Island C – Test project – Networking and Unified Communication

WSC2013_TP39_ISLAND_C_actual_EN

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MODULE – ISLAND C

CONTENTS

This Test Project proposal consists of the following document/file:

1. WSC2013_TP39_ISLAND_C_actual_EN

INTRODUCTION

The competition has a fixed start and finish time. You must decide how to best divide your time.

DESCRIPTION OF PROJECT AND TASKS

You are working as an IT specialist for an international industry company.
As the company is growing, a new branch office in another country has been established.
Next, all authentication and authorization actions should be centralized using a linux server in the headquarters.
To save costs, you have also received the order from the management to replace the existing telephone infrastructure with VoIP telephony solutions.
Additional information is provided in the appendix.

PART 1

Work Task Server lnxsrv1
Note: Please use the default configuration if you are not given the details.

- Operating system (Debian 6) is already preinstalled as a Virtual Machine on PC1
- Configure the server with the settings specified in the appendix
- Install the necessary services:
    - Install and configure FreeRADIUS server
        - Create a "wuser" with password "Skills39-*xyz*" (will be used for wireless clients authentication. "*xyz*" in the password will be provided for you in a separate sheet and it is different on every station.)
        - Make sure winclt2 can establish WPA2 Enterprise wireless connection to rswap1 using the user mentioned above

      Create a "swuser" with password "Skills39" (will be used for Telnet access authentication)
    - Install and configure TFTP server. Make /backup as the root directory.
    - Install and configure NTP server.

PART 2

Work Task Network hqswi1
Note: Please use the default configuration if you are not given the details.

- Connect LAN cables and configure IP addresses according to the network diagram in the appendix
    - Fa 0/1 and 2: hqswi2
    - Fa 0/3: lnxsrv1
    - Fa 0/4: hqrtr1
    - Fa 0/5: winclt1
    - All other ports should be configured for VLAN 11 (client)
- Configure Fa 0/1 and Fa 0/2 as an etherchannel to hqswi2
- Configure switch as VTP server using "WS2013" domain and "Skills39" password
- This switch must be specifically configured as the root bridge
- Configure QoS for VoIP traffic
- Create local user "admin" with password "Skills39"
- Enable telnet access for management. Radius authentication should be the primary authentication method for telnet with the username "swuser", and local authentication as using admin user.
- Backup of hqswi1 configuration should be done automatically to the tftp server on lnxsrv1 every time when the configuration is saved to the NVRAM.

Work Task Network hqswi2
Note: Please use the default configuration if you are not given the details.

- Connect LAN cables and configure IP addresses according to the network diagram in the appendix
    - Fa 0/1 and Fa 0/2: hqswi1
    - Fa 0/4: hqvph1
    - Shut down all unused ports
- Configure Fa 0/1 and Fa 0/2 as an etherchannel to hqswi1
- Configure Fa 0/4 with:
    - STP portfast
    - BPDU-guard
- Configure switch as VTP client using "WS2013" domain and "Skills39" password
- Configure QoS for VoIP traffic

Work Task Network hqvph1
Note: Please use the default configuration if you are not given the details.

- Connect LAN cables and configure IP addresses according to the network diagram in the appendix
- Configure with number 100
- Make sure the VoIP-phone is using VLAN19 for its VoIP-traffic
- The traffic of the connected computer shall use VLAN11

Work Task Network hqrtr1 (Cisco 2901)
Note: Please use the default configuration if you are not given the details.

- Connect LAN cables and configure IP addresses according to the network diagram in the appendix
  - Gi0/0: rsrtr1
  - Gi0/1: hqswi1
- Configure GRE IPSec site-to-site VPN
  - Use pre-shared key “Skills39”
  - Use 90.27.83.16/30 as network for the tunnel
- Configure OSPF as dynamic routing protocol using area 0
  - Make sure OSPF-traffic is only exchanged via tunnel interface
- Configure this router as call manager
  - Number 999 is used for paging all phones of the company
  - Configure button 2 on hqvph1 to call directly to paging extension
  - Configure Intercom service with the extension 199
- Configure QoS on the tunnel interface
  - Give 20% of bandwidth to voice data traffic
  - Give at least 3% of bandwidth to voice control traffic
- Configure DHCP
  - Scope HQ clients
    - Range: 172.17.116.10 – 172.17.119.249
    - Gateway: 172.17.116.1
  - Scope HQ voip
    - Range: 192.168.19.10 – 192.168.19.249
    - Gateway: 192.168.19.1
  - Scope RS clients
    - Range: 192.168.20.10 – 192.168.20.119
    - Gateway: 192.168.20.1
  - Scope RS voip
    - Range: 192.168.29.10 – 192.168.29.60
    - Gateway: 192.168.29.1
- Configure source NAT for internet access. (The point-to point network between the two routers is simulating Internet. There is no real service in it. You can test Internet connection just by pinging public interface of rsrtr1.)

Work Task Network rsrtr1 (Cisco 1941)
Note: Please use the default configuration if you are not given the details.

- Connect LAN cables and configure IP addresses according to the network diagram in the appendix
  - Gi 0/0: hqrtr1
  - Gi 0/1: rswap1
- Configure GRE IPSec site-to-site VPN
  - Use pre-shared key “Skills39”
  - Use 90.27.83.16/30 as network for the tunnel
- Configure OSPF as dynamic routing protocol using area 0
  - Make sure OSPF-traffic is only exchanged via tunnel interface
- Configure QoS on the tunnel interface
  - Give 20% of bandwidth to voice data traffic
  - Give at least 3% of bandwidth to voice control traffic

- Configure DHCP relay for client and voip network
- Configure DHCP
    - Scope RS guest
        - Range: 192.168.28.2 – 192.168.28.14
        - Gateway: 192.168.28.1
- Configure source NAT for internet access. (The point-to point network between the two routers is simulating Internet. There is no real service in it. You can test Internet connection just by pinging public interface of hqrtr1.)
- Make sure communication between internal networks (HQ and remote site) and remote site guest network is prohibited

Work Task Network rswap1
Note: Please use the default configuration if you are not given the details.

- Connect LAN cables and configure IP addresses according to the network diagram in the appendix
- Create wireless network “internalC-x” (x is the number of your workstation)
    - Use WPA Enterprise authentication
    - Use WPA2 / AES encryption
    - Make sure RADIUS is used for authenticate the wireless clients
    - VLAN20
- Create wireless network “guestC-x” (x is the number of your workstation)
    - No authentication
    - VLAN28
- Enable QoS for VoIP traffic

PART 3

Work Task winclt1
Note: Please use the default configuration if you are not given the details.

- Operating system (Windows 7) is already preinstalled on the laptop.
- This laptop will be used by one of the mobile workers of the company. In the HQ site **winclt1 will be used with wired connection, and in RS site** with wireless connection using internalC-x WLAN connection.
- Configure the client with the settings specified in the appendix
- Install and configure Cisco IP Communicator with number 101

Work Task winclt2
Note: Please use the default configuration if you are not given the details.

- Operating system (Windows 7) is already preinstalled as a Virtual Machine on PC1
- Configure the client with the settings specified in the appendix

Work Task winclt3
Note: Please use the default configuration if you are not given the details.

- Operating system (Windows 7) is already preinstalled on PC2
- This PC will be used as a guest PC using guestC-x WLAN connection
- Configure the client with the settings specified in the appendix

APPENDIX

SPECIFICATIONS

lnxsrv1

Organization:	company
Computer name:	lnxsrv1
Domain name:	company.local
User name:	root
Administrator password:	Skills39
IP addresses:	192.168.10.10/24

winclt1

Organization:	company
Computer name:	winclt1
Domain name:	company.local
User name:	admin
Administrator password:	Skills39
IP addresses:	DHCP (VLAN11 or VLAN20)

winclt2

Organization:	company
Computer name:	winclt2
Domain name:	company.local
User name:	admin
Administrator password:	Skills39
IP addresses:	DHCP (VLAN11)

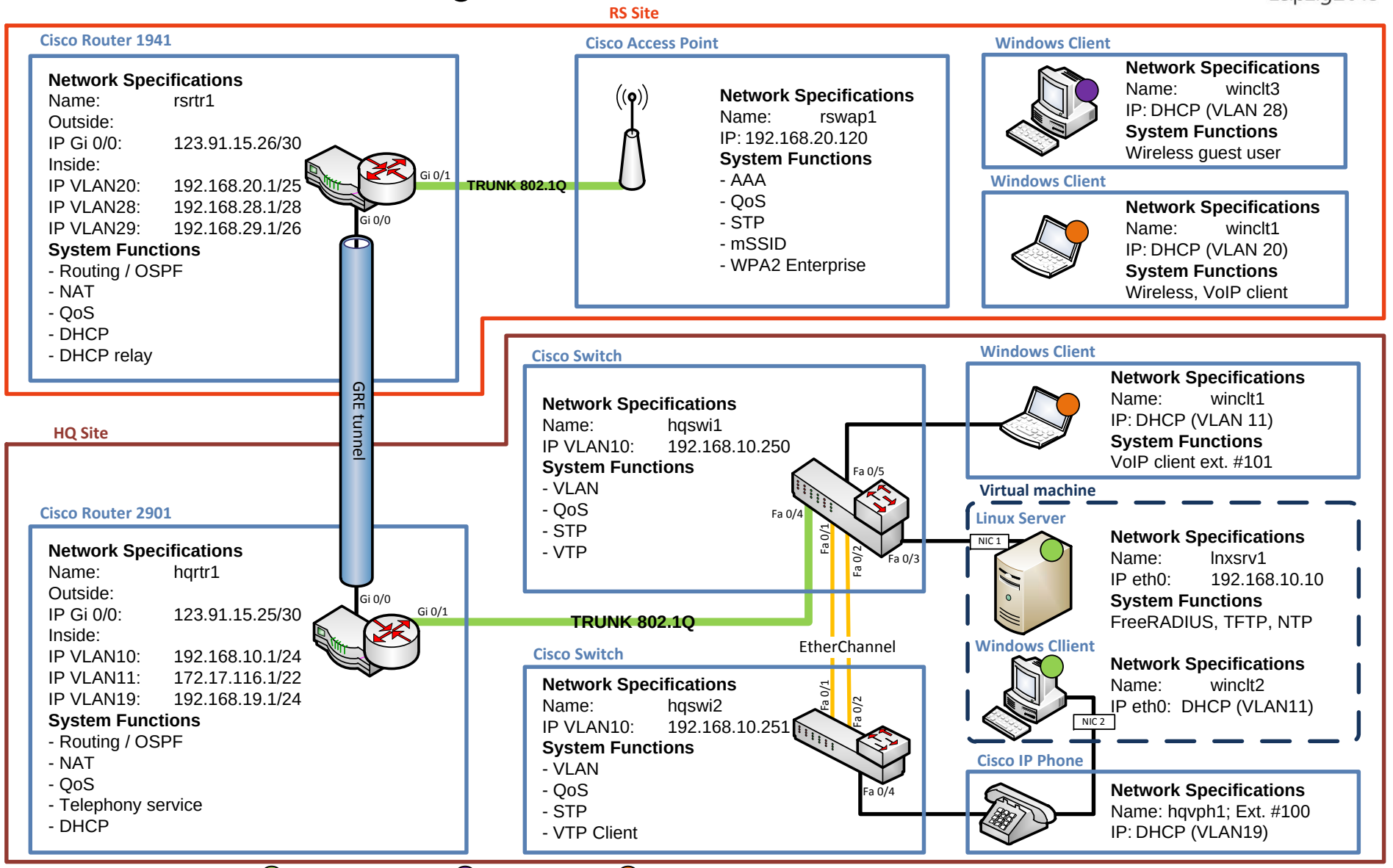
winclt3

Organization:	company
Computer name:	winclt3
Domain name:	company.local
User name:	admin
Administrator password:	Skills39
IP addresses:	DHCP (VLAN28)

NETWORK SPECIFICATIONS

External network	123.91.15.26 /30
GRE tunnel network	90.27.83.16 /30
HQ VLAN 10 (server)	192.168.10.0 /24
HQ VLAN 11 (client)	172.17.116.0 /22
HQ VLAN 19 (voip)	192.168.19.0 /24
RS VLAN 20 (client)	192.168.20.0 /25
RS VLAN 28 (guest)	192.168.28.0 /28
RS VLAN 29 (voip)	192.168.29.0 /26

Island 3 – Network diagram



INSTRUCTIONS

INSTRUCTIONS TO THE COMPETITOR

- Do not bring any materials with you to the competition.
- Mobile phones are not to be used.
- Do not disclose any competition material / information to any person during each day's competition.
- Read the whole competition script prior to starting your work.
- Be aware of different tasks attract a percentage of the overall mark. Plan your time carefully.

EQUIPMENT, MACHINERY, INSTALLATIONS AND MATERIALS REQUIRED

PowerPC 1:

- Performance PC with 8Gb memory with 2 network cards & 1 Wireless PCI card
- Used as lnxsrv1. OS preinstalled (Debian)
- Used as winclt2. OS preinstalled (Windows 7)

PowerPC 2:

- Performance PC with 8Gb memory with 1 network cards & 1 Wireless PCI card
- Used as winclt3. OS preinstalled (Windows 7)

Laptop:

- Laptop with Wireless dongle
- Used as winclt1
- OS preinstalled (Windows 7)

Network:

- 2x Switch Cisco 2960
- 1x Router Cisco 1941
- 1x Router Cisco 2901
- 1x WiFi Access point Cisco AP 1242/AG
- IP Phone Cisco 7962

Additional software:

- Operating System (Windows 7)
- Operating System (Debian 6) (DVD1-8)
- Drivers for peripherals