

EAP-PEAP AND MSCHAPv2 Configuration

Goal: To set up a lanforge wireless station with EAP-PEAP AND MSCHAPv2 authentication.

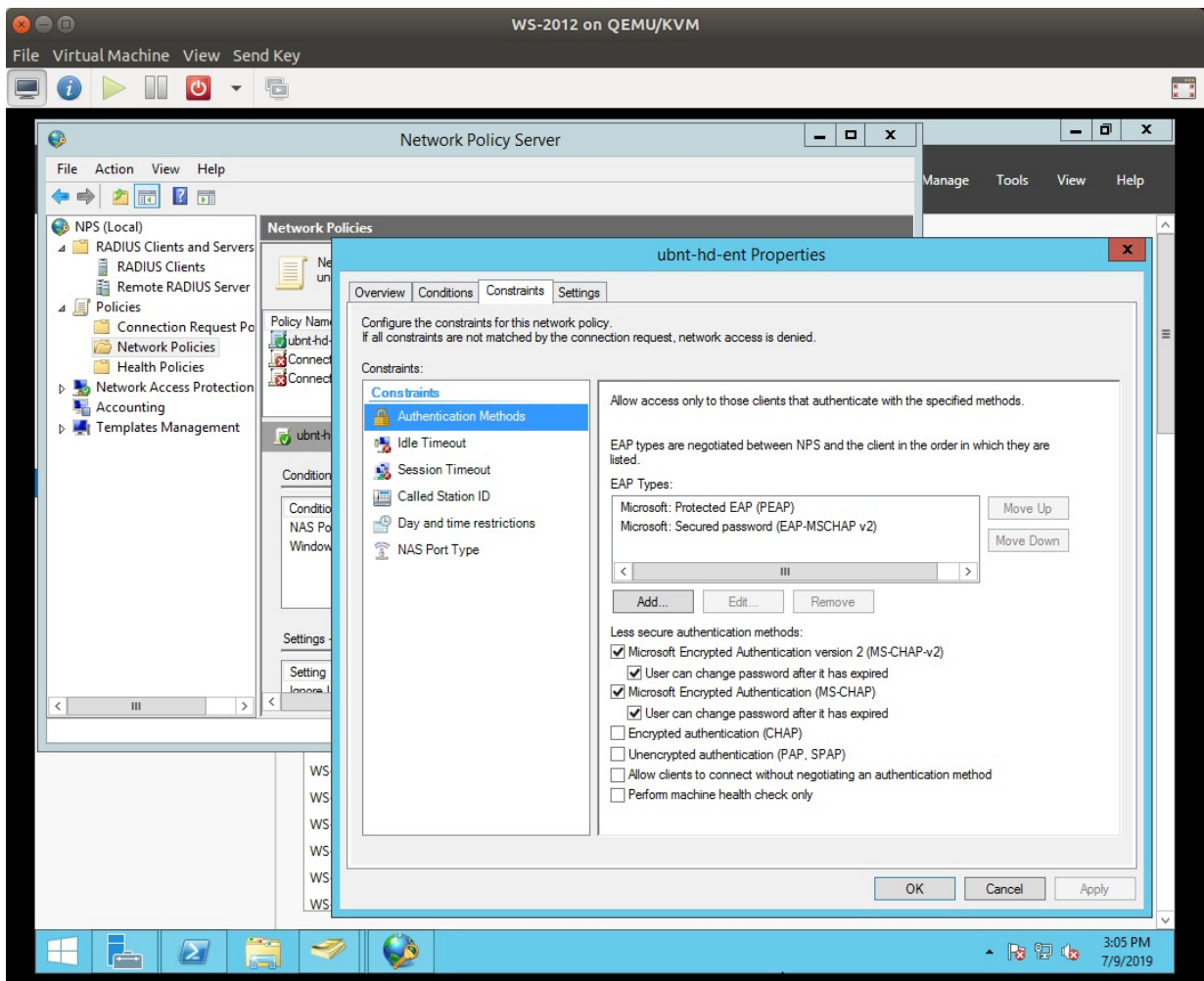
1. RADIUS Server is a Windows Server 2012 VM using its internal RADIUS Server specifically on interface 192.168.2.154.

The screenshot shows the Windows Server Manager console for a VM named 'WS-2012 on QEMU/KVM'. The 'SERVERS' section displays a table of servers. The table has columns: Server Name, IPv4 Address, Manageability, Last Update, and Windows Activation. One server is listed: WS-2012, 192.168.100.77, 192.168.2.154, Online - Performance counters not started, 7/9/2019 3:25:55 PM, 00252-10000-00000-AA. Below the table is an 'EVENTS' section showing a list of events with columns: Server Name, ID, Severity, Source, Log, and Date and Time. The events are all errors from NPS on 7/9/2019.

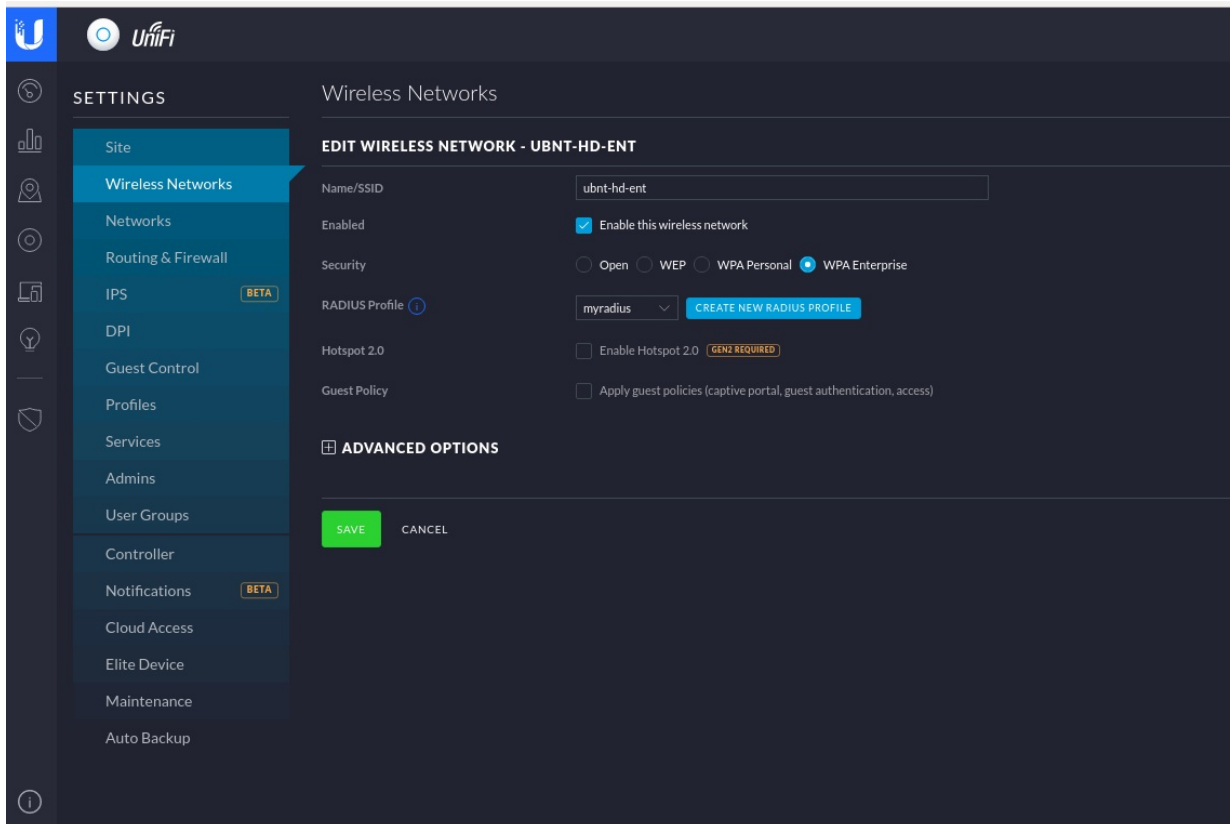
Server Name	IPv4 Address	Manageability	Last Update	Windows Activation
WS-2012	192.168.100.77, 192.168.2.154	Online - Performance counters not started	7/9/2019 3:25:55 PM	00252-10000-00000-AA

Server Name	ID	Severity	Source	Log	Date and Time
WS-2012	13	Error	NPS	System	7/9/2019 9:24:25 AM
WS-2012	13	Error	NPS	System	7/9/2019 9:24:19 AM
WS-2012	13	Error	NPS	System	7/9/2019 9:24:13 AM
WS-2012	13	Error	NPS	System	7/9/2019 9:24:10 AM
WS-2012	13	Error	NPS	System	7/9/2019 9:24:01 AM
WS-2012	13	Error	NPS	System	7/9/2019 9:23:49 AM
WS-2012	13	Error	NPS	System	7/9/2019 9:23:43 AM

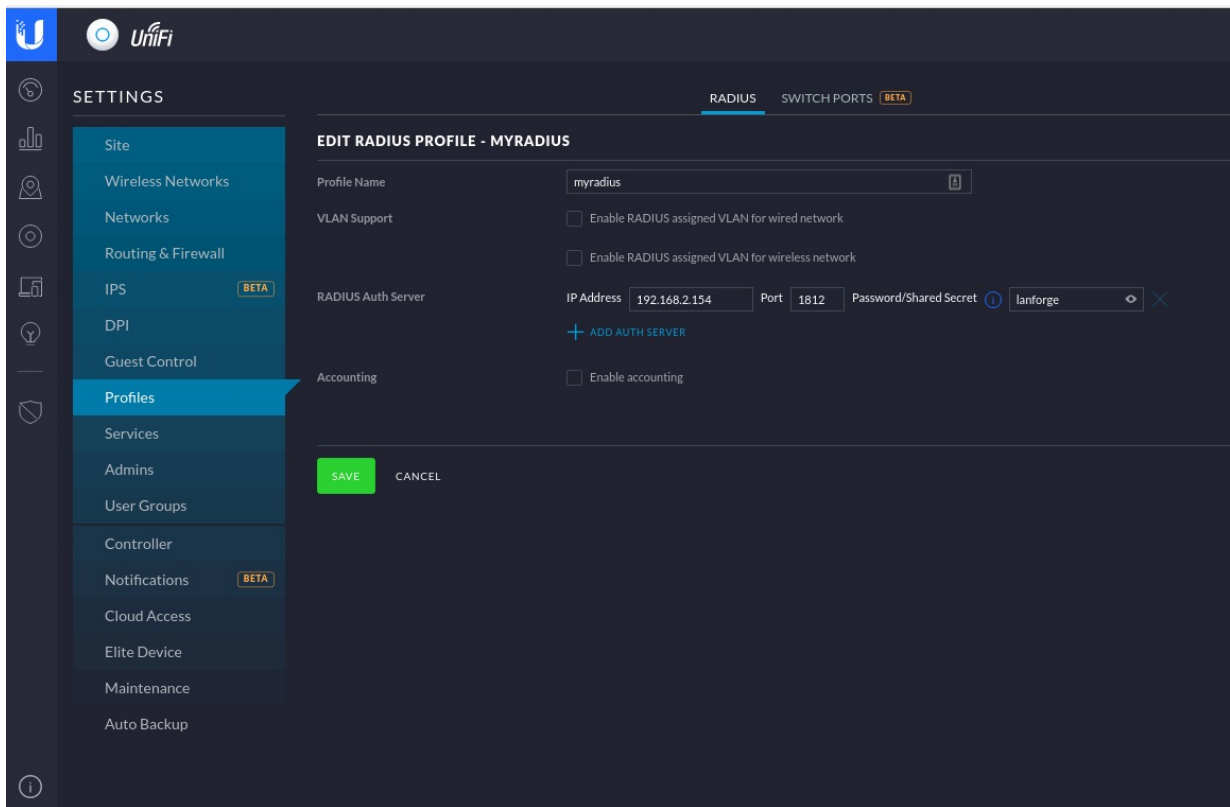
2. RADIUS Server has both EAP-PEAP and MSCHAPv2 configured for use.



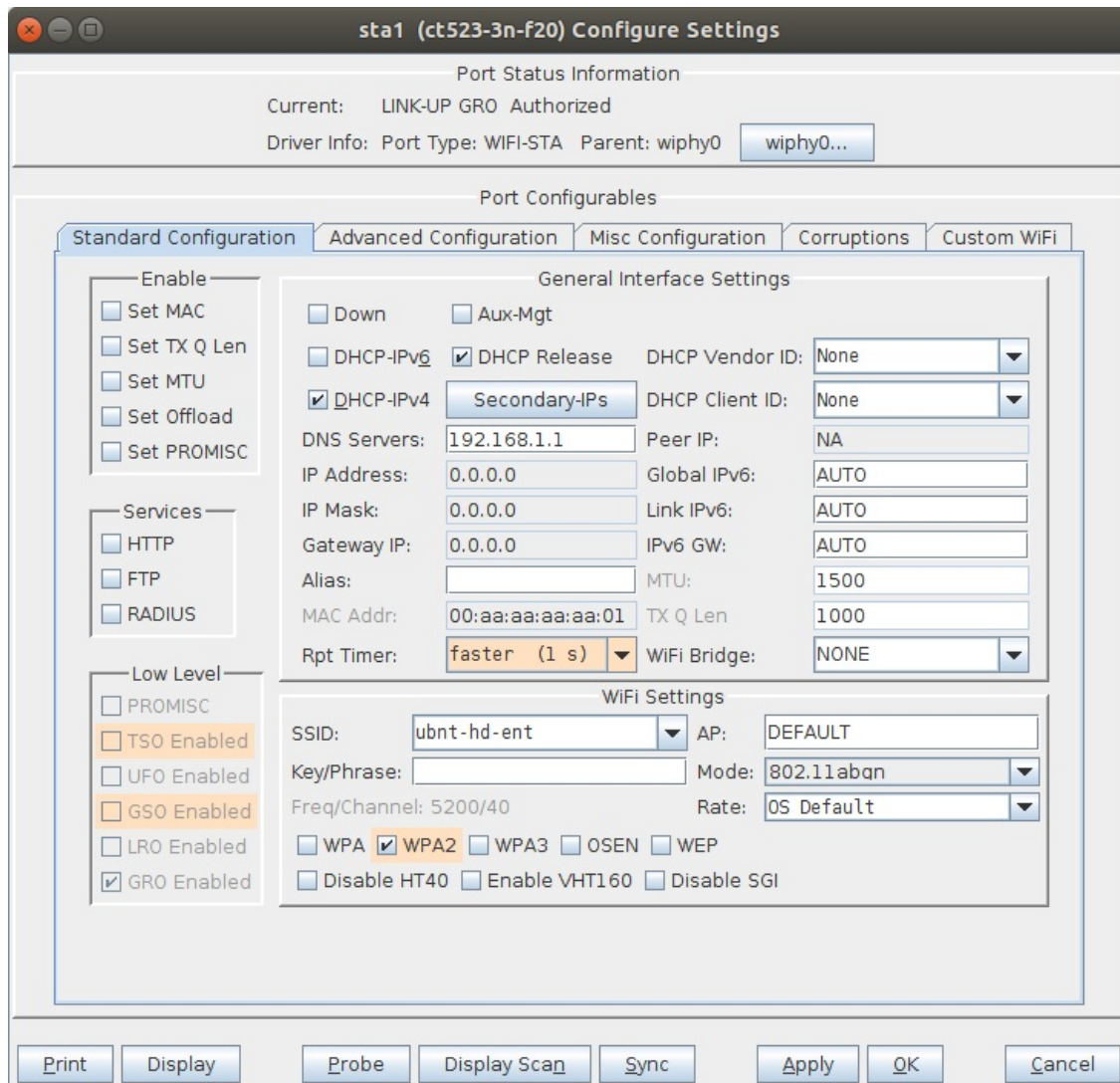
3. AP is a Ubiquiti HD AP with SSID ubnt-hd-ent with WPA Enterprise security.



4. The AP controller points to the RADIUS server at 192.168.2.154.



5. LANforge STA1 basic configuration:



6. LANforge STA1 advanced configuration is using EAP-PEAP.

sta1 (ct523-3n-f20) Configure Settings

Port Status Information

Current: LINK-UP GRO Authorized

Driver Info: Port Type: WIFI-STA Parent: wiphy0 wiphy0...

Port Configurables

Standard Configuration **Advanced Configuration** Misc Configuration Corruptions Custom WiFi

Advanced WiFi Settings

Select 'WPA2' on the Standard Configuration screen to enable Advanced/802.1x and enable Advanced/802.1x to enable most of these. Enabling 802.11u enables others.

Key Management: WPA-EAP HESSID: 00:00:00:00:00:00

Pairwise Ciphers: DEFAULT Realm:

Group Ciphers: DEFAULT Client Cert:

WPA PSK: IMSI:

EAP Methods: EAP-PEAP Milenage:

EAP Identity: lanforge01 Domain:

EAP Anon Identity: Consortium:

EAP Password: !!lanforge123 Phase-1:

EAP Pin: Phase-2:

Private Key: PK Password:

CA Cert File: PAC File:

Network Auth: IEEE80211w: Disabled (0)

☒ Advanced/802.1x ☐ Enable 802.11u ☐ HotSpot 2.0 ☐ Enable PKC

Print
Display
Probe
Display Scan
Sync
Apply
OK
Cancel

7. Wireshark capture of STA1 EAPOL authentication.

sta1-eap-peap-pcap.pcapng

No.	Time	Source	Destination	Protocol	Length	Current Channel	SSID	Authentication SEQ	Info
772	19.516524412	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	EAP	95				Request, Identity
774	19.517453382	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	EAP	105				Response, Identity
787	19.791404244	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	EAP	96				Request, Protected EAP (EAP-PEAP)
789	19.792729482	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	345				Client Hello
801	20.069960287	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	1406				Server Hello, Certificate, Certificate Request, Server Hello Done
803	20.061782185	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	EAP	96				Response, Protected EAP (EAP-PEAP)
814	20.326253297	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	363				Server Hello, Certificate, Certificate Request, Server Hello Done
816	20.329190427	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	438				Certificate, Client Key Exchange, Change Cipher Spec, Encrypted Handshake Message
828	20.596603070	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	159				Change Cipher Spec, Encrypted Handshake Message
830	20.597130380	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	EAP	96				Response, Protected EAP (EAP-PEAP)
841	20.677143184	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	133				Application Data
843	20.878191725	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	170				Application Data
862	21.142284222	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	149				Application Data
864	21.143333554	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	170				Application Data
876	21.409454689	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	165				Application Data
878	21.416634788	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	234				Application Data
890	21.675999119	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	151				Application Data
901	21.677033558	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	170				Application Data
911	21.941194196	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	197				Application Data
913	21.942376027	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	TLV1	234				Application Data
927	22.211661487	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	EAP	94				Success
930	22.222146387	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	EAPOL	267				Key (Message 1 of 4)
932	22.224978880	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	EAPOL	267				Key (Message 2 of 4)
934	22.234758865	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	EAPOL	241				Key (Message 3 of 4)
936	22.235701584	00:aa:aa:aa:aa:01	00:aa:aa:aa:aa:01	EAPOL	105				Key (Message 4 of 4)

Frame 772: 95 bytes on wire (760 bits), 95 bytes captured (760 bits) on interface 0

- Ethernet II Header, Length 48
- IEEE 802.11 radio information
- IEEE 802.11 QoS Data, Flags:F.C
- Logical-Link Control
- 802.1X Authentication
- Extensible Authentication Protocol

```

0000  00 00 30 00 2f 40 00 a0 20 08 00 a0 20 08 00 a0  ..0./0...
0010  20 08 00 00 00 00 00 00 ab 9b 79 01 00 00 00 00  .....
0020  10 00 50 14 40 01 e4 00 00 00 00 00 00 00 00 00  ..P@....
0030  08 02 3c 00 00 aa aa aa 01 f2 9f c2 69 55 12  ....1U...
0040  f2 9f c2 69 55 12 00 00 aa aa 03 00 00 00 00  ....1U...
0050  88 8e 02 00 00 05 01 5a 00 05 01 a1 cf e8 bd  ....Z....

```

sta1-eap-peap-pcap.pcapng Packets: 1186 - Displayed: 25 (2.1%) Profile: Default

8. LANforge STA2 basic configuration:

sta2 (ct523-3n-f20) Configure Settings

Port Status Information
 Current: LINK-UP GRO Authorized
 Driver Info: Port Type: WIFI-STA Parent: wiphy0 [wiphy0...](#)

Port Configurables

Standard Configuration | Advanced Configuration | Misc Configuration | Corruptions | Custom WiFi

Enable

☐ Set MAC

☐ Set TX Q Len

☐ Set MTU

☐ Set Offload

☐ Set PROMISC

Services

☐ HTTP

☐ FTP

☐ RADIUS

Low Level

☐ PROMISC

☒ TSO Enabled

☐ UFO Enabled

☒ GSO Enabled

☐ LRO Enabled

☒ GRO Enabled

General Interface Settings

☐ Down ☐ Aux-Mgt

☐ DHCP-IPv6 ☒ DHCP Release DHCP Vendor ID:

☒ DHCP-IPv4 [Secondary-IPs](#) DHCP Client ID:

DNS Servers: Peer IP:

IP Address: Global IPv6:

IP Mask: Link IPv6:

Gateway IP: IPv6 GW:

Alias: MTU:

MAC Addr: TX Q Len:

Rpt Timer: WiFi Bridge:

WiFi Settings

SSID: AP:

Key/Phrase: Mode:

Freq/Channel: 5200/40 Rate:

☐ WPA ☒ WPA2 ☐ WPA3 ☐ OSEN ☐ WEP

☐ Disable HT40 ☐ Enable VHT160 ☐ Disable SGI

Print Display Probe Display Scan Sync Apply OK Cancel

9. LANforge STA2 advanced configuration is using MSCHAPv2.

sta2 (ct523-3n-f20) Configure Settings

Port Status Information
 Current: LINK-UP GRO Authorized
 Driver Info: Port Type: WIFI-STA Parent: wiphy0 [wiphy0...](#)

Port Configurables

Standard Configuration Advanced Configuration Misc Configuration Corruptions Custom WiFi

Advanced WiFi Settings

Select 'WPA2' on the Standard Configuration screen to enable Advanced/802.1x and enable Advanced/802.1x to enable most of these. Enabling 802.11u enables others.

Key Management: **WPA-EAP** HESSID: 00:00:00:00:00:00
 Pairwise Ciphers: **DEFAULT** Realm:
 Group Ciphers: **DEFAULT** Client Cert:
 WPA PSK:
 EAP Methods: **MSCHAPV2** Milenage:
 EAP Identity: **lanforge02** Domain:
 EAP Anon Identity:
 EAP Password: **!!lanforge123** Phase-1:
 EAP Pin: Phase-2:
 Private Key: PK Password:
 CA Cert File: PAC File:
 Network Auth: ieee80211w: **Disabled (0)**

☒ Advanced/802.1x ☐ Enable 802.11u ☐ HotSpot 2.0 ☐ Enable PKC

[Print](#) [Display](#) [Probe](#) [Display Scan](#) [Sync](#) [Apply](#) [OK](#) [Cancel](#)

10. Wireshark capture of STA2 EAPOL authentication.

sta2-mschapv2-pcap.pcapng

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Wireshark interface showing a capture of STA2 EAPOL authentication. The packet list shows the following details:

No.	Time	Source	Destination	Protocol	Length	Current Channel	SSID	Authentication SEQ	Info
378	9.328336016	f2:9f:c2:69:55:12	00:aa:aa:aa:aa:02	EAP	95				Request, Identity
379	9.328998389	00:aa:aa:aa:aa:02	f2:9f:c2:69:55:12	EAP	105				Response, Identity
380	9.598459795	f2:9f:c2:69:55:12	00:aa:aa:aa:aa:02	EAP	96				Request, Protected EAP (EAP-PEAP)
387	9.599542282	00:aa:aa:aa:aa:02	f2:9f:c2:69:55:12	EAP	96				Response, Legacy Nak (Response Only)
399	9.865322262	f2:9f:c2:69:55:12	00:aa:aa:aa:aa:02	EAP	123				Request, MS-Authentication EAP (EAP-MS-AUTH)
401	9.867273942	00:aa:aa:aa:aa:02	f2:9f:c2:69:55:12	EAP	159				Response, MS-Authentication EAP (EAP-MS-AUTH)
412	9.132674016	f2:9f:c2:69:55:12	00:aa:aa:aa:aa:02	EAP	141				Request, MS-Authentication EAP (EAP-MS-AUTH)
414	9.133680958	00:aa:aa:aa:aa:02	f2:9f:c2:69:55:12	EAP	96				Response, MS-Authentication EAP (EAP-MS-AUTH)
426	9.481831405	f2:9f:c2:69:55:12	00:aa:aa:aa:aa:02	EAP	94				Success
428	9.412393830	f2:9f:c2:69:55:12	00:aa:aa:aa:aa:02	EAPOL	207				Key (Message 1 of 4)
430	9.414699490	00:aa:aa:aa:aa:02	f2:9f:c2:69:55:12	EAPOL	207				Key (Message 2 of 4)
434	9.425594636	f2:9f:c2:69:55:12	00:aa:aa:aa:aa:02	EAPOL	241				Key (Message 3 of 4)
436	9.426624481	00:aa:aa:aa:aa:02	f2:9f:c2:69:55:12	EAPOL	185				Key (Message 4 of 4)

Frame 378: 95 bytes on wire (760 bits), 95 bytes captured (760 bits) on interface 0
 Radiotap Header v0, Length 48
 802.11 radio information
 IEEE 802.11 QoS Data, Flags:F.C
 Logical-Link Control
 802.1X Authentication
 Extensible Authentication Protocol

0000 00 00 30 00 2f 40 00 a0 20 08 00 a0 20 08 00 a0 ...0 /0...
 0010 20 08 00 00 00 00 00 00 4a a8 ba 17 00 00 00 00 ...J.....
 0020 10 0c 50 14 40 01 a3 00 00 00 00 00 00 00 00 ...P@.....
 0030 08 02 3c 00 00 aa aa aa 02 f2 9f c2 69 55 12 ...<.....IU..
 0040 f2 9f c2 69 55 12 00 00 06 00 aa aa 03 00 00 00 ...IU.....
 0050 08 0e 02 00 00 05 02 4e 00 05 01 33 fc 15 9f ...N...S...

sta2-mschapv2-pcap.pcapng Packets: 634 · Displayed: 13 (2.1%) Profile: Default