ATK-DLMP257B

Factory system NFS setup manual

V1.0

ALIENTEK

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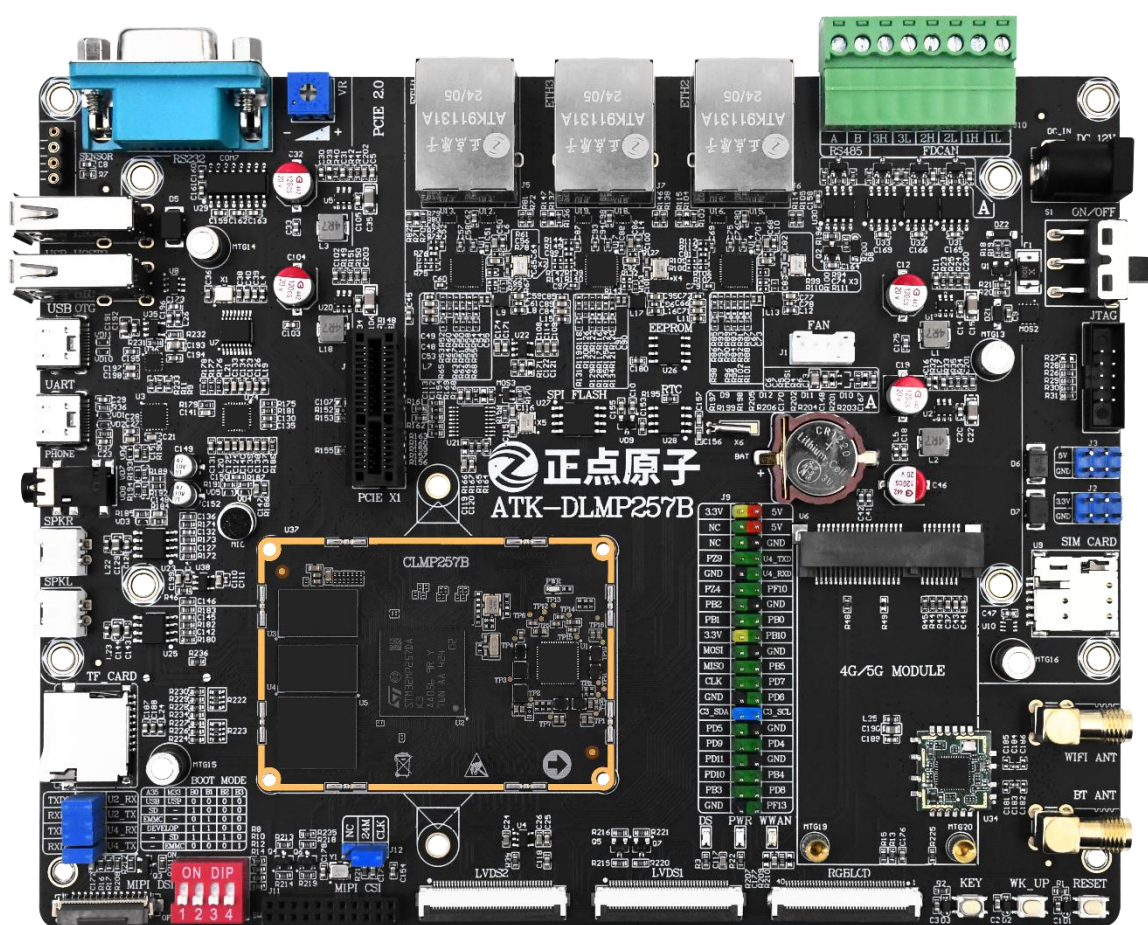
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Catalogue

Introduction

In this chapter, you learned how to set up and configure NFS (Network File System) in Ubuntu and integrate it with your board. NFS (Network File System) is a network file sharing protocol, developed by SUN Corporation, which allows users to access files on remote servers through the network, and the experience is similar to the local file system. In embedded development, NFS is often used to share the root filesystem between a host (such as Ubuntu) and a development board to facilitate debugging and development.

This chapter goes through the process of installing and configuring an NFS server on Ubuntu in detail, including creating an NFS shared directory, modifying the associated configuration files, and starting and checking the status of the NFS server. At the same time, it will also show how to mount the NFS shared directory on the development board to access and modify files through the network, and finally configure and test the NFS environment. Through the study of this chapter, developers can master the basic configuration method of NFS, build a stable network file sharing environment, and provide convenience for subsequent embedded development work.

Chapter 1. Setting Up an NFS environment

1.1 Introduction to NFS

Network File System(NFS) is a UNIX presentation layer protocol developed by SUN Corporation, which enables users to access files elsewhere on the network as if they were using their own computer. We can make the board's root filesystem on Ubuntu and then use NFS to load the root filesystem into the board's DDR..

1.2 Installing the NFS server

In an Ubuntu terminal, run the following command to install NFS.

```
sudo apt-get install nfs-kernel-server
```

```
alientek@ubuntu:~$ sudo apt-get install nfs-kernel-server
[sudo] password for alientek:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  keyutils libevent-2.1-7 libnfsidmap2 libtirpc-common libtirpc3 nfs-common rpcbind
Suggested packages:
  open-iscsi watchdog
The following NEW packages will be installed:
  keyutils libevent-2.1-7 libnfsidmap2 libtirpc-common libtirpc3 nfs-common nfs-kernel-server
  rpcbind
0 upgraded, 8 newly installed, 0 to remove and 60 not upgraded.
Need to get 642 kB of archives.
After this operation, 2,346 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://us.archive.ubuntu.com/ubuntu focal-updates/main amd64 libtirpc-common all 1.2.5-1ubu
ntu0.1 [7,712 B]                                          The rest is too long to show
Get:2 http://us.archive.ubuntu.com/ubuntu focal-updates/main amd64 libtirpc3 amd64 1.2.5-1ubuntu0
```

Figure 1 Installing the NFS service

1.3 NFS shared directories

Create a new NFS shared directory and give the NFS directory read, write, and execute permissions.

```
sudo mkdir /home/alientek/linux/nfs
sudo chmod 777 /home/alientek/linux/nfs/
```

```
alientek@ubuntu:~$ sudo mkdir /home/alientek/linux/nfs
alientek@ubuntu:~$ sudo chmod 777 /home/alientek/linux/nfs/
alientek@ubuntu:~$ ls -l /home/alientek/linux/
total 8
drwxrwxrwx 2 root     root     4096 Apr  1 01:38 nfs
drwxrwxrwx 2 alientek alientek 4096 Apr  1 00:48 tftpboot
```

Figure 2 Creating an NFS shared directory

1.4 Configuring the NFS service

Modify the /etc/default/nfs-kernel-server file.

```
sudo vi /etc/default/nfs-kernel-server
```

Add the NFS version configuration with the following:

```
# Number of servers to start up
RPCNFSDCOUNT="-V 2 8"

# Runtime priority of server (see nice(1))
RPCNFSDPRIORITY=0

# Options for rpc.mountd.
# If you have a port-based firewall, you might want to set up
# a fixed port here using the --port option. For more information,
# see rpc.mountd(8) or http://wiki.debian.org/SecuringNFS
# To disable NFSv4 on the server, specify '--no-nfs-version 4' here
RPCMOUNTDOPTS="-V 2 --manage-gids"

# Do you want to start the svcgssd daemon? It is only required for Kerberos
# exports. Valid alternatives are "yes" and "no"; the default is "no".
NEED_SVCGSSD=""

# Options for rpc.svcgssd.
RPCSVCGSSDOPTS="--nfs-version 2,3,4 --debug --syslog"
```

Figure 3 Modifying the /etc/default/nfs-kernel-server file

Open the /etc/exportsfile by running the following command

sudo vi /etc/exports

Go to /etc/exports.Add the following line at the end of the file.Notice the space in the middle, which is marked in green.

/home/alientek/linux/nfs *(rw,sync,no_root_squash)

/home/alientek/linux/nfs represents the directory shared by NFS

* Allows access to all network segments

rw indicates that the visitor has read-write permission

sync means to write the cache to the device, so to speak

no_root_squash indicates that the visitor has root privileges.

The modifications are shown below.

```
# /etc/exports: the access control list for filesystems which may be exported
#               to NFS clients.  See exports(5).
#
# Example for NFSv2 and NFSv3:
# /srv/homes       hostname1(rw,sync,no_subtree_check) hostname2(ro,sync,no_subtree_check)
#
# Example for NFSv4:
# /srv/nfs4        gss/krb5i(rw,sync,fsid=0,crossmnt,no_subtree_check)
# /srv/nfs4/homes  gss/krb5i(rw,sync,no_subtree_check)
#
home/alientek/linux/nfs *(rw,sync,no_root_squash)
```

Figure 4 Modifying the /etc/exportsfile

Save and exit when you're done.

Restart the NFS server by running the following command:

sudo /etc/init.d/nfs-kernel-server restart

```
alientek@ubuntu:~$ sudo /etc/init.d/nfs-kernel-server restart
Restarting nfs-kernel-server (via systemctl): nfs-kernel-server.service.
```

Figure 5 Restarting the NFS server

Run the following command to view the NFS shared directory:

showmount -e

```
alientek@ubuntu:~$ showmount -e
Export list for ubuntu:
/home/alientek/linux/nfs *
```

Figure 6 Viewing an NFS shared directory

1.5 Network Environment

Make sure the network is working and Ubuntu, Windows, and the board are ping each other.

Here combined with their own network configuration to verify, the author here for:

Development board IP：192.168.6.44

Virtual machine IP：192.168.6.97

1.6 NFS testing

Create a test.c file in /home/alientek/linux/nfs and write hello alientek!

```
alientek@ubuntu:~$ cd /home/alientek/linux/nfs/
alientek@ubuntu:~/linux/nfs$ vi test.c
alientek@ubuntu:~/linux/nfs$ cat test.c
hello alientek!
```

Figure 7 Creating the test.c file

In the development board factory system execute the following instructions to set the development board IP, create a get directory, will virtual machine(192.168.6.97) The NFS shared directory is mounted into the get directory of the board.

mkdir getnfs

mount -t nfs -o nolock,nfsvers=3 192.168.6.97:/home/alientek/linux/nfs getnfs/

After successful mount, go to the getnfs directory to view the mounted files.

```
root@ATK-DLMP257:/getnfs# ls
test.c
root@ATK-DLMP257:/getnfs# cat test.c
hello world
```

Figure 8 Viewing an NFS mount file