**Unix Lab Instructions: FreeBSD Operating System**

**1. Introduction**

In this lab, you'll familiarize yourself with basic Unix-like commands and configurations using FreeBSD. This includes system navigation, shell environment modifications, SSH server configuration, and remote X forwarding setup. You'll use the Remote Unix Lab Environment (RULE) and tools like PuTTY and WinSCP.

**2. Purpose**

* Learn basic Unix commands.
* Understand Unix command line navigation and operation.
* Modify shell environment settings.
* Configure SSH server settings.
* Enable remote X forwarding.

**3. Preparation**

* Review FreeBSD documentation at [FreeBSD Documentation](http://www.freebsd.org/).
* Familiarize yourself with Unix commands, SSH, and remote X forwarding.

**4. Methodology**

**4.1 Software**

1. **PuTTY**: Open and explore preferences; use it to SSH into your FreeBSD RULE host using provided login details.
2. **WinSCP**: Learn to copy and move files to/from your RULE host.

**4.2 Command Syntax**

1. **Basic Commands**:
   * date: Shows the current date and time.
   * date "+DATE: %Y-%m-%d TIME: %H:%M:%S": Custom date and time format.
2. **Commands**:
   * ls: Lists directory contents.
   * ls -al: Lists detailed contents including hidden files.
   * pwd: Prints the working directory.
   * cd <directory>: Change directory.
3. **Manual Pages**:
   * man ls: Shows the manual for the ls command. Use q to quit.
   * man pwd, man date: Explore manual pages for these commands.

**4.3 File Manipulation**

1. **Creating Directory**:
   * mkdir test: Create a directory named "test" in your home directory.

**4.4 Text File Editing**

1. **Inspecting Files**:
   * cat /usr/local/www/apache24/data/index.html: Display file contents.
   * less /usr/local/www/apache24/data/index.html: Paginated file view.
2. **Creating and Editing Files**:
   * ee test.txt: Create and edit test.txt using ee (easy edit).

**4.5 Moving and Deleting Files**

1. **Deleting Files**:
   * rm <filename>: Remove a file.
   * rm -r <directory>: Remove a directory and its contents.
2. **Renaming Files**:
   * mv <oldname> <newname>: Rename a file.

**4.6 Output Redirection**

1. **Commands**:
   * sysctl -a: Displays all system control parameters.
   * sysctl -a | less: Paginated output.
   * sysctl -a | grep “net”: Filter output containing "net".
2. **File Redirection**:
   * cat textfile1.txt >> textfile2.txt: Append contents of textfile1.txt to textfile2.txt.
   * cat textfile1 > textfile2.txt: Overwrite textfile2.txt with textfile1.txt.

**4.7 Becoming the Super User**

1. **Switch to Root**:
   * su: Switch to super user (root). Edit /etc/motd and exit with exit.

**4.8 Changing the Unix Shell**

1. **Changing Shell**:
   * vipw: Edit /etc/passwd to change shell from /bin/sh to /bin/csh.
2. **Editing .cshrc**:
   * Add alias foo ls -lAh to your .cshrc file. Verify changes after re-login.

**4.9 SSH**

1. **SSH Configuration**:
   * Edit /etc/ssh/sshd\_config to permit root login and restart SSH server.
   * Test changes by attempting root login via SSH and verify configuration.

**4.10 X and the GUI**

1. **X Window System**:
   * Research X Windowing System and XMing.
   * Run xcalc and xeyes to test X forwarding.
   * Use ps -ax to check running X applications.

**4.11 Automatically Starting SSH at System Boot**

1. **Enable SSH**:
   * Edit /etc/rc.conf to ensure SSH starts at boot with sshd\_enable = “YES”.

**5. Assessment**

Complete an online quiz based on the lab to assess your understanding. You must score the minimum required to pass and can attempt the quiz multiple times if needed. Ensure to complete it before the next lab session.