Designing a Physical Network

CI5220 Networking and Operating Systems

Aim of the Coursework

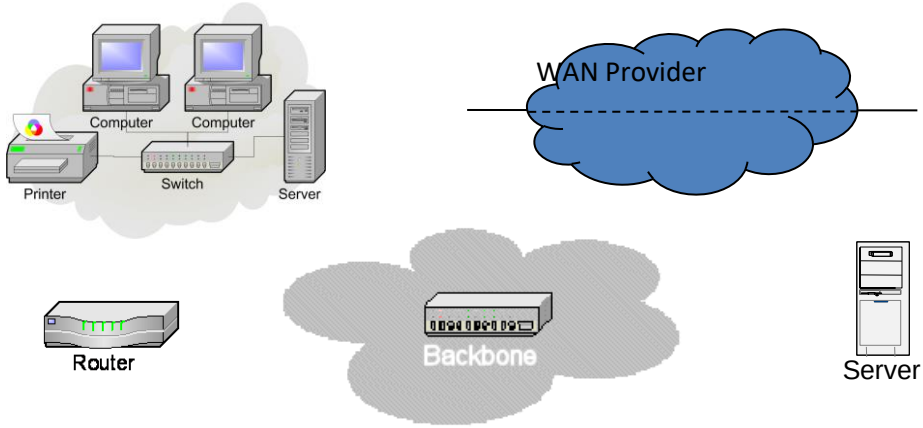
This physical network design coursework is intended to develop your understanding of the different physical networking components required to put together an enterprise network, and how these components are selected and integrated to meet the demands of the enterprise.

Requirement

An enterprise wishes to construct its own physical network to provide connectivity to its various users distributed around its geographically dispersed operation. Using the company specification given overleaf, design, draw and justify your design. Your answer should contain (i) a description of your interpretation of the workgroup and inter-connection requirements, (ii) diagram(s) illustrating your design, and (iii) an accompanying textual description of your diagrams and decisions.

Additional Points

- Use the network component icons developed in the workshop exercises (or those below).
- Use Visio or an equivalent drawing package to construct your diagrams showing the logical structure of your design.
- Note that there is not necessarily a single correct answer. However, avoid *clever* answers (*e.g.* multilayer switches or *vLANs*) unless you fully understand the technology and can adequately explain and justify your answer.
- Marks will be deducted if it is not clear which components are connected to which other components.
- If you feel any of the specification below is ambiguous or unclear, feel free to make any sensible assumptions – though remember to write down these assumptions in your report.
- Avoid generating one large diagram. Break your design into stages, documenting each, and show how these are connected.
- There are no specific length or word count requirements. However please note the marking criteria listed overleaf.
- Complete the "Designing Physical Networks" workshop exercises before starting the coursework.



Deadline: Thursday November 15th 2018

Specification

Dotheboys College (principal Dr. Wackford Squeers) has campuses located in Leeds, Hull and Sheffield. Each site has its own network infrastructure and is connected to the other two sites via WAN links.

The Leeds site has three department buildings (Technology, Law and Business) and an additional Services building, all linked together by a Gigabit Ethernet backbone with a switch in each building. Each department building has three 100baseT Ethernet subnets serving the staff, student and admin user-groups. The Services building houses the WAN router as well as a 100baseT admin network. The main student information and authentication server is also housed on this site.

The Hull site comprises a single large building with an ATM backbone linking four laboratory workgroups. The Sheffield campus has two buildings connected by an FDDI backbone, each with two workgroup subnets of 30 workstations each and an additional small staff workgroup.

Marking

The marking scheme will be based on the following marking criteria:

Components

- 20% Workgroups correctly identified
- 25% Appropriate network components used to fulfil the specification
- 25% Components linked together correctly

Presentation

- 10% Diagrams clear, interpretable and logical
- 20% Textual description of interpretations, assumptions and proposed network solution

Grade Criteria

The table on the next page outlines what is required to achieve specific grades in each of the above criteria.

Submission Requirements

Upload your document to the submission box within the Assignments page of the Canvas module by midnight of the day of the deadline.

If you are ill or have problems which prevent you from meeting the deadline you may be able to negotiate an extension in advance. The University Mitigating Circumstances policy may apply. You will need to use the online Extensions and Mitigation Circumstances system. Remember if you submit a piece of work or attend an examination, you have judged yourself fit to undertake the assessment and cannot claim mitigating circumstances retrospectively.

Grade		Outstanding	Exceeded Expectations	Met Expectations	Below Expectations	Fail
		100-80%	**70-60%**	**60-50%**	**50-40%**	**>40%**
Workgroups correctly identified	20%	All workgroups clearly identified within network design and explicitly identified within the narrative.		Most workgroups identifiable although minor errors in interpreting work groups from specification.	Major errors in interpreting work groups from specification.	Failure to understand centrality of workgroups to design process.
Appropriate network components used to fulfil the specification	25%	The network components all used correctly and their role correctly justified within narrative.	The network components all used correctly and their role correctly described within narrative.	Most network components used appropriately although minor errors in use or role.	Major errors in use of various network components	Little evidence that candidate understands the role of the various network components.
Components linked together correctly	25%	All network components are linked together appropriately and their role correctly justified within narrative.	All network components are linked together appropriately and their role correctly described within narrative.	Most network components are linked together appropriately although there may be minor errors in their connectivity.	Major errors in connectivity of component.	Failure to understand how components should be connected and what device are used to provide the connectivity.
Diagrams clear, interpretable and logical	10%	Diagrams of differing scope providing a clear demonstration of work-groups, components and their connectivity. Descriptive captions and referenced clearly and appropriately within text.		Diagram providing a clear demonstration of the work-groups, components used, and their connectivity. Minor problems with diagrams or captions such as legibility, captioning and relationship to text.	Major problems with the diagrams such as failure to make clear connectivity, disembodied from text, or having the narrative placed in annotation boxes within the diagram.	Poor use of diagrams in terms of content, clarity, captioning and relationship to main narrative.
Textual description of interpretations, assumptions and proposed network solution	20%	Main narrative articulates all assumptions and interpretations, justifies all decisions, and accurately describes the design. Written and structured professionally.	Clear articulation of the network design and aligned with the diagrams. Assumptions and interpretations given. Minor errors in narrative structure or grammar and spelling.		Major issues in the clarity of description or failure to articulate some key assumptions and interpretations.	Failed to provide any meaningful description of the network solution.

Deadline: Thursday November 15th 2018