

Drivers of the Home Broadband Experience



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In today's digital lifestyle, a reliable and high-performing broadband connection is essential for productivity, entertainment, communication, and connectivity. Let's explore the key drivers that shape the home broadband experience



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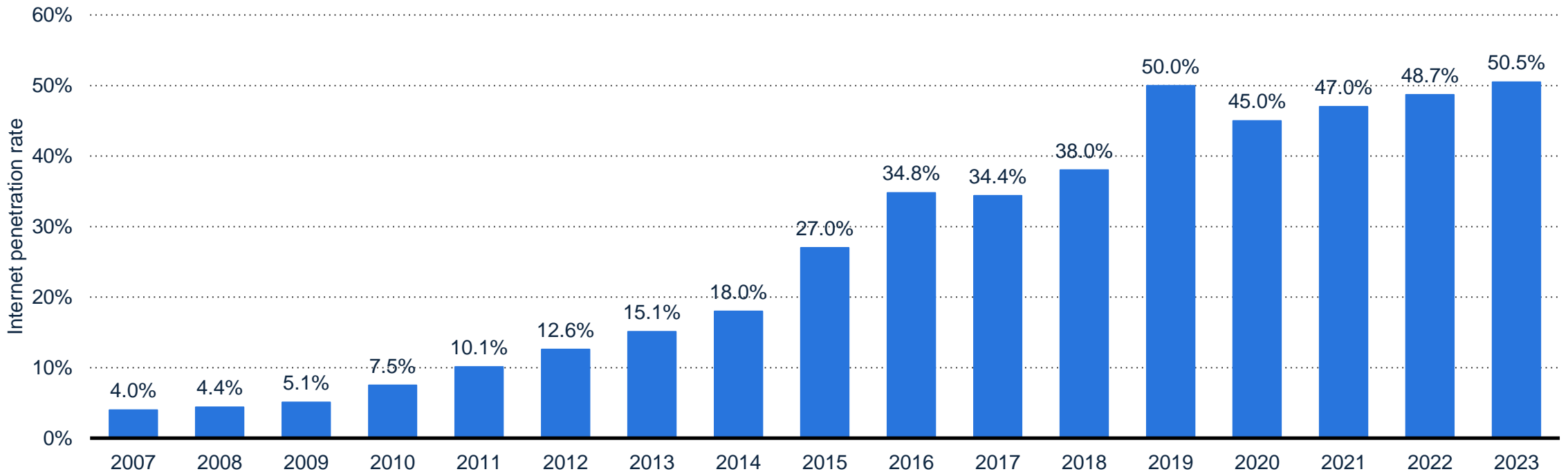
Continuous &
Proactive
monitoring to
deliver
expectations



Wireline Broadband Subs and Bandwidth Growth

India is becoming connected by each passing day. Internet penetration has increased steadily over 15 years

Internet penetration rate in India 2007-2022

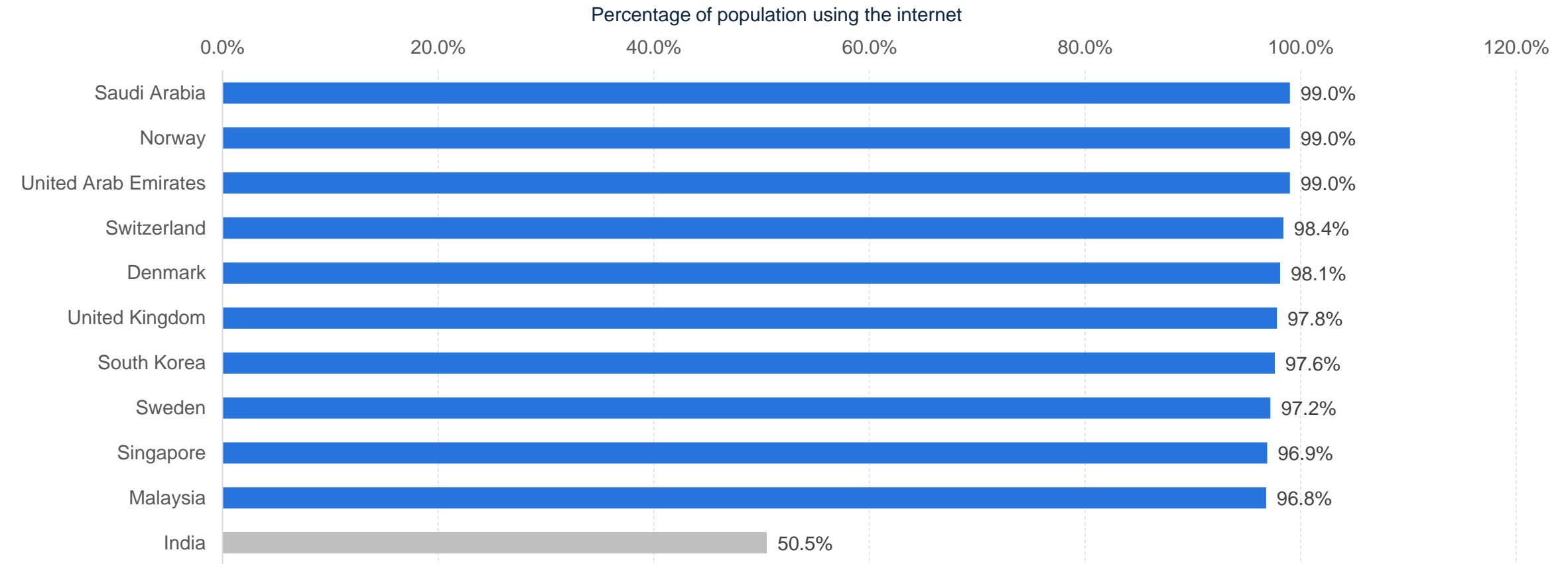


- 3G rollout started in 2009
- 4G Launch in 2016
- 2020 = Covid Lockdown

Description: The internet penetration rate in India went up to nearly 48.7 percent in 2022, from just about four percent in 2007. Although these figures seem relatively low, it meant that almost half of the population of 1.37 billion people had internet access that year. This also ranked the country second in the world in terms of active internet users. [Read more](#)
Note(s): India; 2007 to 2022; not sourced from social media platforms.
Source(s): DataReportal; Hootsuite; We Are Social

India stands at 50th rank with ~50% internet penetration. Huge opportunity ahead

Leading online markets based on internet penetration rate 2023

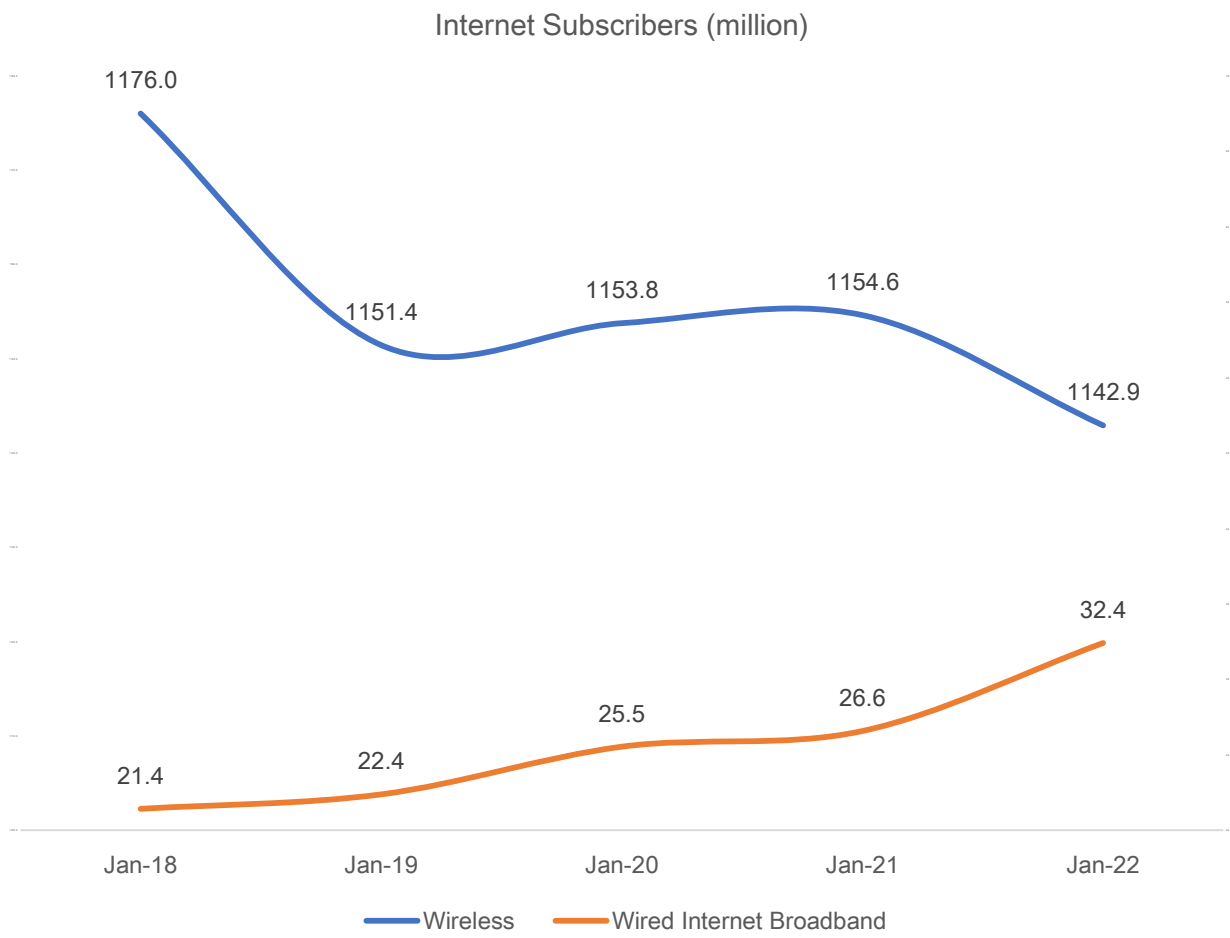


Description: As of April 2023, Norway, Saudi Arabia, and the United Arab Emirates lead the ranking of countries with the highest internet penetration rate, all recording 99 percent. The worldwide internet penetration rate as of April 2023 was 64.6 percent. [Read more](#)

Note(s): Worldwide; April 2023; based on internet penetration in countries/territories with population over 50,000

Source(s): DataReportal; Meltwater; We Are Social

Wireline internet connectivity is under penetrated. Momentum is moving towards wireline broadband



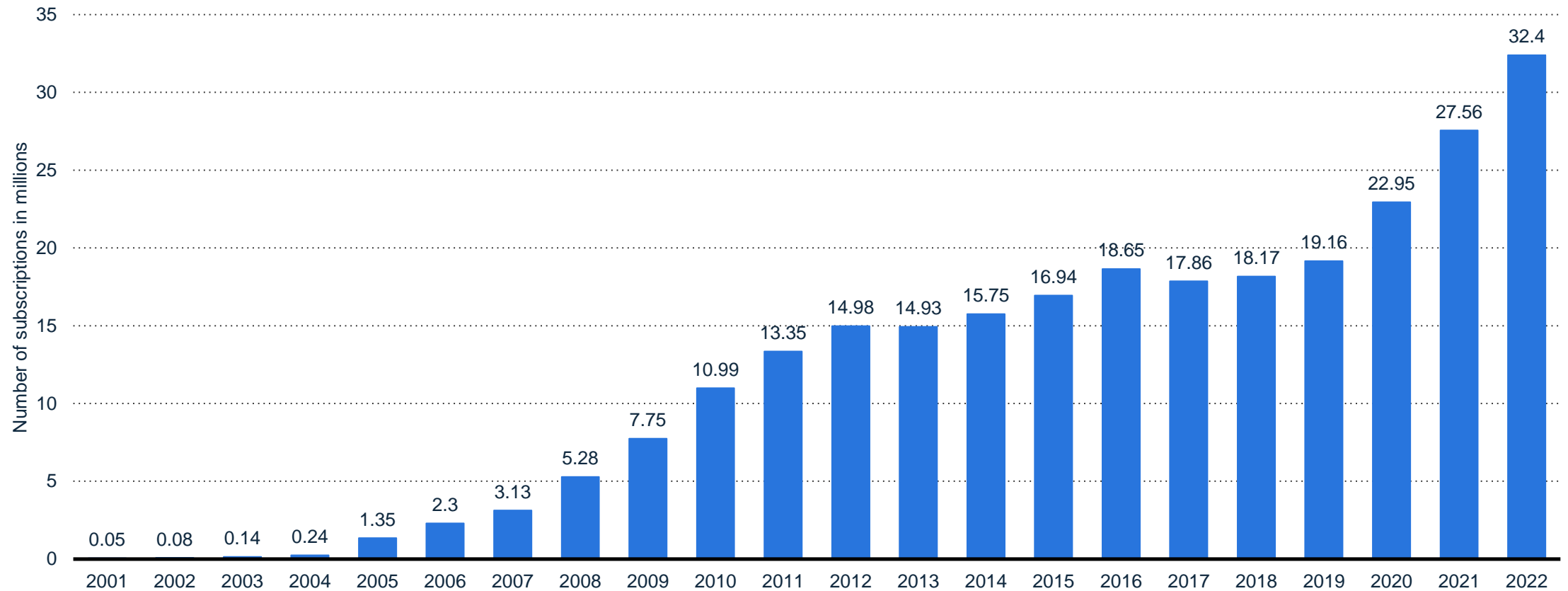
Subscriber (millions)	Dec-18	Dec-19	Dec-20	Dec-21	Dec-22
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Wireless	1176.0	1151.4	1153.8	1154.6	1142.9
% Change		-2%	0%	0%	-1%
Wireline	21.4	22.4	25.5	26.6	32.4
% Change		4%	14%	4%	22%

Source – TRAI

Covid has accelerated wired broadband need. WFH & Online schools has led to subscription of backup connection which is changing now

India: number of fixed broadband subscriptions 2001-2021



Note(s): India; 2001 to 2021

Source(s): ITU; [ID 232947](#)

Effectiveness of Internet Infra is measured by consistent speed throughput

Netflix measures & publishes the same (Netflix speed index shown below)

Countries/Regions

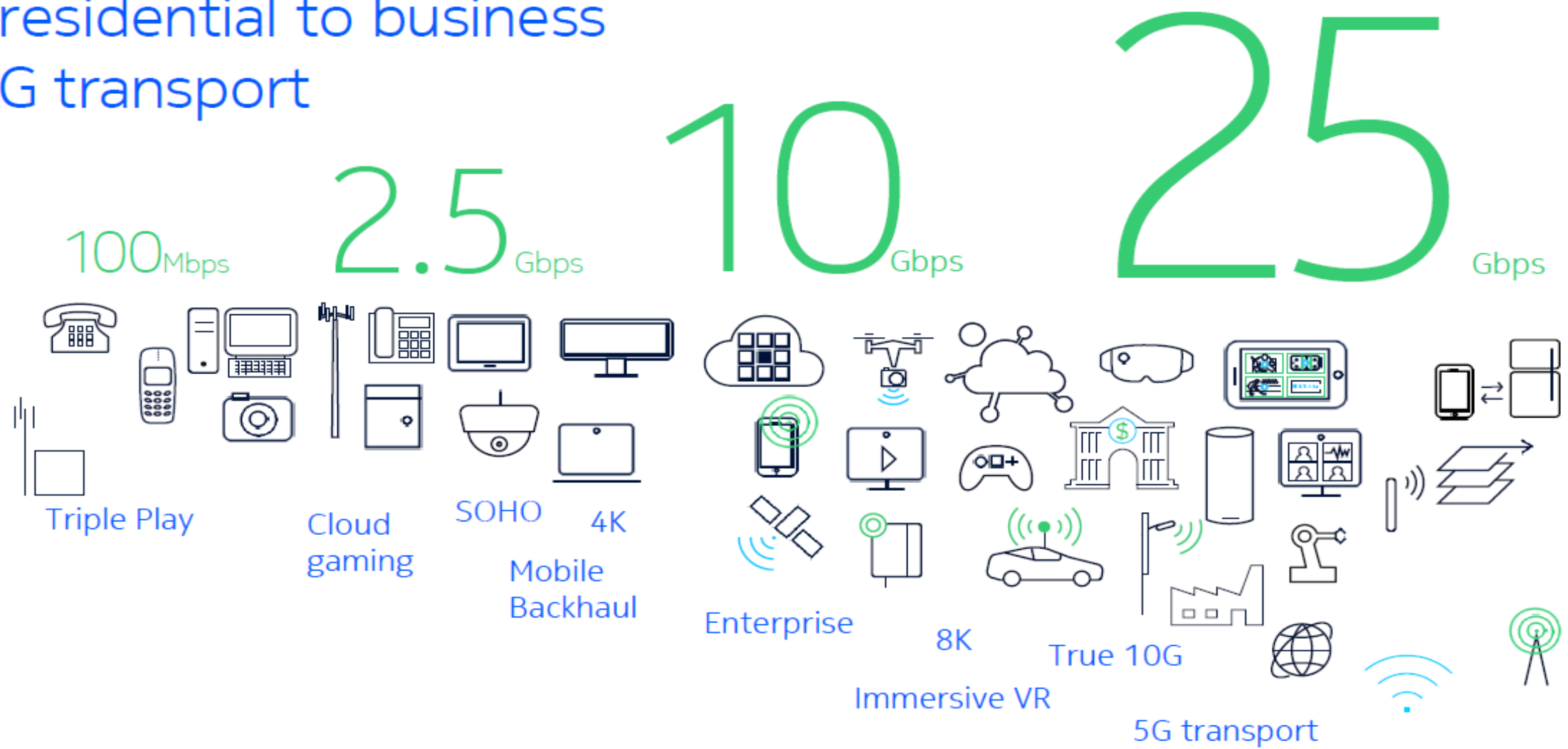
Last Updated: June 2023

Speed (Mbps)	Country/Region	Last 6 Months
 3.6	Canada, Hong Kong, Iceland, Malaysia, Netherlands, Norway, Portugal, Singapore, Spain, Switzerland, Thailand, United States	↓
 3.4	Argentina, Australia, Austria, Belgium, Brazil, Chile, Denmark, Ecuador, Finland, France, Germany, Hungary, India, Ireland, Israel, Italy, Japan, Luxembourg, New Zealand, Panama, Paraguay, Peru, Romania, South Korea, Sweden, Taiwan, United Kingdom, Uruguay, Vietnam	↓
 3.2	Colombia, Costa Rica, El Salvador, Greece, Guatemala, Indonesia, Jamaica, Kuwait, Mexico, Philippines, Poland, Trinidad & Tobago, Türkiye	↓
 3.0	Bolivia, Honduras, Saudi Arabia, South Africa	↓
 2.6	Dominican Republic, Pakistan	↓
 1.8	Venezuela	↓

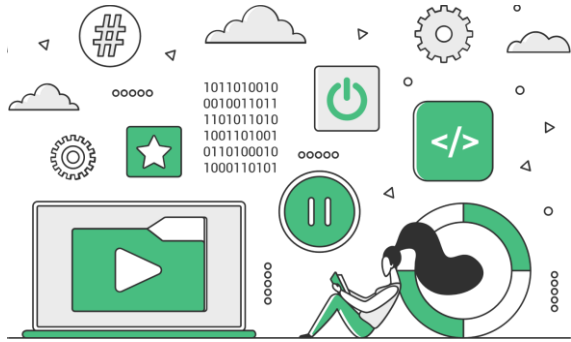
Leavers for Home Broadband usage

Need for stable internet will become stronger, in times ahead & hence wired broadband will act as foundation for change

Broadband speeds drive use cases from residential to business and 5G transport



Home broadband use has grown multiple folds owing to various requirements



Entertainment on the Go

- 4K/8K Video content
- OTT on Smart TVs / Mobile
- VR Content
- Buffer free streaming



Rise of Work From Home

- Zoom/Teams meetings
- Online Classes
- Manage Cloud services
- Tele Medicine



Online Gaming Ecosystem

- Gaming ONTs/Routers
- Low Latency



Transition to Digital Lifestyle

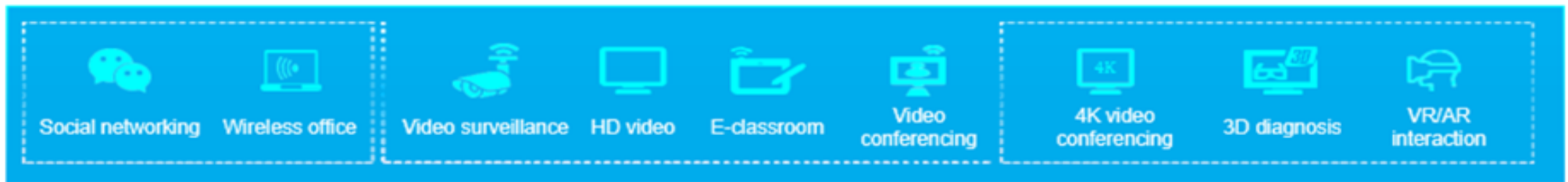
- Online Business
- Online Shopping
- Online Marketing
- Social Networking
- Smart Home/IoT devices

Technology & Device Evolution for Home Broadband

Technology standards have been evolving to cater to growing needs. Future consumption will demand higher throughput



The Wi-Fi standard evolves once every 4–5 years.



Per-user bandwidth > 50 Mbps
Latency < 10 ms

A Tri-Band solution with a good spectrum in the 6GHz band (6E & 7) can deliver a much-needed boost in Wi-Fi capacity and higher speeds while maintaining compatibility with older dual-band devices and alleviating congestion in all bands.

Seamless connectivity within home is best served with combination of superior technology & advance device ecosystem

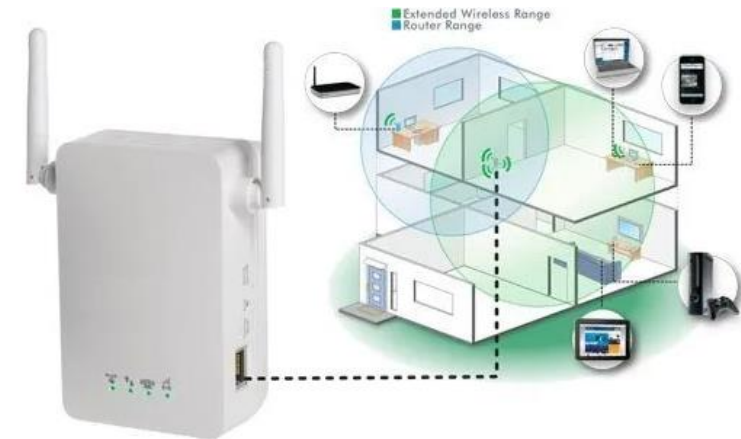
- One Network for Your Entire Home
- Stable Long-Range Connectivity
- Control Your Smart Home- IoT devices
- Fully Secured Network
- Seamless boosted Coverage
- More no. of Clients



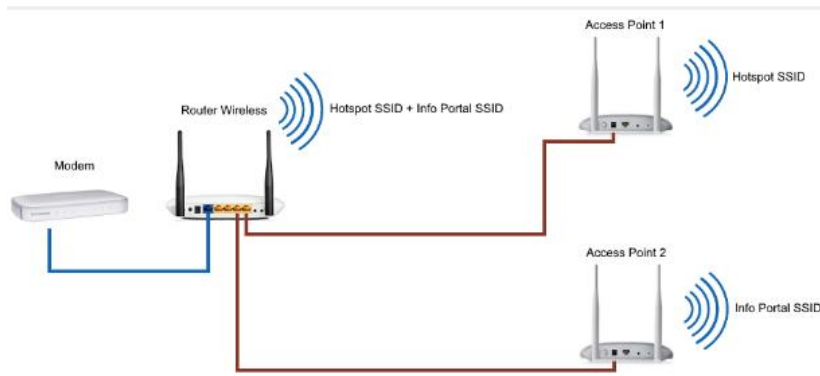
To enhance home coverage, device ecosystem has developed



Standalone CPE WiFi Solution



Extenders/Repeaters Solution



Access Points Solution



Mesh Solution

Use cases for growing bandwidth & factors
impacting it

Great customer experience is based on represented key factors

Key factors

01

100% Fiber Optic Networks

- Greater Bandwidth and Long Distance

02

Network Redundancy and Resilience

- 99.95 % Network Uptime
- Ring Architecture

03

Speed

- Symmetric download & upload speed up to 1 Gbps

04

Low Latency and Ping Time

- Real time access for IoT devices
- Online Gaming

05

Caching & Peering

- Fast Content delivery
- Traffic Management

Continuous & Proactive monitoring to deliver expectations

Governance plays a vital role in rendering continuous superior services

Device Update

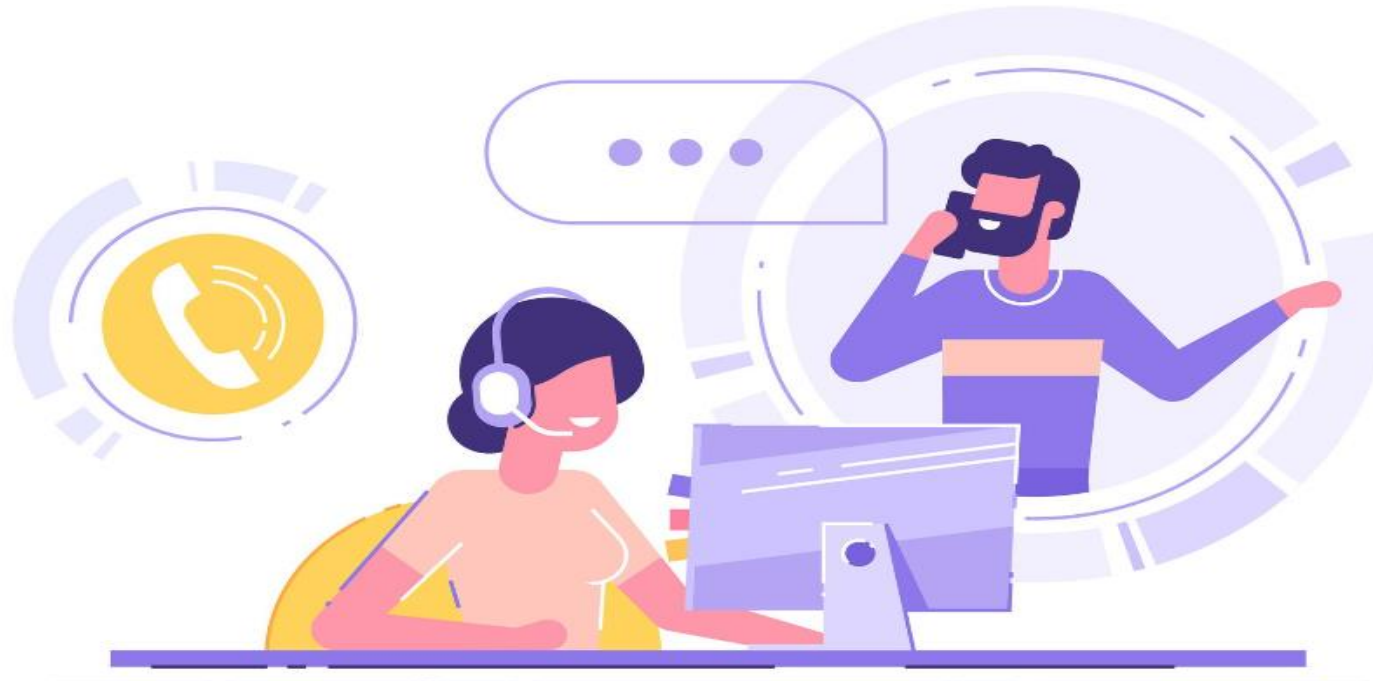
- Device Provisioning
- Device Firmware update
- Security Enablement
- Configuration Management

Device Monitoring

- Optical Power Level Monitoring
- WAN Interface Monitoring
- Performance Monitoring-
CPU/RAM/Data Usage

Remote Troubleshooting

- Remote Speed test
- Bulk Parameter Update
- WiFi Inference Check
- Connectivity Diagnostics



In nutshell,

1. Our Country is at cusp of great tech growth
2. Wireline growth will be boosted by need for stable internet
3. Demand of home broadband bandwidth has increased multifold & will increase multifold in future
4. Technology will augment to deliver the greater demand
5. Foundation to great customer services will be 5 key factors
6. Governance/Proactive monitoring will ensure consistent customer experience

Thank You