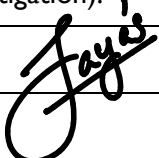


Canterbury Institute of Management (CIM)

ASSESSMENT COVER SHEET



1. Personal Details			
Student ID	Given Name(s)	Surname	Email Address
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Campus	Darwin Campus		
Course Title and Code	MBIS404 Networks and Communications		
Assessment Title	Assesment Task - Week 5		
Due Date & Time	03/11/2024		
Course Lecturer/Tutor Name: Sharad Neupane		Assessment Word Count (if applicable): 429	
2. Student Declaration			
<p>By signing and submitting this coversheet, I/we declare that:</p> <ul style="list-style-type: none"> ✓ This assessment submission is my/our own work unless otherwise acknowledged (including the use of generative AI tools) and is in accordance with the Institute's Academic Integrity and Honesty Policy available on the website. ✓ No part of this assessment has been submitted previously for advanced standing or academic credit in this or any other course. ✓ I/we certify that we have not given a copy or have shown a copy of this assessment item to another student enrolled in the course, other than members of this group. ✓ I/we are aware that the Lecturer/Tutor of this assessment may, for the purpose of assessing this assessment task communicate a copy of this assessment task to a plagiarism checking service to detect possible breaches of academic integrity, for example, plagiarism, recycling, cheating, contract cheating, or unauthorised use of generative AI (which may then retain a copy of the item on its database for the purpose of future investigation). 			
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Data Compression - Presentation Layer

Data compression denotes the reducing the size of data packets by applying specific two-way algorithms that outputs smaller sized data that represents same content. These compressed data packets then applied with associated decompression algorithms that restores original message. These algorithms are classified as lossless algorithms meaning there won't be any data loss between compression and decompression cycles.

Applying these compression algorithms results in lightweight data packets. Smaller data packets consumes less bandwidth and therefore improves bandwidth availability for other peers. This in turns means the data packets are transmitted faster than in comparison to a data packet that is larger in its size. Network latency and throughput is also affected positively with compressed data packets being transmitted.

*Some examples of data compression algorithms used in presentation layer includes **DEFLATE**, **Run-Length Encoding**, **Huffman Coding**.*

Digital Signal Modulation

Digital signal modulation is the enabler for data transmission over electronic modes. Modulation enables efficient use of transmission mode with better utilization of the medium bandwidth resulting in fast efficient transmission of data. These signals are run through demodulation process at the recieving end to understand the meaning of the data being transferred as electronic signals or waves depending on the transmission mode.

Encoding & Decoding Electronic Signals

Encoding electronic signals is the preparation phase for data transmission through an electronic channel. Data is encoded in to agreed format between the transmitter and receiver so the receiver upon receiving the signals can decode the data to its original meaning. This further helps to identify faulty transmissions and request for a retransmission of the faulty portion instead of the whole data context. Another use case is to enable multiple concurrent transmission using same transmission medium to gain better bandwidth advantage, the receiving end can understand which data belong to what context. Some encoding algorithms incorporates compression mechanisms to reduce the size of data chunks further improving network latency and bandwidth for multiple transmissions.

Application Layer - Widely used protocols

Application Layer is the top most layer of the Open Systems Interconnection (*OSI*) model. That being the case it refers to various services & applications of the interconnected devices, some examples includes *Email (SMTP)*, *Web Applications (HTTPS/HTTP)*, *File Transfer (FTP)* *Secure Shell (SSH)*.

- **SMTP [Simple Mail Transfer Protocol]** - Used to send and receive email messages across the network
- **FTP [File Transfer Protocol]** - Used to transmit files over the network
- **SSH [Secure Shell]** - Used to enable command line interfaces to remote servers, devices or mainframes that supports remote secure access
- **HTTP/HTTPS [Hypertext Transfer Protocol/Secure]** - Used to enable access to web applications that are made of Hyper Text Markup Language (HTML)

Evaluation Comments