# AirGroup最佳实践

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# AirGroup部署模式

➢ MM+MD网络架构

- Aruba推荐采用Centralized mode

- 可以采用Centralized/Distributed混合模式，MD Cluster采用Centralized mode，单台MD采用Distributed mode

- 官方不支持Cluster下的Distributed mode

- 官方不支持MM+MD架构下的AirGroup Domain，也就是MM+MD架构下单台MD可以开启Distributed mode，但是不能配置Domain，两台Distributed mode的MD之间的server和user不能发现

➢ Standalone Controller网络架构

- Distributed mode

- 支持AirGroup Domain

# AirGroup Island（Centralized mode）

➢ 大型互联网企业推荐采用centralized mode + island模式，位于不同island的server和user之间不能发现

 - island是基于控制器的airgroup config path来区分的

 - 建议每个职场单独开启airgroup，并调用不同的airgroupprofile

```
(MM1) *[md] (config) #show airgroup switches

Showing AirGroup switches under /md

AirGroup Switch table
---------------------
Mac                 IP           Node path                    Config path   Active Profile    Centralised/Distributed
---                 --           ---------                    -----------   --------------    -----------------------
00:0b:86:9a:fa:77   10.1.30.100  /md/lab/00:0b:86:9a:fa:77    /md/lab       centralized_lab   Centralised
00:0b:86:9b:78:77   10.1.30.101  /md/lab/00:0b:86:9b:78:77    /md/lab       centralized_lab   Centralised
00:0b:86:9a:fa:f7   10.1.30.102  /md/test/00:0b:86:9a:fa:f7   /md/test      centralized_test  Centralised
Num Switches:3
```
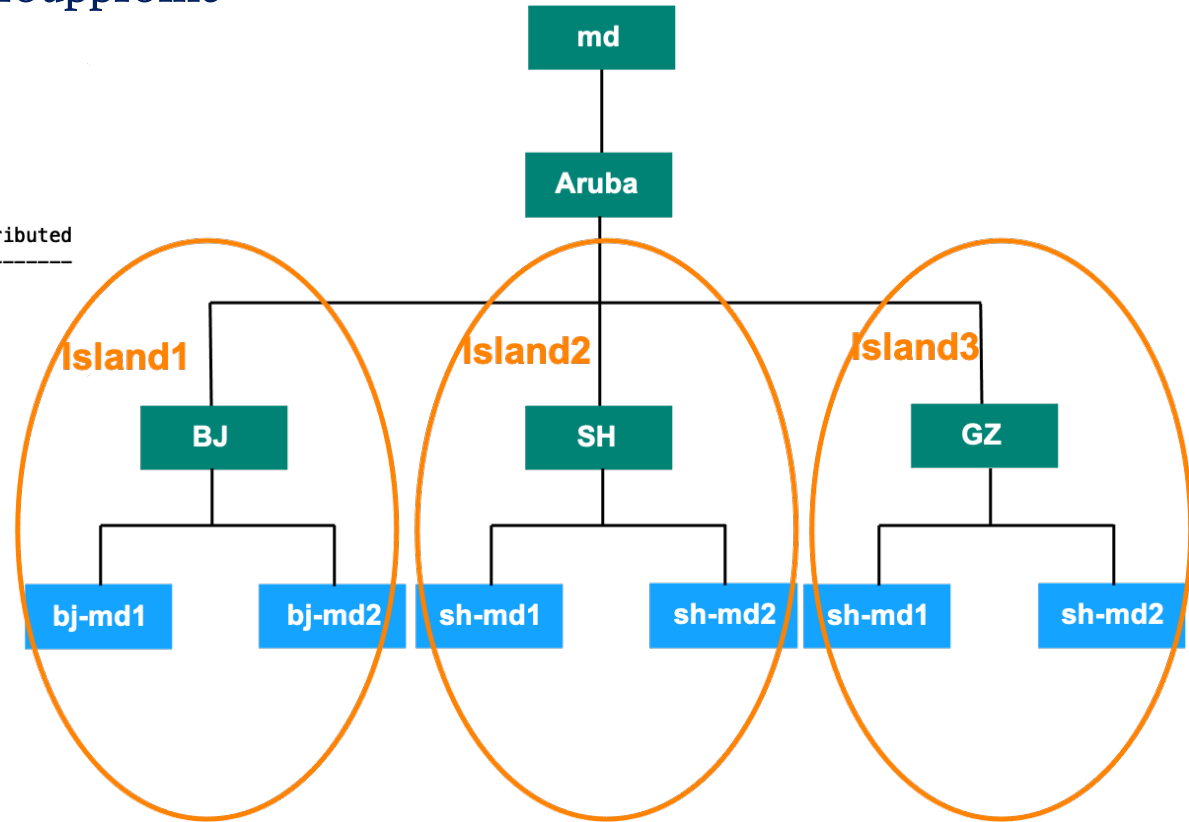
# AirGroup容量限制

**Scalability**

AirGroup can scale to support up to 100,000 devices in which up to 17,000 servers can exist.

In centralized mode, on Mobility Master, the mDNS packet limit is 1750 pps.

In mixed mode, the mDNS packet limit of 1750 pps applies only for centralized mode. The mDNS packet limit for the platforms depends on controller model (see Table 250).

| Stand-alone Controller Model | Number of AirGroup Servers | Number of AirGroup Users |
|---|---|---|
| 7240 | 10000 | 20000 |
| 7220 | 7000 | 15000 |
| 7210 | 5000 | 10000 |
| 7205 | 2000 | 6000 |
| 7030 | 1000 | 3000 |
| 7024 | 600 | 1400 |
| 7010 | 500 | 1500 |
| 7005 | 300 | 700 |

| Stand-alone Controller Model or Distributed Mode | mDNS packets per second (pps) |
|---|---|
| 7280 | 150 |
| 7240 | 150 |
| 7220 | 90 |
| 7210 | 90 |
| 7205 | 60 |
| 7030 | 75 |
| 7024 | 75 |
| 7010 | 45 |
| 7005 | 45 |

# AirGroup pps评估方法

➢ 单独针对一个group开启AirGroup Distributed或者Centralized，Distributed在控制器上通过show airgroup internal-state statistics查看airgroup相关统计，会分别显示MDNS和DLNA的报文统计，opcode 193中Recv Since Last Read会记录mdns/dlna从上次运行此命令到现在增加的报文数，如mdns为（user和server发送的mdns报文总和），通过AirRecorder周期性（如每5秒一次）运行此命令，即可统计此周期内的平均pps（需计算mdns和dlna的总和），Centralized在/md节点下查看MDNS和DLNA的SDN统计报文数

```
(MC1) #show airgroup internal-state statistics

RADIUS Client Messages
----------------------

Type                      Sent Since Last Read    Sent Total    Recv Since Last Read    Recv Total
----                      --------------------    ----------    --------------------    ----------
Auth Req/Resp             0                       0             0                       0
RFC3576                   N/A                     N/A           0                       0
CPPM Device-Entry Added   N/A                     N/A           0                       0
CPPM Device-Entry Deleted N/A                     N/A           0                       0

MDNS Messages
-------------

Opcode  Name                          Sent Since Last Read  Sent Total  Recv Since Last Read  Recv Total
------  ----                          --------------------  ----------  --------------------  ----------
193     N/A                           0                     0           61897                 61897
Rx      Request                       N/A                   N/A         61897                 61897
Rx      Response                      N/A                   N/A         0                     0
Tx      Request-Refresh               0                     0           N/A                   N/A
Tx      Request-discovery             0                     0           N/A                   N/A
Tx      Request-wildcard              0                     0           N/A                   N/A
Tx      Response-Solicited            0                     0           N/A                   N/A
Tx      Response-Solicited-Fragment   0                     0           N/A                   N/A
Tx      Response-Unsolicited          0                     0           N/A                   N/A
Tx/Rx   Total                         61897                 0           N/A                   N/A
```

```
(MM1) *[md] (config-submode)#show airgroup internal-state statistics mdns

RADIUS Client Messages
----------------------

Type                      Sent Since Last Read    Sent Total    Recv Since Last Read    Recv Total
----                      --------------------    ----------    --------------------    ----------
Auth Req/Resp             0                       0             0                       0
RFC3576                   N/A                     N/A           0                       0
CPPM Device-Entry Added   N/A                     N/A           0                       0
CPPM Device-Entry Deleted N/A                     N/A           0                       0

MDNS Messages
-------------

Opcode  Name                          Sent Since Last Read  Sent Total  Recv Since Last Read  Recv Total
------  ----                          --------------------  ----------  --------------------  ----------
-       SDN                           0                     0           46                    48
-       Duplicate drop                N/A                   N/A         0                     0
Rx      Request                       N/A                   N/A         32                    34
Rx      Response                      N/A                   N/A         14                    14
Tx      Request-Refresh               0                     0           N/A                   N/A
Tx      Request-discovery             0                     0           N/A                   N/A
Tx      Request-wildcard              0                     0           N/A                   N/A
Tx      Response-Solicited            0                     0           N/A                   N/A
Tx      Response-Solicited-Fragment   0                     0           N/A                   N/A
Tx      Response-Unsolicited          0                     0           N/A                   N/A
```

# AirGroup部署最佳实践

➤ 规划AirGroup部署模式（Centralize/Distributed）
- Distributed - 适用于MD和MM为WAN连接，MD和MM之间不能保证有效传输带宽
- Centralized - 适用于园区网，或者MD和MM能够保证有效传输带宽

➤ 了解AirGroup规模和service
- 规模 – airgroup servers和airgroup users数量，pps，需要的service
- 测试用户应用是否可以被airgroup识别，以及识别到的service
- 仅开启需要的services（如default-airplay），一定不要使用allowall service，未开启的service不会占用pps
- 评估pps

➤ 有线airgroup server
- 有线airgroup server所处vlan不能同时跨多个Island，因为收到server组播包的所有MD都会向MM转发，MM会Drop重复报文只保留一份，所以server只会属于唯一的Island，其它Island的user无法发现该server
- 尽量避免采用有线airgroup server，因为会导致多台MD向MM转发该server组播包，会增加pps
- 当有线airgroup server数超过50个时，推荐采用ClearPass来限制能够发现此server 的user

# AirGroup部署最佳实践

➢ 将所有不需要airgroup的vlan和role都添加到disallowed vlan/role中

   - 可以分别设置server/user的disallowed vlan/role

   - 此配置可以减少airgroup server/users的数量，但是<span style="color:red">不会降低pps</span>

➢ 建议只在需要airgroup的role下开启mdns/ssdp，其它role全部禁用mdns/ssdp，此配置<span style="color:red">可以降低pps</span>

➢ IPv4/IPv6双栈下，终端的mdns/ssdp会增加一倍，如果不需要IPv6下的airgroup，airgroupprofile中ipv6保持为空（设置为default会开启ipv6 airgroup），未开启ipv6，MD不会通过openflow转发组播报文，<span style="color:red">可以降低pps</span>

➢ 建议开启autoassociation ap-name（仅限wireless server）或者开启基于AP-Name的airgroup server sharing，从而降低user request的响应时延，特别是airgroup server数较多时（超过200台）

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# Airgroup Location Based Sharing介绍

| Location Attribute | Tag=Value Format | Description |
|---|---|---|
| AP-Name based | ap-name=<name> | When the location is set to ap-name, all AirGroup users connected to this AP and to APs which are in the same RF neighborhood can access the shared device. |
| AP-Group based | ap-group=<group> | When the location attribute is set to ap-group, all AirGroup users associated to APs in the specified AP group can access the shared device. |
| AP-FQLN based | fqln=<fqln> | When the location attribute is set to ap-FQLN, all AirGroup users connected to APs on the same floor, and to the APs on a floor above or below the configured APs can access the shared device. |

基于location进行airgroup server device share时：

1. 如果配置为基于ap-name，那么连接到指定的ap-name以及这些ap的相邻ap-name的airgroup user都可以发现该airgroup server。

2. 如果配置为基于ap-group，那么只有连接到指定ap-group下的ap的airgroup user才可以发现airgroup server。

3. 如果配置为基于AP FQLN，那么连接到与指定AP FQLN位于相同floor number以及相邻floor（即楼上和楼下）的AP的airgroup client都可以发现该airgroup server。