



Small Business Network Design with Guest Network

A PROJECT REPORT

Submitted by

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Under the guidance of

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Certified that this project report '**SMALL BUSINESS NETWORK DESIGN WITH GUEST NETWORK**' is the bonafide work of **CHANDRAMOULEESVAR V (Reg. No: RA1811032010003), ASHWATH R (Reg. No: RA1811032010008), S ARUT PRAKASH (Reg. No: RA1811032010020), SWETHA M E (Reg. No: RA1811032010037)** who carried out the project under my supervision. Certified further that, to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion or any other candidate.

Signature

A handwritten signature in blue ink, appearing to be 'K C Prabhu Shankar'.

Mr. K C Prabhu Shankar

GUIDE

Assistant Professor,
Dep. of Computer Science
and Engineering

Signature

A handwritten signature in blue ink, appearing to be 'B. Amutha'.

Dr. B. Amutha

Head of Department

Dep. of Computer Science
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Degree/ Course: B.Tech / Computer Science and Engineering – Internet of Things

Student Name: Chandramouleesvar V

Registration Number: RA1811032010003

Title of Work: Small Business Network with Guest Network

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Student Name: Ashwath R

Registration Number: RA1811032010008

Title of Work: Small Business Network with Guest Network

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Degree/ Course: B.Tech / Computer Science and Engineering – Internet of Things

Student Name: S Arut Prakash

Registration Number: RA1811032010020

Title of Work: Small Business Network with Guest Network

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To be completed by the student for all assessments

Degree/ Course: B.Tech / Computer Science and Engineering – Internet of Things

Student Name: Swetha M E

Registration Number: RA1811032010037

Title of Work: Small Business Network with Guest Network

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Our sincere respect and thanks to my guide, Mr. K.C Prabu Shankar, Assistant Professor (O.G.), Department of Computer Science and Engineering, SRM Institute of Science and Technology, for providing me an opportunity to pursue my project under his/her mentorship. He provided me the freedom and support to explore the research topics of my interest. His passion for solving the real problems and making a difference in the world has always been inspiring.



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PROJECT SCOPE

A small business network has to be designed for an organization. The organization has occasional guest users (Max 10) visiting the office. There are a total of 70 users in the organization. A FTP server has to be implemented for file transfer across the network.

OBJECTIVES

- To setup a small business network for a organization
- Admin network which can handle a maximum of 70 users
- Guest network which can handle a maximum of 10 users
- A FTP server for file transfer with restricted access for the Guest network



NETWORK REQUIREMENTS

1. Separate subnet for guest and LAN network
2. Restricted access for Guest
3. IP Network Design
4. Hardware – Switches and Routers
5. Configuration details on hardware

NETWORK PLANNING

1. The Network is divided into two:
 - Admin Network
 - Guest Network
2. A FTP server is setup for file transfer across the organisation
3. Both LAN and WiFi connection have been provided to users

Admin Network:

- Maximum of 70 users
- All types of access to files in server

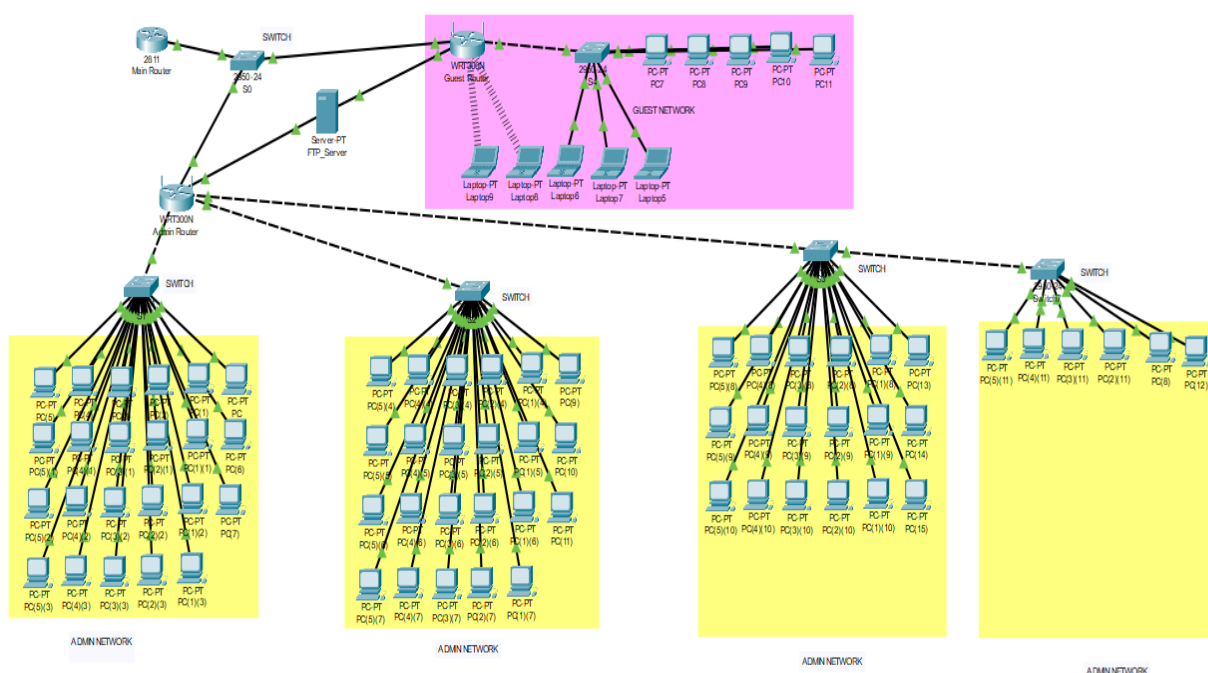
Guest Network:

- Maximum of 10 users
- Restricted access to files in server i.e Guest user is only allowed to Read and List the files in Server

IP NETWORK DESIGN TABLE

Network	Network Address	Beginning Address	Ending Address	Subnet Mask
Admin	10.0.0.1	10.0.0.100	10.0.0.170	255.255.255.0
Guest	192.168.0.1	192.168.0.100	192.168.0.110	255.255.255.0

NETWORK TOPOLOGY DIAGRAM WITH IPADDRESS



Main Router: 192.168.10.1

Admin Router: 10.0.0.1

Guest Router: 192.168.0.1

FTP Server (Admin): 10.0.0.100

FTP Server (Guest): 192.168.0.100



NETWORK INTEGRATION PLAN

FTP Server:

FTP Server

Physical Config **Services** Desktop Programming Attributes

SERVICES

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP**
- IoT
- VM Management
- Radius EAP

FTP

Service ☒ On ☐ Off

User Setup

Username Password

☐ Write ☐ Read ☐ Delete ☐ Rename ☐ List

	Username	Password	Permission	
1	admin	nimda321	RWDNL	Add
2	cisco	cisco	RWDNL	Save
3	guest	4321	RL	Remove

File

1	NewFile.txt
2	asa842-k8.bin
3	asa923-k8.bin
4	c1841-advipservicesk9-mz.124-15.T1.bin
5	c1841-ipbase-mz.123-14.T7.bin
6	c1841-ipbasek9-mz.124-12.bin

Remove

A File Transfer Protocol (FTP) is used to transfer Computer Files between the Client and Server in a Network. Here the FTP server is connected to both the Admin as well as the Guest Router so that both admin and guest can access the files. However, only restricted access is granted for Guest (i.e List, Read)



Admin Router:

Admin Router

Physical Config **GUI** Attributes

Network Setup

Router IP

IP Address: 10 . 0 . 0 . 1

Subnet Mask: 255.255.255.248

DHCP Server Settings

DHCP Server: ☒ Enabled ☐ Disabled **DHCP Reservation**

Start IP Address: 10.0.0. 100

Maximum number of Users: 71

IP Address Range: 10.0.0. 100 - 170

Client Lease Time: 0 minutes (0 means one day)

Static DNS 1: 192 . 168 . 10 . 1

Static DNS 2: 0 . 0 . 0 . 0

Static DNS 3: 0 . 0 . 0 . 0

WINS: 0 . 0 . 0 . 0

☐ Top

Guest Router:

Guest Router

Physical Config **GUI** Attributes

Network Setup

Router IP

IP Address: 192 . 168 . 0 . 1

Subnet Mask: 255.255.255.0

DHCP Server Settings

DHCP Server: ☒ Enabled ☐ Disabled **DHCP Reservation**

Start IP Address: 192.168.0. 100

Maximum number of Users: 11

IP Address Range: 192.168.0. 100 - 110

Client Lease Time: 0 minutes (0 means one day)

Static DNS 1: 192 . 168 . 10 . 1

Static DNS 2: 0 . 0 . 0 . 0

Static DNS 3: 0 . 0 . 0 . 0

WINS: 0 . 0 . 0 . 0

☐ Top



NETWORK CONFIGURATION

Main Router

IP Address: 192.168.10.1

Subnet Mask: 255.255.255.0

Switch

FastEthernet 0/1 VLAN 1 default (Connected to Main Router)

FastEthernet 0/2 VLAN 1 default (Connected to Admin Router)

FastEthernet 0/3 VLAN 3 guest (Connected to Guest Router)

Admin Router

DefaultGateway: 192.168.10.1

DNS_Server: 192.168.10.1

IP: 10.0.0.1

Subnet Mask: 255.255.255.0

IP Range: 10.0.0.100 – 10.0.0.170

SSID: Admin WIFI

Password: nimda321

Guest Router

DefaultGateway: 192.168.10.1

DNS_Server: 192.168.10.1

IP: 192.168.0.1

Subnet Mask: 255.255.255.0

IP Range: 192.168.0.100 – 192.168.0.110

SSID: Guest WIFI

Password: wifi4321



FTP Server (Admin):

FastEthernet0

DefaultGateway: 10.0.0.1

DNS_Server: 192.168.10.1

IP (Static): 10.0.0.100

Subnet Mask: 255.255.255.0

Username: admin

Password: nimda321

Permissions: RWDNL

FTP Server (Guest):

FastEthernet1

DefaultGateway: 192.168.0.1

DNS_Server: 192.168.10.1

IP (Static): 192.168.0.100

Subnet Mask: 255.255.255.0

Username: guest

Password: 4321

Permissions: RL

Admin Network Devices:

DefaultGateway: 10.0.0.1

DNS_Server: 192.168.10.1

IP: Dynamic

Guest Network Devices:

DefaultGateway: 192.168.0.1

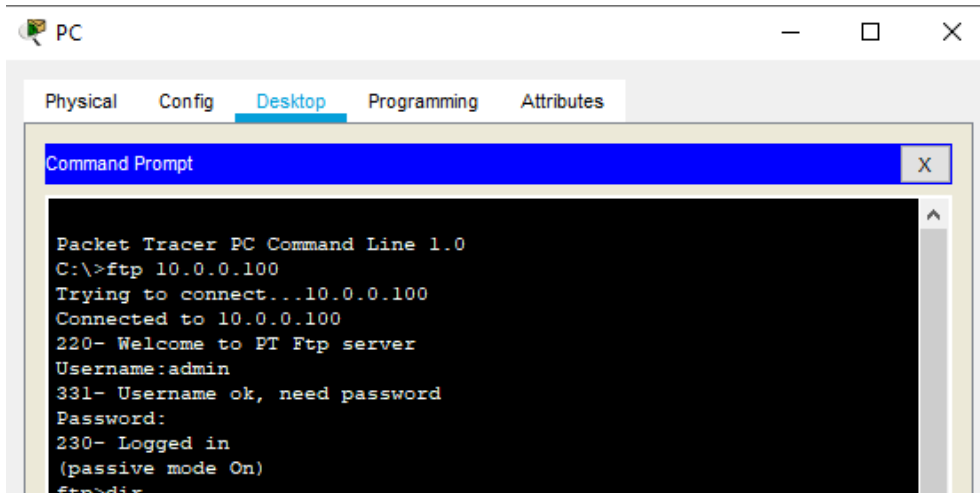
DNS_Server: 192.168.10.1

IP: Dynamic

NETWORK TESTING AND VERIFICATION

Admin Device:

1. Login



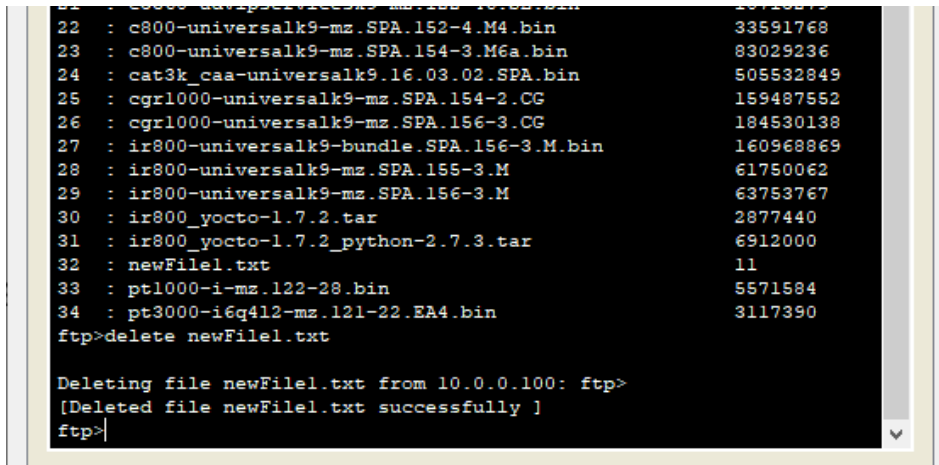
```

PC
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ftp 10.0.0.100
Trying to connect...10.0.0.100
Connected to 10.0.0.100
220- Welcome to PT Ftp server
Username:admin
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>dir

```

2. Perform any operation on files in server. Here we will see how the delete operation works

We are going to delete a file named 'newFile1.txt'



```

22 : c800-universalk9-mz.SPA.152-4.M4.bin 33591768
23 : c800-universalk9-mz.SPA.154-3.M6a.bin 83029236
24 : cat3k_caa-universalk9.16.03.02.SPA.bin 505532849
25 : cgr1000-universalk9-mz.SPA.154-2.CG 159487552
26 : cgr1000-universalk9-mz.SPA.156-3.CG 184530138
27 : ir800-universalk9-bundle.SPA.156-3.M.bin 160968869
28 : ir800-universalk9-mz.SPA.155-3.M 61750062
29 : ir800-universalk9-mz.SPA.156-3.M 63753767
30 : ir800_yocto-1.7.2.tar 2877440
31 : ir800_yocto-1.7.2_python-2.7.3.tar 6912000
32 : newFile1.txt 11
33 : pt1000-i-mz.122-28.bin 5571584
34 : pt3000-i6q412-mz.121-22.EA4.bin 3117390
ftp>delete newFile1.txt

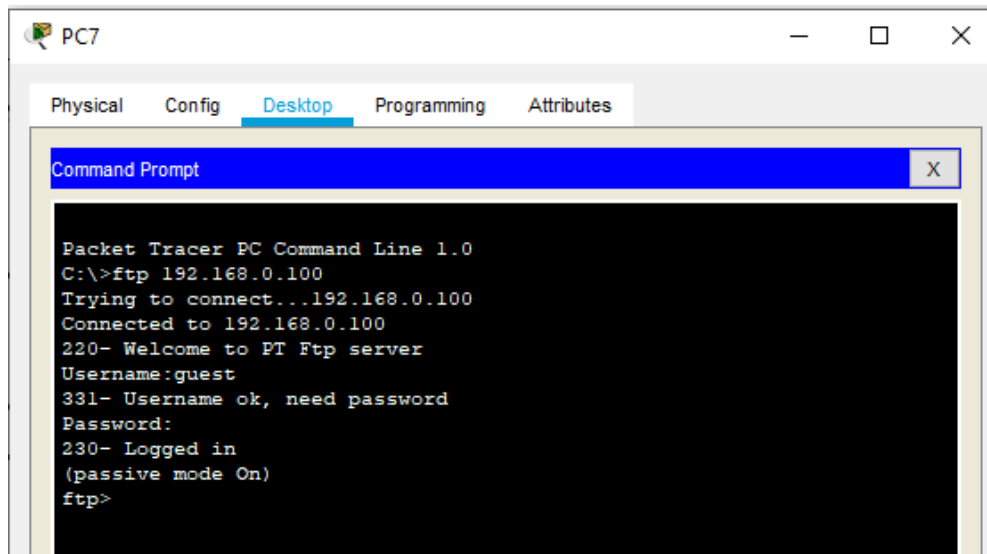
Deleting file newFile1.txt from 10.0.0.100: ftp>
[Deleted file newFile1.txt successfully ]
ftp>

```

The Admin network has all types of access on the files in the server, hence the message 'Deleted file newFile1.txt successfully' is displayed and the specified file has been deleted.

Guest Device:

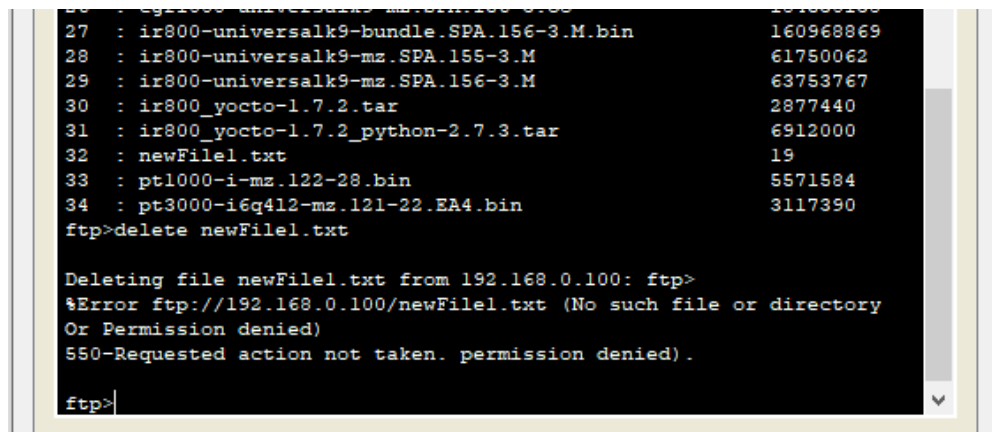
1. Login



```
PC7
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ftp 192.168.0.100
Trying to connect...192.168.0.100
Connected to 192.168.0.100
220- Welcome to PT Ftp server
Username:guest
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>
```

2. Perform delete operation

We are going to delete a file named 'newFile1.txt'



```
27 : ir800-universalk9-bundle.SPA.156-3.M.bin 160968869
28 : ir800-universalk9-mz.SPA.155-3.M 61750062
29 : ir800-universalk9-mz.SPA.156-3.M 63753767
30 : ir800_yocto-1.7.2.tar 2877440
31 : ir800_yocto-1.7.2_python-2.7.3.tar 6912000
32 : newFile1.txt 19
33 : pt1000-i-mz.122-28.bin 5571584
34 : pt3000-i6q412-mz.121-22.EA4.bin 3117390
ftp>delete newFile1.txt

Deleting file newFile1.txt from 192.168.0.100: ftp>
%Error ftp://192.168.0.100/newFile1.txt (No such file or directory
Or Permission denied)
550-Requested action not taken. permission denied).

ftp>
```

Here the guest does not have the access to delete the files in the server, it only has Read and List, hence the 'Permission denied' is displayed. The guest cannot upload Write, Delete or Rename the files in the server.

3. Perform Read operation

```
ftp>get newFile1.txt

Reading file newFile1.txt from 192.168.0.100:
File transfer in progress...

[Transfer complete - 19 bytes]

19 bytes copied in 0.001 secs (19000 bytes/sec)
ftp>
```

The guest can Read the files in the server and hence this message ‘Transfer Complete’ is displayed.

HARDWARE AND SOFTWARE

Hardware:

- Computers
- Laptops
- Routers
- Server
- Switches

Software:

Cisco Packet Tracer