Low Earth Orbit Satellites for Communications

James R Drummond

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Where we are…

- For those of us fortunate to have landlines – count your blessings
- Iridium – low bandwidth, cell phone type service
- Geostationary satellites
  - There is a big “Arctic penalty” due to view angles
  - No service >80N
  - Generally costly
  - High latency

Where we are going

- Constellations of low earth orbit (LEO) satellites offer:
  - Lower cost – to be confirmed in practice!
  - No Artic penalty
  - Low latency
  - Higher bandwidth (but see “low cost”)

Some of the Players in the Game

- Boeing
- China (Hongyan constellation)
- Iridium
- LeoSat
- OneWeb
- SES (MEO)
- SpaceX
- Starlink
- Telesat

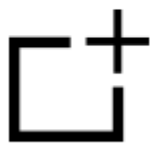
Telesat’s offering

High Throughput

Gigabits per second (Gbps) links available to individual customers along with multiple Terabits per second (Tbps) of total system capacity, dynamically allocated wherever it's needed.

Low Cost

Telesat's service offers a cost per Megabit per second (Mbps) comparable to, or lower than, the lowest cost space systems in the market, or being developed. This is enabled by a system design that drives maximum efficiency from Telesat's Ka-band available spectrum and other network resources.



Flexible & Focused

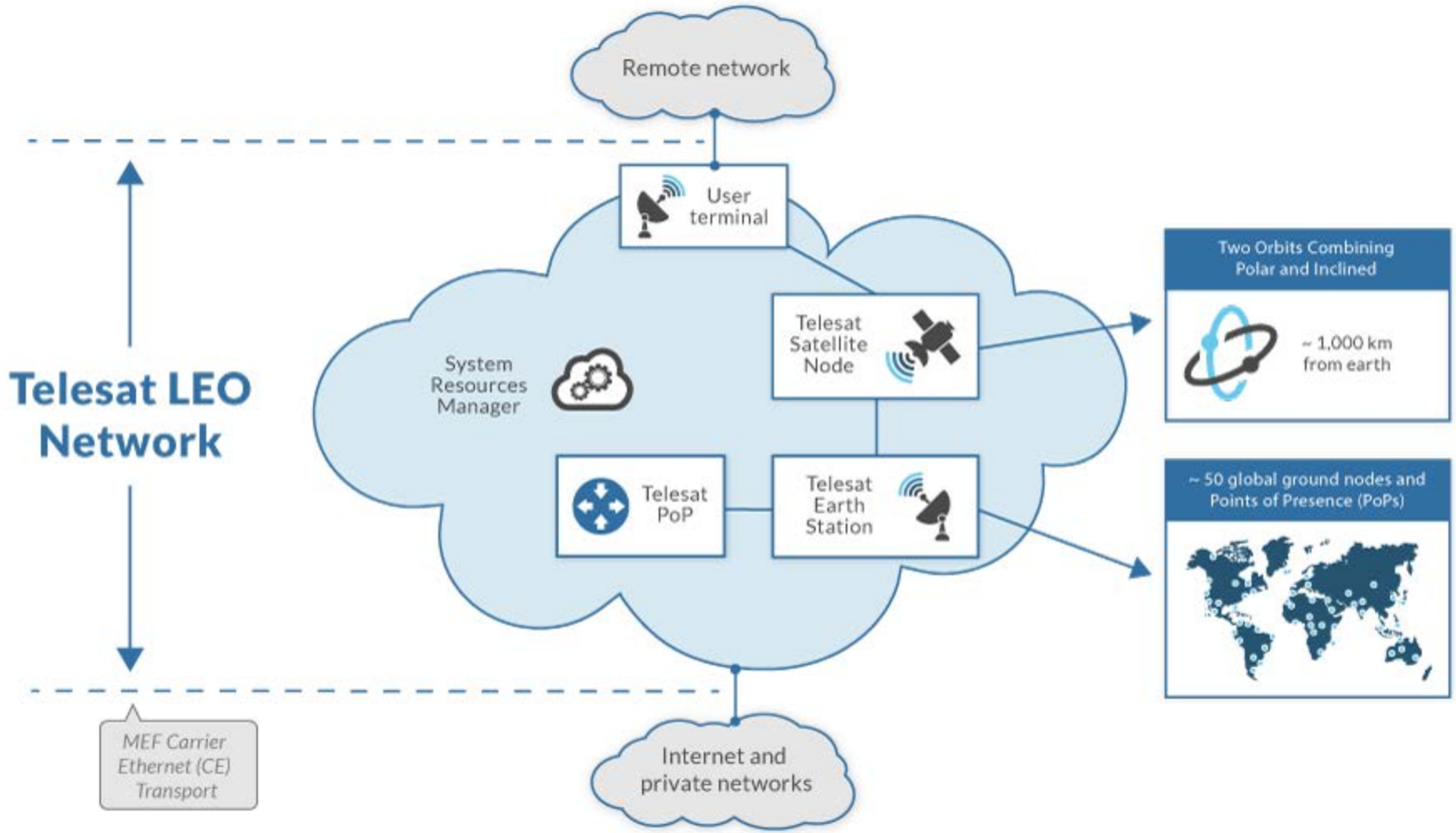
Hundreds of Gbps available to serve multiple users in areas of high demand such as busy airports, major shipping centers, or a community/region requiring immediate communications.

Low Latency

Typical round trip latency of 30-50 msec, more than 10 times faster than GEO satellites. The ultra low latency of Telesat LEO combined with the system's superior speed and capacity results in a user experience on par with the most advanced terrestrial networks but with worldwide availability.

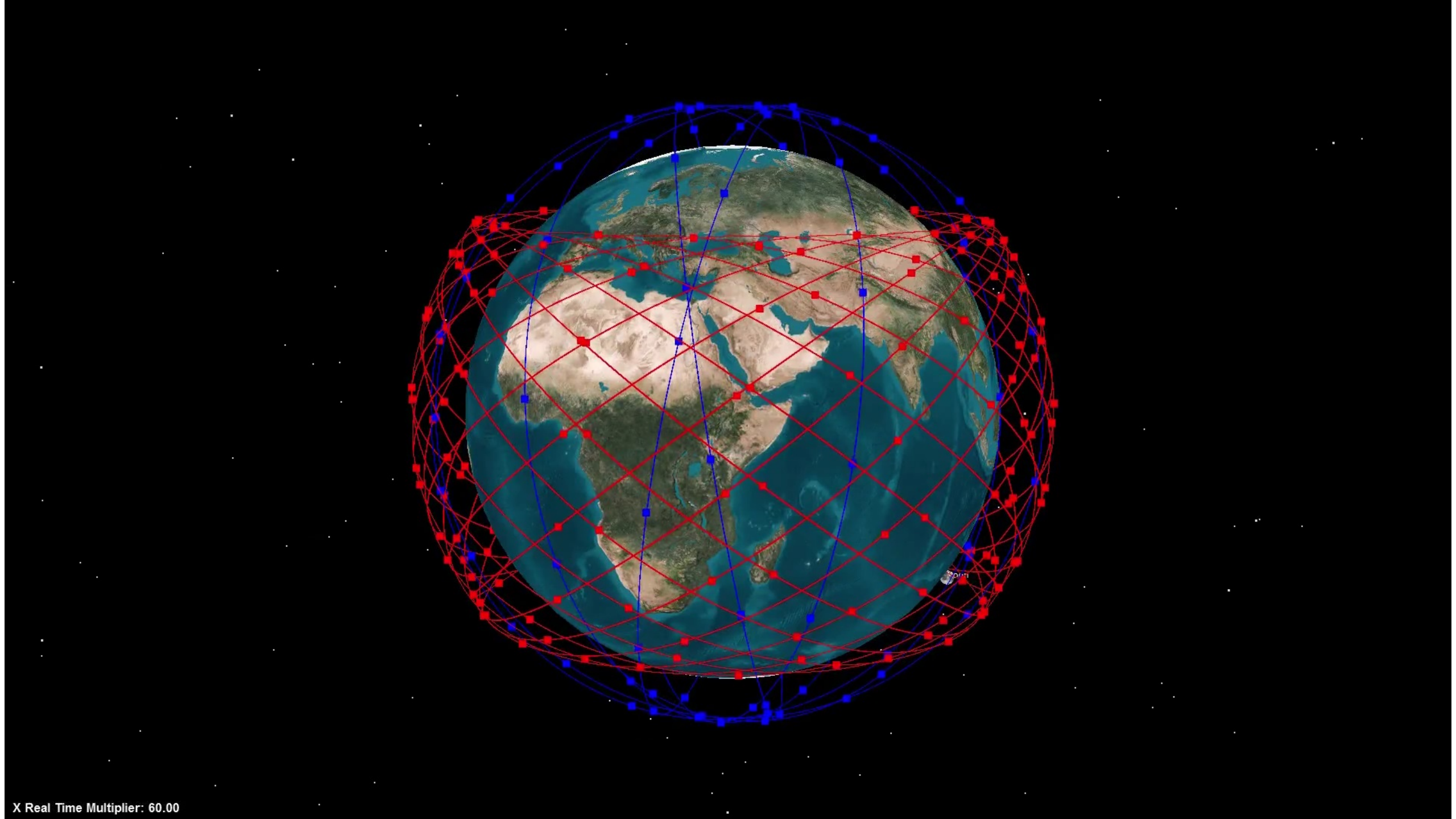
Global Connectivity

Telesat's patent-pending constellation design combining polar and inclined orbits will offer fiber-like broadband anywhere on the globe, even in the most remote locations such as oceans, deserts, hostile areas, and the north and south polar regions.


Remote network
User terminal
Telesat LEO Network
System Resources Manager
Telesat Satellite Node
Telesat PoP
Telesat Earth Station
Two Orbits Combining Polar and Inclined
~ 1,000 km from earth
~ 50 global ground nodes and Points of Presence (PoPs)
MEF Carrier Ethernet (CE) Transport
Internet and private networks

Telesat Constellation

- Latency ~40mS
- Service availability - ~2022
- Ground stations can be steerable antennas or phase arrays
- Inclinations: polar (99.5° - 72 satellites) and (37.4° - 45 satellites – 5 planes)
- Individual links capable of Gigabit-per-second data rates.
- Spectrum allocation would allow expansion to 162 satellites.
- First satellite launched January 12, 2018


X Real Time Multiplier: 60.00


LEO 1