

Quick Note 055

Configure a Digi TransPort Router with NAT to a Passive FTP Server.

Digi Support March 2015

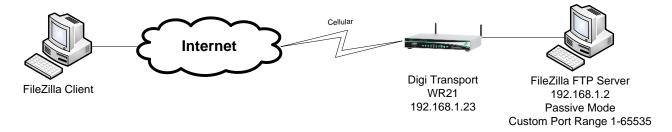
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1 INTRODUCTION

1.1 Introduction

This document will show how to configure IP+Port NAT (Network Address Translation) and the required additional settings for successfully connecting a Passive FTP Server behind the Digi TransPort Router.



In this example, a free FTP server configured in Passive Mode will be used: FileZilla Server. The Server will be connected via ETH 0 to a Digi TransPort WR21. The Client will use Filezilla Client and be configured to Passive Mode only.

1.2 Assumptions

This guide has been written for use by technically competent personnel with a good understanding of the communications technologies used in the product and of the requirements for their specific application. It also assumes a basic ability to access and navigate a Digi TransPort router.

This application note applies only to:

Model: DIGI TransPort WR21/41/44

<u>Please note</u>: If using multiple Passive FTP Servers, Enterprise firmware will be required on Digi TransPort WR21/41 to allow firewall usage.

Firmware versions: 5246 and later

Configuration: This document assumes that the devices are set to their factory default configurations. Most configuration commands are shown only if they differ from the factory default.

<u>Please note</u>: This application note has been specifically rewritten for firmware release 5246 and later but will work on earlier versions of firmware. Please contact <u>tech.support@digi.com</u> if your require assistance in upgrading the firmware of the TransPort router.

1.3 Corrections

Requests for corrections or amendments to this application note are welcome and should be addressed to: <u>tech.support@digi.com</u> Requests for new application notes can be sent to the same address.

2 VERSION

Version Number	Status
1.0	Published

3 FILEZILLA SERVER INSTALLATION AND CONFIGURATION

3.1 Install FileZilla Server

FileZilla Server is a Free FTP/FTPS/SFTP server tool that can be downloaded from SourceForge : <u>https://filezilla-project.org/download.php?type=server</u>

Start the installation and follow the on screen instructions.

At the end of the Installation, start FileZilla Server.

3.2 Configure FileZilla Server

3.2.1 Server Configuration

In the main window, click Edit and Settings

🔁 FileZilla Server (::1)				
File Server Edit ?				
🗲 🔒 🐘 (Settings	C:\ 🔝 🔻			
Users Users 000001118/03/20 Groups 00000118/03/20 Forups 00000118/03/2015 22.501 00000118/03/2015 22.501 00000118/03/2015 22.571 00000118/03/2015 22.771 00000118/03/2015 12.771 00000118/03/2015 12.731 00000118/03/2015 12.8231 000000118/03/2015 12.8231 000000118/03/2015 12.8231 000000118/03/2015 12.8231 000000118/03/2015 12.8231 000000118/03/2015 12.8231 000000118/03/2015 12.8231 000000118/03/2015 12.8231 000000118/03/2015 12.8231 000000118/03/2015 12.8230 000000118/03/2015 12.8230 000000118/03/2015 12.8230 000000118/03/2015 12.8230 000000118/03/2015 12.8230 000000118/03/2015 12.8230 000000118/03/2015 12.8230 000000118/03/2015 12.8230 000	r (192.168.123): 257 "/" is current directory. r (192.168.123): TYPE I r (192.168.123): 200 Type set to I r (192.168.123): TYPE I r (192.168.123): TYPE I r (192.168.123): 200 Type set to I r (192.168.123)			
ID 🗠 Account	IP Transfer		Progress	Speed
Displays the options dialog		108 bytes received 0	B/s 882 bytes sen	t 0 R/s 🔍 🖉

Under **General settings**, select the listening port of the FTP Server. This is the port the WR21 will later use to send the FTP traffic to. By default, the value is **21**.

General settings	General settings		Fi	eZilla Serve
- Welcome message - IP bindings - IP Filter Passive mode settings Security settings Miscellaneous Admin Interface settings	Connection settings	21 0	List of ports between 1 and 65535. (0 for unlimited	
- Logging - Speed Limits - Filetransfer compression - SSL/TLS settings - Autoban	Performance settings	2	This value should be a multiple of the number of processors installed on your system. Increase this value if your server is under heavy load.	
	Timeout settings			
	Connections timeout:	120	in seconds (1-9999, 0 for no timeout).	
ОК	No <u>T</u> ransfer	600	in seconds (600-9999, 0 for no timeout). This value specifies the time a user has to initiate a file transfer.	
Cancel	L <u>og</u> in	60	in seconds (1-9999, 0 for no timeout). This value specifies the time in which a new user has to login.	

Under **Passive mode settings**, click **Use custom port range** and chose the port range to use for Passive mode. This is the port the server will use as outgoing. By default, the range is **1 – 65535**

General settings	Passive mode settings		FileZilla Server
Welcome message IP bindings IP Filter Passive mode settings Security settings Miscellaneous Admin Interface settings Logging Speed Limits Filetransfer compression SSL/TLS settings Autoban	Use custom port range: 1 - 65	Use custom PASV settings if yo are operating the server from behind a NAT router or a firewall. In that case, the IP address of the server is not accessible from outside of the router, so you should fill in the correct address here. Use the port range to limit the number	
OK Cancel	http://ip.filezilla-project.org/ip.ph Information for users with dynamic IPs: If take up to 5 minutes after the next failed in recognizes the changed IP. In most cases, the IP is updated within 30 Image: Don't use external IP for local connect	transfer until FileZilla Server Is after a failed transfer.	₩ ht

Click OK.

3.2.2 User Configuration

In order to allow access to the FTP Server, it is required to create users and assign each users a "Shared Folder". To do so, click on the user icon in the toolbar

🔁 FileZilla	Server (::1)						ſ	
<u>F</u> ile <u>S</u> erve	r <u>E</u> dit <u>?</u>							
🗲 🔒 🗽	🖌 🖸 😤 🤻 🗍 /C/ Ci\ 🚦	. –						
Copyright 2001- https://filezilla-p Connecting to s Connected, wai Logged on Retrieving acco Done retrieving	version 0.9.49 beta 2015 by Tim Kosse (tim kosse @ roject.org/ enver [::1]:14147 ting for authentication unt settings, please wait account settings 2015 16:18:09 - testuser (192.1							
Retrieving acco Done retrieving (000006)18/03, (000006)18/03, (000006)18/03, (000006)18/03,	(2015 16:18:09 - testuser (192.1 unt settings, please wait account settings (2015 16:18:39 - testuser (192.1 (2015 16:18:39 - testuser (192.1 (2015 16:19:09 - testuser (192.1 (2015 16:19:09 - testuser (192.1	68.1.23)> TYPE I 68.1.23)> 200 Type s 68.1.23)> PWD 68.1.23)> 257 "/" is o	current directory.					_
ID 🛆	Account	IP	Transfer			Progress	Speed	
- © -000006	testuser	192.168.1.23						
Ready				19 bytes received	0 B/s	58 bytes sent	t 0 B/s	· · ·

Select **General**, click on **Add**. Choose a name for the user, in this example: **testuser**. Enter a password in the **password** field

Users		×
Page: General Shared folders Speed Limits IP Filter	Account settings Image: Enable account Imag	Users testuser Add <u>R</u> emove Re <u>n</u> ame Copy
OK Cancel	You can enter some comments about the user	

Select **Shared folders**, click on **Add** and select the desired directory on the system to be the root of the FTP Server for this user account. Assign the rights for files and directories by clicking the appropriate boxes on the right.

Users		×
Page: General Shared folders Speed Limits IP Filter	Shared folders Users Directories Aliases CAFTP Write Directories Append Directories Polete V Create Polete V List Add Remove Set as home dir Add Remove Add Remove Set as home dir Rame Copy Set as home dir Rame Copy A directory alias will also appear at the specified location. Aliases must contain the full virtual path Separate multiple aliases for one directory with the pipe character (1) If using aliases, please avoid cyclic directory structures, it will only confuse FTP clients.	
OK Cancel		

Click OK.

4 DIGI TRANSPORT CONFIGURATION

4.1 NAT Configuration

If the default route interface used is the Mobile Interface:

Configuration – Network > Interfaces > Mobile

	letwork > <u>Interfaces</u> > <u>Mobile</u>		
MODILE NE	twork Settings		
	NAT on this interface address		
🗌 Enable	IPsec on this interface		
🗌 Enable	the firewall on this interface		
▶ Mobile	Firmware (OTA) Update		
> SIM Se	lection		
► Advance	ed		
> SMS Se	ettings		
•			•
Apply			

Click **Enable NAT on this interface** and select **IP address and Port** as the option. This will allow to forward incoming FTP traffic on a specified port and forward it to the server on its configured port (by default 21)

Click Apply

Configuration – Network > IP Routing/Forwarding > IP Port Forwarding/Static NAT Mappings

P Port Forward	ling/Static N	IAT Mappings				
In order to f		external networl internal port, an t".			n	
(you may co	nfigure up to	30 forwarding ru	les):			
External Min Port	External Max Port	Forward to Internal IP Address	Forward to Internal Port			
No mappings	have been con	figured				
1515	1515	192.168.1.2	21	Add		
	•					

Choose the incoming port that will be used for FTP traffic and forwarded to the Server's local IP and default port 21. In this example, **1515** is used.

4.2 Single Passive FTP Server configuration

For a Single FTP Server, follow the steps below. For multiple FTP Server configurations, go to Section 4.3

The standard Port Forwarding table will not be able to forward Passive FTP traffic properly without an additional setting to be set via CLI (Command Line). This command will then allow the specified port (same as entered previously) to be used as a NAT port for FTP as long as it matches an External port in the NAT Mappings table.

<u>Please Note</u>: This command will only work to forward 1 FTP connection. Move to the next section for multiple FTP Server forwarding connections.

Administration – Execute a command

Administration - Execute a command	
Command: cmd 0 ftpnatport 1515	
Command: cmd 0 ftpnatport 1515	
OK	

The command to be used is:

cmd 0 ftpnatport **1515**

1515: Port number used in the NAT Mapping table.

Click Execute.

Jump to the next Section 5 for Client Configuration and Testing

4.3 Multiple Passive FTP Server configuration

For multiple FTP Server configurations, follow the steps below. For Single FTP Server configurations, go to <u>Section 4.2</u>

The standard Port Forwarding table will not be able to forward Passive FTP traffic properly without an additional setting to be set via CLI (Command Line). This command will then allow the specified port (same as entered previously) to be used as a NAT port for FTP as long as it matches an External port in the NAT Mappings table.

<u>Please Note</u>: This configuration is intended to be used when a multiple FTP Server configuration is in place and involves using the Firewall. Please note that this setup can be used for a single FTP Server configuration too if preferred.

Configuration – Security > Firewall

System Users			
Firewall			
The firewa	all can	be used to restrict or modify traffic on particular interfaces.	
(You may	/ spec	ifiy up to 750 rules)	
Hits	#	Rule	Action
0	1	pass in break end on ppp 1 proto ftp from any to addr-ppp 1 port=1515 -> to 192.168.1.2 port=ftpcnt	Delete Insert Edit
			Insert

If the firewall is already configured on the device, insert the rule at the top.

If the firewall is not configured and will only be used for this purpose, make sure to delete all rules.

Insert the following line and click OK:

pass	in	break	end	on	ppp	1	proto	ftp	from	any	to	addr-ppp	1	port= 1515	->	to
192.1	.68	.1.2 pc	ort=	21												

1515: External Port used in the NAT Mapping table192.168.1.2: IP Address of the FTP Server21: Internal Port used by the FTP Server

This rule will allow incoming FTP traffic on the Mobile Interface (PPP 1) from any sources to the mobile IP on port 1515. When traffic matches this condition, it will be forwarded to the FTP Server IP address on Port 21.

Repeat this step for any further FTP Server by adding each rules after the next one, for example below with 2 servers

Users			
Firewall			
The firewa	all can	be used to restrict or modify traffic on particular interfaces.	
(You may	y spec	ifiy up to 750 rules)	
Hits	#	Rule	Action
0	1	pass in break end on ppp 1 proto ftp from any to addr-ppp 1 port=1516 -> to 192.168.1.3 port=ftpcnt	Delete Insert Edit
0	2	pass in break end on ppp 1 proto ftp from any to addr-ppp 1 port=1515 -> to 192.168.1.2 port=ftpcnt	Delete Insert Edit
0	3	pass break end	Delete Insert Edit
			Insert

However, another rule will be necessary to allow any other traffic in and out (to have the router act as if the firewall was not enabled)

AFTER the previous line, insert the following rule

pass break end

The firewall configuration should now look like this

' Firewall								
The firewall can be used to restrict or modify traffic on particular interfaces.								
(You ma	y spec	ifiy up to 750 rules)						
Hits	#	Rule	Action					
0	1	pass in break end on ppp 1 proto ftp from any to addr-ppp 1 port=1515 -> to 192.168.1.2 port=ftpcnt	Delete Insert Edit					
0	2	pass break end	Delete Insert Edit					
			Insert					

Click	Save
-------	------

Enable the Firewall on the interface

Configuration – Security > Firewall

figuration - S	Security >	Firewall
ETH 3		
ETH 4		
ETH 5		
ETH 6		
ETH 7		
ETH 8		
ETH 9		
PPP 0		
PPP 1	~	
PPP 2		
PPP 3		
PPP 4		
PPP 5		
PPP 6		
PPP 7		
Stateful 1	Inspectio	n Setting
Apply		

Check **PPP 1**, click **Apply** and **Save** configuration.

5 FILEZILLA CLIENT CONFIGURATION

5.1 Install FileZilla Client

FileZilla Client is a Free FTP/FTPS/SFTP client tool that can be downloaded from SourceForge : <u>https://filezilla-project.org/download.php?type=client</u>

Start the installation and follow the on screen instructions.

At the end of the Installation, start FileZilla Client.

5.2 Configure FileZilla Client for Passive Mode

To open FileZilla configuration, click on Edit and select Settings.

F Fi	leZill	а						
File	Edit	View	Transfer	Server	Bookmarks	ł		
- W		Network configuration wizard						
Host		Clear private data						
		Setting	S]		

Select **FTP** on the left side and under **Transfer Mode**, choose **Passive** and uncheck "**Allow fall back to other transfer mode on failure**". This will prevent FileZilla to try and use Active Mode.

Settings	—
Select page: -Connection -Active mode -Passive mode -FTP Proxy -SFTP -Generic proxy -Transfers -File Types -File exists action -Interface -Date/time format -Filesize format -Filesize format -File lists -Language -File editing	Transfer Mode
ОК	
<u>C</u> ancel	

Select **Passive Mode** on the left side and make sure that "**Use the server's external IP address instead**" is selected

Settings	
Select page: -Connection -FTP -Active mode -Passive mode -FTP Proxy -SFTP -Generic proxy -Transfers -File zvists action -Interface -Date/time format -Filesize format -File lists -Language -File editing	Passive mode Some misconfigured remote servers which are behind a router, may reply with their local IP address. Subset the server's external IP address instead Eall back to active mode
ОК	
<u>C</u> ancel	

Click OK.

6 TESTING

Open FileZilla Client and enter the following details to connect to the FTP Server

E FileZilla			- • ×
<u>File Edit View Transfer Server B</u> ookmarks <u>H</u> elp <u>N</u> ew	version available!		
방 🗸 🛞 🗉 🐏 🗶 😫 🔚 😭 👘	ñ.		
Host: 90.121.92.233 Username: testuser Password:	••••••• Port: 1515 Quickconnect V		
Response: 200 Type set to I Status: Sending keep-alive command	,		*
Command: NOOP			
Response: 200 OK Status: Disconnected from server			=
			-
Local site: \	-	Remote site:	*
E Tesktop	× E		
My Documents			
Gomputer	•		
Filename	Filesize Filetype Last modified	Filename	Filesize Filetype Last modifi
📲 C	Local Disk		
🥔 D:	CD Drive	Not connected to any server	
🥔 E:	CD Drive		
		()	E F
Selected 1 directory.		Not connected.	
Server/Local file Direc Remote file	Size Priority Status		
Queued files Failed transfers Successful transfers			
Queueu mes Palleu transiers Successiul transfers			B30 -
			👯 Queue: empty 🔍 🗨 🚛

Parameter	Setting	Description				
Host	1.2.3.4	IP Address of the TransPort Router's Mobile Interface (PPP 1)				
Username	testuser	Username of the FTP User created on the FTP Server (Section 3.2.2)				
Password	****	Password for the FTP User				
Port	1515	External Port used in the NAT Mapping table				

Once the connection is established, the remote directory content should appear on the right side.

E ftp://testuser@90.121.94.247.1515 - FileZilla		- • ×
Eile Edit View Iransfer Server Bookmarks Help New version available!		
歩 - 二二四 🖄 🖕 🖾 😓 📧 🔿 👘 🧰 👘		
Host: 90.121.94.247 Username: testuser Passyord: ••••••• Port: 1515 Quickconnect •		
Response: 257 "/" is current directory. Command: TYPE I		
Response: 200 Type set to I		
Command: PASV Response: 227 Entering Passive Mode (90,121,94,247,224,218)		
Command: Lat Concerning Found Product		~
Local site: \ Remote site: /		•
e 🧐 Computer 📃 👗		
C (OSDisk)		
⊕_@D: ▼		
Filename Filesize Filetype Last modified Filename Filesize	Filetype	Last modifi
📽 C: Local Disk 🚺		
	Archive	12/5/2013
	Archive	9/5/2013 1:
	Archive	12/11/2014
WR21-5276.2ip 7,257,600	Archive	12/11/2014
		•
		, , , , , , , , , , , , , , , , , , ,
3 directories 4 files. Total size: 22,665,879 bytes		
Server/Local file Direc Remote file Size Priority Status		
Queued files Failed transfers Successful transfers		
		mptv ••
	👯 Queue: ei	mpty

It is possible to verify that Passive mode is being used by looking at the connection log. The following lines should appear

Command:	PASV						
Response:	227	Entering	Passive	Mode (90,	121,	94,247,	224,218)

The FTP Server connection log will show activity and currently connected account

🔁 FileZilla Server (::1)					
<u>File Server Edit ?</u>					
j 🗲 🛍 🐘 🕰 📽 🕴 / /// ex 🎫 🗸					
FileZilla Server version 0.9.49 beta Copyright 2001-2015 by Tim Kosse (tim kosse@filezilla-project.org) https://filezilla-project.org/ Connecting to server [::1]:14147 Connected, waiting for authentication Logged on Retrieving account settings, please wait Done retrieving account settings (000006)18/03/2015 16:18:09 - testuser (192.168.1.23)> NOOP (000006)18/03/2015 16:18:09 - testuser (192.168.1.23)> 200 OK Retrieving account settings, please wait Done retrieving account settings, please wait					
Done retrieving account settings (000006)18/03/2015 16:18:39 - testuser (192.168.1.23)> TYPE I (000006)18/03/2015 16:18:39 - testuser (192.168.1.23)> 200 Type set to I (000006)18/03/2015 16:19:09 - testuser (192.168.1.23)> PWD (000006)18/03/2015 16:19:09 - testuser (192.168.1.23)> 257 "/" is current directory.					
ID 🗠 Account	IP	Transfer		Progress	Speed
- 000006 testuser	192.168.1.23				
Ready			19 bytes received	0 B/s 58 bytes sen	it 0 B/s 🛛 🔍 🥢

7 TRANSPORT CONFIGURATION

Find below the Digi TransPort WR21 Configuration used in this example. Highlighted are required part of the configuration.

```
eth 0 IPaddr "192.168.1.23"
eth 0 gateway "192.168.1.254"
eth 1 IPaddr "192.168.2.23"
addp 0 enable ON
lapb 0 ans OFF
lapb 0 tinact 120
lapb 1 tinact 120
lapb 3 dtemode 0
lapb 4 dtemode 0
lapb 5 dtemode 0
lapb 6 dtemode 0
ip 0 cidr ON
def route 0 ll ent "ppp"
def route 0 ll add 1
nat 0 minport 1515
nat 0 maxport 1515
nat 0 IPaddr "192.168.1.2"
nat 0 mapport 21
dhcp 0 respdelms 500
dhcp 0 mask "255.255.255.0"
dhcp 0 gateway "192.168.1.1"
dhcp 0 DNS "192.168.1.1"
sntp 0 server "time.etherios.com"
snmp 0 generictraps ON
dnssel 0 pattern "*"
dnssel 0 svr "8.8.8.8"
ppp 0 timeout 300
ppp 1 name "W-WAN (HSPA 3G)"
ppp 1 phonenum "*98*1#"
ppp 1 username "username"
ppp 1 epassword "password"
ppp 1 IPaddr "0.0.0.0"
ppp 1 timeout 0
ppp 1 do_nat 2
ppp 1 use modem 1
ppp 1 addion 1
ppp 1 autoassert 1
ppp 1 pingip "8.8.8.8"
ppp 1 pingint 30
ppp 1 ipanon ON
ppp 1 r chap OFF
ppp 2 pingip "8.8.8.8"
ppp 2 pingint 30
ppp 3 defpak 16
ppp 4 defpak 16
modemcc 0 info asy add 3
modemcc 0 init str "+CGQREQ=1"
modemcc 0 init str1 "+CGQMIN=1"
modemcc 0 apn "apn"
modemcc 0 link retries 10
modemcc 0 stat retries 30
modemcc 0 sms interval 1
modemcc 0 sms callerid "*"
modemcc 0 sms access 1
modemcc 0 sms concat 10
modemcc 0 init str 2 "+CGQREQ=1"
modemcc 0 init str1 2 "+CGQMIN=1"
```

```
modemcc 0 apn 2 "Your.APN.goes.here"
modemcc 0 link retries 2 10
modemcc 0 stat retries 2 30
ana 0 anon ON
ana 0 llon ON
ana 0 lapdon 0
ana 0 asyon 1
ana O logsize 45
cmd 0 unitid "ss%s>"
cmd 0 cmdnua "99"
cmd 0 hostname "digi.router"
cmd 0 asyled mode 2
cmd 0 ftpnatport 1515
cmd 0 tremto 1200
cmd 0 rcihttp ON
user 0 access 0
user 1 name "username"
user 1 epassword "KD51SVJDVVg="
user 1 access 0
user 2 access 0
user 3 access 0
user 4 access 0
user 5 access 0
user 6 access 0
user 7 access 0
user 8 access 0
user 9 access 0
local 0 transaccess 2
sslsvr 0 certfile "cert01.pem"
sslsvr 0 keyfile "privrsa.pem"
ssh 0 hostkey1 "privSSH.pem"
ssh 0 nb listen 5
ssh 0 v1 OFF
cloud 0 clientconn ON
cloud 0 server "login.etherios.co.uk"
cloud 0 ssl ON
metrics 0 mobile metrics ON
Power Up Profile: 0
OK
```