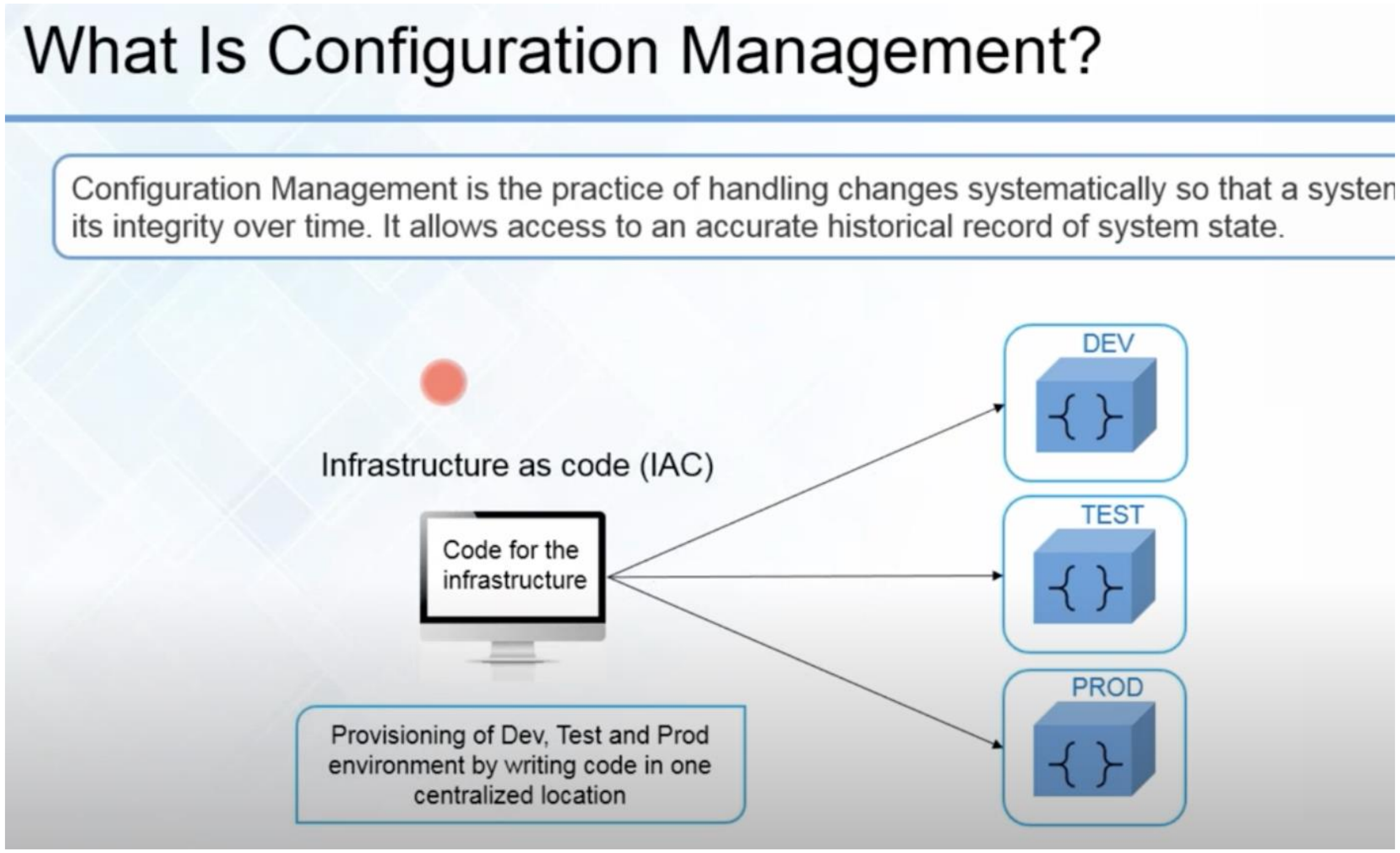
Puppet

Configuration Management Tool

Configuration Management



What Is Configuration Management?

Configuration Management is the practice of handling changes systematically so that a systen
its integrity over time. It allows access to an accurate historical record of system state.

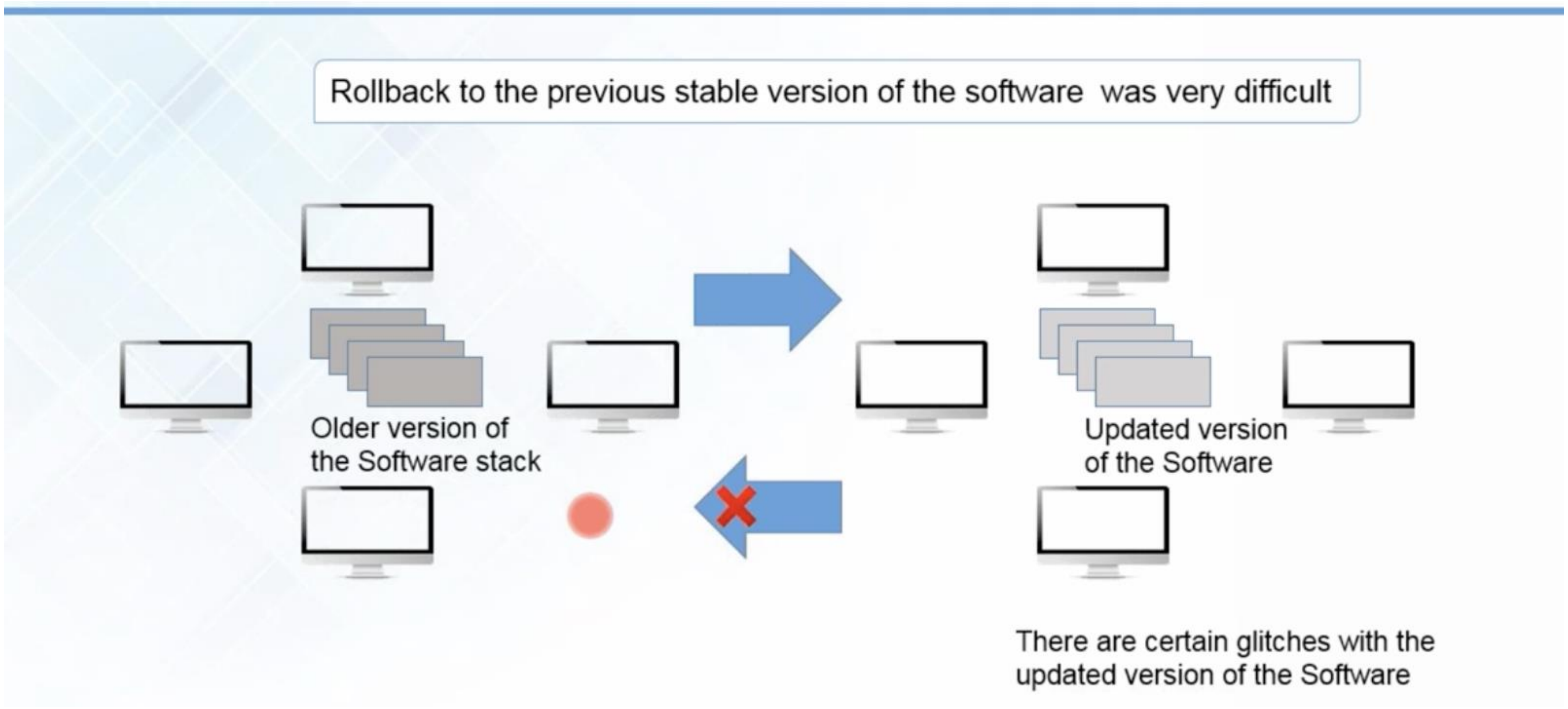
Infrastructure as code (IAC)

Provisioning of Dev, Test and Prod environment by writing code in one centralized location

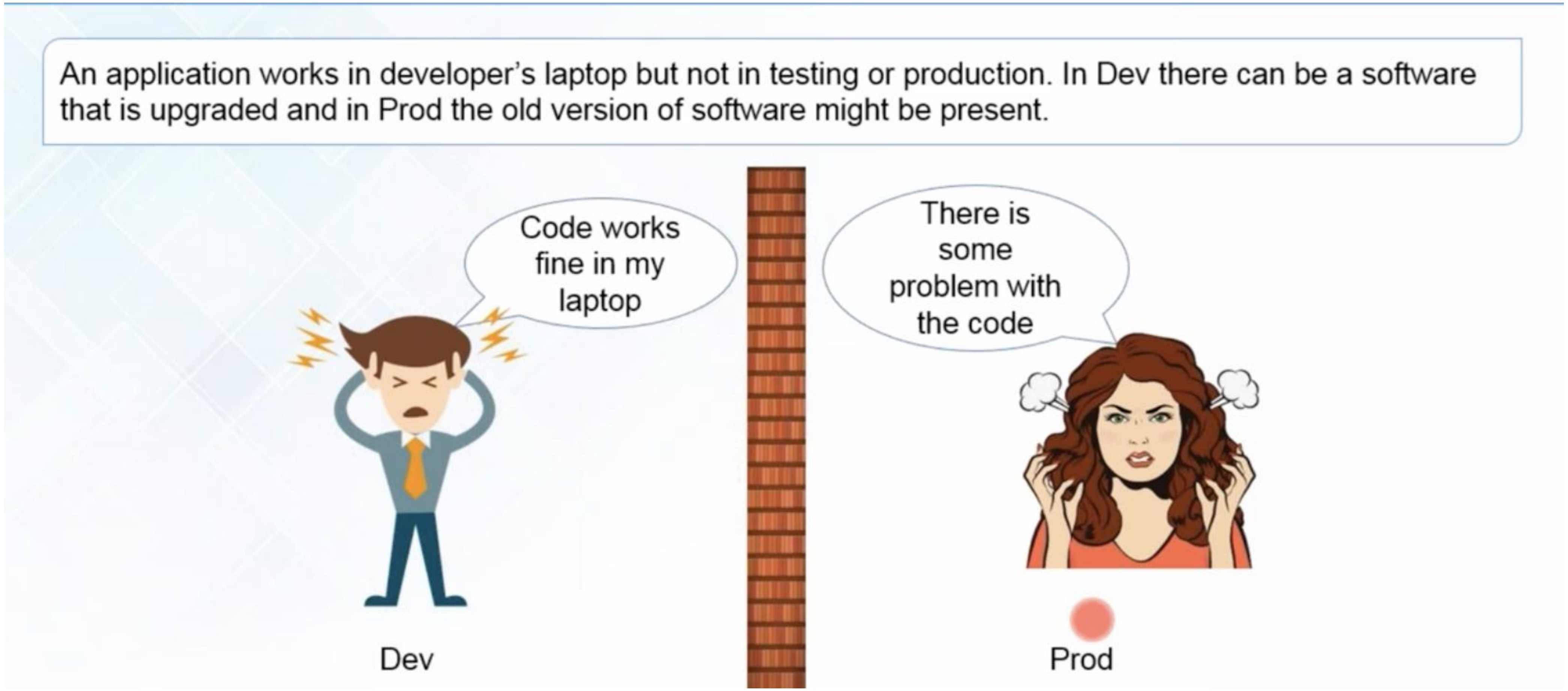
Problems Before Configuration Management

1. Updating with mean stack
2. Code works on Dev machines
3. Rollback of versions

Updating the mean stack


Rollback to the previous stable version of the software was very difficult
Older version of the Software stack
Updated version of the Software
There are certain glitches with the updated version of the Software

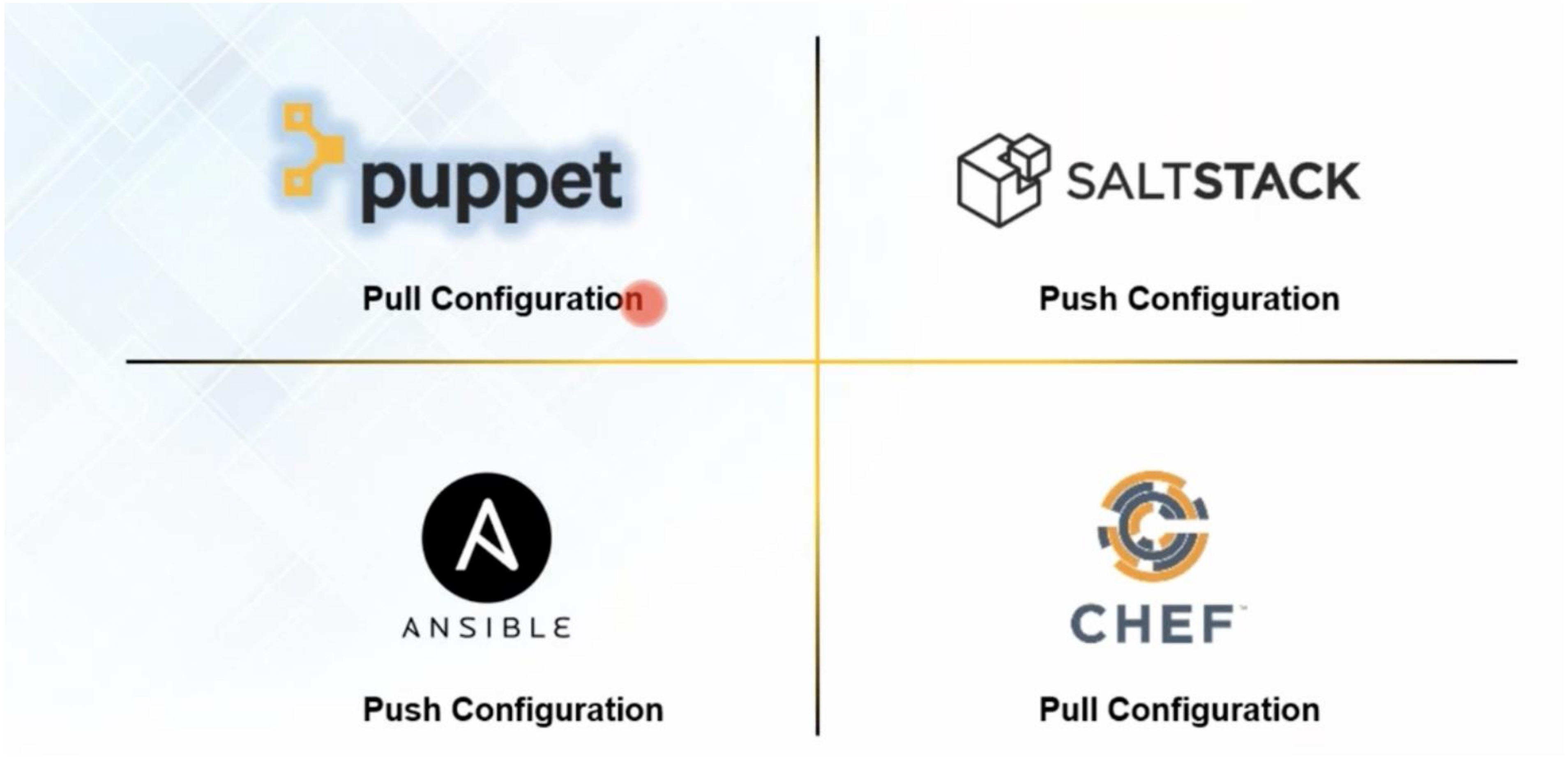
Code doesn’t work on production



An application works in developer’s laptop but not in testing or production. In Dev there can be a software that is upgraded and in Prod the old version of software might be present.

Code works fine in my laptop
There is some problem with the code
Dev
Prod

Configuration Management Tools



puppet

Pull Configuration

SALTSTACK

Push Configuration

ANSIBLE

Push Configuration

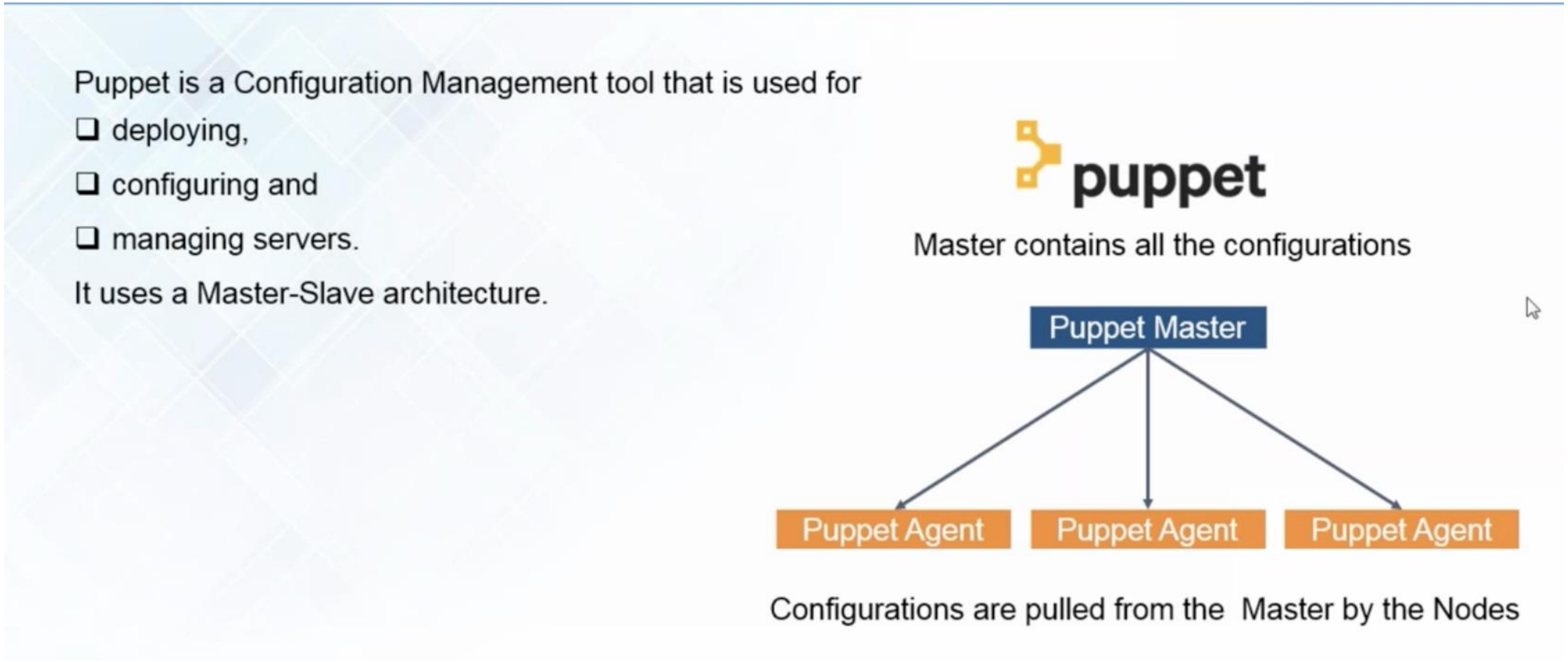
CHEF

Pull Configuration

What is Puppet?

- Puppet is an open-source configuration management tool.
- Automates the deployment, configuration, and management of servers.
- Ensures consistency across multiple systems.

Uses of Puppet



Puppet is a Configuration Management tool that is used for

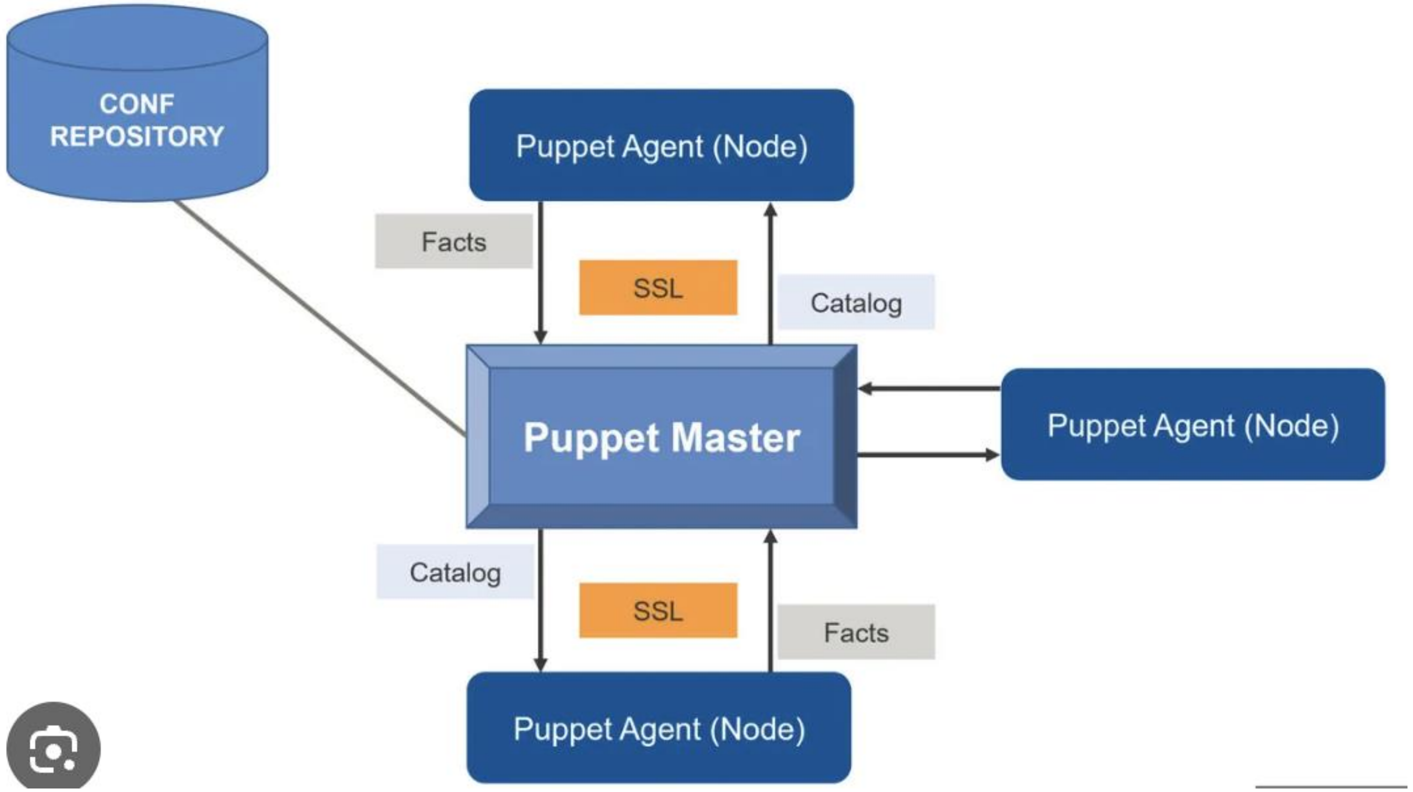
- ❑ deploying,
- ❑ configuring and
- ❑ managing servers.

It uses a Master-Slave architecture.

Master contains all the configurations

Configurations are pulled from the Master by the Nodes

Puppet Architecture



Puppet Architecture

- **Puppet Master:** Central server managing configurations.
- **Puppet Agent:** Client machine applying configurations.
- **Manifests (.pp files):** Define the desired state.
- **Catalog:** Instructions compiled and sent to agents.
- **Modules:** Collection of manifests and files.
- **Facter:** Gathers system facts like OS, memory, CPU.
- **Hiera:** Stores configuration data separately.

How Puppet works

- The agent sends a certificate with its ID to the server.
- The server signs the certificate and sends it back to the client.
- The agent polls the master server for changes.
- If changes are found, the agent notifies the host machine.
- The host machine pulls the changes.
- The agent executes the manifests on its machine.
- The client generates a report that describes any changes made.
- The client sends the report to the master.

Why use Puppet?

- Reduces manual effort and human errors.
- Ensures consistency and repeatability.
- Scales easily in large environments.
- Supports both agent-based and agentless setups.

Installing Puppet

- Puppet Master
  - sudo apt update
  - sudo apt install puppetserver -y
- Puppet Agent
  - sudo apt install puppet-agent –y
- Start the Puppet Service
  - sudo systemctl start puppetserver
  - sudo systemctl enable puppetserver

Puppet Manifest

```
package { 'nginx’:
        ensure => installed,
}
service { 'nginx’:
  ensure => running,
  enable => true,
}
```

Apply the manifest:

```
puppet apply mymanifest.pp
```

Apply manifest

- Puppet apply manifest.pp

Puppet Best Practices

- Follow **Idempotency**: Re-running should not cause unnecessary changes.
- Use **Modules** to structure code.
- Keep manifests **clean and readable**.
- Separate **data from code** using Hiera.
- Use **Git for version control**.

Installing on windows

- Downloads link - https://downloads.puppetlabs.com/windows/
- https://docs.huihoo.com/puppet/windows/installing.html#downloads

Creating File using Puppet

```
• file { '/tmp/hello.txt':   # On macOS/Linux
     ensure  => file,
   content => "Hello, Puppet!",
• }
```

Check Service

```
windowsfeature { 'Web-Server':
  ensure => present,
}

service { 'W3SVC':
  ensure  => running,
  enable  => true,
  require => Windowsfeature['Web-Server'],
}
```

Apply & Verify manifest on windows

- puppet apply C:\puppet\install_apache.pp
- Verify puppet resource package httpd
- netstat -ano | findstr :80