ប្រព័ន្ធប្រតិបត្តិការលីនុច

គោលបំណង

- ការណែនាំឲ្យស្គាល់អំពីប្រព័ន្ធប្រតិបត្តិការលីនុច

- អត្ថប្រយោជន៍លីនុច

- ភាពខុសគ្នារវាងលីនុច និងវីនដូ

ស្វែងយល់អំពីលីនុច

សេចក្តីផ្តើម

កុំព្យូទ័រអាចដំណើរការបានអាស្រ័យលើផ្នែករឹង និងផ្នែកទន់ ។ ផ្នែករឹងសំដៅលើ ថាសរឹង (Hard Disk) សតិ (RAM) ស៊ីភីយូ (CPU) បន្ទះមេ (Mainborad ឬ Motherboard) និងម៉ូនីទ័រ…។

ផ្នែកទន់សំដៅលើប្រព័ន្ធរបស់កុំព្យូទ័រដែលមានតួនាទីបញ្ជាលើផ្នែករឹងកុំព្យូទ័រឲ្យដើរតាមមុខនាទី រៀងៗខ្លួន ។ ចំណែកឯផ្នែកទន់ចែកជាពីរប្រភេទគឺ ប្រព័ន្ធប្រតិបត្តិការ និងកម្មវិធី ផ្នែកទន់ដែលសំខាន់ជាងគេ គឺ ប្រព័ន្ធប្រតិបត្តិការ ។

ប្រព័ន្ធប្រតិបត្តិការចែកជាពីរសំខាន់គឺ ប្រភេទក្លូដប៊ិច (Close Source) និងក្លូដប៊ើកចំហ (Open Source) ។ វីនដូស្ថិតក្នុងប្រភេទក្លូដប៊ិច ចំណែកឯលីនុចវិញស្ថិតក្នុងប្រភេទក្លូដប៊ើកចំហ ។

ការប្រើប្រាស់វីនដូទាមទារឲ្យទិញអាជ្ញាប័ណ្ណពីសំណាក់ក្រុមហ៊ុនម៉ៃក្រូសូហ្វដែលមានតម្លៃថ្លៃ ទាំង ប្រព័ន្ធប្រតិបត្តិការ និងកម្មវិធីផ្សេងៗ ។ វីនដូពោរពេញទៅដោយចន្លោះប្រហោងសុវត្ថិភាព ជាហេតុបង្កបញ្ហា ជាច្រើនដែលបណ្ដាលឲ្យបាត់បង់ទិន្នន័យ ។

១.អ្វីទៅជាលីនុច ?

វាជាប្រភេទប្រព័ន្ធប្រតិបត្តិការក្លូដប៊ើកចំហ ឥតគិតថ្លៃលើអាជ្ញាប័ណ្ណ អ្នកអាចប្រើជាម៉ាស៊ីនផ្ទាល់ខ្លួន ឬម៉ាស៊ីនបម្រើ (Server)។លីនុចស្ថិតនៅក្រោមអាជ្ញាប័ណ្ណ GNU GPL មានន័យថាអ្នកប្រើអាចកែប្រែ និង ផ្សព្វផ្សាយកម្មវិធីធ្វើជារបស់ផ្ទាល់ខ្លួន កម្មវិធីដែលអ្នកបានកែប្រែរួចត្រូវស្ថិតនៅក្រោមអាជ្ញាប័ណ្ណខាងលើ ។

លីនុចជា ខឺណែល (Kernel) ដែលផ្តល់នូវការចូលដំណើរការលើផ្នែករឹង និងត្រួតពិនិត្យការចូល ដំណើរការធនធាន ។ ដោយសារតែខឺណែលនេះហើយ អ្នកអភិវឌ្ឍន៍អាចបង្កើតប្រភេទលីនុចផ្សេងៗ ។

១.១ ប្រភេទលីនុចធម្មតាមួយមានលក្ខណៈដូចតទៅ ៖

- លីនុចខឺណែល

- កម្មវិធីប្រើប្រាស់ដូចជា កម្មវិធីនិពន្ធអត្ថបទ (Text Editor) កម្មវិធីរុករកអ៊ីនធឺណិត

- ចំណុចប្រទាក់អ្នកប្រើ (GUI) ដែលឈរលើប្រព័ន្ធអិចវីនដូ (X Window)

- កម្មវិធីការិយាល័យ

- ឧបករណ៍អភិវឌ្ឍន៍កម្មវិធី និងកម្មវិធីចងក្រង

- កញ្ចប់កម្មវិធីរាប់ពាន់ដែលមានស្រាប់

- កម្មវិធីដំឡើងលីនុច

- ឧបករណ៍ប្រើប្រាំថ្ងៃសម្រាប់គ្រប់គ្រងក្រោយពេលដំឡើងលីនុច្យ៉ូចដូចជា ការបង្កើតអ្នកប្រើថ្មី ការ ដំឡើងកម្មវិធីជាដើម ។

១.២ ប្រវត្តិរបស់លីនុច

ស្រមៃទៅដល់កុំព្យូទ័រកាលពី ៤០ ឆ្នាំមុន ដែលមានទំហំធំស្មើរតែបុ៉ន្ធផ្ទះ ឬ។ហ៊ុលីឡ្យាដ្ឋានមួយ ហើយ មានប្រព័ន្ធប្រតិបត្តិការផ្សេងគ្នា ។ មានន័ យថា ផ្នែកទន់របស់កុំព្យូទ័រមួយមិនអាចដំណើរការលើកុំព្យូទ័រមួយ ទៀតបានឡើយ ដែលជាហេតុធ្វើឲ្យមានការលំបាកទាំងអ្នកប្រើ និងអ្នកគ្រប់គ្រងប្រព័ន្ធ ។

ឆ្នាំ ១៩៦៩ ក្រុមអ្នកអភិវឌ្ឍន៍នៅក្នុងមន្ទីរពិសោធន៍ បែលលែបស់ (Bell Labs) ចាប់ផ្ដើមស្វែងរក ដំណោះស្រាយបញ្ហាផ្នែកទន់ ដោយចង់ឲ្យមានប្រព័ន្ធប្រតិបត្តិការមួយដែលមានលក្ខណៈដូចខាងក្រោម ៖

- សាមញ្ញ ហើយសមស្ួន

- សរសេរដោយភាសាស៊ី (C Program) ជំនួសឲ្យភាសាអាសុ៊ីមប្លី (Assembly)

- អាចយកក្ូដប្រើម្ដងទៀត

ដោយសារតែបែលលែបស់ជាក្រុមហ៊ុនកាន់កាប់ដោយក្រុមហ៊ុន AT&T នៅឆ្នាំ ១៩៨៣ ក្រុមហ៊ុននេះ បានចាប់ផ្ដើមផ្សព្វផ្សាយយូនីក ៥ (Sytem V) ជាប្រព័ន្ធស្ដង់ដាររបស់យូនីក ។

នៅឆ្នាំ ១៩៩១ លីនុច តូវាត (Linux Torvalds) ជានិស្សិតវ័យក្មេងជនជាតិហ្វាំងឡ្យង់បានបញ្ចប់ការ សិក្សាផ្នែកវិទ្យាសាស្ត្រកុំព្យូទ័រ បានចាប់ផ្ដើមអភិវឌ្ឍន៍ខឺណែលចេញពីយូនីកដោយដាក់ឈ្មោះថា លីនុច ស្រដៀងនឹងឈ្មោះរបស់គាត់ក្រោមអាជ្ញប័ណ្ណ GPL (GNU General Public License) ។

១.៣ តើអ្វីទៅជាអាជ្ញប័ណ្ណ GNU?

GNU ជាគម្រោងមួយដែលបានបង្កើតឡើងក្នុងឆ្នាំ ១៩៨៨ ក្នុងគោលបំណងអភិវឌ្ឍន៍ប្រព័ន្ធ ប្រតិបត្តិការមួយស្រដៀងទៅនឹងលីនុច (Unix Like) ដែលជាប្រភេទកម្មវិធីឥតគិតថ្លៃ (Free Software) ។

កម្មវិធី GNU ត្រូវបានចែកចាយទៅគ្រប់អ្នកប្រើ ដើម្បីបំពេញការងាររបស់អ្នក ចំណែកឯកូដប្រភពវិញ ត្រូវបានដាក់ឱ្យប្រើដោយសេរី ដូច្នេះអ្នកប្រើអាចកែប្រែ និងឲ្យស់ប្ដូរកម្មវិធីធ្វើជារបស់ឲ្យល់ខ្លួន ។

លីនុចត្រូវបានបង្កើតឡើងក្រោយតម្រោង GNU/GPL មានន័យថា អ្នកប្រើអាចមានសិទ្ធិប្រើប្រាស់ ប្រតិបត្តិការនេះស្របច្បាប់ ដោយសេរី អាចកែប្រែឯកសារកំណត់រចនាសម្ព័ន្ធនានា មិនត្រឹមតែប៉ុណ្ណោះវា តម្រូវឱ្យអ្នកបើកចំហនូវអ្វីដែលបានធ្វើការកែប្រែលើប្រព័ន្ធរបស់អ្នក ។

១.៤ គុណប្រយោជន៍របស់លីនុច

☺ លក្ខណៈពិសេសរបស់លីនុច

+ ស្ថិរភាព ៖

- អត្តប្រយោជន៍ជាចម្បងរបស់លីនុចគឺ ស្ថិរភាព ។ កម្រជួបបញ្ហាគាំងម៉ាស៊ីន បើទោះបីជាអ្នករត់កម្មវិធី ឬអ្នកប្រើច្រើនក្នុងពេលតែមួយ ម្យ៉ាងទៀតពពួកមេរោគ ឬការវាយប្រហារនានាមានលទ្ធភាពតិចតួច បំផុត ។

+ សុវត្ថិភាពខ្ពស់ ៖

- មានសុវត្ថិភាពជាងវិនដូ អ្នកប្រើម្នាក់ៗអាចចូលដំណើរការឯកសារ ឬទិន្នន័យអាស្រ័យលើការផ្ដល់ សិទ្ធិ ។ កុំព្យូទ័រមិនអាចបិទ ឬបើកដោយស្វ័យប្រវត្តិដោយគ្មានការប្រតិបត្តិពីអ្នកប្រើឡើយ ។

+ ចែកចាយដោយឥតគិតថ្លៃ ៖

- ការប្រើប្រាស់ដោយសេរីឥតគិតថ្លៃ មានន័យថារាល់ការដំឡើង ការចែកចាយ ការធ្វើឱ្យទាន់សម័យ គ្រប់កម្មវិធីទាំងអស់មិនត្រូវបានគិតថ្លៃឡើយ ។

១.៥ ភាពខុសគ្នារវាងលីនុច និងវីនដូ

+ **លីនុច**

- ចំណុចប្រទាក់អ្នកប្រើពីរ គឺ KDE និង GNOM

- តម្លៃ ៖ ប្រើជាមួយកុំព្យូទ័រលើតុ គឺមិនគិត ថ្លៃ ។ តែបើប្រើជាមួយម៉ាស៊ីនបម្រើមានតម្លៃថោក ។

- ចាប់ផ្ដើមកុំព្យូទ័រ ៖ អាចចាប់ផ្ដើមកុំព្យូទ័រពីភាគថាសចម្បង (Primary Disk) និងភាគថាសតក្ក: (Logical Disk) ។

- ប្រព័ន្ធឯកសារ ៖ ជាប្រភេទ ext2, ext3 (ext2+ Journaling system

- ហានានុក្រមឯកសារ ៖ រាល់ថតត្រូវផ្ដើមដោយថតមេសម្គាល់ដោយសញ្ញា / ។ ឧ. /bin, /dev, /etc ...

- កម្មវិធី ៖ មានកម្មវិធីជាច្រើនប្រើដោយមិនគិតថ្លៃ ។

- អាចដំឡើងកម្មវិធីរបស់វីនដូបានមួយចំនួន ឲ្យដំណើរការលើលីនុច ដូចជាកម្មវិធី Orkida Dictionary និងកម្មវិធី exe មួយចំនួនទៀត ។

+ **វីនដូ**

- ចំណុចប្រទាក់តែមួយតាមប្រភេទវីនដូ ។

- ការប្រើប្រាស់កុំព្យូទ័រលើតុមានតម្លៃថ្លៃ ។

- បើប្រើប្រាស់ជាម៉ាស៊ីនបម្រើគិតថ្លៃតាមចំនួនកុំព្យូទ័រ ។

- វីនដូអាចចាប់ផ្ដើមកុំព្យូទ័របានតែពីថាសចម្បង (Primary Disk) តែប៉ុណ្ណោះ ។

- ប្រើប្រព័ន្ធឯកសារ (File System) FAT16 FAT32 និង NTFS ។ មានតែ NTFS ទេដែលមានលក្ខណៈជា Journaling ។

- ភាគច្រើនប្រើអក្សរក្រមអង់គ្លេស ឧ. A: C: D: ...

- មានកម្មវិធីសម្បូរបែបតែមានតម្លៃថ្លៃ

- មិនអាចដំឡើងកម្មវិធីរបស់លីនុចបានទេ

១.៦ �__ស្ទ្រូលីនុច (Distro Linux)

Linux Distribution ឬ Linux Distro ជាសមាជិកគ្រួសារនៃប្រព័ន្ធប្រតិបត្តិការកុំព្យូទ័រស្រដៀងនឹង លីនុច ហើយពួកវាស្ថិតបនាឡើងពីខឺណែលលីនុច ។

គម្រោង Linux Distribution ប្រមាណជាង ៣០០ កំពុងអភិវឌ្ឍន៍នាពេលបច្ចុប្បន្ន

Distribution ដែលពេញនិយមជាងគេ ៖
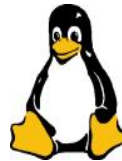
 រ៉ែតហេត ជាឌីស្ទ្រូដែលប្រើប្រាស់កញ្ចប់ rpm

 ហ្វេដូរ៉ា មានមូលដ្ឋានលើកញ្ចប់ rpm គាំទ្រដោយរ៉ែតហេត

 ឌីប្យៀន ជា Distribution ត្រូវបានថែទាំដោយសហគមន៍អ្នក អភិវឌ្ឍន៍ស្ម័គ្រចិត្តមួយក្រុម ដើម្បីបង្កើតកម្មវិធីឥតគិតថ្លៃ ។

 ស៊ិនតូស (Centos) មានមូលដ្ឋានលើរ៉ែតហេត
ហ្វេដូរ៉ា មានមូលដ្ឋានលើកញ្ចប់ rpm គាំទ្រដោយរ៉ែតហេត

អ៊ូប៊ុនទូ (Ubuntu) ជាផ្ដែត Distribution ដែលថ្មី ហើយមានការពេញនិយម មាន មូលដ្ឋានលើកញ្ចប់ dep ។

អូជឺនស៊ូស៊ី (openSUSE) គាំទ្រដោយ Novell មានមូលដ្ឋានលើកញ្ចប់ rpm ។

មេនទ្រីវ៉ា (Mandriva) មានមូលដ្ឋានលើកញ្ចប់

   rpm

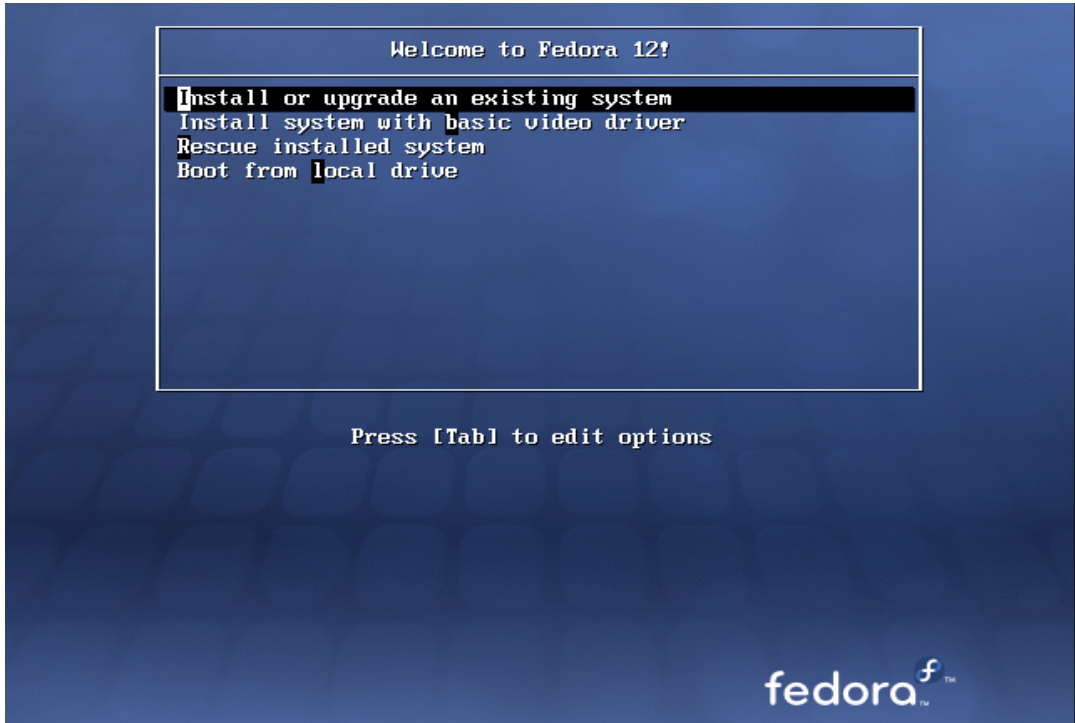ក្នូពពិជ (Knoppix) ជាប្រភេទ LiveCD Distribution រត់ដោយពុំចាំបាច់ដំឡើងក្នុង ចាសរ៉ឹងឡើយ ។

លីនស្ពាយ (Linspire) ជា Distro សម្រាប់ធ្វើពាណិជ្ជកម្មផ្ដែកលើអ៊ូប៊ុនទូ ។

តំឡើង Fedora Core12
Instalation

១ ការតំឡើង Fedora Core 12 ពី Local CD-ROM

ដើម្បីតំឡើង Fedora Core 12 ពី Local CD–ROM យើងគួរតែបំពេញតាមលក្ខខណ្ឌដូចខាងក្រោម៖

– ដាក់បញ្ចូល CD/DVD ហើយ Restart កុំព្យូទ័រ

– បន្ទាប់មកអ្នកនឹងឃើញ ផ្ទាំងមួយដូចខាងក្រោម

វាលបានអោយយើងជ្រើសរើសនូវបីចំនុចដូចខាងក្រោម៖

◆ Install or upgrade an existing system សំរាប់អោយយើងតំឡើងប្រព័ន្ធដំណើរការរបស់ Linux
នេះឡើង

◆ Install System With Basic video driver សំរាប់អោយយើងតំឡើងជា មួយនិង video driver របស់វា

◆ Rescue installed system សំរាប់អោយយើងតំឡើងដើម្បីជួសជុលនូវចំណុចខ្វះខាតរបស់ System

◆ Boot From Local Drive សំរាប់អោយយើង OS ពី Drive របស់ Window

ដូចនេះដំនូរអោយយើងជ្រើសរើសនៅចំណុចទីមួយគឺ

☞   Install or upgrade an existing system ដើម្បីធ្វើការតំឡើងប្រព័ន្ធដំណើរការដោបន្ត

☞ ជ្រើសរើសយក Skip ដើម្បីធ្វើការរំលងចោលនូវការ Testing Media ហើយធ្វើការ Installation ជាបន្ត
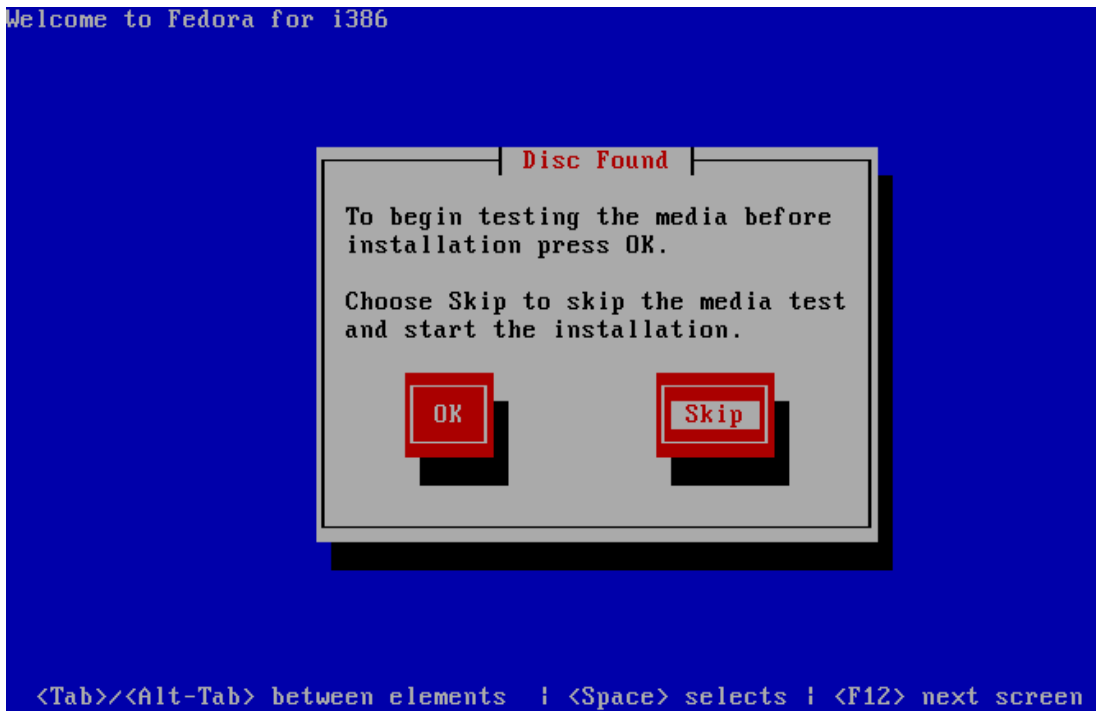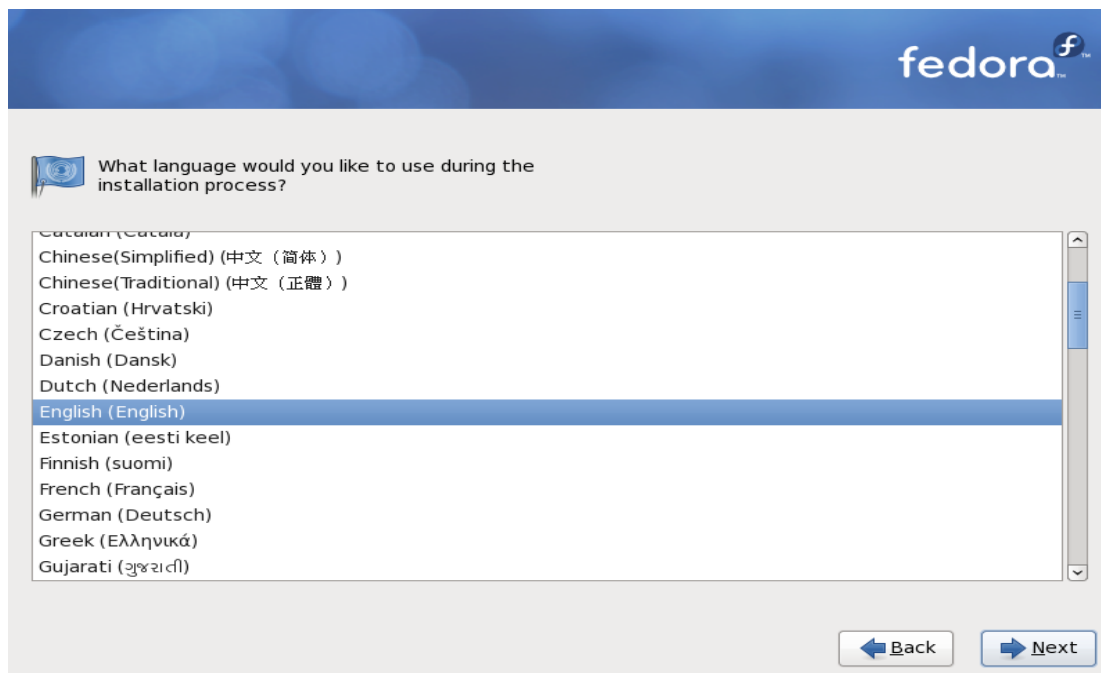

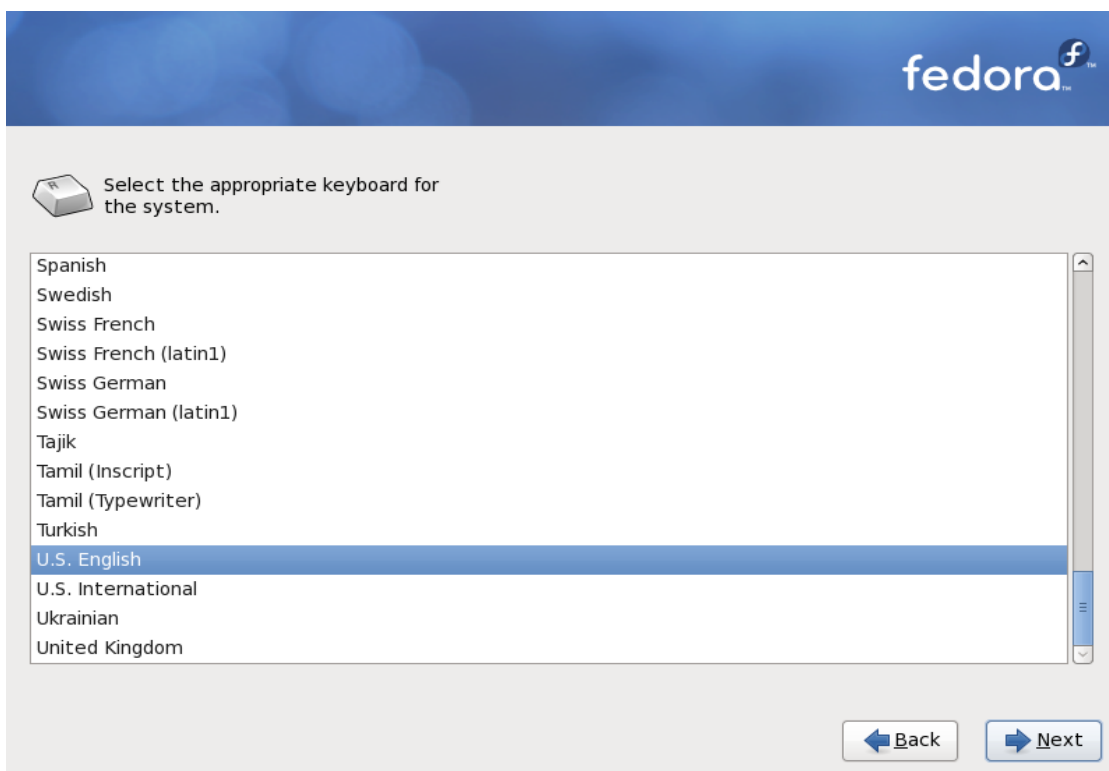☞ បន្ទាប់មកចុច Next ដើម្បីធ្វើការ Setup បន្ត
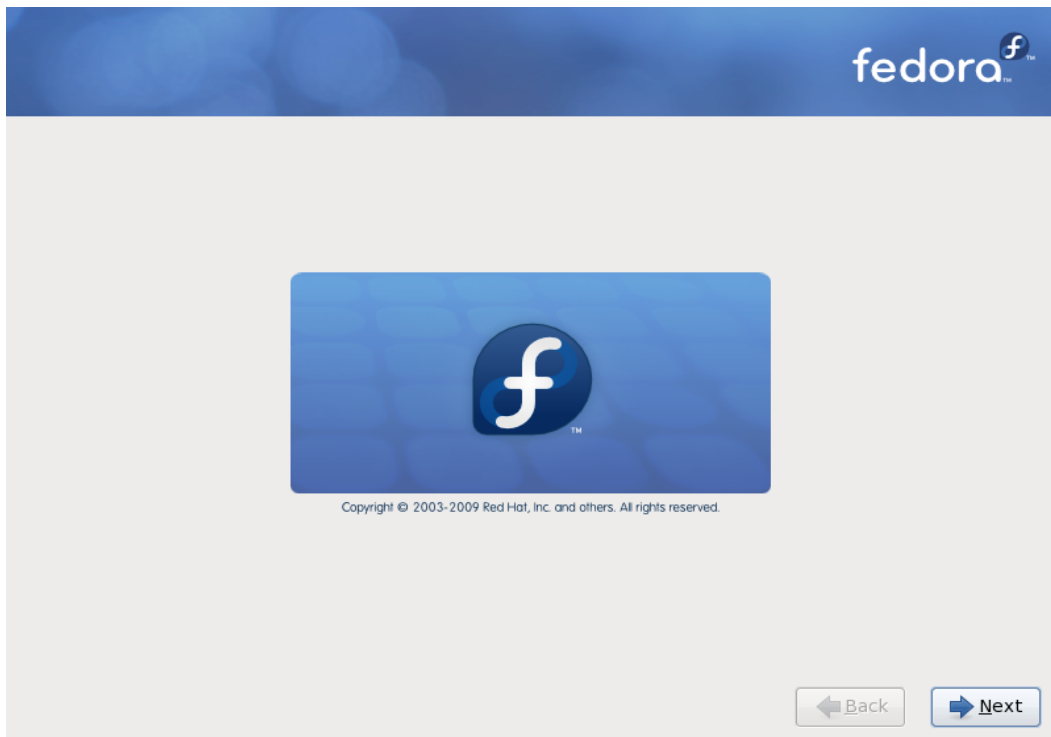
☞ ជ្រើសរើសប្រភេទភាសានាំការដំឡើង គឺជាការជ្រើសភាសា Language ដើម្បីប្រើកាលណាដំឡើង Fedora

☞ ជ្រើសរើសយក Default Keyboard ដើម្បីប្រើកាលណាប្រើ Fedora បន្ទាប់មក Scroll ដោយប្រើ Keyboard អ្នក អាចប្រើក្នុង Option នេះដើម្បីដំឡើងដែលមាន 53 ភាសាខុសៗគ្នានៃ Language Keyboard បន្ទាប់មកចុច Next ដើម្បីបន្ត
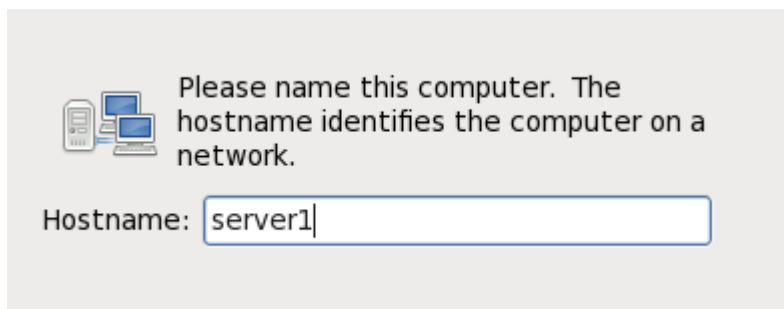
☞   ត្រង់ចំណុចនេះពេលដែលយើងដំឡើង Linux Fedora លើ Vmware ដែលជា Virtual Drive គឺវានមាន
ការ Error កើតឡើងដោយសារវាទាមទា format Drive នេះចោល ដែលបញ្ជាក់ថានិងបាត់បង់ទិន្នន័យ
ដួចនេះគឺតម្រូវអោយយើងយក Re–initialize drive ដើម្បី បន្ត
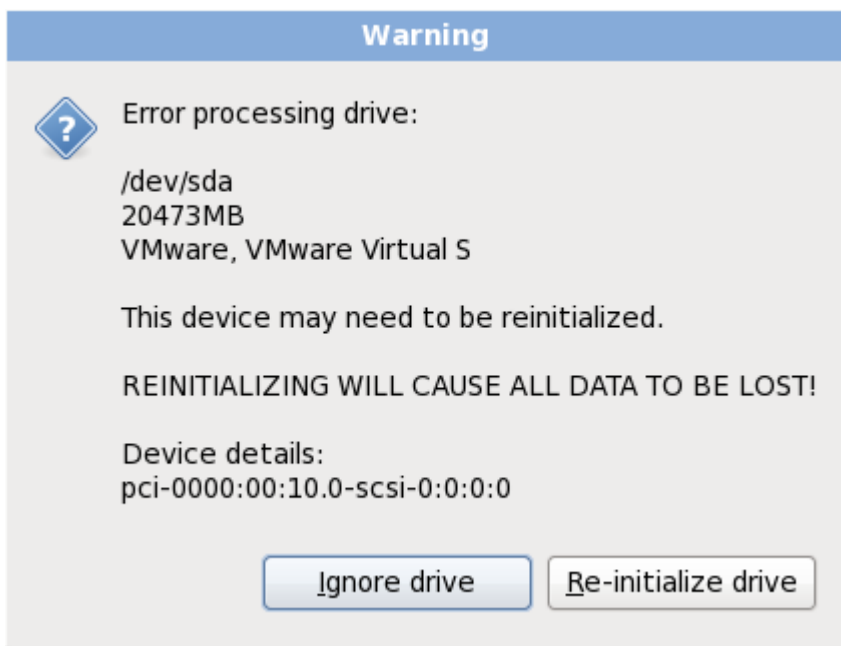
☞   បំពេញឈ្មោះ ឬ HostName របស់ Computer ឧទាហរណ៍ Hostname គឺ Server1
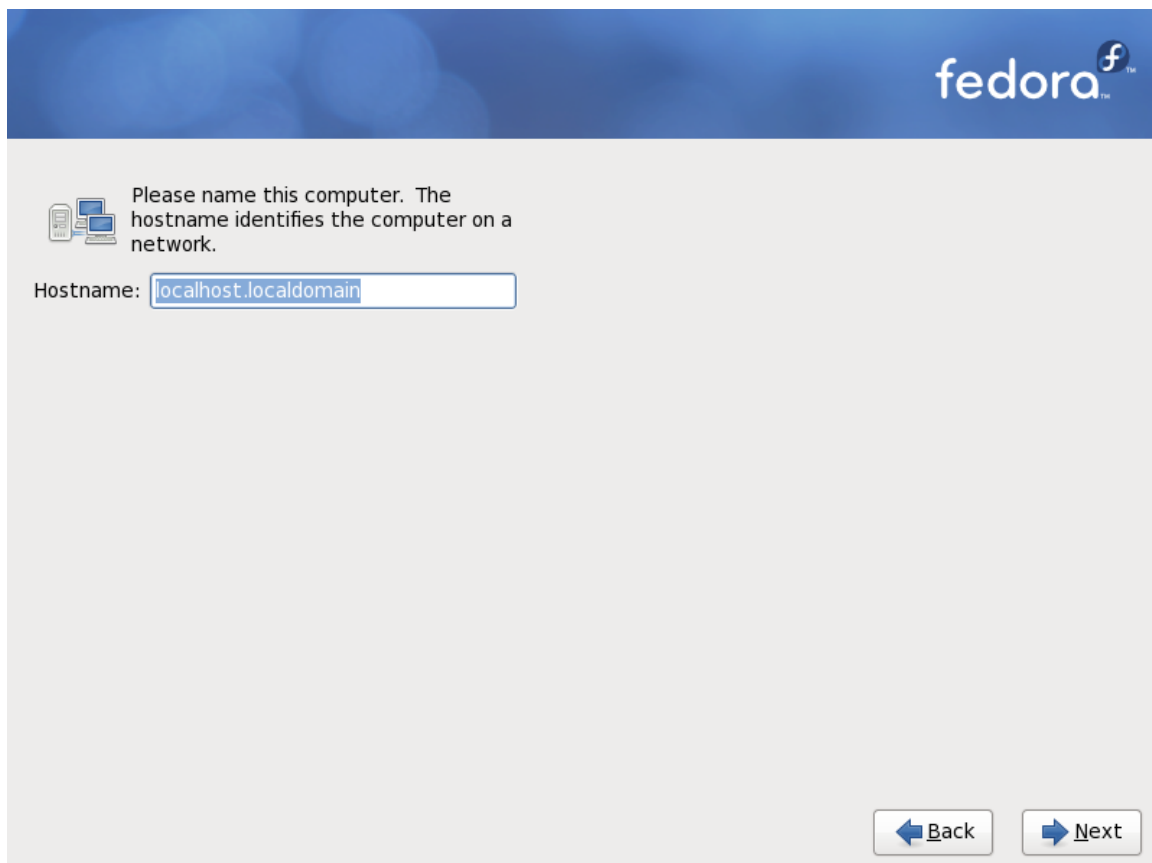
ការកំណត់តំបន់ពេលវេលាសម្រាប់កុំព្យូទ័ររបស់យើង។ តាមរយៈការរើសភាសារួចហើយចំពោះ Fedora គឺយើងជ្រើសរើសតំបន់ពេលវាលាដែលត្រឹមត្រូវបំផុតសម្រាប់យើងគឺ Asia/Phnom Penh គឺសម្រាប់ស្រាម់ប្រទេសកម្ពុជាយើងតែម្តង។
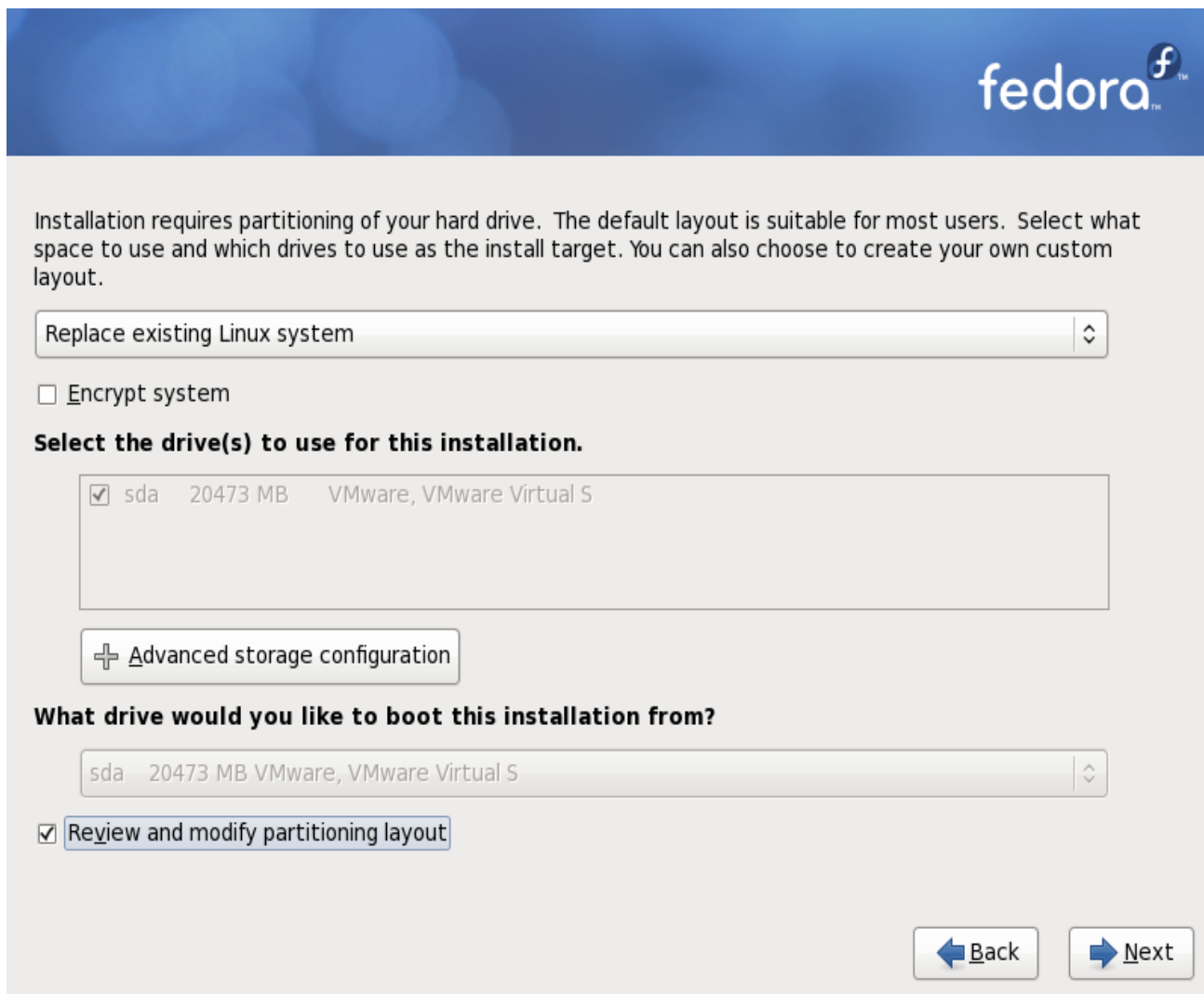
ចុច Next ដើម្បីបន្ត។

បន្ទាប់មកទាមទាដាក់បញ្ចូល root password ដូចបង្ហាញក្នុងរូប។ វាយបញ្ចូលក្នុង Password ចុច Tab រួចវាយសរសេរម្តងទៀតបង្កើតអោយបាន និងផ្ទៀងផ្ទាត់ឡើងវិញ។ password ដែលមានក្នុងករណីនេះយ៉ាង ហោចណាស់ 8 characters ដែលមានគួរអក្សរនិងលេខ ។ រូត (root) គឺជាគណនីយអ្នកប្រើមួយប្រភេទដែល មានសិទ្ធិពិសេស និងមានសិទ្ធិគ្រប់គ្រងលើអ្នកប្រើទាំងអស់ និងការកំណត់របស់ប្រព័ន្ធប្រតិបត្តិការកុំព្យូទ័រ របស់អ្នក។ root អាចដំឡើង ឬលុបគ្រប់កម្មវិធី អាចលុប បង្កើត ឬបូរឈ្មោះ និងសិទ្ធឯកសារទាំងអស់ និង អាចធ្វើកិច្ចការកម្រិតខ្ពស់ផ្សេងៗ។
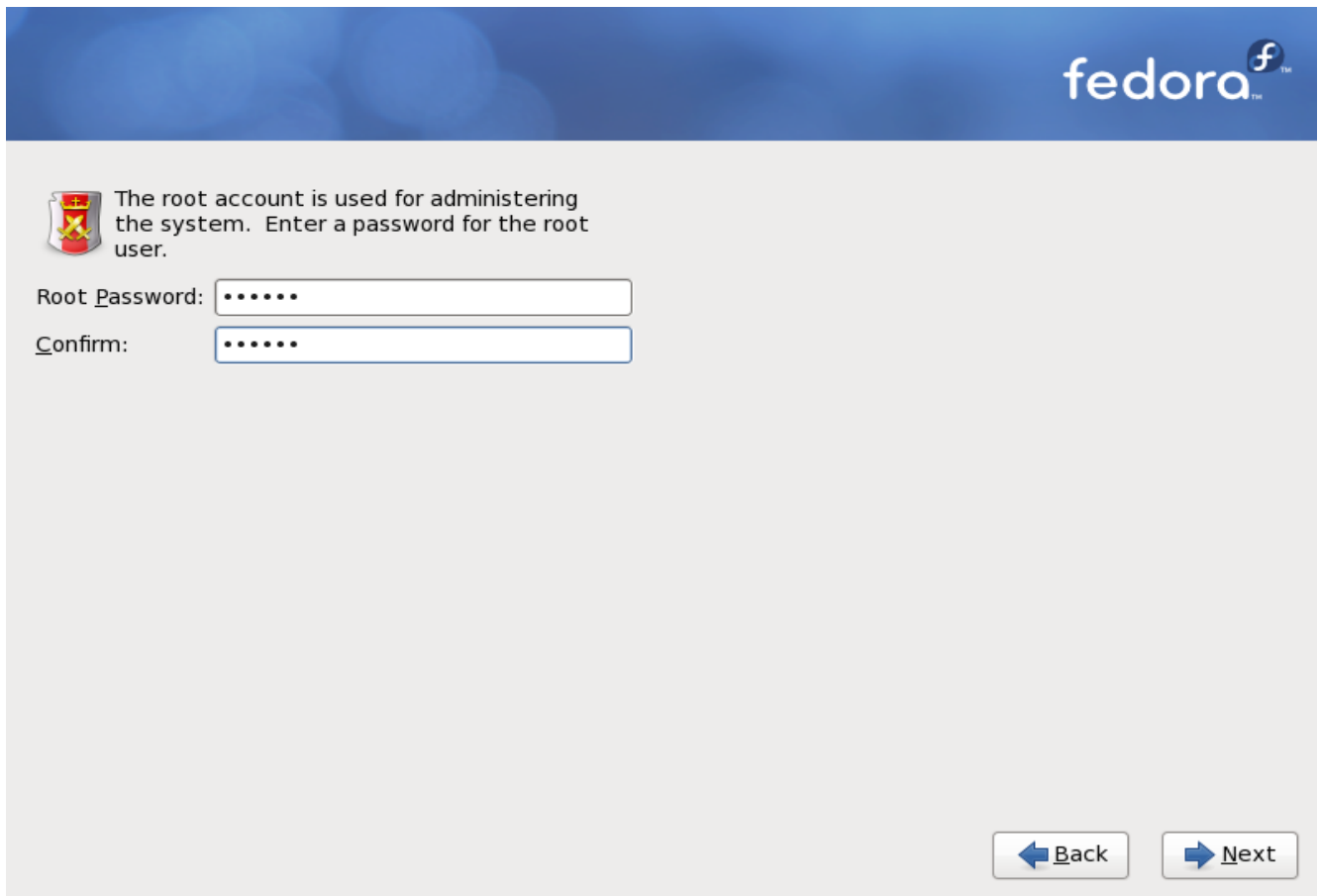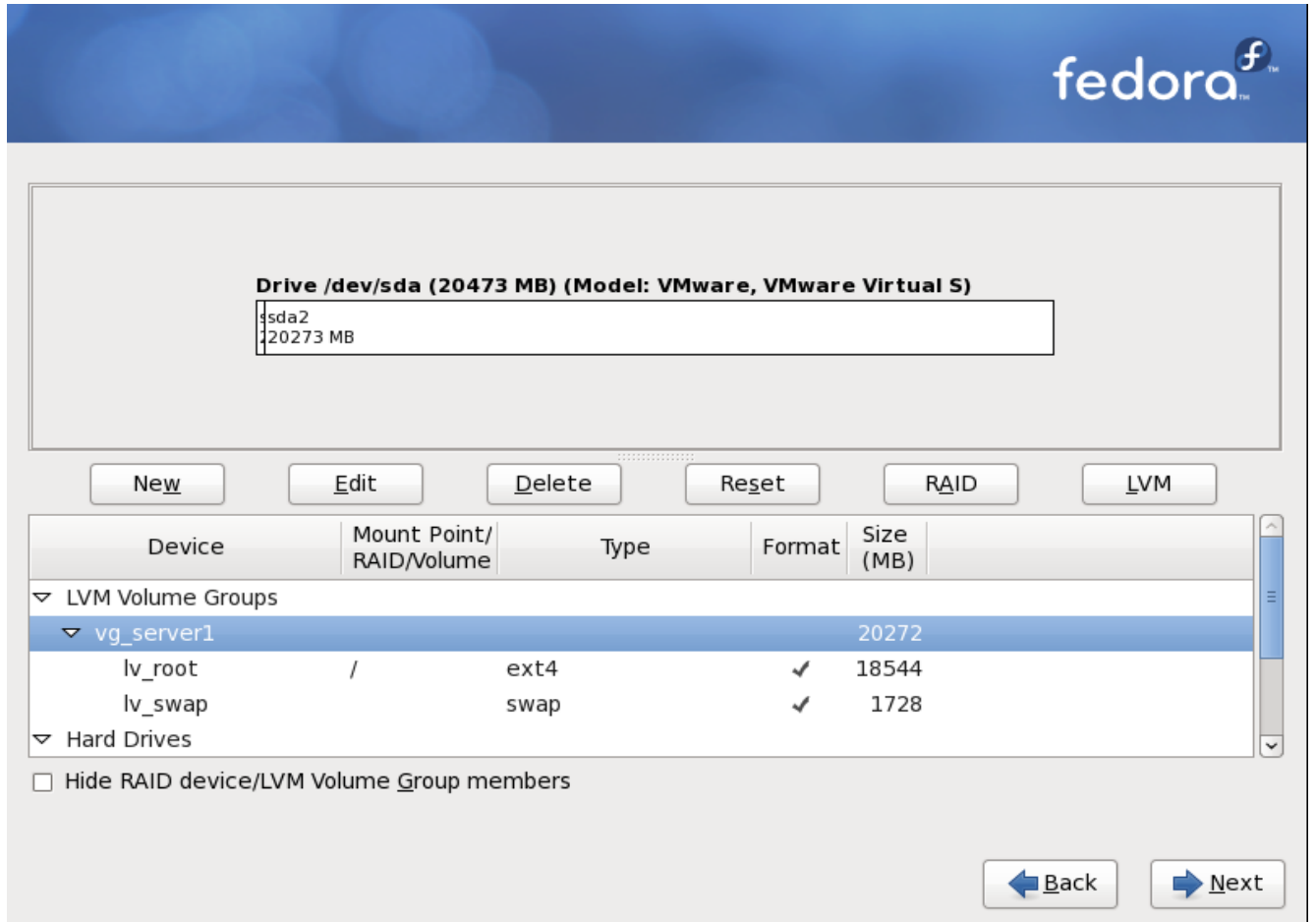

 បើចេញ Message បែបនេះគឺមានន័យថាវាបញ្ជាក់ប្រាប់អំពី Password របស់យើងគឺខ្សោយបើយើង ចង់ដាក់វា គឺចុច Use Anyway ដើម្បីប្រើ Password នេះ។
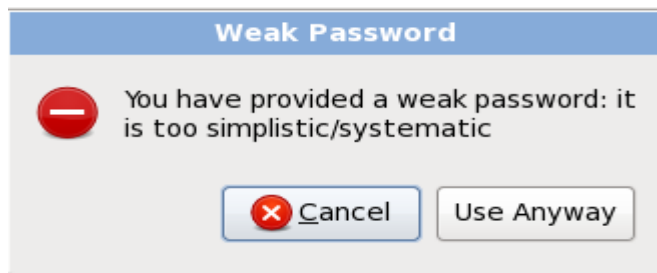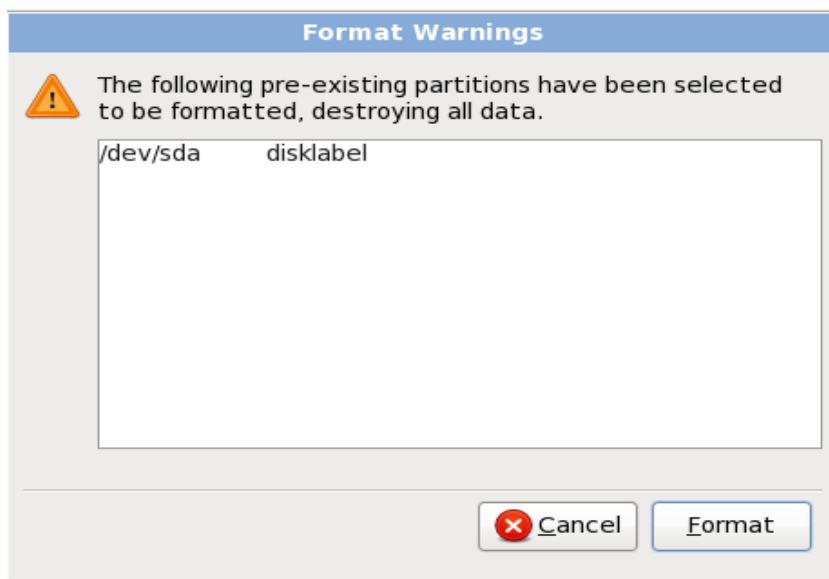
ត្រង់ចំណុចនេះគឺរាបញ្ជាក់ពីការជ្រើសរើស Drive ដើម្បីធ្វើការ Installation ដូចនេះតម្រូវអោយយើង ចុចត្រង់ Review and modify Partitioning layout ដើម្បីធ្វើការបង្ហាញការកំណត់ទំហំរបស់ចតផ្ទះនិមួយៗ ចុច Next ដើម្បីបន្ត។
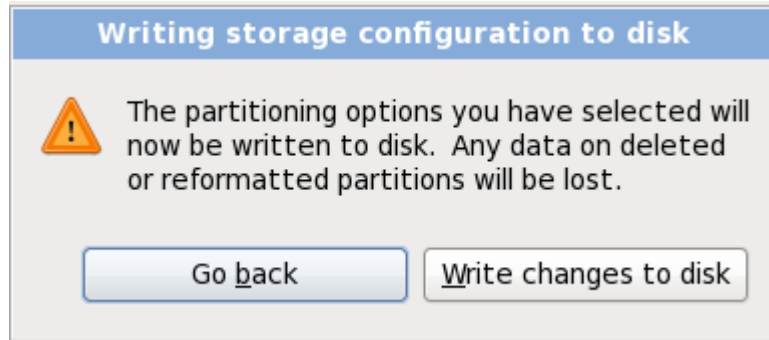
ត្រង់ចំណុចនេះគឺជាកន្លែងកំណត់ឬចែក Partition ទៅតាមតម្រូវការរបស់យើង

ចុច Next ដើម្បីបន្ត
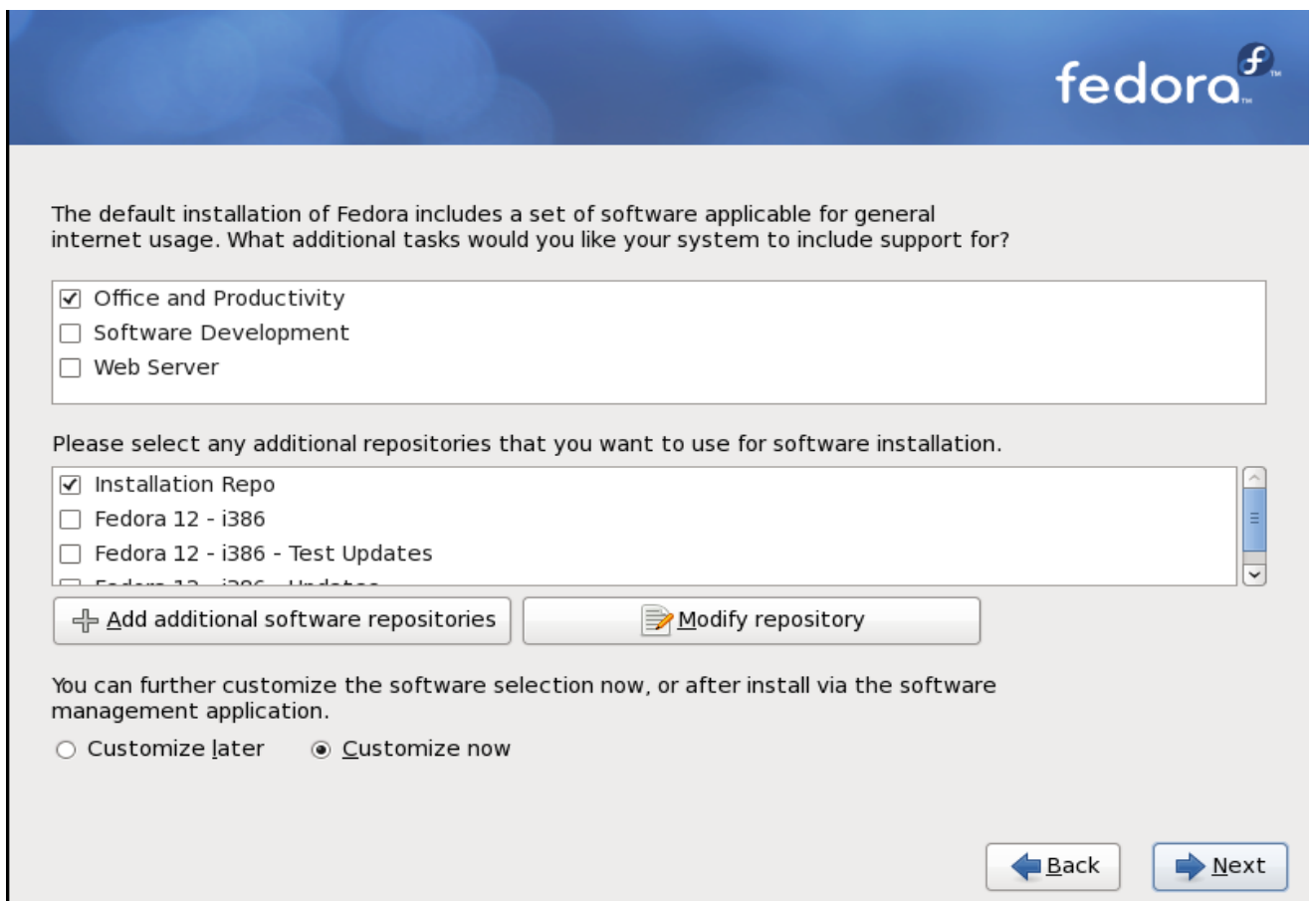

ចុច Format ដើម្បីកំណត់នូវ Partition ដែលយើងតំឡើង

ចុច Write change to disk ដើម្បីធ្វើការកំណត់ការតំឡើងដែលរាបបញ្ចាក់ថានិងបាត់បង់ទិន្នន័យដោយ សាការផ្លាស់ប្ដូ

ត្រង់ចំណុចនេះគឺតម្រូវអោយយើងកំណត់នូវការតំឡើង software ដែលអោយយើងនូវជំរើសពីរ គឺ

– Customize Later គឺជាការតំឡើង Default ឬការកំណត់ជាស្រេច

– Customize now គឺអោយយើងកំណត់តាមតម្រូវការរបស់យើងដែលយើងចង់បាន

ដូចនេះយើងគួរតែចុចយក Costomize now ដើម្បីកំណត់តាមតម្រូវការរបស់យើងតែម្ដ

– ចុច Next ដើម្បីបន្ត

ត្រង់ចំណុចនេះសំខាន់ណាស់គឺជាកំណត់ជ្រើសរើស Software ដែលយើងប្រើប្រាស់ជាចាំបាច់ គឺមានដូចជាៈ

– Desktop Environments គឺកំនត់ជ្រើសនូវ Interface មួយណាដែលយើងចង់ប្រើ រឺយកទាំងពីរ

– Application គឺកម្មវិធីបន្ថែមដូចកម្មវិធី Office ជាដើម

– Development គឺជាកម្មវិធីសម្រាប់អោយយើងបង្កើតនូវ Program ផ្សេងៗ

– Servers សម្រាប់អោយយើងជ្រើសរើសនូវ Service ជាច្រើនតាមតម្រូវការរបស់យើង

– Base System គឺតម្រូវអោយយើងកំណត់យក Tools សំខាន់ៗដូចជា Administration Tools ជាដើម

– Languages គឺតម្រូវអោយយើងកំណត់នូវភាសាដែលគាំទ្រដូចនេះចុចយក Khmer Support
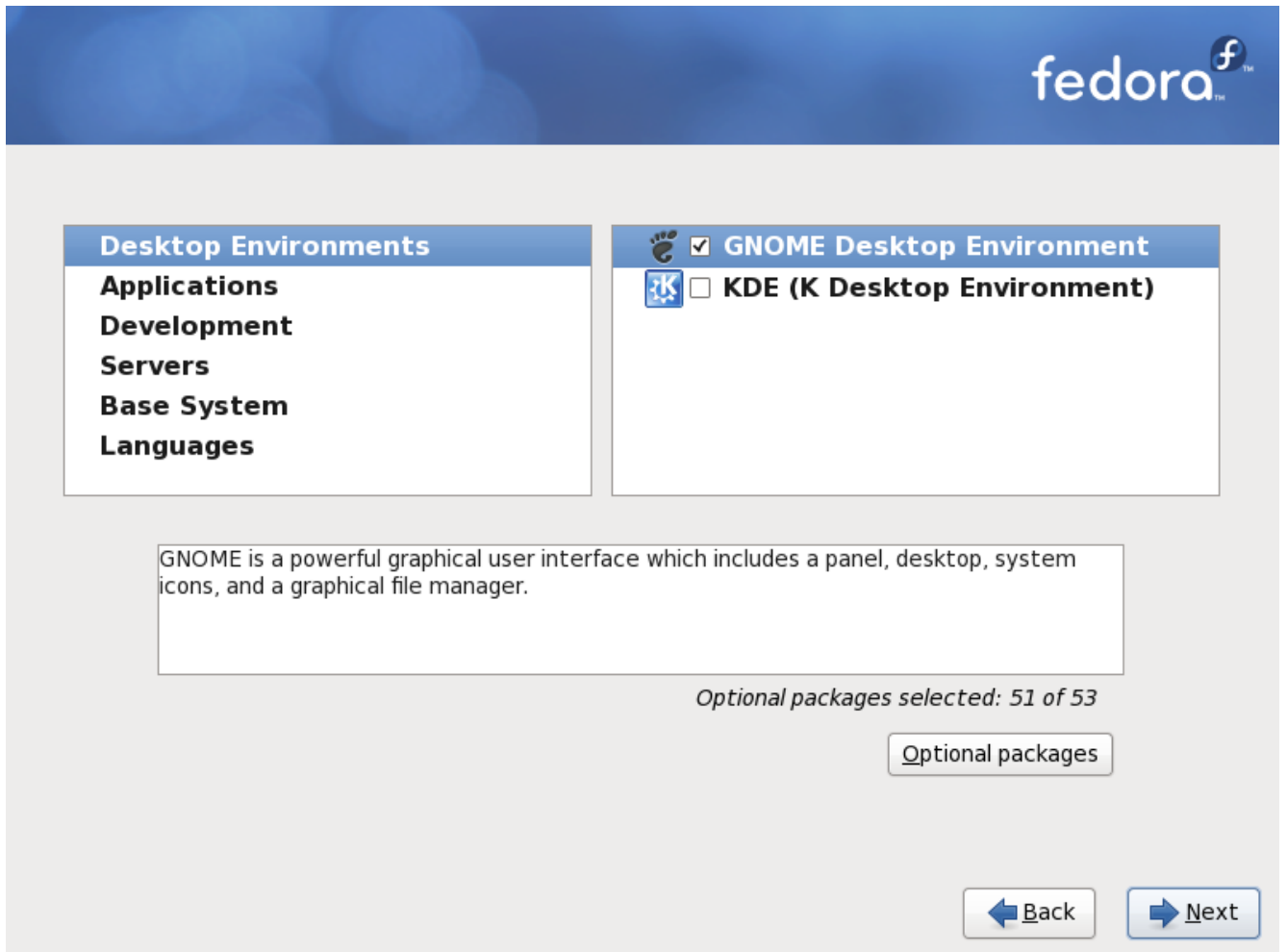
រងចាំប្រតិបត្តិការដំឡើង Packags ទាំងអស់ដែលយើងបានកំណត់
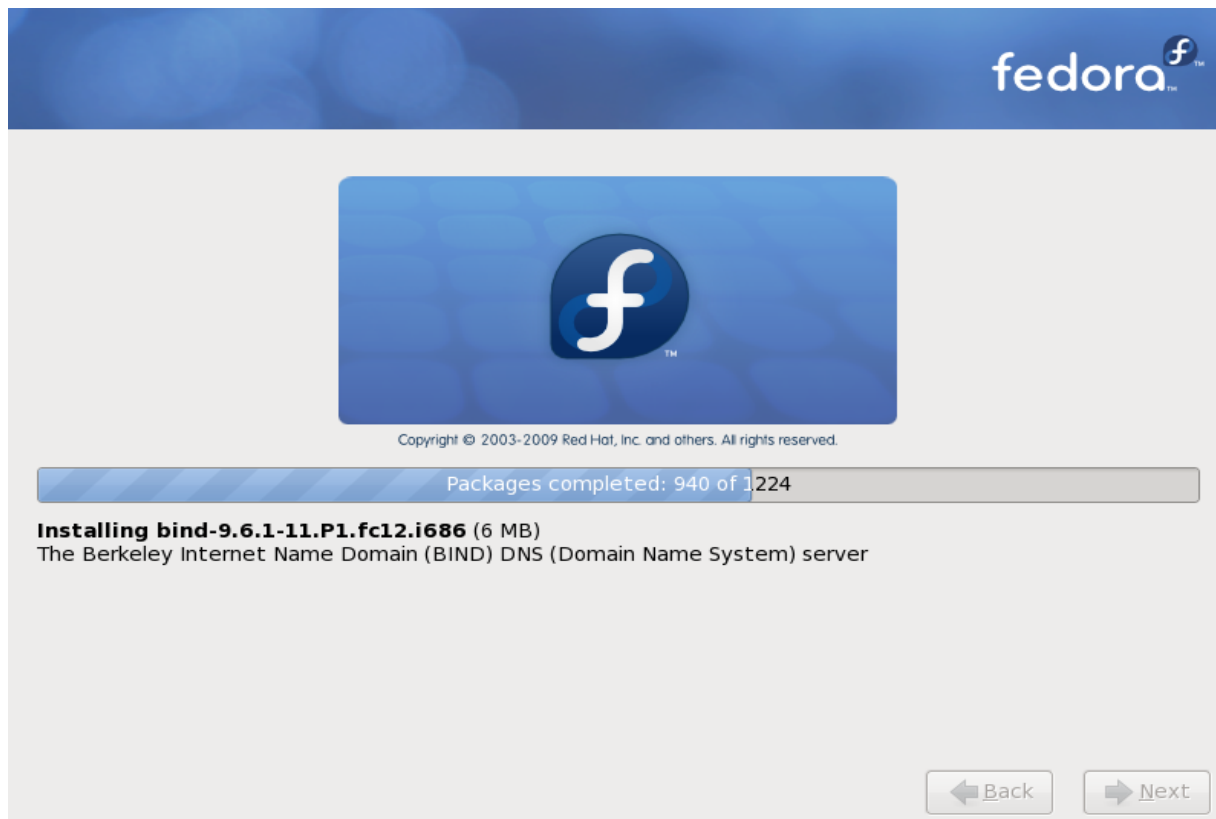
បន្ទាប់មកចុច Forward ដើម្បី Restart ពេល Restart រួចចុច Forward ដើម្បីបន្ត បន្ទាប់មកវាតម្រូវអោយយើងបង្កើតនូវ User Full Name និង Password
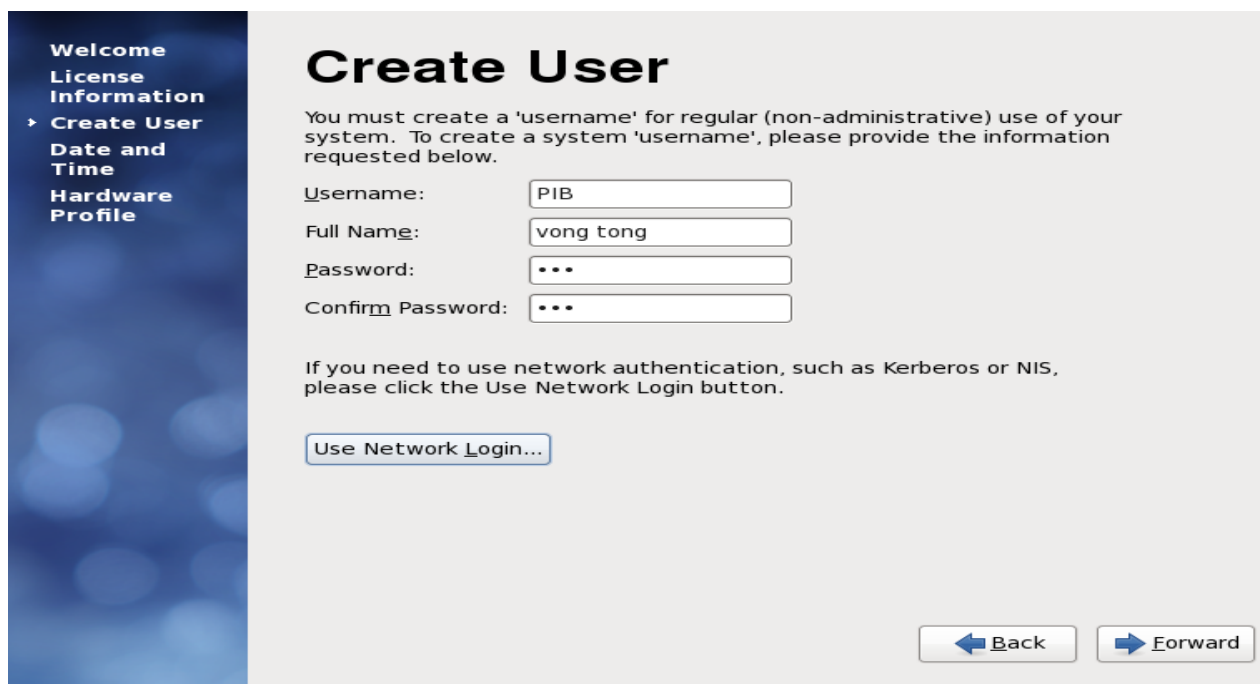
កំណត់ថ្ងៃខែឆ្នាំរបស់កុំព្យូទ័រ និងពេលវេលាអោយបានត្រឹមត្រូវរួច ចុច Forward

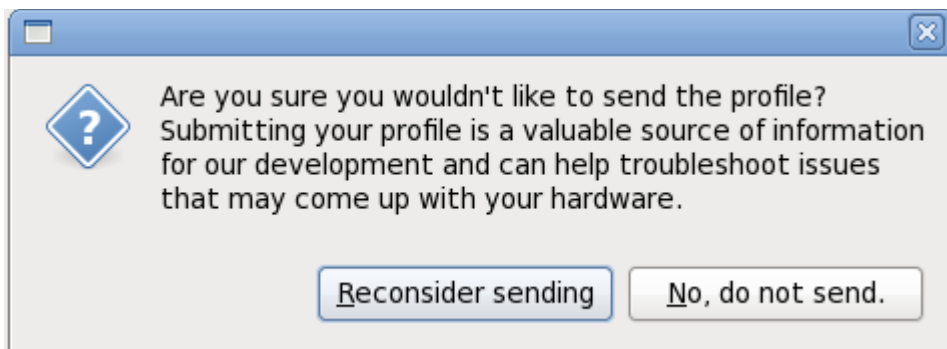បន្ទាប់មកធីក Do not Sent Profile –>Finish រួចវានិងចេញផ្ទាំងមួយដូចខាងក្រោម ចុច យក No do not send ដើម្បីបញ្ចប់។

Getting started and shutting down the system

1. Logging In

The next step to using your Fedora 12 system is to log in. When you log in, you are introducing yourself to the system (also called *authentication*). If you type the wrong user name or password, you will not be allowed access to your system.

1.1. Graphical Login

When your system has booted, a graphical login screen is displayed

1.2. Virtual Console Login

```
Fedora Core release 12 (Constantine)
Kernel 2.6.31.5-127.fc12.i686.PAE on an i686 (tty1)

localhost login:
```

To log in as **root** from the console, type **root** at the login prompt, press [Enter], then type the root's password that you chose during installation at the password prompt and press [Enter].

 After logging in, you can type the command **startx** to start the graphical desktop.

2. Logging Out

2.1. Graphical Logout

To log out your graphical desktop session, select **System** => **Log Out**.

2.2. Virtual Console Logout

If you are not using the X Window System, and you logged in at the console, type **exit** or **[Ctrl]-[D]** to log out of the console session.

3. Shutting Down or Restarting your Computer

3.1. Graphical Shutdown

To shutdown the system, select **System** => **Shut down**

3.2. Virtual Console Shutdown

To shutdown your computer at a shell prompt, type the following command:

       [root@server1 ~]# **halt**

Or   **[**root@server1 ~]# **init 0**

Or   [root@server1 ~]# **shutdown –h now (**បិទភ្លាមបន្ទាប់ពីវាយ Command រួច**)**

Or   [root@server1 ~]# **shutdown –h +15** (បិទរយៈពេល ១៥នាទីបន្ទាប់ពីវាយ Command)

3.3. Virtual Console Restarting

To restart your system at shell prompt, you should type the following commands:

        [root@server1 ~]# **reboot**   (Restart)

Or   [root@server1 ~]# **init 6**   (Restart)

Or   [root@server1 ~]# **shutdown –r now** (Restart ភ្លាមបន្ទាប់ពីវាយ Command)

Or   [root@server1 ~]# **shutdown –r +15** (Restart ១៥ នាទីក្រោយបន្ទាប់ពីវាយ Command រួច)

<div style="text-align:center">

GRUB Boot Loaders

</div>

When a computer running Linux is turned on, the operating system is loaded into memory by a special program called a *boot loader*. A boot loader usually exists on the system's primary hard drive (or other media device) and has the sole responsibility of loading the Linux kernel with its required files or (in some cases) other operating systems into memory.

GNU GRand Unified Boot loader or GRUB is a program which enables the user to select which installed operating system or kernel to load at system boot time. It also allows the user to pass arguments to the kernel.

▸ To change Bootloader, you go to GUI and click **System -> Administration -> Bootloader.**
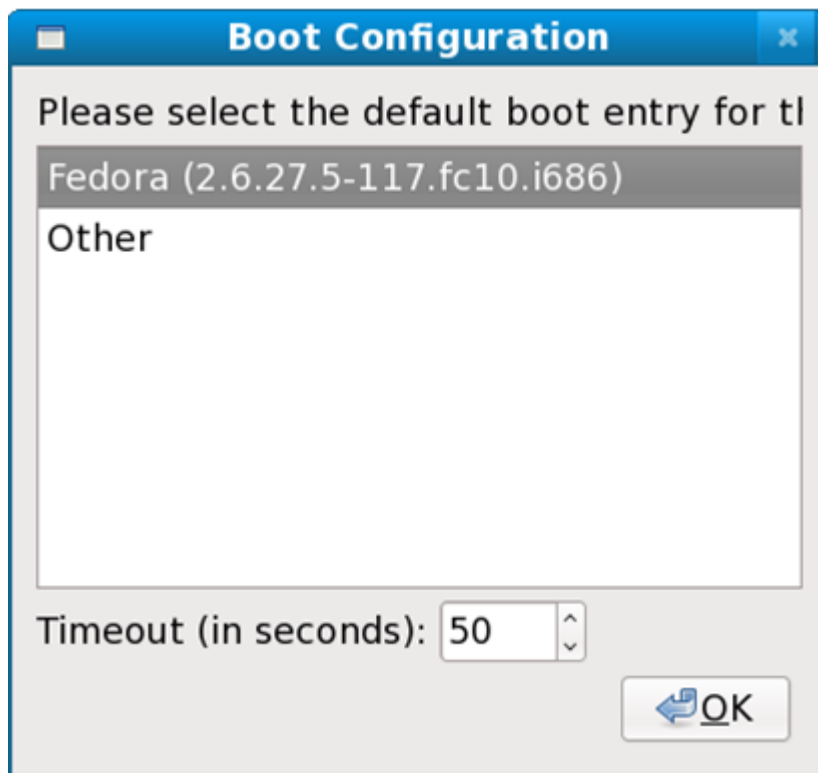
- GRUB configuration file: **/etc/grub.conf** (ជា file ដែលយើងប្រើសម្រាប់ចូលកែ Boot Loaders)

- The sample /etc/grub.conf file:

   ដើម្បីបើក File យើងវាយ Command ដូចខាងក្រោម៖

   <u># vi /etc/grub.conf រួចចុច Enter</u>

```
# 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 (hd0,4)
#           Kernel /vmlinux-version ro root=/dev/mapper/vg_server1-lv_root
#           linitrd /initrd-[generic-]version.img
# boot=/dev/sda
 default=0
timeout=30
splashimage=(hd0,4)grub/splash.xpm.gz
hiddernmenu


title Fedora (2.6.31.5-127.fc12.i686.PAE)
    root (hd0,4)

    kernel /vmlinuz-2.6.31.5-127.fc12.i686.PAE ro root=/dev/mapper/vg_server1-lv_root
LANG=en_US.UTF-8 SYSFONT=latacyrheb-sun16 KEYBOARDTYPE=pc KEYTABLE=us
rhgb quiet

    initrd /initramfs-2.6.31.5-127.fc12.i686.PAE.img
title Other
    rootnoverify (hd0,0)

    chainloader +1
```

- To install GRUB , boot Linux to **Rescue mode** and then install **GRUB** by type:

   grub-install /dev/sda

កម្រិតរត់ (Run Level)

នៅពេលដែលអ្នកចាប់ផ្ដើមកុំព្យូទ័រ ហើយដំណើរការ POST ។ BIOS របស់កុំព្យូទ័រចាប់ផ្ដើមស្វែងរក កម្មវិធីចាប់ផ្ដើមពីថាសរឹង បើអ្នកមានប្រព័ន្ធប្រតិបត្តិការពី រ នឹងចាប់ផ្ដើមប្រព័ន្ធណាមួយ បន្ទាប់មកវារត់ កម្មវិធីចាប់ផ្ដើមប្រព័ន្ធ GRUB ។ GRUB ម៉ឺនុយជ្រើសប្រព័ន្ធប្រតិបត្តិការដើម្បីផ្ដុកសម័យ បើអ្នកមានប្រព័ន្ធ ដំណើរការពីរលីនុច និងវីនដូ អ្នកអាចជ្រើសយកកម្មួយដើម្បីចាប់ផ្ដើមប្រព័ន្ធ ។ GRUB ផ្ដុកខឺណែលលីនុច បើ អ្នកបានជ្រើសយកលីនុច រួចវានឹងចាប់ផ្ដើមកម្មវិធីដែលរត់លើលីនុចគឺ init ។ ការងាររបស់ init គឺរត់ស្គ្រីប កម្រិតរត់ ដែលផ្ដុកផ្ដេករៃង និងផ្ដេកទន់ ។ ស្គ្រីបទាំងនោះស្ថិតនៅក្នុងទីតាំង /etc/rc.d/rc

Runlevels are a state, or *mode*, defined by the services listed in the SysV /etc/rc.d/rc<*x*>.d/ directory, where <*x*> is the number of the runlevel.

The characteristics of a given runlevel determines which services are halted and started by init. For instance, runlevel 1 (single user mode) halts any network services, while runlevel 3 starts these services. By assigning specific services to be halted or started on a given runlevel, init can quickly change the mode of the machine without the user manually stopping and starting services.

កម្រិតរត់ (Run Level) មាន ៧ គឺ ៖

0 — Halt (ប្រើសម្រាប់បិទកុំព្យូទ័រ)

1 — Single-user text mode (ប្រើសម្រាប់បិទម៉ាស៊ីនចូលជារបៀបអ្នកប្រើតែម្នាក់)

2 — Multi user mode without network file system. (អ្នកប្រើច្រើនក្នុងមូលដ្ឋានមិនអាចចូលម៉ាស៊ីន ពីចម្ងាយឡើយ NTF)

3 — Full multi-user text mode (អ្នកប្រើច្រើនអាចចូលក្នុងប្រព័ន្ធបណ្ដាញ)

4 — Not used (user-definable) (មិនប្រើ)

5 — Full multi-user graphical mode (with an X-based login screen) (អ្នកប្រើច្រើនអាចចូល បណ្ដាញ និងប្រើ xdm)

6 — Reboot (សម្រាប់ចាប់ផ្ដើមប្រព័ន្ធឡើងវិញ)

ដើម្បីបើក File នេះគឺយើងត្រូវអនុវត្តដូចខាងក្រោម៖

> #vi etc/inittab បន្ទាប់មកចុច Enter

The default runlevel for the system is listed in **/etc/inittab**. To find out the default runlevel for a system, look for the line similar to the one below near the top of **/etc/inittab**:
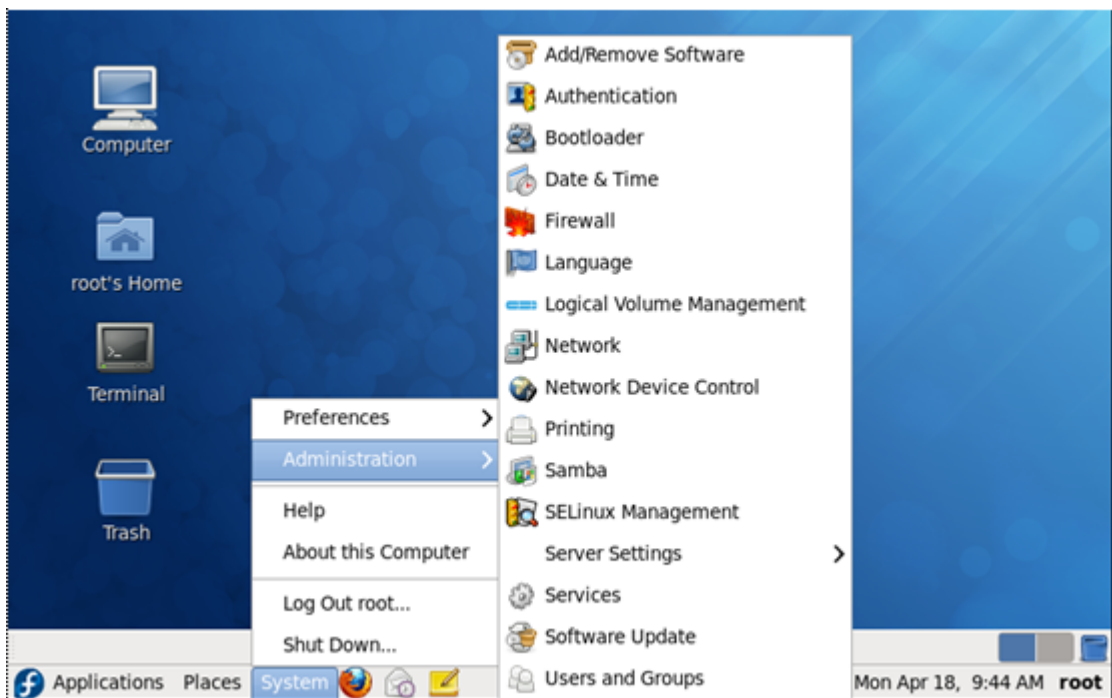
id:3:initdefault:

id:3 មានន័យថាប្រព័ន្ធរបស់យើងគឺស្ថិតនៅ level 3 គឺ Full multi-user text mode ។

## Working with Fedora Core 12

1. Graphical Interface

When you installed Fedora Core 12 you had the opportunity to install a graphical environment. Once you start the X Window System, you will find a graphical interface known as a *desktop*

2. Opening a Shell Prompt

The desktop offers access to a shell prompt, an application that allows you to type commands instead of using a graphical interface for all computing activities.

You can open a shell prompt by click **Applications -> System Tools -> Terminal**.
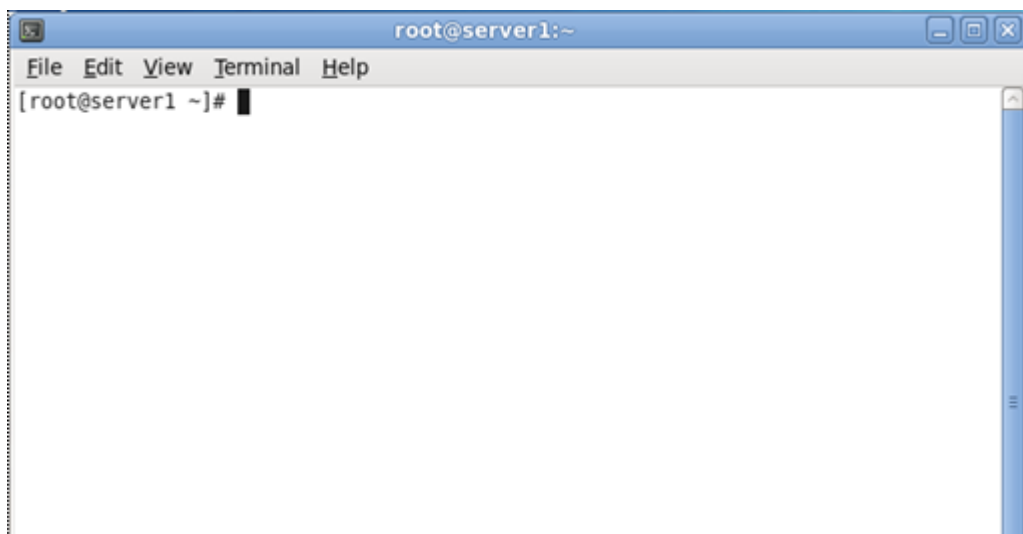
To exit a shell prompt, click the X button on the upper right corner of the shell prompt window, type **exit** at the prompt, or press **[Ctrl]-[D]** at the prompt.

3. Configuring the Date and Time

The Time and Date Properties Tool allows the user to change the system date and time, to configure the time zone used by the system, and to setup the Network Time Protocol (NTP) daemon to synchronize the system clock with a time server.

You must be running the X Window System and have root privileges. To start the application from the desktop click **System -> Administrations -> Date & Time**
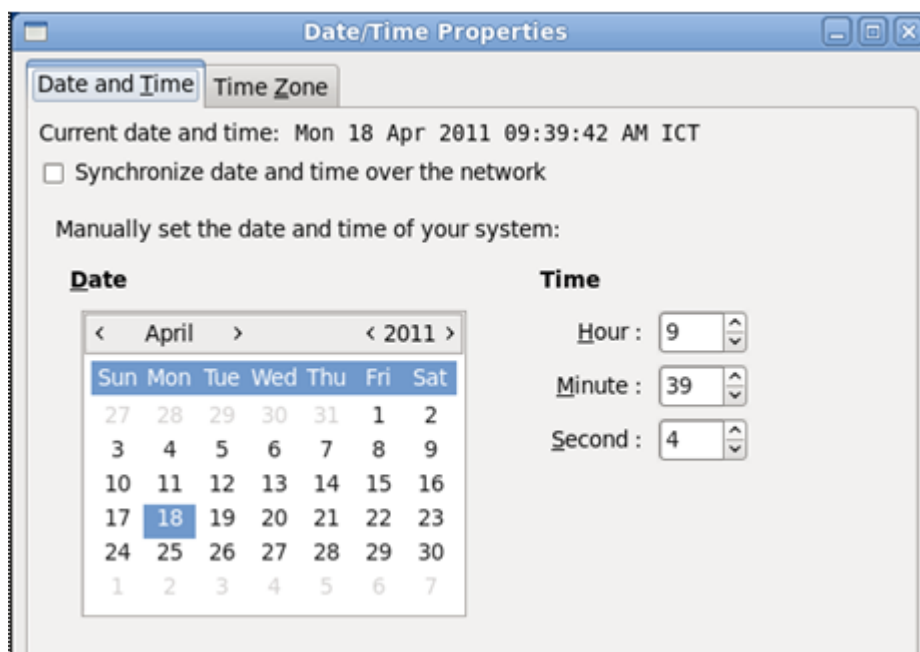
Or you can type the command **system-config-date** at a Terminal prompt.

4. Mounting and Un-mounting a Flash

A flash drive must first be mounted before it can be used. To mount a flash, insert it into the PC, the system will mount flash automatically.

When you are done using the flash, you should un mount it before ejecting it from the drive. To do this, close any applications that may be using files on the flash or exploring the flash, and right-click on the flash drive and select **Unmount** or you can right-click on the flash drive and select **Safely Remove Drive.**

5. CD-ROMs

The CD-ROM format is a popular medium to deliver typically large software applications as well as multimedia games and presentations. Most of the software that can be purchased from retail outlets come in the form of CD-ROMs. This section shows you how to use CD-ROMs on your Fedora Core 12 system.

5.1. Using CD-ROMs From a Shell Prompt

You can also manually mount and un mount your CD-ROMs from a shell prompt. Insert a CD into your CD-ROM drive, open a shell prompt, and type the following command:

```
mount /mnt/cdrom
```

The CD-ROM should now be mounted and available for use with your file manager. You can access your CD-ROM by clicking the home icon on the desktop and typing /mnt/cdrom in the location bar.

After working with your CD, you must unmount it before you can eject it from your CD-ROM drive. Close any applications or file managers that are using the CD-ROM and type the following command at a shell prompt:

```
umount /mnt/cdrom
```

You can now safely press the eject button on your CD-ROM drive to retrieve your CD.

6. Firefox Web Browser

Firefox Web Browser is a powerful, integrated, and standards-compliant Web browser, email client, news reader, and more. The Web browsing component displays Web content such as webpages and images.

To start Firefox Web Browser click the **Applications,** point to **Internet** and select **Firefox Web Browser.**

7. Evolution

Evolution is more than just an email client. It provides all of the standard email client features, including powerful mailbox management, user-defined filters, and quick searches. It additionally features a flexible calendar/scheduler which allows users to create and confirm group meetings and special events online. Evolution is a full-featured personal and workgroup information management tool for Linux and UNIX-based systems, and is the default email client for Red Hat Linux.

To launch Evolution from the desktop panel, click **Applications,** point to **Office** and select **Evolution Mail and Calendar**.

8. Text Editor

The *gedit* application enables you to create and edit text files.

The aim of *gedit* is to be a simple and easy to use text editor. More powerful features can be enable with different plugins, allowing a variety of task related to text-editing.

You can start *gedit* in the following ways:

Click **Application,** point to **Accessories** and select **gedit Text Editor** or at the Terminal you type **gedit** command.

<div align="center">

Terminals and Shells

</div>

1. Terminals

- A "terminal" is a way of typing commands to the computer.

- You can either open a terminal inside of your graphical environment, or you can switch your whole screen to a terminal.

   To open a terminal in a graphical environment:

   Click on **Applications**, point to **System Tools** and click on **Terminal**

To switch your entire screen to a terminal, press **Ctrl-Alt-F1**. You can then switch between six different terminals, by using **Ctrl-Alt-F1** through **Ctrl-Alt-F6**. Pressing **Ctrl-Alt-F7** will bring you back to your graphical environment.

2. Understanding Shell

   Shell executes command entered by user. Shell prompt, is place where you enter command.

The sample shell prompt in the Bash shell:

- To list all shells, you type **chsh –l**

    /bin/sh
    /bin/bash
    /sbin/nologin

- To see which shell you are using, type **chsh**, then press **Enter** and **Enter**

- To change our own current shell to **/bin/sh**, complete the following steps:

    1. Log on as mike

    2. [root@server1 ~]# **chsh**

    3. [root@server1 ~]# **/bin/sh**

    4. [root@server1 ~]# **logout**

    5. Log on as mike
       ‣ What you see?

- To change shell for mike to **/sbin/nologin**, complete the following steps:

    1. Log on as root

    2. [root@server1 ~]# **chsh mike**

    3. [root@server1 ~]# **/sbin/nologin**

    4. Press **Ctrl+Alt+F2**

    5. Type **mike**

    6. Type mike's password
    ‣ What you see?
    ‣ You should change shell for mike back to /bin/bash!

    7. Press **Ctrl+Alt+F1**

    8. [root@server1 ~]# **chsh mike**

    9. [root@server1 ~]# **/bin/bash**

    10. Press **Ctrl+Alt+F2**

អ្វីទៅជាសែល ?

កុំព្យូទ័រយល់ភាសាលេខសូន្យ និងលេខមួយដើម្បីអនុវត្តតាមបញ្ជាអ្នកប្រើ ដែលភាសានោះគេឲ្យឈ្មោះ ថា ប្រព័ន្ធគោលពីរ ។ សែលជាអ្នកបកប្រែទៅវិញទៅមករវាងភាសាមនុស្ស និងភាសាម៉ាស៊ីន ។ សែលដូចគ្នាទៅ នឹងកម្មវិធី DOS របស់វីនដូ ប៉ុន្តែវាពុំមានឥទ្ធិពលដូចសែលក្នុងលីនុចឡើយ ។ សែលអាចនិយាយបានថា វា ជា ចំណុចប្រទាក់អ្នកប្រើរវាងខឺណែលលីនុច និងអ្នកប្រើធ្វើការប្រាស្រ័យទាក់ទងគ្នាតាមរយៈក្បួនចុច ដើម្បីអនុវត្ត ការងារមួយ ។

ឯកសារកំណត់រចនាសម្ព័ន្ធរបស់សែលបេស្ស

ឯកសារកំណត់រចនាសម្ព័ន្ធរបស់សែលបេស្សមានពីរគឺ ឡុកសែល (log shell) ចាប់ផ្ដើមពេលអ្នកប្រើចូល ប្រព័ន្ធតាមក្រាហ្វិក ឬតាមរបៀបអត្ថបទ និង ណាន់ឡុកសែល (non log shell) ជាសែលដែលចាប់ផ្ដើមពីសែល ដែលកំពុងរត់ ។

ការប្រើប្រាស់សែល

ជាទូទៅសែលអាចដំណើរការបានពីរបៀបគឺ របៀបអត្ថបទ (TextMode) និងរបៀបក្រាហ្វិក (GraphicMode) ។

របៀបអត្ថបទ

បើអ្នកស្ថិតក្នុងរបៀបក្រាហ្វិក អ្នកអាចចាប់ផ្ដើមសែលជារបៀបអត្ថបទ

ចុចគ្រាប់ចុច បញ្ជា (Alt) + ឆ្លាស(Ctrl) + F1 ។

អ្នកត្រូវបញ្ចូលឈ្មោះអ្នកប្រើ និងពាក្យសម្ងាត់ដើម្បីចាប់ផ្ដើមសែល បើប្រៀបផ្ទៀបត្រឹមត្រូវនឹងបង្ហាញ បែបនេះ៖ [student@linux ~] $

- student ជាឈ្មោះអ្នកប្រើដែលកំពុងចូល

- linux ឈ្មោះម៉ាស៊ីន

- ~ ជាថតផ្ទះអ្នកប្រើ /home/student

- $ ចូលជាអ្នកប្រើធម្មតា បើរាបង្ហាញសញ្ញា #   សម្គាល់ជាអ្នកប្រើជាន់ខ្ពស់ root ។

ការប្រើប្រាស់ពាក្យបញ្ជា

បន្ទាប់ពីកម្មវិធីTerminalបានបើក អ្នកអាចវាយពាក្យបញ្ជាឲ្យសែលបកប្រែបានហើយ ។ ពាក្យបញ្ជានីមួយ ៗពេលខ្លះត្រូវរត់តែម្ដងៗ ពេលខ្លះទៀតត្រូវការចារ៉ាម៉ែត្រ ឬជម្រើស ។បន្ទាប់ពីកម្មវិធីកុងស្សួលបានបើក អ្នក អាចវាយពាក្យបញ្ជាឲ្យសែលបកប្រែបានហើយ ។ ពាក្យបញ្ជានីមួយៗពេលខ្លះត្រូវរត់តែម្ដងៗ ពេលខ្លះទៀត ត្រូវការចារ៉ាម៉ែត្រ ឬជម្រើស ។អ្នកអាចវាយពាក្យបញ្ជា ឬកែសម្រួលដោយប្រើគ្រាប់ចុចព្រួញទៅឆ្វេង --> ស្ដាំ <-- ឬគ្រាប់ចុចថយក្រោយ (Backspace), Del និងគ្រាប់ចុច Spaceជាដើម ។

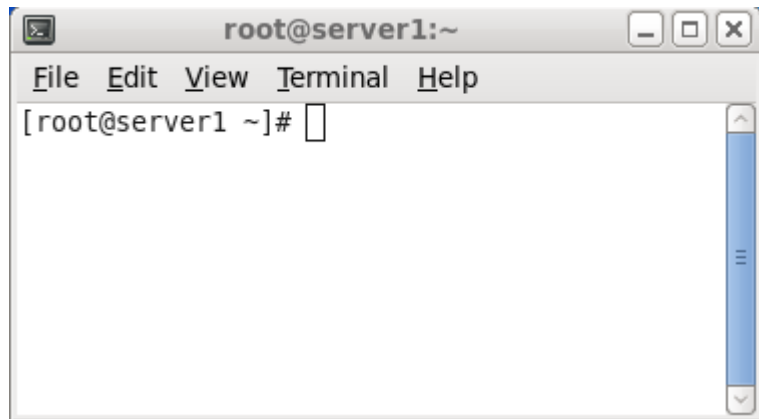ពាក្យបញ្ជាត្រូវបានប្រតិបត្តិ ពេលអ្នកចុចគ្រាប់ចុចបញ្ចូល (Enter) បើការវាយឈ្នោះពាក្យបញ្ជាបានត្រឹមត្រូវ ។

បើអ្នកចង់ត្រឡប់ទៅក្រាហ្វិករវិញគ្រាន់តែចុច(Ctrl+Alt+F7) ។ ដើម្បីវាយពាក្យបញ្ជាជារបៀបក្រាហ្វិក អ្នកត្រូវចាប់ផ្ដើមកម្មវិធីកុងសួល ។

របៀបបើកកម្មវិធី

ចុចគ្រាប់ចុច(Alt+F2)
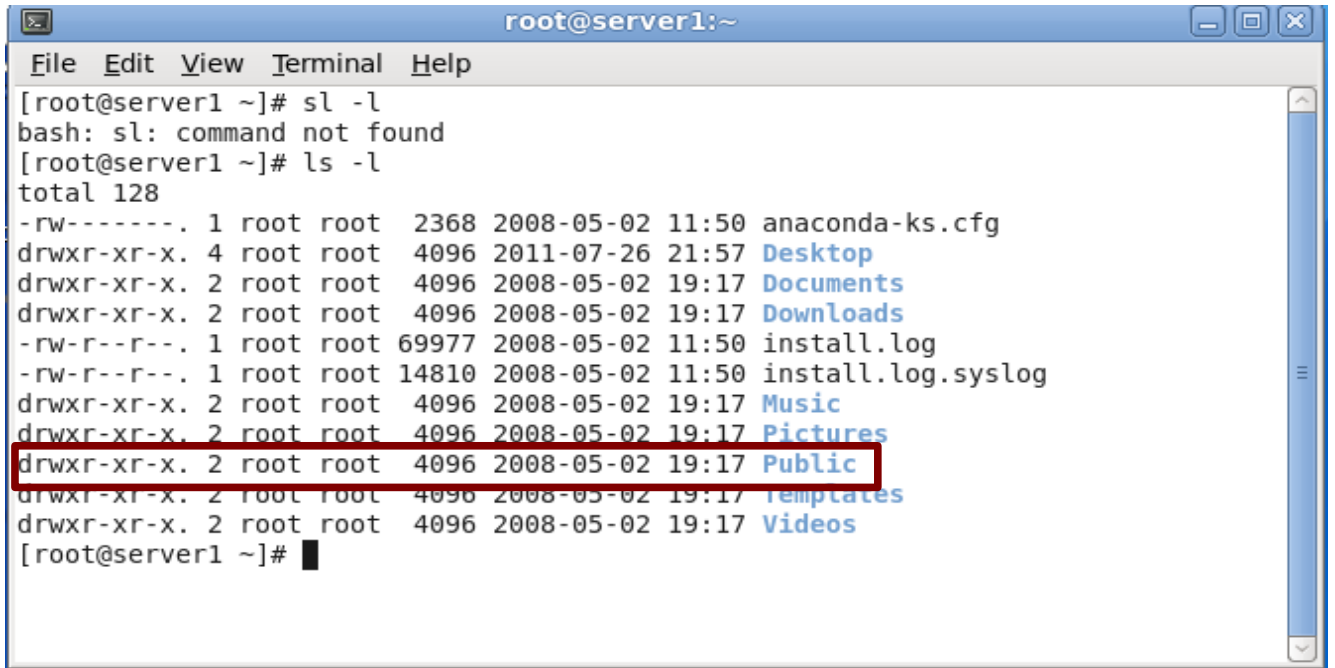
រួចវាយពាក្យបញ្ជា gnome-terminal ចុច Enter វានឹងបើកបង្អួចស្មូនីយ

- root ជាឈ្មោះអ្នកប្រើដែលកំពុងចូល

- server1 ឈ្មោះម៉ាស៊ីន

- ~ ជាថតផ្ទះអ្នកប្រើ /home/root

- $ចូលជាអ្នកប្រើធម្មតា បើរបង្ហាញសញ្ញា #   សម្គាល់ជាអ្នកប្រើជាន់ខ្ពស់ root

```
root@server1:~
File  Edit  View  Terminal  Help
[root@server1 ~]#
```

ការប្រើពាក្យបញ្ជាដោយជាមួយជម្រើស (Option)

ដើម្បីប្រើពាក្យបញ្ជា ls ជាមួយជម្រើសផ្សេងៗ អ្នកត្រូវបន្ថែមសញ្ញាដក (-) នៅពីមុខគ្រប់ជម្រើសទាំងអស់ ។

វាយពាក្យបញ្ជា ls -l នៅក្នុងTerminal

```
root@server1:~
File  Edit  View  Terminal  Help
[root@server1 ~]# sl -l
bash: sl: command not found
[root@server1 ~]# ls -l
total 128
-rw-------. 1 root root  2368 2008-05-02 11:50 anaconda-ks.cfg
drwxr-xr-x. 4 root root  4096 2011-07-26 21:57 Desktop
drwxr-xr-x. 2 root root  4096 2008-05-02 19:17 Documents
drwxr-xr-x. 2 root root  4096 2008-05-02 19:17 Downloads
-rw-r--r--. 1 root root 69977 2008-05-02 11:50 install.log
-rw-r--r--. 1 root root 14810 2008-05-02 11:50 install.log.syslog
drwxr-xr-x. 2 root root  4096 2008-05-02 19:17 Music
drwxr-xr-x. 2 root root  4096 2008-05-02 19:17 Pictures
drwxr-xr-x. 2 root root  4096 2008-05-02 19:17 Public
drwxr-xr-x. 2 root root  4096 2008-05-02 19:17 Templates
drwxr-xr-x. 2 root root  4096 2008-05-02 19:17 Videos
[root@server1 ~]# 
```

drwxr ប្រភេទសិទ្ធិចូលដំណើរការ 2 ចំនួនតំណទៅឯកសារ root ម្ចាស់ឯកសារ ឬថត users ក្រុមដែលបាន កំណត់ទៅឯកសារ ឬថត 2008-5-02 19:17 កាលបរិច្ឆេទ និងពេលវេលាផ្លាស់ប្តូរចុងក្រោយ public ឈ្មោះ ឯកសារ ឬថត ។

ការរកជំនួយ

បើអ្នកចងចាំតែឈ្មោះពាក្យបញ្ជា ប៉ុន្តែមិនដឹងជម្រើស ឬរបៀបណាពួកវា អ្នកអាចប្រើជំនួយដូច ខាងក្រោម ៖

ជម្រើស --help �ឌ. cat --help

ពាក្យបញ្ជា man និង info ក៏ប្រើសម្រាប់មើលជំនួយជាទំព័រ ៌. man cat ឬ info cat បើចង់ចាកចេញពីពាក្យ បញ្ជានេះ វាយគូអក្សរ q នៅលើក្តារចុច ។

ពាក្យបញ្ជា man និង info មិនមានគ្រប់ពាក្យបញ្ជាទាំងអស់នោះទេ ។ ពេលខ្លះពាក្យបញ្ជាទាំងពីរមានដូចគ្នា ពេលខ្លះមានតែ man និងពេលខ្លះទៀតមានតែ info ។

របៀបប្តូរទៅអ្នកប្រើ root

- អ្នកអាចចូលសែលជាអ្នកប្រើកម្រិតខ្ពស់រួត (root)

- វាយពាក្យបញ្ជា su -

- បន្ទាប់មកវាយពាក្យសម្ងាត់របស់ រួត

```
[tong@server1 ~]$ su -
Password:
[root@server1 ~]# id
uid=0(root) gid=0(root) groups=0(root),1(bin),2(daemon),3(sys),4(adm),6(disk),10
(wheel) context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
[root@server1 ~]# whoami
root
[root@server1 ~]# exit
logout
[tong@server1 ~]$ ▮
```

គ្រាប់ចុចផ្លូវកាត់ប្រើជាមួយសែលបបស្ល

ខាងក្រោមនេះជាគ្រាប់ផ្លូវកាត់សំខាន់ៗប្រើក្នុងសែលបបស្ល ៖

គ្រាប់ចុចផ្លូវកាត់	មុខងារ
Ctrl + L	ជម្រះអេក្រង់នៅក្នុងកុងសួល
Ctrl + C	បោះបង់ពាក្យបញ្ជាដែលកំពុងប្រតិបត្តិ
Shift+page up	រម្អូរឡើងលើ
Shift+page down	រម្អូរចុះក្រោម
Ctrl + D	បិទសម័យរបស់សែល
គ្រាប់ចុះក្រោម ឡើង លើ	រកមើលនៅក្នុងប្រវត្តិដើម្បីប្រតិបត្តិពាក្យបញ្ជា

មុខងារបំពេញស្វ័យប្រវត្តិ ៖

ប្រើគ្រាប់ចុចថេបនៅលើក្ដារចុច សូមមើលឧទាហរណ៍ខាងក្រោម ៖

- តាមលំនាំដើមនៅក្នុងថតផ្ទះរបស់អ្នកមានតែថតរងពីរដែលចាប់ផ្ដើមដោយអក្សរ D ដូចគ្នាគឺ Documents

និង Desktop ។

- បើក Terminal រួចវាយពាក្យបញ្ជា cd D

ហើយចុចគ្រាប់ចុចថេបលើកទី១ វាគ្មានអ្វីកើតឡើងឡើយ លុះចុចគ្រាប់ចុចថេបលើក ទីពីរ វានឹងបង្ហាញ ឯកសារដែលផ្ដើមដោយអក្សរ D ។ បើអ្នកវាយអក្សរទីពីរគឺ e រួចចុចគ្រាប់ចុច ថេបម្ដងទៀត វានឹងបំពេញឈ្មោះ Desktop ។
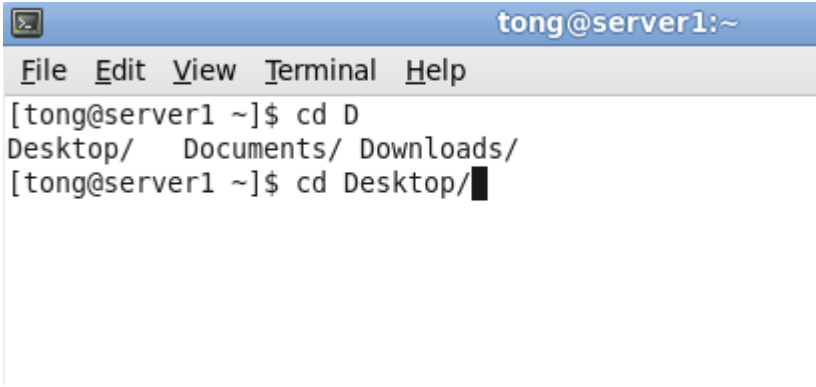
មុខងារប្រវត្តិ (history)

រាល់ពាក្យបញ្ជាដែលអ្នកបានវាយក្នុងសែលបេស្ទ អ្នកមានឱកាសច្រើនក្នុងការហៅមកប្រើម្ដងទៀត ។ តាម លំនាំដើមលិនុចអាចផ្ទុកពាក្យបញ្ជាបាន 1000 ក្នុងឯកសារ .bash_history មានទីតាំងក្នុងថតផ្ទាល់របស់អ្នកប្រើ ម្នាក់ៗ ។

អ្នកអាចបង្ហាញពាក្យបញ្ជាដែលផ្ទុកក្នុងឃ្លាំងប្រវត្តិតែម្ដងដោយប្រើគ្រាប់ចុចព្រួញ ។

ចុចគ្រាប់ចុចព្រួញ ឡើង លើ បង្ហាញនូវពាក្យបញ្ជាដែលអ្នកបានបញ្ចូលពីមុន ។

គ្រាប់ចុចព្រួញចុះក្រោមបង្ហាញពាក្យបញ្ជាបន្ទាប់

បន្ទាប់ពីរកពាក្យបញ្ជាដែលចង់បាន ហើយកែសម្រួលតាមតម្រូវការ រួចចុចគ្រាប់ចុចបញ្ចូល (Enter) ដើម្បីប្រតិបត្តិ ពាក្យបញ្ជា ។

ពាក្យបញ្ជាសំខាន់ៗក្នុងលីនុច

រចនាសម្ព័ន្ធ ឯកសារ ៖

រចនាសម្ព័ន្ធឯកសារលីនុចមានលក្ខណៈជាមែកធាង ដែលមានចត្វតគាងដោយសញ្ញា (/) ។ ខាងក្រោមនេះ ជាការពន្យល់សង្ខេបអំពីចត ក្នុងលីនុច ៖

- / ចត្វតជាចតមេដែលជាចំណុចចាប់ផ្ដើមមែកធាងចត
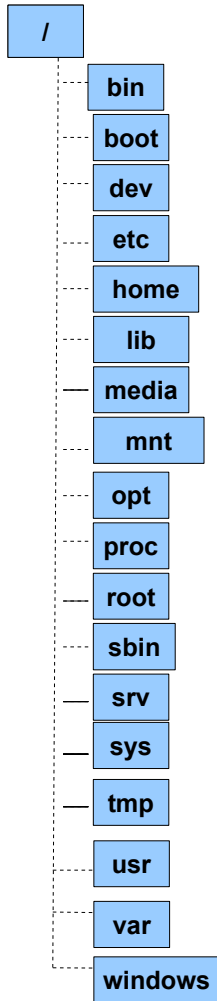
- /bin ចតផ្ទុកពាក្យបញ្ជាអ្នកប្រើធម្មតា និងអ្នកប្រើ root ឧ. mkdir, cp និង rm

- /boot ផ្ទុកកម្មវិធីចាប់ផ្ដើមប្រព័ន្ធ និងខឺណែលសម្រាប់ចាប់ផ្ដើមប្រព័ន្ធ

- /dev ផ្ទុកឯកសារឧបករណ៍ដែលមានក្នុងកុំព្យូទ័រ

- /etc ផ្ទុកឯកសារកំណត់រចនាសម្ព័ន្ធប្រព័ន្ធទាំងមូល

- /home ផ្ទុកអ្នកប្រើក្នុងប្រព័ន្ធ

- /lib ផ្ទុកនូវបណ្ណាល័យ (library) ដែលចាំបាច់សម្រាប់ប្រព័ន្ធ

- /media ចំណុចម៉ោនឧបករណ៍ដូចជា (ស៊ីឌីរ៉ូម ឧបករណ៍ផ្ទុកចល័ត)

- /mnt ចំណុចម៉ោនឯកសារប្រព័ន្ធបណ្ដោះអាសន្ន ឧ. /mnt/server

- /opt ជាថតផ្ទុកនូវរាល់ដំណើរការដែលចាប់ផ្ដើមឡើងពេលកុំព្យូទ័របើក

- /root ថតផ្ទះរបស់អ្នកគ្រប់គ្រងជាន់ខ្ពស់ (root)

- /sbin ផ្ទុកកម្មវិធីរបស់អ្នកប្រើ

- /srv ផ្ទុកឯកសារម៉ាស៊ីនបម្រើ

- /tmp ផ្ទុកឯកសារបណ្ដោះអាសន្ន

- /usr ផ្ទុកកម្មវិធី និងឯកសារជំនួយ ប៉ុន្តែរអាចបានតែអានទេ

ផ្លូវ (Path)
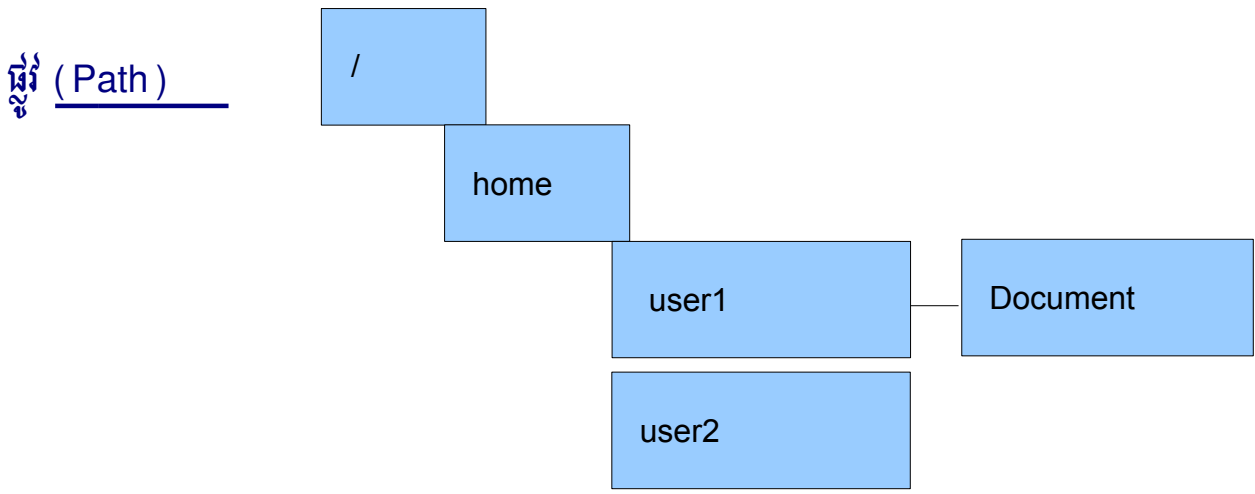
ឧបមាថា អ្នកឈររនៅលើចត្វ្រតដែលតាងដោយសញ្ញា / អ្នកចង់ផ្លាស់ទីទៅថត /home/user1/Documents ប្រើ ៣ក្យបញ្ជា cd ដើម្បីទៅកាន់ថតនោះ៖

- អ្នកត្រូវវាយ >cd /home/user1/Documents ដូចថ្ងៈ /home/student/Documents ជាផ្លូវពេញលេញ ។

- ឧទ្បរសន្មតថាអ្នកកំពុងឈរលើថត Documents អ្នកចង់ចាកចេញពីថត Documents ទៅថតអ្នកប្រើ user2 វិញអ្នកអាចរាយ

- >cd ../../user2 (ជាផ្លូវពាក់ព័ន្ធ) ឬ cd /home/user2 (ជាផ្លូវពេញលេញ)

ពាក្យបញ្ជាប្រើសម្រាប់គ្រប់គ្រងឯកសារ ៖

ពាក្យបញ្ជា ៖
<div style="border:2px solid red; background:#ffff99; text-align:center; font-size:1.5em">cd [option] [folder]</div>

- cd ប្រើសម្រាប់ផ្លាស់ប្ដូរថតបច្ចុប្បន្ន ទៅកាន់ថតផ្សេងទៀត ។Folder ជាផ្លូវ (path) ដែលអ្នកចង់ចូល

ឧ. សន្មតថាអ្នកស្ថិតនៅលើថត /home/student អ្នកចង់ចូលទៅកាន់ថត /Documents/myfolder រាយពាក្យបញ្ជា cd Documents/myfolder

ពាក្យបញ្ជា	និយមន័យ
cd ..	ផ្លាស់ទីថតឡើងលើមួយកម្រិត
cd /	ផ្លាស់ទីទៅកាន់ថតរូត
cd ~	ផ្លាស់ទីទៅថតផ្ទះអ្នកប្រើបច្ចុប្បន្ន
cd	ផ្លាស់ទីទៅថតផ្ទះអ្នកប្រើបច្ចុប្បន្ន

ពាក្យបញ្ជាប្រើសម្រាប់គ្រប់គ្រងឯកសារ ៖

ពាក្យបញ្ជា ៖
<div style="border:2px solid red; background:#ffff99; text-align:center">ls [option]</div>

ls សម្រាប់រាយមាតិកាក្នុងថត បើអ្នករត់ពាក្យបញ្ជា ls ដោយគ្មានប៉ារ៉ាម៉ែត្រ វានឹងរាយបញ្ជីមាតិកានៃថតបច្ចុប្បន្ន ដែលកំពុងស្ថិតនៅជាទម្រង់ខ្លី ។ សូមមើលឧទាហរណ៍ខាងក្រោម ៖

ជម្រើស	និយមន័យ
-l	រាយបញ្ជីលម្អិតមាតិកាងកសារ
-a	មើលឯកសារលាក់នៅក្នុងថតផ្ទះអ្នកប្រើ
-m	មើលមាតិកាឯកសារបំបែកដោយសញ្ញាក្បៀស (,)

ពាក្យបញ្ជា ៖

> **mkdir [option] [folder]**

mkdir ប្រើសម្រាប់បង្កើតថតថ្មី folder ជាថត ឬផ្លូវរបស់ថត

ជម្រើស	និយមន័យ	លទ្ធផល
mkdir dir_name	បង្កើតថតបានតែមួយ	:~/Document> mkdir test
mkdir -p dir_name1/dir_name2	បង្កើតថត និងថតរង	:~/Document> mkdir -p docs/myreport/weekly

ពាក្យបញ្ជា ៖

> **mv [option] source target**

    mv ប្រើសម្រាប់ផ្លាស់ទីថត ឬឯកសារពីទីតាំងដើមទៅកាន់គោលដៅណាមួយជាក់លាក់ ។ ពាក្យបញ្ជានេះក៏អាចប្រើដើម្បីផ្លាស់ប្ដូរឈ្មោះឯកសារ ឬថតបានដែរ ។ source ជាឈ្មោះឯកសារ ឬថតដើមដែលអ្នកចង់ផ្លាស់ទី ឬប្ដូរឈ្មោះ ។ target ជាទីតាំងថ្មីដែលត្រូវផ្លាស់ទៅ ។

ជម្រើស	ពាក្យបញ្ជា
មិនមាន	ប្ដូរឈ្មោះឯកសារពី file1 ទៅ file2
-b	រក្សាទុកប្រភពមុនពេលផ្លាស់ទីទៅកាន់គោលដៅ
-i	អៈអាងព័ត៌មានបន្ថែមអំពីការផ្លាស់ទីឯកសារ
-f	បង្ខំឱ្យផ្លាស់ទី

ពាក្យបញ្ជា ៖

<div style="border:2px solid red; background:#ffffcc; text-align:center; font-size:2em;">

cp [option] source target

</div>

cp សម្រាប់ចម្លងឯកសារពីទីតាំងមួយទៅកាន់ទីតាំងមួយទៀត ។ source ជា
ប្រភពឯកសារដែលត្រូវចម្លងពី ។ target ជាទីតាំងដែលត្រូវចម្លងឯកសារ
ទៅ ។

ជម្រើស	ពាក្យបញ្ជា
-R ឬ r	ចម្លងទាំង ឯកសារ និងថតរង
-i	អៈអាងព័ត៌មានបន្ថែមអំពីការចម្លងឯកសារ
-f	បង្ខំសរសេរជាន់លើឯកសារដែលមានស្រាប់
-v	មើលឈ្មោះឯកសារមុននឹងចម្លង

ពាក្យបញ្ជា ៖

> # rm [option] file

rm សម្រាប់លុបឯកសារ ឬថតចេញពីប្រព័ន្ធ ។ file ឈ្មោះ ឯកសារ

ជម្រើស	ពាក្យបញ្ជា
-R ឬ r	លុបមាតិកាក្នុងថត និងថតរងទាំងអស់
-i	សួរមុននឹងអនុញ្ញាតឲ្យអ្នកលុបឯកសារ
-f	បង្ខំលុបឯកសារទោះជាវាត្រូវបានការពារក៏ដោយ

ពាក្យបញ្ជា ៖

> ## chown [option] username [:group] folder/file

chown ប្រើសម្រាប់ផ្លាស់ប្តូរសិទ្ធិអ្នកប្រើឯកសារ ។ ឧ. chown student textfile.txt ជម្រើស -R សម្រាប់ផ្លាស់ប្តូរឯកសារ និងថតនៅក្នុងថតរងទាំងអស់ អ្នកត្រូវចូលជាអ្នកប្រើជាន់ខ្ពស់ (root) ។

ពាក្យបញ្ជា ៖

> ## cat [option] file

ពាក្យបញ្ជា cat ប្រើសម្រាប់មើលមាតិកាឯកសារលើអេក្រង់ ។

ជម្រើស	ពាក្យបញ្ជា
-n	បង់លេខរៀងជួរនៅក្នុងឯកសារ
-b	បង់លេខរៀងដែលមិនមែនជាជួរទទេ
-s	បង្ហាញជួរទទេ (blank line) ដែលលៗជាប់គ្នាតែម្តង

ពាក្យបញ្ជា ៖

grep [option] searchstring file

ពាក្យបញ្ជាប្រើសម្រាប់ប្រព័ន្ធឯកសារ (File Systems)

ពាក្យបញ្ជា grep ប្រើសម្រាប់ស្វែងរកខ្សែអក្សរ (string) នៅក្នុងឯកសារ ។

ជម្រើស	ពាក្យបញ្ជា
-i	ស្វែងរកមិនប្រកាន់អក្សរតូចធំ
-c	រាប់ចំនួនបន្ទាត់ដែលផ្គូផ្គងការស្វែងរក
-n	បង្ហាញលេខជួរស្វែងរកឃើញ

ពាក្យបញ្ជា ៖

mount [option] [device] mountpiont

ពាក្យបញ្ជានេះប្រើសម្រាប់ម៉ោន (mount) មេឌៀ ដូចជា ថាសរឹង ដ្រាយស៊ីឌីរ៉ូម និងឧបករណ៍ផ្សេងទៀត ។

ជម្រើស	និយមន័យ
-r	ម៉ោនប្រព័ន្ធឯកសារបានតែអាន
-t filesystem	ម៉ោនដោយបញ្ជាក់អំពីប្រភេទប្រព័ន្ធឯកសារ

ពាក្យបញ្ជា ៖

umount [option] mountpiont

ពាក្យបញ្ជានេះប្រើសម្រាប់លុបម៉ោនចេញពីដ្រាយដែលបានម៉ោន

ឧ. # unmount /cdrom ឬ # unmount /dev/hdc

ពាក្យបញ្ជា ៖ less file

ពាក្យបញ្ជានេះប្រើសម្រាប់រកមាតិកាឯកសារ ។ ចុចគ្រាប់ចុច ទំព័រលើ ឬក្រោម ដើម្បីមើលឯកសារម្តង មួយទំព័រៗ ។ ចុចគ្រាប់ចុច Home មើលទំព័រដើម ចុច End សម្រាប់មើលចុងទំព័រ ចុចគ្រាប់ចុច q ដើម្បីចេញពី less ។

ឧ. less readme.txt ឬ man ls ǀ less

ពាក្យបញ្ជា ៖ touch [option] file

touch សម្រាប់បង្កើតឯកសារ ឬផ្លាស់ប្តូរកែប្រែពេលវេលាឯកសារ ។

ជម្រើស	ពាក្យបញ្ជា
touch filename	បង្កើតឯកសារថ្មី
touch -m filename	ផ្លាស់ប្តូរពេលវេលាកែប្រែឯកសារ
touch -t filename	កំណត់ពេលវេលាដោយដៃ

ពាក្យបញ្ជា ៖ du [option] [path]

ពាក្យបញ្ជានេះប្រើសម្រាប់បង្ហាញទំហំសរុបឯកសារ និងថតរងនៅក្នុងថតបច្ចុប្បន្ន ។

ជម្រើស	ពាក្យបញ្ជា
-a	បង្ហាញទំហំឯកសារផ្ទាល់ខ្លួន
-h	បង្ហាញទំហំគិតជាបៃ មេកាបៃ និងជីកាបៃ
-s	បង្ហាញចំនួនឯកសារ

ពាក្យបញ្ជា ៖

free [option]

ប្រើសម្រាប់បង្ហាញព័ត៌មានអំពីសតិ (RAM) និងការប្រើទំហំស្វប ។

ជម្រើស	ពាក្យបញ្ជា
-b	លទ្ធផលបង្ហាញគិតជាបៃ
-k	លទ្ធផលបង្ហាញគិតជាគីឡូបៃ
-m	លទ្ធផលបង្ហាញគិតជាមេកាបៃ

ពាក្យបញ្ជា ៖

date [option]

ប្រើសម្រាប់បង្ហាញពេលវេលាប្រព័ន្ធបច្ចុប្បន្ន ។ ឧ. date

 <u>ពាក្យបញ្ជាសម្រាប់មើលដំណើរការ (processes) ៖</u>

ពាក្យបញ្ជា ៖

top

ប្រើសម្រាប់បង្ហាញដំណើរការកម្មវិធីដែលកំពុងរត់បច្ចុប្បន្ន ចុចគ្រាប់ចុច q ដើម្បីបញ្ឈប់ដំណើរការ វាត្រូវ
បានប្រើដោយគ្មានជម្រើស ។

វាយពាក្យបញ្ជា top

ពាក្យបញ្ជា ៖

ps

វានឹងបង្ហាញកម្មវិធី ឬដំណើរការដែលបានចាប់ផ្តើមជាមួយជម្រើសដូចខាងក្រោម ៖

ជម្រើស	ពាក្យបញ្ជា
-aux	បង្ហាញលេខសម្គាល់ដំណើរការ
-a	បង្ហាញតែដំណើរការនៃកម្មវិធីអ្នកប្រើកំពុងចូល
-l	បង្ហាញជាទ្រង់ទ្រាយ parent ID

ពាក្យបញ្ជា ៖

> ### kill [option] PID

ប្រើសម្រាប់បញ្ឈប់ដំណើរការណាមួយតាមលេខសម្គាល់ដំណើរការ ក(PID)

ខ. អ្នកកំពុងដំណើរការកម្មវិធី firefox ភ្លាមនោះវាចាប់ផ្តើមគាំង ដូច្នេះអ្នកត្រូវតែសម្លាប់ដំណើរការ កម្មវិធីនេះ ។

វាយពាក្យបញ្ជា ps -aux | grep firefox តាមលទ្ធផលបង្ហាញថា PID របស់ firefox គឺ 4261

ពាក្យបញ្ជាផ្សេងៗទៀត ៖

ក្រៅពីពាក្យបញ្ជាដែលរៀបរាប់ខាងលើមានពាក្យបញ្ជាមួយចំនួនទៀត បង្ហាញដូចក្នុងតារាងខាងក្រោម ៖

ពាក្យបញ្ជា	និយមន័យ
clear	ជម្រះអេក្រង់
reboot	ប្រើសម្រាប់ចាប់ផ្តើមម៉ាស៊ីនឡើងវិញ
hostname	បង្ហាញឈ្មោះម៉ាស៊ីន និងប្តូរឈ្មោះម៉ាស៊ីន
echo	បង្ហាញអត្ថបទលើអេក្រង់
alias	កំណត់ឈ្មោះក្លែងក្លាយ
unalias	ប្រើសម្រាប់ដោះឈ្មោះក្លែងក្លាយ

បិទ ឬបើកម៉ាស៊ីន ៖

ពាក្យបញ្ជា ៖

shutdown

ប្រើសម្រាប់បិទម៉ាស៊ីនដោយសុវត្ថិភាព និងការកំណត់ម៉ាស៊ីនបិទតាមពេលវេលា ។

ជម្រើស	សេចក្ដីពិពណ៌នា	
-f	ចាប់ផ្ដើមប្រព័ន្ធរហ័ស ដោយរំលងការត្រួតពិនិត្យឯកសារពេលចាប់ផ្ដើមប្រព័ន្ធពេលក្រោយ ។	
-F	បង្ខំឱ្យត្រួតពិនិត្យប្រព័ន្ធឯកសារពេលចាប់ផ្ដើមប្រព័ន្ធពេលក្រោយ	
-h	បញ្ឈប់ពេលវេលាបន្ទាប់បិទកុំព្យូទ័រ	
-k	វាមិនប្រាកដថាបិទម៉ាស៊ីនទេ ប៉ុន្តែវាផ្ញើសារព្រមាន	
-r	ចាប់ផ្ដើមកុំព្យូទ័រឡើងវិញបន្ទាប់ពីបិទកុំព្យូទ័រ	

ឧ. # shutdown -r now ៖ ចាប់ផ្ដើមបិទកុំព្យូទ័រភ្លាម

#shutdown -r +5 System Maintenance required

#shutdown -h 23:59

——————————

សញ្ញាប្ងូរទិស ?

នៅក្នុងន័យនេះសញ្ញាប្ងូរទិសសំដៅលើសញ្ញា >, <, >>

សញ្ញា < ៖ ប្ងូរទិសការបញ្ចូលស្តង់ដារ

សញ្ញា > ៖ ប្ងូរទិសលទ្ធផលស្តង់ដារ ឬសរសេរជាន់ពីលើ

សញ្ញា >> ៖ ប្ងូរទិសលទ្ធផលស្តង់ដារ ដោយបន្ថែមនៅខាងចុង

ការប្រើប្រាស់សញ្ញាប្ដូរទិស មានទំនាក់ទំនងជាមួយនឹងនាទីនៃលទិ្ធនន័យរបស់លីនុច ។ ជាទូទៅនៃលទិ្ធនន័យ លីនុចមានបីគឺ ៖

stdin (standard input)៖ អានការបញ្ចូលតាមក្ដារចុចតាងដោយនាទីនៃលេខសូន្យ (0)

stdout (standard output) ៖ បញ្ចូនលទ្ធផលបង្ហាញលើម៉ូនីទ័រតាងដោយនាទីនៃលេខ ១

Stderr (standard error) ៖ កំហុសត្រូវបានបង្ហាញលើអេក្រង់តាងដោយនាទីនៃលេខ ២

អ្វីទៅសញ្ញាប្ដូរទិស ?
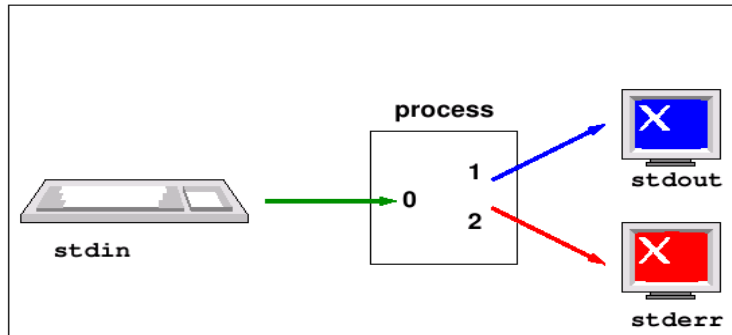
ស្ទង់ដារលទ្ធផល (stdout) ៖

បង្ហាញពីលទ្ធផលនៃការប្រតិបត្តិពាក្យបញ្ជាណាមួយ

សូមមើលឧទាហរណ៍ ៖ ចូរបង្ហាញលទ្ធផលនៃពាក្យបញ្ជា ls នៅក្នុងឯកសារមួយឈ្មោះ filelist.txt ។

:~> ls -l > filelist.txt

:~> ls -la >> filelist.txt

តាមរយៈឧទាហរណ៍ខាងលើបញ្ជាក់ថា លទ្ធផលរបស់ពាក្យបញ្ជា ls -l វានឹងធ្វើជាព័ត៌មានបញ្ចូល ដោយប្រើសញ្ញា > ទៅក្នុងឯកសារ filelist.txt បើប្រើសញ្ញា >> វានឹងបន្ថែមនៅខាងចុង ។

ស្ទង់ដារកំហុស (stderr) ៖

ស្ទង់ដារកំហុស និងស្ទង់ដារលទ្ធផលត្រូវបានបង្ហាញលើអេក្រង់ក្នុងពេលតែមួយ មានន័យថាអ្នកចង់ រក្សាទុកកំហុសនៃការវាយពាក្យបញ្ជាក្នុងឯកសារមួយ ដើម្បីងាយស្រួលដោះស្រាយបញ្ជា ។ មើលឧទាហរណ៍ខាងក្រោម ៖

+ វាយ echo "This is a file for testing">testfile.txt

+ បន្ទាប់មកវាយ cat testfile.txt nofile.txt សូមឲ្យប្រាកដថាគ្មានឯកសារឈ្មោះ nofile.txt

    រូចវានឹងបង្ហាញ

- This is a file for testing ជាស្តង់ដារលទ្ធផល (stdout) ដែលបានមកពីពាក្យ

បញ្ជា echo ។

- cat:nofile.txt: No such file or directory ជាស្តង់ដារកំហុស (stderr)

<u>របៀបអនុវត្តសេចក្ដីបូរទិស ៖</u>

មុខងារការបូរទិស	ខ្លឹមហារណ៏
ធ្វើ stdout ទៅឯកសារ	:~> ls -l > file.txt, :~> ls -l 1 > file.txt (~> = /home/user)
ធ្វើ stderr ទៅឯកសារ	:~> ls | 2 > file.txt លេខ ២ តំណាងឲ្យកំហុស
ធ្វើទាំង stdout និង stderr ទៅឯកសារ	:~> ls -l > file.txt 2>&1
ទទួល stdout ទៅឯកសារ	:~> ls -l > file.txt
បន្ថែម stout ទៅចុងឯកសារ	:~> ls -al >> file.txt ឬ :~> ls -al 1 >> file.txt
បន្ថែម stderr ទៅចុងឯកសារ	:~> ls | 2 >> file.txt
បន្ថែម stderr និង stdout ទៅចុងឯកសារ	:~> ls | >> file.txt 2>&1

ជាទូទៅម៉ាស៊ីនអាចសម្គាល់ឯកសារជាព័ត៌មានបញ្ចូល (input) លទ្ធផល (output) និង កំហុស (error) អាស្រ័យលើលេខតំណាងចាប់ពី ០ ទៅ ២ ។

អ្វីទៅសញ្ញាផាយ ?

សញ្ញាផាយ (।) ប្រើសម្រាប់យកលទ្ធផលនៃពាក្យបញ្ជាមួយធ្វើជាព័ត៌មានបញ្ចូលនៃពាក្យបញ្ជាផ្សេង
ទៀត ។

មានអត្ថប្រយោជន៍ច្រើនក្នុងការស្វែងរកខ្សែអក្សរនៅក្នុងឯកសារ ឬប្រើផ្សំជាមួយពាក្យដទៃទៀត ។
សូមមើលឧទាហរណ៍ខាងក្រោម ៖

:~/Desktop> ls -l >> filelist.txt

:~/Desktop> ls -l ၊ less ប្រើសញ្ញាផាយ (।) ជាមួយពាក្យបញ្ជា less ដើម្បីមើលលទ្ធផល ls -l ម្តងមួយ
ទំព័រ

:~Desktop> ls -l ၊ grep file > newfile.txt តាមរយៈឧទាហរណ៍នេះបញ្ជាក់ថា វានឹងស្វែងរកពាក្យ file
ដែលបានមកពីលទ្ធផលពាក្យបញ្ជា ls -l បន្ទាប់មកវាត្រូវបានសរសេរទៅកាន់ឯកសារឈ្មោះ
newfile.txt ។

File and Directory

1. Useful Configuration Files

- /boot/vmlinuz - the typical location and name of the Linux kernel
- /dev/fd1 - second floppy disk drive
- /dev/hda - first IDE hard drive
- /etc/aliases - file containing aliases used by sendmail and other MTAs (mail transport agents). After updating this file, it is necessary to run the newaliases utility for the changes to be passed to sendmail.
- /etc/bashrc - system-wide default functions and aliases for the bash shell
- /etc/conf.modules - aliases and options for configurable modules
- /etc/crontab - shell script to run different commands periodically (hourly, daily, weekly, monthly, etc.)
- /etc/exports - specifies hosts to which file systems can be exported using NFS. Man exports contains information on how to set up this file for remote users.
- /etc/fstab - contains information on partitions and filesystems used by system to mount different partitions and devices on the directory tree
- /etc/HOSTNAME - stores the name of the host computer
- /etc/hosts - contains a list of host names and absolute IP addresses.
- /etc/hosts.allow - hosts allowed (by the tcpd daemon) to access Internet services

- /etc/hosts.deny - hosts forbidden (by the tcpd daemon) to access Internet services

- /etc/group - similar to /etc/passwd but for groups

- /etc/inetd.conf - configures the inetd daemon to tell it what TCP/IP services to provide (which daemons to load at boot time). A good start to securing a Linux box is to turn off these services unless they are necessary.

- /etc/inittab - runs different programs and processes on startup.

- /etc/issue - pre-login message.

- /etc/mtab - shows currently mounted devices and partitions and their status

- /etc/passwd - contains passwords and other information concerning users who are registered to use the system.

- /etc/printcap - shows the setup of printers

- /etc/profile - sets system-wide defaults for bash shell.

- /etc/resolv.conf - contains a list of domain name servers used by the local machine

- /etc/securetty - contains a list of terminals on which root can login. For security reasons, this should not include dialup terminals.

- /etc/X11/XF86Config - X configuration file. The location in Slackware is /etc/XF86Config.

- /proc/cpuinfo - cpu information

- /proc/filesystems - prints filesystems currently in use

- /proc/interrupts - prints interrupts currently in use

- /proc/version - prints Linux version and other info

- /var/log/messages - used by syslog daemon to store kernel boot-time messages

- /var/log/lastlog - used by system to store information about last boot

- /var/log/wtmp - contains binary data indicating login times and duration for each user on system

2. File Types

- There are 4 types of file:

> Ordinary file (-)

> Directory (d)

> Links file or shortcut (l)

> Device file (b or c)

- To see file type, you type **dir –l**
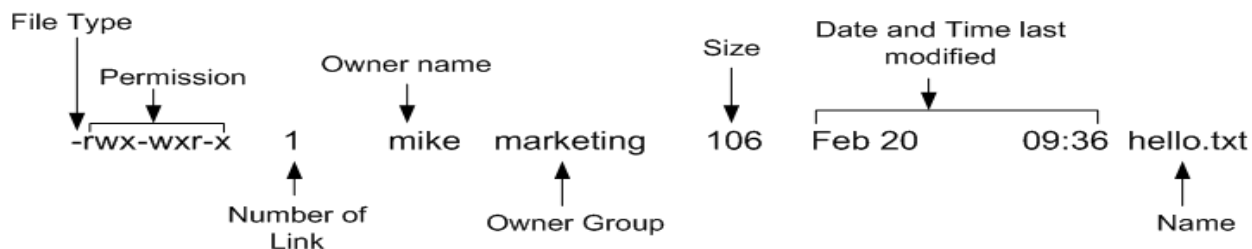
File information displayed using -l option for the dir command

To see file type, you should use **file** command.

Syntax:

file <filename>

Example 1: To see file type of the /etc/grub.conf, you type:

[root@server1 ~]# **file /etc/grub.conf**

Example 2: To see file type of the /etc, you type:

[root@server1 ~]# **file /etc**

File Permission

Fast Facts:

▪ Users are divided into:

Owner (**u**)

Primary group or owner group (**g**)

Other group (**o**)

All users (**a**)

▪ Permission to access file or directory can be:

Read(**r**)

Write(**w**)

Execute(**x**)

No permission (-)

▪ To see permission, you type **dir –l** or **ls –l**

For example, you type dir –l /data

File information displayed using -l option for the dir command

- o   First character to define file type

- o   9 characters next to define permission as the following:

    - ▪   First three characters = Owner's permission

    - ▪   Second three characters = Primary group's mission

    - ▪   Other three characters = Other group's permission

1. Using chown command

chown : Change owner

Syntax

    chown <new-owner> <file1> <dir1> <file2> <dir2> …

Example:

1. [root@server1 ~]# **chown user1 /test**

2. [root@server1 ~]# **chown user2 /tmp/file1 /tmp/file2 /tmp/dir1**

3. [root@server1 ~]# **chown –R /test**

2. Using chgrp command

chgrp : Change primary group

Syntax

     chgrp <new-group> <file1> <dir1> <file2> <dir2> …

Example:

1. [root@server1 ~]# **chgrp group1 /test**

2. [root@server1 ~]# **chgrp group2 /tmp/file1 /tmp/file2 /tmp/dir1**

3. [root@server1 ~]# **chgrp group1 –R /test**

3. Using chmod command

chmod: Change file permission

3.1. Using Symbol text method

Options	Execution
u (user)	
g (group)	
o (other)	
a (all users)	
+	Add permission
-	Remove permission
=	Assign entire set of permission

Syntax

     chmod [u,g,o,a][+,-,=][r,w,x] <file1> <dir1> <file2> <dir2> …

Example:

1.   [root@server1 ~]# **chmod u+x,g-r+x,o-r+w-x /tmp/file1 /tmp/fil2 /tmp/dir1**

2.   [root@server1 ~]# **chmod g+w /tmp/file3**

3.   [root@server1 ~]# **chmod a+x /scripts/myf.sh**

3.2. Using Absolute method

     Octal   Binary

          rwx

0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

1= Turn permission on

0= Turn permission off

Syntax:

      chmod \<digit1\>\<digit2\>\<digit3\> \<file1\> \<dir1\> \<file2\> \<dir2\> ….

For example:

1. [root@server1 ~]# **chmod 645 /tmp/file1 /tmp/file2 /tmp/dir1**

2. [root@server1 ~]# **chmod 711 /scripts/myf.sh**

Note: Finally, you just to remember theses number:

      4 = Read

       2 = Write

       1 = Execute

For example:

      [root@server1 ~]# **chmod 761 /tmp/hello.txt**

Analysis

          7 = 4+2+1 = rwx

          6 = 4+2+0 = rw-

          1 = 0+0+1 = --x

Using Basic Commands

❐ To view all commands, you press **Tab** key twice times

❐ To see command leading by us, you type **us** and press **Tab** key twice times

❐ **Tab** key, use as the completion key.

Example: You want to use **useradd** command, you just type **usera** and then press **Tab** key it should be

useradd

The following are **basic commands** you should use:

man – Read help of command

For example:

      [root@server1 ~]# **man useradd**

▸ Press **Space bar** to see next screen, and press **q** to quit.

su - : Switch user account

Syntax:

      su - <username>

Example 1: To switch user to **root**, you just type

      [root@server1 ~]# **su – root**

Or   [root@server1 ~]# **su -**

Example 2: To switch user to **mike**, you type:

      [root@server1 ~]# **su - mike**

1. File and directory operation

find – To find file

Example 1: To find **ifcfg-eth0** file, you type:

      [root@server1 ~]# **find / -name ifcfg-eth0**

mkdir – Create directory

Syntax:

      mkdir <directory-name>

For example:

1. [root@server1 ~]# **mkdir /mydata**

2. [root@server1 ~]# **mkdir /mydata/test**

3. [root@server1 ~]# **mkdir –p /dir1/dir2/dir3**

cd- Change directory

For example:

1. [root@server1 ~]# **cd /**

2. [root@server1 /]# **cd /tmp**

3. [root@server1 tmp]# **cd ..**

4. [root@server1 /]# **cd ~**

rmdir – Remove empty directory

Syntax: rmdir <directory-name>

For example:

[root@server1 ~]# **rmdir /test**

rm – Remove directory and its content

Syntax:

rm –r <directory>

Example:

1.   [root@server1 ~]# **rm –r /test**

2.   [root@server1 ~]# **rm –rf /test1**

pwd – Print name of current working directory

For example:

[root@server1 ~]# **cd /etc/sysconfig**

[root@server1 ~]# **pwd**

cp – Copy files and directories

Syntax: cp <sources> <destination>

For example:

[root@server1 ~]# **cp /file1 /test/file2 /tmp**

[root@server1 ~]# **cp –r /mydata /tmp**

[root@server1 ~]# **cp –r /test/* /tmp**

[root@server1 ~]# **cp –r /test/[a-d]* /tmp**

mv – Move or rename file

Example 1: To move **file1** from /**test** to /**tmp** directory, you should type:

[root@server1 ~]# **mv /test/file1 /tmp**

Example 2: To rename **/tmp/file1** to /**tmp/file2**, you should type:

[root@server1 ~]# **mv /tmp/file1 /tmp/file2**

cat – Concatenate file and print on the standard output.

Syntax: cat [input] [> or >>] [output]

Example:

[root@server1 ~]# **cat /tmp/file1**

[root@server1 ~]# **cat /tmp/file1 | more**

[root@server1 ~]# **cat /etc/passwd > /tmp/passwd.original**

[root@server1 ~]# **cat /test/hello.txt >> /tmp/passwd.original**

[root@server1 ~]# **cat > /tmp/hello.txt**

(You type message here and press Enter, then press Ctrl+D)

more – Display more screen.

For example:

          1. [root@server1 ~]# **more /etc/passwd**

           2. [root@server1 ~]# **dir /etc | more**

lpr – Print file

For example:

          [root@server1 ~]# **lpr /etc/passwd**

lpq – Show printer queue status.

For example:

          [root@server1 ~]#**lpq**

lprm – Cancel print jobs.

For example:

          [root@server1 ~]# **lprm 0015**

ln – Make link between files.

Syntax: ln <original-file> <new-file>

Example 1:

          [root@server1 ~]# **ln /test1/myfile.sh /test2/myfile.bak**

          [root@server1 ~]# **ln –s /test1/myfile.sh /test2/myfile.bak**

touch – Create a blank file or change file time stamps.

Example 1: To create a blank /tmp/myfile.log file, you type:

          [root@server1 ~]# **touch /tmp/myfile.log**

grep – Print lines matching a pattern

Syntax:

        grep <pattern> file

Example:

[root@server1 ~]# **grep default /etc/grub.conf**

2. Useful Commands

clear – Clear screen.

Example:

[root@server1 ~]# **clear**

alias – Create alias of command.

For example:

[root@server1 ~]# **alias cls=clear**

unalias – Remove alias command

For example: To remove alias cls, you type:

[root@server1 ~]# **unalias cls**

bc – Basic calculator.

For example:

[root@server1 ~]# **bc**

cal – Open calendar.

For example:

[root@server1 ~]# **cal**

date   - Check date and time.

For example:

[root@server1 ~]# **date**

history – Check the history of used commands.

For example:

[root@server1 ~]# **history**

!! – Execute the last command.

For example:

[root@server1 ~]# **!!**

!<number> - Executer the command <number>

For example:

> [root@server1 ~]# **!39**

▸ To clear the history, you just type:

> [root@server1 ~]# **history –C**

whoami – Print effective userID.

For example:

> [root@server1 ~]# **whoami**

who – Check who on the system.

For example:

> [root@server1 ~]# **who**

w – Check who on the system and what they are doing?

Example 1: To check the system who is on and what they are doing, you type:

> [root@server1 ~]# **w**

hostname – Check host name.

For example:

> [root@server1 ~]# **hostname**

write <username> - Write message to <username>

For example:

> [root@server1 ~]# **write mike**
>
> -------
>
> -------
>
> Press Ctrl+D to terminate the session and send

wall – Broadcast message.

For example:

> [root@server1 ~]# **wall "Hello everybody!"**

mesg y <> mesg n – Turn on or turn off message.

mail <username> - Send mail to <username>

Example 1: To send mail to mike, you type of these:

1.   [root@server1 ~]# **mail mike**

2.   [root@server1 ~]#**mail mike@server1**

3.   [root@server1 ~]# **mail –s "Hello from Mike" sok@server1**

4.   [root@server1 ~]# **mail –s "Final exam" mike@server1 < /tmp/fexam.txt**

Example 2: To read mail, you just type:

       [root@server1 ~]# **mail**

Compress/Decompress, zip/unzip and tar

1. gzip: Used to compress file size

Syntax:

```
gzip <file1> <file2> <file3>…
```

Example 1:

1.   Log on as root

2.   [root@server1 /]# **mkdir /test**

3.   [root@server1 /]# **cat /etc/passwd > /test/passwd.bak**

4.   [root@server1 /]# **cat /etc/group > /test/group.bak**

5.   [root@server1 ~]# **cd /test**

6.   [root@server1 test]# **dir**
   ‣ What you see?

7.   [root@server1 test]# **gzip passwd.bak group.bak**

8.   [root@server1 test]# **dir**
   ‣ What you see?

Example 2:

   1.   [root@server1 ~]# **gzip –r /mydata**

   2.   [root@server1 /]# **dir –l /mydata**

2. gunzip: Used to expand/decompress file size.

Syntax:

> gunzip <file1> <file2> <file3>…

Example: To decompress files you compressed above, you type:

    [root@server1 ~]# **gunzip /test/passwd.bak /test/group.bak**

Or type:

    [root@server1 ~]# **gunzip –r /test**

3. zip: Used to package and compress (archive) files

Syntax:

> zip <target-file.zip> <file1> <file2> <file3>…

Example: To zip two files above into the **/tmp/myfiles.zip**, you type:

    [root@server1 ~]# **zip /tmp/myfiles.zip /test/passwd.bak /test/group.bak**

Other examples

    [root@server1 ~]# **zip –r /tmp/myetc.zip /etc**

    [root@server1 ~]# **zip –r /tmp/mydata.zip /etc/passwd /etc/shadow /home**

4. unzip: List, extract compressed file in a zip archive

Syntax:

> **unzip <zip file>**

Example 1: To extract **/tmp/myfiles.zip** above into the **/test2** directory, you type:

   1.   [root@server1 ~]# **cd /test2**

   2.   [root@server1 test2]# **unzip /tmp/myfiles.zip**

Example 2: To extract **/tmp/mydata.zip** above to **/other-dir** directory, you type:

   1.   [root@server1 ~]# **unzip /tmp/mydata.zip –d /other-dir**

   2.   [root@server1 ~]# **dir /other-dir**

5. tar: File archiving

Syntax:

tar –cvf <device> <files> ⇔ tar –xvf <device>.tar

Options:

-c: Create archive   -v: Verbose mode   -f: File to archive to

-x: Extract   -z: Filter the archive through zip   -t: Listing

<u>5.1. Creating a tar archive</u>

Example:

[root@server1 ~]# **tar –cvf /backup/home-20-03-2010.tar /home**

[root@server1 ~]# **tar –cvf /backup/account.tar /etc/passwd /etc/group**

<u>5.2. Restoring from a tar archive</u>

Example 1: To restore **/backup/ home-20-03-2010.tar** file above to current working directory, you type:

1. [root@server1 ~]# **cd /tmp**

2. [root@server1 tmp]# **tar –xvf /backup/ home-20-03-2010.tar**

Example 2: To list files in the **/backup/config-05122007.tar** archive above, you type:

[root@server1 ~]# **tar –tvf /backup/account.tar | more**

Example 3: To restore (extract) a particular file to currently working directory, you type:

[root@server1 ~]# **tar –f /backup/sysconfig-05122007.tar –x etc/sysconfig/network-scripts/ifcfg-lo**

<u>5.3. Other tar facilities</u>

tar has other options, such as the ability to **compress** archives, to **include** files from multiple directories, and to **excludes** certain files.

Example:

1. [root@server1 ~]# **cd /tmp**

2. [root@server1 tmp]# **tar –czvf /tmp/sysconfig-30112007.tar.gz /etc /usr/local/apps/etc**

To restore back, you type:

1. [root@server1 ~]# **cd /tmp**

2. [root@server1 tmp]# **tar –zxvf /tmp/config-30112007.tar.gz**

Using vi Text Editor

1. To start vi, you just type **vi**

2. To open existing file, you type **vi <filename>**
For example, to open /etc/passwd file, you should type:

> **vi /etc/passwd**

3. To create a new file, you type **vi <filename>**
For example, to create /tmp/hello.txt file, you should type:

> **vi /tmp/hello.txt**

4. To open the file in Read Only mode, you type `vi -r` **<filename>**

For example, to open /tmp/hello.txt file as Read only, you should type:

> **vi –r /tmp/hello.txt**

vi mode

There are two types of mode:

1. **Input mode** (insert mode) used for editing

2. **Command mode** used for using its command

- After starting vi, you are currently in the **Command mode**.
- Switch from Command mode to Input mode, you press **i or a**
- Switch from Input mode to Command mode, you press **Esc**

Moving Around the Entire Document

These commands allow you to change the portion of your document that appears on your screen and to move around the document quickly.

Ctrl-f	move forward a screen
Ctrl-b	move back a screen
Ctrl-u	move up half a screen
Ctrl-d	move down half a screen
num G	move to the specified line (use **Ctrl-g** to display the current line number)
:*num*	move to the specified line
G	move to the last line in the file
:$	move to the last line in the file

Searching for Text

Vi has search commands to find a particular section of your document quickly.

/ *pattern*	search forward through the document for the next occurrence of the *pattern* (or string of text)
? *pattern*	search backward through the document for the next occurrence of the *pattern* (or string of text)
n	repeat search in the same direction
N	repeat search in opposite direction
f *char*	search forward from the cursor in the current line for a single character (*char*)
F *char*	search backward from the cursor in the current line for a single character (*char*)
;	repeat single character search in either direction (f or F)

Deleting Text

The following commands allow you to delete single characters, words, or whole lines of text with a single command.

x	delete character under cursor
[*num*] x	delete *num* characters from cursor forward
X	delete character before the cursor
[*num*] X	delete *num* characters before the cursor
[*num*] dw	delete *num* words starting with the current word from the cursor on
D	delete text from the cursor to the end of the current line
[*num*] dd	delete *num* lines starting with the current line

Copying ("Yanking") and Pasting Text

Vi allows you to copy or delete blocks of text and place them elsewhere in your document. The put commands below will insert into the document any text which has been put into the buffer by the delete commands above or the yank (copy) commands below:

x	delete character under cursor
[num] x	delete num characters from cursor forward
X	delete character before the cursor
[num] X	delete num characters before the cursor
[num] dw	delete num words starting with the current word from the cursor on
D	delete text from the cursor to the end of the current line
[num] dd	delete num lines starting with the current line

Saving and exiting basic command:

Command	Action
:w	Save to current file
:w <filename>	Save as another file
w!<filename>	Save as and overwrite another file.
:q	Exit after making no change.
:q!	Exit without saving
:x	Save and exit.
/<string>	To find string

Miscellaneous Vi Commands

The following commands are helpful when using *vi*:

u	undo the last change
U	undo the changes made to the current line
Ctrl-l	redraw the screen if it has been altered by output from some other program or a transmission error (such as a talk request)
Ctrl-g	print the line number of the current line and how many lines are in the document
%	show matching (), {}, or [] when the current character is one of the characters
[num] J	join num lines together, starting with the current line (delete the **Returns** between the lines)
:r filename	read a file into the document below the current line
~	change the case of the current character

Managing User and Group Accounts

I. Managing group and user accounts in GUI
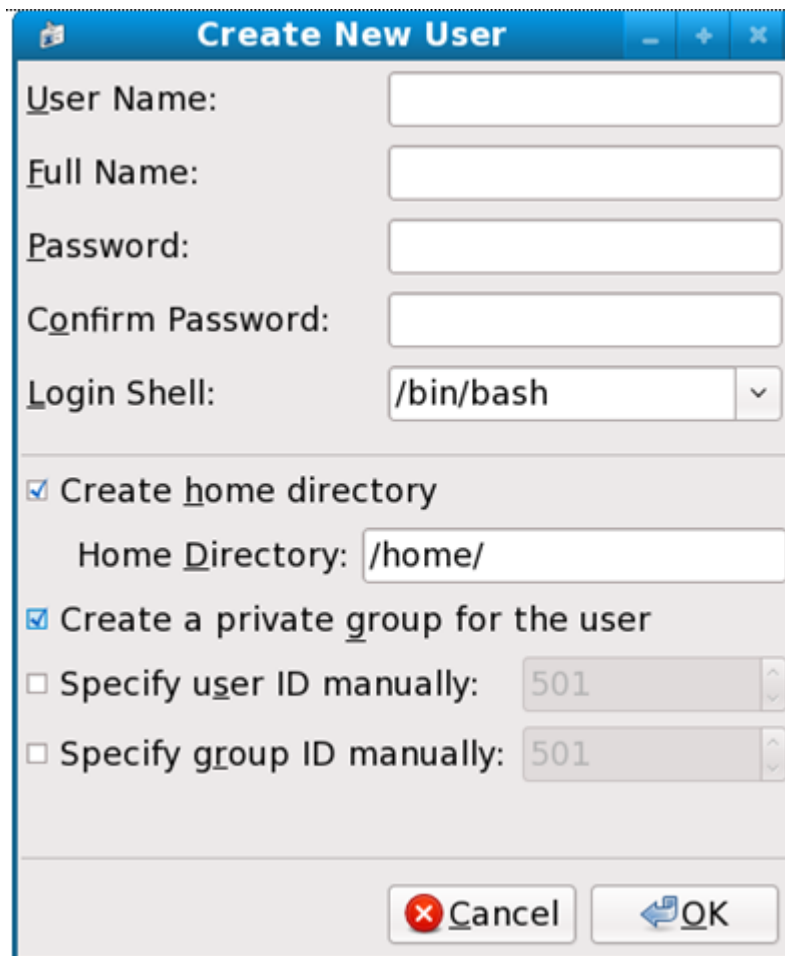
▪To manage group and user accounts in the GUI, click **System,** point to **Administration** and select **Users and Groups**
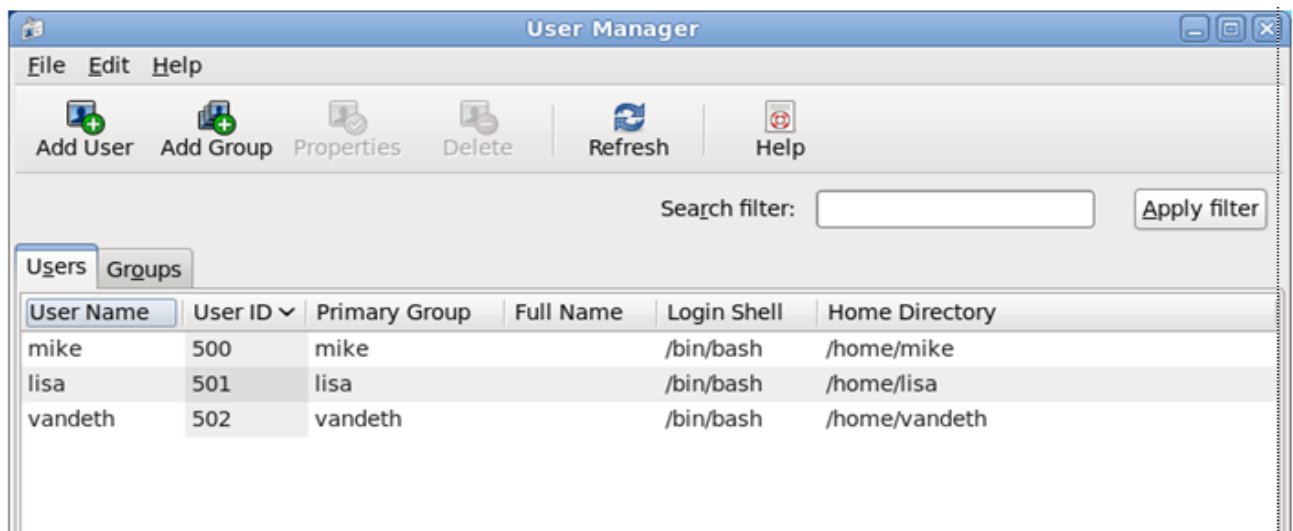
▪ To create Group account, in the User Manager windows, on the Tool bar, click Add Group and then type in appropriate information into text boxes as the picture:
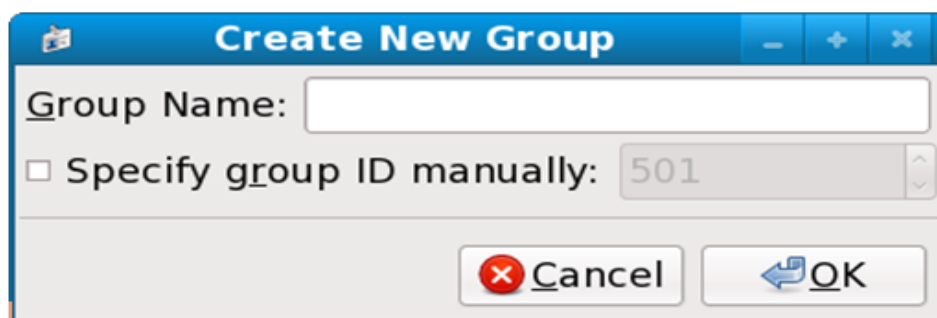
▪   To create user account, in the User Manage windows, click **Add User** and type account information into the appropriate information into the text boxes as the picture:

II. Managing User account and Group account in Shell

1. Files

Files to store account information:

▪   /etc/group: Store group accounts

▪   /etc/gshadow: Store security group password

▪   /etc/passwd: Store user accounts

▪   /etc/shadow: Store security user password.

Important:

The structure of /etc/passwd is that:

user name:password:user ID:group ID:Description:home directory:login shell

For example:

mike:x:500:500:Mike Denner:/home/mike:/bin/bash

2. Commands used to manage account

To manage user and group account in the shell, you should use the following commands:

▪   groupadd: Add new group account

▪   groupdel: Delete group account

▪   groupmod: Modify group account

▪   useradd: Add new user account

▪   userdel: Delete user account

▪   usermod: Modify user account

▪   passwd: Set or change new password

▪   finger: Read user account property

▪   chfn: Change finger info of account.

▪   grpconv, grpunconv, pwconv, pwunconv: convert to and from shadow passwords and groups

Using group command

Syntax:

        groupadd <group-name>

Example 1: To add group account named it **engine**, you type as the following:
        [root@server1 ~]# **groupadd engine**

Using groupmod

Syntax:

To rename group **engine** to **devel**, you type as the following:

        [root@server1 ~]# **groupmod –l engine devel**

Using groupdel

Syntax:

        groupdel <group-name>

Example 1: To delete empty group **engine**, you should type:
        [root@server1 ~]# **groupdel engine**

Using useradd

Syntax:

    useradd [-c comment] [-g group-name] [-d home_dir] [-e expire_date] [-s shell] [-M] login

        -M : Do not create home directory

        -e : Expire date: in the format yyyy-mm-dd

Example 1: To create default user account (no option) call it **user1**, you type:

1.   [root@server1 ~]# **useradd user1**

2.   [root@server1 ~]# **passwd user1**

Example 2:   To create user account name it **kakada** into the **software** group, you type:

1.   [root@server1 ~]# **useradd –g software kakada**
2.   [root@server1 ~]# **passwd kakada**

Example 3:   To create user account named it **dummy** without home directory, you type:

1.   [root@server1 ~]# **useradd -M dummy**

2.   [root@server1 ~]# **passwd dummy**

Using usermod

Syntax:

usermod [-c comment] [-d home_dir] [-e expire_date] [-M] [-g initial_group] [-s shell] [-l new login_name] login

Example 1:   To rename user account from **kakada** to **vanna**, you type:

[root@server1 ~]# **usermod –d /home/vanna –l vanna kakada**

[root@server1 ~]# **mv /home/kakada /home/vanna**

Using userdel

Syntax:

userdel [-r] <user-name>

Example 1:   To delete user account **user1** without delete its home directory, you should type:

[root@server1 ~]# **userdel user1**

Example 2:   To delete user account **user1** and also delete its home directory, you should type:

[root@server1 ~]# **userdel –r user1**

Using finger

Syntax:

finger <user-name>

Example 1:   To read user account information of **mike**, you type:

[root@server1 ~]# **finger mike**

<u>Using chfn</u>

Syntax:

chfn [-f full-name] [-o office] [-p phone-office] [-h home-phone] username

Example 1:   To change user account information of **bora**, you type:

[root@server1 ~]# **chfn –f "Kok Bora" –o "ITech Company" –p "855-23 210 071" –h "855-23 210 087" bora**

Example 2:   To change user information of user **user1**, you should type:

[root@server1 ~]# **chfn user1**

Then you should follow the instruction on the screen by entering user's information into the appropriate text boxes.

Implementing Disk Quotas

▪ Disk space can be restricted by implement disk quotas so that system administrator is altered before a user consumes too much disk space or a partition becomes full.

▪ Disk quota can be configured for individual users as well as user groups.

▪ Quota can be set not just to control the number of disk blocks consumed but to control the number of inodes. Because inodes are used to contain file-related information, this allows control over the number of files that can be created.

1. Configuring Disk Quotas

To implement disk quotas, use the following steps:

1.   Enable quotas per file system by modifying /etc/fstab

2.   Remount the file system(s)

3.   Create the quota files and generate the disk usage table

4.   Assign quotas

Each of these steps is discussed in detail in the following sections.

1.1. Enabling Quotas

As root, using the text editor of your choice, add the usrquota and/or grpquota options to the file systems that require quotas:

```
LABEL=/            /            ext3   defaults     1 1
LABEL=/boot    /boot         ext3   defaults     1 2
none           /dev/pts      devpts gid=5,mode=620  0 0
LABEL=/home    /home          ext3   defaults,usrquota,grpquota 1 2
none           /proc        proc    defaults      0 0
none           /dev/shm      tmpfs  defaults      0 0
/dev/hda2      swap          swap    defaults      0 0
/dev/cdrom     /mnt/cdrom    udf,iso9660 noauto,owner,kudzu,ro 0 0
/dev/fd0       /mnt/floppy   auto   noauto,owner,kudzu 0 0
```

In this example, the /home file system has both user and group quotas enabled.

1.2. Remounting the File Systems

After adding the userquota and grpquota options, remount each file system whose fstab entry has been modified. If the file system is not in use by any process, use the umount command followed by the mount to remount the file system. If the file system is currently in use, the easiest method for remounting the file system is to reboot the system.

1.3. Creating Quota Files

After each quota-enabled file system is remounted, the system is now capable of working with disk quotas. However, the file system itself is not yet ready to support quotas. The next step is to run the quotacheck command.

The quotacheck command examines quota-enabled file systems and builds a table of the current disk usage per file system. The table is then used to update the operating system's copy of disk usage. In addition, the file system's disk quota files are updated.

To create the quota files (aquota.user and aquota.group) on the file system, use the -c option of the quotacheck command. For example, if user and group quotas are enabled for the /home partition, create the files in the /home directory:

```
quotacheck -acug /home
```

The -a option means that all mounted non-NFS file systems in /etc/mtab are checked to see if quotas are enabled. The -c option specifies that the quota files should be created for each file system with quotas enabled, the -u specifies to check for user quotas, and the -g option specifies to check for group quotas.

If neither the -u or -g options are specified, only the user quota file is created. If only -g is specified, only the group quota file is created.

After the files are created, run the following command to generate the table of current disk usage per file system with quotas enabled:

```
quotacheck -avug
```

The options used are as follows:

- a — Check all quota-enabled, locally-mounted file systems
- v — Display verbose status information as the quota check proceeds
- u — Check user disk quota information
- g — Check group disk quota information

After quotacheck has finished running, the quota files corresponding to the enabled quotas (user and/or group) are populated with data for each quota-enabled file system such as /home.

1.4. Assigning Quotas per User

The last step is assigning the disk quotas with the edquota command.

To configure the quota for a user, as root in a shell prompt, execute the command:

edquota *username*

Perform this step for each user for which you want to implement a quota. For example, if a quota is enabled in /etc/fstab for the /home partition (/dev/hda3) and the command edquota testuser is executed, the following is shown in the editor configured as the default for the system:

Disk quotas for user testuser (uid 501):

Filesystem	blocks	soft	hard	inodes	soft	hard
/dev/hda3	440436	0	0	37418	0	0

The first column is the name of the file system that has a quota enabled for it. The second column shows how many blocks the user is currently using. The next two columns are used to set soft and hard block limits for the user on the file system. The inodes column shows how many inodes the user is currently using. The last two columns are used to set the soft and hard inode limits for the user on the file system.

A hard limit is the absolute maximum amount of disk space that a user or group can use. Once this limit is reached, no further disk space can be used.

The soft limit defines the maximum amount of disk space that can be used. However, unlike the hard limit, the soft limit can be exceeded for a certain amount of time. That time is known as the *grace period*. The grace period can be expressed in seconds, minutes, hours, days, weeks, or months.

If any of the values are set to 0, that limit is not set. In the text editor, change the desired limits. For example:

Disk quotas for user testuser (uid 501):

Filesystem	blocks	soft	hard	inodes	soft	hard
/dev/hda3	440436	500000	550000	37418	0	0

To verify that the quota for the user has been set, use the command:

quota testuser

1.5. Assigning Quotas per Group

Quotas can also be assigned on a per-group basis. For example, to set a group quota for the devel group, use the command (the group must exist prior to setting the group quota):

edquota -g devel

This command displays the existing quota for the group in the text editor:

Disk quotas for group devel (gid 505):

Filesystem	blocks	soft	hard	inodes	soft	hard
/dev/hda3	440400	0	0	37418	0	0

Modify the limits, save the file, and then configure the quota.

To verify that the group quota has been set, use the command:

quota -g devel

1.6. Assigning Quotas per File System

To assign quotas based on each file system enabled for quotas, use the command:

edquota -t

Like the other edquota commands, this one opens the current quotas for the file system in the text editor:

Grace period before enforcing soft limits for users:

Time units may be: days, hours, minutes, or seconds

Filesystem	Block grace period	Inode grace period
/dev/hda3	7days	7days

Change the block grace period or inode grace period, save the changes to the file, and exit the text editor.

2. Managing Disk Quotas

If quotas are implemented, they need some maintenance — mostly in the form of watching to see if the quotas are exceeded and making sure the quotas are accurate. Of course, if users repeatedly exceeds their quotas or consistently reaches their soft limits, a system administrator has a few choices to make depending on what type of users they are and how much disk space impacts their work. The administrator can either help the user determine how to use less disk space or increase the user's disk quota if needed.

2.1. Reporting on Disk Quotas

Creating a disk usage report entails running the repquota utility. For example, the command repquota /home produces this output:

```
*** Report for user quotas on device /dev/hda3
Block grace time: 7days; Inode grace time: 7days
                Block limits              File limits
User        used   soft   hard grace   used soft hard  grace
----------------------------------------------------------------
root     --   36     0     0            4    0    0
tfox     --  540     0     0          125    0    0
testuser --  440400 500000 550000    37418  0    0
```

To view the disk usage report for all quota-enabled file systems, use the command:

```
repquota -a
```

While the report is easy to read, a few points should be explained. The -- displayed after each user is a quick way to determine whether the block or inode limits have been exceeded. If either soft limit is exceeded, a + appears in place of the corresponding -; the first - represents the block limit, and the second represents the inode limit.

The grace columns are normally blank. If a soft limit has been exceeded, the column contains a time specification equal to the amount of time remaining on the grace period. If the grace period has expired, none appears in its place.

2.2. Keeping Quotas Accurate

Whenever a file system is not unmounted cleanly (due to a system crash, for example), it is necessary to run quotacheck. However, quotacheck can be run on a regular basis, even if the system has not crashed

```
quotacheck -avug
```

The easiest way to run it periodically is to use cron. As root, you can either use the crontab -e command to schedule a periodic quotacheck or place a script that runs quotacheck in any one of the following directories (using whichever interval best matches your needs):

- /etc/cron.hourly
- /etc/cron.daily
- /etc/cron.weekly
- /etc/cron.monthly

The most accurate quota statistics can be obtained when the file system(s) analyzed are not in active use. Thus, the cron task should be schedule during a time where the file system(s) are used the least. If this time is various for different file systems with quotas, run quotacheck for each file system at different times with multiple cron tasks.

2.3. Enabling and Disabling

It is possible to disable quotas without setting them to be 0. To turn all user and group quotas off, use the following command:

```
quotaoff -vaug
```

If neither the -u or -g options are specified, only the user quotas are disabled. If only -g is specified, only group quotas are disabled.

To enable quotas again, use the quotaon command with the same options.

For example, to enable user and group quotas for all file systems:

```
quotaon -vaug
```

To enable quotas for a specific file system, such as /home:

```
quotaon -vug /home
```

If neither the -u or -g options are specified, only the user quotas are enabled. If only -g is specified, only group quotas are enabled.

Exercise: Implementing Disk Quotas.

In this exercise, you will create a user account call-it lisa and set quota disk (or restrict disk space) for lisa to 6 Mb (6144 Kb). You should complete to the following steps:

1. Log on as root

2. [root@server1 ~]# useradd lisa

3. [root@server1 ~]# passwd lisa

4. [root@server1 ~]# vi /etc/fstab

5. Press I and change similar line:

/dev/... /home   /home   ext4   defaults   1 2

to:

/dev/... =/home   /home   ext4   defaults,usrquota,grpquota   1 2

6. Press Esc and type :x

7. [root@server1 ~]# mount –o remount /home

8. [root@server1 ~]# quotacheck –cug /home

(Type dir /home , you will aquota.user and aquota.group files in /home)

9. [root@server1 ~]# quotacheck –avug (for generate)

10. [root@server1 ~]# edquota lisa

11. [root@server1 ~]# quotacheck -avug

12. Press I and edit to:

Disk quotas for user lisa (uid 500):

Filesystem	blocks	soft	hard	inodes	soft	hard
/dev/hda6	0	5120	6144	0	0	0

13. Press Esc and type :x

14. [root@server1 ~]# quota lisa
    What will you see?

15. [root@server1 ~]# quotaon –vug /home

16. Press Ctrl+Alt+F2 and log on as lisa

17. [root@server1 ~]# cp –a /etc/* /home/lisa
    What will you see at the end of message?

របៀបទី �ពីរ

Disk quotas

I.   **Setup quota**   (www.opensuse.org)

   a.   Konsole

   b.   #su –

   c.   #rpm –ivh quotda-*.rpm

II.   **Enable quotas** (/etc/fstab)

   a.   Konsole

   b.   #cat /etc/fstab   before add/edit usrquota, grpquota option to the
          file systems

```
linux-aj0o:~ # vi /etc/fstab
/dev/disk/by-id/scsi-SATA_VBOX_HARDDISK_VB0c0c0026-d5bdb24f-part1 swap
                              swap        defaults          0 0
/dev/disk/by-id/scsi-SATA_VBOX_HARDDISK_VB0c0c0026-d5bdb24f-part2 /
                              ext3        acl,user_xattr       1 1
/dev/disk/by-id/scsi-SATA_VBOX_HARDDISK_VB0c0c0026-d5bdb24f-part3 /home
                              ext3        acl,user_xattr,usrquota,grpquota    1 2
proc        /proc              proc        defaults          0 0
sysfs       /sys        q      sysfs       noauto            0 0
debugfs     /sys/kernel/debug  debugfs     noauto            0 0
usbfs       /proc/bus/usb      usbfs       noauto            0 0
devpts      /dev/pts           devpts      mode=0620,gid=5   0 0
```

   c.   #vi /etc/fstab   add/edit usrquota, grpquota option to the file systems

III.   **Remount the file system**

   a.   Konsole

   b.   #mount –o remount /home   (restart pc/remount)

IV.   **Create the quota file and generate the disk usage table**

   a.   Terminal

   b.   #su –

   c.   #quotacheck –acug /home   ()

   d.   #quotacheck –avug   ()

      i.   –a: check all quota-enable, locally-mounted the system file

      ii.   –c: specifies quota files should be created for each file

      iii.   –v: display verbose status information

      iv.   –u: check user disk quota information

        v.   –g: check group disk quota information

V.   __Assign quota__

    a.   Terminal

    b.   #su –

    c.   #edquota test   (edit quota user: test)

    d.   #edquota –g Gtest   (edit quota group: Gtest)

    e.   #edquota –t   (grace time period before enforce soft limit)

    f.   #setquota –u test 2000 2500 0 0 /dev/sd7   (set quota user: test2000kb-2500kb)

    g.   #setquota –g Gtest 2000 2500 0 0 /dev/sd7   (set quota group: Gtest2000kb-2500kb)

VI.   __Report disk quota__

    a.   Terminal

    b.   Repquota –aq

VII.   __Enable and disable__

    a.   #quotaoff –avug

    b.   #quotaon –avug

    c.   #quotaon –vug /home

VIII.   __boot quota on start up__

    a.   #chkconfig boot.quota –a

    b.   #/etc/init.d/boot.quota start

Assign administrator's Privilege to Ordinary User with sudo command

- **/etc/sudoers** file used to assign administrator's privilege to ordinary user, so they can run what system command we assigned.

- **visudo** command used to open and edit /etc/sudoers file.

- **which** command used to check the full name of command.
  For example: you type:

  > [root@server1 ~]# **which useradd**
  > /usr/sbin/useradd

  > [root@server1 ~]# **which passwd**
  > /usr/bin/passwd

- Each user use system command assigned by administrator, must type:

  sudo command

  For example:

sudo /usr/sbin/useradd mike

- Here is an example of /etc/sudoers file:

```
# This is a sample /etc/sudoers file
# Declaration
# Syntax:  Alias_Type      NAME=item1,item2,item3…
User_Alias              TOURISM=sok,sao,dara
Host_Alias          ROOM1=pc1,pc2,server2
Cmnd_Alias          ACC=/usr/sbin/useradd,/usr/sbin/userdel,/usr/bin/passwd,
                        /usr/sbin/groupadd,/usr/sbin/groupdel
# User specification
# Syntax:  who    host=[NOPASSWD:]command1,command2,….


   neary                pc1=/sbin/shutdown
dara,vannak              pc2,server2=ACC
TOURISM              ROOM1=NOPASSWD:/usr/sbin/visudo
mike                 ALL=NOPASSWD:ALL
```

- Alias Type: User_Alias, Host_Alias, Cmnd_Alias. We use alias for grouping user, host, and command, easy to assign.

- Syntax to declare alias is
  Alias_Type   NAME=item1,item2,item3…

Which Alias_Type can be User_Alias, Host_Alias, Cmnd_Alias
and NAME=[A-Z]([A-Z][0-9]_)*

Exercise: To assign privilege to **mike** run **useradd, passwd** commands and all users in the **marketing** group run **shutdown** command, you should complete the following steps:

1. Log on as root.

2. [root@server1 ~]# **useradd mike**

3. [root@server1 ~]# **passwd mike**

4. [root@server1 ~]# **groupadd marketing**

5. [root@server1 ~]# **useradd –g marketing lisa**

6. [root@server1 ~]# **passwd lisa**

7. [root@server1 ~]# **visudo**

8. Clear file content and press I to write as bellow:

<blockquote>

mike   server1=NOPASSWD:/usr/sbin/useradd,/usr/bin/passwd

%marketing   server1=/sbin/shutdown
</blockquote>

9. Press **Esc**, and type **:x**

10. Testing: Now you open new Terminal and log on as mike and type:
[mike@server1 ~]$ **sudo /usr/sbin/useradd bora**
[mike@server1 ~]$ **sudo /usr/bin/passwd bora**

‣ What will you see?

Managing Packages with RPM

■   RPM = RedHat Package Manager is a software program used to manage packages, such as install, uninstall…

■   RPM Package file naming scheme:

For example:
Package file name: mc-4.7.0-0.4.pre2.fc12.i386.rpm
mc = Midnight Commander is a friendly user interface file manager program used to manage files.

■   Usage rpm command

Syntax:
> rpm <option> <packages>

Option:
>> - i: Install   -q : Query information   -v: Verify
>> -h : Verbose mode   -q : All   -l : Listing   -e : Remove
>> -f : File

Exercise:

In this exercise, you want to use mc (Midnight Command) program to manage your file in the system, you should complete the following steps:

1. Log on as root and type:

   [root@server1 ~]# **rpm –qa mc**
   ‣ What you see?

2. [root@server1 ~]# **mc**
   ‣ What you see?

3. Insert DVD and type:

   [root@server1 ~]# **mount /mnt/cdrom**

4. [root@server1 ~]# **cd /mnt/cdrom/Packages**

5. [root@server1 ~]# **dir mc***
   ‣ What you see?

6. [root@server1 Packages]# **rpm –ihv mc-4.7.0-0.4.pre2.fc12.i386.rpm**

7. [root@server1 ~]# **rpm –qa mc**
   ‣ What you see?

8. [root@server1 ~]# **mc**
   ‣ What you see?
   ‣ Try to use mc program for a moment.

9. To read information of **mc-4.7.0-0.4.pre2.fc12.i386** package, you type:
   [root@server1 ~]# **rpm –qi mc-4.7.0-0.4.pre2.fc12.i386**

10. To view files in **mc-4.7.0-0.4.pre2.fc12.i386** package, you type:
   [root@server1 ~]# **rpm –ql mc-4.7.0-0.4.pre2.fc12.i386 | more**

11. To uninstall **mc-4.7.0-0.4.pre2.fc12.i386** package, you type:
   [root@server1 ~]# **rpm –e mc-4.7.0-0.4.pre2.fc12.i386**

Other examples:

> o   To upgrade **mc-4.7.0-0.4.pre2.fc12.i386** package, you type:
> [root@server1 ~]# **rpm –Uvh mc-4.7.0-0.4.pre2.fc12.i386**

> o   To check all packages installed in the system, you type:
> [root@server1 ~]# **rpm –qa | more**

> o   To check what package used to create /etc/inittab file, you type:
> [root@server1 ~]# **rpm –qf /etc/inittab**

Shell Script Programming

- ▪   Shell script is series of command written in plain text file. Shell script is just like batch file in MS-DOS or Windows Batch file but is much more powerful.

- ▪   The following steps are required to write shell script:
    - ○   Use any text editor, like vi or mcedit to write shell script.

    - ○   After writing shell script, set execute permission for your script as follows:
      Syntax:

      chmod permission your-script-name

For example:
     chmod +x /scrips/backup.sh

     Or

     chmod 755 /scripts/backup.sh

     ○Execute your script as:

Syntax:

     bash /your-script-name

     For example:

     bash /scripts/backup.sh

Example1: In this example, you should create shell script named **/scripts/hello.sh** to display "Hello World!" on the screen by completing to the following steps:

1. Log on as root

2. [root@server1 ~]# **mkdir /scripts**

3. [root@server1 scripts]# **vi /scripts/hello.sh**

4. Press I and write as the following:

   ```
   #This is my first script. Using echo to display text on screen.
   clear
   echo "Hello World!"
   
   exit
   ```

5. Press **Esc** and type **:x**

6. [root@server1 scripts]# **chmod +x /scripts/hello.sh**

7. [root@server1 scripts]# **bash /scripts/hello.sh**
 ‣ What you see?

Example2: In this example, you should create a shell script named **/scripts/myf.sh** to display the Date and Time and the Calendar of the current system by completing to the following steps:

1. Log on as root

2. [root@server1 scripts]# **vi /scripts/myf.sh**

3. Press I and write as the following:

```
#This script will display Date and Time and the Calendar of the current system.
clear

echo "Can you see the Date and Time of the current system now: "

date

echo "Can you see the calendar of the system now: "

cal

exit
```

4. Press **Esc** and type **:x**

5. [root@server1 scripts]# **chmod +x /scripts/myf.sh**

6. [root@server1 scripts]# **bash /scripts/myf.sh**
 ‣ What you see?

Example 3: In this example, you should create a backup script named **/scripts/backup.sh** to back up particular directory /etc and /home.

1. Log on as root

2. [root@server1 ~]# **vi /scripts/backup.sh**

3. Press I and write as the following:

```
clear
rm –rf /backup/*
tar –cvf /backup/etc.tar /etc
tar –czvf /backup/home.tar.gz /home
```

4. Press **Esc** and type **:x**

5. [root@server1 ~]# **chmod +x /scripts/backup.sh**

6. [root@server1 ~]# **bash /scripts/backup.sh**

1. Using system variables

System variables: BASH, BASH_VERSION, HOME, LOGNAME, SHELL, OSTYPE, PWD…

For example: Script using system variables

1. Log on as root and type vi /scripts/usesysvar.sh

2. Press I and write as the following:

```
clear
echo "Using system variables:"
echo "----------****------------"
echo "This my profile:"
echo "My user name: $LOGNAME"
echo "My home directory: $HOME"
echo "My shell: $SHELL"
echo "My current working directory: $PWD"
echo " "
```

3. Press Esc and type :x

4. [root@server1 ~]# **chmod +x /scripts/usesysvar.sh**

5. [root@server1 ~]# **bash /scripts/usesysvar.sh**
   ‣ What you see?

2. Using user defined variables (UDV)

Syntax:

variable-name=value (no space)

For example: n=15

Direct assignments:

var1=value1

var2=value2

var3=$var1

3. Substituting the output of a command

cwd=`pwd`

4. Using the read command

read filename

cp $filename /tmp

5. Special $ characters

Example:

echo "Thanks for the \$5, $LOGNAME"

6. Shell Arithmetic

Syntax:

expr opt1 math-operator opt2

math-operator: +, -, *, /, %

For example:

expr 1 + 3

expr 12 * 4

For example: This script use read command and math operation

1.   Log on as root and type vi /etc/scripts/usemath.sh

2.   Press I and write as the following:

```
clear
echo –n "Enter your name: "
read name
echo –n "Enter your age: "
read age
nexty=`expr $age + 1`
echo "Hello $name, next year you will be $nexty"

exit
```

3.   Press Esc and type :x

7. Number Comparisons

Option	Meaning
-eq	Equal to
-ne	Not equal to
-gt	Greater than
-ge	Greater than or equal
-lt	Less than
-le	Less than or equal

8. String comparisons

Option	Description
-z string	True if string has zero lengths
-n string	True if string has non-zero lengths
string1 = string2	True if string1 = string2
string1 != string2	True if string1 and string2 are not equal

9. Logical Operations

!: Not

-a: AND

-r: OR

-s <file>: Not empty file

-f <file>: Is file exist or normal file and not a directory

-d <dir>: Is directory exist and not a file.

-w <file>: Is writeable file

-r <file>: Is readable file

-x <file>: Is executable file

10. Using if condition

Syntax:

if condition

then

… command1

fi

11. Using if …else…fi

Syntax:

if condition

then

command1 (or …)

else

command2 (or …)

fi

12. Using Nested if-else-fi

Syntax:

if condition

then

if condition

then

…

else

…

fi

else

…

fi

13. Multilevel if-then-else

Syntax:

if condition

then

condition is zero (true - 0)

execute all commands up to elif statement

elif condition1

then

condition1 is zero (true - 0)

execute all commands up to elif statement

elif condition2

then

condition2 is zero (true - 0)

execute all commands up to elif statement

else

None of the above co4dtion,condtion1,condtion2 are true (i.e.

all of the above nonzero or false)

execute all commands up to fi

fi

14. The case statement

Syntax:

```
case $variable-name in

pattern1)       command
                …;;
pattern2)       command

                    …;;

pattern3)       command

                  …;;
…                 command;;

*)              command;;

esac
```

15. Using for loop

Syntax:

for {variable} in {list}

do

…

done

For example:

for i in 1 2 3 4 5

do

echo "Welcome $i times"

done

Syntax:

for ((expr1; expr2; expr3))

do

---

repeat all statements between don and done until expr2 is true

done

For example:

for ((i = 0; i <= 5; i++))

do

echo "Welcome $i times"

done

16. Using While loop

Syntax:

while [condition]

do

command1

commnad2

…

done

Schedule Task

- Cron is software program used to set schedule task.
- Package file: vixie-cron-3.0.1-74.i386
- Service name: crond
- /etc/cron.allow file used to store user who allowed to uses cron setting their schedule task.
- /etc/cron.deny file used to store user who not allowed to uses cron setting their schedule task.
- crontab file is a file was created when user set schedule task.
- Each user's crontab file name is the same name to the user name and stored in the /var/spool/cron directory.
- Each line in the crontab file is the following:

minute hour day-of-month month day-of-week command

The value of:
minute: 0-59
hour: 0-23
day-of-month: 1-31
month: 1-12 (or the short name of the month such as jan, feb,….)
day-of-week: 0-7 (0 and 7 for Sunday, or you can use sun, mon, tue…)
command: is a command or script file.

Note   You can use:

* : For every

"-" : Between, or "," for listing

- To set schedule task, you type **crontab –e**
- To remove the crontab file, you type **crontab -r**

Exercise

In this exercise, you set schedule task to restart the system every day at 6:25PM and also set the

schedule task to run /scripts/backup.sh script file every Friday at 7:05 PM.

1.   Log on as root

2.   [root@server1 ~]# **dir /var/spool/cron**
   ‣ What you see?

3.   [root@server1 ~]# **crontab –e**

4.   Press **I** and type content as the following:
   25 18 * * * /sbin/shutdown –r now
   05 19 * * 5 bash /scripts/backup.sh

5.   Press Esc and type :x

6.   [root@server1 ~]# **dir /var/spool/cron**
   ‣ What you see?

Now wait and see what will happen to the system?

Exercise:

1.   Log on as root

2.   [root@server1 ~]# mkdir /scripts

3.   [root@server1 ~]# vi /scripts/backup.sh

4.   Press I and write as the following:

   clear
   rm –rf /backup/*.tar
   tar –cvf /backup/etc.tar /etc
   tar –czvf /backup/home.tar.gz /home

5.   Press Esc and type :x

6.   [root@server1 ~]# chmod +x /scripts/backup.sh

7.   [root@server1 ~]# bash /scripts/backup.sh

8.   [root@server1 ~]# dir -l /backup
   ‣ What you see?

9.   [root@server1 ~]# rm –rf /backup/*

10. [root@server1 ~]# dir /backup
   ‣ What you see?

11. [root@server1 ~]# crontab –e

12. Press I and then write as the following:

30 14 * * 6 bash /scripts/backup.sh

13. Press Esc and type :x

14. Wait and see what will happen, then type dir /backup
   ‣ What you see?

Configuring Network Configuration

To configure network configuration, in the GUI you should click **System,** point to **Administration** and select **Network.** Or you can open Terminal and type: **system-config-network.**

To configure Ethernet network interface, you should select **eth0** and click **Edit** on the toolbar.

On the Ethernet Device properties dialog box, you should:

Select **[x] Controller by Network Manager** check box

Select **[x] Active device when computer starts** check box

Select **Statically set IP address** check box and type appropriate information into the boxes provided as example:
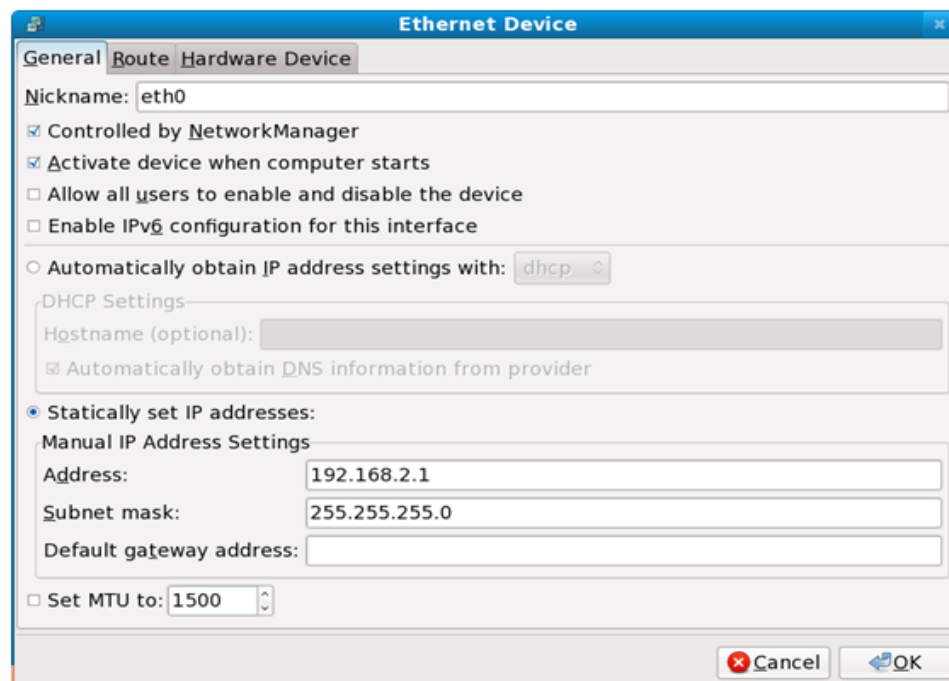
Click **OK,** and click **Yes** when to save the change you make, and then click **OK.**

After change, you need to restart the network service by click **System,** point to **Administration** and select **Services**.

In the Service Configuration dialog box, select **Network** service and click **Enable.** Then click **Restart** to restart the service. Click **Close.**

SSH

Security SHell

ssh- OpenSSH SSH client (remote login program)

ssh (SSH client) is a program for logging into a remote machine and for executing commands on a remote machine. It is intended to replace rlogin and rsh, and provide secure encrypted communications between two untrusted hosts over an insecure network.

Exercise: In this exercise, you have two computers and configured as the diagram:
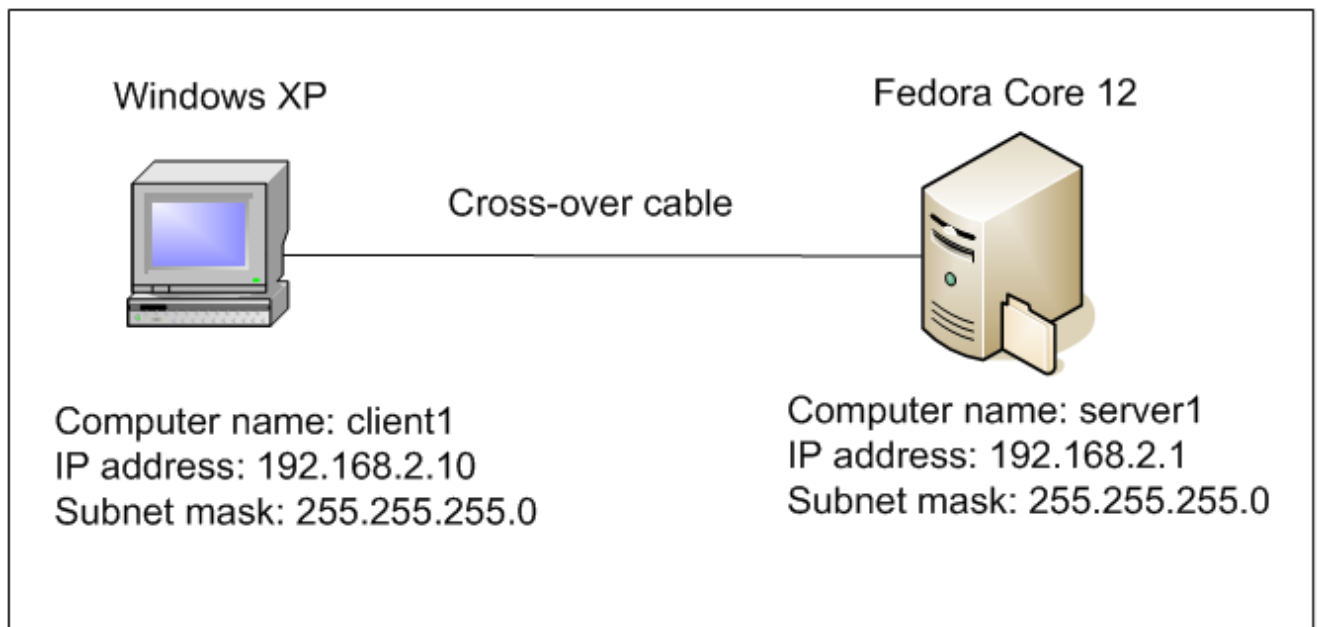
Note

- To check or confirm SSH packages are installed, you type:

  [root@server1 ~]# **rpm –qa | grep ssh**

- SSH service name: **sshd**

To configure **SSH** on your SERVER1 machine, you should complete the following steps:

1. Switch to **server1** machine

2. In the GUI, click **System** -> **Administration** -> **Firewall -> Close**

3. Click **Trusted Services** and select **SSH** check box, click **Apply,** click **Yes** and then click **Close.**

4. Go to Terminal or shell

5. [root@server1 ~]# **chkconfig sshd on**

6.   [root@server1 ~]# **service sshd restart**

7.   Switch to Client1 machine, download **Putty** program. Open **Putty** and type 192.168.2.1 in the Host name (or IP address) text box and click Open.
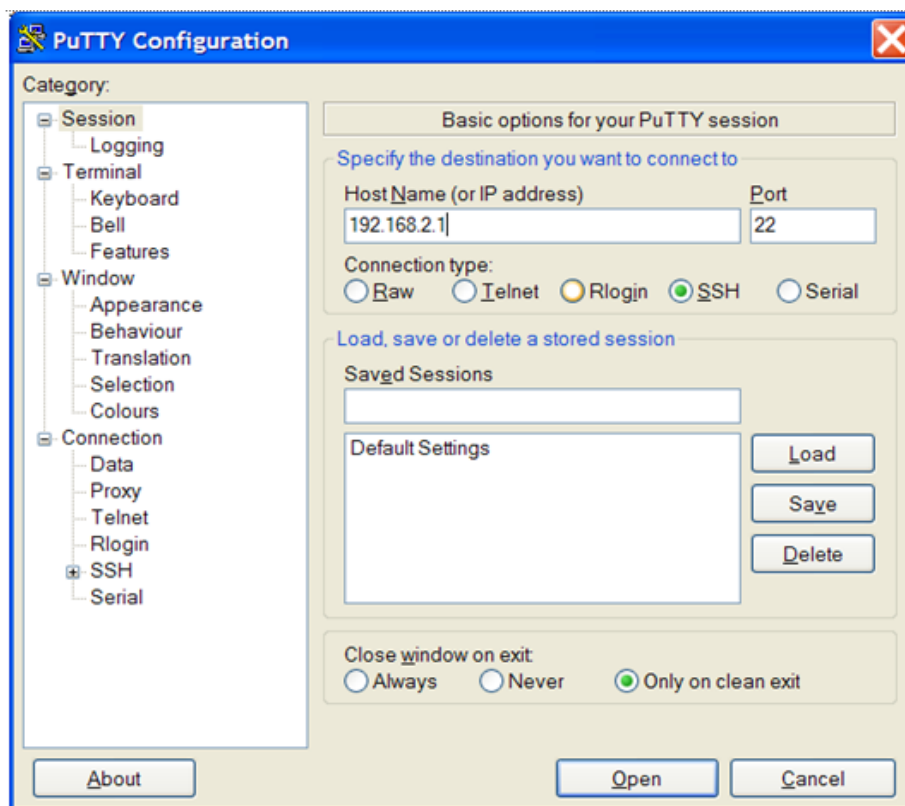
▸ Now you are working in the virtual screen of **server1** machine

Samba

- សាំបា (samba) ៖ ជាសេវាមួយប្រើសម្រាប់ចែកចាយទិន្នន័យ ឯកសារ ម៉ាស៊ីនបោះពុម្ពរវាង លីនុច និងលីនុច ឬផ្ទុយមកវិញ ។

- សាំបា (samba) ត្រូវបានគេប្រើច្រើនបំផុតជាម៉ាស៊ីនបម្រើឯកសារ សម្រាប់ម៉ាស៊ីនដែលប្រើ វីនដូ ។

- សាំបា (samba) ចែកចេញជាពីរ គឺ Samba Server និង Samba Client ។

- ប្រព័ន្ធប្រតិបត្តិការជាច្រើនប្រើ SMB ដើម្បីចែកចាយទិន្នន័យ ។

- SMB អាចចែកចាយម៉ាស៊ីនបោះពុម្ព ដែលបានដំឡើងទាំង ម៉ាស៊ីនបម្រើ និងម៉ាស៊ីនភ្ញៀវ ។

ពិធីការ smb

- smb (Server Message Block) គឺជាពិធីការបណ្ដាញមួយដែល ផ្ដល់សេវាឯកសារ និងសេវាបោះពុម្ពនៅក្នុងបណ្ដាញម៉ាស៊ីនវីនដូ ។

- សាំបា (samba) អាចប្រើបានដូចខាងក្រោម ៖

  - ផ្ដល់សេវាឯកសារ និងចែកចាយម៉ាស៊ីនបោះពុម្ពសម្រាប់ម៉ាស៊ីនភ្ញៀវជាវីនដូ ។

  - ទាញយកសេវាបណ្ដាញឯកសារ និងបោះពុម្ពតាមពិធីការ smb នៅលើលីនុច ។

  - ដើរតួជាអ្នកគ្រប់គ្រងដែនសម្រាប់ម៉ាស៊ីនវីនដូ ។

- សេវា smb ត្រូវបានផ្ដល់ដោយពិធីការ NetBIOS

- NetBIOS គឺជាចំណុចប្រទាក់កម្មវិធី (API) ដែលរចនាឡើងសម្រាប់ទំនាក់ទំនងរវាង កុំព្យូទ័រ ។ វាធ្វើឲ្យម៉ាស៊ីនភ្ជាប់ទៅបណ្ដាញដើម្បីបម្រុង(កក់)ឈ្មោះទុកសម្រាប់កុំព្យូទ័រ ទាំងនោះ ។

ម៉ាស៊ីនបម្រើសាំបា (Samba Server)

- ម៉ាស៊ីនបម្រើសាំបា (Samba Server) ៖

    - ម៉ាស៊ីនបម្រើសាំបា ៖ ជាម៉ាស៊ីនបម្រើដែលផ្ដល់សេវា SMB/CIFS និងដាក់ឈ្មោះសេវា NetBIOS តាម IP ទៅកាន់ម៉ាស៊ីនភ្ញៀវ ។

    - នៅលើលីនុចមានដេមិន (daemon) ពីរសម្រាប់ម៉ាស៊ីនបម្រើ Samba

    smbd ៖ សម្រាប់គ្រប់គ្រងកិច្ច ការទាក់ទងនឹង NetBIOS ទាំង smb/cifs ។

    nmbd ៖ ផ្ដល់នូវសេវាងកសារ និងសេវាចោះពុម្ព សម្រាប់ដាក់ឈ្មោះឲ្យសេវា ។

I. Why use Samba?

- Share files and printers between Linux and Windows system
- Authentication and authorization user (can be promoted as the Domain Controller)
- Name resolution

Exercise 1: Configuring network as Peer-to-Peer or Workgroup network.
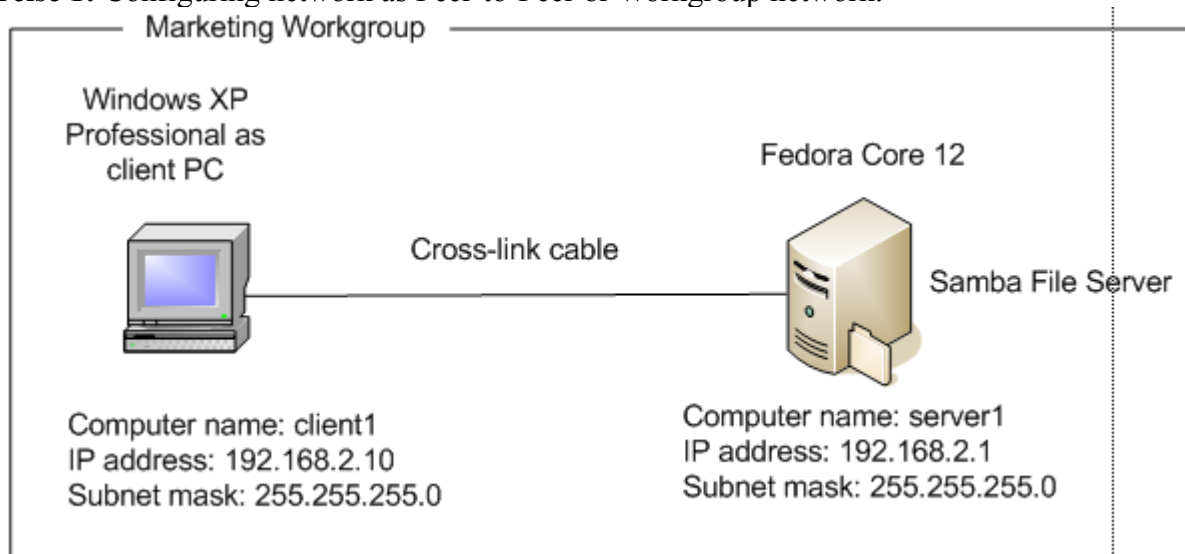
Exercise 1: Configuring Samba File Server

In this Exercise, you should be able configure **SERVER1** machine as the Samba File Server that connect as peer-to-peer with CLIENT1 machine in the **Marketing** workgroup by completing to the following steps:

1. Switch to **SERVER1** machine and log on as root
2. [root@server1 ~]# **startx** to start to GUI
3. Click **System** -> **Administration** -> **Firewall**
4. Click on **Trusted Services** and select **Samba** and **Samba Client** check boxes, click

> **Apply**, click **Yes** and click **Close**.

5. Go back to Shell.

6. [root@server1 ~]# **cat /etc/samba/smb.conf > /etc/samba/smb.conf.original**

7. [root@server1 ~]# **vi /etc/samba/smb.conf**

8. Erase all its original content and write down as the following:

```
# This is sample /etc/samba/smb.conf configuration file
# General settings section
[global]
        workgroup = MARKETING
        server string = Samba File Sever
;       netbios name = server1
;       interfaces = lo eth0 192.168.2.1/24 192.168.3.1/24
;       hosts allow = 127. 192.168.2. 192.168.3
        log file = /var/log/samba/%m.log
        max log size = 50
        security = user
        passdb backend = tdbsam
;       local master = no
;       os level = 33
;       preferred master = yes
        wins support = yes
;       wins server = w.x.y.z
;       win proxy = yes
;       dns proxy = yes
        load printers = yes
        cups options = raw
;       printcap name = /etc/printcap


# This section allow users access their home directory
[homes]
        comment = Home Directories
        browseable = no
        writable = yes
;       valid users = %S
;       valid users = MYDOMAIN\%/S
```

```
# Load printers on the Samba File Server

[printers]

        comment = All printers

        path = /var/spool/samba

        browseable = no

        guest ok = no

        writable = no

        printable = yes
```

9. Pres **Esc** and type **:x**

10. [root@server1 ~]# **testparm**
What will you see?

11. [root@server1 ~]# **chkconfig smb on**

12. [root@server1 ~]# **chkconfig nmb on**

13. [root@server1 ~]# **setsebool –P samba_enable_home_dirs on**

14. Try to create few accounts, for example mike, lisa, sok, sao…

15. [root@server1 ~]# **smbpasswd –a mike**
Type lisa's password (for example, 123456)

16. [root@server1 ~]# **smbpasswd –a lisa**
Type lisa's password (for example, 123456)

17. [root@server1 ~]# **service smb restart**

18. [root@server1 ~]# **service nmb restart**

Exercise 2: Configuring Windows machine as the workgroup network

In this exercise, you should be able configure CLIENT1 machine connect to **Marketing** workgroup (or peer-to-peer) network with SERVER1 by completing the following steps:

1. Switch to **CLIENT1** machine and log on as administrator

2. Right-click **My Computer** and select **Properties**

3. Click **Computer Name** tab

4. Click **Change**

5. Select **Workgroup** and type **MARKETING** and then click OK.

6. Click OK.

7. Click OK

8. Click OK

9. Click **Yes** to restart machine

10. Log on by any Windows account.

11. Let's try to browse network by double-click **My Network Places,** click **View Workgroup computers**

What will you see?

Exercise 3: Sharing other folders

In this Exercise, you should be able share other folders such as CD-ROM, **/tmp**, **/shared/software** and **/shared/docs** from SERVER1 Samba File Server by completing the following steps:

1. Switch to SERVER1 machine and log on as root

2. [root@server1 ~]# **vi /etc/samba/smb.conf**

3. Press I and add to the end of file as the following sections:

```
[cdrom]
        comment = CD-ROM on Samba server
        path = /mnt/cdrom
        browseable = yes
[tmp]
        comment = Temporary Directory
        path = /tmp
        browseable =  Yes
        writeable = yes


[software]
        comment = Software
        path = /shared/software
        browseable = yes
        writable = No


[docs]
        comment = Documents
        path = /shared/docs
        browseable = No
        writeable = yes
        public = no
        valid users = mike lisa
```

create mask = 0777

directory mask = 0775

12. Press **Esc** and type :**x**

13. [root@server1 ~]# **mkdir –p /shared/software**

14. [root@server1 ~]# **chmod a+w /shared/software**

15. [root@server1 ~]# **mkdir –p /shared/docs**

16. [root@server1 ~]# **chmod a+w /shared/docs**

17. [root@server1 ~]# **service smb restart**

18. Now switch to CLIENT1 machine and browse network again to see other folders you just share.

II. **Configuring Samba in Server-base network.**
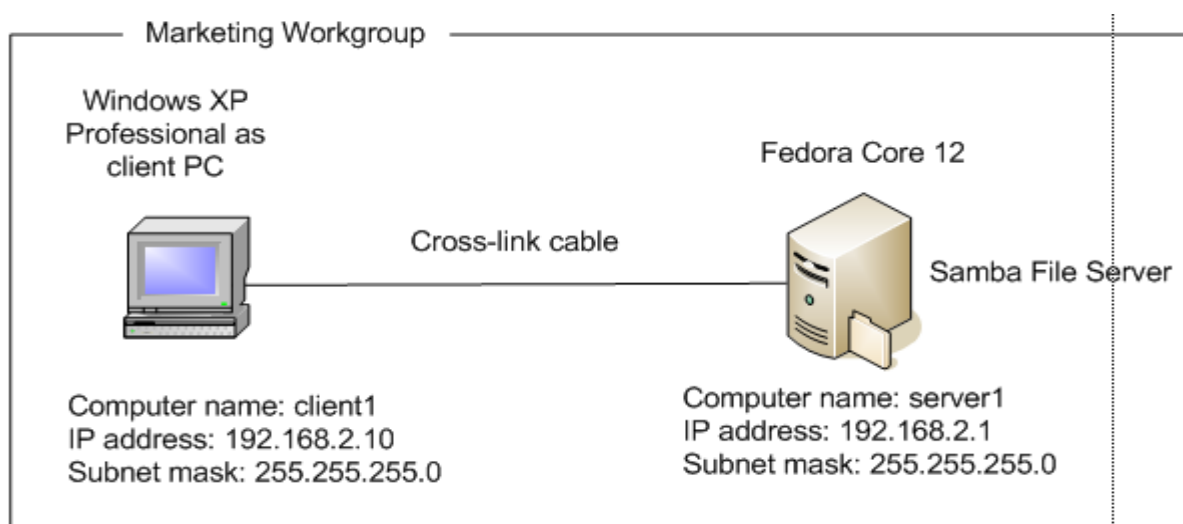
Practice 1: Configuring Samba as Domain Controller.
In this practice, you should configure Samba to promote SERVER1 as the domain controller in the PITC domain by the following steps:

1. Switch to **SERVER1** machine and log on as root.

2. [root@server1 ~]# vi /etc/samba/smb.conf and write down as the followings:

[global]

workgroup = pitc

server string = Samba Sever

log file = /var/log/samba/%m.log

max log size = 50

security = user

passdb backend = tdbsam

wins support = yes

```
        load printers = yes

        cups options = raw

        domain master = yes

        domain logons = yes

        logon script = logon.bat

        logon home = \\server1\homes

        logon path = \\server1\homes

        logon drive = H



[homes]

        comment = Home Directories

        browseable = no

        writeable = yes

        valid users = PITC\%/S


[printers]

        comment = All printers

        path = /var/spool/samba

        browseable = no

        guest ok = no

        writeable = no

        printable = yes


[netlogon]

        comment = Store logon script

         path = /home/samba/netlogon

        read only = yes

        guest ok = yes
```

1.   Pres Esc and type :x

2.   [root@server1 ~]# **testparm**

3.   [root@server1 ~]# **chkconfig smb on**

4.   [root@server1 ~]# **setsebool –P samba_domain_controller on**

5.   [root@server1 ~]# **mkdir –p /home/samba/netlogon**

6.   [root@server1 ~]# **mkdir –p /home/samba/profiles**

7.   [root@server1 ~]# **chmod –R 0755 /home/samba**

8.   [root@server1 ~]# **vi /home/samba/netlogon/logon.bat**

9.   Press I and write down as the following:

```
@ECHO OFF
ECHO Welcome to PITC Domain…
NET USE K: \\SERVER1\software
PAUSE
EXIT
```

10. Press Esc and type :x

11. [root@server1 ~]# **useradd user1**

12. [root@server1 ~]# **passwd user1** (for example 123456)

13. [root@server1 ~]# **service smb restart**

14. [root@server1 ~]# **smbpasswd –a user1**

15. [root@server1 ~]# **smbpasswd –a root**

16. [root@server1 ~]# **groupadd samba-clients**

17. [root@server1 ~]# **useradd –g samba-clients –d /dev/null –s /bin/false client1$**

18. [root@server1 ~]# **passwd –l client1$**

19. [root@server1 ~]# **smbpasswd –a –m client1**

Practice 2: Configuring Windows joint to domain.

In this practice, you should join CLIENT1 Windows machine to PITC domain by completing the following steps:

1.   Switch to **CLIENT1** machine and log on as administrator

2.   Right-click **My Computer** on the desktop and select **Properties**

3.   Click **Computer Name** tab and click **Change**

4.   Select **Domain** check box and type **pitc**; then click OK.

5.   Enter root and root's password (Samba's account and its password)

6.   Click OK.

7.   Click OK

8.   Click OK

9.   Click Yes to restart machine.

10. Log on as user1 and type its password (Samba's account and its password)

11. Now testing the network again by using **My Network Places** and click **Entire Network…** What will you see?

12. Go to Windows Explorer, what will you see then?

SWAT
Samba Web Administration Tool

SWAT (Samba Web Administration Tool) ក៏ជាឧបករណ៍មួយប្រភេទសម្រាប់គ្រប់គ្រងម៉ាស៊ីនបម្រើ សាំបា ។កំណត់រចនាសម្ព័ន្ធម៉ាស៊ីនបម្រើសាំបាតាមចំណុចប្រទាក់ទំព័របណ្តាញ ។ មុននឹងអ្នកអាចប្រើ SWAT បានអ្នកត្រូវបើកសេវា SWAT ជាមុនសិន។

Project: To configure SWAT, you should complete the following steps:
Package files: samba-swat-3.4.5-55.fc12.i686.rpm

Dependency package file: xinetd-2.3.14-29.fc12.i686.rpm

Service name: swat (depend on xinetd)

1. Insert DVD into the

2. [root@server1 ~]# **mount /mnt/cdrom**

3. [root@server1 ~]# **cd /mnt/cdrom/RedHat/RPMS**

4. [root@server1 ~]# **rpm –ihv samba-swat-*.rpm**

5. [root@server1 ~]# **vi /etc/xinetd.d/swat**

6. Press I and add # sign at the beginning of line *only_from = 127.0.0.1*

7. Press Esc and type :x

8. [root@server1 ~]# **chkconfig swat on**

9. [root@server1 ~]# **service xinetd restart**

10. [root@server1 ~]# **startx** to start to GUI, click System, point to Administration and select Firewall.

11. On the Firewall Configuration window, click Other Ports and click Add.

12. Select User Defined check box and type **swat** in the Port/Port Range text box and then click OK.

13. Click Apply, click Yes and click Close.

14. Switch to client1 machine.

15. Open Internet Explorer/Firefox and in the address box, type:

http://SERVER1:901/
or http://192.168.2.1:901

Type root and root's password (System account)
What will you see?

NFS

1. Overview

Network File System (NFS) is a way to share files between machines on a network as if the files were on the client's local hard drive. Fedora can be both an NFS server and NFS client, which means that it can export file system to other systems and mount file systems exported from other machines.

Sharing files from an NFS server is known as exporting the directories.

- ❐ Service name: nfs, nfslock, netfs, rpcbind
- ❐ Package file name: (rpm –qa | grep nfs)
- ❐ Exporting file: /etc/exports
- ❐ Security files: (/etc/hosts.allow and /etc/hosts.deny): Optional

2. Practice

In this practice, you should export /shared/software directory from SERVER1 (192.168.2.1) to /mnt/software directory on SERVER2 (192.168.2.2) as the following picture:
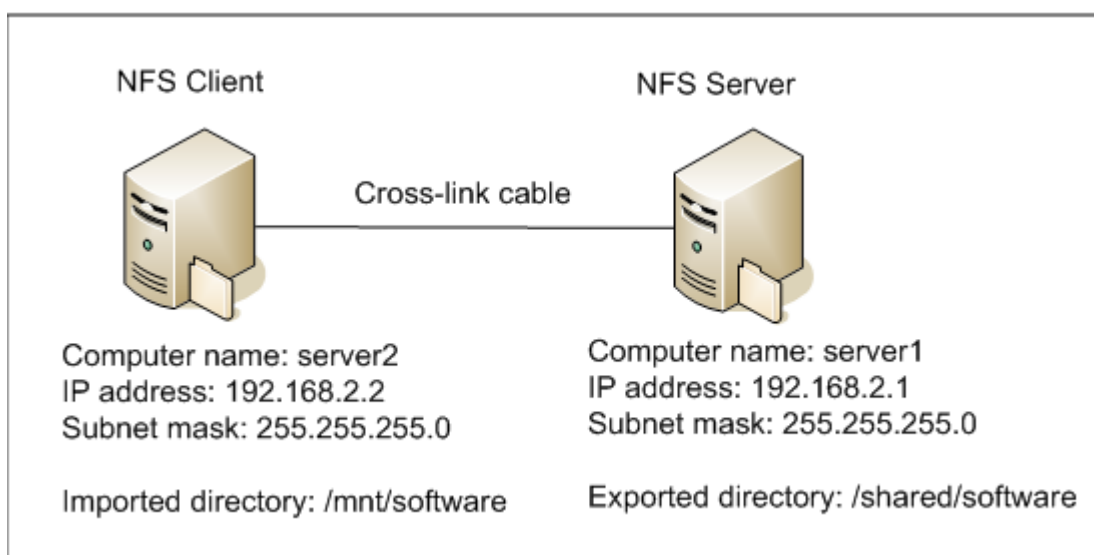
To practice NFS, you should complete the following steps:

1. Switch to SERVER1 machine and log on as **root**

2. [root@server1 ~]# **startx** start to GUI

3. Click System -> Administration -> Firewall. Click Trusted Services and select NFS4 check box and click Apply, then click Yes. Click Close.

4. Go back to Shell

5. [root@server1 ~]# chkconfig nfs on

6. [root@server1 ~]# chkconfig nfslock on

7. [root@server1 ~]# chkconfig rpcbind on

8. [root@server1 ~]# chkconfig netfs off

9. [root@server1 ~]# service nfs restart

10. [root@server1 ~]# service nfslock restart

11. [root@server1 ~]# service rpcbind restart

12. [root@server1 ~]# service netfs stop

13. [root@server1 ~]# mkdir /software

14. [root@server1 ~]# mkdir /software/test

15. [root@server1 ~]#vi /etc/exports

16. Press I and write as the following line:

/shared/software 192.168.2.2/24,192.168.2.3/24(rw,sync,no_root_squash)

17. Press Esc and type :x

18. [root@server1 ~]# exportfs –ra (to invoke shared)

19. [root@server1 ~]# showmount -e

20. Switch to SERVER2 and log on as root

21. [root@server1 ~]# chkconfig nfs off

22. [root@server1 ~]# chkconfig nfslock on

23. [root@server1 ~]# chkconfig rpcbind on

24. [root@server1 ~]# chkconfig netfs on

25. [root@server1 ~]# service nfs stop

26. [root@server1 ~]# service nfslock restart

27. [root@server1 ~]# service rpcbind restart

28. [root@server1 ~]# service netfs restart

29. [root@server2 ~]# vi /etc/fstab

30. Press I and add to the end of file as the following:

192.168.2.1:/shared/software   /mnt/software   nsf   noauto,rw   0 0

31. Press Esc and type :x

32. [root@server2 ~]# mkdir /mnt/software

33. [root@server2 ~]# chkconfig nfs off

34. [root@server2 ~]# chkconfig nfslock on

35. [root@server2 ~]# chkconfig rpcbind on

36. [root@server2 ~]# chkconfig netfs on

37. [root@server2 ~]# service nfs stop

38. [root@server2 ~]# service nfslock restart

39. [root@server2 ~]# service netfs restart

40. [root@server2 ~]# service rpcbind restart

41. [root@server2 ~]# mount /mnt/software

42. [root@server2 ~]# cd /mnt/software

43. [root@server2 software]# dir
    What will you see then?

DNS
Domain Name System

DNS Server

Resolver

Computer name: client1
IP address: 192.168.2.10
Subnet mask: 255.255.255.0

Server name: server1
IP address: 192.168.2.1
Subnet mask: 255.255.255.0

Web Server

Server name: server2
IP address: 192.168.2.2
Subnet mask: 255.255.255.0
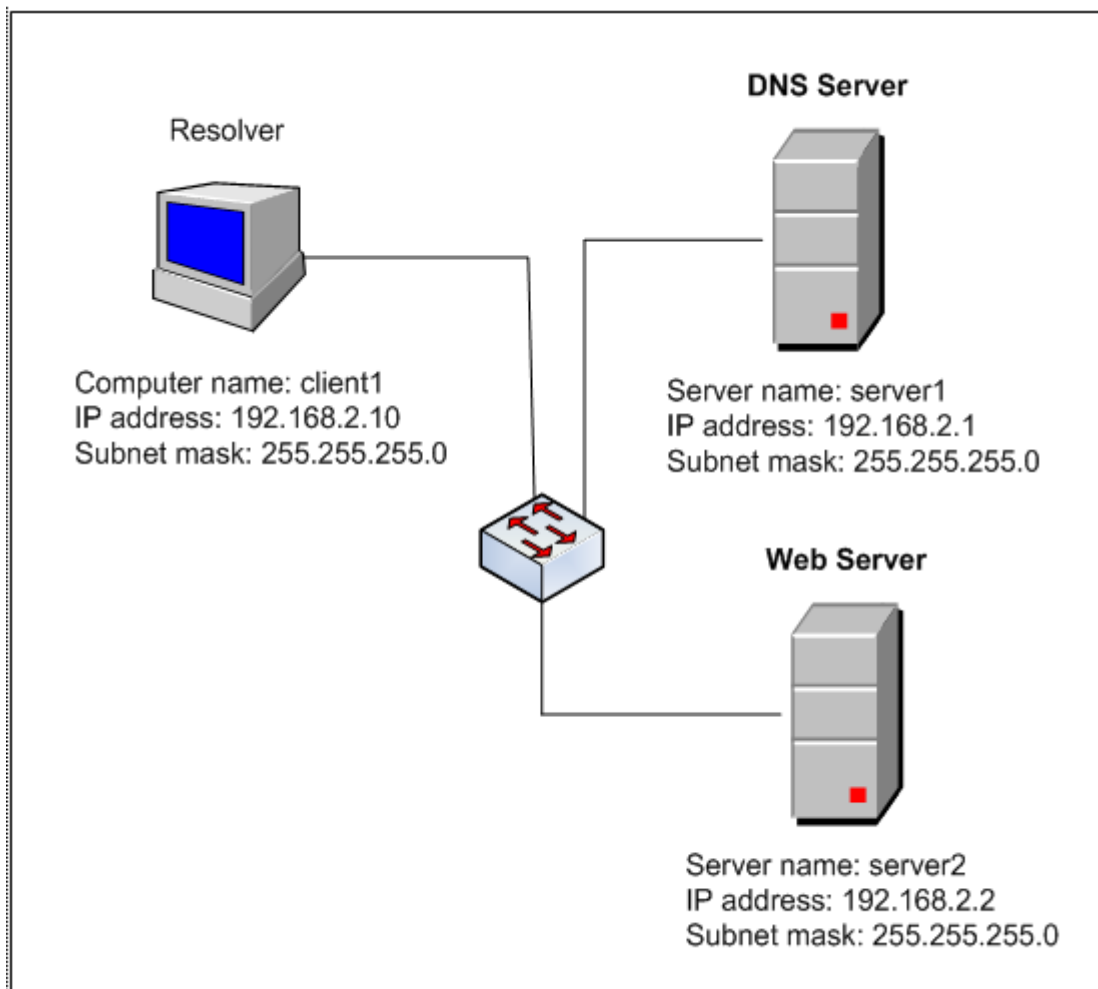
Exercise 1: Configuring DNS Server

In this Exercise, you should be able configure SERVER1 machine as the DNS server by completing the following steps:

1. Switch to **server1** machine and log on as root.

2.   Go to **GUI** and click **System** -> **Administration** -> **Firewall** -> **Close**
Click **Trusted Services** and set select **DNS** and click **Apply**

Click **Close** and click **Yes**.

3.   Go to Terminal or Shell

4.   [root@server1 ~]# **vi /etc/resolv.conf**

5.   Don't modify anything, just press i and add the following line into the end of file:
nameserver 192.168.2.1

6.   Press **Esc** and type **:x**

7.   [root@server1 ~]# **vi /etc/named.conf**

8.   Press I and modify this file until you see content like this:

```
//
// 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 {
        listen-on port 53 { 127.0.0.1;192.168.2.1; };
        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";
        allow-query     { localhost;192.168.2.1/24; };
        recursion yes;
        dnssec-enable yes;
        dnssec-validation yes;
        dnssec-lookaside . trust-anchor dlv.isc.org.;
};

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

zone "." IN {
        type hint;
```

```
        file "named.ca";
};


include "/etc/named.rfc1912.zones";


include "/etc/pki/dnssec-keys//named.dnssec.keys";
include "/etc/pki/dnssec-keys//dlv/dlv.isc.org.conf";
```

9. Press Esc and type :x

Exercise 2: Creating full name.

In this exercise, you should be able to create full name www.test.com for SERVER1machine by completing the following steps:

10. [root@server1 ~]# **vi /etc/named.rfc1912.zones**

11. Press I and write down as the following section into the top of file:

```
zone "test.com" IN {
    type master;
    file "named.test.com";
    allow-update { none;};
};


zone "2.168.192.in-addr.arpa" IN {
    type master;
    file "named.2.168.192.in-addr.arpa";
    allow-update { none;};
};
```

12. Press Esc and type :x

13. [root@server1 ~]# **cd /var/named**

14. [root@server1 ~]# **cat /var/named/named.localhost > /var/named/named.test.com**

15. [root@server1 ~]# **vi /var/named/named.test.com**

16. Press i and correct this file until you see the statement as the following:

```
$TTL        1D
@           IN SOA        @ rname.invalid. (
                              0              ; serial
                              1D             ; refresh
                              1H             ; retry
                              1W             ; expiry
                              3H )           ; minimum
                NS            @
                A      127.0.0.1
                AAAA                ::1
server1    IN     A             192.168.2.1
```

17. Press **Esc** and type **:x**

18. [root@server1 ~]# **cat /var/named/named.loopback > /var/named/named.2.168.192.in-addr.arpa**

19. [root@server1 ~]# **vi /var/named/named.2.168.192.in-addr.arpa**

20. Press i and correct this file until you see the statement as the following:

```
$TTL        86400
@     IN     SOA   @ rname.invalid.  (
                   0       ; serial
                   1D      ; refresh
                   1H      ; retry
                   1W      ; expire
                   3H      ; minimum
            NS     @
            PTR    localhost.
 192.168.2.1    IN    PTR    server1.
```

21. Press **Esc** and type :x

22. [root@server1 ~]# **chkconfig named on**

23. [root@server1 ~]# **service named restart**

24. [root@server1 ~]# **ping server1.test.com**

►What will you see? Now press Ctrl+C to terminate this process.

25. [root@server1 ~]# **vi /var/named/named.test.com**

26. Don't modify anything, just press i and add as the following line into the end of file:

```
   www          IN     CNAME        server1
```

27. Press Esc and type :x

28. [root@server1 ~]# **service named restart**

29. [root@server1 ~]# **ping www.test.com**

►What will you see? Now press **Ctrl+C** to terminate the process.

Exercise 2: Configuring DNS client or resolver.

In this Exercise, you should be able configure CLEINT1 as the DNS client or resolver with the 192.168.2.1 of DNS server by completing the following steps:

1.   Switch to **CLIENT1** machine and log on as **administrator**

2.   Right-click **My Network Places** on the desktop

3.   Select **Properties**

4.   Right-click on the **Local Area Connection** and select **Properties**

5.   Select **Internet Protocol (TCP/IP)** and click **Properties**

6.   Select **Use the following DNS server addresses** and type **192.168.2.1** in the Preferred DNS server address box and then click **OK**

7.   Click **close** and then click **Close**

8.   Go to **Command Prompt** and type:

ping www.test.com

4What will you see?

9.   Type **exit** to exit it now.
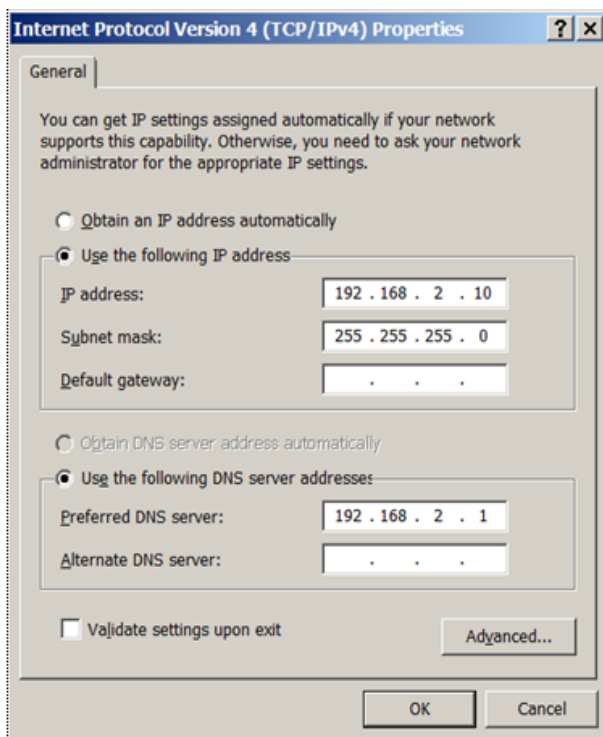
10. Click close and then click **Close**

11. Go to **Command Prompt** and type:

ping www.test.com

4What will you see?

12. Type exit to exit it now.

Building Web Server Services

A Web server is a computer or software program that serves the Web pages to the client on request.

Web servers are used to publish the Web pages on the Internet or an intranet. In essence, a Web server does two things:

❑ It listens for page request from the clients

❑ It examines any page request it receives and responds with the requested page.

Apache Web Server

A Web server is a computer or software program that serves the Web pages to the client on request.

Web servers are used to publish the Web pages on the Internet or an intranet. In essence, a Web server does two things:

❑ It listens for page request from the clients

❑ It examines any page request it receives and responds with the requested page.

Apache Web Server

Include in Fedora Core 12 is most widely used open source Web server. The benefits of the Apache Web server are:

Flexibility

Scalability

Security

Performance

Support

1. Installing Apache

Package Files:

      httpd-2.2.0-5.1.2

      system-config-httpd-1.3.3-1.1

      httpd-manual-2.2.0-5.1.2

2. The Apache Configuration Files

·   The **/etc/httpd/conf/httpd.conf** file is Apache's main configuration file

·   The **/etc/httpd/conf.d** directory contains configuration files for any installed modules

·   The **/etc/httpd/logs** directory is a symbol link to the **/var/log/httpd** directory, which contains all the Apache log files.

3. Starting|Stoping|Restarting Apache Web Server

        chkconfig –list httpd

        chkconfig httpd on

        service httpd start

        service httpd stop

        service httpd restart

4. Testing the Apache Web Server

Once you've started the Apache Web server, you should be able test to see it's working properly.

Open Web browser by click **Applications** -> **Internet** -> **Firefox Web Browser** and type the URL into the address box: http://localhost or http://127.0.0.1

5. Set security

Ø Click **System** -> **Administration** -> **Firewall**-> **Close**.

Ø Click **Trusted Services**, select **WWW (HTTP)** check box and click **Apply**, click **Yes**.

Ø Click **Close**.

6. Configuring the Apache Web Server

Apache Web Server comes with preconfigured, so you will need to modify the Web server to suit your environment.

The Apache configuration file is **/etc/httpd/conf/httpd.conf**

6.1. Overview of the httpd.conf Configuration File

The following are basic directives used to configure your Web server:

ServerRoot directive: Specifies the top-level directory tree under which the server's configuration, error, and log files exist.

ServerRoot "/etc/httpd"

Timeout directive: Defines the amount of time, in seconds, that the server waits for, receives, and sending.

Timeout 300

Listen directive: Define IP address or ports on which the Web server accepts incoming connection request.

Listen 80

ServerAdmin directive: Set the email address of the Web server administrator.

ServerAdmin root@localhost

ServerName directive: Specifies the hostname and port for the server to identify itself. The value must be FQDN name or IP address.

ServerName   new.host.name:80

DocumentRoot directive: Set the directory that will be used to serve the Web pages by default.

DocumentRoot "/var/www/html"

DirectoryIndex directive: Sets the file that Apache will serve if a directory is required

DirectoryIndex index.html index.html.var

ErrorLog directive: It sets location of the error log file. By default, it set t logs/error_log

ErrorLog logs/error_log

CustomLog directive: Sets the location and format of the access log file.

CustomLog logs/access_log

6.2. Basic Configuration

Apache comes with a default configuration, but some options need to be modified in order to host a Web site. The following steps will go through configuring Apache manually by directly configuring the **httpd.conf** file:

4 Open file **/etc/httpd/conf/httpd.conf**

4 Change ServerAdmin directive to your email address of Administrator.

ServerAdmin root@mydomain.com

4 Change ServerName directive by change line #ServerName www.example.com:80 to:

ServerName server1.test.com

Or

ServerName 192.168.2.1

4 Save the httpd.conf file.

4 Restart the httpd service

4 Now browse to http://localhost again, to check that the Web server is still serving Web pages.

6.3. Testing Your Test Page Web site

4 Now open a browser and browse to the page using your server's IP address. (For example, we are using the URL http://192.168.2.1)

4 Now follow to your DNS lesson and create www.test.com domain link to 192.168.2.1 and then

browse again by using the URL **http://www.test.com**

6.4. Setting Up Virtual Hosts

The term *virtual host* refers to the ability of a Web server to run more than one Web site on a single machine.

There are two kinds of virtual hosts, IP-base virtual hosts and Name-base virtual hosts.

IP-base virtual hosts require different IP address for every Web site. You can have more than one physical network connection or use virtual interfaces (IP alias) on one physical network interface.

Name-Base virtual hosts require only one IP address. The system can configure multiple names on each IP address.

The following section will discuss configuration of virtual host on Apache.

6.4.1. IP-Base Virtual Host

To configure IP-based hosting you need one IP address for each virtual host.

You need to point the hostname on the Web site to the correct IP address in DNS.

Once you have finished the IP configuration, proceed to following steps to configure Apache for virtual hosting:

4Open the /etc/httpd/conf/httpd.conf file

4Add the following configuration context to the end of the httpd.conf file.

```
<VirtualHost 192.168.2.1>
        ServerAdmin webmaster@mydomain.com
        DocumentRoot /var/www/doc.example.com
        ServerName  www.example.com
        ErrorLog logs/example.com-error_log
        CustomLog logs/example.com-access_log common
</VirtualHost>
```

4After finishing the virtual host's configuration save the configuration file and restart the Apache server to apply the new configuration.

6.4.2. Name-base Virtual Host

4Lunch an editor, and open file /etc/httpd/conf/httpd.conf

4Uncomment and modify the line #NameVirtualHost *:80 so that it reads:

<div align="center">NameVirtualHost *:80</div>

4Add the following configuration context to the end of the httpd.conf file.

```
<VirtualHost *:80>
        ServerAdmin webmaster@mydomain.com
        DocumentRoot /var/www/docs.example.com
        ServerName  www.example.com
        ErrorLog logs/example.com-error_log
        CustomLog logs/example.com-error_log common
</VirtualHost>
```

4After finishing the virtual host's configuration, save the configuration file and restart Apache server to apply the new configuration.

Configuring Name-Base Virtual Host

In this Exercise, you should be able configure and create two Name-base Virtual hosts www.monday.com and www.tuesday.com on the SERVER1 currently assign to the same IP address 192.168.2.1 by completing the following steps:

1.   Switch to SERVER1 and log on as root

2.   Go to Terminal or Shell

3.   [root@server1 ~]# **vi /etc/httpd/conf/httpd.conf**

4.   Press I and:

▸ Uncomment the line:

#ServerAdmin root@localhost
to
ServerAdmin root@mydomain.com

▸ Uncomment the line:
#ServerName www.example.com:80
to
ServerName 192.168.2.1

▸ Uncomment to line

 #NameVirtualHost *:80 to:

to
NameVirtualHost *:80

▸ Add the statement bellow to the end of file:
<VirtualHost *:80>
    ServerAdmin webmaster@mydomain.com
    DocumentRoot /var/www/doc.monday.com
    ServerName www.monday.com
    ErrorLog logs/monday.com-error_log
    CustomLog logs/monday.com-access_log common
</VirtualHost>

5.   Press **Esc** and type :x

6.   [root@server1 ~]# **mkdir /var/www/doc.monday.com**

7.   [root@server1 ~]# **vi /var/wwwdoc.monday.com/index.html**

8.   Press I and write down as the following content:

```
<html>
<head>

                <title>Monday Web Site</title>

</head>
<body>

                <center>

                <font size=10 color=red>Welcome to Monday Web Site</font>

                </center>

</body>
</html>
```

9.   Press **Esc** and type **:x**

10. [root@server1 ~]# **chkconfig httpd on**

11. [root@server1 ~]# **service httpd restart**

12. Follow to the DNS lesson, create address www.monday.com link to IP address 192.168.2.1

13. Now browse this Web site by click **Application** -> **FireFox Internet Browser** and in the URL address box, type http://www.monday.com
    ‣ What will you see?

‣ *Now let's create another www.tuesday.com Name-base Virtual Hosts*

14. [root@server1 ~]# **vi /etc/httpd/conf/httpd.conf**

15. Press I and just add the following context to the end of file:

```
<VirtualHost *:80>
    ServerAdmin webmaster@mydomain.com
    DocumentRoot /var/www/doc.tuesday.com
    ServerName www.tuesday.com
    ErrorLog logs/tuesday.com-error_log
    CustomLog logs/tuesday.com-access_log common
</VirtualHost>
```

16. Press **Esc** and type **:x**

17. [root@server1 ~]# **mkdir /var/www/doc.tuesday.com**

18. [root@server1 ~]# **vi /var/www/doc.tuesday.com/index.html**

19. Press I and write down as the following content:

```
<html>
<head>

              <title>Tuesday Web Site</title>

</head>
<body>

              <center>

              <font size=10 color=red>Welcome to Tuesday Web Site</font>

              </center>

</body>
</html>
```

20. Press **Esc** and type **:x**

21. [root@server1 ~]# **service httpd restart**

22. Follow to the DNS lesson, create address www.tuesday.com link to IP address 192.168.2.1

23. Now, go to Firefox Internet Browser and browse to http://www.tuesday.com
    ‣ What will you see then?

FTP
File Transfer Protocol
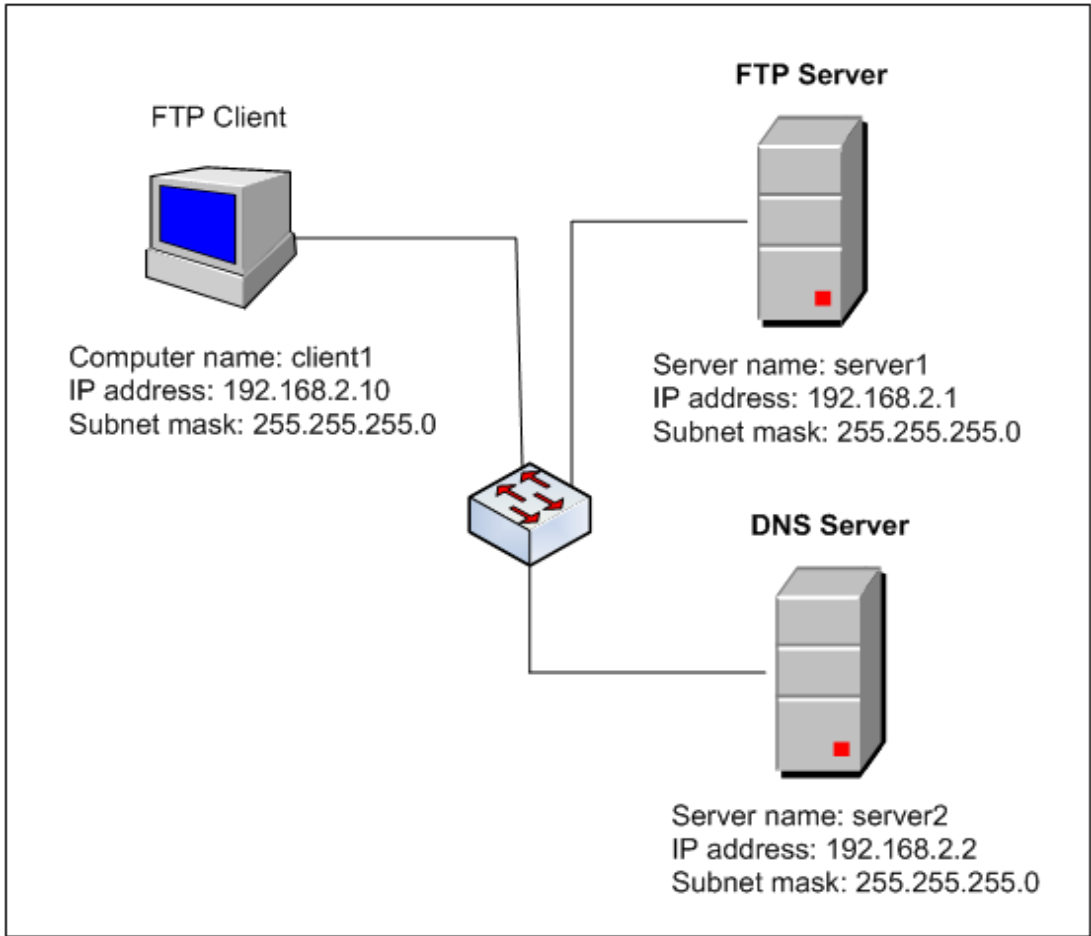
តើអ្វីទៅជា FTP ?

- FTP មកពីពាក្យ (File Transfer Protocol) ជាពិធីការមួយប្រភេទដែលមានភាពងាយស្រួលក្នុងការ ផ្ញើសបូរឯកសារតាមបណ្តាញ ឬលើអ៊ីនធឺណិតជាដើម ។

- FTP ប្រើសម្រាប់ទាញយក (download) ឯកសារពីអ៊ីនធឺណិត ឬតាមបណ្តាញមូលដ្ឋាន ។

- ម៉ាស៊ីនភ្ញៀវ FTP អាចទាញយក ផ្ទុកឡើង (Upload) ឯកសារមួយចំនួនអាស្រ័យលើការការកំណត់ សិទ្ធ ។

<u>ម៉ាស៊ីនបម្រើ និងម៉ាស៊ីនភ្ញៀវ FTP</u>

- ម៉ាស៊ីនបម្រើ FTP រត់កម្មវិធីម៉ាស៊ីនបម្រើ FTP នៅលើបណ្តាញសម្រាប់ស្តើការតភ្ជាប់ពី កុំព្យូទ័រផ្សេងទៀត ។

- ម៉ាស៊ីនភ្ញៀវរត់កម្មវិធីម៉ាស៊ីនភ្ញៀវ FTP អាចចាប់ផ្តើមការតភ្ជាប់ទៅម៉ាស៊ីនបម្រើឯងដែរ ។

- រាល់ពេលតភ្ជាប់ម្តងៗម៉ាស៊ីនភ្ញៀវអាចធ្វើការងារជាច្រើនជាមួយម៉ាស៊ីនបម្រើ ដូចជា ៖

  - ការផ្ទុកឯកសារឡើង (Upload files) ទៅម៉ាស៊ីនបម្រើ

  - ទាញយកឯកសារ (download files) ពីម៉ាស៊ីនបម្រើ

  - ឬឡើណ្ហ៖ ប្ដូរលុបឯកសារមួយចំនួននៅលើម៉ាស៊ីនបម្រើ

FTP Server in the Fedora Core 12

     vsftpd

Installing the vsftpd FTP Server

     Package files: rpm –qa | grep ftp

     Service name: vsftpd

     Configuration files: /etc/vsftpd/vsftpd.conf

Click **System** -> **Administration** -> **Firewall**.

Click **Trusted Services -> select FTP -> click Apply -> Yes -> Close**.

Click **System -> Administration -> SELinux Management.**

Click **Boolean** -> select **Allow ftp to read and write files in the user home directories** check box -> **Close**.
Starting|Stoping|Restarting FTP Server

         chkconfig vsftpd on

         service vsftpd start

         service vsftpd restart

         service vsftpd stop

I. Logging to FTP server

On FTP client machine, go to Command Prompt (Go to Shell for Unix/Linux machine) and type:

     ftp <FTP server's IP address>

or   ftp <domain name>

(To use FTP, you should be able familiar with some of FTP basic commands.)

II. Using Your FTP Server

Four important configurations:

        ·   Configuring for anonymous FTP server file download

· Configuring for anonymous FTP server file upload

· Creating a system account for per-user access to the FTP server

· Blocking FTP access for user accounts.

1. Configuring for anonymous FTP server for File Download

Root directory: /var/ftp

1.1. Setting up the FTP Server

· Owner of /var/ftp directory is root

· Try to create a new file – named test.txt by do as the following:

[root@server1 ~]# **cd /var/ftp/pub**

[root@server1 ~]# **echo "This is the contents of a test.txt file" > test.txt**

1.2. Using an FTP client to test Anonymous Read Access

4Try to download test.txt file by on the FTP client machine, go to Command Prompt (Shell) and type:

ftp 192.168.2.1

Name: anonymous

Password: *******

ftp> **ls**

ftp> **pwd**

ftp> **cd pub**

ftp> **get test.txt**

ftp> **bye**

221 Goodbye

2. **Configuring an Anonymous FTP Server for File Upload**

   2.1. Setting up the FTP server for anonymous Write Access

You should be able complete the following steps:

[root@server1 ~]# **cd /var/ftp/pub**

[root@server1 ~]# **mkdir upload**

[root@server1 ~]# **chgrp ftp upload**

[root@server1 ~]# **chmod –R u=rwx,g=wx,o-rwx upload**

[root@server1 ~]# **vi /etc/vsftpd/vsftpd.conf**

4 Press I and:

4Change line **#Write_enable = YES** to **Write_enable = YES**

4Change line **#anon-upload-enable = YES** to **anon-upload-enable = YES**

Press **Esc** and type **:x**

[root@server1 ~]# **service vsftpd restart**

2.2. Using an FTP client to test Anonymous Write Access

      Go to FTP client machine, go to **Command Prompt**

      Type ftp 192.168.2.1

      Name: anonymous

      Password: *****

      ftp> **pwd**

      ftp> **cd /pub/upload**

      ftp> **put test.txt**

      ftp> **bye**

      221 Goodbye.

3.   FTP Authentication via System Accounts

To enable user can access their home directory, you should be able:

    1.   [root@server1 ~]# **vi /etc/vsftpd/vsftpd.conf**

    2.   Press I and change line: **# local-enable = YES** to **local-enable = YES**

    For example, go to FTP client machine and go to Command Prompt:

Type ftp 192.168.2.1

Name: mike

Password: 123456

ftp> **pwd**

/home/mike

3.1. Disabling Local System User Accounts for FTP

By default, each user can read, write, and execute their home directory.

Because of FTP is unencrypted, so we need to disable FTP access by user accounts:

[root@server1 ~]# **vi /etc/vsftpd/vsftpd.conf**

4 Change line **local-enable = YES** to **local-enable = NO**

4 Press **Esc** and type **:x**

[root@server1 ~]# **service vsftpd restart**

Go to FTP client machine and test again by go to Command Prompt:

Type ftp 192.168.2.1

Name: mike

Password: 123456

530 This FTP server is anonymous only.

Login failed

3.2. Blocking FTP Access for User Accounts

We can disable specific user by using /etc/vsftpd/ftpusers file list user account by do as the following:

1.   [root@server1 ~]# **vi /etc/vsftpd/ftpusers**

2.   Press I and type:

    mike

    lisa

    sok

    …

3.   Press **Esc** and type :**x**

Go to FTP client machine and test again, by go to Command Prompt:

Type ftp 192.168.2.1

Name: mike

Password: 123456

530 Login incorrect

Login failed.

3.3. Configuring an FTP Greeting Banner

We can change default greeting message that the FTP server issues to clients on the connection.

[root@server1 ~]# **vi /etc/vsftpd/vsftpd.conf**

4 Change line **#ftpd_banner = Welcome to blah FTP service**.

Basic FTP Commands

·   To see FTP commands, at FTP console type **help**

·   To see what this command use for, type **help <command>**.

For example type **help mkdir**

Some basic commands:

bye   : Terminate ftp session and exit. For example, type **bye**

close   : Terminate ftp session. For example, type **close**

open   : Connect to remote ftp. For example, type **open 192.168.2.1**

quit   : Terminate ftp session and exit. For example, type **quit**

!   : Escape to the shell. For example type **!** and then type **exit**

pwd   : Print working directory on remote machine. For example type **pwd**

dir   : List contents of remote directory. For example, type **dir**

ls   : List contents of remote directory. For example, type **ls**

mkdir : Make directory on the remote machine. For example, type **mkdir test**

rmdir : Remove directory on the remote machine. For example, type **rmdir test**

cd   : Change remote working directory. For example, type **cd** , **cd ..**

lcd   : Change local working directory. For example, type **lcd**

rename: Rename file. For example, type **rename oldindex.html newindex.html**

delete : Delete remote file. For example, type **delete index.bak**

mdelete: Delete multiple files. For example, type **mdelete ***

put   : Send one file. For example, type **put index.html**

mput : Send multiple files. For example, type **mput ***

get   : Receive file. For example, type **get index.html**

mget   : Get multiple files. For example, type **mget ***

<div style="border:2px solid black; text-align:center; font-weight:bold; color:navy">

DHCP
Dynamic Host Configuration Protocol

</div>

DHCP Configuration Files

- ·   Package file: dhcp-4.1.0p1-12.fc12.i686.rpm
- ·   Configuration file: /etc/dhcp/dhcpd.conf
- ·   Lease file: /var/lib/dhcpd/dhcpd.leases
- ·   Service name: dhcpd

- • DHCP ជាពិធីការ (protocol) ដែលប្រើនៅលើបណ្តាញដើម្បីកំណត់អាសយដ្ឋាន IP និង របាំងបណ្តាញរង (subnet mask) មានន័យថាគ្រប់ម៉ាស៊ីនភ្ញៀវទាំងអស់ត្រូវតែស្នើ អាសយដ្ឋាន IP ពីម៉ាស៊ីនបម្រើ DHCP ។

- • ម៉ាស៊ីនបម្រើត្រូវតែប្រាកដថាគ្រប់ម៉ាស៊ីនភ្ញៀវទាំងអស់មានកាតបណ្តាញ (Network Card) នៅពេលដែលម៉ាស៊ីនបម្រើទទួលបានសំណើ ក៏ផ្តល់អាសយដ្ឋាន IP ទៅឲ្យម៉ាស៊ីនភ្ញៀវ

- • ម៉ាស៊ីនបម្រើ/ម៉ាស៊ីនភ្ញៀវ ៖

  - ម៉ាស៊ីនភ្ញៀវបញ្ជូនសារតាមច្រក 67

  - ម៉ាស៊ីនបម្រើបញ្ជូនសារតាមច្រក 68

- • ការគ្រប់គ្រងអាសយដ្ឋានតាម DHCP ធ្វើឲ្យអ្នកគ្រប់គ្រងប្រព័ន្ធកាន់តែមានភាពងាយស្រួល ក្នុងការគ្រប់គ្រងម៉ាស៊ីនក្នុងបណ្តាញមូលដ្ឋាន ។

- • ម៉ាស៊ីនបម្រើ DHCP មិនត្រឹមតែផ្តល់នូវអាសយដ្ឋាន IP និងរបាំងបណ្តាញ (netmask) ប៉ុណ្ណោះទេ ថែមទាំងផ្តល់នូវឈ្មោះម៉ាស៊ីន (hostname) ដែន (Domain) ច្រកចេញចូល (gateway) និងអាសយដ្ឋាន IP សម្រាប់ម៉ាស៊ីនភ្ញៀវ ។

- • ការបម្រុងទុកអាសយដ្ឋាន IP របស់ម៉ាស៊ីនបម្រើ DHCP តាមវិធីសាស្ត្របីគឺ ៖ Dynamic Allocation, Automatic Allocation និង Manual Allocation ។

ស្វែងយល់អំពីដំណើរការរបស់ DHCP

DHCP ប្រតិបត្តិការការងារតាមបួនដំណាក់កាល ដែលដំណាក់កាលទាំងនោះរួមមាន DHCP Discover, DHCP Offer, DHCP Request និង DHCP Acknowledgment ។
បន្ទាប់ពីម៉ាស៊ីនភ្ញៀវព្រមទទួលអាសយដ្ឋាន IP ម៉ាស៊ីនភ្ញៀវអាចចាប់ផ្តើមស្វែរកអាសយដ្ឋាន ដើម្បីការពារ ប៉ះទង្គិច IP ដែលបណ្ដាលមកពីអាសយដ្ឋានដូចគ្នានៅលើម៉ាស៊ីនបម្រើ DHCP ។

- **DHCP Discover** គឺម៉ាស៊ីនភ្ញៀវផ្សាយ (broadcast)នៅលើបណ្ដាញរង subnet ដើម្បីស្វែងរក ម៉ាស៊ីនបម្រើលើបណ្ដាញ។
ម៉ាស៊ីនភ្ញៀវបង្កើតកញ្ចប់ UDP(User Datagame Protocol)និងរបាំងរង 255.255.255.255 ដើម្បីស្វើ អាសយដ្ឋាន IP ពីម៉ាស៊ីនបម្រើ DHCP ។

- DHCP Offer គឺម៉ាស៊ីនបម្រើ DHCP ទទួលបានសំណើរនៃការជួល IP ពីម៉ាស៊ីនភ្ញៀវ វានឹងផ្តល់ IP ទៅឱ្យម៉ាស៊ីនដែលស្នើរនោះ។ ហើយ ម៉ាស៊ីនបម្រើធ្វើសារ DHCP OFFER តាមបណ្ដាញទៅឱ្យ ម៉ាស៊ីនភ្ញៀវ ។

- DHCP Request គឺនៅពេលម៉ាស៊ីនភ្ញៀវបានទទួលការជួល IP ពីម៉ាស៊ីនបម្រើហើយ វាត្រួតប្រាប់ ម៉ាស៊ីនបម្រើដទៃថាវាបានទទួល IP នោះ ហើយម៉ាស៊ីនភ្ញៀវផ្សាយសារ DHCP REQUEST ដែលមាន IP របស់ម៉ាស៊ីនបម្រើ ។

- DHCP Acknowledgment គឺនៅពេលម៉ាស៊ីនបម្រើ DHCP បានទទួលសារ DHCP REQUEST ពី ម៉ាស៊ីនភ្ញៀវ វា ចាប់ផ្តើមដំណើរចុងក្រោយដើម្បីកំណត់រចនាសម្ព័ន្ធ។ដំណាក់កាលនេះ វាធ្វើការទាក់ទងនិង ធ្វើការផ្ញើកញ្ចប់DHCP PACK ទៅឱ្យម៉ាស៊ីនភ្ញៀវ។

Practice 1: To configure DHCP, you should complete the following steps:

1.   [root@server1 ~]# vi /etc/dhcp/dhcpd.conf

2.   Press I and write as the following:

```
default-lease-time 600;
max-lease-time 7200;

subnet 192.168.2.0 netmask 255.255.255.0 {
      range 192.168.2.5 192.168.2.50;
      range 192.168.2.60 192.168.2.100;
}

option subnet-mask 255.255.255.0;
option broadcast-address 192.168.2.255;
option routers 192.168.2.1;
option domain-name-servers 192.168.2.3,192.168.2.4;
option domain-name "sunnydays.com";
ddns-update-style ad-hoc;
```

3.   Press Esc and type :x

4.   [root@server1 ~]# chkconfig dhcpd on

5.   [root@server1 ~]# /usr/sbin/dhcpd –d –f
(If OK, type /usr/sbin/dhcpd)

6.   Type service dhcpd restart

Practice 2: Configure DHCP client with Windows XP.

To configure DHCP client running Windows XP, you should complete to the following steps:

1.   Log on as administrator

2.   Right-click **My Network Places** and select **Properties**
The Properties window open

3.   Right-click **Local Area Connection** and select **Properties**
The Local Area Connection Properties opens.

4.   Verify three components: Client for Microsoft Networks, File and Printer Sharing for Microsoft Networks, Internet Protocol (TCP/IP) are installed and checked.

5.   High-light **Internet Protocol (TCP/IP)** and click Properties
The TCP/IP Properties opens.

6.   Select **Obtain an IP address automatically** check box and select **Obtain DNS server address automatically** check box and click OK

7.   Click **OK** and click **Close**

8.   Close the window

9.   Go to Command Prompt and type:

ipconfig /release
ipconfig /renew
ipconfig

You have done!

Practice 3: Assign Fixed IP address for a DHCP Client

In this practice, you want to assign a fixed IP address (e.g: 192.168.2.51 you excluded it from range you created) to CLIENT1 machine, you should complete the following steps:

1.   On **CLIENT1** machine, go to Command Prompt and type **ipconfig /all**
Read the Physical Address and write down (e.g: 00-16-CE-DC-AC-7D), and then close it.

2.   Switch to **SERVER1** machine and log on as root

3.   [root@server1 ~]# vi /etc/dhcp/dhcpd.conf

4.   Press I and add as the following into the end of file:
host ns {
     next-server client1;
     hardware Ethernet 00:16:CE:DC:AC:7D;

        fixed-address 192.168.2.51;

}

Press Esc and type :x

5.   [root@server1 ~]# /usr/sbin/dhcpd –d –f

6.   Switch to CLIENT1 machine and log on as administrator

7.   Go to Command Prompt and type:

ipconfig /release
ipconfig /renew

What will you see then?

Mail Server

I. Email – What Is It?

Email, in simple terms, is merely an automated way of delivering conventional mail.

Conventional mail delivery can be thought of three distinct parts: sending email, receiving email and transporting email between one or more intermediates station and route to its final destination.

II. How Does Email Work?

Email work in much the same way as conventional mail. Three distinct agents are involved in this process:

1.　Email client (sender), referred as Mail User Agent (MUA).

2.　Mail transports agent, referred to as the Mail Transport Agent (MTA)

3.　Mail delivery agent (recipient).

TABLE: **Electronic Mail Components**

Agent	Component	Description
Mail User Agent (MUA)	Sender	Format the message, address the message, and delivers the message to the Mail Transport Agent.
Transport Agent (MTA)	Message Handler	Accept message from User Agent and other Transport Agent. Routes the message over appropriate network. Resolve aliases and forwarding.
Delivery Agent	Recipient	Delivery message to destination accessible by recipient.

The sender of an email constructs a message, using an email client, and address it to a recipient. After the email client send the message, the Mail Transport Agent (MTA) take over the process.

The Delivery Agents is really nothing more than an email client or user agent.

Email protocol for Delivery Agent:

　　　IMAP = Internet Message Access Protocol

　　　POP = Post Office Protocol

　　　SMTP = Simple Mail Transport Protocol.

III. Setting up DNS for SMTP Server

Mail Exchange (MX) records in a DNS Configuration are used to identify SMTP mail server resource for a domain.

      IN   MX   preference-value   mail-server-hostname

For example:

      IN   MX   5   mail-server.yourdomain.com

For the preference-value (integer value) is used when you have two or more than one SMTP mail servers.

For example:

      IN   MX   10   fast-mail-server.ad-engine.com

      IN   MX   20   slow-mail-server.engine.com

IV. Setting up an SMTP Mail Server

A mail user agent (MUA) is a mail client program, such as Email or Elm. With and MUA, a user compose a mail message and send it. Then a mail transport agent (MTA) transports the message over Internet. MTAs are mail servers that use the Simple Mail Transport Protocol (SMTP) to send message across the Internet from one mail server to another. On Fedora Core 5, the commonly used MTA is Sendmail, a mail server daemon that constantly checks for incoming message from other mail servers and send outgoing message to appropriate servers.

V. Sendmail

Sendmail operates as a server to both receive and send mail message. Sendmail listens for any mail message received from other host and addressed to users on the network hosts it serves. At the same time, Sendmail handles message users are sending out to remote users, determining to what hosts to send them.

- Installing Sendmail

  Package files: rpm -qa | grep sendmail

  sendmail-8.14.3-8.fc12.i686

  sendmail-cf-8.14.3-8.fc12.i686

- Sendmail Configuration

  Main Configuration file: /etc/mail/sendmail.cf (type **find / –name sendmail.cf**)

  Macro file: /etc/mail/sendmail.mc (type **find /etc / –name sendmail.mc**)

  This is the sendmail macro configuration file for m4. If you make changes to

  /etc/mail/sendmail.mc, you will need to regenerate the

  /etc/mail/sendmail.cf file by confirming that the sendmail-cf package is installed and then performing a

make -C /etc/mail

VI. Setting up POP3 Incoming Mail Server

The Post Office Protocol (POP) allows a remote server to hold mails for users who can then fetch their mail from it when they are ready. POP protocol hold mails until a user access his or her account on the POP server.

You can access the POP server from different hosts; however, when you do, all the messages are transferred to that host. They are not kept on the POP server.

Practice 1: Configuring Sendmail Mail Server

In this practice, you should configure SERVER1 as the Sendmail Mail server with the example.com domain by completing the following steps:

1.   Switch to server1 machine and log on as root

2. Click **System** -> **Administration** -> **Firewall** -> **Close**

3. Click **Trusted Services** -> select **Mail (SMTP)** check box

4. Click **Other Ports** -> **Add** -> select **User Defined** check box -> type 110 in the Port/Port Range text box and click **OK**.

5. Click **Apply** -> click **Yes** -> click **Close**.

6.   Follow to DNS lesson, set up server1 machine as the DNS server and create a domain named it **example.com**

7. [root@server1 ~]#vi /etc/mail/sendmail.mc

8. Press I and modify line:

From:

dnl DAEMON_OPTION('port=smtp, Addr=127.0.0.1, Name=MTA')dnl

to

dnl# DAEMON_OPTION('port=smtp, Addr=127.0.0.1, Name=MTA')dnl

4Placing the cursor bellow the line:

LOCAL_DOMAIN('localhost.localdomain')dnl

and insert a new line as bellow:

LOCAL_DOMAIN(example.com)dnl

9.   Press Esc and type :x

10. [root@server1 ~]#make –C /etc/mail

11. [root@server1 ~]#**vi /var/named/named.example.com**
Press I and add the line as bellow to the end of file:

example.com   IN   MX   10   server1.example.com

12. Press Esc and type :x

13. [root@server1 ~]# **vi /etc/dovecot**

14. Press I and modify lines:

Form

protocols = imap imaps pop3 pop3s

To

protocols = imap imaps pop3 pop3s

From

\# mail_location = mobx:~/mail:INBOX=/var/mail/%u

To

mail_location = mobx:~/mail:INBOX=/var/mail/%u

15. Press Esc and type **:x**

16. [root@server2 ~]# **chkconfig named on**

17. [root@server2 ~]# **service named restart**

18. [root@server1 ~]# **chkconfig sendmail on**

19. [root@server1 ~]# **chkconfig dovecot on**

20. [root@server1 ~]# **service sendmail restart**

21. [root@server1 ~]# **service dovecot restart**

22. [root@server1 ~]# **startx**

Now you try to create two user accounts for Mike and Lisa for testing, by issue the command:

[root@server1 ~]#useradd mike
[root@server1 ~]#passwd mike
[root@server1 ~]#useradd lisa
[root@server1 ~]#passwd lisa

23. [root@server1 ~]#**logout**

24. Now log on as **mike** and type:

[root@server1 ~]#**startx**

Practice: Configuring Mail client on Linux machine

In this practice, you should configure server1 machine as the mail client with mike@example.com account by completing the following steps:

1. Switch to server1 machine and log on as mike

2. Click **Applications** -> **Internet** -> **Evolution Mail and Calendar**

3. Click **Forward** -> Type E-mail address in the E-mail address text box and click Forward -> Select POP in the Server Type list box and type 192.168.2.1 in the Server text box and type mike@example.com in the Username text box and click **Forward** -> **Forward** -> Type 192.168.2.1 in the Server text box and click Forward -> Type Your full name in the Name text box and click **Forward** -> Select Time Zone and click **Forward** -> Click **Apply**.

Now you try to compose a new message and send to lisa@example.com

25. Switch to client1 machine and open Outlook Express and sign up an Lisa account.

Now open Outlook Express. If this the first time, the Interne Connection Wizard will open allow to sign up the account. But it is not the first time, on the menu bar, click Tools menu, point to **Accounts**, click **Mail** tab and click **Add**, select **Mail**. The Internet Connection wizard open. Type Lisa in the Display name text box and click **Next**. Type lisa@example.com in the E-mail address box and click **Next**. Type 192.168.2.1 in the Incoming mail (POP3 or HTTP) server text box and type 192.168.2.1 in the Outgoing mail (SMTP) server text box and click **Next**. Type 123456 (password for lisa account) in the Password text box and click **Next**. Click **Finish**. Click **Close**.

Click **Inbox** in the folder dialog box on the left and click **Send**/**Receive** button on the Tool bar to receive mail from Mike.

Configuring Postfix Mail Server

Package file name: rpm –qa | grep postfix (type yum –y install postfix)

Service name: postfix

Main configuration file: /etc/postfix/main.cf

Practice: Configuring Postfix Mail Server

In this practice , you should configure SERVER1 as Postfix mail server for the example.com domain by completing the following step:

1. Switch to SERVER1 and log on as root

2. Follow DNS lesson and create a domain named example.com

3. [root@server1~]# vi etc/postfix/main.cf

4. Press I and modify following lines so that can read:

myhostname = SERVER1.example.com

mydomain = example.com

myorigin = $mydomain
inet_interfaces = all

mydestination = $myhostname, localhost.$mydomain, localhost, $mydomain

mynetworks = 127.0.0.0/8,192.168.2.0/24

home_mailbox = Maildir/
message_size_limit = 5242880 (5 Mb)

mailbox_size_limit = 104857600

[root@server1 ~]# service sendmail stop

[root@server1 ~]# chkconfig sendmail off

[root@server1 ~]# alternatives --config mta

[root@server1 ~]# chkconfig postfix on

[root@server1 ~]# service postfix restart

<u>Linux Commands Line</u>

System information	
Command	**Description**
# arch	show architecture of machine(1)
# cal 2007	show the timetable of 2007
# cat /proc/cpuinfo	show information CPU info
# cat /proc/interrupts	show interrupts
# cat /proc/meminfo	verify memory use
# cat /proc/swaps	show file(s) swap
# cat /proc/version	show version of the kernel
# cat /proc/net/dev	show network adpters and statistics
# cat /proc/mounts	show mounted file system(s)
# clock -w	save date changes on BIOS
# date	show system date
# date 041217002007.00	set date and time - MonthDayhoursMinutesYear.Seconds
# dmidecode -q	show hardware system components - (SMBIOS / DMI)
# hdparm -i /dev/hda	displays the characteristics of a hard-disk
# hdparm -tT /dev/sda	perform test reading on a hard-disk
# lspci -tv	display PCI devices
# lsusb -tv	show USB devices
# uname -m	show architecture of machine(2)
# uname -r	show used kernel version

Shutdown, Restart and Logout of a system	
Command	**Description**
# init 0	shutdown system(2)
# logout	leaving session
# reboot	reboot(2)
# shutdown -h now	shutdown system(1)
# shutdown -h 16:30 &	planned shutdown of the system at 16:30
# shutdown -c	cancel a planned shutdown of the system
# shutdown -r now	reboot(1)
# telinit 0	shutdown system(3)

| |
| |

Files and Directory

Command	Description
# cd /home	enter to directory '/ home'
# cd ..	go back one level
# cd ../..	go back two levels
# cd	go to home directory
# cd ~user1	go to home directory
# cd -	go to previous directory
# cp file1 file2	copying a file
# cp dir/* .	copy all files of a directory within the current work directory
# cp -a /tmp/dir1 .	copy a directory within the current work directory
# cp -a dir1 dir2	copy a directory
# cp file file1	outputs the mime type of the file as text
# iconv -l	lists known encodings
# iconv -f fromEncoding -t toEncoding inputFile > outputFile	converting the coding of characters from one format to another
# find . -maxdepth 1 -name *.jpg -print -exec convert	batch resize files in the current directory and send them to a thumbnails directory (requires convert from Imagemagick)
# ln -s file1 lnk1	create a symbolic link to file or directory
# ln file1 lnk1	create a physical link to file or directory
# ls	view files of directory
# ls -F	view files of directory
# ls -l	show details of files and directory
# ls -a	show hidden files
# ls *[0-9]*	show files and directory containing numbers
# lstree	show files and directories in a tree starting from root(2)
# mkdir dir1	create a directory called 'dir1'
# mkdir dir1 dir2	create two directories simultaneously
# mkdir -p /tmp/dir1/dir2	create a directory tree
# mv dir1 new_dir	rename / move a file or directory
# pwd	show the path of work directory
# rm -f file1	delete file called 'file1'
# rm -rf dir1	remove a directory called 'dir1' and contents recursively
# rm -rf dir1 dir2	remove two directories and their contents recursively
# rmdir dir1	delete directory called 'dir1'

# touch -t 0712250000 file1	modify timestamp of a file or directory - (YYMMDDhhmm)
# tree	show files and directories in a tree starting from root(1)

File search

Command	Description
# find / -name file1	search file and directory into root filesystem from '/'
# find / -user user1	search files and directories belonging to 'user1'
# find /home/user1 -name *.bin	search files with '. bin' extension within directory '/home/user1'
# find /usr/bin -type f -atime +100	search binary files are not used in the last 100 days
# find /usr/bin -type f -mtime -10	search files created or changed within 10 days
# find / -name *.rpm -exec chmod 755 '{}' \;	search files with '.rpm' extension and modify permits
# find / -xdev -name *.rpm	search files with '.rpm' extension ignoring removable partitions as cdrom, pen-drive, etc.…
# locate *.ps	find files with the '.ps' extension - first run 'updatedb' command
# whereis halt	show location of a binary file, source or man
# which halt	show full path to a binary / executable

Mounting a Filesystem

Command	Description
# fuser -km /mnt/hda2	force umount when the device is busy
# mount /dev/hda2 /mnt/hda2	mount disk called hda2 - verify existence of the directory '/mnt/hda2'
# mount /dev/fd0 /mnt/floppy	mount a floppy disk
# mount /dev/cdrom /mnt/cdrom	mount a cdrom / dvdrom
# mount /dev/hdc /mnt/cdrecorder	mount a cdrw / dvdrom
# mount /dev/hdb /mnt/cdrecorder	mount a cdrw / dvdrom
# mount -o loop file.iso /mnt/cdrom	mount a file or iso image
# mount -t vfat /dev/hda5 /mnt/hda5	mount a Windows FAT32 file system
# mount /dev/sda1 /mnt/usbdisk	mount a usb pen-drive or flash-drive
# mount -t smbfs -o username=user,password=pass	mount a windows network share

//WinClient/share /mnt/share	
# umount /dev/hda2	unmount disk called hda2 - exit from mount point '/ mnt/hda2' first
# umount -n /mnt/hda2	run umount without writing the file /etc/mtab - useful when the file is read-only or the hard disk is full

Disk Space

Command	Description
# df -h	show list of partitions mounted
# dpkg-query -W -f='${Installed-Size;10}t${Package}n' | sort -k1,1n	show the used space by installed deb packages, sorting by size (debian, ubuntu and alike)
# du -sh dir1	estimate space used by directory 'dir1'
# du -sk * | sort -rn	show size of the files and directories sorted by size
# ls -lSr |more	show size of the files and directories ordered by size
# rpm -q -a --qf '%10{SIZE}t%{NAME}n' | sort -k1,1n	show the used space by rpm packages installed sorted by size (fedora, redhat and alike)

Users and Groups

Command	Description
# chage -E 2005-12-31 user1	set deadline for user password
# groupadd [group]	create a new group
# groupdel [group]	delete a group
# groupmod -n moon sun	rename a group from moon to sun
# grpck	check correct syntax and file format of '/etc/group' and groups existence
# newgrp - [group]	log into a new group to change default group of newly created files
# passwd	change password
# passwd user1	change a user password (only by root)
# pwck	check correct syntax and file format of '/etc/passwd' and users existence
# useradd -c "User Linux" -g admin -d /home/user1 -s /bin/bash user1	create a new user "user1" belongs "admin" group
# useradd user1	create a new user
# userdel -r user1	delete a user ('-r' eliminates home directory)
# usermod -c "User FTP" -g system -d /ftp/user1	change user attributes as description, group and other

-s /bin/nologin user1	

Permits on Files

Command	Description
# chgrp group1 file1	change group of files
# chmod ugo+rwx directory1	set permissions reading (r), write (w) and (x) access to users owner (u) group (g) and others (o)
# chmod go-rwx directory1	remove permits reading (r), write (w) and (x) access to users group (g) and others (or
# chmod u+s /bin/file1	set SUID bit on a binary file - the user that running that file gets same privileges as owner
# chmod u-s /bin/file1	disable SUID bit on a binary file
# chmod g+s /home/public	set SGID bit on a directory - similar to SUID but for directory
# chmod g-s /home/public	disable SGID bit on a directory
# chmod o+t /home/public	set STIKY bit on a directory - allows files deletion only to legitimate owners
# chmod o-t /home/public	disable STIKY bit on a directory
# chown user1 file1	change owner of a file
# chown -R user1 directory1	change user owner of a directory and all the files and directories contained inside
# chown user1:group1 file1	change user and group ownership of a file
# find / -perm -u+s	view all files on the system with SUID configured
# ls -lh	show permits on files
# ls /tmp | pr -T5 -W$COLUMNS	divide terminal into 5 columns

Special Attributes on files

Command	Description
# chattr +a file1	allows write opening of a file only append mode
# chattr +c file1	allows that a file is compressed / decompressed automatically by the kernel
# chattr +d file1	makes sure that the program ignores Dump the files during backup
# chattr +i file1	makes it an immutable file, which can not be removed, altered, renamed or linked
# chattr +s file1	allows a file to be deleted safely
# chattr +S file1	makes sure that if a file is modified changes are written in synchronous mode as with sync

# chattr +u file1	allows you to recover the contents of a file even if it is canceled
# lsattr	show specials attributes

Archives and compressed files

Command	Description
# bunzip2 file1.bz2	decompress a file called 'file1.bz2'
bzip2 file1	compress a file called 'file1'
# gunzip file1.gz	decompress a file called 'file1.gz'
# gzip file1	compress a file called 'file1'
# gzip -9 file1	compress with maximum compression
# rar a file1.rar test_file	create an archive rar called 'file1.rar'
# rar a file1.rar file1 file2 dir1	compress 'file1', 'file2' and 'dir1' simultaneously
# rar x file1.rar	decompress rar archive
# tar -cvf archive.tar file1	create a uncompressed tarball
# tar -cvf archive.tar file1 file2 dir1	create an archive containing 'file1', 'file2' and 'dir1'
# tar -tf archive.tar	show contents of an archive
# tar -xvf archive.tar	extract a tarball
# tar -xvf archive.tar -C /tmp	extract a tarball into / tmp
# tar -cvfj archive.tar.bz2 dir1	create a tarball compressed into bzip2
# tar -xvfj archive.tar.bz2	decompress a compressed tar archive in bzip2
# tar -cvfz archive.tar.gz dir1	create a tarball compressed into gzip
# tar -xvfz archive.tar.gz	decompress a compressed tar archive in gzip
# unrar x file1.rar	decompress rar archive
# unzip file1.zip	decompress a zip archive
# zip file1.zip file1	create an archive compressed in zip
# zip -r file1.zip file1 file2 dir1	compress in zip several files and directories simultaneously

RPM Packages (Fedora, Red Hat and like)

Command	Description
# rpm -ivh [package.rpm]	install a rpm package
# rpm -ivh --nodeeps [package.rpm]	install a rpm package ignoring dependencies requests
# rpm -U [package.rpm]	upgrade a rpm package without changing configuration files
# rpm -F [package.rpm]	upgrade a rpm package only if it is already installed

# rpm -e [package]	remove a rpm package
# rpm -qa	show all rpm packages installed on the system
# rpm -qa	grep httpd	show all rpm packages with the name "httpd"
# rpm -qi [package]	obtain information on a specific package installed
# rpm -qg "System Environment/Daemons"	show rpm packages of a group software
# rpm -ql [package]	show list of files provided by a rpm package installed
# rpm -qc [package]	show list of configuration files provided by a rpm package installed
# rpm -q [package] --whatrequires	show list of dependencies required for a rpm packet
# rpm -q [package] --whatprovides	show capability provided by a rpm package
# rpm -q [package] --scripts	show scripts started during installation / removal
# rpm -q [package] --changelog	show history of revisions of a rpm package
# rpm -qf /etc/httpd/conf/httpd.conf	verify which rpm package belongs to a given file
# rpm -qp [package.rpm] -l	show list of files provided by a rpm package not yet installed
# rpm --import /media/cdrom/RPM-GPG-KEY	import public-key digital signature
# rpm --checksig [package.rpm]	verify the integrity of a rpm package
# rpm -qa gpg-pubkey	verify integrity of all rpm packages installed
# rpm -V [package]	check file size, permissions, type, owner, group, MD5 checksum and last modification
# rpm -Va	check all rpm packages installed on the system - use with caution
# rpm -Vp [package.rpm]	verify a rpm package not yet installed
# rpm -ivh /usr/src/redhat/RPMS/`arch`/ [package.rpm]	install a package built from a rpm source
# rpm2cpio [package.rpm]	cpio --extract --make-directories *bin*	extract executable file from a rpm package
# rpmbuild --rebuild [package.src.rpm]	build a rpm package from a rpm source

YUM packages tool (Fedora, RedHat and alike)

Command	Description
# yum -y install [package]	download and install a rpm package
# yum localinstall [package.rpm]	That will install an RPM, and try to resolve all the dependencies for you using your repositories.
# yum -y update	update all rpm packages installed on the system
# yum update [package]	upgrade a rpm package
# yum remove [package]	remove a rpm package
# yum list	list all packages installed on the system

# yum search [package]	find a package on rpm repository
# yum clean [package]	clean up rpm cache erasing downloaded packages
# yum clean headers	remove all files headers that the system uses to resolve dependency
# yum clean all	remove from the cache packages and headers files

DEB packages (Debian, Ubuntu and like)

Command	Description
# dpkg -i [package.deb]	install / upgrade a deb package
# dpkg -r [package]	remove a deb package from the system
# dpkg -l	show all deb packages installed on the system
# dpkg -l | grep httpd	show all deb packages with the name "httpd"
# dpkg -s [package]	obtain information on a specific package installed on system
# dpkg -L [package]	show list of files provided by a package installed on system
# dpkg --contents [package.deb]	show list of files provided by a package not yet installed
# dpkg -S /bin/ping	verify which package belongs to a given file

APT packages tool (Debian, Ubuntu and alike)

Command	Description
# apt-cache search [package]	returns list of packages which corresponds string "searched-packages"
# apt-cdrom install [package]	install / upgrade a deb package from cdrom
# apt-get install [package]	install / upgrade a deb package
# apt-get update	update the package list
# apt-get upgrade	upgrade all of the installed packages
# apt-get remove [package]	remove a deb package from system
# apt-get check	verify correct resolution of dependencies
# apt-get clean	clean up cache from packages downloaded

Pacman packages tool (Arch, Frugalware and alike)

Command	Description
# pacman -S name	Install package 'name' with dependencies
# pacman -R name	Delete package 'name' and all files of it

View file content

Command	Description
# cat file1	view the contents of a file starting from the first row
# head -2 file1	view first two lines of a file
# less file1	similar to 'more' command but which allows backward movement in the file as well as forward movement
# more file1	view content of a file along
# tac file1	view the contents of a file starting from the last line
# tail -2 file1	view last two lines of a file
# tail -f /var/log/messages	view in real time what is added to a file

Text Manipulation

Command	Description
# cat example.txt | awk 'NR%2==1'	remove all even lines from example.txt
# echo a b c | awk '{print $1}'	view the first column of a line
# echo a b c | awk '{print $1,$3}'	view the first and third column of a line
# cat -n file1	number row of a file
# comm -1 file1 file2	compare contents of two files by deleting only unique lines from 'file1'
# comm -2 file1 file2	compare contents of two files by deleting only unique lines from 'file2'
# comm -3 file1 file2	compare contents of two files by deleting only the lines that appear on both files
# diff file1 file2	find differences between two files
# grep Aug /var/log/messages	look up words "Aug" on file '/var/log/messages'
# grep ^Aug /var/log/messages	look up words that begin with "Aug" on file '/var/log/messages'
# grep [0-9] /var/log/messages	select from file '/var/log/messages' all lines that contain numbers

# grep Aug -R /var/log/*	search string "Aug" at directory '/var/log' and below
# paste file1 file2	merging contents of two files for columns
# paste -d '+' file1 file2	merging contents of two files for columns with '+' delimiter on the center
# sdiff file1 file2	find differences between two files and merge interactively alike "diff"
# sed 's/string1/string2/g' example.txt	replace "string1" with "string2" in example.txt
# sed '/^$/d' example.txt	remove all blank lines from example.txt
# sed '/ *#/d; /^$/d' example.txt	remove comments and blank lines from example.txt
# sed -e '1d' exampe.txt	eliminates the first line from file example.txt
# sed -n '/string1/p'	view only lines that contain the word "string1"
# sed -e 's/ *$//' example.txt	remove empty characters at the end of each row
# sed -e 's/string1//g' example.txt	remove only the word "string1" from text and leave intact all
# sed -n '1,5p' example.txt	print from 1th to 5th row of example.txt
# sed -n '5p;5q' example.txt	print row number 5 of example.txt
# sed -e 's/00*/0/g' example.txt	replace more zeros with a single zero
# sort file1 file2	sort contents of two files
# sort file1 file2 | uniq	sort contents of two files omitting lines repeated
# sort file1 file2 | uniq -u	sort contents of two files by viewing only unique line
# sort file1 file2 | uniq -d	sort contents of two files by viewing only duplicate line
# echo 'word' | tr '[:lower:]' '[:upper:]'	convert from lower case in upper case

Character set and Format file conversion

Command	Description
# dos2unix filedos.txt fileunix.txt	convert a text file format from MSDOS to UNIX
# recode ..HTML < page.txt > page.html	convert a text file to html
# recode -l | more	show all available formats conversion
# unix2dos fileunix.txt filedos.txt	convert a text file format from UNIX to MSDOS

Filesystem Analysis

Command	Description
# badblocks -v /dev/hda1	check bad blocks on disk hda1
# dosfsck /dev/hda1	repair / check integrity of dos filesystems on disk hda1
# e2fsck /dev/hda1	repair / check integrity of ext2 filesystem on disk hda1

# e2fsck -j /dev/hda1	repair / check integrity of ext3 filesystem on disk hda1
# fsck /dev/hda1	repair / check integrity of linux filesystem on disk hda1
# fsck.ext2 /dev/hda1	repair / check integrity of ext2 filesystem on disk hda1
# fsck.ext3 /dev/hda1	repair / check integrity of ext3 filesystem on disk hda1
# fsck.vfat /dev/hda1	repair / check integrity of fat filesystem on disk hda1
# fsck.msdos /dev/hda1	repair / check integrity of dos filesystem on disk hda1

Format a Filesystem

Command	Description
# fdformat -n /dev/fd0	format a floppy disk
# mke2fs /dev/hda1	create a filesystem type linux ext2 on hda1 partition
# mke2fs -j /dev/hda1	create a filesystem type linux ext3 (journal) on hda1 partition
# mkfs /dev/hda1	create a filesystem type linux on hda1 partition
# mkfs -t vfat 32 -F /dev/hda1	create a FAT32 filesystem
# mkswap /dev/hda3	create a swap filesystem

Filesystem SWAP

Command	Description
# mkswap /dev/hda3	create a swap filesystem
# swapon /dev/hda3	activating a new swap partition
# swapon /dev/hda2 /dev/hdb3	activate two swap partitions

Backup

Command	Description
# find /var/log -name '*.log' | tar cv --files-from=- | bzip2 > log.tar.bz2	find all files with '.log' extention and make an bzip archive
# find /home/user1 -name '*.txt' | xargs cp -av --target-directory=/home/backup/ --parents	find and copy all files with '.txt' extention from a directory to another
# dd bs=1M if=/dev/hda | gzip | ssh user@ip_addr 'dd of=hda.gz'	make a backup of a local hard disk on remote host via ssh
# dd if=/dev/sda of=/tmp/file1	backup content of the harddrive to a file
# dd if=/dev/hda of=/dev/fd0 bs=512 count=1	make a copy of MBR (Master Boot Record) to floppy

# dd if=/dev/fd0 of=/dev/hda bs=512 count=1	restore MBR from backup copy saved to floppy
# dump -0aj -f /tmp/home0.bak /home	make a full backup of directory '/home'
# dump -1aj -f /tmp/home0.bak /home	make a incremental backup of directory '/home'
# restore -if /tmp/home0.bak	restoring a backup interactively
# rsync -rogpav --delete /home /tmp	synchronization between directories
# rsync -rogpav -e ssh --delete /home ip_address:/tmp	rsync via SSH tunnel
# rsync -az -e ssh --delete ip_addr:/home/public /home/local	synchronize a local directory with a remote directory via ssh and compression
# rsync -az -e ssh --delete /home/local ip_addr:/home/public	synchronize a remote directory with a local directory via ssh and compression
# tar -Puf backup.tar /home/user	make a incremental backup of directory '/home/user'
# (cd /tmp/local/ && tar c .)	ssh -C user@ip_addr 'cd /home/share/ && tar x -p'	copy content of a directory on remote directory via ssh
# (tar c /home)	ssh -C user@ip_addr 'cd /home/backup-home && tar x -p'	copy a local directory on remote directory via ssh
# tar cf - .	(cd /tmp/backup ; tar xf -)	local copy preserving permits and links from a directory to another

CDROM	
Command	**Description**
# cd-paranoia -B	rip audio tracks from a CD to wav files
# cd-paranoia --	rip first three audio tracks from a CD to wav files
# cdrecord -v gracetime=2 dev=/dev/cdrom -eject blank=fast -force	clean a rewritable cdrom
# cdrecord -v dev=/dev/cdrom cd.iso	burn an ISO image
# gzip -dc cd_iso.gz	cdrecord dev=/dev/cdrom -	burn a compressed ISO image
# cdrecord --scanbus	scan bus to identify the channel scsi
# dd if=/dev/hdc	md5sum	perform an md5sum on a device, like a CD
# mkisofs /dev/cdrom > cd.iso	create an iso image of cdrom on disk
# mkisofs /dev/cdrom	gzip > cd_iso.gz	create a compressed iso image of cdrom on disk
# mkisofs -J -allow-leading-dots -R -V	create an iso image of a directory
# mount -o loop cd.iso /mnt/iso	mount an ISO image

Networking (LAN / WiFi)

Command	Description
# dhclient eth0	active interface 'eth0' in dhcp mode
# ethtool eth0	show network statistics of eth0
# host www.example.com	lookup hostname to resolve name to ip address and viceversa
# hostname	show hostname of system
# ifconfig eth0	show configuration of an ethernet network card
# ifconfig eth0 192.168.1.1 netmask 255.255.255.0	configure IP Address
# ifconfig eth0 promisc	configure 'eth0' in promiscuous mode to gather packets (sniffing)
# ifdown eth0	disable an interface 'eth0'
# ifup eth0	activate an interface 'eth0'
# ip link show	show link status of all network interfaces
# iwconfig eth1	show wireless networks
# iwlist scan	wifi scanning to display the wireless connections available
# mii-tool eth0	show link status of 'eth0'
# netstat -tup	show all active network connections and their PID
# netstat -tupl	show all network services listening on the system and their PID
# netstat -rn	show routing table alike "route -n"
# nslookup www.example.com	lookup hostname to resolve name to ip address and viceversa
# route -n	show routing table
# route add -net 0/0 gw IP_Gateway	configure default gateway
# route add -net 192.168.0.0 netmask 255.255.0.0 gw 192.168.1.1	configure static route to reach network '192.168.0.0/16'
# route del 0/0 gw IP_gateway	remove static route
# echo "1" > /proc/sys/net/ipv4/ip_forward	activate ip routing temporarily
# tcpdump tcp port 80	show all HTTP traffic
# whois www.example.com	lookup on Whois database

Microsoft Windows networks (samba)

Command	Description
# mount -t smbfs -o username=user,password=pass //WinClient/share /mnt/share	mount a windows network share
# nbtscan ip_addr	netbios name resolution
# nmblookup -A ip_addr	netbios name resolution
# smbclient -L ip_addr/hostname	show remote shares of a windows host
# smbget -Rr smb://ip_addr/share	like wget can download files from a host windows via smb

IPTABLES (firewall)

Command	Description
# iptables -t filter -L	show all chains of filtering table
# iptables -t nat -L	show all chains of nat table
# iptables -t filter -F	clear all rules from filtering table
# iptables -t nat -F	clear all rules from table nat
# iptables -t filter -X	delete any chains created by user
# iptables -t filter -A INPUT -p tcp --dport telnet -j ACCEPT	allow telnet connections to input
# iptables -t filter -A OUTPUT -p tcp --dport http -j DROP	block HTTP connections to output
# iptables -t filter -A FORWARD -p tcp --dport pop3 -j ACCEPT	allow POP3 connections to forward chain
# iptables -t filter -A INPUT -j LOG --log-prefix	Logging on input chain
# iptables -t nat -A POSTROUTING -o eth0 -j MASQUERADE	configure a PAT (Port Address Traslation) on eth0 masking outbound packets
# iptables -t nat -A PREROUTING -d 192.168.0.1 -p tcp -m tcp --dport 22 -j DNAT --to-destination 10.0.0.2:22	redirect packets addressed to a host to another host

Monitoring and debugging

Command	Description
# free -m	displays status of RAM in megabytes
# kill -9 process_id	force closure of the process and finish it
# kill -1 process_id	force a process to reload configuration
# last reboot	show history reboot
# lsmod	display kernel loaded
# lsof -p process_id	display a list of files opened by processes
# lsof /home/user1	displays a list of open files in a given path system
# ps -eafw	displays linux tasks
# ps -e -o pid,args --forest	displays linux tasks in a hierarchical mode
# pstree	Shows a tree system processes
# smartctl -A /dev/hda	monitoring reliability of a hard-disk through SMART
# smartctl -i /dev/hda	check if SMART is active on a hard-disk
# strace -c ls >/dev/null	display system calls made and received by a process
# strace -f -e open ls >/dev/null	display library calls
# tail /var/log/dmesg	show events inherent to the process of booting kernel
# tail /var/log/messages	show system events
# top	display linux tasks using most cpu
# watch -n1 'cat /proc/interrupts'	display interrupts in real-time

Others useful commands

Command	Description
# alias hh='history'	set an alias for a command - hh = history
# apropos ...keyword	display a list of commands that pertain to keywords of a program , useful when you know what your program does, but you don't know the name of the command
# chsh	change shell command
# chsh --list-shells	nice command to know if you have to remote into another box
# gpg -c file1	encrypt a file with GNU Privacy Guard
# gpg file1.gpg	decrypt a file with GNU Privacy Guard
# ldd /usr/bin/ssh	show shared libraries required by ssh program
# man ping	display the on-line manual pages for example on ping command - use '-k' option to find any related commands

# mkbootdisk --device /dev/fd0 `uname -r`	create a boot floppy
# wget -r www.example.com	download an entire web site
# wget -c www.example.com/file.iso	download a file with the ability to stop the download and resume later
# echo 'wget -c www.example.com/files.iso' | at 09:00	start a download at any given time
# whatis ...keyword	displays description of what a program does
# who -a	show who is logged on, and print: time of last system boot, dead processes, system login processes, active processes spawned by init, current runlevel, last system clock change