

The following procedure details how to setup a control process for multiple nodes in an Oracle RAC Linux cluster to run all Time Machine® operations on each node simultaneously. After following these steps a user will be able to enable or disable their virtual clock on each machine with one command.

## Step 1: Enable rsh and the xinetd daemon and configure it to restart automatically during each system reboot.

If **xinetd** is not enabled on your system, follow the appropriate method listed below for your operating system type.

Note that when a node is rebooted, the **xinetd** service must be restarted.

### Enabling xinetd and rsh on Red Hat 4

To enable **xinetd** on Red Hat version 4, perform the following steps.

1. Prepare the Linux host to provide rsh capability:
  - a. Check that the rsh daemon is installed, using:

```
chkconfig --list | grep rsh
or
rpm -qa | grep rsh-server
```

- b. If the rsh daemon does not exist, install the rsh server RPM package, (rsh-server-0.17-17.i386.rpm).
  - c. Edit the following configuration files:

```
/etc/xinetd.d/rexec with DISABLE = NO
/etc/xinetd.d/rsh with DISABLE = NO
/etc/xinetd.d/rlogin with DISABLE = NO
```

2. If the /etc/securetty file exists, add the following lines to the end of the file.

```
rsh
rexec
rlogin
```

3. Update the following PAM-related files to allow remote logins from other systems:
  - a. Edit the /etc/pam.d/rlogin file and comment out the following line by inserting a pound sign (#):

```
# auth required /lib/security/pam_securetty.so
```

- b. Edit the /etc/pam.d/rsh file and change the following line:

```
auth required /lib/security/pam_rhosts_auth.so
to
auth sufficient /lib/security/pam_rhosts_auth.so
```

4. Restart the xinetd service using **/etc/rc.d/init.d/xinetd restart**.

## Step 2: User IDs on remote nodes

On each remote node, the system administrator must set up a user ID, other than a root ID, for each user on each remote node who will be executing serial or parallel. Both the user name and user ID must be the same on all nodes. Also, the user must be a member of the same named group on the home node and the remote nodes.

**Example:** [oracle@spb10 ~]\$ id

```
uid=500(oracle) gid=501(dba) groups=501(dba)
```

## Step 3: User authorization

Each node needs to be set up such that each userid is authorized to access that node or remote link from the initiating home node. Edit the users **.rhosts** file on each node to specify this users authorization to run commands from other nodes in the cluster.

**Example of file /home/oracle/.rhosts**

(this file can and should be the same on each node. In this example there are two node, spb10 & spb15)

```
spb10-int oracle
spb15-int oracle
spb10 oracle
spb15 oracle
```

## Step 4: Test the setup

After following the above steps on each node in the cluster form the command line on one node test the setup using rsh to run a command on the other node:

Example: (This example was ran from machine spb10 calling out to machine spb15)

```
[oracle@spb10 ~]$ rsh spb15 -l oracle ls
connect to address 15.170.177.15: Connection refused
Trying krb4 rsh...
connect to address 15.170.177.15: Connection refused
trying normal rsh (/usr/bin/rsh)
file1.txt
foo.bar
hello.world
[oracle@spb10 ~]$
```

## Step 5: Creating the control script

Next create an editable script file that will allow all the user's Time Machine commands to be executed on each node. The following is an example of a script that will determine which machine it is being called from, execute the passed-in command on the remote node via remote-shell (rsh) then immediately execute the same command on the local node.

```
#                                     CLUSTERTM
# This Linux shell script file takes in the entire command line string "$@" and passes it to the defined RSH # hosts and then executes the same
# command on the local host. This file must be executed from the same network account on the local host as on the remote host/s.
#
# As this was designed for cluster management this file needs to reside in the users home directory on all machines
#
# Example of use: [oracle@spb15 ~]$ clusterm tmuser -a -u 500 -x 022812552010 -f
#
# Used as above the remote machine and localhost will have a virtual clock for user oracle set to 12:55, Feb 28th 2010.

case $HOSTNAME
in
spb10.usa.hp.com)
    rsh spb15.usa.hp.com -l oracle $@;
    echo -----Now executing command locally-----
    $@;;
spb15.usa.hp.com)
    rsh spb10.usa.hp.com -l oracle $@;
    echo -----Now executing command locally-----
    $@;;
esac
```