest features like tag, category, and content library supported
- ▶ Fully tested for automation execution environments

Requirements

What do I need to get started?



Automation execution environment

vmware®

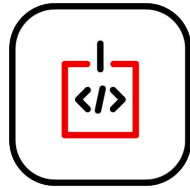
VMware

Requirements

- ▶ aiohttp Python package
 - ▶ Python 3.6 or greater
 - ▶ vmware.vmware_rest collection
 - ▶ ansible-core: >=2.9.10
- ▶ vSphere 7.0.2+

Automation execution environment

Is `vmware_rest` packaged for me?



There are three automation execution environment images provided with Ansible Automation Platform.

The `ee-supported` image contains everything needed to get started with automation for VMware.

1 `ee-29-rhel8`

2 **`ee-supported-rhel8`**

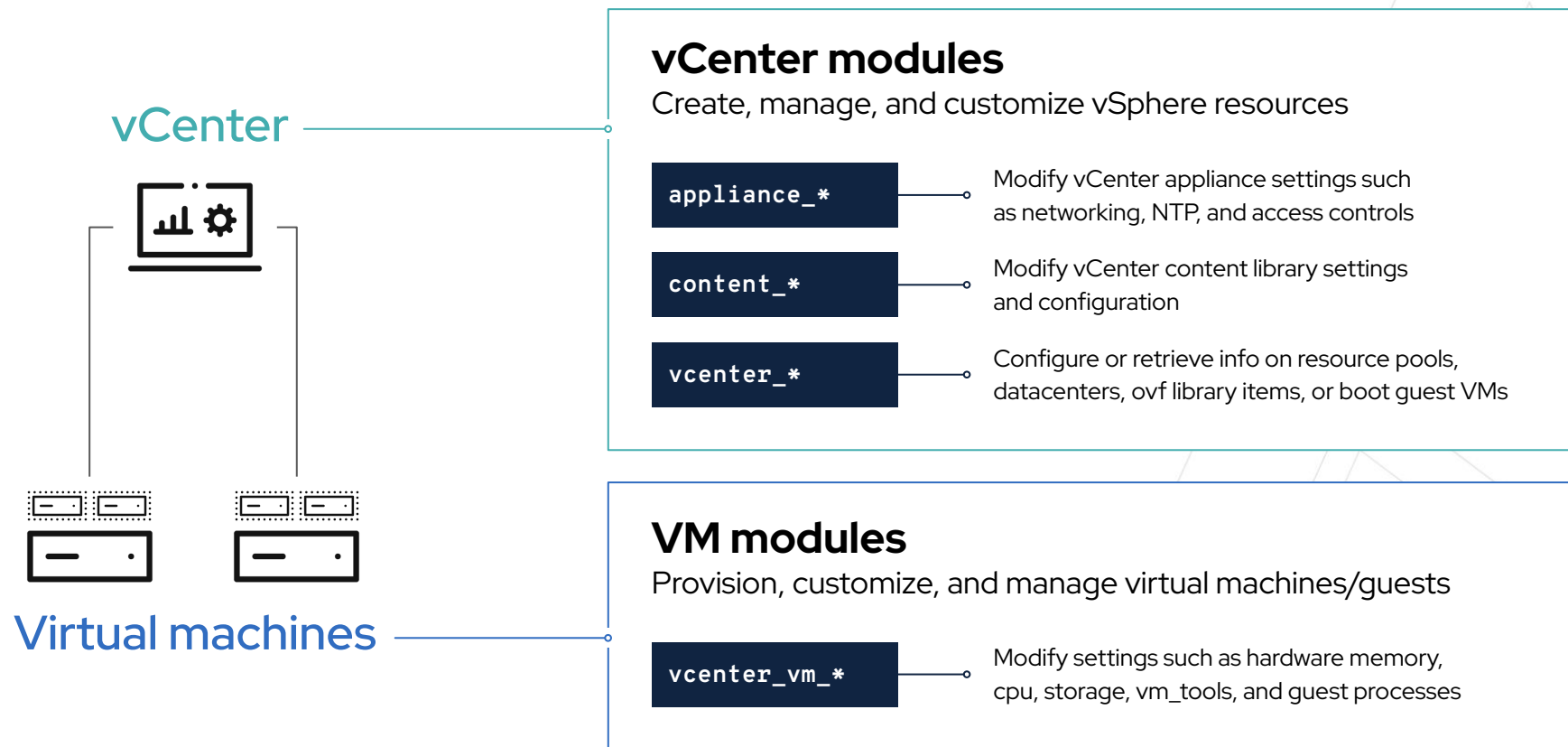
3 `ee-minimal-rhel8`

Includes:

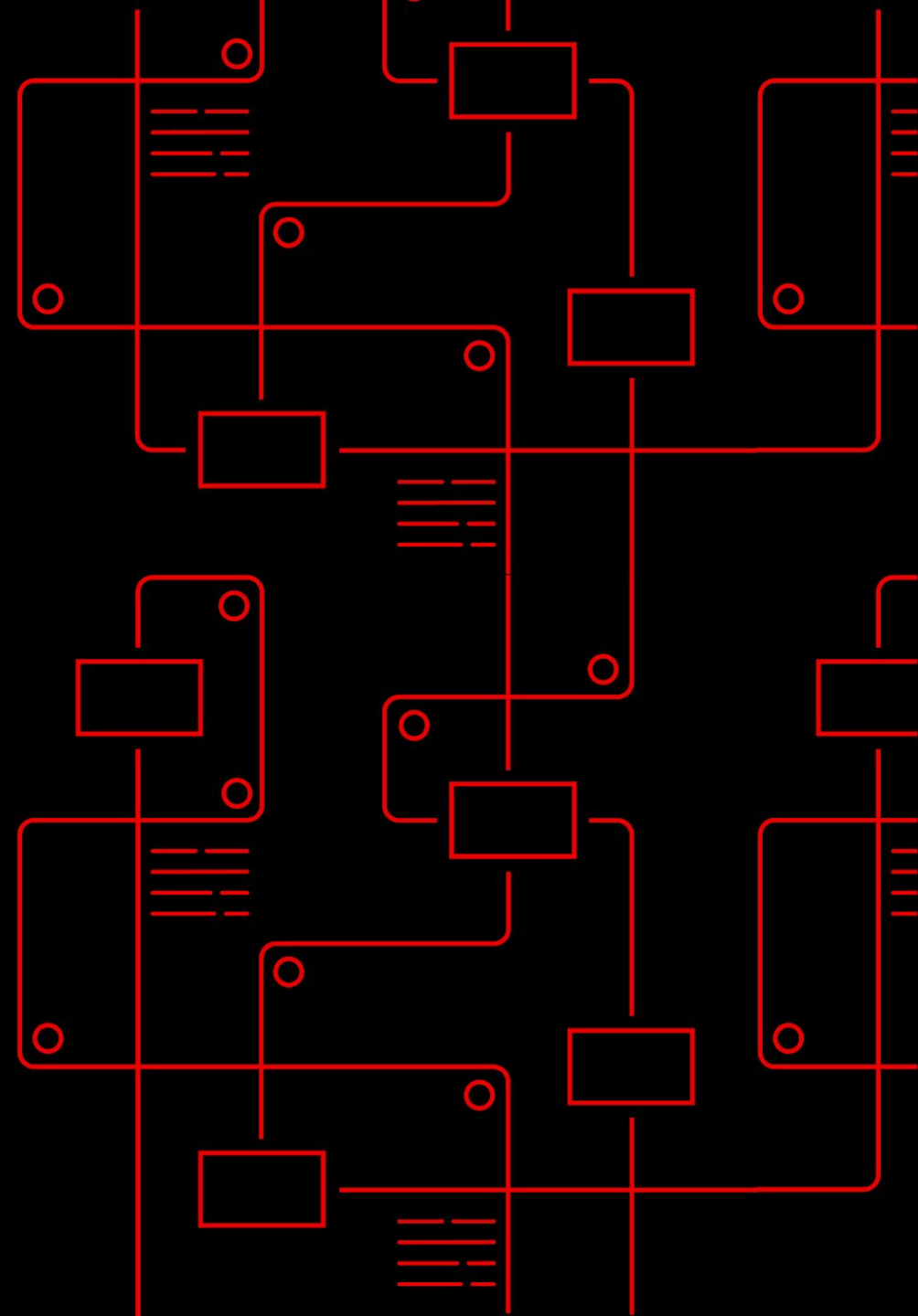
- ▶ `aihttp`
- ▶ Python 3.8.6+
- ▶ `vmware.vmware_rest` collection
- ▶ `ansible-core` 2.11+

vmware_rest modules

Two major categories for automating VMware vSphere



AAP Features



Native credential management

Automation controller can manage VMware vCenter credentials

The screenshot shows the 'Create New Credential' form in the Red Hat Ansible Automation Platform. The form is titled 'Create New Credential' and is located in the 'Credentials' section of the left-hand navigation menu. The form fields are as follows:

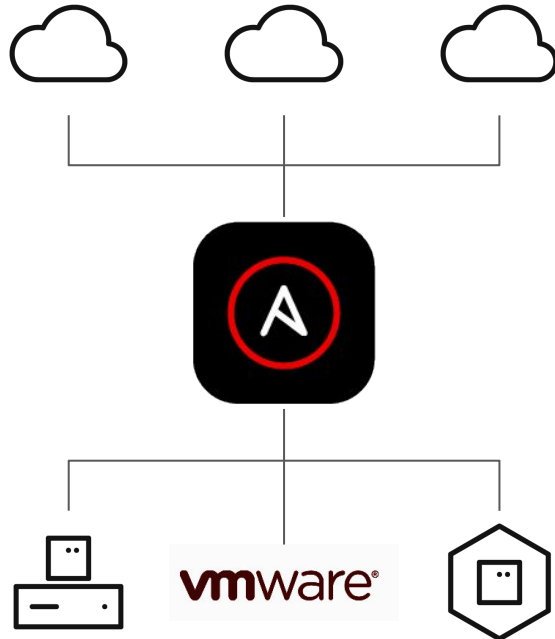
- Name:** VMware credential
- Description:** (empty)
- Organization:** Public Cloud Group
- Credential Type:** VMware vCenter
- Type Details:**
 - VCenter Host:** vcenter.demoredhat.com
 - Username:** admin
 - Password:** (masked with dots)

At the bottom of the form, there are 'Save' and 'Cancel' buttons.

- ▶ Encryption for secret fields use AES in CBC mode with a 256-bit key for encryption, PKCS7 padding, and HMAC using SHA256 for authentication
- ▶ Automation controller is designed such that the SECRET_KEY is never readable in playbooks automation controller launches, that these secrets are never readable by the Automation controller users, and no secret field values are ever made available via the automation controller REST API
- ▶ If a secret value is used in a playbook, we recommend using no_log on the task so that it is not accidentally logged.
- ▶ Ansible controller provides a secret management system that include integrations for:
 - CyberArk Application Identity Manager (AIM)
 - CyberArk Conjur
 - HashiCorp Vault Key-Value Store (KV)
 - HashiCorp Vault SSH Secrets Engine
 - Microsoft Azure Key Management System (KMS)
- ▶ These external secret values will be fetched prior to running a playbook that needs them.

Infrastructure coordination

Why should you choose Ansible Automation Platform for VMware automation?



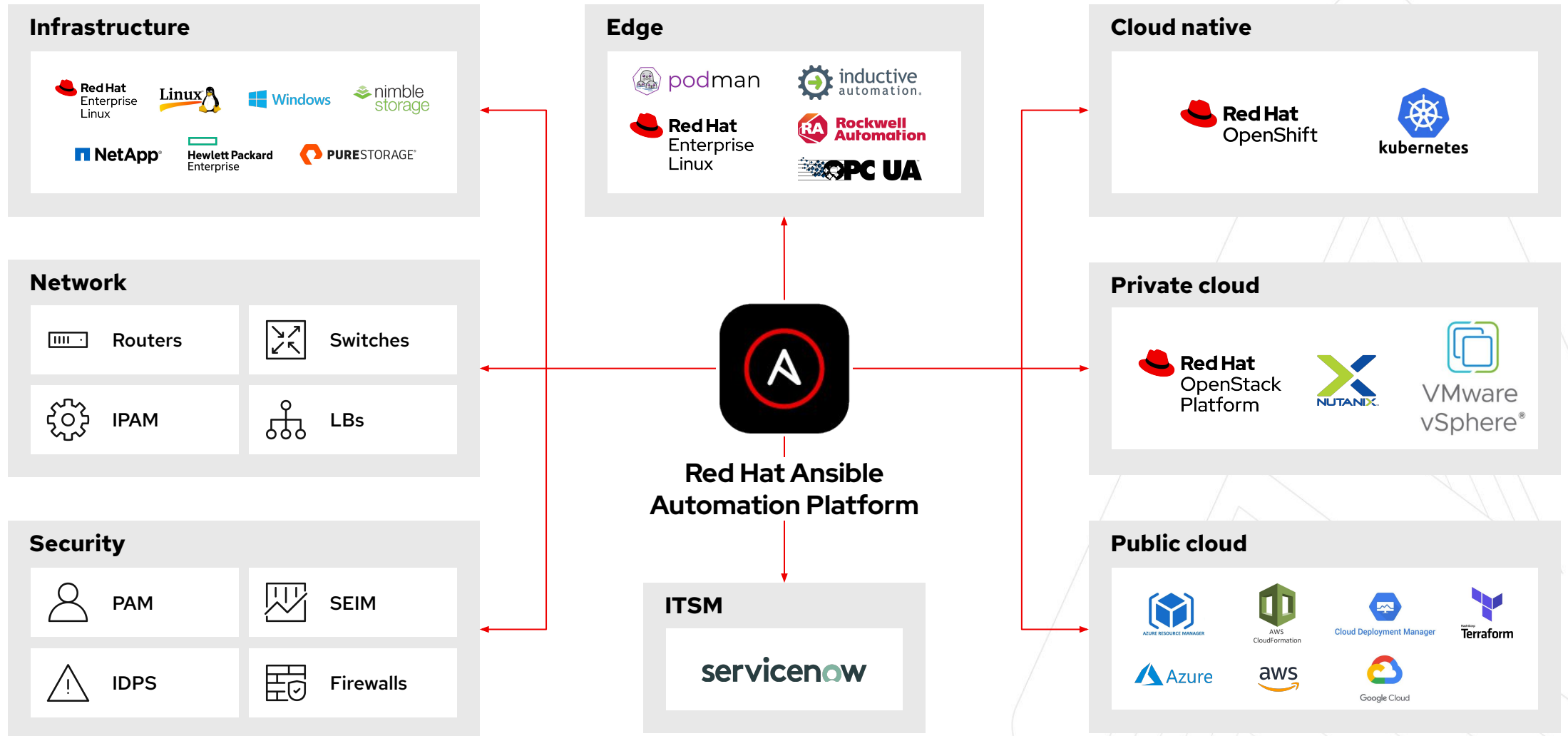
Why is it important?

- ▶ Manage infrastructure outside VMware
- ▶ Integrate with public/private cloud services
- ▶ Security and compliance across your entire infrastructure
- ▶ Automation Governance

Why Red Hat Ansible Automation Platform?

- ▶ Large ecosystem of modules to support entire infrastructure
- ▶ Integration with common logging to capture deviations

Orchestrated vSphere with your entire infrastructure



1 Provision Red Hat Enterprise Linux®

```
---  
- name: create virtual machine  
  vmware.vsphere_rest.vcenter_vm:  
    name: my_application  
    guest_OS: RHEL_8_64
```



2 Deploy application

```
---  
- name: deploy application  
  dnf:  
    name: nginx  
  
- include_role:  
  name: custom nginx application
```



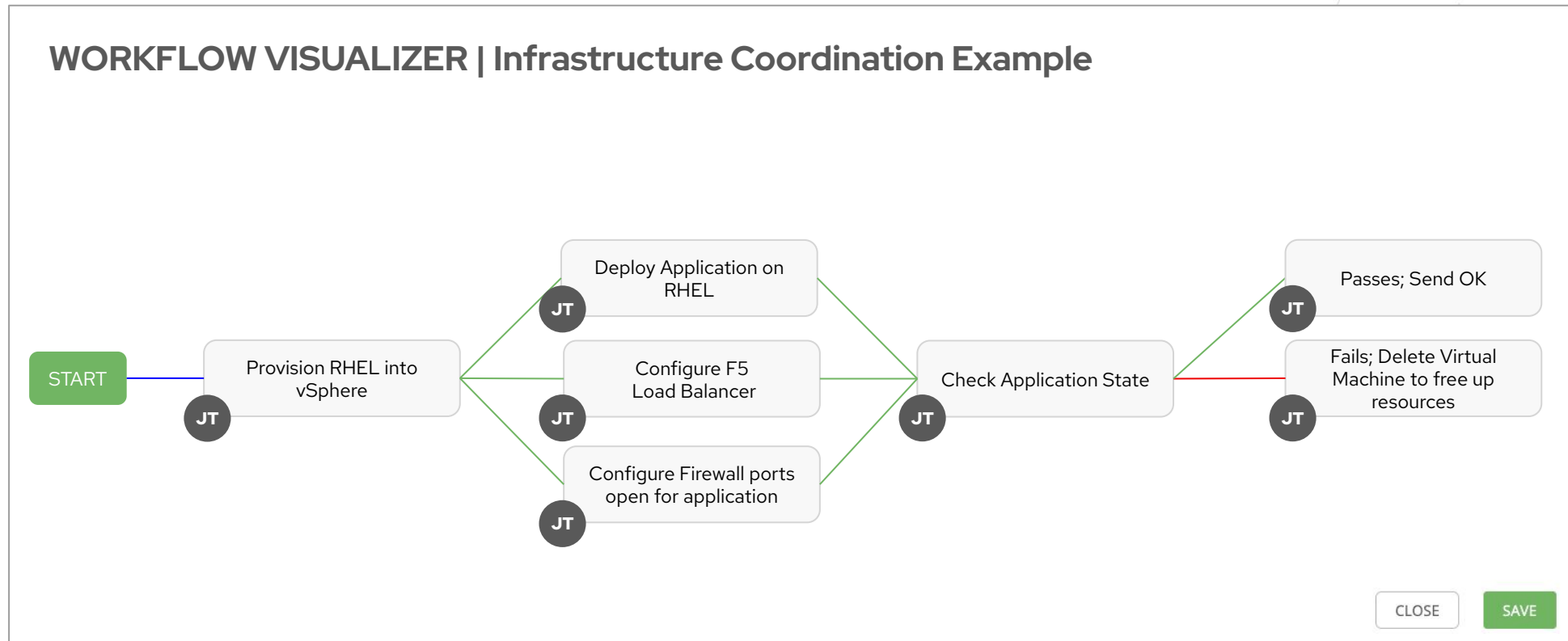
3 Configure F5 load balancer

```
---  
- name: add pool members  
  f5networks.f5_modules.bigip_pool_member:  
    pool: my_pool  
    name: my_application  
    host: "192.168.1.49"
```

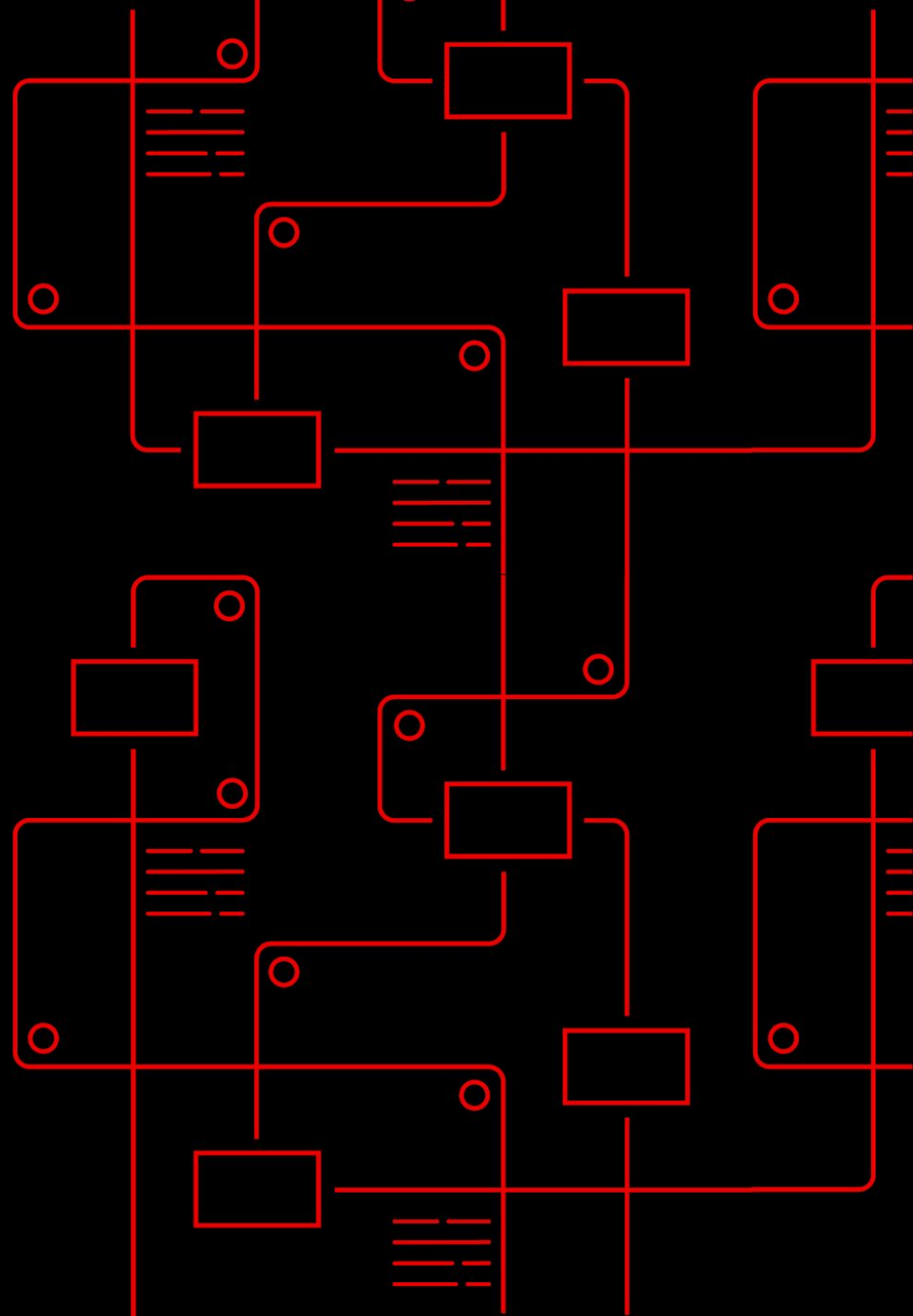


Ansible Automation Platform

Using workflows to enhance your automation

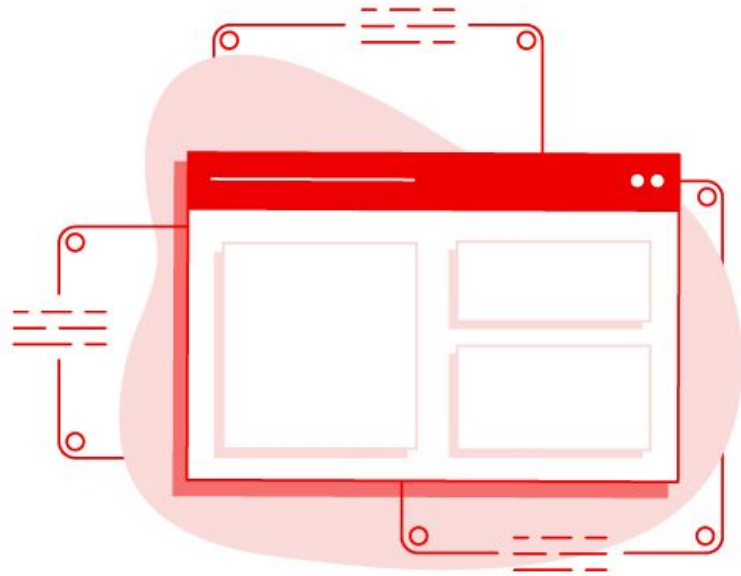


Use cases



Day 0 use case: deploy new ESXi hosts

Speed up the deployment

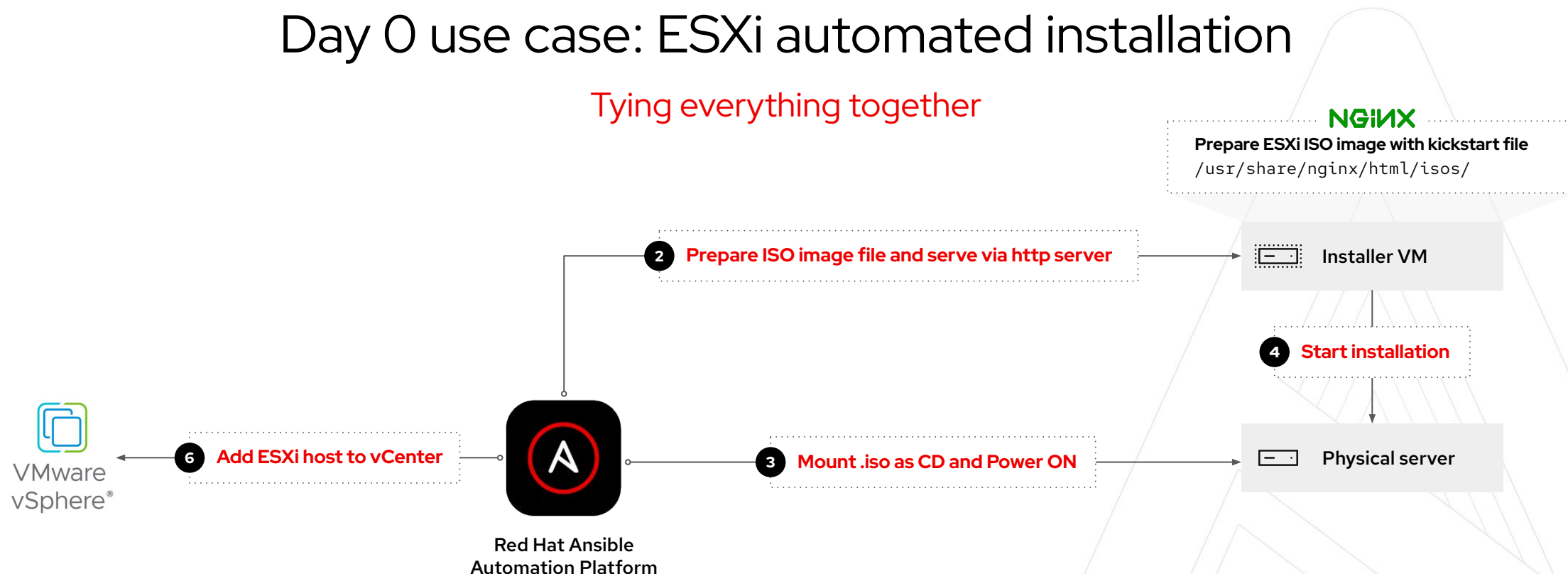


Current manual process

- ▶ Install ESXi hypervisor
- ▶ Add into vCenter
- ▶ Add license
- ▶ Configure syslog, power settings, NTP, core dump, etc
- ▶ Configure vMotion

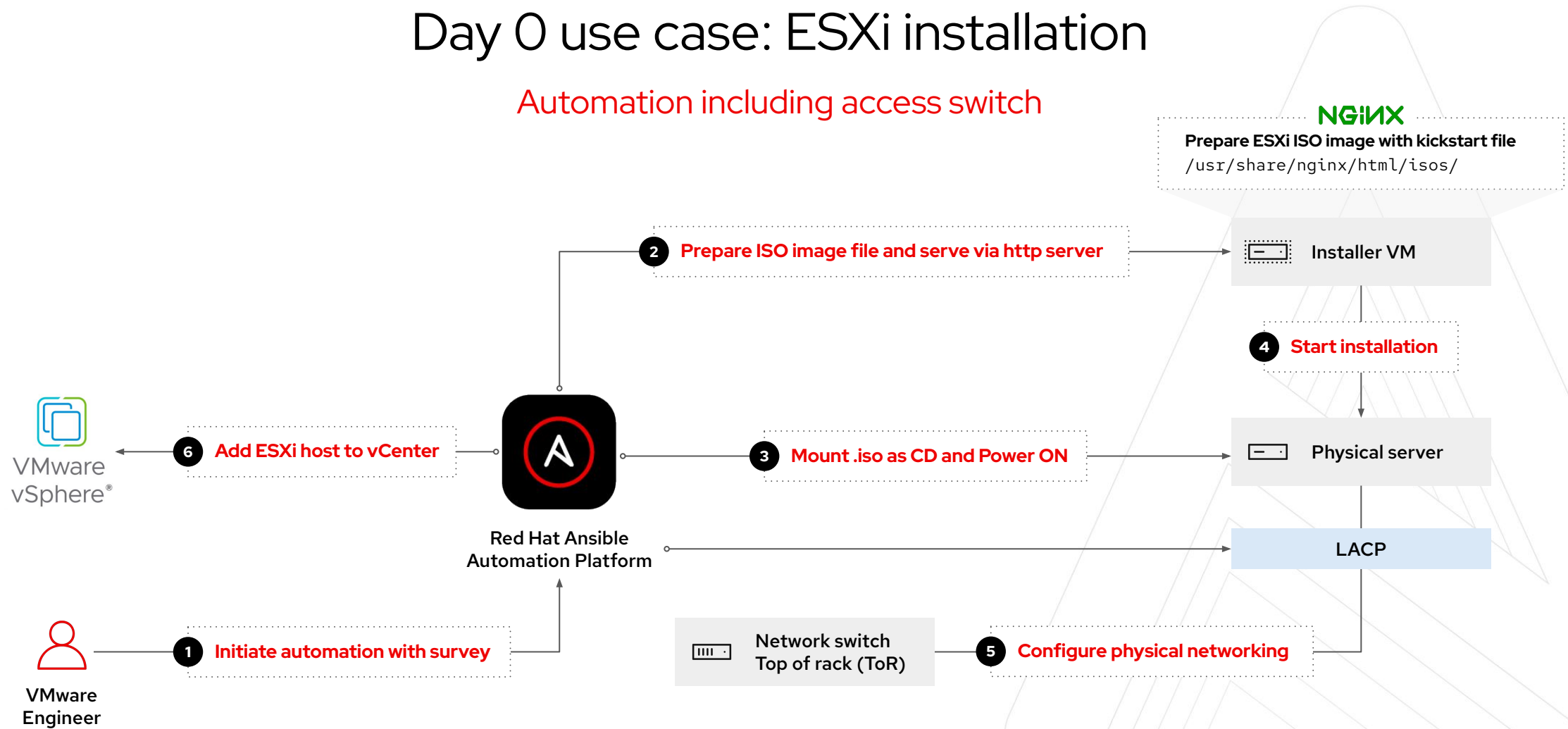
Day 0 use case: ESXi automated installation

Tying everything together



Day 0 use case: ESXi installation

Automation including access switch



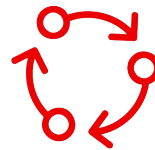
Ansible Automation Platform for VMware key use cases

Automating the deployment and management of VMware systems with existing IT infrastructure



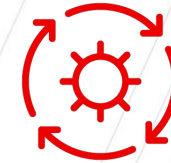
Day 1-2 automation

Repeatable “last mile” automation for VMware hypervisor configuration and management



Lifecycle management

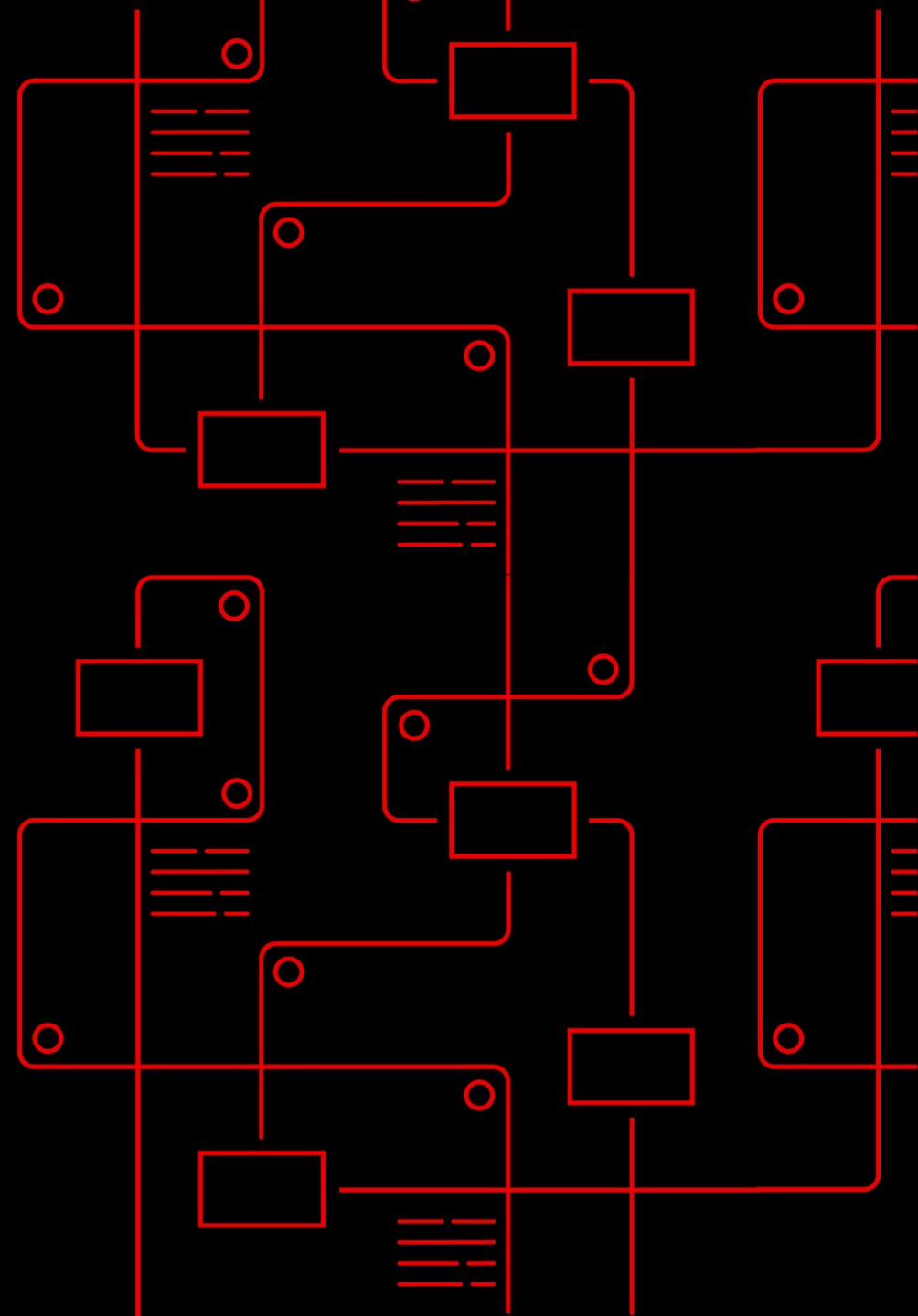
Management of VMware hypervisor and automation of VMs lifecycle management



Business continuity

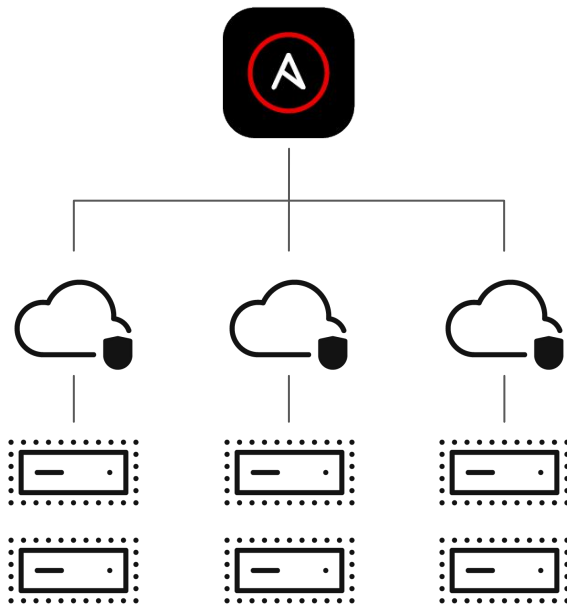
End-to-end business continuity and disaster recovery (DR) automation of VMware vSphere

Day 1-2 automation



VM Deployment

Provisioning and cloning virtual machine guests



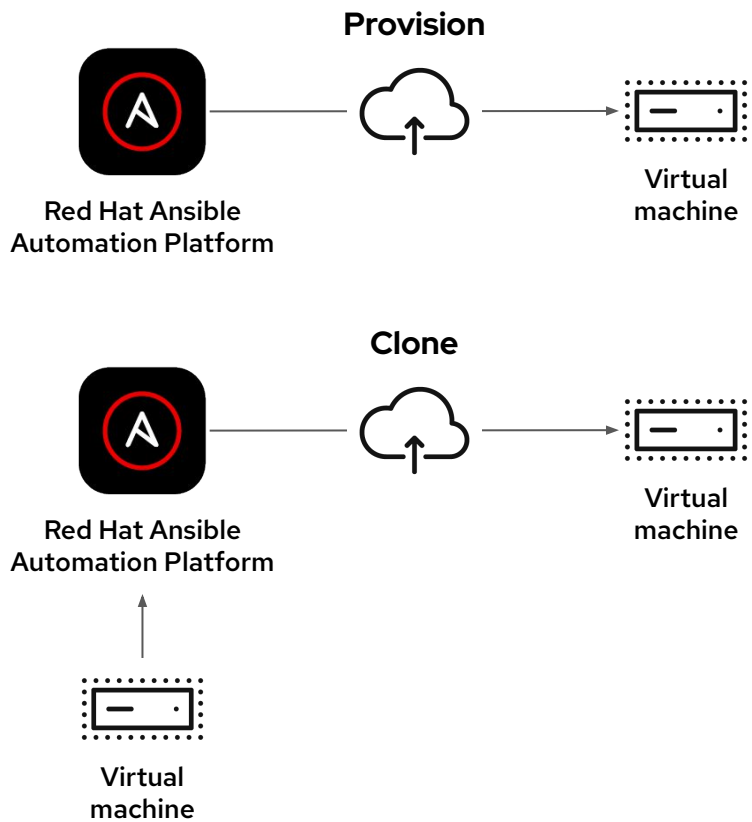
Why is it important?

- ▶ Automate provisioning and deprovisioning of virtual machines
- ▶ Consistent experience for IT operators
- ▶ Enforce compliance and rules sets for deployed machines

Why Red Hat Ansible Automation Platform?

- ▶ Use surveys to create guard rails for users
- ▶ Easy orderable experience with automation services catalog
- ▶ Orchestrate into larger IT processes

VM deployment use cases



For VM deployments specify the following parameters:

- ▶ cluster
- ▶ datastore
- ▶ resource_pool
- ▶ folder

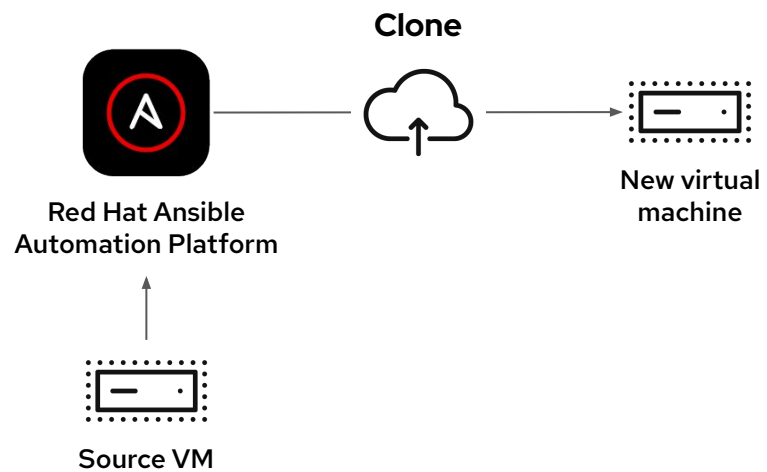
Provision virtual machine

Creating a virtual machine on VMware vSphere

```
---
- name: provision virtual machine
  vmware.vmware_rest.vcenter_vm:
    placement:
      cluster: '{{ my_cluster_info.id }}'
      datastore: "{{ lookup('vmware.vmware_rest.datastore_moid',
'/my_datastore/local') }}"
      folder: '{{ my_folder }}'
      resource_pool: '{{ my_cluster_info.value.resource_pool }}'
    name: example_rhel_server
    guest_OS: RHEL_8_64
    memory:
      size_MiB: 2048
```

Clone virtual machine

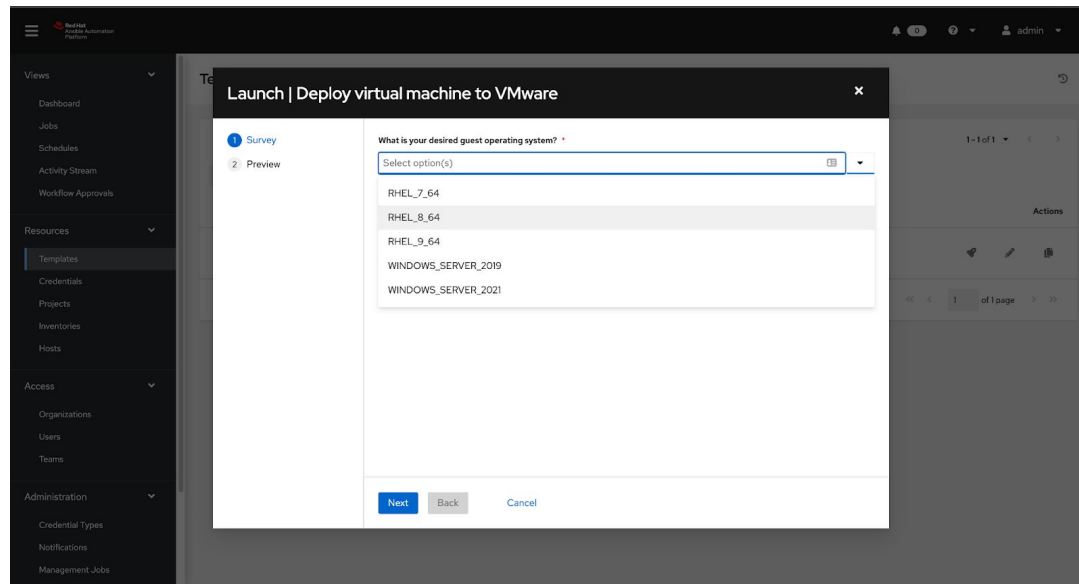
Creating a virtual machine on VMware vSphere



```
---  
- name: Create a VM using clone  
  vmware.vmware_rest.vcenter_vm:  
    placement:  
      datastore: '{{ datastore_id }}'  
      folder: '{{ folder_id }}'  
      resource_pool: '{{ resource_pool_id }}'  
    name: example_rhel_server_clone  
    source: '{{ source_vm_id }}'  
    state: clone
```

Provision virtual machine

Elevate tasks with survey feature



- ▶ No VMware specific knowledge required to execute complex tasks
- ▶ Empower novices to take on more activities with guardrails
- ▶ Automate routine and boring tasks away

Day 1 automation

Setup your VMware vSphere infrastructure



Why is it important?

- ▶ Customization of your VMware infrastructure
- ▶ Consistent automation platform across all IT infrastructure
- ▶ Flexibility to modify your VMware vSphere deployments to meet new demands

Why Red Hat Ansible Automation Platform?

- ▶ Push-button deployment for automation lowers barrier to automate
- ▶ Scheduling in automation controller to enforce configuration policy
- ▶ Customizable RBAC to control who can do what to VMware infrastructure

vmware_rest modules

Configuration management for vSphere environments



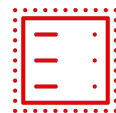
Access

Audit and control the console, direct console UI, shell, SSH, and local accounts



Networking

Retrieve information and configure network configuration



System

Manage vSphere services, retrieve storage configuration, and more

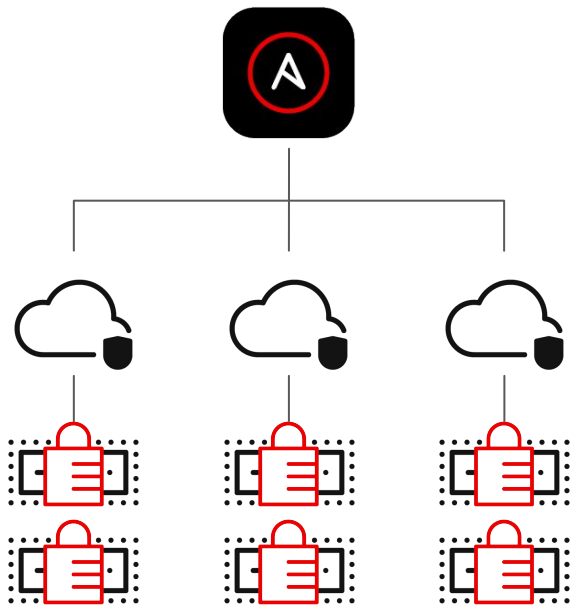


Time management

Configure the NTP server, adjust timezone

Use case: access

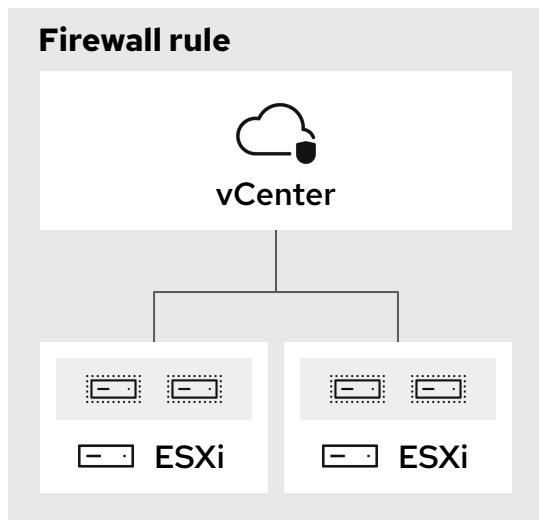
Using automation to control access to vSphere



```
---  
- name: lockdown vSphere  
  hosts: localhost  
  gather_facts: false  
  tasks:  
    - name: Disable the Console CLI  
      vmware.vmware_rest.appliance_access_consolecli:  
        enabled: false  
  
    - name: Disable the Direct Console User Interface  
      vmware.vmware_rest.appliance_access_dcui:  
        enabled: false
```

Use case: networking

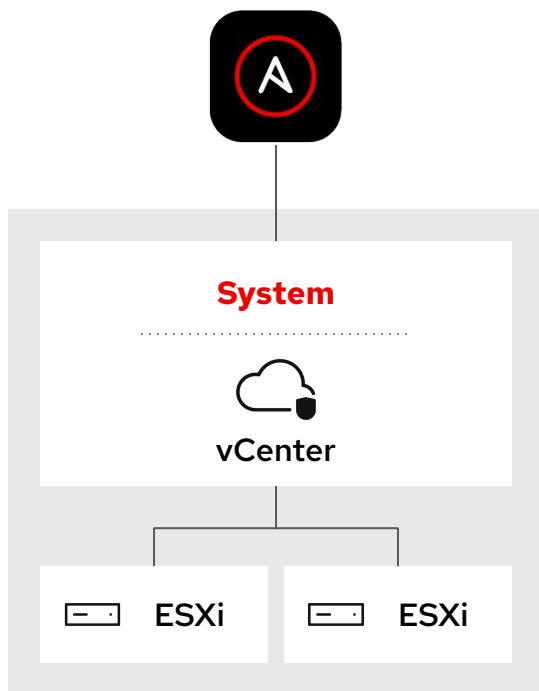
Using automation to configure networking on vSphere



```
---  
- name: modify vSphere firewall  
  hosts: localhost  
  gather_facts: false  
  tasks:  
    - name: Add an extra firewall rule  
      appliance_networking_firewall_inbound:  
        rules:  
          - address: 192.168.1.3  
            prefix: 32  
            policy: ACCEPT
```

Use case: system

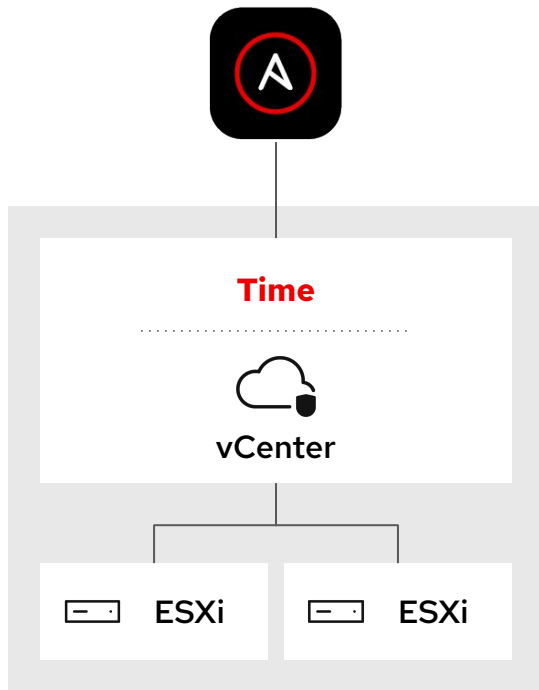
Using automation to control system settings on vSphere



```
---  
- name: resize partitions, apply FIPS and restart  
  hosts: localhost  
  gather_facts: false  
  tasks:  
    - name: Resize partition to 100%  
      vmware.vmware_rest.appliance_system_storage:  
        state: resize  
  
    - name: Turn on the FIPS mode and reboot  
      vmware.vmware_rest.appliance_system_globalfips:  
        enabled: true
```

Use case: time management

Using automation to configure and manage time on VMware vSphere



```
---  
- name: configure time  
  hosts: localhost  
  gather_facts: false  
  tasks:  
    - name: Use the UTC timezone  
      vmware.vmware_rest.appliance_system_time_timezone:  
        name: UTC  
  
    - name: Use NTP to synchronize the clock  
      vmware.vmware_rest.appliance_timesync:  
        mode: NTP
```

Day 2 automation

Automation beyond vSphere deployments



Why is it important?

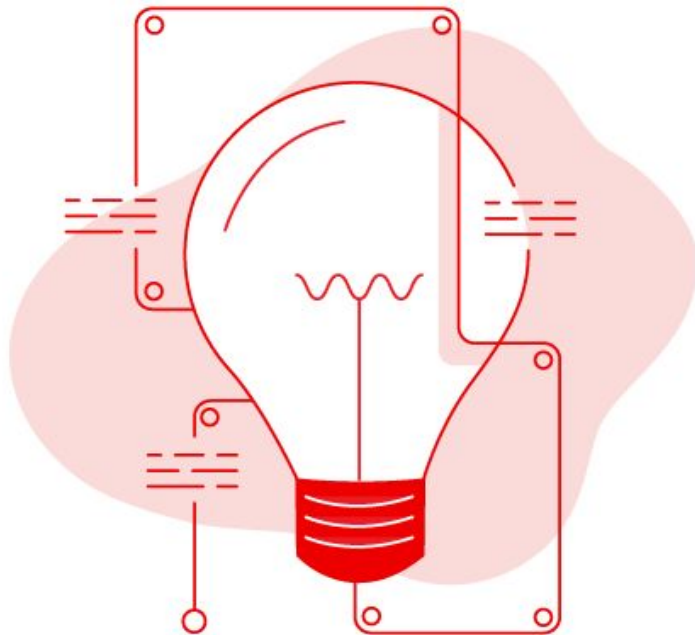
- ▶ Automating routine operational tasks versus just configuration management
- ▶ Automatic IT awareness of infrastructure state
- ▶ Moving administrators from reactive to proactive IT management

Why Red Hat Ansible Automation Platform?

- ▶ Validate operational state and not just configuration state
- ▶ Orchestrate IT processes with workflows
- ▶ Easily integrate data into other systems (websites, databases, ITSM)

Day 2 use cases for automation

Three logical categories for day 2 use cases



Power management

Automation controlling soft booting, shutdown, standby (suspend), soft reboot, hard reboot, hard reset, or hard suspend of virtual machines



Operational awareness

Information gathering modules (`_info`) that return structured data around device status (e.g. `appliance_health_system_info`, `appliance_networking_firewall_inbound_info`)

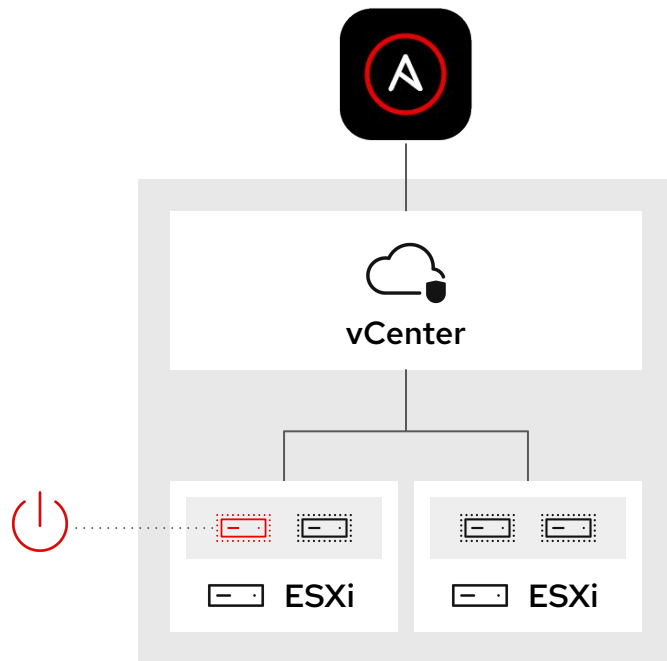


Guest modification

Modify virtual machine properties such as `vm_tools` installation for guest operating systems, changing hardware (e.g. `cdrom` and `sata`) or even starting programs

Use case: power management

Operational tasks for vSphere administrators



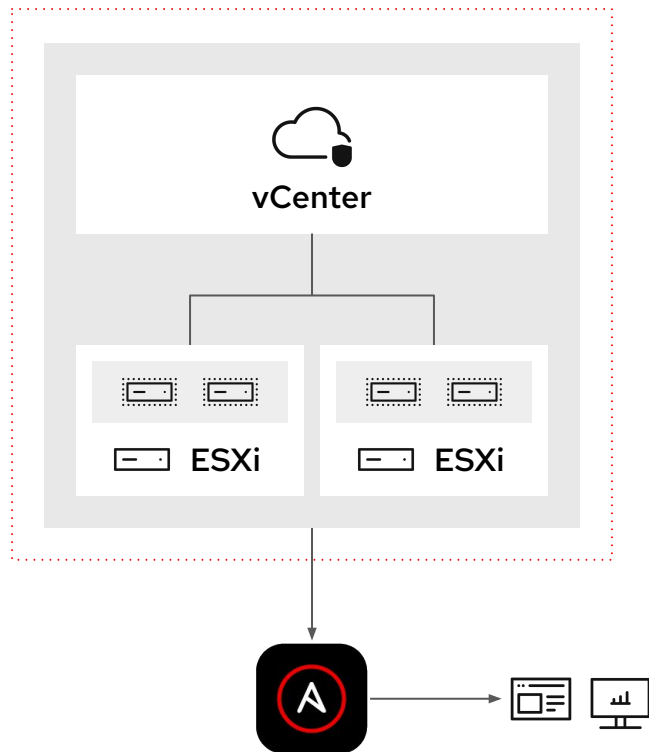
```
---
- name: turn off virtual machine
  hosts: localhost
  gather_facts: false
  tasks:
    - name: Look up the VM called test_vm1 in the inventory
      register: search_result
      vmware.vmware_rest.vcenter_vm_info:
        filter_names:
          - test_vm1

    - name: Collect information about a specific VM
      vmware.vmware_rest.vcenter_vm_info:
        vm: '{{ search_result.value[0].vm }}'
      register: test_vm1_info

    - name: Turn the power of the VM on
      vmware.vmware_rest.vcenter_vm_power:
        state: start
        vm: '{{ test_vm1_info.id }}'
```

Use case: operational awareness

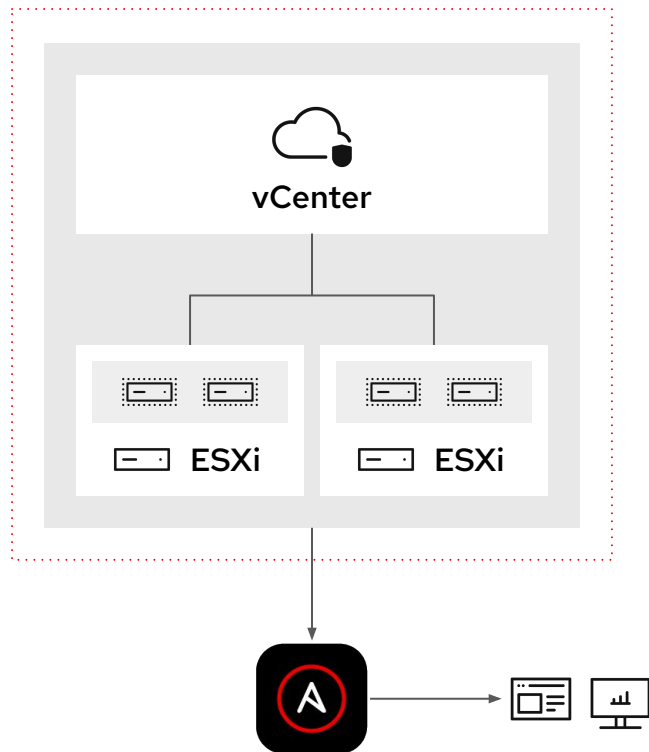
Retrieve Ansible Automation Platform facts around a VMware vSphere resource



```
---  
- name: turn off virtual machine  
  hosts: localhost  
  gather_facts: false  
  tasks:  
    - name: Get the system mem status  
      vmware.vmware_rest.appliance_health_mem_info:  
        register: mem_status  
  
    - name: Check if the system is up to date  
      vmware.vmware_rest.appliance_update_info:  
        register: system_update
```

Use case: operational awareness

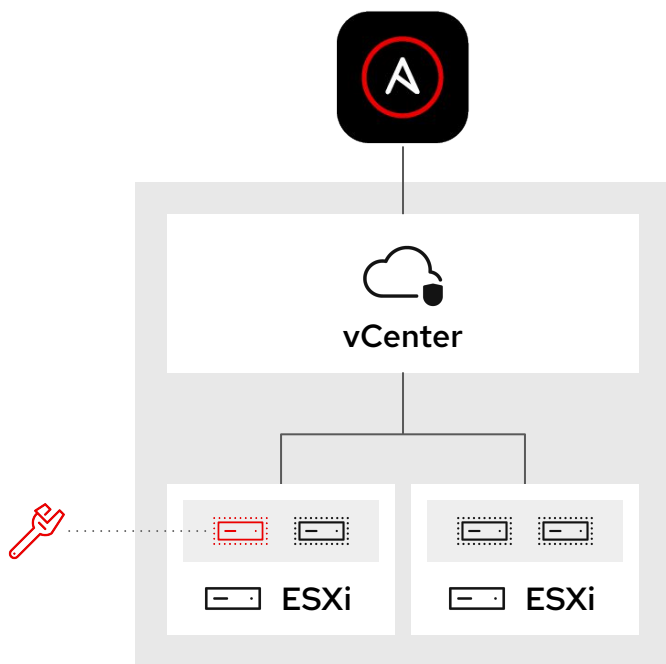
Retrieve ansible facts around a VMware guest



```
---  
- name: retrieve VM information  
  hosts: localhost  
  gather_facts: false  
  tasks:  
    - name: Reads a single environment variable  
      vmware.vmware_rest.vcenter_vm_guest_environment_info  
        name: ANSIBLE_CONFIG  
        register: env_info  
  
    - name: Return information about the guest  
      vmware.vmware_rest.vcenter_vm_guest_identity_info  
        register: env_info
```

Use case: guest modification

Modify guest virtual machine properties



```
---  
- name: modify settings on virtual machine  
  hosts: localhost  
  gather_facts: false  
  tasks:  
    - name: Increase the memory of a VM  
      vmware.vmware_rest.vcenter_vm_hardware_memory:  
        vm: '{{ test_vm1_info.id }}'  
        size_MiB: 1080
```

Day 2 use case: ESXi rolling upgrade

Using automation to configure and manage VMware vSphere



“I would highly suggest Ansible. We manage all of our VMware infrastructure with it and its highly effective.”

First name Last name
Title, Company

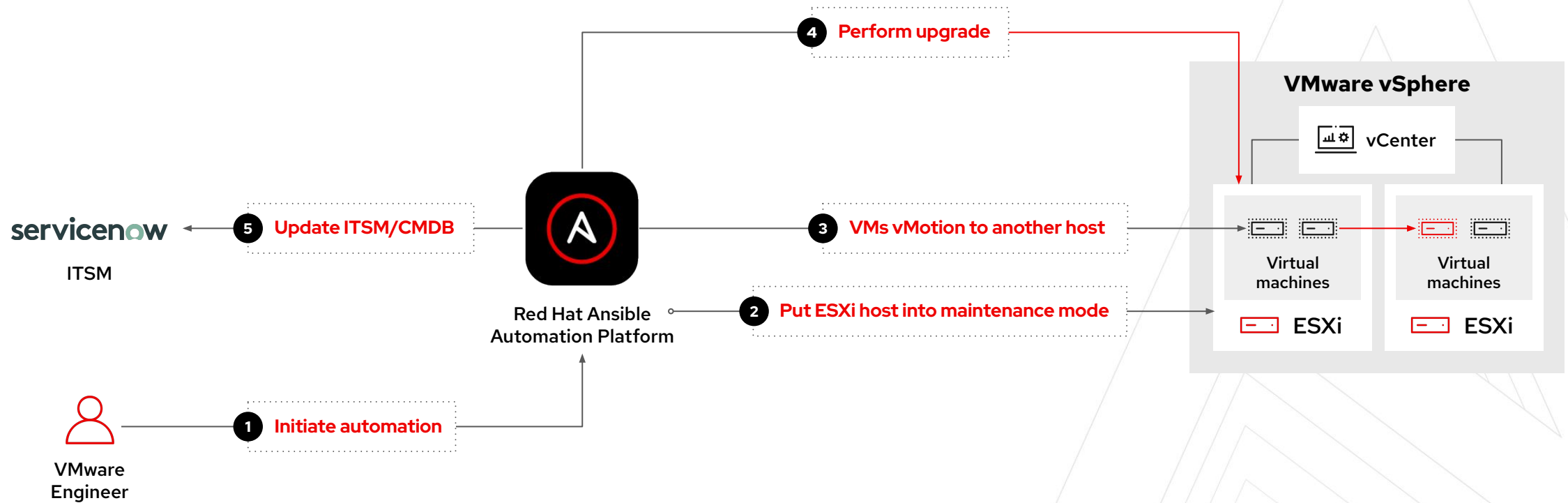
Current manual process

- ▶ Update ESXi hosts 1 at a time using Update Manager
- ▶ Update ESXi hosts 1 at a time using CLI

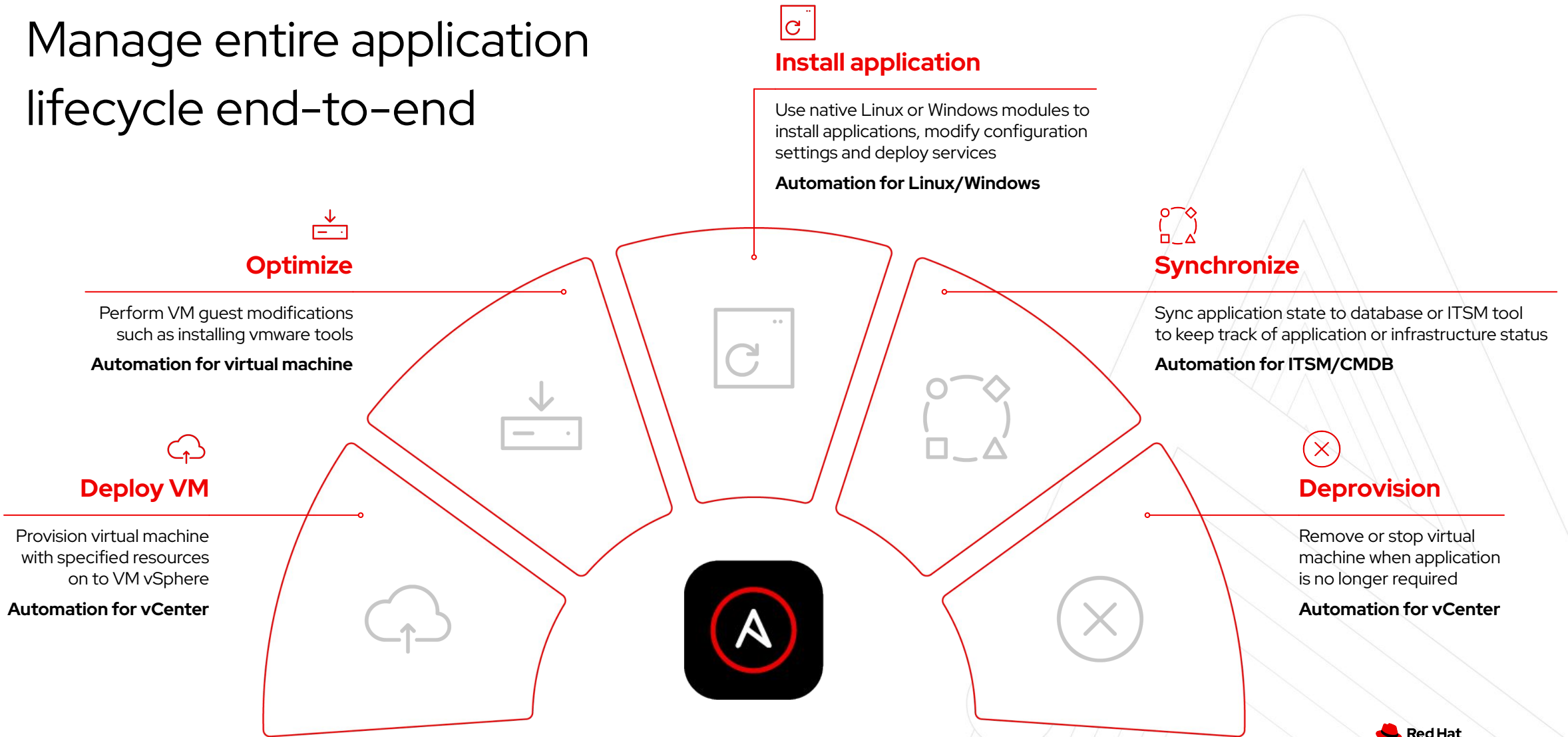
Rationale for automation

- ▶ Perform ESXi patching regularly to avoid security vulnerabilities
- ▶ Shorten patching / upgrade duration, ensuring activities can be completed within maintenance window

Day 2 use case: ESXi rolling upgrade



Manage entire application lifecycle end-to-end



Optimize

Managing guest virtual machines for application lifecycle management

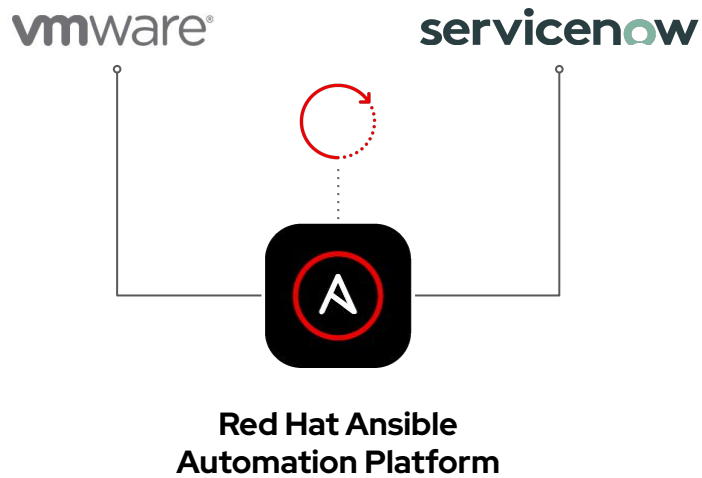
- ▶ Modify and configure guest vm virtual hardware settings
- ▶ Execute programs on guest_vm directly from vSphere
- ▶ Manage networking and power settings for guest virtual machines

```
---
- name: Create a new disk
  vmware.vmware_rest.vcenter_vm_hardware_disk:
    vm: '{{ test_vm1_info.id }}'
    type: SATA
    new_vmdk:
      capacity: 320000

- name: start application on guest vm
  vmware.vmware_rest.vcenter_vm_guest_processes:
    path: /apps/webapp
    state: present
    vm: "{{ app_vm }}"
```

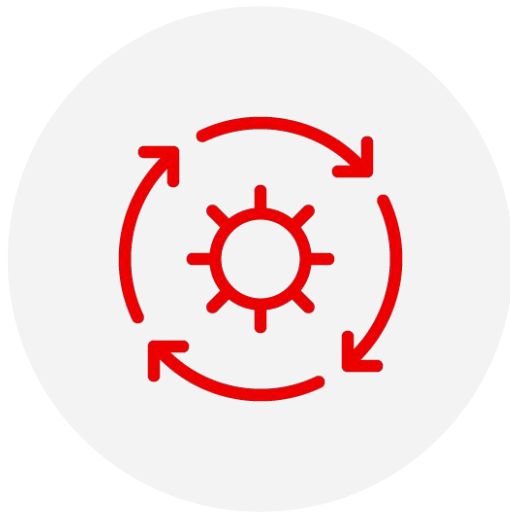
Synchronize with ITSM

Automate VMware information into ITSM tools such as ServiceNow



```
---  
- name: Gather information about All VMware instances  
  vmware.vmware_rest.vcenter_vm_info:  
    register: existing_vms  
  
- name: Create a configuration item  
  servicenow.itsm.configuration_item:  
    name: "{{ item.name }}"  
    other:  
      cpus: "{{ item.cpu_count | default(') }}"  
      memory: "{{ item.memory_size_MiB | default(') }}"  
      sys_class_name: cmdb_ci_vmware_instance  
    loop: "{{ existing_vms.value }}"
```

Business continuity



Why is it important?

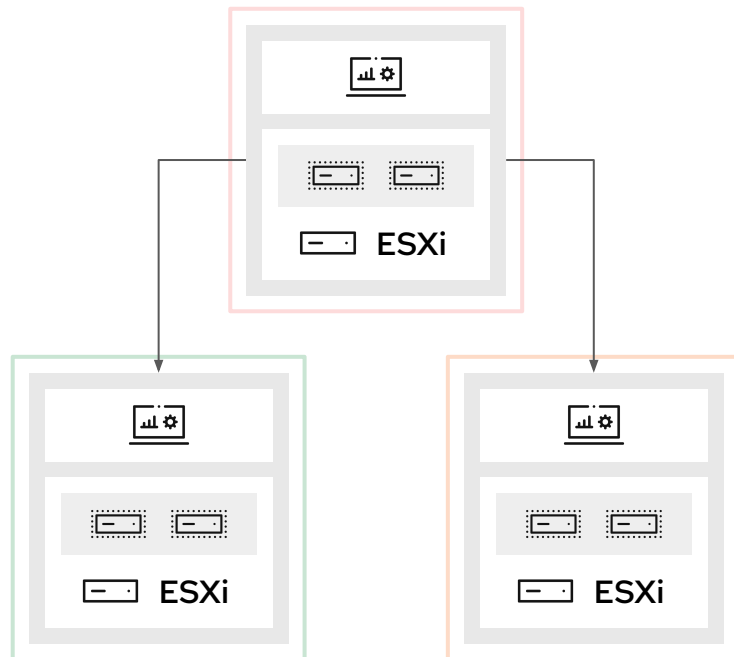
- ▶ Reduces downtime of environments
- ▶ Disaster recovery remediation
- ▶ Traffic redistribution

Why Red Hat Ansible Automation Platform?

- ▶ Advanced infrastructure modification across entire infrastructure
- ▶ Automate backup of configurations and/or data
- ▶ Ansible Automation Platform facts can keep track of your infrastructure's health status

Business continuity

End-to-end business continuity and disaster recovery (DR) automation of VMware infrastructure



VMware vCenter rebuilds and recovery

Hot spares and streamlined restoration of clusters

Backup and restore

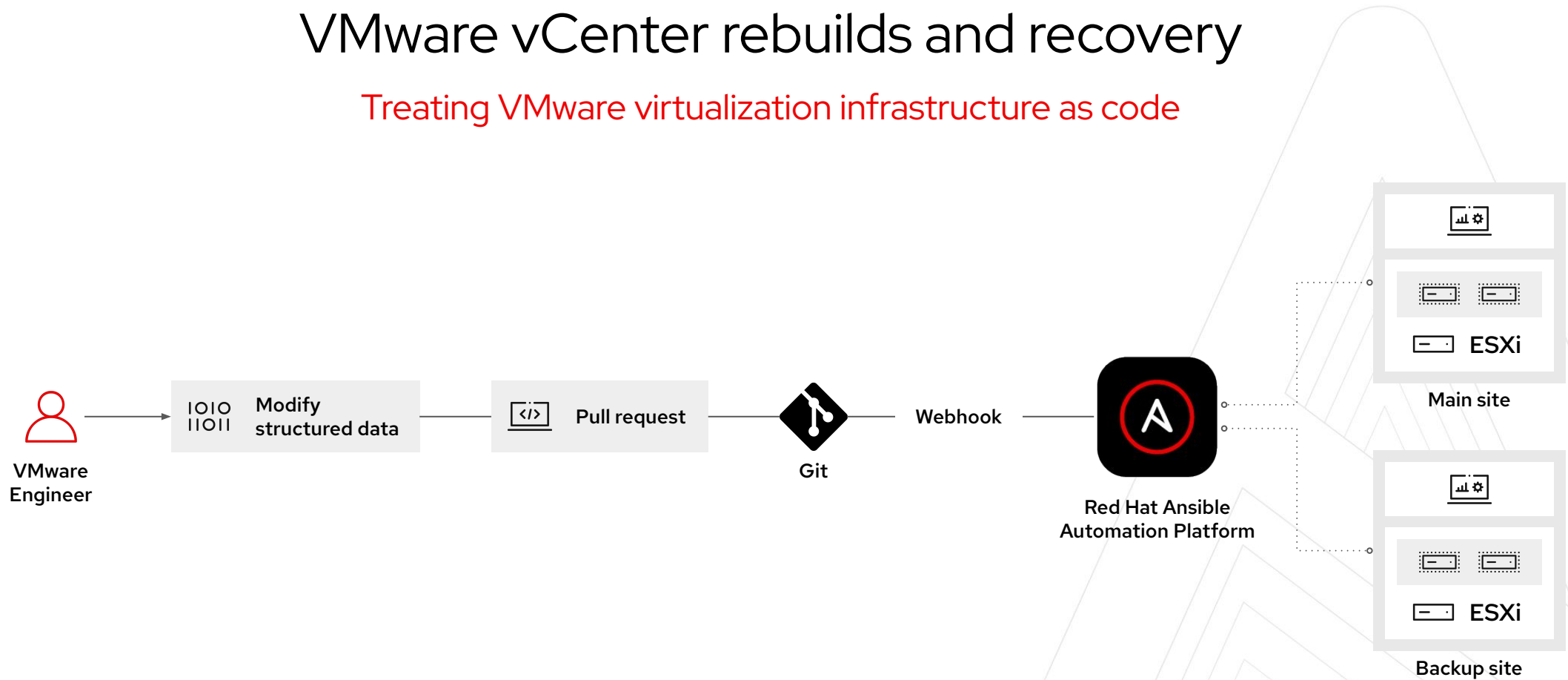
Stateful core services such as etcd and persistent volumes

Traffic redistribution

Rapidly and accurately switch to healthy systems

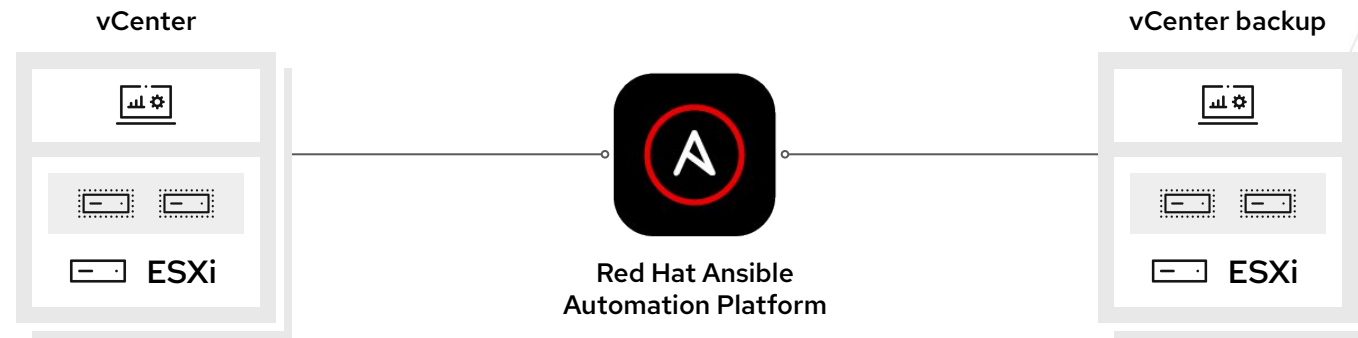
VMware vCenter rebuilds and recovery

Treating VMware virtualization infrastructure as code



Backup and restore

Retrieve configuration and restore

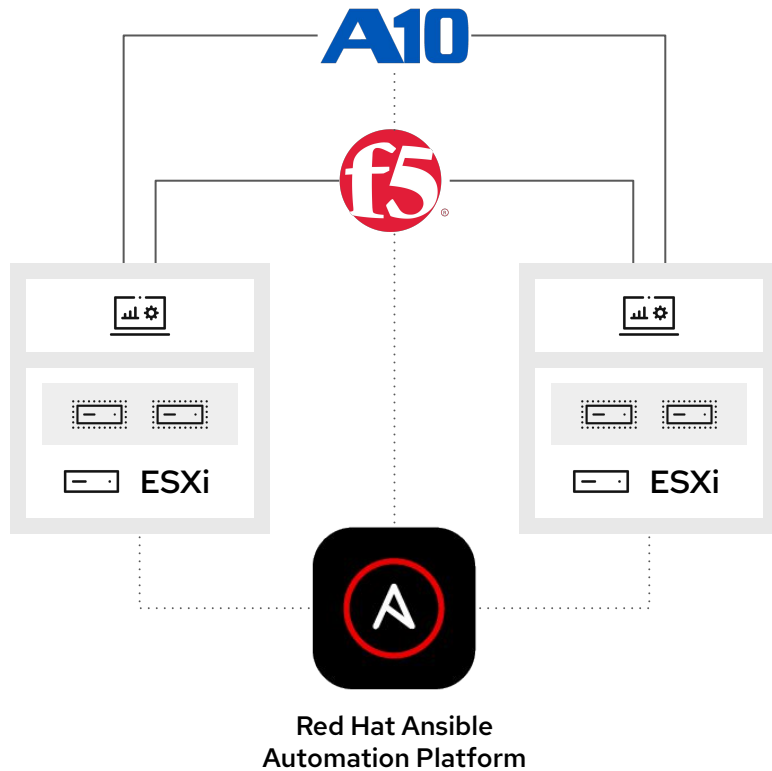


```
---  
- name: export vCenter Server Profiles  
  vmware.vmware_rest.appliance_infraprofile_configs  
  state: export  
  profiles:  
    - ApplianceManagement
```

```
---  
- name: import vCenter Server Profiles  
  vmware.vmware_rest.appliance_infraprofile_configs  
  state: import_profile  
  config_spec: "{{ my_save_profile }}"  
  profiles:  
    - ApplianceManagement
```

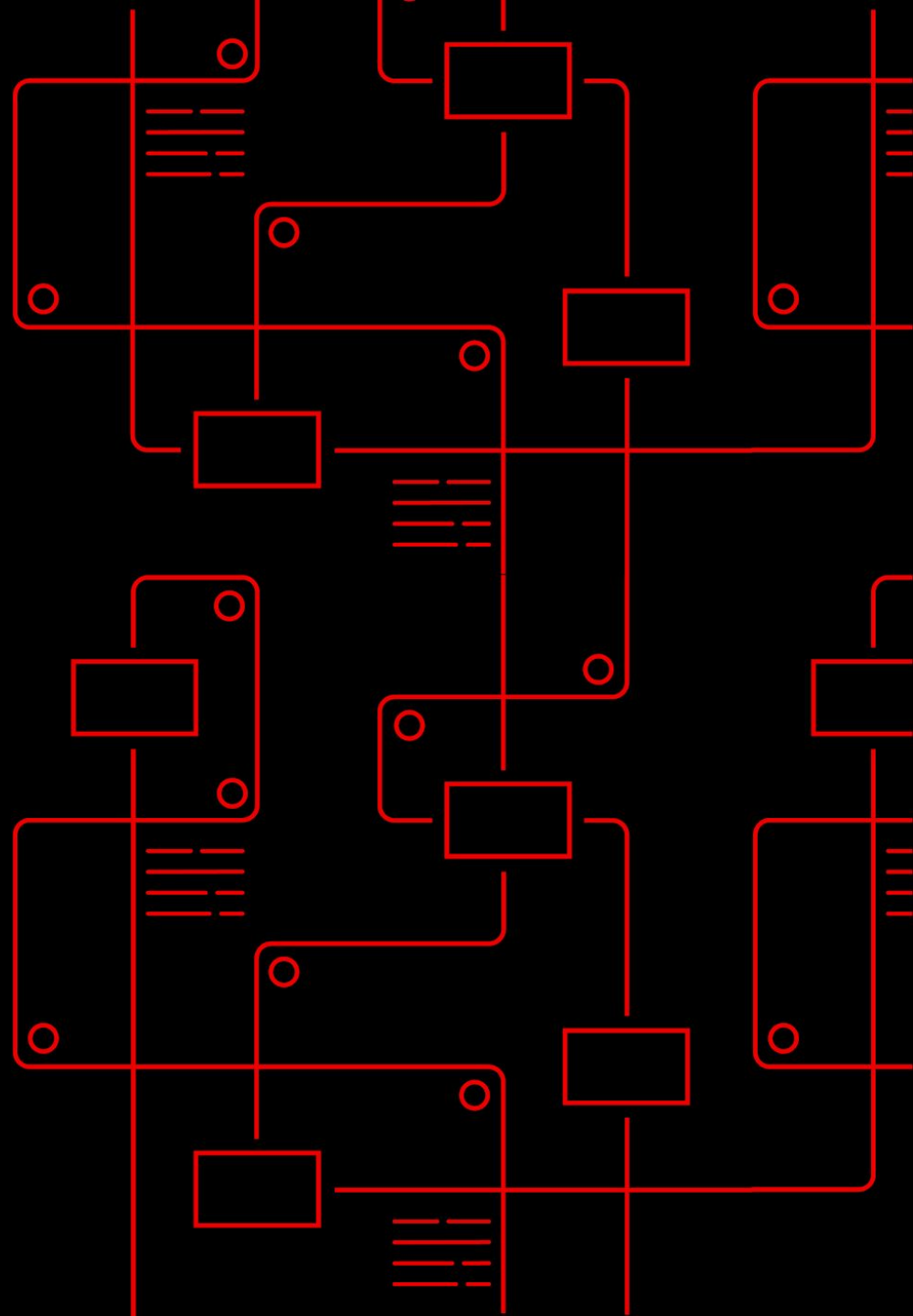
Traffic redistribution

Automate vSphere cluster traffic redistribution through platforms like F5 and A10



```
---  
- name: get health of specified vCenter  
  vmware.vsphere_rest.appliance_health_system_info  
  register: result  
  
- name: configure f5 load balancer  
  f5networks.f5_modules.bigip_pool_member:  
    pool: my_pool  
    name: my_application  
    host: "192.168.1.49"  
  
- name: configure a10 load balancer  
  a10.acos_cli.acos_config:  
    src: "{{item}}"
```

Next steps



Learning resources

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Thank you

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