



Change of Authorization

Change of Authorization (CoA) provides a mechanism to change the attributes of an authentication, authorization, and accounting (AAA) session after it is authenticated.

Identity-Based Networking Services supports change of authorization (CoA) commands for session query, reauthentication, and termination, port bounce and port shutdown, and service template activation and deactivation.

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Feature Information for Change of Authorization

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for Change of Authorization

Feature Name	Releases	Feature Information
Change of Authorization	Cisco IOS XE Amsterdam 17.4.1	The Change of Authorization The following commands were introduced by this feature: show aaa servers , show aaa group radius , show device-tracking policies , show device-tracking database show access-session interface <i>interface-name</i>
Change of Authorization	Cisco IOS XE Amsterdam 17.3.1a	The Change of Authorization The following commands were introduced by this feature: show ip access-lists , show ip access-list interface , debug epm plugin acl event , debug epm plugin acl errors

Information About Change of Authorization

Change of Authorization-Reauthentication Procedure

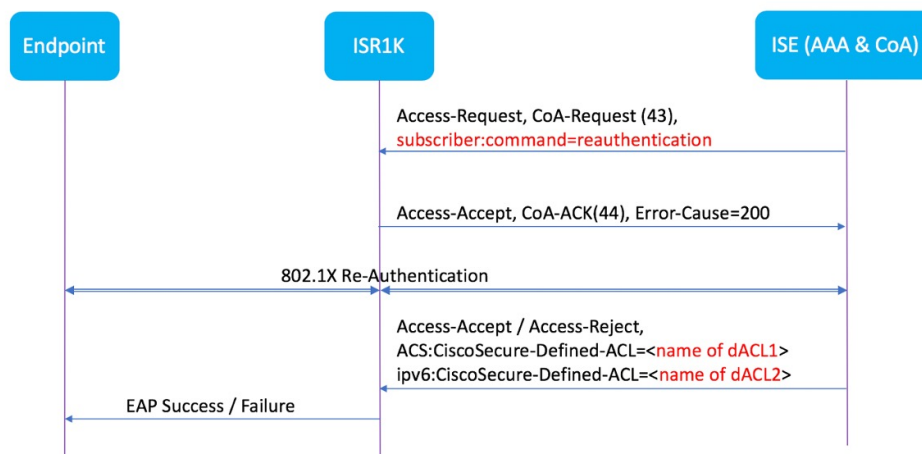
Change of Authorization (CoA) provides a mechanism to change the attributes of an authentication, authorization, and accounting (AAA) session after it is authenticated. The main steps in this procedure are:

- Authentication
- Posture Assessment
- CoA Re-Authentication
- Network Access Authorization



When a policy changes for a user or user group in AAA, administrators can send RADIUS CoA packets from the AAA server, such as a Cisco Identity Secure Engine (ISE) to reinitialize authentication and apply the new policy. This section provides an overview of the RADIUS interface including available primitives and how they are used during a CoA.

The RADIUS CoA provides a mechanism to change the attributes of an AAA session after it is authenticated. When policy changed on user or user group in RADIUS server, administrators can initiate RADIUS CoA process from RADIUS server to re-authenticate or re-authorize new policy



By default, the RADIUS interface is enabled on the device. However, some basic configuration is required for the following attributes:

- Security and Password
- Accounting

After posture assessment is successful, full network access is pushed down to the device for specific client through CoA re-authentication command based on its compliance state derived from last assessment. It is

optional to enforce downloadable ACLs with Permit-ALL or limited access to certain resources to corresponding clients. Per-session CoA requests are supported for session identification, session termination, host reauthentication, port shutdown, and port bounce. This model comprises one request (CoA-Request) and two possible response codes:

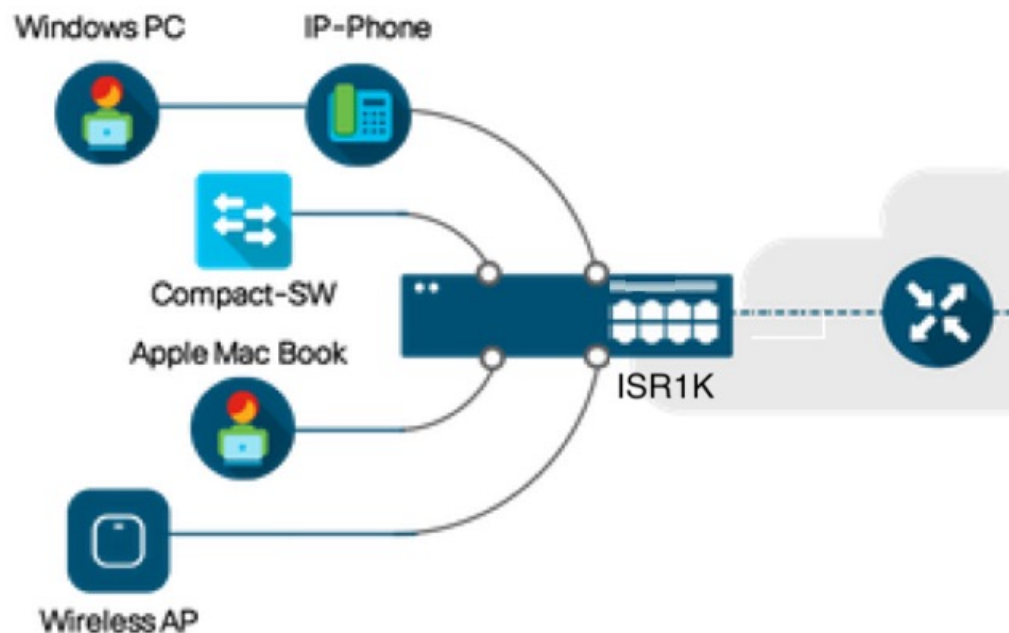
- CoA acknowledgement (ACK) [CoA-ACK]
- CoA nonacknowledgement (NAK) [CoA-NAK]

Change of Authorization

Change of Authorization (CoA) is a critical part of a solution to initiate re-authenticate or re-authorization to an endpoint's network access based on its posture assessment result. This feature is integrated with Cisco AnyConnect, version 4.8 and Cisco ISE, version 2.6.

The network topology below shows a typical Cisco 1000 Series Integrated Services Router as a branch router in a network for secure access with ISE and other network services deployed in Campus or Data Center.

Figure 1: Cisco ISR1000 in a Network for Secure Access with ISE and other Network Services



CoA is critical part of the solution to initiate re-authenticate or re-authorization to endpoint's network access based on its posture assessment result. Downloadable ACL is the Target/Purpose of the entire solution. The per-client basis customized security policies are achieved by it.

Restrictions for Change of Authorization

- Only 8 ports SKUs have TCAM to support DACL and Redirect ACL
- xACL can only match exact value(>,<,>=,<= are not supported)

- Switch ASIC TCAM has only 255 entries (IPv4 ACL entries) in total
- No IPv4 option header support, no IP fragment support in ACL packet inspection
- IPv6 is not supported in this feature
- Port ACL is not supported in this feature
- SISF: Only support none-secure device-tracking (tracking policy with security level 'glean')
- Multi-auth vlan is not supported on Cisco 1000 Series Integrated Services Routers
- Tracking is not getting replaced by 'enable tracking'
- VLAN change does not happen consistently with multiple iterations on client interfaces

How to Configure Change of Authorization

Essential dot1x | SAnet Configuration

```

aaa new-model
aaa authentication dot1x default group coa-ise
aaa authorization network default group coa-ise
dot1x system-auth-control
aaa group server radius coa-ise
  server name coa
radius server coa
  address ipv4 10.10.1.10 auth-port 1812 acct-port 1813
  key cisco123
policy-map type control subscriber simple_coa
  event session-started match-all
  10 class always do-until-failure
  10 authenticate using dot1x
interface gigabitethernet0/0/1
  switchport access vlan 22
  switchport mode access
  access-session closed
  access-session port-control auto
  dot1x pae authenticator
service-policy type control subscriber simple_coa

```

Configure Change of Authorization

```

aaa server radius dynamic-author
  client
  server-key *****
  auth-type any
  ignore server-key
ip access-list extended redirect_acl
  20 deny udp any eq bootps any
  25 deny udp any eq domain any
  30 deny udp any any eq bootpc
  40 deny udp any eq bootpc any
  50 deny ip any host %{ise.ip}
  60 permit tcp any any eq www

```

```

70 permit tcp any any eq 443
device-tracking tracking
device-tracking policy tracking_test
security-level glean
no protocol ndp
no protocol dhcp6
tracking enable
interface 0/0/1
device-tracking attach-policy tracking_test

```

Configuration Examples for Change of Authorization

Example: Check if the RADIUS Server is Active

```

Device# show aaa servers
RADIUS: id 1, priority 1, host 10.75.28.231, auth-port 1812, acct-port 1813, hostname host
State: current UP, duration 188755s, previous duration 0s
Dead: total time 0s, count 0
Platform State from SMD: current UP, duration 188755s, previous duration 0s

```

Example: Device Tracking Policy

```

Device# show aaa group radius coa3 **** port 1813 new-code
User successfully authenticated
USER ATTRIBUTES
username          0   "coa3"

```

To check if the parameters are enabled:

```

Device# show device-tracking policies
Target          Type Policy          Feature          Target range
Gi0/1/1         PORT tracking_test Device-tracking  vlan all
Gi0/1/2         PORT tracking_test Device-tracking  vlan all
Gi0/1/3         PORT tracking_test Device-tracking  vlan all
Gi0/1/4         PORT tracking_test Device-tracking  vlan all

```

To check the SISF table:

```

Device# show device-tracking database
Binding Table has 1 entries, 1 dynamic (limit 100000)
0001:MAC and LLA match    0002:Orig trunk    0004:Orig access
0008:Orig trusted trunk  0010:Orig trusted access  0020:DHCP assigned
0040:Cga authenticated   0080:Cert authenticated  0100:Statically assigned
Network Address          Link Address          Interface  vlan  prlvl  age  state  Time
left
ARP 10.11.22.20          0050.5683.3f97       Gi0/1/4   22   0005   11s  REACHABLE
295 s

```

To check if the access-session is authenticated and authorized:

```

Device# show access-session interface gigabitEthernet 0/1/7 detail
Interface: GigabitEthernet0/1/7
IIF-ID: 0x0DB9315A

```

```
MAC Address: b496.913d.4f9b
IPv6 Address: Unknown
IPv4 Address: 10.10.22.27
User-Name: coa2
Status: Authorized
  Domain: DATA
  Oper host mode: multi-auth
  Oper control dir: both
  Session timeout: N/A
  Common Session ID: 611C4B0A00000053F483D7B0
  Acct Session ID: Unknown
  Handle: 0x21000049
  Current Policy: POLICY_COA
Server Policies: Filter-ID: Filter_ID_COA2
Method status list: Method      State
                   dot1x      Authc Success
```