Manta CLI for CSM

CUG 23

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Cray System Management (CSM)

Cray System Management (CSM)

CFS

BOS

Note: This talk is based on CSM 1.2

# Configuration Framework Service (CFS)

Ansible

CFS layer

CFS configuration

CFS session

CFS layer

- Divided in 2 parts (description and the ansible playbooks)

- A CFS layer description is a "pointer" to an ansible playbook in a git repository

- Two **target definitions** (node image creation or configuring a running node)

- Granularity at the ansible task level

- Each target definition is identified using Boolean cray_cfs_image ansible variable

- For PSI they should be able to build their own layers to deploy extra stuff on top of the existing ones provided by CSCS

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CFS layer (Ansible playbook)
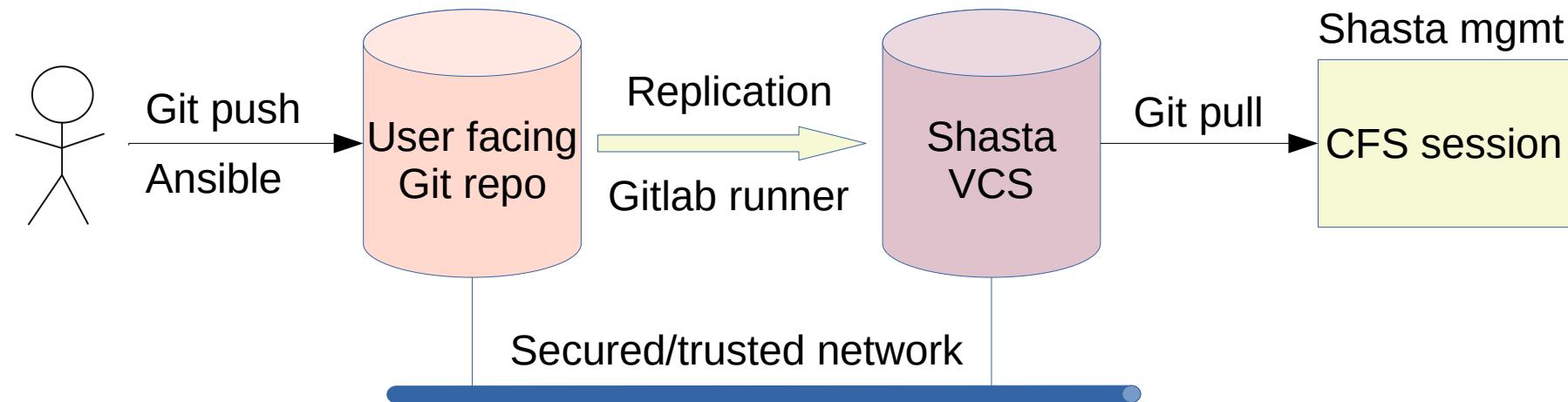
Git push

Ansible

User facing
Git repo

Replication

Gitlab runner

Shasta
VCS

Git pull

Shasta mgmt

CFS session

Secured/trusted network

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CFS layer (definition)

```json
{
    "cloneUrl": "https://api-gw-service-nmn.local/vcs/cray/cscs-config-management.git",
    "commit": "2d6770fb165a6e252e957ee6ab8398e898b6deae",
    "name": "cscs-integration-2.0.44",
    "playbook": "site.yml"
}
```

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CFS layer (definition)

Git repo url to CFS layer code or ansible playbook

```
{
    "cloneUrl": "https://api-gw-service-nmn.local/vcs/cray/cscs-config-management.git",
    "commit": "2d6770fb165a6e252e957ee6ab8398e898b6deae",
    "name": "cscs-integration-2.0.44",
    "playbook": "site.yml"
}
```

Commit id

Ansible playbook
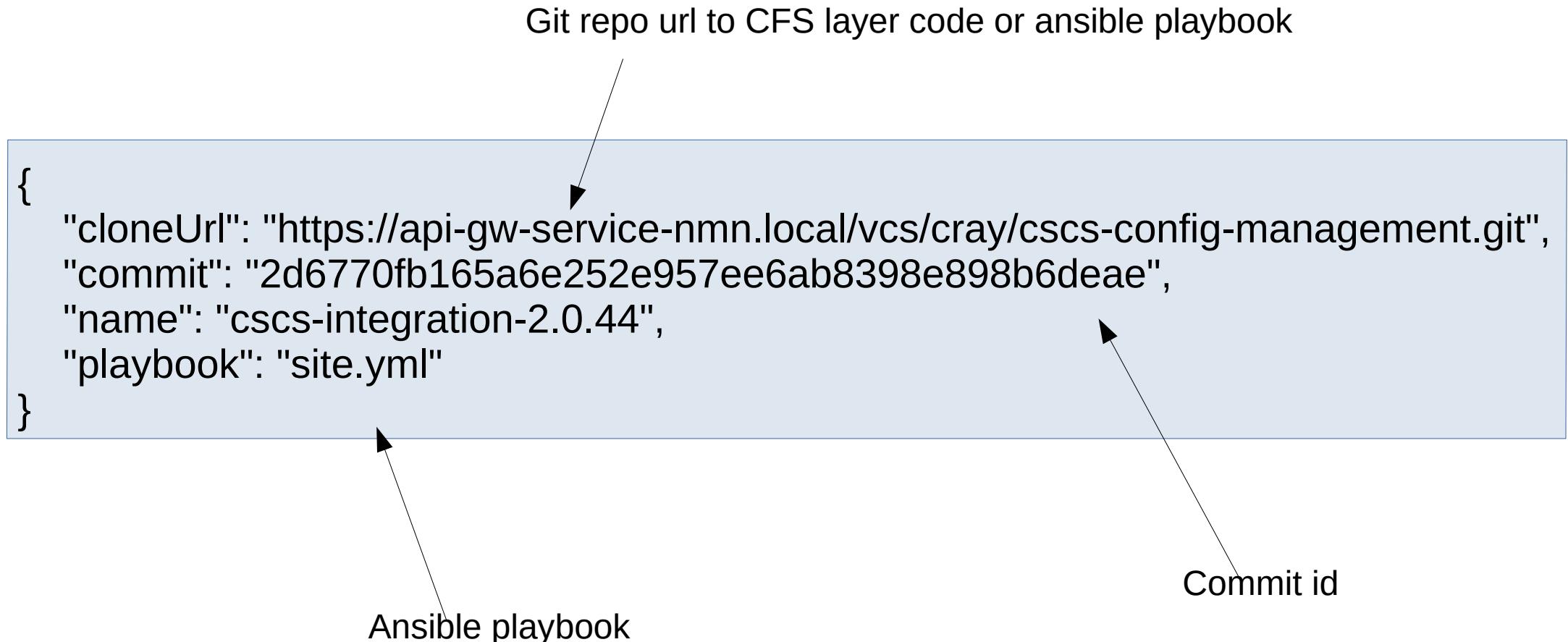
CFS configuration

- A set of CFS layers

- Layers execution order is sorted by "layer id"

- CFS configuration are related to a cluster only through a CFS session

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CFS configuration

```json
{
  "layers": [
    {
      "cloneUrl": "https://api-gw-service-nmn.local/vcs/cray/cos-config-management.git",
      "commit": "60535ef51c0d8baafeaeffd8b6060ed0bd80ab52",
      "name": "cos-integration-2.0.40",
      "playbook": "site.yml"
    },
    {
      "cloneUrl": "https://api-gw-service-nmn.local/vcs/cray/slurm-config-management.git",
      "commit": "87cfbfaa9f24b0e4dcd701bd373091ed922225f8",
      "name": "slurm-integration-0.2.2",
      "playbook": "site.yml"
    },
    {
      "cloneUrl": "https://api-gw-service-nmn.local/vcs/cray/cscs-config-management.git",
      "commit": "2d6770fb165a6e252e957ee6ab8398e898b6deae",
      "name": "cscs-integration-2.0.44",
      "playbook": "site.yml"
    }
  ]
}
```

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CFS session

- A CFS session is an instance of a CFS configuration

- A CFS session can run on any **target definition**

- A CFS session is orchestrated by Kubernetes

- Kubernetes job instantiates a pod with a set of containers

- A subset of these containers runs the CFS layers (e.g. ansible-0, ansible-1, … ansible-i)

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CFS session target image

CFS session

inventory

git

ansible-0

...

ansible-i

git pull → Shasta CVS

SSH

SSH → Target image

Legend:
- Pod
- Container
- Git repo

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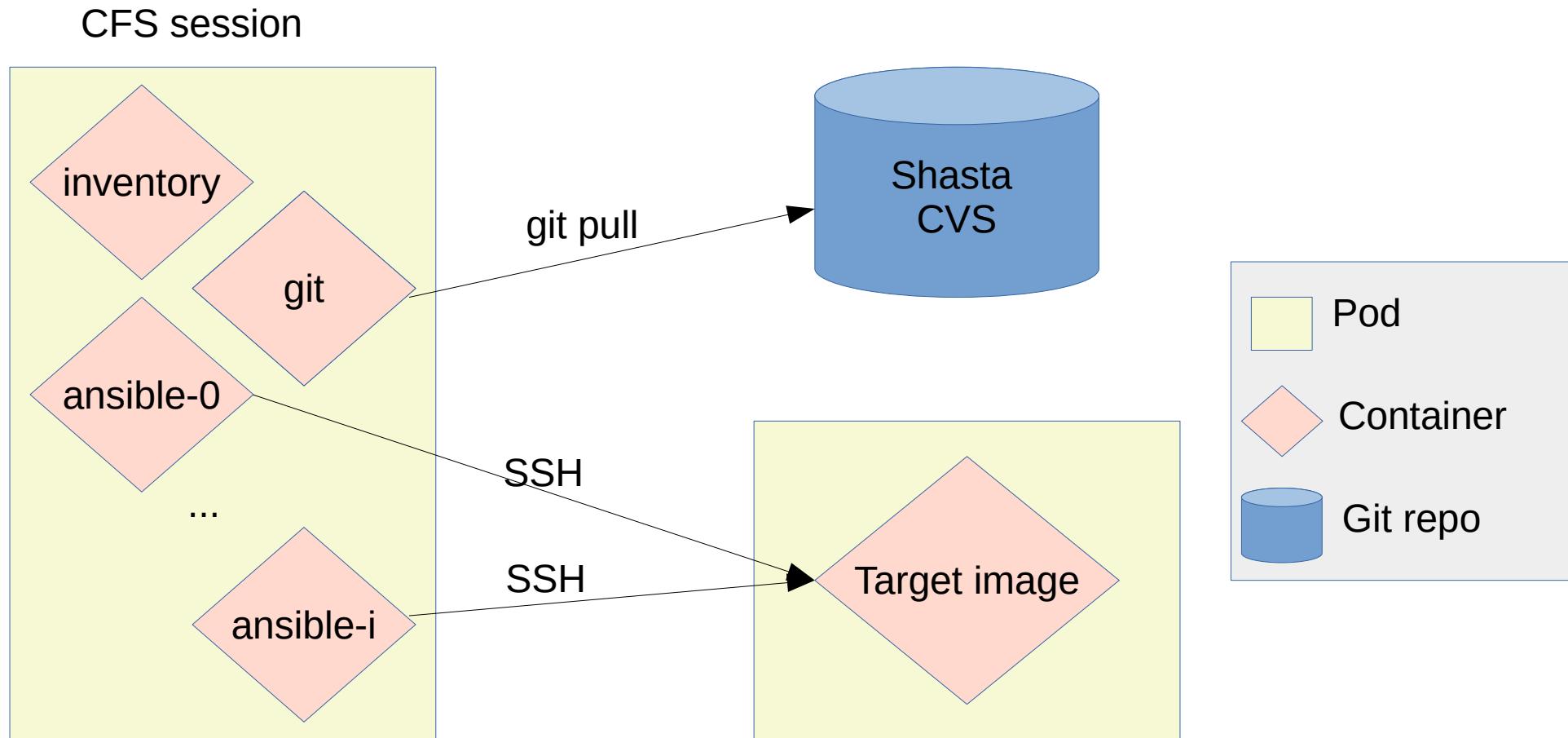
CFS session target dynamic

CFS session

inventory

git

ansible-0

...

ansible-i

git pull

Shasta CVS

SSH

SSH

Shasta node

Pod

Container

Physical machine

Git repo

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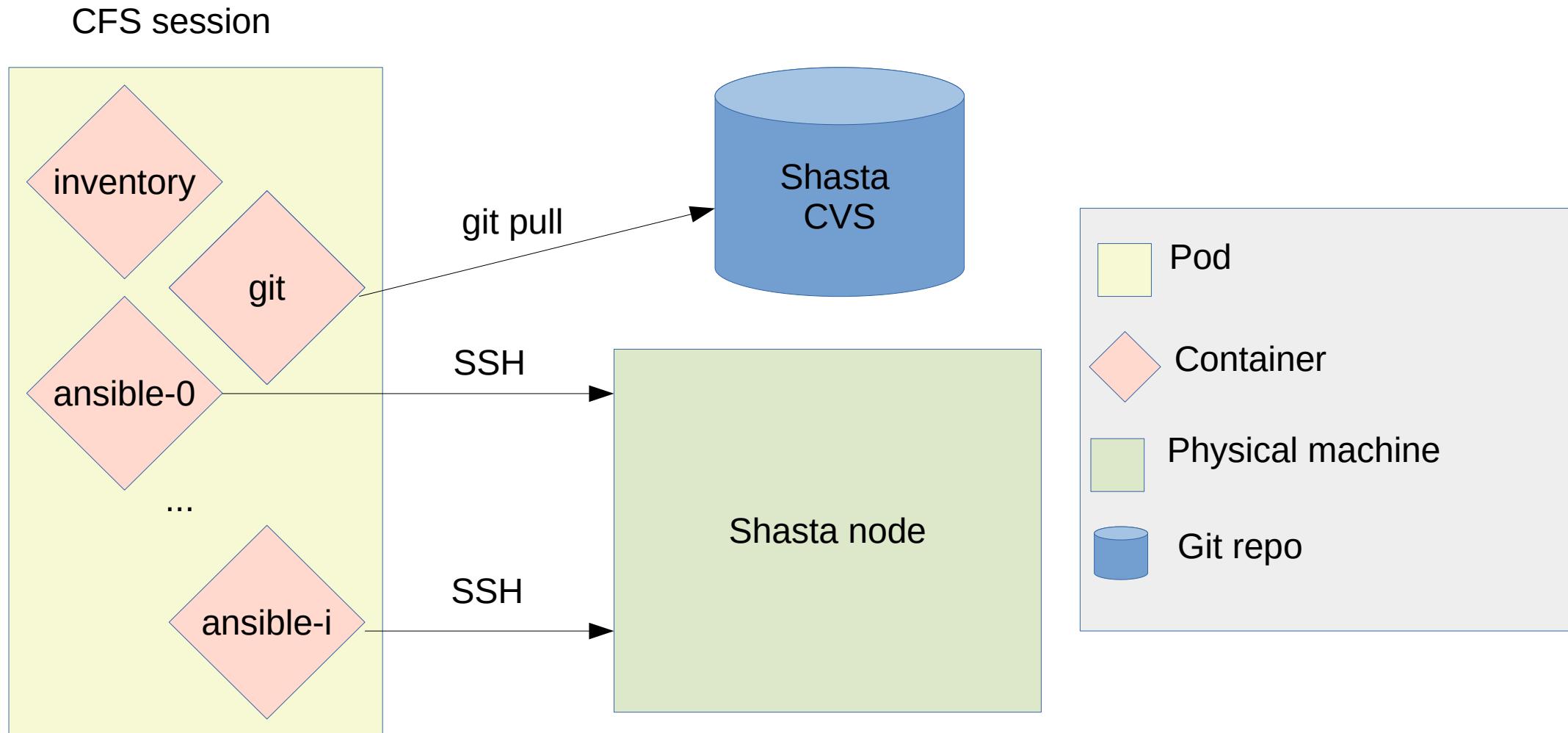
Boot Orchestrator Service (BOS)

Configures nodes boot params so they use the right image (BSS)

Reboots nodes associated with a session template (CAPMC)

Overall

Pros:

Improves communication and collaboration across the site

Persists ansible logs

Logs the history of operations done in Shasta

Cons:

Engineers are less productive

Hard to find information

Information is scattered across different systems

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Manta

Manta Overview

Opinionated Shasta CLI

Ergonomics

Aggregate information from different systems

Binary less

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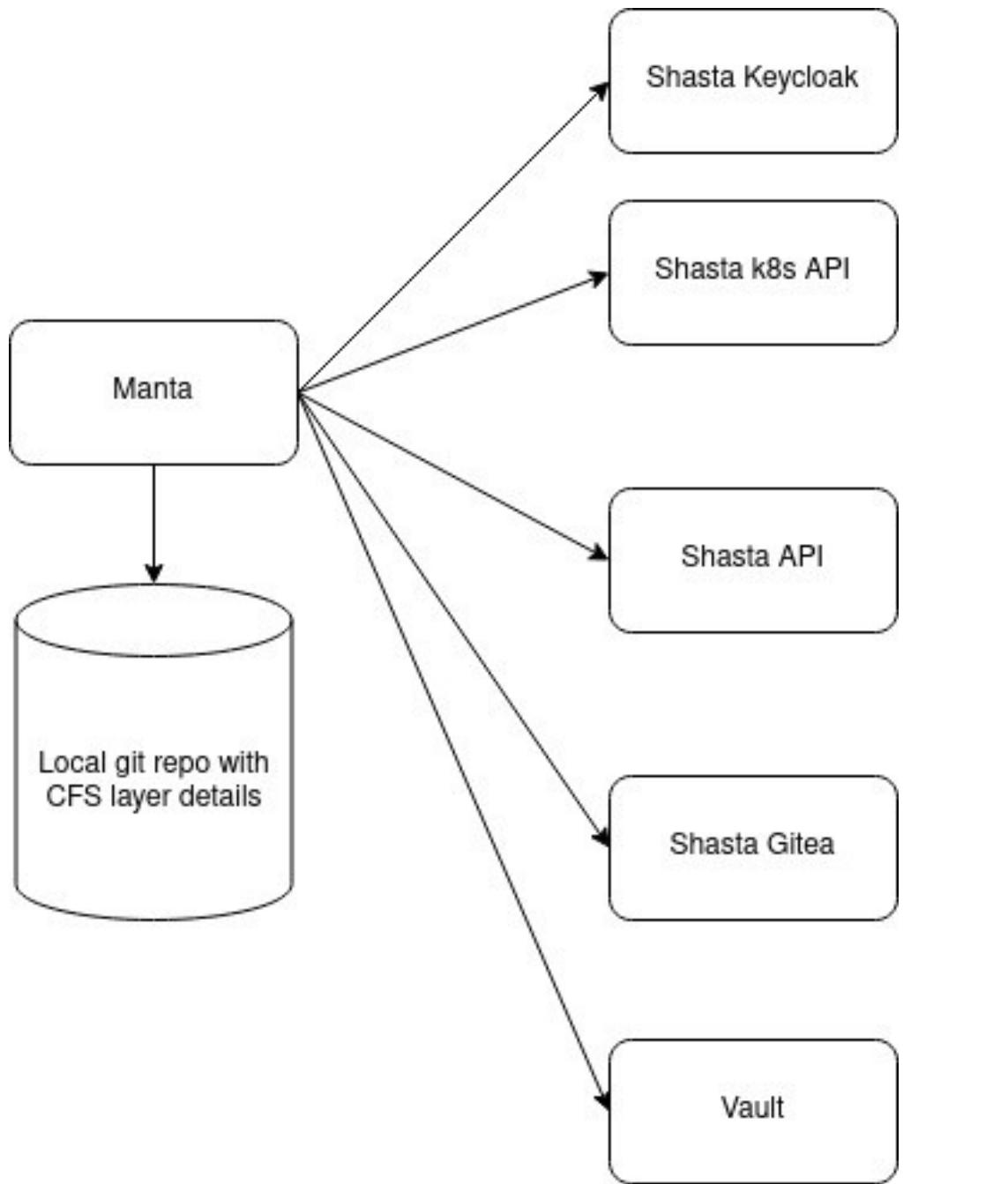
Manta Overview

Manta Overview - Features

- Get information from CSM (CFS, HSM, nodes, etc.)

- Get CFS session logs

- Create CFS configurations

- Create CFS session target definition and image

- Create BOS session template/sessions

- Connect to node's console

- Configure clusters from file

- Start/Shutdown/Reboot nodes

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Manta Overview - Security

- All users using Manta need to have admin role in Keycloak Shasta realm

- K8s and Gitea credentials are stored in Hashicorp Vault

- Hashicorp vault authorization through approle

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Manta Overview - Configuration

Configuration file ~/.config/manta/config

```
base_image_id = "4bf91021-8d99-4adf-945f-46de2ff50a3d"
socks5_proxy = "socks5h://127.0.0.1:1080"
shasta_base_url = "https://api.cmn.alps.cscs.ch/apis"
keycloak_base_url = "https://api.cmn.alps.cscs.ch/keycloak"
gitea_base_url = "https://api.cmn.alps.cscs.ch/vcs"
k8s_api_url = "https://10.252.1.12:6442"
vault_base_url = "https://hashicorp-vault.cscs.ch:8200"
vault_role_id = "b15517de-cabb-06ba-af98-633d216c6d99"
hsm_group = "psi-dev"
```

CSM (keycloak) token ~/.cache/manta/http

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Manta Overview – Node configuration

1) Check local repositories have all changes committed

2) Check most recent commit id exists in CSM VCS

3) Check nodes are available to run CFS session (Nodes in power state "ready" and no CFS sessions scheduled)

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DEMO

Common commands

- Note: manta cli already has a built in help: manta --help or manta *<subcommand>* --help

- List 5 most recent sessions created:
  - manta get session --limit 5

- Get node status:
  - manta get nodes

- Shutdown a node:
  - manta apply node off --force <xname>

- Note: xname example x1004c7s0b0n0

- Build an configuration, then a session, update nodes boot parameters to use new image, reboot them and run a session to finish configuration:
  - manta apply cluster --file *</path/to/sat/file>*

- Create a configuration and a session based on a local repo:
  - manta apply session --repo-path *</path/to/my/local/repo>* --name *<my-session-name>*

- Get session logs:
  - *manta log <session-name>*

Current limitations

- Can't create BOS session template for UANs

- Can't create repos in Shasta git repo

Future Work

Frontend CLI
(Manta)
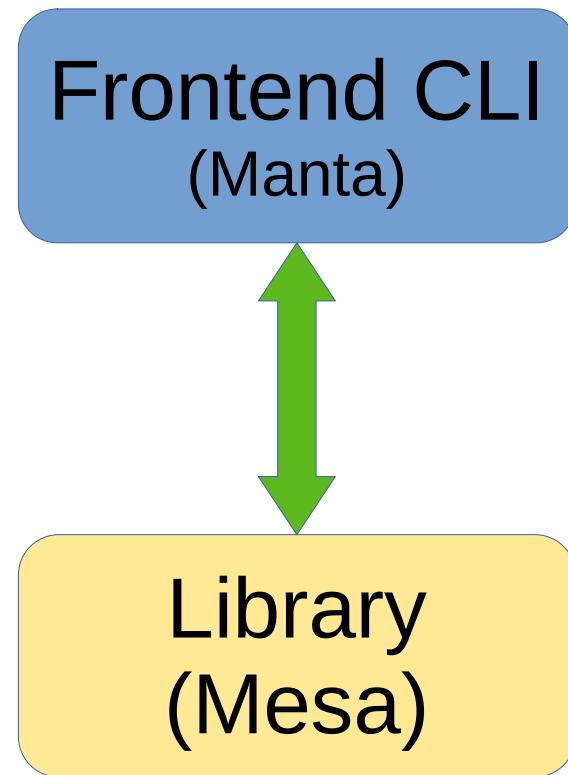
Library
(Mesa)
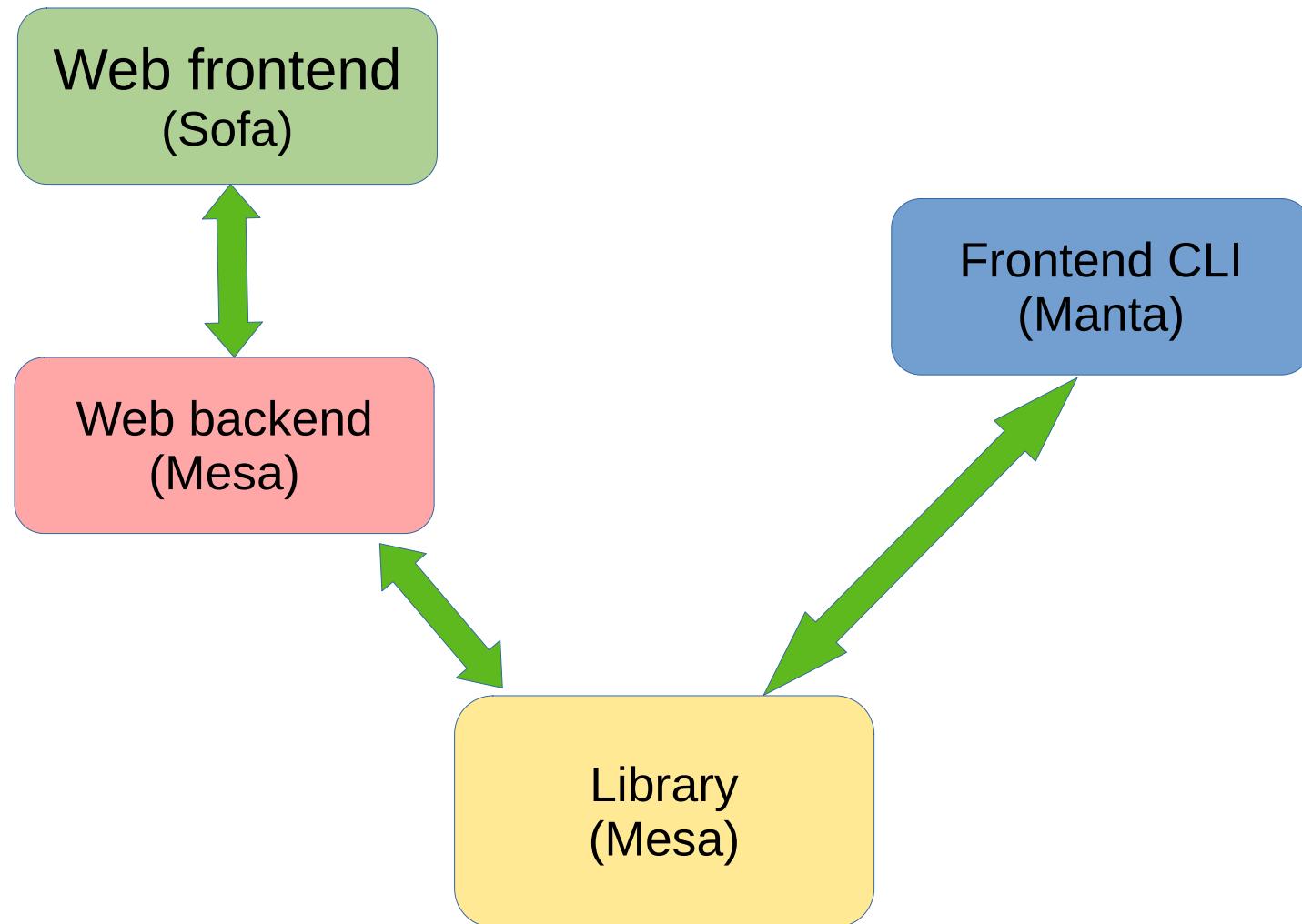
Future Work

Future Work

- Logging

- Security

- Rust library (mesa)

- Web backend (tabla)

- Create a web frontend (sofa)

- Delete/clean CSM data

- Terraform providers?

- Multi-region management?

- Authorization?

- Portability/Accessibility?

Acknowledge

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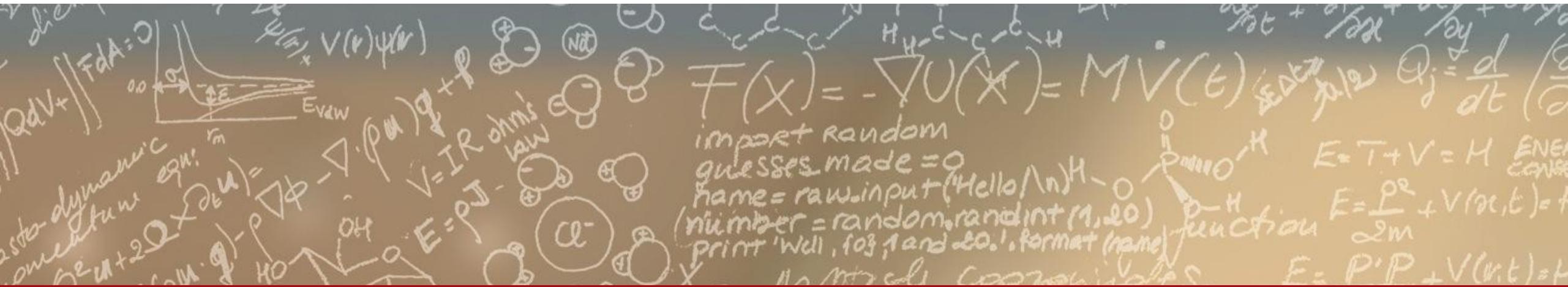
Thank you for your attention.

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manta src: **https://github.com/eth-cscs/manta**