Advanced Network Management and Design

Main Coursework

Yotsuba Group Network Design

***Read me 1st**: The **main part** of this coursework is to be undertaken in a **group of three to four** students (only one submission necessary). Whilst producing this piece of work you are expected to perform research – all sources must be acknowledged and cited using the Coventry University Harvard referencing notation. Note that the **scenario provided does not provide a complete definition of the problem**. You are required to fill in the gaps whenever you feel necessary by making assumptions – please keep those reasonable. Try not to exceed the given word count by more than 10%, excluding appendices, otherwise you might be penalised.*

Scenario

The Yotsuba Group (YG) has recently acquired a newly constructed building with the intention of moving their headquarters there. The building is in the great Tokyo area in the Kento region in Japan, just 5 miles away from the old company headquarters. The Yotsuba Group has been expanding rapidly and the old headquarters can hardly accommodate the current workforce of 290 employees. This recent company expansion has also revealed problems with the old network, as performance appears to have deteriorated dramatically. The board is also concerned with security as a number “incidents” have taken place during the last 6 months. For the purposes of designing an appropriate network for the company’s new headquarters you have been given access to the old, as well as the new, building.

The new building has 8 floors in addition to a two floors deep underground car park. With the exception of the top floor, each floor can accommodate about 60 to 70 employees. Each employee requires a desktop computer as well as a phone. Some employees (depending on the department they belong to) are provided with laptops that would also require network access.

The area of the top floor is smaller than the rest as it features a rather expanded balcony (with a nice view and a mini bar). The board of directors, made up by the 8 department heads, have decided that only their offices and those of their personal assistants should be located on this floor. A luxurious meeting room is also going to be located here. The 8 heads and their departments are listed below (note that at the point of writing this document the number of employees per department was not available):

1. Kyosuke Higuchi: Research and Technology
2. Shingo Mido: Financial Planning
3. Reiji Namikawa: Sales
4. Eiichi Takahashi: Material and Design
5. Suguru Shimura: Personnel
6. Masahiko Kida: Planning and Manufacturing
7. Takeshi Ooi: Legal and Accounting
8. Arayoshi Hatori: Marketing

The IT department (assume that their head is simply not important enough to be on the board) is going to be located on the ground floor. This floor is also going to house a café/relaxation area which, ideally, should include Wi-Fi access and a number of desktop computers that employees can use to access the internet for personal purposes during their lunch breaks (a feature that the old network did not incorporate).

In addition to designing a network that would fulfil the requirements for the problem as defined above, you have also been asked to research and propose appropriate solutions for **two additional problems**:

- The first is investigating the feasibility of renting one of the floors to a different company for the purposes of raising income (but without compromising the security of the Yotsuba Group network).

- The second problem is investigating and proposing a solution for housing parts of the company in the old building (connectivity between this and the new one?). There is no need for this currently but if the company keeps on expanding such a capability might prove most useful.

Tasks

Ultimately you need to produce a report that discusses your design, the problems identified, your solutions to them, and **the justification** of your decisions and solutions. We are interested on how you apply theory for solving specific issues relating to the scenario and your assumptions; reciting everything you know about a topic **without applying it or linking it** to the problem will earn you **very few marks** (you have been warned). The key areas that you need to address in your report are:

Main coursework (group):

		Marks per section/task
0.	Introduction – keep it brief, including structure, presentation, writing style, etc.	**10%**
1.	Explain the requirements gathering process and the assumptions made about the company, the buildings, and other parameters of the problem. If necessary, provide diagrams such as floor plans.	**10%**
2.	Propose devices that could be used for implementing your design, discussing the physical topology, wiring and device placement.	**10%**
3.	Present your network design (including any plans to support expansion in the future). Provide a topology diagram and justify your design decisions.	**10%**
4.	Design an appropriate addressing scheme and discuss/explain/justify this design.	**10%**
5.	Discuss appropriate policies for the network; **no need for a full policy document** (presumably they had one from before) but should address the main issues arising from relocating and resolving any issues identified in your assumptions.	**10%**
6.	Discuss network security threats and for this **particular organisation** and evaluate possible solutions. Provide appropriate documentation, including device configuration snippets if appropriate.	**10%**
7.	Design strategies and plans for network and performance monitoring and maintenance.	**10%**
8.	Identify potential risks and propose a disaster management and contingency plan.	**10%**
9.	References in an appropriate format.	**10%**
	***Max word count** limit excluding diagrams/tables*	**3500**

Please follow the structure outlined above when you make your report – it will be easier for us to mark and for you to make sure that you haven't left out anything important.

Submission Guidelines

The **group report** should be uploaded to CU-Online/Moodle and must be **no more than the word counts specified excluding diagrams and tables**. There are no limits on the number of appendices but those must be clearly labelled as such and be in the same document as the report. Please do include names of the group members in the front page as this will greatly help with double checking group composition and uploading marks correctly and accurately.

The deadline for the main CW is on 31/03/2022 before 18:00.

Marking Scheme

Approximately 10% assigned to each of the tasks identified. Note that some marks are awarded for an appropriate report format, which should contain a contents page and a brief introduction as well as structuring and presenting the content appropriately.

Pass Requirements(40%+)

All tasks attempted to a reasonable degree. Basic explanations of a working solution that is relevant to the specific scenario and consistent with any initial assumptions made about unspecified parameters of the problem.

For a first class (70%+)

A well-structured report presenting a solution based on reasonable assumptions about the various aspects of the problem at hand. All tasks attempted and all problems addressed with workable solutions presented and fully justified. Appropriate diagrams and policy documentation produced in line with current practices and standards. Appropriate use of relevant literature, properly referenced, should be evident in the explanations presented.