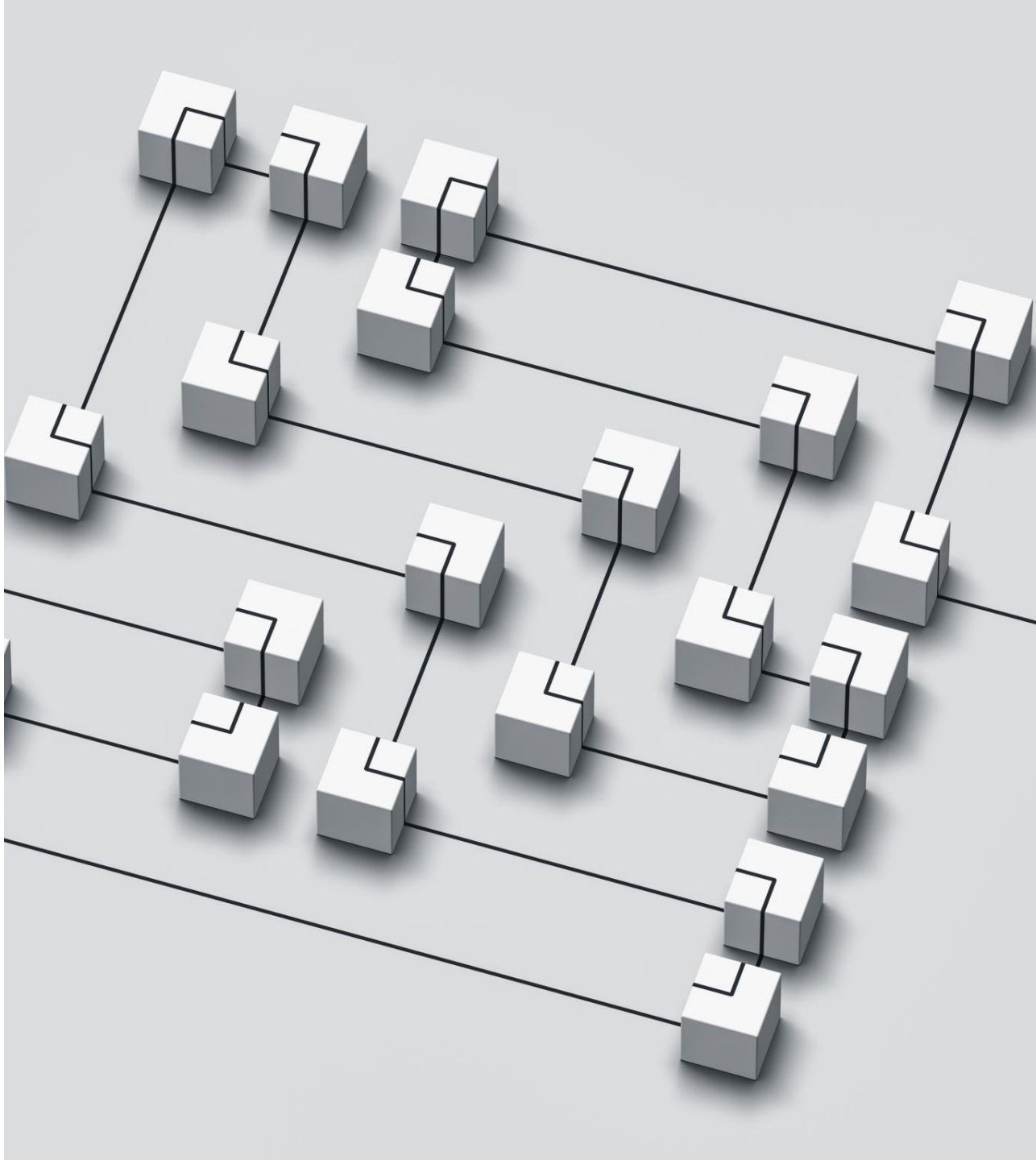
Time-Division Multiple Access TDMA

Time-Division Multiple Access (TDMA) is a communication protocol that divides a single communication channel into distinct time slots, allowing multiple users to share the same frequency band. Each user transmits data in a dedicated time slot, which ensures that signals from different users do not overlap

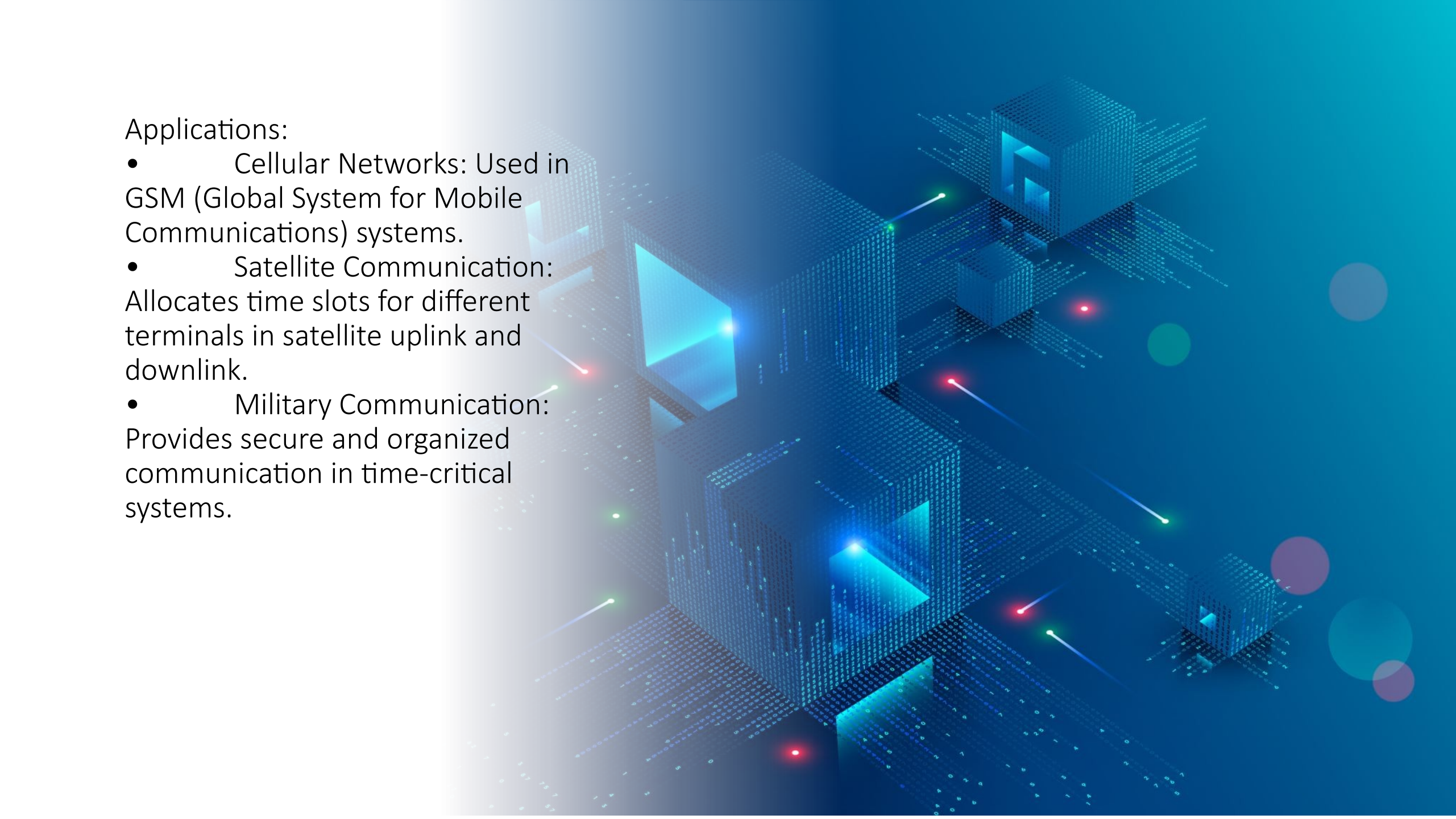
Key Features of TDMA:

1. Time-based Division: The channel is divided into sequential time slots, and each user gets a specific slot.
2. Efficient Resource Utilization: Multiple users share the same frequency without interference, making it efficient for high-traffic systems.
3. Synchronization: All devices need to be synchronized to ensure they transmit and receive data in the correct time slots.
4. No Overlap: Only one user transmits at a time, reducing the risk of signal interference.



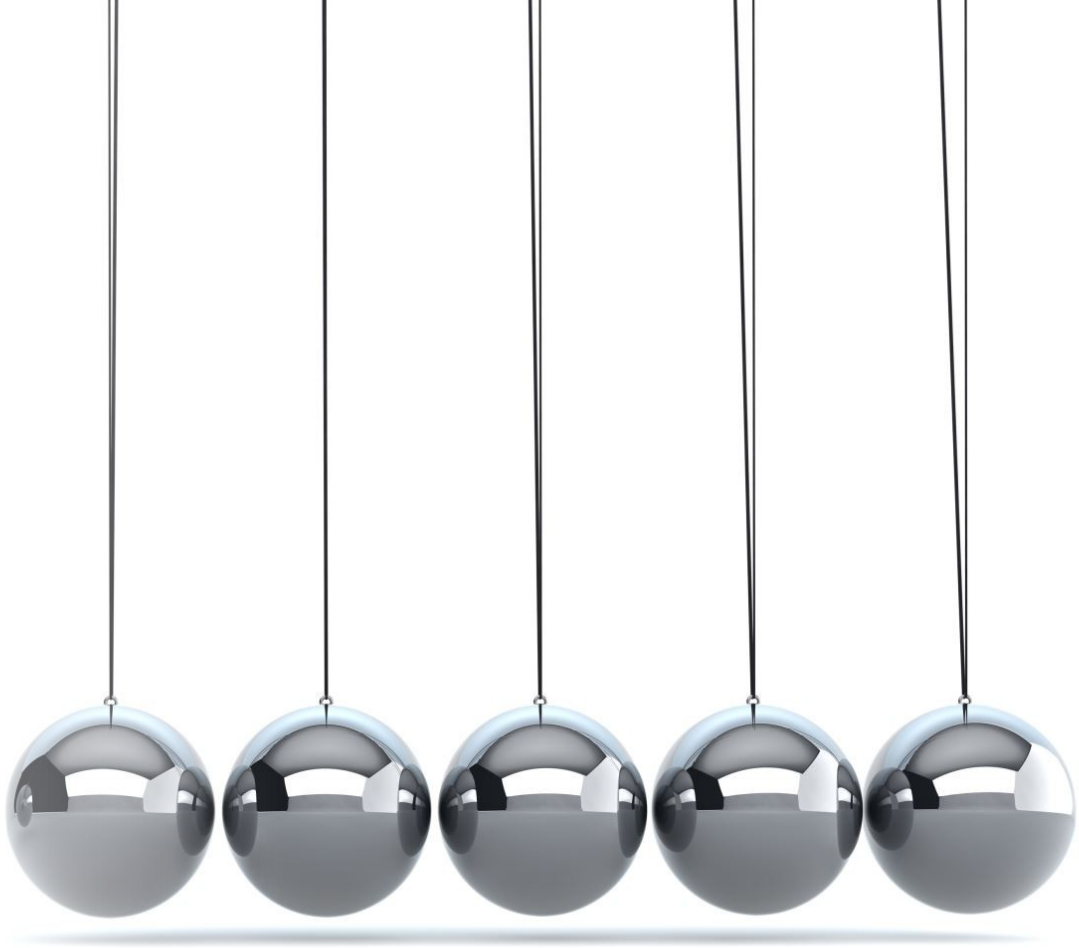
Applications:

- Cellular Networks: Used in GSM (Global System for Mobile Communications) systems.
- Satellite Communication: Allocates time slots for different terminals in satellite uplink and downlink.
- Military Communication: Provides secure and organized communication in time-critical systems.



Advantages:

- High spectral efficiency.
- Easy to implement for systems requiring fixed time slots.
- Avoids interference among users by separating their signals in time.



Disadvantages:

- Requires precise synchronization.
- Delays can occur if users need more data than the allocated slot.
- Limited scalability for high data-demand systems compared to more advanced methods like CDMA or OFDMA.