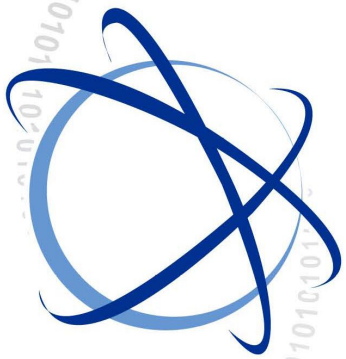
2600-001I85GH
Ver. 7.0

OfficeServ NMS

Installation Manual



SAMSUNG ELECTRONICS

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INTRODUCTION

Purpose

This manual describes how to install the OfficeServ NMS (Network Management System).

Document Content and Organization

This manual is composed of five Chapters, four Annexes and Abbreviation.

CHAPTER 1. Before Installation

This chapter describes hardware and software requirements for installing the OfficeServ NMS.

CHAPTER 2. Operating System Configuration

This chapter describes how to setup the configurations of operating system for running the OfficeServ NMS server.

CHAPTER 3. Installing the OfficeServ NMS Server

This chapter describes how to install the OfficeServ NMS server.

CHAPTER 4. Installing the Database

This chapter describes how to install the database necessary for operating the OfficeServ NMS.

CHAPTER 5. Installing the OfficeServ NMS Client

This chapter describes how to install the OfficeServ NMS client.

ANNEX A. First Logging in

This annex describes how to login in OfficeServ NMS at first.

ANNEX B. Package Upgrade

This annex describes how to upgrade OfficeServ NMS package.

ANNEX C. Re-install MySQL

This annex describes how to re-install MySQL.

ANNEX D. HTTPS Setting

This annex describes how to set HTTPS.

ABBREVIATION

The explanations on the abbreviations used in this manual.

Conventions

The following types of paragraphs contain special information that must be carefully read and thoroughly understood. Such information may or may not be enclosed in a rectangular box, separating it from the main text, but is always preceded by an icon and/or a bold title.

WARNING
Provides information or instructions that the reader should follow in order to avoid personal injury or fatality.

CAUTION
Provides information or instructions that the reader should follow in order to avoid a service failure or damage to the system.

CHECKPOINT
Provides the operator with checkpoints for stable system operation.

NOTE
Indicates additional information as a reference.

Console Screen Output

The lined box with '`Courier New`' font will be used to distinguish between the main content and console output screen text.
'**`Bold Courier New`**' font will indicate the value entered by the operator on the console screen.

Revision History

EDITION	DATE OF ISSUE	REMARKS
00	01. 2006.	First Edition
01	06. 2008.	For OfficeServ NMS v1.2
02	07. 2008.	For OfficeServ NMS v1.3
03	07. 2009.	Added Chapter 7 (Setting EMAIL for alarm and registering CronJob)
04	08. 2010.	Revised for OfficeServ NMS v1.6 and deleted contents for installing the Linux.
6.0	11. 2011.	– Manual Edition allocation method is changed. (Ed.05 → Ver.6.0) – Revised for JDK and MySQL version upgrade.
7.0	03. 2012.	Modified H/W and S/W specifications.

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CHAPTER 1. Before Installation

This chapter describes hardware and software requirements for installing the OfficeServ NMS.

Hardware and Software Requirements

Hardware Specifications

All systems using Unix/Linux/Windows OS can be used as the hardware of OfficeServ NMS server. Client Software uses general PC. In addition, laser printers for printing messages are available.
The minimum hardware requirements for servers or clients should satisfy the following specifications:

Server

Category	Specifications
CPU	3.0 GHz (Intel Zeon processor) or higher recommended
Main Memory	4 GB or higher recommended
Hard Disk	SAS Hard Disk 300 GB or higher
ODD	DVD-ROM Drive
Monitor	19” Monitor
LAN Card	10/100Base-T (RJ-45 Connector)

Client

Category	Specifications
CPU	3.0 GHz (Pentium Core Duo Processor) or higher
Main Memory	2 GB or higher
Hard Disk	100 GB or higher

Category	Specifications
Monitor	Color Monitor with resolution of 1280 X 1024
LAN Card	10/100Base-T (RJ-45 Connector)


NOTE

Hardware Specifications
The specification mentioned above are based on high capacity OfficeServ NMS. For low-capacity configuration and Linux/Windows-based configuration, the hardware specifications may vary according to the management capacity.

Software Specifications

For the normal operation of OfficeServ NMS, the following software environment is required:

Server

Category	Software
OS	Linux (Red Hat Enterprise 5)
JSP/Servlet Engine	Tomcat 5.0.28 or higher
Database	MySQL 5.1.51
JVM	JDK 1.6.0_20
Management Protocol	SNMP
Other Protocols	FTP

Client

Category	Software
OS	Windows XP or higher
Web Browser	Microsoft Internet Explorer version 6.0, 7.0, or 8.0

Software Installation Order

The following programs are installed in the OfficeServ NMS server: Its installation is performed based on the /usr/local directory excluding some softwares like JDK, etc.

Order	Software	Installation Directory	Version	Item
1	OS	-	Linux (Red Hat Enterprise 5)	Refer to the Linux OS installation manual
2	MySQL	/db/mysql/app	5.1.51	Refer to 'Installing Database'
3	JDK	/usr/java	1.6.0_20	Refer to 'Installing JDK 1.6.0_20'
4	Tomcat	/usr/jakarta-tomcat-5.0.28	5.0.28	Refer to 'Installing Tomcat 5.0.28'
5	OfficeServ NMS server	/home	-	Refer to 'Installing the OfficeServ NMS Server Package'

Confirming Hardware Specification and OS Version

Check the hardware specification and the OS version before installing OfficeServ NMS server. For the OS version of the server, Red Hat Enterprise Linux release 5 or more will be desirable. Gcc must be installed when installing the OS. (Recommend full installation.)

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CHAPTER 2. Operating System Configuration

This chapter describes how to setup the configurations of operating system for running the OfficeServ NMS server.

Environment Setup for OfficeServ NMS

Setup the environment information and install additional functions for OfficeServ NMS.

1. The login can be performed at the terminal as follows:

```
$ su -
Passwd:  ******
```

2. Input IP and hostname at /etc/hosts file.

```
# vi /etc/hosts
127.0.0.1 localhost
# OSNMS IP for management system
10.254.199.209 OSM OSM.samsung.com loghost ← IP and Hostname must be
added
```

3. Change hostname at /etc/sysconfig/network file.

```
$ su -
# vi /etc/sysconfig/network
NETWORKING=yes
HOSTNAME=OSM ← Hostname must be changed
GATEWAY=10.254.215.1 ← Default Gateway IP
```

4. Modify kdmrc file at /etc/X11/xdm. (If it exists.)

```
# vi /etc/X11/xdm/kdmrc
[Xdmcp]
# Whether KDM should listen to XDMCP requests.  Default is true.
Enable=false => Change this part into Enable=true.
# The UDP port KDM should listen on for XDMCP requests.  Do not change
the 177.
```

5. Modify the gdm.conf file at /etc/X11/gdm. (If it exists.)

```
# vi /etc/X11/gdm/gdm.conf
[xdmcp]
# Distributions:  Ship with this off.  It is never a safe thing to leave
.
# /etc/hosts.deny to only allow say local access.
Enable=false => Change this part into Enable=true.
```

6. Install RPM for the proper operation of the ‘resources management’ of ‘General Management’. (Check the version of sysstat in the Linux installation CD.)

7. Insert CD into CD-ROM, Select CD-ROM → Fedora → RPMS Folder.

8. Select **Sysstat-5.0.5.9-fc.i386.rpm**.. This file name depends on Linux version. (sysstat-version.rpm)

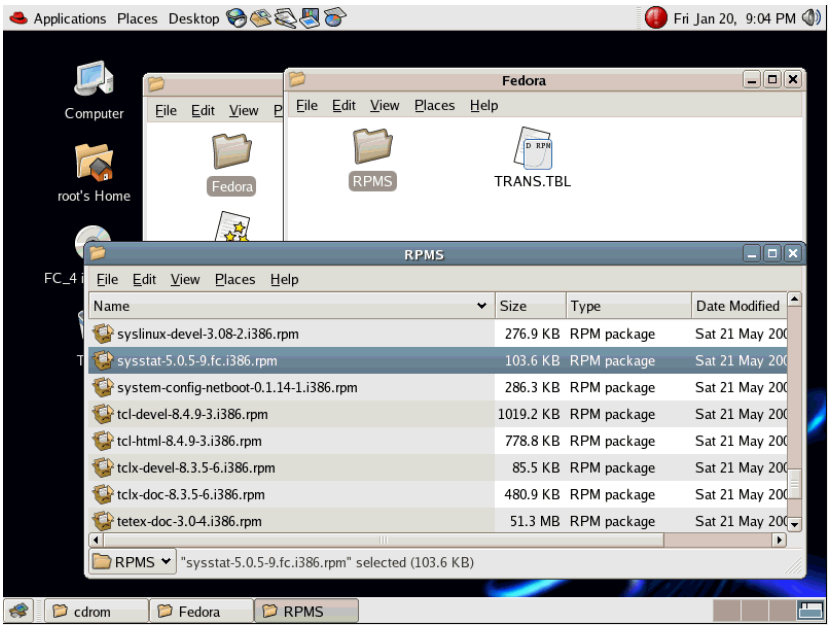


Figure 2.1 Select sysstat of RPM list

9. Prepared system update with double-clicking the selected list.

10. Select **[Continue]** to proceed the installation.

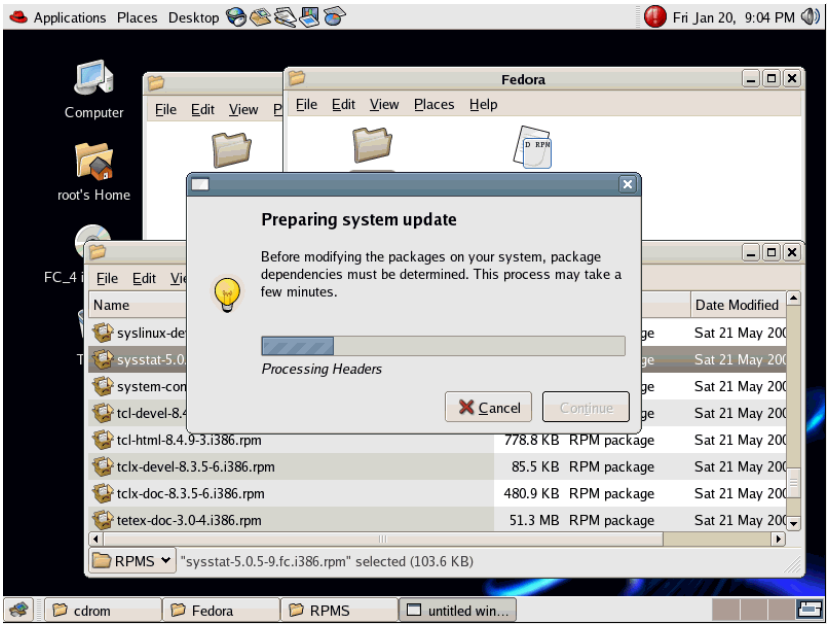


Figure 2.2 Progressing RPM Installation

11. Select **[Continue]**.

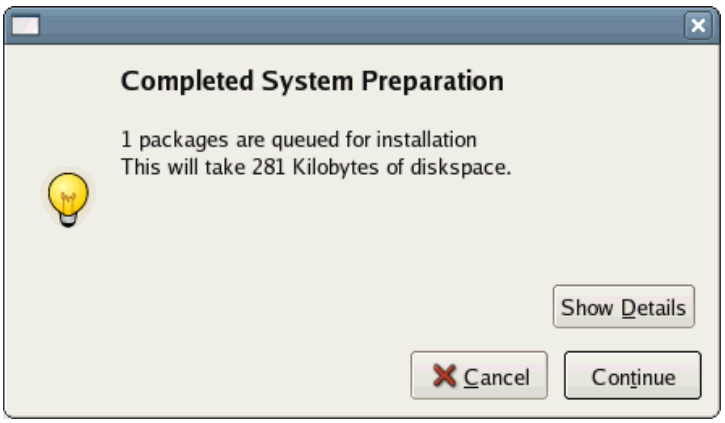


Figure 2.3 Completion of RPM Installation

12. Set the Firewall as Disable.

```
# setup
```

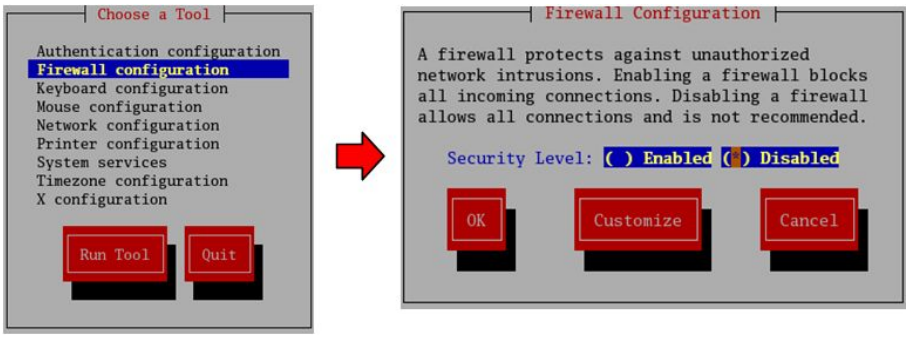


Figure 2.4 Firewall Disable

If the Firewall is set as 'Enabled', all ports are blocked out excluding some ports.

13. Set into the use of krb5-telnet and gssftp at Setup → System Services.

```
# setup
```

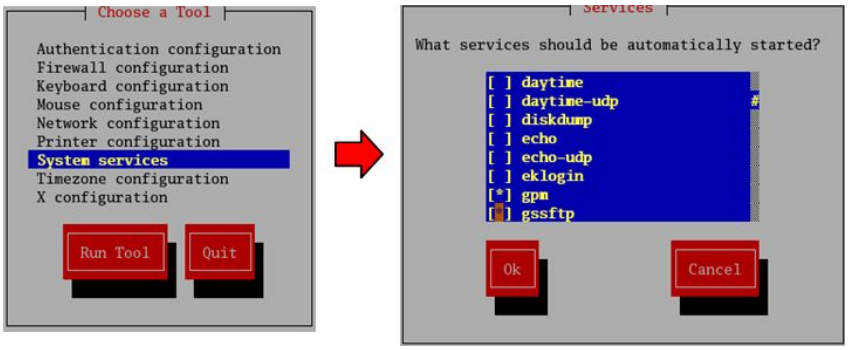


Figure 2.5 System Service

14. If there is no gssftp on the screen or kbr5-telnet, please added the installation files from Linux installation files. (xinet, krb5-telnet, or telnet-server, gssftp, or vsftpd, gssftp)
Log in as root account and insert the CD. Then open folder CD-ROM → Fedora → RPMS. Search installation file and progress installation. (If there is no rpm file to install on the CD, download rpm files for xinetd, vsftpd, telnet-server via internet, and install each rpm files.)

15. Select Krb5-workstation-1.4.3-i386.rpm from Linux installation files. (This file name depends on Linux version)

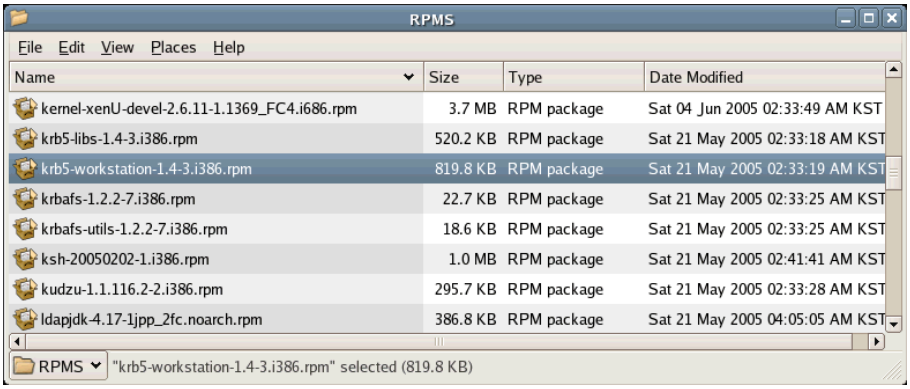


Figure 2.6 Ftp/Telnet Tool Setup

16. After completing Ftp/Telnet Tool Setup, execute **[Desktop]** → **[System Settings]** → **[Server Settings]** → **[Services]**, check gssftp, krb-telnet, xinetd for use, and then restart xinetd.

17. Modify /etc/xinetd.d/krb5-telnet file in order to the permit of Telnet login from the registered user.

```
# vi /etc/xinetd.d/krb5-telnet
service telnet
{
disable = no
flags = REUSE
socket_type = stream
wait = no
user = root
server = /usr/kerberos/sbin/telnetd
# log_on_failure += USERID => Make this part as a comment using “#” .
}
```

In case of Linux, the access to it using root is impossible because its security level is high. Therefore, the root authority should be secured by accessing it as a general user.

18. Modify the /etc/xinetd.d/gssftp file in order to change into FTP login permittable from the registered user. (If it exists.)

```
# vi /etc/xinetd.d/ gssftp
service ftp
{
disable = no
flags = REUSE
socket_type = stream
wait = no
user = root
server = /usr/kerberos/sbin/ftpd
server_args = -l -a => Delete -a.
#log_on_failure += USERID => Make this part as a comment using “#” .
}
```

In case of Linux, its security level is high. Therefore, the access to it using the root is impossible.

19. Reboot the system in order to apply the previous setup or Execute the follows;

```
# cd /etc/rc.d/init.d
# ./xinetd restart
Stopping xinetd:  [ OK ]
Starting xinetd:  [ OK ]
# netstat | egrep  “telnet|ftp”
```

Or restart xinetd on **[Desktop]** → **[System Settings]** → **[Server Settings]** → **[Services]**.

20. Reboot the System in order to apply the changed setup.

```
# sync;sync;sync;
# reboot
```

CHAPTER 3. Installing the OfficeServ NMS Server

This chapter describes how to install the OfficeServ NMS.

Installing the OfficeServ NMS server

Registration and Setup of the OfficeServ NMS Account

Generate the OfficeServ NMS server account.

1. Login with root account at the Linux Server console terminal.

Figure 3.1 Server Login

2. Run the user manager screen on the Linux Windows screen.

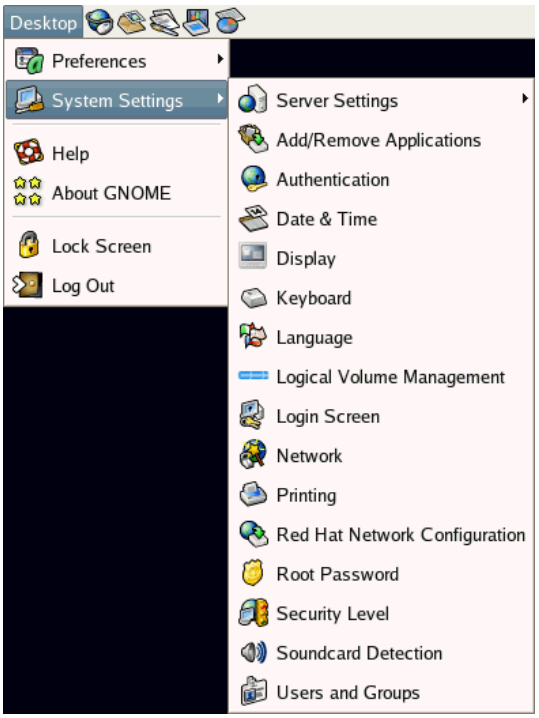
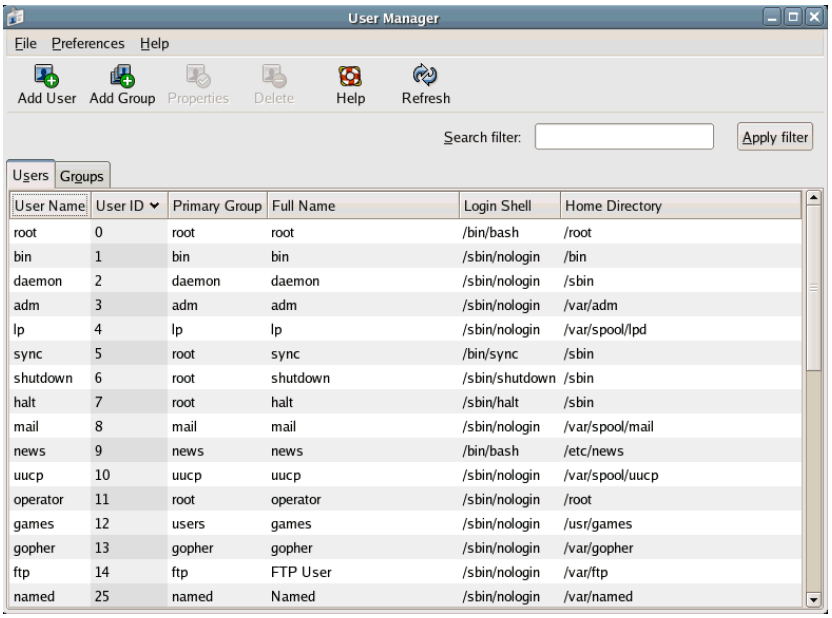


Figure 3.2 Running the Admintool



User Name	User ID	Primary Group	Full Name	Login Shell	Home Directory
root	0	root	root	/bin/bash	/root
bin	1	bin	bin	/sbin/nologin	/bin
daemon	2	daemon	daemon	/sbin/nologin	/sbin
adm	3	adm	adm	/sbin/nologin	/var/adm
lp	4	lp	lp	/sbin/nologin	/var/spool/lpd
sync	5	root	sync	/bin/sync	/sbin
shutdown	6	root	shutdown	/sbin/shutdown	/sbin
halt	7	root	halt	/sbin/halt	/sbin
mail	8	mail	mail	/sbin/nologin	/var/spool/mail
news	9	news	news	/bin/bash	/etc/news
uucp	10	uucp	uucp	/sbin/nologin	/var/spool/uucp
operator	11	root	operator	/sbin/nologin	/root
games	12	users	games	/sbin/nologin	/usr/games
gopher	13	gopher	gopher	/sbin/nologin	/var/gopher
ftp	14	ftp	FTP User	/sbin/nologin	/var/ftp
named	25	named	Named	/sbin/nologin	/var/named

Figure 3.3 Running the admintool

3. Register ‘Groups’.

Figure 3.4 Selecting the Groups

Item	Setup Value
Group Names	office
GID	1000

4. Register the user.

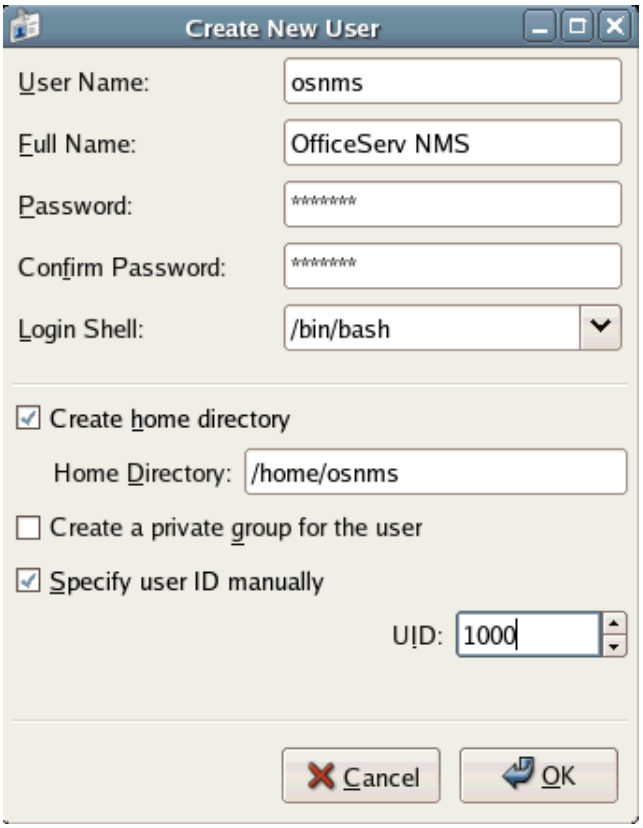


Figure 3.5 Selecting the Add

Item	Setup Value
User Name	osnms
Name	OfficeServ NMS
Login Shell	/bin/ksh
Home Directory	/home/osnms
UID	1000

5. Select the registered users on the user management screen, and select the ‘registration information’ icon to modify the user group.
   - Select the group tab on the user registration information screen.
   - Check the ‘office’ group on the list where the group to which the user is to belong.
   - Select the ‘office’ at the basic group combo box.
   - Click **[OK]** button.

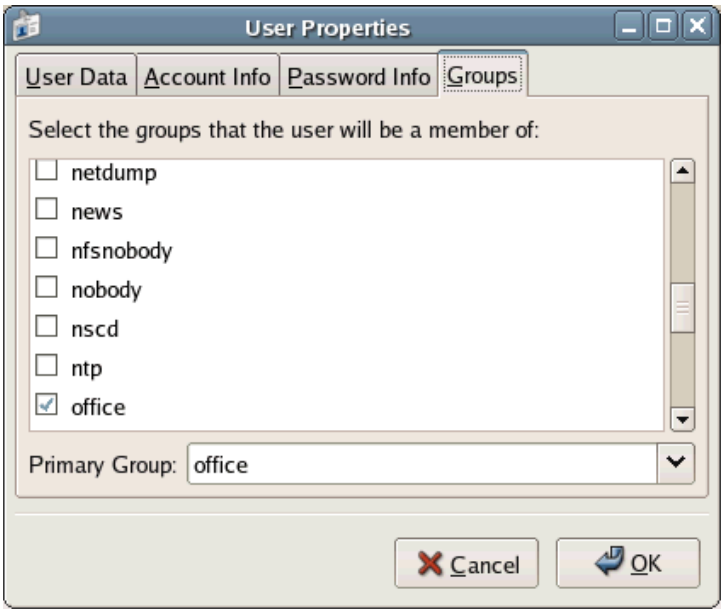


Figure 3.6 Entering the Add Group field

6. Verify the ownership of home directory of osnms account and change the permission into '775'.

```
# cd /home
# chmod -R 775 osnms
# ls -l
drwxr-xr-x 5 root root 4096 Apr 13 15:30 ./
drwxr-xr-x 27 root root 4096 Apr 13 13:35 ../
drwx------ 2 root root 16384 Apr 13 21:41 lost+found/
drwxrwxr-x 9 osnms office 4096 Apr 26 11:04 osnms/
```

Installing JDK 1.6.0_20

The file name necessary for installing JDK is as follows:

- J2SE 32bit System: jdk-6u20-linux-i586.bin
- J2SE 64bit System: jdk-6u20-linux-x64.bin

Installing J2SE

1. Log in the OfficeServ NMS server with Root account.
2. Check if JDK is installed.

```
# which java
```

3. Check if JDK version is right. The JDK version is 1.6.0_20.

```
# java -version
```

If the JDK of which version is not matched, delete the JDK that has installed before using the following command, and proceed with the JDK installation.

```
# cd /mnt/cdrom
# cp ./jdk-6u20-linux-x64.bin /usr
# cd /usr
# jdk-6u20-linux-x64.bin(press Enter)
Do you agree to the above license terms?  [yes or no]yes
```

4. Link the /usr/jdk1.6.0_20 directory to the /usr/java by using the following command. If the java link already exists, delete the link using the /usr/java command, and execute the following command.

```
# rm /usr/java
# ln -s /usr/jdk1.6.0_20 /usr/java
```

5. Designate JAVA_HOME and PATH.

```
export JAVA_HOME=/usr/java
export PATH=$PATH:$JAVA_HOME/bin
```

6. Move to $JAVA_HOME, use command ‘ls -l’, and check group and owner have root permission.

7. Check whether the JDK version is 1.6.0_20 or not.

```
# java -version
Java version "1.6.0_20"
Java™ 2 Runtime Environment, Standard Edition (build 1.6.0_20-b02)
Java HotSpot(TM) 64-Bit Server VM (build 16.3-b01, mixed mode)
```

Installing Tomcat 5.0.28

The file necessary for installing Tomcat is as follows:
Tomcat installing file: tomcat-5.0.28.ta

Installing Tomcat

1. Login to the OfficeServ NMS server with Root account.
2. Release the file compressed in tar format, and generate the link.

```
# cp /mnt/cdrom/.profile
# cp /mnt/cdrom/tomcat5028.tar /usr
# cd /usr
# tar xvf tomcat5028.tar
# ln -s /usr/jakarta-tomcat-5.0.28/ /usr/local/tomcat
```

3. Set the execution right into the execution file.

```
# cd /usr/local/tomcat/bin
# chmod +x *.sh
```

4. Check group and owner have root permission.

```
# cd /usr/local/tomcat
# ls –l
```

Confirming the installation

1. Login the OfficeServ NMS server with Root account.
2. Run the Tomcat as follows:

```
# cd /usr/local/tomcat/bin
# ./startup.sh
```

3. Check if the installation is completed. If the initial window is displayed by entering the following URL into the web browser, it means its installation.

```
http://localhost/manager.jsp
```

4. Perform the termination as follows:

```
# cd /usr/local/tomcat/bin
# ./shutdown.sh
```

Installing Cronolog (Optional)

The file necessary for installing Cronolog is as follows.
Cronolog installing file : cronolog-1.6.2.tar.gz
To install the cronolog, gcc must be installed when you install the Linux OS.
Execute the following command to check the gcc installation.

```
# rpm –qa | grep gcc
```

Installing Cronolog

1. Login to the OfficeServ NMS server with root account.
2. Download the cronolog-1.6.2.tar.gz file from http://cronolog.org/index.html page and save it to /tmp directory. Then install it.

```
# cd /tmp
# gzip ?d cronolog-1.6.2.tar.gz
# cd /usr
# tar xvf /tmp/cronolog-1.6.2.tar
# cd /usr/cronolog-1.6.2
# ./configure
# make install
```

Installing the OfficeServ NMS Server Package

Install the OfficeServ NMS server program using the OfficeServ NMS Installer CD.
Perform this work at the OfficeServ NMS server console.

1. Insert the OfficeServ NMS Server Installation CD, and login with the root operator. The work should be performed at the following environment because the Install File operates at the JAVA environment.

```
export JAVA_HOME=/usr/java
export PATH=$PATH:$JAVA_HOME/bin
```

2. Enter the command as follows:

```
# cd /mnt/cdrom/CDROM_Installers/Linux
# sh ./install.bin
```

If libc.so.6 not found error or librt.so.1 not found error occurs, re-run install.bin after doing the following command.

```
# cp ./install.bin ./install.bin.bak
# cat install.bin.bak | sed "s/export LD_ASSUME_KERNEL/#export
LD_ASSUME_KERNEL/" > /tmp/install.bin
# cp /tmp/install.bin ./
# chmod 755 install.bin
# sh ./install.bin
```

If the following error occurs, re-run install.bin after installing libXp rpm.

```
Invocation of this Java Application has caused an
InvocationTargetException.  This application will now exit.  (LAX)
Stack Trace:
java.lang.UnsatisfiedLinkError:
/usr/j2sdk1.4.2_04/jre/lib/i386/libawt.so:
libXp.so.6:  cannot open shared object file:  No such file or directory
...
```

Refer the URL, http://support.installshield.com/kb/view.asp?arti-cleid=Q000085 when the following error occurs.

```
Invocation of this Java Application has caused an
InvocationTargetException.  This application will now exit.  (LAX)
Stack Trace:
java.lang.NoClassDefFoundError:
...
```

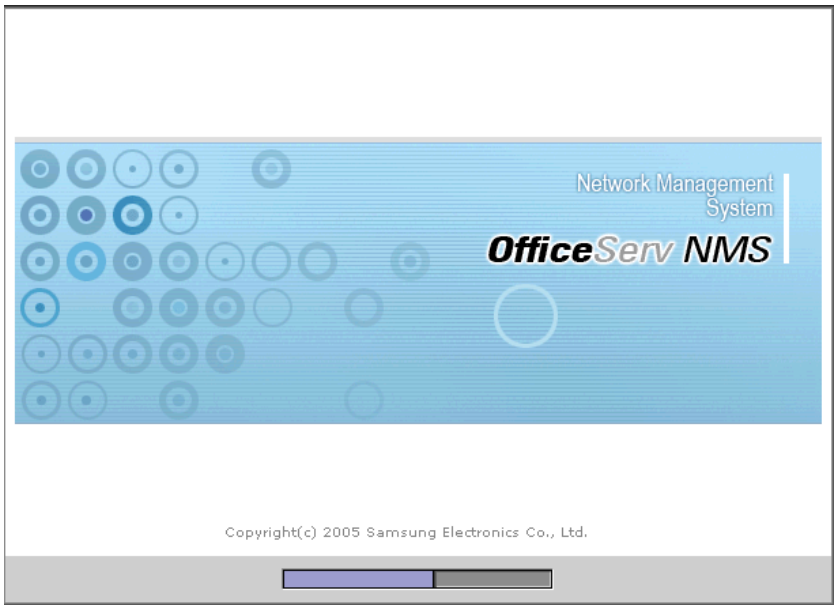


Figure 3.7 Window Displayed When Initially Installed

3. Select **[Next]** if the following installation window is displayed.

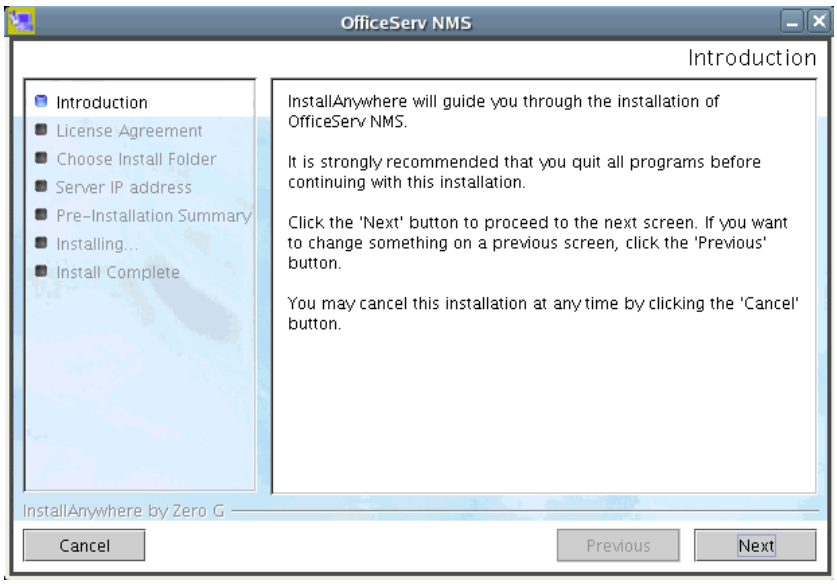


Figure 3.8 Window Introducing the Installation

4. Select 'I accept the terms of the License Agreement' option, and select **[Next]**.

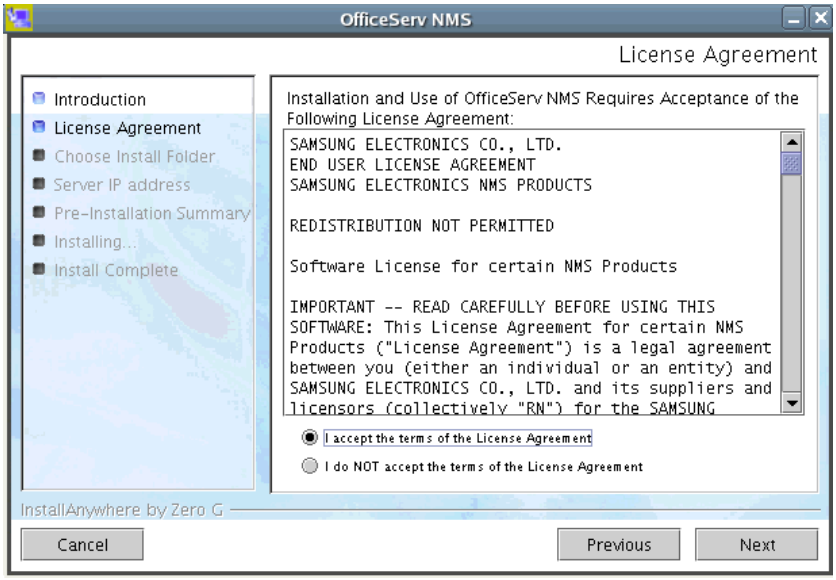


Figure 3.9 Window Displaying the License Agreement

5. Designate the folder that is to be installed into **/home/osnms,** and then select **[Next]**.

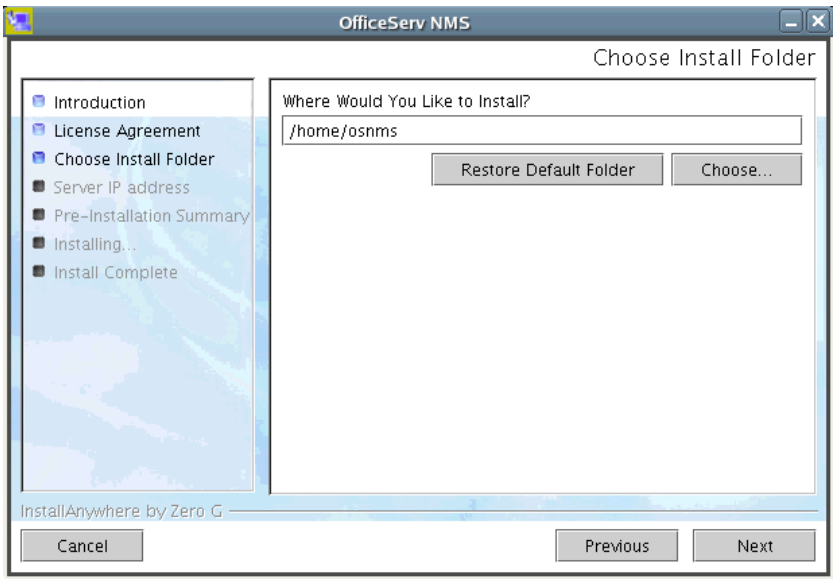


Figure 3.10 Window Displaying the Installing Folder Selection

6. Enter the server IP, and select **[Next]**.

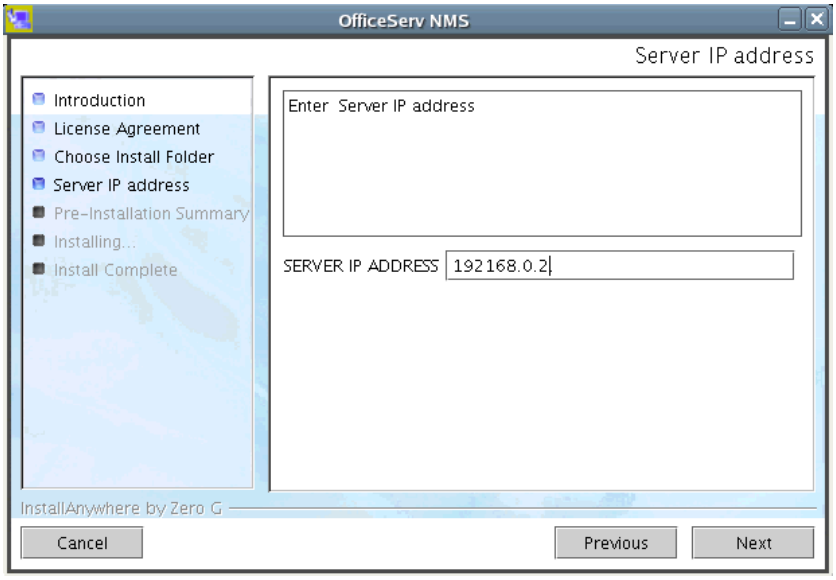


Figure 3.11 Window Displaying the Server IP Addresses

7. Select **[Next]** after selecting country.

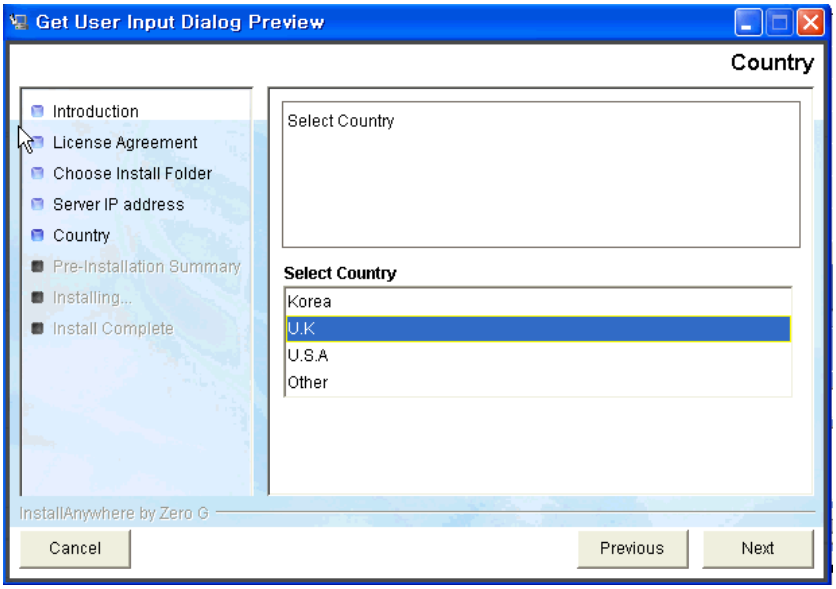


Figure 3.12 Select Country

8. Select **[Next]** after inputting Trap Port Number (Default: 11162)

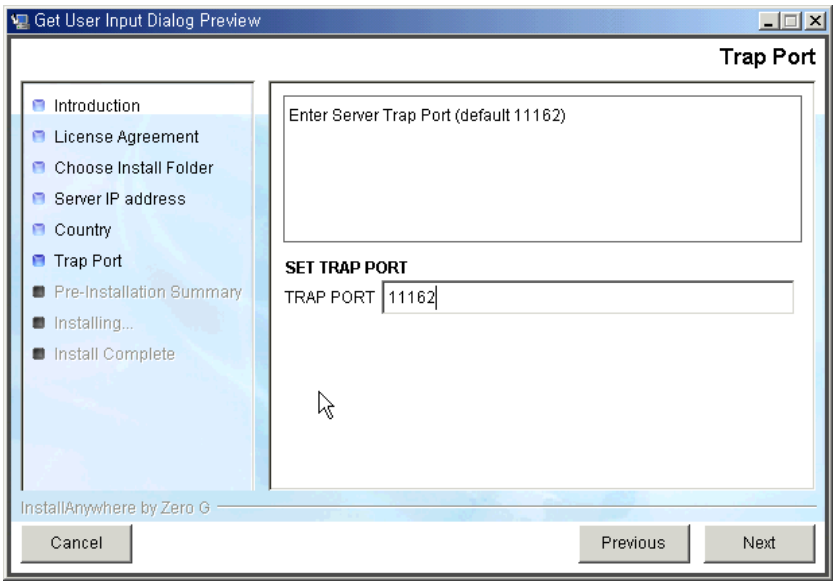


Figure 3.13 Input Trap Port

9. Select **[Install]** if the following window is displayed:

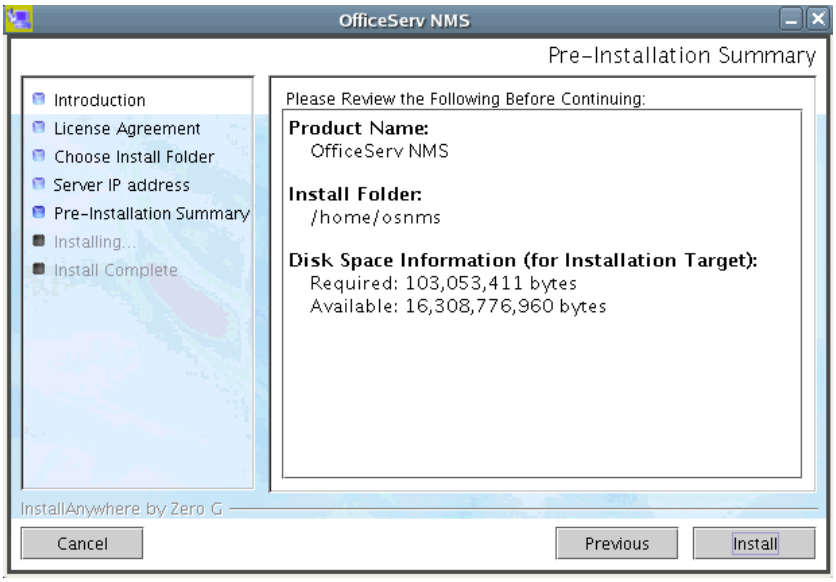


Figure 3.14 Window displaying installation starting

10. Proceed with the installation. It can cost some time to complete its installation.

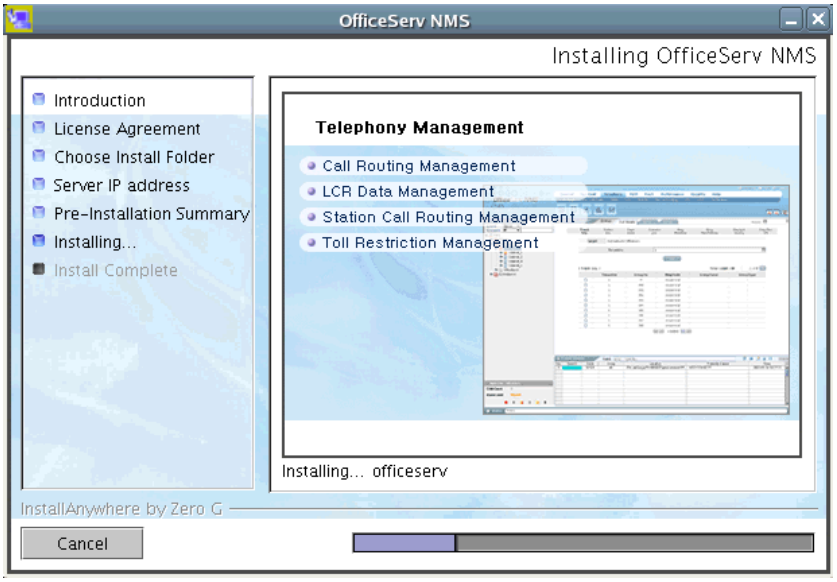


Figure 3.15 Window Displaying the Installation Progressing

11. If the message indicating the completed installation is displayed, it means the OfficeServ NMS installation is completed.

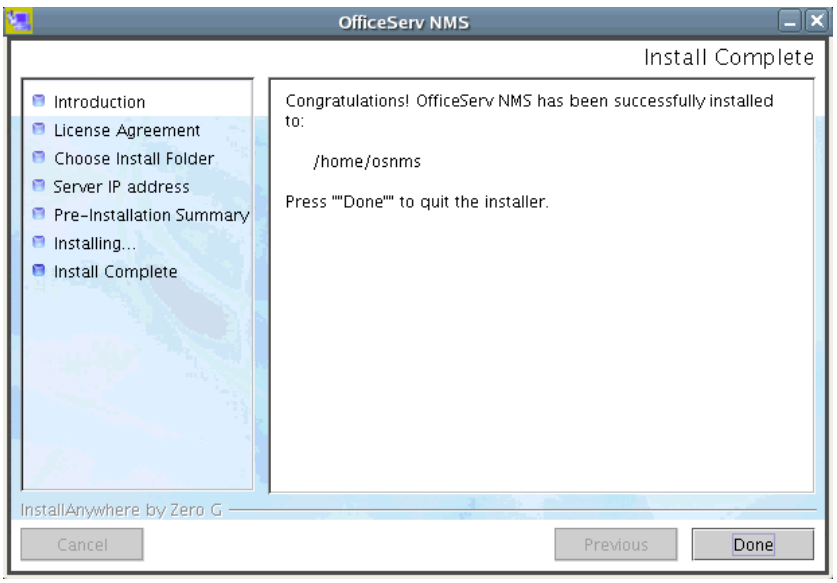


Figure 3.16 Window Displaying the Completed Installation

Generating the License

The work related to License is needed if the overall package installation is completed.
In order to get the license of the NMS Package, the license file should be secured by asking the server's 'Mac Address' and 'How many users to be connected to web server at the same time', 'How many OfficeServ 7000 series systems to be registered' of the person in charge of it. In order to get its license, 'Mac Address', 'Number of Users, simultaneous access', and 'Max. Number of NEs to be registered'. NE(Network Elements) means OfficeServ 7000 series systems. Mac Address can be confirmed by using the following command: (It's changeable by the company's policy.)

```
# ifconfig –a
eth0 Link encap:Ethernet HWaddr 00:12:3F:51:5E:B9
inet addr:10.89.29.50 Bcast:10.89.29.255 Mask:255.255.255.0
inet6 addr:  fe80::212:3fff:fe51:5eb9/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:19746798 errors:0 dropped:0 overruns:0 frame:0
TX packets:10776672 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:100
RX bytes:2370377959 (2.2 GiB) TX bytes:9863516450 (9.1 GiB)
Base address:0xccc0 Memory:dfce0000-dfd00000
lo Link encap:Local Loopback
inet addr:127.0.0.1 Mask:255.0.0.0
inet6 addr:  ::1/128 Scope:Host
UP LOOPBACK RUNNING MTU:16436 Metric:1
RX packets:130025674 errors:0 dropped:0 overruns:0 frame:0
TX packets:130025674 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:10230338235 (9.5 GiB) TX bytes:10230338235 (9.5 GiB)
sit0 Link encap:IPv6-in-IPv4
NOARP MTU:1480 Metric:1
RX packets:0 errors:0 dropped:0 overruns:0 frame:0
TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)
```

Copy the License File (**licenseFile**) into the following directory.

```
/home/osnms/officeserv/data/license
```

Setting E-mail and NMS host for Alarm

E-Mail is used to sending of each alarm to send an e-mail when a specific alarm occurs. For sending e-mail, system should know Mail-Server Information, e-mail ID and each alarm.
Login ‘root’ account, open ‘/etc/hosts’ file and add E-Mail Server Information as the followings.

```
# su - root
# vi /etc/hosts
# Do not remove the following line, or various programs
# that require network functionality will fail.
127.0.0.1 localhost
xxx.xxx.xxx.xxx OSM OSM. loghost ← IP Address and hostname of NMS
xxx.xxx.xxx.xxx mailServer ← IP Address and hostname of Mail Server
→ locate localhost first among aliases of 127.0.0.1.
```

Open ‘$NMS_HOME/data/properties/project-resources.properties’, update host name as the followings:
Remember this hostname should be same hostname of E-mail Server and hostname of ‘/etc/hosts’ file.

```
# vi $NMS_HOME/data/properties/project-resources.properties
fm.tt.email.host=mailServer
```

After rebooting the server, run Tomcat by ’root’ account. (Refer to Installing Tomcat 5.0.28)

Registering Cronjob

It is required deleting reporting files periodically because the files are accumulated.
Login as a root, open file /home/osnms/officeserv/bin/crontab.osnms.cron, and set a keeping period for report files.
Set values for execution time as <<08 7 * * *>> in example below.
« –mtime +7» parameter can be changed, +7 means it's deleted since 7 days are passed.

```
# su - root
# vi /home/osnms/officeserv/bin/crontab.osnms.cron
08 7 * * * /usr/bin/find $NMS_HOME/var/pm/report -name "*Report*" -mtime
+7 -type f -exec /bin/rm {} \;
```

Register Cronjob

```
# crontab /home/osnms/officeserv/bin/crontab.osnms.cron
```

Setting fields of the file is as follows.

Field	Meaning	Remark
First	Minute	0~59
Second	Hour	0~23
Third	Day	1~31
Fourth	Month	1~12
Fifth	Day of the week	0~7 (0 or 7 = Sunday, 1 = Monday, 2 = Tuesday, ...)
Sixth	Command	Command to execute

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CHAPTER 4. Installing the Database

This chapter describes how to install the database necessary for operating the OfficeServ NMS.

Installing the MySQL

Install the MySQL database according to the following procedures.

1. Setting the Basic Environment
2. Installing the Database
3. Creating the Database

MySQL Install CD

MySQL Install CD can be included into OfficeServ NMS Install CD, or an additional Install CD can be provided.

Creating Database

Proceed step 3 after completing installation of the OfficeServ NMS server program.

Environment Setup

Generate the LINUX account that belongs to MySQL group and MySQL group. MySQL database is to be installed under the /db directory designated when the OS is installed.

- /db/mysql/app: Installing MySQL tool
- /db/mysql/data: Database storage space

1. Login with the Root account at the terminal as follows:

```
$ su -
Passwd:  ******
```

2. Delete mysql user and group created when installing Linux OS.

```
# userdel -r mysql
# groupdel mysql
```

3. Generate MySQL as follows (Linux Group ID should be made using the unique value by referring to the /etc/group Information.)

```
# /usr/sbin/groupadd -g 1500 mysql
```

4. Generate MySQL user as follows: (Linux User ID should be made using the unique value by referring to the /etc/passwd Information.) The following shows the example of which password in the MySQL account is set as 'mysql123'.

```
# mkdir /db (The db/mysql file system is not generated when the OS is
installed.)
# /usr/sbin/adduser -u 1500 -g mysql -d /db/mysql -p mysql123 mysql
```

   Or create MySQL user using menu of **[Desktop]** → **[System Settings]** → **[Users and Groups]**. (Refer to 2 of Registration and Setup of the OfficeServ NMS Account)

5. Change the permission of mysql home directory.

```
# cd /db
# chmod -R 775 mysql
```

6. Check the MySQL package of the lower version basically installed on the LINUX OS.

```
# rpm –qa | grep mysql
```

7. Delete all MySQL package information confirmed at the procedure of ‘6’.

```
# rpm –e --nodeps --allmatches <Retreived mysql rpm_name>
```

8. Change the limit of maximum file number opened at the same time in MySQL. If the item does not exit, add the line at the end.

```
# vi /etc/security/limits.conf
Mysql soft nofile 8192
Mysql hard nofile 8192
```

Installing Database

1. Complete the first stage work, and login with MySQL account.

```
$ su - mysql
Passwd:  ******
```

2. Copy the compressed file for installing MySQL as follows, and then install the compressed file for installing the MySQL.
   - 32 bit system: mysql-enterprise-gpl-5.1.51-linux-i686-glibc23.tar.gz
   - 64 bit system: mysql-enterprise-gpl-5.1.51-linux-x86_64-glibc23.tar.gz

```
$ cp /mnt/cdrom/mysql-enterprise-gpl-5.1.51-linux-x86_64-glibc23.tar.gz
$ tar xvfz mysql-enterprise-gpl-5.1.51-linux-x86_64-glibc23.tar.gz
```

3. Rename the MySQL directory of which compression is released as follows:

```
$ mv mysql-enterprise-gpl-5.1.51-linux-x86_64-glibc23 app
```

4. Make the link directory under /usr/local as follows:

```
$ su – root
Passwd :  ******
$ ln –s /db/mysql/app/ /usr/local/mysql
$ exit
```

5. Move to the app directory.

```
$ cd app
$ ls -l
```

6. Execute the script installing MySQL as follows:

```
$ ./scripts/mysql_install_db --user=mysql
```

7. Run the MySQL database server.

```
$ ./bin/mysqld_safe –user=mysql &
```

8. Set the password of the MySQL root account as follows: (The following example is the case where its hostname is root and password is 'megaroot'.)

```
$ ./bin/mysqladmin -u root password "megaroot"
```

9. Login with MySQL root account as follows:

```
$ ./bin/mysql –uroot -pmegaroot
```

10. Delete the MySQL anonymous account like following:

```
($ /bin/mysql –uroot –pmegaroot)

Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 1577
Server version:  5.1.51-enterprise-gpl-pro MySQL Enterprise Server -
Pro Edition (GPL)

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reserved.
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and you are welcome to modify and redistribute it under the GPL v2
license

Type 'help;' or '\h' for help.  Type '\c' to clear the current input
statement.

mysql> delete from mysql.user where user –  "" ;
Query OK, 2 rows affected (0.00 sec)

mysql> flush privileges;
Query OK, 0 rows affected (0.00 sec)

mysql> quit;
Bye
$
```

Creating Database

Before starting the OfficeServ NMS, the database must be created to save server data. Create DBSpace, users, and tables.

1. Login with the root account after the package installation for the OfficeServ NMS server is completed.

```
$ su –
passwd :  ****
#
```

2. Check if JAVA_HOME and PATH are designated. If there is no information produced by the following echo command, it is resulted from the wrong setup of /root/.profile (/root/.bash_profile). Therefore, check firstly the information on the environment file. Please copy /home/osnms/.profile to here, execute '# . ./.profile' and check again.

```
# echo $JAVA_HOME
/usr/java
# echo $CLASSPATH
.:/usr/java/jre/lib/javaplugin.jar:/usr/java/lib/tools.jar:/home/
osnms/officeserv/lib/tool/mysql-connector-java-3.1.12-bin.jar
# echo $PATH
usr/java/bin:/home/osnms/javaws:.:/bin:/usr/bin:/usr/java/bin:/usr/
local/bin:/sbin:/usr/sbin:/usr/X11R6/bin:/home/osnms/officeserv/bin:/
db/mysql/app/bin:/usr/local/apache2/bin:/usr/local/opera/bin
```

3. Check if the MySQL database server has been running.

```
# ps –aef | grep mysql
mysql 14201 1 0 Jan04 ?  00:00:00 /bin/sh /db/mysql/app/bin/mysqld_safe
--datadir=/db/mysql/data --pid-file=
/db/mysql/data/solid.pid
mysql 14247 14201 0 Jan04 ?  00:04:34 /db/mysql/app/bin/mysqld
--defaults-extra-file=/db/mysql/app/data/my.cnf -
-basedir=/db/mysql/app --datadir=/db/mysql/data
--pid-file=/db/mysql/data/solid.pid --skip-locking --port=3306
--socket=/t
mp/mysql.sock
```

4. Run the MySQL database server if there is no Mysqld_safe, mysqld process.

```
# su - mysql
$ ./app/support-files/mysql.server start &
$ exit
```

5. Execute the database. (db_ready program generates the MySQL Dbspace, the basic user information, and backup directory, and perform the MySQL auto-start.) The password is 'megaroot' which was configured at the procedure of '7' in Installing Database.

```
# cd /home/osnms/officeserv/bin
# ./db_ready.sh
```

6. Execute db_schema.sh to generate the OfficeServ NMS server tables.

```
./db_schema.sh
# mysql -uroot -pmegaroot
mysql> grant all on *.* to ems@localhost identified by 'ems';
mysql> flush privileges;
mysql> quit
# ./db_schema.sh
```

7. Execute insLevel1.sh to generate the basic data of OfficeServ NMS.

```
# ./insLevel1.sh
```

8. After starting the OfficeServ NMS as osnms account, register schedule jobs related to database by executing db_schedreg.sh.

```
# su – osnms
Passwd :  ******
$ .  ./.profile
[/home/osnms] EMS start
[/home/osnms] cd /home/osnms/officeserv/bin
[/home/osnms] ./db_schedreg.sh
[/home/osnms] ./correctSchedule.sh
```

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CHAPTER 5. Installing the OfficeServ NMS Client

This chapter describes how to install the OfficeServ NMS client.

Executing the Web Server

Run the OfficeServ NMS server if the installation is all completed. OfficeServ NMS runs in the order of Tomcat → MySQL → OfficeServ NMS Application.

1. Login with the root account, and run the Tomcat.

```
$ su –
passwd :  *****
# /usr/local/tomcat/bin/startup.sh
```

2. Login with MySQL user, and run the database demonstartion. This process can be omitted only if the MySQL demonstration is already under execution. (The running has already been run in the database installation.)

```
# su - mysql
Passwd :  ******
$ /db/mysql/app/support-files/mysql.server start
```

3. Login with osnms account, and run the web server. The web server execution command is as follows:

```
$ su – osnms
passwd :  *****
$ EMS start
```

Client Connection

OfficeServ NMS program provides the graphic user interface (GUI) under the web environment. The operator can use easily the OfficeServ NMS program using the Microsoft Internet Explorer, and the Java Runtime Environment (JRE) should have been firstly installed.

1. Find Java SE Runtime Environment 6u20 from internet.
   You can download from http://www.oracle.com/index.html → Downloads → Java for developers → Previous Release → Java SE6 (It can be changed).
2. Download and install Java SE Runtime Environment.
3. Run the Internet Explorer, enter the OfficeServ NMS URL, and then the login window appears.

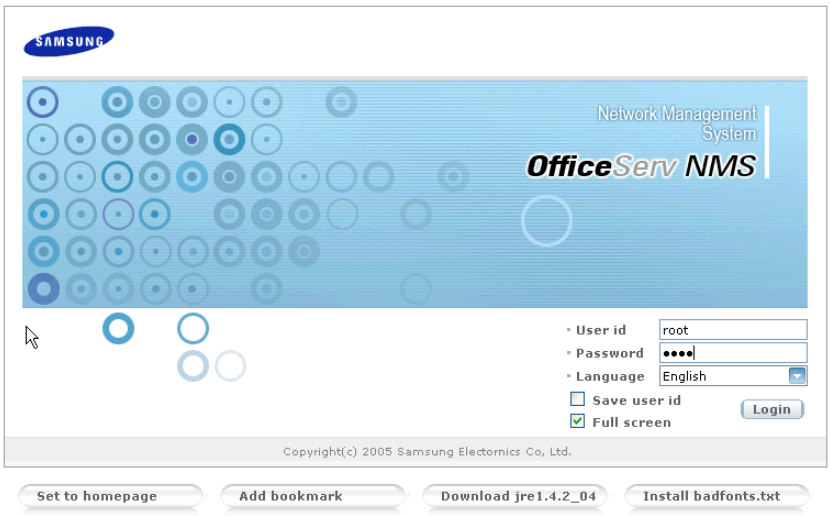

Figure 5.1 Login Window

4. Login with user ID and password.

ANNEX A. First Logging in

Logging in with the Basic Operator ID

OfficeServ NMS Web Client should register the operator's ID when installing for the first time. The operator ID of 'root' is used for registering/deleting the basic operator.
The 'root' can be used only for registering or deleting the early operator information, and the OfficeServ equipments cannot be managed by logging in using this ID.

Initial Logging in

1. Log in by using the 'root', which is a default user ID, and the '1234', which is a default password. You must change the password of 'root' account for security.

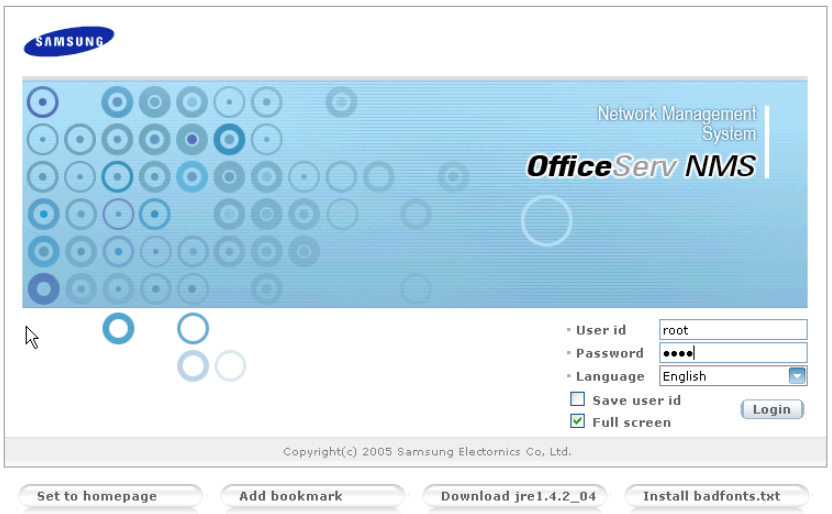

Figure A.1 Starting Window

2. The main Web Browser runs.

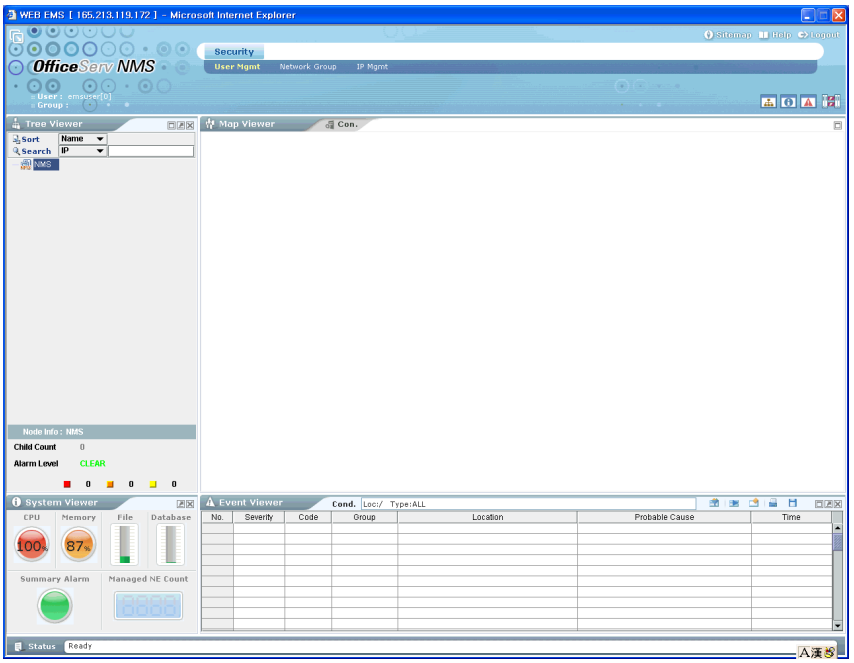

Figure A.2 Main Web Browser

Registering the Permission

OfficeServ Web Client can operate only by the authorized operator only under the permitted Terminal (IP address of PC). Therefore, the Admin operator should set the operator registration and IP address after the initial setup.

Registering the Operator

1. Select **[User Mgmt]**.

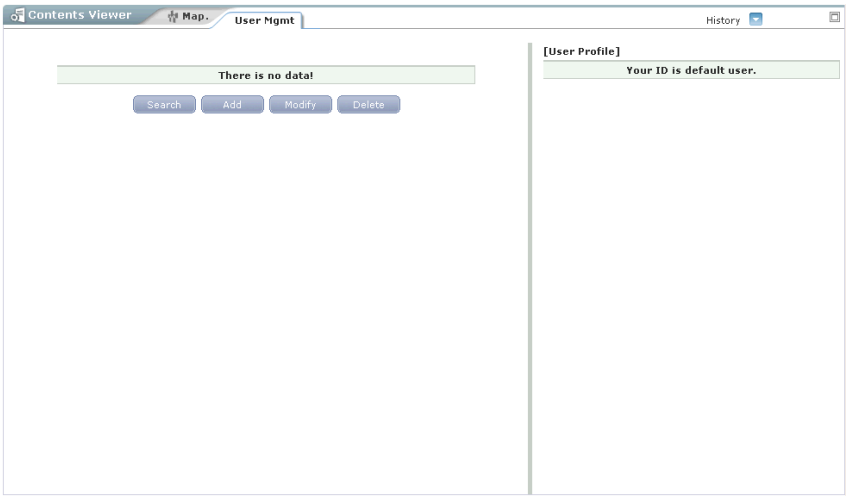

Figure A.3 User Mgmt Window

2. Select **[Add]**, and the **[Register Uwser]** screen is displayed. Enter the necessary items, select **[Add]**, and the confirming questions are displayed. If then, select **[OK]**.

Figure A.4 Register User Window (Add)

Entry Items	Descriptions
User ID	Operator's ID
Password	Operator's Password
Re-Password	Confirming the password
Privilege	A operator level, which can be discriminated into Administrator, Operator, Guest.
Group	Set the NE Group that the operator can manage. The uppermost-leveled operator should select the Default Group.
Login Type	Set whether to access simultaneously with the same ID is available. If it's available, enter the session number that can be accessed.
E-mail	E-mail address

As for the network group, one network group has been already registered with a default group, and the Admin operator can register the additional group in the later and can change the group.

3. If a new user is registered, it is reflected on the result table.

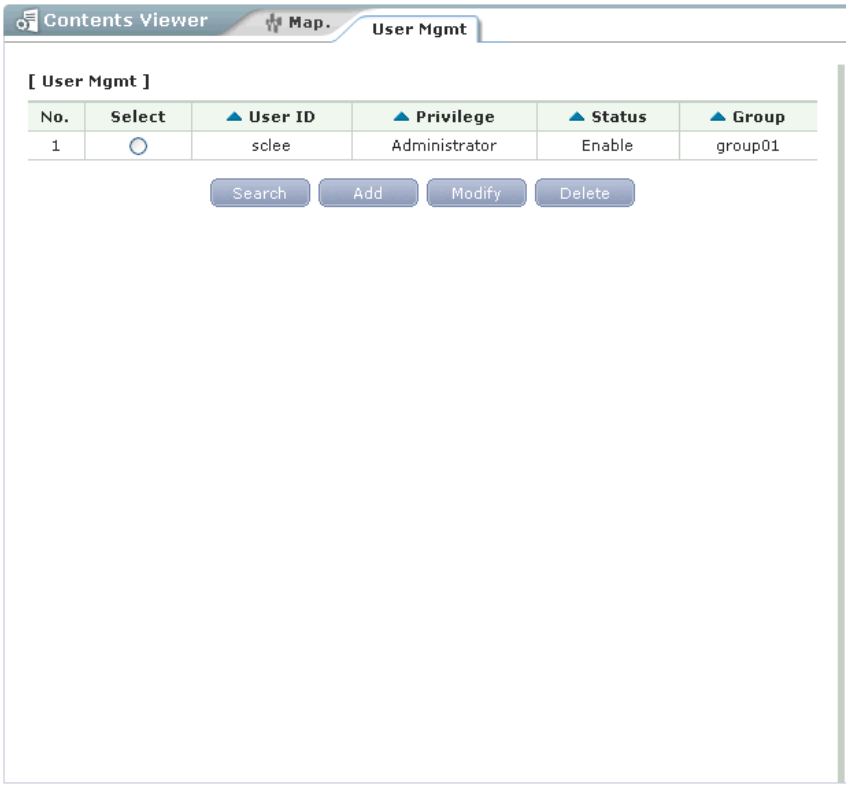

Figure A.5 User Mgmt Window (Completed)

Permitting the Client IP Address

1. Select **[IP Mgmt]**.

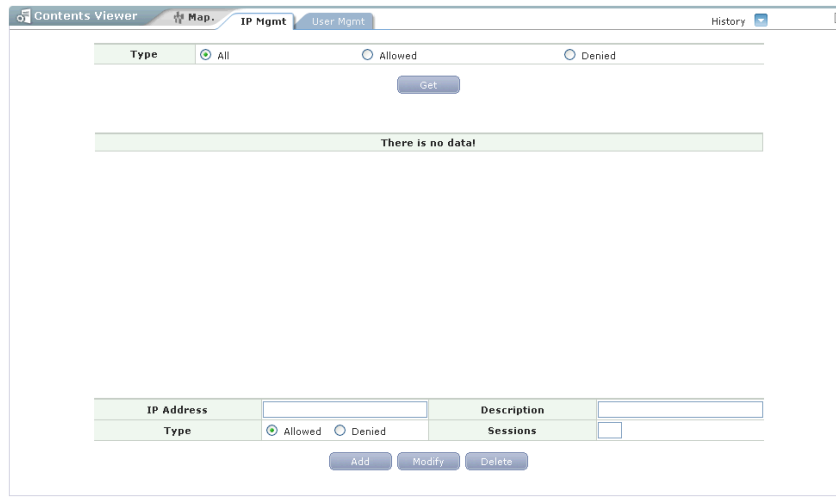

Figure A.6 IP Mgmt Window

2. Enter the relevant information such as the IP address on screen of the lower side (ex. 192.168.87.*, 192.168.0.2), select **[Add]**.

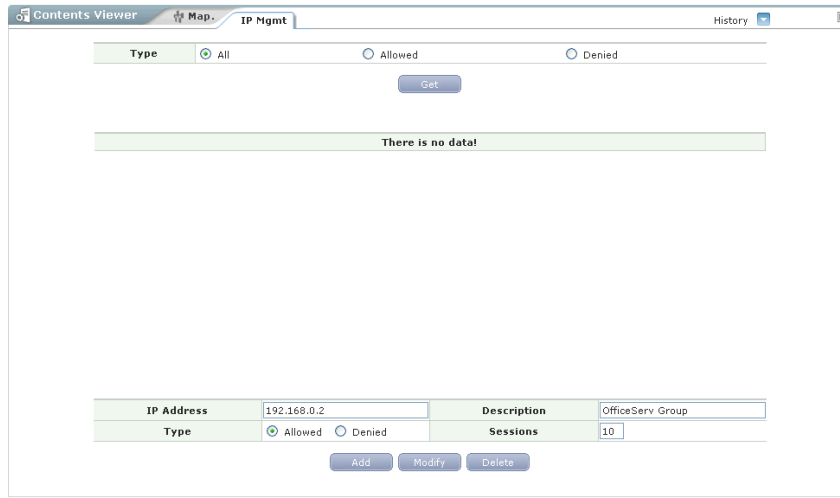

Figure A.7 IP Mgmt Window (Add)

Items	Descriptions
IP Address	Client IP Information
Description	Description on the IP that is to be registered.
Type	Set whether to permit the log-in. In case of Allowed, the login can be executed at the registered IP, and in case of Denied, the login can not be executed at the registered IP.
Sessions	The number of the sessions of which simultaneous login can be performed if the login is allowable.

3. The registered IP address is displayed on the upper side of the screen.

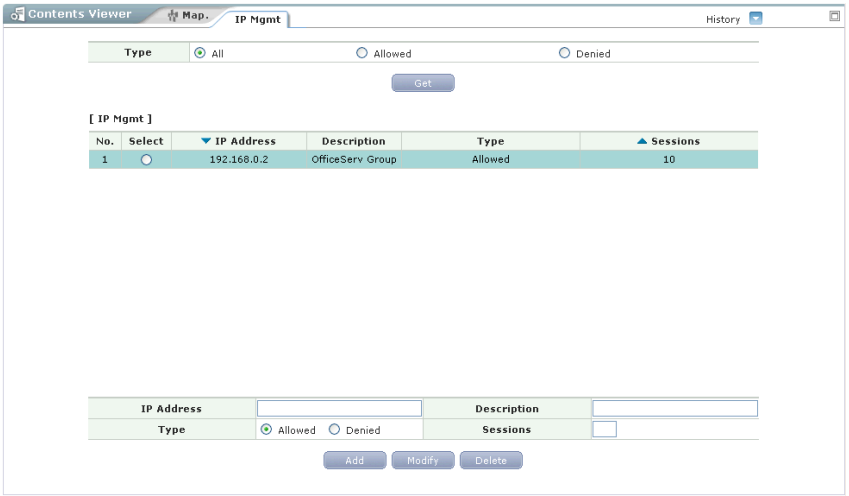

Figure A.8 IP Mgmt Window (Completed)

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ANNEX B. Package Upgrade

Upgrading to Package-v1.6.0

Version : v1.6.0
Package Release date : 2010.07.31
Package : CDROM_Installers.zip
OfficeServ NMS V1.5 package must be installed.

1. Download the new package of OfficeServ NMS server to /tmp.
2. Stop NMS.

```
[osnms:  /home/osnms] EMS stop
EMS system completely stopped.
```

3. Shutdown Tomcat.

```
[osnms:  /home/osnms] su - root
Password:
[osnms:  ]  .  ./.profile
[osnms:  ]  cdtomcat
[osnms:  /usr/local/tomcat] cd bin
[osnms:  /usr/local/tomcat/bin] shutdown.sh
```

4. Backup Database and shutdown MySQL.

```
[osnms:  /usr/local/tomcat/bin] su - mysql
[mysql:/db/mysql] /db/mysql/app/bin/mysqldump -u root --triggers=false
-p --databases common_db > /db/mysql/backup_data_1.5_20110922.sql
Enter password:  ← megaroot (Press Enter)
(This work will take long time depend on Database size.)
[mysql:/db/mysql] /db/mysql/app/bin/mysqldump -u root -p mysql user >
/db/mysql/backup_mysql_user_1.5_20110922.sql
Enter password:  ← megaroot (Press Enter)
```

```
[mysql:/db/mysql]./app/bin/mysqladmin -u root -p shutdown
Enter password:  ← megaroot (Press Enter)
[mysql:/db/mysql]exit
```

5. Install JDK 1.5.0.
6. Install Tomcat 5.0.28. (Refer to the Installing Tomcat 5.0.28)
7. Install Cronolog. (Refer to the Installing Cronolog (Optional))
8. Unzip and install the new package. (as 'root')

```
[osnms:  /root] cd /tmp
[osnms:  /tmp] unzip CDROM_Installers.zip
Archive:  CDROM_Installers.zip
inflating:  InstallerData/IAClasses.zip
inflating:  InstallerData/laxmanifest.txt
inflating:  InstallerData/uninstallmanifest.txt
inflating:  Linux/install.bin
inflating:  Linux/install.bin.lax
inflating:  Linux/InstallerData/Installer.zip
[osnms:  /tmp] cd Linux
[osnms:  /tmp/Linux] sh ./install.bin
```

9. Remove and re-install MySQL.
   Remove MySQL as follows.

```
$ su - root
# cd /db/mysql
# rm -Rf app
```

   Re-install MySQL. (Refer to the .Re-install MySQL-5.0.17)

10. Check if the MySQL database server has been running.

```
# ps -aef | grep mysql
mysql 14201 1 0 Jan04 ?  00:00:00 /bin/sh /db/mysql/app/bin/mysqld_safe
--datadir=/db/mysql/data --pid-file=/db/mysql/data/solid.pid

mysql 14247 14201 0 Jan04 ?  00:04:34 /db/mysql/app/bin/mysqld
--defaults-extra-file=/db/mysql/app/data/my.cnf --basedir=/db/mysql/app
--datadir=/db/mysql/data --pid-file=/db/mysql/data/solid.pid
--skip-locking --port=3306 --socket=/tmp/mysql.sock
```

11. Run the MySQL database server if there is no Mysqld_safe process.

```
# su – mysql
$ ./app/support-files/mysql.server start &
$ exit
```

12. Execute shell script. (If MySQL is not running, start MySQL first.)

```
[osnms:  /home/osnms] su - root
[osnms:  /root] cd /home/osnms/officeserv/bin
[osnms:  /home/osnms/officeserv/bin] migrate_schema_238_to_239.sh
[osnms:  /home/osnms/officeserv/bin]./db_schema.sh
```

13. Run Tomcat.

```
$ su – root
[osnms:  ]  cdtomcat
[osnms:  /usr/local/tomcat] cd bin
[osnms:  /usr/local/tomcat/bin] startup.sh
```

14. Run NMS server.

```
$ su – osnms
Password:******
[osnms:  ]  EMS start
```

15. Check NMS server status.

```
[osnms:  /home/osnms] PS
------------------------------------------------------------
osnms 16752 1 0 13:37 pts launcher
------------------------------------------------------------
osnms 16809 16752 3 13:37 pts us
------------------------------------------------------------
osnms 16836 16752 1 13:37 pts mf
------------------------------------------------------------
osnms 16869 16752 0 13:37 pts ni.snmp
osnms 16907 16752 0 13:37 pts ni.ftp
------------------------------------------------------------
```

16. If NMS server does not run, install license file of OfficeServ NMS and re-do step 13, 14. (Refer to the Generating the License)

Upgrading to Package-v1.6.1

Version : v1.6.1
Package Release date : 2011.09.01
Package : CDROM_Installers.zip
OfficeServ NMS V1.5 or V1.6.0 package must be installed.

1. Download the new package of OfficeServ NMS server to /tmp.
2. Stop NMS.

```
[osnms:  /home/osnms] EMS stop
EMS system completely stopped.
```

3. Shutdown Tomcat.

```
[osnms:  /home/osnms] su - root
Password:
[osnms:  ]  .  ./.profile
[osnms:  ]  cdtomcat
[osnms:  /usr/local/tomcat] cd bin
[osnms:  /usr/local/tomcat/bin] shutdown.sh
```

4. Backup Database and shutdown MySQL.

```
[osnms:  /usr/local/tomcat/bin] su – mysql
[mysql:/db/mysql] /db/mysql/app/bin/mysqldump -u root --triggers=false
-p --databases common_db > /db/mysql/backup_data_1.5_20110922.sql
Enter password:  ← megaroot (Press Enter)
(This work will take long time depend on Database size.)
[mysql:/db/mysql] /db/mysql/app/bin/mysqldump -u root -p mysql user >
/db/mysql/backup_mysql_user_1.5_20110922.sql
Enter password:  ← megaroot (Press Enter)

[mysql:/db/mysql]./app/bin/mysqladmin -u root -p shutdown
Enter password:  ← megaroot (Press Enter)
[mysql:/db/mysql]exit
```

5. Install JDK 1.6.0_20. (Refer to the Installing JDK 1.6.0_20)
6. Install Tomcat 5.0.28. (Refer to the Installing Tomcat 5.0.28)
7. Install Cronolog. (Refer to the Installing Cronolog (Optional))

8. Unzip and install the new package. (as 'root')

```
[osnms:  /root] cd /tmp
[osnms:  /tmp] unzip CDROM_Installers.zip
Archive:  CDROM_Installers.zip
inflating:  InstallerData/IAClasses.zip
inflating:  InstallerData/laxmanifest.txt
inflating:  InstallerData/uninstallmanifest.txt
inflating:  Linux/install.bin
inflating:  Linux/install.bin.lax
inflating:  Linux/InstallerData/Installer.zip
[osnms:  /tmp] cd Linux
[osnms:  /tmp/Linux] sh ./install.bin
```

9. Remove and re-install MySQL.
Remove MySQL as follows.

```
$ su - root
# cd /db/mysql
# rm -Rf app
```

Re-install MySQL. (Refer to the Re-install MySQL-5.1.51)

10. Check if the MySQL database server has been running.

```
# ps -aef | grep mysql
mysql 14201 1 0 Jan04 ?  00:00:00 /bin/sh /db/mysql/app/bin/mysqld_safe
--datadir=/db/mysql/data --pid-file=/db/mysql/data/solid.pid

mysql 14247 14201 0 Jan04 ?  00:04:34 /db/mysql/app/bin/mysqld
--defaults-extra-file=/db/mysql/app/data/my.cnf --basedir=/db/mysql/app
--datadir=/db/mysql/data --pid-file=/db/mysql/data/solid.pid
--skip-locking --port=3306 --socket=/tmp/mysql.sock
```

11. Run the MySQL database server if there is no Mysqld_safe process.

```
# su - mysql
$ ./app/support-files/mysql.server start &
$ exit
```

12. Execute shell script. (If MySQL is not running, start MySQL first.)

```
[osnms:  /home/osnms] su - root
[osnms:  /root] cd /home/osnms/officeserv/bin
[osnms:  /home/osnms/officeserv/bin] migrate_schema_238_to_239.sh
[osnms:  /home/osnms/officeserv/bin]./db_schema.sh
```

13. Run Tomcat.

```
$ su - root
[osnms:  ]  cdtomcat
[osnms:  /usr/local/tomcat] cd bin
[osnms:  /usr/local/tomcat/bin] startup.sh
```

14. Run NMS server.

```
$ su - osnms
Password:******
[osnms:  ]  EMS start
```

15. Check NMS server status.

```
[osnms:  /home/osnms] PS
------------------------------------------------------------
osnms 16752 1 0 13:37 pts launcher
------------------------------------------------------------
osnms 16809 16752 3 13:37 pts us
------------------------------------------------------------
osnms 16836 16752 1 13:37 pts mf
------------------------------------------------------------
osnms 16869 16752 0 13:37 pts ni.snmp
osnms 16907 16752 0 13:37 pts ni.ftp
------------------------------------------------------------
```

16. If NMS server does not run, install license file of OfficeServ NMS and re-do step 13, 14. (Refer to the Generating the License)

ANNEX C. Re-install MySQL

Re-install MySQL-5.0.17

Installing Database

1. Complete the first stage work, and login with MySQL account.

```
$ su - mysql
Passwd:  ******
```

2. Copy the compressed file for installing MySQL as follows, and then install the compressed file for installing the MySQL.

```
$ cp /mnt/cdrom/mysql-pro-5.0.17-beta-linux-i686.tar.gz .
$ gunzip < ./mysql-pro-5.0.17-beta-linux-i686.tar.gz | tar xvf -
```

3. Rename the MySQL directory of which compression is released as follows:

```
$ mv mysql-pro-5.0.17-beta-linux-i686 app
```

4. Move to the app directory.

```
$ cd app
$ ls -l
```

5. Execute the script installing MySQL as follows:

```
$ ./scripts/mysql_install_db --user=mysql
```

6. Run the MySQL database server.

```
$ ./bin/mysqld_safe –user=mysql &
```

7. Set the password of the MySQL root account as follows: (The following example is the case where its hostname is root and password is ‘megaroot’.)

```
$ ./bin/mysqladmin -u root password “megaroot”
```

8. Login with MySQL root account as follows:

```
$ ./bin/mysql –uroot -pmegaroot
```

9. Delete the MySQL anonymous account like following:

```
($ /bin/mysql –uroot –pmegaroot)

Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 23295 to server version:  5.0.17-beta-pro
Type ‘help;’ or ‘\h’ for help.  Type ‘\c’ to clear the buffer.
mysql> delete from mysql.user where user = “” ;
Query OK, 0 rows affected (0.00 sec)
mysql> flush privileges ;
Query OK, 0 rows affected (0.07 sec)
mysql> quit;
Bye
```

Creating Database

Before starting the OfficeServ NMS, the database must be created to save server data. Create DBSpace, users, and tables.

1. Login with the root account after the package installation for the OfficeServ NMS server is completed.

```
$ su –
passwd :  ****
```

2. Check if JAVA_HOME and PATH are designated. If there is no information produced by the following echo command, it is resulted from the wrong setup of /root/.profile (/root/.bash_profile). Therefore, check firstly the information on the environment file. Please copy /home/osnms/.profile to here, execute '# . ./.profile' and check again.

```
# echo $JAVA_HOME
/usr/java
# echo $CLASSPATH
.:/usr/java/jre/lib/javaplugin.jar:/usr/java/lib/tools.jar:/home/
osnms/officeserv/lib/tool/mysql-connector-java-3.1.12-bin.jar
# echo $PATH
usr/java/bin:/home/osnms/javaws:.:/bin:/usr/bin:/usr/java/bin:/usr/
local/bin:/sbin:/usr/sbin:/usr/X11R6/bin:/home/osnms/officeserv/bin:/
db/mysql/app/bin:/usr/local/apache2/bin:/usr/local/opera/bin
```

3. Check if the MySQL database server has been running.

```
# ps –aef | grep mysql
mysql 14201 1 0 Jan04 ?  00:00:00 /bin/sh /db/mysql/app/bin/mysqld_safe
--datadir=/db/mysql/data --pid-file=
/db/mysql/data/solid.pid
mysql 14247 14201 0 Jan04 ?  00:04:34 /db/mysql/app/bin/mysqld
--defaults-extra-file=/db/mysql/app/data/my.cnf -
-basedir=/db/mysql/app --datadir=/db/mysql/data
--pid-file=/db/mysql/data/solid.pid --skip-locking --port=3306
--socket=/t
mp/mysql.sock
```

4. Run the MySQL database server if there is no Mysqld_safe, mysqld process.

```
# su - mysql
$ ./app/support-files/mysql.server start &
$ exit
```

5. Execute the database. (db_ready program generates the MySQL Dbspace, the basic user information, and backup directory, and perform the MySQL auto-start.) The password is 'megaroot' which was configured at the procedure of '7' in Installing Database.

```
# cd /home/osnms/officeserv/bin
# ./db_ready.sh
```

6. Execute db_schema.sh to generate the OfficeServ NMS server tables.

```
./db_schema.sh
# mysql -uroot -pmegaroot
mysql> grant all on *.* to ems@localhost identified by 'ems';
mysql> flush privileges;
mysql> quit
# ./db_schema.sh
```

7. Execute insLevel1.sh to generate the basic data of OfficeServ NMS.

```
# ./insLevel1.sh
```

8. After starting the OfficeServ NMS as osnms account, register schedule jobs related to database by executing db_schedreg.sh.

```
# su – osnms
Passwd :  ******
$ .  ./.profile
[/home/osnms] EMS start
[/home/osnms] cd /home/osnms/officeserv/bin
[/home/osnms] ./db_schedreg.sh
[/home/osnms] ./db_schema_update.sh
[/home/osnms] ./correctSchedule.sh
```

Re-install MySQL-5.1.51

1. Login with MySQL account.

```
$ su – mysql
Passwd :  ******
```

2. Backup the engine of previous MySQL 5.0.x version with 'mv' command.

```
[mysql:/db/mysql] cd /db/mysql
[mysql:/db/mysql] mv /db/mysql/app /db/mysql/app_50
```

3. Copy the installation file of MySQL 5.1.x version, mysql-enterprise-gpl-5.1.51-linux-x86_64-glibc23.tar.gz, in the directory /db/mysql. Change the file's authority as a MySQL user's own.

```
$ cp /mnt/cdrom/mysql-enterprise-gpl-5.1.51-linux-x86_64-glibc23.tar.gz
.
[mysql:/db/mysql] ls -al mysql* -rw-rw-r-- 1 mysql mysql 134210614 Aug
24 13:53 mysql-enterprise-gpl-5.1.51-linux-x86_64-glibc23.tar.gz
[mysql:/db/mysql] chown -R mysql.mysql
mysql-enterprise-gpl-5.1.51-linux-x86_64-glibc23.tar.gz
```

4. Move to the directory /db/mysql and install the MySQL 5.1.x version package.

```
[mysql:/db/mysql] tar xfvz
mysql-enterprise-gpl-5.1.51-linux-x86_64-glibc23.tar.gz
```

5. Rename the MySQL directory (mysql-enterprise-gpl-5.1.51-linux-x86_64-glibc23) as follows. (/app)

```
[mysql:/db/mysql] mv mysql-enterprise-gpl-5.1.51-linux-x86_64-glibc23/
app/
```

6. Change the authority of the MySQL directory.

```
[mysql:/db/mysql] chown -R mysql.mysql app/
```

7. Modify the 'basedir' and 'datadir' of the file '/db/mysql/app/support-files/mysql.server'.

```
[mysql:/db/mysql] cd /db/mysql/app/support-files
[mysql:/db/mysql/app/support-files] vi mysql.server
basedir=/db/mysql/app  ← Search with 'basedir' and
input '/db/mysql/app'.
datadir=/db/mysql/data ← Search with 'datadir' and
input '/db/mysql/data'.
[mysql:/db/mysql/app/support-files]
```

8. Modify the my.conf as a Root account, and start the MySQL service.

```
[mysql:/db/mysql] su -
[root:/] vi /etc/my.cnf
#key_buffer_size = 5000M ← Make this as a comment.
key_buffer_size = 1000M ← Modify.
#innodb_data_file_path = ibdata1:409M:autoextend ← Make this as a
comment.
innodb_data_file_path = ibdata1:2000M;ibdata2:10M:autoextend ← Modify.

[root:/] cd /db/mysql/app/
[root:/db/mysql/app] ./bin/mysqld_safe &
[1] 10281
[root:/db/mysql/app] 110922 12:43:28 mysqld_safe Logging to
'/db/mysql/data/DBTEAM2.err'.
110922 12:43:28 mysqld_safe Starting mysqld daemon with databases from
/db/mysql/data
← Press Enter.
[root:/db/mysql/app]
```

9. Check the log file to verify that the MySQL runs normally.
If the version information (underlined text) on the screen output is as follows, it runs normally. If it is not, check the log file again after 30 s. (Because the starting process is not finished yet.)
Verify the log file name on the screen output in step 8. (underlined text on the screen output of step 8) Then, execute the 'tail' command as follows with the file name.

```
[mysql:/db/mysql/app] tail -5 /db/mysql/data/OSM.err
110922 12:43:29 [ERROR] mysql.user has no 'Event_priv' column at
position 29
110922 12:43:29 [ERROR] Cannot open mysql.event
110922 12:43:29 [ERROR] Event Scheduler:  An error occurred when
initializing system tables.  Disabling the Event Scheduler.
110922 12:43:29 [Note] /db/mysql/app/bin/mysqld:  ready for connections.
```

```
Version:  '5.1.51-enterprise-gpl-pro' socket:  '/tmp/mysql.sock' port:
3306 MySQL Enterprise Server - Pro Edition (GPL)
```

10. Test the MySQL connection.

```
[mysql:/db/mysql/app] ./bin/mysql -u root -p
Enter password:  megaroot ← Press Enter
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 2
Server version:  5.1.51-enterprise-gpl-pro MySQL Enterprise Server -
Pro Edition (GPL)

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reserved.
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and you are welcome to modify and redistribute it under the GPL v2
license
Type 'help;' or '\h' for help.  Type '\c' to clear the current input
statement.

mysql> exit
Bye
[mysql:/db/mysql/app]
```

Execute the MySQL upgrade script.

11. Execute the mysql_upgrade for data upgrade.


NOTE

For the error messages that occur during the upgrade, perform the step 12 below. Warning messages can be ignored.

```
[mysql:/db/mysql/app] /db/mysql/app/bin/mysql_upgrade -u root -p
Enter password:  megaroot ← Press Enter
Looking for 'mysql' as:  /db/mysql/app/bin/mysql
Looking for 'mysqlcheck' as:  /db/mysql/app/bin/mysqlcheck
Running 'mysqlcheck' with connection arguments:  '--port=3306'
'--socket=/tmp/mysql.sock'
Running 'mysqlcheck' with connection arguments:  '--port=3306'
'--socket=/tmp/mysql.sock'
...
OK
```

12. For the tables that has errors during the upgrade, process them as follows.

- Normal message:

```
common_db.cm_t_level1_auto OK
```

- Error message:

```
common_db.cm_t_level1_head
error :  Table upgrade required.  Please do "REPAIR TABLE
`cm_t_level1_head`" or dump/reload to fix it!
```

a. Execute 'check table' for verifying the table status.
b. Execute 'optimize table'.
c. Execute 'check table' again to verify the table status is OK.

```
[root:/db/mysql/app/support-files] su - mysql
[mysql:/db/mysql] cd /db/mysql/app
[mysql:/db/mysql/app] ./bin/mysql -uroot -pmegaroot
mysql> check table common_db.cm_t_level1_head;
+--------------------------+-------+----------+--------------------------+
| Table | Op | Msg_type | Msg_text |
+--------------------------+-------+----------+--------------------------+
| common_db.cm_t_level1_head | check | error | Table upgrade required.
Please do "REPAIR TABLE `cm_t_level1_head`" or dump/reload to fix it!  |
+--------------------------+-------+----------+--------------------------+
1 row in set (0.01 sec)

mysql> optimize table common_db.cm_t_level1_head;
+--------------------------+----------+----------+----------------------+
| Table | Op | Msg_type | Msg_text |
+--------------------------+----------+----------+----------------------+
| common_db.cm_t_level1_head | optimize | note | Table does not support
optimize, doing recreate + analyze instead |
| common_db.cm_t_level1_head | optimize | status | OK |
+--------------------------+----------+----------+----------------------+
2 rows in set (0.02 sec)
mysql> check table common_db.cm_t_level1_head;
+--------------------------+-------+----------+--------------------------+
| Table | Op | Msg_type | Msg_text |
+--------------------------+-------+----------+--------------------------+
| common_db.cm_t_level1_head | check | status | OK |
+--------------------------+-------+----------+--------------------------+
1 row in set (0.01 sec)
mysql>
```

d. If the table still has an error after executing 'optimize table', process it as follows.

```
mysql> use common_db

<<Load the table creation SQL for the table with an error>>
mysql> show create table common_db.fm_t_daily_alarms\G;
*************************** 1.  row ***************************
Table:  fm_t_daily_alarms
Create Table:  CREATE TABLE `fm_t_daily_alarms` (
`level1_id` smallint(6) NOT NULL,
`level2_id` smallint(6) NOT NULL,
`level3_id` smallint(6) NOT NULL,
`level4_id` smallint(6) NOT NULL,
`level5_id` smallint(6) NOT NULL,
`level6_id` smallint(6) NOT NULL,
`level7_id` smallint(6) NOT NULL,
`level8_id` smallint(6) NOT NULL,
`level9_id` smallint(6) NOT NULL,
`level10_id` smallint(6) NOT NULL,
`lloc` varchar(100) DEFAULT NULL,
`alarm_time` char(10) NOT NULL,
`severity` tinyint(4) DEFAULT NULL,
`alarm_group` tinyint(4) DEFAULT NULL,
`alarm_id` varchar(10) DEFAULT NULL,
`count` int(11) DEFAULT NULL,
UNIQUE KEY `fm_ui_daily_alarms`
(`level1_id`,`level2_id`,`level3_id`,`level4_id`,`level5_id`,`level6_id`,
`level7_id`,`level8_id`,`level9_id`,`level10_id`,`lloc`,`alarm_time`,
`severity`,`alarm_group`,`alarm_id`)
) ENGINE=MRG_MyISAM DEFAULT CHARSET=utf8
UNION=(`fm_t_daily_alarms_01`,`fm_t_daily_alarms_02`,`fm_t_daily_alarms_
03`,`fm_t_daily_alarms_04`,`fm_t_daily_alarms_05`,`fm_t_daily_alarms_06`,
`fm_t_daily_alarms_07`,`fm_t_daily_alarms_08`,`fm_t_daily_alarms_09`,`fm
_t_daily_alarms_10`,`fm_t_daily_alarms_11`,`fm_t_daily_alarms_12`)
1 row in set (0.00 sec)

<<Delete the table with an error >>
mysql> drop table common_db.fm_t_daily_alarms;
Query OK, 0 rows affected (0.00 sec)
```

```
<<Re-create the table using the loaded table creation SQL above>>
mysql> CREATE TABLE `fm_t_daily_alarms` (
`level1_id` smallint(6) NOT NULL,
`level2_id` smallint(6) NOT NULL,
arms_06`,`fm_t_daily_alarms_07`,`fm_t_daily_alarms_08`,`fm_t_daily_alarms
_09`,`fm_t_daily_alarms_10`,`fm_t_daily_alarms_11`,`fm_t_daily_alarms_12`
) → `level3_id` smallint(6) NOT NULL,
`level4_id` smallint(6) NOT NULL,
`level5_id` smallint(6) NOT NULL,
`level6_id` smallint(6) NOT NULL,
`level7_id` smallint(6) NOT NULL,
```

```
`level8_id` smallint(6) NOT NULL,
`level9_id` smallint(6) NOT NULL,
`level10_id` smallint(6) NOT NULL,
`lloc` varchar(100) DEFAULT NULL,
`alarm_time` char(10) NOT NULL,
`severity` tinyint(4) DEFAULT NULL,
`alarm_group` tinyint(4) DEFAULT NULL,
`alarm_id` varchar(10) DEFAULT NULL,
`count` int(11) DEFAULT NULL,
UNIQUE KEY `fm_ui_daily_alarms`
(`level1_id`,`level2_id`,`level3_id`,`level4_id`,`level5_id`,`l
evel6_id`,`level7_id`,`level8_id`,`level9_id`,`level10_id`,`lloc`,
`alarm_time`,`severity`,`alarm_group`,
`alarm_id`)
) ENGINE=MRG_MyISAM DEFAULT CHARSET=utf8
UNION=(`fm_t_daily_alarms_01`,`fm_t_daily_alarms_02`,`fm
_t_daily_alarms_03`,`fm_t
_daily_alarms_04`,`fm_t_daily_alarms_05`,`fm_t_daily_alarms_06`,`fm_t
_daily_ala
rms_07`,`fm_t_daily_alarms_08`,`fm_t_daily_alarms_09`,`fm_t_daily_alarms
_10`,`fm_t_daily_alarms_11`,`fm_
t_daily_alarms_12`);
Query OK, 0 rows affected (0.00 sec);
```

13. Stop and restart MySQL.

```
[mysql:/db/mysql/app] su -
[root:/root] cd /db/mysql/app/support-files/
[root:/db/mysql/app/support-files] ./mysql.server stop
Shutting down MySQL......  [ OK ]
[root:/db/mysql/app/support-files] ./mysql.server start
Starting MySQL....  [ OK ]
[root:/db/mysql/app/support-files]
```

14. Apply changes related with SM table of the database.

```
[mysql:/db/mysql/app] su -
[root:/root] cd /home/osnms/officeserv/bin
[root:/home/osnms/officeserv/bin] ./db_schema_osnms_20110214.sh
```

15. Apply changes related with CM table of the database.

```
[root:/home/osnms/officeserv/bin] vi /etc/my.conf
lower_case_table_names = 0 ← Set as ’0’

[root:/home/osnms/officeserv/bin]
/db/mysql/app/support-files/mysql.server stop
Shutting down MySQL......  [ OK ]
[root:/home/osnms/officeserv/bin]
/db/mysql/app/support-files/mysql.server start
Starting MySQL....  [ OK ]

[root:/home/osnms/officeserv/bin] ./rename_osnms_view.sh
[root:/home/osnms/officeserv/bin] vi /etc/my.conf
lower_case_table_names = 1 ← Set as ’1’

[root:/home/osnms/officeserv/bin]
/db/mysql/app/support-files/mysql.server stop
Shutting down MySQL......  [ OK ]
[root:/home/osnms/officeserv/bin]
/db/mysql/app/support-files/mysql.server start
Starting MySQL....  [ OK ]
```

16. Apply changes related with PM table of the database.

```
[root:/home/osnms/officeserv/bin] /db/mysql/app/bin/mysql -uroot
-pmegaroot
mysql> use common_db;
<<Modify the pm_t_base table>>
mysql> show create table pm_t_dase\G;
*************************** 1.  row ***************************
Table:  pm_t_dase
Create Table:  CREATE TABLE `pm_t_dase` (
`level1_id` smallint(6) NOT NULL,
`level2_id` smallint(6) NOT NULL,
`level3_id` smallint(6) NOT NULL,
...
`lloc` varchar(100) NOT NULL,
`version` varchar(20) NOT NULL,
`signal_type` smallint(6) NOT NULL,
`event_time` datetime NOT NULL,
`reserve_str` varchar(20) DEFAULT NULL,
`p1` varchar(20) DEFAULT NULL,
...
`p150` varchar(20) DEFAULT NULL,
KEY `pm_i_dase_etime`
(`signal_type`,`level1_id`,`level2_id`,`level3_id`),
KEY `pm_i_dase_levelid` (`level1_id`,`level2_id`,`level3_id`)
```

```
) ENGINE=MRG_MyISAM DEFAULT CHARSET=utf8
UNION=(`pm_t_base_20111001`,`pm_t_base_20111002`,`pm_t_base_20111003`,
`pm_t_base_20111004`,`pm_t_base_20111005`)
1 row in set (0.00 sec)
mysql> drop table pm_t_dase;
Query OK, 0 rows affected (0.00 sec)

Mysql> CREATE TABLE `pm_t_dase` ( ← Copy and execute the CREATE command
on the above (bold text).
`level1_id` smallint(6) NOT NULL,
`level2_id` smallint(6) NOT NULL,
`level3_id` smallint(6) NOT NULL,
...
`lloc` varchar(100) NOT NULL,
`version` varchar(20) NOT NULL,
`signal_type` smallint(6) NOT NULL,
`event_time` datetime NOT NULL,
`reserve_str` varchar(70) DEFAULT NULL, ← Change the value of
reserve_str to '70'.
`p1` varchar(20) DEFAULT NULL,
...
`p150` varchar(20) DEFAULT NULL,
KEY `pm_i_dase_etime`
(`signal_type`,`level1_id`,`level2_id`,`level3_id`),
KEY `pm_i_dase_levelid` (`level1_id`,`level2_id`,`level3_id`)
) ENGINE=MRG_MyISAM DEFAULT CHARSET=utf8
UNION=(`pm_t_base_20111001`,`pm_t_base_20111002`,`pm_t_base_20111003`,
`pm_t_base_20111004`,`pm_t_base_20111005`);

mysql> show tables like 'pm_t_base_%';
+----------------------------------+
| Tables_in_common_db (pm_t_base_%) |
+----------------------------------+
| pm_t_base_20111001 |
| pm_t_base_20111002 |
| pm_t_base_20111003 |
| pm_t_base_20111004 |
| pm_t_base_20111005 |
+----------------------------------+
mysql> alter table pm_t_base_20111001 modify column reserve_str
varchar(70);
mysql> alter table pm_t_base_20111002 modify column reserve_str
varchar(70);
mysql> alter table pm_t_base_20111003 modify column reserve_str
varchar(70);
mysql> alter table pm_t_base_20111004 modify column reserve_str
varchar(70);
mysql> alter table pm_t_base_20111005 modify column reserve_str
varchar(70);
```

```
<<Modify the pm_t_day table>>
mysql> show create table pm_t_day\G;
*************************** 1.  row ***************************
Table:  pm_t_day
Create Table:  CREATE TABLE `pm_t_day` (
`level1_id` smallint(6) NOT NULL,
`level2_id` smallint(6) NOT NULL,
`level3_id` smallint(6) NOT NULL,
...
`lloc` varchar(100) NOT NULL,
`version` varchar(20) NOT NULL,
`signal_type` smallint(6) NOT NULL,
`event_time` datetime NOT NULL,
`reserve_str` varchar(20) DEFAULT NULL,
`p1` varchar(20) DEFAULT NULL,
...
`p150` varchar(20) DEFAULT NULL,
KEY `pm_i_day_etime`
(`signal_type`,`level1_id`,`level2_id`,`level3_id`),
KEY `pm_i_day_levelid` (`level1_id`,`level2_id`,`level3_id`)
) ENGINE=MRG_MyISAM DEFAULT CHARSET=utf8
UNION=(`pm_t_day_201109`,`pm_t_day_201110`,`pm_t_day_201111`)
1 row in set (0.00 sec)

mysql> drop table pm_t_day;
Query OK, 0 rows affected (0.00 sec)

Mysql> CREATE TABLE `pm_t_day` ( ← Copy and execute the CREATE command
on the above (bold text).
`level1_id` smallint(6) NOT NULL,
`level2_id` smallint(6) NOT NULL,
`level3_id` smallint(6) NOT NULL,
...
`lloc` varchar(100) NOT NULL,
`version` varchar(20) NOT NULL,
`signal_type` smallint(6) NOT NULL,
`event_time` datetime NOT NULL,
`reserve_str` varchar(70) DEFAULT NULL, ← Change the value of
reserve_str to '70'.
`p1` varchar(20) DEFAULT NULL,
...
`p150` varchar(20) DEFAULT NULL,
KEY `pm_i_day_etime`
(`signal_type`,`level1_id`,`level2_id`,`level3_id`),
KEY `pm_i_day_levelid` (`level1_id`,`level2_id`,`level3_id`)
) ENGINE=MRG_MyISAM DEFAULT CHARSET=utf8
UNION=(`pm_t_day_201109`,`pm_t_day_201110`,`pm_t_day_201111`);
mysql> show tables like 'pm_t_day_%';
+---------------------------------+
```

```
| Tables_in_common_db (pm_t_day_%) |
+----------------------------------+
| pm_t_day_201109 |
| pm_t_day_201110 |
| pm_t_day_201111 |
+----------------------------------+
mysql> alter table pm_t_day_201109 modify column reserve_str
varchar(70);
mysql> alter table pm_t_day_201110 modify column reserve_str
varchar(70);
mysql> alter table pm_t_day_201111 modify column reserve_str
varchar(70);
```

```
<<Modify the pm_t_hour table>>
mysql> show create table pm_t_hour\G;
*************************** 1.  row ***************************
Table:  pm_t_hour
Create Table:  CREATE TABLE `pm_t_hour` (
`level1_id` smallint(6) NOT NULL,
`level2_id` smallint(6) NOT NULL,
`level3_id` smallint(6) NOT NULL,
...
`lloc` varchar(100) NOT NULL,
`version` varchar(20) NOT NULL,
`signal_type` smallint(6) NOT NULL,
`event_time` datetime NOT NULL,
`reserve_str` varchar(20) DEFAULT NULL,
`p1` varchar(20) DEFAULT NULL,
...
`p150` varchar(20) DEFAULT NULL,
KEY `pm_i_hour_etime`
(`signal_type`,`level1_id`,`level2_id`,`level3_id`),
KEY `pm_i_hour_levelid` (`level1_id`,`level2_id`,`level3_id`)
) ENGINE=MRG_MyISAM DEFAULT CHARSET=utf8
UNION=(`pm_t_hour_201109`,`pm_t_hour_201110`,`pm_t_hour_201111`)
1 row in set (0.00 sec)

mysql> drop table pm_t_hour;
Query OK, 0 rows affected (0.00 sec)

Mysql> CREATE TABLE `pm_t_hour` ( ← Copy and execute the CREATE command
on the above (bold text).
`level1_id` smallint(6) NOT NULL,
`level2_id` smallint(6) NOT NULL,
`level3_id` smallint(6) NOT NULL,
...
`lloc` varchar(100) NOT NULL,
`version` varchar(20) NOT NULL,
```

```
`signal_type` smallint(6) NOT NULL,
`event_time` datetime NOT NULL,
`reserve_str` varchar(70) DEFAULT NULL, ← Change the value of
reserve_str to '70'.
`p1` varchar(20) DEFAULT NULL,
...
`p150` varchar(20) DEFAULT NULL,
KEY `pm_i_hour_etime`
(`signal_type`,`level1_id`,`level2_id`,`level3_id`),
KEY `pm_i_hour_levelid` (`level1_id`,`level2_id`,`level3_id`)
) ENGINE=MRG_MyISAM DEFAULT CHARSET=utf8
UNION=(`pm_t_hour_201109`,`pm_t_hour_201110`,`pm_t_hour_201111`);

mysql> show tables like 'pm_t_hour_%';
+----------------------------------+
| Tables_in_common_db (pm_t_hour_%) |
+----------------------------------+
| pm_t_hour_201109 |
| pm_t_hour_201110 |
| pm_t_hour_201111 |
+----------------------------------+
mysql> alter table pm_t_hour_201109 modify column reserve_str
varchar(70);
mysql> alter table pm_t_hour_201110 modify column reserve_str
varchar(70);
mysql> alter table pm_t_hour_201111 modify column reserve_str
varchar(70);
```

```
<<Modify the pm_t_month table>>
mysql> show create table pm_t_month\G;
*************************** 1.  row ***************************
Table:  pm_t_month
Create Table:  CREATE TABLE `pm_t_month` (
`level1_id` smallint(6) NOT NULL,
`level2_id` smallint(6) NOT NULL,
`level3_id` smallint(6) NOT NULL,
...
`lloc` varchar(100) NOT NULL,
`version` varchar(20) NOT NULL,
`signal_type` smallint(6) NOT NULL,
`event_time` datetime NOT NULL,
`reserve_str` varchar(20) DEFAULT NULL,
`p1` varchar(20) DEFAULT NULL,
...
`p150` varchar(20) DEFAULT NULL,
KEY `pm_i_month_etime`
(`signal_type`,`level1_id`,`level2_id`,`level3_id`),
KEY `pm_i_month_levelid` (`level1_id`,`level2_id`,`level3_id`)
```

```
) ENGINE=MRG_MyISAM DEFAULT CHARSET=utf8
UNION=(`pm_t_month_201109`,`pm_t_month_201110`,`pm_t_month_201111`)
1 row in set (0.00 sec)

mysql> drop table pm_t_month;
Query OK, 0 rows affected (0.00 sec)

Mysql> CREATE TABLE `pm_t_month` ( ← Copy and execute the CREATE
command on the above (bold text).
`level1_id` smallint(6) NOT NULL,
`level2_id` smallint(6) NOT NULL,
`level3_id` smallint(6) NOT NULL,
...
`lloc` varchar(100) NOT NULL,
`version` varchar(20) NOT NULL,
`signal_type` smallint(6) NOT NULL,
`event_time` datetime NOT NULL,
`reserve_str` varchar(70) DEFAULT NULL, ← Change the value of
reserve_str to '70'.
`p1` varchar(20) DEFAULT NULL,
...
`p150` varchar(20) DEFAULT NULL,
KEY `pm_i_month_etime`
(`signal_type`,`level1_id`,`level2_id`,`level3_id`),
KEY `pm_i_month_levelid` (`level1_id`,`level2_id`,`level3_id`)
) ENGINE=MRG_MyISAM DEFAULT CHARSET=utf8
UNION=(`pm_t_month_201109`,`pm_t_month_201110`,`pm_t_month_201111`);

mysql> show tables like 'pm_t_month_%';
+-----------------------------------+
| Tables_in_common_db (pm_t_month_%) |
+-----------------------------------+
| pm_t_month_201109 |
| pm_t_month_201110 |
| pm_t_month_201111 |
+-----------------------------------+

mysql> alter table pm_t_month_201109 modify column reserve_str
varchar(70);
mysql> alter table pm_t_month_201110 modify column reserve_str
varchar(70);
mysql> alter table pm_t_month_201111 modify column reserve_str
varchar(70);
mysql> exit;
[root:home/osnms/officeserv/bin]
```

17. Execute the migrate_schema_238_to_239.sh only if you upgrade the OfficeServ NMS v1.5 to v1.6.1. (When upgrading the OfficeServ NMS v1.6.0, do not execute the script.)

```
[root:home/osnms/officeserv/bin]./migrate_schema_238_to_239.sh
```

18. Execute the shell script.

```
[root:/home/osnms/officeserv/bin] ./db_schema.sh
```

Schema Upgrade with mysql_upgrade

The basic information table schema of MySQL version 5.1.x is different from that of MySQL version 5.0.x. If you restore the backup files from MySQL version 5.0.x with 'mysqldump' command, there occurs problems on the system operation. Thus, you must upgrade the schema with 'mysql_upgrade' command.

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ANNEX D. HTTPS Setting

HTTPS

Hypertext Transfer Protocol over Secure Socket Layer

This is a web protocol installed in a web browser to encrypt and decrypt the data at the SSL sublayer under the Hypertext Transfer Protocol (HTTP) layer. HTTPS uses port 443 instead of HTTP port 80 in the TCP/IP, and the SSL uses 40 bit key for RC4 stream encryption algorithm. When you enter https://URL in the web browser, then HTTPS encrypts the page and the received https://URL page is decrypted at the HTTPS sublayer. HTTPS and SSL supports X.509 digital certificates for authentication of the user.

Tomcat Setting

Modify the '$TOMCAT_HOME/conf/server.xml'.
Find '8443' and modify the value as '443'. (The SSL port is set by '8443' when the Tomcat is distributed.)
Find the sentences below and remove the comment mark.

```
<Connector port="443"
maxThreads="150" minSpareThreads="25" maxSpareThreads="75"
enableLookups="false" disableUploadTimeout="true"
acceptCount="100" debug="0" scheme="https" secure="true"
clientAuth="false" sslProtocol="TLS" />
```

Creating Certification File

If the user run the Tomcat is a root user, execute the following as a root account.

```
> su - root
> cd ~osnms/officeserv/bin
> makeWebServerKey.sh
[ Removing your keystore file...  ]
[ Input webserver ip address ]
10.254.199.209 (IP address of the real server)
[ Generating keystore file...  ]
Enter keystore password:   changeit (Prohibited to change.)
Generating 1,024 bit RSA key pair and self-signed certificate
(MD5WithRSA)
        for:  CN=172.22.82.237, OU=TELECOM, O=SAMSUNG, L=SUWON,
ST=GYEONGGI, C=KR
Enter key password for <tomcat>
        (RETURN if same as keystore password):  (Press ENTER)
[Saving /home/ssems/.keystore]
 Do you want to certificate your key from Certificate Authority?  [y|n]
n
 Keystore file is saved in your home directory.  See you!
```

Execute as above except the IP.
Check the .keystore file has created in the home directory of the root user.

```
> cd
> ls -al .keystore
...
-rw-r--r--   1 root    root       1360 Jan  6 14:43 .keystore
...
```

Install the KeyStore & Certification Files

When you execute 'makeKeyStoreFile.sh' as a OSNMS account, the server.keystore and client.keystore files are created in the directory '$NMS_HOME/data' and '$NMS_HOME/web' respectively.

```
[OSM:/home/osnms/officeserv/bin] makeKeyStoreFile.sh
---> clean old keystore and certificate file for server
---> Creating pkcs12 keystore and certificate file for server
---> Creating a private key and certificate request for our CA
Generating a 1024 bit RSA private key
.++++++
.......++++++
writing new private key to 'server.key'
-----
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or
a DN.
There are quite a few fields but you can leave some blank
```

```
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [GB]:KR
State or Province Name (full name) [Berkshire]:GYEONGGI
Locality Name (eg, city) [Newbury]:SUWON
Organization Name (eg, company) [My Company Ltd]:SAMSUNG
Organizational Unit Name (eg, section) []:NMS
Common Name (eg, your name or your server's hostname) []:OSM
Email Address []:someone@samsung.com
Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:changeit
An optional company name []:  (press ENTER)
---> Create a CA's self-signed certificate
Signature ok
subject=/C=KR/ST=GYEONGGI/L=SUWON/O=SAMSUNG/OU=NMS/CN=OSM/emailAddress=
someone@samsung.com
Getting Private key
---> Import the CA certificate into the JDK certificate authorities
Owner:  EMAILADDRESS=someone@samsung.com, CN=OSM, OU=NMS, O=SAMSUNG,
L=SUWON, ST=GYEONGGI, C=KR
Issuer:  EMAILADDRESS=someone@samsung.com, CN=OSM, OU=NMS, O=SAMSUNG,
L=SUWON, ST=GYEONGGI, C=KR
Serial number:  0
Valid from:  Mon Jun 07 10:06:27 KST 2010 until:  Thu Jun 04 10:06:27
KST 2020
Certificate fingerprints:
MD5:  87:B0:38:13:2B:A6:12:F5:76:7D:46:E3:D9:E8:17:7A
SHA1:  D7:49:D6:35:67:DE:F2:87:12:AA:B9:C4:2C:19:CA:D8:E6:8C:16:41
Trust this certificate?  [no]:  y
Certificate was added to keystore
---> Creating pkcs12 file from server.pem and server.key
---> copy keystore and certificate file to keystore directory
```

Restarting Tomcat and NMS Server

```
> su - root
> cdtomcat
> cd bin
> ./shutdown.sh
…
> ./startup.sh
…
> su - osnms
[OSM:/home/osnms] EMS stop
EMS system stopped.
[OSM:/home/osnms] EMS start
```

```
EMS system started.
[OSM:/home/osnms] PS
-------------------------------------------------------
osnms 12449 1 0 09:07 pts launcher
-------------------------------------------------------
osnms 12563 12449 1 09:07 pts us
osnms 12716 12449 0 09:07 pts us.snmp
-------------------------------------------------------
osnms 12590 12449 1 09:07 pts mf
osnms 12744 12449 0 09:07 pts mf.oss
-------------------------------------------------------
osnms 12620 12449 0 09:07 pts ni.snmp
osnms 12650 12449 0 09:07 pts ni.ftp
-------------------------------------------------------
osnms 12688 12449 0 09:07 pts nmsif
```

After restarting the server is done, check if the login web page works properly. (Input ’https://Server_IP/’ on the web browser.)

ABBREVIATION

D

DNS	Domain Name System

F

FTP	File Transfer Protocol

G

GUI	Graphic User Interface

H

HTTPS	Hypertext Transfer Protocol over Secure Socket Layer

I

ID	Identifier
IP	Internet Protocol

J

JDK	Java development kit
JRE	Java runtime environment

L

LAN	Local Area Network

N

NE	Network Element

NMS	Network Management System
NTFS	NT File System

O

ODD	Optical Disc Drive

S

SQL	Structured Query Language
SSL	Secure Socket Layer

U

URL	Uniform Resource Locator

OfficeServ NMS

Installation Manual

SAMSUNG ELECTRONICS