

Release 5 Installation Document

- [Introduction](#)
- [How to use this document](#)
- [Deploy Architecture](#)
- [Pre-Installation Requirements](#)
 - [Hardware Requirements](#)
 - [Software Prerequisites](#)
 - [Database Prerequisites](#)
 - [Other Installation Requirements](#)
 - [Installation on the Client PC side\(Teacher/Student Client\)](#)
- [Installation High-Level Overview](#)
 - [Upstream Deployment Guide](#)
 - [Deployment](#)
 - [Tars deployment directory structure](#)
 - [About tarscli](#)
 - [Basic services](#)
 - [Install Virtual Classroom BackEnd](#)
 - [Install Virtual Classroom Frontend](#)
 - [Installation on VM2\(Jenkins Master\)](#)
- [Verifying the Setup](#)
- [Developer Guide and Troubleshooting](#)
- [Uninstall Guide](#)
- [Troubleshooting](#)
- [Maintenance](#)
 - [Blueprint Package Maintenance](#)
- [Frequently Asked Questions](#)
- [License](#)
- [References](#)
- [Definitions, acronyms and abbreviations](#)

Introduction

IEC Akraino Edge Stack supports AR/VR applications. It could support AR/VR Algorithms that with GPU Modeling (i.e. modeling describes the process of forming the shape of an object) Compositing (e.g. Environmental Mapping, Tone Mapping) Rendering and Illumination Models Visualization of Large Volume 3D Models (e.g. Global Network Operations Center monitoring) Registration (e.g. Stitching data from distributed sources) Segmentation (e.g. Segmentation and detection for security monitoring). This IEC Type 4 AR/VR platform utilizes [Tars](#) for remote direct memory access control. In this document, we use **Virtual Classroom** as demo for IEC Type4. Virtual Classroom is an online learning environment that allows teachers and students to communicate and interact with each other in real time. We use **WebGL**, **Three.js** and **JavaScript** to develop Virtual Classroom application.

License

Apache License - V2

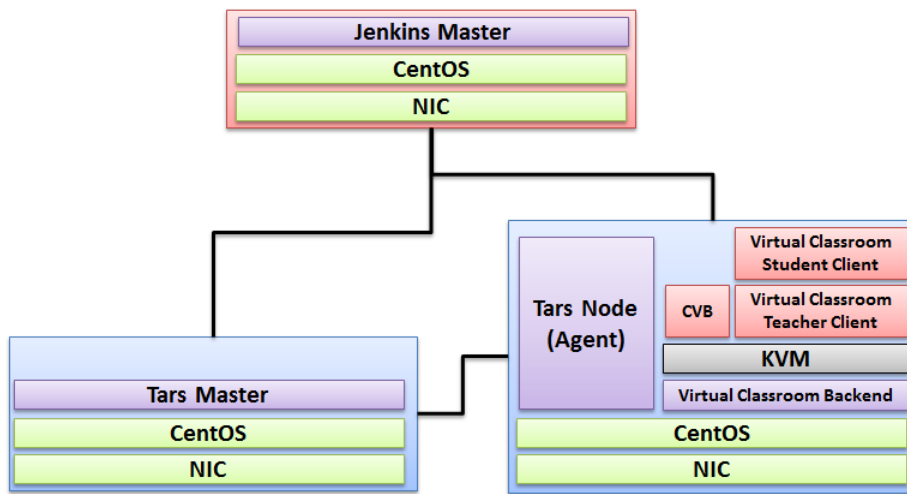
How to use this document

The document includes details of prerequisites /pre-installation, installation and uninstalls steps.

The prerequisites and pre-installation software and hardware should be ready before executing the installation steps.

Deploy Architecture

To make the system deploy, the minimum deployment architecture is shown below, which consist of:



Pre-Installation Requirements

Hardware Requirements

- Wearable Glass (Optional)
- Teacher Client-Side — Personal Computer with Camera
- Student Client-Side — Personal Computer with Camera
- Server Side — 8 Core 16G Virtual Machine on ARM or x86 Platform

Software Prerequisites

- Teacher Side: Windows 10 with a Web Browser that supports WebSockets.
- Student Side: Windows 10 with a Web Browser that supports WebSockets.
- Server Side: CentOS 7.8
- Virtual Classroom (OpenVidu 2.13.0)
- Tars 2.4.13
- IEC 3.0

Database Prerequisites

N/A

Other Installation Requirements

N/A

Installation on the Client PC side(Teacher/Student Client)

Note well: No special software to access the application. The general software is itemized below:

- Install Windows 10
- Install camera driver
- Install Firefox browser

Installation High-Level Overview

Upstream Deployment Guide

K8STARS is a convenient solution to run TARS services in Kubernetes, and it has the following characteristics:

- Maintain the native development capability of TARS;
- Automatic registration and configuration deletion of name service for TARS;
- Support smooth migration of original TARS services to K8S and other container platforms;
- Non intrusive design, no coupling relationship with operating environment.

How K8STARS works?

1. Three interfaces are added in the tarsregistry, which are used for automatic registration, heartbeat reporting and node offline. For details, please refer to [interface definition](#)
2. A 'tarscli' command-line tool is provided to allocate ports, generate configuration, report heartbeat and node offline.

Deployment

1. Deployment tars basic service
 - a. curl https://raw.githubusercontent.com/TarsCloud/K8STARS/master/baseserver/install_all.sh | sh
2. Deployment service example
 - a. Deploy sample simpleserver:

```
cd examples/simple && kubectl apply -f simpleserver.yaml
```

Example description:

- The image is created by the examples/simple/dockerfile file, and the basic image is created by cmd/tarscli/dockerfile
- start.sh: tarscli genconf in is used to generate the tars service startup configuration
- server_meta.yaml The file is used to configure the metadata of the service. For field information, please refer to app/genconf/config.go structure ServerConf . Endpoint defaults to tcp -h \${local_ip} -p \${random_port} , supports automatic filling of IP and random ports. - based on Golang HelloWorld program TestApp.HelloGo See [examples/README.md](#)

3. Verify the deployment Login db_tars , then execute `select * from t_server_conf\G` The node information of simpleserver has been registered automatically.

Tars deployment directory structure

tarscli based on environment variable TARS_PATH(default/tars) to manage services. The directory functions are as follows:

- \${TARS_PATH}/bin Startup scripts and binaries
- \${TARS_PATH}/conf Configuration file
- \${TARS_PATH}/log Log file
- \${TARS_PATH}/data Runtime, Cache file

About tarscli

tarscli provides a set of command tools to facilitate container deployment of TARS services. Parameters can be specified through environment variables. For details, see `tarscli help`.

Here are the sub commands supported by tarscli

- `genconf` is used to generate the startup configuration file of the TARS service. The supported environment variables are:
 - TARS_APPLICATION the application name specified. By default, the _ server_ meta.yaml Read from
 - TARS_SERVER is the service name specified by the _ server_ meta.yaml Read from
 - TARS_BUILD_SERVER the service name at compile time. It will be used when the compiled service name is different from the running service name
 - TARS_LOCATOR can specify the address of registry. The default is tars.tarsregistry.QueryObj@tcp -h tars-registry.tars-system.svc.cluster.local -p 17890 (address of service)
 - TARS_SET_ID can specify service set
 - TARS_MERGE_Conf can specify the configuration template file and merge the configuration into the service startup configuration file
- `supervisor` executes the `genconf` command by default, and then starts and monitors the service. The supported environment variables are:
 - TARS_START_PATH The startup script of the service \$TARS_PATH/bin/start.sh
 - TARS_STOP_PATH The stop script, by default, kill all service processes under path \$TARS_PATH
 - TARS_REPORT_INTERVAL reports the interval heartbeat to registry
 - TARS_DISABLE_FLOW whether to enable traffic when registering with registry. If it is not empty, it means it is off. It is enabled by default
 - TARS_CHECK_INTERVAL check the service status interval. If the status changes, it will be synchronized to the registry in real time
 - TARS_BEFORE_CHECK_SCRIPT the shell command that runs before each check
 - TARS_CHECK_SCRIPT_TIMEOUT the timeout to run the shell command before each check
 - TARS_PRESTOP_WAITTIME turn off traffic - the waiting time before stopping the service. It is used for lossless changes. The default value is 80 seconds
- `hzcheck` is used to synchronize the service status and the pod status of k8s. You need to set the readiness Probe of pod to tarscli hzcheck command
- `prestop` is used to delete the configuration corresponding to the registry before the service exits
 - TARS_PRESTOP_WAITTIME turn off traffic - the waiting time before stopping the service. It is used for lossless changes. The default value is 80 seconds
- `notify` is used to send management commands. The common commands are: tars.setloglevel/tars.pprof, etc

Basic services

TARS related basic services provide rich service governance functions. Please refer to [baseserver](#) for deployment.

- Install Virtual Classroom BackEnd

```
0. prepare : firewall

firewall-cmd --add-port 22/tcp
firewall-cmd --add-port 80/tcp
firewall-cmd --add-port 443/tcp
firewall-cmd --add-port 3478/tcp
firewall-cmd --add-port 3478/udp
firewall-cmd --add-port 40000-57000/tcp
firewall-cmd --add-port 40000-57000/udp
firewall-cmd --add-port 57001-65535/tcp
firewall-cmd --add-port 57001-65535/udp
firewall-cmd --list-all

1. deployment
cd /opt
yum-config-manager \
  --add-repo \
    https://download.docker.com/linux/centos/docker-ce.repo
yum install -y docker-ce docker-ce-cli containerd.io
systemctl enable docker
curl -L https://github.com/docker/compose/releases/download/1.25.0/docker-compose-`uname -s`-`uname -m` -o /usr
/local/bin/docker-compose
chmod +x /usr/local/bin/docker-compose
docker-compose --version

curl https://s3-eu-west-1.amazonaws.com/aws.openvidu.io/install_openvidu_2.13.0.sh | bash

2. Configuration
vi /opt/openvidu/.env

# add IP and admin PW
OPENVIDU_DOMAIN_OR_PUBLIC_IP= $your_host_IP

OPENVIDU_SECRET= $admin_PW

3. Execution
cd /opt/openvidu/
./openvidu start

Available services
Consume OpenVidu REST API through https://$your_host_IP/
If the application is enabled, it will also be available at https://$your_host_IP/
You can open OpenVidu Dashboard to verify everything is working as expected at https://$your_host_IP/dashboard/
with credentials:
user: OPENVIDUAPP
pass: $admin_PW

4. Install Java for Jenkins Slave

For Slave Mode, install Java will be ok.

sudo yum install -y java-1.8.0-openjdk-devel
```

Install Virtual Classroom Frontend

```
##http-server install
npm install -g http-server-ssl

## Virtual Classroom front-end setup
git clone https://github.com/OpenVidu/openvidu-vr.git
cd openvidu-vr/openvidu-vr-room
vi app.js
modify line 163
var OPENVIDU_SERVER_URL = 'https://demos.openvidu.io'; //backend IP
var OPENVIDU_SERVER_SECRET = 'MY_SECRET'; //backend password

http-server-ssl -S &

Run Testing: https://$your_host_IP:8080
```

Installation on VM2(Jenkins Master)

Jenkins is a Java application, so the first step is to install Java. Run the following command to install the OpenJDK 8 package:

```
sudo yum install -y java-1.8.0-openjdk-devel
```

The next step is to enable the Jenkins repository. To do that, import the GPG key using the following curl command:

```
curl --silent --location http://pkg.jenkins-ci.org/redhat-stable/jenkins.repo | sudo tee /etc/yum.repos.d/jenkins.repo
```

And add the repository to your system with:

```
sudo rpm --import https://jenkins-ci.org/redhat/jenkins-ci.org.key
```

Once the repository is enabled, install the latest stable version of Jenkins by typing:

```
sudo yum install -y jenkins
```

After the installation process is completed, start the Jenkins service with:

```
sudo systemctl start jenkins
```

To check whether it started successfully run:

```
systemctl status jenkins
```

You should see something similar to this:

```
# systemctl status jenkins
* jenkins.service - LSB: Jenkins Automation Server
   Loaded: loaded (/etc/rc.d/init.d/jenkins; bad; vendor preset: disabled)
   Active: active (running) since Tue 2020-11-15 11:16:26 CST; 1min 15s ago
     Docs: man:systemd-sysv-generator(8)
  Process: 489 ExecStart=/etc/rc.d/init.d/jenkins start (code=exited, status=0/SUCCESS)
   CGroup: /system.slice/jenkins.service
           └─510 /etc/alternatives/java -Dcom.sun.akuma.Daemon=daemonized -Djava.awt.headless=true -
DJENKINS_HOME=/var/lib/jenkins -jar /usr/l...

Nov 15 11:16:25 VM_0_4_centos systemd[1]: Starting LSB: Jenkins Automation Server...
Nov 15 11:16:26 VM_0_4_centos runuser[491]: pam_unix(runuser:session): session opened for user jenkins by
(uid=0)
Nov 15 11:16:26 VM_0_4_centos runuser[491]: pam_unix(runuser:session): session closed for user jenkins
Nov 15 11:16:26 VM_0_4_centos jenkins[489]: Starting Jenkins [ OK ]
Nov 15 11:16:26 VM_0_4_centos systemd[1]: Started LSB: Jenkins Automation Server.
```

Finally enable the Jenkins service to start on system boot.

```
sudo systemctl enable jenkins
```

output

```
# sudo systemctl enable jenkins
jenkins.service is not a native service, redirecting to /sbin/chkconfig.
Executing /sbin/chkconfig jenkins on
```

Adjust the Firewall If you are installing Jenkins on a remote CentOS server that is protected by a firewall you need to port 8080.

Use the following commands to open the necessary port:

```
sudo firewall-cmd --permanent --zone=public --add-port=8080/tcp
sudo firewall-cmd --reload
```

Setting Up Jenkins To set up your new Jenkins installation, open your browser and type your domain or IP address followed by port 8080:

`http://your_ip_or_domain:8080`

You will see the website itemized below: [blocked URL](#)

Select the left option and install the plugin later: [blocked URL](#)

Automatic install process: [blocked URL](#)

Configure username/password: [blocked URL](#)

Visit Website: [blocked URL](#)

Jenkins is ready: [blocked URL](#)

Verifying the Setup

N/A

Developer Guide and Troubleshooting

Virtual Classroom demo includes two parts: (1) server side and (2) client side. The technologies used to develop these applications includes **WebGL**, **Three.js** and **JavaScript**.

The code could be find at:

```
git clone https://github.com/OpenVidu/openvidu-vr.git
cd /root/openvidu-vr/openvidu-vr-room/
sed -i 's/demos.openvidu.io/${Local_IP_Address}/g' app.js
```

To execute:

```
docker run --rm --name openvidu_server -d -p 4443:4443 -e openvidu.secret=MY_SECRET -e openvidu.publicurl=https://${Local_IP_Address}:4443/ openvidu/openvidu-server-kms
```

Uninstall Guide

1. Stop all tars processes

```
/usr/local/app/tars/tars-stop.sh
```

2. Delete files

```
rm -rf /usr/local/app/tars
rm -rf /usr/local/app/patches
rm -rf /usr/local/app/web
rm -rf /usr/local/tars
```

3. Delete crontab

```
crontab -e
```

```
**Delete this line " * * * * * /usr/local/app/tars/tarsnode/util/monitor.sh ***
```

Troubleshooting

N/A

Maintenance

Blueprint Package Maintenance

Frequently Asked Questions

- https://tarscloud.github.io/TarsDocs_en/question/Install_faq-en.html
- https://tarscloud.github.io/TarsDocs_en/question/tarscpp-question.html
- https://tarscloud.github.io/TarsDocs_en/question/tarsjava-question.html
- https://tarscloud.github.io/TarsDocs_en/question/tarsphp-question.html

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References

N/A

Definitions, acronyms and abbreviations

N/A