

Scalable Network Design for Schools

Introduction to Network Basics: Shared vs Dedication Capacity

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Introduction to Network Basics: Shared vs Dedicated Capacity

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Outline

- Definitions
- Comparisons
- Considerations
- Q & A

Definitions

Shared capacity means that the internet bandwidth is shared among multiple users or customers.

The speed and performance of the internet connection may vary depending on how many users are online at the same time and what they are doing.

Ideal for a few users (SOHO)

Definitions

Dedicated capacity means that the internet bandwidth is reserved for exclusive use by a single user or customer.

The speed and performance of the internet connection are guaranteed and consistent at all times.

Recommended for networks with more users

Shared Capacity: Pros & Cons



Pros


- It's cheap compared to dedicated capacity

Cons

- It's unpredictable
- It's affects your ability to scale
- Performance depends on utilisation of others
- Affected by consumption of others

Silver



- Up to 20 Mbps download
- Up to 20 Mbps upload
- Unlimited usage
- Installation fee: 

Dedicated Capacity



Pros

- Utilisation is easily monitored
- Not affected by consumption of others
- Performance is predictable
- Allows for better scaling and planning

Cons

- It's more expensive compared to shared capacity

Shared
Capacity



Dedicated
Capacity

Considerations: Bandwidth Requirements



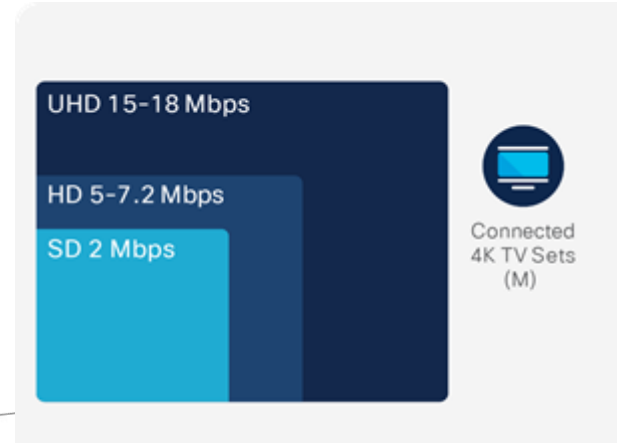
Teaching, learning and research needs	Optimal bandwidth per student
Access to Open Educational Resources	1 Mbps
Learning Management System, Moodle, Canvas	1 Mbps
Online Public Access Catalogue, digital library access	500 Kbps
Video streaming	5 Mbps
Remote Instruction	1 Mbps
Video Conferencing	1.5 Mbps
Large files download	100 Mbps
Open science – access to lab and instruments	100 Mbps

Source: Various

Considerations: Market Trends



- Growth in Internet users
- Shifts in mix of devices and connections
- Sensitisation and exposure,
- 240 p, 360p 480p 720 p 1080 p,2k ,4K



82% of Global Internet Traffic in 2022 Will Come From Video

Proving the popularity of video content, [Cisco reports](#) that 82% of global internet traffic will come from either video streaming or video downloads in 2022.

Indicators of low bandwidth



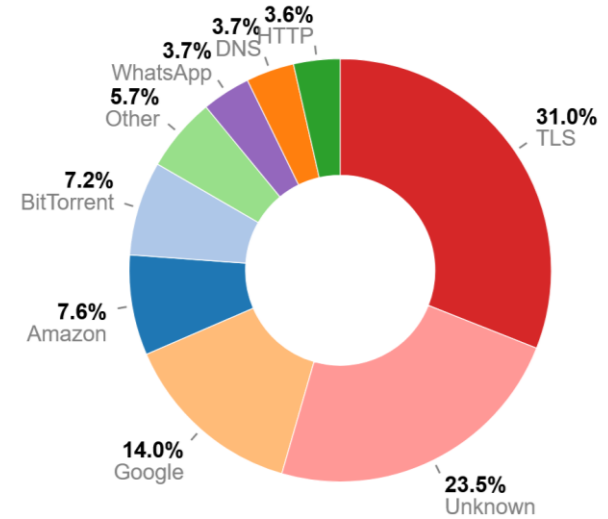
- Slow Internet speeds
- Packet loss
- Patchy VoIP calls and streams
- Webpages loading slowly or getting timed out entirely
- Trouble connecting remote servers.
- High retransmit rate



What consumes my bandwidth?



- Explosive network growth
- Software updates
- Server backups
- Number of users on the network
- Capacity hungry applications (Video, streaming)
- Peer-to-peer (P2P) software
Torrents, downloads

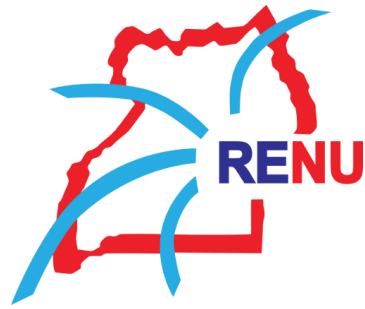


Considerations: What next?



- Plan to upgrade
- Sensitisations of the Users
- Capacity hungry applications
- Schedule utilisations for upgrades, backups
- Equipment considerations
- Know your network, Monitor your network.
- Acceptable use policies (AUP)
- Network Design considerations

Q & A



THE END

Thank you