



The bridge to possible

The Internet and CDNs

Some observations from a network perspective

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BRKSPM-2024



The Internet Reality – circa 2020 – Major US Carrier

>90% of
Volume: encrypted



>70% of
Volume: to Cloud

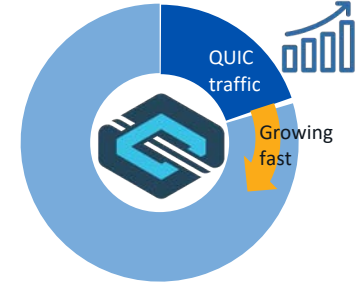


10 Cloud sites
"Elephant destinations"
not "Elephant flows"

~50% of Flows:
DNS



>20% of Traffic:
QUIC



Many small flows
Micro-sessions

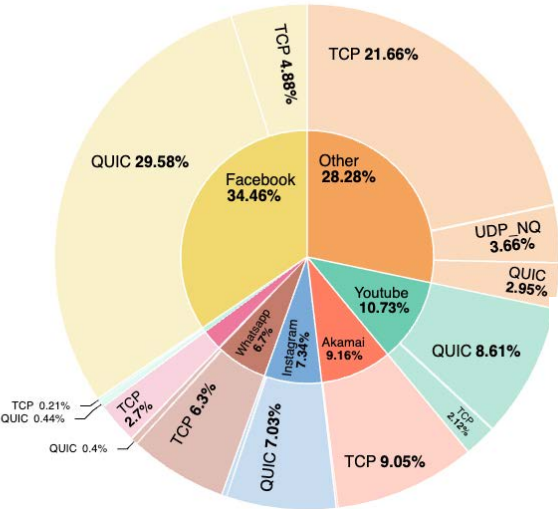
- Destination: all-encrypted world
- Cloud: concentrating the Internet

- Content: DNS is the load-balancer
- QUIC: Future Protocol of choice

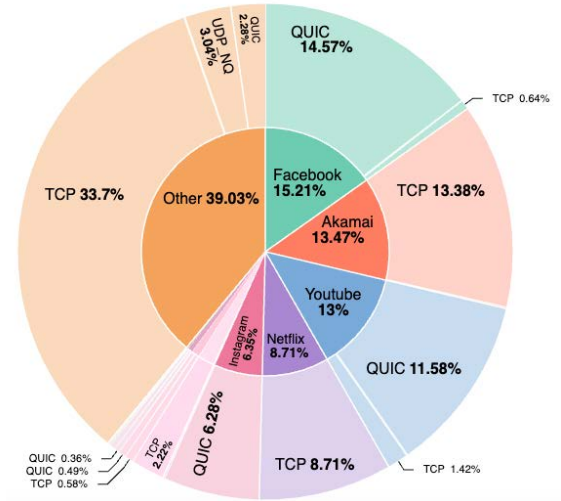
Early 2024 Data: QUIC still going strong



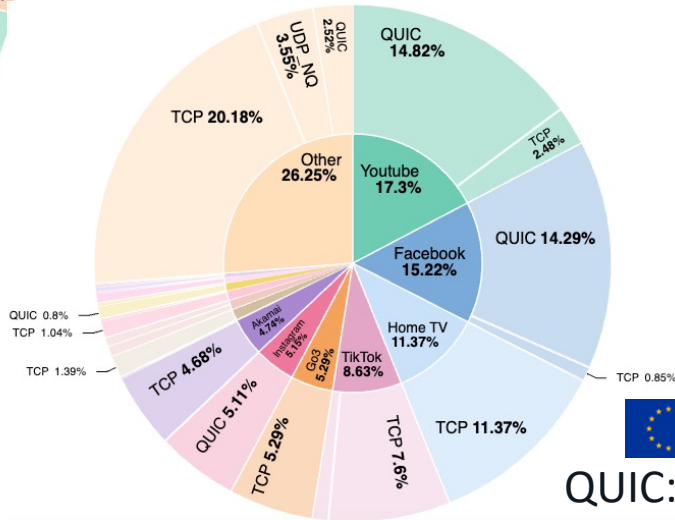
LATAM



QUIC: 47.31%



QUIC: 41.5%

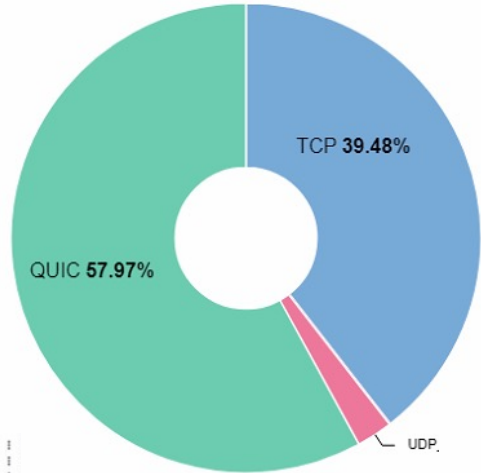


QUIC: 41.98%



2024 APJC New Measurements

QUIC Volume:
57.97%

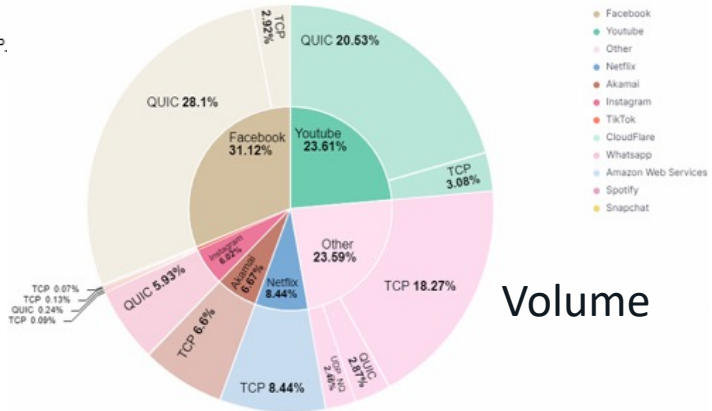
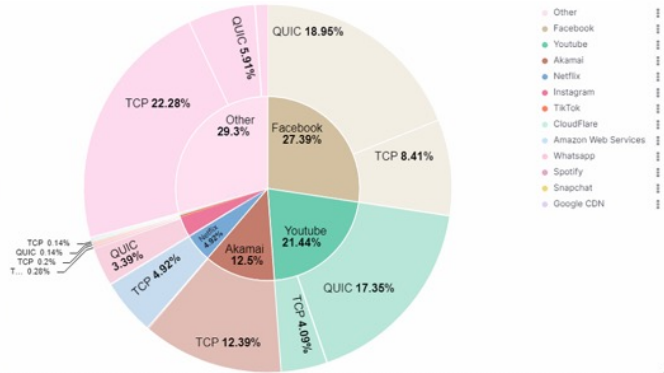


37% is Meta
“Meta Addiction”



Flows:

QUIC: 46.12%
TCP: 52.7%



Volume



#Flows

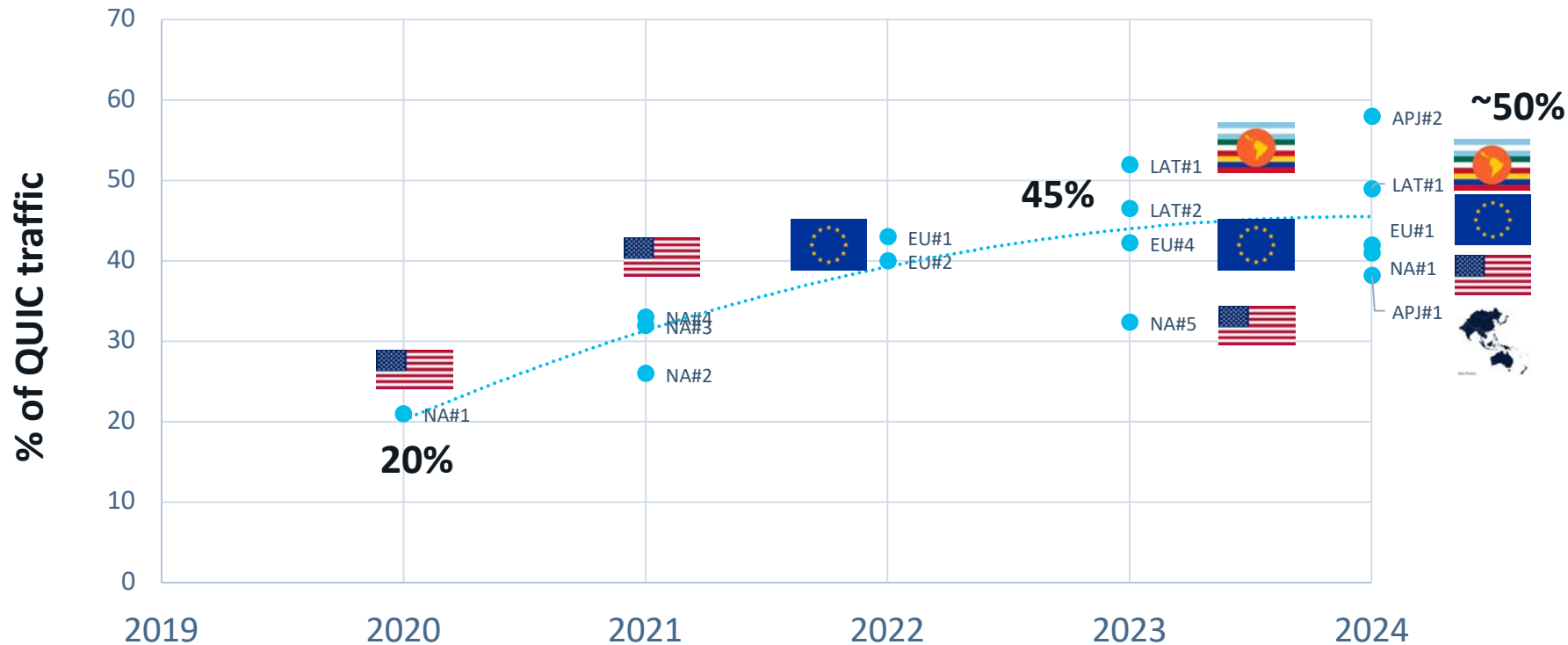
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QUIC is growing across the world

various snapshots – Approaching 50% WW

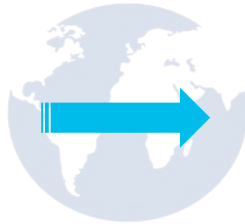
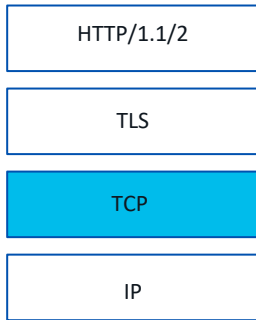
QUIC traffic evolution data 2020-2024



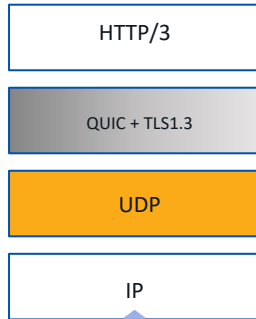
DPI is gone

HTTP/3 Stack = UDP+QUIC+TLS+H3+DoH+eSNI/ECH

Old App Stack



New App Stack



- **Improved Security**
- **Multi-session**
- **Improved QoE**
- **APP friendly design**



DoH

DoT – RFC7858
DoH – RFC8484

Application Controlled DNS
DNS Traffic not observable

Google & CloudFlare serve 50% of global DNS requests
Both support DoH
All major OSs & Browsers support DoH
(Firefox Defaults for US to CloudFlare)



eSNI / ECH

RFC8744

Target Domain is opaque / unobservable



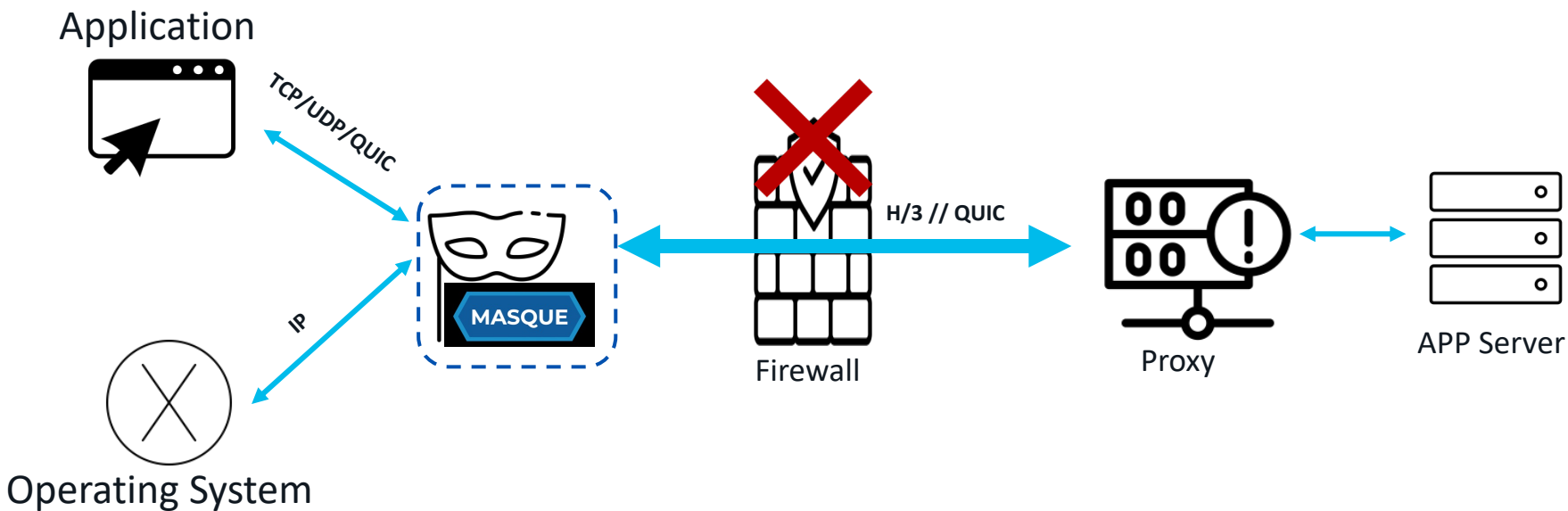
Large Scale Adoption

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Tunneling is the new normal for APPs

also: welcome to a new threat vector (exfiltration tool?)

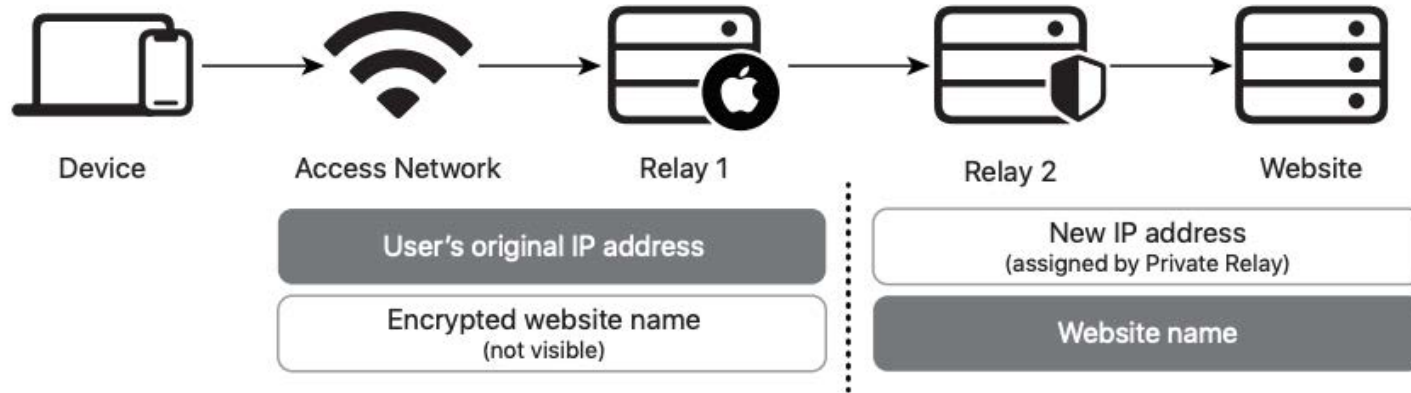


Multiplexed Application Substrate over QUIC Encryption

Goal is to develop mechanism(s) that allow configuring and concurrently running multiple proxied stream- and datagram-based flows inside an HTTP connection.

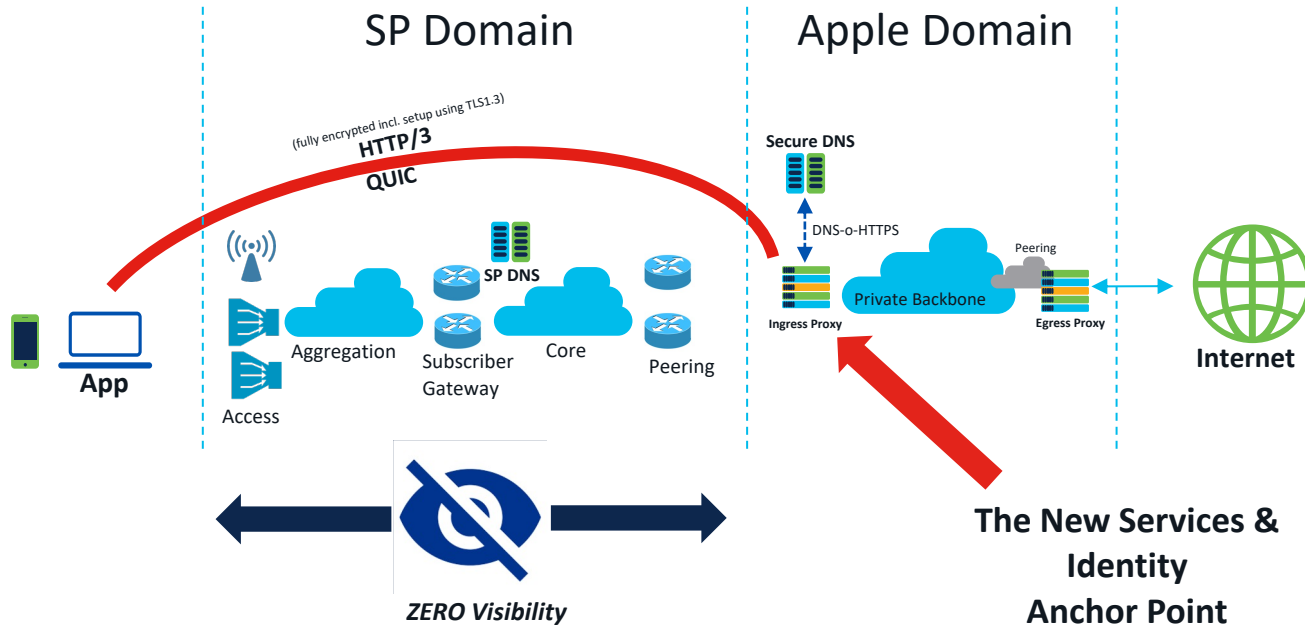
Apple Private Relay: Dual Hop Masque

Private Relay Dual-hop Architecture



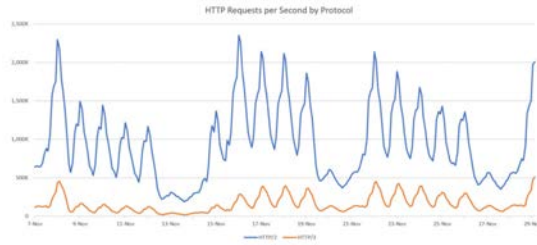
Decoupling users from content

SP Domain has less (or “no”) insights on traffic

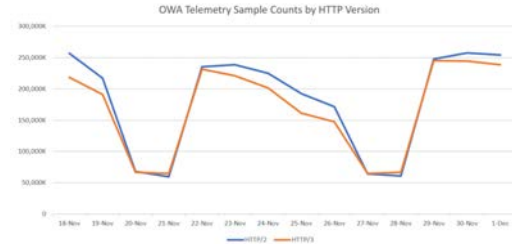


QUIC at MSFT*

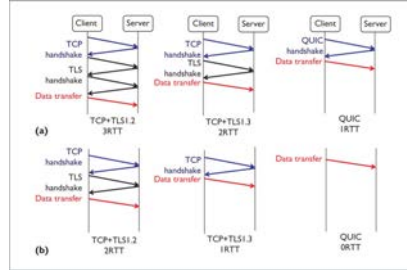
- 70% of worldwide front-end servers deployed latest Windows Server with HTTP/3 support
- Chart below shows all EXO H2/H3 usage; including browser, mobile and desktop clients



Easy to adopt



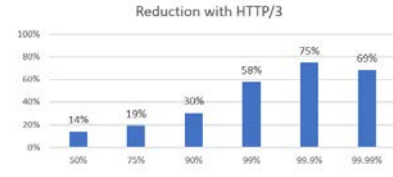
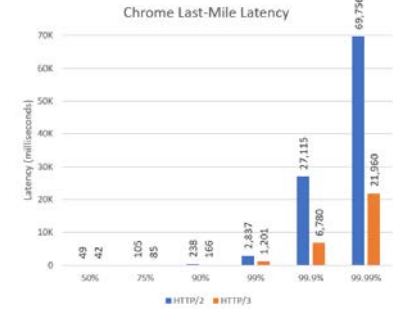
Outlook runs on Quic/H3



SMBoQUIC – No VPN



Pervasive across Products



Outlook web access *actually* runs better using H/3



* Source: EPIQ 20212, Nick banks, MSFT

SP Services Portfolio needs assessment

(non-exhaustive list)



Differentiated Billing

- ➔ *Zero rated Apps*
- ➔ *App aware service*



Regulated Services

- ➔ *Site blocking*
- ➔ *Traffic intercept*



Traffic Management

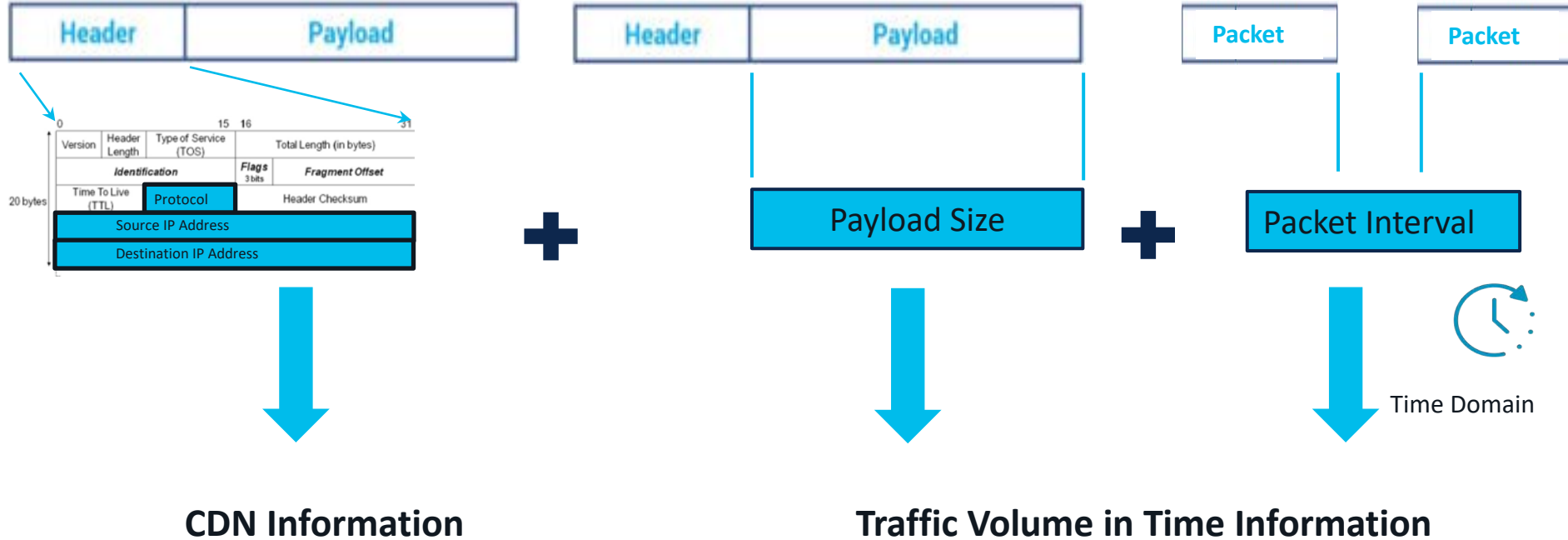
- ➔ *Peering*
- ➔ *Optimal interconnect*



Business Services

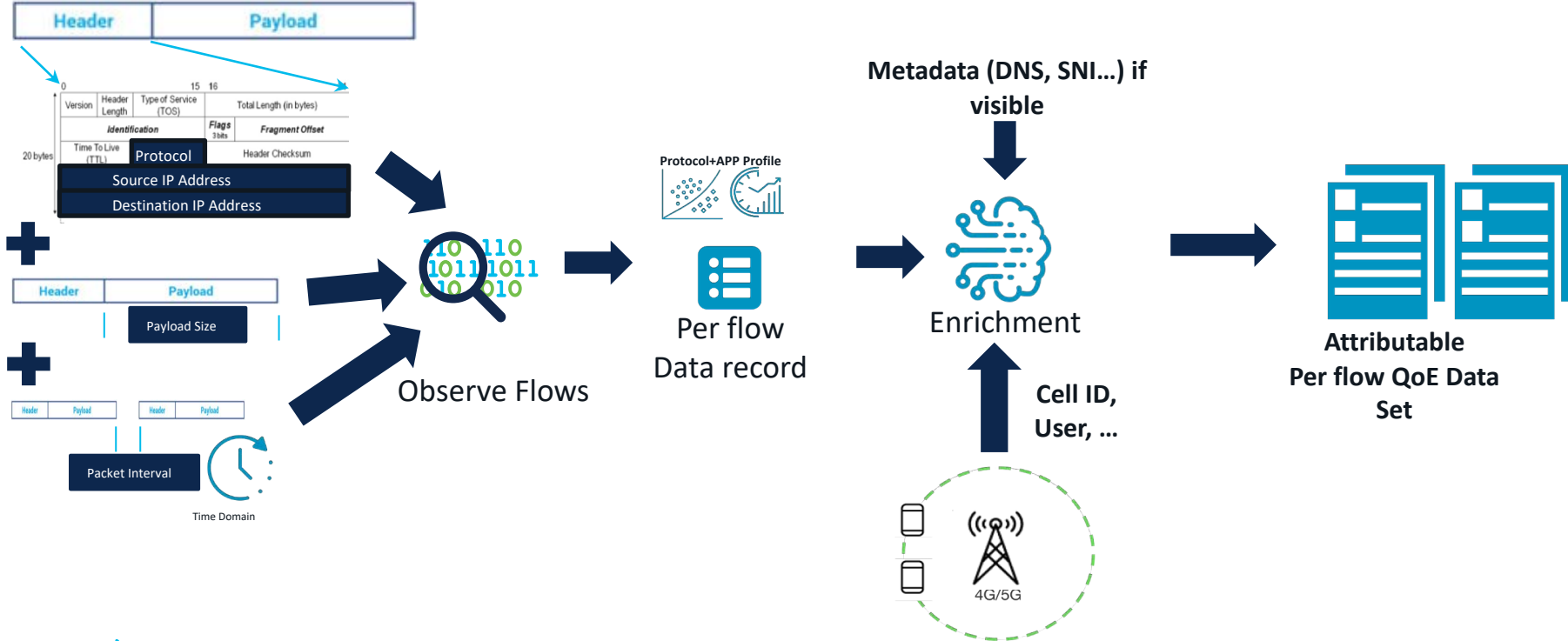
- ➔ *VPN*
- ➔ *Security*

There is some information that will not go away



Real Data from Real traffic

Basis for building use cases





The bridge to possible

Thank you

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