

# 5G in Satellite communication

***ADVANCE YOUR CAREER WITH 5G***



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- With the next generation of satellites – built from 5G architecture – they will integrate with networks to manage connectivity to cars, vessels, airplanes and other IoT devices in remote and rural areas.
- In future, 5G signals will beam down from space and support our “terrestrial” 5G infrastructure on earth.
- In future, there will be space race for satellites, promising to offer customers a seamless wireless experience across the entire globe.

# LEO satellites

- Traditional GEO satellites remain in fixed position relative to any position.
- Low earth orbit (LEO) satellites are miniaturized , orbiting versions that operate between 500 and 2000 Km above earth's surface.
- This creates a smaller coverage area so LEO satellites continuously handoff communication signals and traffic.

# Private LEO satellites

- A new space race is emerging among companies to deploy LEO satellite constellations to deliver high speed internet service to emerging markets and business customers.
- The Kuiper system, it will deliver high throughput , low-latency broadband service to millions of underserved customers.
- Each of these companies recognizes the potential of private satellite constellations to not only provide internet connectivity to rural areas but also satisfy the global networking services.

# Coverage & Integration

- In a 5G interconnected world, smart cities will utilize ultrafast speeds and low latency to connect everything in it.
- This requires small 5G towers placed in high traffic areas that demand a lot of bandwidth and have a direct LOS for optimal speed and performance.
- LEO satellites will play a key part in extending cellular 5G networks to air, sea and other remote areas not covered by small cell networks.

# Coverage & Integration

- For the end-user , satellites offer a seamless extension of 5G services from the city to airplanes, cruise liners and other vehicles in remote locations.
- IoT sensors and M2M connections on farms and remote worksites like mines can also capitalize on wide coverage areas

# Coverage & Integration

- Integrating satellites with 5G infrastructure improves the QoE of high capacity apps.
- By intelligently routing and offloading traffic, satellites save valuable spectrum and improve the resilience of each network.
- In the event of a natural or man-made disaster where 5G infrastructure is damaged, satellite networks can take over and keep the network alive.



# Multicast streaming

- The traditional core market of satellite communication is media broadcast.
- With the proliferation of mobile devices, media content trends are shifting away from live linear TV broadcasts, to low latency on-demand streaming.
- Media streaming is one of the key use cases for new satellite technology.

# Multicast streaming

- With the help of 5G-enabled satellites, these immersive experiences can globally transmit higher data rates to support smooth delivery and low latency to mobile devices.

# Satellites & IoT

- To combat on-going security vulnerabilities, devices need constant updates and future 5G devices will require an efficient distribution of data on a large scale.
- With wide coverage and broadcast capabilities , satellites are well positioned to support IoT.
- They can offer shared UL connectivity for a massive amount of IoT devices and provide data aggregation.

# Backhauling hi-speed services

- Satellite communication has a deep history in providing secure networks for high-speed and mission critical environments like air navigation systems.
- With larger constellations and a decrease of E2E delay, satellite networks can supply the required backhaul for high speed services.

# Backhauling hi-speed services

- With the right blend of economies and performance characteristics, satellites can provide additional services to high speed platforms and network platforms that are difficult to manage.
- Satellites can complement 5G and provide backhaul services, especially in areas where it is difficult to install physical infrastructure.