配置在5760和3850系列WLCs的无线组播

Contents

Introduction

本文描述如何配置在Cisco 5760和3850系列无线局域网控制器(WLCs)的无线组播，支持*与单播的组播*并且*组播与组播*交付机制。

Prerequisites

Requirements

Cisco建议您有组播实施基础知识在Cisco 5760和3850系列WLCs的。

Components Used

本文档中的信息基于以下软件和硬件版本：

- Cisco 5760系列WLC
- Cisco 3850系列WLC
- Cisco 3602系列接入点(AP)。

The information in this document was created from the devices in a specific lab environment.All of the devices used in this document started with a cleared (default) configuration.If your network is live, make sure that you understand the potential impact of any command.

Configure

完成这些步骤为了在下一代配线间(NWGC)平台的enable (event)组播：

1. 输入在控制器的**无线multicast命令**为了enable (event)组播：

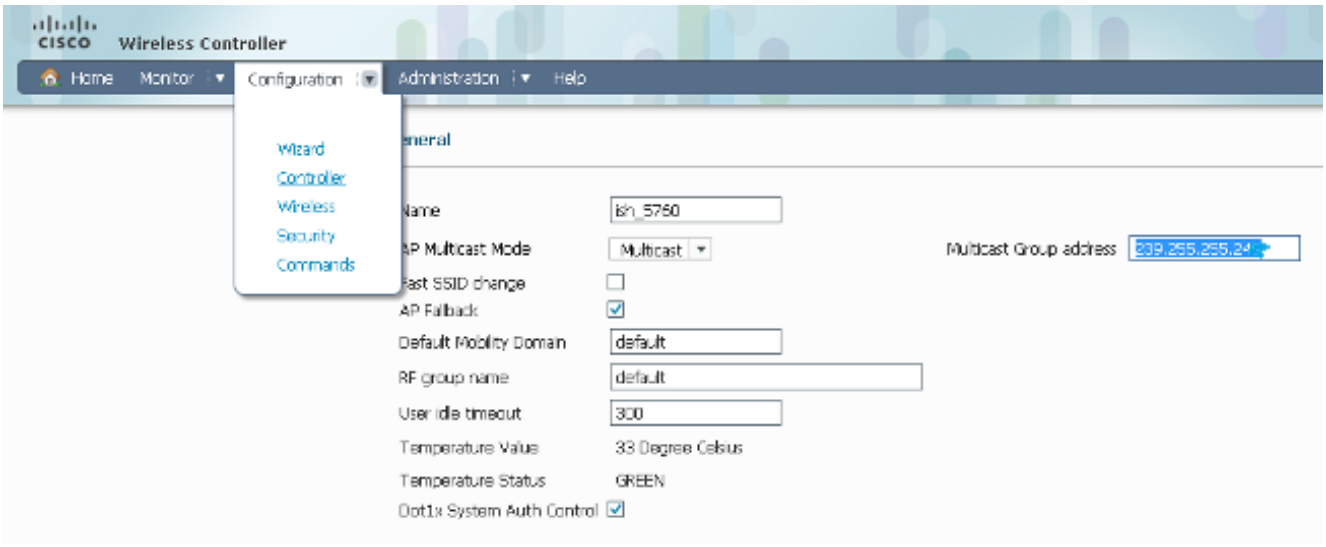
```
ish_5760(config)#wireless multicast
```

Note:此命令默认情况下enable (event)*与单播*交付机制的*组播*。

2. 如果*必须*更改交付机制*组播与组播*，则请输入此命令：

```
ish_5760(config)#ap capwap multicast 239.255.255.250
```

Note:此命令配置所有无线访问访问接入点的组播组(CAPWAP) APs控制和设置加入，优化交换机，以便传送到达所有APs的组播CAPWAP信息。此进程是不同的，当使用时单播模式，因为然后将要求交换机传送单播信息到所有CAPWAP APs。这帮助使在控制器的系统负载减到最小。随意地，您能连接到从GUI的**Configuration>控制器**为了配置此信息，如显示这里：



3. 输入监听在控制器的这些命令为了enable (event)互联网组管理协议(IGMP)默认情况下(被启用)：

```
ip igmp snooping

ip igmp snooping querier
```

Note:**ip igmp snooping querier命令**配置控制器，以便周期地证实客户端是否仍然听组播数据流。

在NGWC的组播流

当早先配置是被实施的时，这些步骤概述组播数据流的流在NGWCs的：

1. 控制器截断无线客户端发送的IGMP信息包。

2. 如果该组播组VLAN*来源*组合的客户端条目存在，控制器然后更新IGMP计时器。

   如果这是一个新的条目，则WLC用范围创建根据(来源，组， VLAN)元组(MGID)的一个组播组标识，在1和4,095之间的第2层(L2)或在4,160和8,191之间第3层的(L3)。

3. 转发IGMP信息包上行。

4. MGID条目被发送到AP，与客户端关联信息一起，以便客户端能收到组播数据流。

5. 基于交付机制(与单播/组播的组播)，控制器适当地寄数据流给AP。 **Note**:如果交付机制是组播，则数据包传输层安全(DTL)加密和服务质量(QoS)标记不适用。
6. AP然后寄数据流给每个客户端，如所需求。

Verify

完成这些步骤为了验证您的配置适当地工作：

1. 输入**显示无线multicast命令**为了验证组播是否正确地被启用了：

```
ish_5760#show wireless multicast

Multicast : Enabled
AP Capwap Multicast : Multicast
AP Capwap Multicast group Address : 239.255.255.249
AP Capwap Multicast QoS Policy Name : unknown
AP Capwap Multicast QoS Policy State : None
Wireless Broadcast : Disabled
Wireless Multicast non-ip-mcast : Disabled

Vlan Non-ip-mcast Broadcast MGID
--------------------------------
1 Enabled Enabled Disabled
10 Enabled Enabled Enabled
24 Enabled Enabled Enabled
25 Enabled Enabled Enabled
26 Enabled Enabled Enabled
32 Enabled Enabled Enabled
```

2. 输入**显示capwap总和**命令为了验证CAPWAP信息：

```
ish_5760#show capwap sum

Name Src Src Dest Dst Dtls MTU Xact
IP Port IP Port En
---- ----------- ---- ------------ ----- ---- ----- ---
Ca1  172.16.15.1 5247 239.10.10.11 5247  No   1449  1
Ca19 172.16.15.1 5247 172.17.1.54  52451 Yes  1380  3
```

Note:如输出所显示， **Ca1**接口使用AP组播模式。而**Ca19**接口有*DTL*值的**是**， **Ca1**接口有*DTL*值没有。

3. 输入**显示capwap详细资料**或**显示capwap汇总**为了验证参加了组播组的AP数：

```
CAPWAP Tunnels General Statistics:
Number of Capwap Data Tunnels = 2
Number of Capwap Mobility Tunnels = 0
Number of Capwap Multicast Tunnels = 1


Name APName Type PhyPortIf Mode McastIf
------ --------------------------------
Ca2 ish_3502_lw_2 data  -  multicast Ca0
Ca1 ish_ap       data  - multicast Ca0
```

```
Ca0 -     mcas - unicast     -


Name SrcIP               SrcPort     DestIP DstPort DtlsEn MTU
--- ---------------     -------     ------  ------- ------ ---
Ca2 10.105.132.138 5247 10.106.55.133   39237   No     1464
Ca1 10.105.132.138 5247 10.106.15.135   38899   No     1464
Ca0  10.105.132.138 5247  239.255.255.249 5247    No      1464


Name IfId              McastRef
---   ------------------ --------
Ca2   0x0098BA0000000041 0
Ca1   0x00BC2C800000003D 0
Ca0   0x008B53C000000001  2
```

Note:此输出最后一行指向为组播数据流被创建的CAPWAP隧道接口，并且McastRef显示参加了组的AP数。此信息是有用的，当不收到组播数据流的您必须证实时AP是否参加了组播组。

4. 输入show int capwap 0命令为了验证隧道接口显示目的地地址作为组地址的组播：

```
ish_5760#show int capwap 0
Capwap0 is up, line protocol is up
Hardware is Capwap
MTU 1464 bytes, BW 10000000 Kbit/sec, DLY 0 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation UNKNOWN, loopback not set
Keepalive set (10 sec)
Carrier delay is 0 msec
Tunnel iifid 39217105861607425, Tunnel MTU 1464
Tunnel source 10.105.132.138:5247, destination 239.255.255.249:5247
```

5. 输入summary命令显示无线的组播组为了验证MGID条目是否为客户端尝试参加的组播组被创建(239.255.255.250用于此示例)：

```
ish_5760#show wireless multicast group summary
IPv4 groups
-------------
MGID   Source   Group             Vlan
---------------------------------------
4160   0.0.0.0 239.255.255.250   32
```

6. 输入此命令为了验证正在考虑中的客户端是否被添加了到MGID表：

```
ish_5760#show wireless multicast group 239.255.255.250 vlan 32
Source : 0.0.0.0
Group : 239.255.255.250
Vlan : 32
MGID : 4160


Number of Active Clients : 1
Client List
-------------


Client MAC     Client IP      Status
---------------------------------------
1410.9fef.272c 192.168.24.50 MC_ONLY
```

7. 输入此命令为了验证MGID条目是否在此客户端的AP被添加了：

```
ish_ap#show capwap mcast mgid id 4160
L3 MGID = 4160 WLAN bitmap = 0x0001
Slot map/tx-cnt: R0:0x0000/0 R1:0x0001/1499
Clients per Wlan
Wlan : 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

!! This shows the number of clients per slot, per Service Set
Identification (SSID) on the AP.

Normal Mcast Clients R0: 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Normal Mcast Clients R1: 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
rx pkts = 1499 drp pkts = 0
tx packets:
wlan : 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
slots0 : 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
slots1 : 1499 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0


Normal Mcast Clients:
Client: 1410.9fef.272c --- Qos User Priority: 0
```

Note:考虑在收到的和传送的信息包的计数器。此信息是有用的，当您尝试确定时AP是否适当地转发信息包到客户端。

8. 输入show ip igmp snooping igmpv2-tracking命令为了查看所有客户端组播组映射。他们加入了的这提供被联络客户端的快照和组。以下为示例输出：

```
ish_5760#show ip igmp snooping igmpv2-tracking

Client to SGV mappings
----------------------

Client: 192.168.24.50 Port: Ca1
Group: 239.255.255.250 Vlan: 32 Source: 0.0.0.0 blacklisted: no

!! If the client has joined more than one multicast group, all the group entries
will be shown here one after the other.


SGV to Client mappings
----------------------

Group: 239.255.255.250 Source: 0.0.0.0 Vlan: 32
Client: 192.168.24.50 Port: Ca1 Blacklisted: no

!! If there is more than one client entry, these will be shown here.
```

9. 输入此命令为了验证从控制器的MGID ：

```
ish_5760#show ip igmp snoop wireless mgid
Total number of L2-MGIDs = 33

Total number of MCAST MGIDs = 0

Wireless multicast is Enabled in the system
Vlan bcast nonip-mcast mcast mDNS-br mgid Stdby Flags
1 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
100 Enabled Disabled Enabled Enabled Disabled 0:1:1:0
115 Enabled Disabled Enabled Enabled Disabled 0:1:1:0
```

```
517 Enabled Disabled Enabled Enabled Disabled 0:1:1:0
518 Enabled Disabled Enabled Enabled Disabled 0:1:1:0
519 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
520 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
521 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
522 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
523 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
524 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
525 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
526 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
527 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
528 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
529 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
530 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
531 Enabled Disabled Enabled Enabled Enabled 0:1:1:1
1002 Enabled Enabled Enabled Enabled Disabled 0:0:1:0
1003 Enabled Enabled Enabled Enabled Disabled 0:0:1:0
1004 Enabled Enabled Enabled Enabled Disabled 0:0:1:0
1005 Enabled Enabled Enabled Enabled Disabled 0:0:1:0


Index MGID (S, G, V)
------------------------------------------------------
```

Troubleshoot

这是您能使用为了排除从控制器的配置问题故障的调试指令列表：

- **监听的debug ip igmp**
- **debug ip igmp监听的239.255.255.250**
- **debug ip igmp探测询问器**
- **debug ip igmp监听无线ios客户端跟踪**
- **debug ip igmp监听无线ios事件**
- **debug ip igmp监听无线ios错误**
- **debug ip igmp监听无线ap详细资料**
- **debug ip igmp监听无线ap错误**
- **debug ip igmp监听无线ap事件**
- **debug ip igmp监听无线ap消息**
- **调试平台组播**
- **调试平台组播错误**
- **调试平台组播事件**

- 调试平台l2m-igmp/l2m-mld/l2multicast/l3multicast
- 调试l2mcast无线ios错误
- 调试l2mcast无线ios mgid
- 调试l2mcast无线ios spi

  Note:保证您只使用相关组播调试指令为了避免性能问题。

这是示例show debug命令输出：

```
show debug
NG3K Wireless:
NG3K WIRELESS Error DEBUG debugging is on
L3 Multicast platform:
NGWC L3 Multicast Platform debugs debugging is on
L2M IGMP platform debug:
NGWC L2M IGMP Platform debugs debugging is on
NGWC L2M IGMP SPI debugs debugging is on
NGWC L2M IGMP Error debugs debugging is on
IP multicast:
IGMP debugging is on for 239.10.10.11
IGMP tracking:
igmpv2 tracking debugging is on
L2MC Wireless:
L2MC WIRELESS SPI EVENTS debugging is on
L2MC WIRELESS REDUNDANCY EVENTS debugging is on
L2MC WIRELESS ERROR debugging is on
IGMP Wireless:
IGMP SNOOP wireless IOS Errors debugging is on
IGMP SNOOP wireless IOS Events debugging is on

Nova Platform:
igmp/snooping/wireless/ap/event debugging is on
multicast/event debugging is on
igmp/snooping/wireless/ap/message/rx debugging is on
igmp/snooping/wireless/ap/message/tx debugging is on
wireless/log debugging is on
l2multicast/error debugging is on
igmp/snooping/wireless/ap/error debugging is on
multicast/error debugging is on
multicast debugging is on
l2multicast/event debugging is on
wireless/platform debugging is on
igmp/snooping/wireless/ap/detail debugging is on
```

这是显示在控制器的MGID创建的输出示例：

```
*Sep 7 00:12:11.029: IGMPSN: Received IGMPv2 Report for group 239.255.255.250 received
on Vlan 32, port Ca1
*Sep 7 00:12:11.029: IGMPSN: group: Received IGMPv2 report for group 239.255.255.250
from Client 192.168.24.50 received on Vlan 32, port Ca1
*Sep 7 00:12:11.029: (l2mcast_tracking_is_client_blacklisted) Client: 192.168.24.50
Group: 239.255.255.250 Source: 0.0.0.0 Vlan: 32 Port: Ca1
*Sep 7 00:12:11.029: (l2mcsn_process_report) Allocating MGID for Vlan: 32 (S,G):
:239.255.255.250
```

***Sep 7 00:12:11.029: (l2mcast_wireless_alloc_mcast_mgid) Vlan: 32 Source: 0.0.0.0 Group: 239.255.255.250**
*Sep 7 00:12:11.030: (l2mcast_wireless_alloc_mcast_mgid) Hash entry added!
***Sep 7 00:12:11.030: (l2mcast_wireless_track_and_inform_client) Protocol: IGMPSN Client-address: 192.168.24.50 (S,G,V): 0.0.0.0 239.255.255.250 32 Port: Ca1, MGID: 4160 Add: Add**
***Sep 7 00:12:11.030: (l2mcast_get_client_params) Client Addr: 192.168.24.50 Client-id: 40512055681220617 Mcast-vlan: 32(l2mcast_wireless_inform_client) Protocol: IGMPSN Client-address: 192.168.24.50 (S,G,V): 0.0.0.0 239.255.255.250 32 Port: Ca1, iifid = 0x9667C000000004 MGID: 4160 Add: Add**
*Sep 7 00:12:11.030: (l2mcast_wireless_inform_client) Sent INFORM CLIENT SPI
*Sep 7 00:12:11.030: (l2mcast_wireless_track_and_inform_client) l2mcast_wireless_inform_client passed
*Sep 7 00:12:11.032: %IOSXE-7-PLATFORM: 1 process wcm: IGMP has sent the WCM_INFORM_CLIENT with ^I client_id = 40512055681220617/8fed8000000009 ^I capwap id = 42335320837980164 ^I mac_addr = 1410.9fef.272c ^I num_entry = 1

一旦条目在Cisco IOS被创建支持，这通过对无线控制模块(WCM)进程，验证，在添加条目前：

***Sep 7 00:12:11.032: %IOSXE-7-PLATFORM: 1 process wcm: i = 0, source = 0.0.0.0 group = 239.255.255.250 client_ip = 192.168.24.50 vlan = 32, mgid = 4160 add = 1**
*Sep 7 00:12:11.032: %IOSXE-7-PLATFORM: 1 process wcm: in igmp_wcm_client_join_callback source = 0.0.0.0 group = 239.255.255.250 client_ip = 192.168.24.50 vlan = 32 client_mac = 1410.9fef.272c mgid = 4160
*Sep 7 00:12:11.032: %IOSXE-7-PLATFORM: 1 process wcm: apfMswtp_iifid = 9667c000000004 capwap_if_id = 9667c000000004
*Sep 7 00:12:11.032: %IOSXE-7-PLATFORM: 1 process wcm: rrc_manual_mode = 0 rrc_status = 2
*Sep 7 00:12:11.032: %IOSXE-7-PLATFORM: 1 process wcm: locking mgid Tree in file bcast_process.c line 491
*Sep 7 00:12:11.033: %IOSXE-7-PLATFORM: 1 process wcm: allocateL3mgid: mgid entry AVL search key dump:
*Sep 7 00:12:11.033: %IOSXE-7-PLATFORM: 1 process wcm: 00000000: 00 00 00 00 ef 01 01 01 00 08 ff ff ff ff ff ff .....^M 00000010: ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff ff .....^M 00000020: ff ff ..^M
*Sep 7 00:12:11.033: %IOSXE-7-PLATFORM: 1 process wcm: mcast_group_client_lookup: Lookup failed for client with mac 1410.9fef.272c
*Sep 7 00:12:11.033: %IOSXE-7-PLATFORM: 1 process wcm: unlocking mgid Tree in file bcast_process.c line 624
*Sep 7 00:12:11.033: %IOSXE-7-PLATFORM: 1 process wcm: spamLradSendMgidInfo: ap = 0C85.25C7.9AD0 slotId = 1, apVapId = 1, numOfMgid = 1 join = 1 isL2Mgid = 0, mc2ucflag = 0, qos = 0
***Sep 7 00:12:11.033: %IOSXE-7-PLATFORM: 1 process wcm: mscbApMac = 0c85.25c7.9ad0 client_mac_addr = 1410.9fef.272c slotId = 1 vapId = 1 mgid = 4160 numOfSGs = 2, rrc_status = 2**

这是您能使用为了排除从AP的配置问题故障的调试指令列表：

- **调试capwap mcast fwd**
- **调试capwap mcast查询**

这是示例**debug命令**输出：

*Sep 7 06:00:38.099: CAPWAP MCAST: capwapDecodeMgidPayload: mgidTypeStr L3 IGMP MGID ADD,mgidType 53,mgid=4160,mgid operation=1
*Sep 7 06:00:38.099: CAPWAP MCAST: capwapAddMgidEntry: slotId= 1, client_mac= 1410.9fef.272c, mgid= 4160, wlanid= 0, mc2ucflag= 0, priority= 0, downpriority= 0 L3 mgid flag = L3 IGMP MGID .
*Sep 7 06:00:38.099: CAPWAP MCAST: allocateMgidEntry: mgid = 4160,isL3Mgid=1
***Sep 7 06:00:38.099: CAPWAP MCAST: capwap_bss_mgid_enable:MGID 4160 enable - Slot=1 WLAN=1**

```
*Sep 7 06:00:38.099: CAPWAP MCAST: L3 IGMP MGID ADD MGID = 4160 SUCCESSFUL .!!
```

> Note:当MGID条目被添加时， VLAN ID显示作为0在早先输出中。然而，即使条目被删除，它显示正确的VLAN映射。

这是列表表示命令，您能使用从控制器的进一步分析：

- 显示无线客户端汇总
- 显示wcdb数据库全部
- 显示无线组播组汇总
- 显示无线组播组<ip> VLAN <id>
- 显示无线组播源<ip>组<ip> VLAN <id>
- show ip igmp snooping无线mgid
- show ip igmp snooping igmpv2-tracking

这是列表表示命令，您能使用从AP的进一步分析：

- 显示capwap mcast mgid全部
- 显示capwap mcast mgid id <id>

重要考虑

这是一些重要考虑和限制关于在本文描述的配置：

- 的组播组的数量每个客户端能监听被限制到16。一旦客户端发送与第17个组的*加入*请求，创建在Cisco IOS边发生，但是WCM边*传送拒绝*信息到Cisco IOS。组队的后者然后删除。
- 目前，支持仅IGMP版本2 (V2)。如果客户端使用IGMP版本3 (V3)，则MGID创建在控制器不发生。为此，在来源、组和VLAN，源地址总是0.0.0.0。
- 从4,160的NGWC范围支持到8,191 L3 MGIDs的数量。因为MGID条目是组播地址和VLAN的组合，只可以有4,000个这样组合。这在大环境里也许是一个限制。
- 不支持在VLAN间的*Bonjour*功能。这是因为IP地址224.0.0.251是本地链路组播地址。Cisco 5760和3850系列WLCs，类似其他Catalyst交换机，不监听本地链路地址。为此，您将看到此错误信息出现：

```
IGMPSN: group: Received IGMPv2 report for group 224.0.0.251 from Client 192.168.24.94
received on Vlan 32, port Ca93 with invalid group address.
```