



Test Multicast Routing

Tool To Assist Network Testing of Multicast Routing

Version 02

August 4, 2011

detect. notify. activate.TM

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Before You Begin

Future Functionality

This tool is provided as a good faith effort to help with a specific need. There is no guarantee that this tool will continue to function as ongoing development and changes occur. There could come a time where a software change made causes this tool not to function as it does today.

Software Upgrades

Because this tool is a good faith effort to provide some add on functionality it cannot be assumed that this tool will function with future versions of Singlewire Applications. Product enhancements and development could change an application in such a way that this tool would cease to function properly.

Technical Support

Because this tool is a good faith effort to provide some add on functionality, Singlewire Technical Support cannot provide assistance with the configuration of the tool. The tool is offered “as is”.

Overview

How The Tool Works

The tool can operate in three different ways:

- Multicast Server – transmit multicast packets on the network
- Multicast Client – listen and receive multicast packets on the network
- Two Phone Send & Receive – send commands to two Cisco IP phones telling one phone to transmit multicast audio packets and the other phone to listen for those multicast packets.

Nothing to Install

The tool is a self contained executable and does not install any software. To run the tool, double click the exe. A window will appear with menu choices.

Advanced Custom Configuration

The tool defaults to using the following values for its multicast traffic:

- IP Address – 239.0.1.2
- UDP Port – 20480
- TTL – 16

The values above are what Singlewire InformaCast defaults to for its audio traffic. To use values other than the above, type the word “custom” at the menu prompt of the tool.

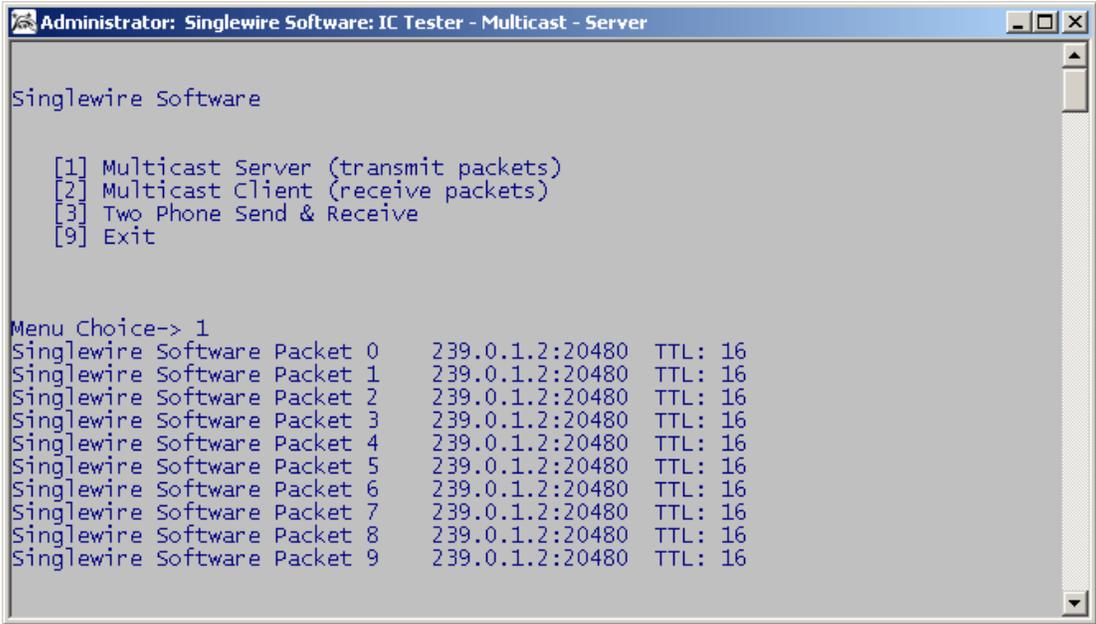
Run The Tool

The tool can be obtained from the Singlewire website. Once downloaded unzip the file and read the accompanying documentation. To run the tool, double click the exe. A menu will appear with choices on how to run the tool. To stop the tool, you can do the following:

- Choose 9 at the menu selection.
- Press “CTRL+C”.
- Close the window of the tool.

Multicast Server

This option is used in conjunction with the “Multicast Client” option. Use the “Multicast Server” option to transmit multicast traffic on the network.



```
Administrator: Singlewire Software: IC Tester - Multicast - Server

Singlewire Software

[1] Multicast Server (transmit packets)
[2] Multicast Client (receive packets)
[3] Two Phone Send & Receive
[9] Exit

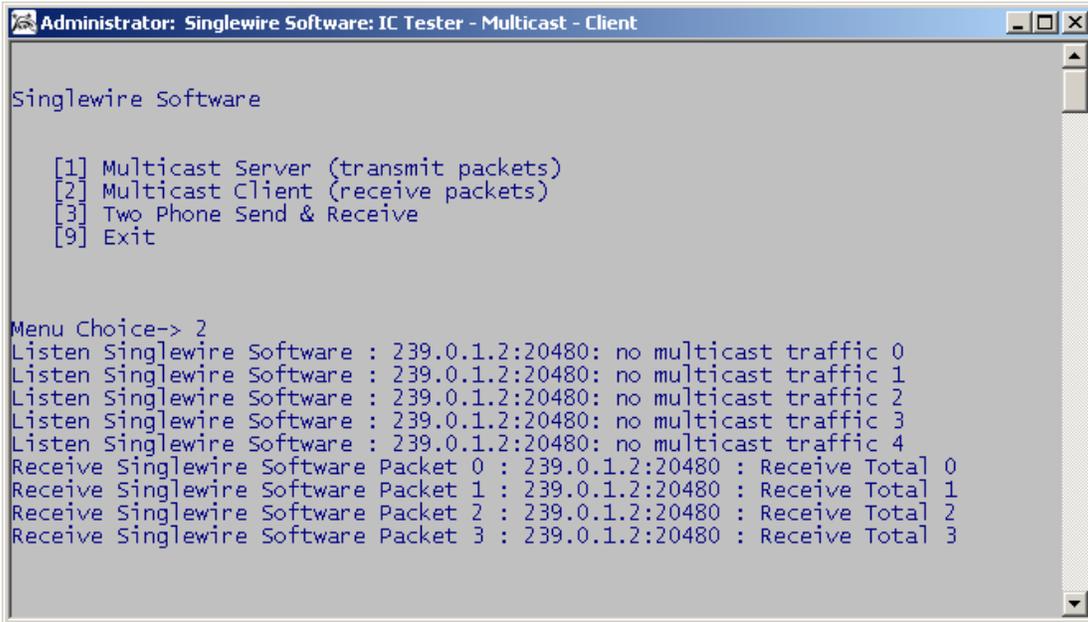
Menu Choice-> 1
Singlewire Software Packet 0 239.0.1.2:20480 TTL: 16
Singlewire Software Packet 1 239.0.1.2:20480 TTL: 16
Singlewire Software Packet 2 239.0.1.2:20480 TTL: 16
Singlewire Software Packet 3 239.0.1.2:20480 TTL: 16
Singlewire Software Packet 4 239.0.1.2:20480 TTL: 16
Singlewire Software Packet 5 239.0.1.2:20480 TTL: 16
Singlewire Software Packet 6 239.0.1.2:20480 TTL: 16
Singlewire Software Packet 7 239.0.1.2:20480 TTL: 16
Singlewire Software Packet 8 239.0.1.2:20480 TTL: 16
Singlewire Software Packet 9 239.0.1.2:20480 TTL: 16
```

The tool will transmit multicast traffic to address 239.0.1.2 on port 20480 with a TTL of 16. These are the default values that Singlewire InformaCast uses for its audio traffic.

By running this tool on the server where Singlewire applications will be installed you will be able to verify if the multicast traffic can route from the server itself, across the network, and can be received by the needed endpoints.

Multicast Client

This option is used in conjunction with the “Multicast Server” option. Use the “Multicast Client” option to request multicast traffic on the network, and verify that it is received.



```
Administrator: Singlewire Software: IC Tester - Multicast - Client

Singlewire Software

[1] Multicast Server (transmit packets)
[2] Multicast Client (receive packets)
[3] Two Phone Send & Receive
[9] Exit

Menu Choice-> 2
Listen Singlewire Software : 239.0.1.2:20480: no multicast traffic 0
Listen Singlewire Software : 239.0.1.2:20480: no multicast traffic 1
Listen Singlewire Software : 239.0.1.2:20480: no multicast traffic 2
Listen Singlewire Software : 239.0.1.2:20480: no multicast traffic 3
Listen Singlewire Software : 239.0.1.2:20480: no multicast traffic 4
Receive Singlewire Software Packet 0 : 239.0.1.2:20480 : Receive Total 0
Receive Singlewire Software Packet 1 : 239.0.1.2:20480 : Receive Total 1
Receive Singlewire Software Packet 2 : 239.0.1.2:20480 : Receive Total 2
Receive Singlewire Software Packet 3 : 239.0.1.2:20480 : Receive Total 3
```

The tool will send an IGMP version 2 request to the network for traffic on IP address 239.0.1.2 and will listen on port 20480. These are the default values that Singlewire InformaCast uses for its audio traffic. If no traffic is present the tool will state that is in the “Listen” state and has found “no multicast traffic”. When the tool sees the multicast traffic, it will show that it is in the “Receive” state and show the “Receive Total” of multicast packets.

This tool should be run on workstations that are on the VLAN that the endpoints will be on. For example, if the endpoints will be Cisco IP phones, then this tool should be run on a PC connected to the voice VLAN.

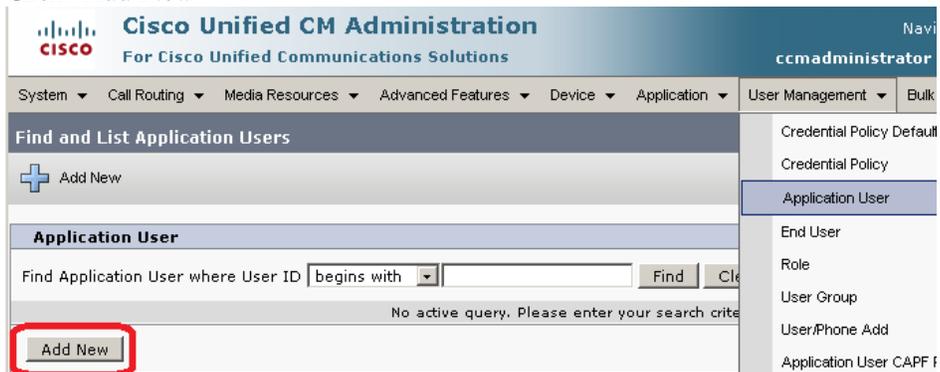
Two Phone Send & Receive

This setting allows the control of two Cisco IP phones for testing. It will put one phone into a transmitting state and a second phone into a receiving state. The transmitting phone will put audio packets on the network. The receiving phone will request the audio traffic from the network and if received, play that audio through its speaker.

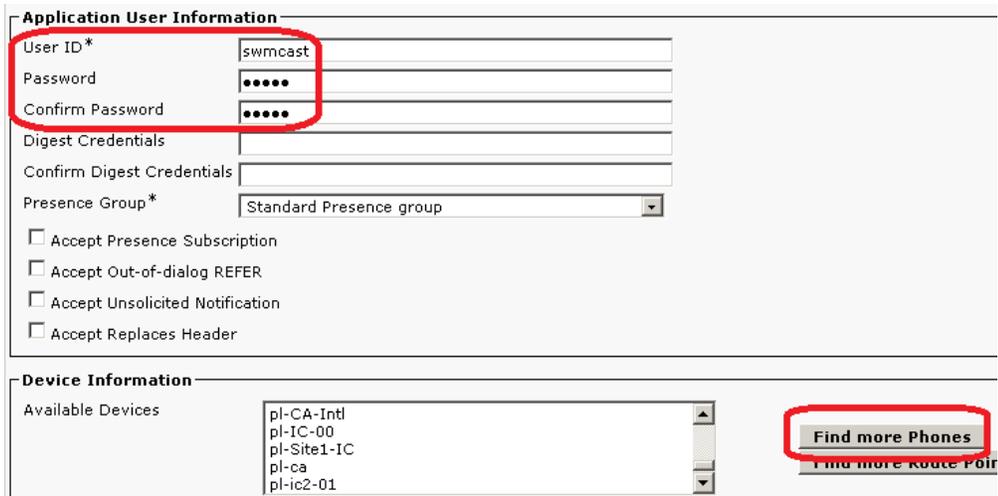
Authentication and User Setup

To control Cisco IP phones a user account with access to those phones is needed.

1. Log into CUCM's ccmadmin web interface (<http://<cucmIP>/ccmadmin>)
2. Choose "User Management > Application User"
3. Click "Add New"



4. Assign a username and password
5. Click to "Find More Phones"



6. Locate the phones you will use to test with. You can assign as many phones as you need to this user.
7. Check the box next to the phones that will be used to test with
8. Make a note of these phone's IP addresses as they will be needed when running the tool
9. Click the "Add Selected" button and then close.

The screenshot shows the 'Find and List Phones' window. At the top, there are buttons for 'Select All', 'Clear All', 'Add Selected' (highlighted with a red box), and 'Close'. Below these is a search bar with 'Find Phone where' and 'Description' dropdowns, and a search input field containing 'pl'. The main area is a table with the following columns: Device Name (Line), Description, Device Pool, Device Protocol, Status, and IP Address.

<input type="checkbox"/>	Device Name (Line)	Description	Device Pool	Device Protocol	Status	IP Address
<input type="checkbox"/>	SEP0022EE0201A1	pl Algo SIP 8180 Audio Alerter Master	pl-InfirmaCast	SIP	Unknown	Unknown
<input type="checkbox"/>	pl-ic2-01	pl IC on 172.30.237.150	pl-InfirmaCast	SCCP	Unknown	Unknown
<input type="checkbox"/>	SEP016086611158	pl IPC	pl-Site1-Phones-NoSRST	SCCP	Unknown	Unknown
<input type="checkbox"/>	SEP00271365ED35	pl IPC - MAC for IC	pl-Site1-Phones-NoSRST	SCCP	Unknown	Unknown
<input type="checkbox"/>	pl-IC-00	pl Singlewire InformaCast CallBack	pl-InfirmaCast	SCCP	Registered with IPTAPPS-CUCM80-SUB	172.30.229.14
<input checked="" type="checkbox"/>	SEP1C17D340F2B6	pl Site 1 Fancy Phone	pl-Site1-Phones-NoSRST	SIP	Registered with IPTAPPS-CUCM80-SUB	172.30.237.223
<input checked="" type="checkbox"/>	SEP04FE7F6905FD	pl Site1 1158 7962	pl-Site1-Phones-NoSRST	SCCP	Registered with IPTAPPS-CUCM80-SUB	172.30.237.221
<input type="checkbox"/>	SEP001FCA35859C	pl Site1 7906 1140	pl-Site1-Phones-NoSRST	SCCP	Registered with IPTAPPS-CUCM80-SUB	172.30.237.222
<input type="checkbox"/>	SEP00070E958C76	pl Site2 7960	pl-Site1-Phones-	SCCP	Unknown	Unknown

10. Back on the user page, note that the phones are now listed as "Controlled Devices"

11. Click “Save” to save the user information

Application User Configuration Related U

Save

Status
Status: Ready

Application User Information

User ID*
Password
Confirm Password
Digest Credentials
Confirm Digest Credentials
Presence Group*
 Accept Presence Subscription
 Accept Out-of-dialog REFER
 Accept Unsolicited Notification
 Accept Replaces Header

Device Information

Available Devices
pl-IC-00
pl-Site1-IC
pl-ca
pl-ic2-01

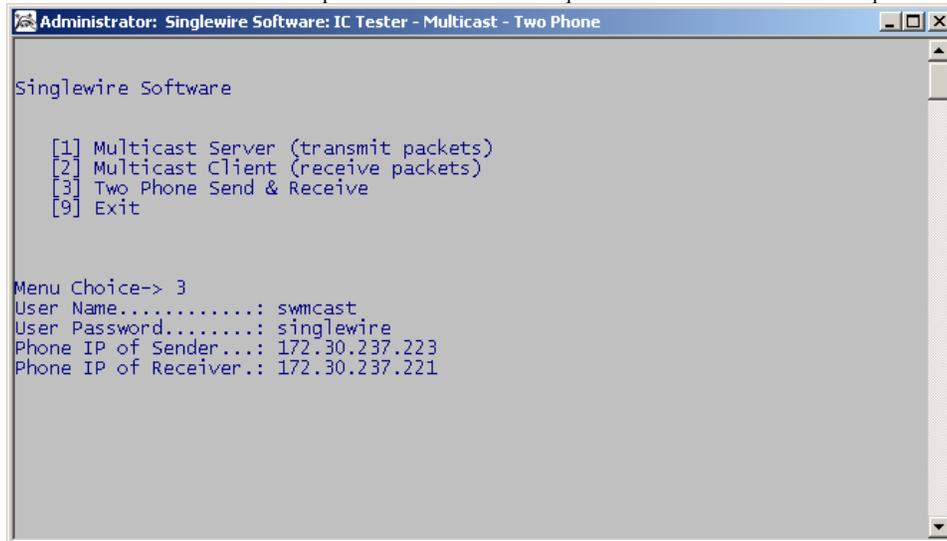
Controlled Devices
SEP04FE7F6905FD

Find more Phones
Find more Route Points

Using The Testing Tool

12. Double click the testing tool exe
13. Enter the created CUCM application user and password
14. Enter the IP address of the phone that should transmit audio packets.

15. Enter the IP address of the phone that should request and receive the audio packets



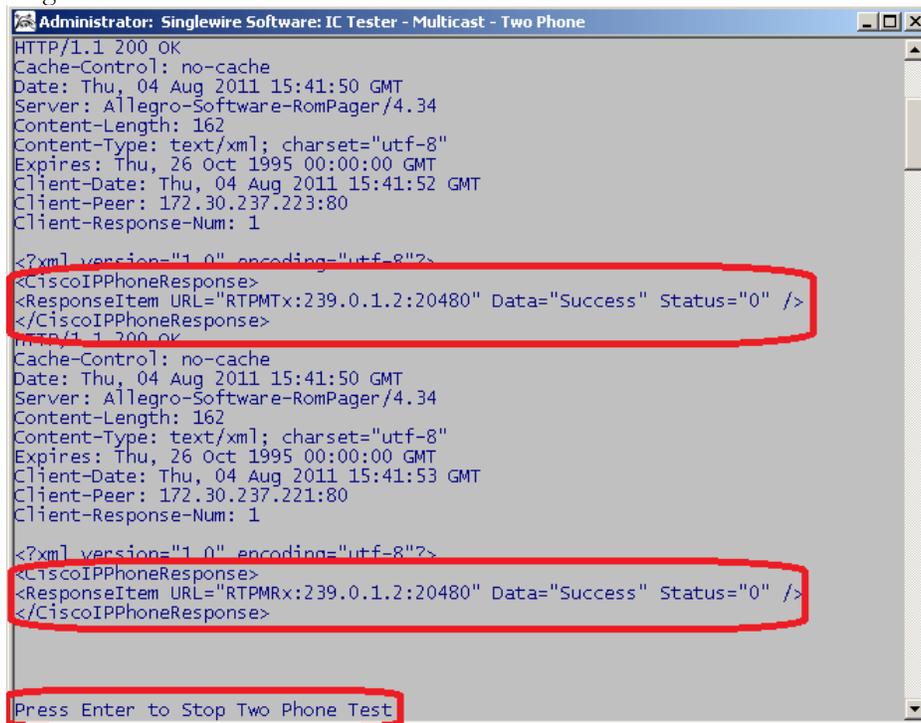
```

Administrator: Singlewire Software: IC Tester - Multicast - Two Phone
Singlewire Software

[1] Multicast Server (transmit packets)
[2] Multicast Client (receive packets)
[3] Two Phone Send & Receive
[9] Exit

Menu Choice-> 3
User Name.....: swmcast
User Password.....: singlewire
Phone IP of Sender...: 172.30.237.223
Phone IP of Receiver..: 172.30.237.221
  
```

16. The testing tool will display the responses heard by the phones. If both phones are successful, the transmitting phone will put an audio stream on the network with IP address 239.0.1.2 on port 20480 with a TTL of 16. These are the default values that Singlewire InformaCast uses for its audio traffic.



```

Administrator: Singlewire Software: IC Tester - Multicast - Two Phone
HTTP/1.1 200 OK
Cache-Control: no-cache
Date: Thu, 04 Aug 2011 15:41:50 GMT
Server: Allegro-Software-RomPager/4.34
Content-Length: 162
Content-Type: text/xml; charset="utf-8"
Expires: Thu, 26 Oct 1995 00:00:00 GMT
Client-Date: Thu, 04 Aug 2011 15:41:52 GMT
Client-Peer: 172.30.237.223:80
Client-Response-Num: 1

<?xml version="1.0" encoding="utf-8"?>
<CiscoIPPhoneResponse>
<ResponseItem URL="RTPMtx:239.0.1.2:20480" Data="Success" Status="0" />
</CiscoIPPhoneResponse>
HTTP/1.1 200 OK
Cache-Control: no-cache
Date: Thu, 04 Aug 2011 15:41:50 GMT
Server: Allegro-Software-RomPager/4.34
Content-Length: 162
Content-Type: text/xml; charset="utf-8"
Expires: Thu, 26 Oct 1995 00:00:00 GMT
Client-Date: Thu, 04 Aug 2011 15:41:53 GMT
Client-Peer: 172.30.237.221:80
Client-Response-Num: 1

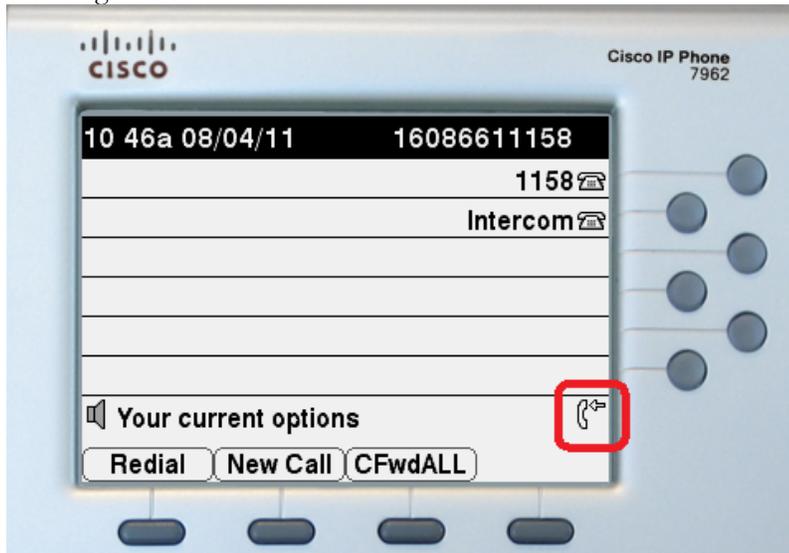
<?xml version="1.0" encoding="utf-8"?>
<CiscoIPPhoneResponse>
<ResponseItem URL="RTPMtx:239.0.1.2:20480" Data="Success" Status="0" />
</CiscoIPPhoneResponse>

Press Enter to Stop Two Phone Test
  
```

17. The phone that is transmitting audio will show an icon signaling that it is in transmit mode



18. The phone that is listening for the audio will display an icon signaling that it is in receiving mode



19. If multicast can route between the two phones the audio from the transmitting phone should be heard at the receiving phone.
20. To stop the test, press enter in the window of the testing tool and phones will be deactivated.

Troubleshooting

Server & Client Mode

Server says it is transmitting but the client never receives any packets

This indicates that multicast is not routing properly. Singlewire publishes a whitepaper on multicast, but your network vendor will be a better resource to configure multicast routing in your environment.

<https://www.singlewire.com/wp-multicast-informacast.html>

Client shows a bunch of “garbage” when run

This indicates there is other multicast traffic on the network with the same destination IP address and UDP port. See the “Overview > Advanced Custom Configuration” section of this document.

Two Phone Send & Receive Mode

Phones never show the sending or receiving icon

This is probably an issue with the authentication. Ensure the following:

- Application user created in CUCM
- Proper user and password are entered for this CUCM application user
- Phones are associated to the CUCM application user
- The tool has access to the phones (can you ping the phone?)
- Can you access the phone directly with the user and password (http:<phoneIP>/CGI/Screenshot)?

Phones show sending and receiving icons but no audio is heard

This indicates that multicast is not routing properly. Singlewire publishes a whitepaper on multicast, but your network vendor will be a better resource to configure multicast routing in your environment.

<https://www.singlewire.com/wp-multicast-informacast.html>

Need To Use Non Default Multicast IP, Port, or TTL

See the “Overview > Advanced Custom Configuration” section of this document.

Things Still Do Not Work

1. Install Wireshark on the PC the tool is being run
2. Start a wireshark capture
3. Run the tool
4. Stop the capture
5. Examine the capture
 - Does it show the traffic?
 - Server mode – should be transmitting multicast
 - Client mode – should send IGMP Joins to network and receive multicast traffic from the server
 - Two Phone mode – should see commands sent to IP phones and the responses from those IP phones

Release Notes

Version 02 – August 4, 2011

- Cisco phone models 89XX do not obey same command to “stop” as previous phones. Command changed to support all phone models.
- Documentation updated to MS Word version containing more detailed instructions and troubleshooting
- Ability to use the “custom” menu command documented to modify the multicast IP, port, or TTL.

Version 01 – June 2, 2010

- Multicast server functionality to transmit multicast packets
- Multicast client functionality to request and listen for multicast packets
- Ability to control two Cisco IP phones: one to transmit multicast audio and one to request and receive the multicast audio
- Hidden ability to modify multicast IP, port, and TTL not documented
- Documentation is a txt README