



CSN08704

Telecommunications

Pre-Introduction

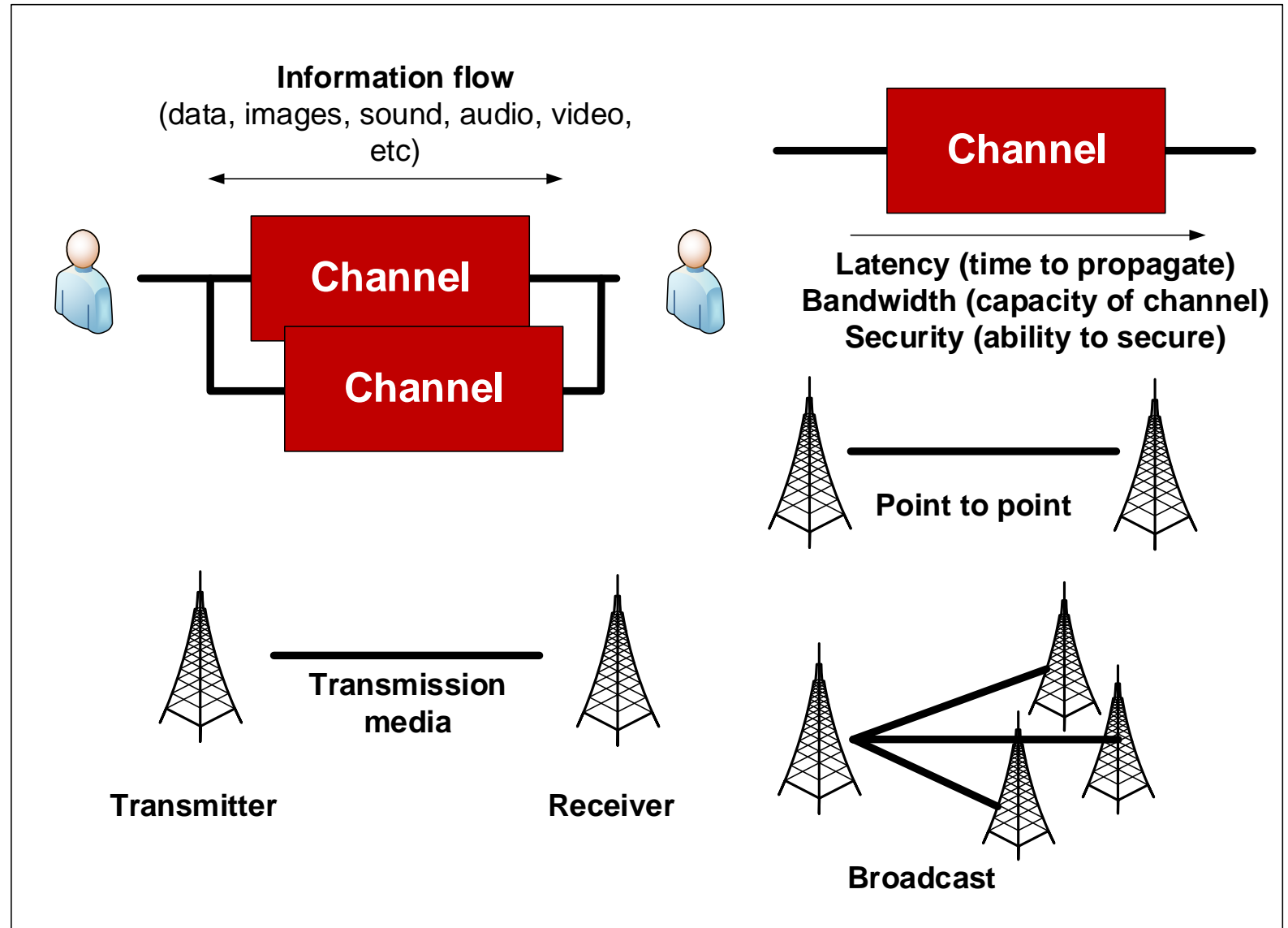
Data, Audio, Video and Images

<http://asecuritysite.com/comms>

Prof Bill Buchanan

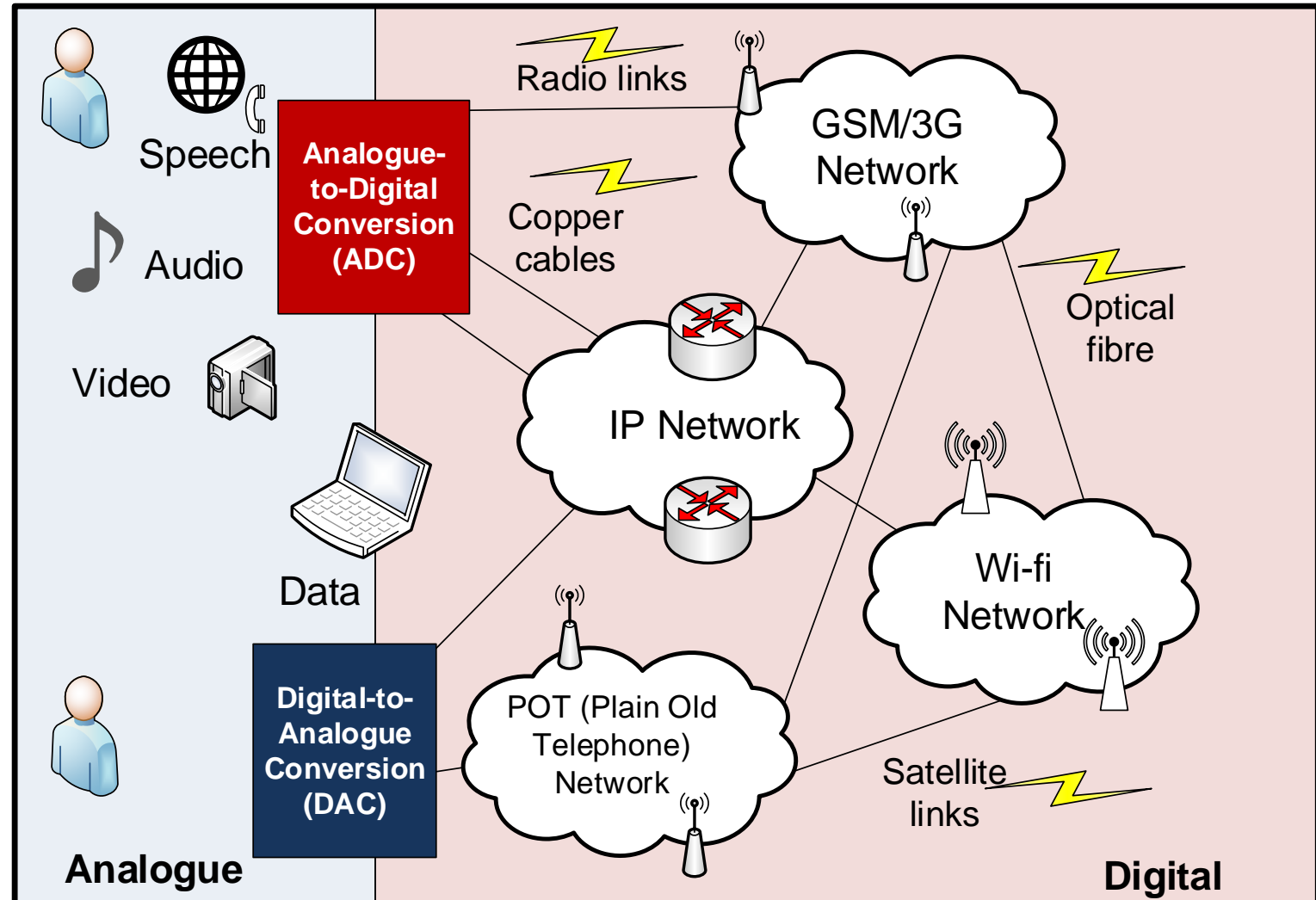
A Few Principles

- We have a **transmitter**, a **receiver** and **transmission media**.
- Information flows from two entities over a **channel**.
- We can have **broadcast** or **point-to-point**.



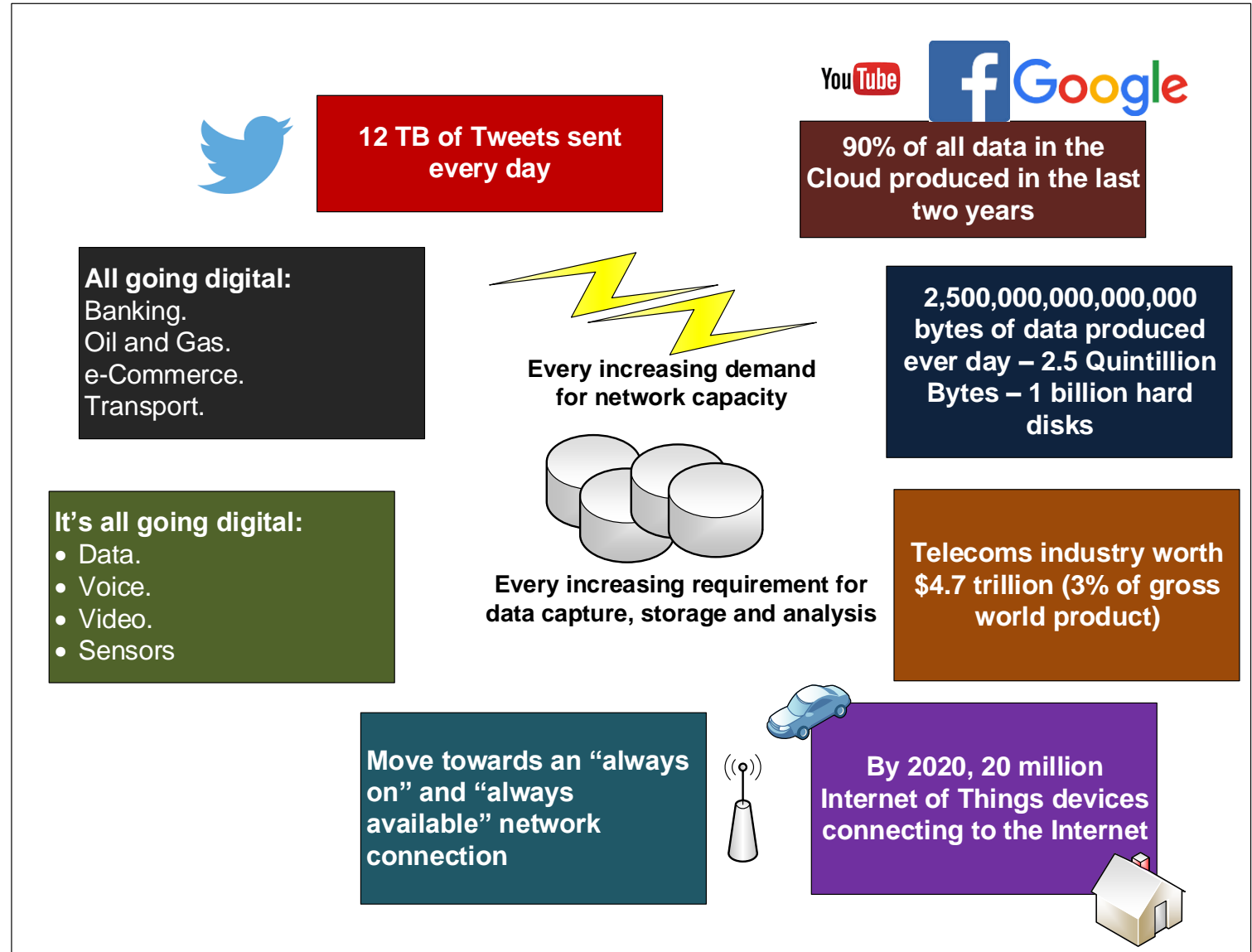
Intercommunications

- Differing inputs signals.
- Differing transmission media and transmission rates.
- Different addressing methods: eg IP address and Telephone Number.
- Different Quality of Service (QoS) requirements ... fast or reliable?



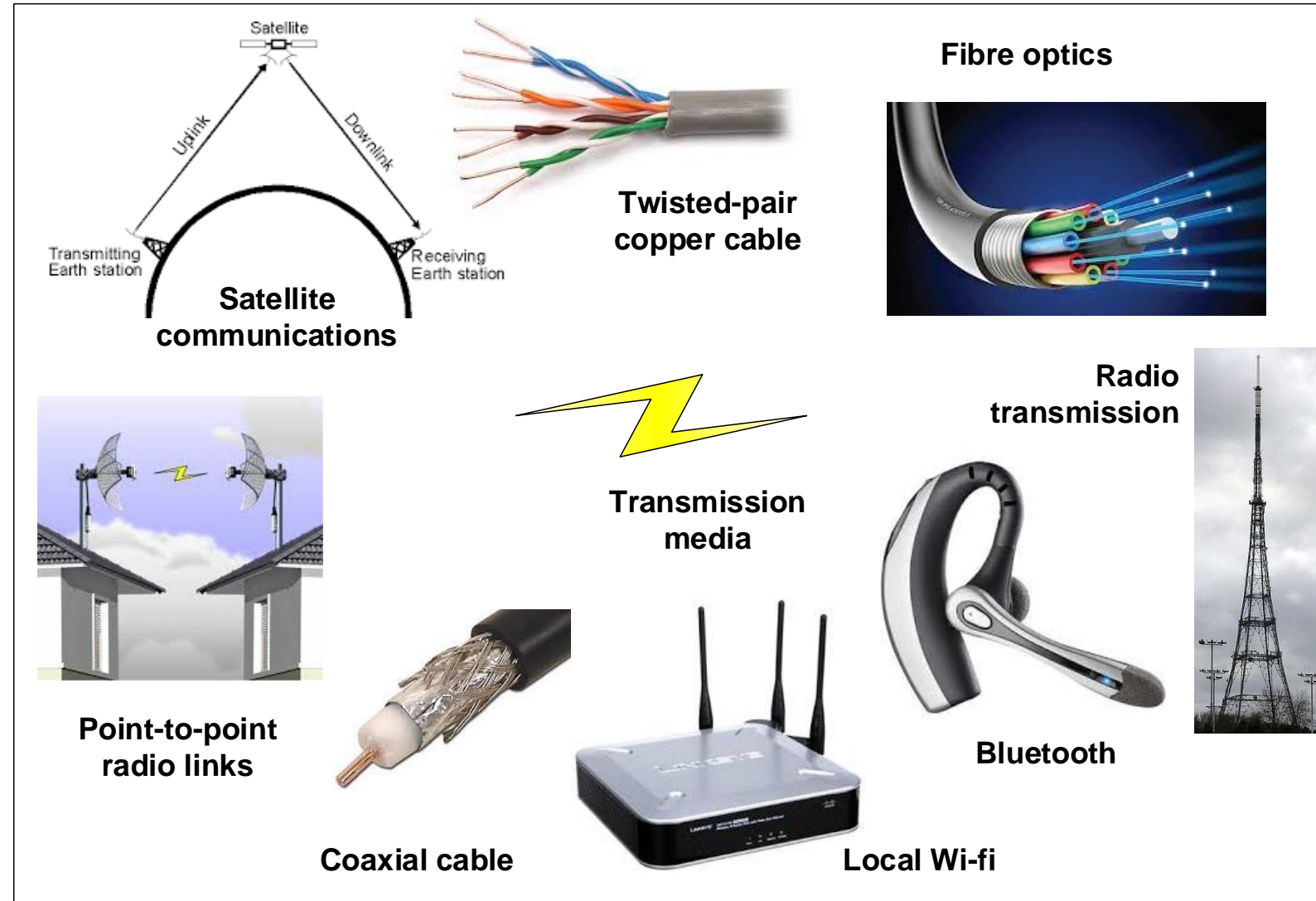
Every increasing demand ...

- Ever increasing requirement for network capacity.
- Every increasing reliance for “always-on” and “always available” network connection.
- Number of devices connecting increases by the day.



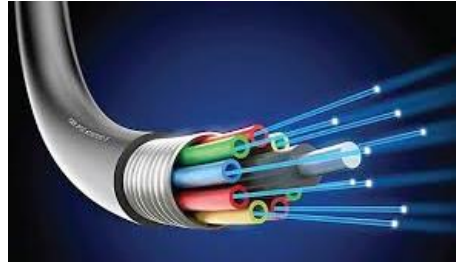
Communication Media

- Many different types of media ... radio ... electrical signals ... light pulses.



Differing transmission rate

- The speed of a connection typically measured in the amount of bits that can be sent per second (bps).
- Media differs in its capacity.



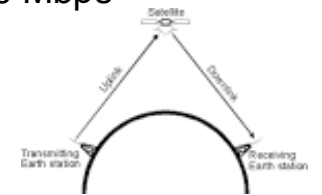
Fiber optics:
40 Gbps



Ethernet:
Fast Ethernet: 100Mbps
Gigabit Ethernet: 1Gbps
10GE: 10Gbps



Point-to-point:
200 Mbps



Satellite comms:
200 Mbps



RS-232:
9600 bps

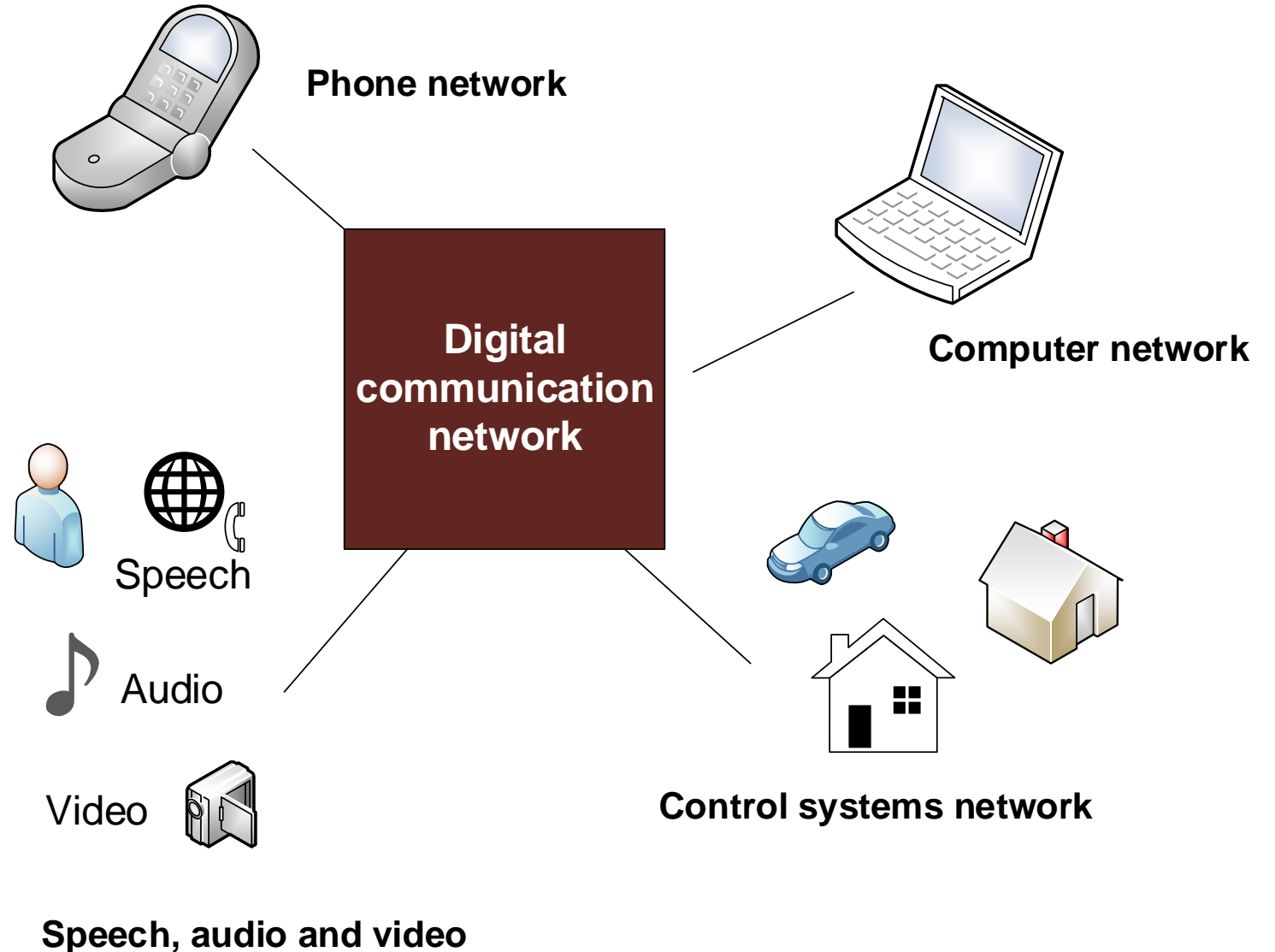


Wi-fi (IEEE 802.11)
54 Mbps



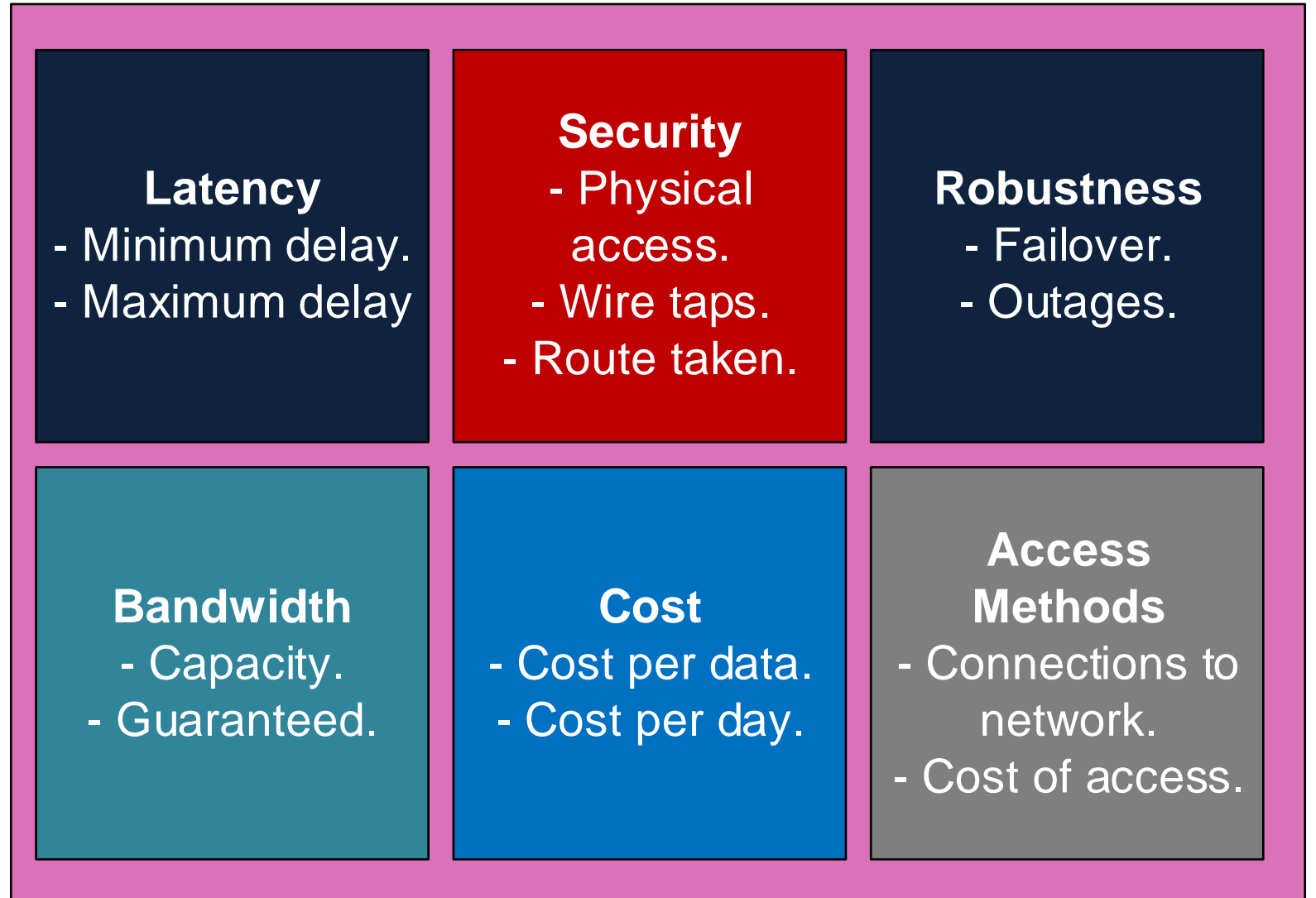
Network convergence

- Fusion of many different information sources into a digital communication network.



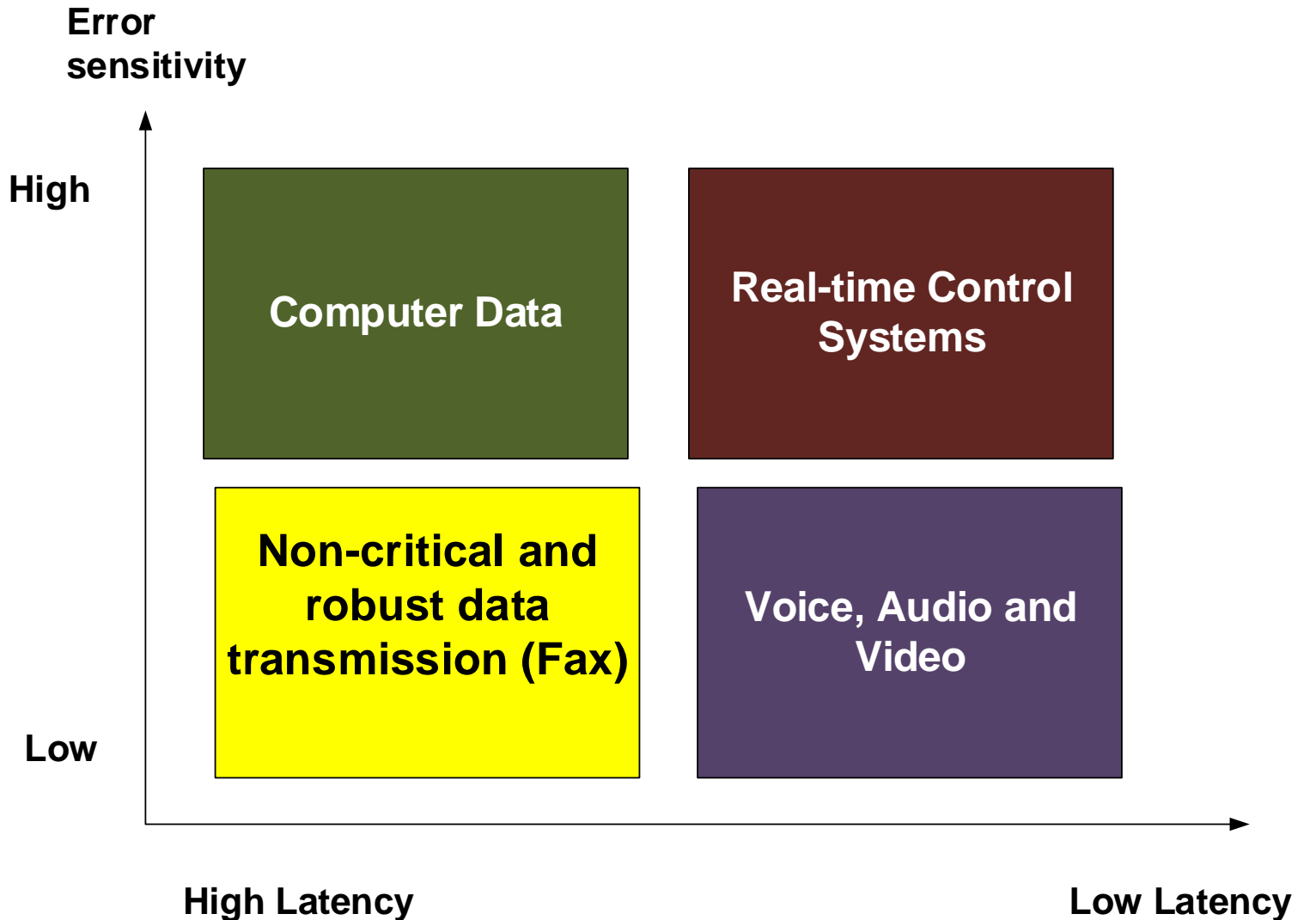
Network convergence ... differing requirements

- Communication channel has many different aspects. Inc support for legacy systems.



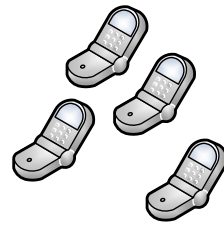
Network convergence ... differing requirements

- Different types of traffic have different needs (Quality of Service – Latency (the delay in the transmission channel) v Error sensitivity.

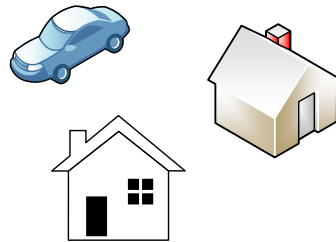


Ever Increasing Demand

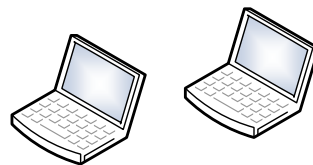
- Increasing hosts connecting.
- Increasing services ... games ... TV ... e-Commerce ... Cloud ...



7.2 billion mobile phones connecting to communications infrastructure



By 2020, 20 billion devices to connect to the Internet



Host IP addresses have been exhausted

Communication Service Providers



janet

Communication Device Providers



JUNIPER NETWORKS

Digital TV



On-line games



e-Commerce

amazon

Cloud providers



Service Providers



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