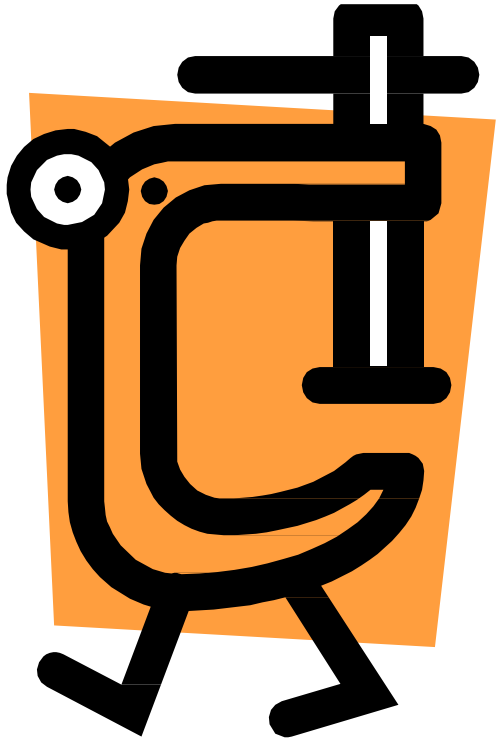
Backup Operations

Module Overview

- Archiving with tar
- Mirror directories with rsync
- Image disks with dd
- Tape Devices
- Bacula and other backup suites

Backup Operations

Archives and Compression Tools



Simple backup and restore solutions can be provided by the command tar and if required compressed using algorithms such as **gzip** and **bzip2**

/bin/tar

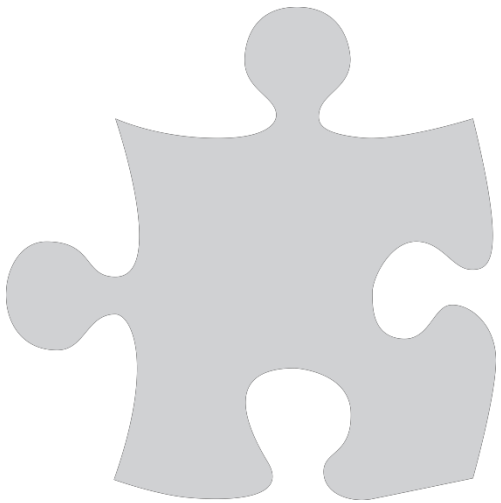
- The command tar itself or Tape Archive is used to create a single file from one or more files or directories
- **-c** to create an archive
- **-t** to test or verify an archive
- **-x** is used to expand or restore the archive

/bin/gzip

- The archive can be compressed with gzip with the **-z** option
- Or afterwards with gzip
- **gzip etc.tar**
- The above will create **etc.tar.gz**
- Expand using **gunzip etc.tar.gz**

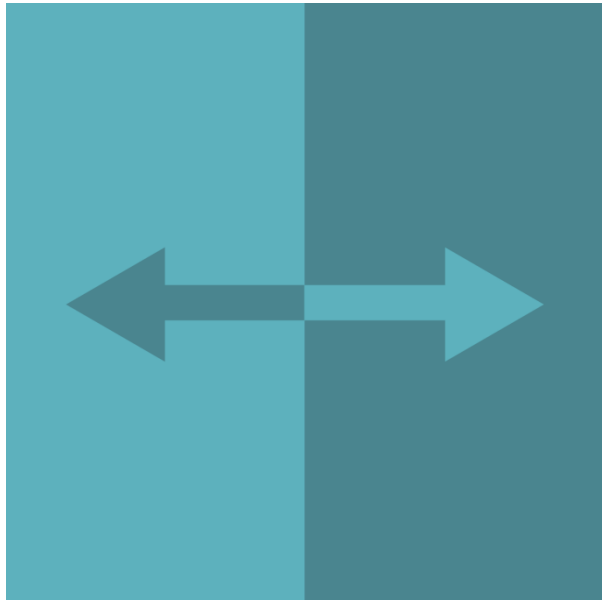
/bin/bzip2

- Similarly, bzip2 compression can be used with **-j** option
- Or afterwards with bzip2
- **bzip2 etc.tar**
- The above will create **etc.tar.bz2**
- Expand using **bunzip2 etc.tar.bz2**



Demo: Using simple backup solutions

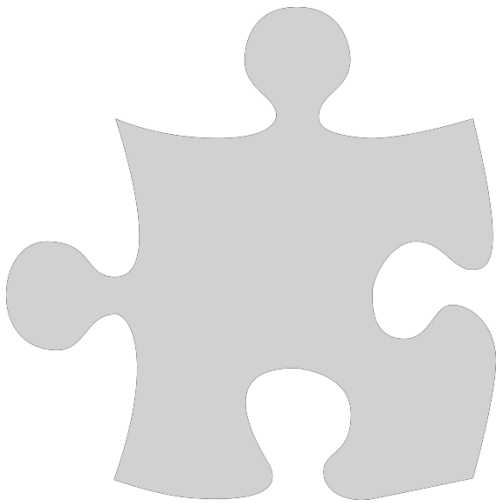
Mirror Directories with rsync



- **Locally**: rsync -rv /home/ /backup
- **Remotely**:
  rsync -rve ssh /home/ fred@svr1:/backup
- Configure a **rsync server**, often used as distributions mirrors
- TCP Port **873**

Configure rsync Server on Ubuntu

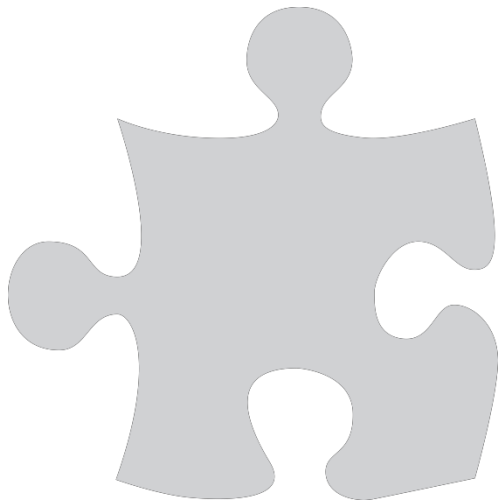
```
$ sudo vi /etc/default/rsync
RSYNC_ENABLE=true
$ sudo vu /etc/rsyncd.conf
[doc]
path = /usr/share/doc
read only = true
$ service rsync start
$ rsync -av server1::doc/ /data`
```



Demo: Configure the rsync server

Duplicating Disks with dd

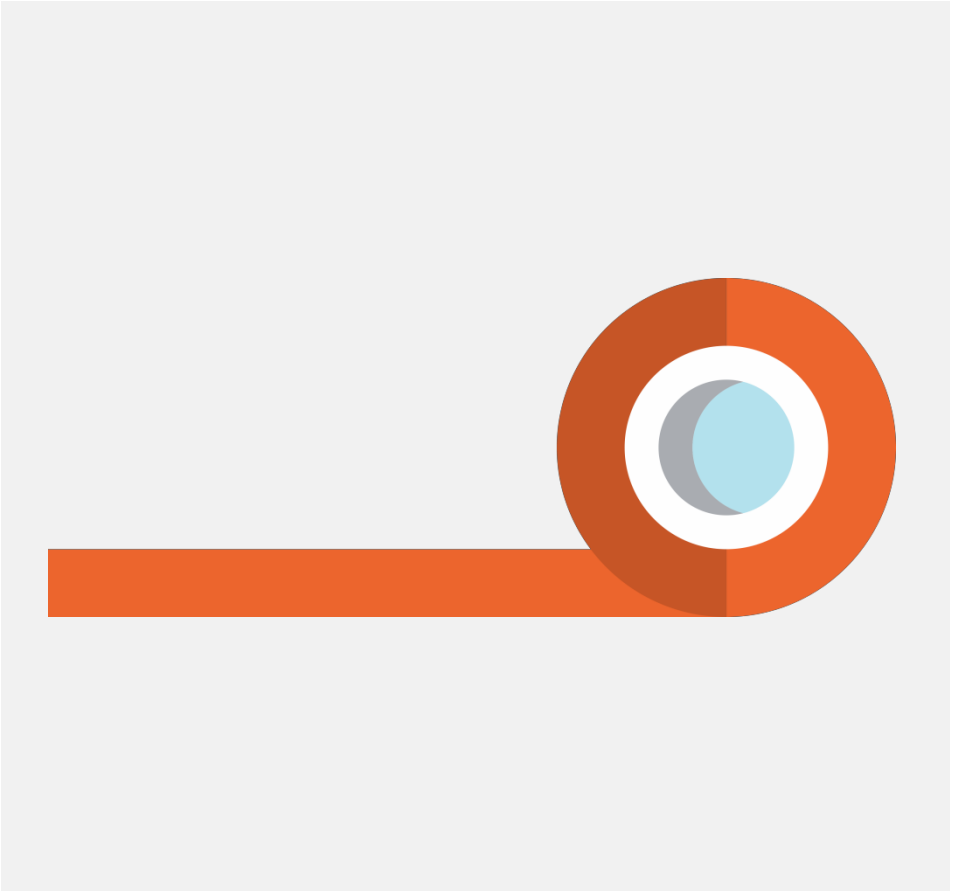
- The command **dd** can be used to image a disk or partition
- dd if=/dev/cdrom of=/tmp/disk.iso
- dd if=/dev/sda of=/tmp/sda.mbr count=1 bs=512



Demo: Using dd

Tape Device

- Rewinding tape device:
- **/dev/st***
- Non-Rewinding tape device
- **/dev/nst***
- Utility to control magnetic tapes
- **/bin/mt**



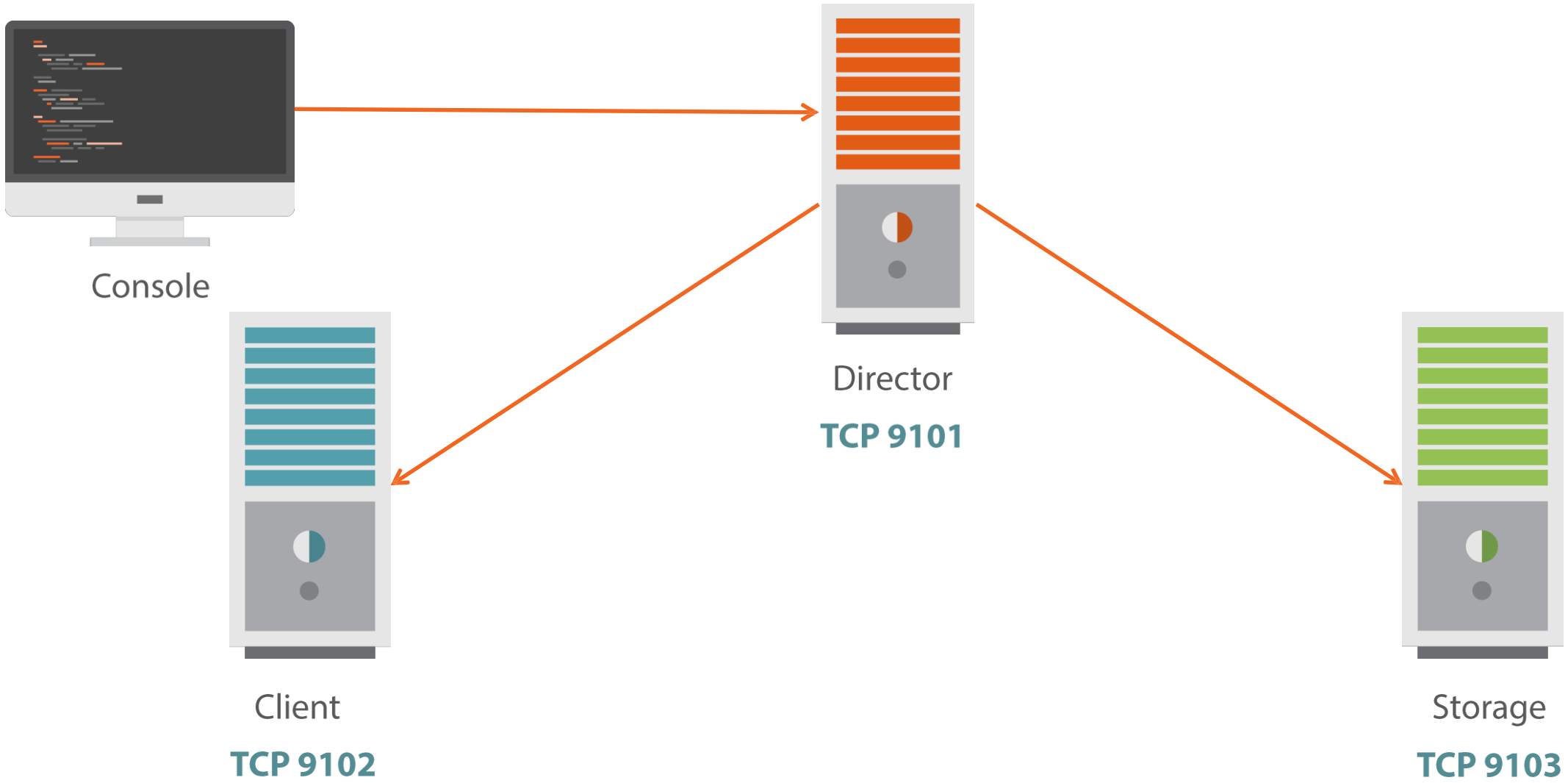
Backup Suites

- Bacula
- Amanda
- BackupPC

Backups @ DIY'R'Us

- Whilst these solutions are acceptable and useful in their own right
- Danny needs a central backup server solution to coordinate data archiving and storage
- The consideration is the Open Source Software: Bacula

Bacula Components



Installing Bacula on Ubuntu

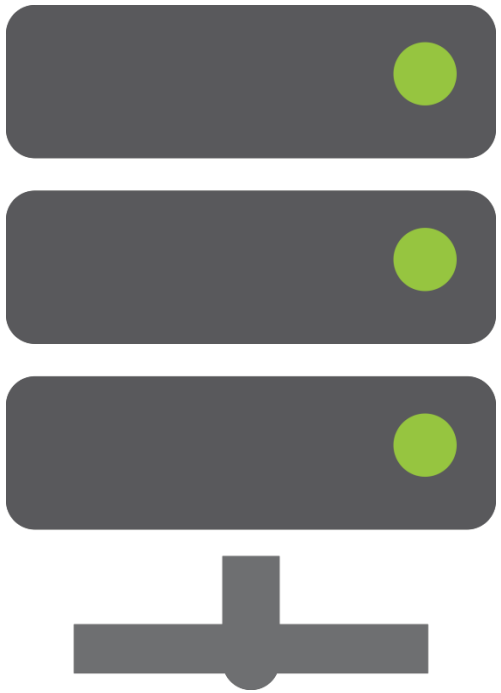
- Bacula requires a catalog, on Ubuntu this defaults to MySQL
- $ sudo apt-get install mysql-server
- To install all elements of bacula: client, storage, director
- $ sudo apt-get install bacula

```
$ mysql -u root -p -e ‘USE bacula; SHOW TABLES;’
```

MySQL Catalog

Bacula supports **MySQL**, **SQLite** and **PostgreSQL** as the catalog server

Using the mysql client we can check the creation of the database and tables post-installation



Demo: Installing Bacula on Ubuntu 14.04

```
$ sudo mkdir -p -m 700 /bacula/{restore,backup}
$ sudo chown -R bacula.bacula /bacula
```

Create Directories

On the **Storage Server** we need to create the **/bacula/backup** directory

On the **Client** we need to create the **/bacula/restore** directory

Configure the Storage Server

```
$ sudo vi /etc/bacula/bacula-sd.conf
 Archive Device = /bacula/backup

$ sudo bacula-sd -tc /etc/bacula/bacula-sd.conf

$ sudo service bacula-sd restart
```

Configure the Director FileSet

```
$ sudo vi /etc/bacula/bacula-dir.conf
FileSet {
    Name = "Full Set"
    Include {
      Options {
        signature = MD5
      }
      File = /etc
      File = /home
    }
```

Here we select /home and /etc as backup targets

Configure the Director Job

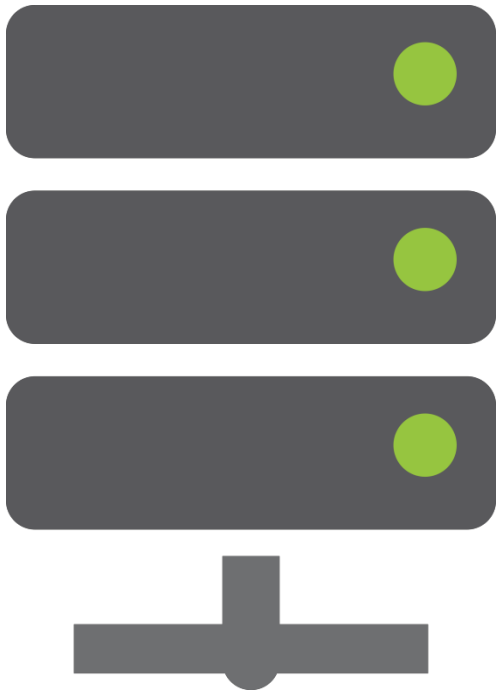
```
$ sudo vi /etc/bacula/bacula-dir.conf
Job {
  Name = "RestoreFiles"
  Type = Restore
  Client=bacula-server-
  fd  FileSet="Full Set"
  Storage = File
  Pool = Default
  Messages = Standard
  Where = /bacula/restore
}
```

Here we set the restore target on the client

```
$ sudo bacula-director -tc /etc/bacula/bacula-dir.conf
$ sudo service bacula-director restart
```

Test Configuration and Restart

Testing the configuration prior to the service restart is always a good idea and is similar to the testing we saw with the Storage Server



Demo: Configuring a Single Server Bacula Solution

Test Backup: Label Media

- Start the console
- $ sudo bconsole
- At the * prompt create a label with:
- ***label**
- Enter new Volume name
- Choose 2 for the File pool

Test Backup: Backup

- Start the console
- $ sudo bconsole
- ***run**
- Select Job resource 1 (BackupClient1)
- **yes** to start the backup
- Check messages
- ***messages**

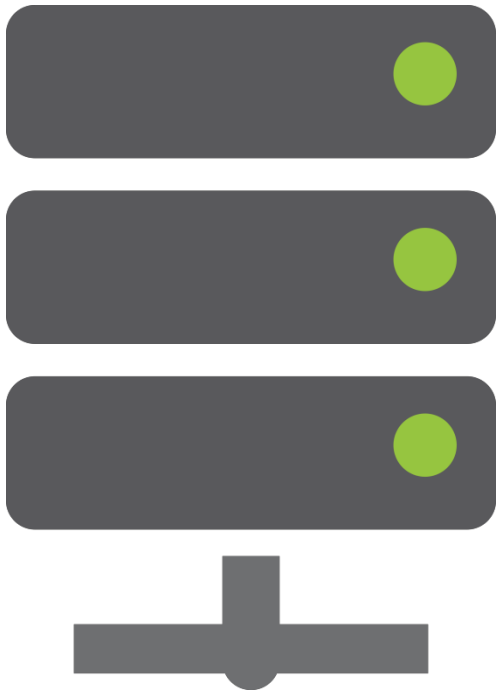
Test Backup: Restore

- Start the console
- $ sudo bconsole
- ***restore all**
- Select 5 for most recent backup
- **done** to start the restore
- Check messages
- ***messages**

Check File System

- Backup is created on the storage server
- Restore is created on the client

- **/bacula/backup/<label>**
- **/bacula/restore/**



Demo: Testing Bacula

Summary

- Reviewed tar, gzip and bzip2
- rsync and rsync server for mirroring directories
- Used dd to image disks
- Reviewed tape devices
- Installed and used Bacula

Next Up: Notifying users, Objective 206.3