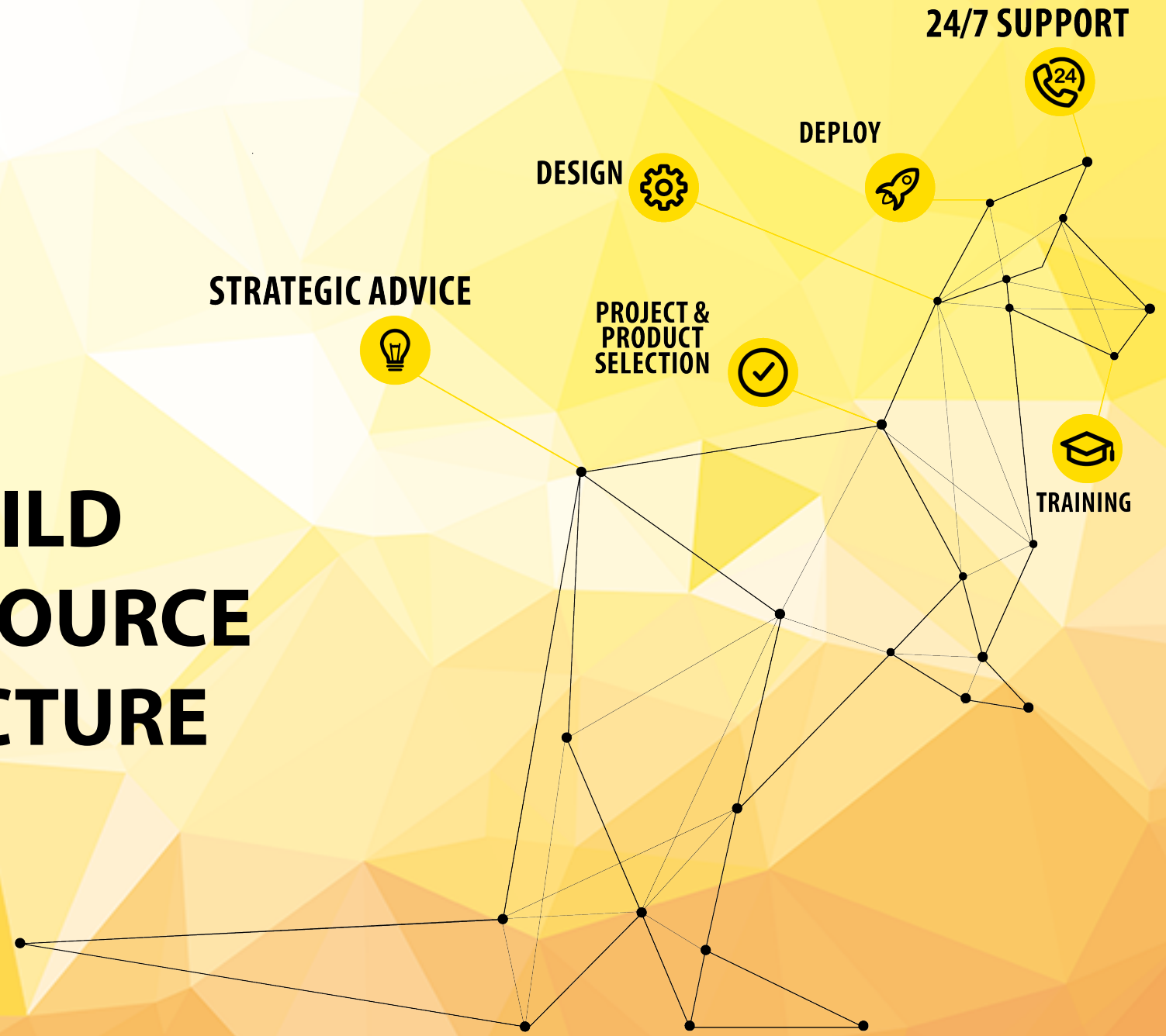
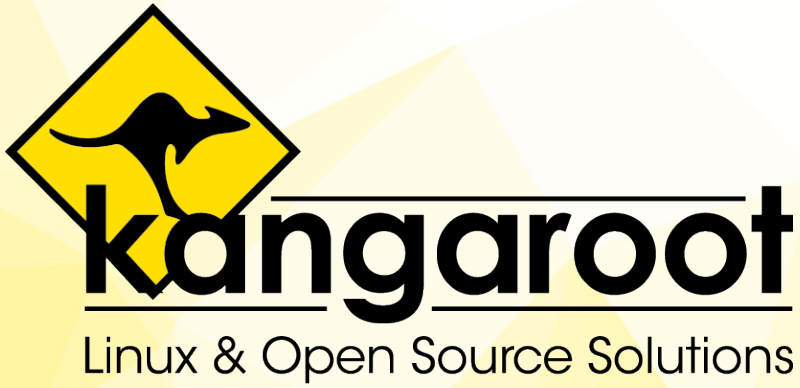
kangaroot

Linux & Open Source Solutions

LET US BUILD YOUR OPEN SOURCE INFRASTRUCTURE





(Ab)using CI/CD for self-service access requests

Ruben de Smet

ABOUT US

Red Hat
Premier
Business Partner

BELGIUM'S TOP LINUX AND
OPEN SOURCE SERVICE PROVIDER

20 YEARS OF EXPERIENCE
IN OPEN SOURCE

VENDOR
INDEPENDENT

BROAD SET OF PARTNERS

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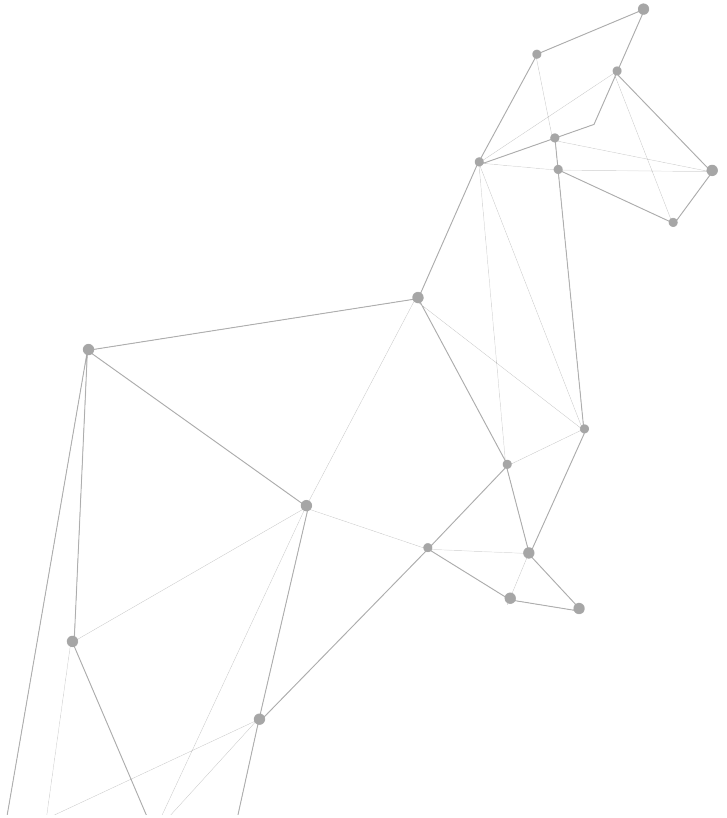
INTRODUCTION

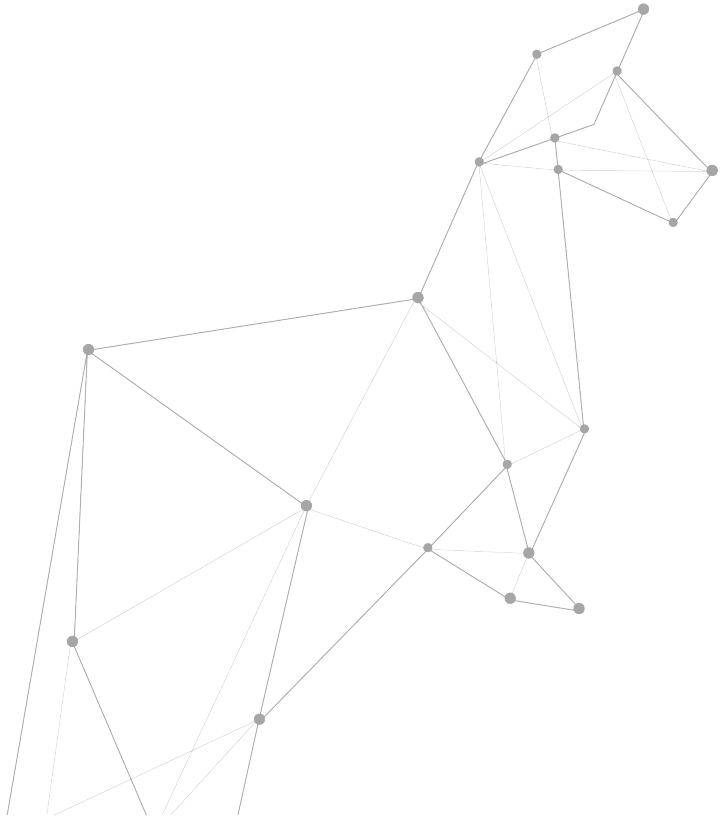
25 years of service; we need continuous improvement and scaling to enable automation of our consultancy business.

What better than to eat our own dogfood and apply DevOps principles?



PRESENTATION

1. Problem and requirements
2. Tools
3. Solution Architecture
4. Metadata
5. Automation
6. Security
7. Implementation
8. Conclusion

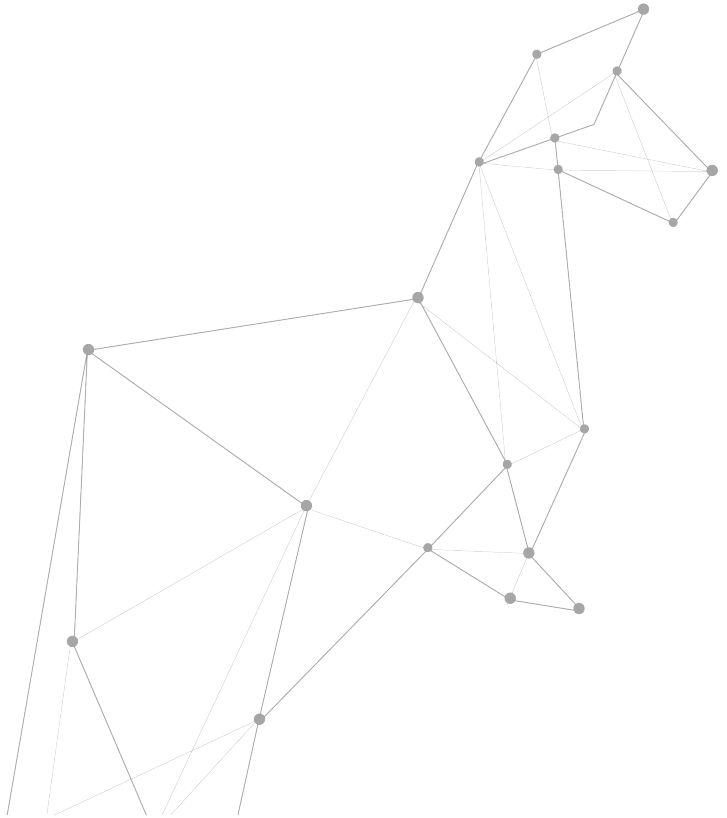


PROBLEM AND REQUIREMENTS

Problem: onboarding and offboarding engineers, customers in a secure and efficient way.

Requirements:

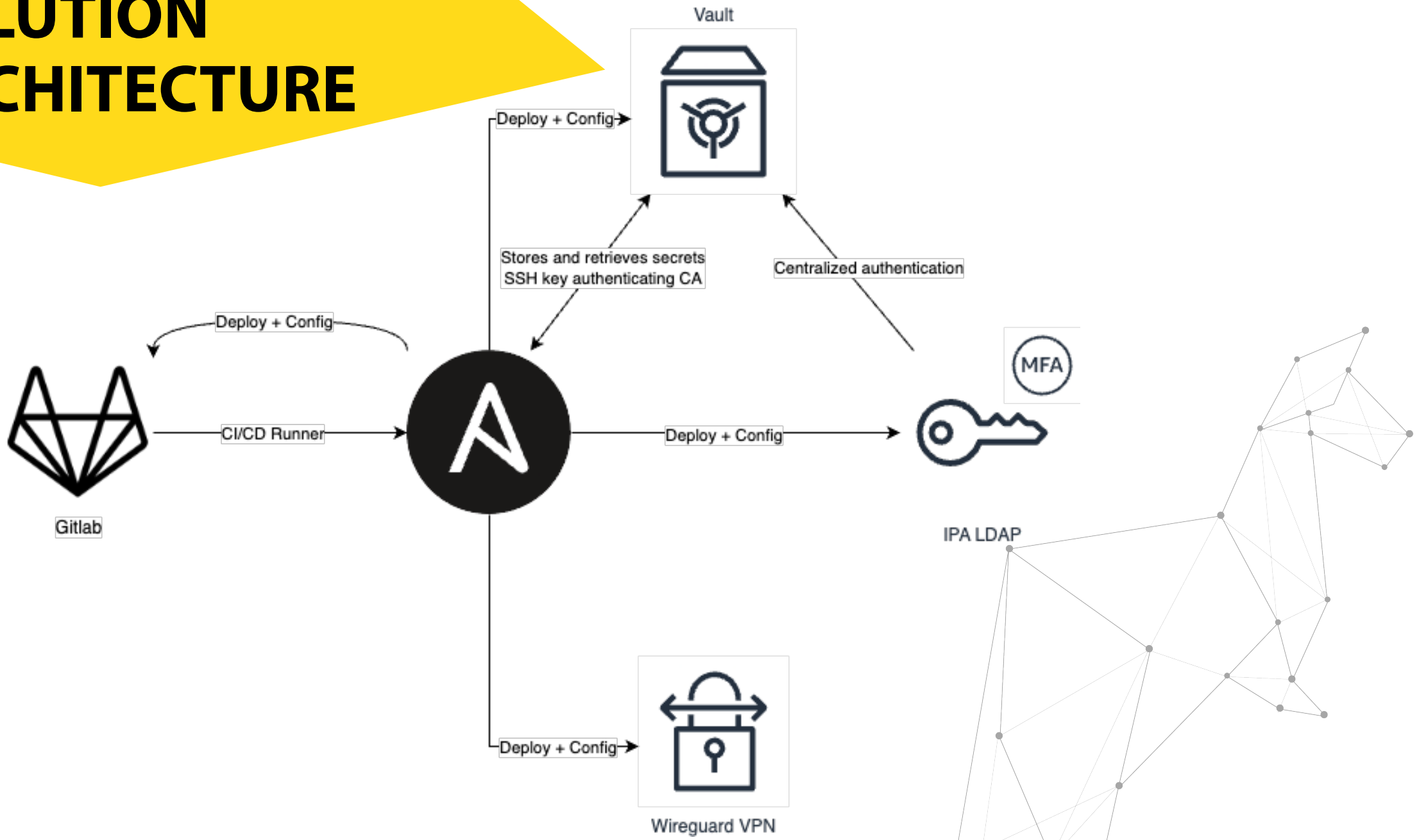
- Automation and integration with ever-changing and variable infrastructure
- Self-service
- Audit logging / traceability
- Secure



TOOLS

- YAML: data model
- Ansible: automation
- Wireguard: network access
- IPA: central authentication
- GitLab: version-controlled document store and pipelines
- HashiCorp Vault: secret management
- SSO (future): Keycloak

SOLUTION ARCHITECTURE



METADATA

master / metadata / customers / kangaroot.yml

kangaroot.yml 976 B

```yaml
id: 1
name: kangaroot
members:
  - id: rvalkenaers
    access: manage
  - id: rdesmet
    access: manage
  - id: pdens
    access: manage
  - id: pleurs
    access: manage
```

master / metadata / users.yml

users.yml 29.02 KiB Blame Edit

```yaml
---
users:
  - login: rvalkenaers
    first_name: Rien
    surname: Valkenaers
    sshpubkey:
      rien.valkenaers@kangaroot.net: ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIBzcW7lCukm6PgYyvZodNVlgvxY5zaW
    vpn:
      public_key: 2pXGTnyIHmlytopDBn168c745Hnzyu/o+UDkhvu5ilc=
      ip: 172.20.2.10/32
  - login: rdesmet
    first_name: Ruben
    surname: de Smet
    sshpubkey:
      ruben@kangaroot.net: ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIFY0H2rVuz5qvFFliE5pjO1cMu87QrMH63hnAHZ2B
      cardno000611517510: ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDi35FCuO/KNC6T4HAFZ5rRi+YcSLRaTxlDX2WMNe
    vpn:
      public_key: Nmvr/dUMnQTKlW0LgFcyD6L09wcD93AQx6FYVak3DGM=
      ip: 172.20.2.11/32
  - login: pdens
    first_name: Peter
    surname: Dens
```

master / metadata / groups.yml

groups.yml 1.88 KiB

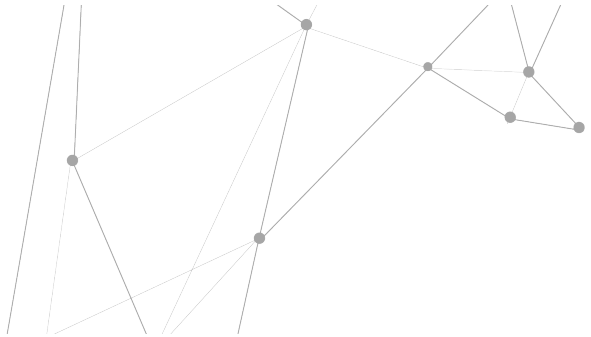
```yaml
---
ipa_groups:
- name: gitlab
  user:
  - rvalkenaers
  - rdesmet
  - pdens
  - pleurs
```

ot.be: ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDJ8s7vYa6Xd1K3gB8esuhsNHcfyGtQIU+e8

lb465+k3kSt1wCcy9oqYJXegXojIesME9mPj0=

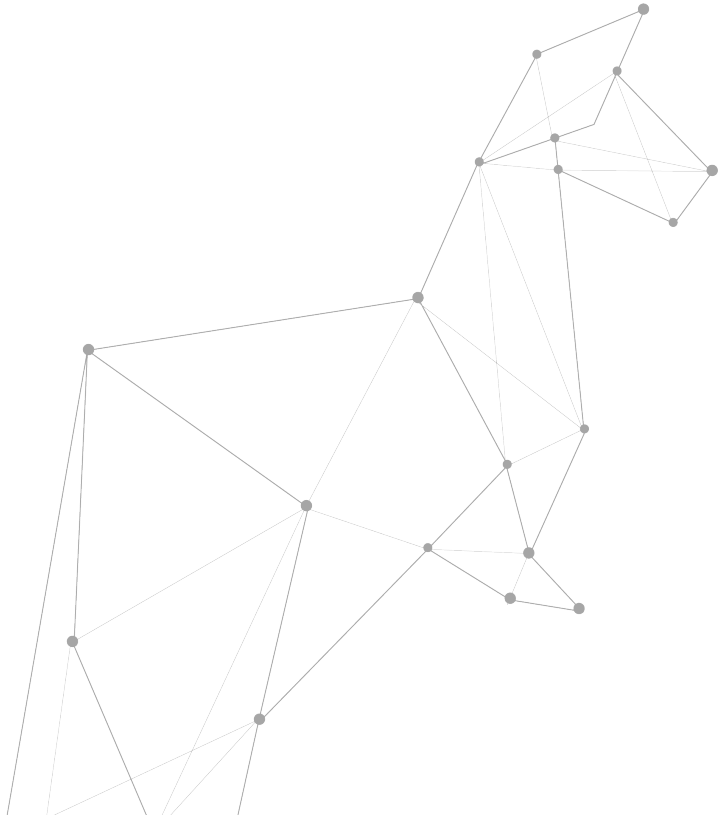
kH/NFMZ2Ty4qhte2P8tVbLr0DjwKXLR/zcyVHihj4WM=

3.12/32



REQUIREMENTS

- **Automation and integration with ever-changing and variable infrastructure**
- Self-service
- Audit logging / traceability
- Secure

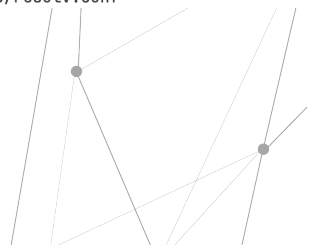


AUTOMATION

Ansible + Docker APIs, 3rd party libraries, link it all together

```
- src: ssh://git@gitlab.kangaroot.net:2222/kangaroot/ansible-roles/docker-selinux.git
  scm: git
  name: docker-selinux
- src: ssh://git@gitlab.kangaroot.net:2222/kangaroot/ansible-roles/freeipa-client.git
  scm: git
  name: freeipa-client
- src: ssh://git@gitlab.kangaroot.net:2222/kangaroot/ansible-roles/freeipa-server.git
  scm: git
  name: freeipa-server
- src: ssh://git@gitlab.kangaroot.net:2222/kangaroot/ansible-roles/rclone.git
  scm: git
  name: rclone
- src: ssh://git@gitlab.kangaroot.net:2222/kangaroot/ansible-roles/smokeping.git
  scm: git
  name: smokeping
- src: ssh://git@gitlab.kangaroot.net:2222/kangaroot/ansible-roles/wireguard-docker.git
  scm: git
  name: wireguard-docker
```

```
container_registries:
  - registry_url: gitlab.kangaroot.net:4567
    username: "{{ lookup('vault', 'secret=secret/kangaroot/gitlab:username') | mandatory }}"
    password: "{{ lookup('vault', 'secret=secret/kangaroot/gitlab:token') | mandatory }}"

containers:
  - name: vault
    image: vault:1.13.3
    hostname: vault.kangaroot.net
    capabilities: IPC_LOCK
    command: server
    env:
      VAULT_LOCAL_CONFIG: '{"backend": {"file": {"path": "/vault/file"}}, "ui": "true", "listener": [{"tcp"
      VAULT_API_ADDR: http://0.0.0.0:8200
    ports:
    - 8200:8200
    restart_policy: always
    volumes:
    - /data/vault/config:/vault/config
    - /data/vault/file:/vault/file
    - /data/vault/logs:/vault/logs
    - /etc/resolv.conf:/etc/resolv.conf
  - name: prometheus
    image: prom/prometheus:v2.47.2
    command: --config.file=/etc/prometheus/prometheus.yml --storage.tsdb.path=/data --storage.tsdb.retentio
    ports:
    - 9090:9090
    restart_policy: always
    volumes:
    - /etc/prometheus/prometheus.yml:/etc/prometheus/prometheus.yml
    - /data/prometheus:/data
    - /etc/resolv.conf:/etc/resolv.conf
  - name: node-exporter
    image: quay.io/prometheus/node-exporter:v0.18.1
    command: --path.rootfs=/host
    restart_policy: always
    pid_mode: host
    network_mode: host
    volumes:
    - /:/host:ro,rslave
    - /etc/resolv.conf:/etc/resolv.conf
  - name: gitlab-runner
    image: gitlab/gitlab-runner:latest
    hostname: gitlab-runner.kangaroot.net
    restart_policy: always
    volumes:
    - /var/run/docker.sock:/var/run/docker.sock
    - /data/gitlab-runner/config:/etc/gitlab-runner:Z
    - /etc/resolv.conf:/etc/resolv.conf
```



master ansible / azure / requirements-azure.txt

requirements-azure.txt 1.28 KiB

```
packaging
requests[security]
xmltodict
azure-cli-core==2.26.1
azure-common==1.1.11
azure-identity==1.7.0
azure-mgmt-apimanagement==0.2.0
azure-mgmt-authorization==0.51.1
azure-mgmt-batch==5.0.1
azure-mgmt-cdn==3.0.0
azure-mgmt-compute==10.0.0
azure-mgmt-containerinstance==1.4.0
azure-mgmt-containerregistry==2.0.0
azure-mgmt-containerservice==9.1.0
azure-mgmt-datalake-store==0.5.0
azure-mgmt-dns==2.1.0
azure-mgmt-keyvault==1.1.0
azure-mgmt-marketplaceordering==0.1.0
azure-mgmt-monitor==3.0.0
azure-mgmt-managedservices==1.0.0
azure-mgmt-managementgroups==0.2.0
azure-mgmt-network==12.0.0
azure-mgmt-nspkg==2.0.0
```

AUTOMATION

Bootstrap documentation

```
44  .ansible: &ansible_template
45    image:
46      name: cytopia/ansible:2.9-tools
47      entrypoint: [""]
48    cache:
49      key: "ansible"
50      paths:
51      - .ansible/roles
52      - vault
53    before_script:
54    - source ./scripts/bootstrap-ansible
55    after_script:
56    - ./vault token revoke -self
57
58  .vaultssh: &vaultssh_template >
59    ssh-keygen -t ed25519 -C "kangaroot-ansible+${CI_COMMIT_REF}@gitlab.kangaroot.net" -f ~/.ssh/
60    ./vault write -field=signed_key ssh/sign/gitlab-signer public_key=@$HOME/.ssh/id_ed25519.pub
```

Using the ansible-bootstrap container

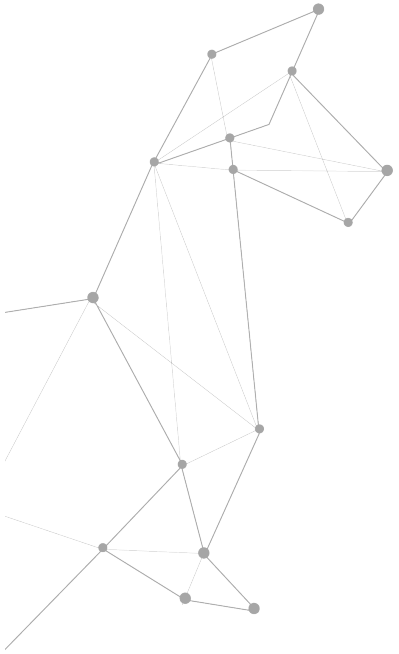
Create a PAT in gitlab @ https://gitlab.kangaroot.net/-/profile/personal_access_tokens

On your laptop/host:

```
docker login gitlab.kangaroot.net:4567
docker pull gitlab.kangaroot.net:4567/kangaroot/ansible/ansible-bootstrap:latest
docker run -it --add-host=mgmt01.azure.kangaroot.net:23.97.206.3 --entrypoint /bin/sh gitlab.kangaroot.net:4567/kangaroot/ansible/ansible-b
```

In the container:

```
source env
source azure/env
./vault login

ssh-keygen -t ed25519 -C "ansible-bootstrap@gitlab.kangaroot.net" -f ~/.ssh/id_ed25519 -q -N ""
./vault write -field=signed_key ssh/sign/gitlab-signer public_key=@$HOME/.ssh/id_ed25519.pub > ~/.ssh/id_ed25519-cert.pub # generate and si

ansible-playbook -i inventories/azure -l __ansible_role_mgmt kangaroot.yml --check --diff
```



AUTOMATION

Provision GitLab

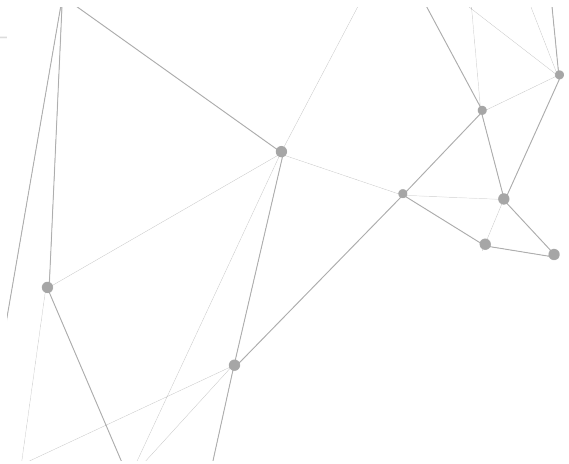
Subgroups and projects | Shared projects | Archived projects

- A **ansible**
- D **documentation**
- M **metadata**

```yaml
- name: Create GitLab projects for every customer
  gitlab_project:
    server_url: https://gitlab.kangaroot.net
    api_token: "{{ lookup('vault','secret=secret/kangaroot/gitlab:token') }}"
    validate_certs: False
    name: "{{ async_item[1] }}"
    state: "{{ async_item[0].state | default('present') }}"
    group: "{{ (async_item[0].name == 'kangaroot') | ternary('', 'customers/') }}{{ async_item[0].name | re
    visibility: "private"
  async: 360
  poll: 0
  loop: "{{ loopdata }}"
  loop_control:
    loop_var: "async_item"
    label: "{{ async_item[0].name | regex_replace(' ', '') }}/{{ async_item[1] }}"
  register: _create_project_threads
  changed_when: False
- name: Wait for GitLab projects to be created
  async_status:
    jid: "{{ async_item.ansible_job_id }}"
  register: _create_project_status
  retries: 50
  delay: 3
  until: _create_project_status.finished
  loop: "{{ _create_project_threads.results }}"
  loop_control:
    loop_var: "async_item"
    label: "{{ async_item.async_item[0].name | regex_replace(' ', '') }}/{{ async_item.async_item[1] }}"
```

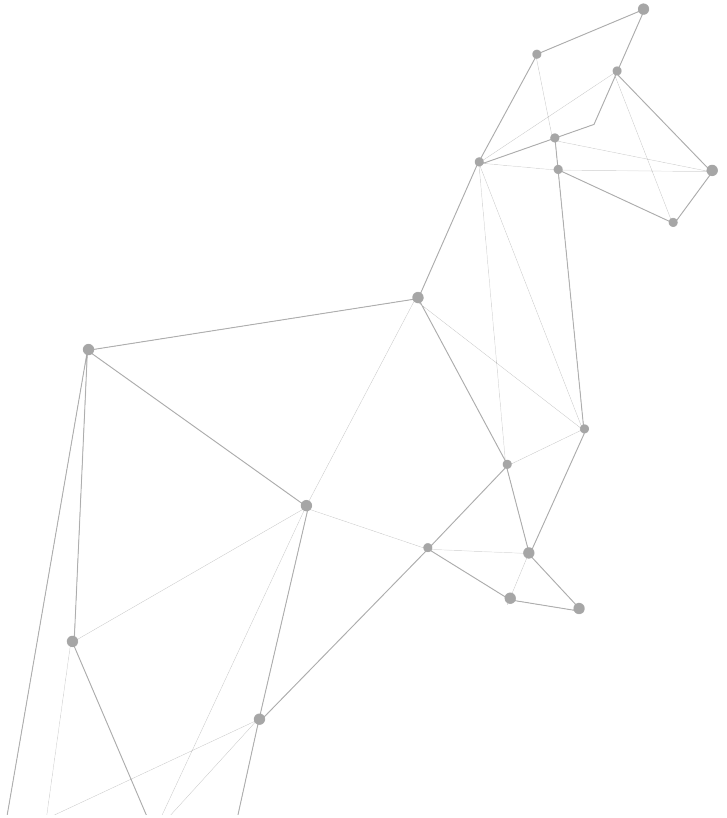
kangaroot / **ansible**

```yaml
    - name: Checkout every standard repository for every customer # noqa 102 302
      shell: |
        mkdir -p /tmp/{{ item[0].name | regex_replace(' ', '') }}/{{ item[1] }} \
        && git clone https://ansible:{{ lookup('vault','secret=secret/kangaroot/gitlab:token') }}@gitlab.kangaroot.net/{{ (item[0]
        && cd /tmp/{{ item[0].name | regex_replace(' ', '') }}/{{ item[1] }} \
        && git config user.name "root" \
        && git config user.email "support@kangaroot.net"
      loop: "{{ customers | product(['ansible','documentation','metadata']) | list }}"
      loop_control:
        label: "{{ item[0].name | regex_replace(' ', '') }}/{{ item[1] }}"
      when: "'customers/{{ item[0].name | regex_replace(' ', '') }}/{{ item[1] }}' in {{ repositories.json | selectattr('empty_rep
      tags:
      - git
      - template
```



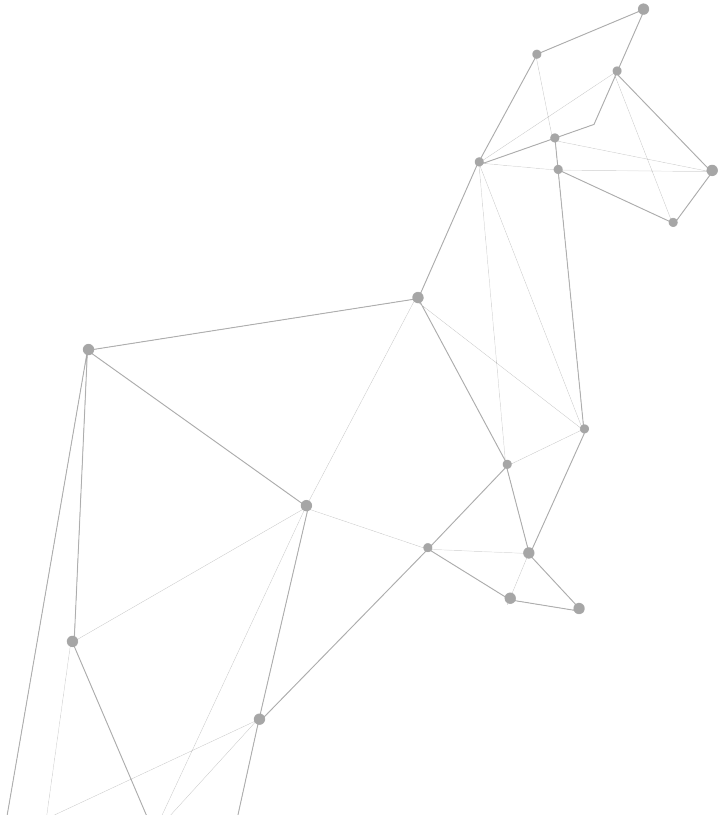
REQUIREMENTS

- Automation and integration with ever-changing and variable infrastructure
- **Self-service**
- Audit logging / traceability
- **Secure**



SECURITY

- Never put secrets in GIT
- Hashicorp Vault + GitLab + IPA integration
- VPN/Firewall sensitive services (or zero-trust...)
- Trust, but verify (audit logs for giving yourself permissions)



SECURE
SELF SERVICE

Centralised authentication and authorisation with 2FA in FreeIPA

kangaroot / **ansible**

```
25      - name: Create users
26        ipa_user:
27          name: "{{ item.login }}"
28          givenname: "{{ item.first_name }}"
29          sn: "{{ item.surname }}"
30          sshpubkey: "{{ item.sshpubkey.values() | list | default([]) }}"
31          password: "{{ lookup('vault', 'secret=secret/kangaroot/ipa/initial-passwo
32          update_password: on_create
33          state: "{{ item.state | default('enabled') }}"
34          validate_certs: no
35        loop: "{{ users }}"
36        loop_control:
37          label: "{{ item.login }}"
38        tags: [ 'api' ]
39      - name: Create IPA groups
40        ipa_group:
41          name: "{{ item.name }}"
42          user: "{{ item.user }}"
43          state: "{{ item.state | default('present') }}"
44          validate_certs: no
45        loop: "{{ ipa_groups }}"
46        loop_control:
47          label: "{{ item.name }}"
48        tags: [ 'api' ]
49      - name: Create customer readonly groups (readonly)
50        ipa_group:
51          name: "customer-{{ item.id }}-readonly"
52          description: "{{ item.name }}"
53          user: "{{ item.members | selectattr('access','defined') | selectattr('acc
54          state: "{{ item.state | default('present') }}"
55          validate_certs: no
56        when: "'members' in item and item['members'] | length > 0"
57        loop: "{{ customers }}"
58        loop_control:
59          label: "{{ item.name }}"
60        tags: [ 'api' ]
61      - name: Create customer readwrite groups (readwrite/undefined)
62        ipa_group:
63          name: "customer-{{ item.id }}-readwrite"
```

SECURE
SELF SERVICE

Hashicorp Vault with policies per customer, created through pipeline and mapped to LDAP groups

master ansible / azure / vault / templates / policies

Name	Last con
..	
admin.hcl.j2	allow ad
customer-ro.hcl.j2	strip spa
customer-rw.hcl.j2	strip spa

```
86    - name: Create customers ro policies
87      hashivault_policy_set:
88        name: "customer-{{ item.id }}-ro"
89        rules: "{{ lookup('template', './templates/policies/customer-ro.hcl.j2', tem
90      loop: "{{ customers }}"
91      loop_control:
92        label: "{{ item.name }}"
93    - name: Create customers rw policies
94      hashivault_policy_set:
95        name: "customer-{{ item.id }}-rw"
96        rules: "{{ lookup('template', './templates/policies/customer-rw.hcl.j2', tem
97      loop: "{{ customers }}"
98      loop_control:
99        label: "{{ item.name }}"
100   - name: Map customer ro policies to ldap groups
101     hashivault_write:
102       secret: '/auth/ldap/groups/customer-{{ item.id }}-readonly'
103       data:
104         policies: ["default","customer-{{ item.id }}-ro"]
105       update: yes
106     loop: "{{ customers }}"
107     loop_control:
108       label: "{{ item.name }}"
109   - name: Map customer rw policies to ldap groups
110     hashivault_write:
111       secret: '/auth/ldap/groups/customer-{{ item.id }}-readwrite'
112       data:
113         policies: ["default", "customer-{{ item.id }}-rw"]
114       update: yes
115     loop: "{{ customers }}"
116     loop_control:
117       label: "{{ item.name }}"
118   - name: Map customer manage policies to ldap groups
119     hashivault_write:
120       secret: '/auth/ldap/groups/customer-{{ item.id }}-manage'
121       data:
122         policies: ["default", "customer-{{ item.id }}-rw"]
123       update: yes
124     loop: "{{ customers }}"
125     loop_control:
126       label: "{{ item.name }}"
127   - name: Enable audit logs
```

SECURE
SELF SERVICE

Wireguard VPN configuration based on metadata users

master / metadata / users.yml

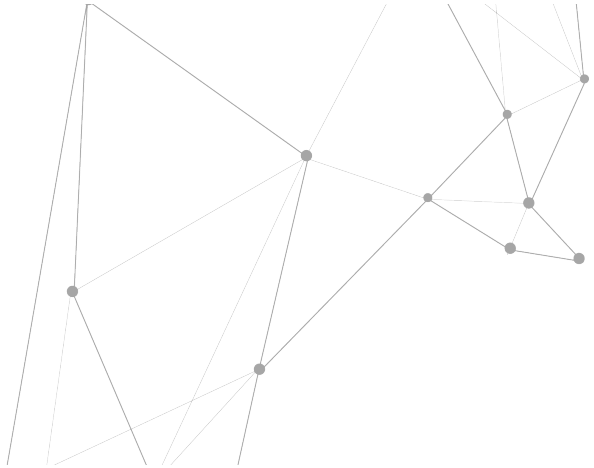
users.yml 29.02 KiB — Blame — Edit

```yaml
---
users:
  - login: rvalkenaers
    first_name: Rien
    surname: Valkenaers
    sshpubkey:
      rien.valkenaers@kangaroot.net: ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIBzcW7lCukm6PgYyvZodNVlgvxY5zaW
    vpn:
      public_key: 2pXGTnyIHmlytopDBn168c745Hnzyu/o+UDkhvu5ilc=
      ip: 172.20.2.10/32
  - login: rdesmet
    first_name: Ruben
    surname: de Smet
    sshpubkey:
      ruben@kangaroot.net: ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIFY0H2rVuz5qvFFliE5pjO1cMu87QrMH63hnAHZ2B
      cardno000611517510: ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDi35FCuO/KNC6T4HAFZ5rRi+YcSLRaTxlDX2WMNe
    vpn:
      public_key: Nmvr/dUMnQTKlW0LgFcyD6L09wcD93AQx6FYVak3DGM=
      ip: 172.20.2.11/32
  - login: pdens
    first_name: Peter
    surname: Dens
```

master / wireguard-docker / templates / wg0.conf.j2

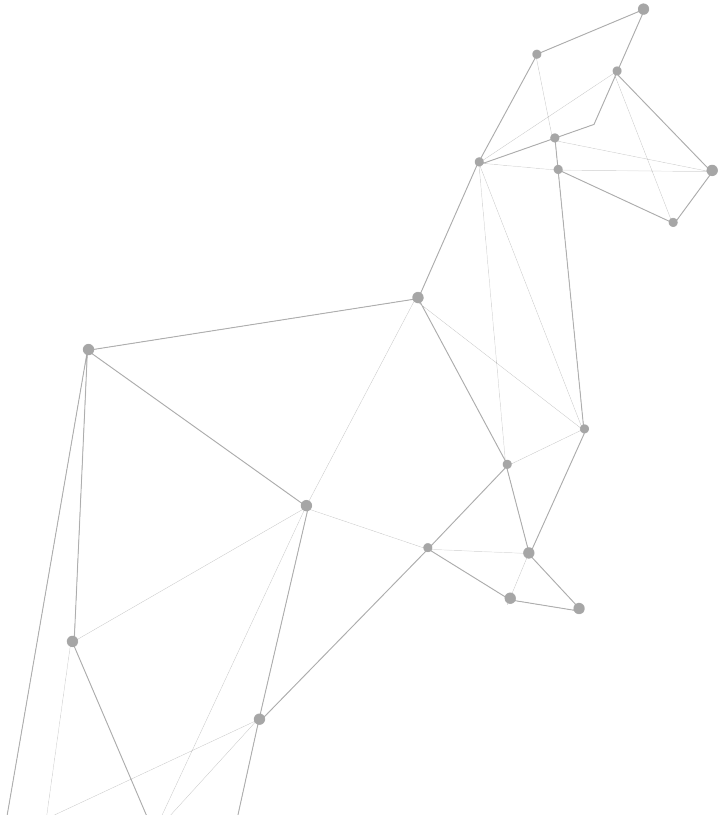
wg0.conf.j2 1.29 KiB — Blame — Edit

```
[Interface]
Address = {{ wireguard_docker.address }}
PrivateKey = {{ wireguard_docker.private_key }}
ListenPort = {{ wireguard_docker.port }}

{% if wireguard_docker.forward_traffic == true %}
PostUp   = iptables -A FORWARD -i %i -j ACCEPT; iptables -A FORWARD -o %i -j ACCEPT; iptab
PostDown = iptables -D FORWARD -i %i -j ACCEPT; iptables -D FORWARD -o %i -j ACCEPT; iptab
{% endif %}

{% for peer in wireguard_docker.peers %}
# {{ peer.name }}
[Peer]
PublicKey = {{ peer.public_key }}
AllowedIPs = {{ peer.ip }}
{% endfor %}

{% if users and users | length > 0 %}
{% for peer in users %}
{% if not 'state' in peer or peer.state == 'enabled' %}
# {{ peer.login }}
[Peer]
PublicKey = {{ peer.vpn.public_key }}
AllowedIPs = {{ peer.vpn.ip }}
{% if 'vpn' in peer and 'mobile_ip' in peer.vpn and 'mobile_public_key' in peer.vpn %}
{% if (peer.vpn.mobile_ip != None and peer.vpn.mobile_ip != '') and (peer.vpn.mobile_publi
# {{ peer.login }} mobile
[Peer]
PublicKey = {{ peer.vpn.mobile_public_key }}
AllowedIPs = {{ peer.vpn.mobile_ip }}
{% endif %}
```



REQUIREMENTS

- Automation and integration with ever-changing and variable infrastructure
- Self-service
- **Audit logging / traceability**
- Secure



AUDIT LOGGING TRACEABILITY

GIT: changelogs, pull requests and merge reviews

adding the new customer

Edit | Code

Merged **João Ricardo Zózimo Serras** requested to merge into `master` 5 months ago

Overview 0 | Commits 1 | Pipelines 0 | Changes 1 | Add a to do

0 | 0

Approved by

Merged by Matthias Vandegaer 5 months ago — Revert | Cherry-pick

Merge details
- Changes merged into `master` with `8f4913d8`.
- Deleted the source branch.

Pipeline #2622 passed
Pipeline passed for `8f4913d8` on `master` 5 months ago

Assignee Edit
João Ricardo Zózimo Serras

Reviewer Edit
Matthias Vandegaer

Labels Edit
None

Milestone Edit
None

Time tracking
No estimate or time spent

2 Participants

Activity

All activity

- **João Ricardo Zózimo Serras** requested review from @mvandegaer 5 months ago
- **João Ricardo Zózimo Serras** assigned to @jserras 5 months ago
- **Matthias Vandegaer** approved this merge request 5 months ago

---

Yorben Caplier @ycaplier
Pushed to branch `master`
`509146d1` · Add ycaplier to .yml

Sven Meeus @smeeus
Pushed to branch `master`
`ff697b0c` · Add smeeus

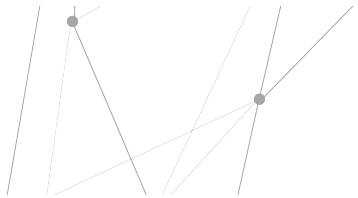
Matthias Vandegaer @mvandegaer
Pushed to branch `master`
`27874286` · Add new customer

Thomas Brijs @tbrijs
Pushed to branch `master`
`9acbde1d` · add tbrijs to

Matthias Vandegaer @mvandegaer
Pushed to branch `master`
`f75c614f` · temporary rsa key. Gitlab seems to really not want users without a ...

Matthias Vandegaer @mvandegaer
Pushed to branch `master`
`0609b6a4` · add jvanmeel so gitlab is ready

Ruben Capota @rcapota
Pushed to branch `master`
`a8f5a5c6` · gave myself manage access to the customers listed in the VPN checks



AUDIT LOGGING TRACEABILITY

Hashicorp vault: audit logs and ACL for sensitive data

```
    loop_control:
      label: "{{ item.name }}"
  - name: Map customer manage policies to ldap grou
    hashivault_write:
      secret: '/auth/ldap/groups/customer-{{ item.
      data:
        policies: ["default", "customer-{{ item.id
      update: yes
    loop: "{{ customers }}"
    loop_control:
      label: "{{ item.name }}"
  - name: Enable audit logs
    hashivault_audit_enable:
      name: "file"
      options:
        file_path: /vault/logs/audit.log
```


```
{"time":"2024-10-07T07:56:39.817579745Z","type":"request","auth":{"client_token":"hmac-sha256:cbb918f020b93b4c79299b1f40df823f4b9a5bef621466896331f259be929d2","display_name":"ldap-rcapota","policies":["customer-1-rw","customer-13-rw","customer-137-rw","customer-207-rw","customer-267-rw","customer-6-rw","customer-387-rw","customer-407-rw","customer-422-rw","customer-426-rw","customer-431-rw","customer-439-rw","customer-440-rw","customer-448-rw","customer-514-rw","customer-531-rw","customer-537-rw","customer-540-rw","customer-542-rw","customer-547-rw","customer-558-rw","customer-560-rw","cust","customer-207-rw","customer-267-rw","customer-285-rw","customer-336-rw","customer-350-rw","customer-37-rw","customer-379-rw","customer-386-rw","customer-439-rw","customer-440-rw","customer-448-rw","customer-458-rw","customer-483-rw","customer-484-rw","customer-494-rw","customer-496-rw","customer-47-rw","customer-558-rw","customer-560-rw","customer-567-rw","default"],"policy_results":{"allowed":true,"granting_policies":[{"name":"default","name72-7aa5-4aa7-58ef7857b9cb","token_type":"service","token_ttl":2764800,"token_issue_time":"2024-09-16T07:14:08Z"},"request":{"id":"4343e93a-3e9e-210d-"mount_point":"sys/","mount_type":"system","mount_accessor":"system_178f2936","client_token":"hmac-sha256:6201306652b536e08cf43f759e79aab7c803dff5e998b360e655d2db4a0e0e27dfd09be929d2","namespace":{"id":"root"},"path":"sys/capabilities-self","data":{"paths":["hmac-sha256:e1431aacb92011db5513fd6a398}}
{"time":"2024-10-07T07:56:39.818302752Z","type":"response","auth":{"client_token":"hmac-sha256:cbb918f020b93b4c79299b1f40df823f4b9a5bef621466896331f259be929d2","display_name":"ldap-rcapota","policies":["customer-1-rw","customer-13-rw","customer-137-rw","customer-207-rw","customer-267-rw","customer-6-rw","customer-387-rw","customer-407-rw","customer-422-rw","customer-426-rw","customer-431-rw","customer-439-rw","customer-440-rw","customer-448-rw","customer-514-rw","customer-531-rw","customer-537-rw","customer-540-rw","customer-542-rw","customer-547-rw","customer-558-rw","customer-560-rw","cust","customer-207-rw","customer-267-rw","customer-285-rw","customer-336-rw","customer-350-rw","customer-37-rw","customer-379-rw","customer-386-rw","customer-439-rw","customer-440-rw","customer-448-rw","customer-458-rw","customer-483-rw","customer-484-rw","customer-494-rw","customer-496-rw","customer-47-rw","customer-558-rw","customer-560-rw","customer-567-rw","default"],"policy_results":{"allowed":true,"granting_policies":[{"name":"default","name72-7aa5-4aa7-58ef7857b9cb","token_type":"service","token_ttl":2764800,"token_issue_time":"2024-09-16T07:14:08Z"},"request":{"id":"4343e93a-3e9e-210d-"mount_point":"sys/","mount_type":"system","mount_accessor":"system_178f2936","client_token":"hmac-sha256:6201306652b536e08cf43f759e79aab7c803dff5e998b360e655d2db4a0e0e27dfd09be929d2","namespace":{"id":"root"},"path":"sys/capabilities-self","data":{"paths":["hmac-sha256:e1431aacb92011db5513fd6a398},"response":{"mount_point":"sys/","mount_type":"system","mount_accessor":"system_178f2936","data":{"capabilities":["hmac-sha256:e779434a222d6f3b93fa5781bff6ef82ef7a202b2f23b1a24c0e","hmac-sha256:bbc0ec8b0908a266483ea0735415ca38fdf8fed8b33b897d4c152f1d8544f219"],"secret/metadata/Daikin/kubeadmin":6:cebe8ed5bad3692bd96990fb423f0e885781bff6ef82ef7a202b2f23b1a24c0e","hmac-sha256:bbc0ec8b0908a266483ea0735415ca38fdf8fed8b33b897d4c152f1d8544f219"]}}
```

IMPLEMENTATION

How does it all fit together? v1

For `master`

10 Jobs 5 minutes 19 seconds, queued for 4 seconds

Pipeline Needs Jobs 10 Tests 0

lint

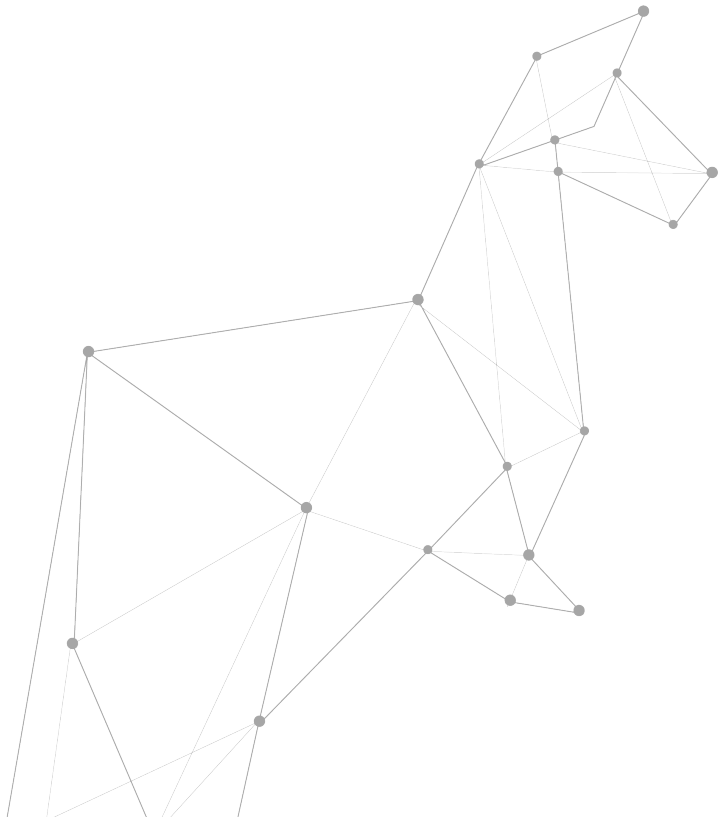
- lint
- lint_gitlab
- lint_ipa
- lint_vault

check

- check_gitlab
- check_ipa
- check_vault

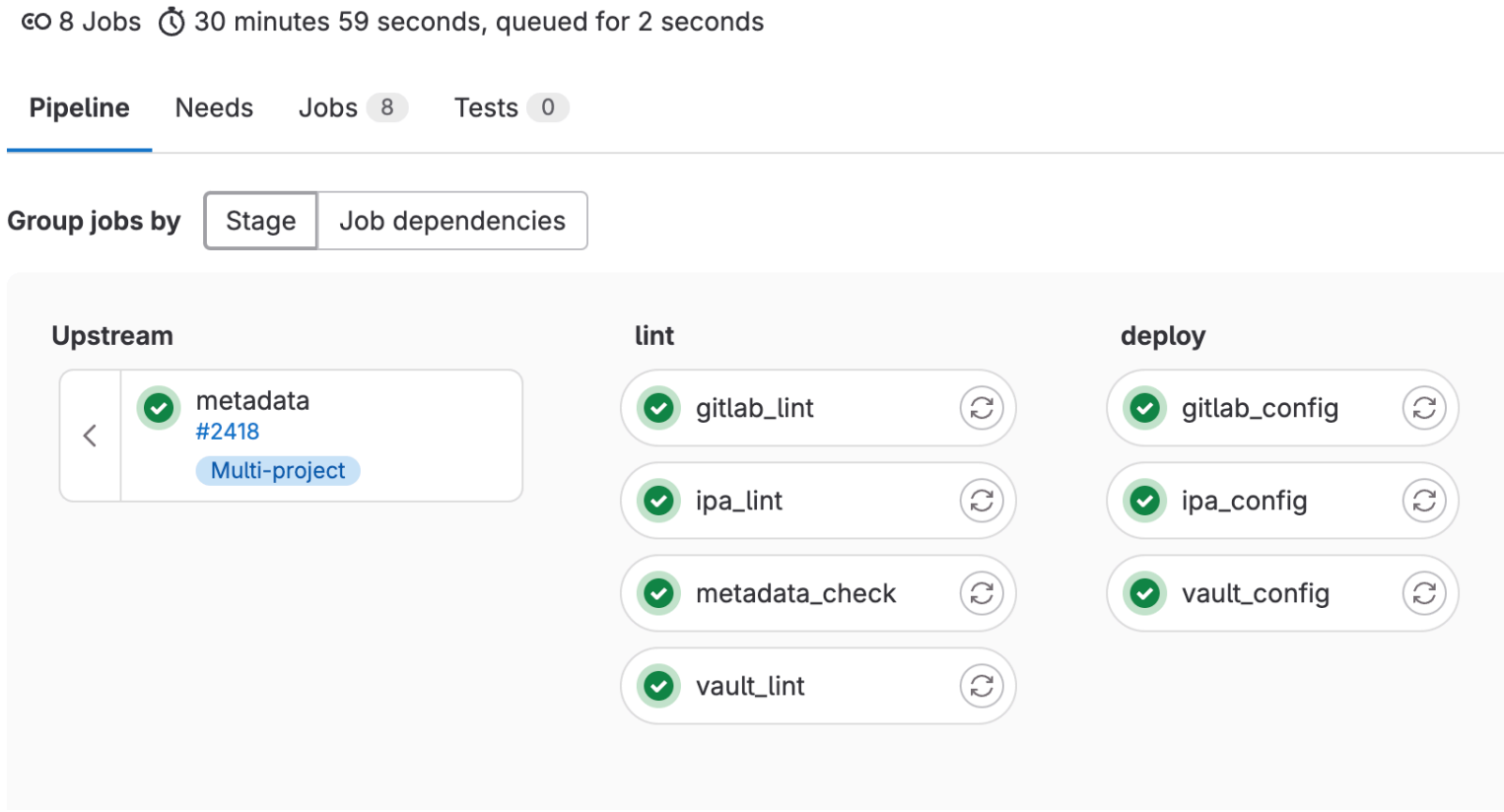
deploy

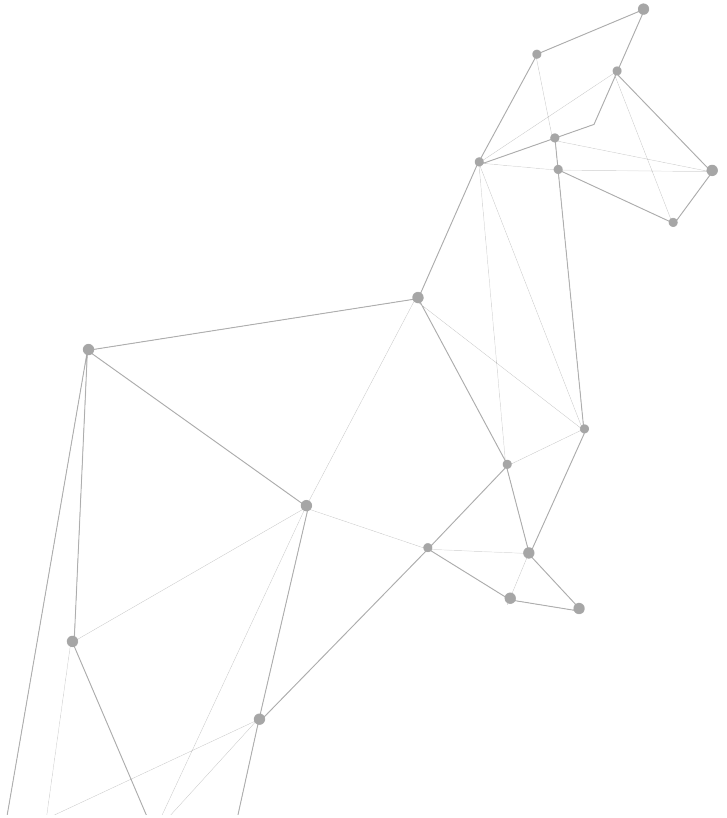
- deploy_gitlab
- deploy_ipa
- deploy_vault



IMPLEMENTATION

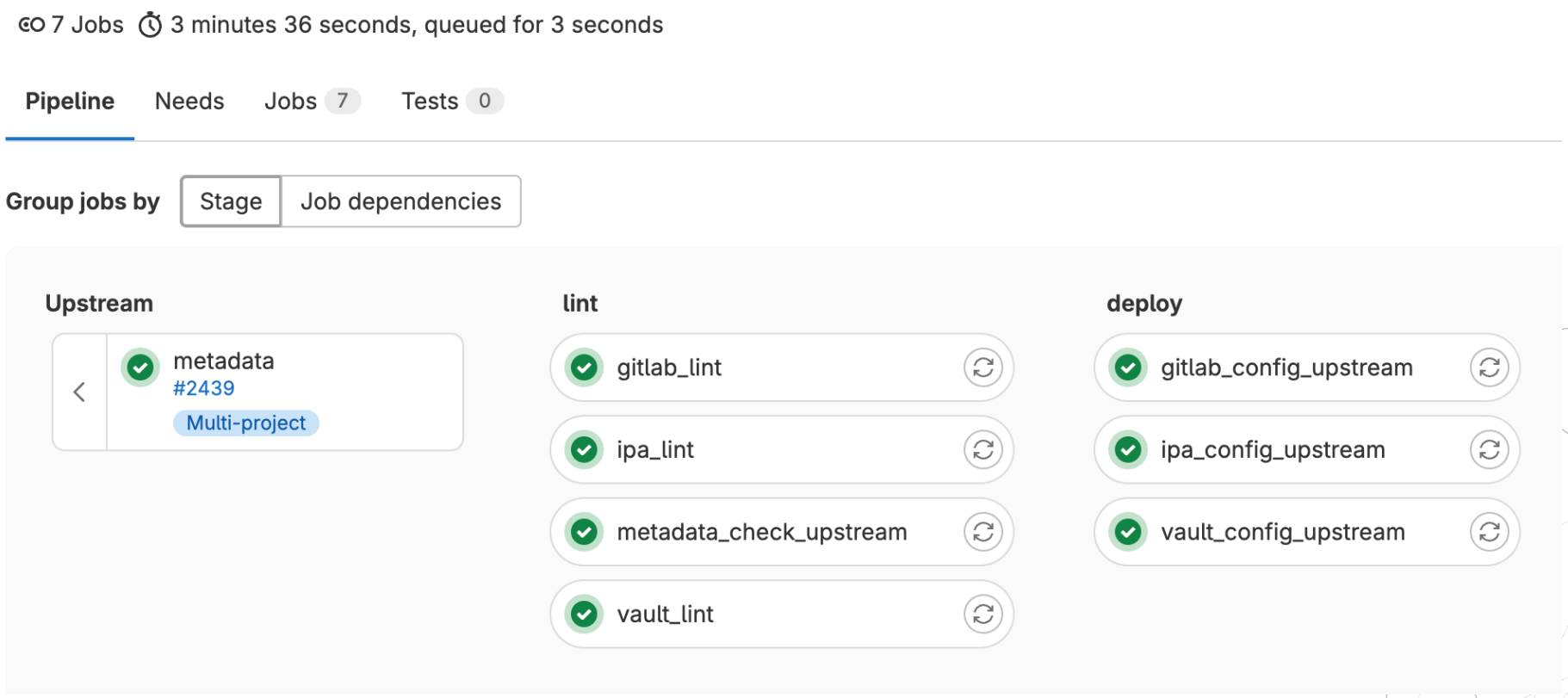
How does it all fit together? v2





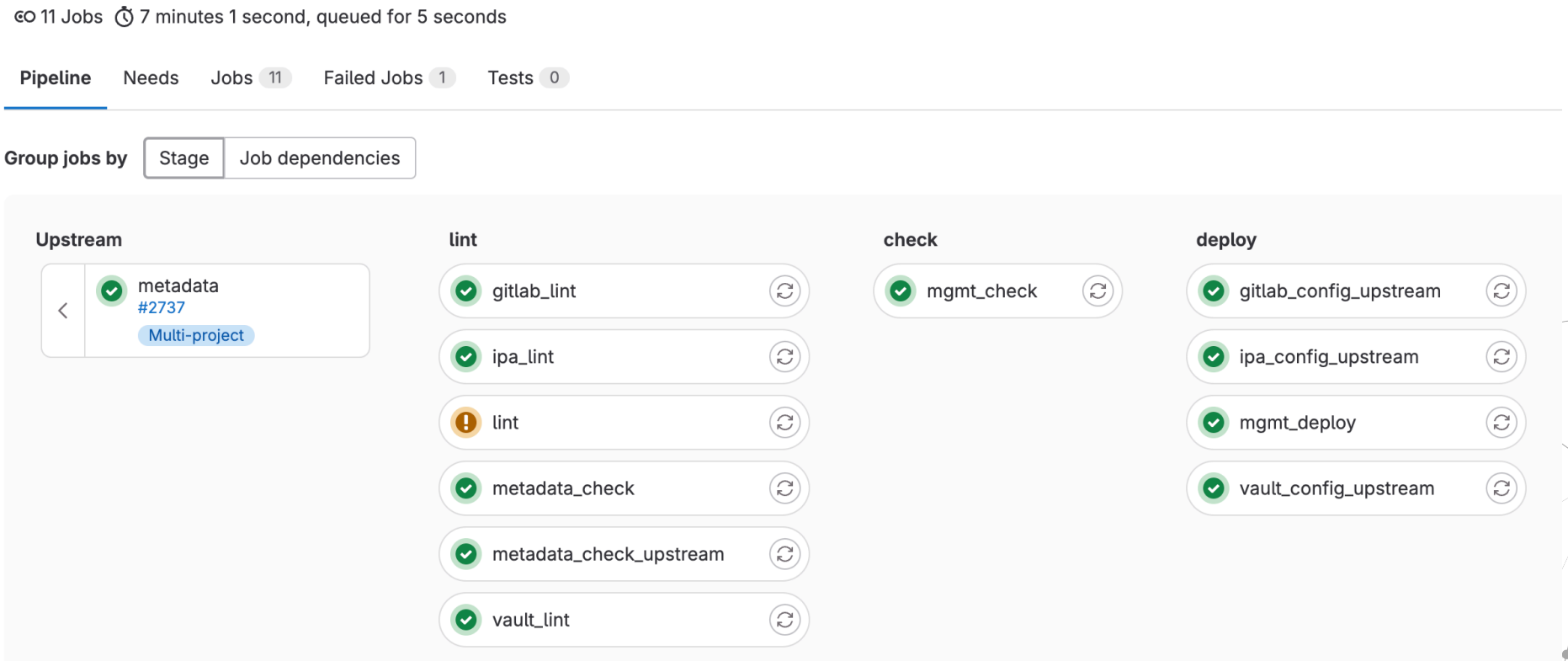
IMPLEMENTATION

How does it all fit together? v3a



IMPLEMENTATION

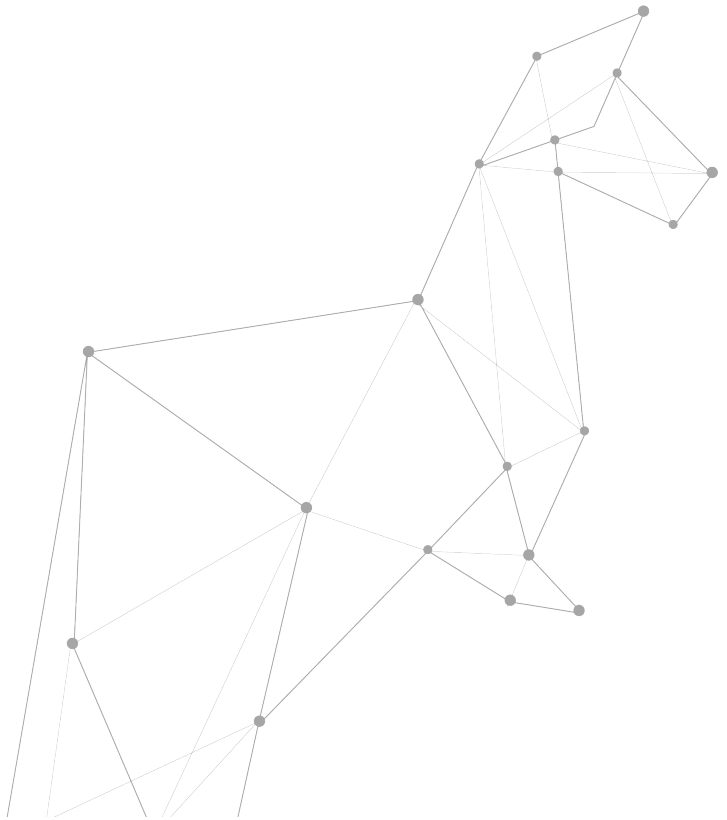
How does it all fit together? v3b



CONCLUSION

Thinking outside the box when it comes to open source tools can help you introduce structure and automation.

This empowers your employees to do their job, while ensuring they do things the right way.



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Questions?

Thank you !

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