Setting-Up an Open-Source Backup Software Amanda Community in About 15 Minutes

Abstract

Amanda is the most popular open source backup and recovery software in the world because of its openness, robustness, functionality and scalability. Yet it is very easy to set up and maintain in production. This article illustrates how, in about 15 minutes, you can:

- Install and configure the Amanda backup server.
- Prepare four different machines (SLES 10, Fedora 8, Windows XP. and Windows 2000) for backup.
- Set backup parameters.
- Verify the configuration.
- Verify the backup.

Version 1.3

The Problem

Today's businesses rarely run on just one operating system. Linux users and administrators often have strong preferences for one distribution over another, web designers might lean towards the Mac, and legacy software and hardware may require various UNIX operating systems. Yet, despite the complexity of modern business computing environments, a system administrator is expected to find a reliable backup solution.

Even in the case where users are expected to keep important files on networked resources, for true data protection of your digital assets, desktop machines and laptops will also be backed up. With the price of hard disk storage continuously falling, today it is common to have terabytes of storage and corresponding amounts of data that can potentially be lost[1]. Furthermore, we live in a global and e-commerce economy, where businesses run around the clock and crucial business data is constantly changing. In this environment, it is more critical than ever to have a reliable backup system in place.

The Challenge

For our 15-minute challenge, we want to backup two Linux systems (each running a different Linux distribution) , one Windows XP system, and one Windows 2000 computer, using only freely-available open source software.

Our scenario is as follows:

The user "Sunil" works with sensitive information. We need to make a backup of his home directory, **/home/sunil**, which resides on a Linux system called **Iron**, running Fedora 8. Our webmaster needs to backup the **/var/www/html** directory on the webserver, **Copper**, running SUSE Linux Enterprise Server 10 (SLES 10). Our manager works solely on a Windows XP system called **Uranium**, and keeps all of his work in a folder on the C: drive called "**Data**". Our project data is stored on a shared folder called "Projects" on a Windows 2000 system **Nickel**.

Here is a summary of our configuration:

Client	Filesystem	OS	Compression
Copper	/var/www/html	SLES 10	Yes
Iron	/home/sunil	Fedora 8	Yes
Uranium	C:\Data	Windows XP	Yes
Nickel	//nickel.zmanda.com/Projects	Windows 2000	Yes

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[1]   "Data expands to fill the space available for storage" is a common maxim that dates back decades and is a variant of Parkinson's Law.

2

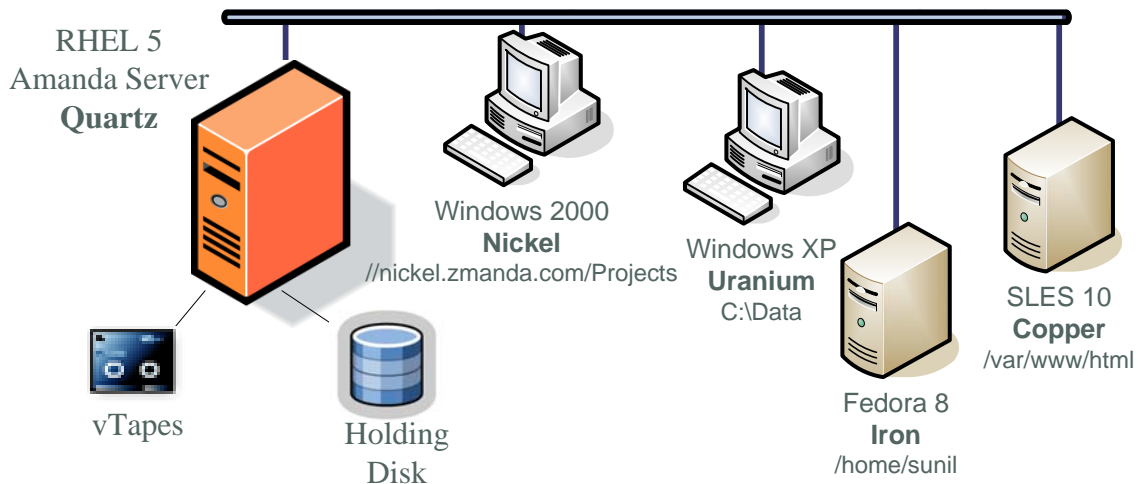# The Solution: Amanda

Amanda is open-source backup software that is flexible, secure and scalable in dynamic computing environments. Amanda can save you from expensive proprietary backup software and from those custom backup scripts that don't scale and have a propensity to break at the worst times. Dating back to 1991, Amanda has been used successfully in environments from one standalone machine to hundreds of clients. Amanda is so thoroughly documented, from community wikis to published system administration texts, that it might be hard to discern just how easy an Amanda backup can be.

This article will show you how, in about 15 minutes, you can:

1. Install and configure the Amanda backup server
2. Install and configure the three different clients for backup
3. Set backup parameters
4. Verify the configuration
5. Perform a backup
6. Recover some files from a backup

We will install and configure Amanda backup server software on a machine running Red Hat Enterprise Linux 5 named **Quartz**. The Amanda Server software manages the backup data, the backup schedule, and stores the backups on media. We will install and configure Amanda backup client software on Copper and on Iron. The Windows XP client, Uranium, will be backed up over the network using Zmanda Windows Client Community Edition (ZWC). Windows 2000 client, Nickel will be backed up using Samba.

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Installation Prerequisites

The basic Amanda setup consists of an Amanda server, the Amanda clients that are to be backed up, and the storage media on which the backup data will be stored, such as tape or hard disk. We can also use an intermediate storage area called a **holding disk** for caching the data. A **holding disk** provides two key benefits to Amanda:

- It allows data to be streamed to media at full speed, preventing tape buffer under-runs and shoe-shining of tapes

- It can act as a hedge against media failure, where data can be first backed-up to the **holding disk**, and then later be spooled to media when it is available.

While it is not absolutely necessary, it can improve performance significantly, especially when backing-up to tape, and is usually included as a part of even a basic setup.

You may want to take a look at the Introduction to Amanda. This will give you some understanding of the advantages of using Amanda, the community around Amanda, and the resources available to you.

Before we begin, please note the following prerequisites:

1. tar 1.15 or later and xinetd are required, so they must be installed on **Quartz**, **Iron** and **Copper**.

2. Samba should be installed on **Quartz**, to backup Windows 2000 host **Nickel**

3. **Quartz** will send out email reports of each backup run, so it must be able to send mail to the root user.

4. The systems should all be on the same network and available.

5. We will need general root access as well as remote root access through SSH to UNIX and Linux clients. Ensure SSH is enabled and working as it will be used by configuration commands later.

6. We should ensure that the directories to be backed up exist.

7. The Amanda 2.6.0p2 backup server RPM should be downloaded on **Quartz**

8. The Amanda client RPM should be downloaded on **Iron** and **Copper**

9. The ZWC client should be downloaded on **Uranium**.

NOTE: Amanda binary and source RPM packages, source tarballs, and the binary of Zmanda Windows Client Community Edition are all freely available from Zmanda.

Also note that this article assumes a fresh install of Amanda. If you have an existing Amanda installation, additional steps are needed to ensure the proper upgrade to the latest Amanda release (2.6.0 and later).

Installation of the Amanda Backup Server

1. Log in as root on **Quartz**, the Red Hat Enterprise Linux 5 server.

2. Install the Amanda 2.6.0 amanda-backup_server RPM. As a part of the installation a user named *amandabackup* is created who belongs to the group *disk*.

```
[root@quartz ]# rpm -ivh amanda-backup_server-2.6.0p2-
1.rhel4.i386.rpm
warning: amanda-backup_server-2.6.0p2-1.rhel4.i386.rpm: V3 DSA
signature: NOKEY, key ID 3c5d1c92
Preparing...
########################################## [100%]
```

```
Aug  8 2008 02:37:52: Preparing to install: Amanda Community
Edition - version 2.6.0p2
Aug  8 2008 02:37:52: Checking for 'amandabackup' user...
Aug  8 2008 02:37:52:
Aug  8 2008 02:37:52:  The Amanda backup software is configured to
operate as the
Aug  8 2008 02:37:52:  user 'amandabackup'.  This user exists on
your system and has not
Aug  8 2008 02:37:52:  been modified.  To ensure that Amanda
functions properly,
Aug  8 2008 02:37:52:  please see that the following parameters are
set for that
Aug  8 2008 02:37:52:  user.:
Aug  8 2008 02:37:52:
Aug  8 2008 02:37:52:  SHELL:           /bin/sh
Aug  8 2008 02:37:52:  HOME:            /var/lib/amanda
Aug  8 2008 02:37:52:  Default group:  disk
Aug  8 2008 02:37:52:  Verifying amandabackup parameters :
Aug  8 2008 02:37:52:  Verified group name of user 'amandabackup'
Aug  8 2008 02:37:52:  Verified Default shell for user
'amandabackup'
Aug  8 2008 02:37:52:  Verified Default home directory for user
amandabackup
Aug  8 2008 02:37:52:
Aug  8 2008 02:37:52:
Aug  8 2008 02:37:52: === Amanda backup server installation
started. ===
   1:amanda-backup_server
######################################### [100%]


Aug  8 2008 02:37:54: Updating system library cache...done.
Aug  8 2008 02:38:36: Reloading xinetd configuration...Stopping
xinetd: [  OK  ]
Starting xinetd: [  OK  ]
success.
Aug  8 2008 02:38:37: Installing '/var/amanda/amandates'.
Aug  8 2008 02:38:37: The file '/var/amanda/amandates' has been
created.
Aug  8 2008 02:38:37: Ensuring correct permissions for
'/var/amanda/amandates'.
Aug  8 2008 02:38:37: '/var/amanda/amandates' Installation
successful.
Aug  8 2008 02:38:37: Checking '/var/lib/amanda/.amandahosts' file.
Aug  8 2008 02:38:37: Checking '/etc/amanda/amanda-client.conf'
file.
Aug  8 2008 02:38:37: Create '/var/lib/amanda/.am_passphrase' file.
Aug  8 2008 02:38:37: Installing '/var/lib/amanda/.gnupg'.
Aug  8 2008 02:38:37: '/var/lib/amanda/.gnupg' will be created.
Aug  8 2008 02:38:37: The directory '/var/lib/amanda/.gnupg'
created successfully.
Aug  8 2008 02:38:37: Ensuring correct permissions for
'/etc/.gnupg'.
Aug  8 2008 02:38:37: '/var/lib/amanda/.gnupg' Installation
successful.
Aug  8 2008 02:38:37: Creating directory '/var/lib/amanda/.ssh'.
Aug  8 2008 02:38:37: Creating ssh RSA key in
'/var/lib/amanda/.ssh/id_rsa_amdump'
Aug  8 2008 02:38:37: Setting ownership and permissions for
'/var/lib/amanda/.ssh' and '/var/lib/amanda/.ssh/id_rsa_amdump*'
```

```
Aug  8 2008 02:38:37: Creating ssh RSA key in
'/var/lib/amanda/.ssh/id_rsa_amrecover'
Aug  8 2008 02:38:37: Setting ownership and permissions for
'/var/lib/amanda/.ssh'
Aug  8 2008 02:38:37: Checking for '/var/lib/amanda/.profile' and
ensuring correct environment.
Aug  8 2008 02:38:37: Setting ownership and permissions for
'/var/lib/amanda/.profile'


For latest Amanda documentation, checkout Amanda Wiki:
http://wiki.zmanda.com
Aug  8 2008 02:38:38: === Amanda backup server installation
complete. ===
Amanda installation log can be found in
'/var/log/amanda/install.log' and errors (if any) in
'/var/log/amanda/install.err'.
```

3. As root set password for user *amandabackup* on **Quartz**

```
[root@quartz]# passwd amandabackup
Changing password for user amandabackup.
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```

Installation of the Amanda Clients

Installation of Amanda Client RPM on Iron (Fedora 8)

1. Log in as root on **Iron**.
2. Install the Amanda 2.6.0 backup_client RPM. As a part of the installation a user named *amandabackup* is created who belongs to the group *disk*.

```
[root@iron /]# rpm -ivh amanda-backup_client-2.6.0p2-1.fc4.i386.rpm
Preparing...
######################################### [100%]
Jan 18 2008 15:48:17: Preparing to install: Amanda Community
Edition - version 2.6.0
Jan 18 2008 15:48:17: Checking for 'amandabackup' user...
Jan 18 2008 15:48:18:
Jan 18 2008 15:48:18:  The 'amandabackup; user account has been
successfully created.
Jan 18 2008 15:48:18:  Furthermore, the account has been
automatically locked for you
Jan 18 2008 15:48:18:  for security purposes.  Once a password for
the  'amandabackup'
Jan 18 2008 15:48:18:  account has been set, the user can be
unlocked by issuing
Jan 18 2008 15:48:18:  the following command as root.:
Jan 18 2008 15:48:18:
Jan 18 2008 15:48:18:  # passwd -u amandabackup
Jan 18 2008 15:48:18:
Jan 18 2008 15:48:18:  If this is not a new installation of Amanda
and you have
Jan 18 2008 15:48:18:  pre-existing Amanda configurations in
/etc/amanda
```

```
Jan 18 2008 15:48:18:  you should ensure that 'dumpuser' is set to
'amandabackup'
Jan 18 2008 15:48:18:  in those configurations.  Additionally, you
should ensure
Jan 18 2008 15:48:18:  that /var/lib/amanda/.amandahosts on your
client systems
Jan 18 2008 15:48:18:  is properly configured to allow connections
for the user
Jan 18 2008 15:48:18:  'amandabackup'.
Jan 18 2008 15:48:18:
Jan 18 2008 15:48:18:
Jan 18 2008 15:48:18: === Amanda backup client installation
started. ===
   1:amanda-backup_client
########################################## [100%]
Jan 18 2008 15:48:21: Updating system library cache...done.
Jan 18 2008 15:48:46: Reloading xinetd configuration...Stopping
xinetd: [  OK  ]
Starting xinetd: [  OK  ]
success.
Jan 18 2008 15:48:46: Installing '/etc/amandates'.
Jan 18 2008 15:48:46: Ensuring correct permissions for
'/etc/amandates'.
Jan 18 2008 15:48:46: '/etc/amandates' Installation successful.
Jan 18 2008 15:48:46: Checking '/var/lib/amanda/.amandahosts' file.
Jan 18 2008 15:48:46: Checking '/etc/amanda/amanda-client.conf'
file.
Jan 18 2008 15:48:46: Installing '/var/lib/amanda/.gnupg'.
Jan 18 2008 15:48:46: '/var/lib/amanda/.gnupg' will be created.
Jan 18 2008 15:48:46: The directory '/var/lib/amanda/.gnupg'
created successfully.
Jan 18 2008 15:48:46: Ensuring correct permissions for
'/etc/.gnupg'.
Jan 18 2008 15:48:46: '/var/lib/amanda/.gnupg' Installation
successful.
Jan 18 2008 15:48:46: Creating directory '/var/lib/amanda/.ssh'.
Jan 18 2008 15:48:46: Creating ssh RSA key in
'/var/lib/amanda/.ssh/id_rsa_amrecover'
Jan 18 2008 15:48:47: Setting permissions for
'/var/lib/amanda/.ssh' and '/var/lib/amanda/.ssh/id_rsa_amrecover*'
Jan 18 2008 15:48:47: Checking for '/var/lib/amanda/.profile' and
ensuring correct environment.
Jan 18 2008 15:48:47: Setting ownership and permissions for
'/var/lib/amanda/.profile'

For latest Amanda documentation, checkout Amanda Wiki:
http://wiki.zmanda.com
Jan 18 2008 15:48:47: Setting ownership and permissions for
'/var/lib/amanda/.profile'
Jan 18 2008 15:48:48: === Amanda backup client installation
complete. ===
Amanda installation log can be found in
'/var/log/amanda/install.log' and errors (if any) in
'/var/log/amanda/install.err'.
```

3. As root set password for user **amandabackup** on Iron

```
[root@iron]# passwd amandabackup
Changing password for user amandabackup.
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```

Installation of Amanda Client RPM on Copper (SLES 10)

1. Log in as the root user on Copper, your SUSE Linux Enterprise Server 10 client.

2. Install the Amanda 2.6.0 backup_client RPM. As a part of the installation a user named *amandabackup* is created who belongs to the group *disk*.

```
copper:/ # rpm -ivh amanda-backup_client-2.6.0p2-1.sles9.i386.rpm
Preparing...
########################################### [100%]
Nov 16 2007 19:40:30: Preparing to install: Amanda Community
Edition - version 2.6.0
Nov 16 2007 19:40:30: Checking for 'amandabackup' user...
Nov 16 2007 19:40:30:
Nov 16 2007 19:40:30:  The Amanda backup software is configured to
operate as the
Nov 16 2007 19:40:30:  user 'amandabackup'.  This user exists on
your system and has not
Nov 16 2007 19:40:30:  been modified.  To ensure that Amanda
functions properly,
Nov 16 2007 19:40:30:  please see that the following parameters are
set for that
Nov 16 2007 19:40:30:  user.:
Nov 16 2007 19:40:30:
Nov 16 2007 19:40:30:  SHELL:          /bin/sh
Nov 16 2007 19:40:30:  HOME:           /var/lib/amanda
Nov 16 2007 19:40:30:  Default group:  disk
Nov 16 2007 19:40:30:  Verifying amandabackup parameters :
Nov 16 2007 19:40:30:  Verified group name of user 'amandabackup'
Nov 16 2007 19:40:30:  Verified Default shell for user
'amandabackup'
Nov 16 2007 19:40:30:  Verified Default home directory for user
amandabackup
Nov 16 2007 19:40:30:
Nov 16 2007 19:40:30:  Checking ownership of '/var/lib/amanda'...
correct.
Nov 16 2007 19:40:30:
Nov 16 2007 19:40:30: === Amanda backup client installation
started. ===
   1:amanda-backup_client
########################################### [100%]
Nov 16 2007 19:40:32: Updating system library cache...done.
Nov 16 2007 19:40:35: Reloading xinetd configuration...Stopping
xinetd: [  OK  ]
Starting xinetd: [  OK  ]
success.
Nov 16 2007 19:40:36: Checking '/var/lib/amanda/.amandahosts' file.
Nov 16 2007 19:40:36: Checking '/etc/amanda/amanda-client.conf'
file.
Nov 16 2007 19:40:36: Checking for '/var/lib/amanda/.profile' and
ensuring correct environment.
Nov 16 2007 19:40:36: Setting ownership and permissions for
'/var/lib/amanda/.profile'


Need enterprise level support for Amanda? Upgrade to Amanda
Enterprise Edition: http://www.zmanda.com/amanda-enterprise-
edition.html
Nov 16 2007 19:40:36: Checking for '/var/lib/amanda/.profile' and
ensuring correct environment.
Nov 16 2007 19:40:36: Setting ownership and permissions for
'/var/lib/amanda/.profile'
```

```
Nov 16 2007 19:40:36: === Amanda backup client installation
complete. ===
Amanda installation log can be found in
'/var/log/amanda/install.log' and errors (if any) in
'/var/log/amanda/install.err'.
```

3. As root set password for user *amandabackup* on Copper

```
[root@copper client]# passwd amandabackup
Changing password for user amandabackup.
New UNIX password:
Retype new UNIX password:
passwd: all authentication tokens updated successfully.
```

Installation of Amanda Client on Uranium (Windows XP)

1. Navigate to the directory where you downloaded the Amanda Client package.

2. Double-click the setup.exe to install the Windows client.

NOTE: Even though the latest version of the Windows client is 2.6.0p2, it will work just fine with Amanda Server version 2.6.0. For additional details about ZWC client installation please refer to the Amanda Wiki.

No installation needed on Nickel (Windows 2000)

There is no need to install anything on Windows 2000 client. Simply share the folder called 'Projects" and make sure that the local Windows user "Sunil" has full read access to it. Amanda will use Samba with Sunil's user name and password to back it up.

Configuring the Backup Server

We will backup all the 4 clients on **Quartz** in the /data directory. Ensure that we are logged-in to **Quartz** as user *root*.

1. Create a directory for our vtapes:

```
[root@quartz ~]# mkdir -p /data/amanda/vtape/DailySet1
[root@quartz ~]# chown -R amandabackup:disk \
/data/amanda/vtape/DailySet1
[root@quartz ~]# chmod -R 750 /data/amanda/vtape/DailySet1
```

2. Change to the *amandabackup* user:

```
[root@quartz ~]# su – amandabackup
```

3. As *amandabackup* user, run *amserverconfig* to create a vtape configuration:

```
-bash-3.00$ amserverconfig DailySet1 --template harddisk --tapedev
/data/amanda/vtape/DailySet1 --mailto root@localhost --dumpcycle
1week --runspercycle 5 --tapecycle 12 --runtapes 1
Logging to /var/log/amanda/amserverconfig.20071110093724.debug
/var/lib/amanda/gnutar-lists directory exists
/etc/amanda/DailySet1/advanced.conf created and updated
curinfo and index directory created
tapelist file created
disklist file created
Creating custom configuration using templates
custom amanda.conf created
creating vtape directory
amlabel vtapes
amtape: changer is reset, slot 1 is loaded.
```

```
/var/lib/amanda/example/xinetd.amandaserver contains the latest
Amanda server daemon configuration.
Please merge it to /etc/xinetd.d/amandaserver.
DONE.
You have new mail in /var/spool/mail/root
```

4. Use *amaddclient* to enable backups of client **iron**:

```
-bash-3.00$ amaddclient --config DailySet1 --client iron.zmanda.com
--diskdev /home/sunil --dumptype  comp-user-tar
Logging to /var/log/amanda/amaddclient.20071110095743.debug
/etc/amanda/DailySet1/disklist has 'iron.zmanda.com /home/sunil
...' entry, file not updated
updating /var/lib/amanda/.amandahosts on quartz.zmanda.com
/var/lib/amanda/.amandahosts contains iron.zmanda.com root, file
not updated
Attempting to update /var/lib/amanda/.amandahosts on
iron.zmanda.com
amandabackup@iron.zmanda.com's password:
.amandahosts
100%   76     0.1KB/s   00:00
amandabackup@iron.zmanda.com's password:
.amandahosts.tmp
100% 115     0.1KB/s   00:00
iron.zmanda.com:/var/lib/amanda/.amandahosts updated successfully
Creating amanda-client.conf for iron.zmanda.com
Creating  /etc/amanda/DailySet1 on iron.zmanda.com
amandabackup@iron.zmanda.com's password:
amandabackup@iron.zmanda.com's password:
amanda-client.conf-iron.zmanda.com
100%  386    0.4KB/s   00:00
Copy /var/lib/amanda/amanda-client.conf-iron.zmanda.com to
iron.zmanda.com successfully
File /var/lib/amanda/example/xinetd.amandaclient contains the
latest Amanda client daemon configuration.
Please merge it to /etc/xinetd.d/amandaclient.
```

5. Use *amaddclient* to enable backups of client **copper**:

```
-bash-3.00$   amaddclient --config DailySet1 --client
copper.zmanda.com --diskdev /var/www/html --dumptype  comp-user-tar
Logging to /var/log/amanda/amaddclient.20071110100355.debug
/etc/amanda/DailySet1/disklist has 'copper.zmanda.com /var/www/html
...' entry, file not updated
updating /var/lib/amanda/.amandahosts on quartz.zmanda.com
/var/lib/amanda/.amandahosts contains copper.zmanda.com root, file
not updated
Attempting to update /var/lib/amanda/.amandahosts on
copper.zmanda.com
amandabackup@copper.zmanda.com's password:
.amandahosts
100%   76     0.1KB/s   00:00
amandabackup@copper.zmanda.com's password:
.amandahosts.tmp
100% 115     0.1KB/s   00:00
copper.zmanda.com:/var/lib/amanda/.amandahosts updated successfully
Creating amanda-client.conf for copper.zmanda.com
Creating  /etc/amanda/DailySet1 on copper.zmanda.com
amandabackup@copper.zmanda.com's password:
amandabackup@copper.zmanda.com's password:
amanda-client.conf-copper.zmanda.com
100%  386    0.4KB/s   00:00
```

```
Copy /var/lib/amanda/amanda-client.conf-copper.zmanda.com to
copper.zmanda.com successfully
File /var/lib/amanda/example/xinetd.amandaclient contains the
latest Amanda client daemon configuration.
Please merge it to /etc/xinetd.d/amandaclient.
```

6. Use *amaddclient* to enable backups of windows XP client (ZWC) **Uranium**:

   a) Before running *amaddclient*, append the following dumptype definitions to the file "/etc/amanda/template.d/dumptypes" . These definitions are needed to backup ZWC clients.

   ```
   define dumptype zwc-normal {
           global
           program "DUMP"
   }

   define dumptype zwc-compress {
           global
           compress client fast
           program "DUMP"
   }
   ```

   b) Run *amaddclient*:

   ```
   -bash-3.00$  amaddclient --config DailySet1 --client
   uranium.zmanda.com --diskdev C:/Data  --dumptype zwc-compress
   Logging to /var/log/amanda/amaddclient.20080813095400.debug
   /etc/amanda/DailySet1/disklist updated
   updating /var/lib/amanda/.amandahosts on quartz.zmanda.com
   /var/lib/amanda/.amandahosts contains uranium.zmanda.com  root,
   file not updated
   Attempting to update /var/lib/amanda/.amandahosts on
   uranium.zmanda.com
   ssh: connect to host uranium.zmanda.com  port 22: Connection
   refused
   WARNING: scp from uranium.zmanda.com  not successful.
   Check uranium.zmanda.com :/var/lib/amanda/.amandahosts file.
   If entry 'quartz.zmanda.com  amandabackup' is not present,
   append the entry to the file manually.
   Creating amanda-client.conf for uranium.zmanda.com
   Creating  /etc/amanda/DailySet1 on uranium.zmanda.com
   ssh: connect to host uranium.zmanda.com  port 22: Connection
   refused
   WARNING: Cannot create /etc/amanda/DailySet1 on
   uranium.zmanda.com
   Please copy /var/lib/amanda/amanda-client.conf-
   uranium.zmanda.com  to uranium.zmanda.com  manually
   File /var/lib/amanda/example/xinetd.amandaclient contains the
   latest Amanda client daemon configuration.
   Please merge it to /etc/xinetd.d/amandaclient.
   ```

7. Use *amaddclient* to enable backups of windows 2000 client **Nickel** and setup Quartz to access Nickel's shared "Projects" folder:

   a) Use *amaddclient* to enable backups of windows 2000 client **Nickel**:

   ```
   -sh-3.00$ amaddclient --config DailySet1 --client
   quartz.zmanda.com --diskdev "//nickel.zmanda.com/Projects" --
   dumptype  comp-user-tar
   Logging to /var/log/amanda/amaddclient.20080820131541.debug
   /etc/amanda/DailySet1/disklist updated
   ```

```
updating /var/lib/amanda/.amandahosts on rhel4-32-
image.zmanda.com

/var/lib/amanda/.amandahosts contains quartz.zmanda.com root,
file not updated

Attempting to update /var/lib/amanda/.amandahosts on
quartz.zmanda.com

amandabackup@quartz.zmanda.com's password:

.amandahosts
100%  413     0.4KB/s   00:00

/var/lib/amanda/.amandahosts contains rhel4-32-image.zmanda.com
amandabackup, file not updated

quartz.zmanda.com:/var/lib/amanda/.amandahosts updated
successfully

Creating amanda-client.conf for quartz.zmanda.com

Creating  /etc/amanda/DailySet1 on quartz.zmanda.com

amandabackup@quartz.zmanda.com's password:

mkdir: cannot create directory `/etc/amanda/DailySet1': File
exists

WARNING: Cannot create /etc/amanda/DailySet1 on
quartz.zmanda.com

Please copy /var/lib/amanda/amanda-client.conf-
quartz.zmanda.com to quartz.zmanda.com manually

File /var/lib/amanda/example/xinetd.amandaclient contains the
latest Amanda client daemon configuration.
```
b) As root, setup Quartz to access shares on Nickel:

    i. You will need to be root to create an "/etc/amandapass" file with the following contents required to access Nickel's shared "Projects" directory (Windows user "Sunil" and password "password" are separated by a percent sign, %; WORKGROUP is optional):

```
//nickel.zmanda.com/Projects  Sunil%password
WORKGROUP
```

    ii. Change "/etc/amandapass" file to be owned by user "amandabackup":

```
[root@quartz ~]# chown amandabackup:disk
/etc/amandapass
```

    iii. Change the permissions on "/etc/amandapass" so only owner can write to it:

```
[root@quartz ~]# chmod 700 /etc/amandapass
```

Note: For this paper, we installed Amanda 2.6.0 on a host that had a previous installation of Amanda. Your output messages will be slightly different with a fresh installation.

Verification and Backup

We will test the backup configuration for all 4 clients and then kick-off a backup run. Ensure that we are logged-in to **Quartz** as user ***amandabackup***.

1. As ***amandabackup***, run the *amcheck* command to test validity of the configuration and connectivity between client and server

```
[amandabackup@quartz ~]$ amcheck DailySet1


Amanda Tape Server Host Check
-----------------------------
slot 1: read label `DailySet1-1', date `X'
NOTE: skipping tape-writable test
Tape DailySet1-1 label ok
```

```
NOTE: host info dir /etc/amanda/DailySet1/curinfo/iron.zmanda.com
does not exist
NOTE: it will be created on the next run.
NOTE: index dir /etc/amanda/DailySet1/index/iron.zmanda.com does
not exist
NOTE: it will be created on the next run.
NOTE: host info dir /etc/amanda/DailySet1/curinfo/copper.zmanda.com
does not exist
NOTE: it will be created on the next run.
NOTE: index dir /etc/amanda/DailySet1/index/copper.zmanda.com does
not exist
NOTE: it will be created on the next run.
NOTE: host info dir
/etc/amanda/DailySet1/curinfo/uranium.zmanda.com does not exist
NOTE: it will be created on the next run.
NOTE: index dir /etc/amanda/DailySet1/index/uranium.zmanda.com does
not exist
NOTE: it will be created on the next run.
NOTE: host info dir /etc/amanda/DailySet1/curinfo/quartz.zmanda.com
does not exist
NOTE: it will be created on the next run.
NOTE: index dir /etc/amanda/DailySet1/index/quartz.zmanda.com does
not exist
NOTE: it will be created on the next run.


Server check took 1.527 seconds
Amanda Backup Client Hosts Check
--------------------------------
Client check: 4 hosts checked in 0.894 seconds, 0 problems found
(brought to you by Amanda 2.6.0p2)
```

2. The *amcheck* command should not generate any errors. If we see the expected "0 problems found" result, we can now initiate the first full backup:

```
[amandabackup@quartz ~]$ amdump DailySet1
```

3. Once the backup run is complete, the root user should receive an e-mail with the backup summary on the Amanda server.

4. We can now create a cron job for user **amandabackup** that will execute *amdump* and initiate the backups automatically. Execute the *crontab* command to create the job:

```
[amandabackup@quartz ~]$ crontab –e
```

and add this line to the file to run backups daily from Monday-Friday at 1am:

```
0 1 * * 1-5 /usr/sbin/amdump DailySet1
```

Recovery

Finally, we will perform a recovery of some of the data we have backed-up. Note that this is a crucial step -- a backup system should always be checked to confirm that data can be recovered. Recovery procedure for windows client is different from Linux client. Direct restore on ZWC client is not yet supported. Data is first restored on Amanda Server, and then copied to ZWC client

Recovery of Linux client (Copper):

1. On the host **Copper, as** the user **root,** run *amrecover* to initiate the data recovery process.

```
copper:/etc/amanda # amrecover  DailySet1
AMRECOVER Version 2.6.0. Contacting server on quartz.zmanda.com ...
220 quartz AMANDA index server (2.6.0) ready.
Setting restore date to today (2007-01-08)
200 Working date set to 2007-01-08.
200 Config set to DailySet1.
501 Host copper is not in your disklist.
Trying host copper.zmanda.com ...
200 Dump host set to copper.zmanda.com.
Use the setdisk command to choose dump disk to recover
amrecover>
```

2. The list of commands below will demonstrate a recovery of a set of different files and directories to the "/tmp" directory.

```
amrecover> listdisk
200- List of disk for host copper.zmanda.com
201- /var/www/html
200 List of disk for host copper.zmanda.com
amrecover> setdisk /var/www/html
200 Disk set to /var/www/html.
amrecover> ls
2007-01-05-13-04-03 tar-1.15/
2007-01-05-13-04-03 .
amrecover> cd tar-1.15
/var/www/html/tar-1.15
amrecover> ls
2007-01-05-13-04-03 scripts/
2007-01-05-13-04-03 doc/
2007-01-05-13-04-03 configure
2007-01-05-13-04-03 config/
2007-01-05-13-04-03 COPYING
2007-01-05-13-04-03 AUTHORS
2007-01-05-13-04-03 ABOUT-NLS
amrecover> add scripts/
Added dir /tar-1.15/scripts/ at date 2007-01-05-13-04-03
amrecover> add configure
Added file /tar-1.15/configure
amrecover> add doc/
Added dir /tar-1.15/doc/ at date 2007-01-05-13-04-03
amrecover> lcd /tmp
amrecover> extract
Extracting files using tape drive chg-disk on host
quartz.zmanda.com.
The following tapes are needed: DailySet1-02
Restoring files into directory /tmp
Continue [?/Y/n]? y
Extracting files using tape drive chg-disk on host
quartz.zmanda.com.
Load tape DailySet1-02 now
Continue [?/Y/n/s/t]? y
./tar-1.15/doc/
./tar-1.15/scripts/
./tar-1.15/configure
./tar-1.15/doc/Makefile.am
./tar-1.15/doc/Makefile.in
./tar-1.15/doc/convtexi.pl
./tar-1.15/doc/fdl.texi
```

```
./tar-1.15/doc/freemanuals.texi
./tar-1.15/doc/getdate.texi
./tar-1.15/doc/header.texi
./tar-1.15/doc/stamp-vti
./tar-1.15/doc/tar.info
./tar-1.15/doc/tar.info-1
./tar-1.15/doc/tar.info-2
./tar-1.15/doc/tar.texi
./tar-1.15/doc/version.texi
./tar-1.15/scripts/Makefile.am
./tar-1.15/scripts/Makefile.in
./tar-1.15/scripts/backup-specs
./tar-1.15/scripts/backup.in
./tar-1.15/scripts/backup.sh.in
./tar-1.15/scripts/dump-remind.in
./tar-1.15/scripts/restore.in
amrecover> quit
200 Good bye.
```

3. We can now verify that the files have been recovered successfully by running run the following command.

```
copper:/ # tree /tmp/tar-1.15
/tmp/tar-1.15
|-- configure
|-- doc
|   |-- Makefile.am
|   |-- Makefile.in
|   |-- convtexi.pl
|   |-- fdl.texi
|   |-- freemanuals.texi
|   |-- getdate.texi
|   |-- header.texi
|   |-- stamp-vti
|   |-- tar.info
|   |-- tar.info-1
|   |-- tar.info-2
|   |-- tar.texi
|   `-- version.texi
`-- scripts
|-- Makefile.am
|-- Makefile.in
|-- backup-specs
|-- backup.in
|-- backup.sh.in
|-- dump-remind.in
`-- restore.in


2 directories, 21 files
```

Recovery of ZWC client (Uranium):

The procedure to recover backup of windows client Uranium is as follows.

1. Login as root on Amanda Server and create a directory, where you will restore the data. Make user "amandabackup" as the owner of the directory.

```
# mkdir /restore
# chown amandabackup:disk /restore
```

2. As user 'amandabackup' confirm the type of backup that you want to restore using command "amadmin". In our case we will be restoring full as well as incremental backup dated 13 August 2008. Syntax for amadmin is "amadmin <BackupSetName> find <hostname> <disk>"

```
# su - amandabackup


-sh-3.00$ amadmin DailySet1 find uranium.zmanda.com C:/Data
date                 host                 disk      lv tape or file
file part status
2008-08-13 10:23:07 uranium.zmanda.com "C:/Data"  0 DailySet1-8
1  1/1 OK
2008-08-13 10:25:15 uranium.zmanda.com "C:/Data"  1 DailySet1-9
1  1/1 OK
```

3. Change directory to /restore

```
-sh-3.00$ cd /restore
```

4. Use "amfetchdump" to extract the contents from full backup (2008-08-13 10:23:07).Syntax of the command is "amfetchdump <BackupSetName <host> <disk> <YYYYMMDDHHMMSS>"

```
-sh-3.00$ amfetchdump DailySet1 uranium.zmanda.com C:/Data
20080813102307
1 tape(s) needed for restoration
The following tapes are needed: DailySet1-8
Press enter when ready
amfetchdump: slot 9: time 20080813102515 label DailySet1-9 (wrong
tape)
amfetchdump: slot 10: time X            label DailySet1-10 (wrong
tape)
amfetchdump: slot 11: time X            label DailySet1-11 (wrong
tape)
amfetchdump: slot 12: time X            label DailySet1-12 (wrong
tape)
amfetchdump: slot 1: time 20080808060359 label DailySet1-1 (wrong
tape)
amfetchdump: slot 2: time 20080808063824 label DailySet1-2 (wrong
tape)
amfetchdump: slot 3: time 20080811050822 label DailySet1-3 (wrong
tape)
amfetchdump: slot 4: time 20080811060158 label DailySet1-4 (wrong
tape)
amfetchdump: slot 5: time 20080811063142 label DailySet1-5 (wrong
tape)
amfetchdump: slot 6: time 20080811063355 label DailySet1-6 (wrong
tape)
amfetchdump: slot 7: time 20080813095029 label DailySet1-7 (wrong
tape)
amfetchdump: slot 8: time 20080813102307 label DailySet1-8 (exact
label match)
Scanning volume DailySet1-8 (slot 8)
amfetchdump: 1: restoring FILE: date 20080813102307 host
uranium.zmanda.com disk "C:/Data" lev 0 comp N program pkzip
```

5. Now extract the contents from incremental backup (2008-08-13 10:25:15)

```
-sh-3.00$ amfetchdump DailySet1 uranium.zmanda.com C:/Data
20080813102515

1 tape(s) needed for restoration

The following tapes are needed: DailySet1-9

Press enter when ready

amfetchdump: slot 8: time 20080813102307 label DailySet1-8 (wrong
tape)

amfetchdump: slot 9: time 20080813102515 label DailySet1-9 (exact
label match)

Scanning volume DailySet1-9 (slot 9)

amfetchdump: 1: restoring FILE: date 20080813102515 host
uranium.zmanda.com disk "C:/Data" lev 1 comp N program pkzip
```

6. Now you can see both the files (full + incremental) in /restore

```
-sh-3.00$ ls
uranium.zmanda.com.C__Data.20080813102307.0
uranium.zmanda.com.C__Data.20080813102515.1
```

7. Move both the files from step 6 to the windows system where you want to
   restore and extract the data using Compressed Folders utility in Windows XP
   or programs such as Winzip or PKzip.

Recovery of Windows 2000 client (Nickel):

Recovery process of **Nickel** is exactly same as the recovery of Linux client **Copper**. Just in this
case you have to do recovery (amrecover) on Amanda Server (Quartz) and then move the
restored data to Nickel.

Conclusion

So, as we have just seen, backing-up and restoring files with Amanda is incredibly
easy. Setup is also very quick. For more information, there is a wealth of
documentation and examples available on the **Amanda Wiki**. There is also a large
community ready to respond to ideas and requests for help on the **Amanda Forums**.
As you explore the features and flexibility of Amanda, you will find that there is much
more power to be harnessed from building your backup and recovery solution around
Amanda.