



OmniTWAG

OmniTouch

OmniTWAG

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.

OmniTWAG WiFi 3GPP TWAG WiFi SIM

TWAG EAP-AKA - SIM WiFi WiFi WiFi

- SIM
-
- WiFi WPA2
- SIM

-
-
- WiFi
- WiFi
- WiFi IMSI
- WiFi

-
-
- WiFi

WiFi

WiFi

TWAG

TWAG

- WiFi RADIUS Diameter SWx
- HSS/HLR Diameter SWx

WiFi AP

1. IMSI SIM
2. WiFi AP RADIUS TWAG
3. TWAG HSS
4. TWAG EAP-AKA
5. WiFi
- 6.

- STa*: WiFi AP TWAG RADIUS/Diameter 3GPP AAA
- SWx: TWAG 3GPP AAA HSS Diameter
- S2a/S2b: GTP
- SGI:
- 802.11: WiFi
- EAPOL: EAP over LAN 802.1X

Omnitouch OmniTWAG v0.1.0				Licensed to: Omnitouch © 2025 Omnitouch			
Resources Configuration Diameter Diameter Test RADIUS Clients Access Points Client Usage	Client Usage & Accounting				3 Sessions	0 Active	↓ 204.4 MB / ↑ 623.07 MB
	SESSION ID	USER	CLIENT MAC	AP / SSID	STATUS	DURATION	DATA USAGE
	00000010	0313380900001867@wla...	86-81-69-A7-B4-B2	10.7.15.72	▷	4m 10s	↓ 193.3 MB / ↑ 427.72 MB
	0000000F	0313380900001867@wla...	86-81-69-A7-B4-B2	10.7.15.72	⏏	8h 27m	↓ 4.12 MB / ↑ 146.5 MB
	0000000E	0313380900001867@wla...	86-81-69-A7-B4-B2	10.7.15.72	⏏	16m 9s	↓ 6.98 MB / ↑ 48.85 MB

```
#####
TWAG #####
1. #####
#####
#####
    • / WiFi
    • /
    • RADIUS
#####
2. #####
WiFi OCS CCR-Initial#####
#####
    • /
    • WiFi
    • WiFi /
#####
#####
#####
    • OCSCCR-ICCR-T
    • CCR-
    •
    •
3. Gy #####
##### 3GPP WiFi OCS #####
#####
    •
    • WiFi
    • 10GB
    •
#####
#####
    • CCR-ICCR-UCCR-T OCS
    • 10MB50MB100MB
    • B0% CCR-
    •
    •
    •
#####
#####
EAP-AKA
#####
1. MAR/MAA HSS XRES MAA TWAG
2. TWAG RES HSS XRES TWAG UE RES HSS
3. TWAG HSS — 3GPP AAA TWAG
#####
NAI IMSI
5055700000000001@lan.mnc057.mcc505.3gppnetwork.org
<<IMSI>@lan.mnc<<MNC>.mcc<<MCC>.3gppnetwork.org
- IMSI 0 IMSI SIM
#####MSK
MSK EAP-AKA 512 64 WiFi
MSK
1. UE TWAG MSK
2. UE SIM CK/IK
3. TWAG HSS CK/IK
4. MSK = PRF(CK || IK, "Full Authentication", IMSI, ...)
MSK
1. PMK PMK = MSK 256 32
2. WPA2 1-Way UE AP PMK PTK
3. WiFi PTK TK
##### MSK
    • MSKWiFi
```

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◆◆◆◆◆SQN◆◆◆◆◆

-

◆ ◆ ◆ ◆

```
TWAG  config/  Elixir  config/runtime.exs
```


Diameter $\diamond\diamond$

```
❖❖ config :diameter_ex❖
```

3GPP TS 23.003

epc.mnc<MNC>.mcc<MCC>.3gppnetwork.org

◆◆◆

- [illegible]

DRA ♦♦♦♦♦♦♦♦♦♦ OmniDRA♦♦♦♦♦ IP ♦♦♦♦♦ DRA♦♦♦♦♦♦♦♦ HSS♦DRA ♦♦♦♦♦♦♦♦♦♦♦♦♦♦ IMSI ♦♦♦♦♦♦♦♦♦♦♦♦♦♦ HSS♦

RADIUS

```
❖❖ config :omnitwag❖
```

```
config :ommitwag,  
  radius_config: %{\n    # 🔗 RADIUS 🔗 IP 🔗\n    🔗 = 🔗\n    allowed_source_subnets: ["10.7.15.0/24", "192.168.1.0/24"],\n\n    # RADIUS 🔗\n    # 🔗 AP 🔗\n    secret: "YOUR_STRONG_SECRET_HERE"\n  }\n}
```

Resources

Configuration

Diameter

Diameter Test

RADIUS Clients

Access Points

Client Usage

Access Points

1 AP

1 Total Clients

NAS IP ADDRESS LAST SEEN	AP MAC / SSID UPTIME	SSID	CLIENTS
10.7.15.72 2025-10-12 10:31:50	64-D9-89-1D-A4-20:ONS 5m 33s	-	1

Access Point Details

Called Station ID (AP MAC:SSID)	64-D9-89-1D-A4-20:ONS
Client Count	1
First Seen	2025-10-12 10:31:49
Framed MTU	1400
Last Seen	2025-10-12 10:31:50
NAS IP Address	10.7.15.72
NAS Port Type	Wireless-802.11



```
#####
  • ##### RADIUS #####20 #####
  • ## allowed_source_subnets ## AP ##
  • #####1812/1813 ##

#####

allowed_source_subnets: ["10.7.15.0/24", "192.168.1.0/24"]

#####/#####

Prometheus ###

# config :omnitwag#

config :omnitwag,
  prometheus: %{
    # Prometheus #####
    port: 9568
  }

#####http://<twag-ip>:9568/metrics

#####

#####
1812UDP RADIUS ##
1813UDP RADIUS ##
3868TCP DiameterSWx # HSS/DRA#
443 TCP HTTP Web ##
8444TCP HTTP REST API
9568TCP Prometheus ##

#####

#####

OmnitWAG ##### WiFi AP #####

  • WPA2-#####802.1X #####
  • RADIUS #####
  • EAP-AKA #####

#####Cisco AironetArubaUniFiRuckus##### hostapd # AP

##### AP #####
1. WPA2-#####802.1X#####
2. RADIUS ##### TWAG IP #
3. RADIUS #####1812
4. RADIUS #####1813#####
5. RADIUS ##### TWAG #####
6. EAP #####EAP-AKA#####

Cisco AP #####

CLI #####

! ## RADIUS ##
radius-server host 10.5.198.200 auth-port 1812 acct-port 1813 key YOUR_SHARED_SECRET

! ## SSID # 802.1X
dot11 ssid OPERATOR-WIFI
  vlan 10
  authentication open eap eap_methods
  authentication network-eap eap_methods
  authentication key-management wpa version 2

! # SSID #####
interface Dot11Radio0
  encryption mode ciphers aes-ccm
  ssid OPERATOR-WIFI

Web #####
1. ##### -- AAA -- RADIUS #####
2. ## RADIUS #####10.5.198.200:1812#####
3. ##### WLAN ##
4. ##### WPA2-##
5. # EAP ##### EAP-AKA # ##
6. ## RADIUS #####

hostapd #####

##### Linux # AP#OpenWrt#####

# /etc/hostapd/hostapd.conf
```

```
interface=wlan0
driver=nl80211
ssid=OPERATOR-WIFI

# WPA2-
wpa=2
wpa_key_mgmt=WPA-EAP
wpa_pairwise=CCMP
ieee8021x=1

# RADIUS
auth_server_addr=10.5.198.200
auth_server_port=1812
auth_server_shared_secret=YOUR_SHARED_SECRET

acct_server_addr=10.5.198.200
acct_server_port=1813
acct_server_shared_secret=YOUR_SHARED_SECRET

# EAP
eap_server=0

# 2.0 -
interworking=1
internet=1
anqp_3gpp_cell_net=505,057
domain_name=wlan.mnc057.mcc505.3gppnetwork.org
nai_realm=0,wlan.mnc057.mcc505.3gppnetwork.org,0,21[2:1][5:7]
roaming_consortium=505057
hs20=1
```

AP TWAG

- AP TWAG 1812/1813
- TWAG HSS 3868
- TWAG 443

2.0

2.0Passpoint

2.0Passpoint 802.11u WiFi WiFi WiFi

-
- SIM EAP-AKA
- OSEN OSU
-
-

2.0 AP

AP

1. 802.11u ANQP
2. WPA2-802.1X
3. EAP-AKA EAP-AKA
4. ANQP

hostapd AP

```
# 2.0 / Passpoint
interworking=1
internet=1
asra=0
esr=0
uesa=0

# ANQP
anqp_3gpp_cell_net=505,057
domain_name=omnitouchns.com,wlan.mnc057.mcc505.3gppnetwork.org

# NAI
nai_realm=0,wlan.mnc057.mcc505.3gppnetwork.org,0,21[2:1][5:7]
# <>,<>,<eap>[auth-id:auth-val]
# 21 = EAP-AKA
# 2:1 = SIM
# 5:7 = EAP EAP-AKA

#
roaming_consortium=505057
# MCC=505MNC=057

#
venue_group=1
venue_type=8
venue_name=eng: WiFi

# WPA2-
wpa=2
wpa_key_mgmt=WPA-EAP
rsn_pairwise=CCMP
ieee8021x=1

# RADIUS OmnitWAG
auth_server_addr=10.5.198.200
auth_server_port=1812
auth_server_shared_secret=YOUR_SHARED_SECRET

acct_server_addr=10.5.198.200
acct_server_port=1813
acct_server_shared_secret=YOUR_SHARED_SECRET

# SSID
ssid=OperatorWiFi
utf8_ssid=1

# 2.0
hs20=1
hs20_oper_friendly_name=eng: WiFi
```

1. Passpoint WiFi
2. AP ANQP
3. ANQP MCC/MNC
4. >
5. EAP-AKA
6. WiFi

1. MCC/MNC
- 2.
3. WPA2-WPA2-PSK
- 4.
5. WiFi

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1. telnet <hss-ip> 3868
2. Diameter <Origin-Host>Origin-Realm IP
3. HSS/DRA 3GPP
4. TCP 3868

- IP/
- TCP 3868
- Origin-Host/Realm
- HSS/DRA TWAG

>5

1. HSS
2. ping <hss-ip>mtr <hss-ip>
3. TWAG top>htop
4. Diameter

- HSS
-
- TWAG CPU/
-

```
# RADIUS
tcpdump -i eth0 -n port 1812 or port 1813 -w radius.pcap

# Diameter
tcpdump -i eth0 -n port 3868 -w diameter.pcap

# AP
tcpdump -i eth0 -n host 10.7.15.72 and port 1812 -w radius-ap1.pcap

Wireshark RADIUS Diameter
```

TWAG

```
# shell TWAG
iex --sname debug --remsh twag@hostname --cookie <cookie>
```

IEEx

```
#
CryptoState.keys()

#
CryptoState.get("0505338057900001867@wlan.mnc057.mcc505.3gppnetwork.org")

# AP
APState.list()

#
ClientUsage.list()
```

RES <XRES> <RES>		AP TWAG RADIUS
Diameter	SIM Ki HSS	
EAP	HSS	HSS
EAP-AKA	EAP	AP EAP-AKA AP
	SQLN	EAP-AKA

OmniTWAG 3GPP IETF

- 3GPP TS 23.402 3GPP
- 3GPP TS 24.302 3GPP EPC
- 3GPP TS 29.273 Diameter SWx/SWm
- 3GPP TS 33.402 3GPP
- 3GPP TS 35.206 Milenage
- RFC 2865 RADIUS
- RFC 2866 RADIUS
- RFC 3579 RADIUS EAP
- RFC 4187 EAP-AKA
- RFC 5448 EAP-AKA

OmniTWAG Omnitouch 3GPP WiFi

- 1.
2. SWx EAP-AKA RADIUS
3. SIM
4. MSK WPA2
5. 2.0
- 6.
7. HSS OmniDRA

2.0 2025 OmniTWAG - WiFi © 2025 Omnitouch