Manage vSphere with PowerCLI DSC Resources, Finally!

Kyle Ruddy
Sr Architect, Technical Marketing

October 18, 2019

Speaker Introduction

Kyle Ruddy

Senior Architect, Technical Marketing

Writer @ kmruddy.com
GitHub @ github.com/kmruddy
Podcast @ vBrownBag.com
Twitter @kmruddy
MS MVP Cloud/Datacenter Management

Agenda

What is Configuration Management?

What is PowerShell?

What is PowerCLI?

Desired State Configuration (DSC) Introduction

DSC Resources for VMware

Configuration Management

"Configuration management (CM) is a systems engineering process for establishing and maintaining consistency of a product's performance, functional, and physical attributes with its requirements, design, and operational information throughout its life."

https://en.wikipedia.org/wiki/Configuration_management

Configuration Management

Provides:

- Declarative and idempotent (repeatable) deployment
- Unified configuration
- Conformance

Configuration files separate intent:

- **Formerly**: How I want to do it
- **Now**: What I want it to be

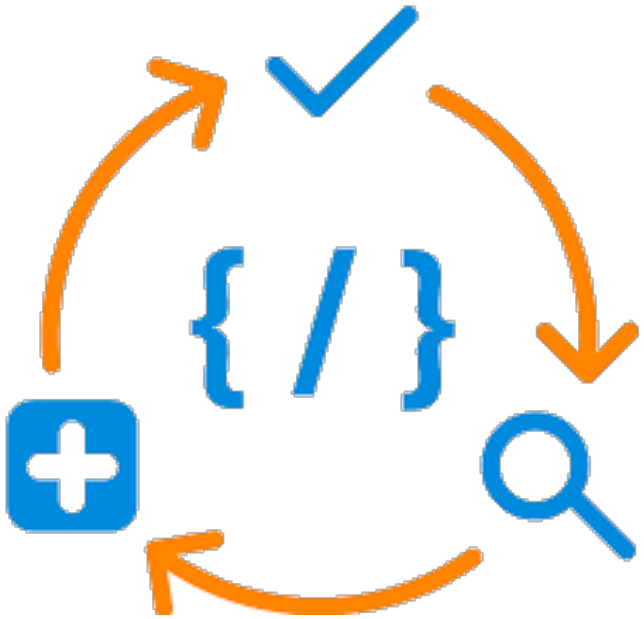


Image Courtesy of: https://www.chef.io/configuration-management/

Why Configuration Management Matters

Everyone wins!

Administrators

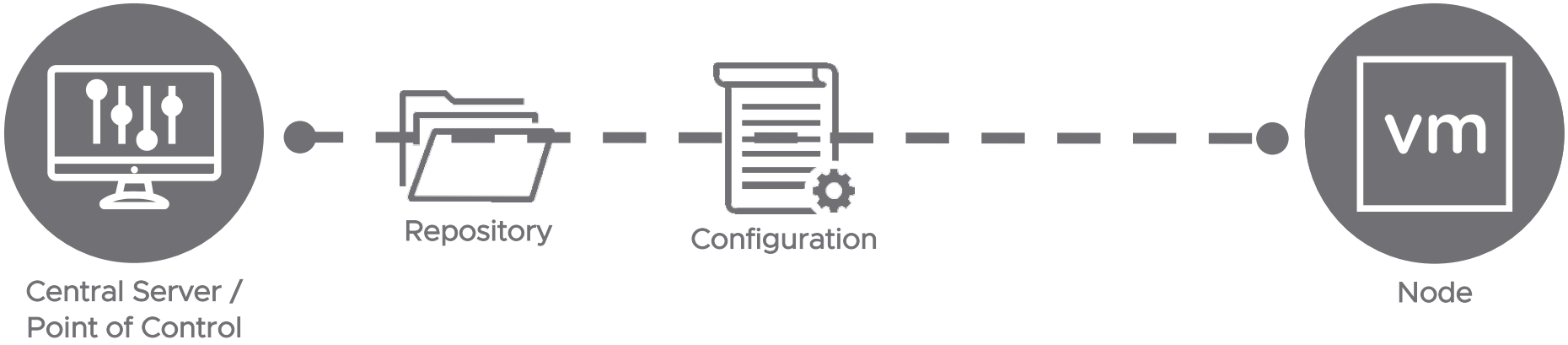
- Speed
- Visibility
- Organization
- Auditability
- Scalable

Developers

- Speed
- Consistency
- Reliability

Configuration Management Breakdown

What's really going on...



Configuration Management Options

Comparing the Options

	Ansible	Chef	Puppet	SaltStack	PowerShell DSC
Script Language	Python	Ruby	Custom Ruby DSL	Python	PowerShell
Infrastructure	Controller applies config via SSH	Chef Workstation push config to Chef Server, then to nodes	Puppet Master syncs config to nodes	Salt Master push config to Minion	Node pulls config from Pull Server
Central Point of Control	Ansible Tower	Chef Server	Puppet Master	Salt Master	Pull Server or Azure Automation
Script Terminology	Playbook / Roles	Recipes / Cookbooks	Manifests / Modules	State / Formula	Configurations / Resources
Task Execution Order	Sequential	Sequential	Non-Sequential	Sequential	Sequential

Partial Source: https://www.digitalocean.com/community/tutorials/an-introduction-to-configuration-management

Ansible Example – VMware

Configure Host NTP Settings

```
- name: Set NTP servers for all ESXi Host in given Cluster
  vmware_host_ntp:
    hostname: '{{ vcenter_hostname }}'
    username: '{{ vcenter_username }}'
    password: '{{ vcenter_password }}'
    cluster_name: '{{ cluster_name }}'
    state: present
    ntp_servers:
        - 0.pool.ntp.org
        - 1.pool.ntp.org
  delegate_to: localhost
```

Ansible Example - URI

VCSA SSH Service Management

```yaml
- hosts: localhost
  become: no

  tasks:
    - name: vcenter login
      uri:
        url: https://cloudvc.student.lab/rest/com/vmware/cis/session
        force_basic_auth: yes
        method: POST
        user: administrator@vsphere.local
        password: P@ssw0rd
        status_code: 200
        validate_certs: no
      register: login

    - name: disable ssh
      uri:
        url: https://cloudvc.student.lab/rest/appliance/access/ssh
        force_basic_auth: yes
        method: PUT
        body_format: json
        body: "{{ lookup('file','sshoff.json') }}"
        validate_certs: no
        headers:
          Cookie: "{{login.set_cookie}}"
```

What is PowerShell?

"Windows PowerShell is a task automation and configuration management framework from Microsoft, consisting of a command-line shell and associated scripting language built on the .NET Framework."

https://en.wikipedia.org/wiki/Windows_PowerShell

What is PowerShell?

A simple and straight-forward path to automation

- Already installed on all modern Windows Operating Systems
- Integrated and rich help system

Modular and Object-oriented

- The best of a programming language melded with a scripting language
- True portability of code via modules (and snap-ins)

PowerShell Core 6.0 available additionally for Linux and MacOS

Open Sourced: https://github.com/PowerShell/PowerShell

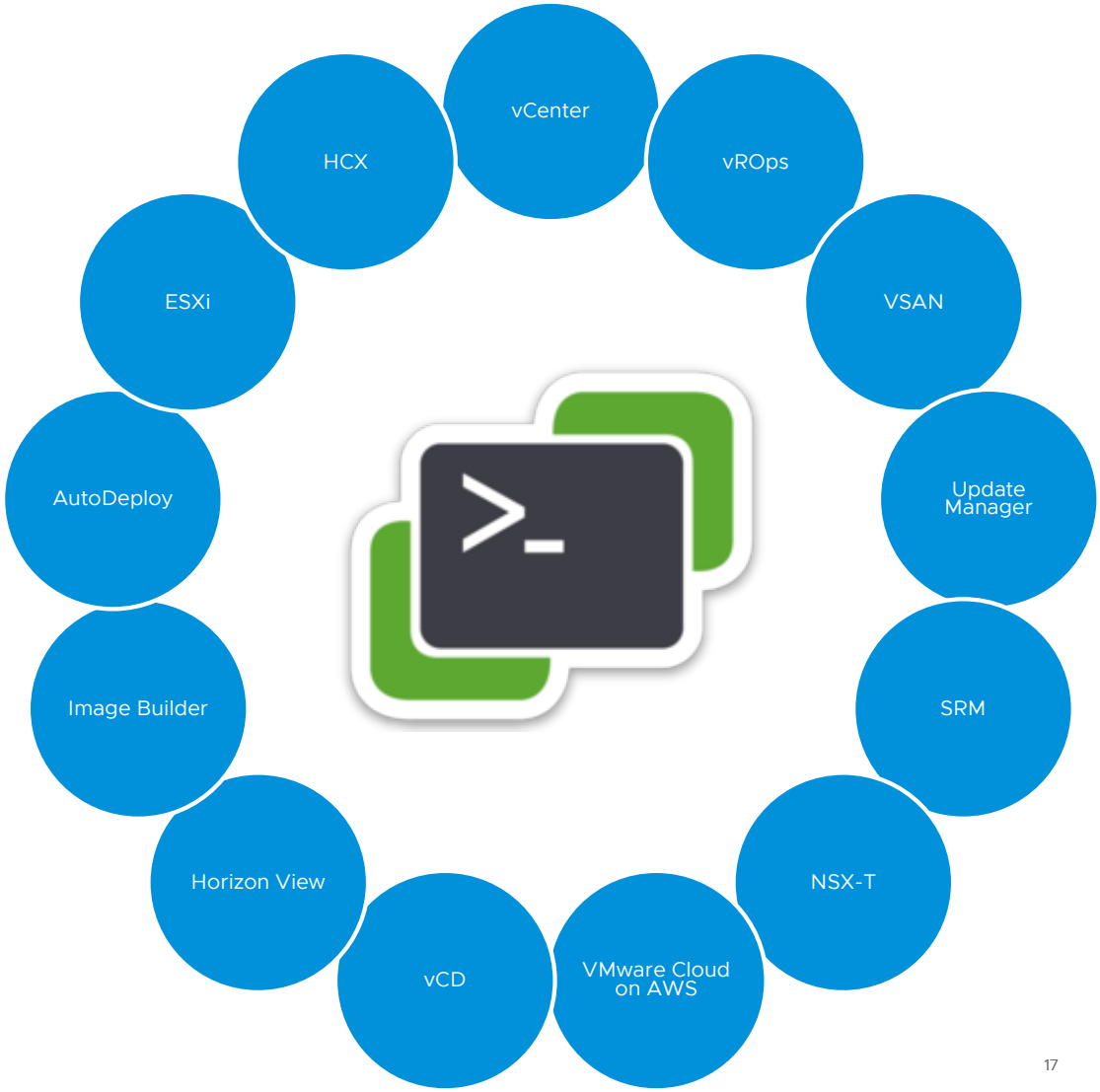
What is PowerCLI?

What is PowerCLI?

VMware's command-line and scripting tool built on Windows PowerShell

Features more than 700 cmdlets for managing and automating vSphere, vCloud, and Horizon environments

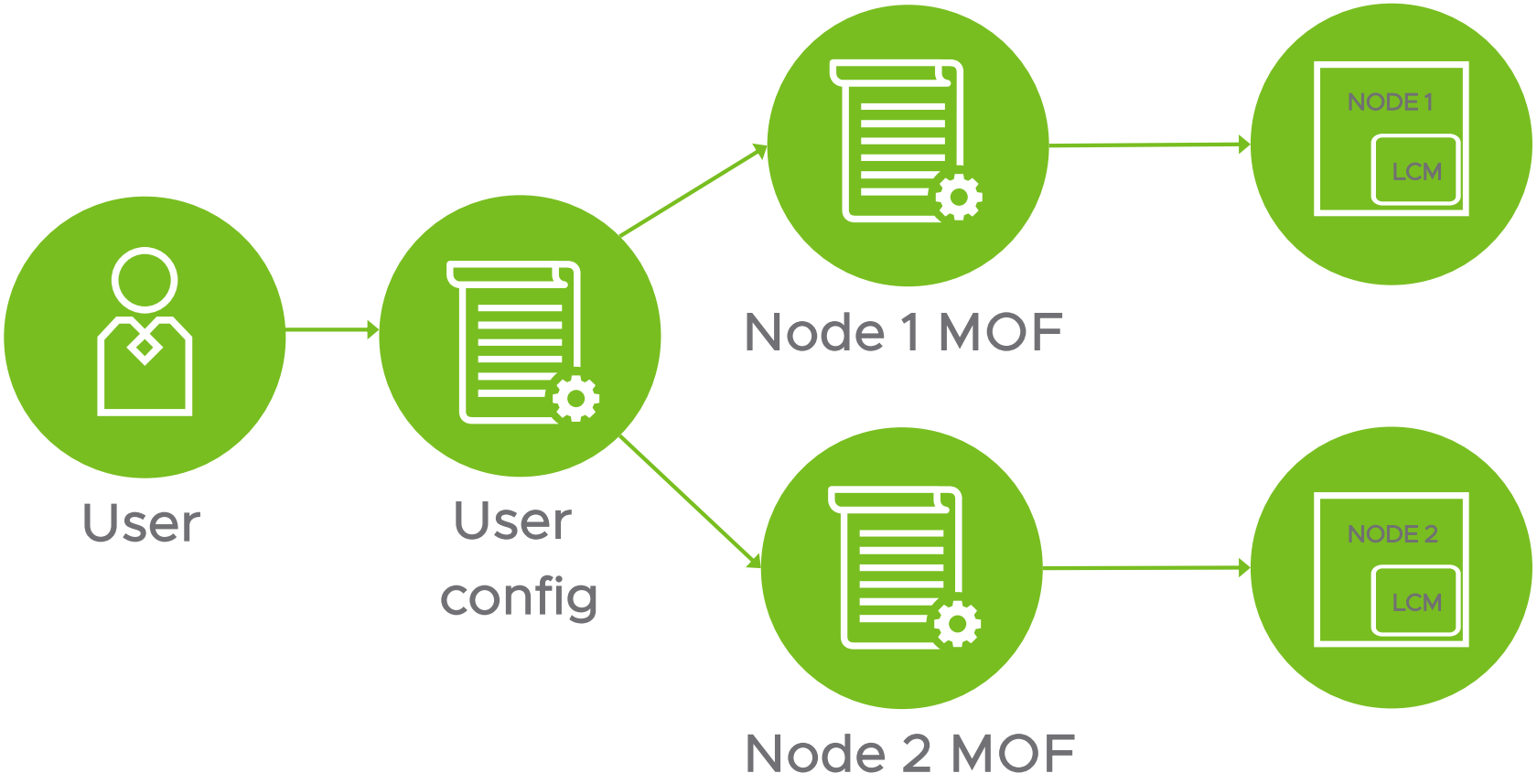
One of the most robust and complete PowerShell deployments in the world



PowerShell
Desired State Configuration

Introduction

How DSC works



Sample Configuration File

```
1  Configuration MyDscConfiguration {
2
3      Node @('localhost', 'server01') {
4          WindowsFeature MyFeatureInstance {
5              Ensure = 'Present'
6              Name = 'RSAT'
7          }
8
9          WindowsFeature MyFeatureInstance {
10             Ensure = 'Present'
11             Name = 'BitLocker'
12         }
13     }
14 }
15
16 MyDscConfiguration
```

Desired State Configuration

Resources for VMware

DSC Resources for VMware

Overview

Introduced December of 2018: VMware.vSphereDSC

Allows declarative language-based management against vCenter and ESXi Hosts

Open Sourced: https://github.com/vmware/dscr-for-vmware

- Contributions Welcome!

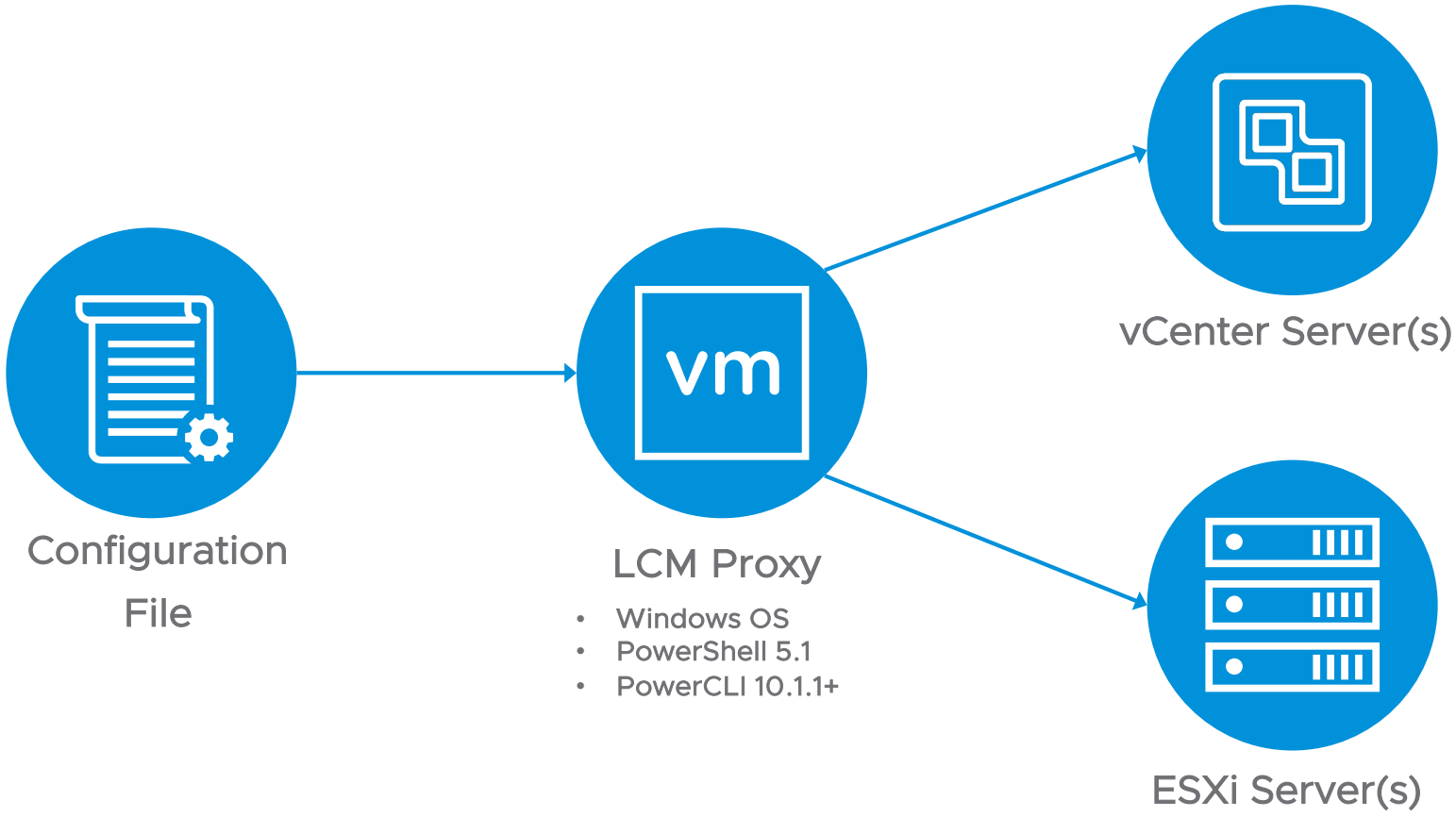
Dependencies:

- PowerShell 5.1
- PowerCLI 10.1.1 or newer

Requirements:

- Able to run PowerShell as Administrator
- PowerCLI and vSphere DSC installed for all users' access

DSC for VMware



Sample Configuration File

```
1  Configuration VMHostNtpSettings_Config {
2      Import-DscResource -ModuleName VMware.vSphereDSC
3
4      Node localhost {
5          $Password = $Password | ConvertTo-SecureString -AsPlainText -Force
6          $Credential = New-Object System.Management.Automation.PSCredential($User, $Password)
7
8          VMHostNtpSettings vmHostNtpSettings {
9              Name = $Name
10             Server = $Server
11             Credential = $Credential
12             NtpServer = @("0.pool.ntp.org", "1.pool.ntp.org")
13             NtpServicePolicy = "automatic"
14         }
15     }
16 }
17
18 VMHostNtpSettings_Config -ConfigurationData $script:configurationData
```

DSC Resources for VMware

Currently Available

vCenter Settings

- Statistics
- Logging Level
- TaskMaxAge
- EventMaxAge
- Motd
- Issue
- Datacenter
- Cluster

ESXi Host Settings

- NTP
- DNS
- SATP Claim Rules
- TPS
- Issue
- Syslog
- Services
- Standard Switches

PowerCLI Settings

- Configuration

DSC Resources for VMware

In Progress

Standard Switch Resources

- Security
- Shaping
- Teaming

VMHost Resources

- Advanced Settings
- PCI Passthrough
- Power Policies

Cluster Resources

- HA Settings
- DRS Settings

PowerCLI DSC Demos

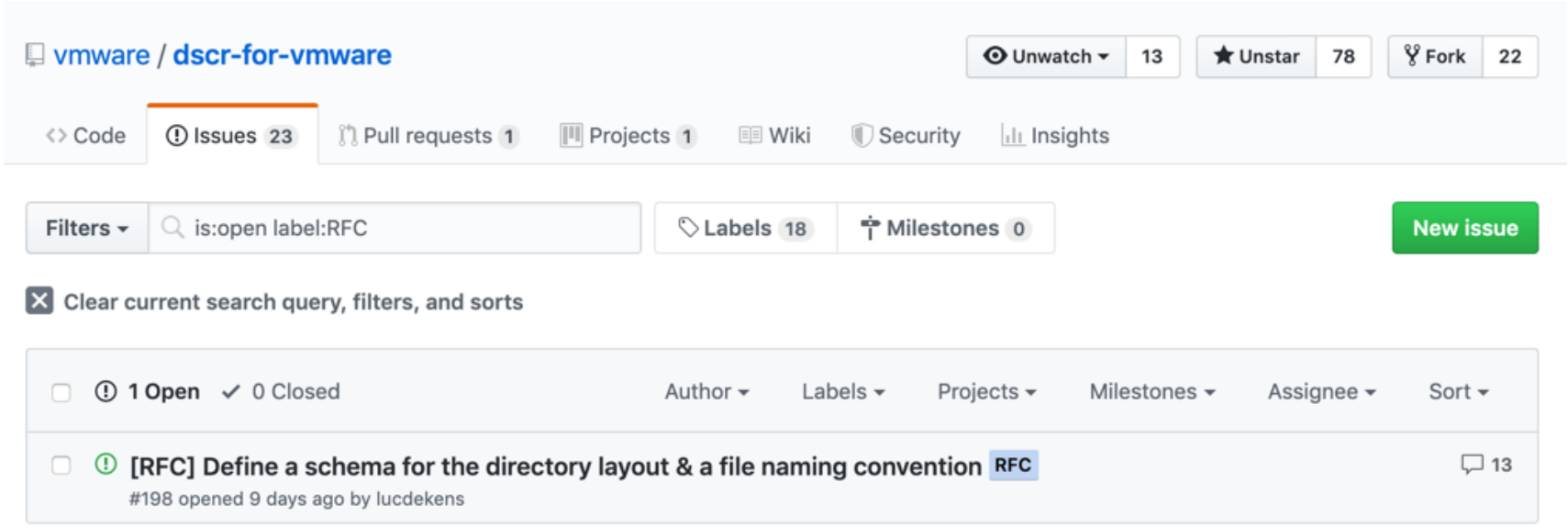
One More Thing…

DSC Is a Platform Interface

Hot Take Alert

Open Request for Comment

Composite Resources Schema and Conventions



Info: https://github.com/vmware/dscr-for-vmware

Kyle Ruddy - @kmruddy

Thank You

VMware {code}