

# Country Options Configuration for E1 R2 Signaling

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## Introduction

R2 signaling is a channel associated signaling (CAS) system developed in the 1960s that is still in use today in Europe, Latin America, Australia, and Asia. R2 signaling exists in several country versions or variants, in an international version called Consultative Committee for International Telegraph and Telephone (CCITT–R2). The R2 signaling specifications are contained in ITU–T Recommendations Q.400 through Q.490.

E1 R2 signaling is an international signaling standard that is common to channelized E1 networks. E1 R2 signaling has been supported on the Cisco AS5200, 5300, and 5800 series access routers. E1 R2 signaling was introduced to the Cisco 2600/3600 series routers in Cisco IOS® Software Release 12.1.2XH and 12.1(3)T. E1 R2 is also supported on the E1 voice WAN interface cards (VWICs), which can be inserted into the WIC slot on the IAD2430s. Furthermore, Cisco AS5350, 5400, and 5850 also support this application.

**Note:** R2 signaling is not supported on the Cisco MC3810 router.

The purpose of this document is to offer some example configurations and important guidelines that will help customers set up an R2 interconnection. Troubleshooting is not covered as part of this document. For information on troubleshooting E1 R2, refer to E1 R2 Signaling Configuration and Troubleshooting.

## Prerequisites

### Requirements

There are no specific requirements for this document.

### Components Used

This document is not restricted to specific hardware versions; however, some software recommendations are made. These recommendations are based on the fact that major software defects that are related to this technology have been identified and addressed by the respective versions. Nonetheless, extensive testing is required before you use the software in a production environment.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

## Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

## E1 R2 Configuration Examples

This section provides a list of functional configuration examples that have been tested. These examples should be used as a reference when you provision E1 R2 in countries where the default settings do not apply.

**Note:** Only the commands under `cas-custom` are shown. The configuration of voice ports and dial peers is not covered. Cisco IOS Software Release 12.3(9) was used to test these configurations.

### Mexico Telmex Modified

```
controller E1 0/0
 framing NO-CRC4
 ds0-group 1 timeslots 1-15,17-30 type r2-digital r2-compelled ani
 cas-custom 1
   country telmex
   category 2
   answer-signal group-b 1
```

**Note:** In some implementations, Telmex requires that Group A signals be used for automatic number identification (ANI) collection. If this is needed, add the command `groupa-callerid-end` under `cas-custom`. If this command is not configured, the router uses the country default (a Group C signal).

### Argentina Telecom

```
controller E1 0/0
 ds0-group 0 timeslots 1-15,17-31 type r2-digital r2-compelled ani
 framing NO-CRC4
 cas-custom 0
   country argentina
   dnis-complete
```

**Note:** For most configurations, Telecom Argentina requires that an I-15 signal be sent after the last DNIS digit is dialed. If this is the case, configure `dnis-complete`. By default, an I-12 signal is used.

### Venezuela CANTV

For incoming calls:

```
controller E1 0/0
 framing NO-CRC4
 ds0-group 0 timeslots 1-15,17-31 type r2-digital r2-compelled ani
 cas-custom 0
   country venezuela
   answer-signal group-a 6
   dnis-complete
```

**Note:** CANTV Venezuela uses A6 for answer signal.

For outgoing calls:

```
controller E1 0/2/0
framing NO-CRC4
ds0-group 1 timeslots 1-15 type r2-digital dtmf dnis
```

## Brazil

```
controller E1 0/0
framing NO-CRC4
ds0-group 0 timeslots 1-15,17-31 type r2-digital r2-compelled ani
cas-custom 0
country brazil
category 2
answer-signal group-b 1
```

**Note:** Some Telefonica circuits require metering to be enabled. If needed, add the metering command under cas-custom.

## China

```
controller E1 0/0
framing NO-CRC4
ds0-group 0 timeslots 1-15,17-31 type r2-digital r2-compelled ani
cas-custom 0
country china
answer-signal group-b 1
```

## E1 R2 Caveats

The following is a list of software caveats related to E1 R2. In order to follow these bug ID links and see detailed bug information, you must be a registered user and you must be logged in.

Cisco Bug ID	Description
CSCed55231	<del>MRP does not clear R2 call cleanly</del>
CSCed22834	ICS7700 does not recognize inbound BLOCKING state
CSCec77853	<del>One way audio with SIP and E1 R2</del>
CSCec64185	E1 R2: Bad implementation of A-2 signal for Argentina
CSCec58903	<del>E1 R2: AS does not detect BLOCKING state</del>
CSCea55028	voice call stuck if call setup time takes more than 15s
CSCea17341	Calls fail with answer signal group A and no DID configured
CSCdz69604	5400 E1 R2 is not sending answer signal group A
CSCeb36413	<del>E1 R2 call fails on 5400 and 5850</del>
CSCdy36274	<del>E1 R2 hung call when redial to same destination</del>
CSCea64554	

	Call stuck on 3600 when hairpinning from E1 R2 to ISDN
CSCea61403	Unprotected buginf in R2 calls
CSCed44156	E1 R2 needs configurable DNIS timeout for 2600
CSCdy22974	Spurious memory access at tsp_voice_call_check on OGW
CSCdx66463	R2 voice port locks up in R2_Q421_IC_CLR_BWD state
CSCea81777	Hairpin call get disconnect from E1 R2 to CAS E&M
CSCeb52314	AS5850 chooses a DS0-group not defined on the POTS dial-peer
CSCdz66927	Voice-ports Hung and Digits not being pulsed out
CSCeb65150	E1 R2 Needs configurable DNIS timeout for 7200 series

## E1 R2 Recent Commands

Cisco has recently added new commands for E1 R2 implementations, to improve the flexibility of this application and to meet customer demands. These are the most important commands:

- **alert-wait-time** Time to wait for alert indication for incoming R2 calls. Default is 15 seconds.
- **call guard-timer** To set a guard timer to accept or reject a call, in the event that the RADIUS server fails to respond to a pre-authentication request.
- **cause-on-congestion** Translates the R2 congestion signal to the ISDN cause value, in order to return this value to the originating voice gateway.
- **disconnect-tone** Provides a tone to the calling party after the ending Group B register signal.
- **signal-end-to-end** Transfer R2 Category and Answer signals end-to-end.
- **trunk-group label** Configure interface to be in a trunk group.

**Note:** Some of those commands are platform-specific. Refer to the Command Lookup Tool for details about every option.

## NetPro Discussion Forums – Featured Conversations

Networking Professionals Connection is a forum for networking professionals to share questions, suggestions, and information about networking solutions, products, and technologies. The featured links are some of the most recent conversations available in this technology.

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Voice & Video: IP Phone Services for End Users

Voice & Video: Unified Communications
Voice & Video: IP Phone Services for Developers
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## Related Information

- **E1 R2 Signaling Configuration and Troubleshooting**
- **E1 R2 Signaling for the Cisco AS5300 and Cisco AS5200 Access Servers**
- **E1 R2 Signaling for the Cisco 3620 and 3640 Series Routers**
- **E1 R2 Signaling for the Cisco AS5800**
- **Voice Technology Support**
- **Voice and Unified Communications Product Support**
- **Recommended Reading: Troubleshooting Cisco IP Telephony**
- **Technical Support & Documentation – Cisco Systems**

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