



## Multi-Preshared Key

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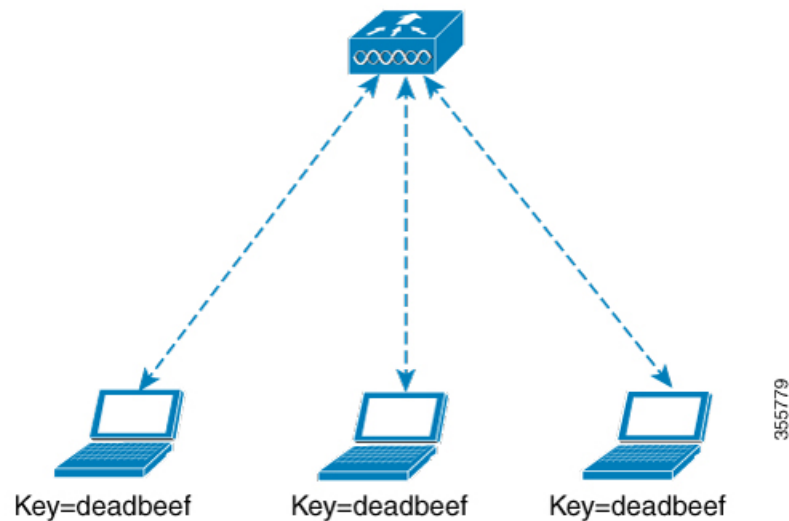
## Information About Multi-Preshared Key

Multi-PSK feature supports multiple PSKs simultaneously on a single SSID. You can use any of the configured PSKs to join the network. This is different from the Identity PSK (iPSK), wherein unique PSKs are created for individuals or groups of users on the same SSID.

From 16.10 onwards, each SSID supports five PSKs, which can be extended

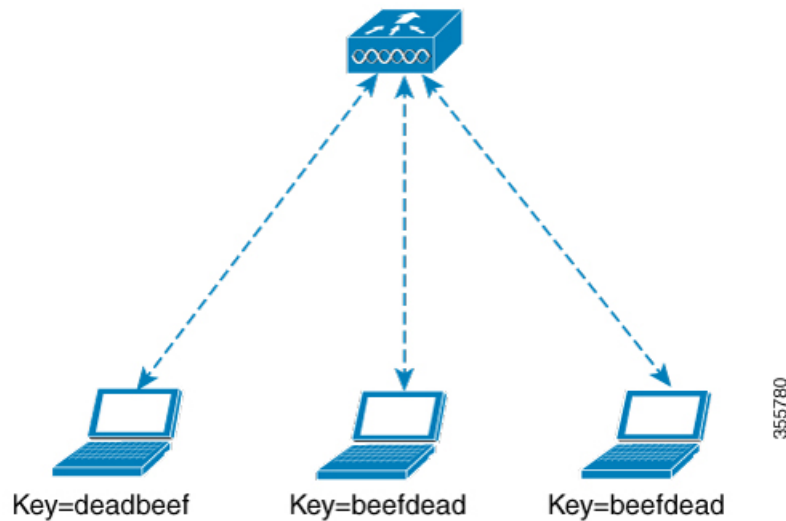
In a traditional PSK, all the clients joining the network use the same password as shown in the below figure.

**Figure 1: Traditional PSK**



But with multi-PSK, client can use any of the configured pre-shared keys to connect to the network as shown in the below figure.

Figure 2: Multi-PSK



In Multi-PSK, two passwords are configured (deadbeef and beefdead) for the same SSID. In this scenario, clients can connect to the network using either of the passwords.

## Restrictions on Multi-PSK

- Central authentication is supported in local, flex, and fabric modes only.
- In central authentication flex mode, the standalone AP allows client join with the highest priority PSK (*priority 0* key). New clients that do not use the highest priority PSK are rejected during the standalone mode.
- Multi-PSK does not support local authentication.

## Configuring Multi-Preshared Key (GUI)

### Procedure

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- Step 1** Choose **Configuration** > **Tags & Profiles** > **WLANs**.
  - Step 2** On the **Wireless Networks** page, click the name of the WLAN.
  - Step 3** In the **Edit WLAN** window, click the **Security** tab.
  - Step 4** In the **Layer2** tab, choose the **Layer2 Security Mode** from the following options:
    - None: No Layer 2 security
    - 802.1X: WEP 802.1X data encryption type
    - WPA + WPA2: Wi-Fi Protected Access
    - Static WEP: Static WEP encryption parameters
    - Static WEP+802.1X: Both Static WEP and 802.1X parameters

Parameters	Description
<b>802.1X</b>	
WEP Key Size	Choose the key size. The available values are <i>None</i> , <i>40 bits</i> , and <i>104 bits</i> .
<b>WPA + WPA2</b>	
Protected Management Frame	Choose from the following options: <ul style="list-style-type: none"> <li>• Disabled</li> <li>• Optional</li> <li>• Required</li> </ul>
WPA Policy	Check the check box to enable WPA policy.
WPA Encryption	Choose the WPA encryption standard. A WPA encryption standard must be specified if you have enabled WPA policy.
WPA2 Policy	Check the check box to enable WPA2 policy.
WPA2 Encryption	Choose the WPA2 encryption standard. A WPA encryption standard must be specified if you have enabled WPA policy.
Auth Key Mgmt	Choose the rekeying mechanism from the following options: <ul style="list-style-type: none"> <li>• 802.1X</li> <li>• FT + 802.1X</li> <li>• PSK: You must specify the PSK format and a preshared key</li> <li>• Cisco Centralized Key Management: You must specify a Cisco Centralized Key Management Timestamp Tolerance value</li> <li>• 802.1X + Cisco Centralized Key Management: You must specify a Cisco Centralized Key Management Timestamp Tolerance value</li> <li>• FT + 802.1X + Cisco Centralized Key Management: You must specify a Cisco Centralized Key Management Timestamp Tolerance value</li> </ul>
<b>Static WEP</b>	

Parameters	Description
Key Size	Choose the key size from the following options: <ul style="list-style-type: none"> <li>• 40 bits</li> <li>• 104 bits</li> </ul>
Key Index	Choose a key index from 1 to 4. One unique WEP key index can be applied to each WLAN. As there are only four WEP key indexes, only four WLANs can be configured for static WEP Layer2 encryption.
Key Format	Choose the encryption key format as either ASCII or HEX.
Encryption Key	Enter an encryption key that is 13 characters long.
<b>Static WEP + 802.1X</b>	
Key Size	Choose the key size from the following options: <ul style="list-style-type: none"> <li>• 40 bits</li> <li>• 104 bits</li> </ul>
Key Index	Choose a key index from 1 to 4. One unique WEP key index can be applied to each WLAN. As there are only four WEP key indexes, only four WLANs can be configured for static WEP Layer2 encryption.
Key Format	Choose the encryption key format as either ASCII or HEX.
Encryption Key	Enter an encryption key that is 13 characters long.
WEP Key Size	Choose from the following options: <ul style="list-style-type: none"> <li>• None</li> <li>• 40 bits</li> <li>• 104 bits</li> </ul>

**Step 5** Click **Save & Apply to Device**.

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# Configuring Multi-Preshared Key (CLI)

## Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b> <b>Example:</b> Device# <code>configure terminal</code>	Enters global configuration mode.
<b>Step 2</b>	<b>wlan wlan-name wlan-id ssid</b> <b>Example:</b> Device(config)# <code>wlan mywlan 1 SSID_name</code>	Configures WLAN and SSID.
<b>Step 3</b>	<b>no security wpa akm dot1x</b> <b>Example:</b> Device(config-wlan)# <code>no security wpa akm dot1x</code>	Disables security AKM for dot1x.
<b>Step 4</b>	<b>security wpa akm psk</b> <b>Example:</b> Device(config-wlan)# <code>security wpa akm psk</code>	Configures PSK.
<b>Step 5</b>	<b>security wpa wpa2 mpsk</b> <b>Example:</b> Device(config-wlan)# <code>security wpa wpa2 mpsk</code>	Configures multi-PSK.
<b>Step 6</b>	<b>priority priority_value set-key {ascii [0   8] pre-shared-key   hex [0   8] pre-shared-key}</b> <b>Example:</b> Device(config-mpsk)# <code>priority 0 set-key ascii 0 deadbeef</code>	Configures PSK priority and all its related passwords. The <i>priority_value</i> ranges from 0 to 4. <b>Note</b> You need to configure <b>priority 0</b> key for multi-PSK.
<b>Step 7</b>	<b>no shutdown</b> <b>Example:</b> Device(config-mpsk)# <code>no shutdown</code>	Enables WLAN.
<b>Step 8</b>	<b>exit</b> <b>Example:</b> Device(config-wlan)# <code>exit</code>	Exits WLAN configuration mode and returns to configuration mode.

	Command or Action	Purpose
<b>Step 9</b>	<b>end</b>  <b>Example:</b> Device(config)# <b>end</b>	Returns to privileged EXEC mode. Alternatively, you can also press <b>Ctrl-Z</b> to exit global configuration mode.

## Verifying Multi-PSK Configurations

To verify the configuration of a WLAN and a client, use the following command:

```
Device# show wlan id 8
WLAN Profile Name      : wlan_8
=====
Identifier              : 8
Network Name (SSID)    : ssid_8
Status                  : Enabled
Broadcast SSID         : Enabled
Universal AP Admin     : Disabled
Max Associated Clients per WLAN : 0
Max Associated Clients per AP per WLAN : 0
Max Associated Clients per AP Radio per WLAN : 200
Number of Active Clients : 0
CHD per WLAN           : Enabled
Multicast Interface    : Unconfigured
WMM                     : Allowed
WifiDirect              : Invalid
Channel Scan Defer Priority:
  Priority (default)    : 5
  Priority (default)    : 6
Scan Defer Time (msecs) : 100
Media Stream Multicast-direct : Disabled
CCX - AironetIe Support : Enabled
CCX - Diagnostics Channel Capability : Disabled
Peer-to-Peer Blocking Action : Disabled
Radio Policy           : All
DTIM period for 802.11a radio : 1
DTIM period for 802.11b radio : 1
Local EAP Authentication : Disabled
Mac Filter Authorization list name : Disabled
Mac Filter Override Authorization list name : Disabled
Accounting list name   :
802.1x authentication list name : Disabled
802.1x authorization list name : Disabled
Security
  802.11 Authentication : Open System
  Static WEP Keys       : Disabled
  802.1X                 : Disabled
  Wi-Fi Protected Access (WPA/WPA2/WPA3) : Enabled
    WPA (SSN IE)        : Disabled
    WPA2 (RSN IE)       : Enabled
      MP SK              : Enabled
      AES Cipher        : Enabled
      CCMP256 Cipher    : Disabled
      GCMP128 Cipher    : Disabled
      GCMP256 Cipher    : Disabled
    WPA3 (WPA3 IE)     : Disabled
  Auth Key Management
    802.1x              : Disabled
    PSK                  : Enabled
```

```

CCKM : Disabled
FT dot1x : Disabled
FT PSK : Disabled
FT SAE : Disabled
PMF dot1x : Disabled
PMF PSK : Disabled
SAE : Disabled
OWE : Disabled
SUITEB-1X : Disabled
SUITEB192-1X : Disabled
CCKM TSF Tolerance : 1000
FT Support : Adaptive
  FT Reassociation Timeout : 20
  FT Over-The-DS mode : Enabled
PMF Support : Disabled
  PMF Association Comeback Timeout : 1
  PMF SA Query Time : 200
Web Based Authentication : Disabled
Conditional Web Redirect : Disabled
Splash-Page Web Redirect : Disabled
Webauth On-mac-filter Failure : Disabled
Webauth Authentication List Name : Disabled
Webauth Authorization List Name : Disabled
Webauth Parameter Map : Disabled
Tkip MIC Countermeasure Hold-down Timer : 60
Non Cisco WGB : Disabled
Band Select : Enabled
Load Balancing : Disabled
Multicast Buffer : Disabled
Multicast Buffer Size : 0
IP Source Guard : Disabled
Assisted-Roaming
  Neighbor List : Disabled
  Prediction List : Disabled
  Dual Band Support : Disabled
IEEE 802.11v parameters
  Directed Multicast Service : Disabled
  BSS Max Idle : Disabled
    Protected Mode : Disabled
  Traffic Filtering Service : Disabled
  BSS Transition : Enabled
    Disassociation Imminent : Disabled
    Optimised Roaming Timer : 40
    Timer : 200
  WNM Sleep Mode : Disabled
802.11ac MU-MIMO : Disabled
802.11ax paramters
  OFDMA Downlink : unknown
  OFDMA Uplink : unknown
  MU-MIMO Downlink : unknown
  MU-MIMO Uplink : unknown
  BSS Color : unknown
  Partial BSS Color : unknown
  BSS Color Code :

```

To view the WLAN details, use the following command:

```

Device# show run wlan
wlan wlan_8 8 ssid_8
  security wpa psk set-key ascii 0 deadbeef
  no security wpa akm dot1x
  security wpa akm psk
  security wpa wpa2 mpsk
  priority 0 set-key ascii 0 deadbeef
  priority 1 set-key ascii 0 deaddead

```

```
priority 2 set-key ascii 0 d123d123
priority 3 set-key hex 0 023456789012345678901234567890123456789012345678901234
priority 4 set-key hex 0 123456789012345678901234567890123456789012345678901234
no shutdown
```