CONVERSANT Version 8
Two B-Channel Transfer
Feature Description

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Preventing Toll Fraud

"Toll fraud" is the unauthorized use of your telecommunications system by an unauthorized party (for example, a person who is not a corporate employee, agent, subcontractor, or working on your company's behalf). Be aware that there may be a risk of toll fraud associated with your system and that, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

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Your company's "telecommunications equipment" includes both this Avaya product and any other voice/data/video equipment that could be accessed via this Avaya product (that is, "networked equipment").

An "outside party" is anyone who is not a corporate employee, agent, subcontractor, or working on your company's behalf. Whereas, a "malicious party" is anyone (including someone who may be otherwise authorized) who accesses your telecommunications equipment with either malicious or mischievous intent.

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- Mischief (troubling, but apparently innocuous, tampering)
- Harm (such as harmful tampering, data loss or alteration, regardless of motive or intent)

Be aware that there may be a risk of unauthorized intrusions associated with your system and/or its networked equipment. Also realize that, if such an intrusion should occur, it could result in a variety of losses to your company (including but not limited to, human/data privacy, intellectual property, material assets, financial resources, labor costs, and/or legal costs).

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- System administration documents
- Security documents
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- Telecommunications security experts

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Part 68: Answer-Supervision Signaling. Allowing this equipment to be operated in a manner that does not provide proper answer-supervision signaling is in violation of Part 68 rules. This equipment returns answer-supervision signals to the public switched network when:

- Answered by the called station
- Answered by the attendant
- Routed to a recorded announcement that can be administered by the CPE user

This equipment returns answer-supervision signals on all DID calls forwarded back to the public switched telephone network. Permissible exceptions are:

- A call is unanswered
- A busy tone is received
- A reorder tone is received

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This digital apparatus does not exceed the Class A limits for radio noise emissions set out in the radio interference regulations of the Canadian Department of Communications.

Le Présent Appareil Nomérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la class A préscrites dans le reglement sur le brouillage radioélectrique édicté par le ministére des Communications du Canada.

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EMC Directive 89/336/EEC

Low Voltage Directive 73/23/EEC

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Acknowledgment

This document was written by the CONVERSANT documentation team at Avaya, Inc.

Two B-Channel Transfer Feature Description
Issue 1.0

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About this document

This document describes the Two B-Transfer (TBCT) feature of the CONVERSANT System Version 8.0 and provides instructions for:

- Installing and configuring the TBCT software
- Configuring the TBCT feature for CONVERSANT
- Adding Two B-Channel Transfer to an application

It also explains:

- TBCT alarms
- Return codes

What is Two B-Channel Transfer?

The CONVERSANT Two B-Channel Transfer (TBCT) feature is a means for the CONVERSANT to take advantage of the Explicit Network Call Transfer operations that a customer subscribes to on ISDN PRI trunks.

To use this CONVERSANT feature, a customer must first subscribe to one of the following network call transfer operations:

- TBCT - A feature running on a National ISDN (NI) network provided by both Nortel and Lucent. The TBCT feature is provided to CONVERSANT by a Nortel DMS100 or a Lucent 5ESS switch.
- RLT - A proprietary version of TBCT on a Nortel proprietary PRI (NTNA). The RLT feature is provided to CONVERSANT only by the Nortel DMS100 switch.

With the CONVERSANT TBCT feature, a call coming into the CONVERSANT on one B (bearer) channel can be connected, within the switch, to a call that has been made by the CONVERSANT on another B channel, and both incoming and outgoing calls on the CONVERSANT are released. Without this feature, the connection would need to be maintained within the CONVERSANT for the duration of the call. Instead, just as the CONVERSANT hands off calls locally to a PBX, it can hand off this call as soon as possible. The result is that fewer resources are tied up and more transactions can be handled by the CONVERSANT.

Installing and configuring the TBCT software

Before you begin

Before you install and configure the TBCT, make sure that:

- Your Central Office has administered your PRI trunk groups correctly
- The PRI package is installed
- The Service Creation (SC) package is installed
- Your lines are in service

Central Office administration of the PRI trunk group

You must ensure that your Central Office has administered your PRI trunk groups so that:

- All of your PRIs are at the same PRI serving group
- Your PRI trunks are administered for TBCT on the network switch
- Your trunk groups are two-way trunks

You must also determine the hunt direction on the switch. Switches usually deliver incoming calls by hunting the B-channels in order from either low to high or high to low. When you configure the TBCT feature, you can hunt for outgoing channels in the opposite direction, minimizing the number of collisions between incoming and outgoing calls.

PRI package

Check to make sure that the PRI package is installed using the **`pkginfo`** command:

```
pkginfo pri
```

For a complete explanation of the **`pkginfo`** command, see “pkginfo” in Appendix A, “Summary of Commands,” of *CONVERSANT System Version 8.0 Administration*, 585-313-510.

If the PRI package is not on your system, you must purchase it before you can install TBCT.

Lines in service

Check to see if the lines are all in service using the **`dispay card`** command:

```
disp card all
```

For a complete explanation of the **`display card`** command, see “display card” in Appendix A, “Summary of Commands,” of *CONVERSANT System Version 8.0 Administration*, 585-313-510.

Service Creation package

Check to make sure that the Service Creation package is installed using the **`pkginfo`** command:

```
pkginfo sc
```

For a complete explanation of the **`pkginfo`** command, see “pkginfo” in Appendix A, “Summary of Commands,” of *CONVERSANT System Version 8.0 Administration*, 585-313-510.

If the SC package is not on your system, it has been removed. Reinstall the package using **pkgadd**. For a complete explanation of the **`pkgadd`** command, see “pkgadd” in Appendix A, “Summary of Commands,” of *CONVERSANT System Version 8.0 Administration*, 585-313-510.

Install the TBCT software

To install the TBCT package, run **pkgadd** using this commandline format.

`pkgadd -d` ***`path`*** **`tbct`**

For a complete explanation of the **`pkgadd`** command, see “pkgadd” in Appendix A, “Summary of Commands,” of *CONVERSANT System Version 8.0 Administration*, 585-313-510.

Note:

Although you are not required to reboot at this time, it is always recommended to reboot after installing new software.

Configuring the TBCT feature for CONVERSANT

To complete the configuration of the TBCT package on the CONVERSANT, you must

- Administer the PRI trunk type for the CONVERSANT system
- Modify the following TBCT files:
  - **pri.rc**
  - **tbct.rc**

Administer the PRI type

To administer the correct PRI trunk type for your system:

1. Run **cvis_menu**
2. From the main menu, select:

```
Voice System Administration >
    Switch Interfaces >
        Digital Interfaces >
            ISDN- Primary Rate Interface >
                Assign Card (or Change Card)
```

3. Press **F2** to display a list of available cards on the system.
4. Select the T1/E1 to be configured as PRI.
5. For `Type:` Select the PRI type for your system:

For ...	Select...
TBCT with a Lucent 5ESS switch on a National ISDN protocol	`TBCT`
TBCT with a Nortel DMS100 switch on a National ISDN protocol	`TBCT`
RLT with a Nortel DMS-100 switch on a Nortel proprietary switch	`Nortel`

For more information about assigning the PRI type to your system, see “Assigning the PRI Protocol to Digital Circuit Cards” in Chapter 5, “Voice

System Administration," of *CONVERSANT System Version 8.0 Administration*, 585-313-510

Modifying the TBCT files

To configure TBCT, modify the following files:

- **pri.rc**
- **tbct.rc**

  Before modifying any file, copy the file to a backup file (for example, ***filename*.bak** or ***filename*.old**) in case you need to revert to the original file.

You can modify these files in either of two ways:

- Run **tbct_config** to modify *either* **tbct.rc** *or* **tbct.rc** and **pri.rc**.

  See Using tbct_config to modify TBCT files on page 8

  or

- Edit the individual files.

  See Editing the TBCT files on page 9.

Using tbct_config to modify TBCT files

tbct_config provides a set of menus from which you select your choices for the TBCT configuration. **tbct_config** then makes the changes to **tbct.rc**. After you have made all of your choices for the **tbct.rc** fields, the tool asks you if you want it to change the **pri.rc** file also.

1. Enter **tbct_config**.

   The system begins displaying menus for each of the fields in the **tbct.rc** file:

```
Select TBCT_TYPE:  (default=1)
  1) NT_RLT
  2) NT_NI
  3) LU_NI
==>

Enter BCH_RESERVE: (default=10)

Select PRIORITY: (default=1)
  1) Transfer on answer
  2) Transfer on alert
==>

Enter MAX_RING: (default=20)
==>

Select EH_METHOD: (default=1)
  1) Stay Bridging
  2) Disconnect
==>

Select CH_METHOD: (default=1)
  1) Ascent
  2) Decent
==>
```

2. Enter the number for your choice. If you enter a number out of range or tab past a choice, **tbct_config** enters the default into **tbct.rc**.

   Note:

   For information about each of the fields, see Field values for tbct.rc file on page 11.

   tbct_config then asks whether you want it to modify the **pri.rc** file (based on your input to the first menu):

```
The configuration file for pri may or may not
be changed.  Do you want this program to modify
pri.rc file? [y/n/q]
==>
y
```

```
=====================================================
                !!IMPORTANT!!
  The FLAG parameter under /vs/data/pri/pri.rc file
  has to be modified in order to support TBCT/RLT.
  Suggested values are:
  Nortel Custom:   0x80949
  NISDN w/o BCAS:  0x40988
  NISDN w BCAS:    0x409a9
  The parameter should be changed by this program.

  In order to make the change effective
  Voice System has to be restarted.
=====================================================
```

3. Enter **y**, **n**, or **q**. The program defaults to **y** (yes).
4. Restart the voice system.

Editing the TBCT files

Edit the pri.rc file

1. Using vi or another UNIX text editor, open the **pri.rc** file:

   `/vs/data/pri/pri.rc`

2. In the **pri.rc** file, modify the `FLAGS` parameter depending on the switch configuration.

   The `FLAGS` parameter is written in a line in the file. For example:

   `FLAGS=0x409a9`

For ...	Enter this FLAGS parameter ...
TBCT with a Lucent 5ESS switch on a National ISDN protocol	0x409a9
TBCT with a Nortel DMS100 switch on a National ISDN protocol	0x409a9
RLT with a Nortel DMS-100 switch on a Nortel proprietary switch	0x80949

Edit the tbct.rc file

1. using vi or another UNIX text editor, open the **tbct.rc** file:

   /vs/data/pri/tbct.rc

   Following is an example **tbct.rc** file:

```
# /vs/data/tbct.rc
#
# 1-NT_RLT, 2-NT_NI, 3-LU_NI
TBCT_TYPE=3
# Number of reserved B Channels for transferring outgoing calls.
BCH_RESERVE=10
# Priority.  1-Transfer on answer. 2-Transfer on alert.
# Not available for NT_RLT
PRIORITY=1
# Maximum number of rings before answering
MAX_RING=20
# Error Handling Method.  1-Stay Bridging, 2-Disconnect.
EH_METHOD=1
# Chan Hunting Method.  1-ascent. 2-decent.
CH_METHOD=1
```

2. Modify the field values as necessary in the **tbct.rc** file, following the guidelines in the following table, Field values for tbct.rc file.

Field values for tbct.rc file

Field	Specifies	Options	Default conditions
TBCT_TYPE	The type of TBCT / RLT PRI feature you subscribe to	• **1** (Nortel RLT) • **2** (Nortel NI) • **3** (Lucent 5ESS)	If: • Any number besides 1, 2, or 3 is assigned here or • This parameter is missing in **tbct.rc** TBCT_TYPE is set to 1.
BCH_RESERVE	Number of reserved B-channels for outgoing calls	Any positive number between 1 and half of the number of B-channels on the system	If: • Any number less than one or greater than half of the total B-channels is assigned here or • This parameter is missing in **tbct.rc** BCH_RESERVE is assigned the number of B-channels on the system divided by four.

Field values for tbct.rc file

Field	Specifies	Options	Default conditions
`PRIORITY` RLT transfers only on CONNECT.	The priority of sending the TBCT / RLT request to the network: • Transfer on CONNECT the call is transfered when the outgoing call is answered. • Transfer on ALERTING requests the transfer as soon as ring tone is detected. This option transfers the call more quickly.	• **1** (transfer on CONNECT) • **2** (transfer on ALERTING)	If: • Any number besides 1 or 2 is assigned here or • This parameter is missing in **tbct.rc** `PRIORITY` is set to 1 (transfer on CONNECT). If you have the RLT service and assign 2, your service will still transfer on CONNECT.
`MAX_RING` (used only when `PRIORITY` = 1)	Maximum number of rings to wait for an answer before abandoning the call	Any number.	If: • Any number less than 0 is assigned here or • This parameter is missing in **tbct.rc** `MAX_RING` is assigned the default of **20**.

Field values for tbct.rc file

Field	Specifies	Options	Default conditions
`EH_METHOD`	Error handling method if the transfer fails.	• **1** (Stay Bridged) Maintains a voice connection between the incoming and outgoing calls and waits for one of the parties to disconnect. This option uses more capacity of the call system. • **2** (Disconnect) Disconnects the outgoing call. It also: — Returns an error indication to the application — Logs a system alarm event This option provides for a disconnect message.	If: • Any number besides **1** or **2** is assigned here or • This parameter is missing in **tbct.rc** `EH_METHOD` is set to 1.
`CH_METHOD`	Channel hunt method (ascend, or descend) To minimize collisions between incoming and outgoing calls, it is recommended that the system hunt for outgoing channels in the opposite direction from the direction the switch is using for incoming calls.	**1** (ascending) **2** (descending)	If: • Any number besides **1** or **2** is assigned here or • This parameter is missing in **tbct.rc** `CH_METHOD` is set to **1**.

3. For the changes to take effect, use the following commands to stop and then restart the voice system:

   stop_vs
   start_vs

Adding Two B-Channel Transfer to an application

A CONVERSANT script writer can add TBCT to an application.

Writing a script with ...	Add TBCT by using ...
irAPI	the function **irTBCT**
Voice@Work	one or two external functions: • **tbct_getinfo** (optional) • **tbct_xfer**
Script Builder	one or two external functions: • **tbct_getinfo** (optional) • **tbct_xfer**

The following sections further explain the use of these functions.

Adding TBCT using irAPI

To use TBCT functionality in an irAPI script, use the **irTBCT** function.

For more information about **`irTBCT`**, see the **`irTBCT`** man page.

Adding TBCT using Script Builder or Voice@Work

To use TBCT functionality in a Script Builder or Voice@Work script, use the two TBCT PRI external functions:

- **tbct_getinfo** (optional)
- **tbct_xfer** (required)

tbct_info

tbct_getinfo makes the initial call to Irapi to get:

- Automatic Number Identification (ANI) number

  The calling number for the incoming call
- Dialed Number Identification Service (DNIS) number

  The called number for the incoming call
- User-to-User Information (UUI) for the incoming call

tbct_info is the most convenient way to retrieve this information if you need it for your application.

tbct_xfer

tbct_xfer transfers the call to the network switch (the incoming and outgoing calls to and from the CONVERSANT are released, and the two calls are connected at the switch)

Inputs to **tbct_xfer** are:

- ANI of incoming call (optional)
- UUI of incoming call (optional)
- Transfer number (required)

TBCT alarms

TBCT generates system alarms for the following conditions:

- Failure to initialize TBCT proc process
- PRI trunk groups incorrectly administered
- Failure to complete a transfer other than a busy or ring/no answer transfer destination

- No outgoing B-channel to complete a transfer request
- Inability to launch any outgoing calls

To find the TBCT alarms in the alarm log, find alarms of type **PRI 007**. If "**TBCT**" is in the text of the alarm, it is a TBCT alarm.

The text of the alarm explains the condition generating the alarm.

Return codes

TBCT returns `1` for a successful operation.

When TBCT encounters problems, it returns the following codes:

Return code	Reason
`-100`	Initialization failed
`-99`	Call hangs up when TBCT is not yet completed
`-98`	TBCT type is not supported
`-97`	CONVERSANT internal error
`-96`	No transfer number supplied
`-95`	No resource
`-94`	Outgoing call failed
`-93`	Glare/call collision
`-92`	Bridging failed
`-91`	Protocol error
`-90`	Outgoing call is busy
`-89`	Outgoing call is fast busy
`-88`	Outgoing call is reorder
`-87`	Outgoing call is no-answer
`-86`	Any other error

Glossary

ANI	automatic number identification
automatic number identification	A service feature in which the directory number or equipment number of a calling station is automatically obtained.
dialed number identification service	A service that allows an incoming call to contain information about the telephone number for which it is destined.
DNIS	dialed number identification service
INTUITY Response Application Programming Interface	A library of commands that provide a standard development interface for voice-telephony applications.
IRAPI	INTUITY Response Application Programming Interface
NFAS	non-facility associated signaling
non-facility associated signaling	Out-of-band signaling, such as SS7.
PRI	primary rate interface
primary rate interface	A version of ISDN that allows multiple (23) voice channels to be carried on just two wires, along with a single data channel
Release Line Trunk	An early version of TBCT introduced by Nortel Networks on a Nortel proprietary network.
RLT	Release Line Trunk
TBCT	Two B-Channel Transfer
Two B-Channel Transfer	See What is Two B-Channel Transfer? on page 3
user-to-user information	Information of end-to-end significance sent over the ISDN D (data) channel, for example, caller's name or account number.
UUI	user-to-user information

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