

Part No. 213346-A
May 2002

Network Managers Guide for Symposium TAPI Service Provider for Meridian 1, release 2.3.1

NORTEL
NETWORKS™

Copyright © 2002 Nortel Networks

All rights reserved. May 2002.

The information in this document is subject to change without notice. The statements, configurations, technical data, and recommendations in this document are believed to be accurate and reliable, but are presented without express or implied warranty. Users must take full responsibility for their applications of any products specified in this document. The information in this document is proprietary to Nortel Networks Inc.

Trademarks

Nortel Networks, the Nortel Networks logo, the Globemark, Meridian, Optivity, and Symposium are trademarks of Nortel Networks.

Microsoft, Windows, and Windows NT are trademarks of Microsoft Corporation.

SAP, mySAP, mySAP.com, and SAPphone are trademarks of SAP AG.

pcAnywhere is a trademark of the Symantec Corporation.

Adobe and Acrobat Reader are trademarks of Adobe Systems Incorporated.

The asterisk after a name denotes a trademarked item.

Statement of conditions

In the interest of improving internal design, operational function, and/or reliability, Nortel Networks Inc. reserves the right to make changes to the products described in this document without notice.

Nortel Networks Inc. does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

Restricted rights legend

Use, duplication, or disclosure by the United States Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013.

Notwithstanding any other license agreement that may pertain to, or accompany the delivery of, this computer software, the rights of the United States Government regarding its use, reproduction, and disclosure are as set forth in the Commercial Computer Software-Restricted Rights clause at FAR 52.227-19.

Statement of conditions

In the interest of improving internal design, operational function, and/or reliability, Nortel Networks Inc. reserves the right to make changes to the products described in this document without notice.

Nortel Networks Inc. does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

Portions of the code in this software product may be Copyright © 1988, Regents of the University of California. All rights reserved. Redistribution and use in source and binary forms of such portions are permitted, provided that the above copyright notice and this paragraph are duplicated in all such forms and that any documentation, advertising materials, and other materials related to such distribution and use acknowledge that such portions of the software were developed by the University of California, Berkeley. The name of the University may not be used to endorse or promote products derived from such portions of the software without specific prior written permission.

SUCH PORTIONS OF THE SOFTWARE ARE PROVIDED “AS IS” AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

In addition, the program and information contained herein are licensed only pursuant to a license agreement that contains restrictions on use and disclosure (that may incorporate by reference certain limitations and notices imposed by third parties).

This equipment complies with Part 68 of FCC Rules. All direct connections to telephone network lines must be made using standard plugs and jacks compliant with FCC Part 68. Please note the following:

1. You are required to request service from the telephone company before you connect the unit to a network. When you request service, you must provide the telephone company with the following data:

- When you request T1 Service, you must provide the telephone company with

- The Facility Interface Code

Provide the telephone company with all the codes below:

- 04DU9-BN (1.544 MB, D4 framing format)
- 04DU9-DN (1.544 MB, D4 framing format with B8ZF coding)
- 04DU9-1KN (1.544 MB, ESF framing format)
- 04DU9-1SN (1.544 MB, ESF framing format with B8ZF coding)
- 04DU9-1ZN (1.544 MB, ANSI ESF and ZBTISI without line power)

The telephone company will select the code it has available.

- The Service Order Code(s) (SOC): 6.0F

- The required Universal Service Order Code (USOC) jack: RJ48C

- When you request 56K/64K Service, you must provide the telephone company with

- The Facility Interface Code: 04DU5-56/64

- The Service Order Code(s) (SOC): 6.0F

- The required Universal Service Order Code (USOC) jack: RJ48S

- When you request V.34 Service, you must provide the telephone company with

- The required Universal Service Order Code (USOC) jack: RJ11C

- The make, model number, Ringer Equivalence Number (REN), and FCC Registration number of the unit

The REN helps you determine the number of devices you can connect to your telephone line and still have all of those devices ring when your number is called. In most, but not all, areas, the sum of the RENs of all devices should not exceed 5.0. To be certain of the number of devices you can connect to your line, you should call your local telephone company to determine the maximum REN for your calling area. This equipment must not be used on party lines or coin lines.

- When you request ISDN “U” Interface Service, you must provide the telephone company with

- The Facility Interface Code: 02IS5

- The Service Order Code(s) (SOC): 6.0F

- The required Universal Service Order Code (USOC) jack: RJ49C

- When you request ISDN “S/T” Interface Service, you must provide the telephone company with

- The Service Order Code(s) (SOC): 6.0N

- The make, model number, and FCC Registration number of the NT1

Note: ISDN S/T cannot be directly connected to the network.

- When you request Primary Rate ISDN Service, you must provide the telephone company with

- The Facility Interface Code: 04DU9-1SN (1.544 MB, ESF framing format with B8ZF coding)

- The Service Order Code(s) (SOC): 6.0F

— The required Universal Service Order Code (USOC) jack: RJ48C

2. Your telephone company may make changes to its facilities, equipment, operations, or procedures that could affect the proper functioning of your equipment. The telephone company will notify you in advance of such changes to give you an opportunity to maintain uninterrupted telephone service.
3. If the unit causes harm to the telephone network, the telephone company may temporarily discontinue your service. If possible, they will notify you in advance, but if advance notice is not practical, you will be notified as soon as possible and will be informed of your right to file a complaint with the FCC.
4. If you experience trouble with the unit, please contact the Nortel Networks Technical Solutions Center in your area for service or repairs. Repairs should be performed only by service personnel authorized by Nortel Networks.

North America (800) 4NORTEL or (800) 466-7835

EMEA (33) (4) 92-966-968

Asia Pacific (61) (2) 9927-8800

China (800) 810-5000

5. You are required to notify the telephone company when you disconnect the unit from the network.

Nortel Networks Inc. software license agreement

This Software License Agreement (“License Agreement”) is between you, the end-user (“Customer”) and Nortel Networks Corporation and its subsidiaries and affiliates (“Nortel Networks”). PLEASE READ THE FOLLOWING CAREFULLY. YOU MUST ACCEPT THESE LICENSE TERMS IN ORDER TO DOWNLOAD AND/OR USE THE SOFTWARE. USE OF THE SOFTWARE CONSTITUTES YOUR ACCEPTANCE OF THIS LICENSE AGREEMENT. If you do not accept these terms and conditions, return the Software, unused and in the original shipping container, within 30 days of purchase to obtain a credit for the full purchase price.

“Software” is owned or licensed by Nortel Networks, its parent or one of its subsidiaries or affiliates, and is copyrighted and licensed, not sold. Software consists of machine-readable instructions, its components, data, audio-visual content (such as images, text, recordings or pictures) and related licensed materials including all whole or partial copies. Nortel Networks grants you a license to use the Software only in the country where you acquired the Software. You obtain no rights other than those granted to you under this License Agreement. You are responsible for the selection of the Software and for the installation of, use of, and results obtained from the Software.

1. Licensed Use of Software. Nortel Networks grants Customer a nonexclusive license to use a copy of the Software on only one machine at any one time or to the extent of the activation or authorized usage level, whichever is applicable. To the extent Software is furnished for use with designated hardware or Customer furnished equipment (“CFE”), Customer is granted a nonexclusive license to use Software only on such hardware or CFE, as applicable. Software contains trade secrets and Customer agrees to treat Software as confidential information using the same care and discretion Customer uses with its own similar information that it does not wish to disclose, publish or disseminate. Customer will ensure that anyone who uses the Software does so only in compliance with the terms of this Agreement. Customer shall not a) use, copy, modify, transfer or distribute the Software except as expressly authorized; b) reverse assemble, reverse compile, reverse engineer or otherwise translate the Software; c) create derivative works or modifications unless expressly authorized; or d) sublicense, rent or lease the Software. Licensors of intellectual property to Nortel Networks are beneficiaries of this provision. Upon termination or breach of the license by Customer or in the event designated hardware or CFE is no longer in use, Customer will promptly return the Software to Nortel Networks or certify its destruction. Nortel Networks may audit by remote polling or other reasonable means to determine Customer’s Software activation or usage levels. If suppliers of third party software included in Software require Nortel Networks to include additional or different terms, Customer agrees to abide by such terms provided by Nortel Networks with respect to such third party software.

2. Warranty. Except as may be otherwise expressly agreed to in writing between Nortel Networks and Customer, Software is provided “AS IS” without any warranties (conditions) of any kind. NORTEL NETWORKS DISCLAIMS

ALL WARRANTIES (CONDITIONS) FOR THE SOFTWARE, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY OF NON-INFRINGEMENT. Nortel Networks is not obligated to provide support of any kind for the Software. Some jurisdictions do not allow exclusion of implied warranties, and, in such event, the above exclusions may not apply.

3. Limitation of Remedies. IN NO EVENT SHALL NORTEL NETWORKS OR ITS AGENTS OR SUPPLIERS BE LIABLE FOR ANY OF THE FOLLOWING: a) DAMAGES BASED ON ANY THIRD PARTY CLAIM; b) LOSS OF, OR DAMAGE TO, CUSTOMER'S RECORDS, FILES OR DATA; OR c) DIRECT, INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS OR SAVINGS), WHETHER IN CONTRACT, TORT OR OTHERWISE (INCLUDING NEGLIGENCE) ARISING OUT OF YOUR USE OF THE SOFTWARE, EVEN IF NORTEL NETWORKS, ITS AGENTS OR SUPPLIERS HAVE BEEN ADVISED OF THEIR POSSIBILITY. The forgoing limitations of remedies also apply to any developer and/or supplier of the Software. Such developer and/or supplier is an intended beneficiary of this Section. Some jurisdictions do not allow these limitations or exclusions and, in such event, they may not apply.

4. General

- a. If Customer is the United States Government, the following paragraph shall apply: All Nortel Networks Software available under this License Agreement is commercial computer software and commercial computer software documentation and, in the event Software is licensed for or on behalf of the United States Government, the respective rights to the software and software documentation are governed by Nortel Networks standard commercial license in accordance with U.S. Federal Regulations at 48 C.F.R. Sections 12.212 (for non-DoD entities) and 48 C.F.R. 227.7202 (for DoD entities).
- b. Customer may terminate the license at any time. Nortel Networks may terminate the license if Customer fails to comply with the terms and conditions of this license. In either event, upon termination, Customer must either return the Software to Nortel Networks or certify its destruction.
- c. Customer is responsible for payment of any taxes, including personal property taxes, resulting from Customer's use of the Software. Customer agrees to comply with all applicable laws including all applicable export and import laws and regulations.
- d. Neither party may bring an action, regardless of form, more than two years after the cause of the action arose.
- e. The terms and conditions of this License Agreement form the complete and exclusive agreement between Customer and Nortel Networks.
- f. This License Agreement is governed by the laws of the country in which Customer acquires the Software. If the Software is acquired in the United States, then this License Agreement is governed by the laws of the state of New York.

Preface	19
Before you begin	19
Text conventions	20
Related publications	21
Chapter 1	
Overview	23
Target audience	24
Symposium TAPI SP architecture options	25
Call center environment	25
Knowledge worker environment	27
Networked TAPI and IVR	28
Microsoft TAPI server and client	29
Meridian Link Services	29
Configuration and maintenance	29
FlexLM License Manager	30
Features of Symposium TAPI SP	30
Basic call control	30
Enhanced call control	31
Automatic call distribution	31
ACD proxy service	31
Agent walkaway feature	32
Telephone set control	32
Outbound and predictive dialing applications	33
Trunk monitoring	33
Interactive voice response	33
Security features	33
Auto link recovery feature	34
Dynamic database feature	34
Administration features	34
Symposium configuration application	34
Logger application	34
License Manager troubleshooting tools	35
Microsoft TAPI browser application	35
Symposium TAPI SP feature interactions	35

Feature interactions in a call center environment	35
Feature interactions in a knowledge worker environment	36
Feature interactions in all environments	36
Feature interactions with other software applications	37
Networking between Symposium TAPI Service Providers	37
On demand call data	37
Call data networking requirements	38
Restriction for NACD overflow and call data	38

Chapter 2

Installation guidelines

39

General prerequisites	40
Preparing the TAPI server	40
Preparing the Meridian 1 switch	41
Required applications	41
Optional applications	42
Installing the security device	42
Configuring local area networks	43
Configuring the E-LAN	43
Assigning an IP address for the Meridian 1 switch	44
Defining a routing table	44
Primary IP address procedures	45
Activation procedure	45
Validation procedure	45
Recovery procedure	46
Installation notes for a knowledge worker environment	47
Installing Symposium TAPI SP software	48
Installation notes in a call center environment	53
Preparing a Symposium Call Center Server	54
Prerequisites	54
Configuring an isolated C-LAN for TAPI traffic	55
Installing Symposium TAPI SP software	56
Configuring the FlexLM License Manager	60

Chapter 3	
Preparing the TAPI environment	63
Microsoft TAPI terminology	63
TAPI server domains	64
Windows NT domain architecture	64
Microsoft Windows 2000 domain architecture	65
Trust relationships between domains	65
Symposium TAPI SP domain considerations	66
Configuring domains on the TAPI server	69
Configuring a Windows NT server as a standalone server	69
Configuring a Windows NT server as a PDC	71
Configuring domains on a Microsoft Windows 2000 server	72
Remote procedure calls and trust relationships	75
Client user issues	76
Configuring Microsoft TAPI for Symposium TAPI SP	77
Avoiding basic configuration problems	78
Configuring a Windows NT server for Symposium TAPI SP	79
Enabling telephony services	79
Assigning lines to clients	79
Configuring a Microsoft Windows 2000 server for Symposium TAPI	80
Enabling telephony services	81
Assigning lines to clients	84
Configuring TAPI clients	86
Chapter 4	
Configuration guidelines	87
Downloading information from the Meridian 1 switch	88
Converting the text file	89
Configuring the Symposium TAPI SP database	92
Configuring the provider table	93
Configuring the Meridian 1 Host table	95
Configuring the trunk table	97
Configuring the treatments table	98
Configuring the TN table	100
Adding a new TN	100

Modifying a TN	101
Deleting a TN/all TNs	102
Adding a DN	103
Modifying a DN	103
Deleting a DN	104
Configuring the CDN table	104
Configuring the network TAPI/IVR table	106
Adding an IVR remote host address	108
Modifying an IVR remote host address	109
Deleting an IVR remote host address	110
Deleting all IVR remote host addresses	110
Configuring SAP compliance	111
Configuring the log styles table	113
Adding a log style	114
Editing a log style	115
Deleting a log style	115
Configuring an additional database	116

Chapter 5

Upgrading Symposium TAPI SP

117

Upgrading Symposium TAPI SP software	117
Installing a product enhancement package	117
Performing a full reinstall	118
Removing an earlier release from a Windows NT 4.0 server	119
Removing an earlier release from a Microsoft Windows 2000 server	119
Installing the latest software release	120
Configuring the latest software release	120
Upgrading your license file	121
Recovering database table information	121
Verifying the software upgrade	121
Retaining line associations	121
Upgrading Symposium TAPI SP features	123
Importing the new license file	123
Increasing the number of clients	123

Adding new features or changing the TAPI environment	127
Chapter 6	
Networked TAPI/IVR	129
Network TAPI/IVR license file considerations	129
Integrated IVR-CTI	130
IVR-CTI call flow example	131
LAN configuration	132
IVR-CTI integration in a Meridian 1 environment	132
Symposium TAPI SP IVR driver	133
IVR-CTI messages	133
Network call data	134
Periphonics IVR system	135
Overview of the VPS/is	135
Overview of the IPML server	136
Networking call data	136
Configuring networking call data capabilities	138
Call data networking between IVR and Symposium TAPI SP	139
Verifying call data networking	139
Call data networking between TAPI servers with NACD overflow	143
Verifying NACD overflow with TAPI operations	144
Call data networking between TAPI service providers without NACD overflow	147
Verifying call data networking without NACD	148
Troubleshooting IVR and networking features	149
No IVR registration message on TAPI server initialization	150
No call data message received by TAPI server when a call is transferred from IVR port to ACD queue	151
Call data appears in overflow.log file, but does not appear in screen pop to agent	151
No call data is seen when transferred or conferenced to a remote Meridian 1 switch	152
Call data does not appear to agent when a call is transferred using NACD overflow	153

Chapter 7	
Compatibilities and features	155
Product compatibilities	155
Meridian 1 switch compatibility	155
Telephone set compatibility	156
Desktop PC compatibility	157
Microsoft TAPI compatibility	157
Windows NT service pack compatibility	158
Microsoft Windows 2000 service pack compatibility	158
Interface device compatibility	159
Nortel Networks application compatibility	159
Third-party application compatibility	160
Feature support	160
Basic call control	160
Enhanced call control	161
ACD	162
Lines and DN	163
Device controls	163
Communication	164
Security	164
Diagnostic	165
General administration	165
Succession CSE1000 support	165
Remote Office support	166
Multiple appearance DN (MADN) feature support	166
Chapter 8	
Troubleshooting	169
License Manager troubleshooting applications	169
Logger troubleshooting application	169
Running a troubleshooting session	170
Saving troubleshooting information	172
Controlling the size of the active log file	172
Printing the log file	172
Microsoft TAPI browser application	172

Verifying default line properties	173
Verifying that telephone sets are configured correctly	175
Using the TAPI browser for acceptance testing	176
Answering an incoming call	176
Making a blind transfer of a call	176
Creating a 3-party conference call	177
Calling from a digital telephone set to DN and ACD sets	177
Putting a call on hold and unhold	178
Windows phone dialer application	178
Common troubleshooting issues	178
Symposium TAPI SP fails to initialize lines	179
First call attempt fails	179
Download from the Meridian 1 switch fails	179
Testing connectivity	180
Testing the TCP/IP connection	180
Idle message when a remote party disconnects a call	180
No telephony devices appear in TCMAApp	180
Connectivity problems and solutions	181
Port conflicts	182
Microsoft TAPI issues	184
No error recovery	184
TAPISRV unable to locate the DLL file	184
RegisterProcessService not found	184
LINERR_NODRIVER error message	184
LineInitializeEx reports Success when the service is stopped	185
Meridian Link Services issues	185
Meridian Link Services presents no information	185
Call progress messages not delivered	185
Status change messages not delivered	187
Dropping the original call during consultation transfer	187
Transferring number not displayed	187
Blind transfer fails	187
Caller ID not reported	187
Call status messages sent by Meridian Link Services	188
Called number not displayed when routed to a CDN	188

Call parking not supported	188
Enhanced ISDN progress messages for outbound calls	188
Glossary of acronyms	191

Figure 1	TAPI architecture in a call center environment	26
Figure 2	TAPI direct connection architecture	27
Figure 3	TAPI system architecture supporting IVR functionality	28
Figure 4	Direct connect installation for a knowledge worker environment	47
Figure 5	Detecting a previous release	49
Figure 6	Setup Type window	50
Figure 7	TAPI server type window	51
Figure 8	InstallShield Wizard Complete window	52
Figure 9	SCCS installation in a call center environment	53
Figure 10	Isolating TAPI-traffic on a separate C-LAN	55
Figure 11	Detecting a previous release	57
Figure 12	Setup Type window	58
Figure 13	TAPI server type window	59
Figure 14	InstallShield wizard complete window	60
Figure 15	Licenses window in the FlexLM License Manager	61
Figure 16	Sample license file	61
Figure 17	Standard multidomain configuration	67
Figure 18	Non-standard multidomain configuration	68
Figure 19	Local Group Properties window	70
Figure 20	Add Users and Groups window	70
Figure 21	User account in Local Group Properties window	71
Figure 22	Local Group Properties window	73
Figure 23	Add Users and Groups window	73
Figure 24	User account in Local Group Properties window	74
Figure 25	Selecting Add a User	79
Figure 26	Selecting Changing Selected User's Line Access	80
Figure 27	Select Computer window	82
Figure 28	Telephony Server Properties window	83
Figure 29	Select Users window	84
Figure 30	Telephony Services administration window	85
Figure 31	Edit Users window	85
Figure 32	Configuration application window	90
Figure 33	Opening the download.txt file	91
Figure 34	Text File Translator Status window	91
Figure 35	Provider Table window	93

Figure 36	Meridian 1 Host window	95
Figure 37	Treatments Table window	98
Figure 38	Line Devices window	100
Figure 39	Add a Terminal Number Record window	101
Figure 40	Line PAdd a Terminal Number Record windowproperties window	102
Figure 41	Warning message	103
Figure 42	DN Properties window	104
Figure 43	CDN window	105
Figure 44	Add a Control Directory Number window	105
Figure 45	Network TAPI/IVR server window	107
Figure 46	Add Remote Host Address window	108
Figure 47	Edit Remote Host Address window	109
Figure 48	Compliance window	111
Figure 49	Enabling SAP compliance	112
Figure 50	Log styles window	114
Figure 51	Opening the download.txt file	125
Figure 52	Text File Translator Status window	126
Figure 53	IVR-CTI call flow example	131
Figure 54	Networking call data	137
Figure 55	TAPI browser application	140
Figure 56	Open all lines display in the TAPI browser application	141
Figure 57	Displaying call information in the TAPI browser application	142
Figure 58	TAPI browser application	145
Figure 59	Open all lines display in the TAPI browser application	146
Figure 60	Displaying call information in the TAPI browser application	147
Figure 61	Logger window	171
Figure 62	TAPI Browser window	173
Figure 63	Default Values Parameter window	174
Figure 64	LineOpen window	175

Table 1	Required Meridian 1 applications	41
Table 2	Optional Meridian 1 applications	42
Table 3	Meridian 1 switch compatibility	155
Table 4	Telephone set compatibility	156
Table 5	Desktop PC compatibility	157
Table 6	Microsoft TAPI compatibility	157
Table 7	Windows NT service pack compatibility	158
Table 8	Microsoft Windows 2000 service pack compatibility	158
Table 9	Interface device compatibility	159
Table 10	Nortel Networks application compatibility	159
Table 11	Third-party application compatibility	160
Table 12	Basic call control	160
Table 13	Enhanced call control	161
Table 14	ACD	162
Table 15	Line and DN capacities	163
Table 16	Device controls	163
Table 17	Communication	164
Table 18	Security	164
Table 19	Diagnostic	165
Table 20	General administration	165
Table 21	Resolving connectivity issues	181

Preface

This Network Managers Guide provides installation, configuration, upgrading, and troubleshooting guidelines for configuring a telephony application programming interface (TAPI) server on a Windows NT* or Microsoft* Windows 2000 platform using Symposium TAPI Service Provider for Meridian 1, release 2.3.1.

Before you begin

The *Network Managers Guide for Symposium TAPI Service Provider for Meridian 1, release 2.3.1*, release 2.3.1, is designed to be read by system integrators, network managers, and sales engineers who have expert knowledge of the following products:

- Meridian 1 switch
- Microsoft TAPI software
- Windows NT server or Microsoft Windows 2000 server

If you are using Symposium TAPI Service Provider for Meridian 1 in a Call Center environment, expert knowledge of Symposium Call Center products is also a requirement.

Text conventions

This guide uses the following text conventions:

angle brackets (< >)	Indicate that you choose the text to enter based on the description inside the brackets. Do not type the brackets when entering the command. Example: If the command syntax is <code>ping <ip_address></code> , you enter <code>ping 192.32.10.12</code>
bold Courier text	Indicates command names and options and text that you need to enter. Example: Use the dinfo command. Example: Enter show ip {alerts routes} .
braces ({})	Indicate required elements in syntax descriptions where there is more than one option. You must choose only one of the options. Do not type the braces when entering the command. Example: If the command syntax is <code>show ip {alerts routes}</code> , you must enter either <code>show ip alerts</code> or <code>show ip routes</code> , but not both.
brackets ([])	Indicate optional elements in syntax descriptions. Do not type the brackets when entering the command. Example: If the command syntax is <code>show ip interfaces [-alerts]</code> , you can enter either <code>show ip interfaces</code> or <code>show ip interfaces -alerts</code> .
<i>italic text</i>	Indicates new terms, book titles, and variables in command syntax descriptions. Where a variable is two or more words, the words are connected by an underscore. Example: If the command syntax is <code>show at <valid_route></code> , <i>valid_route</i> is one variable and you substitute one value for it.
plain Courier text	Indicates command syntax and system output, for example, prompts and system messages. Example: <code>Set Trap Monitor Filters</code>

separator (>)	<p>Shows menu paths when describing nested menus. Example: Protocols > IP identifies the IP sub-menu on the Protocols menu.</p> <p>Shows overlay when describing Meridian 1 switch interface. Example: > 20 identifies overlay 20 to the Meridian 1 switch.</p>
vertical line ()	<p>Separates choices for command keywords and arguments. Enter only one of the choices. Do not type the vertical line when entering the command.</p> <p>Example: If the command syntax is show ip {alerts routes}, you enter either show ip alerts or show ip routes, but not both.</p>

Related publications

For more information about the Symposium TAPI Service Provider, refer to the following documents:

- *Engineering Guidelines for Symposium TAPI Service Provider for Meridian 1, release 2.3.1*, part number 213345-A
- *Release Notes for Symposium TAPI Service Provider for Meridian 1, release 2.3.1*, part number 213347-A

You can print selected technical manuals and release notes free, directly from the Internet. Go to the www.nortelnetworks.com/documentation URL. Find the product for which you need documentation. Then locate the specific category and model or version for your hardware or software product. Use Adobe* Acrobat Reader* to open the manuals and release notes, search for the sections you need, and print them on most standard printers. Go to Adobe Systems at the www.adobe.com URL to download a free copy of the Adobe Acrobat Reader.

You can purchase selected documentation sets, CDs, and technical publications through the Internet at the www1.fatbrain.com/documentation/nortel/ URL.

Chapter 1

Overview

Symposium TAPI Service Provider for Meridian 1, release 2.3.1, uses a distributed client/server environment to integrate a telephone on a user's desktop with client and server-based applications. The telephone is physically connected to a Meridian 1 PBX switch but is not physically connected to a client PC. You do not need any special telephones, connectors, circuit packs, or additional wiring for the client PC.

Symposium TAPI SP for Meridian 1 is a full function service provider for the Microsoft Telephony Application Programming Interface (TAPI), releases 2.x and 3.0. Microsoft TAPI provides a set of C-language programming routines that support telephony control capabilities for central office switches.

Symposium TAPI SP software is platform vendor independent (PVI) and can be installed on any platform that supports one of the following operating systems:

- Windows NT server, release 4.0, with a minimum of service pack 6a installed
- Microsoft Windows 2000 server, with a minimum of service pack 2 installed

When installed on a server, Symposium TAPI SP supports TAPI-compliant applications running on the following client PCs:

- Windows NT workstation
- Microsoft Windows 2000 Professional
- Microsoft Windows ME
- Microsoft Windows 98
- Microsoft Windows 95

Release 2.3.1 of Symposium TAPI SP integrates with the Meridian 1 switch in two distinct ways, depending on the type of TAPI environment required. The TAPI environments available are either a call center environment, or a knowledge worker environment. In addition, you can add networked TAPI and interactive voice response (IVR) features. When you purchase Symposium TAPI Service Provider, you can choose from one of the following options:

- call center environment
- direct connect for a knowledge worker environment
- call center environment with networked TAPI and IVR
- direct connect with networked TAPI and IVR



Note: Symposium TAPI SP, release 2.3.1, also supports the legacy Meridian Link Module. For information about upgrading to Symposium TAPI SP, release 2.3.1, in this environment, refer to your Meridian Link Module documentation, and to the *Network Manager's Guide Reference Guide for Installing, Configuring, and Maintaining the Symposium TAPI Service Provider for Meridian 1 Release 2.3*, which you can download from <http://www.nortelnetworks.com>.



Warning: Symposium TAPI Service Provider for Meridian 1 provides an interface between a Meridian 1 system and Microsoft TAPI services. Ultimate responsibility for the TAPI environment rests with Microsoft. For information refer to <http://www.microsoft.com>.

Target audience

This document is written for system integrators and network managers who have expert knowledge of the following products:

- Meridian 1 switch
- Microsoft TAPI software
- Windows NT server or Microsoft Windows 2000 server

If Symposium TAPI Service Provider for Meridian 1 is to be used in a call center environment, expert of knowledge of Symposium Call Center products is also a requirement.

Do not attempt to install or configure Symposium TAPI SP unless you have received accredited training in Symposium TAPI Service Provider.

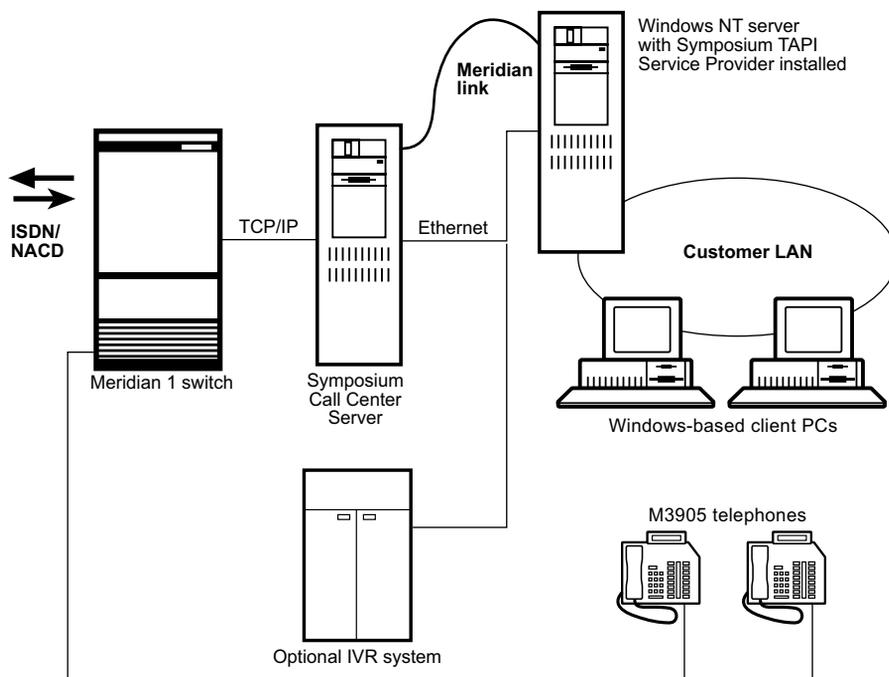
Symposium TAPI SP architecture options

Symposium TAPI SP is a flexible application that enables a Meridian 1 switch to integrate with Microsoft TAPI services. In a call center the service provider delivers TAPI capabilities within a skill-based routing (SBR) environment. In a knowledge worker environment where automatic call distribution (ACD) routing is sufficient, Symposium TAPI SP delivers TAPI capabilities through a direct connection with the Meridian 1 switch. The optional networked TAPI/IVR feature supports networked skill-based routing (NSBR) and network ACD (NACD) in a call center environment, or NACD only in a knowledge worker environment.

Call center environment

In a call center Symposium TAPI Service Provider monitors TAPI ports on the Meridian 1 switch and passes information such as automatic number identification/dialed number identification service (ANI/DNIS) and calling line identification (CLID) to a TAPI-compliant application on a client PC, via the Microsoft TAPI server. The TAPI application on the client PC presents this information to the agent, perhaps in the form of a screenpop. If you install an IVR system in a call center, Symposium TAPI SP uses similar processes to present caller entered data (CED), such as customer account number, to an agent. This section provides an overview of a call center implementation without IVR. Refer to [Chapter 6, “Networked TAPI/IVR,” on page 129](#) for information about networked TAPI and IVR in a call center.

In a call center environment, Symposium TAPI SP connects to a Meridian 1 switch via the Meridian Link Services application that is installed on the Symposium Call Center Server (SCCS). ([Figure 1](#))

Figure 1 TAPI architecture in a call center environment

The SCCS provides skill-based routing and call center reporting services. Symposium TAPI SP adds computer telephony integration (CTI) features within this environment. To support installations served by the SCCS, Symposium TAPI SP links with the Meridian 1 switch via the Meridian Link Services application that is resident on the SCCS.

All Meridian 1 switches use a private, embedded LAN (E-LAN) to isolate Meridian system traffic from the customer local area network (C-LAN). In a call center, the SCCS is configured as a member of both the E-LAN and the C-LAN via separate 10/100BASE-T Ethernet ports on the server. This configuration maintains the isolation between telephony and data traffic. The TAPI server has one 10/100 BASE-T Ethernet connection to the C-LAN, and communicates with the E-LAN via a direct connection to the SCCS.



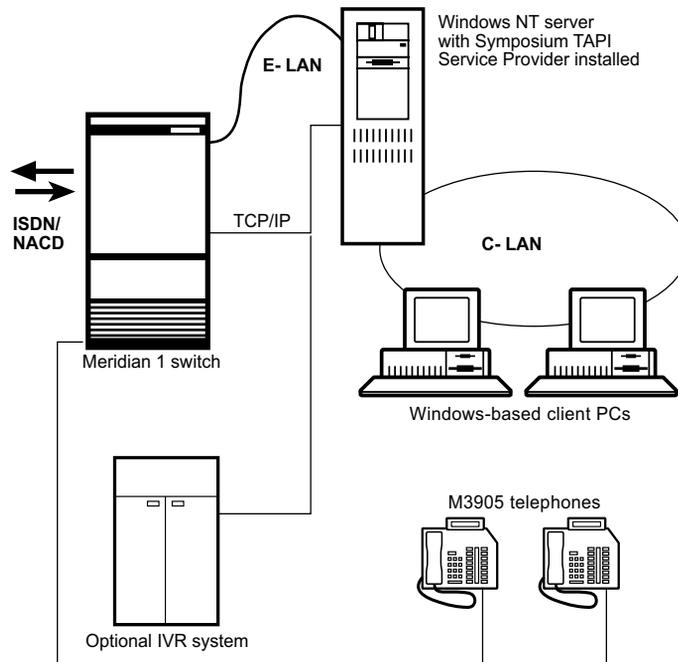
Note: This document provides guidelines for a TAPI implementation with the SCCS. Where fewer agents are required, Symposium TAPI Service Provider can deliver TAPI services via the Symposium Express Call Center (SECC).

Knowledge worker environment

Where ACD routing is not required you can configure a direct connection from Symposium TAPI SP to the Meridian 1 switch. Symposium TAPI Service Provider monitors TAPI ports on the Meridian 1 switch and passes information such as ANI/DNIS and CLID to a TAPI-compliant application on the client PC, via the Microsoft TAPI server. The TAPI client presents this information to the agent, for example in the form of a screenpop. This section provides an overview of an implementation in a knowledge worker environment.

In a knowledge worker environment Symposium TAPI SP connects directly to a Meridian 1 switch via a TCP/IP Ethernet connection. (Figure 2)

Figure 2 TAPI direct connection architecture

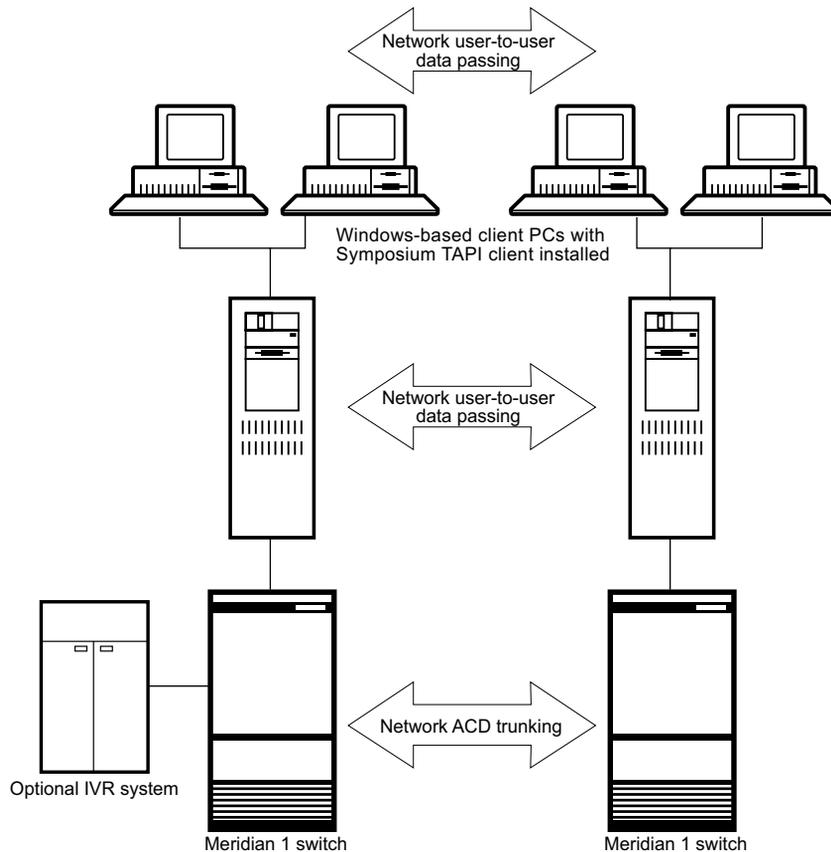


With a direct connection implementation a single Meridian 1 switch can support a maximum of sixteen TAPI servers.

Networked TAPI and IVR

Symposium TAPI SP provides server-to-server networking over LAN or WAN. The service provider has an open interface through which it can obtain information collected by IVR systems. IVR information is passed to TAPI-compliant applications using the standard TAPI interface. (Figure 3)

Figure 3 TAPI system architecture supporting IVR functionality



Symposium TAPI Service Provider works transparently with multiple Windows NT or Microsoft Windows 2000 servers. This environment is commonly used for NACD with a default of 512 bytes passed with a call locally or between servers in a NACD configuration.

Microsoft TAPI server and client

The Microsoft TAPI Server (TAPISRV) is a server service that can be accessed by clients via the MS remote service provider (RSP). On client PCs, access to the TAPISRV is provided by installing the Microsoft Windows remote service provider (RSP) telephony module. This module routes TAPI requests to a specific TAPI service provider.

TAPI-compliant applications on client PCs issue TAPI messages. TAPISRV communicates with the client via the LAN over a TCP/IP Ethernet connection. TAPISRV routes TAPI messages from TAPI-compliant applications on the client to Symposium TAPI SP on the TAPI server. Symposium TAPI SP converts TAPI messages to corresponding switch messages through the Meridian Link Services application installed on an SCCS, or via a direct Ethernet connection to the Meridian 1 switch. Symposium TAPI SP also converts Meridian 1 switch messages to TAPI messages for routing to client applications via TAPISRV.

Meridian Link Services

Meridian Link Services enables an application in a host computer to use the call control and call monitoring functions of a Meridian 1 system. Symposium TAPI Service Provider extends these capabilities to TAPI-compliant applications running on client PCs in a local area network (LAN) using TCP/IP on a 10/100BASE-T Ethernet connection.

Configuration and maintenance

Symposium TAPI SP includes a configuration application that provides two configuration methods: automatic configuration or manual configuration.

Automatic configuration translates database tables from overlays 20, 21, and 23 on the Meridian 1 switch and enters this information into the Symposium TAPI Service Provider database tables. The configuration application displays this information in dialog boxes for viewing and maintenance.

Manual configuration is necessary for instances where it becomes necessary to add, delete, or modify database information,. Manual configuration enables you to alter the database tables through changing fields in relevant configuration dialog boxes.

FlexLM License Manager

The FlexLM License Manager application allows you to configure the license manager server and the license file that you received when you purchased Symposium TAPI Service Provider. The license file is necessary for Symposium TAPI Service Provider to work. The license file allows TAPI applications to simultaneously monitor and control a maximum of 1,200 DN's.

Features of Symposium TAPI SP

Symposium TAPI Service Provider for Meridian 1, release 2.3.1, supports a wide range of features, including the following:

- basic call control
- enhanced call control
- automatic call distribution,
- outbound trunk monitoring
- predictive dialing applications
- IVR

Basic call control

The basic call control features that Symposium TAPI SP supports include:

- make call
- answer call
- release call
- hold call
- unhold call

- conference call (three party)
- transfer call
 - blind transfer
 - supervised transfer
- monitoring of call events

Enhanced call control

The enhanced call control features that Symposium TAPI SP supports include:

- swap hold
- caller destination number (CDN) treatments
 - ringback
 - busy
 - silence
 - music



Note: CDN treatments are not supported in a knowledge worker environment which is based on a direct connection.

Automatic call distribution

Symposium TAPI SP supports software-based distribution of calls using these ACD features:

- setting up one main number and distributing the calls to a group of agents
- setting up a supervisor position for an ACD group
- monitoring the quality of the service being provided to incoming callers
- gathering information on the calls such as, hold time, time in queue, and the number of agents logged in a queue.

ACD proxy service

The ACD proxy service, which is a separate ACD application provided with Symposium TAPI SP, allows agents to do the following:

- log in/log out
- ready/not ready
- walkaway/return
- call forward/cancel call forward
- make set busy
- make set in service

The ACD proxy service also registers ACD queue numbers so that an agent can log in to an ACD queue without launching an application.

Agent walkaway feature

The agent walkaway feature works in the following ways:

- To walkaway with a current call, an active agent does the following:
 - presses the hold key
 - unplugs the headset
 - walks away

The logger application displays a walkaway message for that agent position. When the agent returns and plugs back into the set, the logger application displays a return message for that agent position.

- To walkaway with a current call, a non-active agent does the following:
 - places the phone in the not-ready state
 - presses the hold key
 - unplugs the headset
 - walks away

The logger application displays a walkaway message for that agent position. When the agent returns and plugs back into the set, the logger application displays a return message for that agent position. This action allows the agent to enter the not-ready state without disconnecting.

Telephone set control

You can manipulate a telephone set using the following features:

- call forwarding
- message waiting indicator
- device validation
- event management

Outbound and predictive dialing applications

Symposium TAPI SP supports outbound and predictive dialing applications from third parties that use the TAPI Service Provider interface for call control and monitoring. Outbound and predictive dialing applications and tools are used in call centers to perform telemarketing, collections, telesales, and account management.

Trunk monitoring

The trunk monitoring feature allows Symposium TAPI SP to process the link messages for inbound calls on a monitored trunk. The application can use trunk information to record conversation on incoming calls.

Interactive voice response

Symposium TAPI SP provides call data support for inbound calls transferred from the Nortel Networks Periphonics IVR system or third-party systems running on ports that are monitored by Symposium TAPI Service Provider. The service provider also provides network call data support for calls overflowed from other remote Meridian 1 switches controlled by Symposium TAPI Service Provider.

The IVR to TAPI server interface consists of a core set of software applications and a per port license. All IVR ports must be licensed individually.

Security features

FlexLM License Manager, supplied by GLOBEtrouter Software Inc., is provided with Symposium TAPI SP to manage your software license file. A physical security feature that connects to the server by a 25-pin D-type parallel port is also provided. The service provider will not operate unless both the software license and physical security device are installed and configured correctly.

Auto link recovery feature

The auto link recovery feature monitors the link status between Symposium TAPI SP and the link protocol on the Meridian 1 switch. If link loss is detected the service provider tries to reestablish the link and revalidates the link status.

To enable the auto link recovery feature on the Meridian 1 switch in a call center environment, you must set the polling interval for the switch-to-host protocol to a value greater than zero. For information, refer to [“Configuring the Meridian 1 Host table” on page 95](#). In a knowledge worker environment which uses a direct connection TAPI architecture, auto link recovery is the default setting.

Dynamic database feature

Symposium TAPI Service Provider, release 2.3.x, allows run time updates from the Symposium configuration application to the TAPI server. Modifications, such as addition or deletion of controllable telephone sets and their call control supported features are reported immediately to Symposium TAPI SP during run time.

Administration features

A range of administration features is available for Symposium TAPI SP.

Symposium configuration application

In the Symposium configuration application you can enter information into the Symposium TAPI SP database tables and maintain this information. These tables include entries for controllable telephone sets and related call control features.

Logger application

In the event of problems, you can use the logger tool to trace application activities. During a troubleshooting session, the logger application writes status and error messages (as defined on the configuration dialog boxes) to the scrollable logger window. When the logger window is full, the logger application writes status and error messages to a logger overflow file. You can save the information in the logger overflow file to use for diagnostic and troubleshooting purposes. You can also print a complete file, or highlighted sections.

License Manager troubleshooting tools

The following tools assist you in troubleshooting the FlexLM License Manager:

- SADDDBMON is a console debug monitor application that displays error information describing the cause of failure.
- debug.log is log file written by FlexLM License Manager with status information and an error log in case of failure.

Microsoft TAPI browser application

The Microsoft TAPI browser application enables you to verify that Symposium TAPI SP is installed and configured properly and is operating correctly. This feature is applicable only in a call center configuration and is not supported in a direct connect knowledge worker configuration.

Symposium TAPI SP feature interactions

Users of TAPI-compliant applications must be aware of feature interactions with Symposium TAPI SP.

Feature interactions in a call center environment

When running TAPI-compliant applications with Symposium TAPI SP using Meridian Link Services on the SCCS, the following features are not available:

- not-ready with optional disconnect. An application invokes the not-ready status for a set without disconnecting the call
- enhanced time stamp IE. This feature is used in status change
- set feature notification messages for:
 - ready/not-ready
 - log in/log out
 - walk away/return

Feature interactions in a knowledge worker environment

The following features are not supported in a knowledge worker environment with a direct connection architecture:

- CDN treatments/call routing features
- CDN call model

Feature interactions in all environments

The following feature interactions apply in all implementations of Symposium TAPI SP:

- Symposium TAPI SP does not support multiple users placing a call on hold. If a Symposium TAPI SP application station calls another Symposium TAPI SP application station, only one user can put the call on hold.
- Symposium TAPI SP supports analog telephone sets in a different way from digital telephone sets. If you use analog telephone sets, be aware of the following:
 - Symposium TAPI SP does not recognize call activity associated with an analog telephone's directory number if a call to an analog ACD set is abandoned.
 - Symposium TAPI SP does not support a TAPI-compliant application answering calls for analog sets; users of analog sets must lift the handset or otherwise cause the line to go off hook to answer calls.
 - Symposium TAPI SP supports a TAPI-compliant application hanging up the telephone of an analog set but the handset must be returned to the cradle before it is picked up again.
- Symposium TAPI SP offers limited support for multiple appearance directory numbers (MADNs).
- Symposium TAPI SP does not display the called number (when dialing from a telephone set) until the called party answers.
- Symposium TAPI SP does not support multiple call ring (MCR) and multiple call no ring (MCN) features.
- Symposium TAPI SP does not support speed dial feature access codes.
- Symposium TAPI SP does not recognize the DNs of callers that hang up during a supervised transfer or conference call.

- Symposium TAPI SP does not recognize calls that have been manually transferred from a telephone set not configured with the associated set (AST) feature.
- Symposium TAPI SP does not support the group call feature.

Feature interactions with other software applications

Symposium TAPI SP is compatible with a range of software applications, including Nortel Networks Symposium Agent. Refer to the user documentation provided with these products for detailed information. Refer to the *Engineering Guide for Symposium TAPI Service Provider for Meridian 1, release 2.3.1*, part number 213345-A, for information about supported software.

Networking between Symposium TAPI Service Providers

The Meridian 1 switch supports call routing between a network of Meridian 1 switches over ISDN trunks using network automatic call distribution (NACD). This functionality ensures that Symposium TAPI SP can track call data consistently and reliably for calls that overflow from one Meridian 1 switch to another.

On demand call data

When a call is offered to an agent, it contains the calling line identification (CLID) of the local Meridian 1 switch. When a call is overflowed through NACD to a remote switch, the following identifiers are used:

- the CLID of the switch that received the overflowed call
- the network CLID for the remote switch that overflowed the call, containing two elements:
 - the CLID for the remote switch
 - the home location code (HLOC) for that switch

Symposium TAPI SP extracts the HLOC from the network CLID and searches the IVR host database table to locate the IP address of the TAPI server at the site associated with this HLOC. The IVR host database table is configured during initialization and contains the HLOC and corresponding IP address of all participating TAPI servers in network. When an IP address is found, Symposium TAPI SP sends a TCP/IP message requesting call data for the network CLID to the remote Symposium TAPI server.

Call data networking requirements

The requirements for call data networking are as follows:

- All switches must be on an ISDN trunk.
- The NACD application must be installed on the Meridian 1 switch.
- Each switch must have a unique HLOC.
- To communicate with each other, all Symposium TAPI servers must be running release 2.2 or higher of the service provider software.
- All servers must be visible over TCP/IP, which should be verified by pings.
- Symposium TAPI SP must have the TAPI_IVR_feature option on the supplied license file.

Restriction for NACD overflow and call data

Network call data works only if the call comes from another agent via another Meridian 1 switch. The destination of the call can be either an ACD queue or a CDN.

Chapter 2

Installation guidelines

Before you install Symposium TAPI Service Provider for Meridian 1, release 2.3.1, you must prepare the TAPI environment. This chapter provides the following information:

- prerequisites
- how to configure local area networks
- how to install Symposium TAPI SP in a knowledge worker (direct connect) environment
- how to install Symposium TAPI SP in a call center

The information in this chapter refers to a first-time installation of Symposium TAPI SP. If you want to upgrade to release 2.3.1 from an earlier release of the software, refer to [Chapter 5, “Upgrading Symposium TAPI SP,” on page 117](#). If you want to install Symposium TAPI SP with a legacy system such as the Meridian Link Module, refer to the following:

- the product documentation you received with the Meridian Link Module
- *Network Managers Guide, a Reference Guide for Installing, Configuring, and Maintaining Symposium TAPI Service Provider for Meridian 1, release 2.3*, which is available on the Nortel Networks Website at <http://www.nortelnetworks.com>.



Note: This document highlights requirements that are specific to the operation of Symposium TAPI SP. It does not provide installation and configuration guidelines for dependent products. It is assumed that dependent products are installed and configured by qualified engineers.

General prerequisites

Before you commence installation, refer to the *Engineering Guidelines for Symposium TAPI Service Provider for Meridian 1*, part number 213345-A, which outlines the minimum hardware and software requirements for the TAPI server. This section provides the following information:

- how to prepare the TAPI server
- how to prepare the Meridian 1 switch
- how to install the security device
- how to configure local area networks



Note: You can perform a network installation of Symposium TAPI SP. To do so, you must enter the network address of the destination server before performing the installation.

Preparing the TAPI server

Symposium TAPI Service Provider is platform vendor independent (PVI) and can be installed on any system that runs one of the following operating systems:

- Windows NT server, release 4.0, with a minimum of service pack 6a installed
- Microsoft Windows 2000 server, with a minimum of service pack 2 installed

Nortel Networks recommends that you allocate a dedicated server for TAPI activities.

Refer to *Engineering Guidelines for Symposium TAPI Service Provider for Meridian 1*, part number 213345-A for detailed specifications for the hardware and software requirements for the TAPI server. You must comply with these specifications, and note the following requirements if you plan to install Symposium TAPI SP on a Windows NT server:

- Do not use a beta release of Windows NT server software.
- The required service pack is not supplied with Symposium TAPI SP and must be downloaded from the Microsoft Website at <http://www.microsoft.com>. A readme.txt file provided with Microsoft TAPI software provides information about installing the service pack.

- The Windows NT service pack includes an upgrade to Microsoft TAPI software. When you install the service pack, do not install Microsoft TAPI software afterwards because this can cause unexpected behavior in Symposium TAPI SP.

Preparing the Meridian 1 switch

Before the Meridian 1 switch can support TAPI operations, a number of Meridian applications must be installed on the switch. Depending on the type of capability required, a range of additional applications can also be installed.



Note: You can install Symposium TAPI SP, release 2.3.1, with a Succession CSE1000 switch in place of a Meridian 1 switch. The same installation and configuration guidelines apply.

Required applications

Table 1 lists the applications that must be installed on a Meridian 1 switch in order to support Symposium TAPI SP in either a call center (SCCS) or knowledge worker (direct connect) environment.

Table 1 Required Meridian 1 applications

Application (Option)	Purpose	SCCS	Direct connect
35	Integrated messaging (IMS)	X	X
77	Command and status link (CSL)	X	X
153	ISDN/AP for third parties (IAP3P)	X	
247	Call ID	X	
311	NGCC mixed generation call center		X
324	NGEN new generation foundation		X

Optional applications

Table 2 lists additional applications that can be installed, depending on the level of TAPI functionality required.

Table 2 Optional Meridian 1 applications

Application (Option)	Purpose
40	Basic ACD
41	Basic ACD B
42	Basic ACD 3 usage reports
43	Basic ACD C2 load management
45	Basic ACD A
50	ACD D used for ACD MAX applications
145	Integrated services digital network (ISDN)
146	Primary rate access (PRA)
214	Enhanced ACD routing (EAR)
215	Customer controlled routing (CCR)

Installing the security device

A security device is provided with Symposium TAPI SP. The software will not run until you install the device on the TAPI server, Symposium TAPI SP will not run.

The security device has a 25-pin connector, labeled “computer” at one end. Attach this connector to any parallel port on the TAPI server, and tighten the screws firmly to ensure that the device is securely connected to the port. If a printer is connected to the computer, attach a shielded printer cable to the outside connector of the security device. If multiple security devices are attached to the parallel port, the Symposium TAPI SP device must be the first one attached directly to the port.

If the computer is close to a wall or another obstacle, attach an extension cable to a parallel port and attach the security device to this extension cable. Use a straight through DB-25 male to DB-25 female extension cable.

Configuring local area networks

All Meridian 1 switches use a Meridian 1 embedded LAN (E-LAN) for system access and control. In a TAPI environment it is necessary to isolate telephony traffic from data traffic. Telephony traffic is confined to the E-LAN and data traffic travels on a separate LAN, the customer LAN (C-LAN) or C-LANs. To ensure that telephony traffic is isolated from data traffic, the following network interfaces are required:

- In a knowledge worker environment, the TAPI server requires two 10/100BASE-T network Ethernet ports, one connecting to the E-LAN and the other connecting to the C-LAN.
- In a call center environment, the TAPI server requires one 10BASE-T network Ethernet port to connect to the C-LAN. A direct connection to the SCCS provides a link to the E-LAN.

An additional C-LAN is required in a call center environment to ensure that Symposium TAPI SP traffic is not affected by non-TAPI data traffic. An Ethernet switch or router is installed to provide routing between these C-LANs.

Configuring the E-LAN

If you are installing Symposium TAPI SP in an existing Meridian 1 environment the E-LAN configuration will be in place. If the installation is in a new environment, it is necessary to configure the E-LAN on the Meridian 1 switch.

Applications connect to the E-LAN using the IP address of the Ethernet port on the Meridian 1 switch and port number 8888. The switch dynamically assigns the appropriate E-LAN address for each application.

There are two elements in configuring the E-LAN: hardware configuration of the Ethernet port on the switch and the software configuration. Refer to the product documentation provided with your Meridian 1 switch for instructions on hardware configuration. When you complete the hardware configuration of the Ethernet port, perform the software configurations described in the following sections.

Assigning an IP address for the Meridian 1 switch

To assign an IP address for an Ethernet port, log on to the Meridian 1 switch through Optivity Telephony Manager (OTM). Use the following sample as a template, substituting relevant values where appropriate in overlay 117:

```
> LD 117
```

```
NEW HOST M1SERVER_A 47.1.1.10
```

where `M1SERVER_A` is the host name for the IP address
and `47.1.1.10` is the IP address of the active Ethernet port

```
CHG ELNK ACTIVE M1SERVER_A
```

```
CHG MASK 255.255.255.0
```

where `255.255.255.0` is the local subnet mask

In a redundant system, with a dual CPU, repeat this process for the backup, inactive CPU, using the following template and substituting appropriate values where necessary:

```
> LD 117
```

```
NEW HOST M1SERVER_B 47.1.1.11
```

where `M1SERVER_B` is the host name for the IP address
and `47.1.1.11` is the IP address of the standby Ethernet port

```
CHG ELNK INACTIVE M1SERVER_B
```

After you assign the necessary IP address(es), press the <MAN INT> button on the CPU card to manually initialize the system and activate the new IP address information.

Defining a routing table

The routing table supplies the Meridian 1 switch with the IP addresses of a gateway server. This information allows the switch to send return messages to the gateway for forwarding to the requesting client. If you have a default gateway in the network, use the following sample as a template, substituting relevant values where appropriate:

```
> LD 117
```

```
NEW ROUT 0.0.0.0 47.1.1.250
```

where 47.1.1.250 is the IP address of the default gateway

Primary IP address procedures

This section provides procedures for the activation, validation, and recovery of the Primary IP address.

Activation procedure

Manually initialize the system to activate the connection to the IP address configured in overlay 117.



Note: You must perform a manual initialization to establish the initial connection to the primary IP address. After the connection is established, another manual initialization is required only if the primary IP address is changed.

Validation procedure

To verify that the primary IP address is active, compare the IP address configured in overlay 117 with the IP address used in overlay 137. The IP addresses must be identical in both overlays. To perform the validation, use the following sample as a template, substituting relevant values where appropriate:

```
> LD 117<cr>
```

```
OAM000
```

```
PRT ELNK<cr>
```

```
ACTIVE ETHERNET: PRIMARY_IP 47.48.49.50
```

```
INACTIVE ETHERNET: SECONDARY_IP 47.48.49.51
```

```
OK
```

```
> LD 137 <cr>
```

```
CIOD000
```

```
STAT ELNK<cr>
```

```
ELNK ENABLED
```

```
Ethernet (ln unit number 0):
```

```
Host: PRIMARY_IP Internet address: 47.48.49.50
```

```
where 47.48.49.50 indicates the actual IP address used
Broadcast address: 47.48.49.255
Ethernet address: 00:00:75:32:1e:ca
Netmask: 0xff000000; Subnetmask: 0xfffff000
33520 packets received; 12308 packets sent
0 input errors; 0 output errors
0 collisions
```

If the IP addresses are not identical, the IP address is invalid and it is necessary to perform the recovery procedure.

Recovery procedure

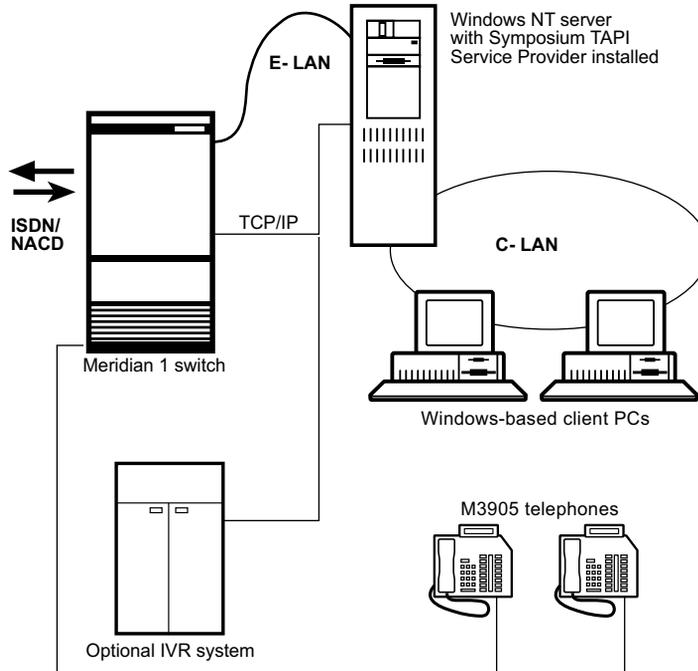
If the connection to the Primary IP address is lost, it can be reestablished by performing the following tasks:

- 1** Manually initialize the system to reestablish a connection to the primary IP address.
- 2** Perform the validation procedure again to confirm the Ethernet connection is fully functional.

Installation notes for a knowledge worker environment

In a knowledge worker environment, where skill-based routing is not required, a direct connect configuration is used (Figure 4).

Figure 4 Direct connect installation for a knowledge worker environment



Before you proceed, ensure that the prerequisites described earlier in this chapter are met. The following requirements are also necessary:

- You must have administrative rights and be familiar with Microsoft TAPI operation to install this software.
- TCP/IP must be configured and operational on both the Meridian 1 host link and on the TAPI server.

Installing Symposium TAPI SP software

To install Symposium TAPI SP on the TAPI server, perform the following tasks:

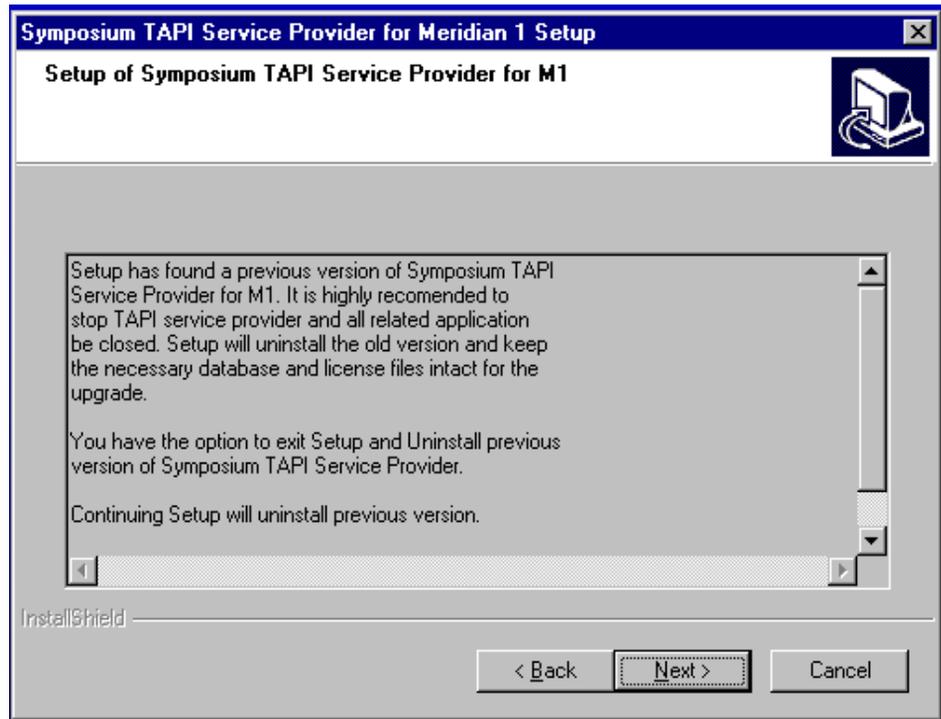


Note: Before you install Symposium TAPI SP, close any TAPI application running on the server or client.

- 1 Log on to the TAPI server.
- 2 Insert the Symposium TAPI Service Provider CD into the CD drive.
- 3 Select Start > Run.
- 4 Type the drive\setup.exe. For example, e:\setup.exe. Alternatively, in the Windows Explorer window, select the drive and navigate to the setup.exe file.
- 5 Select the setup.exe file to launch the wizard-driven installation application.
- 6 In the welcome window, click Next to display the software license agreement window.
- 7 Click Yes to indicate that you accept the terms of the software license agreement before proceeding to the destination location window.
- 8 Click on Next to continue with the installation process. If you wish to cancel the installation at any point, click Cancel on any of the installation windows.

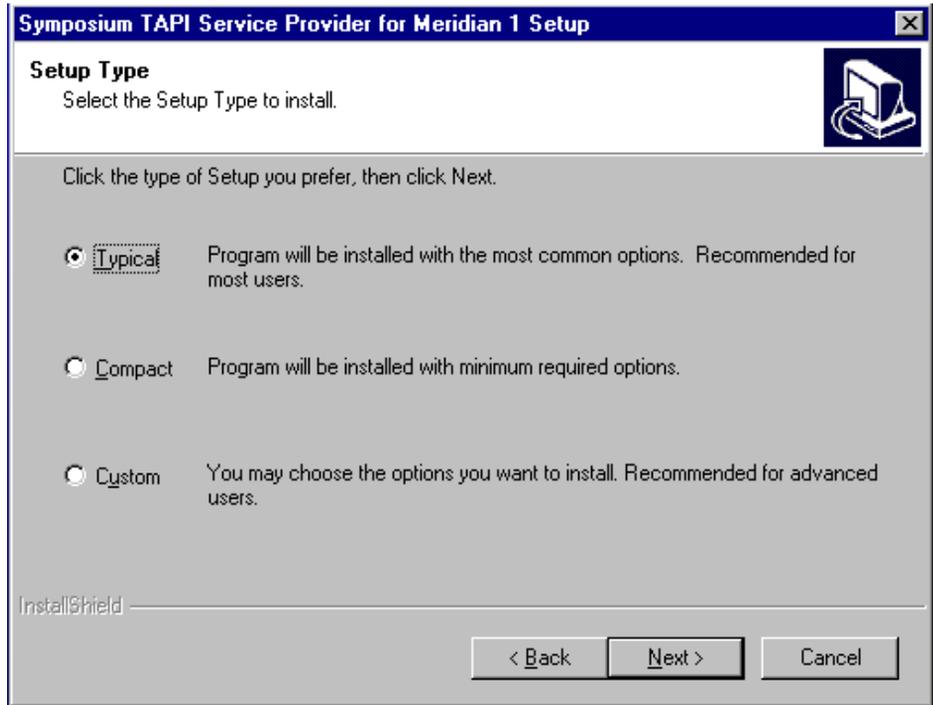
- 9 The installation application issues a notification if it detects a previous release of Symposium TAPI SP (Figure 5). If this occurs, refer to Chapter 5, “Upgrading Symposium TAPI SP,” on page 117, for further information.

Figure 5 Detecting a previous release



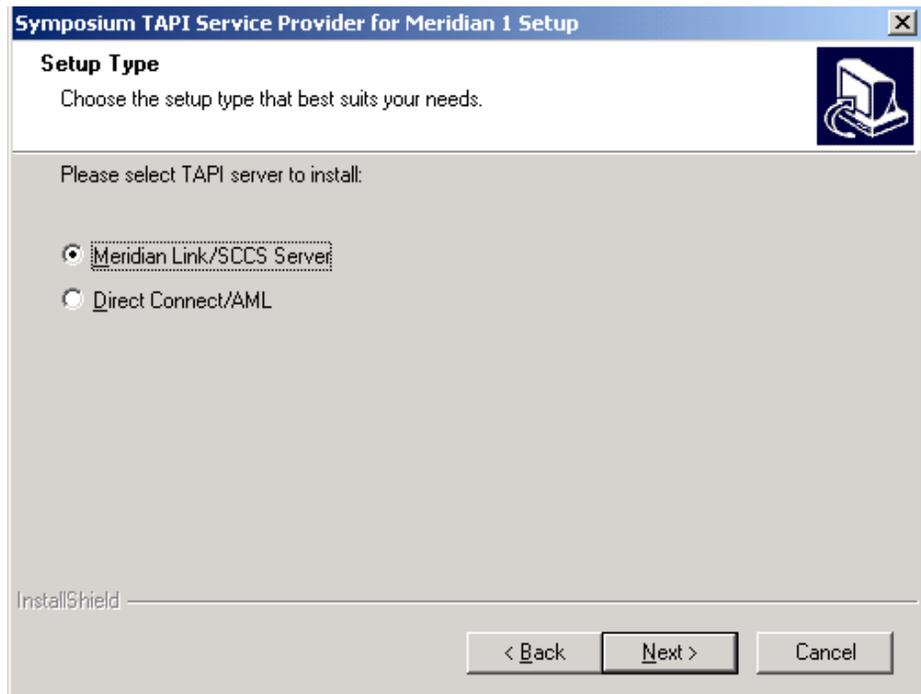
If no previous release is detected, the Setup Type window opens (Figure 6). Select the setup type you prefer and click Next.

Figure 6 Setup Type window



- 10 In the TAPI server type window (Figure 7), select direct connect and click Next.

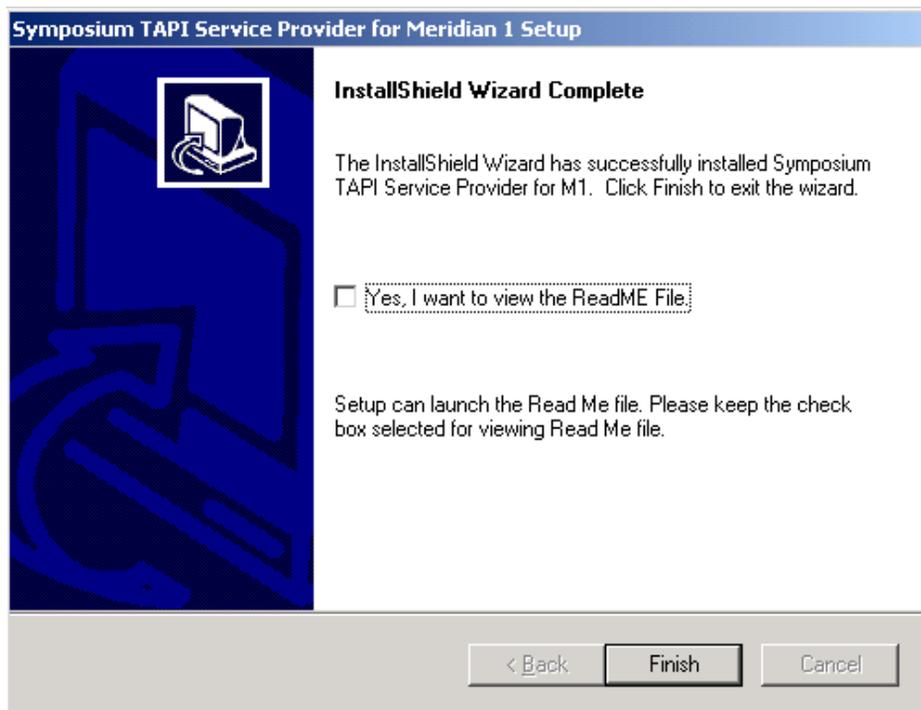
Figure 7 TAPI server type window



- 11 The installation application copies the required files to the specified directory. A status window displays installation progress.
- 12 When the copying is complete, the setup application automatically configures the software license. If it cannot locate the license file, you are prompted to provide an alternative path to the license file. Symposium TAPI SP will not operate without the license file. Click Yes to locate it.

- 13 In the select folder for license file window, navigate to the location of the file. The setup application configures the license file before presenting the InstallShield Wizard complete window (Figure 8).

Figure 8 InstallShield Wizard Complete window

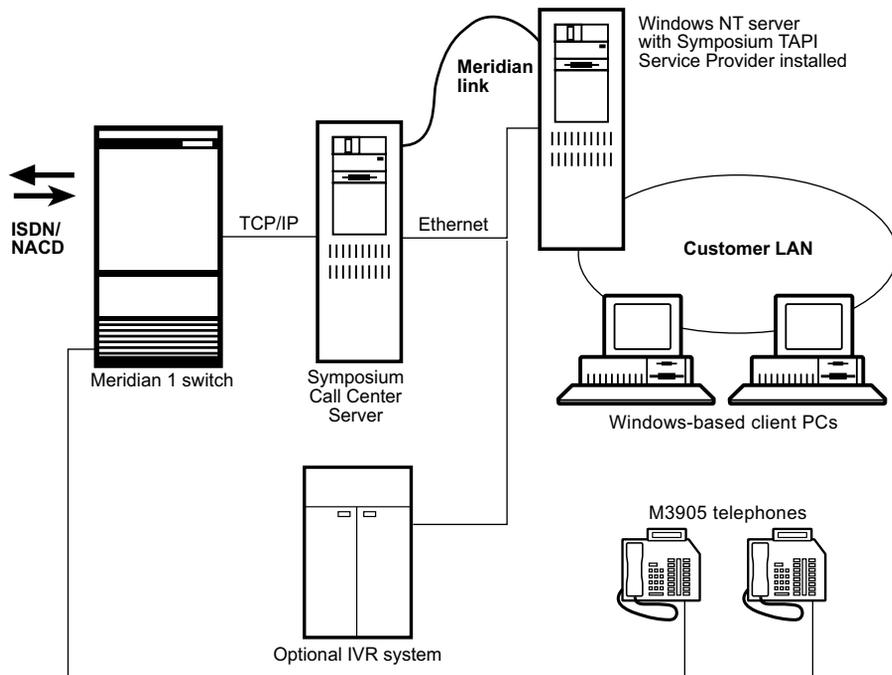


- 14 Click Yes I want to view the ReadMe File to display the Readme.txt file. This file includes valuable information on Symposium TAPI Service Provider for Meridian 1, release 2.3.1. Nortel Networks recommends that you read this file before configuring and using the software.
- 15 Click Finish to complete the installation.

Installation notes in a call center environment

This section describes the procedures to install Symposium TAPI SP in a call center environment with the Symposium Call Center Server (Figure 9). The same procedures apply if you are installing Symposium TAPI SP in a call center environment with Symposium Express Call Center. Two 10/100BASE-T network Ethernet ports are required on the SCCS to ensure physical isolation between the E-LAN and the C-LANs. Only one 10/100BASE-T network Ethernet port is necessary on the TAPI server to connect to the C-LAN.

Figure 9 SCCS installation in a call center environment



Before you proceed, ensure that the prerequisites described earlier in this chapter are met. The following requirements are also necessary:

- You must have administrative rights and be familiar with Microsoft TAPI operation to install this software.
- TCP/IP must be configured and operational on both the Meridian 1 host link and on the TAPI server.

Preparing a Symposium Call Center Server

In a Symposium Call Center Server (SCCS) environment, Symposium TAPI SP integrates with the Meridian 1 switch through Meridian Link Services on the SCCS. Meridian Link Services is supplied with the SCCS software and communicates with the TAPI server over an Ethernet connection, using the TCP/IP protocol. Meridian Link Services communicates with the Meridian 1 switch over a second Ethernet connection using the TCP/IP protocol.

Prerequisites

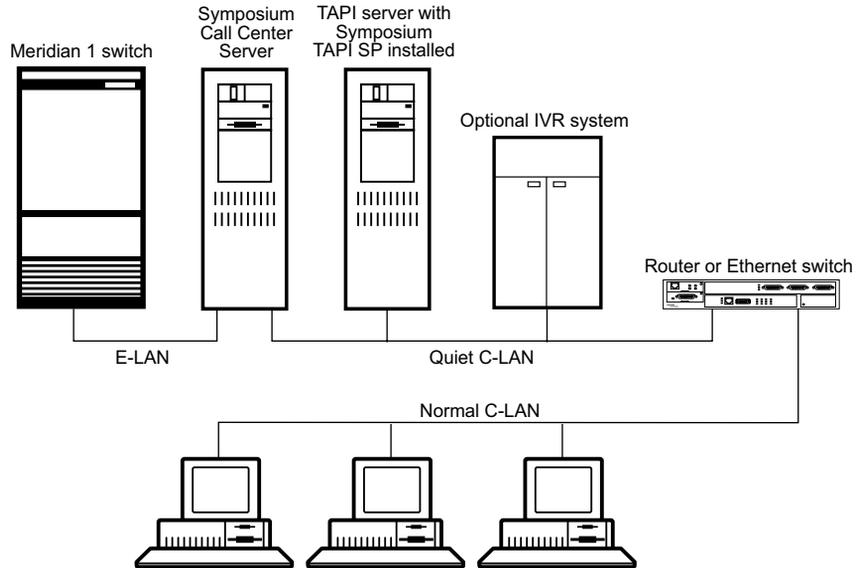
To prepare the SCCS for TAPI operations, verify the following:

- the SCCS is fully functioning with all user IDs and passwords properly configured
- the necessary telephone user ID's and passwords are configured if the SCCS is used for skill-based routing
- the TAPI server is connected on the C-LAN
- Meridian Link Services is running on the SCCS server

Configuring an isolated C-LAN for TAPI traffic

If there is heavy traffic on the C-LAN, certain Symposium TAPI SP real-time activities, such as window-pops, can operate incorrectly. To restrict data traffic reaching Symposium TAPI SP, create an isolated C-LAN dedicated to TAPI-related traffic (Figure 10).

Figure 10 Isolating TAPI-traffic on a separate C-LAN



In a multiple C-LAN configuration, traffic is isolated on the following LANs:

- Traffic between the Meridian 1 switch and the SCCS is isolated on the E-LAN.
- Traffic between the SCCS and Symposium TAPI SP is isolated on its own, dedicated C-LAN. If an IVR system is installed, IVR traffic is also confined to this C-LAN.
- Data traffic between client PCs and data servers is isolated on the main C-LAN.

Install a router or Ethernet switch to provide routing between C-LANs.

Installing Symposium TAPI SP software

To install Symposium TAPI SP on the TAPI server, perform the following tasks:

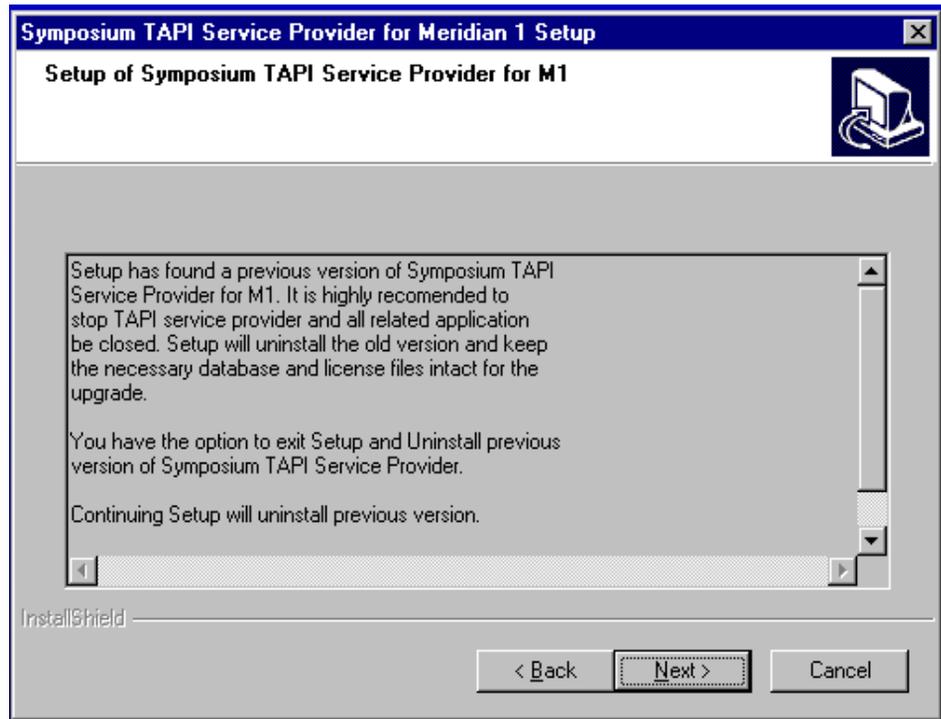


Note: Before you install Symposium TAPI SP, close any TAPI application running on the server or client.

- 1 Log on to the TAPI server.
- 2 Insert the Symposium TAPI Service Provider CD into the CD drive.
- 3 Select Start > Run.
- 4 Type the drive\setup.exe, for example, e:\setup.exe. Alternatively, in the Windows Explorer window, select the drive icon and navigate to the setup.exe file.
- 5 Click the setup.exe file to start the wizard-driven installation application.
- 6 In the welcome window click Next to display the software license agreement.
- 7 Click Yes to indicate that you accept the terms of the software license
- 8 Click Next to continue with the installation. If you wish to cancel the installation at any point, click Cancel on any of the installation windows.

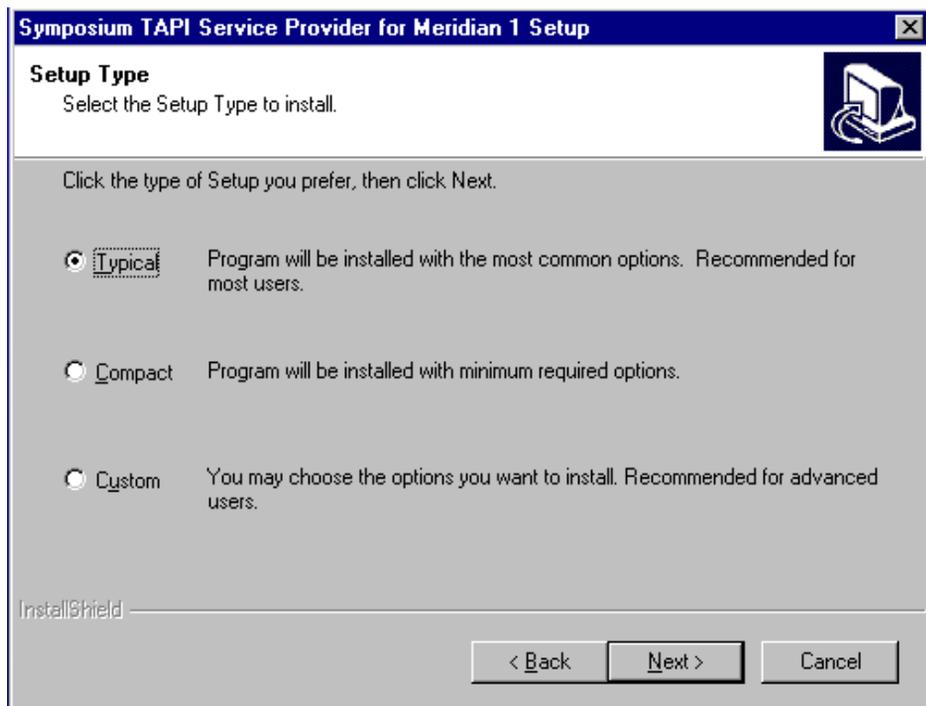
- 9 The installation application issues a notification if it detects a previous release of Symposium TAPI SP (Figure 11). If this occurs, refer to Chapter 5, “Upgrading Symposium TAPI SP,” on page 117, for further information.

Figure 11 Detecting a previous release



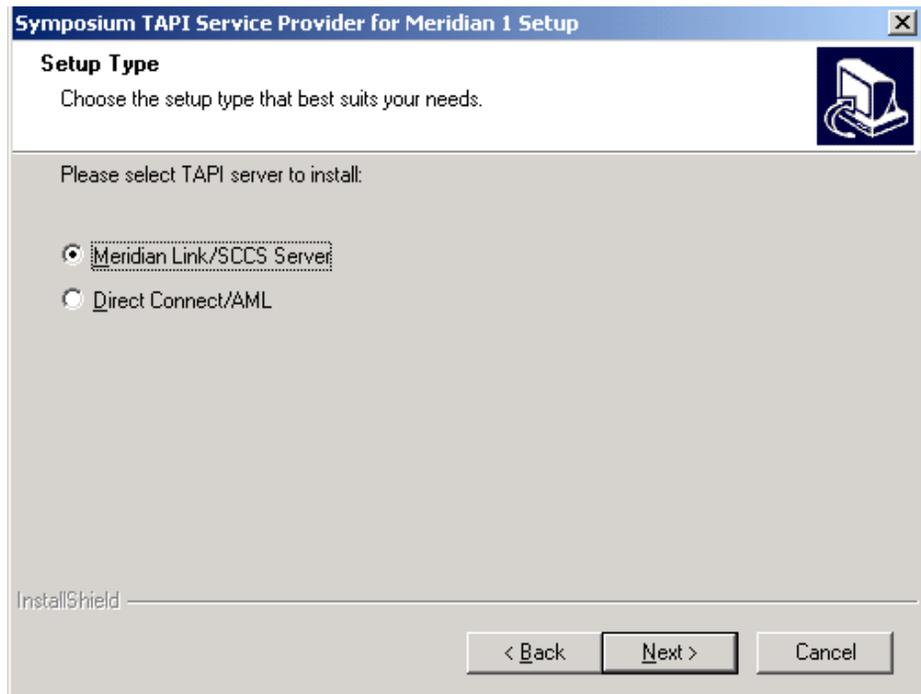
- 10 Assuming that no previous release is detected, the Setup Type window opens (Figure 12). Select the setup type you prefer and click Next.

Figure 12 Setup Type window



- 11 In the TAPI server type window that opens (Figure 13), select the Meridian Link/SCCS server option and click Next.

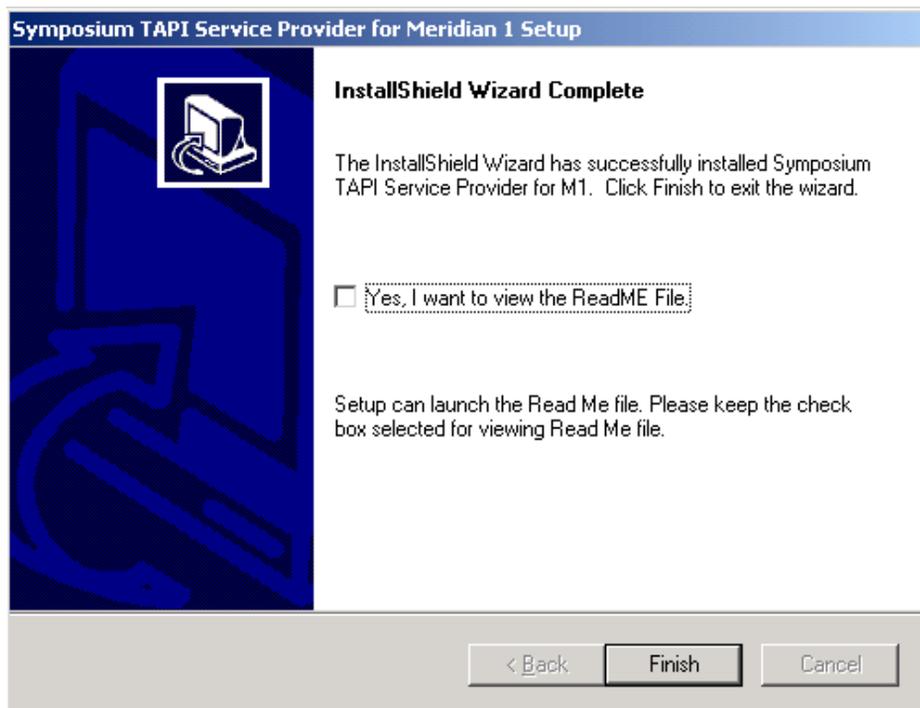
Figure 13 TAPI server type window



- 12 The installation application copies the required files to the specified directory. A status window displays installation progress.
- 13 When the copying is complete, the set up application automatically configures the software license. If it cannot locate the license file, you are prompted to provide an alternative path to the license file. Symposium TAPI SP cannot operate without the license file. Click Yes if you wish to locate the license file.

- 14 In the select folder for license file window, navigate to the location of the license file. The setup application configures the license file before displaying the InstallShield Wizard Complete window (Figure 14).

Figure 14 InstallShield wizard complete window



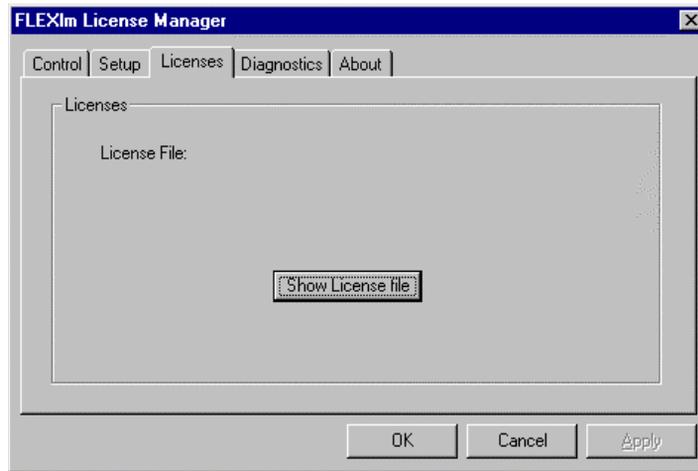
- 15 Click Yes I want to view the ReadMe File to display the readme.txt file. This file includes valuable information on Symposium TAPI Service Provider for Meridian 1, release 2.3.1. Nortel Networks recommends that you read this file before configuring and using the software.
- 16 Click Finish to complete the installation.

Configuring the FlexLM License Manager

The FlexLM License Manager is provided with Symposium TAPI SP to manage your software license. When you install Symposium TAPI SP it automatically loads your software license file. Before configuring Symposium TAPI SP, you must configure your software license file with the name of your TAPI server:

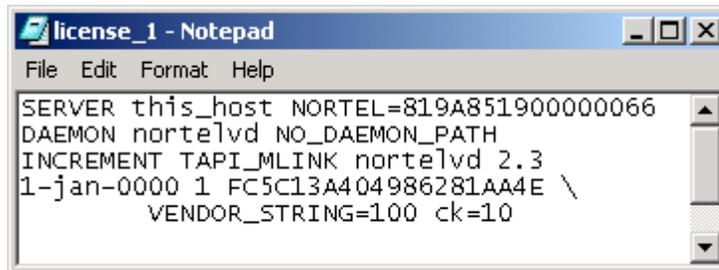
- 1 Select Start > Programs > Nortel > Nortel Symposium TAPI Service Provider for Meridian 1 > FlexLM License Manager.
- 2 Click the Licenses tab; then click Show License file. (Figure 15)

Figure 15 Licenses window in the FlexLM License Manager



- 3 The license file (which opens in Notepad) contains a number of lines of information. Change the entry in the first line to reflect your server name. (Figure 16)

Figure 16 Sample license file



Caution: Do not change any other information in this file. If you change other information, you invalidate your license.

- 4 Select File > Save to save the changes and exit the application.

Chapter 3

Preparing the TAPI environment

This chapter provides information about preparing the TAPI environment, including the following sections:

- TAPI server domains
- Configuring Microsoft TAPI for Symposium TAPI SP

Microsoft TAPI terminology

Before you begin, familiarize yourself with the following Microsoft TAPI terms:

- remote — TAPI remote service provider (remotesp.tsp)
- client machine — the machine using the remote service provider
- client machine domain — the domain to which the client machine belongs
This information is only relevant if the client is a Windows NT machine.
- client user — the domain user logged onto the client machine
- client domain — the domain to which the client user (TAPI client) belongs
- server machine — the Windows NT or Microsoft Windows 2000 telephony server machine
- server machine domain — the machine domain to which the telephony server belongs
- server service — the telephony service running on the telephony server, which is also called service, telephony service, or server
- server user — the domain account to which the telephony server service belongs, for example TAPIAdmin
- server user domain — the user domain to which the server user belongs

TAPI server domains

Symposium TAPI SP requires that all TAPI clients log in through a domain. A domain is a windows networking concept designed to facilitate the administration and security of network resources on Windows NT and Microsoft Windows 2000 servers. Where multiple servers are required in a network, a domain server provides centralized management of all user account information. Users only log on to one server rather than multiple servers. Domains combine the features of workgroups and directories, allowing users to access resources on multiple servers within a centralized management structure. In large networks you can create multiple domains and you establish trust relationships between domains to provide users with access to resources on other domains.

Before you configure TAPI domains, you must be familiar with the concepts and procedures for domain management provided by Microsoft. For information use the search facility at <http://www.microsoft.com>.

Windows NT domain architecture

You can designate a Windows NT server as one of the following:

- primary domain controller (PDC)
- backup domain controller (BDC)
- member or standalone server

When you install a Windows NT server you are prompted to select one of these options. When you designate a server as a PDC, a domain is created automatically. The PDC maintains the security account management (SAM) database, which is the only read/write copy of the master database for the domain. If users cannot access the PDC, they cannot log on to the network. Therefore, you must designate at least one other server as a BDC per domain. At regular intervals, the PDC circulates read-only copies of the SAM database to all BDCs in the domain. If the PDC is unavailable, users can log on through a BDC but the BDC cannot update account information. You can designate the BDC to become the acting PDC if necessary, for example, in the event of server failure.

Alternatively, you can designate a server as a member (standalone) server in a domain. A standalone server has access to all resources for the domain without any responsibility for security management.

The SAM database resides in server RAM. Microsoft recommends that you do not allow the SAM database to exceed 40MB in size. In a large network, multiple domains allow you to spread the logon processing requirements over a number of PDC and BDC servers.

Microsoft Windows 2000 domain architecture

Domain structures are different on a Microsoft Windows 2000 network, which uses the *active directory* architecture for domain management. The active directory stores all objects and their attributes, including security attributes. All servers in the Microsoft Windows 2000 domain are peers to one another and share responsibility for security management. Users can log on through any server and account information can be updated on any server. Servers dynamically share account update information with all other servers in the domain.

Trust relationships between domains

In large networks, or in networks where you want to create separate domains for different departments or for security reasons, you can establish multiple domains. You can designate trust relationships between domains to provide members of one domain with access to the resources of another domain without having to logon to separate domains. The type of trust relationship you designate varies according to network and security requirements.

For example, you can create a domain for the sales department and another domain for the accounts department. You can provide users of the accounts domain with access to resources in the sales domain, without granting access to accounts resources to users in the sales domain. In this scenario you can create a one-way trust relationship between these domains. Domain controllers for the sales domain trust users logged on to the accounts domain, but users logged on to the sales domain are not trusted by domain controllers for the accounts domain.

However, if you also want to allow access to the accounts domain to users logged on to the sales domain, you can create a two-way trust relationship between the domains. Two-way trust is established in different ways on Windows NT and Microsoft Windows 2000 platforms:

- On a Windows NT network, you must designate two one-way trust relationships between two domains.

- On a Microsoft Windows 2000 network you can designate a two-way trust relationship between two domains.

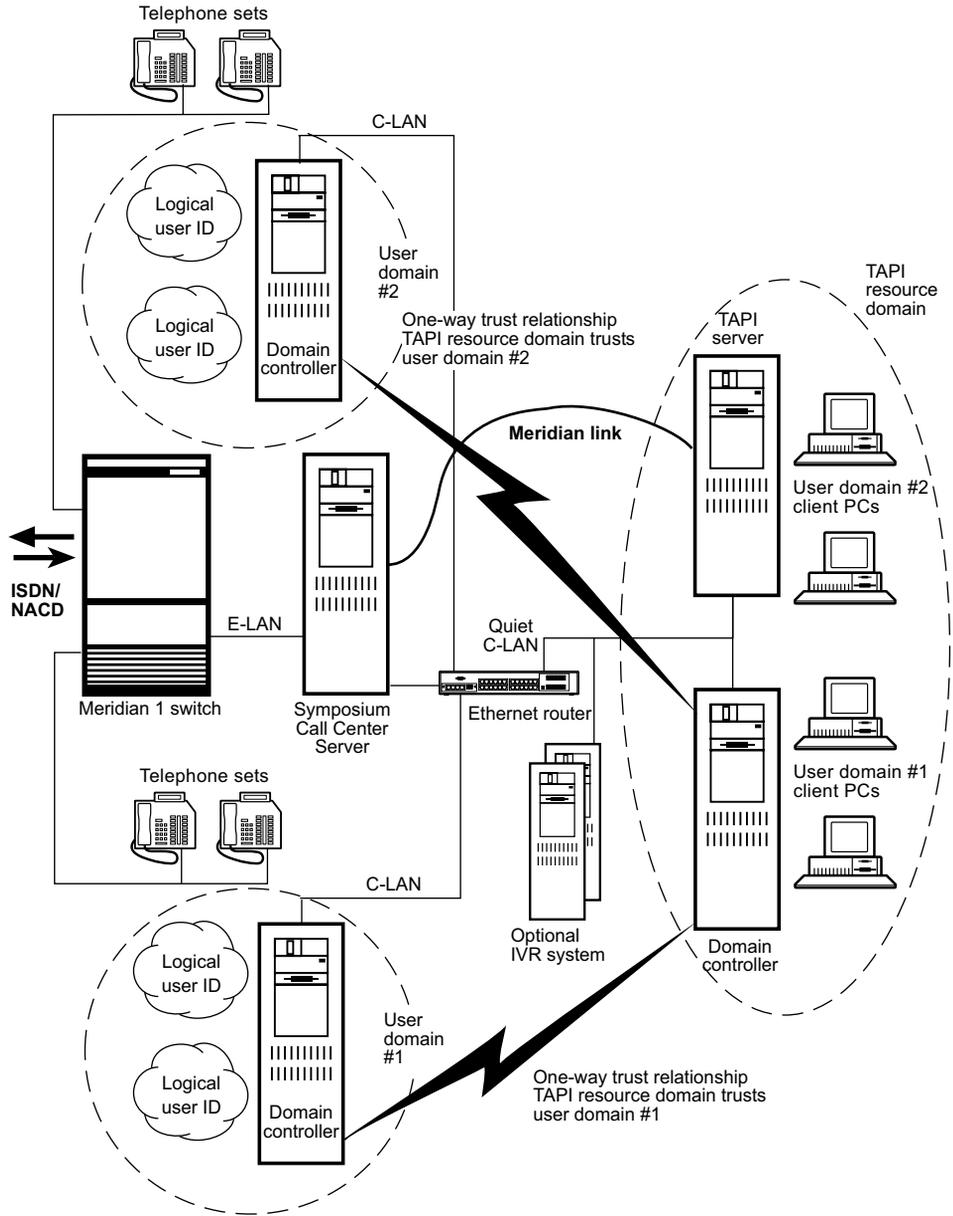
Symposium TAPI SP domain considerations

On a Windows NT network, the Symposium TAPI SP server is usually designated either as a PDC or as a standalone server. If you plan to designate the TAPI server as a PDC, consider the processing requirements before configuring the server.

Before establishing TAPI services and installing Symposium TAPI SP, must understand the domain and security requirements of the network. Microsoft recommends two-way trust relationships for TAPI services. However, some customer requirements can dictate one-way trust relationships for security purposes. This section provides two sample trust relationship configurations for Symposium TAPI SP in a multidomain network.

Figure 18 shows a non-standard multidomain configuration with one-way trust relationships between the TAPI resource domain and user domains.

Figure 18 Non-standard multidomain configuration



Configuring domains on the TAPI server

This section describes how to configure domains on both a Windows NT and a Microsoft Windows 2000 server. On a Windows NT server, you can configure the server to be either:

- a standalone (member) server
- a PDC if no PDC exists



Note: Consider the processing implications before you configure the TAPI server as a PDC, and verify that CPU utilization on the server, with the logger application in use, does not exceed 50% of capacity.

Configuring a Windows NT server as a standalone server

To configure the TAPI server as a standalone server in a domain perform the following tasks:

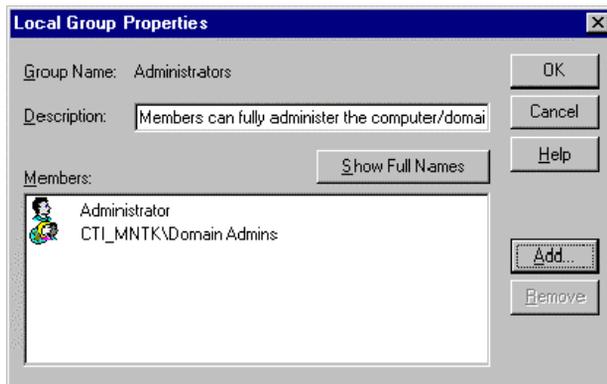
- 1 Ask your network administrator to add the standalone server to the domain.
- 2 Ask your network administrator for a user account on the domain with administrator rights. This account enables your telephony service to run TCMSETUP on your local machine.
- 3 Ask your network administrator to verify that all TAPI users are configured as domain users.
- 4 Log on to your local machine as administrator.



Note: Always log on to your local machine as administrator. Never log on directly to the domain server.

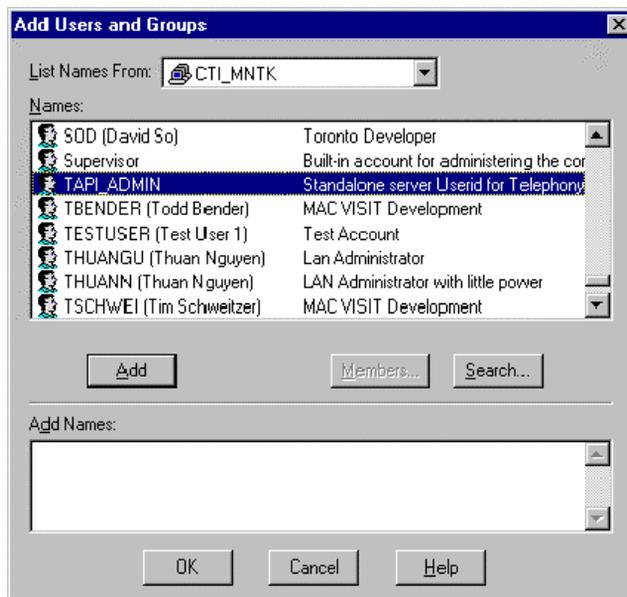
- 5 Select Start > Programs > Administrative Tools > User click Administrators to display the Local Group Properties window. (Figure 19)

Figure 19 Local Group Properties window



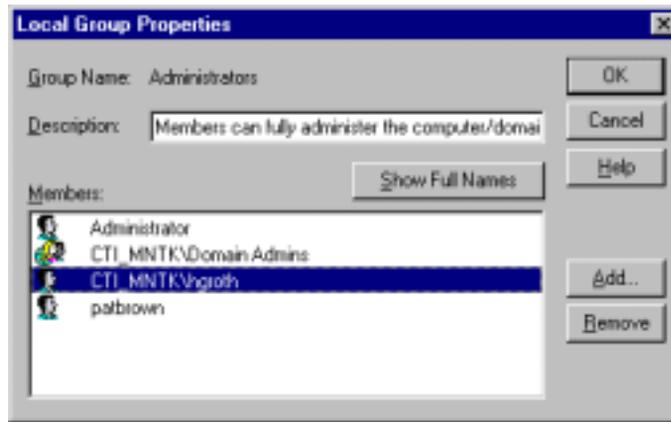
- 6 Highlight your domain user account and click Add to display the Add Users and Groups window. (Figure 20)

Figure 20 Add Users and Groups window



- 7 Locate and highlight your user account for your telephony service and click Add to ensure that your user account now displays on the Local Group Properties window. (Figure 21)

Figure 21 User account in Local Group Properties window



Configuring a Windows NT server as a PDC

To configure the TAPI server as a primary domain controller perform the following tasks:

- 1 Add all users to the server.
- 2 Select Start > Programs > Administrative Tools > User Manager, to display the User Manager window.
- 3 In the User Manager window, add a user to the server with administrators privileges to run telephony services on the server. This user account will be used only with telephony services startup, TCMSetup and optional ACDProxy startup on this server. Nortel Networks recommends that you do not use the administrator account for this purpose.

- 4 To add a client machine to the domain, select Start > Programs > Administrative Tools > Server Manager. Select the Computer tab and then click Add to Domain.



Note: Clients can log on to one domain at a time only. If a client wants to log on to the TAPI domain, the user must first log off from any other domain.

- 5 Enter the name of the client computer exactly as it appears on the client PC.
- 6 Select the appropriate operating system and click Add.
- 7 Repeat steps 4 through 6 for each client you want to add to the domain.

Configuring domains on a Microsoft Windows 2000 server

The active desktop environment on a Microsoft Windows 2000 server provides dynamic domain management. To configure the server as a member of a domain perform the following tasks:

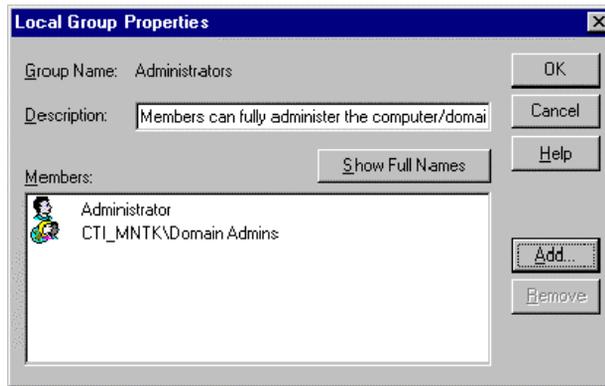
- 1 Ask your network administrator to add the server to the domain.
- 2 Ask your network administrator for a user account on the domain with administrators rights. This account enables your telephony service to run TCMSETUP on your local machine.
- 3 Ask your network administrator verify that all TAPI users are already configured as domain users.
- 4 Log on to your local machine as administrator.



Note: Always log on to your local machine as administrator. Never log on directly to the domain server.

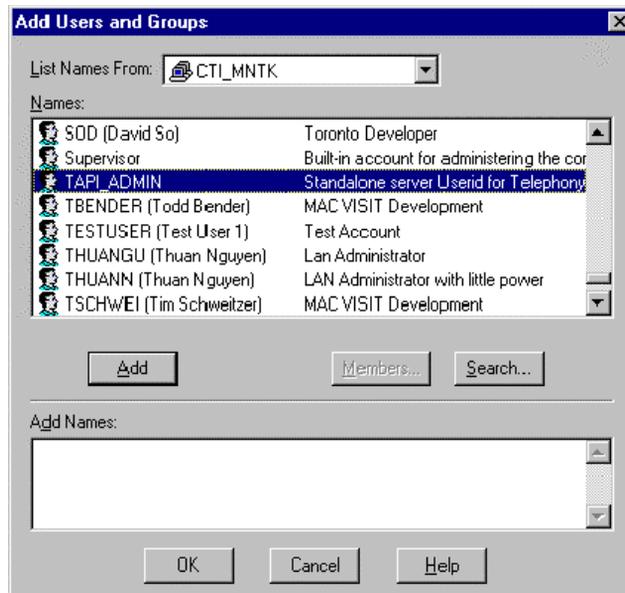
- 5 Select Start > Programs > Administrative Tools > Active Directory > Users and Computers and click Administrators to display the Local Group Properties window. (Figure 22)

Figure 22 Local Group Properties window



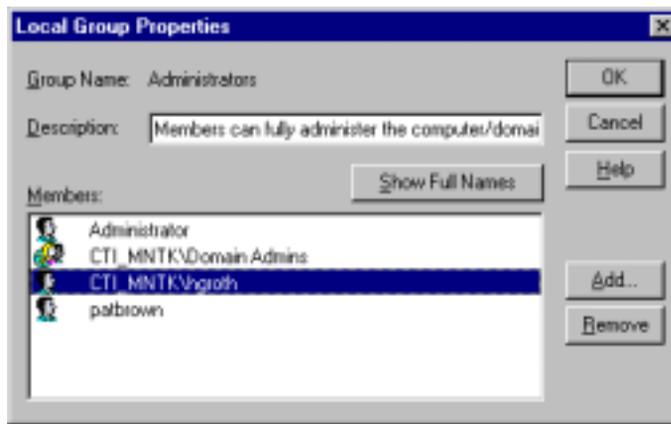
- 6 Highlight your domain user account and click Add to display the Add Users and Groups window. (Figure 23)

Figure 23 Add Users and Groups window



- 7 Locate and highlight your user account for your telephony service and click Add to ensure that your user account now displays on the Local Group Properties window. (Figure 24)

Figure 24 User account in Local Group Properties window



- 8 To add a client machine to the domain, select Start > Programs > Administrative Tools > Server Manager. Select the Computer tab and then click Add to Domain.



Note: Clients can log on to one domain at a time only. If a client wants to log on to the TAPI domain, the user must first log off from any other domain.

- 9 Enter the name of the client computer exactly as it appears on the client.
- 10 Select the appropriate operating system and click Add.
- 11 Repeat steps 8 through 10 for each client you want to add to the domain.

Remote procedure calls and trust relationships

When a remote TAPI client communicates with a TAPI server, two remote procedure calls (RPCs) are required. This requirement often causes problems because network administrators do not usually configure their networks to allow reverse RPC requests which are not necessary for most network services. Telephony services are an exception because they rely on domain-based validation, which requires reverse RPCs.



Note: The behaviour described in this section does not occur in a network where Windows 2000 client machines are validated by a Microsoft Windows 2000 server. A second RPC is not required in such a network configuration.

In a typical TAPI call, the following communication occurs:

- The client sends an RPC request to the TAPI server over a TCP/IP connection.
- The TAPI server verifies the client by communicating with the primary domain controller of the server machine domain.
- If the server machine domain trusts the user domain, the client is validated and the TAPI server looks up what lines the clients has permission to use.
- The TAPI Server sends a second (reverse) RPC request to the primary domain controller for the client machine domain to verify the client.
- If the client machine domain trusts the server user domain, the validation succeeds.

In this example, the following trust relationships are necessary:

- The server machine domain must trust the server user domain.
- The client machine domain must trust the client user domain to enable client users to log in.

Trust relationships are simplified if the server machine domain is the same as the server user domain, or if the user machine domain is the same as the user domain. These groups can be configured as members of just one domain, or they can be configured as four separate domains, depending on network requirements.

Common causes for failure of the second RPC connection include:

- The client machine domain doesn't trust the server user domain. This common failure occurs when the server is in a resource domain that has a one-way trust relationship with the user domain.
- the client machine is not correctly configured to validate using domain accounts
- the client machine is not configured to allow the server user to use network resources

Where there is a resource domain, the simplest configuration is to place the server user account into the client user domain, creating just one user domain which is trusted by both machine domains.

To test whether your the server machine and client machine are correctly configured for RPCs, perform the following tasks:

- 1 On the client machine, log in as the client user.
- 2 In the DOS window, enter the following command:

```
NET VIEW \\ServerMachine
```

If the command succeeds, even if there are no entries in the list, the first RPC connection can be made.

- 3 On the server machine, log in as the server user.
- 4 In the DOS window, enter the following command:

```
NET VIEW \\ClientMachine
```

If the command succeeds, even if there are no entries in the list, the second RPC connection can be made.

If either of the net view commands fails, you have a security problem that must be resolved. During validation TCP/IP must be the only protocol installed on the server machine to ensure that the tests do not use other protocols to succeed accidentally.

Client user issues

The scenarios described above assume that the logged on user is the client user. Problems can occur because the client user is the first application that sends a lineInitialize command to the TAPI server. If a TAPI-based application, such as remote access services (RAS) or Microsoft Fax, is configured to wait for

incoming telephone calls, the application can start before a user logs on to the TAPI server. In this situation the client user is the TAPI application, not the logged on user, and the server denies any line devices to Symposium TAPI services. It is not possible to renegotiate with the server to establish the logged on user as the client user.

The solution is not to install a modem on the client user machine, and not to install modem-based applications. If you encounter such problems, check if telephony services are running immediately after you log on, before starting any TAPI applications. If telephony services are running, identify the application that is causing TAPI to start up too early. It may be possible to change configurations to stop the application starting automatically. However, Nortel Networks recommends that you uninstall the application.

Configuring Microsoft TAPI for Symposium TAPI SP

The information in this section is designed to supplement the TAPI documentation provided by Microsoft. Before you install Microsoft TAPI, consult the Microsoft TAPI readme.txt file. Follow the installation procedures provided in that document.

This section provides guidelines for configuring the following elements of the TAPI environment:

- Assigning lines to users
- Configuring client PCs

Before you begin, verify the following:

- The required operating system and service pack is installed on the server and the server is functioning correctly. Refer to the *Engineering Guidelines for Symposium TAPI Service Provider for Meridian 1*, part number 213345-A for more information.
- The ACDProxy service login and password are set up and are the same as the login and password used by the telephony service.
- The user login and password are set on the server.

The following section describes how to configure the TAPI environment on a Windows NT 4.0 server. Information on configuring the TAPI environment on a Microsoft Windows 2000 server is provided on [page 80](#).

Avoiding basic configuration problems

You can avoid basic configuration problems if you comply with the following guidelines:

- 1 Run TCMSSetup on the server and client machines.
- 2 Use TCMAApp to configure line permissions.
- 3 Verify that TAPIAdmin is a domain account.
- 4 Verify that TAPIClient is a domain account.
- 5 Configure TCP/IP on server and client machines.
- 6 Install service pack 6a or higher on a Windows NT 4.0 server and any Windows NT 4.0 clients.
- 7 Install service pack 2 or higher on a Windows 2000 server.
- 8 Configure file sharing and user level access on Windows 9x clients.
- 9 Set log on validation to log onto Windows domain for Windows 9x clients.

Configuring a Windows NT server for Symposium TAPI SP

When you install Symposium TAPI SP, you must prepare the server for TAPI operations.

Enabling telephony services

To enable telephony services on a Windows NT server, select Start > Run and enter the following command, substituting appropriate values where necessary:

```
tcmsetup.exe /s domain \userid password (
```

where:

s is the server name

domain is the domain of the TAPI server

userid is the user ID for a user with administration privileges for telephony services

password is the password associated with this user ID.

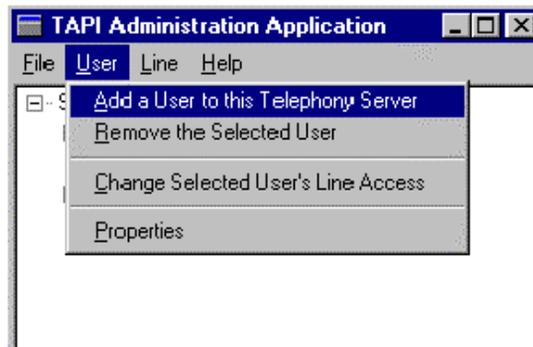
When the telephony services are set up a confirmation window appears.

Assigning lines to clients

To assign lines to TAPI clients, perform the following tasks:

- 1 Select Start > Run and select the TCMApp.exe, located in the c:\Winnt\system32 directory to display the TAPI administration application window. (Figure 25)

Figure 25 Selecting Add a User



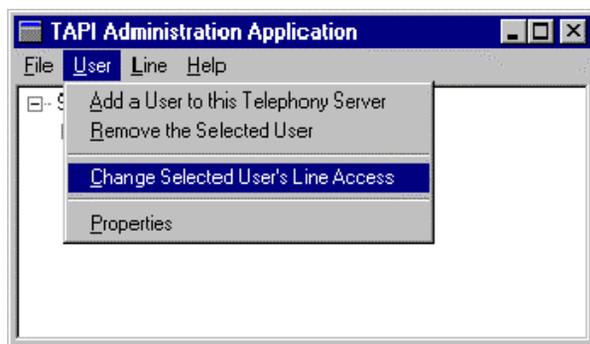
- 2 Select User > Add a User to the Telephony Server to add a client to the server.



Note: The first time you run TCMApp.exe, you must select User > Add a User to the Telephony Server before the following configuration windows can appear.

- 3 Select the client in the main panel of the TAPI administration application window and select User > Change Selected User's Line Access (Figure 26). Highlight the line you want to associate with this user and click OK to save the configuration.

Figure 26 Selecting Changing Selected User's Line Access



- 4 The line you select appears underneath the entry for the client in the main pane of the TAPI administration application window.
- 5 Repeat these procedures to add each client and to assign lines to all of them.
- 6 Exit the application, clicking Yes when prompted to do so to save the information.

Configuring a Microsoft Windows 2000 server for Symposium TAPI

After you install Symposium TAPI SP, you must prepare the server for TAPI operations.

Enabling telephony services

To enable telephony services on a Windows 2000 server perform the following tasks:

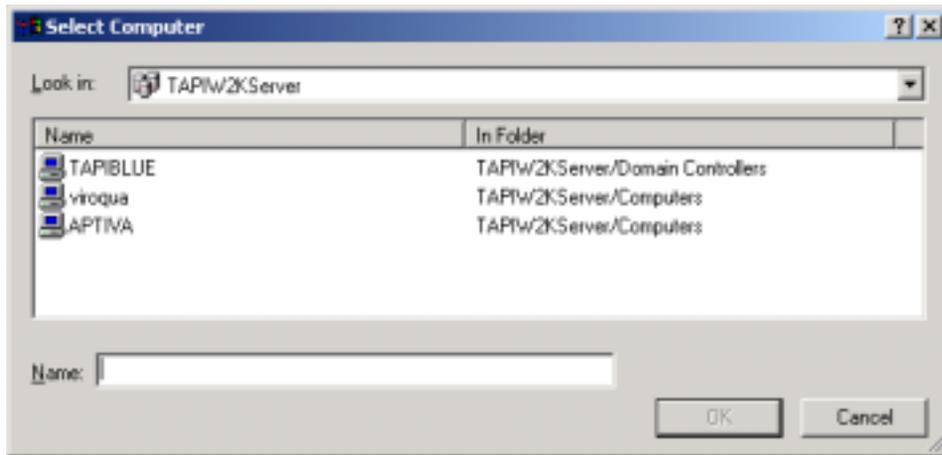
- 1 Select Start > Run and enter the following command:

```
tapi.mgmt.msc (
```

- 2 Before you can enable the telephony server you must start telephony services by selecting Start > Settings > Control Panel > Administrative Tools > Services to display the services administration window. Select Telephony and right-click your mouse to display the properties for telephony services, which provides these options:
 - start
 - stop
 - pause
 - resume
- 3 Select Start.
- 4 Select Start > Programs > Administrative Tools > Computer Management > Services and Applications > Telephony to display the Telephony Services administration window.

- 5 If the server you want to manage does not appear on the server list, select the Action menu > Add Computer to display the Select Computer window.(Figure 27)

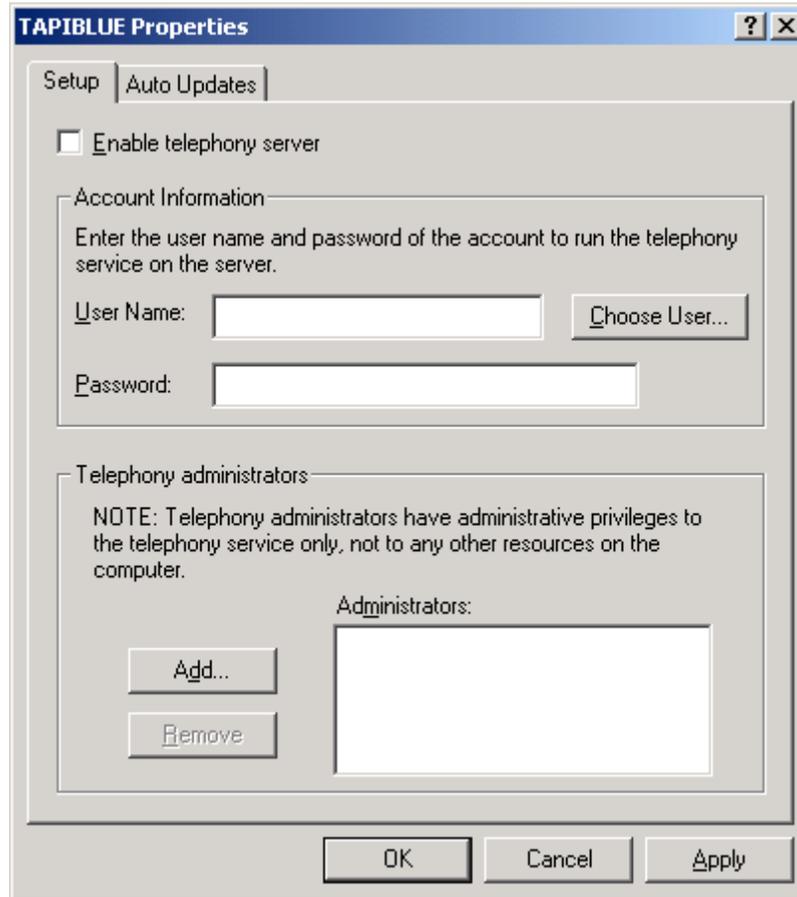
Figure 27 Select Computer window



- 6 In the Look in field, highlight the domain for the server. In the Name field enter the name of the server. The server now appears on the server list in the telephony administration window.

- 7 Select the server you want to manage in the server list and select Action menu > Properties to display the Telephony Server Properties window. (Figure 28)

Figure 28 Telephony Server Properties window



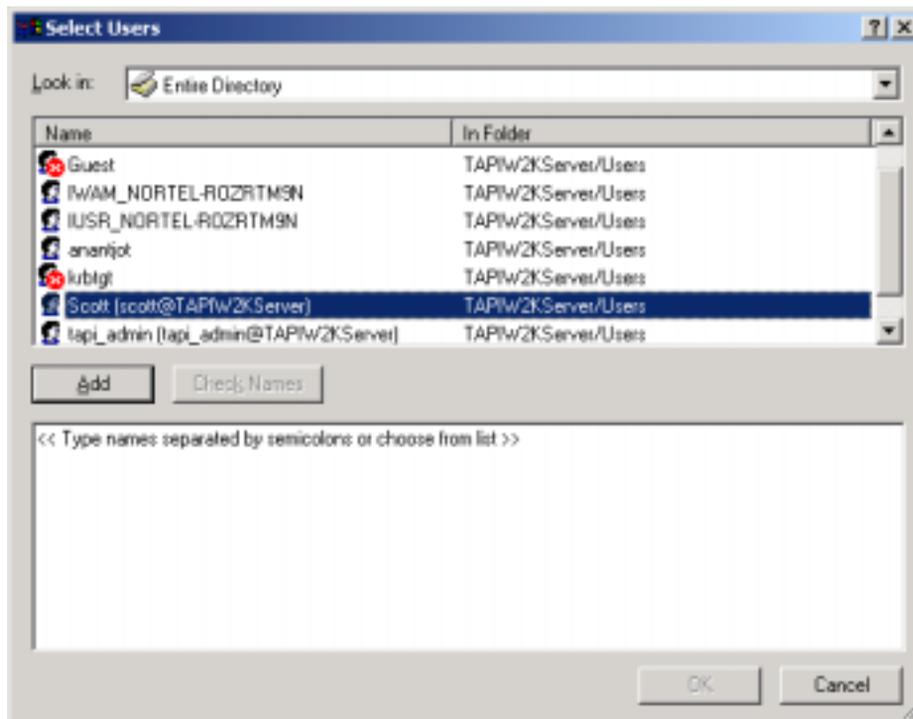
- 8 In the Setup tab select Enable telephony server. If the Enable telephony server option is unavailable, checked that you clicked Start in Step 2 above.
- 9 In Account Information type the user name and password for the account that will run the telephony service on the server.



Note: The account to manage the telephony server must be a member of the administrators group on the server. The account must be also in the same domain as the TAPI server or be in a domain that has a two-way trust relationship with that domain.

- 10 If you want to add a telephony administrator who is not an administrator on the server, click Add to display the Select Users window. (Figure 29)

Figure 29 Select Users window

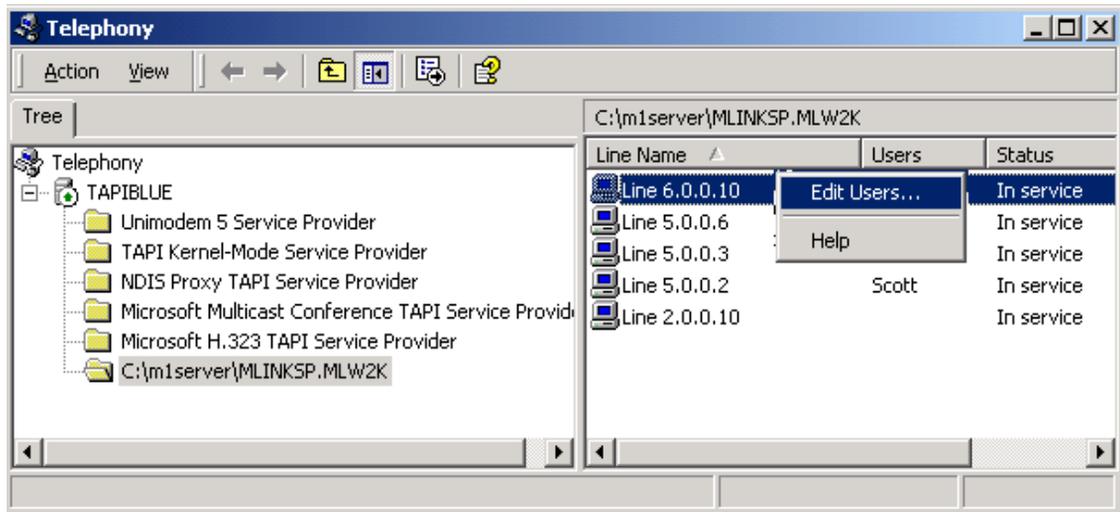


- 11 In the Look in field, select the domain where the user is located. Select the user name from the list of names that is displayed, and click Add. Click OK and this information will appear in the Telephony Server Properties window.
- 12 In the telephony services properties window, click OK to save changes.

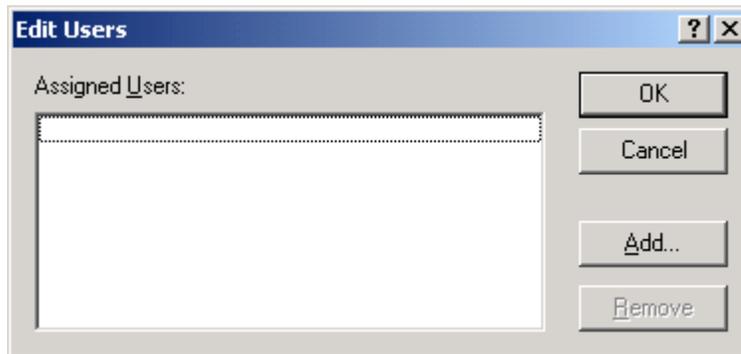
Assigning lines to clients

To assign lines to TAPI clients, perform the following tasks:

- 1 Select Start > Programs > Administrative Tools > Telephony to display the telephony service administration window. (Figure 30)

Figure 30 Telephony Services administration window

- 2 Select the telephony services provider from the list of service providers and select Action menu > Edit Users to display the Edit Users window.(Figure 31)

Figure 31 Edit Users window

- 3 Select Add to display the Select Users window. (Figure 29).
- 4 In the Look in field, select the domain where the user is located. Select the user name from the list of names that is displayed, and click Add. Click OK to save these changes. The users name appears as an assigned user in the Edit Users window.
- 5 Repeat these procedures for each user that you want to add as a TAPI client.

- 6 If you want to remove a user, select the user's name from the list of assigned users in the edit user window and click Remove, and then click OK to save the change.

Configuring TAPI clients

All client PCs must conform to the guidelines provided in the *Engineering Guide to Symposium TAPI Service Provider for Meridian 1*, part number 213345-A. Because client PCs can be logged in to only one domain at a time, remove all PCs you are configuring for TAPI from any prior domains before you configure them for TAPI. If necessary, install Microsoft TAPI, release 2.x or release 3, on the client before specifying the telephony server(s). To do this, select Start > Run and enter `tcmssetup /c server1 server2`, where server1 and server2 represent the server names of the TAPI servers.

Chapter 4

Configuration guidelines

To configure Symposium TAPI Service Provider for Meridian 1, release 2.3.1, use the configuration application provided with the software. The configuration application populates and maintains the Symposium TAPI SP database tables with information about each controllable telephone. In the configuration windows you can add, modify, and delete information in the database tables. If you have multiple customer numbers, you can maintain this information in separate databases.

Use the configuration application to enter information, automatically or manually, into the database tables. In an automatic configuration, information about controllable telephones is downloaded from the Meridian 1 switch. The configuration application then translates this information and enters it into the Symposium TAPI SP database tables. In a manual configuration, instead of downloading information from the Meridian 1 switch, you enter the information manually in the various windows in the configuration application. Manual configuration is time-consuming if you need to control a large number of agents.

After information is entered into the database, you can add, modify, or delete this information in the configuration application. In a direct connect environment, Symposium TAPI SP dynamically updates such changes to the database tables. In a call center environment, changes to the database tables are automatically updated in the DNRelease indication message sent from the SCCS to Symposium TAPI SP. This process updates the database by deleting DNs and TNs. Changes made in the configuration application do not affect the information on the Meridian 1 switch. This chapter provides guidelines for:

- downloading configuration information from the Meridian 1 switch
- using the Symposium TAPI SP configuration application
- configuring an additional customer

Downloading information from the Meridian 1 switch

Before you download information from the Meridian 1 switch, create a switch configuration information text file on the TAPI server:

- 1 In Notepad or a similar text editor application, create a text file.
- 2 Save this text file as download.txt in the c:\m1server directory on the TAPI server.
- 3 Connect to the Meridian 1 switch from the TAPI server in one of the following ways:
 - On a Windows NT server, select Start > Programs > Accessories > Hyperterminal.> HyperTerminal application.
 - On a Microsoft Windows 2000 server, select Start > Programs > Accessories > Communications > HyperTerminal application.
- 4 When the port settings window opens, log on to the switch.
- 5 Select transfers.
- 6 In the HyperTerminal application on a Windows NT server, select the Receive option; on a Microsoft Windows 2000 server, select the Capture Text option.
- 7 Select the download.txt file that you created earlier.



Note: When you log on to the Meridian 1 switch, if transfers does not appear, press the Return key until it is displayed.

- 8 To capture information about all used terminal number blocks (TNB), enter the following commands in overlay 20:

```
> LD 20
REQ: PRT
TYPE: TNB
CUST 0 (or customer number)
~
DES <cr>
```



Note: To download information from the Meridian 1 overlay applications can take a long time.

-
- 9 To capture information about route data blocks (RDB), enter the following commands in overlay 21:

```
> LD 21
REQ: PRT
TYPE: RDB
CUST: 0 (or customer number)
~
ACOD <cr>
```

- 10 To capture information about control directory number (CDN) blocks, enter the following commands in overlay 23:

```
> LD 23
REQ: PRT
TYPE: CDN
CUST: 0 (or customer number)
~
CDN <cr>
```



Note: Download only the CDNs that you require for TAPI operation. If you download other CDNs, you must delete them after the download is complete.

- 11 After you download the information from the overlays, stop the hyperterminal application.
- 12 Close the hyperterminal application to save the information.

Converting the text file

To convert the text file containing switch information, perform the following tasks in the Symposium TAPI SP configuration application:

- 1 Select Start > Programs > Nortel > Nortel Symposium TAPI Service Provider for M1 to start the configuration application (Figure 32).

Figure 32 Configuration application window

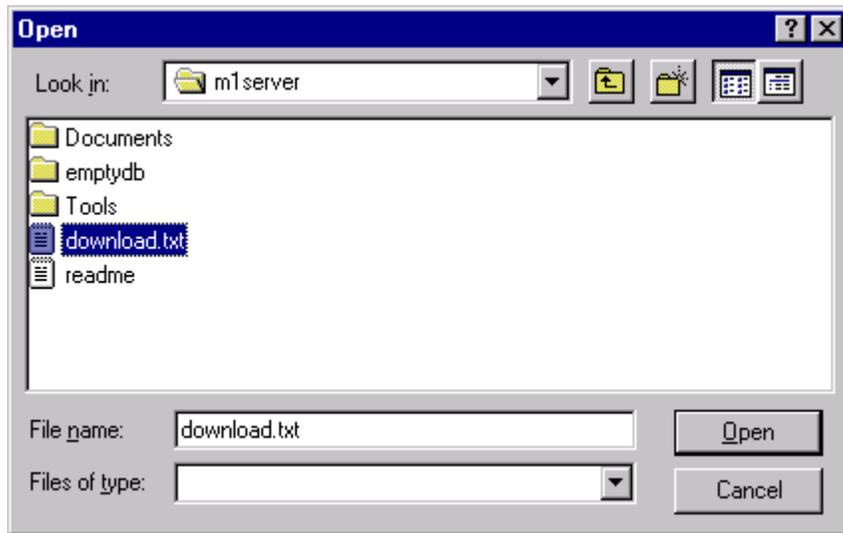
The screenshot shows a Windows-style configuration window titled "Symposium TAPI SP for Meridian 1 Configuration". The window has a menu bar with "Provider", "Meridian 1 Host", "Network TAPI/IVR Server", "Log Styles", "Compliance", and "About". The main area contains several configuration sections:

- Application Name:** A text box containing "Meridian Link SP".
- Timeout in seconds:** A group box containing three text boxes: "Initialization" (32), "Shutdown" (32), and "Command" (5).
- Call Data:** A group box containing two text boxes: "Size" (512) and "Life Span" (10) with "minutes" to its right. Below these is a checkbox labeled "Disable copy of call data to consultative call", which is currently unchecked.
- Convert text file to database fields:** A label next to a "Convert Text file" button.
- Log Style:** A dropdown menu currently showing "1".

At the bottom of the window are three buttons: "OK", "Cancel", and "Apply".

- 2 Click Convert Text file to display the open window. (Figure 33)

Figure 33 Opening the download.txt file



- 3 Select c:\m1server\download.txt. Click Open to display the Text File Translator Status window.(Figure 34)

Figure 34 Text File Translator Status window



- 4 Click Start.

The conversion process adds all information downloaded from the Meridian 1 switch to the Symposium TAPI SP database. Some of this information can be unnecessary or inappropriate. For example, the Meridian 1 switch assumes that IVR ports are analog. These ports must be set on the TN Table window of the configuration application. You must delete CDNs that are downloaded that Symposium TAPI SP does not need to monitor.

Configuring the Symposium TAPI SP database



Note: Nortel Networks recommends that only experienced database administrators configure the Symposium TAPI SP database.

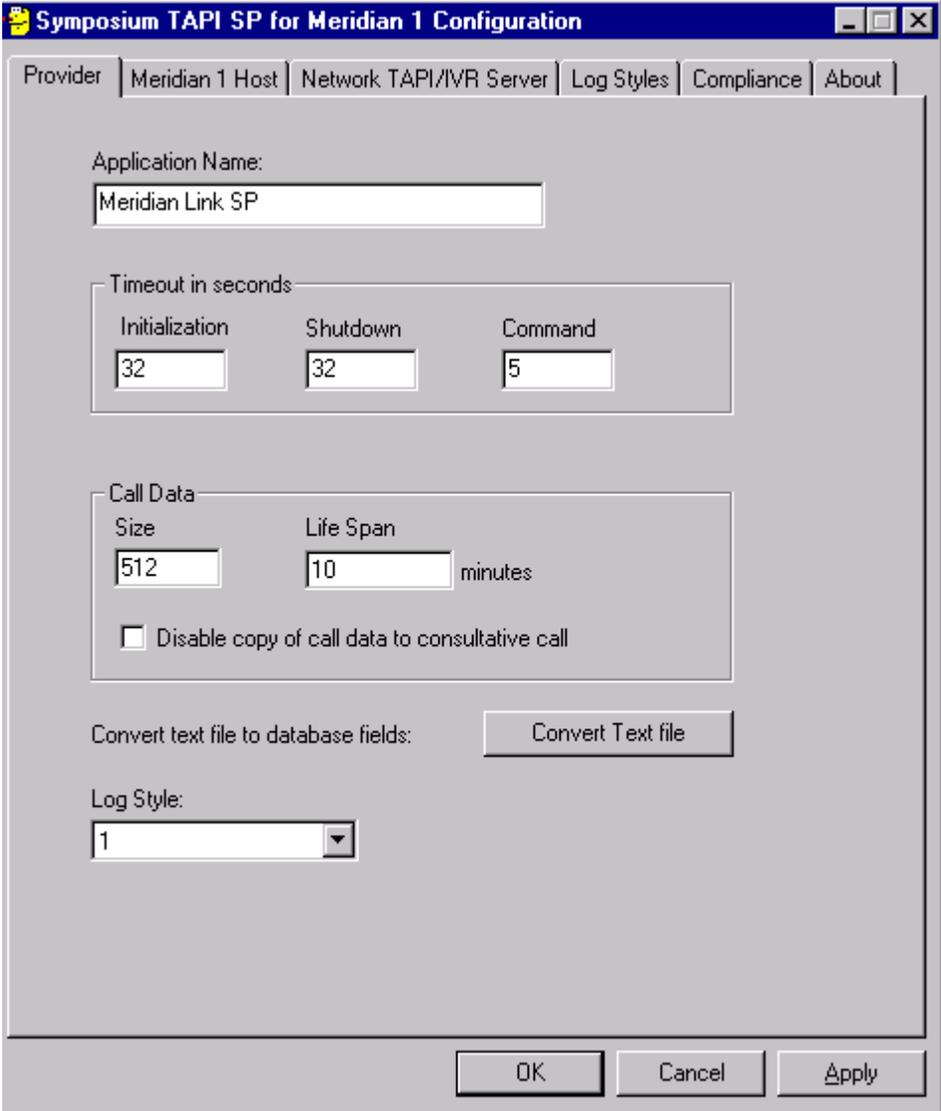
This section describes the Symposium TAPI SP database tables and how to manage them in the Symposium TAPI SP configuration application. Each database table has an associated window in the graphical user interface (GUI) of the configuration application. The database tables are:

- Provider
- Meridian 1 Host
- Network TAPI/IVR Server
- Log Styles
- Compliance

Configuring the provider table

In the provider table configuration window you can add, modify, or delete information about the application that is registered currently with Meridian Link Services. (Figure 35)

Figure 35 Provider Table window



The screenshot shows a Windows-style dialog box titled "Symposium TAPI SP for Meridian 1 Configuration". The "Provider" tab is selected, with other tabs including "Meridian 1 Host", "Network TAPI/IVR Server", "Log Styles", "Compliance", and "About".

Fields and controls visible in the "Provider" tab:

- Application Name:** A text box containing "Meridian Link SP".
- Timeout in seconds:** A group box containing three text boxes: "Initialization" (32), "Shutdown" (32), and "Command" (5).
- Call Data:** A group box containing two text boxes: "Size" (512) and "Life Span" (10) minutes. Below these is a checkbox labeled "Disable copy of call data to consultative call", which is currently unchecked.
- Convert text file to database fields:** A button labeled "Convert Text file".
- Log Style:** A dropdown menu currently showing "1".

At the bottom of the dialog are three buttons: "OK", "Cancel", and "Apply".

You can perform the following configurations in the Provider Table window:

- Application name. A string of up to 19 ASCII characters that identifies the provider application. If you enter more than 19 characters Meridian Link Services does not operate.
- Timeout values. You can configure timeout values for the following events. The default values are sufficient for 50 users but you must increase these values if you are adding more than 50 users
 - Initialization — the length of time that Symposium TAPI SP waits to establish communication with the switch before generating an error. The default and minimum value is 32 seconds.
 - Shutdown — the length of time that Symposium TAPI SP waits for shutdown to be completed before generating an error. The default value and minimum value is 32 seconds.
 - Command — the length of time that Symposium TAPI SP waits for a command response before generating an error. The default and minimum value is five seconds.
- Call data size. Enter the number of bytes that can be stored as call data. The default size is 512 bytes but Nortel Networks recommends that you change this size to reflect actual requirements to minimize the amount of network load allocated to call data traffic.
- Call data life span. Enter the length of time that call data will be stored.
- Disable copy of call data to consultative call. A new feature available with Symposium TAPI Service Provider for Meridian 1, release 2.3.1, which allows you to disable copying call data when calls are transferred or conferenced.
- Log style. Select the number of log style to use for troubleshooting purposes. The default style is 1 and you can create new log styles in the Log Styles window.

Configuring the Meridian 1 Host table

In the Meridian 1 Host window of the configuration application you can add, modify, or delete host/machine/association information contained in the Meridian 1 Host database. (Figure 36)

Figure 36 Meridian 1 Host window

Symposium TAPI SP for Meridian 1 Configuration

Provider Meridian 1 Host Network TAPI/IVR Server Log Styles Compliance About

Host

Host Name:

Host Address:

Meridian Link Release:

Machine

Machine Name: Host Port:

Meridian 1 Release: Phantom DN:

Association

Customer Number: Monitor All DN's

Registration Password: Monitor No DN's

Polling Interval:

Services

Inbound Call Processing Enhanced Routing

Outbound Call Processing

Log Style:

Trunk Table Treatment Table TN Table Control DN

OK Cancel Apply

In the Meridian 1 Host window you can perform the following configurations:

- Host name. Nortel Networks recommends that you do not change the default setting. The host name is case-sensitive, containing a maximum of 20 characters that represent the host name.
- Host address. Enter the IP address of the host for Meridian Link Services. In a call center, the host address is the IP address of the SCCS. In a direct connect environment, the host address is the IP address of the E-LAN port on the Meridian 1 switch.
- Meridian Link release. Select the correct release number of Meridian Link Services.
- Machine name. Enter a string of a maximum of 20 ASCII characters that identifies the Meridian 1 switch associated with the registered application.
- Meridian 1 release — select the correct release number of the Meridian 1 application.
- Host port. This port number must match the one configured in the Meridian Link Services. In an SCCS configuration accept the default. For a direct connect configuration, change the entry to 8888.
- Phantom DN. A reserve DN configured on the switch for the following call features:
 - Hold
 - Transfer
 - Redirect
 - Conference
- Customer number. If multiple customers are configured you can specify a particular one in this field.
- Registration password . You can use this optional field if you require an association with a specific registration. You can enter a character string of four to sixteen characters.

- Polling interval. The default value is 0, and valid values are 0 through 100. The value determines the frequency with which Meridian Link Services polls the link between the SCCS and Symposium TAPI SP. In a call center environment, you must set a link value greater than 0 to ensure link detection between Meridian Link Services and Symposium TAPI SP. If you set a link value of 1, the link is polled every 10 seconds.



Caution: In a call center environment, you must change the default polling interval value of 0 to at least 1 to ensure that link loss is detected between Meridian Link Services and Symposium TAPI SP.

- Monitor all DNs/no DNs. Select the appropriate checkbox. The default is to monitor all DNs.
- Services. Select the required services.

You can access four Meridian 1 Host table submenus by clicking on the buttons at the bottom of this window.

Configuring the trunk table

Symposium TAPI SP uses information in the trunk table to monitor outbound trunk routing. Before you can monitor a trunk, verify that:

- the trunk is configured as an associated set (AST) on the switch
- the IAPG is configured to select the appropriate events (1 = all events)
- the trunk is configured for monitoring on the TAPI server



Note: The status of a monitored trunk is detected only if answer and disconnect supervision are enabled for the trunk. On a digital trunk interface, answer supervision and disconnect supervision is enabled by default. For a universal trunk card, in overlay 14, set the SUPN prompt to yes to enable answer supervision and disconnect supervision.

To configure the trunk table click on Trunk Table in the Meridian 1 Host configuration window. In the Trunk Table window you can perform the following configurations:

- Add a route number record. Enter the number of a route you want to monitor.

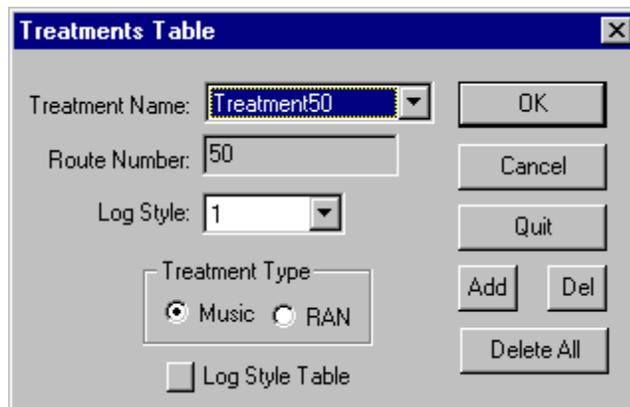
- Delete a route number record. Delete the number of a route that you no longer want to monitor.
- Add a range of route numbers. Add a range of route numbers to monitor.
- Delete all route numbers. Delete all route numbers to prevent the monitoring of outbound trunks.

Configuring the treatments table

The treatments database table is used by the routing application. You can add new treatments in the Treatments Table window in the configuration application. If you make changes in the Treatments Table window they apply only to the information contained in the Symposium TAPI SP database and do not affect the configuration of the Meridian 1 switch.

To access the Treatments Table window click on Treatments Table in the Meridian 1 Host configuration window. (Figure 37)

Figure 37 Treatments Table window



In the Treatments Table window you can perform the following configurations:

- Treatment name. Type a maximum of 32 characters that identifies this treatment (user-defined).
- Route number. Type a number between 1 through 511 that identifies the route number for this treatment.
- Log style. Select the log style for this treatment. To create a new log style for this treatment click Log Style Table to display the log style table window.

- Treatment type. Select Music to play music or select RAN to play a recorded announcement.
- Add. Create a new treatment.
- Delete/delete all. Delete a treatment/delete all treatments.

To add a new treatment:

- 1** Click Add Treatment to display the add new treatment window.
- 2** Type a new treatment number and click OK.
- 3** In the main Treatments Table window select a route number, log style, and treatment type.
- 4** Click OK to save the new treatment to the treatments table in Symposium TAPI SP.

To modify a treatment:

- 1** Scroll through the treatment numbers in the treatment number field and highlight the treatment number you want to modify.
- 2** When this treatment number appears in the treatment number field, make required changes in any or all of the following fields:
 - route number
 - log style
 - treatment type
- 3** Click OK to save the modified information to the treatments table in Symposium TAPI SP.

To delete a treatment:

- 1** Scroll through the treatment numbers in the treatment number field and highlight the treatment number that you want to delete.
- 2** When this treatment number appears in the treatment number field, click delete.
- 3** Click OK to save this information to the treatments table in Symposium TAPI SP.

- To delete all treatments, click Delete All. Click OK to save this information to the treatments table in Symposium TAPI SP.

Configuring the TN table

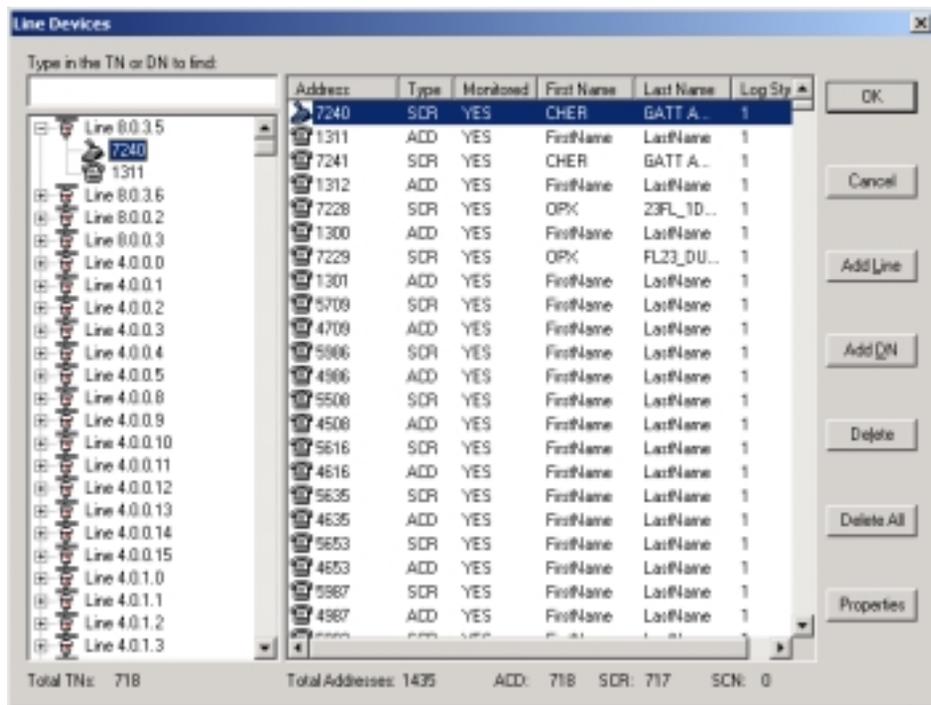
The TN table contains the terminal number (TN) and directory number (DN) configurations on the Meridian 1 switch. Each line configured on the switch has a terminal number (TN). You can associate a maximum of two directory numbers (DNs) with each TN.

Adding a new TN

To add a new TN to the TN table:

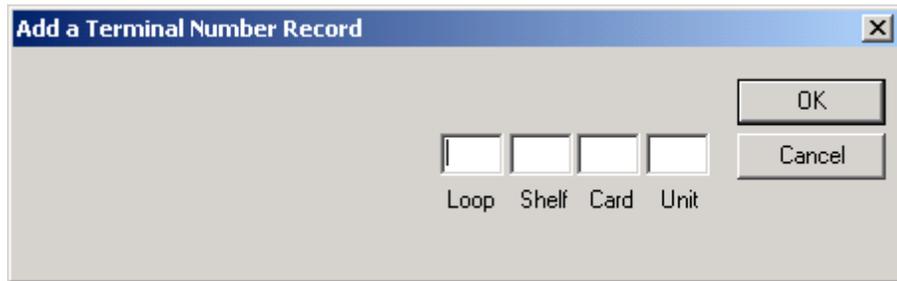
- In the Meridian 1 Host configuration window click TN Table to display the Line Devices window. (Figure 38)

Figure 38 Line Devices window



- 2 Click Add Line to display the Add a Terminal Number Record window. (Figure 39)

Figure 39 Add a Terminal Number Record window



- 3 Type the loop, shelf, card, and unit numbers that identify the physical location on the Meridian 1 switch of the TN you are adding.
- 4 Click OK to save the new TN to the TN table.
- 5 Perform the procedures described below to modify the information for this TN.

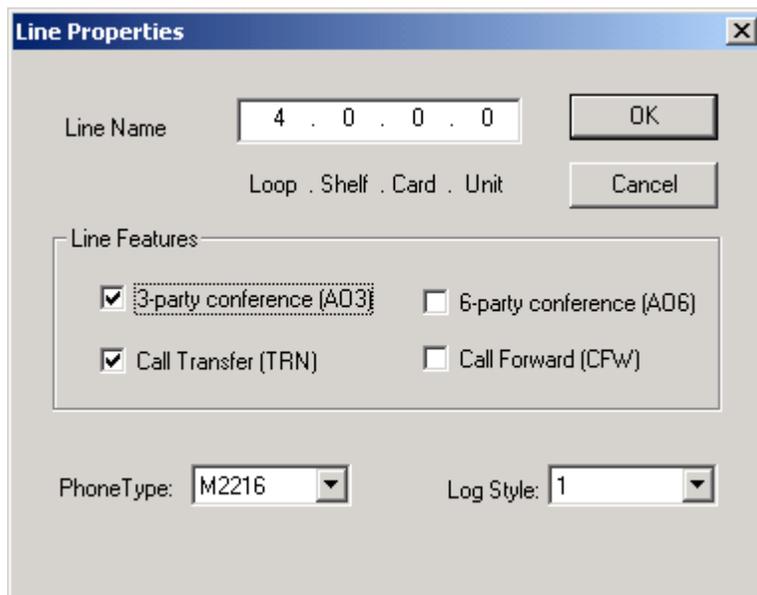
Modifying a TN

To modify the information associated with a TN:

- 1 Click TN Table in the Meridian 1 Host configuration window to display the Line Devices window. (Figure 38)
- 2 Select the line you want to configure from the panel on the left side of the window. If you do not know the line number for the TN, enter the TN number in the field at the top left of the Line Devices window to search for the associated line number.

- 3 After you select the appropriate line, click Properties to display the Line Properties window. (Figure 40)

Figure 40 Line PAdd a Terminal Number Record windowproperties window



The image shows a 'Line Properties' dialog box with the following fields and options:

- Line Name:** A text field containing '4 . 0 . 0 . 0'.
- Loop . Shelf . Card . Unit:** A text field for additional line identification.
- Line Features:** A section containing four checkboxes:
 - 3-party conference (A03)
 - 6-party conference (A06)
 - Call Transfer (TRN)
 - Call Forward (CFW)
- PhoneType:** A dropdown menu currently set to 'M2216'.
- Log Style:** A dropdown menu currently set to '1'.
- Buttons:** 'OK' and 'Cancel' buttons are located on the right side.

- 4 Select the line features, phone type, and log style that you want to configure for this TN.
- 5 Click OK to save this information to the TN table.

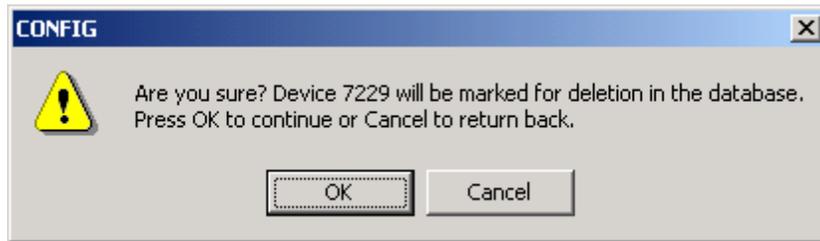
Deleting a TN/all TNs

To delete a line from the TN table:

- 1 In the Line Devices window, select the line you want to delete in the panel on the left side of the window.
- 2 Click the Del button to delete this line from the TN table.

- 3 In the warning message window that is displayed (Figure 41), click OK to delete the line from the TN table.

Figure 41 Warning message



- 4 To delete all TNs from the TN table, in the Line Devices window, click Delete All. Click OK in the warning message window that is displayed.

Adding a DN

You can associate a maximum of two DNs with each line in the TN table. When you add, modify, or delete information in the DN table, the TN table reflects the changes. To add a new DN:

- 1 In the Line Devices window, in the panel on the left side of the window, select the line number to which you want to add a DN.
- 2 Click Add DN on the right side of the window to display the add a directory number record window.
- 3 Type the directory number and select the DN type. Click OK to save this information to the DN table and the TN table.
- 4 Modify the information associated with this DN.

Modifying a DN

To modify a DN:

- 1 In the Line Devices window, locate the line number that you want to configure in the left panel of the window.
- 2 Expand the information under this line number to display its associated DN or DNs.

- 3 Select the DN that you want to modify. Click Properties to display the DN Properties window. (Figure 42)

Figure 42 DN Properties window

The image shows a dialog box titled "DN Properties". It has a blue title bar with a close button. The main area is light gray and contains the following elements:

- Directory:** A text box containing "1234".
- DN Type:** A dropdown menu with "SCR" selected.
- Key #:** A text box containing "0".
- Log Style:** A dropdown menu with "1" selected.
- DN Monitored:** A checked checkbox.
- Display Name:** A group box containing two text boxes: "First" with "FirstName" and "Last" with "LastName".
- Buttons:** "OK" and "Cancel" buttons on the right side.

- 4 Type information in fields as required. Click OK to save these changes to the DN table and the TN table.

Deleting a DN

To delete a DN from the DN table and the TN table:

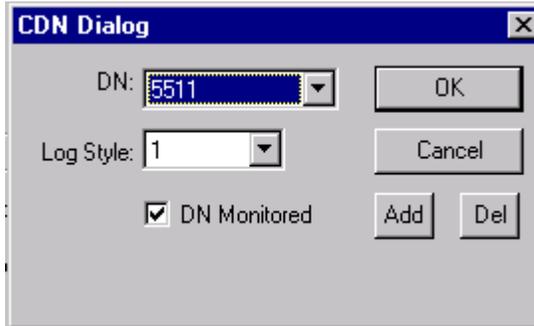
- 1 In the Line Devices window, select the DN you want to delete.
- 2 Click the Del button.
- 3 Click OK in the warning window that is displayed to save the information to the DN table and the TN table.

Configuring the CDN table

Information in the control directory number (CDN) table is used for host enhanced routing.

To access the CDN window shown in [Figure 43](#), click CDN Table in the Meridian 1 Host configuration window:

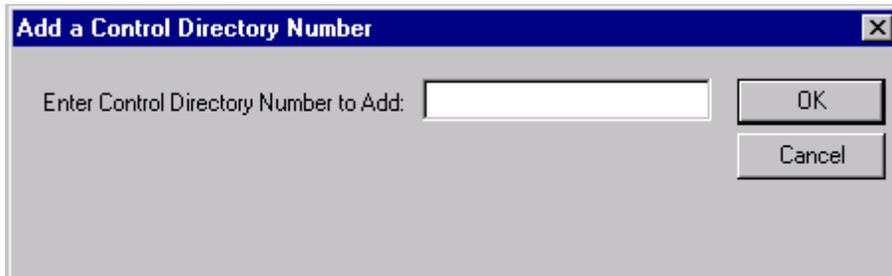
Figure 43 CDN window



To add a new CDN:

- 1 In the CDN window, click Add to display the Add a Control Directory Number window. ([Figure 44](#))

Figure 44 Add a Control Directory Number window



- 2 Type the CDN you wish to add. Click OK to save the information to the CDN table.

To modify a CDN:

- 1 In the CDN window scroll the entries in the DN field. Select the DN you wish to modify.
- 2 Select the desired log style or click Log Style Table if you want to create a new log style for this DN.

- 3 Click OK to save this information to the CDN table.

To delete a CDN:

- 1 In the CDN window scroll the entries in the DN field. Select the DN you wish to delete.
- 2 Click Delete.
- 3 Click OK to save these changes to the CDN table.

Configuring the network TAPI/IVR table

The IVR driver on Symposium TAPI SP uses information in the IVR host table database for the following:

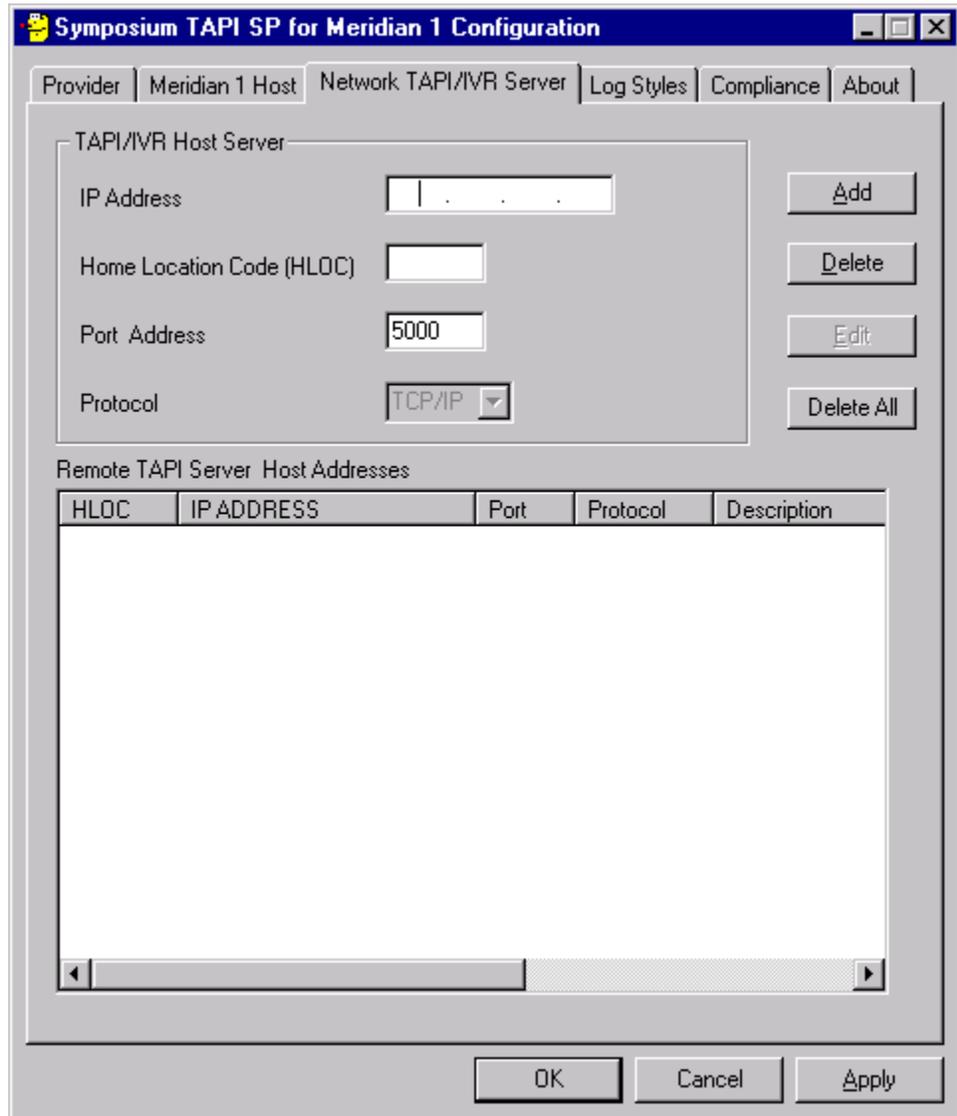
- to open a listening IVR port that the IVR application uses to register with the IVR driver on the TAPI server
- to keep this link open between Symposium TAPI SP and the IVR system, so that the IVR system can send call data to the TAPI server

In a networked environment, the IVR driver uses information stored in the remote host address table to request call data for inbound calls overflowed from a remote Meridian 1 switch.

Refer to [Chapter 6, “Networked TAPI/IVR,” on page 129](#) for information about networking and IVR features for Symposium TAPI SP.

To configure IVR for Symposium TAPI SP, click the Network TAPI/IVR Server tab in the main window of the configuration application. (Figure 45)

Figure 45 Network TAPI/IVR server window



In the network TAPI/IVR configuration window you can configure the following elements:

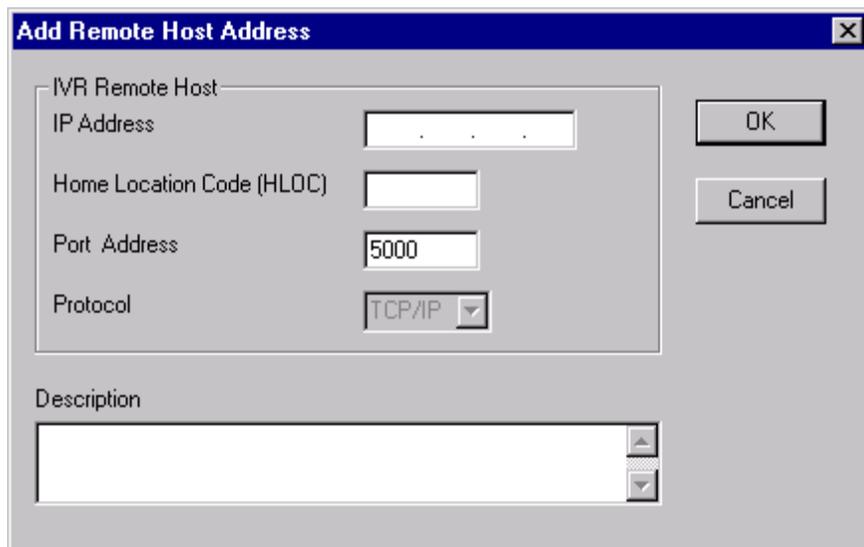
- IP address of the IVR server.
- Home location code (HLOC) of the Meridian 1 switch for the IVR system, which is the same as the HLOC printed on the switch, in overlay 21.
- Port address. The default port value for the IVR port is 5000 but you can change this if you discover port conflicts.
- Protocol. TCP/IP is the required protocol.
- Remote TAPI server host addresses. To attach call data to calls during an ACD transfer or a NACD overflow, you must specify a remote host address for each TAPI server in the network.

Adding an IVR remote host address

To add an IVR remote host address:

- 1 In the Network TAPI/IVR Server window, click Add to display the Add Remote Host Address window. (Figure 46)

Figure 46 Add Remote Host Address window



The screenshot shows a dialog box titled "Add Remote Host Address". It contains the following fields and controls:

- IVR Remote Host** (label)
- IP Address** (text input field)
- Home Location Code (HLOC)** (text input field)
- Port Address** (text input field containing "5000")
- Protocol** (dropdown menu showing "TCP/IP")
- OK** button
- Cancel** button
- Description** (label)
- A large empty text area with scroll bars for the description.

- 2 Type the following in the appropriate fields:

- the IP address of the remote TAPI server
 - the HLOC for the Meridian 1 switch associated with the remote TAPI server
 - the port address for the remote IVR driver
 - the protocol for the remote IVR driver
- 3 Click OK to return to the Network TAPI/IVR Server window.
 - 4 Click OK in this window to add the remote host address to the database.

Modifying an IVR remote host address

To modify an IVR remote host address:

- 1 In the Network TAPI/IVR Server window, select the entry you want to modify in the list of remote host addresses.
- 2 Click Edit to display the Edit Remote Host Address window. (Figure 47)

Figure 47 Edit Remote Host Address window

The screenshot shows a dialog box titled "Edit Remote Host Address". It contains the following fields and controls:

- IP Address:** A text box containing "47.106.100.21".
- Home Location Code (HLOC):** A text box containing "559".
- Port Address:** A text box containing "5000".
- Protocol:** A dropdown menu currently set to "TCP/IP".
- Description:** A text area containing "Our Option 11 TAPI Server".
- Buttons:** "OK" and "Cancel" buttons are located on the right side of the dialog.

- 3 Modify the values that you want to change. Click OK to return to the Network TAPI/IVR Server window.
- 4 Click OK in this window to save the modified information to the database.

Deleting an IVR remote host address

To delete an IVR remote host address:

- 1 In the Network TAPI/IVR Server window, click the entry you want to delete in the list of remote host addresses.
- 2 Click Del to delete the entry from the remote host address list.
- 3 Click OK to delete the remote host address from the database.

Deleting all IVR remote host addresses

To delete all IVR remote host addresses:

- 1 In the Network TAPI/IVR Server window, click Delete All.
- 2 Click OK to save the changes to the database.

Configuring SAP compliance

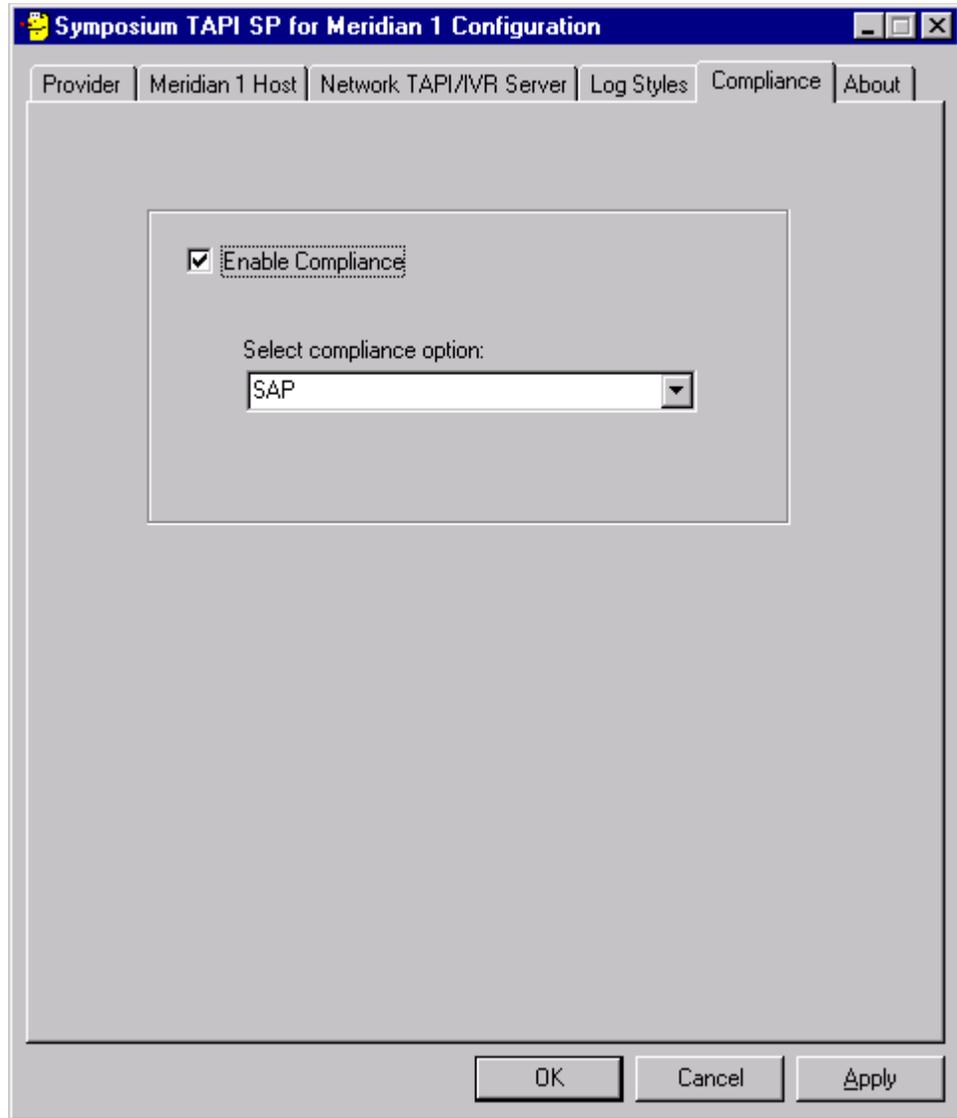
Symposium TAPI Service Provider, release 2.3.1, supports mySAP and SAPphone. To enable SAP compliance on the TAPI server, click the Compliance tab on the main window of the configuration application. (Figure 48)

Figure 48 Compliance window



Click in the check box to enable SAP compliance. (Figure 49)

Figure 49 Enabling SAP compliance



SAP compliance is currently the only feature that you can enable in the compliance window.

Configuring the log styles table

The log styles table provides information for the logger troubleshooting application. Each item in the Symposium TAPI SP database is assigned a log style. You cannot modify or remove two default log styles. These default settings are 0, which logs no items, and 1, which logs all items. For troubleshooting purposes, you may need to create additional log styles to trace specific data items.

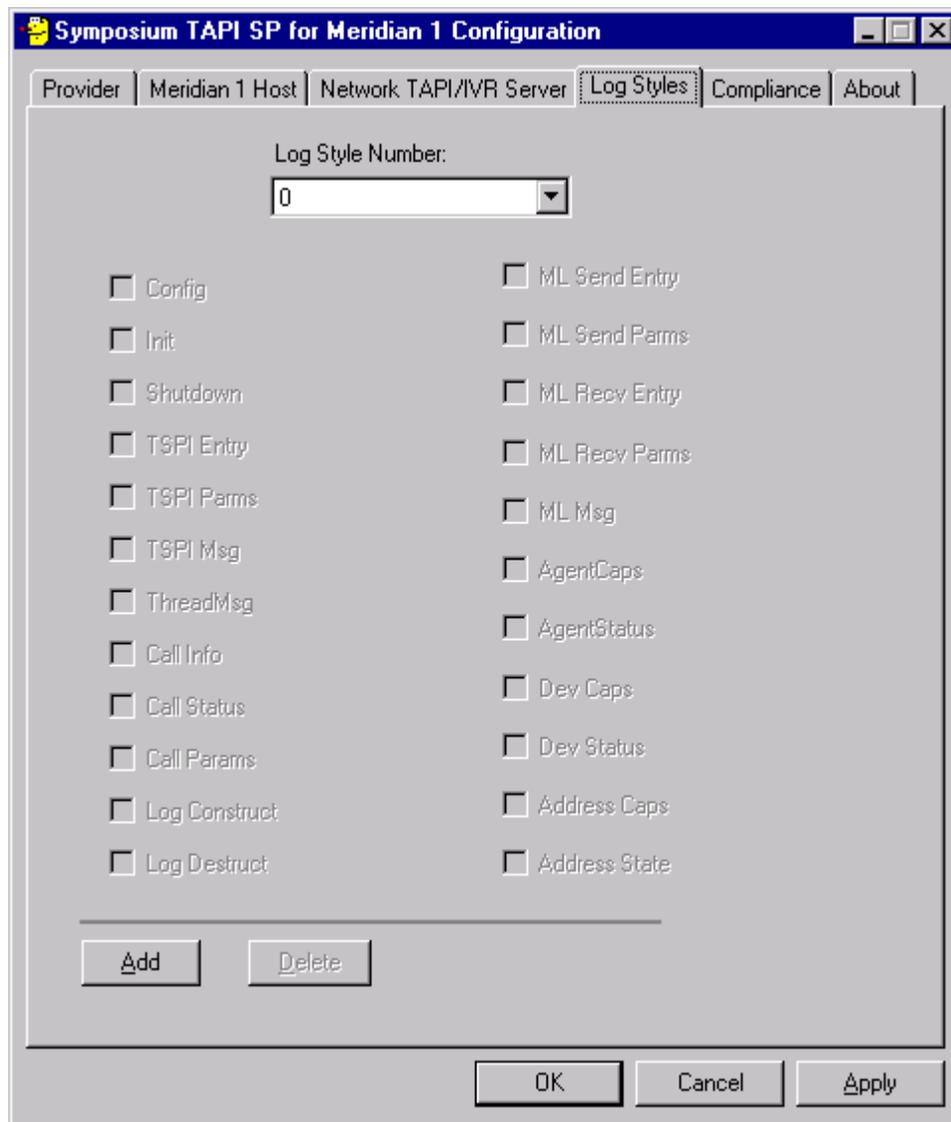
Log styles are numbered consecutively. Numbers 0 and 1 are default styles. The first log style you create is number “2”. Continue to number the log styles in sequence. If you delete a log style, all subsequent log style numbers are reduced by one, and the configuration application dynamically updates all Symposium TAPI SP database tables to reflect the change in log style numbers.

Adding a log style

To add a new log style to the log style table:

- 1 Click the Log Styles tab in the main window of the configuration application to display the log styles window. (Figure 50)

Figure 50 Log styles window





Note: You can view the log styles window from several configuration windows. However, if you wish to add or delete log styles you must access the log styles window by clicking the Log Styles tab in the main window of the configuration application.

- 2 Click Add. The number in the Log Style Number field increases to the next consecutive number.
- 3 Click OK to save the new log style number to the log style table and return to the main window of the configuration application.
- 4 Click the Log Styles tab to display the log styles window again.
- 5 Click the check boxes next to the data items you want the logger application to log and display.
- 6 Click OK to save the changes and return to the main window of the configuration application.

The new log style is now available in all configuration windows.

Editing a log style



Note: You cannot edit or delete log styles 0 and 1, which are the default log styles.

To edit a log style:

- 1 In the log style window, select the log style you want to edit in the Log Style Number field.
- 2 Click the check boxes next to the data items you want to include, or deselect check boxes next to the data items you want to remove.
- 3 Click OK to save the changes and return to the main window of the configuration application.

Deleting a log style

To delete a log style:

- 1 In the log style window, select the log style you want to delete in the Log Style Number field.
- 2 Click Delete.
- 3 Click OK to save the changes and return to the main window of the configuration application.

The configuration of Symposium TAPI SP is now complete. Repeat the procedures if multiple customers are configured on the Meridian 1 switch. If only one customer is configured on the switch, exit the configuration application by clicking Quit.

Configuring an additional database

If you have multiple customer numbers (0 and 1), you can create separate Symposium TAPI SP databases for each customer. When you download information from the Meridian 1 switch for the first database, for customer 0, this information is saved by default in the c:\m1server directory as m1spdb.mbd. To create a new customer database, you must define a different name for the file, or store it in a different directory. To perform an automatic configuration, ensure that the correct customer number is specified in Meridian 1 overlays. For information, refer to [“Downloading information from the Meridian 1 switch”](#) on page 88.

If you create an additional database, ensure the correct database file is loaded before accessing the Symposium TAPI SP configuration application to perform additional configurations. You cannot switch databases when the configuration application is running. To switch to another customer database, you must close the configuration application, reload the correct database file, and restart the configuration application.

Chapter 5

Upgrading Symposium TAPI SP

This chapter describes how to perform the following upgrades to Symposium TAPI SP:

- upgrade software from an earlier release to Symposium TAPI Service Provider for Meridian 1, release 2.3.1
- upgrade your TAPI system to add clients or features or to change the TAPI environment

Upgrading Symposium TAPI SP software

When you upgrade from an earlier release of Symposium TAPI SP software you can install a PEP or perform a full reinstall. You can download the PEP from the Nortel Networks Website. A copy is also supplied on the Symposium TAPI SP, release 2.3.1 software CD. If you avail of the free upgrade option available to Symposium TAPI SP, release 2.3 customers, you can access the PEP only from the Nortel Networks Website.



Note: Nortel Networks recommends that you make a backup copy of your m1spdb.mdb file and store it in a safe location any time you perform an upgrade to Symposium TAPI SP. Repeat the backup procedure after you complete the upgrade.

Installing a product enhancement package

Before you install the PEP file shut down Symposium TAPI SP and switch off telephony services and ACD proxy services:

- On a Windows NT 4.0 server, select Start > Settings > Control Panels > Services. In the Services Administration window, select Telephony, right click the mouse, and click Stop. This procedure also stops ACD proxy services. Verify that both services are stopped before you proceed.
- On a Microsoft Windows 2000 server, select Start > Settings > Control Panels > Administrative Tools > Services. In the Services Administration window, select Telephony, right click the mouse, and click Stop. This procedure also stops ACD proxy services. Verify that both services are stopped before you proceed.

To install the PEP file, perform the following tasks:

- 1 Start the ML2.3.1pep.exe application.
- 2 Specify the location where the extracted files will be placed. In the location field enter the pathname, such as C:\mlserver, where Symposium TAPI SP is installed, or click Browse, and navigate to the folder.



Note: The default location for Symposium TAPI SP, release 2.2 and 2.3 is C:\mlserver. The default location for Symposium TAPI SP, release 2.1 is C:\\WINNT\\system32 on a Windows NT server.

- 3 When you are asked if the file should be overwritten, click Yes To All.
- 4 When the installation is complete, restart the server.

To verify that the installation is successful, start the configuration application for Symposium TAPI SP, and click the About tab to view information about the software. Alternatively, start the logger application and then start Symposium TAPI SP. The current release of the software is listed in the header information in the logger window.

Performing a full reinstall

To perform a full reinstall, you must uninstall the earlier release of the software from the server before you install the new release.

Removing an earlier release from a Windows NT 4.0 server

To remove Symposium TAPI SP from a Windows NT server, perform the following tasks

- 1 Log on to the server.
- 2 Select Start > Settings > Control Panel > Services to display the Services Administration window.
- 3 In the Services Administration window select telephony services, right click the mouse and select stop. This procedure also stops ACDProxy services
- 4 Select Start > Programs > Nortel > Nortel Networks Symposium TAPI Service Provider for M1 > FlexLM License Manager. Select File > Exit to stop the license manager.
- 5 Verify that all TAPI applications on the server, including TCMAApp, are stopped. For information about services that may be dependent on Microsoft TAPI refer to the Microsoft Website at <http://www.microsoft.com>.
- 6 Make a copy of the m1spdb.mdb file, which is usually located in the C:/M1server directory, and store it in a safe place. This procedure ensures that you have a backup copy of the Symposium TAPI SP database in the event of a system crash or other failure during the upgrade process.
- 7 Select Start > Settings > Control Panel > Add/Remove Programs > Symposium TAPI Service Provider > Remove.
- 8 Restart the server to save these changes.

Removing an earlier release from a Microsoft Windows 2000 server

To remove Symposium TAPI SP from a Microsoft Windows 2000 server:

- 1 Log on to the server.
- 2 Select Start > Settings > Control Panel > Administrative Tools > Services to display the Services Administration window.
- 3 In the Services Administration window select telephony services, right click the mouse and select stop. This procedure also stops ACDProxy services

- 4 Select Start > Programs > Nortel > Nortel Networks Symposium TAPI Service Provider for M1 > FlexLM License Manager. Select File > Exit to stop the license manager.
- 5 Verify that all TAPI applications on the server, including TCMApp, are stopped. For information about services that may be dependent on Microsoft TAPI refer to the Microsoft Website at <http://www.microsoft.com>.
- 6 Make a copy of the m1spdb.mdb file which is usually located in the C:/M1server directory and store it in a safe place. This procedure ensures that you have a backup copy of the Symposium TAPI SP database in the event of a system crash or other unforeseen failure during the upgrade process.
- 7 Select Start > Settings > Control Panel > Add/Remove Programs > Symposium TAPI Service Provider > Remove.
- 8 Restart the server to save these changes.

Installing the latest software release

Before you install the latest release of Symposium TAPI SP software from your CD, verify that the earlier release is removed and that telephony services and ACD proxy services are stopped. Refer to [Chapter 2, “Installation guidelines,”](#) on [page 39](#) for instructions about installing the software.

Configuring the latest software release

After you complete the quick upgrade or full reinstall of Symposium TAPI Service Provider for Meridian 1, release 2.3.1, verify that the configuration information contained in the m1spdb.mdb file is entered in the database tables. Select Start > Programs > Nortel > Nortel Symposium TAPI Service Provider for M1 > Configuration application.

The latest release of Symposium TAPI SP software adds a Compliance tab which provides access to the compliance administration window. This window allows you to configure Symposium TAPI SP to support SAPphone.

Upgrading your license file

When you perform a full reinstall of Symposium TAPI SP, the FlexLM License Manager is also reinstalled, and is automatically configured with information from the license.dat file that is supplied on the software CD. It is necessary to enter the TAPI server host name in the new license file. For information, refer to [“Configuring the FlexLM License Manager” on page 60](#).

Recovering database table information

If the Symposium TAPI SP database tables are not automatically configured during the upgrade procedure, perform a manual update from the backup file you made of the m1spdb.mdb file. To manually update the database tables:

- 1 In the configuration application, click the Providers tab and click Convert Text file to display the Open window.
- 2 Navigate to the location of the backup you made of the m1spdb.mdb file. Click Open to import the configuration file into the current release of the software.

Verifying the software upgrade

When required upgrade procedures are complete, on the TAPI server, restart telephony services and ACD proxy services if required. Start the TAPI browser application. Initialize and open all lines.

Retaining line associations

To ensure that line associations are retained when you upgrade to Symposium TAPI SP, release 2.3.1, perform the following tasks:



Caution: These procedures require you to change the registry files on the TAPI server. Make a backup file of your registry values and store in a safe location before you make any changes.

- 1 In Notepad or a similar text application, open the tsec.ini file located in the Winnt directory on the TAPI server. Following is an example of a tsec.ini file:

```
[WISCONSIN\Guest]
lines=9,589828
[WISCONSIN\Lab19]
lines=9,589829
```

- 2 Note the provider ID in the tsec.ini file, which is the number following “lines=”, before the “;” (comma). In this example, the provider ID is 9.
- 3 Select Start > Run. Type **regedit** and click OK to begin editing the registry.
- 4 Select HKEY_LOCAL_MACHINE > Software > Microsoft > Windows > CurrentVersion > Telephony.
- 5 Rename the ProviderX folder, where X is the current numeric value, to ProviderY, where Y is the numeric value you recorded for the provider ID (Provider9 in the example above).
- 6 Select the ProviderY folder to display its registry entry, which will be similar to the following:

Name	Data
(Default)	(value not set)
NextProviderID	0x0000000b (11)
NumProviders	0x00000003 (3)
ProviderFilename0	"kmd dsp.tsp"
ProviderFilename1	"unimdm.tsp"
ProviderFilename2	"MLINK.XXX"
ProviderID0	0x00000001 (1)
ProviderID1	0x00000002 (2)
ProviderID2	0x0000000a (10)

- 7 Locate the provider filename that precedes the “MLINKSP.XXX” field — ProviderFilename2 in the example provided.
- 8 Locate the provider ID that matches the provider filename, which is ProviderID2 on the last line of the example registry file.
- 9 Double-click this entry, ProviderID2 in the example, and change the numeric value shown in parenthesis, (10) in the example, to the provider ID value you noted in the tsec.ini file in step 2 above.
- 10 Select Registry and Exit.
- 11 Stop ACDProxy service and restart it.
- 12 Start TCMAApp and verify that TAPI server users are assigned specific lines.

Upgrading Symposium TAPI SP features

When you purchase Symposium TAPI SP, you purchase a license for a specific number of clients and a specific range of services. To increase the number of clients or change the range of services you must purchase a new license.

Importing the new license file

Before you can upgrade TAPI services you must purchase a new license, and load this new license file onto the server. To load your new license into the FlexLM License Manager, perform the following tasks:

- 1 On the TAPI server, locate the license file that you wish to replace. This file is usually located in C:/M1server/license.dat.
- 2 Right-click the mouse and select Rename to rename the file, for example as oldlicense.dat.
- 3 Copy your new license.dat file into the c:/m1server directory.
- 4 Select Start > Programs > Nortel > Nortel Symposium TAPI Service Provider for M1 > FlexLM License Manager. Click the Licenses tab and click Show License file.
- 5 The license file opens in Notepad or similar text editor application. Enter the TAPI server name in the first line of the license file and select File > Save to save this change. For information refer to [“Configuring the FlexLM License Manager” on page 60](#).

Increasing the number of clients

After you install the new license file, configure new clients on Symposium TAPI SP. If you wish to configure a small number of additional clients you can manually configure them in the Symposium TAPI SP configuration application. Refer to [Chapter 4, “Configuration guidelines,” on page 87](#) for information about configuring clients.

If you want to configure a many additional clients it is more efficient to download the configuration information from the Meridian 1 switch. To download information for new clients perform the following tasks:

- 1 In Notepad or a similar text editor application, create a text file.
- 2 Save this text file as download.txt in the c:\m1server directory on the TAPI server.
- 3 Connect to the Meridian 1 switch from the TAPI server through one of the following:
 - On a Windows NT server, select Start > Programs > Accessories > Communications > Hyperterminal > HyperTerminal application.
 - On a Microsoft Windows 2000 server, select Start > Programs > Accessories > Communications > Hyperterminal application.
- 4 When the port settings window opens, log on to the switch.
- 5 Select Transfers.
- 6 In the HyperTerminal application on a Windows NT server select Receive Text File; on a Microsoft Windows 2000 server select Capture Text.
- 7 Select the download.txt file that you created previously.



Note: If the Transfers menu does not appear when you log on to the Meridian 1 switch, press the Return key until it appears.

- 8 To capture information about additional terminal number blocks (TNB), enter the following commands in overlay 20:

```
> LD 20
REQ: PRT
TYPE: TNB (specify range of new TNBs you want to add to TAPI)
CUST 0 (or customer number)
~
DES <cr>
```



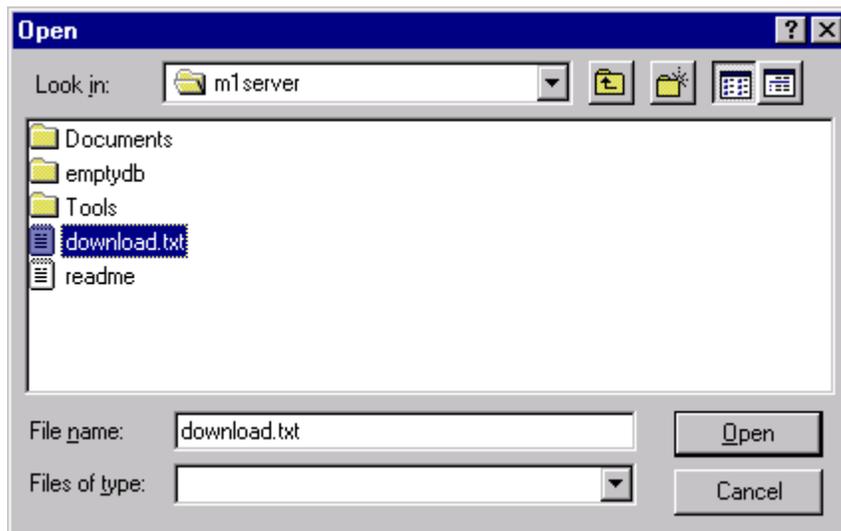
Note: To download information from Meridian 1 overlay applications can take a considerable amount of time.

- 9 To capture information about additional route data blocks (RDB), enter the following commands in overlay 21:

```
> LD 21
REQ: PRT
TYPE: RDB (specify range of new RDBs you want to add to TAPI)
CUST: 0 (or customer number)
~
ACOD <cr>
```

- 10 After the information from the overlays is downloaded, on a Windows NT server, click Stop; on a Microsoft Windows 2000 server click Capture Text Stop.
- 11 Close the hyperterminal application to save the information.
- 12 In the Symposium TAPI SP configuration application click Convert Text file to display the open window. (Figure 51)

Figure 51 Opening the download.txt file



- 13** Select `c:\mlserver\download.txt`. Click Open to display the Text File Translator Status window.(Figure 52)

Figure 52 Text File Translator Status window



- 14** Click Start.

This process adds all downloaded Meridian 1 switch information to the Meridian TAPI Service Provider database. When the process is completed, restart FlexLM and ACD Proxy services and start all client and server applications. The TAPI server database is reread and the new TNBs are appended to the end of the existing database.

If all the client/server applications and ACDProxy service are stopped during the upgrade procedure, when you restart ACDProxy service the database becomes active and all new lines are visible. It is not necessary to restart the server unless an application was not stopped during the upgrade.

Adding new features or changing the TAPI environment

To add new TAPI features you must purchase a new license and perform a full reinstall. To add network TAPI/IVR features, you must configure these features in the configuration application. Refer to [“Configuring the network TAPI/IVR table” on page 106](#) for information. To add Symposium Agent support refer to the Symposium Agent product documentation for configuration information. To add Symposium Web Center Portal refer to the Symposium Web Center Portal product documentation for configuration information.

To move from a knowledge worker environment to a call center environment you must purchase a new license and perform a complete reinstallation and configuration. For information refer to the *Engineering Guidelines for Symposium TAPI Service Provider for Meridian 1, release 2.3.1*, part number 213345-A and to [Chapter 2, “Installation guidelines,” on page 39](#) and [Chapter 4, “Configuration guidelines,” on page 87](#) of this document.

Chapter 6

Networked TAPI/IVR

When you purchase Symposium TAPI Service Provider for Meridian 1, release 2.3.1, you choose between call center and direct connect capabilities. For each of these systems, you can choose an additional module that offers interactive voice response (IVR) and networking features. This chapter provides an overview of these features but does not provide installation or configuration information for the necessary engineering procedures. Installation and configuration must be carried out by qualified personnel only.

Network TAPI/IVR license file considerations

Before you can access these optional features, you must upgrade your Symposium TAPI license to include network TAPI and IVR capabilities. When you estimate the number of lines you require in your new license, include the lines used to monitor IVR ports in the total number of open lines required.

Each TAPI server must have a license file that includes the network TAPI/IVR option to receive call data for an ACD transfer or NACD overflow calls.

Integrated IVR-CTI

The IVR and networking option available for Symposium TAPI SP enables integrated IVR-CTI functionality in a Meridian 1 PBX environment. The optional module provides an interface between the TAPI server and either the Nortel Networks Periphonics IVR system, or a third party IVR system.



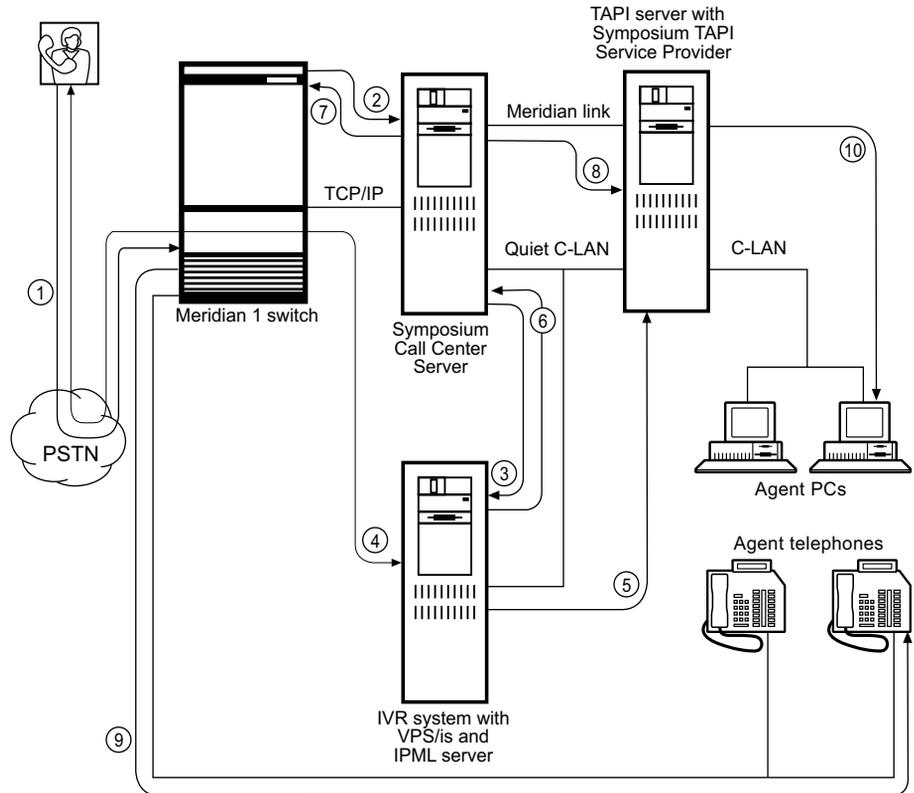
Note: Nortel Networks recommends that you must not attempt to integrate Symposium TAPI SP with any IVR system unless you are a member of the Nortel Networks developer program and have expert knowledge of the IVR system you are installing.

To provide integrated IVR-CTI functionality using Symposium TAPI SP you require two components: the Symposium TAPI SP IVR driver that is supplied with the IVR and networking module, and an IVR system. This section provides a brief description of the Symposium TAPI SP IVR driver and the Periphonics IVR system. For information about integrating a third party IVR system with Symposium TAPI SP, refer to the Nortel Networks developer program.

IVR-CTI call flow example

This section provides a sample call flow that illustrates how caller related information collected by an IVR system is made available to call center agents through Symposium TAPI SP. [Figure 53](#) shows the events in the sample call flow.

Figure 53 IVR-CTI call flow example



The numbers on the illustration correspond to the numbers of the following events:

- 1 A caller dials into the Meridian 1 switch over the PSTN.
- 2 The Meridian 1 switch queues the call to a CDN for the SCCS.
- 3 The SCCS opens a voice session with the IVR system.

- 4 The IVR system plays a prompt for the caller, for example a request for a PIN.
- 5 The IVR system passes the CED to the Symposium TAPI SP IVR driver, where the CED and associated CLID are stored.
- 6 At the same time, the IVR system passes the CED to the SCCS, which assigns the call to a destination DN, based on skill-based routing.
- 7 The SCCS instructs the Meridian 1 switch to transfer the call to the destination DN.
- 8 At the same time, the SCCS passes the CLID and destination DN to Symposium TAPI SP, where the IVR driver searches for CED associated with the CLID.
- 9 The Meridian 1 switch transfers the call to the selected agent's telephone set.
- 10 Symposium TAPI SP passes this CED to a TAPI-compliant application on the PC associated with the destination DN.

LAN configuration

IVR communication with Symposium TAPI SP should be on a dedicated LAN and not on the main C-LAN. It can share the same LAN as Meridian Link Services, which is installed on the SCCS. Refer to [“Configuring an isolated C-LAN for TAPI traffic” on page 55](#) for further information.

IVR-CTI integration in a Meridian 1 environment

Integrated IVR-CTI functionality is possible in a Meridian 1 environment through the following Meridian capabilities:

- The Meridian 1 switch provides the telephony switching requirements for IVR activities.
- Meridian Link Services provides the call progress information that is necessary to track calls and gather call information.

The IVR system connects directly to the Meridian 1 switch to provide caller input services. The system is connected to an isolated C-LAN, which allows packet data transfer with Symposium TAPI SP and the SCCS.

Symposium TAPI SP IVR driver

When you install the IVR and networking option of Symposium TAPI SP, the IVR driver is installed. The driver provides call data support for inbound calls transferred from IVR ports that are controlled by an IVR system and are monitored by Symposium TAPI SP.

In a networked TAPI environment, the IVR driver also provides network call data support for calls overflowed from a remote Meridian 1 switch. When calls are overflowed, the IVR driver requests call data from the IVR driver on the remote TAPI server. The IVR driver uses the TCP/IP protocol to communicate with the IVR system and with networked TAPI servers.

IVR-CTI messages

IVR-CTI integration occurs through the exchange of a series of messages between the IVR system and the Symposium TAPI SP IVR driver. In a networked TAPI environment these messages are relayed by the main TAPI server to remote TAPI servers. The different message types are:

- A *registration message* is sent by the IVR system to the Symposium TAPI IVR driver when a call arrives on an IVR port. The registration message opens a connection to the IVR driver, which remains open until a disconnection message is sent.
- A *caller data message* is sent by the IVR system to the IVR driver containing CED received by the IVR system.
- A *disconnect message* is sent by the IVR system to the IVR driver when IVR treatment for a call is complete.
- An *unsolicited status message* is sent by the IVR driver to the IVR system if any of the ports specified in the registration message cannot be monitored.
- A *request call data message* is sent by the receiving IVR driver to a remote IVR driver if a call is overflowed from one site to another in a networked TAPI environment. If this message does not include a network CLID, the receiving IVR driver searches for the network CLID in its IVR server database table in order to respond.
- A *caller info data message* is sent by the remote IVR driver to the receiving IVR driver in response to a request call data message in a networked TAPI environment.

Network call data

Nortel Networks recommends that the IVR system is centralized at the main site in a networked environment. To receive IVR treatment, all incoming calls are routed into the Meridian 1 switch at the main site. The IVR system passes the CLID and CED to the central Symposium TAPI SP IVR driver which stores this information.

When a call is routed to a remote site, the TAPI server at that site extracts the HLOC from the network CLID. It checks if this HLOC is in its IVR host database table, and sends a request call data message over TCP/IP to the TAPI server at the main site. The main TAPI server then sends a caller data message to the remote TAPI server. All TAPI servers must be configured with the IP address and HLOC of the main TAPI server. These common configurations ensure that when a call arrives into a remote site, the remote TAPI server can match the HLOC contained in the network CLID with the HLOC for the main TAPI server stored in its IVR host database table.

There are two ways of attaching data from the IVR system to TAPI:

- If call data is associated with a network CLID, Symposium TAPI SP does not monitor the incoming IVR port.
- If call data is associated with a specific DN port, Symposium TAPI SP must monitor the incoming IVR port.

For information about configuring and maintaining the IVR host database table refer to [“Configuring the network TAPI/IVR table” on page 106](#).

The Symposium TAPI SP IVR driver performs the following tasks:

- monitors IVR DNs and records associated network CLIDs
- receives IVR registration messages which include an indication of whether CLID can be sent
- if the CLID cannot be sent, stores the port list as well as the source IP and port address of the IVR port
- receives IVR disconnect messages and removes items from the port monitor list associated with the source IP and port address
- receives IVR caller data from the IVR system and if the network CLID is not included, looks up and includes the associated network CLID

- returns IVR caller info data messages in response to IVR request call data messages via TCP/IP communication

Periphonics IVR system

The Nortel Networks Periphonics IVR system is a powerful IVR system that can provide IVR functionality for thousands of ports, with up to 480 IVR ports supported in a single cabinet. The Periphonics IVR system supports the following IVR features:

- text to speech
- Large vocabulary speech recognition through its OSCAR speech server
- multiple speech recognition vendors, including Nuance
- self-service solutions which can include multiple layers.
- A GUI-based application builder (PeriProducer) for creating a range of basic to complex voice menus

The system has two server elements: the voice processing series/information server (VPS/is) which provides voice services, and the integrated package for Meridian link (IPML) server. Both servers can co-reside on one Windows NT server. The IPML server can be installed only on this platform. The VPS/is server can also be installed on a Sun UNIX platform but it cannot then co-reside with the IPML server.

Overview of the VPS/is

The VPS/is is a server that integrates a variety of call processing functions with data communication and transaction processing. The server connects to the Meridian 1 switch via a T1/E1 connection to a line side T1/E1 (LST1/EI) card on the switch. The card provides the voice interface between the IVR system and the Meridian 1 switch. The LST1/EI card emulates an analog line card to the Meridian 1 software, and supports one T1/E1 line with 24/30 channels. You can configure each channel separately.

Overview of the IPML server

The IPML server enables communication between the VPS/is server and a range of other interfaces including Symposium TAPI SP and the SCCS. Through the IPML server, the VPS/is server can perform all required telephony requests, responses, and events it receives from Meridian Link Services. It runs on a Windows NT platform only.

The IPML server provides an interface to pass caller entered data (CED), such as a PIN, from the VPS/is to the TAPI driver task on Symposium TAPI SP. Through a separate interface component the IPML server passes the CED to the SCCS.

When you install the IPML server the following configurations files are created:

```
cstapi.cfg  
cstapils.cfg
```

You must customize these configuration files on the IPML server to incorporate specific information relating to your site. For more information refer to the Periphonics product documentation.

Networking call data

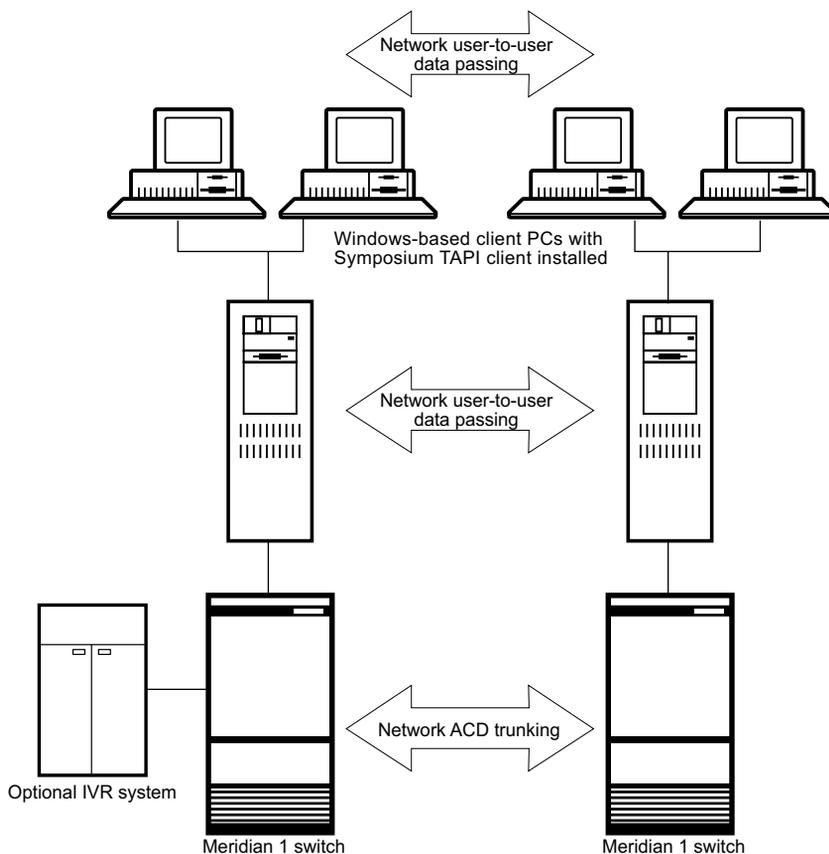
In the context of Microsoft TAPI, networking is defined as the ability to associate and deliver user data with a call. User data can be:

- an account code entered via an IVR system
- a transaction account record number
- agent-entered notes
- information relevant to an individual call

The ability to network call data facilitates the coordination of information available to agents when calls are transferred or conferenced locally.

Symposium TAPI SP can consistently and reliably track call data related to calls that are NACD overflowed, transferred, or conferenced outside the switch to another Meridian 1 switch. Figure 54 shows how information is shared between users, TAPI servers, and Meridian 1 switches in a networked environment.

Figure 54 Networking call data



The Meridian 1 switch supports call routing between a network of Meridian 1 switches through ISDN trunk using network automatic call distribution (NACD). This functionality allows Symposium TAPI Service Provider for Meridian 1 to track call data related to calls that overflow from one Meridian 1 switch to another. The call data is obtained through the network over TCP/IP.

Configuring networking call data capabilities

To enable networking call data capabilities the following requirements must be met:

- 1 All Meridian 1 switches must be on an ISDN trunk and configured to pass network CLID. In the network call trace feature on the switches, verify that the switches pass network CLIDs between them. For more information refer to the Meridian 1 switch product documentation.
- 2 Verify that the NACD application (package 207) is installed on the Meridian 1 switches by entering the following commands in overlay 22:

```
> LD 22
REQ PRT
TYPE PKG
```

- 3 In overlay 15, at the customer data block prompt, verify that each Meridian 1 switch has a unique HLOC.
- 4 Verify that all Symposium TAPI servers are configured for TCP/IP, by using the ping utility.
- 5 The supplied license file for local and remote Symposium TAPI SP servers must include the network TAPI/IVR server option.
- 6 Verify that all IVR host database tables are configured with entries for the HLOC, IP address, and port numbers of all participating Symposium TAPI SP servers.



Note: Networking call data works only if the call comes from another ACD queue via another Meridian 1 switch. The destination of the call on the receiving site must be an ACD queue or CDN.

- 7 Configure the call data life span that defines the amount of time the call data object lasts in memory. After the call data life span elapses, call data objects not referenced by any call from the call data list are removed. For information refer to [“Configuring the provider table” on page 93](#).
- 8 Configure call data size in the provider table. The valid range for call data size is 10 – 8192 bytes; the default value is 512 or 0x200 bytes.

Call data networking between IVR and Symposium TAPI SP

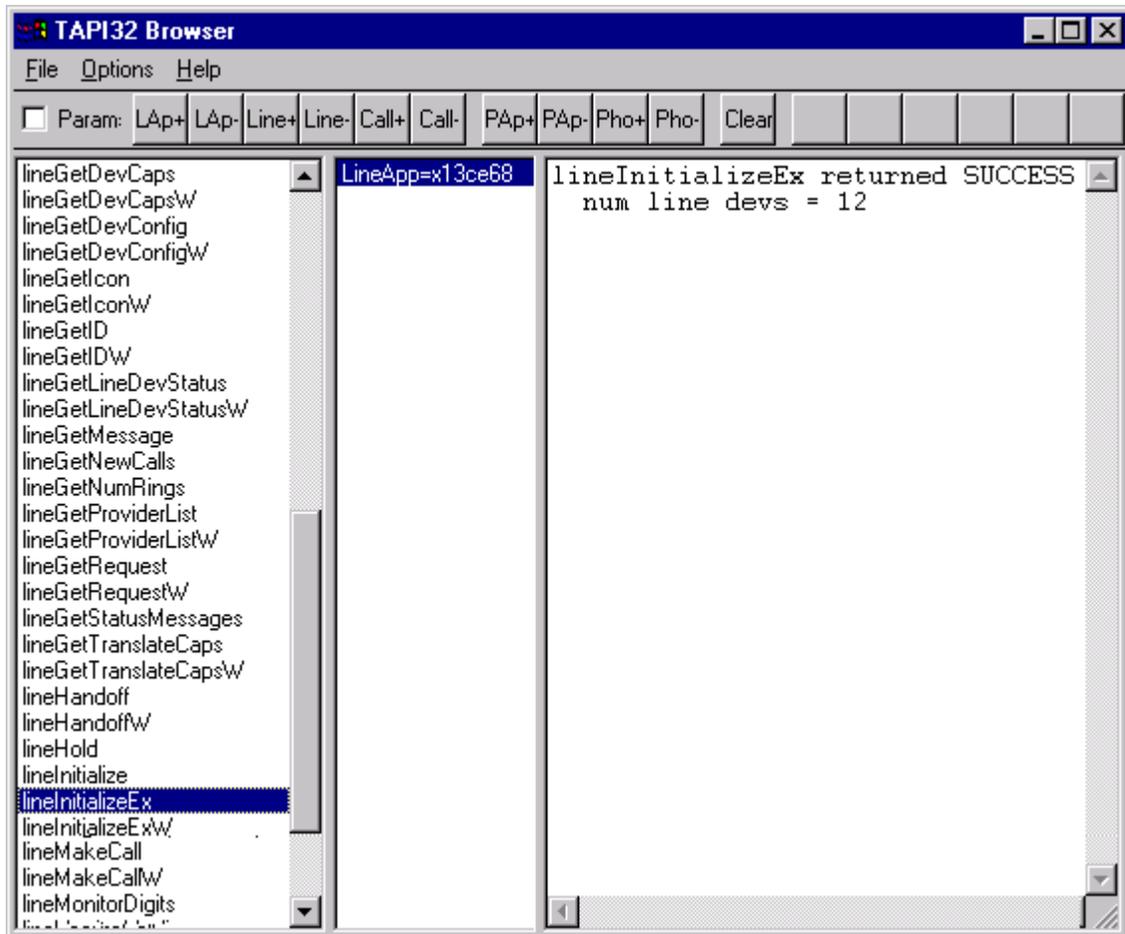
Call data networking between an IVR system and Symposium TAPI SP is possible only on IVR ports that are monitored by Symposium TAPI SP. Enable IVR on all IVR ports that you want to be monitored by Symposium TAPI SP in the configuration application. The following processes occur when call data is networked:

- 1 The IVR system registers itself with Symposium TAPI SP by connecting to a configured TCP port (by default 5000) and sending a registration message.
- 2 When a call is placed to a line attached to the IVR system, Symposium TAPI SP detects the call because it is monitoring all lines on the IVR system. It saves the CLID for that call.
- 3 The IVR system plays prompts and collects data.
- 4 The IVR system passes the collected data to Symposium TAPI SP via TCP/IP.
- 5 Symposium TAPI SP creates a call data block that contains both the call data and the CLID.
- 6 The IVR system transfers the call from its port to a destination DN on the switch. Typically it transfers the call to an ACD queue. In turn, the ACD software presents the call to a call center agent.
- 7 Symposium TAPI SP informs all TAPI applications monitoring the agent's telephone set of the new call. The TAPI applications retrieve the data by calling `lineGetCallInfo`. This data is commonly used for screen pop purposes.

Verifying call data networking

To verify that call data networking is operating correctly, perform the following tasks in the TAPI browser application:

- 1 Select `lineInitializeEx` function in the left pane of the TAPI browser application to display initialization information for the line. (Figure 55)

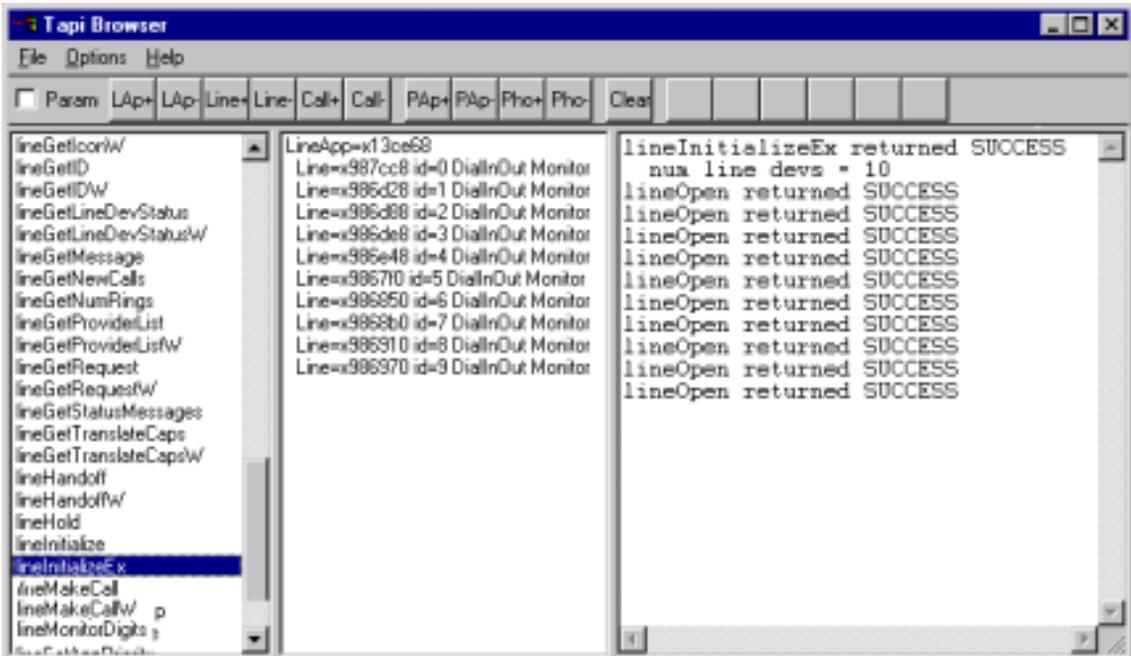
Figure 55 TAPI browser application

- 2 The right hand pane displays the following information:

```
lineInitializeEx returned SUCCESS
num line devs = n
```

where n is the number of TNs successfully registered with the switch.

- 3 In the left hand pane scroll OpenAllLines. Select the entry to display line information in the middle pane. (Figure 56)

Figure 56 Open all lines display in the TAPI browser application

- 4 Use any non-monitored telephone set (TN or DN) to make a call to the IVR port. Follow the voice prompts set by the script to enter call data.

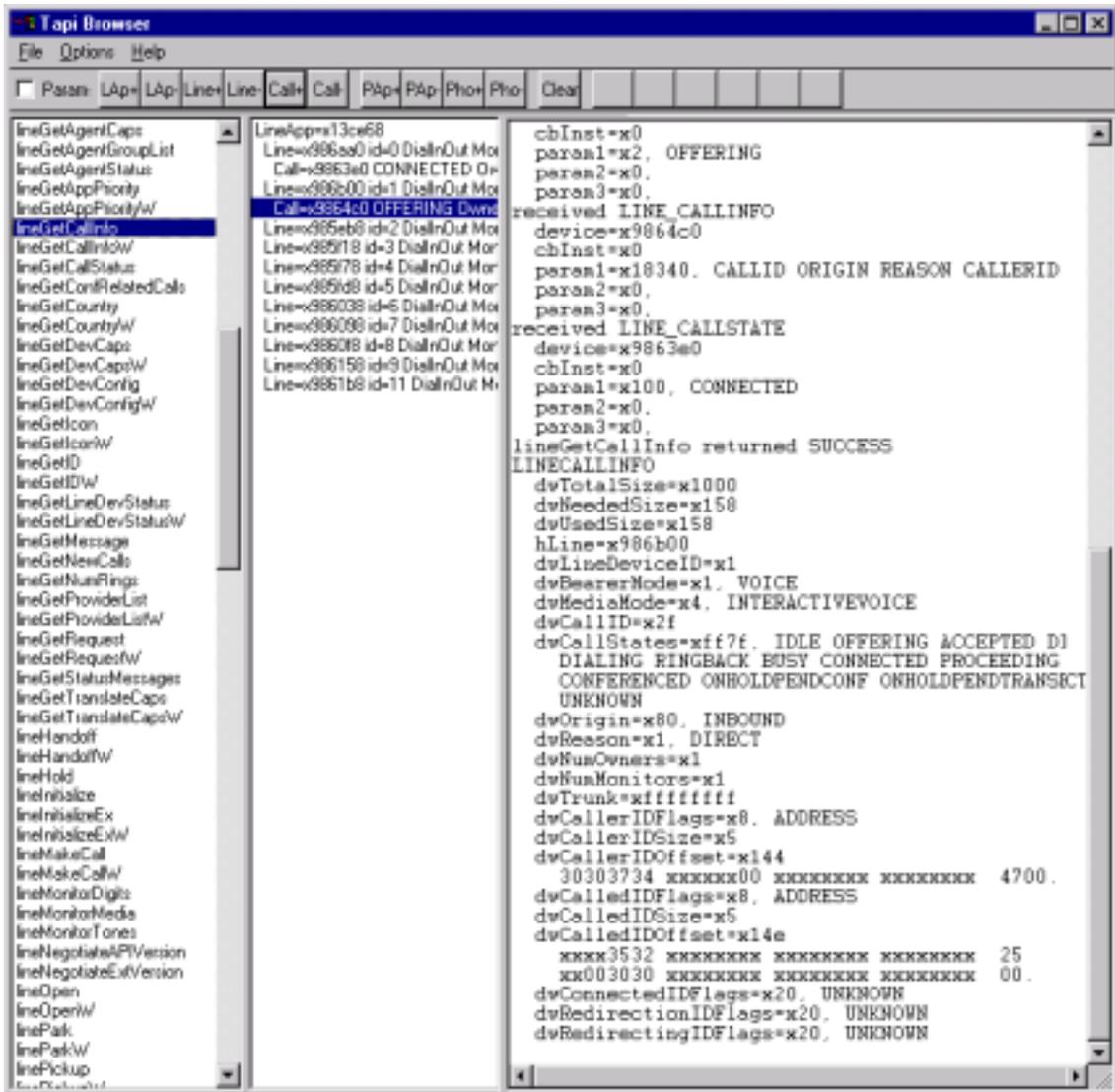
At the same time, the TAPI browser displays a call appearing on one of the lines which is the line monitoring the current called IVR port DN.

When the call data entry is complete, the IVR system transfers the call to an ACD queue.

The call appears in the middle pane of the TAPI browser as “offering” to one of the lines in the ACD queue in which the agent is logged.

- 5 Select the offering call in the middle pane . In the left pane, select the lineGetCallInfo function to display information for the call in the right hand pane. (Figure 57)

Figure 57 Displaying call information in the TAPI browser application



The `dwUserUserInfo` and `dwCallData` fields of `LINECALLINFO` structure show the call data entered by the user.

Call data networking between TAPI servers with NACD overflow

This section provides an example of how call data is communicated from a local Symposium TAPI SP to a remote Symposium TAPI SP. In this scenario two Meridian 1 switches are connected via ISDN/PRI trunks: M1-A and M1-B. An IVR system is attached to M1-A. Both switches use Symposium TAPI SP and the ACD queue to which the IVR system transfers the call is configured to immediately overflow to M1-B.

In this scenario the following processes occur:

- 1 A call arrives on a line attached to the IVR system that is monitored by the TAPI server. Because M1-A is part of a network of Meridian 1 switches, the CLID contains an identifier that uniquely identifies it as a CLID on M1-A, the home location code (HLOC).
- 2 The IVR system plays prompts and collects data from the caller.
- 3 The IVR system uses TCP/IP to send CED along with information about the port or DN on which the data was collected to the Symposium TAPI SP for M1-A.
- 4 The Symposium TAPI SP for Meridian 1-A updates its call data objects and stores them in an index-based STL data structure.
- 5 The IVR system transfers the call from its port to a destination DN on the switch. Typically, it transfers the call to an ACD queue.



Note: The list of all participating TAPI service providers is read from the database during initialization of Symposium TAPI SP.

- 6 The call leaves M1-A and is delivered to an ACD queue on M1-B.
- 7 The M1-B TAPI server receives the call. In addition to all the mandatory information elements, the message contains the network CLID. The M1-B TAPI server interprets the message as if the call originated from the remote Meridian 1.
- 8 The M1-B TAPI server extracts the HLOC from the network CLID field and searches its IVR host database table for the HLOC. If a match is found, it

sends an IVR request call data message over TCP/IP to the TAPI server for M1-A.

- 9 The Symposium TAPI server for M1-A receives the message and, after searching its call data list, finds the call data for the call appearing on the M1-B TAPI server. M1-A TAPI server sends a caller info data message back to the M1-B TAPI server.
- 10 The M1-B TAPI server receives the caller info data message and replaces the CLID field with the M1-B current local call ID.
- 11 The M1-B TAPI server passes the data to any TAPI applications monitoring the agent's telephone via a LINECALLINFO message and the subsequent lineGetCallInfo function call.

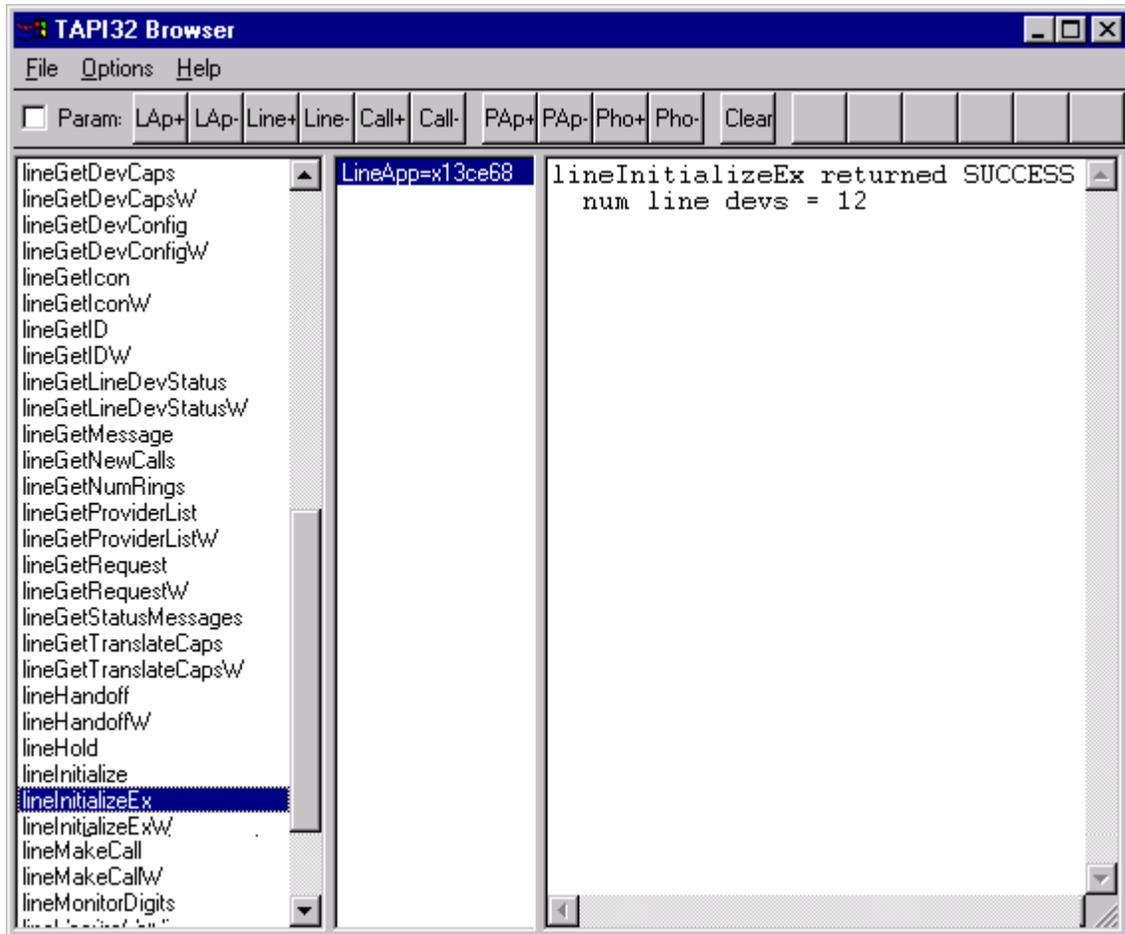
Verifying NACD overflow with TAPI operations

Verify that the IVR system and mlinksp.ini file are properly configured before starting Symposium TAPI SP. Also verify that NACD overflow time is set on the switch for the ACD queue on M1-A to overflow calls to an ACD queue on M1-B.

To verify that NACD overflow is functioning correctly with Symposium TAPI SP, perform the following tasks in the TAPI browser application:

- 1 Select lineInitializeEx function in the left pane of the TAPI browser application to display initialization information for the line. (Figure 58)

Figure 58 TAPI browser application

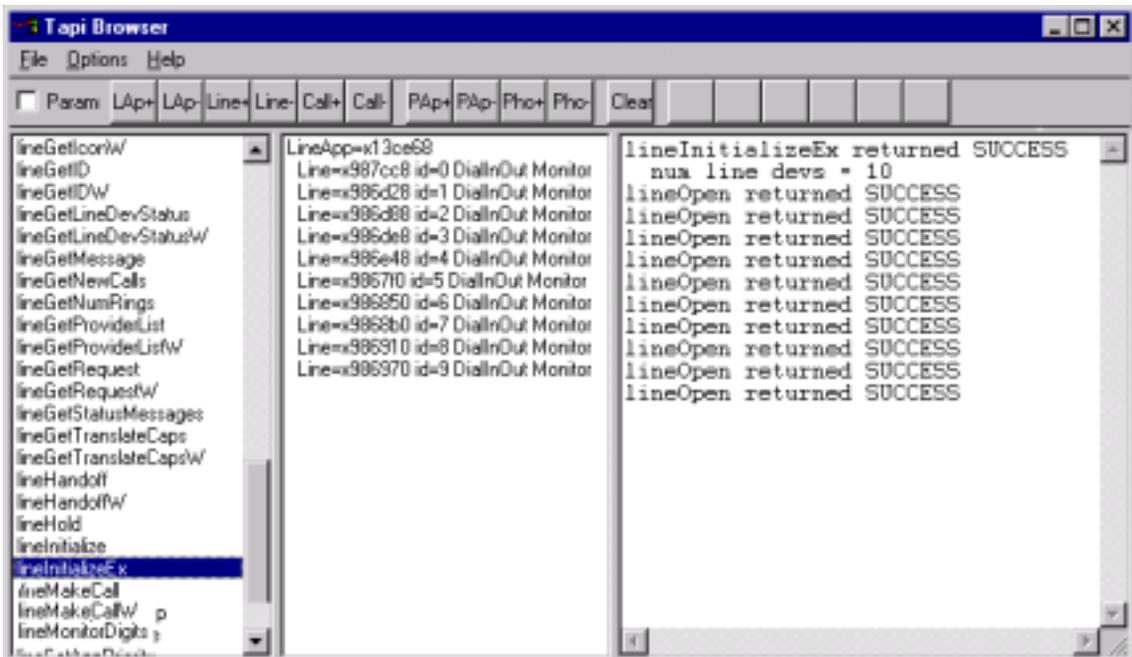


- 2 The right hand pane displays the following information:

```
lineInitializeEx returned SUCCESS
num line devs = n
```

where n is the number of TNs successfully registered with the switch.

- 3 In the left hand pane scroll to OpenAllLines. Select the entry to display line information in the middle pane. (Figure 59)

Figure 59 Open all lines display in the TAPI browser application

- 4 Use any non-monitored telephone set (TN or DN) to make a call to the IVR port. Follow the voice prompts set by the script to enter call data.

At the same time, the TAPI browser displays a call appearing on one of the lines which is the line monitoring the current called IVR port DN.

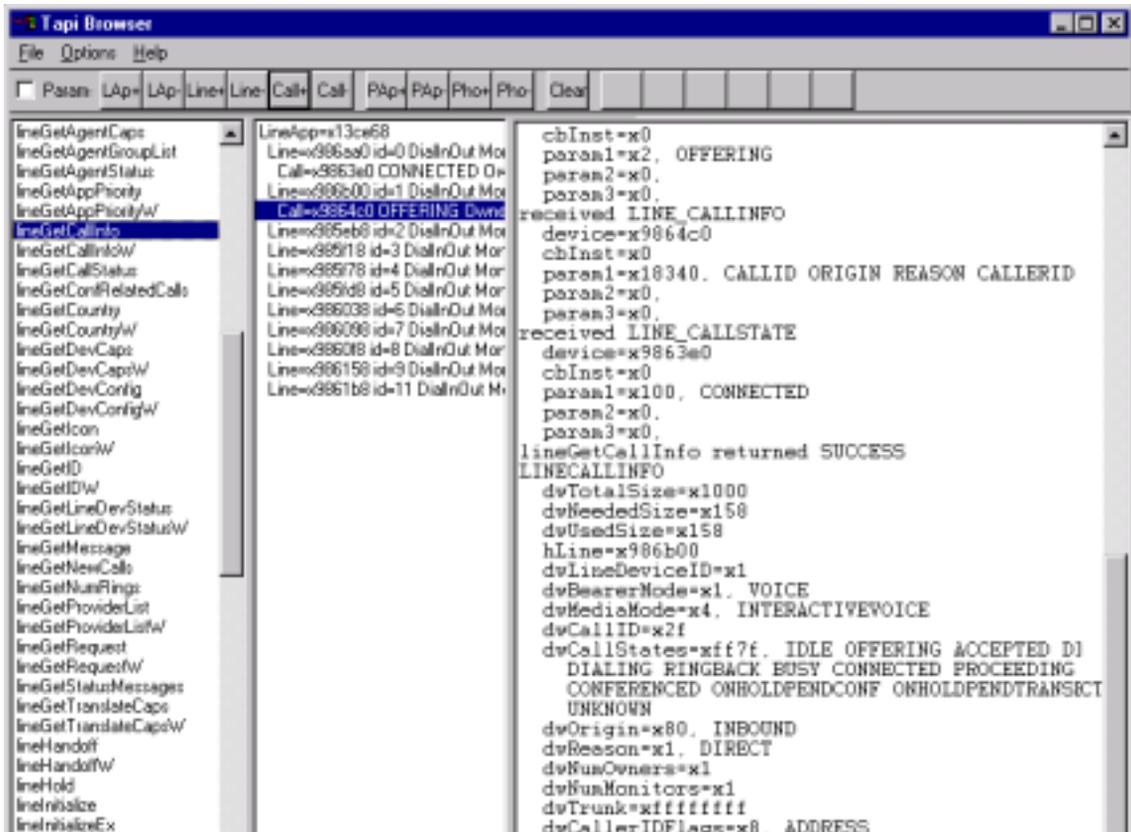
When the call data entry is complete, the IVR system transfers the call to an ACD queue.

The NACD overflow option set on the M1-A switch causes the call to be overflowed to the ACD queue on the M1-B switch.

The call appears in the middle pane of the TAPI browser as “offering” to one of the lines in the ACD queue in which the agent is logged.

- 5 Select the offering call in the middle pane and, in the left pane select the lineGetCallInfo function to display information for the call in the right hand pane. (Figure 60)

Figure 60 Displaying call information in the TAPI browser application



The dwUserUserInfo and dwCallData fields of LINECALLINFO structure show the call data entered by the user.

Call data networking between TAPI service providers without NACD overflow

This section describes how call data is communicated from a local Symposium TAPI SP to a remote Symposium TAPI SP without the IVR system and NACD overflow switch setting. This example uses lineSetCallData to establish call data on an active call and then transfers or conferences to an ACD queue on the remote Meridian 1 switch. In this scenario two Meridian 1 switches (M1-A and M1-B) are connected via ISDN/PRI trunks. Both switches use Symposium TAPI Service Provider for Meridian 1.

In this scenario the following processes occur:

- 1 A call arrives on the ACD queue and the ACD software on M1-A presents the call to a call center agent.
- 2 The agent selects the active call and uses `lineSetCallData` to set call data. Symposium TAPI SP informs all TAPI applications monitoring the agent's telephone of the new call data available. The TAPI applications retrieve the data by calling `lineGetCallInfo`. This data is commonly used for screen pop purposes.
- 3 The Symposium TAPI SP for M1-A updates its call data objects list.
- 4 The agent transfers or conferences the active call to an ACD queue on the M1-B switch.
- 5 The M1-B TAPI server receives the call which, in addition to containing all mandatory information elements, also contains the network CLID. The M1-B TAPI server interprets the message as if the call originated from the remote Meridian 1.
- 6 The M1-B TAPI server extracts the HLOC from the network CLID field and searches its IVR host database table for the HLOC. If a match is found the TAPI server for M1-B sends a request call data message via TCP/IP to the M1-A TAPI server.
- 7 The TAPI server for M1-A receives the message and, after searching its call data list, finds the call data for the call appearing on the M1-B TAPI server. M1-A TAPI server sends a caller info data message back to the M1-B TAPI server.
- 8 The M1-B TAPI server receives caller info data message and replaces the CLID field with the M1-B current local CLID.

Verifying call data networking without NACD

To verify call data networking without NACD, perform the following tasks in the TAPI browser application:

- 1 On the Symposium TAPI server for M1-A, select `OpenAllLines` in the left hand pane.
- 2 On the Symposium TAPI server for M1-B, select `OpenAllLines` in the left hand pane.

- 3 From another telephone set, call the DN of a monitored telephone set.

On the TAPI server for M1-A perform the following tasks in the TAPI browser application:

- 1 Select the offering call in the middle pane, and select lineAnswer in the left hand pane.
- 2 To do a blind transfer of call data select the connected line in the middle pane. Select lineSetupTransfer in the left hand pane.
- 3 Click OK.
- 4 Select lineSetCallData in the left hand pane. Click OK.
- 5 Select DialtoneLine in the left hand pane and click Line Dial.
- 6 Select IpszDestAddress. Enter a valid DN on switch B to transfer to.
- 7 Click OK.

To answer an incoming call on the TAPI server for M1-B, in the TAPI browser application perform the following tasks:

- 1 Select the offering call in the middle pane and select lineAnswer in the left hand pane.
- 2 Select lineGetCallInfo in the left hand pane to display line call information in the right hand pane. The dwUserUserInfo and dwCallData fields of LINECALLINFO structure show the call data entered by the user.

Troubleshooting IVR and networking features

This section describes some common problems encountered when configuring IVR and networking features for Symposium TAPI SP. When troubleshooting keep the logger application running. Clear the log file before you begin a troubleshooting session. To store important log information permanently, rename the overflow.log file, or save it to a different location.

No IVR registration message on TAPI server initialization

If no IVR registration message appears in the overflow.log file capture after initialization of the TAPI server, perform the following tasks:

- 1 Use the ping utility to verify that the Symposium TAPI server and the IVR system are able to communicate. If there is no communication between them, consult your data network administrator for assistance. Otherwise, continue to next task.
- 2 Shut down Symposium TAPI SP.
- 3 Open the DOS Command prompt window on the TAPI server. Enter the following command:

```
netstat -a >a.txt" <Enter>
```
- 4 Open the a.txt file in Notepad or similar text editor application.
- 5 If port 5000 is listed as LISTENING or ESTABLISHED it indicates that there is a port conflict and that the port is already in use by another application. Consult your data network administrator to resolve the conflict.
- 6 If port 5000 is not listed, clear the overflow.log using the logger application. Start Symposium TAPI SP.
- 7 Open the DOS Command prompt window on the TAPI server and enter the following command:

```
netstat -a >a.txt" <Enter>
```
- 8 Open the a.txt file in Notepad or similar text editor application.
- 9 If port 5000 is listed as LISTENING and does not have an entry as ESTABLISHED, verify that the IVR system is configured for port 5000.
- 10 If port 5000 is listed as LISTENING and also has entry as ESTABLISHED, or if port 5000 is not listed as LISTENING, check the configurations for the port on the IVR system. Verify that the port number of the IP address for the TAPI server is correct.



Note: If such behaviour occurs save the overflow.log file from the logger application and contact Nortel Networks GNCS for assistance.

No call data message received by TAPI server when a call is transferred from IVR port to ACD queue

If an improper or forced shutdown of Microsoft TAPI or Symposium TAPI SP occurs, it is possible that call data messages won't be received by the TAPI server when a call is transferred from an IVR port to an ACD queue. To resolve the situation perform the following tasks:

- 1** Shut down Symposium TAPI SP and verify that it is shut down in the logger application.
- 2** Stop the IVR system.
- 3** Verify that the IVR system is configured to monitor each DN that is used by IVR ports. If any of these values require modification, reconfigure the IVR system.
- 4** Clear the overflow.log file using the logger application and start Symposium TAPI SP. Verify in the logger application that services have successfully started.
- 5** Start the IVR system.
- 6** Wait for the IVR registration message to appear in the logger window. Test functionality by calling IVR port DN. Follow the voice prompts to enter call data.
- 7** When the IVR system transfers a call from the IVR port to an ACD queue, a call appears on an agent line logged in to that queue. Verify this procedure in the TAPI browser application by calling lineGetCallInfo to check call data. If no call data is verified, save the logs and contact Nortel Networks product support.

Call data appears in overflow.log file, but does not appear in screen pop to agent

If call data appears in the overflow.log file or in the logger application, but this data does not appear with a screen pop-up to an agent, perform the following tasks:

- 1** Verify that Symposium TAPI SP is monitoring all IVR ports.

- 2 Examine the IVR Caller Data message in the overflow.log file to check which IVR port DN is being called . Verify that this DN is included in the Symposium TAPI SP database for monitoring purpose.
- 3 If the problem persists, save the overflow.log file and contact Nortel Networks GNCS.

No call data is seen when transferred or conferenced to a remote Meridian 1 switch

If no call data is seen when transferred or conferenced to a remote Meridian 1 switch, perform the following tasks:

- 1 Verify that all Meridian 1 switches in the network are connected using ISDN/PRI trunking.
- 2 Verify that all Meridian 1 switches are configured to pass network CLID.
- 3 Configure the network call trace feature to verify that the Meridian 1 switches pass network CLIDs between them. If this is not the case, stop and consult switch administrator.
- 4 Verify that the IVR host tables on all Symposium TAPI servers in the network contain the IP addresses and HLOCs of all other Symposium TAPI servers in the network.

Call data does not appear to agent when a call is transferred using NACD overflow

If there is call data when a call is transferred from the IVR port to an ACD queue on the same switch, but the call data does not appear to an agent when the call is transferred to a remote Meridian 1 switch using NACD overflow, it is necessary to verify that NACD overflow is set correctly. If NACD queues are set correctly, in overlay 23 the following type of information appears:

```
> LD 23
ACD000
MEM AVAIL: (U/P): 1941668    USED: 679771    TOT: 2621439
DISK SPACE NEEDED: 181 KBYTES
2MB BACKUP DISKETTE(S) NEEDED: 1 (PROJECTED)
ACD DNS AVAIL: 23860    USED: 140    TOT: 24000
REQ PRT
TYPE NACD
CUST 0

ACDN 7194
TABL D
ACD DN # : 7194
TABLE NAME: D
ENTRY NO  TARGET ID      TIMER VALUE  STATUS  REGISTERED
1         3258                4         ACTIVE  OK

MEM AVAIL: (U/P): 1941668    USED: 679771    TOT: 2621439
DISK SPACE NEEDED: 181 KBYTES
2MB BACKUP DISKETTE(S) NEEDED: 1 (PROJECTED)
ACD DNS AVAIL: 23860    USED: 140    TOT: 24000
REQ
```

Chapter 7

Compatibilities and features

This chapter provides detailed information about software compatibilities with Symposium TAPI SP, and describes various feature interactions.

Product compatibilities

Symposium TAPI SP is compatible with a wide range of products required for computer telephony integration. Before integrating the software with a product, check in the tables provided in this section to determine the level of compatibility.

Meridian 1 switch compatibility

[Table 3](#) lists the Meridian 1 switches that Symposium TAPI SP supports.

Table 3 Meridian 1 switch compatibility

	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3.0	Release 2.3.1
Minimum X11 software release				
SCCS environment, with optional IVR Release 22	Y	Y	Y	Y
Direct connect environment, with optional IVR Release 23.37	Y	Y	Y	Y

Telephone set compatibility

Table 4 lists the telephone sets Symposium TAPI SP supports.

Table 4 Telephone set compatibility

Telephone set	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
M2000 series digital telephones				
M2009	Y	Y	Y	Y
M2018	Y	Y	Y	Y
M2317	Y	Y	Y	Y
Meridian modular telephones (MMT)				
M2006	Y	Y	Y	Y
M2008	Y	Y	Y	Y
M2216	Y	Y	Y	Y
M2616	Y	Y	Y	Y
M39xx telephones				
M3901	Y	Y	Y	Y
M3902	Y	Y	Y	Y
M3903	Y	Y	Y	Y
M3904	Y	Y	Y	Y
M3905	N	N	Y	Y
Orion telephone sets (European)				
M3110	Y	Y	Y	Y
M3310	Y	Y	Y	Y
M3820	Y	Y	Y	Y
Analog telephone sets				
500/2500 sets	Y	Y	Y	Y
IP telephone sets				
i2004 Internet telephone	N	N	N	Y
i2050 software telephone	N	N	N	Y

Desktop PC compatibility

Table 5 lists the desktop PCs that Symposium TAPI SP supports.

Table 5 Desktop PC compatibility

Desktop PC	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Windows 95	Y	Y	Y	Y
Windows 98	Y	Y	Y	Y
Windows NT 4.0 workstation	Y	Y	Y	Y
Windows NT 4.0 server	Y	Y	Y	Y
Windows 2000 workstation	N	N	Y	Y
Windows 2000 server	N	N	Y	Y
Windows ME	Y	Y	Y	Y
Windows XP	N	N	N	N ¹
Windows .NET	N	N	N	N ¹

- 1 Nortel Networks has not yet performed sanity tests on these new operating systems. An advisory bulletin will be issued when tests have been completed.
- 2 Symposium TAPI SP is not supported in a Microsoft Terminal Services environment, or terminal services environments from other vendors, such as the Citrix product.

Microsoft TAPI compatibility

Table 6 lists Microsoft TAPI release compatibility with Symposium TAPI SP.

Table 6 Microsoft TAPI compatibility

Microsoft TAPI releases	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
TAPI 2.0	Y	Y	Y	Y
TAPI 2.1	Y	Y	Y	Y
TAPI 3.0	N	N	Y	Y
TAPI 3.1	N	N	N	N ¹

- 1 Nortel Networks has not yet performed sanity tests on Microsoft TAPI 3.1, which is provided with the new .NET operating systems. An advisory bulletin will be issued when tests have been completed.

Windows NT service pack compatibility

[Table 7](#) lists Windows NT service pack release compatibility with Symposium TAPI SP.

Table 7 Windows NT service pack compatibility

Windows NT service pack	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Service pack 3	Y	Y	N	N
Service pack 4	Y	Y	N	N
Service pack 5	Y	Y	N	N
Service pack 6	Y	Y	N	N
Service pack 6a	Y	Y	Y	Y

Microsoft Windows 2000 service pack compatibility

[Table 8](#) lists Microsoft Windows 2000 service pack release compatibility with Symposium TAPI SP.

Table 8 Microsoft Windows 2000 service pack compatibility

Microsoft Windows 2000 service pack	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Service pack 1	N	N	Y	N
Service pack 2	N	N	Y	Y

Interface device compatibility

[Table 9](#) lists interface device compatibility with Symposium TAPI SP.

Table 9 Interface device compatibility

Interface device	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Meridian Link 5, 5C	Y	Y	Y	Y
Symposium Link 6.01	Y	Y	Y	Y
Meridian Link Services (MLS) 4.0	N	N	Y	Y
Meridian Link Services (MLS) 4.2	N	N	Y	Y

Nortel Networks application compatibility

[Table 10](#) lists Nortel Networks application compatibility with Symposium TAPI SP.

Table 10 Nortel Networks application compatibility

Application	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Symposium Agent 1.1	Y	Y	N	N
Symposium Agent 2.0	Y	Y	N	N
Symposium Agent 2.3	N	N	Y	Y

Third-party application compatibility

[Table 11](#) lists third-party application compatibility with Symposium TAPI SP.

Table 11 Third-party application compatibility

Application	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
pcAnywhere 10.5	N	N	N	Y
Norton Antivirus	N	N	N	Y
InnoculateIT	N	N	N	Y
SAPphone R/3 2.54	N	N	N	Y

Feature support

Symposium TAPI SP supports a large number of computer telephony integration features and a range of administrative tools.

Basic call control

[Table 12](#) lists basic call control features Symposium TAPI SP supports.

Table 12 Basic call control

Feature	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Make call	Y	Y	Y	Y
Answer	Y	Y	Y	Y
Hold	Y	Y	Y	Y
Unhold	Y	Y	Y	Y
Blind transfer	Y	Y	Y	Y
Supervised transfer	Y	Y	Y	Y
Three-party conference	Y	Y	Y	Y

Table 12 Basic call control (continued)

Feature	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Six-party conference	Y	Y	Y	Y
CLID	Y	Y	Y	Y
DNIS	Y	Y	Y	Y
DNIS name display	N	N	N	N
InBand ANI	Y	Y	Y	Y
Manual conference tracking (monitored addresses)	Y	Y	Y	Y
Manual transfer tracking (monitored addresses)	Y	Y	Y	Y
Call party name display - direct connect configuration only	Y	Y	Y	Y
Multiple appearance DN ¹	Y	Y	Y	Y
Generate DTMF tones	N	N	N	N
Gather DTMF tones	N	N	N	N

1 This feature has limitations. For information refer to [“Multiple appearance DN \(MADN\) feature support” on page 166](#).

Enhanced call control

[Table 13](#) lists enhanced call control features Symposium TAPI SP supports.

Table 13 Enhanced call control

Feature	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
CDN treatments (ringback, busy, silence, music)	Y	Y	Y	Y
Call park (park and retrieve)	N	N	N	N
Call pickup	N	N	N	N
Night service	N	N	N	N

Table 13 Enhanced call control (continued)

Feature	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Ring again (activate and cancel)	N	N	N	N
Swap hold	Y	Y	Y	Y
Call waiting	N	N	N	N
Call routing (redirect/blind transfer)	Y	Y	Y	Y

ACD

[Table 14](#) lists ACD features Symposium TAPI SP supports.

Table 14 ACD

Feature	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Login	Y	Y	Y	Y
Logout	Y	Y	Y	Y
Ready	Y	Y	Y	Y
Not ready	Y	Y	Y	Y
Not ready reason codes	N	N	N	N ¹
Walk away/return	Y	Y	Y	Y
ACD statistics	Y	Y	Y	Y
Not ready after call completed/on disconnect	Y	Y	Y	Y
Emergency	N	N	N	N
Emergency reason codes	N	N	N	N ¹
Activity code	Y	Y	Y	Y
Night service	Y	Y	Y	Y
Call agent	Y	Y	Y	Y
Observe agent	N	N	N	N
Answer agent	Y	Y	Y	Y

Table 14 ACD (continued)

Feature	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Display agent	Y	Y	Y	Y
Supervisor key	N	N	N	N ^{FOOT}

- 1 The support of reason codes is a new feature available in Meridian Link Services 4.2. Nortel Networks will conduct sanity tests and issue an advisory bulletin when results are available.

Lines and DNs

[Table 15](#) lists the line and DN capacities Symposium TAPI SP supports.

Table 15 Line and DN capacities

Feature	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Max DNs/Address per set	2	2	2	2
Max telephones per TAPI server	1000	1000	1200	1200

Device controls

[Table 16](#) lists device controls Symposium TAPI SP supports.

Table 16 Device controls

Feature	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Message waiting lamp activation	Y	Y	Y	Y
Make set busy — message waiting lamp notification	Y	Y	Y	Y
Forward calls	N	N	N	N

Communication

Table 17 lists communication features Symposium TAPI SP supports.

Table 17 Communication

Feature	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
IVR integration support				
Call data	Y	Y	Y	Y
Network IVR	Y	Y	Y	Y
Networking support				
Call data	Y	Y	Y	Y
Network CLID	Y	Y	Y	Y
Network ACD	Y ¹	Y	Y	Y
ESN	Y ¹	Y	Y	Y

1 Networking support on release 2.1 is not compatible with later releases.

Security

Table 18 lists security features Symposium TAPI SP supports.

Table 18 Security

Feature	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
25-pin D-type parallel port security device	Y	Y	Y	Y
Keycodes	Y	Y	Y	Y
License management	Y	Y	Y	Y

Diagnostic

Table 19 lists diagnostic features Symposium TAPI SP supports.

Table 19 Diagnostic

Feature	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Logger application	Y	Y	Y	Y
Microsoft TAPI browser	Y	Y	Y	Y
SNMP alerts	N	N	N	N

General administration

Table 20 lists general administrative features Symposium TAPI SP supports.

Table 20 General administration

Feature	Symposium TAPI Service Provider			
	Release 2.1	Release 2.2	Release 2.3	Release 2.3.1
Dynamic database	N	N	Y	Y
Link recovery	N	Y	Y	Y
Version ID tool	N	N	Y	Y
DN/TN search	N	N	Y	Y

Succession CSE1000 support

Symposium TAPI Service Provider for Meridian 1, release 2.3.1, supports the Succession Communication Server for Enterprise 1000 (CSE1000). The IP-based Succession CSE1000 can be used in place of a Meridian 1 switch in your TAPI environment. Symposium TAPI SP delivers the same range of features and operates in the same manner as with a Meridian 1 installation.

Remote Office support

Symposium TAPI SP supports the Nortel Networks Remote Office 9150, release 1.1, enabling a maximum of 32 users located in a remote office to log on to the TAPI server domain.

Multiple appearance DN (MADN) feature support

The MADN feature enables you to monitor calls to one DN from multiple telephone sets. Symposium TAPI SP supports this feature with certain limitations. To understand MADN operation in a Symposium TAPI environment, examine a scenario where you configure two lines, 4 0 0 2 and 4 0 0 3, to monitor an MADN of 2530. When a call is made to MADN 2530, the following process occurs on the telephone sets:

- 1 Both telephone sets show the ringing call state.
- 2 If you answer the call using the 2530 address on 4 0 0 2, both telephone sets show the connected state but no call control is possible from the 4 0 0 3 telephone set.
- 3 If 4 0 0 2 places the call on hold, either of the telephone sets can perform unhold.
- 4 The telephone set that performs unhold assumes call control.

Although the TAPI server behavior is different than usual, it provides the required MADN capabilities through the TAPI application. During the call, the following behavior occurs on the TAPI server:

- 1 Although both telephone sets show the ringing call state, the TAPI browser application shows a call offered message on line 4 0 0 2 only.
- 2 If you answer the call manually using the 2530 address on line 4 0 0 3, the TAPI browser application shows a call connected message on line 4 0 0 2 only.
- 3 In this scenario, no call control is possible from the 4 0 0 2 telephone set, but the TAPI browser application enables you to perform call control from line 4 0 0 2 through the TAPI application that monitors the line.

To configure MADN on Symposium TAPI SP:

- 1** Assume you require the following MADN configuration:
 - TN 4 0 0 2 (manager) with 2400 DN and 2530 MADN.
 - TN 4 0 0 3 (secretary) with 2300 DN and 2530 MADN.
- 2** Configure TN 4 0 0 2 — for information refer to [“Adding a new TN” on page 100](#).

Symposium TAPI SP does not allow you to enter the same MADN information for TN 4 0 0 3 because it is already entered in the TN database for TN 4 0 0 2.
- 3** Save the information, and restart the TAPI server.
- 4** Run the TCMAPP application to assign lines to users.
- 5** Add TN 4 0 0 2 to the secretary’s user permissions to give her control of the manager’s MADN line, in addition to her own line on TN 4 0 0 3.

Chapter 8

Troubleshooting

This chapter provides information on the following:

- applications you can use to troubleshoot issues with Symposium TAPI SP
- procedures for dealing with common problems

License Manager troubleshooting applications

The FlexLM License Manager contains two troubleshooting applications:

- `sadbmon` is a console debug monitor application that logs information when Symposium TAPI SP attempts to validate the features purchased by the user. The application is located in the `tools` sub-folder of the License Manager directory.
- a `debug.log` file is written by the License Manger and contains error logs plus status information. The file is located in the destination install folder of Symposium TAPI Service Provider.

Logger troubleshooting application

If a problem occurs when installing or running Symposium TAPI SP, you can run the logger application to create a log of activities which can help to identify the source of the problem. The application displays information in the logger window that you can save in the overflow file for review by technical personnel.



Note: Run the logger application only if requested to do so by Nortel Networks GNCS.

Before you run a troubleshooting session with the logger application, verify that the desired log style is selected for the feature(s) you want to troubleshoot. For more information refer to [“Configuring the log styles table” on page 113](#).

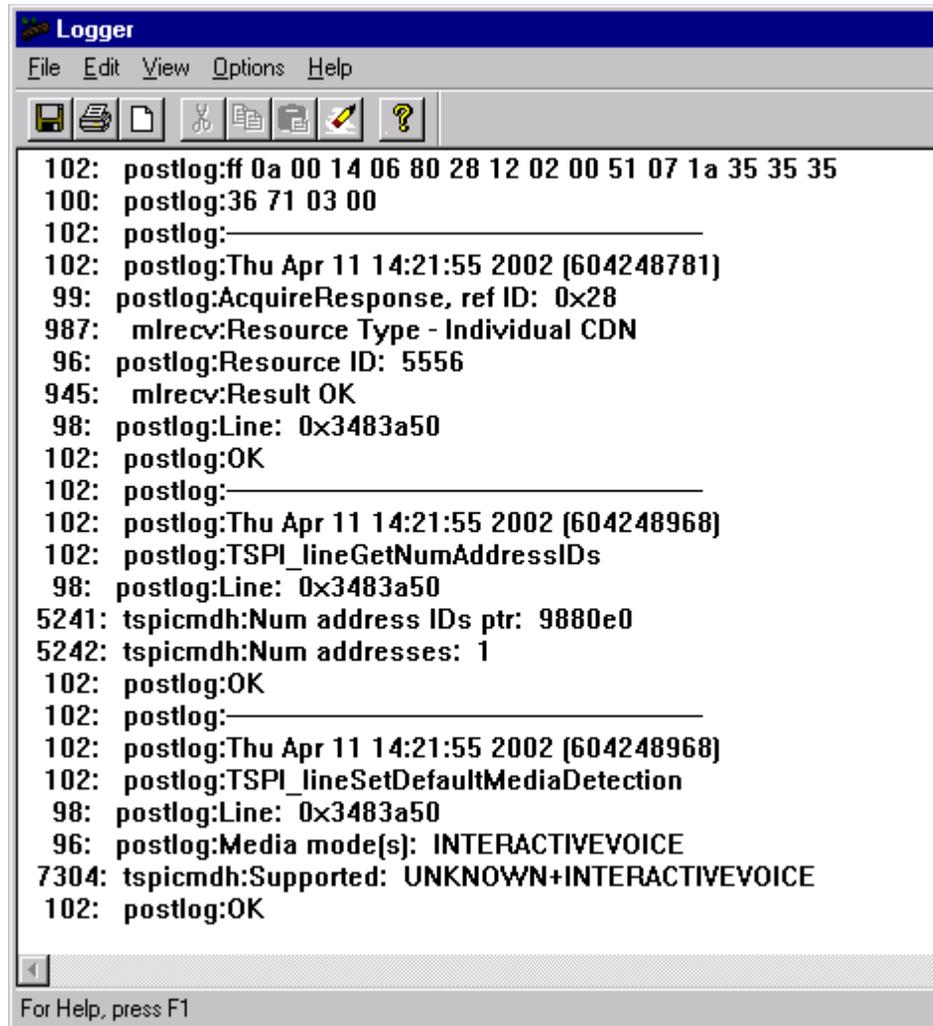
Running a troubleshooting session

To run a troubleshooting session in the logger application:

- 1 Stop the Symposium TAPI SP application.
- 2 In Windows Explorer, navigate to C:\mlserver\tools\logger.exe.

- 3 Start the logger application to display the logger window. (Figure 61)

Figure 61 Logger window



- 4 Select Options menu > Clear Overflow File. This procedure ensures that you save information from the current troubleshooting session only.
- 5 Start Symposium TAPI SP. The event and error messages that appear in the logger window are based on the log styles you defined for each feature in the host database.

Saving troubleshooting information

When the troubleshooting session is complete, save the information to file by performing one of the following procedures in the logger window:

- 1 Select Options menu > Append Overflow File.
- 2 Select File menu > Save As. Enter the desired file name and directory path.

Controlling the size of the active log file

In a busy call center, many megabytes of information can be generated in the log file in less than a minute, which can affect virtual memory availability for Symposium TAPI SP operations. To control the size of the active log file, use the recycle log file option to define a maximum size in megabytes for the log file and/or maximum time. When either of these conditions is met, the logger application renames the log file to the current name with a .bak extension and creates a new log file to continue the troubleshooting session. However, if these conditions are met a second time, the logger application repeats the procedure and overwrites the first backup file with the second backup file.

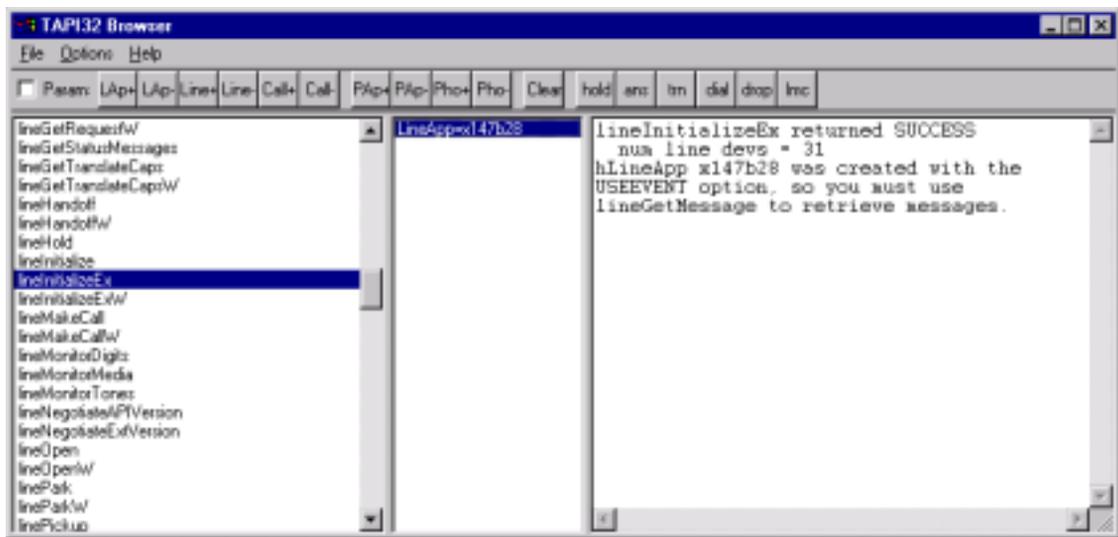
Printing the log file

You can print all the text in the log file by selecting File menu > Print, or by selecting the print icon located on the toolbar of the logger window. If you want to print only selected text in the log file, select the text you want to print and then select File menu > Print or select the print icon on the toolbar.

Microsoft TAPI browser application

The Microsoft TAPI browser application is provided with the Symposium TAPI SP software CD, or you can download it from the Microsoft Website at <http://www.microsoft.com>. To start the browser application, select Start > Programs > Nortel > Nortel Networks Symposium TAPI Service Provider for MI > TAPI browser to display the TAPI Browser window. (Figure 62)

Figure 62 TAPI Browser window

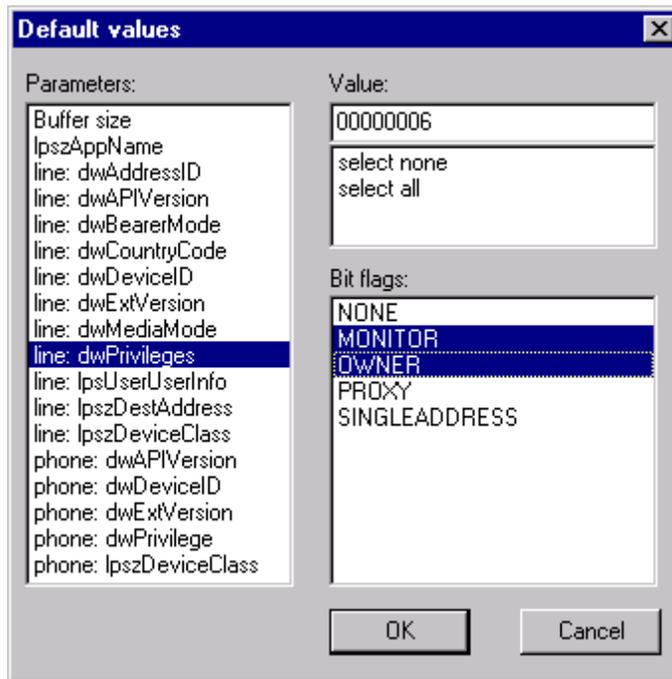


Verifying default line properties

To verify that the default values for a line are set to monitor, owner, and interactive voice:

- 1 Select Options menu > Default Values to display the Default Value Parameters window. (Figure 63)

Figure 63 Default Values Parameter window



- 2 In the Parameters pane, select line: dwPrivileges. Verify that MONITOR and OWNER are highlighted in the Bit flags pane. If monitor and owner are not highlighted, you can select them by holding down the control key while you click on both entries.
- 3 In the Parameters pane, select line: dwMediaMode. Verify that INTERACTIVE VOICE is selected in the Bit flags pane.
- 4 Click OK to save these default values.
- 5 To ensure that only active calls are monitored, in the main TAPI browser window, select Options menu > Auto-deallocate idle monitored calls.
- 6 To initialize these lines, load Symposium TAPI SP by selecting the LAp+ button on the tool bar.

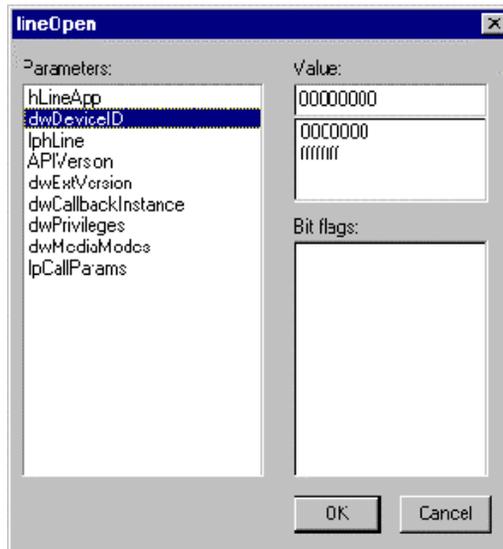
The middle pane lists the hexadecimal addresses where these lines are stored in TAPI server memory. The right-hand pane displays the number of lines that were initialized successfully.

Verifying that telephone sets are configured correctly

To verify that a telephone set is configured correctly:

- 1 In the Symposium TAPI SP configuration application, select Meridian 1 Host tab > TN table button to display a list of the TNs that are configured for Symposium TAPI SP. Identify the telephone set associated with line 0.
- 2 In the TAPI browser application, click the Param check box on the toolbar. Click the Line+ button on the toolbar to display the lineOpen window. (Figure 64)

Figure 64 LineOpen window



- 3 Select dwDeviceID in the left-hand pane.
- 4 Click OK to return to main configuration window.
- 5 Select line 0 in the middle pane of the main TAPI browser window.
- 6 Perform an action with the telephone set associated with line 0. For example, take the receiver off hook or make a manual call to the device.

- 7 Monitor the results of these activities in the right-hand pane to verify that the telephone is configured correctly.
- 8 For a more thorough verification, you can perform the same procedures on randomly selected lines.

If a success message does not appear in the right-hand pane in response to a specific action, start the logger application and perform the same procedures and save the log file for referral to technical support. For information refer to [“Running a troubleshooting session” on page 170](#).



Note: If the TAPI browser application ceases to operate for any reason, you must restart the server before you can restart the application.

Using the TAPI browser for acceptance testing

This section describes a number of acceptance tests you can perform through the TAPI browser application to ensure that Symposium TAPI SP is operating correctly. Before you begin:

- 1 Start the TAPI browser application.
- 2 Click the LAP+ button on the toolbar to load Symposium TAPI SP.
- 3 Ensure that the Parameters check box in the toolbar is deselected.
- 4 In the left-hand pane select OpenAllLines.

Answering an incoming call

To verify that Symposium TAPI SP answers incoming calls:

- 1 From another telephone set, dial the DN of a monitored telephone set.
- 2 Select the offering call in the middle pane. In the left-hand pane, select lineAnswer.
- 3 Click OK.

Making a blind transfer of a call

To make a blind transfer of a call:

- 1 Select the connected line in the middle pane. In the left-hand pane, select LineBlindTransfer.
- 2 Click OK.
- 3 Select the Dialtone line in the middle pane. In the left-hand pane, select LineDial.
- 4 In the left-hand pane, select IpszDestAddress. Enter a valid DN to which to transfer the call.
- 5 Click OK.



Note: You cannot perform a blind transfer to a CDN unless you install a patch to Symposium TAPI SP software. For more information contact your Nortel Networks representative or distributor.

Creating a 3-party conference call

To create a 3-party conference call:

- 1 Follow earlier procedures for answering an incoming call.
- 2 In the left-hand pane select LineSetupConference.
- 3 In the right-hand pane select the Dialtone line. In the left-hand pane select LineDial.
- 4 In the left-hand pane select IpszDestAddress. Enter a valid DN to which to conference the call.
- 5 In the middle pane select OnHoldPendingConference. In the left-hand pane, select LineAddToConference.

Calling from a digital telephone set to DN and ACD sets

To make a call on a digital telephone set for DN and ACD telephone sets:

- 1 In the middle pane, select a line that will make the call. In the left-hand pane, select lineMakeCall.
- 2 In the left-hand pane, select IpszDestAddress. Enter a valid DN to call.
- 3 Click OK.

Putting a call on hold and unhold

To put a call on hold and unhold:

- 1 In the middle pane, select a connected. In the left-hand pane, select lineHold.
- 2 To unhold the call, in the middle pane select the onhold call. In the left-hand pane, select lineUnHold.

Windows phone dialer application

Windows NT and Microsoft Windows 2000 operating systems provide a phone dialer application that you can use to verify that Symposium TAPI SP is operating correctly. To call a line monitored by Symposium TAPI SP, perform the following tasks:

- 1 Select Start > Programs > Accessories > Communications > Phone Dialer to start the phone dialer application.
- 2 Select a line number to control from the drop-down list to display the keypad.
- 3 Dial a known working number that can be answered. A completed call verifies that Symposium TAPI SP is working correctly.

Common troubleshooting issues

This section provides troubleshooting guidelines for a number of common issues. There are simple solutions for some issues. Other issues require that you perform a number of procedures in a specific order so that you can isolate the source of the problem.

Symposium TAPI SP fails to initialize lines

If Symposium TAPI SP supports more than 50 lines, the lines can fail to initialize when you start Symposium TAPI SP. The failure occurs because the initialization time-out value is too low. The default and minimum value for this parameter is 32 seconds, but you must increase the value if you are supporting more than 50 lines. For information on changing the initialization time-out value, refer to [“Configuring the provider table” on page 93](#).

First call attempt fails

If your first attempt to make a call fails, after you install and configure the various hardware and software components of your TAPI environment, verify the following are configured correctly:

- all hardware connections
- direct connect and value added server (VAS) ID
- DCE/DTE jumper settings
- direct connect (Link 0) values
- Meridian Link (Link 1) values
- IP address of the TAPI server
- host database table values
- TAPI client application

Download from the Meridian 1 switch fails

After you download switch configurations from the Meridian 1 switch, if no lines appear in the Symposium TAPI SP database, or if you receive an error message indicating that the download failed, perform the following tasks:

- 1 Verify that the text “LD 20” appears in the download.txt file.
- 2 Verify that an AST value is defined for each TN. The text conversion tool requires an AST value to write a TN into the Symposium TAPI SP database.

Testing connectivity

Various methods of testing the E-LAN link on the Meridian 1 switch are described in the Meridian 1 product documentation. Nortel Networks can request you to run a troubleshooting session in the logger application to log the messages that are exchanged during connectivity tests.

Testing the TCP/IP connection

Use the ping command to test the TCP/IP connection from Symposium TAPI SP to the SCCS or to the Meridian 1 switch. To perform a ping on the connection:

- 1 Open a DOS window on the TAPI server.
- 2 Type ping [SCCS/Meridian 1 switch TCP/IP address]
- 3 If the ping is successful, a message is displayed saying the host was contacted.
- 4 If the ping is not successful, a message is displayed saying the host was not contacted.
- 5 Close the ping window by pressing Esc.

Idle message when a remote party disconnects a call

When a remote party disconnects a call, Symposium TAPI SP sends a disconnected call state message. To clear the call, Microsoft TAPI must also drop the call, by invoking the lineDrop command. This command causes Symposium TAPI SP to change the call state to idle.

A call handle remains valid after a call is dropped to enable Microsoft TAPI to use call operations such as lineGetCallInfo to retrieve information about a call, for example for logging purposes. Microsoft TAPI eventually uses the linCloseCall command to shut down operations for the call and release the call handle.

No telephony devices appear in TCMApp

If many TNs in a large database are removed and new ones are added, TCMApp adds the new lines to the end of the list of available telephony devices. If you cannot see any telephony devices, scroll down to find the newly added TNs.

Connectivity problems and solutions

Table 21 provides troubleshooting solutions for a range of connectivity issues that you can encounter.

Table 21 Resolving connectivity issues

Problem	Solution
Symposium TAPI SP does not load and you receive the following error message: Connect error, host %s %d	This error message indicates that a connection cannot be made to Meridian Link Services on the SCCS or on the Meridian 1 switch. Use the ping command to check the connection, the host name, and the IP address of the SCCS or the Meridian 1 switch.
The connection to the Meridian 1 switch cannot be established. The switch tries to connect but does not give a registration association identifier.	<ul style="list-style-type: none"> On the Meridian 1 switch, use mlsr commands to check Meridian Link Services operation on the Meridian 1 switch. Refer to the Meridian 1 product documentation for information. Check the Symposium TAPI SP configurations to ensure that all values are correct.
A client application cannot access Symposium TAPI SP.	<ul style="list-style-type: none"> Verify that Symposium TAPI SP is registered and operational. Access the Windows task manager by right-clicking the mouse on the Windows menu bar to verify that the TAPISRV application is running.
Client applications are not initialized by Symposium TAPI SP.	<ul style="list-style-type: none"> On the Meridian 1 switch, use mlsr commands to check Meridian Link Services operation on the Meridian 1 switch. Refer to the Meridian 1 product documentation for information. Check the Symposium TAPI SP configurations to ensure that all values are correct. Access the Windows task manager by right clicking the mouse on the Windows menu bar to verify that the TAPISRV application is running.
The switch connection drops and terminates calls. You receive an error message: Failed to allocate call info memory. The following message appears in the error log: Resource_limitation _rejection.	All existing calls are aborted. While the connection is down, no new requests are allowed; however, Symposium TAPI SP continues to advertise services. The reason for this behavior is that Symposium TAPI SP has run out of memory and the solution is to add more memory to the server.

Table 21 Resolving connectivity issues (continued)

Problem	Solution
Symposium TAPI SP stops responding.	<ul style="list-style-type: none"> • If the Meridian 1 switch fail, use Meridian 1 procedures to identify and correct the problem. • Verify that Symposium TAPI SP is registered and operational. • Access the Windows task manager by right-clicking the mouse on the Windows menu bar to verify that the TAPI SRV application is running. <p>If Symposium TAPI SP still does not respond, shut down and restart your machine to close the TAPISRV application file. Uninstall and reinstall Symposium TAPI SP.</p>
An incoming call over an Inbound ANI (IANI) trunk carrying a 10-digit ANI terminates at an ACD agent's In-Calls key. However, if the call appears in a TAPI-compliant application and the incoming caller hangs up (abandons the call), all subsequent calls to the InCalls key are not recognized.	The agent must answer the next call by pressing the In-Calls key on the set manually.

Port conflicts

To identify whether any port conflicts exist, in a Windows NT command console, enter the command: **netstat -a**. This command generates a list containing the following information about ports:

- protocol — either TCP or UDP
- local address of the machine and the port that are in use
- foreign address and port number
- state — LISTENING, ESTABLISHED, CLOSE_WAIT, or TIME_OUT

The presence of a port 5000 on this list before you install Symposium TAPI SP indicates a potential conflict.

The following list is a typical example:

```
netstat -a
Active Connections
Proto Local Address          Foreign Address         State
TCP   tapidmsscout:ftp       0.0.0.0:0               LISTENING
TCP   tapidmsscout:70        0.0.0.0:0               LISTENING
TCP   tapidmsscout:80        0.0.0.0:0               LISTENING
TCP   tapidmsscout:135      0.0.0.0:0               LISTENING
TCP   tapidmsscout:135      0.0.0.0:0               LISTENING
TCP   tapidmsscout:407      0.0.0.0:0               LISTENING
TCP   tapidmsscout:1031     0.0.0.0:0               LISTENING
TCP   tapidmsscout:1035     0.0.0.0:0               LISTENING
TCP   tapidmsscout:1052     0.0.0.0:0               LISTENING
TCP   tapidmsscout:1691     0.0.0.0:0               LISTENING
TCP   tapidmsscout:137      0.0.0.0:0               LISTENING
TCP   tapidmsscout:138      0.0.0.0:0               LISTENING
TCP   tapidmsscout:nbsession 0.0.0.0:0               LISTENING
TCP   tapidmsscout:137      0.0.0.0:0               LISTENING
TCP   tapidmsscout:138      0.0.0.0:0               LISTENING
TCP   tapidmsscout:nbsession 0.0.0.0:0               LISTENING
TCP   tapidmsscout:nbsession PLATFORM3:1377          ESTABLISHED
TCP   tapidmsscout:nbsession BUILD:4664              ESTABLISHED
TCP   tapidmsscout:1052     47.113.64.34:8888      CLOSE_WAIT
TCP   tapidmsscout:1691     ntftp:ftp               ESTABLISHED
TCP   tapidmsscout:4029     0.0.0.0:0               LISTENING
TCP   tapidmsscout:4029     ntftp:nbsession         ESTABLISHED
TCP   tapidmsscout:137      0.0.0.0:0               LISTENING
TCP   tapidmsscout:138      0.0.0.0:0               LISTENING
TCP   tapidmsscout:nbsession 0.0.0.0:0               LISTENING
TCP   tapidmsscout:1029     0.0.0.0:0               LISTENING
TCP   tapidmsscout:1029     localhost:1035          ESTABLISHED
TCP   tapidmsscout:1030     0.0.0.0:0               LISTENING
TCP   tapidmsscout:1035     localhost:1029          ESTABLISHED
UDP   tapidmsscout:135      *:*
UDP   tapidmsscout:407      *:*
UDP   tapidmsscout:nbname   *:*
UDP   tapidmsscout:nbdatagram *:*
UDP   tapidmsscout:nbname   *:*
UDP   tapidmsscout:nbdatagram *:*
UDP   tapidmsscout:nbname   *:*
UDP   tapidmsscout:nbdatagram *:*
```

Microsoft TAPI issues

This section describes some common issues related to Microsoft TAPI.

No error recovery

If you need to restart Microsoft TAPI, for example after an application ceases to operate, you must shut down and restart the server. Because users can not stop the TAPISRV application there is no way of unloading Microsoft TAPI except by restarting the server.

TAPISRV unable to locate the DLL file

If you receive the error message `tapisrv.exe unable to locate DLL`, you must restart the server to enable the system to locate the DLL file.

RegisterProcessService not found

If you receive the error message `RegisterProcessService not found in kernel32.dll`, you have installed a version of Windows NT 4.0 that contains an incorrect release of the TAPISRV application. This version of TAPISRV issues a call to the `kernel32.dll` for a `RegisterProcessService`, but this routine no longer exists in the `kernel32.dll`. This version of the software appears on some Microsoft developer CDs and the size and date of the file are:

- file size — 111,616 bytes
- date — 06/17/97 5:48pm

To resolve this problem you must either reinstall the operating system from an installation CD that you know to be reliable, or repair the TAPISRV application by upgrading from Microsoft TAPI 2.0 to a later version.

LINERR_NODRIVER error message

A `LINERR_NODRIVER` error message indicates that Microsoft TAPI is assigning the first line to a unimodem. Nortel Networks recommends that you do not install a modem on the TAPI server. To resolve the conflict, uninstall the modem driver from the server.

LineInitializeEx reports Success when the service is stopped

When Symposium TAPI SP is stopped, Microsoft TAPI continues to load other TAPI providers, presenting a success report followed by the number of devices. However, when the Symposium TAPI SP service is stopped, the number of devices is reported as 0.

Meridian Link Services issues

This section contains known issues that occur when Meridian Link Services does not present complete information.

Meridian Link Services presents no information

Meridian Link Services presents no information on incoming calls that are not answered and forwarded to a CDN. However, if the call is answered manually, a status change message of active is presented, followed by a connected message.

Call progress messages not delivered

If a non-AST controlled telephone is called as the consultation leg of a manually initiated (from the telephone and not a TAPI application) conference call, certain call progress messages are not delivered to the application.

For example, consider three telephones: A, B and C. Both A and B are under AST-control, but C is not. The agent on telephone A establishes a call to the agent on telephone B. Using the conference key and the key pad on A, agent A places a consultation call to the agent on telephone C. Because no Meridian Link Services messages are sent when C answers the call, Symposium TAPI SP cannot determine if agent C answered. In this scenario, Symposium TAPI SP registers the call events as follows:

- Agent A establishes a call to agent B — CallHandle1 = CONNECTED.
- Agent A places a consultation call to agent C resulting in the following:
 - CallHandle1 = CONFERENCED
 - CallHandle2 = DIALTONE

— CallHandle3 = ONHOLDPENDING-CONF



Note: CallHandle2 is the consultation leg of the call and CallHandle3 is the conference call.

- Agent C answers the consultation call and all call handles remain the same.
- Agent A completes the conference call resulting in the following:
 - CallHandle1 = CONFERENCED
 - CallHandle2 = CONFERENCED
 - CallHandle3 = CONNECTED

Consider a second scenario, where agent C disconnects prior to the completion of the conference call. Meridian Link Services does not send any message indicating that agent C disconnected. In this situation Symposium TAPI SP, and subsequently the TAPI application, lose track of the true state of the call. In such a scenario Symposium TAPI registers the call events as follows:

- Agent A establishes a call to agent B — CallHandle1 = CONNECTED.
- Agent A places a consultation call to agent C resulting in the following:
 - CallHandle1 = CONFERENCED
 - CallHandle2 = DIALTONE
 - CallHandle3 = ONHOLDPENDCONF
- Agent C answers the consultation call and all call handles remain the same.
- Agent C disconnects before agent A completes the conference call and all call handles remain the same.

The behavior in this scenario is not typical and would not be expected by a TAPI application. CallHandle2 and CallHandle3 ought to change to the idle state, while CallHandle1 ought to change to the onhold state.

The same problem can occur with a supervised transfer, given the same three phones as described in the earlier scenarios. No messages are sent when agent C answers the consultation call, or when agent C drops a call prior to completion of the supervised transfer.

Status change messages not delivered

If a transfer consultation call is dropped after it is answered but before it is completed, Symposium TAPI SP does not deliver status change messages except in the following circumstances:

- The third party does not answer.
- The consultation call is to an AST-monitored telephone set.

If the consultation call is to an AST-monitored telephone set, the internal status is relayed back to the telephone set that initiated the call, enabling proper recovery.

When a three-party conference is manually created and put on hold, Meridian Link Services does not send a status change message to Symposium TAPI SP, with the result that the service provider does not know the call is on hold.

Dropping the original call during consultation transfer

If the original call is dropped while the consultation call is ringing, Symposium TAPI SP fails.

Transferring number not displayed

When transferring a call, Meridian Link Services supplies only the DN of the party performing the transfer if the destination party DN is AST-controlled.

Blind transfer fails

It is not possible to perform a blind transfer to a CDN unless you install a patch for Symposium TAPI SP. For information refer to Nortel Networks GNCS.

Caller ID not reported

Meridian Link Services does not transfer the CLID to the called party in a conference call if the receiving DN is not AST-controlled. The CLID of the party initiating the conference displays as unknown.

Call status messages sent by Meridian Link Services

Meridian Link Services still sends call status messages, even if you select outbound call processing only in the configuration application. It is normal practice to select inbound call processing as well.

Called number not displayed when routed to a CDN

Meridian Link Services presents the calling number, but not the called number, when the incoming call is transferred or forwarded to a CDN. For example, 2495 calls 2491, 2491 forwards the call to a CDN (2121). The route request message shows the calling number (2495) but not the called number (2491).

Call parking not supported

Meridian Link Services does not support call parking. There are no park or unpark status change messages. When a call park is performed manually at the telephone set, the call is reported as on hold and does not go off hold. If the call is not picked up, a new call is presented in addition to the onhold call, with the same CLID as the CLID of the held call.

Enhanced ISDN progress messages for outbound calls

Meridian Link Services provides additional information on the progress of networked calls for outbound calls provided by the Meridian 1 switch over ISDN. The Meridian Link protocol, minimum release 5, supports all of the following ISDN-related, information element (IE) messaging:

- 1 — unallocated (unassigned) number
- 3 — no route to destination
- 17 — user busy
- 18 — no user responding
- 22 — number changed
- 27 — destination out of order
- 28 — invalid number format (address incomplete)
- 34 — no circuit/channel available
- 38 — network out of order
- 41 — temporary failure

- 42 — switch equipment congestion
- 127 — interworking, unspecified with inband information available

Predictive dialer and outbound dialing applications can process more calls in less time by interpreting the called party status. Invalid numbers can be compiled and manually updated by agents to increase the accuracy of the customer database.

Glossary of acronyms

A

ACD
automatic call distribution

ANI
automatic number identification

AST
associated set

B

BDC
backup domain controller

C

CDN
control destination number

CED
caller entered data

C-LAN
customer LAN

CLID
calling line identification

CPU
central processing unit

CSE1000
Communication Server for Enterprise 1000

CTI
computer telephony integration

D

DN
directory number

DNIS
dialed number identification service

DNS
domain name service

E

E-LAN
embedded LAN

ESN
electronic switched network

G

GB
gigabyte

GUI
graphical user interface

H

HDX
Host Data Exchange

HLOC
Home Location Code

I

IP

Internet Protocol

IPML

integrated package for Meridian Link

ISDN

integrated services digital network

IVR

interactive voice response

L

LAN

local area network

LOC

Location code

LST1/EI card

line side T1/E1 card

M

MADN

multiple appearance directory number

MAT

Meridian Administration Terminal

MB

megabyte

MCN

multiple call no ring

MCR

multiple call ring

MSB

make set busy

N

NACD

network automatic call distribution

NMS

Network Management System

NRD

not ready

NSBR

network skill based routing

O

OTM

Optivity Telephony Manager

P

PBX

private branch exchange

PDC

Primary Domain Controller

PEP

product enhancement package

PIN

personal identification number

PSTN

public serviv telephone network

PVI

platform vendor independent

R

RAM

random access memory

RAN

recorded announcement

RAS
remote access services

RDB
route data block

RPC
remote procedure call

RSP
remote service provider

S

SAM database
security account management database

SBR
skill based routing

SCCS
Symposium Call Center Server

SECC
Symposium Express Call Center

Symposium TAPI SP
Symposium TAPI Service Provider

T

TAPI
telephony application programming
interface

TAPISRV
Microsoft TAPI server

TCP/IP
Transport Control Protocol/Internet Protocol

TN
terminal number

TNB
terminal number block

V

VLAN
virtual LAN

VPS/is
voice processing server/information server

W

WAN
wide area network

A

ACD

- features supported with releases of Symposium

- TAPI SP 162

- overview 31

- proxy service overview 31

- active desktop domain management 65

- additional database

- configuration 116

- administrative features supported by releases of

- Symposium TAPI SP 165

- agent walkaway

- logger application display 32

- assigning lines to clients

- Microsoft Windows 2000 server 84

- Windows NT 4.0 server 79

- auto link recovery

- Meridian 1 switch 34

- overview 34

- Symposium TAPI SP 34

- automatic call distribution. See ACD

B

- backup domain controller. See BDC

BDC

- overview 64

C

- call center environment

- C-LAN 26

- dynamic database updating 87

- E-LAN 26

- feature interactions 35

- illustration 26

- installation 53

- installing Symposium TAPI SP 56

- isolated C-LAN 55

- LAN requirements 53

- Meridian Link Services 25

- overview 25

- SCCS LAN connectivity 26

- skill-based routing 25

- Symposium Express Call Center (SECC) 26

- call control

- basic features supported 30

- basic features supported with releases of

- Symposium TAPI SP 160

- enhanced features supported 31

- enhanced features supported with releases of

- Symposium TAPI SP 161

- call data 153

- associated with a network CLID 134

- associated with a specific DN port 134

- configuring life span in the provider table 94

- configuring size in the provider table 94

- disabling copy to consultative calls in the

- provider table 94

- NACD overflow 38

- network CLID 138

- network TAPI 38

- networked 134

- networking between IVR and Symposium TAPI

- SP 139

- networking between TAPI servers with NACD

- overflow 143

- networking configuration 138

- networking verification 139

- not presented in screen pop 151

- not seen in consultative call 152

- supported by IVR driver 133

- tracking NACD overflow 137

- verifying without NACD 148

- CDN

- adding to Symposium TAPI SP database 105

- configuring in Symposium TAPI SP

- database 104

- deleting from Symposium TAPI SP

- database 106

- downloading from Meridian 1 switch 89

- modifying in Symposium TAPI SP

- database 105

- CDN table

- adding a new CDN 105

- configuration 104
 - deleting a CDN 106
 - modifying a CDN 105
 - C-LAN
 - call center environment 26
 - data traffic 43
 - isolated, configuration 55
 - isolating TAPI traffic 55
 - isolation 43
 - SCCS 26
 - CLID
 - monitoring 134
 - client user logon issues 76
 - communication features supported by releases of Symposium TAPI SP 164
 - configuration
 - adding a telephony administrator on Microsoft Windows 2000 server 84
 - additional database 116
 - after a software upgrade 120
 - assigning lines to clients on Microsoft Windows 2000 server 84
 - automatic 29
 - configuring database tables 92
 - converting the text file from Meridian 1 switch download 89
 - defining a routing table 44
 - domains on a Windows 2000 server 72
 - downloading Meridian 1 switch information 88
 - E-LAN 43
 - enabling telephony services on Microsoft Windows 2000 server 81
 - FlexLM License Manager 60
 - increasing the number of clients 123
 - isolated C-LAN 55
 - manual 30
 - Meridian 1 Host table 95
 - Microsoft TAPI 77
 - Microsoft TAPI on Microsoft Windows 2000 server 80
 - Microsoft TAPI on Windows NT 4.0 server 78
 - network TAPI/IVR table 106
 - provider table 93
 - recovering database information after a software upgrade 121
 - retaining line associations after a software upgrade 121
 - TAPI clients 86
 - trunk table 97
 - verifying a software upgrade 121
 - Windows NT server as a PDC 71
 - Windows NT server as a standalone server in a domain 69
 - configuration application
 - CDN table 104
 - configuring database tables 92
 - configuring the provider table 93
 - converting the text file from Meridian 1 switch download 89
 - log styles table 113
 - Meridian 1 Host table 95
 - network TAPI/IVR table 106
 - overview 34
 - TN table 100
 - treatments table configuration 98
 - trunk table configuration 97
 - customer LAN. See C-LAN
- ## D
- debug.log
 - overview 35
 - desktop PC compatibility with Symposium TAPI SP releases 157
 - devices controls supported by releases of Symposium TAPI SP 163
 - diagnostic features supported by releases of Symposium TAPI SP 165
 - direct connect environment
 - ACD 25
 - dynamic database updating 87
 - feature interactions 36
 - illustration 27
 - installation 47
 - knowledge worker environment 27
 - overview 27

-
- DN
 - adding to Symposium TAPI SP database 103
 - configuration 100
 - deleting from Symposium TAPI SP database 104
 - IVR monitoring 134
 - modifying in Symposium TAPI SP database 103
 - number supported with releases of Symposium TAPI SP 163
 - domains
 - active desktop 65
 - backup domain controller (BDC) 64
 - client user logon issues 76
 - common causes of RPC failure 75
 - configuring a Windows NT server as a PDC 71
 - configuring a Windows NT server as a standalone server 69
 - configuring on a Microsoft Windows 2000 server 72
 - domain controllers 64
 - master security database 64
 - member 64
 - Microsoft trust relationships
 - recommendations 66
 - modem-based applications issues 77
 - non-standard multidomain configuration 68
 - overview 64
 - primary domain controller 64
 - remote access services (RAS) issues 76
 - remote procedure call 75
 - reverse RPCs 75
 - RPC behaviour in a typical TAPI call 75
 - SAM database maximum size 65
 - SAM database overview 64
 - standalone server 64
 - standard multidomain configuration 67
 - Symposium TAPI SP considerations 66
 - validating RPC configuration 76
 - Windows 2000 server 65
 - downloading control directory number (CDN) blocks 89
 - downloading route data blocks 89
 - downloading terminal number blocks 88
 - dynamic database
 - call center environment 87
 - direct connect environment 87
 - overview 34
 - E**
 - E-LAN
 - assigning an IP address 44
 - call center environment 26
 - configuration 43
 - isolation 43
 - SCCS 26
 - telephony traffic 43
 - embedded LAN. See E-LAN
 - enabling telephony services
 - Microsoft Windows 2000 server 81
 - Windows NT 4.0 server 79
 - F**
 - feature interactions
 - call center environment 35
 - direct connect 36
 - general 36
 - knowledge worker environment 36
 - SCCS 35
 - FlexLM License Manager
 - configuration 60
 - overview 30
 - troubleshooting overview 35
 - upgrading 121
 - I**
 - increasing the number of clients 123
 - installation
 - call center environment 53
 - direct connect 47
 - full reinstall of Symposium TAPI SP 118
 - knowledge worker environment 47
 - PEP on a Microsoft Windows 2000 server 118
-

- PEP on a Windows NT 4.0 server 118
 - SCCS prerequisites 54
 - security device 42
 - Symposium TAPI SP 48
 - Symposium TAPI SP in a Call Center environment 56
 - uninstalling an earlier release from a Microsoft Windows 2000 server 119
 - uninstalling from a Windows NT 4.0 server 119
 - verifying PEP installed successfully 118
 - interactive voice response. *See* IVR
 - interface device compatibility with releases of Symposium TAPI SP 159
 - IP address
 - activating 45
 - Meridian 1 switch 44
 - recovery 46
 - validation 45
 - IVR
 - adding a remote IVR host address to Symposium TAPI SP database 108
 - adding IP address to Symposium TAPI SP database 108
 - adding Meridian 1 switch HLOC to Symposium TAPI SP database 108
 - call data networking and Symposium TAPI SP 139
 - call data not presented in screen pop 151
 - call flow example 131
 - caller data message 133
 - caller info data message 133
 - CTI integration with Meridian 1 switch 132
 - deleting a remote IVR host address to Symposium TAPI SP database 110
 - disconnect message 133
 - driver for Symposium TAPI SP 133
 - driver support for network call data 133
 - integration CTI capabilities with Symposium TAPI SP 130
 - IPML 130
 - IPML overview 136
 - IVR port address in Symposium TAPI SP database 108
 - IVR-CTI messages 133
 - LAN configuration 132
 - license file considerations 129
 - modifying a remote IVR host address in Symposium TAPI SP database 109
 - monitor DNs 134
 - monitor network CLIDs 134
 - network call data 134
 - networked call data between TAPI servers 143
 - no registration message on TAPI server initialization 150
 - overview 28, 33
 - Periphonics IVR system 130
 - Periphonics system overview 135
 - port list 134
 - port monitor list 134
 - registration message 133
 - request call data message 133
 - troubleshooting 149
 - troubleshooting call data not presented with NACD overflow 153
 - troubleshooting call data not seen in consultative call 152
 - troubleshooting call data transferred from IVR port to ACD queue 151
 - unsolicited status message 133
 - verifying call data networking 139
 - verifying call data networking without NACD 148
 - VPS/is 130
 - VPS/is overview 135
- ## K
- knowledge worker environment
 - ACD 25
 - direct connect 27
 - feature interactions 36
 - illustration 27
 - installation 47
 - overview 27

L

LAN

- call center environment 26
- call center environment requirements 53
- configuration 43
- IVR configuration 132
- SCCS connectivity 26
- SCCS requirements 53

license file

- configuration 60
- management overview 30
- maximum number of DNs supported 30
- network TAPI/IVR considerations 129
- upgrading 121

line associations

- retaining after a software upgrade 121

link loss detection 97

log style

- configuration 113
- provider table 94
- treatments table 98

log styles table

- adding a log style 114
- configuration 113
- default log styles 113
- deleting a log style 115
- editing a log style 115

logger application

- adding a log style 114
- agent walkaway feature 32
- configuring log styles 113
- default log styles 113
- deleting a log style 115
- editing a log style 115
- overview 34

MMADN feature support for Symposium TAPI
SP 166

management applications

- configuration application overview 34

license file troubleshooting overview 35

logger application overview 34

TAPI browser application overview 35

Meridian 1 Host table

- CDN table 104
- configuration 95
- customer number 96
- host address 96
- host name 96
- host port 96
- machine name 96
- Meridian 1 release 96
- Meridian Link release 96
- monitor all DNs/no DNs 97
- phantom DN 96
- polling interval 97
- registration password 96
- services 97
- TN table 100
- treatments table 98
- trunk table 97

Meridian 1 switch

- activating an IP address 45
- assigning an IP address 44
- auto link recovery 34
- defining a routing table 44
- downloading switch information to TAPI
server 88
- IP address recovery 46
- ISDN trunks to other switches for NACD 137
- IVR-CTI integration capabilities 132
- optional applications 42
- required applications 41
- Symposium TAPI SP release compatibility 155
- TAPI-enabling 41
- validating an IP address 45

Meridian Link Services

- overview 29

Microsoft TAPI

- assigning lines to clients on Microsoft Windows
2000 server 84
- assigning lines to clients on Windows NT 4.0
server 79

- client domain 63
- client machine 63
- client machine domain 63
- client user 63
- client user issues 76
- compatibility with Symposium TAPI SP 157
- configuration 77
- configuring TAPI clients 86
- enabling telephony services on Microsoft Windows 2000 server 81
- enabling telephony services on Windows NT 4.0 server 79
- modem-based applications issues 77
- overview 29
- remote access services (RAS) issues 76
- remote service provider 63
- server machine 63
- server machine domain 63
- server service 63
- server user 63
- server user domain 63
- TAPISRV application 29
- terminology 63
- trust relationships recommendations 66
- Windows NT 4.0 server configuration 78

Microsoft Windows 2000

- service pack compatibility with releases of Symposium TAPI SP 158

Microsoft Windows 2000 server

- adding a telephony administrator 84
- assigning lines to clients 84
- configuring Microsoft TAPI 80
- enabling telephony services 81
- installing a PEP 118
- Microsoft TAPI configuration 80
- RPCs 75
- uninstalling an earlier release 119

Microsoft Windows remote service provider 29

N

NACD

- ISDN trunking between Meridian 1 switches 137
- Meridian 1 switch application 138
- network TAPI overview 37
- overflow and call data 38
- overflow of call data between networked TAPI servers 143
- overflow verification 144
- verifying call data networking without NACD 148

network TAPI

- call data and NACD overflow 38
- call data networking requirements 38
- call data overview 37
- overview 37

network TAPI/IVR table

- adding Meridian 1 switch HLOC 108
- configuration 106
- deleting a remote host address 110
- IP address of IVR server 108
- IVR port address 108
- modifying a remote host address 109
- remote host address 108

Nortel Networks application compatibility with releases of Symposium TAPI SP 159

not presented with NACD overflow 153

O

outbound dialing applications

- overview 33

P

PDC

- configuring a Windows NT server 71
- master security database for domain 64
- overview 64
- SAM database maximum size 65

PEP

- installation 117
- installing on a Microsoft Windows 2000 server 118

installing on a Windows NT 4.0 server 118
 verifying installation 118

Periphonics IVR overview 135

platform vendor independent (PVI) 23

predictive dialing applications
 overview 33

primary domain controller. See PDC

product enhancement package. See PEP

provider table
 application name 94
 call data life span 94
 call data size 94
 command timeout value 94
 configuration 93
 disable copy of call data to consultative call 94
 initialization timeout value 94
 log style 94
 shutdown timeout value 94

R

Remote Office support for Symposium TAPI
 SP 166

remote procedure call. See RPC

routing table
 configuration 44

RPC

common causes of failure 75
 in a typical TAPI call 75
 Microsoft Windows 2000 server 75
 reverse 75
 trust relationships overview 75
 validating configuration 76

S

SADDBMON
 overview 35

SAM database
 maximum size 65

SCCS

C-LAN 26

E-LAN 26
 feature interactions 35
 illustration 26
 Meridian Link Services 25
 skill-based routing 25
 TAPI-enabling 54

security
 features supported by releases of Symposium
 TAPI SP 164
 overview 33

security account management database. See SAM
 database

security device
 installation 42

Succession CSE1000 support for Symposium TAPI
 SP 165

Symposium TAPI SP 71
 ACD features supported 162
 adding new features 127
 administrative features supported 165
 auto link recovery 34
 basic call control features supported 160
 call data networking and IVR 139
 changing the TAPI environment 127
 communication features supported 164
 compatibility with Microsoft TAPI 157
 compatibility with Microsoft Windows 2000
 service packs 158
 compatibility with Windows NT 4.0 service
 packs 158
 configuration application overview 34
 configuring a Windows NT server as a
 standalone server in a domain 69
 configuring domains on a Microsoft Windows
 2000 server 72
 desktop PC compatibility 157
 device controls supported 163
 diagnostic features supported 165
 domain considerations 66
 dynamic database overview 34
 enhanced call control features supported 161
 increasing the number of clients 123
 installation 48

- installation in a call center environment 56
- installation in a SCCS environment 56
- integrated IVR capabilities 130
- Interface device compatibility 159
- isolated C-LAN configuration 55
- IVR driver 133
- IVR-CTI call flow example 131
- IVR-CTI messages 133
- logger application overview 34
- Meridian 1 switch release compatibility 155
- Microsoft TAPI configuration 77
- non-standard multidomain configuration 68
- Nortel Networks application compatibility 159
- number of DNs supported 163
- number of lines supported 163
- recovering information after a software upgrade 121
- security features supported 164
- standard multidomain configuration 67
- support for MADN feature 166
- support for Remote Office 166
- support for Succession CSE1000 165
- telephone set compatibility 156
- third-party application compatibility 160
- upgrading 117
- upgrading features 123

T

- TAPI browser application
 - overview 35

- TAPI client
 - configuration 86
 - PCs supported 23

- TAPI server
 - backup domain controller (BDC) 64
 - domain member 64
 - domain standalone server 64
 - domains 64
 - downloading Meridian 1 switch information 88
 - installing the security device 42
 - primary domain controller 64
 - upgrading Symposium TAPI SP 117

- TAPIAdmin 78
- TAPIClient 78
- TAPISRV. See TAPI browser application
- target audience 24
- TCMApp 78
- TCMSetup 78
- telephone set
 - overview of control features 32
 - Symposium TAPI SP release compatibility 156
- third-party application compatibility with releases of Symposium TAPI SP 160

- TN
 - adding to Symposium TAPI SP database 100
 - configuration 100
 - deleting from Symposium TAPI SP database 102
 - modifying in Symposium TAPI SP database 101

- TN table
 - adding a DN 103
 - adding a new TN 100
 - configuration 100
 - deleting a DN 104
 - deleting a TN 102
 - modifying a DN 103
 - modifying a TN 101

- treatments table
 - adding a new treatment 99
 - configuration 98
 - deleting a treatment 99
 - log style 98
 - route number 98
 - treatment name 98
 - treatment type 99

- trunk monitoring
 - overview 33

- trunk table
 - adding a range of route numbers 98
 - adding a route number record 97
 - configuration 97
 - deleting a route number record 98

deleting all route numbers 98

trust relationships

common causes of RPC failure 75

remote procedure call 75

reverse RPCs 75

RPC behaviour in a typical TAPI call 75

validating RPC configuration 76

U

upgrading

adding new features 127

changing the TAPI environment 127

product enhancement package 117

Symposium TAPI SP 117

W

Windows NT 4.0 server

assigning lines to clients 79

enabling telephony services 79

installing a PEP 118

Microsoft TAPI configuration 78

service pack compatibility with releases of

Symposium TAPI SP 158

uninstalling an earlier release 119