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Willtek
4400

Saving Result Logs to a File Server

Connect the 4400 to a remote PC to upload and post-process measurement results

This application note describes the background and process for saving test result files generated in the Willtek 4400 Mobile Phone Tester to a remote PC/server on a local area network (LAN). This capability allows transfer and storage of test results to a central location where they can then be retrieved, analysed in greater detail or archived for long-term storage. Applications include comparison of test results for the same phone on a number of occasions, in a manufacturing or repair environment where the directory and file name can be correlated with the phone's IMEI serial number. In manufacturing applications, test results may need to be held as part of quality procedures within ISO 9000 approval. Trend analysis from stored results can also help diagnose long-term drift problems due to components, process changes and other effects.

Creating result logs manually

Result logs can be created either manually or from within a RAPID! test script. The easiest way to document your results is with a screenshot saved in a bitmap file on the floppy disk. This file can be copied from the floppy disk to a directory on the server from within the RAPID! environment. The advantage of using a screenshot is that it can be used in manual operation (without using an automated test). The disadvantage, however, is that the results are not easy to post-process because they are saved in a graphical format rather than in a numerical or text format.

Procedure

To set up the 4400 to send screenshots to the floppy disk instead of a printer, the 4400 and the PC must first be set up to act as a network file system (NFS) client and server; see section "NFS connection set-up". Then select the **Parallel Port** field in the **Tools > Config > I/O** menu. Change the setting to "BMP File to floppy disk".

To take a screenshot from a measurement and save it on the floppy disk, ensure that a floppy disk with enough free capacity is inserted, and press the **Print** hardkey. To copy the file from the floppy disk to a server location, press **Tools > RAPID!**

and select the file in the file menu (on /io/ floppy). Press **ETC > Copy**, push **to IO** and select **server**, then confirm with **OK** to save the file. This creates a copy of the screenshot on the server disk, so you can use it for documentation and archiving purposes.

Creating result logs from within a test script

A result log in numerical format is easier to post-process and archive. It can be generated from within a test script. Test scripts can automate test sequences, result in a simple pass/fail decision and are easy to program on the 4400 with the built-in RAPID! development enviroment. The user's guide provides a comprehensive description of RAPID! and the 4400 already comes with a number of test scripts that can be used as examples.

Programming example

Here is an example RAPID! program to save two measurement results in a file on the network; it is a good idea to use the serial number (IMEI) of the phone under test as a directory or file name for the results.

```
LET FILE = FREEFILE
LET FILEDIR$ = "/rapid/results/"
LET FILENAME$ = FILEDIR$ + IMEI$ + ".TXT"
LET SERVERFILENAME$ = "/io/server" + FILENAME$
OPEN FILENAME$ FOR OUTPUT AS #FILE
PRINT #FILE,"Results for mobile ";IMEI$
PRINT #FILE,"    TX Power:  ",TXPWR
PRINT #FILE,"    Freq. Error:",FREQERR
CLOSE #FILE
LET QUOTE$ = CHR$(34)
LET FILENAME$ = QUOTE$ + FILENAME$ + QUOTE$
LET SERVERFILENAME$ = QUOTE$ + SERVERFILE-
NAME$ + QUOTE$
LET COMMAND$ = "cp -c " + FILENAME$ + " " +
SERVERFILENAME$
SHELL COMMAND$
LET COMMAND$ = "rm -f " + FILENAME$
SHELL COMMAND$
```

NFS connection set-up

Getting started with the 4400

The 4400 must be fitted with the Willtek 4478 TCP/IP Option; this includes the software licence and the network adaptor card (PCMCIA) for the 4400. The option is available through Willtek and local distributors and can be installed in the field. The card is installed as a PCMCIA card in one of the slots on the rear panel of the 4400. You will also need a connection cable to the PC or LAN. With the card plugged in at switch-on, the 4400 starts its Network File Server (NFS) and client applications allowing access both to and from the 4400 over the LAN.

TCP/IP Option
Ethernet PC Card

Cable connection via LAN

Card

willtek
4400
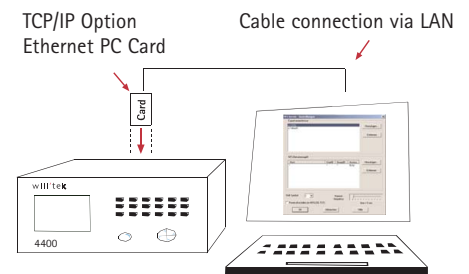
Getting started with the PC and remote connection

To store 4400 files on the remote PC, the computer must be a file server offering NFS (Network File System) capability. NFS server software is available from various vendors. The following are just two examples:

TrueGrid NFS Server from XYZ Scientific Applications, Inc. is a command-line tool that is free of charge. It can be found at www.simtel.net by entering "NFS server" in the Search field on the top-right.

nfsAxe from Lab-NC Ltd. is a shareware program; this means that you can try out the software before deciding to buy and use it for commercial purposes.

The NFS file structure will be familiar to UNIX users as the application allows you to make local directories (with their files and subdirectories) available to external devices and allows you to define access rights.

NFS server software installation

TrueGrid NFS Server

The advantage of this software is that it is free of charge. Download and unpack the software to a local directory (e.g. "c:\Program files\TrueGrid"). Create subdirectory "etc" in the Windows installation directory (e.g. "c:\Windows\ etc" or "c:\WINNT\ etc") and copy the files "exports" and "rpc" to this directory. Modify the exports file to list the server directories that you want to make available on the network. For example: "/d -path=d:\" makes the whole of the local drive D: available; the path that the 4400 sees is /[pc-ip-address]:d.
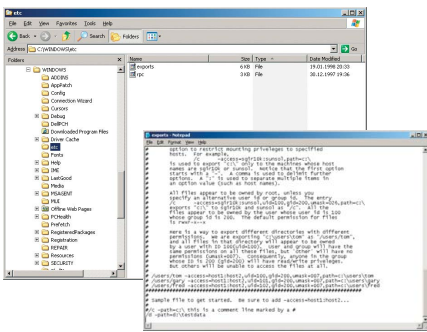
The exports file can also be used to define access rights (e.g. you can make files or directories read-only).

Open a command prompt window and enter the following commands depending on the operating system:

On a Windows 95/98/Me system, enter:
    PORTMAP
    NFS

On a Windows NT/2000/XP system, enter:
   PORTMAP ADD
    NFS ADD
    NFS START

The server is now running. On a Windows NT/2000/XP system the server will automatically restart each time you start your PC.

nfsAxe

This NSF software is inexpensive and provides a graphical user interface to define settings. You can see which devices are trying to connect to the PC, which is very helpful for debugging purposes. Download

the software and unzip it to a temporary directory on your PC. Run setup.exe if it has not started automatically. This will install nfsAxe on your computer and create a number of icons in a new program group within your **Start > Programs** menu.

Follow the on-screen instructions. Run NFS Server from the new program group and click "Export...". Add at least one export directory. Note that directory names are automatically converted to lowercase. Add NFS User Access Rights for all UserIDs and GroupIDs, and disable "Only read access" (e.g. the 4400 is permitted to read from and write to the file server). Close the Export dialogue box. The NFS server is now ready to operate.
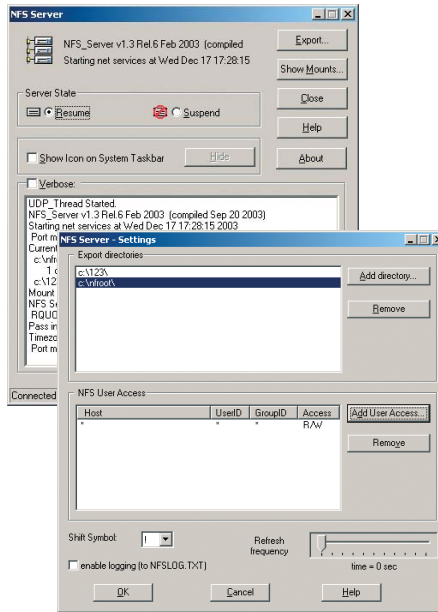

4400 Settings

For saving files on an NFS server on the network, some parameter settings are required on the 4400. These parameters can be set in the 4400 TCP/IP section of the Tools > Config > I/O menu.
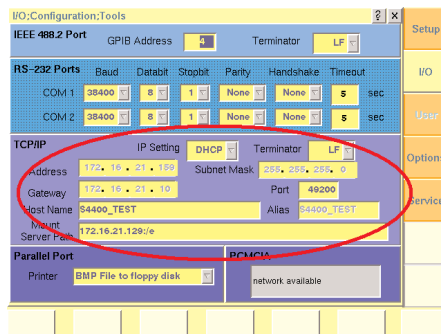
Before starting, you need to know if you are going to use a fixed IP address or allow the network to assign an IP address through DHCP. On most networks, DHCP will work very well. However, if your network will not allow you to use DHCP assigned IP addresses, or if you are using a PC and a cross over cable as your server, you will need to use fixed addressing.

You will also need to know the IP address of your server. The IP address of the file server can be found by opening a command prompt window on the PC and entering the following command: ipconfig. This will result in the IP address of the server being displayed.
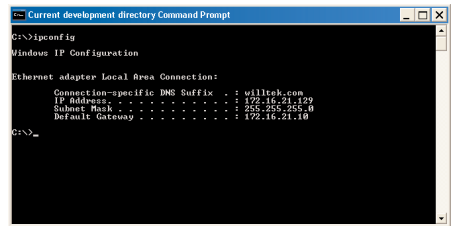
DHCP

To use DHCP, select DHCP in the IP Setting drop box. If the status message in the PCMCIA box says **TCP/IP changed, please reboot** you must reboot before you can continue.

Next set the Mount Server path. This is the IP address of the file server and the path that the server provides for external devices. In this example, assuming that the path of the exported directory is e (defined as /e -path=e:\ if using the TrueGrid NFS server, or exporting the entire E:/ drive if using WinAxe Server software), the mount path for this system would be 172.16.21.129:/e

FIXED

To use fixed IP addressing, select FIXED in the IP Setting drop box. If the status message in the PCMCIA box says **TCP/IP changed, please reboot** you must reboot before you can continue. The next step is to assign an IP address to the 4400. The IP address can be divided into four sections as aaa.bbb.ccc.ddd. When assigning the IP address of the 4400, the portions represented by aaa, bbb, and ccc should be the same as the address of the server. The portion represented by ddd should

be unique for each device that is on the network. Valid values for ddd are numbers from 0 to 255. For this example, a valid IP address for the 4400 would be 172.16.21.201. If the status message in the PCMCIA box says **TCP/IP changed, please reboot** you must reboot before you can continue.

Now the gateway address should be set up. The gateway address should be the same as the gateway address of the PC. In this example, set the gateway address to 172.16.21.10. If the status message in the PCMCIA box says **TCP/IP changed, please reboot** you must reboot before you can continue.

Next set up the subnet mask. This also should be set the same as the subnet mask of the server. In this example, set the subnet mask to 255.255.255.0. If the status message in the PCMCIA box says **TCP/IP changed, please reboot** you must reboot before you can continue.

Now set up the Mount Server path. This is the IP address of the file server and the path that the server provides for external devices. In this example, assuming that the path of the exported directory is e (defined as /e -path=e:\ if using the True-Grid NFS server, or exporting the entire E:/ drive if using WinAxe Server software), the mount path for this system would be 172.16.21.129:/e

Testing the set-up

The 4400 should now be able to "see" the directory that the file server provides over the NFS server software. To check if it works, select the **Tools > RAPID!** environment. There should be a new entry "/io/server" with the directories and files from the file server. Depending on the access rights for external users and devices, it should now be possible to read and/or write files in these locations.

To ensure that the 4400 is properly connected and its TCP/IP software is running, use the command line window on the PC to enter: "ping [4400-address]" where [4400-address] is the 4400 IP address that you entered in the I/O menu. The command results in a few data packets being sent to the 4400; the 4400 should respond within a few milliseconds. If both the 4400 and the PC are connected to the network but the 4400 cannot see the drive, check the mounted server path in **Tools > Config > I/O**; ensure that the address is correct, with a colon and a slash between the server IP address and the exported directory name (example: "172.16.19.54 :/c/nfroot"). Note that directory names should be lowercase. If the 4400 still cannot see the drive, configure any firewall software that may be running on the PC to ensure that it will allow access to the 4400.

About the 4478 TCP/IP Option

The versatility and accuracy of the 4400 series provide outstanding measurement capability to manufacturing and support groups in the mobile industry. With the networking ability provided by the 4478 TCP/IP Option, the full benefits of the 4400 are enhanced and can be accessed remotely via the LAN (local area network). Applications include:

- Download of firmware updates so all the machines run with the same functionality.
- Providing access to files on the 4400 hard disk from a remote location so results can be easily extracted and analysed e.g. for phone performance.
- Loading new operating programs ensuring consistent testing is performed.
- Full remote control via SCPI commands to allow automatic control with full functionality.

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