

Call Progress Analysis

- Call Progress Analysis Over IP-to-IP Media Session, on page 1
- Feature Information for Call Progress Analysis Over IP-IP Media Session, on page 2
- Restrictions for Call Progress Analysis Over IP-to-IP Media Session, on page 3
- Configure Call Progress Analysis Over IP-to-IP Media Session, on page 4

Call Progress Analysis Over IP-to-IP Media Session

The Call Progress Analysis Over IP-IP Media Session feature enables the detection of automated answering systems and live human voices on outbound calls and communicates the detected information to the external application. Typically, call progress analysis (CPA) is extensively used in contact center deployments in conjunction with the outbound Session Initiation Protocol (SIP) dialer, where CPA is enabled on the Cisco Unified Border Element (CUBE), and digital signal processors (DSP) perform the CPA functionality.

Call Progress Analysis

Call progress analysis (CPA) is a DSP algorithm that analyzes the Real-Time Transport Protocol (RTP) voice stream to look for special information tones (SIT), fax or modem tones, human speech, and answering machine tones. CPA also passes the voice information to Cisco IOS or CUBE.

CPA is initiated on receiving a new SIP INVITE with x-cisco-cpa content. While a call is in progress, the DSP or the Xcoder analyzes the incoming voice or media stream. The DSP identifies the type of voice stream based on statistical voice patterns or specific tone frequencies and provides the information to the CUBE. The CUBEnotifies the dialer with a SIP UPDATE with x-cisco-cpa content along with the detected event. Based on the report, the caller (dialer) can decide to either transfer the call or terminate the call.

To use the CPA functionality, you must enable CPA and configure CPA timing and threshold parameters.

Table 1: X-cisco-cpa content meaning

SIP Message	Direction of Message	Meaning
18x or 200	Cisco IOS to dialer	CUBE informs the dialer if CPA is enabled for a call or not.
New INVITE	Dialer to Cisco IOS	Dialer requests Cisco IOS or the CUBE to activate the CPA algorithm for this session.

SIP Message	Direction of Message	Meaning
UPDATE	Cisco IOS to dialer	Cisco IOS or the CUBE notifies the dialer about the detected event.

CPA Events

Table 2: CPA Event Detection List

CPA Event	Definition
Asm	Answer machine
AsmT	Answer machine terminate tone
CpaS	Start of the Call Progress Analysis
FT	Fax/Modem tone
LS	Live human speech
LV	Low volume or dead air call
SitIC	Special information tone IC -- Intercept -- Vacant number or Automatic Identification System (AIS)
SitNC	SIT tone NC—No Circuit (NC), Emergency, or Trunk Blockage
SitVC	SIT tone VC—Vacant Code
SitRO	SIT tone RO—Reorder Announcement
SitMT	Miscellaneous SIT Tone

Feature Information for Call Progress Analysis Over IP-IP Media Session

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 3: Feature Information for Call Progress Analysis Over IP-IP Media Session

Feature Name	Releases	Feature Information
Call Progress Analysis Over IP-to-IP Media Session	15.3(2)T	The Call Progress Analysis Over IP-to-IP Media Session feature enables detection of automated answering systems and live human voices on outbound calls and communicates the detected information to an external application. The following command was introduced: **call-progress-analysis**.
Call Progress Analysis Over IP-to-IP Media Session	Cisco IOS XE Release 3.9S	The Call Progress Analysis Over IP-to-IP Media Session feature enables detection of automated answering systems and live human voices on outbound calls and communicates the detected information to an external application. The following command was introduced: **call-progress-analysis**.
Support for additional call flows	15.5(2)T Cisco IOS XE Release 3.15S	Call Progress Analysis feature is enhanced to support the following call-flows: • 180 SIP response received without SDP • Direct call connect (without 18x from Service Provider) • Multiple 18x response to INVITE • Early dialog UPDATE • Dialer-CUBE CPA call record

Restrictions for Call Progress Analysis Over IP-to-IP Media Session

- Only SIP-to-SIP Early Offer (EO-to-EO) call flows are supported.
- Session Description Protocol (SDP) passthrough and flow-around media calls are not supported.
- Only the G711 flavor of codec is supported.
- High Availability (HA) is not supported.
- Skinny Client Control Protocol (SCCP)-based digital signal processor (DSP) farm is not supported.
- CPA cannot not be detected if Dialer uses Inband as DTMF relay mechanism, that is, Inband to RTP-NTE DTMF inter-working is not supported with CPA.

- CPA call record is not supported for "180 without SDP" and "Direct Call Connect (without 18x)" call flows from Service Provider.
- With VCC codec configured on the dial-peer, the list of codecs in the VCC should match with the list of codec provisioned in DSP transcoder profile when CPA is enabled.

Configure Call Progress Analysis Over IP-to-IP Media Session

Enable CPA and Setting the CPA Parameters

Perform the following task to enable CPA and set the CPA timing and threshold parameters:

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **dspfarm profile** *profile-identifier* **transcode**
4. **call-progress-analysis**
5. **exit**
6. **voice service voip**
7. **cpa timing live-person** *max-duration*
8. **cpa timing term-tone** *max-duration*
9. **cpa threshold active-signal** *signal-threshold*
10. **end**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**dspfarm profile** *profile-identifier* **transcode** **Example:** `Device(config)# dspfarm profile 15 transcode`	Enters DSP farm profile configuration mode, defines a profile for DSP farm services, and enables the profile for transcoding.

	Command or Action	Purpose
Step 4	**call-progress-analysis** **Example:** `Device(config-dspfarm-profile)# call-progress-analysis`	Enables call progress analysis (CPA) on CUBE. • You must configure this command to activate the CPA feature and set CPA parameters.
Step 5	**exit** **Example:** `Device(config-dspfarm-profile)# exit`	Exits DSP farm profile configuration mode and enters global configuration mode.
Step 6	**voice service voip** **Example:** `Device(config)# voice service voip`	Enters voice service configuration mode.
Step 7	**cpa timing live-person** *max-duration* **Example:** `Device(conf-voi-serv)# cpa timing live-person 2501`	(Optional) Sets the maximum waiting time (in milliseconds) that the CPA algorithm uses to determine if a call is answered by a live human.
Step 8	**cpa timing term-tone** *max-duration* **Example:** `Device(conf-voi-serv)# cpa timing term-tone 15500`	(Optional) Sets the maximum waiting time (in milliseconds) that the CPA algorithm uses to wait for the answering machine termination tone after the answering machine is detected.
Step 9	**cpa threshold active-signal** *signal-threshold* **Example:** `Device(conf-voi-serv)# cpa threshold active-signal 18db`	(Optional) Sets the threshold (in decibels) of an active signal that is related to the measured noise floor level. • If a signal threshold configured by this command is greater than the measured noise floor level, then the signal is considered as active. The active signal thresholds that you can configure are 9, 12, 15, 18, and 21 decibels.
Step 10	**end** **Example:** `Device(conf-voi-serv)# end`	Exits voice service configuration mode and returns to privileged EXEC mode.

Example: Enabling CPA and Setting the CPA Parameters

The following example shows how to enable CPA and set a few timing and threshold parameters. Depending on your requirements, you can configure more timing and threshold parameters.

```
Device> enable
```

```
Device# configure terminal
Device(config)# dspfarm profile 15 transcode
Device(config-dspfarm-profile)# call-progress-analysis
Device(config-dspfarm-profile)# exit
Device(config)# voice service voip
Device(conf-voi-serv)# cpa timing live-person 2501
Device(conf-voi-serv)# cpa timing term-tone 15500
Device(conf-voi-serv)# cpa threshold active-signal 18db
Device(conf-voi-serv)# end
```

Verify the Call Progress Analysis Over IP-to-IP Media Session

Perform this task to verify that call progress analysis has been configured for a digital signal processor (DSP) farm profile.

SUMMARY STEPS

1. **enable**
2. **show dspfarm profile** *profile-identifier*

DETAILED STEPS

Procedure

Step 1 **enable**

Enables privileged EXEC mode.

Example:

```
Device> enable
```

Step 2 **show dspfarm profile** *profile-identifier*

Displays the configured DSP farm profile information for a selected Cisco Call Manager group. In the following sample output, the Call Progress Analysis field shows that CPA is enabled.

Example:

```
Device# show dspfarm profile 3

 Profile ID = 3, Service =Universal TRANSCODING, Resource ID = 3
 Profile Description :
 Profile Service Mode : Non Secure
 Profile Admin State : UP
 Profile Operation State : ACTIVE
 Application : CUBE   Status : ASSOCIATED
 Resource Provider : FLEX_DSPRM   Status : UP
 Number of Resource Configured : 4
 Number of Resources Out of Service : 0
 Number of Resources Active : 0
 Codec Configuration: num_of_codecs:4
 Codec : g711ulaw, Maximum Packetization Period : 30
 Codec : g711alaw, Maximum Packetization Period : 30
 Codec : g729ar8, Maximum Packetization Period : 60
 Codec : g729abr8, Maximum Packetization Period : 60
```

```
Noise Reduction : ENABLED
Call Progress Analysis : ENABLED
```

Tips to Troubleshoot

Use the following commands to troubleshoot the call progress analysis for SIP-to-SIP calls:

- **debug ccsip all**
- **debug voip ccapi inout**
- **debug voip hpi all**
- **debug voip ipipgw**
- **debug voip media resource provisioning all**