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puppet as a DevOps Tool

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What is PUPPET

Puppet is a powerful tool used for automating the configuration management of your IT infrastructure.

It allows you to manage your servers, networks, and applications at scale and ensures that they are configured and maintained consistently.

- ➢ Puppet is a configuration management tool.
- ➢ Automated configuration management is scalable and prevents vulnerabilities.
- ➢ Puppet is easy to read and write.
- ➢ The Puppet language is platform-agnostic. It runs on many different platforms without code changes.
- ➢ Much of the code you need to automate and configure your servers has already been written in the form of Puppet modules(opens in a new tab).
- ➢ The Puppet language is a core part of both open-source Puppet (OSP) and Puppet Enterprise (PE).

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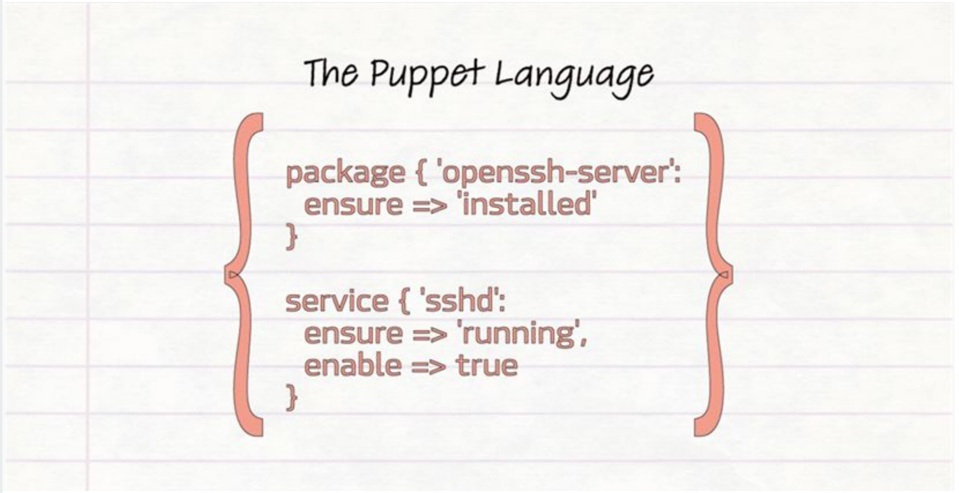
PUPPET SYNTAX

Syntax

```
<TYPE> { '<TITLE>':
        <ATTRIBUTE> => <VALUE>, }
```



```
package { 'openssh-server':
  ensure => 'installed'
}

service { 'sshd':
  ensure => 'running',
  enable => true
}
```

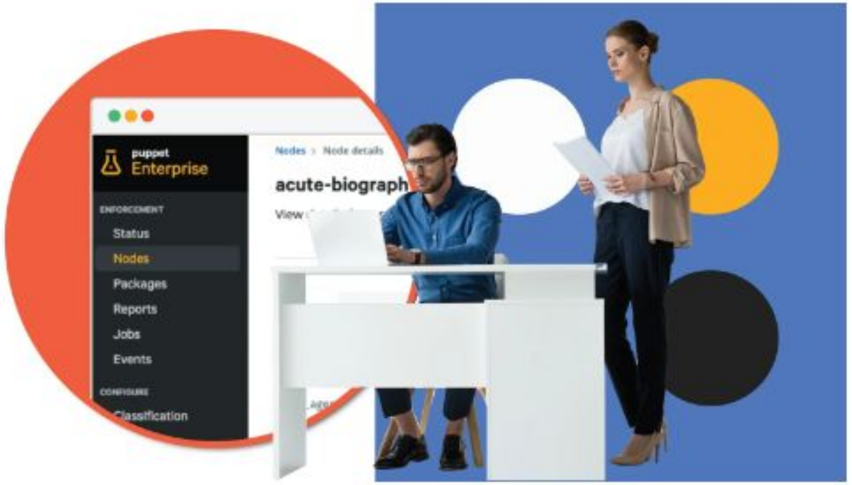
Configuration management tools

- ➔ Ansible
- ➔ Chef
- ➔ Puppet
- ➔ SaltStack (Salt)
- ➔ Terraform
- ➔ Docker and Kubernetes
- ➔ AWS CloudFormation
- ➔ Azure Resource Manager (ARM)
- ➔ Google Cloud Deployment Manager
- ➔ Jenkins

Configuration management tools were introduced to help solve this problem. These tools automate the process of:-

- Configuring,
- Deploying
- Managing software and hardware components.

Overall, Puppet simplifies the management of complex infrastructure by allowing administrators to define configurations in a **declarative manner** and **automating** the process of ensuring that systems are in the **desired state**.



Puppet vs. Ansible: What's the Difference?

The main difference between Puppet and Ansible is that Puppet is built for complexity, scale, and long-term deployment, while many use Ansible for smaller, simpler deployments. Additionally, Puppet uses desired state automation – Ansible is built to be task-based, and can only be used declaratively with more effort.

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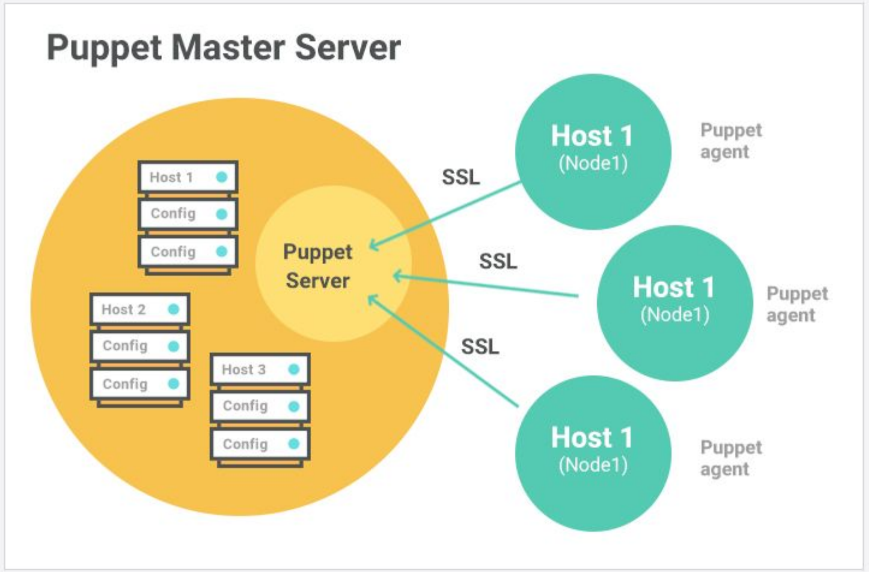
How does it work?



Declaration of Desired State: Puppet uses a domain-specific language (DSL) to define the desired configuration state of your systems. This includes specifying things like which software packages should be installed, which files should exist and their contents, which services should be running, and more.

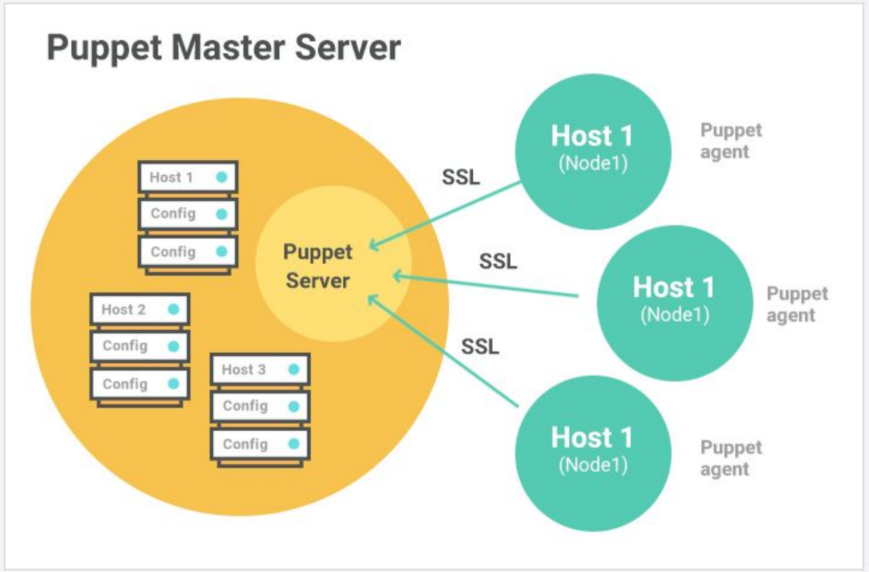
Puppet Manifests: Puppet code is typically organized into manifests, which are files containing the configuration instructions. These manifests specify what resources should be managed and what their desired states are.

Agent-Server Model: Puppet operates on a client-server model. Puppet agents run on the target systems that need to be configured. These agents periodically request updates from a Puppet master server.

Catalog Compilation: The Puppet master server compiles a catalog for each Puppet agent. The catalog is a compiled representation of the desired configuration based on the manifests. It includes a list of resources and their associated attributes.

Comparison and Enforcement: The Puppet agent receives the catalog from the Puppet master and compares the current state of the system to the desired state described in the catalog.

How does it work?



Automation: If there are differences between the actual state and the desired state, Puppet takes action to bring the system in line with the desired state. This might involve installing or uninstalling packages, modifying configuration files, starting or stopping services, and more.

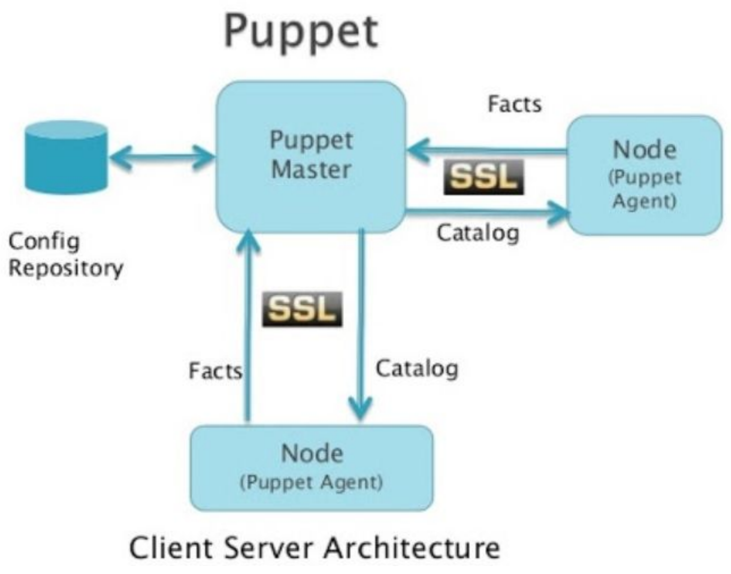
Reporting and Logging: Puppet agents report their activities and changes back to the Puppet master. This information can be used for auditing, troubleshooting, and monitoring purposes.

Invariant: Puppet is designed to be invariant, meaning that you can apply the same configuration repeatedly without causing issues. If a system is already in the desired state, Puppet will not make unnecessary changes.

Extensibility: Puppet is highly extensible and supports the use of modules, which are reusable units of configuration. Puppet Forge is a repository of pre-built Puppet modules created by the community.

Version Control: It's common practice to store Puppet code in version control systems like Git, allowing you to track changes, collaborate with others, and manage your infrastructure as code.1

In brief



Agent: The agent is software installed on each target node or server you want to manage. It communicates with the Puppet master server to request and apply configurations. The agent periodically checks in with the master to ensure the system aligns with the desired state defined in Puppet manifests.

Master: The master, often referred to as the Puppet master server, is a central server where you store your Puppet configuration files (**manifests**) and maintain a repository of desired configurations. It compiles Puppet manifests into catalogs for each agent, sends these catalogs to agents upon request, and receives reports from agents about the changes made during configuration enforcement. The Puppet master is responsible for orchestrating and controlling the configuration management process across your infrastructure.

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DEMO

Configuring Code Manager to move code from source control to the primary server.

Questions?