



FortiAP?Fortinet??????(thin)??AP, ??????AP. ??????Zero Configuration, ??CAWAP??, ?????????????(P1).  
FortiAP????????FortiGate??, ??????FortiWiFi??(20C/40C/50B/60C...). ??????????, ??????????(P1), ??????  
FortiGate?, ??????????(?FortiOS??).



????????????????, ????. ??????????2R2T, ?222B?????, ??????2dbi. ?????????????, ??????????monitor??(??)  
??AP-scan??. ?????????, ??????:



?????????LED???, WiFi1~3?????????, ???2R2T, ?Radio1?Radio2??FortiOS???, ????, WiFi3???????, ?????3R3T??  
(???, Fortinet????). ETH??????, ??FortiGate???, ethernet???GbE, ??????????.



????????, USB????, ?????for future use, CONSOLE????RJ-45 to RS232 cable??CLI??, ??????. ETH PoE??  
 ?????FortiGate, ?????802.3af, ???AC????, ?????????PoE adapter??L2/L3 PoE??.

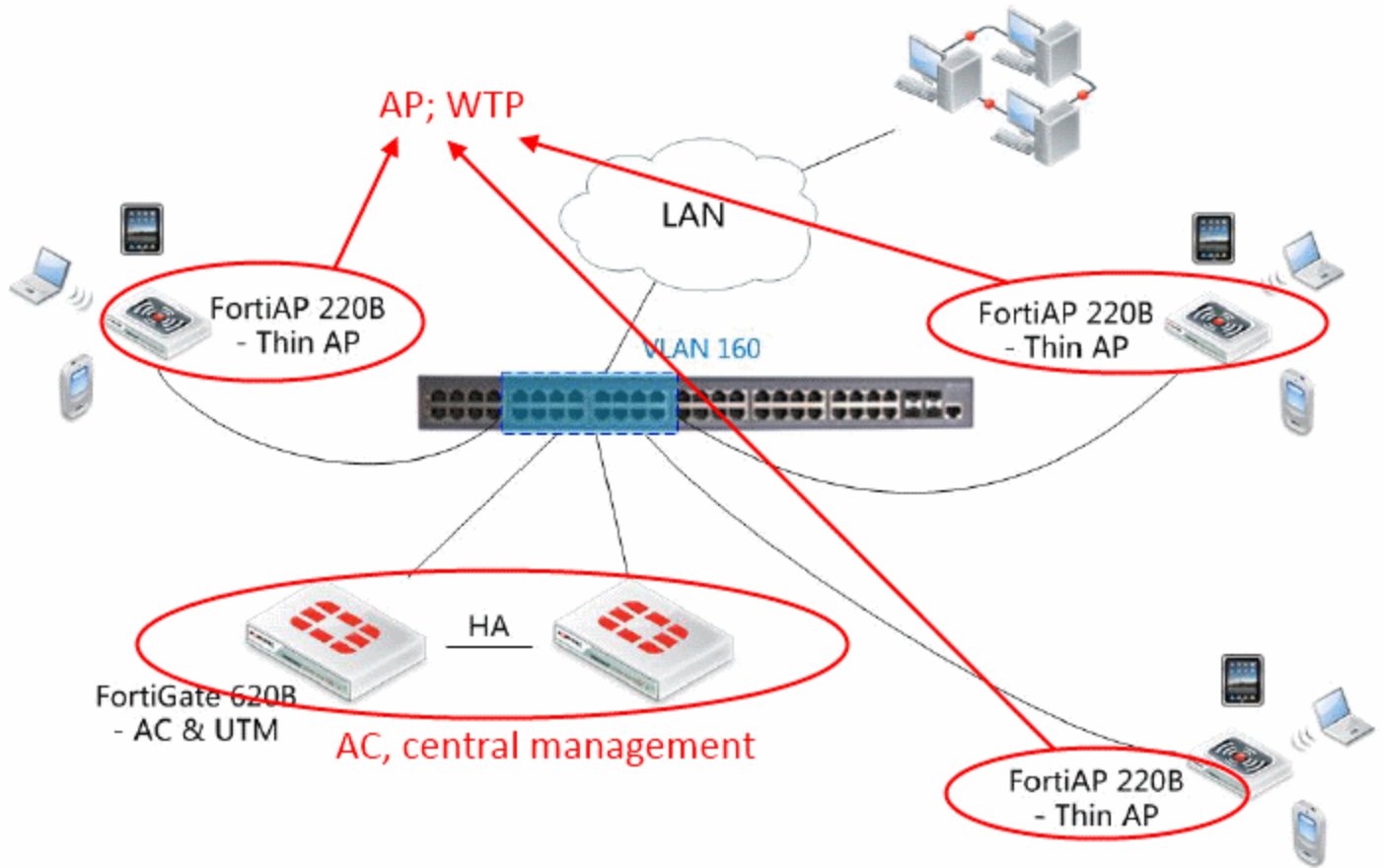
FortiAP????CAWAP(Control And Provisioning of Wireless Access Points)??, ???AP????????????  
 (FortiGate)???, CAWAP????RFC-5415?RFC-5416??:

1. <http://tools.ietf.org/html/rfc5415>
2. <http://tools.ietf.org/html/rfc5416>

??CAWAP???, Fortinet????????, ??????: AP(WTP)?AC.

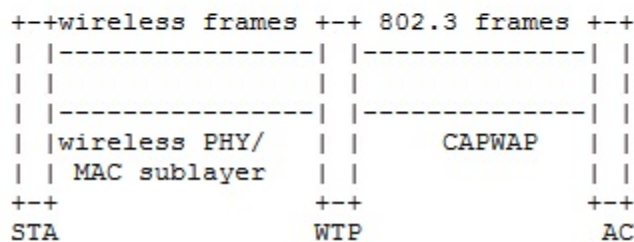
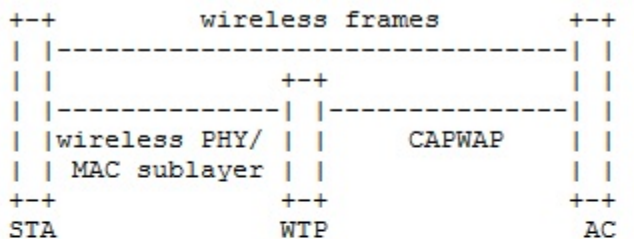
1. AP: Access Point, ??????, ??????(wireless frames)????, ??WTP(\*).
2. AC: Access Controller, ?AP????, ?????AC????, AC????????.

\* WTP: Wireless Termination Point



?AP?AC?Fortinet???????, AP??FortiAP; ?AC??????FortiGate. ??CAWAP?????, ??????:

1. AP????AC????, ?????AC-Discovery??????.
2. ??CAWAP?????, ???(??IP??)??port?5246/5247, UDP(\*)
3. CAWAP??????DTLS(Datagram Transport Layer Security)??????, ?????. Fortinet?????control traffic????.
4. ??(frame)????????802.11?????(wireless frame)??802.3????????.



5. ??AC??????10????AP(WTP, managed AP), AC??????????????.

????CAWAP???, ??FortiAP, ???CLI??????AP???????, ???! ????????, ??GUI, ????????????(FortiWiFi?????? FortiGate?CLI????).

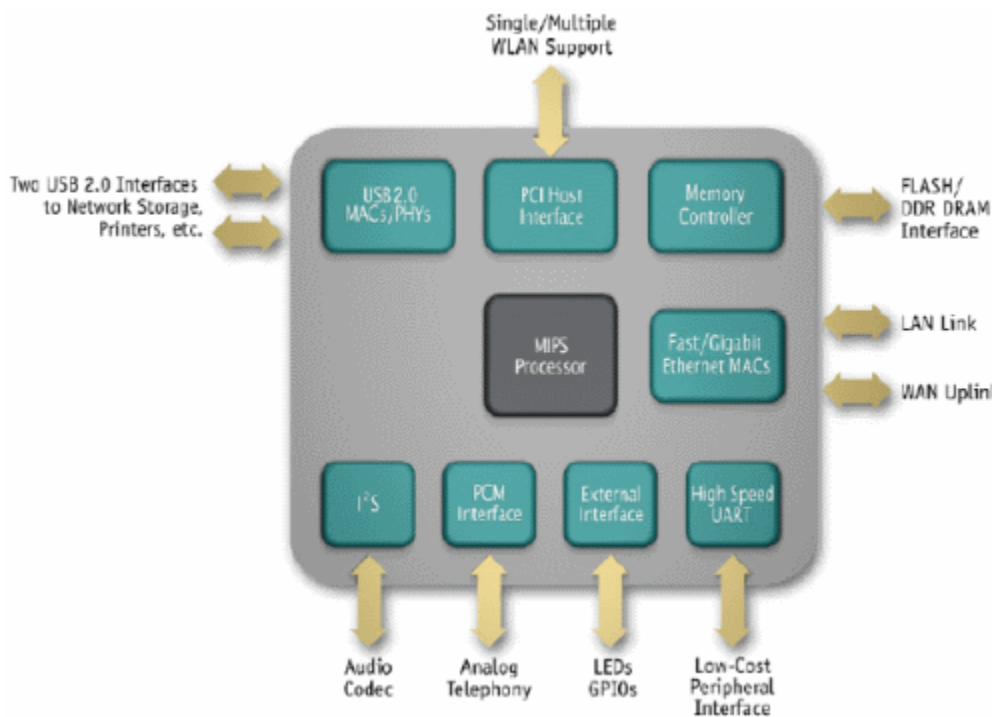
```

COM1 - PuTTY
Ver:04000010
Serial number: FAP22B3U11005034
Region code: T
DRAM: b8050000: 0xc0140180
64 MB
id read 0x100000ff
flash size 16MB, sector count = 256
Flash: 16 MB
Using default environment

In: serial
Out: serial
Err: serial
Net: ag7100_enet_initialize...
ATHRF1E:
No phy found for unit 0
eth0: 00:09:0f:f1:a7:e2
eth0 up
ATHRF1E: Port 1, Negotiation timeout
ATHRF1E: unit 1 phy addr 0 ATHRF1E: reg0 1000
eth1: 00:09:0f:f1:a7:e3
eth1 up
eth0, eth1
Hit any key to stop autoboot: 0

```

?AP????????, ?????????, DRAM buffer?64MB, FLASH?16MB, ??SoC?????????Atheros?AR7100.



[http://www.atheros.com/media/resourc...e\\_23\\_file2.pdf](http://www.atheros.com/media/resourc...e_23_file2.pdf)

??SoC??MIPS????????????????, ??AP-scan. ??FortiAP????????, ?????MIPS????, ???FortiGate(AC)??

??cat /proc/cpuinfo?????AR7100?MIPS CPU??, ?????????:



```

BusyBox v1.01 (2012.08.07-23:24+0000) Built-in shell (ash)
Enter 'help' for a list of built-in commands.

FAP22B3U11005034 # cat /proc/cpuinfo
system type      : Atheros AR7100 (hydra)
processor        : 0
cpu model        : MIPS 24K U7.4
BogoMIPS         : 451.58
wait instruction : yes
microsecond timers : yes
tlb_entries      : 16
extra interrupt vector : yes
hardware watchpoint : yes
ASEs implemented : mips16
VCEd exceptions  : not available
VCEI exceptions  : not available

```

BogoMIPS?451.58, ??clock??????300~400MHz??, MIPS 24K??.

```

COM1 - PuTTY
No phy found for unit 0
eth0: 00:09:0f:f1:a7:e2
eth0 up
ATHRF1E: Port 1, Negotiation timeout
ATHRF1E: unit 1 phy addr 0 ATHRF1E: reg0 1000
eth1: 00:09:0f:f1:a7:e3
eth1 up
eth0, eth1
Hit any key to stop autoboot: 0
## Booting image at bf940000 ...
Image Name: Linux Kernel Image
Created: 2012-08-07 23:21:44 UTC
Image Type: MIPS Linux Kernel Image (gzip compressed)
Data Size: 1044785 Bytes = 1020.3 kB
Load Address: 80002000
Entry Point: 80212000
Verifying Checksum ... OK
Uncompressing Kernel Image ... OK

init started: BusyBox v1.01 (2012.08.07-23:24+0000) multi-call binary
init started: BusyBox v1.01 (2012.08.07-23:24+0000) multi-call binary
Starting pid 570, console /dev/
FAP22B3U11005034 mips #1 Tue Aug 7 16:21:37 PDT 2012 (none)
FAP22B3U11005034 login: █

```

?????????BusyBox OS, Fortinet??FortiAP????????????????AC-Discovery?????, ??????????????:

```

COM1 - PuTTY
LOGIN_PASSWD
COUNTRY_STR
WTP_NAME
WTP_LOCATION
AC_DISCOVERY_TYPE
    0(auto), 1(static) 2(dhcp), 5(broadcast), 6(multicast)
AC_IPADDR_1
AC_IPADDR_2
AC_IPADDR_3
AC_CTL_PORT
AC_DISCOVERY_MC_ADDR
AC_DISCOVERY_DHCP_OPTION_CODE
FAP22B3U11005034 # cfg -s
AP_IPADDR:=10.1.32.224
AP_NETMASK:=255.255.255.0
IPGW:=10.1.32.192
ADDR_MODE:=STATIC
TELNET_ALLOW:=0
AC_DISCOVERY_TYPE:=0
AC_IPADDR_1:=10.1.32.254
AC_CTL_PORT:=5246
AC_DISCOVERY_MC_ADDR:=224.0.1.140
AC_DISCOVERY_DHCP_OPTION_CODE:=139
FAP22B3U11005034 #

```

????????????????????, ??FortiGate????????????(L2+L3...). ??CAWAP??, AP(WTP)?AC????????AC-Discovery?
 ???, AC?(Discovery)???FortiGate?FortiAP???, AP(WTP)????AC????, ??????????, ??NAT, DHCP?, ??????. ??
 AC????????! ?????????FortiGate????FortiAP???, ?????????ADDR\_MODE, ??????. STATIC????????????, ??
 ?????DHCP. ?????DHCP?????????. ?DHCP??:

1. 0.0.0.0/24??, port 67~68=[?]=>255.255.255.255/32
2. Gateway???, port 67~68=[?]=>255.255.255.255/32
3. FortiAP??IP, ????? 5246 port?FortiGate??.

3	7	internal	wan1	<a href="#">ipANY_intANY</a>	<a href="#">ipFIXED_BROADCAST</a>		<input checked="" type="checkbox"/> always	<input checked="" type="checkbox"/> DHCP
4	8	wan1	internal	<a href="#">ipPTR_wan1</a>	<a href="#">ipFIXED_BROADCAST</a>		<input checked="" type="checkbox"/> always	<input checked="" type="checkbox"/> DHCP

[for example]

Broadcast DHCP request:

wan1-- 0.0.0.0.68 -> 255.255.255.255.67: udp

wan1 -- 192.168.8.1.67 -> 192.168.8.2.68: udp

The FortiAP unit is assigned the IP address 192.168.8.2. It will then communicate with the WiFi controller on 192.168.8.1 using the CAPWAP control port 5246.

5246?AC port(udp)????????, ???FortiGate?????. ?????, ??????????. ?????, ?????????multicast, ???DST address?: 240.0.1.140???multicast?. ?????L3???, ??mutlicast?, ??????????. ?????????.

[for example]

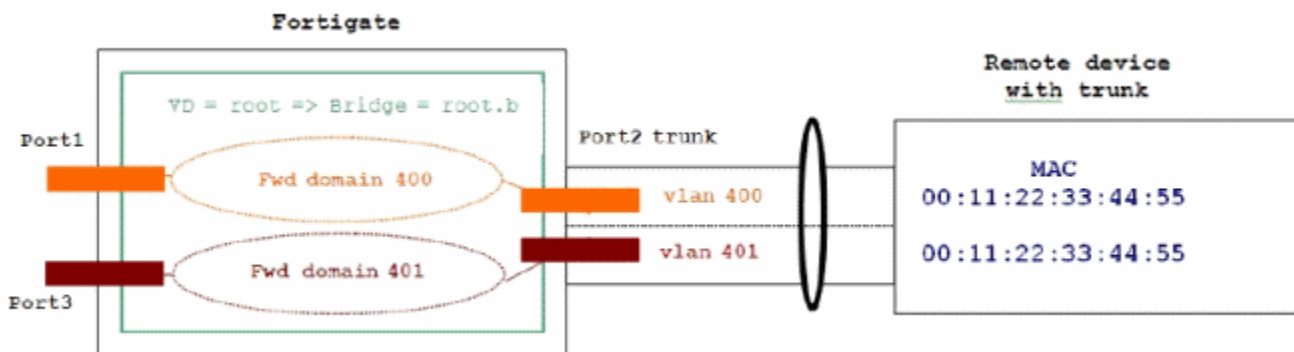
```
FortiAP[DMZ]FGT 110C(TP)[wan1]<===>[wan1]FGT 60C[wan1]VTU-R
```

```
<<includes>>{
```

```
vap1[DMZ]FGT 110C(TP)[vlan1@wan1]<===>[vlan1@wan1]FGT 60C[wan1]VTU-R
```

```
vap2[DMZ]FGT 110C(TP)[vlan2@wan1]<==>[vlan2@wan1]FGT 60C[wan1]VTU-R
}
```

110C??TP mode, ??????firwall?UTM?????, 60C??DHCP Server??IP, vap?????, ?????FortiAP??PHY????? VAP(Virtual AP), ?????AP???????, ??????. ?????????????????, ?????????????, ???????????, ??VLAN??, ????????? ?????, ???????????. FortiGate????????collision domain[def: 0], VLAN????????????????, ?????????, ???CLI? collision domain?????: set forward-domain [var|var is number].



?????VLAN??(\*), ?????????(????!), ?????????FortiAP?????.  
 \* ?VLAN?, ??VLAN??PHY??CLI?vlanforward???, ??VLAN?????????????.

???110C ??FortiAP(WTP)?????(AC), ???WTP????110C(AC)?, ???VLAN????????????, ???collision domain??, ??? ?FortiAP?????????. ???collision domain??????, ?????????????????, FortiAP(WTP)???110C?TP???, ??60C??DHCP server?????????????????. ?????CLI??ping??:

```
Connected
FWF60C3G11012569 # exe ping 10.1.32.193
PING 10.1.32.193 (10.1.32.193): 56 data bytes
64 bytes from 10.1.32.193: icmp_seq=0 ttl=255 time=1.1 ms
64 bytes from 10.1.32.193: icmp_seq=0 ttl=255 time=1.2 ms (DUP!)
64 bytes from 10.1.32.193: icmp_seq=0 ttl=255 time=1.3 ms (DUP!)
64 bytes from 10.1.32.193: icmp_seq=1 ttl=255 time=0.5 ms
64 bytes from 10.1.32.193: icmp_seq=1 ttl=255 time=0.7 ms (DUP!)
64 bytes from 10.1.32.193: icmp_seq=1 ttl=255 time=0.7 ms (DUP!)
64 bytes from 10.1.32.193: icmp_seq=2 ttl=255 time=0.5 ms
64 bytes from 10.1.32.193: icmp_seq=2 ttl=255 time=0.6 ms (DUP!)
64 bytes from 10.1.32.193: icmp_seq=2 ttl=255 time=0.7 ms (DUP!)
```

?DHCP????????FortiAP?????, ?????????, ???????. ???AC-Discovery??????. ???solution?????:

1. ??FortiAP?CLI(BusyBox)??static configuration??????, ??unicast??.
2. ?110C?TP mode??NAT mode, ??! NAT?TP????????????????????.
3. ?WTP????60C(AC)?, ?????????. ??FortiAP??VAPs??????110C????????, ??QoS.

??, ?????????, ?????FortiAP?BusyBox????????????(\*). ??! ?????????, ??TP?NAT????????????, ??NAT????????????? ?, ?????pass-through. ???solution?????, ??????!! ??FortiAP?Gateway UTM???FortiAP??VAPs??????, ?????????(??bridge). ?????FortiAP??60C?.

\* ???FortiWiFi????FortiOS?CLI????.

?????, ?????????????, collision domain???. ?????????, ?????mutlicast???:



```

Connected
FGT80C3911620414 # config fire multicast-policy
FGT80C3911620414 (multicast-policy) #

```

????AC??(Discovery)?, FortiAP?FortiGate?????????(port: 5246, udp):

1. Multicast, ????, ???domain
2. Broadcast
3. Static IP, unicast, ????

Broadcast????, ????????. ??????????Static IP, ??????????AP??DHCP??, ??????????. ???FortiWiFi?????(WiFi unit? ???AP?????managed AP?????FortiGate????????), ??????????, ??????commands:

```

config sys glo
set wireless-mode wtp
[after reboot...]
config wire glo
set ac-disc static
(the following commands not in any docs, I don't know why..)
config ac-l
edit 1
set ip A.B.C.D(80C, Gateway IP)
end

```

AC-Discovery??FortiAP?????, ??????????! ????????????????, ????(Multicast, DHCP)?????????, ??????????.

????DHCP???, ?DHCP server, ???FortiGate?????????. ??????DHCP Server?????:

Interface Name:

Mode:

Enable:

Type:  Regular  IPsec

IP:  -

Network Mask:

Default Gateway:

DNS Service:  Use System DNS Setting  Specify

IP Reservation

Create New  Edit  Delete  Add from DHCP Client List

IP
10.17.32.64

▼ [Advanced...] (DNS, WINS, Custom Options, Exclude Ranges.)

Domain:

Lease Time:  Unlimited  
 3 (days) 0 (hours) 0 (minutes)  
 (5 minutes - 100 days)

IP Assignment Mode:  Server IP range  User-group defined method

WINS Server 0:

WINS Server 1:

Options

Code:  Options:

Exclude Ranges

Starting IP	End IP	Delete
<input type="text" value="10.17.32.192"/>	<input type="text" value="10.17.32.192"/>	<input type="button" value="🗑"/>
<input type="text" value="10.17.32.1"/>	<input type="text" value="10.17.32.63"/>	<input type="button" value="🗑"/>
<input type="text" value="10.17.32.64"/>	<input type="text" value="10.17.32.127"/>	<input type="button" value="🗑"/>
<input type="text" value="10.17.32.193"/>	<input type="text" value="10.17.32.254"/>	<input type="button" value="🗑"/>

????????????????Options????, ??OPTION CODE, ??CODE????FortiAP??FortiWiFi??OPTION CODE????????.

```

AP_IPADDR:=10.1.32.224
AP_NETMASK:=255.255.255.0
IPGW:=10.1.32.192
ADDR_MODE:=STATIC
TELNET_ALLOW:=0
AC_DISCOVERY_TYPE:=0
AC_IPADDR_1:=10.1.32.254
AC_CTL_PORT:=5246
AC_DISCOVERY MC ADDR:=224.0.1.140
AC_DISCOVERY DHCP OPTION CODE:=139
FAP22B3U11005034 #
    
```

OPTION CODE?????, ???FortiAP(AC)????(bind), ???16??(Hex)??IPv4????FortiAP:  
 C0A819C3=> C0.A8.19.C3=> 192.168.25.195

??????AP??, ??????AP??OPTION CODE???, ????. ??????DHCP??ForiAP??. ?multicast???, FortiGate?????  
 FortiAP???, ???Managed AP??????????????.

State	Status	Name	Clients
	Connected	FAP22B3U1100	3
	Connecting	FWF60C3G1101	0

?????, FortiAP?????????????????. ??????, ???AC????????(?????Disconnected).

Serial Number: FWF60C3G11012569

Name:

Description: WTP [Change]

**Managed AP Status**

Status: Connecting

State: Discovered Authorize

??????, ?????AP?????????. ?????AC????????????.

Serial Number	<input type="text" value="FWF60C3G11012569"/>
Name	<input type="text"/>
Description	WTP <a href="#">[Change]</a>
<b>Managed AP Status</b>	
Status	Connected
Connecting From	10.1.32.192
Join Time	09/22/12 14:15
Clients	0
FortiAP OS Version	FWF60C-v4.0-build639 <a href="#">[Upgrade]</a>
State	Authorized <input type="button" value="Deauthorize"/> <input type="button" value="Restart"/>
<b>Wireless Settings</b>	
AP Profile	FWF60CR12d4GpNOSCAN <a href="#">[Change]</a>
Radio 1	
Mode	Access Point
Band	802.11n
Channel	1, 6, 11

????????, ?????f/w, ?????????...???? AP????????, Fortinet????????AP profile?????. ?????????model???. ????

Name Comments  0/63Platform **FAP220B/FAP221B** ▼

## ▼ Radio 1

Mode  Disable  Access Point  Dedicated MonitorBackground Scan  Disable  EnableRadio Resource Provision 

Band 802.11na\_5G ▼

Short Guard Interval 20/40 MHz Channel Width Channel  149  153  157  161

TX Power 100 %

SSID

Available

Selected

FORTINET\_MANAGED  
FORTINET\_UNMANAGED

## ▼ Radio 2

Mode  Disable  Access Point  Dedicated MonitorBackground Scan  Disable  EnableRadio Resource Provision 

Band 802.11ng\_2.4G ▼

Short Guard Interval Channel  1  2  3  4  5  6  7  8  9  10  11

TX Power 100 %

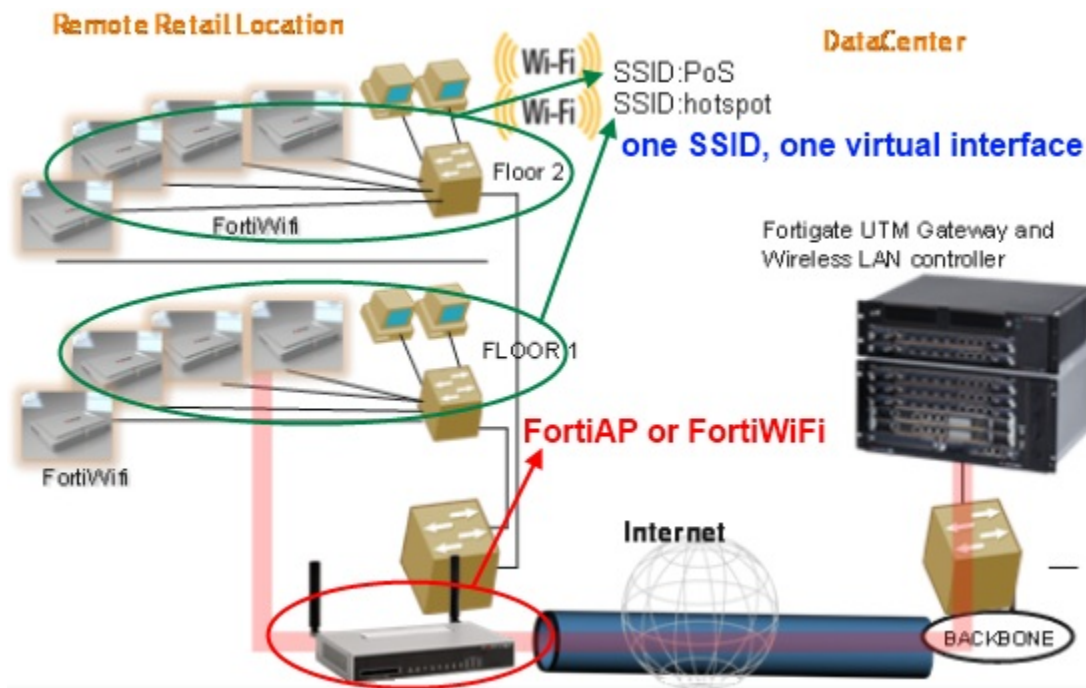
SSID

Available

Selected

FORTINET\_MANAGED  
FORTINET\_UNMANAGED

FortiAP 220B??dual-band, ??????2.4G?5G?????, ??5G??radio 1???. ??????! 40MHz????5G??, 2.4G???.  
 FortiAP??SSID????, ?????FortiOS??????Managed AP?????SSID. SSID????AP??AP???????, FortiAP??????  
 PHY, ??PHY????VAPs(???, ??????14????).



??VAP????????????, ?????????????, ?policy-based configuration????????????QoS, ??????...

**System**

**Policy**

**Firewall Objects**

**UTM Profiles**

**VPN**

**User**

**WiFi Controller**

- WiFi Network
  - SSID**
  - Rogue AP Settings
- Managed Access Points
  - Managed FortiAP
  - Custom AP Profile
- Monitor



+ Create New   Edit   Delete

	SSID
<input type="checkbox"/>	FORTINET_MANAGED
<input type="checkbox"/>	FORTINET_UNMANAGED

可以建立超過10組以上的SSID

??SSID????????????(??????VAP), ??????????DHCP. ??????, ??SSID????, ??TP????, ??NAT?????  
 DHCP?????.



Interface Name	<input type="text"/>
Status	<input checked="" type="radio"/> Enabled  <input type="radio"/> Disabled 
<b>WiFi Settings</b>	
SSID	<input type="text" value="fortinet"/>
Security Mode	<input type="text" value="WPA/WPA2-Personal"/> ▼
Data Encryption	<input checked="" type="radio"/> AES <input type="radio"/> TKIP <input type="radio"/> TKIP+AES
Pre-shared Key	<input type="text"/> (8 - 63 characters)
Block Intra-SSID Traffic	<input type="checkbox"/>
Maximum Clients	<input type="checkbox"/> Limit Concurrent WiFi Clients
Comments	<input type="text" value="Write a comment..."/> 0/63

SSID?????????, VAP, TP?????????SSID??policy????DHCP Server?????. ??NAT?????????, ???combined, ???  
 ????:

<http://kb.fortinet.com/kb/microsites...200%2037796535>

???????Rogue AP Settings??, ??AP Scan??. FortiOS???AP Scan?????:

1. ?????Monitor?????radio?
2. Monitor????????????????.

Name

Comments  0/63

Platform

---

**Radio 1**

Mode  Disable  Access Point  Dedicated Monitor

Rogue AP On-Wire Scan

---

**Radio 2**

Mode  Disable  Access Point  Dedicated Monitor

Background Scan  Disable  Enable

Radio Resource Provision

Band

Short Guard Interval

Channel  1  2  3  4  5  6  7  8  9  10  11

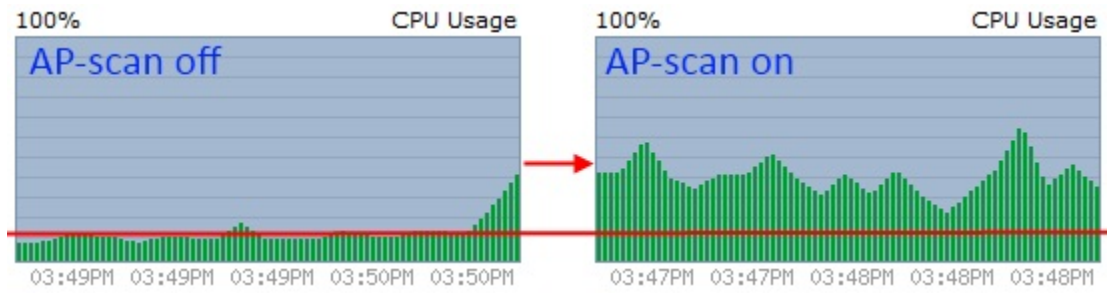
TX Power

---

SSID

Available	Selected
FORTINET_MANAGED FORTINET_UNMANAGED	

??????????, ?????. ??????. ?????????????, ??????CLI?????. FortiAP??AP-scan?????????MIPS????????, ?????????? FortiGate?CPU??, ??FortiWiFi????????, ?unit??WiFi controller??AP-scan??CPU?????????. ?60C??, ??? 15~20%?CPU??, ??????????.



???AP-scan??, ??????????. Rogue AP On-Wire?????????, ??????FortiAP?????????. ???????, ??????????GUI monitor?Rogue AP??, ??????:

System	State	Online Status	SSID	Security Type	Channel	MAC Address	Vendor Info	Signal Strength	Detected By	On-wire
	<input type="checkbox"/>	<input type="checkbox"/>		OPEN	1	00:24:6c:49:7d:52	ARUBA NETWORKS,	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	<input type="checkbox"/>		OPEN	1	00:24:6c:49:7d:53	ARUBA NETWORKS,	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	0024A5B4		8	34:08:04:27:8f:82	D-Link Corporation	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	ani99		8	06:24:a5:b4:ce:dd	Buffalo Inc.	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>			11	80:1f:02:67:3b:34	Edimax Technology	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	APTG Wi-Fi	OPEN	6	04:12:46:9a:ac:22		📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	ASUS	WPA2	11	bc:ae:c5:c4:c8:8a	ASUSTek COMPUTER	📶	FAP22B3U11005034 (2), FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	Betty-AP2	WPA Auto	4	f4:ec:38:ae:d4:ca	TP-LINK	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	CHT Wi-Fi(HiNet)	OPEN	6	04:11:46:9a:ac:22		📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	CHT Wi-Fi(HiNet)	OPEN	8	34:01:04:27:8f:82		📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	DC_FTP	WPA2	1	c8:6c:87:1a:c0:7d	Zyxel	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	FET Wi-Fi	OPEN	1	00:24:6c:49:7d:50	ARUBA NETWORKS,	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	FET-Network	WEP	1	f4:c7:14:8b:93:5f	Huawei Device Co.,	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	harrynet880	WPA2	11	b0:b2:dc:31:f8:e0	Zyxel	📶	FWF60C3G11012569 (1), FAP22B3U11005034 (2)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	HiLife-MAC	OPEN	1	00:24:6c:49:7d:51	ARUBA NETWORKS,	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	HPC5A5B1	OPEN	10	02:25:05:04:4f:ff	eks Engel GmbH &	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	jalai	WPA	1	20:cf:30:d7:2d:d8	ASUSTek COMPUTER	📶	FWF60C3G11012569 (1), FAP22B3U11005034 (2)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	mpcm	OPEN	11	00:24:a5:0f:7a:57	Buffalo Inc.	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	NBG4104	WPA2	1	ca:6c:87:8c:63:b0		📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	one	OPEN	6	38:16:d1:cf:8e:e1	Samsung Electronics	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	P874	WPA	1	c8:6c:87:1c:8f:5e	Zyxel	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	popo	WEP	6	00:26:f3:5f:05:42	SMC Networks	📶	FWF60C3G11012569 (1), FAP22B3U11005034 (2)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	TOTOLINK-3F	OPEN	11	78:44:76:d7:52:e0	Zioncom technology	📶	FWF60C3G11012569 (1), FAP22B3U11005034 (2)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	林昱鑫	WPA2	1	7e:59:48:65:18:f5		📶	FWF60C3G11012569 (1)	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>		WEP	3	00:13:1a:4b:eb:90	Cisco Systems	📶	FWF60C3G11012569 (1)	<input type="checkbox"/>

????????????????Rogue??Accepted, ??????????. ??????????(report), ?Event Log?????. ???AP-scan?????????, ??????????????, ??????CLI?????:

Each WiFi radio can perform monitoring of radio channels in its operating band while acting as an AP. It does this by briefly switching from AP to monitoring mode. By default, a scan period starts every 300 seconds. Each second a different channel is monitored for 20ms until all channels have been checked.

During heavy AP traffic, it is possible for background scanning to cause lost packets when the radio switches to monitoring. To reduce the probability of lost packets, you can set the CLI `ap-bgscan-idle` field to delay the switch to monitoring until the AP has been idle for a specified period. This means that heavy AP traffic may slow background scanning.

The following CLI example configures default background rogue scanning operation except that it sets `ap-bgscan-idle` to require 100ms of AP inactivity before scanning the next channel.

```
config wireless-controller wtp-profile
edit ourprofile
config radio-1
set ap-bgscan enable
set rogue-scan enable
set ap-bgscan-period 300
set ap-bgscan-intv 1
set ap-bgscan-duration 20
set ap-bgscan-idle 100
end
end
```

AP-scan?????15???, ??????. ?! ???CLI?????, ??????600??????:

```
FGT80C3911620414 (FWF60CR1DMpSCAN) # config radio-1

FGT80C3911620414 (radio-1) # get
ap-fgscan-report-intv: 15
ap-scan-passive      : disable
mode                 : monitor
rogue-scan           : enable
```

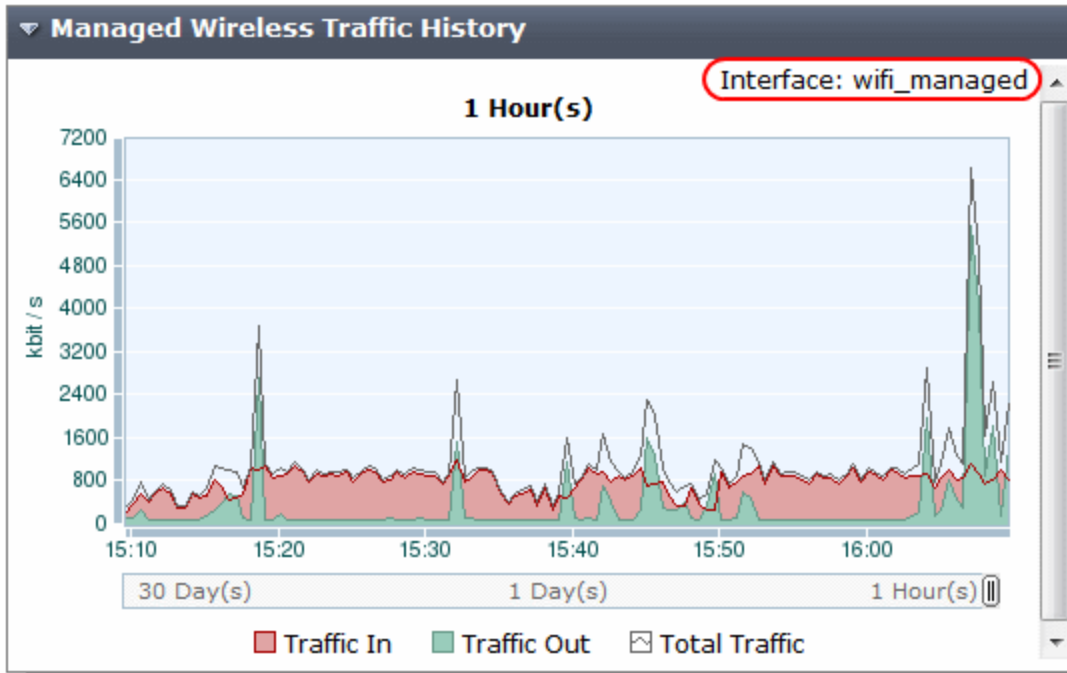
????, Log Config?Wireless Event Log????, ???Event Log?????????Rogue AP????, ?????:

#	Date	Time	Level	User Interface	Action	Message
6	2012-09-24	15:49:18	Warning		ap-leave	AP FWF60C3G11012569 left.
7	2012-09-24	15:49:18	Warning		ap-fail	AP FWF60C3G11012569 failed.
8	2012-09-24	15:49:13	Warning		ap-kick	AP FWF60C3G11012569 kicked.
9	2012-09-24	15:49:13	Warning		ap-kick	AP FWF60C3G11012569 kicked.
10	2012-09-24	15:48:58	Warning		rogue-ap-off-air	AP HTC Portable Hotspot d4:20:6d:28:01:88 chan 1 live 981 age 927
11	2012-09-24	15:48:46	Warning		rogue-ap-detected	AP CHT Wi-Fi(HiNet) 04:11:46:9a:ac:22 chan 6 live 96257
12	2012-09-24	15:48:30	Warning		rogue-ap-detected	AP 0024A5B4CEDD 00:24:a5:b4:ce:dd chan 8 live 91734
13	2012-09-24	15:48:30	Warning		rogue-ap-detected	AP 0024A5B4CEDD-1 06:24:a5:b4:ce:dd chan 8 live 95935
14	2012-09-24	15:47:58	Warning		rogue-ap-detected	AP S170(0000) 00:17:b2:b2:b4:39 chan 6 live 9
15	2012-09-24	15:47:28	Warning		rogue-ap-on-wire	AP FORTINET_MANAGED 00:09:0f:f1:a7:e4 MAA 00:09:0f:f1:a7:e2
16	2012-09-24	15:47:10	Warning		rogue-ap-detected	AP mpcm 00:24:a5:0f:7a:57 chan 11 live 95561
17	2012-09-24	15:46:59	Warning		rogue-ap-detected	AP FORTINET_UNMANAGED 06:09:0f:f1:a7:e4 chan 149 live 0
18	2012-09-24	15:46:59	Warning		rogue-ap-detected	AP FORTINET_MANAGED 00:09:0f:f1:a7:e4 chan 149 live 0
19	2012-09-24	15:46:54	Warning		ap-join	AP FWF60C3G11012569 joined.
20	2012-09-24	15:46:50	Warning		ap-leave	AP FWF60C3G11012569 left.
21	2012-09-24	15:46:50	Warning		ap-fail	AP FWF60C3G11012569 failed.

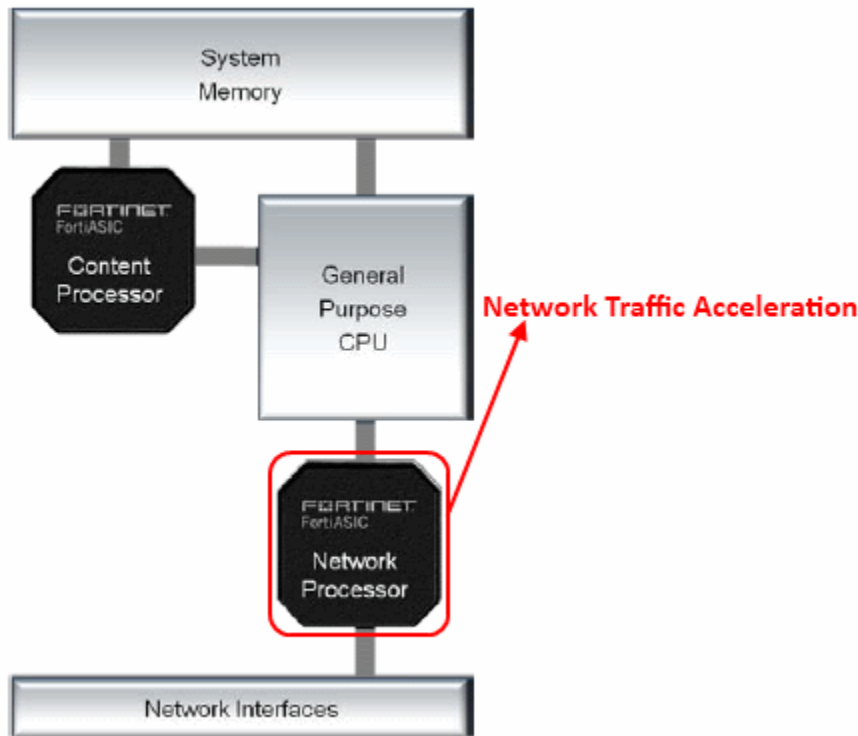
????????, ???client???FortiAP(WTP)???FortiGate(AC), ??IP?????, ????????DHCP Monitor?????, ????? Client Monitor????????????, ?????:

MAC	Auth	IP	FortiAP	SSID	Channel	Bandwidth Tx/Rx	Signal Strength/Noise	Association Time	Band	Rate
f4:6d:04:5e:1b:46	Pass	10.17.32.64	FAP22B3U11005034 (1)	FORTINET_MANAGED	149	915 Kbps	37 dB	09/23/12 15:06	802.11na_5G	130.0 Mbps
f4:6d:04:5e:1b:7a	Pass	10.17.32.129	FAP22B3U11005034 (1)	FORTINET_MANAGED	149	2163 Kbps	30 dB	09/23/12 13:24	802.11na_5G	130.0 Mbps

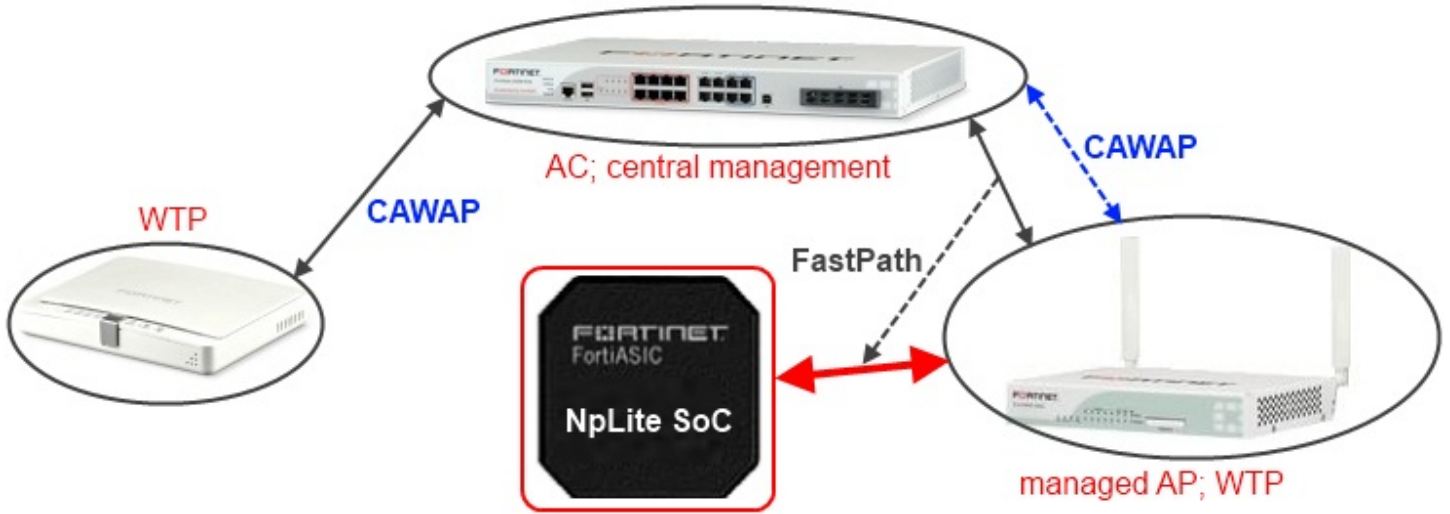
?????Dashboard??, ??Traffic History?????VAP?????????????????:



?Fortinet?????ASIC????-FortiASIC, ?????Network Processor, ???NPU. NPU?????????????????.



NPU?????????I/O??, ?????VPN?????. ?????????????(100D, 200B or up)?????ASIC??, ?????????FortiGate 60C(or FortiWiFi)????NPU?(?NpLite), ???NPU???FastPath, ???CPU?SlowPath?. ?????????, ?????wireless???traffic ???NPU??, ???CPU????, ?????????????????, ???FortiWiFi??, ???NPU, ??wireless traffic????, ??????????????. ????????? ???managed AP????????????, ??200B(Celeron 1.2GHz, 2GB DRAM, NP2, CP6), ??AC??wireless traffic???I/O??.



????????????????????, ??UTM, QoS Traffic Shaper????NPU????, ?????????FortiGate???

??, ?????FortiAP?????:

1. ??CAWAP??, ?????AP??, ??FortiGate??AC??????.
2. AC-Discovery????????, ?????????.
3. ?PHY???VAP??, ?????????.
4. Rogue AP???FortiWiFi??????CPU??; ?FortiAP????MIPS????.
5. ???, ?????????Static IP configuration????.
6. ???FortiOS 5.0????????, ?????????.
7. wireless???traffic???NPU????, ??CPU????.
8. ??CAWAP??, AP?AC?????tunnel, ??control traffic??DLTS????.
9. ??FortiAP????????, ??AP?PHY?????SSID. ??SSID?????virtual interface.
10. ??PoE??, ???PoE????.
12. ??2.4G?5G??, ??40MHz????5G??.
13. virtual interface?????physical interface??????, ?????????.

????FortiAP??FortiWiFi?????:



Wireless Standards & Features	FortiWi-Fi					FortiAP		
	30B	50B	60B	60C	80/81CM	210B	220B	222B
Thick AP	✓	✓	✓	✓	✓	N/A	N/A	N/A
Thin AP	Option	Option	Option	Option	Option	✓	✓	✓
Number of Wi-Fi radios	1	1	1	1	1	1	2	2
802.11a			✓	✓	✓	✓	✓	✓
802.11b	✓	✓	✓	✓	✓	✓	✓	✓
802.11e and WME Multimedia Extensions	✓	✓	✓	✓	✓	✓	✓	✓
802.11g	✓	✓	✓	✓	✓	✓	✓	✓
802.11h	✓	✓	✓	✓	✓	✓	✓	✓
802.11i (TKIP/AES)	✓	✓	✓	✓	✓	✓	✓	✓
802.11j	✓	✓	✓	✓	✓	✓	✓	✓
802.11n (2x2 MIMO)				✓	✓	✓	✓	✓
802.11X	✓	✓	✓	✓	✓	✓	✓	✓
Power over Ethernet (PoE) option		802.3af				802.3af	802.3af	802.3at
High Throughput 40Mhz option				✓	✓	✓	✓	✓
Short Guard interval				✓	✓	✓	✓	✓
Max wireless Association / Total	54Mbps	54Mbps	54Mbps	300Mbps	300Mbps	300Mbps	600Mbps	600Mbps
Number of SSID's per Radio (one reserved per radio)	8	8	8	8	8	8	16	16
Simultaneous client access and background Scan	2.4GHz only	2.4GHz only	2.4GHz only	2.4GHz & 5GHz	2.4GHz & 5GHz	2.4GHz & 5GHz	2.4GHz & 5GHz	2.4GHz & 5GHz
Simultaneous client access and full-time Rogue Detection							✓	
'On-wire' Rogue correlation and Suppression				✓		✓	✓	✓
Ability to serve as wireless controller for FortiAP		✓	✓	✓	✓	N/A	N/A	N/A
Fast Roaming						✓	✓	✓
Number of Thin APs supported	See Controller Sizing Matrix at Docs.Fortinet.Com					N/A		

**\*FOS v5.0 improvement:**

1. IDS supported.
2. VLAN supported.
3. improve wireless performance.
4. enhanced mesh network supported.
5. improve CAPWAP support.(data channel encryption(s/w-based)).
6. Client Load-balancing(Freq&AP).
7. WTP mode is not supported.