CMPG315 Group Project Task Outlines

Overview

The scenario for this project is as follows:

You and the members of your group have been hired by an IT company that wants to expand. After careful consideration of the factors, and after consulting with potential clients, the company has decided to open up a new office. The new office does not have any suitable network infrastructure apart from a single ISP fibre connection and ONT, and the company has given you the task of setting up the new office network in the new building. You have to design the network in such a way that the costs are kept to a minimum, and satisfies all of the requirements that the company has put in place.

In addition to setting up the network, the company has instructed your group to develop a small, simple, text messaging app that can be used for non-confidential communication in the office. The company has decided that it will mainly use computers that run Windows, and as such the task is to develop a text-messaging app that will run on Windows. The company has indicated that it wants the app to be fully portable.

Group Task 1: Preparation (completion: by 6 April)

Each member of the group should aim to complete the following in their own time before the **6th of April**:

1. Complete the following (or similar) free online courses:
    a. https://www.udemy.com/course/manageyourtime/
    b. https://www.udemy.com/course/git-started-with-github/
    c. https://www.udemy.com/course/git-expert-4-hours/
    d. https://www.udemy.com/course/project-and-project-management/
    e. https://skillsforall.com/topics/cisco-packet-tracer
2. Write a short reflection of not more than 250 words in which you discuss the soft skills that you have learned from the courses. The reflection of all the members of the group has to be included in the final documentation that will be handed in on, or prior to, the day of the project demonstration.
3. Meet in person as a whole group and get to know one another. You should also use this meeting to work through the project documentation in detail, discuss the work division, assign roles such as group coordinator/leader, and to determine the group's internal work ethic. This ethic should cover topics such as when and where work is done, in which manner, and what the group will consider as delinquency. In other words, you as group will determine how to identify when someone isn't contributing as they should. Write up the group's work ethic; it will also be included in the final documentation.
4. Set up a timeline for the overall project. Include time contingencies of 20% in case something goes wrong, or tasks take longer to complete than expected.
5. Submit the draft versions of the reflections (one for each group member), timeframe, and the summary of work ethic (one per group) using the assignment that will be open on the 8th of April on eFundi. **The group coordinator/leader is the only one that submits assignments.**

Group Task 2: Continuous Reporting (duration: entire project timeline)

For the entire duration of the project, the group must:

1. Keep notes and attendance for every meeting and work session.
2. Keep record of each member's assigned tasks and responsibilities. Each task should have a milestone date that is realistic and achievable. If the group wants to penalize people for not keeping to their timelines and milestones (see Notes, considerations and Penalties below), this should be discussed and clarified in the group's internal work ethic (see Task 1).
3. The group coordinator/leader is responsible for keeping track of when tasks are completed. A completed task sheet should be included in the final documentation.
4. You are strongly encouraged to make use of GitHub to manage your project.

Group task 3: Topological Network Design (completion: by 21 April)

The group should aim to complete the Packet Tracer project, as explained in the attached Packet Tracer project descriptions, by the 21nd of April.

Group Task 3: Text Messaging App Development (completion: early on 15 May)

The group must design and build a small text messaging app, that connects via the Internet, that has **all** of the following features:

1. Runs on Windows computers (may run on iOS and Android as well, but **must** run on Windows);
2. Has a useable and user friendly GUI;
3. Can send and receive text messages;
4. Can send both individual and group messages;
5. Is **fully portable**, i.e. no software has to be installed in order for the app to function on a Windows machine; and
6. Connects via the Internet, and not over a LAN. For your demonstration, a LAN will probably not be available, so your application must be able to function via the Internet.

Notes, considerations, and penalties

Please take note of the following:

- There are no restrictions on how you may develop the app. You may use any tools, IDE's, programming languages, etc. that you want. The list in Group Task 3 above contains all of the requirements for the app. However, do keep in mind that you may not install any additional software. This includes external libraries such as runtimes, IDE's, and language packs – it must be **fully portable** on Windows devices.
- The topological network design must be done in Packet Tracer.
- Try not to unnecessarily overcomplicate your tasks.
- Multiple group tasks can run concurrently. Only the completion date is set, not the starting date.

- You will have to submit all of your project files on eFundi along with your final documentation prior to the demonstration. The demonstrations will take place over a few days, but the submission date is the same for all of the groups.
- You must submit <u>fully</u> by the project due date to avoid penalties.
- You will be allowed to submit late, but for every full "project" day that you are late the group will suffer a -10% penalty to the final mark. A partial submission will not be considered a submission. Examples:
  - Your project receives a final mark of 90%, but your final submission is 3 "project" days late. The penalty is -30%, i.e. your final project mark will be (90 – 30) = 60%.
  - Your project receives a final mark of 67%, but your final submission is 7 "project" days late. The penalty is -70%, i.e. your final project mark should be (67 – 70) = -3%. **However, as you did submit work and a negative mark will not be given, you will still receive 10% as your project mark.** This also means that 10% is the lowest mark your group will receive <u>if your group **submits late**</u>.
- A full "project" day, in the context of this project, is considered any 24-hour period where any number of those 24 hours falls on a weekday (Monday – Friday). This means that, if submissions close on a Sunday at 15:00, you will receive your first penalty if you do not submit by Monday at 15:00.
- You must submit prior to your demo; you may not demo until you have submitted.
- The demonstrations will take place from the 15th of May. The exact dates will be communicated closer to the time.
- At the end of the project, after your demo, you as a group will be offered the opportunity to adjust the mark of individual group members. This is specifically aimed at members that did not contribute as they should have, but still contributed enough that the group feels that the member still deserves to receive a mark. The adjustments will be in the form of percentages of the final mark. Examples:
  - Member 1 should receive 70% of the final mark per the group's decision, and the group received a mark of 90%. This means that Member 1 receives 0.7(90) = 63% as final mark.
  - Member 6 should receive 50% of the final mark per the group's decision, and the group received a mark of 90%. However, the group submitted 3 "project" days late and thus received a final mark of 60%. Member 6's mark is determined using the final project mark after all penalties. This means that Member 6 receives 0.5(60) = 30% as final mark.

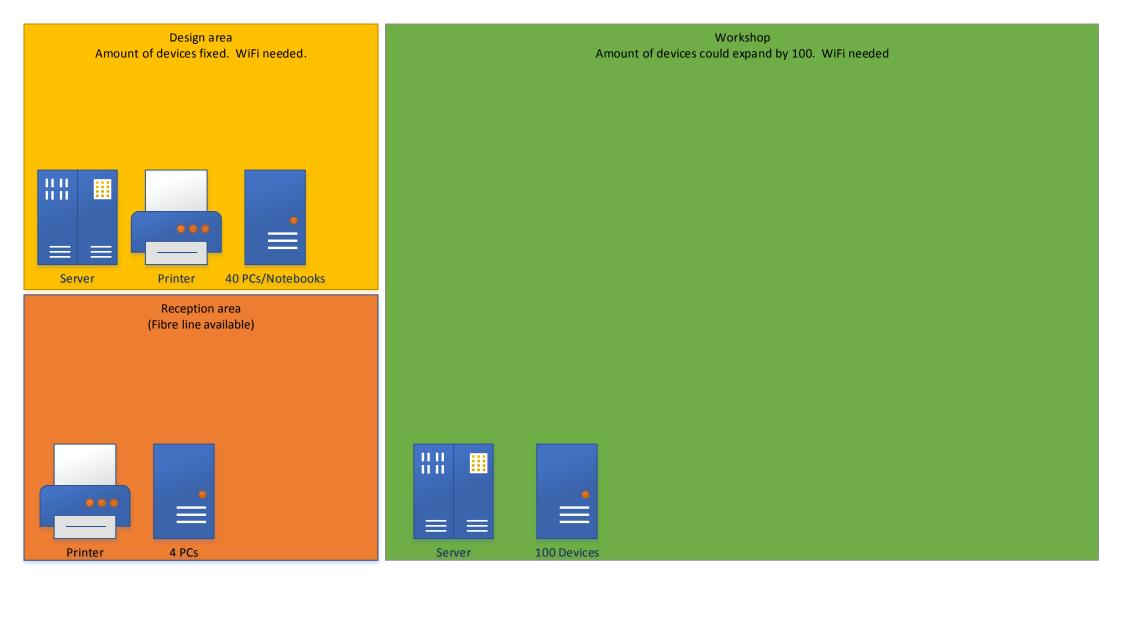# Packet Tracer Project Goals and Guidelines

General:

- Complete the project in the assigned groups.
- Use Packet Tracer to design a network setup that addresses the needs shown in the attached diagram.
- You may use any design approach you deem appropriate. You must be able to motivate your decision.
- Focus on building a robust, yet affordable, network.
- Each section (reception, design, workshop) has to be isolated (e.g. a reception computer should not be able to communicate with a design computer).
- Each section must have Internet connectivity. There is only one Internet access point.
- The printers in each section should be accessible over the network.
- The network in each section should be representative of the perceived network needs of the section.
- The network must be able to accommodate the growth as shown.
- The overall cost should be kept as low as possible.
- Your Packet Tracer file must provide proper simulation of the network (i.e. it has to work in Packet Tracer)
- Determine appropriate subnets, IP addresses, and routing setups, where appropriate.
- Include, if needed, additional hardware for a virtual office environment.

Documentation:

- A project report must be submitted on eFundi prior to the demo. In the event of a face-to-face demo, a physical copy of the documentation has to be brought along for evaluation. This may be a printed copy, or a copy on a tablet.
- The following must be included in the report:
  - Overview of the problem (diagram). Discuss possible issues that need to be addressed. Also focus on work-at-home aspects.
  - Describe the network topology your group designed. Discuss selection of routers, switches, repeaters, etc. and motivate the selection of each.
  - Provide and discuss the setup costs required to build your network. Identify network hardware currently on the market that will satisfy the needs of your network and identify the lowest price. Remember to consider the robustness of the network – significantly cheaper hardware is cheaper for a reason. Provide a full budget – include estimated labour costs and contingencies.
  - Discuss how users of the network would connect remotely. Consider the following:
    - Which remote software should be used, and why (include choices in the budget);
    - Security implications (e.g. vulnerability to lateral movement);
    - Bring Your Own Device considerations; and
    - Establishment of a cooperative virtual workspace.
  - Evaluate the designed network:
    - Does it fulfil the requirements?
    - What is good about this setup?
    - What is problematic about this setup?
    - Which part of the network is likely to need the most maintenance? Can this part of the network be installed in a way that facilitates maintenance?
    - Which parts, if any, would remain if the company moves to a virtual office environment? Why?

Group work:

- Keep a full record of the group's communication as evidence. Keep backups of all emails and messages, and keep a record of any video conferences (date, time, length, participants, etc.)
- Each group must select a group leader. The leader will be responsible for managing communications between the group members and coordinating efforts.
- Consult the disciplinary guidelines if a group member/leader causes problems. Remember to hold any meetings/hearings virtually.

Design area
Amount of devices fixed. WiFi needed.

Server   Printer   40 PCs/Notebooks

Workshop
Amount of devices could expand by 100. WiFi needed

Server   100 Devices

Reception area
(Fibre line available)

Printer   4 PCs

GUIDELINES FOR DISMISSAL OF PROJECT GROUP MEMBER

1. Each project group must have a project leader.
2. The project leader may dismiss a member from the project group in the event that:
    a. There is a valid reason for the dismissal; and
    b. The correct procedure has been followed in determining that dismissal is a reasonable response.
3. The following are the only reasons that are considered valid for dismissing a project group member:
    a. The member fails to contribute where needed or required on a regular basis;
    b. The member repeatedly and maliciously undermines the efforts of the group;
    c. The member is wilfully and repeatedly absent from mandatory meetings as decided upon by the group and fails to contribute as a result.

4. Should any of the reasons mentioned in 3(a), 3(b) or 3(c) be brought to the attention of the project leader, the leader should issue an immediate warning to the accused group member.
5. If the accused member continues to be accused of the transgressions mentioned in 3(a), 3(b) or 3(c), the group leader should contact the accused member as soon as possible and arrange for a hearing. The hearing is to be at the earliest possible time that the group leader, the accused member, as well as at least two other members of the group can be present. Should the accused member fail to appear at more than two (2) of these hearings, and there is no reasonable reason for the accused to be absent, the group may proceed with the accused's hearing in absentia.
6. At the hearing all relevant accusations must be discussed. During this discussion the accused member must be given a fair and reasonable chance to defend against the accusations.
7. Should the accused member be unable to reasonably defend against the accusations the project leader has the option to dismiss the accused member from the group. Dismissal requires that:
    a. At least two other group members are present during the full length of the hearing to act as witnesses;
    b. It is possible to distribute the dismissed member's work to other members; and
    c. There is no workable alternative to dismissal.
8. In the event that the project leader is guilty of any of the transgressions mentioned in 3(a), 3(b) or 3(c), the group has the option of electing a new project leader. The new project leader should then follow the procedure as described in 5, 6, and 7 in dealing with the old project leader.
9. Any dismissed group member has the right to appeal the dismissal. The lecturer handles all appeals with regards to dismissals.
10. During the appeal the following will be required:
    a. The group leader must provide evidence that the dismissed group member is potentially guilty of a transgression as mentioned in 3(a), 3(b) and 3(c). Evidence such as testimony from the group members, meeting notes, and signed schedule documents, will be considered sufficient;
    b. The group leader must provide evidence that the correct procedure was followed in determining that the dismissal was reasonable. The testimony from all witnesses present at the hearing as described in 5, 6, and 7 will be considered sufficient; and
    c. Any evidence brought by the dismissed member that refutes either 10(a) or 10(b).
11. In the event that the lecturer finds that the dismissal was unreasonable, or that workable alternatives exist, the dismissal may be overturned either completely, or in favour of any workable alternatives.
12. Should the dismissal stand the dismissed member is prohibited from joining any other project group.

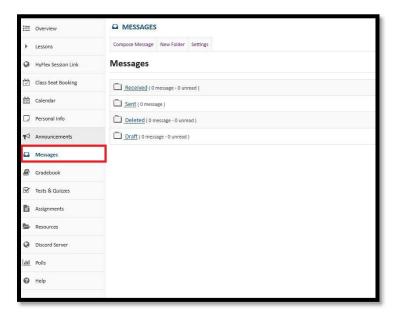# VERKLARING VAN PUNT AANPASSINGS / DECLARATION OF MARK ADJUSTMENTS

Groep ID / Group ID: **N**   **P**   **G**   _

Naam van lid / *Name of member*	Studente nommer / *Student number*	Persentasie van punt / *Percentage of mark*

Ons, die ondergetekende lede van hierdie groep, bevestig hiermee dat die punte aanpassings wat hier gegee word, akkuraat is. Ons neem verder eienaarskap van die besluit om hierdie aanpassings te maak, en verklaar dat die besluit sonder kwaadwilligheid, en in die belang van regverdigheid geneem is.

We, the undersigned members of this group, hereby confirm that the mark adjustments of the group members given here are accurate. We furthermore take ownership of the decision to make these adjustments, and declare that the decision was made without malice and in the interest of fairness.

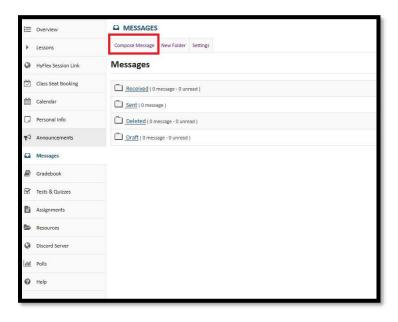| Naam van lid / *Name of member*	Studente nommer / *Student number*	Handtekening / *Signature*

Using the eFundi Messages tool to contact fellow project group members

The messaging tool on eFundi is useful for getting into contact with your fellow project group members if you don't have their contact details. You use the tool as follows:
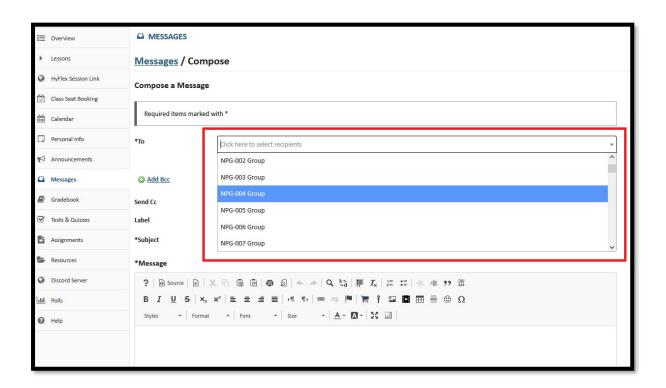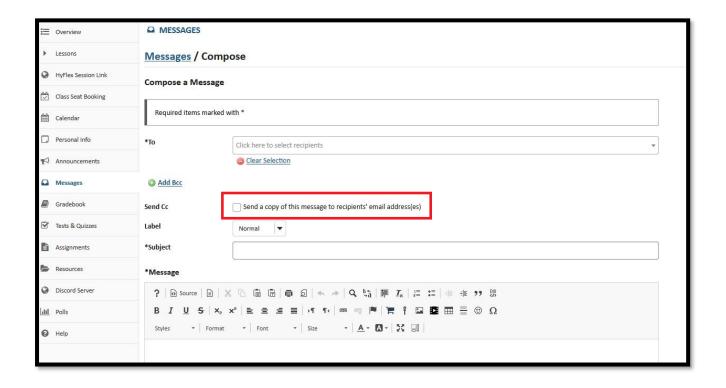
1. Open the Messages Tool

2. Click on "Compose Message"

3. Select the recipient(s) using "*To". Your group members have been assigned to a group on eFundi; you can simply select the group ID to send a message to everyone in the group

4. Check "Send a copy of this message to recipients' email address(es)" to make sure that the message is sent to the recipient's email address

5. Type out your message and click "Send". Neither "Preview" nor "Save Draft" will send the message