Final Project

Announce: 20081230
Due: 20090120

Outline

- Team Work - Find at most two partner to finish this job (each team has 1~3 members)
- Basic (70%)
  - Lab1 – NFS exports and mount
  - Lab2 – NIS servers and clients
  - Lab3 – NIS, NFS, and amd
- Extended (30%-50%)
  - Ex1 - NIS slave server
  - Ex2 - FTP site cross multiple machines
  - Ex3 - Each user has his/her blog on each server's ~user
  - …
- Appendix
  - Appendix A – mount_nullfs

Lab1 – NFS exports and mount(1)

- Goal:
  - Export NFS
  - Import NFS
- Requirement:
  - Mount NFS with correct exports permission
- Triangle relationship
- Arrow is the direction of exports
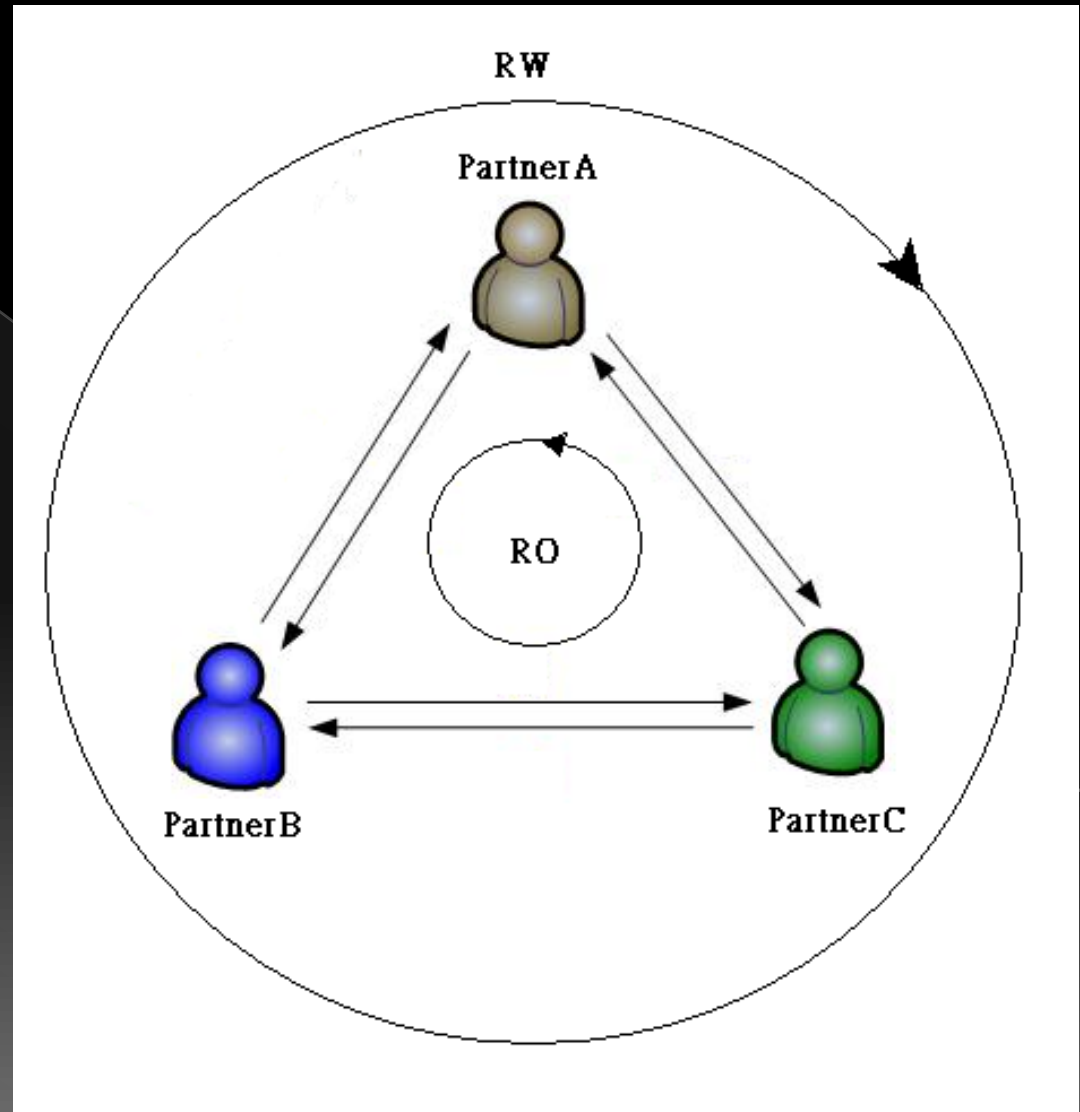
Lab1 – NFS exports and mount(2)

- ◉ For PartnerA
  - › Make directories as following names
    - • **$ mkdir /home/partnerA**
    - • **$ mkdir /home/partnerB**
    - • **$ mkdir /home/partnerC**
  - › Export /home/partnerA (Relation as previous picture)
    - • Modify **/etc/exports**
    - • Read-Only for partnerB, Read-Write for partnerC
  - › Edit /etc/fstab to mount partnerB and partnerC via NFS
  - › Try to Create Files in these two NFS
    - • PartnerA can write /home/partberB, cannot write /home/partnerC
- ◉ Similarly for PartnerB and PartnerC

Lab2 – NIS servers and clients(1)

- ⊙ Goal:
  - › NIS master servers, and clients
- ⊙ Requirement:
  - › Share *master.passwd*, *passwd*, and *group*
  - › Three NIS accounts, you can choose names you like (everyone has his/her own account)
  - › The group of these accounts is written in NIS group
  - › All NIS accounts can login all NIS clients, but only *admin user* (the owner of NIS master server gets) can login the NIS master server
  - › No need to take care the home directories, and other filesystems

Lab2 – NIS servers and clients(2)

- Settings for NIS master server(1)
  - › Copy /var/yp/Makefile.dist to **/var/yp/Makefile** (original is a symbolic link)
  - › Comment out this line in the Makefile
    - **NOPUSH = "True"** ➜ **#NOPUSH = "True"**
  - › To ensure NIS master server reads the shared files from NIS, please modify the GROUP variables to be read from /var/yp/
    - GROUP = $(**YPDIR**)/group
  - › Copy **master.passwd**, **group** from /etc/ to /var/yp/

Lab2 – NIS servers and clients(3)

- Settings for NIS master server(2)
  - Modify *master.passwd*
    - Delete system accounts, and add three NIS accounts
      - You can use the names you like, but not be the same as system's accounts
      - Notice no collision with local accounts
    - Their home directories in */nis/home/*nis_account (Will be done in Lab3)
  - Modify *group*
    - Add a NIS group
  - Build NIS master server
    - Set domainname
    - Modify */etc/rc.conf*
    - *$ ypinit –m <domainname>*
    - Start NIS Master Server

Lab2 – NIS servers and clients(4)

- Settings for NIS clients
  - Set domainname
  - Modify */etc/rc.conf*
  - Modify */etc/hosts*
    - Add the entry of the NIS server
  - Modify */etc/group*
  - Modify */etc/master.passwd*
  - Start NIS Client
  - Note: The NIS master server also needs to be an NIS client, but only *admin user* can login

Lab3 – NIS, NFS, and amd(1)

- Goal:
  - Continue after Lab2, using NFS as NIS home
- Requirement:
  - Pick a machine different from the NIS master server to export NFS
  - Export Read-Write for all
  - maproot=*nobody* for all clients, but *root* for NIS master server
  - Because /etc/exports cannot export one device, please use *mount_nullfs* to mount this filesystem to */home/for_nis*
  - NFS clients should let NIS users see their home directories at */nis/home/*nis_account
    - Symbolic *link* /nis/home to the amd real mount point
    - Check permission is correct (user can do anything in his own home dir)

Lab3 – NIS, NFS, and amd(2)

- Add some files on the NIS master server
  - Modify the AMDHOST variables to be read from /var/yp/
    - AMDHOST = $(*YPDIR*)/amd.map
  - Copy *amd.map*, *netgroup* from /etc/ to /var/yp/
  - Modify *amd.map*
    - The *fstype* of NFS SERVER machine (link) is different from that of other NFS CLIENT machine
  - Modify *netgroup*
    - Use *netgroup* to export the NFS, and so add one new client is easy
    - Also, you can add admins in one netgroup for NIS master to set in the master.passwd (*Optional*)
  - Rebuild NIS database

Lab3 – NIS, NFS, and amd(3)

- Export NIS Home
  - › Use *mount_nullfs* to mount this filesystem to */home/for_nis*
  - › Modify */etc/exports*
    - Export /home/for_nis to all, specify the *maproot* option.
  - › Modify */etc/rc.conf*
  - › Run NFS server
- Run amd on all machines
  - › Modify */etc/rc.conf*
  - › Start amd
  - › Note: In amd_flags, set the mapname as amd.map, it will automatically search the NIS, you can man amd.conf and see the map_type for more information.

Bonus
Bonus1 – NIS slave server

- Goal:
  - Pick the machine, which is neither the NFS server nor the NIS master server, and build the NIS slave server.
- Requirement:
  - The NIS slave server can bind itself
- Settings for the NIS slave server
  - Set domainname
  - Modify **/etc/rc.conf**
  - ypinit -s <master> <domainname>
  - Start NIS Slave Server
  - You can read this for more details
    - http://www.tw.freebsd.org/doc/en/books/handbook/network-nis.html

Appendix
Appendix A – mount_nullfs

- ◉ $ man exports
  A host may be specified only once for each local file system on the server and there may be only one default entry for each server file system that applies to all other hosts.

- ◉ The command
  - › mount_nullfs <origin> <new_path>
  - › For example
    - • `$ mkdir /home/allhome` make a directory for Real NFS Home
    - • `$ mkdir /home/for_nis` make a directory for NFS Home exports
    - • `$ mount_nullfs /home/allhome  /home/for_nis`   mount it

- ◉ Use it in /etc/fstab
  - › Change the fstype to nullfs
  - › For example
    - • `/home/allhome  /home/for_nis  nullfs  rw     2      2`