无线控制器故障切换配置实例

目录

| 介绍 | |
|---------------------|---|
| 先决条件 | |
| 需求 | |
| 设备要求 | |
| 网络拓扑 | |
| 配置 | |
| 为多台 WLC 配置移动组 | |
| 为 LAP 指定主、备、第三台 WLC | 7 |
| 配置 WLC Fallback 特性 | |
| 验证 | 9 |
| | |
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介绍

本文档介绍配置多个无线控制器故障切换,又称作控制器冗余。当主控制器失效, 第二台控制器接替其工作而成为主控制器。

先决条件

需求

·熟悉Cisco瘦AP和WLC的基本操作

·熟悉瘦AP通信协议(LWAPP)

更多信息请参考文档 Understanding the Lightweight Access Point Protocol (LWAPP).

·熟悉配置外部DHCP服务器

设备要求

本文档使用以下软硬件版本:

·Cisco Aironet 1000 系列瘦AP (LAP)

·2台 Cisco 2000 系列控制器,软件版本为3.2.78.0

· Microsoft Windows Server 2003 Enterprise DHCP server

本文档同样适用于 Cisco 其他瘦 AP 和 WLC 产品。

网络拓扑

本文档网络使用以下结构:

2台Cisco2006控制器、1台LAP、1台外部DHCP服务器通过HUB连接,所有设备位于同一子网。LAP最初注册到主WLC上,需要对LAP和WLC进行必要的配置使当 主WLC故障时,LAP能够自动切换到备用WLC上,同时当主WLC恢复,LAP又可 以注册回主WLC,这需要在WLC上配置移动组和AP的切换特性。

Note: 本文档假设WLC已经进行基本的配置,并且LAP已经注册到主WLC上。关于 LAP注册到WLC的配置文档,请参考 Lightweight AP (LAP) Registration to a Wireless LAN Controller (WLC).



配置

为了实现WLC故障切换或冗余,必须完成以下步骤: 1.为两台WLC配置移动组. 2.为 LAP 指定主、备、第三台 WLC 3.WLC上配置fallback特性

为多台 WLC 配置移动组

通过配置移动组可以让无线客户端在一组 WLC 之间无缝漫游及提供负载均衡和冗余的功能。如果一台 WLC 故障,相关联的 AP 可以自动启动换到移动组中其他 WLC 上。当主 WLC 恢复正常, AP 可以重新注册到该台 WLC 上。故障切换时间为 30 秒,这个期间通信将会中断。

Note: 所有属于同一个移动组的 WLC 配置的移动组名字要一致,且大小写敏感。移动组成员必须包括该组内所有的 WLC,以确保可以做到 WLC 的无缝切换,以及当 主 WLC 恢复正常,能够让 AP 重新注册。

本实例移动组包括两台 WLC,通过以下步骤配置无线移动组:

1. WLC 图形界面下,在上方的菜单下点击进入 Controller,然后在左边菜单选择 Mobility Groups.

出现窗口 Static Mobility Group Members,在这里可以增加或者编辑移动组。

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| do do | MONITOR V | NLANS C | ONTROLLER | WIRELESS | SECURITY | MANAGEMENT | COMMANDS | HELP | |
| Controller | Static Mobili | ty Group I | Members | | | | | New | EditAll |
| General | Default M | obility Gro | up Test | | | | | \smile | |
| Inventory | MAC Adds | | TR Address | . , | and the second | | | | |
| Interfaces | PIAC AGO | 0.55 | 172 to 1 20 | | aroup same | | | | |
| Internal DHCP Server | 00:00:05:3 | 3:04:80 | 1/2.10.1.30 | (i | local) | | | | |
| Mobility Management Mobility Groups Mobility Statistics | | | | | | | | | |
| Ports | | | | | | | | | |
| Master Controller Mode | | | | | | | | | |
| Network Time Protocol | | | | | | | | | |
| QoS Profiles | | | | | | | | | |
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2. 增加一个新的移动组

本例只包括两台 WLC.

- a. 选择 New.
- b. 设定移动组成员 IP、MAC 以及组名称.

本实例第二台 WLC 的 IP 为 172.16.1.50 , MAC 地址为 00:0b:85:33:52:80, 移动组为 Test.

c. 点击 Apply.

以下为配置实例:

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| Conce Stateme | | | | | | | | onfiguration | | ogout Refresh |
| Acres | MONITOR | WLANS | CONTROLLER | WIRELESS | SECURITY | MANAGEMENT | COMMANDS | HELP | | |
| Controller | Mobility G | roup Men | nber > New | | | _ | | < Bac | k | Apply |
| General Inventory Interfaces | Member IP Member M | Address | 172.16.1.50 s 00:0b:85:33:5 | 2:80 | | | | | | |
| Mobility Management Mobility Groups Mobility Statistics | Group Nam | 58 | Test | | | | | | | |
| Ports Master Controller Mode | | | | | | | | | | |
| Network Time Protocol | | | | | | | | | | |
| QoS Profiles | | | | | | | | | | |
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3. 通过 Ping 菜单检测移动组成员的连通性.

Ping 功能在右上角, Ping 结果如下图所示:

| ÷••÷ © ⊇ ₫ © | B 8 3 | ù- 🌒 | | | | | | | 1 93 - 7 |
|---|-------------------------------|---|---|------------------------|-------------------------|-----------------------|--------------------|------|-----------------|
| dires Surress | MONITOR | WLANS | CONTROLLER | WIRELESS | SECURITY | MANAGEMENT | Save C COMMANDS | HELP | Logout Refre |
| Controller | Static Mob | ality Grou | p Members | | | | | New | EditAll |
| General Inventory Interfaces Internal DHCP Server Mobility Management Mobility Groups Mobility Statistics Ports Master Controller Mode Network Time Protocol QoS Profiles | Default MAC Ad 00:0b:85 | Nobility G dress 5:33:84:e0 5:33:52:80 | y Group Test IP Address Group Name a0 172.16.1.30 (Local) 80 172.16.1.50 Test <u>Remove Pine</u> | | | | | | |
| | | Microso | R Internet Diplor Reply received fr | er Con Mobility Peer : | 172.16.1.50 : (sr OK | nd count = 3, receive | × count = 3) | > | |
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在另一台 WLC 上重复以上步骤,组名字大小写敏感,并且在两台 WLC 上必须要一致。移动组主要用于支持在 WLC 内部以及 WLC 之间漫游。更多信息请参考 Overview of Mobility Groups section of Configuring Mobility Groups.

为 LAP 指定主、备、第三台 WLC

接下来的步骤为 LAP 指定主、备、第三台 WLC:

1. 图形界面下选择 Wireless 菜单,选择 AP 列表下的 AP, 点击 Detail

出现新的窗口 All APs > Details.

| | | | | | | Logout Ref |
|------------------------------|--|---|--|---|---|---|
| MONITOR WLANS (| CONTROLLER W | IRELESS SECURITY | MANAGEMENT | COMMANE | IS HELP | |
| All APs > Details | | | | | < Back | Apply |
| General | an Shith di | | Versions | | > 70.0 | |
| Ethernet MAC Address | 00:0b:85:5b:fb:d0 | 1 | Boot Version | 0.0 | 0.0.0 | |
| Base Radio MAC | 00:0b:85:5b:fb:d0 | | Inventory Inf | omation | | |
| Regulatory Domain | 80211bg: -A 8021 | 1a: -A | mventory m | ormation | | |
| AP IP Address | 172.16.1.42 | | AP Model | AP | 1010 | |
| AP Static IP | | | AP Certificate | Type Ma | chorsourv | |
| AP ID Admin Status | 3 Feable | | REAP Mode su | pported No | } | |
| AP Mode | local | 3 | | | | |
| Operational Status | REG | | | | | |
| Port Number | 1 | | | | | |
| AP Group Name | | | | | | |
| Location | default_location | | | | | |
| Primary Controller Name | WLC-1 | | | | | |
| Secondary Controller Name | WLC-2 | | | | | |
| Tertiary Controller Name | | | | | | |
| Statistics Timer | 180 | | | | | |
| Radio Interfaces | | | | | | |
| Number of Radio Interf | faces | 2 | | | | |
| Radio Interface Typ | pe Admin Status | Oper Status | Regulator | y Domain | | |
| 802.11a | Enable | UP | Supported | | | |
| 802.11b/g | Enable | UP | Supported | | | |
| Hardware Reset | | Set to F | actory Defaults | | | |
| | MONITOR WLANS All APs > Details General AP Name Ethernet MAC Address Base Radio MAC Regulatory Domain AP ID AP Static IP AP ID Admin Status Port Number AP Group Name Location Primary Controller Name Statistics Timer Radio Interfaces Number of Radio Interface Typ 802.11a 102.11b/g | MONITOR WLANS CONTROLLER W AII APs > Details General AP Name sp:Sb:fb:d0 Ethernet MAC Address 00:0b:85:Sb:fb:d0 Base Radio MAC 00:0b:85:Sb:fb:d0 Base Radio MAC 00:0b:85:Sb:fb:d0 Regulatory Domain 80211bg: -A 8021 AP ID 3 Admin Status Enable AP ID 3 Admin Status Enable Operational Status REG Port Number 1 AP Group Name | MONITOR WLANS CONTROLLER WIRELESS SECURITY AII APS > Details | MONITOR WLANS CONTROLLER WIRELESS SECURITY MANAGEMENT All APs > Details General Versions AP Name sp:Sb:fb:d0 S/W Version Ethernet MAC Address 00:0b:85:Sb:fb:d0 Boot Version Base Radio MAC 00:0b:85:Sb:fb:d0 Inventory Inf Regulatory Domain 00211bg: -A 802211a: -A AP Model AP IP Address 172:16.1.42 AP Seriel Num AP ID 3 AP Certificate AP ID 3 AP Certificate AP Mode Socal REAP Mode su Operational Status REG Port Number Operational Status REG Port Number Secondary Controller WLC-1 Name Name Secondary Controller WLC-2 Name 160 Statistics Timer 160 Radio Interfaces 2 Radio Interfaces 2 Radio Interface Type Admin Status Oper Status Regulator 802:11a Enable UP Supported 802:11a Enable UP Supported | ANDITION WLANS CONTROLLER WIRELESS SECURITY MANAGEMENT COMMAND All APs > Details General Versions 3.3 AP Name spi5b:fb:d0 S/W Version 3.3 Ethernet MAC Address 00:0b:85:5b:fb:d0 Boot Version 0.1 Base Radio MAC 00:0b:85:5b:fb:d0 Boot Version 0.1 Base Radio MAC 00:0b:85:5b:fb:d0 Inventory Information AP IP Address 172:16:1.42 AP Serial Number With AP Certificate Type AP ID 3 AP Certificate Type Me AP Node Socal REAP Mode supported No Operational Status REG Port Number 1 AP Group Name Image Image No Statistics Timer 180 Statistics Timer 180 Statistics Timer 180 Supported Supported 802:11a Enable UP Supported 802:124 Enable UP Supported 802:124 Enable UP Supported | MANITOR WLANS CONTROLLER WIRELESS SECURITY MANAGEMENT COMMANDS HELP All APs > Details |

2. 在该窗口下,定义主、备、以及第三台 WLC。.

Note: 在主、备、第三台 WLC 下输入相关 WLC 的名字,而不是输入 IP 或 MAC.

Note: 本列只包括主、备 WLC

配置 WLC Fallback 特性

最后一步是配置 WLC Fallback 特性:

- 1. WLC 图形界面下进入 Controller > General.
- 2. 在 AP Fallback 选项,选择 Enabled
- 3. Click Apply.

Note: 在备用 WLC 上配置 Fallback 特性即可。既便如此,建议在所有 WLC 上配置 Fallback 特性,因为,主 WLC 同样可以作为其他 AP 的备用 WLC。

| ann fersen | | | | Save Co | infiguration Pilig | Logout Refresh |
|---|---------------------------------|------------|--------------------|-----------------|----------------------|----------------|
| A. A. Conservation | MONITOR WLANS CONTROLLER | WIRELESS S | ECURITY MANAGEME | NT COMMANDS | HELP | |
| Controller | General | | | | | Apply |
| General | 802.3x Flow Control Mode | Disabled 💌 | | | | |
| Inventory Interfaces | LWAPP Transport Mode | Layer 3 💌 | (Current Operating | Mode is Layer3) | | |
| Internal DHCP Server Mobility Management | Ethernet Multicast Mode | Disabled . | | | | |
| Mobility Groups Mobility Statistics | Aggressive Load Balancing | Disabled . | | | | |
| Ports Master Controller Mode | Peer to Peer Blocking Mode | Disabled . | | | | |
| Network Time Protocol | Over The Air Provisioning of AP | Enabled 😧 | | | | |
| QoS Profiles | AP Fallback | Enabled . | | | | |
| | Fast SSID change | Disabled . | | | | |
| | Default Mobility Domain Name | Cisco | | | | |
| | RF-Network Name | Cisco | | | | |
| | User Idle Timeout (seconds) | 300 | | | | |
| | ARP Timeout (seconds) | 300 | | | | |
| | Web Radius Authentication | PAP * | | | | |
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至此 WLC 故障切换配置完成。当主 WLC(本例为 WLC-1)出现故障, AP 会自动注册 到 WLC-2 上,当 WLC-1 恢复正常, AP 便重新注册到 WLC-1 上,主、备 WLC 的切换 同样会影响 AP 上的客户端。

验证

本节用来验证配置.

<u>Output Interpreter Tool</u>(注册用户)(OIT)支持某些 show 命令. 使用该工具 查看相关 SHOW 命令的输出信息。

关闭主 WLC 的电源, AP 默认需要 30 秒钟通过心跳来判断主 WLC 失效, 30 秒后, AP 再发送 7 次心跳信息,每次一秒钟,用以发现备用 WLC,如果仍然没有收到主 WLC 的回复, AP 会注册到可用的 WLC 上。因此, AP 注册到备用 WLC 上需要将近 80 秒的时间。AP 注册到备用 WLC 上以后,仍然查询主 WLC 的状态,可以通过命令 debug lwapp client packet 查看相关信息.

Note: 心跳报文类似 Keep alive 报文。AP 心跳默认为 30 秒,这个时间可以调 节,最低为 1 秒。

下图显示 AP 注册到备用 WLC 上:

| | Q B 8 Q D B | | | | | | | - | h firm | - | - | |
|---|--------------------------------------|---|---------|----------------|-----------|--|------------------|-------------------|------------|---------|----|--|
| CO STOTEME | | | | | | | Save C | | | | | |
| handha | MONITOR WLAN: | : COM | TROLLER | WIRELESS | SECURITY | MANAGEMENT | COMMANDS | HELP | | | | |
| onitor | Summary | | | | | | | | | | | |
| mmary atistics Controller | Controller Summ Management IP Add | ary | 172.16 | 5.1.50 | | Rogue S | ummary | | 0 | Datal | | |
| orts . | Software Version | | 3.2.78 | .0 | | Active Ro | ogue Clients | | 0 | Datail | | |
| oque APs | System Name | | WLC-2 | \geq | | Adhee Re | ague cherics | | 0 | Datail | | |
| nown Rogue APs | Up Time | | 0 days | , 0 hours, 4 r | minutes | Request | oyues | | • | 1022023 | | |
| due Clients | System Time | | Thu Ma | ar 30 16:11:0 | 4 2006 | Rogues o | in wired wetwork | | | | | |
| 02.11a Radios | 802.11a Network St | ate | Enable | rd | | | | | | | | |
| B02.11b/g Radios Clients RADIUS Servers | 802.11b/g Network | State | Enable | d | Top WLANs | | | | | | | |
| | | | | | WLAN | | | # of Cl by SSI | ients D | | | |
| | Access Point Sur | nmary | | | cisco123 | | | 0 | Deta | uil (| | |
| | | Total | Up | Down | 1 | | | | | | | |
| | 802.11a Radios | 802.11a Radios 1 🕒 1 🖶 0 Detail Most Recent Traps | | | | | | | | | | |
| | 802.11b/g Radios | 1 | • 1 | • • | Detail | | | | | | | |
| | All APs | 1 | • 1 | • • | Detail | AP's Interface:1(802.11b) Operation State Up: Base Rac | | | | | 1 | |
| | | | | | | AP's Interface:0(802.11a) Operation State Up: Base Rac | | | | | | |
| | Client Summary | | | | | AP Associated. Base Radio MAC: 00:0b:85:5b:fb:d0 | | | | | | |
| | chun cumur, | | | | | Cold Start: | | | | | | |
| | Current Clients | | 1 | | Detail | Link Up: Slot: 0 Port: 1 | | | | | | |
| | Excluded Clients | | 0 | | Detail | | | | | View A | đ. | |
| | Disabled Clients | | 0 | | Detail | | | | | | | |
| | | | | | | This page | refreshes every | 30 seconds. | | | | |



当主 WLC(WLC-1) 恢复正常, AP 又重新注册到 WLC-1 上, 如下所示

| * • * • 🔘 🖸 🖄 | 0.0000 |) | | | | | | | | - 19 - | 0> |
|--|---|-------------------|----------------------------|-------------------------|-------------------------------------|--------------------------|-------------------|-------------|-------------------|------------|------|
| Cieco Statema | | | | | | | Save C | | | Logout Re | fres |
| A. A. | MONITOR WLAN | s con | ITROLLER | WIRELESS | SECURITY | MANAGEMENT | COMMANDS | HELP | | | |
| Monitor | Summary | | | | | | | | | | |
| Summary Statistics Controller Ports Wireless Rogue APs | Controller Sumn Management IP Ad Software Version | nary fress | 172.16 3.2 78 | .1.30 | Rogue Summary Active Rogue APs 0 | | | | | | |
| | System Name | System Name WLC-1 | | | | | | | 0 | Detail | |
| Known Rogue APs | Up rime | | 0 doys | , 0 hours, 0 r | ninutes | Roques o | n Wired Network | e 1 | 0 | | |
| Roque Clients Adhoc Roques 802.11a Radios 802.11b/g Radios Clients RADIUS Servers | System Time 802.11a Network S 802.11b/g Network | tate State | Thu Ma Enable Enable | ar 30 13:35:5 d d | 6 2006 | Top WLANs | | | | | |
| | Access Boint Bu | | | | | WLAN | | | # of Cl by SSI | ients D | |
| | Access Point Su | mmary | | | | Cisco123 | 1 | | 0 | Detail | |
| | | Total | Total Up | | | | | | | | |
| | 802.11a Radios | 1 | • 1 | • 0 | Detail | Most Recent Traps | | | | | |
| | 802.11b/g Radios | 1 | • 1 | • 0 | Detail | | | | | | |
| | All APs | 1 | • 1 | • 0 | Detail | AP Asso | b:fb:d0 | | | | |
| | | | | | | Cold Start: | | | | | |
| | Client Summary | | | | | Link Up: Slot: 0 Port: 1 | | | | | |
| | | | | | | Link Do | wn: Slot: 0 Port: | 1 | | | |
| | Current Clients | | 0 | | Detail | View | | | | | |
| | Excluded Clients | | 0 | | Detail | | | | | | |
| | Disabled Clients | | 0 | | Detail | This page | refreshes every | 30 seconds. | | | |
| | | | | | | | | | | | |

可以通过命令 show ap summary 查看 AP 注册到 WLC 上,如下:

(Cisco Controller) >show ap summary

AP Name Slots AP Model Ethernet MAC Location Port ap:5b:fb:d0 2 AP1010 00:0b:85:5b:fb:d0 default_location

排错

Note:使用 Debug 命令前,请参考 Important Information on Debug Commands

命令 debug lwapp client packet 显示 AP 向 WLC 发送的 controller 查找信息

```
Cisco Controller) > debug lwapp client packet
*Feb 25 02:12:55.743: Sent Msg Type : ECHO_REQUEST
```

*Feb 25 02:12:55.743: Msg Length : 12

*Feb 25 02:12:55.743: Msg SeqNum : 48

*Feb 25 02:12:55.744: Sent Msg Type : PRIMARY_DISCOVERY_REQ

*Feb 25 02:12:55.744: Msg Length : 27

*Feb 25 02:12:55.744: Msg SeqNum : 0

*Feb 25 02:12:55.744: Recd Msg Type : ECHO_RESPONSE

*Feb 25 02:12:55.744: Msg Length : 0

*Feb 25 02:12:55.745: Msg SeqNum : 48

*Feb 25 02:12:55.745: LWAPP_CLIENT_PACKET_DEBUG: SPAM received ECHO_RESPONSE

*Feb 25 02:12:55.745: Recd Msg Type : PRIMARY_DISCOVERY_RES

*Feb 25 02:12:55.746: Msg Length : 27

*Feb 25 02:12:55.746: Msg SeqNum : 0

*Feb 25 02:12:55.746: LWAPP_CLIENT_PACKET_DEBUG: SPAM received PRIMARY_DISCOVERY_RES

通过 debug 命令对配置进行排错:

- **debug lwapp events enable**—显示 AP 注册到 WLC 上的相关信息
- **debug lwapp errors enable**—显示 LWAPP 的错误信息.
- **debug dhcp message enable**—显示 DHCP server 的相关信息.
- **debug dhcp packet enable**—显示 DHCP server 的收发信息.

有时,同一移动组下的瘦 AP 被其他 WLC 认为是非法 AP,这是一个 bug. bug ID 为 <u>CSCse87066</u>(注册用户使用).这会发生在以下两种情况下:

- 1. AP 有多于 24 个邻居, 而 AP 最多支持 24 个, 其余的将视为非法 AP。
- 2. AP1 可以发现注册到 AP2 上的客户端,但是无法发现 AP2,因此无法将 AP2 当做一个邻居。

解决方式为在 WLC 或者 WCS 上手动配置 AP known internal, 配置步骤如下:

- 1. WLC 图形界面下选择 Wireless.
- 2. 在左边菜单下点击 Rogue Aps.
- 3. 在非法 AP 下点击 Edit.
- 4. 在 Update Status 菜单下选择 Known internal , 点击 Apply.