Information & Communication Technology

ES2012_TP2010_PT

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CONTENTS

This Test Project proposal consists of the following documentation/files:

1. ES2012_TP2010_PT.doc
2. IPv6.pka
3. Firewall.pka
4. Marking scheme

INTRODUCTION

This test project is designed to be executed during the three days of the competition. At the end of Day1, experts will assess your work and give you a grade for Day1. A substantial part of the work you do on Day1 remains significant during Day2, but that does not mean it will be evaluated again in Day 2; this would only happen if it was an integral part, direct or indirectly, of something that was asked for Day2. Likewise, at the end of Day2, experts will assess your work and give you a grade for Day2. Some of the tasks you completed on Day1, as well as on Day2, carry on to Day3. In addition, in Day3 you will perform other tasks and by the end of the day you will have a project that summarizes what was requested on Day1, added or removed on Day2 and added or removed on Day3; in other words, by the end of Day3 you should have a complete working project that reflects the original requirements along with the modifications, additions and removals of the second and third day. It is important to understand this, because on Day3 experts will not only evaluate the work you did on that day, but they will also evaluate all the other aspects of the work you did on days 1 and 2. They will evaluate your final project.

The Test Project was designed in such a way that it specifies what is to be done, but in numerous cases it is not specific and it is up to you to decide what to do. One thing you should consider doing is leaving some documentation, in electronic format, for the experts to look at and better understand the reasoning behind your choices on items that can be implemented in more than one way.

The purpose of the Test Project is to simulate as much as possible a real scenario that could occur on a normal enterprise. It is not intended to be tricky or present situations that would hardly occur in real life. We hope you enjoy implementing this project.

DESCRIPTION OF PROJECT AND TASKS

The project consists in:

- Configuring a wired and wireless Windows based network;
- Configuring a wired and wireless Linux based network;
- Interconnecting both networks over local and WAN technologies;
- Implement security measures to protect network communications;
- Integrate diverse technologies;

INSTRUCTIONS TO THE COMPETITOR

In the event you need to configure a username which has not been explicitly specified, use only these usernames: “root”, “admin”, “luxadmin”. If it is possible to specify more than one user then you should configure both users with the same password.

Use only these passwords: Spa2012 Euro2012

In case you only need one password use the first one; only use the second password if you have to as in the case where you configure an enable password and an enable secret on a Cisco equipment.

We will not try any other password; if we cannot get in with one of those two passwords we will not be able to evaluate your work and therefore your team will not get a grade on the items we weren’t able to check.

EQUIPMENT, MACHINERY, INSTALLATIONS AND MATERIALS REQUIRED

The infrastructure list as it is known on July 31, 2012.

MATERIALS, EQUIPMENT AND TOOLS SUPPLIED BY COMPETITORS IN THEIR TOOLBOX

Competitors will be supplied with paper, pens and pencils.

MATERIALS & EQUIPMENT AND TOOLS PROHIBITED IN THE SKILL AREA

Competitors are not allowed to bring any personal items to the competition area.

MARKING SCHEME

The marking scheme is an integral part of this project and is included at the end.

OTHER

Other information may be passed on to the competitors at the competition site.

Work order: Day 1 Duration: 6 hours

1. We, at the Spa Skills Corporation, are in the process of evaluating an integrated solution made up of Windows and Linux based servers and would like your team to develop a proof of concept implementation for the purpose of demonstrating the functionality of the new design.

2. During the three days you are with us, your team will develop a gradually more complex network. The topology for the first day is illustrated in the following figure.

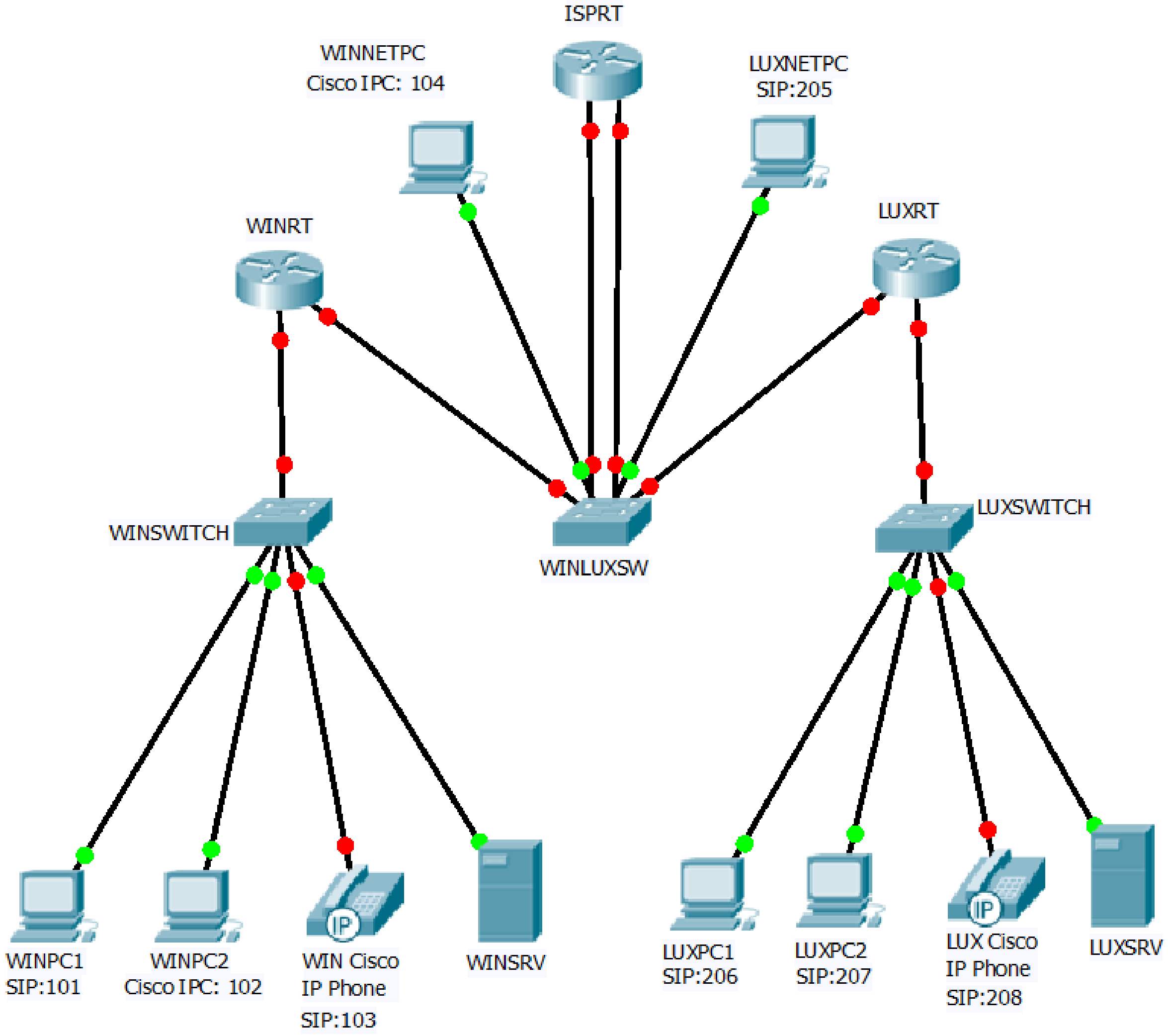

Figure 1

3. As you can see, the network is divided into a Windows based branch and a Linux based branch. Besides these two corporate branches, we also have a Windows and a Linux client that will connect to the internal networks from a simulated Internet. Both clients and servers will be strictly implemented as virtual machines. Calculate the sub-networks to be used in the topology wasting the least number of IP addresses.

NOTE: Native VLAN is always VLAN 88

1. WINDOWS BRANCH 172.16.160.0/19	HOSTS	NETWORK	FIRST IP	LAST IP	BROADCAST
WINRT Local Area Network VLAN 10	1000				
WINSWITCH Management Network – VLAN 20	60				

2. LINUX BRANCH 10.0.208.0/20	HOSTS	NETWORK	FIRST IP	LAST IP	BROADCAST
LUXRT Local Area Network VLAN 100	500				
LUXSWITCH Management Network – VLAN 200	100				

3. ISPRT NETWORK 85.95.208.0/20	HOSTS	NETWORK	FIRST IP	LAST IP	BROADCAST
ISPRT WINNETPC Network VLAN 30	100				
ISPRT LUXNETPC Network VLAN 300	300				
WINRT Connection VLAN 40	2				
LUXRT Connection VLAN 400	2				

4. Configure all Cisco equipment to be managed both locally and remotely strictly with SSH.

5. Configure ISPRT with the first usable address for each network. Configure this router as a DNS server for the WINNETPC and WINLUXPC networks; it should not resolve any names directly. It should forward all requests for winspa.org records to the WINSRV server and all requests for luxspa.org records to the LUXSRV server. Configure one Ethernet interface for VLANs 30 and 40 and the other one for VLANs 300 and 400.

6. Configure WINRT with the first usable address for the Local Area Network and with the first usable address for the WINSWITCH Management Network. Configure the link to the ISPRT router which goes through the WINLUXSW switch.

7. Configure the WINSWITCH with the last usable address and the WINLUXSW with the next to cast usable address for the WINSWITCH Management Network. Configure the WINLUXSW with the VLANs and

trunk links necessary to support the topology, as detailed in Figure 1 and the address table above.

8. Configure LUXRT with the first usable address for the Local Area Network and with the first usable address for the LUXSWITCH Management Network. Configure the link to the ISPRT router which goes through the WINLUXSW switch.

9. Configure the LUXSWITCH with the last usable address for the LUXSWITCH Management Network.

10. Configure the WINSRV server with the last usable IP address.

11. Configure LUXSRV with the last usable IP address.

12. Clients in the WINNETPC LAN get their IP configuration from the DHCP server in ISPRT router; exclude the first and last 10 address. Although it's not shown in the topology in figure 1.0 you also have one laptop; when you plug the laptop into the WINNETPC LAN, it should always get the second highest usable IP address.

13. Clients in the LUXNETPC LAN get their IP configuration from the DHCP server in ISPRT router; exclude the first 10 address. Although it's not shown in the topology in figure 1.0 you also have one laptop; when you plug the laptop into the LUXNETPC LAN, it should always get the second highest usable IP.

14. Configure static routing as you see fit keeping in mind that the objective is total connectivity and that the ISPRT router is simulating an ISP router.

15. By now your infrastructure should be complete and you have total connectivity with static addresses.

16. The WINSRV server will run Active Directory, HTTP, FTP, DHCP, DNS, Exchange, media services and anything else you find necessary. Configure the server according to the following requirements:

    a. Install Active Directory and DNS for winspa.org domain. The DNS server should only resolve hosts for the winspa.org zone and forward all other requests to the ISPRT router.

    b. Create an organizational unit with the name of Trainees and inside create 250 users. The accounts must follow the format TraineeXXX where the XXX represents the number of users. For example, the first account would Trainee1, the tenth and hundredth would be respectively Trainee10 and Trainee100. Keep in mind that besides local access they must all have remote access and that the first time they access the server can be via a VPN connection. You can and should use a script to do this task.

    c. Whenever one of the Trainee accounts logs into a machine for the first time, the application located inside the **GPO_Install** folder should be automatically installed using Group Policy Objects.

d. All users, except administrators, must have a roaming profile. Disc Z should point to the root area of the user.

e. Create the following users implementing restrictions on the login hours. Configure quota for the users in the group North, which should be automatically notified if they are 2MB or less from reaching their quota. If they exceed the quota they should be denied space on the disk.

USER	EMAIL	OU	GROUP	WORK SCHEDULLE	QUOTA
miguel	miguel@winspa.org	OU_North	North	No restrictions	20 MB
maria	maria@winspa.org	OU_North	North	09:00 - 18:00 – Monday to Friday	25 MB
terceira	terceira@winspa.org	OU_Center	Center	No restrictions	–
pico	pico@winspa.org	OU_Center	Center	14:00 - 18:00 – Monday, Wednesday and Friday	–
faial	faial@winspa.org	OU_Center	Center	Any time Monday, Wednesday and Friday	–
graciosa	graciosa@winspa.org	OU_Center	Center	Any time Saturday and Sundays	–
jorge	jorge@winspa.org	OU_Center	Center	9:00 – 13:00 – Monday, Wednesday and Friday	–
flores	flores@winspa.org	OU_South	South	No restrictions	–
corvo	corvo@winspa.org	OU_South	South	Any time Tuesday, Thursday and Friday	–

f. Create an hidden administrative share with the name Software. Only Administrators may have access to this folder.

g. The users flores and corvo may not have access to the Execute or the Command line prompt.

h. All users, except administrators, will have a mandatory background image called Skills.jpg assigned by the server and are not allowed to change the background image.

i. This server will host 4 web sites that may be served by both the IIS web server on port 80 as well as the Apache web server on port 8080. Make the necessary settings to create the following four Named Virtual Hosts both in the IIS web server as well as in the Apache web server. Create a file named index.html for each web site and place it in the root of each server, this file should contain a message alluding to its web site.

Access by the IIS web server	Access by the Apache web serer	Root
http://www.winspa.org	http://www.winspa.org:8080	c:\Inetpub\wwwroot
http://north.winspa.org	http://north.winspa.org:8080	c:\Inetpub\north
http://center.winspa.org	http://center.winspa.org:8080	c:\Inetpub\center
http://south.winspa.org	http://south.winspa.org:8080	c:\Inetpub\south

j. Access to the North, Center and South web sites, served by IIS and Apache, is restricted to the users within each respective group. Access to the www.winspa.org is public.

k. Install and configure an FTP server. When users from the North, Center and South groups log in, they should go automatically to the root of their respective web sites; they should also be restricted to the root of their respective web sites. When the Administrator logs in, he should go directly to the Inetpub directory and have full access to folders and files in that directory.

l. Install and configure PHP, whichever version you wish, to run both in the IIS web server as well as in the Apache web server. The PHP module should process files ending in ".php", ".htm" and ".html". Create a small file called info.php and place in the root of each web site. Make copies of this file to info.htm and info.html in the root of each site. The contents of this file should be:

```
<script language=php>
   phpinfo();
</script>
```

m. Install and configure Exchange Server 2010 to provide SMTP, POP3 and IMAP email to all users of the winspa.org domain.

n. Install and configure Windows Media Services creating a broadcast of the Dogs.wmv video with the name "spaskills" which should be accessible by the link "http://www.spaskills.org/spaskills.asx". User miguel must have total permissions because he is the administrator of the video transmissions. To make the management of the transmissions easier, it should be possible to manage de media services server from the address "http://media.winspa.org:8088".

o. Clients in the WINRT LAN get their full IP configuration from the DHCP server in WINSRV; exclude the first and last 10 address.

17. The LUXSRV server will perform basically the same functions as the WINSRV server. It will run HTTP, FTP, DHCP, DNS, SMTP/POP3 and anything else you find necessary. Configure the server according to the following requirements:

    a. Configure a DNS server to resolve hosts for the luxspa.org zone and forward all other requests to the IPSRT router.

    b. Create a group called Trainees. Create 250 users and add them to the Trainees group. The accounts must follow the format TraineeXXX where the XXX represents the number of users. For example, the first account would Trainee1, the tenth and hundredth would be respectively Trainee10 and Trainee100.

c. Create the following users implementing restrictions on the login hours.

USER	EMAIL	GROUP	WORK SCHEDULLE
miguel	miguel@luxspa.org	North	No restrictions
maria	maria@luxspa.org	North	09:00 - 18:00 – Monday to Friday
terceira	terceira@luxspa.org	Center	No restrictions
pico	pico@luxspa.org	Center	14:00 - 18:00 – Monday, Wednesday and Friday
faial	faial@luxspa.org	Center	Any time Monday, Wednesday and Friday
graciosa	graciosa@luxspa.org	Center	Any time Saturday and Sundays
jorge	jorge@luxspa.org	Center	9:00 – 13:00 – Monday, Wednesday and Friday
flores	flores@luxspa.org	South	No restrictions
corvo	corvo@luxspa.org	South	Any time Tuesday, Thursday and Friday
luxadmin	luxadmin@luxspa.org	admins	No restrictions

d. This server will host 4 web sites that will be served by the Apache web server on port 80. Make the necessary settings to create the following four Named Virtual Hosts in the Apache web server. Create a file named index.html for each web site and place it in the root of each server, this file should contain a message alluding to its web site.

Access by the Apache web serer	Root
http://www.luxspa.org	/var/www/www
http://north.luxspa.org	/var/www/north
http://center.luxspa.org	/var/www/center
http://south.luxspa.org	/var/www/south

e. Access to the North, Center and South web sites is restricted to the users within each respective group. Access to the www.luxspa.org is public.

f. Install and configure an FTP server. When users from the North, Center and South groups log in, they should go automatically to the root of their respective web sites; they should also be restricted to the root of their respective web sites. When the **luxadmin** user logs in, he should go directly to the root of the www.luxspa.org site and have full access to the folders and files within that directory.

g. Install and configure PHP, whichever version you wish. The PHP module should process files ending in ".php", ".htm" and ".html". Create a small file called info.php and place in the root of each web site. Make copies of this file to info.htm and info.html in the root of each site. The contents of this file should be:

```
<script language=php>
    phpinfo();
</script>
```

h. Configure this server to provide SMTP, POP3 and IMAP mail services to the users within the luxspa.org domain.

i. Clients in the LUXRT LAN get their full IP configuration from the DHCP server in LUXSRV; exclude the first and last 10 address.

j. Install and configure Asterisk VoIP with 8 extensions numbered 101-104 and 205-208. This server will provide telephony services for the Linux branch as well as the Windows branch.

k. Configure extension 999 so that it may be used to check voicemail.

l. Any calls received before 08:00:00 and after 22:00:00 should automatically be forwarded to voicemail.

18. The Windows clients will serve essentially to test functionality of the configurations made on the both servers. Configure the Windows clients as follows:

a. WINPC1 [Primary user for this computer is: miguel]
   i. Add this computer to the Windows domain.
   ii. Install and configure the VoIP Client X-Lite with extension 101. Place calls to 102, 104 and 206.
   iii. Leave and access voicemail.
   iv. In Thunderbird configure two email accounts: a SMTP/POP3 account to access the WINSRV server and a SMTP/IMAP to access the LUXSRV server. Send and receive email from both accounts within and across domains.
   v. Access the 4 web sites in WINSRV and in LUXSRV.
   vi. Access the http://www.spaskills.org/spaskills.asx to view the video.
   vii. Access the http://media.winspa.org:8088 and confirm that only miguel can get in.

b. WINPC2 [Primary user for this computer is: terceira]
   i. Add this computer to the Windows domain.
   ii. Install and configure the VoIP 3CX with extension 102. Place calls to 205 and 207.
   iii. Leave and access voicemail.
   iv. Install Windows Live Essentials.
   v. In Windows Mail configure two email accounts: a SMTP/IMAP account to access the WINSRV server and a SMTP/POP3 to access the LUXSRV server.

c. WINNETPC [Primary user for this computer is: flores]
   i. Install and configure the VoIP Client X-Lite with extension 104. Place calls to 101, 205 and 206.
   ii. In Thunderbird configure two email accounts: a SMTP/POP3 account to access the WINSRV server and a SMTP/POP3 to access the LUXSRV server. Send and receive email from both accounts within and across domains.
   iii. Access the 4 web sites in WINSRV and in LUXSRV.
   iv. Access the http://www.spaskills.org/spaskills.asx to view the video.

19. The Linux clients will serve essentially to test functionality of the configurations made on the both servers. Configure the Linux clients as follows:

a. LUXPC1 [Primary user for this computer is: miguel]
   i. Install and configure a SIP Client:_____________ of your choice with extension 206. Place calls to 102, 102 and 104.
   ii. Leave and retrieve voicemail.
   iii. Login as miguel and in Thunderbird configure two email accounts: a SMTP/POP3 account to access the WINSRV server and a SMTP/IMAP to access the LUXSRV server. Send and receive email from both accounts within and across domains.
   iv. Access the 4 web sites in WINSRV and in LUXSRV.
   v. Access the http://www.spaskills.org/spaskills.asx to view the video.
   vi. Access the http://media.winspa.org:8088 and confirm that only miguel can get in.

b. LUXPC2 [Primary user for this computer is: terceira]
   i. Install and configure a different SIP Client:_____________ with extension 207. Place calls to 102 and 104.
   ii. Leave and access voicemail.
   iii. In Thunderbird configure two email accounts: a SMTP/IMAP account to access the WINSRV server and a SMTP/POP3 to access the LUXSRV server. . Send and receive email from both accounts within and across domains.

c. LUXNETPC [Primary user for this computer is: flores]

    i. Install and configure a SIP Client:_____________ of your choice with extension 205. Place calls to 101, 104 and 206.
    ii. In Thunderbird configure two email accounts: a SMTP/POP3 account to access the WINSRV server and a SMTP/POP3 to access the LUXSRV server. Send and receive email from both accounts.
    iii. Access the 4 web sites in WINSRV and in LUXSRV.
    iv. Access the http://www.spaskills.org/spaskills.asx to view the video.

20. Logoff and shutdown all your equipment, both virtual and physical.

CONGRATULATIONS – YOU MADE IT TO THE END OF DAY 1

Work order: Day 2 Introduction

Welcome to the second day. Your work for today is a continuation of the project you started yesterday and is based on the principle that you completed your assignments yesterday. We have already evaluated the work you did yesterday. If you did not complete all your tasks, you may choose to do so today, but please be aware that we may not be re-evaluating them, as they may not be a requirement to complete today's project. In other words, a task requested yesterday will only be re-evaluated today if it fits within the work requested today.

Essentially we are replacing the Asterisk VoIP with a Cisco solution, replacing static routing with dynamic routing, adding a VPN server on the WINSRV machine for the WINNETPC clients, adding a VPN server on the LUXSRV machine for the LUXNETPC clients and adding WiFi secure communications.

VERY IMPORTANT NOTE:

In the event the IOS installed in the Cisco routers do not support Cisco Cal Manager Express, the VoIP tasks requested today shall be implemented using Asterisk and SIP soft phones; in other words, if CME is not available, the VoIP requirements for today are exactly the same as those requested yesterday. One of the following two boxes will be checked by two experts to indicate which of the two VoIP solutions you should implement today.

Implement Asterisk VoIP: YES □ NO □ Implement Cisco CME VoIP: YES □ NO □

Expert:____ Country:__________

Expert:____ Country:__________

Work order: Day 2 Duration: 6 hours

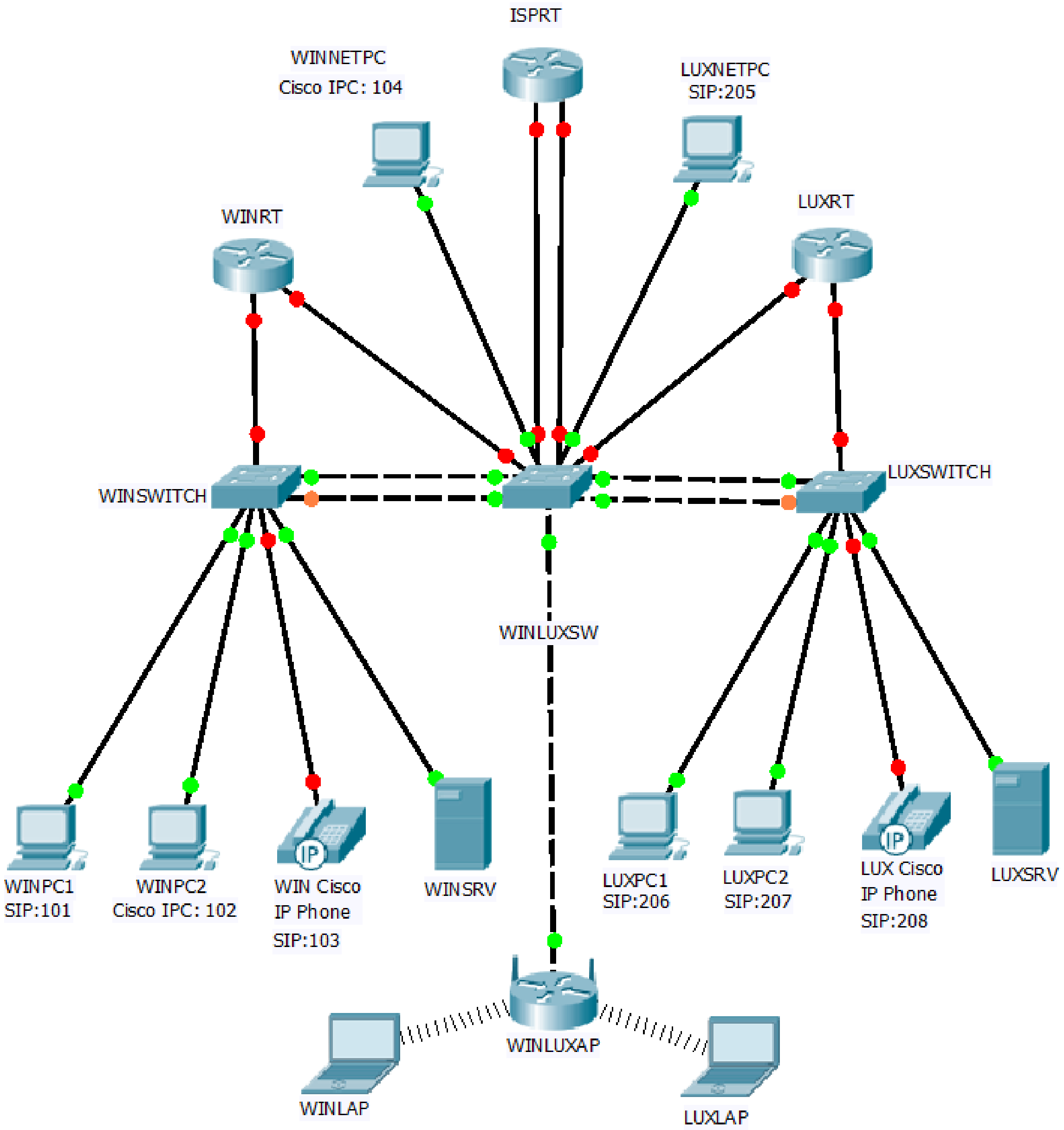

Figure 2

The best way to understand this topology is to think of the WINLUXSW switch as two switches and think of the WINLUXAP as two APs. WINLAP connects to WINLUXAP1 which connects to WINLUXSW1 which then connects to WINSWITCH; LUXLAP connects to WINLUXAP2 which connects to WINLUXSW2 which then connects to LUXSWITCH. Because we do not have an extra switch and an extra AP, we will use VLANs to separate traffic and restrict the communication between WINSWITCH and WINLUXSW to VLAN 10 and restrict the communication between LUXSWITCH and WINLUXSW to VLAN 100. Obviously you will have to configure VLANs on the AP. The Native VLAN must also be allowed to pass between the switches.

Please note that whatever was requested for yesterday is still valid for today unless it is replaced with a new request in today's project. For example, all the IP addressing scheme remains valid for today. Also, keep in mind that certain configuration aspects are not explicitly requested, but you are required to complete them; for example, if we ask you to configure ISPRT to connect to WINRT with the PPP protocol, we will not ask you to connect the WINRT router to the ISPRT router with the PPP protocol; we expect you to infer that.

1. On the ISPRT router:
    a. Configure interface Loopback 0 with the IP address 199.199.199.199/32. Configure a default static route to Loopback 0.

    b. Configure the link to WINRT for the PPP protocol with CHAP authentication; if the link quality falls below 80% the connection should be dropped.

    c. Configure the link to LUXRT for the PPP protocol with PAP authentication; if the link quality falls below 75% the connection should be dropped.

    d. Replace static routing with dynamic routing. Configure EIGRP with the WINRT and OSPF with the LUXRT routers. We understand this is not a normal request but we are just testing this topology in a laboratory. In both cases configure authentication with Message-Digest algorithm 5. Announce both LANs to the WINRT router via EIGRP and to the LUXRT router via OSPF. Announce the default static route to the WINRT and to the LUXRT routers.

    e. Redistribute the EIGRP routes to the OSPF network and the OSPF routes to the EIGRP network.

    f. Configure a dynamic access list to restrict access from the WINNETPC and the LUXNETPC entire networks. If a valid user and password is entered, all traffic shall be permitted for a maximum of 15 minutes. The idle timeout must be set at 10 minutes.

2. On the WINRT router:
    a. Confirm that the Ethernet interfaces are configured correctly to support the topology.

    b. Announce the LANs via EIGRP to the ISPRT router.

    c. Configure an ACL to allow only Windows branch PCs, including WINNETPC and WINLAP, to configure the router remotely via virtual lines.

    d. Configure CME to handle all calls within the winspa.org domain; extensions 100-199. All calls to the luxspa.org domain, extensions 200-299, should be routed to the LUXRT router.

3. On the LUXRT router:
    a. Confirm that the Ethernet interfaces are configured correctly to support the topology.

    b. Announce the LANs via OSPF to the ISPRT router.

c. Configure interface Loopback 0 with IP address 188.188.188.188/32.

d. Configure CME to handle all calls within the luxspa.org domain; extensions 200-299. All calls to the winspa.org domain, extensions 100-199, should be routed to the WINRT router.

4. On the WINLUXSW switch:

a. Configure VLANs as appropriate.

b. Connect two links to the WINSWITCH and configure them as an Etherchannel with the PAgP protocol. The only VLANs allowed on this link are: 10, 20 and 88.

c. Connect two links to the LUXSWITCH and configure them as an Etherchannel with the LACP protocol. The only VLANs allowed on this link are: 100, 200 and 88.

d. Configure the switch with the next to last usable address for the WINSWITCH Management Network. This should already be done as it was requested yesterday, but you should confirm.

e. Connect and configure an interface to the WINLUXAP access point.

5. On the WINLUXAP access point:

a. Configure two SSIDs: WINSPA_XX and LUXSPA_XX. When a client connects to the WINSPA_XX network it should get IP information from the WINSRV DHCP server. When it connects to the LUXSPA_XX network it should get IP information from the LUXSRV DHCP server. Configure the CCK Transmitter, OFDM Transmitter and Client Power to the minimum possible ***[this item is not evaluated but we thank you].*** Use only the 802.11g radio. Broadcast the SSIDs.
Configure the radio channel to □ Channel 1 □ Channel 6 □ Channel 11.
Note: XX is your country code.

b. The only wireless device allowed to connect to either network is your laptop.

c. Configure and activate WPA2-PSK with AES. Please make up a key of mixed capital letters and numbers of around 8 characters and write it in this box:

On the WINSRV server:

d. Configure the WINSRV server as an IPSEC VPN server. Make sure that no other VPN connection except L2TP/IPSEC is allowed to the server and set the authentication to MS-Chap-2. VPN clients should get IP information from the DHCP server in WINSRV.

6. On the LUXSRV server:

   a. Install and configure OpenVPN to work in the SSL/TLS mode. Generate and initialize the Public Key Infrastructure (PKI), the certificates and the private keys for the LUXSRV server and for the WINNETPC and LUXNETPC. VPN clients should get static IP information; we are not expecting more than 10 clients.

   b. Stop and remove, if you wish, the Asterisk VoIP server.

7. On the WINNETPC:

   a. Install the OpenVPN client, configure and open a VPN connection to the LUXSRV server.

   b. Configure and open a VPN connection to the WINSRV server.

8. On the LUXNETPC:

   a. Configure and open a VPN connection to the LUXSRV server to be used by all users.

   b. Configure and open a VPN connection to the WINSRV server to be used by all users.

9. WINPC2 [Primary user for this computer is: terceira]
   a. Install the Cisco IP Communicator. Place a call to 101, 103 and 208.

10. WIN Cisco IP Phone
    a. Place a call to 101, 102, 206 and 208.

11. LUX Cisco IP Phone
    a. Place a call to 102, 103 and 207.

[NB: The Test Project continues on the next page.]

Packet Tracer Activity – Ipv6.pka

IPv6 and RIPng Packet Tracer Exercise: The objective of this exercise is to demonstrate IPv6 networks and operations as well as communication between IPv4 and IPv6 networks.

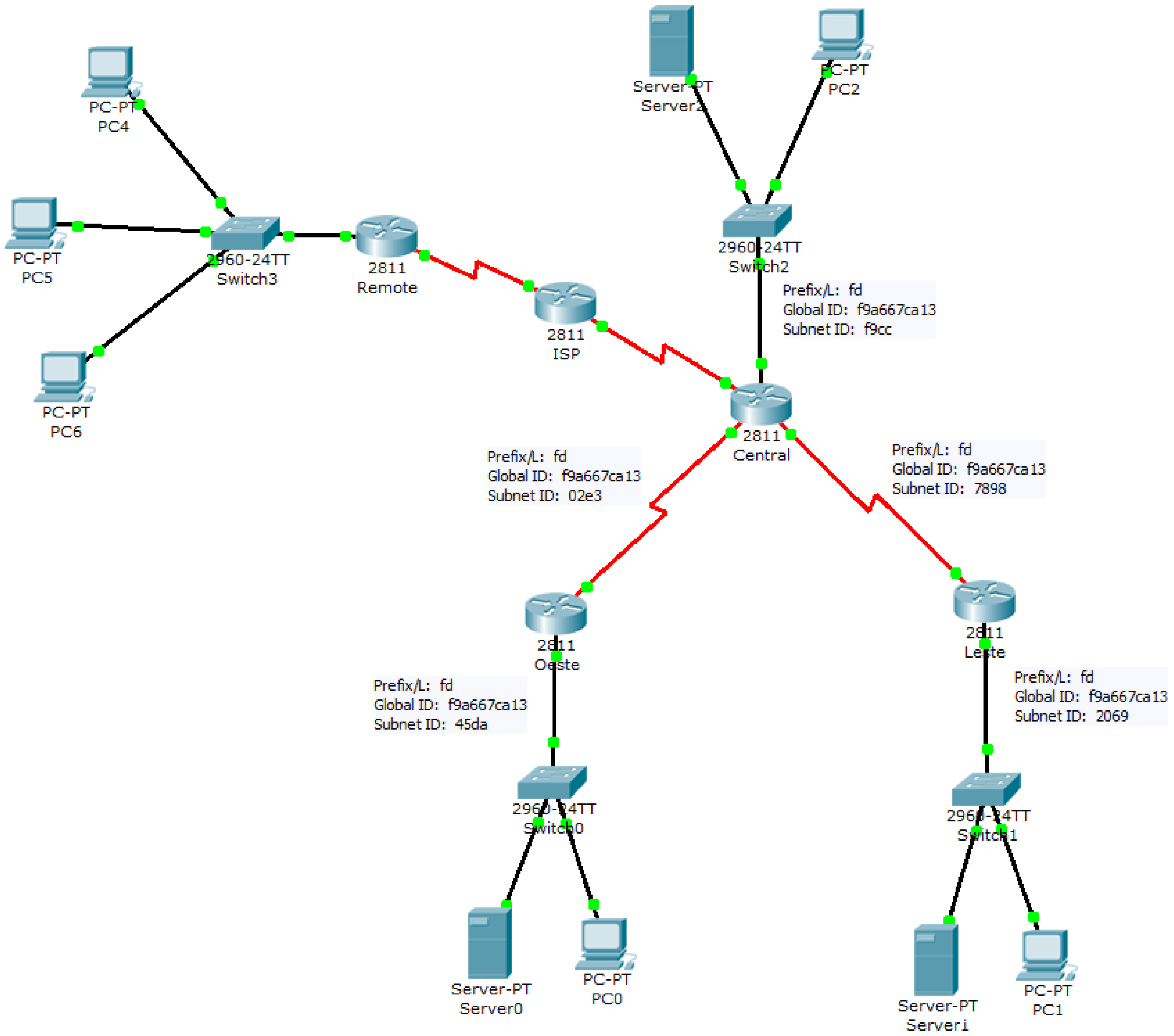

Figure 3

12. The first objective is to configure the LANs connected to the Central, Oeste and Leste routers. These three local networks only use IPv6. Assign the first IP address to the interface on the router, the second to the server and the third to the PC.

LAN Router Central:

Prefix/L: fd Global ID: f9a667ca13 Subnet ID: f9cc

LAN Router Oeste:

Prefix/L: fd Global ID: f9a667ca13 Subnet ID: 45da

LAN Router Leste:

Prefix/L: fd Global ID: f9a667ca13 Subnet ID: 2069

WAN Central - Leste:

Prefix/L: fd Global ID: f9a667ca13 Subnet ID: 7898

WAN Central – Oeste

Prefix/L: fd Global ID: f9a667ca13 Subnet ID: 02e3

13. In the links between router Central and Oeste and Central and Leste, the first address is configured on the Central router and the second address is configured on the other router.

14. Configure the RIPng process with the name CENTRAL in such a way that there is complete connectivity between the three LANs connected to the Central, Oeste and Leste routers.

15. Configure a static default route on routers Oeste and Leste using the outgoing interface S0/0/0. This route will be used by the LANs respectively.

16. Configure IPv6 NAT-PT on router Central.

17. The computers connected to the LAN in the router Remote will use the destination IP numbers 192.168.0.1, 192.168.0.2 e 192.168.0.3 to read the servers located in the local networks of routers Central, Oeste and Leste respectively. For example, when PC4 sends a ping to 192.168.0.1, the server in the LAN attached to the Central router should answer.

18. The pool of addresses used by the computers in the LAN attached to the Remote router when they are in the IPv6 network goes from FDF9:A667:CA13:3F00::1 to FDF9:A667:CA13:3F00::FFFF. The name of the pool should be v6POOL

19. Complete the "ipv6 access-list LISTAv6" allowing the LANs attached to the Central router, the Oeste router and the Leste router to reach any destination. Use 3 lines. Do not remove the Remark which is already there.

20. Complete the "ip access-list standard v4LISTA" allowing the IPv4 address, or addresses, which reach this router coming from the Remote network. Do not remove the Remark which is already there.

21. The ISP router is already configured; do not make any configurations on this router.

22. The router Remote is already partially configured. Configure Dynamic Nat with Port Overload (PAT) for the local network, using the outgoing interface S0/0/1. Use numbered ACL 1.

23. Save the final version of your solution to a file called Final_IPv6_XX.pka [replace the XX with your country code] and call at three experts; each will keep a copy of your file.

CONGRATULATIONS – YOU MADE IT TO THE END OF DAY 2

Work order: Day 3 Duration: 6 hours

Welcome to the last day. Your work for today is a continuation of the project you have been working on for the last two days. We have already evaluated the work you did the first day and yesterday, but today we will make a final evaluation of your entire project, as it stands today. This means that today you have a chance to finish and polish up some aspects that did not go very well over the last two days. What we are looking for today is a complete well thought out project that works well.

The topology for today changes in the sense that we will have a site-to-site VPN and two remote access VPNs, allowing the WINNETPC and the LUXNETPC to access the network over a Cisco router based VPN. All access of these two Internet based PCs to the local networks will be exclusively over the remote access VPN tunnels, unless they are accessing the www.winspa.org and the www.luxspa.org sites, which are open to public access.

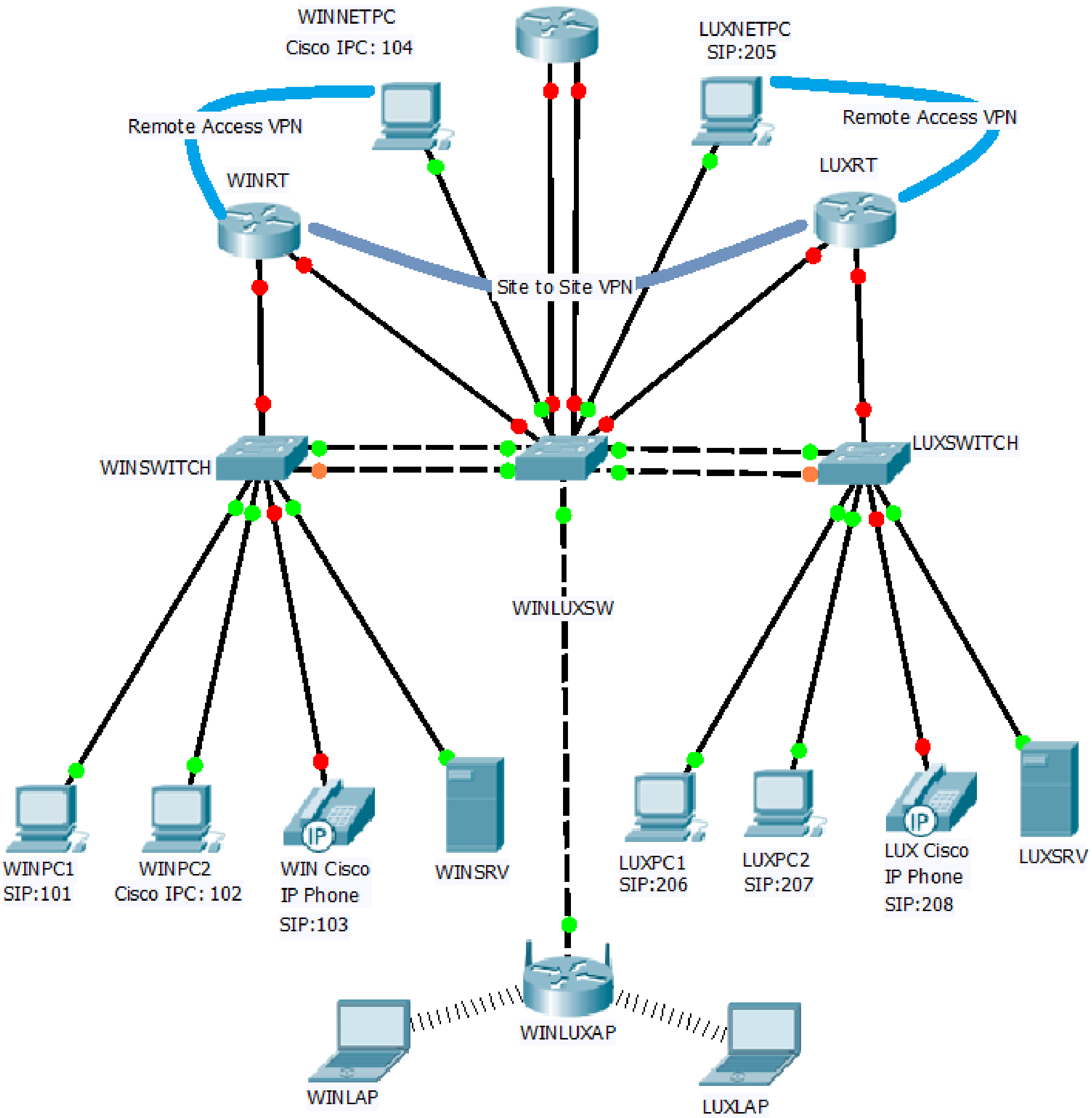

Figure 4

1. On the WINRT router, besides other implicit tasks, you should:
   a) Remove all dynamic routing.
   b) Configure a default static route to the ISPRT router.
   c) Implement NAT with Port Overload using the Serial interface.
   d) Implement a Remote Access VPN with AES 256 and SHA-1 (if not available then use 3DES and MD5).
   e) The DHCP server in WINSRV should assign all IP information; make the necessary modifications.
   f) The Network Policy Server function in the WINSRV server should validate all winspa.org VPN users.
   g) Configure a site-to-site VPN with the LUXRT router taking into account the following:
      a) Authentication method: pre-share
      b) Encryption algorithm: AES with 256 bits
      c) Hash algorithm: SHA-1
      d) Diffie-Hellman group: Group 5
      e) Lifetime: 3600
   h) Configure EIGRP with the LUXRT router, announcing the Tunnel interface and the local area networks. IP addresses for the Tunnel interfaces are left at your discretion.
   i) All traffic between the two sites should be encrypted.

2. On the LUXRT router, besides other implicit tasks, you should:
   a) Remove all dynamic routing.
   b) Configure a default static route to the ISPRT router.
   c) Implement Dynamic NAT; the public addresses are 194.65.3.64/26
   d) Implement a Remote Access VPN with 3DES and MD5.
   e) VPN clients should get IP information from a static pool; make the necessary modifications.
   f) luxspa.org VPN users should be validated by the router’s local database.
   g) Configure a site-to-site VPN with the WINRT router taking into account the following:
      a) Authentication method: pre-share
      b) Encryption algorithm: AES with 256 bits
      c) Hash algorithm: SHA-1
      d) Diffie-Hellman group: Group 5
      e) Lifetime: 3600
   h) Configure EIGRP with the WINRT router, announcing the Tunnel interface and the local area networks. IP addresses for the Tunnel interfaces are left at your discretion.
   i) All traffic between the two sites should be encrypted.

3. On the ISPRT router remove all dynamic routing and configure static routing as you see appropriate.

4. All the tasks requested on Day 1 which were not altered on Day 2, as well as tasks requested on Day2 which were not altered on Day 3 remain effective and will be evaluated today.

5. Packet Tracer Activity – Firewall.pka

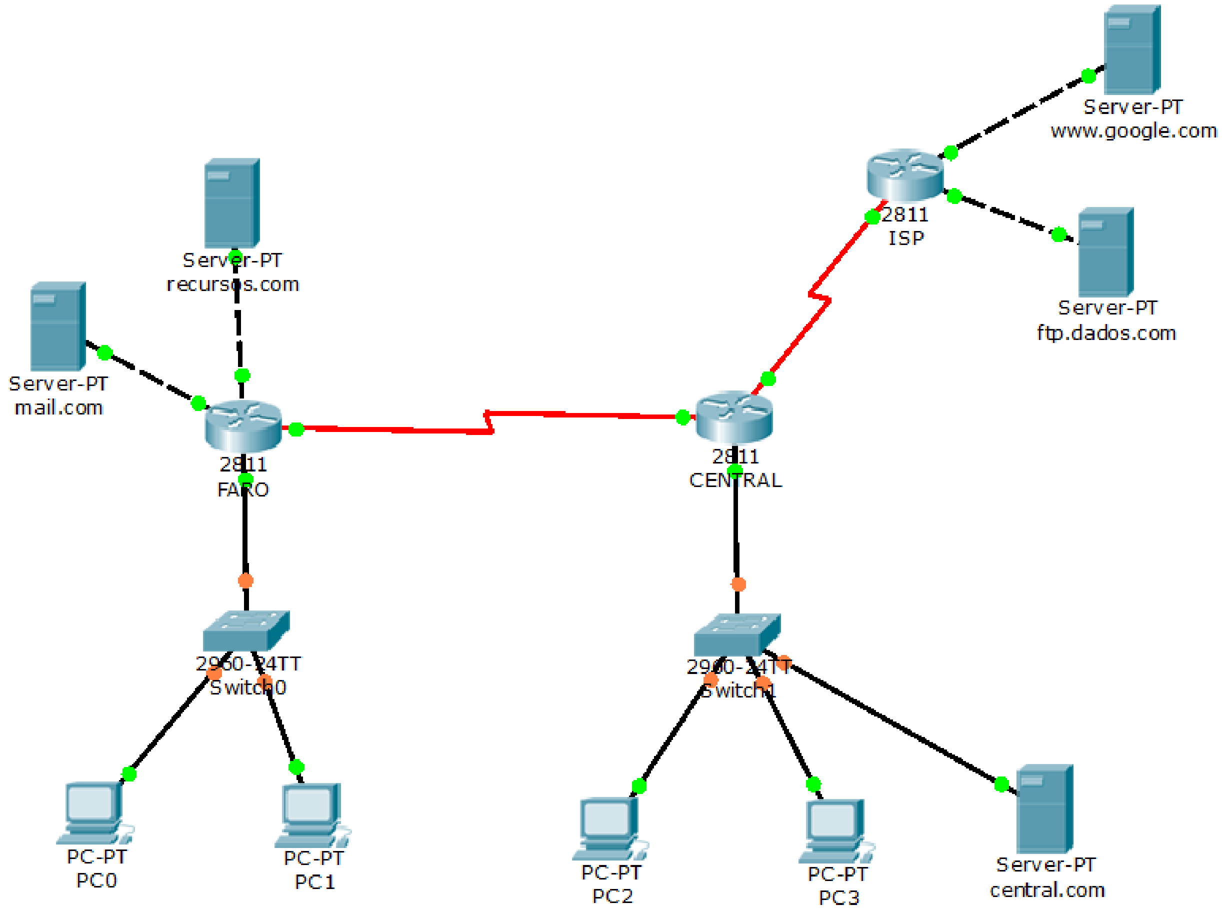

Figure 5

The network administrator, after analyzing the security policies of the company, decided that the following ACLs need to be implemented and assigned this job to your group with the following instructions:

6. In router CENTRAL:
   a) Create a numbered ACL, with the lowest possible number, which will control all traffic that leaves the 10.0.0.0/28 network connected to the F0/0 interface of router CENTRAL. This ACL shall:
      i. Allow the network connected to the F0/0 interface to access the http server in www.google.com
      ii. Allow the network connected to the F0/0 interface to access the HTTPS server in www.google.com
      iii. Allow the network connected to the F0/0 interface to access the FTP server in ftp.dados.com

iv. Allow the network connected to the F0/0 interface to access the SMTP, POP3 and IMAP servers in mail.com
v. Allow the network connected to the F0/0 interface to access the HTTP server in recursos.com
vi. Allow the network connected to the F0/0 interface to access the HTTPS server in recursos.com
vii. Allow the host central.com to answer DNS requests
viii. Allow the network connected to the F0/0 interface to PING any destination
ix. Apply the ACL wherever you find appropriate

b) Create a numbered ACL, with the second lowest possible number, which will control all traffic that returns from the ISP router. This ACL shall:
i. Allow answers from the FTP server in ftp.dados.com to the network connected to the interface F0/0 of router CENTRAL
ii. Allow answers from the HTTP and HTTPS servers in www.google.com to the network connected to the interface F0/0 of router CENTRAL
iii. Allow replies to PING from any network to any network
iv. Apply the ACL wherever you find appropriate

7. In router Faro:
a) Create a numbered ACL, with the lowest possible number, which will control all traffic that leaves the 172.16.0.0/22 network connected to the F0/0 interface of router FARO. This ACL shall:
i. Allow the network connected to the F1/0 interface to access the SMTP, POP3 and IMAP servers in mail.com
ii. Allow the network connected to the F1/0 interface to access the HTTP server in recursos.com
iii. Allow the network connected to the F1/0 interface to access the HTTPS server in recursos.com
iv. Allow the network connected to the F1/0 interface to access the DNS server located in the central.com computer
v. Allow the network connected to the F1/0 interface to to answer PING requests coming from any network
vi. Apply the ACL wherever you find appropriate

b) Create a numbered ACL, with the second lowest possible number, which will control all traffic that leaves the 172.18.0.0/30 network connected to the F0/1 interface of router FARO. This ACL shall:
i. Allow the host mail.com to answer SMTP, POP3 and IMAP requests to any network.
ii. Allow the host mail.com to answer PING requests coming from any network.
iii. Allow the host mail.com to make DNS requests from the DNS server in central.com
iv. Apply the ACL wherever you find appropriate

c) Create a numbered ACL, with the third lowest possible number, which will control all traffic that leaves the 172.17.0.0/30 network connected to the F0/0 interface of router Faro. This ACL shall:

   i. Allow the host recursos.com to answer http requests to any network.
   ii. Allow the host recursos.com to answer HTTPS requests to any network.
   iii. Allow the host recursos.com to answer PING requests coming from any network.
   iv. Allow the host recursos.com to make DNS requests from the DNS server in central.com
   v. Apply the ACL wherever you find appropriate

CONGRATULATIONS – YOU MADE IT

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Skill Domain 2012

EuroSkills - Spa-Francorchamps 2012

23 Nov 2010 – 26 Nov 2010

INFRASTRUCTURE LIST
Skills Competition nnnn – Trade 2010

GENERAL INSTALLATIONS (to be completed by the organizer)

Description	Nº 👤	Nº 👤	TO Req. Qty	Supl. Qty	Producer	Model	Specifications	Supplier	Comments
Basic LCD Monitor (Experts/CIS)									
Basic computer (Experts/CIS)							Computer for experts (CIS System) with internet access		
Colour LaserJet									
Chairs									
Cleaning set									
Clock									
Coat Rack									
Fire Extinguisher									
First Aid kit									
Flip Chart / White Board									
Lockable file cabinet									
Lockers for Competitors									
Lockers for Experts									
Set of office materials									
Tables (1800x600)									
Tables (for PC work)									

⚙ = Skill | 👤= Competitor | 👤 = Expert | 👥 = Group of Competitors | 👥 = Group of Experts

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Europe

WORKSHOP INSTALLATIONS (Precise description from the equipments that are to be in the workshop, to be developed from TO)

Description	Nº 👤	TO Req. Qty	Supl. Qty	Sample Y/N	Producer	Model	Specification	Supplier	Comments

Please add lines whenever necessary!

⚙ = Skill | 👤= Competitor | 👤 = Expert | 👥 = Group of Competitors | 👥 = Group of Experts

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MATERIALS / CONSUMABLES (Materials for Test Project)

Description	👤 N.	TO Req. Qty	Supl. Qty	Sample Y/N	Producer	Model	Specification	Supplier	Comments

Please add lines whenever necessary!

⚙ = Skill | 👤= Competitor | 👤 = Expert | 👥 = Group of Competitors | 👥 = Group of Experts