DATA COMMUNICATION & NETWORKS

Metropolitan Area Network

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Data Communication and Computer Network
Midterm Project

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CHAPTER 1

Introduction

1.1 Project Definition and Problem Formulation

Two Office of a company need a network over routers and switches connecting via ISP. In this context, offices will be connected to each other with the metropolitan area network application. Offices will be connected via ISP (Internet Service Provider).

1.2 The purpose and motivation of the project

The motivation in this network project is to establish a reliable, efficient and quality infrastructure network in order to meet the demands of company's offices in the best way.

The network will support E-MAIL, VoIP Conference, WEB, Wireless Connection , FTP, DNS, DHCP Protocols . Various features such as internet connection and inter-device communication will be provided among the devices in the network according to the design of network architecture.

1.3. Term Definitions

End devices such as computers, laptop, tablet, cell-phone on the network act as Leaf Nodes. Routers, switches will control the network they are Central Nodes. Servers will provide data support to the network. Computer systems that we create using all of these devices are called topology. Topologies are architectural network design that designed by an authorized network administrator.

The project network uses “STAR” topology to connect each device and each facility with a central “switch” module.

A “PACKET” contains a source; destination, data, size, and other useful information that helps packet make it to the appropriate location and get reassembled properly. Protocol is rules that provides a communication and other transfer systems work in specified standards, harmoniously.

“CHANEL” is interval of frequency that data pass. System is all hardware in physical network and software that controls and operates interconnection of network devices.

“System” is a collection of elements or components that are organized for a common purpose.

“Switch”, in the context of networking is a high-speed device that receives incoming data packets and redirects them to their destination on a local area network (LAN).

“Router” is a Layer 3 network gateway device, meaning that it connects two or more networks and that the router operates at the network layer of the OSI model.

CHAPTER 2

Method and Simulation

2.1 Simulation and Modeling Concepts

Dictionary means of the Simulation is ; After modeling a theoretical or physical real system in a computer environment, for this purpose, operating experiments in order to understand the behavior of the system or to evaluate different strategies is a technique that evaluates the features and behaviors of these systems through a computer. [1]

The simulations in this project are called network simulations. It is checked whether the infrastructure installed in these simulations works according to the requests. No matter how much network simulations are done, unexpected errors can always occur on the real network (i.e Deadlock). In network simulations, scenarios determined among the participants (Leaf Nodes, Internal Nodes, other devices) in the network are applied. Sending ping is a basic test to understand that communication has been provided between devices.

Writing, reading, updating, renaming Data; Accessing the Database; Sending and Receiving Mail; Web searching accessibility are special cases and simulated only on specified devices. Interpreting the gained / observed results of simulations is the purpose of simulation.

Modeling is to imitate real structures in computer structured systems. Routers, Switches and other elements are modeled in computer environments, then simulations are executed out on these models.

2.2 Simulation Environment/Tool

Packet Tracer by Cisco Systems is a cross platform visual simulation tool. It supported on Linux, Android, iOS, Windows and MacOS.

Packet Tracer by Cisco Systems is a cross platform visual simulation tool. It supported on Linux, Android, iOS, Windows and MacOS. It has simple interface and command palette to perform operations. It allows users to create topologies. It has simulating facilities that has end and network devices to simulate networks before they are installed. It has extensive resources created by Cisco Systems and Users.

Devices can be programmed from the Command Line, also they can be programed from simple Device Interfaces.

2.3 Network Design Requirements

In this section characteristics, architecture, structure, configuration, used protocols and design details of the system will be given. Protocols used in the network are TCP, VoIP, POP3, SMTP, FTP, DHCP, DNS, HTTP.

System network includes 2 subnetwork represents offices of a company. Both offices have 3 facilities and each facility has own local area networks.

2.4 Requirement Analysis

There are many device requirement at the MAN. They are classified as 2 different classes. First one is the Network Devices, they are Routers, Switches, Access Points. They has many types. The second class is End Devices (leaf device), they are Servers, Workstations (Pc), Laptops, Phones and Tablets. Table at the below shows all devices at the network.

Devices							
Router	Switch	Access Point	Server	Pc	Laptop	Phone	Tablet
O1S1	Switch [0-6]	Access Point [0-3]	DHCP	Workstation PC [0-23]	Laptop [0-2]	Phone [0-11]	TablePC [0-4]
O1S2	FTP switch		Web Service [0-9]				
O2S1	web services switch		DNS				
O2S2			Mail Server				
midRouter1			FTP Servers [0-3]				
ISP router							
ISPCloudRouter							

Network Devices Table

The network requirements and specifications are given below:

1. Metropolitan area network design includes two distinct branch office in at the same city, which are connected by a router (over) via an ISP (Internet Service Provider).

2. First branch's network is comprised of 3 distinct faculties (offices) and each facility has different requirements.

All specification for the first office is as following:

a. (first facility of first branch) First faculty has 3 workstation (Pc) users, 3 wireless users (laptop) and 3 smartphone (phone) users. These users browse web, send emails and transfer files by using their devices.

b. (second facility of first branch) Second faculty has 6 workstation (Pc) users who use Web and FTP. 2 of workstations are used for VoIP conference events.

c. (third facility of First branch) There are 10 web servers, 4 FTP servers, 1 DHCP server, 1 mail server, 1 DNS (Domain Name Server).

3. Second branch includes 3 distinct facility and each faculty includes different units and requirements.

a. (first facility of second branch) First facility has 5 workstation users, 5 wireless users and 5 tablet users who connect the Internet using wireless connection, browse Web and use email applications.

b. (second facility of second branch) Second facility has 5 workstation users and 2 smartphone users. They use web browsing, editing applications and transfer files.

c. (third facility of second branch) Third facility has 5 workstation users and 2 smartphone users. They use web browsing and email applications.

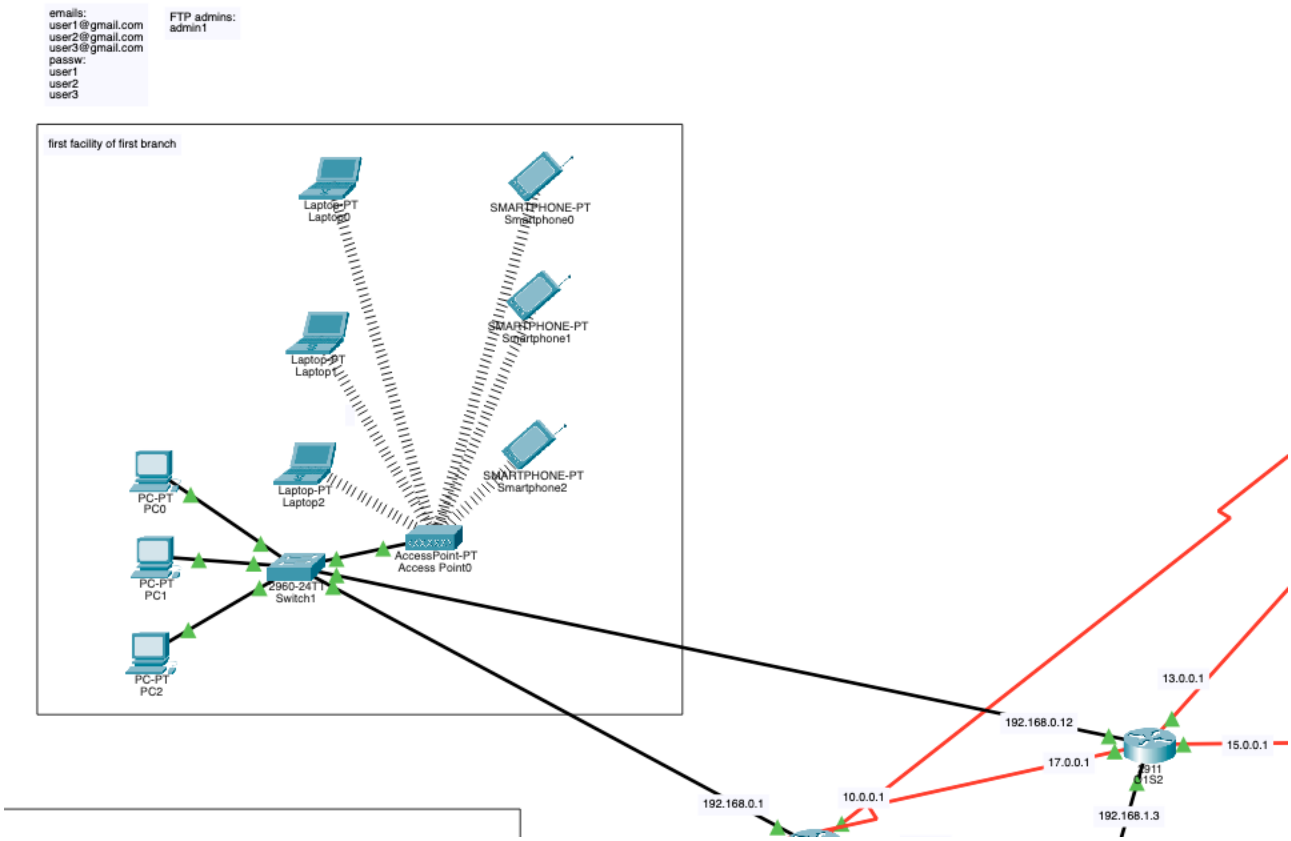
2.5 Definitions of the System/Model

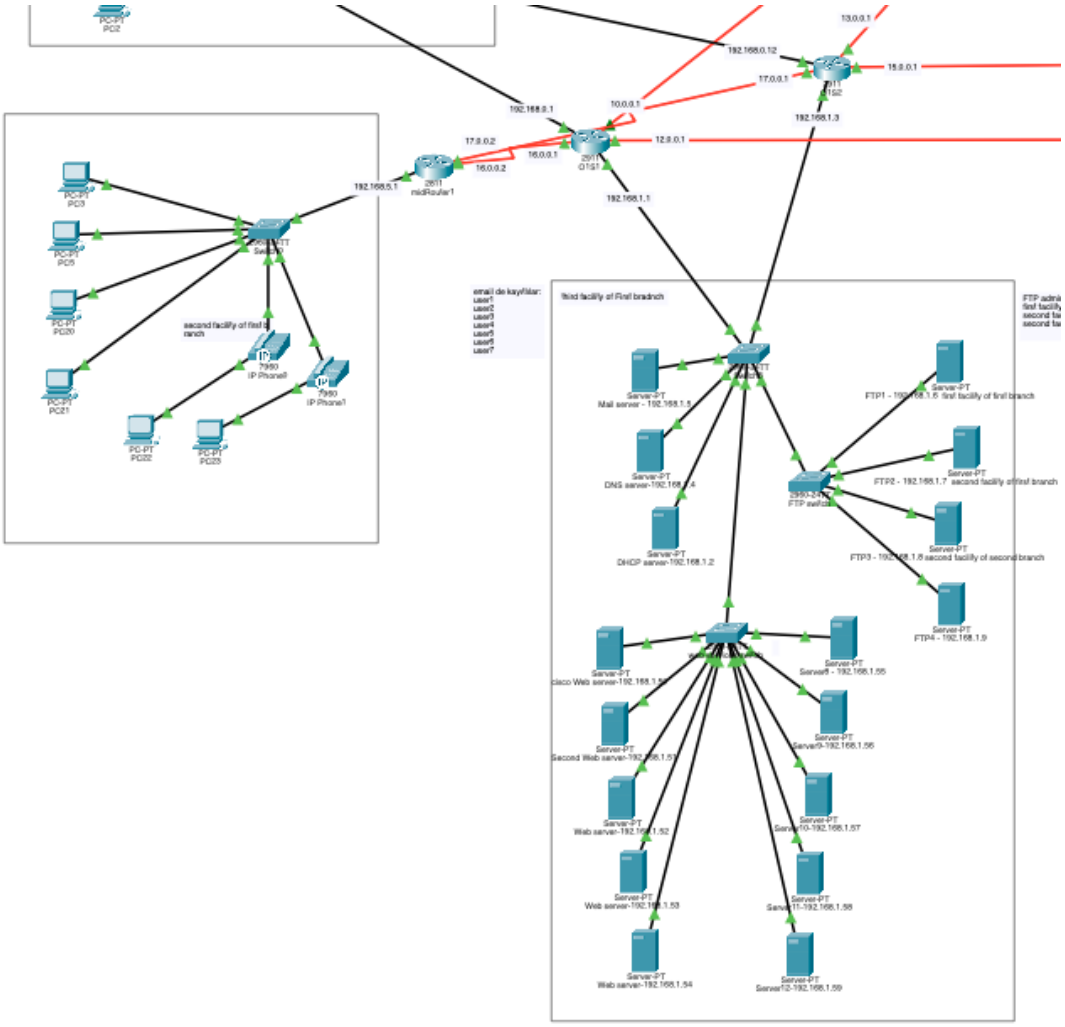
- Network uses star topology method to connect devices and subnetworks.
- DHCP, DNS, WEB, E-MAIL, FTP servers' services are deployed.
- Facilities have a unique IP configuration and devices in same facilities use this IP configuration.
- PCs, tablets, smart phones, servers are the nodes of network generates data to transfer.

CHAPTER 3

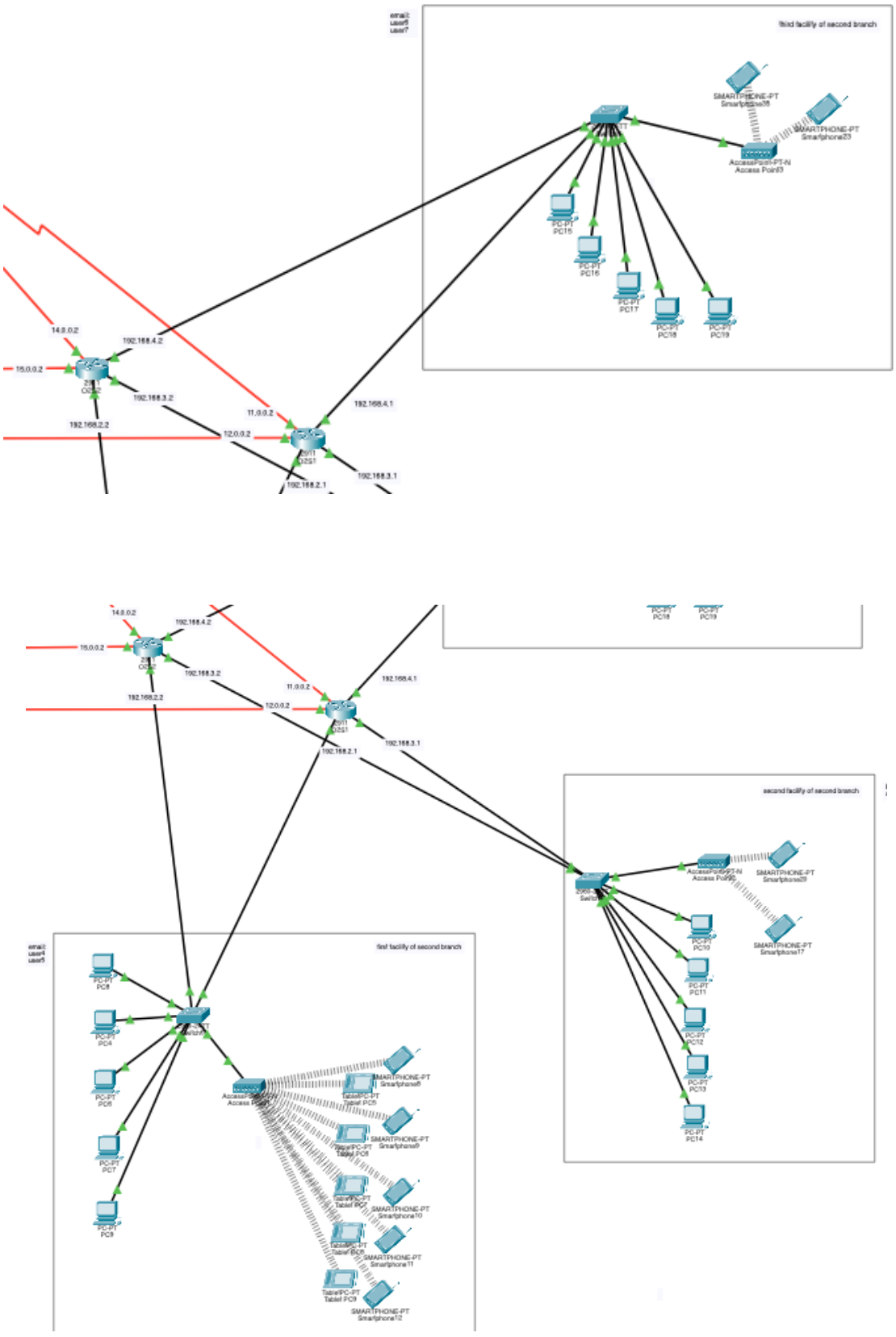
Traffic Analysis and Simulation Results

3.1 Network Design

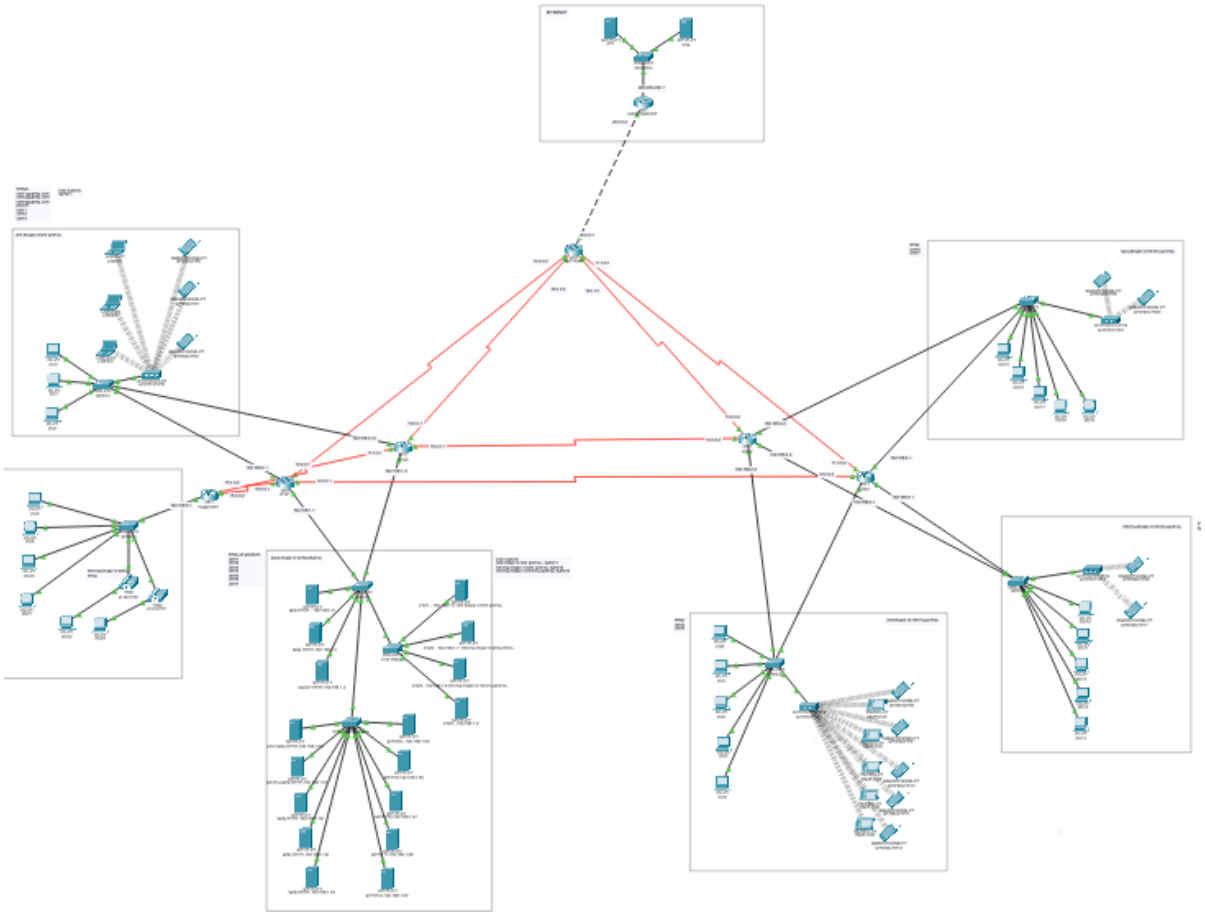



PC-PT PC2
192.168.0.1
10.0.0.1
192.168.0.12
13.0.0.1
15.0.0.1
17.0.0.1
192.168.1.3
17.0.0.2
16.0.0.1
16.0.0.2
12.0.0.1
192.168.5.1
2811 midRouter1
192.168.1.1
PC-PT PC3
PC-PT PC5
PC-PT PC20
PC-PT PC21
PC-PT PC22
PC-PT PC23
7960 IP Phone0
7960 IP Phone1
second facility of first branch
email de kayitlar:
user1
user2
user3
user4
user5
user6
user7
third facility of First branch
Server-PT Mail server - 192.168.1.6
Server-PT DNS server-192.168.1.4
Server-PT DHCP server-192.168.1.2
Server-PT FTP1 - 192.168.1.6 first facility of first branch
Server-PT FTP2 - 192.168.1.7 second facility of first branch
Server-PT FTP3 - 192.168.1.8 second facility of second branch
Server-PT FTP4 - 192.168.1.9
Server-PT Server5 - 192.168.1.55
Server-PT Server9-192.168.1.56
Server-PT Server10-192.168.1.57
Server-PT Server11-192.168.1.58
Server-PT Server12-192.168.1.59
Server-PT Web server-192.168.1.52
Server-PT Web server-192.168.1.53
Server-PT Web server-192.168.1.54

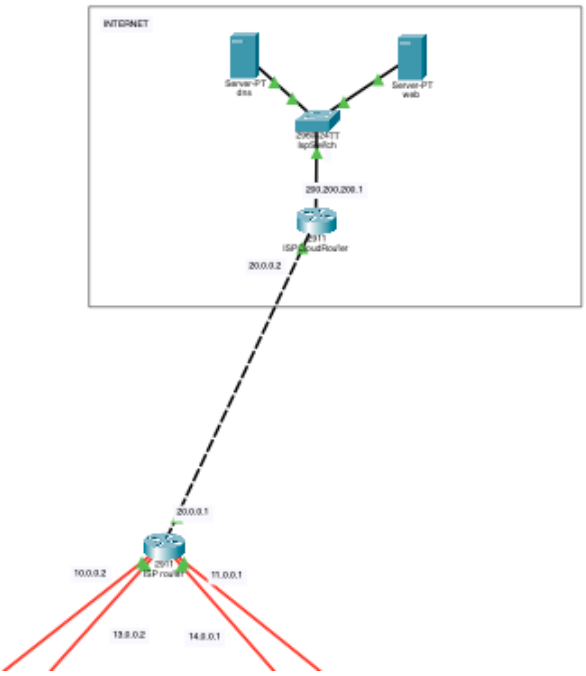
Network 1


third facility of second branch
SMARTPHONE-PT
Smartphone23
Access Point-PT-N
Access Point3
PC-PT
PC15
PC16
PC17
PC18
PC19
14.0.0.2
192.168.4.2
15.0.0.2
192.168.3.2
192.168.2.2
11.0.0.2
12.0.0.2
192.168.4.1
192.168.3.1
192.168.2.1
second facility of second branch
SMARTPHONE-PT
Smartphone20
Smartphone17
PC10
PC11
PC12
PC13
PC14
first facility of second branch
PC8
PC4
PC6
PC7
PC9
Tablet PC5
Tablet PC8
Tablet PC7
Tablet PC9
Smartphone6
Smartphone9
Smartphone10
Smartphone11
Smartphone12

Network 2



Metropolitan Area Network



ISP

3.2 Network Simulations

Network simulations made by network developer / designer / technician.
Simulations test the system with various scenarios. They are always a tolerance. Situations not considered in practice may occur when system start to run.

Simulation Scenario 1:

A wireless user from first facility of second branch wants to read emails and browse Web.

Web browsing:

Simulation Panel

Event List

Vis.	Time(sec)	Last Device
	0.000	--
	0.001	Smartphone35
	0.002	Access Point3
	0.003	Switch5
	0.004	O2S1
	0.005	O1S1
	0.006	Switch3
	0.006	--
	0.007	Access Point3
	0.007	Access Point3
	0.007	DNS server-192.168.1.4
	0.008	Switch3
	0.009	O1S1
	0.010	O2S1
	0.011	Switch5
	0.012	Access Point3
	0.012	Access Point3
	0.012	--
	0.013	--
	0.014	Smartphone35

Simulation Panel

Event List

Vis.	Time(sec)	Last Device
	0.014	Smartphone35
	0.015	Access Point3
	0.015	--
	0.016	Access Point3
	0.016	Access Point3
	0.016	Switch5
	0.017	O2S1
	0.017	--
	0.018	O1S1
	0.019	Switch3
	0.019	Switch3
	0.019	Switch3
	0.019	Switch3
	0.019	Switch3
	0.019	Switch3
	0.020	web services switch
	0.020	web services switch
	0.020	web services switch
	0.020	web services switch
	0.020	web services switch

Simulation Panel

Event List

Vis.	Time(sec)	Last Device
	0.019	Switch3
	0.020	web services switch
	0.020	web services switch
	0.020	web services switch
	0.020	web services switch
	0.020	web services switch
	0.020	web services switch
	0.020	web services switch
	0.020	web services switch
	0.020	web services switch
	0.020	web services switch
	0.020	FTP switch
	0.020	FTP switch
	0.020	FTP switch
	0.020	FTP switch
	0.021	cisco Web server-192.168.1.50
	0.022	web services switch
	0.023	Switch3
	0.315	--
	0.316	Smartphone35

Reading e mail:

Simulation Panel

Event List

Vis.	Time(sec)	Last Device
	0.000	--
	0.001	Smartphone9
	0.002	Access Point1
	0.003	Switch6
	0.004	O2S1
	0.005	O1S1
	0.005	--
	0.006	Access Point1
	0.006	Access Point1
	0.006	Access Point1
	0.006	Access Point1
	0.006	Access Point1
	0.006	Access Point1
	0.006	Access Point1
	0.006	Access Point1
	0.006	Access Point1
	0.006	Switch3
	0.007	Mail server - 192.168.1.5
	0.008	Switch3

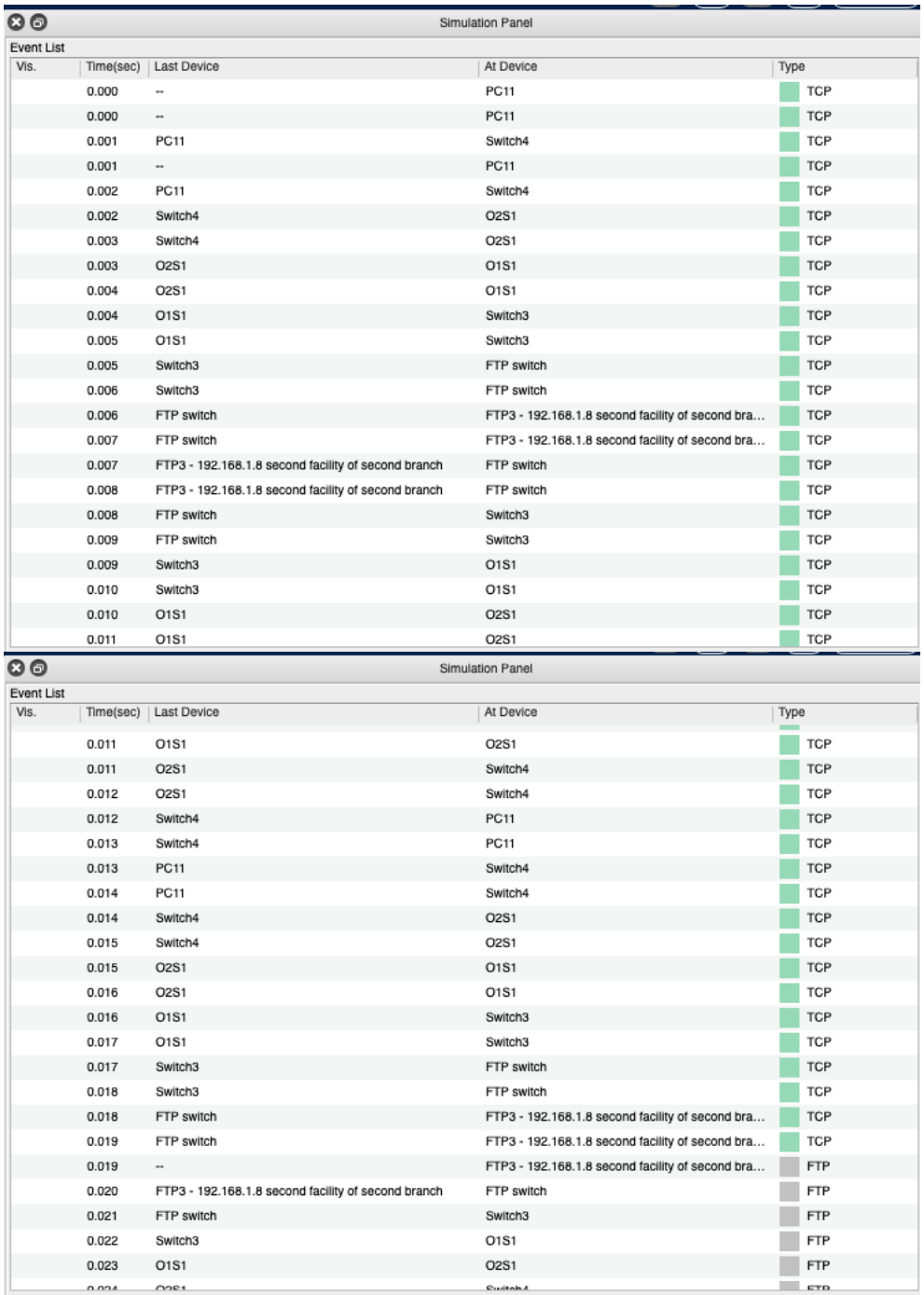
Simulation Panel

Event List

Vis.	Time(sec)	Last Device
	0.006	Access Point1
	0.006	Switch3
	0.007	Mail server - 192.168.1.5
	0.008	Switch3
	0.009	O1S1
	0.010	O2S1
	0.011	Switch6
	0.012	Access Point1
	0.012	Access Point1
	0.012	Access Point1
	0.012	Access Point1
	0.012	Access Point1
	0.012	Access Point1
	0.012	Access Point1
	0.012	Access Point1
	0.012	Access Point1
	0.012	Access Point1
	0.012	--
	0.015	--
	0.016	Smartphone9

Simulation Scenario 2:

A computer engineer from second facility of second branch developed a web application and wants to send his/her code files to FTP server in the third facility of first branch.



Simulation Panel

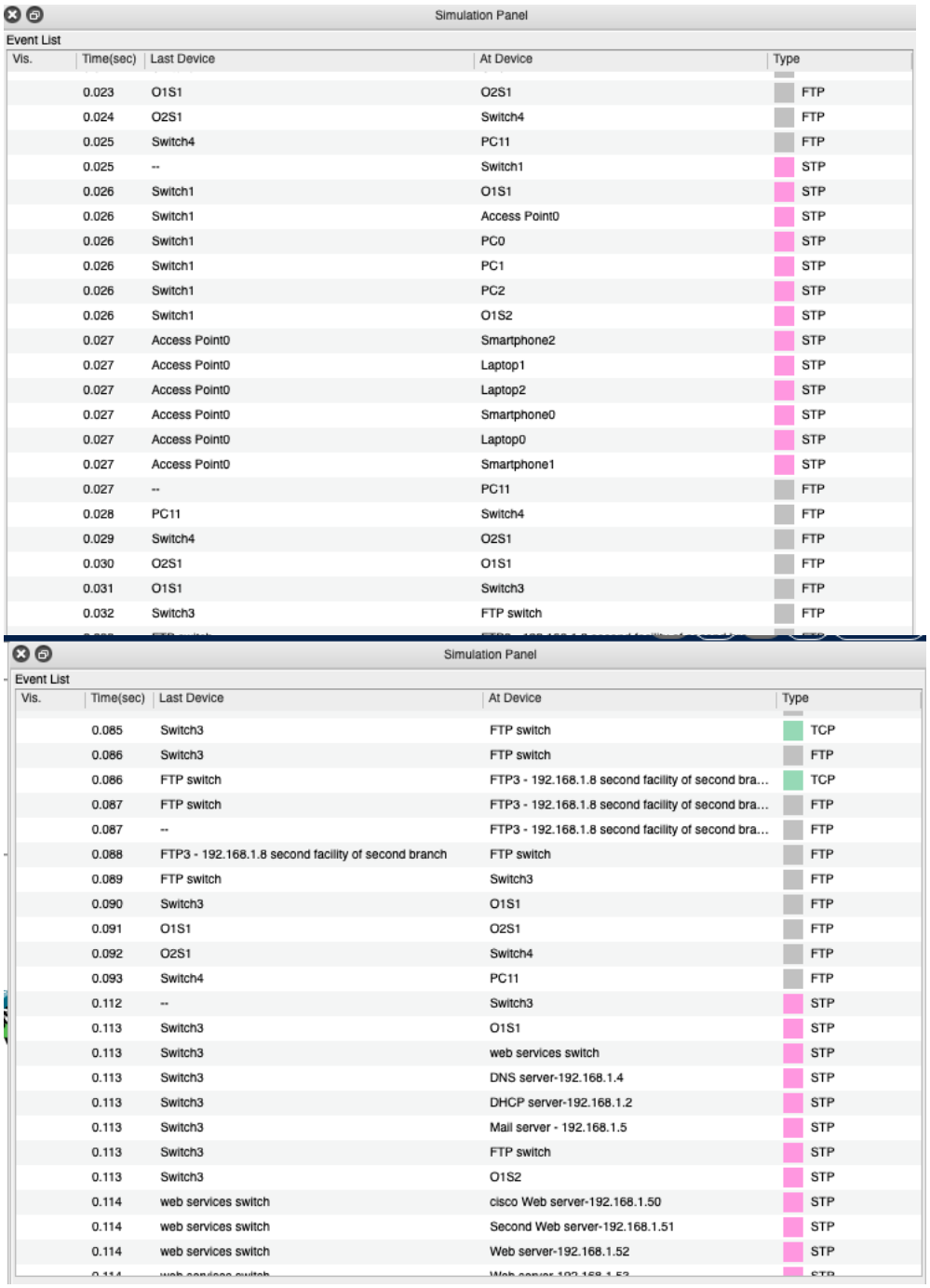
Event List

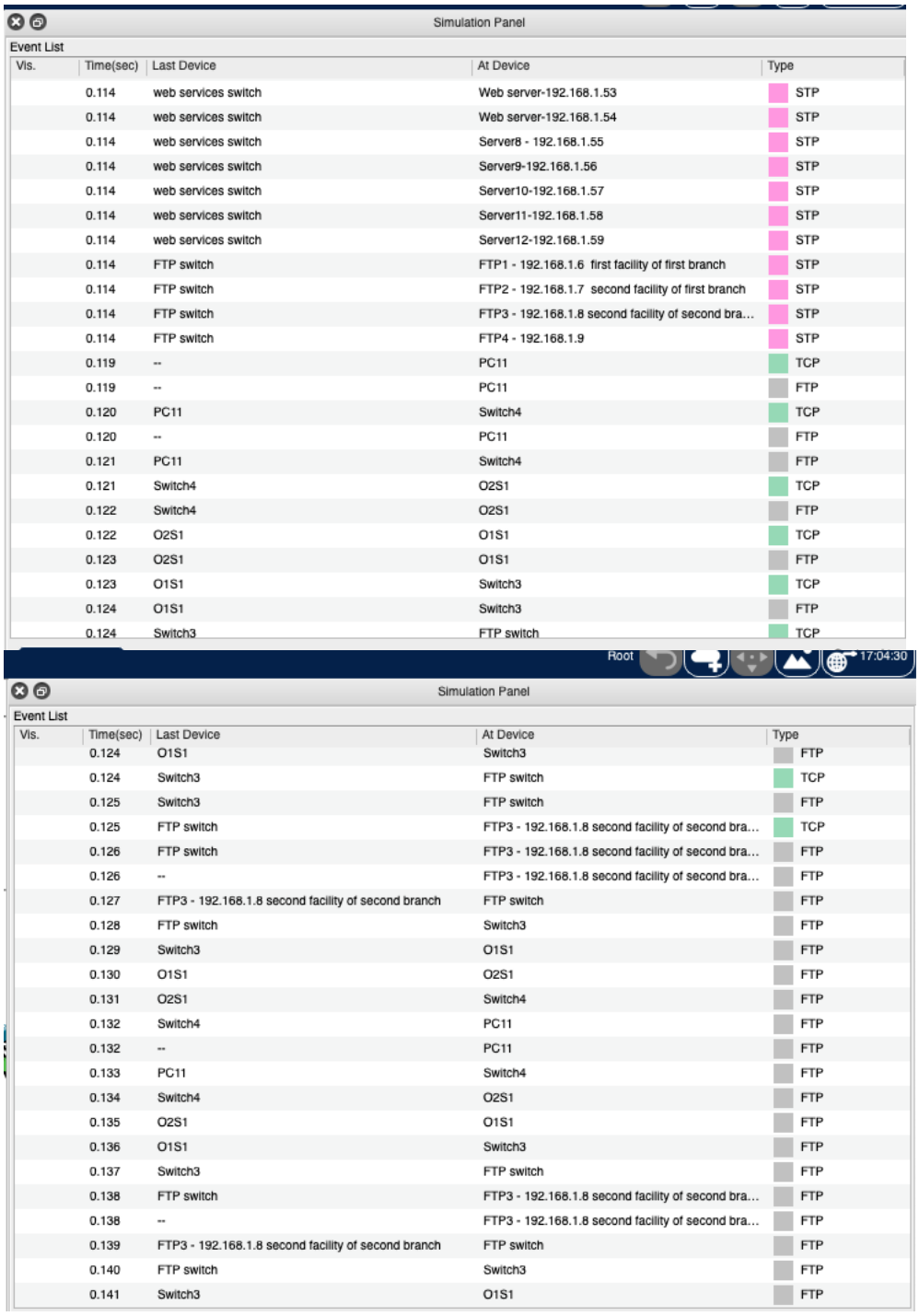
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC11	TCP
	0.000	--	PC11	TCP
	0.001	PC11	Switch4	TCP
	0.001	--	PC11	TCP
	0.002	PC11	Switch4	TCP
	0.002	Switch4	O2S1	TCP
	0.003	Switch4	O2S1	TCP
	0.003	O2S1	O1S1	TCP
	0.004	O2S1	O1S1	TCP
	0.004	O1S1	Switch3	TCP
	0.005	O1S1	Switch3	TCP
	0.005	Switch3	FTP switch	TCP
	0.006	Switch3	FTP switch	TCP
	0.006	FTP switch	FTP3 - 192.168.1.8 second facility of second bra...	TCP
	0.007	FTP switch	FTP3 - 192.168.1.8 second facility of second bra...	TCP
	0.007	FTP3 - 192.168.1.8 second facility of second branch	FTP switch	TCP
	0.008	FTP3 - 192.168.1.8 second facility of second branch	FTP switch	TCP
	0.008	FTP switch	Switch3	TCP
	0.009	FTP switch	Switch3	TCP
	0.009	Switch3	O1S1	TCP
	0.010	Switch3	O1S1	TCP
	0.010	O1S1	O2S1	TCP
	0.011	O1S1	O2S1	TCP

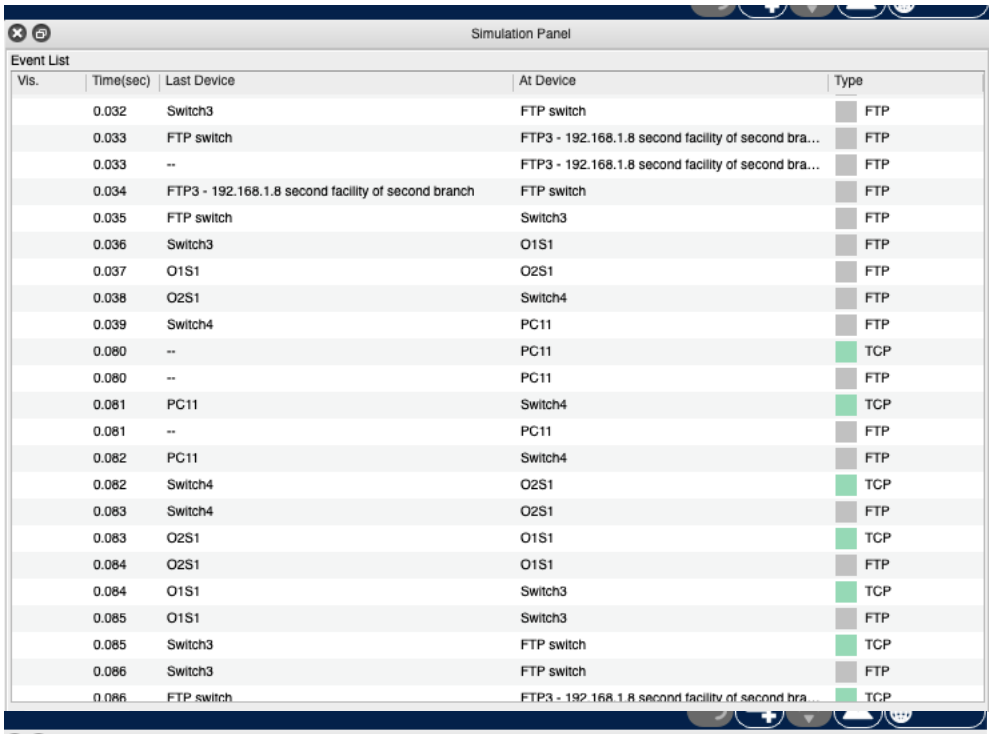
Simulation Panel

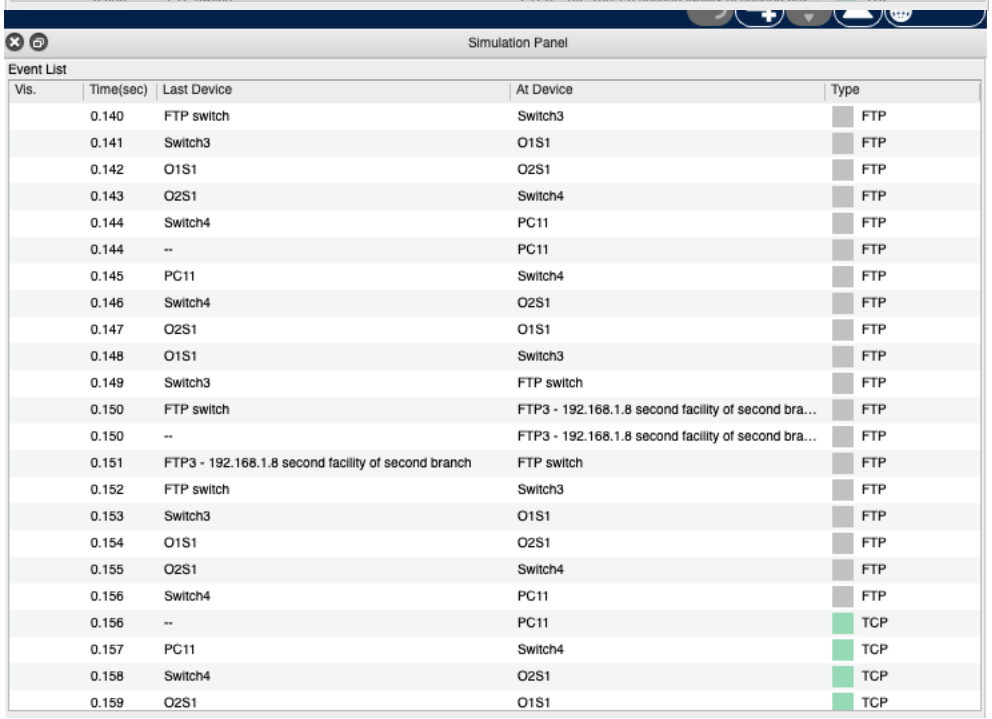
Event List

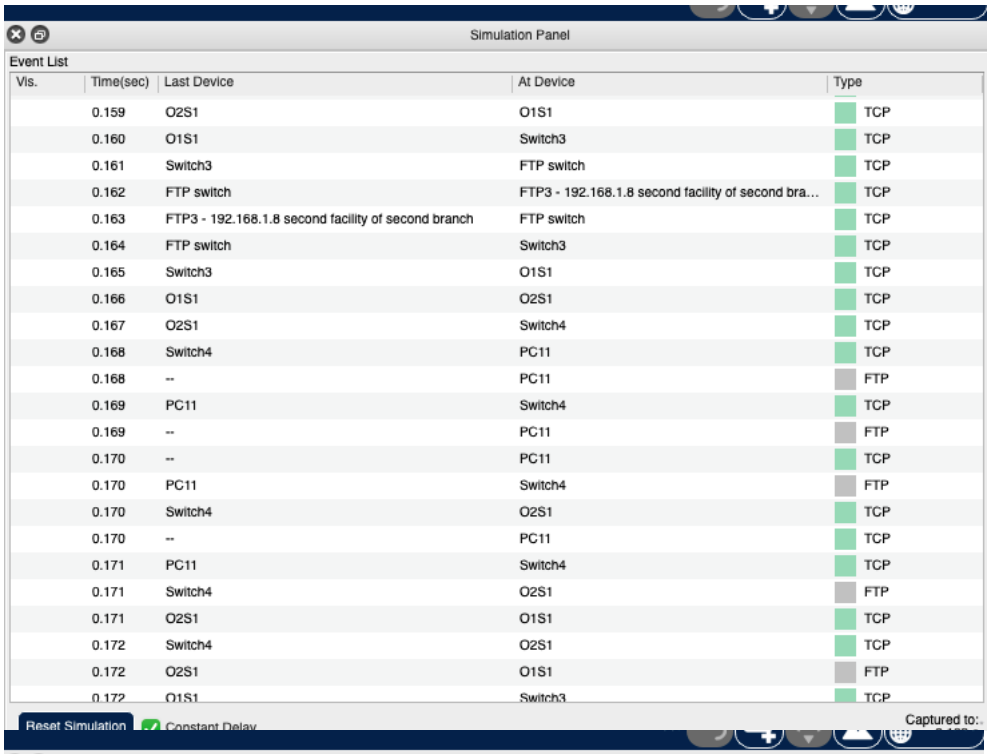
Vis.	Time(sec)	Last Device	At Device	Type
	0.011	O1S1	O2S1	TCP
	0.011	O2S1	Switch4	TCP
	0.012	O2S1	Switch4	TCP
	0.012	Switch4	PC11	TCP
	0.013	Switch4	PC11	TCP
	0.013	PC11	Switch4	TCP
	0.014	PC11	Switch4	TCP
	0.014	Switch4	O2S1	TCP
	0.015	Switch4	O2S1	TCP
	0.015	O2S1	O1S1	TCP
	0.016	O2S1	O1S1	TCP
	0.016	O1S1	Switch3	TCP
	0.017	O1S1	Switch3	TCP
	0.017	Switch3	FTP switch	TCP
	0.018	Switch3	FTP switch	TCP
	0.018	FTP switch	FTP3 - 192.168.1.8 second facility of second bra...	TCP
	0.019	FTP switch	FTP3 - 192.168.1.8 second facility of second bra...	TCP
	0.019	--	FTP3 - 192.168.1.8 second facility of second bra...	FTP
	0.020	FTP3 - 192.168.1.8 second facility of second branch	FTP switch	FTP
	0.021	FTP switch	Switch3	FTP
	0.022	Switch3	O1S1	FTP
	0.023	O1S1	O2S1	FTP

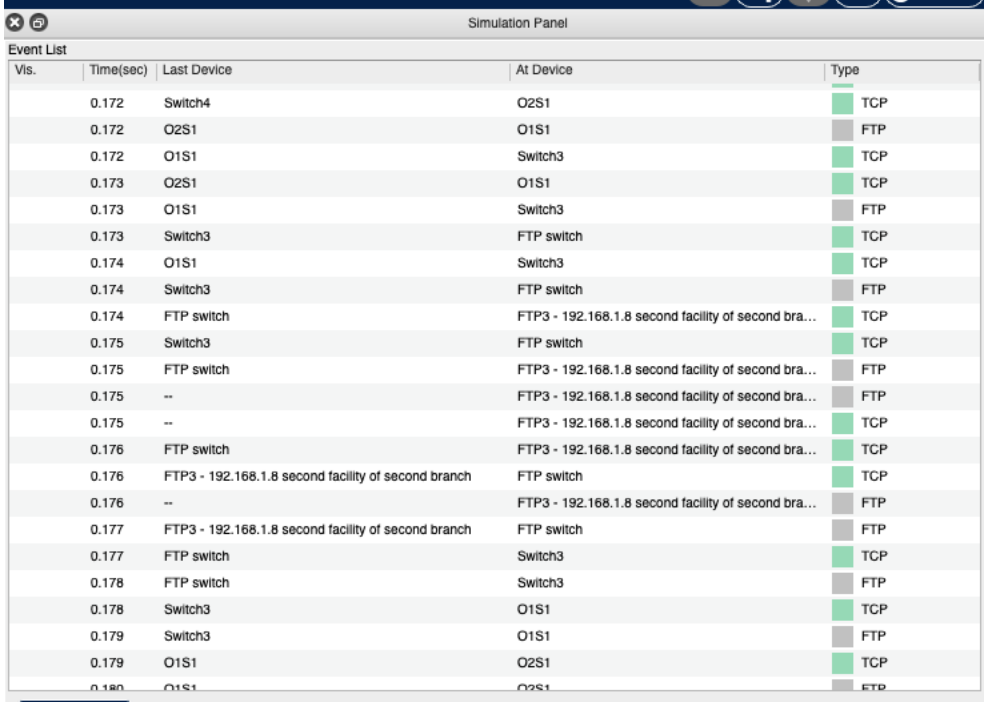

Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.023 O1S1 O2S1 FTP
0.024 O2S1 Switch4 FTP
0.025 Switch4 PC11 FTP
0.025 -- Switch1 STP
0.026 Switch1 O1S1 STP
0.026 Switch1 Access Point0 STP
0.026 Switch1 PC0 STP
0.026 Switch1 PC1 STP
0.026 Switch1 PC2 STP
0.026 Switch1 O1S2 STP
0.027 Access Point0 Smartphone2 STP
0.027 Access Point0 Laptop1 STP
0.027 Access Point0 Laptop2 STP
0.027 Access Point0 Smartphone0 STP
0.027 Access Point0 Laptop0 STP
0.027 Access Point0 Smartphone1 STP
0.027 -- PC11 FTP
0.028 PC11 Switch4 FTP
0.029 Switch4 O2S1 FTP
0.030 O2S1 O1S1 FTP
0.031 O1S1 Switch3 FTP
0.032 Switch3 FTP switch FTP
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.085 Switch3 FTP switch TCP
0.086 Switch3 FTP switch FTP
0.086 FTP switch FTP3 - 192.168.1.8 second facility of second bra... TCP
0.087 FTP switch FTP3 - 192.168.1.8 second facility of second bra... FTP
0.087 -- FTP3 - 192.168.1.8 second facility of second bra... FTP
0.088 FTP3 - 192.168.1.8 second facility of second branch FTP switch FTP
0.089 FTP switch Switch3 FTP
0.090 Switch3 O1S1 FTP
0.091 O1S1 O2S1 FTP
0.092 O2S1 Switch4 FTP
0.093 Switch4 PC11 FTP
0.112 -- Switch3 STP
0.113 Switch3 O1S1 STP
0.113 Switch3 web services switch STP
0.113 Switch3 DNS server-192.168.1.4 STP
0.113 Switch3 DHCP server-192.168.1.2 STP
0.113 Switch3 Mail server - 192.168.1.5 STP
0.113 Switch3 FTP switch STP
0.113 Switch3 O1S2 STP
0.114 web services switch cisco Web server-192.168.1.50 STP
0.114 web services switch Second Web server-192.168.1.51 STP
0.114 web services switch Web server-192.168.1.52 STP

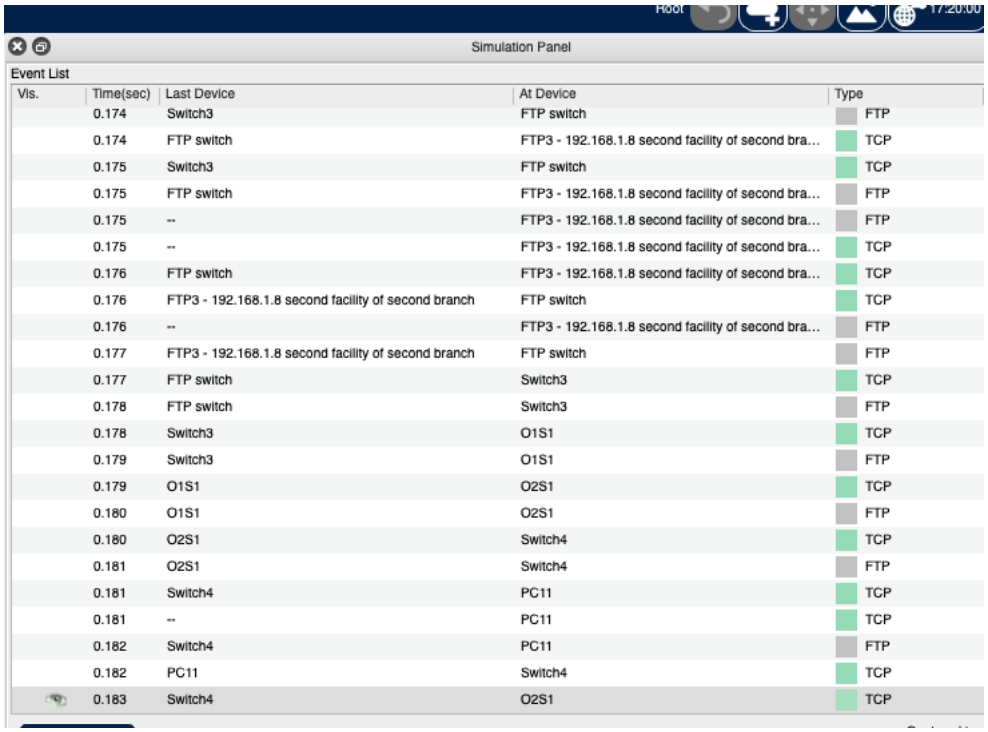

Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.114 web services switch Web server-192.168.1.53 STP
0.114 web services switch Web server-192.168.1.54 STP
0.114 web services switch Server8 - 192.168.1.55 STP
0.114 web services switch Server9-192.168.1.56 STP
0.114 web services switch Server10-192.168.1.57 STP
0.114 web services switch Server11-192.168.1.58 STP
0.114 web services switch Server12-192.168.1.59 STP
0.114 FTP switch FTP1 - 192.168.1.6 first facility of first branch STP
0.114 FTP switch FTP2 - 192.168.1.7 second facility of first branch STP
0.114 FTP switch FTP3 - 192.168.1.8 second facility of second bra... STP
0.114 FTP switch FTP4 - 192.168.1.9 STP
0.119 -- PC11 TCP
0.119 -- PC11 FTP
0.120 PC11 Switch4 TCP
0.120 -- PC11 FTP
0.121 PC11 Switch4 FTP
0.121 Switch4 O2S1 TCP
0.122 Switch4 O2S1 FTP
0.122 O2S1 O1S1 TCP
0.123 O2S1 O1S1 FTP
0.123 O1S1 Switch3 TCP
0.124 O1S1 Switch3 FTP
0.124 Switch3 FTP switch TCP
Root
17:04:30
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.124 O1S1 Switch3 FTP
0.124 Switch3 FTP switch TCP
0.125 Switch3 FTP switch FTP
0.125 FTP switch FTP3 - 192.168.1.8 second facility of second bra... TCP
0.126 FTP switch FTP3 - 192.168.1.8 second facility of second bra... FTP
0.126 -- FTP3 - 192.168.1.8 second facility of second bra... FTP
0.127 FTP3 - 192.168.1.8 second facility of second branch FTP switch FTP
0.128 FTP switch Switch3 FTP
0.129 Switch3 O1S1 FTP
0.130 O1S1 O2S1 FTP
0.131 O2S1 Switch4 FTP
0.132 Switch4 PC11 FTP
0.132 -- PC11 FTP
0.133 PC11 Switch4 FTP
0.134 Switch4 O2S1 FTP
0.135 O2S1 O1S1 FTP
0.136 O1S1 Switch3 FTP
0.137 Switch3 FTP switch FTP
0.138 FTP switch FTP3 - 192.168.1.8 second facility of second bra... FTP
0.138 -- FTP3 - 192.168.1.8 second facility of second bra... FTP
0.139 FTP3 - 192.168.1.8 second facility of second branch FTP switch FTP
0.140 FTP switch Switch3 FTP
0.141 Switch3 O1S1 FTP


Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.032 Switch3 FTP switch FTP
0.033 FTP switch FTP3 - 192.168.1.8 second facility of second bra... FTP
0.033 -- FTP3 - 192.168.1.8 second facility of second bra... FTP
0.034 FTP3 - 192.168.1.8 second facility of second branch FTP switch FTP
0.035 FTP switch Switch3 FTP
0.036 Switch3 O1S1 FTP
0.037 O1S1 O2S1 FTP
0.038 O2S1 Switch4 FTP
0.039 Switch4 PC11 FTP
0.080 -- PC11 TCP
0.080 -- PC11 FTP
0.081 PC11 Switch4 TCP
0.081 -- PC11 FTP
0.082 PC11 Switch4 FTP
0.082 Switch4 O2S1 TCP
0.083 Switch4 O2S1 FTP
0.083 O2S1 O1S1 TCP
0.084 O2S1 O1S1 FTP
0.084 O1S1 Switch3 TCP
0.085 O1S1 Switch3 FTP
0.085 Switch3 FTP switch TCP
0.086 Switch3 FTP switch FTP
0.086 FTP switch FTP3 - 192.168.1.8 second facility of second bra... TCP


Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.140 FTP switch Switch3 FTP
0.141 Switch3 O1S1 FTP
0.142 O1S1 O2S1 FTP
0.143 O2S1 Switch4 FTP
0.144 Switch4 PC11 FTP
0.144 -- PC11 FTP
0.145 PC11 Switch4 FTP
0.146 Switch4 O2S1 FTP
0.147 O2S1 O1S1 FTP
0.148 O1S1 Switch3 FTP
0.149 Switch3 FTP switch FTP
0.150 FTP switch FTP3 - 192.168.1.8 second facility of second bra... FTP
0.150 -- FTP3 - 192.168.1.8 second facility of second bra... FTP
0.151 FTP3 - 192.168.1.8 second facility of second branch FTP switch FTP
0.152 FTP switch Switch3 FTP
0.153 Switch3 O1S1 FTP
0.154 O1S1 O2S1 FTP
0.155 O2S1 Switch4 FTP
0.156 Switch4 PC11 FTP
0.156 -- PC11 TCP
0.157 PC11 Switch4 TCP
0.158 Switch4 O2S1 TCP
0.159 O2S1 O1S1 TCP


Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.159 O2S1 O1S1 TCP
0.160 O1S1 Switch3 TCP
0.161 Switch3 FTP switch TCP
0.162 FTP switch FTP3 - 192.168.1.8 second facility of second bra... TCP
0.163 FTP3 - 192.168.1.8 second facility of second branch FTP switch TCP
0.164 FTP switch Switch3 TCP
0.165 Switch3 O1S1 TCP
0.166 O1S1 O2S1 TCP
0.167 O2S1 Switch4 TCP
0.168 Switch4 PC11 TCP
0.168 -- PC11 FTP
0.169 PC11 Switch4 TCP
0.169 -- PC11 FTP
0.170 -- PC11 TCP
0.170 PC11 Switch4 FTP
0.170 Switch4 O2S1 TCP
0.170 -- PC11 TCP
0.171 PC11 Switch4 TCP
0.171 Switch4 O2S1 FTP
0.171 O2S1 O1S1 TCP
0.172 Switch4 O2S1 TCP
0.172 O2S1 O1S1 FTP
Reset Simulation
Constant Delay
Captured to:


Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.172 Switch4 O2S1 TCP
0.172 O2S1 O1S1 FTP
0.172 O1S1 Switch3 TCP
0.173 O2S1 O1S1 TCP
0.173 O1S1 Switch3 FTP
0.173 Switch3 FTP switch TCP
0.174 O1S1 Switch3 TCP
0.174 Switch3 FTP switch FTP
0.174 FTP switch FTP3 - 192.168.1.8 second facility of second bra... TCP
0.175 Switch3 FTP switch TCP
0.175 FTP switch FTP3 - 192.168.1.8 second facility of second bra... FTP
0.175 -- FTP3 - 192.168.1.8 second facility of second bra... FTP
0.175 -- FTP3 - 192.168.1.8 second facility of second bra... TCP
0.176 FTP switch FTP3 - 192.168.1.8 second facility of second bra... TCP
0.176 FTP3 - 192.168.1.8 second facility of second branch FTP switch TCP
0.176 -- FTP3 - 192.168.1.8 second facility of second bra... FTP
0.177 FTP3 - 192.168.1.8 second facility of second branch FTP switch FTP
0.177 FTP switch Switch3 TCP
0.178 FTP switch Switch3 FTP
0.178 Switch3 O1S1 TCP
0.179 Switch3 O1S1 FTP
0.179 O1S1 O2S1 TCP



Operation time(sec) variable is shown in the pictures. myDevelopedProgram.txt file can be sent to the corresponding FTP server in third facility of first branch.

Simulation Scenario 3:

Two users from second facility of first branch want to talk via VoIP.

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	IP Phone0	SCCP
	0.001	IP Phone0	Switch0	SCCP
	0.002	Switch0	Router2	SCCP
	0.002	Switch0	IP Phone1	SCCP
	0.003	Router2	Switch0	SCCP
	0.004	Switch0	IP Phone0	SCCP
	0.004	--	IP Phone0	SCCP
	0.005	IP Phone0	Switch0	SCCP
	0.006	Switch0	Router2	SCCP
	0.007	Router2	Switch0	SCCP
	0.007	--	Router2	SCCP
	0.008	Router2	Switch0	SCCP
	0.008	Switch0	IP Phone0	SCCP
	0.008	Switch0	IP Phone1	SCCP
	0.009	Switch0	IP Phone0	SCCP
	0.051	--	IP Phone0	TCP
	0.052	IP Phone0	Switch0	TCP
	0.053	Switch0	Router2	TCP
	0.159	--	IP Phone1	TCP
	0.160	IP Phone1	Switch0	TCP
	0.161	Switch0	Router2	TCP
	0.810	--	Switch0	STP
	0.811	Switch0	IP Phone1	STP
	0.811	Switch0	IP Phone0	STP
	0.811	Switch0	Router2	STP
	0.811	Switch0	Router2	STP
	0.812	IP Phone1	PC23	STP
	0.812	IP Phone0	PC22	STP
	0.822	--	Switch1	STP
	0.823	Switch1	PC1	STP
	0.823	Switch1	first branch	STP
	0.823	Switch1	Access Point0	STP
	0.823	Switch1	PC0	STP
	0.823	Switch1	PC2	STP
	0.823	Switch1	Router0	STP
	0.823	--	Switch5	STP
	0.823	--	IP Phone1	SCCP
	0.824	Access Point0	Laptop2	STP
	0.824	Access Point0	Laptop1	STP
	0.824	Access Point0	Smartphone1	STP
	0.824	Access Point0	Laptop0	STP
	0.824	Switch5	Second Branch router	STP
	0.824	Switch5	PC18	STP
	0.824	Switch5	PC15	STP
	0.824	Switch5	Access Point3	STP
	0.824	Switch5	PC16	STP
	0.824	Switch5	PC17	STP
	0.824	Switch5	PC19	STP
	0.824	Switch5	Router1	STP
	0.824	Access Point0	Smartphone0	STP
	0.824	Access Point0	Smartphone0	STP
	0.824	IP Phone1	Switch0	SCCP
	0.825	Access Point3	Smartphone23	STP
	0.825	Access Point3	Smartphone35	STP
	0.825	Switch0	Router2	SCCP
	0.825	--	Switch3	STP
	0.826	Switch3	Router0	STP
	0.826	Switch3	first branch	STP
	0.826	Switch3	FTP switch	STP
	0.826	Switch3	DHCP server-192.168.1.2	STP
	0.826	Switch3	web services switch	STP
	0.826	Switch3	DNS server-192.168.1.4	STP
	0.826	Switch3	Mail server - 192.168.1.5	STP
	0.826	Router2	Switch0	SCCP
	0.826	--	Router2	SCCP
	0.827	Router2	Switch0	SCCP
	0.827	FTP switch	FTP1 - 192.168.1.6 first facility of first branch	STP
	0.827	FTP switch	FTP3 - 192.168.1.8 second facility of second...	STP
	0.827	FTP switch	FTP4 - 192.168.1.9	STP
	0.827	FTP switch	FTP2 - 192.168.1.7 second facility of first br...	STP
	0.827	web services switch	cisco Web server-192.168.1.50	STP
	0.827	web services switch	Web server-192.168.1.53	STP
	0.827	web services switch	Server9-192.168.1.56	STP
	0.827	web services switch	Second Web server-192.168.1.51	STP
	0.827	web services switch	Web server-192.168.1.52	STP

Vis.	Time(sec)	Last Device	At Device	Type
	0.827	web services switch	Web server-192.168.1.52	STP
	0.827	web services switch	Server8 - 192.168.1.55	STP
	0.827	web services switch	Web server-192.168.1.54	STP
	0.827	web services switch	Server11-192.168.1.58	STP
	0.827	web services switch	Server10-192.168.1.57	STP
	0.827	web services switch	Server12-192.168.1.59	STP
	0.827	Switch0	IP Phone0	SCCP
	0.828	Switch0	IP Phone1	SCCP
	0.828	IP Phone0	Switch0	SCCP
	0.829	IP Phone1	Switch0	SCCP
	0.829	Switch0	Router2	SCCP
	0.830	Switch0	Router2	SCCP
	0.830	Router2	Switch0	SCCP
	0.831	Router2	Switch0	SCCP
	0.831	Switch0	IP Phone1	SCCP
	0.831	--	IP Phone1	RTP
	0.831	--	IP Phone1	ARP
	0.832	Switch0	IP Phone0	SCCP
	0.832	--	IP Phone0	RTP
	0.832	IP Phone1	Switch0	ARP
	0.832	--	IP Phone0	ARP
	0.833	IP Phone0	Switch0	ARP
	0.833	Switch0	Router2	ARP
	0.833	Switch0	IP Phone0	ARP
	0.834	Switch0	Router2	ARP

Vis.	Time(sec)	Last Device	At Device	Type
	0.834	Switch0	Router2	ARP
	0.834	Switch0	IP Phone1	ARP
	0.834	IP Phone0	Switch0	ARP
	0.835	IP Phone1	Switch0	ARP
	0.835	Switch0	IP Phone1	ARP
	0.836	Switch0	IP Phone0	ARP
	0.836	--	IP Phone1	SCCP
	0.837	IP Phone1	Switch0	SCCP
	0.838	Switch0	Router2	SCCP
	0.839	--	ISPCloudRouter	RIPv1
	0.839	--	ISPCloudRouter	RIPv1
	0.839	Router2	Switch0	SCCP
	0.839	--	Router2	SCCP
	0.840	ISPCloudRouter	lspSwitch	RIPv1
	0.840	ISPCloudRouter	ISP router	RIPv1
	0.840	Router2	Switch0	SCCP
	0.840	Switch0	IP Phone0	SCCP
	0.840	--	Router2	SCCP
	0.841	Router2	Switch0	SCCP
	0.841	lspSwitch	dns	RIPv1
	0.841	lspSwitch	web	RIPv1
	0.841	Switch0	IP Phone1	SCCP
	0.842	Switch0	IP Phone1	SCCP
	0.848	--	lspSwitch	STP
	0.849	lspSwitch	web	STP

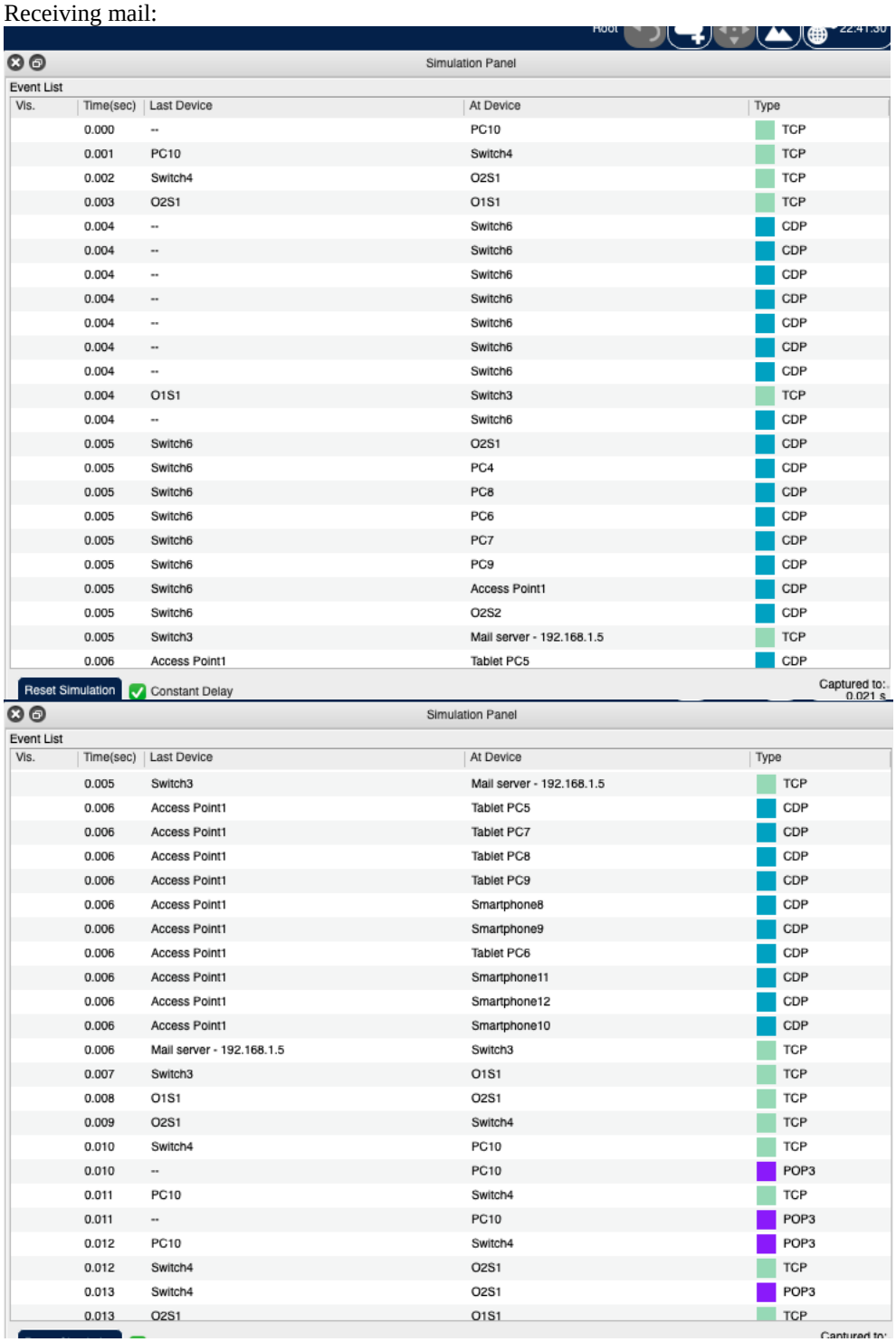
Vis.	Time(sec)	Last Device	At Device	Type
	0.840	ISPCloudRouter	ISP router	RIPv1
	0.840	Router2	Switch0	SCCP
	0.840	Switch0	IP Phone0	SCCP
	0.840	--	Router2	SCCP
	0.841	Router2	Switch0	SCCP
	0.841	lspSwitch	dns	RIPv1
	0.841	lspSwitch	web	RIPv1
	0.841	Switch0	IP Phone1	SCCP
	0.842	Switch0	IP Phone1	SCCP
	0.848	--	lspSwitch	STP
	0.849	lspSwitch	web	STP
	0.849	lspSwitch	dns	STP
	0.849	lspSwitch	ISPCloudRouter	STP
	0.853	--	IP Phone0	TCP
	0.854	--	Switch0	STP
	0.854	IP Phone0	Switch0	TCP
	0.854	--	Switch0	STP
	0.855	Switch0	PC20	STP
	0.855	Switch0	PC5	STP
	0.855	Switch0	Router2	STP
	0.855	Switch0	PC21	STP
	0.855	Switch0	PC3	STP
	0.855	Switch0	IP Phone1	STP
	0.855	Switch0	IP Phone0	STP
	0.855	--	Switch0	STP

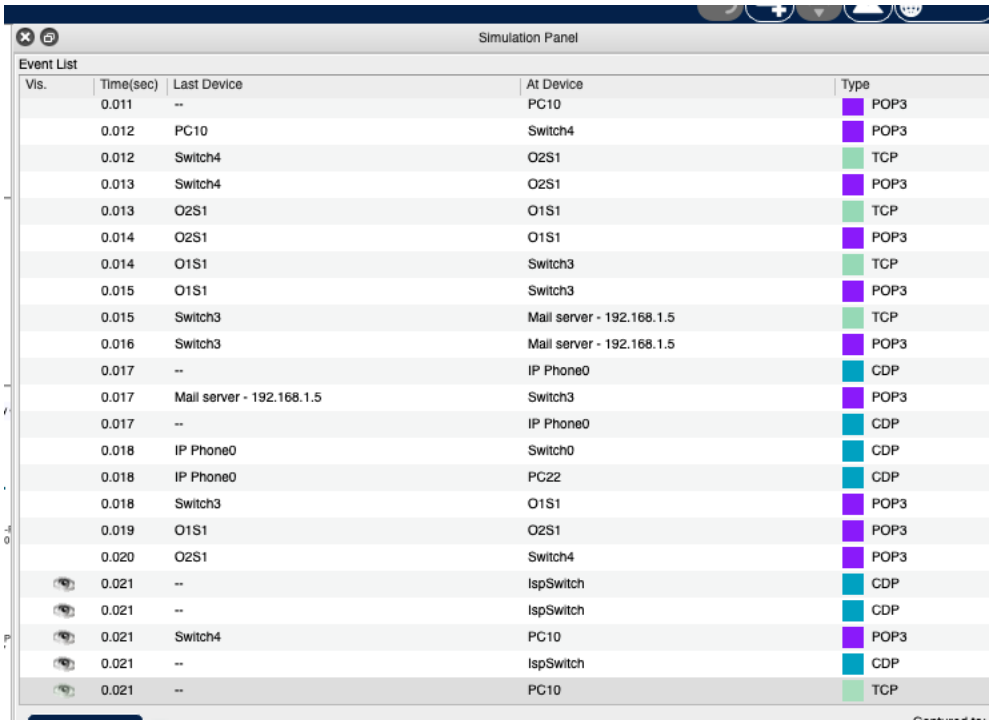
Simulation Scenario 4:

A user in the second facility of first branch wants to send an email message to his friend in the second facility of second branch.

Sending mail:

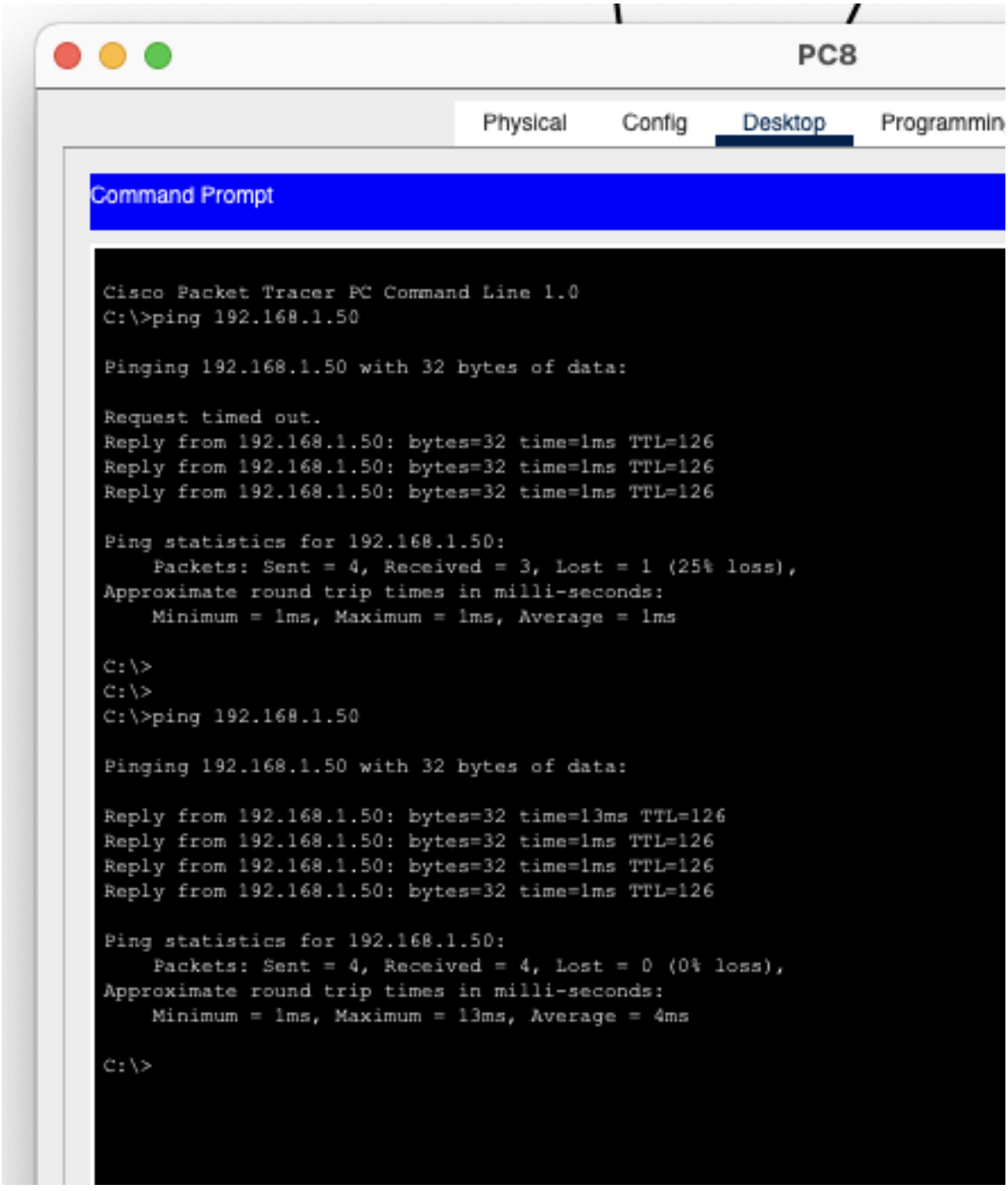
Receiving mail:

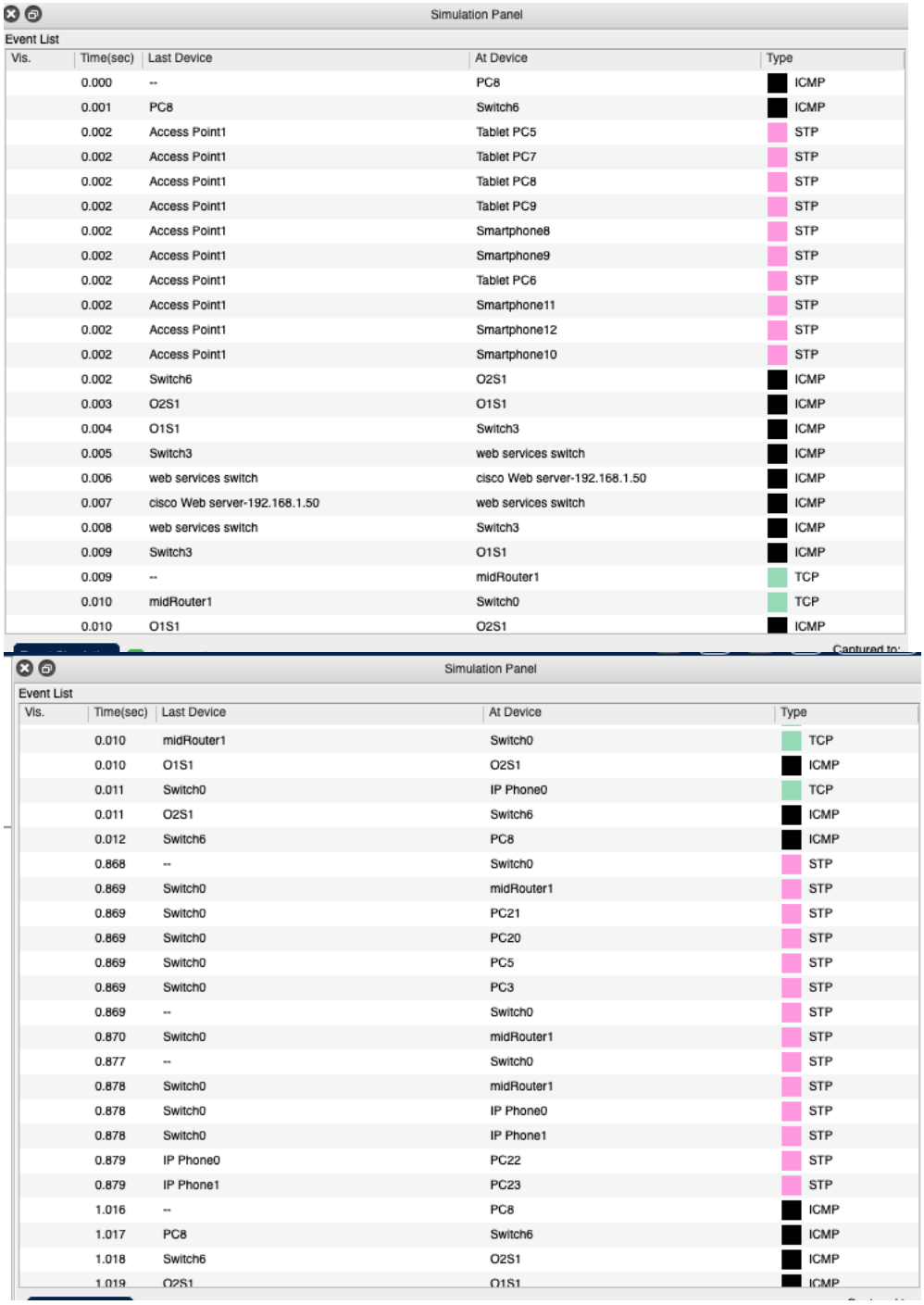


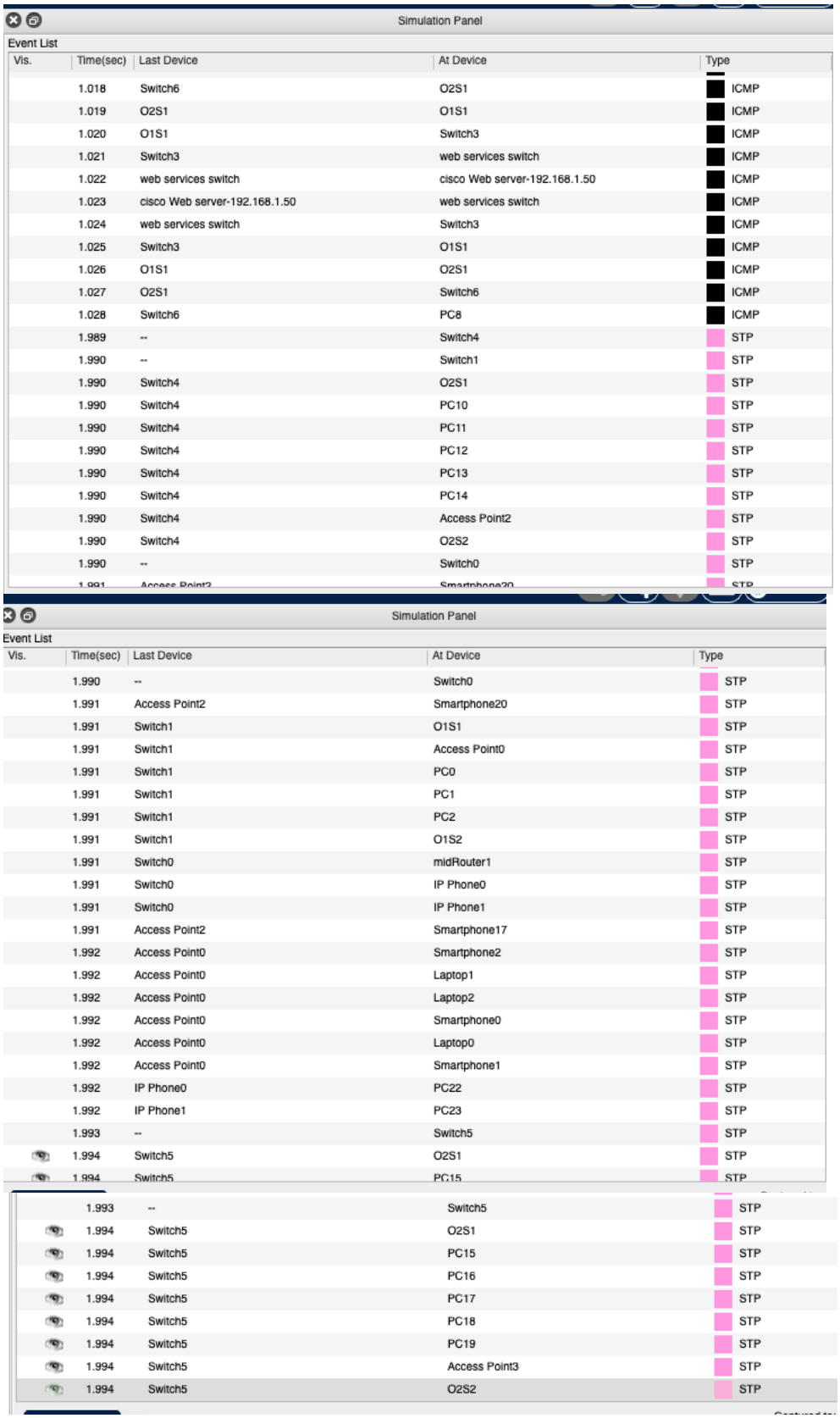

Simulation Panel
Event List
Vis.
Time(sec)
Last Device
At Device
Type
0.011 -- PC10 POP3
0.012 PC10 Switch4 POP3
0.012 Switch4 O2S1 TCP
0.013 Switch4 O2S1 POP3
0.013 O2S1 O1S1 TCP
0.014 O2S1 O1S1 POP3
0.014 O1S1 Switch3 TCP
0.015 O1S1 Switch3 POP3
0.015 Switch3 Mail server - 192.168.1.5 TCP
0.016 Switch3 Mail server - 192.168.1.5 POP3
0.017 -- IP Phone0 CDP
0.017 Mail server - 192.168.1.5 Switch3 POP3
0.017 -- IP Phone0 CDP
0.018 IP Phone0 Switch0 CDP
0.018 IP Phone0 PC22 CDP
0.018 Switch3 O1S1 POP3
0.019 O1S1 O2S1 POP3
0.020 O2S1 Switch4 POP3
0.021 -- IspSwitch CDP
0.021 -- IspSwitch CDP
0.021 Switch4 PC10 POP3
0.021 -- IspSwitch CDP
0.021 -- PC10 TCP

Simulation Scenario 5:

A user from first facility of second branch pings Web server of second facility of first branch.




Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.000 -- PC8 ICMP
0.001 PC8 Switch6 ICMP
0.002 Access Point1 Tablet PC5 STP
0.002 Access Point1 Tablet PC7 STP
0.002 Access Point1 Tablet PC8 STP
0.002 Access Point1 Tablet PC9 STP
0.002 Access Point1 Smartphone8 STP
0.002 Access Point1 Smartphone9 STP
0.002 Access Point1 Tablet PC6 STP
0.002 Access Point1 Smartphone11 STP
0.002 Access Point1 Smartphone12 STP
0.002 Access Point1 Smartphone10 STP
0.002 Switch6 O2S1 ICMP
0.003 O2S1 O1S1 ICMP
0.004 O1S1 Switch3 ICMP
0.005 Switch3 web services switch ICMP
0.006 web services switch cisco Web server-192.168.1.50 ICMP
0.007 cisco Web server-192.168.1.50 web services switch ICMP
0.008 web services switch Switch3 ICMP
0.009 Switch3 O1S1 ICMP
0.009 -- midRouter1 TCP
0.010 midRouter1 Switch0 TCP
0.010 O1S1 O2S1 ICMP
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.010 midRouter1 Switch0 TCP
0.010 O1S1 O2S1 ICMP
0.011 Switch0 IP Phone0 TCP
0.011 O2S1 Switch6 ICMP
0.012 Switch6 PC8 ICMP
0.868 -- Switch0 STP
0.869 Switch0 midRouter1 STP
0.869 Switch0 PC21 STP
0.869 Switch0 PC20 STP
0.869 Switch0 PC5 STP
0.869 Switch0 PC3 STP
0.869 -- Switch0 STP
0.870 Switch0 midRouter1 STP
0.877 -- Switch0 STP
0.878 Switch0 midRouter1 STP
0.878 Switch0 IP Phone0 STP
0.878 Switch0 IP Phone1 STP
0.879 IP Phone0 PC22 STP
0.879 IP Phone1 PC23 STP
1.016 -- PC8 ICMP
1.017 PC8 Switch6 ICMP
1.018 Switch6 O2S1 ICMP
1.019 O2S1 O1S1 ICMP


Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
1.018 Switch6 O2S1 ICMP
1.019 O2S1 O1S1 ICMP
1.020 O1S1 Switch3 ICMP
1.021 Switch3 web services switch ICMP
1.022 web services switch cisco Web server-192.168.1.50 ICMP
1.023 cisco Web server-192.168.1.50 web services switch ICMP
1.024 web services switch Switch3 ICMP
1.025 Switch3 O1S1 ICMP
1.026 O1S1 O2S1 ICMP
1.027 O2S1 Switch6 ICMP
1.028 Switch6 PC8 ICMP
1.989 -- Switch4 STP
1.990 -- Switch1 STP
1.990 Switch4 O2S1 STP
1.990 Switch4 PC10 STP
1.990 Switch4 PC11 STP
1.990 Switch4 PC12 STP
1.990 Switch4 PC13 STP
1.990 Switch4 PC14 STP
1.990 Switch4 Access Point2 STP
1.990 Switch4 O2S2 STP
1.990 -- Switch0 STP
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
1.990 -- Switch0 STP
1.991 Access Point2 Smartphone20 STP
1.991 Switch1 O1S1 STP
1.991 Switch1 Access Point0 STP
1.991 Switch1 PC0 STP
1.991 Switch1 PC1 STP
1.991 Switch1 PC2 STP
1.991 Switch1 O1S2 STP
1.991 Switch0 midRouter1 STP
1.991 Switch0 IP Phone0 STP
1.991 Switch0 IP Phone1 STP
1.991 Access Point2 Smartphone17 STP
1.992 Access Point0 Smartphone2 STP
1.992 Access Point0 Laptop1 STP
1.992 Access Point0 Laptop2 STP
1.992 Access Point0 Smartphone0 STP
1.992 Access Point0 Laptop0 STP
1.992 Access Point0 Smartphone1 STP
1.992 IP Phone0 PC22 STP
1.992 IP Phone1 PC23 STP
1.993 -- Switch5 STP
1.994 Switch5 O2S1 STP
1.993 -- Switch5 STP
1.994 Switch5 O2S1 STP
1.994 Switch5 PC15 STP
1.994 Switch5 PC16 STP
1.994 Switch5 PC17 STP
1.994 Switch5 PC18 STP
1.994 Switch5 PC19 STP
1.994 Switch5 Access Point3 STP
1.994 Switch5 O2S2 STP

Simulation Scenario 6:

A laptop user from first facility of first branch office wants to send email to her friend in the first facility of second branch office.

Simulation Panel

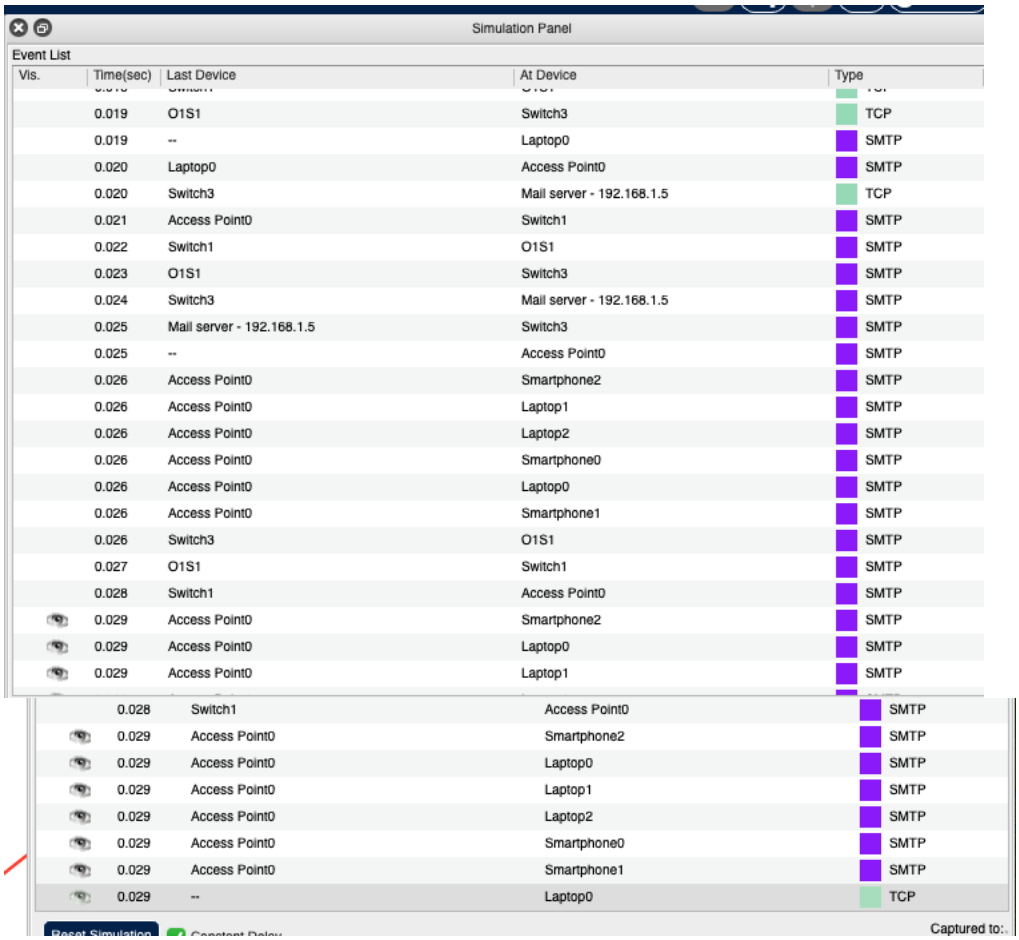
Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	Laptop0	TCP
	0.001	Laptop0	Access Point0	TCP
	0.002	Access Point0	Switch1	TCP
	0.003	Switch1	O1S1	TCP
	0.004	O1S1	Switch3	TCP
	0.004	--	Access Point0	TCP
	0.005	Access Point0	Smartphone2	TCP
	0.005	Access Point0	Laptop1	TCP
	0.005	Access Point0	Laptop2	TCP
	0.005	Access Point0	Smartphone0	TCP
	0.005	Access Point0	Laptop0	TCP
	0.005	Access Point0	Smartphone1	TCP
	0.005	Switch3	Mail server - 192.168.1.5	TCP
	0.006	Mail server - 192.168.1.5	Switch3	TCP
	0.007	Switch3	O1S1	TCP
	0.008	O1S1	Switch1	TCP
	0.008	--	Switch0	STP
	0.009	Switch0	midRouter1	STP
	0.009	Switch0	PC21	STP
	0.009	Switch0	PC20	STP
	0.009	Switch0	PC5	STP
	0.009	Switch0	PC3	STP
	0.009	Switch1	Access Point0	TCP

Simulation Panel

Event List

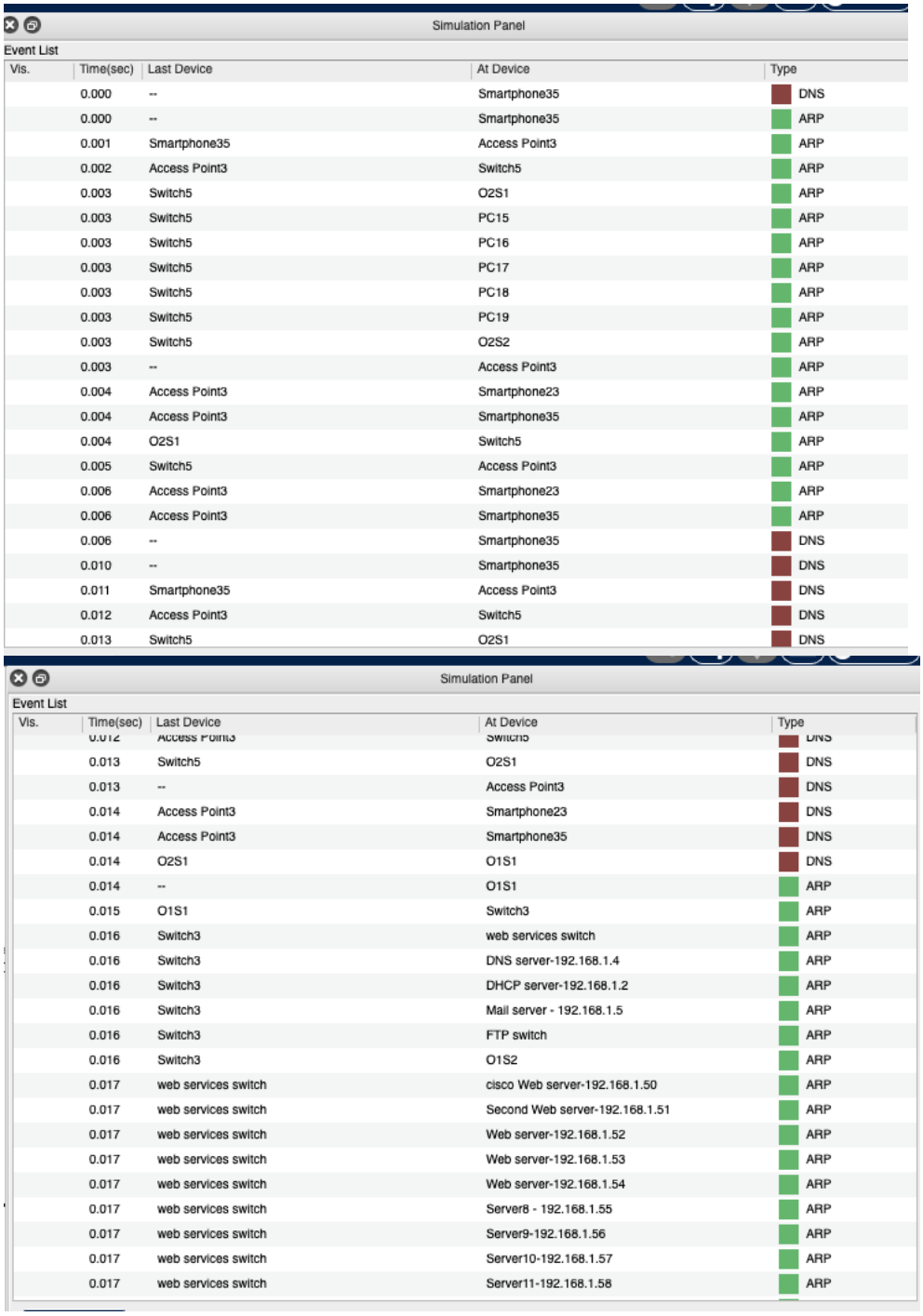
Vis.	Time(sec)	Last Device	At Device	Type
	0.009	Switch0	PC3	STP
	0.009	Switch1	Access Point0	TCP
	0.009	--	Switch0	STP
	0.010	Access Point0	Smartphone2	TCP
	0.010	Access Point0	Laptop0	TCP
	0.010	Access Point0	Laptop1	TCP
	0.010	Access Point0	Laptop2	TCP
	0.010	Access Point0	Smartphone0	TCP
	0.010	Access Point0	Smartphone1	TCP
	0.010	Switch0	midRouter1	STP
	0.010	--	Laptop0	SMTP
	0.015	--	Laptop0	TCP
	0.016	Laptop0	Access Point0	TCP
	0.017	Access Point0	Switch1	TCP
	0.017	--	Access Point0	TCP
	0.018	Access Point0	Smartphone2	TCP
	0.018	Access Point0	Laptop1	TCP
	0.018	Access Point0	Laptop2	TCP
	0.018	Access Point0	Smartphone0	TCP
	0.018	Access Point0	Laptop0	TCP
	0.018	Access Point0	Smartphone1	TCP
	0.018	Switch1	O1S1	TCP
	0.019	O1S1	Switch3	TCP


Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.019 O1S1 Switch3 TCP
0.019 -- Laptop0 SMTP
0.020 Laptop0 Access Point0 SMTP
0.020 Switch3 Mail server - 192.168.1.5 TCP
0.021 Access Point0 Switch1 SMTP
0.022 Switch1 O1S1 SMTP
0.023 O1S1 Switch3 SMTP
0.024 Switch3 Mail server - 192.168.1.5 SMTP
0.025 Mail server - 192.168.1.5 Switch3 SMTP
0.025 -- Access Point0 SMTP
0.026 Access Point0 Smartphone2 SMTP
0.026 Access Point0 Laptop1 SMTP
0.026 Access Point0 Laptop2 SMTP
0.026 Access Point0 Smartphone0 SMTP
0.026 Access Point0 Laptop0 SMTP
0.026 Access Point0 Smartphone1 SMTP
0.026 Switch3 O1S1 SMTP
0.027 O1S1 Switch1 SMTP
0.028 Switch1 Access Point0 SMTP
0.029 Access Point0 Smartphone2 SMTP
0.029 Access Point0 Laptop0 SMTP
0.029 Access Point0 Laptop1 SMTP
0.028 Switch1 Access Point0 SMTP
0.029 Access Point0 Smartphone2 SMTP
0.029 Access Point0 Laptop0 SMTP
0.029 Access Point0 Laptop1 SMTP
0.029 Access Point0 Laptop2 SMTP
0.029 Access Point0 Smartphone0 SMTP
0.029 Access Point0 Smartphone1 SMTP
0.029 -- Laptop0 TCP
Reset Simulation
Captured to:

Simulation Scenario 7:

A smartphone user from third facility of second branch office wants to use ssh to connect to a Web server in the third facility of first branch office.

This scenario takes so much time(sec). because of that simulation statistic is so long. I took pictures of them a little.



Simulation Panel

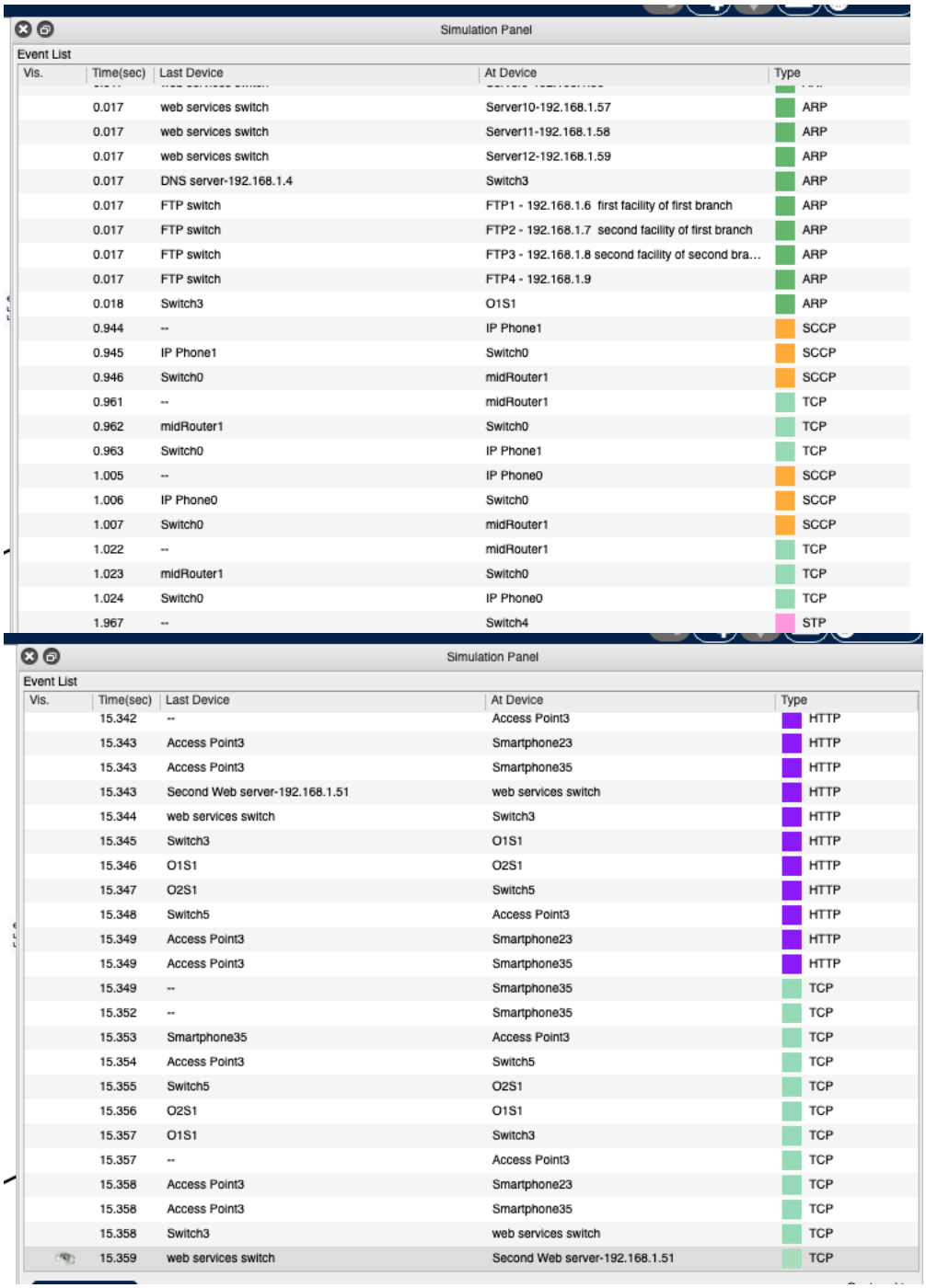
Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	Smartphone35	DNS
	0.000	--	Smartphone35	ARP
	0.001	Smartphone35	Access Point3	ARP
	0.002	Access Point3	Switch5	ARP
	0.003	Switch5	O2S1	ARP
	0.003	Switch5	PC15	ARP
	0.003	Switch5	PC16	ARP
	0.003	Switch5	PC17	ARP
	0.003	Switch5	PC18	ARP
	0.003	Switch5	PC19	ARP
	0.003	Switch5	O2S2	ARP
	0.003	--	Access Point3	ARP
	0.004	Access Point3	Smartphone23	ARP
	0.004	Access Point3	Smartphone35	ARP
	0.004	O2S1	Switch5	ARP
	0.005	Switch5	Access Point3	ARP
	0.006	Access Point3	Smartphone23	ARP
	0.006	Access Point3	Smartphone35	ARP
	0.006	--	Smartphone35	DNS
	0.010	--	Smartphone35	DNS
	0.011	Smartphone35	Access Point3	DNS
	0.012	Access Point3	Switch5	DNS
	0.013	Switch5	O2S1	DNS

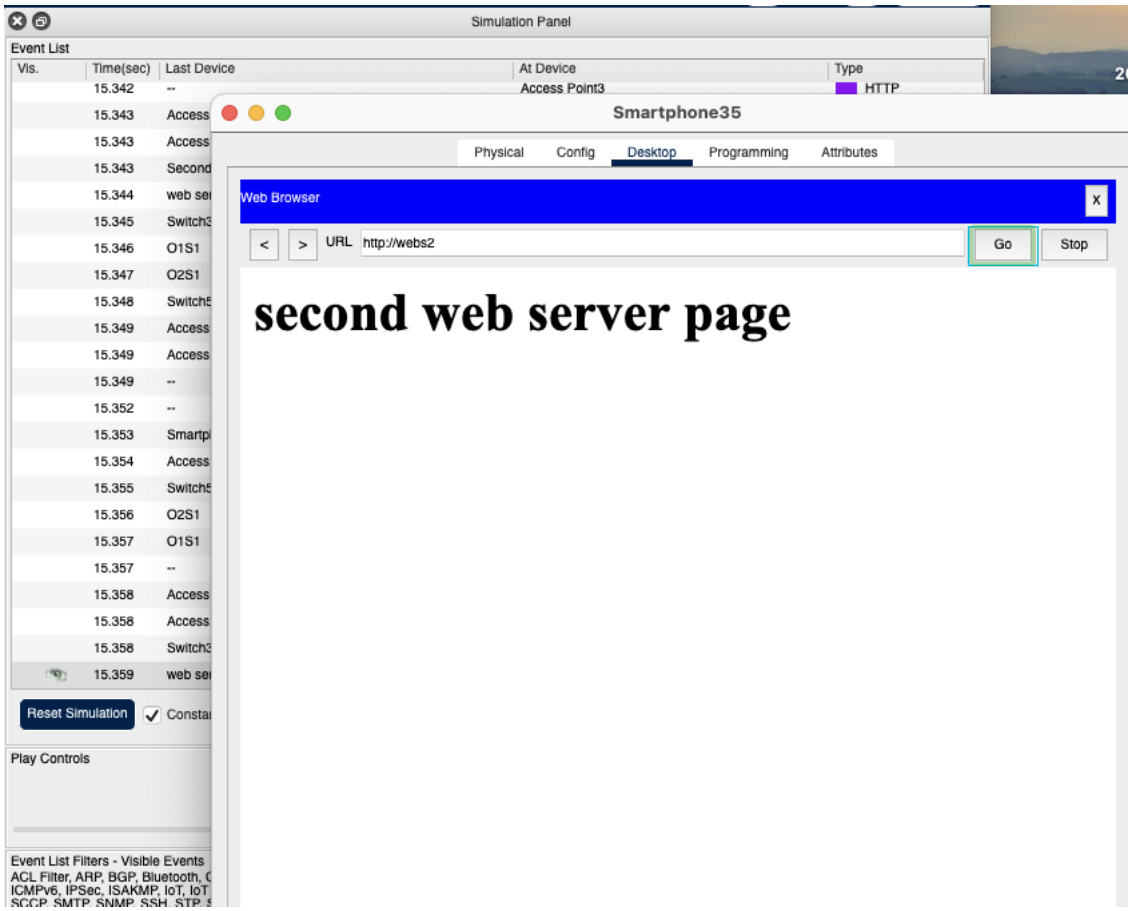
Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.013	Switch5	O2S1	DNS
	0.013	--	Access Point3	DNS
	0.014	Access Point3	Smartphone23	DNS
	0.014	Access Point3	Smartphone35	DNS
	0.014	O2S1	O1S1	DNS
	0.014	--	O1S1	ARP
	0.015	O1S1	Switch3	ARP
	0.016	Switch3	web services switch	ARP
	0.016	Switch3	DNS server-192.168.1.4	ARP
	0.016	Switch3	DHCP server-192.168.1.2	ARP
	0.016	Switch3	Mail server - 192.168.1.5	ARP
	0.016	Switch3	FTP switch	ARP
	0.016	Switch3	O1S2	ARP
	0.017	web services switch	cisco Web server-192.168.1.50	ARP
	0.017	web services switch	Second Web server-192.168.1.51	ARP
	0.017	web services switch	Web server-192.168.1.52	ARP
	0.017	web services switch	Web server-192.168.1.53	ARP
	0.017	web services switch	Web server-192.168.1.54	ARP
	0.017	web services switch	Server8 - 192.168.1.55	ARP
	0.017	web services switch	Server9-192.168.1.56	ARP
	0.017	web services switch	Server10-192.168.1.57	ARP
	0.017	web services switch	Server11-192.168.1.58	ARP


Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.017 web services switch Server10-192.168.1.57 ARP
0.017 web services switch Server11-192.168.1.58 ARP
0.017 web services switch Server12-192.168.1.59 ARP
0.017 DNS server-192.168.1.4 Switch3 ARP
0.017 FTP switch FTP1 - 192.168.1.6 first facility of first branch ARP
0.017 FTP switch FTP2 - 192.168.1.7 second facility of first branch ARP
0.017 FTP switch FTP3 - 192.168.1.8 second facility of second bra... ARP
0.017 FTP switch FTP4 - 192.168.1.9 ARP
0.018 Switch3 O1S1 ARP
0.944 -- IP Phone1 SCCP
0.945 IP Phone1 Switch0 SCCP
0.946 Switch0 midRouter1 SCCP
0.961 -- midRouter1 TCP
0.962 midRouter1 Switch0 TCP
0.963 Switch0 IP Phone1 TCP
1.005 -- IP Phone0 SCCP
1.006 IP Phone0 Switch0 SCCP
1.007 Switch0 midRouter1 SCCP
1.022 -- midRouter1 TCP
1.023 midRouter1 Switch0 TCP
1.024 Switch0 IP Phone0 TCP
1.967 -- Switch4 STP

Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
15.342 -- Access Point3 HTTP
15.343 Access Point3 Smartphone23 HTTP
15.343 Access Point3 Smartphone35 HTTP
15.343 Second Web server-192.168.1.51 web services switch HTTP
15.344 web services switch Switch3 HTTP
15.345 Switch3 O1S1 HTTP
15.346 O1S1 O2S1 HTTP
15.347 O2S1 Switch5 HTTP
15.348 Switch5 Access Point3 HTTP
15.349 Access Point3 Smartphone23 HTTP
15.349 Access Point3 Smartphone35 HTTP
15.349 -- Smartphone35 TCP
15.352 -- Smartphone35 TCP
15.353 Smartphone35 Access Point3 TCP
15.354 Access Point3 Switch5 TCP
15.355 Switch5 O2S1 TCP
15.356 O2S1 O1S1 TCP
15.357 O1S1 Switch3 TCP
15.357 -- Access Point3 TCP
15.358 Access Point3 Smartphone23 TCP
15.358 Access Point3 Smartphone35 TCP
15.358 Switch3 web services switch TCP
15.359 web services switch Second Web server-192.168.1.51 TCP


Simulation Panel
Event List
Vis.
Time(sec)
Last Device
At Device
Type
Access Point3
HTTP
Reset Simulation
Play Controls
Event List Filters - Visible Events
Smartphone35
Physical
Config
Desktop
Programming
Attributes
Web Browser
URL
http://webs2
Go
Stop
second web server page

Additional Simulation Scenario 1:

PC0 in the first facility of first branch send a file to corresponding FTP server.

```
C:\>ftp 192.168.1.6
Trying to connect...192.168.1.6
Connected to 192.168.1.6
220- Welcome to PT Ftp server
Username:admin1
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>
ftp>put myFish.txt

Writing file myFish.txt to 192.168.1.6:
File transfer in progress...

[Transfer complete - 9 bytes]

9 bytes copied in 0.052 secs (173 bytes/sec)
```

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.197	O1S1	Switch1	FTP
	0.198	Switch1	PC0	FTP
	0.198	--	PC0	FTP
	0.199	PC0	Switch1	FTP
	0.200	Switch1	O1S1	FTP
	0.201	O1S1	Switch3	FTP
	0.202	Switch3	FTP switch	FTP
	0.203	FTP switch	FTP1 - 192.168.1.6 first facility of first branch	FTP
	0.203	--	FTP1 - 192.168.1.6 first facility of first branch	FTP
	0.204	FTP1 - 192.168.1.6 first facility of first branch	FTP switch	FTP
	0.205	FTP switch	Switch3	FTP
	0.206	Switch3	O1S1	FTP
	0.207	O1S1	Switch1	FTP
	0.208	Switch1	PC0	FTP
	0.208	--	PC0	FTP
	0.209	PC0	Switch1	FTP
	0.210	Switch1	O1S1	FTP
	0.211	O1S1	Switch3	FTP
	0.212	Switch3	FTP switch	FTP
	0.213	FTP switch	FTP1 - 192.168.1.6 first facility of first branch	FTP
	0.213	--	FTP1 - 192.168.1.6 first facility of first branch	FTP
	0.214	FTP1 - 192.168.1.6 first facility of first branch	FTP switch	FTP

Simulation Panel

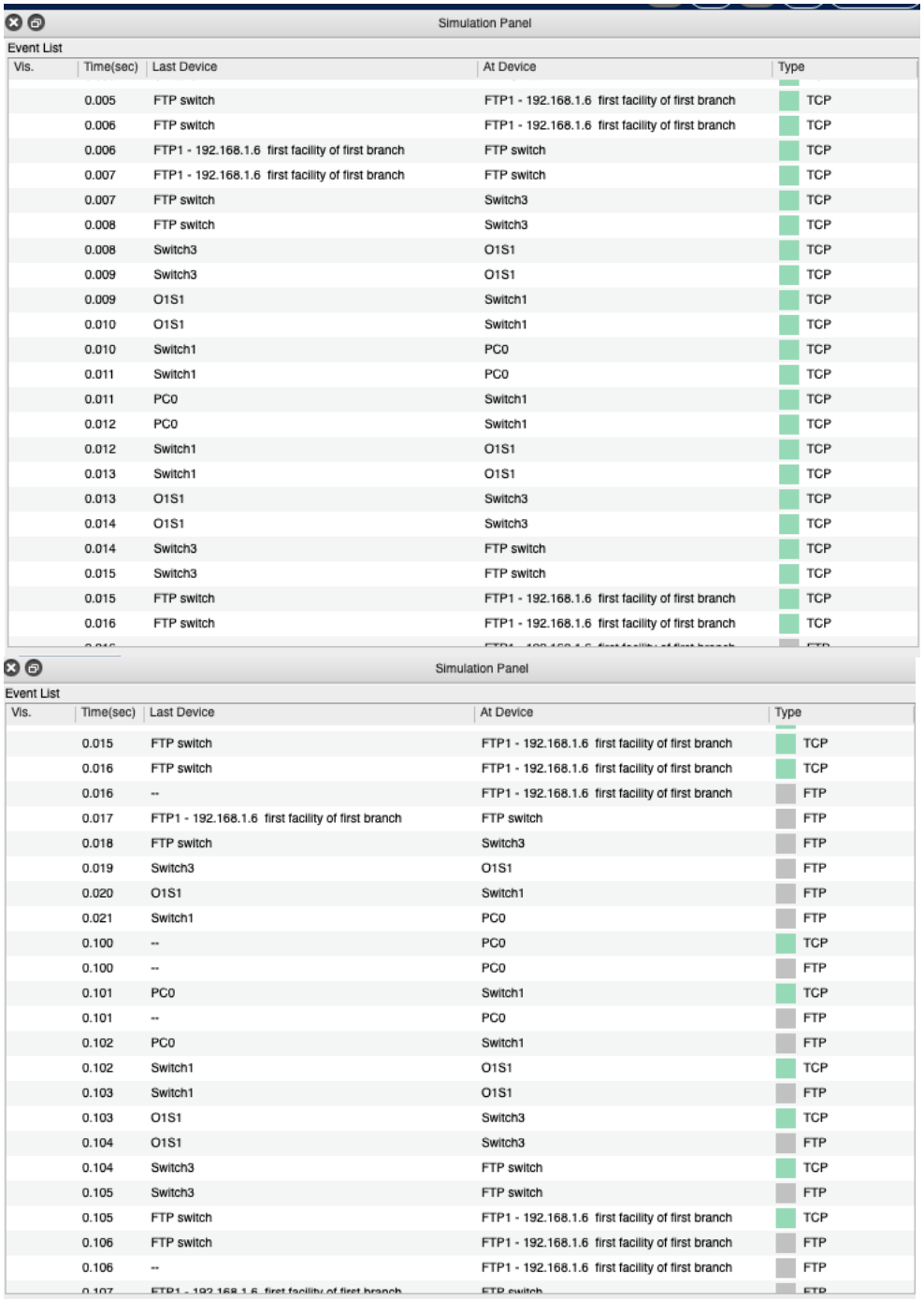
Event List

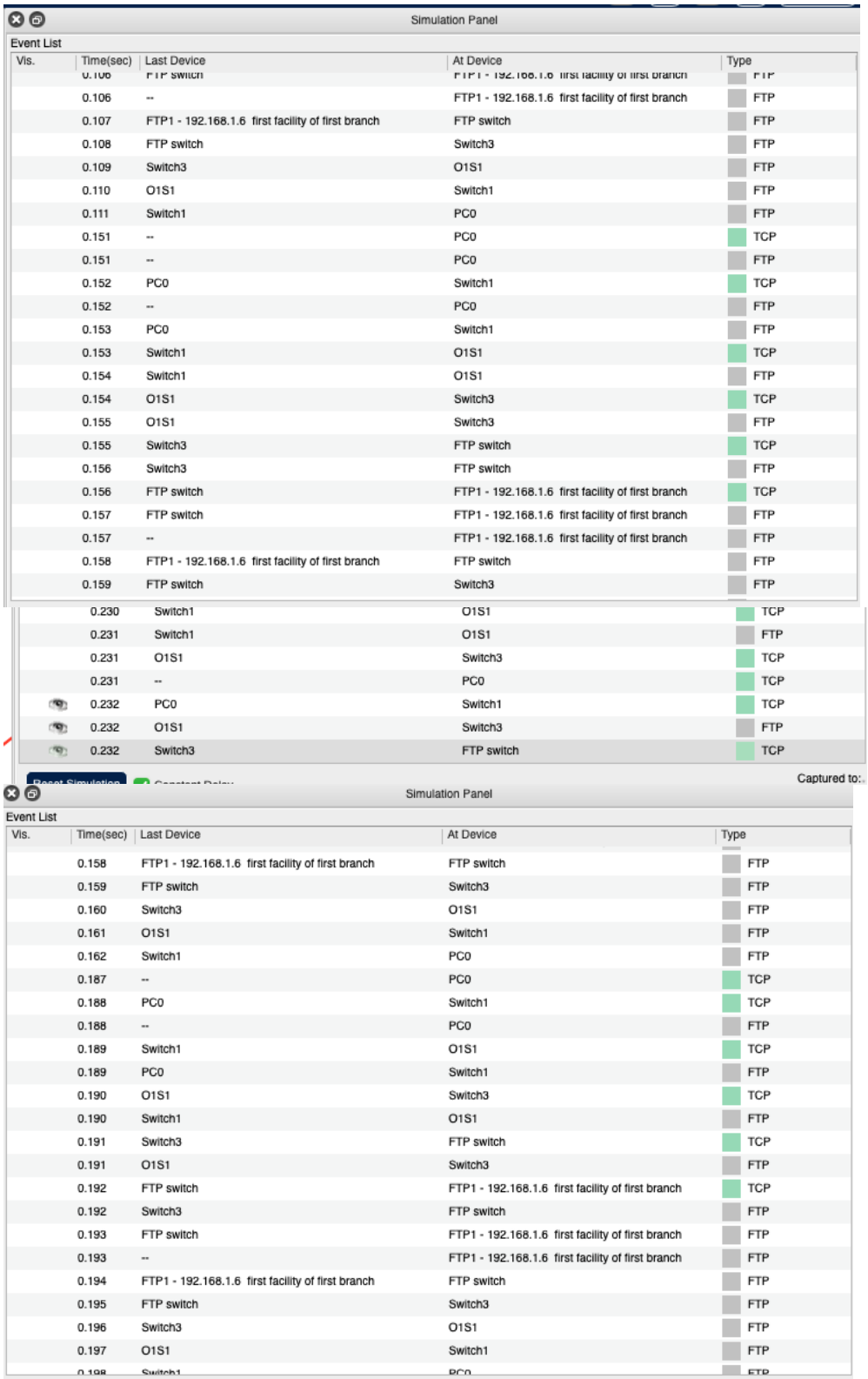
Vis.	Time(sec)	Last Device	At Device	Type
	0.214	FTP1 - 192.168.1.6 first facility of first branch	FTP switch	FTP
	0.215	FTP switch	Switch3	FTP
	0.216	Switch3	O1S1	FTP
	0.217	O1S1	Switch1	FTP
	0.218	Switch1	PC0	FTP
	0.218	--	PC0	TCP
	0.219	PC0	Switch1	TCP
	0.220	Switch1	O1S1	TCP
	0.221	O1S1	Switch3	TCP
	0.222	Switch3	FTP switch	TCP
	0.223	FTP switch	FTP1 - 192.168.1.6 first facility of first branch	TCP
	0.224	FTP1 - 192.168.1.6 first facility of first branch	FTP switch	TCP
	0.225	FTP switch	Switch3	TCP
	0.226	Switch3	O1S1	TCP
	0.227	O1S1	Switch1	TCP
	0.228	Switch1	PC0	TCP
	0.228	--	PC0	FTP
	0.229	PC0	Switch1	TCP
	0.229	--	PC0	FTP
	0.230	PC0	Switch1	FTP
	0.230	Switch1	O1S1	TCP
	0.231	Switch1	O1S1	FTP
	0.231	O1S1	Switch3	TCP

Simulation Panel

Event List

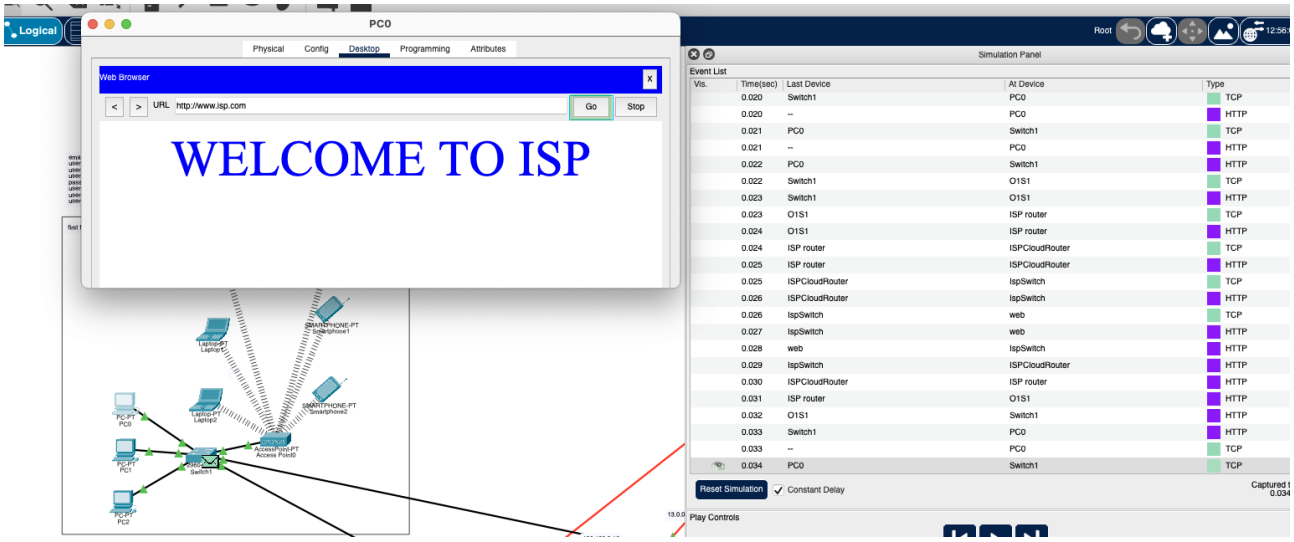
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC0	TCP
	0.000	--	PC0	TCP
	0.001	PC0	Switch1	TCP
	0.001	--	PC0	TCP
	0.002	Access Point1	Tablet PC5	STP
	0.002	Access Point1	Tablet PC7	STP
	0.002	Access Point1	Tablet PC8	STP
	0.002	Access Point1	Tablet PC9	STP
	0.002	Access Point1	Smartphone8	STP
	0.002	Access Point1	Smartphone9	STP
	0.002	Access Point1	Tablet PC6	STP
	0.002	Access Point1	Smartphone11	STP
	0.002	Access Point1	Smartphone12	STP
	0.002	PC0	Switch1	TCP
	0.002	Access Point1	Smartphone10	STP
	0.002	Switch1	O1S1	TCP
	0.003	Switch1	O1S1	TCP
	0.003	O1S1	Switch3	TCP
	0.004	O1S1	Switch3	TCP
	0.004	Switch3	FTP switch	TCP
	0.005	Switch3	FTP switch	TCP
	0.005	FTP switch	FTP1 - 192.168.1.6 first facility of first branch	TCP
	0.006	FTP switch	FTP1 - 192.168.1.6 first facility of first branch	TCP


Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.005 FTP switch FTP1 - 192.168.1.6 first facility of first branch TCP
0.006 FTP switch FTP1 - 192.168.1.6 first facility of first branch TCP
0.006 FTP1 - 192.168.1.6 first facility of first branch FTP switch TCP
0.007 FTP1 - 192.168.1.6 first facility of first branch FTP switch TCP
0.007 FTP switch Switch3 TCP
0.008 FTP switch Switch3 TCP
0.008 Switch3 O1S1 TCP
0.009 Switch3 O1S1 TCP
0.009 O1S1 Switch1 TCP
0.010 O1S1 Switch1 TCP
0.010 Switch1 PC0 TCP
0.011 Switch1 PC0 TCP
0.011 PC0 Switch1 TCP
0.012 PC0 Switch1 TCP
0.012 Switch1 O1S1 TCP
0.013 Switch1 O1S1 TCP
0.013 O1S1 Switch3 TCP
0.014 O1S1 Switch3 TCP
0.014 Switch3 FTP switch TCP
0.015 Switch3 FTP switch TCP
0.015 FTP switch FTP1 - 192.168.1.6 first facility of first branch TCP
0.016 FTP switch FTP1 - 192.168.1.6 first facility of first branch TCP
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.015 FTP switch FTP1 - 192.168.1.6 first facility of first branch TCP
0.016 FTP switch FTP1 - 192.168.1.6 first facility of first branch TCP
0.016 -- FTP1 - 192.168.1.6 first facility of first branch FTP
0.017 FTP1 - 192.168.1.6 first facility of first branch FTP switch FTP
0.018 FTP switch Switch3 FTP
0.019 Switch3 O1S1 FTP
0.020 O1S1 Switch1 FTP
0.021 Switch1 PC0 FTP
0.100 -- PC0 TCP
0.100 -- PC0 FTP
0.101 PC0 Switch1 TCP
0.101 -- PC0 FTP
0.102 PC0 Switch1 FTP
0.102 Switch1 O1S1 TCP
0.103 Switch1 O1S1 FTP
0.103 O1S1 Switch3 TCP
0.104 O1S1 Switch3 FTP
0.104 Switch3 FTP switch TCP
0.105 Switch3 FTP switch FTP
0.105 FTP switch FTP1 - 192.168.1.6 first facility of first branch TCP
0.106 FTP switch FTP1 - 192.168.1.6 first facility of first branch FTP
0.106 -- FTP1 - 192.168.1.6 first facility of first branch FTP


Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.106 -- FTP1 - 192.168.1.6 first facility of first branch FTP
0.107 FTP1 - 192.168.1.6 first facility of first branch FTP switch FTP
0.108 FTP switch Switch3 FTP
0.109 Switch3 O1S1 FTP
0.110 O1S1 Switch1 FTP
0.111 Switch1 PC0 FTP
0.151 -- PC0 TCP
0.151 -- PC0 FTP
0.152 PC0 Switch1 TCP
0.152 -- PC0 FTP
0.153 PC0 Switch1 FTP
0.153 Switch1 O1S1 TCP
0.154 Switch1 O1S1 FTP
0.154 O1S1 Switch3 TCP
0.155 O1S1 Switch3 FTP
0.155 Switch3 FTP switch TCP
0.156 Switch3 FTP switch FTP
0.156 FTP switch FTP1 - 192.168.1.6 first facility of first branch TCP
0.157 FTP switch FTP1 - 192.168.1.6 first facility of first branch FTP
0.157 -- FTP1 - 192.168.1.6 first facility of first branch FTP
0.158 FTP1 - 192.168.1.6 first facility of first branch FTP switch FTP
0.159 FTP switch Switch3 FTP
0.230 Switch1 O1S1 TCP
0.231 Switch1 O1S1 FTP
0.231 O1S1 Switch3 TCP
0.231 -- PC0 TCP
0.232 PC0 Switch1 TCP
0.232 O1S1 Switch3 FTP
0.232 Switch3 FTP switch TCP
Captured to:
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.158 FTP1 - 192.168.1.6 first facility of first branch FTP switch FTP
0.159 FTP switch Switch3 FTP
0.160 Switch3 O1S1 FTP
0.161 O1S1 Switch1 FTP
0.162 Switch1 PC0 FTP
0.187 -- PC0 TCP
0.188 PC0 Switch1 TCP
0.188 -- PC0 FTP
0.189 Switch1 O1S1 TCP
0.189 PC0 Switch1 FTP
0.190 O1S1 Switch3 TCP
0.190 Switch1 O1S1 FTP
0.191 Switch3 FTP switch TCP
0.191 O1S1 Switch3 FTP
0.192 FTP switch FTP1 - 192.168.1.6 first facility of first branch TCP
0.192 Switch3 FTP switch FTP
0.193 FTP switch FTP1 - 192.168.1.6 first facility of first branch FTP
0.193 -- FTP1 - 192.168.1.6 first facility of first branch FTP
0.194 FTP1 - 192.168.1.6 first facility of first branch FTP switch FTP
0.195 FTP switch Switch3 FTP
0.196 Switch3 O1S1 FTP
0.197 O1S1 Switch1 FTP

Additional Simulation Scenario 2:

A User in MAN network system tries to search www.isp.com on the web browser.



CHAPTER 4

Conclusion

Users can browse web, send and receive e-mails, transfer files and ping. DHCP server assigns IP and DNS address to all devices. All requirements are satisfied. Our offices has been created the MAN network in line with the demands of company administrations.

CHAPTER 5

References

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- https://www.youtube.com/watch?v=RB4LiS2lIXo
- https://www.netacad.com/courses/packet-tracer
- https://www.youtube.com/watch?v=MXNM7_Kykaw