What is Radio Frequency (RF), Very Small Aperture Terminal (VSAT) based internet connectivity?

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In news

Under the e-Court project Department of Justice plans to connect complexes located all over India by a high-speed Wide Area Network (WAN) via different modes of connectivity such as Radio Frequency (RF), Very Small Aperture Terminal (VSAT)

What is a Very Small Aperture Terminal (VSAT) connectivity?

- VSAT is a two-way satellite ground station with a dish antenna that is smaller than 3.8 meters. The majority of VSAT antennas range from 75 cm to 1.2 m.
- VSATs **access satellites in geosynchronous orbit or geostationary orbit** to relay data from small remote Earth stations (terminals) to other terminals (in mesh topology) or master Earth station “hubs” (in star topology).
- VSATs **are used to transmit narrowband data (e.g., point-of-sale transactions using credit cards, polling or RFID data, or SCADA), or broadband data** (for the provision of satellite Internet access to remote locations, VoIP or video).
- VSATs are also used for **transportable, on-the-move** (utilising phased array antennas) or mobile maritime communications.
- It is also used as a backup communication link for mission critical systems such as remote autonomous mine sites and offshore Oil and Gas rigs.

- VSAT links are used for both internet data and voice (VoIP – Voice over IP) traffic.

Configurations of VSAT

Most VSAT networks are configured in one of these topologies:

- A star topology, using a central uplink site, such as a network operations center (NOC), to transport data back and forth to each VSAT via satellite
- A mesh topology, where each VSAT relays data via satellite to another terminal by acting as a hub, minimizing the need for a centralized uplink site

What is Radio Frequency (RF) connectivity?

- When it comes to wireless connectivity, a radio frequency (RF) signal refers to a wireless electromagnetic signal used as a form of communication
- Radio waves are a form of electromagnetic radiation with identified radio frequencies that range from 3kHz to 300 GHz.
- Frequency refers to the rate of oscillation (of the radio waves.) RF propagation occurs at the speed of light and does not need a medium like air in order to travel.
- RF waves occur naturally from sun flares, lightning, and from stars in space that radiate RF waves as they age

Its usage

RF communication is used in many industries including television broadcasting, radar systems, computer and mobile platform networks, remote control, remote metering/monitoring, and many more.