Jio Business

The changing contours of connectivity

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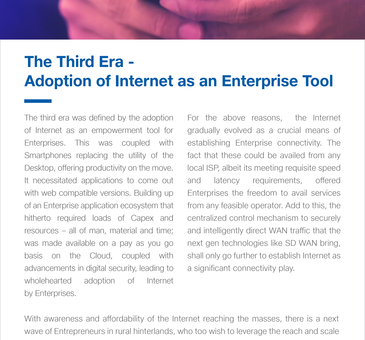
The recent years have involved a high mindshare for the application ecosystem. With its gradual transition from something to explore, to it becoming an integral part of our daily life – be it for communication, utilitarian, fitness, entertainment or infotainment. Subtle and somewhere enveloped behind are the arteries that serve these Apps, namely the telecommunication networks. True to the adage that we value something only in its absence, we spare a fleeting thought about their criticality only in the midst of an outage.

Hence, take this opportunity to reminisce on the evolution of this crucial element and peer into what lies ahead.

The evolution of connectivity networks in an Indian context can be broadly classified into three distinct eras.

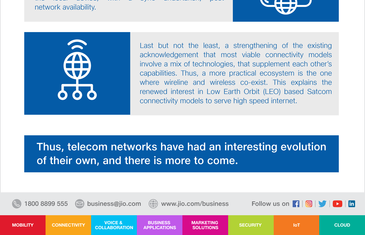
The First Era - Triggered by Liberalization

The first era was triggered by the liberalization of the Indian Economy and the resultant National Telecom Policy (NTP) of 1995, which lasted for a decade thereon. This was dominated by terrestrial leased line networks deployed by Government entities viz. BSNL and MTNL; charged exorbitant prices and what may now seem, an endless time of multiple months to deploy. Customers were left with little choice. An alternate option that emerged as a result of NTP was the breed of satellite operators, which while being expensive, offered quick deployment. Enterprise applications too, revolved around thin route data treading in Kbps speeds, rightly as a result of the limited options at hand. Enterprise Voice was frequently run on satellite, with the experience being that of an ISD or a walkie talkie operation, with a delay long enough to necessitate an over and out' post each sentence, so as to retain meaningful continuity in dialogues.



The Second Era - Driven by VPN-based Technologies

The second era commenced in mid 2000s with VPN based technologies making their presence felt. The mesh architecture, the resulting redundancies, lowering of costs per Kbps, the option to avail bandwidths in Mbps speeds and their availability across key geographies – ensured that it started to edge Satcom out. Terrestrial Leased lines too started either being relegated to local deployments as last mile to the VPN mesh, or being preferred for niche use cases involving cutting down on latency as in Cable and Broadcasting. The ubiquity USP of Satellite tech lost out to its limitation on speeds and high unit costs. It too got restricted to niches like low bandwidth mission critical use cases like ATM deployments or Multicast as in Digital Cinema or Distance Learning. Empowered by the reach offered by VPN, Enterprises started expansion into Tier 3 and 4 geographies to leverage cost arbitrage and tax-free opportunities. While service providers tried their best to serve customers in remote geographies, Return on Investments were frequently questionable and limited the ability to reach.



The Third Era - Adoption of Internet as an Enterprise Tool

The third era was defined by the adoption of Internet as an empowerment tool for Enterprises. This was coupled with Smartphones replacing the utility of the Desktop, offering productivity on the move. It necessitated applications to come out with web compatible versions. Building up of an Enterprise application ecosystem that hitherto required loads of Capex and resources – all of man, material and time; was made available on a pay as you go basis on the Cloud, coupled with advancements in digital security, leading to wholehearted adoption of Internet by Enterprises.

For the above reasons, the Internet gradually evolved as a crucial means of establishing Enterprise connectivity. The fact that these could be availed from any local ISP, albeit its meeting requisite speed and latency requirements, offered Enterprises the freedom to avail services from any feasible operator. Add to this, the centralized control mechanism to securely and intelligently direct WAN traffic that the next gen technologies like SD WAN bring, shall only go further to establish Internet as a significant connectivity play.

With awareness and affordability of the Internet reaching the masses, there is a next wave of Entrepreneurs in rural hinterlands, who too wish to leverage the reach and scale on offer. These bring their own set of challenges with them. The sparse population, dispersed geographies and lower ARPUs, raise questions over the financial economics of laying high speed networks.

The Future - Upcoming Trends

The above has led to emergence of the following trends

Maturity of the 'Mobile is the new Desktop' concept, with customers expecting more application prowess on the go. This is driving the evolution of wireless technologies, with 5G wireless and Wi-Fi 6, ensuring maximum speeds and enhanced performance in high density areas.

Percolation of 5G networks in select geographies have led to use cases centred around high bandwidths and ultra-low latencies. These include establishing of dense commutes, filter out real time errors in manufacturing facilities through high resolution image analysis, and facilitate online gaming enthusiasts with fast response times; to name a few.

A gradual shift from the single centrally hosted server mindset to a mesh of multiple servers hosted at network peripheries; to ensure that each client server exchange need not clog the entire network and gets addressed at the network edge.

Evolution of application models resilient to connectivity vagaries, through support for operation in hybrid viz. Offline + Online environs. Thus, in the scenario of a connectivity miss, the application runs and stores data on the local device; with a sync undertaken, post network availability.

Last but not the least, a strengthening of the existing acknowledgement that most viable connectivity models involve a mix of technologies, that supplement each other's capabilities. Thus, a more practical ecosystem is the one where wireline and wireless co-exist. This explains the renewed interest in Low Earth Orbit (LEO) based Satcom connectivity models to serve high speed internet.

Thus, telecom networks have had an interesting evolution of their own, and there is more to come.