Gymea Technology High School
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10 Computing Technology

Task 5: Modelling and Building Networks

Due Date: 1 Nov 2024 Week 6B

Distributed: 17 Oct 2024 Week 1A

Weighting: 30%

Task Type: Individual Project

Syllabus Outcome/s: CT5-DPM-01, CT5-COL-01, CT5-DAT-01

Unit: Modelling networks and social connections

Task Description

Scenario:

RossCo Printing are a small family printing business that are looking to redo their local network to take advantage of some new Internet of Things(IoT) devices they've recently purchased.

PART A - Practical Project and Report

You will be configuring and networking devices together to form a simple network, and then running testing to ensure network reliability.

As part of this task, you'll need to document and demonstrate the following:

- Setup of a PC running Windows 10 including naming the machine with a unique name to ensure easy identification
- Connect the PC using appropriate Ethernet cabling to a network switch
- Assigning static IPs to the device and then running a PING test to ensure connectivity to other network devices, as well as successful connectivity to the Internet
- Update drivers for the inbuilt network card, graphics card and audio card and OS on the PC to ensure optimal operation of the PC
- Configuring the inbuilt security protections within Windows 10, including the inbuilt Windows Defender, Windows Firewall and User Account Policies
- Produce a report showing
    - A network diagram to graphically represent your network, showing all devices including the PCs, switch and router
    - Describe the function and purpose of each network component in your network
    - Outline the security risks and measures the company should take to secure their new network and associated devices

Remember to take screenshots at each step of your practical (e.g. as you setup the computer, connect to the switch etc) above to document your project.

PART B - IoT Devices Practical and Report

Having set up the basic network devices, you'll now be looking at adding some IoT devices to the network. You'll need to research some possible IoT devices, before configuring and utilising the Smart Home devices provided by the school.

For your report, you need to research at least **FOUR** IoT devices, and include the following information:

- Name, Price and Vendor
- Functionality (eg what does the device do?)
- Technical information (e.g. information around what type of sensors/input are used, the type of data collected and how this can be used to provide functionality etc. Include any information on how this device can be used as part of existing Home Automation setup)
- Connectivity requirements (e.g. how does the device connect to your local network, how does it communicate with other devices on your network and other IoT devices)

You'll need to record a video demonstrating your successful configuration and use of these devices, along with any code/automations created/used to demonstrate successful operation.

Glossary of Key Words

These verbs will provide an understanding of the detail needed to successfully complete this task:

- **Demonstrate:** Show by example
- **Describe:** Provide characteristics and features
- **Outline:** Sketch in general terms; indicate the main features of

Details of Submission

PART A - Practical Project and Report
Submit your report showing evidence of completion of all tasks in Part A, to Google Classroom by the due date, using the scaffold provided.

PART B - IoT Devices Practical and Report
Upload your complete video demonstration, along with your completed IoT Research Report to Google Classroom by the due date, using the scaffold provided.

Teacher Feedback and Student Self-Reflection

The task will be returned to students within **14 days** of the due date. Information on how to improve will be provided through written teacher feedback and the marking criteria. Students can clarify or seek further feedback by speaking with their teacher.

Upon return of the task and teacher feedback, students will also be expected to complete the following self-reflection form, to provide them with the opportunity to reflect on the strength of their performance, as well as areas that have been identified to strengthen in future tasks - https://forms.gle/Ck4y1jid49x7sKfq7

How does this link to my learning?

This task will allow students to:

- Demonstrates knowledge and skills in using a modern operating system and basic network configuration of devices to allow for communication between and to the Internet.
- Ability to document project work and communicate understanding of various network components, security risks and measures needed to secure a network

Assessment Procedures

Students should be fully aware of the School Assessment Procedures for their year group. These were provided at the beginning of the school year and are available off the school website under the Learning menu for each year group.

Marking Criteria

PART A - Practical Project and Report					
Criteria	**1**	**2**	**3**	**4**	**5**
Setup of PC	PC partially configured as per task requirements	PC configured as per task requirements			
Network Configuration	Attempts to connect PC using cabling	PC connected using appropriate cabling, no IP addresses configured	PC connected using appropriate cabling, static IP configured but no evidence of connectivity provided	PC connected using appropriate cabling, static IP configured and evidence of successful two-way communication provided	
Device Update	Attempts to update PC with limited success	PC updated with latest OS patches	PC updated with latest OS patches and evidence of attempts to update drivers provided	PC updated with latest OS patches and evidence of all drivers updated provided	
Security Protections	Attempts to configure any of the listed inbuilt security protections	Evidence of configuration of 1-2 of the listed inbuilt security protections provided	Evidence of configuration of all listed inbuilt security protections provided	Detailed evidence of configuration of all listed inbuilt security protections provided	
Network Diagram	Limited attempt at completing network diagram	Network diagram provided showing all network devices with some use of correct symbols evident	Network diagram provided showing all network devices using mostly correct symbols and diagram terminology	Detailed network diagram provided showing all network devices using correct symbols and diagram terminology	
Report	Limited detail provided in report	Basic report provided identifying most network components and outlining some security considerations	Report addresses most network components, with some discussion around security provided	Report addresses all network components, with discussion around security risks and/or measures included	Detailed report addressing all network components, with detailed discussion on security risks and measures included
					Part A TOTAL / 23

PART B - IoT Devices Practical and Research					
Criteria	**1**	**2**	**3**	**4**	**5**
Video Demonstration	Limited attempt made at configuring and using IoT devices provided	Video provided shows evidence of configuration and some successful operation of some IoT devices used	Video provided shows evidence of successful configuration and some successful operation of some IoT devices used	Video provided shows evidence of successful configuration and operation of all IoT devices used, with some code/automations used submitted	Video provided shows evidence of successful configuration and operation of all IoT devices used, with all code/automations used submitted
IoT Research	Limited attempt made at completing research into existing IoT devices	Report identifies **1** IoT device, identifying the price, functionality, technical requirements and/or connectivity requirements	Report provided showing evidence of research into **2** IoT devices, outlining information about each including price, functionality, technical requirements and connectivity requirements	Report describes **3 - 4** IoT devices, and includes information about each including price, functionality, technical requirements and connectivity requirements	Detailed report provided showing evidence of research into more than **4** IoT devices, clearly describing the price, functionality, technical requirements and connectivity requirements of the devices
					Part B TOTAL / 10
					Part A and B TOTAL / 33

Literacy Criteria

Literacy Outcomes	Elementary achievement You have:	Limited achievement You have:	Satisfactory achievement You have:	High achievement You have:	Outstanding achievement You have:
	0	0.25	0.5	0.75	1
Vocabulary *Uses technical vocabulary to explain concepts and/or range of precise and appropriate words for effect*	Very limited response. Few content words used.	Only simple words are used.	Some precise and technical words are used.	Sustained use of precise and technical words.	Sustained, consistent and fluent use of precise and technical words.
Punctuation *Use of correct and appropriate sentence and other punctuation for effect, and to aid in reading of the text*	No evidence of correct sentence punctuation.	Sentence punctuation is correctly used in at least one place - *one sentence is punctuated correctly.*	Some correct sentence level punctuation (at least 50%). May attempt other punctuation where it is required.	Mostly correct sentence level punctuation (80%) and at least two correct examples of other punctuation.	Writing contains accurate use of all applicable punctuation.
Sentences & Cohesion *The intentional construction of a variety of sentences to match purpose and audience, and the control of multiple sentence threads across the whole text.*	No clear evidence of sentences: a list of words OR text fragments.	At least one sentence is used correctly. Some meaning can be construed from the text.	Some correct formation of sentences. Mainly uses simple and compound sentences, but may attempt more complex structures.	Most sentences are correct. Range of sentence types and connectives are evident, but with varied effectiveness.	All sentences are correct, effective and controlled, and include a range of sentence types and connectives (complex sentences and other sophisticated structures)
Paragraphs *Paragraphs are used to effectively structure information and partition events and ideas*	No correct use of paragraphing; may be a block of text or random breaks.	Ideas are separated; paragraphs may contain some unrelated ideas.	At least ONE paragraph is well structured and develops an idea	Writing is organised into paragraphs that assist the reader to digest chunks of the text, but may not be linked or executed effectively.	All components of the paragraphs are evident and paragraphing is consistent and well-developed across the whole text.
Text Structure *Uses features of the appropriate text type*	No evidence of the structural features of the appropriate text type. *No attempt to write in the appropriate text type and/or response is off task.*	Minimal evidence of the structural features - *1 component evident* - of the appropriate text type.	Some evidence of the structural features - *2 components evident* - of the appropriate text type.	Substantial evidence of the structural features - *all components evident but there may be some lapses* - of the appropriate text type.	Coherent and controlled use of **all** the appropriate structural features of the text type.
	Level of response is well below syllabus expectation	Level of response is below syllabus expectation	Level of response is equivalent to syllabus expectation	Level of response is above syllabus expectation	Level of response is well above syllabus expectation
				Literacy Total / 5	
				Grand Total /38	