



Task [1.1[Research Agreement] – SIT723

Student Name:	Zhuoyu Li
Supervisors' Names:	Dr Jonathan Kua
Project Title:	Low Latency Data Transport Protocols and Internet Service Architecture for Emerging Technologies
SIT723 Target Grade:	D/HD
Overleaf Project Link:	TBA
Project Folder Link:	https://drive.google.com/drive/folders/1cpuCMTc7giCz6qTvKiMZ83-fzkiX4pMD?usp=drive_link
Worklog:	https://docs.google.com/spreadsheets/d/1ime0IUuKVogPnpkM1ToJBZM6HZUA3pBn/edit?usp=drive_link&ouid=109473622249282003910&rtpof=true&sd=true
Overall project progress:	Connected with Supervisor

Describe what you have done in this task in detail below:

Allocated to Project

Contact Dr. Lei Pan to inquire if it is possible to replace the supervisor

Successfully replaced supervisor

Connected with new Supervisor



Went through Project Description

Low Latency Data Transport Protocols and Internet Service Architecture for Emerging Technologies

Supervisor: Dr Jonathan Kua, jonathan.kua@deakin.edu.au

Associate Supervisor: Dr Shiva Pokhrel

Campus: Melbourne Burwood; Cloud

Start: Trimester 1; Trimester 2

Project type: Group

Project Discipline: Applied IT/Emerging Technologies

Project Description:

The Transmission Control Protocol (TCP) has been the de facto transport protocol on the Internet for the past four decades. Despite many refinements over

the years, its fundamental principles for reliable data transfer have remained essentially unchanged. In recent years, however, momentum has been building

for a major rethink of TCP. This is reflected, for example, in Google's development of Quick UDP-based Internet Connections (QUIC) and Bottleneck

Bandwidth and Round-trip Time (BBR), as well as new data networking and congestion control strategies. Recent work in transport protocols focused on

IETF's recommendations for Low Latency, Low Loss, and Scalable Throughput (L4S) Internet Service Architecture [RFC9330] and Active Queue Management

(AQM) [RFC7567].

It is critical to ensure that future Internet service architecture addresses the challenges posed by the emerging technologies, such as the Metaverse which

requires immersive real-time streaming applications. This project will identify and characterise the communication and networking challenges for realising

these applications. This project will also focus on the key enablers and implementation recommendations to achieve a ubiquitous, seamless and embodied



access to the Metaverse, including leveraging cutting-edge next-generation communication solutions and the cloud-edge computation framework to deliver

low-latency immersive interactions and experiences across the network.

Keywords: Internet Congestion Control, Transmission Control Protocol, Active Queue Management, Low-Latency Networking

Necessary Skills: Computer networking, python programming, machine learning, knowledge on operating systems and kernel development highly desirable