

How to Troubleshoot Partial Registration for MRA

Contents

[Introduction](#)

[Background Information](#)

[What is Partial Registered for a Device?](#)

[SIP Phone with Multiple Lines Registration](#)

[Troubleshooting](#)

[Optional Troubleshooting Procedure](#)

[Configure RTMT Alarm](#)

[Enhancement Request](#)

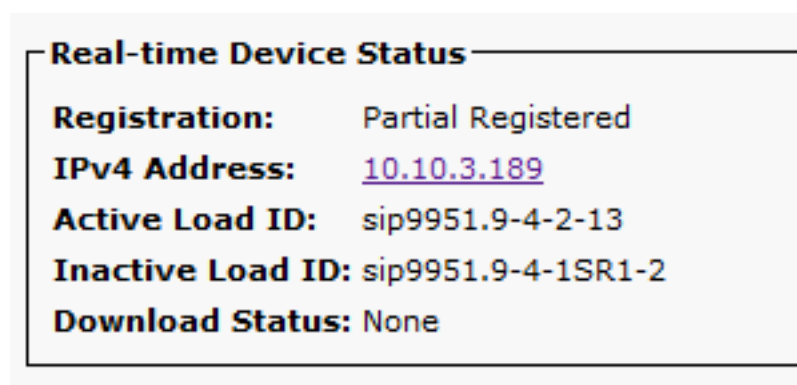
Introduction

This document describes, how to troubleshoot Partial Registered Session Initiation Protocol (SIP) Phone over Mobile and Remote Access (MRA), why this happen, and how to identify it.

Background Information

What is Partial Registered for a Device?

Partially registered means that not all lines on a SIP phone have registered. This issue can be cause for different reasons, like Line Button templates, Identity Trust list/Certificate Trust List (ITL/CTL) mismatch, SIP message size, Keep alive, etc.



Real-time Device Status	
Registration:	Partial Registered
IPv4 Address:	10.10.3.189
Active Load ID:	sip9951.9-4-2-13
Inactive Load ID:	sip9951.9-4-1SR1-2
Download Status:	None

SIP Phone with Multiple Lines Registration

The first register from an endpoint with multiple lines contains all SIP lines configured to register all lines.

Then it's expected to see **REGISTER** (Keep-alive) messages every 120 seconds (actually 115 seconds which is 120 minus the delta value configured in SIP profile, which is 5 seconds by

default). In this case, the phone sends keep-alive every 115 seconds, as shown in the image:

Time	Leg 1	Leg 2	CSeq	Source	Destination	Expires
21:17:42.610	→ REGISTER		200 REGISTER	10.2.60.26	10.2.60.24	0
21:17:42.613		→ REGISTER	200 REGISTER	10.2.60.24	10.2.60.21	0
21:17:42.614		← 100 TRYING	200 REGISTER	10.2.60.21	10.2.60.24	
21:17:42.614		← 200 OK	200 REGISTER	10.2.60.21	10.2.60.24	0
21:17:42.615	← 200 OK		200 REGISTER	10.2.60.24	10.2.60.26	0
21:19:42.726	→ REGISTER		202 REGISTER	10.2.60.26	10.2.60.24	0
21:19:42.728		→ REGISTER	202 REGISTER	10.2.60.24	10.2.60.21	0
21:19:42.729		← 100 TRYING	202 REGISTER	10.2.60.21	10.2.60.24	
21:19:42.730	← 200 OK		202 REGISTER	10.2.60.24	10.2.60.26	0
21:19:42.730		← 200 OK	202 REGISTER	10.2.60.21	10.2.60.24	0
21:21:42.813	→ REGISTER		203 REGISTER	10.2.60.26	10.2.60.24	0
21:21:42.816		→ REGISTER	203 REGISTER	10.2.60.24	10.2.60.21	0
21:21:42.817	← 200 OK		203 REGISTER	10.2.60.24	10.2.60.26	0
21:21:42.817		← 100 TRYING	203 REGISTER	10.2.60.21	10.2.60.24	
21:21:42.817		← 200 OK	203 REGISTER	10.2.60.21	10.2.60.24	0
21:23:42.900	→ REGISTER		204 REGISTER	10.2.60.26	10.2.60.24	0
21:23:42.903		→ REGISTER	204 REGISTER	10.2.60.24	10.2.60.21	0
21:23:42.904		← 100 TRYING	204 REGISTER	10.2.60.21	10.2.60.24	
21:23:42.905	← 200 OK		204 REGISTER	10.2.60.24	10.2.60.26	0

In the first **REGISTER** the SIP phone sends more details inside the **Content-Type** section of the Session Description Protocol (SDP), as shown in the next image:

```
SIPMSG:
|REGISTER sip:cucm01 SIP/2.0
Via: SIP/2.0/TLS 172.16.84.116:53479;branch=z9hG4bK00067b6
Call-ID: 00505696-ff30005e-00005f3d-00000f17@172.16.84.116
CSeq: 2150 REGISTER
Contact: <sip:01d82b96-c892-24ea-0794-46b5b9e55f6d@172.16.84.116:53479;transport=tls>;+sip.instance="urn:uuid:00000000-0000-0000-0000-00505696ff30-";
+u.sip.device.name.ccm.cisco.com="alimad";+u.sip.model.ccm.cisco.com="503";video
From: <sip:2001@cucm01>;tag=00505696ff30067500002408-00000a99
To: <sip:2001@cucm01>
Max-Forwards: 70
Route: <sip:expe01.apolo.local;transport=tls;lr>;<sip:10.15.13.15:5061;transport=tls;zone-id=1;directed;lr>;<sip:cucm01;transport=tcp;lr>
User-Agent: Cisco-CSF
Expires: 3600
Date: Thu, 17 Jun 2021 23:56:04 GMT
Proxy-Authorization: Digest username="Alimad", realm="expe01.apolo.local", uri="sip:cucm01", response="32872bf3e4ae98deff90f8f415cdf24",
nonce="2876968fd795de089669f607a2f381f09dc5ab24d18fe6af2d673a337f71", opaque="AQAAAGU/AqvV02M9X4g88YpmF/3z7P0x", cnonce="000043af", qop=auth, nc=00000001, algorithm=MD5
Supported: replaces,join,sdp-anat,norefersub,resource-priority,extended-refer,X-cisco-callinfo,X-cisco-serviceuri,X-cisco-escapecodes,X-cisco-service-control,X-cisco-srtp-fallback,
cisco-monrec,X-cisco-config,X-cisco-sis-7.0.0,X-cisco-xsi-8.5.1,X-cisco-graceful-reg,X-cisco-duplicate-reg,path
Reason: SIP ;cause=200;text="cisco-alarm:111 Name=alimad ActiveLoad=Jabber_for_Windows-12.8.1.52494 InactiveLoad=Jabber_for_Windows-12.8.1.52494 Last=Application-Requested-Destroy"
Mime-Version: 1.0
Content-Type: multipart/mixed;boundary=uniqueBoundary
Content-Length: 1271

--uniqueBoundary
Content-Type: application/x-cisco-remotec-req+xml
Content-Disposition: session;handling=optional

<?xml version="1.0" encoding="UTF-8"?> <x-cisco-remotec-req> <bulkregisterreq> <contact all="true"> <register></register> </contact> </bulkregisterreq>
</x-cisco-remotec-req>
--uniqueBoundary
Content-Type: application/x-cisco-remotec-req+xml
Content-Disposition: session;handling=optional

<?xml version="1.0" encoding="UTF-8"?> <x-cisco-remotec-req> <optionsind> <combine max="6"> <remotec> <status></status> </remotec>
<service-control></service-control> </combine> <dialog usage="hook status"> <unot></unot> <sub></sub> </dialog> <dialog usage="shared line">
<unot></unot> <sub></sub> </dialog> <presence usage="blf speed dial"> <unot></unot> <sub></sub> </presence> <joinreq></joinreq>
<cfwdall-anyline></cfwdall-anyline> <coaching></coaching> <oosalarm></oosalarm> <x-cisco-number></x-cisco-number> <bfcpc></bfcpc> <ix></ix>
<gatewayrecording></gatewayrecording> <conferenceDisplayInstance></conferenceDisplayInstance> </optionsind> </x-cisco-remotec-req>
--uniqueBoundary--
```

The next **REGISTER** messages does not contain any additional **Content-Type** information.

```
SIPMSG:
|REGISTER sip:cucm01 SIP/2.0
Via: SIP/2.0/TLS 10.15.13.20:7001;egress-zone=MRAZ0ne;branch=z9hG4bK53395b9916f575179b029f0d5799277033.eb5a12fcd592fc1768578e8bcb402dfe;
proxy-call-id=7703cb29-e531-42eb-8dca-f7b6a2667b5a;rport
Via: SIP/2.0/TLS 172.16.84.116:53479;branch=z9hG4bK00000b30;received=10.88.246.8;rport=53479;ingress-zone=CollaborationEdgeZone
Call-ID: 00505696-ff30005e-00005f3d-00000f17@172.16.84.116
CSeq: 2156 REGISTER
Contact: <sip:01d82b96-c892-24ea-0794-46b5b9e55f6d@172.16.84.116:53479;transport=tls>;+sip.instance="urn:uuid:00000000-0000-0000-0000-00505696ff30-"
;+u.sip!devicename.ccm.cisco.com="alimad";+u.sip!model.ccm.cisco.com="503";video;bfc;+u.sip!userid.ccm.cisco.com="Alimad"
From: <sip:2001@cucm01>;tag=00505696ff30067c0000647-000026e9
To: <sip:2001@cucm01>
Max-Forwards: 15
Route: <sip:cucm01;transport=tcp;lr>
Path: <sip:10.15.13.20:7001;transport=tls;lr>
Path: <sip:10.88.246.8:53479;transport=tls;apparent;ds;lr>
User-Agent: Cisco-CSF
Expires: 3600
Date: Fri, 18 Jun 2021 00:03:44 GMT
Supported: replaces,join,sdp-anat,norefersub,resource-priority,extended-refer,X-cisco-callinfo,X-cisco-serviceuri,X-cisco-escapecodes,X-cisco-service-control,
X-cisco-srtp-fallback,X-cisco-monrec,X-cisco-config,X-cisco-sis-7.0.0,X-cisco-xsi-8.5.1,X-cisco-graceful-reg,X-cisco-duplicate-reg,path
P-Asserted-Identity: <sip:2001@cucm01>
X-TAATag: a678a78f-f348-4405-acbd-1495bc45253d
Session-ID: 4c06c9f100255000a000094fd8df0000;remote=00000000000000000000000000000000
Content-Length: 0
```

In summary, when an endpoint connected over MRA has multiple lines configured and a SIP keep Alive arrives at Cisco Unified Communications Manager (CUCM) too late, that CUCM has already cleared the registration (unregistered the device), when the keep Alive arrives, CUCM re-registers the device but only the primary line since that is all that is in the register message.

There are also other scenarios when the phone connects over MRA where this problem can occur. If the Transmission Control Protocol (TCP) connection drops between Expressway-C and CUCM, the SIP phone is unregistered from the CUCM perspective, but the phone does not know this and sends a Keep Alive register instead of a Full register, that causes the **Partial Registration** behavior.

Troubleshooting

Collect the next log files:

- Expressway C and E Diagnostics logs. [Downloading Expressway Diagnostic Logs and Packet Captures | Cisco Virtual Events](#)
- CUCM traces. [Unified Communications Manager - RTMT Trace Collection | Cisco Virtual Events](#)
 - Call Manager
 - Event Viewer System and Application logs.
- IP Phone PRT. [How to Collect a Collaboration Endpoint PRT File with Cisco 78XX and 88XX Phones - Cisco](#)

Expressway logs, are taken in real time, it's not possible to know when would be a good time to start/stop Diagnostics logs, so in case you want to review the information mentioned above, you can follow the next procedure:

Optional Troubleshooting Procedure

There is a way to set alerts with Real-Time Monitoring Tool (RTMT). The idea is to take logs from Expressways with Windows Secure Copy (WinSCP) right after the email alert from RTMT tool is received.

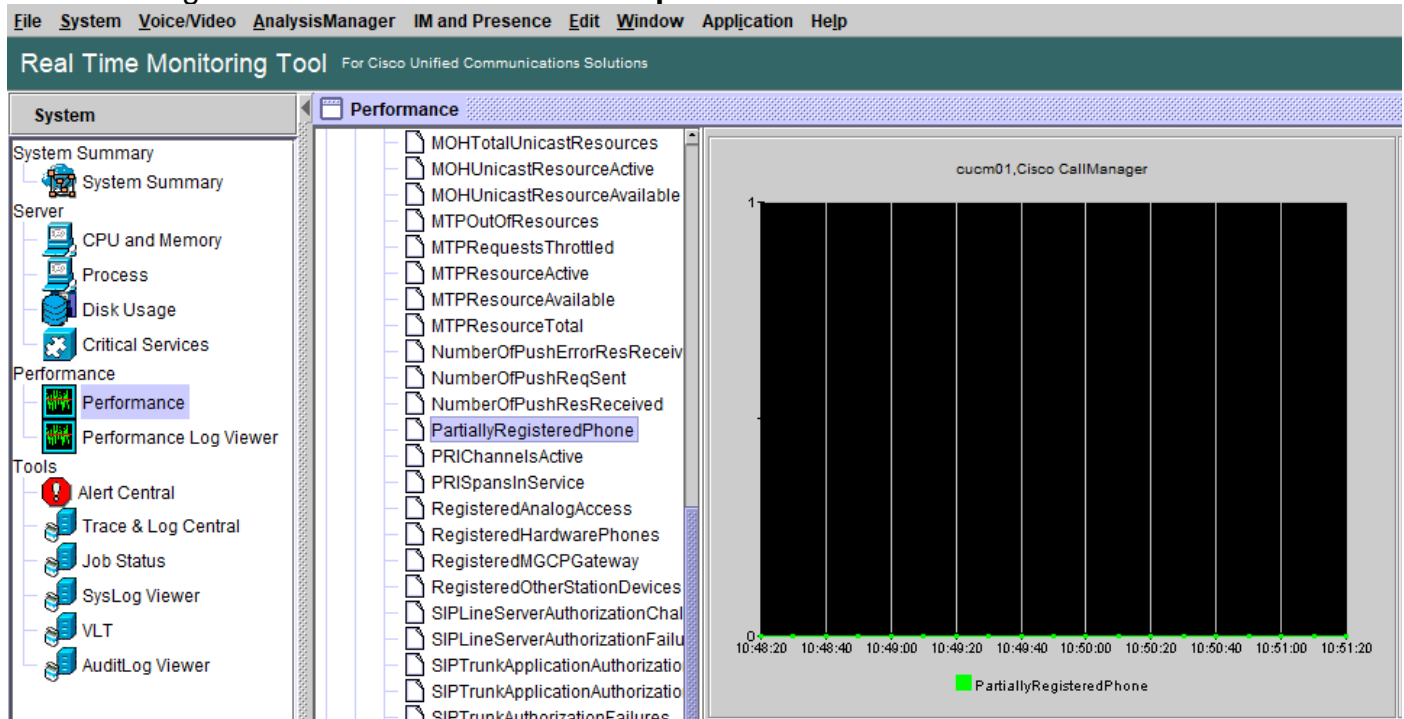
Note: E-mail server must be already configured.

<https://www.cisco.com/c/en/us/support/docs/unified-communications/unity-connection/117890-technote-cucm-00.html>

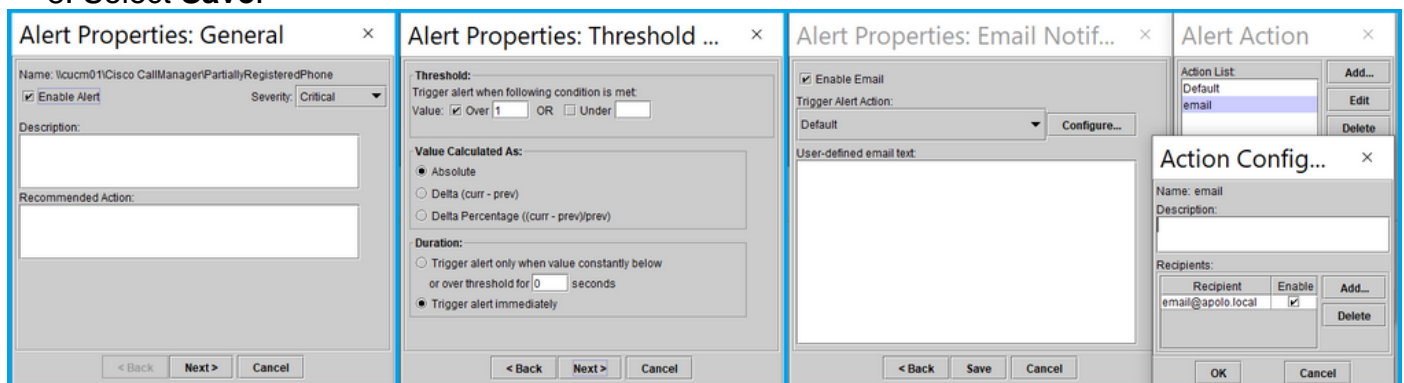
Configure RTMT Alarm

It's possible to create an alarm with RTMT tool, that sends an email, once a SIP Phone is on Partial Registered state, in order to implement the alarm follow the next steps:

1. Open RTMT tool, and navigate to **Performance > Performance**. Then Select **Cisco CallManager** and look for **PartiallyRegisteredPhone**.
2. Then right click and select **Set Alert/Properties**.



3. Check **Enable Alert**, and Set **Severity** as **Critical**.
4. Under **Threshold** configuration, check **Value**, then you can set **Over** as 1.
5. Check **Enable Email** option.
6. Under **Trigger Alert Action**, select **Configure**, select **Add** and set a new name for the Action List, in this example the name is **email**.
7. **Add** the email address for the alerts to be received.
8. Select **Save**.



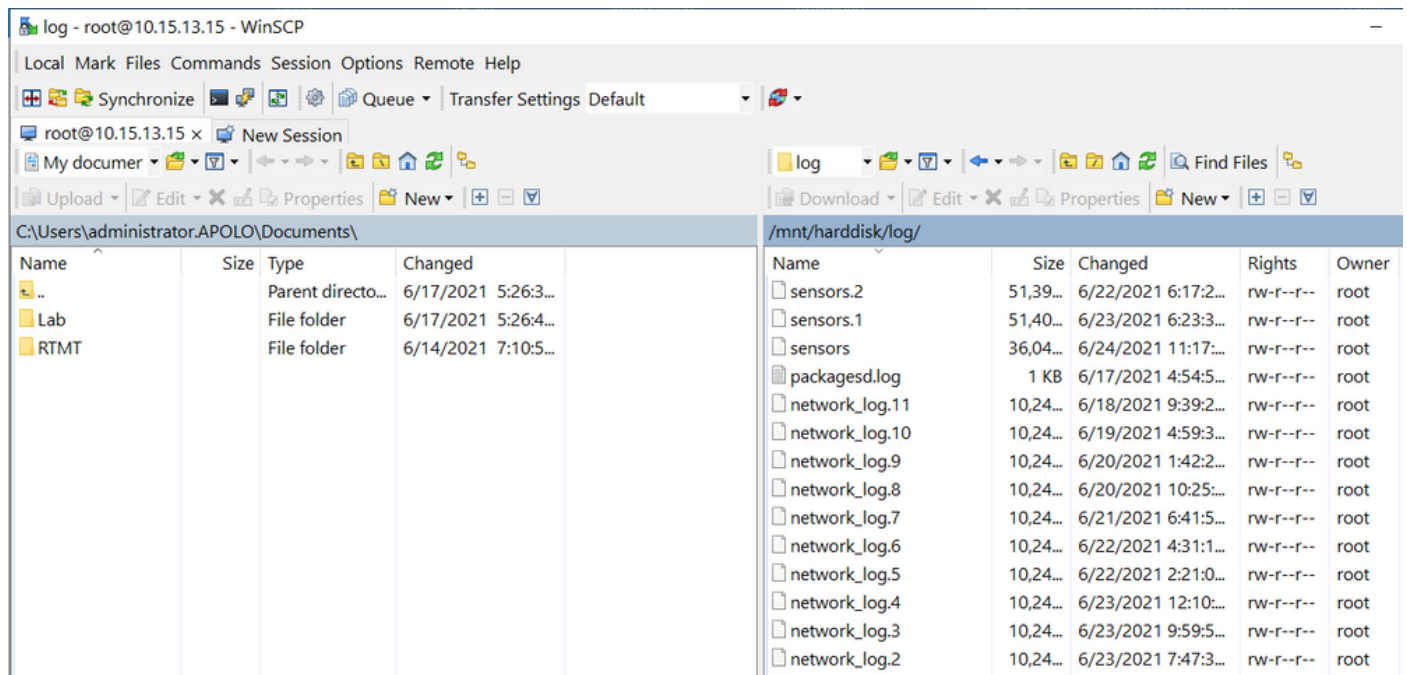
Once you get an alert from RTMT tool, you can go to your **Expressways** servers and follow the next steps:

1. Open WinSCP, access Expressway C and E, with IP address or Fully Qualified Domain Name (FQDN) and **root** credentials.

2. Navigate to **/mnt/harddisk/log/**.

3. Download important files: **network_logmessagesdeveloper_log**

Expressways usage can overwrite the information on log files very fast, make sure you get the files with the correct time stamp.



With information included on network_log file, is possible to determine if **REGISTER** messages reach CUCM servers on time, and if after any issue, IP Phone sends **REGISTER** message with one or all the lines to register back.

Enhancement Request

Currently the CUCM is unable to notify the SIP phones that are Partially Registered, an enhancement to allow CUCM the notification is already opened: [CSCvw49110](#).

As stated on enhancement request the workaround is:

- Reset the endpoint to force all lines to re-register.
- Additionally increase the **Timer Register Delta** value in the SIP Profile on CUCM to 20 (default is 5) to tolerate more delay and decrease the likelihood this occurs.