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mDNS Implementation

Laerdal Medical Cisco WLC AirOS

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1 Deployment Considerations

Bonjour protocol operates on service announcements and service queries which allow devices to ask and advertise specific applications such as:

- SimMan3G
- Patient Monitor
- LinkBox
- Session Viewer
- iTunes Wireless iDevice Syncing
- •

Each query or advertisement is sent to the Bonjour multicast address for delivery to all clients on the subnet. Apple's bonjour protocol relies on mDNS operating at UDP port 5353 and each query or advertisement are sent to the following reserved group addresses:

- IPv4 Group Address 224.0.0.251
- IPv6 Group Address FF02::FB

The addresses used by the Bonjour protocol are link-local multicast addresses and thus are only forwarded on the local L2 domain. Routers cannot use multicast routing to redirect the traffic because the time to live (TTL) is set to one, and link-local multicast is meant to stay local by design.



1.1 Cisco Wireless LAN Controller (WLC)

On the Cisco Wireless LAN Controller the Bonjour services are not advertised by default on access points that are configured in the mode local. In order for the WLC to advertise the mDNS services that the Laerdal Medical simulation devices advertise. The custom mDNS strings must be added to the WLC configuration.

The following outlines how to add mDNS strings to the WLC:



1.2 General Panel

Under the General Panel custom mDNS service strings can be added.

Controller	mDNS						
General Icons Inventory Interfaces Interface Groups Multicast Network Routes Redundancy Internal DHCP Server	Global Configuration mDNS Global Snooping mDNS Policy 1 Query Interval (10-120) Master Services Database Select Service Query State		(mins)				
 Mobility Management Ports NTP CDP PMIPv6 	Query Status LSS Status Origin ALL Add		Query	LSS			
Tunneling	Service Name	Service String	Status	Status	Origin		
▶ TPv6	AirPrint	_ipptcp.local.	<		ALL	~	-
	AirTunes	_raoptcp.local.	~		ALL	~	-
mDNS General	AppleTV	_airplaytcp.local.	✓		ALL	~	-
Profiles	HP Photosmart Printer 1	_universalsubipptcp.local.	~		ALL	~	-
Domain Names	HP Photosmart Printer 2	_cupssubipptcp.local.	<		ALL	~	-
mDNS Browser mDNS Policies	Printer	_printertcp.local.	<		ALL	~	-
Advanced	1. If global mDNS access policy is e	nabled, LSS will be ignored.					

Controller	mDNS										
General											
Icons	Global Configuration	Global Configuration									
Inventory											
Interfaces	mDNS Global Snooping										
Interface Groups	mDNS Policy 1										
Multicast	Query Interval (10-120)	15	(mins)								
Network Routes											
Redundancy	Master Services Database										
Internal DHCP Server	Select Service	✓ None									
Mobility Management	Query Status	AirTunes Apple File Sharing Protocol(AFP)									
	LSS Status	Scanner									
Ports		FTP									
▶ NTP		NFS iTunes Music Sharing									
▶ CDP	Add	iTunes Wireless Device Syncing									
PMIPv6		Apple Remote Desktop									
Tunneling	Service Name	Apple CD/DVD Sharing	Query Status	LSS Status	Origin						
h TDv6	AirPrint	Other	<		ALL	~	-				
F IPVO	AirTunes	_raoptcp.local.	~		ALL	~	-				
▼ mDNS	AppleTV	_airplaytcp.local.	Z		ALL	~	-				
Profiles	HP Photosmart Printer 1	_universalsubipptcp.local.	<		ALL	~	-				
Domain Names	HP Photosmart Printer 2	_cupssubipptcp.local.	<		ALL	~	-				
mDNS Browser mDNS Policies	Printer	_printertcp.local.	<		ALL	~	-				

Select other from the drop down menu and enter the custom mDNS service information.

To enable mDNS advertisements "mDNS Global Snooping" must be enabled.

Note: Origin by default is set to "ALL" which includes wired and wireless connections.

mDNS Global Snooping						
mDNS Policy ¹						
Query Interval (10-120)	1	5 (mins)				
laster Services Database						
Select Service	Other					
Service Name	Screen_Capture					
Service String	_httptcp.local.					
Query Status 🗹						
LSS Status						
Origin V ALL WIRELESS WIRED	•					
Service Name	Service String	Query Status	LSS Status	Origin		
AirPrint	_ipptcp.local.	<		ALL	~	•
AirTunes	_raoptcp.local.	 ✓ 		ALL	~	,
AppleTV	_airplaytcp.local.	 ✓ 		ALL	~	•
HP Photosmart Printer 1	_universalsubipptcp.loc	al. 🗹		ALL	~	•
	_cupssubipptcp.local.	✓		ALL	~	•
HP Photosmart Printer 2						

Important Note: All mDNS service strings that are entered on the WLC must include the ".local." ending to be consider a valid service string.

After the custom service has been added to the WLC. The next step is to add the mDNS service to a mDNS profile. This mDNS profile must be associated to the wireless network that will be used by the simulation devices.

Service Name	Service String	Query Status	LSS Status	Origin		
AirPrint	_ipptcp.local.	<		ALL	~	•
AirTunes	_raoptcp.local.	<		ALL	~	•
<u>AppleTV</u>	_airplaytcp.local.	<		ALL	~	
HP_Photosmart_Printer_1	_universalsubipptcp.local.	<		ALL	~	
HP_Photosmart_Printer_2	_cupssubipptcp.local.	<		ALL	~	•
Printer	_printertcp.local.	<		ALL	~	•
Screen Capture	_httptcp.local.	<		ALL	~	-

1.3 mDNS Profile

Select profile link under mDNS. On the profile panel you can add the custom mDNS services to an existing or create a new mDNS profile.

uluili. cisco	MONITOR	<u>W</u> LANs	<u>C</u> ONTROLLER	WIRELESS	<u>S</u> ECURITY	M <u>A</u> NAGEMENT	C <u>O</u> MMANDS	HELP	<u>F</u> EEDBACK
Controller	mDNS Pr	ofiles							
General Icons	Number of P	Profiles 2							
Inventory	Profile Na	me				No. Of Serv	vices		
Interfaces	SimProfile					0			
Interface Groups	default-md	ns-profile				6			
Multicast									
Network Routes									
Redundancy									
Internal DHCP Server									
Mobility Management									
Ports									
▶ NTP									
▶ CDP									
PMIPv6									
Tunneling									
▶ IPv6									
mDNS General Profiles Domain Names mDNS Browser									

Select the mDNS Profile link to open it. Then select the custom mDNS service from the dropdown menu then click add. Repeat this process until all the services you would like advertised on the network have been added to the mDNS profile.

Controller	mDNS Profile > Edit				
General Icons Inventory Interfaces Interface Groups	Profile Name Profile Id Service Count No. of Interfaces Attached Interfaces		SimProfile 1 0 0		
Network Routes	No. of Interface Groups Attache	d	0		
 Redundancy Internal DHCP Server 	No. of Wlans Attached		0		
Mobility Management Ports	Wlan Ids No. of Guest Lans Attached		0		
 NTP CDP 	Guest Lan Ids No. of Local Policies Attached		0		
PMIPv6Tunneling	Local Policy Ids				
▶ IPv6	Services List				
 mDNS General Profiles Domain Names mDNS Browser mDNS Policies 	Service Name Service Name	 ✓ AirPrint AirTunes AppleTV HP_Photosmart_Printer_1 HP_Photosmart_Printer_2 Printer 			
Advanced		Screen_Capture			

1.4 Associate mDNS Profile with SSID

The final step is to select WLAN ->SSID->Advanced tab and in the mDNS section select the correct mDNS profile to add it to the wireless SSID.

Click save to s	ave the settin	gs.		
<u>MONITOR</u> <u>W</u> LANS <u>C</u> ON	ITROLLER WIRELESS	ECURITY MANAGEMENT	- C <u>O</u> MMANDS HE <u>L</u> P <u>F</u> EEDBACK	
WLANs > Edit 'SIMUI	LATOR_SSID'			
General Security	QoS Policy-Mappin	g Advanced		
Central Assoc	Enabled		PMIP Profile	None V
Lync			PMIP Realm	
Lync Server	Disabled 🗸		Universal AP Admin Support	
11k			Universal AP Admin	
Neighbor List	Enabled		11v BSS Transition Support	
Neighbor List Dual Band	Enabled		BSS Transition	
			Optimized Roaming Disassociation Timer(0 to 40 TBTT)	40
			BSS Max Idle Service	
			Directed Multicast Service	
			Tunneling	
			Tunnel Profile	None V
			mDNS	1
			mDNS Snoopi SimProfile	Enabled
			mDNS Profile 🗸 default-mdns-profile	
			TrustSec	
			Security Group Tag	0
			OpenDNS	
Post Notes				
mDNS				
mDNS Snooping		🗹 Er	abled	
mDNS Profile Sin	nProfile 💙			