Avaya Call Management System

LAN Backup User Guide

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http://www.avaya.com/support

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Preface

Avaya Call Management System (CMS) is an application for businesses and organizations that use Avaya communication servers to process large volumes of telephone calls using the Automatic Call Distribution (ACD) feature. Avaya CMS supports solutions for routing and agent selection, multi-site contact centers, remote agents, reporting, interfaces to other systems, workforce management, desktop applications, system recovery, and quality monitoring.

Avaya CMS is part of the Operational Effectiveness solution of the Avaya Customer Interaction Suite.

This section includes the following topics:

- Purpose on page 7
- Intended users on page 8
- Overview on page 8
- Conventions and terminology on page 9
- Reasons for reissue on page 9
- Documentation Web sites on page 10
- Support on page 10

Purpose

The purpose of this document is to describe how to use the LAN backup feature with Avaya CMS.

Intended users

This document is written for:

- Avaya support personnel
- Contact center administrators
- Tivoli administrators

Users of this document must be familiar with Tivoli Storage manager, Avaya CMS, and the Solaris operating system.

Overview

This document includes the following topics:

- Overview of the LAN backup feature on page 11

  Provides an overview of the supported LAN backup software, supported hardware and support information.
- Software configuration for LAN backups on page 17

  Provides the LAN backup configuration procedures.
- Backing up and restoring data on page 31

  Provides the file system backup procedures and recovery procedures.
- Troubleshooting the LAN backup feature on page 65

  Provides information on how to fix various software-related problems.

Conventions and terminology

If you see any of the following safety labels in this document, take careful note of the information presented.

CAUTION:
Caution statements call attention to situations that can result in harm to software, loss of data, or an interruption in service.

WARNING:
Warning statements call attention to situations that can result in harm to hardware or equipment.

DANGER:
Danger statements call attention to situations that can result in harm to personnel.

SECURITY ALERT:
Security alert statements call attention to situations that can increase the potential for unauthorized use of a telecommunications system.

Reasons for reissue

This document includes the following update:

- Oracle Corporation now owns Sun Microsystems. Instead of rebranding references to Sun Microsystems with the Oracle name, all occurrences of Sun and Sun Microsystems will remain as is in this document.
- Support for Netbackup 7.0 and Tivoli Storage Manager 5.5.0 and 6.2.1.

August 2014

- Support for the TSM 6.2.1 clients on Netra X4270.

CAUTION:
Netbackup 7.0 and Tivoli Storage Manager 5.5.0 are only supported on T5120 and T5220 platforms. They are not supported on the Netra X4270 platform.

Documentation Web sites

All CMS documentation can be found at http://www.avaya.com/support. New issues of CMS documentation will be placed on this Web site when available.

Use the following Web sites to view related support documentation:

- Information about Avaya products and service

  http://www.avaya.com

- Sun hardware documentation

  http://docs.sun.com

Support

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See the Support Directory listings on the Avaya Web site.

Escalating a technical support issue

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Overview of the LAN backup feature

The Avaya Call Management System (CMS) LAN backup feature provides an alternative to the traditional method of backing up and restoring data. In the past, the only way to backup and restore data was to use a tape device located with Avaya CMS. LAN backup allows you to back up Avaya CMS data and system information over a local area network (LAN) to a network backup server. The network backup server has a software package that can control where, how, and when the data is stored.

The benefits of using the Avaya CMS LAN backup feature are:

- Automated data backups
- Centralized storage location for backing up multiple Avaya CMS servers
- Faster data backups and restores (dependent on network configuration and traffic)

This section includes the following topics:

- Required software on page 11
- Tivoli client software compatibility on page 12
- Tivoli server software compatibility on page 12
- Netbackup client software compatibility on page 13
- Netbackup server software compatibility on page 13
- Required hardware on page 13
- Support restrictions on page 14
- General roles and responsibilities on page 14

Required software

The following software has been certified by Avaya for use with the LAN backup feature:

- Avaya CMS R16.3, any associated software and one of the following client/server configurations:
  - Tivoli Storage Manager (TSM) version 5.5.0; CMS requires TIVsmCapi and TIVsmCba packages. Tivoli Data Protection for Informix (TDPinformix64.pkg), add both packages within this package structure.

- Tivoli Storage Manager (TSM) version 6.2.1; CMS requires TIVCapi and TIVCba packages. A Tivoli Data Protection for Informix package compatible with TSM 6.2.1 is already included with the Informix installation for CMS.
- Netbackup 7.0; Installation of the Netbackup 7.0 client software for Solaris 10 is required on the CMS.

CAUTION:
Netbackup 7.0 and Tivoli Storage Manager 5.5.0 are only supported on the T5120, T5220, and T4-1 platforms.The Netra X4270 platform only supports the Tivoli Storage Manager 6.2.1 clients.

For additional information about the TSM (5.5.0 or 6.2.1) software, see:

- Tivoli client software compatibility on page 12
- Tivoli server software compatibility on page 12

Important:
CMS R16.3 is only certified on TSM 5.5.0, TSM 6.2.1, and Netbackup 7.0.

Tivoli client software compatibility

Use Tivoli Storage Manager UNIX Backup/Archive Clients version 5.5.0 with Tivoli Data Protection for Informix version 5.2.1 64-bit. Select “all” when installing the package TDPinformix64 so packages TDPIlic64 and TDPInf64 are installed.

Use Tivoli Storage Manager server version 6.2.1 with the version of 6.2.1 of the Tivoli Storage Manager UNIX Backup/Archive Clients software.

Tivoli server software compatibility

Use Tivoli storage manager server version 5.5.0 with version 5.5.0 of the Tivoli Storage Manager UNIX Backup/Archive Clients software.

Use Tivoli storage manager server version 6.2.1 with version 6.2.1 of the Tivoli StorageManager UNIX Backup/Archive Clients software.

CAUTION:
Tivoli Storage Manager 5.5.0 is only supported on T5120 and T5220 platforms. It is not supported on the Netra X4270 platform.

Netbackup client software compatibility

Use Netbackup version 7.0 client for Solaris 10.

Netbackup server software compatibility

Use Netbackup version 7.0 server.

CAUTION:
Netbackup 7.0 is only supported on T5120 and T5220 platforms. It is not supported on the Netra X4270 platform.

Required hardware

The following hardware is required to use the LAN backup feature:

- A storage device that is capable of interfacing with the storage manager software
- A network server for the storage manager server software

CAUTION:
To perform Data migrations using a LAN Backup server requires that the system use 300GB disks. Since R16.3 is an upgrade path for R16, R16.1, and R16.2, disk size could still be 146GB on a CMS system. If LAN data migration is required, you must perform a CUE upgrade to R16.3, which includes the larger size disks.

Note:
An Avaya CMS server cannot be used as a network backup server.

- Any additional hardware required by Avaya CMS R16.3

Support restrictions

LAN Backup can be used with the CMS High Availability configuration with the following consideration:

- The LAN backup cannot be used to transfer data between the two HA CMS server.
- The LAN backup can be used to back up each individual HA server.
- The LAN backup can be used for data migration, but requires a set of disks of specific size to allow for storage space needed to migrate. See the hardware requirements section above.
- A Professional Services offer is required to transfer and sync data between the two HA servers.

General roles and responsibilities

The Tivoli storage manager product is very sophisticated. You must be familiar with the Tivoli storage manager software product before using the Avaya CMS LAN backup feature. This document is not intended to replace the Tivoli storage manager documentation.

Note:

Some useful Tivoli Storage Manager documents are:

– *Tivoli Storage Manager Installing the Clients*

– *Tivoli Storage Manager Quick Reference for the Backup-Archive Clients*

– *Tivoli Data Protection for Informix Installation and User's Guide*

A useful Informix document is:

– *Informix Backup and Restore Guide*

Some useful Netbackup documents are

– *Symantec NetBackup™ 7.0 Installation Guide for Unix* and

– *Symantec NetBackup™ 7.0 for Informix Administrator's Guide*.

The following table summarizes the various tasks and responsibilities involved with setting up and maintaining an Avaya CMS server that is using the LAN backup feature.

Task	Customer	Avaya support[1]
Obtaining the network backup client and server software	X	N/A
Obtaining a network server for the network backup server software	X	N/A
Installing the network backup client and server software	X	N/A
Obtaining a storage device capable of interfacing with the network backup server	X	N/A
Installing the Data Protection for Informix	X	N/A
Configuring the server software for LAN backups	X	N/A
Configuring the Avaya CMS software for LAN backup	X	X
Backing up Avaya CMS data	X	N/A
Backing up the Avaya CMS server	X	N/A
Restoring Avaya CMS data	X	N/A
Installing new hardware	N/A	X
Enabling the Avaya CMS server to boot for a system restore	N/A	X
Preparing the system for a restore over the LAN	X	N/A
Restoring the Avaya CMS server data	X	N/A
Troubleshooting the network backup server software	X	N/A
Troubleshooting the network backup server	X	N/A

Task	Customer	Avaya support[1]
Troubleshooting the LAN	X	N/A
Troubleshooting the network backup client software	X	N/A

1. Additional support provided by Avaya could result in additional time and material expenses.

Software configuration for LAN backups

This section contains the procedures for configuring an Avaya Call Management System (CMS) for use with the LAN backup feature. The customer is responsible for the installation of the network backup software and the configuration of the network backup server software.

This section includes the following topics:

- Prerequisites on page 17
- Initial configuration of the Avaya CMS software for LAN backup on page 18
- Recommended ON-Bar configurations on page 18
- Recommended network backup client configurations for Avaya CMS on page 22
- Recording network information on page 28

Prerequisites

Before configuring any Avaya CMS software for the LAN backup, the customer must perform the following tasks:

- Be familiar with the network backup software product.
- Install the network backup software client software on the Avaya CMS server.
- Install the network backup server software.
- Install the Tivoli Data Protection for Informix software.
- Register the network backup licenses.
- Perform any customization required by the network backup server software.
- Verify that the storage manager server can detect network backup clients.
- Verify the node name of the server where the network backup server software resides
- Register the client node of Avaya CMS with the server software.
- If using the Tivoli Storage Manager 5.5.0 or 6.2.1, obtain the password and user ID for the client node of Avaya CMS. This password and user ID was created when the Avaya CMS client node was registered with the server software.
- Verify that the **sm_versions** file contains the correct storage manager version. The file is located at **$INFORMIX/etc/sm_versions**

- For TSM 5.5.0, copy **/opt/informix/etc/sm_versions.std** to **/opt/informix/etc/sm_versions**, the add "1|5.5.0|tsm|5.5.0" to the end of the **/opt/informix/etc/sm_versions file**.
- For TSM 6.2.1, copy **/opt/informix/etc/sm_versions.std to /opt/informix/etc/sm_versions**, the add "1|6.2.1|tsm|6.2.1" to the end of the **/opt/informix/etc/sm_versions file**.
- For Netbackup 7.0, the **/usr/openv/netbackup/bin/informix_config** script will set the values in the **sm_versions** file. If not set properly by the script (below), the file should have one line with the following text:

  ```
  1|1.1.0|Veritas-Netbackup|1|
  ```

- Verify that **/cms/install/logdir/dsmerror.log** (for TSM 5.5.0 and 6.2.1), or **/cms/install/logdir/nbuerror.log** (for Netbackup 7.0) has permissions set to 660.
- Create a policy domain for the Avaya CMS client node.

The procedures for performing these prerequisites can be found in the Tivoli or Netbackup documentation. For more information about the Tivoli software installation, see *Tivoli Data Protection for Informix Installation and User's Guide*, *Tivoli Storage Manager Installing the Clients, Tivoli Storage Manager Quick Reference for the Backup-Archive Clients*, or the appropriate Tivoli storage manager quick-start guide.

For more information about the Netbackup software installation, see *Symantec NetBackup™ 7.0 Installation Guide for Unix.*

CAUTION:
Netbackup 7.0 and Tivoli Storage Manager 5.5.0 are only supported on T5120 and T5220 platforms. They are not supported on the Netra X4270 platform.

Initial configuration of the Avaya CMS software for LAN backup

Currently, no additional configuration of the Avaya CMS software is required to use the LAN backup feature.

Recommended ON-Bar configurations

The ON-Bar configuration should already be correctly configured for your Avaya CMS. Use the following procedure to check the current ON-Bar configuration and make any necessary adjustments.

To check the Informix ON-Bar configuration for use with LAN backup:

1. Set the IDS environment by entering:

   ```
   . /opt/informix/bin/setenv
   ```

2. Enter:

   ```
   cat /opt/informix/etc/onconfig.cms| grep BAR_ACT_LOG
   ```

3. Verify that the Informix configuration parameters for Avaya CMS have been set up.

   For more information, see "Setting the Informix configuration parameters for Avaya CMS" in the appropriate *Avaya CMS Software Installation, Maintenance, and Troubleshooting* guide.

4. Verify that the `BAR_ACT_LOG` setting is:

   `/cms/install/logdir/bar_act.log`

   Example:

```
#####################################################################
# Licensed Material - Property Of IBM
#
# "Restricted Materials of IBM"
#
# IBM Informix Dynamic Server
# Copyright IBM Corporation 1996, 2009. All rights reserved.
#
# Title: onconfig.std

# Description: IBM Informix Dynamic Server Configuration Parameters
#
# Important: $INFORMIXDIR now resolves to the environment
# variable INFORMIXDIR. Replace the value of the INFORMIXDIR
# environment variable only if the path you want is not under
# $INFORMIXDIR.
#
# For additional information on the parameters:
# http://publib.boulder.ibm.com/infocenter/idshelp/v115/index.jsp
#####################################################################
……................................................................
……................................................................
……................................................................
#####################################################################
# Backup and Restore Configuration Parameters
#####################################################################
# BAR_ACT_LOG         - The ON-Bar activity log file location.
#                       Do not use the /tmp directory. Use a
#                       directory with restricted permissions.
# BAR_DEBUG_LOG       - The ON-Bar debug log file location.
#                       Do not use the /tmp directory. Use a
#                       directory with restricted permissions.
# BAR_DEBUG           - The debug level for ON-Bar. Acceptable
#                       values are 0 (off) through 9 (high).
# BAR_MAX_BACKUP      - The number of backup threads used in a
#                       backup. Acceptable values are 0 (unlimited)
#                       or any positive integer.
# BAR_RETRY           - Specifies the number of time to retry a
#                       backup or restore operation before reporting
#                       a failure
# BAR_NB_XPORT_COUNT  - Specifies the number of data buffers that
#                       each onbar_d process uses to communicate
#                       with the database server
BAR_XFER_BUF_SIZE   - The size, in pages, of each data buffer.
#                       Acceptable values are 1 through 15 for
#                       4 KB pages and 1 through 31 for 2 KB pages.
RESTARTABLE_RESTORE - Enables ON-Bar to continue a backup after a
#                       failure. Acceptable values are OFF or ON.
```

```
BAR_PROGRESS_FREQ   - Specifies, in minutes, how often progress
#                       messages are placed in the ON-Bar activity
#                       log. Acceptable values are: 0 (record only
#                       completion messages) or 5 and above.
# BAR_BSALIB_PATH     - The shared library for ON-Bar and the
#                       storage manager. The default value is
#                       $INFORMIXDIR/lib/ibsad001 (with a
#                       platform-specific file extension).
# BACKUP_FILTER       - Specifies the pathname of a filter program
#                       to transform data during a backup, plus any
#                       program options
# RESTORE_FILTER      - Specifies the pathname of a filter program
#                       to transform data during a restore, plus any
#                       program options
# BAR_PERFORMANCE     - Specifies the type of performance statistics
#                       to report to the ON-Bar activity log for backup
#                       and restore operations.
#                       Acceptable values are:
#                        0 = Turn off performance monitoring (Default)
#                        1 = Display the time spent transferring data
#                            between the IDS instance and the storage
#                            manager
#                        2 = Display timestamps in microseconds
#                        3 = Display both timestamps and transfer
#                            statistics
#####################################################################
BAR_ACT_LOG /cms/install/logdir/bar_act.log
BAR_DEBUG_LOG $INFORMIXDIR/tmp/bar_dbug.log
BAR_DEBUG 0
BAR_MAX_BACKUP 0
BAR_RETRY 1
BAR_NB_XPORT_COUNT 20
BAR_XFER_BUF_SIZE 31
RESTARTABLE_RESTORE ON
BAR_PROGRESS_FREQ 0
BAR_BSALIB_PATH
BACKUP_FILTER
RESTORE_FILTER
BAR_PERFORMANCE 0
#####################################################################
# Informix Storage Manager (ISM) Configuration Parameters
#####################################################################
# ISM_DATA_POOL - Specifies the name for the ISM data pool
……................................................................
……................................................................
……................................................................
```

5. Choose one of the following:
   - If the settings are correct, go to Recommended network backup client configurations for Avaya CMS on page 22.
   - If the settings are *not* correct for Avaya CMS:

a. Enter:

```
vi /opt/informix/etc/onconfig.cms
```

b. Change any required settings in the **onconfig.cms** file.

c. When finished press **Esc**. Then enter:

```
:wq!
```

d. Go to Recommended network backup client configurations for Avaya CMS on page 22.

Recommended network backup client configurations for Avaya CMS

Information on installing the Tivoli storage manager client can be found in *Tivoli Storage Manager Installing the Clients* or the appropriate Tivoli storage manager quick-start guide.

This information is all specific to Tivoli Storage Manager 5.5.0 and 6.2.1 configurations.This section includes the following topics:

- Verifying dsm.opt on page 22
- Verifying dsm.sys on page 23
- Specifying the location of the XBSA library on page 24
- Setting the correct version of dsmtca on page 25
- Initializing the TSM password on page 25
- Generating the Tivoli password file on page 25
- Verifying the presence of the include and exclude list on page 26

Verifying dsm.opt

To verify that the **dsm.opt** file has been set up correctly:

1. Enter:

```
cat /usr/bin/dsm.opt
```

2. Verify that the file contains the `SErvername` setting. The `SErvername` setting should contain the host name of the server running the storage manager server software.

   Example:

```
************************************************************************
* Tivoli Storage Manager                                               *
*                                                                      *
* Sample Client User Options file for UNIX (dsm.opt.smp)               *
************************************************************************
................
................
................
* SErvername       A server name defined in the dsm.sys file
SErvername server_1
```

3. Choose one of the following:
   a. If the setting is correct, continue with Verifying dsm.sys on page 23.
   b. If the setting is *not* correct, perform the following steps:
      1. Enter:

         `vi /usr/bin/dsm.opt`
      2. Change any required settings in the **dsm.opt** file.
      3. Press **Esc**. Then enter:

         `:wq!`
      4. Continue with Verifying dsm.sys on page 23

Verifying dsm.sys

To verify that the **dsm.sys** file has been set up correctly:

1. Enter:

   `cat /usr/bin/dsm.sys`

   The file should contain the following settings:

   - `SErvername` should contain the host name of the server running the storage manager server software.
   - `COMMmethod` should be set to TCPip.
   - `TCPServeraddress` should contain the host and domain name of the Tivoli server.
   - `PasswordAccess` should be set to generate.
   - `inclexcl` should contain the correct path for the include/exclude lists for the LAN backup. The path is **/cms/LANbkup/incl_excl/backup_excl.tivoli**

- `errorlogname` should contain the correct path for the Tivoli storage manager error log. The path is **/cms/install/logdir/dsmerror.log**
- `schedlogname` should contain the correct path for the Tivoli storage manager schedule log. The path is **/cms/install/logdir/dsmsched.log**
- `schedlogretention` should be set to 60

Example:

```
**********************************************************************
* Tivoli Storage Manager                                             *
..................
...............
...............
SErvername  server_1
   COMMmethod         TCPip
   TCPPort            1500
   TCPServeraddress   server_1.domain.company.com

PasswordAccess generate

inclexcl /cms/LANbkup/incl_excl/backup_excl.tivoli
errorlogname /cms/install/logdir/dsmerror.log
schedlogname /cms/install/logdir/dsmsched.log
schedlogretention 60
```

2. Choose one of the following:
   a. If the settings are correct, go to Specifying the location of the XBSA library on page 24.
   b. If the settings are *not* correct, perform the following procedure:
      1. Enter:

         `vi /usr/bin/dsm.sys`
      2. Change any required settings in the **dsm.sys** file.
      3. Press **Esc**. Then enter:

         `:wq!`
      4. Go to Specifying the location of the XBSA library on page 24.

Specifying the location of the XBSA library

To specify the location of the XBSA library:

1. Enter the following command for TSM 5.5.0 configurations:

   `ln -s /opt/tivoli/tsm/client/informix/bin64/libTDPinf64.so /opt/informix/lib/ibsad001.so`

2. Enter the following command for TSM 6.2.1 configurations:

   `ln -s /opt/informix/lib/libtxbsa.so /opt/informix/lib/ibsad001.so`

3. Go to Generating the Tivoli password file on page 25.

Setting the correct version of dsmtca

Remove the current dsmtca file and link the 64-bit dsmtca file:

1. Enter the following commands:

   `rm /usr/bin/dsmtca`

   `ln -s /opt/tivoli/tsm/client/api/bin64/dsmtca /usr/bin/dsmtca`

Initializing the TSM password

To initialize the TSM password enter:

`/opt/informix/bin/txbsapswd`

Generating the Tivoli password file

A Tivoli password file must be generated on Avaya CMS. If this file is not created, system restores will fail. The password was set up when the Avaya CMS client node was registered with the storage manager server software. This password is controlled by the customer but the customer is required to provide this password to technical support personnel as needed. This password grants access to *only* the Avaya CMS node, not to any other client nodes. This file needs to be created only during a new client software installation, or if the storage manager client password has changed.

To generate a password file:

1. Enter:

   `cd /tmp`

2. Access the command line mode of the storage manager by entering:

   `dsmc`

   The system attempts to query any data that is backed up, and then displays the following message:

```
Please enter your user ID (default):
```

3. Enter the user ID.

   The system displays the following message:

```
Please enter password for user ID "default"
```

4. Enter the password for the Tivoli storage manager server software.

   Important:
   Ignore any error messages about the backup.

5. Enter:

   quit

6. Initialize the XBSA password.

   /opt/informix/bin/txbsapswd

   Note:
   If the system nodename has previously been administered on the Server, you may have to reset the password using "update node <nodename> <password>" on the TSM server.

7. Go to Verifying the presence of the include and exclude list on page 26.

Verifying the presence of the include and exclude list

To verify the presence of the include and exclude list:

1. Enter:

   cd /cms/LANbkup/incl_excl

2. Enter:

   ls

   The system displays the following message:

```
backup_excl.tivoli
```

3. If the include and exclude list does not exist, contact Avaya technical support or your product representative for more information.

Recommended Netbackup 7.0 client configurations for Avaya CMS

Information on installing the Netbackup 7.0 client can be found in *Symantec NetBackup™ 7.0 Installation Guide for Unix*. This information is all specific to Netbackup 7.0 configurations.

This section includes the following topics:

- Verifying bp.conf on page 27
- Specifying the location of the XBSA library on page 27

Verifying bp.conf

After installation of the Netbackup 7.0 client software, a file named **/usr/openv/netbackup/bp.conf** should be created. The format of this file is simple. See the example below:

```
cuckoo# more /usr/openv/netbackup/bp.conf
SERVER = tofu
CLIENT_NAME = cuckoo
```

In this simple form, the `bp.conf` file has the minimum information of showing the Netbackup 7.0 Server name and the Netbackup 7.0 client name. Customers experienced with Netbackup may include additional options in the file, if needed.

Note:
All Netbackup servers used for customer's implementation must be included in the `bp.conf` file.

Specifying the location of the XBSA library

Netbackup provides a script that does some setup work for the XBSA connection.

1. Enter the following command:

   ```
   /usr/openv/netbackup/bin/informix_config
   ```

The system requests the Informix instance home path.

2. Enter:

   ```
   /opt/informix
   ```

   The system responds with:

```
Changing Informix scripts' file ownership and group

Adding NetBackup to /opt/informix/etc/sm_versions

Linking /usr/lib/ibsad001.so to
/usr/openv/netbackup/bin/infxbsa.so64
```

Now specify the location of the XBSA file for the CMS setup.

3. Enter the following command:

```
ln -s /usr/openv/netbackup/bin/infxbsa.so64 /opt/informix/lib/ibsad001.so
```

Setting up Netbackup policies

There need to be two policies set up for Netbackup - one for the data backup and another for the filesystem backup. See Appendix D for examples of setting the Netbackup policies. See the *Symantec NetBackup™ 7.0 Installation Guide for Unix* for more information and options on Netbackup Policies.

Important:
Avaya support personnel are not responsible for configuring policies or providing Netbackup support.

Recording network information

Some networking information is specific for the individual Avaya CMS server. This information can be very helpful for technical support personnel who may be troubleshooting your system. Use the following table to record your network information:

Avaya CMS network information	
Host name	
IP address	
Subnet mask	
IP address of the gateway (also called the default router)	

IP address of the DNS server	
Tivoli storage manager or Netbackup 7.0	
Server host name	
Node name (also called the host name)	

Backing up and restoring data

This section contains the procedures used to back up and restore data on your Avaya Call Management System (CMS). The Avaya CMS LAN backup feature works two ways, depending on the type of data to be backed up.

Data backup: Runs through the Informix tool ON-Bar

ON-Bar interfaces with the storage manager using the X/Open Backup Services Application Programmer's Interface (XBSA interface). ON-Bar backups up the data in the Informix database and the system tables. This is a binary data backup and cannot be used for data migration purposes. For details on migration, see Migration data backup on page 31.

Migration data backup: Creates a ASCII output file that is sent to the LAN backup server as a regular file. Do not use this for daily backup. This method is for use in preparing for a data migration only.

System backup: Uses a storage manager to manage the backup and restore

The storage manager backs up the Avaya CMS operating-system files.

This section includes the following topics:

- Recommendations for backing up data on page 31
- Performing a system backup on page 32
- Performing a data backup on page 35
- Performing a migration data backup on page 37
- Restoring from a migration data backup on page 38
- Restoring Avaya CMS data on page 43
- Restoring an Avaya CMS on page 45

Recommendations for backing up data

Avaya recommends the following:

- Routine backups should be scheduled to occur when network traffic is low.
- Avaya CMS data should be backed up with a full backup on a weekly basis.
- Avaya CMS data should be backed up with an incremental backup on a daily basis.

- Avaya CMS migration data should be backed up when a system upgrade or other data migration event is expected to take place.
- Avaya CMS information should be backed up with a full backup on a monthly basis.
- Avaya CMS information should be backed up with an incremental backup on a weekly basis.
- The three most recent system backups should be maintained for every Avaya CMS server.
- Schedule the Avaya CMS data backup to occur immediately after the system backup.
- If using LAN backup for migration purposes, you should backup only when needed for a specific migration task. LAN data backup/restore will be your primary data backup/restore strategy.
- If using tape for migrations, LAN data backup/restore will still be your primary data backup/restore strategy.
- For Tivoli Storage Manager 5.5.0 and 6.2.1 configurations, create a separate policy domain for the Avaya CMS servers.
- For Netbackup 7.0 configurations, DO NOT setup automatic backups on the Netbackup 7.0 Server. You will need a policy and a user schedule, but do not schedule any automatic backups. Use cron jobs to run the Avaya CMS scripts for performing your backups. Create a "User Backup" for use by the CMS scripts.
- Verify that your LAN backup is correctly backing up your data before you discontinue using a tape device for backups.

Performing a system backup

This section describes how to back up the Avaya CMS system data. The Avaya CMS backup is a backup option you can use instead of the CMSADM tape backup. The system backup saves all of the file systems on the computer, including:

- Solaris system files and programs
- Avaya CMS programs

The system backup does *not* save Avaya CMS data tables or remote file systems.

This section includes the following topics:

- When to perform a system backup on page 33
- Setting up automated system backups on page 33
- Backing up the system on demand on page 33

When to perform a system backup

Perform the system backup:

- After the Avaya CMS is provisioned

  This backup contains the Solaris system files and programs and Avaya CMS configuration data placed on the computer by TSC provisioning personnel.
- Before and after the Avaya CMS software is upgraded
- Once a month

Setting up automated system backups

See *Tivoli Storage manager Quick Reference for the Backup-Archive Clients* for information on how to configure the storage manager software to automate system backups. See Recommendations for backing up data on page 31 for more information.

Automated backups for Netbackup are not to be pulled by the Netbackup server. Instead, the backups should be scheduled using the CMS provided scripts and cron.

Backing up the system on demand

CAUTION:
Netbackup 7.0 and Tivoli Storage Manager 5.5.0 are only supported on T5120 and T5220 platforms. They are not supported on the Netra X4270 platform.

Backing up system on demand using Tivoli Storage Manager

To back up your Avaya CMS system data outside of the normal backup schedule:

1. Enter:

   `/cms/LANbkup/bin/backup.tivoli X`

   where ***X*** is one of the following:

   - `0` for a full system backup
   - `1` for an incremental system backup

   Note:
   The Tivoli documentation refers to the full data backup as a selective backup.

2. Verify that the backup has completed successfully by entering:

   `cat /cms/install/logdir/backup.log`

   For more information, see Backup logs on page 66.

3. Perform a data backup. For more information, see Performing a data backup on page 35.

Additional references

For information about backing up data, see *Tivoli Storage manager Quick Reference for the Backup-Archive Clients*.

Backing up the system on demand using NetBackup

To back up your Avaya CMS system data outside of the normal backup schedule:

1. Enter:

   `/cms/LANbkup/bin/backup.netbackup X`

   where ***X*** is one of the following:

   - `0` for a full system backup
   - `1` for an incremental system backup

2. Verify that the backup has completed successfully by entering:

   `cat /cms/install/logdir/backup.log`

   For more information, see Backup logs on page 66.

   Note:
   When a backup using Netbackup completes, the system may display the following message:

   ```
   EXIT STATUS 1: the requested operation was partially successful
   ```

   This message is normal. The system generates this message because Netbackup attempts to modify file timestamps after it backs up a file. However, Solaris will not allow timestamps on certain files to be updated.

3. Perform a data backup. For more information, see Performing a data backup on page 35.

   Note:
   For information about backing up data, see *Symantec NetBackup™ 7.0 for Informix Administrator's Guide*.

Performing a data backup

This section describes how to backup the Avaya CMS data in the Informix database and the system tables. The Avaya CMS data backup, is a backup option you can use instead of the Avaya CMS maintenance tape backup. You can perform a full or incremental backup of the Avaya CMS data. The data backup does not back up the Avaya CMS operating system files.

This section includes the following topics:

- When to perform a data backup on page 35
- Setting up automated data backups on page 35
- Backing up data on demand on page 36

When to perform a data backup

Perform the data backup:

- Immediately after a system backup
- Before and after the Avaya CMS software is upgraded
- On a daily basis

Setting up automated data backups

See *Tivoli Data Protection for Informix Installation and User's Guide* for information on how to configure the storage manager server software to automate data backups. See Recommendations for backing up data on page 31 for more information.

Automated backups for Netbackup are not to be pulled by the Netbackup server. Instead, the backups should be scheduled using the CMS provided scripts and cron.

Backing up data on demand

Backing up data on demand using Tivoli Storage Manager

To back up your Avaya CMS data outside of the normal backup schedule:

1. Enter:

   `/cms/LANbkup/bin/onbar_backup.tivoli X`

   where ***X*** is one of the following:

   - `0` for a full data backup
   - `1` for an incremental data backup

   Note:
   The Tivoli documentation refers to the full data backup as a selective backup.

2. Verify that the backup has completed successfully by entering the following commands:

   `cat /cms/install/logdir/backup.log`

   `cat /cms/install/logdir/bar_act.log`

   For more information, see Backup logs on page 66.

   Note:
   Ignore the following message that occurs the first time the data backup is executed. The file **'/opt/informix/etc/ixbar.1'** is created when the first data backup completes.

   > Open or close failed on file **'/opt/informix/etc/ixbar.1',** errno =2. No such file or directory

Additional references

For more information about backing up data, see the *Informix Backup and Restore Guide*.

Backing up data on demand using NetBackup

To back up your Avaya CMS data outside of the normal backup schedule:

1. Enter:

   `/cms/LANbkup/bin/onbar_backup.netbackup X`

   where ***X*** is one of the following:

   - `0` for a full data backup

- `1` for an incremental data backup

The system may display the following message:

```
Open or close failed on the file /opt/informix/etc/ixbar.1, errno=2. No such
file or directory.
```

Note:
The file **`/opt/informix/etc/ixbar.1`** is created when the first data backup completes. Ignore the message that the system displays for the first time the data backup is executed.

2. Verify that the backup has completed successfully by entering the following commands:

   `cat /cms/install/logdir/backup.log`

   `cat /cms/install/logdir/bar_act.log`

   For more information, see Backup logs on page 66

   Note:
   Ignore the following message WARNING: BAR_TIMEOUT Storage Manager Progress may be stalled. The onbar backup forks the dbs backup processes in a different order each time. If the cmsdbs happens to go before any other dbs backup, it may easily take more than the timeout value for the other dbs backup processes. Check the Netbackup server for problems if you suspect the backup has actually stalled.

Additional references

For more information about backing up data, see the *Symantec NetBackup™ 7.0 for Informix Administrator's Guide*.

Performing a migration data backup

CAUTION:
Netbackup 7.0 and Tivoli Storage Manager 5.5.0 are only supported on T5120 and T5220 platforms. They are not supported on the Netra X4270 platform.

This section contains the following topics:

- Backup migration data on demand using Tivoli Storage Manager on page 38
- Backup migration data on demand using Netbackup on page 38

Note:
This backup type is NOT to be used for daily backups. It is intended only for performing backups before a data migration event.

Backup migration data on demand using Tivoli Storage Manager

To backup data for migration purposes to the Tivoli Storage Manager backup server:

1. Enter:

   `/cms/LANBkup/bin/backup_maint.tivoli`
2. Verify that the backup has completed successfully by entering the following command:

   `cat /cms/install/logdir/backup.log`
3. For more information, see Backup logs on page 66.

Backup migration data on demand using Netbackup

To backup data for migration purposes to the Netbackup backup server:

1. Enter:

   `/cms/LANbkup/bin/backup_maint.netbackup`
2. Verify that the backup has completed successfully by entering the following command:

   `cat /cms/install/logdir/backup.log`
3. For more information, see Backup logs on page 66.

Restoring from a migration data backup

CAUTION:
Netbackup 7.0 and Tivoli Storage Manager 5.5.0 are only supported on T5120 and T5220 platforms. They are not supported on the Netra X4270 platform.

This section contains the following topics:

- Restore migration data on demand using Tivoli Storage Manager on page 39
- Restore migration data on demand using Netbackup on page 39

Note:
This backup type is NOT to be used for daily backups. It is intended only for performing backups before a data migration event.

Restore migration data on demand using Tivoli Storage Manager

To restore data for migration purposes to the Tivoli Storage Manager backup server:

1. Enter:

   /cms/LANbkup/bin/restore_maint.tivoli

2. Verify that the restore has completed successfully by entering the following command:

   cat /cms/install/logdir/restore.log

3. For more information, see Backup logs on page 66.

Restore migration data on demand using Netbackup

To restore data for migration purposes to the Netbackup backup server:

1. Enter:

   /cms/LANbkup/bin/restore_maint.netbackup

2. Verify that the restore has completed successfully by entering the following command:

   cat /cms/install/logdir/restore.log

3. For more information, see Backup logs on page 66

Migrating customer data

This section includes the following topics:

- Migrating system administration data to the new system on page 39
- Migrating agent and call center administration to the new system on page 41
- Migrating historical data to the new system on page 41

Migrating system administration data to the new system

This procedure supports the standard like-for-like ACD migration from the old system to a new system. That is, ACD 1 migrates to ACD 1, ACD 2 migrates to ACD 2, ACD 3 migrates to ACD 3 and so on. Any variations on this standard migration scheme are supported by Avaya Professional Services in the United States or the International Avaya Professional Services or COE outside of the United States.

CAUTION:
Perform this procedure only once. Attempting to migrate system administration data more than once causes catastrophic errors from which you are unable to recover. Failure to heed to this warning can irretrievably destroy data.

To migrate the system administration data:

1. Log on to CMS.

   The system displays the CMS main window.

2. From the CMS main menu, select **System Setup > CMS State** to put CMS into single-user mode.

3. From the CMS main menu, select **System Setup > R3 Migrate Data**.

   The system displays the **R3 Migrate Data** window.

4. In the **R3 Migrate Data** window, enter the values and select the options that are indicated in the following table:

   For the device name in the **System Setup > R3 Migrate Data** screen, use the device name: "DO NOT USE".

Field	Value to enter or option to select
Device Name	The device name
Data Type	System Administration data
Specify ACD(s)	All ACDs

5. Press **Enter** to access the action list in the top right corner.

6. Select **Run** and press **Enter**.

   The system displays the progress of the migration in the Status: field. When the migration ends, the system indicates the success or failure of the migration in this field.

Note:
After the migration is complete, you will receive a message if the migration of any custom reports fail. Information about the failed reports are written to the `r3mig.log` file. After you acknowledge the message, contact Avaya Professional Services to have the custom report migrated to the new system.

7. Press **F3** (commands) and select the **UNIX** option to display the UNIX prompt.

8. Enter:

   `pg /cms/migrate/r3mig.log`

   This command displays the customer migration log.

9. Look at the contents of the customer migration log and take any necessary corrective action. Note that the migration log file can be large. For help with interpreting the log, contact technical support or your customer representative.
10. To exit the UNIX window, enter:

    ```
    exit
    ```

Migrating agent and call center administration to the new system

To migrate agent and call center administration data:

1. Verify that the full maintenance backup tape created earlier is in the tape drive.
2. From the CMS main menu, select **System Setup > R3 Migrate Data**.

   The system displays the **R3 Migrate Data** window.
3. In the **R3 Migrate Data** window, enter the values and select the options that are indicated in the following table:

   For the device name in the **System Setup > R3 Migrate Data** screen, use the device name: DO NOT USE.

Field	Value to enter or option to select
Device Name	The device name
Data Type	Agent/Call Center Admin data
Specify ACD(s)	All ACDs

4. Press **Enter** to access the action list in the top right corner.
5. Select **Run** and press **Enter**.

   The system displays the progress of the migration in the Status: field. When the migration ends, the system indicates the success or failure of the migration in this field.
6. Press **F3** (commands) and select the **UNIX** option to display the UNIX prompt.

Migrating historical data to the new system

This procedure supports the standard like-for-like ACD migration from the old system to a new system. That is, ACD 1 migrates to ACD 1, ACD 2 migrates to ACD 2, ACD 3 migrates to ACD 3 and so on. Any variations on this standard migration scheme are supported by Avaya Professional Services in the United States or the International Avaya Professional Services or COE outside of the United States.

To migrate historical data to the new system:

1. Log on to CMS.

   The system displays the CMS main window.

2. Verify that the full maintenance backup tape created earlier is in the tape drive.
3. From the CMS main menu, select **System Setup > R3 Migrate Data**.

   The system displays the **R3 Migrate Data** window.

4. Enter the values and select the options that are indicated in the following table:

   For the device name in the **System Setup > R3 Migrate Data** screen, use the device name: DO NOT USE.

Field	Value to enter or option to select
Device Name	The device name
Data Type	Historical data
Stop Date	Leave blank
Stop Time	11:59 PM
Specify ACD(s)	All ACDs or a specific ACD if not moving all ACDs

5. Press **Enter** to access the action list in the top right corner.
6. Select **Run** and press **Enter**.

   The system displays the progress of the migration in the Status: field. When the migration ends, the system indicates the success or failure of the migration in this field.

   Note:
   A full historical migration can take several hours. It runs in the background, so you can exit the migration window and perform other tasks. If you do that, bring up the migration window periodically to check on the progress.

7. Press **F3** (commands) and select the UNIX option to display the UNIX prompt.
8. Enter:

   ```
   pg /cms/migrate/r3mig.log
   ```

   This command displays the customer migration log.

9. Look at the contents of the customer migration log and take any necessary corrective action. Note that the migration log file can be large. For help with interpreting the log, contact technical support or your customer representative.
10. Repeat this procedure using the incremental backup tape if one was created.

11. To exit the UNIX window, enter:

    exit

Restoring Avaya CMS data

Use the restore command to obtain copies of backed up files from the server. To restore the files, you must specify the correct path and directory.

This section includes the following topics:

- Restoring Avaya CMS data from a data backup on page 43
- Restoring specific files from a data backup on page 45

Restoring Avaya CMS data from a data backup

CAUTION:
Netbackup 7.0 and Tivoli Storage Manager 5.5.0 are only supported on T5120 and T5220 platforms. They are not supported on the Netra X4270 platform.

This section includes the following topics:

- Restoring Avaya CMS data from data backup using Tivoli Storage Manager on page 43
- Restoring Avaya CMS data from data backup using NetBackup on page 44

Restoring Avaya CMS data from data backup using Tivoli Storage Manager

To restore all Avaya CMS data:

1. Enter:

   cd /

2. Enter:

   /cms/LANbkup/bin/onbar_restore.tivoli

   Note:
   If the Avaya CMS software is on, the restore script will automatically turn the Avaya CMS software off and Informix IDS off.

   The system displays the following message:

```
Do you want to continue? (y/n)
```

3. Enter: **y**

   The system restores the data.

   Important:
   Some storage devices require the media to be changed manually. It may be necessary to have someone change the storage media.

4. Verify that the restore has completed successfully by entering:

   cat /cms/install/logdir/restore.log

   The system displays the Avaya CMS restore log.

For more information about restoring files, see *Tivoli Data Protection for Informix Installation and User's Guide*.

Restoring Avaya CMS data from data backup using NetBackup

To restore all Avaya CMS data:

1. Enter:

   cd /

2. Enter:

   /cms/LANbkup/bin/onbar_restore.netbackup

   Note:
   If the Avaya CMS software is on, the restore script will automatically turn the Avaya CMS software off and Informix IDS off.

   The system displays the following message:

   ```
   Do you want to continue? (y/n)
   ```

3. Enter: **y**

   The system restores the data.

   Important:
   Some storage devices require the media to be changed manually. It may be necessary to have someone change the storage media.

4. Verify that the restore has completed successfully by entering:

   cat /cms/install/logdir/restore.log

   The system displays the Avaya CMS restore log.

5. For more information about restoring files, see *Symantec NetBackup™ 7.0 for Informix Administrator's Guide*.

Restoring specific files from a data backup

For information about restoring specific files, see *Tivoli Storage Manager for UNIX Using the Backup-Archive Clients*.

Restoring an Avaya CMS

This section describes how to restore an entire system. A system restore will be required. The paired set of disks fails or becomes corrupt on a system.

This section includes the following topics:

- Prerequisites on page 45
- Restoring an Avaya CMS server on page 45
- Restoring an Avaya CMS server and data on page 54

Prerequisites

Before you begin restoring the system, perform the following tasks:

- Locate the most recent system backup on the storage manager.
- Locate the most recent data backup on the storage manager.
- Obtain the appropriate version of the Solaris software.
- Perform any necessary hardware repairs.
- Obtain the storage manager client software:
  - Tivoli Data Protection for Informix
  - Tivoli Storage Manager UNIX Backup/Archive Clients
  - Netbackup 7.0 Solaris 10 Client

Restoring an Avaya CMS server

You must re-enable the system to boot and then restore the system software.

The section includes the following topics:

- Prerequisites on page 46

- Installing Solaris 10 on page 47
- Configuring RAID and initial installation of Solaris 10 on page 49

Prerequisites

Before you begin the installation procedures, perform the following tasks:

- Obtain the appropriate version of the Solaris 10 software disc, SPARC or x86. For more information, see **Software for Avaya CMS Release 16** from *Software Installation, Maintenance, and Troubleshooting Guide* for the supported Solaris versions.
- Identify the host name of the system, which is designated by the Technical Service Center (TSC).
- Identify the Internet Protocol (IP) address of the system (this may be the factory default or an address in a customer's network).
- Identify the default router for the system (this may be the factory default or an address in a customer's network).
- Identify the subnet mask for the system (this may be the factory default or an address in a customer's network).
- Identify the number and size of disk drives on the system.
- Verify that all power cords are fully connected to all hardware devices, and that power is applied to all hardware devices.
- Identify the tape devices on the system.
- Verify that all hardware components of the system, including hardware controller, port cards, and tape drives, are correctly installed.

Note:

The T5120 4-core system must have disks installed in slots 0, 1, 2 and 3.

The T5220,T5120 8-core, or T4-1 system must have disks installed in slots 0, 1, 2, 3, 4 and 5.

The x86 system must have disks installed in slots 0 and 1.

Installing Solaris 10

This section describes the booting procedure for SPARC and x86 systems.

WARNING:
The Solaris 10 DVD must match the Solaris release, Solaris version, and platform type of the system you are restoring.

Before a restore is required, check the `/etc/release` file on the system. If the first line of the file has "`s10s_u6wos_07b`", then you have a Solaris 10 update 6 release and need the Solaris 10 10/08 (Update 6) SPARC DVD. If the first line of the file has "`s10s_u9wos_14a`", then you have a Solaris 10 Update 9 release and need the Solaris 10 9/10 (Update 9) DVD for the appropriate platform, SPARC or x86. The LAN restore script will attempt to verify this for you, but informs you about this after you have partially completed loading the temporary OS on the system.

- If the system is a SPARC platform, continue with Installing Solaris 10 on SPARC systems on page 47.
- If the system is an x86 platform, continue with Installing Solaris 10 on x86 systems on page 48.

Installing Solaris 10 on SPARC systems

1. Disconnect all USB storage devices.
2. Turn on the power to all of the external devices, such as tape drives.
3. Turn on the monitor.
4. Power on the Avaya CMS system.

Note:
Depending on the model, it can take several minutes for the system to boot up.

5. At the command line prompt, enter:

   ```
   setenv auto-boot? false
   ```

6. Enter:

   ```
   reset-all
   ```

7. Enter:

   ```
   probe-scsi-all
   ```

8. Insert the appropriate version of the Solaris 10 SPARC software disc into the disc drive.
9. Boot to the Solaris DVD.

Note:
The T4-1 platform does not have a graphical card so the system must be booted to single user mode. During the boot process the system can display `/dev/fb` error messages. Ignore these messages.

- If the platform is a T5120/T5220, enter:

  `boot cdrom`

  Continue with Step 10.

- If the platform is a T4-1, enter:

  `boot cdrom -rsw`

  Continue with Step 2 of Configuring RAID and initial installation of Solaris 10 on page 49.

The system boots from the disc.

10. Select the language that is appropriate for your location, and press **Enter**.

    The system displays "**Welcome**" Screen.

11. Continue with Configuring RAID and initial installation of Solaris 10 on page 49.

Installing Solaris 10 on x86 systems

Installation of Solaris 10 on x86 systems continues from *Setting up RAID 1 on x86 systems*.

1. Verify the Solaris 10 x86 software disc is in the disc drive. Enter:

   `Ctrl+Alt+Del`

   Note:
   If the system appears to hang then manually power off the system and manually power the system back on.

   The system boots from the Solaris 10 x86 software disc.

2. Select "**Solaris**" at the **Grub** screen.

   The system displays a series of dots during the boot process. When the system is finished configuring the devices, it displays a list of options.

3. Enter the number associated with the **Solaris Interactive(default)** option.

   The system can display a screen warning the users that they have 30 seconds to respond.

   The system displays a series of messages while it attempts to configure the network interfaces, set up Java, and begins the Extracting windowing system process.

   The **Configure Keyboard Layout** screen is displayed.

4. Select the appropriate language. Press **F2**.

   The system displays a pop-up window in the upper left corner of the screen asking if the print is legible to determine if the graphical interface of the video card is working.

5. Place the cursor in the screen and press **Enter**.

   CAUTION:
   If the user does not press enter in this popup window within a short period of time, the system will exit the graphical interface installation. If this occurs, reboot the system and repeat Installing Solaris 10 on x86 systems on page 48.

6. Select the appropriate language. Press **Enter**.

   The system displays the "**Welcome**" screen.

7. Continue with Configuring RAID and initial installation of Solaris 10 on page 49.

Configuring RAID and initial installation of Solaris 10

WARNING:
The Solaris 10 DVD, used to boot the system, must match the Solaris release and platform type of the system you are restoring. A mismatch in the Solaris release, Solaris version, or platform type causes the restore process to fail.

The system should be booted to the appropriate Solaris 10 DVD with the "**Welcome**" screen displayed.

1. Open a terminal window.
   a. Right click in the desktop area of the screen.
   b. Select "**Programs**".
   c. Select "**Terminal**…" from the dropdown list.

Enter the following commands from the terminal window's command line:

2. Enter:

   ```
   stty erase Backspace
   ksh -o vi
   ```

3. Enter:

   ```
   umount /cdrom
   ```

   Use the following table to determine the cdrom path for your system:

CDROM Path for platform type

Platform Type	CDROM Path
T5120/T5220	/dev/dsk/c0t0d0s0

T4-1	/dev/dsk/c0t6d0s0
x86	/dev/dsk/c1t0d0s0

4. Enter:

   eject -f <cdrom_path>

5. Remove the Solaris 10 DVD and put it in a safe place.
6. Insert the Avaya Call Management System software disc, for the appropriate platform, SPARC or x86, into the disc drive.
7. Enter:

   ls -l /cdrom

   - If no error message is displayed it implies that the `/cdrom` directory exists. Continue with Step 8.
   - If an error message is displayed it implies that the `/cdrom` directory does not exist. Enter:

     mkdir /cdrom

8. To mount the disc in the disc drive, enter:

   mount -F hsfs <cdrom_path> /cdrom

   Verify the prelansetup file exists in the `/cdrom` directory.

9. Enter:

   ls -l /cdrom | grep prelansetup

   - If the **prelansetup** file exists, continue with Step 10.
   - If the **prelansetup** file does not exist, check to be sure the correct Avaya Call Management System software disc was inserted and repeat Steps 3 through 9. If the file still does not exist the cdrom may not be mounting properly, escalate through normal channels.

10. Enter:

    /cdrom/prelansetup

    The system displays the following message:

```
<timestamp> WARNING: /etc/release is not available

***** IMPORTANT!! *****

The system is booted from a Solaris 10 9/10 (Update 9) DVD

If the system is being restored be sure that the system is booted from the same
version of Solaris that was used to build the original CMS system.

Please enter y to continue or press any other key to quit:
```

- If you are sure the system is booted from the correct Solaris 10 DVD release, enter **y**. Continue with Step 11.
- If you are not sure the system is booted from the correct Solaris 10 DVD release, enter **n**.

  Repeat this procedure after you have booted the system from the correct Solaris 10 DVD release.

11. The system prompts the user for the hostname of the CMS system.

```
Please enter the hostname of the CMS system.

Enter the hostname.
```

12. The system prompts the user to verify the CMS hostname entered.

```
You have entered [ <hostname> ].  Is this correct? (Y|N)
```

    Do one of the following actions:

- If the hostname entered is correct, enter **y**. Press **Enter**. Continue with Step 13.
- If the hostname entered is not correct, enter **n**. Press **Enter**. The user is prompted to reenter the hostname of the CMS system.

13. The system prompts the user for the IP address of the CMS system.

```
Please enter the IP address of the CMS system.

Enter the IP address.
```

14. The system prompts the user to verify the CMS IP address entered.

```
You have entered [ xxx.xxx.xxx.xxx ].  Is this correct? (Y|N)
```

Do one of the following actions:

- If the IP address entered is correct, enter **y**. Press **Enter**. Continue with Step 15.
- If the IP address entered is not correct, enter **n**. Press **Enter**. The user is prompted to reenter the IP address of the CMS system.

15. The system prompts the user for the netmask address of the CMS system.

```
Please enter the netmask address of the CMS system.

Enter the Netmask address.
```

16. The system prompts the user to verify the netmask address entered.

```
You have entered [ xxx.xxx.xxx.xxx ].  Is this correct? (Y|N)
```

Do one of the following actions:

- If the netmask address entered is correct, enter **y**. Press **Enter**. Continue with Step 17.
- If the netmask address entered is not correct, enter **n**. Press **Enter**. The system prompts the user to reenter the netmask address.

17. The system prompts the user for the router address of the CMS system.

```
Please enter the router address of the CMS system.

Enter the router address.
```

18. The system prompts the user to verify the router address entered.

```
You have entered [ xxx.xxx.xxx.xxx ].  Is this correct? (Y|N)
```

Do one of the following actions:

- If the router address entered is correct, enter **y**. Press **Enter**. Continue with Step 19.
- If the router address entered is not correct, enter **n**. Press **Enter**. The user is prompted to reenter the router address.

19. The system begins the installation of Solaris 10. The system displays messages similar to the following:

```
add net default: gateway: xxx.xxx.xxx.xxx

 Testing connection. Please wait...

 xxx.xxx.xxx.xxx is alive

<timestamp> INFO:CMS Hostname: <cms_hostname>
<timestamp> INFO:Interface: <interface#>
<timestamp> INFO:CMS IP address: <cms_ip_address>
<timestamp> INFO:Netmask: <netmask_ip_address>
<timestamp> INFO:Router: <router_ip_address>

<timestamp> INFO:Setting up RAID - RAID 10 for SPARC, RAID 1 for x86
<timestamp> INFO:LSI chip RAID card. MegaCli utility will be used
.
.
.
<timestamp> INFO:Mounting file systems
<timestamp> INFO:Starting restore from your cmsadm backup.
<timestamp> INFO:This process can take a long time. Please wait...
```

If the **prelansetup** process fails to configure the RAID hardware controller and install Solaris 10, repeat this procedure. If the process fails again, escalate through normal channels.

The system writes restore messages from the **prelansetup** script to the `/tmp/root/restorecms.log`.

WARNING:
The system does not install graphic packages as part of the Solaris 10 installation. The system restores the graphic packages from commands executed later in this document. The remaining steps in this procedure are entered at the command line prompt.

20. The system automatically reboots and displays the console login prompt.

Note:
If the system does not display the login prompt and the boot process appears to be hung, try pressing the **Enter** key. During the boot process, the system can display error messages. Ignore these messages.

21. Enter **root.**

    There is no root password assigned at this time.

22. The system displays the command line prompt.

23. Continue with Enabling the Korn shell on page 54.

Enabling the Korn shell

To enable the Korn shell:

1. Open a terminal window.
2. From the command prompt enter:

   `stty erase` Backspace

   `ksh -o vi`

   Note:
   The system displays the **Backspace** as `^H`. On some systems **Backspace** will not work. If this is the case, substitute `"^H"` for **Backspace**.
3. If the system is a x86 platform, continue with Restoring an Avaya CMS server and data on page 54.
4. Set auto-boot? to true.

   Enter: **`eeprom auto-boot?=true`**
5. Verify auto-boot? is set to true.

   Enter: **`eeprom | grep auto-boot?`**
6. Set `fcode-debug`? back to it's original setting.

   Enter: **`eeprom fcode-debug?=<Orig_fcode-debug?>`**

   where `Orig_fcode-debug`? is the original `fcode-debug`? setting documented in Step 7 of the section Setting up RAID 10.

Restoring an Avaya CMS server and data

CAUTION:
Netbackup 7.0 and Tivoli Storage Manager 5.5.0 are only supported on T5120 and T5220 platforms. They are not supported on the Netra X4270 platform.

If using Netbackup 7.0, go to Restoring an Avaya CMS Server and data using NetBackup on page 60.

Restoring an Avaya CMS Server and data using Tivoli Storage Manager

To restore the system data:

1. Install the TSM client software on the Avaya CMS server. The Tivoli Storage Manager UNIX Backup/Archive Clients software disc contains the **TIVsmCapi.pkg** and the **TIVsmCba.pkg** software packages.

   For more information about installing the client software, see the appropriate Tivoli quick start guide or *Tivoli Storage Manager Installing the Clients*.

2. Perform any customization required for communication with the server software. The CMS server must be on the network. For more information, see Configuring the network settings on an Avaya CMS server on page 72 and Enabling DNS on an Avaya CMS server on page 73.

3. Enter:

   `vi /usr/bin/dsm.sys`

   The file should contain the following settings:

   - `SErvername` should contain the host name of the server running the storage manager server software.
   - `COMMmethod` should be set to TCPip.
   - `TCPServeraddress` should contain the host and domain name of the Tivoli server.
   - `PasswordAccess` should be set to generate.

   Example:

```
************************************************************************
* Tivoli Storage Manager                                               *
..................
...............
...............
SErvername  server_1
   COMMmethod         TCPip
   TCPPort            1500
   TCPServeraddress   server_1.domain.company.com

PasswordAccess generate
```

4. If the settings are not correct in the **dsm.sys** file, make the appropriate changes.

5. Press **Esc**. Then enter:

   `:wq!`

6. Enter:

   `vi /usr/bin/dsm.opt`

   The file should contain the following setting:

- `SErvername` should contain the host name of the server running the storage manager server software.

Example:

```
************************************************************************
* Tivoli Storage Manager                                               *
*                                                                      *
* Sample Client User Options file for UNIX (dsm.opt.smp)               *
************************************************************************

*  This file contains an option you can use to specify the TSM
*  server to contact if more than one is defined in your client
*  system options file (dsm.sys).  Copy dsm.opt.smp to dsm.opt.
*  If you enter a server name for the option below, remove the
*  leading asterisk (*).

************************************************************************

* SErvername       A server name defined in the dsm.sys file
SErvername server_1
```

7. If the settings are not correct in the **dsm.opt** file, make the appropriate changes.
8. Press **Esc**. Then enter:

   :wq!

9. Customize any network settings for the Avaya CMS server. For more information, see Configuring the network settings on an Avaya CMS server on page 72.
10. Setting the correct version of **dsmtca**

    Run the following commands:

    rm /usr/bin/dsmtca

    ln -s /opt/tivoli/tsm/client/api/bin64/dsmtca /usr/bin/dsmtca

11. Enter:

    cd /tmp

12. Enter:

    touch /dsmerror.log

    chmod 777 /dsmerror.log

13. Access the command line mode of the storage manager by entering:

    dsmc

    The system attempts to query any data that is backed up, and then displays the following message:

```
Please enter your user ID (default):
```

14. Enter the user ID.

    The system displays the following message:

```
Please enter password for user ID "default"
```

15. Enter the password for the Tivoli storage manager server software.

    Important:
    Ignore any error messages about the backup.

16. Enter:

    quit

17. Restore CMS by entering the following command on a single line at the command prompt:

    dsmc restore /cms/ -subdir=yes -latest 2>&1 | tee -a /tmp/tmp.log

    Note:
    You can check for error messages from the restore in **/tmp/tmp.log**. This log will not be present if the system is rebooted.

18. Restore the system data by entering:

    /cms/LANbkup/bin/restore.tivoli

    Important:
    Some storage devices require the media to be changed manually. It may be necessary to have someone change the storage media.

    The system displays the following message:

```
Do you want to continue? (y/n)
```

19. Enter: **y**

    The system restores the system data and reboots.

    Note:
    The Tivoli Storage Manager may prompt you to enter the user ID and user password.

20. Log into the system as **root**.
21. Verify that the restore has completed successfully by entering:

    cat /cms/install/logdir/restore/restorecms.log

    The system displays the Avaya CMS restore log.

22. Enter:

    touch /cms/install/logdir/bar_act.log

    chmod 660 /cms/install/logdir/bar_act.log

23. Enter:

    chown informix:informix /cms/install/logdir/bar_act.log

24. Enter:

    /opt/informix/bin/txbsapswd

25. Restore the Avaya CMS data by entering:

    /cms/LANbkup/bin/onbar_restore.tivoli

    The system displays the following message:

    ```
    Do you want to continue? (y/n)
    ```

26. Enter: **y**

    Note:
    Depending on the amount of data, the data restore could take several minutes or several hours to complete.

27. If the system prompts for a user ID, enter the Tivoli Server user ID.
28. If the system prompts for a user password, enter the Tivoli Server user password.

29. Verify that the restore has completed successfully by entering:

    cat /cms/install/logdir/restore.log

    The restore log will contain messages similar to the following as the restore process progresses.

```
Total number of objects restored:           1

Total number of objects failed:             0

Total number of bytes transferred:          26  B

Data transfer time:                         0.00 sec

Network data transfer rate:                 540.22 KB/sec

Aggregate data transfer rate:               0.00 KB/sec

Elapsed processing time:                    00:00:03

dsmc command return code:                   0

dsmc Server Version:                        5.5


onbar -r -w -p started Fri Nov  1 11:59:06 MST 2009

onbar -r -w -p finished Fri Nov  1 15:36:24 MST 2009

Rolling forward the logical logs. Please wait...

onmode -sy started Fri Nov  1 15:36:24 MST 2009

+++++ ON-Bar RESTORE SUCCESSFULLY FINISHED Fri Nov  1 15:37:12 MST 2009
```

Important:
Some storage devices require the media to be changed manually. It may be necessary to have someone change the storage media.

30. Verify that the Informix configuration parameters for the Avaya CMS software are correct.

    For more information, see *Setting the Informix configuration parameters for Avaya CMS* in the appropriate version of the *Avaya CMS Software Installation, Maintenance, and Troubleshooting Guide*.

31. Turn on the Avaya CMS software.

    a. Enter:

       cmsadm

       The system displays the **CMSADM** menu.

    b. Enter the number associated with the **run_cms** option.

c. Enter the number associated with the **Turn on CMS** option.

Restoring an Avaya CMS Server and data using NetBackup

To restore the system data:

1. Install the NetBackup 7.0 client software on the Avaya CMS server.

For more information on installing the client software, see the appropriate section in the *Symantec NetBackup™ 7.0 Installation Guide for Unix*.

2. Perform any customization required for communication with the server software. The CMS server must be on the network. For more information, see the Configuring the network settings on an Avaya CMS server on page 72 and Enabling DNS on an Avaya CMS server on page 73.
3. Restore the CMS system by entering the following command on a single line at the command prompt:

   ```
   /usr/openv/netbackup/bin/bprestore -L /tmp/tmp.log -C {clientname}
     -t 0 -k "CMS_Full" -w 8:00:00 /etc/system
   ```

4. Reboot the system using:

   ```
   shutdown -y -i6 -g0
   ```

5. Once the system is back up, login as root.

   Note:
   The graphical login screen is not displayed at this point of the restore process.

6. Enter:

   ```
   stty erase Backspace
   ```

   ```
   ksh -o vi
   ```

7. Restore CMS by entering the following command on a single line at the command prompt:

   ```
   /usr/openv/netbackup/bin/bprestore -L /tmp/tmp.log -C {clientname}
     -t 0 -k "CMS_Full" -w 8:00:00 /cms/
   ```

   Note:
   You can check for error messages from the restore in `/tmp/tmp.log`. This log will not be present if the system is rebooted.

8. Restore the system data by entering:

   ```
   /cms/LANbkup/bin/restore.netbackup
   ```

   Important:
   Some storage devices require the media to be changed manually. It may be necessary to have someone change the storage media.

The system displays the following message:

```
Do you want to continue? (y/n)
```

9. Enter **y**. The system restores the system data and reboots.

Note:
The `restore.netbackup` process may take a few hours to complete. DO NOT interrupt the restore.

10. Log in to the system as **root**.
11. Verify that the restore has completed successfully by entering:

    `tail -20 /cms/install/logdir/restore.log`

    The system displays the Avaya CMS restore log.
12. Check to see if the `/cms/install/logdir/bar_act.log` exists, enter:

    `ls -l /cms/install/logdir/bar_act.log`

    The system displays messages similar to the following:

```
-rw-rw----   1 informix informix   90162 Apr 18 09:06 /cms/install/logdir/bar_act.log
```

13. Review the file properties for the `/cms/install/logdir/bar_act.log` file:

- If the /`cms/install/logdir/bar_act.log` exists and the file properties are correct, continue with Step 16.
- If the `/cms/install/logdir/bar_act.log` does not exist, continue with Step 14.
- If the `/cms/install/logdir/bar_act.log` exists but the file properties are not correct, continue with Step 15.

14. Enter:

    `touch /cms/install/logdir/bar_act.log`
15. Enter:

    `chmod 660 /cms/install/logdir/bar_act.log`

    `chown informix:informix /cms/install/logdir/bar_act.log`
16. Restore the Avaya CMS data by entering:

    `/cms/LANbkup/bin/onbar_restore.netbackup X`

    where X is one of the following:

    - 0 for a full system backup

- 1 for an incremental system backup

The system displays the following message:

```
Do you want to continue? (y/n)
```

17. Enter: **y**

Note:
Depending on the amount of data, the data restore could take several minutes or several hours to complete.

18. To monitor the data restore process, enter:

    tail -f /cms/install/logdir/bar_act.log

19. Verify that the restore has completed successfully by entering:

    cat /cms/install/logdir/restore.log

    The restore log will contain messages similar to the following as the restore process progresses.

```
Total number of objects restored:            1

Total number of objects failed:              0

Total number of bytes transferred:           26  B

Data transfer time:                          0.00 sec

Network data transfer rate:                  540.22 KB/sec

Aggregate data transfer rate:                0.00 KB/sec

Elapsed processing time:                     00:00:03

dsmc command return code:                    0

dsmc Server Version:                         5.5


onbar -r -w -p started Fri Nov  1 11:59:06 MST 2009

onbar -r -w -p finished Fri Nov  1 15:36:24 MST 2009

Rolling forward the logical logs. Please wait...

onmode -sy started Fri Nov  1 15:36:24 MST 2009

+++++ ON-Bar RESTORE SUCCESSFULLY FINISHED Fri Nov  1 15:37:12 MST 2009
```

Important:
Some storage devices require the media to be changed manually. It may be necessary to have someone change the storage media.

20. Verify that the Informix configuration parameters for the Avaya CMS software are correct.

    For more information, see *Setting the Informix configuration parameters for Avaya CMS* in the appropriate version of the *Avaya CMS Software Installation, Maintenance, and Troubleshooting Guide*.

21. Turn on the Avaya CMS software.

    a. Enter:

    ```
    cmsadm
    ```

    The system displays the **CMSADM** menu.

    b. Enter the number associated with the **run_cms** option.

Enter the number associated with the **Turn on CMS** option.

Additional Information

For more information, see *Symantec NetBackup™ 7.0 Installation Guide for Unix*.

Troubleshooting the LAN backup feature

This section provides solutions for common problems with the Avaya Call Management System (CMS) LAN backup feature.

This section includes the following topics:

- Basic troubleshooting on page 65
- Backup logs on page 66
- Configuring the network settings on an Avaya CMS server on page 72
- Enabling DNS on an Avaya CMS server on page 73
- Troubleshooting the Tivoli Storage Manager include and exclude list on page 74
- Tivoli Storage Manager Storage pool variable error messages on page 76
- Verifying the network card settings on page 77
- Checking shared memory parameters on page 78
- Restarting a Tivoli Storage Manager restore after it has stopped on page 79

CAUTION:
Netbackup 7.0 and Tivoli Storage Manager 5.5.0 are only supported on T5120 and T5220 platforms. They are not supported on the Netra X4270 platform.

Basic troubleshooting

When trying to determine why a backup or restore is not working, there are some basic steps you should perform first:

1. Verify that the Avaya CMS server, backup server, and storage device has power and is online.
2. Verify that the appropriate storage media is loaded in the storage device.
3. Check the cabling on the Avaya CMS server. Make sure all the cables and connectors are securely attached.
4. Verify that the Avaya CMS server can detect the backup server over the network.
5. Verify that the backup server can detect the Avaya CMS server over the network.

Backup logs

There are five backup logs that can be used to monitor the status of a backup. The backup logs are found in **/cms/install/logdir**

This section includes the following topics:

- backup.log on page 66
- bar_act.log on page 68
- dsierror.log on page 68
- dsmerror.log on page 68
- nbuerror.log on page 69
- restore.log on page 70

For more information on error codes, see the appropriate Tivoli storage manager administrator's guide.

backup.log

The **backup.log** file contains the most information about the status of backups. This log includes information on:

- When the backup started and ended
- The type of backup performed
- Connection to the storage manager server
- Level of the backup
- Files included in the backup
- Network status

Example:

```
===== LAN SYSTEM BACKUP STARTED Fri Feb 15 12:16:01 MST 2002

/cms/LANbkup/bin/backup.tivoli 0
Converter started Fri Feb 15 12:16:17 MST 2002
Converter completed successfully Fri Feb 15 12:16:30 MST 2002
Tivoli Storage Manager started Fri Feb 15 12:16:31 MST 2002
Tivoli Storage Manager
Command Line Backup Client Interface - Version 4, Release 2, Level 1.0
(C) Copyright IBM Corporation, 1990, 2001, All Rights Reserved.

Node Name: GROMMIT
Session established with server SERVER1: Solaris 7/8
  Server Version 4, Release 2, Level 1.0
  Server date/time: 02/15/02   12:20:54  Last access: 02/15/02   12:09:34


Total number of objects inspected:   39,925
Total number of objects backed up:   39,916
Total number of objects updated:          0
Total number of objects rebound:          0
Total number of objects deleted:          0
Total number of objects expired:          0
Total number of objects failed:           0
Total number of bytes transferred:     1.15 GB
Data transfer time:                  239.39 sec
Network data transfer rate:        5,049.49 KB/sec
Aggregate data transfer rate:        703.47 KB/sec
Objects compressed by:                    0%
Elapsed processing time:           00:28:38

===== LAN SYSTEM BACKUP SUCCESSFULLY FINISHED Fri Feb 15 12:45:12 MST 2002

+++++ ON-Bar BACKUP STARTED Fri Feb 15 13:12:00 MST 2002

/cms/LANbkup/bin/onbar_backup.tivoli 0
onbar -b -w -L 0 started Fri Feb 15 13:12:14 MST 2002
.................
.................
.................
Total number of bytes transferred:    19.30 MB
Data transfer time:                    4.14 sec
Network data transfer rate:        4,768.22 KB/sec
Aggregate data transfer rate:      1,299.32 KB/sec
Objects compressed by:                    0%
Elapsed processing time:           00:00:15

+++++ ON-Bar BACKUP SUCCESSFULLY FINISHED Fri Feb 15 13:13:10 MST 2002
```

bar_act.log

The **bar_act.log** file contains information about the status of the Informix On-Bar data backups. For more information, see the Informix documentation.

Example:

```
2002-02-15 12:04:59 793  791 /opt/informix/bin/onbar_d -r -w -p
2002-02-15 12:05:14 793  791 Successfully connected to Storage Manager.
2002-02-15 12:05:14 793  791 Begin cold level 0 restore rootdbs (Storage Manager copy
ID: 0 1423128).
2002-02-15 12:05:55 793  791 Completed cold level 0 restore rootdbs.
2002-02-15 12:05:55 793  791 Begin cold level 0 restore logdbs (Storage Manager copy ID:
0 1423130).
.................
.................
.................
2002-02-15 13:12:53 2401  2399 /opt/informix/bin/onbar_d complete, returning 15
2 (0x98)
```

dsierror.log

The **dsierror.log** file contains information about the communication between the X/Open Backup Services Application Programmer's Interface (XBSA interface) and On-Bar. This log may not exist on your system. The error log is created when a failure message is generated.

Example:

```
12/03/01   16:05:41 TcpOpen: TCP/IP error connecting to server.
12/03/01   16:05:41 sessOpen: Failure in communications open call. rc: -50
12/03/01   18:38:45 cuSignOnResp: Server rejected session; result code: 53
12/03/01   18:38:45 sessOpen: Error 53 receiving SignOnResp verb from server
```

dsmerror.log

The **dsmerror.log** file contains information about Tivoli storage manager software processes. This log provides error codes that can be used to obtain more information about any potential problems with the software. This log may not exist on your system. The error log is created when a failure message is generated.

Example:

```
03/04/02   14:07:21 TcpOpen: TCP/IP error connecting to server.
03/04/02   14:07:21 sessOpen: Failure in communications open call. rc: -50
03/04/02   14:07:21 ANS1017E Session rejected: TCP/IP connection failure
```

To display help information on a specific client error code:

1. From the # prompt, enter:

   dsmc

   The system enters the storage manager command line mode and the prompt changes to `tsm>`.

2. Enter

   help

   The system displays a help menu.

3. Scroll through the help menu to find the range of error codes that the error code would fit into.
4. Enter the numeric designation for the error code range.
5. Scroll through the error code table to find the entry for the error code.

   Example:

   If the log displays the error code ANS1115W, enter: **help**

   The system displays the help menu.

   Scroll through the list, and find the option for the error message:

```
 167 -  ANS1100-ANS1119
```

   Enter: **167**

   The system displays a table with error codes. Scroll through the table, and locate the error message.

```
 ANS1115W File 'file-namefile-namefile-name' excluded by Include/
Exclude list
```

nbuerror.log

The **nbuerror.log** file contains information about Netbackup 7.0 software processes. This log provides error codes that can be used to obtain more information about any potential problems with the software. This log may not exist on your system. The error log is created when a failure message is generated.

Tivoli Storage Manager additional troubleshooting

To display help information on a specific client error code:

1. From the # prompt, enter:

   dsmc

The system enters the storage manager command line mode and the prompt changes to **<tsm>**

2. Enter **help**

The system displays the help menu.

3. Scroll through the help menu to find the range of error codes that the error code would fit into.
4. Enter the numeric designation for the error code range.
5. Scroll through the error code table to find the entry for the error code.

   For example, If the log displays the error code ANS1115W, enter: **help**. The system displays the help menu. Srcoll throught the list and find the option for the error message:

   ```
   167 -  ANS1100-ANS1119
   ```

   Enter: **167**.

   The system displays a table with error codes. Scroll through the table and locate the error message:

   ```
   ANS1115W File 'file-namefile-namefile-name' excluded by Include/
   Exclude list
   ```

restore.log

The **restore.log** file contains information about the status of a data or system restore. This log is an Avaya CMS log. The other backup logs can be used to provide more detailed information about a particular backup or restore process.

Example:

```
===== LAN SYSTEM RESTORE STARTED Fri Feb 15 11:18:01 MST 2002

Restore root file system, please wait...
dsmc restore / /r_root -subdir=yes -preserv=complete started Fri Feb 15 11:18:07
 MST 2002
dsmc restore / /r_root -subdir=yes -preserv=complete finished Fri Feb 15 11:41:0
5 MST 2002
find /devices /dev | cpio -pmudv /r_root started Fri Feb 15 11:41:05 MST 2002
1 blocks
build devices tree finished Fri Feb 15 11:41:18 MST 2002
fmthard:  New volume table of contents now in place.

===== LAN SYSTEM RESTORE SUCCESSFULLY FINISHED Fri Feb 15 11:41:25 MST 2002

+++++ ON-Bar RESTORE STARTED Fri Feb 15 12:02:57 MST 2002

Tivoli Storage Manager
Command Line Backup Client Interface - Version 4, Release 2, Level 1.0
(C) Copyright IBM Corporation, 1990, 2001, All Rights Reserved.

Restore function invoked.
Node Name: GROMMIT
Session established with server SERVER1: Solaris 7/8
  Server Version 4, Release 2, Level 1.0
  Server date/time: 02/15/02   12:07:29  Last access: 02/15/02   11:22:27

ANS1247I Waiting for files from the server...
Restoring             512 /opt/informix/etc/conv [Done]
Restoring             512 /opt/informix/etc/en_us [Done]
.................
.................
.................
Restore processing finished.

Total number of objects restored:       139
Total number of objects failed:           0
Total number of bytes transferred:    19.15 MB
Data transfer time:                    1.33 sec
Network data transfer rate:        14,694.95 KB/sec
Aggregate data transfer rate:      1,111.19 KB/sec
Elapsed processing time:           00:00:17
Tivoli Storage Manager
Command Line Backup Client Interface - Version 4, Release 2, Level 1.0
(C) Copyright IBM Corporation, 1990, 2001, All Rights Reserved.
```

Configuring the network settings on an Avaya CMS server

The **hosts** file contains the network settings for an Avaya CMS server. If the system is unable to detect the network, the network settings might be incorrect.

To configure networking:

1. Enter:

   `vi /etc/hosts`

   Important:
   The items in this file must be separated by tabs, not spaces, and any comments must begin with a `#`. The entry for `localhost` must remain on line four and the entry for `loghost` must remain on line five.

   The `loghost` line should contain the Avaya CMS server:

   – IP address

   – Host name

   – Hostname.fully qualified domain name

   – loghost

   The fully qualified domain name is the customer domain name.

   Example:

```
#
# Internet host table
#
127.0.0.1       localhost
192.168.2.1   hostname   hostname.company.com  loghost
```

2. Add a line to this file for the router that will connect to this computer. You must enter the IP address and designate it as a router.
3. Add a line to this file for the LAN backup server that will connect to this computer. You must enter the IP address and designate it with the host name.

   This example shows the recommended default IP addressing scheme for a closed network.

```
#
# Internet host table
#
127.0.0.1      localhost
192.168.2.1    hostname   hostname.company.com  loghost
192.168.2.103  router
195.168.2.108  backup_server
```

4. Press **Esc**. Then enter:

   ```
   :wq!
   ```

5. If the Avaya CMS server uses DNS, see Enabling DNS on an Avaya CMS server on page 73.

Enabling DNS on an Avaya CMS server

If the system is receiving error messages pertaining to an inability to resolve a host name, DNS might be set up incorrectly.

To enable DNS:

1. Enter:

   ```
   cp /etc/nsswitch.dns /etc/nsswitch.conf
   ```

2. Enter:

   ```
   vi /etc/defaultrouter
   ```

   The system creates the **defaultrouter** file.

3. On the first line, enter the IP address of the gateway.
4. Press **Esc** and enter:

   ```
   :wq!
   ```

5. Enter:

   ```
   vi /etc/resolv.conf
   ```

   The system creates the **resolv.conf** file.

6. On the first line, enter the company domain name.

   Example:

   domain *company.com*

7. On the next line, enter the DNS IP address.

   Example:

   nameserver *135.9.1.39*

8. Press **Esc** and enter:

   ```
   :wq!
   ```

9. Enter:

   ```
   touch /etc/norouter
   ```

10. Enter:

    `route add default IP_address 1`

    where ***`IP_address`*** is the IP address of the gateway.

Troubleshooting the Tivoli Storage Manager include and exclude list

WARNING:
These notes are for Tivoli Storage Manager only. The scripts for the Netbackup Server create their own include list at `/cms/LANbkup/incl_excl/bkup_incl.netbackup`. Changes to the included files must be made in the Netbackup scripts, and should only be made by Avaya.

To verify the files in the include and exclude list:

1. Enter:

   `cd /cms/LANbkup/incl_excl`

2. Enter:

   `cat backup_excl.tivoli`

   The system displays a file similar to the following example.

   Example:

```
exclude.dir /proc
exclude.dir /cdrom
exclude.dir /n
exclude.dir /vol
exclude.dir /floppy
exclude.dir /xfn
exclude.dir /dev
exclude.dir /devices
exclude.dir /tmp/.../*
exclude /tmp/*
exclude.dir /var/tmp/.../*
exclude /var/tmp/*
exclude /.../core
exclude /etc/path_to_inst
exclude /etc/nologin
exclude /etc/mnttab
exclude.dir /var/spool/lp/temp
exclude.dir /var/spool/lp/tmp
exclude.dir /var/spool/lp/requests
exclude.dir /var/spool/mqueue
exclude /var/spool/locks/*
exclude.dir /cms/tmp/.../*
exclude /cms/tmp/*
exclude /.../BI/add_on/data/forwarder/*
exclude.dir /INFORMIXTMP
```

3. Perform the following steps *only* if a modification is required for the **backup_excl.tivoli** file:

   CAUTION:
   Modifying this file can cause future system restores to fail. Contact Avaya technical support or your product distributor before modifying this file.

   a. Enter:

      `vi /cms/LANbkup/incl_excl/backup_excl.tivoli`

   b. Change any required settings in the **backup_excl.tivoli** file.

      1. To exclude a directory from the backup, enter:

         `exclude.dir` *`directory_path`*

         where ***`directory_path`*** is the full path for the directory.

2. To exclude a file from the backup, enter:

   exclude *file_path*

   where ***file_path*** is the full path for the file.

c. Press **Esc**. Then enter:

   :wq!

Tivoli Storage Manager Storage pool variable error messages

The Tivoli storage manager server software can be configured to backup data to a disk drive and then migrate the data to another type of storage media. When a predetermined threshold value is reached, a set amount of data on the disk drive is migrated to another type of storage media. This process is controlled by the highmig and lowmig storage pool variables. If the highmig and lowmig storage pool variables are incorrectly set up, then the backup will generate error messages in the **backup.log file** and the **bar_act.log** file.

The **backup.log** file contains the following error message:

```
+++++ ON-Bar BACKUP FAILED Wed Feb 27 12:34:24 MST 2002
```

The **bar_act.log** file contains the following error message:

```
 2002-02-27 12:34:17 6549  6547 XBSA Error: (BSAEndTxn) Exceeded
available resources.
 2002-02-27 12:34:24 6549  6547 /opt/informix/bin/onbar_d complete,
returning 19 (0x13)
```

The error messages are generated because the system is attempting to migrate only part of an ACD dbspace to the storage media. Entire ACD dbspaces must be migrated. ACD dbspaces can contain more than 2 GB of data.

Contact your Tivoli administrator if these error messages are generated. The administrator will need to adjust the highmig and lowmig storage pool variables based on the amount of data to be stored on the disk drive and the amount of data to be migrated to the storage media.

Verifying the network card settings

Important:
To determine which parameters are supported by a driver, use the following command: **`ndd /dev/e1000g0 \?`**

Use the following commands to verify the network card settings:

1. To determine the duplex setting of the network card, enter:

   `ndd /dev/e1000g0 link_duplex`

   The system displays a number representing the duplex setting for the network interface.

Number displayed	Link mode
1	half
2	full

2. To determine the speed of the network connection, enter:

   `ndd /dev/e1000g0 link_speed`

   The system displays a number representing the speed setting for the network interface.

Link speed (Mbps)
10 Mbps
100 Mbps
1000Mbps

3. To determine network connectivity, enter:

   `ndd /dev/e1000g0 link_status`

   The system displays a number representing the status of the network interface.

Number displayed	Link mode
0	no link
1	link established

Note:
If you need to change any network card settings, contact your Avaya or Avaya partner representative.

Checking shared memory parameters

If a data restore fails, check the shared memory parameters. Shared memory errors may be created if a data restore fails or is manually stopped before completion. If the shared memory errors are not removed, future restores will fail. The system may also display the following error message:

```
oninit: Fatal error in shared memory creation
```

To check the shared memory:

1. Verify that the Avaya CMS software and IDS software are off.
   a. Enter:

      cmsadm

      The system displays the **CMSADM** menu.
   b. Enter the number associated with the **run_cms** option.
   c. Enter the number associated with the **Turn off both CMS and IDS** option.
2. Determine if there are any shared memory errors by entering:

   ipcs

   The system displays one of the following messages:

   - If there are *no* memory errors the system displays a message similar to the following:

```
IPC status from <running system> as of Mon Mar  4 14:55:37 EST 2002
T         ID      KEY        MODE        OWNER    GROUP
Message Queues:
Shared Memory:
m          0   0x50000b2d --rw-r--r--     root     root
m          4   0x50302    --rw-rw-rw-     root     root
m          5   0x30302    --rw-rw-rw-     root     root
Semaphores:
s          4   0x540302   --ra-ra-ra-     root     root
```

- If there are memory errors the system displays a message similar to the following:

```
IPC status from <running system> as of Mon Mar  4 14:41:22 EST 2002
T         ID      KEY        MODE        OWNER    GROUP
Message Queues:
Shared Memory:
m          0   0x50000b2d --rw-r--r--     root     root
m       1318   0x52574801 --rw-rw----     root informix
m       1319   0x52574802 --rw-rw----     root informix
m       1320   0x52574803 --rw-rw-rw-     root informix
m          4   0x50302    --rw-rw-rw-     root     root
m          5   0x30302    --rw-rw-rw-     root     root
Semaphores:
s          4   0x540302   --ra-ra-ra-     root     root
```

3. Remove any entries that have a group of Informix by entering:

   ipcrm -m *ID*

   where ***ID*** is the ID number for the line.

   Example:

   ipcrm -m 1318

4. It may be necessary to repeat Step 3 several times. Remove all Informix entries under Message Queues, Shared Memory, and Semaphores.

Restarting a Tivoli Storage Manager restore after it has stopped

If a data or system restore is stopped partway through the restore process, you might receive the following error message when you attempt to restart the restore:

```
An active restore for the same source file specification exsists.
```

The system generates this message when the restore command is run. This message is displayed from the terminal window and in the **dsmerror.log** file. This error is generated because the Tivoli server is still attempting to execute the previous restore session.

To start a new restore session:

1. Enter:

   dsmc cancel restore

   The system displays a list of the restore sessions that are still running.

2. Enter the number of the session you want to cancel. It might be necessary to repeat this process several times.
3. After removing the previous restore sessions, choose one of the following commands to start a new restore process:
   - Restore the system data by entering:

     `/cms/LANbkup/bin/restore.tivoli`
   - Restore the Avaya CMS data by entering:

     `/cms/LANbkup/bin/onbar_restore.tivoli`
4. Continue with the remainder of the restore procedure you were performing.

Appendix A: Mirrored system disk pairs

Use the following tables to determine the disk layout for your mirrored system.

Sun Enterprise T5120 4-core mirrored disk pairs

Primary disk	Mirrored disk
slot 0	slot 1
slot 2	slot 3

Sun Enterprise T5220 and T5120 8-core mirrored disk pairs

Primary disk	Mirrored disk
slot 0	slot 1
slot 2	slot 3
slot 4	slot 5

Sun Enterprise x86 mirrored disk pairs

Primary disk	Mirrored disk
slot 0	slot 1

Appendix B: Example Tivoli Storage Manager policy domain

A policy domain is a group of clients that have similar requirements for backing up and archiving data. It is recommended that you create a separate policy domain for your Avaya CMS servers.*The settings for your particular policy domain will vary from those given in this procedure.* For guidelines on backing up an Avaya CMS server, see Recommendations for backing up data on page 31 and the appropriate Tivoli documentation.

Important:
Avaya support personnel are not responsible for configuring policy domains or providing Tivoli support.

Example procedure:

1. Enter:

   dsmadmc

   The system displays the following message:

```
Tivoli Storage Manager
Command Line Administrative Interface - Version 4, Release 2, Level 1.0
(C) Copyright IBM Corporation, 1990, 2001, All Rights Reserved.

Enter your user id:
```

2. Enter your user ID.

   The system displays the following message:

```
Enter your password:
```

3. Enter your password.

   The system displays the `tsm: SERVER1>` prompt.

4. Perform the following procedure to configure a policy domain:

   a. Create a copy of the standard policy domain by entering:

      copy domain standard *cmsdomain*

Note:
The dash (-) at the end of the following command, allows you to enter a single large command as several smaller lines of text. The dash allows the command to continue across multiple lines.

b. Update the backup copy group by entering:

```
update copygroup cmsdomain standard standard standard -
type=backup verexists=4
```

c. Verify the policy set by entering:

```
validate policyset cmsdomain standard
```

d. Activate the policy set for the policy domain by entering:

```
activate policyset cmsdomain standard
```

Note:

If the node is not registered, you must register the node by entering the following command:

```
register node samplenode samplepassword domain=cmsdomain -
userid=none
```

e. Add the node to the policy domain by entering:

```
update node samplenode domain=cmsdomain
```

Appendix C: Example Avaya CMS scheduler policy for Tivoli Storage Manager

The Tivoli scheduler is used to automate your backups. This appendix shows an example of how to set up a scheduler policy. *The settings for your particular scheduler policy will vary from those given in this procedure.* For guidelines on backing up an Avaya CMS server, see Recommendations for backing up data on page 31 and the appropriate Tivoli documentation.

Important:
Avaya support personnel are not responsible for configuring scheduler policies or providing Tivoli support.

Example procedure:

1. On the Avaya CMS server, perform the following procedure:
   a. Enter:

      `vi /etc/inittab`

      The system displays the **inittab** file.

   b. Add the following line to the end of the file:

      `ts::once:/usr/bin/dsmc sched > /dev/null 2>&1`

   c. To save and close the file press **Esc**. Then enter:

      `:wq!`

   d. Enter:

      `nohup dsmc sched > /dev/null 2>&1 &`

2. Using the Tivoli Administrative interface, perform the following procedure:
   a. Enter:

      `dsmadmc`

      The system displays the `tsm SERVER >` prompt.

Note:
The dash (-) at the end of the following commands, allows you to enter a single large command as several smaller lines of text. The dash allows the command to continue across multiple lines.

b. Define the backup schedule for the daily Avaya CMS incremental data backup by entering the following commands:

```
define sched cmsdomain daily_cms_backup type=client -
desc="daily CMS incremental data backup" -
action=command obj="/cms/LANbkup/bin/onbar_backup.tivoli 1" -
startdate=06/01/2002 starttime=01:00:00 dayofweek=weekday
```

c. Define the backup schedule for the weekly Avaya CMS incremental system and full data backups by entering the following commands:

```
define sched cmsdomain weekly_cms_backup type=client -
desc="weekly CMS incremental system and full data backups" -
action=command obj="/cms/LANbkup/bin/backup.tivoli 1; " -
"/cms/LANbkup/bin/onbar_backup.tivoli 0" -
startdate=06/01/2002 starttime=01:00:00 -
duration=4 durunits=hours perunits=weeks dayofweek=saturday
```

d. Define the backup schedule for the monthly Avaya CMS full system and incremental data backups by entering the following commands:

```
define sched cmsdomain monthly_cms_backup type=client -
desc="monthly CMS full system and incremental data backups" -
action=command obj="/cms/LANbkup/bin/backup.tivoli 0; " -
"/cms/LANbkup/bin/onbar_backup.tivoli 1" -
startdate=06/01/2002 starttime=01:00:00 duration=4 -
durunits=hours perunits=months dayofweek=sunday
```

3. Enter the following commands:

```
define association cmsdomain daily_cms_backup samplenode
define association cmsdomain weekly_cms_backup samplenode
define association cmsdomain monthly_cms_backup samplenode
```

4. On the Avaya CMS server perform the following procedure:

a. Enter:

```
dsmc
```

The system displays the `tsm>` prompt.

b. Verify the schedule by entering:

`q sched`

The system displays a message similar to the following:

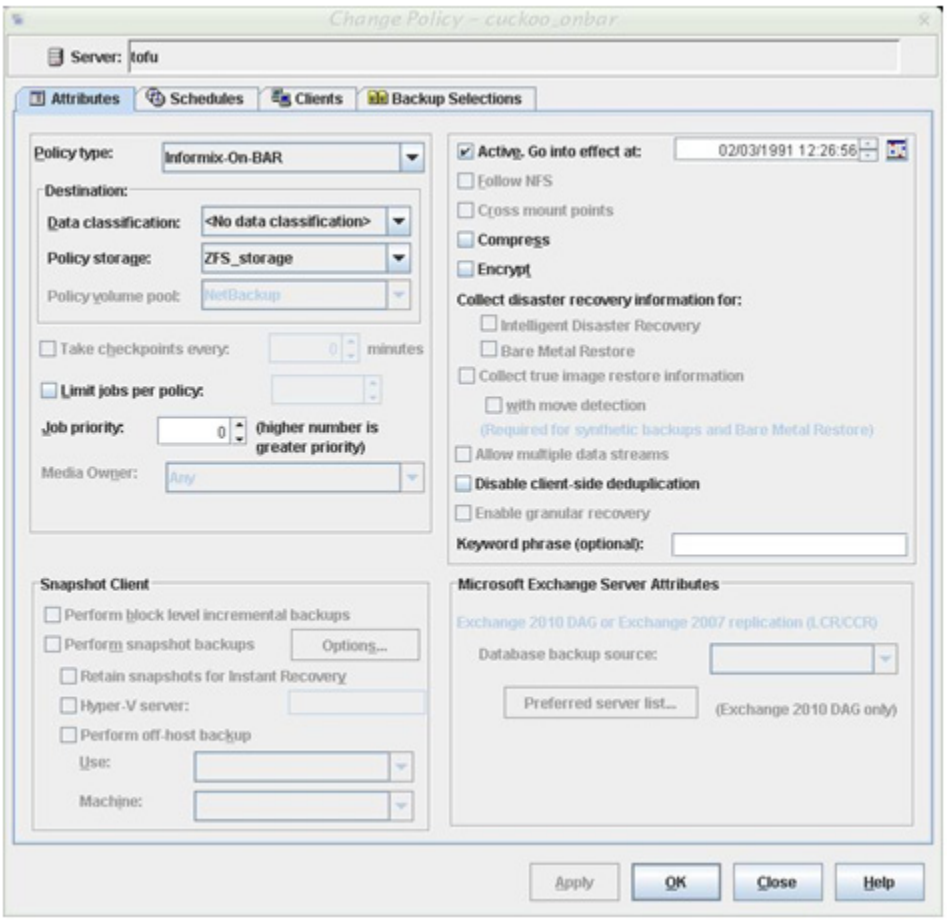
```
Node Name: samplenode
Session established with server SERVER1: Solaris 7/8
  Server Version 4, Release 2, Level 1.0
  Server date/time: 06/17/02   15:59:29  Last access: 06/17/02   15:58:31

    Schedule Name: DAILY_CMS_BACKUP
      Description: daily CMS incremental data backup
           Action: Command
          Options:
          Objects: /cms/LANbkup/bin/onbar_backup.tivoli 1
         Priority: 5
   Next Execution: 9 Hours and 1 Minute
         Duration: 1 Hour
           Period: 1 Day
      Day of Week: Weekday
           Expire: Never

    Schedule Name: WEEKLY_CMS_BACKUP
      Description: weekly CMS incremental system and fully data backups
           Action: Command
          Options:
          Objects: /cms/LANbkup/bin/backup.tivoli 1; /cms/LANbkup/bin/
onbar_backup.tivoli 0
         Priority: 5
   Next Execution: 105 Hours and 1 Minute
         Duration: 4 Hours
           Period: 1 Week
      Day of Week: Saturday
           Expire: Never

    Schedule Name: MONTHLY_CMS_BACKUP
      Description: monthly CMS full system and incremental data backups
           Action: Command
          Options:
          Objects: /cms/LANbkup/bin/backup.tivoli 0; /cms/LANbkup/bin/
onbar_backup.tivoli 1
         Priority: 5
   Next Execution: 465 Hours and 1 Minute
         Duration: 4 Hours
           Period: 1 Month
      Day of Week: Sunday
           Expire: Never
```

Appendix D: Example Avaya CMS policies for Netbackup 7.0

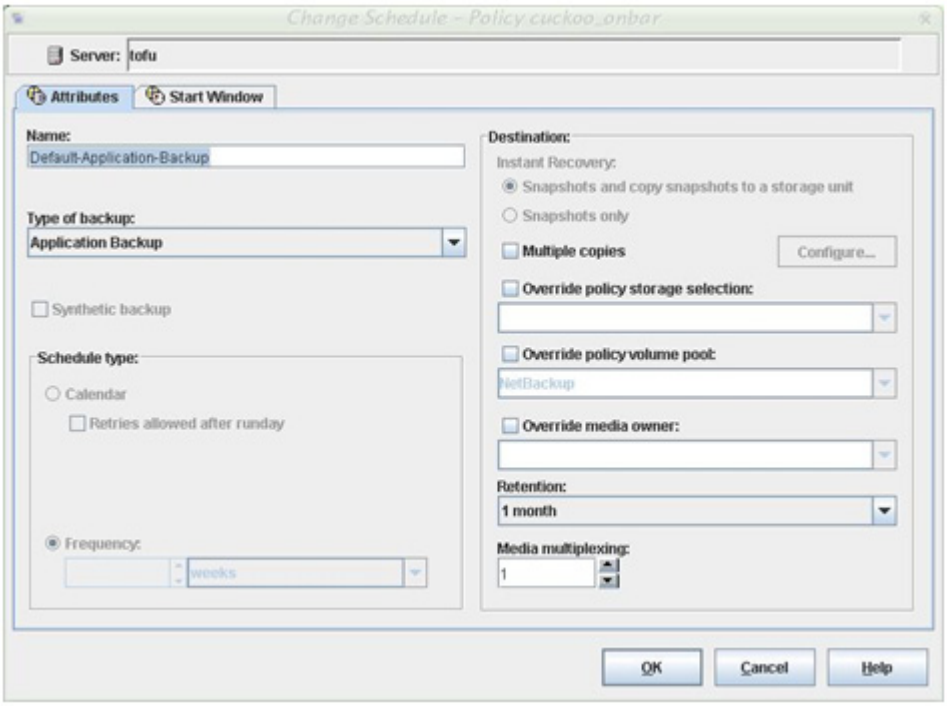
Important:
This appendix provides some Avaya CMS policy examples. There are other ways to get the same results for some of the selections. Pay special attention to the policy type because these are the policy types that are needed. Also, you must always have the schedule looking like the items below if you are running the backups from the CMS server as described in this document.

Example policy for data

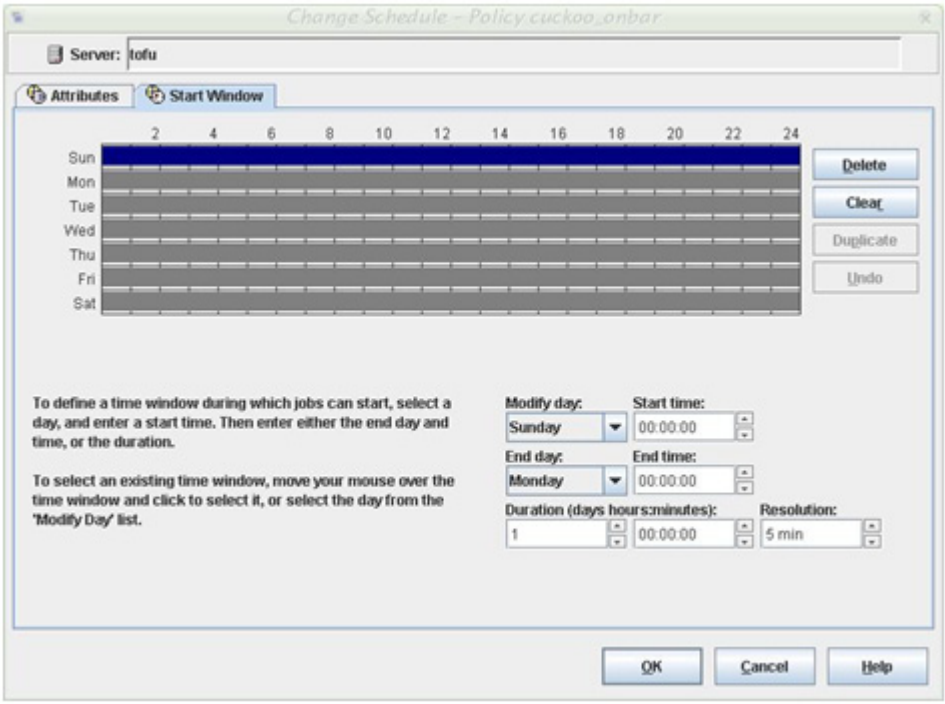
The following screen shot shows the data policy attributes screen from a Netbackup 7.0 server.



The next screen shows the policy schedule attributes:

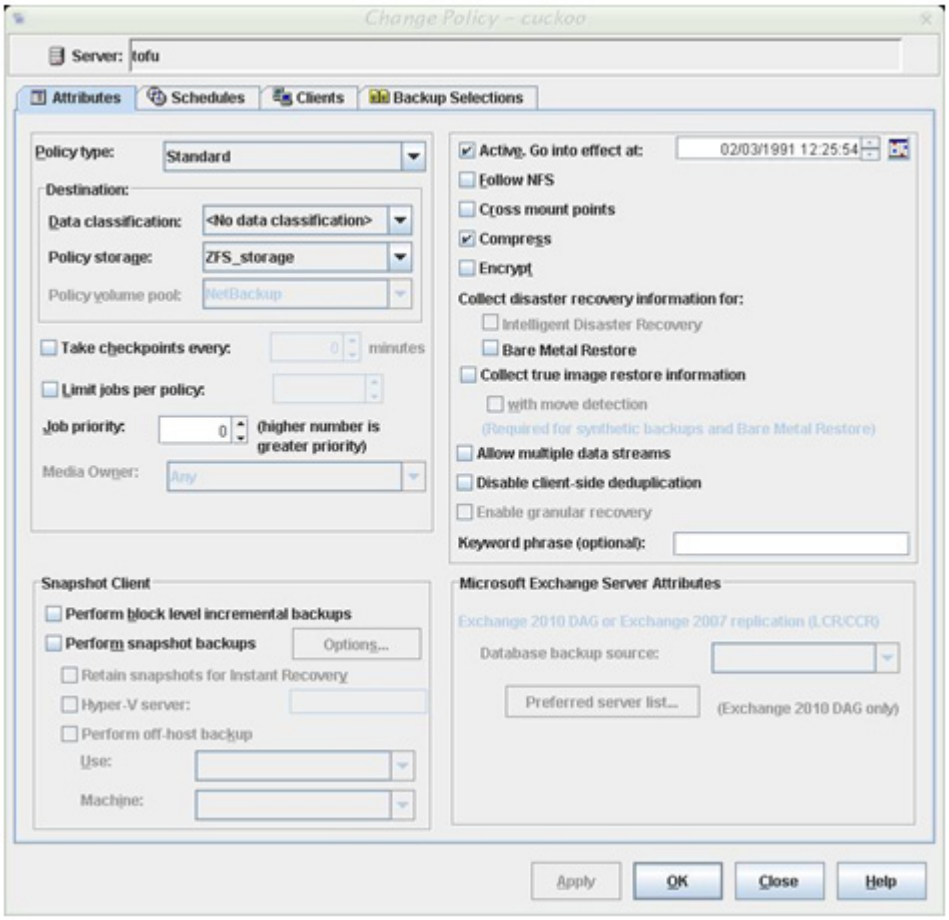


The next screen shot shows the schedule start settings:

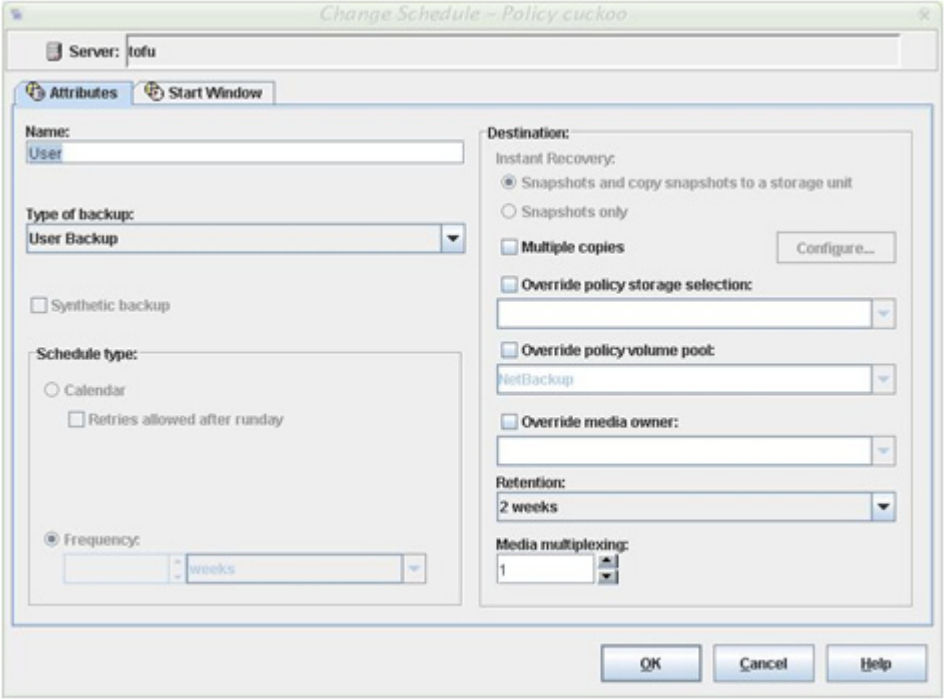


Example policy for File systems (OS)

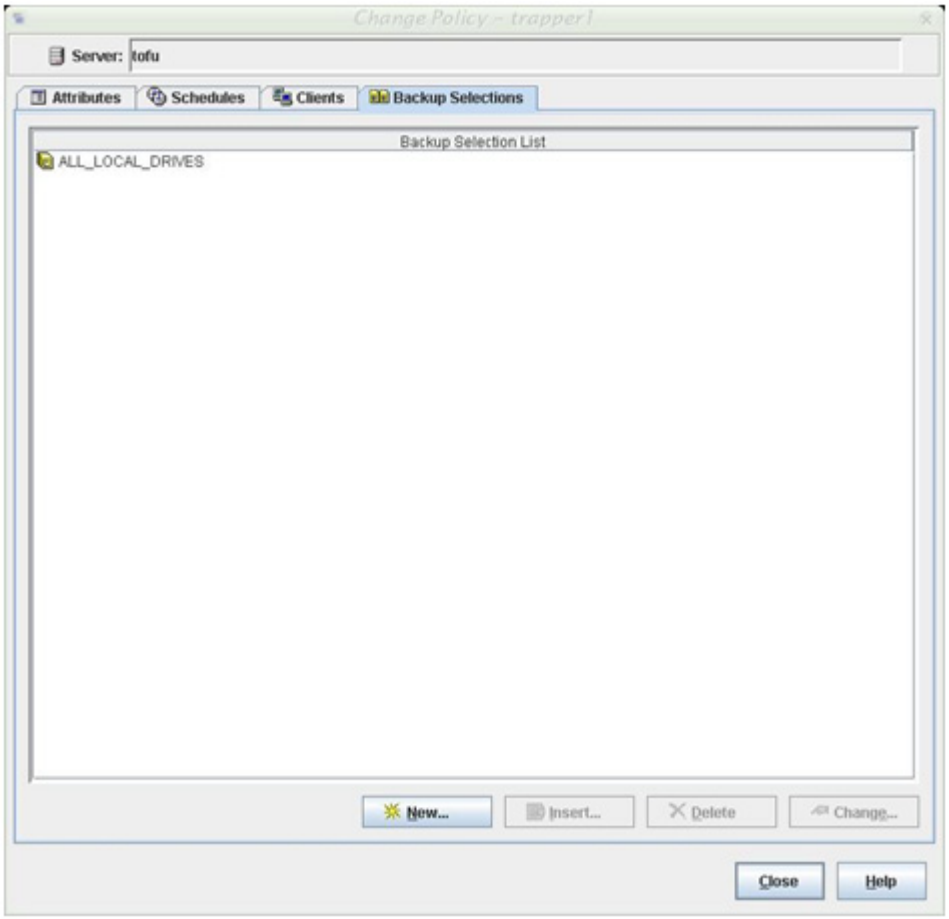
The following screen shot shows the OS policy attributes screen from a Netbackup 7.0 server:



The next screen shows the policy schedule attributes:



The next screen shot shows the file selections for OS backup policy.


Change Policy - trapper1
Server: tofu
Attributes
Schedules
Clients
Backup Selections
Backup Selection List
ALL_LOCAL_DRIVES
New...
Insert...
Delete
Change...
Close
Help

Glossary

ACD	See Automatic Call Distribution (ACD) on page 95.
Automatic Call Distribution (ACD)	A switch feature. ACD is software that channels high-volume incoming call traffic to agent groups (splits or skills). Also an agent state where the extension is engaged in an ACD call (with the agent either talking to the caller or the call waiting on hold).
Avaya Call Management System (CMS)	A software product used by business customers that have a telecommunications switch and receive a large volume of telephone calls that are processed through the Automatic Call Distribution (ACD) feature of the switch.
Avaya CMS	See Avaya Call Management System (CMS) on page 95.
Data collection off	Avaya CMS is not collecting ACD data. If you turn off data collection, Avaya CMS will not collect data on current call activity.
Data backup	The backup that uses ON-Bar to backup the Avaya CMS Informix data.
Data restore	The restore that uses ON-Bar to restore the Avaya CMS Informix data.
Database	A group of files that store ACD data according to a specific time frame: current and previous intrahour real-time data and intrahour, daily, weekly, and monthly historical data.
Database item	A name for a specific type of data stored in one of the Avaya CMS databases. A database item may store ACD identifiers (split numbers or names, login IDs, VDNs, and so on) or statistical data on ACD performance (number of ACD calls, wait time for calls in queue, current states of individual agents, and so on).
Database tables	Tables that Avaya CMS uses to collect, store, and retrieve ACD data. Standard Avaya CMS items (database items) are names of columns in the Avaya CMS database tables.
Device	The term used to refer to the peripheral itself; for example, a hard disk or a tape drive. A peripheral is sometimes referred to as a subdevice or an Logical Unit (LU).
Disk	A round platter, or set of platters, coated with magnetic medium and organized into concentric tracks for storing data.
EAD	See Expert Agent Distribution (EAD) on page 96.
EAS	See Expert Agent Selection (EAS) on page 96.
Error message	An error message is a response from a program indicating that a problem has arisen or something unexpected has happened, requiring your attention.

Ethernet	A type of network hardware that allows communication between systems connected directly together by transceiver taps, transceiver cables, and a coaxial cable. Also implemented using twisted-pair telecommunications wire and cable.
Exception	A type of activity on the ACD which falls outside of the limits the customer has defined. An exceptional condition is defined in the Avaya CMS Exceptions subsystem, and usually indicates abnormal or unacceptable performance on the ACD (by agents, splits or skills, VDNs, vectors, trunks, or trunk groups).
Expert Agent Distribution (EAD)	A call queued for a skill will go to the most idle agent (primary skill agent). Agents who are idle and have secondary agent skills will receive the call queued for a skill if there are no primary agents available.
Expert Agent Selection (EAS)	An optional feature that bases call distribution on agent skill (such as language capability). EAS matches the skills required to handle a call to an agent who has at least one of the skills required.
Forecast reports	These reports display expected call traffic and agent or trunk group requirements for the customer's call center for a particular day or period in the future.
Historical database	Contains intrahour records for up to 62 days in the past, daily records for up to 5 years in the past, and weekly or monthly records for up to 10 years for each CMS-measured agent, split or skill, trunk, trunk group, vector, and VDN.
Historical reports	Reports that display past ACD data for various agent, split or skill, trunk, trunk group, vector, or VDN activities.
Host name	A name that you (or your system administrator) assign to your system unit to uniquely identify it to the Solaris operating system (and also to the network).
IDS	See Informix Dynamic Server (IDS) on page 96.
Informix Dynamic Server (IDS)	The relational database management system that is used with Avaya CMS Release 3 Version 9 and later.
Link	A transmitter-receiver channel or system that connects two locations.
Log in	The process of gaining access to a system by entering a user name and, optionally, a password.
Log out	The process of exiting from a system.
Measured	A term that means an ACD element (agent, split or skill, trunk, trunk group, vector, VDN) has been identified to Avaya CMS for collection of data.
Multi-user mode	A mode of Avaya CMS in which any administered CMS user can log into CMS. Data continues to be collected if data collection is "on".
Network address	A unique number assigned to each system on a network, consisting of the network number and the system number. Also known as Internet Address or Internet Protocol (IP) address.
Node	A unique name used to identify a client to the server.

Non-Volatile Random Access Memory (NVRAM)	A random access memory (RAM) system that holds its contents when external power is lost.
NVRAM	See Non-Volatile Random Access Memory (NVRAM) on page 97.
ON-Bar	An Informix IDS tool that works with a Storage Manager to backup and restore the Informix Database.
Operating system (OS)	The software that controls and allocates the resources, such as memory, disk storage, and the screen display for the computer.
Single-user mode	An Avaya CMS mode in which only one person can log into CMS. Data collection continues if data collection is "on". This mode is required to change some CMS administration.
Skill	In relationship to the call center, think of skill as a specific customer need or requirement, or perhaps a business need of the call center.
SQL	See Structured Query Language (SQL) on page 97.
Small Computer System Interface (SCSI)	A hardware interface that allows the connection of peripheral devices (such as hard disks, tape drives and CD-ROM drives) to a computer system.
Split	A group of extensions that receive special-purpose calls in an efficient, cost-effective manner. Normally, calls to a split arrive over one or a few trunk groups.
Storage device	A hardware device that can receive data and retain it for subsequent retrieval. Such devices cover a wide range of capacities and speeds of access.
Storage manager	A 3rd party software package that manages backups and restores. It gets the data from Avaya CMS and ON-Bar and writes it to the storage devices.
Structured Query Language (SQL)	A language used to interrogate and process data in a relational database. SQL commands can be used to interactively work with a database or can be embedded within a programming language to interface to a database.
Super-user	A user with full access privileges on a system, unlike a regular user whose access to files and accounts is limited.
Switch	A private switch system providing voice-only or voice and data communications services (including access to public and private networks) for a group of terminals within a customer's premises.
System	A general term for a computer and its software and data.
System backup	The backup that uses a storage manager to backup the UNIX files.
System restore	The restore that uses a storage manager to restore the UNIX files.
TCP/IP	See Transmission Control Protocol/Internet Protocol (TCP/IP) on page 98.
Tivoli Storage Manager (TSM)	The Storage Manager supported in the first release of LAN Backup.

TSC	Technical Service Center. The Avaya organization that provides technical support for Avaya products.
TSM	See Tivoli Storage Manager (TSM) on page 97.
Transmission Control Protocol/ Internet Protocol (TCP/IP)	A communications protocol that provides interworking between dissimilar systems. It is the de facto standard for UNIX systems.
Trunk	A telephone line that carries calls between two switches, between a Central Office (CO) and a switch, or between a CO and a phone.
Trunk group	A group of trunks that are assigned the same dialing digits - either a phone number or a Direct Inward Dialing (DID) prefix.
UNIX system	The operating system on the computer on which Avaya CMS runs. A user can access the UNIX system from the "Commands" SLK. SUN uses Solaris as its UNIX operating system.
User ID	The login ID for an Avaya CMS user.
User name	A combination of letters, and possibly numbers, that identifies a user to the system.
VDN	See Vector Directory Number (VDN) on page 98.
Vector	A list of steps that process calls in a user-defined manner. The steps in a vector can send calls to splits, play announcements and/or music, disconnect calls, give calls a busy signal, or route calls to other destinations. Calls enter vector processing by way of VDNs, which may have received calls from assigned trunk groups, from other vectors, or from extensions connected to the switch.
Vector Directory Number (VDN)	An extension number that is used in ACD software to permit calls to connect to a vector for processing. A VDN is not assigned an equipment location; it is assigned to a vector. A VDN can connect calls to a vector when the calls arrive over an assigned automatic-in trunk group or when calls arrive over a dial-repeating (DID) trunk group, and the final digits match the VDN. The VDN by itself may be dialed to access the vector from any extension connected to the switch.
XBSA (X/Open Backup Services Application Programmer's Interface)	An open system interface that allows ON-Bar to communicate to the Storage Manager.

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