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Disconnect Supervision

NOTE

- **1G**: When you see configuration parameters labeled as 1G, you will know that they are based on Tenor software version P4-2-20. If you have a lower version of software, then some of the commands may not be available or may be named differently. Check with your CLI guide to verify this. This document does not address the A200.

- **2G**: These configuration parameters apply to the Tenor AX, AS, DX, and CMS.

- **TCM**: Indicates a procedure in the *Tenor Configuration Manager* software.

Introduction

This document is designed to help explain and resolve issues associated with a lack of disconnect supervision from a switch or PSTN provider. This could result in channels and/or lines appearing to be in use when no call exists. The channels may also appear to be "hung."

This document describes the types of disconnect supervision that the Tenor can recognize and how to configure the Tenor for them. There is also information on when this problem is most likely to appear.

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Types of Disconnect Supervision

The Tenor supports three major types of disconnect supervision. One of these types should be supported in your area.

Forward Disconnect

Forward disconnect, also called battery removal, is when the PSTN provider removes the battery current from the analog line for a period of time. When the Tenor is configured to acknowledge this type of supervision, it drops the line when it receives this signal from the PSTN. The correct setting for the Tenor to use this type of supervision is Loop Start with Fwd Disconnect. Forward disconnect supervision is most prevalent on analog lines in North America.

Reverse Battery

Reverse battery, also called reverse polarity, is when the PSTN provider reverses the polarity of the battery current for both answer supervision and disconnect supervision. When the Tenor is configured to acknowledge reverse battery, it disconnects the line when it receives this signal from the PSTN. The correct setting for the Tenor to support this type of disconnect supervision is Loop Start Rev Battery (not available in analog Tenors whose serial number is less than 1000).

Disconnect Tone

Disconnect Tone is when the PSTN provider sends a tone, similar to a fast busy tone, to indicate that the call is disconnected. When the Tenor is configured to acknowledge this tone, it disconnects the line upon receiving this tone. To configure the Tenor for this, you must set the Tenor for Loop Start and then set Disconnect Tone. You can easily tell if you have this type of supervision from the PSTN. First, connect a phone to the line, and call someone. Once the other end answers, have them hang up the phone, but you stay on the line. If you hear a fast busy tone immediately after the other end hangs up, then your PSTN is providing disconnect tones. In some cases, there may be a delay in the PSTN providing this tone, which will cause a delay in the Tenor dropping the call.

All of the above types of supervision are provided from the PSTN provider to the Tenor. Once the Tenor receives this supervision from the PSTN, it passes the disconnect back to the other end of the connection.

Disconnect Scenarios

Two common situations that come up when you have a lack of proper disconnect supervision are as follows.

- Channels are off-hook or in use for an unusually long period of time
- Channels are off-hook or in use when there should be no call active

These types of situations are more common when using analog lines to connect to the Tenor.

Common applications where a problem with disconnect is more prevalent are as follows:

- OPX
- Inbound from PSTN
- Poor IP Connection

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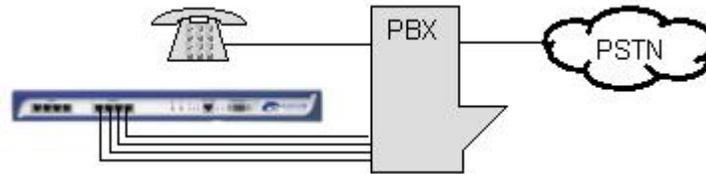Email: service@quintum.com

OPX

Figure 1

This is where the Analog Tenor is connected to the station side of the PBX, as shown in Figure 1. With these connections, the Tenor looks like a phone to the PBX, and calls are generated from a local phone user who dials the extension to which the Tenor is connected.

The PBX routes the call as an internal or extension dialed call to the Tenor. When the phone user hangs up the phone, the PBX may not provide the disconnect to the Tenor because the PBX believes the Tenor is really a phone. In this situation, the PBX always waits for the phone to hang up the line. However, the Tenor cannot initiate the disconnect as it is a switch and it must be told to disconnect the call. If such a disconnect was sent from the other end of the call, that would be fine, but for best results, we suggest that you configure the PBX to provide disconnect supervision towards the station side (to the Tenor) and configure the Tenor for the type of disconnect supervision to be used.

Inbound from PSTN

Figure 2

Figure 2 is basic to many different applications, and shows a call flow where calls are all incoming to the Analog Tenor from the PSTN. One example of this would be for calling card services. In this scenario, there could be a disconnect problem if the type of disconnect supported by the PSTN is not known, and the originator hangs up the call anytime before the call connects to the destination end. When this happens, the Tenor must be told that the originator has hung up the line, and what type of disconnect supervision is provided from the PSTN. An indication of incorrect disconnect supervision will be that the PSTN line will remain off-hook from the Tenor's point of view and will not be available for calls.

Poor IP Connection

In this scenario, if a call is over IP and connected to the PSTN at one location and the IP network experiences a high percentage of packet loss (or fails completely) during a call, the voice call will not be automatically disconnected. Both ends of the call may hang up, but if the disconnect supervision configured on the PSTN side of the Tenor is not correct, the Tenor will not get a disconnect from the PSTN user. Additionally, because there is a problem on the IP side, the Tenor will not get the disconnect from the other end of the call.

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Configuring for Disconnect Supervision

All the 1G configuration parameters below are based on Tenor software version P4-2-15. If you have a lower version of software, then some of the commands may not be available or may be named differently. Check your CLI guide to verify this.

All commands are issued from a Telnet session or CLI session. After making the necessary changes, you must submit the configuration.

Forward Disconnect Supervision

As described above, this is when the PSTN removes the battery from the analog line for a period of time to signal that the other end of the line has hung up.

To configure for this type of supervision, do the following.

> **1G:** Quintum> **config pstn 1 <Enter>**

This will bring you to the first PSTN trunk group.

> **2G:** config> **cassg 1 <Enter>**

This will bring you to the first channel-associated signaling group (where signaling type is configured).

> **TCM:** You must go to *Circuit Configuration* > *Signaling Configuration* > *CAS Signaling Group*.

To set this Tenor to recognize a forward disconnect, you must set the CAS Signaling to Loop Start with Fwd Disconnect.

> **1G:** config pstntg 1# **cassig 6 <enter>**

> **2G:** config CASSignalingGroup-1 # **set st 3**

> **TCM:** You must go to *Circuit Configuration* > *Signaling Configuration* > *CAS Signaling Groups* > *CAS Signaling Group-n* > *General tab* > *Signaling Type* and select Loop Start, Forward Disconnect from the drop-down box.

When CAS Signaling is set to Loop Start with Fwd Disconnect this way, no other disconnect supervision will be accepted. You may be able to configure other disconnect supervision methods through the CLI, such as disconnect tone, but only the forward disconnect will be recognized.

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Reverse Battery Supervision

As described above, this is when the PSTN reverses the polarity of the line to signal that the call has been answered and when it is disconnected.

To configure for this type of supervision, do the following.

1G: Quintum> **config pstn 1 <Enter>**

This will bring you to the first PSTN trunk group.

2G: config> **cassg 1 <Enter>**

This will bring you to the first channel-associated signaling group (where signaling type is configured).

TCM: You must go to *Circuit Configuration* > *Signaling Configuration* > *CAS Signaling Group*.

To set this Tenor to recognize a battery reversal disconnect, you must do the following.

1G: config pstntg 1# **cassig 5 <Enter>**

2G: config-CASSignalingGroup-1 **set st 2 <Enter>**

TCM: You must go to *Circuit Configuration* > *Signaling Configuration* > *CAS Signaling Groups* > *CAS Signaling Group-1* > *General tab* > *Signaling Type*. Select Loop Start, Reverse Battery from the drop-down box.

CAS Signaling is now set to Loop Start with Reverse Battery.

When set this way, no other disconnect supervision will be accepted. You may be able to configure other disconnect supervision methods through the CLI, such as disconnect tone, but only the reverse battery disconnect will be recognized.

NOTE
Battery Reversal is available in all digital Tenors but only those analog Tenors that have a serial number higher than A002-0009FF.

Disconnect Tone

As described earlier, this is when the PSTN provides a tone to the Tenor when the other end has hung up the line. The disconnect tone supervision will only work if the CAS Signaling is set to Loop Start.

In order to activate this, you will need to do the following.

1G: config pstntg 1# **cassig 1 <Enter>**

2G: config-CASSignalingGroup-1 **set st 1 <Enter>**

TCM: You must go to *Circuit Configuration* > *Signaling Configuration* > *CAS Signaling Groups* > *CAS Signaling Group-1* > *General tab* > *Signaling Type*. Select Loop Start from the drop-down box.

To set this Tenor to recognize a disconnect tone, you need to set the Supervision parameter to either Disconnect or Answer and Disconnect. You do that as follows.

1G: config pstntg 1# **super 1 <Enter>**

2G: config-CASSignalingGroup-1# **set tbs 1 <Enter>**

TCM: From the **Signaling** tab, set the Tone Based Supervision to Disconnect Supervision (see Figure 6).

Sets the supervision to disconnect tone only.

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or

1G: config pstntg 1# **super 3 <Enter>**

2G: config-CASSignalingGroup-1# **set tbs 3 <Enter>**

TCM: From the **Signaling** tab, set the Tone Based Supervision to Answer and Disconnect.

Sets the supervision to disconnect tone and answer.

NOTE

While you may see parameters in the config sys# prompt related to disconnect supervision, these parameters are not used to adjust the parameters to detect. These parameters are only used to tell the Tenor how to generate the tone towards the PBX trunk group, and they should not be changed. Changing them will have no affect on the Tenor's ability to detect disconnect tone from the PSTN.

For the frequencies and cadence, etc., the Tenor will automatically detect tones between 250 and 600 Hertz. The Tenor will learn the cadence used for this tone being used by the switch and based on detecting 3 cycles.

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Command Quick List

1G Tenor Commands

Trunk Group Commands

cassignaling

Description	Used to configure the type of channel associated signaling to be used for this trunk group. Also provides some forms of disconnect supervision.
Prompt Level	config pstntg 1# or config pbxtg 1#
Syntax	**cassignaling** or **cassig** {**1** | **5** | **6**}
Arguments	**1** Loop Start signaling only.
	5 Loop Start Reverse Battery.
	6 Loop Start with Fwd Disconnect
Default	1 (Loop Start)
Availability	All Tenor Releases.
Example	config pstntg 1# **cassig 6** (sets the pstn trunk group CAS signaling to Loop Start with Fwd Disconnect).

supervision

Description	Used to configure the type of disconnect and answer supervision used for this trunk group.
Prompt Level	config pstntg 1# or config pbxtg 1#
Syntax	**supervision** or **super** {**0** | **1** | **2** | **3**}
Arguments	**0** No Supervision set.
	1 Disconnect Tone Supervision (cassig must be set to 1 only).
	2 Answer Supervision (only available on PSTN trunk group).
	3 Answer and Disconnect Supervision (cassig must be set to 1 and only available on PSTN trunk group).
Default	0 (None)
Availability	All Tenor Releases.
Example	config pstntg 1# **super 1** (enables disconnect tone).

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sys level command (config sys#)

discfrequency

Description	Used to configure the range (minimum and maximum) of the disconnect tone that the Tenor will generate towards the PBX trunk group.
Prompt Level	config sys#
Syntax	**discfrequency** or **discfreq** {*minfreq*} {*maxfreq*}
Arguments	*minfreq* Minimum frequency of tone.
	maxfreq Maximum frequency of tone.
Default	480 620
Availability	All Tenor Releases.
Guidelines	This parmeter is NOT used to change how the Tenor detects the tone from the PSTN.
Example	config sys# **discfreq 460 600** (sets frequency range between 460 and 600 Hz).

disconoff

Description	Used to configure the cadence of the disconnect tone that the Tenor generates towards the PBX trunk group.
Prompt Level	config sys#
Syntax	**disconoff** or **discon** {*ontime*} {*offtime*}
Arguments	*ontime* Sets the amount of ms the tone is on for.
	offtime Sets the amount of ms the tone is off for.
Default	250 250
Availability	All Tenor Releases.
Guidelines	This parameter is NOT used to change how the Tenor detects the tone from the PSTN.
Example	config sys# **discon 200 200** (sets cadence to 200ms on and 200ms off).

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2G Tenor Commands

SignalingType

Description	Used to configure the type of channel associated signaling to be used for this trunk group. Also provides some forms of disconnect supervision.
Prompt Level	config CASSignalingGroup-line#
Syntax	**set signalingtype** or **set st** {**1** | **2** | **3**}
Arguments	**1** Loop Start signaling only. **2** Loop Start Reverse Battery. **3** Loop Start with Fwd Disconnect
Default	1 (Loop Start)
Availability	All Tenor Gen 2 Releases.
Example	config CASSignalingGroup-line # **set st 3**

ToneBasedSupervision

Description	Used to configure the type of disconnect and answer supervision used for this trunk group.
Prompt Level	config CASSignalingGroup-line#
Syntax	**set tonebasedsupervision** or **set tbs** {**0** | **1** | **2** | **3**}
Arguments	**0** No Supervision set. **1** Disconnect Supervision only. **2** Answer Supervision only. **3** Answer and Disconnect Supervision.
Default	0 (None)
Availability	All Tenor Gen 2 Releases.
Example	config CASSignalingGroup-line # **set tbs 1**