

## The Geopolitics of Satellite Net

**Prelims:** Current events of national and international importance.

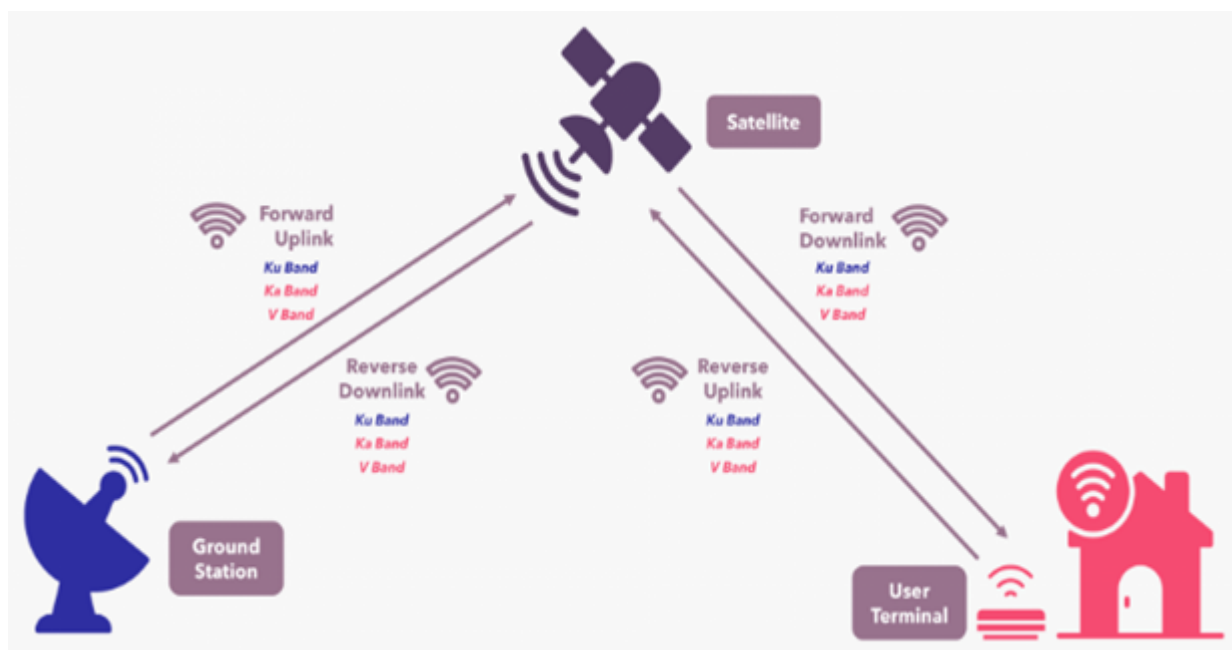
**Mains:** GS III - Science and Technology developments and their applications and effects in everyday life.

### Why in news?

Recently, SpaceX partnered with Airtel and Jio to expand Starlink services across India.

### What is satellite net?

- **Satellite broadband technology** – It is also known as satellite telephony, a satellite communication technology using satellite constellations in the Low Earth Orbit (LEO).
- It is a high-speed wireless communication to bring internet traffic to a consumer's home/office via a satellite network in space.
- **Data speeds** – It can go beyond 300 Mbps, but initial peak speeds likely 100 Mbps.
- **Working** – A satellite network involves geostationary or low-earth orbit (LEO) satellites.
- The heart of the network operation is an earth station gateway located in a particular region that links satellite network to the Net.
- Consumer needs a device, called a user access terminal (UT) and antenna to connect to a satellite network.



Satellite Constellation Project	Owning Agency
BlueBird satellites	AST SpaceMobile.

Starlink network	SpaceX
Project Kuiper	Amazon
OneWeb	ISRO & Uk's OneWeb Group

## What are the aspects of satellite internet with regard to economic and geopolitical conditions?

- **Digital Sovereignty** - It refers to a country's or organization's ability to control its own digital assets, data, and infrastructure, encompassing both
  - **Data sovereignty** - Governing data within its borders
  - **Technological sovereignty** - Controlling its digital environment.
- Here, the nations have both profitable telecommunications and strategic independence.
  - **Example:** *China's GuoWang constellation*, where China has high economic value and high geopolitical control.
- **Market Dominance** - It refers to a situation where a company holds a significant share of the market, potentially leading to a monopolistic structure whereby, the host nation depends on a single private entity for essential connectivity services.
  - **Example:** *Starlink*, which currently offers commercial potential but placing control largely outside the host nation's hands.
- It is a scenario of high economic value but low geopolitical control for the host nation.
- **Strategic Asset** - It refers to a satellite capability or infrastructure that is crucial for national security and strategic independence, even if it's not economically viable on its own.
  - **Example:** *India limited indigenous satellites*, like NAVIC System prioritizes strategic independence over immediate economic returns.
  - It is of low economic value and high geopolitical control.

**NavIC (Navigation with Indian Constellation)** is a regional navigation satellite system of India, designed with a constellation of 7 satellites providing Standard Position Service (SPS) for civilian users and Restricted Service (RS) for military purposes.

- **Marginal Presence** - It is the scenario of having limited economic value and strategic influence due to being in a developmental phase or lacking significant global impact.
  - **Example,** *Amazon's Kuiper project*

## What are the significances of Starlink-Airtel & Jio partnership?

Starlink

- It is a satellite internet network, the *world's 1<sup>st</sup> and largest satellite constellation*, a constellation of many satellites that orbit the Earth, at about 550 km, and cover the entire globe.
- **Launched in** - 2019, by SpaceX, an American company.
- **Coverage** - Over 70 countries
- **Objective** - To provide *high-speed internet coverage* to every part of the world and to provide global mobile phone service.
- **Working** - It involves beaming *internet data via radio signals* through the vacuum of space.
- Ground stations then broadcast those signals to orbiting satellites, which relay the data back to Earth-side users.

- It could act as a fundamental shift in the conceptions of connectivity, national sovereignty, and economic power in the digital age.
- **Economic benefits**

<b>For Airtel and Jio</b>	Starlink allows them to provide high-speed Internet to India's most remote regions without the infrastructure costs of terrestrial networks.
<b>For SpaceX</b>	It opens up a huge market in India.

- **Administrative advantage** - It also *takes care of India's complex regulatory landscape* by channelling Starlink's technology through domestic players.
- **Geopolitical significance** - This partnership indicates a geopolitical realignment in the Indo-Pacific region.
- It gives the *U.S. an advantage* in the competition for digital influence, particularly as China develops its rival GuoWang constellation.
- **Digital sovereignty** - The partnership model adopted by Airtel and Jio creates a buffer that preserves some measure of sovereignty.
- *Technology transfer provisions and local data storage* requirements could protect India's concerns and also enhance India's long-term capabilities.

### What are the challenges in this partnership?

- **Monopolistic concerns** - With around 7,000 satellites already in orbit, SpaceX enjoys first-mover advantages in the low earth orbit internet market.

*OneWeb, another constellation and closest competitor to starlink, operates fewer than 650 satellites, while Amazon's Project Kuiper remains very small.*

- **Economic problems** - There are problems of *competition, pricing, and dependency*.
- **Security concerns** - It runs the risk of having *private companies influencing nation-state* over critical infrastructure.
  - SpaceX briefly cut Ukraine's Starlink access during critical military operations in 2022.
- **Absence of the Bharat Sanchar Nigam Limited (BSNL)** - BSNL could have helped reduce some of India's strategic concerns as it is a state-owned enterprise with

extensive rural presence.

- Non-inclusion of it resulted in *losing of more direct government oversight* and broader reach.
- **Governance challenges** - It will include *orbital debris management, and space traffic control*.
- Their transnational nature will require international governance cooperation even amid strategic competition

### What lies ahead?

- **Developing indigenous solutions** - Continuing *investment in ISRO's satellite internet* projects to reduce long-term dependency.
- **Following Hybrid model** - It can try to balance technological pragmatism with strategic autonomy.
- **Inclusion of BSNL** - Partnering with BSNL can ensure digital sovereignty of India.
- **Encouraging competition** - Opening up for multiple satellite providers (like OneWeb, Amazon Kuiper) to prevent monopoly.
- **Enhancing accessibility** - Involving some *innovative sales techniques*, such as tiered pricing models and package deals, would be needed.

*Tiered pricing models offer customers different levels of service or features at varying price points, allowing them to choose options that best suit their needs and budgets.*

### Reference

[The Hindu| Partnership of Starlink with Airtel and Jio](#)

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