Velocidades del Troubleshooting 802.11n

Contenido

Introducción

Este documento aborda problemas frecuentes a tener en cuenta en el troubleshooting de la producción inalámbrica. Este documento incluye el uso de las herramientas para medir el funcionamiento y la producción de la red inalámbrica, que incluye diversos Puntos de acceso del vendedor 802.11n (APs) en comparación con Cisco 1252 AP bajo condiciones de prueba similares.

prerrequisitos

Requisitos

Cisco recomienda que usted tiene estos requisitos:

- Herramientas tales como iPerf, y analizadores de red tales como análisis de espectro de OmniPeek y de Cisco
- 802.11n utilizó 1140, 1250, 3500, y las 1260 Series APs

Componentes Utilizados

La información que contiene este documento se basa en las siguientes versiones de software y hardware.

- Versión de software corriente 6.0.182 del regulador de WS-SVC-WiSM
- AIR-LAP1142-A-K9 APs

Convenciones

Consulte Convenciones de Consejos TécnicosCisco para obtener más información sobre las convenciones del documento.

Antecedentes

802.11n es nacido debido a varios cambios realizados en la agregación del capítulo APs: A-MPDU y A-MSDU.

- Tamaño Ack del bloque
- Vinculación MCS y del canal
- MIMO
- Usando 5GHz sobre 2.4 gigahertz: también el Wi-Fi de la mención certifica la vinculación del canal en 5GHz

Resuelva problemas el regulador para las velocidades 11n

Complete estos pasos:

1. Verifique que la ayuda 802.11n esté activada en el regulador.

```
(WiSM-slot3-2) >show 802.11a
802.11a Network..................................... Enabled
11nSupport..................................... Enabled
802.11a Low Band.......................... Enabled
802.11a Mid Band.......................... Enabled
802.11a High Band......................... Enabled
802.11a Operational Rates
802.11a 6M Rate.............................. Mandatory
802.11a 9M Rate.............................. Supported
802.11a 12M Rate............................. Disabled
802.11a 18M Rate............................. Supported
802.11a 24M Rate............................. Mandatory
802.11a 36M Rate............................. Supported
802.11a 48M Rate............................. Supported
802.11a 54M Rate............................. Supported
802.11n MCS Settings:
MCS 0........................................ Supported
MCS 1........................................ Supported
MCS 2........................................ Supported
MCS 3........................................ Supported
MCS 4........................................ Supported
MCS 5........................................ Supported
```

2. Las tarifas N se logran dos maneras. Acelera al esquema de codificación de la modulación (MCS) 7 puede ser logrado sin usar la vinculación del canal. Para el MCS valora sobre 7 y hasta 15, vinculación del canal necesita ser activado. Usted puede verificar si la vinculación del canal se activa usando este **comando show** en el regulador:

```
(WiSM-slot3-2) >show advanced 802.11a channel
Automatic Channel Assignment
Channel Assignment Mode....................... AUTO
Channel Update Interval....................... 600 seconds [startup]
Anchor time (Hour of the day).................. 0
Channel Update Contribution................... SNI.
Channel Assignment Leader..................... 00:1d:45:f0:d2:c0
Last Run...................................... 371 seconds ago
DCA Sensitivity Level......................... STARTUP (5 dB)
DCA 802.11n Channel Width..................... 40 MHz
```

```
Channel Energy Levels
Minimum..................................... unknown
Average..................................... unknown
Maximum..................................... unknown
Channel Dwell Times
Minimum..................................... unknown
Average..................................... unknown
Maximum..................................... unknown
802.11a 5 GHz Auto-RF Channel List
Allowed Channel List.....................
36,40,44,48,52,56,60,64,149,
153,157,161
Unused Channel List.....................
100,104,108,112,116,132,136,
```

3. Usted puede también configurar la anchura del canal por el AP usando estos comandos:

```
(WiSM-slot3-2) >show advanced 802.11a channel
Automatic Channel Assignment
Channel Assignment Mode..................... AUTO
Channel Update Interval..................... 600 seconds [startup]
Anchor time (Hour of the day)............... 0
Channel Update Contribution................. SNI.
Channel Assignment Leader................... 00:1d:45:f0:d2:c0
Last Run.................................... 371 seconds ago
DCA Sensitivity Level....................... STARTUP (5 dB)
DCA 802.11n Channel Width..... 40 MHz
Channel Energy Levels
Minimum..................................... unknown
Average..................................... unknown
Maximum..................................... unknown
Channel Dwell Times
Minimum..................................... unknown
Average..................................... unknown
Maximum..................................... unknown
802.11a 5 GHz Auto-RF Channel List
Allowed Channel List.....................
36,40,44,48,52,56,60,64,149,
153,157,161
Unused Channel List.....................
100,104,108,112,116,132,136,
```

4. El intervalo del guardia y las tarifas correspondientes MCS ayudan a determinar las tarifas de datos que se consideran en los clientes 802.11n. Éstos son los comandos de verificar esta configuración:

```
(WiSM-slot3-2) >show 802.11a
802.11a Network.............................. Enabled
11nSupport................................... Enabled
802.11a Low Band..........................  Enabled
802.11a Mid Band..........................  Enabled
802.11a High Band.........................  Enabled
802.11a Operational Rates
802.11a 6M Rate.............................  Mandatory
802.11a 9M Rate.............................  Supported
802.11a 12M Rate............................  Disabled
802.11a 18M Rate............................  Supported
802.11a 24M Rate............................  Mandatory
802.11a 36M Rate............................  Supported
802.11a 48M Rate............................  Supported
802.11a 54M Rate............................  Supported
802.11n MCS Settings:
MCS 0..................................... Supported
MCS 1..................................... Supported
MCS 2..................................... Supported
MCS 3..................................... Supported
```

```
MCS 4..................................... Supported
MCS 5..................................... Supported
MCS 6..................................... Supported
MCS 7..................................... Supported
MCS 8..................................... Supported
MCS 9..................................... Supported
MCS 10.................................... Supported
MCS 11.................................... Supported
MCS 12.................................... Supported
MCS 13.................................... Supported
MCS 14.................................... Supported
MCS 15.................................... Supported
802.11n Status:
A-MPDU Tx:
Priority 0.............................. Enabled
Priority 1.............................. Disabled
Priority 2.............................. Disabled
Priority 3.............................. Disabled
Priority 4.............................. Disabled
Priority 5.............................. Disabled
Priority 6.............................. Disabled
Priority 7.............................. Disabled
Beacon Interval................................. 100
CF Pollable mandatory........................... Disabled
CF Poll Request mandatory....................... Disabled
--More-- or (q)uit
CFP Period...................................... 4
CFP Maximum Duration............................ 60
Default Channel................................. 36
Default Tx Power Level.......................... 1
DTPC Status..................................... Enabled
Fragmentation Threshold......................... 2346
Pico-Cell Status................................ Disabled
Pico-Cell-V2 Status............................. Disabled
TI Threshold.................................... -50
Traffic Stream Metrics Status................... Disabled
Expedited BW Request Status..................... Disabled
World Mode...................................... Enabled
EDCA profile type............................... default-wmm
Voice MAC optimization status................... Disabled
Call Admission Control (CAC) configuration
Voice AC - Admission control (ACM)............. Enabled
Voice max RF bandwidth......................... 75
Voice reserved roaming bandwidth.............. 6
Voice load-based CAC mode...................... Enabled
Voice tspec inactivity timeout................. Disabled
Video AC - Admission control (ACM)............. Disabled
Voice Stream-Size.............................. 84000
Voice Max-Streams.............................. 2
Video max RF bandwidth......................... Infinite
Video reserved roaming bandwidth.............. 0
```

Asegure la agregación del paquete A-MPDU. Para mejor esfuerzo, los niveles de QoS se activan vía estos comandos:**permiso de la prioridad 0 del tx del a-mpdu del 802.11a 11nSupport de los configpermiso de la prioridad 0 del tx del a-mpdu del 802.11b 11nSupport de los config**

5. Las tres Antenas en la radio A deben ser utilizadas. Asegúrese de que las Antenas sean el mismo modelo.
6. En la red inalámbrica (WLAN) configurada para la Conectividad del cliente, WMM debe ser permitido o ser requerido, y AES o el cifrado abierto debe ser utilizado solamente. Esto se puede verificar usando este comando hecho salir:

```
(WiSM-slot2-2) >show wlan 1
```

```
WLAN Identifier.................................. 1
Profile Name..................................... wlab5WISMip22
Network Name (SSID).............................. wlab5WISMip22
Status........................................... Enabled
MAC Filtering.................................... Disabled
Broadcast SSID................................... Enabled
AAA Policy Override.............................. Disabled
Network Admission Control
NAC-State..................................... Disabled
Quarantine VLAN.............................. 0
Number of Active Clients...................... 0
Exclusionlist Timeout......................... 60 seconds
Session Timeout............................... 1800 seconds
CHD per WLAN..................................... Enabled
Webauth DHCP exclusion........................... Disabled
Interface........................................ management
WLAN ACL......................................... unconfigured
DHCP Server...................................... Default
DHCP Address Assignment Required................. Disabled
Quality of Service............................... Silver (best effort)
WMM.............................................. Allowed
CCX - AironetIe Support.......................... Enabled
CCX - Gratuitous ProbeResponse (GPR)............. Disabled
CCX - Diagnostics Channel Capability............. Disabled
Dot11-Phone Mode (7920).......................... Disabled
Wired Protocol................................... None
IPv6 Support..................................... Disabled
Peer-to-Peer Blocking Action..................... Disabled
Radio Policy..................................... All
DTIM period for 802.11a radio.................... 1
DTIM period for 802.11b radio.................... 1
Radius Servers
Authentication................................ Global Servers
Accounting.................................... Disabled
Local EAP Authentication......................... Disabled
Security
802.11 Authentication:........................ Open System
Static WEP Keys.............................. Disabled
802.1X....................................... Disabled
Wi-Fi Protected Access (WPA/WPA2)............. Enabled
WPA (SSN IE)............................... Disabled
WPA2 (RSN IE)............................. Enabled
TKIP Cipher............................ Disabled
AES Cipher............................. Enabled
Auth Key Management
802.1x................................. Enabled
PSK.................................... Disabled
CCKM................................... Disabled
FT(802.11r)............................ Disabled
FT-PSK(802.11r)........................ Disabled
FT Reassociation Timeout....................... 20
FT Over-The-Air mode........................... Enabled
FT Over-The-Ds mode............................ Enabled
CKIP ..................................... Disabled
IP Security.................................... Disabled
IP Security Passthru........................... Disabled
Web Based Authentication....................... Disabled
Web-Passthrough................................ Disabled
Conditional Web Redirect....................... Disabled
Splash-Page Web Redirect....................... Disabled
Auto Anchor.................................... Disabled
H-REAP Local Switching......................... Enabled
H-REAP Learn IP Address........................ Enabled
Infrastructure MFP protection.................. Enabled (Global
```

```
Infrastructure
MFP Disabled)
Client MFP..................................... Optional
Tkip MIC Countermeasure Hold-down Timer....... 60
Call Snooping.................................. Disabled
Band Select.................................... Enabled
Load Balancing................................. Enabled
```

7. Diversidad de antena: si usa solamente dos Antenas por cualquier motivo, usted necesita utilizar la antena A y B para transmisor /receptor los puertos.

En el lado del cliente:

1. Suplicante usado para controlar la placa de red inalámbrica, preferida para hacer juego al vendedor del suplicante a la placa de red inalámbrica.
2. Drivers del cliente: usted necesita asegurarse de que los últimos drivers del cliente se estén ejecutando en las placas de red inalámbrica.
3. Entre en contacto con a su vendedor del adaptador de red inalámbrica.
4. Asegúrese de que usted esté utilizando 11n certificara el adaptador para alcanzar las tarifas de datos 11n.

Productos del con certificación Wi-Fi:

http://www.wi-fi.org/certified_products.php

Cómo mejorar el funcionamiento:

1. Uso del canal — Uso del canal del informe de los analizadores de red en el porcentaje de transmitir pasado tiempo y de recibir los marcos. Esto ayuda a medir la variación potencial en la velocidad debida distanciarse de un Punto de acceso. Esto ayudará a vigilar y ver por ejemplo, si un canal es completamente el transmitir ocupado en 1Mbps bajo condiciones ideales se realizaría en 0.94Mbps bajo utilización del 100%.
2. El medio físico usado en Tecnología inalámbrica también dicta los funcionamientos. Usando 802.11g o el 802.11a sobre el 802.11b ofrece a mucho los más altos rendimientos, a menudo hasta el 30 mbps sobre el 802.11b donde una capacidad de la radio 6mpbs se divide entre todas las estaciones asociadas.
3. Tamaños de celda — Se recomienda para encoger los tamaños de celda para tener los clientes como más cercano a los APs como sea posible. Esto beneficiará a las tarifas de datos en las cuales el cliente puede conectar con el AP. Esto puede ser hecha reduciendo los niveles de potencia en el AP al más bajo.
4. El tamaño de celda que encoge también disminuye interferencia del cocanal. Si usan RRM, los APs deben escoger los canales dinámicamente por el despliegue. Sin embargo, si ejecuta la asignación dinámica del canal, asegúrese de que usted no tenga dos APs en los niveles de potencia alta en la misma derecha del canal uno al lado del otro.
5. La protección también hace la producción golpear.

Cómo calcular la producción vía el iPerf

Extremidades de la disposición de Iperf

Para esos clientes o probadores que no posean el carro, Iperf se puede utilizar en lugar de otro. Esto está disponible en http://www.macalester.edu/crash/software/pc/iperf/kperf_setup.exe.

Rendimiento de procesamiento de TCP de medición

Funcione con este comando en el lado del servidor:

```
(WiSM-slot2-2) >show wlan 1
WLAN Identifier.................................. 1
Profile Name..................................... wlab5WISMip22
Network Name (SSID).............................. wlab5WISMip22
Status........................................... Enabled
MAC Filtering.................................... Disabled
Broadcast SSID................................... Enabled
AAA Policy Override.............................. Disabled
Network Admission Control
NAC-State..................................... Disabled
Quarantine VLAN.............................. 0
Number of Active Clients......................... 0
Exclusionlist Timeout............................ 60 seconds
Session Timeout.................................. 1800 seconds
CHD per WLAN..................................... Enabled
Webauth DHCP exclusion........................... Disabled
Interface........................................ management
WLAN ACL......................................... unconfigured
DHCP Server...................................... Default
DHCP Address Assignment Required................. Disabled
Quality of Service............................... Silver (best effort)
WMM.............................................. Allowed
CCX - AironetIe Support.......................... Enabled
CCX - Gratuitous ProbeResponse (GPR)............. Disabled
CCX - Diagnostics Channel Capability............. Disabled
Dot11-Phone Mode (7920).......................... Disabled
Wired Protocol................................... None
IPv6 Support..................................... Disabled
Peer-to-Peer Blocking Action..................... Disabled
Radio Policy..................................... All
DTIM period for 802.11a radio.................... 1
DTIM period for 802.11b radio.................... 1
Radius Servers
Authentication.............................. Global Servers
Accounting..................................... Disabled
Local EAP Authentication......................... Disabled
Security
802.11 Authentication:........................... Open System
Static WEP Keys.............................. Disabled
802.1X........................................... Disabled
Wi-Fi Protected Access (WPA/WPA2)............. Enabled
WPA (SSN IE)............................... Disabled
WPA2 (RSN IE)............................... Enabled
TKIP Cipher............................ Disabled
AES Cipher............................. Enabled
Auth Key Management
802.1x................................. Enabled
PSK.................................... Disabled
CCKM................................... Disabled
FT(802.11r)............................ Disabled
FT-PSK(802.11r)........................ Disabled
FT Reassociation Timeout....................... 20
FT Over-The-Air mode........................... Enabled
FT Over-The-Ds mode............................ Enabled
CKIP ........................................... Disabled
IP Security.................................... Disabled
IP Security Passthru........................... Disabled
```

```
Web Based Authentication..................... Disabled
Web-Passthrough.............................. Disabled
Conditional Web Redirect..................... Disabled
Splash-Page Web Redirect..................... Disabled
Auto Anchor.................................. Disabled
H-REAP Local Switching....................... Enabled
H-REAP Learn IP Address...................... Enabled
Infrastructure MFP protection................. Enabled (Global
Infrastructure
MFP Disabled)
Client MFP................................... Optional
Tkip MIC Countermeasure Hold-down Timer..... 60
Call Snooping................................ Disabled
Band Select.................................. Enabled
Load Balancing............................... Enabled
```

Funcione con este comando en el lado del cliente:

```
(WiSM-slot2-2) >show wlan 1
WLAN Identifier.............................. 1
Profile Name................................. wlab5WISMip22
Network Name (SSID).......................... wlab5WISMip22
Status....................................... Enabled
MAC Filtering................................ Disabled
Broadcast SSID............................... Enabled
AAA Policy Override.......................... Disabled
Network Admission Control
NAC-State.................................... Disabled
Quarantine VLAN.............................. 0
Number of Active Clients..................... 0
Exclusionlist Timeout........................ 60 seconds
Session Timeout.............................. 1800 seconds
CHD per WLAN................................. Enabled
Webauth DHCP exclusion....................... Disabled
Interface.................................... management
WLAN ACL..................................... unconfigured
DHCP Server.................................. Default
DHCP Address Assignment Required............. Disabled
Quality of Service........................... Silver (best effort)
WMM.......................................... Allowed
CCX - AironetIe Support...................... Enabled
CCX - Gratuitous ProbeResponse (GPR)......... Disabled
CCX - Diagnostics Channel Capability......... Disabled
Dot11-Phone Mode (7920)...................... Disabled
Wired Protocol............................... None
IPv6 Support................................. Disabled
Peer-to-Peer Blocking Action................. Disabled
Radio Policy................................. All
DTIM period for 802.11a radio................ 1
DTIM period for 802.11b radio................ 1
Radius Servers
Authentication............................... Global Servers
Accounting................................... Disabled
Local EAP Authentication..................... Disabled
Security
802.11 Authentication:....................... Open System
Static WEP Keys.............................. Disabled
802.1X....................................... Disabled
Wi-Fi Protected Access (WPA/WPA2)............ Enabled
WPA (SSN IE)............................... Disabled
WPA2 (RSN IE)............................. Enabled
TKIP Cipher.............................. Disabled
AES Cipher............................... Enabled
```

```
Auth Key Management
802.1x.................................. Enabled
PSK..................................... Disabled
CCKM.................................... Disabled
FT(802.11r)............................. Disabled
FT-PSK(802.11r)......................... Disabled
FT Reassociation Timeout.......................... 20
FT Over-The-Air mode.............................. Enabled
FT Over-The-Ds mode............................... Enabled
CKIP ..................................... Disabled
IP Security.............................. Disabled
IP Security Passthru..................... Disabled
Web Based Authentication................. Disabled
Web-Passthrough.......................... Disabled
Conditional Web Redirect................. Disabled
Splash-Page Web Redirect................. Disabled
Auto Anchor.............................. Disabled
H-REAP Local Switching................... Enabled
H-REAP Learn IP Address.................. Enabled
Infrastructure MFP protection.............. Enabled (Global
Infrastructure
MFP Disabled)
Client MFP............................... Optional
Tkip MIC Countermeasure Hold-down Timer....... 60
Call Snooping............................ Disabled
Band Select.............................. Enabled
Load Balancing........................... Enabled
```

```
------------------------------------------------------------
Server listening on TCP port 5001
TCP window size:  256 KByte
------------------------------------------------------------
------------------------------------------------------------
Client connecting to 10.10.10.10, TCP port 5001
TCP window size:  256 KByte
------------------------------------------------------------
[1788] local 10.10.10.20 port 1155 connected with 10.10.10.10 port 5001
[1820] local 10.10.10.20 port 1153 connected with 10.10.10.10 port 5001
[1868] local 10.10.10.20 port 1150 connected with 10.10.10.10 port 5001
[1836] local 10.10.10.20 port 1152 connected with 10.10.10.10 port 5001
[1804] local 10.10.10.20 port 1154 connected with 10.10.10.10 port 5001
[1852] local 10.10.10.20 port 1151 connected with 10.10.10.10 port 5001
[ ID] Interval       Transfer     Bandwidth
[1788]  0.0-60.1 sec    124 MBytes  17.3 Mbits/sec
[1868]  0.0-60.1 sec    123 MBytes  17.1 Mbits/sec
[1820]  0.0-60.2 sec    110 MBytes  15.4 Mbits/sec
[1804]  0.0-60.1 sec   84.6 MBytes  11.8 Mbits/sec
[1852]  0.0-60.1 sec   89.2 MBytes  12.4 Mbits/sec
[1836]  0.0-60.2 sec   86.3 MBytes  12.0 Mbits/sec
[SUM]  0.0-60.2 sec    617 MBytes  86.0 Mbits/sec
[1952] local 10.10.10.20 port 5001 connected with 10.10.10.10 port 2663
[1832] local 10.10.10.20 port 5001 connected with 10.10.10.10 port 2664
[1748] local 10.10.10.20 port 5001 connected with 10.10.10.10 port 2665
[1732] local 10.10.10.20 port 5001 connected with 10.10.10.10 port 2666
[1800] local 10.10.10.20 port 5001 connected with 10.10.10.10 port 2667
[1812] local 10.10.10.20 port 5001 connected with 10.10.10.10 port 2668
[ ID] Interval       Transfer     Bandwidth
[1800]  0.0-60.0 sec    114 MBytes  15.9 Mbits/sec
[1812]  0.0-60.0 sec    117 MBytes  16.3 Mbits/sec
[1952]  0.0-60.1 sec   89.6 MBytes  12.5 Mbits/sec
[1748]  0.0-60.1 sec    129 MBytes  18.1 Mbits/sec
[1732]  0.0-60.1 sec    111 MBytes  15.5 Mbits/sec
[1832]  0.0-60.1 sec    112 MBytes  15.6 Mbits/sec
[SUM]  0.0-60.1 sec    672 MBytes  93.8 Mbits/sec
```

El primer número circundado en esta imagen representa el rendimiento de procesamiento ascendente, el segundo número circundado representa (AP al cliente) la producción rio abajo.

Producción de medición UDP

Cierre las aplicaciones anteriores de Iperf en ambos el costado del servidor y el cliente. Ambos necesitan ser puestos otra vez, solamente este vez para la prueba de rendimiento UDP.

Funcione con este comando en el lado del servidor:

```
(WiSM-slot2-2) >show wlan 1
WLAN Identifier.................................. 1
Profile Name..................................... wlab5WISMip22
Network Name (SSID).............................. wlab5WISMip22
Status........................................... Enabled
MAC Filtering.................................... Disabled
Broadcast SSID................................... Enabled
AAA Policy Override.............................. Disabled
Network Admission Control
NAC-State..................................... Disabled
Quarantine VLAN.............................. 0
Number of Active Clients...................... 0
Exclusionlist Timeout......................... 60 seconds
Session Timeout............................... 1800 seconds
CHD per WLAN..................................... Enabled
Webauth DHCP exclusion........................ Disabled
Interface..................................... management
WLAN ACL..................................... unconfigured
DHCP Server................................... Default
DHCP Address Assignment Required.............. Disabled
Quality of Service............................ Silver (best effort)
WMM........................................... Allowed
CCX - AironetIe Support....................... Enabled
CCX - Gratuitous ProbeResponse (GPR).......... Disabled
CCX - Diagnostics Channel Capability.......... Disabled
Dot11-Phone Mode (7920)....................... Disabled
Wired Protocol................................ None
IPv6 Support.................................. Disabled
Peer-to-Peer Blocking Action.................. Disabled
Radio Policy.................................. All
DTIM period for 802.11a radio................. 1
DTIM period for 802.11b radio................. 1
Radius Servers
Authentication............................... Global Servers
Accounting.................................... Disabled
Local EAP Authentication...................... Disabled
Security
802.11 Authentication:........................ Open System
Static WEP Keys............................... Disabled
802.1X........................................ Disabled
Wi-Fi Protected Access (WPA/WPA2)............. Enabled
WPA (SSN IE)............................... Disabled
WPA2 (RSN IE)............................... Enabled
TKIP Cipher............................ Disabled
AES Cipher............................. Enabled
Auth Key Management
802.1x................................. Enabled
PSK.................................... Disabled
CCKM................................... Disabled
FT(802.11r)............................ Disabled
FT-PSK(802.11r)........................ Disabled
FT Reassociation Timeout....................... 20
FT Over-The-Air mode........................... Enabled
FT Over-The-Ds mode............................ Enabled
```

```
CKIP ..................................... Disabled
IP Security.................................. Disabled
IP Security Passthru......................... Disabled
Web Based Authentication..................... Disabled
Web-Passthrough.............................. Disabled
Conditional Web Redirect..................... Disabled
Splash-Page Web Redirect..................... Disabled
Auto Anchor.................................. Disabled
H-REAP Local Switching....................... Enabled
H-REAP Learn IP Address...................... Enabled
Infrastructure MFP protection................. Enabled (Global
Infrastructure
MFP Disabled)
Client MFP................................... Optional
Tkip MIC Countermeasure Hold-down Timer..... 60
Call Snooping................................ Disabled
Band Select.................................. Enabled
Load Balancing............................... Enabled
```

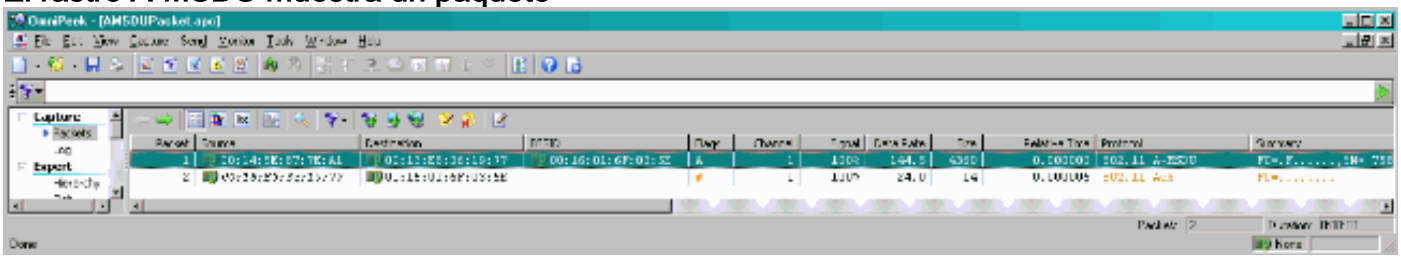
Funcione con este comando en el lado del cliente:

```
(WiSM-slot2-2) >show wlan 1
WLAN Identifier.............................. 1
Profile Name................................. wlab5WISMip22
Network Name (SSID).......................... wlab5WISMip22
Status....................................... Enabled
MAC Filtering................................ Disabled
Broadcast SSID............................... Enabled
AAA Policy Override.......................... Disabled
Network Admission Control
NAC-State................................... Disabled
Quarantine VLAN.............................. 0
Number of Active Clients..................... 0
Exclusionlist Timeout........................ 60 seconds
Session Timeout.............................. 1800 seconds
CHD per WLAN................................. Enabled
Webauth DHCP exclusion....................... Disabled
Interface.................................... management
WLAN ACL..................................... unconfigured
DHCP Server.................................. Default
DHCP Address Assignment Required............. Disabled
Quality of Service........................... Silver (best effort)
WMM.......................................... Allowed
CCX - AironetIe Support...................... Enabled
CCX - Gratuitous ProbeResponse (GPR)......... Disabled
CCX - Diagnostics Channel Capability......... Disabled
Dot11-Phone Mode (7920)...................... Disabled
Wired Protocol............................... None
IPv6 Support................................. Disabled
Peer-to-Peer Blocking Action................. Disabled
Radio Policy................................. All
DTIM period for 802.11a radio................ 1
DTIM period for 802.11b radio................ 1
Radius Servers
Authentication............................... Global Servers
Accounting................................... Disabled
Local EAP Authentication..................... Disabled
Security
802.11 Authentication:....................... Open System
Static WEP Keys.............................. Disabled
802.1X....................................... Disabled
Wi-Fi Protected Access (WPA/WPA2)............ Enabled
WPA (SSN IE)................................. Disabled
```

```
WPA2 (RSN IE)..............................  Enabled
TKIP Cipher................................  Disabled
AES Cipher.................................  Enabled
Auth Key Management
802.1x.....................................  Enabled
PSK........................................  Disabled
CCKM.......................................  Disabled
FT(802.11r)................................  Disabled
FT-PSK(802.11r)............................  Disabled
FT Reassociation Timeout...................  20
FT Over-The-Air mode.......................  Enabled
FT Over-The-Ds mode........................  Enabled
CKIP ......................................  Disabled
IP Security................................  Disabled
IP Security Passthru.......................  Disabled
Web Based Authentication...................  Disabled
Web-Passthrough............................  Disabled
Conditional Web Redirect...................  Disabled
Splash-Page Web Redirect...................  Disabled
Auto Anchor................................  Disabled
H-REAP Local Switching.....................  Enabled
H-REAP Learn IP Address....................  Enabled
Infrastructure MFP protection..............  Enabled (Global
Infrastructure
MFP Disabled)
Client MFP.................................  Optional
Tkip MIC Countermeasure Hold-down Timer.....  60
Call Snooping..............................  Disabled
Band Select................................  Enabled
Load Balancing.............................  Enabled
```

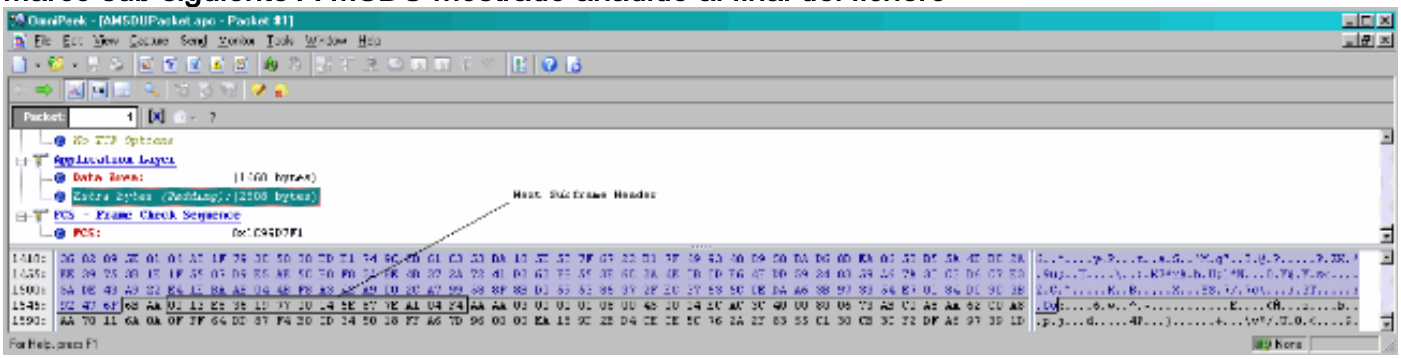
Éste es un ejemplo de las capturas de Omnipeek para analizar la **Unidad de datos de servicio global MAC**:

El rastro A-MSDU muestra un paquete



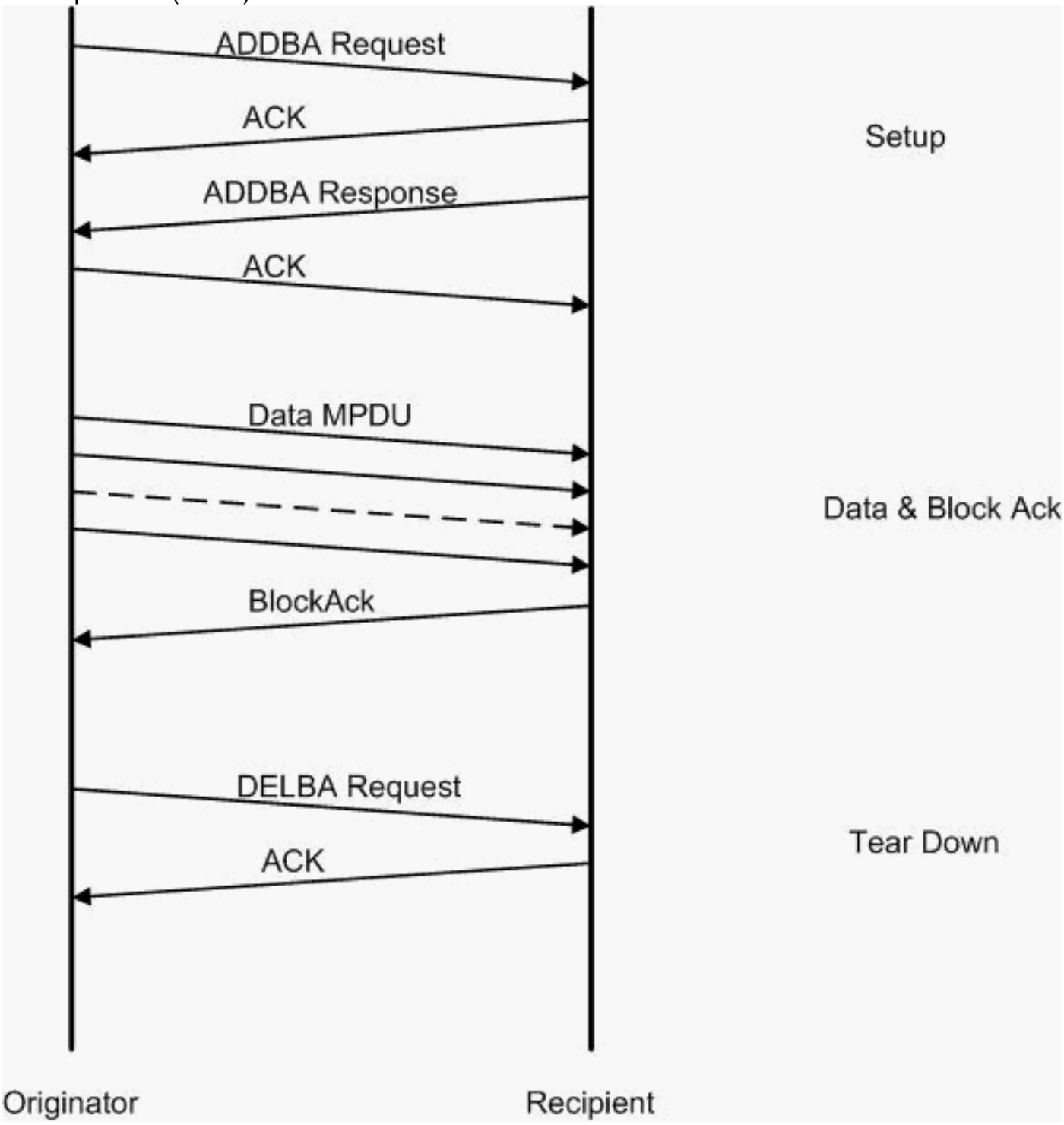
- Solamente se muestra el primer marco sub.
- Necesite examinar el vaciado Hex para ver los marcos sub adicionales.

Marco sub siguiente A-MSDU mostrado añadido al final del fichero



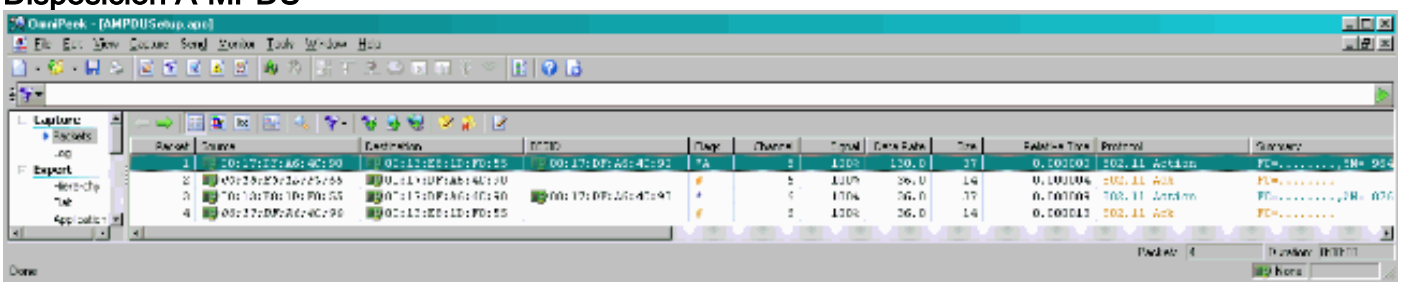
- Un A-MPDU es una estructura que contiene MPDUs múltiple, transportada como solo PSDU por el PHY.

- Indicación que el paquete es los datos A-MPDU en el Procedimiento de convergencia de la capa física (PLCP).



Éste es un ejemplo de las capturas de Omnipeek para analizar la **unidad de datos global del protocolo MAC**:

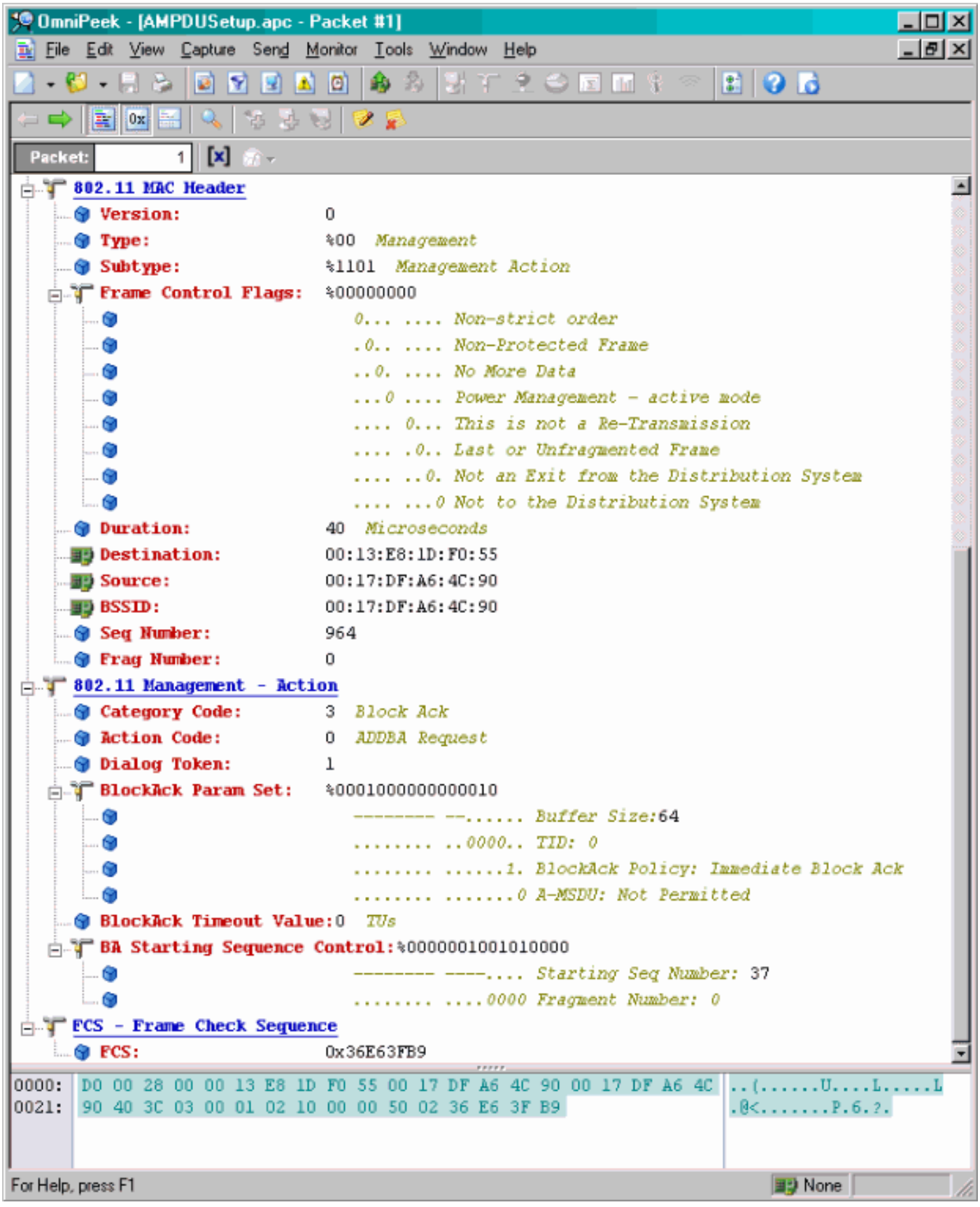
Disposición A-MPDU



- ADDBA — Agregue el acuse de recibo del bloque
- Petición ADDBA — Contiene el identificador, la directiva Ack del bloque, el tamaño de almacenador intermediario, el etc.
- Respuesta ADDBA — Puede cambiar la directiva y el tamaño de almacenador intermediario.

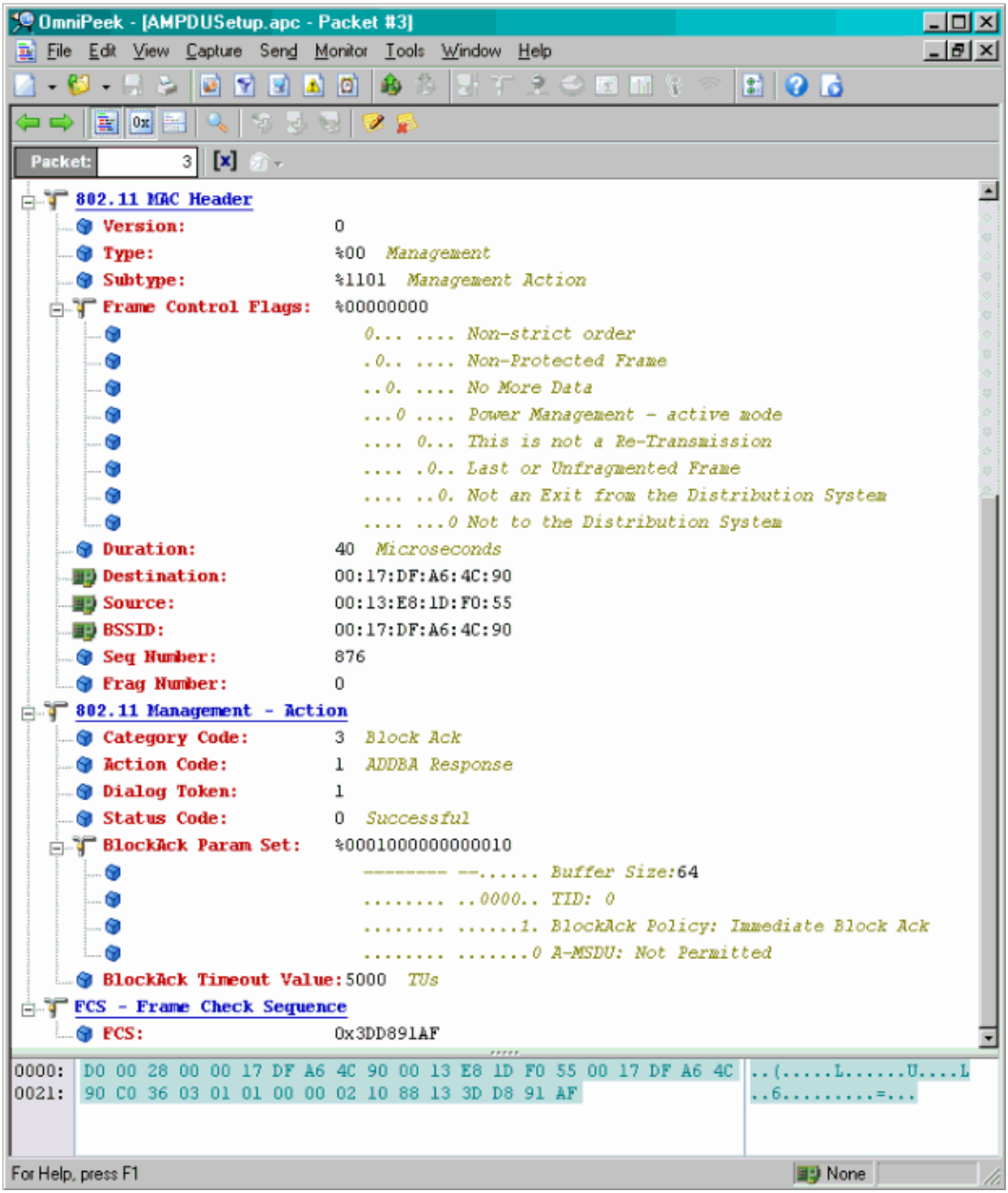
Disposición A-MPDU

- Petición ADDBA
- AP1250 utiliza un descanso de cero para no indicar ningún descanso.



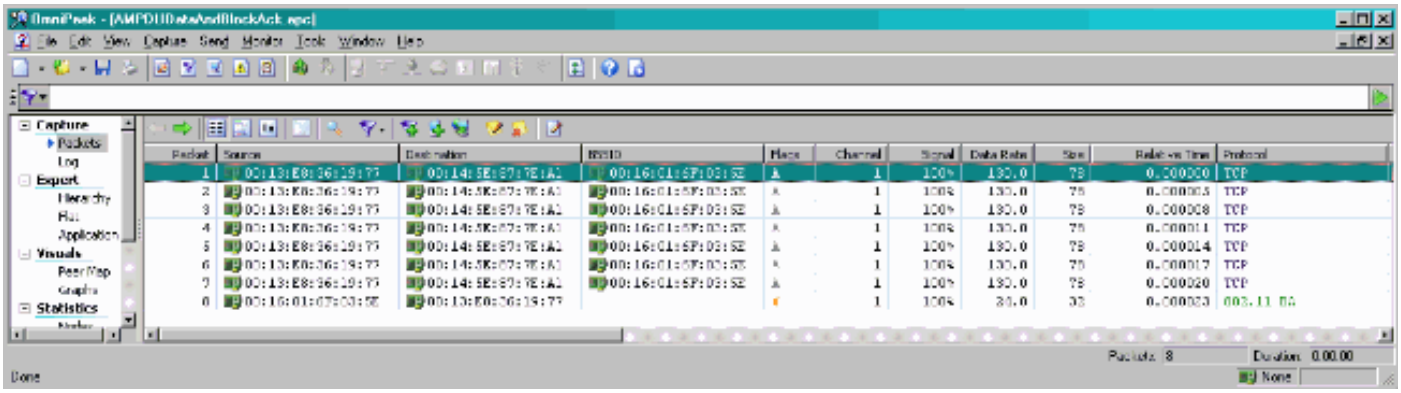
Disposición A-MPDU

- Respuesta ADDBA
- El receptor necesita indicar que acuerdo Ack del bloque fuera establecido con éxito.



Transferencia de datos A-MPDU

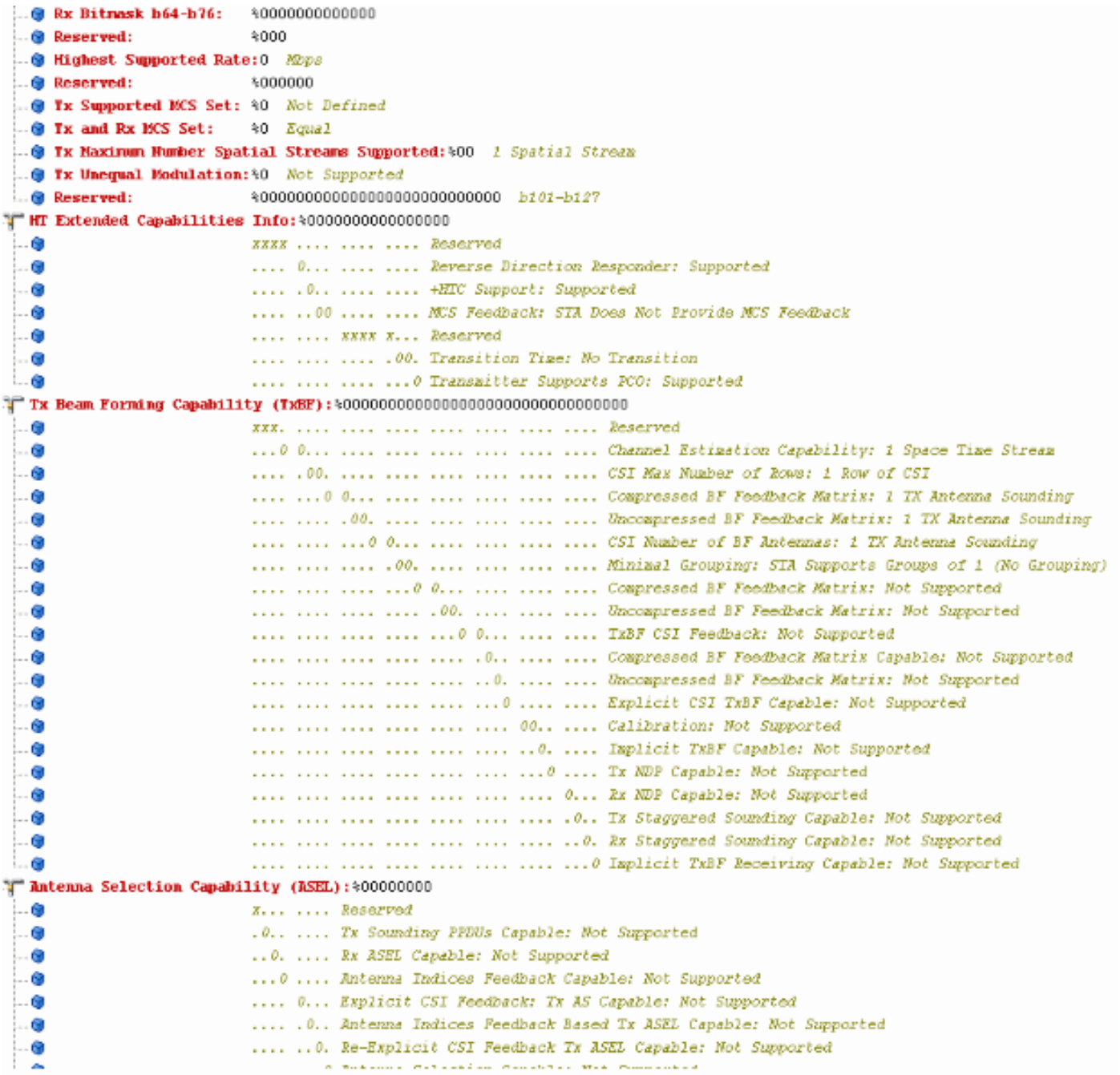
- El bloque Ack contiene la BITMAP comprimida para indicar que MPDUs recibió.
- Refiera a la sección 9.10.7" de IEEE 802.11n las Extensiones HT-inmediatas Ack del bloque" para la información sobre el envío del bloque Ack.



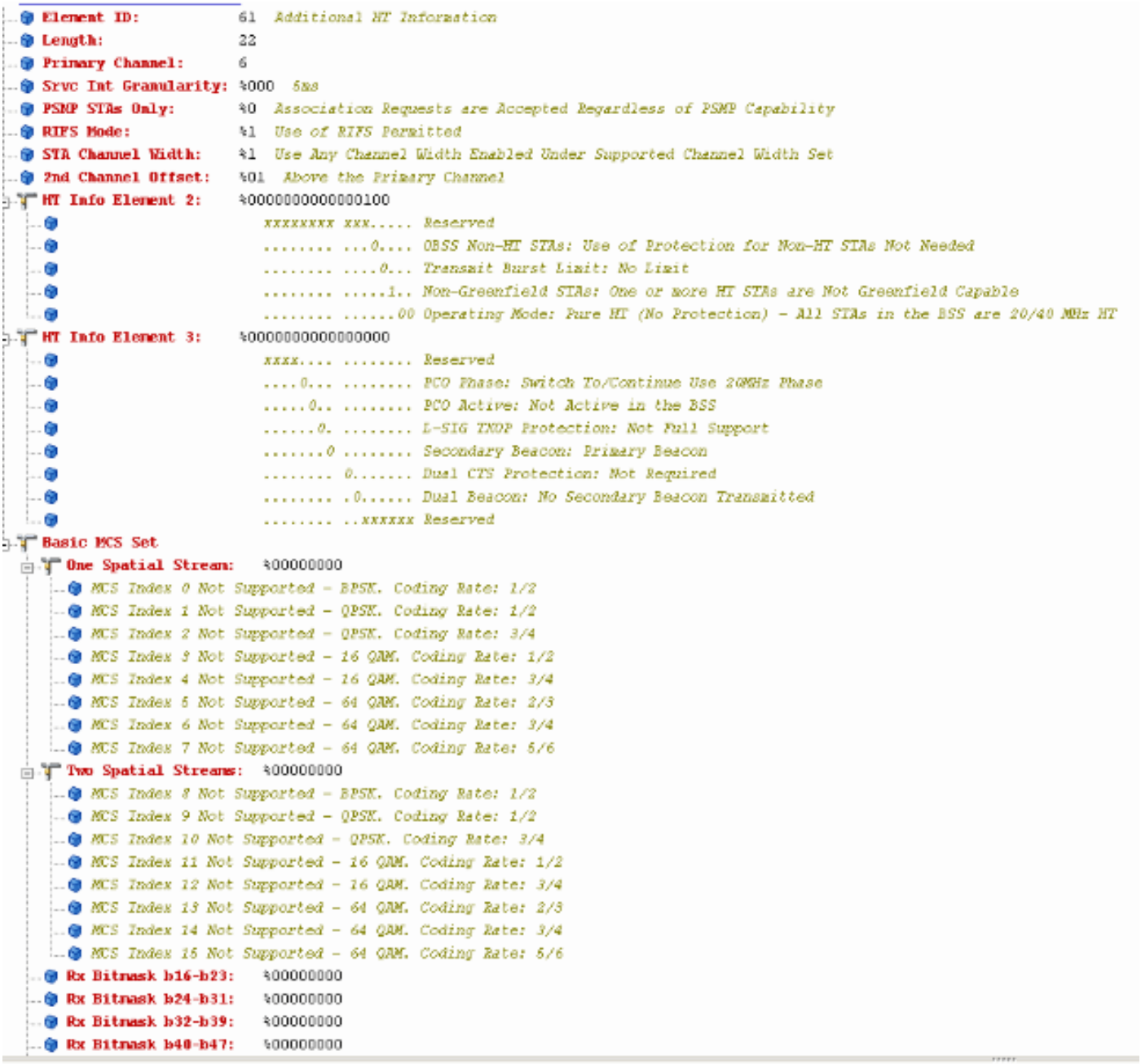
Capacidades des divulgación en los faros

- **HT Capability Info**
  - **Element ID:** 45 HT Capability Info
  - **Length:** 26
  - **HT Capability Info:** %0001100001101110
    - *0..... ..... L-SIG TXOP Protection Support: Not Supported*
    - *.0..... ..... AP allows use of 40MHz Transmissions In Neighboring BSSs*
    - *..0..... ..... Device/BSS does Not Support use of PSMP*
    - *...1.... ..... BSS does Allow use of DSSS/CCK Rates @40MHz*
    - *....1... ..... Maximal A-MSDU size: 7935 bytes*
    - *.....0.. ..... Does Not Support HT-Delayed BlockAck Operation*
    - *.....00 ..... No Rx STBC Support*
    - *..... 0..... Transmitter does Not Support Tx STBC*
    - *..... .1..... Short GI for 40 MHz: Supported*
    - *..... ..1..... Short GI for 20 MHz: Supported*
    - *..... ...0.... Device is Not Able to Receive PPDUs with GF Preamble*
    - *..... ....11.. Spatial Multiplexing Enabled*
    - *..... ......1. Both 20MHz and 40MHz Operation is Supported*
    - *..... ....0 LDPC coding capability: Not Supported*
  - **A-MPDU Parameters:** %00011011
    - *xxx..... Reserved*
    - *...110.. Minimum MPDU Start Spacing: 8 usec*
    - *......11 Maximum Rx A-MPDU Size: 64K*
  - **Supported MCS Set**
    - **One Spatial Stream:** %11111111
      - *MCS Index 0 Supported - BPSK. Coding Rate: 1/2*
      - *MCS Index 1 Supported - QPSK. Coding Rate: 1/2*
      - *MCS Index 2 Supported - QPSK. Coding Rate: 3/4*
      - *MCS Index 3 Supported - 16 QAM. Coding Rate: 1/2*
      - *MCS Index 4 Supported - 16 QAM. Coding Rate: 3/4*
      - *MCS Index 5 Supported - 64 QAM. Coding Rate: 2/3*
      - *MCS Index 6 Supported - 64 QAM. Coding Rate: 3/4*
      - *MCS Index 7 Supported - 64 QAM. Coding Rate: 5/6*
    - **Two Spatial Streams:** %01111111
      - *MCS Index 8 Supported - BPSK. Coding Rate: 1/2*
      - *MCS Index 9 Supported - QPSK. Coding Rate: 1/2*
      - *MCS Index 10 Supported - QPSK. Coding Rate: 3/4*
      - *MCS Index 11 Supported - 16 QAM. Coding Rate: 1/2*
      - *MCS Index 12 Supported - 16 QAM. Coding Rate: 3/4*
      - *MCS Index 13 Supported - 64 QAM. Coding Rate: 2/3*
      - *MCS Index 14 Supported - 64 QAM. Coding Rate: 3/4*
      - *MCS Index 15 Not Supported - 64 QAM. Coding Rate: 5/6*
    - **Rx Bitmask b16-b23:** %00000000
    - **Rx Bitmask b24-b31:** %00000000
    - **Rx Bitmask b32-b39:** %00000000
    - **Rx Bitmask b40-b47:** %00000000
    - **Rx Bitmask b48-b55:** %00000000

Capacidades des divulgación en los faros:



Capacidades des divulgación en los faros:



Asociación similar con la adición del bloque Ack puesta para A-MPDU:

194	00:13:E8:1D:F0:55	00:17:DF:A6:4C:90	802.11 Ack		#	100%	6.0	14
195	00:17:DF:A6:4C:90	Ethernet Broadcast	802.11 Beacon	00:17:DF:A6:4C:90	*	100%	6.0	204
196	00:13:E8:1D:F0:55	Ethernet Broadcast	802.11 Probe Req	Ethernet Broadcast	*	100%	1.0	81
197	00:17:DF:A6:4C:90	00:13:E8:1D:F0:55	802.11 Probe Rsp	00:17:DF:A6:4C:90	*+	100%	6.0	204
198	00:13:E8:1D:F0:55	00:17:DF:A6:4C:90	802.11 Ack		#	100%	6.0	14
199	00:13:CE:89:DC:A2	Ethernet Broadcast	802.11 Probe Req	Ethernet Broadcast	*	100%	1.0	87
200	00:13:E8:36:19:77	Ethernet Broadcast	802.11 Probe Req	Ethernet Broadcast	*	100%	1.0	81
201	00:17:DF:A6:4C:90	00:13:E8:36:19:77	802.11 Probe Rsp	00:17:DF:A6:4C:90	*+	100%	6.0	204
202	00:13:E8:36:19:77	00:17:DF:A6:4C:90	802.11 Ack		#	100%	6.0	14
203	00:13:E8:36:19:77	Ethernet Broadcast	802.11 Probe Req	Ethernet Broadcast	*	100%	1.0	74
204	00:13:E8:36:19:77	Ethernet Broadcast	802.11 Probe Req	Ethernet Broadcast	*	100%	1.0	81
205	00:17:DF:A6:4C:90	00:13:E8:36:19:77	802.11 Probe Rsp	00:17:DF:A6:4C:90	*+	100%	6.0	204
206	00:13:E8:36:19:77	00:17:DF:A6:4C:90	802.11 Ack		#	100%	6.0	14
207	00:13:CE:89:DC:A2	Ethernet Broadcast	802.11 Probe Req	Ethernet Broadcast	*	52%	1.0	55
208	00:13:CE:89:DC:A2	Ethernet Broadcast	802.11 Probe Req	Ethernet Broadcast	*	97%	1.0	55
209	00:13:CE:89:DC:A2	Ethernet Broadcast	802.11 Probe Req	Ethernet Broadcast	*	100%	1.0	87
210	00:13:CE:89:DC:A2	Ethernet Broadcast	802.11 Probe Req	Ethernet Broadcast	*	100%	1.0	55
211	00:17:DF:A6:4C:90	Ethernet Broadcast	802.11 Beacon	00:17:DF:A6:4C:90	*	100%	6.0	204
212	00:13:CE:89:DC:A2	Ethernet Broadcast	802.11 Probe Req	Ethernet Broadcast	*	95%	1.0	55
213	00:13:CE:89:DC:A2	Ethernet Broadcast	802.11 Probe Req	Ethernet Broadcast	*	100%	1.0	87
214	00:13:CE:89:DC:A2	Ethernet Broadcast	802.11 Probe Req	Ethernet Broadcast	*	100%	1.0	55
215	00:13:E8:1D:F0:55	00:17:DF:A6:4C:90	802.11 Auth	00:17:DF:A6:4C:90	*	100%	36.0	34
216	00:17:DF:A6:4C:90	00:13:E8:1D:F0:55	802.11 Ack		#	100%	36.0	14
217	00:17:DF:A6:4C:90	00:13:E8:1D:F0:55	802.11 Auth	00:17:DF:A6:4C:90	*	100%	36.0	34
218	00:13:E8:1D:F0:55	00:17:DF:A6:4C:90	802.11 Ack		#	100%	36.0	14
219	00:13:E8:1D:F0:55	00:17:DF:A6:4C:90	802.11 Assoc Req	00:17:DF:A6:4C:90	*	100%	36.0	134
220	00:17:DF:A6:4C:90	00:13:E8:1D:F0:55	802.11 Ack		#	100%	36.0	14
221	00:17:DF:A6:4C:90	00:13:E8:1D:F0:55	802.11 Assoc Rsp	00:17:DF:A6:4C:90	*	100%	130.0	180
222	00:13:E8:1D:F0:55	00:17:DF:A6:4C:90	802.11 Ack		#	100%	36.0	14
223	192.168.170.89	224.0.0.1	IGMP	00:17:DF:A6:4C:90		100%	130.0	84
224	00:13:E8:1D:F0:55	00:17:DF:A6:4C:90	802.11 Ack		#	100%	36.0	14
225	192.168.170.89	224.0.0.1	IGMP	00:17:DF:A6:4C:90	+	100%	130.0	84
226	00:13:E8:1D:F0:55	00:17:DF:A6:4C:90	802.11 Ack		#	100%	36.0	14
227	00:17:DF:A6:4C:90	00:13:E8:1D:F0:55	WLCCP	00:17:DF:A6:4C:90		100%	130.0	92
228	00:13:E8:1D:F0:55	00:17:DF:A6:4C:90	802.11 Ack		#	100%	36.0	14
229	00:17:DF:A6:4C:90	00:13:E8:1D:F0:55	802.11 Action	00:17:DF:A6:4C:90	*	100%	130.0	37
230	00:13:E8:1D:F0:55	00:17:DF:A6:4C:90	802.11 Ack		#	100%	36.0	14
231	00:13:E8:1D:F0:55	00:17:DF:A6:4C:90	802.11 Action	00:17:DF:A6:4C:90	*	100%	36.0	37
232	00:17:DF:A6:4C:90	00:13:E8:1D:F0:55	802.11 Ack		#	100%	36.0	14

Verifying A-MPDU is enabled on the controller

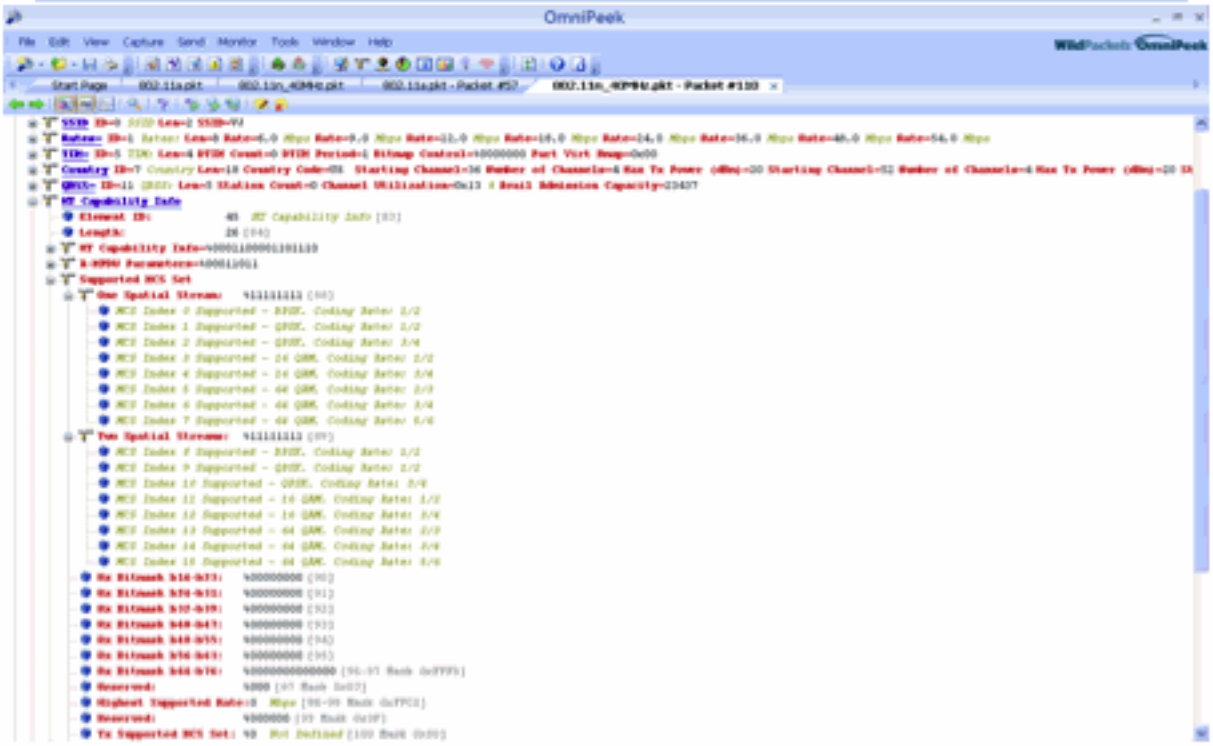
Above is a beacon frame from an SSID enabled for n rates

- ********** **Showing the channel Width to be 40MHz** **********

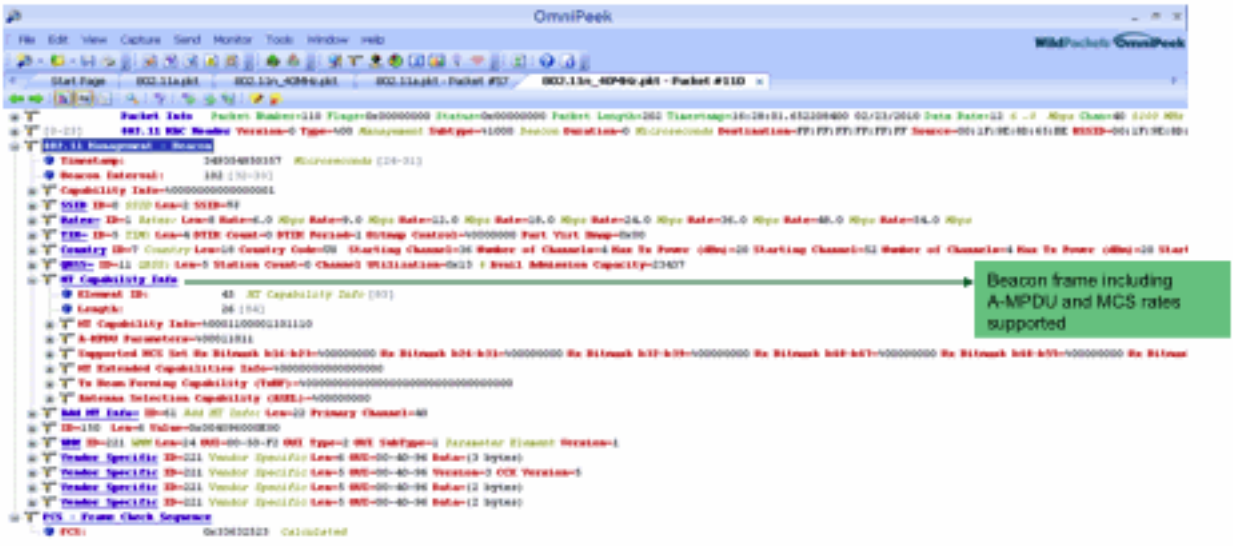
- interface Dot11Radio1
- Radio AIR-RM1252A, Base Address 001f.9ea6.8520, BBlock version 0.00, Software version 2.10.20
- Serial number: FOC1212405A
- Number of supported simultaneous BSSID on Dot11Radio1: 16
- Carrier Set: Americas (OFDM) (US) (-A)
- Uniform Spreading Required: Yes
- **Configured Frequency: 5180 MHz Channel 36 40MHz, extended above**
- Allowed Frequencies: 5180(36) 5200(40) 5220(44) 5240(48) *5260(52) *5280(56) *5300(60) *5320(64) *5500(100) *5520(104) *5540(108) *5560(112) *5580(116) *5660(132) *5680(136) *5700(140) 5745(149) 5765(153) 5785(157) 5805(161) 5825(165)
- * = May only be selected by Dynamic Frequency Selection (DFS)
- Listen Frequencies: 5180(36) 5200(40) 5220(44) 5240(48) 5260(52) 5280(56) 5300(60) 5320(64) 5500(100) 5520(104) 5540(108) 5560 (112) 5580(116) 5660(132) 5680(136) 5700(140) 5745(149) 5765(153) 5785(157) 5805(161) 5825(165)
- Beacon Flags: 0, Interface Flags 20105: Beacons are enabled; Probes are enabled
- Configured Power: 14 dBm (level 1)
- Active power levels by rate
- 6.0 to 54.0 , 14 dBm
- 6.0-bf to 54.0-b, 8 dBm, changed due to regulatory maximum
- m0. to m15.-4, 11 dBm, changed due to regulatory maximum
- OffChnl Power: 14, Rate 6.0
- --More-- Allowed Power Levels: -1 2 5 8 11 14
- --More-- Allowed Client Power Levels: 2 5 8 11 14
- Receive Antennas : right-a left-b middle-c
- Transmit Antennas : right-a left-b, oldm single
- Antenna: external, Gain: Allowed 11, Reported 0, Configured 0, In Use 11
- Active Rates: basic-6.0 9.0 basic-12.0 18.0 basic-24.0 36.0 48.0 54.0
- Current Rates: basic-6.0 9.0 basic-12.0 18.0 basic-24.0 36.0 48.0 54.0
- Allowed Rates: 6.0 9.0 12.0 18.0 24.0 36.0 48.0 54.0
- All Rates: 6.0 9.0 12.0 18.0 24.0 36.0 48.0 54.0 m0. m1. m2. m3. m4. m5. m6. m7. m8. m9. m10. m11. m12. m13. m14. m15.
- **Default Rates: basic-6.0 9.0 basic-12.0 18.0 basic-24.0 36.0 48.0 54.0 m0. m1. m2. m3. m4. m5. m6. m7. m8. m9. m10. m11. m12. m13. m14. m15.**
- **Best Range Rates: basic-6.0 9.0 12.0 18.0 24.0 36.0 48.0 54.0 m0. m1. m2. m3. m4. m5. m6. m7. m8. m9. m10. m11. m12. m13. m14. m15.**
- **Best Throughput Rates: basic-6.0 basic-9.0 basic-12.0 basic-18.0 basic-24.0 basic-36.0 basic-48.0 basic-54.0 m0. m1. m2. m3. m4. m5. m6. m7. m8. m9. m10. m11. m12. m13. m14. m15.**

MCS Rates on 802.11n beacon

Supported MCS rates



802.11a with N rates Enabled



802.11A Beacon frame

Información Relacionada

- Soporte Técnico y Documentación - Cisco Systems