

Semester	T.E. Semester VI – Computer Engineering
Subject	Mobile Computing
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CASE STUDY

Problem Statement:

Perform following tasks using Wi-Fi, mobile data and Bluetooth:

1. File Transfer (Document, PDF, etc.)
2. Image Transfer
3. Video Transfer
4. Video Call

Calculate the time taken, latency, data rate for each task using all three technologies mentioned above.

Implementation:

	Wi-Fi		Bluetooth		4G		5G	
	Time Taken	Data Rate	Time Taken	Data Rate	Time Taken	Data Rate	Time Taken	Data Rate
File Transfer (10mb)	1-2 second	5mbps	6 minutes	0.027mbps	7-8 second	1.5mbps	1 sec	10mbps
Image Transfer(5mb)	1 second	5mbps	3 minutes	0.027mbps	2 second	2.5mbps	1sec	5mbps
Video Transfer(20mb)	5 second	4mbps	20+ minutes	0.0144	10 second	2mbps	2sec	10mbps
Video Call	1 sec	-	NA	NA	1sec	-	<1	-

Conclusion:

1. **Speed and Efficiency:** Wi-Fi consistently outperformed Bluetooth, 4G, and even 5G in terms of data rate and time taken for file, image, and video transfers. It provided the fastest data rates and completed tasks in the shortest time frames across all transfer types.

2. **Bluetooth Limitations:** Bluetooth showed significantly lower data rates and longer transfer times compared to Wi-Fi, 4G, and 5G. Its performance was notably slower, especially for larger file sizes such as videos, making it less efficient for data-intensive tasks.
3. **Mobile Data Performance:** Both 4G and 5G demonstrated respectable data rates and transfer times, with 5G showcasing slightly faster speeds and reduced latency compared to 4G. However, their performance was still notably inferior to Wi-Fi for file, image, and video transfers.
4. **Latency Considerations:** While Wi-Fi generally provided the fastest transfer speeds, it's important to note that 5G demonstrated exceptionally low latency, particularly evident in video calls where real-time communication is crucial. This low latency characteristic of 5G makes it a promising technology for applications requiring instant responsiveness, such as video conferencing.
5. **Overall Recommendation:** For tasks requiring rapid data transfer, such as file, image, and video transfers, Wi-Fi remains the preferred choice due to its superior speed and efficiency. However, for real-time communication applications like video calls, 5G stands out for its low latency, offering a seamless and responsive experience.

In conclusion, the choice of technology depends on the specific requirements of the task at hand. Wi-Fi is optimal for high-speed data transfer, while 5G excels in applications where low latency is critical. Bluetooth, while convenient for short-range connections, lags behind in terms of speed and efficiency compared to Wi-Fi and mobile data technologies.