Introduction to Modern Configuration Management

Fish
jfsc@cin.ufpe.br

THE ATTENDANTS WILL LEARN...

- Understand DevOps disciplines

- Uderstand what is configuration management

- Understand challanges of configuration management at scale

- Understand the role of Configuration management tools

- What is infrastrucutre-as-a-code

- Use the Ansible to implement concepts

AssertLab
Advanced Software and Systems
Engineering Research Technologies

DevOps Disciplines

–Software and Infrastructure Automation

–Development management

–Architecting

–Environment Management

–Application Lifecycle Management

–Configuration Management

–Service dependency management

–Tooling

–Collaboration

– Monitoring & measurement (peoples, machines, systems)

What is?

- "is a set of tracking and control activities that are initiated when a software engineering projects begins and terminates when software is taken out of operation" [Pressman]

Processes of CM

- Change Management

- Version Management

- System Building

- Release Management

From : Ian Sommerville. Software engineering 2011

AssertLab
Advanced Software and Systems
Engineering Research Technologies

Components of modern CM

- Distributed Version Control,

- braching models,

- build managers,

- cotainers,
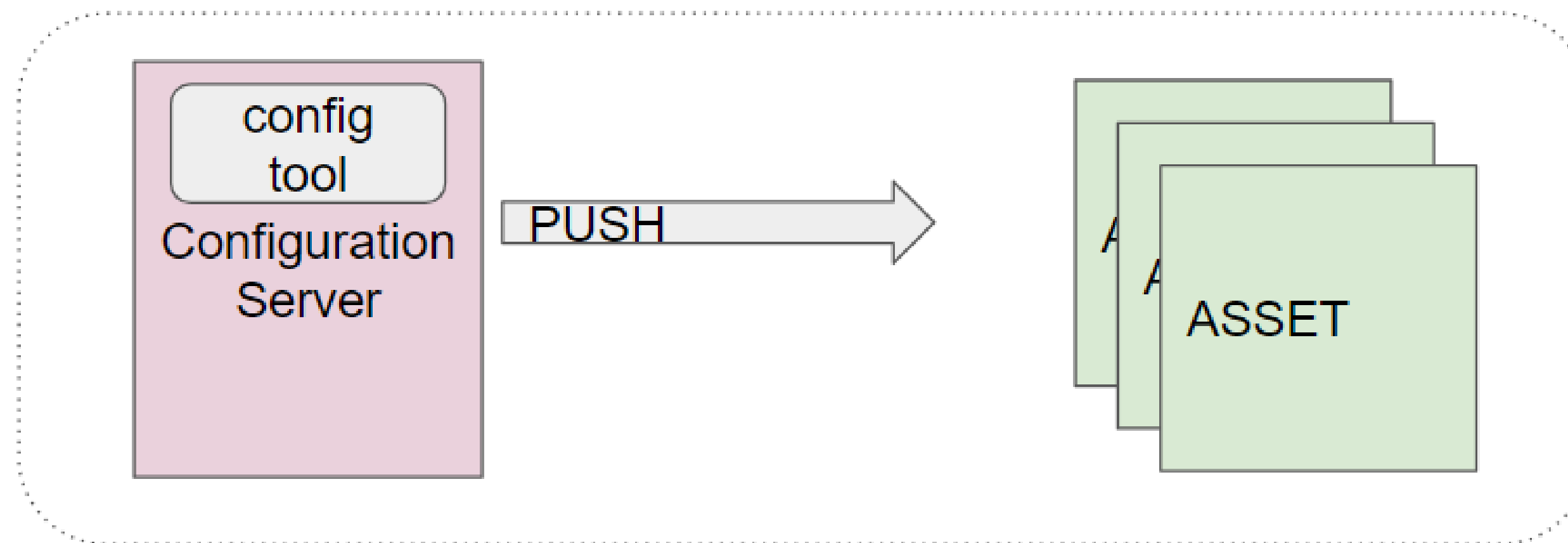
- data migration,

- configuration tools, data migration

AssertLab
Advanced Software and Systems
Engineering Research Technologies

Development Paradigm

Imperative	vs	Declarative
• Functional		• Object Oriented
• Do this, then this		• Do this and this, as you see fit
• Chef		
• Salt		• Puppet
• Ansible		• Salt

From: https://www.assistanz.com/imperative-versus-declarative-in-configuration-management-systems-saltstack/

Common configuration models

- Easier to manage.
- Less enforcement of state (ASSET can drift from config.
- ASSET is managed centrally.
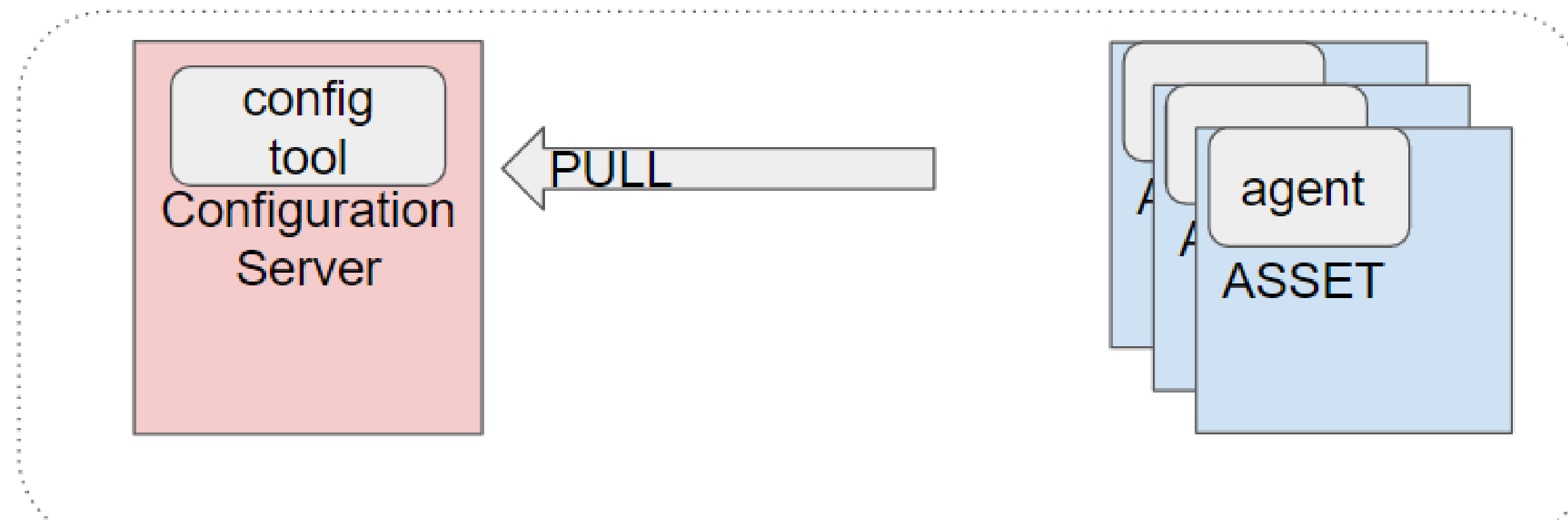
- Better at ensuring assets stay in sync with config. I.e, agent can enforce state.
- More complex.
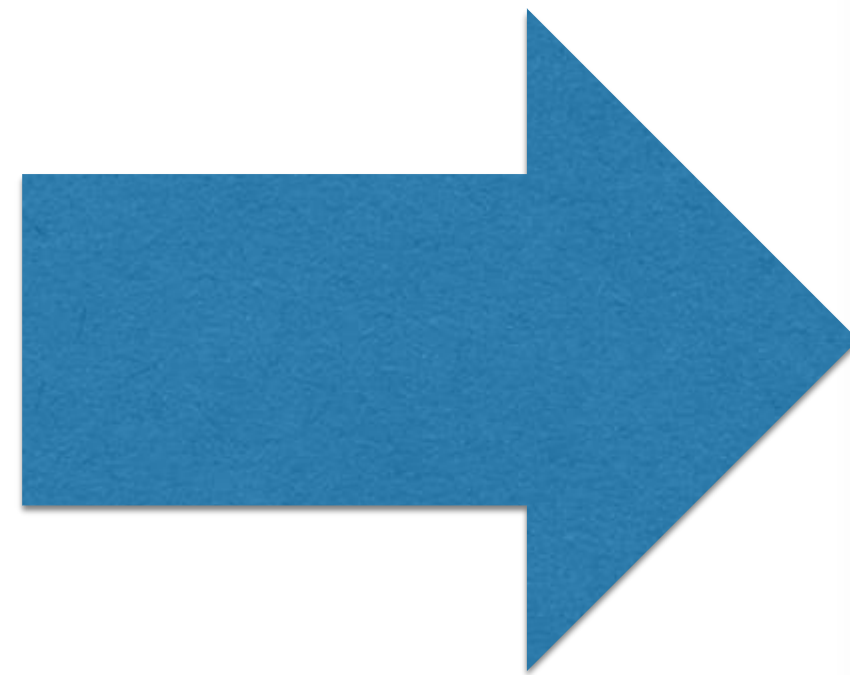- ASSET can register itself.

From: Cristopher http://tiny.cc/devops-cm-slides

AssertLab
Advanced Software and Systems
Engineering Research Technologies

idempotency

- The state don´t change even after multiple calls to a same operation

Idempotency example

$ echo "not idempotent" > file.txt

I'm an idempotent example

```
27 lines (22 sloc)    442 Bytes

 1    ---
 2    - name: Install python-pip
 3      yum:
 4        name: python-pip
 5        state: present
 6
 7    - name:  Check version of pip
 8      pip:
 9       name: pip
10       version: 9.0.1
```

AssertLab
Advanced Software and Systems
Engineering Research Technologies

40 anos

Centro de
Informática

Infrastructure as Code(IaC)

- The process of managing and provisioning computer [data centers](#) through **machine-readable definition files**, rather than physical hardware configuration or interactive configuration tools. [wiki]

Why IaC?

- Configuring Application Server is
  - Redundant
  - Time consuming
  - Error prone
- Application Servce Configuration
  - Changes over time
- Documentation
  - Goes stale

Configuration Tools to help

- Chef

- Puppet

- Ansible ← Our Focus

- Bosh

AssertLab
Advanced Software and Systems
Engineering Research Technologies

What is Ansible

- An open source CM tool which can configure systems, deploy software, and orchestrate more advanced IT tasks such as continuous deployments or zero downtime rolling updates. [from Ansible]

Ansible Components

- Inventory file(s)

- Group vars

- Host vars

- Playbooks

- Roles

- Tasks

- Best practices

AssertLab
Advanced Software and Systems
Engineering Research Technologies

Centro de
Informática

Go to "hands-on" HW11