Engineering Guidelines for Symposium TAPI Service Provider for Meridian 1, release 2.3.1

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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 ZBTSI 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.

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Preface

These engineering guidelines provide a product overview, hardware and software guidelines, and server engineering 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 *Engineering Guidelines for Symposium TAPI Service Provider for Meridian 1*, release 2.3.1, is designed to be read by system planners and 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 `ping <ip_address>`, you enter `ping 192.32.10.12`
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 `show ip {alerts|routes}`, you must enter either `show ip alerts` or `show ip routes`, 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 `show ip interfaces [-alerts]`, you can enter either `show ip interfaces` or `show ip interfaces -alerts`.
italic text	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 `show at <valid_route>`, *valid_route* 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: `Set Trap Monitor Filters`

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

Related publications

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

- *Network Managers Guide to Symposium TAPI Service Provider for Meridian 1, release 2.3.1,* part number 213346-A
- *Release Notes for Symposium TAPI Service Provider for Meridian 1, release 2.3.1,* part number 213347-A

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Chapter 1
Overview

This guide describes the engineering rules and capacity guidelines to apply when designing a computer telephony integration (CTI) system based on Symposium TAPI Service Provider for Meridian 1, release 2.3.1, and Microsoft TAPI, release 2.x or release 3.

Nortel Networks recommends that you adhere closely to the engineering rules and capacity guidelines as outlined in this document to ensure that the product operates effectively.

The guide is divided into the following chapters:

- Chapter 1 — Overview
- Chapter 2 — Hardware and software guidelines
- Chapter 3 — Server engineering guidelines

Product description

The Symposium TAPI Service Provider (SP) for Meridian 1 is a multifunctional service provider that is used in combination with Microsoft TAPI software, release 2.x or 3.0, to integrate the telephony capabilities of a Meridian 1 switch with windows-based business applications. The service provider enables a wide range of CTI functionality, in Call Center and knowledge worker environments.

Features

Symposium TAPI SP offers comprehensive support for the call processing features of a Meridian 1 switch, through a switch control protocol that enables Symposium TAPI SP to control the switch. The service provider enables the following functions:

- Meridian Call Center agent functions such as:
  — login
  — ready/not-ready
  — agent DN control
- basic call control
- enhanced call control
- automatic call distribution (ACD)
- device control
- support for outbound and predictive dialing applications from third-party vendors
- advanced integration with IVR systems for inbound calls
- multisite TAPI networking

Connection types

Symposium TAPI SP can enable a range of CTI features in a Meridian 1 network. You can choose one of three connection arrangements, depending on your existing equipment and the level of functionality you require. The connection types are as follows:

1 *Meridian Link services connection* is suitable if you wish to use Symposium TAPI SP in an existing Symposium Call Center with skill-based routing of calls. Select the link keycode option for this type of installation.

2 *Direct connection* is suitable if you do not require Call Center capabilities, for example you can use it in a knowledge worker environment where ACD-based routing over an Ethernet E-LAN connection is sufficient. Select the direct connect keycode option for this type of installation.

3 *Meridian Link connection* is suitable if you wish to add Symposium TAPI SP capabilities to an older Meridian Link system. The Meridian Link module has been replaced by Meridian Link services. Select the link keycode option for this type of installation.

Server location

The physical location of your TAPI server depends on the type of connection you require. In a Call Center the TAPI server must have physical proximity to the Symposium Call Center server (SCCS). In a direct connect environment, the server must have physical proximity to the Meridian 1 switch. Before you provision a server for Symposium TAPI services, refer to the *Network Managers Guide for Symposium TAPI Service Provider for Meridian 1, release 2.3.1*, for information about physical location requirements.

Server platform

Symposium TAPI SP is platform vendor independent (PVI) and can be installed on any PVI server that supports either Microsoft Windows 2000 server, with a minimum of service pack 2 installed, or a Windows NT server, release 4.0 or higher, with a minimum of service pack 6a installed. The servers are pre-loaded with the following Microsoft TAPI software releases:

- Windows NT server, release 4.0, supports Microsoft TAPI, release 2.x
- Microsoft Windows 2000 server supports Microsoft TAPI, release 2.x and release 3, while retaining compatibility with earlier releases

Warning: Symposium TAPI SP is supported only if it is installed in a true Windows environment. Symposium TAPI SP is not supported if it is installed in a Microsoft Terminal Services environment or terminal services environments from other vendors, such as Citrix.

Note: Nortel Networks supports Symposium TAPI SP only on English-language software versions.

Client PC support

Symposium TAPI SP supports TAPI-compliant applications running on a PVI client that supports one of the following operating systems:

- Microsoft Windows 2000 Professional
- Microsoft Windows ME

- Windows NT workstation
- Microsoft Windows 98
- Microsoft Windows 95

> → **Note:** Nortel Networks does not support TAPI-compliant applications running on the Microsoft Windows XP operating system, or on the Microsoft Windows.NET operating system.

Telephone set support

Symposium TAPI SP monitors and controls the telephony activities of the following telephones that are registered on a Meridian 1 switch:

- The following models of Meridian digital telephones:
  — M2008
  — M2216
  — M2616
  — M3110
  — M3310
  — M35xx
  — M39xx
- Meridian analog telephone set 2500 with certain limitations. For information refer to the *Network Managers Guide for Symposium TAPI Service Provider for Meridian 1*.
- i2004 Internet telephone
- i2050 software telephone

> → **Note:** Refer to the *Network Managers Guide for Symposium TAPI Service Provider for Meridian 1* for information about limitations in the operation of the multiple appearance and DN (MADN) feature on all telephone sets.

SAPphone support

SAP* has certified that Symposium TAPI SP, release 2.3.1. is compatible with
SAPphone* R/3, release 2.54, which is the soft phone interface to mySAP*
customer relationship management (CRM) solutions.

Chapter 2
Hardware and software guidelines

This chapter outlines the minimum hardware and software requirements for Symposium TAPI Service Provider, release 2.3.1. Nortel Networks recommends that you familiarize yourself with the engineering considerations outlined in Chapter 3, "Server engineering guidelines" and with the installation guidelines provided in the *Network Managers Guide for Symposium TAPI Service Provider for Meridian 1*, release 2.3.1, before you install Symposium TAPI SP on a server.

Hardware compatibility policy

Symposium TAPI SP can be installed on servers that are included on the Microsoft Compatibility List for the Windows NT 4.0 server or the Microsoft Windows 2000 server, available on the Microsoft Website at http://www.microsoft.com. The server must also conform to the following guidelines contained in this document:

• minimum hardware specifications
• installation of third-party software as outlined in this document
• any other guidelines specified in this document

The Nortel Networks' position is that the support contract for the PVI server hardware is with the server vendor and not with Nortel Networks. It is the responsibility of the distributor to ensure that the hardware platform is operational and properly prepared and tested prior to installing Symposium TAPI SP.

The distributor/end user must ensure that testing of a PVI server is carried out prior to putting the server into operation in a customer environment. The distributor/end user must attempt to resolve hardware faults before referring them to Nortel Networks. During the course of problem diagnosis, Nortel Networks Global Networks Technical Support (GNTS) may request that additional tests are carried out on PVI hardware.

Hardware guidelines

This section outlines the recommended server specification for a new installation of Symposium TAPI SP. If you are upgrading from an earlier release of Symposium TAPI SP, and do not want to upgrade your TAPI server, refer to the minimum requirements later in this section.

Recommended server configuration

If you are installing a new TAPI system, Nortel Networks recommends that you provision a server with adequate capacity for future upgrades.

Windows NT 4.0 server

Table 1 lists the recommended hardware configuration to install Symposium TAPI SP on a Windows NT 4.0 server.

Table 1 Recommended configuration for a Windows NT 4.0 server

Component	Minimum requirement
Computer/processor	Pentium III 1.0 GHz PC
Memory	256 MB RAM
Hard disk	20 MB of free disk space
Microsoft TAPI software	Pre-loaded on the Windows NT server, with a minimum of service pack 6a installed
Parallel port	Integrated IBM compatible, 25 pin, D type for attaching the security device
Disk drive	CD-ROM drive
Disk drive	3.5" floppy drive
• 1 x 10/100BASE-T Network Ethernet port • 2 x 10/100BASE-T network Ethernet ports	• Call Center installation • Direct connect installation
Monitor	VGA/Super VGA (800 X 600 pixels)
Peripherals	Keyboard and mouse

Microsoft Windows 2000 server

Table 2 lists the recommended hardware configuration to install Symposium TAPI SP on a Microsoft Windows 2000 server.

Table 2   Recommended configuration for a Microsoft Windows 2000 server

Component	Minimum requirement
Computer/processor	Pentium III 1.0 GHz PC
Memory	512 MB RAM
Hard Disk	20 MB of free disk space
Microsoft TAPI software	Pre-loaded on the Microsoft Windows 2000 server, with a minimum of service pack 2 installed
Parallel port	Integrated IBM compatible, 25 pin, D type for attaching the security device
Disk drive	CD-ROM
Disk drive	3.5 floppy
• 1 x 10/100BASE-T network Ethernet port • 2 x10/100BASE-T network Ethernet ports	• Call Center installation • Direct connect installation
Monitor	VGA/Super VGA (800 X 600 pixels)
Peripherals	Keyboard and mouse

Minimum hardware requirements

If you are upgrading to release 2.3.1 from an earlier release of Symposium TAPI SP, it is possible that your TAPI server does not conform to the hardware configurations recommended above. These recommendations ensure that the server has sufficient processing power to run the Symposium TAPI SP application while running debug utilities and other approved applications.

Backup, disaster recovery, and solution redundancy

A backup tape drive is not a requirement for Symposium TAPI SP.

You can use a hardware-RAID solution provided it doesn't have a negative impact on TAPI performance. If you encounter issues with a hardware-RAID solution, refer them to the RAID vendor. Software-RAID solutions, such as the one available from Microsoft, are not supported.

Nortel Networks is unable to guarantee compatibility with any high availability solution because such solutions usually require the installation of additional software or components which may conflict with Symposium TAPI operation.

If you require a hardware redundant solution it must be tested by one of the following:

• verification testing by a Nortel Networks Packaged Services group
• compatibility testing via the Nortel Networks Developer Program

For information refer to your Nortel Networks representative or visit the Nortel Networks developer program Website at http://www.nortelnetworks.com/developer.

> **Note:** Symposium TAPI SP does not support Microsoft clustering because the software is not, currently, cluster-aware.

Software guidelines

The real-time processing requirements of Symposium TAPI SP can be significantly impaired if unapproved software applications are running on the server. If you install approved software on the TAPI server, you must adhere to the following installation guidelines:

1 Verify that Symposium TAPI SP is operating correctly.

2 Install a software application.

3 Verify that Symposium TAPI SP is operating correctly.

4 Run the Performance Monitor application on the TAPI server to assess CPU utilization when Symposium TAPI SP, the logger application, and the new software are all running together.

If you want to install multiple applications, install each product separately and apply verification procedures before installing the next product, to ensure that you can eliminate the point of conflict or failure if problems occur.

Caution: In the event of performance-related issues, any unapproved software must be eliminated as the cause of the problem prior to contacting Nortel Networks GNTS.

Symposium TAPI SP can co-reside with Symposium Agent server software, but no other applications can be installed on the server which might impede TAPI performance. Third-party software cannot be installed on the TAPI server unless it is on Microsoft's Compatibility List and conforms to the guidelines provided in this section.

Note: The TAPI server must never exceed an average of 50% of CPU utilization with debug utilities running. If you install additional software components on the server, you must verify that it does not cause CPU utilization to exceed this capacity when debug utilities are running.

Third-party software guidelines

Warning: Nortel Networks authorizes the installation of Symposium Agent server software on the TAPI server. However, due to the mission-critical, real-time processing performed by Symposium TAPI SP, no other *application-class* software can be installed on the TAPI server.

Application-class software products generally require a level of system resources that can have a negative impact on Symposium TAPI operation. Therefore, Nortel Networks recommends that you do not install any application class software on the TAPI server other than Symposium Agent server software. The installation of application-class software products on the TAPI server can cause a real-time system to operate outside of known engineering limits and create potential problems such as the following:

- CPU contention
- increased network traffic load
- disk access degradation

Utility-class software

Certain *utility-class* software products, such as hardware diagnostics or backup utilities, require less system resources and can be installed if they are in strict compliance with the recommendations provided in this document. Utilities that cause system problems and degrade performance must never be installed on the TAPI server, including the following:

• Screen savers
• Disk compression utilities
• Memory-saving utilities that "reclaim" memory unused by Microsoft applications.

Utility applications guidelines

You can install utility-class applications on the TAPI server when they conform to the following guidelines:

• During run-time, the utility must not degrade the TAPI system beyond an average of 50% of CPU usage. The utility must not reduce the minimum amount of free hard disk space required by Symposium TAPI Service Provider, the Windows operating system, and Symposium Agent if it is installed on the server.
• The utility must not cause any improper software shutdowns or out-of-sequence shutdowns.
• The utility must not attempt to administer the Symposium TAPI SP software.
• If the utility has its own database, it must not affect the Symposium database.
• The installation or removal of a utility should not impair the operation of Symposium TAPI SP software. If a conflict occurs, such as can occur between conflicting dll files, it may be necessary to reinstall the server.
• Before you put the TAPI server into operation, you must perform tests to ensure that you meet these guidelines. During fault diagnosis Nortel Networks GNTS can ask for the results of these tests and request the removal of third-party software.

Antivirus software guidelines

The risk of virus infection is minimal on the TAPI server because support personnel require a minimal level of access, either locally or via remote access. However, if corporate security policies require you to install antivirus software on all servers, you must strictly monitor the installation, and activities of the antivirus application to ensure that TAPI activities are not impaired.

Beta Note: Nortel Networks is currently testing on industry-standard antivirus software applications, and early results indicate the following generic guidelines for the use of antivirus software, including the following:

> → **Note:** The recommendations provided in this section are intended as guidelines only, and do not constitute a guarantee of compatibility. Nortel Networks does not intend to perform ongoing compatibility testing, or testing on other antivirus packages.

- Install Symposium TAPI Service Provider software before installing antivirus software.
- Set virus scans or log recordings to run on the server during off-peak hours so that CPU utilization does not exceed stated guidelines. Run the Windows Performance Monitor application to verify that CPU usage during scans does not exceed the stated guidelines.
- Disable active virus scans when you run diagnostic traces or log recordings on the TAPI server.
- Do not configure the anti-virus software to deal automatically with suspected infected files. In the event that infected files are detected, do not attempt to replace or remove them. Contact your local Nortel Networks support representative for assistance in determining if a suspected file is part of the Symposium application or is a critical system file.
- Under no circumstances configure antivirus software for automatic download of virus definition update files from the Internet. Nortel Networks recommends that you download virus definition update files to another location on the customer network before you manually load them on to the TAPI server. This arrangement restricts access to the Internet, and thus reduces the risk of downloading infected files.

- All CD-ROMs and floppy disks should be scanned prior to installation or uploading to the server to minimize any exposure to infected files from outside sources.
- Nortel Networks has not performed testing of the impact on TAPI performance of the Simple Network Management Protocol (SNMP) alert feature on antivirus software. Therefore, Nortel Networks recommends that you do not activate the SNMP alert feature in your antivirus software.

> **Note:** If your require assistance with configuring antivirus software refer to your vendor.

Uninterruptible power supply (UPS) guidelines

If smart UPS software is installed on the TAPI server, it must conform to the general guidelines for installing third party utilities. Nortel Networks only supports the manual shutdown and startup of the Symposium TAPI server. The provider of the UPS solution must provide documentation, testing, and support of Symposium TAPI SP prior to installation of the UPS solution.

Symposium Agent server software guidelines

If you intend to use Symposium Agent as part of your TAPI solution, you can either install it on a standalone server or to co-reside with Symposium TAPI SP on the TAPI server. Before you install Symposium Agent on the TAPI server, ensure that you conform with the guidelines provided in the following documents:

- *Network Managers Guide for Symposium TAPI Service Provider for Meridian 1*, *release 2.3.1*
- Symposium Agent product documentation available on the Nortel Networks Website.

SAPphone server guidelines

If you use SAPphones for CRM functionality, Nortel Networks recommends that you install the SAPphone server, release 3, on a separate server platform.

> ⚠ **Warning:** Nortel Networks recommends that you do not install the SAPphone server on the TAPI server as it can lead to problems such as CPU contention, increased network traffic loading, or disk access degradation.

pcAnywhere guidelines

pcAnywhere *is a remote support software application provided by the Symantec Corporation. Nortel Networks tested the performance of pcAnywhere, release 10.5, with Symposium TAPI SP. The test results indicate that pcAnywhere can be used to connect to the Symposium TAPI SP server in the following ways:

*   Via Ethernet connection over a LAN
*   Via dial-up connection into a primary domain controller (PDC) which provides access to the TAPI server via a LAN

Problems will occur if you attempt to connect directly to the TAPI server via a modem due to a potential conflict when a modem driver co-exists with TAPI drivers on the same server.

> ⚠ **Warning:** Nortel Networks recommends that you do not install a modem driver on the TAPI server.

Chapter 3
Server engineering guidelines

This chapter provides detailed server engineering guidelines that you must conform to for effective TAPI operation and describes the technical parameters that can have an impact on performance.

Technical parameters that impact on performance

This section outlines technical parameters that can impact on system performance:

- number of lines/clients
- number and duration of calls
- size and volume of attached data — TAPI and IVR
- TAPI networking
- co-residency with Symposium Agent
- debug/logging activities
- co-residency with other applications

Number of lines/clients

Symposium TAPI Service Provider will support between 10 and 1200 lines connected simultaneously to a single TAPI server.

Number and duration of calls

Symposium TAPI SP is designed to handle up to 16,000 basic calls per hour. A basic call has the following stages:

- call setup
- talk/hold time
- call tear down

Increasing the complexity or duration of calls will reduce this capacity.

Attached data

The amount of data attached to a call has a significant impact on performance. Attached data that affects performance includes both TAPI data and IVR data. Symposium TAPI SP will handle a maximum of 4096 bytes of attached data (TAPI + IVR) per call. The default call data size allowed per call is 512 bytes. To optimize performance, use the configuration application to set the call data size to match your actual call data requirements. If the call data size is set higher than your requirements, performance suffers because unneccessary memory is allocated for each call.

TAPI networking

Symposium TAPI SP operates in the following Meridian 1 network environments:

*   networked SCCS Call Center
*   ESN network

Before you provision a network TAPI environment, estimate the maximum server processing and TCP/IP connectivity requirements of intersite routing activities.

Co-residency with Symposium Agent

Symposium Agent, release 2.3 can co-reside on the TAPI server with Symposium TAPI SP, release 2.3x, subject to the following limitation imposed by Symposium Agent requirements:

*   Symposium Agent can not be installed on a server with multiple CPUs
*   Symposium Agent can not co-reside on a TAPI server that supports more than 500 agents.

Debugging activities

Running the logger application for Symposium TAPI SP places considerable processing load on the CPU. You must provision your server for the use of the logger application at peak times, with all applications running, without exceeding the 50% CPU utilization guideline.

Co-residency with other applications

No third-party applications are supported to co-reside on the TAPI server other than those stated in the software guidelines (). Performance of Symposium TAPI SP is likely to be significantly affected by co-residency with any third-party applications.

Server capacity guidelines

When you are selecting your server allow enough room for future expansion and for the different operating conditions outlined above.

CPU utilization

CPU utilization with all applications running and under peak traffic load must not exceed an average of 50%. In the event that CPU utilization exceeds this limit on a regular basis Nortel Networks recommends that you upgrade the server to one with a higher CPU specification.

Memory

Sufficient memory must be provisioned to minimize the amount of paging-to-disk activities which has a detrimental impact on real-time performance.

LAN traffic guidelines

This section provides guidelines to provision basic LAN capacity for the different types of messaging that occur in the TAPI environment. In all TAPI environments allow sufficient bandwidth for:

- Meridian 1 Link protocol messages
- Microsoft TAPI messages

If your TAPI services include IVR and networking of call data, you must allow additional bandwidth for:

- IVR messages
- Call data networking messages between TAPI servers

Meridian 1 Link protocol messages

The network traffic on the LAN relating to Meridian 1 Link protocol messages is directly proportional to the number of lines monitored and the number of calls appearing in the switch on these lines. During the life of a basic call, normal operations performed include MAKECALL, ANSWER, HOLD, UNHOLD and DROP.

To calculate the load on a LAN assume that every inbound call appearing in the Call Center does ANSWER, HOLD, UNHOLD and DROP operations. The total number of bytes required for the messages related to these operations is 763 bytes per call. Therefore, to calculate the LAN requirements for Meridian 1 Link protocol messages, for 10,000 basic calls per hour, use the following formula:

(763 x 10,000) / 3600 (seconds per hour) = 2120 bytes per second

Microsoft TAPI messages

The LAN requirements for Microsoft TAPI messages are very dependent on the customer implementation of Microsoft TAPI. Nortel Networks is currently conducting tests and sample data will be provided before Symposium TAPI SP, release 2.3.1 is issued for general availability (GA).

IVR messages

The LAN requirements for IVR messages are very dependent on the customer implementation. Nortel Networks is currently conducting tests and sample data will be provided before Symposium TAPI SP, release 2.3.1 is issued for general availability (GA).

Call data networking messages between TAPI servers

The network traffic overhead due to call data networking messages is directly related to the following:

- the number of calls overflowed from one Meridian switch to a remote Meridian switch
- the size of attached data where Symposium TAPI SP provides call data networking services
- the type of TAPI environment

Nortel Networks is currently conducting tests and sample data will be provided before Symposium TAPI SP, release 2.3.1 is issued for general availability (GA).

Summary of LAN requirements

To calculate overall LAN requirements, add the bytes per second required for each of the message types discussed above. This sum does not include bandwidth allocation for the following:

- polling messages
- login/logout messages
- acknowledgement messages
- complex calls

Nortel Networks recommends that you make a generous provision for these additional requirements.

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 servic 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