Configuring TACACS+ Login Authentication on NPort and EDS Devices

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Contents

1 Purpose and Scope 2
2 Validated Environment 2
3 Docker Installation 3
3.1 Set Up the Docker APT Repository 3
3.2 Install the Docker Packages 3
4 Create the TACACS+ Dockerfile 4
5 Create the TACACS+ Configuration File 5
6 Build the TACACS+ Docker Image 7
7 Run TACACS+ With Docker Compose 7
7.1 Modify tac_plus.conf After Deployment 9
7.2 Useful Docker Commands 10
8 Configure the NPort 6150-G2-T for TACACS+ Login Authentication 10
8.1 Set Date, Time, and Time Zone 11
8.2 Create TACACS+ Authentication Server Settings 11
8.3 Check Account Groups 12
8.4 Monitor Accounting Information 12
9 Configure EDS-4008-2GT-2GS for TACACS+ Login Authentication 14
9.1 EDS TACACS+ Configuration File Example 14
9.2 Set the Time Zone 17
9.3 Synchronize the System Time 18
9.4 Set Login Authentication 19
9.5 Set TACACS+ Server Settings 20
9.6 Logout and Test Authentication 21
10 Validation Checklist 22
11 Troubleshooting 22

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1 Purpose and Scope

This guide describes how to configure **TACACS+** login authentication for **NPort 6150-G2-T** and **EDS-4008-2GT-2GS** devices using a TACACS+ server deployed in a Docker container on **Ubuntu 24.04 LTS Server**.

The procedure covers:

- Installing Docker on Ubuntu 24.04 LTS Server.
- Creating a TACACS+ Docker image.
- Preparing the `tac_plus.conf` configuration file.
- Running TACACS+ with Docker Compose.
- Verifying the TACACS+ container and accounting logs.
- Configuring TACACS+ login authentication on the NPort and EDS devices.

2 Validated Environment

Table 1: Validated test bench environment

Component	Version/Details
Operating System	Ubuntu 24.04.4 LTS
Kernel	Linux 6.8.0-124-generic
Docker version	29.6.0
TACACS+ Server IP-Address	192.168.127.67/24
NPort 6150-G2-T IP-Address	192.168.127.254/24
EDS-4008-2GT-2GS IP-Address	192.168.127.253/24
NPort 6150-G2-T firmware version	v1.2.0 Build 26042302
EDS-4008-2GT-2GS firmware version	v4.2 Build 2026_0209_1745



IMPORTANT

Ensure that the device management network can reach the TACACS+ server on TCP port 49. The shared key configured on the devices must match the key configured in `tac_plus.conf`.

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3 Docker Installation

Before deploying the TACACS+ container, install the Docker environment.



Figure 1: Docker platform logo

3.1 Set Up the Docker APT Repository

Add Docker's official GPG key.

```
$ sudo apt-get update
$ sudo apt-get install ca-certificates curl
$ sudo install -m 0755 -d /etc/apt/keyrings
$ sudo curl -fsSL https://download.docker.com/linux/ubuntu/gpg \
-o /etc/apt/keyrings/docker.asc
$ sudo chmod a+r /etc/apt/keyrings/docker.asc
```

Add the Docker repository to the APT sources.

```
$ echo \
  "deb [arch=$(dpkg --print-architecture) \
  signed-by=/etc/apt/keyrings/docker.asc] \
  https://download.docker.com/linux/ubuntu \
  $(. /etc/os-release && \
  echo "${UBUNTU_CODENAME:-$VERSION_CODENAME}") stable" | \
  sudo tee /etc/apt/sources.list.d/docker.list > /dev/null
$ sudo apt-get update
```

3.2 Install the Docker Packages

Install the Docker packages.

```
$ sudo apt-get install docker-ce docker-ce-cli containerd.io \
docker-buildx-plugin \
docker-compose-plugin docker-compose
```

On Ubuntu 24.04 LTS Desktop, install the following additional packages if required.

```
$ sudo apt install python3-setuptools
```

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Verify the Docker installation by running the **hello-world** container.

```
$ sudo docker run hello-world
```

Expected output includes the confirmation message below.

```
Hello from Docker!
This message shows that your installation appears to be working correctly.
```

4 Create the TACACS+ Dockerfile

Create a new directory for the TACACS+ Dockerfile, and switch to it.

```
$ mkdir tacacs
$ cd tacacs/
```

Create the Dockerfile in the **tacacs** directory.

```
$ nano Dockerfile
```

Use the following Dockerfile content.

```
# Use the base Ubuntu image
FROM ubuntu:18.04

# Update & upgrade
RUN apt-get update && apt-get upgrade -y

# Install TACACS+
RUN apt-get install tacacs+ -y

# Install the nano text editor
RUN apt-get install nano -y

# Clear local repo
RUN apt-get clean

# Create a user with a home directory
RUN useradd -m -d /home/moxa -s /bin/bash moxa

# Add password to moxa account
RUN echo "moxa:moxa" | chpasswd

# Run  tac_plus as foreground process and  use /etc/tacacs+/tac_plus.conf
as the config file
CMD ["tac_plus", "-G", "-C", "/etc/tacacs+/tac_plus.conf"]
```

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Set permissions if necessary.

```
$ sudo chmod 644 Dockerfile
```

Note If diagnostic information is required, replace the final CMD line with the debug variant shown below. This logs TACACS+ debug output to **/var/log/tac_plus.log**.

```
CMD ["tac_plus", "-G", "-C", "/etc/tacacs+/tac_plus.conf", \
"-d", "8", "-d", "16", "-l", \
"/var/log/tac_plus.log"]
```

Table 2: TACACS+ debug values

Value	Meaning
8	Authorization debugging
16	Authentication debugging
32	Password file processing debugging
64	Accounting debugging
128	Config file parsing and lookup
256	Packet transmission/reception
512	Encryption/decryption
1024	MD5 hash algorithm debugging
2048	Very low-level encryption/decryption

5 Create the TACACS+ Configuration File

Create the TACACS+ configuration file. This file contains the login authentication configuration for the NPort device.

```
$ nano tac_plus.conf
```

Use the following configuration.

```
# Define where to log accounting data; this is the default.
accounting file = /var/log/tac_plus.acct

# This is the key that clients have to use to access Tacacs+
key = testing1234

# Use /etc/passwd file to do authentication
#default authentication = file /etc/passwd
```

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```
user = Alice {
  chap = cleartext "Alice"
  member = "Administrator"
}

user = Ted {
  chap = cleartext "Ted"
  member = "Operator"
}

group = Administrator {
  default service = permit
  service = exec {
    priv-lvl = 15
  }
}

group = Operator {
  default service = permit
  service = exec {
    priv-lvl = 1
  }
}

# You can use a feature like per host key with different enable passwords
#host = 127.0.0.1 {
# key = test
# type = cisco
# enable = <des|cleartext> enablepass
# prompt = "Welcome XXX ISP Access Router \n\nUsername:" #}
# We  also  can  define  local users  and  specify  a  file where  data
is stored.  # That file may be filled using tac_pwd
#user = test1 {
# name =  "Test  User" # member = staff
# login = file /etc/tacacs/tacacs_passwords #}
# We can also specify rules valid per group of users. #group = group1 {
# cmd =  conf  { # deny
# }
#}
# Another example: forbid configure command for some hosts for a defined
range of clients #group = group1 {
# login = PAM
# service = ppp
# protocol = ip {
# addr =  10.10.0.0/24 # }
# cmd = conf {  # deny .*
# }
#}
```

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```
user = DEFAULT {
  login = PAM
  service = ppp protocol = ip {}
}

# Much  more  features are available, like ACL,  more  service
compatibilities,
# commands authorization, scripting authorization.
# See the man page for those features.
```

Set permissions if necessary.

```
$ sudo chmod 644 tac_plus.conf
```

6 Build the TACACS+ Docker Image

Build the Docker image.

```
$ sudo docker build -t tacacs .
```

A successful build ends with an image named **tacacs:latest**. Example output:

```
[+] Building 7.7s (11/11) FINISHED
=> => naming to docker.io/library/tacacs:latest
=> => unpacking to docker.io/library/tacacs:latest
```

Verify that the image is available.

```
$ sudo docker images
```

Expected output:

```
IMAGE                ID             DISK USAGE   CONTENT SIZE   EXTRA
hello-world:latest   96498ffd522e       25.9kB         9.49kB    U
tacacs:latest        cc1af9f9deed        228MB         68.6MB
```

7 Run TACACS+ With Docker Compose

Create **docker-compose.yml** in the **tacacs** directory.

```
$ nano docker-compose.yml
```

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Add the following content.

```
version: "3"
services:
  tacacs:
    container_name: tacacs
    image: tacacs
    ports:
      - "192.168.127.67:49:49/tcp"
    environment:
      - VIRTUAL_HOST=tacacs.meuts.local
    restart: always
    volumes:
      - /etc/timezone:/etc/timezone:ro
      - /etc/localtime:/etc/localtime:ro
      # Share the hosts /var/log directory with Docker TACACS+ for
      tac_plus.acct accounting file
      - /var/log:/var/log:rw
      # Share the hosts /home/moxa/tacacs/tac_plus.conf with Docker TACACS+
      for tac_plus.conf
      - /home/moxa/tacacs/tac_plus.conf:/etc/tacacs+/tac_plus.conf:ro
```

Set permissions if necessary.

```
$ sudo chmod 644 docker-compose.yml
```

Start the container.

```
$ sudo docker-compose up -d
```

Expected output:

```
Creating network "tacacs_default" with the default driver
Creating tacacs ... done
```

Check the container status.

```
$ sudo docker ps
```

Expected output:

```
CONTAINER ID IMAGE  COMMAND                  STATUS           PORTS                     NAMES
74ad91e07e46 tacacs "tac_plus -G -C /etc..." Up About a minute 192.168.127.67:49->49/tcp tacacs
```



IMPORTANT

If the STATUS of the container is **`Restarting`**, review the syntax of **`tac_plus.conf`** and the **`Dockerfile`**. A TACACS+ configuration error can prevent the container from staying up.

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Log in to the container shell if required.

```
$ sudo docker exec -it tacacs /bin/bash
```

Inside the container, the TACACS+ service can be controlled from **/etc/init.d**.

```
# ./tacacs_plus stop
  * Stopping TACACS+ authentication daemon tacacs+ [ OK ]
# ./tacacs_plus restart
  * Restarting TACACS+ authentication daemon tacacs+ [ OK ]
```

7.1 Modify tac_plus.conf After Deployment

If the configuration file must be changed, for example, to change the shared key, use the following process.

Stop the container.

```
$ sudo docker stop tacacs
```

Edit **tac_plus.conf** on the host OS.

```
$ nano tac_plus.conf
```

Example change:

```
# This is the key that clients have to use to access Tacacs+
key = E_2025
```

Start the container again and verify the status.

```
$ sudo docker start tacacs
$ sudo docker ps
```

Expected output:

```
CONTAINER ID IMAGE  COMMAND              CREATED        STATUS        PORTS
    NAMES
3620aea46680 tacacs “tac_plus -G -C /etc" 13 minutes ago Up 12 seconds 192.168.127.7:49->49/tcp
    tacacs
```

Review the mounted configuration file inside the container.

```
$ sudo docker exec -it tacacs /bin/bash
# nano /etc/tacacs+/tac_plus.conf
```

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Expected output:

```
...
# This is the key that clients must use to access Tacacs+
key = E_2025
...
```

Exit from the container by following the command

```
exit
```

7.2 Useful Docker Commands

```
# List Docker containers
sudo docker ps -a

# Stop Docker container
sudo docker stop <CONTAINER_NAME>

# Start Docker container
sudo docker start <CONTAINER_NAME>

# Delete Docker container
sudo docker rm <CONTAINER_NAME>

# List Docker images
sudo docker image ls

# Delete Docker image
sudo docker rmi <IMAGE_NAME>
```

8 Configure the NPort 6150-G2-T for TACACS+ Login Authentication

This section describes how to configure TACACS+ login authentication on the NPort device.

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8.1 Set Date, Time, and Time Zone

Configure the NPort time settings from **System Settings > General > Date & Time**.

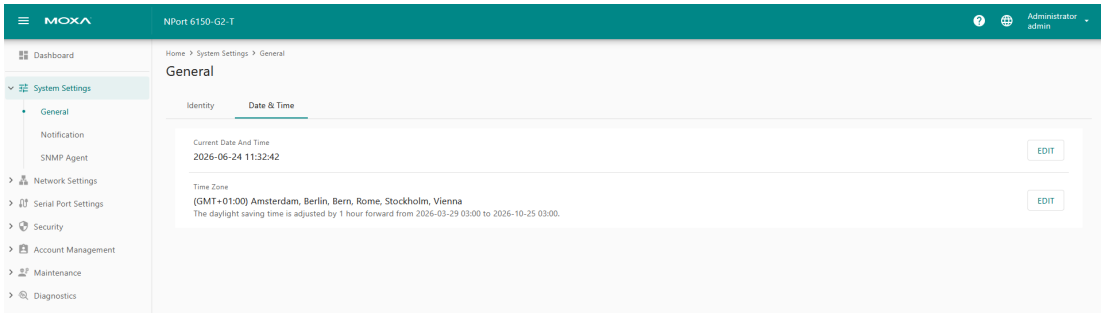


Figure 2: NPort date and time settings

8.2 Create TACACS+ Authentication Server Settings

Create the TACACS+ server settings and enable accounting from **Account Management > Authentication Server > CREATE**.

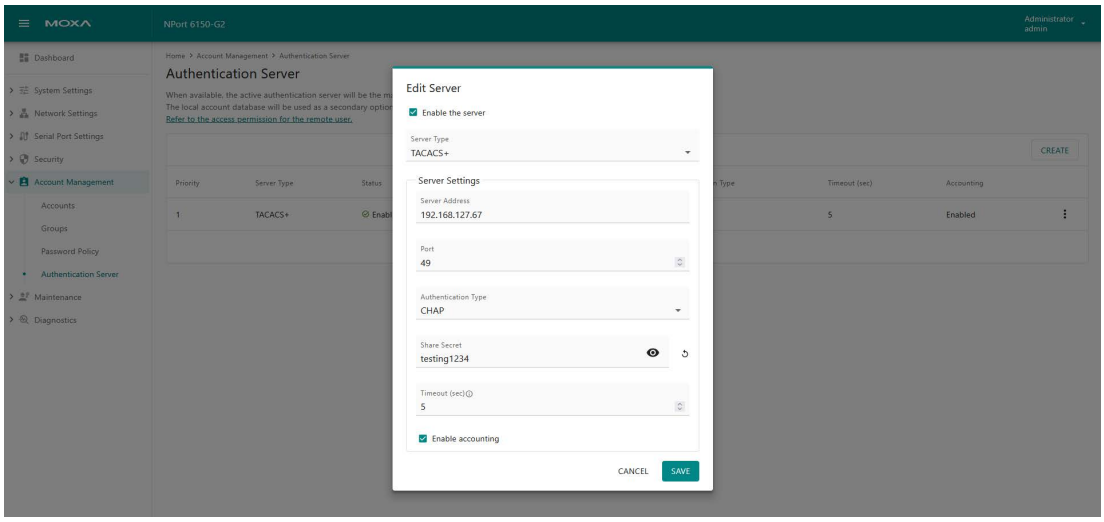


Figure 3: NPort TACACS+ authentication server settings

8.3 Check Account Groups

Check the available account groups from **Account Management > Accounts > CREATE**. The groups used on the device must match the groups used in **`tac_plus.conf`**.

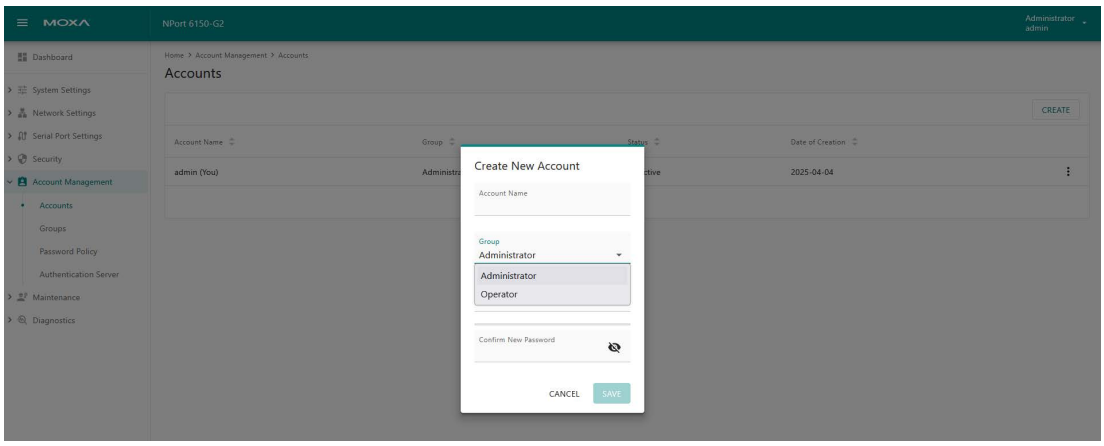


Figure 4: NPort account group settings

Table 3: NPort privilege levels

Privilege Level	Account Type
priv-lvl = 15	Administrator account
priv-lvl = 1	Operator account

8.4 Monitor Accounting Information

Accounting information can be monitored on the Ubuntu host in **`/var/log/tac_plus.acct`**.

A successful login can be monitored from **Diagnostics > System Log**.

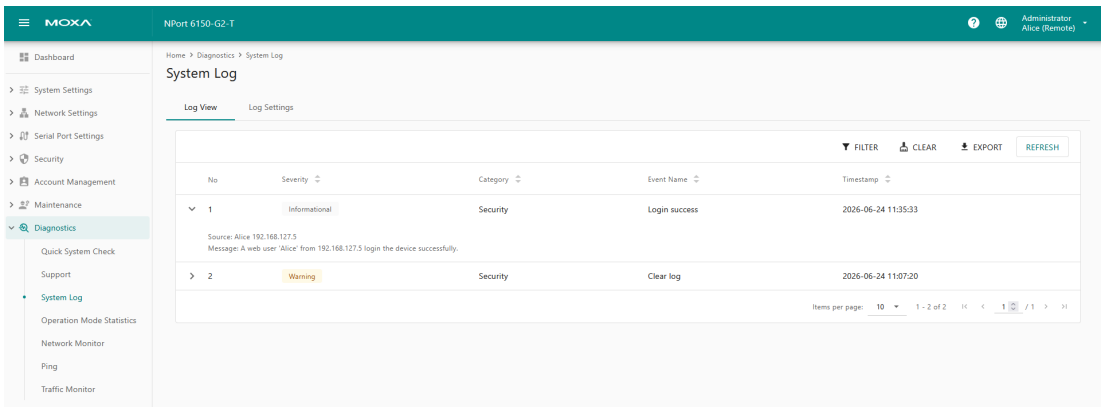


Figure 5: NPort system log with successful login information

TACACS+ connections can also be viewed on the Ubuntu host.

```
$ cat /var/log/tac_plus.log

Wed Jun 24 11:30:13 2026 [1]: Reading config
Wed Jun 24 11:30:13 2026 [1]: Version F4.0.4.27a Initialized 1
Wed Jun 24 11:30:13 2026 [1]: tac_plus server F4.0.4.27a starting
Wed Jun 24 11:30:13 2026 [1]: socket FD 3 AF 2
Wed Jun 24 11:30:13 2026 [1]: uid=0 euid=0 gid=0 egid=0 s=781507200
Wed Jun 24 11:36:21 2026 [7]: connect from 192.168.127.254
[192.168.127.254]
Wed Jun 24 11:36:21 2026 [7]: 192.168.127.254 unknown-port: chap
user=Alice, id=-116 chal_len=16
Wed Jun 24 11:36:21 2026 [7]: chap-login query for 'Alice' port unknown-
port from 192.168.127.254 accepted
Wed Jun 24 11:36:21 2026 [8]: connect from 192.168.127.254
[192.168.127.254]
Wed Jun 24 11:36:21 2026 [8]: Start authorization request
Wed Jun 24 11:36:21 2026 [8]: do_author: user='Alice'
Wed Jun 24 11:36:21 2026 [8]: user 'Alice' found
Wed  Jun 24 11:36:21 2026 [8]: Alice may  run an unlimited number of
sessions  Wed Jun 24 11:36:21 2026 [8]: exec authorization request for
Alice
Wed Jun 24 11:36:21 2026 [8]: exec is explicitly permitted by line 22
Wed Jun 24 11:36:21 2026 [8]: nas:service=shell (passed thru)
Wed Jun 24 11:36:21 2026 [8]: nas:cmd= (passed thru)
Wed Jun 24 11:36:21 2026 [8]: nas:absent, server:priv-lvl=15 -> add priv-
lvl=15 (k)
Wed Jun 24 11:36:21 2026 [8]: added 1 args
Wed Jun 24 11:36:21 2026 [8]: out_args[0] = service=shell input copy
discarded
Wed Jun 24 11:36:21 2026 [8]: out_args[1] = cmd= input copy discarded
Wed Jun 24 11:36:21 2026 [8]: out_args[2] = priv-lvl=15 compacted to
out_args[0]
Wed Jun 24 11:36:21 2026 [8]: 1 output args
Wed Jun 24 11:36:21 2026 [8]: authorization query for 'Alice' unknown from
192.168.127.254 accepted
Wed Jun 24 11:36:21 2026 [9]: connect from 192.168.127.254
[192.168.127.254]
Wed Jun 24 11:40:47 2026 [10]: connect from 192.168.127.254
[192.168.127.254]
```

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Accounting information can be read from **/var/log/tac_plus.acct**.

```
$ cat /var/log/tac_plus.acct

Jun 24 11:36:21 192.168.127.254 Alice unknown unknown start
start_time=1782293733 task_id=3109
     service=system protocol=http addr=192.168.127.254
Jun 24 11:40:47 192.168.127.254 Alice unknown unknown stop
stop_time=1782293999 task_id=1329
     service=system protocol=http addr=192.168.127.254 elapsed_time=266
     bytes_in=0 bytes_out=0
```

9 Configure EDS-4008-2GT-2GS for TACACS+ Login Authentication

This section describes how to configure TACACS+ login authentication on the EDS switch.

9.1 EDS TACACS+ Configuration File Example

For the EDS switch, the **tac_plus.conf** file can use the following role and privilege mapping.

```
# Define where to log accounting data, this is the default.
accounting file = /var/log/tac_plus.acct

# This is the key that clients have to use to access Tacacs+
key = testing1234

# Use /etc/passwd file to do authentication
#default authentication = file /etc/passwd

user = Alice {
  chap = cleartext "Alice"
  member = "Admin"
}

user = Ted {
  chap = cleartext "Ted"
  member = "User"
}
```

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```
user = Bob {
  chap = cleartext "Bob"
  member = "Supervisor"
}

group = Admin {
  default service = permit
  service = exec {
    priv-lvl = 15
  }
}

group = Supervisor {
  default service = permit
  service = exec {
    priv-lvl = 12
  }
}

group = User {
  default service = permit
  service = exec {
    priv-lvl = 1
  }
}

# You can use a feature like per host key with different enable passwords
#host = 127.0.0.1 {
#      key  = test
#      type = cisco
#      enable = <des|cleartext> enablepass
#      prompt = "Welcome XXX ISP Access Router \n\nUsername:" #}
# We  also  can  define  local users  and  specify  a  file where  data
is stored.
# That file may be filled using tac_pwd
#user = test1 {
#      name = "Test  User" #      member = staff
#      login = file /etc/tacacs/tacacs_passwords #}
# We can also specify rules valid per group of users. #group = group1 {
#      cmd  =  conf {
#      deny
#      }
#}
# Another example : forbid configure command for some hosts # for a define
range of clients
#group = group1 {
#      login = PAM
#      service = ppp
#      protocol = ip {
```

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```
#              addr =  10.10.0.0/24 #     }
#       cmd = conf {
#       deny .*
#       }
#}

user = DEFAULT {
       login = PAM
       service = ppp protocol = ip {}
}

# Much more  features are availables, like ACL,  more  service
compatibilities,
# commands authorization, scripting authorization.
# See the man page for those features.
```

Note The group names in the TACACS+ configuration must match the user account groups configured on the switch under **System > Account Management > User Accounts >** .

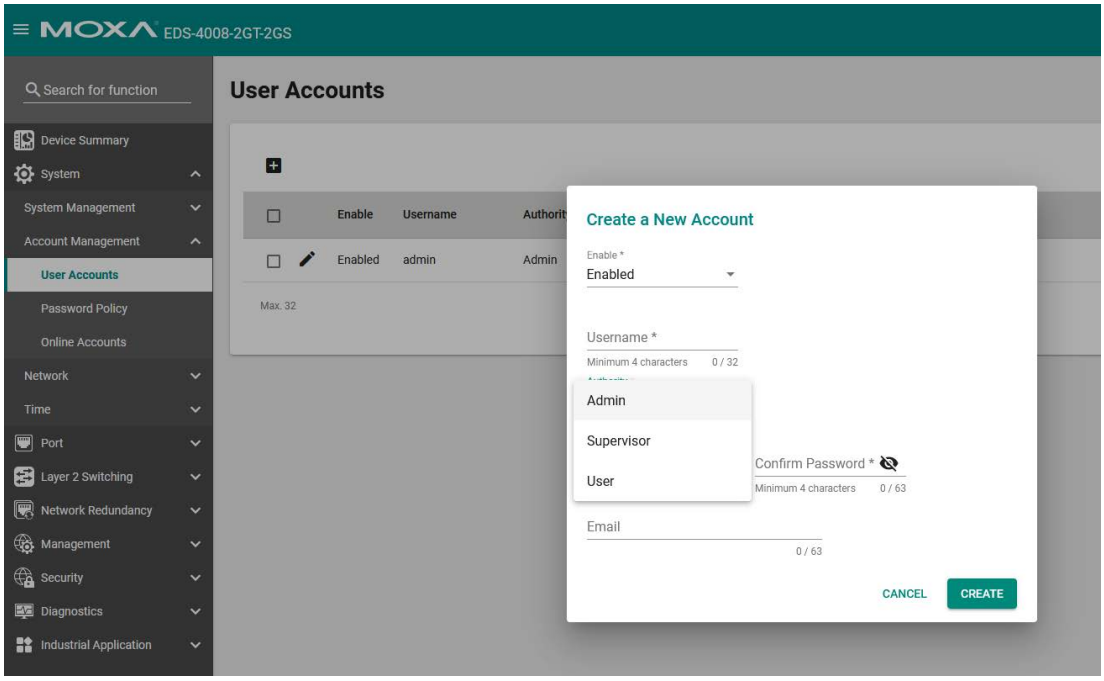


Figure 6: EDS user account group selection

Table 4: EDS privilege levels

Privilege Level	Account Type
priv-lvl = 15	Admin account
priv-lvl = 12	Supervisor account
priv-lvl = 1	User account

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9.2 Set the Time Zone

Set the time zone from **System > Time > System Time > Time Zone**.

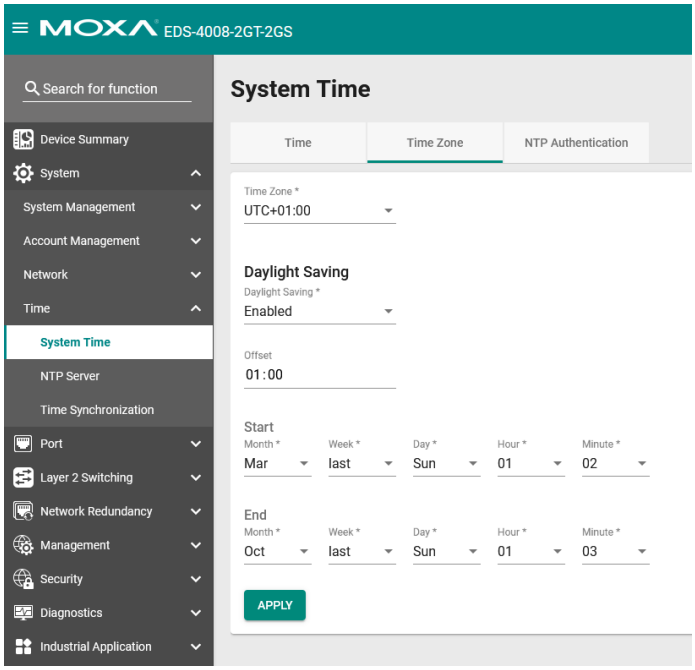


Figure 7: EDS time zone configuration

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9.3 Synchronize the System Time

Synchronize the system time from the browser by going to **System > Time > System Time > Time**.

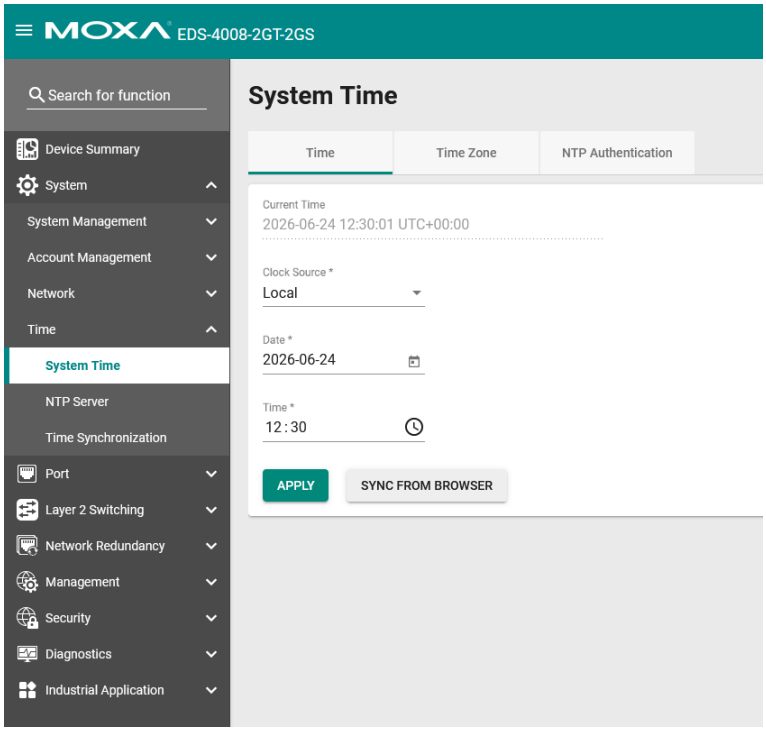


Figure 8: EDS time synchronization from the browser

9.4 Set Login Authentication

Set the login authentication mode to **TACACS+, Local** from **Security > Authentication > Login Authentication**.

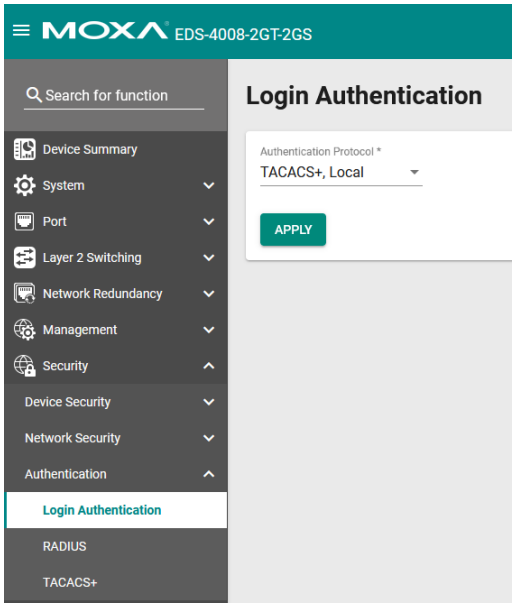


Figure 9: EDS login authentication settings

9.5 Set TACACS+ Server Settings

Configure the TACACS+ server from **Security > Authentication > TACACS+**.

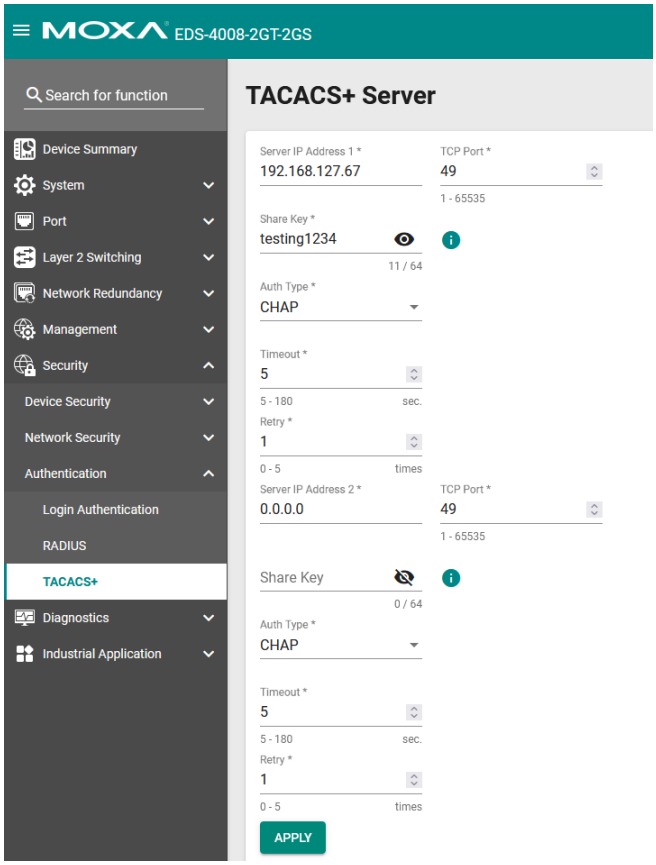


Figure 10: EDS TACACS+ server settings

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9.6 Logout and Test Authentication

Log out of the switch and log in again with a TACACS+ user.

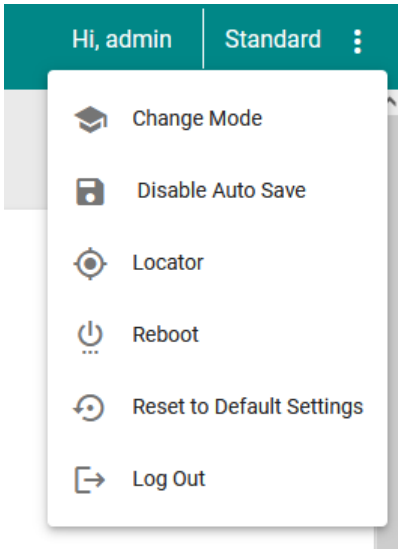


Figure 11: EDS logout menu

Successful login can be checked from **Diagnostics > System Status > Log and Event Notification > Event Logs**.

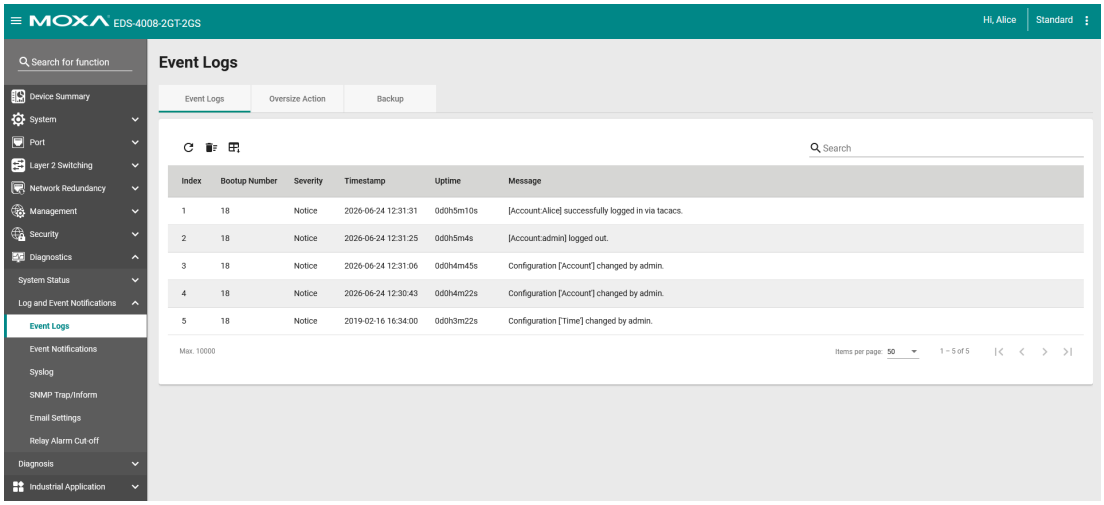


Figure 12: EDS successful login event log

10 Validation Checklist

Use the following checklist to validate the deployment.

- Docker is installed and **`sudo docker running hello-world`** completes successfully.
- The **`tacacs`** Docker image is built successfully.
- The TACACS+ container is running and listening on **TCP** port **49**.
- The TACACS+ shared key matches between **`tac_plus.conf`** and the device configuration.
- The user group names in **`tac_plus.conf`** match the account roles on the device.
- Device time and server time are correct.
- Login authentication is set to **TACACS+, Local** where applicable.
- Successful login events are visible in device logs.
- Accounting data is written to **`/var/log/tac_plus.acct`**.

11 Troubleshooting

Table 5: Common troubleshooting checks

Symptom	Recommended Check
Container keeps restarting	Check syntax in **`tac_plus.conf`** and verify that the mounted file path is correct.
Authentication fails	Confirm username, password, group membership, shared key, and device TACACS+ settings.
No accounting data	Confirm that **`/var/log`** is mounted read/write access and that accounting is enabled on the device.
Device cannot reach the server	Check routing, firewall rules, and TCP port 49 reachability.
Wrong privilege level	Confirm that the TACACS+ group name and **`priv-lvl`** mapping match the device account type.

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