Chapter 1 # LINUX BASIC

មុននិងធ្វើការដំឡើង Linux *យើងត្រូវយល់ពី* File System *របស់វាសិន។តើ* Linux *និង* windows *អាចដំឡើងជាមួយគ្នាបានដែលរឺទេ?*

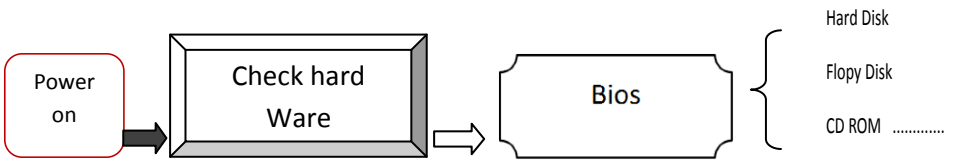
ចំពោះ windows *និង* Linux *យើងមិនអាចដំឡើងជាមួយគ្នាបានទេពីព្រោះវាមានបច្ចេកវិទ្យាក្នុងការគ្រប់គ្រងFile System ។*

*ចំពោះ*window *មានប្រភេទ* Files System *ជា* Fat ,NTFS..

ចំពោះ Linux *វាមានប្រភេទ* Files System *ជា*ext2 ,ext3, ext4..។

1.1**ការដំឡើងប្រព័ន្ធ** Linux (Debian)

មុននិងធ្វើការដំឡើងយើងត្រូវសិក្សាស្វែងយល់ថាតើ Computer *វាធ្វើការយ៉ាងដូចម្តេចដើម្បីអាចដំឡើងប្រព័ន្ធដំណើការបាន។*



ក្នុងចំណោម os *ដែលប្រើលើពិភពលោក* os Linux *គឺជា* os *មួយដែលមានការពេញនិយមប្រើប្រាស់យ៉ាងទូលំទូលាយដែលវាមានគុណសម្បត្តិដូចជា*

១-Free Licence

២ -Open Source

៣-Mutitassking

៤-Muti User *វាមាន*៦ Terminal *ដែលជា* Graphic Desktop

៥-*វាមានការតំរូវការ* Hard Ware *តូចជាងពួក* Windows *ហើយវាអាចបញ្ចូ* Hard Ware *អស់*

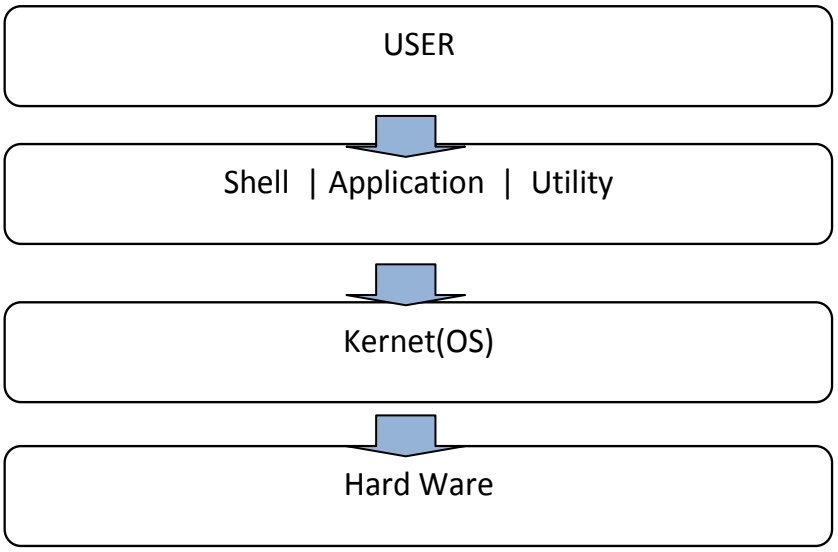
លទ្ធភាពទៀតផង។

ទន្លឹមនិងនោះផងដែរវាក៏មានគុណវិបត្តិផងដែរ

១-ក្នុងករណីមានបញ្ហាណាមួយកើតឡើងមិនមានក្រុមហ៊ុនណាមួយទទួលខុសត្រូវឡើយ

២-វាពិបាកក្នុងការរក Driver របស់ Hard Ware ។

1.2 **សំណង់** Linux



Kernel គឺជាកម្មវិធីរបស់ Linux ចំពោះការកែប្រែ Kernelវាជះឥទ្ធិពលយ៉ាងខ្លាំងទៅលើ Linux ដូចនេះហើយបានជាពេលដំឡើងវាសួរអោយដាក់ Password Kernel រឺទេ។ ហើយវាក៏ជាមជ្ឈមណ្ឌលធ្វើការ Process រវាង User និង Hard ware ហើយវាក៏អាចធ្វើការ Update បានផងដែលដើម្បីអោយវាស្គាល់ Hard Wareកាន់តែច្រើន។

Shell គឺជាបណ្តុំនៃ Command ដែលទទួលការបញ្ជាពី User ដើម្បីអនុវត្តន៍ការងារអ្វីមួយ។វាចាប់ផ្តើមដំណើការនៅពេល User Logon ចូល System ។នៅក្នុង Linux មាន Shell ជាច្រើនដូចជា CSHELL ដែល Command របស់វាដូចនិង Program C ។នៅក្នុង Linux យើងប្រើប្រាស់ Base Shell ។

1.3 **ទេសនាសម្ព័ន្ធរបស់** Directory Linux

-/ (System root) : គឺជា Top level នៃ Directory របស់ Linux ដែលវាផ្ទុកដោយ Directory និង File ជាច្រើន។

-/root : គឺជា Home Directory របស់ User Account root(Super User) ប្រើសំរាប់ផ្ទុក User Profiles នៃ User Account root ។

-/Home : គឺជា Home Directory របស់ User ក្រៅពី root សំរាប់ផ្ទុក User Profiles របស់ User Account។

-/lib : គឺជា Directory សំរាប់ផ្ទុក Library Files ដែលអនុញ្ញាតិអោយ Soft Ware យកទៅប្រើប្រាស់។

-/Usr : ផ្ទុកទៅដោយ Files និង Softជាច្រើនដែលយើងបានដំឡើងលើ Linux ។

-/Tmp : ផ្ទុកទៅដោយ Files បណ្តោះអាសន្ន។

-/etc : ផ្ទុកទៅដោយ Configuration Files ជាច្រើន(Files ASCI Text) សំរាប់កែប្រែទៅតាមតំរូវការរបស់យើង។

-/dev : ផ្ទុកដោយ Device ដែលបានភ្ជាប់ជាមួយ System។ដែលឈ្មោះរបស់វាបានជំនួសដោយ File។

-/bin : ជា Directory សំរាប់ផ្ទុក User Command

-/sbin : ជា Directory សំរាប់ផ្ទុក System Command

Ex: shutdown ,restart.....។

-/mnt : សំរាប់ផ្ទុក mount point របស់ Device Name។

-/Proc : ផ្ទុកព័តមានអំពី Kernetរបស់ Linux

-/boot : ផ្ទុក Kernel របស់ Linuxព្រមទាំង Files ដើម្បី Linux អាចដំណើការបាន។

-/Var : សំរាប់ផ្ទុក Log File mailbox

-/User/Local : សំរាប់ផ្ទុក Software ដើម្បី Shari ទៅអោយ computer ដ៏ទៃនៅលើ Linux ។

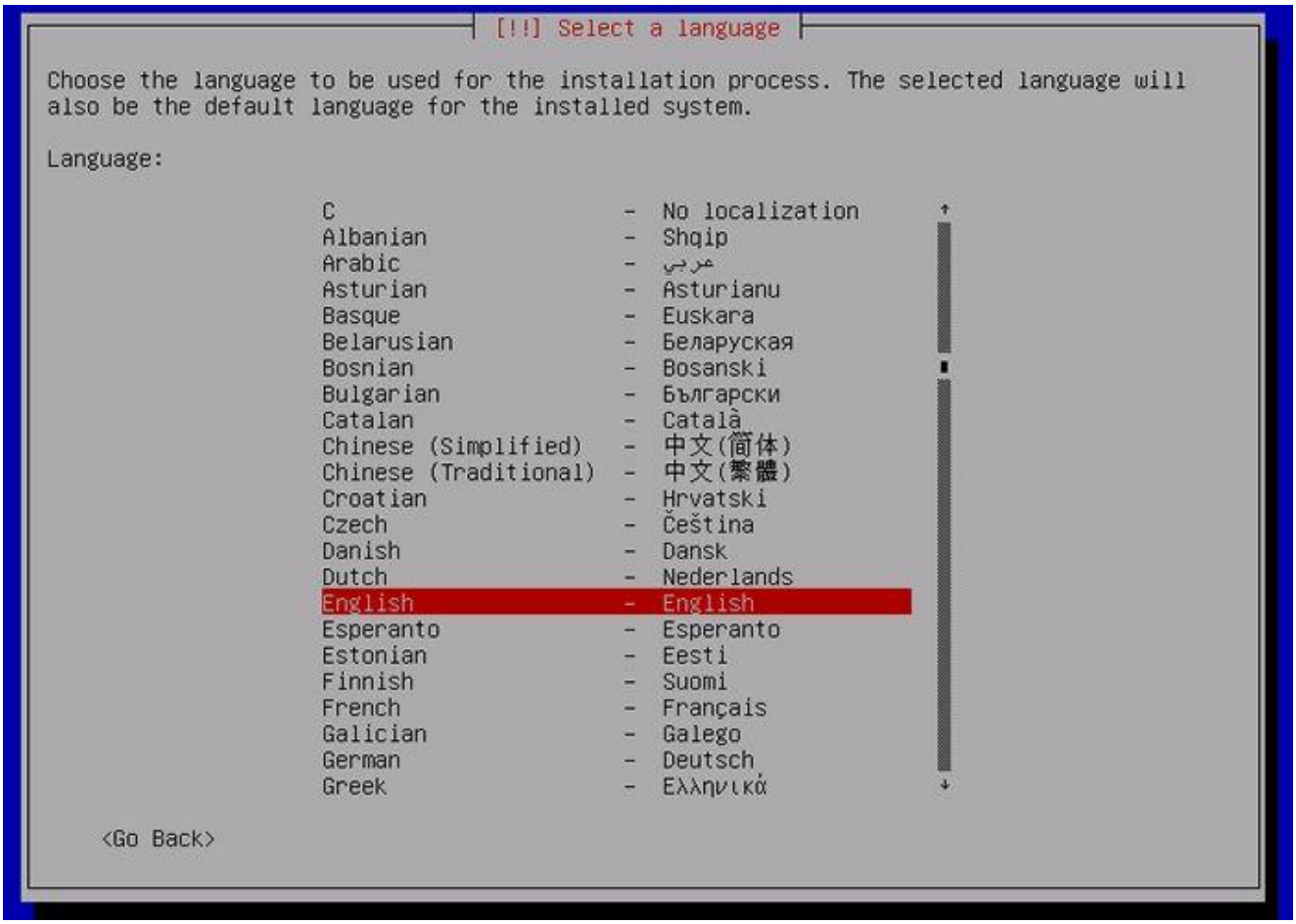
1.4 ការដំឡើងប្រព័ន្ធ linux

1 Install Debian 6

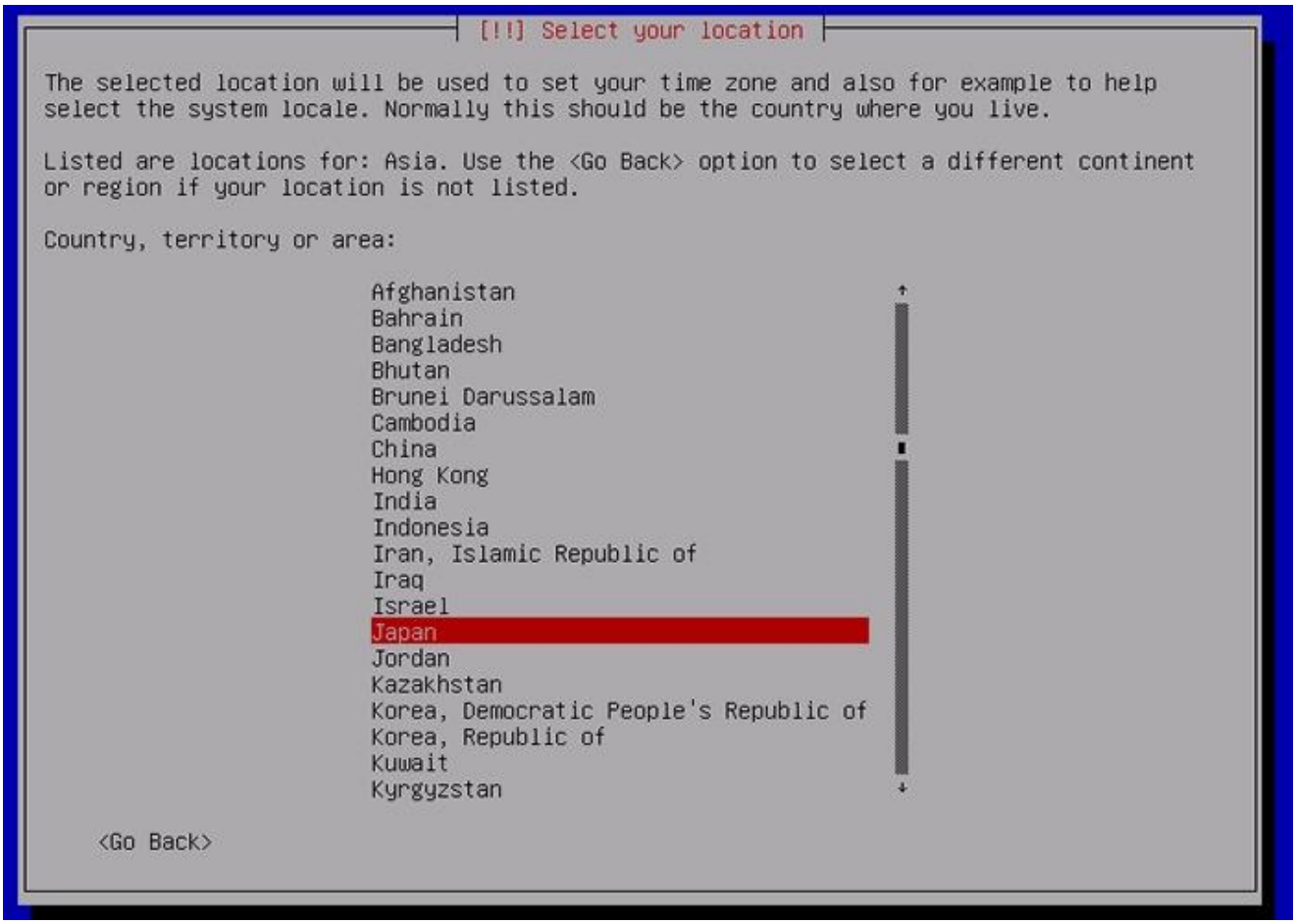
Install Debian GNU/Linux 6..0

[1] Insert a disk for installation of Debian GNU/Linux 6.0 and reboot your computer. The screen of selecting language. Choose it and go next.

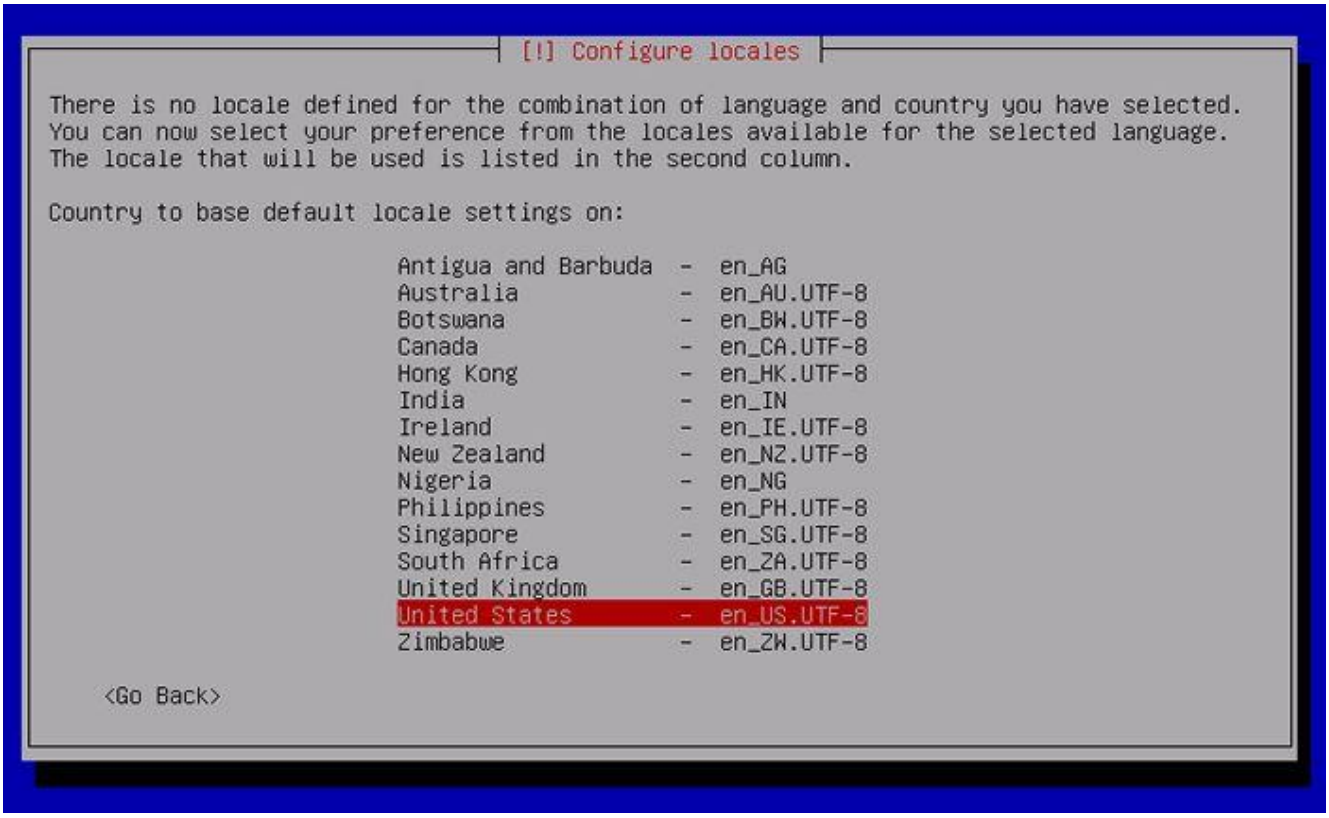
[2] Select your language.



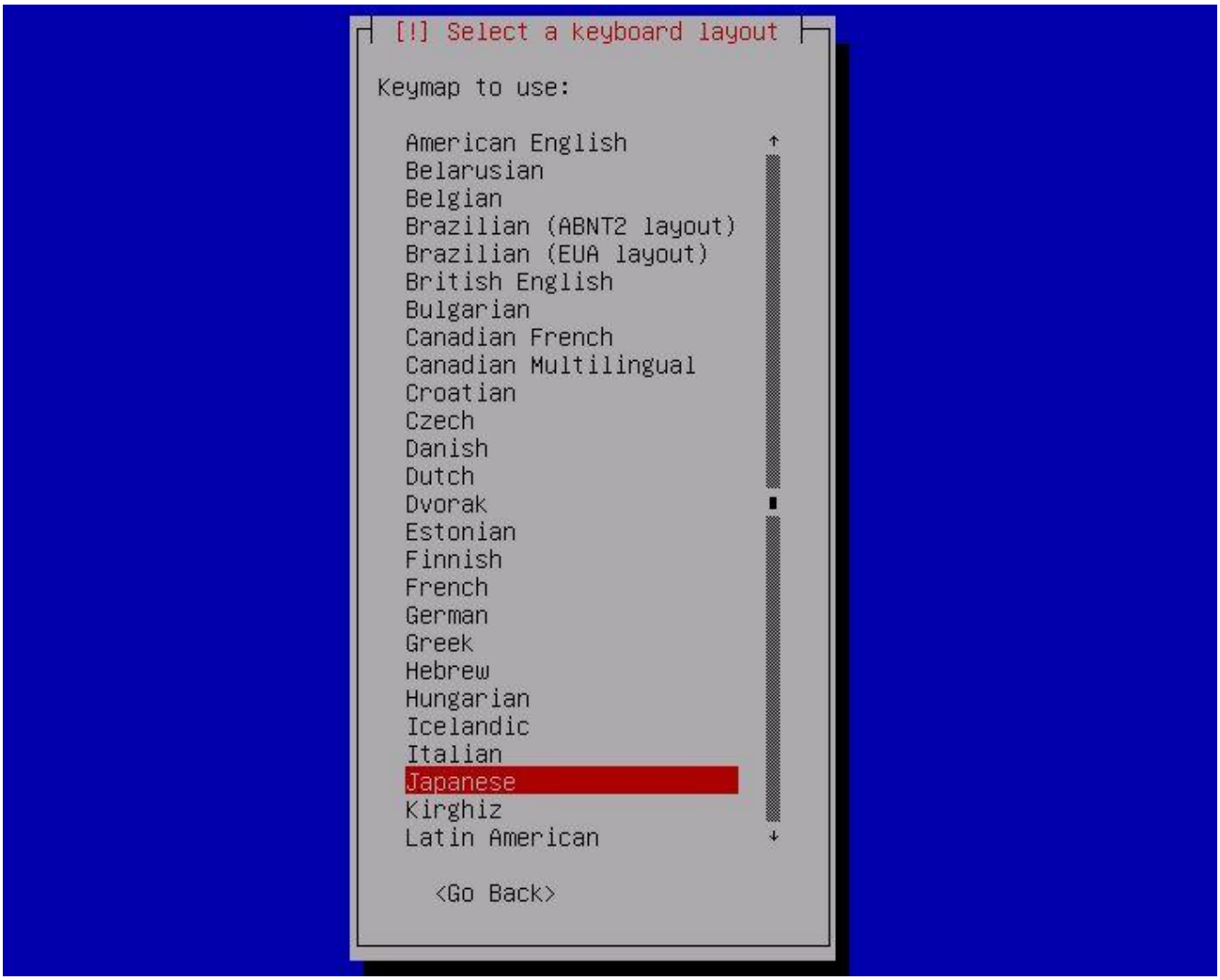
[3] Select your time-zone.



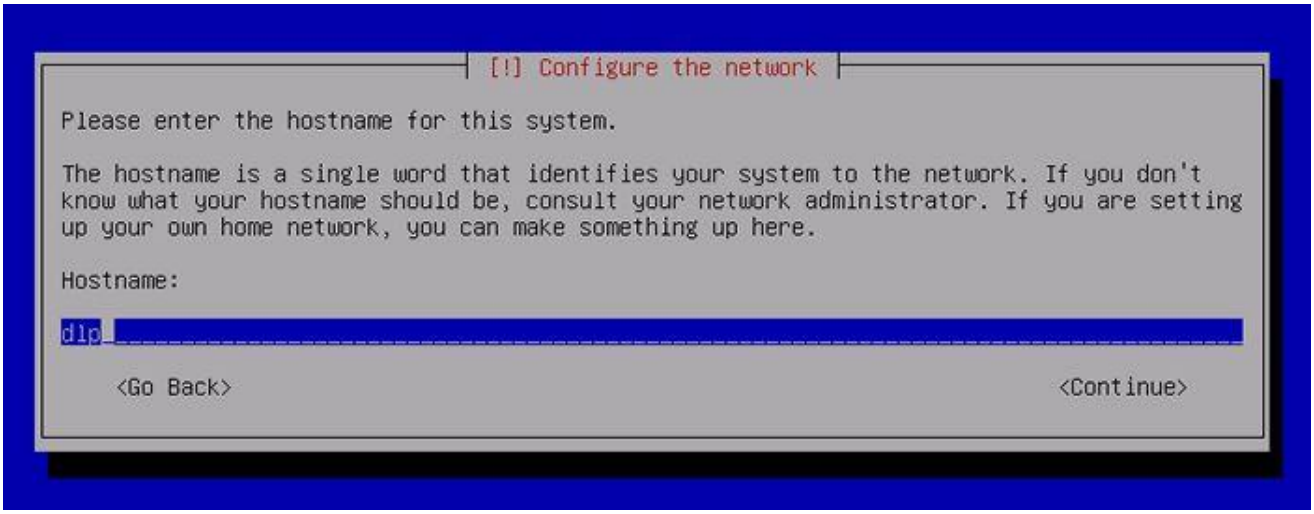
[4] Select the locale.



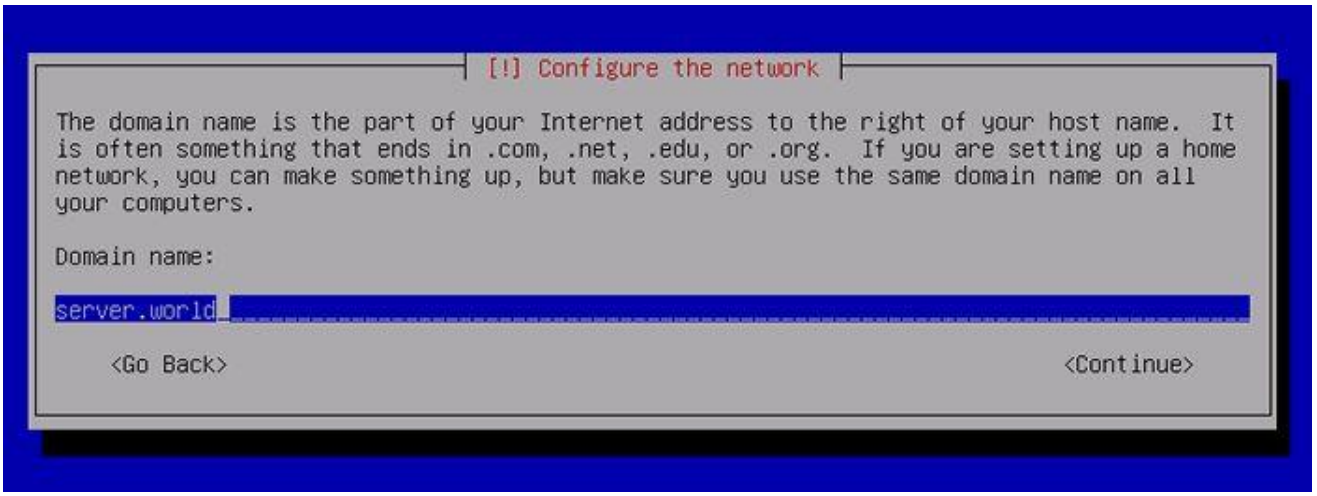
[5] Select your keyboard layout.



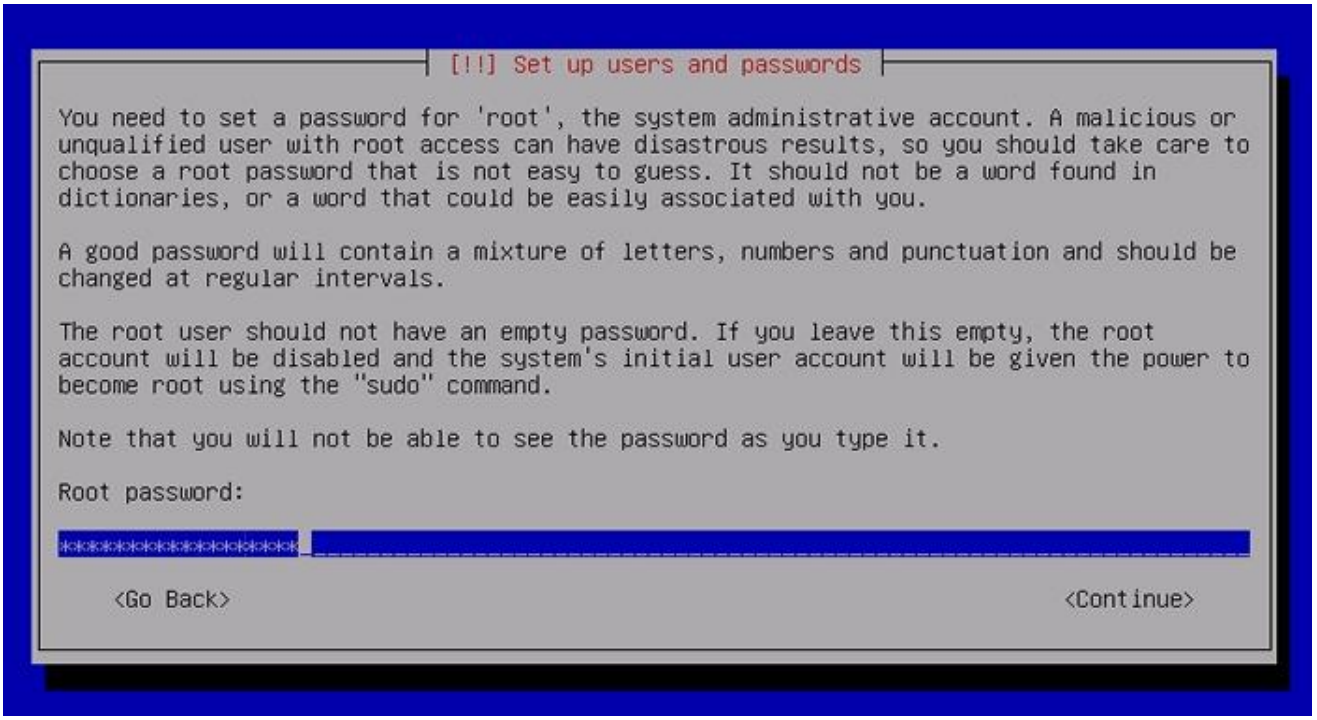
[6] Set your server's hostname you'd like to set.



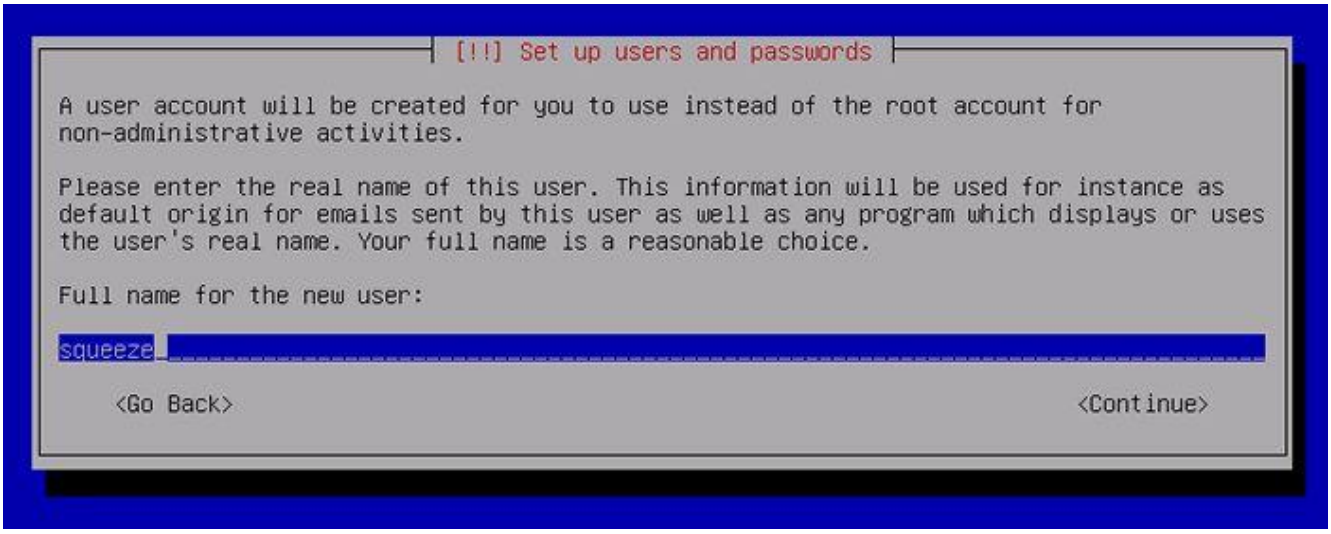
[7] Set your network domain name.



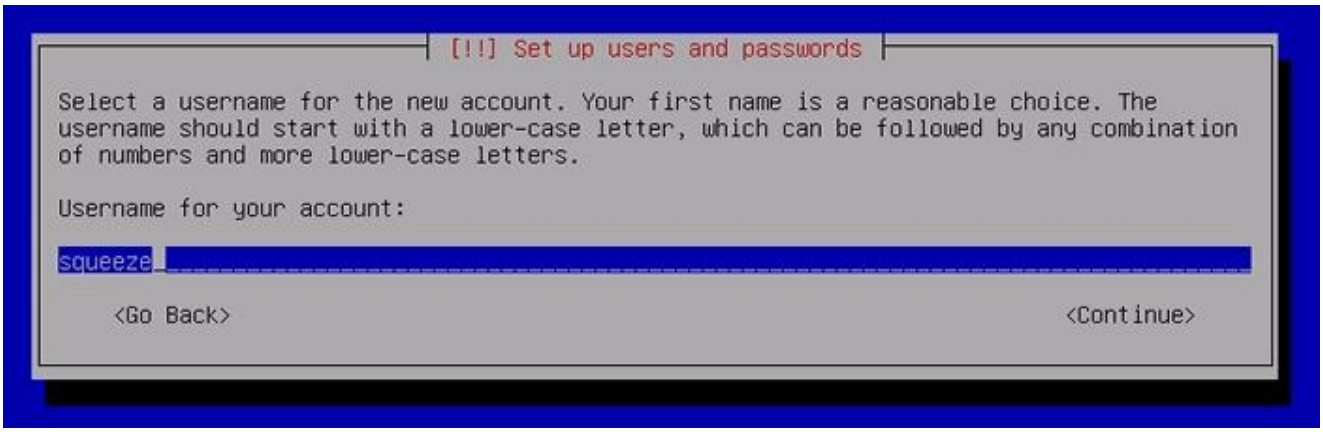
[8] Set root password. If you will use root priviledge with sudo, Go next without inputing any one on here.



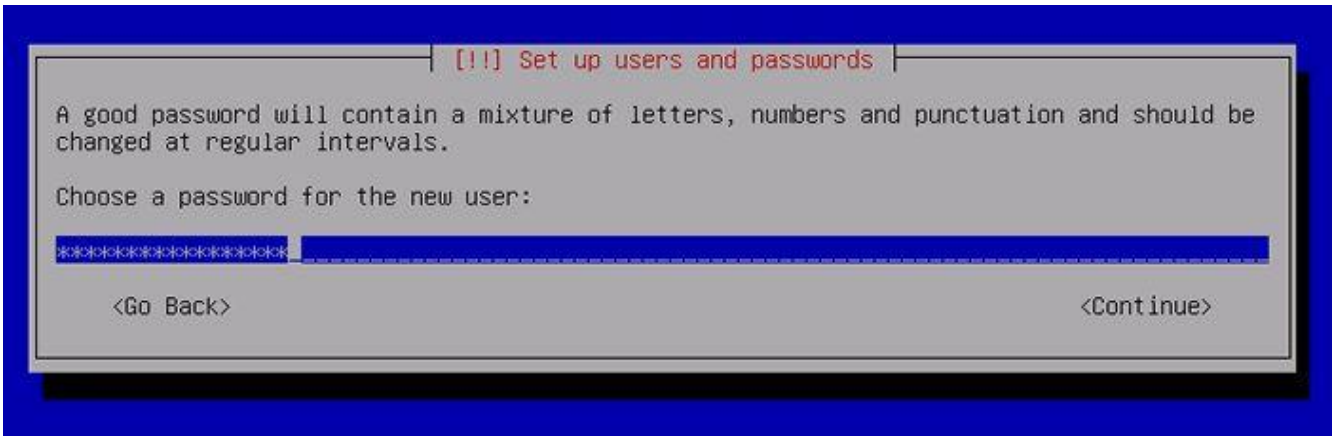
[9] Set a User Account. Input user's ful name on here.



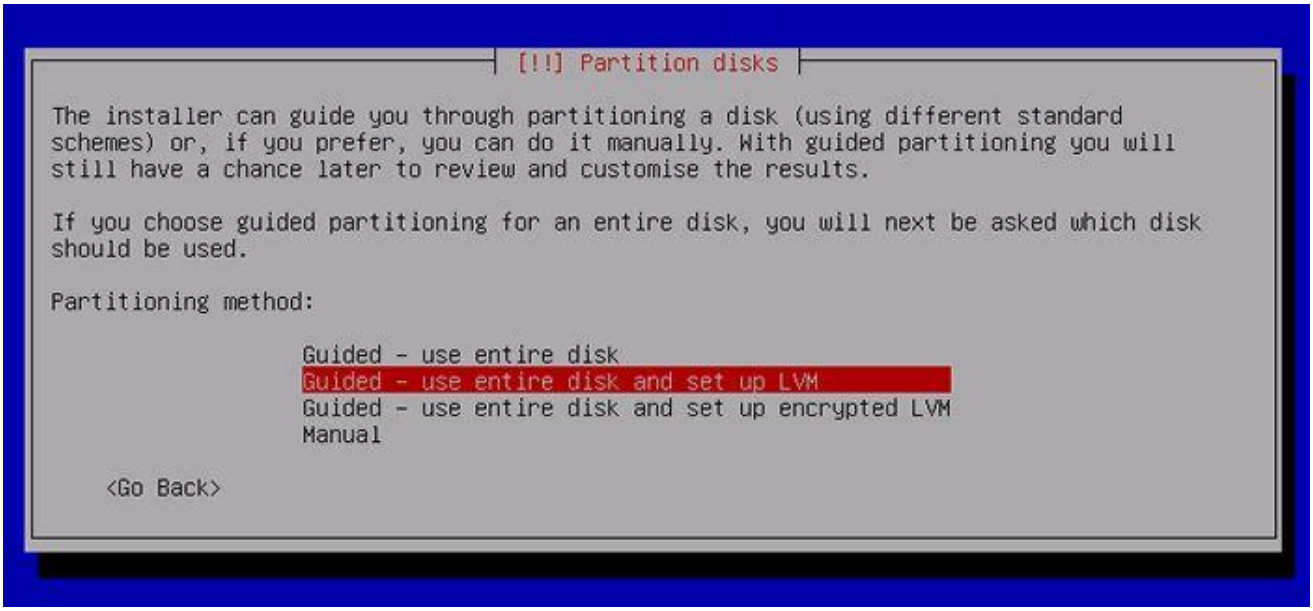
[10] Set user name that is used on the system.



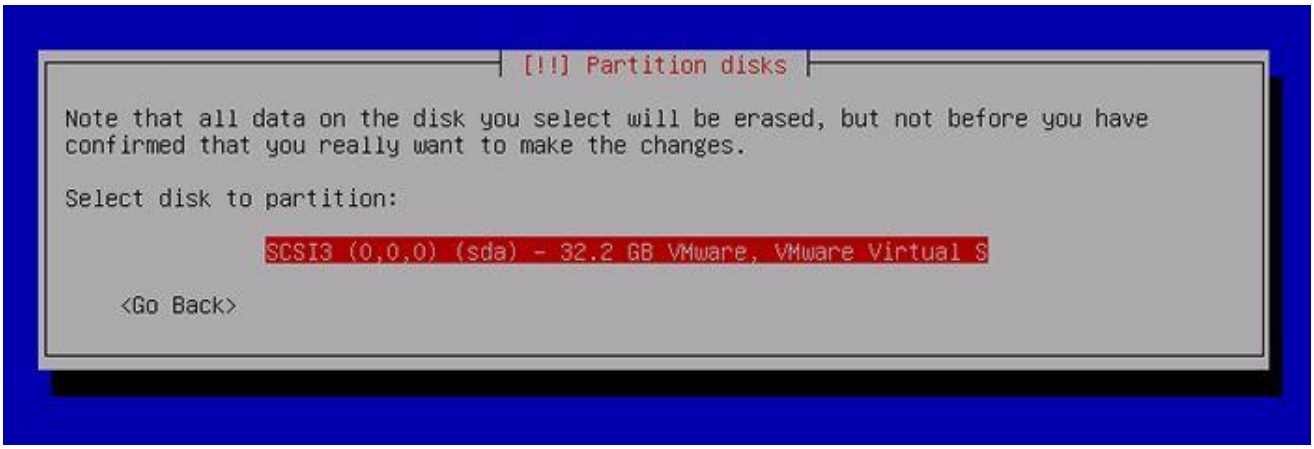
[11] Set user's password.



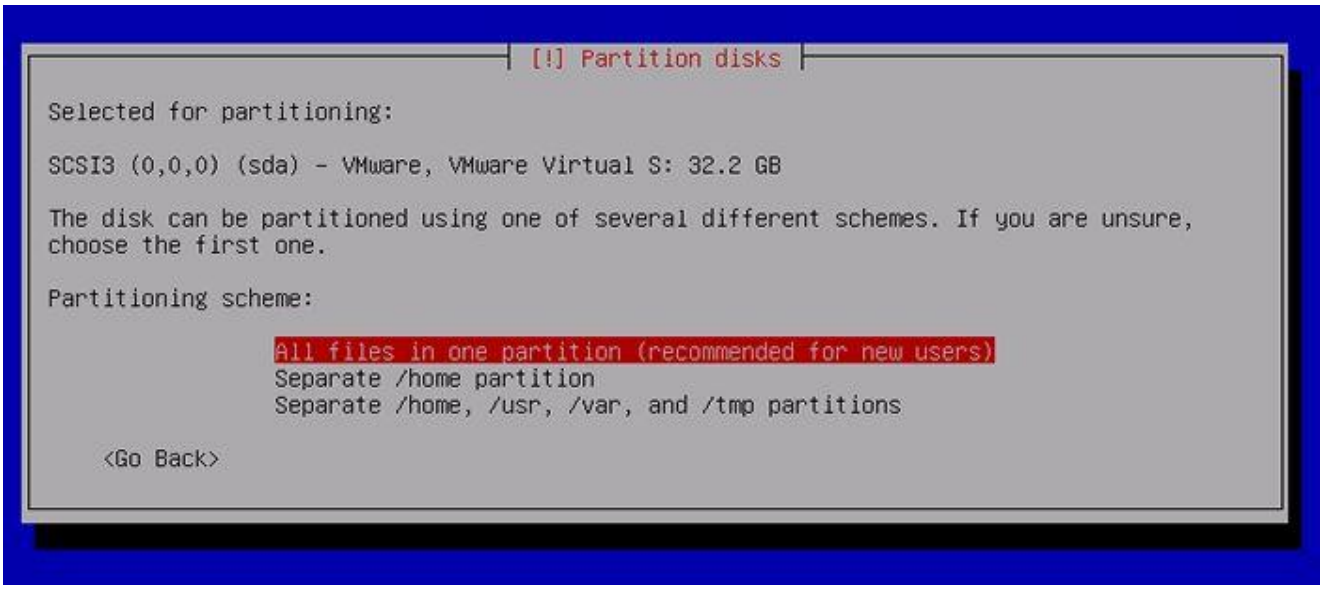
[12] Set partition layouts. This example shows to use entire disk and set LVM.



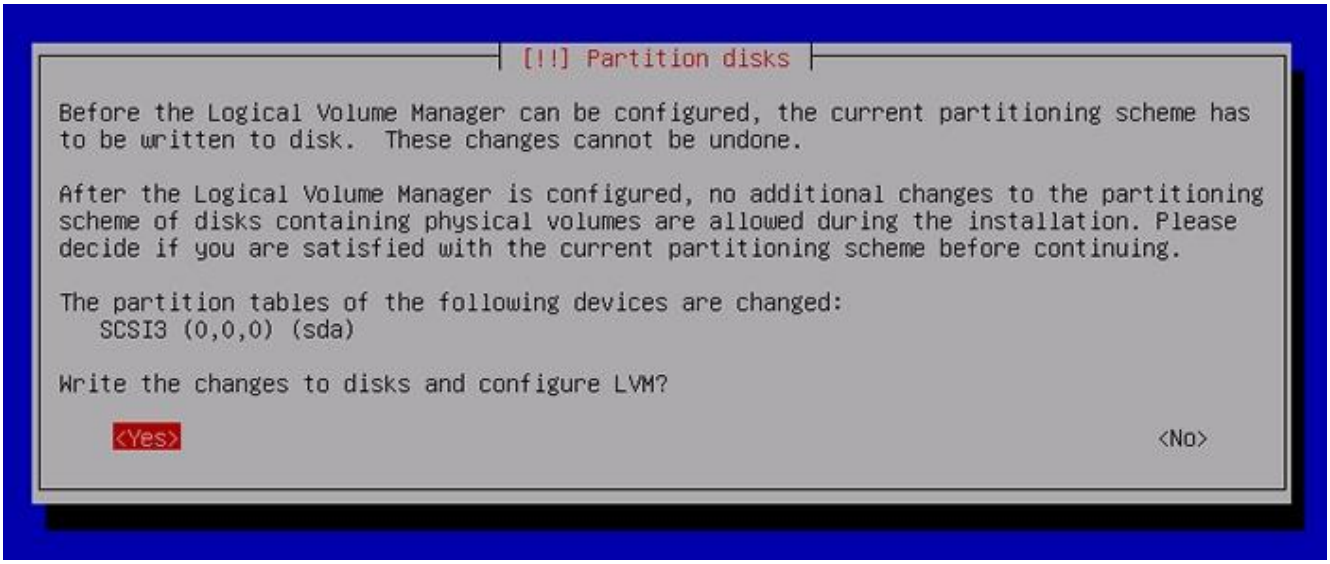
[13] Select a disk to configure partitions.



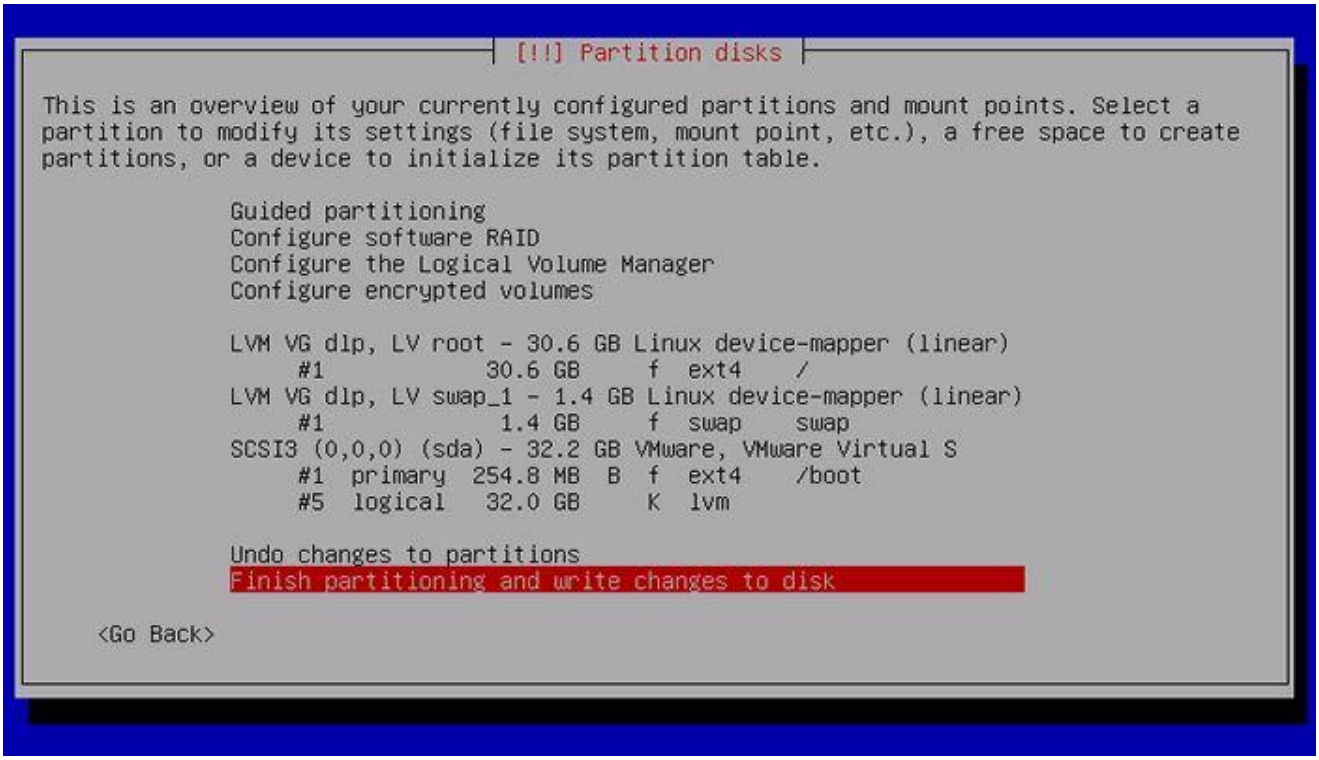
[14] Select partition layouts. This example shows to set only one partition (= /).



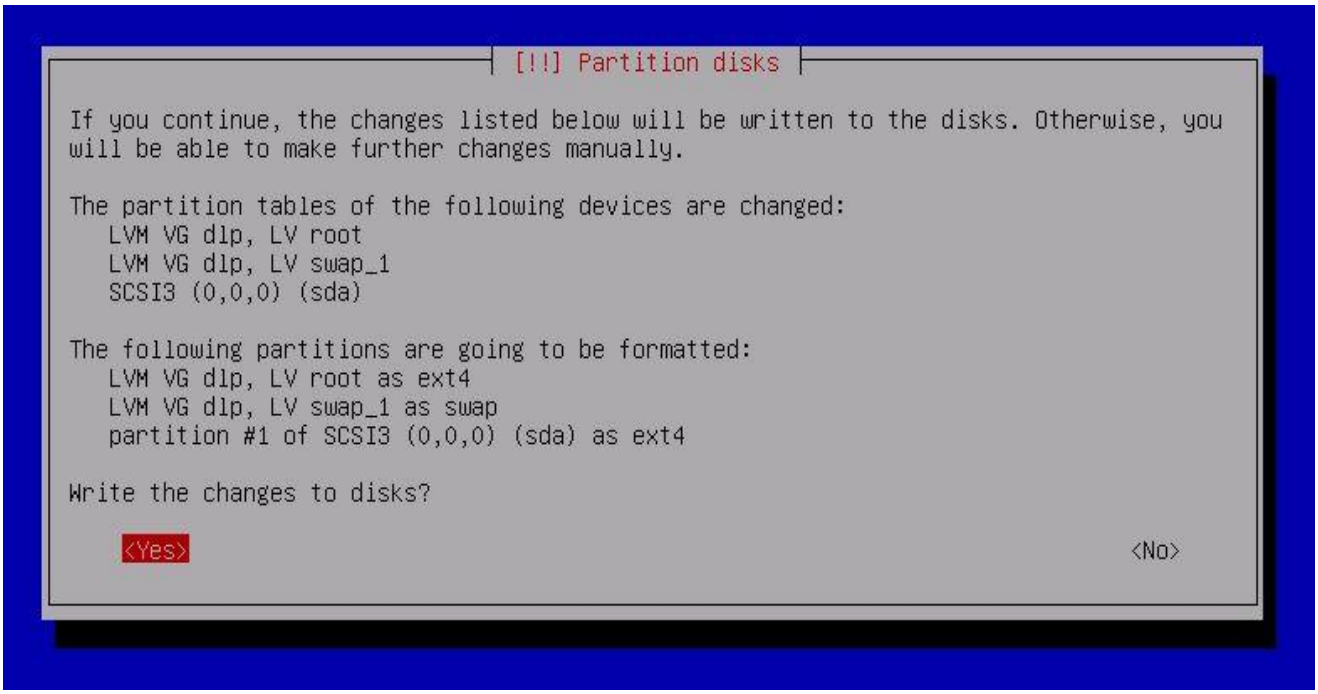
[15] Answer 'Yes' If it's OK all.



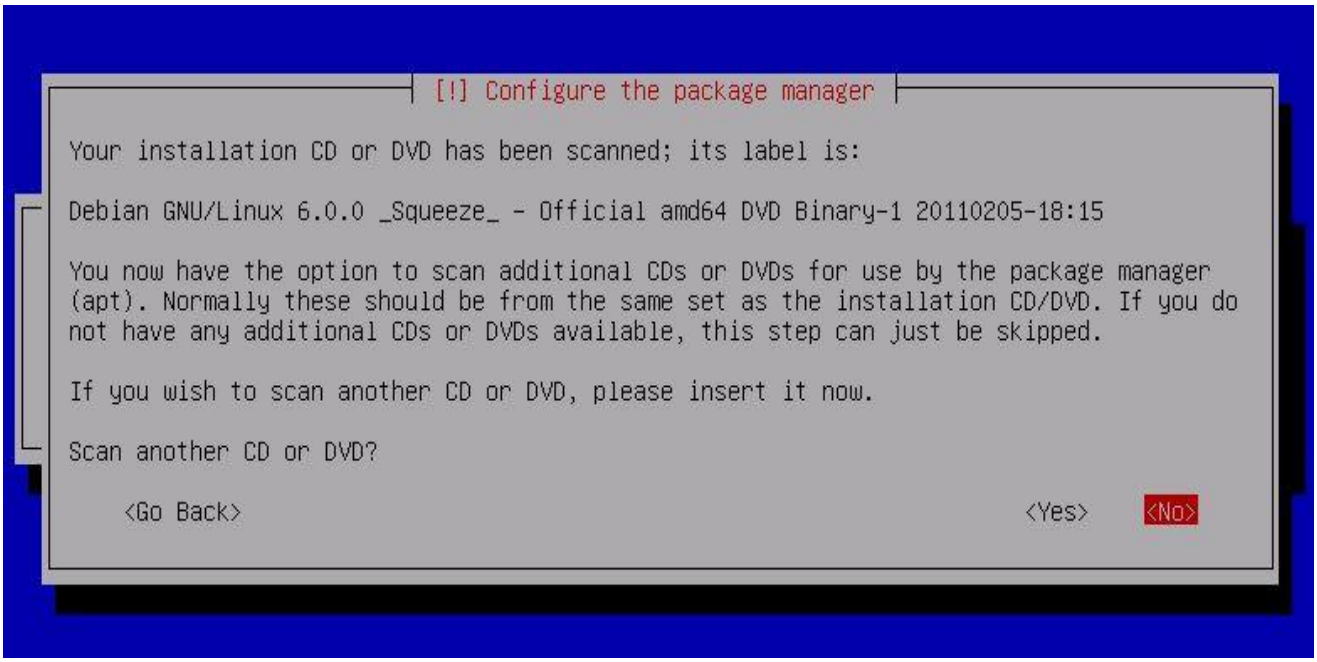
[16] Partitions you set are listed all. If it's OK all, Select 'Finish' and go next.



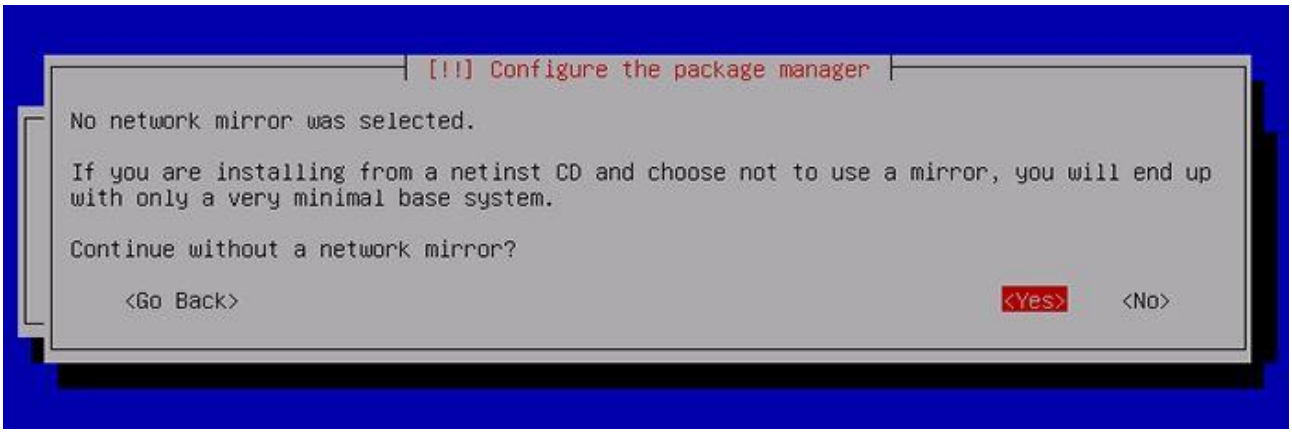
[17] Answer 'Yes' if it's OK to change the disk for new partiton layouts.



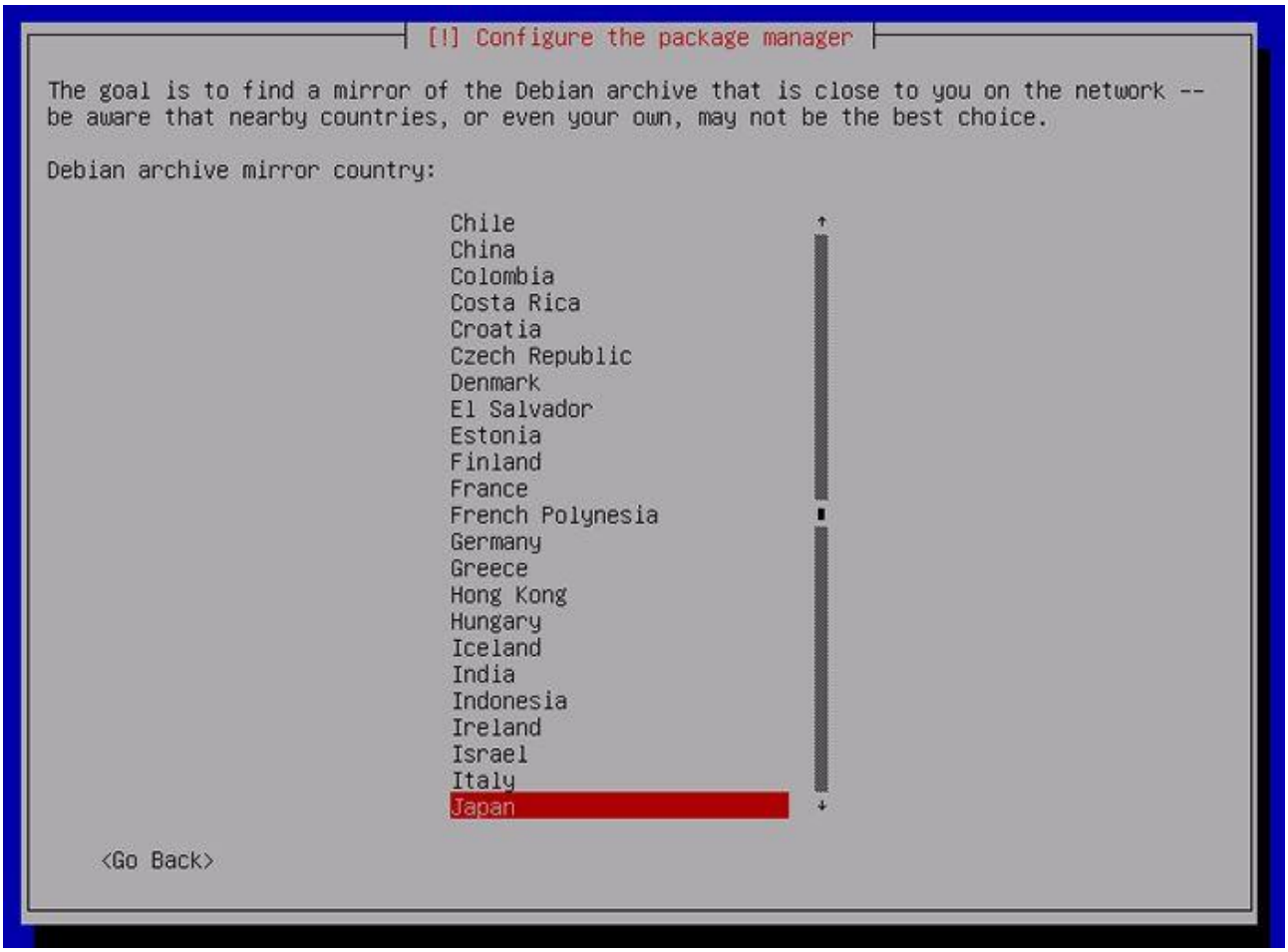
[18] If you'd like to use another CD/DVD media for installation, Answer 'Yes', or it's 'No' if not.



[19] Set mirror site. If you'd like to use it, Answer 'Yes'.

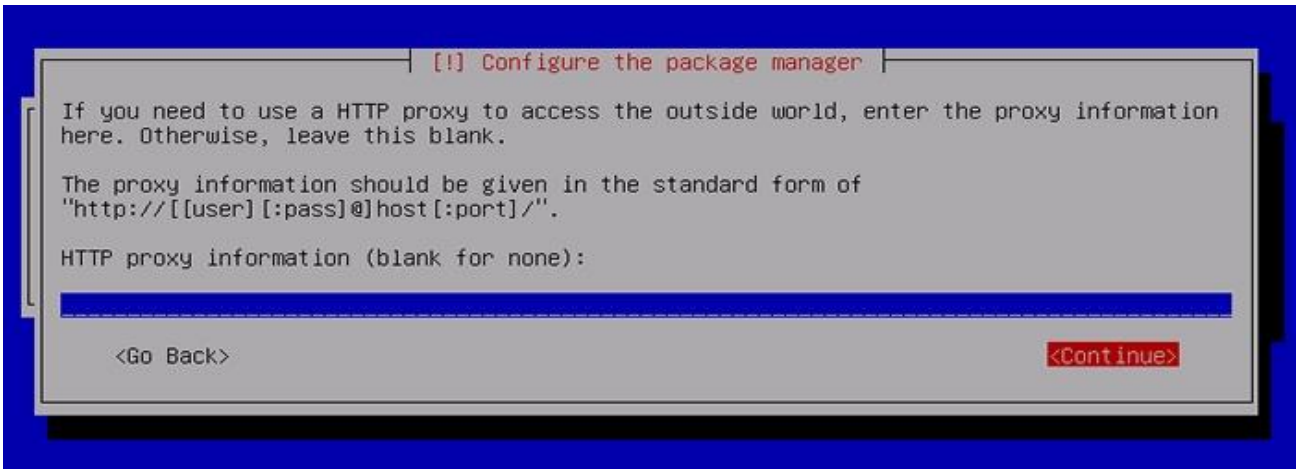


[20] Select a country that mirror site is placed you'd like to use.

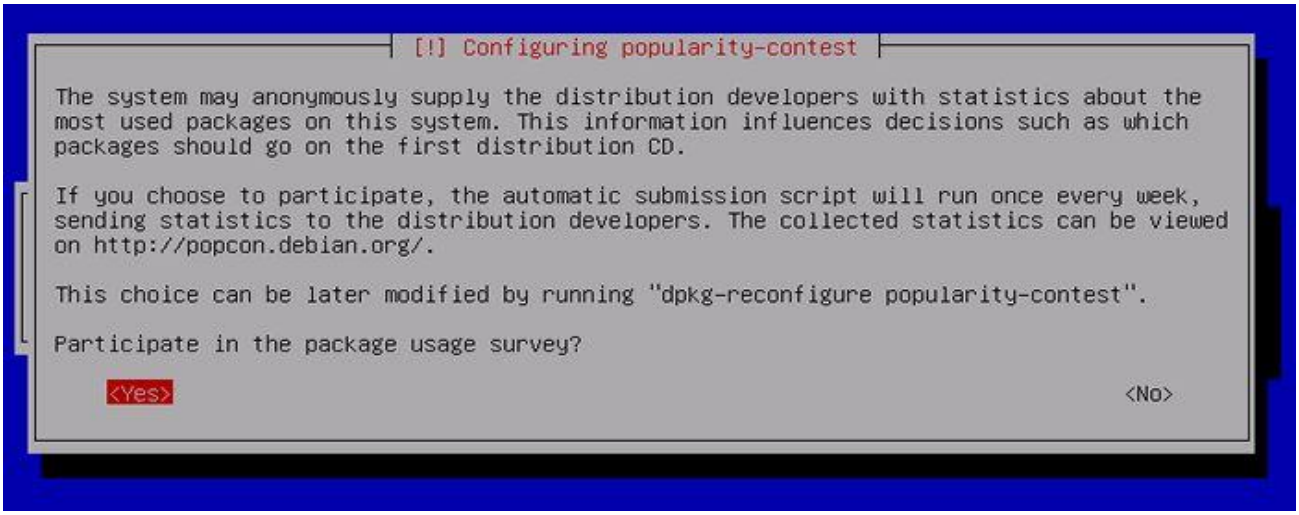


[21] Select a mirror site.

[22] If you use proxy, set it. If not, go next without inputing any one.

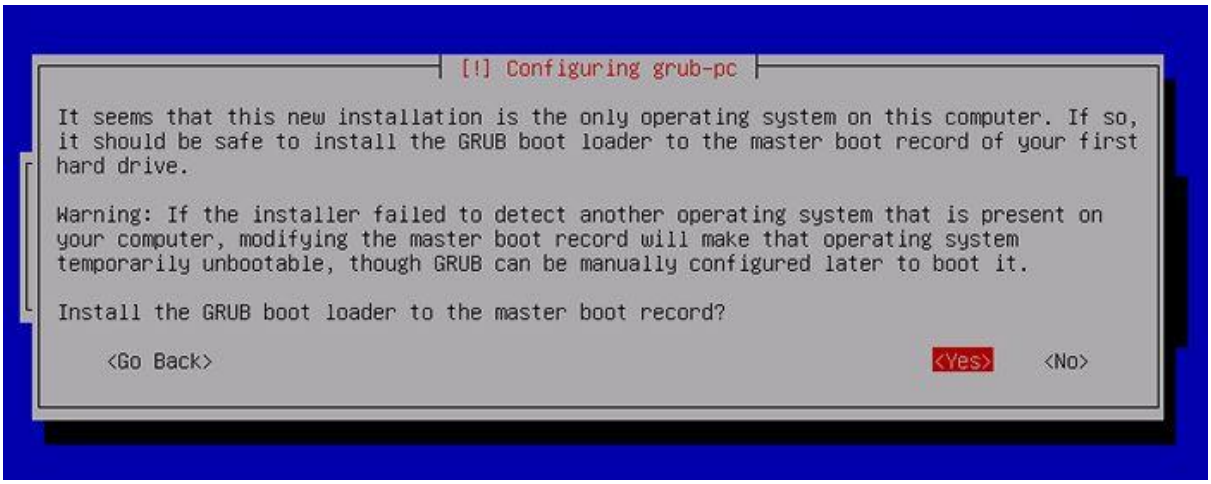


[23] Participate in the package usage survey positively.

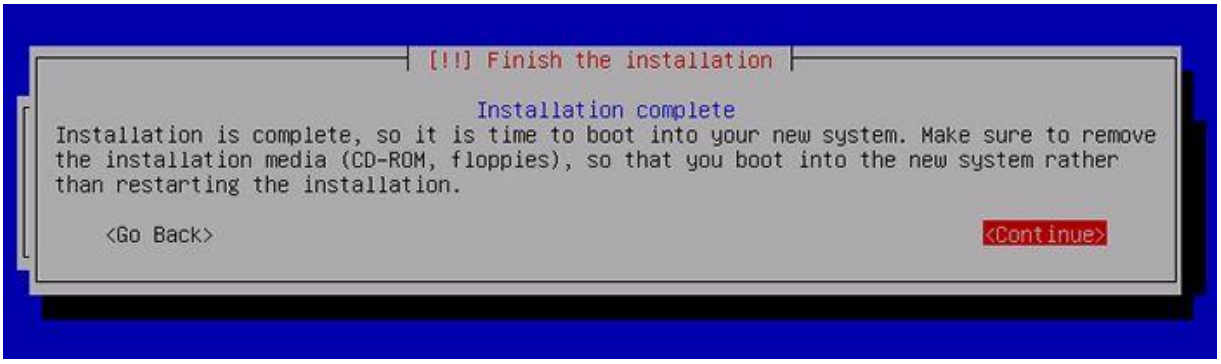


[24] Select Software group you'd like to install. Configure minimum settings at the first. Go next without checking any boxes.

[25] This is Grub settings section. Generally, answer 'Yes'.



[26] Instalattion just finished. Eject the disk and Continue, then the system will reboot automatically.



[27] Login prompt is shown as follows after booting the system. Login with a user you set during installation or root.

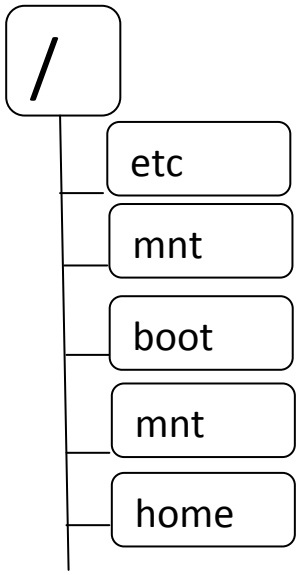
Chapter 2 # Using Command Line

2.1-**ការបង្កើត** Directory

Syntax: #mkdir [Path]<DirectoryName>

ចំណាំ: Directory មិនអាចប្រើ Space បានទេ។ ហើយមិនគួរប្រើ សញ្ញាពិសេសឡើយ ។

- Path :គឺជាទីតាំងរបស់ដែលយើងចង់បង្កើត Directory។
- រវាង Command និង Parameter ត្រូវមាន Space យ៉ាងតិចមួយ។
- Directory គឺជាឈ្មោះរបស់ Directory ដែលយើងចង់បង្កើត។



ឧទាហរណ៍ : យើងចង់បង្កើត Directory ឈ្មោះ BBU នៅក្នុង /home

#mkdir /home/BBU ↵

ដើម្បីបង្ហាញទីតាំងដែលយើងកំពុងនៅយើងប្រើ Command

#pwd↵

Directory ដែលយើងកំពុងនៅយើងហៅថា Active Directory ។

Command សំរាប់មើលថាតើនៅក្នុង Directory មាន Files និង Directory អ្វីខ្លះយើងប្រើ Command #ls ↵

ដែលមាន Systax: #ls [Path]<Directory Name>

Command សំរាប់ Change Active Directoryយើងប្រើ Command #cd

ដែលមានរូបមន្ត: #cd [Path]<Directory Name>

Command សំរាប់ថយក្រោយមួយ Directory គឺមាន

Syntacx:#cd ..

ឧទាហរណ៍ #cd /mnt/user/data

គោលបំណងយើងចង់ចូលត្រឹម #/mnt/user

យើងត្រូវវាយ #cd /mnt/user/data ..↵

Note: ករណីយើងចង់ប្តូរទៅកាន់ Home Directory របស់ User ដែលកំពុង Logon យើងប្រើ Command #cd ~↵

2.1.1ការបង្កើត File

Syntax: #cat > [Path]<FileName>

ចំពោះរូបមន្តនេះករណីយើងបង្កើត File តែបើ File គោះមានទំរយរបស់ File។ ករណីសរសេរចប់ ត្រូវចុច Ctrl+d ដើម្បី Save ។

បើយើងចង់បង្កើត File តែគ្មានអត្ថន័យភ្លាមៗយើងប្រើរូបមន្ត

Syntax:#touch [Path]<FileName>

បើចង់ដាក់អត្ថន័យអោយ File យើងប្រើរូបមន្ត

Syntax:#echo "StringAdd" >> [Path]<FileName>

បើយើងចង់ Replace អត្ថន័យចាស់យើងប្រើរូបមន្ត

Syntax: #echo "StringReplace" > [Path]<FileName>

បើចង់មើលអត្ថន័យរបស់ File យើងប្រើរូបមន្ត

Syntax:#cat [Path]<FileName>

ម្យ៉ាងទៀតយើងប្រើ

Syntax:#vi [Path]<FileName>

រូបមន្តនេះសំរាប់ប្រើដើម្បីបង្កើត File និង Edit File ។

2.1.2 **ការលុប** Directory **និង** File

Syntax: #rmdir [Path]<Directory name>↵

ចំពោះរូបមន្តនេះអាចលុបបានតែ Directory ណាដែល Empty តែប៉ុណ្ណោះ ។

រូបមន្តសំរាប់លុប Directory ដែលមានផ្ទុក SubDirectory

Sysntax: #rm -r –f [Path]<FileName>

-r រឺ -R សំរាប់លុប Directory និង លុប File

-f សំរាប់បង្ខំ

សំរាប់លុប Directory ណាដែលផ្ទុកដោយ SubDirectory និង Files។

រូបមន្តសំរាប់លុប File

ចំពោះ Flag ពីរយើងអាចដាក់បញ្ចូលគ្នាបាន

#rm –rf /home/data

Syntax:#rm [Path]<FileName>

ករណីនេះវាសួរ Yes/No ដើម្បីកុំអោយសួរប្រើ -f ។

ចំណាំ *.* សំរាប់លុប File ទាំងអស់

*.txt សំរាប់លុប File ទាំងអស់ដែលមាន (.txt)

???.*សំរាប់លុប File ដែលមានអក្សរ៣ខ្ទង់មុខ

ដើម្បីមើល Command ដែលយើងបានប្រើយើងវាយ

#history ↵

ពេលនោះយើងនិងទទួលបាននូវ ID របស់ Command ទាំងអស់ព្រមទាំង ឈ្មោះរបស់ Command។

ID របស់ Command វានិងចេញតាម Command Name ដែលយើងប្រើមុនគេ។ ID របស់ Command Name នោះយើងអាចយកមកប្រើដូនជាឈ្មោះរបស់ Command Name ដោយគ្រាន់តែដាក់សញ្ញា (!) ពីមុខ ID ។

បើចង់ប្រើ Commandចុងក្រោយយើងគ្រាន់តែវាយ !! ។

ដើម្បីលុប Commandដែលយើងធ្លាប់ប្រើយើងវាយ

#history -c↵

ដើម្បីសួរពីរបៀបប្រើ Command យើងប្រើ

#man CommandName↵

ដើម្បីចាកចេញពីអត្ថន័យរបស់ Command name យើងចុច Ctrl+z

Command គឺជាឃ្លាបញ្ជាដែល User បញ្ជាទៅលើ OS ដើម្បីអនុវត្តន៍ការងារណាមួយ ។ Command ទាំងអស់ផ្ទុក Shell ។

2.1.3 **ការមើល** Directory **និង** Files

ដើម្បីមើល Directoryនិង Files យើងប្រើ Command ls

Syntax: #ls [option] <Path>

ដើម្បីមើលថាតើនៅក្នុង Directory នោះមាន Files និង Directory អ្វីខ្លះ យើងប្រើ Command

#ls –l [Directoryname]

ដើម្បី Copy File យើងប្រើ Command cp ដែលមាន Syntax ដូចខាងក្រោម :

#cp [path]<Source File> [path]<Definition file>

-Definition File មានក៏បានអត់ក៏បាន តែបើមាននោះវានិងដូឈ្មោះ File តែអត្ថន័យនៅផ្សេងដែល ។

ដើម្បី Copy Directory យើងប្រើ Command cp ដែលមាន Syntax ដូចខាងក្រោម :

#cp -r [path]<directory name> [path]<directory name>

Command សំរាប់ Move Files យើងប្រើ Command mv ដែលមាន Syntax: ដូចខាងក្រោម:

#mv [Path]<SourcFile> [Path]<DefinitionFile >

2.1.4 ការប្រើប្រាស់ Command vi

Creating and editing a text file with `vi`

`vi` (pronounced "vee eye") is really the only editor that comes with almost every Unix-like operating system, and Debian is no exception. `vi` was originally written at the University of California at Berkeley. The editor's name is short for "visual", referring to the fact that `vi` provides a visual display of the text file; this was once considered a unique feature, giving you an idea how old the program is.

Vi “Vee Eye” វាគឺជា editer តែមួយគត់ដែលBuild មកជាមួយរាល់ Operation System Unix ទាំងអស់។ ហើយ Debian ក៏មិនបានលើកលែងដែល។ VIគឺត្រូវបានបង្កើតឡើងនៅសាកលវិទ្យាល័យនៃរដ្ឋ Californai ដែលមានឈ្មោះថា Berkeley ។ vi គឺចេញពីពាក្យកាត់ “visual” ដែលផ្អែកលើការបង្ហាញជាអក្សរនៃText File។

`vi` is somewhat hard to get used to, but has many powerful features. In general, we suggest that a new user use Emacs for daily tasks such as programming. However, `vi` is sometimes more convenient or the only available editor; it is also a much smaller file to download.

The following discussion of `vi` should also apply to `vi` variants such as `elvis` and `vim`.

8.3.1 Creating a file

1. `vi testfile`

   In your home directory, invoke vi by typing `vi` followed by the name of the file you wish to create. You will see a screen with a column of tildes (~) along the left side. `vi` is now in command mode. Anything you type will be understood as a command, not as content to add to the file. In order to input text, you must type a command.

2. `i`

   The two basic input commands are `i`, which means "insert the text I'm about to type to the left of the cursor", and `a`, which means "append the text I'm about to type to the right of the cursor". Since you

are at the beginning of an empty file, either of these would work. We picked `i` arbitrarily.

3. Type in some text; here's a profound statement from philosopher Charles Sanders Peirce, if you can't think of your own:

```
      And what, then, is belief? It is the demi-cadence
      which closes a musical phrase in the symphony of our
      intellectual life.  We have seen that it has just
      three properties: First, it is something that we are
      aware of; second, it appeases the irritation of doubt;
      and, third, it involves the establishment in our
        nature of a rule of action, or, say for short, a
        habit.
```

   Press `RET` after each line, since `vi` will not move to the next line automatically; when you finish typing, press the `ESC` key to leave insert or append mode and return to command mode.

4. `:wq`

   If you've done everything correctly, when you type this command it should appear at the bottom of your screen, below all the ~ characters. The `:` tells `vi` you're about to give a series of commands; the `w` means to write the file you've just typed in --- in most new programs this is called "save" --- and the `q` means to quit `vi`. So you should be back at the shell prompt.

5. `cat testfile`

   `cat` will display the file you typed on the screen.

Don't remove `testfile`, we'll use it in the next tutorial section.

As you use `vi`, always remember that pressing `ESC` will return you to command mode. So if you get confused, press `ESC` a couple times and start over.

`vi` has an annoying tendency to beep whenever you do something you aren't supposed to, like type an unknown command; don't be alarmed by this.

8.3.2 Editing an existing file

To use `vi`, you only need to read Moving around in a file, Section 8.3.2.1 and Deleting text, Section 8.3.2.2. Later sections explain advanced features, but they are not strictly necessary, though often more efficient and less tedious.

8.3.2.1 Moving around in a file

To move around in a file, Debian's `vi` allows you to use the arrow keys. The traditional keys also work, however; they are `h` for left, `j` for down, `k` for up, and `l` for right. These keys were chosen because they are adjacent on on the home row of the keyboard, and thus easy to type. Many people use them instead of the

arrow keys since they're faster to reach with your fingers.

1. `vi testfile`

   Open the file you created earlier with `vi`. You should see the text you typed before.

2. Move around the file with the arrow keys or the `hjkl` keys. If you try to move to far in any direction, `vi` will beep and refuse to do so; if you want to put text there, you have to use an insertion command like `i` or `a`.

3. `:q`

   Exit `vi`.

8.3.2.2 Deleting text

1. `vi testfile`

   Open your practice file again.

2. `dd`

   The `dd` command deletes a line; the top line of the file should be gone now.

3. `x`

   `x` deletes a single character; the first letter of the second line will be erased. Delete and backspace don't work in `vi`, for historical reasons[13]. Some `vi` variants, such as `vim` will let you use backspace and delete.

4. `10x`

   If you type a number before a command, it will repeat the command that many times. So this will delete 10 characters.

5. `2dd`

   You can use a number with the `dd` command as well, deleting two lines.

6. `:q`

   This will cause an error, because you've changed the file but haven't saved yet. There are two ways to avoid this; you can `:wq`, thus writing the file as you quit, or you can quit without saving:

7. `:q!`

   With an exclamation point, you tell `vi` that you really mean it, and it should quit even though the file

isn't saved. If you use `:q!` your deletions will not be saved to `testfile`; if you use `:wq`, they will be.

8. `cat testfile`

   Back at the shell prompt, view `testfile`. It should be shorter now, if you used `:wq`, or be unchanged if you used `:q!`.

`:q!` is an excellent command to remember, because you can use it to bail out if you get hopelessly confused and feel you've ruined the file you were editing. Just press `ESC` a few times to be sure you're in command mode and then type `:q!`. This is guaranteed to get you out of `vi` with no damage done.

You now know everything you need to do basic editing; insertion, deletion, saving, and quitting. The following sections describe useful commands for doing things faster; you can skip over them if you like.

8.3.2.3 Sophisticated movement

There are many motion commands, here's a quick summary:

`w`

Move to the start of the next word

`e`

Move to the end of the next word

`E`

Move to the end of the next word before a space

`b`

Move to the start of the previous word

`0` (zero)

Move to the start of the line

`^`

Move to the first word of the current line

`$`

Move to the end of the line

`RET`

Move to the start of the next line

`-`

Move to the start of the previous line

`G`

Move to the end of the file

`1G`

Move to the start of the file

n`G`

Move to line number *n*

`C-G`

Display the current line number

`H`

Top line of the screen

`M`

Middle line of the screen

`L`

Bottom of the screen

n`|`

Move cursor to column *n*

The screen will automatically scroll when the cursor reaches either the top or the bottom of the screen. There are alternative commands which can control scrolling the text.

`C-f`

Scroll forward a screen

`C-b`

Scroll backward a screen

`C-d`

Scroll down half a screen

`C-u`

Scroll down half a screen

8.3.2.4 Repeating commands

As mentioned above you can often prefix a command with a number to repeat that command multiple times. For example, the `l` key moves left; `10l` moves you left 10 positions to the left.

If you wanted to enter a number of spaces in front of the some text you could use a number with the insert command. Enter the number *n* then `i` followed by `SPACE` and `ESC`. You should get *n* spaces.

The commands that deal with lines use a number to refer to line numbers. The `G` is a good example; if you preface it with a number it will go to that line.

8.3.2.5 Advanced reference

This section gives a more comprehensive list of commands you can use. It is just a reference; if you want, try the commands out to see what they do.

Insertion commands:

`a`

Append to the right of the cursor

`A`

Append at the end of the line

`i`

Insert text to the left of the cursor

`I`

Insert text to the left of the first non-blank character on current line

`o`

Open a new line below the current line and insert text

`O`

Open a new line above the current line and insert text

Deletion commands:

`x`

Delete the character under the cursor

`dw`

Delete from the current position to the end of the word

`dd`

Delete the current line.

`D`

Delete from the current position to the end of the line

Commands in combination can be more powerful. In particular, `d` followed by a motion command deletes from the cursor to wherever you asked to move. Some examples:

`d`*`n`*`w`

Deletes *n* words (*`n`*`dw` works too)

`dG`

Delete from the current position to the end of the file

`d1G`

Delete from the current postion to the start of the file

`d$`

Delete from current postion to the end of the line (same as `D`)

`d`*`n`*`$`

Delete from current line the end of the *n*th line

Undo commands:

`u`

Undo the last command

`U`

Undo all change to the current line

`:e!`

"Edit again". Like quitting with `:q!` and restarting --- returns you to the last time you did a `:w` to save.

You can undo an undo, so `uu` results in an undone undo, or no change.

Replacement commands:

`r`*c*

Replace the character under the cursor with *c*

`R`

Overwrites text

`cw`

Changes the current word

`c$`

Changes text from current position to end of the line

`c`*n*`w`

Changes next *n* words.(same as *n*cw)

`c`*n*`$`

Changes to the end of the *n*th line

`C`

Changes to the end of the line (same as *c$*)

`cc`

Changes the current line

`s`

Substitutes text you type for the current character

n`s`

Substitutes text you type for the next *n* characters

The commands in the above list which allow you to enter more than a single character of text have to be exited with the `ESC` key, returning you to command mode.

Cut and paste involves first *yanking* (cutting or copying) some text and placing it in a buffer (or "clipboard"); then moving to the desired new location; then pasting the text.

To cut text use the `y` command and its variants:

`yy`

Yank a copy of the current line

`nyy`

Yank the next *n* lines

`yw`

Yank a word

`ynw`

Yank *n* words

`y$`

Yank the text between the cursor and the end of the line

Paste commands:

`p`

Paste to the right of the cursor

`P`

Paste to the left of the cursor

`nP`

Paste *n* copies to the left of the cursor

When using `vi` within an xterm or using a variant of `vi` that supports X, you can also use the mouse to copy text. See The X Window System, Chapter 10 for how to copy and paste in X; be sure you're in insert mode when you paste, or the pasted text will be interpreted as a command.

When you delete, the deleted text is copied to the buffer (clipboard); you can then use the paste commands.

This allows you to cut-and-paste, while the `y` commands result in copy-and-paste.

`vi` has commands to search for text. You can also use these as movement commands, if you want to move to a particular word or character.

The simplest search commands look for characters.

`f`*c*

Find the next character *c* to the right of or below the current position

`F`*c*

Find the next character *c* to the left of or above the current position

`t`*c*

Move right to character before the next *c*.

`T`*c*

Move left to the character following the preceding *c*.

`;`

Repeats the last character search command

`,`

Same as `;` but reverses the direction of the original command.

If the character you were searching for was not found, `vi` will beep or give some other sort of signal. `vi` allows you to search for any text, not just a character.

`/`*text*

Searches right and down for the next occurence of *text*.

`?`*text*

Searches left and up for the next occurance of *text*.

`n`

Repeat the last `/` or `?` command

`N`

Repeats the last `/` or `?` in the reverse direction

When using the / or ? commands a line will be cleared along the bottom of the screen. You enter the text to search for followed by RET.

OS Linux ក៏ដូចជា OS ដ៏ទៃដើម្បីប្រើប្រាស់បានយើងត្រូវ Login (Username + password) User Account ក្នុង Linux ចាំបាច់ត្រូវមាន Password ។

ហើយ User Account មួយៗមានសិទ្ធមិនដូចគ្នាទេវាអាស្រ័យលើអ្នកគ្រប់គ្រងជាអ្នកកំណត់សិទ្ធ ។

សៅក្នុង Linux User ចែកចេញជាពីគឺ

១ User Build in កើតពេលយើងដំឡើង Linux

២ User ដែលយើងបង្កើតឡើងដោយ User ដែលមានសិទ្ធបង្កើត (root)៕

User Build in ចែកចេញជាពីគឺ

១ Supper User ហៅថា (root (UID=0)

២ System User (UID 1->99)

System User មានជាច្រើនសៅក្នុង Linux តែយើងមិនអាចយកវាមក Logon បានទេ ។

សៅពេលដែល User normal ត្រូវបានបង្កើតវាទទួលបាន(UID>=500) ហើយ System linux ក៏បានបង្កើត Home Directory ដែលមានឈ្មោះដូចនិង UserNameសោះក្នុង Directory ក្នុង Home ដើម្បីផ្ទុក User Profiles នៃ User Account សោះ។

ហើយពេលសោះ System Linux ក៏បានបង្កើត Private group មួយដែលGroup សោះមានឈ្មោះដូចគ្នាទៅនិង User Name ហើយ User account ដែលបានបង្កើតសោះជាសមាជិកដោយស្វ័យប្រវត្តិ។

2.2. Add a user

2.2.1 Add a user for system administration

```
[root@dlp ~]# useradd fedora
[root@dlp ~]# passwd fedora
Changing password for user fedora.
New UNIX password:                  # set password
Retype new UNIX password:           # verify
passwd: all authentication tokens updated successfully.
[root@dlp ~]# exit                  # loguot
```

2.2.2 Try to switch to a user that was added above

```
dlp login: fedora                   # input user name
password:                           # password
[fedora@dlp ~]$ su -                # switch to root
Password:                           # root password
[root@dlp ~]#                       # just switched to root
```

2.2.3 Make a user (it's 'fedora' in this example) be only a user who can switch to root as an administration user

```
[root@dlp ~]# vi /etc/group

# line 11: add user name
wheel:x:10:root,fedora

[root@dlp ~]# vi /etc/pam.d/su

#%PAM-1.0
auth        sufficient    pam_rootok.so
# Uncomment the following line to implicitly trust users in the "wheel" group.
#auth       sufficient    pam_wheel.so trust use_uid
# Uncomment the following line to require a user to be in the "wheel" group.
# uncomment the following line
auth        required      pam_wheel.so use_uid
auth        include       system-auth
account     sufficient    pam_succeed_if.so uid = 0 use_uid quiet
account     include       system-auth
password    include       system-auth
session     include       system-auth
session     optional      pam_xauth.so
```

2.2.4 Configure that forwarding emails for root to administration user you set above

សៅក្នុង Linux ព័ត៌មាន User ទាំងអស់គឺត្រូវបានផ្ទុកក្នុង File មួយដែលមានឈ្មោះវា Password សៅក្នុង File នេះចែកចេញជាបន្ទាត់ដែលបន្ទាត់នីមួយៗគឺជាព័ត៌មាននៃ User Account មួយ ។

ហើយយើងក៏អាចកែប្រែព័ត៌មាននៃ User Account នេះបានដែរ។

ដូចនេះ File Passwd គឺជា File configuration របស់ User account។

សៅក្នុងបន្ទាត់នីមួយៗចែកចេញជា 7 Columដែលបែងចែកដោយសញ្ញា (:) ។

-Column ទី១ គឺជា User Name នៃ User Account នោះ។

-Column ទី២ គឺជា Password នៃ User Account នោះតំណាងដោយអក្សរ(x) ហើយពីត៍មាននៃ User Account នីមួយៗផ្ទុកក្នុង File /etc/shadow

-Column ទី៣ គឺជា User ID របស់ User Account

-Column ទី៤ គឺជា ID របស់ Group ដែល User Account ជាសមាជិក

-Column ទី៥ គឺជា Full Name នៃ User Account នោះ

-Column ទី៦ គឺជា ទីតាំងនៃ User Account នោះ

-Column ទី៧ គឺជាទីតាំង Shell នៃ User Account នោះ

យើងដឹងហើយថា File Shadow គឺជា File ផ្ទុកព័ត៌មានរបស់ User Account ។ ហើយមួយបន្ទាត់

គឺជាព័ត៌មានរបស់ User Account មួយដែលចែកជា ៨ Column គឺ

-Column ទី១ គឺជា User Name នៃ User Account ដែលមានឈ្មោះដូចទៅនឹង User Name នៃ User Account

-Column ទី២ គឺជា Password នៃ User Account នៃ User Account នោះ ដែលមានលក្ខណៈ Encript ។

បើមើលនៅក្នុង Shadow មានសញ្ញា (!!) នោះបញ្ជាក់ថាគ្មាន Password តែបើមាននិមិត្តសញ្ញា (*) នោះបញ្ជាក់ថា User Account នោះត្រូវបាន Disable ជាបណ្តោះអាសន្ន ។

-Column ទី៣ គឺជាចំនួនថ្ងៃដែល User Account នោះបានប្តូរ Password ជាលើកចុងក្រោយដោយចាប់គិតពីថ្ងៃទី 01/10/1970 ។

-Column ទី៤ គឺជា Minimumte password Age គិតជាថ្ងៃប្រសិនជាស្មើ (0) មានន័យថា User Account នោះអាចប្តូរ Password បានដោយសេរី ។

-Column ទី៥ គឺជា Maxcimumte Password Age គិតជាថ្ងៃ ។

-Column ទី៦ គឺជាចំនួនថ្ងៃ និងផ្តល់ព័ត៌មាន Wanning មុន Password Expire ជាទូទៅវាត្រូវតូចជា Column ទី៥ ។

-Column ទី៧ គឺជា ចំនួនថ្ងៃដែល User Account និង Disable បន្ទាប់ពី Password ត្រូវ Expire ។

-Column ទី៨ គឺជាចំនួនថ្ងៃដែល User Account នោះត្រូវបាន Disableដែល User Account នោះត្រូវបានចាប់គិតពីថ្ងៃ 01/01/1970 ។

ដើម្បីលុប User Account យើងប្រើ userdel UserName តែ Command នេះគ្រាន់តែលុប User Account តែប៉ុណ្ណោះមិនបានលុប Home Directory របស់ User Account នោះទេ ។

ដើម្បីលុប User Account លុបទាំង Home Directory យើងប្រើ Command

#userdel -r UserName↵

យើងអាច Disable User Account តាមវិធីបែបមួយចំនួនដូចខាងក្រោម

១»ប្រើ Command

#passwd -l Username↵ Disable

#passwd -u Username↵ Enable

#usermod -L UserName↵ Disable

#usermod -U UserName↵ Enable

Group

នៅក្នុង Linux Group ចែកចេញជា ២ប្រភេទគឺ

-Group Build in និង Privade group

១»Group Build in គឺជា Group ដែលបានបង្កើតឡើងដោយស្វ័យប្រវត្តិពេលយើងតំឡើង Linux

២»Private Group គឺជា Group ដែលកើតឡើងដោយសារគេបង្កើតហើយបង្កើតដោយ User ដែលមានសិទ្ធបង្កើតហើយមាន ID>=500

ដើម្បីបង្កើត Group យើងប្រើ Command

#groupadd groupName↵

Eg:

#groupadd itbbu↵ បើវាដំបូងវាទទួលបាន ID=500

សៅក្នុង Linux ដើម្បីអោយដឹងថាមាន Group អ្វីខ្លះយើងចូលមើលក្នុង /etc/group ។ សៅក្នុង File នេះ វាចែកចេញជាបន្លាត់ដែលបន្លាត់មួយជាព័ត៌មានរបស់ User Account មួយ ។

ដើម្បី Add User Account ណាមួយចូល Group យើងប្រើ Command

#gpasswd -a UserName groupName↵

Eg #gpasswd -a bbu linux↵

ដើម្បីលុប User Account ណាមួយចេញពី Group ណាមួយយើងប្រើ Command

#gpasswd -d UserName GroupName↵

ដើម្បីផ្តល់សិទ្ធអោយ User Account ណាមួយគ្រប់គ្រង Group យើងប្រើ Command

#gpasswd -A UserName GroupName↵

ដើម្បីលុប Group ណាមួយយើងប្រើ Command

#groupdel GroupName↵

Chapter 3

Permission

3.1 មើល File និង Directory ពីសិទ្ធនិង Ownner

នៅក្នុង Linux *ដើម្បីអោយដឹងថា* User Account *ឬក៏* Group *ណាមួយមានសិទ្ធធ្វើអ្វីខ្លះទៅលើ* File *ឬ* Directory *យើងប្រើ* Command

#ls -l [path]<File Name>↵

Eg

#ls -l /etc/passwd↵

#ls -l /etc↵

#ls -l ↵

Eg

#ls -l \etc\passwd↵

-rw-r—r-- | L | root | root | 2068 2010-10-10 10:29 | \etc\passwd

----1---- --2-- ---3--- --4--- ----------5---------- ---------6---------

1. *ប្រាប់អោយដឹងថាតើវាជា* File *ឬ* Directory *និងមានសិទ្ធអ្វីខ្លះ*

2. *គឺជា* Link File

3. *គឺជា* Owner User *របស់* File *ឬ* Directory *នោះ* Owner User *ជាទូទៅគឺជាអ្នកដែលបង្កើត* File *ឬ*

Directory នោះ ក៏ប៉ុន្តែយើងក៏អាចប្តូរ Owner User នោះបានដែរ ។

4. គឺជា Group របស់ File រឺ Directory នោះ ប៉ុន្តែយើងក៏អាចប្តូរ Groupនោះបានដែរ ។

5. គឺជាកាលបរិច្ឆេទចុងក្រោយដែលយើងបានកែប្រែ File រឺ Directory នោះ

6. ប្រាប់អោយដឹងពីឈ្មោះ File រឺ Directory នោះ ។

Column 1

-/rw- /r— /r—

--1.1-- --1.2--- --1.3-- --1.4--

1.1 ប្រសិនបើជាសញ្ញាដកបញ្ជាក់ថាជា File តែបើជាអក្ស d បញ្ជាក់ថាជា Directory

1.2 គឺជាសិទ្ធរបស់ Owner user ទៅលើ File រឺ Directory នោះ

r= read ,w= Write ,x=Execute , ជាក(-) = គ្មានសិទ្ធ

1.3 គឺជា Permission របស់ Group នៃ File រឺ Directory នោះ

1.4 គឺជាសិទ្ធរបស់ User ដ៏ទៃដែលមិនមែនជា Owner និងមិនមែនជាសមាជិករបស់ Group ។

3.2 Change Ownner របស់ File ឬ Directory

ដើម្បី Change Owner របស់ File ឬ Directory យើងប្រើ Command

#chown UserName [Path]<File ឬ Directory>↵

3.3 Change Group របស់ File ឬ Directory

ដើម្បី Change Group របស់File ឬ Directory យើងប្រើ

#chgrp NewGroup [Path]<File ឬ Directory>↵

យើងអាចធ្វើការកែប្រែសិទ្ធរបស់ Owner , Group នៃ File ឬ Directory តាមរយៈប្រើ Command chmod ។

ប៉ារ៉ាម៉ែតដែលប្រើជាមួយ chmod មានដូចជា

u: តំណាងអោយ Owner User

g: តំណាងអោយ Group

o: តំណាងអោយ Other user

a: តំណាងអោយ all User (u+g+o)

+: សំរាប់បន្ថែមសិទ្ធ Add Permission

-: សំរាប់ដកសិទ្ធ Remove Permission

=: សំរាប់កំណត់ឡើងវិញនូវសិទ្ធ Reset Permission

#chmod g+w [path]<File or DirectoryName> ↵បន្ថែមសិទ្ធ Write អោយ group

#chmod u+x ----↵ បន្ថែមសិទ្ធ Execute អោយ Owner user

#chmod ug+xr ----↵ បន្ថែមសិទ្ធ Write និង Execute អោយ Owner user និង Group

#chmod ug-xr ----↵ ដកសិទ្ធ Write និង Execute ពី Owner user និង Group

#chmod u=xr ----↵ កែប្រែសិទ្ធឡើងវិញនូវ Write និង Execute អោយ Owner user

យើងក៏អាចធ្វើការផ្តល់សិទ្ធដោយការប្រើប្រាស់ Command chmod ជាមួយលេខដែលមាន Syntax ដូចខាងក្រោម

Note:

N,N1,N2,...គឺជាផលបូកនៃ Permission ទាំងអស់

#chmod NN1N2 [Path]<File Or Directory>↵

ជា Defual N=0

r=4

w=2

x=1

-=0 (គ្មានសិទ្ធ)

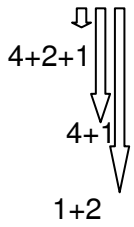
N ជាលេខតំណាងអោយសិទ្ធរបស់ Owner ទៅលើ File ឬ Directory

N1 លេខតំណាងអោយសិទ្ធរបស់ Group ទៅលើ File ឬ Directory

N2 លេខតំណាងអោយសិទ្ធរបស់ Other User ទៅលើ File ឬ Directory

ឧទាហរណ៍

#chmod 753 -----↵



Owner user មានសិទ្ធ Read, Writeនិង Execute

Group មានសិទ្ធ Read និង Execute

Other User មានសិទ្ធ Write និង Execute

យើងអាចធ្វើការ Change owner user របស់ File ឬ Directory ដោយប្រើ Command chmod

#chmod NewUser [Path]<File or Directory>↵

Note: NewUser មានស្រាប់ក្នុង System ។

ដើម្បី Change Group របស់ File ឬ Directory យើងប្រើ Command

#chgrg NewGroup [Path]<File ឬ Directory>↵

Note: NewGroup មានស្រាប់ក្នុង System ។

Chapter 4

សិទ្ធក្នុងការប្រើ SYSTEM

4.1 ការផ្តល់សិទ្ធអោយ User

តាមធម្មតាការបង្កើត User យើងប្រើ Command useradd គឺវាមិនមានសិទ្ធក្នុងការគ្រប់គ្រងនោះទេ ដើម្បីផ្តល់សិទ្ធអោយ UserAccount នោះមានសិទ្ធគ្រប់គ្រងយើងត្រូវទៅ Configure File មួយដែលមានឈ្មោះថា Sudoers ដែលមានទីតាំង /etc/sudoers ។

Syntax:

username/groupname servername = (user can be run as) command

note:

នៅក្នុង Linux User ហើយនិង Group មានឈ្មោះដូចគ្នា។ ដូច្នោះដើម្បីបញ្ជាក់ថា Group យើងត្រូវដាក់សញ្ញា % ពីមុខ ។

4.2 ការ Add user ហើយនិង Group linux មានសិទ្ធ ដូច root

Add user dara ហើយនិង Group linux មានសិទ្ធ ដូច root

dara,%linux ALL = (ALL) ALL

peter,%office ALL = /sbin/, /usr/sbin, /usr/share/man/man1/ls.1.gz, /usr/share/man/man1p/ls.1p.gz

មានន័យថា: User peter និង Group office មានសិទ្ធប្រើប្រាស់ Command ទាំងអស់ដែលផ្តុំកក្នុង /sbin/, /usr/sbin, /usr/share/man/man1/ls.1.gz, /usr/share/man/man1p/ls.1p.gz

ចំណាំ: ចំពោះការបិទ Command យើងប្រោះសញ្ញា (!) ពីមុខ ។

4.3 ការបិទ Command

បើយើងចង់បិទ Command តែមួយ ឬ ច្រើននោះត្រូវបញ្ជាក់ទីតាំងរបស់ Command និង ឈ្មោះ

របស់ Command

ឧទាហរណ៍:

មិនចង់អោយ User peter ប្រើ Command ls

peter ALL = !/bin/ls …..

ALIAS

Syntax:

UserName Aliasuser GroupNameAlias = User, User1, User2, User3…

ចូលបង្កើត User មួយឈ្មោះ User នេះមានសិទ្ធបង្កើត User ហើយផ្តើមដោយ lt ។

#useradd dara↵

#passwd dara↵

password …….

confirm ……..

#vi /etc/sudoers↵

dara ALL = (ALL) /usr/sbin/useradd lt*↵

Chapter 5

BOOT PROCESS

5.1 ការ Configure Grub File

នៅក្នុង Linux Boot Loader មានពីរប្រភេទគឺ៖

1-LiLo (Linux loader)

2-Grub (grand unified boot loader)

ដែល LILo ប្រើជាមួយ Linux Version ទាបហើយ Grub ប្រើជាមួយ Linux Version ចាប់ពី Core 8 ទៅ ។

ដើម្បីធ្វើការ Configure File របស់ Grup គឺយើងត្រូវទៅ Configure File មួយដែលមានឈ្មោះថា grub.conf ដែលមានទីតាំង /etc/grub.conf

```
# grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE:  You have a /boot partition.  This means that
#          all kernel and initrd paths are relative to /boot/, eg.
#          root (hd0,0)
#          kernel /vmlinuz-version ro root=/dev/mapper/luks-ba4eec46-a190-4d1c-9b2a-b5184eabe410
#          initrd /initrd-version.img
#boot=/dev/md0
default=0
timeout=0
splashimage=(hd0,0)/grub/splash.xpm.gz
password 12345
hiddenmenu
title Fedora (2.6.27.5-117.fc10.i686)
password 123456
        root (hd0,0)
        kernel /vmlinuz-2.6.27.5-117.fc10.i686 ro root=UUID=42ca489b-3dad-4725-a008-0497f60aba78 rhgb quiet
        initrd /initrd-2.6.27.5-117.fc10.i686.img
```

#boot=/dev/md0 ជា HDD ដែលវា Boot

default=0 ជាចំនួនវាទីដែល Boot

timeoup=5 ជាចំនួនវាទីដែល User ធ្វើការជ្រើសរើស

splashimage=(hd0,0)/grub/splash.xpm.gz

boot ពី HDD ទីមួយនៃ partition ទីមួយ (hd0,0)

hiddentment បើមិនចុច Arrow key នោះទេវានិងមិនបង្ហាញទេហើយយើងក៏អាចដាក់ Password ការពារពីការកែប្រែផ្សេងៗផងដែរ។

title Fedora(2.6.2.3)-42.fc10 ឈ្មោះនៃ OS ដែល Load ចូល

root (hd0,0) ជាទីតាំងរបស់ root

kernel /vmlinux 2-2.6 ជា Kernel version របស់ Fedora

សៅក្នុង Linux មាន Run Level =7 ដែលយើងអាចកំណត់អោយ OS របស់យើងសៅពេលដំណើរការដំបូងអោយដំណើរការចូល Level ណាមួយដោយស្វ័យប្រវត្តិ ។

Run Level 0(init 0) ប្រើសំរាប់ shutdown computer ។

Run Level 1(init 1) គឺជា Single User mode មានន័យថាសៅក្នុង Run Level នេះមានតែ Supper User(root) ដែលអាច Logon ចូល Linux ដូចនេះ System Linux និង Logon ដោយស្វ័យប្រវត្តិដោយប្រើ Account root ដោយមិនទាមទា Password ។ សៅក្នុង Run Level នេះប្រើសំរាប់ Reset Password Root និង Repair System មួយចំនួន ។

Run Level 2(init 2) គឺជា multiple user modeមានន័យថា User ជាច្រើនអាច Logon ចូល System ក៏ប៉ុន្តែសៅក្នុង Run Level នេះ Service មួយចំនួនមិនដំណើរការទេ ។

Run Level 3(init 3) គឺជា multiple user ហើយ Service ទាំងអស់ដំណើរការធម្មតាតែគ្មាន Desktop ទេ ។

Run Level 4(init 4) មិនត្រូវបានប្រើប្រាស់ទេ ។

Run Level 5(init 5) គឺជា multiple user mode & graphic mode ហើយ Service ទាំងអស់ដំណើរការធម្មតា ។

Run Level 6(init 6) ប្រើសំរាប់ Reboot ឬ Restart Computer ។

សៅក្នុង Linux ដើម្បីកំណត់សៅពេលដំណើរការដំបូង យើងត្រូវទៅ Configure File មួយឈ្មោះថា inittab គឺសៅក្នុង /etc/inittab ។

chapter 6

ការប្រើប្រាស់ Disk Storage

6.1 ការ ប្រើប្រាស់ Disk Storage

នៅក្នុង Linux *នឹម្បីប្រើប្រាស់* Disk Storage *ដែលបានភ្ជាប់លុះត្រាតែយើងស្គាល់ឈ្មោះវាជាមុនសិន ។*

Hard Dish ,USB *ឈ្មោះរបស់វាអាស្រ័យលើ* Interface *ដែលបាន* Connect *ទៅកាន់នោះ ។*

នៅក្នុង Linux *យើងអាចប្រើ* Command *ដើម្បី មើល* Drive *ប្រសិនបើយើងមិនស្គាល់* Drive *ទាំងនោះ*

#fdisk -l↵ *មើលទាំងអស់*

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

Disk /dev/sda: 9663 MB, 9663676416 bytes
255 heads, 63 sectors/track, 1174 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Disk identifier: 0x000888e8

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1          25      200781   fd  Linux raid autodetect
/dev/sda2              26        1148     9020497+  fd  Linux raid autodetect
/dev/sda3            1149        1173      200812+  82  Linux swap / Solaris

Disk /dev/sdb: 9663 MB, 9663676416 bytes
255 heads, 63 sectors/track, 1174 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Disk identifier: 0x00091b25

   Device Boot      Start         End      Blocks   Id  System
/dev/sdb1   *           1          25      200781   fd  Linux raid autodetect
/dev/sdb2              26        1148     9020497+  fd  Linux raid autodetect
/dev/sdb3            1149        1173      200812+  82  Linux swap / Solaris
[root@fserver ~]#
```

#fdisk -l /dev/sda↵ *ករណីស្គាល់*

```
[root@fserver ~]# fdisk -l /dev/sda

Disk /dev/sda: 9663 MB, 9663676416 bytes
255 heads, 63 sectors/track, 1174 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Disk identifier: 0x000888e8

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1   *           1          25      200781   fd  Linux raid autodetect
/dev/sda2              26        1148     9020497+  fd  Linux raid autodetect
/dev/sda3            1149        1173      200812+  82  Linux swap / Solaris
```

6.2 ការ Mount Disk Storage

បន្ទាប់ពីយើងស្គាល់ឈ្មោះ Device ដើម្បីអាចប្រើប្រាស់បានយើងត្រូវ mount វាជាមុនសិន ដោយប្រើ Command

#mount <Device Name> <mount point>↵

mount point គឺជា Directory មួយសំរាប់ផ្ទុកទិន្នន័យរបស់ Device name មានន័យថាបន្ទាប់ពីយើងប្រើប្រាស់ Command mound គឺយើងប្រើប្រាស់ mount point នោះដើម្បីលុប បង្កើត កែប្រែ…… ដូចធ្វើការជាមួយ Devcie name ។

Note: mount point ជាទូទៅយើងបង្កើតនៅក្នុង /mnt ។

ដើម្បី Unmount Device នោះយើងប្រើ Command

#umount <mountpoind>↵

IDE1
- Primary Master->/dev/hda
- Primary Slave ->/dev/hdb

IDE2
- Primary Master->/dev/hac
- Primary Slave ->/dev/hdd

SATA1
- Primary Master->/dev/sda
- Primary Slave ->/dev/sdb

SATA2
- Primary Master->/dev/sac
- Primary Slave ->/dev/sdd

6.3 ការមើលទំហំ Disk Storage

ដើម្បីមើលថាតើយើងប្រើអស់ទំហំប៉ុន្មានយើងប្រើ Command

#df -h <mountpiond>↵

Note: មុននិងប្រើប្រាស់ Command នេះបានត្រូវ mount វាជាមុនសិន ។

6.4 ការចែក Partition Disk Storage

ដើម្បីចែក Partition យើងប្រើ Command :

#fdisk –v <device name>↵

p: មើល Partition ក្នុង Device

n: បង្កើត Partition ថ្មី

d: delete partition

w: Save នូវអ្វីដែលបានកែប្រែ

q: ចាកចេញពីកម្មវិធី fdisk

a: កំណត់ active partition

t: change partition system id

m: display partition ដែលមិនស្គាល់

បន្ទាប់ពីយើងចែក Partition ដោយប្រើ fdisk ហើយយើងត្រូវ Formart Partition នោះជាមុនសិន ៖

mkfs -t [TypeFileSystem] <Partition>

ឧទាហរណ៍

mkfs -t ext2 /dev/fd0

ខាងក្រោមគឺជារូបមន្តរួមរបស់ mkfs

Syntax

mkfs [-V] [-t fstype] [fs-options] filesys [blocks]

-V	Produce verbose output, including all file system-specific commands that are executed. Specifying this option more than once inhibits execution of any file system-specific commands. This is really only useful for testing.
-t fstype	Specifies the type of file system to be built. If not specified, the default file system type (currently ext2) is used.
fs-options	File system-specific options to be passed to the real file system builder. Although not guaranteed, the following options are supported by most file system builders.
-c	Check the device for bad blocks before building the file system.
-l	Read the bad blocks list from filename
-v	Produce verbose output.

Examples

mkfs -t ext2 /dev/fd0

The above example would create an ext2 filesystem on a floppy diskette in the first floppy drive.

Chapter 7 ការដំឡើង SoftWare

7.1 ការInstall Software

នៅក្នុង Linux ក៏ដូចជា OS ដទៃដែរមុននិងប្រើប្រាស់ Software គឺយើងត្រូវ Install វាជាមុនសិន ។

នៅក្នុង Linux យើងអាច Install ដោយប្រើ Command មួយចំនួនដូចខាងក្រោម៖

១.ប្រសិនបើ File ដែលយើង Install ជា File rpm ពេលនោះយើងត្រូវ Install ដោយប្រើ rpm ដើម្បី Install

ដើម្បីដំឡើងយើងប្រើ៖

#rpm -i [Path]<Software Name+Extension>↵

ករណីនេះពេលដំឡើងគ្មានឃើញសកម្មភាពទាំងអស់តែបើ Arrow នោះវាបង្ហាញ តែបើ Complete នោះវាមិនឃើញអ្វីទាំងអស់ ។

#rpm -ivh [Path]<Software Name+Extension>↵

ករណីនេះវាបង្ហាញភាគរយនៃការ Install ។

ដើម្បី Uninstall យើងប្រើ Command rpm ដូចគ្នាគឺ៖

#rpm -e <Software Name>↵

ដើម្បីមើលថាតើយើងបាន Install អ្វីខ្លះយើងប្រើ Command៖

#rpm -qa ↵ មើលទាំងអស់

#rpm -qa |grep Software ↵

សំរាប់រកឈ្មោះ Software ដែលបាន Install ។

ដើម្បី Update Software ដែលមាន Extension .rpm គឺ៖

#rpm -U <Software Name>↵

ប្រសិនជា File ដែលយើងចង់ Install មាន Extension ជា .sh ដើម្បី ធ្វើការដំឡើង Software ប្រភេទនេះយើងប្រើ៖

#sh [Path]<File name>↵

រឺយើងអាច Double Click យកតែម្តងក៏បាន ។

7.2 UnInstall Software

តែពេលយើង Uninstall យើងប្រើ Command rpm វិញ ។

យើងអាច Install Software rpm ដោយប្រើ Command yum ។ តែយើង អាចប្រើបានលុះត្រាតែយើងភ្ជាប់ Internet ជាមុនសិនពីព្រោះការប្រើ Command នេះវា Install Automatic ចេញពី Ftp server ដែលវាបានកំណត់ទុករួចជាស្រេច ។

ដើម្បី Install ដោយប្រើ yum យើងប្រើ ៖

#yum install <Software Name>↵

ដើម្បី Uninstall ដោយប្រើ yum យើងប្រើ ៖

#yum remove <Software Name>↵

ដើម្បី Check មើល Software ដែលបាន Install ដោយប្រើ Command yum យើងប្រើ

#yum list <SoftwareName>↵

ដើម្បី Update មើល Software ដែលបាន Install ដោយប្រើ Command yum យើងប្រើ

#yum update <SoftwareName>↵

យើងក៏អាច install Software ចេញពី ទីតាំង របស់ Hard dish ,usb..ដោយប្រើ Command yum ដូចជា៖

#yum Localinstall[path]<File Name>↵

Note:

7.3 Mount Device ណាមួយដោយស្វ័យប្រវត្តិ

ដើម្បី Mount Device ណាមួយដោយស្វ័យប្រវត្តិ ជាអចិន្ត្រៃយើងត្រូវ ទៅ Configure File មួយគឺ៖

#/etc/fstab នៅក្នុង File នោះវាចែកចេញជាបន្លាត់ដែលបន្លាត់និមួយៗគឺជា Device មួយដែលបាន Mount ទៅកាន់ Mount Point ណាមួយដោយស្វ័យប្រវត្តិនៅពេលដែល User Logon ប្រើ Linux ។

នៅក្នុង File /etc/fstab ចែកចេញជា ៥ Column

#vi /etc/fstabp

/dev/sdb /mnt/usb Vfat defaults 0[1] 0[2]

/dev/sdv ជាDevice Name ដែលចង់ Mount ដោយស្វ័យប្រវត្តិ

/mny/usb ជា mount point ដែលយើងបង្កើត

Vfat ជា File System របស់ Window ដែលត្រូវនិង Fat32

default ជា Keyword (defual word)

[1]: បើដាក់លេខ0 សោះវានិងមិនបាន check device សោះទេតែបើដាក់លេខ 1 សោះវានិង back up ដោយស្វ័យប្រវត្តិនិង restore ពេលមានបញ្ហាក្នុងខណៈពេលម៉ាស៊ីនមិនប្រក្រតី ។

[2]: បើដាក់លេខ 0 សោះវាមិន check សោះទេហើយប្រើជាមួយ System root ។

លេខ 1 សោះវានិង Check

លេខ 2 ប្រើជាមួយ Sytem ក្រៅពី root

Note:

Vfat =Fat32 for windows

msdox=Fat16

ext2 }
} File System for Linux
ext3. }

Chapter 8 Network settings

8.1 ការប្រើ Command hostname

សៅក្នុង Linux ដើម្បី check មើលឈ្មោះគឺប្រើ Command hostname ៖

```
[root@fserver ~]# hostname
fserver
[root@fserver ~]#
```

8.2 ការប្រើប្តូរឈ្មោះ Computer

ដើម្បីប្តូរឈ្មោះ Computer ជាលក្ខណៈបណ្តោះអាសន្នយើងប្រើ

#hostname ComputerName↵

តែពេលយើង Restart ពេលនោះវានិងត្រឡប់មកឈ្មោះដើមវិញ។

ដើម្បីប្តូរឈ្មោះ Computer ជារៀងរហូតយើងត្រូវទៅ Configure File មួយដែលមានឈ្មោះថា Network សៅក្នុង /etc/sysconfig/network ដោយស្វែងរក Parameter មួយមានឈ្មោះថា hostname ។

```
NETWORKING=yes
HOSTNAME=fserver
```

8.3 ការ Check និង Set IP

ដើម្បី Check ip យើងប្រើ Command

#ifconfig

ដើម្បីកំណត់ Ip Address ទៅអោយ Network Card ណាមួយយើងអាចអនុវត្តន៍បានតា ររបៀបដូចខាងក្រោម៖

១.យើងប្រើ Command ifconfig ជាមួយ Syntax ដូចខាងក្រោម

#ifconfig <NetworkCardName> <IP Address> netmask <NetmaskAddess> up

```
[root@fserver ~]# ifconfig eth3 192.168.100.2 netmask 255.255.255.0 up
[root@fserver ~]# ifconfig eth3
eth3      Link encap:Ethernet  HWaddr 00:0C:29:D4:5F:12
          inet addr:192.168.100.2  Bcast:192.168.100.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fed4:5f12/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:302 errors:0 dropped:0 overruns:0 frame:0
          TX packets:36 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:33731 (32.9 KiB)  TX bytes:7345 (7.1 KiB)
          Interrupt:19 Base address:0x2480

[root@fserver ~]#
```

ការប្រើ Command នេះគឺយើងប្តូរ IP ជាលក្ខណៈបណ្តោះអាសន្នប៉ុណ្ណោះនៅពេលយើង Restart នោះវានឹងប្តូរមកភាពដើមវិញទាំងអស់។

២.ដើម្បីកំណត់ IP ជាស្ថេរភាពយើងត្រូវទៅ Configure File មួយដែលមានឈ្មោះនិងទីតាំងដូចខាងក្រោម៖

/etc/sysconfig/network-scripts/ifcfg-networkcardname

ឧទាហរណ៍:

```
[root@fserver ~]# vi /etc/sysconfig/network-scripts/ifcfg-eth3
```

```
# Advanced Micro Devices [AMD] 79c970 [PCnet32 LANCE]
DEVICE=eth3
HWADDR=00:0c:29:d4:5f:12
ONBOOT=no
~
```

យើង Edit

```
IPADDR=192.168.1.100
NETMASK=255.255.255.0
BOOTPROTO=static
ONBOOT=yes
#
# The following settings are optional
#
BROADCAST=192.168.1.255
NETWORK=192.168.1.0
```

DEVICE=eth3 ឈ្មោះ Network Card

IPADDR=192.168.1.100 គឺជា Ip របស់ Network Card

ONBOOT=yes ពេល Boot គឺប្រើ Network Card ខាងលើ

NETMASK=255.255.255.0 គឺជា Netmask របស់ Network Card

BOOTPROTO=static គឺដើម្បីបញ្ជាក់ថាវា Static ip ។

ករណីយើងចង់ប្រើ DHCP Client យើងកែលើ Static មក dhcp ។

៣.យើងអាចកំណត់ IP ដោយប្រើ Command Setup វាមិនត្រឹមតែអនុញ្ញាតិអោយយើងកំណត់ IP ប៉ុណ្ណោះទេគឺវាអាច Configure Firewall Check service កំណត់ម៉ោង Configure Key board....។

យើងដឹងហើយថា នៅលើ Network Card មួយយើងអាច Add IP បានជាច្រើនដែលហៅថា IP Alias ដោយប្រើដូចខាងក្រោម៖

8.4 ការប្រើ Command ifconfig

១.យើងប្រើ Command

#ifconfig <ifcfg-ethName:0 IPAddress netmask ipNetmask up > នេះគឺគ្រាន់តែជាលក្ខណៈបណ្តោះអាសន្នតែប៉ុណ្ណោះ។

ឧទាហរណ៍:

#ifconfig ifcfg-eth3:0 192.168.1.10 netmask 255.255.255.0 up ↵

២.ឬយើងអាចបង្កើត File មួយដែលមានឈ្មោះចេញពី Network Card ណាមួយដែលយើងប្រើ៖

ifcfg-NetworkCardName:0 ហើយត្រង់ Device=eth3:0

8.5 ការប្រើ Command Start & Stop Service network

ការ Configure File នេះគឺយើងត្រូវបូត IP ជារៀងរហូតបន្ទាប់ពីយើង Edit File រួចយើងត្រូវប្រើ Command ដូចខាងក្រោម៖

#ifup NetworkCard (Restart)

#ifdown NetwordCard (Stop)

#service network restart (Restart)

#service network stop (Stop)

សៅក្នុង Linux យើងអាចកំណត់សៅពេលយើងប្រើប្រាស់ឈ្មោះជំនួស IP តើ Linux វាស្វែរ File Host មុន ឬ DNS មុន។

យើងដឹងហើយថា host File មិនថា windows ឬ Linux ក្តី ដើម្បីកំណត់ក្នុងការប្រើឈ្មោះជំនួយ IP យើងទៅ Configure File host ។

#etc/host.conf

order hosts, bind

ដើម្បី Point IP ជាច្រើនទៅកាន់ឈ្មោះតែមួយយើងត្រូវប្តូរពាក្យ bind ទៅជា multi on ។

ដើម្បី Add IP Address របស់ DNS ទៅអោយ Network Card គឺយើងត្រូវទៅ Configure File មួយដែលមានឈ្មោះថា resolv.conf ដែលមានទីតាំង /etc/resolv.conf ។

ដើម្បី Start ពេល IP បានកែប្រែយើងប្រើ Command

#service network restart↵

3.1 Set static IP address to the server, DHCP is not recommended if you use as a server, Change it.

```
[root@dlp ~]# vi /etc/sysconfig/network-scripts/ifcfg-eth0

DEVICE=eth0
HWADDR=00:50:43:00:3B:AE
# change
ONBOOT=yes
# add lines
BOOTPROTO=none
TYPE=Ethernet
# DNS server's IP address
DNS1=10.0.0.1
# this server's IP address
IPADDR=10.0.0.30
# subnet mask
NETMASK=255.255.255.0
# default gateway
GATEWAY=10.0.0.1
USERCTL=no
IPV6INIT=no
PREFIX=24
PEERDNS=no
```

3.2 Start Network Service

```
[root@dlp ~]# /etc/rc.d/init.d/network start
Bringing up loopback interface:    [  OK  ]
Bringing up interface eth0:        [  OK  ]
[root@dlp ~]# chkconfig network on
[root@dlp ~]# ifconfig
eth0      Link encap:Ethernet HWaddr 00:50:43:00:3B:AE
          inet addr:10.0.0.30 Bcast:10.0.0.255 Mask:255.255.255.0
          inet6 addr: fe80::250:43ff:fe00:3bae/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:12068 errors:0 dropped:0 overruns:0 frame:0
          TX packets:7445 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:15474350 (14.7 MiB) TX bytes:582667 (569.0 KiB)
          Interrupt:30 Base address:0x6000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING MTU:16436 Metric:1
          RX packets:8 errors:0 dropped:0 overruns:0 frame:0
          TX packets:8 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:680 (680.0 b) TX bytes:680 (680.0 b)
```

3.3 Disable IPv6 if you don't need it.

```
[root@dlp ~]# ifconfig
eth0      Link encap:Ethernet HWaddr 00:50:43:00:3B:AE
          inet addr:10.0.0.30 Bcast:10.0.0.255 Mask:255.255.255.0
          inet6 addr: fe80::250:43ff:fe00:3bae/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:12068 errors:0 dropped:0 overruns:0 frame:0
          TX packets:7445 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:15474350 (14.7 MiB) TX bytes:582667 (569.0 KiB)
          Interrupt:30 Base address:0x6000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING MTU:16436 Metric:1
          RX packets:8 errors:0 dropped:0 overruns:0 frame:0
          TX packets:8 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:680 (680.0 b) TX bytes:680 (680.0 b)

[root@dlp ~]# echo "install ipv6 /bin/true" > /etc/modprobe.d/disable-ipv6.conf
[root@dlp ~]# reboot                    # reboot
```

```
[root@dlp ~]# ifconfig
eth0      Link encap:Ethernet HWaddr 00:50:43:00:3B:AE
          inet addr:10.0.0.30 Bcast:10.0.0.255 Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:12068 errors:0 dropped:0 overruns:0 frame:0
          TX packets:7445 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:15474350 (14.7 MiB) TX bytes:582667 (569.0 KiB)
          Interrupt:30 Base address:0x6000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          UP LOOPBACK RUNNING MTU:16436 Metric:1
          RX packets:8 errors:0 dropped:0 overruns:0 frame:0
          TX packets:8 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:680 (680.0 b) TX bytes:680 (680.0 b)
```

8.6 Configure Services

8.6.1 stop services that are enabled by default but you don't need them. List all services by a command below.

```
[root@dlp ~]# chkconfig --list | less
```

8.6.2 Stop a service. The example below means stop 'netfs' and disable auto-start at booting system.

```
[root@dlp ~]# /etc/rc.d/init.d/netfs stop
[root@dlp ~]# chkconfig netfs off
```

8.6.3 Following list is services by default if you install Fedora 14 as the same procedure with this site. (Minimal only). '*' means Author sets auto-start.

auditd	The audit package contains the user space utilities for storing and searching the audit records generate by the audit subsystem in the Linux 2.6 kernel
cgconfig	Start cgconfigparser
cgred	This is a daemon for automatically classifying processes into cgroups based on UID/GID
crond	The daemon to execute scheduled commands
ip6tables	It's IPv6 packet filter administration
iptables	It's administration tool for IPv4 packet filtering and NAT
lvm2-monitor	Monitor LVM2 with using dmeventd
netconsole	It sends printk message from kernel on UDP
netfs	NFS client
network	Network system
rdisc	Detect routers in local subnets
restorecond	It's the daemon that watches for file creation and then sets the default SELinux file context
rsyslog	It reads and/or clears kernel message ring buffer; set console_loglevel
saslauthd	saslauthd is a daemon process that handles plaintext authentication requests on behalf of the SASL library
sendmail	SMTP server
sshd	OpenSSH SSH daemon
udev-post	Moves the generated persistent udev rules to /etc/udev/rules.d

Chapter 9

DHCP Server

9.1 ការ Configure DHCP

DHCP=Dynamic host configuration protocol

DHPC Client វាមិនអាស្រ័យលើ OS ទេអោយតែ Client សោះវានិងទទួល បាន IP ដូចៗគ្នា ។

ដើម្បីអាចប្រើប្រាស់ DHCP Server បានយើងត្រូវ៖

១. install DHCP server

២.សៅក្នុង Linux បន្ទាប់ពី Install DHCP Server ហើយយើងត្រូវតែមាន IP មួយដែលសៅក្នុង range ដែលត្រូវផ្តល់អោយ Client ។

៣.បន្ទាប់ពី Install DHCP server ហើយយើងត្រូវទៅ Configure File មួយដែលមានឈ្មោះថា /etc/dhcpd.conf

សៅក្នុង File Configuration របស់ DHCP យើងអាចប្រើ Stype updated បាន 2 គឺ៖

1- ddns-update-stype interim;

stype នេះយើងច្រើនប្រើជាមួយ DHCP Client ដែលជា Linux ចាប់ពី Linux Core 7 ឡើង ។

2- ddns-update-stype ad-hoc;

ជា DHCP Version មុនចាប់ពី Linux Core 7 ចុះ ។

Stype នេះត្រូវសរសេរសៅបន្ទាត់លើគេ របស់ File Configure ។

- គ្រប់បន្ទាត់នីមួយៗក្នុង File នេះត្រូវបញ្ចប់ដោយសញ្ញា (;) ។

ប៉ារ៉ាម៉ែតមួយចំនួនដែលប្រើជាមួយ File Configure នេះមានដូចជា៖

- subnet ប្រើសំរាប់កំណត់ Subnet ណាដែលយើងនិងប្រើប្រាស់ IP ដែលនិងផ្តល់អោយ Client ។
- ប៉ារ៉ាម៉ែត netmast ប្រើសំរាប់កំណត់ Subnet mast ដែលយើងផ្តល់ អោយ Client

- ប៉ារ៉ាម៉ែត option routers សំរាប់ផ្តល់ IP Router អោយ Client
- ប៉ារ៉ាម៉ែត subnet-mask សំរាប់កំណត់ Subnet mask ដើម្បីបោះ អោយ Client
- ប៉ារ៉ាម៉ែត option domain-name-server សំរាប់បោះ IP DNS អោយ Client
- ប៉ារ៉ាម៉ែត option domain-name សំរាប់ផ្តល់ឈ្មោះ Domain អោយ Client
- ប៉ារ៉ាម៉ែត range សំរាប់ផ្តល់ IP ពីចន្លោះណាដល់ចន្លោះណា

បន្ទាប់ពីយើង Configure ហើយយើង Save File ។ ហើយយើងត្រូវ start service dhcp ដោយ ប្រើ

```
#service dhcp restart ↵
#chkconfig --level 35 dhcp on↵
```

ឧទាហរណ៍: DHCP Server

```
ddns-update-style interim;
subnet 192.168.0.0 netmast 255.255.255.0 {
    option routers IPROUTER, IPROUTER1 ;
    option domain-name "taohou.com" ;
    option domain-name-server IPDNS ;
    option subnet-mask 255.255.255.0 ;
    max-lease-time 7200 ;
range 192.168.0.1 192.168.0.255 ;
}
```

9.2 ការបង្កើត Scope

ការបង្កើត Supper Scope

ដើម្បីបង្កើត Supper Scope នៅក្នុង DHCP របស់ Linux យើង ប្រើ Keyword ដែលមាន Syntax ដូចខាងក្រោម៖

```
        ddns-update-stype-interim ;
    shared-network   networdlab1 {
    option-domain-name-servers 192.168.1.1 ;
    option   subnet-mask  255.255.255.0 ;
    option  domain-name  "taohou.com" ;
    subnet  192.168.1.1  netmast   255.255.255.0 {
    option  routers  192.168.1.254 ;
    max-lease-time  7200 ;
    range 192.168.1.10  192.168.1.100 ;
}
    subnet  192.168.1.0   netmast   255.255.255.0 {
    option  routers  192.168.1.20 ;
    max-lease-time  7200 ;
    range  192.168.1.200  192.168.1.254 ;
    }
}
```

9.3 ការកំណត់ IP តាម Max Ip Address

ដើម្បីបោះ IP ទៅអោយ Client តាមរយៈ Max Ip Address គឺយើង ត្រូវប្រើ Key word មួយឈ្មោះថា host

```
    host  namepc  {
        hardware  ethernet  MaxIP ;
        fixed-address  192.168.0.12 ;
    }
```

នៅក្នុងការធ្វើ DHCP របស់ Linux បើចង់មើល Max Ip Address របស់ Client យើងត្រូវចូល Check លើ File

#/var/lib/dhcpd/dhcpd.lease

ដើម្បីអោយដឹងថា ថាតើ DHCP Serverបានបោះ IP ណាខ្លះអោយDHCP Client យើងត្រូវ ចូលមើលក្នុង File មួយដែលមានឈ្មោះថា

#vi /var/lib/dhcpd/dhcpd.lease

ដើម្បីបោះ IP ទៅអោយ Client តាមរយៈ Max Ip Address គឺយើងត្រូវប្រើ Keyword មួយចំនួនដូចខាងក្រោម

host name pc {

hardware ethernet MaxIp ;

fixed-address 192.168.1.1 ; → ជា Ip សំរាប់បោះអោយ PC

}

Note: Keyword host ត្រូវសរសេរក្នុង Scope ។

នៅក្នុង Linux បើចង់មើល Max Ip Address របស់ Client យើងត្រូវចូលទៅ Check លើ File មួយដែលមានឈ្មោះ និង ទីតាំងដូចខាងក្រោម:

#/var/lib/dhcpd/dhcpd.lease

DHCP releagent គឺជា Service មួយប្រើសំរាប់ផ្តល់ព័ត៌មាន Network ទៅអោយ DHCP Client ដែលនៅក្នុង Subnet 2 ផ្សេងគ្នា ។

ដើម្បី Configue DHCP Releagent គឺយើងត្រូវទៅ Configure File មួយដែលមានឈ្មោះនិងទីតាំងគឺ /etc/sysconfig/dhcrelay ។

បន្ទាប់ពីយើងបាន Configure យើងត្រូវទៅ Restart Service មួយដែលមានឈ្មោះថា dhcrelay

#chkconfig -- level 35 dhcrelay on

Note: Sevice របស់ DHCP Releagent គឺដើជាមួយ DHCP Server ការ Configure dhcrelay

Chapter 10 Telnet Server

10.1 ការ Configure Telnet Server

Telnetserver វាជា Third Parti Software របស់ Linux ដូចនេះដើម្បីប្រើប្រាស់វាបានយើងត្រូវ Install វាជាមុនសិន បន្ទាប់ពី Install ហើយយើងត្រូវទៅ Configure File មួយដែលមានឈ្មោះថា telnet នៅក្នុង /etc/xnetd.d/telnet↵

file នេះវាចែកចេញជាបន្ទាត់គឺយើងត្រូវទៅរក Key Word មួយដែលមានឈ្មោះថា Disable ជា Defual Disable=yes មានន័យថាយើងពុំអាច ប្រើប្រាស់ Telnet Server បានទេ ។

ដូចនេះដើម្បីអោយ Telnet Client អាចទំនាក់ទំនងជាមួយ Telnet Server គឺយើងត្រូវប្តូរទៅជា no បន្ទាប់ពីយើងបានកែប្រែហើយយើងត្រូវ Save ហើយវត្រូវ Start Service មួយដែលមានឈ្មោះថា xinetd ។

ដើម្បី Start service ណាមួយនៅក្នុង Linux យើងត្រូវប្រើ Command:

#service ServiceNane start/stop↵

#service ServiceName status↵ ឆែកមើលថាតើ Service Name នោះ Start ឬ Stop ។

យើងអាចកំណត់អោយ Service ណាមួយ Start ដោយស្វ័យប្រវត្តិ នៅពេល Windows Start ជាលើកដំបូងគឺយើងត្រូវប្រើ Command ដូចខាងក្រោម៖

#chkconfig --level Levelname serviceName on↵

#chkconfig --level 35 xinetd on↵

Chapter 11 Update system

11.1 ทำไม Update your system with 'yum' command

However, before doing it, Install 'yum-plugin-fastestmirror' that looks for fast server and download packages from there automatically when yum command is used.

```
[root@dlp ~]# yum -y install yum-plugin-fastestmirror
Setting up Install Process
Resolving Dependencies
--> Running transaction check
---> Package yum-plugin-fastestmirror.noarch 0:1.1.28-1.fc14 set to be updated
--> Finished Dependency Resolution

Dependencies Resolved

================================================================================
Package                 Arch         Version                   Repository   Size
================================================================================
Installing:
  yum-plugin-fastestmirrornoarch     1.1.28-1.fc14             updates      16 k

Transaction Summary
================================================================================
Install               1 Package(s)
Upgrade               0 Package(s)

Total download size: 16 k
Installed size: 35 k
Downloading Packages:
yum-plugin-fastestmirror-1.1.28-1.fc14.noarch.rpm        | 17 kB 00:00
Running rpm_check_debug
Running Transaction Test
Transaction Test Succeeded
Running Transaction
  Installing : yum-plugin-fastestmirror-1.1.28-1.fc14.noarch 1/1

Installed:
  yum-plugin-fastestmirror.noarch 0:1.1.28-1.fc14

Complete!
[root@dlp ~]# yum -y update
```

Chapter 12 Configure sudo

12.1 Configure sudo to separate users duty if some people share privileges

12.1.1 Transfer root privilege to a user all

```
[root@dlp ~]# visudo

# add at the last line: user 'fedora' can use all root privilege
fedora   ALL=(ALL)   ALL

# how to write ⇒ destination host=(owner) command

# make sure with user 'fedora'
[fedora@dlp ~]$ /sbin/shutdown -r now
shutdown: Need to be root                # denied normally
[fedora@dlp ~]$ sudo /sbin/shutdown -r now
Password:                                # own password

The system is going down for reboot NOW!   # just executed
```

12.2 In addition to the setting [12.1], set that some commands are not allowed

```
[root@dlp ~]# visudo

# near line 49: add aliase for the kind of shutdown commands
Cmnd_Alias SHUTDOWN = /sbin/halt, /sbin/shutdown, \
/sbin/poweroff, /sbin/reboot, /sbin/init

# add ( commands in aliase 'SHUTDOWN' are not allowed )
fedora   ALL=(ALL)   ALL, !SHUTDOWN

# make sure with user 'fedora'
[fedora@dlp ~]$ sudo /sbin/shutdown -r now
Password:
Sorry, user fedora is not allowed to execute '/sbin/shutdown -r now' as root on dlp.server.world.   # denied
```

12.3 Transfer some commands with root privilege to users in a group

```
[root@dlp ~]# visudo

# near line 51: add aliase for the kind of user management comamnds
Cmnd_Alias USERMGR = /usr/sbin/useradd, /usr/sbin/userdel, /usr/sbin/usermod, \
/usr/bin/passwd

# add at the last
%usermgr ALL=(ALL) USERMGR

[root@dlp ~]# groupadd usermgr
[root@dlp ~]# vi /etc/group

# add a user in this group
usermgr:x:502:fedora

# make sure with user 'fedora'
[fedora@dlp ~]$ sudo /usr/sbin/useradd testuser
[fedora@dlp ~]$              # done normally
[fedora@dlp ~]$ sudo /usr/bin/passwd testuser
Changing password for user testuser.
New UNIX password:           # set testuser's password
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```

12.4 Transfer a command with root privilege to a user

```
[root@dlp ~]# visudo

# add at the last
fedora   ALL=(ALL) /usr/sbin/visudo
cent     ALL=(ALL) /usr/sbin/useradd, /usr/sbin/userdel, /usr/sbin/usermod, /usr/bin/passwd
suse     ALL=(ALL) /bin/vi

# make sure with user 'fedora'
[fedora@dlp ~]$ sudo /usr/sbin/visudo

# possible to open and edit
## Sudoers allows particular users to run various commands as
## the root user, without needing the root password.
##

# make sure with user 'cent'
[cent@dlp ~]$ sudo /usr/sbin/userdel -r testuser
[cent@dlp ~]$                 # done normally

# make sure with user 'suse'
[suse@dlp ~]$ sudo /bin/vi /boot/grub/grub.conf

# possible to open and edit
# grub.conf generated by anaconda
#
# Note that you do not have to rerun grub after making changes to this file
# NOTICE: You have a /boot partition. This means that
```

12.5 The logs for sudo are kept in '/var/log/secure', but there are many kind of logs in it. So if you'd like to keep only sudo's log in a file, Set like follows.

```
[root@dlp ~]# visudo

# add at the last
Defaults syslog=local1

[root@dlp ~]# vi /etc/rsyslog.conf

# The authpriv file has restricted access.
local1.*     /var/log/sudo.log        # line 42: add
authpriv.*   /var/log/secure

[root@dlp ~]# /etc/rc.d/init.d/rsyslog restart
Shutting down system logger:      [  OK  ]
Starting system logger:           [  OK  ]
```

Chapter 13 SSH Server

13.1 ការដំឡើង និង Configuration SSH Server

open secute shell (SSH) គឺជា Protocol មួយប្រើសំរាប់ជំនួស Telnet ,ftp, rlogin ,rsh, rep ហើយ SSH វាប្រើជាលក្ខណៈ Encrypt ។

នៅក្នុង Linux ដើម្បីអាចប្រើ Service នេះបានយើងត្រូវ Install package មួយដែលមានឈ្មោះថា ៖

_ openssh-server....fc10.rpm សំរាប់ server

_ openssh-client....fc10.rpm សំរាប់ Client

បន្ទាប់ពី Install Service នេះហើយយើងត្រូវទៅ Configure File មួយដែលមានឈ្មោះថា sshd-config

#vi /etc/sshd-config

បន្ទាប់ពីធ្វើការ Configure File នេះហើយយើងត្រូវ Start Service មួយដែលមានឈ្មោះថា sshd

#service sshd restart

ដើម្បី Connect ssh client និង ssh server យើងត្រូវប្រើ third party software...។

13.2 ការដំឡើង និង Configuration Client

ដើម្បីឲ្យ Linux ក្លាយជា ssh client យើងត្រូវ Install package មួយដែលមានឈ្មោះថា Openssh-client ----fc10.rpm

ដើម្បី Connect ទៅកាន់ openssh-server យើងត្រូវវាយ

#ssh IPserver

#ssh 192.168.1.1

បើយើងយក Linux មក Logon នោះវាគិតថាជា Client របស់ server ដែលបង្កើតដូចនេះថាគ្រាន់តែទៀមទា password ប៉ុណ្ណោះ ។

តែបើយក xp Logon នោះវាទៀមទា UserName +Password ។

ដើម្បីអាចឲ្យ xp Logon ចូល Linux ដោយប្រើ ssh គឺយើងត្រូវប្រើ Third party Software ដើម្បី Logon ដូចជា putty ជាដើម ។

ssh មិនត្រឹមតែអាចអោយយើង Remote ពីចំងាយប៉ុណ្ណោះទេ ។ វាថែមទាំងអាចអោយយើង Trainsver File ពីចំងាយបានទៀតផង។

scp <parth><FileName> Ip Server:<Parth>< File Name>

scp ប្រើសំរាប់ trainsver file ពី local ទៅ Server

Client (Linux)[/mnt/winword.txt] DC(Linux)

192.168.0.10 192.168.0.1

Ex: #scp /mnt/winword.txt 192.168.0.1:/mnt/doc

#scp /mnt/doc.txt admin@192.168.0.120:/home/admin

ចង់ Trainsver អោយ User admin ដោយដាក់ File នៅក្នុង /home/admin(Specifig User name)។

ការ Trainsver File ពី Server មក Client វិញ

Syntax:#scp username@tohostname:/remotefile /newlocalfileclient

13.3 Password Authentication

Configure SSH Server. Before configuration, it's neccessary to set config on routers that tcp packets to port 22 can pass through.

13.3.1 Configure SSH server for Windows clietnt computer to be able to login from them. This is the way with Password Authentication.

```
[root@dlp ~]# vi /etc/ssh/sshd_config

# line 40: uncomment and change 'no'
PermitRootLogin no

# line 63: uncomment
PermitEmptyPasswords no
PasswordAuthentication yes

[root@dlp ~]# /etc/rc.d/init.d/sshd restart
Stopping sshd:                             [  OK  ]
Starting sshd:                             [  OK  ]
```

13.4 Get an apprication which you can login from Windows clients. This example shows to use Putty like below. Input your server's IP address and Click 'Open' button.

Chapter 14

Automatic task

14.1 ការដំឡើង និង Configuration

សៅក្នុង System Linux *យើងអាច* Config *អោយកិច្ចការណាមួយអោយដំណើរការដោយ ស្វ័យប្រវត្តិ ដោយកំណត់ទៅលើពេលវាលា គឺថ្ងៃខែឆ្នាំ ។ យើងអាចកំណត់ការងារមួយចំនួន ដូចជា* back up system, sent mail Run Scrip, shutdown . ....

សៅក្នុង Linux Tools *មួយចំនួនដែលធ្វើការកំណត់ការងារណាមួយដោយស្វ័យប្រវត្តិរបស់* Linux *គឺមានឈ្មោះ* Cron, Anacrond , Bath , ...

-Cron *គឺជា* Tools *មួយដែលអាចអោយយើងដើម្បីប្រើធ្វើការកំណត់ទៅលើ* Scedure *អ្វីមួយ ដើម្បីដំណើរការ ការងារណាមួយដែលមានការផ្សំដូចជា ម៉ោង នាទី* Day of month ,Minute Day of week ,and week

មុននឹងអាចប្រើ Service *នេះបានគឺយើងត្រូវ* Install Package *មួយឈ្មោះថា* Vixie-Cron...fc10.rpm *ជាមុន សិន។*

បន្ទាប់ពី Install *ហើយយើងត្រូវទៅ* Configer File *មួយឈ្មោះនិងទីតាំង*/etc/crontab *។*

សៅក្នុង File *នេះចែកចេញជា បន្ទាត់ដែលបន្ទាត់នីមួយៗគឺជាកិច្ចការណាមួយដែលយើង កំណត់ទៅអោយ* Linvx *ដើម្បីអនុត្តន៍លើការងារនោះសៅលើពេលវេលានោះ។*

Note:*បើសិនជាដល់ពេលវេលានៃការអនុវត្តន៍ការងារនោះក៏ប៉ុន្តែ*Compoter *របស់យើងបិទ ។ ពេលនោះ* Service Cron *មិនអនុវត្តន៍ការងារនោះទេ ។*

សៅក្នុង line *នីមួយៗ វាបែងចែកជា* Colum *ដែល*Culomn*នីមួយៗបែងចែកដោយ* Space **៖**

- Column *ទី*1 *សំរាប់* Minute : (0-59)
- Column *ទី*2 *សំរាប់* Hour :(0-23)
- Column *ទី*3 *សំរាប់* Day of month (*ថ្ងៃទី*1,2, 3, ..30*គិតតាមខែ*) *។*

- Column ទី4 សំរាប់month (1-12) វីអាចប្រើ 3 តួដំបូងនៃឈ្មោះEnglish ជាភាសា
- Column ទី5 សំរាប់ Day of week :(1-7) 7= Sunday
- Column ទី6 ជា User Name : គឺជាUser ដែលមានសិទ្ធិអនុវត្តន៍កិច្ចការងារនោះ
- Column ទី7 សំរាប់Command : គឺជាCommand line ដែលត្រូវអនុវត្តន៍កិច្ចការងារនោះតាមពេលកំណត់។

បន្ទាប់ពី Configure file នេះហើយគឺត្រូវ Start Service មួយឈ្មោះថា Crond ។

Note:មាននិមិត្តសញ្ញាមួយចំនួនដែលត្រូវបានប្រើប្រាស់នៅក្នុង Columnនេះ។

-(*) តំណាងអោយគ្រប់លេខទាំងអស់ គ្រប់តំលៃ

-(-) គឺជាចន្លោះលេខ Ex (2-5)មានន័យថាចាប់ពី 2,3,4,5 និងធ្វើការអ្វីមួយ

-(,) គឺជាចន្លោះពេលនៃការកំណត់ Ex (2,5)មានន័យថាខែ 2 និង ខែ 5 រឺថ្ងៃទី 2 និងថ្ងៃទី 5 រឺ

-(*/ចំនួន) មានន័យថារៀងរាល់ (*) នៃចំនួននោះវា និងធ្វើការ ។

Ex: រៀងរាល់ ថ្ងៃនាទី30អោយ Backup ម្តង។

នៅត្រង់ទីយើងដាក់ */30

សំនួរអនុវត្តន៍

1 ចូល Backup home Directory របស់ User Account root ទៅកាន់ Usb mount pointe usb ត្រូវបង្កើតដោយខ្លួនéងហើយកំណត់អោយ Linux Mount ដោយស្វ័យប្រវត្តន៍ទៅកាន់ Usb នេះនៅពេល Logon ប្រើ System ការ Backup នេះគឺធ្វើឡើងរៀងរាល់ថ្ងៃអាទិត្យម៉ោង 8យប់។

2 ឧបមាថាយើងច្រឡំអោយ Linux Restart រៀងរាល់នាទីតើធ្វើយ៉ាងណាទើបអាច Remove កិច្ចការនេះចោលដើម្បីអាចអោយយើងប្រើបានជាធម្មតា។

3 យើងដឹងហើយថាយើងអាច Boot ចូល Single mode ដោយមិនចាំបាច់ស្គាល់ Password root តើធ្វើយ៉ាងណាទើបអោយពេលBoot ចូល Single Mode ទាមទាPassword root ដែរ។

Chapter 15

DNS Server

15.1 Install And Configure BIND

Configure DNS server which resolves domain name or IP address.

```
[root@dlp ~]# yum -y install bind bind-utils
```

15.2 Install BIND

15.3 Configure BIND

This example is done with grobal IP address [172.16.0.80/29], Private IP address [10.0.0.0/24], Domain name [server.world]. However, Please use your own IPs and domain name when you set config on your server. (Actually, [172.16.0.80/29] is for private IP address, though.)

```
[root@dlp ~]# vi /etc/named.conf

//
// named.conf
//
// Provided by Red Hat bind package to configure the ISC BIND named(8) DNS
// server as a caching only nameserver (as a localhost DNS resolver only).
//
// See /usr/share/doc/bind*/sample/ for example named configuration files.
//

options {
    # make it comment
    # listen-on port 53 { 127.0.0.1; };
    # make it comment
    # listen-on-v6 port 53 { ::1; };
    directory               "/var/named";
    dump-file               "/var/named/data/cache_dump.db";
    statistics-file         "/var/named/data/named_stats.txt";
    memstatistics-file      "/var/named/data/named_mem_stats.txt";
    # query range ( set it if make DNS for internal server only )
    allow-query             { localhost; 10.0.0.0/24; };
    recursion yes;

    dnssec-enable yes;
    dnssec-validation yes;
    dnssec-lookaside auto;
    # transfer range ( set it if you have secondary DNS )
    allow-transfer { localhost; 10.0.0.0/24; };
    # recursion range ( set it if make DNS for internal server only )
    allow-recursion { localhost; 10.0.0.0/24; };
```

```
    /* Path to ISC DLV key */
    bindkeys-file "/etc/named.iscdlv.key";

};

logging {
    channel default_debug {
        file "data/named.run";
        severity dynamic;
    };
};

# chnage all from here
# here is the section for internal informations
view "internal" {
    match-clients {
        localhost;
        10.0.0.0/24;
    };
    zone "." IN {
        type hint;
        file "named.ca";
    };
    # set zones for internal
    zone "server.world" {
        type master;
        file "server.world.lan";
        allow-update { none; };
```

```
    };
    # set zones for internal
    zone "0.0.10.in-addr.arpa" {
        type master;
        file "0.0.10.db";
        allow-update { none; };
    };
include "/etc/named.rfc1912.zones";
};
# here is the section for external informations
view "external" {
    match-clients {
        any;
    };
    zone "." IN {
        type hint;
        file "named.ca";
    };
    # set zones for external
    zone "server.world" {
        type master;
        file "server.world.wan";
        allow-update { none; };
    };
    # set zones for external *note
    zone "80.0.16.172.in-addr.arpa" {
        type master;
        file "80.0.16.172.db";
        allow-update { none; };
    };
};
include "/etc/named.root.key";

# *note : For How to write for reverse resolving, Write network address reversely like below
```

```
10.0.0.0/24
network address         ⇒ 10.0.0.0
range of network        ⇒ 10.0.0.0 - 10.0.0.255
how to write            ⇒ 0.0.10.in-addr.arpa

172.16.0.80/29
network address         ⇒ 172.16.0.80
range of network        ⇒ 172.16.0.80 - 172.16.0.87
how to write            ⇒ 80.0.16.172.in-addr.arpa
```

15.4 Set Zones for forward resolution

Create zone files that servers resolve IP address from domain name.

15.5 For internal zone

This example uses internal address[10.0.0.0/24], domain name[server.world], but please use your own one when you set config on your server.

```
[root@dlp ~]# vi /var/named/server.world.lan

$TTL    86400
@       IN      SOA   dlp.server.world. root.server.world. (
                2010110301      ;Serial
                3600            ;Refresh
                1800            ;Retry
                604800          ;Expire
                86400           ;Minimum TTL
)
                # define name server
                IN        NS     dlp.server.world.
                # internal IP address of name server
                IN        A      10.0.0.30
                # define Mail exchanger
                IN        MX 10 dlp.server.world.

                # define IP address and hostname
dlp             IN        A      10.0.0.30
```

15.6 For external zone

This example uses external address[172.16.0.80/29], domain name[server.world], but please use your own one when you set config on your server.

```
[root@dlp ~]# vi /var/named/server.world.wan

$TTL    86400
@       IN      SOA   dlp.server.world. root.server.world. (
                2010110301      ;Serial
                3600            ;Refresh
                1800            ;Retry
                604800          ;Expire
                86400           ;Minimum TTL
)
                # define name server
                IN        NS     dlp.server.world.
                # external IP address of name server
                IN        A      172.16.0.82
                # define Mail exchanger
                IN        MX 10 dlp.server.world.

                # define IP address and hostname
dlp             IN        A      172.16.0.82
```

15.7 Set Zones for reverse resolution

Create zone files that servers resolve domain names from IP address.

15.8 For internal zone

This example uses internal address[10.0.0.0/24], domain name[server.world], but please use your own one when you set config on your server.

```
[root@dlp ~]# vi /var/named/0.0.10.db

$TTL    86400
@       IN      SOA   dlp.server.world. root.server.world. (
                2010110301      ;Serial
                3600            ;Refresh
                1800            ;Retry
                604800          ;Expire
                86400           ;Minimum TTL
)
                # define name server
                IN        NS     dlp.server.world.

                # define range that this domain name is in
                IN        PTR    server.world.
                # define IP address and hostname
                IN        A      255.255.255.0

30              IN        PTR    dlp.server.world.
```

15.9 For external zone

This example uses external address[172.16.0.80/29], domain name[server.world], but please use your own one when you set config on your server.

```
[root@dlp ~]# vi /var/named/80.0.16.172.db

$TTL    86400
@       IN      SOA   dlp.server.world. root.server.world. (
                2010110301      ;Serial
                3600            ;Refresh
                1800            ;Retry
                604800          ;Expire
                86400           ;Minimum TTL
)
                # define name server
                IN        NS    dlp.server.world.

                # define range that this domain name is in
                IN        PTR   server.world.
                # define IP address and hostname
                IN        A     255.255.255.248

82              IN        PTR   dlp.server.world.
```

15.10 Start BIND

15.10.1 Start BIND

```
[root@dlp ~]# /etc/rc.d/init.d/named start
Starting named:                            [  OK  ]
[root@dlp ~]# chkconfig named on
```

15.10.2 Change settings where server to name resolution

```
[root@dlp ~]# vi /etc/sysconfig/network-scripts/ifcfg-eth0

DEVICE=eth0
HWADDR=00:50:43:00:3B:AE
ONBOOT=yes
BOOTPROTO=none
TYPE=Ethernet
# change to own
DNS1=10.0.0.30
IPADDR=10.0.0.30
NETMASK=255.255.255.0
GATEWAY=10.0.0.1
USERCTL=no
IPV6INIT=no
PREFIX=24
PEERDNS=no

[root@dlp ~]# /etc/rc.d/init.d/network restart
Shutting down interface eth0:              [  OK  ]
Shutting down loopback interface:          [  OK  ]
Bringing up loopback interface:            [  OK  ]
Bringing up interface eth0:                [  OK  ]
```

15.10.3 Make sure server can resolve domain names or IP addresses

```
[root@dlp ~]# dig dlp.server.world.

; <<>> DiG 9.7.2-P2-RedHat-9.7.2-2.P2.fc14 <<>> dlp.server.world.
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 34681
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 0

;; QUESTION SECTION:
;dlp.server.world.              IN      A

;; ANSWER SECTION:
dlp.server.world.       86400   IN      A       10.0.0.30   # answered

;; AUTHORITY SECTION:
server.world.           86400   IN      NS      dlp.server.world.

;; Query time: 0 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Wed Nov 3 22:56:57 2010
;; MSG SIZE rcvd: 64
```

```
[root@dlp ~]# dig -x 10.0.0.30

; <<>> DiG 9.7.2-P2-RedHat-9.7.2-2.P2.fc14 <<>> -x 10.0.0.30
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 39653
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 1

;; QUESTION SECTION:
;30.0.0.10.in-addr.arpa.        IN      PTR

;; ANSWER SECTION:
30.0.0.10.in-addr.arpa. 86400   IN      PTR     dlp.server.world.   # answered

;; AUTHORITY SECTION:
0.0.10.in-addr.arpa.    86400   IN      NS      dlp.server.world.

;; ADDITIONAL SECTION:
dlp.server.world.       86400   IN      A       10.0.0.30

;; Query time: 0 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Wed Nov 3 22:59:07 2010
;; MSG SIZE rcvd: 100
```

15.11 Set CNAME

If you'd like to set another name to your Host, define CNAME record in zone file

15.11.1 Set CNAME record in zone file

```
[root@dlp ~]# vi /var/named/server.world.lan

$TTL    86400
@       IN      SOA   dlp.server.world. root.server.world. (
                # update serial
                2010110303      ;Serial
                3600            ;Refresh
                1800            ;Retry
                604800          ;Expire
                86400           ;Minimum TTL
)
                IN          NS     dlp.server.world.
                IN          A      10.0.0.30
                IN          MX 10 dlp.server.world.

dlp             IN          A      10.0.0.30
# [ aliase IN CNAME server's name ]
ftp             IN      CNAME   dlp.server.world.

[root@dlp ~]# rndc reload
server reload successful

[root@dlp ~]# dig ftp.server.world.

; <<>> DiG 9.7.2-P2-RedHat-9.7.2-2.P2.fc14 <<>> dlp.server.world.
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 34681
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 0

;; QUESTION SECTION:
;ftp.server.world.                IN      A

;; ANSWER SECTION:
ftp.server.world.       86400   IN      CNAME   dlp.server.world.
dlp.server.world.       86400   IN      A       10.0.0.30

;; AUTHORITY SECTION:
server.world.           86400   IN      NS      dlp.server.world.
```

15.12 Configure as a Slave Server

Configure DNS as as Slave Server. It's easy to set up it.

Following example shows an environment that master DNS is "dlp.server.world", Slave DNS is "ns.example.host".

15.12.1 Write config in Zone file on Master DNS

```
[root@dlp ~]# vi /var/named/server.world.wan

$TTL    86400
@       IN      SOA   dlp.server.world. root.server.world. (
                # update serial
                2010110302      ;Serial
                3600            ;Refresh
                1800            ;Retry
                604800          ;Expire
                86400           ;Minimum TTL
)
                IN        NS    dlp.server.world.
                # add slave name server
                IN        NS    ns.example.host.
                IN        A     172.16.0.82
                IN        MX 10 dlp.server.world.

dlp             IN        A     172.16.0.82

[root@dlp ~]# rndc reload
server reload successful
```

15.13 Configuration on Slave DNS

```
[root@ns ~]# vi /etc/named.conf

    # add lines like below
    zone "server.world" {
        type slave;
        masters { 172.16.0.82; };
        file "slaves/server.world.wan";
    };

[root@ns ~]# rndc reload
server reload successful
[root@ns ~]# ls /var/named/slaves
server.world.wan                # zone file in master DNS has been just transfered
```

Chapter 16 Virtualization Server

16.1 Install KVM

It's Virtualization with KVM (Kernel-based Virtual Machine) + QEMU. This requires that the CPU on your computer has a function Intel VT or AMD-V.

16.1.1 Install KVM

```
[root@dlp ~]# yum -y install qemu-kvm libvirt python-virtinst bridge-utils

[root@dlp ~]# modprobe kvm
[root@dlp ~]# modprobe kvm_intel   # if AMD, "kvm_amd"
[root@dlp ~]# lsmod | grep kvm
kvm_intel    40231 0
kvm          252952 1 kvm_intel
[root@dlp ~]# /etc/rc.d/init.d/libvirtd start
 Starting libvirtd daemon:          [ OK ]
[root@dlp ~]# chkconfig libvirtd on
```

16.1.2Configure Bridge networking for KVM virtual machine

```
[root@dlp ~]# cd /etc/sysconfig/network-scripts
[root@dlp network-scripts]# cp ifcfg-eth0 ifcfg-br0
[root@dlp network-scripts]# vi ifcfg-br0

DEVICE=br0            # change
HWADDR=00:14:85:F0:57:28
ONBOOT=yes
BOOTPROTO=none
TYPE=Bridge           # change
DNS1=10.0.0.30
IPADDR=10.0.0.30
NETMASK=255.255.255.0
GATEWAY=10.0.0.1
USERCTL=no
IPV6INIT=no
PREFIX=24
PEERDNS=no
```

```
[root@dlp network-scripts]# vi ifcfg-eth0

DEVICE=eth0
HWADDR=00:14:85:F0:57:28
ONBOOT=yes
BOOTPROTO=none
TYPE=Ethernet
DNS1=10.0.0.30
IPADDR=10.0.0.30
NETMASK=255.255.255.0
GATEWAY=10.0.0.1
USERCTL=no
IPV6INIT=no
PREFIX=24
PEERDNS=no
BRIDGE=br0              # add
```

```
[root@dlp network-scripts]# cd
[root@dlp ~]# /etc/rc.d/init.d/network restart
Shutting down interface eth0:                [  OK  ]
Shutting down loopback interface:            [  OK  ]
Bringing up loopback interface:              [  OK  ]
Bringing up interface eth0:                  [  OK  ]
Bringing up interface br0:                   [  OK  ]
[root@dlp ~]# ifconfig
br0       Link encap:Ethernet HWaddr 00:14:85:F0:57:28
          inet addr:10.0.0.30 Bcast:10.0.0.255 Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:2217 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2242 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:270242 (263.9 KiB) TX bytes:378561 (369.6 KiB)

eth0      Link encap:Ethernet HWaddr 00:14:85:F0:57:28
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:202238 errors:0 dropped:0 overruns:0 frame:0
          TX packets:101540 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:283089551 (269.9 MiB) TX bytes:5809514 (5.5 MiB)
          Interrupt:30 Base address:0x8000
```

```
lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          UP LOOPBACK RUNNING MTU:16436 Metric:1
          RX packets:8 errors:0 dropped:0 overruns:0 frame:0
          TX packets:8 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1035 (1.0 KiB) TX bytes:1035 (1.0 KiB)

virbr0    Link encap:Ethernet HWaddr EE:52:9F:C3:31:42
          inet addr:192.168.122.1 Bcast:192.168.122.255 Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)
```

16.2 Create Virtual Machine #1

Install GuestOS and create Virtual Machine. This example shows to install Fedora 14.

16.2.1 Install on text mode via network, it's OK on Console or remote connection with Putty and so on.

```
[root@dlp ~]# mkdir -p /var/kvm/images     # create a directory for virtual machines
[root@dlp ~]# virt-install \
-n www \
-r 1024 \
-f /var/kvm/images/www.img \
-s 20 \
--vcpus=2 \
--os-type linux \
--os-variant=fedora14 \
--network bridge=br0 \
--network bridge=br1 \
--nographics \
--location='http://ftp.riken.jp/Linux/fedora/releases/14/Fedora/x86_64/os/' \
--extra-args='console=tty0 console=ttyS0,115200n8'

Starting install...                        # start installation
```

For options, make sure 'man virt-install', there are many options.

-n specify the name of Virtual Machine
-r specify the amount of memories of Virtual Machine
-f specify the location of disks of Virtual Machine
-s specify the amount of disks of Virtual Machine
--vcpus=
specify the virtual CPUs
--os-type
specify types of GuestOS
--network=
specify network types of Virtual Machine
--nographics
nographics
--location=
specify location of installation where from
--extra-args=
specify parameters that is set in kernel

16.2.2 Install with text mode, it's the same with common procedure of installation. After finishing installation, reboot first and then login prompt is shown like follwos.

```
Fedora release 14 (Laughlin)
Kernel 2.6.35.6-45.fc14.x86_64 on an x86_64 (/dev/ttyS0)

localhost.localdomain login:          # login as root

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

16.2.3 Move to GuestOS to HostOS with Ctrl +] key.
Move to HostOS to GuestOS with a command 'virsh console (name of virtual machine)'.

```
[root@localhost ~]#                   # push Ctrl + ]
[root@dlp ~]#                         # Host's console

[root@dlp ~]# virsh console www       # move to Guest
Connected to domain www
Escape character is ^]                # Enter key

[root@localhost ~]#                   # Guest's console
```

16.2.4 Because after installing GuestOS from network, it is minimum settings, so it's useful to save it as a template in order to create new virtual machines later. Please refer next procedure to create a new virtual machine from template below.

```
[root@localhost ~]#                   # Ctrl + ] key
[root@dlp ~]#                         # Host's console
[root@dlp ~]# cp /var/kvm/images/www.img /root/guest.img   # disk image
[root@dlp ~]# cp /etc/libvirt/qemu/www.xml /root/guest.xml   # XML file
```

16.2.5 Set basic initial configuration to GuestOS first before using it.

16.3 Create Virtual Machine #2

Create a Virtual Machine from template.

16.3.1 Create a Virtual Machine from template that is made in previous page

```
# copy disk image and XML file for a new Virtual Machine
[root@dlp ~]# cp guest.img /var/kvm/images/mail.img
[root@dlp ~]# cp guest.xml /etc/libvirt/qemu/mail.xml

[root@dlp ~]# uuidgen -t                    # generate UUID
101dea3a-6b02-11df-add6-001a4d459f57        # remember

[root@dlp ~]# vi /etc/libvirt/qemu/mail.xml

<domain type='kvm'>
 # change name
 <name>mail</name>
 # change UUID generated above
 <uuid>101dea3a-6b02-11df-add6-001a4d459f57</uuid>
 <memory>1048576</memory>
 <currentMemory>1048576</currentMemory>
 <vcpu>2</vcpu>
 <os>
  <type arch='x86_64' machine='pc-0.13'>hvm</type>
  <boot dev='hd'/>
 </os>
 <features>
  <acpi/>
  <apic/>
  <pae/>
 </features>
 <clock offset='utc'/>
 <on_poweroff>destroy</on_poweroff>
 <on_reboot>restart</on_reboot>
 <on_crash>restart</on_crash>
 <devices>
  <emulator>/usr/bin/qemu-kvm</emulator>
  <disk type='file' device='disk'>
   <driver name='qemu' type='raw'/>
   # change disk
```

```
    <source file='/var/kvm/images/mail.img'/>
    <target dev='vda' bus='virtio'/>
    <address type='pci' domain='0x0000' bus='0x00' slot='0x04' function='0x0'/>
   </disk>
   <interface type='bridge'>
    # remove the line for mac address
    <mac address='52:54:00:bc:8f:f3'/>
    <source bridge='br0'/>
    <model type='virtio'/>
    <address type='pci' domain='0x0000' bus='0x00' slot='0x04' function='0x0'/>
   </interface>
   <interface type='bridge'>
    # remove the line for mac address
    <mac address='52:54:00:59:da:9d'/>
    <source bridge='br1'/>
    <model type='virtio'/>
    <address type='pci' domain='0x0000' bus='0x00' slot='0x05' function='0x0'/>
   </interface>
   <serial type='pty'>
    <target port='0'/>
   </serial>
   <console type='pty'>
    <target type='serial' port='0'/>
   </console>
   <input type='tablet' bus='usb'/>
   <memballoon model='virtio'>
    <address type='pci' domain='0x0000' bus='0x00' slot='0x05' function='0x0'/>
   </memballoon>
  </devices>
</domain>
```

```
[root@dlp ~]# virsh define /etc/libvirt/qemu/mail.xml   # define new settings
Domain mail defined from /etc/libvirt/qemu/mail.xml
[root@dlp ~]# virsh start mail --console
Domain mail started
Connected to domain mail

Fedora release 14 (Laughlin)
Kernel 2.6.35.6-48.fc14.x86_64 on an x86_64 (/dev/ttyS0)

localhost.localdomain login:                # completed to boot
```

16.3.2 News GuestOS' network is failed to boot because it is the same to existing GuestOS's one. So Change network settings for new one.

```
[root@localhost ~]# ifconfig -a
eth2      Link encap:Ethernet HWaddr 52:54:00:46:CA:E3
          BROADCAST MULTICAST MTU:1500 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)
          Interrupt:11

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          UP LOOPBACK RUNNING MTU:16436 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

[root@localhost ~]# cd /etc/sysconfig/network-scripts
[root@localhost network-scripts]# mv ifcfg-eth0 ifcfg-eth2
[root@localhost network-scripts]# vi ifcfg-eth2

# change name and MAC address to correct one
# If you set static IP address, See initial config
DEVICE=eth2
BOOTPROTO=dhcp
HWADDR=52:54:00:46:CA:E3
NM_CONTROLLED="yes"
ONBOOT=yes
```

```
[root@localhost network-scripts]# /etc/rc.d/init.d/network restart
Shutting down loopback interface:  [  OK  ]
Bringing up loopback interface:    [  OK  ]
Bringing up interface eth2:
Determining IP information for eth2... done.
[  OK  ]
[root@localhost network-scripts]# ifconfig
eth2      Link encap:Ethernet HWaddr 52:54:00:46:CA:E3
          inet addr:10.0.0.205 Bcast:10.0.0.255 Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:12 errors:0 dropped:0 overruns:0 frame:0
          TX packets:10 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:1216 (1.1 KiB) TX bytes:1277 (1.2 KiB)
          Interrupt:11 Base address:0xc000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          UP LOOPBACK RUNNING MTU:16436 Metric:1
          RX packets:6 errors:0 dropped:0 overruns:0 frame:0
          TX packets:6 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:828 (828.0 b) TX bytes:828 (828.0 b)
```

16.4 Create Virtual Machine #3

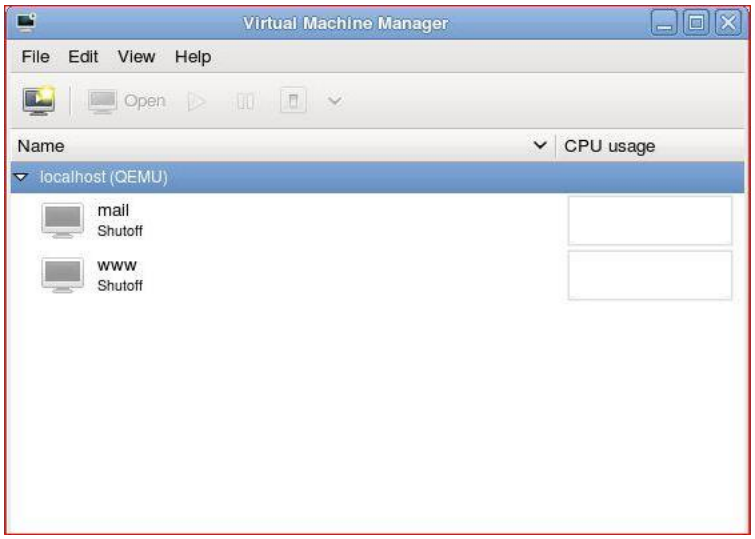
If you install Desktop Environment, it's possible to create a Virtula machine on GUI. This example shows to install Windows 7 on GUI.

16.4.1 Install virt-manager first

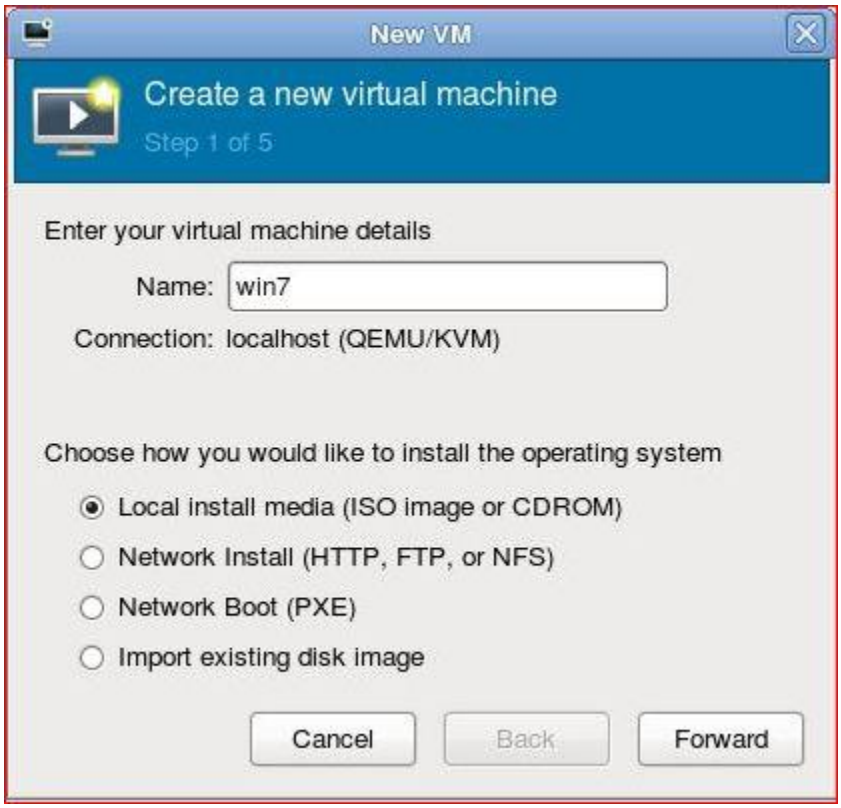
```
[root@dlp ~]# yum -y install virt-manager
```

16.4.2 Start X Window System and run 'Virtual Machine Manager'

16.4.3 Click 'New' button and open a wizard to create a new Virtual Machine

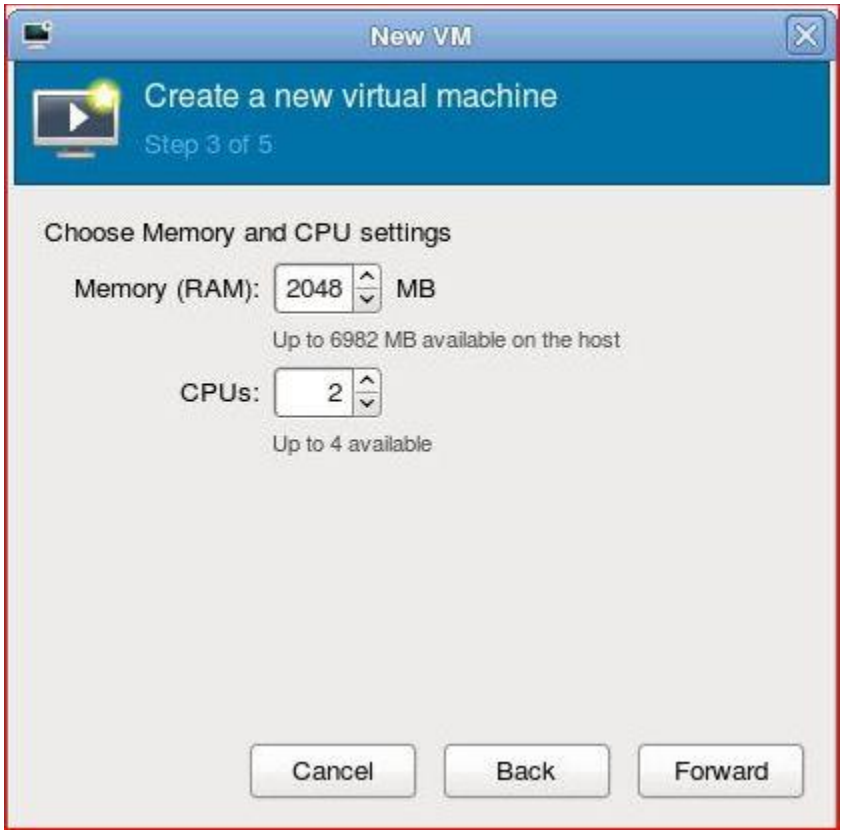


16.4.4 Specify the name of virtula machine and installation source. This example selects local media



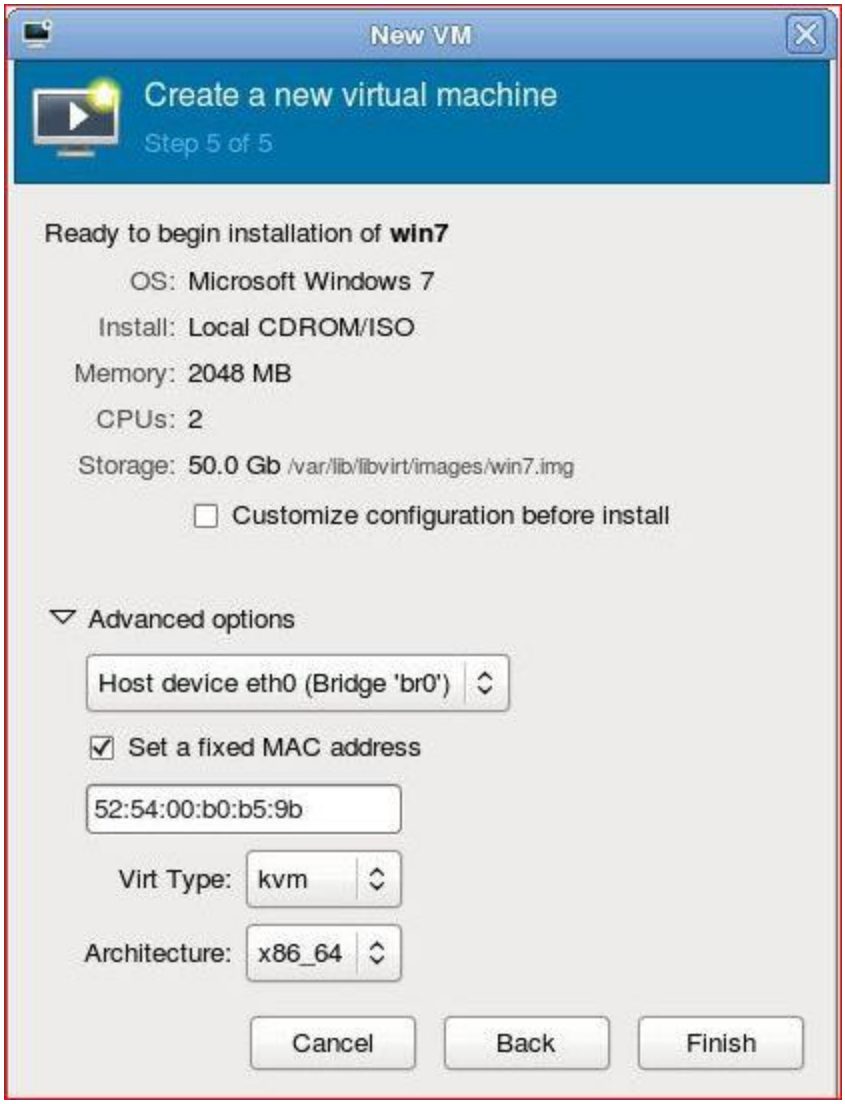
16.4.5 Select Installation media or ISO image, and specify OS type and version

16.4.6 Specify amount of memories and number of virtula CPUs



16.4.7 Specify amount of disks

16.4.8 Open 'Advanced options' and make sure the settings for networking or architecture are correct



16.4.9 Installation starts

16.4.10 Installation finished and Windows 7 is running

16.5 Operations

Operarions with virsh command.

16.5.1 Start Virtual Machine

```
[root@dlp ~]# virsh start www              # Start Virtual Machine 'www'
Domain www started

[root@dlp ~]# virsh start www --console    # start and connect to console of 'www'
Domain www started
Connected to domain www
```

16.5.2 Stop Virtual Machine

```
[root@dlp ~]# virsh destroy www          # Stop fourcely Virtual Machine 'www'
Domain www destroyed
```

16.5.3 List all Virtual Machines

```
[root@dlp ~]# virsh list                 # List all active Virtual Machines
 Id Name                 State
----------------------------------------
 2  win7                 running

[root@dlp ~]# virsh list --all           # List all Virtual Machines include inactives
 Id Name                 State
----------------------------------------
 2  win7                 running
 1  www                  shut off
```

16.5.4 Switch console Move to GuestOS to HostOS with Ctrl +] key.
Move to HostOS to GuestOS with a command 'virsh console (name of virtual machine)'.

```
[root@dlp ~]# virsh console www          # connect to 'www'
Connected to domain www
Escape character is ^]                   # Enter key

Fedora release 14 (Laughlin)
Kernel 2.6.35.6-48.fc14.x86_64 on an x86_64 (/dev/ttyS0)

www.server.world login:                  # just switched on Guest

Password:
Last login: Thu Nov 4 12:33:37 on ttyS0
[root@www ~]#                            # push Ctrl + ]
[root@dlp ~]#                            # just switched on Host
```

16.5.5 Other options. There are many options, please try to execute them

[root@dlp ~]#
virsh --help

virsh [options] [commands]

options:
-c | --connect <uri>
hypervisor connection URI

-r | --readonly
connect readonly

-d | --debug <num>
debug level [0-5]

-h | --help
this help

-q | --quiet
quiet mode

-t | --timing
print timing information

-l | --log <file>
output logging to file

-v | --version
program version

commands (non interactive mode):
help
print help

attach-device
attach device from an XML file

attach-disk
attach disk device

attach-interface
attach network interface

autostart
autostart a domain

capabilities
capabilities

cd
change the current directory

connect
(re)connect to hypervisor

console
connect to the guest console

cpu-baseline
compute baseline CPU

cpu-compare

compare host CPU with a CPU described by an XML file

create
create a domain from an XML file

start
start a (previously defined) inactive domain

destroy
destroy a domain

detach-device
detach device from an XML file

detach-disk
detach disk device

detach-interface
detach network interface

define
define (but don't start) a domain from an XML file

domid
convert a domain name or UUID to domain id

domuuid
convert a domain name or id to domain UUID

dominfo
domain information

domjobinfo
domain job information

domjobabort
abort active domain job

domname
convert a domain id or UUID to domain name

domstate
domain state

domblkstat
get device block stats for a domain

domifstat
get network interface stats for a domain

dommemstat

get memory statistics for a domain

domxml-from-native
Convert native config to domain XML

domxml-to-native
Convert domain XML to native config

dumpxml
domain information in XML

edit
edit XML configuration for a domain

find-storage-pool-sources
discover potential storage pool sources

find-storage-pool-sources-as
find potential storage pool sources

freecell
NUMA free memory

hostname
print the hypervisor hostname

list
list domains

migrate
migrate domain to another host

net-autostart
autostart a network

net-create
create a network from an XML file

net-define
define (but don't start) a network from an XML file

net-destroy
destroy a network

net-dumpxml
network information in XML

net-edit
edit XML configuration for a network

net-list

list networks

net-name
convert a network UUID to network name

net-start
start a (previously defined) inactive network

net-undefine
undefine an inactive network

net-uuid
convert a network name to network UUID

iface-list
list physical host interfaces

iface-name
convert an interface MAC address to interface name

iface-mac
convert an interface name to interface MAC address

iface-dumpxml
interface information in XML

iface-define
define (but don't start) a physical host interface from an XML file

iface-undefine
undefine a physical host interface (remove it from configuration)

iface-edit
edit XML configuration for a physical host interface

iface-start
start a physical host interface (enable it / "if-up")

iface-destroy
destroy a physical host interface (disable it / "if-down")

nodeinfo
node information

nodedev-list
enumerate devices on this host

nodedev-dumpxml
node device details in XML

nodedev-dettach

dettach node device from its device driver

nodedev-reattach
reattach node device to its device driver

nodedev-reset
reset node device

nodedev-create
create a device defined by an XML file on the node

nodedev-destroy
destroy a device on the node

pool-autostart
autostart a pool

pool-build
build a pool

pool-create
create a pool from an XML file

pool-create-as
create a pool from a set of args

pool-define
define (but don't start) a pool from an XML file

pool-define-as
define a pool from a set of args

pool-destroy
destroy a pool

pool-delete
delete a pool

pool-dumpxml
pool information in XML

pool-edit
edit XML configuration for a storage pool

pool-info
storage pool information

pool-list
list pools

pool-name

convert a pool UUID to pool name

pool-refresh
refresh a pool

pool-start
start a (previously defined) inactive pool

pool-undefine
undefine an inactive pool

pool-uuid
convert a pool name to pool UUID

secret-define
define or modify a secret from an XML file

secret-dumpxml
secret attributes in XML

secret-set-value
set a secret value

secret-get-value
Output a secret value

secret-undefine
undefine a secret

secret-list
list secrets

pwd
print the current directory

quit
quit this interactive terminal

reboot
reboot a domain

restore
restore a domain from a saved state in a file

resume
resume a domain

save
save a domain state to a file

schedinfo

show/set scheduler parameters

dump
dump the core of a domain to a file for analysis

shutdown
gracefully shutdown a domain

setmem
change memory allocation

setmaxmem
change maximum memory limit

setvcpus
change number of virtual CPUs

suspend
suspend a domain

ttyconsole
tty console

undefine
undefine an inactive domain

uri
print the hypervisor canonical URI

vol-create
create a vol from an XML file

vol-create-from
create a vol, using another volume as input

vol-create-as
create a volume from a set of args

vol-clone
clone a volume.

vol-delete
delete a vol

vol-dumpxml
vol information in XML

vol-info
storage vol information

vol-list

list vols

vol-path
convert a vol UUID to vol path

vol-name
convert a vol UUID to vol name

vol-key
convert a vol UUID to vol key

vcpuinfo
domain vcpu information

vcpupin
control domain vcpu affinity

version
show version

vncdisplay
vnc display

(specify help <command> for details about the command)

Chapter 17 SPICE Server

17.1 Install Spice Server and Configuration

Install Desktop Virtualization "SPICE (Simple Protocol for Independent Computing Environment)". It's possible to connect to virtual machines from remote client computer.

17.1 .1Install SPICE Server

```
[root@dlp ~]# yum -y install spice-protocol spice-server
```

17.1.2 Create a shell script to start virtual machine with SPICE

```
[root@dlp ~]# vi /usr/local/bin/qemu-spice

# create new
#!/bin/bash

exec /usr/bin/qemu-kvm $* \
-vga qxl \
-spice port=5930,disable-ticketing

[root@dlp ~]# chmod 755 /usr/local/bin/qemu-spice
```

17.3.1 Edit existing virtual machine's xml-file and start virtual machine with SPICE. This site's example has created virtual machine without graphics, so it's OK to change settings like follows, but if you created virtual machine with graphics, Remove "<graphics>***" and "<video>"*** sections in xml file because qxl is used for graphics.

```
[root@dlp ~]# vi /etc/libvirt/qemu/www.xml

# change emulator
<emulator>/usr/local/bin/qemu-spice</emulator>

# change "slot='0x02'" section to any other empty numbers because '0x02' is used by qxl if "slot='0x02'" exists
<address type='pci' domain='0x0000' bus='0x00' slot='0x05' function='0x0'/>

[root@dlp ~]# virsh define /etc/libvirt/qemu/www.xml        # define new settings
Domain www defined from /etc/libvirt/qemu/www.xml
[root@dlp ~]# virsh start www                               # start virtual machine
Domain www started
```

17.1.4 If you use virtula machine with GUI, Install QXL driver in GuestOS of virtual machine

```
[root@mail ~]# yum -y install xorg-x11-drv-qxl
```

17.1.5 Configuration is all OK. See next page to connect to SPICE server from SPICE

client

17.2 SPICE Client

Connect to virtual machine that is started with SPICE. This example uses Fedora 14 for SPICE client.

17.2.1 Install SPICE client

```
[root@www ~]# yum -y install spice-protocol spice-client
```

17.2.2 Start X windows system and input command like follows to connect to virtual machine

17.2.3 Just connected

17.3 SPICE Client - Windows 7

SPICE client for Windows is also provided, so it's possible to connect from Windows. This example uses Windows 7 (x64) for SPICE client.

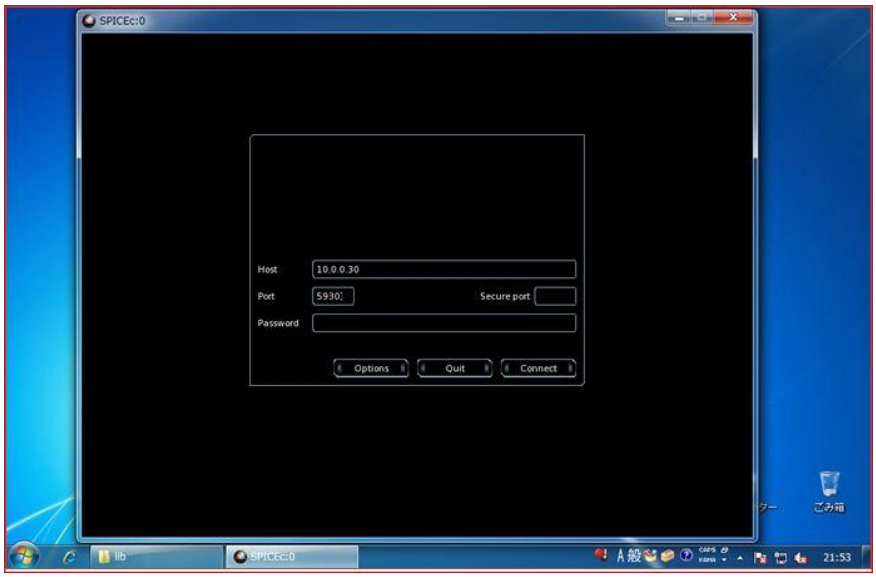
17.3.1 Download SPICE client from the link below.

⇒ http://www.spice-space.org/download.html

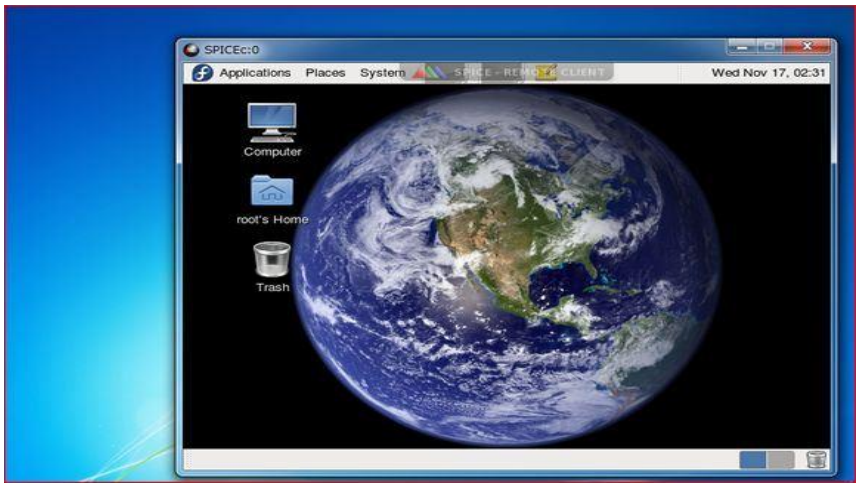
Download "spice-client-win32-0.6.3.zip" and "spice_libs_win32_063_and_earlier.zip". Next, unzip "spice-client-win32-0.6.3.zip"

and there is a "spicec.exe" in it. Next, unzip "spice_libs_win32_063_and_earlier.zip" and there is a "lib" folder in it.

Copy "spicec.exe" in "lib" folder and double click it, then following screen is shown, Input KVM host's hostname or IP address and port.



Just connected.



Chapter 18 Cloud Server

18.1 Install Cloud Server and Configuration

Install Eucalyptus (frontend)

Configure Cloud Server with Eucalyptus. This example based on the environment below.
(1) frontend

[10.0.0.20]

- Fedora 14 (x86_64) KVM Host
(2) node1

[10.0.0.30]

- Fedora 14 (x86_64) KVM Host
It's necessarry to be running KVM hypervisor on the frontend and node1.
And also, because this example configures networking with SYSTEM Mode, it's necessarry to be running DHCP Server on the frontend.
First, Configure frontend on here.

18.1.1 Install Packages

```
[root@frontend ~]# yum -y install java-1.6.0-openjdk java-devel ant ant-nodeps httpd aoetools vblade vtun
```

18.1.2 Install Eucalyptus

```
[root@frontend ~]# vi /etc/yum.repos.d/euca.repo

[euca]
name=Eucalyptus
baseurl=http://www.eucalyptussoftware.com/downloads/repo/eucalyptus/2.0.1/yum/fedora/
enabled=0

[root@frontend ~]# yum --enablerepo=euca -y install eucalyptus-cloud eucalyptus-cc eucalyptus-walrus eucalyptus-sc euca2ools --nogpgcheck

[root@frontend ~]# /etc/rc.d/init.d/eucalyptus-cloud start
Starting Eucalyptus services: walrus sc cloud done.
[root@frontend ~]# /etc/rc.d/init.d/eucalyptus-cc start
Starting Eucalyptus cluster controller: done.
[root@frontend ~]# chkconfig eucalyptus-cloud on
[root@frontend ~]# chkconfig eucalyptus-cc on
```

Install Eucalyptus (node)

Configure node.
(1) frontend [10.0.0.20]

- Fedora 14 (x86_64) KVM Host

(2) node1 [10.0.0.30]

- Fedora 14 (x86_64) KVM Host

The frontend has been configured and KVM hypervisor has also been configured on the node1 first.

[1]I nstall some packages first.

```
[root@node1 ~]# yum -y install httpd aoetools vblade
```

[2] Install Eucalyptus.

```
[root@node1 ~]# vi /etc/yum.repos.d/euca.repo

[euca]
name=Eucalyptus
baseurl=http://www.eucalyptussoftware.com/downloads/repo/eucalyptus/2.0.1/yum/fedora/
enabled=0

[root@node1 ~]# yum --enablerepo=euca -y install eucalyptus-nc --nogpgcheck

[root@node1 ~]# vi /etc/libvirt/libvirtd.conf

# line 81: uncomment and change
unix_sock_group = "kvm"

# line 88: uncomment
unix_sock_ro_perms = "0777"

# line 98: uncomment
unix_sock_rw_perms = "0770"

# line 129: uncomment
auth_unix_ro = "none"

# line 138: uncomment
auth_unix_rw = "none"

[root@node1 ~]# /etc/rc.d/init.d/libvirtd restart
Stopping libvirtd daemon:          [ OK ]
Starting libvirtd daemon:          [ OK ]
[root@node1 ~]# /etc/rc.d/init.d/eucalyptus-nc start
Starting Eucalyptus services:
Enabling bridge netfiltering for eucalyptus.
done.
[root@frontend ~]# chkconfig eucalyptus-nc on
```

18.1.3Initial Config #1

Add Components on the frontend.

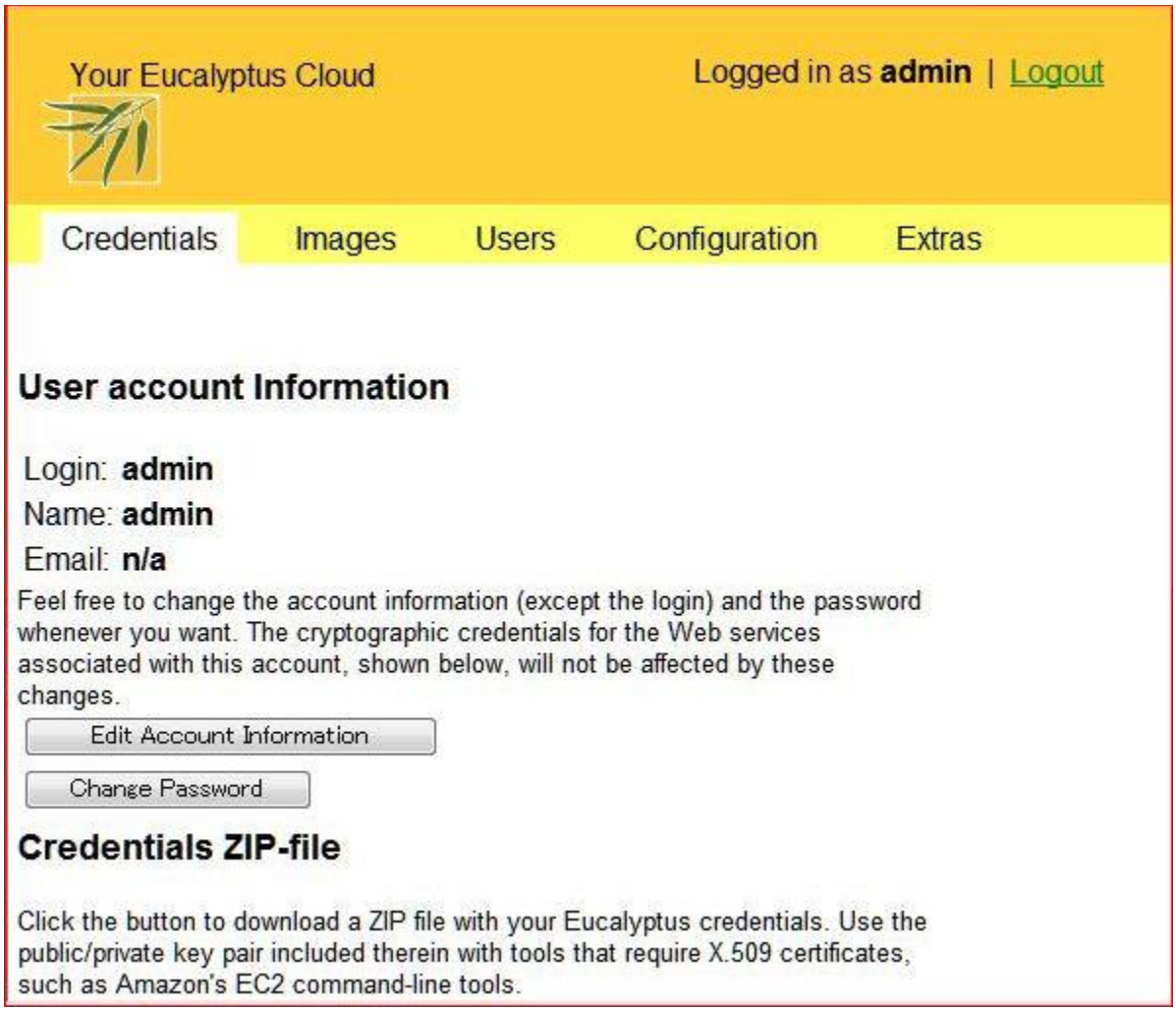
```
# add Walrus ( for IP address, specify your frontend's IP address )
[root@frontend ~]# euca_conf --register-walrus 10.0.0.20
Trying rsync to sync keys with "10.0.0.20"...root.0.0.20's password:
done.
SUCCESS: new walrus on host '10.0.0.20' successfully registered.

# add Cluster Controller ( for "cluster01", specify any name, and for IP address, specify your frontend's IP address )
[root@frontend ~]# euca_conf --register-cluster cluster01 10.0.0.20
Trying rsync to sync keys with "10.0.0.20"...root.0.0.20's password:
done.
SUCCESS: new cluster 'cluster01' on host '10.0.0.20' successfully registered.

# add Storage Controller ( for IP address, specify your frontend's IP address )
[root@frontend ~]# euca_conf --register-sc cluster01 10.0.0.20
Adding SC 10.0.0.20 to cluster cluster01
Trying rsync to sync keys with "10.0.0.20"...root.0.0.20's password:
done.
SUCCESS: new SC for cluster 'cluster01' on host '10.0.0.20' successfully registered.

# add Node Controller ( for IP address, specify your node's IP address )
[root@frontend ~]# euca_conf --register-nodes "10.0.0.30"
INFO: We expect all nodes to have eucalyptus installed in / for key synchronization.

Trying rsync to sync keys with "10.0.0.30"...The authenticity of host '10.0.0.30 (10.0.0.30)' can't be established.
RSA key fingerprint is xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.0.0.30' (RSA) to the list of known hosts.
root.0.0.30's password:
done.
```

18.1.4 Initial Config #2

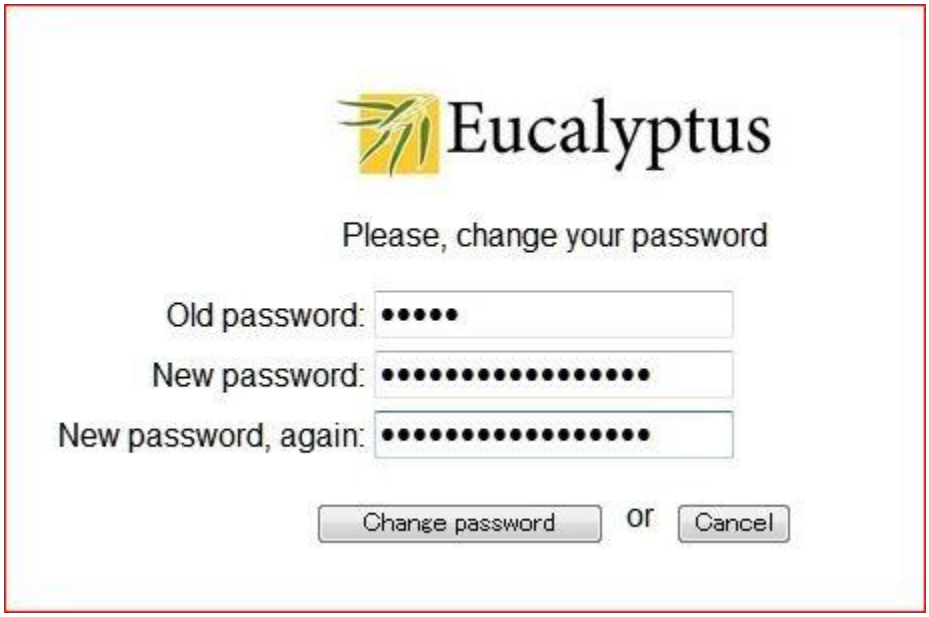
Configure some settings on the Web controles.

18.1.4.1 Access to 'https://(frontend's IP address):8443/' with web browser and login. Default user name and password is both 'admin'

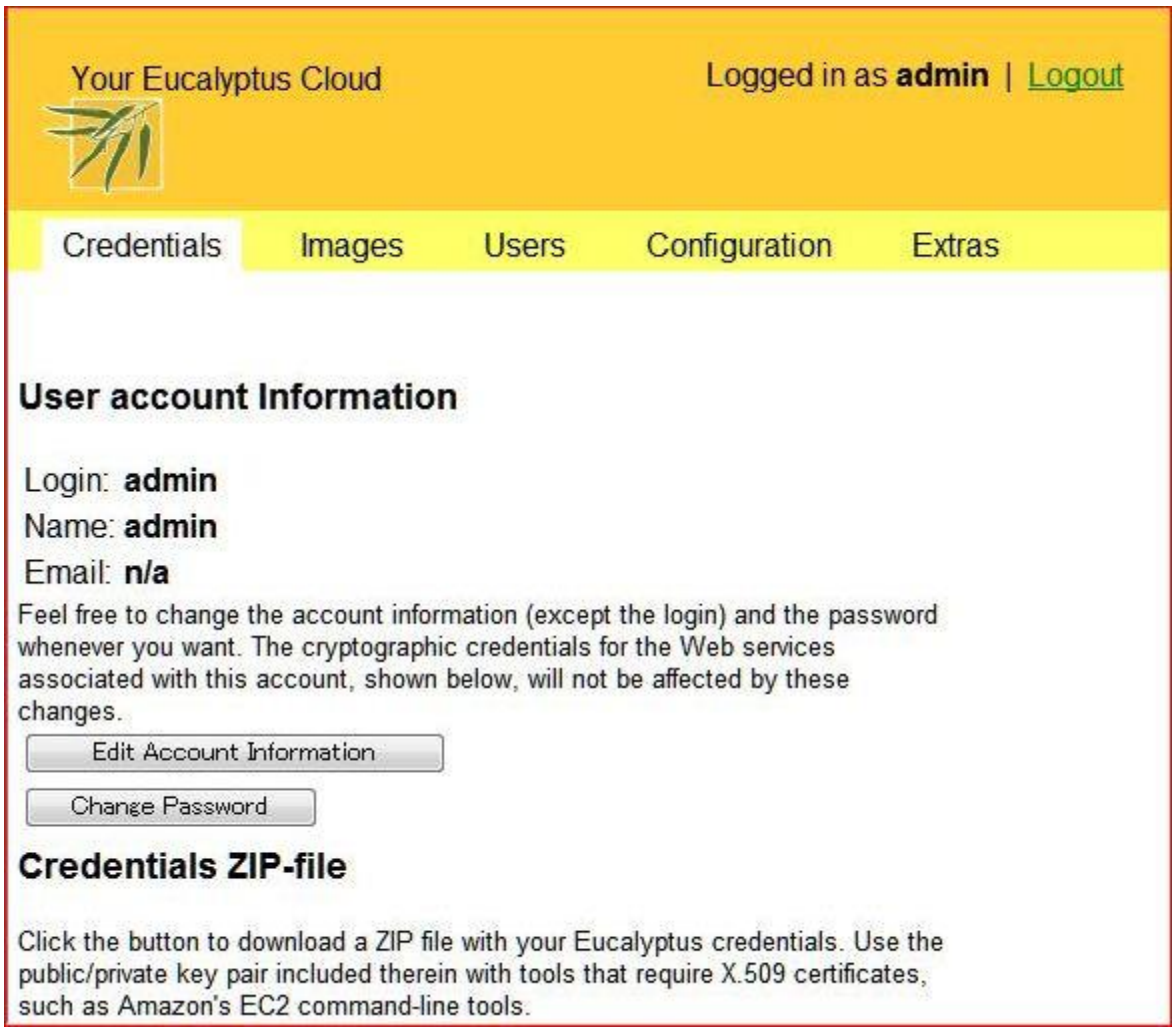
18.1.4.2 After login, Click "Change Password" to change admin's password



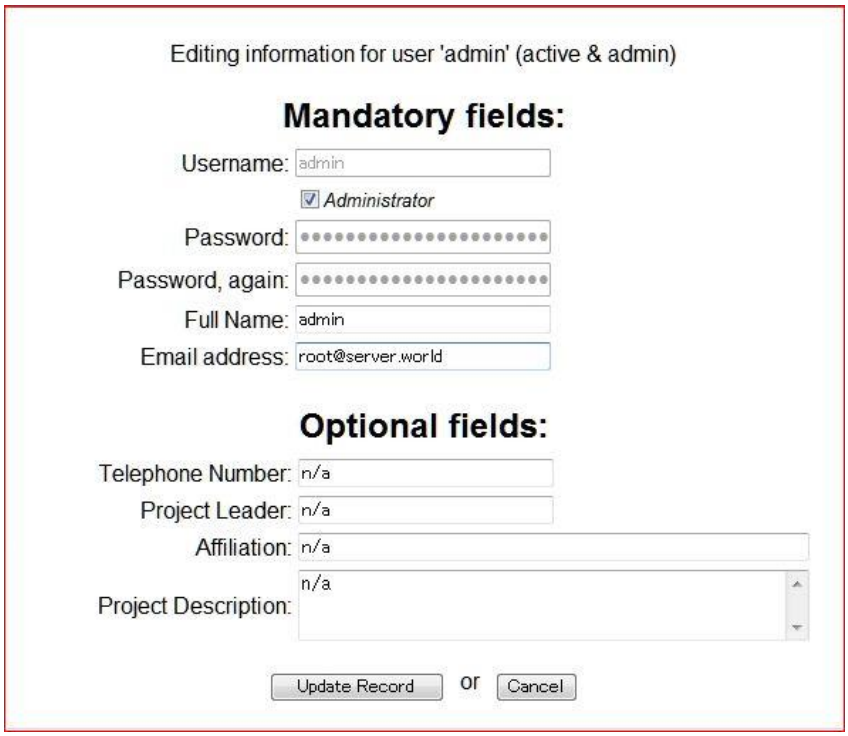
18.1.4.3 Input old password and new one and click "Change Password"



18.1.4.4 Set admin's email address. Click "Edit Account Information"



18.1.4.5 Input admin's email address in "Email address" field and click "Update Record"



18.1.4.6 Get certificates. Click "Download Certificate" and save it on your local

18.1.4.7 Install certificates on your frontend. If you got it on your client PC, Upload it with FTP or SFTP

```
[root@frontend ~]# mkdir ~/.euca
[root@frontend ~]# chmod 700 ~/.euca
[root@frontend ~]# mv euca2-admin-x509.zip ~/.euca
[root@frontend ~]# cd ~/.euca
[root@frontend .euca]# unzip euca2-admin-x509.zip
Archive: euca2-admin-x509.zip
To setup the environment run: source /path/to/eucarc
  inflating: eucarc
  inflating: cloud-cert.pem
  inflating: jssecacerts
  inflating: euca2-admin-8b0219c4-pk.pem
  inflating: euca2-admin-8b0219c4-cert.pem
[root@frontend .euca]# chmod 600 *
[root@frontend .euca]# source eucarc
[root@frontend .euca]# echo "source ~/.euca/eucarc" >> ~/.bashrc
[root@frontend .euca]# cd
[root@frontend ~]# euca_conf -synckeys

INFO: We expect all nodes to have eucalyptus installed in / for key synchronization.
Trying rsync to sync keys with "10.0.0.30"...root.0.0.30's password:
done.
[root@frontend ~]# euca-describe-availability-zones verbose
AVAILABILITYZONE  cluster01        10.0.0.20
AVAILABILITYZONE  |- vm types      free / max cpu ram disk
AVAILABILITYZONE  |- m1.small     0008 / 0008   1   128   2
AVAILABILITYZONE  |- c1.medium    0008 / 0008   1   256   5
AVAILABILITYZONE  |- m1.large     0004 / 0004   2   512  10
AVAILABILITYZONE  |- m1.xlarge    0004 / 0004   2  1024  20
AVAILABILITYZONE  |- c1.xlarge    0002 / 0002   4  2048  20
```

18.1.5 Add Images

Add an image on Eucalyptus. This example shows to add CentOS 5.3.

```
[root@frontend ~]# wget http://eucalyptussoftware.com/downloads/eucalyptus-images/euca-centos-5.3-x86_64.tar.gz

[root@frontend ~]# tar zxvf euca-centos-5.3-x86_64.tar.gz
[root@frontend ~]# cd euca-centos-5.3-x86_64
[root@frontend euca-centos-5.3-x86_64]# euca-bundle-image -i kvm-kernel/vmlinuz-2.6.28-11-generic --kernel true
Checking image
Tarring image
Encrypting image
Splitting image...
Part: vmlinuz-2.6.28-11-generic.part.0
Generating manifest /tmp/vmlinuz-2.6.28-11-generic.manifest.xml
[root@frontend euca-centos-5.3-x86_64]# euca-upload-bundle -b centos-kernel-bucket \
-m /tmp/vmlinuz-2.6.28-11-generic.manifest.xml
Checking bucket: centos-kernel-bucket
Creating bucket: centos-kernel-bucket
Uploading manifest file
Uploading part: vmlinuz-2.6.28-11-generic.part.0
Uploaded image as centos-kernel-bucket/vmlinuz-2.6.28-11-generic.manifest.xml
[root@frontend euca-centos-5.3-x86_64]# euca-register centos-kernel-bucket/vmlinuz-2.6.28-11-generic.manifest.xml
IMAGE eki-A7E117B5
[root@frontend euca-centos-5.3-x86_64]# euca-bundle-image -i kvm-kernel/initrd.img-2.6.28-11-generic --ramdisk true
Checking image
Tarring image
Encrypting image
Splitting image...
Part: initrd.img-2.6.28-11-generic.part.0
Generating manifest /tmp/initrd.img-2.6.28-11-generic.manifest.xml
[root@frontend euca-centos-5.3-x86_64]# euca-upload-bundle -b centos-ramdisk-bucket \
-m /tmp/initrd.img-2.6.28-11-generic.manifest.xml
Checking bucket: centos-ramdisk-bucket
Creating bucket: centos-ramdisk-bucket
```

```
Uploading manifest file
Uploading part: initrd.img-2.6.28-11-generic.part.0
Uploaded image as centos-ramdisk-bucket/initrd.img-2.6.28-11-generic.manifest.xml
[root@frontend euca-centos-5.3-x86_64]# euca-register centos-ramdisk-bucket/initrd.img-2.6.28-11-generic.manifest.xml
IMAGE eri-10291911
[root@frontend euca-centos-5.3-x86_64]# euca-bundle-image -i centos.5-3.x86-64.img --kernel eki-A7E117B5 --ramdisk eri-10291911
Checking image
Tarring image
Encrypting image
Splitting image...
Part: centos.5-3.x86-64.img.part.0
Part: centos.5-3.x86-64.img.part.1
Part: centos.5-3.x86-64.img.part.2
Part: centos.5-3.x86-64.img.part.3
Part: centos.5-3.x86-64.img.part.4
Part: centos.5-3.x86-64.img.part.5
Part: centos.5-3.x86-64.img.part.6
Part: centos.5-3.x86-64.img.part.7
Part: centos.5-3.x86-64.img.part.8
Part: centos.5-3.x86-64.img.part.9
Part: centos.5-3.x86-64.img.part.10
Part: centos.5-3.x86-64.img.part.11
Part: centos.5-3.x86-64.img.part.12
Part: centos.5-3.x86-64.img.part.13
Part: centos.5-3.x86-64.img.part.14
Part: centos.5-3.x86-64.img.part.15
Part: centos.5-3.x86-64.img.part.16
Part: centos.5-3.x86-64.img.part.17
Part: centos.5-3.x86-64.img.part.18
Generating manifest /tmp/centos.5-3.x86-64.img.manifest.xml
[root@frontend euca-centos-5.3-x86_64]# euca-upload-bundle -b centos-image-bucket \
-m /tmp/centos.5-3.x86-64.img.manifest.xml
Checking bucket: centos-image-bucket
Creating bucket: centos-image-bucket
Uploading manifest file
Uploading part: centos.5-3.x86-64.img.part.0
Uploading part: centos.5-3.x86-64.img.part.1
Uploading part: centos.5-3.x86-64.img.part.2
Uploading part: centos.5-3.x86-64.img.part.3
Uploading part: centos.5-3.x86-64.img.part.4
Uploading part: centos.5-3.x86-64.img.part.5
Uploading part: centos.5-3.x86-64.img.part.6
Uploading part: centos.5-3.x86-64.img.part.7
Uploading part: centos.5-3.x86-64.img.part.8
Uploading part: centos.5-3.x86-64.img.part.9
Uploading part: centos.5-3.x86-64.img.part.10
Uploading part: centos.5-3.x86-64.img.part.11
Uploading part: centos.5-3.x86-64.img.part.12
Uploading part: centos.5-3.x86-64.img.part.13
Uploading part: centos.5-3.x86-64.img.part.14
Uploading part: centos.5-3.x86-64.img.part.15
Uploading part: centos.5-3.x86-64.img.part.16
Uploading part: centos.5-3.x86-64.img.part.17
Uploading part: centos.5-3.x86-64.img.part.18
Uploaded image as centos-image-bucket/centos.5-3.x86-64.img.manifest.xml
[root@frontend euca-centos-5.3-x86_64]# euca-register centos-image-bucket/centos.5-3.x86-64.img.manifest.xml
IMAGE emi-1C70159E
```

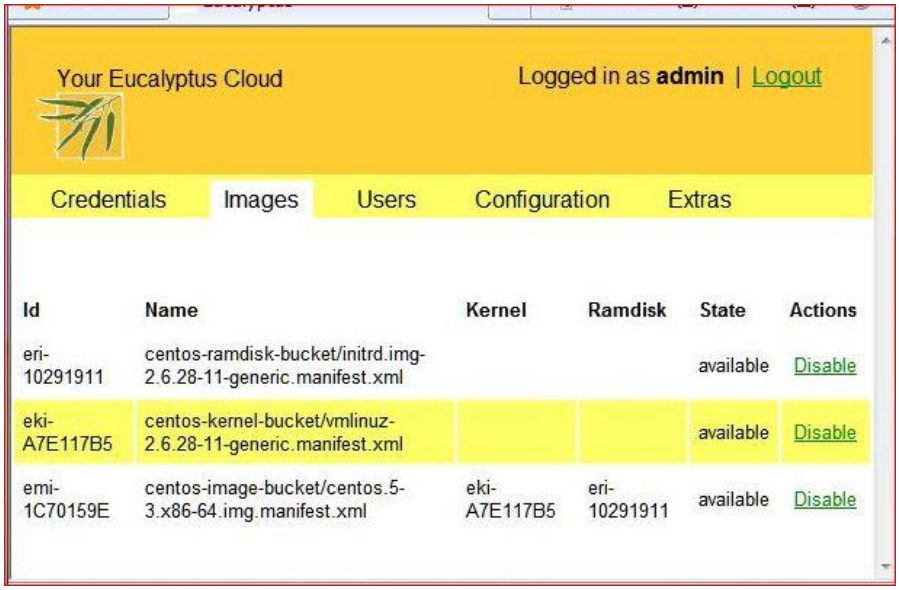
18.1.6 Run Instance with admin user

Start Instance from an image.

18.1.6.1 Create keypair first

```
[root@frontend ~]# euca-add-keypair my-key > ~/.ssh/id_rsa-my-key
[root@frontend ~]# chmod 600 ~/.ssh/id_rsa-my-key
```

18.1.6.2 Start Instance with "euca-run-instances" command. It's possible to make sure the field "eki-***" and others on the web controls




```
[root@frontend ~]# euca-run-instances -k my-key --kernel eki-A7E117B5 --ramdisk eri-10291911 emi-1C70159E
RESERVATION  r-384E0659          admin           admin-default
INSTANCE     i-3EB907B6          emi-1C70159E    0.0.0.0   0.0.0.0   pending   my-key
             2010-11-23T11:52:52.807Z   eki-A7E117B5   eri-10291911
```

18.1.6.3 After for a moment, Instance will have an IP address like follows

```
[root@frontend ~]# euca-describe-instances
RESERVATION  r-4591078D          admin           default
INSTANCE     i-2BBC056D          emi-1C70159E    10.0.0.202   10.0.0.202   running   my-key
             0   m1.small   2010-11-23T12:39:01.773Z   cluster01   eki-A7E117B5   eri-10291911
```

18.1.6.4 Login to instance with key that is made in [18.1.6.1]

```
[root@frontend ~]# ssh -i .ssh/id_rsa-my-key -l root 10.0.0.202
The authenticity of host '10.0.0.202 (10.0.0.202)' can't be established.
RSA key fingerprint is xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx:xx.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '10.0.0.202' (RSA) to the list of known hosts.
-bash-3.2#                                  # just logined
```

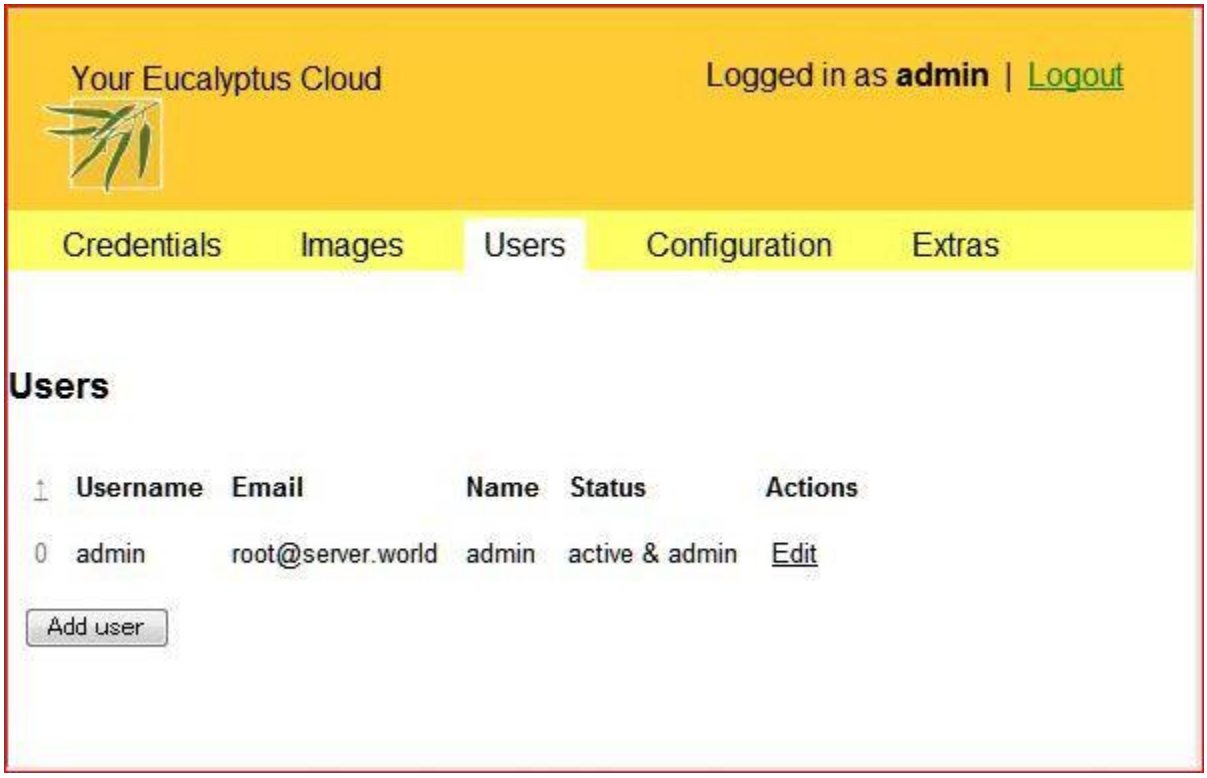
18.1.6.5 Input command like follows when you shutdown Instance

```
[root@frontend ~]# euca-terminate-instances i-2BBC056D
INSTANCE i-50A20926
```

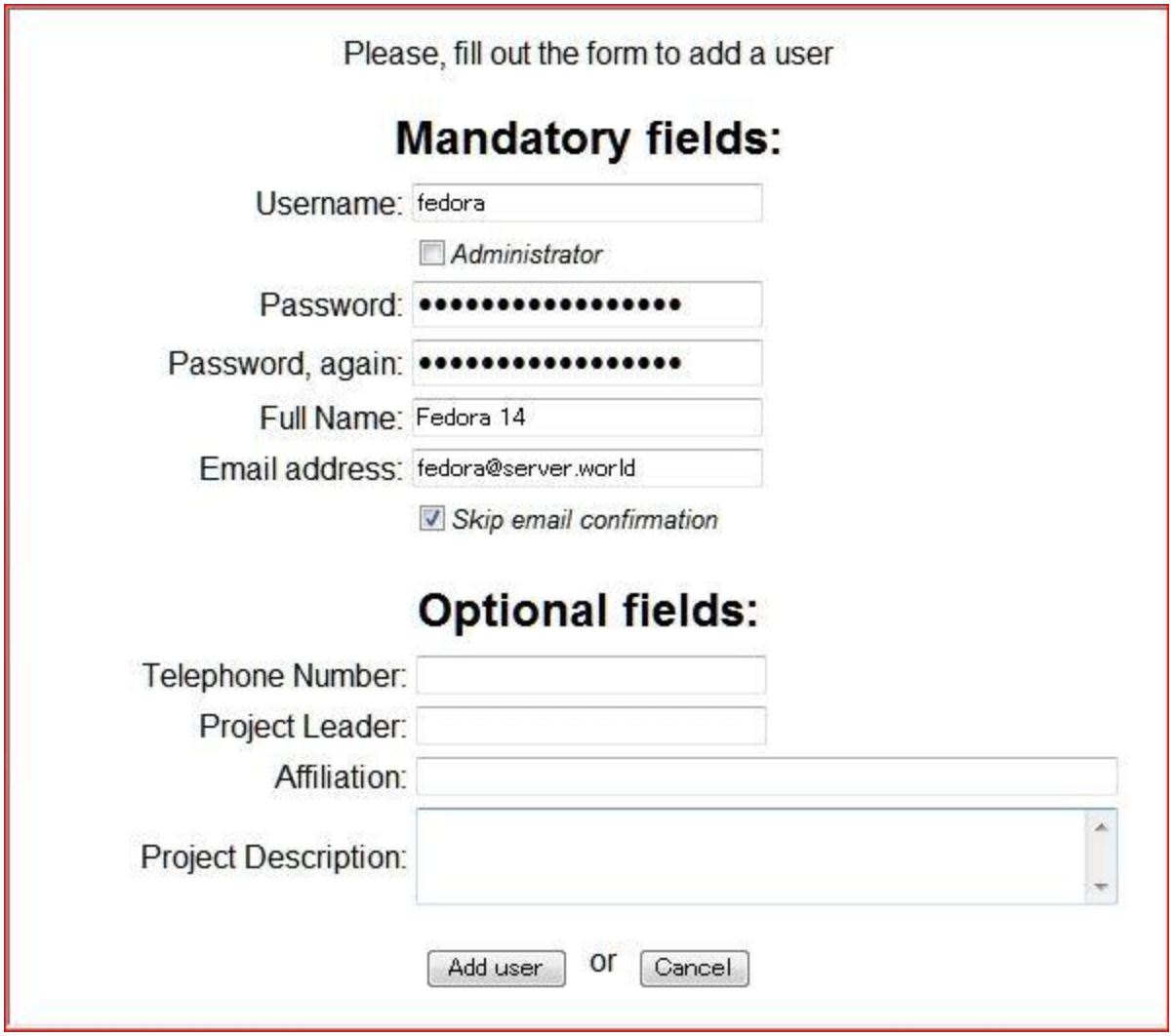
18.1.7 add user

Add a common user in order to make him to be able to run instance.

18.1.7.1 Access to 'https://(your frontend server):8443/' and move 'Users' tab and click 'Add user'

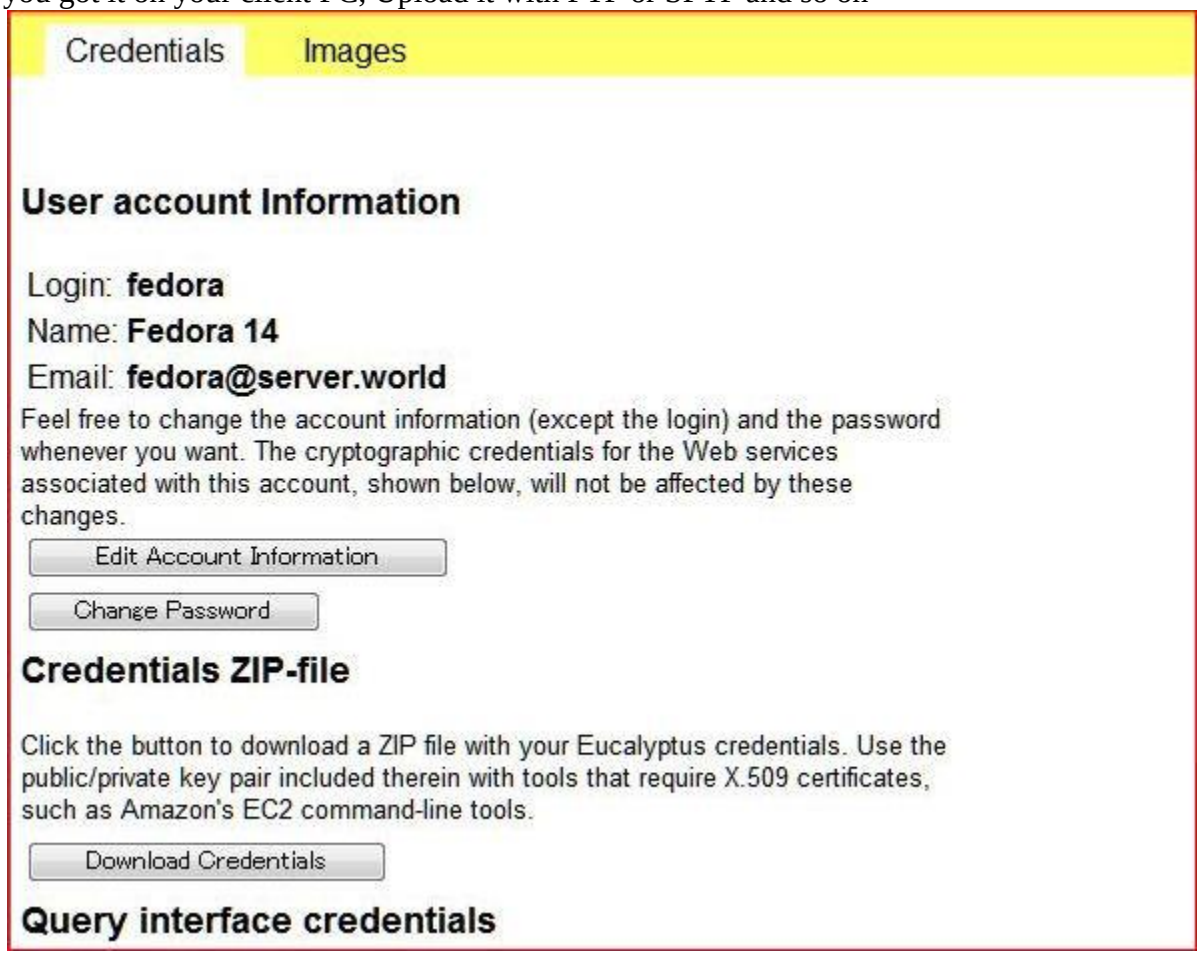


18.1.7.2 Input some informations for a user. Then check a box "Skip email comfirmation". If you don't check it, the account will not be active untill the user confirms on an email


Please, fill out the form to add a user
Mandatory fields:
Username:
fedora
Administrator
Password:
Password, again:
Full Name:
Fedora 14
Email address:
fedora@server.world
Skip email confirmation
Optional fields:
Telephone Number:
Project Leader:
Affiliation:
Project Description:
Add user
or
Cancel

18.1.7.3 Logout and Login again with a user

18.1.7.4 Get certificates. Click "Download Certificate" and save it on your local. If you got it on your client PC, Upload it with FTP or SFTP and so on



18.1.7.5 Login with a user and Install certificates on your frontend

```
[fedora@frontend ~]$ mkdir -p ~/.euca/certs
[fedora@frontend ~]$ chmod -R 700 ~/.euca/certs
[fedora@frontend ~]$ mv euca2-fedora-x509.zip ~/.euca/certs
[fedora@frontend ~]$ cd ~/.euca/certs
[fedora@frontend certs]$ unzip euca2-fedora-x509.zip
Archive: euca2-fedora-x509.zip
To setup the environment run: source /path/to/eucarc
  inflating: eucarc
  inflating: cloud-cert.pem
  inflating: euca2-fedora-473badff-pk.pem
  inflating: euca2-fedora-473badff-cert.pem
[fedora@frontend certs]$ rm euca2-fedora-x509.zip
[fedora@frontend certs]$ chmod 600 *
[fedora@frontend certs]$ source eucarc
[fedora@frontend certs]$ echo "source ~/.euca/certs/eucarc" >> ~/.bashrc
[fedora@frontend certs]$ cd
[fedora@frontend ~]$ euca-add-keypair my_key > ~/.euca/my_key
[fedora@frontend ~]$ chmod 600 ~/.euca/my_key
```

Chapter 19 NFS Server

19.1 Install and Configuration

Configure NFS Server to share any directories.

19.1.1 It's the Configuration on the system you want to build NFS server

```
[root@nfs ~]# yum -y install nfs-utils     # install

[root@nfs ~]# vi /etc/exports

# write like below *note
/home 10.0.0.0/24(rw,sync,no_root_squash,no_all_squash)

# *note
/home                   ⇒ shared directory
10.0.0.0/24             ⇒ range of networks NFS permits accesses
rw                      ⇒ possible to read and write
sync                    ⇒ synchronize
no_root_squash          ⇒ enable root privilege
no_all_squash           ⇒ enable users' authority

[root@nfs ~]# /etc/rc.d/init.d/rpcbind start
Starting rpcbind:                          [  OK  ]
[root@nfs ~]# /etc/rc.d/init.d/nfslock start
Starting NFS statd:                        [  OK  ]
[root@nfs ~]# /etc/rc.d/init.d/nfs start
Starting NFS services:                     [  OK  ]
Starting NFS daemon:                       [  OK  ]
Starting RPC idmapd:                       [  OK  ]
[root@nfs ~]# chkconfig rpcbind on
[root@nfs ~]# chkconfig nfslock on
[root@nfs ~]# chkconfig nfs on
```

19.1.2 Configuration on NFS clients

```
[root@www ~]# yum -y install nfs-utils  # install

[root@www ~]# /etc/rc.d/init.d/rpcbind start
Starting rpcbind:                          [  OK  ]
[root@www ~]# /etc/rc.d/init.d/rpcidmapd start
Starting RPC idmapd:                       [  OK  ]
[root@www ~]# /etc/rc.d/init.d/nfslock start
Starting NFS statd:                        [  OK  ]
[root@www ~]# /etc/rc.d/init.d/netfs start
Mounting other filesystems:                [  OK  ]
[root@www ~]# chkconfig rpcbind on
[root@www ~]# chkconfig rpcidmapd on
[root@www ~]# chkconfig nfslock on
[root@www ~]# chkconfig netfs on
[root@www ~]# mount -t nfs nfs.server.world:/home /home
[root@www ~]# df -h
Filesystem                      Size      Used      Avail          Use%  Mounted on
/dev/mapper/VolGroup-lv_root    18G       810M      16G            5%    /
tmpfs                           500M      0         500M           0%    /dev/shm
/dev/sda1                       485M      44M       417M           10%   /boot
nfs.server.world:/home          18G       843M      16G            6%    /home
# home directory on NFS is mounted

[root@www ~]# vi /etc/fstab
# add at the lat line: change home directory this server mounts to the one on NFS
/dev/mapper/VolGroup-lv_root    /          ext4       defaults              1 1
UUID=27993c31-9468-495f-bff1-630c1cd02196  /boot   ext4   defaults         1 2
tmpfs                           /dev/shm   tmpfs      defaults              0 0
devpts                          /dev/pts   devpts     gid=5,mode=620        0 0
sysfs                           /sys       sysfs      defaults              0 0
proc                            /proc      proc       defaults              0 0
nfs.server.world:/home          /home      nfs        defaults              1 1
```

Chapter 20 NIS Server

20.1 Install and configuration

Configure NIS Server in order to share users' accounts among local networks.

```
[root@dlp ~]# yum -y install ypserv rpcbind

[root@dlp ~]# ypdomainname server.world   # set NIS domain name
[root@dlp ~]# vi /etc/sysconfig/network

NETWORKING=yes
HOSTNAME=dlp.server.world
# add at the the last line
NISDOMAIN=server.world

[root@dlp ~]# vi /var/yp/Makefile

# MERGE_PASSWD=true|false
# line 42: change
MERGE_PASSWD=false

# MERGE_GROUP=true|false
# line 46: change
MERGE_GROUP=false

# line 78: change
ALIASES = /etc/aliases
```

```
# line 117: add
all: passwd shadow group hosts rpc services netid protocols

[root@dlp ~]# vi /var/yp/securenets

host            127.0.0.1
255.255.255.0   10.0.0.0

[root@dlp ~]# /etc/rc.d/init.d/rpcbind start
Starting portmap:                                  [  OK  ]
[root@dlp ~]# /etc/rc.d/init.d/ypserv start
Starting YP server services:            [  OK  ]
[root@dlp ~]# /etc/rc.d/init.d/yppasswdd start
Starting YP passwd service:             [  OK  ]
[root@dlp ~]# chkconfig rpcbind on
[root@dlp ~]# chkconfig ypserv on
[root@dlp ~]# chkconfig yppasswdd on

[root@dlp ~]# /usr/lib64/yp/ypinit -m     # update NIS database

At this point, we have to construct a list of the hosts which will run NIS
servers. dlp.server.world is in the list of NIS server hosts. Please continue to add
the names for the other hosts, one per line. When you are done with the
list, type a <control D>.
        next host to add: dlp.server.world
        next host to add:                  # push Ctrl + D key
The current list of NIS servers looks like this:
```

```
dlp.server.world

Is this correct? [y/n: y] y                    # answer 'yes'
We need a few minutes to build the databases...
Building /var/yp/server.world/ypservers...
Running /var/yp/Makefile...
gmake[1]: Entering directory `/var/yp/server.world'
Updating passwd.byname...
Updating passwd.byuid...
Updating shadow.byname...
Updating group.byname...
Updating group.bygid...
Updating hosts.byname...
Updating hosts.byaddr...
Updating rpc.byname...
Updating rpc.bynumber...
Updating services.byname...
Updating services.byservicename...
Updating netid.byname...
Updating protocols.bynumber...
Updating protocols.byname...
Updating mail.aliases...
gmake[1]: Leaving directory `/var/yp/server.world'

dlp.server.world has been set up as a NIS master server.

Now you can run ypinit -s dlp.server.world on all slave server.

# It's neccessary to update NIS database with following way if new user is added again
[root@dlp ~]# cd /var/yp
[root@dlp yp]# make
```

20.2 Configure NIS Server 1

Configure NIS Server in order to share users' accounts among local networks.

```
[root@dlp ~]# yum -y install ypserv rpcbind

[root@dlp ~]# ypdomainname server.world   # set NIS domain name
[root@dlp ~]# vi /etc/sysconfig/network

NETWORKING=yes
HOSTNAME=dlp.server.world
# add at the the last line
NISDOMAIN=server.world

[root@dlp ~]# vi /var/yp/Makefile

# MERGE_PASSWD=true|false
# line 42: change
MERGE_PASSWD=false

# MERGE_GROUP=true|false
# line 46: change
MERGE_GROUP=false

# line 78: change
ALIASES = /etc/aliases

# line 117: add
all: passwd shadow group hosts rpc services netid protocols

[root@dlp ~]# vi /var/yp/securenets

host            127.0.0.1
255.255.255.0   10.0.0.0
```

```
[root@dlp ~]# /etc/rc.d/init.d/rpcbind start
Starting portmap:                                  [  OK  ]
[root@dlp ~]# /etc/rc.d/init.d/ypserv start
Starting YP server services:              [  OK  ]
[root@dlp ~]# /etc/rc.d/init.d/yppasswdd start
Starting YP passwd service:               [  OK  ]
[root@dlp ~]# chkconfig rpcbind on
[root@dlp ~]# chkconfig ypserv on
[root@dlp ~]# chkconfig yppasswdd on

[root@dlp ~]# /usr/lib64/yp/ypinit -m     # update NIS database

At this point, we have to construct a list of the hosts which will run NIS
servers. dlp.server.world is in the list of NIS server hosts. Please continue to add
the names for the other hosts, one per line. When you are done with the
list, type a <control D>.
        next host to add: dlp.server.world
        next host to add:                  # push Ctrl + D key
The current list of NIS servers looks like this:

dlp.server.world

Is this correct? [y/n: y] y                # answer 'yes'
We need a few minutes to build the databases...
Building /var/yp/server.world/ypservers...
Running /var/yp/Makefile...
gmake[1]: Entering directory `/var/yp/server.world'
Updating passwd.byname...
Updating passwd.byuid...
Updating shadow.byname...
Updating group.byname...
Updating group.bygid...
Updating hosts.byname...
Updating hosts.byaddr...
Updating rpc.byname...
Updating rpc.bynumber...
Updating services.byname...
Updating services.byservicename...
Updating netid.byname...
Updating protocols.bynumber...
Updating protocols.byname...
Updating mail.aliases...
gmake[1]: Leaving directory `/var/yp/server.world'

dlp.server.world has been set up as a NIS master server.

Now you can run ypinit -s dlp.server.world on all slave server.

# It's neccessary to update NIS database with following way if new user is added again
[root@dlp ~]# cd /var/yp
[root@dlp yp]# make
```

20.2 Configure NIS Client

Configure on NIS clients in order to share users' accounts.

```
[root@www ~]# yum -y install ypbind rpcbind

[root@www ~]# vi /etc/sysconfig/network

NETWORKING=yes
HOSTNAME=www.server.world
# add at the last line
NISDOMAIN=server.world

[root@www ~]# vi /etc/sysconfig/authconfig

USENIS=yes            # line 19: change

[root@www ~]# vi /etc/yp.conf

# add at the last line ( [domain] server [NIS server] )
domain server.world server dlp.server.world

[root@www ~]# vi /etc/nsswitch.conf

passwd:     files nis                 # line 33: add
shadow:     files nis                 # add
group:      files nis                 # add

[root@www ~]# chkconfig rpcbind on
[root@www ~]# chkconfig ypbind on
[root@www ~]# shutdown -r now

www.server.world login: fedora        # user on NIS
Password:                             # password
Last login: Sat Nov 6 07:23:01 on ttyS0
No directory /home/fedora!
Logging in with home = "/".
-bash-4.1$                            # logined
-bash-4.1$ ypwhich
10.0.0.30
-bash-4.1$ ypcat passwd
fedora:x:500:500::/home/fedora:/bin/bash
nfsnobody:x:4294967294:4294967294:Anonymous NFS User:/var/lib/nfs:/sbin/nologin
```

Chapter 21 LDAP Server

21.1 Install and Configuration

Configure LDAP Server in order to share users' accounts among local networks.

21.1.1 Install 389 Directory Server

```
[root@master ~]# yum -y install 389-ds openldap-clients

[root@master ~]# setup-ds-admin.pl      # setup

==============================================================================
This program will set up the 389 Directory and Administration Servers.

It is recommended that you have "root" privilege to set up the software.
Tips for using this program:
- Press "Enter" to choose the default and go to the next screen
- Type "Control-B" then "Enter" to go back to the previous screen
- Type "Control-C" to cancel the setup program

Would you like to continue with set up? [yes]:          # Enter

==============================================================================
BY SETTING UP AND USING THIS SOFTWARE YOU ARE CONSENTING TO BE BOUND BY
AND ARE BECOMING A PARTY TO THE AGREEMENT FOUND IN THE
LICENSE.TXT FILE. IF YOU DO NOT AGREE TO ALL OF THE TERMS
OF THIS AGREEMENT, PLEASE DO NOT SET UP OR USE THIS SOFTWARE.

Do you agree to the license terms? [no]: yes          # yes

==============================================================================
Your system has been scanned for potential problems, missing patches,
etc. The following output is a report of the items found that need to
be addressed before running this software in a production
environment.

389 Directory Server system tuning analysis version 10-AUGUST-2007.

NOTICE : System is x86_64-unknown-linux2.6.33.4-95.fc13.x86_64 (2 processors).

NOTICE : The net.ipv4.tcp_keepalive_time is set to 7200000 milliseconds
(120 minutes). This may cause temporary server congestion from lost
client connections.

WARNING: There are only 1024 file descriptors (hard limit) available, which
limit the number of simultaneous connections.
```

```
WARNING: There are only 1024 file descriptors (soft limit) available, which
limit the number of simultaneous connections.

Would you like to continue? [no]: yes                  # yes

================================================================================
Choose a setup type:

1. Express
Allows you to quickly set up the servers using the most
common options and pre-defined defaults. Useful for quick
evaluation of the products.

2. Typical
Allows you to specify common defaults and options.

3. Custom
Allows you to specify more advanced options. This is
recommended for experienced server administrators only.

To accept the default shown in brackets, press the Enter key.

Choose a setup type [2]:                               # Enter

================================================================================
Enter the fully qualified domain name of the computer
on which you're setting up server software. Using the form
<hostname>.<domainname>
Example: eros.example.com.

To accept the default shown in brackets, press the Enter key.

Computer name [master.server.world]:                   # Enter
```

```
The servers must run as a specific user in a specific group.
It is strongly recommended that this user should have no privileges
on the computer (i.e. a non-root user). The setup procedure
will give this user/group some permissions in specific paths/files
to perform server-specific operations.

If you have not yet created a user and group for the servers,
create this user and group using your native operating
system utilities.

System User [nobody]:                          # Enter
System Group [nobody]:                         # Enter

================================================================================
Server information is stored in the configuration directory server.
This information is used by the console and administration server to
configure and manage your servers. If you have already set up a
configuration directory server, you should register any servers you
set up or create with the configuration server. To do so, the
following information about the configuration server is required: the
fully qualified host name of the form
<hostname>.<domainname>(e.g. hostname.example.com), the port number
(default 389), the suffix, the DN and password of a user having
permission to write the configuration information, usually the
configuration directory administrator, and if you are using security
(TLS/SSL). If you are using TLS/SSL, specify the TLS/SSL (LDAPS) port
number (default 636) instead of the regular LDAP port number, and
provide the CA certificate (in PEM/ASCII format).

If you do not yet have a configuration directory server, enter 'No' to
be prompted to set up one.

Do you want to register this software with an existing
configuration directory server? [no]:          # Enter
```

```
Please enter the administrator ID for the configuration directory
server. This is the ID typically used to log in to the console. You
will also be prompted for the password.

Configuration directory server
administrator ID [admin]:                    # Enter
Password:                                    # set LDAP admin password
Password (confirm):                          # verify

================================================================================
The information stored in the configuration directory server can be
separated into different Administration Domains. If you are managing
multiple software releases at the same time, or managing information
about multiple domains, you may use the Administration Domain to keep
them separate.

If you are not using administrative domains, press Enter to select the
default. Otherwise, enter some descriptive, unique name for the
administration domain, such as the name of the organization
responsible for managing the domain.

Administration Domain [server.world]:        # Enter

================================================================================
The standard directory server network port number is 389. However, if
you are not logged as the superuser, or port 389 is in use, the
default value will be a random unused port number greater than 1024.
If you want to use port 389, make sure that you are logged in as the
superuser, that port 389 is not in use.

Directory server network port [389]:         # Enter

================================================================================
Each instance of a directory server requires a unique identifier.
This identifier is used to name the various
instance specific files and directories in the file system,
as well as for other uses as a server instance identifier.
Directory server identifier [master]:        # Enter
```

```
The suffix is the root of your directory tree. The suffix must be a valid DN.
It is recommended that you use the dc=domaincomponent suffix convention.
For example, if your domain is example.com,
you should use dc=example,dc=com for your suffix.
Setup will create this initial suffix for you,
but you may have more than one suffix.
Use the directory server utilities to create additional suffixes.

Suffix [dc=server, dc=world]:                    # Enter

================================================================================
Certain directory server operations require an administrative user.
This user is referred to as the Directory Manager and typically has a
bind Distinguished Name (DN) of cn=Directory Manager.
You will also be prompted for the password for this user. The password must
be at least 8 characters long, and contain no spaces.
Press Control-B or type the word "back", then Enter to back up and start over.

Directory Manager DN [cn=Directory Manager]:     # Enter
Password:                                        # set Directory Manager's password
Password (confirm):                              # verify

================================================================================
The Administration Server is separate from any of your web or application
servers since it listens to a different port and access to it is
restricted.

Pick a port number between 1024 and 65535 to run your Administration
Server on. You should NOT use a port number which you plan to
run a web or application server on, rather, select a number which you
will remember and which will not be used for anything else.

Administration port [9830]:                      # Enter
```

```
The interactive phase is complete. The script will now set up your
servers. Enter No or go Back if you want to change something.

Are you ready to set up your servers? [yes]:            # Enter
Creating directory server . . .
Your new DS instance 'master' was successfully created.
Creating the configuration directory server . . .
Beginning Admin Server creation . . .
Creating Admin Server files and directories . . .
Updating adm.conf . . .
Updating admpw . . .
Registering admin server with the configuration directory server . . .
Updating adm.conf with information from configuration directory server . . .
Updating the configuration for the httpd engine . . .
Starting admin server . . .
The admin server was successfully started.
Admin server was successfully created, configured, and started.
Exiting . . .
Log file is '/tmp/setupTYMZf5.log'

[root@master ~]# chkconfig dirsrv on
[root@master ~]# chkconfig dirsrv-admin on
```

21.1.2 Add Existing User and Group to LDAP Server

```
[root@master ~]# wget http://www.padl.com/download/MigrationTools.tgz
[root@master ~]# tar zxvf MigrationTools.tgz
[root@master ~]# cd MigrationTools-47
[root@master MigrationTools-47]# vi migrate_common.ph

# line 71: specify domain name
$DEFAULT_MAIL_DOMAIN = "server.world";

# line 74: specify suffix
$DEFAULT_BASE = "dc=server,dc=world";

[root@master MigrationTools-47]# grep ":5[0-9][0-9]" /etc/passwd > passwd
[root@master MigrationTools-47]# grep ":5[0-9][0-9]" /etc/group > group
[root@master MigrationTools-47]# ./migrate_passwd.pl passwd > passwd.ldif
[root@master MigrationTools-47]# ./migrate_group.pl group > group.ldif
[root@master MigrationTools-47]# sed -e "s/ou=Group/ou=Groups/g" group.ldif > groups.ldif

[root@master MigrationTools-47]# ldapadd -x -D "cn=Directory Manager" -W -f passwd.ldif
Enter LDAP Password:                # password
adding new entry "uid=fedora,ou=People,dc=server,dc=world"

adding new entry "uid=cent,ou=People,dc=server,dc=world"

adding new entry "uid=ubuntu,ou=People,dc=server,dc=world"

adding new entry "uid=debian,ou=People,dc=server,dc=world"

[root@master MigrationTools-47]# ldapadd -x -D "cn=Directory Manager" -W -f groups.ldif
Enter LDAP Password:                # password
adding new entry "cn=fedora,ou=Groups,dc=server,dc=world"

adding new entry "cn=cent,ou=Groups,dc=server,dc=world"

adding new entry "cn=ubuntu,ou=Groups,dc=server,dc=world"

adding new entry "cn=debian,ou=Groups,dc=server,dc=world"
```

21.1.3 If you'd like to delete User or Group that is added in LDAP Server, Do as below

```
[root@master ~]# ldapdelete -x -D "cn=Directory Manager" -W "uid=fedora,ou=People,dc=server,dc=world"
Enter LDAP Password:
[root@master ~]# ldapdelete -x -D "cn=Directory Manager" -W "cn=fedora,ou=Groups,dc=server,dc=world"
Enter LDAP Password:
```

21.1.4 Configuration for LDAP Client

```
[root@www03 ~]# yum -y install openldap-clients nss_ldap

[root@www03 ~]# vi /etc/openldap/ldap.conf

# add at the last line
# LDAP server's URI
URI ldap://10.0.0.30/
# specify Suffix
BASE dc=server,dc=world
TLS_CACERTDIR /etc/openldap/cacerts

[root@www03 ~]# vi /etc/nss_ldap.conf

# line 15 maike it comment
# host 127.0.0.1

# line 18: specify Suffix
base dc=server,dc=world

# add at the last line
uri ldap://10.0.0.30/
ssl no
tls_cacertdir /etc/openldap/cacerts

[root@www03 ~]# vi /etc/pam_ldap.conf

# line 17: maike it comment
# host 127.0.0.1

# line 20: specify Suffix
base dc=server,dc=world

# add at the last line
uri ldap://10.0.0.30/
ssl no
tls_cacertdir /etc/openldap/cacerts
pam_password crypt
```

```
[root@www03 ~]# vi /etc/pam.d/system-auth

# add like follows
#%PAM-1.0
# This file is auto-generated.
# User changes will be destroyed the next time authconfig is run.
auth        required      pam_env.so
auth        sufficient    pam_fprintd.so
auth        sufficient    pam_unix.so nullok try_first_pass
auth        requisite     pam_succeed_if.so uid >= 500 quiet
auth        sufficient    pam_ldap.so use_first_pass
auth        required      pam_deny.so

account     required      pam_unix.so
account     sufficient    pam_localuser.so
account     sufficient    pam_succeed_if.so uid < 500 quiet
account     [default=bad success=ok user_unknown=ignore] pam_ldap.so
account     required      pam_permit.so

password    requisite     pam_cracklib.so try_first_pass retry=3 type=
password    sufficient    pam_unix.so sha512 shadow nullok try_first_pass use_authtok
password    sufficient    pam_ldap.so use_authtok
password    required      pam_deny.so

session     optional      pam_keyinit.so revoke
session     required      pam_limits.so
session     [success=1 default=ignore] pam_succeed_if.so service in crond quiet use_uid
session     required      pam_unix.so
session     optional      pam_ldap.so
# add if you need ( create home directory automatically if it's none )
session     optional      pam_mkhomedir.so skel=/etc/skel umask=077
```

```
[root@www03 ~]# vi /etc/nsswitch.conf

passwd:     files ldap                # line 33: add
shadow:     files ldap                # add
group:      files ldap                # add

netgroup:   nisplus ldap              # line 57: add

[root@www03 ~]# shutdown -r now

www03.server.world login: fedora      # user on LDAP
Password:
Creating directory '/home/fedora'.
Last login: Sat Nov 6 11:06:44 on ttyS0
[fedora@www03 ~]$                     # just logined
[fedora@www03 ~]$ passwd              # change LDAP password
Changing password for user fedora.
Enter login(LDAP) password:
New password:
Retype new password:
LDAP password information changed for fedora
passwd: all authentication tokens updated successfully.
```

22.1 Install and Configure httpd

Install httpd and Configure Web Server.

22.1.1 Install httpd

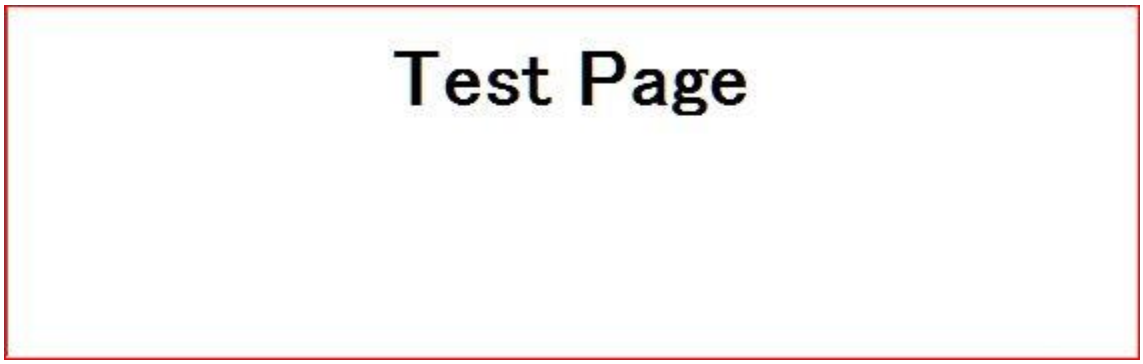
```
[root@www03 ~]# yum -y install httpd

# remove test page
[root@www03 ~]# rm -f /etc/httpd/conf.d/welcome.conf
# remove test page
[root@www03 ~]# rm -f /var/www/error/noindex.html
# create a link for Perl
[root@www03 ~]# ln -s /usr/bin/perl /usr/local/bin/perl
```

22.1.2 Configure httpd

```
[root@www03 ~]# vi /etc/httpd/conf/httpd.conf

# line 44: change
ServerTokens Prod

# line 76: change to ON
KeepAlive On

# line 262: Admin's address
ServerAdmin root@server.world

# line 276: server's name
ServerName www03.server.world:80

# line 331: change (disable Indexes)
Options FollowSymLinks ExecCGI

# line 338: change
AllowOverride All

# line 402: add file name that it can access only with directory's name
DirectoryIndex index.html index.cgi index.php

# line 536: change
ServerSignature Off

# line 759: make it comment
#AddDefaultCharset UTF-8

# line 796: uncomment and add file-type that apache looks them CGI
AddHandler cgi-script .cgi .pl

[root@www03 ~]# /etc/rc.d/init.d/httpd start
Starting httpd:                            [ OK ]
[root@www03 ~]# chkconfig httpd on
```

22.1.3 Make HTML test page and access to it with web browser. It's OK if following page is shown

```
[root@www03 ~]# vi /var/www/html/index.html

<html>
<body>
<div style="width: 100%; font-size: 40px; font-weight: bold; text-align: center;">
Test Page
</div>
</body>
</html>
```



22.1.4 Make CGI test page and access to it with web browser. It's OK if following page is shown

```
[root@www03 ~]# vi /var/www/html/index.cgi

#!/usr/local/bin/perl

print "Content-type: text/html\n\n";
print <<"EOM";
<html>
<body>
<div style="width: 100%; font-size: 40px; font-weight: bold; text-align: center;">
CGI Test Page
</div>
</body>
</html>
EOM
exit;

[root@www03 ~]# chmod 705 /var/www/html/index.cgi
```

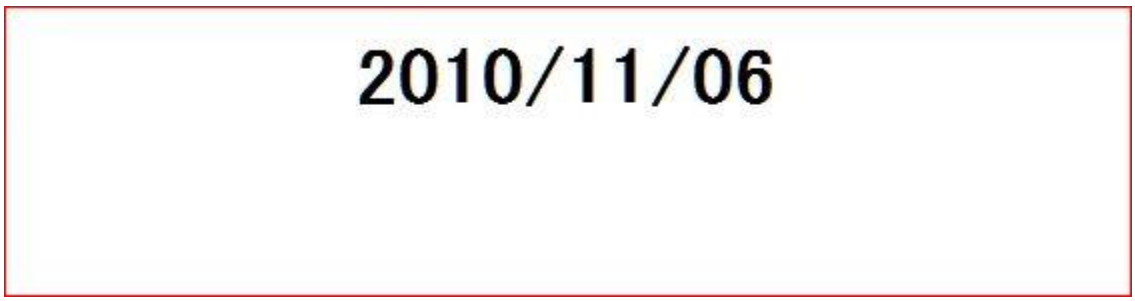
22.2 Install PHP

22.2.1 Install PHP

```
[root@www03 ~]# yum -y install php php-mbstring php-pear
[root@www03 ~]# /etc/rc.d/init.d/httpd reload
Reloading httpd:                    [ OK ]
```

22.2.2 Make PHP test page and access to it with web browser. It's OK if following page is shown

```
[root@www03 ~]# vi /var/www/html/index.php

<html>
<body>
<div style="width: 100%; font-size: 40px; font-weight: bold; text-align: center;">
<?php
      print Date("Y/m/d");
?>
</div>
</body>
</html>
```



22.3 Enable User dir

Enable userdir, users can build websites with this config.

22.3.1 Configure httpd

```
[root@www03 ~]# vi /etc/httpd/conf/httpd.conf

# line 366: make it comment
#UserDir disable

# line 373: uncomment
UserDir public_html

# line 381-392: uncomment
<Directory /home/*/public_html>
    AllowOverride All       # change
    Options ExecCGI         # enable CGI
    <Limit GET POST OPTIONS>
        Order allow,deny
        Allow from all
    </Limit>
    <LimitExcept GET POST OPTIONS>
        Order deny,allow
        Deny from all
    </LimitExcept>
</Directory>

[root@www03 ~]# /etc/rc.d/init.d/httpd restart
Stopping httpd:                            [ OK ]
Starting httpd:                            [ OK ]
```

22.3.2 Make CGI test page in a user's home directory and access to it with web browser. It's OK if following page is shown

```
[fedora@www03 ~]$ mkdir public_html
[fedora@www03 ~]$ chmod 711 /home/fedora
[fedora@www03 ~]$ chmod 755 /home/fedora/public_html
[fedora@www03 ~]$ cd public_html
[fedora@www03 public_html]$ vi index.cgi

#!/usr/local/bin/perl

print "Content-type: text/html\n\n";
print <<"EOM";
<html>
<body>
<div style="width: 100%; font-size: 40px; font-weight: bold; text-align: center;">
Test Page ( /home/fedora/public_html )
</div>
</body>
</html>
EOM
exit;

[fedora@www03 public_html]$ chmod 705 index.cgi
```

22.4 Configure SSL Configration of SSL

22.4.1 Create certificate first

Create SSL Certificates

Create a your server's original SSL Certificate. If you use your server as a business, it had better buy and use a Formal Certificate from Verisigh and so on.

```
[root@www03 ~]# cd /etc/pki/tls/certs
[root@www03 certs]# make server.key
umask 77 ; \
        /usr/bin/openssl genrsa -aes128 2048 > server.key
Generating RSA private key, 2048 bit long modulus
.....................................................++++++
.............++++++
e is 61251 (0x10001)
Enter pass phrase:                    # set passphrase
Verifying - Enter pass phrase:        # verify
# remove passphrase from private key
[root@www03 certs]# openssl rsa -in server.key -out server.key
Enter pass phrase for server.key:     # input passphrase
writing RSA key
[root@www03 certs]#
[root@www03 certs]# make server.csr
umask 77 ; \
        /usr/bin/openssl req -utf8 -new -key server.key -out server.csr
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [XX]:JP                    # country
State or Province Name (full name) [e]:Hiroshima   # state
Locality Name (eg, city) [Default City]:Hiroshima       # city
Organization Name (eg, company) [Default Company Ltd]:Server World   # company
Organizational Unit Name (eg, section) []:IT Solution   # department
Common Name (eg, your server's hostname) []:www.server.world   # server's FQDN
Email Address []:webmaster@server.world                 # email address
Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:              # Enter
An optional company name []:          # Enter
[root@www03 certs]#
[root@www03 certs]# openssl x509 -in server.csr -out server.crt -req -signkey server.key -days 3650
Signature ok
subject=/C=JP/ST=Hiroshima/L=Hiroshima/O=Server World/OU=IT Solution/CN=www03.server.world/emailAddress=webmaster.server.world
Getting Private key
[root@www03 certs]# chmod 400 server.*
```

22.5 Configre httpd

```
[root@www03 ~]# yum -y install mod_ssl

[root@www03 ~]# vi /etc/httpd/conf.d/ssl.conf

# line 78: uncomment
DocumentRoot "/var/www/html"

# line 79: uncomment and specify server name
ServerName www03.server.world:443

# line 106: specify certificate
SSLCertificateFile /etc/pki/tls/certs/server.crt

# line 113: specify certification key
SSLCertificateKeyFile /etc/pki/tls/certs/server.key

[root@www03 ~]# /etc/rc.d/init.d/httpd restart
Stopping httpd:                            [ OK ]
Starting httpd:                            [ OK ]
```

Access to the test page with https. Following window is shown because Certification File is made by yourdelf, it's no ploblem, Click Ok to proceed.
Install your server's certificate on your PC, then it's possible to access with no error.

22.6 Virtual Hostings

It's the example to configure virtual hostings. Following example is done as domain name[server.world (root directory[/var/www/html])], virtual domain name[virtual.host (root directory[/home/fedora/public_html])]. Before doing it, it's necessarry to add new doman name in your DNS first.

22.6.1 Configure httpd for Virtual Hostings

```
[root@www03 ~]# vi /etc/httpd/conf/httpd.conf

# line 990: uncomment
NameVirtualHost *:80

# at the last lines: ( for original domain )
<VirtualHost *:80>
  DocumentRoot /var/www/html
  ServerName www03.server.world
  ErrorLog logs/server.world-error_log
  CustomLog logs/server.world-access_log combined
</VirtualHost>

# at the last lines: ( for virtual domain )
<VirtualHost *:80>
  DocumentRoot /home/fedora/public_html
  ServerName www03.virtual.host
  ErrorLog logs/virtual.host-error_log
  CustomLog logs/virtual.host-access_log combined
</VirtualHost>

[root@www03 ~]# /etc/rc.d/init.d/httpd restart
Stopping httpd:                [  OK  ]
Starting httpd:                [  OK  ]
```

22.6.2 Access to the test page that has original domain, it's OK if possible

22.6.3 Access to the test page that has virtual domain

, it's OK if possible

```
[fedora@www ~]$ vi ./public_html/index.cgi

#!/usr/local/bin/perl

print "Content-type: text/html\n\n";
print <<"EOM";
<html>
<body>
<div style="width: 100%; font-size: 40px; font-weight: bold; text-align: center;">
Virtual Host Test Page </div>
</body>
</html>
EOM
exit;

[fedora@www ~]$ chmod 705 ./public_html/index.cgi
```

22.7 Configure WebDAV

Here is the example to configure WebDAV

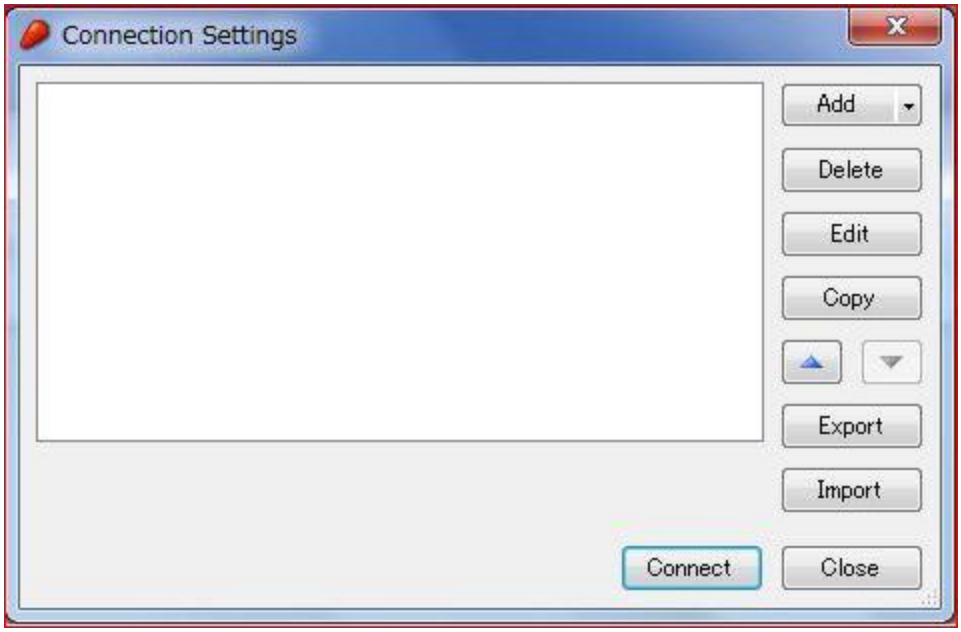
22.7.1 For example, Make a directory [security] and it makes possible to connect to WebDAV directory only by SSL

```
[root@www03 ~]# mkdir /home/security
[root@www03 ~]# chown apache. /home/security
[root@www03 ~]# chmod 770 /home/security
[root@www03 ~]# vi /etc/httpd/conf.d/webdav.conf

Alias /share /home/security
<Location /share>
  DAV On
  SSLRequireSSL
  Options None
  AuthType Basic
  AuthName WebDAV
  AuthUserFile /etc/httpd/conf/.htpasswd
  <LimitExcept GET OPTIONS>
     Order allow,deny
     Allow from 10.0.0.          # IP address you allow
     Require valid-user
  </LimitExcept>
</Location>

[root@www03 ~]# htpasswd -c /etc/httpd/conf/.htpasswd fedora
New password:                    # set password
Re-type new password:            # verify
Adding password for user fedora
[root@www03 ~]# /etc/rc.d/init.d/httpd restart
Stopping httpd:                [ OK ]
Starting httpd:                [ OK ]
```

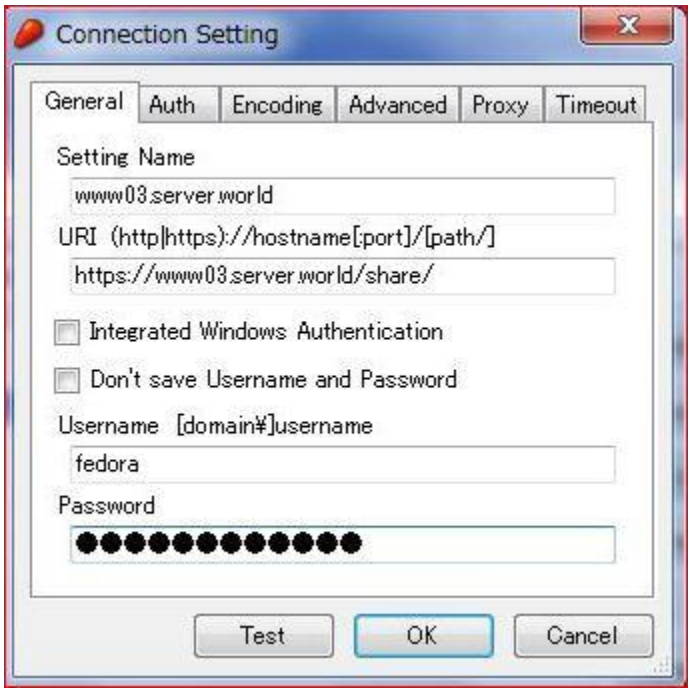
22.7.2 config on client PC (Windows 7)

Windows 7 does not have webdav function, so Use free software for webdav client. Download 'CarotDAV' for free from following site.

After downloading, Install and start CarotDAV, the following screen is shown, Click 'Add' button and select 'WebDAV'.

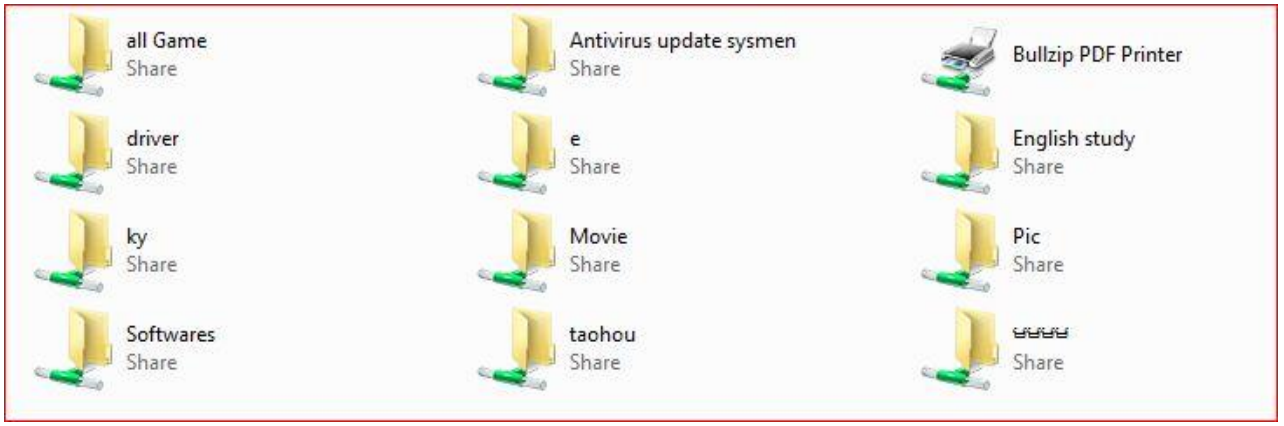


22.7.3 Input any name in 'Setting Name' field and input [server name:webdav directory] in 'URI' field and input user name and password like follows



22.7.4 The waring is shown like follows, it's SSL certificates is not installed on your PC, it's no ploblem, Click 'Ignore' and go next

22.7.5 Just accessed6



22.8 Install SpeedyCGI

7.1 Install SpeedyCGI that makes CGI fast

```
[root@www03 ~]# yum -y install perl-CGI-SpeedyCGI

# create a link
[root@www03 ~]# ln -s /usr/bin/speedy /usr/local/bin/speedy
```

7.2 How to write a CGI scripts. Change PATH like follows. Reffer other options on SpeedyCGI site

```
[root@www03 ~]# vi /var/www/html/speedy.cgi

#!/usr/local/bin/speedy -- -t300 -M1

print "Content-type: text/html\n\n";
print <<"EOM";
<html>
<body>
<div style="width: 100%; font-size: 40px; font-weight: bold; text-align:center;">
SpeedyCGI Test Page
</div>
</body>
</html>
EOM
exit;

[root@www03 ~]# chmod 705 /var/www/html/speedy.cgi
```

22.9 Enable Proxy_http

Foward requests to another web server by mod_proxy. This means configuring Web server as a revers proxy.

(1) www03.server.world [10.0.0.31] - Web server #1

(2) dlp.server.world [10.0.0.30]- Web server #2

This example set servers that requests to Web server (1) forward to under /test on webserver (2)

22.9.1 Configure httpd

```
[root@www03 ~]# vi /etc/httpd/conf.d/proxy.conf

# create new
# a directory you'd like to foward
<Location /proxy>
  # a destination directory that is forwared
  ProxyPass http://dlp.server.world/test
  ProxyPassReverse http://dlp.server.world/test
</Location>

[root@www03 ~]# /etc/rc.d/init.d/httpd restart
Stopping httpd:                [  OK  ]
Starting httpd:                [  OK  ]
```

Access with web browser. First, access to the place that does not have forwarding setting. Web server (1) replys normally as a following screen.

Access to /proxy. Web server (2) replys as a following screen

22.10 Basic auth+LDAP

Configure httpd and set a page that people must authenticate and the authentication is from LDAP server. Therefore it's necessarry to run LDAP server in your LAN.

22.10.1 9.1 It needs 'mod_authnz_ldap7 module, but it's loaded by default. If your httpd does not load it, add following lines in your httpd.conf

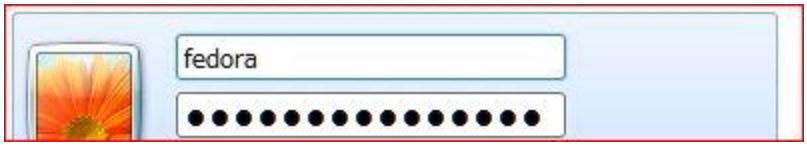
LoadModule ldap_module modules/mod_ldap.so

LoadModule authnz_ldap_module modules/mod_authnz_ldap.so

Following example shows 'test' directory requires an authentication.

```
[root@www03 ~]# vi /etc/httpd/conf.d/auth.conf

# create new
<IfModule authnz_ldap_module>
    <Directory /var/www/html/test>
        SSLRequireSSL
        AuthName "Authentication"
        AuthType Basic
        AuthBasicProvider ldap
        AuthLDAPURL ldap://10.0.0.30/dc=server,dc=world?uid?sub?(objectClass=*)
        Require ldap-filter objectClass=posixAccount
    </Directory>
</IfModule>

[root@www03 ~]# /etc/rc.d/init.d/httpd restart
Stopping httpd:                [  OK  ]
Starting httpd:                [  OK  ]

[root@www03 ~]# vi /var/www/html/test/index.html

# create a test page
<html>
<body>
<div style="width: 100%; font-size: 40px; font-weight: bold; text-align: center;">
Test Page for LDAP Auth
</div>
</body>
</html>
```

Access to the test page with web browser, then authentication is required as a config. Input a LDAP user and authenticate here.



Just accessed.

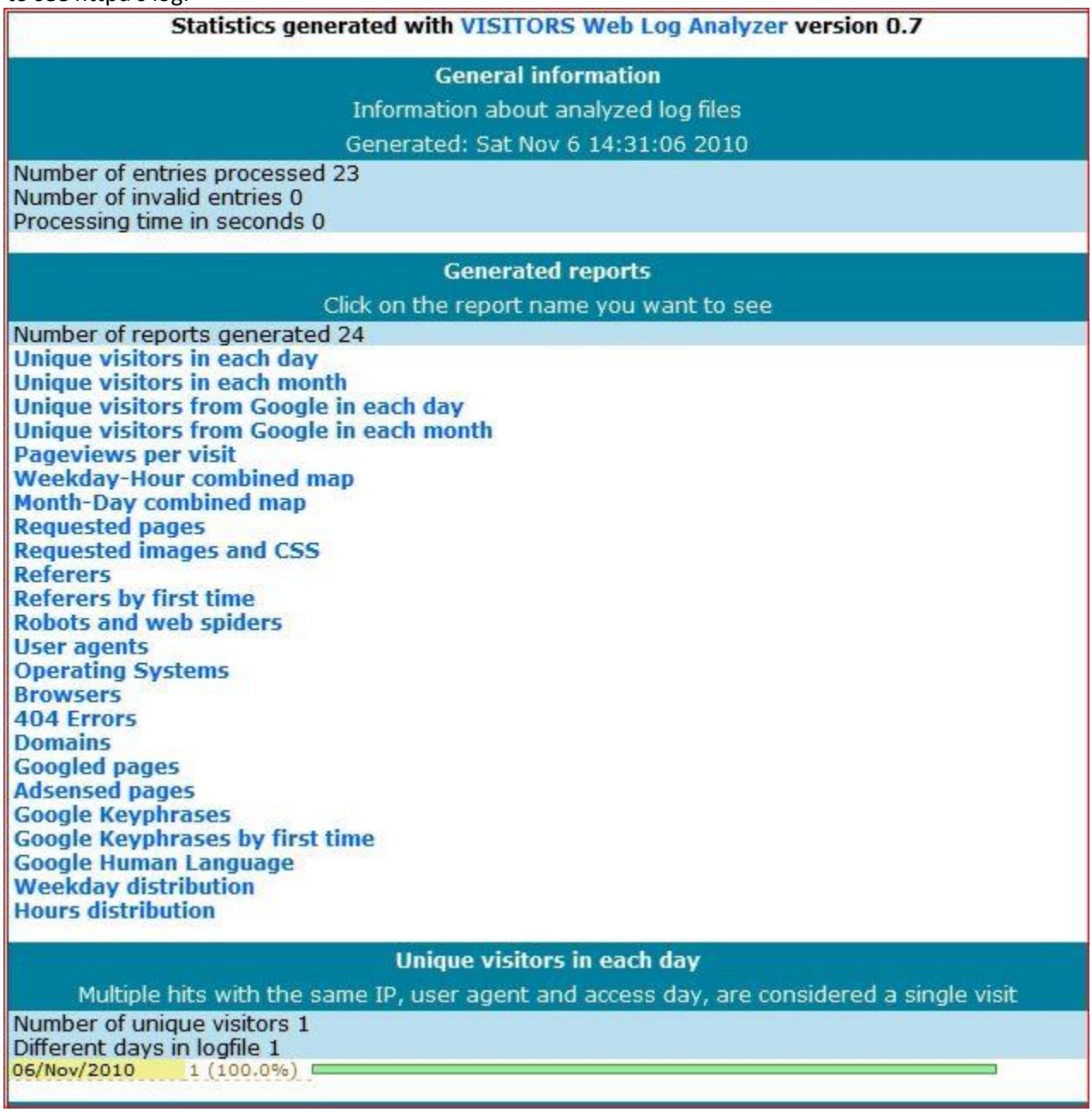
22.11 Apache access log analyzer- Visitors

Install Apache log analizer, Visitors

22.11.1 Install Visitors

```
[root@www03 ~]# yum -y install graphviz

[root@www03 ~]# wget wget http://www.hping.org/visitors/visitors-0.7.tar.gz

[root@www03 ~]# tar zxvf visitors-0.7.tar.gz
[root@www03 ~]# cd visitors_0.7
[root@www03 visitors_0.7]# make
[root@www03 visitors_0.7]# cp visitors /usr/local/bin/
[root@www03 visitors_0.7]# cd
[root@www03 ~]# mkdir /var/www/html/visitors
[root@www03 ~]# vi /etc/httpd/conf.d/visitors.conf

# create new
<Location /visitors>
   Order deny,allow
   Deny from all
   Allow from 10.0.0.0/24          # IP address you allow
</Location>

[root@www03 ~]# /etc/rc.d/init.d/httpd restart
Stopping httpd:                 [  OK  ]
Starting httpd:                 [  OK  ]

# generate common reports
[root@www03 ~]# visitors -A /var/log/httpd/access_log -o html > /var/www/html/visitors/index.html
--
56 lines processed in 1 seconds
0 invalid lines, 0 blacklisted referers

# generate page tour reports
[root@www03 ~]# visitors -A -m 30 /var/log/httpd/access_log -o html --trails --prefix http://www03.server.world > /var/www/html/visitors/trails.html
--
56 lines processed in 1 seconds
0 invalid lines, 0 blacklisted referers

# generate page tour image
[root@www03 ~]# visitors /var/log/httpd/access_log --prefix http://www03.server.world -V > /var/www/html/visitors/graph.dot
--
56 lines processed in 1 seconds
0 invalid lines, 0 blacklisted referers
[root@www03 ~]# dot -Tpng /var/www/html/visitors/graph.dot > /var/www/html/visitors/graph.png
```

Access to 'http://(your server's name or IP address)/visitors/', then following screeen is shown and it's possible to see httpd's log.



Statistics generated with VISITORS Web Log Analyzer version 0.7

General information

Information about analyzed log files

Generated: Sat Nov 6 14:31:06 2010

Number of entries processed 23
Number of invalid entries 0
Processing time in seconds 0

Generated reports

Click on the report name you want to see

Number of reports generated 24
Unique visitors in each day
Unique visitors in each month
Unique visitors from Google in each day
Unique visitors from Google in each month
Pageviews per visit
Weekday-Hour combined map
Month-Day combined map
Requested pages
Requested images and CSS
Referers
Referers by first time
Robots and web spiders
User agents
Operating Systems
Browsers
404 Errors
Domains
Googled pages
Adsensed pages
Google Keyphrases
Google Keyphrases by first time
Google Human Language
Weekday distribution
Hours distribution

Unique visitors in each day

Multiple hits with the same IP, user agent and access day, are considered a single visit

Number of unique visitors 1
Different days in logfile 1
06/Nov/2010 1 (100.0%)

Unique visitors in each day

Multiple hits with the same IP, user agent and access day, are considered a single visit

Number of unique visitors 1
Different days in logfile 1

06/Nov/2010	1 (100.0%)	

Unique visitors in each month

Multiple hits with the same IP, user agent and access day, are considered a single visit

Number of unique visitors 1
Different months in logfile 1

Nov/2010	1 (100.0%)	

Unique visitors from Google in each day

The red part of the bar expresses the percentage of visits originated from Google

Number of unique visitors 1
Number of unique visitors from google 0
Different days in logfile 1

06/Nov/2010	0 (0.0%)	

Unique visitors from Google in each month

The red part of the bar expresses the percentage of visits originated from Google

Number of unique visitors 1
Number of unique visitors from google 0
Different months in logfile 1

Nov/2010	0 (0.0%)	

Weekday-Hour combined map

Brighter means higher level of hits

Hour with max traffic starting at Sa 12:00 with hits 1
Hour with min traffic starting at Mo 00:00 with hits 0

Month-Day combined map

Brighter means higher level of hits

Month-Day combined map

Brighter means higher level of hits

Day with max traffic is Nov 06 with hits 1
Day with min traffic is Nov 06 with hits 1

Pageviews per visit

Number of pages requested per visit

Only documents are counted (not images). Reported ranges: 1

11-20	1 (100.0%)	

Requested pages

Page requests ordered by hits

Different pages requested 5

1)	4	/index.cgi
2)	4	/
3)	3	/index.php
4)	2	/index.html
5)	1	/~fedora/index.cgi

Requested images and CSS

Images and CSS requests ordered by hits

Different images and CSS requested 1

1)	9	/favicon.ico

Referers

Referers ordered by visits (google excluded)

Different referers 1

1)	1	none

Referers by first time

Referers ordered by first time date, newer on top (referers from google excluded)

Referers by first time

Referers ordered by first time date, newer on top (referers from google excluded)

Different referers 1

1)	06/Nov/2010	none

Robots and web spiders

Agents requesting robots.txt. MSIECrawler excluded.

Total number of different robots 0

User agents

The entire user agent string ordered by visits

Different agents 1

1)	1	Mozilla/4.0 (compatible; MSIE 8.0; Windows NT 6.1; WOW64; Trident/4.0; SLCC2; .NET CLR 2.0.50727; .N...

Operating Systems

Operating Systems by visits

Different operating systems listed 1

Windows	1 (100.0%)	

Browsers

Browsers used by visits

Different browsers listed 1

Explorer unknown version	1 (100.0%)	

404 Errors

Requests for missing documents

Different missing documents requested 1

1)	9	/favicon.ico

Domains

Top Level Domains sorted by visits

Total number of Top Level Domains 1

numeric IP	1 (100.0%)	

Googled pages

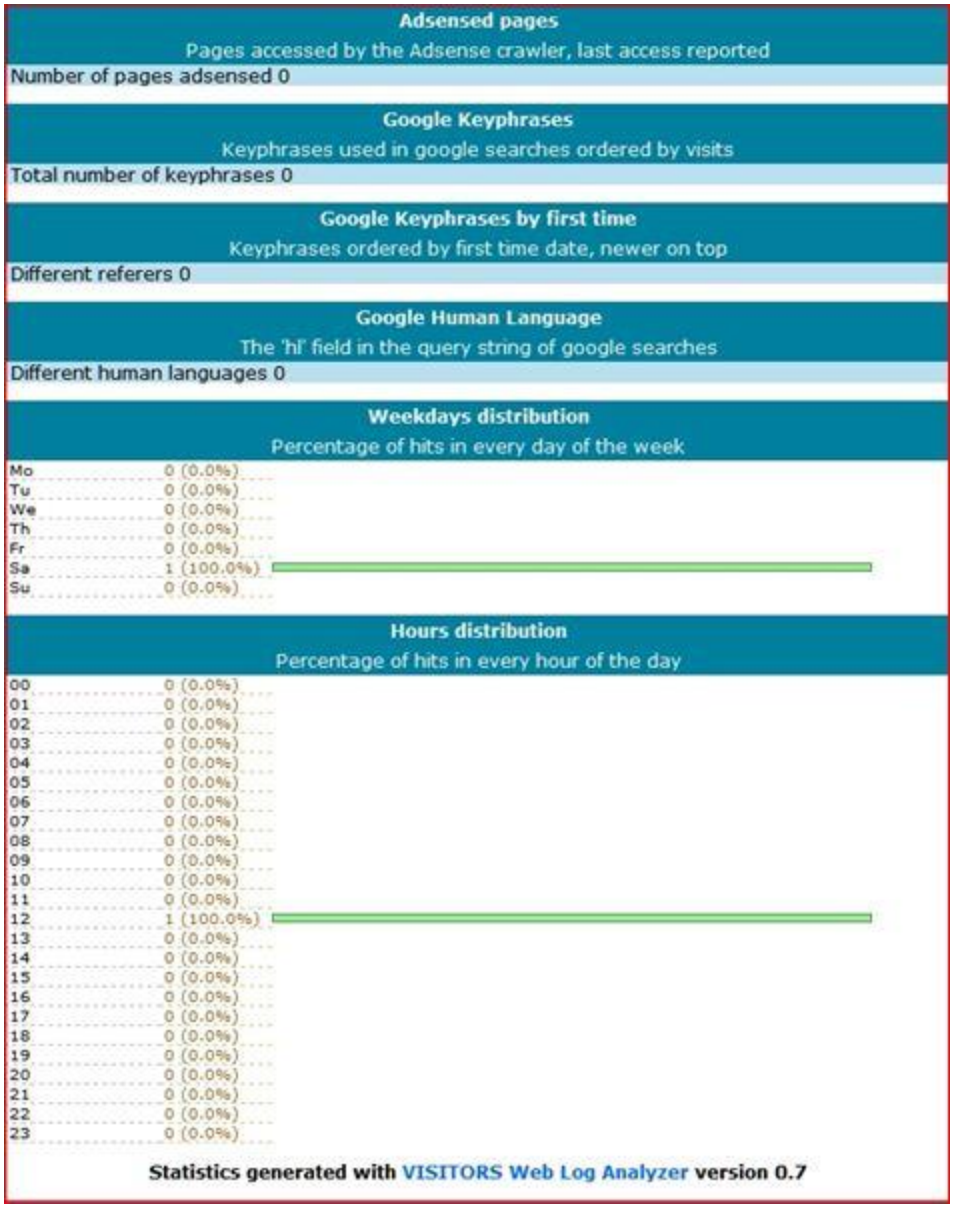
Pages accessed by the Google crawler, last access reported

Number of pages googled 0

Adsensed pages

Pages accessed by the Adsense crawler, last access reported

Number of pages adsensed 0



Adsensed pages

Pages accessed by the Adsense crawler, last access reported

Number of pages adsensed 0

Google Keyphrases

Keyphrases used in google searches ordered by visits

Total number of keyphrases 0

Google Keyphrases by first time

Keyphrases ordered by first time date, newer on top

Different referers 0

Google Human Language

The 'hl' field in the query string of google searches

Different human languages 0

Weekdays distribution

Percentage of hits in every day of the week

Mo	0 (0.0%)
Tu	0 (0.0%)
We	0 (0.0%)
Th	0 (0.0%)
Fr	0 (0.0%)
Sa	1 (100.0%)
Su	0 (0.0%)

Hours distribution

Percentage of hits in every hour of the day

00	0 (0.0%)
01	0 (0.0%)
02	0 (0.0%)
03	0 (0.0%)
04	0 (0.0%)
05	0 (0.0%)
06	0 (0.0%)
07	0 (0.0%)
08	0 (0.0%)
09	0 (0.0%)
10	0 (0.0%)
11	0 (0.0%)
12	1 (100.0%)
13	0 (0.0%)
14	0 (0.0%)
15	0 (0.0%)
16	0 (0.0%)
17	0 (0.0%)
18	0 (0.0%)
19	0 (0.0%)
20	0 (0.0%)
21	0 (0.0%)
22	0 (0.0%)
23	0 (0.0%)

Statistics generated with VISITORS Web Log Analyzer version 0.7

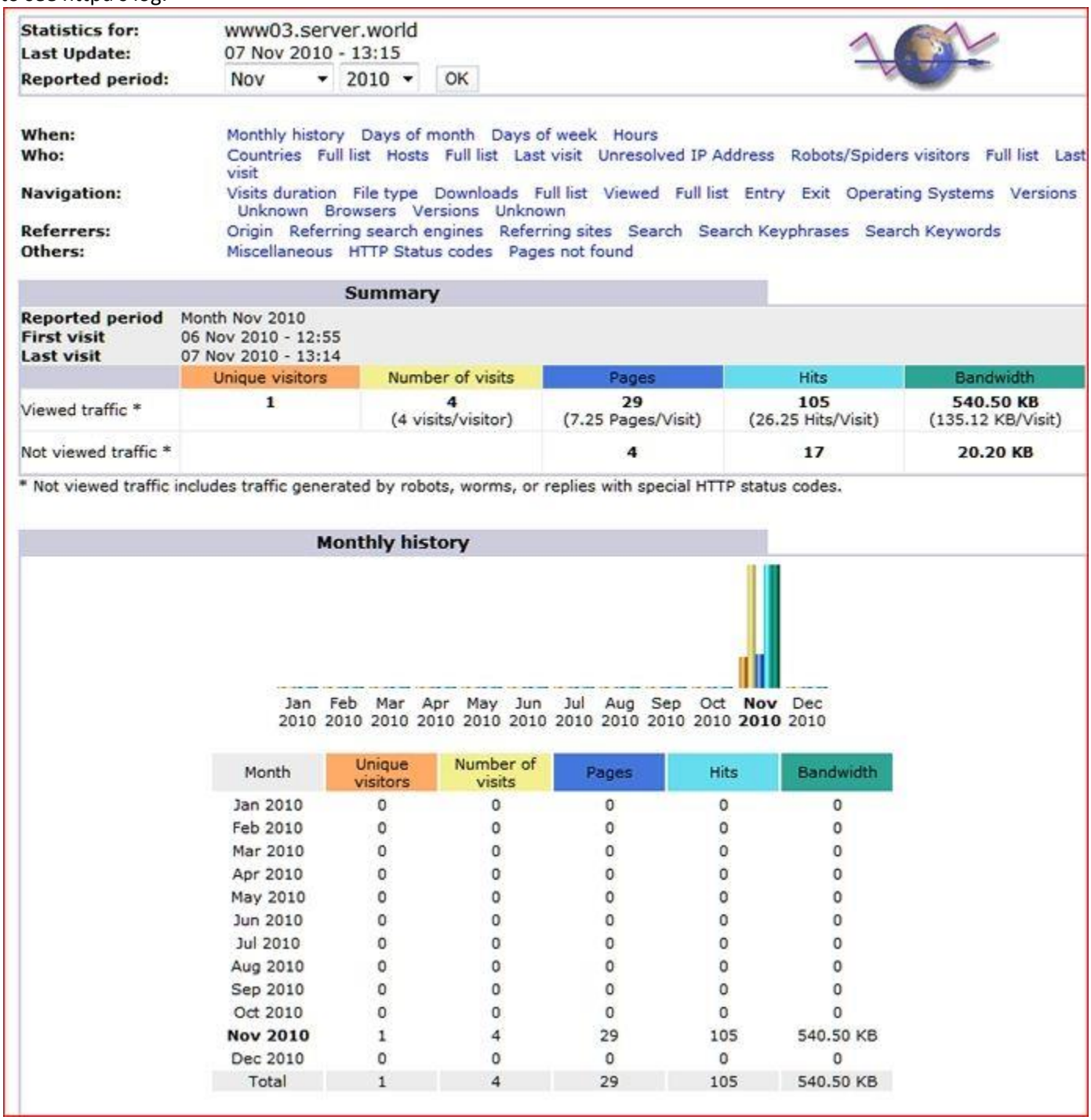
22.12 Apache access log analyzer-AWstats

Install Apache log analizer, AWstats.

22.12.1 Install AWstats

```
[root@www03 ~]# yum -y install awstats

[root@www03 ~]# vi /etc/awstats/awstats.www03.server.world.conf   # this file is already locate (replace your server's name)

# line 122: change
# if your config for log format in httpd.conf is 'combined' Set here '1'
# If log-config is 'common' set here '4', but in this case, some informations can't be get (browser info and so on)
LogFormat=1

# line 153, set your hostname
SiteDomain="www03.server.world"

# line 168: set IP address you'd like to exclude
HostAliases="localhost 127.0.0.1 REGEX[server\.world$] REGEX[^10\.0\.0\.]"

[root@www03 ~]# vi /etc/httpd/conf.d/awstats.conf

# add Alias
Alias /report "/usr/share/awstats/wwwroot/"
<Directory "/usr/share/awstats/wwwroot">
    Options None
    AllowOverride None
    Order allow,deny
    Allow from 127.0.0.1 10.0.0.0/24       # IP address you allow
</Directory>

[root@www03 ~]# /etc/rc.d/init.d/httpd restart
Stopping httpd:                [  OK  ]
Starting httpd:                [  OK  ]

# generate reports
[root@www03 ~]# /usr/share/awstats/wwwroot/cgi-bin/awstats.pl -config=www03.server.world -update
Create/Update database for config "/etc/awstats/awstats.www03.server.world.conf" by AWStats version 7.0 (build 1.964)
From data in log file "/var/log/httpd/access_log"...
Phase 1 : First bypass old records, searching new record...
Searching new records from beginning of log file...
Phase 2 : Now process new records (Flush history on disk after 20000 hosts)...
Jumped lines in file: 0
Parsed lines in file: 29
Found 0 dropped records,
Found 0 comments,
Found 0 blank records,
Found 0 corrupted records,
Found 0 old records,
Found 29 new qualified records.
# generate HTML from reports
[root@www03 ~]# /usr/share/awstats/wwwroot/cgi-bin/awstats.pl -config=www03.server.world -output -staticlink
> /usr/share/awstats/wwwroot/index.html

# change cron's setting
[root@www03 ~]# vi /etc/cron.hourly/awstats

#!/bin/bash
# make it comment
#exec /usr/share/awstats/tools/awstats_updateall.pl now -configdir="/etc/awstats" -awstatsprog="/usr/share/awstats/wwwroot/cgi-bin/awstats.pl" > /dev/null
# add
/usr/share/awstats/wwwroot/cgi-bin/awstats.pl -config=www03.server.world -update > /dev/null
/usr/share/awstats/wwwroot/cgi-bin/awstats.pl -config=www03.server.world -output -staticlink > /usr/share/awstats/wwwroot/index.html
exit 0
```

Access to 'http://(your server's name or IP address/)/report/', then follwing sacreen is shown and it's possible to see httpd's log.



Statistics for: www03.server.world
Last Update: 07 Nov 2010 - 13:15
Reported period: Nov 2010 OK

When: Monthly history Days of month Days of week Hours
Who: Countries Full list Hosts Full list Last visit Unresolved IP Address Robots/Spiders visitors Full list Last visit
Navigation: Visits duration File type Downloads Full list Viewed Full list Entry Exit Operating Systems Versions Unknown Browsers Versions Unknown
Referrers: Origin Referring search engines Referring sites Search Search Keyphrases Search Keywords
Others: Miscellaneous HTTP Status codes Pages not found

Summary

Reported period Month Nov 2010
First visit 06 Nov 2010 - 12:55
Last visit 07 Nov 2010 - 13:14

	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Viewed traffic *	**1**	**4** (4 visits/visitor)	**29** (7.25 Pages/Visit)	**105** (26.25 Hits/Visit)	**540.50 KB** (135.12 KB/Visit)
Not viewed traffic *			**4**	**17**	**20.20 KB**

* Not viewed traffic includes traffic generated by robots, worms, or replies with special HTTP status codes.

Monthly history

Jan 2010 Feb 2010 Mar 2010 Apr 2010 May 2010 Jun 2010 Jul 2010 Aug 2010 Sep 2010 Oct 2010 **Nov 2010** Dec 2010

Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan 2010	0	0	0	0	0
Feb 2010	0	0	0	0	0
Mar 2010	0	0	0	0	0
Apr 2010	0	0	0	0	0
May 2010	0	0	0	0	0
Jun 2010	0	0	0	0	0
Jul 2010	0	0	0	0	0
Aug 2010	0	0	0	0	0
Sep 2010	0	0	0	0	0
Oct 2010	0	0	0	0	0
Nov 2010	1	4	29	105	540.50 KB
Dec 2010	0	0	0	0	0
Total	1	4	29	105	540.50 KB

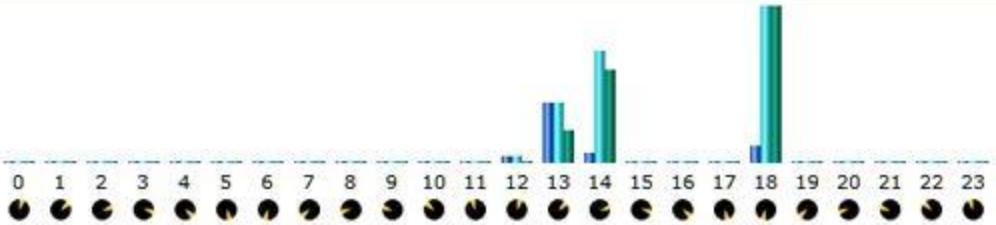
Days of month

Day	Number of visits	Pages	Hits	Bandwidth
01 Nov 2010	0	0	0	0
02 Nov 2010	0	0	0	0
03 Nov 2010	0	0	0	0
04 Nov 2010	0	0	0	0
05 Nov 2010	0	0	0	0
06 Nov 2010	3	22	98	481.35 KB
07 Nov 2010	1	7	7	59.15 KB
08 Nov 2010	0	0	0	0
09 Nov 2010	0	0	0	0
10 Nov 2010	0	0	0	0
11 Nov 2010	0	0	0	0
12 Nov 2010	0	0	0	0
13 Nov 2010	0	0	0	0
14 Nov 2010	0	0	0	0
15 Nov 2010	0	0	0	0
16 Nov 2010	0	0	0	0
17 Nov 2010	0	0	0	0
18 Nov 2010	0	0	0	0
19 Nov 2010	0	0	0	0
20 Nov 2010	0	0	0	0
21 Nov 2010	0	0	0	0
22 Nov 2010	0	0	0	0
23 Nov 2010	0	0	0	0
24 Nov 2010	0	0	0	0
25 Nov 2010	0	0	0	0
26 Nov 2010	0	0	0	0
27 Nov 2010	0	0	0	0
28 Nov 2010	0	0	0	0
29 Nov 2010	0	0	0	0
30 Nov 2010	0	0	0	0
Average	0	0	0	0
Total	4	29	105	540.50 KB

Days of week

Day	Pages	Hits	Bandwidth
Mon	0	0	0
Tue	0	0	0
Wed	0	0	0
Thu	0	0	0
Fri	0	0	0
Sat	22	98	481.35 KB
Sun	7	7	59.15 KB

Hours



Hours	Pages	Hits	Bandwidth	Hours	Pages	Hits	Bandwidth
00	0	0	0	12	2	2	264 Bytes
01	0	0	0	13	19	19	60.63 KB
02	0	0	0	14	3	35	178.90 KB
03	0	0	0	15	0	0	0
04	0	0	0	16	0	0	0
05	0	0	0	17	0	0	0
06	0	0	0	18	5	49	300.71 KB
07	0	0	0	19	0	0	0
08	0	0	0	20	0	0	0
09	0	0	0	21	0	0	0
10	0	0	0	22	0	0	0
11	0	0	0	23	0	0	0

Visitors domains/countries (Top 10) - Full list

Domains/Countries		Pages	Hits	Bandwidth
? Unknown	ip	29	105	540.50 KB
Others		0	0	0

Hosts (Top 10) - Full list - Last visit - Unresolved IP Address

Hosts : 0 Known, 1 Unknown (unresolved ip) 1 Unique visitors	Pages	Hits	Bandwidth	Last visit
10.0.0.2	29	105	540.50 KB	07 Nov 2010 - 13:14

Robots/Spiders visitors (Top 10) - Full list - Last visit

0 different robots*	Hits	Bandwidth	Last visit

* Robots shown here gave hits or traffic "not viewed" by visitors, so they are not included in other charts.

Visits duration

Number of visits: 4 - Average: 655 s	Number of visits	Percent
0s-30s	1	25 %
30s-2mn		
2mn-5mn		
5mn-15mn	1	25 %
15mn-30mn	1	25 %
30mn-1h		
1h+		
Unknown	1	25 %

File type

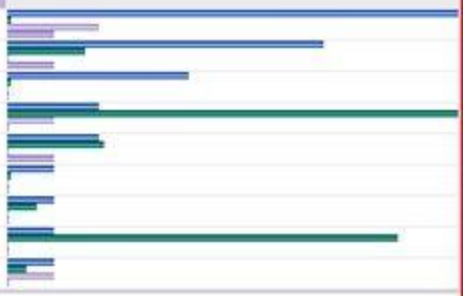
File type		Hits	Percent	Bandwidth	Percent
png	Image	64	60.9 %	72.47 KB	13.4 %
php	Dynamic PHP Script file	22	20.9 %	273.37 KB	50.5 %
js	JavaScript file	7	6.6 %	190.16 KB	35.1 %
cgi	Dynamic Html page or Script file	5	4.7 %	695 Bytes	0.1 %
gif	Image	3	2.8 %	321 Bytes	0 %
css	Cascading Style Sheet file	2	1.9 %	3.25 KB	0.6 %
html	HTML or XML static page	2	1.9 %	260 Bytes	0 %

Downloads (Top 10) - Full list

Downloads: 0	Hits	206 Hits	Bandwidth	Average size

Pages-URL (Top 10) - Full list - Entry - Exit

9 different pages-url	Viewed	Average size	Entry	Exit
/	10	121 Bytes	2	1
/report/	7	10.22 KB		1
/index.cgi	4	134 Bytes		
/visitors/	2	59.15 KB	1	
/phpmyadmin/phpmyadmin.css.php	2	12.57 KB		1
/~fedora/index.cgi	1	159 Bytes		
/phpmyadmin/navigation.php	1	3.85 KB		
/phpmyadmin/main.php	1	51.22 KB		
/phpmyadmin/	1	2.38 KB	1	



Operating Systems (Top 10) - Full list/Versions - Unknown

Operating Systems	Hits	Percent
Windows	105	100 %

Browsers (Top 10) - Full list/Versions - Unknown

Browsers	Grabber	Hits	Percent
MS Internet Explorer	No	105	100 %

Connect to site from

Origin	Pages	Percent	Hits	Percent
Direct address / Bookmark / Link in email...	25	100 %	26	100 %
Links from an Internet Search Engine - Full list				
Links from an external page (other web sites except search engines) - Full list				
Unknown Origin				

Search Keyphrases (Top 10)

Full list

0 different keyphrases	Search	Percent

Search Keywords (Top 10)

Full list

0 different keywords	Search	Percent

Miscellaneous

Miscellaneous		
Successful hits on favicon.ico	1 / 1 Visitors	100 %

HTTP Status codes

	HTTP Status codes*	Hits	Percent	Bandwidth
302	Moved temporarily (redirect)	2	50 %	438 Bytes
401	Unauthorized	1	25 %	1.08 KB
301	Moved permanently (redirect)	1	25 %	243 Bytes

* Codes shown here gave hits or traffic "not viewed" by visitors, so they are not included in other charts.

22.13 Web Mail-SquirrelMail

Install SquirrelMail to build web-based mail transfer system like yahoo mail or hotmail. SMTP/IMAP server is needed to run in your LAN.

22.13.1 Install SquirrelMail

```
[root@www03 ~]# yum -y install squirrelmail

[root@www03 ~]# cd /usr/share/squirrelmail/plugins/
[root@www03 plugins]# wget http://www.squirrelmail.org/plugins/compatibility-2.0.16-1.0.tar.gz
[root@www03 plugins]# wget http://www.squirrelmail.org/plugins/empty_trash-1.4-1.2.2.tar.gz
[root@www03 plugins]# wget http://www.squirrelmail.org/plugins/secure_login-1.4-1.2.8.tar.gz
[root@www03 plugins]# tar zxvf compatibility-2.0.16-1.0.tar.gz
[root@www03 plugins]# tar zxvf empty_trash-1.4-1.2.2.tar.gz
[root@www03 plugins]# tar zxvf secure_login-1.4-1.2.8.tar.gz
[root@www03 plugins]# rm -f *.tar.gz
[root@www03 plugins]# cd
[root@www03 ~]# /usr/share/squirrelmail/config/conf.pl   # run config script
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Main Menu --
1. Organization Preferences
2. Server Settings
3. Folder Defaults
4. General Options
5. Themes
6. Address Books
7. Message of the Day (MOTD)
8. Plugins
9. Database
10. Languages

D. Set pre-defined settings for specific IMAP servers

C Turn color off
S Save data
Q Quit

Command >> 1  # select
SquirrelMail Configuration : Read: config.php (1.4.0)
```

```
--------------------------------------------------
Organization Preferences
1. Organization Name        : SquirrelMail
2. Organization Logo        : ../images/sm_logo.png
3. Org. Logo Width/Height   : (308/111)
4. Organization Title       : SquirrelMail
5. Signout Page             :
6. Top Frame                : _top
7. Provider link            : http://squirrelmail.org/
8. Provider name            : SquirrelMail

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> 5  # change log-out page


When users click the Sign Out button they will be logged out and
then sent to signout_page. If signout_page is left empty,
(hit space and then return) they will be taken, as normal,
to the default and rather sparse SquirrelMail signout page.

[]: /webmail    # change log-out page
SquirrelMail Configuration : Read: config.php (1.4.0)
--------------------------------------------------
Organization Preferences
1. Organization Name        : SquirrelMail
2. Organization Logo        : ../images/sm_logo.png
3. Org. Logo Width/Height   : (308/111)
4. Organization Title       : SquirrelMail
5. Signout Page             : /webmail
6. Top Frame                : _top
7. Provider link            : http://squirrelmail.org/
8. Provider name            : SquirrelMail
```

```
R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> r  # back to menu
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Main Menu --
1. Organization Preferences
2. Server Settings
3. Folder Defaults
4. General Options
5. Themes
6. Address Books
7. Message of the Day (MOTD)
8. Plugins
9. Database
10. Languages

D. Set pre-defined settings for specific IMAP servers

C Turn color off
S Save data
Q Quit

Command >> 2  # select
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Server Settings
```

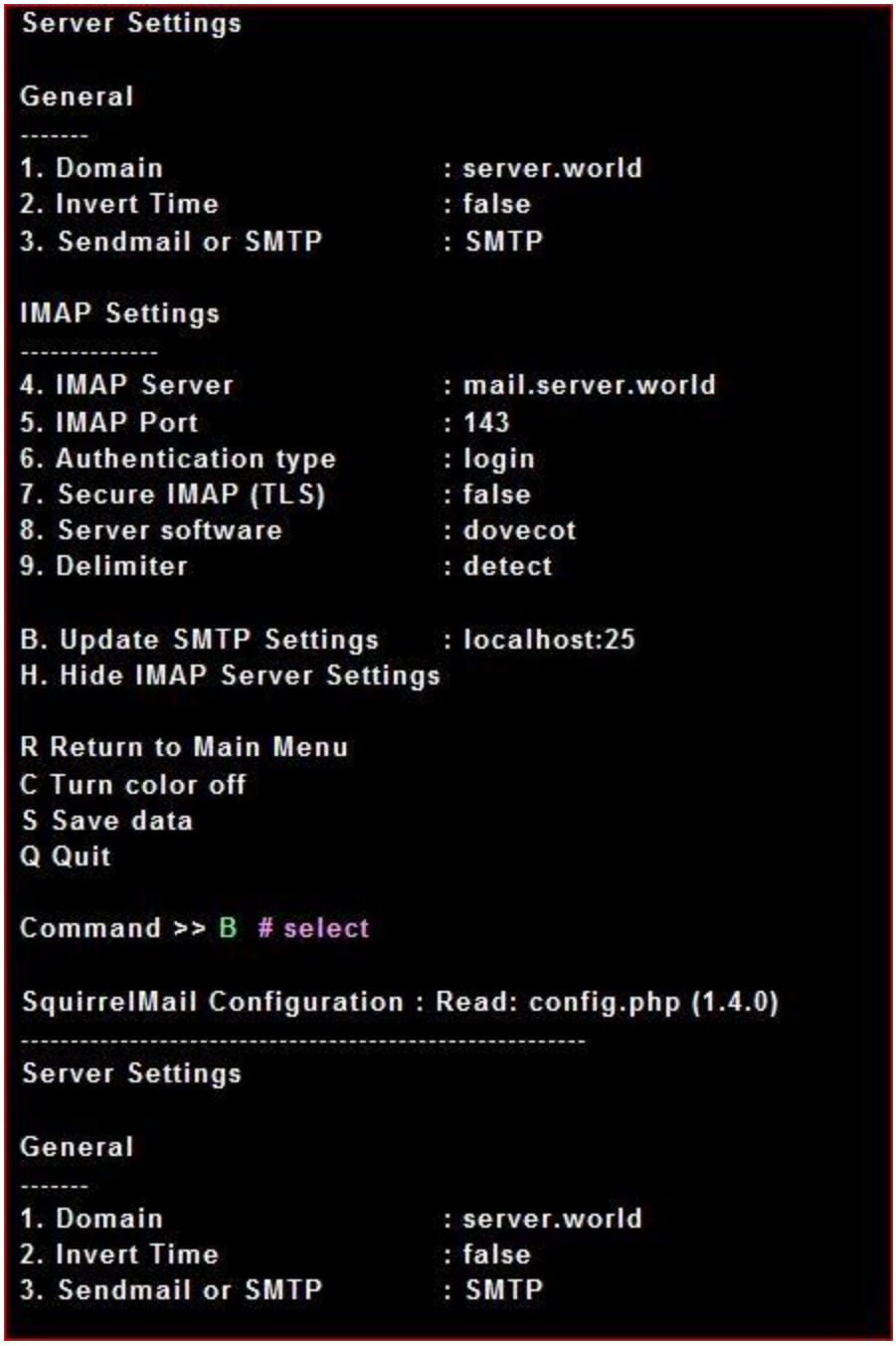
```
General
-------
1. Domain                     : localhost
2. Invert Time                : false
3. Sendmail or SMTP           : Sendmail

A. Update IMAP Settings       : localhost:143 (uw)
B. Change Sendmail Config     : /usr/sbin/sendmail

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> 1  # change to your domain name

The domain name is the suffix at the end of all email addresses. If
for example, your email address is jdoe.com, then your domain
would be example.com.

[localhost]: server.world  # input
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Server Settings

General
-------
1. Domain                     : server.world
2. Invert Time                : false
3. Sendmail or SMTP           : Sendmail

A. Update IMAP Settings       : localhost:143 (uw)
B. Change Sendmail Config     : /usr/sbin/sendmail
R Return to Main Menu
C Turn color off
S Save data
Q Quit
```

```
Command >> 3  # select

You now need to choose the method that you will use for sending
messages in SquirrelMail. You can either connect to an SMTP server
or use sendmail directly.

1. Sendmail
2. SMTP
Your choice [1/2] [1]: 2  # change to SMTP
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Server Settings

General
-------
1. Domain                 : server.world
2. Invert Time            : false
3. Sendmail or SMTP       : SMTP

A. Update IMAP Settings   : localhost:143 (uw)
B. Change Sendmail Config : localhost:25
R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> A  # select

SquirrelMail Configuration : Read: config.php (1.4.0)
```

```
Server Settings

General
-------
1. Domain                 : server.world
2. Invert Time            : false
3. Sendmail or SMTP       : SMTP

IMAP Settings
-------------
4. IMAP Server            : localhost
5. IMAP Port              : 143
6. Authentication type    : login
7. Secure IMAP (TLS)      : false
8. Server software        : uw
9. Delimiter              : /

B. Update SMTP Settings   : localhost:25
H. Hide IMAP Server Settings

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> 4  # select

This is the hostname where your IMAP server can be contacted.
[localhost]: mail03.server.world  # specify your IMAP server
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Server Settings

General
-------
1. Domain                 : server.world
2. Invert Time            : false
3. Sendmail or SMTP       : SMTP
```

```
IMAP Settings
-------------
4. IMAP Server                : mail03.server.world
5. IMAP Port                  : 143
6. Authentication type        : login
7. Secure IMAP (TLS)          : false
8. Server software            : uw
9. Delimiter                  : /

B. Update SMTP Settings       : localhost:25
H. Hide IMAP Server Settings

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> 8  # select

Each IMAP server has its own quirks. As much as we tried to stick
to standards, it doesn't help much if the IMAP server doesn't follow
the same principles. We have made some work-arounds for some of
these servers. If you would like to use them, please select your
IMAP server. If you do not wish to use these work-arounds, you can
set this to "other", and none will be used.
   bincimap                   = Binc IMAP server
   courier                    = Courier IMAP server
   cyrus                      = Cyrus IMAP server
   dovecot                    = Dovecot Secure IMAP server
   exchange                   = Microsoft Exchange IMAP server
   hmailserver                = hMailServer
   macosx                     = Mac OS X Mailserver
   mercury32                  = Mercury/32
   uw                         = University of Washington's IMAP server
   gmail                      = IMAP access to Google mail (Gmail) accounts
   other                      = Not one of the above servers
[uw]: dovecot  # select Dovecot
SquirrelMail Configuration : Read: config.php (1.4.0)
```

```
Server Settings

General
-------
1. Domain                 : server.world
2. Invert Time            : false
3. Sendmail or SMTP       : SMTP

IMAP Settings
-------------
4. IMAP Server            : mail.server.world
5. IMAP Port              : 143
6. Authentication type    : login
7. Secure IMAP (TLS)      : false
8. Server software        : dovecot
9. Delimiter              : /

B. Update SMTP Settings   : localhost:25
H. Hide IMAP Server Settings

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> 9  # select

This is the delimiter that your IMAP server uses to distinguish between
folders. For example, Cyrus uses '.' as the delimiter and a complete
folder would look like 'INBOX.Friends.Bob', while UW uses '/' and would
look like 'INBOX/Friends/Bob'. Normally this should be left at 'detect'
but if you are sure you know what delimiter your server uses, you can
specify it here.

To have it autodetect the delimiter, set it to 'detect'.

[/]: detect  # change to 'detect'
SquirrelMail Configuration : Read: config.php (1.4.0)
```


Server Settings
General
1. Domain : server.world
2. Invert Time : false
3. Sendmail or SMTP : SMTP
IMAP Settings
4. IMAP Server : mail.server.world
5. IMAP Port : 143
6. Authentication type : login
7. Secure IMAP (TLS) : false
8. Server software : dovecot
9. Delimiter : detect
B. Update SMTP Settings : localhost:25
H. Hide IMAP Server Settings
R Return to Main Menu
C Turn color off
S Save data
Q Quit
Command >> B # select
SquirrelMail Configuration : Read: config.php (1.4.0)
Server Settings
General
1. Domain : server.world
2. Invert Time : false
3. Sendmail or SMTP : SMTP

```
4. SMTP Server               : localhost
5. SMTP Port                 : 25
6. POP before SMTP           : false
7. SMTP Authentication       : none
8. Secure SMTP (TLS)         : false
9. Header encryption key     :

A. Update IMAP Settings      : mail03.server.world:143 (dovecot)
H. Hide SMTP Settings

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> 4  # select

This is the hostname of your SMTP server.
[localhost]: mail03.server.world  # specify your SMTP server
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Server Settings

General
-------
1. Domain                    : server.world
2. Invert Time               : false
3. Sendmail or SMTP          : SMTP

SMTP Settings
-------------
4. SMTP Server               : mail03.server.world
5. SMTP Port                 : 25
6. POP before SMTP           : false
7. SMTP Authentication       : none
8. Secure SMTP (TLS)         : false
9. Header encryption key     :
```

```
A. Update IMAP Settings       : mail03.server.world:143 (dovecot)
H. Hide SMTP Settings

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> 7  # select

If you have already set the hostname and port number, I can try to
automatically detect the mechanisms your SMTP server supports.
Auto-detection is *optional* - you can safely say "n" here.

Try to detect auth mechanisms? [y/N]: y  # yes (auto detect)
Trying to detect supported methods (SMTP)...
Testing none: SUPPORTED
Testing login: SUPPORTED
Testing CRAM-MD5: NOT SUPPORTED
Testing DIGEST-MD5: NOT SUPPORTED

What authentication mechanism do you want to use for SMTP connections?
none - Your SMTP server does not require authorization.
login - Plaintext. If you can do better, you probably should.
cram-md5 - Slightly better than plaintext.
digest-md5 - Privacy protection - better than cram-md5.

*** YOUR SMTP SERVER MUST SUPPORT THE MECHANISM YOU CHOOSE HERE ***
If you don't understand or are unsure, you probably want "none"

none, login, cram-md5, or digest-md5 [none]: login  # select login
SMTP authentication uses IMAP username and password by default.

Would you like to use other login and password for all SquirrelMail
SMTP connections? [y/N]: n
SquirrelMail Configuration : Read: config.php (1.4.0)
```

```
Server Settings

General
-------
1. Domain                       : server.world
2. Invert Time                  : false
3. Sendmail or SMTP             : SMTP

SMTP Settings
-------------
4. SMTP Server                  : mail03.server.world
5. SMTP Port                    : 25
6. POP before SMTP              : false
7. SMTP Authentication          : login (with IMAP username and password)
8. Secure SMTP (TLS)            : false
9. Header encryption key        :

A. Update IMAP Settings         : mail03.server.world:143 (dovecot)
H. Hide SMTP Settings

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> r  # back
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Main Menu --
1. Organization Preferences
2. Server Settings
3. Folder Defaults
4. General Options
5. Themes
6. Address Books
7. Message of the Day (MOTD)
8. Plugins
9. Database
10. Languages
```

```
D. Set pre-defined settings for specific IMAP servers

C Turn color off
S Save data
Q Quit

Command >> 10  # select
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Language preferences
1. Default Language          : en_US
2. Default Charset           : iso-8859-1
3. Enable lossy encoding     : falsev

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> 1  # select

SquirrelMail attempts to set the language in many ways. If it
can not figure it out in another way, it will default to this
language. Please use the code for the desired language.

[en_US]: ja_JP  # change to your language
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Language preferences
1. Default Language          : ja_JP
2. Default Charset           : iso-8859-1
3. Enable lossy encoding     : false

R Return to Main Menu
C Turn color off
S Save data
Q Quit
```

```
Command >> 2  # select
This option controls what character set is used when sending
mail and when sending HTML to the browser.

This option is used only when default language is 'en_US'.

[iso-8859-1]: iso-2022-jp  # specify your language
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Language preferences
1. Default Language          : ja_JP
2. Default Charset           : iso-2022-jp
3. Enable lossy encoding     : false
R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> r  # back
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Main Menu --
1. Organization Preferences
2. Server Settings
3. Folder Defaults
4. General Options
5. Themes
6. Address Books
7. Message of the Day (MOTD)
8. Plugins
9. Database
10. Languages

D. Set pre-defined settings for specific IMAP servers

C Turn color off
S Save data
Q Quit
```

```
Command >> 4  # select
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
General Options
1. Data Directory                : /var/lib/squirrelmail/prefs/
2. Attachment Directory          : /var/spool/squirrelmail/attach/
3. Directory Hash Level          : 0
4. Default Left Size             : 150
5. Usernames in Lowercase        : false
6. Allow use of priority         : true
7. Hide SM attributions          : false
8. Allow use of receipts         : true
9. Allow editing of identity     : true
Allow editing of name            : true
Remove username from header      : false
10. Allow server thread sort     : true
11. Allow server-side sorting    : true
12. Allow server charset search  : true
13. Enable UID support           : true
14. PHP session name             : SQMSESSID
15. Location base                :

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> 7  # select
Hide SM attributions (y/n) [n]: y  # Yes
SquirrelMail Configuration : Read: config.php (1.4.0)
```

```
General Options
1. Data Directory                : /var/lib/squirrelmail/prefs/
2. Attachment Directory          : /var/spool/squirrelmail/attach/
3. Directory Hash Level          : 0
4. Default Left Size             : 150
5. Usernames in Lowercase        : false
6. Allow use of priority         : true
7. Hide SM attributions          : true
8. Allow use of receipts         : true
9. Allow editing of identity     : true
Allow editing of name            : true
Remove username from header      : false
10. Allow server thread sort     : true
11. Allow server-side sorting    : true
12. Allow server charset search  : true
13. Enable UID support           : true
14. PHP session name             : SQMSESSID
15. Location base                :

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> r  # back
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Main Menu --
1. Organization Preferences
2. Server Settings
3. Folder Defaults
4. General Options
5. Themes
6. Address Books
7. Message of the Day (MOTD)
8. Plugins
9. Database
10. Languages
```

```
D. Set pre-defined settings for specific IMAP servers

C Turn color off
S Save data
Q Quit

Command >> 8  # select
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Plugins
Installed Plugins
1. delete_move_next
2. squirrelspell
3. newmail

Available Plugins:
4. listcommands
5. filters
6. fortune
7. mail_fetch
8. message_details
9. compatibility
10. calendar
11. translate
12. sent_subfolders
13. empty_trash
14. spamcop
15. bug_report
16. abook_take
17. info
18. secure_login
19. administrator

R Return to Main Menu
C Turn color off
S Save data
Q Quit
```

```
Command >> 9  # add compatibility (number is different at an env)
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Plugins
Installed Plugins
1. delete_move_next
2. squirrelspell
3. newmail
4. compatibility

Available Plugins:
5. listcommands
6. filters
7. fortune
8. mail_fetch
9. message_details
10. calendar
11. translate
12. sent_subfolders
13. empty_trash
14. spamcop
15. bug_report
16. abook_take
17. info
18. secure_login
19. administrator

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> 13  # add empty_trash (number is different at an env)
SquirrelMail Configuration : Read: config.php (1.4.0)
```

```
Plugins
Installed Plugins
1. delete_move_next
2. squirrelspell
3. newmail
4. compatibility
5. empty_trash

Available Plugins:
6. listcommands
7. filters
8. fortune
9. mail_fetch
10. message_details
11. calendar
12. translate
13. sent_subfolders
14. spamcop
15. bug_report
16. abook_take
17. info
18. secure_login
19. administrator

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> 18  # add secure_login (number is different at an env)
SquirrelMail Configuration : Read: config.php (1.4.0)
---------------------------------------------------
Plugins
Installed Plugins
1. delete_move_next
2. squirrelspell
3. newmail
4. compatibility
5. empty_trash
```

```
5. empty_trash
6. secure_login

Available Plugins:
7. listcommands
8. filters
9. fortune
10. mail_fetch
11. message_details
12. calendar
13. translate
14. sent_subfolders
15. spamcop
16. bug_report
17. abook_take
18. info
19. administrator

R Return to Main Menu
C Turn color off
S Save data
Q Quit

Command >> q  # quit

You have not saved your data.
Save? [Y/n]: y  # save
Data saved in config.php

Exiting conf.pl.
You might want to test your configuration by browsing to
http://your-squirrelmail-location/src/configtest.php
Happy SquirrelMailing!

[root@www03 ~]# cd /usr/share/squirrelmail/plugins/secure_login
[root@www03 secure_login]# cp config.sample.php config.php
[root@www03 secure_login]# vi config.php

# line 24: change (continue to connect with SSL after login)
$change_back_to_http_after_login = 0;

[root@www03 secure_login]# /etc/rc.d/init.d/httpd reload
Reloading httpd:     [  OK  ]
```

22.13.2 Access to 'http://(your server's name or IP address/)/webmail/', then follwing sacreen is shown, then authenticate your user name and password to login

type username:
Password:

to logon.

22.14 Web Mail-Round Cube

Install RoundCube to build web-based mail transfer system like yahoo mail or hotmail. SMTP/IMAP server is needed to run in your LAN. And also MySQL Server is required. (or SQLite, PostgreSQL)
This example uses servers below for configuration of RoundCube.
www03.server.world - RoundCube server

mail03.server.world - SMTP/IMAP server

22.14.1 Install RoundCube

```
[root@www03 ~]# yum -y install roundcubemail

[root@www03 ~]# mysql -u root -p          # login to MySQL
Enter password:
Welcome to the MySQL monitor. Commands end with ; or g.
Your MySQL connection id is 4 to server version: 5.0.22

Type 'help;' or '\h' for help. Type '\c' to clear the buffer.

# create 'roundcube' database ( set any password for 'password' )
mysql> create database roundcube character set utf8 collate utf8_bin;
Query OK, 1 row affected (0.00 sec)
mysql> grant all privileges on roundcube.* to roundcube identified by 'password';
Query OK, 0 rows affected (0.00 sec)
mysql> exit
Bye

[root@www03 ~]# cd /usr/share/doc/roundcubemail-0.3.1/SQL
[root@www03 SQL]# mysql -u roundcube -p roundcube < mysql.initial.sql
Enter password:
[root@www03 SQL]# cd
[root@www03 ~]# vi /etc/roundcubemail/db.inc.php

# line 21: change like follows ( replace your password for 'password' )
$rcmail_config['db_dsnw'] = 'mysql://roundcube:password@localhost/roundcube';

[root@www03 ~]# vi /etc/roundcubemail/main.inc.php

# line 66: specify IMAP server (SSL)
$rcmail_config['default_host'] = 'ssl://mail03.server.world';

# line 69: specify IMAP port (SSL)
$rcmail_config['default_port'] = 993;

# line 87: specify domain name
$rcmail_config['mail_domain'] = 'server.world';

# line 102: specify SMTP server (SSL)
$rcmail_config['smtp_server'] = 'ssl://mail03.server.world';
```

```
# line 105: specify SMTP port (SSL)
$rcmail_config['smtp_port'] = 465;

# line 109: change ( use the same user for SMTP auth and IMAP auth )
$rcmail_config['smtp_user'] = '%u';

# line 113: change ( use the same password for SMTP auth and IMAP auth )
$rcmail_config['smtp_pass'] = '%p';

# line 123: specify SMTP HELO host
$rcmail_config['smtp_helo_host'] = 'mail03.server.world';

# line 168: change to your language
$rcmail_config['language'] = ja_JP;

# line 180: change UserAgent
$rcmail_config['useragent'] = 'Server World Webmail';

# line 183: change title
$rcmail_config['product_name'] = 'Server World Webmail';

# line 218: change default charaset
$rcmail_config['default_charset'] = 'iso-2022-jp';

[root@www03 ~]# vi /etc/httpd/conf.d/roundcubemail.conf

# line 5: change
Alias /roundcube /usr/share/roundcubemail

<Directory /usr/share/roundcubemail/>
    Order Deny,Allow
    Deny from all
    Allow from 127.0.0.1 10.0.0.0/24        # IP address you allow
</Directory>

[root@www03 ~]# /etc/rc.d/init.d/httpd restart
Stopping httpd:                 [ OK ]
Starting httpd:                 [ OK ]
```

22.14.2 Access to 'http://(your server's name or IP address/)/roundcube/', then follwing sacreen is shown, then authenticate your user name and password to login.

type username & Password to logon.

Chapter 23 MySQL

23.1 Install MySQL for Database Server

```
[root@www03 ~]# yum -y install mysql-server

[root@www03 ~]# /etc/rc.d/init.d/mysqld start
Initializing MySQL database: Installing MySQL system tables...
OK
Filling help tables...
OK

To start mysqld at boot time you have to copy
support-files/mysql.server to the right place for your system

PLEASE REMEMBER TO SET A PASSWORD FOR THE MySQL root USER !
To do so, start the server, then issue the following commands:

/usr/bin/mysqladmin -u root password 'new-password'
/usr/bin/mysqladmin -u root -h www.server.world password 'new-password'

Alternatively you can run:
/usr/bin/mysql_secure_installation

which will also give you the option of removing the test
databases and anonymous user created by default. This is
strongly recommended for production servers.

See the manual for more instructions.

You can start the MySQL daemon with:
cd /usr ; /usr/bin/mysqld_safe &

You can test the MySQL daemon with mysql-test-run.pl
cd /usr/mysql-test ; perl mysql-test-run.pl

Please report any problems with the /usr/bin/mysqlbug script!
```

```
Starting mysqld:    [  OK  ]

[root@www03 ~]# chkconfig mysqld on
[root@www03 ~]# mysql -u root       # login to MySQL
Welcome to the MySQL monitor. Commands end with ; or g.
Your MySQL connection id is 2 to server version: 5.0.22

Type 'help;' or '\h' for help. Type '\c' to clear the buffer.

# show user info
mysql> select user,host,password from mysql.user;
+------+--------------------+----------+
| user | host               | password |
+------+--------------------+----------+
| root | localhost          |          |
| root | www03.server.world |          |
| root | 127.0.0.1          |          |
|      | localhost          |          |
|      | www03.server.world |          |
+------+--------------------+----------+
5 rows in set (0.00 sec)

# set root password
mysql> set password for root@localhost=password('password');
Query OK, 0 rows affected (0.00 sec)

# set root password
mysql> set password for root@'127.0.0.1'=password('password');
Query OK, 0 rows affected (0.00 sec)

# set root password
mysql> set password for root@'www03.server.world'=password('password');
Query OK, 0 rows affected (0.00 sec)
```

23.1.1 Operate from web browser – phpmyadmin

23.1.1.1 Install phpmyadmin

```
[root@www03 ~]# yum -y install phpMyAdmin php-mysql php-mcrypt

[root@www03 ~]# vi /etc/httpd/conf.d/phpMyAdmin.conf

# line 14: add IP address you allow
Allow from 127.0.0.1 10.0.0.0/24

[root@www03 ~]# /etc/rc.d/init.d/httpd reload
Reloading httpd:    [  OK  ]
```

23.1.1.2 Access to 'http://(your hostname or IP address)/(alias name you set)/' with web browser, then following screen is shown. Login with a user in MySQL.
type root & password to logon.

23.1.1.3 Just logined. You can operate MySQL on here.

Chapter 24

FTP Server

24.1 Install and Configuration

ប្រើសំរាប់អនុញ្ញាតិអោយយើង Uplaod និង Download File នៅក្នុង Linux ដើម្បីប្រើវាបាន យើងត្រូវ Install Packaged មួយដែលមានឈ្មោះថា vsftpd….fc10.i386.rpm

បន្ទាប់ពី Install រួចហើយ គឺយើងត្រូវទៅ Configure File មួយដែលមានឈ្មោះថា /etc/vsftpd/vsftpd.conf នៅក្នុង File នេះវាចែកចេញជាបន្ទាត់ ដែលបន្ទាត់នីមួយៗគឺជា Key word មួយ ព្រមទាំងតំលៃដែល Keyword នោះនិងទទួលដែលរវាង Keyword និងតំលៃត្រូវមាន សញ្ញាស្មើ (=)

```
# Vi /etc/vsftpd/vsftpd.conf
```

Key word

ananymous_enable=YES អនុញ្ញាត្តិអោយ User Account Anony mous Connect មកកាន់ ftp server នៅពេលដែល User Account អាចប្រើ User Anonymous គឺ Ftp server មិនទាមទារអោយ Password ទេ៕

Note: បើ anonymous – enable =No មានន័យថាមិនអនុញ្ញាត្តិអោយ User Anonym oust log ចូល serverទេ។

anon-upload-enable= YES : មានន័យថាអោយ User Account

Anony movst មានសិទ្ធិUpload ។ លុះត្រាតែ Key word។

Write-enable = YES ដែលទើបមានប្រសិទ្ធភាព។

បើវាស្មើ=No នោះវាគ្មានសិទ្ធិ Upload ទេ។

anon- mkdir-write-enable =YES :មានន័យថាអនុញ្ញាត្តិអោយ Anonymousមានសិទ្ធិបង្កើត Directoryលើ server ftp។

បើវា=No នោះមានន័យថា User Anony moust មិនអាចបង្កើត Directory លើ ftp serverទេ។

dirmessage-enable =YES:មានន័យថាពេលប្តូរចុះឡើងនូវ Active directory នោះវាជារបស់ Message ប្រាប់ ។

#local_enable=YES:អនុញ្ញាតិអោយ Local Logon ប្រើ FTP Server បាន

#write_enable=YES

24.1.1 Configure FTP Server-Vsftpd

Install Vsftpd to configure FTP server to transfer files.

24.1.1.1 Install Vsftpd

```
[root@www03 ~]# yum -y install vsftpd

[root@www03 ~]# vi /etc/vsftpd/vsftpd.conf

# line 12: no anonymous
anonymous_enable=NO

# line 80,81: uncomment ( allow ascii mode )
ascii_upload_enable=YES
ascii_download_enable=YES

# line 95, 96: uncomment ( enable chroot )
chroot_local_user=YES
chroot_list_enable=YES

# line 98: uncomment ( specify chroot list )
chroot_list_file=/etc/vsftpd/chroot_list

# line 104: uncomment
ls_recurse_enable=YES

# add at the last line
# specify root directory ( if don't specify, users' home directory become FTP home directory)
local_root=public_html

# use localtime
use_localtime=YES

[root@www03 ~]# vi /etc/vsftpd/chroot_list

# add users you allow to move over their home directory
fedora

[root@www03 ~]# /etc/rc.d/init.d/vsftpd start
Starting vsftpd for vsftpd:      [  OK  ]
[root@www03 ~]# chkconfig vsftpd on
```

24.2.1 Configure FTP Server-ProFTPD

24.2.1.1 Install ProFTPD

```
[root@www03 ~]# yum -y install proftpd

[root@www03 ~]# vi /etc/proftpd.conf

# line 8: change to your hostname
ServerName      "www03.server.world"

# line 10: change to your email address
ServerAdmin     root@server.world

# add near line 48
# get access log
ExtendedLog     /var/log/proftpd/access.log WRITE,READ default
# get auth log
ExtendedLog     /var/log/proftpd/auth.log AUTH auth

[root@www03 ~]# vi /etc/ftpusers

# add users you prohibit to FTP access
test

[root@www03 ~]# /etc/rc.d/init.d/proftpd start
Starting proftpd:                          [  OK  ]
[root@www03 ~]# chkconfig proftpd on
```

24.3.1 Configure FTP Server-ProFTPD

Install ProFTPD to configure FTP server to transfer files.

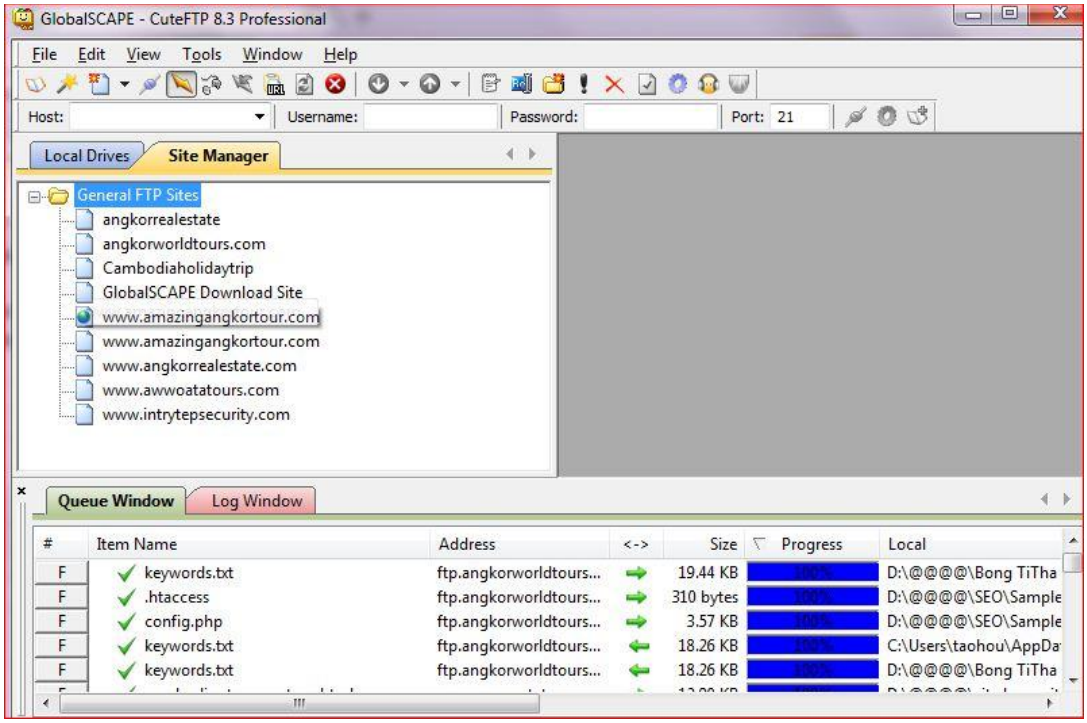
24.3.1.1 Install ProFTPD

```
[root@www03 ~]# yum -y install proftpd

[root@www03 ~]# vi /etc/proftpd.conf

# line 8: change to your hostname
ServerName      "www03.server.world"

# line 10: change to your email address
ServerAdmin     root@server.world

# add near line 48
# get access log
ExtendedLog     /var/log/proftpd/access.log WRITE,READ default
# get auth log
ExtendedLog     /var/log/proftpd/auth.log AUTH auth

[root@www03 ~]# vi /etc/ftpusers

# add users you prohibit to FTP access
test

[root@www03 ~]# /etc/rc.d/init.d/proftpd start
Starting proftpd:                          [  OK  ]
[root@www03 ~]# chkconfig proftpd on
```

24.2 FTP Client

Transfer files to yuour FTP server from your PC with cuteFTP

24.2.1 Install FileZilla to your PC and run it, then following screen is shown. Input your FTP's Hostname, user-name. password, connection-port, like follows. Next Click 'Connect'



24.3 Vsftpd Over SSL/TLS

Enable SSL/TLS on Vsftpd.

24.3.1 Config for SSL/TLS

```
[root@www03 ~]# cd /etc/pki/tls/certs
[root@www03 certs]# openssl req -x509 -nodes -newkey rsa:1024 -keyout /etc/pki/tls/certs/vsftpd.pem -out /etc/pki/tls/certs/vsftpd.pem
Generating a 1024 bit RSA private key
......++++++
.......++++++
writing new private key to '/etc/pki/tls/certs/vsftpd.pem'
-----
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:JP            # country
State or Province Name (full name) [Some-State]:Hiroshima   # state
Locality Name (eg, city) []:Hiroshima           # city
Organization Name (eg, company) [Internet Widgits Pty Ltd]:Server World   # company
Organizational Unit Name (eg, section) []:IT Solution   # department
Common Name (eg, YOUR name) []:www03.server.world   # server's FQDN
Email Address []:xxx@server.world               # email address

[root@www03 certs]# chmod 600 vsftpd.pem
[root@www03 certs]# vi /etc/vsftpd/vsftpd.conf

# add at the last line
rsa_cert_file=/etc/pki/tls/certs/vsftpd.pem
ssl_enable=YES                          # enable SSL
force_local_data_ssl=YES                # require SSL connection
force_local_logins_ssl=YES              # require SSL connection

[root@www03 certs]# /etc/rc.d/init.d/vsftpd restart
Shutting down vsftpd:        [ OK ]
Starting vsftpd for vsftpd:  [ OK ]
```

24.4 Configure on client PC. Use FileZilla that has a function of connecting trough SSL/TLS. Open 'File'-'Site Manager' and input login info, and select 'TLS/SSL' in 'Server Type'

24.5 Following waring is shown because certificate is originally created, but it's no ploblem. Go next

24.6 ProFTPD Over SSL/TLS

24.6.1 Config for SSL/TLS

```
[root@www03 ~]# cd /etc/pki/tls/certs
[root@www03 certs]# openssl req -x509 -nodes -newkey rsa:1024 -keyout /etc/pki/tls/certs/proftpd.pem -out /etc/pki/tls/certs/proftpd.pem
Generating a 1024 bit RSA private key
.....++++++
.....++++++
writing new private key to '/etc/pki/tls/certs/proftpd.pem'
-----
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [AU]:JP             # country
State or Province Name (full name) [Some-State]:Hiroshima   # state
Locality Name (eg, city) []:Hiroshima            # city
Organization Name (eg, company) [Internet Widgits Pty Ltd]:Server World   # company
Organizational Unit Name (eg, section) []:IT Solution   # department
Common Name (eg, YOUR name) []:www03.server.world   # server's FQDN
Email Address []:xxx@server.world                # email address

[root@www03 certs]# chmod 600 proftpd.pem
[root@www03 certs]# vi /etc/proftpd.conf

# line 171: change like follows
#<IfDefine TLS>
    TLSEngine                   on
    TLSRequired                 on
    TLSRSACertificateFile       /etc/pki/tls/certs/proftpd.pem
    TLSRSACertificateKeyFile    /etc/pki/tls/certs/proftpd.pem
    TLSCipherSuite              ALL:!ADH:!DES
    TLSOptions                  NoCertRequest
    TLSVerifyClient             off
    TLSRenegotiate              ctrl 3600 data 512000 required off timeout 33 00
    TLSLog                      /var/log/proftpd/tls.log
#    <IfModule mod_tls_shmcache.c>
#     TLSSessionCache           shm:/file=/var/run/proftpd/sesscache
#    </IfModule>
#</IfDefine>

[root@www03 certs]# /etc/rc.d/init.d/proftpd restart
Shutting down proftpd:          [ OK ]
Starting proftpd:               [ OK ]
```

24.6.2 Configure on client PC. Use FileZilla that has a function of connecting trough SSL/TLS. Open 'File'-'Site Manager' and input login info, and select 'TLS/SSL' in 'Server Type'

24.6.3 Following waring is shown because certificate is originally created, but it's no ploblem. Go next

Chapter 25 Mail Server

25.1 Install and Configure Postfix

Install Postfix to configure SMTP Server. This example shows to configure SMTP-Auth to use Dovecot's SASL function.

25.2 Install and Configure Postfix

```
[root@mail03 ~]# yum -y install postfix

[root@mail03 ~]# vi /etc/postfix/main.cf

# line 75: uncomment and specify hostname
myhostname = mail03.server.world

# line 83: uncomment and specify domain name
mydomain = server.world

# line 99: uncomment
myorigin = $mydomain

# line 116: change
inet_interfaces = all

# line 164: add
mydestination = $myhostname, localhost.$mydomain, localhost, $mydomain

# line 264: uncomment and specify your LAN
mynetworks = 127.0.0.0/8, 10.0.0.0/24

# line 419: uncomment (use Maildir)
home_mailbox = Maildir/

# line 545: uncomment, line 546: add
header_checks = regexp:/etc/postfix/header_checks
body_checks = regexp:/etc/postfix/body_checks

# line 571: add
smtpd_banner = $myhostname ESMTP

# add at the last line
# limit an email size 10M
message_size_limit = 10485760
# limit mailbox 1G
mailbox_size_limit = 1073741824
```

```
# for SMTP-Auth settings
smtpd_sasl_type = dovecot
smtpd_sasl_path = private/auth
smtpd_sasl_auth_enable = yes
smtpd_sasl_security_options = noanonymous
smtpd_sasl_local_domain = $myhostname
smtpd_client_restrictions = permit_mynetworks,reject_unknown_client,permit
smtpd_recipient_restrictions = permit_mynetworks,permit_auth_destination,permit_sasl_authenticated,reject

[root@mail03 ~]# vi /etc/postfix/header_checks

# add at the head
# reject if email address is empty
/^From:.*<#.*@.*>/ REJECT
/^Return-Path:.*<#.*@.*>/ REJECT

[root@mail03 ~]# vi /etc/postfix/body_checks

# reject if includes 'example.com' in mail body
/^(|[^>].*)example.com/ REJECT

[root@mail03 ~]# /etc/rc.d/init.d/sendmail stop
Shutting down sm-client:     [  OK  ]
Shutting down sendmail:      [  OK  ]
[root@mail03 ~]# chkconfig sendmail off
[root@mail03 ~]# alternatives --config mta   # change default MTA

There are 2 programs which provide 'mta'.

Selection    Command
-----------------------------------------------
*+ 1    /usr/sbin/sendmail.sendmail
   2    /usr/sbin/sendmail.postfix

Enter to keep the current selection[+], or type selection number: 2   # switch to postfix

[root@mail03 ~]# /etc/rc.d/init.d/postfix start
Starting postfix:                [  OK  ]
[root@mail03 ~]# chkconfig postfix on
```

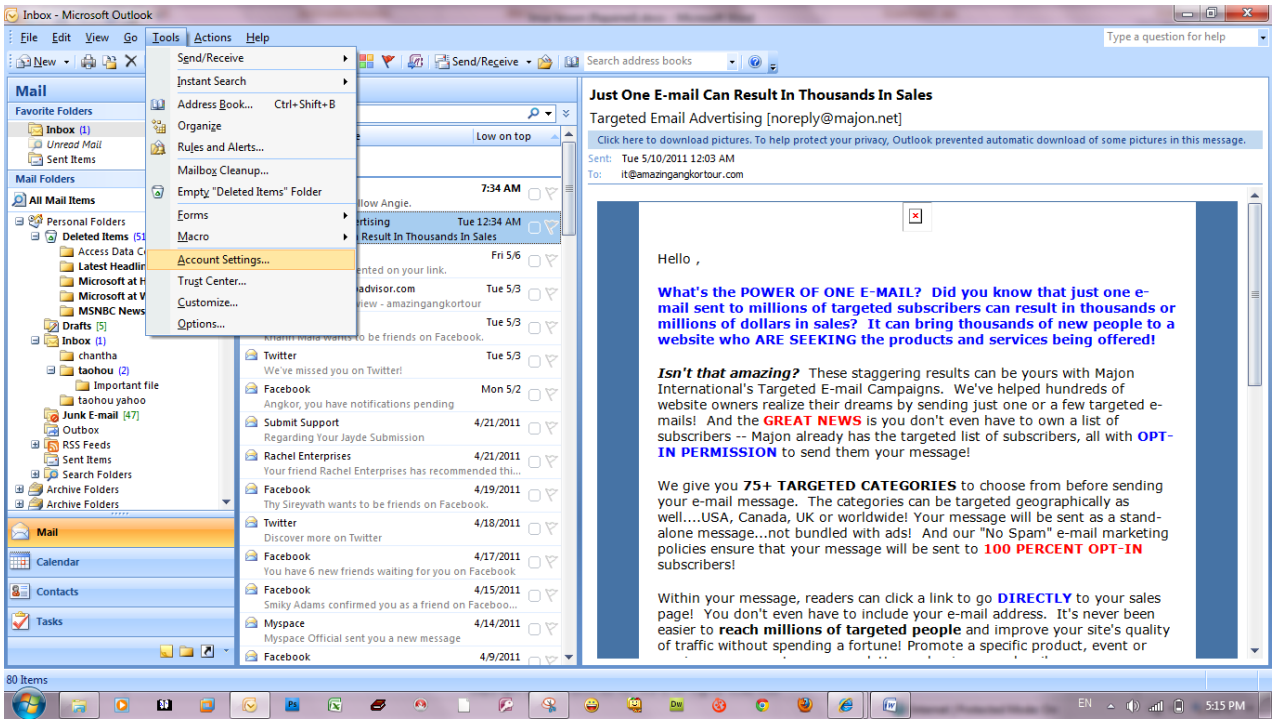
25.3 Install and Configure Dovecot

Install Dovecot to Configure POP/IMAP Server. This example shows to configure to provide SASL function to Postfix.

```
[root@mail03 ~]# yum -y install dovecot

[root@mail03 ~]# vi /etc/dovecot/conf.d/10-auth.conf

# line 9: uncomment and change ( allow plain text auth )
disable_plaintext_auth = no

# line 97: add
auth_mechanisms = plain login

[root@mail03 ~]# vi /etc/dovecot/conf.d/10-mail.conf

# line 30: uncomment and add
mail_location = maildir:~/Maildir

[root@mail03 ~]# vi /etc/dovecot/conf.d/10-master.conf

# line 84-86: uncomment and add
# Postfix smtp-auth
unix_listener /var/spool/postfix/private/auth {
    mode = 0666
    user = postfix          # add
    group = postfix         # add
}

[root@mail03 ~]# /etc/rc.d/init.d/dovecot start
Starting Dovecot Imap:          [  OK  ]
[root@mail03 ~]# chkconfig dovecot on
```

25.3.1 Configure Client

25.3.1.1 Start With microsoft outlook.



25.4 Configure SSL

Configure SSL settings in order to encrypt datas in connection.

25.4.1 Create certificates first, see here

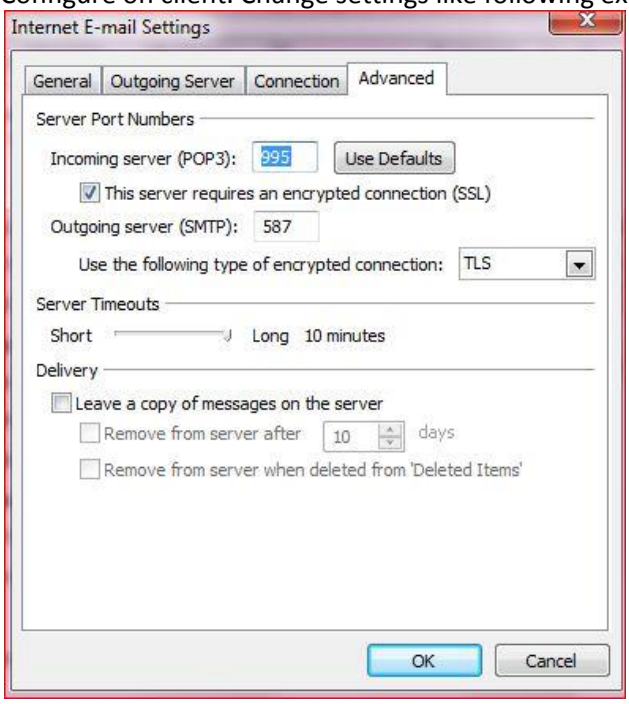
Create a your server's original SSL Certificate. If you use your server as a business, it had better buy and use a Formal Certificate from Verisigh and so on.

```
[root@www03 ~]# cd /etc/pki/tls/certs
[root@www03 certs]# make server.key
umask 77 ; \
    /usr/bin/openssl genrsa -aes128 2048 > server.key
Generating RSA private key, 2048 bit long modulus
.....................................................++++++
.............++++++
e is 61251 (0x10001)
Enter pass phrase:                  # set passphrase
Verifying - Enter pass phrase:      # verify
# remove passphrase from private key
[root@www03 certs]# openssl rsa -in server.key -out server.key
Enter pass phrase for server.key:   # input passphrase
writing RSA key
[root@www03 certs]#
[root@www03 certs]# make server.csr
umask 77 ; \
    /usr/bin/openssl req -utf8 -new -key server.key -out server.csr
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [XX]:JP                  # country
State or Province Name (full name) [e]:Hiroshima  # state
Locality Name (eg, city) [Default City]:Hiroshima      # city
Organization Name (eg, company) [Default Company Ltd]:Server World  # company
Organizational Unit Name (eg, section) []:IT Solution  # department
Common Name (eg, your server's hostname) []:www.server.world  # server's FQDN
Email Address []:webmaster@server.world               # email address
Please enter the following 'extra' attributes
to be sent with your certificate request
A challenge password []:            # Enter
An optional company name []:        # Enter
[root@www03 certs]#
[root@www03 certs]# openssl x509 -in server.csr -out server.crt -req -signkey server.key -days 3650
Signature ok
subject=/C=JP/ST=Hiroshima/L=Hiroshima/O=Server World/OU=IT Solution/CN=www03.server.world/emailAddress=webmaster.server.world Getting Private key
[root@www03 certs]# chmod 400 server.*
```

25.5 Configure Postfix and Dovecot for SSL

```
[root@mail03 ~]# vi /etc/postfix/main.cf

# add at the last line
smtpd_use_tls = yes
smtpd_tls_cert_file = /etc/pki/tls/certs/server.crt
smtpd_tls_key_file = /etc/pki/tls/certs/server.key
smtpd_tls_session_cache_database = btree:/etc/postfix/smtpd_scache

[root@mail03 ~]# vi /etc/postfix/master.cf

# line 17-18: uncomment
smtps     inet  n       -       n       -       -       smtpd
  -o smtpd_tls_wrappermode=yes

[root@mail03 ~]# vi /etc/dovecot/conf.d/10-ssl.conf

# line 6: uncomment
ssl = yes

# line 12,13: uncomment and specify certificate
ssl_cert = </etc/pki/tls/certs/server.crt
ssl_key = </etc/pki/tls/certs/server.key

[root@mail03 ~]# /etc/rc.d/init.d/postfix restart
Shutting down postfix:          [ OK ]
Starting postfix:               [ OK ]
[root@mail03 ~]# /etc/rc.d/init.d/dovecot restart
Stopping Dovecot Imap:          [ OK ]
Starting Dovecot Imap:          [ OK ]
```

Configure on client. Change settings like following example. (if you use PO3S, input '995 for incoming mail)



Click syncronize on Windows Live Mail, then following warning is shown because certificate file is created on your server. It's no ploblem. Click 'Yes' to Proceed, then it's possible to send/receive emails trough SSL connection.

25.6 Virtual Domains

Configure for Virtulal Domain to send an email with another domain name different from original domain.
This example set config as,
present domain name ⇒ server.world
new domain name ⇒ virtual.host
and userA has an email address fedora@mail03.server.world now
and Add userB newly and Give him an email address fedora@mail03.virtual.host

25.6.1Config for Virtual Domain

```
[root@mail03 ~]# vi /etc/postfix/main.cf

# add at the last line
virtual_alias_domains = virtual.host
virtual_alias_maps = hash:/etc/postfix/virtual

[root@mail03 ~]# vi /etc/postfix/virtual

# add at the head
fedora@mail03.virtual.host  userB

[root@mail03 ~]# postmap /etc/postfix/virtual
[root@mail03 ~]# /etc/rc.d/init.d/postfix reload
Reloading postfix:                [ OK ]
```

25.7 Configure on client for new account and make sure to be able to send emails(microsoft outlook)

now you can try yourself to configure email account.

25.8 Run with Clamav-ClamSMTP

25.8.1 Install Clam AntiVirus to protect from virus
25.8.2 Install Clam AntiVirus

```
[root@mail ~]# yum -y install clamav clamav-update

[root@mail ~]# vi /etc/freshclam.conf

# line 8: make it comment
#Example

[root@mail ~]# freshclam          # update pattern files
ClamAV update process started at Thu Nov 4 13:57:19 2010
Downloading main.cvd [100%]
main.cvd updated (version: 52, sigs: 704727, f-level: 44, builder: sven)
Downloading daily.cvd [100%]
daily.cvd updated (version: 12202, sigs: 144664, f-level: 53, builder: guitar)
Downloading bytecode.cvd [100%]
bytecode.cvd updated (version: 89, sigs: 10, f-level: 53, builder: edwin)
Database updated (849401 signatures) from database.clamav.net (IP: 203.212.42.128)
```

25.8.3 Try to scan

```
[root@mail ~]# clamscan --infected --remove --recursive /home

----------- SCAN SUMMARY -----------
Known viruses: 848164
Engine version: 0.96.3
Scanned directories: 73
Scanned files: 62
Infected files: 0
Data scanned: 0.84 MB
Data read: 0.74 MB (ratio 1.13:1)
Time: 3.019 sec (0 m 3 s)

# try to download trial virus
[root@mail ~]# wget http://www.eicar.org/download/eicar.com

[root@mail ~]# clamscan --infected --remove --recursive .
./eicar.com: Eicar-Test-Signature FOUND
./eicar.com: Removed.              # just detected

----------- SCAN SUMMARY -----------
Known viruses: 848164
Engine version: 0.96.3
Scanned directories: 1
Scanned files: 10
Infected files: 1
Data scanned: 0.02 MB
Data read: 0.01 MB (ratio 2.00:1)
Time: 3.331 sec (0 m 3 s)
```

25.8.4 Install Clamav first and Configure to run Postfix with Clamav to scan virus timely. Install ClamSMTP to do it

```
[root@mail03 ~]# yum -y install clamsmtp

[root@mail03 ~]# vi /etc/clamsmtpd.conf

# line 6: change
OutAddress: 127.0.0.1:10026

# line 22: uncomment and change
Listen: 127.0.0.1:10025

# line 25: change
ClamAddress: /var/run/clamd.clamsmtp/clamd.sock

# line 28: uncomment
Header: X-Virus-Scanned: ClamAV using ClamSMTP

# line 34: uncomment
Action: drop

[root@mail03 ~]# vi /etc/postfix/main.cf

# add at the last line
content_filter = scan:127.0.0.1:10025
```

```
[root@mail03 ~]# vi /etc/postfix/main.cf

# add at the last line
content_filter = scan:127.0.0.1:10025

[root@mail03 ~]# vi /etc/postfix/master.cf

# add at the last line
scan unix -       -       n       -       16 smtp
     -o smtp_data_done_timeout=1200
     -o smtp_send_xforward_command=yes
     -o disable_dns_lookups=yes
127.0.0.1:10026 inet n    -       n       -       16 smtpd
     -o content_filter=
     -o local_recipient_maps=
     -o relay_recipient_maps=
     -o smtpd_restriction_classes=
     -o smtpd_client_restrictions=
     -o smtpd_helo_restrictions=
     -o smtpd_sender_restrictions=
     -o smtpd_recipient_restrictions=permit_mynetworks,reject
     -o mynetworks_style=host
     -o smtpd_authorized_xforward_hosts=127.0.0.0/8

[root@mail03 ~]# /etc/rc.d/init.d/clamsmtp-clamd start
Starting clamd.clamsmtp:                   [ OK ]
[root@mail03 ~]# /etc/rc.d/init.d/clamsmtpd start
Starting ClamSmtpd:                        [ OK ]
[root@mail03 ~]# /etc/rc.d/init.d/postfix restart
Shutting down postfix:                                 [ OK ]
Starting postfix:                                      [ OK ]
[root@mail03 ~]# chkconfig clamsmtp-clamd on
[root@mail03 ~]# chkconfig clamsmtpd on
```

These lines below are added in header section of emails after this configuration

```
X-Priority: 3
X-MSMail-Priority: Normal
Importance: Normal
X-Mailer: Microsoft Windows Live Mail 14.0.8117.416
X-MimeOLE: Produced By Microsoft MimeOLE V14.0.8117.416
X-Virus-Scanned: ClamAV using ClamSMTP
```

Try to send test virus with email, then it will not send to a mailbox and logs like below are recorded.

```
457 Nov  7 11:54:02 mail03 postfix/smtp[1351]: A747E62A9C: to=<fedora@mail03.vir
    tual.host>, relay=127.0.0.1[127.0.0.1]:10025, delay=5.6, delays=0.07/0.02/0.
    07/5.4, dsn=2.0.0, status=sent (250 Virus Detected; Discarded Email)
458 Nov  7 11:54:02 mail03 postfix/qmgr[1263]: A747E62A9C: removed
459 Nov  7 11:54:02 mail03 clamsmtpd: 100004: from=fedora@mail03.virtual.host, t
    o=fedora@mail03.virtual.host, status=VIRUS:Eicar-Test-Signature
```

25.9 Mail Log Analyzer-plogsumm

25.9.1Install pflogsumm that is Postfix mail log analyzer.

```
[root@mail03 ~]# yum -y install postfix-perl-scripts

# generate log summary for yesterday
[root@mail03 ~]# perl /usr/sbin/pflogsumm -d yesterday /var/log/maillog

Postfix log summaries for Nov 6

Grand Totals
------------
messages

     2 received
     2 delivered
     0 forwarded
     0 deferred
     0 bounced
     2 rejected (50%)
     0 reject warnings
     0 held
     0 discarded (0%)

     14379 bytes received
     14379 bytes delivered
        1 senders
        1 sending hosts/domains
        2 recipients
        1 recipient hosts/domains
```

```
Per-Hour Traffic Summary
    time            received    delivered   deferred    bounced     rejected
    ------------------------------------------------------------------------------
    0000-0100       0           0           0           0           0
    0100-0200       0           0           0           0           0
    0200-0300       0           0           0           0           0
    0300-0400       0           0           0           0           0
    0400-0500       0           0           0           0           0
    0500-0600       2           2           0           0           0
    0600-0700       0           0           0           0           0
    0700-0800       0           0           0           0           0
    0800-0900       0           0           0           0           0
    0900-1000       0           0           0           0           1
    1000-1100       0           0           0           0           0
    1100-1200       0           0           0           0           0
    1200-1300       0           0           0           0           0
    1300-1400       0           0           0           0           0
    1400-1500       0           0           0           0           0
    1500-1600       0           0           0           0           0
    1600-1700       0           0           0           0           1
    1700-1800       0           0           0           0           0
    1800-1900       0           0           0           0           0
    1900-2000       0           0           0           0           0
    2000-2100       0           0           0           0           0
    2100-2200       0           0           0           0           0
    2200-2300       0           0           0           0           0
    2300-2400       0           0           0           0           0

Host/Domain Summary: Message Delivery
    sent cnt        bytes       defers      avg dly     max dly     host/domain
    --------        -------     -------     -------     -------     -----------
    2               14379       0           2.1 s       4.1 s       server.world

Host/Domain Summary: Messages Received
    msg cnt         bytes       host/domain
    --------        -------     -----------
    2               14379       server.world

Senders by message count
```

```
    2 root@server.world

Recipients by message count
---------------------------
    1 fedora@server.world
    1 root@server.world

Senders by message size
-----------------------
    14379 root@server.world

Recipients by message size
--------------------------
    7214 fedora@server.world
    7165 root@server.world

message deferral detail: none

message bounce detail (by relay): none

message reject detail
---------------------
  RCPT
    Recipient address rejected: Access denied (total: 2)
    1 all9988@gmail.com
    1 candy59839@yahoo.com.tw

message reject warning detail: none

message hold detail: none

message discard detail: none

smtp delivery failures: none

Warnings: none

Fatal Errors: none

Panics: none

Master daemon messages: none

[root@mail03 ~]# crontab -e

# send mail log summary at AM 1:00 everyday to root
00 01 * * * perl /usr/sbin/pflogsumm -e -d yesterday /var/log/maillog | mail -s 'Logwatch for Postfix' root
```

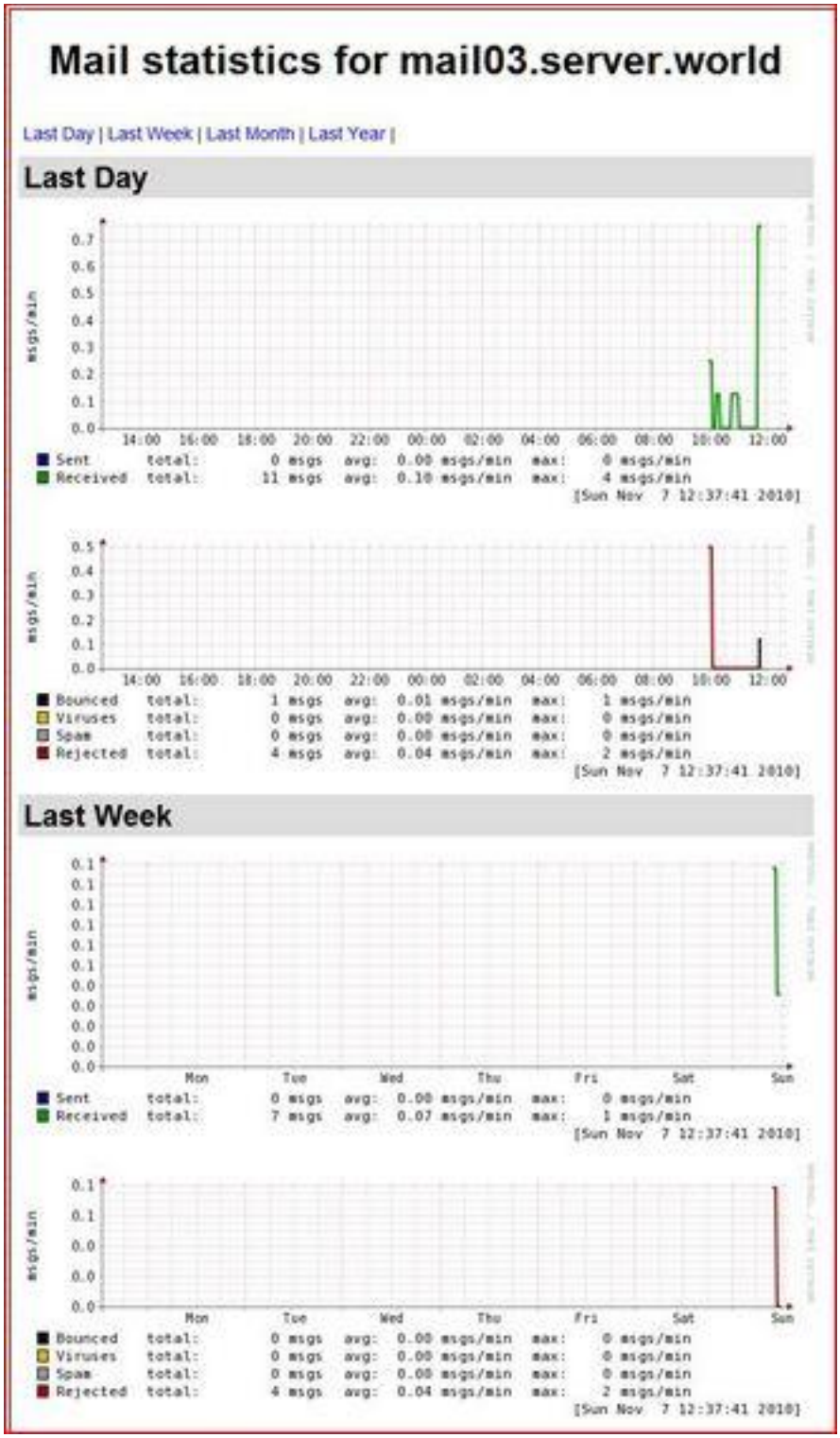
25.10 Mail Log Analzer-MailGraph

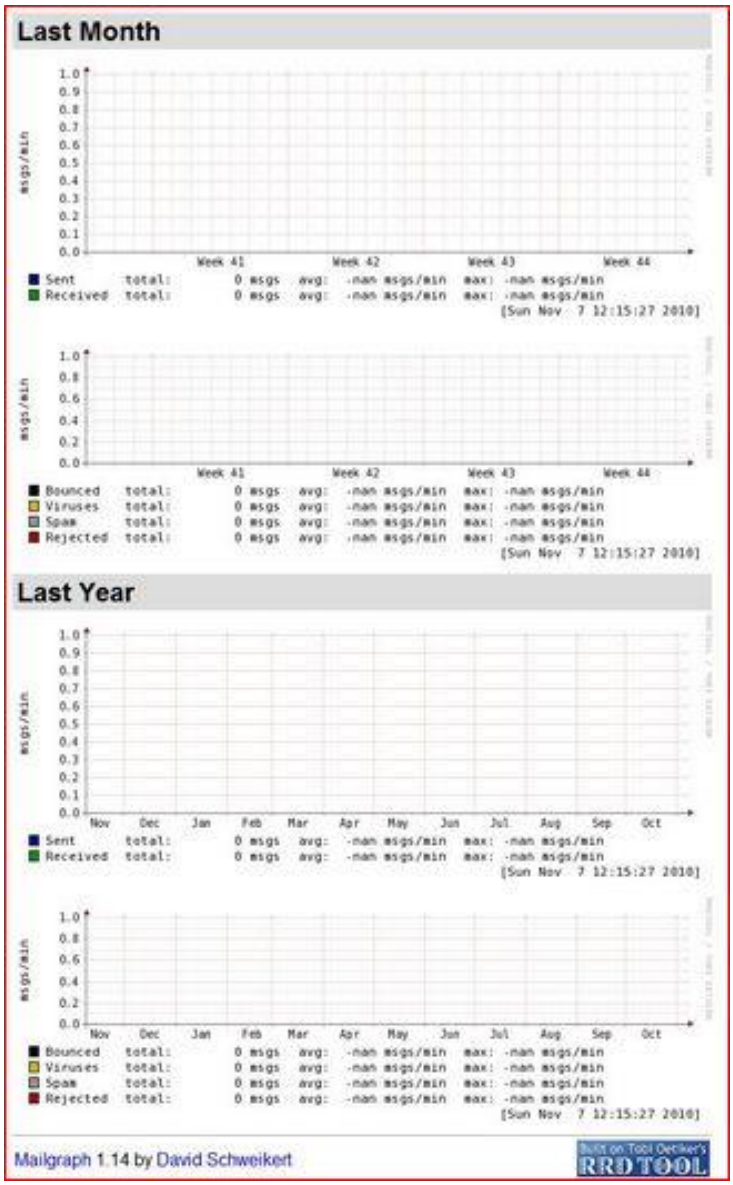
Install maillog analyzer MailGraph. Web Server is also necessarry to be installed.

25.10.1 Install MailGraph

```
[root@mail03 ~]# yum -y install mailgraph

[root@mail03 ~]# vi /etc/httpd/conf.d/mailgraph.conf

Alias /mailgraph /usr/share/mailgraph

AddHandler cgi-script .cgi

<Directory /usr/share/mailgraph/>
   AllowOverride None
   Options +ExecCGI
   DirectoryIndex mailgraph.cgi

   Order Deny,Allow
   Deny from all
   Allow from 127.0.0.1 10.0.0.0/24# IP address you allow
</Directory>

[root@mail03 ~]# /etc/rc.d/init.d/mailgraph start
Starting mailgraph:          [  OK  ]
[root@mail03 ~]# /etc/rc.d/init.d/httpd restart
Stopping httpd:              [  OK  ]
Starting httpd:              [  OK  ]
[root@mail03 ~]# chkconfig mailgraph on
```

25.10.2 Access to 'http://(your server's name or IP address)/mailgraph/' with web browser. Then following screen is shown and it's possible to make sure mail log summary


Mail statistics for mail03.server.world
Last Day | Last Week | Last Month | Last Year |
Last Day
msgs/min
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
14:00 16:00 18:00 20:00 22:00 00:00 02:00 04:00 06:00 08:00 10:00 12:00
Sent total: 0 msgs avg: 0.00 msgs/min max: 0 msgs/min
Received total: 11 msgs avg: 0.10 msgs/min max: 4 msgs/min
[Sun Nov 7 12:37:41 2010]
msgs/min
0.5
0.4
0.3
0.2
0.1
0.0
14:00 16:00 18:00 20:00 22:00 00:00 02:00 04:00 06:00 08:00 10:00 12:00
Bounced total: 1 msgs avg: 0.01 msgs/min max: 1 msgs/min
Viruses total: 0 msgs avg: 0.00 msgs/min max: 0 msgs/min
Spam total: 0 msgs avg: 0.00 msgs/min max: 0 msgs/min
Rejected total: 4 msgs avg: 0.04 msgs/min max: 2 msgs/min
[Sun Nov 7 12:37:41 2010]
Last Week
msgs/min
0.1
0.1
0.1
0.1
0.1
0.1
0.0
0.0
0.0
0.0
Mon Tue Wed Thu Fri Sat Sun
Sent total: 0 msgs avg: 0.00 msgs/min max: 0 msgs/min
Received total: 7 msgs avg: 0.07 msgs/min max: 1 msgs/min
[Sun Nov 7 12:37:41 2010]
msgs/min
0.1
0.1
0.0
0.0
0.0
Mon Tue Wed Thu Fri Sat Sun
Bounced total: 0 msgs avg: 0.00 msgs/min max: 0 msgs/min
Viruses total: 0 msgs avg: 0.00 msgs/min max: 0 msgs/min
Spam total: 0 msgs avg: 0.00 msgs/min max: 0 msgs/min
Rejected total: 4 msgs avg: 0.04 msgs/min max: 2 msgs/min
[Sun Nov 7 12:37:41 2010]


Last Month
msgs/min
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Week 41
Week 42
Week 43
Week 44
Sent total: 0 msgs avg: -nan msgs/min max: -nan msgs/min
Received total: 0 msgs avg: -nan msgs/min max: -nan msgs/min
[Sun Nov 7 12:15:27 2010]
msgs/min
1.0
0.8
0.6
0.4
0.2
0.0
Week 41
Week 42
Week 43
Week 44
Bounced total: 0 msgs avg: -nan msgs/min max: -nan msgs/min
Viruses total: 0 msgs avg: -nan msgs/min max: -nan msgs/min
Spam total: 0 msgs avg: -nan msgs/min max: -nan msgs/min
Rejected total: 0 msgs avg: -nan msgs/min max: -nan msgs/min
[Sun Nov 7 12:15:27 2010]
Last Year
msgs/min
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Sent total: 0 msgs avg: -nan msgs/min max: -nan msgs/min
Received total: 0 msgs avg: -nan msgs/min max: -nan msgs/min
[Sun Nov 7 12:15:27 2010]
msgs/min
1.0
0.8
0.6
0.4
0.2
0.0
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Bounced total: 0 msgs avg: -nan msgs/min max: -nan msgs/min
Viruses total: 0 msgs avg: -nan msgs/min max: -nan msgs/min
Spam total: 0 msgs avg: -nan msgs/min max: -nan msgs/min
Rejected total: 0 msgs avg: -nan msgs/min max: -nan msgs/min
[Sun Nov 7 12:15:27 2010]
Mailgraph 1.14 by David Schweikert
Built on Tobi Oetiker's
RRDTOOL

25.11 Mail Log Analzer-Awstats

Install maillog analyzer AWstats. Web Server is also needed. Web Server is also necessarry to be installed.

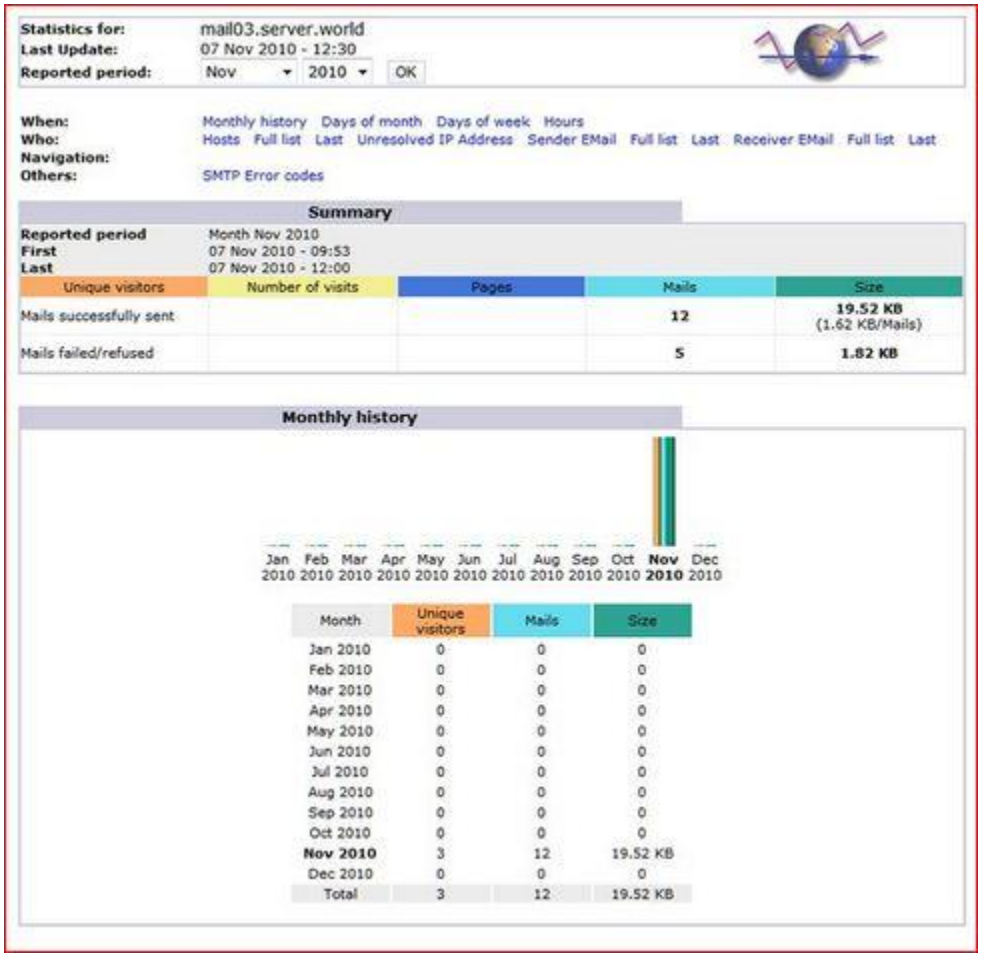
25.11.1 Install AWstats

```
[root@mail03 ~]# yum -y install awstats

[root@mail03 ~]# vi /etc/awstats/awstats.mail03.server.world.conf   # this file that has hostname is already created automatically

# line 51: change
LogFile="/usr/share/awstats/tools/maillogconvert.pl standard < /var/log/maillog |"

# line 63: change
LogType=M

# line 122 make it comment / add the line below
# LogFormat=1
LogFormat="%time2 %email %email_r %host %host_r %method %url %code %bytesd"

# line 153 specify hostname
SiteDomain="mail03.server.world""

# line 830: change like below
LevelForBrowsersDetection=0
LevelForOSDetection=0
LevelForRefererAnalyze=0
LevelForRobotsDetection=0
LevelForSearchEnginesDetection=0
LevelForKeywordsDetection=0
LevelForFileTypesDetection=0
LevelForWormsDetection=0
```

```
# line 948: change like below
ShowMonthStats=UHB
ShowDaysOfMonthStats=HB
ShowDaysOfWeekStats=HB
ShowHoursStats=HB
ShowDomainsStats=0
ShowHostsStats=HBL
ShowRobotsStats=0
ShowEMailSenders=HBML
ShowEMailReceivers=HBML
ShowSessionsStats=0
ShowPagesStats=0
ShowFileTypesStats=0
ShowOSStats=0
ShowBrowsersStats=0
ShowOriginStats=0
ShowKeyphrasesStats=0
ShowKeywordsStats=0
ShowMiscStats=0
ShowHTTPErrorsStats=0
ShowSMTPErrorsStats=1

[root@mail03 ~]# vi /etc/httpd/conf.d/awstats.conf

# add Alias
Alias /report "/usr/share/awstats/wwwroot/"
<Directory "/usr/share/awstats/wwwroot">
    Options None
    AllowOverride None
    Order allow,deny
    Allow from 127.0.0.1 10.0.0.0/24  # IP address you allow
</Directory>
```

```
[root@mail03 ~]# /etc/rc.d/init.d/httpd restart
Stopping httpd:            [  OK  ]
Starting httpd:            [  OK  ]

# generate reports
[root@mail03 ~]# /usr/share/awstats/wwwroot/cgi-bin/awstats.pl -config=mail03.server.world -update
Create/Update database for config "/etc/awstats/awstats.mail03.server.world.conf" by AWStats version 6.95 (build 1.943)
From data in log file "/usr/share/awstats/tools/maillogconvert.pl standard < /var/log/maillog |"...
Phase 1 : First bypass old records, searching new record...
Searching new records from beginning of log file...
Phase 2 : Now process new records (Flush history on disk after 20000 hosts)...
Jumped lines in file: 0
Parsed lines in file: 172
Found 6 dropped records,
Found 0 corrupted records,
Found 0 old records,
Found 166 new qualified records.
# generate HTML from reports
[root@mail03 ~]# /usr/share/awstats/wwwroot/cgi-bin/awstats.pl -config=mail03.server.world -output -staticlink > /usr/share/awstats/wwwroot/index.html

# change cron
[root@mail03 ~]# vi /etc/cron.hourly/awstats

#!/bin/bash
# make it comment
#exec /usr/share/awstats/tools/awstats_updateall.pl now -configdir="/etc/awstats" -awstatsprog="/usr/share/awstats/wwwroot/cgi-bin/awstats.pl" >
/dev/null
# add
/usr/share/awstats/wwwroot/cgi-bin/awstats.pl -config=mail03.server.world -update > /dev/null
/usr/share/awstats/wwwroot/cgi-bin/awstats.pl -config=mail03.server.world -output -staticlink > /usr/share/awstats/wwwroot/index.html
exit 0
```

25.11.2 Access to 'http://(your server's name or IP address)/report/' with web browser. Then following screen is shown and it's possible to make sure mail log summary



Statistics for: mail03.server.world
Last Update: 07 Nov 2010 - 12:30
Reported period: Nov 2010 OK

When: Monthly history Days of month Days of week Hours
Who: Hosts Full list Last Unresolved IP Address Sender EMail Full list Last Receiver EMail Full list Last
Navigation:
Others: SMTP Error codes

Summary

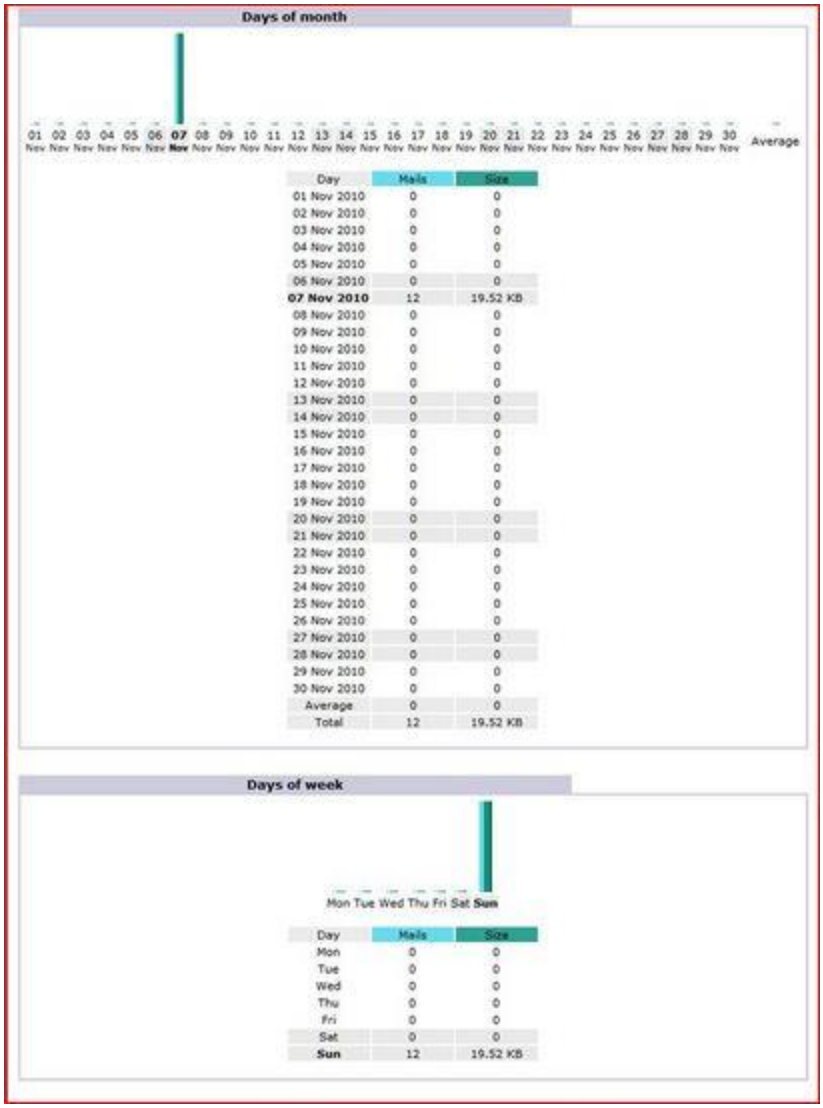
Reported period: Month Nov 2010
First: 07 Nov 2010 - 09:53
Last: 07 Nov 2010 - 12:00

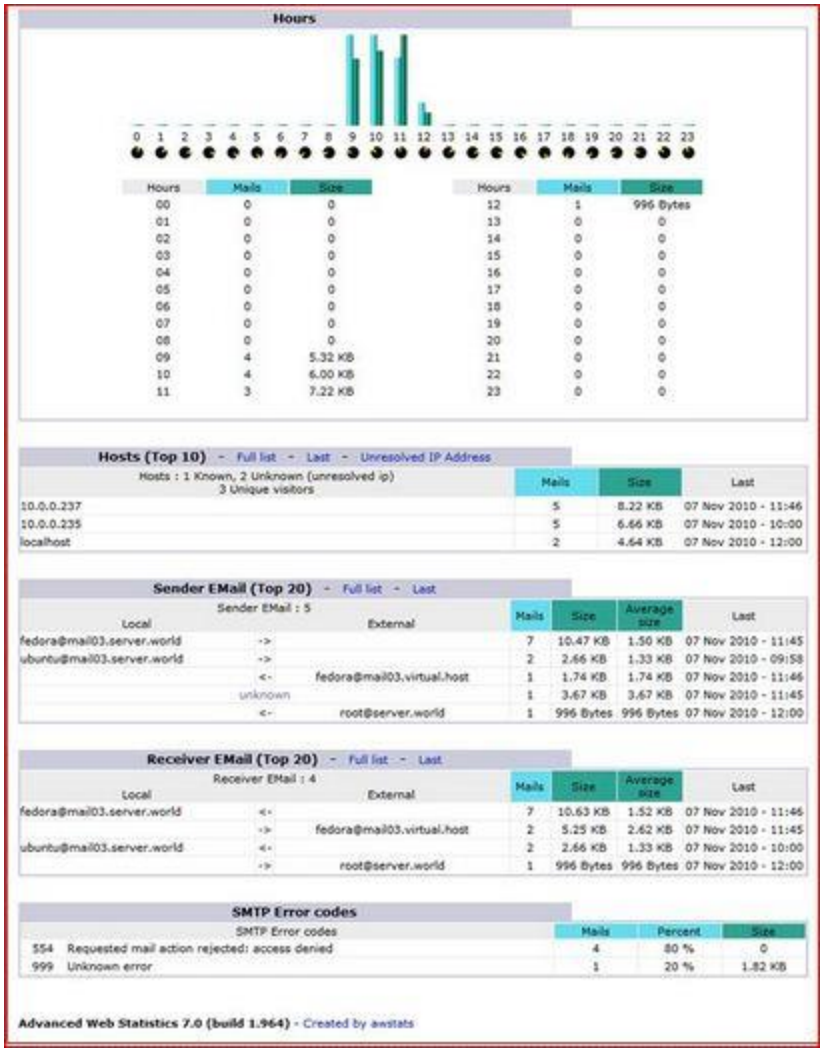
Unique visitors	Number of visits	Pages	Mails	Size
Mails successfully sent			12	19.52 KB (1.62 KB/Mails)
Mails failed/refused			5	1.82 KB

Monthly history

Jan 2010 Feb 2010 Mar 2010 Apr 2010 May 2010 Jun 2010 Jul 2010 Aug 2010 Sep 2010 Oct 2010 **Nov 2010** Dec 2010

Month	Unique visitors	Mails	Size
Jan 2010	0	0	0
Feb 2010	0	0	0
Mar 2010	0	0	0
Apr 2010	0	0	0
May 2010	0	0	0
Jun 2010	0	0	0
Jul 2010	0	0	0
Aug 2010	0	0	0
Sep 2010	0	0	0
Oct 2010	0	0	0
Nov 2010	3	12	19.52 KB
Dec 2010	0	0	0
Total	3	12	19.52 KB


Days of month
01 Nov 02 Nov 03 Nov 04 Nov 05 Nov 06 Nov 07 Nov 08 Nov 09 Nov 10 Nov 11 Nov 12 Nov 13 Nov 14 Nov 15 Nov 16 Nov 17 Nov 18 Nov 19 Nov 20 Nov 21 Nov 22 Nov 23 Nov 24 Nov 25 Nov 26 Nov 27 Nov 28 Nov 29 Nov 30 Nov Average
Day Mails Size
01 Nov 2010 0 0
02 Nov 2010 0 0
03 Nov 2010 0 0
04 Nov 2010 0 0
05 Nov 2010 0 0
06 Nov 2010 0 0
07 Nov 2010 12 19.52 KB
08 Nov 2010 0 0
09 Nov 2010 0 0
10 Nov 2010 0 0
11 Nov 2010 0 0
12 Nov 2010 0 0
13 Nov 2010 0 0
14 Nov 2010 0 0
15 Nov 2010 0 0
16 Nov 2010 0 0
17 Nov 2010 0 0
18 Nov 2010 0 0
19 Nov 2010 0 0
20 Nov 2010 0 0
21 Nov 2010 0 0
22 Nov 2010 0 0
23 Nov 2010 0 0
24 Nov 2010 0 0
25 Nov 2010 0 0
26 Nov 2010 0 0
27 Nov 2010 0 0
28 Nov 2010 0 0
29 Nov 2010 0 0
30 Nov 2010 0 0
Average 0 0
Total 12 19.52 KB
Days of week
Mon Tue Wed Thu Fri Sat Sun
Day Mails Size
Mon 0 0
Tue 0 0
Wed 0 0
Thu 0 0
Fri 0 0
Sat 0 0
Sun 12 19.52 KB



Hours

Hours	Mails	Size	Hours	Mails	Size
00	0	0	12	1	996 Bytes
01	0	0	13	0	0
02	0	0	14	0	0
03	0	0	15	0	0
04	0	0	16	0	0
05	0	0	17	0	0
06	0	0	18	0	0
07	0	0	19	0	0
08	0	0	20	0	0
09	4	5.32 KB	21	0	0
10	4	6.00 KB	22	0	0
11	3	7.22 KB	23	0	0

Hosts (Top 10) - Full list - Last - Unresolved IP Address

Hosts : 1 Known, 2 Unknown (unresolved ip) 3 Unique visitors	Mails	Size	Last
10.0.0.237	5	8.22 KB	07 Nov 2010 - 11:46
10.0.0.235	5	6.66 KB	07 Nov 2010 - 10:00
localhost	2	4.64 KB	07 Nov 2010 - 12:00

Sender EMail (Top 20) - Full list - Last

Sender EMail : 5 Local		External	Mails	Size	Average size	Last
fedora@mail03.server.world	->		7	10.47 KB	1.50 KB	07 Nov 2010 - 11:45
ubuntu@mail03.server.world	->		2	2.66 KB	1.33 KB	07 Nov 2010 - 09:58
	<-	fedora@mail03.virtual.host	1	1.74 KB	1.74 KB	07 Nov 2010 - 11:46
	unknown		1	3.67 KB	3.67 KB	07 Nov 2010 - 11:45
	<-	root@server.world	1	996 Bytes	996 Bytes	07 Nov 2010 - 12:00

Receiver EMail (Top 20) - Full list - Last

Receiver EMail : 4 Local		External	Mails	Size	Average size	Last
fedora@mail03.server.world	<-		7	10.63 KB	1.52 KB	07 Nov 2010 - 11:46
	->	fedora@mail03.virtual.host	2	5.25 KB	2.62 KB	07 Nov 2010 - 11:45
ubuntu@mail03.server.world	<-		2	2.66 KB	1.33 KB	07 Nov 2010 - 10:00
	->	root@server.world	1	996 Bytes	996 Bytes	07 Nov 2010 - 12:00

SMTP Error codes

SMTP Error codes		Mails	Percent	Size
554	Requested mail action rejected: access denied	4	80 %	0
999	Unknown error	1	20 %	1.82 KB

Advanced Web Statistics 7.0 (build 1.964) - Created by awstats

Chapter 26 # Samba Server

Samba គឺជា serverមួយដែលប្រើសំរាប់ធ្វើការរ Shair resource ជាង Osដ៏ទៃ (os Microsoft) ។ហើយវាក៏អាចShair resovrec រវាង Linux ដូចគ្នាដែរ។ដើម្បីអាចប្រើ Service នេះបានយើងត្រូវ Install មួយដែលមានឈ្មោះថា Samba….fcs.ib86.rpm.

បន្ទាប់ពីInstallហើយយើងត្រូវ Configre fileមួយដែលមានឈ្មោះថាSmb.conf នៅក្នុងទីតាំង #/etc/sambo/smbr conf/

នៅក្នុង File នេះវាចែកចេញជាBloke គឺbloke នីមួយៗត្រូវសរសេរនៅក្នុង[ ] ហើយខាងក្រោមជាParameter (Paramat = គឺតំលៃប្រែប្រួល អាចកែប្រែប្រួលបាន)។

- Bloke ទាំងអស់រួមមាន

  -[globle] :សំរាប់កំណត់ប៉ារ៉ាម៉ែត្រួមសំរាប់ទៅអោយផ្នែកដ៏ទៃ

  -[Printers]: សំរាប់Shair priter

  -[homes]:ប្រើសំរាប់កំណត់home user log on

  -[net log on]: សំរាប់ផ្ទុកទៅដោយ Script

  -[Profle]:សំរាប់ផ្ទុកកំណត់Paramet ដែលទាក់ទង t profile user Account។

Sambo….fcio i386 tpm សំរាប់ serverមុនពេលវាទាមទា Samba-Common….fclo.rpm

Samba-clienf:គឺដើម្បីConneet ជាមួយClientSystem-config-samba:សំរាប់Configure លើGrapic Desk Topប៉ារ៉ាម៉ែត្រនៅក្នុងផ្នែកGloble

-Secority = ជាDefualtវាស្មើ userពេលនោះSambo server អាចក្លាយទៅជាPDC (Primany Controler) រឺជាwork station បើសិនវាស្មើDomainពេលនៅវានិងក្លាយជាសមាជិកនៃPDC

26.1 Create a Fully accessed directory

Install Samba and Create a shared directory that anybody can read and write, and

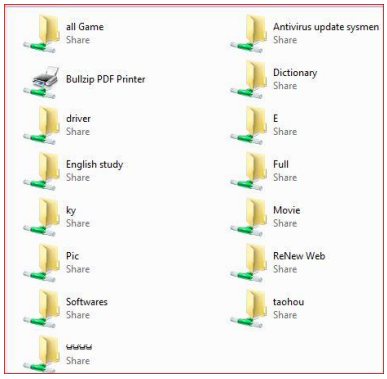
authentication is not needed.

26.1.1Install Samba

```
[root@lan03 ~]# yum -y install samba

[root@lan03 ~]# mkdir /home/share
[root@lan03 ~]# chmod 777 /home/share
[root@lan03 ~]# vi /etc/samba/smb.conf

# near line 66: add
unix charset = UTF-8

# line 87: change (Windows' default)
workgroup = WORKGROUP

# line 93: uncomment and change IP address you allow
hosts allow = 127. 10.0.0.

# line 119: change (no auth)
security = share

# add at the bottom
[Share]                 # any name you like
   path = /home/share   # shared directory
   writable = yes       # OK to write
   guest ok = yes       # guest OK
   guest only = yes     # guest only
   create mode = 0777   # fully accessed
   directory mode = 0777  # fully accessed
   share modes = yes    # warn if some people access to a file

[root@lan03 ~]# /etc/rc.d/init.d/smb start
Starting SMB services:      [  OK  ]
[root@lan03 ~]# chkconfig smb on
```

26.1.2 Configure on Windows client. This example is on Windows 7. Select [My Computer] - [Map Network Drive] like following example.

26.1.3 Specify shared folder's place in Folder section like example and Click 'Finish' button to enter.



26.1.4 Done to access to shared folder.

26.2 Create a limited directory

Create a shared directory that requires user authentication.

26.2.1 Configure Samba

```
[root@lan03 ~]# groupadd security
[root@lan03 ~]# mkdir /home/security
[root@lan03 ~]# chgrp security /home/security
[root@lan03 ~]# chmod 2770 /home/security
[root@lan03 ~]# vi /etc/samba/smb.conf

# line 119: change ( require auth )
security = user

# add at the bottom
[Security]                  # any name you like
   path = /home/security
   writable = yes
   create mode = 0770
   directory mode = 0770
   share modes = yes
   guest ok = no            # guest not allowed
   valid users = @security  # allow only security group

[root@lan03 ~]# /etc/rc.d/init.d/smb restart
Shutting down SMB services:  [  OK  ]
Starting SMB services:       [  OK  ]
[root@lan03 ~]# smbpasswd -a fedora# add a user in Samba
New SMB password:                  # set password
Retype new SMB password:           # verify
Added user fedora.
[root@lan03 ~]# vi /etc/group

security:x:502:fedora       # add
```

26.2.2 Configure on Windows client. This example is on Windows 7. Select [My Computer] - [Map Network Drive] like following example.

26.2.3 Input '\\(server)\(shared directory)'

26.2.4 Password is required. Input the one set in [1].

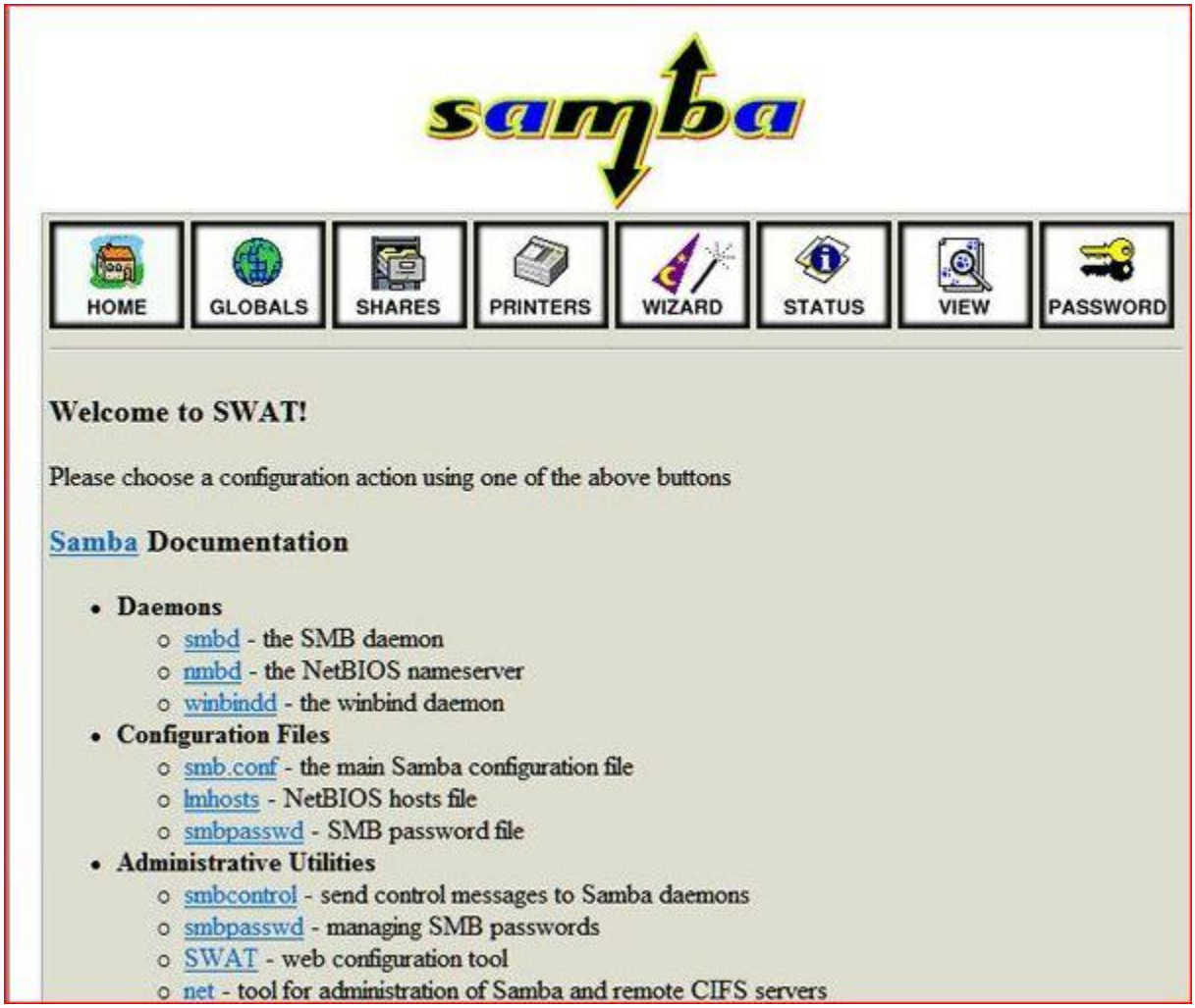
26.3 Install Swat

Install SWAT to configure Samba from Web browser.

26.3.1Install xinetd first because it's needed

```
[root@lan03 ~]# yum -y install xinetd samba-swat

[root@lan03 ~]# vi /etc/xinetd.d/swat

# line 10: add IP address you permit
only_from = 127.0.0.1 10.0.0.0/24

# line 14: change
disable = no

[root@lan03 ~]# /etc/rc.d/init.d/xinetd start
Starting xinetd:                [  OK  ]
[root@lan03 ~]# chkconfig xinetd on
```

26.3.2 Access to [http://(server's hostname or IP address):901]. After accessing, user name and password is required to login. Input for root's one in it and login, then following screen is shown and you can configure samba on browser



Chapter 27 Proxy Server

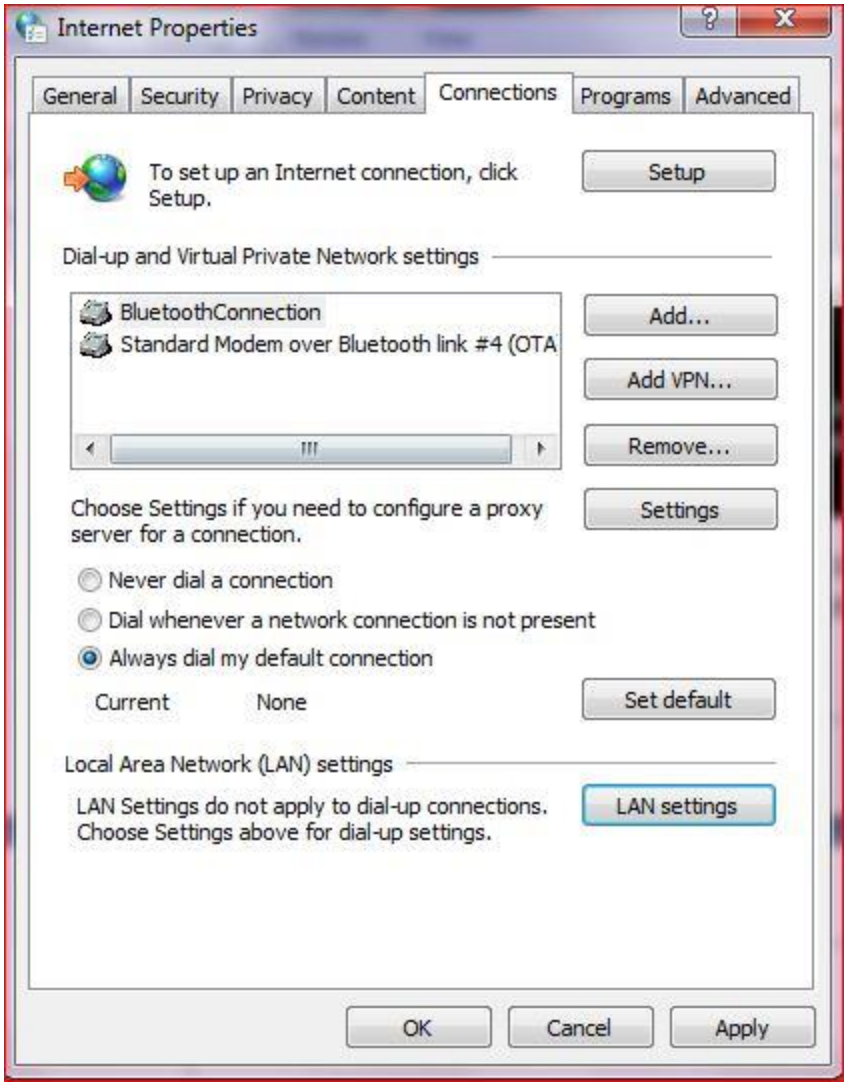
27.1 Install Squid

Configure Proxy server and make web browzing fast. Install Squid for it.

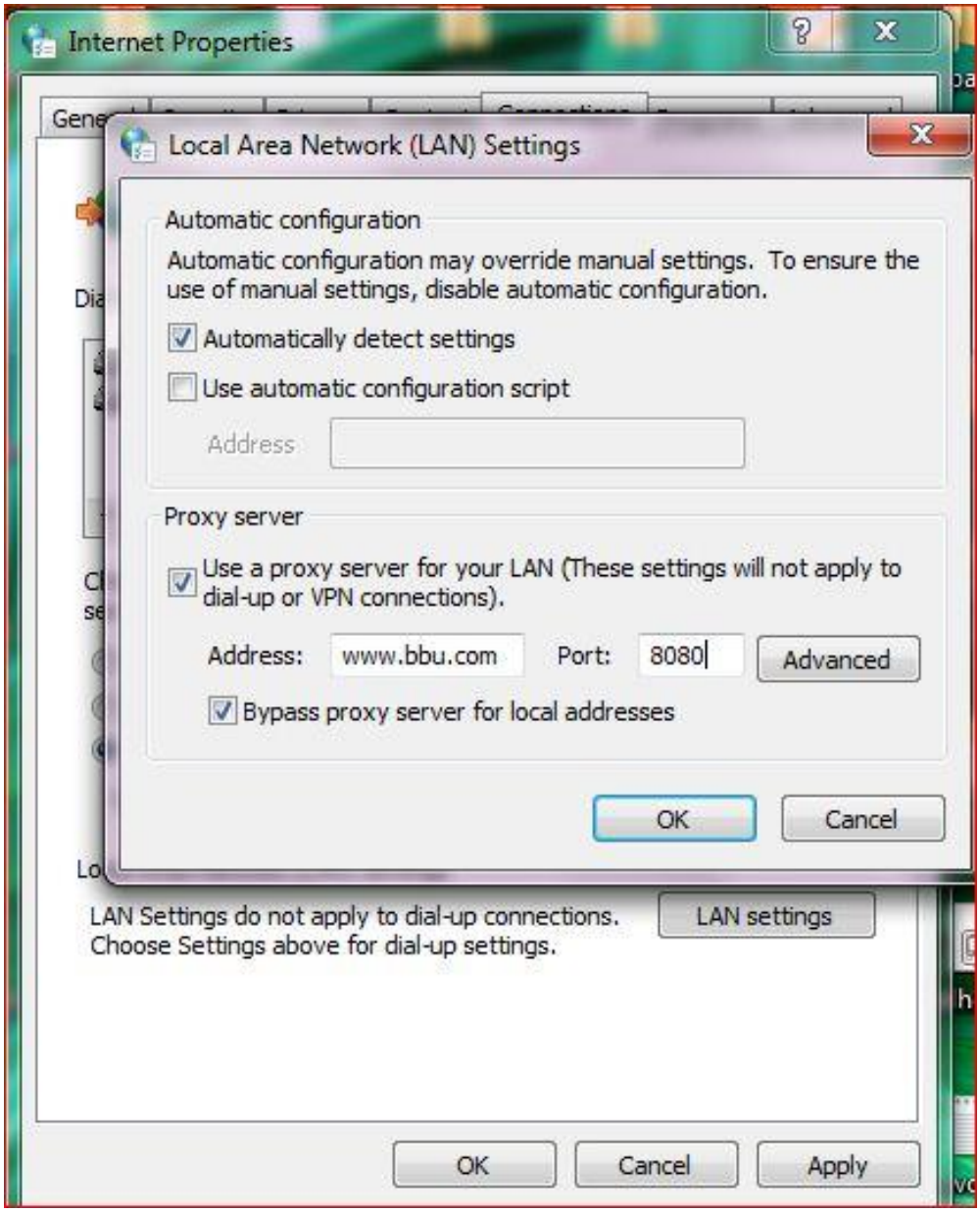
27.1.1 Install and configure Squid

```
[root@lan03 ~]# yum -y install squid

[root@lan03 ~]# vi /etc/squid/squid.conf

# line 11: maike it comment all
#acl localnet src 10.0.0.0/8
#acl localnet src 172.16.0.0/12
#acl localnet src 192.168.0.0/16
#acl localnet src fc00::/7
#acl localnet src fe80::/10
# line 16: add ( range you allow to access )
acl lan src 10.0.0.0/24

# line 55: make it comment
#http_access allow localnet
http_access allow localhost
# line 57: add ( allow 'lan' above )
http_access allow lan
# And finally deny all other access to this proxy
http_access deny all

# line 62: change
http_port 8080

# add at the last line
request_header_access X-Forwarded-For deny all
request_header_access Via deny all
request_header_access Cache-Control deny all

# add (specify hostname)
visible_hostname lan03.server.world

# add (hide IP address)
forwarded_for off

[root@lan03 ~]# /etc/rc.d/init.d/squid start
init_cache_dir /var/spool/squid... Starting squid: OK ]
[root@lan03 ~]# chkconfig squid on
```

27.1.2 Start Web browser on your client PC. This is the example on Internet Explorer 8. Select [Tools] - [Internet Options] and move to [Connections] tab like below



27.1.3 Check 'use a proxy' and input server's hostname and port number set in the section [1]. Then, you can access to internet through proxy server



27.2 Run with clamav-Squid Clamav

Install SquidClamav and Configure Proxy Server in order to scan download files to protect from virus. Install clamav first.

27.2.1 Install Clamav-server first

```
[root@lan03 ~]# yum -y install clamav-server

[root@lan03 ~]# cp /usr/share/doc/clamav-server-0.96.3/clamd.conf /etc/clamd.d/squid.conf
[root@lan03 ~]# vi /etc/clamd.d/squid.conf

# line 8: make it comment
#Example

# line 14: uncomment and change
LogFile /var/log/clamd.squid

# line 62: uncomment and change
PidFile /var/run/clamd.squid/clamd.pid

# line 66: uncomment
TemporaryDirectory /var/tmp

# line 81: uncomment and change
LocalSocket /var/run/clamd.squid/clamd.sock

# line 97: uncomment
TCPSocket 3310

# line 191: change
User squidclamav

[root@lan03 ~]# useradd -d /var/tmp -s /sbin/nologin squidclamav
useradd: warning: the home directory already exists.
Not copying any file from skel directory into it.
[root@lan03 ~]# mkdir /var/run/clamd.squid
[root@lan03 ~]# chown squidclamav. /var/run/clamd.squid
[root@lan03 ~]# cp /usr/share/doc/clamav-server-0.96.3/clamd.sysconfig /etc/sysconfig/clamd.squid
[root@lan03 ~]# vi /etc/sysconfig/clamd.squid

# line 1,2: uncomment and change
CLAMD_CONFIGFILE=/etc/clamd.d/squid.conf
CLAMD_SOCKET=/var/run/clamd.squid/clamd.sock

[root@lan03 ~]# cp /usr/share/doc/clamav-server-0.96.3/clamd.init /etc/rc.d/init.d/clamd.squid
[root@lan03 ~]# vi /etc/rc.d/init.d/clamd.squid

# line 6: change
CLAMD_SERVICE=squid

[root@lan03 ~]# chmod 755 /etc/rc.d/init.d/clamd.squid
[root@lan03 ~]# touch /var/log/clamd.squid
[root@lan03 ~]# chown squidclamav. /var/log/clamd.squid
[root@lan03 ~]# chmod 600 /var/log/clamd.squid
[root@lan03 ~]# /etc/rc.d/init.d/clamd.squid start
Starting clamd.squid:  [ OK ]
[root@lan03 ~]# chkconfig --add clamd.squid
[root@lan03 ~]# chkconfig clamd.squid on
```

27.2.2 Install SquidClamav

```
[root@lan03 ~]# yum -y install curl-devel

[root@lan03 ~]# wget http://ftp.jaist.ac.jp/pub/sourceforge/s/project/sq/squidclamav/squidclamav/5.6/squidclamav-5.6.tar.gz
[root@lan03 ~]# tar zxvf squidclamav-5.6.tar.gz
[root@lan03 ~]# cd squidclamav-5.6
[root@lan03 squidclamav-5.6]# ./configure
[root@lan03 squidclamav-5.6]# make
[root@lan03 squidclamav-5.6]# make install
[root@lan03 squidclamav-5.6]# cd
[root@lan03 ~]# rm -rf squidclamav-5.6
[root@lan03 ~]# vi /etc/squidclamav.conf

# line 12: change
squid_port 8080

# line 15: change ( destination URL for redirect. Create it first )
redirect http://www03.server.world/error.html

# line 20: change
clamd_local /var/run/clamd.squid/clamd.sock

# line 21: uncomment and change
clamd_ip 127.0.0.1

# line 22: uncomment
clamd_port 3310

# line 35 and later: make it comment all (but never make it comment if you'd like to enable to scan a kind of file)
# Do not scan images
# abort ^.*\.(ico|gif|png|jpg)$
# abortcontent ^image\/.*$
#
```

27.2.3 Configure Squid

```
[root@lan03 ~]# vi /etc/squid/squid.conf

# line 7: add
acl purge method PURGE

# line 46: uncomment
http_access deny to_localhost

# line 57: add
# http_access allow localnet
http_access allow localhost
http_access allow purge localhost
http_access deny purge
http_access allow lan

# add at the last line
url_rewrite_access deny localhost
url_rewrite_program /usr/local/bin/squidclamav
url_rewrite_children 15

[root@lan03 ~]# touch /var/log/squid/squidclamav.log
[root@lan03 ~]# chown squid. /var/log/squid/squidclamav.log
[root@lan03 ~]# /etc/rc.d/init.d/squid restart
Stopping squid: .....                      [  OK  ]
Starting squid: .                          [  OK  ]
```

27.2.4 Try to access to a page that has trial virus from here
http://www.eicar.org/anti_virus_test_file.htm
Click 'eicar.com' and rty to download it. Then, the error page that is set in the config of squidclamav. Virus is blocked normally.

27.1.2 Run with SquidGuard

Run Squid with SquidGuard that is a URL redirector. Configure squidClamav first.

27.3.1 Install and configure SquidGuard (this config is most simply example)

```
[root@lan03 ~]# yum -y install squidGuard

[root@lan03 ~]# mv /etc/squid/squidGuard.conf /etc/squid/squidGuard.conf.sample
[root@lan03 ~]# vi /etc/squid/squidGuard.conf

# create new
dbhome /var/squidGuard/blacklists
logdir /var/log/squid

# define a category 'dame'
dest dame {
    # prohibited domain list
    domainlist dame/domains
    # prohibited url list
    urllist dame/urls
    }

acl {
    default {
        # allow to access except 'dame'
        pass !dame all
        # redirect URL
        redirect http://www03.server.world/error.html
    }
}

[root@lan03 ~]# cd /var/squidGuard
[root@lan squidGuard]# tar zxvf blacklists.tar.gz
[root@lan squidGuard]# mkdir ./blacklists/dame
[root@lan squidGuard]# vi ./blacklists/dame/domains

# write domains you'd like to prohibit to access
yahoo.co.jp
example.com

[root@lan squidGuard]# vi ./blacklists/dame/urls

# write URLs you'd like to prohibit to access
www.yahoo.co.jp/deny/
www.example.com/
```

```
[root@lan squidGuard]# cd
[root@lan03 ~]# squidGuard -C all
[root@lan03 ~]# chown -R squid. /var/squidGuard/blacklists/dame
[root@lan03 ~]# vi /etc/squidclamav.conf

# line 16: uncomment and change PATH
squidguard /usr/bin/squidGuard

[root@lan03 ~]# /etc/rc.d/init.d/squid restart
Stopping squid: .....                      [  OK  ]
Starting squid: .                          [  OK  ]
```

27.3.2 Try to access to Yahoo set as prohibited domain in [1]. Prohibited domain is blicked normally

27.4 Configure as a reverse proxy

Configure Squid as a reverse proxy server. It is useful for improving server's performance or security.

27.4.1 Configure Squid

```
[root@lan03 ~]# vi /etc/squid/squid.conf

# near line 60: add (allow all http access)
http_access allow all

# line 64: specify Web server's IP address which listens requests
http_port 80 defaultsite=10.0.0.31

# line 71: add
cache_peer 10.0.0.31 parent 80 0 no-query originserver

[root@lan03 ~]# /etc/rc.d/init.d/squid restart
Stopping squid:          [  OK  ]
Starting squid:          [  OK  ]
```

27.4.2 Change Settings of DNS or router if needed, and access to verify settings


http://lan03.server.world/index.html - Windows Internet Explorer
http://lan03.server.world/index.html
Bing
お気に入り
http://lan03.server.world/inde...
ページ(P)
ツール(O)
www03.server.world
インターネット | 保護モード: 無効
100%

Chapter 28 VNC Server

28.1 Install and Configure

28.1.1 Install VNC Server to operate Fedora with GUI remotely from Windows client

```
[root@dlp ~]# yum -y install tigervnc-server

[root@dlp ~]# su - fedora       # switch to a user you'd like to config VNC
[fedora@dlp ~]$ vncpasswd       # set VNC password
Password:                       # input
Verify:                         # verify
[fedora@dlp ~]$ vncserver :1    # start
xauth: (stdin):1: bad display name "dlp.server.world:1" in "add" command
New 'dlp.server.world:1 (fedora)' desktop is dlp.server.world:1

Creating default startup script /home/fedora/.vnc/xstartup
Starting applications specified in /home/fedora/.vnc/xstartup
Log file is /home/fedora/.vnc/dlp.server.world:1.log
[fedora@dlp ~]$ vncserver -kill #1stop
Killing Xvnc process ID 9894
[fedora@dlp ~]$ vi /home/fedora/.vnc/xstartup

#twm &                  # last line: make it comment
exec gnome-session &    # run Ghome

# run with diplay number '1', screen resolution '800x600', color depth '24'
[fedora@dlp ~]$ vncserver :1 -geometry 800x600 -depth 24
```

28.1.2 Install VNC viewer on client computer next. Download from the site below to install

http://www.realvnc.com/products/free/4.1/download.html

Start VNC viewer after installing. Then following scrren is shown. Input [(Server's hostname or IP address):(display number)] like following example.

28.1.3 Password is required. Input VNC password you set in the section [28.1.1]

28.1.4 Just Connected