

Internet from satellites

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In news

Following the successful launch of 36 satellites on May 28, OneWeb's Low Earth Orbit (LEO) constellation reached 218 in-orbit satellites.

Key updates

- The company only has one more launch to complete before it obtains the capacity to enable its 'Five to 50' service of offering internet connectivity to all regions north of 50 degrees latitude.
- The Five to 50 service is expected to be switched on by June 2021 with global services powered by 648 satellites available in 2022.

What is the Internet from satellites?

Satellite internet is wireless internet beamed down from satellites orbiting the Earth. It's a lot different from land-based internet services like cable or DSL, which transmit data through wires.

How does it work?

- Satellite internet works by using radio waves to communicate with satellites orbiting the Earth.
- Data is sent and retrieved through a communication network that starts with your device and travels through your modem and satellite dish, out to a satellite in space, then back to Earth to ground stations known as network operations centers.
- And then, data travels back through this network out to space and then back to your satellite dish on Earth to deliver data on your device.

LEO(Low Earth Orbit) technology

- LEO satellites are positioned around 500km-2000km from earth, compared to stationary orbit satellites which are approximately 36,000km away.
- Latency, or the time needed for data to be sent and received, is contingent on proximity.
- As LEO satellites orbit closer to the earth, they are able to provide stronger signals and faster speeds than traditional fixed-satellite systems.
- Additionally, because signals travel faster through space than through fibre-optic cables, they also have the potential to rival if not exceed existing ground-based networks.

Problems with LEO satellites

- However, LEO satellites travel at a speed of 27,000 kph and complete a full circuit of the planet in 90-120 minutes.
- As a result, individual satellites can only make direct contact with a land transmitter for a short period of time thus requiring massive LEO satellite fleets and consequently, a significant capital investment.
- Due to these costs, of the three mediums of Internet – fibre, spectrum and satellite – the latter is the most expensive.
- In line with that assessment, LEO satellite broadband is only preferable in areas that cannot be reached by fibre and spectrum services.

About OneWeb

- It is a global communications company that aims to deliver broadband satellite Internet around the world through its fleet of LEO satellites.
- In 2010, the company declared bankruptcy but was able to resume operations following an inflow of investment from

a consortium consisting of the UK Government, Hughes Communication, Sunil Mittal's Bharti Global Limited, SoftBank and Eutelsat, a leading European satellite operator.

- OneWeb satellites are built at a OneWeb and Airbus joint venture facility in Florida that can produce up to two satellites a day.
- The launch roll-out of the satellites is facilitated by French company Arianespace using Russian made Soyuz rockets.
- The company has announced plans to enter the Indian market by 2022.

Other companies that are working to provide internet from Satellite

- **Starlink**, a venture led by Elon Musk's SpaceX. Starlink currently has 1,385 satellites in orbit and has already started beta testing in North America and initiating pre-orders in countries like India.
- **According to an Asian Development Bank report**, authored by John Garrity and Arndt Husar, Starlink is "by far the most advanced in its satellite deployments" with OneWeb coming in second and Canadian company Telesat, a distant third.
- **Amazon** is a newcomer to the space, with its Project Kuiper initiative announced in 2019.
- **Other companies** have also ventured into this market, including tech heavyweights **Google and Facebook**. The former launched its 'Loon' project in 2013, using high-altitude balloons to create an aerial wireless network.
- After testing the service in rural Kenya, Google's parent company, Alphabet, abandoned the project in 2021.
- Taking a different track, Facebook attempted to beam internet down to earth using drones.

Criticisms of LEO satellites

- During the days of the Sputnik and Apollo missions, **governments dominated and regulated space-based activities**. However, today, the balance of power has shifted from countries to companies.
- Euroconsult, a leading satellite consultancy firm, estimates that 1,250 satellites will be launched annually this decade, with 70% of them for commercial purposes.
- Even government entities like the US Department of Defence have turned to private providers, entering into a contract to buy satellites from SpaceX
- **Another worry is** that there are already almost 1 million objects larger than 1cm in diameter in orbit, a byproduct of decades of space activities.
- Those objects, colloquially referred to as **'space junk,'** have the potential to damage spacecrafts or collide with other satellites.

Indian satellite internet market

- The acquisition of OneWeb by Bharati Limited could arguably give it a distinct advantage in India and parts of Africa, in which another Bharati company, Airtel, already has a significant presence.
- **Currently, Starlink and OneWeb aim to launch in India by 2022**, with Amazon's Project Kuiper also in talks to receive regulatory approval to operate in the country.
- Over 70% of rural Indians do not have access to the Internet, a problem that is particularly worrisome given the increasing need for digital integration in the fields of education and banking in light of the pandemic.
- Additionally, according to the ADB report referenced earlier, "telecom operators are already challenging the expected market entry of LEO satellites," fearing that they could cut into their profits.
- Barriers to entry and elevated prices will make it

difficult for satellite broadband companies to operate in India in the short term but according to several estimates, they will eventually become a major player in the industry.