iPECS

IPCR

Administrator Guide

Please read this manual carefully before operating your set. Retain it for future reference.

iPECS is an Ericsson-LG Brand

ERICSSON | LG

Document Information

S/W Version	Issue	Changes	Release Date
1.0Aa	1.0	Initial release.	2013-06-05
1.0Ba	1.1	Added further explanation how to install Fedora 16.	2013-07-03
1.0Bc	1.2	Applied new CI	2014-02-10
1.0Bh	1.3	Added Clonezilla	2014-03-12
1.0Bh	1.4	Added VM-ware install and modify Document	2014-03-29
2.0Ad	1.5	Added IPCR 2.0 Function (Multi-IPCR)	2014-05-28
2.0Ad	1.6	IPCR Partition change	2014-12-12
2.0Ad	1.7	Applied new CI	2015-07-23
2.0Ao	1.8	Added HA Function	2015-11-16
2.1Aa	1.9	Added IPCR Partition and CentOS Install	2016-07-18
2.2Ab	2.0	Added HA set up and recording type	2017-09-15
2.2Ad	2.1	HA Function temporary removed from the S/W Version 2.2Ad	2017-10-18
2.2Ad	2.2	General update and release	2017-11-08
2.2Ad	2.3	Amended pictures and release	2018-06-04
3.0Ah	2.4	Apply IPCR 3.0	2018-08-31
3.0Al	2.5	Added HA Function	2019-06-11
3.1Ad	2.6	Added concurrent license (UCM Only)	2019-08-29

Table of Contents

About This Guide

This section describes the purpose, audience, organization, and conventions that are used in this iPECS IPCR (Call Recording) Administrator Guide

NOTE Your actual display screens may be slightly different than what was displayed in this manual depending on the OS (Operating System) and other factors. All information in this guide is subject to change without prior notice.

Purpose

The guide provides detailed information about the iPECS IPCR installation, iPECS system configuration, and administration of the iPECS IPCR Server.

Audience

The intended audience for this document is an administrator who wants to operate and manage the iPECS IPCR Server. The reader should have some knowledge of the iPECS System.

Document Organization

This guide consists of six chapters and five appendixes. The title of each chapter (and appendix) is as follows:

- About This Guide.
- Chapter 1 Introduction
- Chapter 2 iPECS IPCR Installation
- Chapter 3 iPECS System Configuration
- Chapter 4 iPECS IPCR server HA (High Availability)
- Chapter 5 iPECS IPCR Server Configuration
- Chapter 6 iPECS IPCR Web
- Appendix A:Database Backup and Restore
- Appendix B:Setup in VM Workstation Player
- Appendix C:Create a bootable flash drive for installing iPECS IPCR
- Appendix D:Installing IPCR on 1TB and above HDD
- Appendix E:How to Upload SSL certificate
- Appendix F:How to Mount to backup directory

- Appendix G:Useful Information

Document Conventions

This section describes text formatting conventions and important notice formats used in this guide.

Text formatting

The narrative-text formatting conventions that are used are as follows:

Convention	Description
Bold text	It may indicate a button, menu item, or dialog box option you can click or select.
Italic text	A cross-reference or an important term.
Code text	A command prompt.
*(Asterisk)	Items or fields marked with an asterisk (*) are required.

Important notice

The following icons and notices are used in this guide to convey important cautions and notes.

CAUTION A caution statement alerts you to situations that may cause damage to hardware, software, or data.

NOTE A note provides additional explanations, important information, or a reference to the relative information.

Chapter 1.

Introduction

IPCR is a specialized SIP recording tool that works with ERICSSON-LG enterprise iPECS exchanges. This product allows you to check the agent's call status in real time and save and listen to your calls. In addition, iPECS IPCR provides call statistics, provides system threshold settings, automatic backups, and web logs, and sends out messages when problems occur.

1.1 iPECS Call Recording Server

The administrator can configure multiple User admin levels and define the features and functions available to each level. A user may be limited to recording only, search & play, call monitoring and recording, and access to various management and administrative Web pages.

The iPECS Internet Protocol Call Recording (IPCR) server application employs a Linux OS and VoIP technology to deliver advanced Call Recording capabilities to iPECS platforms. The advanced capabilities provide automatic and on-demand call recording for recording Agents linked to objects (stations numbers) registered with the iPECS platform.

An IPCR server can be associated with from one (1) to ten (10) host iPECS systems permitting the application to record calls for a network of systems. Each iPECS host can support one (1) to ten (10) IPCR servers allowing separation of Call Recording based on tenant or other iPECS system groupings.

Employing iPECS and SIP protocols, the iPECS IPCR application provides an affordable SMB solution to recording and monitoring calls. iPECS protocols are employed to register and control call recordings. The iPECS IPCR application registers with the iPECS host as any other iPECS device. The registration can be automatic 'plug-and-play' or by listing the MAC address of the Call Recording server in the iPECS host database for local or remote service.

The iPECS IPCR application operates as an iPECS SIP Phone to receive RTP (Real-Time Protocol) packets. When a call is received, configured objects invite the call recording Agent to join the call and deliver RTP packets to the iPECS IPCR application for storage as part of a conference call. Once the call is terminated, the recording Agent is released and a record of the call and RTP packet media (voice) are stored.

1.2 Support Functions

The iPECS IPCR application supports both Automatic recording of all calls (ACR) and configured users assigned a Two-way Recording button can request an active call be recorded, ODR (On-demand recording). In the latter case, when the call is connected to an On-demand recording object, the recording Agent is activated, and the media is sent to the Call Recording server. If during the call the user requests recording, audio for the entire call is stored from the beginning of the call. If the user does not request recording during the call, when the call is complete, the recording Agent is released, and the media is not stored.

1.3 Web Server Module

iPECS IPCR includes a Web server module. The Web server module is the user-interface for administrative and user functions and features of the application. In addition to configuring the iPECS IPCR for registration with the host iPECS systems, the administrator can configure Automatic Back-up of recordings, type of recording (All calls or On-demand), security for signaling and media packets, and server usage thresholds for e-mail notification. The administrator can view and search the Web module activity and the Call Statistics log.

The administrator can configure multiple User admin levels and define the features and functions available to each level. A user may be limited to recording only, search & play, call monitoring and recording, and access to various management and administrative Web pages.

1.4 Server Environment

During installation, the CentOS 6.9 must be configured to support the iPECS IPCR application. This includes:

- Create the partition ('/var/REC') for the application and storage of recording
- Install the 'Web Server' task
- Install the 'PostgreSQL' database
- Disable the CentOS Firewall
- Configure the iPECS IPCR Sever network parameters
- Establish the 'ntsysv' for automatic restart of the Web and database processes
- Create a back-up directory

1.5 OS & Server Requirements

The server as recommended below is capable of handling a maximum of 500 simultaneous calls.

Item	Requirements
Operating System	CentOS 7.3 64 bit, CentOS 6.9 32 bit version
Server CPU	4 Core CPU or higher

Item	Requirements
Server RAM	Minimum 4G byte, Recommend 8G byte
Server HDD	500G byte or higher
External HDD	Optional for back up

- Even though a user does not activate on-demand call recording, RTP traffic is still sent to the IPCR application should the user determine the need to activate recording during the call.
- The IPCR normally works regardless of the name of the network interface card (NIC) in Linux.

NOTE When installing IPCR on a VM, a CPU that **Hyper-Threading** support should use at least 8 cores.

1.6 iPECS Host Platform

The IPCR application has been designed to work with the iPECS family of systems.

Specifically, the following platforms are compatible:

- iPECS eMG version 3.5.21 or higher, iPECS UCM version 2.6 or higher, iPECS UCP version 3.5.21 or higher.
- MCIMs are required to record conference calls. MCIM is related to 3 more conference and SIP phone two way record.
- VOIM is related to relay between local and Remote and Codec conversion.
- Gateway Channels Resource which required for Call Recording are shown in below table.

iPECS System	eMG80	eMG800	UCP	UCM
Extension	VoIB 1 Ch	VoIB 1 Ch	MCIM 3 Ch (SIP Phone, DTIM/SLTM/WTIM G.723, G.729)	VPCM 3 Ch
Trunk (Analog/Digital)	VoIB 1 Ch	VoIB 1 Ch	MCIM 3 Ch	VPCM 3 Ch

- **DTIM/SLTM/WTIM** needs **MCIM 3 channel** only when **G.723** or **G.729** is used. It does not need MCIM channel when G.711 is used.
- In case of LIP extension recording, because LIP supports 3 way conferencing by itself, no additional VoIB/MCIM/VPCM channel is needed.
- All the above information is valid only when all recording devices, VoIB/MCIM/VPCM and IPCR server exist in the same local network.

Chapter 2.

iPECS IPCR Installation

The iPECS Call Recording application program has been optimized to run under the CentOS 7.3 64 bit or CentOS 6.9 32 bit Linux environment from Red Hat and others. The host iPECS platform should be configured for the Call Recording Server as discussed in Chapter 3 iPECS System Configuration, and the installation follow the procedure for each installation described in the below section.

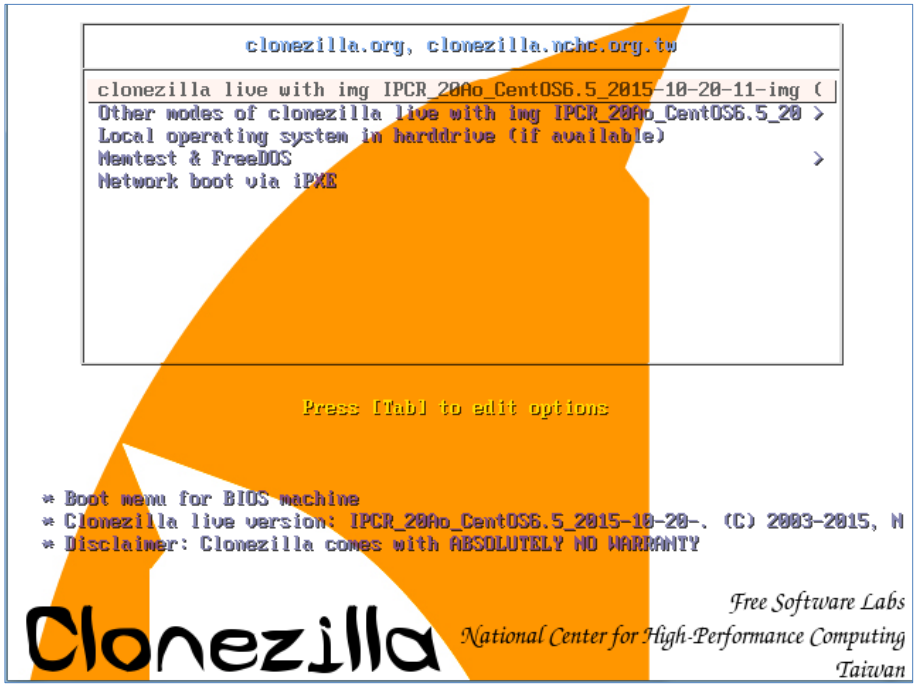
- Install the CentOS 7.3 64 bit Linux OS, refer to section 2.2.1 Download CentOS 7.3 64 bit and Manual Install.
- Install the CentOS 6.9 32 bit Linux OS, refer to section 2.2.2 Download CentOS 6.9 32 bit and Manual Install.
- Install the iPECS IPCR application program, refer to section 2.2.3 iPECS IPCR application program Installation.

2.1 Easy install

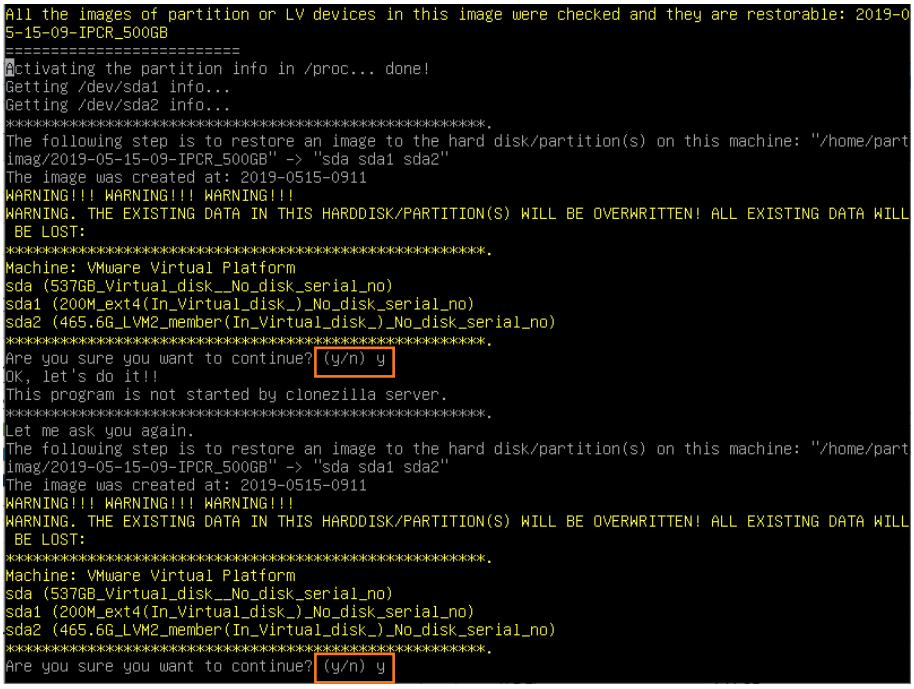
Easy installation with Clonezilla or VM Workstation player (VM Workstation Pro). Please refer to Appendix B: Setup in VM Workstation Player.

2.1.1 Clonezilla

1. Make the *clonezilla_live_with_img_IPCR_xxx_CentOSx.x_YYYY-MM-DD-img.iso* Image to USB device or DVD
2. Insert USB device or DVD to boot with it.
3. Upon prompting the following display, select the first menu and press **Enter** Key.

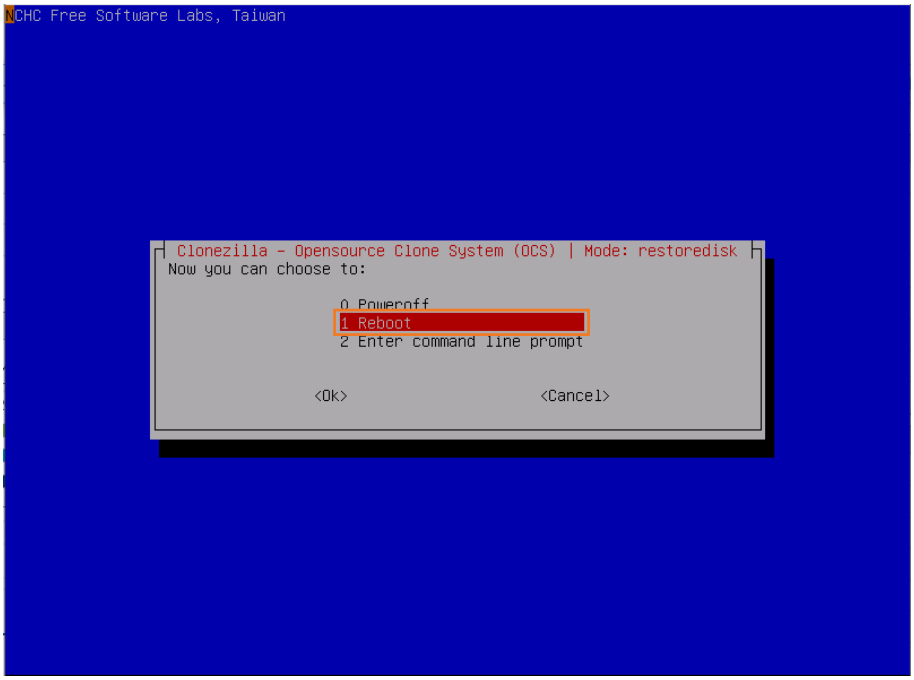


4. Upon prompting the following display for the confirmation, select **'yes'** for the next step.

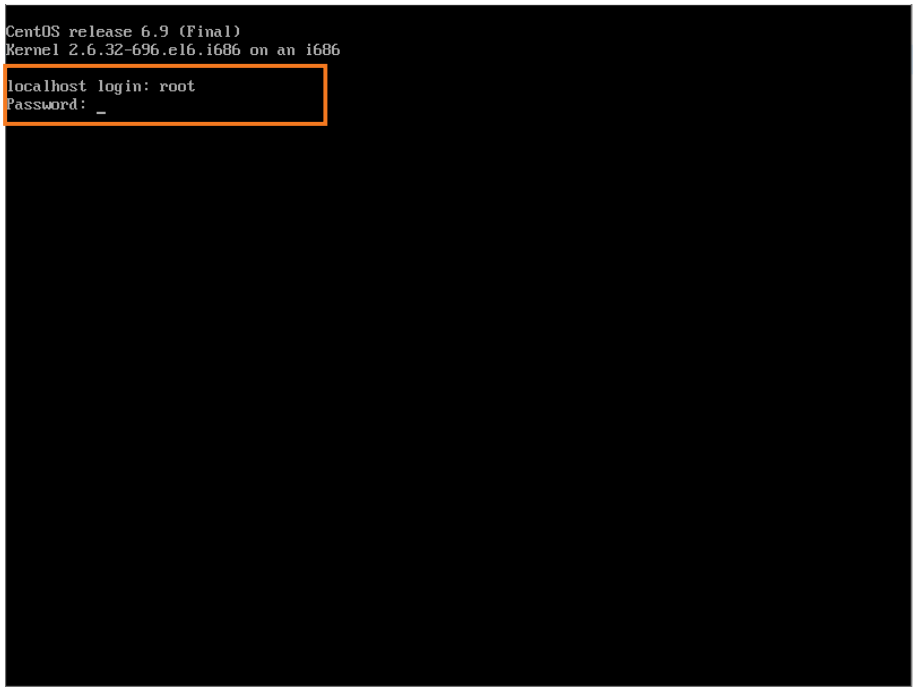


5. After the automatic installation of CentOS 6.9 OS & iPECS IPCR S/W to each section, remove the USB device or DVD.

6. To reboot, press '1' on the keyboard.



7. Login to terminal with the root Identification.



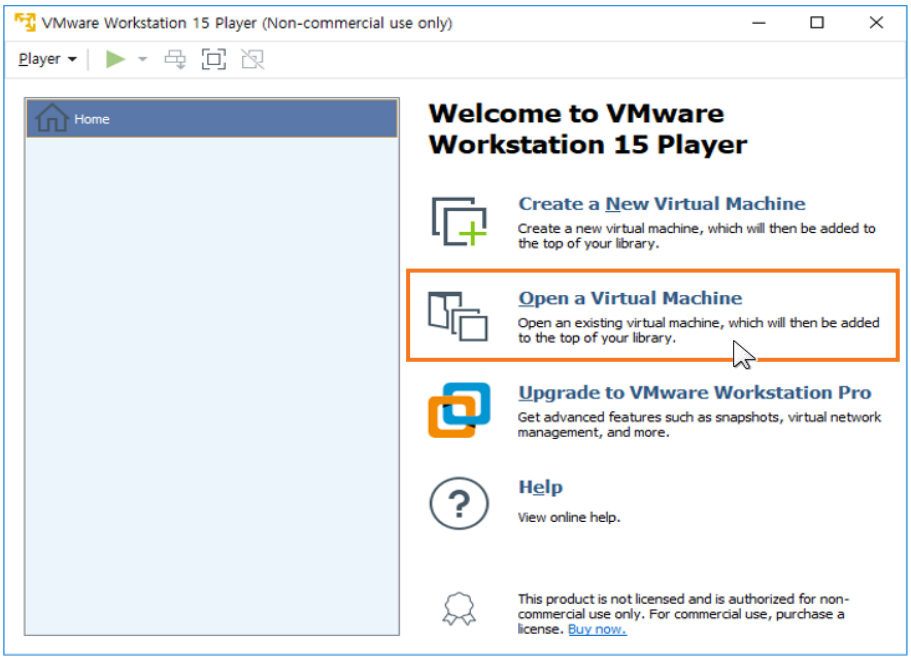
- Default ID / Password: root / p@ssw0rd
- Please note that you are required to change your password immediately. Type a new password to change the default password.

8. After rebooting, configure the IP address of iPECS IPCR Server to eth0.
9. To set network configuration, refer to section 2.3 To set network configuration to static for details.

2.1.2 VM Workstation Player

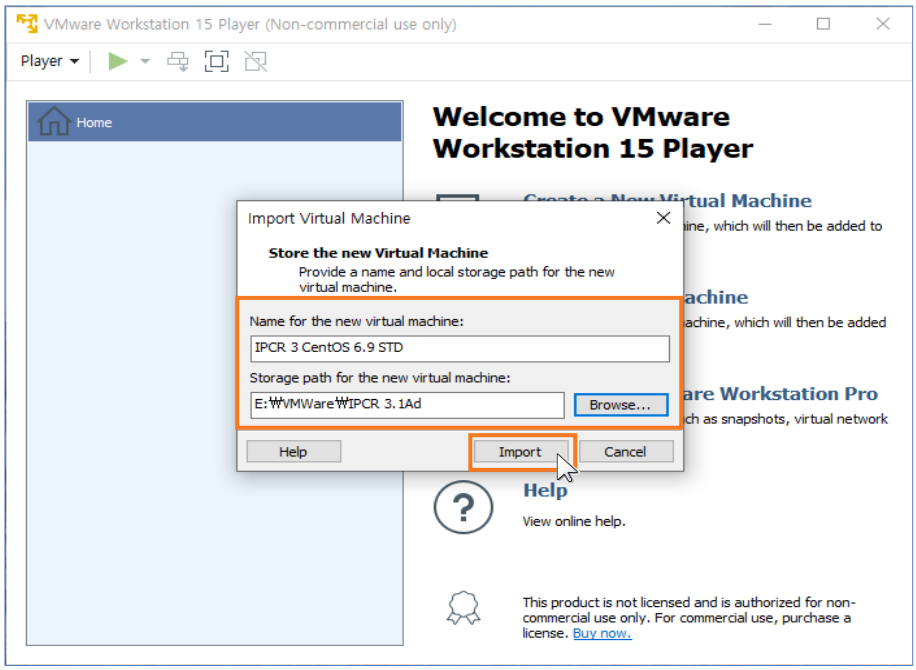
Where to download and how to install of the VM Workstation Player to the iPECS IPCR Server, refer to Appendix B: Setup in VM-Player for details.

1. Run the VMware Player 15 to install the iPECS IPCR using the prepared OVF file.
   - The VMware for Windows application can be launched from the Windows Start Menu (VMware Workstation 15 Player) or click the desktop shortcut icon.
2. Click **Open a Virtual Machine** to select a file.

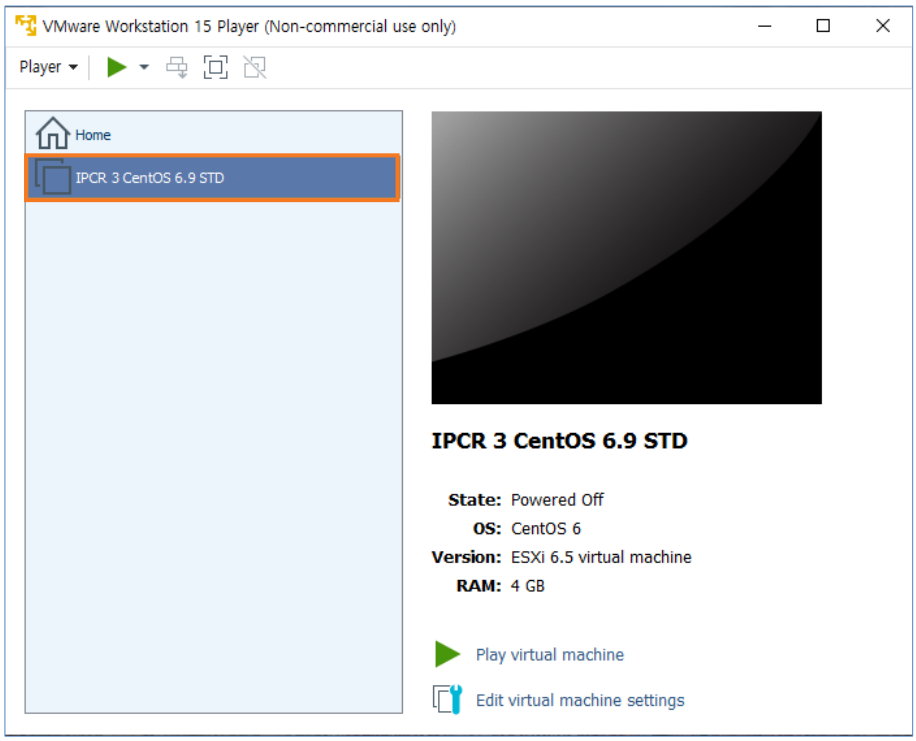


3. Browse to the .ovf file and click **Open** button.

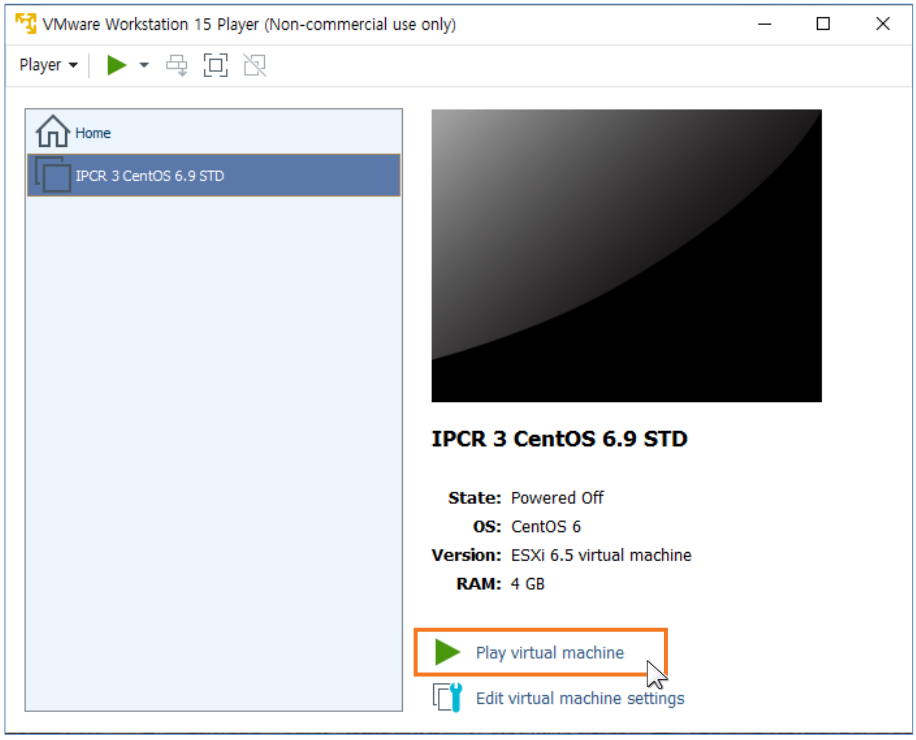
4. Type a name for the virtual machine, type or browse to the directory for the virtual machine files, and click **Import** button.



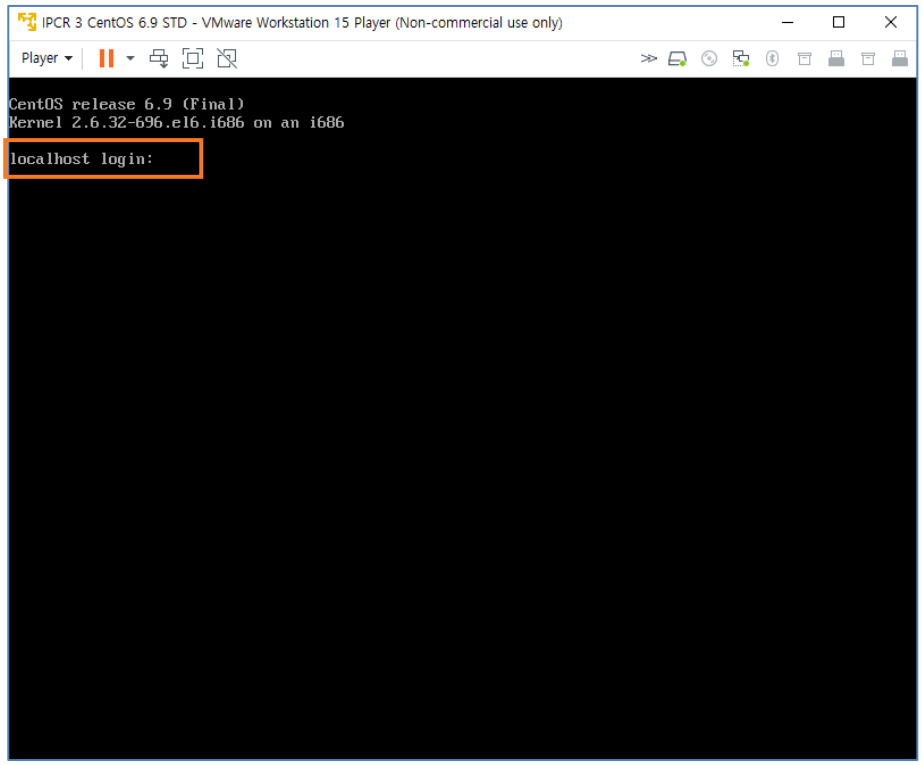
5. After VM Workstation Player successfully imports the OVF virtual machine, the virtual machine appears in the virtual machine library.



6. Click **Play Virtual Machine** to start the virtual machine in VM Workstation Player.



7. Login to terminal with the root Identification.



8. To set network configuration, refer to section 2.3 To set network configuration to static for details.

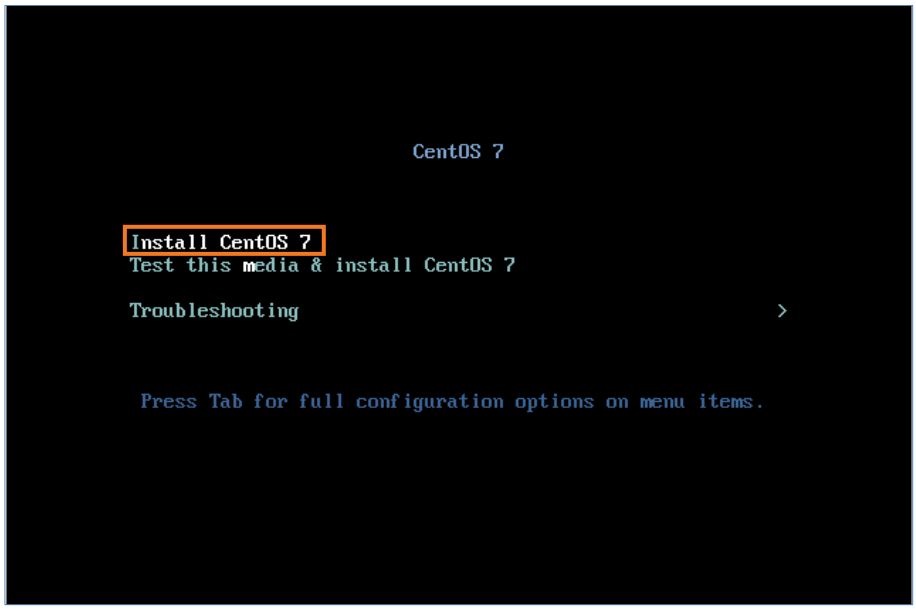
2.2 Manual Install

iPECS IPCR works with CentOS 7.3 64 bit or CentOS 6.9 32 bit. Follow the steps to install CentOS to run iPECS IPCR.

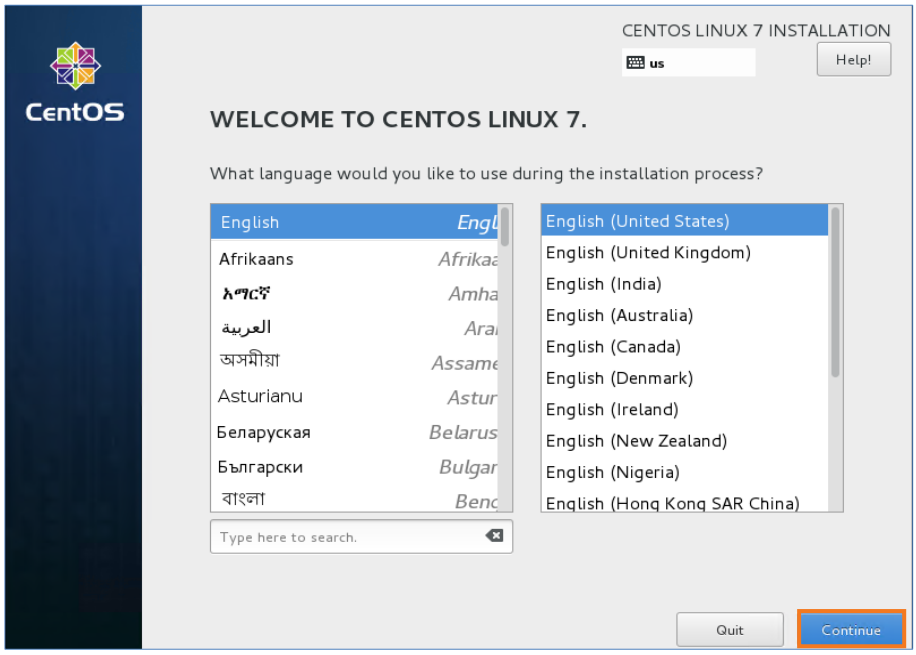
2.2.1 Download CentOS 7.3 64 bit and Manual Install

iPECS IPCR can support RedHat and CentOS 7.3 64 bit Linux. Linux OS can be downloading from the centos web site http://www.centos.org.

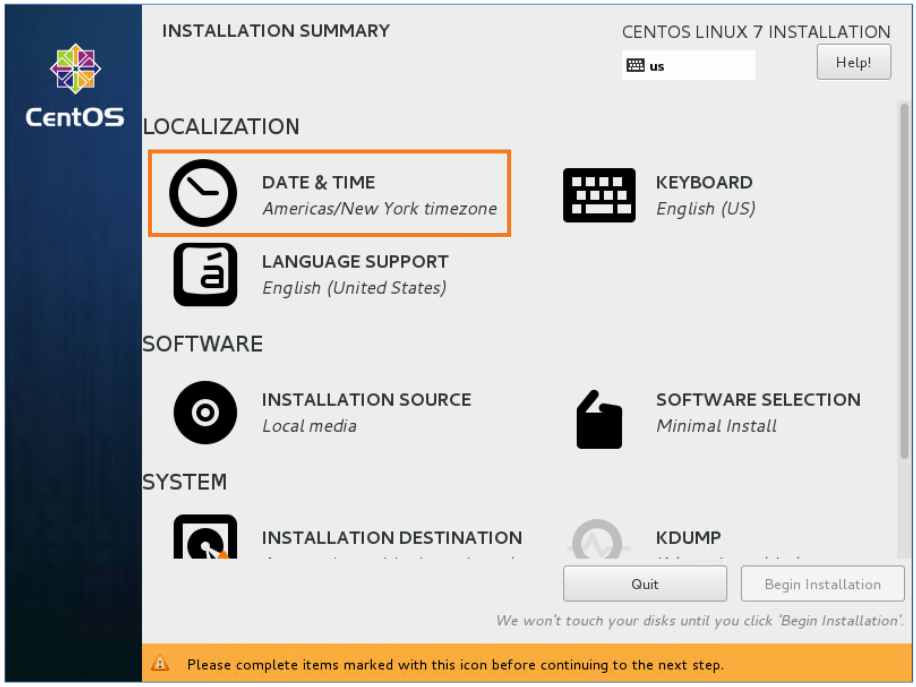
1. Select **'Install CentOS7'** and press **Ente**r Key.



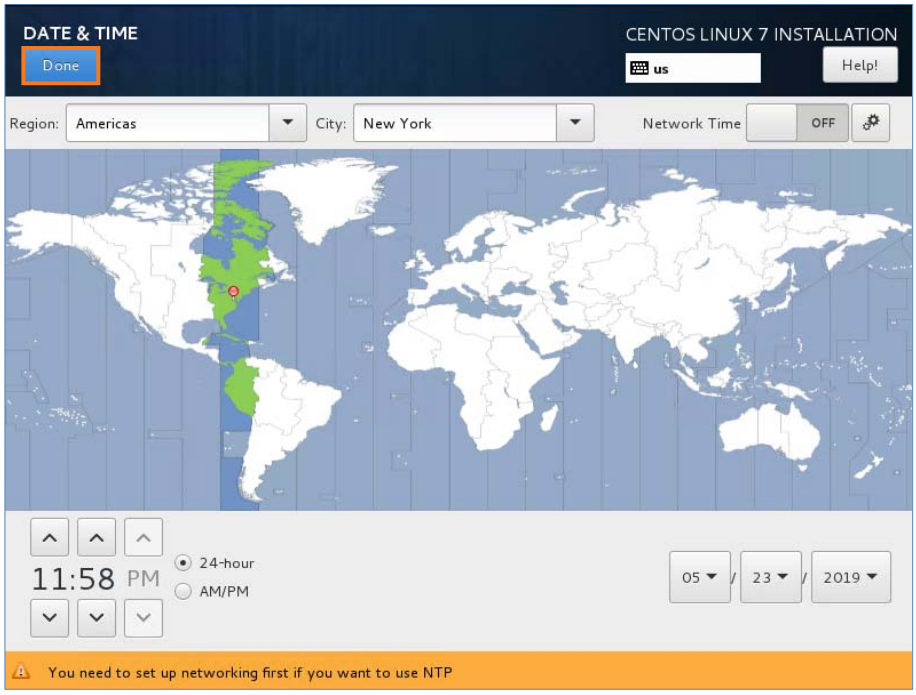
2. Select **'Continue'** and click **Enter** key.



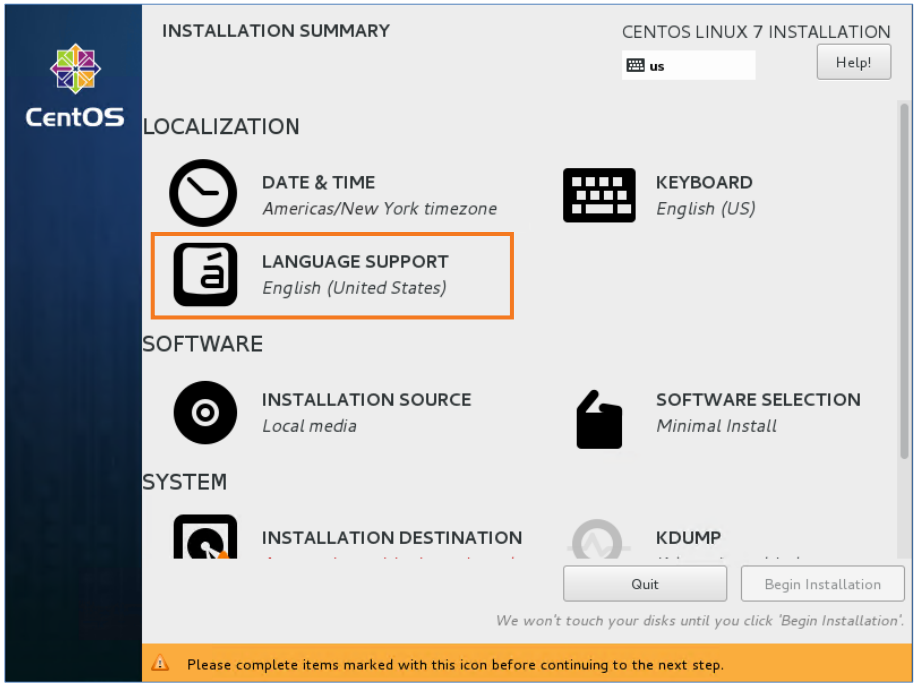
3. Click **DATE &TIME** icon in the LOCALIZATION field.



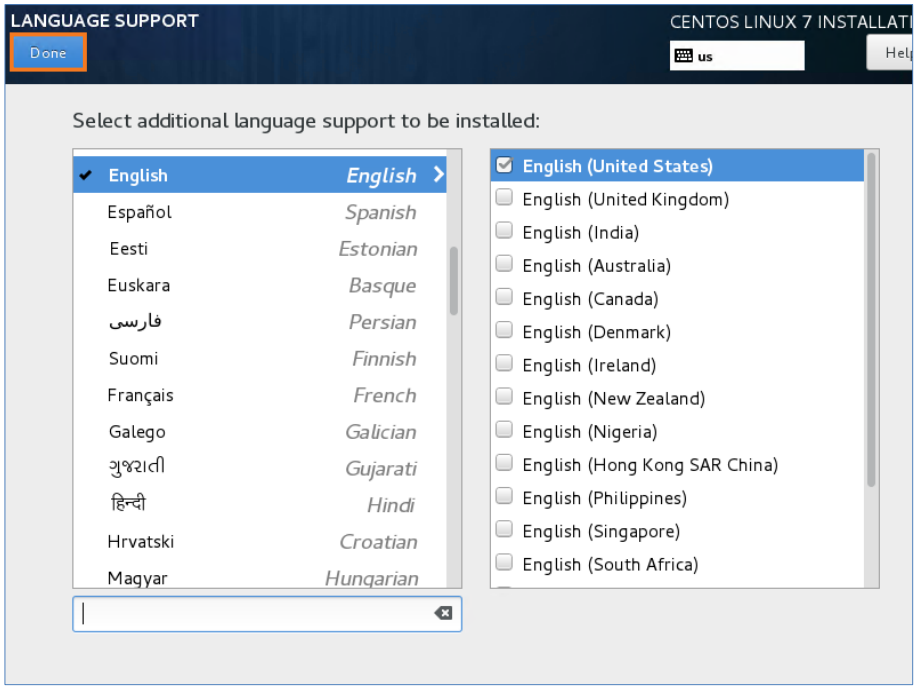
4. Set to the desired time zone and click the **Done** button.



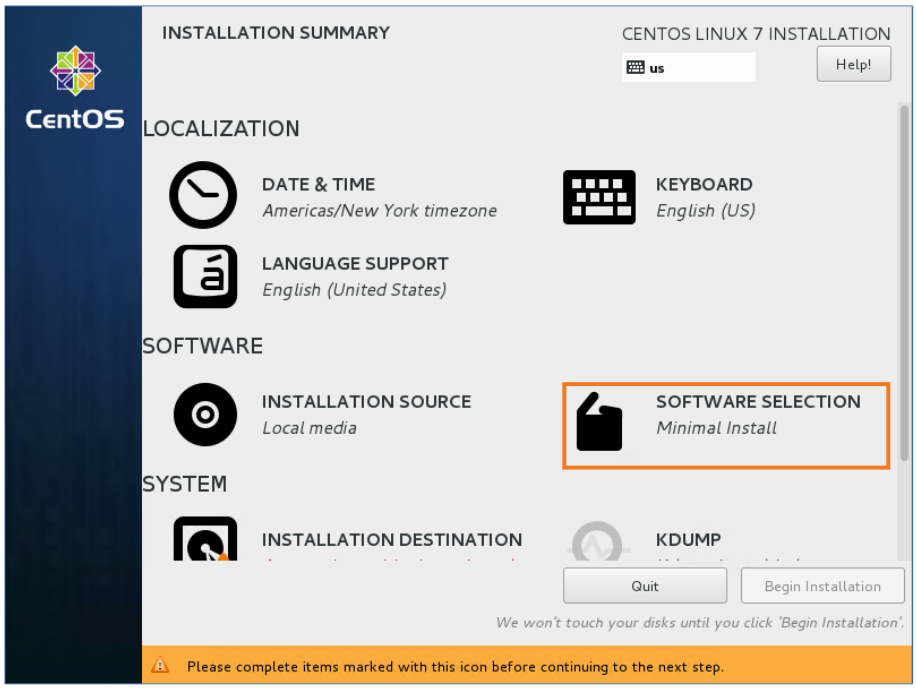
5. Click **LANGUAGE SUPPORT** icon in the LOCALIZATION field.



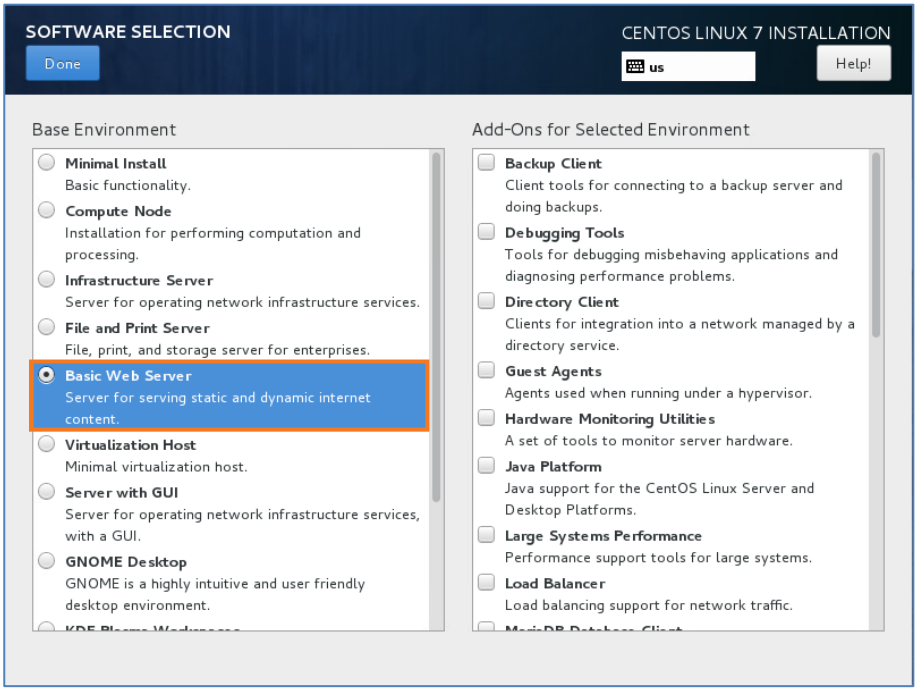
6. Set it in the desired language and click the **Done** button.



7. Click **SOFTWARE SELECTION** icon in the SOFTWARE field to display the Software Selection screen.

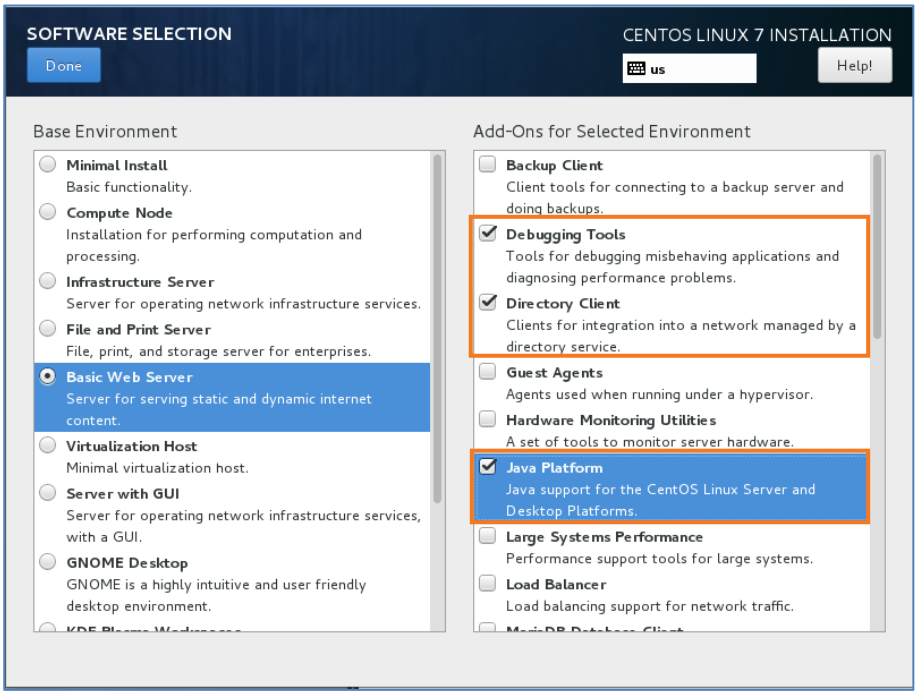


8. The screen is in two parts, check the box as shown in the Base Environment on the left.



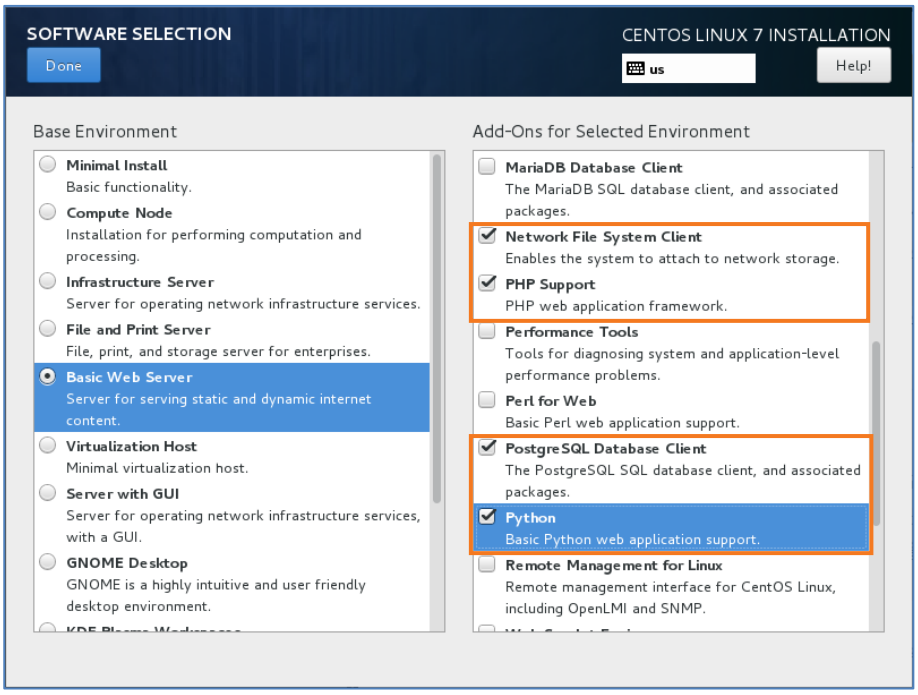
- The environment you checked is the best matches what the system will be used for.

9. Check the box as shown in the Add-Ons on the right.

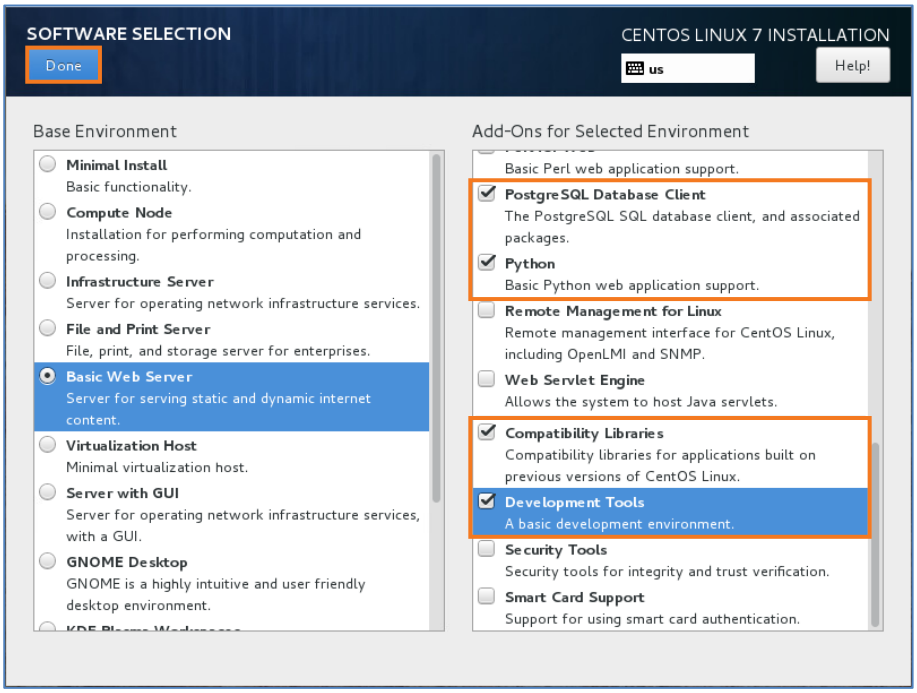


- The software you checked will be added to the selected Base Environment.

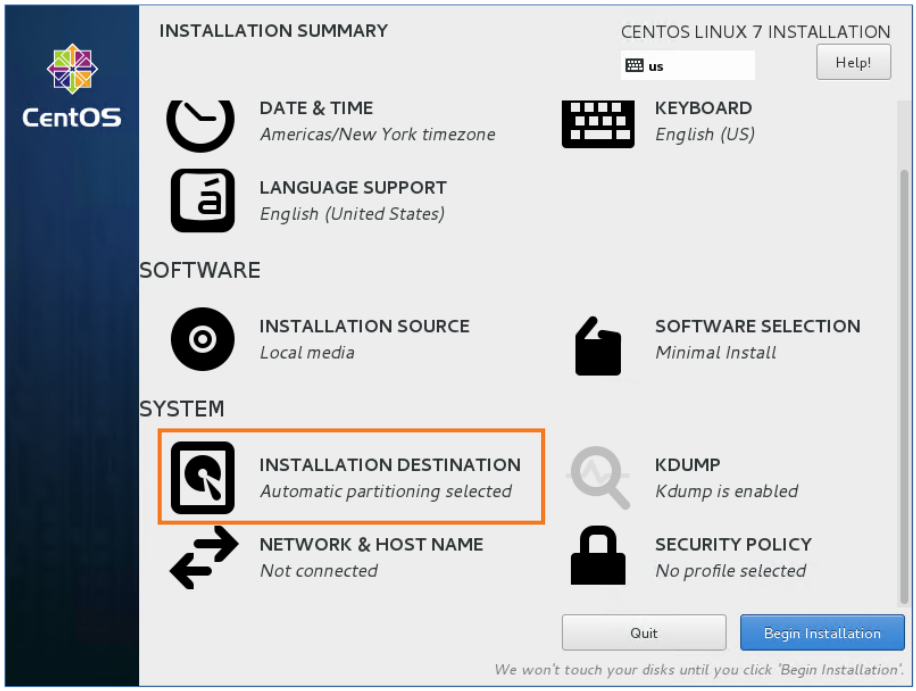
10. Continuing from previous step.



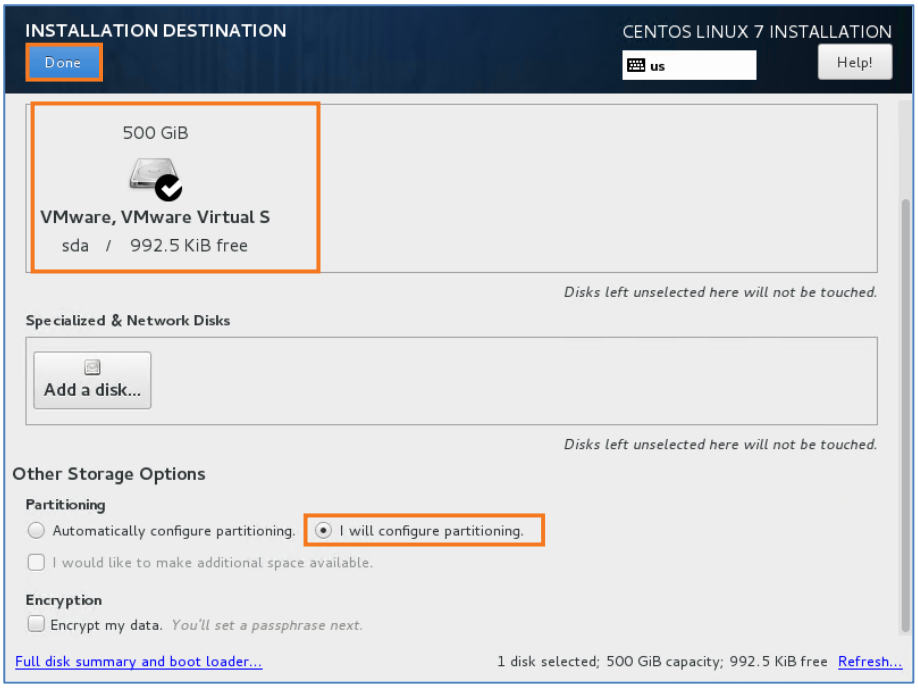
11. And then, click **Done** button.



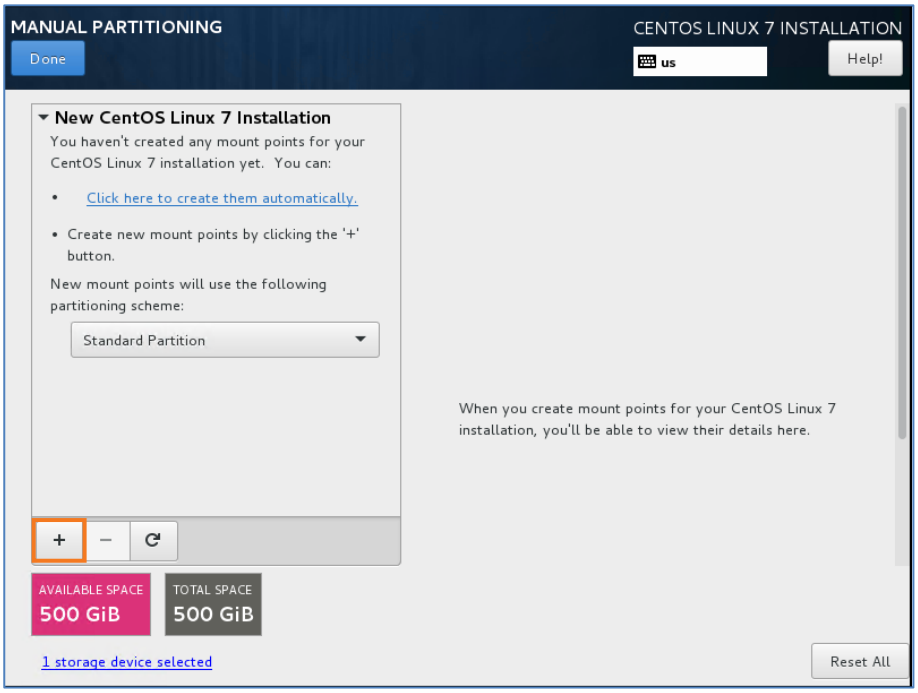
12. Click **INSTALLATION DESTINATION** icon in the SYSTEM field.



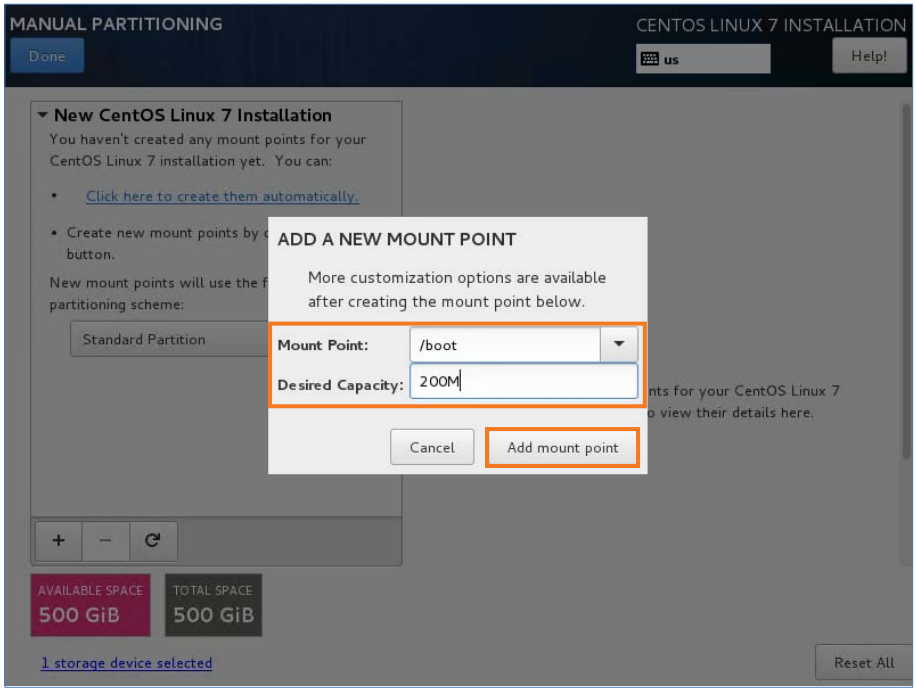
13. Select the HDD you want to install, click the **Configure partitioning** button, and click **Done** button.



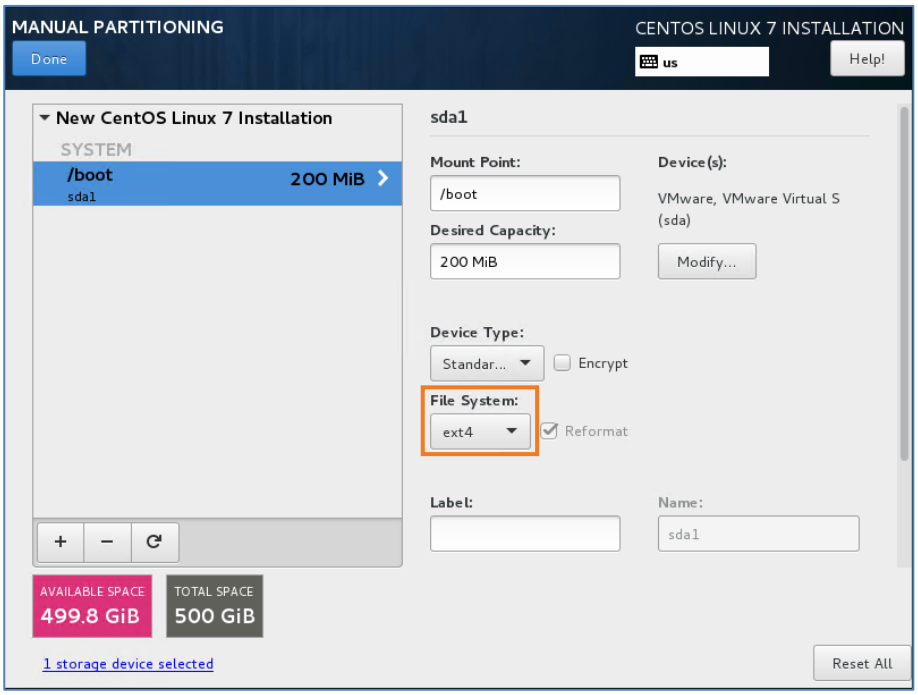
14. Click **Add** (+) button.



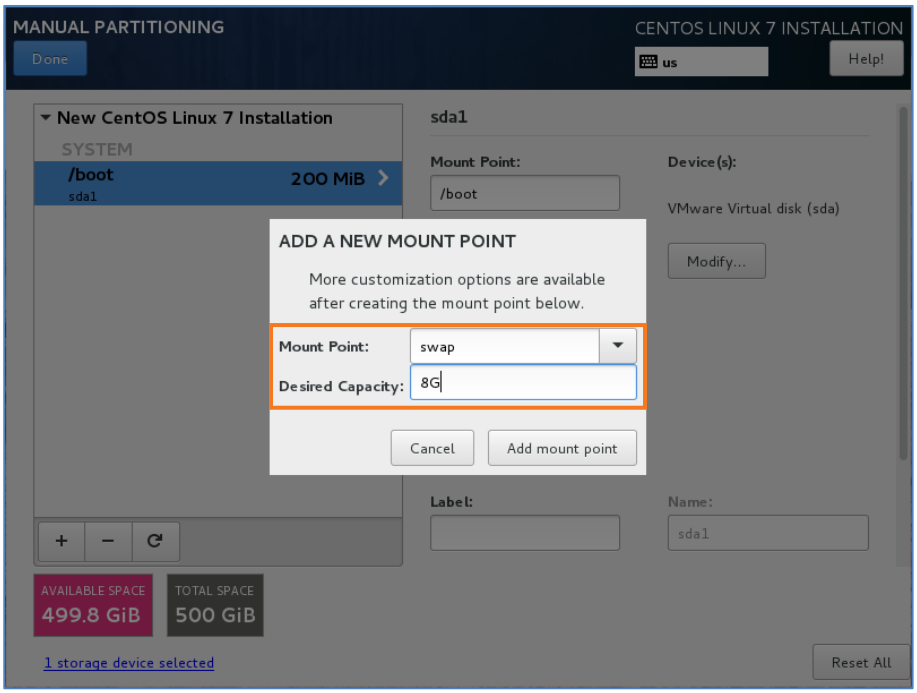
15. Then select the size of the /boot section then click **Add mount point** button.



16. Click **File System**: to select ext4.

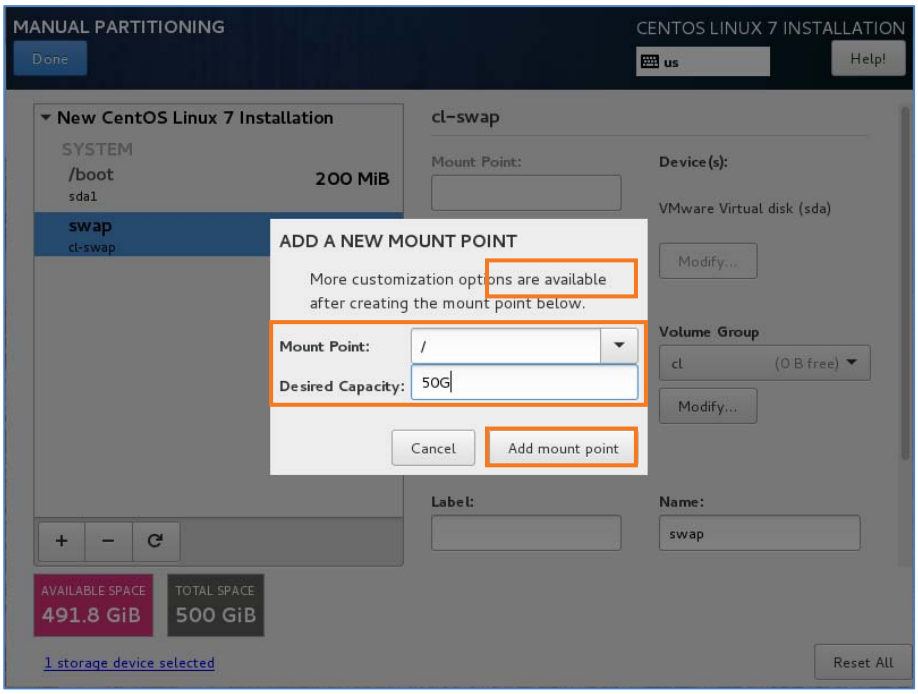


17. Click **Add** (+) button, then select the size of the swap section then click **Add mount point** button.

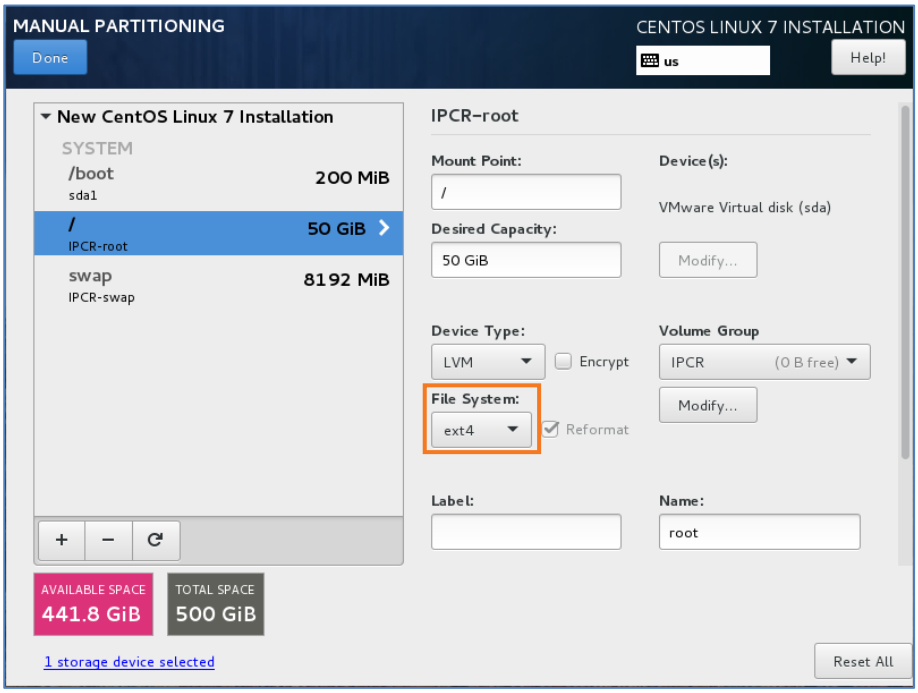


- The Swap size, assign double the size of the memory.

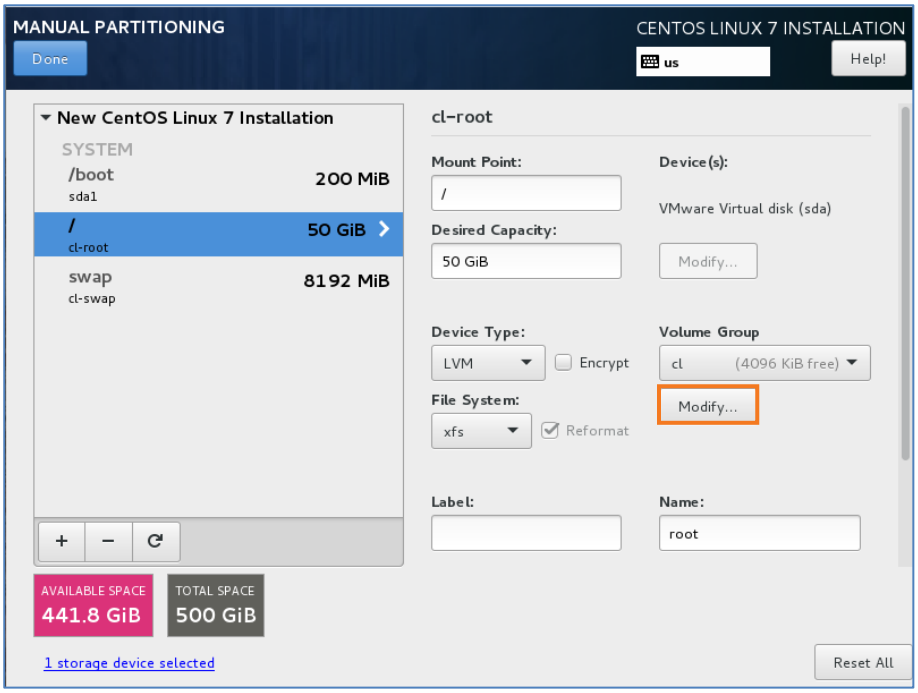
18. Click **Add** (+) button, then select the size of the root section then click **Add mount point** button.



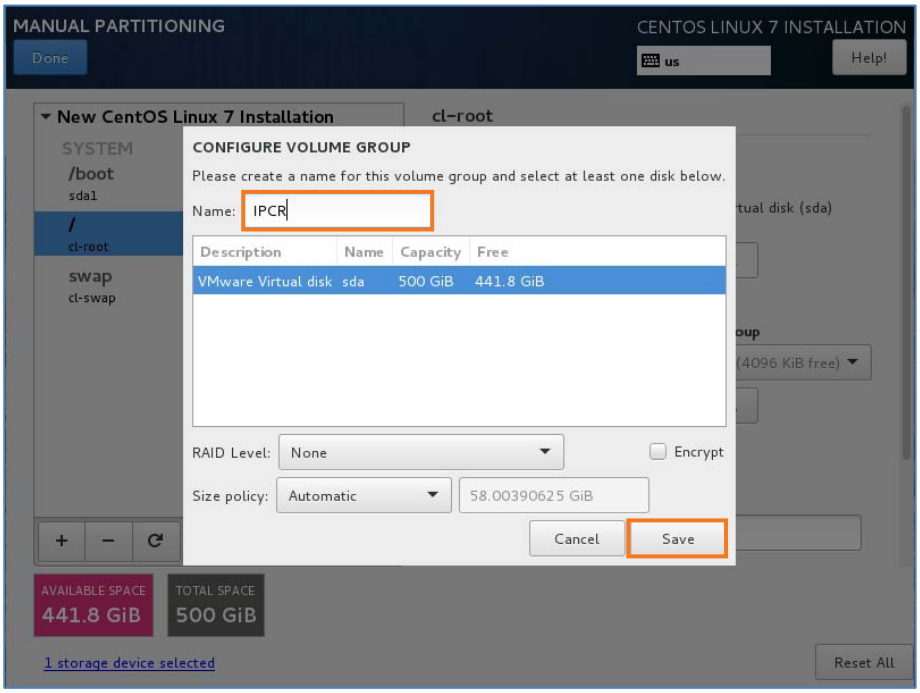
19. Click **File System**: to select ext4.



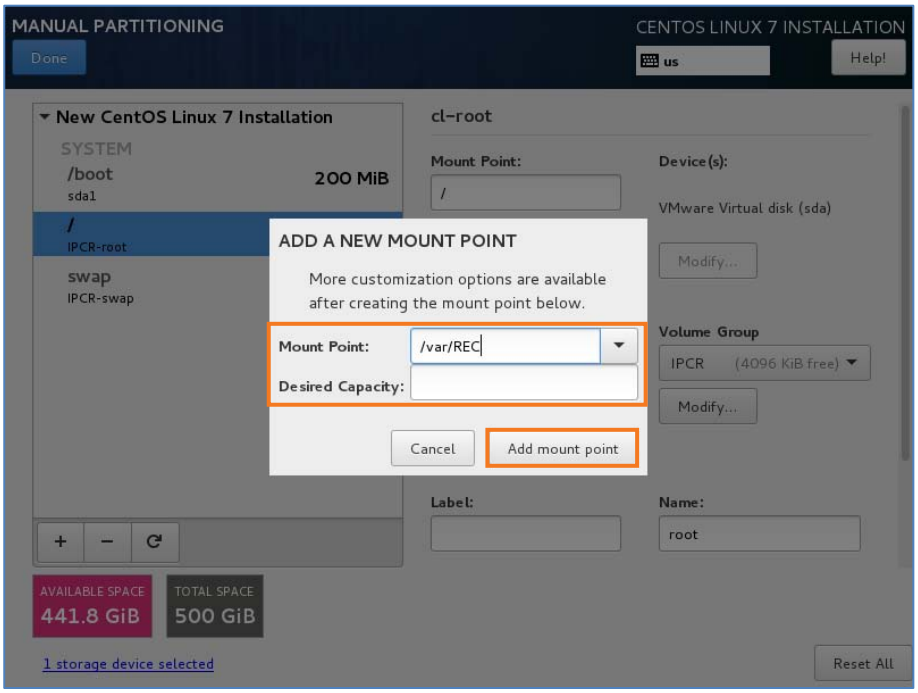
20. Click **Modify** button.



21. Modify the name to IPCR and click **Save** button.

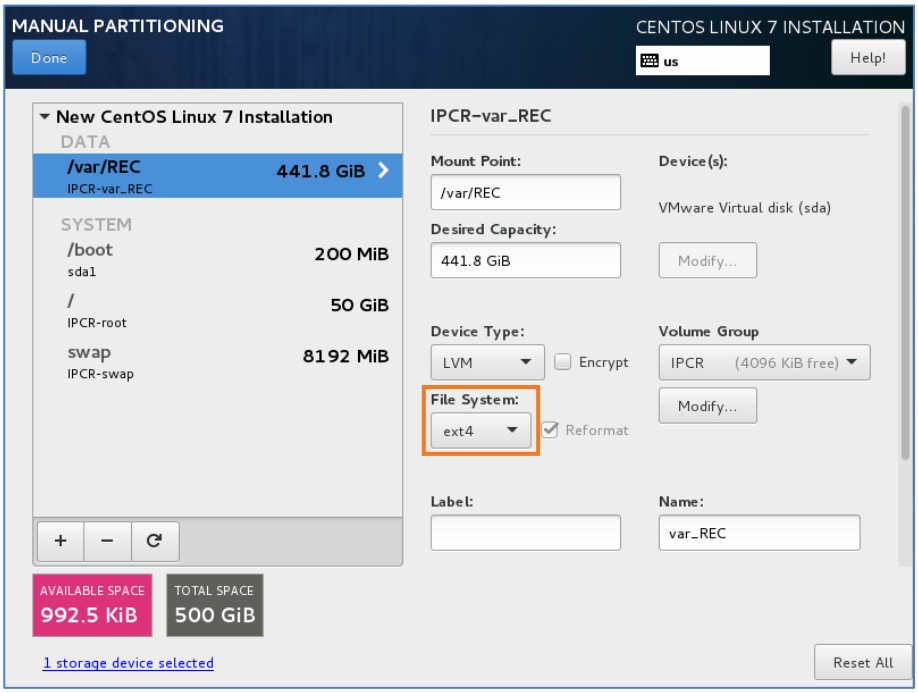


22. Click **Add** (+) button, then enter /var/REC as Mount Point then click **Add mount point** button.

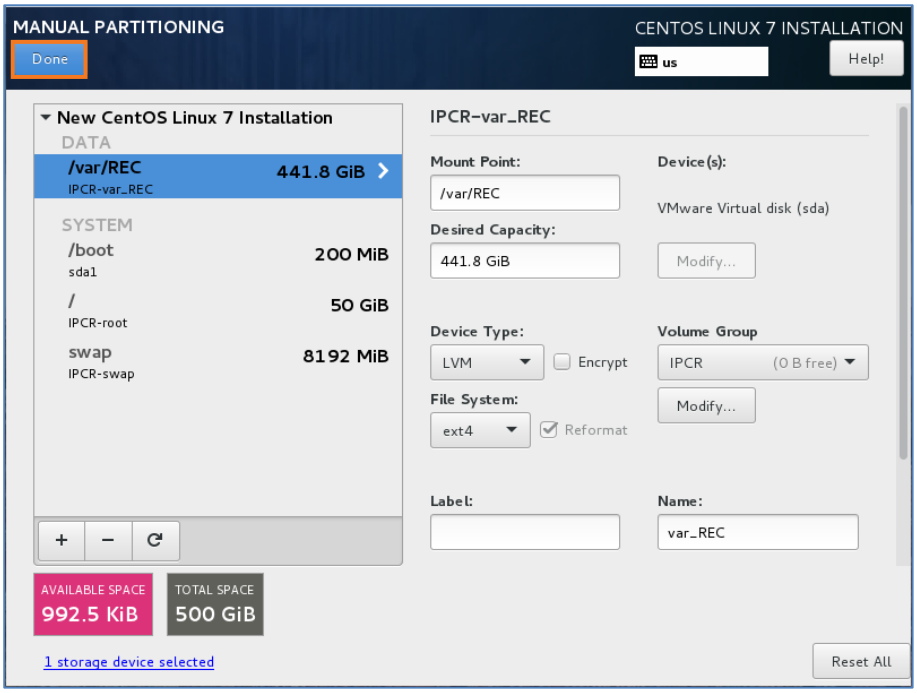


- When the **Desired Capacity** is mounted in a blank space, it is automatically allocated.

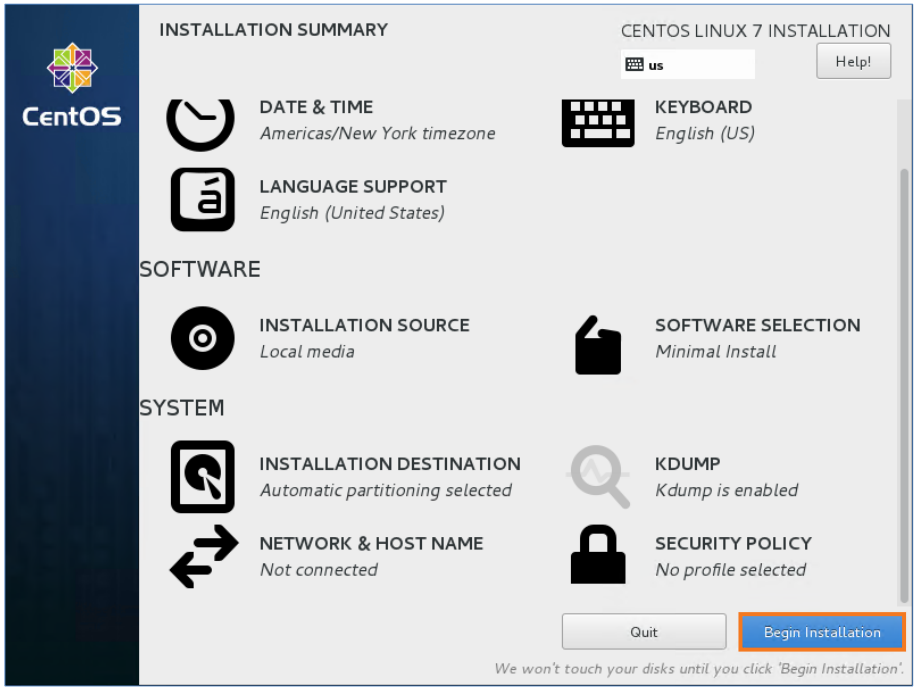
23. Click **File System**: to select ext4.



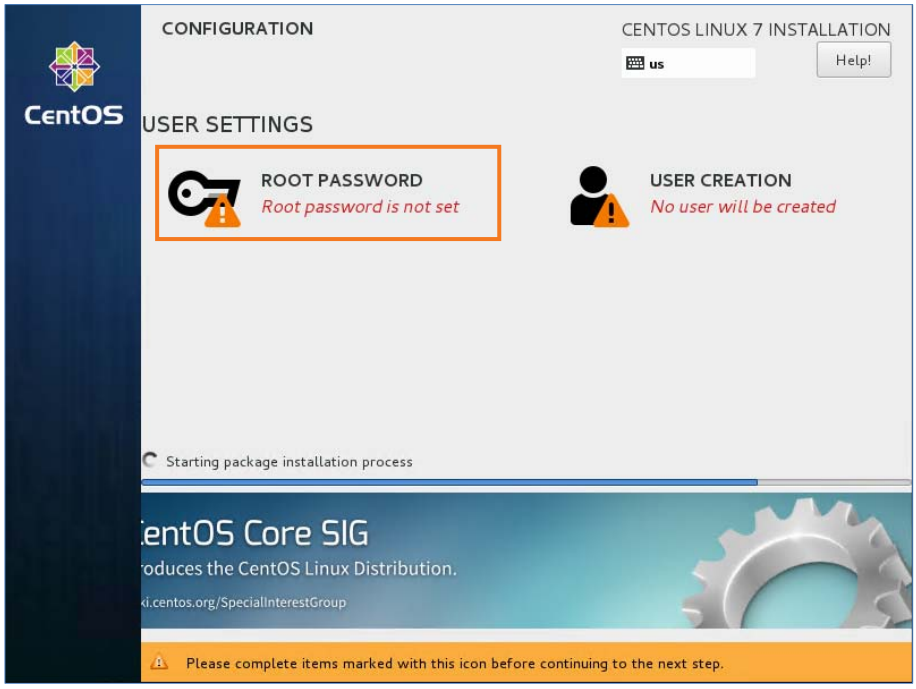
24. And then, click **Done** button.



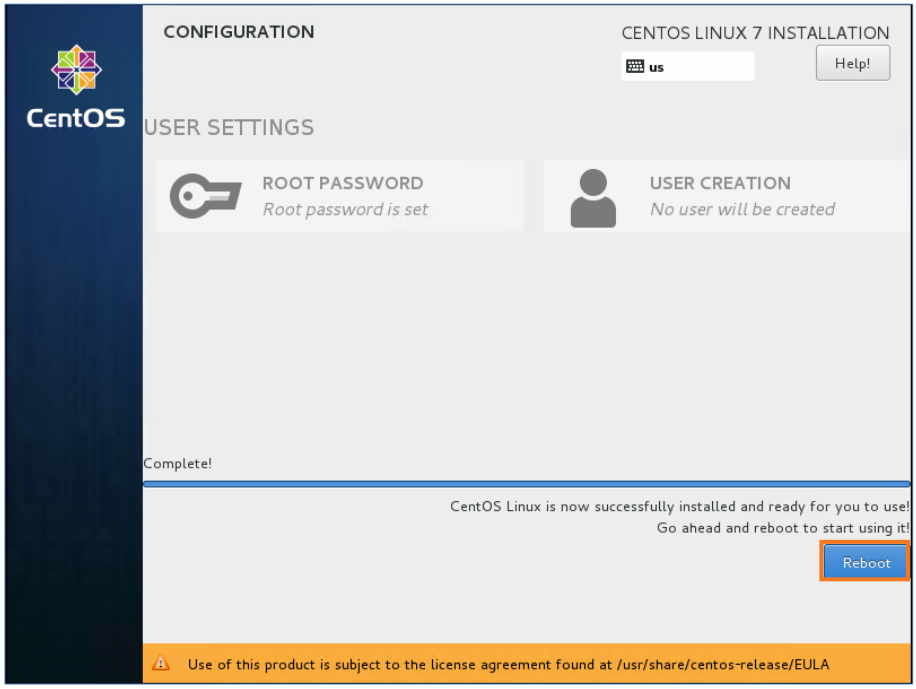
25. Click **Begin Installation** button.



26. In the USER SETTINGS field , click **ROOT PASSWORD** then set the password.



27. When the installation is complete, click **Reboot** button.

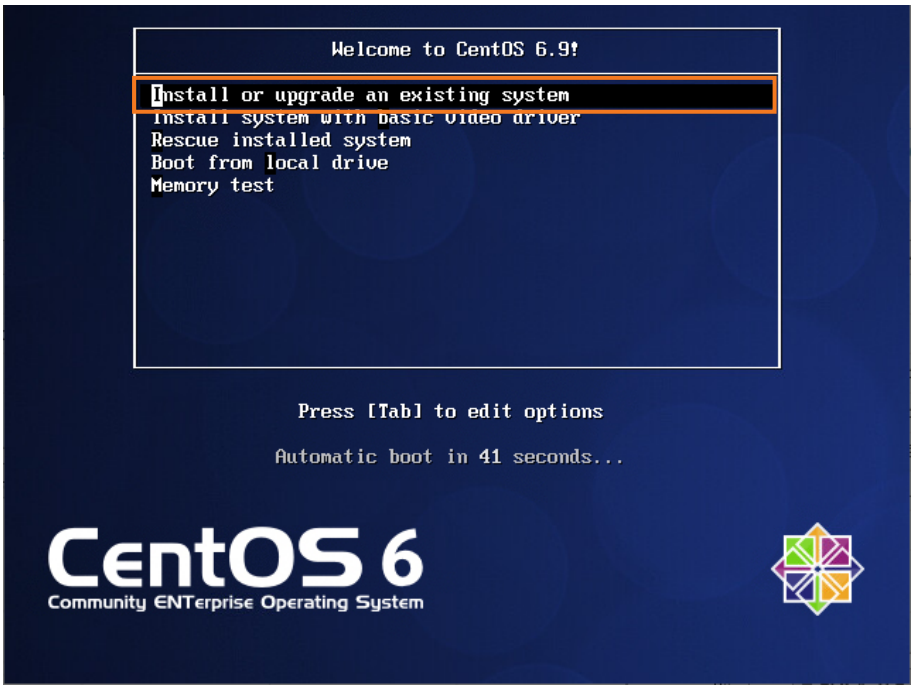


28. To set network configuration, refer to section 2.3 To set network configuration to static for details.

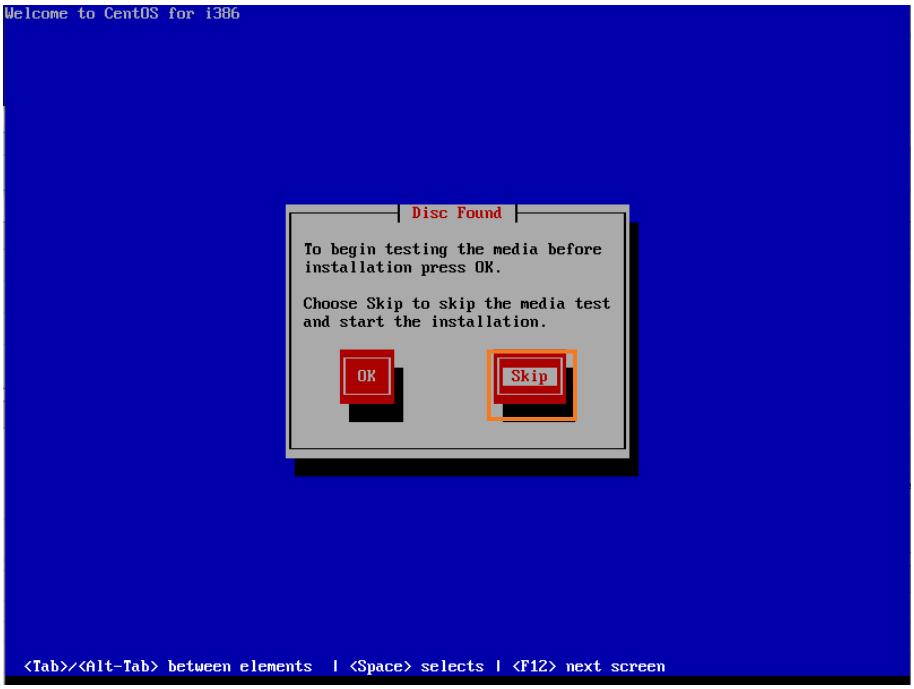
2.2.2 Download CentOS 6.9 32 bit and Manual Install

iPECS IPCR can support RedHat and CentOS 6.9 32 bit Linux. Linux OS can be downloading from the centos web site http://www.centos.org.

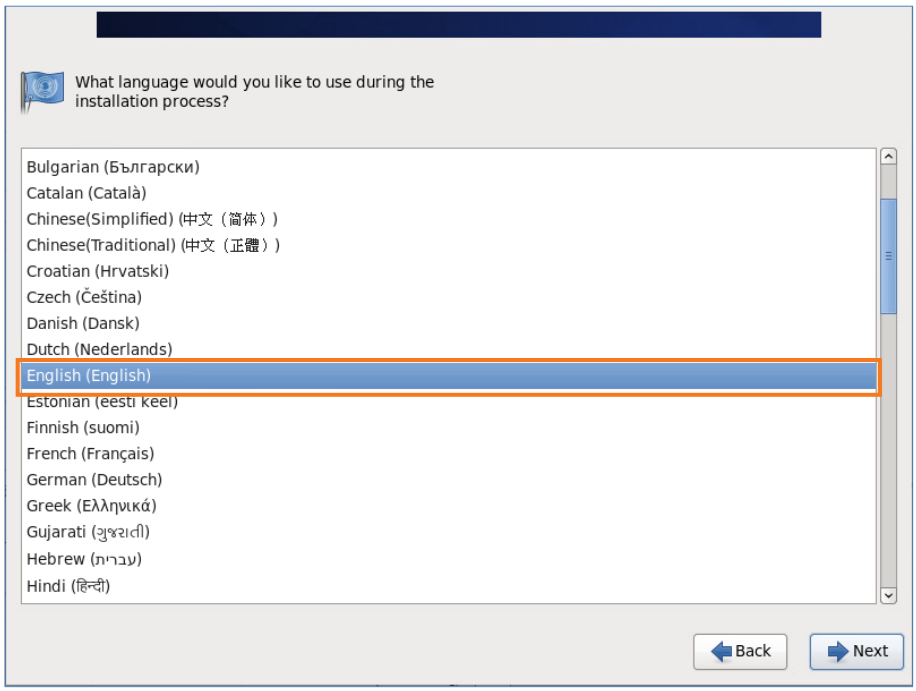
1. Select **'Install or upgrade an existing system'** and press **Enter** key.



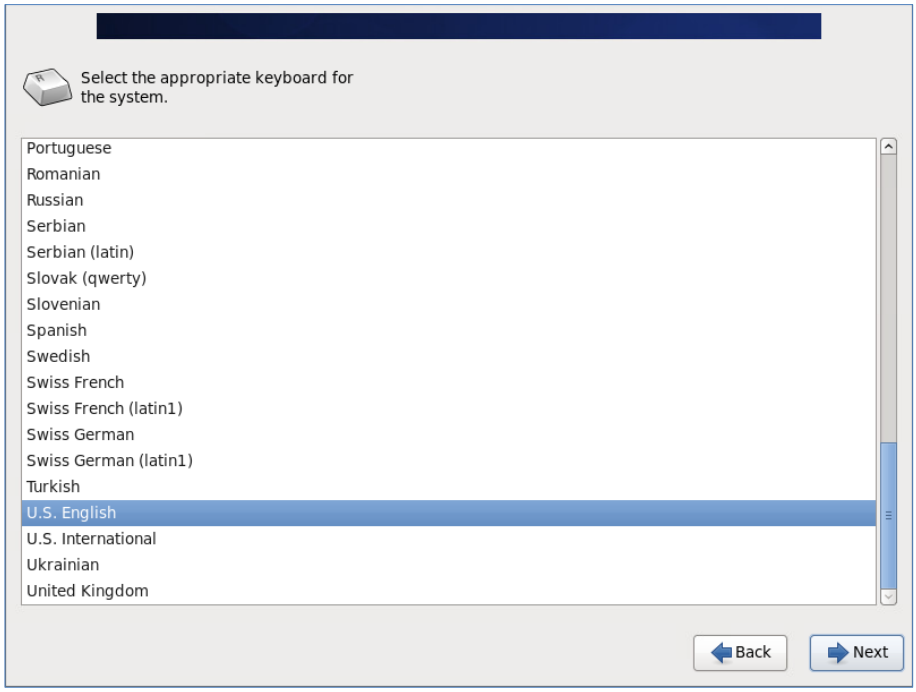
2. Skip Media Test by clicking **Skip** button.



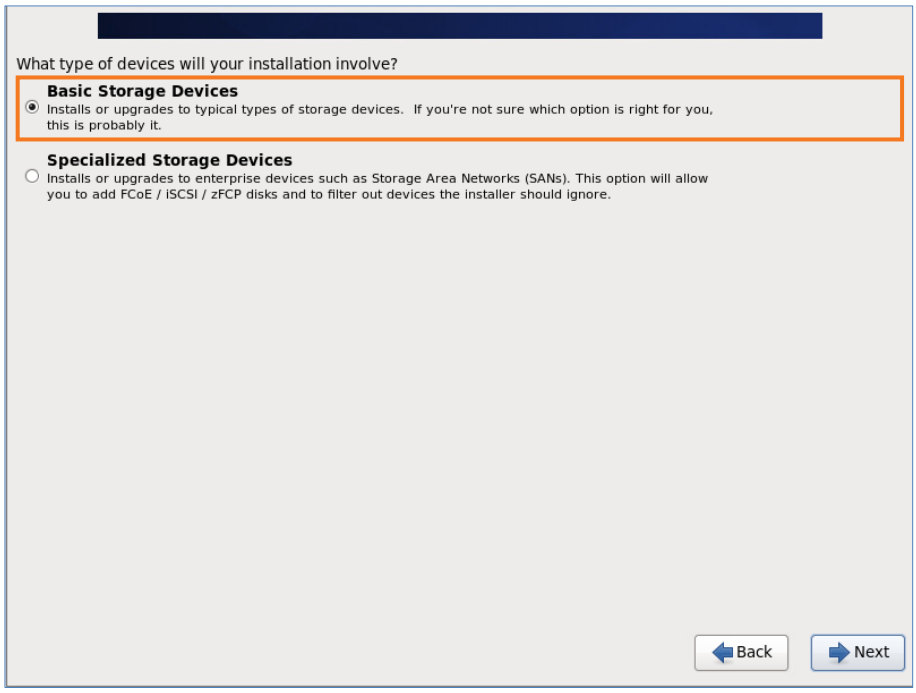
3. Select Language to use when installing then click **Next** button.



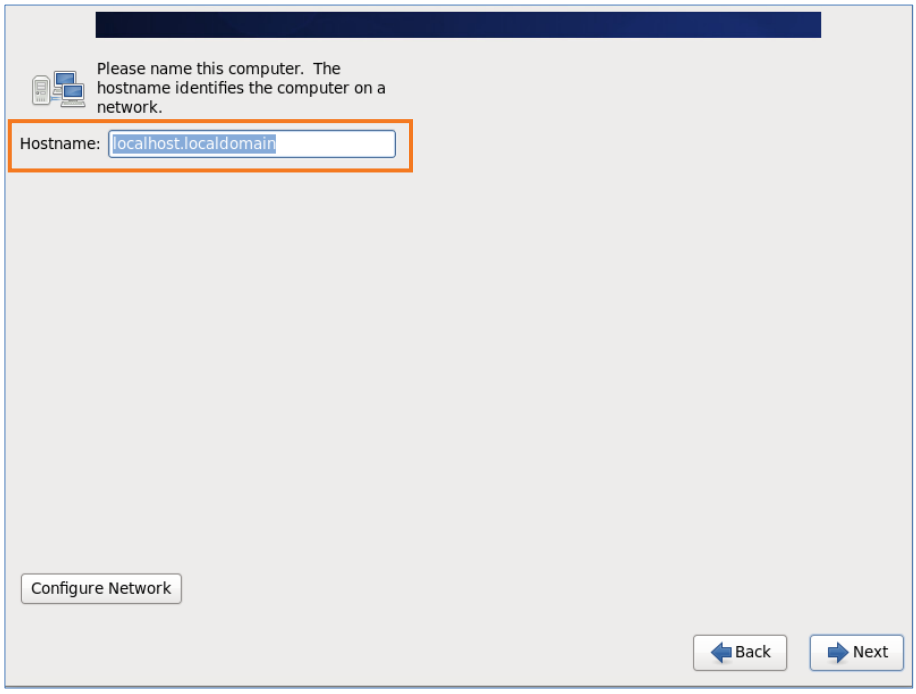
4. Select the language for the system and click **Next** button.



5. Click to select **'Basic Storage Devices'**. By default select 'Basic Storage Devices' then click **Next** button.

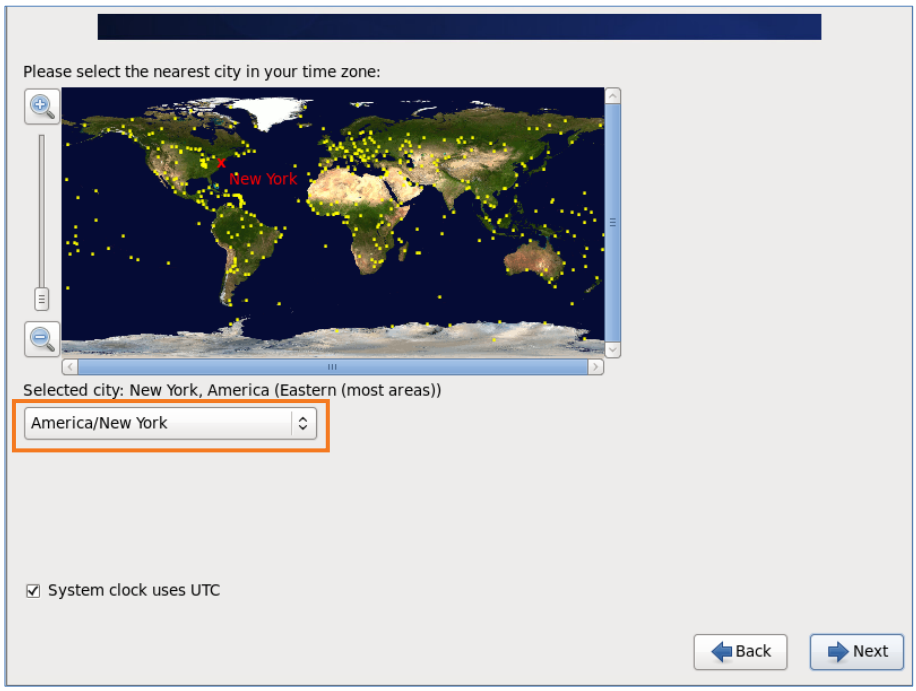


6. Set Hostname. On the user PC network enter the Hostname then click **Next** button to continue.

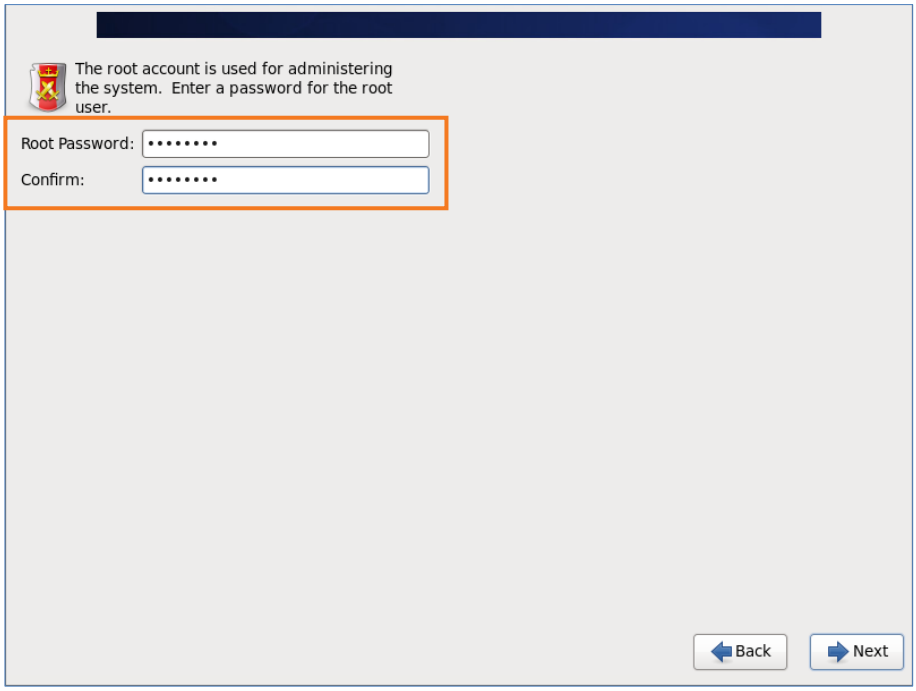


- As shown in the figure above, *localhost.localdomain* is set on the default Hostname section. This process can be omitted.

7. Set the Time Zone. Select the user time zone then click **Next** button.

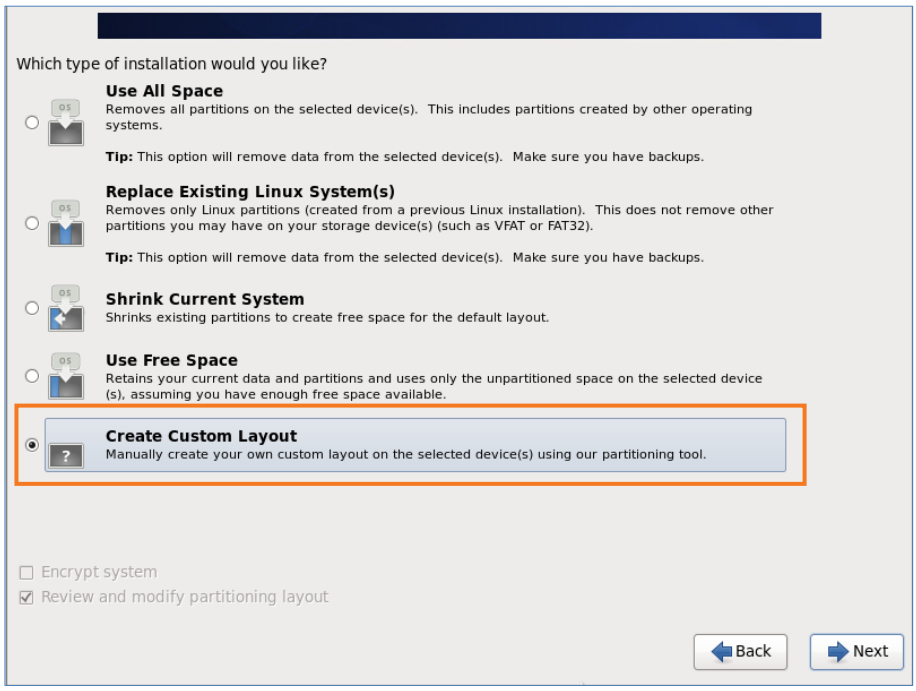


8. Set the Root password. Set the Password and then click **Next** button.



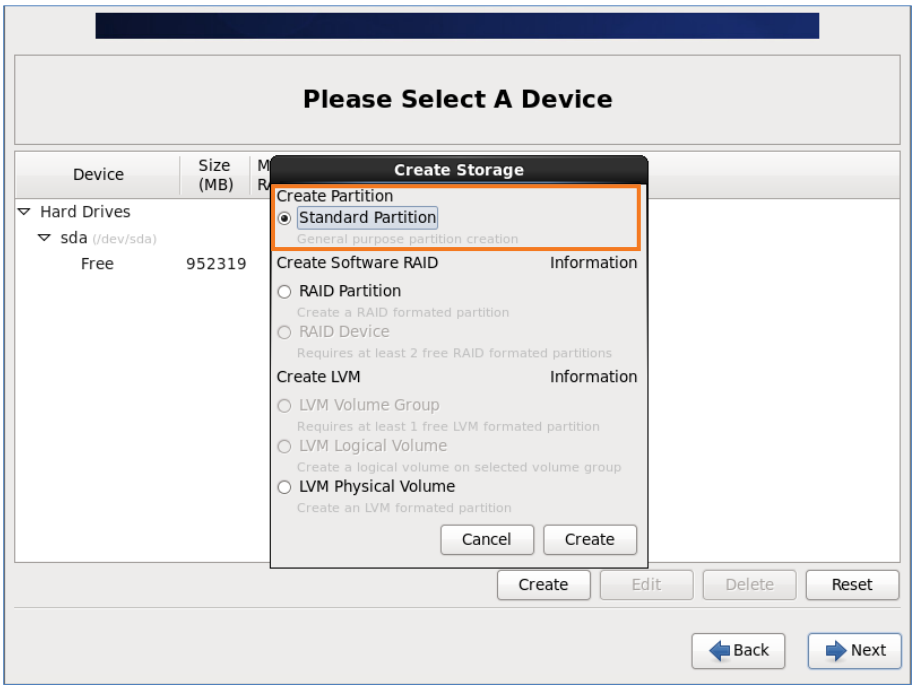
- Note that the default password is not set. We recommend that you set the strong and complicated password to strengthen the security.
- If you don't set password or you set a weak password, you might be a target to hacking. If you DO NOT SET PASSWORD, you cannot proceed to the next step.

9. Set the Partition. You must select Create Custom Layout then click **Next** button.

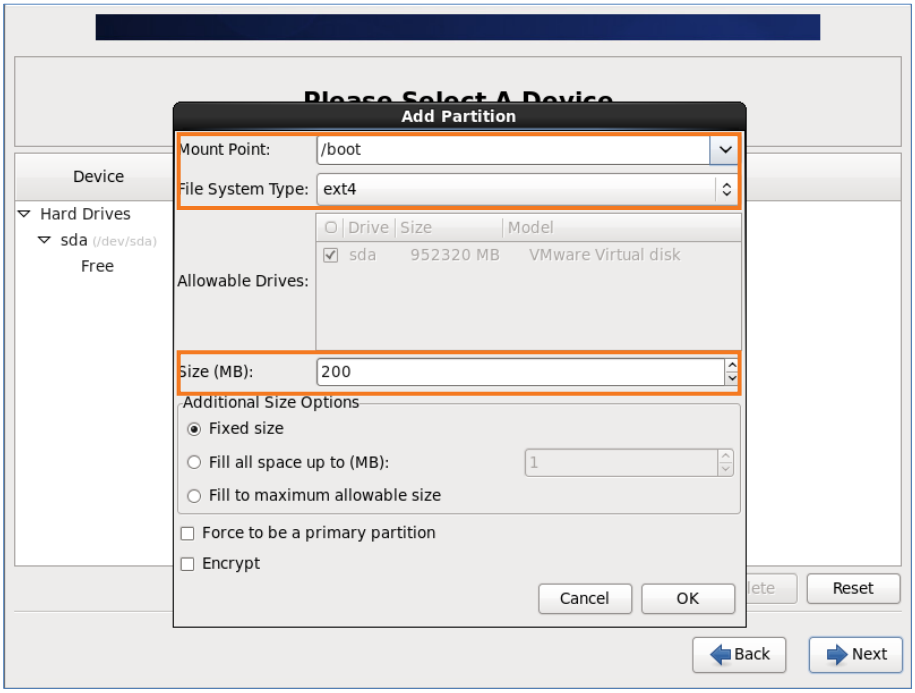


10. Create a Standard Partition in the /boot section. Follow the sequence below on how to generate partition.

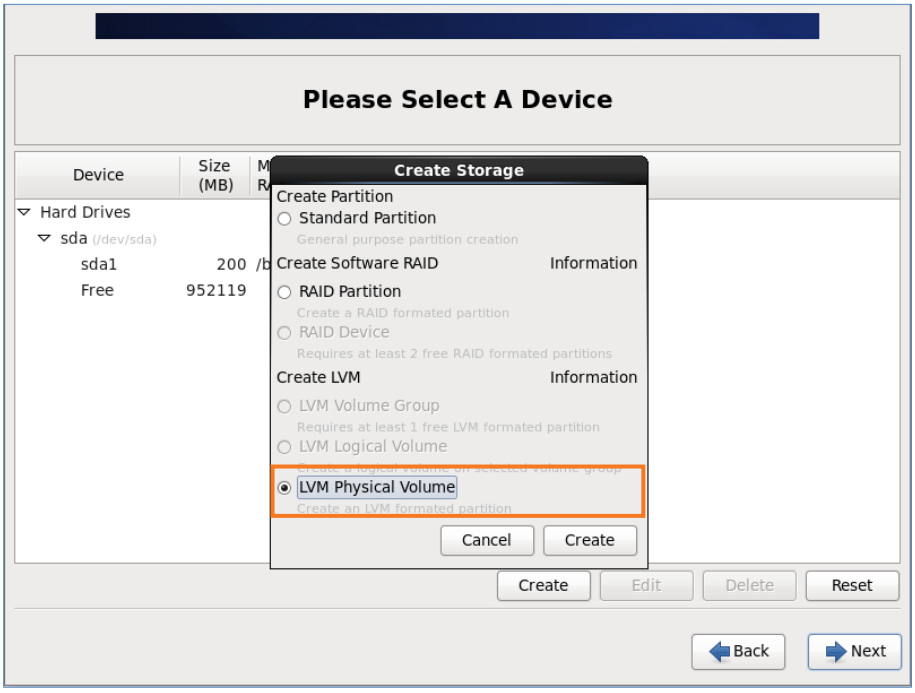
a. Click **Create** button to create Standard Partition in /boot section then click **Create** button in the popup window.



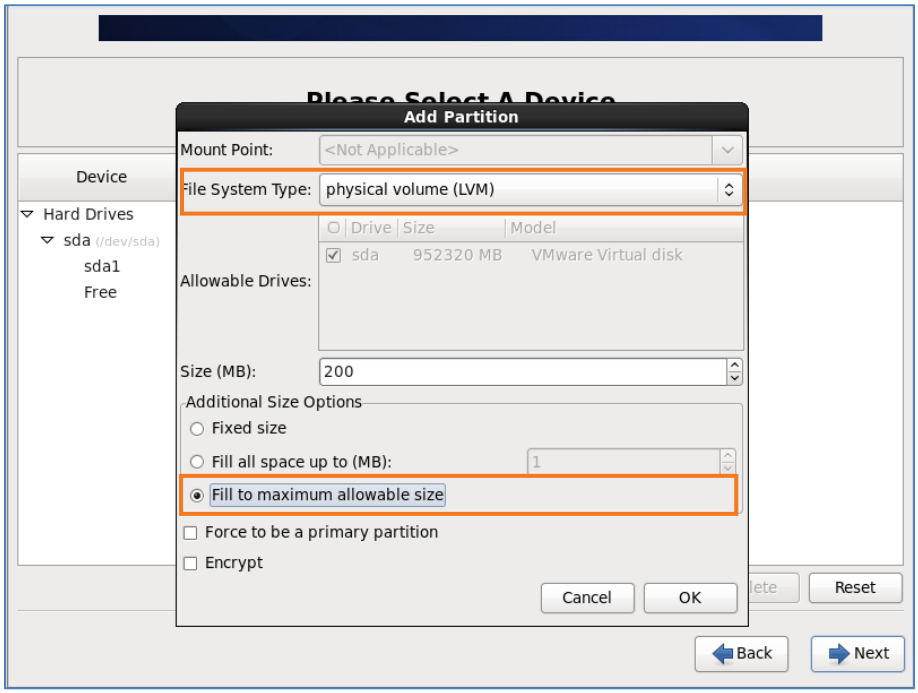
b. Then select the size of the /boot section then click **OK** button in the popup window.



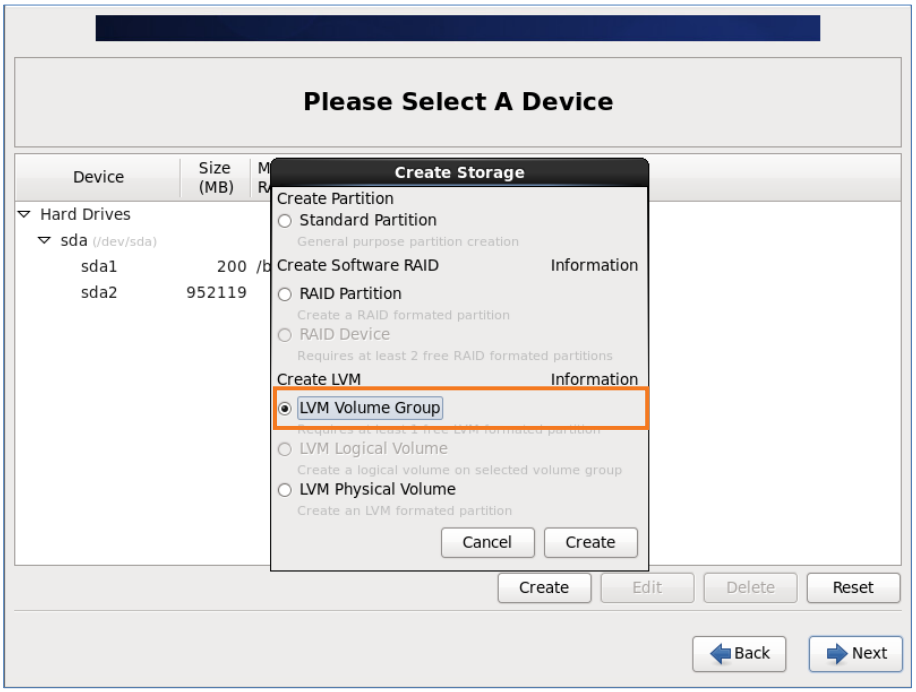
c. Click **Create** button to change all the remaining storage to LVM Physical Volume then click **Create** button in the popup window.



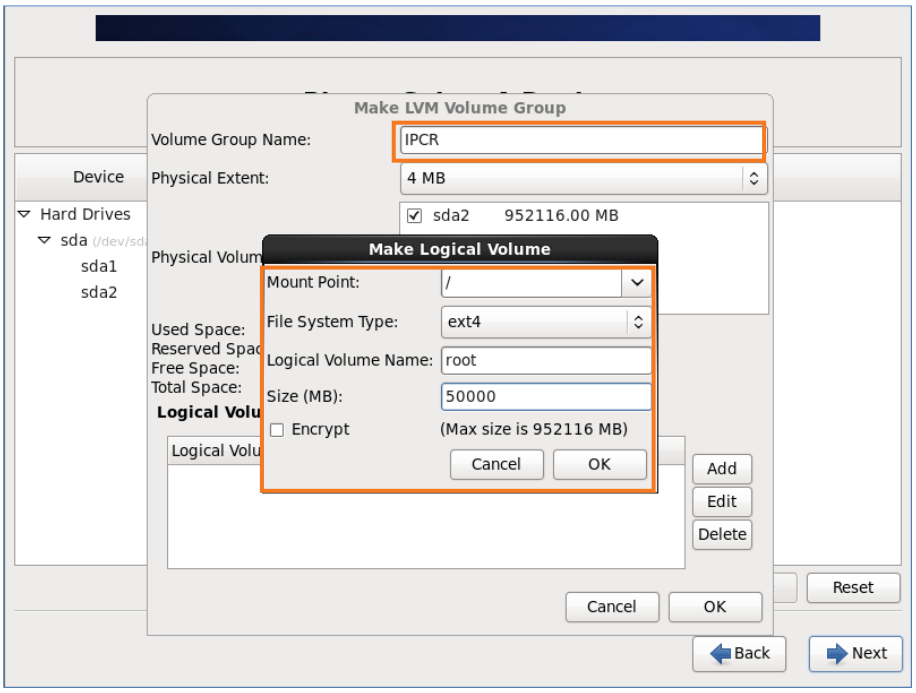
d. Set system type to be 'Physical Volume (LVM)' then select Fill to Maximum allowable size then click **OK** button in the popup window.



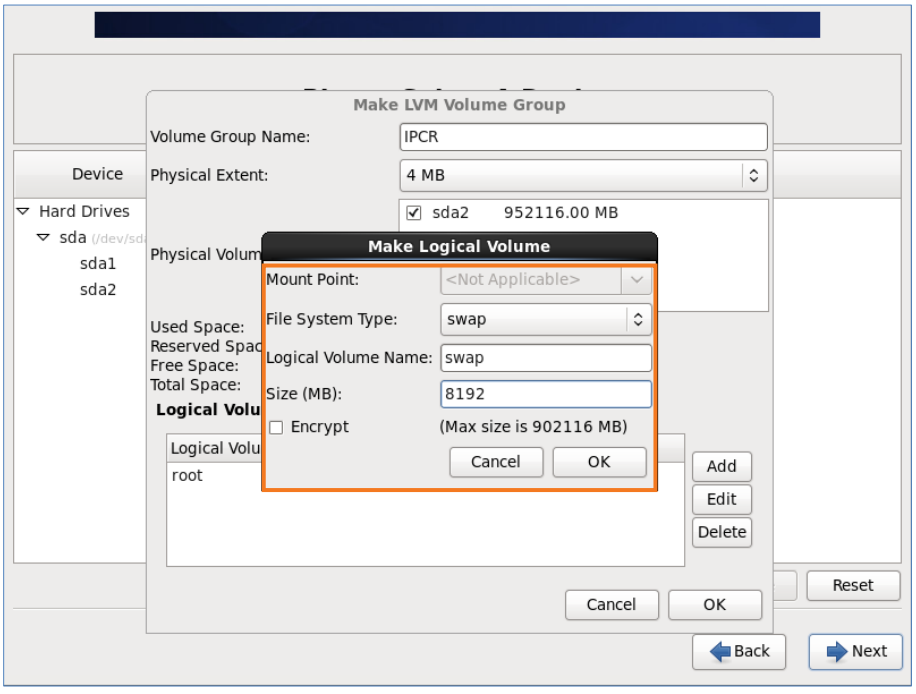
e. Click **Create** button to select LVM Volume Group then click **Create** button in the popup window.



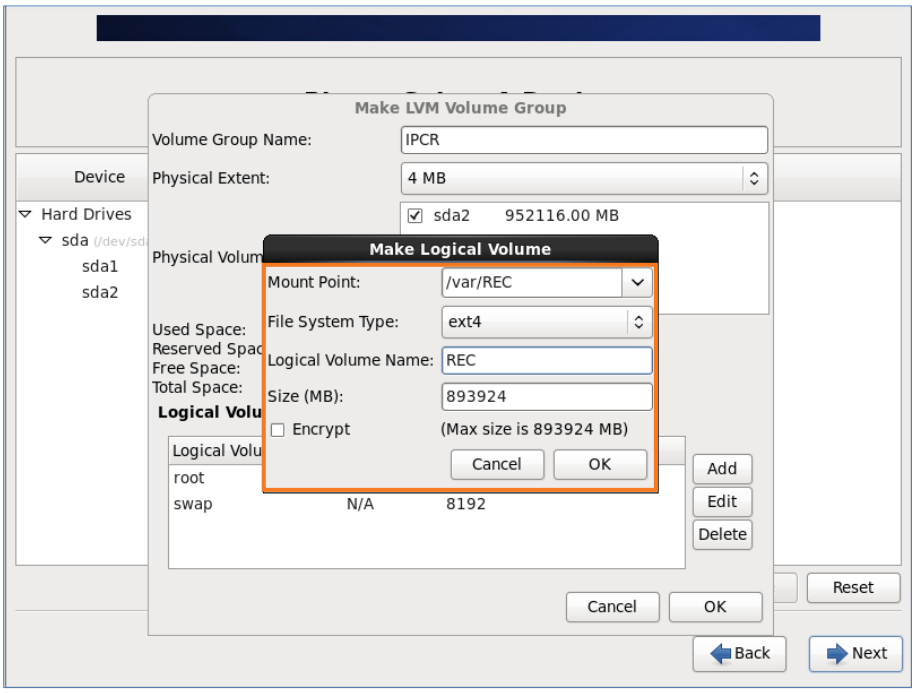
f. Create Logic Volume under LVM Volume Group as shown below then click **OK** button in the popup window.



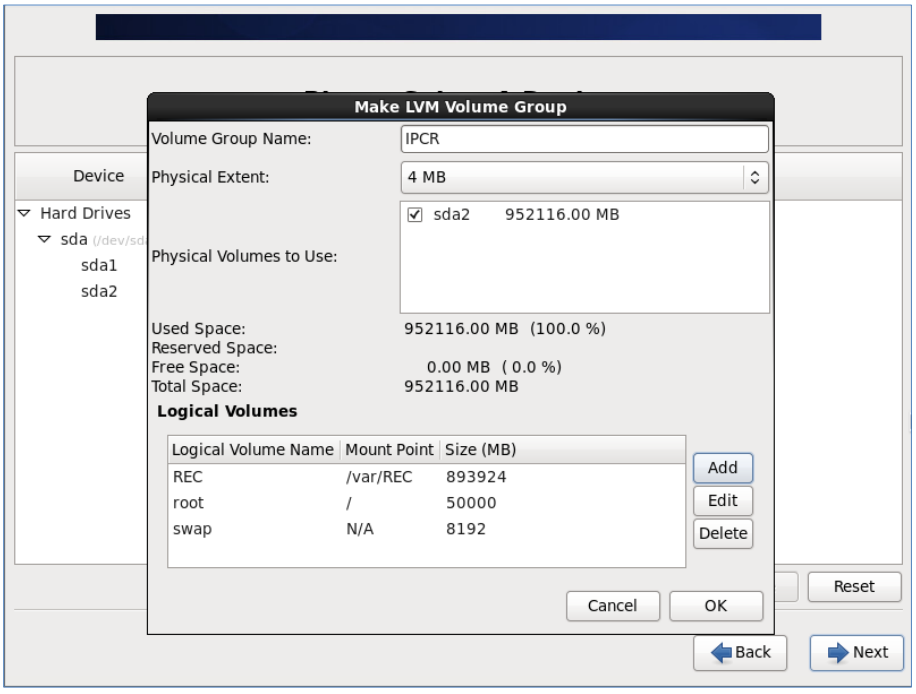
g. For the Swap size, assign double the size of the PC capacity as shown below then click **OK** button in the popup window.



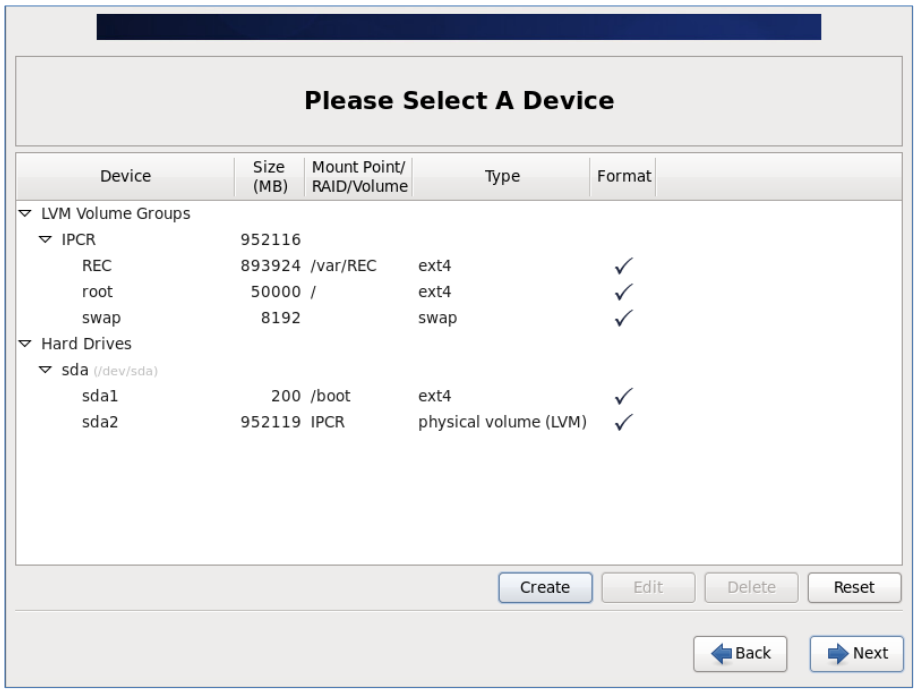
h. For /var/REC size assign the remaining PC memory capacity as shown below then click **OK** button in the popup window.



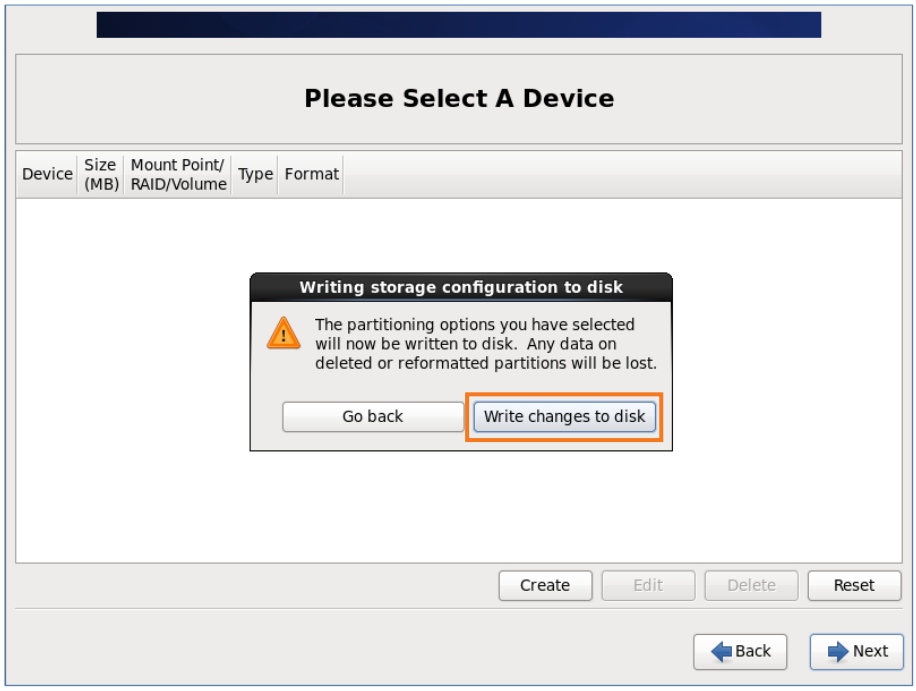
i. If the above was executed successfully you can view the information as shown below then click **OK** button in the popup window.



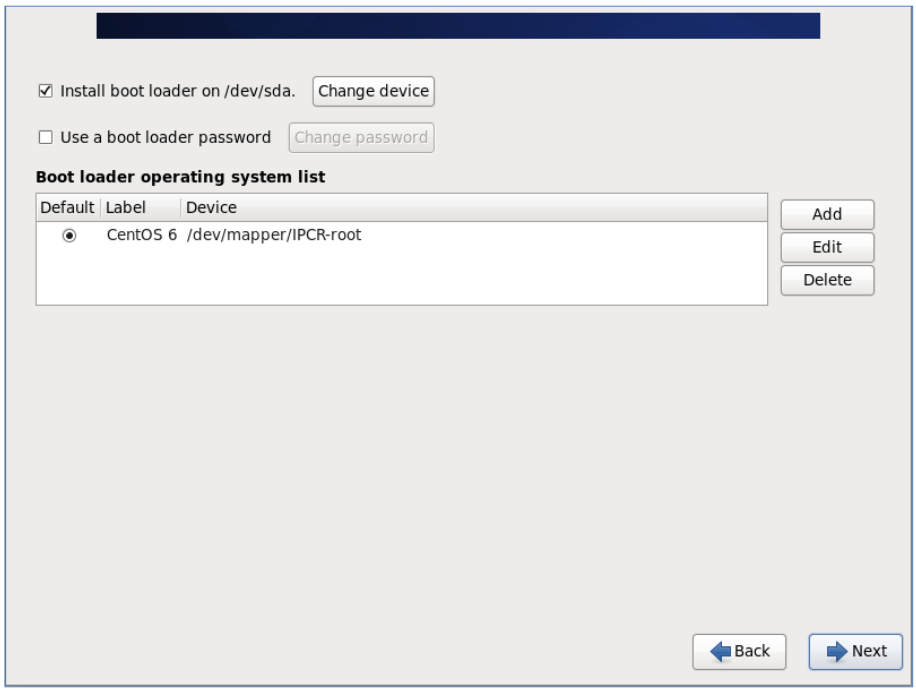
11. From the figure below you can Confirm the information assign to all IPCR (LVM Volume Groups and Hard Drive) then click **Next** button.



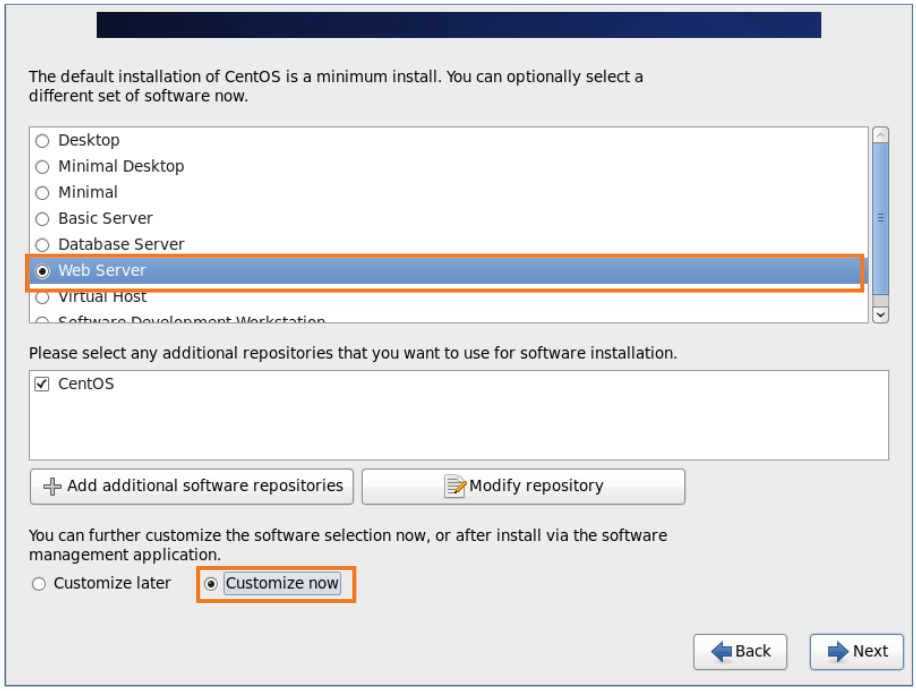
12. Hard disk (Format). You will need to format hard disk before setting any partition. Click **Write changes to disk or format** button in the popup window to confirm



13. Confirm the disk format then click **Next** button.

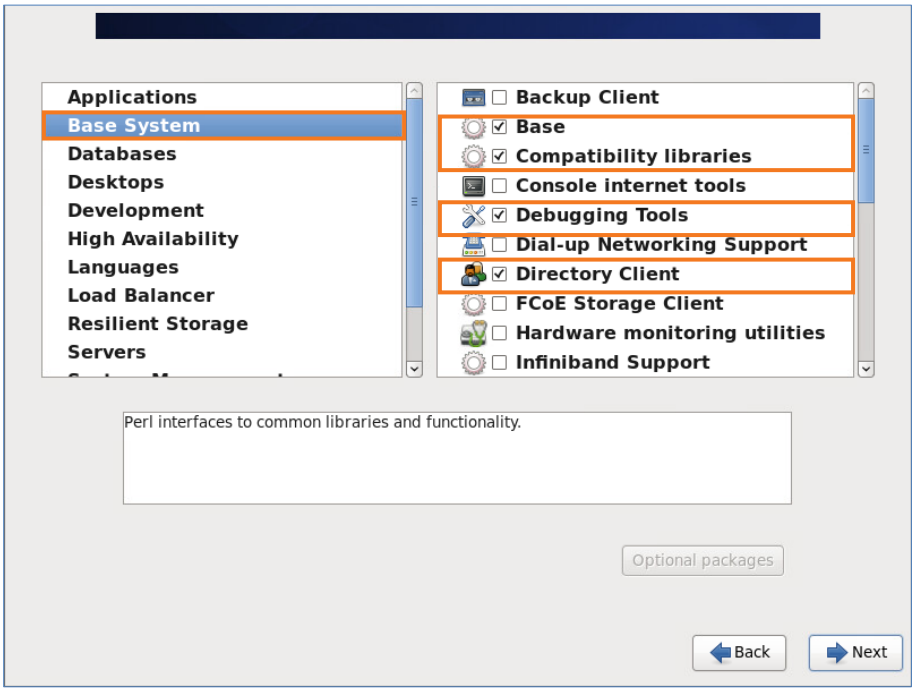


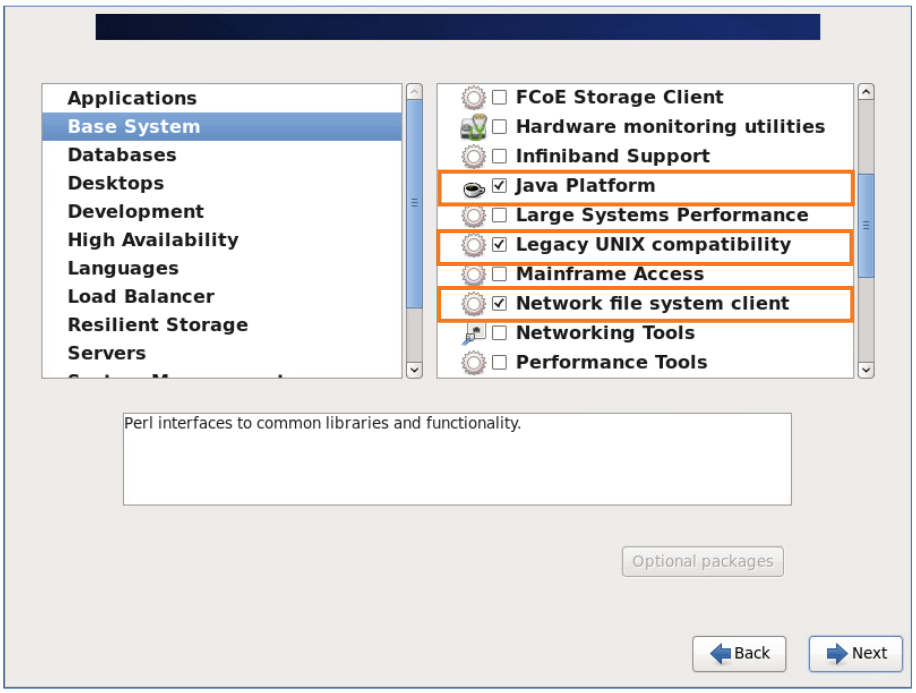
14. Installing OS. It is recommended to select Web Server as the Linux OS Type. Then click **Next** button.



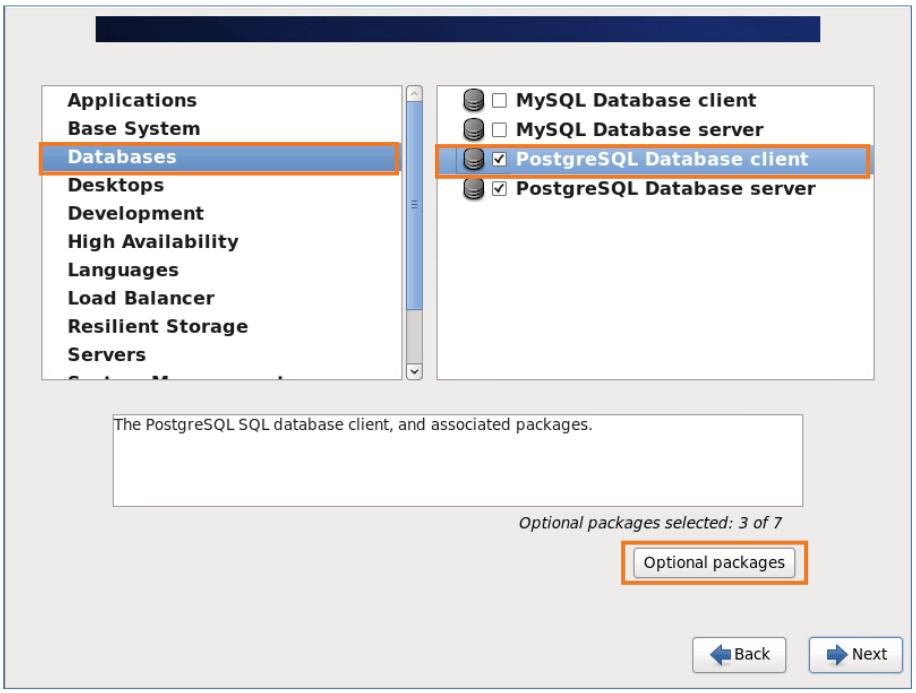
15. Selecting application. To install IPCR successfully the following features has to be selected. On the selection screen, click the content in left side and you can see more detail on the right side. Use the scroll bar to select the sub-item.

a. Click **Base System** then select detailed item on the right side. Follow the selection sequence is as shown below.

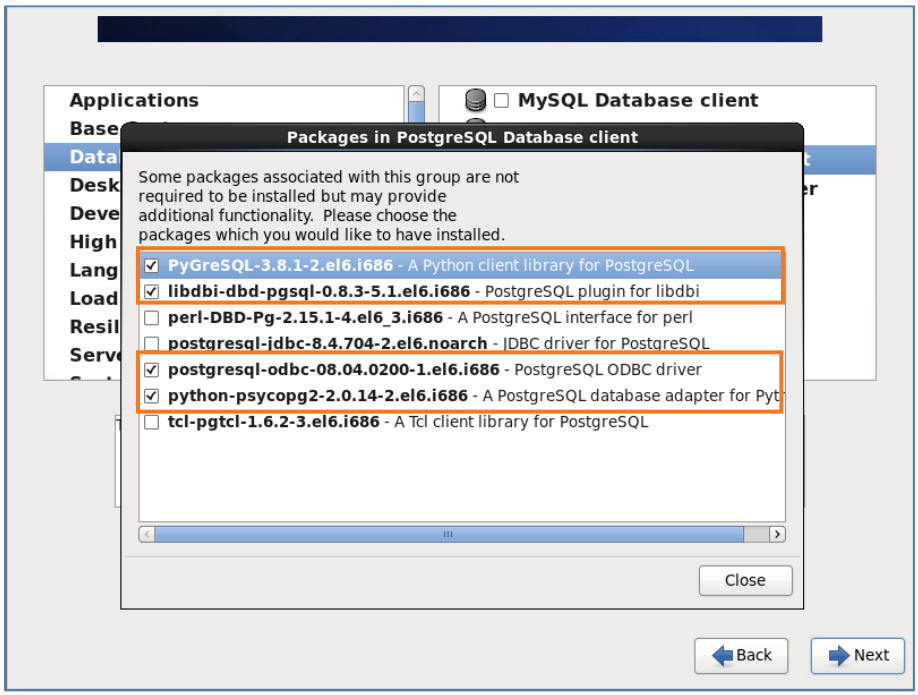




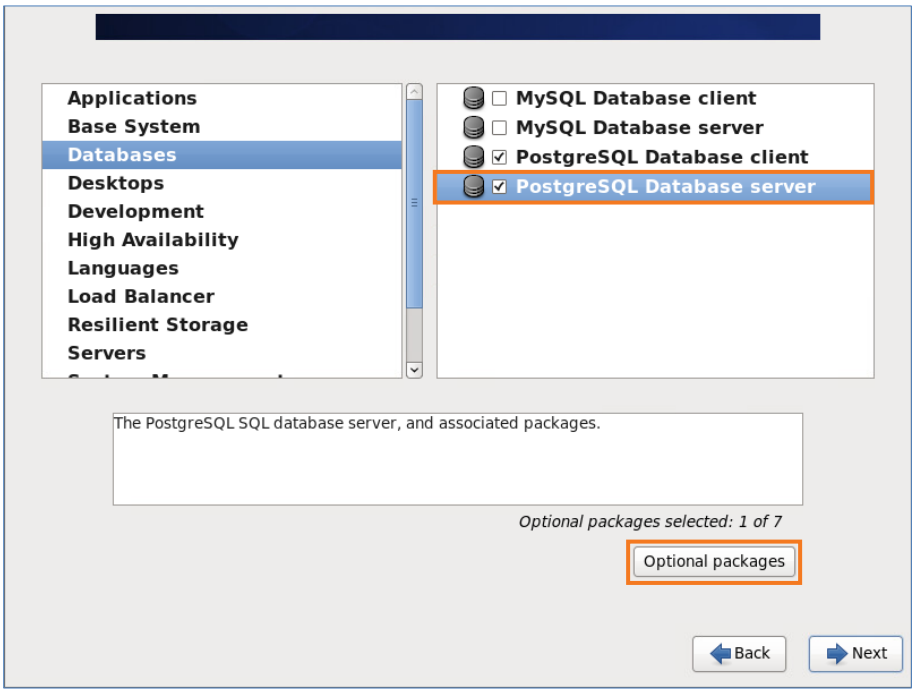
b. Click **Databases** on the left side and select detailed item PostgreSQL Databases client on the right side, then select by clicking **Optional packages** button.



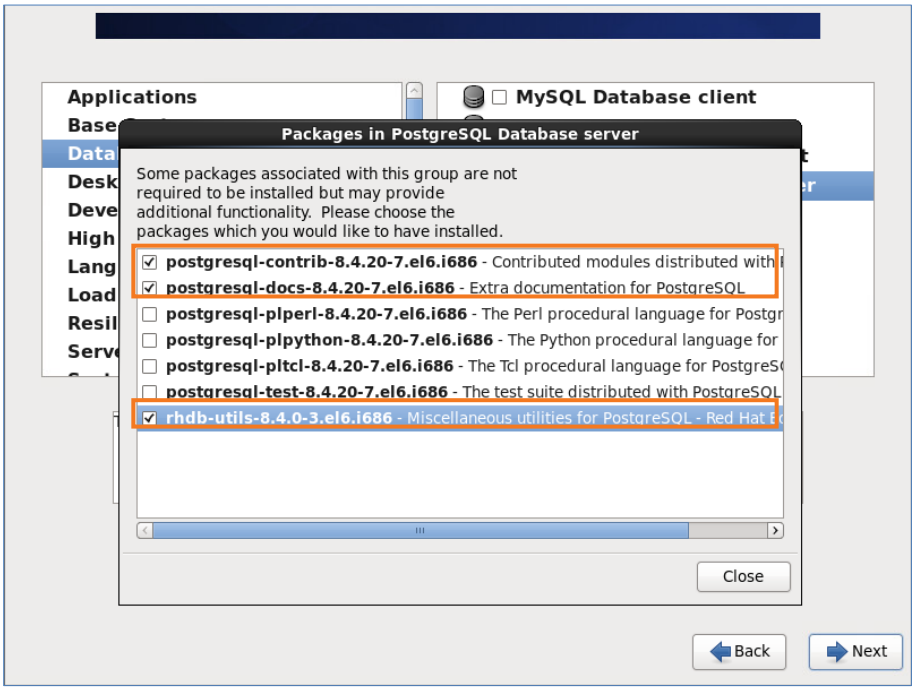
c. Select the needed option under PostgreSQL Databases client then click **Close** button in the popup window.



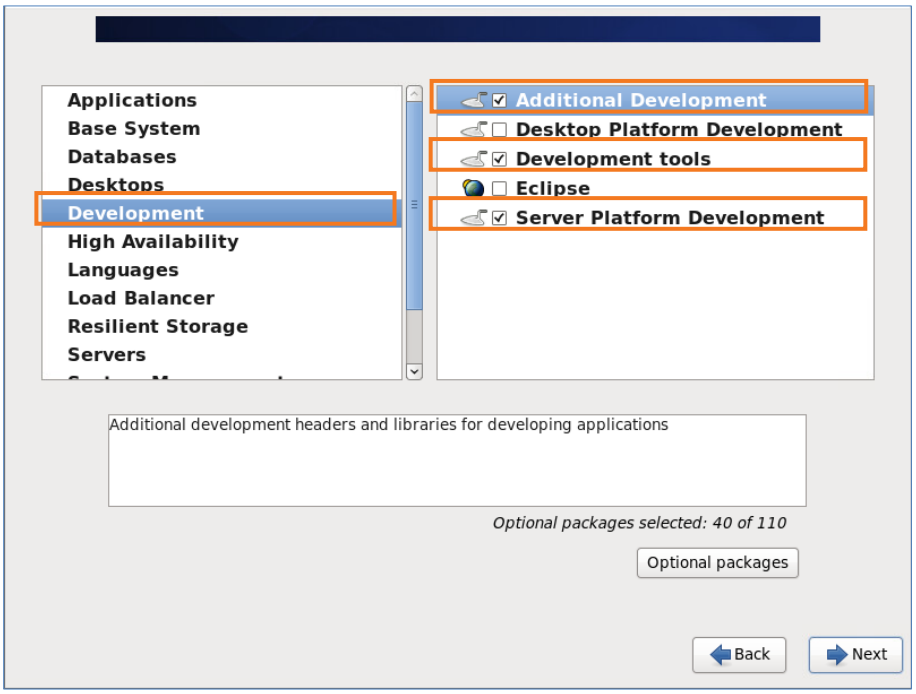
d. Still under Databases select PostgreSQL Databases server and select by click **Optional packages** button.



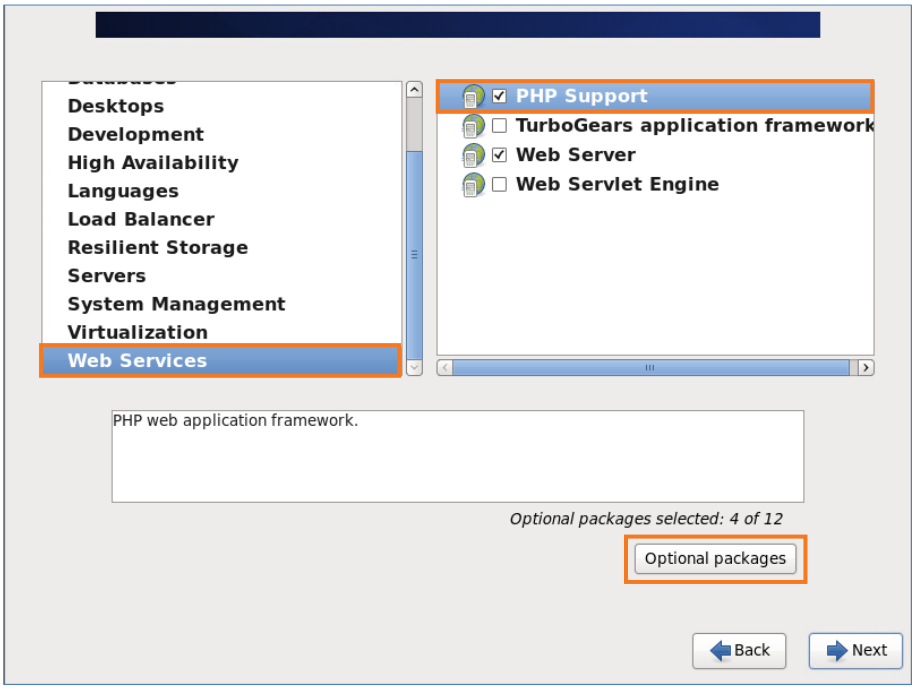
e. Select the needed option under PostgreSQL Databases server then click **Close** button in the popup window.



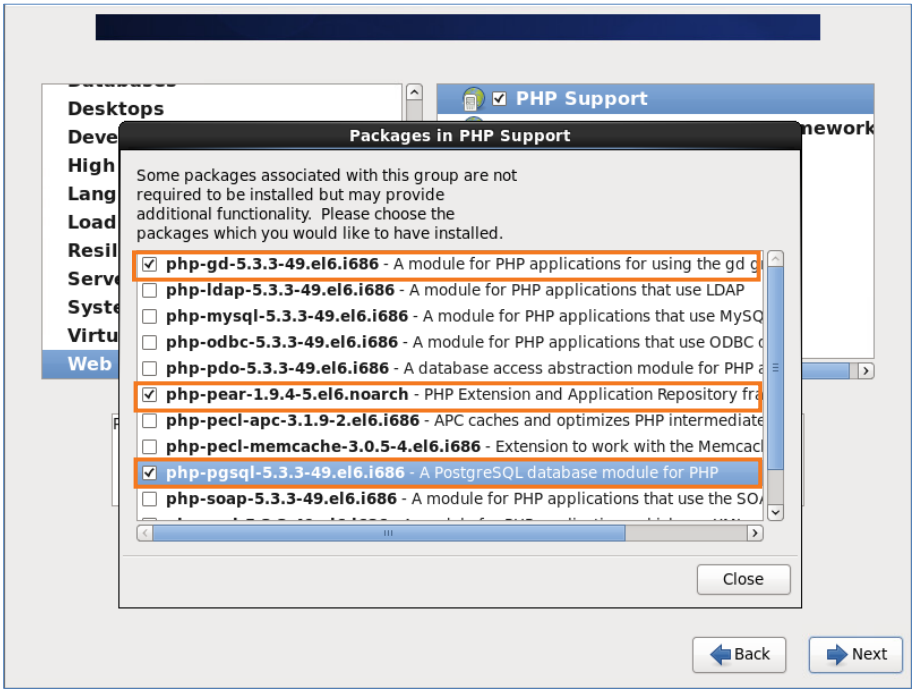
f. Select **Development** and chose detail items on the right side. Follow the selection sequence is as shown below.



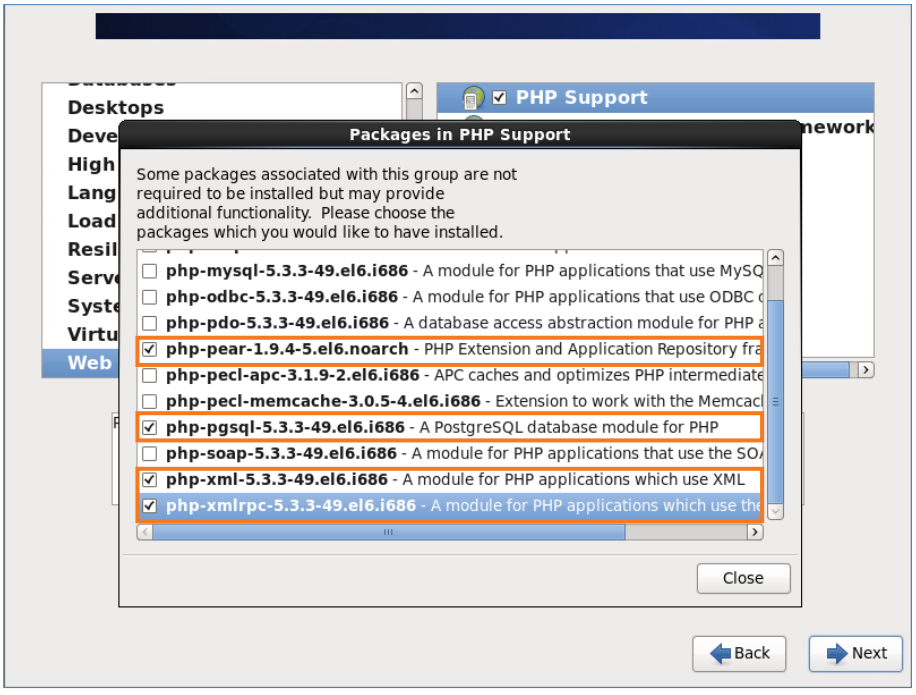
g. Select **Web Services** and chose PHP Support item on the right side then select by clicking **Optional packages** button.



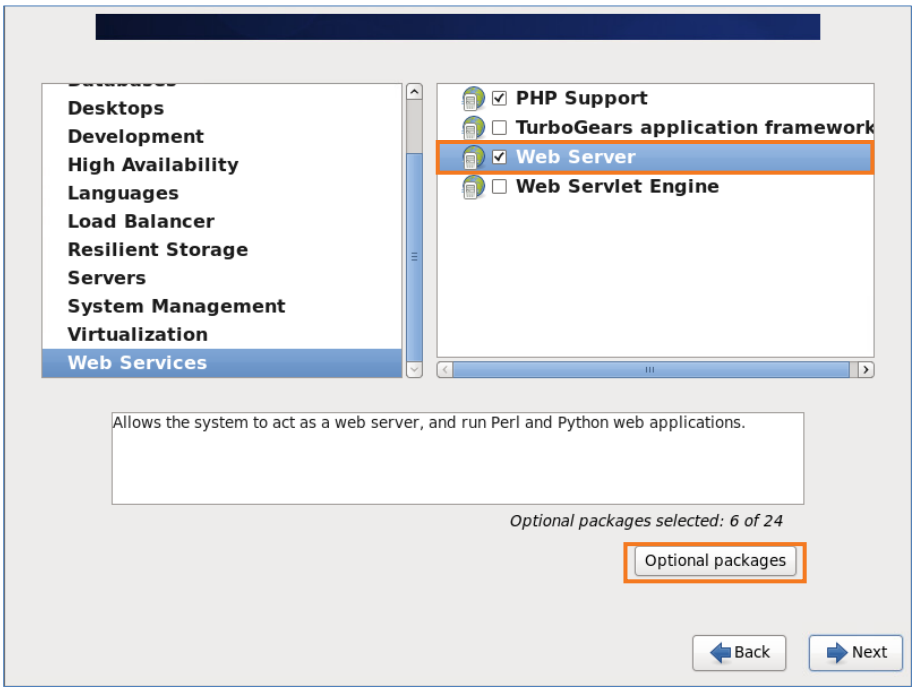
h. Select more option for PHP Support then click **Close** button in the popup window.



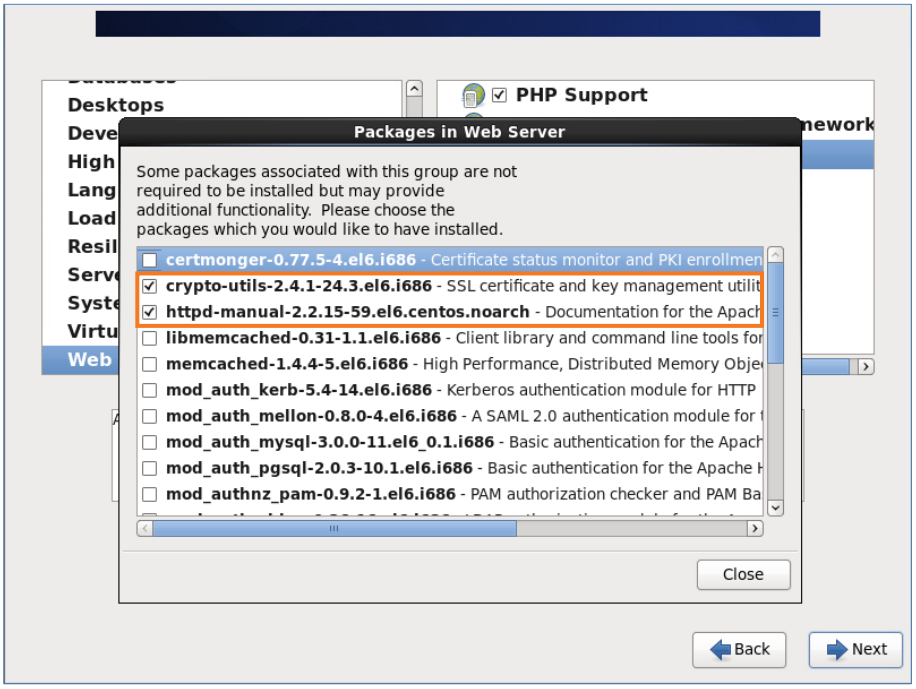
i. Use scroll bar then select needed options then click **Close** button in the popup window.



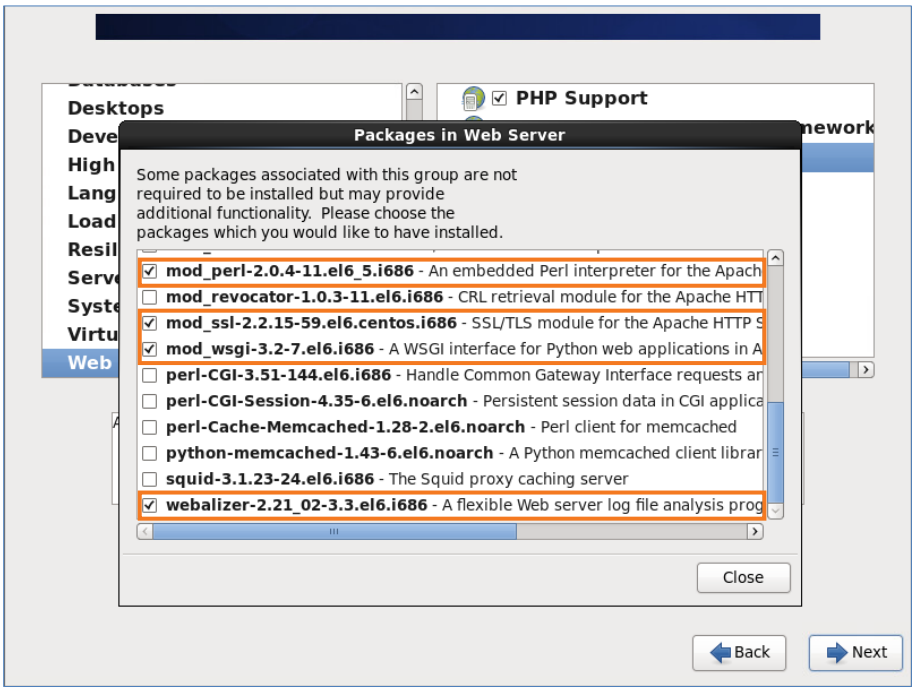
j. Select **Web Services** on the left side and select Web Server on the right side. Select by clicking **Optional packages** button.



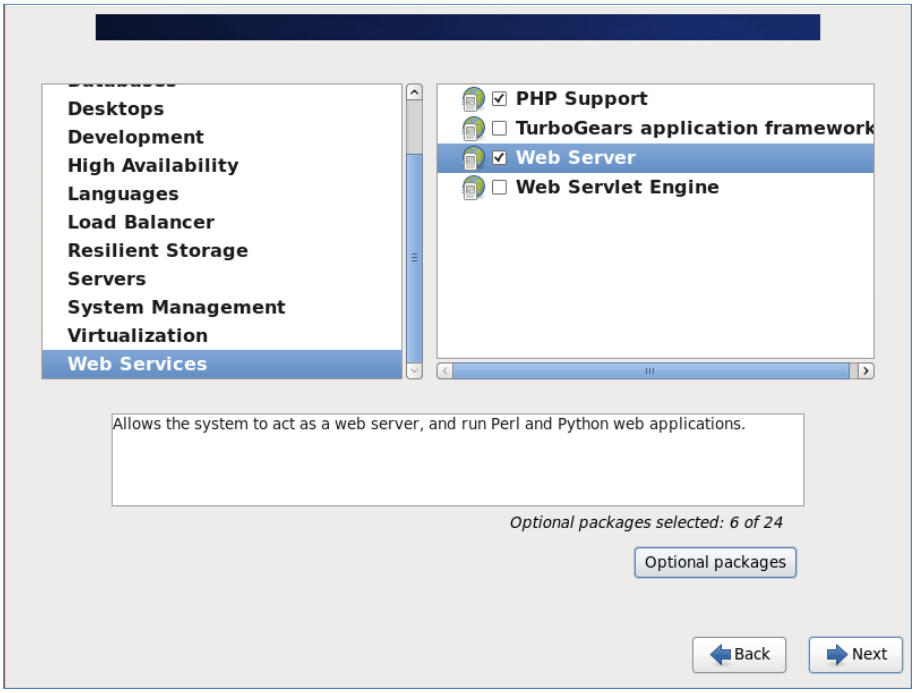
k. Select needed options in Web Server.



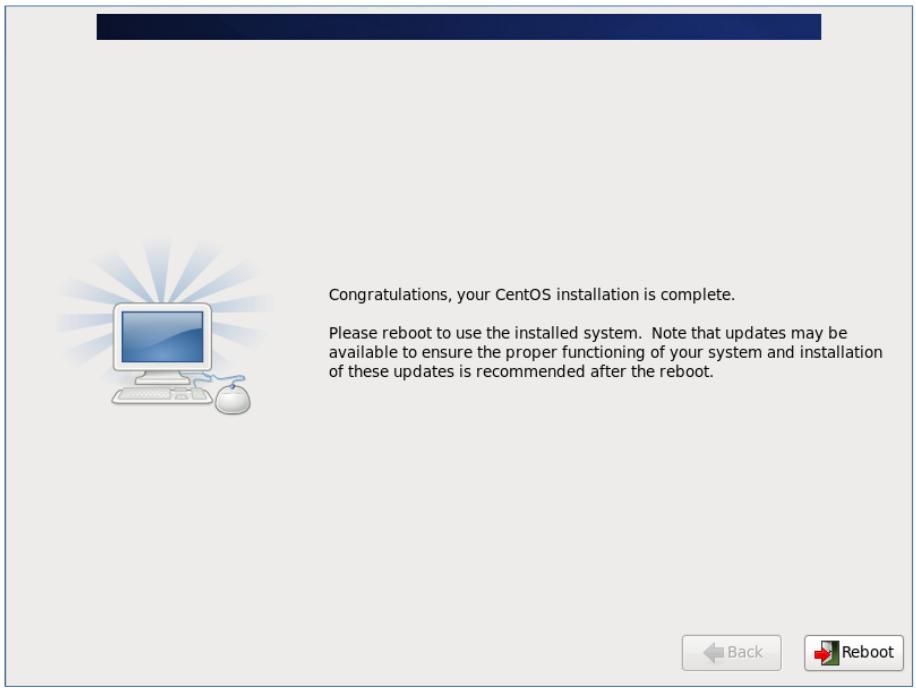
l. Use the scroll bar and select the needed options then click **Close** button in the popup window.



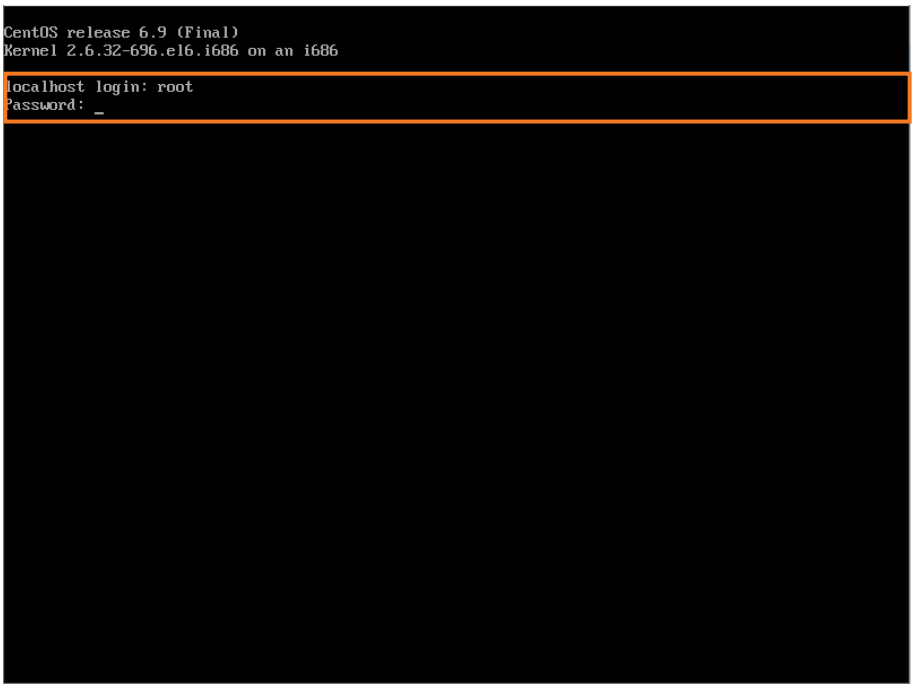
m. After selecting all the needed options in Web Services then click **Next** button.



16. If the installation was successful window as shown below will be displayed. To use the system click **Reboot** button.



17. Login to terminal with the root Identification.



18. To set network configuration, refer to section 2.3 To set network configuration to static for details.

2.2.3 iPECS IPCR application program Installation

Follow the process below to install the iPECS IPCR application program.

1. Login to terminal with the root Identification.

```
[root@localhost ~]# su root
Password
```

   - # su root – Change to root identification
   - Password – Input the password

2. Download the Install file (install_ipcr.tar.gz) to the /root folder in the server. Locate the folder with the file and copy to the /root folder.

```
[root@localhost ~]# cd 'located folder'
[root@localhost ~]# cp install_ipcr.tar.gz /root
```

   - # cd 'located folder' – Change directory to the folder with the file
   - # cp install_ipcr.tar.gz /root – Copy the install_ipcr.tar.gz file to /root

3. In the /root folder, extract the file.

```
[root@localhost ~]# tar xvfzp install_ipcr.tar.gz -C /
```

4. Check the install.sh permission.

```
[root@localhost ~]# ls -al install.sh
```

   - The server response should appear similar to below indicating the insall.sh is available.
   - `-rwxrwxrwx 1 root root 1388 2010-07-21 09:01 install.sh`

5. Install the iPECS IPCR application with the 'install.sh' command.

```
[root@localhost ~]# ./install.sh
```

   Note that If it is failed and cannot create directory error, you can delete the folder use the following command to delete the folder: `rm -rf /usr/furence /usr/local/tomcat7 /var/REC/*`
   And repeat step 3 to install it again.

6. After Installation is complete, the server will reboot.

```
The system is going down for reboot NOW!
```

7. After the reboot, the server *LXprocess* will start the iPECS IPCR application process.
8. Check the iPECS IPCR application status with the below command.

   a. Rec process check.

```
[root@localhost ~]# ps -ef | grep Rec
```

   - **Normal case:** The server should return the message with the PID

```
root     2460     1  2 17:48 ?      00:01:32 ./Rec_Signal.exe
root     2520     1  4 17:48 ?      00:02:32 ./RecSee_RTP.exe
root    23589  3046  0 18:51 pts/0   00:00:00 grep Rec
```

   - **Abnormal case:** Note a single line response as below is abnormal.

```
root     9519  9484  0 13:48 pts/1   00:00:00 grep Rec
```

b. RV process check.

```
[root@localhost ~]# ps -ef | grep RV
```

- Normal case: The server should return the message with the PID

```
root     2628    1  0 17:48 ?      00:00:15 ./RVModule
root    24784  3046  0 18:55 pts/0   00:00:00 grep RV
```

- **Abnormal case:** Note a single line response as below is abnormal.

```
root     9519  9484  0 13:48 pts/1   00:00:00 grep RV
```

c. DBGw process check.

```
[root@localhost ~]# ps -ef | grep DBGw
```

- **Normal case:** The server should return the message with the PID

```
root     2628    1  0 17:48 ?      00:00:15 ./DBGw.exe
root    24784  3046  0 18:55 pts/0   00:00:00 grep DBGw
```

- **Abnormal case:** Note a single line response as below is abnormal.

```
root     9519  9484  0 13:48 pts/1   00:00:00 grep DBGw
```

9. If the iPECS IPCR application is not running.

a. Execute the LXprocess start command to start the LXprocess.

```
[root@localhost ~]# cd /usr/furence/IPCR3.0/exe/LXprocess
[root@localhost ~]# ./LXP_START.sh
[root@localhost ~]# ps -ef | grep LX
```

- # cd /usr/furence/IPCR3.0/exe/LXprocess – Change directory to the folder with the LXprocess executable file.
- # ./LXP_START.sh – Command to start the LXprocess.
- # .ps -ef | grep LX – Command to check the status of LXprocess

b. LXprocess is running, the server should return the message with the PID. After then the IPCR application will restart automatically.

```
root    27963    1  0 19:04 pts/0   00:00:02 ./LXprocess
root    29734  3046  0 19:10 pts/0   00:00:00 grep LX
```

10. If LXprocess is running but the iPECS IPCR application is not properly executed.

a. Verify the permission to run the iPECS IPCR application.

```
[root@localhost ~]# cd /usr/furence/IPCR3.0/exe
[root@localhost ~]# chmod 755 backup DBGw.exe FTPTransfer MIG.exe Rec* RVModule
```

- # ls -al – Command to determine the iPECS IPCR application status.
- # chmod 755 backup DBGw.exe FTPTransfer MIG.exe Rec* RVModule – Change the

permission to execute IPCR application.

- The server response should appear indicating the IPCR application is available.
- -rwxr-xr-x 1 root root 3184807 2010-09-08 17:17 'Process Name'
- * Process Name : backup, DBGw.exe, FTPTransfer, MIG.exe, RecSee_RTP, Rec_Signal, RVModule

b. After then the iPECS IPCR application will restart automatically.

2.3 To set network configuration to static

This section guides you on how to set up an IPCR server with a static IP. Look at the manual for Centos version 7.3 or 6.9 and set it.

2.3.1 To set network configuration to static in centos7.3 64bit

The IPCR server only supports the network interface name of eth0.

1. Edit file /etc/default/grub through Terminal in IPCR server to set Network device name.

```
# vi /etc/default/grub
```

2. Add net.ifnames=0 biosdevname=0 to line GRUB_CMDLINE_LINUX.

```
GRUB_TIMEOUT=5
GRUB_DISTRIBUTOR="$(sed 's, release .*$,,g' /etc/system-release)"
GRUB_DEFAULT=saved
GRUB_DISABLE_SUBMENU=true
GRUB_TERMINAL_OUTPUT="console"
GRUB_CMDLINE_LINUX="crashkernel=auto rd.lvm.lv=IPCR/root rd.lvm.lv=IPCR/swap rhgb quiet net.ifnames=0 biosdevname=0"
GRUB_DISABLE_RECOVERY="true"
```

3. Execute a command through Terminal in IPCR server to set Network device name.

```
# grub2-mkconfig -o /boot/grub2/grub.cfg
```

4. Edit ifcfg file name.

```
# mv /etc/sysconfig/network-scripts/ifcfg-network_interface_name
/etc/sysconfig/network-scripts/ifcfg-eth0
```

5. Edit NAME, DEVICE parameters and IP address in ifcfg file to new Network Interface name.

```
# vi /etc/sysconfig/network-scripts/ifcfg-eth0
```

6. You can see the setting picture like this.

```
TYPE=Ethernet
BOOTPROTO=static
DEFROUTE=yes
PEERDNS=yes
PEERROUTES=yes
IPV4_FAILURE_FATAL=no
IPV6INIT=no
IPV6_AUTOCONF=no
IPV6_DEFROUTE=no
IPV6_PEERDNS=no
IPV6_PEERROUTES=no
IPV6_FAILURE_FATAL=no
IPV6_ADDR_GEN_MODE=stable-privacy
NAME=eth0
UUID=03b46f1a-e766-4ace-bdc5-79e16bc0464f
DEVICE=eth0
ONBOOT=yes
IPADDR=124.46.120.105
NETMASK=255.255.255.0
GATEWAY=124.46.120.254
DNS1=8.8.8.8
```

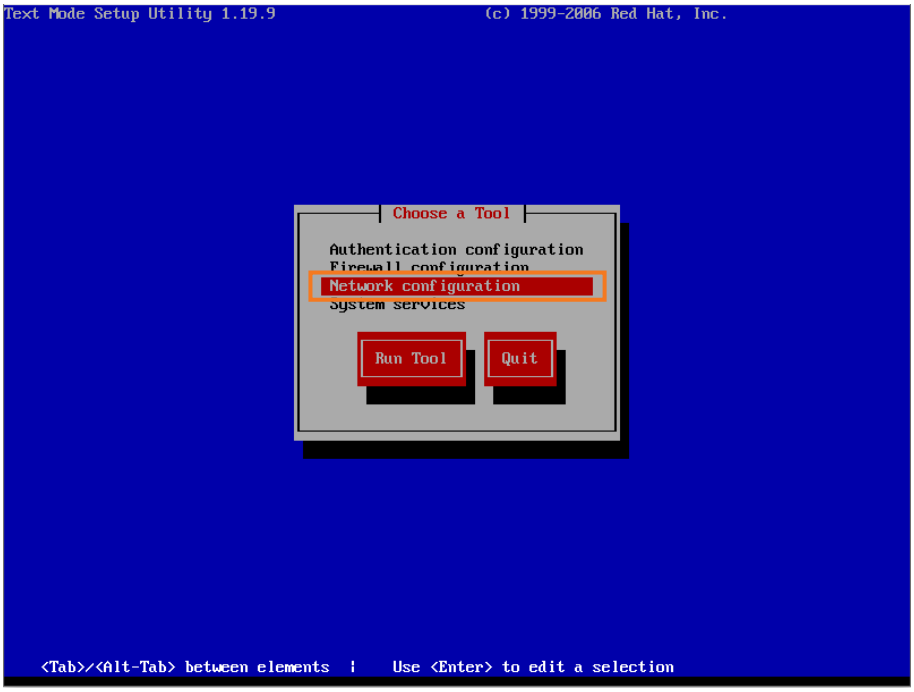
7. Modify IPADDR, NETMASK, and GATEWAY information according to the network environment you want to use.
8. Set BOOTPROTO to static to assign to static IP.
9. The HWADDR information should be annotated.
10. Execute a :wq! command to save the file.
11. Reboot the server.

2.3.2 To set network configuration to static in CentOS 6.9 32bit

1. Execute the **setup** command to begin the configuration.

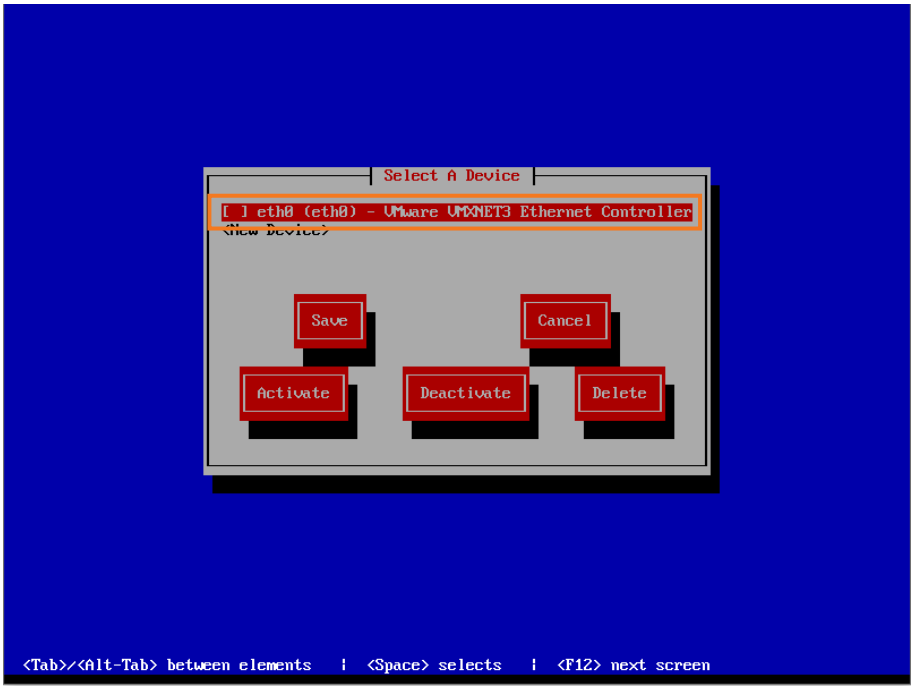
```
[root@localhost ~]# setup
```

2. Select the **Network configuration**.

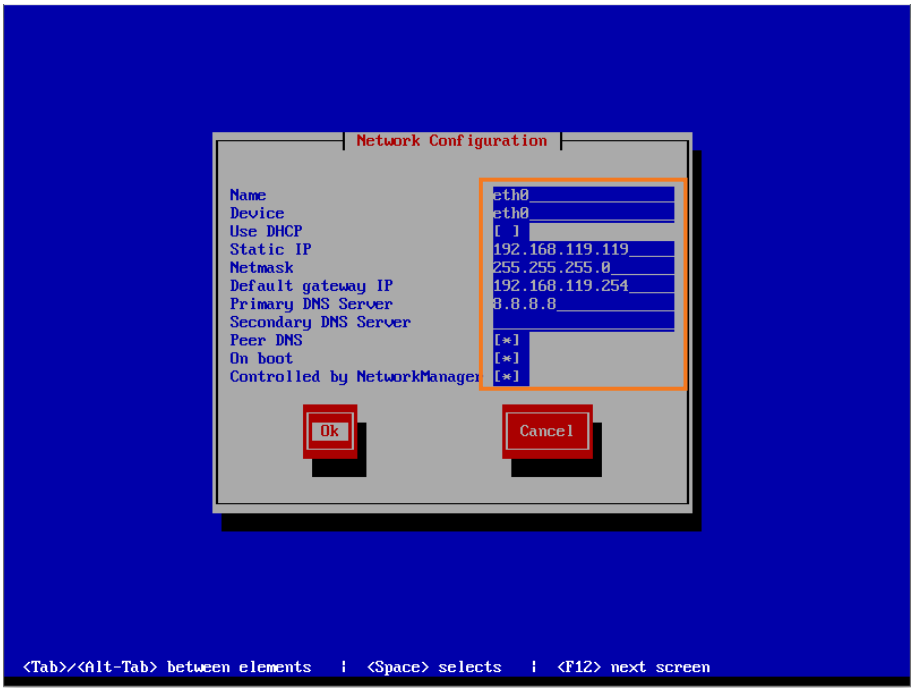


3. Select the **Device configuration.**

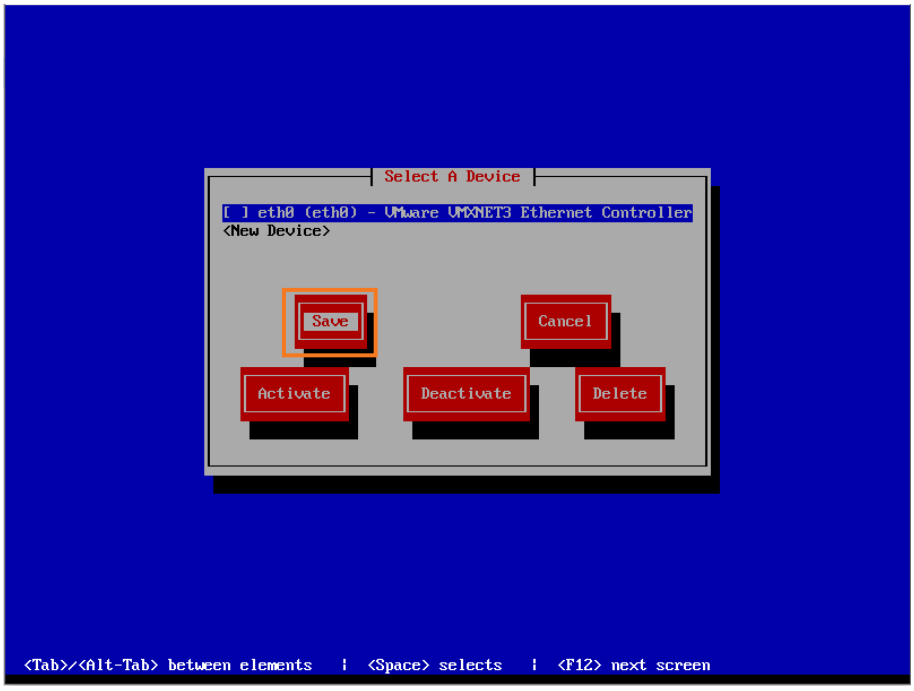
4. Select the **'eth0 (eth0) – Advanced Micro Devices, ~'.**



5. Fill the **Network configuration** then click **OK** button.

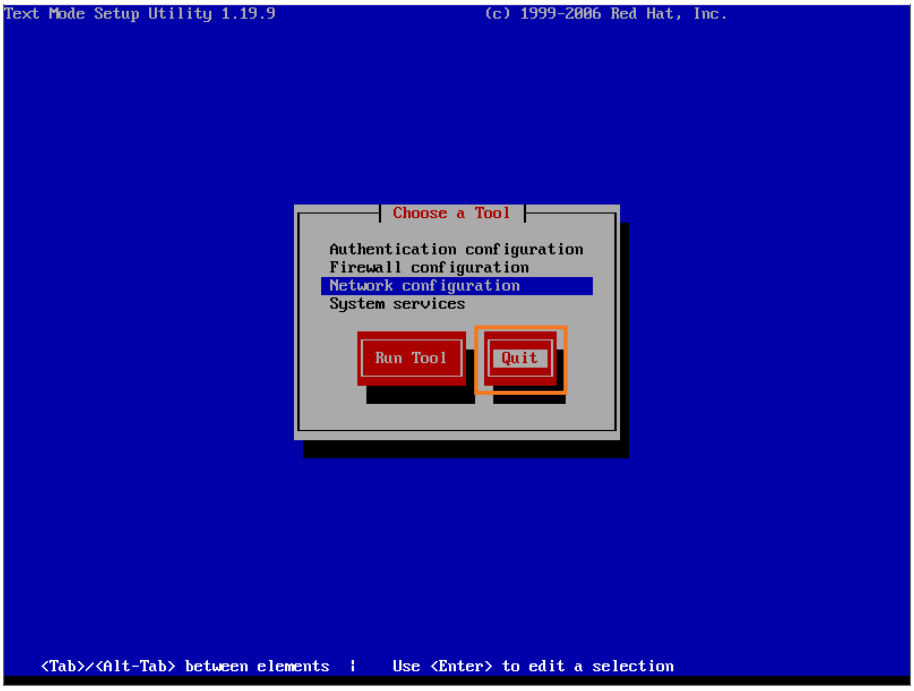


6. Click **Save** button to save the configuration.

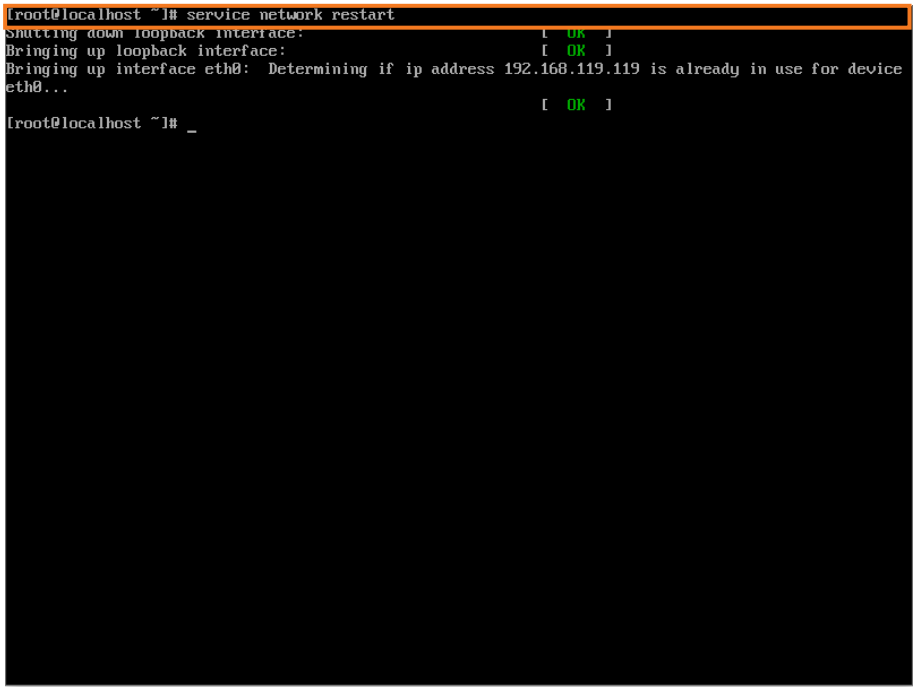


7. Click **Save&Quit** button.

8. Click **Quit** button.



9. Restart the network service.



2.4 Executing IPCR Process

The IPCR process can be executed in the following ways.

1. Login to the terminal with the root account.
2. First execute LXprocess.

```
[root@localhost ~]# cd /usr/furence/IPCR3.0/exe/LXprocess
[root@localhost ~]# ./LXP_START.sh
```

   - # cd /usr/furence/IPCR3.0/exe/LXprocess – Move to the path where the LXprocess executable file is located.
   - # ./LXP_START – Run script file to drive LXprocess.

3. IPCRs automatically execute in a short time when LXprocess is executed.

2.5 Terminate IPCR Process

1. Login to the terminal with the root account.
2. Close LXprocess first.

```
[root@localhost ~]# cd /usr/furence/IPCR3.0/exe/LXprocess
[root@localhost ~]# ./LXP_STOP.sh
```

   - # cd /usr/furence/IPCR3.0/exe/LXprocess – Move to the path where the LXprocess executable file is located.
   - # ./LXP_STOP.sh –Execute script file ending LXprocess.

3. Stop the IPCR engine

```
[root@localhost ~]# cd /usr/furence/IPCR3.0/exe
[root@localhost ~]# ./REC_STOP.sh
```

   - # cd /usr/furence/IPCR3.0/exe – Move to the path where the IPCR executable file is located.
   - t# ./REC_STOP.sh – Run a script file that terminates the IPCR process.

Chapter 3.

iPECS System Configuration

Prior to starting the iPECS IPCR server, it is recommended that the iPECS system platform be configured. Configuration of the iPECS system for operation with iPECS IPCR server follow the procedure for each system described in the below section.

- How to set up the iPECS UCP/eMG system, refer to section 3.1 iPECS UCP/eMG .
- How to set up the iPECS CM system, refer to section 3.2 iPECS CM .

3.1 iPECS UCP/eMG

This section describes how to set up the iPECS UCP/eMG to enable iPECS IPCR.

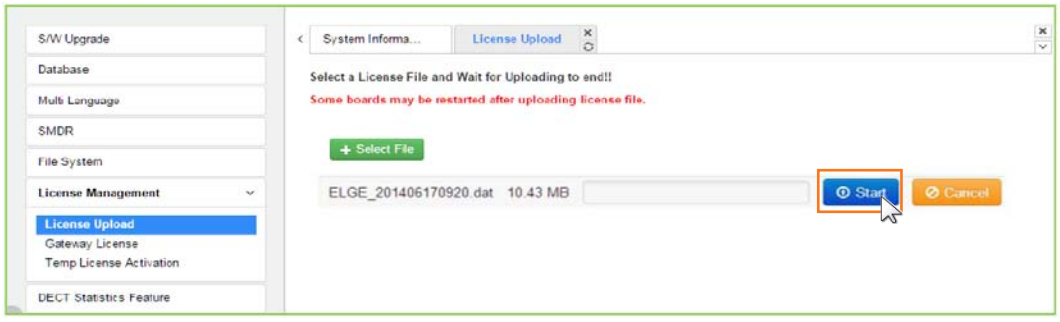
3.1.1 Unlock up to number of iPECS IPCR server and Agent ID

Unlock (license) codes for the iPECS UCP permit operation with up to ten (10) Call recording servers simultaneously.

In addition, the codes define the number of iPECS IPCR servers, recording Agents available and SIP Phone. iPECS IPCR server needs at least one (1) copy, and SIP phone unlocks key needs only one (1) copy for an iPECS IPCR.

In the iPECS UCP web admin page:

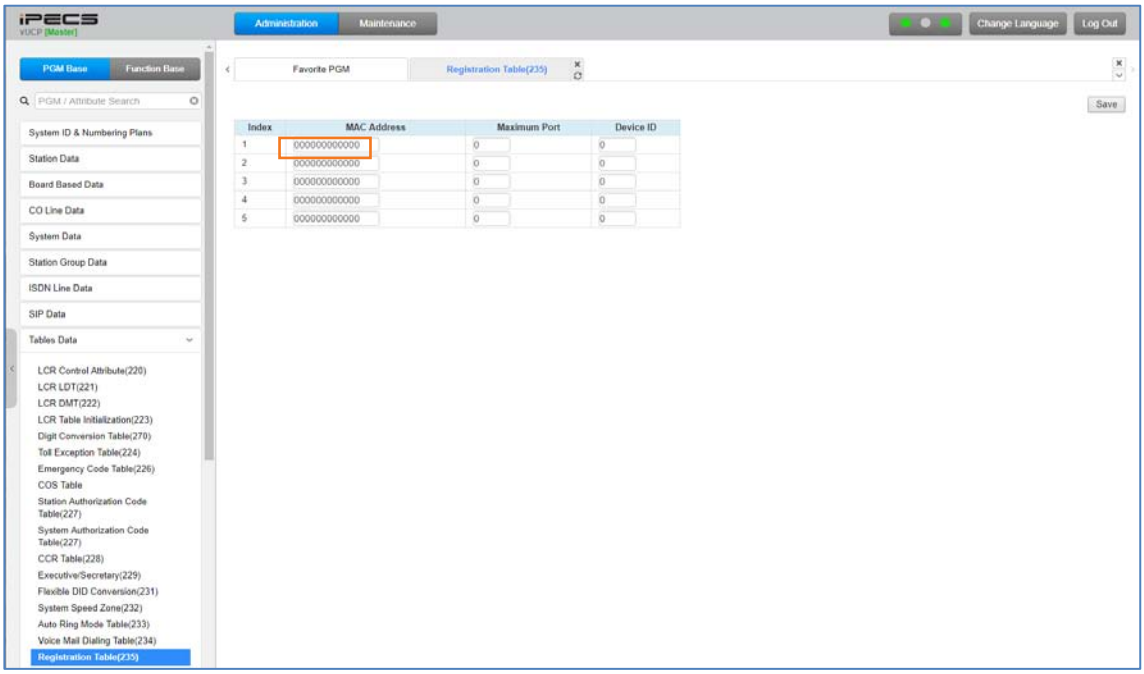
- Click the **'System Management'** tab.
- Click **License Management** to select sub menu.
- Click **License Upload**. The upload the Key code provided from your local Ericsson-LG Enterprise representative.
- And then click **Start** (Start) button.



3.1.2 iPECS IPCR Server MAC Address

The iPECS IPCR server can be registered with the iPECS host either employing the automatic registration method (Dipswitch 3 set to 'On') or using the MAC address registration.

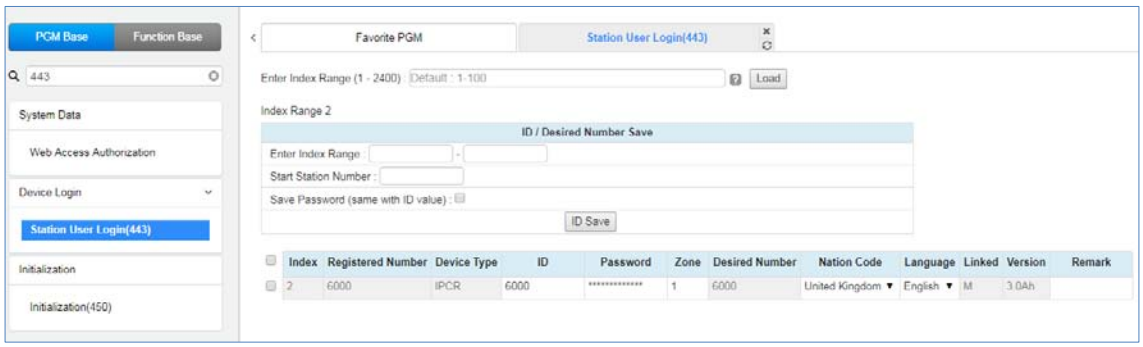
For MAC address registration, assign the MAC address and number of Agents for the iPECS IPCR server in the Registration Table (PGM 235).



3.1.3 Station User Login

After the iPECS IPCR server registers with the iPECS host using either the MAC or automatic registration method, the iPECS IPCR server will login for service.

The iPECS IPCR server will send the SIP ID and password to the iPECS system. The iPECS system will then populate the Station User Login (PGM 443) with the received credentials and assign the next available station number to the iPECS IPCR server.



NOTE For PGM (443) ID and password, please enter the SIP ID and Password to be used in iPECS IPCR.

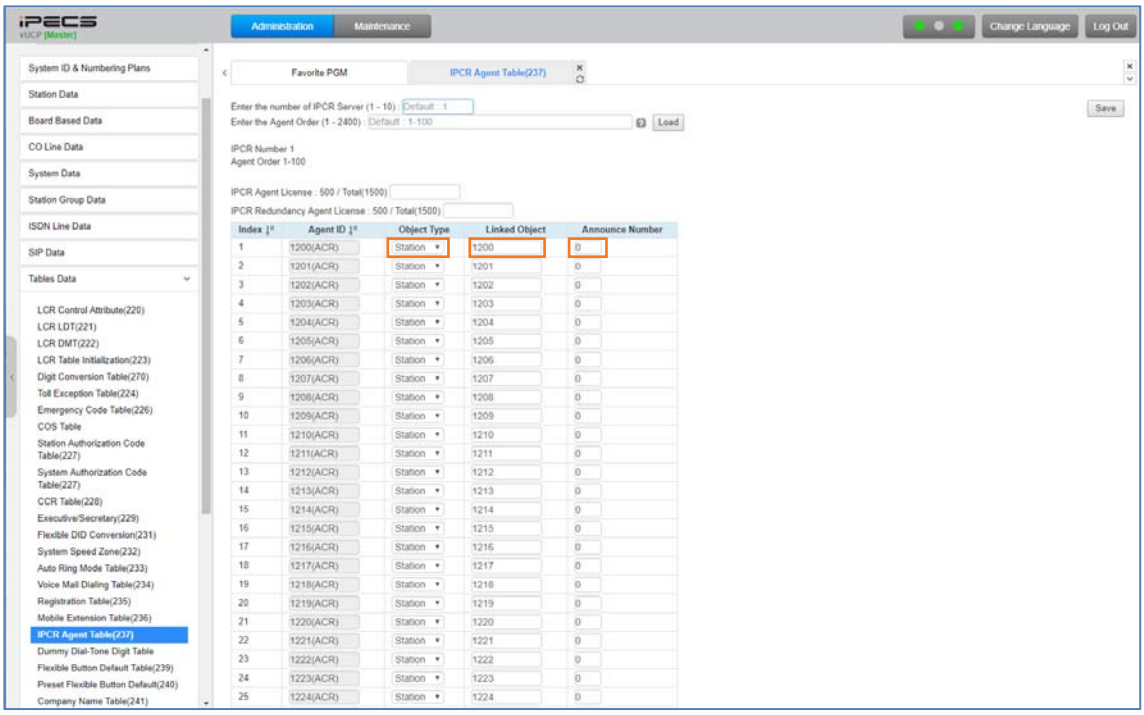
3.1.4 iPECS IPCR Agent ID Table

Prior to programming the Agent Table, the iPECS IPCR server must be registered with the iPECS UCP and the iPECS IPCR server must be logged into the iPECS UCP.

In addition, the iPECS IPCR Channel registration may be configured to assign agents to channels in the iPECS IPCR server.

Each Agent is linked to an iPECS UCP object (a Station) in the iPECS IPCR Agent Table (PGM 237).

The Agent table indicates the number of agents associated with a specific iPECS IPCR server, the Agent Id, and the linked object information.



3.1.5 iPECS IPCR SIP Station Registration

The iPECS IPCR server interfaces to the iPECS UCP as a single SIP Phone. Registration between the iPECS IPCR server and UCP is automatic once both are configured.

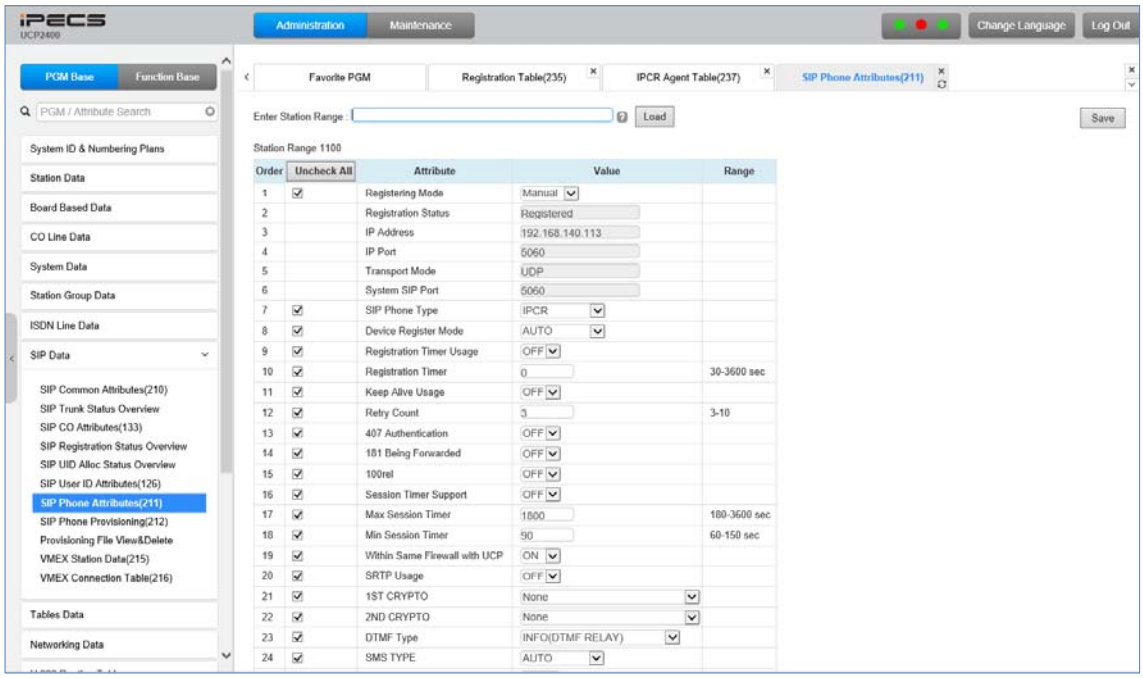
Under the SIP Phone Attributes, the Registration Mode must be set to Manual and the SRTP Usage, and 1st and 2nd encryption mode can be configured.

The encryption algorithm can be selected as AES or, for Korea, ARIA. The remaining SIP Phone Attributes are not used for the iPECS IPCR server.

Prior to programming the Agent Table, the IPCR server must be registered with the iPECS LIK/UCP and the iPECS IPCR application must be logged into the iPECS UCP. Refer to section 6.6.2 PBX Registration for details.

The station number of the iPECS IPCR server can be verified in Station User Login (PGM 443)

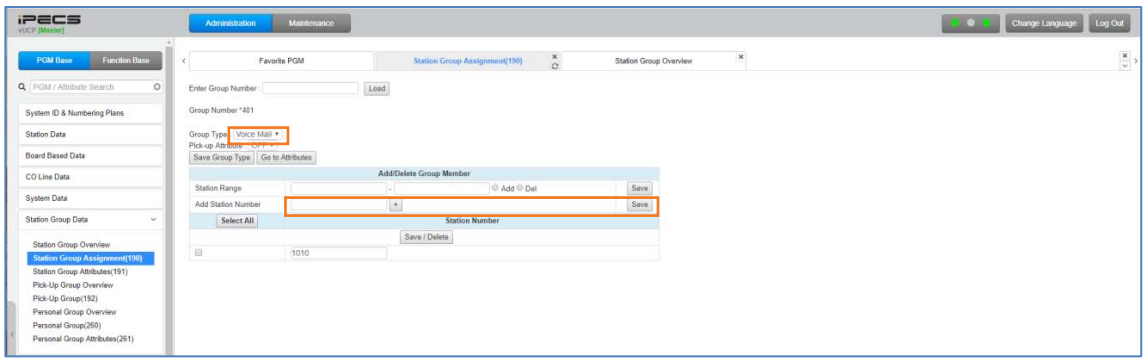
after registration and login.



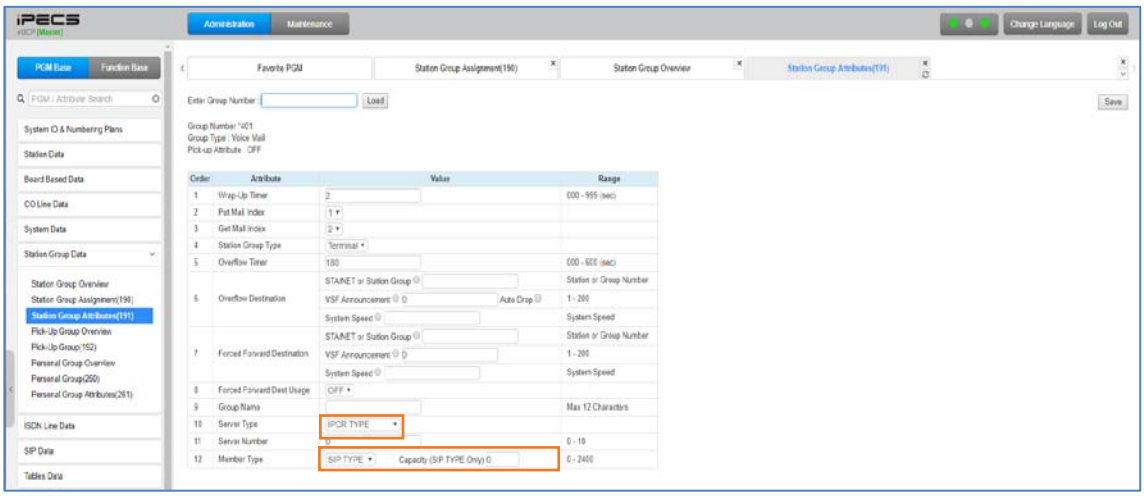
3.1.6 VM Group Configuration for iPECS IPCR Server

The Station associated with each IPCR server must be assigned to an External Voice Mail Group.

The station number of the iPECS IPCR server is determined by the order of registration with the host system and the desired station number if requested in the Station User Login (PGM 443) and available.



Click **Go to Attributes** (Go to Attributes) button to open the Station Number Attributes (PGM 191) tab, and then continue the VM Group Configuration for iPECS IPCR server.



However, verify the station number assigned in PGM 443 before configuring the VM Group.

NOTE If it is not assigned well, you can set iPECS IPCR type and SIP for member in ADM 191.

3.1.7 Automatic Station Recording & Destination

The Auto Recording Option and Destination must be defined for Stations linked to an Agent in the iPECS IPCR Agent Table.

The Auto Record Option enables recording and the Destination defines the Voice Mail Group of the associated Call Recording server.

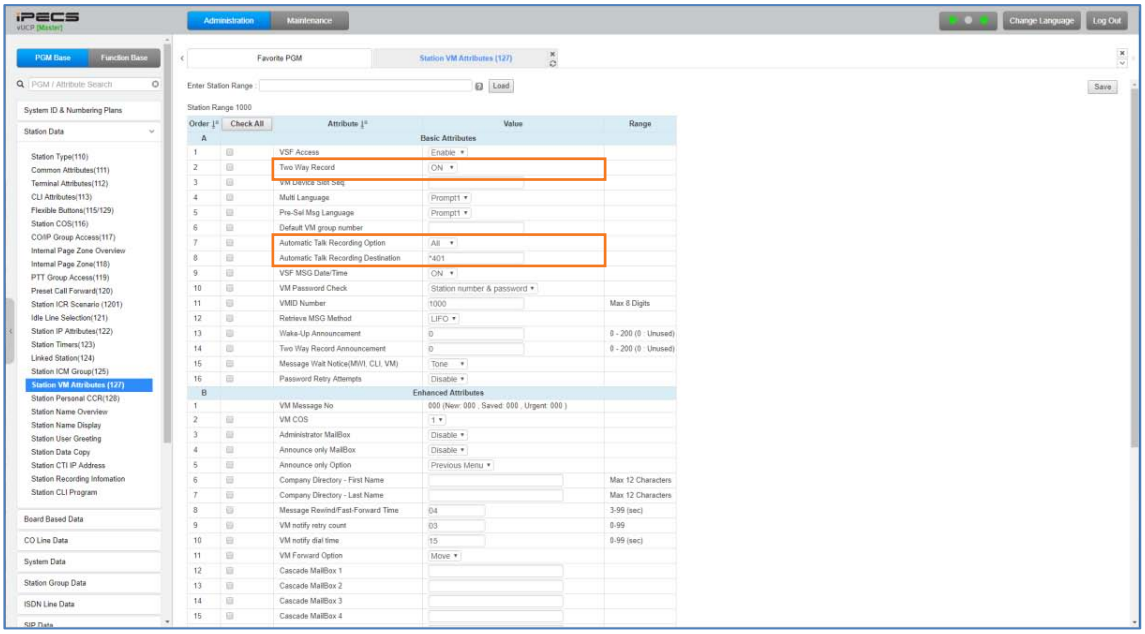
The station number assigned Agent ID is automatically ON 58th item (Automatic Talk Recording Option: 'ON').

In the iPECS UCP/eMG web admin page:

- Click the **'Administration'** menu.
- Click **Station Data** to select sub menu.
- Click **Station VM Attributes** to display setting page.
  - Click the '**Enter Station Range'** input field to enter number then click **Load** (Load) button.
  - Click the checkbox to enable the Auto Record Option.
  - Click the checkbox to enter the destination iPECS IPCR server Voice Mail Group number.
- And then click **Save** (Save) button.

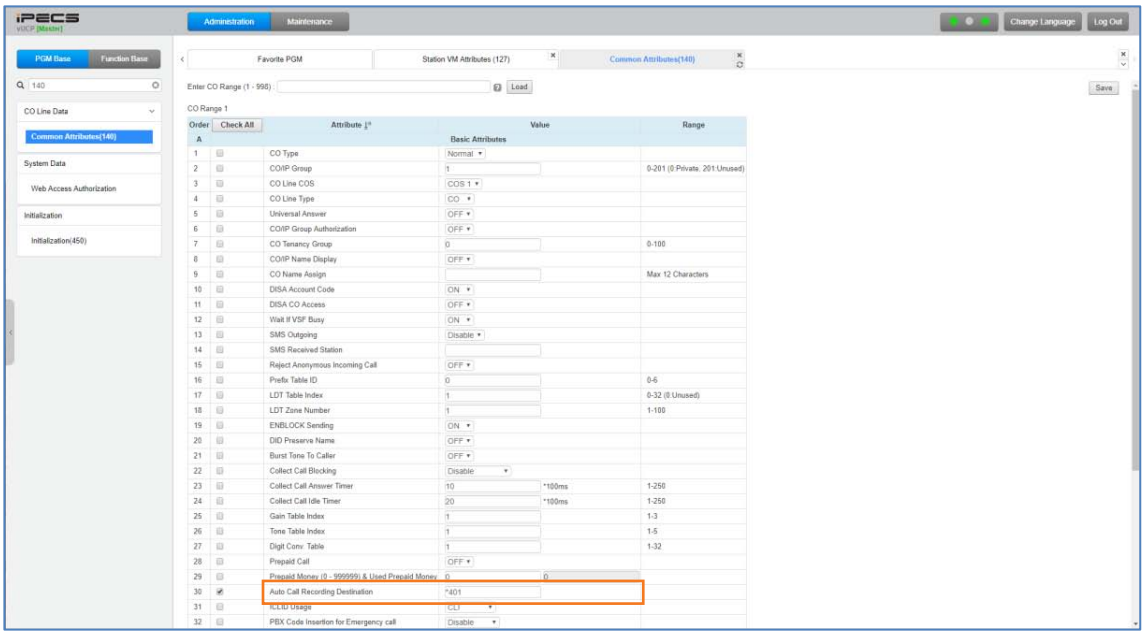
3.1.7.1 Station Recording

In case of the linked object is Station, it should be set as below.



3.1.7.2 CO Recording

In case of the linked object is CO, it should be set as below.



3.1.8 Trace and Monitoring

1. If there are some problems, you can trace it as below in MFIM.

```
mon> t s call
mon> t s rawdata
mon> t s debug(there is no agent Id in ADM 237)
mon> t b 5 ( if 5 is slot of IPCR server, server cannot register system)
mon> t s fsipm( if SIP phone of IPCR cannot register to System LIK)
mon> t v


..
mon> x
..
```

2. You can capture ethereal packets between iPECS IPCR and iPECS UCP/eMG system if there is no recorded file in the iPECS IPCR.

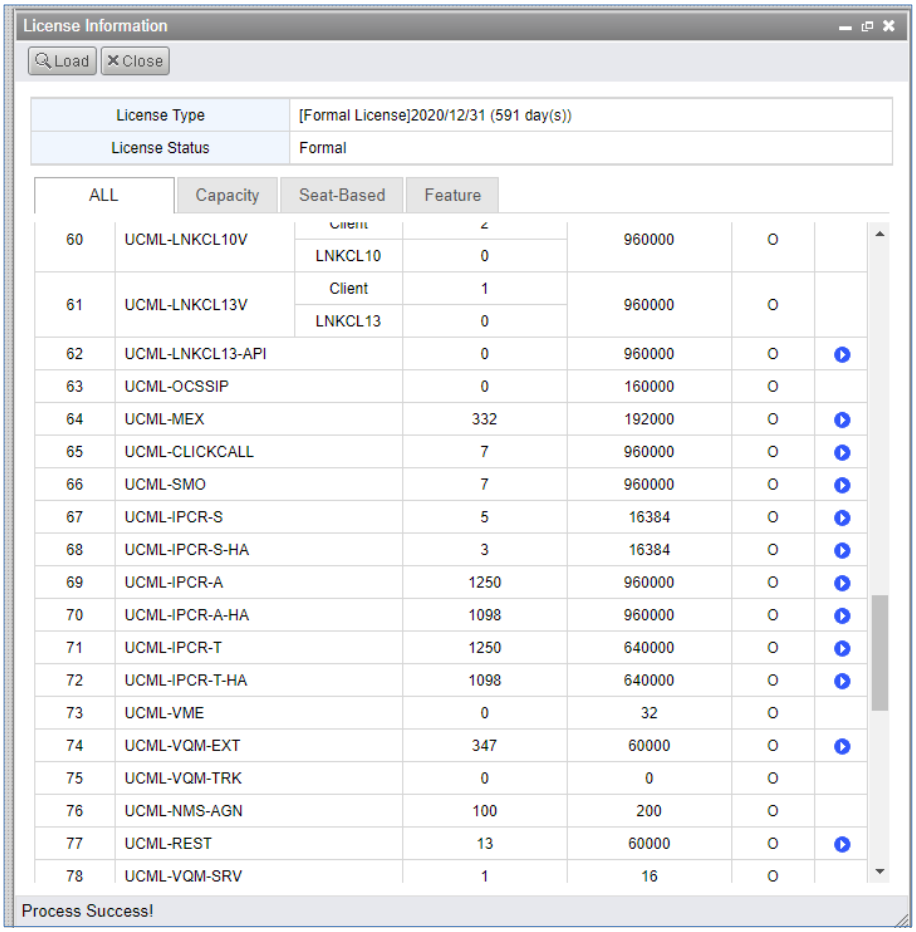
3.2 iPECS CM

This section describes how to set up iPECS CM so that iPECS IPCR works.

3.2.1 Unlock up to number of iPECS IPCR server and Agent ID

Lock key of iPECS IPCR should be unlocked up to number of server and Agent ID. Server can be register up to 5. And so, the servers can unlock up to 30000.

Note that the Agent can be register up to System station number, and it is depending on the system capacity.

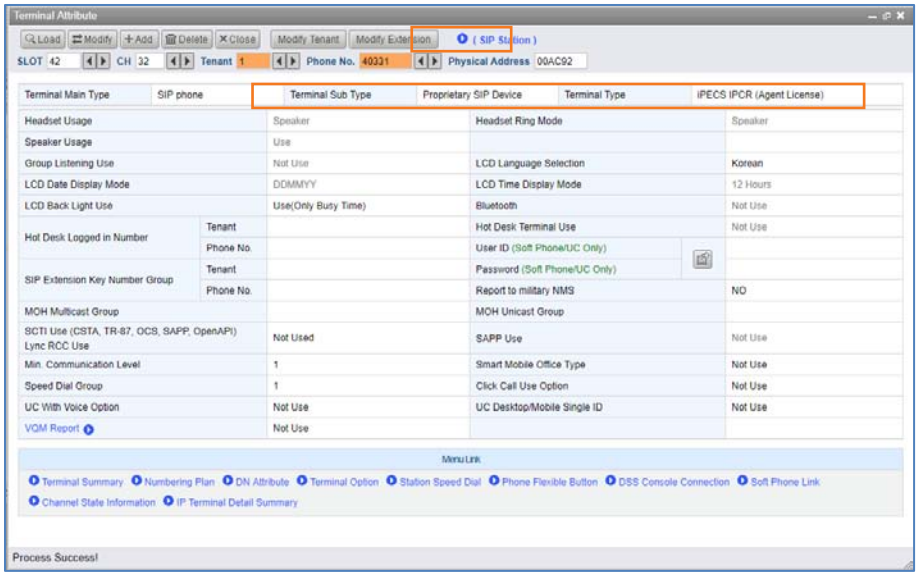


3.2.2 iPECS IPCR Agent ID

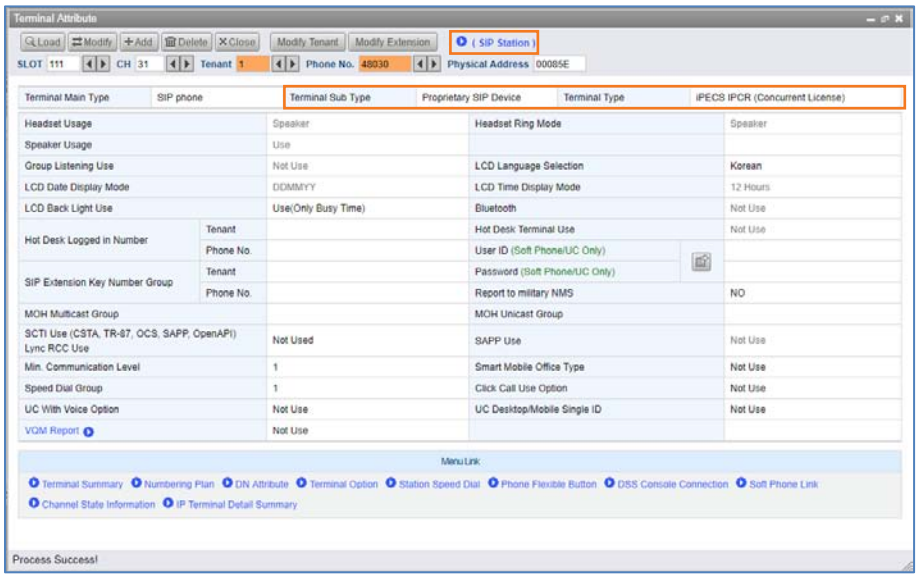
Agent ID should be matched with a station number that wants to be recorded.

3.2.3 iPECS IPCR SIP Station Registration

1. iPECS IPCR's SIP station should be register through iPECS IPCR server process of registration.
2. Change the terminal type according to the license.
   a. Agent license should be set as below.

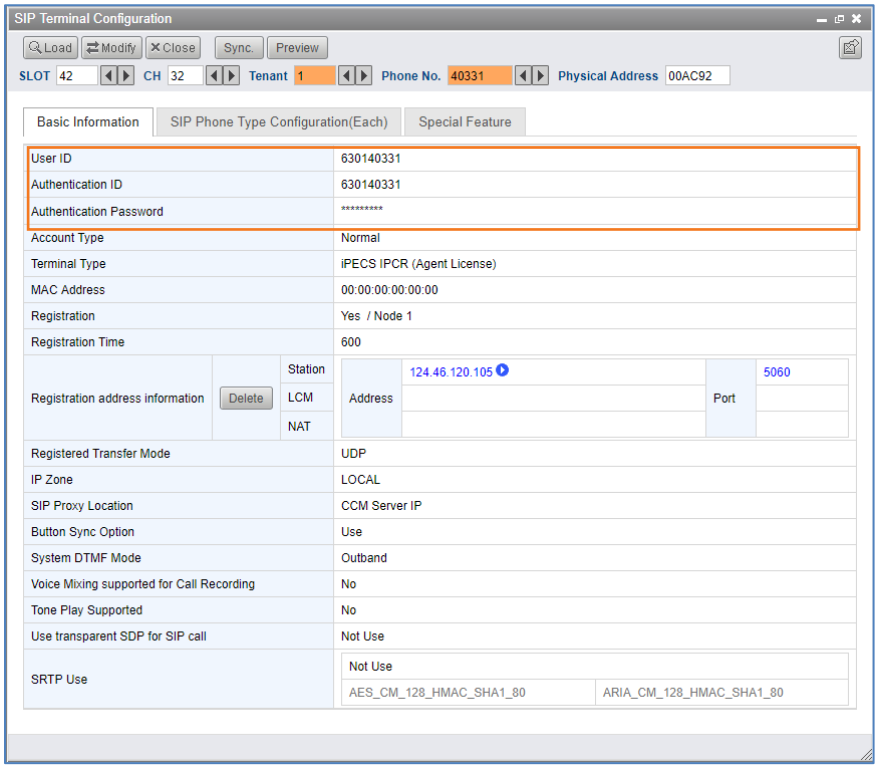


   b. Concurrent license should be set as below.

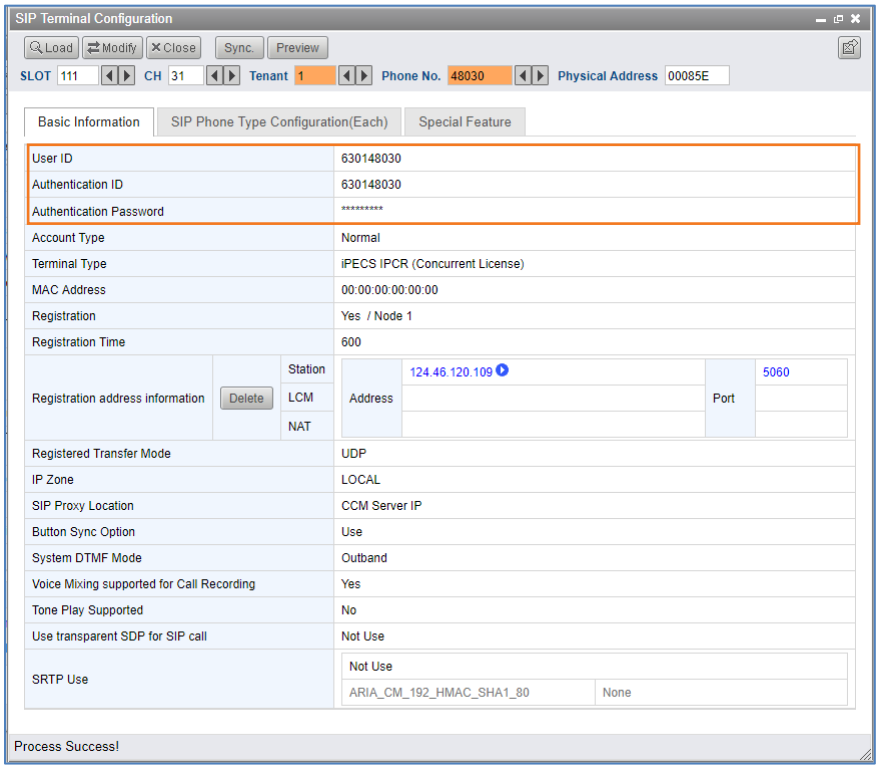


3. And set SIP user ID with tenant prefix number and make empty auth ID and password.

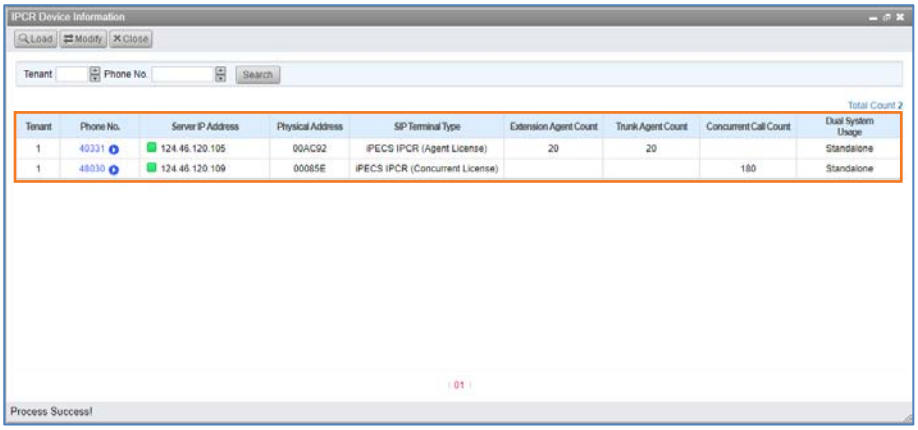
   a. Agent license should be set as below.



   b. Concurrent license should be set as below.



4. If a SIP is assigned to 'Proprietary SIP Device', then you can see the iPECS IPCR Device Information.



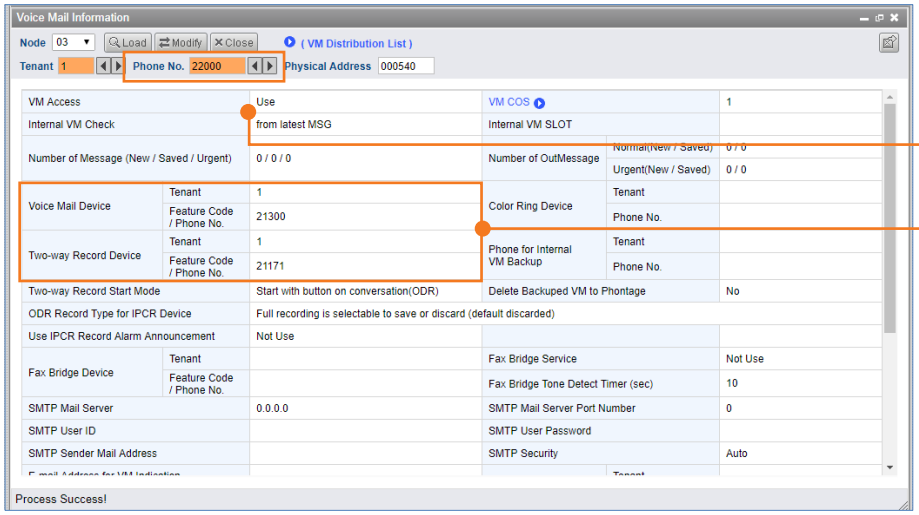
5. You should set IP address of iPECS IPCR and the number of agent count. Agent count is restricted in license. Also, if the iPECS IPCR is completely registered to iPECS-CM, you can verify that the Terminal Type of the SIP Station is set to the iPECS IPCR.

3.2.4 VM Group Configuration for iPECS IPCR Server

Please note that you do not need to program about this. iPECS CM uses a different mechanism.

3.2.5 Automatic Station Recording & Destination

An agent ID in iPECS IPCR means a station number which has to be programmed to record its voice. So, If Agent ID information is sent to iPECS-CM from iPECS IPCR.



- The **Two-way record Device information** is automatically set with iPECS IPCR SIP number on the agent ID number's DN Voice Mail Information Attribute in WMS
- And also the **Two-way record start mode** is automatically set according to the Agent ID recording type of IPCR.

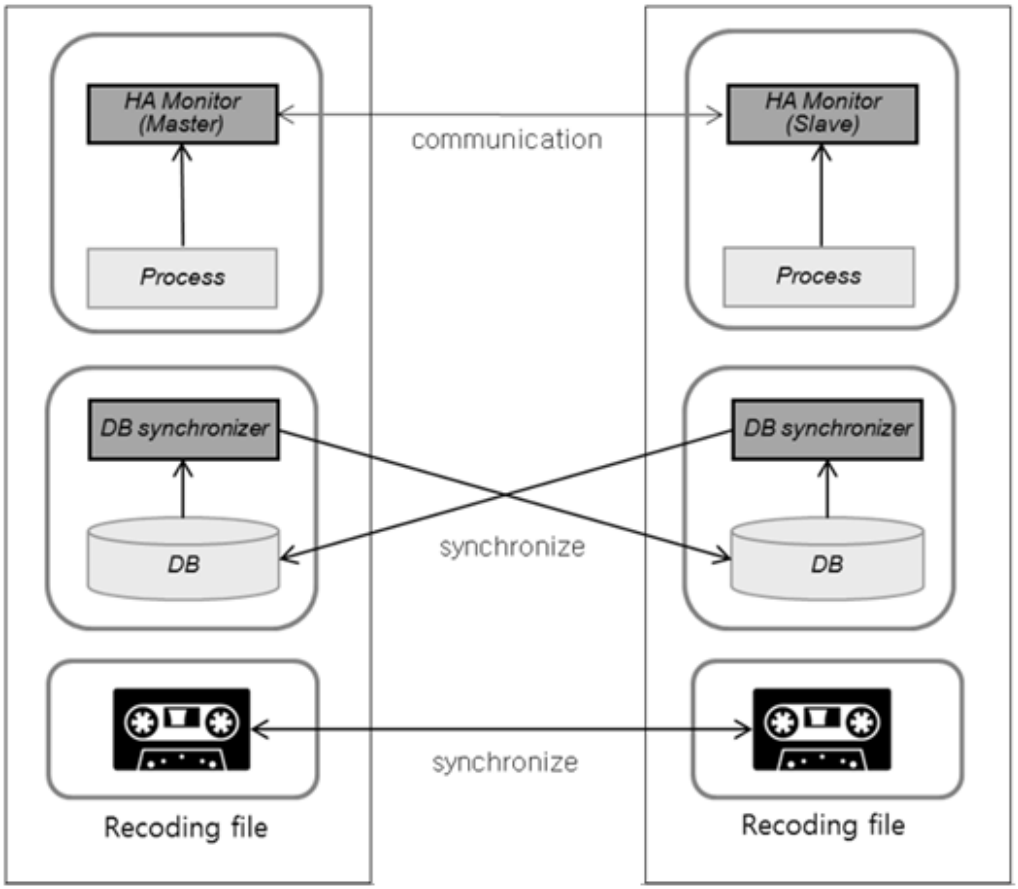
Chapter 4.

iPECS IPCR server HA (High Availability)

High Availability, or HA as it is abbreviated, refers to the availability of resources in the iPECS IPCR server, in the wake of component failures in the iPECS IPCR server. This can be achieved in a redundant server to ensure availability. For this reason, the iPECS IPCR can work continuously even if it might have problems.

4.1 System Configuration

The iPECS IPCR continues to work on the standby server when there is a problem with a process or network on the active server. The iPECS IPCR uses only eth0 network device to check server status and provide redundancy services.

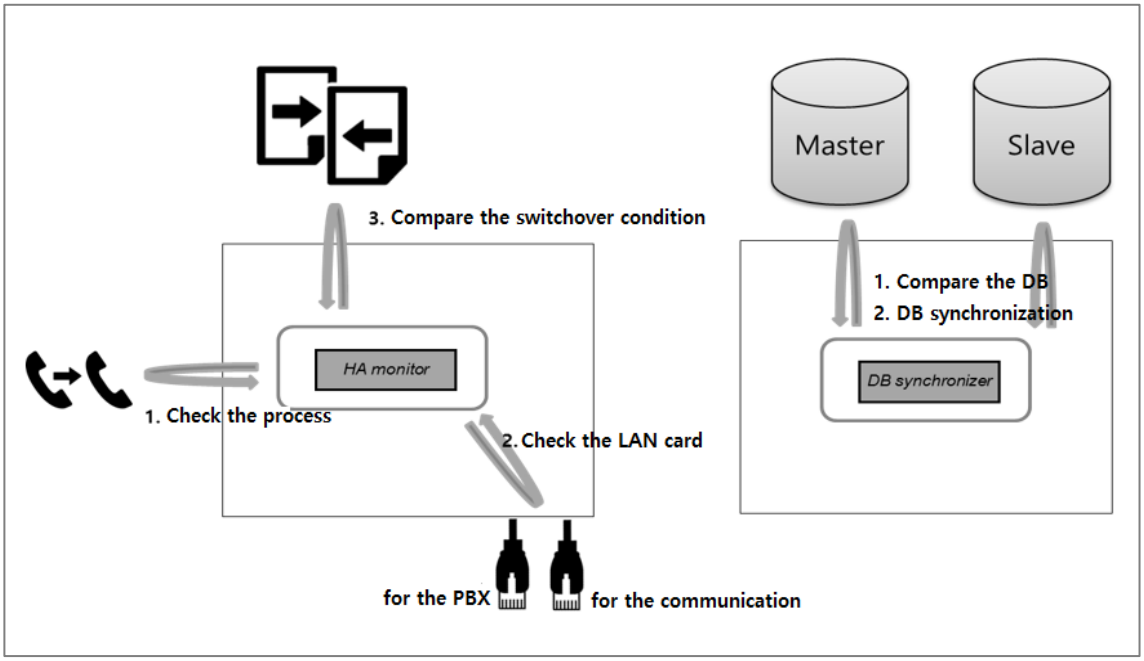


NOTE iPECS IPCR HA is supported on Unified(UCP, eMG) 3.5.21, UCM 3.0 and higher.

4.2 Data Synchronization

The synchronization part of the iPECS IPCR HA system is divided into two parts.

- **Database:** The DB synchronizer module executes an unexecuted query by iteratively comparing its DB and its counterpart DB.
- **Recording File:** The two servers monitor the folders where the recording files are stored and perform a copy operation when a newly created recording file exists.



4.3 HA Module Set up

In order to run the High Availability module, you need to respectively set the '.ini' file in the Active and Standby server according to your environment. Configuration of the iPECS IPCR server follow the procedure for each server described in the below section.

- How to set .ini file on Active server, refer to section 4.4.1 HA Module set up in Active Server.
- How to set .ini file on Standby server, refer to section 4.4.2 HA Module set up in Standby Server.

4.3.1 HA Module set up in Active Server

1. Execute a command thought Terminal in Active server to set HA module.

```
# vi /usr/furence/IPCR3.0/HA/ini/config.ini
```

2. You can see the setting picture like this.

```
[LOG]
;log file path
PATH=/usr/furence/bin/log/HA.log

;log file deletion cycle
PURGEAGE=3 months

[PROCESS_CHECK]
;the number of process to monitor
PROCESS_NUM = 5

;switchover condition
;1: switchover even if only one to monitor is dead
;2: switchover if all processes to monitor are dead
OBSERVATION_MODE=1

;the path of the process to monitor
PROCESS_PATH1=/usr/furence/IPCR3.0/exe/DBGw.exe
PROCESS_PATH2=/usr/furence/IPCR3.0/exe/Rec_Signal.exe
PROCESS_PATH3=/usr/furence/IPCR3.0/exe/RecSee_RTP.exe
PROCESS_PATH4=/usr/furence/IPCR3.0/exe/RVModule
PROCESS_PATH5=/usr/furence/IPCR3.0/exe/FTPTransfer

;cycle to check whether the process to monitor is running.  (Sec)
PROCESS_CHECK_CYCLE = 5
```

```
[AGENT]
;mode selection
;1: active mode
;2: standby mode
MODE=1

;current server IP address
THIS_SERVER_IP = 192.168.0.51

;current server gateway address
GATEWAY_IP = 192.168.0.1

;current server port (port to receive packets from the other party HA)
HEART_BEAT_RECEIVE_PORT = 7777

;cycle of the heartbeat signal (Sec)
HEART_BEAT_INTERVAL = 5

;the maximum heartbeat signal listening time for switchover.
;If the heartbeat signal is not received within setting time, switchover
MAX_HEART_BEAT_RECEIING_TIME =15

;the other server IP address
PARTNER_IP= 192.168.0.52

;the other server port (port of the other party HA to receive packets.)
PARTNER_HEART_BEAT_RECEIVE_PORT = 7777

;ignore consecutive incoming packets less than IGNORE_TIME(sec)
IGNORE_TIME=2

WAITING_TIME_BEFORE_PROCESS_RUN = 5

;cycle to check the lancard (Sec)
LAN_CARD_CHECK_PURGEAGE = 5

;the service IP address
```

```
VIRTUAL_IP= 192.168.0.50

;the command to activate the service IP address
VIRTUAL_IP_START_COMMAND=service network restart

;the command to deactivate the service IP address
VIRTUAL_IP_STOP_COMMAND=/etc/sysconfig/network-scripts/ifdown eth0

;process that must be terminated additionally when the process is switched
RELATED_PROCESS=

[ADVENCE]
KEYWORD=defunct
PROCESS_KILL_COMMAND=pkill -9

[DB]
;1:pg 2:oracle 3:ODBC
DBKIND=1
DBSTR=localhost@recsee3p
DBID=postgres
DBPW=fcpass
```

3. Modify the following items in the .ini file. To edit this .ini file, you should enter the vi's edit mode by pressing on the keyboard i button.
   - **MODE:** Enter the number 1. (1 is an Active server, 2 is a Standby server.)
   - **THIS_SERVER_IP:** Enter the communication IP address of the Active server.
   - **GATEWAY_IP:** Enter the gateway IP address of the Active server.
   - **PARTNER_IP:** Enter the communication IP address of the Standby server.
   - **VIRTUAL_IP:** Enter the service IP address. (Both Active and Standby servers use the same value.)
   - VI**RTUAL_IP_START_COMMAND:** Enter the following command service network restart
   - **VIRTUAL_IP_STOP_COMMAND:** Enter the following command /etc/sysconfig/network-scripts/ifdown eth0
4. Execute a :wq! command to save the file after pressing **ESC** button on the keyboard.

4.3.2 HA Module set up in Standby Server

1. Execute a command thought Terminal in Standby server to set HA module.

```
# vi /usr/furence/IPCR3.0/HA/ini/config.ini
```

2. You can see the setting picture like this.

```
[LOG]
;log file path
PATH=/usr/furence/bin/log/HA.log

;log file deletion cycle
PURGEAGE=3 months

[PROCESS_CHECK]
;the number of process to monitor
PROCESS_NUM = 5

;switchover condition
;1: switchover even if only one to monitor is dead
;2: switchover if all processes to monitor are dead
OBSERVATION_MODE=1

;the path of the process to monitor
PROCESS_PATH1=/usr/furence/IPCR3.0/exe/DBGw.exe
PROCESS_PATH2=/usr/furence/IPCR3.0/exe/Rec_Signal.exe
PROCESS_PATH3=/usr/furence/IPCR3.0/exe/RecSee_RTP.exe
PROCESS_PATH4=/usr/furence/IPCR3.0/exe/RVModule
PROCESS_PATH5=/usr/furence/IPCR3.0/exe/FTPTransfer

;cycle to check whether the process to monitor is running.  (Sec)
PROCESS_CHECK_CYCLE = 10

[AGENT]
;mode selection
;1: active mode
;2: standby mode
MODE=2

;current server IP address
```

```
THIS_SERVER_IP = 192.168.0.52

;current server gateway address
GATEWAY_IP = 192.168.0.1

;current server port (port to receive packets from the other party HA)
HEART_BEAT_RECEIVE_PORT = 7777

;cycle of the heartbeat signal (Sec)
HEART_BEAT_INTERVAL = 5

;the maximum heartbeat signal listening time for switchover.
;If the heartbeat signal is not received within setting time, switchover
MAX_HEART_BEAT_RECEIING_TIME =15

;the other server IP address
PARTNER_IP= 192.168.0.51

;the other server port (port of the other party HA to receive packets.)
PARTNER_HEART_BEAT_RECEIVE_PORT = 7777

;ignore consecutive incoming packets less than IGNORE_TIME(sec)
IGNORE_TIME=2

;waiting time to setup service IP before starting the process
WAITING_TIME_BEFORE_PROCESS_RUN = 5

;cycle to check the lancard (Sec)
LAN_CARD_CHECK_PURGEAGE = 5

;the service IP address
VIRTUAL_IP= 192.168.0.50

;the command to activate the service IP address
VIRTUAL_IP_START_COMMAND=/etc/sysconfig/network-scripts/ifdown eth0 &&
ifconfig eth0 hw ether 00:0C:29:89:B8:E4 && service network restart

;the command to deactivate the service IP address
```

```
VIRTUAL_IP_STOP_COMMAND=/etc/sysconfig/network-scripts/ifdown eth0
;process that must be terminated additionally when the process is switched
RELATED_PROCESS=

[ADVENCE]
KEYWORD=defunct
PROCESS_KILL_COMMAND=pkill -9

[DB]
;1:pg 2:oracle 3:ODBC
DBKIND=1
DBSTR=localhost@recsee3p
DBID=postgres
DBPW=fcpass
```

3. Modify the following items in the .ini file. To edit this .ini file, you should enter the vi's edit mode by pressing on the keyboard i button.
   - **MODE:** Enter the number 2. (1 is an Active server, 2 is a Standby server.)
   - **THIS_SERVER_IP:** Enter the communication IP address of the Standby server.
   - **GATEWAY_IP:** Enter the gateway IP address of the Standby server.
   - **PARTNER_IP:** Enter the communication IP address of the Active server.
   - **VIRTUAL_IP:** Enter the communication IP address of the Standby server.
4. Execute a `wq!` command to save the file after pressing **ESC** button on the keyboard.

4.4 Data HA Set up

The Active and Standby servers periodically synchronize the recording files and database information. Configuration of the iPECS IPCR server follow the procedure for each setting described in the below section.

- How to set the recording file synchronization, refer to section 4.5.1 Setting for Recording Files HA.
- How to set the crontab for recording files and DB synchronization, refer to section 4.5.2 Crontab Setting for Data HA.

4.4.1 Setting for Recording Files HA

The HA module synchronizes recording files using rsync and ssh utility which are provided by Linux.

4.4.1.1 Settings for Recording Files HA on Active Server

1. Execute a command thought Terminal in Active server to set up.

```
# ssh-keygen –t rsa
```

2. Press **Enter** key when the following message appears.

```
Generating public/private dsa key pair
Enter file in which to save the key (/root/.ssh/id_dsa):
```

3. Press **Enter** key when the following message appears.

```
Created directory '/root/.ssh'.
Enter passphrase (empty for no passphrase):
```

4. Press **Enter** key when the following message appears.

```
Enter same passphrase again:
```

5. If it worked properly, you can see the following message.

```
Your identification has been saved in /root/.ssh/id_dsa.
Your public key has been saved in /root/.ssh/id_dsa.pub.
The key fingerprint is:
82:b7:3b:ae:ab:e9:d3:b6:16:7a:bf:4b:b8:ad:ff:e4 root@localhost.localdomain
The key's randomart image is:
+--[ DSA 1024]----+
|                 |
|                 |
|                 |
|     .           |
|    . o S        |
|    .o o         |
|   o.,o .        |
|  o.=+.+         |
| .+**OO=E        |
+-----------------+
```

6. Before executing the following commands on the Active server, you must complete the same steps 1 to 5 on the Standby server.

```
# scp –p /root/.ssh/id_rsa.pub root@192.168.0.52:/root/.ssh/authorized_keys
```

   - In the above command, the IP address corresponding to 192.168.0.52 is the communication IP address of the Standby server.
   - Enter the communication IP address of the standby server according to the established High Availability environment.

7. When the process up to step 6 is completed, modify the ipcr_rsync_recfile.sh file for your High Availability environment. First, enter the following command and press **Enter** key.

```
# vi /usr/furence/IPCR3.0/HA/cron/ipcr3.0_rsync_rec.sh
```

8. If it worked properly, you can see the following shell script file.

```
#!/bin/sh

EXE_SIG_NAME="Rec_Signal.exe"

if [ "$(ps -Al | grep $EXE_SIG_NAME | grep -v grep | wc -l)" != 0 ]
then
      echo "THIS SERVER IS ACTIVE"
      rsync -av -e ssh /var/REC/RecSee_Data/root@192.168.0.52:/var/REC/RecSee_Data/
else
      echo "THIS SERVER IS STANDBY"
      rsync -av -e ssh root@192.168.0.52:/var/REC/RecSee_Data/ /var/REC/RecSee_Data/
fi
```

9. Modify this shell script file for your High Availability environment. To edit this file, press i key on the keyboard in the state of step 8 to enter vi's edit mode. If you are in vi's edit mode normally, it is shown as below.

```
#!/bin/sh

EXE_SIG_NAME="Rec_Signal.exe"

if [ "$(ps -Al | grep $EXE_SIG_NAME | grep -v grep | wc -l)" != 0 ]
then
      echo "THIS SERVER IS ACTIVE"
      rsync -av -e ssh /var/REC/RecSee_Data/ root@192.168.0.52:/var/REC/RecSee_Data/
else
      echo "THIS SERVER IS STANDBY"
      rsync -av -e ssh root@192.168.0.52:/var/REC/RecSee_Data/ /var/REC/RecSee_Data/
fi

 -- INSERT --
```

10. The IP address which is entered in the red square box is the communication IP address of the Standby server. Enter the communication IP of the Standby server for your High Availability environment.

```
#!/bin/sh

EXE_SIG_NAME="Rec_Signal.exe"

if [ "$(ps -Al | grep $EXE_SIG_NAME | grep -v grep | wc -l)" != 0 ]
```

```
then
      echo "THIS SERVER IS ACTIVE"
      rsync -av -e ssh /var/REC/RecSee_Data/ root@192.168.0.52:/var/REC/RecSee_Data/
else
      echo "THIS SERVER IS STANDBY"
      rsync -av -e ssh root@192.168.0.52:/var/REC/RecSee_Data/ /var/REC/RecSee_Data/
fi

 -- INSERT --
```

11. When you have finished editing, press **ESC** key on the keyboard to exit edit mode. If you exit the edit mode normally, the letter INSERT shown in the step 10 disappears.

```
#!/bin/sh

EXE_SIG_NAME="Rec_Signal.exe"

if [ "$(ps -Al | grep $EXE_SIG_NAME | grep -v grep | wc -l)" != 0 ]
then
     echo "THIS SERVER IS ACTIVE"
     rsync -av -e ssh /var/REC/RecSee_Data/ root@192.168.0.52:/var/REC/RecSee_Data/
else
     echo "THIS SERVER IS STANDBY"
     rsync -av -e ssh root@192.168.0.52:/var/REC/RecSee_Data/ /var/REC/RecSee_Data/
fi
```

12. Execute a command to save the file after pressing **ESC** key on the keyboard.

```
#!/bin/sh

EXE_SIG_NAME="Rec_Signal.exe"

if [ "$(ps -Al | grep $EXE_SIG_NAME | grep -v grep | wc -l)" != 0 ]
then
     echo "THIS SERVER IS ACTIVE"
     rsync -av -e ssh /var/REC/RecSee_Data/ root@192.168.0.51:/var/REC/RecSee_Data/
else
     echo "THIS SERVER IS STANDBY"
     rsync -av -e ssh root@192.168.0.51:/var/REC/RecSee_Data/ /var/REC/RecSee_Data/
fi









:wq!
```

13. Repeat steps 7 through 12 to the to the shell file below.

- vi /usr/furence/IPCR3.0/HA/cron/ipcr3.0_rsync_ann.sh
- vi /usr/furence/IPCR3.0/HA/cron/ipcr3.0_rsync_dbb.sh

4.4.1.2 Settings for Recording Files HA on Standby Server

1. Execute a command thought Terminal in Standby server to set up.

```
# ssh-keygen –t rsa
```

2. Press **Enter** key when the following message appears.

```
Generating public/private dsa key pair.
Enter file in which to save the key (/root/.ssh/id_dsa):
```

3. Press **Enter** key when the following message appears.

```
Created directory ‘/root/.ssh’.
Enter passphrase (empty for no passphrase):
```

4. Press **Ente**r key when the following message appears.

```
Enter same passphrase again:
```

5. If it worked properly, you can see the following message.

```
Your identification has been saved in /root/.ssh/id_dsa.
Your public key has been saved in /root/.ssh/id_dsa.pub.
The key fingerprint is:
92:08:4a:16:42:77:8a:76:04:8a:4a:a6:b6:07:d4:02 root@localhost.localdomain
The key's randomart image is:
+--[ DSA 1024]----+
|E+.o .           |
|= * o            |
|oX.+             |
|X.o. . .         |
|+o  . o S        |
|. o    .         |
| . .             |
|  .              |
|                 |
+-----------------+
```

6. Before executing the following commands on the Standby server, you must complete the same steps 1 to 5 on the Active server.

```
# scp –p /root/.ssh/id_rsa.pub root@192.168.0.51:/root/.ssh/authorized_keys
```

- In the above command, the IP address corresponding to 192.168.0.51 is the communication IP address of the Active server.
- Enter the communication IP address of the Active server according to the established High Availability environment.

4.4.2 Crontab Setting for Data HA

This is the description for changing the default data synchronization cycle. The default synchronization cycle is 3 minutes. Because the synchronization consumes a lot of system resources such as the CPU and IO traffic, it is recommended to set it for more than 2 minutes.

4.4.2.1 Crontab Setting for Data HA on Active Server

1. To do configuration, enter the following command at the terminal.

```
[root@localhost ~]# crontab -e
```

2. If you enter the command correctly, you can see the following screen.

```
* * * * * /usr/furence/IPCR3.0/HA/cron/ipcr3.0_ha_exec_recfile.php > /dev/null 2>&1
* * * * * /usr/bin/java -jar /usr/furence/IPCR3.0/HA/cron/ipcr3.0_db_sync.jar > /dev/null 2>&1
*/3 * * * * /usr/furence/IPCR3.0/HA/cron/ipcr3.0_rsync_rec.sh > /dev/null 2>&1
*/3 * * * * /usr/furence/IPCR3.0/HA/cron/ipcr3.0_rsync_ann.sh > /dev/null 2>&1
*/3 * * * * /usr/furence/IPCR3.0/HA/cron/ipcr3.0_rsync_dbb.sh > /dev/null 2>&1
```

- In the red box, you can see that it is 3 (default setting). It means to synchronize every 3 minutes. ('*' means every minutes).
- If you enter the desired number (minute), the cycle would be changed.

4.4.2.2 Crontab Setting for Data HA on Standby Server

1. To do configuration, enter the following command at the terminal.

```
[root@localhost ~]# crontab -e
```

2. If you enter the command correctly, you can see the following screen.

```
* * * * * /usr/furence/IPCR3.0/HA/cron/ipcr3.0_ha_exec_recfile.php > /dev/null 2>&1
* * * * * /usr/bin/java -jar /usr/furence/IPCR3.0/HA/cron/ipcr3.0_db_sync.jar > /dev/null 2>&1
```

- In the red box, you can see that it is 3 (default setting). It means to synchronize every 3 minutes. ('*' means every minutes).
- If you enter the desired number (minute), the cycle would be changed.

4.5 Executing IPCR High Availability Process

There are two ways to run the High Availability program as described in below, one is automatic execution and the other is manual execution.

4.5.1 Automatic Executing Set up in CentOS6.9 32bit

To automatically execute the IPCR high availability program, enter the following.

```
#cp /usr/furence/IPCR3.0/HA/ipcr_ha_start.sh/etc/profile.d/ipcr_ha_start.sh
```

4.5.2 Automatic Executing Stop in CentOS6.9 32bit

Execute a command thought Terminal.

```
[root@localhost ~]# rm -rf /etc/profile.d/ipcr_ha_start.sh
[root@localhost ~]# reboot
```

4.5.3 Automatic Executing Set up in CentOS7.3 64bit

To automatically execute the IPCR high availability program, enter the following.

```
#cp /usr/furence/IPCR3.0/HA/auto_run_ha.service /usr/lib/systemd/system
#systemctl daemon-reload
#systemctl start auto_run_ha.service
#systemctl enable auto_run_ha.service
```

4.5.4 Automatic Executing Stop in CentOS7.3 64bit

To stop the IPCR high availability program, enter the following.

```
#systemctl disable auto_run_ha.service
```

4.5.5 Manual Executing

Execute a command thought Terminal to execute HA module

```
[root@localhost ~]# /usr/furence/IPCR3.0/HA/FurenceHA
```

4.6 Condition for Switchover

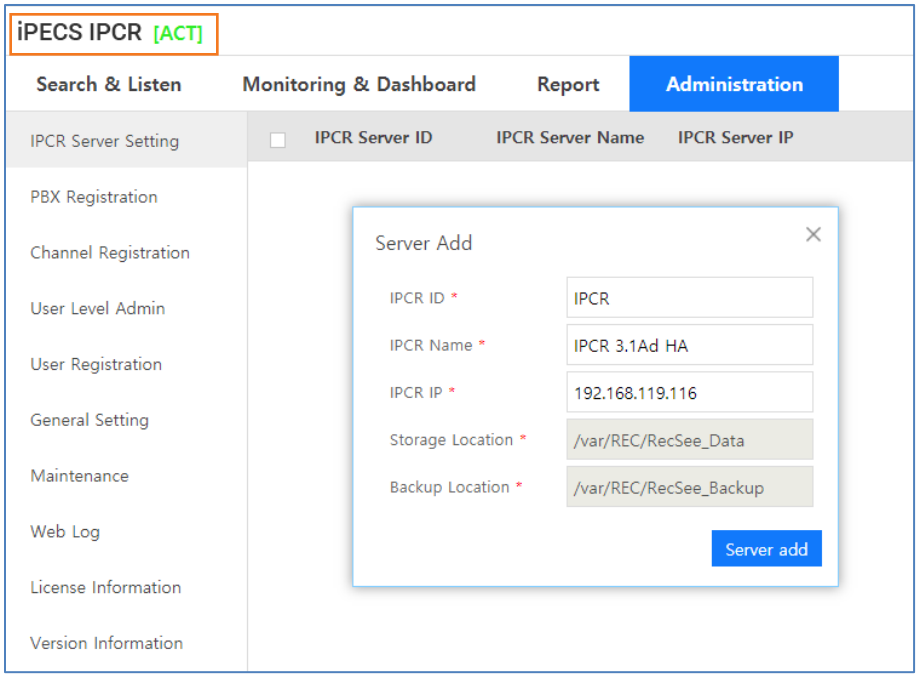
It is switched automatically between Active and Standby server under the following conditions.

- When Network has problems.
- When iPECS IPCR process is not running.
- When iPECS IPCR server power Off.

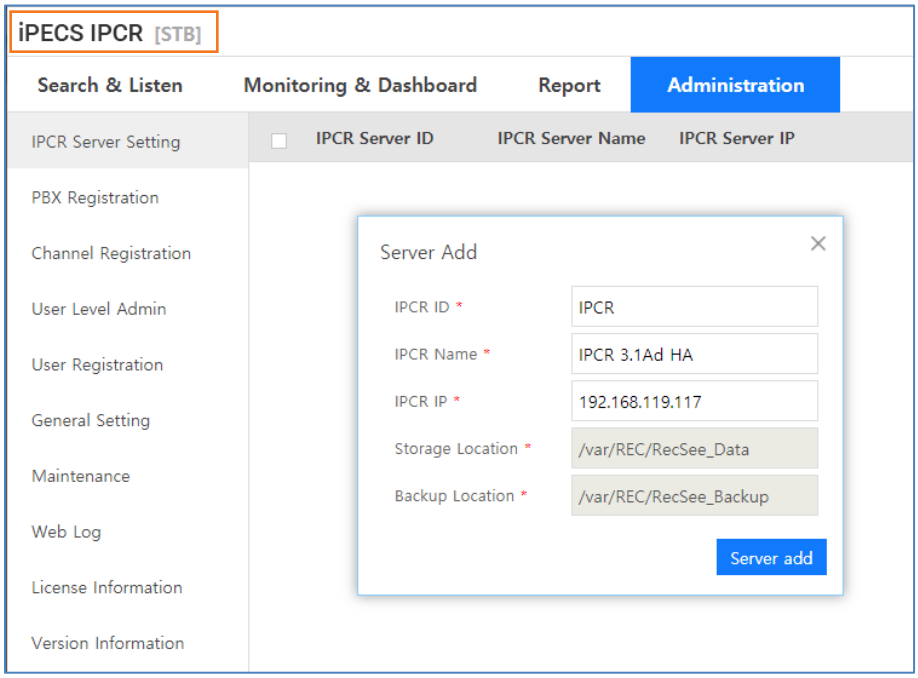
4.7 HA Configuration Prerequisites

For HA configurations, NTP synchronization must be used for each server and IPCR Name must be the same as IPCR ID.

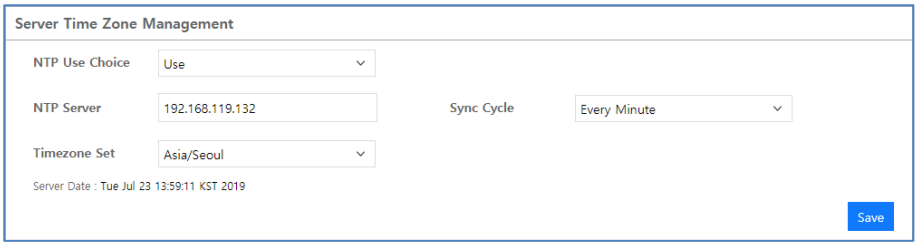
1. Set the IPCR ID and IPCR name of the redundant server as shown below.
   a. In the current Active server.



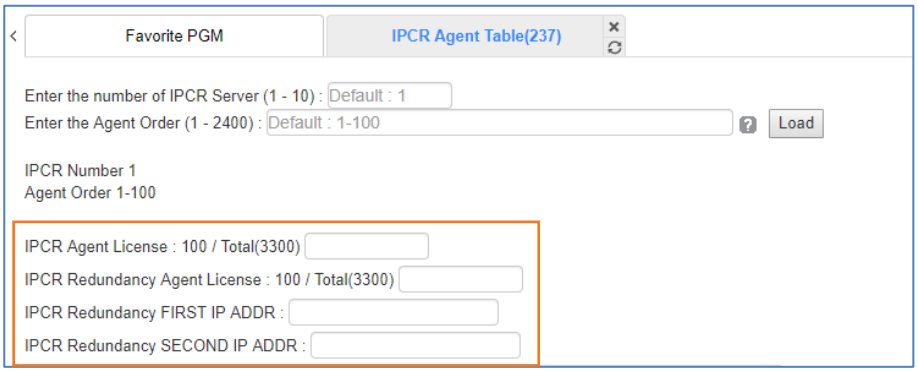
   b. In the current Standby server.



2. If each server must be synchronized to the same NTP server and the external network is not available, use the NTP synchronization feature of the IPECS system.



3. The IP of each server must be entered in PGM 237 of the IPECS system.



Chapter 5.

iPECS IPCR Server Configuration

Once configured for registration and login, the iPECS IPCR server registers with the iPECS system using automatic or MAC address registration. The iPECS IPCR server then will login to the iPECS system employing the SIP Id and password, which must match the User Id and password that assigned on the iPECS iPCR web. If any, it can be defined in the Device User Login program (PGM 443) where the desired station number. Once login is complete, the remaining characteristics of the iPECS system and the iPECS IPCR web can be configured and calls recorded.

The following basic configuration is required before the iPECS IPCR is executed.

5.1 Basic Configuration

To be able to interact with the iPECS system, you must create a basic configuration the iPECS IPCR web before using iPECS IPCR server.

5.1.1 iPECS IPCR Server Configuration

Register basic information of the iPECS IPCR server to be linked with the iPECS system.

1. Connect to the iPECS IPCR Web.
2. Click the **Administration > IPCR Server Registration** menu.
3. Refer to section 6.6.1 iPECS iPECS IPCR Server Setting for detail configuration.

5.1.2 iPECS system Registration

Register basic information of the iPECS system to be linked with iPECS IPCR.

1. Connect to the iPECS IPCR Web.
2. Click the **Administration > PBX Registration** menu.
3. Refer to section 6.6.2 iPECS System Registration for detail configuration.

5.1.3 Channel Registration

Register the channel to record the call.

1. Connect to the iPECS IPCR web.
2. Click the **Administration > Channel registration** menu.

3. Refer to section 6.6.3 Channel registration for detail configuration.

5.1.4 User Level Admin

Create and register the required user level in addition to the default level 'administrator'.

1. Connect to the iPECS IPCR Web.
2. Click the **Administration > User level admin** menu.
3. Refer to section 6.6.4 User Level Admin for detail configuration.

5.1.5 User Registration

Register users to use the iPECS IPCR. Users include administrators, people to be recorded, and iPECS IPCR Web users.

1. Connect to the iPECS IPCR Web.
2. Click the **Administration > User registration** menu.
3. Refer to section 6.6.5 User Registration for detail configuration.

Chapter 6.

iPECS IPCR Web

The iPECS IPCR Web includes an integrated Web server that is employed for access to Administrative and User functions. You can access the iPECS IPCR Web to manage iPECS IPCR system, check the recorded file, and see the call status of the agent. You can view statistics on the call from the web and provide iPECS IPCR system management.

6.1 Access and login

This section describes how to access and login to the iPECS IPCR Web. We highly recommend using the Chrome browser for the best results.

6.1.1 To access

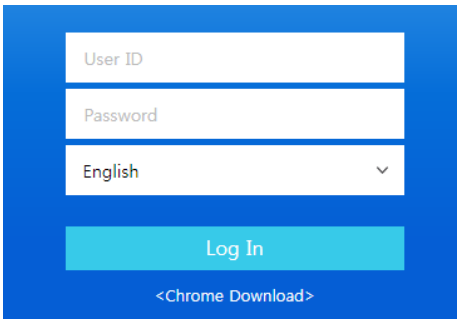
1. Open a web browser on the PC.
2. Type the iPECS IPCR Server IP address in the browser's address box.
   - For example, http://192.168.119.112 or https://192.168.119.112
   - If you don't know the IP address, contact your system administrator.
3. Press **Enter** key then you will be seeing the login page first.

   - This page may be different according to your web browser.
   - At the Log In page you will be asked for a User ID and Password.

6.1.2 To login

The initial access to the web page iPECS IPCR web, you should use '**admin**' for the default ID and Password.

1. Click **User ID** field and enter in User ID.



2. Press **Tab** key to Password and enter your password.
3. Choose language between English or Local.
   - The initial local language is Korean. Local language can be changed from section 6.6.7.7 Language Setting.
4. Click **Log In** button to login to the application.
   - After login to the iPECS IPCR web, you can configure ID and Passwords for each User. Refer to section 6.6.5.2 User Registration for details.

NOTE It is important to change the default User ID and Password immediately after you have successfully logged in to the iPECS IPCR Web for the first time.

6.1.3 Logout

If you do not want any additional operation more you need to logout the iPECS IPCR web page to secure your information.

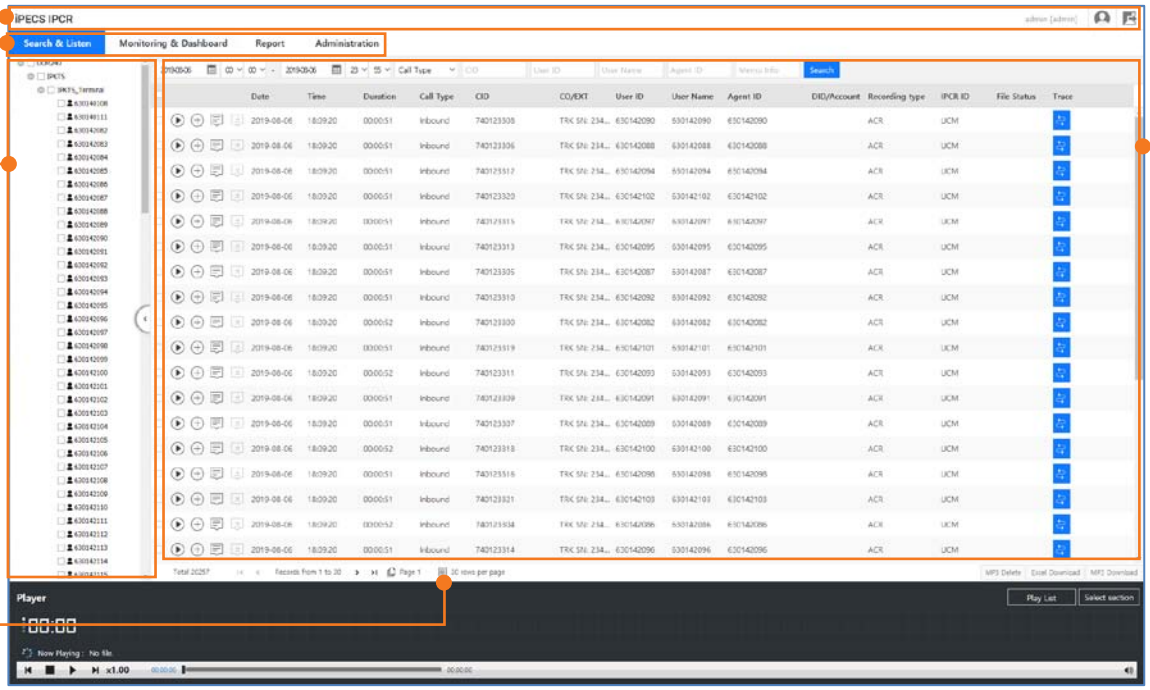
1. To close your session.
2. Click **Logout** ( ) button located on the upper right corner of the iPECS IPCR Web page.

NOTE If you do not any operation for a half hour, your session will be closed automatically.

6.2 Web Layout

This section describes the layout of the iPECS IPCR web that is divided into Title Bar, Main Menu, Organization (or Sub menu) pane and Task Area.

When you logged in to the iPECS IPCR web the following 'Search & Listen page' is displayed on your screen, and it can be displayed only to the permitted user assigned by Admin.



6.2.1 Title bar Area

At the top left side shows its title as iPECS IPCR, and the top right side is the Profile area which show user's account information such as an ID, user name, phone number etc.

- **Profile:** Allows you to open your profile by clicking the image ( ), and also you can change your profile by going to '**Administration' > 'User Registration'**, and then double click on the User Name you want to edit.
- **Logout (Close session):** Allows you to close your session by clicking the **Logou**t ( ) button.

6.2.2 Organization (or Sub menu) Area

In the 'Search & Listen' and 'Monitoring & Dashboard' menu provides Organization of Users as a tree structure for easy searching. In the 'Administration' menu shows its sub menu items.

6.2.3 Main Menu Tab Area

You can select a menu for each operation from the main menu, and the content of selected menu will be displayed on the right Task Area. Depending on the User Level, the menu that provided through main or sub menu may be different.

6.2.4 Task Area

All actions related each menu is displayed here. The 'Search & Listen' and 'Monitoring & Dashboard' menu have a feature to extend task area. Click ( ) button to use more wide area and click on it again will toggle it back on.

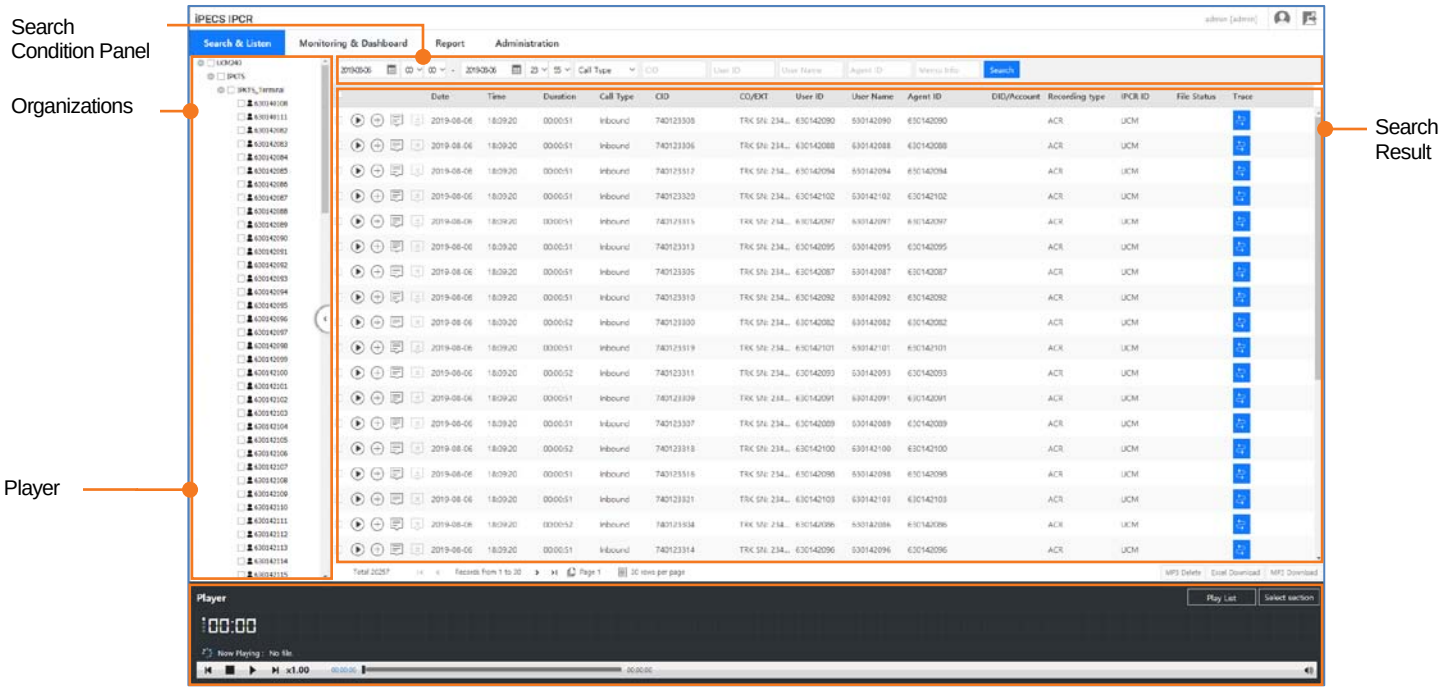
6.3 Search & Listen

In the 'Search & Listen' page, the user can enter search criteria to locate specific call recordings. The user can listen to recordings, add a text memo to the recording log, and download the recording log. In the **'Task Area'**, you can enter search criteria in the 'Search Condition panel' located on the top left side of screen. In the **'Organization Area'**, you can search a specific user in the Organization of Users. Click the checkbox to select a specific user. The **'Player'** is located at the bottom of the screen and you can play a call recording from the searched list. The Play Control Panel contains buttons for playback controls (play, pause mute, volume, playback speed, etc.). Just above the playback controls is a chart that will display a file name of recordings matching the enter search criteria.

6.3.1 Search the Recording Log

The user can enter various search criteria and display logs for recordings matching the search criteria. The Search page will display a list of recordings that match the search criteria.

The number of records displayed on the page can be adjusted using the drop-down at the lower left of the main screen. Each record displays the **Date, Time, CID, Agent and Call type** as well as icons for listen, add a memo, or download the recording or log.

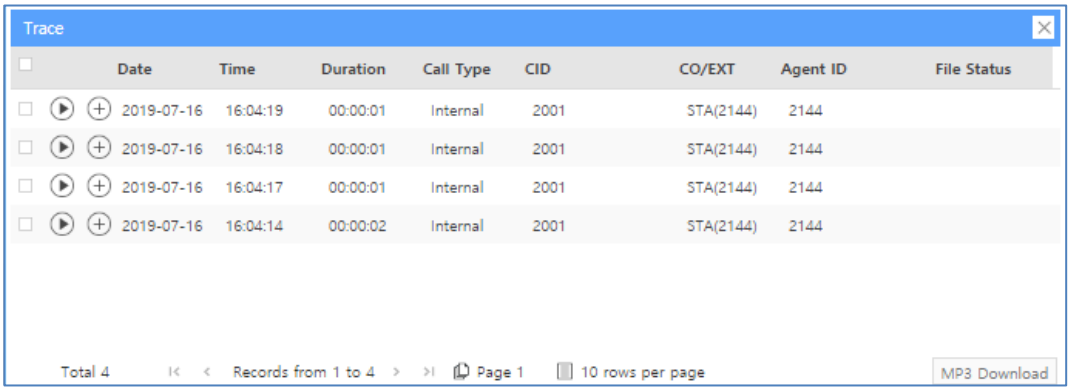


To search the recording log:

1. Select the **Search & Listen** from the main menu tab.
2. Enter search criteria (Agent Id, User Id, CID, Call Type, Time and date) in the Search Condition Panel
3. Select **Search** button to start searching.

Call Trace function:

Call Trace function shows a list of calls associated with conference call, Transfer call, and hold functions.



1. Click the **Trace** ( ) button to the right of the search result.
2. A list of calls associated with select call is displayed and can be played and downloaded.

6.3.2 Listening to a Recording

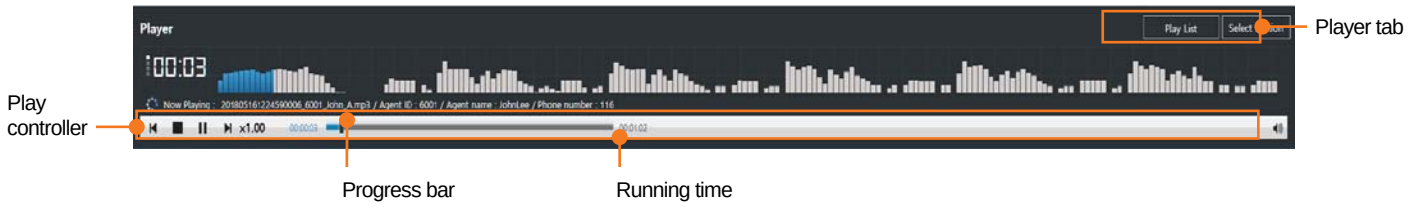
The player is displayed on the bottom of the 'Search & Listen' page.

To listen to a recording:

1. Select the Listen icon to the left of the desired recording.
2. Use the controls at the below of window to control playback of the recording.
3. If the recording file is ODR2 (On Demand Recording Type2), the playing time of the player and the call time may be different.

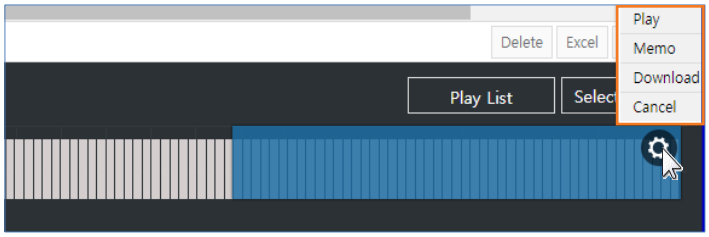
To use Player

The player is displayed on the bottom of the 'Search & Listen' page.



On the Player tab, you can select:

- **Play List** (Play List) button use to see the playlist. You can to add a recording file to this playlist. Click **Play List** button to popup the **Play List** then click the ⊕ button from the searched list in the task area.
- **Select section** (Select section) button use to select a particular section of recording file. You can specify a section through drag and drop after clicking **Select section** button. Click **Customize** (⚙) icon to choose a function button that use to in the section.



  - **Play:** play from the section
  - **Memo:** make notes for the section
  - **Download:** download the selected section
  - **Cancel**: cancel the selected section and return to previous status.

On the Play controller, you can select a button to:

- **Play** (▶) button use to play a track
- **Pause** (⏸) button use to temporarily stop the playing of the track
- **Stop** (■) button Use to stop the playing of the track
- **Next** (⏭) button use to go to the next track while listening,
- **Previous** (⏮) button use to go to the previous track while listening,
- **Playback speed** (x1.00) button use to adjust the playing speed.
- Progress bar: Shows the progression of playing of the track
- Running time: Shows a recording file's length.
- Volume control (🔊): Use to adjust a volume. Click the 🔊 icon to adjust the volume within the range. Drag the control bar left or right to the level you find acceptable.

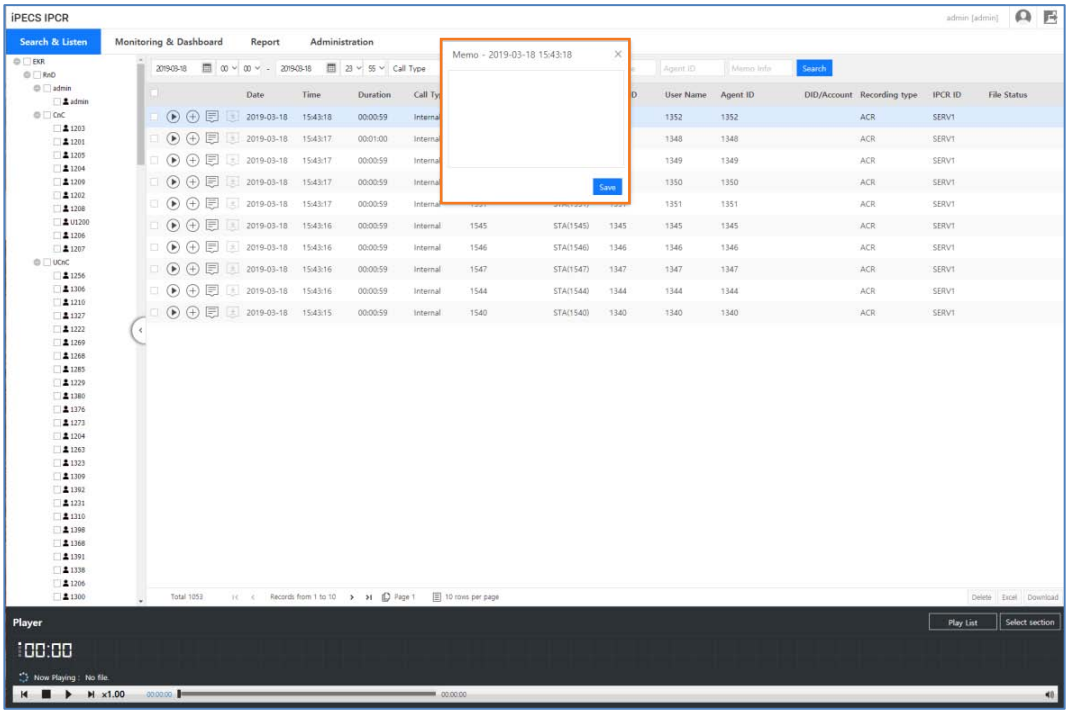
6.3.3 Add a Memo to a Recording

The following is a description of the features you can add a memo to a recording

To add or display a memo:

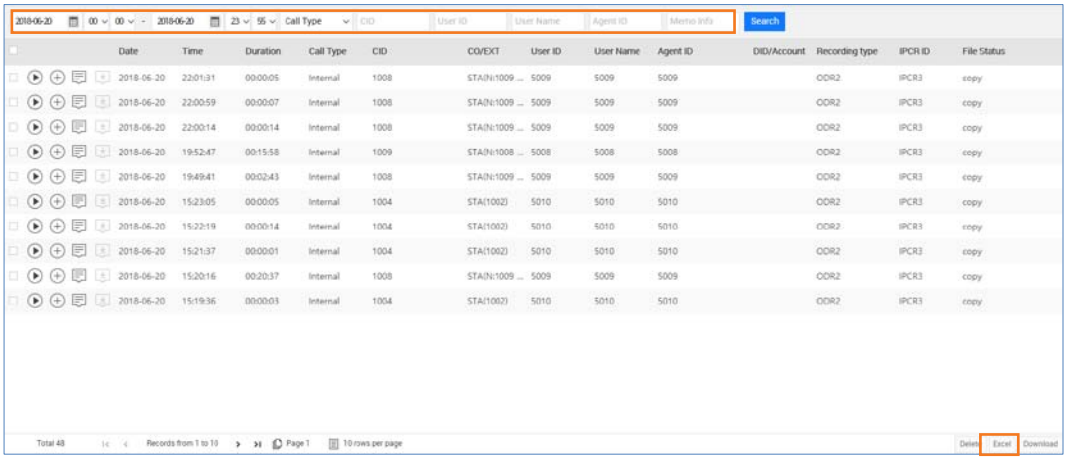
1. Select the **Memo** (💬) icon to the left of the desired recording
2. In the popup screen enter the desired memo,
3. Select **Save** button to store the memo and then **Close** button in the popup window to confirm.

If a memo has been entered for a recording, additional memos can be added. In this case, the additional memos will display in different colors.



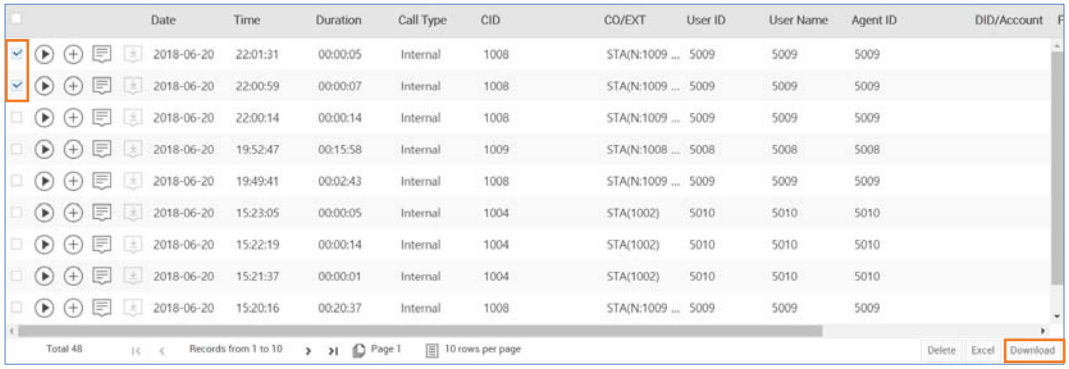
6.3.4 Downloading Logs or Recordings

To download the recording logs:



1. Click **Excel** (Excel) button.
2. Follow the on-screen instructions to name and save the log file.
   - If you have more than 100,000 viewed data, Excel download will be restricted.

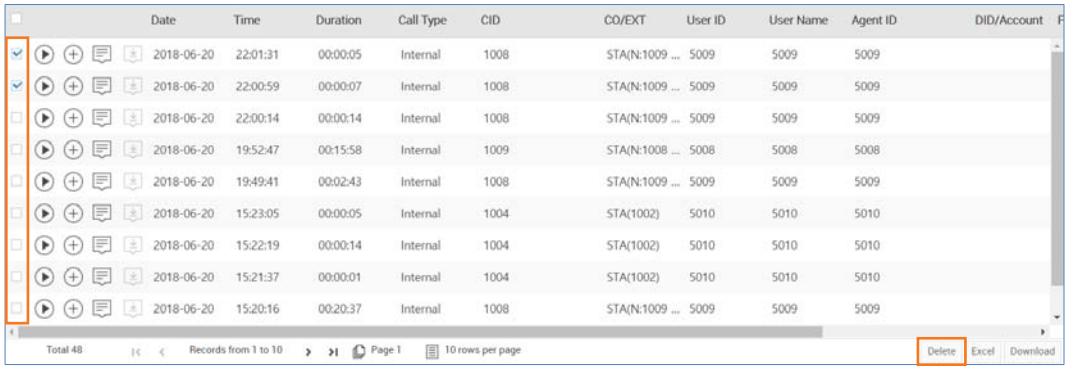
To download a call recording:



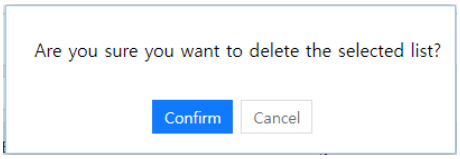
1. Check the box to the left of the desired recordings log.
2. Select the **Download** (Download) button.
3. Follow the on-screen instructions to name and save the log file.

6.3.5 Deleting Recording file

The file delete time may differ slightly depending on the file size.



1. Select the checkbox ( ) you want to delete.
2. Click **Delete** button and then **Confirm** button in the popup window to confirm.



NOTE The files once deleted cannot be restored, so please proceed with caution.

6.4 Monitoring & Dash Board

The monitoring screen shows the recording status of agents. Agents registered with user name and extension number in user management are displayed on the monitoring screen.

6.4.1 Real Time Call Monitoring

The Real-time Call Monitoring page presents the status of the recording Agents and permits monitoring in-process call recordings. Agents are displayed as an icon, refer to section 6.4.1.1 Icon View, or 6.4.1.2 Grid View for details. The user may select the view using the 'Icon View' or 'Grid View' button at the top of the left pane. Users can monitor an active recording by selecting the **Listen** (🎧) icon for the agent.

6.4.1.1 Icon View

Selecting the Icon **View** button in the upper area of the left pane displays the recording Agent Icon View page below. Each Agent is represented by an icon with the User Id and name.

The icon indicates the Agent status as:

-  : Agent logged in and idle
-  : ACR Agent busy and recording in process
-  : ODR Agent busy, the call recording button will flash to indicate recording in process

To monitor the call of an Agent that is in the recording state:

- Click the **Headset** (🎧) in the Agent icon, the headset will flash and audio for the call is presented to the PC.

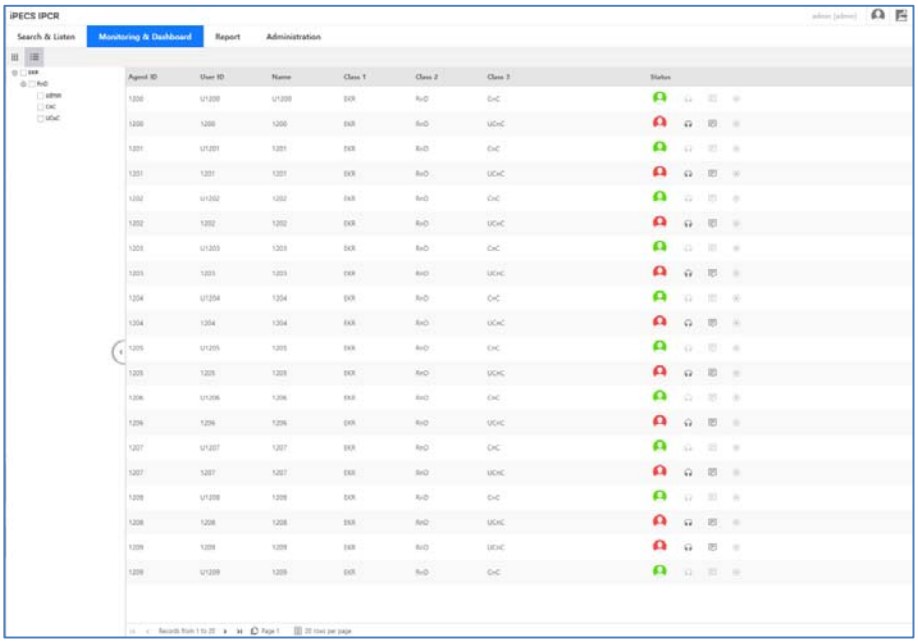
- If you click **Memo** ( ) icon memo will popup.
- It is possible to confirm the popup memo in lookup menu.

To activate call recording for an On-demand recording Agent:

- Select the **Record** ( ) in the Agent icon, the button will flash, and the Agent can be monitored as described above.
- To cancel the recording, press the **Record** ( ) again prior to completion of the call.

6.4.1.2 Grid View

Selecting the Grid View button in the upper area of the left pane displays the recording Agent Grid View page below. Each Agent is represented by an entry in the listing with the User Id name, Class (user group), Agent Id, and status icons.



The Agent status is indicated by the icons as below:

- : Agent logged in and idle
- : ACR Agent busy and recording in process.
- : ODR Agent busy, the call recording button will flash to indicate recording in process.

To monitor the call of an Agent that is in the recording state:

- Click the **Headset** ( ) in the Agent icon.
- Then the headset will flash and audio for the call is presented to the PC.

To activate call recording for an On-demand recording Agent:

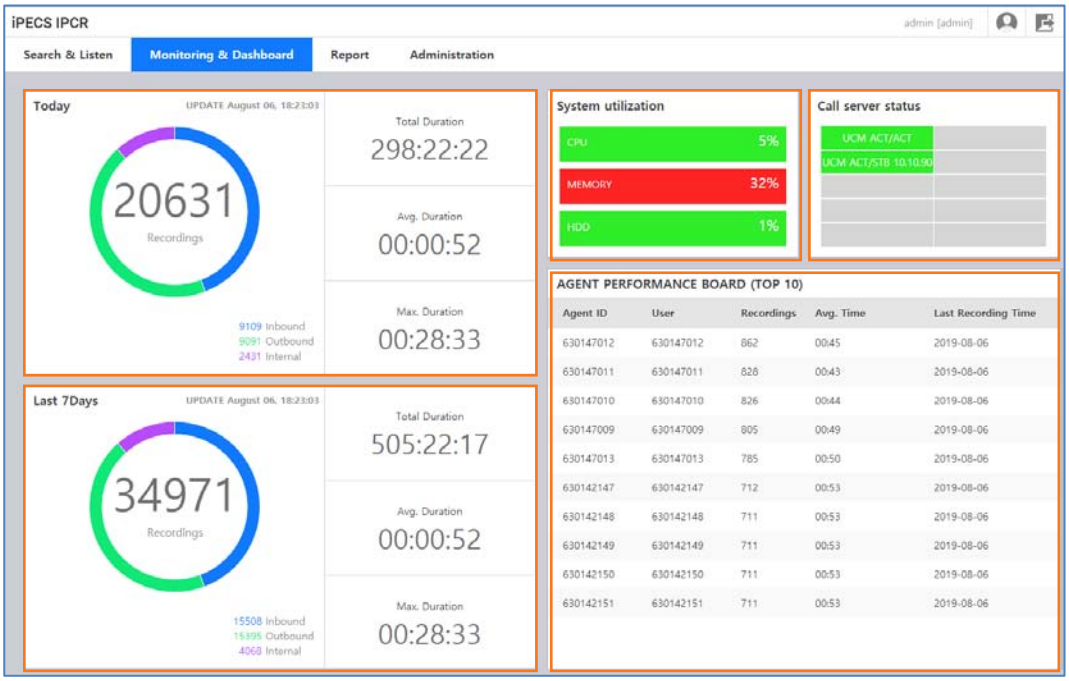
- Select the **Record** (⦿) icon for the Agent, the button will flash and the Agent can be monitored as described above.
- To cancel the recording, press the **Record** (⦿) icon again prior to completion of the call.

6.4.2 Dash Board

The Storage Monitor graphically displays the current CPU, memory and backup memory usage as well as a graph of memory use over time.

To view the Server status report:

- Select the Monitoring & Dashboard tab from the IPCR web.
- Select the Dashboard tab.
- You can check the items below.



- **Daily call status:** show the daily call status.
- **Weekly call status:** show the weekly call status.
- **System utilization:** show the current CPU, Memory, Disk utilization of the IPCR server.
- **Call server status:** show the status of the connection between the PBX and the IPCR server. If the connection to the PBX is normal, it will be displayed in green color or red if abnormal.
- **Agent performance board (top 10):** show call statistics of the top 10 agents.

6.5 Report

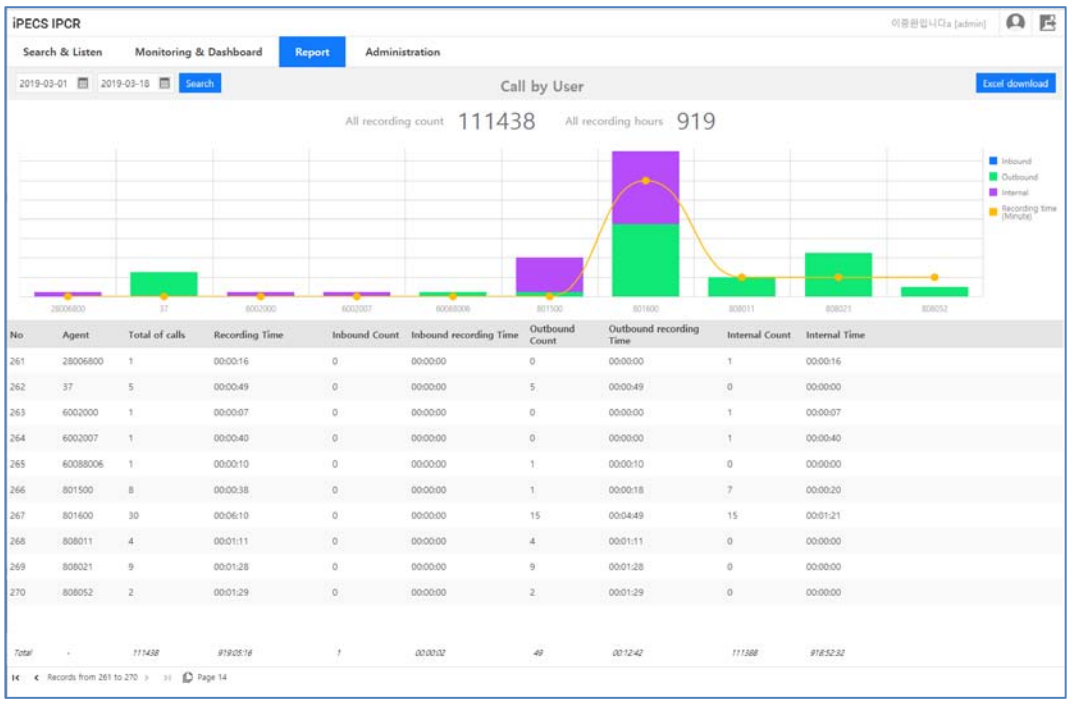
The Call Statistics Web page delivers a graphical and tabular view of call traffic to the iPECS IPCR application. The type of call (incoming or outgoing), number of each call type and duration of the calls is provided. In addition, the Call Statistics report can be downloaded as a worksheet file for further analysis. The drop-down at the bottom left of the page can be used to select the number of records displayed on the page.

To view the Call Statistics report:

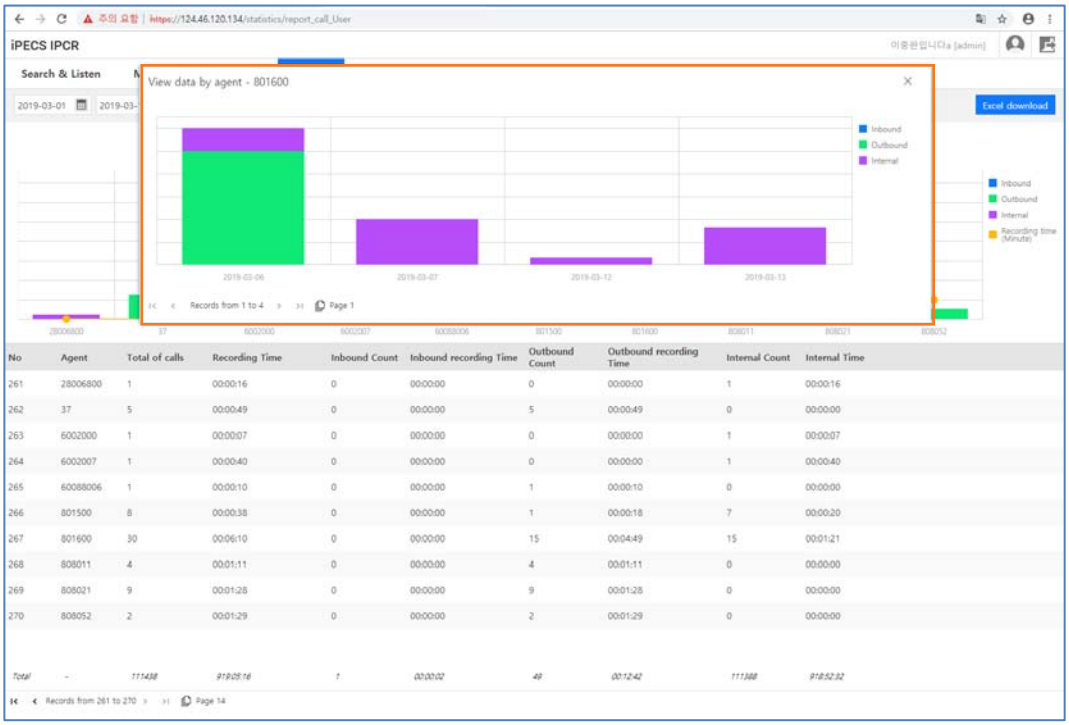
- Select the Report tab from the iPECS IPCR web.
- Select the Call by Month, Call by Day, Call by Time, Call by User, Call by CO, Call by DID, Call by Concurrent (Day), Call by Concurrent (Time).
- Enter search criteria (Start date, End date).
- Select Search.

To download the Call Statistics report:

- Select **Excel download** (Excel download) button while viewing the desired report.
- Follow the instructions to save the file locally.

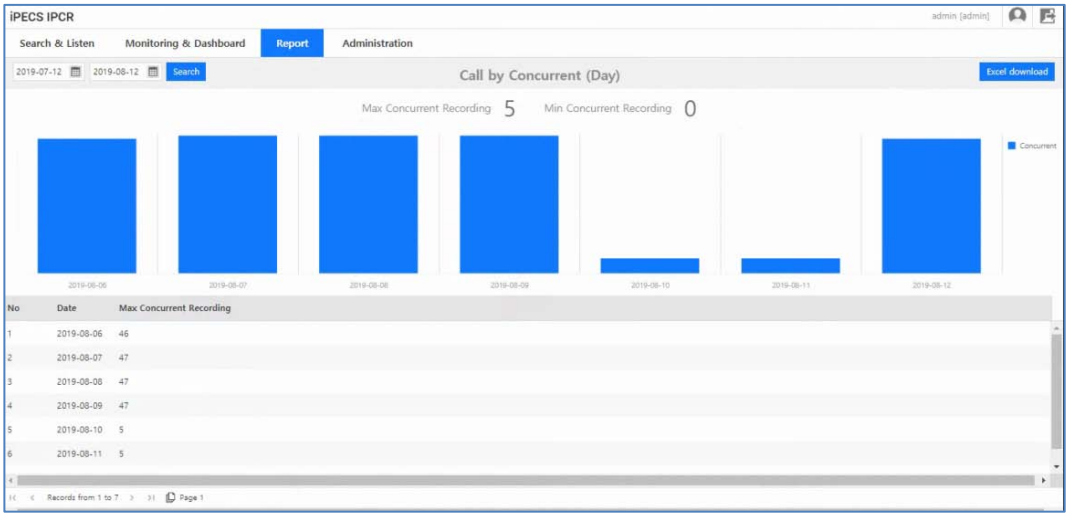


To view Call by User information at the popup:



- When you click on the scale of the x-axis of the graph on the Call by User page,
- The call statistics information for that agent is popup in a separate window, as shown above.

You can view the Concurrent License Statistics (Day, Time):



6.6 Administration

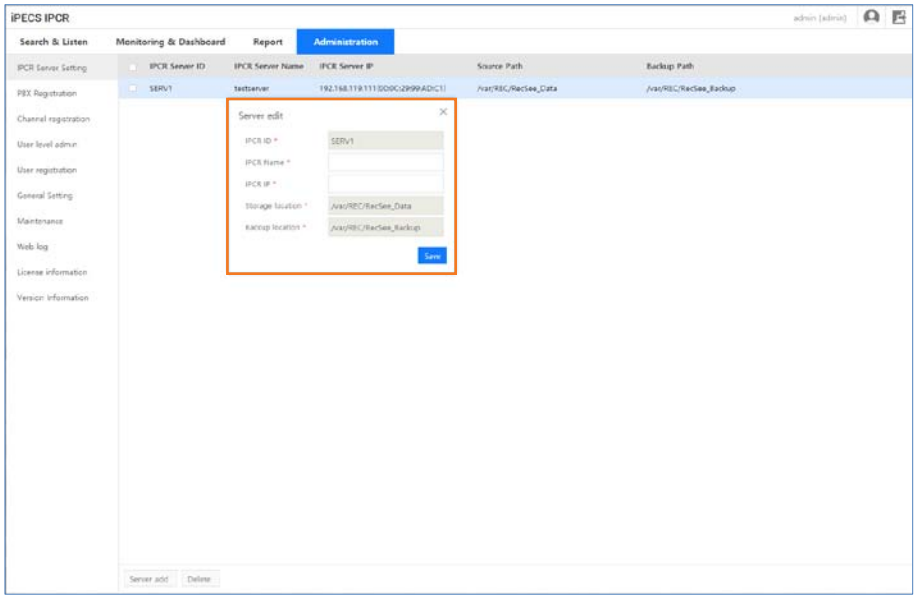
The iPECS IPCR Administration menu includes tabs at the top of the page for User registration, User admin level, PBX Registration, Channel registration, and Setting menus. Each tab displays the Web page associated with the menu and may include several lower level tabs.

6.6.1 iPECS IPCR Server Setting

iPECS IPCR Server Setting defines the iPECS IPCR server information for the application including IP address and path for Back-up services. Server IP and ID should be assigned for IPCR's operations.

To configure the iPECS IPCR server information:

1. Select the Administration tab from the iPECS IPCR web.
2. Select the iPECS IPCR Server Setting.
3. Click **Add Server** button at the bottom of the page will pop up a separate Add Server window.
   - Input information as desired.
   - **IPCR ID:** up to 5 character,
   - **IPCR Name**: up to 20 characters.
   - **IPCR IP:** only IPv4 format is supported.
4. Click **Add Server** button.



NOTE You can modify the entered iPECS IPCR server information by double click at the mouse in the same way as above.

To delete the iPECS IPCR server information:

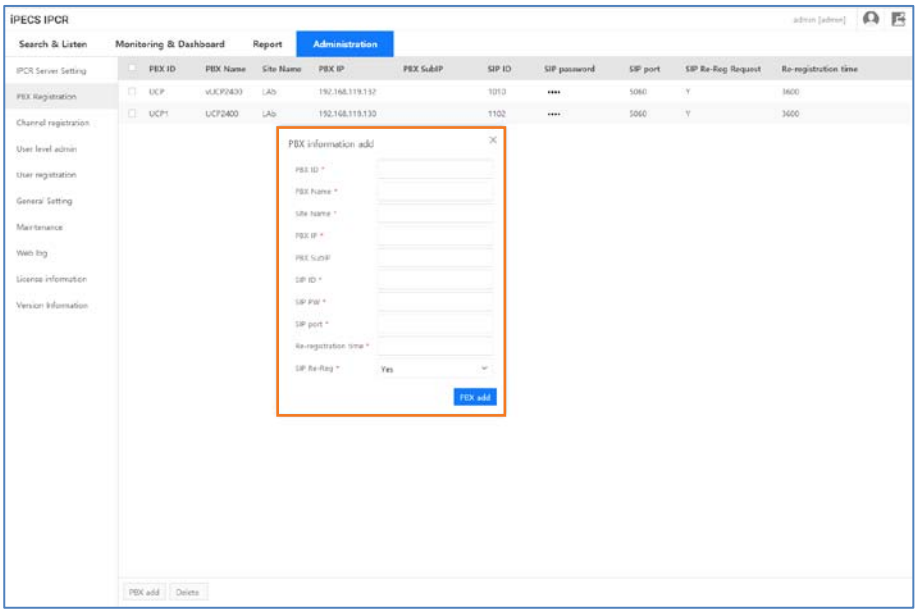
1. Click the checkbox to the left of the iPECS IPCR server entry that you want to delete.
2. Click **Delete** button at the bottom of the page.

6.6.2 iPECS System Registration

iPECS IPCR can be configured to work with ten (10) iPECS systems simultaneously. Each iPECS system is defined under the PBX Registration tab. The SIP Id and password, the iPECS system Id and IP address are required. The Keep Alive timer is not used. The SIP Id and password are sent to the iPECS host during login. If assigned in the host, must match the Station User Id parameters in the iPECS host. Once the IPCR application is configured for PBX Registration and the iPECS host is configured for registration and login, the iPECS IPCR sever should be registered with the host. Note a value must be entered for the Keep-alive timer however, the timer is not used.

To configure the iPECS host information for iPECS IPCR:

1. Select the Administration tab from the iPECS IPCR web.
2. Select the PBX Registration tab.
3. Click **PBX add** button at the bottom of the page to pop up a separate window to add the PBX information.
4. Input the PBX information which you want to add.



Item	Specification
PBX ID:	Up to 5 Characters
Site Name:	Up to 20 Characters
SIP ID:	Up to 12 Characters
SIP Port:	4 or 5 digits
Re-registration time:	We recommend 3,600 seconds
PBX Name: up to 20 Characters	PBX Name: up to 20 Characters
PBX IP: PBX Sub IP:	IP v4 IP v4
SIP password:	Up to 12 Characters
SIP Re-Reg Request:	Y or N

You can modify the entered PBX information by double click at the mouse in the same way as above.

- **PBX ID:** ID set by iPECS
- **PBX IP:** iPECS connect IP
- **PBX Sub IP:** iPECS area redundancy Set IP. (Sub IP can be found in PGM503 at iPECS UCP and LCM Redundancy information at iPECS CM.)
- **SIP ID:** Connection ID to iPECS
- **SIP password:** Connection password to iPECS
- **SIP Re-Reg Request:** Whether the exchange is reconnected
- **Re-registration time:** Exchange Re-registration Time

To delete the PBX Information:

1. Click the checkbox to the left of the PBX Information entry that you want to delete.
2. Click **Delete** button at the bottom of the page.

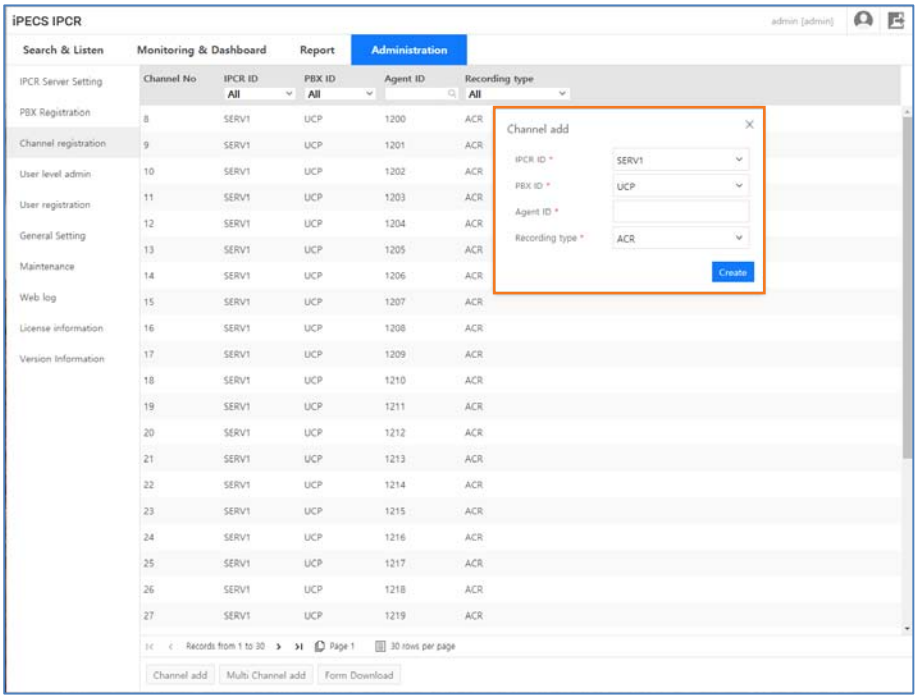
6.6.3 Channel registration

The iPECS IPCR will allocate channels based on the number of licenses defined for the server. Each channel is assigned an Agent Id, which is assigned a User name and is further associated with an object in the host iPECS database (PGM 237).

The channel is configured to activate recording for all calls or on-demand. One PBX needs at least one more channel. If there is no channel for one PBX, SIP of iPECS IPCR cannot work. Channel cannot erase it after register.

To configure iPECS IPCR channels:

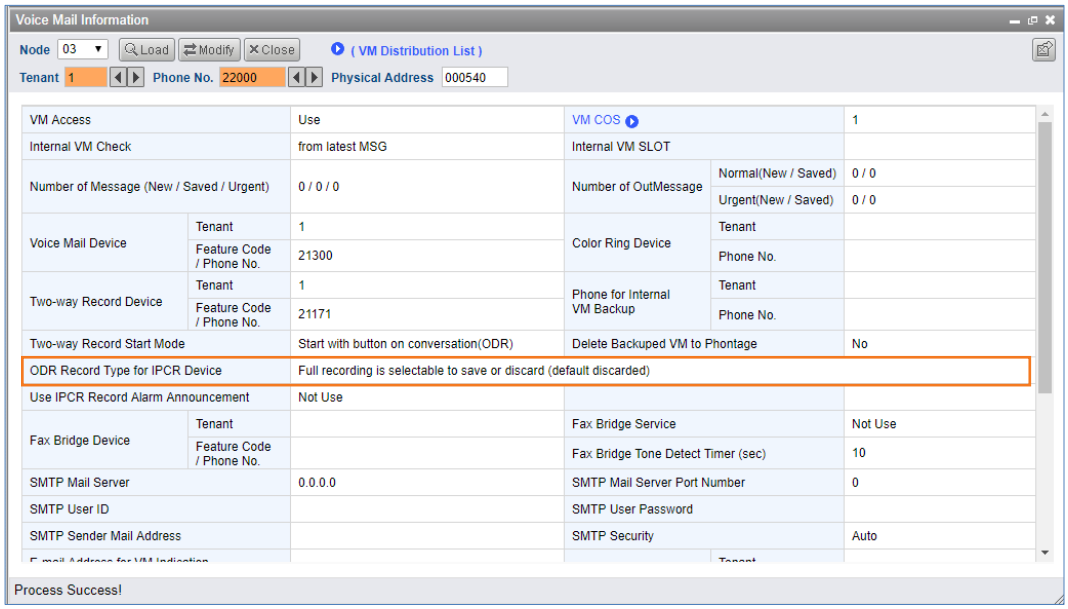
1. Select the Administration tab from the iPECS IPCR web.
2. Select the Channel Registration tab.
3. Click **Channel add** button at the bottom of the page to pop up a separate window to add the Channel information.
4. Input the channel characteristics including the Agent ID (up to 6-characters).



5. Select the type of recording using the description below.
   - **All Call Recording:** record all your calls.
   - **On Demand Recording 1:** record only the call which you want to record. You can select whether or not to record the call by using the monitoring screen of the iPECS IPCR Web or the on demand record button of the phone.
   - **On Demand Recording 2:** select the section that you want to record. You can select the recording section by using the monitoring screen of the iPECS IPCR Web or the on demand record button of the phone.

If you select the On Demand Recording 2 in iPECS CM system:

The settings on the PBX web page are required as shown below.



- Please select ODR Record Type for iPECS IPCR Device option as Full recording is selectable to save or discard (default discarded).
- Select **Save** button.

How to use the Multiple Channel add:

You can register more than one channel at a time via the Excel file. You can download the Excel file for multichannel registration by clicking the Form Download button at the bottom of the page.

	A	B	C	D	E	F	G	H
1	IPCR ID	PBX ID	Agent ID	Call Type	[A: ACR], [S: ODR1], [P: ODR2]			
2	IPCR	UCP	1000	A				
3	IPCR	UCP	1001	S				
4	IPCR	UCP	1002	P				
5	IPCR	UCP	1003	A				
6	IPCR	UCP	1004	A				
7	IPCR	UCP	1005	A				
8								

- **System ID:** input the registered IPCR ID on the Administration > IPCR Server Setting page.
- **PBX ID:** input the registered PBX ID on the Administration > PBX Registration page.
- **Agent ID:** input the Agent ID to register.
- **Call Type:** input the recording type.
- Input all Channel information to add and save the Excel file.

- Click **Multi-Channel add** button at the bottom of the page to view the popup window below. Click **File** button to select an Excel file above and click **Create** button to add multiple channels.

How to use the Delete Channel:

- Check the checkbox on the left side of the channel for deletion and click the Delete button at the bottom.

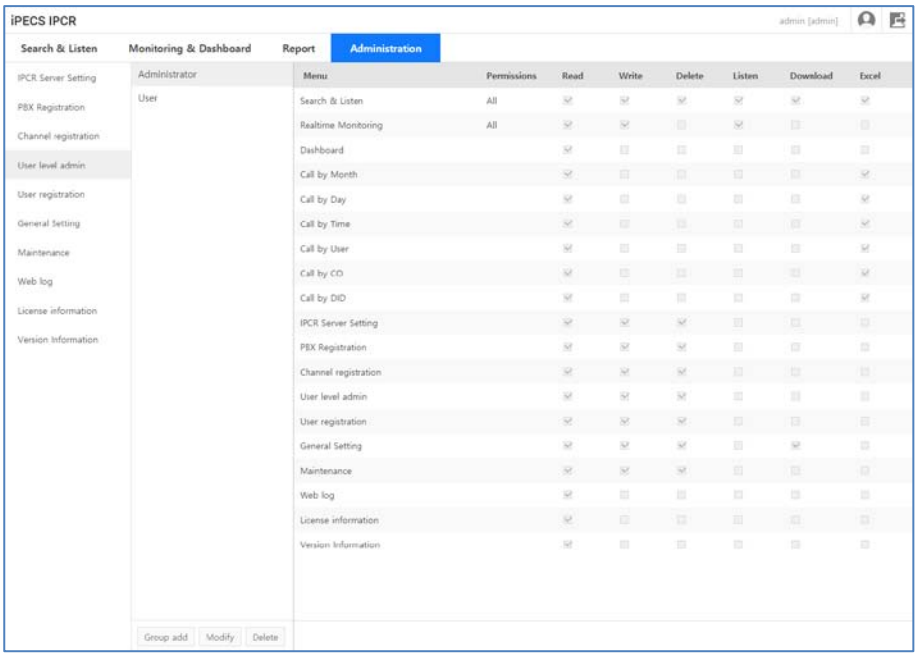
NOTE Channel deletion is only possible when connected to IPECS system. Channel deletion is supported in UCP/eMG 3.5.21 Ver and CM 2.6 Ver.

6.6.4 User Level Admin

Based on the User Admin Level, a user is allowed access to specified features and functions of the iPECS IPCR Web Server. A maximum of 10 User Admin levels can be configured.

To access the User Admin Level settings:

1. Select the Administration tab from the iPECS IPCR web.
2. Select the User level admin tab.
3. Input a Level name, up to 20 characters.
4. Check appropriate 'Activation' boxes for the User Level Admin.



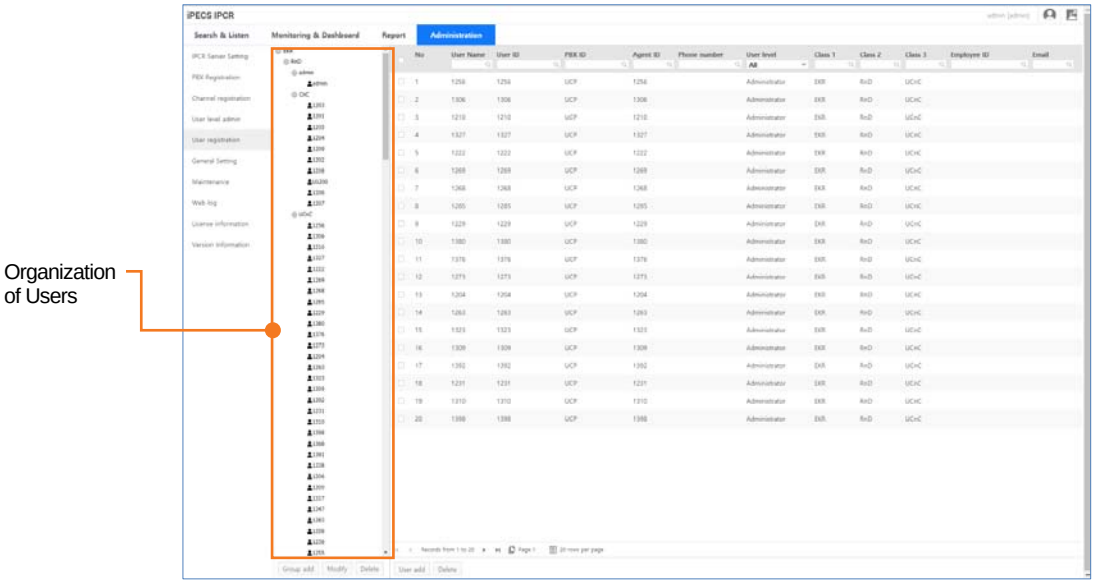
- A User admin level can be deleted using the **Delete** button.

6.6.5 User Registration

User Registration establishes User Groups and details for each user. Each user is registered with the iPECS IPCR application at one of three class or group levels, establishing a hierarchy. This function is often used to separate departments and groups for easier user and administration access. The initial Web page indicates the number of Users for each Class level in the main window and a tree display of user groups in the left window.

To access the User Registration page:

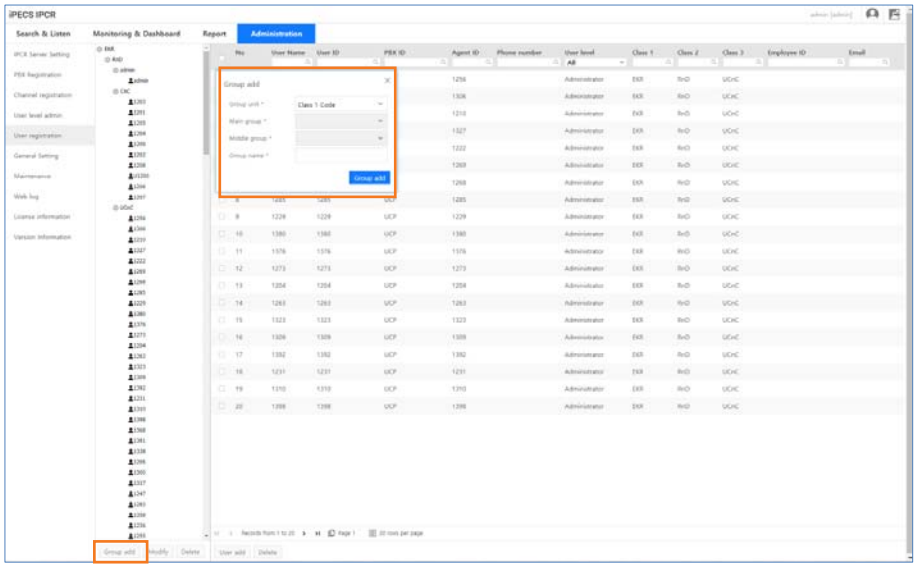
1. Select the Administration tab from the iPECS IPCR web.
2. Select the User registration tab.



6.6.5.1 User Group Registration

To add or modify a Class (User group):

1. Click **Group add** button at the bottom of the page to pop up a separate Group add window.
2. Select the unit of group you want to add and input a group name.(up to 20 characters)
3. Click **Group add** button at the bottom of the popup window.
4. You can modify the group by clicking the Modify button at the bottom of the page.



To delete a Class (User group):

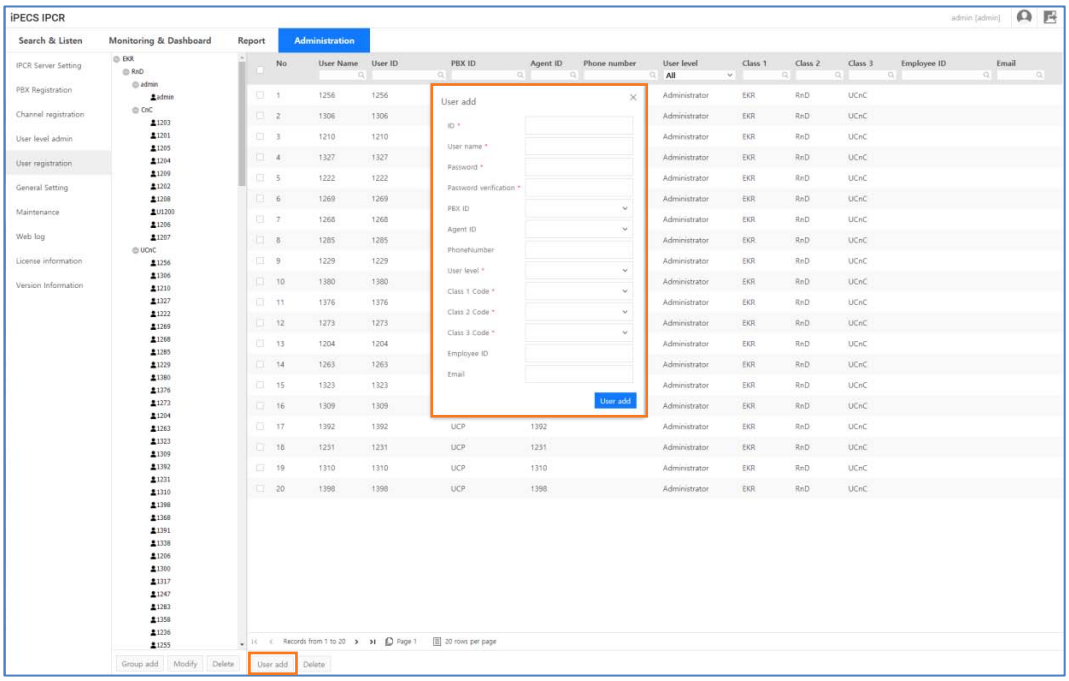
1. On the User Classification screen, select the group unit you want to delete.
2. Click **Delete** button at the bottom of the page.

NOTE You can save, modify, and delete them in the same way as the middle and small group name. In addition, you must register big and middle and small group first before registering users.

6.6.5.2 User Registration

Each user is identified and a Name assigned. The User Id and password are the credentials employed by the user for login to the iPECS IPCR Web functions. The User Level is the User Admin Level that determines the functions and features available to the user as configured in section 5.2.2. Note the Agent Ids are available only after registration and login to an iPECS host with licensed Agents. If enabled, the user activity in the iPECS IPCR Web is logged.

To add a user:



- You must enter ID. (up to 12 characters)
- You must enter User name. (up to 20 characters)
- You must enter Password. (up to 20 characters)

Password can be entered up to 20 characters in combination with English, numeric, and special characters (! @ % ^ & *).

- Select Agent ID.
- You must select user level
- Input Employee ID and email as required.

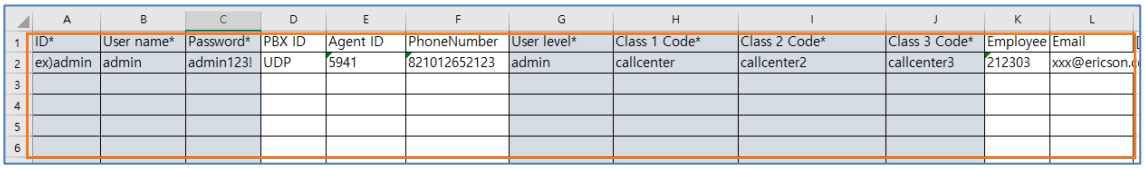
NOTE You can modify the entered User information by double click at the mouse in the same way as above.

To modify user information or delete a User:

- At the User Classification screen, select the user name you want to delete.
- Click on the checkbox to the left of the user entry.
- Click **Delete** button at the bottom of the page.

How to use the Multiple User add:

You can register more than one user at a time via the Excel file. You can download the Excel file for multiuser registration by clicking the Form Download button at the bottom of the page.



	A	B	C	D	E	F	G	H	I	J	K	L
1	ID*	User name*	Password*	PBX ID	Agent ID	PhoneNumber	User level*	Class 1 Code*	Class 2 Code*	Class 3 Code*	Employee	Email
2	ex)admin	admin	admin123!	UDP	5941	821012652123	admin	callcenter	callcenter2	callcenter3	212303	xxx@ericson.c
3												
4												
5												
6												

- Input all user information to add and save the Excel file.
- Click **Multi User add** button at the bottom of the page to view the popup window below. Click **File** button to select an Excel file above and click **Create** button to add multiple Users.

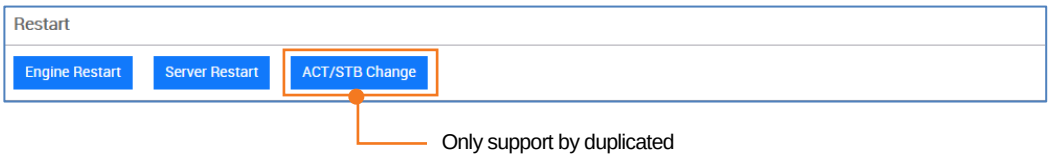
NOTE Columns with * are mandatory columns.

6.6.6 General Setting

In this section you can restart the engine or restart the server and set password policy, announcement settings, mail settings, threshold settings, and server time settings.

6.6.6.1 Restart

Button for restarting the iPECS IPCR engine or restarting the iPECS IPCR server.



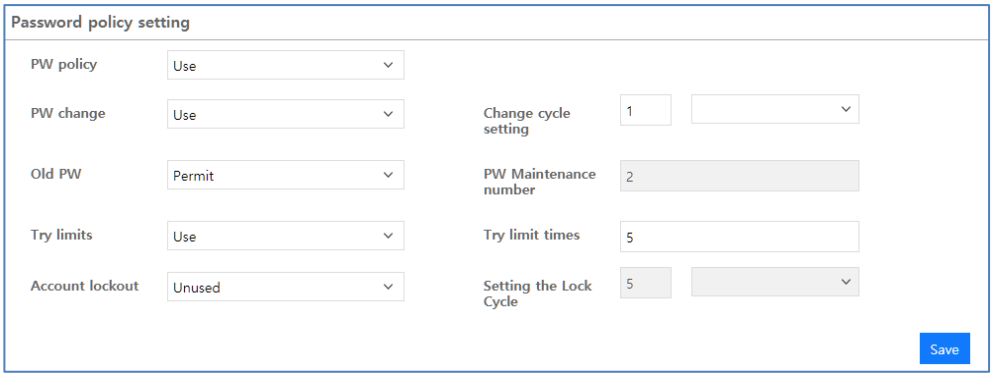
Restart:

You can see the Restart section at the **Administration > General Setting** page.

- If you want to restart the iPECS IPCR engine, click **Engine Restart** button.
- If you want to restart the server where the iPECS IPCR engine is running, click **Server Restart** button.

6.6.6.2 Password Policy Setting

This is a page for setting the password policy for a user account in the iPECS IPCR Web.



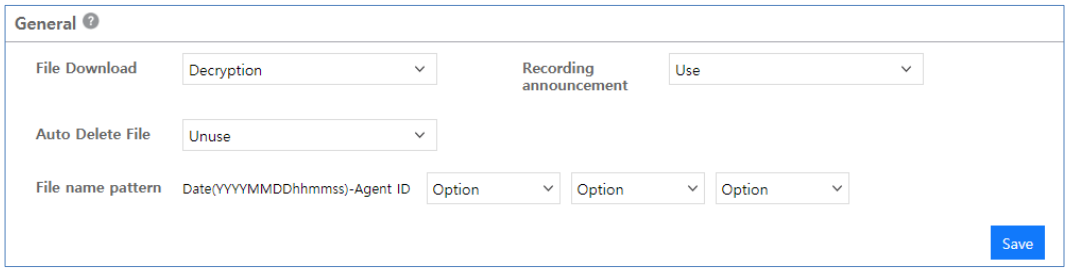
To set up the password policy:

You can see the Password Policy Settings section at the Administration > General Setting page.

- **PW policy:** you can choose whether or not to use password policy. If you use a password policy, all user passwords must combination with English, numeric, and special characters (! @ % ^ & *)
- **PW change:** you can choose whether or not to use the PW Change Cycle. You can select Use (recommended), and Unused option. When using the Use option, you can set the PW change cycle (day, week, month, year).
- **Old PW:** you can choose whether or not to use the old password. You can select Permit, Limited number of times, Block option. When using Limited number of times option, you can set the PW Maintenance number.
- Try limits: this option limits the number of password input failures. When using this option, you can set the number of Try limit times.
- Account lockout: you can set whether or not to lock accounts for accounts that have not been used for a certain period of time. When using this option, you can set the Lock Cycle (days, weeks, months, and years).

6.6.6.3 General

This is a page for setting up the general information related to using the iPECS IPCR.



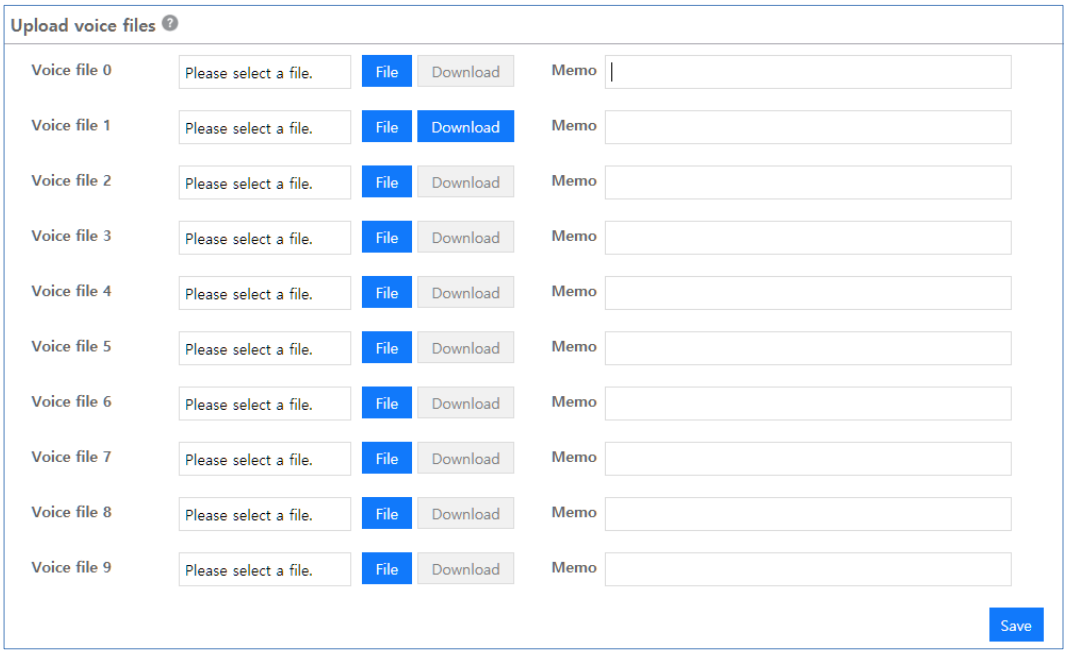
To set up the general information:

You can see the General section at the Admin >Administration > General Setting page.

- **File Download:** you can set how files are downloaded.
- **Recording announcement:** you can select whether or not the announcement is recorded.
- **Auto Delete File:** you can select whether or not to use the automatic deletion of recording files.
- **File name pattern :** you can select File name pattern
- You must restart the iPECS IPCR engine after modify General information

6.6.6.4 Upload Voice(Announcement) Files

You can upload an announcement voice file for use of the recording.



How to upload voice (announcement) file:

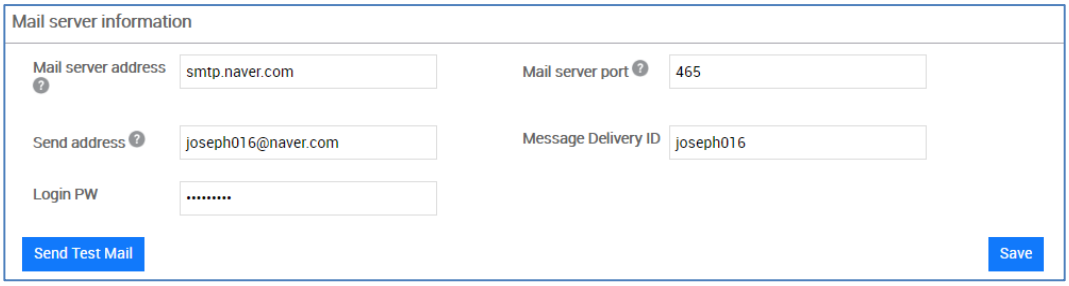
You can see the Upload Voice Files section at the Administration > General Setting page.

- You can upload up to 10 announcement voice files.
- Click **File** button to select the announcement voice file which you want to upload.
- Click **Save** button to upload the announcement voice file to the iPECS IPCR server.
- You can download the uploaded announcement voice file in the iPECS IPCR server via the **Download** button.

NOTE Only voice file1 is available in IPCES-UCM.

6.6.6.5 Mail Server Information

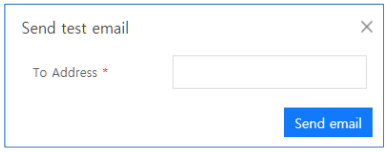
This is a page for setting up a Mail server information (SMTP)to receive various alarms mails.



To set up mail server information:

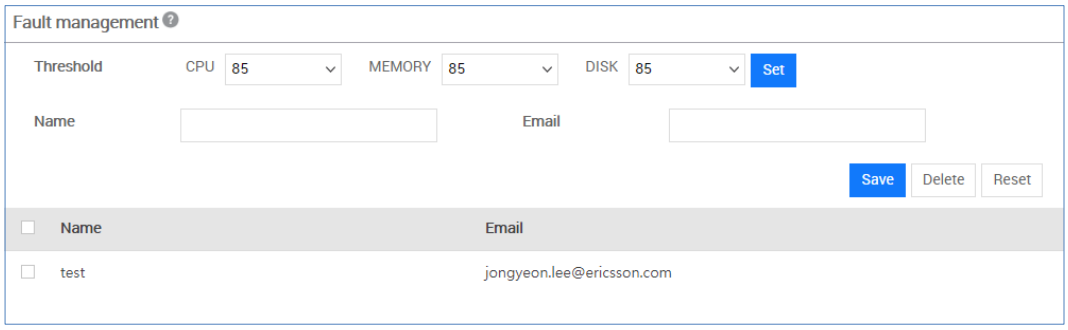
You can see the Mail Server Information section at the Administration > General Setting page.

- Input the address in Mail Server Address. Be sure to input your outgoing mail server address.
- Input the mail server port number. If you are using Gmail as your mail server, please set the mail server port to 587.
- In Send address, input Mail address.
- In Message Delivery ID, input account ID.
- In Login PW, input your Mail Server Login password. If you are using Gmail as your mail server, please input your Gmail account password.
- When clicking the **Send Test Mail** button, you can see Test Mail Send window as shown below. Input your e-mail address to receive the test mail and click **Send email** button. If the mail server information which you entered is correct, test mail will be sent normally.



6.6.6.6 Fault Management

This is a page for setting the thresholds of resource in the IPCR server and the email address to notify when a failure occurs.



To set up fault management:

You can see the Fault Management section at the Administration > General Setting page.

1. Set thresholds by resource (CPU, MEMORY, DISK).
2. Click **Set** button to save the threshold information.
3. Input the information (name, e-mail address) for which you want to receive the alarm mail if the threshold is exceeded. To use this feature, you must input the Mail Server Information section at the **Administration > General Setting** page.
4. Click **Save** button.

NOTE You can modify the entered email information by double click at the mouse in the same way as above. You must restart the IPCR engine after modify Fault manage information.

To delete:

- Click the checkbox for the item you want to delete.
- Click **Delete** button.

To initialize:

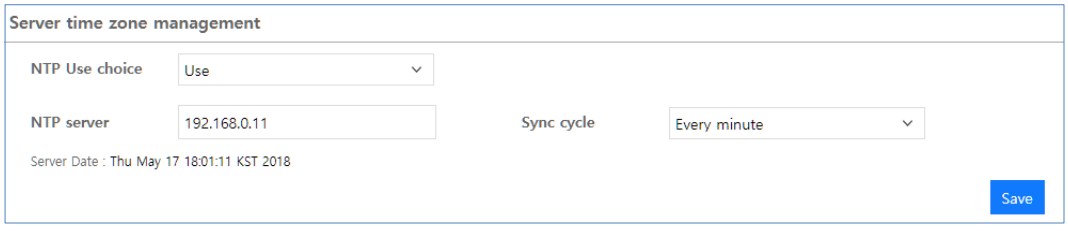
- You can initialize the input form
- by clicking **Reset** button.

6.6.6.7 Server Time Zone Management

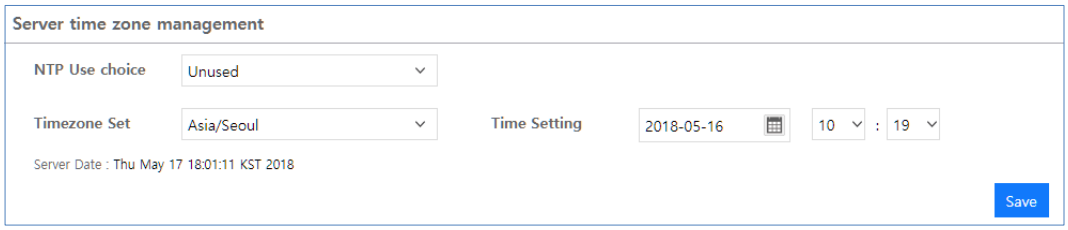
This is a page for managing the time zone of the IPCR server.

To set up server time zone:

You can see the Server time zone management section at the Administration > General Setting page.



- **NTP Use choice:** select whether or not to use NTP. When using NTP, Set the following values
  - **NTP server:** Input NTP server information
  - **Sync cycle:** Select how often to synchronize with the NTP server.



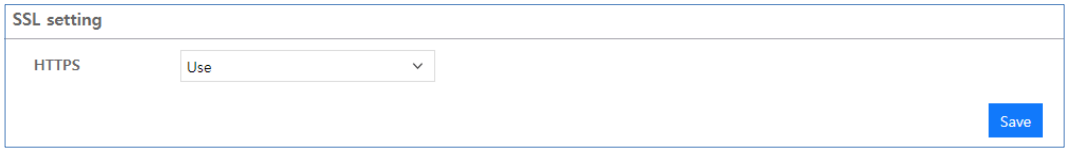
- **Time zone Set/ Time Setting:** You can set time zone and server time.

6.6.6.8 SSL Setting

This page is a page that use or unused SSL on an iPECS IPCR.

To set up SSL Setting:

You can see the SSL Setting section at the **Administration > General Setting** page.



- **HTTPS :** select whether or not to use SSL
- If you are using HTTPS, you must include https:// before the connection URL.

6.6.6.9 Concurrent License Setting

You can use the IPECS-IPCR Concurrent License when you use the IPCES-UCM system. When you use the current license, you can register up to 2,000 channels regardless of the number of licenses.

To set up Concurrent License Setting:

You can see the SSL Setting section at the **Administration > General Setting** page.

- Concurrent licenses limit the number of concurrent recording lines by the license quantity.
- When using a Concurrent license, the following login page appears:

6.6.7 Maintenance

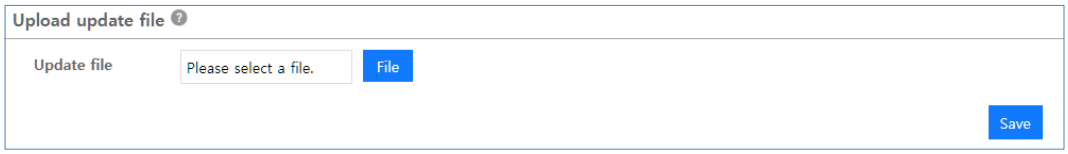
The maintenance section provides iPECS IPCR upgrades and automatic backup, FTP backup, and migration functions.

6.6.7.1 Upload Update File

This is a page for uploading the iPECS IPCR update file (update_*.tar.gz). You must restart the iPECS IPCR server after you upload the update file.

To upload the iPECS IPCR update file:

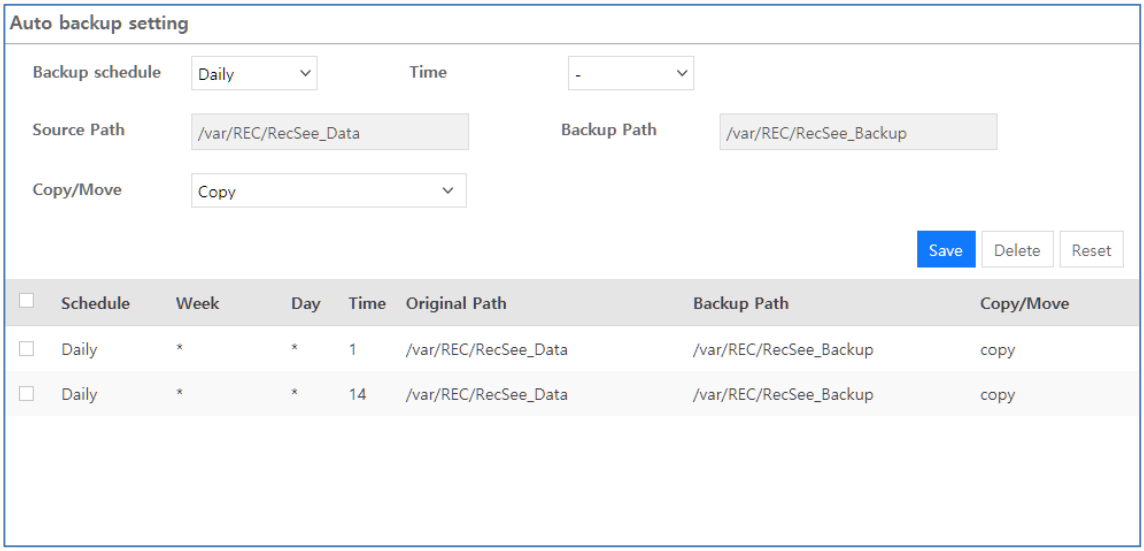
You can see the Upload update files section at the Administration > Maintenance page.



1. Click **Files** button to select the iPECS IPCR update file (update_*.tar.gz.)
2. Click **Save** button to upload the file to the IPCR server.

6.6.7.2 Auto Backup Setting

The iPECS IPCR application will perform a periodic backup of recordings. Automatic Backup defines the interval between backups, the source and destination paths, and copy or move. When the backup is copied, the original recording is maintained on the iPECS IPCR server and copied to the back-up path. When 'Move' is selected, the recording files are moved to the back-up path and deleted from the iPECS IPCR server.



To set up Automatic Backup:

You can see the Auto backup setting section at the Administration > Maintenance page.

1. Select the auto backup schedule information. Backup schedules are divided into Daily, Weekly, and Monthly.
2. Select Copy/Move option.
3. Click **Save** button.

NOTE Mount the physical disk to the /var/REC/RecSee_Backup path.

To delete:

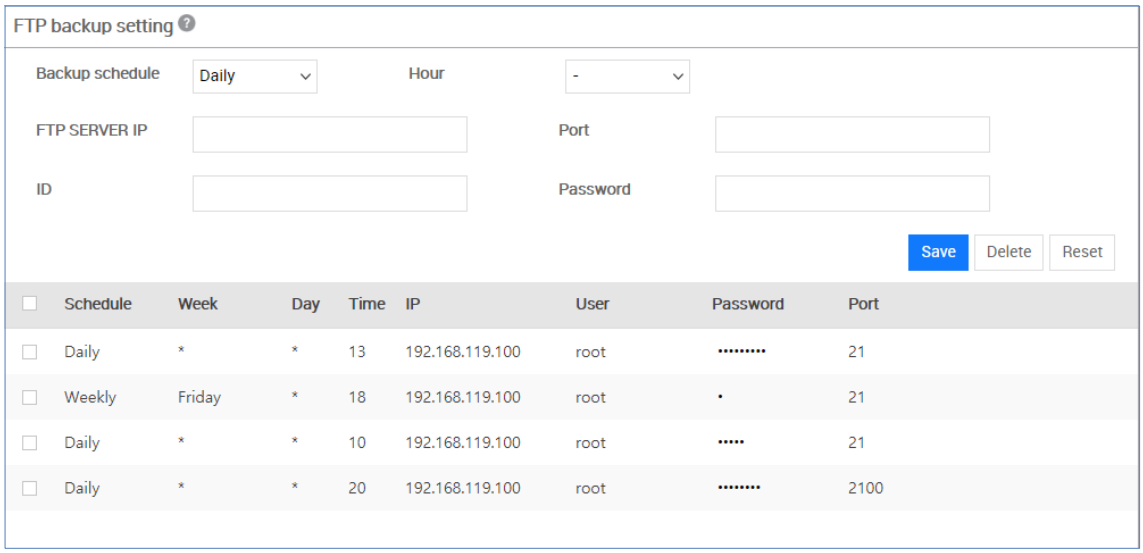
- Click the checkbox for the item you want to delete.
- Click **Delete** button.

To initialize:

- You can initialize the input form
- by clicking the **Reset** button.

6.6.7.3 FTP Backup Setting

This is a page for setting for back up recording files from the iPECS IPCR server to an FTP server which you established. You can back up your recording files via FTP at a fixed time for every day, week and month.



To set up FTP backup setting:

You can see the FTP Backup settings section at the Administration > Maintenance page.

1. Select the FTP backup schedule information. Backup schedules are divided into Daily, Weekly, and Monthly.
2. Input the FTP server connection information where you want to back up recording files.
3. Check cycle: Set how often to check FTP schedule information.
4. Click **Save** button.

To delete:

- Click the checkbox for the item you want to delete.
- Click **Delete** button.

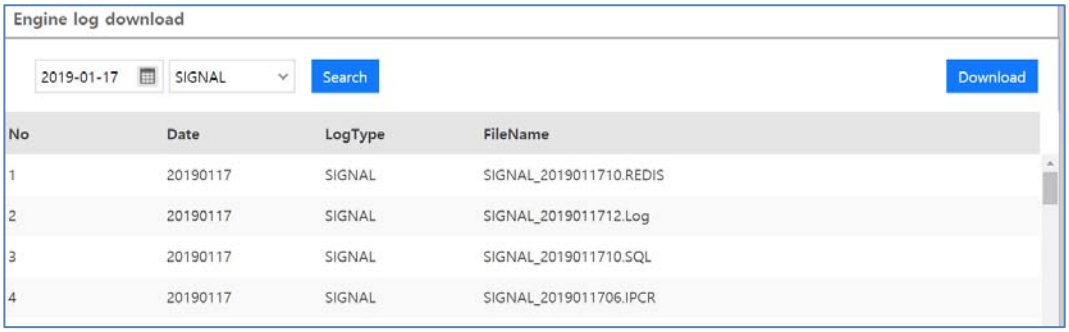
To initialize:

- You can initialize the input form
- by clicking **Reset** button.

NOTE You must restart the iPECS IPCR engine after modify FTP backup setting information. FTP backups are performed up to the previous day's data.

6.6.7.4 Engine log downloadk

This page allows you to download logs from the iPECS IPCR engine. When an iPECS IPCR problem occurs, the user can download logs and easily make trouble shooting.



Engine Log Pattern:

- **DBGw:** DBGW_*_yyyymmdd + Sequence number
- **RTP:** RTP_yyyymmddhh + Log type
- **RVM:** RVM_yyyymmddhh + Log type
- **LXprocess:** XPROCESS_ yyyymmddhh + Log type
- **SIGNAL:** SIGNAL_ yyyymmddhh + Log type
- **FTPTransfer:** PRINT_hh.log

6.6.7.5 PCAP Download

This page is a feature that populates and downloads packets that enter the iPECS IPCR server.

- Click **Start** button to start capturing,
- And then press the Stop button to download automatically. The size of the capture file is up to 50MB.

6.6.7.6 Database Management

This page manages the database of the iPECS IPCR.

This page allows users to back up, download, upload, and restore databases. Up to three backup files can be saved.

How to use Database Management:

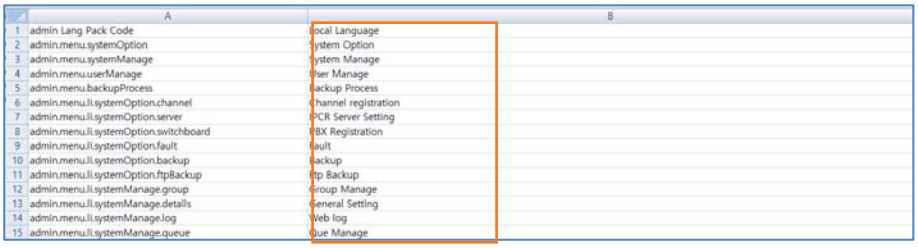
- Click **Backup Start** button to back up the database of the current iPECS IPCR.
- Click **Restore** button, all existing data will be deleted and the backup file will be used for restore
- You can save your backup files to your PC by click **download** button.
- The downloaded backup files can also be uploaded using the Backup File Upload.
- The backup data is deleted when the **Delete** button is clicked.

6.6.7.7 Language Setting

This page allows you to set the local language of iPECS IPCR to the desired language.

To set up Local language setting:

1. Click **Download Form** Button to 'lang_local_pack.zip'
2. As shown below, translate English into local language, (ex – local_Lang_admin.CSV). Column A and Row 1 of the CSV file should not be modified.

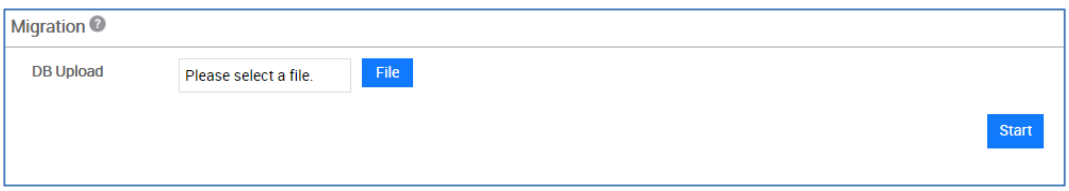


	A	B
1	admin Lang Pack Code	local Language
2	admin.menu.systemOption	System Option
3	admin.menu.systemManage	System Manage
4	admin.menu.userManage	User Manage
5	admin.menu.backupProcess	Backup Process
6	admin.menu.li.systemOption.channel	Channel registration
7	admin.menu.li.systemOption.server	IPCR Server Setting
8	admin.menu.li.systemOption.switchboard	PBX Registration
9	admin.menu.li.systemOption.fault	Fault
10	admin.menu.li.systemOption.backup	Backup
11	admin.menu.li.systemOption.ftpBackup	Ftp Backup
12	admin.menu.li.systemManage.group	Group Manage
13	admin.menu.li.systemManage.details	General Setting
14	admin.menu.li.systemManage.log	Web log
15	admin.menu.li.systemManage.queue	Que Manage

3. Upload the Translated CSV file.
4. When the upload is complete, restart the server and delete the cookies and cache in browser.

6.6.7.8 Migration

This is a page for setting for the iPECS IPCR Migration. If you have previously used the iPECS IPCR version 2, you can migrate existing data to iPECS IPCR version 3 through setting on this page.



To set up Migration setting:

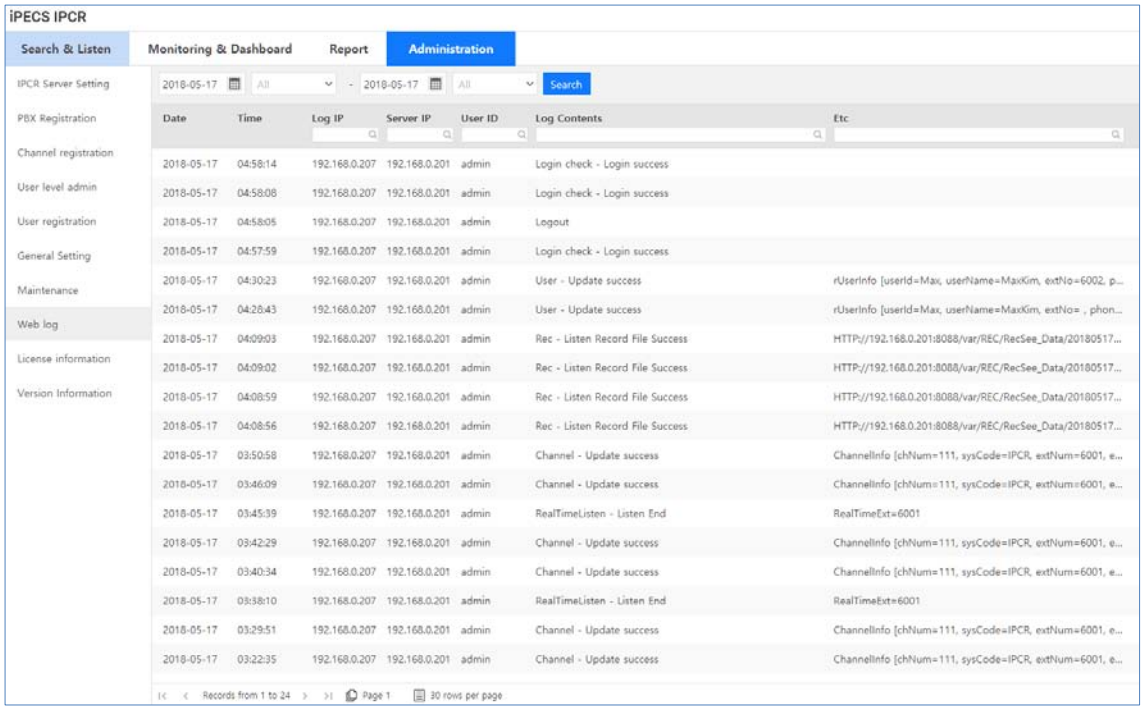
When you before start migration, backup the iPECS IPCR Version 2 recording file into new iPECS IPCR Server # Appendix A.4 - Recording File Backup and Restore reference. When creating version 2 DB backup file # Appendix A.2 - DB backup reference

You can see the Migration section at the Administration > Maintenance page.

1. Click **File** button to select the iPECS IPCR Version 2 database that you backed up in advance and click **Save** button to perform the DB upload.
2. Click **Start** button to proceed with the iPECS IPCR migration.
   - When the migration begins, you will see the progress in the Migration section and keep the page when the backup file is restored.

6.6.8 Web Log

This is a page for showing logs about recording, listening, changing information, monitoring, and failures performed in the iPECS IPCR Web.



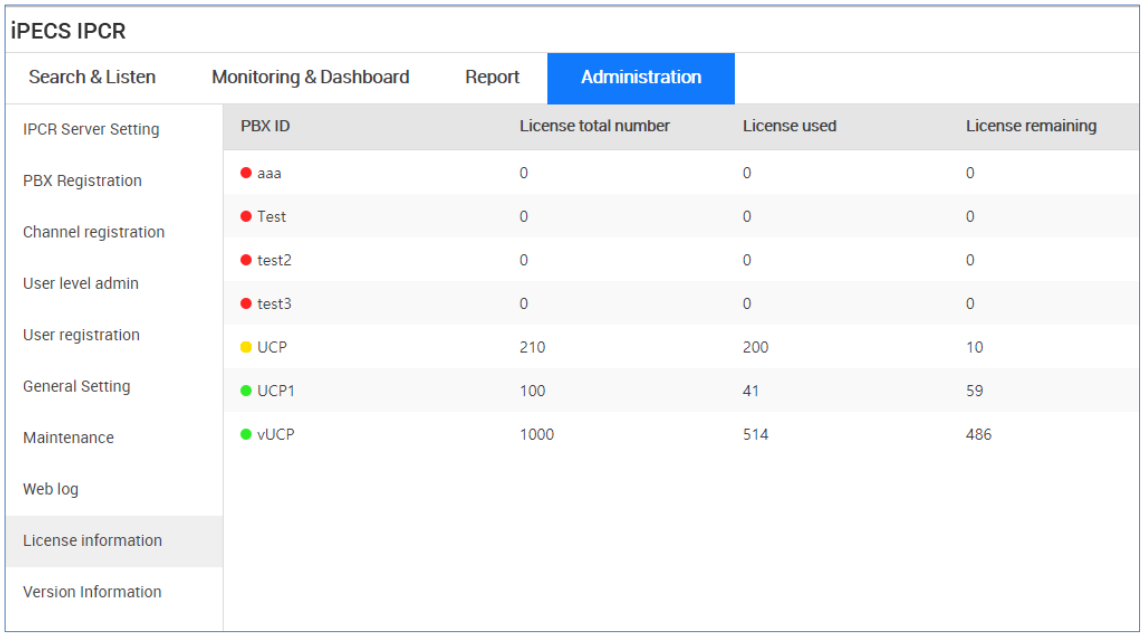
To view the iPECS IPCR Server log:

You can see the above page at the Administration > Web log page.

- Select the date and time of the log information you want to find.
- Click **Search** button.

6.6.9 License Information

This is a page for showing a license information for the iPECS IPCR. You can see the License total number, License used, License remaining by PBX ID.



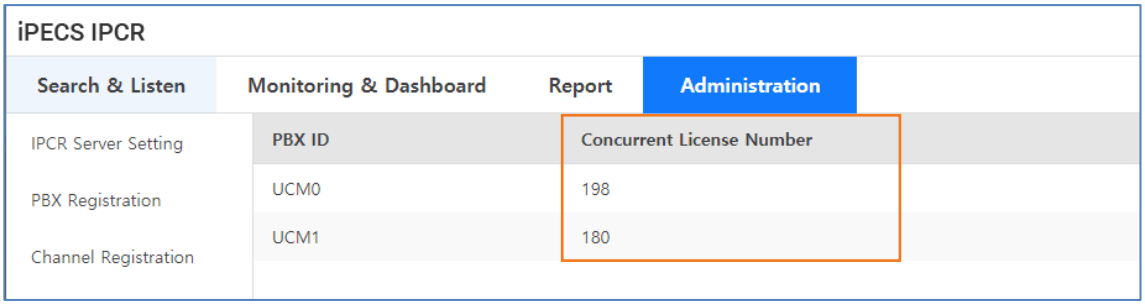
To view the license information for the iPECS IPCR:

You can see the above page at the Administration > License information page.

- A circle next to the exchange ID indicates the status of license usage
- ● Appears when the remaining license quantity is missing or is less than zero
- ● Appears when the remaining license quantity is less than 10% of the total usage
- ● Appears when the remaining license quantity is more than 10% of the total usage

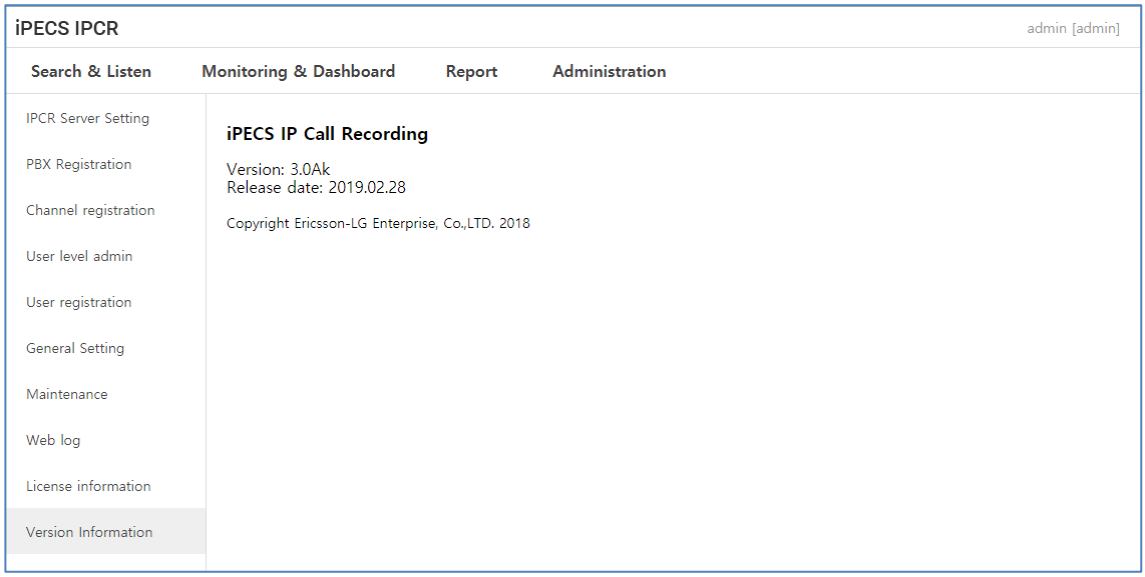
When you use the current license:

The number of Concurrent licenses is shown as shown in the capture below.



6.6.10 Version Information

This is a page for showing the iPECS IPCR version information.



To view the version information for the iPECS IPCR:

You can see the above page at the **Administration > Version information** page.

Appendix A:

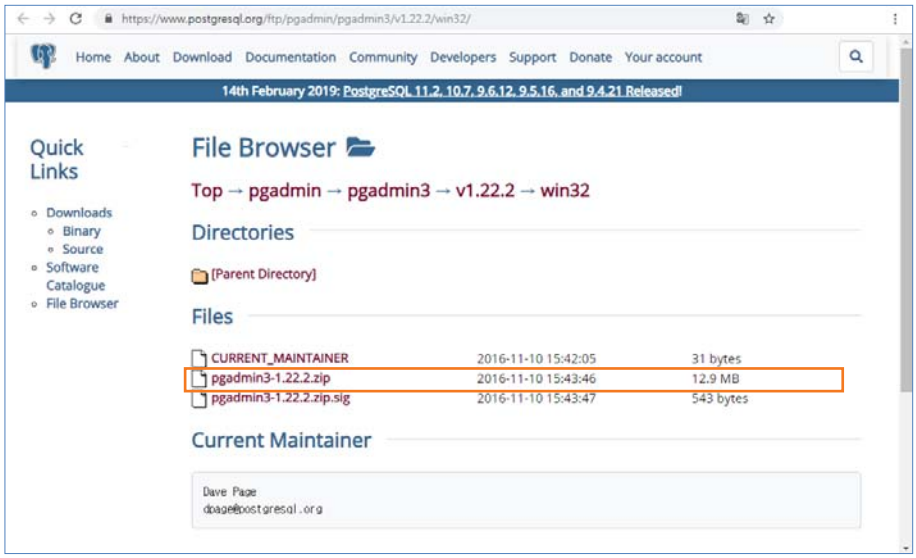
Database Backup and Restore

Database information of the IPCR can be conveniently backed up and restored using a tool called pgAdmin.

A.1 Download pgAdmin

In order to back up and restore the Database, it is recommended to use pgAdmin as tool. pgAdmin is a free software project released under the PostgreSQL/Artistic license.

1. Open Chrome browser and visit the following link to download the pgAdmin 3-1.22.1.zip file. https://www.postgresql.org/ftp/pgadmin/pgadmin3/v1.22.2/win32/



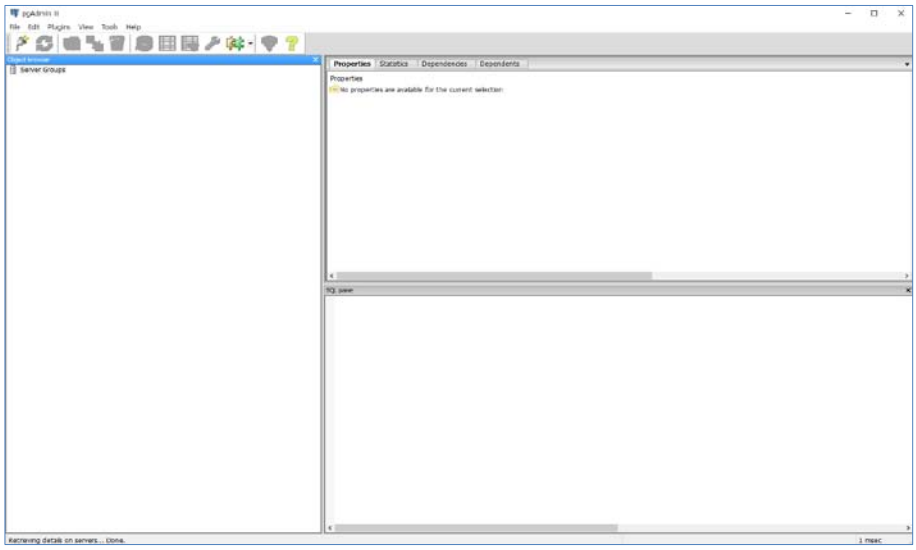
2. You can install after extracting the files (default).

A.2 DB Backup

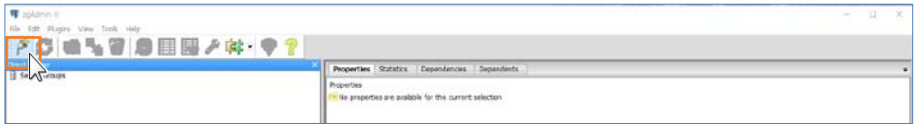
You can back up the database of the iPECS IPCR using pgAdmin in the following order.

A.2.1 Run the pgAdmin

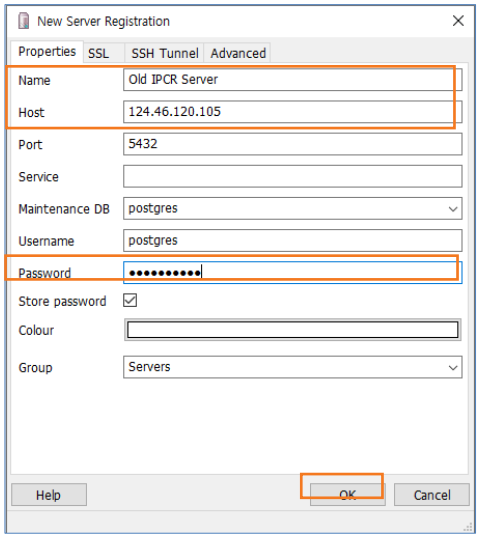
1. Execute the **pgAdmin III** application.
   - The **pgAdmin III** for Windows application can be launched from the Windows Start Menu (pgAdmin III).
2. The following pgAdmin III main page is displayed on your screen.



3. Click the **Connect** ( ) icon to add a connection to a server.



4. A **Properties** tab appears in the New Server registration page.
5. Select an item to modify and click **OK** button to save.

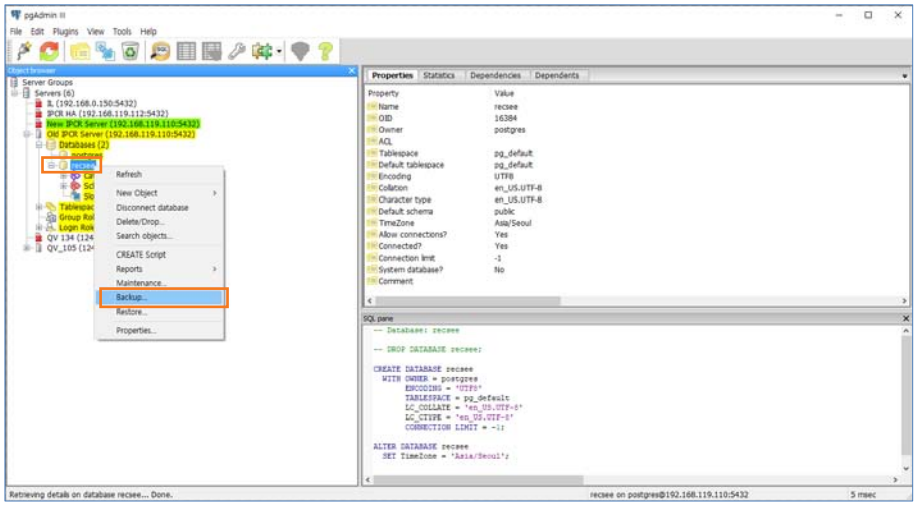


- **Name:** Server name
- **Password:** Ver.2.X - postgres012 or postgres
- **Colour:** Change or not

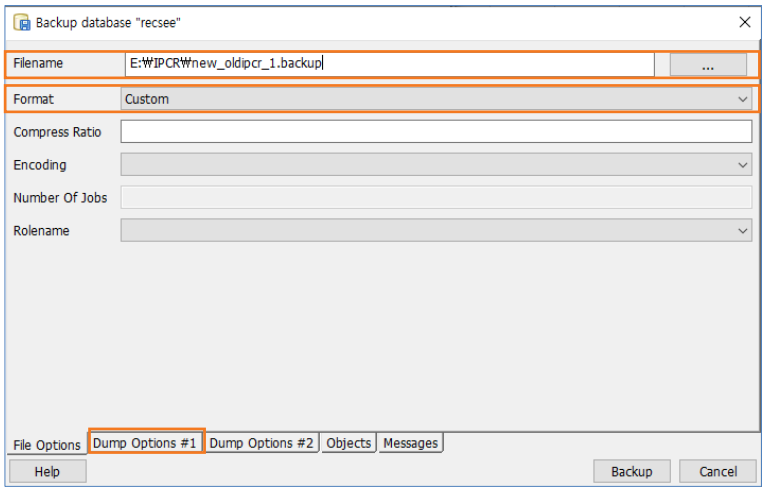
A.2.2 Select DB Backup Path

Select the database backup path using pgAdmin.

1. Move the cursor to the Servers (1) at the Object browser.
2. Click the icon beside the **Server (1)** to expand one level at a time.
3. Go to **Old IPCR Server > Databases (2) > recsee** by clicking on the icon.
4. Right-click on the **recsee** to select **Backup** from the context menu.



5. Select an item to modify and click **OK** button to save.



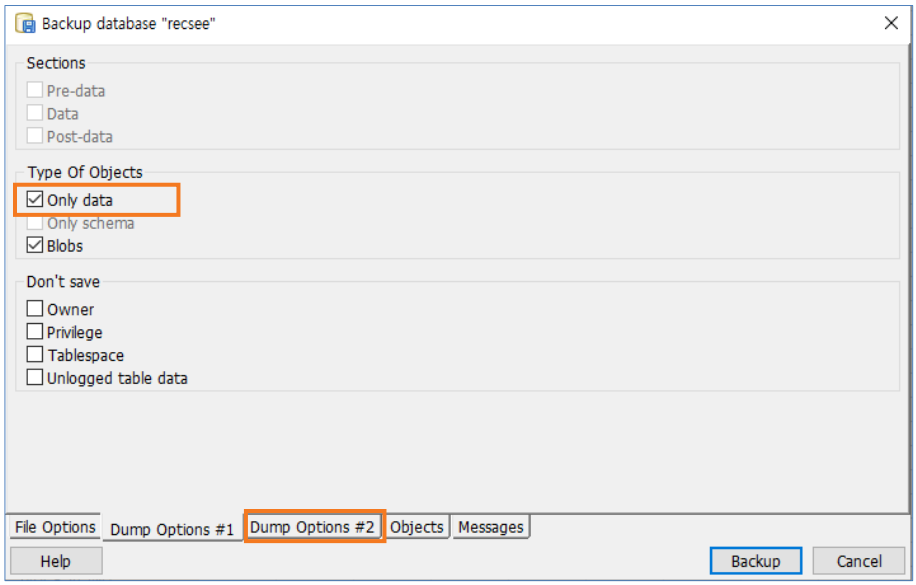
- **Filename:** Backup file name
- **Format:** Custom

6. Click **'Dump Option #1'** tab to set more option.

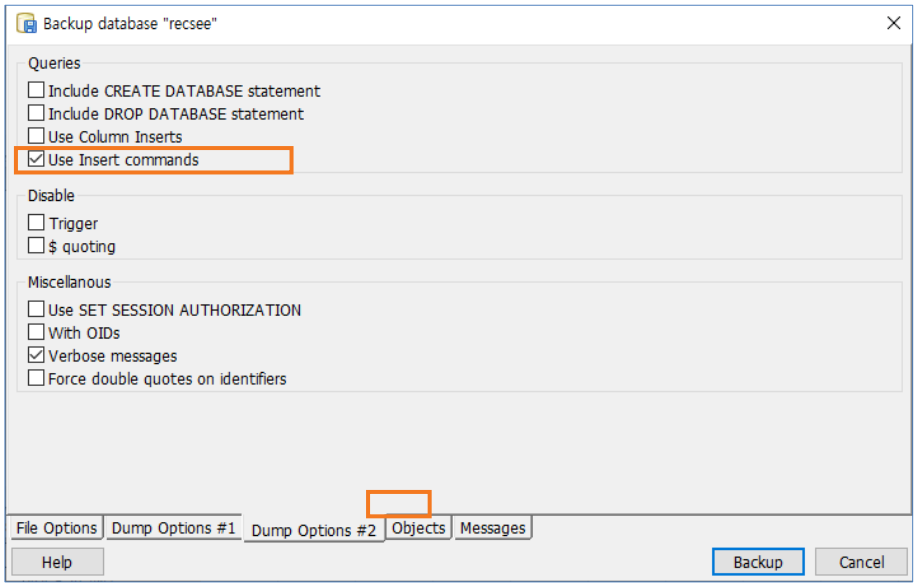
A.2.3 Dump Option

In the Backup database "recsee" page, click the tab **of Dump Option # 1** and **# 2** to proceed as follows.

1. Click on the **Only data** checkbox to select.
2. Click the **Dump Option #2** tab.



3. Click on the **Use Insert commands** checkbox to select.

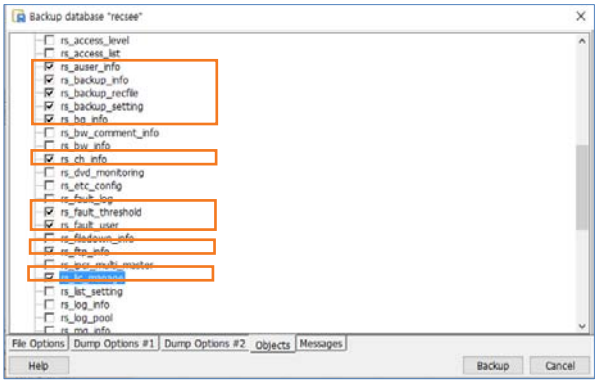


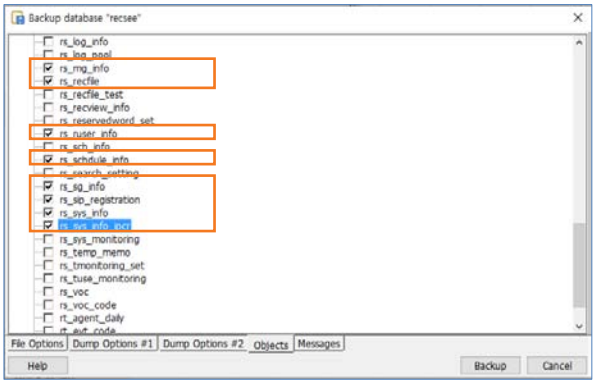
4. Click **Objects** tab to set more option.

A.2.4 Objects

In the Backup database "recsee" page, click the **Objects** tab to proceed as follows.

1. Click to checkbox to select options.



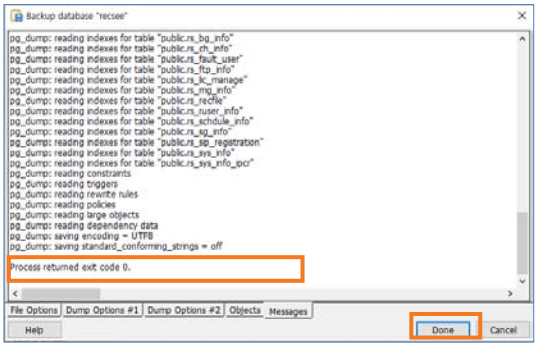


2. Click **Backup** button.

A.2.5 Backup

After completing the above steps, the database backup process of the iPECS IPCR is completed. The file that has been backed up exists in the backup path which was set up during the above process, and you can use this file when restoring.

1. If you see **Process returned exit code 0** at the bottom of the Backup data base "recsee" page, it means the backup is normally completed.



2. Click **Done** button to complete the DB Backup process.

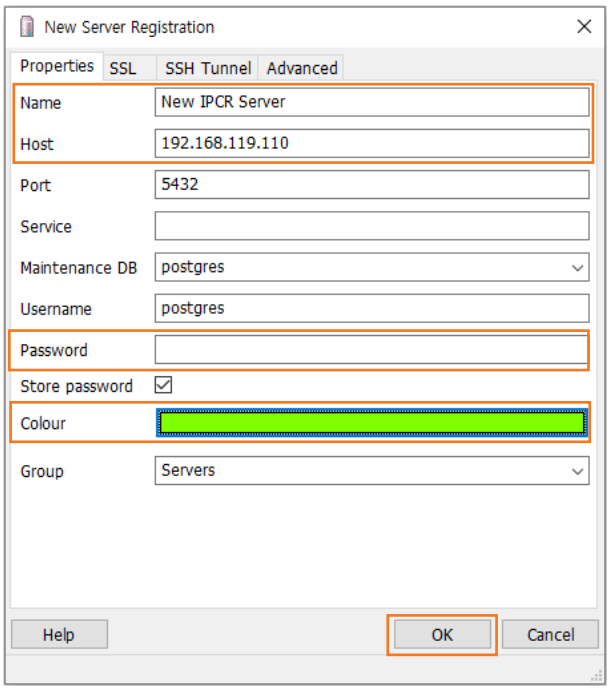
A.3 DB Restore

You can restore the database of the IPCR using pgAdmin in the following order.

A.3.1 Run the pgAdmin

1. Execute the **pgAdmin III** application.
2. Click the **Connect** ( ) icon.

3. A **Properties** tab appears in the New Server registration page.
4. Select an item to modify and click **OK** button to save.



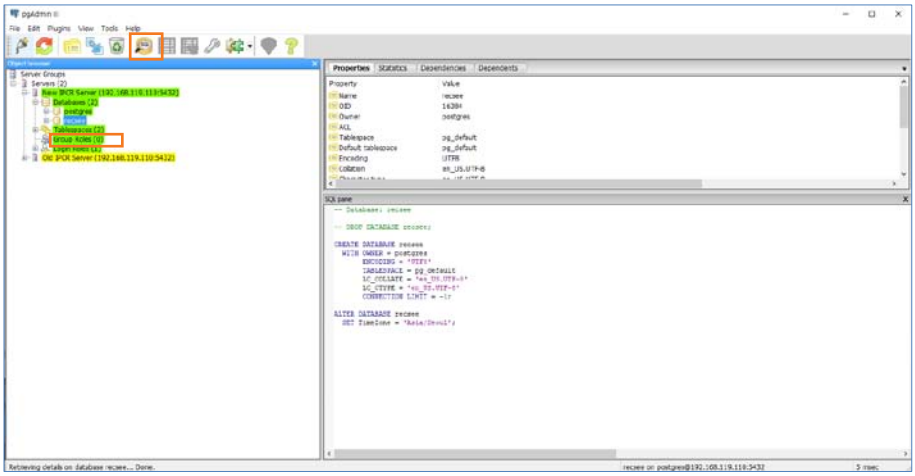
- **Name:** Server name
- **Password:** Ver.2.X - postgres012 or postgres
- **Colour:** Change or not

A.3.2 Setting Query

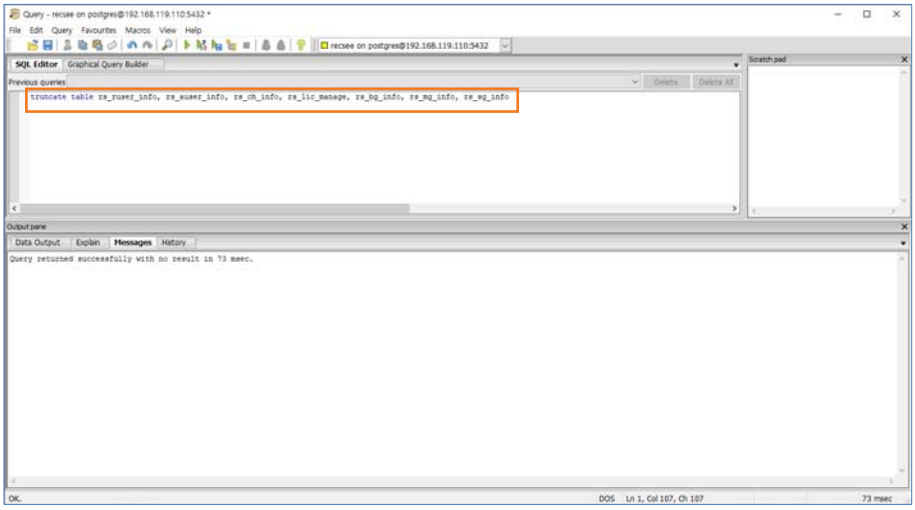
Before restoring database of the iPECS IPCR, you should input the below query. The **truncate table** is the SQL command which is used to delete all rows of existing table.

1. Move the cursor to the Servers (2) at the Object browser.
2. Click the icon beside the **Server (2)** to expand one level at a time.

3. Go to **New IPCR Server > Databases (2) > recsee** by clicking on the ⊞ icon.
4. Click both the **recsee** and the **SQL** (SQL) icon.



5. Copy and paste the query to SQL Editor when it opens. The query is "truncate table rs_ruser_info, rs_auser_info, rs_ch_info, rs_lic_manage, rs_bg_info, rs_mg_info, rs_sg_info".

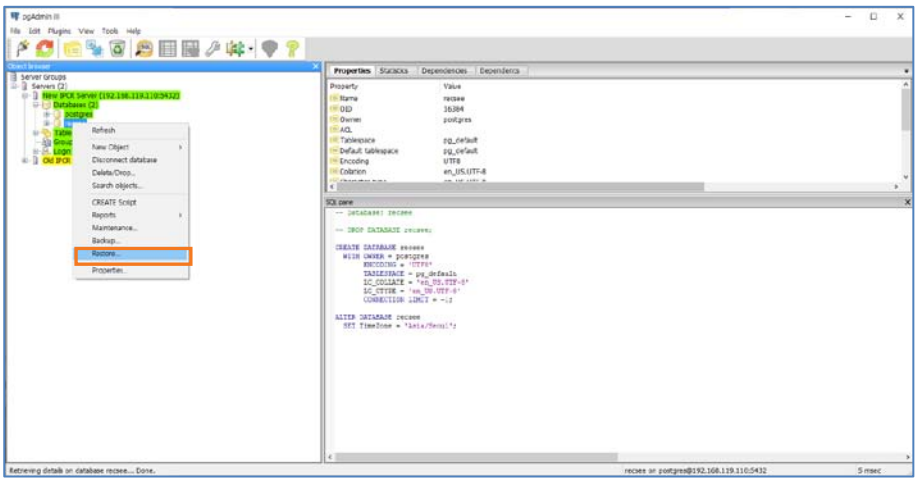


6. Click the **Execute query** (▶) icon.

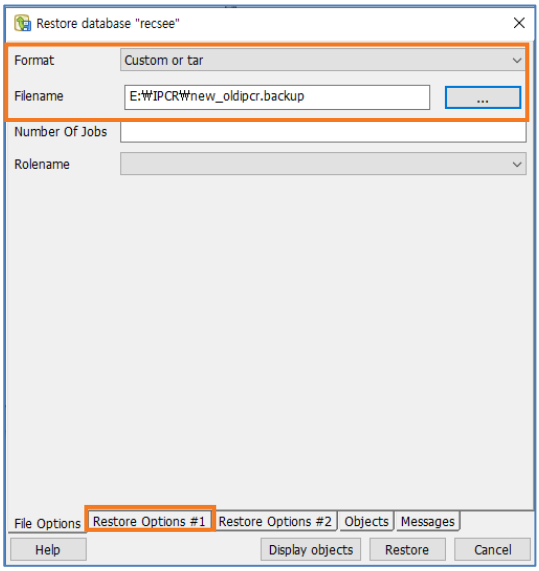
A.3.3 Select DB Restore Path

Select the database restore path using pgAdmin.

1. Move the cursor to the ⊞ Servers (2) at the Object browser.
2. Click the ⊞ icon beside the **Server (2)** to expand one level at a time.
3. Go to **New IPCR Server > Databases (2) > recsee** by clicking on the ⊞ icon.
4. Right-click on the **recsee** to select **Restore** from the context menu.



5. Select an item to modify and click **OK** button to save.



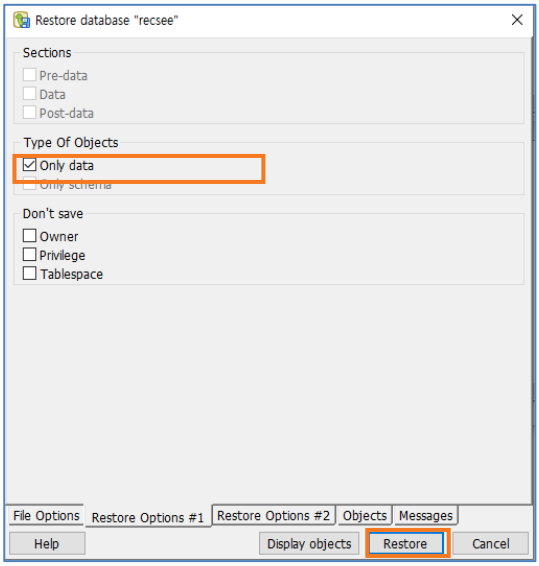
- **Format:** Custom or tar
- **Filename:** "recsee" Backup file

6. Click **Restore Options #1** tab to set more option.

A.3.4 Option

In the Backup database "recsee" page, click the **Restore Options #1** tab to proceed as follows.

1. Click on the **Only data** checkbox to select.
2. Click **Restore** button.



A.4 Recording File Backup and Restore

Describes how to install and use FTP program filezilla which is a FTP client and free software. You can use filezilla to backup and restore your recorded files.

A.4.1 FileZilla Download and install

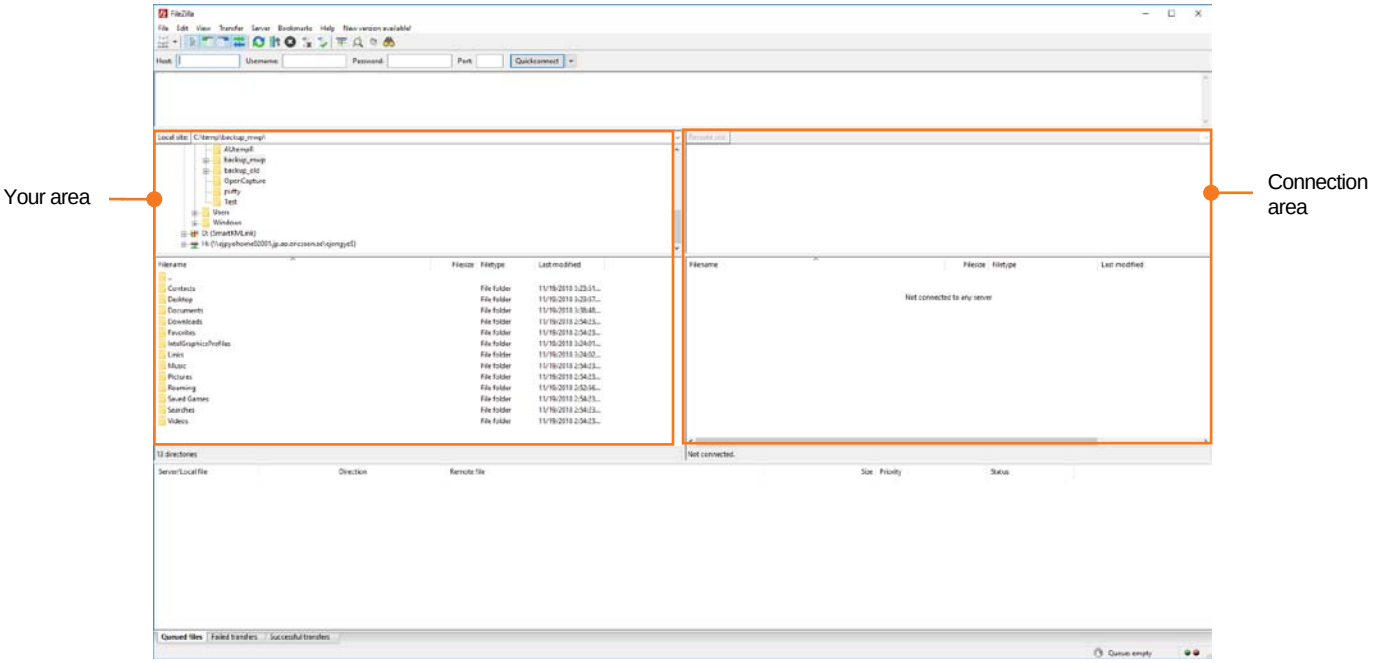
1. Open Chrome browser and visit the following link to download the FileZilla setup file. https://filezilla-project.org/

2. Click **Download Filezilla Client** and follow the on-page instructions to download.

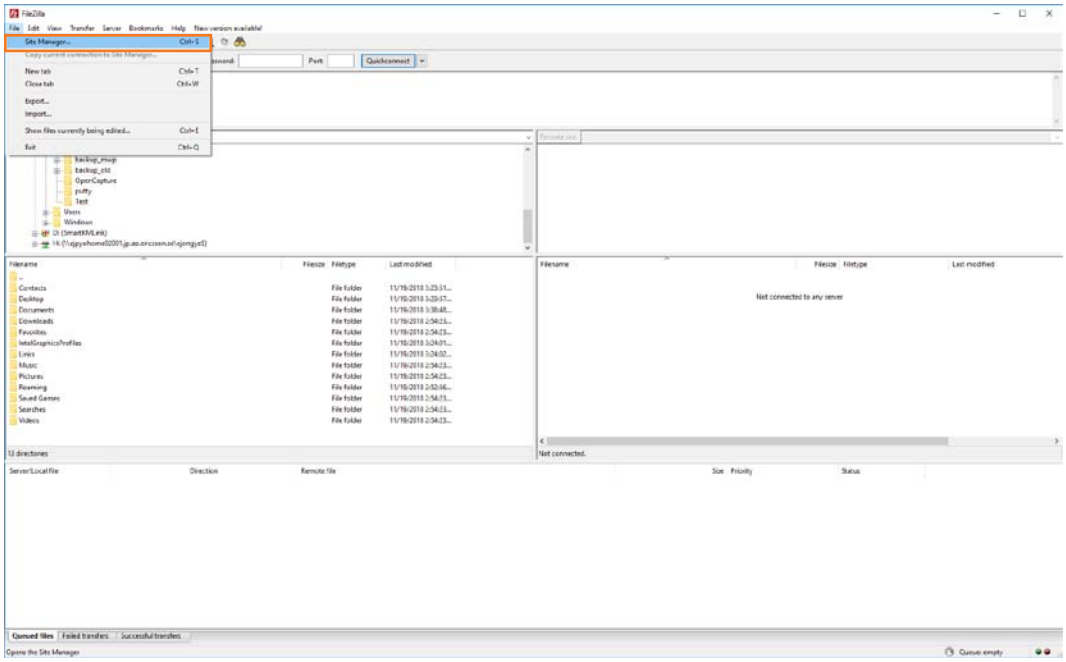
3. Double-click **Filezilla** file you've downloaded to install.

A.4.2 Recording file backup

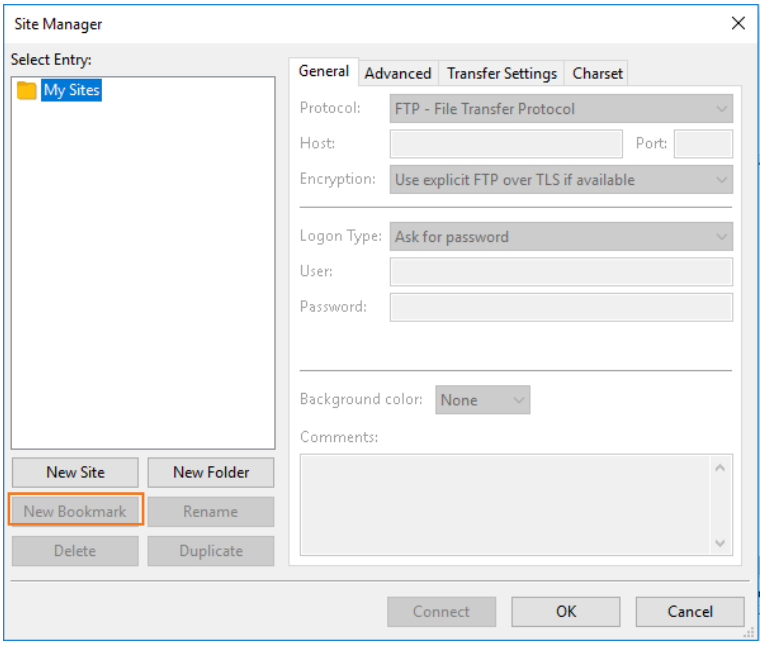
1. Run the **Filezilla** application.
   - The Filezilla for Windows application can be launched from the Windows Start Menu (FileZilla).
2. The following Filezilla main page is displayed on your screen. Marked with the **Local site:** is your work area, and the marked with **Remote site:** is the area of information to connect.



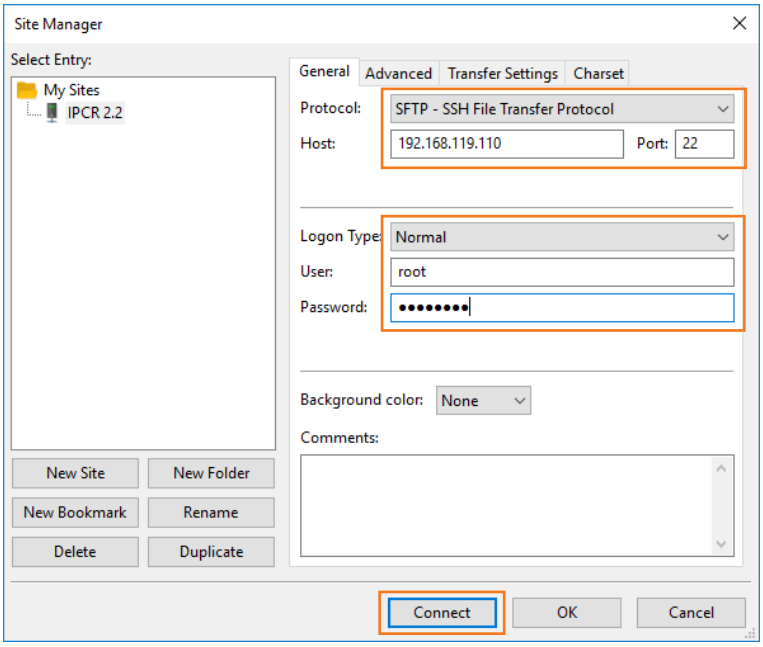
3. Go to **File > Site Manager** to popup the Site Manager window.



4. Click **New Site** button and type the site name.

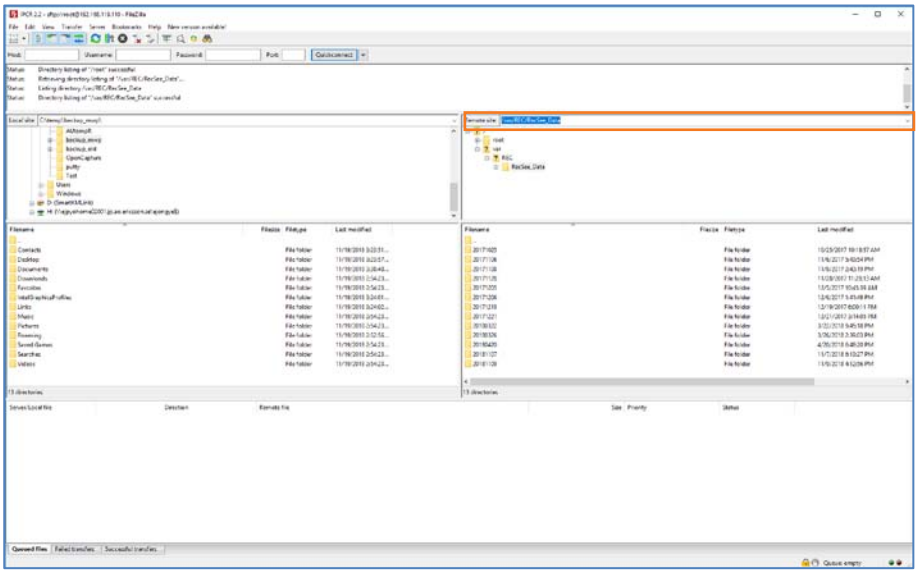


5. In the **'General'** tab, enter the information of the existing Old IPCR Server. When you have finished, click **Connect** button.

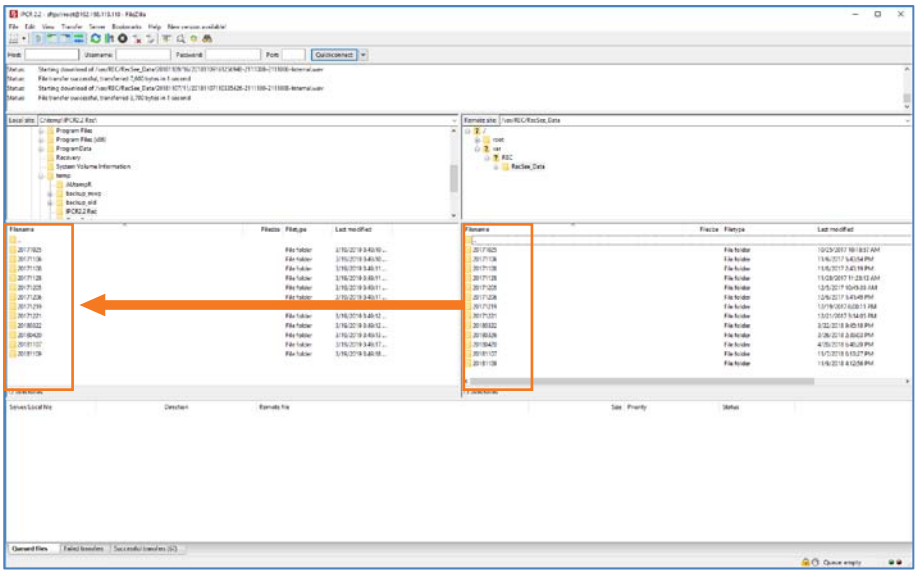


- **Host:** Old version IPCR server IP
- **Port:** 22 --- SFTP default Port
- **Protocol:** SFTP – SSH File Transfer Protocol
- **Logon Type**: Normal
- **User:** username – default root
- **Password:** password – default p@ssw0rd.

6. When connected, it moves to the recording file path. The path is /var/REC/RecSee_Data



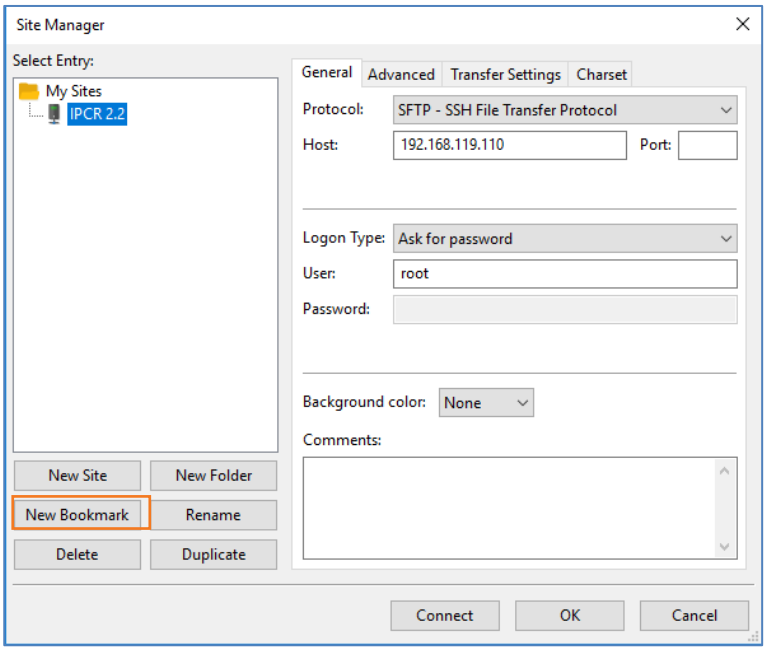
7. Backs up the recording files that exist in the path. Create a directory to back up and drag and drop it to the directory where you want to migrate.



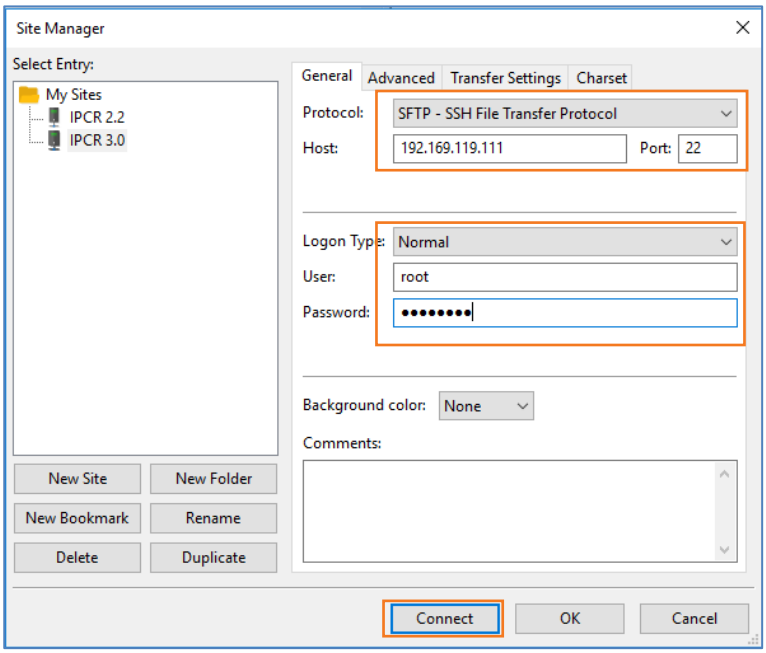
A.4.3 Recording file restore

When the backup is completed, connect to the newly installed IPCR.

1. Click **New Site** button and type the site name.



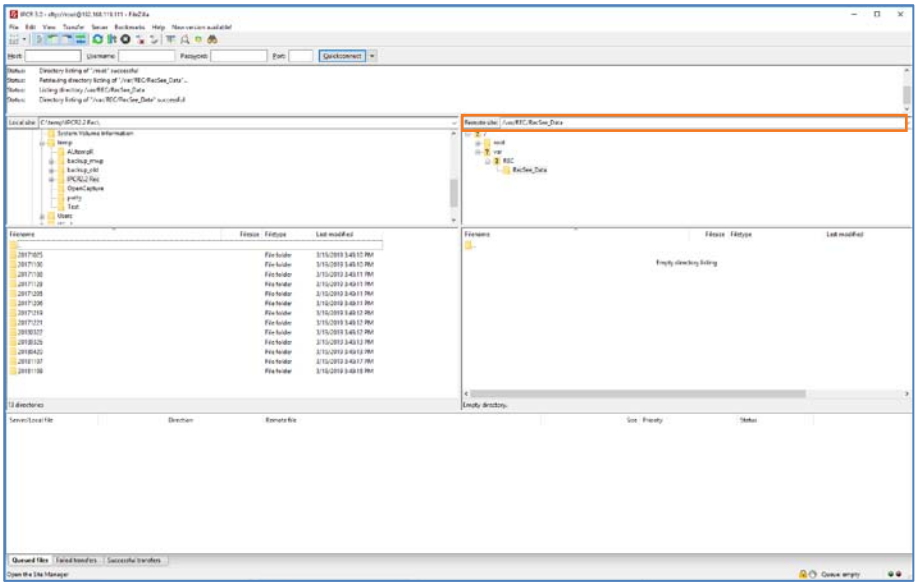
2. In the **'General'** tab, enter the information of the existing New IPCR Server. When you have finished, click **Connect** button.



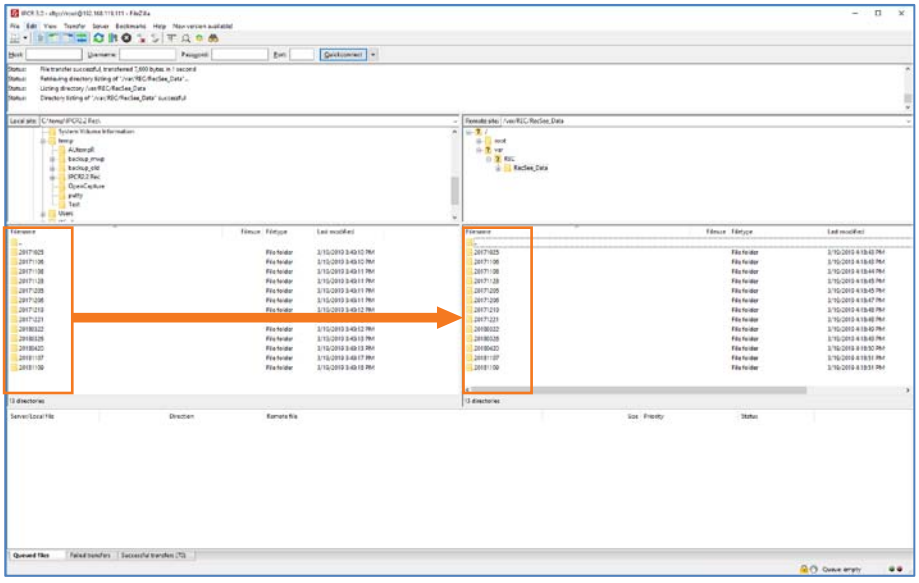
- **Host:** Old version IPCR server IP
- **Port:** 22 --- SFTP default Port
- **Protocol:** SFTP – SSH File Transfer Protocol

- **Logon Type**: Normal
- **User:** username – default root
- **Password:** password – default p@ssw0rd.

3. Once connected, it will go to the same path as show in the below picture. The 'path' is /var/REC/RecSee_Data.



4. Restore the recorded recording file to the new IPCR recording file path.



- Select all backed up files and drag and drop them to that path.

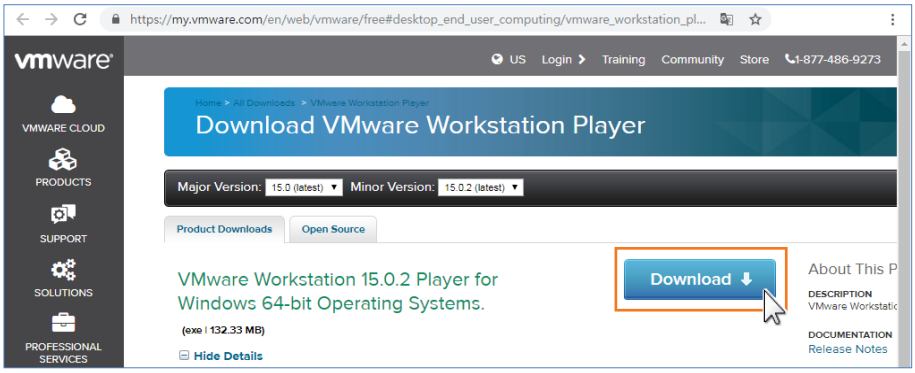
Appendix B:

Setup in VM Workstation Player

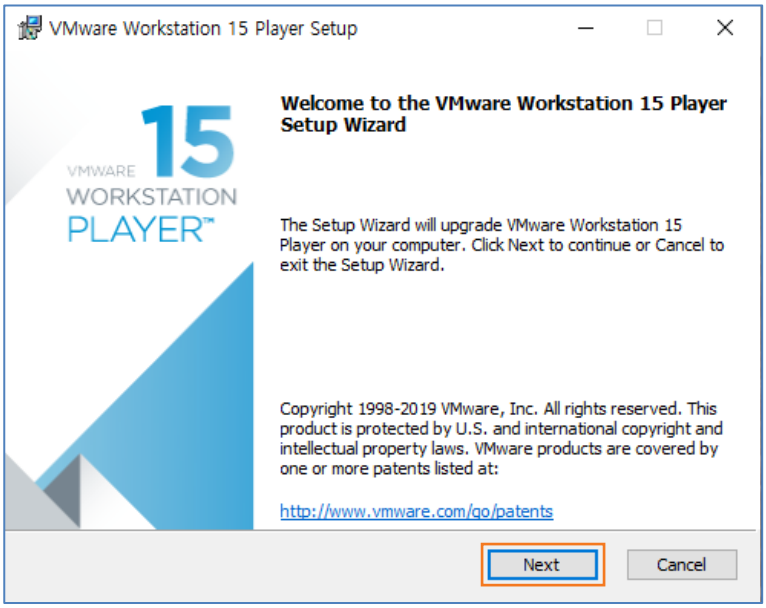
This chapter describes how to install IPCR in the VM Workstation Player 15 or higher installed with Clonezilla.

B.1 Install VMPlayer15

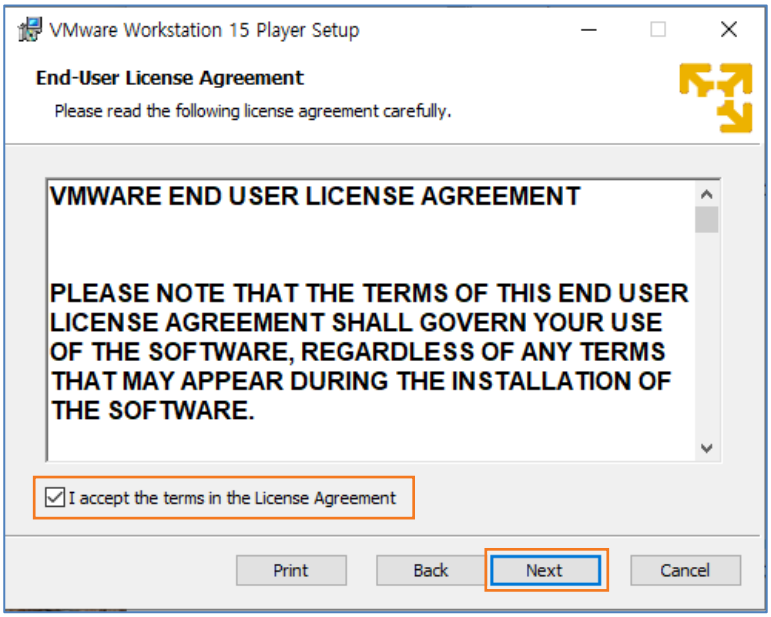
1. Open Chrome browser and visit the following link to download the VMplayer15 installation file. https://my.vmware.com/en/web/vmware/free#desktop_end_user_computing/vmware_workstation_player/15_0



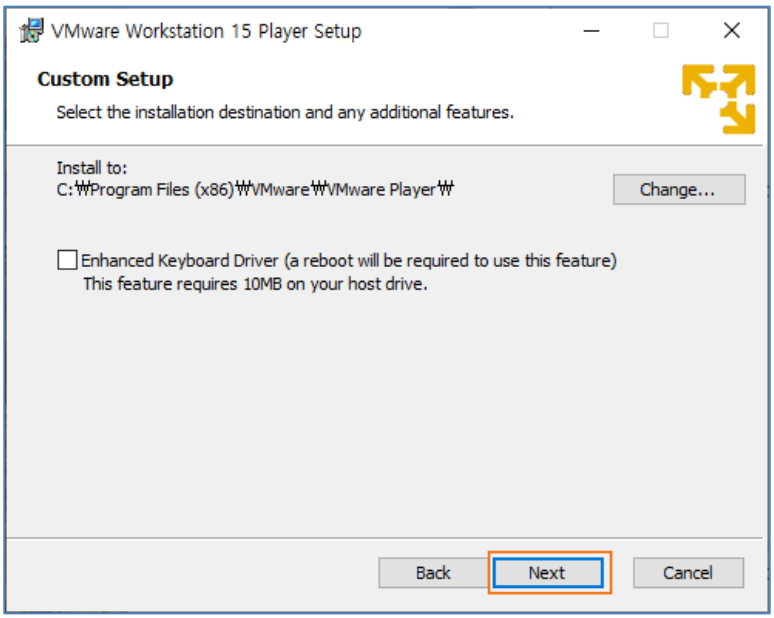
2. Double-click VMware Workstation player file you've downloaded to install. The Setup Wizard will install VMware player on your computer. Click **Next** button to continue.



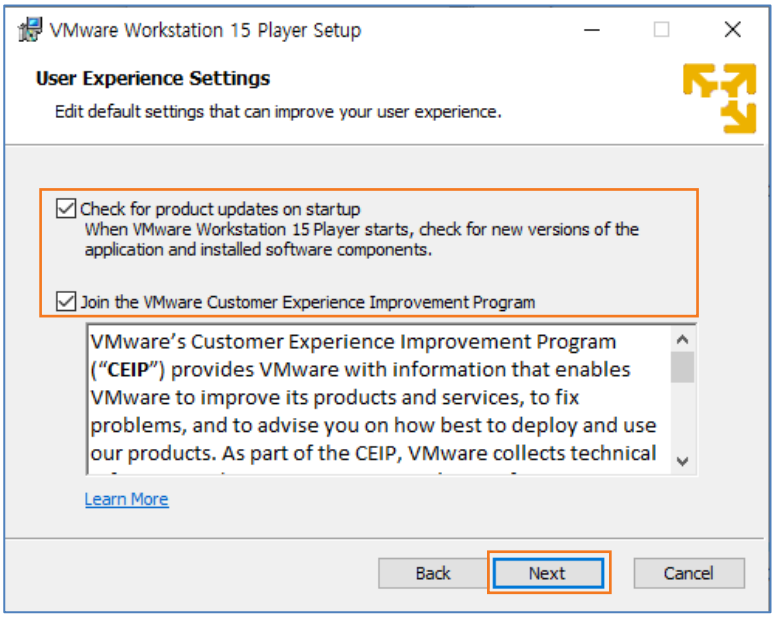
3. Read the terms in the license agreement, then click the checkbox and click **Next** button.



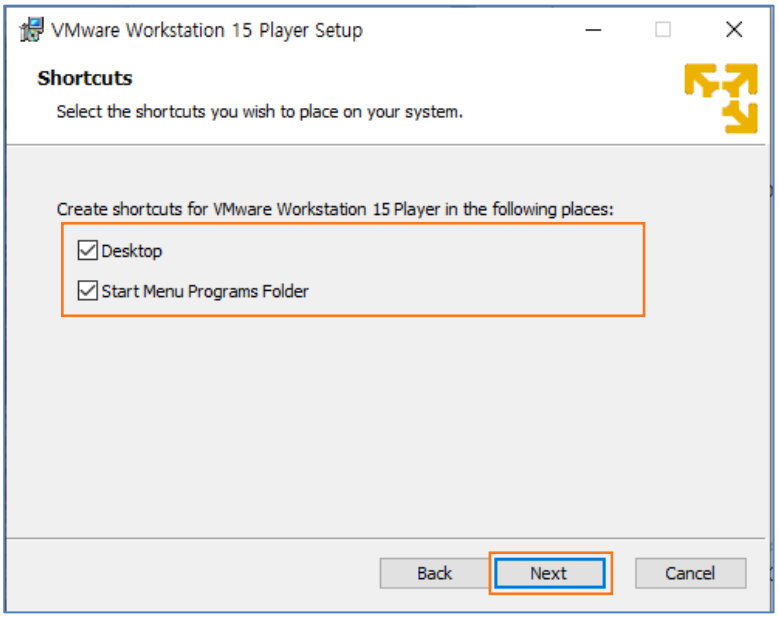
4. Installation directory appears then click **Next** button. If you want to change the Installation directory, click 'Change...' to set your directory.



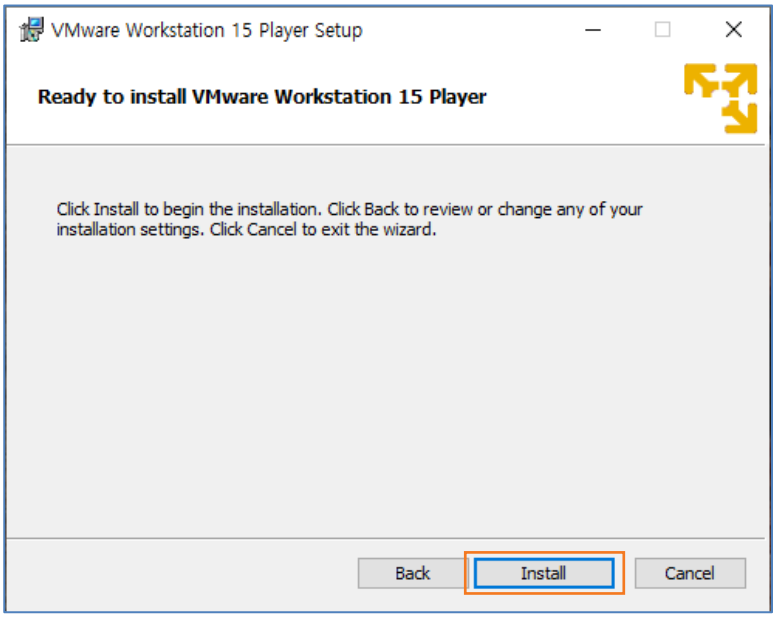
5. Click the checkbox to select the desired options then click **Next** button. (Optional items)



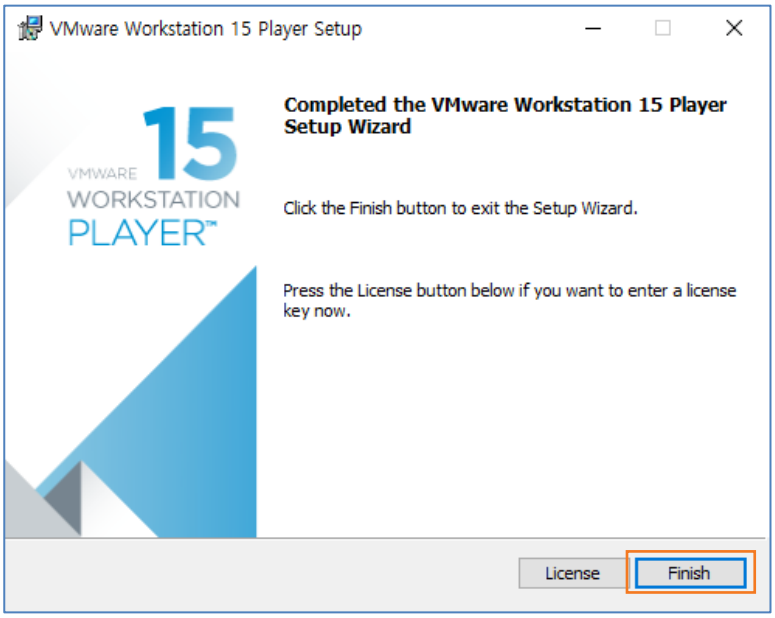
6. Click the checkbox to select the desired options then click **Next** button. (Optional items)



7. Click **Install** button to start installation.



8. After being completed program installation, click **Finish** button to complete.



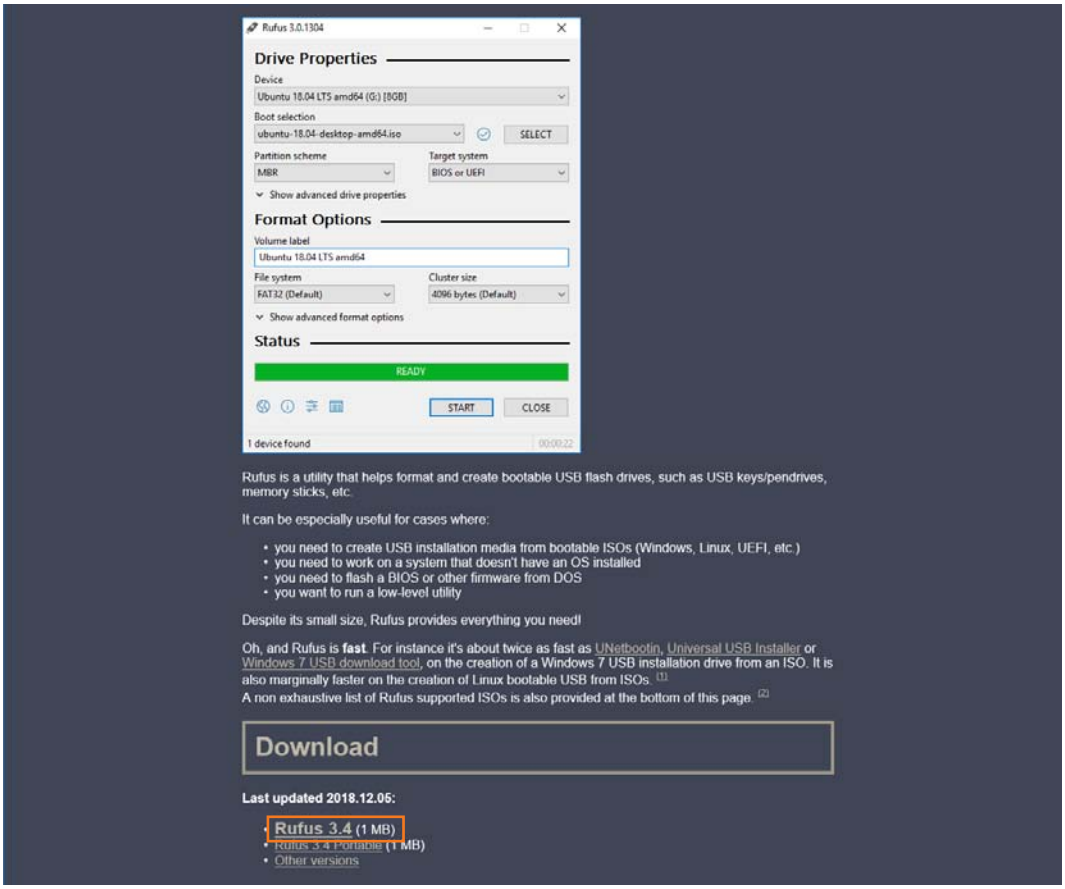
Appendix C:

Create a bootable flash drive for installing IPCR

This chapter describes how to create a bootable flash drive for installing IPCR.

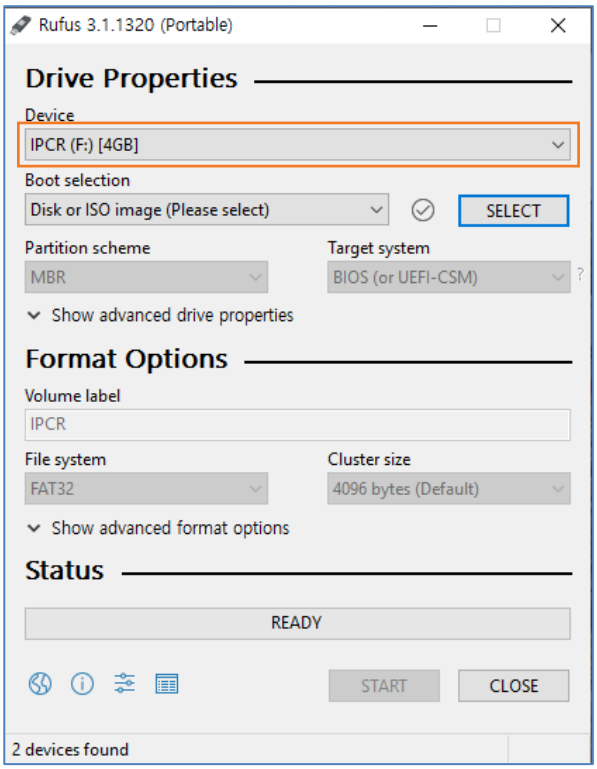
C.1 Create a bootable flash drive Using rufus

1. Open Chrome browser and visit the following link to download the Rufus installation file. https://rufus.ie/

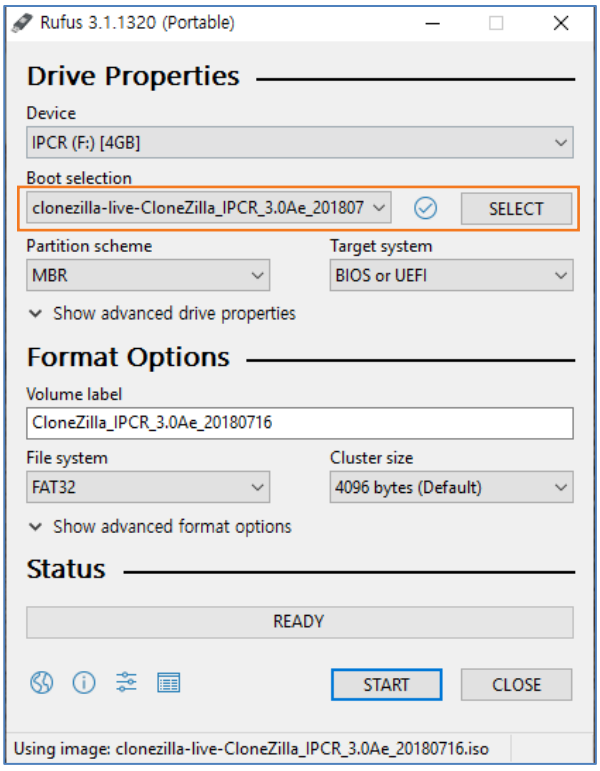


2. Double-click the rufus-3.4 you've downloaded to run.

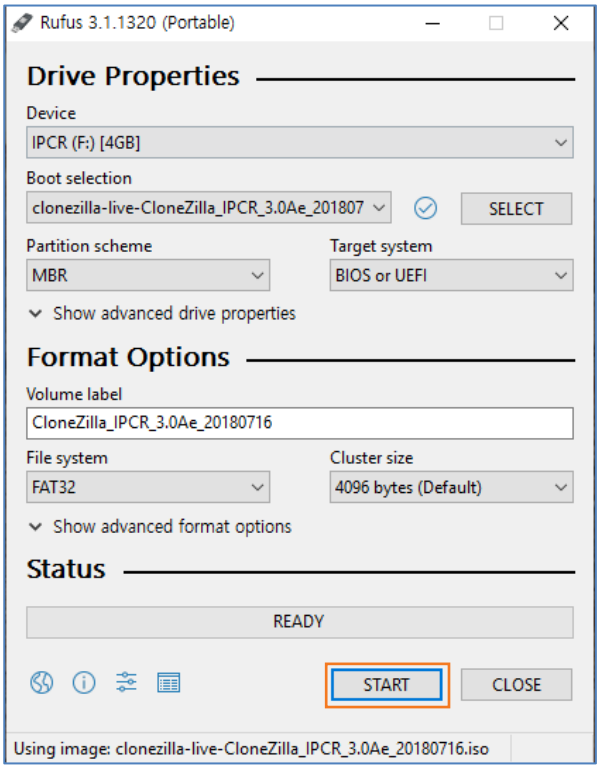
3. At the Drive Properties, click the **Device** ( ) to select a storage device to use as a bootable flash drive.



4. Click **SELECT** (SELECT) button and select ISO image to install.



5. Click **START** (START) button after the above procedure.



6. Click **CLOSE** button when Rufus finishes preparing USB drive.

Appendix D:

Installing IPCR on 1TB and above HDD

Install 1TB and more HDD with IPCR CD for 500GB type. In the installed IPCR server merge the remaining HDD storage of /var/REC partition.

D.1 HDD Capacity Expansion

In accordance with your choice, the result can be changed.

- **Case1:** Install additional HDD to IPCR of Clonezilla.
- **Case2:** Install additional HDD to IPCR of CentOS6.9 32bit and IPCR s/w.

D.1.1 Merge remaining storage in IPCR server/var/REC Partition

1. Open the Terminal and enter a command to check the storage that is not currently assigned.

```
[root@localhost ~]# cfdisk
```

2. Free Space is displayed on the Terminal. As shown above, the FS type free space is not assigned.

3. Create PV (Physical Volume). Because /dev/sda1 is /boot, /dev/sda2 is /var/REC is being used so the remaining storage is /dev/sda3.

```
[root@localhost ~]# mknod /dev/sda3 b 8 3
[root@localhost ~]# chown root:disk /dev/sda3
```

- Make Physical Volume command is mknod
  - **File Name:** /dev/sda3.
  - **Device Type:** b
  - **Device's Major Number:** 8
  - **Device Sequence:** 3
- Permission granted command is chown
  - **Group Name:Owner Name:** root:disk
  - **File Name:** /dev/sda3.

4. Create a Partition with the storage which is not assigned. For the Partition number (1-4) item, /dev/sda1 – 4, input 3.

```
[root@localhost ~]# fdisk /dev/sda

WARNING: DOS-compatible mode is deprecated. It's strongly recommended to
         switch off the mode (command 'c') and change display units to
         sectors (command 'u').

Command (m for help): p

Disk /dev/sda: 998.6 GB, 998579896320 bytes
255 heads, 63 sectors/track, 121403 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00075d5e

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1          26      204800   83  Linux
Partition 1 does not end on cylinder boundary.
/dev/sda2              26       60802   488180736   8e  Linux LVM
Partition 2 does not end on cylinder boundary.

Command (m for help): n
Command action
   e   extended
   p   primary partition (1-4)
p
Partition number (1-4): 3
First cylinder (60802-121403, default 60802):
Using default value 60802
Last cylinder, +cylinders or +size{K,M,G} (60802-121403, default 121403):
Using default value 121403
```

Enter

Enter

5. Change the assigned partition's system type /dev/sda2 to Linux LVM. Set the fdisk command below from t > Hex Code to 8e.

```
Command (m for help): p

Disk /dev/sda: 998.6 GB, 998579896320 bytes
255 heads, 63 sectors/track, 121403 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00075d5e

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1          26      204800   83  Linux
Partition 1 does not end on cylinder boundary.
/dev/sda2              26       60802   488180736   8e  Linux LVM
Partition 2 does not end on cylinder boundary.
/dev/sda3           60802      121403   486783037+  83  Linux

Command (m for help): t
Partition number (1-4): 3
Hex code (type L to list codes): 8e
Changed system type of partition 3 to 8e (Linux LVM)

Command (m for help): w
The partition table has been altered!

Calling ioctl() to re-read partition table.

WARNING: Re-reading the partition table failed with error 16: Device or resource busy.
The kernel still uses the old table. The new table will be used at
the next reboot or after you run partprobe(8) or kpartx(8)
Syncing disks.
[root@localhost ~]#
```

6. Set the partition to fdisk and confirm the partition (p) and restart the IPCR server.

```
[root@localhost ~]# fdisk /dev/sda

WARNING: DOS-compatible mode is deprecated. It's strongly recommended to
         switch off the mode (command 'c') and change display units to
         sectors (command 'u').

Command (m for help): p

Disk /dev/sda: 998.6 GB, 998579896320 bytes
255 heads, 63 sectors/track, 121403 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x00075d5e

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1          26      204800   83  Linux
Partition 1 does not end on cylinder boundary.
/dev/sda2              26       60802   488180736   8e  Linux LVM
Partition 2 does not end on cylinder boundary.
/dev/sda3           60802      121403   486783037+  8e  Linux LVM

Command (m for help): q

[root@localhost ~]# reboot_
```

7. Create the PV (Physical Volume).

```
[root@localhost ~]# pvcreate /dev/sda3
  Physical volume "/dev/sda3" successfully created
[root@localhost ~]#
```

8. Add Physical Volumes to a VG (Volume Group). IPCR's Volume Group Name is IPCR.

```
[root@localhost ~]# vgextend IPCR /dev/sda3
  Volume group "IPCR" successfully extended
[root@localhost ~]# _
```

9. Increase the LV (Logical Volume).

```
[root@localhost ~]# lvextend -l +100%FREE /dev/IPCR/REC
  Size of logical volume IPCR/REC changed from 408.73 GiB (104636 extents) to 872.96 GiB (223479 ext
ents).
  Logical volume REC successfully resized.
[root@localhost ~]# _
```

- Use +100%FREE command to expand all remaining storage.
- When setting the option be careful with capital and small letter.

10. Reflecting the file system LV (Logical Volume)

```
[root@localhost ~]# resize2fs /dev/IPCR/REC
resize2fs 1.41.12 (17-May-2010)
Filesystem at /dev/IPCR/REC is mounted on /var/REC; on-line resizing required
old desc_blocks = 26, new_desc_blocks = 55
Performing an on-line resize of /dev/IPCR/REC to 228842496 (4k) blocks.
The filesystem on /dev/IPCR/REC is now 228842496 blocks long.
```

11. Verify the partition with the command df –h.

```
[root@localhost ~]# df -h
Filesystem            Size  Used Avail Use% Mounted on
/dev/mapper/IPCR-root
                       48G  3.7G   42G   8% /
tmpfs                 2.0G     0  2.0G   0% /dev/shm
/dev/sda1             190M   38M  143M  21% /boot
/dev/mapper/IPCR-REC  860G  247M  816G   1% /var/REC
[root@localhost ~]#
```

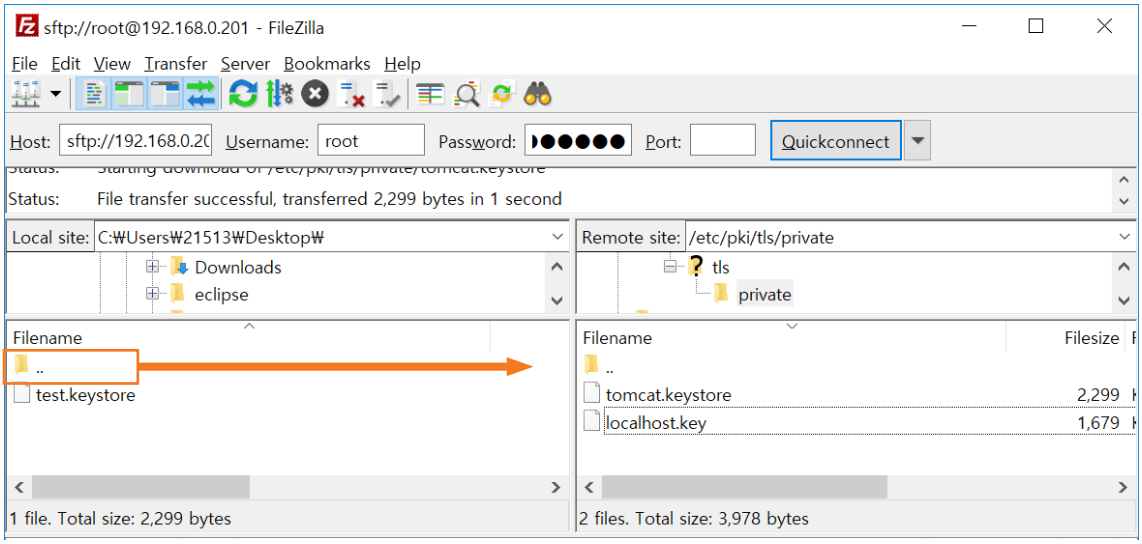
Appendix E:

How to Upload SSL certificate

This chapter describes how to Upload SSL certification.

E.1 How to Upload SSL certificate

1. Upload the keystore file to the following path (/etc/pki/tls/private) using FTP



2. connect to SSH and enter the following command:

```
[root@localhost ~]# cd /usr/local/tomcat7/conf
[root@localhost ~]# vi server.xml
```

3. change the following text to new information. (KeystorePass is the password of the Certified certificate)

```
<Connector port="443" protocol="HTTP/1.1" SSLEnabled="true"
maxThreads="150"
scheme="https" secure="true" clientAuth="false" sslProtocol="TLS"
keystoreFile="/etc/pki/tls/private/tomcat.keystore"
keystorePass="p@ssw0rd"/>
```

ex) keystoreFile="/etc/pki/tls/private/test.keystore" keystorePass="ipcrhttps"

```
<Connector port="443" protocol="HTTP/1.1" SSLEnabled="true"
       maxThreads="150" scheme="https" secure="true"
       clientAuth="false" sslProtocol="TLS"
       keystoreFile="/etc/pki/tls/private/test.keystore" keystorePass="ipcrhttps"/>
```

4. Execute a :wq! command to save the file after pressing ESC button on the keyboard.
5. Please enter the following command

```
[root@localhost ~]# service tomcat restart
```

```
[root@localhost conf]#
[root@localhost conf]# service tomcat restart
Restarting tomcat:
Using CATALINA_BASE:   /usr/local/tomcat7
Using CATALINA_HOME:   /usr/local/tomcat7
Using CATALINA_TMPDIR: /usr/local/tomcat7/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /usr/local/tomcat7/bin/bootstrap.jar:/usr/local/tomcat7/bin/tomcat-juli.jar
Using CATALINA_BASE:   /usr/local/tomcat7
Using CATALINA_HOME:   /usr/local/tomcat7
Using CATALINA_TMPDIR: /usr/local/tomcat7/temp
Using JRE_HOME:        /usr
Using CLASSPATH:       /usr/local/tomcat7/bin/bootstrap.jar:/usr/local/tomcat7/bin/tomcat-juli.jar
Tomcat started.
[root@localhost conf]#
```

Appendix F:

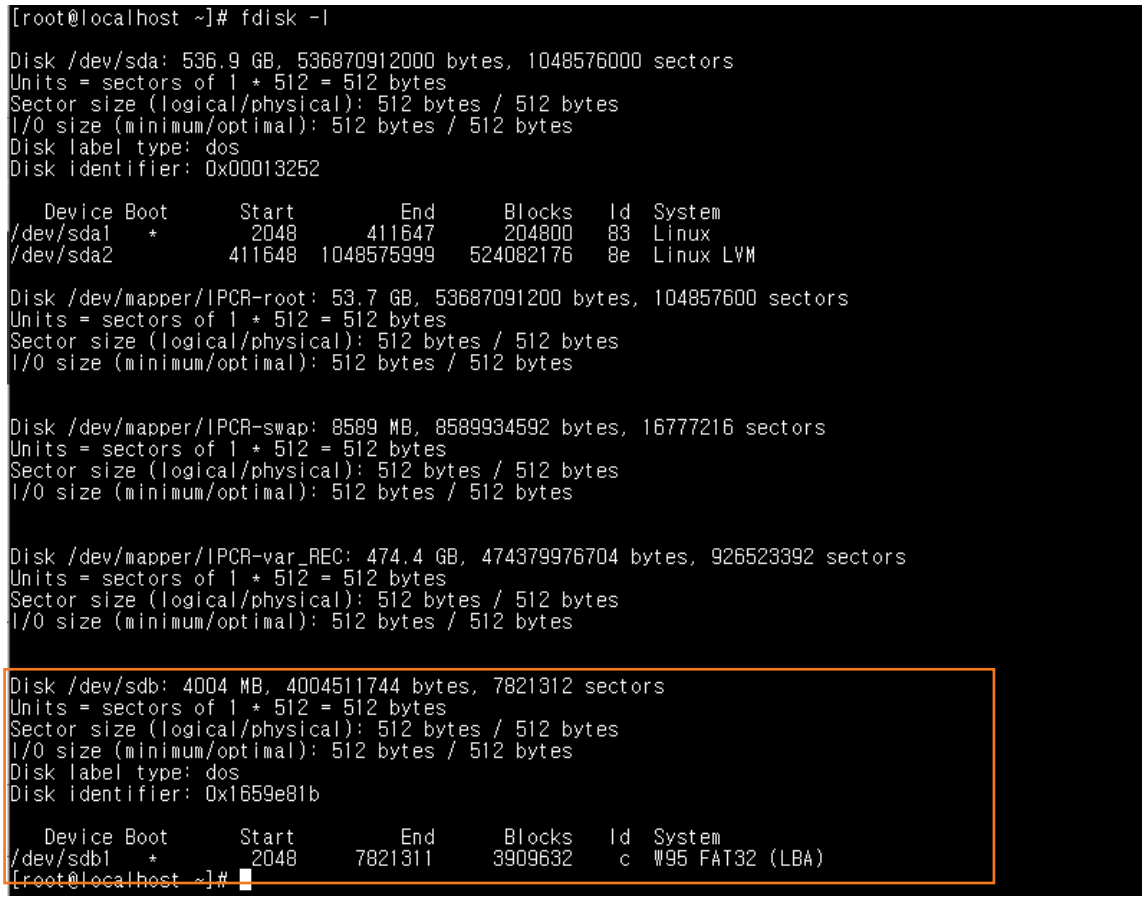
How to Mount to backup directory

This chapter describes how to mount additional HDD in a backup directory

F.1 How to Mount to backup directory

1. Connect the storage device to the IPCR server.
2. Enter the following command at the terminal.

```
[root@localhost ~]# fdisk -l
```



```
[root@localhost ~]# fdisk -l

Disk /dev/sda: 536.9 GB, 536870912000 bytes, 1048576000 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x00013252

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *        2048      411647      204800   83  Linux
/dev/sda2          411648  1048575999   524082176   8e  Linux LVM

Disk /dev/mapper/IPCR-root: 53.7 GB, 53687091200 bytes, 104857600 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes


Disk /dev/mapper/IPCR-swap: 8589 MB, 8589934592 bytes, 16777216 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes


Disk /dev/mapper/IPCR-var_REC: 474.4 GB, 474379976704 bytes, 926523392 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes


Disk /dev/sdb: 4004 MB, 4004511744 bytes, 7821312 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x1659e81b

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1   *        2048     7821311     3909632    c  W95 FAT32 (LBA)
[root@localhost ~]#
```

- If the system type is NTFS, the command below must be entered and mounted.

```
[root@localhost ~]# yum install epel-release
[root@localhost ~]# yum install ntfs-3g
```

3. Enter the following command at the terminal.

```
[root@localhost ~]# mount /dev/sdb1 /var/REC/RecSee_Backup
```

```
[root@localhost ~]# mount /dev/sdb1 /var/REC/RecSee_Backup/
[root@localhost ~]# df -h
Filesystem               Size  Used Avail Use% Mounted on
/dev/mapper/IPCR-root     48G  6.2G   40G  14% /
devtmpfs                 990M     0  990M   0% /dev
tmpfs                   1000M     0 1000M   0% /dev/shm
tmpfs                   1000M  105M  896M  11% /run
tmpfs                   1000M     0 1000M   0% /sys/fs/cgroup
/dev/sda1                190M   96M   81M  55% /boot
/dev/mapper/IPCR-var_REC  440G  262G  156G  63% /var/REC
tmpfs                    200M     0  200M   0% /run/user/1000
tmpfs                    200M     0  200M   0% /run/user/0
/dev/sdb1                3.8G  855M  2.9G  23% /var/REC/RecSee_Backup
[root@localhost ~]#
```

- The backup directory must be /var/REC/RecSee_Backup unconditionally.

4. Enter the following command for the auto-mount.

```
[root@localhost ~]# vi /etc/rc.d/rc.local
```

5. Enter the following text and save rc.local.

```
#!/bin/bash
# THIS FILE IS ADDED FOR COMPATIBILITY PURPOSES
#
# It is highly advisable to create own systemd services or udev rules
# to run scripts during boot instead of using this file.
#
# In contrast to previous versions due to parallel execution during boot
# this script will NOT be run after all other services.
#
# Please note that you must run 'chmod +x /etc/rc.d/rc.local' to ensure
# that this script will be executed during boot.

touch /var/lock/subsys/local

mount /dev/sdb1 /var/REC/RecSee_Backup
~
```

Appendix G:

Useful Information

This chapter contains the open source software used in the iPECS Cloud.

G.1 Open Source Software Notice

Open Source Software used in this product are listed as below. You can obtain a copy of the Open Source Software License from Ericsson-LG Enterprise Web site, http://www.ericssonlg-enterprise.com. Ericsson-LG Enterprise reserves the right to make changes at any time without notice.

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jQuery UI	MIT License

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