

SSH Tunnel -

Requirements: FortClient VPN, Putty SSH Client.

a. FortClient VPN configurations: <Contact: daniel.meyer@iem.fraunhofer.de>

FortiClient -- Zero Trust Fabric Agent

FortiClient VPN

Upgrade to the full version to access additional features and receive technical support.

Edit VPN Connection

VPN SSL-VPN XML

Connection Name

Description

Remote Gateway ✕
[+Add Remote Gateway](#)

☐ Customize port

☐ Enable Single Sign On (SSO) for VPN Tunnel

Client Certificate ☒ None ☐ Prompt

Authentication ☐ Prompt on login ☒ Save login ☐ Disable


Username

Cancel Save

FortiClient -- Zero Trust Fabric Agent

FortiClient VPN

Upgrade to the full version to access additional features and receive technical support.



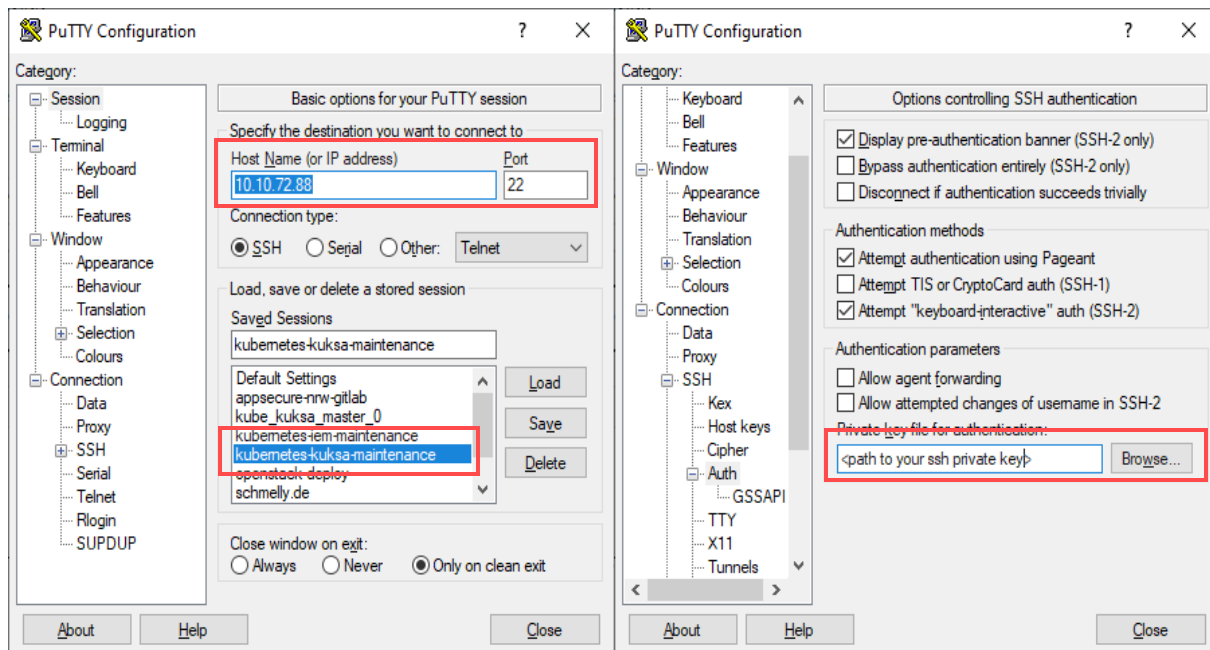
VPN Name ▼ ≡

Username

Password

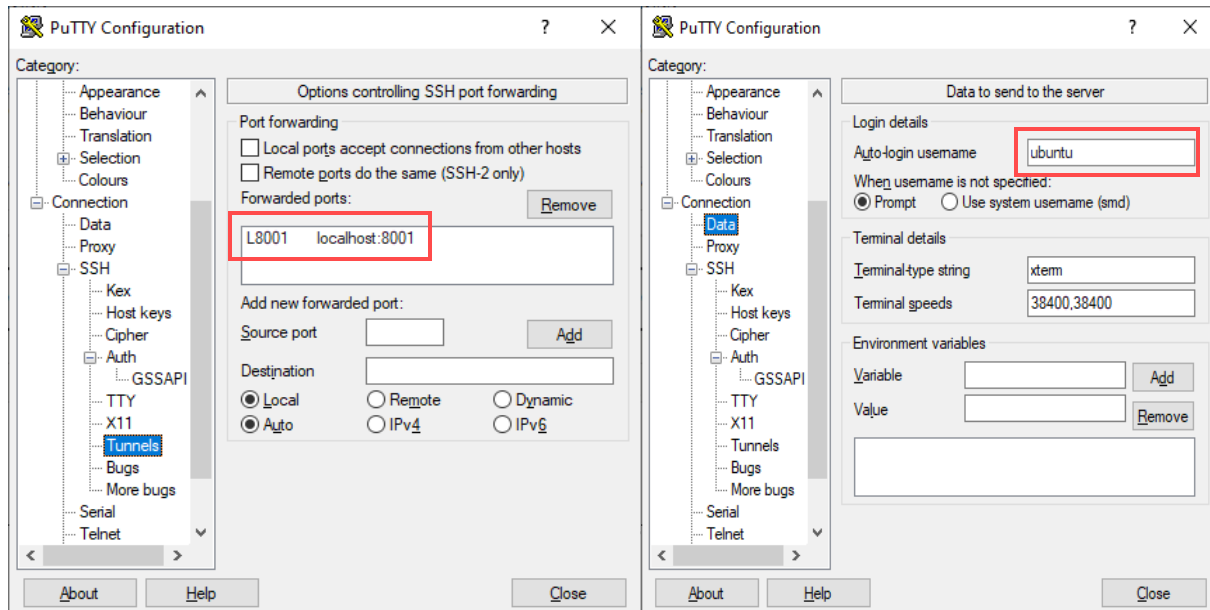
Connect

b. SSH Client Configurations: <Contact: david.schmelter@iem.fraunhofer.de>



SSH-privatekey: <https://owncloud.fraunhofer.de/index.php/s/kXI5kaixwV6xFzI>

password: %qg_kA`7qkV|UjvAYD,e



PuTTY Key Generator –

c. Private key: <Contact: david.schmelter@iem.fraunhofer.de>

- With the help of Putty key generator, we can *Load* and change the ssh private key for easy login or remove the ssh private key passphrase to eliminate the step of password login.
- The new ssh private key can be obtained with the *Generate* and *Save private key* options.

The screenshot shows the PuTTY Key Generator application window. The 'Key' section displays the public key for pasting into the OpenSSH authorized_keys file, the key fingerprint, and the key comment. The 'Actions' section contains buttons for 'Generate', 'Load', and 'Save private key', which are highlighted with a red box. The 'Parameters' section shows the type of key to generate (RSA) and the number of bits in a generated key (2048).

PuTTY Key Generator

File Key Conversions Help

Key

Public key for pasting into OpenSSH authorized_keys file:

```
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQBAQC9S4bcBnu/7Qls2Guu5AxXBAT8K8HbbG0gflg2jzjRdgU/V10L4f0f272iz1faot64
Y1v3KY3720I/OCTAjIYYiUnr75CqMUrT08yzvIqVhVHF23kWZcvs9QQ6Ys2X5f9UXCfXtkrQrM9TwnW2bkUmwQ
+upeZlb76Jfru53HqBpnOjSzKHinyglBlsWjB1sW1nQCpP9Sxuru24oG5ry7tvhlP4aRY2lyo9S9r9wmfHaaPLc9n8dE0KSLKLB
JlcmRtyRKCOPELWneTPNa2YhLp7jj0wq2IYuw9/MUOk1NQ7LxiqYhB0tiNyXB9UVjFBgNOvda17Eu17ekQiWppF7n
```

Key fingerprint: ssh-rsa 2048 SHA256:ITzXqsCPCcuYlecD2LXT+uG+UKYy0PwfNhx9ibF8

Key comment: imported-openssh-key

Key passphrase:

Confirm passphrase:

Actions

Generate a public/private key pair

Load an existing private key file

Save the generated key

Generate

Load

Save private key

Save public key

Parameters

Type of key to generate:

☒ RSA ☐ DSA ☐ ECDSA ☐ EdDSA ☐ SSH-1 (RSA)

Number of bits in a generated key: 2048

Maintenance VM –

d. Maintenance Server: <Contact: david.schmelter@iem.fraunhofer.de>

- Maintenance VM Login:

```
ubuntu@kubernetes-kuksa-demonstrator-maintenance: ~  
Using username "ubuntu".  
Authenticating with public key "imported-openssh-key"  
Welcome to Ubuntu 20.04.4 LTS (GNU/Linux 5.4.0-1082-kvm x86_64)  
  
* Documentation: https://help.ubuntu.com  
* Management:   https://landscape.canonical.com  
* Support:       https://ubuntu.com/advantage  
  
This system has been minimized by removing packages and content that are  
not required on a system that users do not log into.  
  
To restore this content, you can run the 'unminimize' command.  
  
30 updates can be applied immediately.  
To see these additional updates run: apt list --upgradable  
  
New release '22.04.1 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
*** System restart required ***  
Last login: Thu Jan 26 14:12:16 2023 from 10.10.100.11  
(python-venv) ubuntu@kubernetes-kuksa-demonstrator-maintenance:~$
```

Dependencies - Kube control <kubect!> and helm must be configured in the VM server.

Open Stack –

- OpenStack host the maintenance instance.

openstack

100% IEM • 300-demonstrators

Project

API Access

Compute

Overview

Instances

Images

Key Pairs

Server Groups

Volumes

Container Infra

Network

Orchestration

DNS

Identity

Project / Compute / Instances

Instances

Instance ID =

Filter

Launch Instance

Delete Instances

More Actions

Displaying 4 items

<input type="checkbox"/>	Instance Name	Image Name	IP Address	Flavor	Key Pair	Status	Availability Zone	Task	Power State	Age	Actions	
<input type="checkbox"/>	kubernetes-kuksa-demonstrator-k2leo4nezhk7-node-1	fedora-coreos-34-20211031.3.0-openstack.x86_64	10.10.10.91	k8s-worker.1.xlarge	-	Active	us-east-1a	nova	None	Running	1 week, 2 days	Create Snapshot
<input type="checkbox"/>	kubernetes-kuksa-demonstrator-k2leo4nezhk7-node-0	fedora-coreos-34-20211031.3.0-openstack.x86_64	10.10.10.206	k8s-worker.1.xlarge	-	Active	us-east-1a	nova	None	Running	1 week, 2 days	Create Snapshot
<input type="checkbox"/>	kubernetes-kuksa-demonstrator-k2leo4nezhk7-master-0	fedora-coreos-34-20211031.3.0-openstack.x86_64	10.10.10.27	k8s-master.1.xlarge	-	Active	us-east-1a	nova	None	Running	1 week, 2 days	Create Snapshot
<input type="checkbox"/>	kubernetes-kuksa-demonstrator-maintenance	ubuntu-20.04-minimal-cloudimg-amd64	10.10.10.161, 10.10.72.88	gp.1.medium	kubernetes-kuksa-demonstrator	Active	us-east-1a	nova	None	Running	8 months, 2 weeks	Create Snapshot

Displaying 4 items

Link to OpenStack dashboard: <https://openstack.ad.iem-hoc.de/project/>

Kubernetes Dashboard –

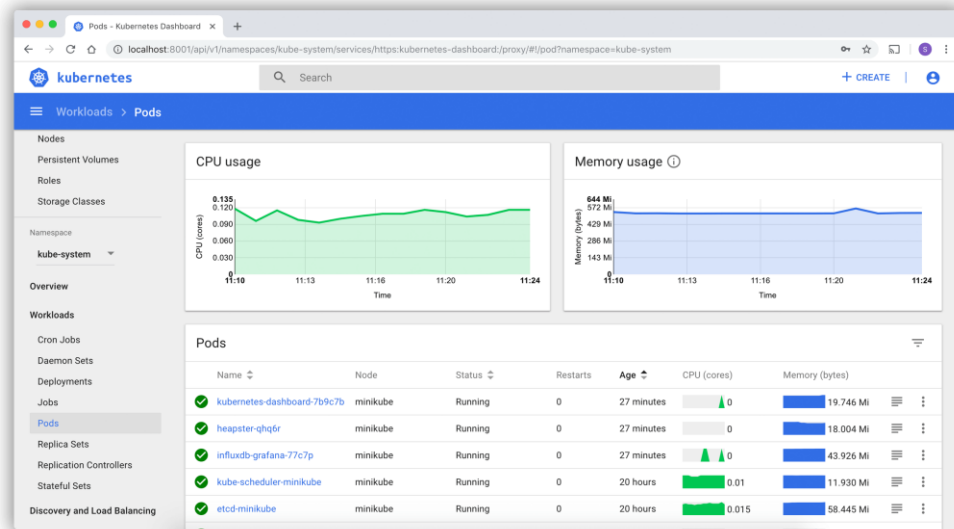
- Kubernetes Dashboard is a web based user interface for Kubernetes clusters.
- Kubernetes Dashboard:

\$kubectl proxy

```
(python-venv) ubuntu@kubernetes-kuksa-demonstrator-maintenance:~$  
(python-venv) ubuntu@kubernetes-kuksa-demonstrator-maintenance:~$  
(python-venv) ubuntu@kubernetes-kuksa-demonstrator-maintenance:~$ kubectl proxy  
Starting to serve on 127.0.0.1:8001
```

Link to dashboard:

<http://localhost:8001/api/v1/namespaces/kube-system/services/https:kubernetes-dashboard:/proxy/#/overview?namespace=default>



Source: <https://kubernetes.io/docs/tasks/access-application-cluster/web-ui-dashboard/>

Common Kubernetes Commands –

- To deploy and halt the Kuksa-Cloud helm chart:

The required parameters and components need to be configured and enabled in the Kuksa-Chart: `./workspace/kuksa.cloud/deployment/helm/kuksa-cloud/values.yaml`

Deploy: *\$helm install kuksa-cloud ./kuksa-cloud*

```
(python-venv) ubuntu@kubernetes-kuksa-demonstrator-maintenance:~/workspace/kuksa.cloud/deployment/helm$ helm install kuksa-cloud ./kuksa-cloud
00126 14:30:52.292229 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.327778 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.349066 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.375935 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.395242 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.416790 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.436431 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.468345 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.495636 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.516247 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.537458 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.555281 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.583349 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
00126 14:30:52.613172 23111 warnings.go:70] apiextensions.k8s.io/v1beta1 CustomResourceDefinition is deprecated in v1.16+, unavailable in v1.22+; use apiextensions.k8s.io/v1 CustomResourceDefinition
```

Halt: *\$helm uninstall kuksa-cloud*

```
(python-venv) ubuntu@kubernetes-kuksa-demonstrator-maintenance:~/workspace/kuksa.cloud/deployment/helm$ helm uninstall kuksa-cloud
00126 14:30:32.844386 23105 warnings.go:70] rbac.authorization.k8s.io/v1beta1 ClusterRoleBinding is deprecated in v1.17+, unavailable in v1.22+; use rbac.authorization.k8s.io/v1 ClusterRoleBinding
00126 14:30:32.857548 23105 warnings.go:70] rbac.authorization.k8s.io/v1beta1 ClusterRoleBinding is deprecated in v1.17+, unavailable in v1.22+; use rbac.authorization.k8s.io/v1 ClusterRoleBinding
00126 14:30:32.869025 23105 warnings.go:70] rbac.authorization.k8s.io/v1beta1 ClusterRole is deprecated in v1.17+, unavailable in v1.22+; use rbac.authorization.k8s.io/v1 ClusterRole
00126 14:30:32.874958 23105 warnings.go:70] rbac.authorization.k8s.io/v1beta1 ClusterRole is deprecated in v1.17+, unavailable in v1.22+; use rbac.authorization.k8s.io/v1 ClusterRole
release "kuksa-cloud" uninstalled
(python-venv) ubuntu@kubernetes-kuksa-demonstrator-maintenance:~/workspace/kuksa.cloud/deployment/helm$
```

- To check the deployed Pod Status:

\$kubectl get pods

```
(python-venv) ubuntu@kubernetes-kuksa-demonstrator-maintenance:~/workspace/kuksa.cloud/deployment/helm$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
kuksa-cloud-adapter-http-vertx-77d565f9c6-6wg4z   0/1     CrashLoopBackOff   177       22h
kuksa-cloud-ambassador-7c98c455fb-7wsq7           1/1     Running           0          22h
kuksa-cloud-ambassador-7c98c455fb-849gx           1/1     Running           0          22h
kuksa-cloud-app-store-67b58d9d44-dbzbs            1/1     Running           0          22h
kuksa-cloud-artemis-6cfb57d78f-nr8hr              1/1     Running           152        22h
kuksa-cloud-connector-7b9546bdcc-zgp1p            1/1     Running           1          22h
kuksa-cloud-dispatch-router-6689bd578b-5jtt4      1/1     Running           3          22h
kuksa-cloud-grafana-798b6bd67d-ddd2q              2/2     Running           0          22h
kuksa-cloud-influxdb-0                            1/1     Running           0          22h
kuksa-cloud-keycloak-0                            1/1     Running           0          22h
kuksa-cloud-prometheus-server-77d4769954-pgvhc    2/2     Running           0          22h
kuksa-cloud-service-auth-5c97cc6996-lnlitt        0/1     CrashLoopBackOff   256        22h
kuksa-cloud-service-device-registry-0             0/1     CrashLoopBackOff   250        22h
(python-venv) ubuntu@kubernetes-kuksa-demonstrator-maintenance:~/workspace/kuksa.cloud/deployment/helm$
(python-venv) ubuntu@kubernetes-kuksa-demonstrator-maintenance:~/workspace/kuksa.cloud/deployment/helm$
(python-venv) ubuntu@kubernetes-kuksa-demonstrator-maintenance:~/workspace/kuksa.cloud/deployment/helm$
(python-venv) ubuntu@kubernetes-kuksa-demonstrator-maintenance:~/workspace/kuksa.cloud/deployment/helm$
```

- To get the status and details of a deployed pod:

```
$kubectl describe pod <pod_name>
```

- To debug and access the terminal for the deployed pods:

```
$kubectl exec -stdin -tty <pod_name> -- /bin/bash
```

OR

```
$kubectl exec -stdin -tty <pod_name> -- /bin/sh
```

- To get the logs details of a deployed pod:

```
$kubectl logs <pod_name>
```

Some important github repository links –

e. links to repo:

- Kuksa-Val:

Link to github repo: <https://github.com/eclipse/kuksa.val>

- Kuksa-Cloud:

Link to github repo: <https://github.com/eclipse/kuksa.cloud>

- HONO:

Link to github repo: [packages/charts/hono at master · eclipse/packages · GitHub](#)

Car2Cloud demonstrator –

- Steps to setup and run the carTelemetry feeder and Kuksa2HONO are part of Readme file.