IT 341: Introduction to System Administration

Notes for Project #8: Backing Up Files with *rsync*

- **These notes explain some of the concepts you will encounter in Project #08: Backing Up Files with *rsync***

Topics

Backing Up

- One of the most important duties of a system administrator is backing up
- Data is valuable and when it disappears bad things happen
- There are two types of data a system administrator must back up
  - Data created by users
  - Data necessary to maintain system services

Backing Up

- Backups can be made to many devices but there are three general categories
  - Another partition of the disk which holds the data
  - A disk on a separate machine
  - Removable media
- Each of these destinations have their advantages
- Backing up to another partition is the easiest to set up
- It requires nothing more than disk space

Backing Up

- But if the data loss is due to hardware failure this option is useless
- Backing up to another machine requires a little more work than backing up locally but it is less vulnerable to hardware failure
- It is vulnerable to a major disaster that would take out the entire network like a fire or an earthquake
- The third option, backing up to removable media is the safest as long as the media is kept off site

Backing Up

- But maintaining removable media off site cannot be completely automated and requires some labor
- The best approach is both backup to a machine on the network and to removable media
- The network copy of the data could contain backups for the previous week while the removable media backup could take you back years

rsync

- There are many backup programs available but the Unix utility *rsync* is a good place to start
- *rsync* synchronizes files and directories.
- Therefore, any change to files and directories on one machine are also made on the other
- *rsync* uses a special algorithm to minimize the network traffic needed for the backup

rsync

- Two transmissions of data take place when *rsync* is run:
  - One stream goes from the first machine to the second
  - The other goes the other way
- These are continuous streams not a series of smaller packets
- *rsync* can be run either as a utility from the *command line* or as a daemon
- rsync was originally written as a replacement for *rcp* and *scp*

rsync

- By default *rsync* determines if two files are different by comparing their modification date and size
- Although *rsync* started out as a Linux/Unix utility it has been ported to both Mac OS and Windows
- *rsync* is an open source utility that is distributed under the GNU General Public License
- It has a web presence at http://rsync.samba.org

Running *rsync*

- *rsync* was originally written as a replacement for *rcp* and *scp*
- For this reason, it use a syntax similar to those programs
- *rsync* needs a source and a destination
- Either the source or the destination can be on another machine but not both

Running *rsync*

- You can even use *rsync* to synchronize two files or directories on the same machine
- When using *rsync* to backup files to another machine the format of the command line is

```
rsync [OPTION ...] SOURCE ... USERNAME@]HOSTNAME:DESTINATION
```

where [ ] means optional and ... means one or more

- When using *rsync* to restore files from another machine the format of the command line is

```
rsync [OPTION ...] [USERNAME@]HOSTNAME:SOURCE ...
[DESTINATION]
```

rsync Options

- Like most Unix utilities *rsync has a number of options*
- Here are the ones we will be using

v Verbose - print what's go*in*g on

z Compress - compress the network traffic

a Archive mode- the same as the options **rlptgoD**

r Recursive - copy directories and their contents

l Links - copy symbolic links as symbolic links, not real copies

p Permissions - keep the permissions of the original files or directories

t Times - keep the modification times of the original files or directories

g Groups - keep the group of the orginal files or directories

o Owner - keeps the owner of the original files

D Devices - copy special files that only the root can access