



SECURITY BULLETIN – Worldwide H.323 and SIP Botnet Calling Systems as “cisco” and other Variants  
**Version 1.5**

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## Security Bulletin Relating to Worldwide Botnet Dialing H.323 and SIP-Capable Systems

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Effective January 1, 2014, the below applies to all Polycom security publications:

Polycom may at times issue either a **Security Advisory** or a **Security Bulletin** with regards to a particular vulnerability or set of vulnerabilities. If a **Security Advisory** is issued, this means that one more Polycom products are verified by Polycom to be affected by one or more vulnerabilities.

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This information applies only to those Polycom products that might answer, respond to, or forward an H.323 or SIP call.

*This advisory is NOT about any vulnerability in any Polycom product. This advisory serves to educate those for whom unwanted inbound H.323 and SIP calls have become a problem. Polycom products are NOT demonstrating a vulnerability when they respond properly to H.323 and SIP calls.*

### Situation Summary

*A “botnet”, or mass group of systems on the Internet under the control of one or several malicious entities, is being used to place calls to any device on the Internet that can meaningfully respond to an*

*H.323 or SIP call. This means endpoints, bridges, MCU's, gatekeepers, firewalls, proxies, etc. might all be called by the botnet.*

*The purpose of the botnet is unclear, although toll fraud is usually the purpose behind such broad sweeps against systems that speak a specific communications protocol. The systems used in the botnet are, as is typical with this method, innocent third-party hosts whose owners are most likely unaware are a part of the botnet.*

*The botnet can successfully be run against all H.323 and SIP systems it finds on the Internet, and is presumably noting which systems respond to calls for future attacks.*

*One particular botnet advertises itself by the fact that it seems to consistently use "h323-ID = 'cisco'". The name appears to be unrelated to anything in the real world, and is rather a way of adding seeming legitimacy to the H.323 botnet. Others seen more recently are simply using an IP address for the h323-ID.*

## **Situation Details**

The botnet appears to be at least partially (probably mostly) comprised of web servers around the Internet, all of which appear to be operating below recommended security patch levels. Such systems are owned by innocent third parties who do not patch their systems to current levels. The attackers first use known security flaws to compromise such systems, and then insert code that dials H.323 and SIP systems and reports back to the individual(s) who created this illegal system ("bot master" and "bot herder" are the normal terms for the one(s) in control of the botnet).

Every system we have been able to analyze (but one) conforms with this model. One of the IP addresses used to call H.323 systems was analyzed and is shown below. The one system that did not conform with the under-patched web server model was an instance of FreePBX – most likely compromised in a similar manner for identical purposes.

From the perspective of the Internet, this is just a random web server whose owner failed to patch things when known vulnerabilities were announced (we had permission to scan). Such systems might be behind on patching Apache or OpenSSL or other similar modules. This one (as reported by Nikto, a free vulnerability scanner) has a vulnerability from 2002 among its many vulnerabilities.

Again, this is NOT a "bad guy" system. This is a third-party web server, poorly maintained, compromised by the attacker(s), and then loaded with the software that is performing the calls:

```

- Nikto v2.1.6
-----
+ Target IP:
+ Target Hostname:
+ Target Port:      80
+ Start Time:      2014-11-05 13:07:55 (GMT-8)
-----
+ Server: Apache/2.2.14 (Unix) DAV/2 mod_ssl/2.2.14 OpenSSL/0.9.81 PHP/5.3.1 mod
_apreq2-20090110/2.7.1 mod_perl/2.0.4 Perl/v5.10.1
+ Retrieved x-powered-by header: PHP/5.3.1
+ The anti-clickjacking X-Frame-Options header is not present.
+ Root page / redirects to: http://fischer.appiaservices.com/xampp/
+ Server leaks inodes via ETags, header found with file /favicon.ico, inode: 305
42811, size: 30894, mtime: Fri May 11 05:40:36 2007
+ Apache mod_negotiation is enabled with MultiViews, which allows attackers to e
asily brute force file names. See http://www.wisec.it/sectou.php?id=4698ebdc59d1
5. The following alternatives for 'index' were found: HTTP_NOT_FOUND.html.var, H
TTP_NOT_FOUND.html.var, HTTP_NOT_FOUND.html.var, HTTP_NOT_FOUND.html.var, HTTP_N
OT_FOUND.html.var, HTTP_NOT_FOUND.html.var, HTTP_NOT_FOUND.html.var, HTTP_NOT_FO
UND.html.var, HTTP_NOT_FOUND.html.var, HTTP_NOT_FOUND.html.var, HTTP_NOT_FOUND.h
tml.var, HTTP_NOT_FOUND.html.var, HTTP_NOT_FOUND.html.var, HTTP_NOT_FOUND.html.v
ar, HTTP_NOT_FOUND.html.var
+ PHP/5.3.1 appears to be outdated (current is at least 5.4.28)
+ OpenSSL/0.9.81 appears to be outdated (current is at least 1.0.1e). OpenSSL 0.
9.8r is also current.
+ Apache/2.2.14 appears to be outdated (current is at least Apache/2.4.7). Apach
e 2.0.65 (final release) and 2.2.26 are also current.
+ mod_ssl/2.2.14 appears to be outdated (current is at least 2.8.31) (may depend
on server version)
+ mod_perl/2.0.4 appears to be outdated (current is at least 2.0.7)
+ mod_apreq2-20090110/2.7.1 appears to be outdated (current is at least 2.8.0)
+ Perl/v5.10.1 appears to be outdated (current is at least v5.14.2)
+ OSUDB-877: HTTP TRACE method is active, suggesting the host is vulnerable to X
ST
+ mod_ssl/2.2.14 OpenSSL/0.9.81 PHP/5.3.1 mod_apreq2-20090110/2.7.1 mod_perl/2.0
4 Perl/v5.10.1 - mod_ssl 2.8.7 and lower are vulnerable to a remote buffer over
flow which may allow a remote shell. CVE-2002-0082, OSUDB-756.

```

## Impact and Risk

Since the attack is so widespread, since its purpose cannot be truly uncovered, and since each target network is different both in purpose and in layout, no one statement can be made about impact and risk. As noted above, botnets that dial communication protocols over and over to as many hosts as possible are quite likely looking for a means to conduct toll fraud – dialing calls through third-party systems, without the consent of the owners of those third-party systems.

## General Mitigations

**The challenge with these scenarios is that the target hosts (all H.323 and SIP-listening devices) are doing exactly what they are set up to do: answering calls. Polycom products are not vulnerable to anything in this situation.** Mitigations to relieve the burden presented by these non-stop calls therefore come in the form of adding some ability to discern desired calls from undesired calls.

Whitelisting is the most common method for separating the good calls from the bad. In an environment where all of the “good guys” are known, it is best to simply create whitelists comprised of those addresses, and to deny all inbound calls NOT from those addresses.

Other times blacklists can be grown and maintained, blocking each of the botnet callers as it is logged and confirmed to be a “bad guy”.

**Important Note:** Polycom strongly recommends system administrators check RPAD Call History periodically to detect botnets and add rules to RPAD to block against them.

### How to Detect New H.323 Bots:

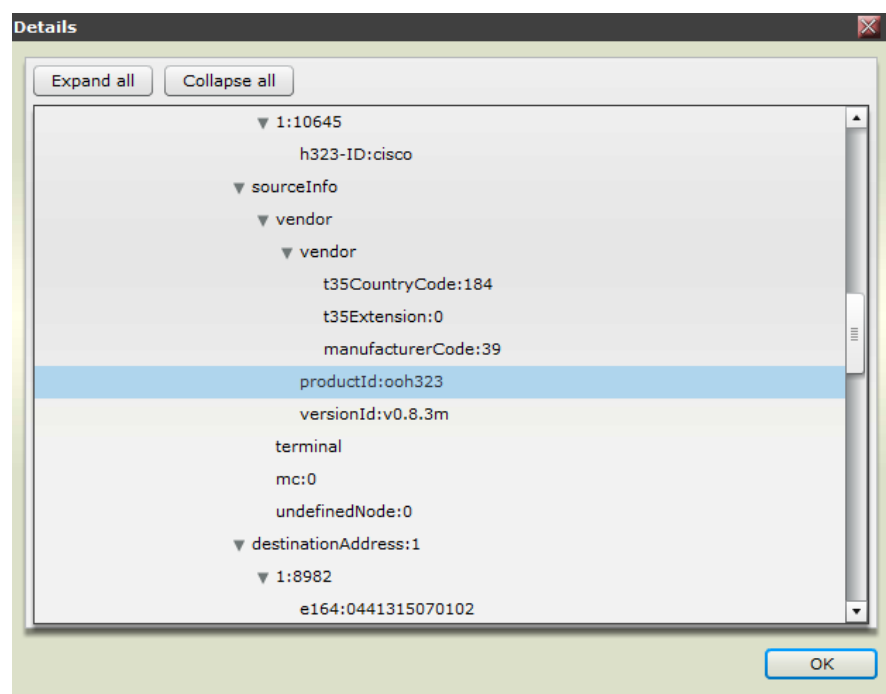
The initial botnet has consistently populated two key H.323 fields with the same information.

H.323 Alias Value: (h323-ID = "cisco")  
Vendor Product ID Field: (productId = "ooh323")

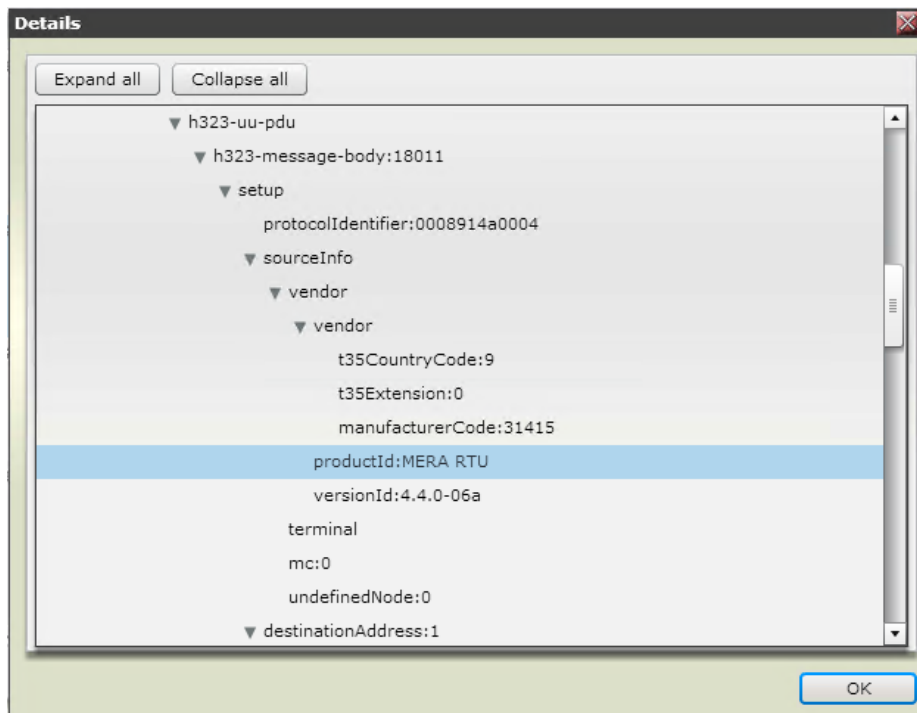
A newer variant has changed this, using an IP address for its h323-ID field but consistently populates the productId field with "MERA RTU".

H.323 Alias Value: (h323-ID = random IP address)  
Vendor Product ID Field: (productId = "MERA RTU")

The below RPAD screenshot taken from an RPAD management interface (Diagnostics->Call History->Show Call Details->Call Events->Show Message) shows both fields from the initial botnet findings:

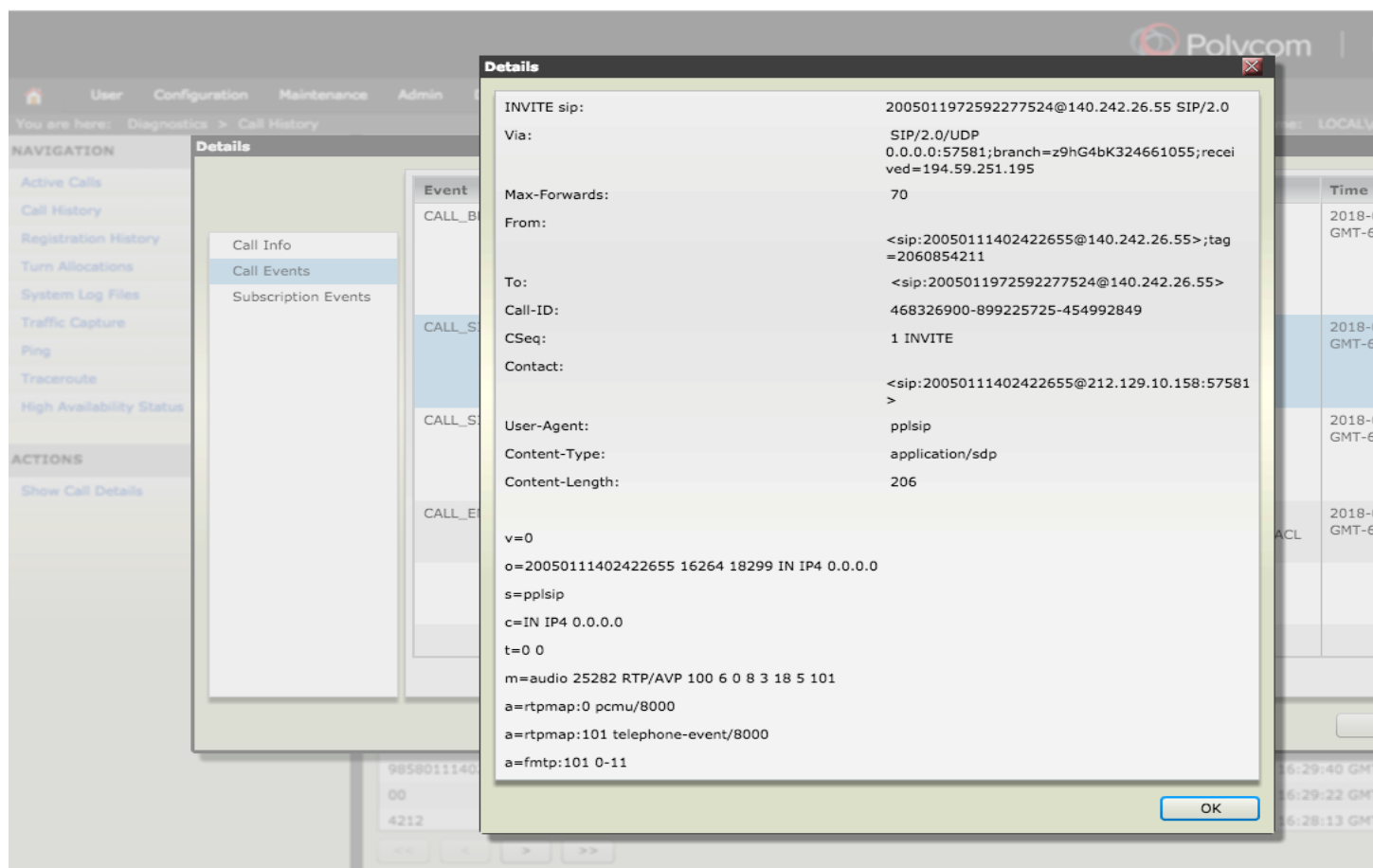


The latest variant of the botnet can be seen using “MERA RTU” in the RPAD screenshot below:



### How to Detect New SIP Bots:

The below RPAD screenshot taken from an RPAD management interface (Diagnostics->Call History->Show Call Details->Call Events->Show Message) shows a sip botnet pplsip (User-Agent field):



## Solution

### Firewalls:

Polycom cannot give advice on specific firewall configurations or specific firewalls. Those who have a third-party firewall as their defense against incoming H.323 calls should consult with their firewall and/or security experts before implementing any of the high-level recommendation in this advisory.

H.323 is not traditionally a firewall-friendly protocol. H.323 uses both UDP and TCP over a range of ports both static and dynamic. Firewalls that support H.323 natively include special rules or modules to deal with the nuances of the H.323 protocol. Such firewalls might be able to use the field information above in the form of rules or ACL's.

Alternatively, a firewall can come at the problem with more traditional IP-based whitelisting or blacklisting techniques.

### RealPresence Access Director (RPAD):

RPAD administrators can make rules to enable blocking for the two fields listed above.

Since the release of software version 4.2.2, RPAD improves these rules and administrators should ensure they're running this or later versions.

### H.323

There are several malicious H.323 agents that can cause problems for customer environments. The table below lists some of the more common agents.

Name	Attribute	Operator	Value
ooh323	request.endpointVendor.productId	==	ooh323
MERA RTU	request.endpointVendor.productId	==	MERA RTU
cisco	request.srcAlias.fist323-ID	==	cisco

The rule for Product ID of “ooh323” is shown here below. Similar rules should be set for other agents.

Condition:

Attribute	Operator	Value
request.endpointVendor.productId	==	ooh323

(request.endpointVendor.productId == "ooh323")

### SIP

There are a growing number of malicious SIP agents that can cause problems with customer environments. The table below lists some of the more common malicious SIP agents.

Agent Name	Attribute	Operator	Value
Friendly-scanner	request.user-agent	==(case-insensitive)	Friendly-scanner
PBX	request.user-agent	==(case-insensitive)	PBX
Sipvicious	request.user-agent	==(case-insensitive)	Sipvicious
Voip	request.user-agent	==(case-insensitive)	Voip
Sipcli.*	request.user-agent	Matches	S s (I i)(P p)(C c)(L l)(I i).*
Pplsip	request.user-agent	==(case-insensitive)	Pplsip
VaxSIPUserAgent.*	request.user-agent	Matches	V v (A a)(X x)(I i)(P p)(U u)(S s)(E e)(R r)(A a)(G g)(E e)(N n)(T t).*
Asterisk.*	request.user-agent	Matches	A a (S s)(T t)(E e)(R r)(I i)(S s)(K k).*
SIPscan.*	request.user-agent	Matches	S s (I i)(P p)(S s)(C c)(A a)(N n).*
eyeBeam.*	request.user-agent	Matches	E e (Y y)(E e)(B b)(E e)(A a)(M m).*
VaxIPUserAgent.*	request.user-agent	Matches	V v (A a)(X x)(S s)(I i)(P p)(U u)(S s)(E e)(R r)(A a)(G g)(E e)(N n)(T t).*
Linksys/PAP2T-5.1.6	request.user-agent	==(case-insensitive)	Linksys/PAP2T-5.1.6
VoIP v11.1.2	request.user-agent	==(case-insensitive)	VoIP v11.1.2
xlite.*	request.user-agent	Matches	X x (L l)(I i)(T t)(E e).*





Cisco-SIPGateway/IOS-12.x	request.user-agent	==(case-insensitive)	Cisco-SIPGateway/IOS-12.x
FreePBX 1.8	request.user-agent	==(case-insensitive)	FreePBX 1.8
MizuPhone	request.user-agent	==(case-insensitive)	MizuPhone
AVM FRITZ!Box.*	request.user-agent	Matches	(A a)(V v)(M m)(""(F f)(R r)(I i)(T t)(Z z)(!)(B b)(O o)(X x)).*
zxcvdf11	request.user-agent	==(case-insensitive)	zxcvdf11
snom360*	request.user-agent	Matches	(S s)(N n)(O o)(M m)360.*
Skipper x1.2	request.user-agent	==(case-insensitive)	Skipper x1.2
Sipscan*	request.user-agent	Matches	(S s)(I i)(P p)(S s)(C c)(A a)(N n).*
PortSIP*	request.user-agent	Matches	(P p)(O o)(R r)(T t)(S s)(I i)(P p).*
Performance	request.user-agent	==(case-insensitive)	Performance
pbx	request.user-agent	==(case-insensitive)	pbx
Linksys*	request.user-agent	Matches	(L l)(I i)(N n)(K k)(S s)(Y y)(S s).*
Independent	request.user-agent	==(case-insensitive)	Independent
eyebeam.*	request.user-agent	==(case-insensitive)	(E e){Y y}(E e)(B b)(E e)(A a)(M m).*
66.71	request.user-agent	Matches	66.71
Z	request.user-agent	Matches	Z

The rule for SIP agent “friendly-scanner” is shown here below. Similar rules should be set for other malicious SIP agents.

Condition:

Attribute	Operator	Value
request.user-agent	==	friendly-scanner

(request.user-agent == "friendly-scanner")

Detailed information about enabling and activating rules in RPAD is available in Appendix A at the end of this document.

**Video Border Proxy (VBP):**



VBP version 11.2.20 has fixed the issue without need for any configuration changes. This version disables fastStart on the WAN side when the call originates from a non-registered client.

This change appears to reduce the nuisance factor of the H.323 botnet without the need for configuration changes.

## Revision History

DRAFT 1.0 – Original publication: November 6, 2014. RPAD configurations given with lighter reference to VBP.

Version 1.0 – Removed DRAFT status, cleared for public consumption, provided detail on VBP upgrade.

Version 1.1 – Clarification on advisory/bulletin differences and inclusion of *h323-ID = "cisco"* string earlier in the document.

Version 1.2 – Updated bulletin to address current attacks and defense configurations for "MERA RTU".

Version 1.3 – Updated bulletin to address current attacks and defense configurations for H.323 and SIP.

Version 1.4 – Updated bulletin to add additional H.323 and SIP agents.

Version 1.5 – Updated sip botnet table with new known botnets.

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## Appendix A: Detailed Instructions for Writing Rules in RPAD

Revealing the source H323-ID alias value of 'cisco': The RPAD Diagnostics->Call History->H323 Signaling type output shows them as:

Originator	Destination	Start Time	End Time	Signaling
H323_ID:cisco	DIALED_DIGITS:00220044122	2014-11-05 10:39:03 GMT-5	2014-11-05 10:39:03 GMT-5	H.323
H323_ID:cisco	DIALED_DIGITS:00344122780	2014-11-05 10:31:02 GMT-5	2014-11-05 10:31:02 GMT-5	H.323
H323_ID:cisco	DIALED_DIGITS:00644131507	2014-11-05 10:06:27 GMT-5	2014-11-05 10:06:27 GMT-5	H.323
H323_ID:cisco	DIALED_DIGITS:00944122780	2014-11-05 09:35:03 GMT-5	2014-11-05 09:35:03 GMT-5	H.323
H323_ID:cisco	DIALED_DIGITS:01144131507	2014-11-05 09:27:09 GMT-5	2014-11-05 09:27:09 GMT-5	H.323
H323_ID:cisco	DIALED_DIGITS:01100441315	2014-11-05 09:05:29 GMT-5	2014-11-05 09:05:29 GMT-5	H.323
H323_ID:cisco	DIALED_DIGITS:10441315070	2014-11-05 08:28:02 GMT-5	2014-11-05 08:28:02 GMT-5	H.323
H323_ID:cisco	DIALED_DIGITS:10044131507	2014-11-05 08:20:24 GMT-5	2014-11-05 08:20:24 GMT-5	H.323
H323_ID:cisco	DIALED_DIGITS:10004413150	2014-11-05 08:12:34 GMT-5	2014-11-05 08:12:34 GMT-5	H.323
H323_ID:cisco	DIALED_DIGITS:10144122780	2014-11-05 08:04:32 GMT-5	2014-11-05 08:04:32 GMT-5	H.323
H323_ID:cisco	DIALED_DIGITS:10114413150	2014-11-05 07:56:19 GMT-5	2014-11-05 07:56:19 GMT-5	H.323
H323_ID:cisco	DIALED_DIGITS:11100441227	2014-11-05 07:48:20 GMT-5	2014-11-05 07:48:20 GMT-5	H.323
H323_ID:cisco	DIALED_DIGITS:12340044122	2014-11-05 07:24:37 GMT-5	2014-11-05 07:24:37 GMT-5	H.323

The screenshot shows the 'Details' view of a call. The 'Call Info' section is expanded, showing the following details:

- Call Info:**
  - Call status: Call Ended
  - Start time: 2014-11-05 10:39:03 GMT-5
  - End time: 2014-11-05 10:39:03 GMT-5
  - Duration: 00:00:00
  - Signaling: H.323
- Originator:**
  - Call ID: 9c5ef3c3-7dc4-1e40-09d1-c334aa5ffa88
  - From: H323\_ID:cisco
  - To: DIALED\_DIGITS:002200441227806181
  - Dialed string: DIALED\_DIGITS:002200441227806181
  - IP address: 27.251.106.77
- Destination:**
  - Call ID: 9c5ef3c3-7dc4-1e40-09d1-c334aa5ffa88
  - From: H323\_ID:cisco
  - To: DIALED\_DIGITS:002200441227806181
  - Dialed string: DIALED\_DIGITS:002200441227806181
  - IP address: 27.251.106.77

Creating an RPAD ACL to prevent the unit from processing those inbound calls:

Configuration->Access Control List Rules

To create the new Rule

In the Actions pane click Add

The Add Rule dialog opens

Give the Rule a Name, such as MaliciousTraffic

Use the drop-arrow to select H323

Optionally, provide a Description such as “this Rule is intended to match on h323ID=cisco and will be used with a Deny action to block unwanted call attempts.”

In the Add Rule dialog, click Add to add a Condition

The Add Condition dialog opens

In the Add Condition dialog, use the drop-arrow for Attribute and select **request.srcAlias.firstH323-ID**

If the Operator is not == use the drop-arrow to select == (two equal symbols)

In the Value field enter “cisco” without the quotes.

Click Ok to save the condition

The new Rule should appear similar to this:

Attribute	Operator	Value
request.srcAlias.firstH323-ID	==	cisco

To apply the Rule, go to Configuration->Access Control List Settings

If there are no existing Settings, click Add in the Actions pane to open the Add ACL Setting dialog

For Service Name use the drop-arrow to select H323

For IP use the drop arrow to select the External Signaling IP of your RPAD

For Port use the drop-arrow to select H.225 call signaling port:1720

In the Rule Setting area click Add to open the Add Rule dialog

Use the drop-arrow under Access Control List Name to select the MaliciousTraffic Rule created in the previous step

Use the drop-arrow below Action to select Deny

Click Ok to add the Rule to the Rule Settings area

In the Rule Setting area, highlight the MaliciousTraffic Rule and then use the Priority Up button to move this rule to the top of the list; you may have to Priority Up more than once.

Click OK to save the Setting

The completed rule should appear similar to this example:

Service Name: H323

IP: External signaling IP : 140.242.225.1

Port: H.225 call signaling port : 1720

**Rule Setting**

Rule Name	Action
MaliciousTraffic	deny
H323_Guest_Call_Not_To_71xx	deny

Priority Down Priority Up

Add Edit Delete

OK Cancel Help

After applying the ACL to TCP1720, the next incident will to occur show a Call\_End of TERMINATED\_BY\_RPAD.

RPAD Diagnostics->Call History->H323 Signaling type output

Click the call to select it, then click Show Call Details in the Actions pane

In the Call Details dialog, click Call Events to display the details

Event	Attributes	Time
CALL_BEGIN	Native-callid: 9c5ef3c3-7dc4-1e40-09d1-c334aa5ffa88 Source-uri: H323_ID:cisco Destination-uri: DIALED_DIGITS:002200441227806181 Signaling-type: H.323 Direction: INBOUND	2014-11-05 10:39:03.114 GMT-5
CALL_SIGNALING_EVENT	Event-type: INBOUND_REQUEST Far-end: 27.251.106.77:47944 Summary: setup Details: <input type="button" value="Show Message"/>	2014-11-05 10:39:03.115 GMT-5
CALL_END	Native-callid: 9c5ef3c3-7dc4-1e40-09d1-c334aa5ffa88 Reason: <b>TERMINATED_BY_RPAD</b>	2014-11-05 10:39:03.135 GMT-5
CALL_SIGNALING_EVENT	Event-type: OUTBOUND_REQUEST Far-end: 27.251.106.77:47944 Summary: releaseComplete Details: <input type="button" value="Show Message"/>	2014-11-05 10:39:03.136 GMT-5

4 records found

Note the sourceIP seen in the CALL\_SIGNALING\_EVENT for the Far-End

You should add Conditions to deny the traffic based on the product.VendorID, which has been seen as “ooh323” and lately as “MERA RTU”.

To add these Conditions, go to Configuration->Access Control List Rules, click your MaliciousTraffic Rule to select it, and click Edit in the Actions pane to open the Edit Rule dialog. You will need to follow these steps for each product.VendorID – “ooh323” and “MERA RTU”.

Using the steps details above, Add a Condition by first clicking the existing H323.request.dstAlias.firstH323-ID entry, then click the Add button to open the Add Condition dialog

Use the drop-arrow below Relation to select **or**

Use the drop-arrow below Attribute to select **request.endpointVendor.productId**

Use the drop-arrow below Operator to select == (two equal symbols)

In the Value field enter

**ooh323** (This is two lower-case “o” characters, a lower-case “h” and the digits “323”)

**or**

**MERA RTU**

Click OK to add the new Condition

Click OK again to save the changes to the Rule; there is no need to re-apply the Rule in Access Control List Settings

Shown below is the created Rule for “ooh323”.

