**The University of New Mexico**

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Report: Comparison between multiplexing and multiple access

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When learning about communication systems, two terms that come up a lot are multiplexing and multiple access. Multiplexing is all about combining multiple signals from the same source or device so they can be sent together over a single channel. For example, a phone company might take several phone calls from one location and send them over one line using time or frequency division. The idea is to save bandwidth by packing things together. Common types of multiplexing are TDM (Time Division Multiplexing), FDM (Frequency Division Multiplexing), and CDM (Code Division Multiplexing).

On the other hand, multiple access is used when you’ve got multiple users or devices trying to share the same communication channel, like many earth stations trying to use one satellite transponder. The system must manage who gets access and when, so that signals don’t interfere with each other. This is where TDMA, FDMA, and CDMA come in, similar names to multiplexing methods, but here they’re being used to coordinate access across different users, not just signals.

Multiplexing is about signal management, while multiple access is about user coordination. Understanding both is key to building efficient and scalable communication systems, especially for things like satellite links and cellular networks where resources are limited and everyone wants a turn.