

# LEO



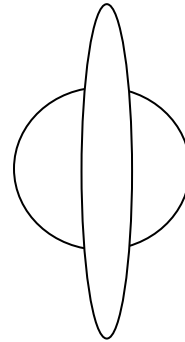
By

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# LEO satellites

- ✓ Group of Satellites forms a Satellite Network
- ✓ Orbit: Polar
- ✓ Foot print: 8000 km Diameter
- ✓ Altitude: 500 to 2000 km
- ✓ Period: 90 – 120 Minutes
- ✓ Speed: 20000 km/h – 25000 km/h



# Big LEO

- ✓ Little LEO: Below 1 GHz
- ✓ Big LEO: 1 – 3 GHz (Iridium)
- ✓ Whole earth can be covered with 66 satellites
- ✓ Objective - Voice communication and at most low bit rate data communication

# Big LEO

- ✓ 11 satellites in each orbit
- ✓ Each satellite has 40 spot beams
- ✓ 750 km
- ✓ Iridium is the 77th element in our periodic table
- ✓ Motorola in the year 1990
- ✓ Eight years project

# Broadband LEO

- ✓ Broadband LEO: Broadband Internet Access (Teledesic)
- ✓ Project by Craig McCaw and Bill Gates in the year 1990
- ✓ Objective of providing data transfer at a much higher rate
- ✓ Very similar to fiber optic like communication (in other words to provide broadband service)

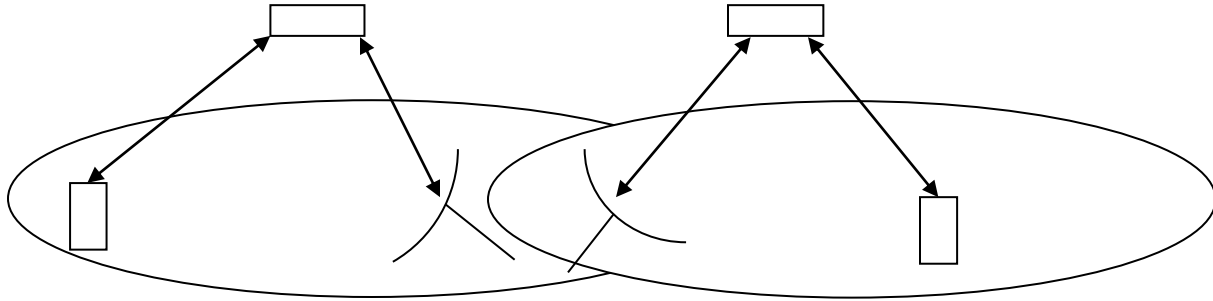
# Broadband LEO

- ✓ Designed with 288 satellites in 12 polar orbits
- ✓ 24 satellites in each orbit and you have got 12 such polar orbits
- ✓ At an altitude of 1350 km
- ✓ ISL – 8 Neighboring Satellites
- ✓ Data rates: 155Mbps Uplink and 1.2Gbps Downlink

# Links

- ✓ Inter Satellite Link (ISL): Two satellites can communicate to each other
- ✓ User Mobile Link (UML): Mobile phones can communicate with the satellite
- ✓ Gate Way Link(GWL): Satellites can communicate to down station

# Links





# References

- ✓ Books:
  - ✓ Data communication and Networking, 4<sup>th</sup> Edition, Behrouz A Forouzan
  - ✓ Computer Networks, 4<sup>th</sup> Edition, Andrew S. Tanenbaum
- ✓ Various relevant Websites

Thank You