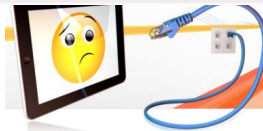
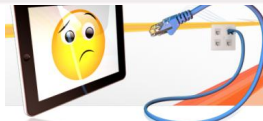
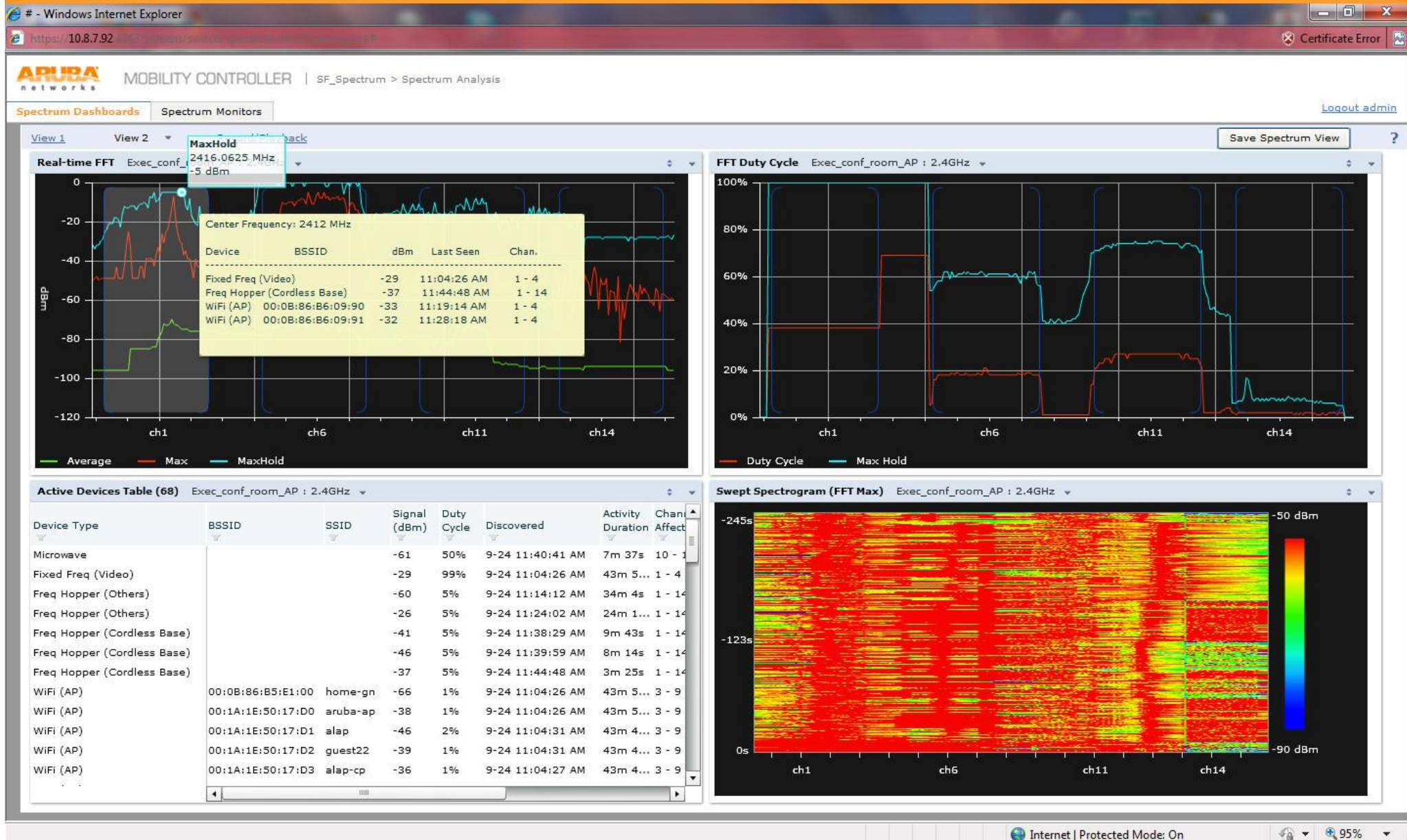


# What Aruba Wireless Tools Could Check RF and 802.11 Health?

# Wireless Tools – Spectrum Analysis



# Wireless Tools – Spectrum Analysis



# Wireless Tools – 802.11 Packet Capture

## Performing an Aruba AP Remote 802.11 Packet Capture with Wireshark version 1.4.3 and newer

- **Setting up Aruba AP's to perform a remote packet capture for a laptop/desktop**
  1. SSH into an Aruba Controller that has APs.
  2. Find out which AP you would like to perform a remote wireless packet capture by using the CLI command "show ap active".
  3. Tell the AP to perform a remote packet capture and send the 802.11 data and above to the laptop/desktop that has Wireshark 1.4.3.

```
pcap raw-start <AP IP address> <Laptop/Desktop that has Wireshark 1.4.3 running> <a specified udp port> 0
```



# Wireless Tools – 802.11 Packet Capture

- **Example**

1. The AP-105 has an IP address of 10.8.7.104
2. There is a laptop with IP address 10.8.7.64 and has Wireshark 1.4.3 running according to the instructions in the following slides.
3. The syntax specifies 0 for the last value because it is telling the AP to send the frames in Wireshark pcap format.

```
(Aruba_Thailand_3600) #pcap raw-start 10.8.7.104 10.8.7.64 8888 0
```

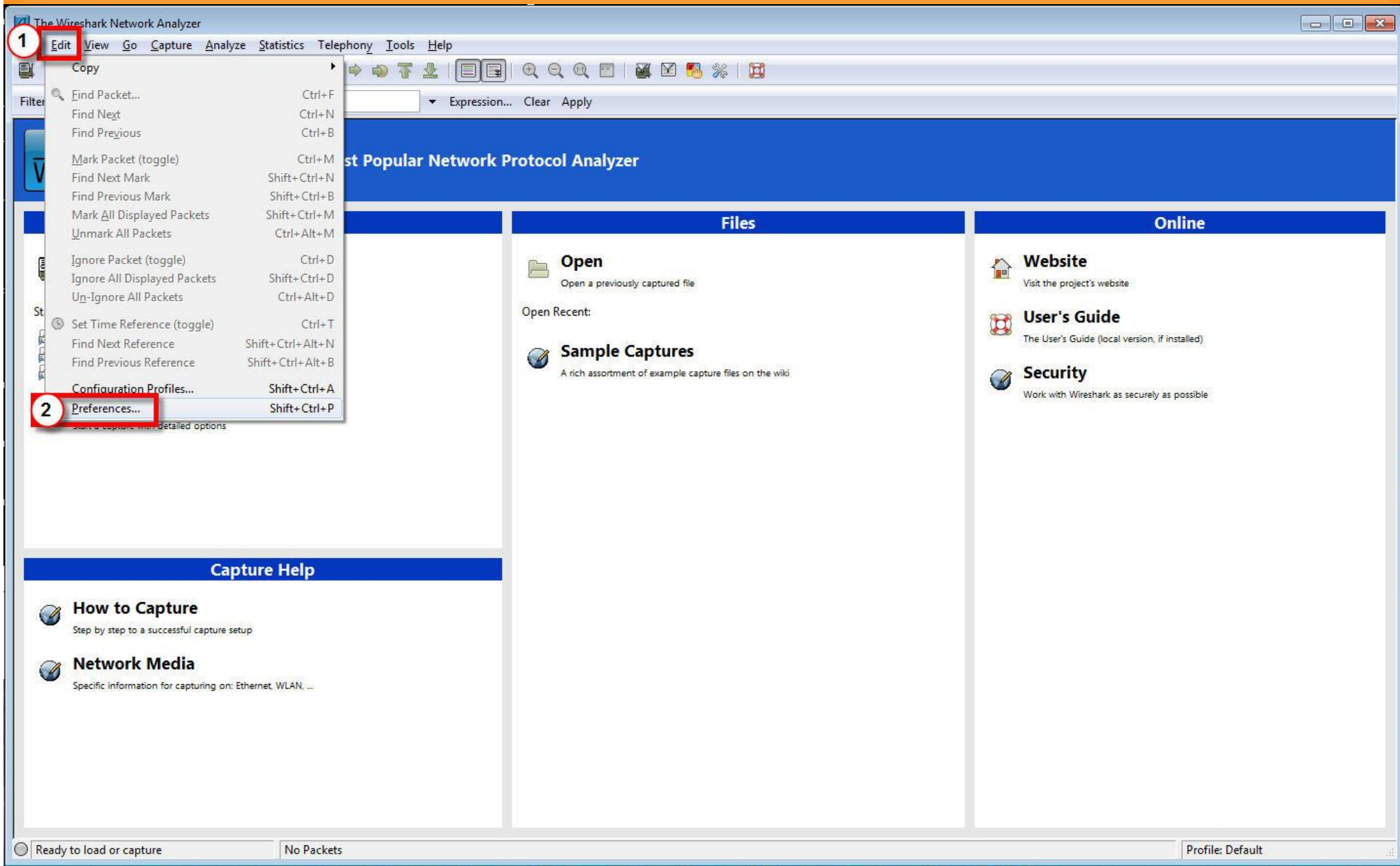
```
pcap-id:1
```

```
(Aruba_Thailand_3600) #
```

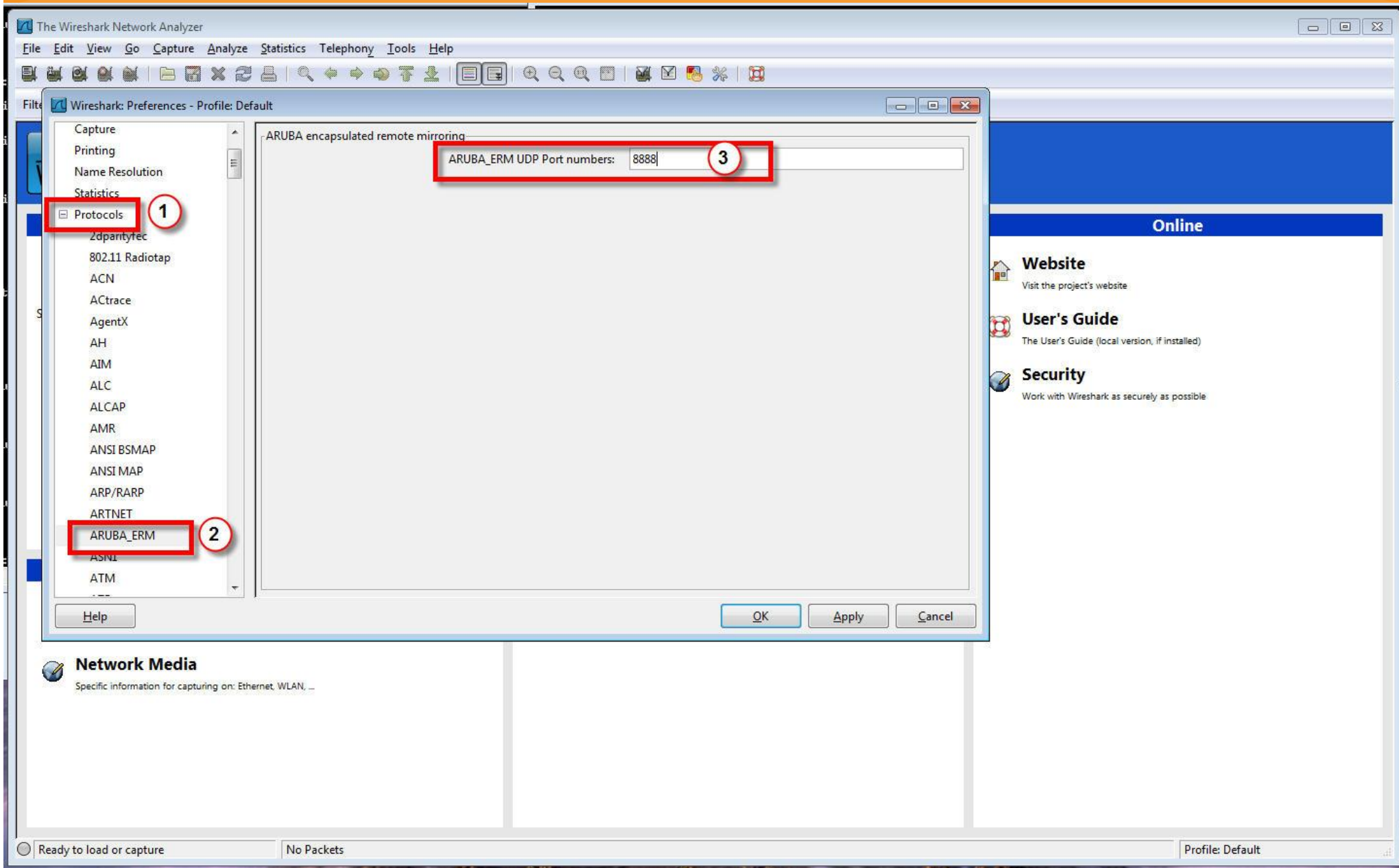




# Wireless Tools – 802.11 Packet Capture



# Wireless Tools – 802.11 Packet Capture



# Wireless Tools – 802.11 Packet Capture

Intel(R) 82567... Connection - Wireshark

File Edit View Capture Analyze Statistics Telephony Tools Help

Interfaces... Ctrl+I

Options... Ctrl+K

Start Ctrl+E

Stop Ctrl+E

Restart Ctrl+E

Capture Filters... Ctrl+R

Filter: Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Info
234	1.536450	ArubaNet_61:1b:ec	Usi_69:46:6e	IEEE 802.11	IEEE 802.11 Beacon frame, SN=557, FN=0, Flags=....., BI=100[Malformed Packet]
235	1.559324	ArubaNet_81:14:99	Broadcast	IEEE 802.11	IEEE 802.11 Beacon frame, SN=3742, FN=0, Flags=....., BI=100, SSID="aruba9"
236	1.580291	ArubaNet_81:14:99	Broadcast	IEEE 802.11	IEEE 802.11 Beacon frame, SN=308, FN=0, Flags=....., BI=100, SSID="GuestNet"[Malformed Packet]
237	1.580648	ArubaNet_81:14:99	Broadcast	IEEE 802.11	IEEE 802.11 Beacon frame, SN=1908, FN=0, Flags=....., BI=100, SSID="ipadtest"[Malformed Packet]
238	1.603374	ArubaNet_81:14:99	Broadcast	IEEE 802.11	IEEE 802.11 Beacon frame, SN=3549, FN=0, Flags=....., BI=100, SSID="jeff-wpa2-psk-aes-34"[Malformed Packet]
239	1.603790	ArubaNet_81:14:99	Broadcast	IEEE 802.11	IEEE 802.11 Beacon frame, SN=3548, FN=0, Flags=....., BI=100, SSID="jhuang-tls-3400"[Malformed Packet]
240	1.604182	ArubaNet_81:14:99	Broadcast	IEEE 802.11	IEEE 802.11 Beacon frame, SN=3547, FN=0, Flags=....., BI=100, SSID="jhuang-peap-nooffload-34"
241	1.605184	ArubaNet_40:17:71	Broadcast	IEEE 802.11	IEEE 802.11 Beacon frame, SN=3029, FN=0, Flags=....., BI=100, SSID="mm-wpa2-psk"[Malformed Packet]
242	1.605579	ArubaNet_40:17:71	Broadcast	IEEE 802.11	IEEE 802.11 Beacon frame, SN=3028, FN=0, Flags=....., BI=100, SSID="mm-wpa2"[Malformed Packet]
243	1.608706	SecondRu_1a:80:11	24:1a:00:01:73:7a	IEEE 802.11	IEEE 802.11 Probe Request, SN=128, FN=0, Flags=..MPR.FT
244	1.609115	SecondRu_1a:80:11	24:1a:00:01:73:7a	IEEE 802.11	IEEE 802.11 Probe Request, SN=128, FN=0, Flags=..MPR.FT[Malformed Packet]
245	1.609496	SecondRu_1a:80:11	24:1a:00:01:73:7a	IEEE 802.11	IEEE 802.11 Probe Request, SN=128, FN=0, Flags=..MPR.FT[Malformed Packet]
246	1.637663	69:e8:e1:af:e8:cd	08:44:81:4c:4b:56	IEEE 802.11	IEEE 802.11 Beacon frame, SN=874, FN=9, Flags=....., BI=100, SSID="demo-guest"
247	1.638125	ArubaNet_50:17:33	Broadcast	IEEE 802.11	IEEE 802.11 Beacon frame, SN=610, FN=0, Flags=....., BI=100, SSID="demo-employee"[Malformed Packet]
248	1.638512	ArubaNet_50:17:33	Broadcast	IEEE 802.11	IEEE 802.11 Beacon frame, SN=609, FN=0, Flags=....., BI=100, SSID="demo-app"[Malformed Packet]
249	1.638915	ArubaNet_50:17:33	Broadcast	IEEE 802.11	IEEE 802.11 Beacon frame, SN=558, FN=0, Flags=....., BI=100

Frame 234: 322 bytes on wire (2576 bits), 322 bytes captured (2576 bits)

Ethernet II, Src: ArubaNet\_61:1b:ec (00:0b:86:61:1b:ec), Dst: Usi\_69:46:6e (00:27:13:69:46:6e)

Internet Protocol, Src: 10.8.7.104 (10.8.7.104), Dst: 10.8.7.64 (10.8.7.64)

User Datagram Protocol, Src Port: ddi-udp-1 (8888), Dst Port: ddi-udp-1 (8888)

ARUBA encapsulated remote mirroring

IEEE 802.11 Beacon frame, Flags: .....

IEEE 802.11 wireless LAN management frame

[Malformed Packet: IEEE 802.11]

0000 00 27 13 69 46 6e 00 0b 86 61 1b ec 08 00 45 00 .'.iFn..a....E.

0010 01 34 1a 7c 00 00 3f 11 3d 86 0a 08 07 68 0a 08 .4.|.?.=....h..

0020 07 40 22 b8 22 b8 01 20 00 00 4d 37 a5 16 00 0c .@". "...M7....

0030 10 63 00 00 01 08 00 00 01 08 80 00 00 00 ff ff .C.....P.....P.0

0040 ff ff ff ff 00 1a 1e 50 17 30 00 1a 1e 50 17 30 .....P.....P.0

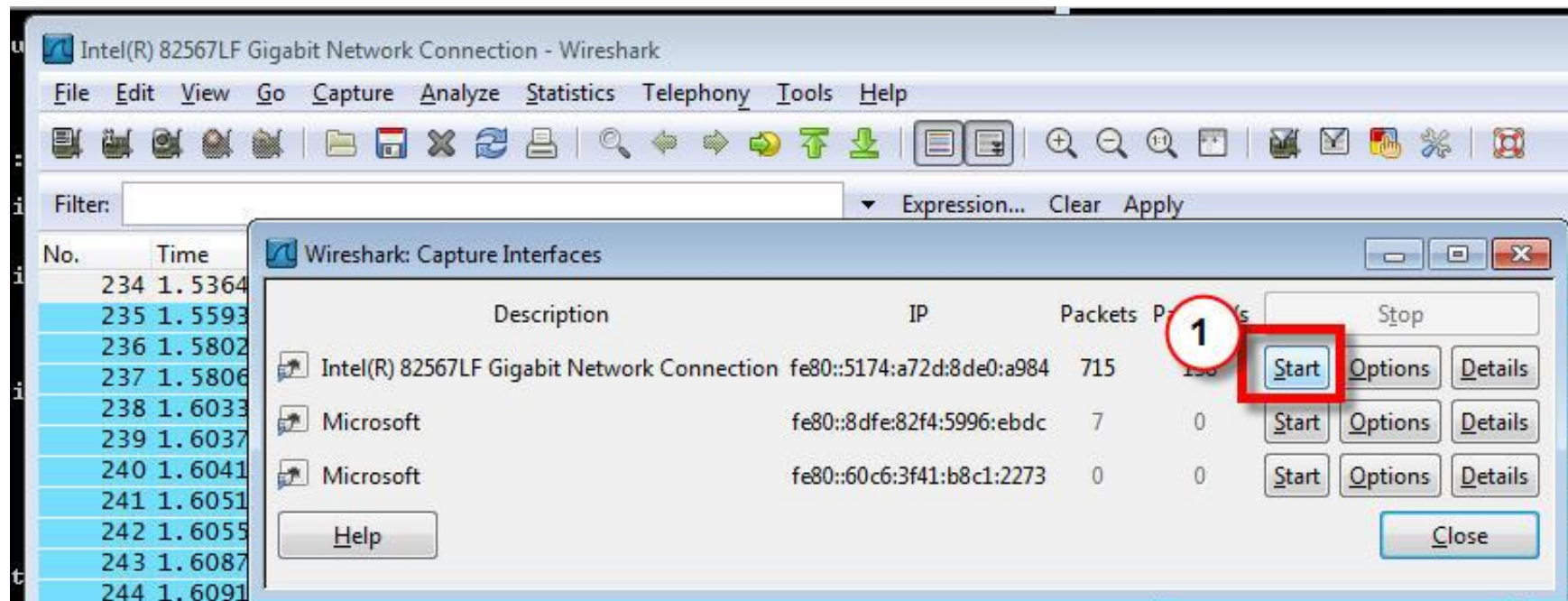
0050 00 27 13 69 46 6e 00 0b 86 61 1b ec 08 00 45 00 .'.iFn..a....E.

File: "C:\Users\kperedia\AppData\Local\Te... Packets: 5270 Displayed: 5270 Marked: 0 Dropped: 0 Profile: Default

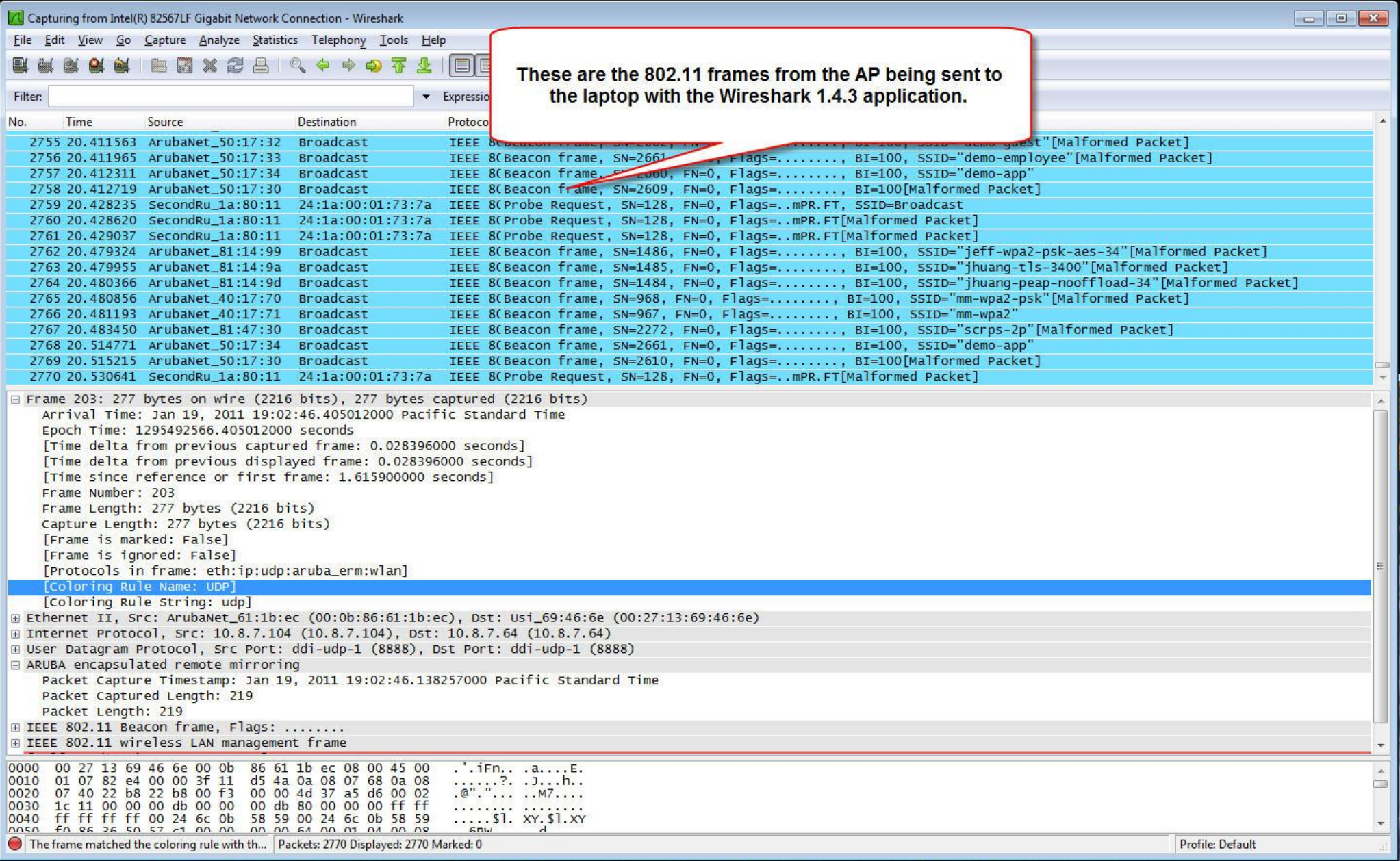




# Wireless Tools – 802.11 Packet Capture



# Wireless Tools – 802.11 Packet Capture



# Wireless Tools – 802.11 Packet Capture

- **To stop the remote packet capture**

- Find out the BSSID that is being used to sniff use the CLI command "show ap pcap status ip-addr <AP IP address>"

Example:

```
(Aruba_Thailand_3600) #show ap pcap status ip-addr 10.8.7.104
Packet Capture Sessions
-----
pcap-id filter type intf channel max-pkts max-pkt-size num-pkts status url target
-----
1 raw 00:24:6c:0b:57:b8 157 in-progress 10.8.7.64/8888
(Aruba_Thailand_3600) #
```

- Stop the remote packet capture by using the CLI command "pcap stop <AP IP address> bssid <intf column value shown above>".

```
(Aruba_Thailand_3600) #pcap stop 10.8.7.104 1 bssid 00:24:6c:0b:57:b8
pcap-id:1
(Aruba_Thailand_3600) #
```





# Wireless Tools – Airwave Mgmt Client

AirWave Management Client

File Tools View Help

**Adapter**

Description: Intel(R) WiFi Link 5300 AGN  
MAC: 00:21:6A:51:71:EA  
Capability: 802.11ag

**Current Operation**

Current PHY: 11an  
Auth Type: RSNA  
Cipher: CCMP  
PCI Compliant: ☒

**Quality Metrics - MOS: 4.2**

Signal: -51 dBm Link Speed: 300 MBps 09:46:52 AM  
Auth Time: 109 ms DHCP Time: 32 ms 09:46:42 AM  
Latency: 0 ms Jitter: -- 09:47:06 AM  
BW In: 13.567 Mbps BW Out: 13.803 Mbps 09:42:56 AM

**RF Summary**

Categories	Networks	Radios	BSSIDs
Total	67	83	176
Rogue	63	67	124

**Last AMP Update: 09:47:03 AM (Success)**

SSID	BSSID	Channel	PHY	S...	Sec...	Vendor	Device Name	Mode	Last Heard	RAPID Class...
sd-ai	00:24:6C:AE:92:9A	48	11an			Aruba		InfraStructure	09:46 AM	Rogue
test-open	00:1A:1E:84:92:B0	48	11an			Aruba		InfraStructure	09:46 AM	Rogue
ethersphere-vocera	00:1A:1E:55:0F:E2	11	11gn			Aruba	92C	InfraStructure	09:46 AM	Managed
Wifi corporativo BB...	00:1A:1E:84:92:B1	48	11an			Aruba		InfraStructure	09:46 AM	Rogue
mm-test	00:1A:1E:50:03:50	161	11an			Aruba		InfraStructure	09:46 AM	Rogue
emp1	00:1A:1E:58:0C:20	11	11gn			Aruba		InfraStructure	09:46 AM	Rogue
AirPennNet-Help	00:24:6C:D0:A4:11	165	11a			Aruba		InfraStructure	09:46 AM	Rogue
upennntest-noaccess	00:24:6C:D0:A4:11					Aruba		InfraStructure	09:46 AM	Rogue
AirPennNet	00:24:6C:D0:A4:11					Aruba		InfraStructure	09:46 AM	Rogue
guest	00:1A:1E:55:0F:E2					Aruba	92C	InfraStructure	09:46 AM	Managed
guest	00:24:6C:29:B5:B2					Aruba	72C	InfraStructure	09:46 AM	Managed
upennntest-noaccess	00:1A:1E:55:0F:E2	165	11a			Aruba		InfraStructure	09:46 AM	Rogue
guest1	00:1A:1E:58:0C:21	11	11gn			Aruba		InfraStructure	09:46 AM	Rogue
ethersphere-wpa2	00:1A:1E:55:0F:F3	153	11an			Aruba	92C	InfraStructure	09:46 AM	Managed
ethersphere-vocera	00:24:6C:29:B5:B2	6	11gn			Aruba	72C	InfraStructure	09:46 AM	Managed
ethersphere-vocera	00:1A:1E:55:0F:F2	153	11an			Aruba	92C	InfraStructure	09:46 AM	Managed
ethersphere-voip	00:1A:1E:55:0F:F1	153	11an			Aruba	92C	InfraStructure	09:46 AM	Managed
ethersphere-wpa2	00:1A:1E:55:0F:E3	11	11gn			Aruba	92C	InfraStructure	09:46 AM	Managed
tac-ascom	00:24:6C:D0:A5:80	6	11g			Aruba		InfraStructure	09:46 AM	Rogue
aruba-ap	00:1A:1E:8C:55:30	149	11a			Aruba		InfraStructure	09:46 AM	Rogue
ethersphere-wpa2	00:24:6C:29:B5:B3	6	11gn			Aruba	72C	InfraStructure	09:46 AM	Managed

Currently associated AP SSID, BSSID, channel, phy type, -dBm signal strength, and AP name.

-60 dBm

Query Hunt Locate Renew IP/Auth Speed





# Checking Controller Health

# Controller CPU Stats

```
(ethersphere-lms3) #show cpuload
```

```
user 1.2%, system 0.9%, idle 97.9%
```

```
(ethersphere-lms3) #
```



# Controller CPU Stats (cont'd)

```
(ethersphere-lms3) #show cpuload current
```

```
top2 - 08:02:44 up 28 days, 12:50,  0 users,  load average: 0.01, 0.04, 0.01
```

```
Tasks: 180 total,  1 running, 179 sleeping,  0 stopped,  0 zombie
```

```
Cpu(s):  0.7%us,  0.4%sy,  0.0%ni, 98.7%id,  0.0%wa,  0.0%hi,  0.2%si,  0.0%st
```

```
Mem:  1541896k total,  255388k used, 1286508k free,    7592k buffers
```

```
Swap:      0k total,      0k used,      0k free,  107588k cached
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
30222	root	15	0	3860	1056	772	R	7	0.1	0:00.09	top2
1546	root	16	0	5180	860	624	S	2	0.1	260:20.45	msgHandler
1639	root	15	0	19220	9372	1608	S	2	0.6	1114:26	wms
1	root	16	0	5180	628	508	S	0	0.0	0:18.69	init

```
.....
```

```
(ethersphere-lms3) #
```



# Controller Processes Stats

```
ethersphere-lms3) #show processes sort-by cpu
```

%CPU	S	PID	PPID	VSZ	RSS	F	NI	START	TIME	EIP	CMD
3.0	S	1748	1498	11068	3000	4	0	Aug05 20:57:10	2b0f5094	/mswitch/bin/snmpd	
2.7	S	1639	1498	19220	9372	4	0	Aug05 18:34:33	2b2ae094	/mswitch/bin/wms -l 5	
1.8	S	1650	1498	19820	10460	4	0	Aug05 12:22:01	2b2e4094	/mswitch/bin/stm	
0.6	S	1649	1498	21868	8344	4	0	Aug05 04:26:04	2b1bb094	/mswitch/bin/auth	
0.6	S	1546	1498	5180	860	0	0	Aug05 04:20:24	2ae66094	/mswitch/bin/msgHandler -g	
0.5	S	1505	1498	7000	1276	4	0	Aug05 03:54:45	2b011094	/mswitch/bin/packet_filter	
0.3	S	1749	1498	11620	4152	4	0	Aug05 02:09:02	2b0f5094	/mswitch/bin/trapd	
0.1	S	1143	1141	5740	1456	4	0	Aug05 00:49:11	2ad23094	/mswitch/bin/syslogd -x -r -n -m 0 -f /mswitch/conf/syslog.conf	
0.1	S	1625	1624	72244	18164	5	0	Aug05 00:41:27	2b28d0f8	/mswitch/bin/fpapps	
0.0	S	30183	1758	9028	2288	4	0	08:01 00:00:00	2b046094	sshd: support@pts/0	
0.0	S	19	1	0	0	1	-5	Aug05 00:14:28	00000000	[events/1]	
0.0	S	1548	1498	29132	17244	4	0	Aug05 00:05:34	2b2e4094	/mswitch/bin/cfgm	
0.0	S	1503	1498	28500	17044	4	0	Aug05 00:03:47	2b074f10	/mswitch/bin/fpcli	
0.0	S	1628	1498	11488	1996	0	0	Aug05 00:02:32	2b2a2094	/mswitch/bin/licensemgr	
0.0	S	1627	1498	6060	1404	4	0	Aug05 00:01:31	2aece094	/mswitch/bin/pim	
0.0	S	30198	30183	2176	400	4	0	08:02 00:00:00	2ac16094	-sshwrap	
0.0	S	1696	1498	8916	1944	0	0	Aug05 00:01:11	2b0f4094	/mswitch/bin/mobileip	





# Show Datapath Utilization Stats

```
(ethersphere-lms3) #show datapath utilization
```

```
Datapath Network Processor Utilization
```

-----+-----+-----+-----+				
Cpu utilization during past				
Cpu	1 Sec	4 Secs	64 Secs	
-----+-----+-----+-----+				
8	0%	0%	0%	
9	0%	0%	0%	
10	0%	0%	0%	
11	0%	0%	0%	
12	0%	0%	0%	
13	0%	0%	0%	
14	0%	0%	0%	
15	0%	0%	0%	
16	0%	0%	0%	
17	0%	0%	0%	
18	0%	0%	0%	
19	0%	0%	0%	
20	0%	0%	0%	
21	0%	0%	0%	
22	0%	0%	0%	
23	0%	0%	0%	
24	0%	0%	0%	
25	0%	0%	0%	
26	0%	0%	0%	
27	0%	0%	0%	
28	0%	0%	0%	
29	0%	0%	0%	
30	0%	0%	0%	
31	0%	0%	0%	



# Controller Datapath Frame Stats

```
(ethersphere-lms3) #show datapath frame
```

## Datapath Frame Statistics

-----

Allocated Frames	773
IP Datagrams Fragmented	231003191
IP Fragmentation Failures	0
IP Reassembled Datagrams	64779609
IP Reassembly overlaps	0
IP Reassembly Failures	2994
Invalid IP headers Received	135
BPDUs Received	0
LAPDUs Received	0
Runts Received	0
WIFI Frames Re-Assembled	10062
WIFI Re-Assembly Failures	36
WIFI AMSDU	1
WIFI AMSDU De-aggregated	0
WIFI AMSDU De-agg Failures	0
xSec Frames Re-Assembled	0
xSec Re-Assembly Failures	0
Station Not Data Ready	165632
Association Throttle	0



# Controller Datapath Frame Stats

(ethersphere-lms3) #show datapath frame

	SLOT 0	SLOT 1	SLOT 2	SLOT 3
-----				
Rx Frames	0	0	0	1739824041
Rx Failures	0	0	0	0
Rx Underflows	0	0	0	0
Rx Overflows	0	0	0	0
Tx Frames	0	0	0	1854857209
Tx Failures	0	0	0	0
Tx Underflows	0	0	0	0
Tx Overflows	0	0	0	0
Descr Failures	0	0	0	0
Alloc Failures	0	0	0	0
Dot1d Discards	24755	0	0	247769
Dot1Q Discards	0	0	0	321
Denied Frames	134028	0	0	267090
Policed Frames	35336	0	0	251008



# Controller Datapath Session Stats

(ethersphere-lms3) #show datapath session table

## Datapath Session Table Entries

-----

Flags: F - fast age, S - src NAT, N - dest NAT

D - deny, R - redirect, Y - no syn

H - high prio, P - set prio, T - set ToS

C - client, M - mirror, V - VOIP

I - Deep inspect, U - Locally destined

F - Indicates fastage, Session will be aged out in 15-30 seconds if there is no activity, without the flag it is 30 minutes.  
Y - Two handshake incomplete. Same age restrictions as F apply]  
C - Client side of the session. Usually the originator side of the traffic.  
I - Deep inspect for ALG purpose. Packets get punted to SP most of the times to open up additional ports.  
U - Session is destined to me. Rarely used. Ex TFTP sessions from AP for image download.  
P- Set the .lp priority on the packet. It is also learnt .lp in most cases. Cisco advocates I believe .lp of 5 or 7 for voice, so you invariably see voice sessions tied with this flag. Other than that they don't have any relation.  
H - High priority. Any internal punts between CPU will use high priority queue.  
T - Set IP TOS to the shown value.

Source IP	Destination IP	Prot	SPort	DPort	Cntr	Prio	ToS	Age	Destination	TAge	Flags
-----	-----	----	-----	-----	----	----	---	---	-----	----	-----
10.5.168.14	10.6.6.104	17	2240	49152	0	0	0	0	vlan 166	ff	FHV
					0	0	0	0	vlan 166		FHV
10.5.168.14	10.6.6.104	17	2241	49153	0	0	0	0	sysmsg 107	ff	FRHV
					0	0	0	0	sysmsg 107		FRHV
10.5.168.30	10.6.6.104	17	32773	5060	0	6	56	1	0/0	14	FHPTMCI
					0	6	56	2	0/0		FHPTMCI
10.6.6.104	10.5.168.14	17	49153	2241	0	0	0	0	sysmsg 107	ff	FRHV
					0	0	0	18	sysmsg 107		FRYHV

