Verify 802.1X Client Exclusion on an AireOS WLC

Contents

Introduction

This document describes the 802.1X Client Exclusion on an AireOS Wireless LAN Controller (WLC).

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Cisco AireOS WLC
- 802.1X Protocol
- Remote Authentication Dial-In User Service (RADIUS)
- Identity Service Engine (ISE)

Components Used

The information in this document is based on AireOS.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background Information

The 802.1X Client Exclusion is an important option to have on an 802.1X authenticator such as a WLC. This is in order to prevent an overload of the authentication server infrastructure by Extensible Authentication Protocol (EAP) clients that are hyperactive or function improperly.

User Cases

Example use cases include:

- An EAP supplicant that is configured with incorrect credentials. Most supplicants, such as EAP supplicants, cease authentication attempts after a few successive failures. However, some EAP supplicants continue attempts to reauthenticate upon failure, possibly many times per second. Some clients overload RADIUS servers and cause a Denial of Service (DoS) for the whole network.
- After a major network failover, hundreds or thousands of EAP clients can simultaneously attempt to authenticate. As a result, the authentication servers can be overloaded and provide a slow response. If the clients or authenticator time out before the slow response is processed, then a vicious cycle can occur where the authentication attempts continue to time out, and then try to process the response again.

Note: An admission control mechanism is required in order to allow authentication attempts to succeed.

How 802.1X Client Exclusion Works?

802.1X Client Exclusion prevents clients from sending authentication attempts for a period of time after excessive 802.1X authentication failures. On an AireOS WLC 802.1X, client exclusion is globally enabled by navigating to **Security** > **Wireless Protection Policies** > **Client Exclusion Policies** by default and can be seen in this image.

Client Exclusion can be enabled or disabled on a per-WLAN basis. By default, it is enabled with a timeout of 60 seconds before AireOS 8.5 and 180 seconds starting in AireOS 8.5.

Exclusion Settings to Protect RADIUS Servers from Overload

In order to validate that the RADIUS server is protected from overload due to wireless clients that function incorrectly, verify that these settings are in effect:

- **Excessive 802.1X Authentication Failures** are selected in the WLC global Client Exclusion Policies.
- **Client Exclusion** is set to Enabled in the WLAN advanced settings.
- **Client Exclusion Timeout Value** is set to 60 to 300 seconds.

Note: Values higher than 300 seconds provide better protection but can trigger user complaints.

- Configure AireOS EAP timers and ISE Protected Extensible Authentication Protocol (PEAP) settings

Problems That Prevent 802.1X Exclusion from Working

Several configuration settings, in the WLC and in the RADIUS server can prevent 802.1X Client Exclusion from working.

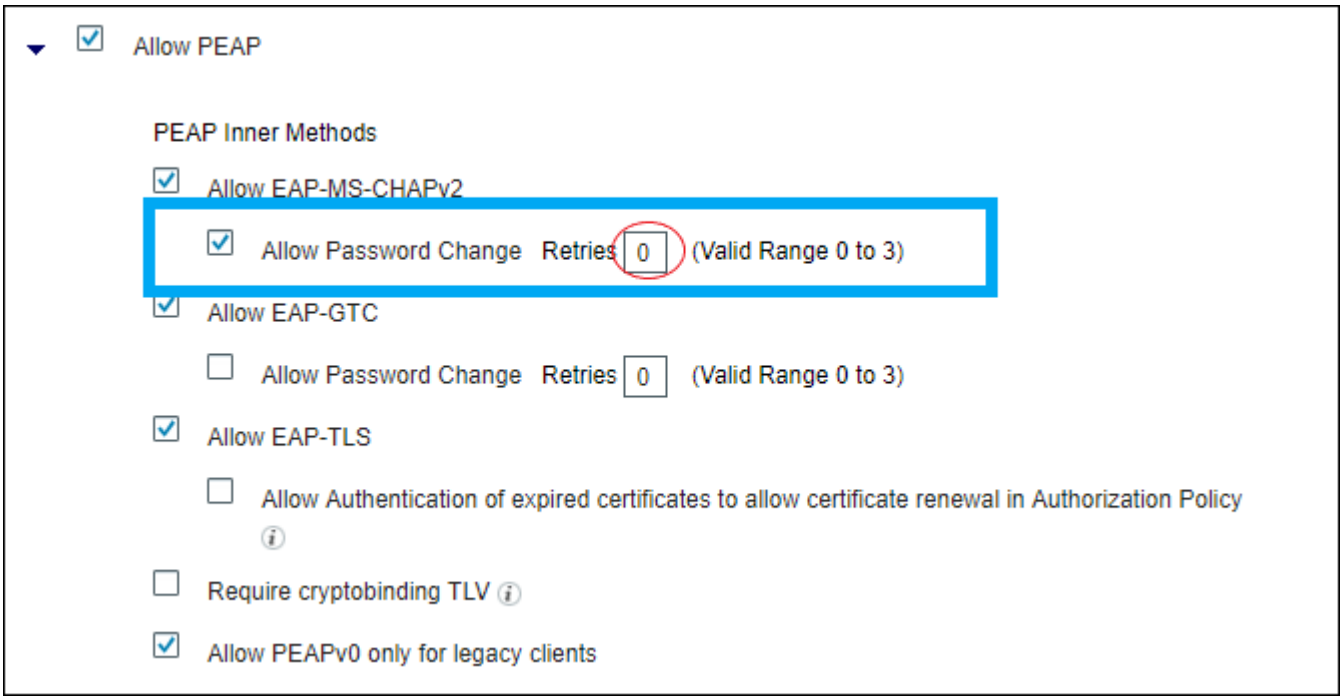
Clients Not Excluded Due to WLC EAP Timer Settings

By default, wireless clients are not excluded when **Client Exclusion** is set to Enabled on the WLAN. This is due to long default EAP timeouts of 30 seconds which cause a client that misbehaves never to hit enough successive failures to trigger an exclusion. Configure shorter EAP timeouts with increased numbers of retransmissions to allow the 802.1X Client Exclusion to take effect. See the timeout example.

```
config advanced eap identity-request-timeout 3
config advanced eap identity-request-retries 10
config advanced eap request-timeout 3
config advanced eap request-retries 10
```

Clients Not Excluded Due to ISE PEAP Settings

In order for 802.1X Client Exclusion to work, the RADIUS server must send an Access-Reject when authentication fails. If the RADIUS server is ISE and if PEAP is in use, then exclusion can not happen and it depends on the ISE PEAP settings. Within ISE, navigate to **Policy** > **Results** > **Authentication** > **Allowed Protocols** > **Default Network Access** as shown in the image.



If you set **Retries** (circled in red on the right) to 0, then ISE must send Access-Reject immediately to the WLC, which must enable the WLC in order to exclude the client (if it tries three times to authenticate).

> **Note**: The setting of **Retries** somewhat independent of the **Allow Password Change** checkbox, that is, the **Retries** value can be honored, even if **Allow Password Change** is unchecked. However, if **Retries** set to 0, then **Allow Password Change** does not work.

> **Note**: For further information, review Cisco Bug ID CSCsq16858. Only registered Cisco users can access Cisco bug tools and information.

Related Information

- **Prevent Large-Scale Wireless RADIUS Network Melt Downs**
- **Cisco Technical Support & Downloads**