

Test Beam Server Box Setup

The basic setup was done with internet access in the SLAC group C lab

- Install CentOS 7 (Minimal Compute Node and Development Tools)
- Add an user named "beam"
- Disable selinux by editing /etc/selinux/config and setting SELINUX=disabled
- Disable firewall by running: systemctl disable firewalld && systemctl stop firewalld

Installation of additional packages needed to compile the EUDAQ software

EUDAQ requires gcc version 4.9 or higher. Installation of gcc 6 from devtoolset-4

```
yum install centos-release-scl
yum-config-manager --enable rhel-server-rhsc1-7-rpms

yum install devtoolset-4
```

Install ROOT and cmake3 from EPEL 7

```
yum install epel-release
yum-config-manager --enable epel

yum install root
yum install cmake3
```

Additional packages needed for EUDAQ

```
yum install libusb-devel
yum install qt5-qtbase-dev
```

Other useful/required packages (sshfs = user space ssh filesystem, emacs, etc.)

```
yum install sshfs emacs xauth
```

The server box has two ethernet ports. One is used to connect to the restricted ESA network, the second port to connect to a private RCE network.

Configuration of the ESA NIC (edit /etc/sysconfig/network-scripts/ifcfg-enp2s0)

```
TYPE=Ethernet
PROXY_METHOD=none
BROWSER_ONLY=no
BOOTPROTO=none
DEFROUTE=yes
IPV4_FAILURE_FATAL=no
IPV6INIT=no
NAME=enp2s0
UUID=a1104b8c-87b0-4867-b7df-9eca4bb605b2
DEVICE=enp2s0
ONBOOT=yes
IPADDR=172.27.104.45
PREFIX=22
GATEWAY=172.27.104.1
```

Configuration of the RCE NIC (edit /etc/sysconfig/network-scripts/ifcfg-enp3s0)

```
TYPE=Ethernet
PROXY_METHOD=none
BROWSER_ONLY=no
BOOTPROTO=static
DEFROUTE=yes
IPV4_FAILURE_FATAL=no
IPV6INIT=no
NAME=enp3s0
UUID=7689a12c-c8f6-43af-9d42-062a5e4967a2
DEVICE=enp3s0
ONBOOT=yes
IPADDR=192.168.1.1
PREFIX=24
```

Install and configure a dhcp server for the RCE network

```
yum install dhcp

systemctl start dhcpd
systemctl enable dhcpd
```

Edit /etc/dhcp/dhcpd.conf

```
subnet 192.168.1.0 netmask 255.255.255.0 {
  host rce0 {
    hardware ethernet 08:00:56:00:45:10 ;
    fixed-address 192.168.1.10;
  }
  host rce1 {
    hardware ethernet 08:00:56:00:45:00;
    fixed-address 192.168.1.11;
  }
  host rce2 {
    hardware ethernet 08:00:56:00:46:21;
    fixed-address 192.168.1.12;
  }
}
```

Append RCE definitions to /etc/hosts

```
192.168.1.10 rce0
192.168.1.11 rce1
192.168.1.12 rce2
```

To allow updates in the restricted network yum needs to be configured to use a SOCKS5 proxy.

(Recipe for ssh tunnel for the SOCK5 proxy need to be defined/tested for ESA)

Edit /etc/yum.conf and add the line below to the "main" section:

```
proxy=socks5h://localhost:1080
```

Accessing the internet through a double hop ssh SOCKS5 proxy for yum and git.

This is using ar-eudaq and rhel32-6 as hops, localhost:1080 as SOCKS5 proxy, localhost:2222 as ssh forward to rhel6-32

```
ssh -t -L 1080:localhost:9696 -L2222:localhost:2222 <your_slac_user_name>@172.27.100.8 ssh -L2222:localhost:22 -D 9696 rhel6-32 -N
```

Compiling EUDAQ.

As user "beam" run

```
git config --global http.proxy 'socks5h://127.0.0.1:1080' #setup git proxy
git clone -b v1.7.0 https://github.com/eudaq/eudaq.git
```

```

mkdir /home/beam/afs

#use sshfs to mount AFS

sshfs -p 2222 <your_slac_user_name>@localhost:/afs /home/beam/afs

cp -r /home/beam/afs/desy.de/group/telescopes/tlu/ZestSC1 /home/beam/eudaq/extern
cp -r /home/beam/afs/desy.de/group/telescopes/tlu/tlufirmware /home/beam/eudaq/extern

#unmount AFS

fusermount -u /home/beam/afs

source /opt/rh/devtoolset-4/enable #enable gcc 4.9

cd /home/beam/eudaq/build

cmake3 -DBUILD_tlu=ON -DTLUFIRMWARE_PATH=/home/beam/eudaq/extern/tlufirmware ..

make

make install #this installs to /home/beam/eudaq/bin and lib

```

Installing RCE SDK as root

```

mkdir /opt/AtlasRceSdk

cd /opt/AtlasRceSdk

curl --socks5-hostname 127.0.0.1:1080 http://rceprojectportal.web.cern.ch/RceProjectPortal/software/SDK/V0.11.1.tar.gz | tar xvfz -

```

Obtaining and compiling the RCE software as user "beam"

```

git clone --recurse-submodules https://:@gitlab.cern.ch:8443/rce/pixelrce.git

cd pixelrce/rce

source /opt/rh/devtoolset-4/enable

source scripts/setup-dev.sh

```

Setting up an RCE with static IP

make sure the ntp daemon is installed and enabled:

```

yum install ntp

```

Edit /etc/ntp.conf and replace server definitions by

server 172.27.100.16

```

systemctl start ntpd

systemctl start enable ntpd

```

Edit /etc/rc.local

```

ntpdate -s 172.27.100.16
touch /var/lock/subsys/local

```

Fix permissions

```

chmod +x /etc/rc.d/rc.local

```

Edit /etc/sysconfig/network-scripts/ifcfg-eth0

```
NAME=eth0
TYPE=ethernet
BOOTPROTO=none
DEVICE=eth0
NETMASK=255.255.252.0
IPADDR=172.27.104.52
DNS1=134.79.111.111
GATEWAY=172.27.104.1
ONBOOT=yes
NM_CONTROLLED=no
IPV4_FAILURE_FATAL=no
IPV6INIT=no
```