



ISDN Generic Transparency Descriptor (GTD) for Setup Message

The ISDN Generic Transparency Descriptor for Setup Message feature provides support for mapping ISDN information elements (IEs) to corresponding GTD parameters. The following IEs and parameters are supported:

- Originating Line Information (OLI)
- Bearer Capability (USI and TMR)
- Called Party Number (CPN)
- Calling Party Number (CGN)
- Redirecting Number (RGN, OCN and RNI)

Feature Specifications for the ISDN Generic Transparency Descriptor for Setup Message Feature

Feature History

Release	Modification
12.2(15)T	This feature was introduced.

Supported Platforms

Cisco 2611, Cisco 2612, Cisco 2613, Cisco 2620, Cisco 2621, Cisco 2650, Cisco 2651, Cisco 3631, Cisco 3640, Cisco 3725, Cisco 3745, Cisco AS5300, and Cisco AS5400

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Prerequisites for ISDN GTD for Setup Message

You must configure your VoIP network and Cisco IOS gateways to allow sending and processing of ISDN Q.931 Setup messages.

Restrictions for ISDN GTD for Setup Message

The ISDN GTD for Setup Message feature does not support ISDN BRI calls.

Information About ISDN GTD for Setup Message

To configure the ISDN GTD for Setup Message feature, you need to understand the following concepts:

- [Benefits of ISDN GTD for Setup Message, page 2](#)
- [Feature Design of ISDN GTD for Setup Message, page 2](#)
- [ISDN IE to GTD Parameter Mapping, page 3](#)

Benefits of ISDN GTD for Setup Message

- Allows VoIP service providers to develop custom call treatments and enhanced service offerings based on call origination
- Allows service providers to correctly identify the source of a call, bill appropriately, and settle accurately with other network providers

Feature Design of ISDN GTD for Setup Message

The ISDN GTD for Setup Message feature allows the delivery of information elements present in ISDN Setup messages to Toolkit Command Language (TCL) scripts, RADIUS accounting servers and routing servers in VOIP networks. This allows TCL scripts and routing servers to access ISDN signaling information to provide enhanced features and routing services. In particular the OLI IE present in AT&T (TR-41459 ISDN PRI UNI Specification) and MCI Setup messages can be passed to the 'originating-line-info' VSA in RADIUS Start Accounting messages to identify the originating caller.

Federal Communications Commission (FCC) regulations mandate that pay telephone operators be compensated by network operators for 1-800 number calls made from their pay telephones. Prior to the implementation of the ISDN GTD for Setup Message feature, network operators had no way to identify calls made from their pay telephones. This inability resulted in network operators having to compensate pay telephone operators directly from their own revenues. In addition, network operators had no billing records to validate pay telephone operators' settlement requests to prevent fraud. The ISDN GTD for Setup Message feature provides Cisco networks the ability to correctly identify the source of a call. This feature allows networks to do the following:

- Extract Originating Line Information (OLI) to identify pay telephone calls and pass on applicable charges
- Generate billing records that can be used to validate pay telephone operator settlement requests. For information on accounting records and RADIUS billing, refer to [RADIUS VSA Voice Implementation Guide](#).

The ISDN GTD for Setup Message feature provides the flexibility to identify other types of originated calls (from prisons, hotels, and so forth) and allows you to use the TCL interface to define custom services for these types of calls. For more information on TCL application programming, refer to [TCL IVR API Version 2.0 Programmer's Guide](#).

In addition to passing OLI, this feature supports GTD mapping for Bearer Capability, Called Party Number, Calling Party Number, and Redirecting Number IEs.

Cisco implements this feature on Cisco IOS gateways by providing a mechanism to allow creating and passing the Q931 Setup message and its parameters in a GTD format. The Setup message, received by the gateway to initiate call establishment, is mapped to the GTD Initial Address Message (IAM). Generic transparency descriptors represent parameters within signaling messages and enable transport of signaling data in a standard format across network components and applications. The GTD mechanism allows them to share signaling data and achieve interworking between different signaling types. This feature supports only ISDN PRI and Non-Facility Associated Signaling (NFAS) calls.

ISDN IE to GTD Parameter Mapping

ISDN messages, used to signal call control, are composed of information elements and follow the format specified in ITU-T Q.931. The ISDN GTD for Setup Message feature supports only the mapping of Q931 Setup messages to GTD IAM messages. This section defines ISDN to GTD mapping for supported IEs and GTD parameters. Throughout this document parameters are referred to by both the parameter name, and the three character GTD code.

[Table 1](#) defines the mapping of ISDN IEs to GTD parameters. The GTD mechanism also passes the following parameters for which there are no corresponding ISDN IEs:

- Calling Party Category (CPC)
- Forward Call Indicators (FCI)
- Protocol Name (PRN)

Table 1 ISDN IEs Mapped to GTD Parameters

ISDN Information Element	GTD Parameters
Bearer Capability	USI (User Service Information), TMR (Transmission Medium Requirements)
Called Party Number	CPN (Called Party Number)
Calling Party Number	CGN (Calling Party Number)
Redirecting Number	RGN (Redirecting Number), OCN (Original Called Number), RNI (Redirection Information)
Originating Line Info	OLI (Originating Line Information)

**Note**

GTD mapping allows a maximum of two redirecting number (original called number) IEs per call. If only one IE is present in the incoming Setup message, then both RGN and OCN parameters are built by the ISDN stack and the RGN and OCN parameters will contain the same values. If two IEs are present, then OCN contains information specified in the first IE and RGN contains information for the second IE. RNI contains redirection reasons. If only one IE is present then both the redirection reason (rr) field and original redirection reason (orr) field in the GTD RNI parameter contain the redirection reason indicated in the IE. When two IEs are present, then the GTD orr field indicates the redirection reason of the first IE and the GTD rr field indicates that of the second IE.

Mapping for Called Party Number (CPN), Calling Party Number (CGN) and Redirecting Information (RGN)

This section defines mapping for fields and values common to the CPN, CGN, and RGN GTD parameters carried in the GTD IAM message.

[Table 2](#) defines mapping for ISDN type of number fields to GTD nature of address (noa) fields.

Table 2 *Type of Number to Nature of Address Mapping*

ISDN Type of Number	GTD Nature of Address (noa)
0—unknown	00—unknown (number present)
1—international number	06—unique international number
2—national number	04—unique national (significant) number
3—network specific number	08—network specific number
4—subscriber number	02—unique subscriber number
6—abbreviated number	34—abbreviated number

[Table 3](#) defines mapping for ISDN numbering plan identification fields to GTD numbering plan indicator (npi) fields.

Table 3 *Numbering Plan Identification to Numbering Plan Indicator Mapping*

ISDN Numbering Plan Identification	GTD Numbering Plan Indicator (npi)
0—unknown	u—unknown
1—ISDN Telephony numbering plan	1—ISDN numbering plan
2—telephony numbering plan	1—ISDN numbering plan (best fit)
3—data numbering plan	2—data numbering plan
4—telex numbering plan	3—telex numbering plan
8—national standard numbering plan	5—national numbering plan
9—private numbering plan	4—private numbering plan

[Table 4](#) defines mapping for ISDN and GTD presentation indicator (pi) fields.

Table 4 *Presentation Indicator Mapping*

ISDN Presentation Indicator	GTD Presentation Indicator (pi)
—	u—unknown
0—presentation allowed	y—presentation allowed
1—presentation restricted	n—presentation not allowed
2—number not available due to interworking	0—address not available

Mapping for Calling Party Number (CGN)

Table 5 defines mapping for ISDN and GTD screening indicator (si) fields.

Table 5 *Screening Indicator Mapping*

ISDN Screening Indicator	GTD Screening Indicator (si)
—	u—unknown
0—user-provided, not screened	1—user provided not screened
1—user-provided, verified and passed	2—user provided screening passed
2—user-provided, verified and failed	3—user provided screening failed

Mapping for Redirection Information (RNI)

Table 6 defines mapping for the ISDN reason for redirection fields to GTD original redirection reason (orr) and redirection reason (rr) fields in the GTD RNI parameter.

Table 6 *Reason for Redirection to Original Redirection Reason and Redirection Reason Mapping*

ISDN Reason for Redirection	GTD Original Redirection Reason (orr) and Redirection Reason (rr)
0—unknown	u—unknown
1—call forwarding busy or called DTE busy	1—user busy
2—call forwarding no reply	2—no reply
4—call deflection	4—deflection during alerting
5—call deflection immediate response	5—call deflection immediate response
9—called DTE out of order	2—no reply (best fit)
10—call forwarding by the called DTE	5—call deflection immediate response (best fit)
13—call transfer	5—call deflection immediate response (best fit)
14—call pickup	5—call deflection immediate response (best fit)
15—call forwarding unconditional	3—unconditional

Mapping for Originating Line Information (OLI)

Table 7 defines mapping for OLI fields.

Table 7 *Originating Line Information Mapping*

ISDN Originating Line Information	GTD Originating Line Information (oli)
0— pots	0—pots
1—multiparty line	1—multiparty line
2—ANI failure	2—ANI failure
6—Station Level Rating	6—Station Level Rating
7—special operator handling required	7—special operator handling required
8—inter-LATA restricted	8— inter-LATA restricted
10—test call	10—test call
20—AIOD-listed DN sent	20—AIOD-listed DN sent
23—coin or noncoin on calls using database access	23—coin or noncoin on calls using database access
24—800 service call	24—800 service call
25— 800 service call from a pay station	25—800 service call from a pay station
27—payphone using coin control signaling	27—payphone using coin control signaling
29— prison or inmate service	29—prison or inmate service
30— intercept (blank)	30—intercept (blank)
31—intercept (trouble)	31—intercept (trouble)
32— intercept (regular)	32—intercept (regular)
34—telco operator handled call	34—telco operator handled call
36—CPE	36—CPE
52—OUTWATS	52—OUTWATS
60—TRS call from unrestricted line	60—TRS call from unrestricted line
61—wireless or cellular PCS (type 1)	61—wireless or cellular PCS (type 1)
62—wireless or cellular PCS (type 2)	62—wireless or cellular PCS (type 2)
63— wireless or cellular PCS (roaming)	63—wireless or cellular PCS (roaming)
66—TRS call from hotel	66—TRS call from hotel
67—TRS call from restricted line	67—TRS call from restricted line
68— inter-LATA restricted hotel	68—inter-LATA restricted hotel
78—inter-LATA restricted coinless	78—inter-LATA restricted coinless
70—private paystations	70—private paystations
93—private virtual network	93—private virtual network

Mapping for Bearer Capability (USI and TMR) Parameters

The ISDN Bearer Capability IE is mapped to the GTD User Service Information (USI) and Transmission Medium Requirements (TMR) parameters. [Table 8](#) defines mapping for coding standard fields and values.

Table 8 ISDN to GTD Coding Standard Mapping

ISDN Coding Standard	GTD Coding Standard (cs)
0—CCITT standardized coding	c—CCITT/ITU standardized coding
1—reserved for other international standard	i—ISO/IEC standard
2—national standard	n—national standard
3—standard defined for the network	p—standard defined for the network

[Table 9](#) defines ISDN to GTD mapping for information transfer capability fields and values.

Table 9 Information Transfer Capability Mapping

ISDN Information Transfer Capability	GTD Information Transfer Capability (cap)
0—speech	s—speech
8—unrestricted digital information	d—unrestricted digital information
9—restricted digital information	r—restricted digital information
16—3.1 kHz audio	3—3.1 kbps audio
17—7 kHz audio	7—7 kbps audio
24—video	v— video

[Table 10](#) defines mapping for transfer mode fields and values.

Table 10 Transfer Mode Mapping

ISDN Transfer Mode	GTD Transfer Mode (mode)
0—circuit mode	c—circuit mode
2—packet mode	p—packet mode

[Table 11](#) defines mapping for information transfer rate fields and values.

Table 11 Information Transfer Rate Mapping

ISDN Information Transfer Rate	GTD Information Transfer Rate (rate)
0—packet mode	0—not applicable (used for packet call)
16—64 kbps	1—64 kbps
17—2x64 kbps	7—2x64 kbps
19—384 kbps	2—384 kbps

ISDN Information Transfer Rate	GTD Information Transfer Rate (rate)
21—1536 kbps	4—1536 kbps
23—1920 kbps	5—1920 kbps

Table 12 defines mapping for transmission medium requirements.

Table 12 *Transmission Medium Requirements Mapping*

ISDN Information Transfer Capability	ISDN Information Transfer Rate	GTD Transmission Medium Requirements
0—speech	—	00
8—unrestricted digital information	16—64 kbps	01
8—unrestricted digital information	17—2x64 kbps	04
8—unrestricted digital information	19—384 kbps	05
8—unrestricted digital information	21—1536 kbps	06
8—unrestricted digital information	23—1920 kbps	07
16—3.1 kHz audio	—	02
17—7 kHz audio	—	08
24—video	—	08

Table 13 defines mapping for structure fields and values.

Table 13 *Structure Mappings*

Structure	Structure (str)
0—default	0—default or unknown
1—8 kHz integrity	1—8 kHz integrity
4—service data unit integrity	2—service data unit integrity
7—unstructured	3—unstructured

Table 14 defines mapping for configuration fields and values.

Table 14 *Configuration Field Mapping*

ISDN Configuration	GTD Configuration (conf)
0—point to point	0—point to point

Table 15 defines mapping for establishment fields and values.

Table 15 *Establishment Field Mapping*

ISDN Establishment	GTD Establishment (estab)
0—demand	d—demand

Table 16 defines mapping for symmetry fields and values.

Table 16 *Symmetry Field Mapping*

ISDN Symmetry	GTD Symmetry (sym)
0—bidirectional symmetric	sb—symmetric bidirectional

Table 17 defines mapping for Layer 1 protocol fields and values.

Table 17 *Layer 1 Protocol Mapping*

ISDN Information Layer 1 Protocol	GTD Layer 1 Protocol (lay1)
1—CCITT standardized V110	v110—CCITT standardized V.110/X.30
2—G.711 μ -law	ulaw—G711 μ -law
3—G.711A-law	alaw—G711 A-law
4—G.721 32 kbps	g721—G721 32 kbps
5—G.722 and G.725	g722—G.722 and G.725/G.724 7 kHz audio
6—G.7xx 384 video	g735—G.735 for 384 kbps video
7—non-CCITT standardized	nonc— non-CCITT rate adaptation
8—CCITT standardized V.120	v120—CCITT standardized V.120
9—CCITT standardized X.31	hdlc—CCITT standardized X.31

Table 18 defines mapping for synchronization fields and values.

Table 18 *Synchronization Mapping*

ISDN Synchronous/Asynchronous	GTD Synchronization (sync)
0—synchronous	y—synchronous
1—asynchronous	n—asynchronous

Table 19 defines mapping for negotiation fields and values.

Table 19 *Negotiation Mapping*

ISDN Negotiation	GTD Negotiation (neg)
0—in-band negotiation not possible	0—in-band negotiation not possible
1—in-band negotiation possible	1—in-band negotiation possible

Table 20 defines mapping for user rate fields and values.

Table 20 *User Rate Mapping*

ISDN User Rate	ISDN User Rate (subrate)
0—rate is indicated by E-bits	0—rate is indicated by E-bits
1—0.6 kbps	1—0.6 kbps
2—1.2 kbps	2—1.2 kbps
3—2.4 kbps	3—2.4 kbps
4—3.6 kbps	4—3.6 kbps
5—4.8 kbps	5—4.8 kbps
6—7.2 kbps	6—7.2 kbps
7—8.0 kbps	7—8.0 kbps
8—9.6 kbps	8—9.6 kbps
9—14.4 kbps	9—14.4 kbps
10—16.0 kbps	10—16.0 kbps
11—19.2 kbps	11—19.2 kbps
12—32.0 kbps	12—32.0 kbps
14—48.0 kbps	13—48.0 kbps
15—56.0 kbps	14—56.0 kbps
16—64.0 kbps	14—56.0 kbps (best fit)
21—0.1345 kbps	15—0.1345 kbps
22—0.100 kbps	16—0.1000 kbps
23—0.075/1.2 kbps	17—0.075/1.2 kbps
24—1.2/0.075 kbps	18—1.2/0.075 kbps
25—0.050 kbps	19—0.050 kbps
26—0.075 kbps	20—0.075 kbps
27—0.110 kbps	21—0.110 kbps
28—0.150 kbps	22—0.150 kbps
29—0.200 kbps	23—0.200 kbps
30—0.300 kbps	24—0.300 kbps
31—12 kbps	25—12 kbps

Table 21 defines mapping for intermediate rate fields and values.

Table 21 *Intermediate Rate Mapping*

ISDN Intermediate Rate	GTD Intermediate Rate (int)
1—8 kbps	08—8 kbps
2—16 kbps	16—16 kbps
3—32 kbps	32—32 kbps

Table 22 defines mapping for network independent clock on transmission fields and values.

Table 22 *Mapping for Network Independent Clock on Transmission*

ISDN Network Independent Clock on TX	ISDN Network Independent Clock on TX (txnic)
0—not required to send data	n—not required to send data
1—required to send data	y—required to send data

Table 23 defines mapping for network independent clock on reception fields and values.

Table 23 *Mapping for Network Independent Clock on Reception*

ISDN Network Independent Clock on RX	GTD Network Independent Clock on RX (rxnic)
0—cannot accept data	n—cannot accept data
1—can accept data	y—can accept data

Table 24 defines mapping for flow control on transmission fields and values.

Table 24 *Mapping for Flow Control on Transmission*

ISDN Flow Control on TX	GTD Flow Control on TX (txfl)
0—not required to send data	n—not required to send data
1—required to send data	y—required to send data

Table 25 defines mapping for flow control on reception fields and values.

Table 25 *Mapping for Flow Control on Reception*

ISDN Flow Control on RX	GTD Flow Control on RX (rxfl)
0—cannot accept data	n—cannot accept data
1—can accept data	y—can accept data

Table 26 defines mapping for rate adaptation header fields and values.

Table 26 *Mapping for Rate Adaptation Header*

ISDN Rate Adaptation Header/No Header	GTD Rate Adaptation Header (hdr)
0—rate adaptation header not included	n—rate adaptation header not included
1—rate adaptation header included	y—rate adaptation header included

Table 27 defines mapping for multiframe establishment support for data link fields and values.

Table 27 *Mapping for Multiframe Establishment (MFE) Support*

ISDN MFE Support in Data Link	GTD MFE Support in Data Link (mf)
0—MFE not supported	n—MFE not supported
1—MFE supported	y—MFE supported

Table 28 defines mapping for mode of operation fields and values.

Table 28 Mode of Operation Mapping

ISDN Mode of Operation	GTD Mode of Operation (mode)
0—bit transparent mode of operation	0—bit transparent mode of operation
1—protocol sensitive mode of operation	1—protocol sensitive mode of operation

Table 29 defines mapping for logical link identifier negotiation fields and values.

Table 29 Logical Link Identifier (LLI) Mapping

ISDN LLI Negotiation	GTD LLI Negotiation (lli)
0—default	0—default
1—full protocol negotiation	1—full protocol negotiation

Table 30 defines mapping for assignor and assignee fields and values.

Table 30 Mapping for Assignor and Assignee

ISDN Assignor and Assignee	GTD Assignor and Assignee (asgn)
0—message originator is default assignee	0—message originator is default assignee
1—message originator is assignor only	1—message originator is assignor only

Table 31 defines mapping for in-band and out-of-band negotiation fields and values.

Table 31 Mapping for Inband and Out-of-Band Negotiation

ISDN In-band and Out-of-Band Negotiation	GTD In-band and Out-of-Band Negotiation (inbnd)
0—negotiation done with USER INFO	0— not applicable to this protocol
1—negotiation done in-band	1— negotiation done in-band

Table 32 defines mapping for fields and values for number of stop bits.

Table 32 Mapping for Number of Stop Bits

ISDN Number of Stop Bits	GTD Number of Stop Bits (stp)
1—1 bit	1—1 bit
2—1.5 bit	3—1.5 bit
3—2 bits	2—2 bits

Table 33 defines mapping for fields and values for number of data bits.

Table 33 Mapping for Number of Data Bits

ISDN Number of Data Bits	GTD Number of Data Bits (dat)
1—5 bits	5—5 bits
2—7 bits	7—7 bits
3—8 bits	8—8 bits

Table 34 defines mapping for parity information fields and values.

Table 34 Parity Mapping

ISDN Parity Information	GTD Parity (par)
0—odd	o—odd
2—even	e—even
3—none	n—none
4—forced to 0	0—forced to 0
5—forced to 1	1— forced to 1

Table 35 defines mapping for duplex mode fields and values.

Table 35 Duplex Mode Mapping

ISDN Duplex Mode	GTD Duplex (dup1)
0—half duplex	h—half duplex
1—full duplex	f—full duplex

Table 36 defines mapping for modem type fields and values.

Table 36 Modem Type Mapping

Modem Type	Modem Type (modm)
1—V.21	11—V.21
2—V.22	00—V.22
3—V.22 <i>bis</i>	01—V.22 <i>bis</i>
4—V.23	02—V.23
5—V.26	03—V.26
6—V.26 <i>bis</i>	04—V.26 <i>bis</i>
7—V.26 <i>ter</i>	05—V.26 <i>ter</i>
8—V.27	06—V.27
9—V.27 <i>bis</i>	07—V.27 <i>bis</i>
10—V.27 <i>ter</i>	08—V.27 <i>ter</i>
11—V.29	09—V.29

Modem Type	Modem Type (modm)
12—V.32	10—V.32
13—V.35	12—V.34 (best fit)

Table 37 defines mapping for Layer 2 protocol fields and values.

Table 37 Layer 2 Protocol Mapping

ISDN User Information Layer 2 Protocol	GTD Layer 2 Protocol (lay2)
2—Q.921	2—Q.921
6—X.25	1—X.25

Table 38 defines mapping for Layer 3 protocol fields and values.

Table 38 Layer 3 Protocol Mapping

ISDN User Information Layer 3 Protocol	GTD Layer 3 Protocol (lay3)
2—Q.931	2—Q.931
6—X.25	1—X.25

How to Configure ISDN GTD for Setup Message

This section contains the following procedures.

- [Configuring ISDN GTD for Setup Message, page 14](#) (optional)
- [Configuring OLI IE to Interface with MCI Switches, page 15](#) (optional)

Configuring ISDN GTD for Setup Message

This feature is enabled by default; no configuration tasks are required to enable this feature. This task reenables the feature if it was disabled by using the **no isdn gtd** command.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface**
4. **isdn gtd**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	interface Example: Router(config)# interface	Enters interface configuration mode.
Step 4	isdn gtd Example: Router(config-if)# isdn gtd	Enables GTD parameter mapping for ISDN IEs.

Configuring OLI IE to Interface with MCI Switches

You must configure the Cisco IOS gateway to support the switch variant from which the gateway receives ISDN signaling. For a gateway that interfaces to an MCI switch or PBX, the OLI IE identifier for the MCI ISDN variant, as defined in *CPE Requirements for MCI ISDN Primary Rate Interface*, (014-0018-04.3D-ER, revision 4.3D, February 10, 1998), is configurable. Select the IE value that indicates OLI information to configure gateway support for the MCI ISDN variant.

Configuring the OLI IE Identifier

This task configures the OLI IE identifier value to support the MCI switch interface.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface**
4. **isdn ie oli *value***

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	interface Example: Router(config)# interface	Enters interface configuration mode.
Step 4	isdn ie oli value Example: Router(config-if)# isdn ie oli 7F	Configures the OLI IE identifier to allow the gateway to interface with an MCI switch. <ul style="list-style-type: none"> OLI IE identifier values are specified in hexadecimal format. Values range from 00 to 7F.

Examples

Use the **show running-config** command to verify configuration for the ISDN GTD for Setup Message feature. If GTD mapping is enabled, which is the default setting, the **show running-config** output does not display the **isdn gtd** command.

In the following sample out put, the **isdn gtd** command is disabled and the OLI IE value is set to 1F:

```
Router# show running-config
Building configuration...

Current configuration :4112 bytes
!
version 12.2
no parser cache
service timestamps debug datetime msec
service timestamps log uptime
no service password-encryption
!
hostname Router
!
boot system flash:c5300-i-mz.122-4.2
no logging buffered
enable secret
enable password
!
username guam password
username user1 password
username user2 password
spe 2/0 2/7
  firmware location system:/ucode/mica_port_firmware
!
```

```
!
resource-pool disable
!
ip subnet-zero
no ip domain lookup
ip domain name cisco.com
ip host nlab-boot 172.21.200.2
ip host dirt 172.69.1.129
ip host dsbu-web.cisco.com 172.19.192.254 172.71.162.82
ip host lab 172.19.192.254
!
isdn switch-type primary-ni
isdn gateway-max-interworking
!
!
trunk group 1
  carrier-id cd1
  max-retry 2
  hunt-scheme random
!
!
trunk group 2
  max-retry 2
  hunt-scheme random
!
!
!
voice service voip
!
!!
no voice hpi capture buffer
no voice hpi capture destination
!
!
fax interface-type modem
mta receive maximum-recipients 0
!
!
controller T1 0
  framing esf
  clock source line primary
  linecode b8zs
  pri-group timeslots 1-24 nfas_d primary nfas_int 0 nfas_group 0
  no yellow generation
  no yellow detection
!
controller T1 1
  framing esf
  clock source line secondary 1
  linecode b8zs
  pri-group timeslots 1-24 nfas_d backup nfas_int 1 nfas_group 0
  no yellow generation
  no yellow detection
!
controller T1 2
  framing esf
  linecode b8zs
  pri-group timeslots 1-24 nfas_d none nfas_int 2 nfas_group 0
  no yellow generation
  no yellow detection
!
controller T1 3
  framing esf
  linecode b8zs
```

```

pri-group timeslots 1-24
no yellow generation
no yellow detection
!
!
interface Ethernet0
ip address 10.0.44.29 255.255.255.0
no ip route-cache
no ip mroute-cache
no cdp enable
!
interface Serial0:23
ip address 10.1.1.2 255.255.255.0
dialer map ip 10.1.1.1 name host 1111
dialer-group 1
isdn switch-type primary-ni
isdn protocol-emulate network
isdn T310 30000
isdn negotiate-bchan
isdn bchan-number-order descending
no cdp enable
!
interface Serial3:23
ip address 10.9.9.9 255.255.255.0
dialer map ip 10.8.8.8 name host 8888
dialer map ip 10.8.8.8 255.255.255.0
dialer-group 1
isdn switch-type primary-net5
isdn protocol-emulate network
isdn incoming-voice modem
isdn disconnect-cause 126
no isdn outgoing display-ie
isdn ie oli 1F
no isdn gtd
no cdp enable
!
interface FastEthernet0
no ip address
no ip route-cache
no ip mroute-cache
shutdown
duplex auto
speed auto
no cdp enable
!
interface Group-Async1
no ip address
encapsulation ppp
dialer in-band
dialer-group 1
no keepalive
group-range 1 96
!
interface Dialer1
ip address 10.2.2.2 255.255.255.0
encapsulation ppp
no ip route-cache
no ip mroute-cache
dialer remote-name host
dialer-group 1
no fair-queue
!
interface Dialer2
no ip address

```

```
no cdp enable
!
interface Dialer5
 ip address 10.1.1.1 255.0.0.0
 encapsulation ppp
 no ip route-cache
 no ip mroute-cache
 dialer in-band
 dialer map ip 10.1.1.2 name host 1234567
 dialer-group 1
 ppp authentication chap
!
ip default-gateway 10.0.44.1
ip classless
ip route 0.0.0.0 0.0.0.0 10.0.44.1
ip route 0.0.0.0 0.0.0.0 Ethernet0
no ip http server
!
!
access-list 101 permit ip any any
dialer-list 1 protocol ip permit
no cdp run
!
snmp-server enable traps tty
snmp-server enable traps isdn layer2
snmp-server host 10.1.1.1 public
!
call rsvp-sync
!
voice-port 0:D
!
voice-port 3:D
!
!
mgcp profile default
!
dial-peer cor custom
!
!!
dial-peer voice 2 voip
 destination-pattern 111
 session target ipv4:10.0.45.87
!
dial-peer voice 10 pots
 destination-pattern 9999
 direct-inward-dial
 port 3:D
 prefix 9999
!
dial-peer voice 20 voip
 destination-pattern 000000002.
 session target ipv4:10.0.44.28
!
dial-peer voice 50 pots
 destination-pattern 2222
 direct-inward-dial
 port 0:D
 prefix 2222
!
alias exec c conf t
!
line con 0
 exec-timeout 0 0
 logging synchronous
```

```
line 1 96
  no flush-at-activation
  modem InOut
  transport input all
  transport output lat pad telnet rlogin udptn v120 lapb-ta
line aux 0
line vty 0 4
  password
  login
!
!
end
```

Troubleshooting Tips

Use the following **debug** commands to display information related to GTD mapping:

- **debug gtd details**
- **debug gtd events**
- **debug gtd error**

Configuration Examples for ISDN GTD for Setup Message

This section provides configuration examples for the tasks identified in the previous section.

- [Configuring GTD Mapping Example, page 20](#)
- [Configuring OLI IE Example, page 20](#)
- [Verifying GTD Mapping Example, page 20](#)

Configuring GTD Mapping Example

In the following example, GTD mapping is enabled:

```
enable
configure terminal
interface
  isdn gtd
```

Configuring OLI IE Example

In the following example, the value of the OLI IE identifier for interfacing to an MCI switch is configured to 7F:

```
enable
configure terminal
interface
  isdn ie oli 7F
```

Verifying GTD Mapping Example

The following example shows sample output for the **debug gtd events** command:

```

Router# debug gtd events
00:05:19:%SYS-5-CONFIG_I:Configured from console by console
*Aug  8 06:32:20.915:ISDN Se3:23 Q931:RX <- SETUP pd = 8  callref = 0x0002
  Bearer Capability i = 0x8890
    Standard = CCITT
    Transer Capability = Unrestricted Digital
    Transfer Mode = Circuit
    Transfer Rate = 64 kbit/s
  Channel ID i = 0xA98397
    Exclusive, Channel 23
  Called Party Number i = 0x81, '9999'
    Plan:ISDN, Type:Unknown
*Aug  8 06:32:20.919:ISDN Se3:23:Built a GTD of size 86 octets for ISDN message type 0x5
*Aug  8 06:32:20.919:tsp_ccrawmsg_encap:calling cdapi_find_tsm
*Aug  8 06:32:20.919:cdapi_find_tsm:Found Tunnelled Signaling Msg with GTD:PROT_PTYPE_GTD
*Aug  8 06:32:20.919:cdapi_find_tsm:Found a gtd msg of length 86:
*Aug  8 06:32:20.919:gtd msg = "IAM,
PRN,isdn*,,,
USI,rate,c,d,c,1
TMR,01
CPN,00,,1,9999
CPC,09
FCI,,,,,,y,"

*Aug  8 06:32:20.923:ccGTDExtractParm:Starting
*Aug  8 06:32:20.923: tunnelledPtype = 2
*Aug  8 06:32:20.923: gtdInstance = 0
*Aug  8 06:32:20.923: gtdBitMap = 0xFFFFFFFF
*Aug  8 06:32:20.923:ccGTDExtractParm:TunnelledContent has GTD message
*Aug  8 06:32:20.923:gtd msg = "IAM,
PRN,isdn*,,,
USI,rate,c,d,c,1
TMR,01
CPN,00,,1,9999
CPC,09
FCI,,,,,,y,"

*Aug  8 06:32:20.927:ccGTDExtractParm:GTD Parm CPC obtained
*Aug  8 06:32:20.927:ccGTDExtractParm:GTD Parm TMR obtained
*Aug  8 06:32:20.927:ccGTDExtractParm:GTD Parm PRN obtained
*Aug  8 06:32:21.547:ccMapGCItoGUID:GTD Parm GCI not present
*Aug  8 06:32:21.547:ccMapGUIDtoGCI:Modified GTD string to include GCI
*Aug  8 06:32:21.547:ccMapGUIDtoGCI:Calling update_gtd_in_raw_msg_buffer
*Aug  8 06:32:21.547:update_gtd_in_raw_msg_buffer:Inserting 124 byte GTD string into
rawmsg buffer.
The new gtd string is:
*Aug  8 06:32:21.547:gtd msg = "IAM,
PRN,isdn*,,,
USI,rate,c,d,c,1
TMR,01
CPN,00,,1,9999
CPC,09
FCI,,,,,,y,
GCI,7ba32c886c2c11d48005b0f6ff40a2c1"

*Aug  8 06:32:21.547:update_gtd_in_raw_msg_buffer:Original rawmsg buf length is 115
the original gtd length was 86
the new gtd length is = 124
*Aug  8 06:32:21.547:update_gtd_in_raw_msg_buffer:New data and IE inserted in rawmsg buff,
rawmsg buf length is now 153
*Aug  8 06:32:21.551:Have gtd msg, length=124:
*Aug  8 06:32:21.551:gtd msg = "IAM,
PRN,isdn*,,,
USI,rate,c,d,c,1

```

```

TMR,01
CPN,00,,1,9999
CPC,09
FCI,,,,,,,,Y,
GCI,7ba32c886c2c11d48005b0f6ff40a2c1"

*Aug 8 06:32:21.555:Have gtd msg, length=124:
*Aug 8 06:32:21.555:gtd msg = "IAM,
PRN,isdn*,,,
USI,rate,c,d,c,1
TMR,01
CPN,00,,1,9999
CPC,09
FCI,,,,,,,,Y,
GCI,7ba32c886c2c11d48005b0f6ff40a2c1"

*Aug 8 06:32:21.559:ccMapGUIDtoGCI:GTD Parm GCI is
present:7ba32c886c2c11d48005b0f6ff40a2c1, just returning
*Aug 8 06:32:21.559:ccGTDExtractParm:Starting
*Aug 8 06:32:21.559: tunnelledPtype = 2
*Aug 8 06:32:21.559: gtdInstance = 0
*Aug 8 06:32:21.559: gtdBitMap = 0xFFFFBFFF
*Aug 8 06:32:21.559:ccGTDExtractParm:TunnelledContent has GTD message
*Aug 8 06:32:21.559:gtd msg = "IAM,
PRN,isdn*,,,
USI,rate,c,d,c,1
TMR,01
CPN,00,,1,9999
CPC,09
FCI,,,,,,,,Y,
GCI,7ba32c886c2c11d48005b0f6ff40a2c1"

*Aug 8 06:32:21.559:ccGTDExtractParm:GTD Parm CPC obtained
*Aug 8 06:32:21.559:ccGTDExtractParm:GTD Parm TMR obtained
*Aug 8 06:32:21.563:ccGTDExtractParm:GTD Parm PRN obtained
*Aug 8 06:32:21.563:ISDN Se3:23 Q931:TX -> CALL_PROC pd = 8 callref = 0x8002
      Channel ID i = 0xA98397
      Exclusive, Channel 23

```

Additional References

For additional information related to the ISDN GTD for Setup Message feature, see the following sections:

- [Related Documents](#)
- [Standards](#)
- [MIBs](#)
- [RFCs](#)
- [Technical Assistance](#)

Related Documents

Related Topic	Document Title
IP configuration tasks	<i>Cisco IOS IP Configuration Guide</i> , Release 12.2
IP configuration commands	<i>Cisco IOS Voice, Video, and Fax Command Reference</i> , Release 12.2
VoIP configuration tasks	<i>Cisco IOS Voice, Video, and Fax Configuration Guide</i> , Release 12.2
RADIUS VSA configuration	<i>RADIUS VSA Voice implementation Guide</i>
VoIP configuration	<i>Voice over IP for the Cisco AS5300</i>
VoIP configuration	<i>Voice over IP for the Cisco AS5800</i>
VoIP configuration	<i>Voice over IP for the Cisco 2600/3600 Series</i>
TCL IVR programming	<i>TCL IVR API Version 2.0 Programmer's Guide</i>

Standards

Standards ¹	Title
014-0018-04.3D-ER	<i>CPE Requirements for MCI ISDN Primary Rate Interface</i> , revision 4.3D, February 10, 1998
TR-41459	<i>AT&T Network ISDN Primary Rate Interface and Special Applications Specifications, User-Network Interface</i> , 1999

1. Not all supported standards are listed.

MIBs

MIBs ¹	MIBs Link
<ul style="list-style-type: none"> No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature. 	<p>To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at the following URL:</p> <p>http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml</p>

1. Not all supported MIBs are listed.

To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:

<http://tools.cisco.com/ITDIT/MIBS/servlet/index>

If Cisco MIB Locator does not support the MIB information that you need, you can also obtain a list of supported MIBs and download MIBs from the Cisco MIBs page at the following URL:

<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

To access Cisco MIB Locator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions found at this URL:

<http://www.cisco.com/register>

RFCs

RFCs ¹	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature	—

1. Not all supported RFCs are listed.

Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/public/support/tac/home.shtml

Command Reference

This section documents new commands. All other commands used with this feature are documented in the Cisco IOS Release 12.2 command reference publications.

- [isdn ie oli](#)
- [isdn gtd](#)

isdn ie oli

To configure the value of the OLI IE identifier when the gateway receives ISDN signaling from an MCI switch, use the **isdn ie oli** command in interface configuration mode. To disable the OLI IE identifier, use the **no** form of this command.

isdn ie oli *value*

no isdn ie oli *value*

Syntax Description

<i>value</i>	Hexadecimal number specifying the value that is used to indicate OLI information from the MCI switch. Range is 00 to 7F.
--------------	--

Defaults

This command is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
12.2(15)T	This command was introduced.

Usage Guidelines

Use the **isdn ie oli** command to configure gateway support for the MCI ISDN variant by specifying the IE value that indicates OLI information.

Examples

The following example configures the OLI IE value to a hex value of 7A:

```
isdn ie oli 7A
```

Related Commands

Command	Description
isdn gtd	Enables GTD parameter mapping for ISDN information elements (IEs).

isdn gtd

To enable generic transparency descriptor (GTD) mapping for information elements (IEs) sent in ISDN Setup messages, use the **isdn gtd** command in interface configuration mode. To disable GTD mapping, use the **no** form of this command.

isdn gtd

no isdn gtd

Syntax Description This command has no arguments or keywords.

Defaults GTD mapping is enabled.

Command Modes Interface configuration

Command History	Release	Modification
	12.2(15)T	This command was introduced.

Usage Guidelines Use the **isdn gtd** command to enable GTD parameter mapping for the following ISDN IEs:

- Originating Line Information (OLI)
- Bearer Capability (USI and TMR)
- Called Party Number (CPN)
- Calling Party Number (CGN)
- Redirecting Number (RGN, OCN and RNI)

Examples The following example enables GTD parameter mapping:

```
isdn gtd
```

Glossary

AAA— Authentication, authorization, and accounting. Pronounced "triple a."

GTD— Generic transparency descriptor

IE— Information element.

ISDN— Integrated Services Digital Network. Communication protocol offered by telephone companies that permits telephone networks to carry data, voice, and other source traffic.

ITU-T— International Telecommunication Union Telecommunication Standardization Sector. International body that develops worldwide standards for telecommunications technologies. The ITU-T carries out the functions of the former CCITT.

NFAS — Non-Facility Associated Signaling. A classification of signalling protocols that provide the signalling channel in a separate physical line from the bearer channels.

PRI— Primary Rate Interface. ISDN interface to primary rate access. Primary rate access consists of a single 64-kbps D channel plus 23 (T1) or 30 (E1) B channels for voice or data.

PSTN— Public switched telephone network. General term referring to the variety of telephone networks and services in place worldwide. Sometimes called POTS

RADIUS— Remote Authentication Dial-In User Service. Database for authenticating modem and ISDN connections and for tracking connection time.

Q.931—ITU-T specification for signaling to establish, maintain, and clear ISDN network connections.

TCL— Toolkit Command Language. A scripting language used for gateway products both internally and externally to Cisco IOS software code.

**Note**

Refer to the [Internetworking Terms and Acronyms](#) for terms not included in this glossary.
