



Multi-Preshared Key

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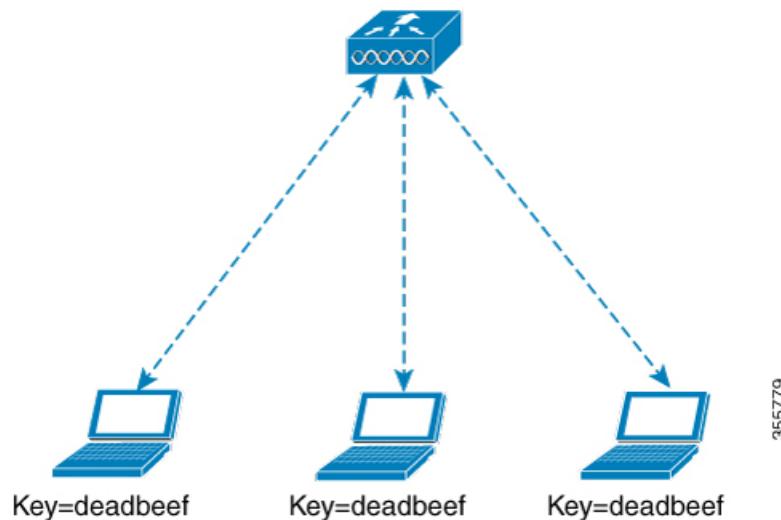
Information About Multi-Preshared Key

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

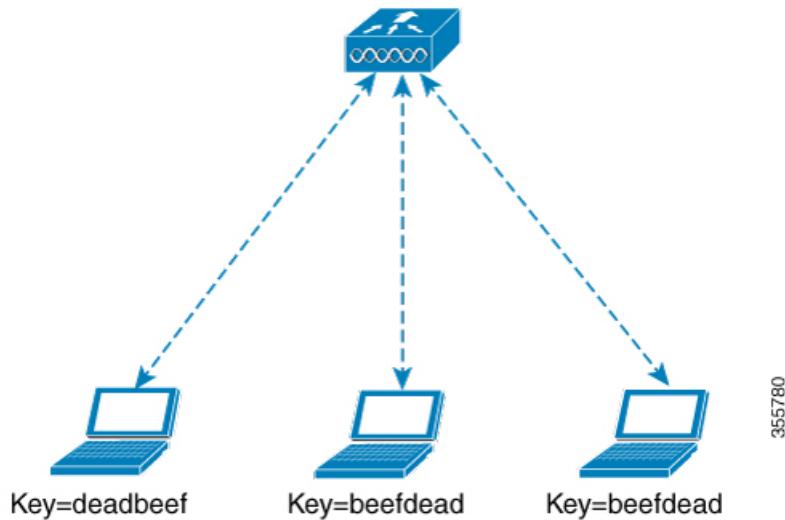
In a traditional PSK, all the clients joining the network use the same password as shown in the below figure.

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

- 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
802.1X	
WEP Key Size	Choose the key size. The available values are <i>None</i> , <i>40 bits</i> , and <i>104 bits</i> .
WPA + WPA2	
Protected Management Frame	<p>Choose from the following options:</p> <ul style="list-style-type: none"> • Disabled • Optional • Required
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	<p>Choose the rekeying mechanism from the following options:</p> <ul style="list-style-type: none"> • 802.1X • FT + 802.1X • PSK: You must specify the PSK format and a preshared key • Cisco Centralized Key Management: You must specify a Cisco Centralized Key Management Timestamp Tolerance value • 802.1X + Cisco Centralized Key Management: You must specify a Cisco Centralized Key Management Timestamp Tolerance value • FT + 802.1X + Cisco Centralized Key Management: You must specify a Cisco Centralized Key Management Timestamp Tolerance value
Static WEP	

Parameters	Description
Key Size	Choose the key size from the following options: <ul style="list-style-type: none">• 40 bits• 104 bits
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.
Static WEP + 802.1X	
Key Size	Choose the key size from the following options: <ul style="list-style-type: none">• 40 bits• 104 bits
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">• None• 40 bits• 104 bits

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

Configuring Multi-Preshared Key (CLI)

Procedure

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

Verifying Multi-PSK Configurations

	Command or Action	Purpose
Step 9	end Example: Device(config)# end	Returns to privileged EXEC mode. Alternatively, you can also press Ctrl-Z 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
      MPSK                  : 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 parameters		
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 mpesk
        priority 0 set-key ascii 0 deadbeef
        priority 1 set-key ascii 0 deaddead
```

Verifying Multi-PSK Configurations

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