Enterprise Networking with Secure Access Service Edge

-- New Role of the Internet amid COVID-19 Crisis

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Speaker Biography

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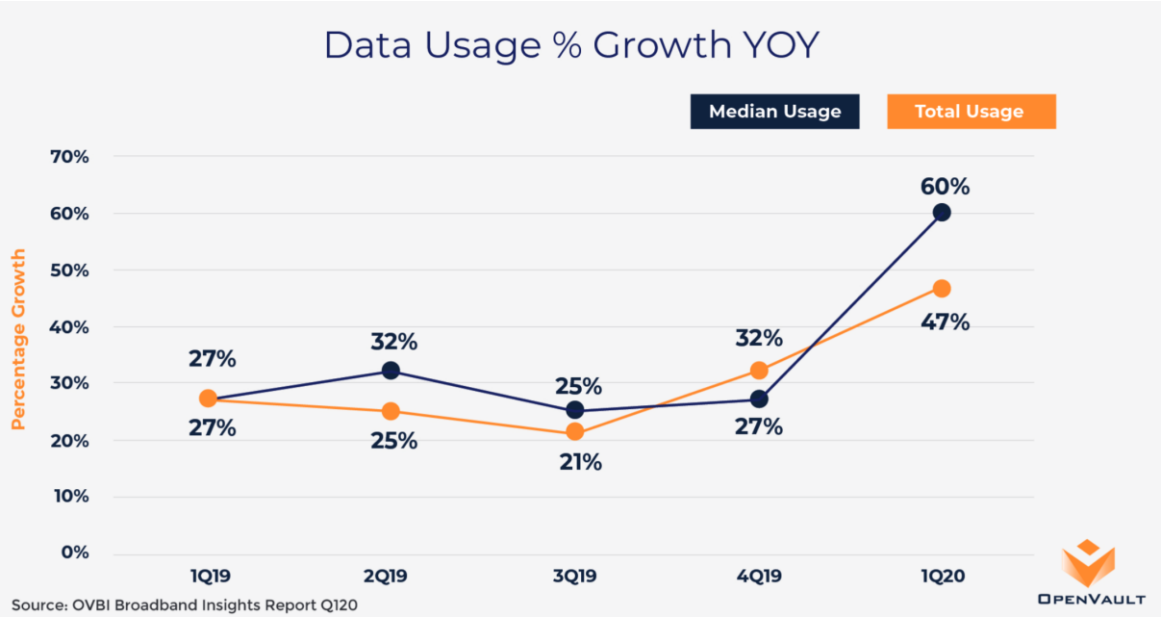
Zhaobo Zhang is a principal engineer in Network Technologies Lab at Futurewei Technologies, Inc. She has been working on machine learning applications for anomaly detection, system testing, fault diagnosis for 10 years. Her recent focus is on cloud-native networking and resource orchestration with machine learning. She received her B.S. in Electronics Engineering from Tsinghua University, China, and Ph.D. in Electrical and Computer Engineering from Duke University, U.S.

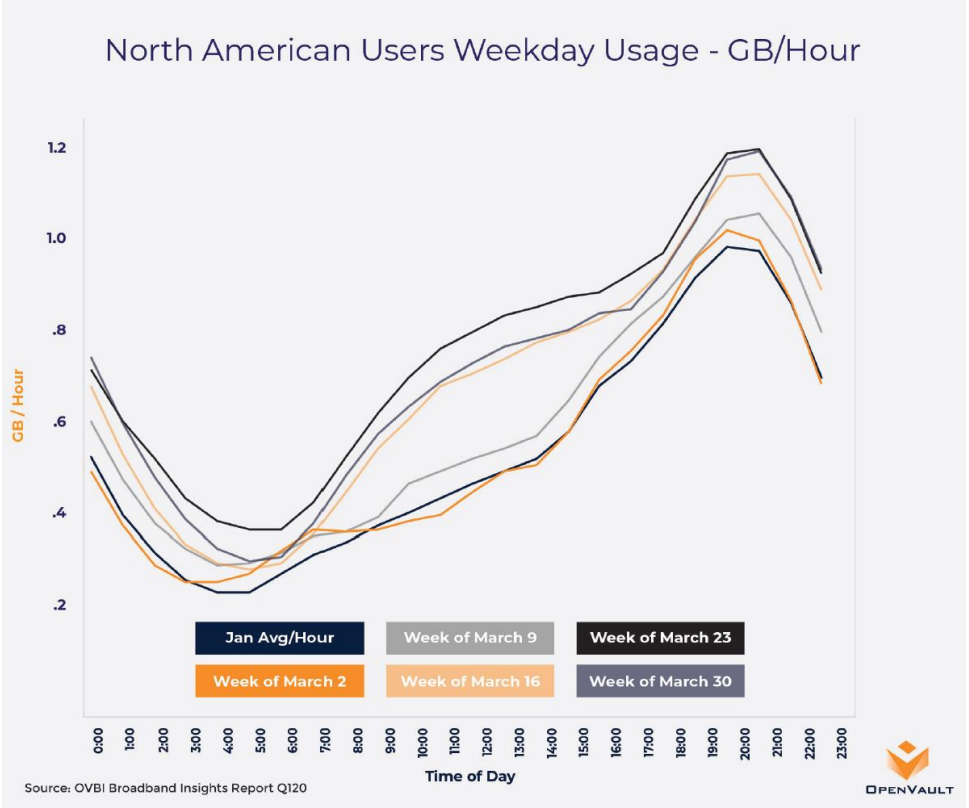
Outline

- Internet Usage and Performance amid the Pandemic
- Cloud Providers' Global Backbone Networks
- Enterprise WAN Transformation
- Secure Access Service Edge
- Takeaways

Internet Usage Surges amid the COVID-19 Pandemic

- Monthly average of data usage 1Q2020 per subscriber has increased to 402.5 GB from 273.5 GB, compared to 1Q2019, increased by 47%
- Daily usage patterns shifted during 1Q20, daytime usage spiking the week of March 23rd
- Streaming, media, gaming, business usage all increases

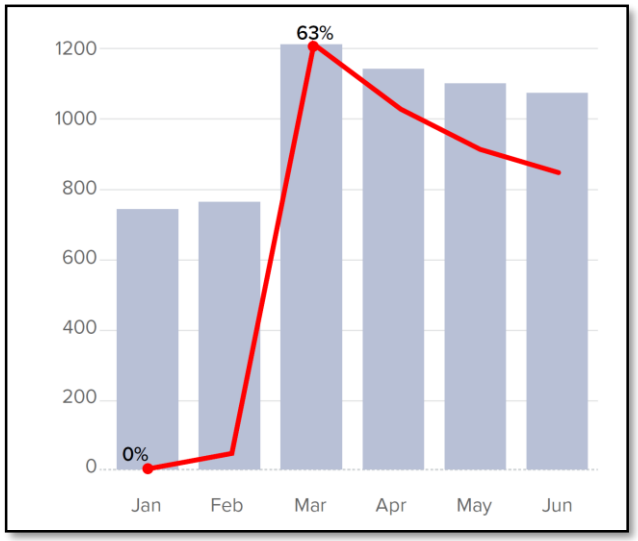


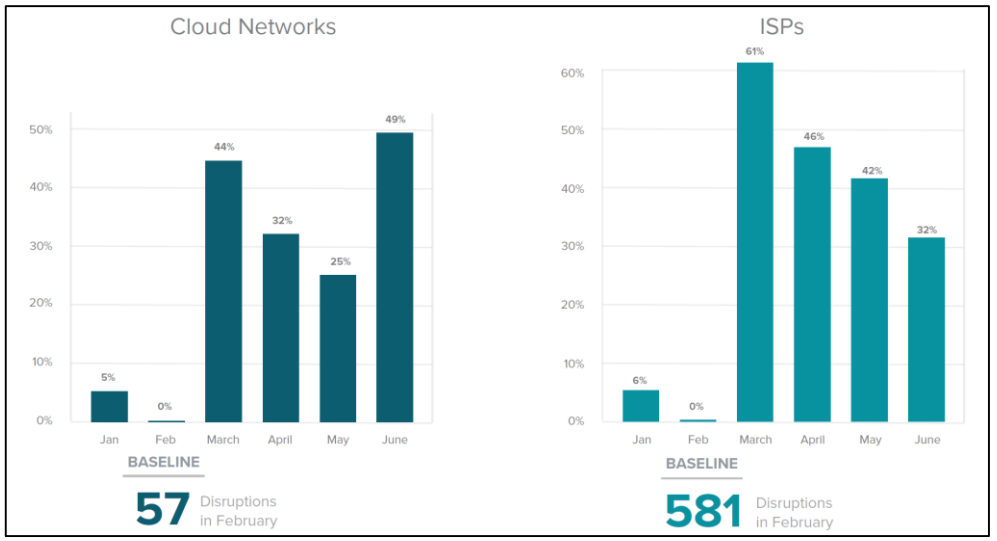


https://openvault.com/wp-content/uploads/2020/05/Openvault_Q120_DataUsage_FINAL.pdf

Internet Performance under the COVID-19 Impact

- Global Internet disruptions increase 63% in Mar 2020 over Jan 2020 *
  - Traffic delay, loss, jitter generally remained within tolerable rages
  - Increased disruptions are more caused by traffic engineering activity, instead of congestion
- Cloud provider networks demonstrate greater resilience than ISP networks, with fewer outages
- CDN and DNS providers held up well, no outages increase, but performance changed due to traffic pattern changes brought on by work from home activity

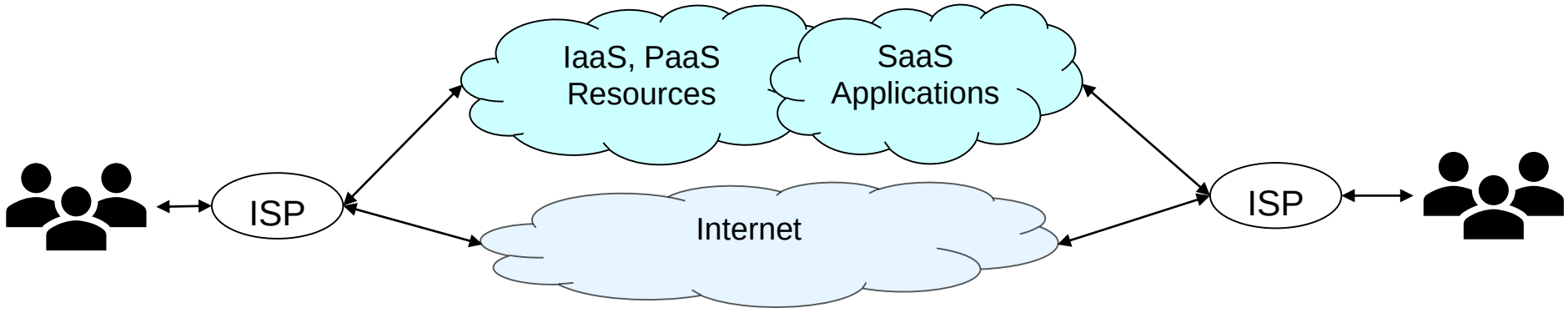




*The statements and charts above are from ThousandEyes Internet Performance 2020 Report https://www.thousandeyes.com/resources/internet-performance-report-COVID-19-impact

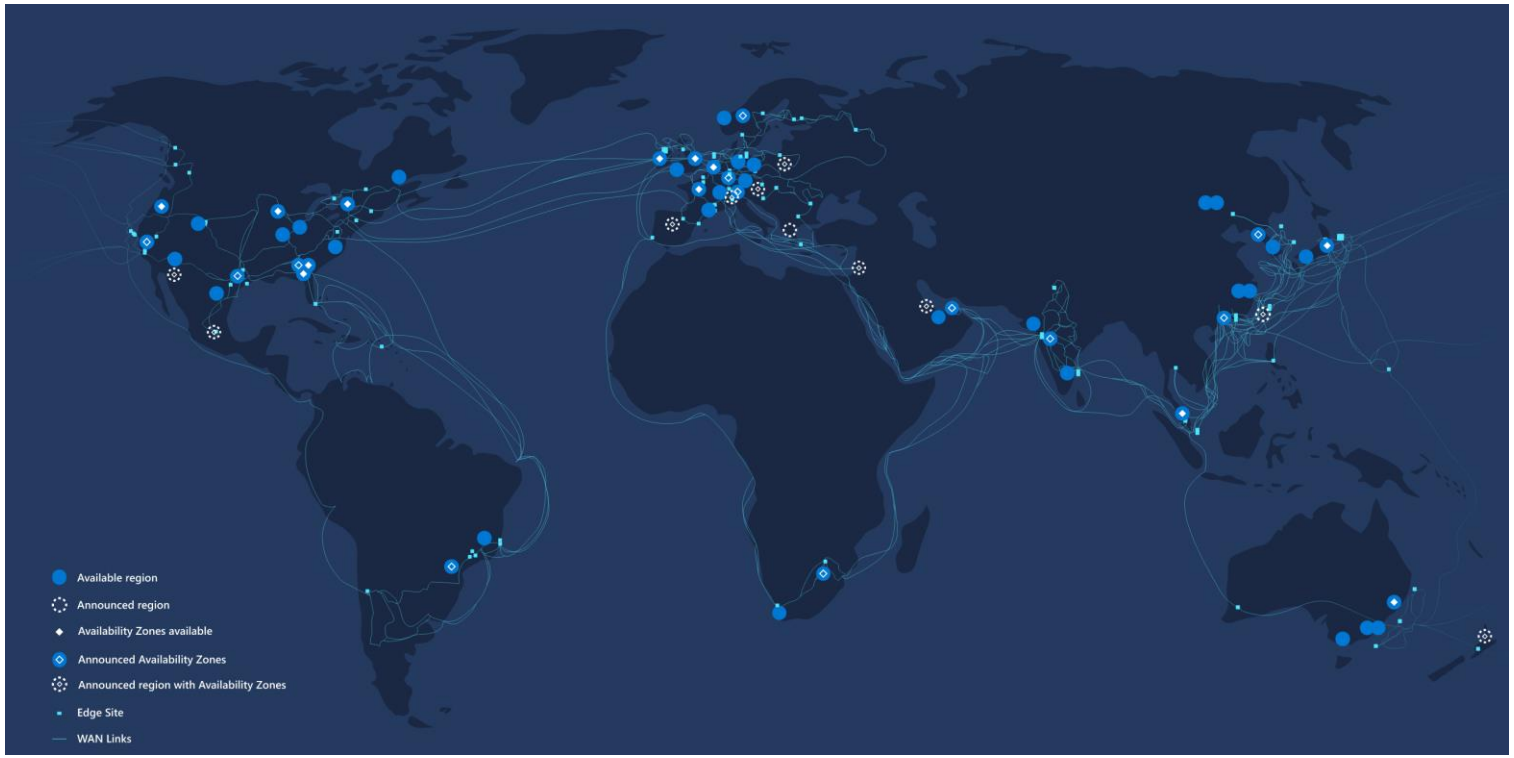
Cloud Providers Share the Traffic Burden

- Cloud services (IaaS, PaaS, SaaS) support professionals to work from home, children to learn online, and health-related demands, etc.
  - Microsoft Teams, 2.7 Billions of minutes of meeting daily
  - Zoom, 7 PB data transfer daily in the cloud



Cloud Providers' Global Backbone Networks

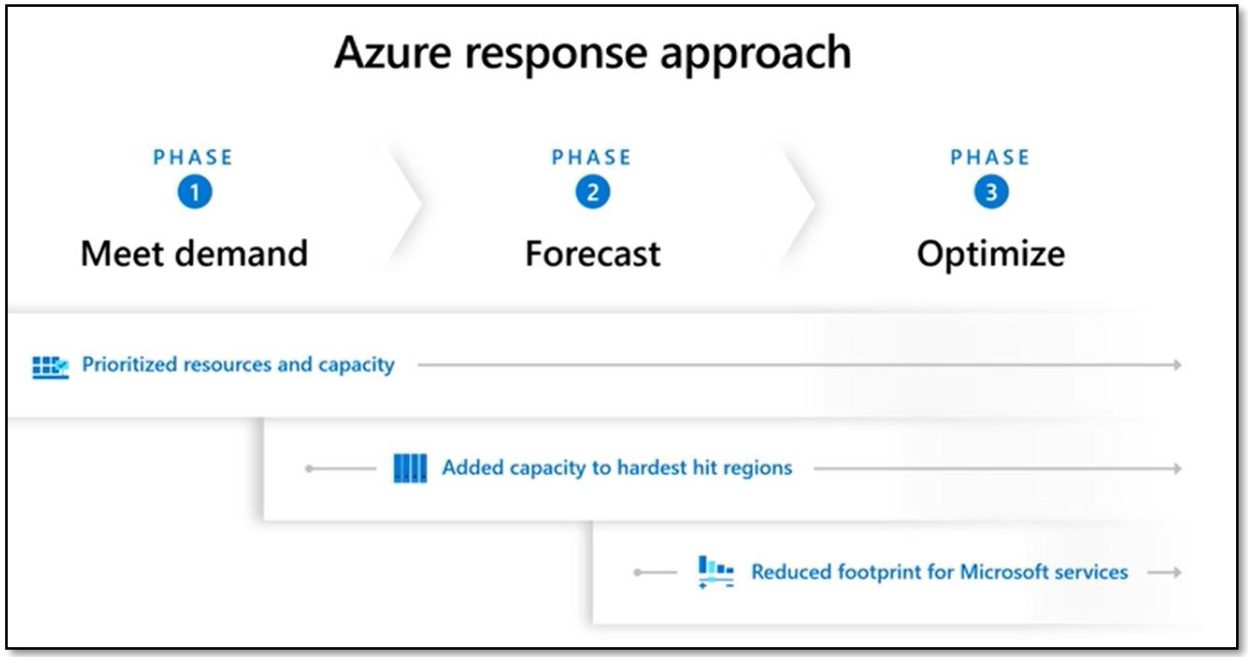
- Azure Global Network Example*
  - 60+ regions (data center), 170+ edge sites (PoP), 160k+ miles of fiber and subsea cable

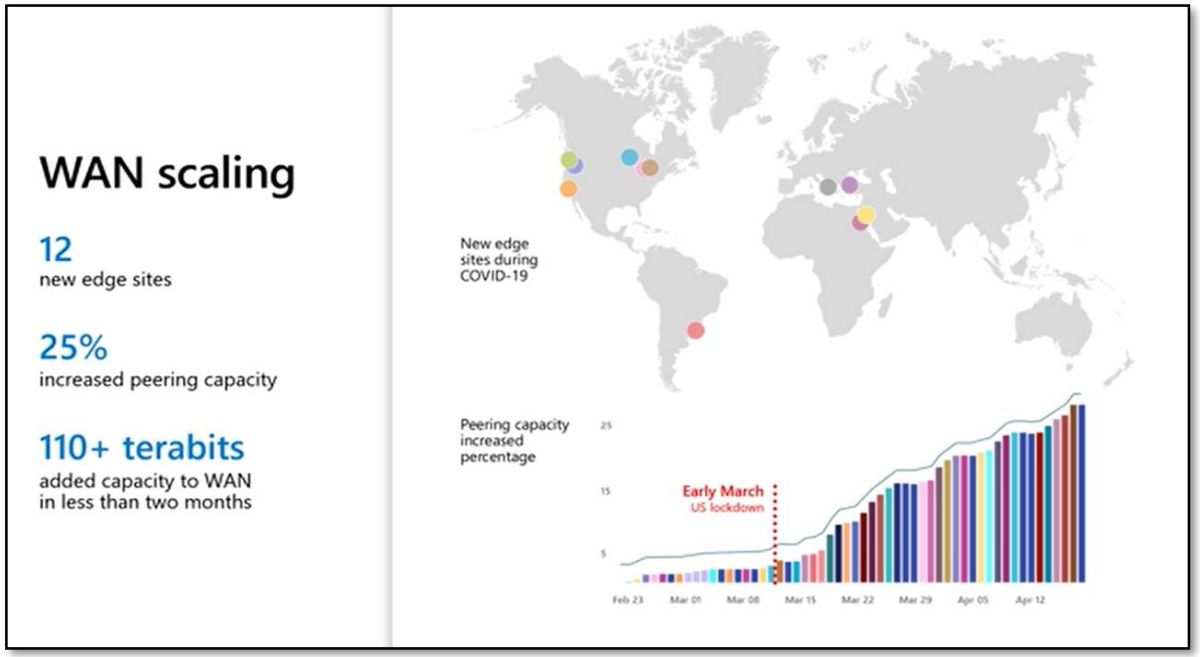


*https://azure.microsoft.com/en-us/global-infrastructure/global-network/

Surge Adaption in Cloud Networking Infrastructure

- Microsoft Azure Example*
  - Software optimization (Prioritize features, reduce resource consumption for Teams)
  - Hardware fast deployment and scale out (Data Center and Edge site expansion)





*https://azure.microsoft.com/en-us/blog/azure-responds-to-covid19

Challenges in Enterprise Networking

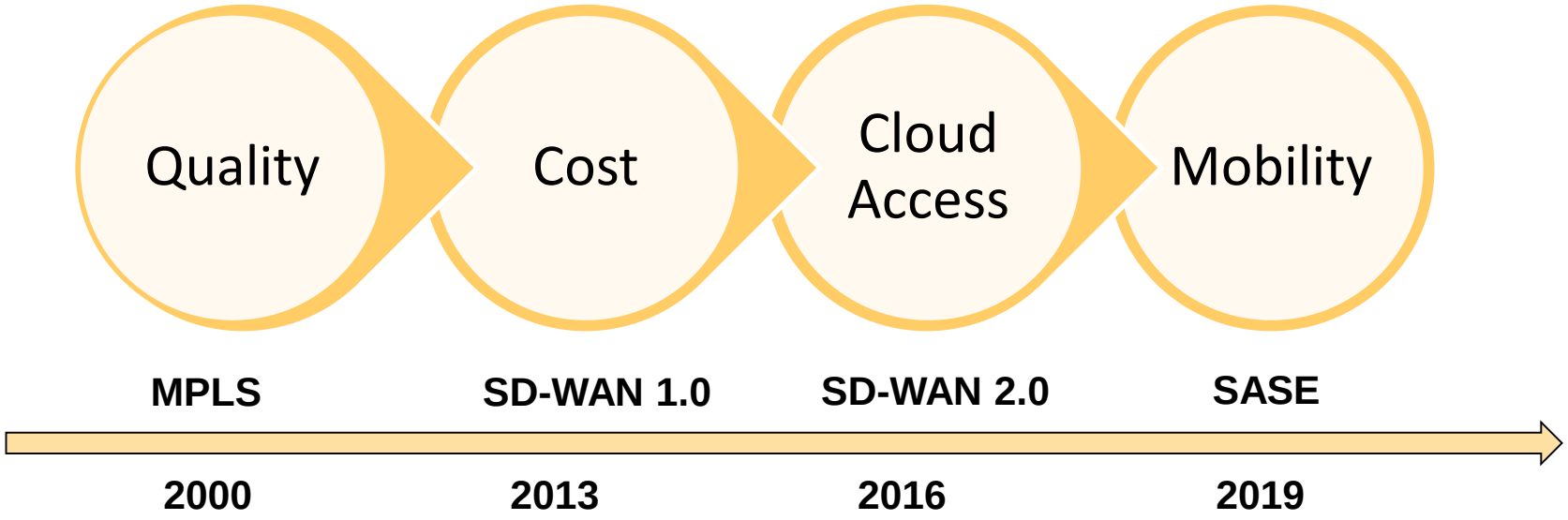
- COVID-19 pandemic brings significant uncertainties, enterprise IT face unprecedented challenges
  - **Scalability**, scale network up and down to open/close branches
  - **Agility**, launch new SaaS application for collaboration, productivity
  - **Manageability**, centralized control for employee access, and network configuration, observability
  - **Security**, direct and secure Internet access and internal access for large number of work-from-home employees

From VPNs to Zero Trust Security

- VPN issues
  - Slow, reroute to HQ and then to Cloud
  - Limited Collaboration, e.g. co-editing files is not supported
  - Security challenges, flat network, access to everything not specific applications
- Zero Trust Security
  - Provide and continuously authorize access to resources based on identity, instead of location
  - Enforce the principle of least privilege, i.e., only grant users (or services) access to assets they specifically need, and nothing more

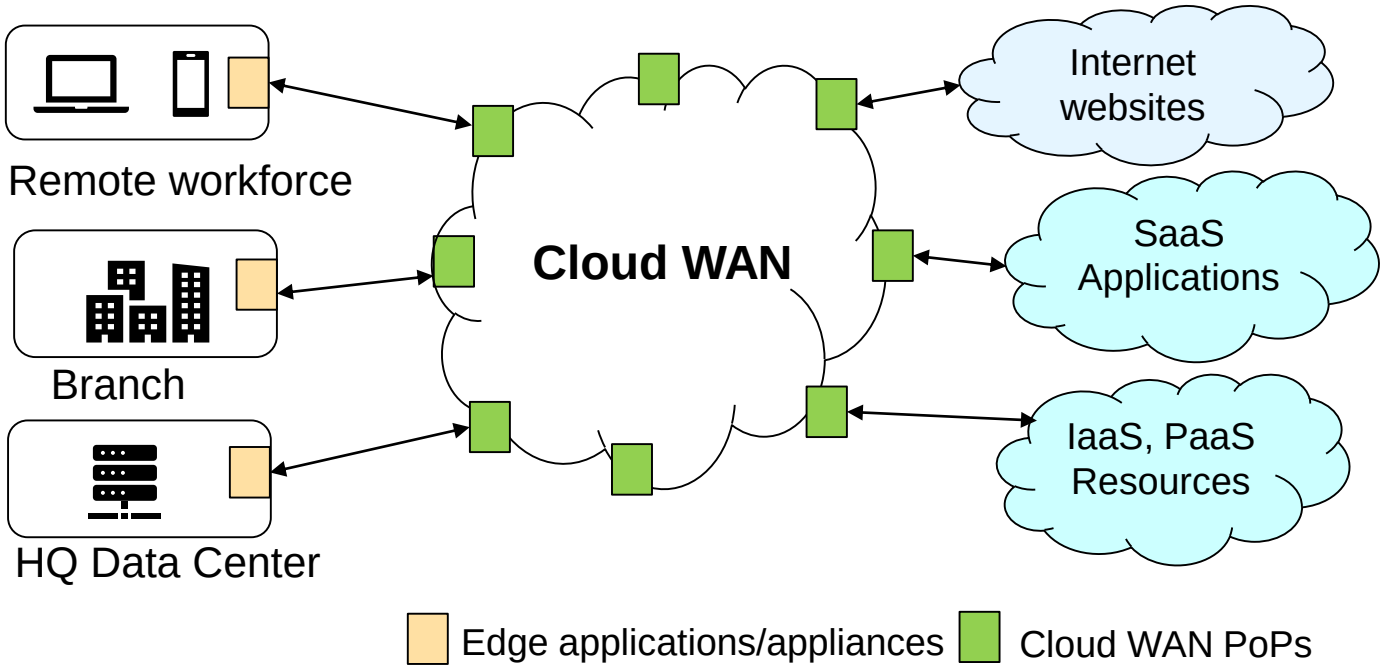
Enterprise Wide-Area Network (WAN) Transformation

- Different Drivers and products in the past two decades



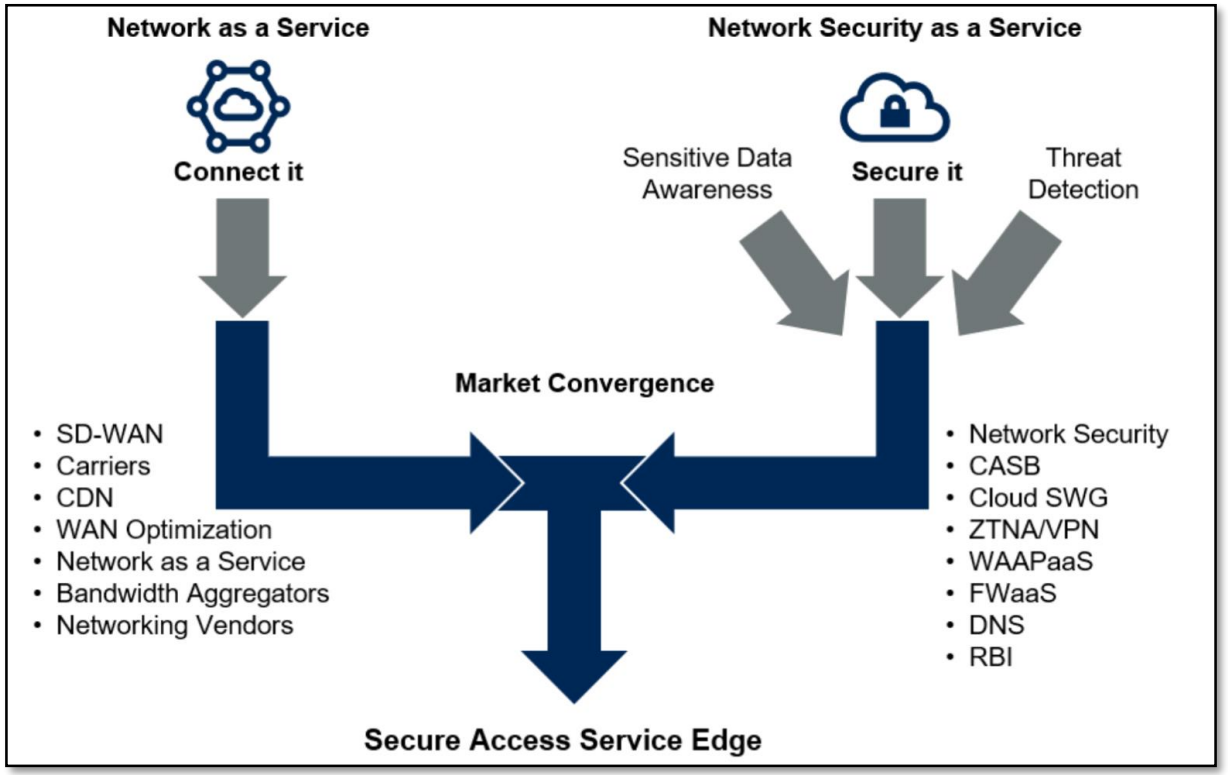
Today's Needs for Enterprise WAN

- Fast and secure access for any device anywhere
  - Zero trust framework; Security as a service at cloud edge
  - Cloud-native architecture; Globally distributed network



Secure Access Edge Service (SASE)

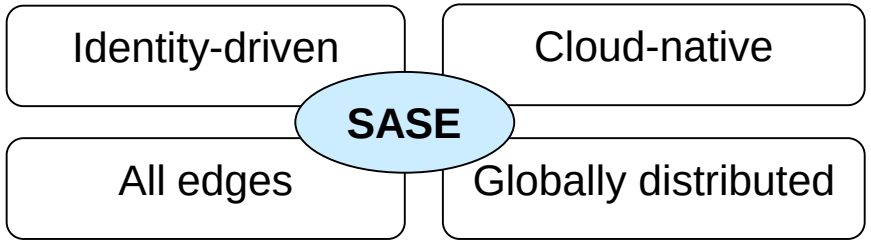
- SASE, a term coined by Gartner in July 2019, converges network services and security services together*



*Gartner Report: The Future of Network Security Is in the Cloud, https://www.valtix.com/uploads/secure-access-service-edge-gartner.pdf

SASE Characteristics and Capabilities

- Four main characteristics



- Three levels of capabilities

Core	**SD-WAN, SWG, CASB, ZTNA, FWaaS** ➢ Identify sensitive data/malware ➢ Encrypt/Decrypt content at line speed, at scale ➢ Continuously monitor sessions for risk/trust levels
Recommended	**Network sandbox, recursive DNS, RBI, WAAP**
Optional	**VPN, Wi-fi hotspot protection, offline protection**

Industry Movements

- Different providers compete from different perspectives
  - **SD-WAN providers** integrate security features
  - **Network Security providers** integrate more network services
  - **CDN, Colo providers and new challengers** plan their private networks and client-side applications to join the race
- An optimized solution for the convergence of network and security services is still under exploration

Takeaways

- Internet plays a critical role to support our daily lives during the pandemic with cloud providers and Internet service providers working together
- Internet is transforming with cloud providers' private backbone networks
- Work-from-home norm drives the changes of enterprise WAN
- Direct cloud access and converged secure edge are the future directions of enterprise networking, and SASE is a promising architecture

THANK YOU