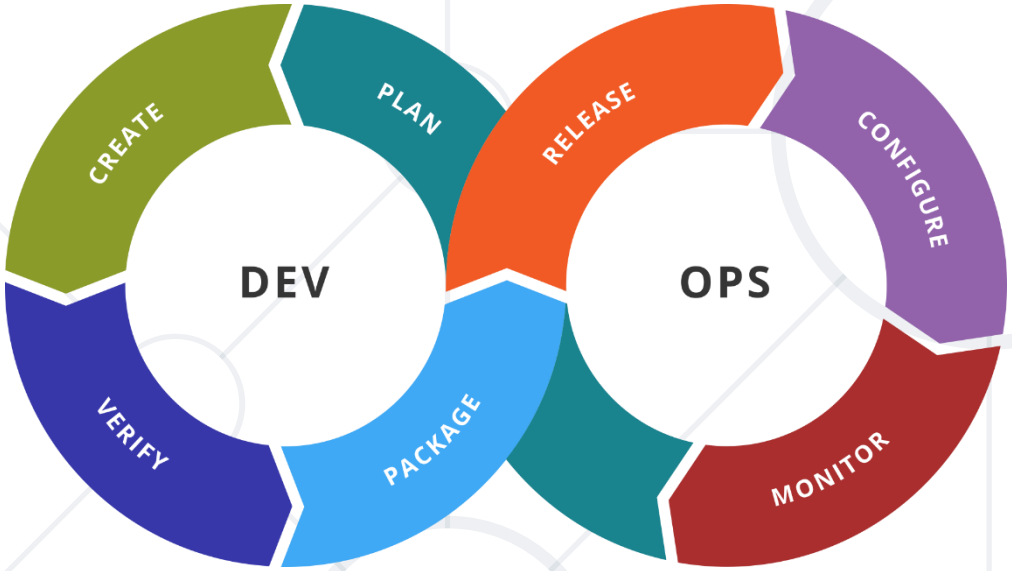
Salt

Introduction and Basic Techniques



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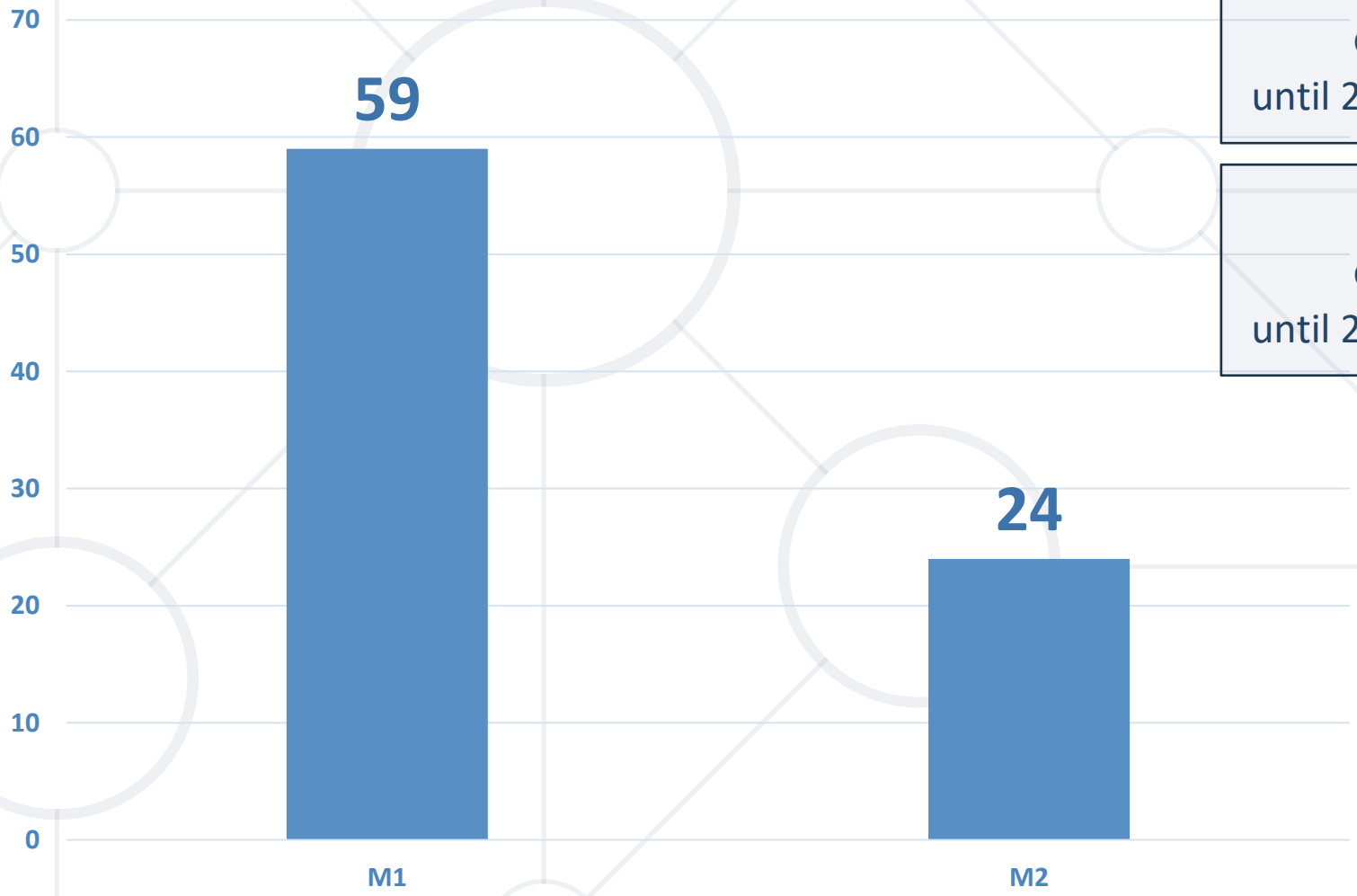
Homework Progress



Solutions for M2
can be submitted
until 23:59 on 19.04.2023

Solutions for M3
can be submitted
until 23:59 on 26.04.2023

Previous Module (M2)

Quick Overview

What We Covered

1. Introduction to Ansible
   - Other solutions
   - Ansible architecture
2. Working with Ansible
   - Work with Inventories and Configurations
   - Using Modules
3. Advanced Ansible
   - Playbooks and Roles

This Module (M3)

Topics and Lab Infrastructure

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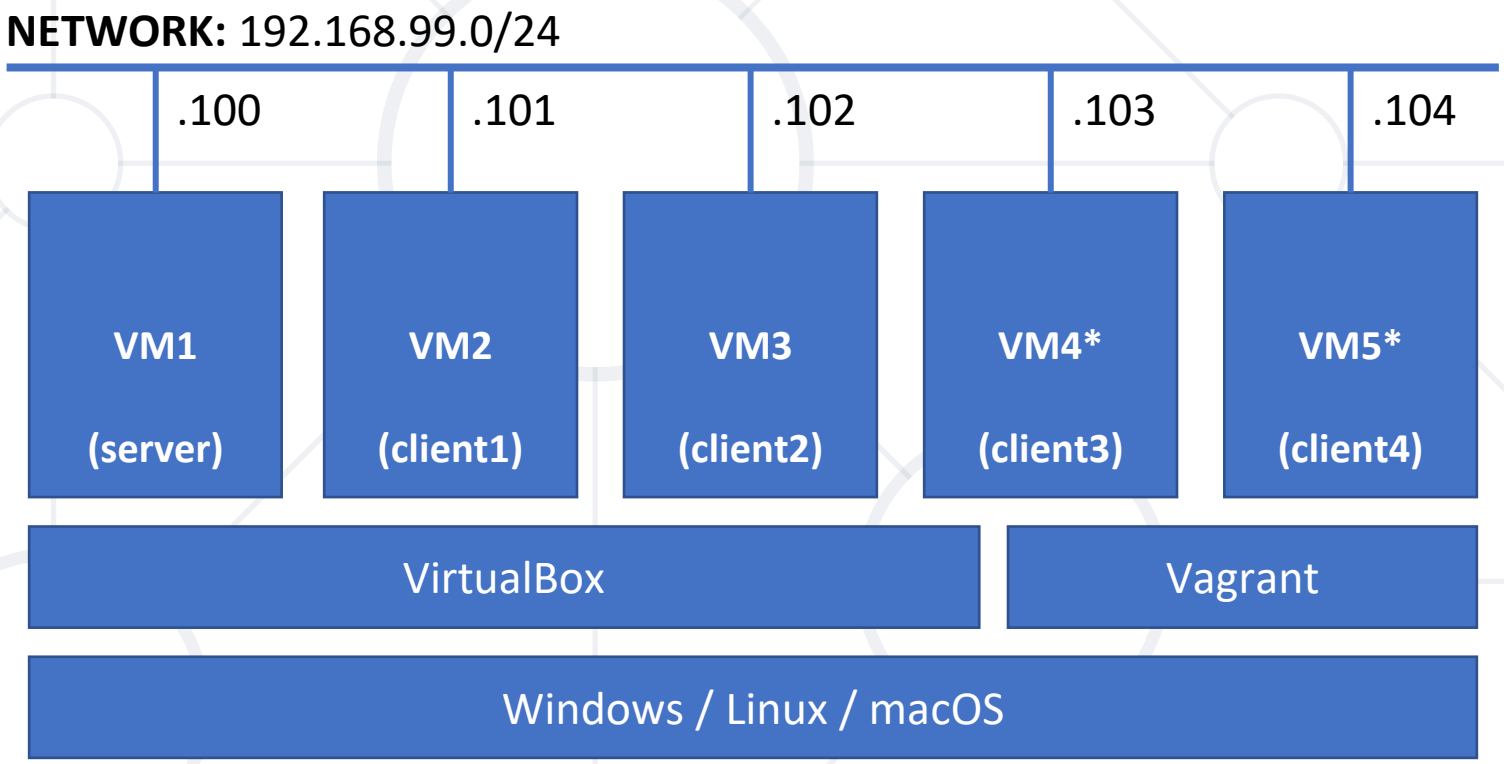
Lab Infrastructure



* VM4 and VM5 can be skipped. Of course, the exercises should be adjusted accordingly

Salt 101

Introduction. Architecture. Installation

Introduction

- Infrastructure management solution that can be used for **data-driven orchestration**, **remote execution**, and **configuration management**
- Management instructions are written in **YAML**
- Two operation modes – with **agents** (**minions**) and agent-less
- Linux/Unix/Windows are both supported as **minions** and **masters**
- Installable via **package management system** and **bootstrap script**

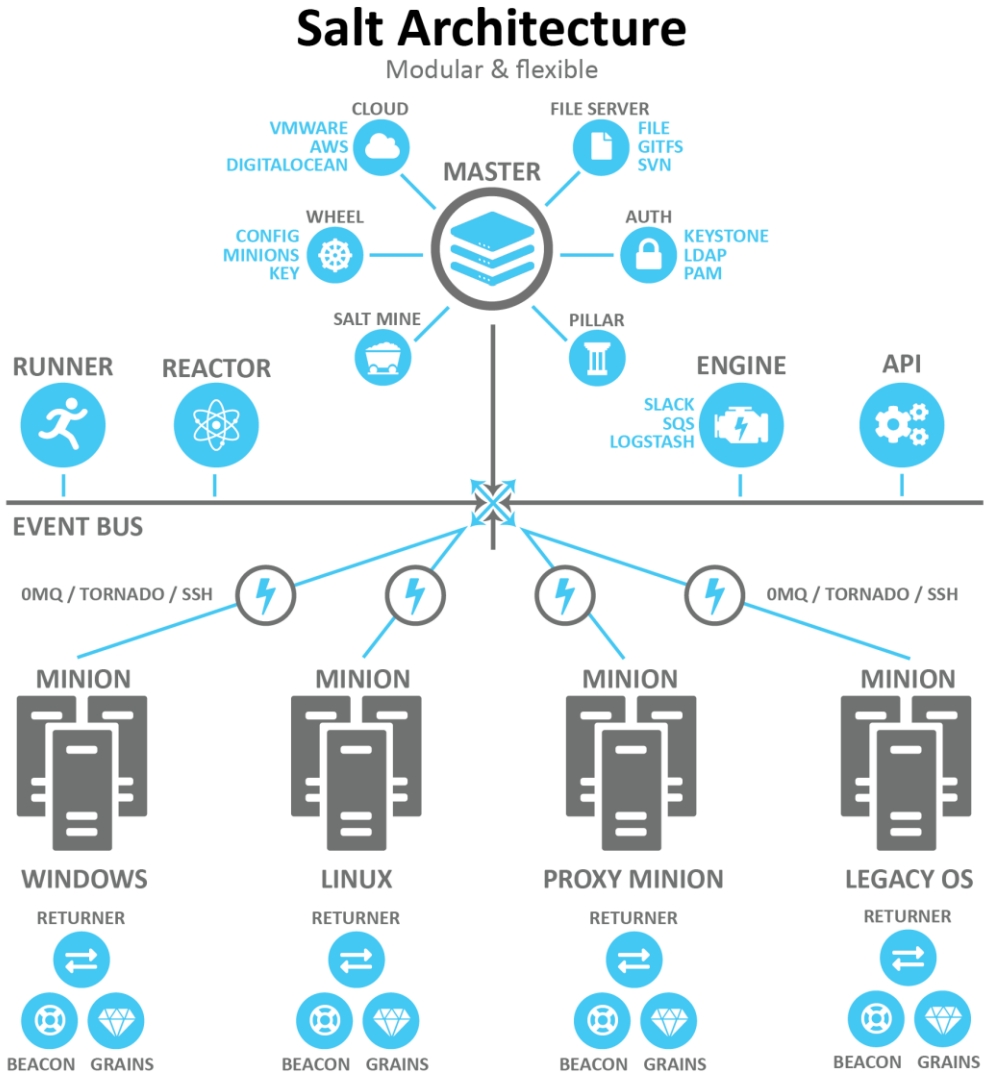
Components and Workflow

- **Salt master** is the machine that controls the infrastructure and dictates policies for the servers it manages
- Master operates both as a **repository** for **configuration data** and as the **control center** that initiates **remote commands** and ensures the **state** of your other machines
- Servers that Salt manages are called **minions**
- Minions are responsible for **executing the instructions** sent by the master, **reporting** on the success of jobs, and **providing data** about the underlying host

Artifacts

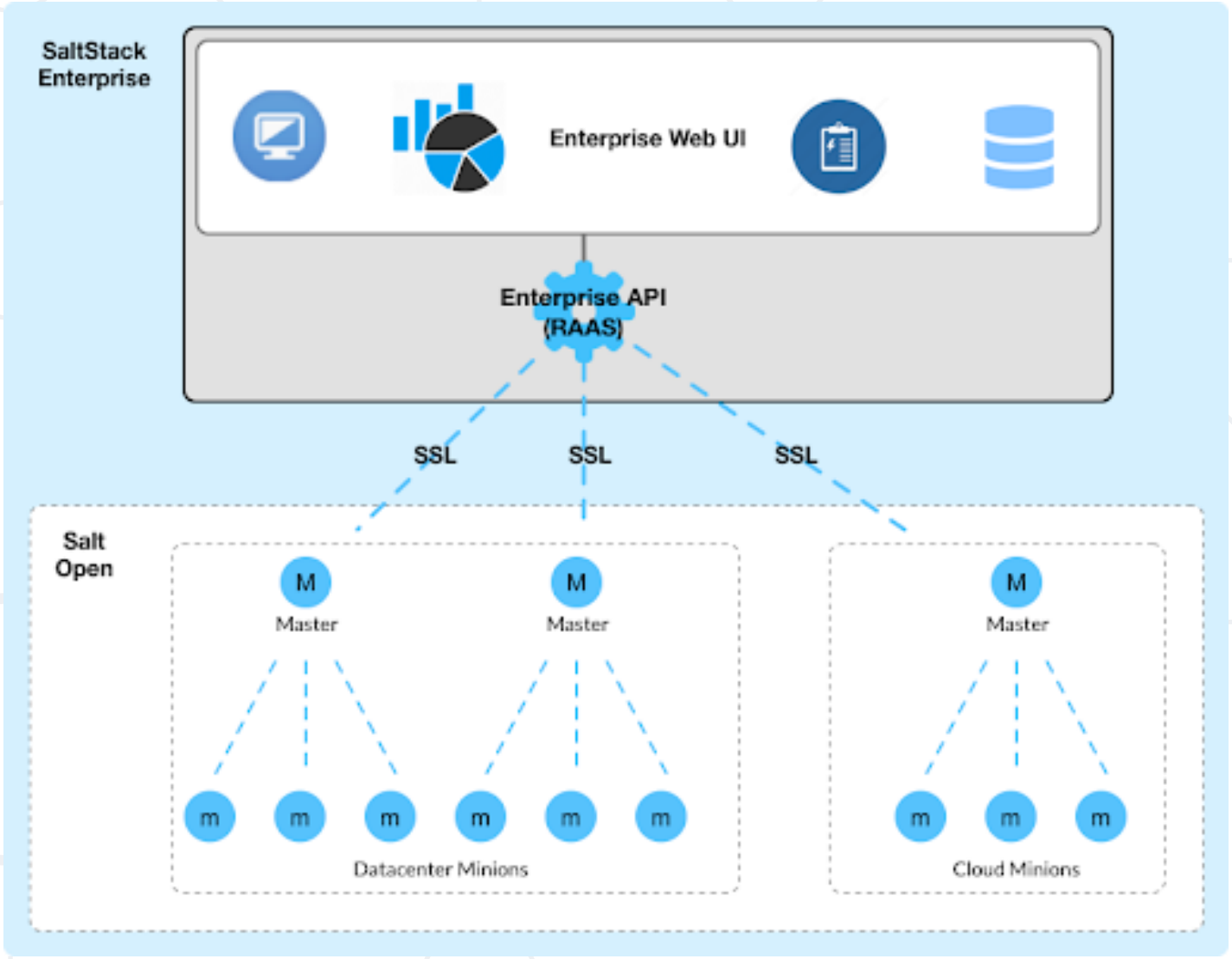
- **Execution modules** are sets of related **functions** that perform work on minions
- The configuration management portion of Salt is primarily implemented using the **state** system, which uses **state modules**
- Salt **formulas** are **sets of state module calls**, arranged with the aim of producing a certain result
- Configuration management is handled by **SLS files**, written in **YAML**, that describe how a system should look once the formula has been applied
- Salt **grains** are pieces of information, gathered by and maintained by a minion, primarily concerning its underlying host system

General Salt Architecture



https://docs.saltproject.io/salt/user-guide/en/latest/topics/overview.html

SaltStack Config



https://docs.saltproject.io/salt/user-guide/en/latest/topics/overview.html

Practice: Salt 101

Live Demonstration in Class

Salt 102

Files. Templates. Filtering. Pillars and Beacons

General Files Outline

- Main Salt components configuration files
  - **/etc/salt/master** and **/etc/salt/minion**
- State files describe the desired state for the minions
  - **YAML** based **SLS** files stored in **/srv/salt** by default
- Top file (**top.sls**) maps minions to states
- Configuration can be split amongst several state files

Filtering (or targeting)

- Can be applied when the configuration is deployed
- Done either in the top file or during the execution
- May use the full name or part of the name plus globing
- Regular expressions are also available
- List of minions can also be used as a target
- IP addresses or subnet addresses can be used as well
- Grain information can be used as well

Pillars

- They are similar to the grains but are created on the master
- Contain information about a minion or group of minions
- Can be used to store and send sensitive data
- Or to hold a variable data
- Usually stored in /srv/pillar folder
- Follow the same structure as with the standard config files
- Use the SLS extension and have a top file as well

Beacons

- Use the Salt event system to monitor non-Salt processes
- Minions monitor and report any activity
- Support monitoring of activities like
  - **File system changes** and **service status**
  - **Network** and **disk usage**, etc.
- Configured either in **/etc/salt/minion**
- Or in **/etc/salt/minion.d/beacons.conf**
- Require the **Pyinotify** package to be present on the minions

Reactors

- Ability to trigger actions in response to an event
- Bind SLS files to event tags on the master
- Have two parts
  - Reactor option set in the master configuration file
  - Reaction files use highdata (like the state system) to define reactions to be executed
- Usually stored in **/srv/reactor/**
- Can be **local**, **runner**, **wheel**, or **caller**

Practice: Salt 102

Live Demonstration in Class

Salt 103

Custom Modules

General #1

- Regular **Python** modules
- Stored in a directory called **_modules/** within the **file_roots** specified by the master config file
- Synced to the minions when **state.highstate** is run
- Or by executing the **saltutil.sync_modules** or **saltutil.sync_all** functions
- If having the same name with a system module, they will take the place of the default module with the same name

General #2

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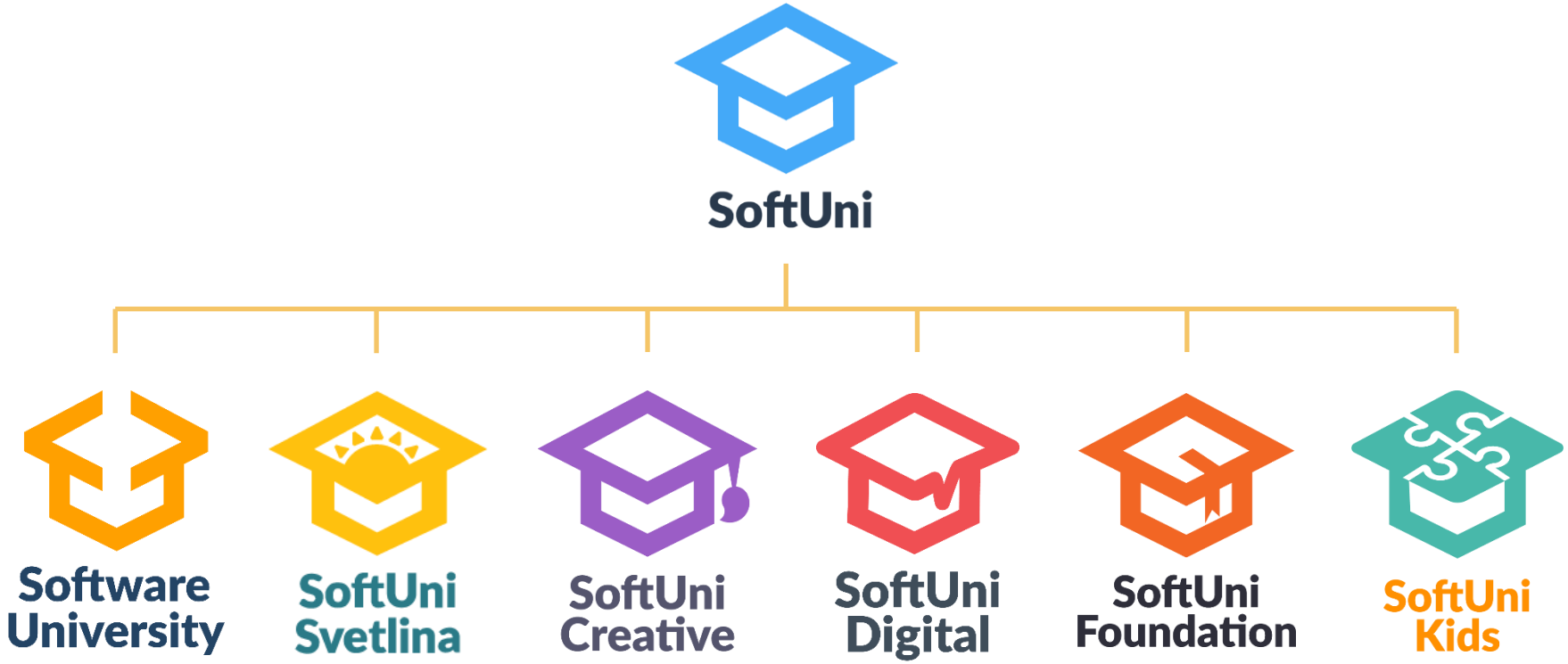
- Module's default name is its **filename**
- The **`__virtualname__`** variable definition defines a custom name for the module
- Its is returned by the **`__virtual__`** function
- Documentation can be added by adding **Python docstring** to the function
- We can have private functions (start with _) which are not visible outside the module. For example, **`_calc()`**
- Salt sees the public functions. For example, **`get()`**. They are available as **`module.get()`**

Practice: Salt 103

Live Demonstration in Class

Questions?



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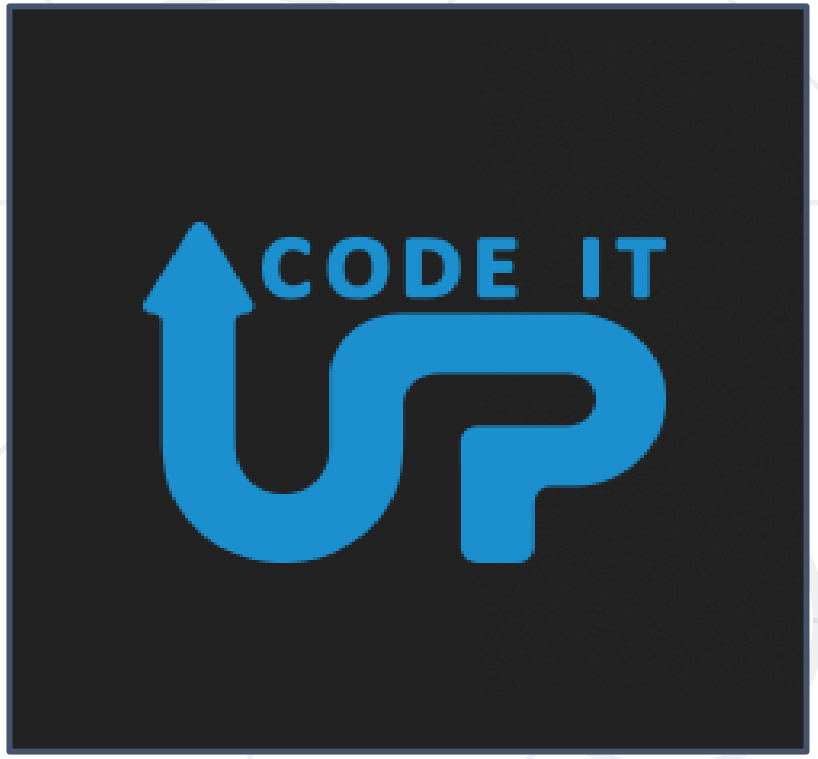

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