Element Management System (EMS) Server Installation & Maintenance Manual

Version 3.0

Document #: LTRT-94106 Rev 004

Notice

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Table of Contents

List of Figures

Note: When viewing this manual on CD, Web site or on any other electronic copy, all cross-references are hyperlinked. Click on the page or section numbers (shown in blue) to reach the individual cross-referenced item directly. To return to the point from where you accessed the cross-reference,
press **Alt** + ←.

Note: The EMS supports the following Nortel products:

1. Media Gateway 3500

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Customer Support

Customer technical support and service are provided by Nortel. Contact support@nortel.com.

Abbreviations and Terminology

Each abbreviation, unless widely used, is spelled out in full when first used. Only industry-standard terms are used throughout this manual. The $ symbol indicates hexadecimal notation.

Related Documentation

Manual Name
Media Gateway 3500 Media Gateway Installation, Operation & Maintenance Manual
Media Gateway 3500 Product Description
Element Management System (EMS) User's Manual
Element Management System (EMS) Product Description
Element Management System (EMS) Online Help

1 Overview

The EMS provides customers with the capability to easily and rapidly provision, deploy and manage up to 100 Media Gateway 3500 media gateways.

Provisioning, deploying and managing these Media Gateways with the EMS is performed from a centralized management station (PC) with a user-friendly Graphical User Interface (GUI).

The EMS comprises two infrastructure elements:

1. EMS **Server** (running on **Sun™ Microsystems' Solaris™**)
2. EMS **Client** (running on Microsoft™ Windows™ operating system), displaying the EMS GUI screens that provide the Customer access to system entities.

This EMS Installation & Maintenance Manual is intended for anyone responsible for installing and maintaining Nortel's EMS server and the server database – Oracle 9i, running on a UNIX™.

Customers should also refer to the Oracle9i Installation Guide, Release 2 (9.2.0.1.0) for UNIX Systems: AIX-Based Systems, Compaq Tru64 UNIX, HP; 9000 Series HP-UX, Linux Intel, and Sun Solaris as of May 2002. Part No. A96167-01.

1.1 Document Conventions

`Courier`	-	`UNIX Commands`
[ ]	-	***User-inserted input***
Times New Roman, bold, size 11	-	User name, path or file name

When x.y.z appears in this document as part of a software file name, 'x.y' indicates the major version and 'z' indicates the build number. For example, 3.0.56: '3.0' indicates the major version and '56' indicates the build number.

2 EMS Server and Client Requirements

This section lists the platform and software required to run the EMS software.

2.1 EMS System Requirements

Table 2-1: EMS Minimal Platform Requirements

Resource	EMS Server	EMS Client
Operating System	Solaris™ 64-bit, version 5.9	Windows™ 2000 / XP
Memory	1 GB RAM	512 MB RAM
Disk space	40 GB	300 MB
Processor	1 GHz UltraSPARC IIIi	600 MHz Pentium III
Swap space	2 GB	1 GB

Table 2-2: EMS Software Requirements

#	EMS Server	EMS Client
1	JDK 1.4.2 for Solaris™	JDK 1.4.2 for Windows™
2	X Server and Window Manager	
3	Executable tcsh	

Table 2-3: OS Patches Required for EMS Server

#	Patch Name	Required by Application
1	SUNWarc	Oracle 9i DB
2	SUNWbtool	Oracle 9i DB
3	SUNWhea	Oracle 9i DB
4	SUNWlibm	Oracle 9i DB
5	SUNWlibms	Oracle 9i DB
6	SUNWsprot	Oracle 9i DB
7	SUNWtoo	Oracle 9i DB
8	SUNWi1of	Oracle 9i DB
9	SUNWxwfnt	Oracle 9i DB
10	SUNWxwkey	Oracle 9i DB
11	UPDATE5	Oracle 9i DB (recommended)

3 EMS Server Pre-Installation Requirements

Before beginning the EMS server installation procedure, verify that your system meets the hardware, disk space, operating system and other requirements.

This is necessary for the installation to succeed.

3.1 Hardware Requirements

1. RAM - A minimum of 1 GB

   To determine the amount of random access memory installed on your system, enter the following command:

   ```
   tcsh
   prtconf | grep -i mem
   ```

2. Swap Space - Disk space of twice the system's physical memory, or 2 GB, whichever is greater.

   To determine the amount of swap space currently configured in your system, enter the following command:

   ```
   swap -l
   ```

   (Skip this step if you're using Nortel's CDs to install the Solaris operating system)

   From the output of the command that you enter, divide the value shown in the BLOCKS column by 2.

3. Disk Space – A minimum of 40 GB (on the same disk or under RAID - Redundant Arrays of Independent Disks)

   To determine the amount of disk space of your system, enter the following command:

   df –k

   Temporary disk space required during the application installation in the /tmp is up to 400 MB. If you do not have enough space in the /tmp directory, set the TMPDIR and TMP environment variables to specify a directory with sufficient space.

4. CD-ROM device - A CD-ROM drive capable of reading ISO 9660 format CD-ROM discs with RockRidge extensions

Note: If you're using Nortel's CD to install the Solaris 9 operating system, refer to the next section (Section **Error! Reference source not found.**).

If you're using your own CD to install the Solaris 9 operating system, refer to Appendix B on page 39.

3.2 Software Requirements

1. X Server and Window Manager

Use any X server supported by your UNIX operating system.
Use any Sun™ -supported Window Manager supported by your UNIX operating system.

To determine if your X Window System is working correctly on your local system, enter the following command:

```
xclock
```

The X clock should appear on your monitor.

2. Required executables:

   tcsh (UNIX shell)

   The following executables must be present: make, ar, ld, nm.

   To determine if one of these executables exists on your system, run:

   ```
   man <executable name>
   ```

3. JDK 1.4.2 for Solaris

   To determine what JDK version is installed, run:

   ```
   java -version
   ```

   In the event that an old version is found, the JDK 1.4.2 Installation Kit can be found on the EMS CD.

   To install JDK 1.4.2 for UNIX:

   1. Copy the files **j2sdk-1_4_2-solaris-sparc.sh** and **j2sdk-1_4_2-solaris-sparcv9.sh** to the root directory /
   2. Ensure that the files **j2sdk-1_4_2-solaris-sparc.sh** and **j2sdk-1_4_2-solaris-sparcv9.sh** have execute permissions for root user.
   3. Run **j2sdk-1_4_2-solaris-sparc.sh**
   4. When prompted, accept the license agreement; the first script of the jdk installation process is begun.
   5. Run **j2sdk-1_4_2-solaris-sparcv9.sh**
   6. When prompted, accept the license agreement; the second script of the jdk installation process is begun.
   7. Following the installation process, check that a new directory with the name j2sdk1.4.2 under / was created.

3.3 Setup Tasks to Perform as Root User

The following pre-installation setup tasks configure your system and set up the account, group, variables and permissions needed to run the EMS server.

To set up your environment, log in as the **root** user and perform the following tasks for your platform:

3.3.1 Configure Kernel Parameters

The EMS database extensively uses UNIX resources such as shared memory, swap memory, and semaphore for interprocess communication. If your parameter settings are insufficient for the database, you'll experience problems during installation and instance startup. The greater the amount of data you can store in memory, the faster your database

will operate. In addition, by maintaining data in memory, the UNIX kernel reduces disk I/O activity.

Review your kernel parameter settings to ensure that they meet database requirements. If you do not do this, you may experience errors during installation or operational errors after installation. These are the recommended kernel parameter requirements for a typical database environment. If you have previously tuned your kernel parameters to levels that meet your application needs, then continue to use these values. A system restart is necessary for the kernel changes to take effect if you change the kernel settings.

Kernel Parameter Settings for Solaris™

Use a text editor to change the kernel parameter settings in the /etc/system file after making a backup copy ("cp /etc/system /etc/system_backup"). If you have previously changed your kernel for another program to levels equal to or higher than the levels the database requires, then do not change the settings. If the levels are too low, change them to levels at least as high as those in the table. If you change the settings, save the /etc/system file and restart the system (mandatory).

Make sure that you use the correct syntax.

Example for syntax:

```
set semsys:seminfo_semmni=100

set semsys:seminfo_semmns=1024

set semsys:seminfo_semmsl=256

set shmsys:shminfo_shmmax=4294967295

set shmsys:shminfo_shmmin=1

set shmsys:shminfo_shmmni=100

set shmsys:shminfo_shmseg=20
```

After rebooting, verify that the values are correct by running the following command:

```
sysdef
```

If you get a message stating "IPC semaphores module is not loaded" use the following command:

```
sysdef -s
```

If you get a message stating "IPC shared memory module is not loaded" use the following command:

```
sysdef -m
```

The kernel parameter values presented in Table 3-1 are the minimum required.

Table 3-1: Kernel Parameters Minimum Values

Kernel Parameter	Setting	Purpose
SEMMNI	100	Defines the maximum number of semaphore sets in the entire system.
SEMMNS	1024	Defines the maximum semaphores in the system. This setting is a minimum recommended value.
SEMMSL	256	Defines the minimum recommended value, for initial installation only.
SHMMAX	4294967295	Defines the maximum allowable size of one shared memory segment. 4 GB = 4294967295
SHMMIN	1	Defines the minimum allowable size of a single shared memory segment.
SHMMNI	100	Defines the maximum number of shared memory segments in the entire system.
SHMSEG	20	Defines the maximum number of shared memory segments one process can attach.

3.3.2 Create UNIX Group for Database Administrator

The installation requires a database administration group to complete installation.

This document refers to these administrative UNIX groups as OSDBA, typically named **dba**.

- You must create the OSDBA group. By default, the Oracle Universal Installer searches for a group called **dba**.
- To create the required groups, use the graphical utility: **admintool**.

  Alternatively, run the following command:

  ```
  /usr/sbin/groupadd dba
  ```

3.3.3 Create a UNIX Account to Own EMS and Database Software

The EMS account is the UNIX user account that owns the Database software after installation. You must run the Oracle Universal Installer with this user account. Table 3-2 describes the properties of the EMS account.

Table 3-2: EMS Account Properties

Property	Description
Login Name	**acems**
Primary GID	The **dba** group.
Home Directory	Choose a home directory consistent with other user home directories. It is recommended to place the home directory under a separate partition, to ensure resources availability. Allocate at least 20G. See Appendix B - Installing Solaris 9 Operating System with Your Own CD  **Note:** In the instructions below, the Home Directory /ACEMS is used *as an example only*. You can use this directory but if you choose to use your own different Home Directory, replace each /ACEMS with your Home Directory.
Login Shell	The default shell must be /usr/bin/tcsh

Caution: Use the EMS account only for installing and maintaining the EMS software and database. Do not use the root account as the EMS account.

To create the EMS account, use the graphical utility **admintool** or run the following commands as **root**:

```
useradd -u 1004 -g dba -d /ACEMS -s /bin/tcsh acems
```

```
passwd acems (for configure the acems password)
```

To verify the EMS account, access the primary group log in as `acems` and run the following command:

```
id -a
```

You should see the **dba** group after gid=.

Login with **acems** user to create the home directory for the user **acems**.

You must stay in this session because if you don't, you won't be able to log in since the home directory does not exist yet. To change to **acems** user, run the following command:

```
su acems
```

To create the home directory and set the ownership, run the `following` commands:

```
mkdir /ACEMS
```

```
chown –R acems:100 /ACEMS
```

Set the home directory permissions as follows:

- user: read, write and execute permissions.

- group: read and execute permissions.
- other: read and execute permissions.

This can be done using the command: chmod 755 ACEMS

3.3.4 Set Permission for File Creation

The umask parameter must be set to 022 for the **acems** user to ensure that the group and others have read and execute permissions (but not write permission) on the installed files.

1. Check the current setting by entering the following command:

   ```
   umask
   ```

2. If the umask command does not return the value 022, then set it for **acems** user by adding the following line to the.cshrc file:

   ```
   umask 022
   ```

3. Execute the following command to verify the umask setting:

   ```
   umask 022
   ```

3.4 Setup Tasks to Perform as acems

Log in as the EMS account **acems** and perform the following tasks as necessary:

3.4.1 Set Environment Variables

Table 3-3 provides a brief summary of the variables listed in this section. See each variable's entry in this section for instructions on setting the variable appropriately.

Table 3-3: Environment Variable Summary

Variable	Description	Required
ORA_NLS33	Location of character set data.	Yes
ORACLE_BASE	Directory at the top of the Oracle software and administrative file structure.	Yes
ORACLE_DOC	Directory where documentation is installed.	No
ORACLE_HOME	Directory containing Oracle software for a particular release.	Yes
ORACLE_SID	The Oracle server instance identifier, to use during installation.	Yes
PATH	Shell's search path for executable.	Yes
NLS_LANG	The character set of the database	Yes

Environment variables for tcsh are placed in a file named .cshrc under the home directory. If you do not have this file, create a new file ".cshrc" under the home directory of **acems** user. If the file exists, edit it and add the variables described below. Set the following parameters using the **setenv** command:

Note: If an Oracle Server already exists on your system, do not install EMS software.

PATH

The PATH variable specifies the shell's search path for executables. Set the shell's search path to include the information in the following:

```
ORACLE_HOME/bin, /usr/ccs/bin, /usr/bin, /etc,
/usr/openwin/bin, and /usr/local/bin, if it exists
```

If you installed JDK 1.4.2 earlier (explained under Section 2), also add the directory /j2sdk1.4.2/bin to the PATH variable at the path beginning.

To verify that the correct JDK is used by this user, run the command:

```
which java
```

It returns the path to /j2sdk1.4.2/bin

ORA_NLS33

The ORA_NLS33 variable specifies the directory location of the *.nlb files. The *.nlb files define languages, territories, character sets and linguistic sorting orders. Set this variable to the default location, which is ORACLE_HOME/ocommon/nls/admin/data.

ORACLE_BASE

The ORACLE_BASE variable specifies the directory at the top of the Oracle software and administrative file structure.

Set this variable to the home directory of **acems**.

Ensure that **acems** has writing permissions to this directory

ORACLE_HOME

The ORACLE_HOME variable specifies the directory containing the Oracle software for a particular release.

Place the ORACLE_HOME directory under the ORACLE_BASE directory.

The recommended value is:

$ORACLE_BASE/orahome

ORACLE_SID

The ORACLE_SID variable specifies the System Identifier (SID). Set it to the value **dbems**

NLS_LANG

The NLS_LANG variable specifies the language and character set that is used in the database. Set it to the value AMERICAN_AMERICA.UTF8

Example for .cshrc file:

```
umask 022
setenv PATH :/j2sdk1.4.2/bin:${PATH}:/ACEMS/orahome/bin:
```

```
setenv ORACLE_HOME /ACEMS/orahome
setenv ORACLE_BASE /ACEMS  #(your acems home directory)
setenv ORA_NLS33 $ORACLE_HOME/ocommon/nls/admin/data
setenv ORACLE_SID dbems
setenv NLS_LANG AMERICAN_AMERICA.UTF8
```

4 Installing the EMS Server

4.1 Running the Installation Script

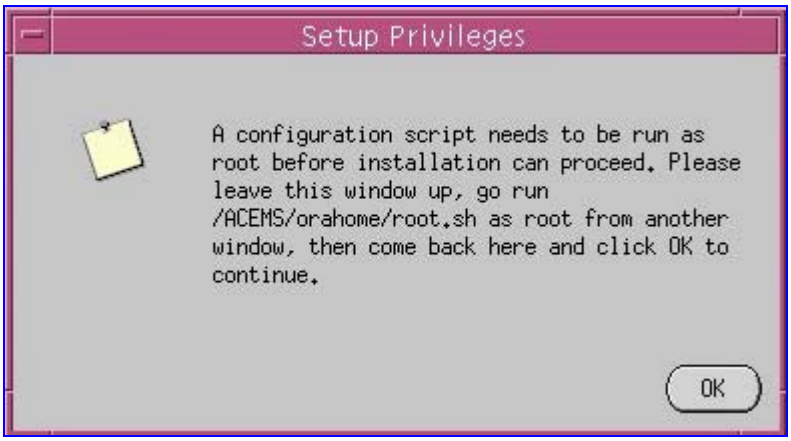
➢ To run the installation script, perform the following procedures as acems user:

1. Login to the server in using X-Browser as `acems user` with password `acems.`
2. Insert the EMS Installation CD.
3. Copy the file **emsServerDeploy_3.0.x.tar** from /cdrom to acems user home directory. (Replace "**x**" with the appropriate minor version string from the real file name.)
4. Unpack the file **emsServerDeploy_3.0.x.tar** by running the command:
   `tar –xf emsServerDeploy_3.0.x.tar`

   A new directory named **EmsServerInstall** is created.
5. Run the installation script named **install** from its location under **EmsServerInstall** (it's important to run it from its location and not with a full path)
   `cd EmsServerInstall`
   `install`
6. The License Agreement must be accepted to continue with the installation. After reading it, accept it by pressing 'y' or 'yes'; pre-installation requirement checks are now carried out. The installation checks that the system holds up for the requirements. If any check fails, a detailed message is displayed with instructions on how to fix the problem. The installation cannot proceed without passing the requirements. If a problem is encountered, fix it as instructed and repeat the installation. Following pre-installation requirement checks, system checks are carried out: Operating System requirements, memory and disk size, Java™ version, etc.
7. Press ENTER to continue.
8. When you're prompted for the ORACLE_HOME directory, the default value defined in the prompt is /ACEMS/orahome. Press ENTER to use this value (recommended) or choose another location; Oracle variables verifications are performed.
9. Press ENTER to continue; when you're prompted for the database location, the default defined in the prompt is /ACEMS/oradata. Press ENTER to use this value (recommended) or choose another location; Oracle variables verifications are continued.
10. Press ENTER to continue; UNIX kernel parameters verifications are performed.
11. Press ENTER to continue.
12. X-window check: Press ENTER to continue.
13. When you're prompted for the EMS software location, the default value defined in the prompt is /ACEMS (recommended). If you choose another location, the location must be an existing directory under `acems` home directory with writing permissions for `acems`. This directory will be referred to as the EMS software directory.
14. In the EMS Software Installation section press Enter to continue and provide the root password when prompted.
15. In the Oracle Software Installation section press Enter to continue
16. Enter the Database Installation CD #1 when required.
17. Provide root password when required.
18. When required, type 'eject' on a new console screen and insert database installation CD #2. Edit the edit box from /cdrom/orcl9201_1/ to: /cdrom/orcl9201_2/ and click OK
19. When required, type 'eject' on the console screen and insert database installation CD #3. Edit the edit box from /cdrom/orcl9201_1/ to: /cdrom/orcl9201_3/ and click OK

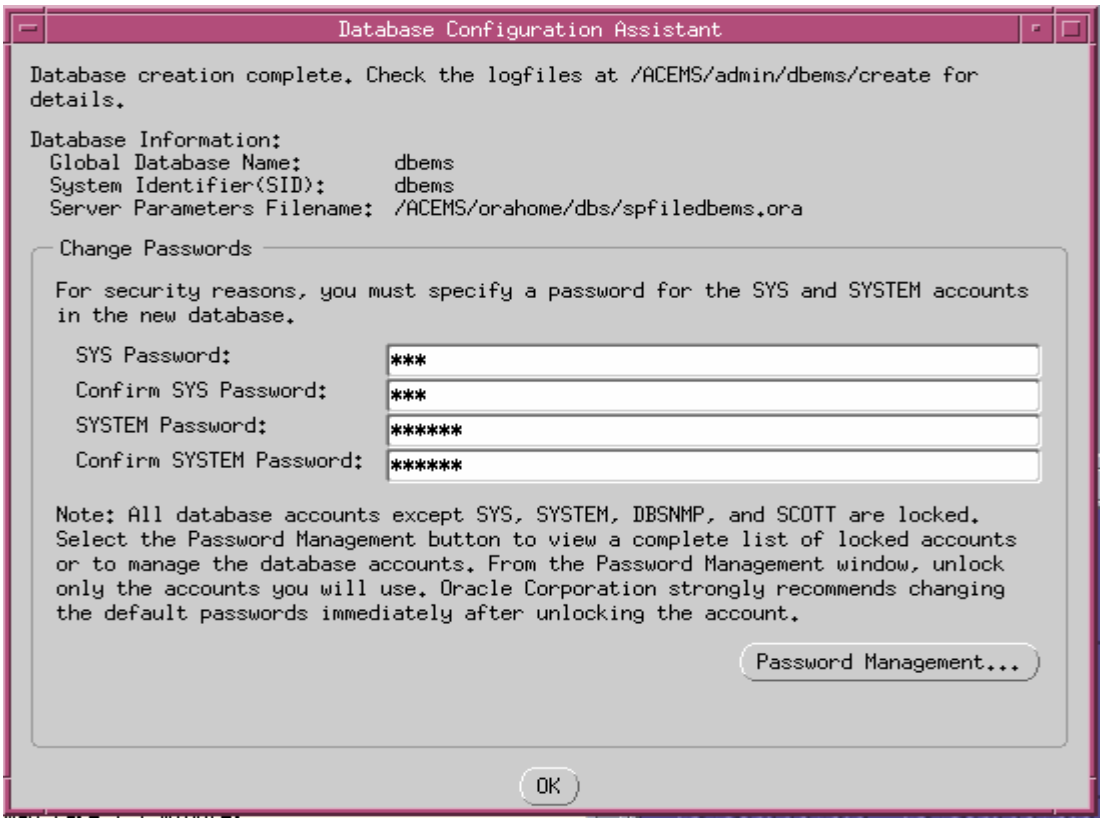
20. A new screen is displayed with an instruction to run root.sh

Figure 4-1: Run the root.sh Configuration Script



21. Open the Console screen as root user and run /ACEMS/orahome/root.sh; the script prompts for the full path name of your local bin directory. The default path is /usr/local/bin. Press Enter, and after the script is complete, click OK in the 'Setup Privileges' window.
22. Type "eject cdrom" in the terminal window and insert the Oracle Patch 9.2.0.5 CD when required and press Enter; the Oracle Universal Installer bar appears.
23. After the bar window disappears, press Enter in the terminal window (when required) to continue; the Installation of Oracle Patch 9.2.0.5 bar appears.
24. After the bar window disappears, press Enter when required; a new bar 'Loading Database Creation' appears.
25. The progress bar is closed. A new screen is opened to enter passwords for database users.

Figure 4-2: Screen to Enter Passwords for Database Users



26. Enter:

Change SYS Password (sys)
Change SYSTEM Password (system)

Note: It is important that you remember the password for SYS and SYSTEM users.

27. Wait 60-80 minutes while SQL configurations are performed. The database schema is created and Java classes are loaded to the database. The latter process takes a long time. Do not close it before the script is complete.

28. When prompted for the user root password, enter the correct password. If you do not have the root password, this step can be performed later by running the script **Create_StartShutScripts_InEtcDir_AndChangeOratab** manually from acems user, and provide the root password; you've now successfully completed the installation.

29. Rebooting the server is recommended.

30. If you choose not to reboot the server, run the following script as root:

```
/ACEMS/server_x.y.z/watchDog_unix &
```

If the error "command not found" occurs when trying to run watchDog_unix or runServer_unix from the directory where it is located the current directory(.) is not part of the search path. To check the path, run the command:

```
echo $PATH
```

If the current directory is not in the path, run the scripts as follows:

cd /ACMES/server_x.y.z

./watchDog_unix
./runServer_unix

Note: If you performed the procedure to start the EMS server automatically, check that the server is up after reboot and do not run it again.

31. Run the EMS client and connect the EMS server. The first-time Username and password are acladmin and changeMe2004 respectively.
32. Create a new user for the EMS. Create the new user with your own password.

4.2 Activating the NTP Server / NTP Server and Client

The NTP script triggers the EMS server to synchronize its clock according to the clocks of other devices, and vice versa. (The other devices can be any device containing an NTP server or client, such as Media Gateway 3500).

The NTP server allows other devices to syncronize their clocks according to the EMS server clock.

The NTP client activates sychronization of the EMS server clock according to another (more accurate) NTP server clock.

➢ To run the NTP script, take these steps:

1. Log in to the EMS server as `root`
2. Change directory to the directory in which the script is located.
   For example:

   # cd /ACEMS/server_x.y.z/
3. Run the script command:

   ```
   # perl runNtp.pl
   ```
4. Choose 1 to start NTP services
5. For the EMS server to act as NTP server *and* NTP client, choose 'y'
6. If you choose 'y', enter the IP address of the NTP server according to whose clock the NTP client clock will synchonize.
7. If you choose 'n', only the NTP server is launched.

➢ To stop the NTP script, take these steps:

1. Log in to the EMS server as `root`
2. Change directory to the directory in which the script is located.
   For example:

   # cd /ACEMS/server_x.y.z/
3. Run the script command:

   ```
   # perl runNtpServer.pl
   ```
4. Choose 2 to stop NTP services

5 Upgrading the EMS Server

The Server installation verify it can perform upgrade procedure from your old version. If the EMS does not support upgrading from your old version, refer to Section 9, Reinstalling EMS Server Software, on page 33.

➢ To upgrade the EMS server, take these steps:

1. Login as root and stop the EMS Server application:
   #cd /ACEMS/server_x.y.z
   #./ServerShutdown
2. Login the EMS Server as `acems`
3. Back up the current database and save the *dmp* file on another location (refer to Section 8, Maintaining the EMS Server, on page 31)
4. Insert the CD labeled 'EMS Software and Documentation'.
5. Copy the file emsServerDeploy_x.y.z.tar into the directory /ACEMS
6. Unpack the archive file.
7. Run the installation script named install from its location under EmsServerInstall (it's important to run it from its location and not with a full path)

   ```
   >cd EmsServerInstall
   >install
   ```
8. Accept the license agreement
9. Press Enter when required
10. If there are NO database schema changes between the previous version and the required version, the following message appears :

    ```
    An old version - x.y.z - of EMS software was found. This script
    will run an upgrade patch. All your data will be preserved.
    ```

    Press ENTER to continue.
    In the event that there are database schema changes between the previous version and the required version, the following message appears:

    ```
    An old version - x.y.z - of EMS software was found.
    Back up the server before you continue with the upgrade
    procedure (for detailed information on backing up, refer to
    ```
    Backing up the Database `on page 31).`

    Press ENTER to continue.
11. When you're prompted for the EMS software location, the default value defined in the prompt is /ACEMS (recommended). If you choose another location, the location must be an existing directory under `acems` home directory with writing permissions for `acems`. This directory will be referred to as the EMS software directory.
12. Provide the root password when required.
13. Press Enter when required.
    If there are database schema changes please skip to step 15.

    ONLY if there are NO database schema changes between the previous version and the required version, the following message appears:

    ```
    Patch Upgrade Completed Successfully
    ```

Important: Do not perform the next step before you receive the message above.

14. The EMS server upgrade is now completed. Go to step 18.
15. Wait for the upgrade to complete.
16. Copy the folder /tmp/ems_upgrade to another permanent directory. These files include your old data of nodes, profiles and operators list. These files are only created if database schema changes were implemented above.
17. Press ENTER to continue.
18. Login as root and reboot the server.
19. Install the appropriate version of the EMS client.
20. Run the EMS client and connect the EMS server with the default login user name and password (the password for acladmin should be preserved across upgrades).
21. If database schema changes were implemented above take the following actions:
    a. Add the relevant versions for the media gateways using the Sofware Manager
    b. Take the files from the ems_upgrade folder in the EMS server and locate them on the EMS client PC using FTP.
    c. Add the Nodes tree to the new server:
       - Right-click on the Globe
       - Add Multiple MGs
       - Browse for the file `nodes_upgrade.csv`
       - Press OK
    d. Add operators using the file operators.csv. Note that this file can be used as a list of operators and their details only; the operators must manually be added to the EMS.
    e. Attach the profiles to the appropriate MGs using the file

       `profile_attachments.csv`

       Note that this file can be used as a list of profiles and MGs only; the profiles must manually be applied to the MGs in the EMS:

       - Right-click on the MG and choose 'Apply Master Profile'.
       - Select the appropriate profile from the list according to profile_attachments.csv
       - Click OK

5.1 Running Database Maintenance Tasks

To maintain the database in an optimum configuration, periodically perform the following tasks:

To perform scheduling for the backup procedure, run:

backup_scripts/schedule_backup

6 EMS Server Security

6.1 Configuring the Firewall

➢ **To enable EMS Client ↔ EMS Server ↔ Managed Gateways communication according to Figure 6-1, define the following rules in the firewall:**

1. EMS Client ↔ EMS Server

   Open TCP ports 2001, 1044, 1616 for RMI communication between the EMS server and its clients.

2. EMS server ↔ All managed media gateways

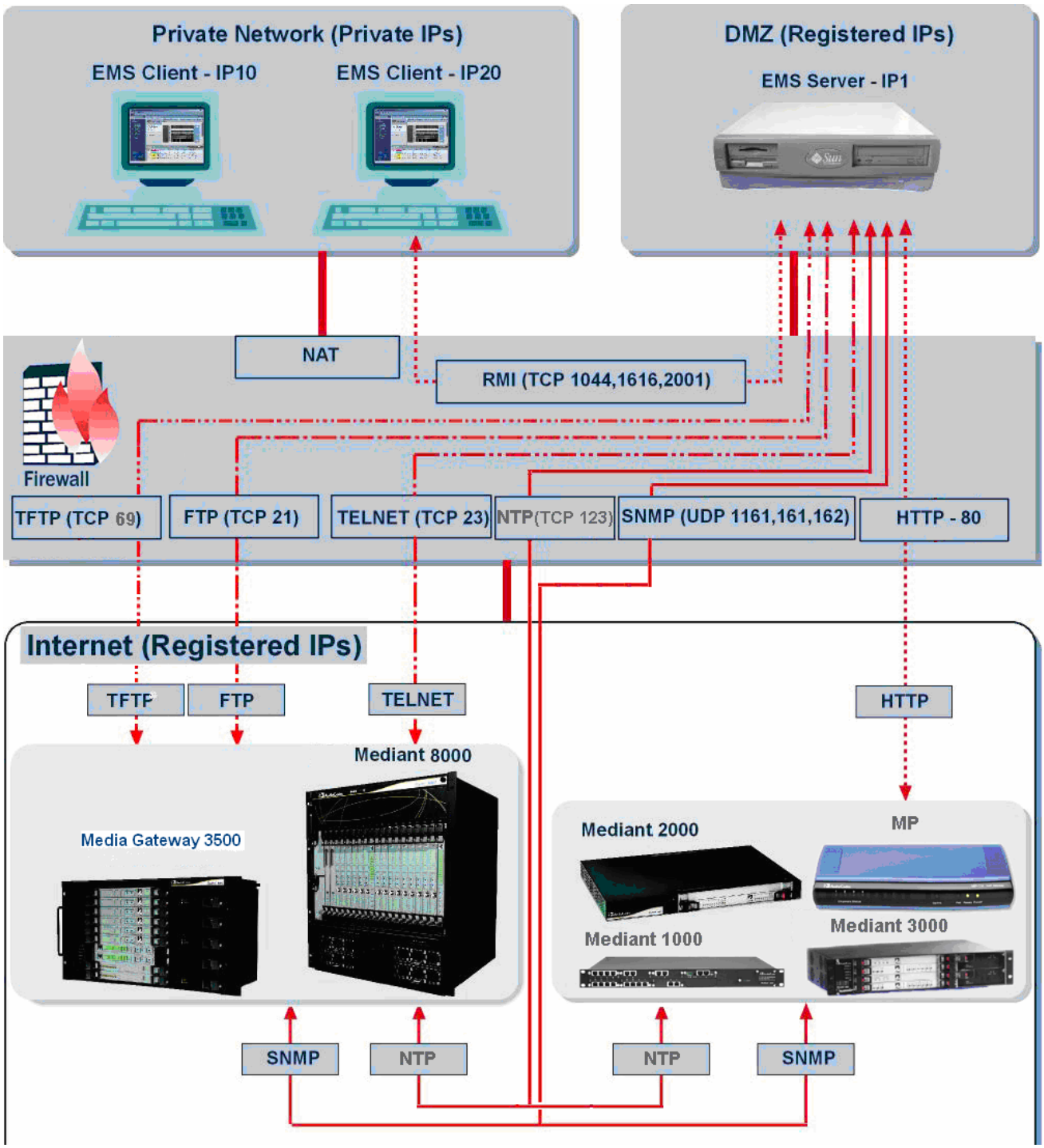
   Open UDP ports 1161 & 162 on the EMS server side for SNMP communication.

   Open UDP port 161 for all media gateways for SNMP communication.

3. EMS Server ↔ Managed Media Gateway 3500

   Open TCP ports 21 and 23 between the EMS server and the above devices for FTP and Telnet communication

Figure 6-1: Firewall Configuration Schema



6.2 EMS Server Hardening

The purpose of the hardening procedure is to protect the EMS server from unauthorized access and hostile attack. It makes it hard to break in by closing all superfluous EMS server ports.

➢ To activate the hardening feature, take these steps:

1. Connect the server as acems, using secured shell (ssh).
2. Change user to root (su root) and supply the root password.
3. Run the script: *# perl server_x.y.z/emsHarden.pl*
4. Choose 1 to close unnecessary services
5. 'Enable HTTPS' is used to load files via secured communication. This is not required for the Media Gateway 3500 so choose 'No'.
6. 'Enable HTTP' is used to load files via unsecured communication. If you wish to use secured communication only in order to load files, choose 'No'; this closes the HTTP port.
7. 'Enable TFTP': This is not required for the Media Gateway 3500 so choose 'No'.
8. Choose a new password for the `root` user and for `acems` user. The default is 'letmein'. It is strongly recomended to change the default.

Note: Note and retain these passwords for future access. There is no way to restore these passwords or to enter the server without them.

9. The EMS server is hardened.

6.3 Roll Back from Hardened Server

➢ To roll back from a hardened server, take these steps:

1. Connect the server as `root`, using secured shell (ssh).
2. Run the script: *# perl server_x.y.z/emsHarden.pl*
3. Choose 2 for opening all services.
4. Restore the default passwords; the EMS server is rolled back to its default state.

Reader's Notes

7 Running the EMS Server

➢ To run the EMS server:

- Run script **watchDog_unix** under directory server_x.y.z

➢ To stop the EMS server from running:

- Run script **ServerShutdown** under directory server_x.y.z

Reader's Notes

8 Maintaining the EMS Server

8.1 Backing up the Database

Nortel provides a simple mechanism for data backup in the form of a script that uses Oracle import and export tools. The script can be scheduled to run periodically and can also be run manually.

It is highly recommended to back up the EMS data manually, especially after an extensive configuration process, to ensure safeguarding in the event of a malfunction.

➢ To back up the database manually:

4. Run the following script to manually export the data:

   backup_scripts /manual_backup

A file named EMSexport.dmp is created under this location, at the scheduled time or after manual export. You MUST back up this file in another location each time.

8.2 Recovery after Database Failure

Three kinds of failures are possible:

1. Total machine failure.
2. Database could not be started.
3. Database is started but the EMS schema is damaged.

The actions to be performed in each case are different. First establish what the case is, in order to follow the right procedure.

In all cases, when running the recovery script, check that the EMS server is down.

8.2.1 Total Machine Failure

Reinstall the EMS and database software (refer to Section 3, EMS Server Pre-Installation Requirements, on page 9). This brings the EMS to a state where the database is started and running. Thereafter, perform the procedure described in Section 8.2.2; the database is started but the EMS schema is damaged.

8.2.2 Database is Started but the EMS Schema is Damaged

1. Check that the database is up and that the EMS server is down.
2. Run the following recovery script:

   recovery_scripts/schema_recovery

3. Copy the backed-up software files to the location **server_x.y.z\emsSwFiles**. If this directory does not exist, create it.

8.3 Check Free Disk Space

The scheduled task for disk space performs basic maintenance. In addition, manually check the disk space from time to time to see if the disk is full and if other applications (like mail, loggers, etc.) are occupying some disk space that can be freed by deleting external files.

Run the command:

```
df -k
```

If disk usage is over 80%, some space must be freed. This task is very important because shortage of disk space can cause an application failure.

9 Reinstalling EMS Server Software

Note: This procedure does NOT preserve data previously saved in the EMS server. Before taking this step, it is advised to back up the EMS server and make sure that the installation procedure is well understood and that all pre-requirements are met.

To upgrade the EMS from version 1.6 Beta 2 or 2.1 to version 3.x, the database must be reinstalled. To install the new software version, first remove the previous software version.

9.1 Removing the Previous Software Version

➢ To remove the previous software version, take these steps:

1. Log in the EMS-Server as acems user
2. Remove all the data under the acems user home directory. Run the command:

   ```
   rm –r /<acems_home_dir>/*
   ```

3. Remove Oracle definition. Run the command:

   ```
   rm –r /var/opt/oracle
   ```

4. Reboot the system (mandatory).

9.2 Installing the New Software Version

1. Refer to Section 4, Installing the EMS Server, on page 17 to install the server.
2. It is recommended to reboot the system after the installation is finished and verify automatic startup.

Reader's Notes

10 Installing the EMS Client

10.1 Installing the EMS Client on a Client PC

1. Insert Nortel's EMS installation disk.
2. Double-click the EMS Client Installation file (PC)/setupwin32.exe) and follow the installation instructions.
3. As a result of the installation process, the EMS Client icon is added to the desktop.

10.1.1 Running the EMS on a Client PC

➢ **To run the EMS on a client PC:**

- Double click the EMS Client icon on your desktop, or run Start>Programs>EMS Client.

10.1.2 First-Time Login

1. Log in as user 'acladmin' with password 'changeMe2004'.

   Note that User Name and Password are case-sensitive. If you incorrectly define these or the field Server IP Address, a prompt is displayed indicating that the fields should be redefined correctly.
2. In the main screen, open the 'Users List' and add new users according to your requirements.

10.2 Installing the EMS Client on a Client PC using Java Web Start (JAWS):

Java Web Start (JAWS) enables you to install the EMS client (compatible with your EMS server version) without using any CDs.

➢ **To install the EMS client on a client PC using JAWS:**

1. Open Internet Explorer and type the EMS Server IP in the Address field and add /jaws as suffix, for example:

   http://10.7.6.5/jaws/
2. Follow the online instructions.

Reader's Notes

11 Appendix A - Frequently Asked Questions (FAQs)

11.1 Pre-installation

Q: Kernel Parameters for semaphores was added to the system file, but not shown when running sysdef command

A: Run the following command:

```
ipcs -s
```

Run sysdef command to verify that the parameters were updated.

11.2 Installation

Q: "Out of Memory" error encountered while creating database

A: The system parameters were not defined. Refer to Section 12.1 on page 39 and verify that all the required parameters are defined and that the syntax is correct.

Q: "Cannot write file…" error encountered during software installation

A: If you didn't define the location of ORACLE_HOME under the **acems** user home directory, then you might have forgotten to give the **acems** user writing permissions to this location.

11.3 Post-installation

Q: When trying to run watchDog_unix or runServer_unix from the directory where it is located, there is an error "command not found".

A: The current directory(.) is not part of the search path. To check the path, run the command:

```
echo $PATH
```

If the current directory is not in the path, run the scripts as follows:
./watchDog_unix
./runServer_unix

Note: If you performed the procedure to start the EMS server automatically, check that the server is up after reboot and do not run it again.

11.4 After Rebooting the Machine

Q: The database is not starting automatically after the machine is rebooted.

A: Check:

1. The syntax in var/opt/oracle/oratab: the file should end with an empty line.
2. That the symbolic link "S90dbstart" under /etc/rc2.d is not broken
3. That all scripts have execute permissions for **acems** user
4. That the default shell for **acems** user is tcsh.

11.5 Changes Not Updated in the Client

Q: After successful installation, multiple add operation as well as changes made by other clients are not updated in the client.

A: Check the configuration of the date on the server machine. This problem occurs when the daylight-saving configuration is defined incorrectly.

12 Appendix B - Installing Solaris 9 Operating System with Your Own CD

Read this Appendix if you're installing the Solaris operating system with your own CD. If you're using Nortel's CD to install Solaris, refer to Section **Error! Reference source not found.** on page **Error! Bookmark not defined.**.

12.1 Operating System Requirements

1. Operating System

   The EMS server requires Solaris™ 64-bit, version 5.9.
   To determine the current operating system version, run:

   ```
   uname –a
   ```

2. Operating System Patches (mandatory)

   SUNWarc
   SUNWbtool
   SUNWhea
   SUNWlibm
   SUNWlibms
   SUNWsprot
   SUNWtoo
   SUNWi1of
   SUNWxwfnt
   SUNWxwkey

To determine if the specific patch is installed, run (for example):

```
showrev -p | grep SUNWarc
```

12.1.1 Software Requirements

1. X Server and Window Manager

   Use any X server supported by your UNIX operating system.
   Use any Sun™-supported Window Manager supported by your UNIX operating system.

   To determine if your X Window System is working correctly on your local system, enter the following command:

   ```
   xclock
   ```

   X clock should appear on your monitor.

2. Required executables:

   tcsh (UNIX shell)

   The following executables must be present: make, ar, ld, nm.

   To determine if one of these executables exists on your system, run:

   ```
   man <executable name>
   ```

3. JDK 1.4.2 for Solaris

   To determine what JDK version is installed, run:

   ```
   java -version
   ```

In the event that an old version is found, the JDK 1.4.2 Installation Kit can be found on Nortel's EMS CD.

➢ To install JDK 1.4.2 for UNIX:

1. Copy the files **j2sdk-1_4_2-solaris-sparc.sh** and **j2sdk-1_4_2-solaris-sparcv9.sh** to the root directory /
2. Ensure that the files **j2sdk-1_4_2-solaris-sparc.sh** and **j2sdk-1_4_2-solaris-sparcv9.sh** have execute permissions for root user.
3. Run **j2sdk-1_4_2-solaris-sparc.sh**
4. When prompted, accept the license agreement; the first script of the JDK installation process is begun.
5. Run **j2sdk-1_4_2-solaris-sparcv9.sh**
6. When prompted, accept the license agreement; the second script of the JDK installation process is begun.
7. Following the installation process, check that a new directory with the name j2sdk1.4.2 under / was created.

12.1.2 Installation

➢ To install Solaris™:

1. **Insert CD 1 into the CD ROM**
2. **<ALT+b> (for ok mode)**

   `boot cdrom`
3. **Select a language**

   `0 for English`
4. **Select a local**

   `0 for English`
5. **What type of Terminal are you using?**

   `12 (for x-terminal)`
6. **About the Solaris Installation**

   `Press F2 to continue.`
7. **Identify this system**

   `Press F2 to continue.`
8. **Network connectivity**

   `[x] Yes`

   Press F2 to continue.
9. **DHCP**

   `[x] No`

   Press F2 to continue.
10. **Primary Network Interface**

    Place an “X” by the appropriate interface.

    Press F2 to continue.
11. **Host Name**

    `Host Name: [enter host name]`

    `Press` F2 to continue.
12. **IP Address**

```
IP Add: [enter IP address]
```

Press F2 to continue.

13. **Subnets**

```
[x] Yes
```

Press F2 to continue.

14. **Net mask**

```
Net mask – [Enter Net mask]
```

Press F2 to continue.

15. **IP V6**

```
[x]No
```

Press F2 to continue.

16. **Set Default Route**

[x] Specify one

Press F2 to continue.

17. **Default route IP Address**

```
Router IP Address: [enter default router IP address]
```

Press F2 to continue.

18. **Confirm Information**

```
Press F2 to continue.
```

19. **Configure Security Policy**

```
keyboard security
```

[x]No

Press F2 to continue.

20. **Confirm Information**

```
Press F2 to continue.
```

21. **Name service**

```
additional services
```

[x] None

Press F2 to continue.

22. **Confirm Information**

```
Press F2 to continue.
```

23. **Time Zone** (Select based on continent and ocean)
24. **Select your region**

```
Press F2 to continue.
```

25. **Time Zone** (Select based on response in step 23.
26. **Date and Time**

```
Adjust the time
```

Press F2 to continue.

27. **Confirm Information**

```
Press F2 to continue.
```

System identification is completed.

12.2 Solaris™ Interactive Installation

`F4 Initial`

F2 Standard

1. **Select Geographical Regions**

   `Select your geographical region`

   Press F2 to continue.

2. **Select Software**

   `[x] Entire Distribution plus OEM support 64 bit`

   Press F2 to continue.

3. **Select Disk**

   `Press F2 to continue.`

4. **Preserve Data?**

   `Press F2 to continue.`

5. **Automatically Layout File System?**

   `Press F2 for auto layout`

6. **Automatically Layout File System**

   `File system for layout:`

   [x] /

   [x] swap

   Press F2 to continue.

7. **File System and Disk layout**

   `Press F4 for customize.`

   Allocate for swap RAM*2 or 1G (Recommendation)

   Allocate /ACEMS – At least 20G

   Allocate / All the rest of the disk

   Important: Don't touch the overlap size or Name!

   Press F2 to continue.

   Verify that the information is as you defined.

   Press F2 to continue.

8. **Mount Remote File System**

   `Press F2 to continue.`

9. **Profile**

   `Press F2 to continue.`

10. **Reboot after installation**

    `[x] Auto reboot`

    Press F2 to continue.

11. **Root password: [Enter the password]**

    Re-enter your root password: [Enter the password]

12. **Media [1] Press Enter**
13. **Insert CD 2**

14. **Press Enter**
15. **Installation details**

    `Press Enter`

    End of Solaris 9 Software 2 Installation.

    Press Enter
16. **Remove the CD from the CD ROM**

    `Press Enter to reboot`

12.3 Post-installation: Basic Configuration

Open a new Terminal window and run the following 5 commands (after each command, press Enter):

```
# TERM=vt100
# export TERM
# tcsh
# cd /etc
# vi ftpd/ftpusers
```

The last command opens the text file **ftpusers**. Insert **#** before the root user (it enables the root user's FTP). (Note that for help with using the vi editor, type 'man vi' in the Terminal and press Enter; the vi's manual opens). Press Esc and then type in :x! to exit the file and save the changes.

Edit the following 4 files in precisely the same way as described for the # **vi ftpusers** file above.

```
# vi default/login
```

Insert **#** before the line `CONSOLE=/dev/console` (it enables Telnet, x-manager, etc...)

```
:x!
```

```
# vi inittab
```

`/sun<enter>`	-	for search for the word 'sun'
`cw vt100`	-	to change the word to vt100
`:x!`	-	to save & exit

```
# vi vfstab
```

Under the column 'Mount Options', change the default "no" to "- logging" and delete the "–" (minus sign) in the next column.

:x!

(for on-line save to disk)

```
#vi rcS
```

/-o p	-	to search for "-o p"
cw –y	-	to change -o p into -y

:x!

Reader's Notes