Internet Through High Altitude Balloons

Why in News

Recently, the US has planned to transmit the Internet to the people in Cuba via **high-altitude balloons** when their government has blocked access.

- There is an ongoing **protest in Cuba** against long standing restrictions on rights, scarcity of food and medicines, and the government's poor response to the **Covid-19** pandemic.

Key Points

- **High Altitude Balloons for Internet:**
    - They are commonly known as **Loon Balloons** as the first High Altitude Balloon for providing internet was used under **Project Loon.**
    - They are **made of the commonplace plastic polyethylene** and are the **size of a tennis court.**
    - They are **powered by solar panels** and controlled by **software on the ground.**
    - While up in the air, **they act as floating cell towers,** transmitting internet signals to ground stations and personal devices.
        - They float **60,000 to 75,000 feet, above the Earth,** well above commercial jetliner routes.
    - They last for **well over 100 days in the stratosphere** before being returned to earth.
    - Each balloon can serve thousands of people. But they **had to be replaced every five months or so because of the harsh conditions in the** stratosphere**.** And the balloons can be difficult to control.

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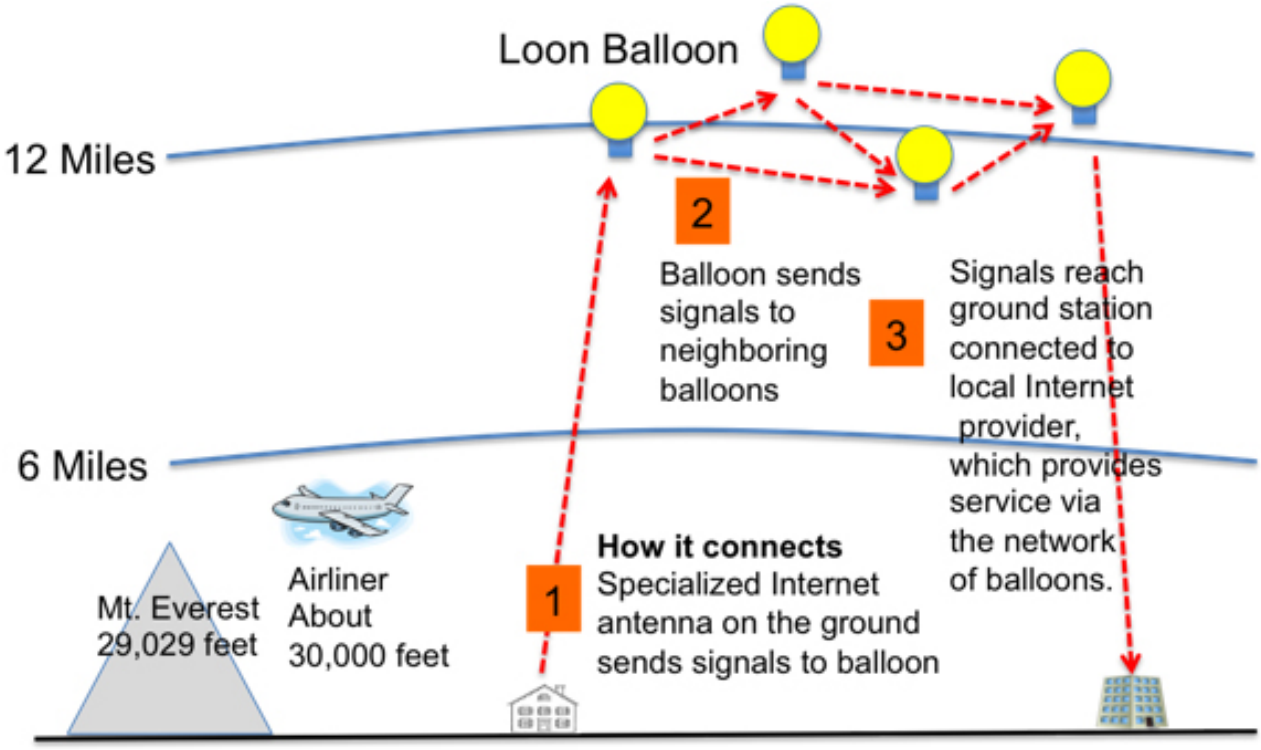

- **Requirements:**
  - **Network:**
    - Beyond the balloons themselves, it **needed network integration** with a telecom to provide service and some equipment on the ground in the region.
  - **Permission:**
    - It also needs **permission from local regulators.**
- **Significance:**
  - **Cheap:**
    - By allowing phone companies **to expand their coverage where needed,** the balloons **are intended to offer countries a cheaper option** than laying cables or building cell towers.
  - **Access to Remote Areas:**
    - They are able to **bring Internet access to remote and rural areas** poorly served by existing provisions, and **to improve communication during natural disasters to affected regions.**
- **Challenges:**
  - **Need Unused Band:**
    - It would need an **unused band of spectrum,** or **radio frequencies, to transmit a connection,** and spectrum use is **typically controlled by national governments.**
    - Anyone trying this would have to find **a free block of spectrum** that wouldn't be interfered with.
  - **Uneconomical:**
    - Balloon- or **drone**-powered networks **aren't likely to be economical over the long term.**

- **Operational Challenges:**
    - Developing **algorithms** to appropriately map balloon positions, determining a good strategy **to deal with unpleasant weather** and addressing the concern of **relying on the non-renewable resources** are among other challenges.

Project Loon

- It was **started in 2011** by Alphabet, the parent company of Google. It was a **network of stratospheric balloons** designed to bring Internet connectivity to rural and remote areas.
- It **shut down that project in January 2020** as it **wasn't commercially viable.**
- Prior to the shutdown, Loon balloons **had been providing service in mountainous** areas in **Kenya** through a partnership with a local telecom.
- The service **also helped provide wireless communications in Puerto Rico** in the aftermath of **Hurricane Maria.**

Source: IE