How the Internet is Changing
A Personal View

Colin Perkins
The Internet We Had

Numerous application layer protocols

TCP/IPv4

Insecure DNS
Insecure data transport
Lacking privacy
Useful but vulnerable to attack

Diverse network of networks

www.example.com

HTTP
IMAP
SMTP
SIP
MQTT
Jabber
RTSP
The Internet We (Nearly) Have

Numerous applications

HTTPS

www.example.com

Secure DNS

Secure data transport

Increasingly private – provided your threat model aligns with that of the hypergiants

QUIC/IPv6

Hypergiants and eyeball networks
Positives

• The protocols have evolved, but we still have a (mostly) common global infrastructure
• Performance has massively improved
• Security and privacy have improved

• The Internet infrastructure proved flexible and secure enough to support society during COVID lockdowns, home working, etc.
• We have a massively flexible global infrastructure that’s essential to operation of society – we need to keep that available
Challenges

• Managing centralisation
  • Hypergiants have too much power; barriers to entry are high

• Managing fragmentation
  • How to increase diversity of provision without splintering the network?
  • **There is strong value in common infrastructure**
    • This *does not* mean the same rules about content, moderation, etc., need apply everywhere; these largely relate to applications running on the Internet, not to the Internet infrastructure

• Balancing these issues while maintaining security and privacy
  • Hypergiants have too much visibility into data, but interoperability requirements introduce security challenges
  • No known way to safely protect against “bad” actors while permitting access for “good” actors
Out of Scope

• Blockchain and Web3
• Content moderation and taming social media
• AI, Chat GPT, etc.

• **Many significant challenges in this space** – but largely relating to applications that run on the Internet, rather than to the Internet infrastructure where IETF/IRTF work
  • (AI also has applications to managing the infrastructure)