

R3 Installation Document

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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

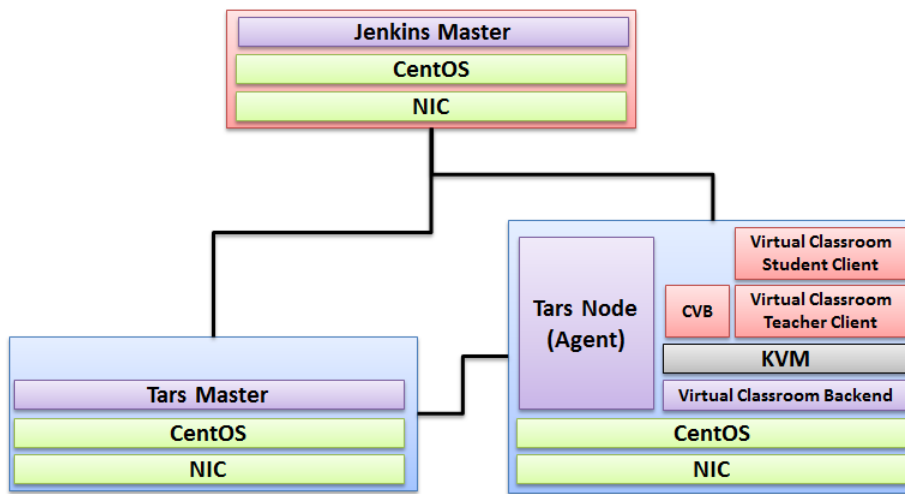
How to use this document

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 8
- Virtual Classroom (OpenVidu 2.13.0)
- Tars 2.1.0
- 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

Installation for Tars Master

- Install CentOS 8, refer to <https://phoenixnap.com/kb/how-to-install-centos-8>
- Install IEC, refer to [IEC Type1&2 Installation Guide for R2](#)
- Install Tars, refer to https://tarscloud.github.io/TarsDocs_en/installation/source.html

1. Dependency install

```
yum install -y glibc-devel gcc gcc-c++ bison flex make cmake psmisc ncurses-devel zlib-devel openssl openssl-devel
```

```
## install mysql
wget -i -c http://dev.mysql.com/get/mysql57-community-release-el7-10.noarch.rpm
yum -y install mysql57-community-release-el7-10.noarch.rpm
yum -y install mysql-community-server
yum -y install mysql-devel
```

If you have problems to install mysql with the above step, add the new mysql repository to local server with this yum command and then re-run the previous commands.

```
sudo yum localinstall https://dev.mysql.com/get/mysql57-community-release-el7-10.noarch.rpm
```

```
yum install mariadb-server -y
```

```
## Configure mysql
systemctl start mariadb.service
systemctl enable mariadb.service
systemctl status mariadb.service
mysql -u root -p
```

```
grep "password" /var/log/mariadb/mariadb.log
```

```
ALTER USER 'root'@'localhost' IDENTIFIED BY '{your passwd}';
flush privileges;
```

2. Install develop environment for Tars

```
yum install -y npm
npm i -g pm2
```

```
wget -qO- https://raw.githubusercontent.com/creationix/nvm/v0.33.11/install.sh | bash
source ~/.bashrc
```

```
nvm install v8.11.3
npm install -g pm2 --registry=https://registry.npm.taobao.org
```

```
mkdir Tars
cd Tars
git clone https://github.com/TarsCloud/TarsFramework.git --recursive
cd TarsFramework/build
chmod u+x build.sh
./build.sh prepare
./build.sh all
```

```
###Recompile if needed.###
```

```
./build.sh cleanall
./build.sh all
```

Change to user root and create the installation directory.

```
cd /usr/local
mkdir tars
mkdir app
chown ${normal user}:${normal user} ./tars/
chown ${normal user}:${normal user} ./app/
```

```
cd
cd Tars/TarsFramework/build/
./build.sh install or make install
```

The default install path is /usr/local/tars/cpp
If you want to install on different path:

```
**modify tarscpp/CMakeLists.txt**
**modify TARS_PATH in tarscpp/servant/makefile/makefile.tars**
**modify DEMO_PATH in tarscpp/servant/script/create_tars_server.sh**
```

3. Tars framework Installation

3.0 Firewall setup

```
firewall-cmd --zone=public --permanent --add-service=http
firewall-cmd --add-port 3000/tcp
firewall-cmd --add-port 3001/tcp
firewall-cmd --add-port 3306/tcp
```

3.1. Add user

```
mysql -u root -p
grant all on *.* to 'tarsAdmin'@'%' identified by 'Tars@2019' with grant option;
grant all on *.* to 'tarsAdmin'@'172.22.195.10' identified by 'Tars@2019' with grant option;
grant all on *.* to 'tarsAdmin'@'Node-1' identified by 'Tars@2019' with grant option;
flush privileges;
```

3.2 setup mysql privileges

```
mysql -u root -p
>use mysql
>select Host from user where User='root';
if shown as "localhost" we can update as following command

>update user set host = '%' where user ='root';
>FLUSH PRIVILEGES;
'% update to the host IP and then use mysql -u root -p --host '%ip' change back '%'
```

```
cd /Tars
git clone https://github.com/TarsCloud/TarsWeb.git
mv TarsWeb web
cp -rf web /usr/local/tars/cpp/deploy/
cd /usr/local/tars/cpp/deploy
chmod a+x linux-install.sh
./linux-install.sh MYSQL_HOST MYSQL_ROOT_PASSWORD INET REBUILD(false[default]/true) SLAVE(false[default]/true)
./linux-install.sh 192.168.1.10 our_PW eno1 false false admin 3306
```

Installation for Tars Agent(Jenkins Slave)

- Install CentOS 8, refer to <https://phoenixnap.com/kb/how-to-install-centos-8>
- Install IEC, refer to [IEC Type1&2 Installation Guide for R2](#)
- Install Tars, refer to <https://github.com/TarsCloud/Tars/blob/master/Install.md>
- 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 install docker-ce --nobest --allowdowngrade
systemctl enable --now 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 2019-10-15 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...

Oct 15 11:16:25 VM_0_4-centos systemd[1]: Starting LSB: Jenkins Automation Server...
Oct 15 11:16:26 VM_0_4-centos runuser[491]: pam_unix(runuser:session): session opened for user jenkins by
(uid=0)
Oct 15 11:16:26 VM_0_4-centos runuser[491]: pam_unix(runuser:session): session closed for user jenkins
Oct 15 11:16:26 VM_0_4-centos jenkins[489]: Starting Jenkins [ OK ]
Oct 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

TBD...

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References

N/A

Definitions, acronyms and abbreviations

N/A