



# TACACS+ Configuration Examples

Avi Technical Reference (v18.2)

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# TACACS+ Configuration Examples

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## ISE TACACS+ Server

Cisco ISE is a security policy management platform that provides secure access to network resources. Cisco ISE functions as a policy decision point and enables enterprises to ensure compliance, enhance infrastructure security, and streamline service operations.

Given below are steps involved in setting up an ISE TACACS+ server as a remote authentication and authorization system for Avi Vantage.

- The ISE server is generally configured with external Identity Sources (in this case OpenLDAP).

The screenshot shows the Cisco Identity Services Engine (ISE) configuration page for an Authentication Policy. The page is titled "Authentication Policy" and includes a description: "Define the Authentication Policy by selecting the protocols that ISE should use to communicate v... For Policy Export go to [Administration > System > Backup & Restore > Policy Export Page](#)".

Policy Type:  Simple  Rule-Based

Network Access Service: Allowed Protocol : Default Device A... (dropdown menu)

Identity Source: OpenLDAP (dropdown menu)

Options:

If authentication failed	Reject
If user not found	Reject
If process failed	Drop

The screenshot shows the Cisco Identity Services Engine (ISE) configuration interface. The breadcrumb navigation at the top reads: Home > Operations > Policy > Guest Access > Administration > Work Centers > Identity Management > External Identity Sources > Identity Source Sequences > Settings. The left sidebar, titled "External Identity Sources", contains a tree view with folders for Certificate Authentication Profile, Active Directory, LDAP, RADIUS Token, RSA SecurID, and SAML Id Providers. The "LDAP" folder is expanded, and "OpenLDAP" is selected. The main content area is titled "LDAP Identity Sources List > OpenLDAP" and "LDAP Identity Source". It features a tabbed interface with "General" selected. The configuration fields include: Name (OpenLDAP), Description (empty), Schema (Custom), Subject Objectclass (inetOrgPerson), Group Objectclass (posixGroup), Subject Name Attribute (uid), Group Map Attribute (memberUid), and Certificate Attribute (empty). At the bottom, there are radio buttons for "Subject Objects Contain Reference To Groups" (unselected) and "Group Objects Contain Reference To Subjects" (selected), and a dropdown for "Subjects In Groups Are Stored In Member Attribute As" set to "Username".

LDAP Identity Sources List > [OpenLDAP](#)

### LDAP Identity Source

General **Connection** Directory Organization Groups Attributes

Primary Server	Secondary Server
<p><input type="checkbox"/> Enable Secondary Server</p> <p>* Hostname/IP <input type="text" value="10.10.23.120"/> ⓘ</p> <p>* Port <input type="text" value="389"/></p> <p>Access <input type="radio"/> Anonymous Access <input checked="" type="radio"/> Authenticated Access</p> <p>Admin DN * <input type="text" value="cn=admin,dc=example,dc=com"/></p> <p>Password * <input type="password" value="*****"/></p> <p>Secure Authentication <input type="checkbox"/> Enable Secure Authentication <input type="checkbox"/> Enable Server Identity Check</p> <p>LDAP Server Root CA <input type="text" value="Thawte Primary Root CA"/> ⓘ</p> <p>Issuer CA of ISE Certificate <input type="text" value="Select if required (optional)"/> ⓘ</p>	<p>Hostname/IP <input type="text"/> ⓘ</p> <p>Port <input type="text" value="389"/></p> <p>Access <input checked="" type="radio"/> Anonymous Access <input type="radio"/> Authenticated Access</p> <p>Admin DN <input type="text"/></p> <p>Password <input type="password"/></p> <p>Secure Authentication <input type="checkbox"/> Enable Secure Authentication <input type="checkbox"/> Enable Server Identity Check</p> <p>LDAP Server Root CA <input type="text" value="Thawte Primary Root CA"/> ⓘ</p> <p>Issuer CA of ISE Certificate <input type="text" value="Select if required (optional)"/> ⓘ</p>

LDAP Identity Sources List > [OpenLDAP](#)

### LDAP Identity Source

General Connection **Directory Organization** Groups Attributes

\* Subject Search Base   ⓘ

\* Group Search Base   ⓘ

Search for MAC Address in Format

Strip start of subject name up to the last occurrence of the separator

Strip end of subject name from the first occurrence of the separator

- ISE LDAP settings used to fetch LDAP groups in order to use them for Authorization conditions

LDAP Identity Sources List > **OpenLDAP**

### LDAP Identity Source

General    Connection    Directory Organization    **Groups**    Attributes

Edit    Add    Delete Group

<input type="checkbox"/>	Name	
<input type="checkbox"/>	cn=Application-Operator,ou=Groups,dc=example,dc=com	
<input type="checkbox"/>	cn=LDAP-Group1,ou=Groups,dc=example,dc=com	
<input type="checkbox"/>	cn=anothergroup,ou=Groups,dc=example,dc=com	
<input type="checkbox"/>	cn=contractors,ou=Groups,dc=example,dc=com	
<input type="checkbox"/>	cn=demoavitest,ou=Groups,dc=example,dc=com	
<input type="checkbox"/>	cn=denied,cn=employees,ou=Groups,dc=example,dc=com	
<input type="checkbox"/>	cn=employees,ou=Groups,dc=example,dc=com	
<input type="checkbox"/>	cn=partners,ou=Groups,dc=example,dc=com	

- ISE Authorization conditions added for Users in the AD groups

Identity Services Engine    Home    Operations    Policy    Guest Access    Administration    Work Centers

TrustSec    Device Administration

Overview    Identities    User Identity Groups    Network Resources    Network Device Groups    **Policy Conditions**    Policy Results    Device Admin

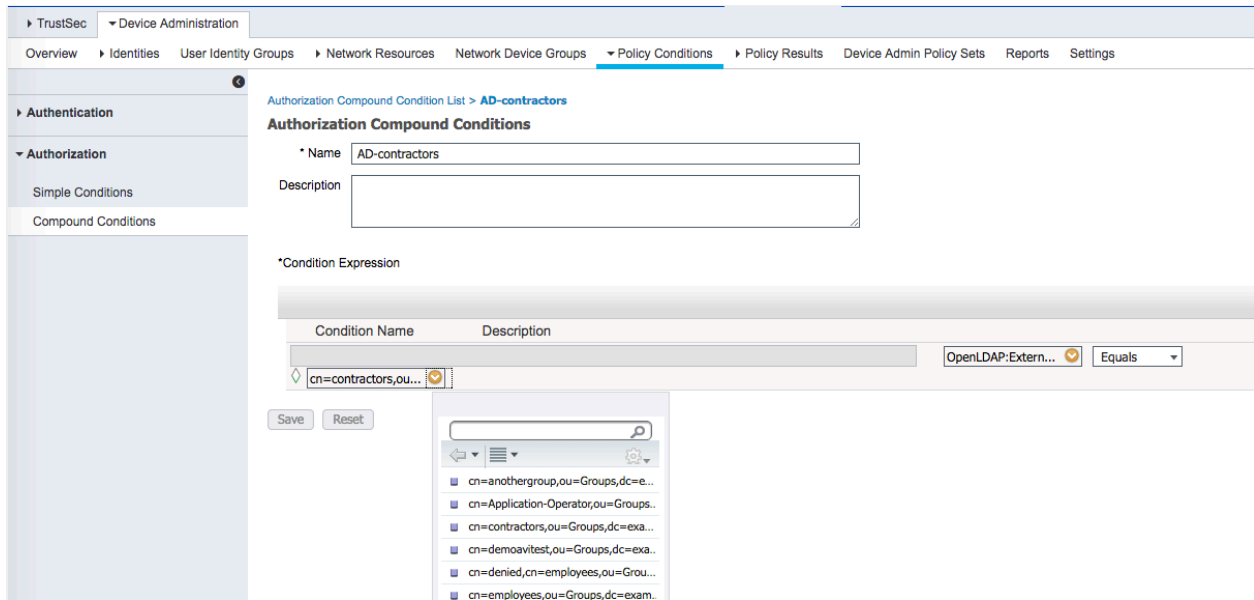
**Authorization Compound Condition List >**

### Authorization Compound Conditions

For Policy Export go to Administration > System > Backup & Restore > Policy Export Page

Edit    Add    Duplicate    Delete

<input type="checkbox"/>	Name	Profile
<input type="checkbox"/>	AD-contractors	
<input type="checkbox"/>	AD-employees	
<input type="checkbox"/>	BYOD_is_Registered	



- ISE server should recognize all Avi Vantage Controller cluster nodes as valid Network Devices.

**Identity Services Engine** | Home | Operations | Policy | Guest Access | Administration | Work Centers

System | Identity Management | Network Resources | Device Portal Management | pxGrid Services | Feed Service | Identity Mapping

Network Devices | Network Device Groups | **Network Device Profiles** | External RADIUS Servers | RADIUS Server Sequences | NAC Managers | External

Network Device Profile List > **AviController** Save Reset

### Network Device Profile

\* Name:

Description:

Icon: Change icon... Set To Default ?

Vendor:

#### Supported Protocols

RADIUS

TACACS+

TrustSec

RADIUS Dictionaries:

#### Templates

[Expand All](#) / [Collapse All](#)

- ▶ **Authentication/Authorization**
- ▶ **Permissions**
- ▶ **Change of Authorization (CoA)**
- ▶ **Redirect**

The screenshot displays the Cisco Identity Services Engine (ISE) configuration interface for a Network Device. The breadcrumb navigation shows: Home > Operations > Policy > Guest Access > Administration > Work Centers > Network Resources > Device Portal Management > pxGrid Services > Feed Service > Identity Mapping > Network Devices. The left sidebar shows a tree view with 'Network devices' selected. The main content area is titled 'Network Devices List > AviControllers' and 'Network Devices'. The configuration fields are as follows:

- Name:
- Description:
- \* IP Address:  /
- \* Device Profile:
- Model Name:
- Software Version:
- \* Network Device Group
  - Location:
  - Device Type:
- RADIUS Authentication Settings
- TACACS+ Authentication Settings
  - Shared Secret:
  - Enable Single Connect Mode 
    - Legacy Cisco Device
    - TACACS+ Draft Compliance Single Connect Support

- ISE requires shell profiles and TACACS+ profiles configured.



The screenshot shows the 'TACACS Profiles' configuration page in the Identity Services Engine. The breadcrumb navigation is: Home > Operations > Policy > Guest Access > Administration > Work Centers > TrustSec > Device Administration > Policy Results > TACACS Profiles. The page displays a table of profiles with the following data:

Name	Description
Default Shell Profile	Default Shell Profile
ShellProfileRO	
ShellProfileRW	

The screenshot shows the configuration details for the 'ShellProfileRW' TACACS profile. The breadcrumb navigation is: Home > Operations > Policy > Guest Access > Administration > Work Centers > TrustSec > Device Administration > Policy Results > TACACS Profiles > ShellProfileRW. The configuration fields are:

- Name: ShellProfileRW
- Description: (empty)

The 'Raw View' tab is selected, showing the following profile attributes:

```
priv-lvl=15
aviRole=read-write
```

- ISE device policy sets default condition updated to assign different shell profiles based on group membership.

Overview | Identities | User Identity Groups | Network Resources | Network Device Groups | Policy Conditions | Policy Results | **Device Admin Policy Sets** | Reports | Settings

**Policy Sets**

Search policy names & descriptions.

**Summary of Policies**  
A list of all your policies

**Global Exceptions**  
Rules across entire deployment

**Default**  
Tacacs\_Default

Save Order | Reset Order

Define the Policy Sets by configuring rules based on conditions. Drag and drop sets on the left hand side to change the order.  
For Policy Export go to [Administration > System > Backup & Restore > Policy Export Page](#)

Status	Name	Description
<input checked="" type="checkbox"/>	Default	Tacacs_Default

Regular  Proxy Sequence

**Proxy Server Sequence**

Proxy server sequence:

**Authentication Policy**

<input checked="" type="checkbox"/>	Default Rule (if no match)	Allow Protocols : Default Device Admin	and use : OpenLDAP
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**Authorization Policy**

**Exceptions (0)**

Standard

Status	Rule Name	Conditions (Identity groups and other conditions)	Command Sets	Shell Profiles
<input checked="" type="checkbox"/>	PermitShowCommands	if AD-contractors	then PermitShowCommands AND ShellProfileRO	
<input checked="" type="checkbox"/>	PermitAllCommands	if AD-employees	then PermitAllCommands AND ShellProfileRW	
<input checked="" type="checkbox"/>	Tacacs_Default	if no matches, then	DenyAllCommands AND Default Shell Profile	

- The Avi Vantage TACACS+ auth profile should be configured with the same shared secret that was assigned to the device in ISE. The "service" attribute is generally required to identify and authorize a Vantage user. Authorization attributes from a TACACS+ server can be used to map Avi Vantage users to various roles and tenants. In the case of an ACS server, service=avishell is required for user authorization; while in the case of an ISE server, service=avishell is known to cause authorization failure.

To know more, refer to [TACACS+ Authentication](#)

### Edit Auth Profile: ISE Tacacs server

Name \* ?

Type ?

LDAP
TACACS+

TACACS+ Servers ?

+ Add Item

Port ?

Password ?

TACACS+ Service ?

Login
v

TACACS+ Authorization Attributes ?

Name <span style="font-size: x-small;">?</span>	Value <span style="font-size: x-small;">?</span>	
service	avishell	<input checked="" type="checkbox"/> Mandatory <span style="font-size: x-small;">?</span>

+ Add Attribute

- Avi Vantage TACACS+ authorization role and tenant mapping configured to assign different roles based on TACACS+ attribute value

To know more, refer to [User Account Roles](#).

Administration
Accounts
Settings
Controller
System Upgrade
GSLB
? admin (admin)

Authentication/Authorization
Access Settings
DNS / NTP
Licensing
Email/SMTP
Tenant Settings
SSH Key Settings
Upload HSM Packages

Authentication/Authorization: TACACS+ ✎

Profile: ISE Tacacs server

Tenant and Role Mapping New Mapping

Search

Displaying 2 item(s)

Authorization	Assignment
<input type="checkbox"/> Group Any Attribute aviRole contains read-write	Tenant All Role From Select List System-Admin <span style="float: right; font-size: x-small;">↓ ✎</span>
<input type="checkbox"/> Group Any Attribute aviRole contains read-only	Tenant All Role From Select List Application-Operator <span style="float: right; font-size: x-small;">↑ ✎</span>

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## Shrubbery TAC\_PLUS

- TAC\_PLUS server is a much simpler alternative to ISE/ACS. This is mostly relevant in development or testing environments. Conceptually, users are assigned to groups and groups have request and response attributes.

```
key = xxxxxxxx

group = netadmin {
    default service = permit
    login = file /etc/passwd
    service = exec {
        priv-lvl = 15
    }
}

group = admin {
    default service = permit
}

group = jenkinsattrs {
    default service = permit
    service = jenkins {
        avirole = Tacacs-Admin
        avitenant = Tacacs-Tenant1
    }
}

group = jenkinsunknown {
    default service = permit
    service = jenkins {
        avirole = "Unknown Role"
        avitenant = "Unknown Tenant"
    }
}

group = jenkinsnoattrs {
    default service = permit
    service = jenkins {
    }
}

user = aviuser {
    member = netadmin
}

user = jenkinstest1 {
    login = cleartext "password"
    member = jenkinsattrs
}

user = jenkinstest2 {
    login = cleartext "password"
    member = jenkinsattrs
}
```

```
[[root@localhost ~]# cat /etc/systemd/system/tac_plus.service
[Unit]
Description=TACACS+ Service
After=syslog.target

[Service]
Type=simple
ExecStart=/usr/local/sbin/tac_plus -C /etc/tac_plus/tac_plus.conf -L -p 49 -d 65535 -Gt -l /var/log/tac_plus.log
KillMode=process
Restart=always
ExecReload=/bin/kill -HUP $MAINPID

[Install]
WantedBy=multi-user.target
```

- Avi Vantage TACACS+ auth profile is configured the same way as that for ISE or ACS.

### Other Articles of Interest:

[Protocol Ports Used by Avi Vantage for Management Communication](#)