

Worksheet 3: Distributed File Systems

Name:

Class:

Please complete this worksheet and print it out.

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Objectives

This exercise aims to investigate network file structures using various tools.

Windows NT/2000

Aims	Procedure	Note																		
<p>This exercise aims to investigate network file structures using various tools.</p>	<p>Login to the University SoC Win NT Service. Open the My Computer icon, identify the allocated drive letters of all network drives. Select each drive, use File > Properties to gain more detail. Note the type of file system each uses.</p>	<table border="1"> <thead> <tr> <th data-bbox="995 1312 1139 1357">Letter</th> <th data-bbox="1139 1312 1187 1357">:</th> <th data-bbox="1187 1312 1390 1357">Filesys</th> </tr> </thead> <tbody> <tr> <td><input type="text"/></td> <td>:</td> <td><input type="text"/></td> </tr> <tr> <td><input type="text"/></td> <td>:</td> <td><input type="text"/></td> </tr> <tr> <td><input type="text"/></td> <td>:</td> <td><input type="text"/></td> </tr> <tr> <td><input type="text"/></td> <td>:</td> <td><input type="text"/></td> </tr> <tr> <td><input type="text"/></td> <td>:</td> <td><input type="text"/></td> </tr> </tbody> </table>	Letter	:	Filesys	<input type="text"/>	:	<input type="text"/>	<input type="text"/>	:	<input type="text"/>	<input type="text"/>	:	<input type="text"/>	<input type="text"/>	:	<input type="text"/>	<input type="text"/>	:	<input type="text"/>
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<p>Note the details of any NFS drives.</p>	<p>For each NFS drive click on the NFS Properties tab. Note the name of the host of the file system, and the pathname of the host.</p>	<p>Drive:</p> <input type="text"/> <p>Unix host:</p> <input type="text"/>																		

		Pathname: <input type="text"/>
		Drive: <input type="text"/>
		Unix host: <input type="text"/>
		Pathname: <input type="text"/>
		Drive: <input type="text"/>
		Unix host: <input type="text"/>
		Pathname: <input type="text"/>
File name translation	Will the system alter file name as seen by the local system?	Yes or No? <input type="text"/>

UNIX

Aims	Procedure	Note
Login to the SoC UNIX system	Start > Run Open: telnet tenet.dcs.napier.ac.uk	

<p>Unix Prompts (either):</p> <pre>> (tcsh) \$ (Bourne/Korn)</pre> <p>Find the physical mount point for your "~" home directory.</p>	<pre>selene:~ > selene:~ > df ~</pre>	<p>File system available (yes or no)?</p> <div style="border: 1px solid black; height: 40px; width: 100%;"></div>
<p>List all the remoted file systems currently mounted by this Unix station.</p>	<pre>selene:~ > df</pre> <p><i>Note: Use " more" to page the result</i></p>	<p>Record the names of all the remote hosts which export storage space. Also note if any of the mounted file system correspond to space also available as network drive letters by WinNT.</p> <p>Hostname</p> <div style="border: 1px solid black; height: 40px; width: 100%;"></div> <p>Hostname</p> <div style="border: 1px solid black; height: 40px; width: 100%;"></div> <p>Hostname</p> <div style="border: 1px solid black; height: 40px; width: 100%;"></div>

RPC Services

Just like ping verifies connections between hosts, the tool **rpcinfo** allows the user to interact with the rpcbind (or portmap) daemon.

rpcinfo will normally display a list of RPC services offered by any machine running rpcbind and shows program numbers, service names and versions.

Aims	Procedure	Note
<p>Check the local Unix system is running portmap or rpcbind</p>	<pre>:~ > ps -ef</pre>	<p>Look for the rpcbind or portmap process, it is required for the rest of this exercise.</p>

<p>Run rpcinfo on the currently logged Unix system. The (-s) option gives a more readable output.</p>	<pre>:~ > rpcinfo -s</pre>	<p>Many RPC services should be listed regardless of whether the host is an NFS client or NFS server. However the service NFS will only be listed if the host is a server.</p>
<p>List RPC services on one of the hosts already known to export its file system</p>	<pre>rpcinfo -s host</pre>	<p>Verify the existence of the NFS service.</p> <p>Program number</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>
<p>It is also possible to broadcast to all host rpcbind services and list which provides a particular service.</p>	<pre>rpcinfo -b nfs 2</pre>	<p>Note the hosts which reply indicating support for the particular NFS RPC service. These are therefore the NFS Network File Servers.</p> <p>Host</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div> <p>Host</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div> <p>Host</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div> <p>Host</p> <div style="border: 1px solid black; height: 20px; width: 100%;"></div>

Note: rpcinfo is also available for WinNT via:

[Start] > Tools > Unix > NFS Maestro > System Administration > Rpcinfo

Mounting a filesystem

Students may already have "world" readable file space as part of their storage tree. Typically the contents of the directory `~/public_html` must be world readable to allow the web server to access the student's WWW pages, where they exist.

Because whole of the `~/` file system is mounted on the WinNT system as drive "H:" students can modify their web pages "locally" by editing any `H:\public_html*.html` file.

There is however a slight problem with this arrangement. The default access permissions for the H: drive need to be:

```
-rwx-----
```

meaning that only the owner can read the file, this gives the web server a problem because it is not running with the owner's file permissions. One work around is to manually alter the file permissions to:

```
-rwxr-xr-w
```

every time a file is modified, obviously a bit tedious. However a more convenient solution can be achieved by mounting (mapping) the `~/public_html` folder as a separate additional drive, say W: for Web, and giving it appropriate default access permissions.

Aims	Procedure	Note
Map a new W: Drive Start NFS Network Access	[Start] > Tools > Unix > NFS Maestro > NFS Network Access	This is the Hummingbird WinNT client tool for admin- istering NFS mounts.
The path used will be the same as used for "H:" but with /public_html appended	Network path: <code>\\host\path.</code>	
	Drive: W: Username: Password:	Normal network login (UNIX) <input data-bbox="1102 1910 1393 2000" type="text"/>

Set Permissions	Protection: Check the following permissions boxes. RWX-R-XR-X	This will ensure that any new files created will be <i>world readable</i> .
	Check the "Lower Case" radio button.	When using html files/links etc. it is simpler to stick to lower case file names.
Create a simple HTML file in W: using Notepad.	Accessories > Notepad Enter some HTML. E.g. <H1>Hello World</H1>	
Save the file in the web directory	Save As: W:test.html	
Check the new file is accessible by the web server Replace /~INNNNNNN with your login id.	Start a web browser and access the URL: http://www.dcs.napier.ac.uk/~1NNNNNNN/test.html	Access successful (yes/no)? <div style="border: 1px solid black; height: 30px; width: 100%;"></div>

Unix/Win9x/NT Filename Interoperability

There are some unusual effects of creating files shared across dissimilar systems, E.g. Unix/Win. One of the effects is shown next.

Aims	Procedure	Note
<p>On the Unix System use <code>touch</code> to create empty files with similar names in different caSES.</p>	<pre>cd ~ touch myfile.txt touch MyFile.txt ls</pre> <p>Under WinNT open the H: drive and examine the file names used for the pair.</p>	<p>Names differ to UNIX (yes/no)?</p> <div data-bbox="1102 651 1394 745" style="border: 1px solid black; height: 42px; width: 100%;"></div>
	<p>Under WinNT, delete one of the above files, make a copy of the remaining one and give it exactly the same name as the one previously deleted!</p>	<p>Change observed?</p> <div data-bbox="1102 920 1382 1070" style="border: 1px solid black; height: 67px; width: 100%;"></div>