3 Basic Network Service and Application Configuration

3.1 Lab 1: FTP Configuration

3.1.1 Introduction

3.1.1.1 About This Lab

Multiple file management modes are supported,

such as File Transfer Protocol (FTP), Trivial File Transfer Protocol (TFTP), and Secure File Transfer Protocol (SFTP). You can select one based on service and security requirements.

A device can work as either a server or a client.

- If the device works as a server, you can access the device from a client to manage files on the device and transfer files between the client and device.
- If the device works as a client, you can access another device (the server) from the device to manage and transfer files.

3.1.1.2 Objectives

Upon completion of this task, you will be able to:

- Understand how an FTP connection is established
- Learn how to configure FTP server parameters
- Learn how to transfer files to an FTP server

3.1.1.3 Networking Topology

R1 needs to manage the configuration file of R2.

R1 functions as the FTP client, and R2 functions as the FTP server.

Figure 3-1 Lab topology for FTP configuration
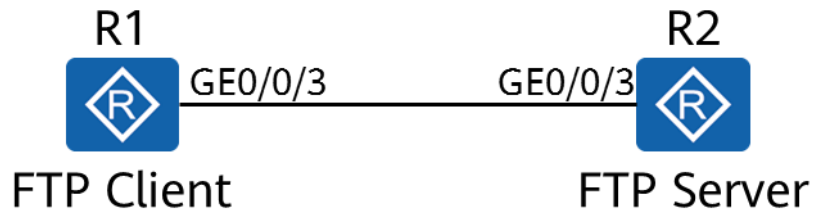
3.1.2 Lab Configuration

3.1.2.1 Configuration Roadmap

1. Configure the FTP server function and parameters.
2. Configure local FTP users.
3. Log in to the FTP server from the FTP client.
4. Perform file operations from the FTP client.

3.1.2.2 Configuration Procedure

Step 1 Complete basic device configuration.

\# Name the devices.

The details are not provided here.

\# Configure the device IP addresses.

```
[R1]interface GigabitEthernet 0/0/3
[R1-GigabitEthernet0/0/3]ip address 10.0.12.1 24
```

```
[R2]interface GigabitEthernet 0/0/3
[R2-GigabitEthernet0/0/3]ip address 10.0.12.2 24
[R2-GigabitEthernet0/0/3]quit
```

\# Save the configuration file for subsequent verification.

```
<R1>save test1.cfg
 Are you sure to save the configuration to test1.cfg? (y/n)[n]:y
 It will take several minutes to save configuration file, please wait........
 Configuration file had been saved successfully
 Note: The configuration file will take effect after being activated
```

```
<R2>save test2.cfg
 Are you sure to save the configuration to test2.cfg? (y/n)[n]:y
 It will take several minutes to save configuration file, please wait.......
 Configuration file had been saved successfully
 Note: The configuration file will take effect after being activated
```

\# Display the current file list.

```
<R1>dir
Directory of flash:/
```

```
Idx  Attr   Size(Byte)      Date  Time(LMT)        FileName
  0  -rw-   126,538,240     Jul 04 2016 17:57:22     ar651c- v300r019c00Sspc100.cc
  1  -rw-   23,963          Feb 21 2020 09:22:53     mon_file.txt
  2  -rw-   721             Feb 21 2020 10:14:33     vrpcfg.zip
  3  drw-   -               Jul 04 2016 18:51:04     CPM_ENCRYPTED_FOLDER
  4  -rw-   783             Jul 10 2018 14:46:16     default_local.cer
  5  -rw-   0               Sep 11 2017 00:00:54     brdxpon_snmp_cfg.efs
  6  drw-   -               Sep 11 2017 00:01:22     update
  7  drw-   -               Sep 11 2017 00:01:48     shelldir
  8  drw-   -               Feb 20 2020 21:33:16     localuser
  9  drw-   -               Sep 15 2017 04:35:52     dhcp
 10  -rw-   509             Feb 21 2020 10:18:31     private-data.txt
 11  -rw-   2,686           Dec 19 2019 15:05:18     mon_lpu_file.txt
 12  -rw-   3,072           Dec 18 2019 18:15:54     Boot_LogFile
 13  -rw-   1,390           Feb 21 2020 10:18:30     test1.cfg

510,484 KB total available (386,448 KB free)



<R2>dir
Directory of flash:/

Idx  Attr   Size(Byte)      Date  Time(LMT)        FileName
  0  -rw-   126,538,240     Jul 04 2016 17:57:22     ar651c- v300r019c00Sspc100.cc
  1  -rw-   11,405          Feb 21 2020 09:21:53     mon_file.txt
  2  -rw-   809             Feb 21 2020 10:14:10     vrpcfg.zip
  3  drw-   -               Jul 04 2016 18:51:04     CPM_ENCRYPTED_FOLDER
  4  -rw-   782             Jul 10 2018 14:48:14     default_local.cer
  5  -rw-   0               Oct 13 2017 15:36:32     brdxpon_snmp_cfg.efs
  6  drw-   -               Oct 13 2017 15:37:00     update
  7  drw-   -               Oct 13 2017 15:37:24     shelldir
  8  drw-   -               Feb 20 2020 20:51:34     localuser
  9  drw-   -               Oct 14 2017 11:27:04     dhcp
 10  -rw-   1,586           Feb 21 2020 10:16:51     test2.cfg
 11  -rw-   445             Feb 21 2020 10:16:52     private-data.txt
 12  -rw-   4,096           Aug 06 2019 11:19:08     Boot_LogFile

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The configuration files of the two devices are saved successfully.
```

Step 2 Configure the FTP server function and parameters on R2.

```
[R2]ftp server enable
Info: Succeeded in starting the FTP server
```

The **ftp server enable** command enables the FTP server function. By default, the FTP function is disabled.

Other optional configuration parameters include the port number of the FTP server, source IP address of the FTP server, and maximum idle time of FTP connections.

Step 3 Configure local FTP users.

```
[R2]aaa
[R2-aaa]local-user ftp-client password irreversible-cipher Huawei@123
Info: Add a new user.
[R2-aaa]local-user ftp-client service-type ftp
[R2-aaa]local-user ftp-client privilege level 15
```

The user level is specified. The user level must be set to 3 or higher to ensure successful connection establishment.

```
[R2-aaa]local-user ftp-client ftp-directory flash:/
```

The authorized directory of the FTP user is specified. This directory must be specified. Otherwise, the FTP user cannot log in to the system.

Step 4 Log in to the FTP server from the FTP client.

Log in to the FTP client.

```
 <R1>ftp 10.0.12.2
Trying 10.0.12.2 ...

Press CTRL+K to abort
Connected to 10.0.12.2.
220 FTP service ready.
User(10.0.12.2:(none)):ftp-client
331 Password required for ftp-client.
Enter password:
230 User logged in.

[R1-ftp]
You have logged in to the file system of R2.
```

Step 5 Perform operations on the file systems on R2.

Configure the transmission mode.

```
 [R1-ftp]ascii
200 Type set to A.
```

Files can be transferred in ASCII or binary mode.

ASCII mode is used to transfer plain text files, and binary mode is used to transfer application files, such as system software, images, video files, compressed files, and database files. The configuration file to be downloaded is a text file.

Therefore, you need to set the mode to ASCII. The default file transfer mode is ASCII. This operation is for demonstration purpose only.

Download the configuration file.

```
[R1-ftp]get test2.cfg
200 Port command okay.
150 Opening ASCII mode data connection for test2.cfg.
226 Transfer complete.
FTP: 961 byte(s) received in 0.220 second(s) 4.36Kbyte(s)/sec.
```

Delete the configuration file.

```
[R1-ftp]delete test2.cfg
Warning: The contents of file test2.cfg cannot be recycled. Continue? (y/n)[n]:y
250 DELE command successful.
```

Upload the configuration file.

```
[R1-ftp]put test1.cfg
200 Port command okay.
150 Opening ASCII mode data connection for test1.cfg.
226 Transfer complete.
FTP: 875 byte(s) sent in 0.240 second(s) 3.64Kbyte(s)/sec.
```

Close the FTP connection.

```
[R1-ftp]bye
221 Server closing.
```

```
<R1>
```

----End

3.1.3 Verification

Display the file directories of R1 and R2.

```
<R1>dir
```

```
Directory of flash:/

 Idx  Attr   Size(Byte)      Date  Time(LMT)      FileName
  0  -rw-   126,538,240     Jul 04 2016 17:57:22        ar651c- v300r019c00Sspc100.cc
  1  -rw-      23,963       Feb 21 2020 09:22:53        mon_file.txt
  2  -rw-        721        Feb 21 2020 10:14:33        vrpcfg.zip
  3  drw-         -         Jul 04 2016 18:51:04        CPM_ENCRYPTED_FOLDER
  4  -rw-        783        Jul 10 2018 14:46:16        default_local.cer
  5  -rw-         0         Sep 11 2017 00:00:54        brdxpon_snmp_cfg.efs
  6  drw-         -         Sep 11 2017 00:01:22        update
  7  drw-         -         Sep 11 2017 00:01:48        shelldir
  8  drw-         -         Feb 20 2020 21:33:16        localuser
  9  drw-         -         Sep 15 2017 04:35:52        dhcp
 10  -rw-       1,586       Feb 21 2020 10:26:10        test2.cfg
● 11  -rw-        509             Feb 21 2020 10:18:31          private-data.txt
 12  -rw-       2,686       Dec 19 2019 15:05:18        mon_lpu_file.txt
 13  -rw-       3,072       Dec 18 2019 18:15:54        Boot_LogFile
 14  -rw-       1,390       Feb 21 2020 10:18:30        test1.cfg

510,484 KB total available (386,444 KB free)
```

```
<R2>dir
Directory of flash:/

 Idx  Attr   Size(Byte)      Date Time(LMT)       FileName
  0  -rw-   126,538,240     Jul 04 2016 17:57:22        ar651c- v300r019c00Sspc100.cc
  1  -rw-      11,405       Feb 21 2020 09:21:53        mon_file.txt
  2  -rw-        809        Feb 21 2020 10:14:10        vrpcfg.zip
  3  drw-         -         Jul 04 2016 18:51:04        CPM_ENCRYPTED_FOLDER
  4  -rw-        782        Jul 10 2018 14:48:14        default_local.cer
  5  -rw-         0         Oct 13 2017 15:36:32        brdxpon_snmp_cfg.efs
  6  drw-         -         Oct 13 2017 15:37:00        update
  7  drw-         -         Oct 13 2017 15:37:24        shelldir
  8  drw-         -         Feb 20 2020 20:51:34        localuser
  9  drw-         -         Oct 14 2017 11:27:04        dhcp
 10  -rw-       1,390       Feb 21 2020 10:25:42        test1.cfg
 11  -rw-        445        Feb 21 2020 10:16:52        private-data.txt
 12  -rw-       4,096       Aug 06 2019 11:19:08        Boot_LogFile

510,484 KB total available (386,464 KB free)
```

3.1.4 Configuration Reference

Configuration on R1

```
#
 sysname R1
#
interface GigabitEthernet0/0/3
 ip address 10.0.12.1 255.255.255.0
#
return
```

Configuration on R2

```
#
 sysname R2
#
aaa
local-user ftp-client password irreversible-cipher
%^%#'XqV;f=C;/1!\sQ6LA+Ow8GBO;W%0HBf0`>p(`[SpV]J%Amom!na3:4RvFv@%^%#
 local-user ftp-client privilege level 15
 local-user ftp-client ftp-directory flash:/
 local-user ftp-client service-type ftp
#
interface GigabitEthernet0/0/3
 ip address 10.0.12.2 255.255.255.0
#
 ftp server enable
```

```
#
user-interface vty 0 4
 authentication-mode aaa
 user privilege level 15
#
return
```

3.1.5 Quiz

1. Does FTP work in active or passive mode by default?