

6G WIRELESS

Performance

What's New

Anticipated Deployment Time



PERFORMANCE

5G

- 20 Gbps throughput
- 99.999% reliability
- 1 ms latency
- 1M devices/km^2
- 90% more energy efficient as 4G

6G

- 1000 Gbps throughput
- 99.9999% (100x more reliable)
- .1 ms latency (Ultra Low Latency)
- 10M devices/km^2
- Twice as energy efficient as 5G



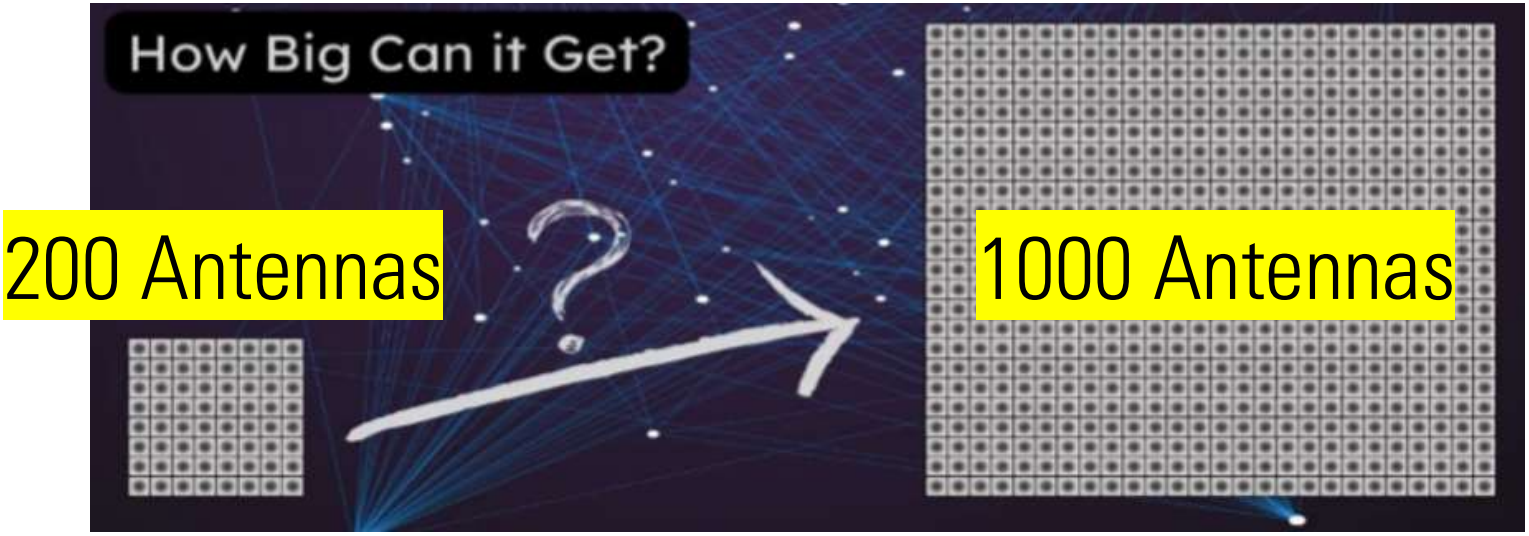
WHAT'S NEW



The biggest anticipated changes from 5g to 6g include:

- Ultra Massive MIMO & Beamforming
- High Frequency Bands
- Satellite Integration
- AI & Machine Learning
- Enhanced Security Features

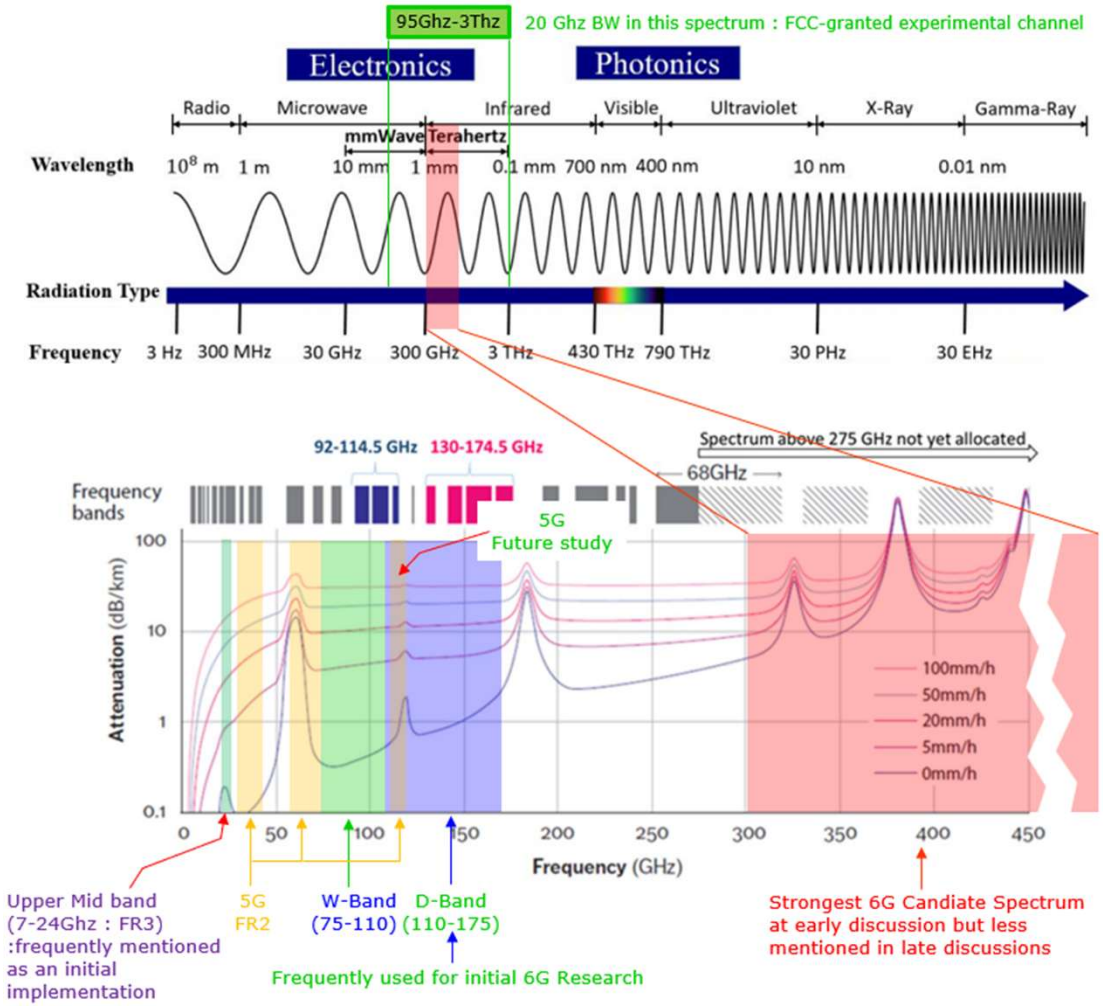
MIMO



Dev

3g – 6g
Legacy Antennas
Beamforming
Benefits

BEAMFORMING



Upper Mid Bands

7-15 GHz (6 – 24 GHz)

Benefits

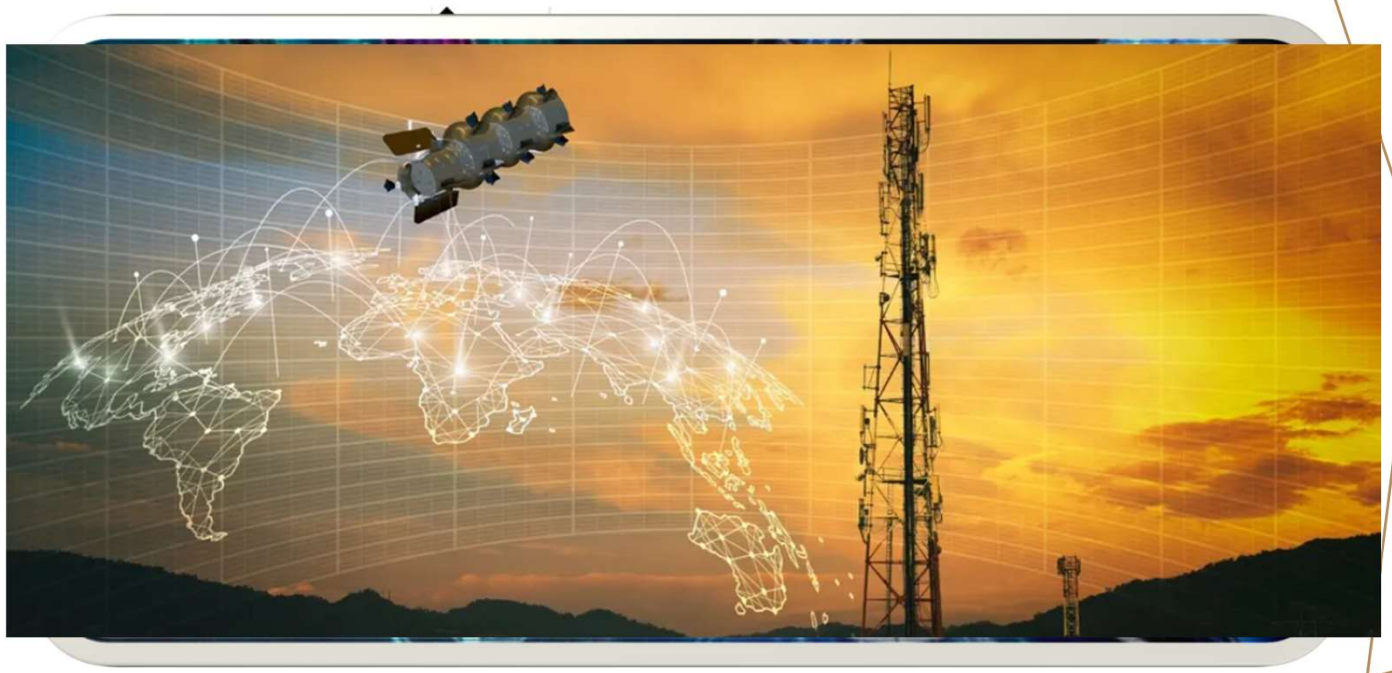
Low Freq. – Good Range/Bad Throughput

High Freq. – Bad Range/Great Throughput

NEW SPECTRUM

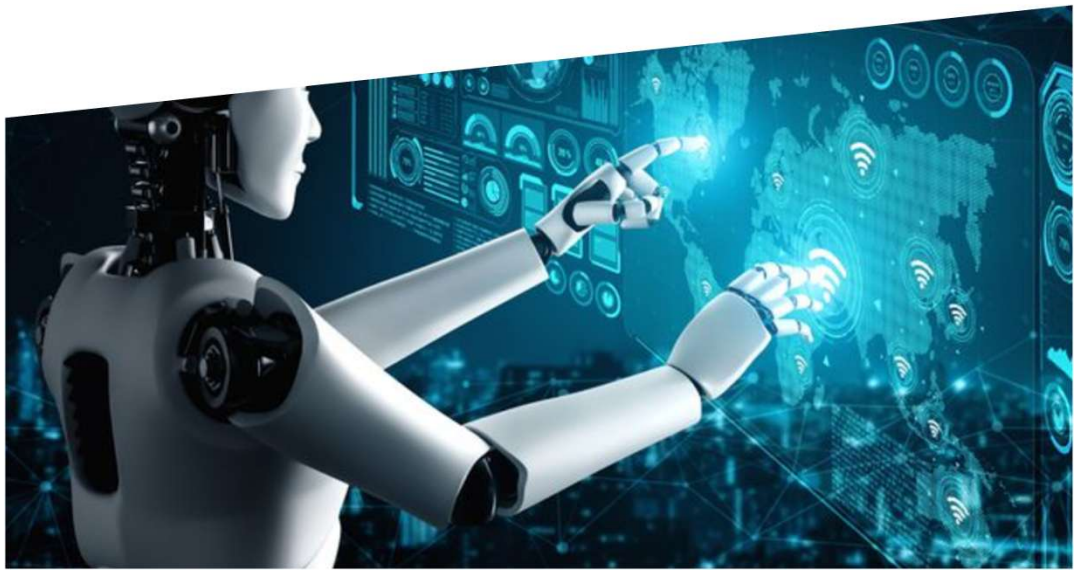
SATELLITE IMPLEMENTATION

- Backhaul
- Global presence
- Seamless handoffs
- New Satellite Technology
- Low earth orbit



AI & MACHINE LEARNING

- AI is anticipated to play a huge role in 6G networking
  - Self Healing
  - Self Optimizing
  - Enhanced Security

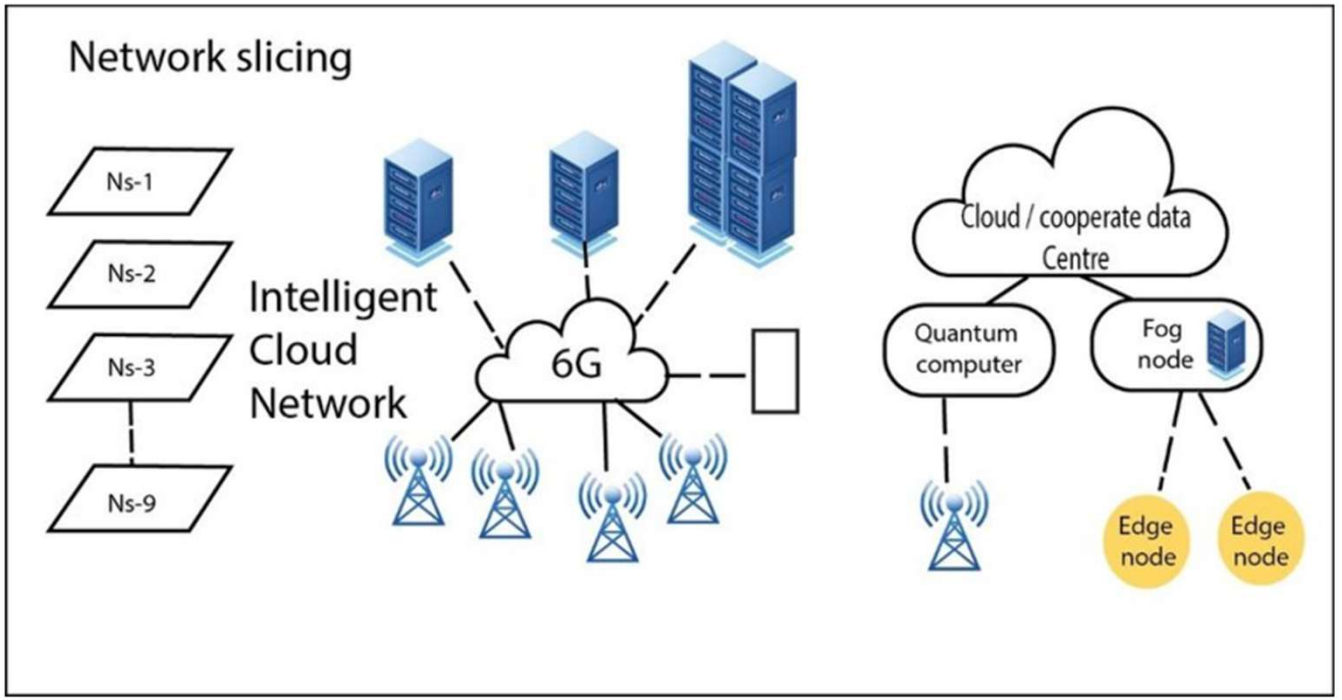


NETWORK SLICING

Dynamic slicing

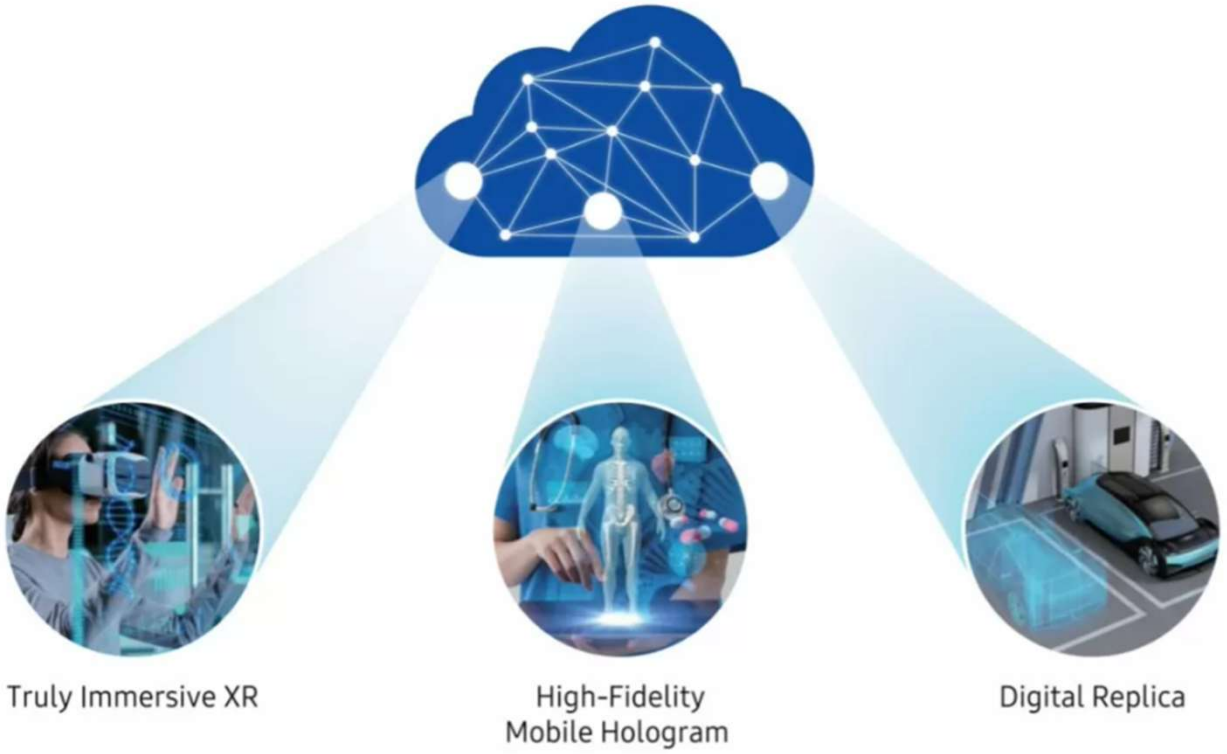
Network Orchestration

Service Isolation



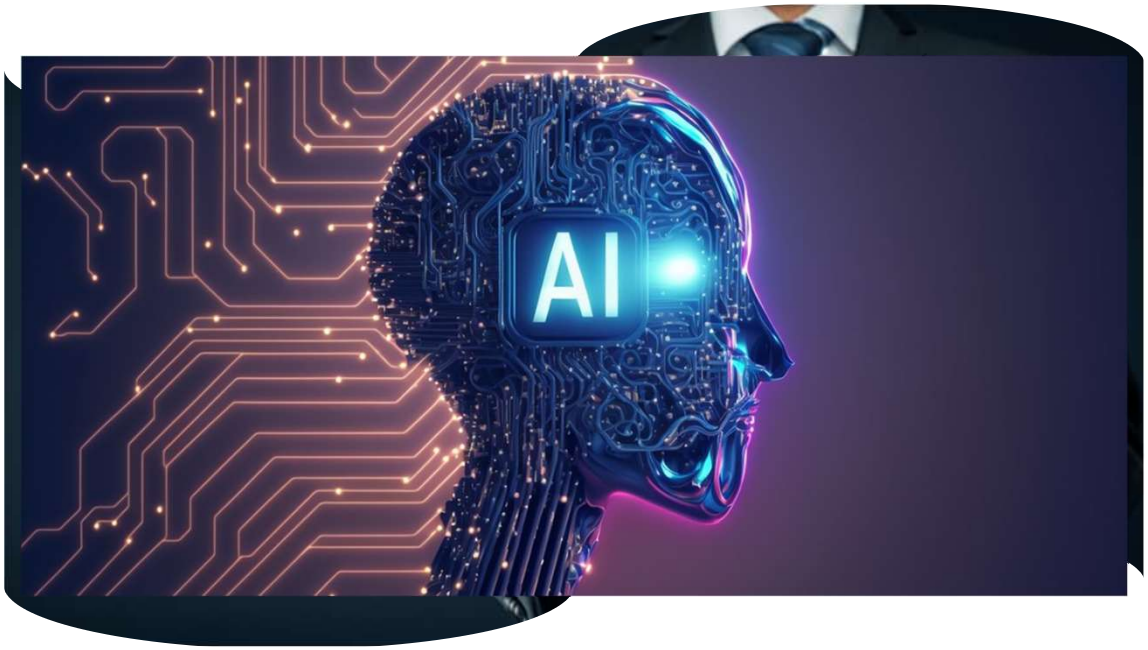
NETWORK SLICES EXAMPLES

- Augmented Reality
  - Holographs
  - 3D Communication
- Remote Devices
  - Remote Surgeries
- Autonomous Vehicles
- Collaborative Robotics
- Block Chain
- Quantum Communications



BETTER SECURITY

- Quantum Computing
  - Encryption
  - Authentication
- Network Intelligence



ENERGY EFFICIENCY

- Beamforming
- Dynamic power scaling
- Sleep modes
- Better architecture



EVOLUTION TO 6G

Anticipated to deploy in 2030s

