Assessment Task
- Project Report – Architecture 1

Semester 2 2016

ASSESSMENT INSTRUCTIONS

Qualification Code & Name	Stream / Specialisation
ICT50415 Diploma of Information Technology Networking	Networking

Unit/s of Competency

Code	Unit/s of Competency Name
ICTNWK507	Install, operate and troubleshoot medium enterprise routers
ICTNWK508	Install, operate and troubleshoot medium enterprise switches
ICTTEN6206A	Produce an ICT Network Architecture Design

Assessment Task Number	Assessment Name
4	Project Report

Due Date

Session 14

Submission Details

Submit via Connect >> **Project Report** Dropbox submission link.

Instructions to Students

- You are required to review the given **scenario** and the network design documentation to produce a **Network Design and Implementation Report**.
- The Report should use the **Template** document [**Architecture 1-LAN Design-Template.docx**] to prepare the final documentation.
- There is no Word limit, but you need to provide adequate information for each area given in the **Template** document.
- The Report may contain a minimum of 06 pages, but not over a maximum of 15 pages.
- Normal Text Font: Arial Narrow, Size: 12

Range and Conditions of Assessment

- All information provided should be adequately referenced.
- The Report has to be completed using the **Architecture-1-LAN-Design-Template** document**.**

Evidence Required to be Submitted

If you have completed this Report together with another student, each student should submit a copy of the Report.

Marking Criteria to Achieve a Satisfactory Result

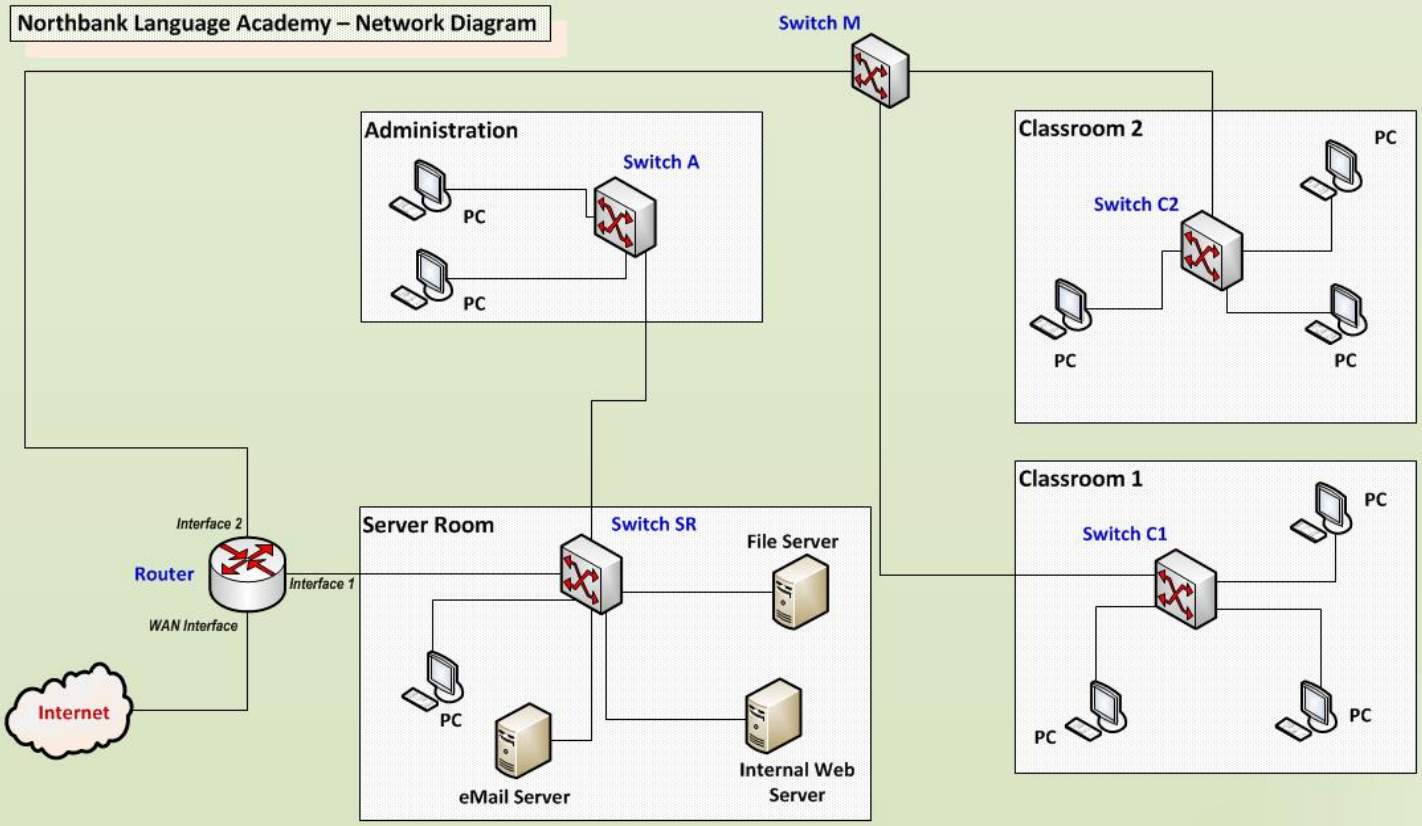
For more information, refer to the **Marking Criteria** document.

SCENARIO – Northbank Language Academy

Northbank Language Academy is a small educational institute located in South End, providing Australian English language courses for students with non-English speaking backgrounds. With their expanding clientele, the CEO Malcolm Nelson has decided to implement a Local Area Network with access to the Internet. This network will assist the academic staff, as they could use more video related material from YouTube for teaching purposes rather than using old-style classroom teaching.

Sylvester, the network project manager, has given an outline physical topology diagram (*see below*) for the proposed network as requested by Malcolm. As Sylvester is currently busy with another network design project, Malcolm has awarded this network design contract to you on Sylvester's recommendations.

Physical Topology



Equipment Requirements

Location	Equipment	Number of Items
Server Room	Router	1
	Switch SR	1
	Desktop Computers	5
	File Server	1
	eMail Server	1
	Internal Web Server	1
Administration	Switch A	1
	Desktop Computers	10
Classroom 1	Switch C1	1
	Desktop Computers	30
Classroom 2	Switch C2	1
	Desktop Computers	30
Outside Area	Switch M	1

Equipment Placement

Location	Equipment
Sever Room Rack	Router
	Switch SR
	File Servers
Administration Rack	Switch A
Classroom 1 Rack	Switch C1
Classroom 2 Rack	Switch C2
Outside Rack	Switch M

Cable Distances

- Refer to the diagram for the cable distances between the networking devices.
- From a Switch patch panel to each desktop computer in that room, the cable length is 25 m. This length is the same for the Server Room, Administration, Classroom 1 and Classroom 2 desktop computers

Task Requirements

You are expected complete the following two tasks.

1 **Produce a Network Design and Implementation Report** addressing the following areas.

- **Equipment / Media Requirements**
  - Networking equipment: Routers, Switches, and rack units
  - Computers and Servers.
  - Different types of media (cables)
  - Internet access plan - Unlimited data including the service provider and the cost
    - Include specifications from the vendors about each of the equipment required. Include technical specifications, cost, vendor, warranty and any other relevant information.
- **Applicable Standards**

  Standards applicable for the different types of network cabling used in this design.
- **Logical Topology**

  Refer to item 2 Logical Topology / Packet Tracer Activity [next page].
- **WHS Requirements**

  WHS requirements and applicable legislation for such a network installation. E.g.: electrical and manual handling, protective gear.
- **Implementation Plan**

  An implementation plan including the main phases / tasks and estimated durations for each of the tasks.
- **Network Usage Calculations**
  - **Bandwidth Requirements – Internet Usage** [http://bandwidthpool.com/bandwidth-calculator/]

    Calculate the total bandwidth requirements for the Internet Usage using the following information. Total downtime per year has to be less than 60 minutes.
    - 25 users – Some file downloads, streaming music, video
    - 25 users – Large file downloads, interactive web conferencing
    - 15 users – intense internet-based application use
  - **Network Throughput - File Transfer** [http://wintelguy.com/wanperf.pl]

    Calculate the file transfer times within the network for the following scenarios. Consider at least three file sizes for each bandwidth value. Assume the default values for packet loss, MTU, TCP/IP header overhead and TCP Window size.

Link Bandwidth (Mbps)	File Size (Mbytes)
100	From 100 to 1000
100	From 1000 to 2000
1000	From 1000 to 2000

- **Review of the Current Topology**

  Review the current topology and make suggestions for improvements to the network design. Include the additional equipment requirements and cost, if wireless access to be provided within the two classrooms for students to access the network.
- **Letter – Report Submission**

  Write a brief letter to the CEO, informing him that you have completed the Report as required.
- **References**

  Support the information you have provided with relevant references, as appropriate. This may include web site references for equipment vendors, service providers and standards organisations. Refer to the **Physical Topology - Network Diagram** given, for more information. Follow **APA Standard** for referencing.

Report Template

CEO Malcolm pays attention to every detail and as such has already prepared a template for the Report. He wants you to provide the final report with all the information, using the **Report Template** as a guide for the documentation.

Template document: **Architecture-1-LAN-Design-Template.docx**

Save the above document as Architecture-1-LAN-Design-AB-CD.docx, **where**

- **AB** is the *First Name*, *Last Name* initial letters of Student 1 and
- **CD** is the *First Name*, *Last Name* initial letters of Student 2.

2	**Logical Topology / Packet Tracer Activity**
	o Design an IP Addressing Scheme [logical design] for the Local Area Network. Use a Loopback interface on the Router to simulate the Internet connection.
	  o As the Router is capable to be setup as a DHCP Server, IP addresses for the end devices has to be provided via ***Interface 1*** and ***Interface 2***.
	  o **All the Servers** and the management addresses for the **Switches** should be configured with static IP addresses.
	o Create the Network as a Packet Tracer activity, using the given diagram. Apply the IP Addressing Scheme you have designed earlier. The network has to be operational.