Server OS and Third Party Software Setup - 6.*

Server OS and Third Party Software Setup

How to setup the server including OS installation, third party software and components installations.

Contents

Requirements

Needed to install Variations:

- Linux server with root access
- 2 or 3 static IP addresses - This is to avoid a conflict on port 80. One address is for the Darwin Streaming Server and one for the Apache webserver. A third IP address can be used to refer to the server in general and for RMI traffic. The following directions assume three static IP addresses have been created and will be used in the manner specified above.

OS and 3rd-Party Software Installation

> ⚠ **As _root_ user**
>
> Perform the following installation steps as *root* or **sudo**

Linux

- Install your choice of Linux distribution.
  Indiana University currently runs Variations on **Red Hat Enterprise Linux 6 (RHEL 6)**. Derivatives of it such as Centos or White Box will be very similar, but for other distributions, the filenames and/or procedures may be different. The instructions below are tailored to RHEL6.
    - Select "Software Development Workstation" when asked about selecting a software set.
    - When creating the first user, this can be the "dmlserv" user that is required further on in the installation. ([Variations Administration User Account Creation](#))
    - Set up your RedHat Network subscription, and update to latest release:
      yum update
    - Install needed packages
      yum install gd-devel gdbm-devel
    - Ensure that **hostname -i** returns the numeric IP address and not the host name.
        - If **hostname -i** returns the IP and 127.0.0.1, edit */etc/hosts* so that the ::1 entry has only the values localhost6.localdomain6 and localhost6.
        - If **hostname -i** returns the host name, edit */etc/hosts* to put the IP and hostname in a separate line entry.

      Example /etc/hosts

      ```
      # Do not remove the following line, or various programs
      # that require network functionality will fail.
      127.0.0.1       localhost.localdomain localhost
      129.12.345.67   taishan.dlib.indiana.edu taishan
      ::1             localhost6.localdomain6 localhost6
      ```

Network Alias Devices

- Create Network Alias Devices
    - These IP addresses will be used for the Variations webserver and Darwin streaming server. They must be on the same network as the machine's address. The NETMASK and BROADCAST variables below will be the same as their counterparts in */etc/sysconfig/network-scripts/ifcfg-eth0*.
    - Create an Network Device for the webserver by creating */etc/sysconfig/network-scripts/ifcfg-eth0:0* with this content:

```
DEVICE=eth0:0
IPADDR=Variations webserver IP address
NETMASK=Variations webserver netmask
BROADCAST=Variations webserver broadcast address
ONBOOT=yes
```

- Create a Network Device for the streaming server by creating */etc/sysconfig/network-scripts/ifcfg-eth0:1* with this content:

```
DEVICE=eth0:1
IPADDR=_Darwin streaming IP address
NETMASK=Darwin streaming netmask
BROADCAST=Darwin streaming broadcast address
ONBOOT=yes
```

- Bring up the new devices to verify they are configured correctly:
  ifup eth0:0
  ifup eth0:1
  You will need to do this only once, since they will be brought up when the machine is rebooted.

Firewall

Variations uses the following ports:

- eth0 - TCP 139 and 445 (Samba), 1099 (RMI Registry), 1100 (UI Logging Server), 49930 and 49931 (Variations RMI Server)
- eth0:0 (Apache) - TCP 80, 443
- eth0:1 (Darwin Streaming Server) - TCP 80, 554 and UDP 6970-6999

- Configure the firewall by running System->Administration->Firewall.
    - Under **trusted services**, check SSH, Samba (if using Samba for derivative uploads), Secure WWW, and WWW.
    - Under **other ports**, add 554, 1099, and 1100 (all TCP).
    - Then add the following "User Defined" ports:
        - 6970-6999 UDP (for Darwin Streaming Server)
            - Add this as the range '6970-6999'
        - 49930 and 49931 (for RMI servers, i.e., Variations server and lease manager). These RMI port numbers are configurable, and can be set in the file: *dml/conf/server/dmlserver.xml* .

Java

Install Java:

- Download the latest JavaSE 1.6 JDK -rpm.bin Package for your architecture from Sun.
  IU is currently running Java version 1.6.0_24.
- Run:
  sh *jdk-6u25-linux-x64-rpm.bin*
  and accept the license agreement.
- Create */etc/profile.d/java.sh* with this content:

```
export JAVA_HOME=/usr/java/jdk1.6.0_25
export PATH=$JAVA_HOME/bin:$PATH
```

> ⚠ Check that your JAVA_HOME location and version matches your installation

- Modify the file *$JAVA_HOME/jre/lib/security/java.policy* by adding the lines listed below to the **grant** block. **Modify the IP addresses and machine names to those of the machine for your Variations server.** These additions are necessary to get the Variations servers to work. For example:

Example IP	Server	Example DNS Name
129.79.184.181	Variations Webserver (device eth0:0)	
129.79.184.188	host machine (device eth0)	Server1.dlib.indiana.edu

```
permission java.net.SocketPermission "129.79.184.181:80",     "connect,resolve";
permission java.net.SocketPermission "Server1.dlib.indiana.edu", "resolve";
permission java.net.SocketPermission "129.79.184.188:1024-",  "connect,accept,resolve";
permission java.util.PropertyPermission "dml.client.url.userguidebase", "read";
permission java.util.PropertyPermission "dml.leaseManager.*", "read";
permission java.util.PropertyPermission "dml.login.loginHandler", "read";
permission java.util.PropertyPermission "user.dir", "read";
permission java.util.PropertyPermission "variations2.dir", "read";
permission java.io.FilePermission "<<ALL FILES>>", "read,execute";
permission java.io.FilePermission "/home/dmlserv/content/-", "read,execute,delete";
permission java.io.FilePermission "/home/dmlserv/public_html/score-leases/-", "read,execute,delete";
permission java.lang.RuntimePermission "setFactory";
```

Apache

- Install Apache HTTP Server. http://httpd.apache.org/ Install version 2.2 or later. Certain parts of Variations require a web server to handle html web pages and cgi-bin scripts.
    - The Apache HTTP Server should have been installed with RHEL, check for installation:
      yum list httpd
        - If needed, install apache:
          yum install httpd
- Append the following lines to your apache configuration file /etc/httpd/conf/httpd.conf:

```
#
# Variations specific configuration
#
ScriptAlias /variations/cgi-bin/ "/home/dmlserv/Variations-6.1/public_html/cgi-bin/"

<Directory "/home/dmlserv/Variations-6.1/public_html/cgi-bin">
    AllowOverride All
    Options FollowSymLinks
    Order allow,deny
    Allow from all
</Directory>

Alias /variations/ "/home/dmlserv/Variations-6.1/public_html/"

<Directory "/home/dmlserv/Variations-6.1/public_html">
    AllowOverride All
    Options FollowSymLinks
    Order allow,deny
    Allow from all
</Directory>
```

- Set the webserver to listen to the network alias.
  In the file /etc/httpd/conf/httpd.conf, change the line:

```
Listen 80
```

to the line:

```
Listen your-Variations-webserver-IP-address:80
```

where your-Variations-webserver-IP-address is the IP you assigned to eth0:0.
    - Set the webserver to start automatically at boot:
      chkconfig httpd on
    - Start the server now:
      service httpd start

> ⚠ Note that Apache is still listening to :443 on all hosts with this configuration.

- SELinux settings for Apache
  If SELinux is present and in enforcing mode (default for RHEL), make the following boolean settings to allow browser access to cgi and user (dmlserv) home directores.

setsebool -P httpd_enable_cgi=1
setsebool -P httpd_enable_homedirs=1
setsebool -P httpd_read_user_content=1

MySQL

Variations uses two databases for Metadata and Access Management. Currently Variations is configured to work with MySQL and will require that you set up these databases in the configuration of the Variations server. Linux distributions such as RedHat Enterprise 6 already come with the appropriate version of Mysql. If you are using another Linux distribution you may want to check that it has a compatible version of MySQL or download a more current version. For more information on the Variations database see the Databases page

- - Check to see if mysql is already installed:
    yum list mysql mysql-server
    - If needed, install mysql:
    yum install mysql mysql-server

- MySql has internal parameters specifying how long to keep a stale connection before dropping it. For interactive logons this is *interactive_timeout* and for non-interactive it is *wait_timeout*. Note that *wait_timeout* is set from *interactive_timeout* when the login is interactive. The default setting for these parameters is 8 hours (specified in seconds). After this time, the connection is dropped and cannot be reestablished without restarting the server. To fix this problem set both *wait_timeout* and *interactive_timeout* to 24 hours (86,400 seconds) in the MySql configuration file */etc/my.cnf* under both the *mysqld* and *mysqld_safe* sections.

```
wait_timeout=86400
interactive_timeout=86400
character_set_client=utf8
character_set_server=utf8
default-storage-engine=INNODB
```

The default minimum length for words used in fulltext indexes is 4. This means that searches for words less than 4 characters will fail (e.g., "U2" or "Yes"). It is probably a good idea to reset this to 1 in the */etc/my.cnf* file under both the *mysqld* and *mysqld_safe* sections. Also, MySQL has a default stopword file that excludes certain words from the text index, and it may exclude words that users might reasonably want to search on. Therefore, it may be best to turn this off by setting ft_stopword_file to "". For a list of MySQL default stop words, see http://dev.mysql.com/doc /refman/5.1/en/fulltext-stopwords.html. One can also set *ft_stopword_file* to the name of a file that contains a custom list of stop words.

```
ft_min_word_len=1
ft_stopword_file=""
```

- Set mysql to start automatically at boot:
  chkconfig mysqld on
- Start the server now:
  service mysqld start
- Download MySQL Connector/J database driver for Java (version 5.1 or later).
    - Expand the archive and put the file *mysql-connector-java-5.1.17-bin.jar* in the location _/usr/local/lib/_you can put this file in another location but will need to update the configuration file later.

Perl

- Install Perl
    - Check to see if perl is already installed:
      yum list perl
    - If needed, install perl:
      yum install perl
- Install other needed modules and packages

> ⚠ Note that cpan is an online repository for perl modules and that installing modules from it may occasionally fail due to failed tests. In these situations, you can pass a flag to the cpan command that forces the installation. Your command should then look like `cpan -fi module`. Note when you do this so that you can be on the lookout for any issues that may arise as a result of these potentially buggy perl modules. You can update the perl modules when a new version is released by running the install command again. Many modules will require dependency modules so make sure to answer yes to the prompts to include them in the build/install process.

- Configure and update CPAN:
  cpan -i Bundle::CPAN Answer 'yes' to the automatic configuration question.
- Install the GD module:
  cpan -i GD
- Install the GD::Graph module:
  cpan -i GD::Graph
- Install the CGI module:
  cpan -i CGI
- Install the LWP module:
  cpan -i LWP
- Install the Time::Local module:
  cpan -i Time::Local

- Install the DateTime module:
  cpan -i DateTime
- Install the XML::LibXML module:
  cpan -i XML::LibXML
- Install the XML::LibXSLT module:
  cpan -i XML::LibXSLT

Darwin

- **About**
  The Darwin Streaming Server is an open-source RTP/RTSP server originally developed by Apple as the Quicktime Streaming Server. Darwin is capable of serving MOV and MP4 files that have been hinted for streaming. Variations will use this server to stream audio to the end users. For more information on how Variations' audio streaming works visit the Audio Streaming page. For more information about running Darwin see the Administrator's Guide.

- **Darwin Installation Instructions**
  - Download and Install
    - Download Linux Package (for Fedora Core 4 or later, that's us) from:
      http://dss.macosforge.org/
      At that site, scroll down to *Related Links* at the bottom, and follow *Previous releases*.
      At the *Previous Releases* page, under *Linux installer (v5.5.5)*, follow *Streaming Server*.
      At this point an Apple ID login or account creation, and license agreement is required before the download is started. Download to any tidy location. The download will install into proper standard locations.
    - Once downloaded, unpack it:
      tar -xzf *DarwinStreamingSrvr5.5.5-Linux.tar.gz*
    - Change location into the unpacked directory and invoke the installation script:
      ./Install
      - You will be prompted for an administrator user name and password.
      - If you get errors from /usr/local/bin/qtpasswd make sure that you have the required i686 libraries then rerun the installation script:
        ```
        yum install glibc.i686 libstdc++.i686; ./Install
        ```
    - Make the Darwin log path readable for Variations statistics scripts:
      chmod a+rx /var/streaming /var/streaming/logs
  - Installing Darwin as a Service
    To make Darwin start on boot and be accessible as a service in */etc/init.d/* follow these steps:
      - Download the init.d script to */etc/init.d/*
      - Set permissions on the script:
        chmod 755 /etc/init.d/dss
      - Set **dss** to run as a service on boot:
        chkconfig dss on
      - At this point, you can start **dss** manually:
        /etc/init.d/dss start
        The **dss** script has five possible actions:
        /etc/init.d/dss *option*

Option	Action
start	Starts the server
stop	Stops the server
status	Provides current running status for streaminaadminserver and DarwinStreamingServer
restart	Does a **stop** and then a **start**
condrestart	If Darwin is running, does a **stop** and then a **start**
reload	Forces Darwin to reread configuration files without disconnecting users

  - Configuring Darwin
    First, edit */etc/streaming/streamingserver.xml* to bind the streaming server to its assigned IP address:

    ```
    <PREF NAME="bind_ip_addr" >your streaming IP address</PREF>
    ```

    You will need to restart the Darwin Streaming Servers for this change to take effect.
    /etc/init.d/dss restart
    Point your browser to http://localhost:1220/ to access the Darwin management tool.

    > ⚠ If you do not have terminal access to this machine and port 1220 is not open, you can try forwarding an X connection through SSH: `ssh -Y hostname`. This approach requires that X11 is installed on both the server and client of the the SSH connection. Once connected launch the browser of your choice, ie: **firefox localhost:1220**.

    The only settings that need to be changed for Variations are:
- the Media Directory
  /home/dmlserv/content/streaming

- enabling Port 80 streaming
  Port 80 streaming should be turned on as a fall back for the Variations client in case firewalls or NAT devices prevent it from receiving RTSP (TCP and UDP) traffic properly.

Variations Administration User Account Creation

If the dmlserv user was created during the first boot process, then also

- Change the permissions on dmlserv's home directory:
  chmod a+rx /home/dmlserv

If the dmlserv user was **not** created during the first boot process, then

- **Create dmlserv account.**
  Set up dmlserv account on the server, with home directory of *home/dmlserv*.
  - Create the account:
    /usr/sbin/useradd -c "DML Server Account" dmlserv
  - Set the password:
    passwd dmlserv
  - Change the permissions on dmlserv's home directory:
    chmod a+rx /home/dmlserv

Next Steps

You have just finished installing the all of the components needed to install and run the Variations server software. Proceed to the next step and install the Variations Server Software.
Back to the Administrators Guide Home Page