Iridium GMDSS

Maritime Academy Training Pack
Module One: The Iridium Network

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Training Overview & Usage Guide

- Adoption of Iridium® GMDSS is rapidly increasing among Safety of Life at Sea (SOLAS) class vessels
- This training pack is designed to deliver a complete overview of Iridium GMDSS & Iridium Certus® services to maritime colleges and schools
- Instructors are encouraged to integrate the text and media of this training pack into their respective course material
- Integration of this training pack into a maritime course will ensure that the next generation of seafarers have knowledge of Iridium GMDSS services

Module One: The Iridium Network

- Iridium Introduction
- The Iridium Satellite Constellation
- Iridium Compared to Other Satellite Networks
- Low Earth Orbit (LEO) & GEO (Geostationary) Comparisons
- Unique Attributes of a LEO Network Combined with L-band Frequency
- Coverage

Introduction to Iridium

Iridium is a global satellite communications company that provides access to voice and data services anywhere on Earth. With its constellation of satellites, the Iridium network connects people and devices in the world's most remote places — and close to home.

2 Million+ Global Subscribers

450+ Technology Partners

MARITIME

AVIATION

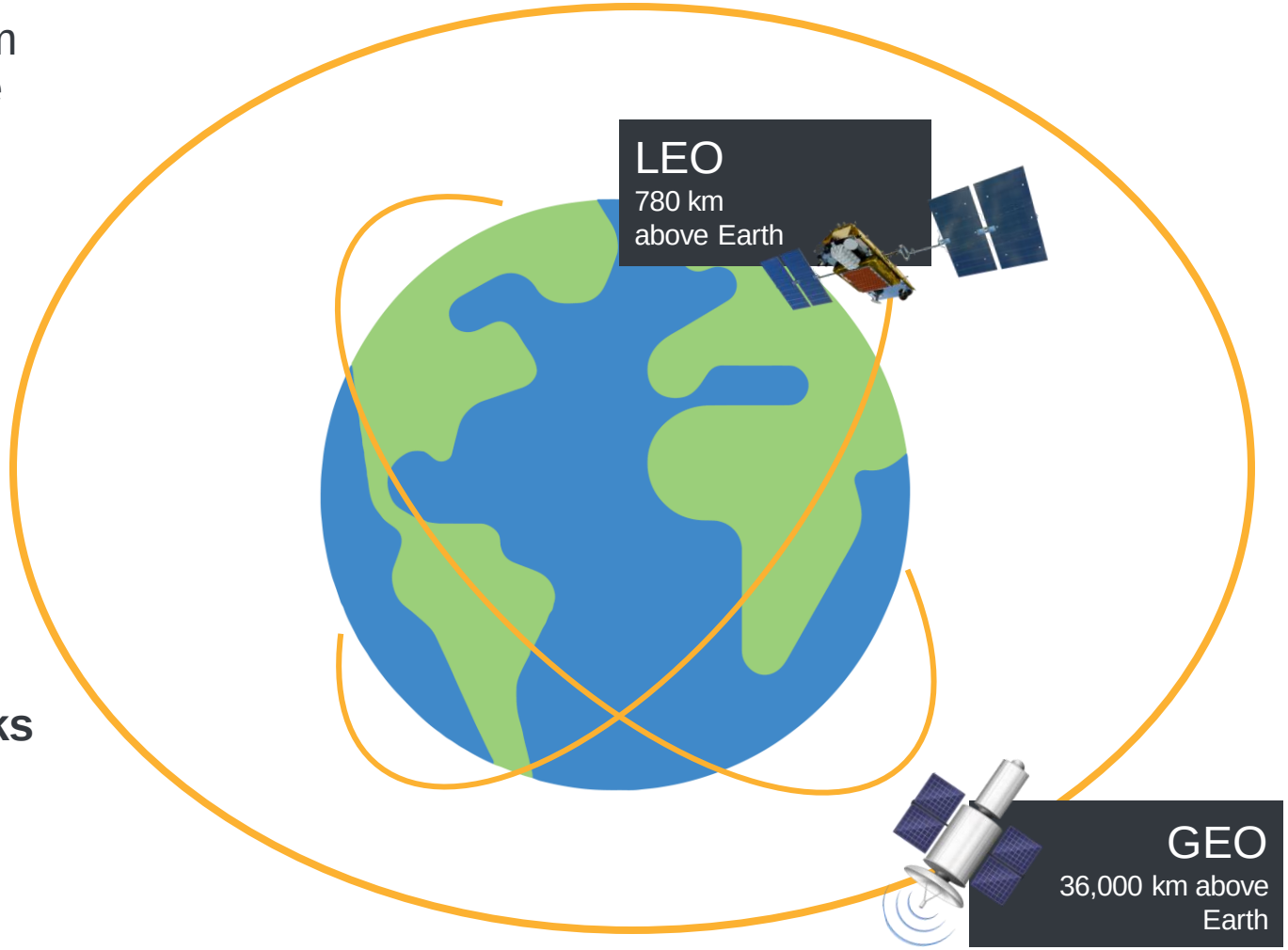
GOVERNMENT

IoT INTERNET OF THINGS

LAND / MOBILE

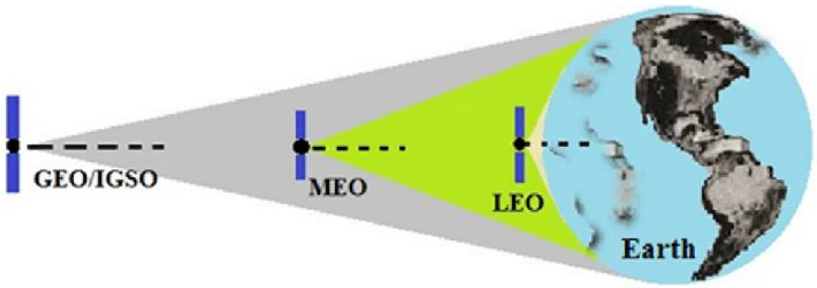
Iridium Compared to Other Satellite Networks

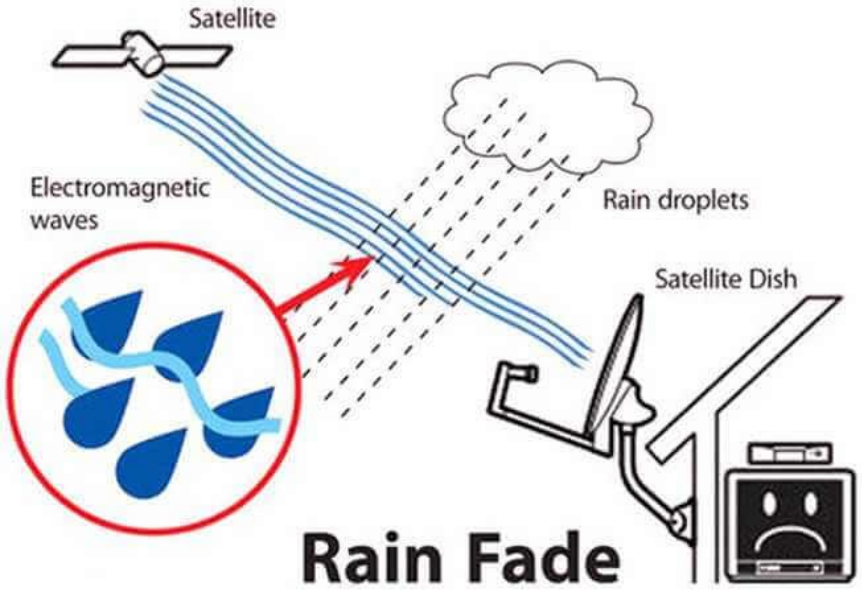
- **Iridium operates a LEO network**
  - 66 satellites orbit approximately 780 km above Earth; 14 in-orbit spares provide resiliency
  - The constellation constantly orbits the Earth, providing global coverage (including polar regions)
- **There are many GEO satellites**
  - GEO satellites orbit the equator at a distance of ~36,000 km
  - The position of the satellites remains fixed on the same point on Earth
  - Inmarsat has 15 GEO satellites
- **Starlink & OneWeb operate LEO networks**
  - Starlink has thousands of satellites in orbit 480 km above Earth
  - OneWeb has hundreds of satellites in orbit 1,200 km above Earth



LEO vs GEO

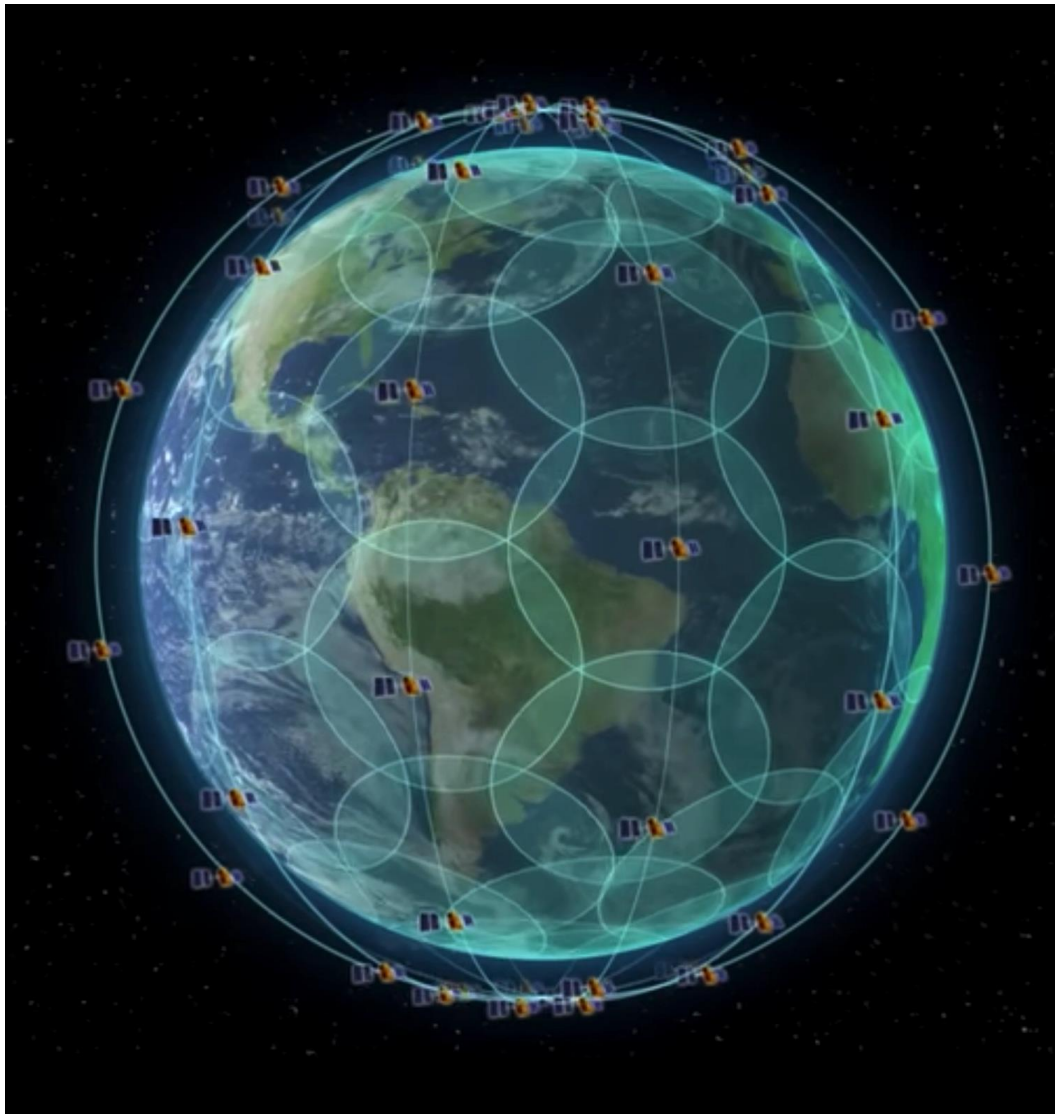
- **LEO Advantages**
  - Iridium's LEO constellation orbits Earth above the vessel; there is always at least one satellite in view of the terminal
- **GEO Blockages**
  - GEO constellations generally cover a large part of Earth's surface, but cannot cover polar areas
    - Because the satellite is always at a specific position relative to terminal, transmissions between a vessel and GEO satellites can be easily blocked by vessel's funnel, masts or cranes
- **L-band Advantages**
  - L-band (over which Iridium operates) provides dependable connectivity even in adverse weather conditions
- **Ku/Ka-band Weather Resilience**
  - Higher frequencies like Ka & Ku band are easily affected by wet weather (rain, snow, fog), potentially causing signal loss



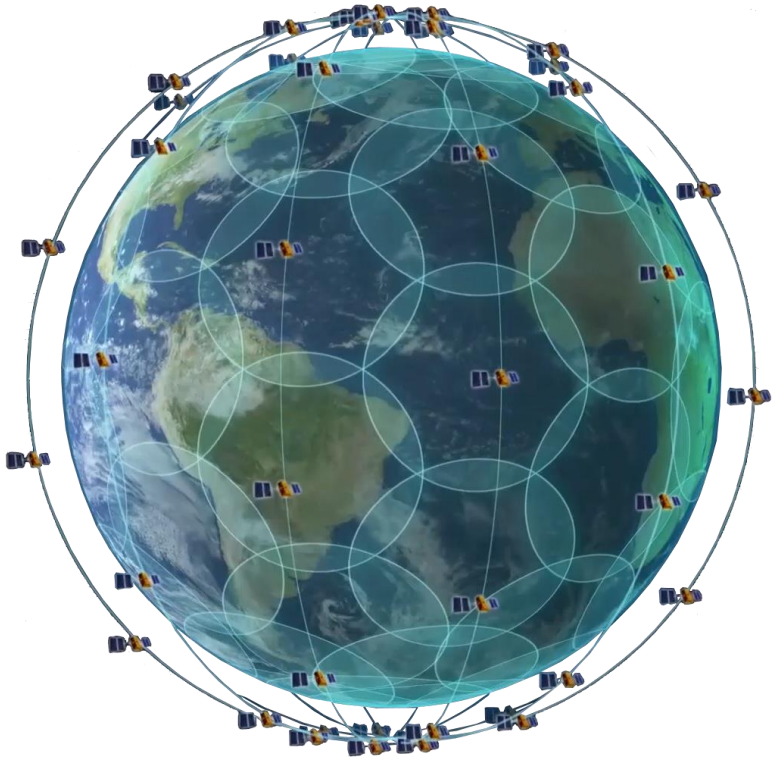


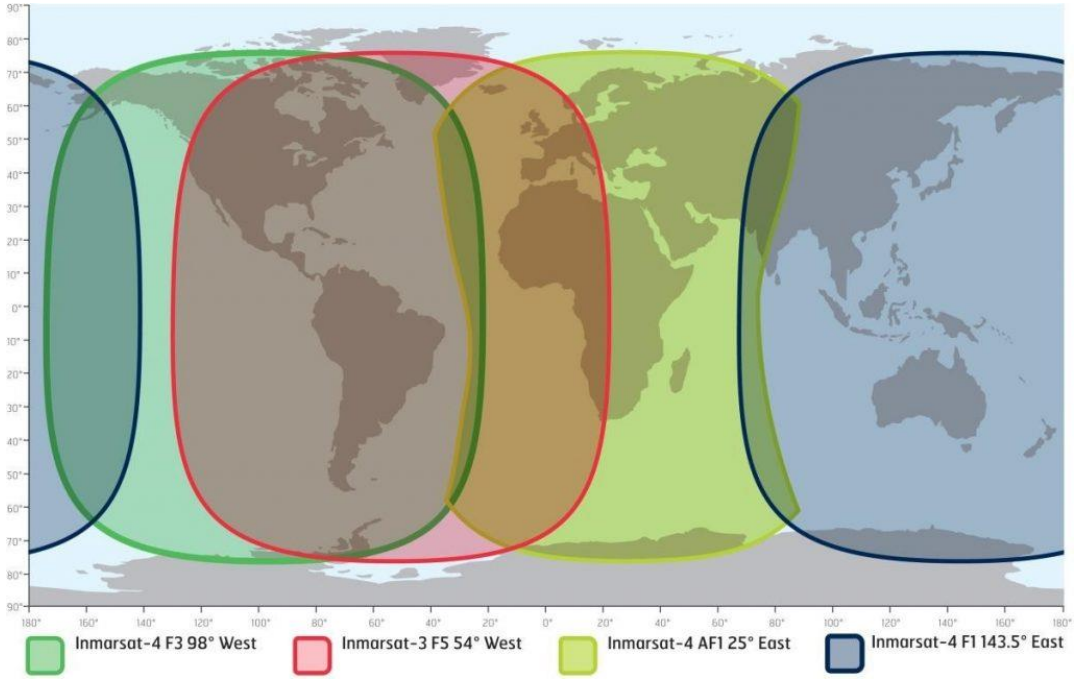
The Iridium Satellite Constellation

- Each of the 66 satellites orbits Earth, crossing at the poles, providing an always-present network globally
- Each satellite has “beams” that cover Earth’s surface below the satellite
- The constellation downlinks the network’s voice and data traffic to Iridium gateways around the world
- The constellation uses crosslinks to transfer voice and data traffic between the Iridium terminal and ground station, reducing the need for local terrestrial connections
  - Iridium’s crosslinks provide reliable connectivity for terminals anywhere on Earth
  - Crosslinks allow ground traffic through potentially one (or many) ground stations, meaning each satellite does not have to be in view of a ground station to connect to send voice and data traffic back to earth



Coverage Comparison





- Iridium's LEO network provides full global coverage, allowing for operation anywhere on Earth
- Multiple satellites can be in view at once, significantly reducing blockage risk

- Inmarsat's GEO satellites are in a fixed position, each illuminating a portion of Earth (Ocean Region)
- Generally, only one operational satellite is in view at a time in a fixed position, significantly increasing blockage risk

What is Iridium Certus?

A flexible, award-winning platform with solutions that scale to meet size, weight, and power requirements.

With speed capabilities ranging up to 704 Kbps, Iridium Certus offers the highest speed L-band connectivity and only truly global mobile satellite service on the market. Iridium Certus is a flexible, evolving platform that provides a combination of devices and service speeds to match customer needs.

High-quality services anywhere in the world:

- IP Data
- High Quality Voice
- Iridium Messaging Transport (IMT)
- Prepaid Voice
- Safety Services
- Secondary Data Flow

Thank You!

Iridium GMDSS Saves Lives

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