

Versatility 2024

Beyond Earth: Best Practices for Satellite Networking

Satellite Enters the Mainstream – 8 Takeaways

- The future outlook shifts to less GEO
- A shift in Satellite's role
- Investment in multi-orbit services
- More diverse service offerings
- Technological advancements and adoption
- Achieving 100% uptime
- Growing demand and market opportunities
- Enabling mission-critical applications & use-cases



Frequent Challenges for Satellite Networks

- Latency
- Mobility
- Cost
- Degradation
- Bonding
- Bandwidth



Key SASE features in the satellite context

Class of Service

- App-QoS capabilities
- Hierarchical CoS
- BW signalling across the network
- Implement granular CoS (per device, customer, or circuit) with full visibility

Traffic Engineering

- E2E SLA monitoring
- Tunnel-less SD-WAN
- Header Compression
- Traffic conditioning (FEC, Packet Replication)
- SaaS Monitoring
- Best Gateway selection

WAN Optimization

- Native TCP Optimization
- Buffering and Congestion Control
- Split connections to overcome latency issues
- Integration with specialized 3rd party VNFs for advanced WAN optimization, using uCPE feature.

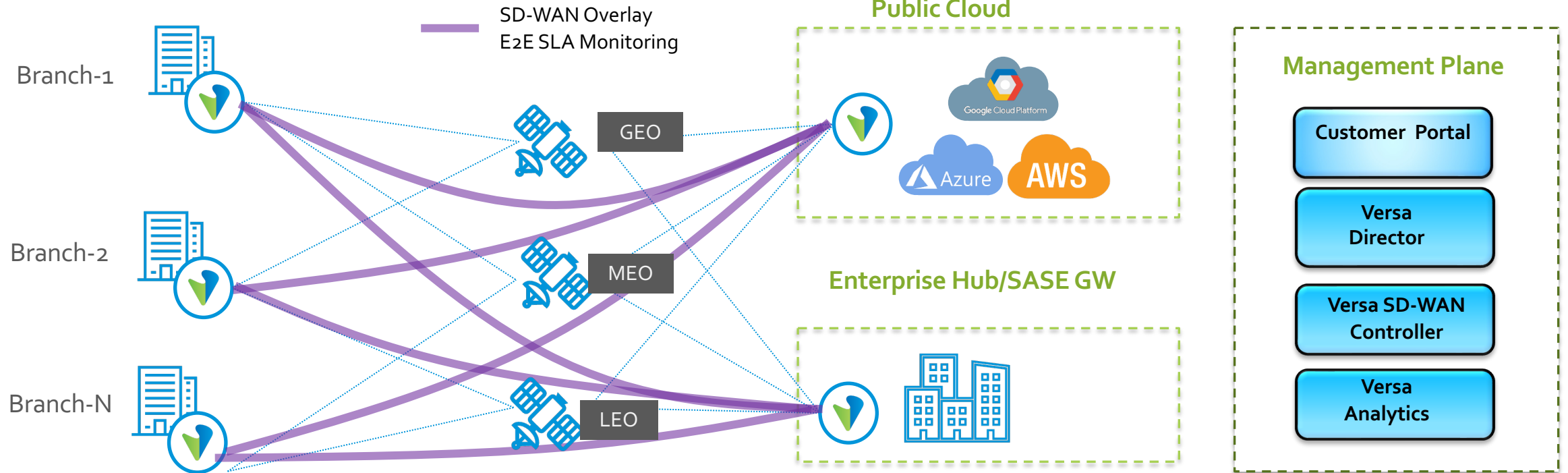
Cloud Security

- Build light branches, run security in the cloud.
- Leverage cloud gateways for middle-mile

Hardware flexibility

- Integration with several modems/technologies.
- 5G capable hardware
- Flexible options for management plane (Cloud, on-prem, hybrid)

Traffic Engineering for Multi-Orbit networks



Application Traffic Conditioning

- Link Bonding using Weighted Load Balancing across links
- Load balancing is transparent for the end user.
- Seamless failover to backup links.
- Application-based SLAs.

Satellite Metrics Integration via Rest API Calls

Continuous Monitoring of all SD-WAN links

- Monitor: BW, latency, jitter, error rate, packet loss using smart probes (ITU-TY.1731 in IP). MOS score targets - for Voice, Video

Traffic Management to dynamically changing network conditions

- WAN link selection based on network performance

Adaptive shaping

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The Secure SD-WAN Leader



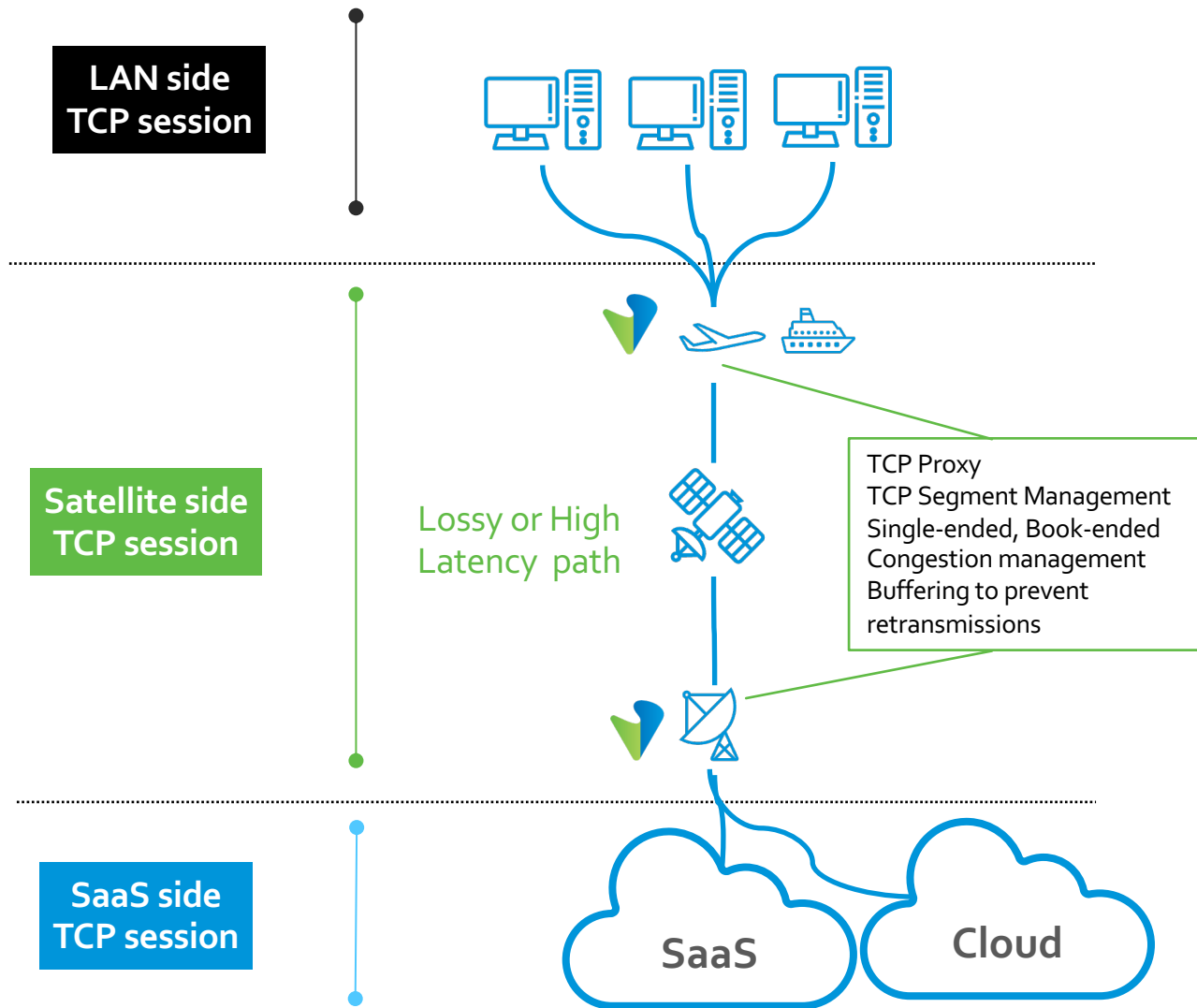
Versa Secure SD-WAN enables secure, scalable, and reliable networking increasing, automates your infra while dramatically driving down costs (CapEx and OpEx).

These are our takeaways of the requirements for SASE in the Satellite Vertical

- ✓ The industry is moving to a multi-orbit approach. SD-WAN is a key element of that strategy
- ✓ A modern SASE solution, should integrate Advanced Traffic Steering, CoS, and TCP Optimization to its feature list
- ✓ LEO Satellite providers are disrupting the market due to their reach and cost
- ✓ We see several use cases for SASE architectures, especially in maritime, aero, oil-and-gas, and cellular backhaul use cases
- ✓ Tunnel-less SD-WAN allows us to keep all its benefits while reducing the overhead.
- ✓ Flexible HW choices with certified white boxes or Versa appliances with integrated 4G/5G



TCP Optimization for high latency connections



Optimizes response time for links with High Latency or Packet Loss

Full TCP Proxy

- TCP Proxy for bookended or single ended deployments
- Latency Splitting – splitting e2e session to smaller segments

Enabling High Performance TCP Options

- TCP SACK, Window Scaling, Timestamping support
- Pre-acknowledging data

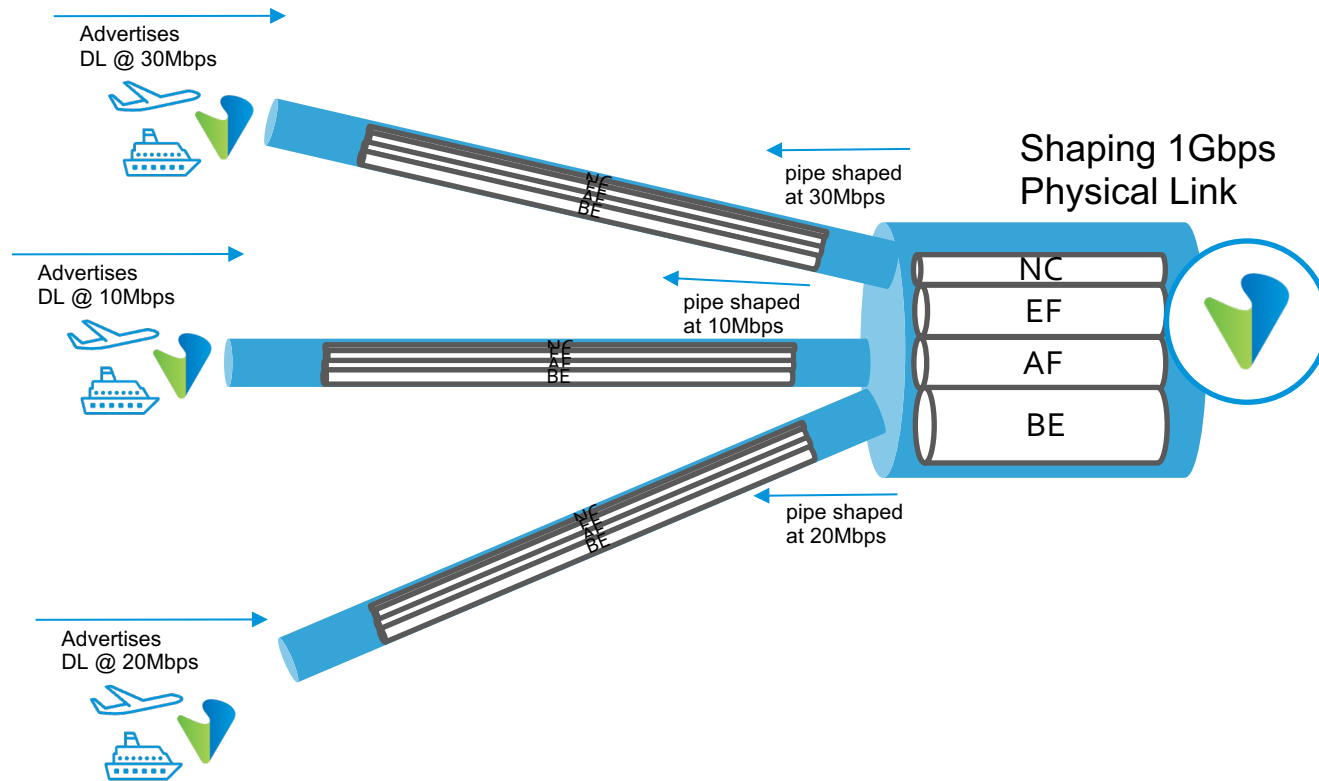
Implementation of state-of-the-art protocols that suite better different link conditions

- Hybla
- BBR
- Cubic
- New Reno

HTTP / HTTPS Proxy

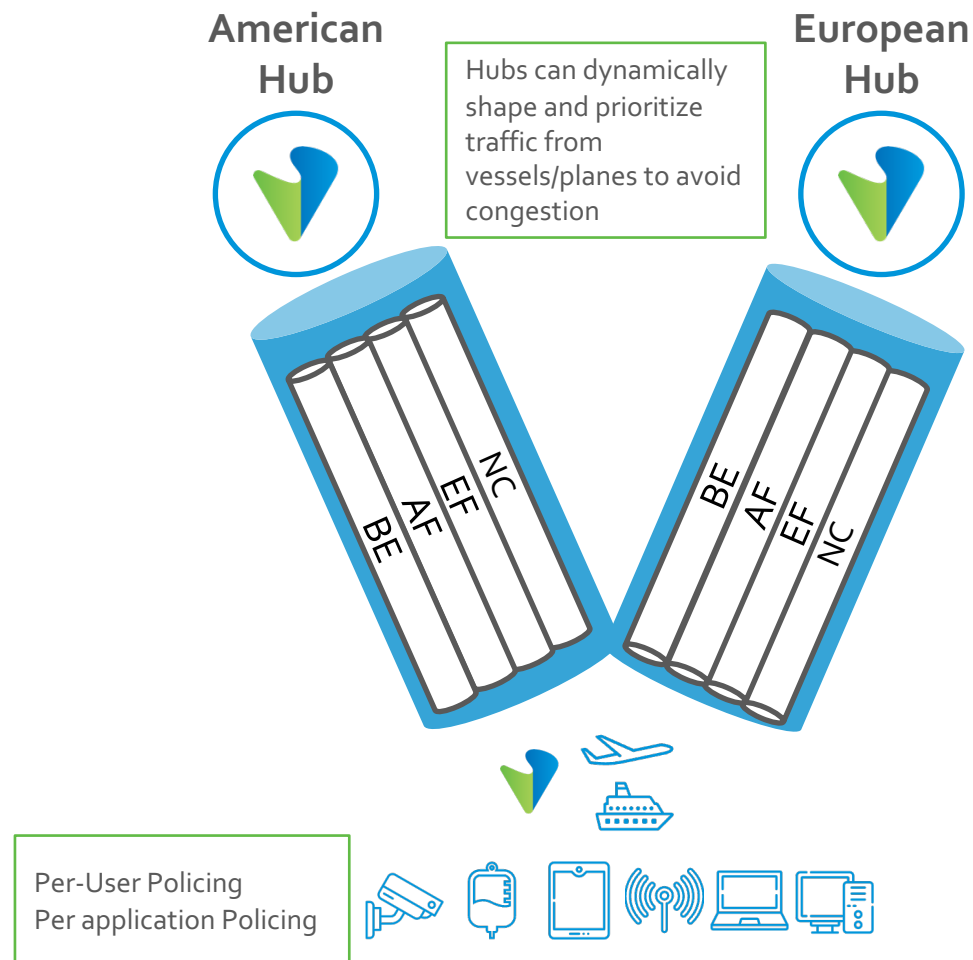
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Adaptative Shaping



- Hubs aggregate multiple spokes. For that reason, the bandwidth of hubs is much higher than remote devices –normally more than 10x. Therefore, hubs are required limit the transmit rate of the remote devices, otherwise packets are dropped by the medium.
- The Versa OS Adaptive Shaping feature allows the hub to build a virtual pipe towards the remote devices, to honor traffic priorities for each Traffic Class.
- The hub configures the shaping rate of the pipe dynamically at the advertised download speed of the remote

Hierarchical QoS and Adaptative Shaping



Policy Driven

- Application-ID, User/Group, URL, Device, Security and other criteria

Hierarchical QoS

- Shape and Policing functions for traffic management
- 4 Traffic Classes and 16 Forwarding Classes for traffic prioritization
- Hierarchical shaping: per customer, per interface, per VLAN, etc.
- Per user and per application policing for greater granularity
- Dot1p and DSCP remarking to integrate with underlay QoS
- QoS integrated into Analytics for better monitoring

Adaptative Shaping

- Hub devices can shape traffic to/from devices dynamically
- Throttle down individual appliances in cases of congestion
- Implement shaping for each remote site's WAN circuit with full visibility

LTE/5G and Near-Shore Wi-Fi connectivity

Use cheaper circuits when

- Prefer cheaper links over costly satellite links.
- Automatically choose LTE, 5G, or Wireless P2MP links when available.
- When necessary, failover to satellite without service disruption.

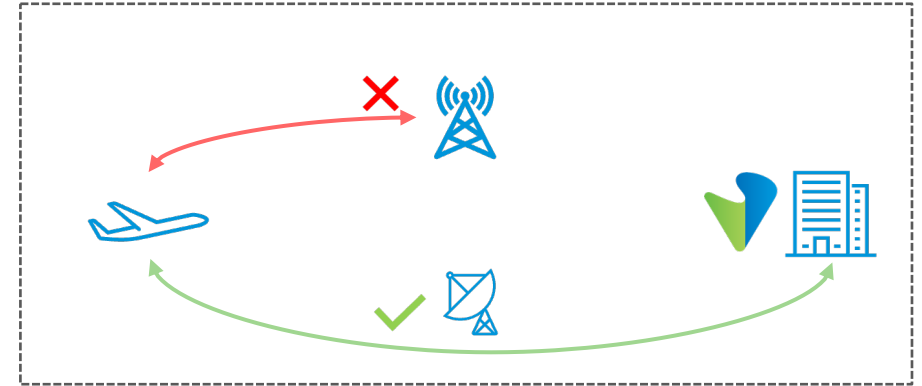
Integrated Wireless

- 4G/5G capable hardware.
- Use Versa native 4G/5G modems. Use our built-in modems for simplicity or install external models to extend your range.
- Manage your wireless links from a single point of glass.

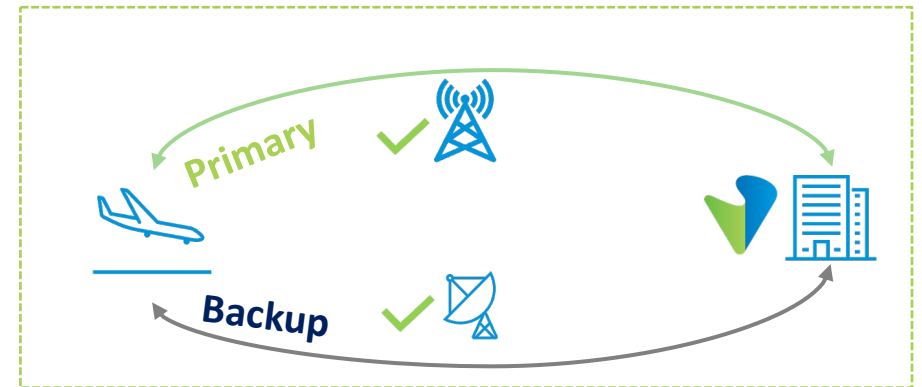
Dynamic and Encrypted Overlays

- Automatically build secure overlays when using unsecure links.
- Multiple encryption options and protocols.
- Secure and automatic rekey to protect your network against intrusions.

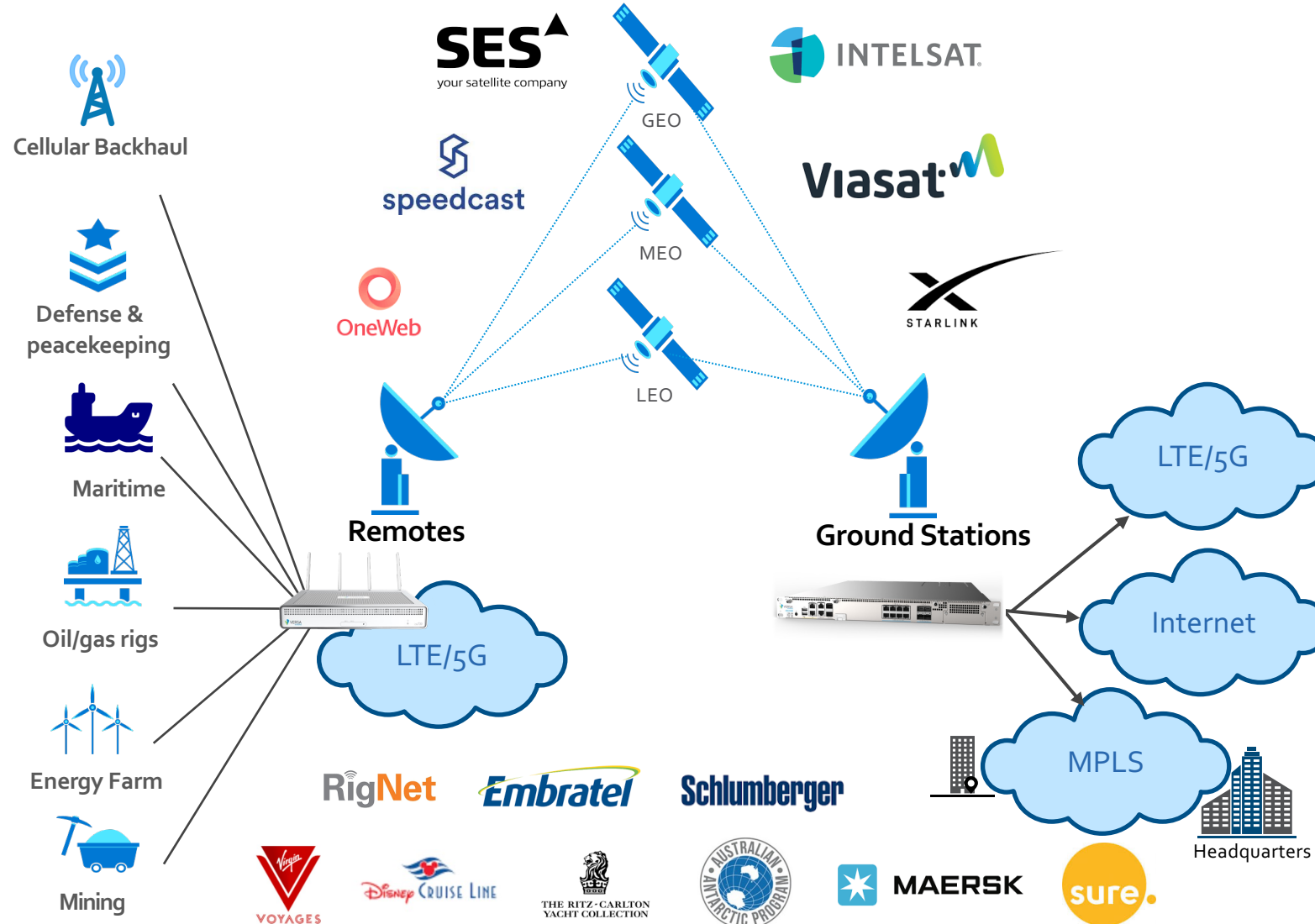
When in the air...



When landing...



Proven Secure SD-WAN for Multi-orbit Satellite



Hybrid Terrestrial and Satellite Network

- Encrypted end-to-end VPNs over diverse underlays

Application-Based Traffic Steering

- Dynamically use the appropriate satellite link to achieve the desired application SLA and/or condition the traffic (FEC, Replication)

Bandwidth Capacity Blending

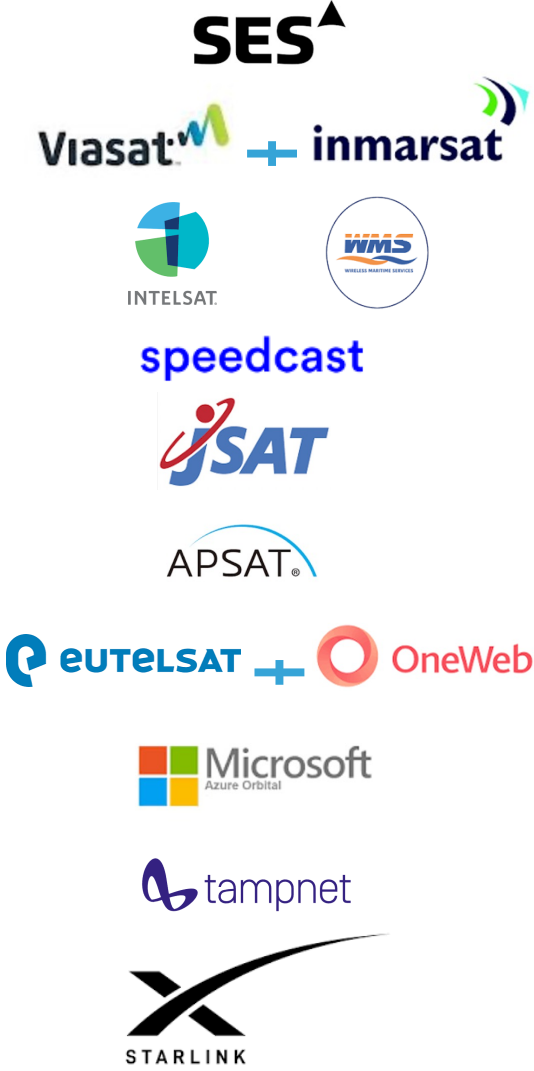
- Load-balance over more than one satellite link
- Active-Active, Active-Standby, site diversity

One-box WAN

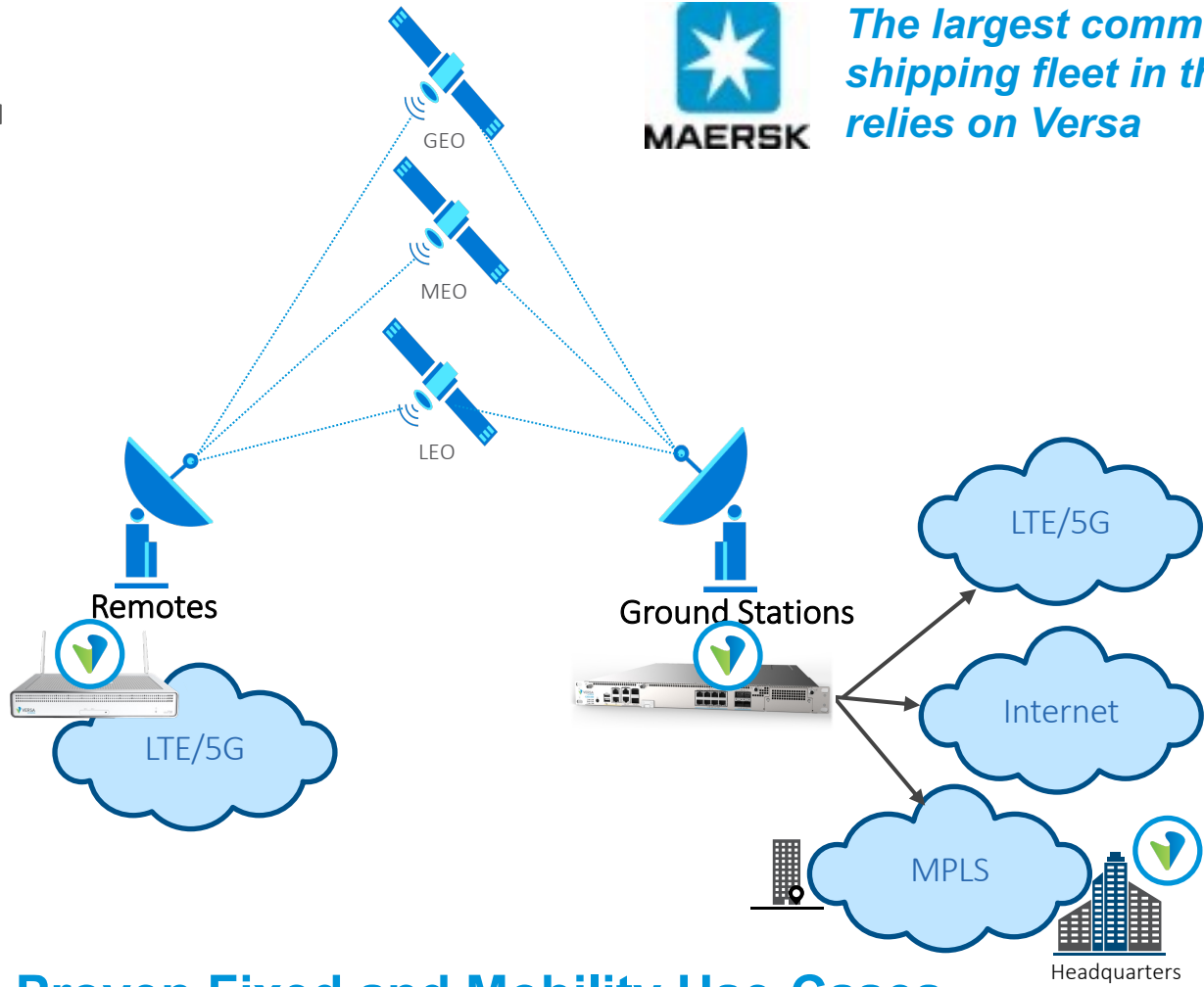
- Satellite, MPLS, Broadband, LTE, 5G
- L2, Routing, SD-WAN, Security
- TCP-Opt improves performance over high delay ccts

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Versa: Proven SDWAN for Multi-orbit Satellite



- Cellular Backhaul
- Defense
- Maritime
- Oil/gas Rigs
- Wind Farms
- Commercial Aviation /UAVs
- Land Mobility



MAERSK

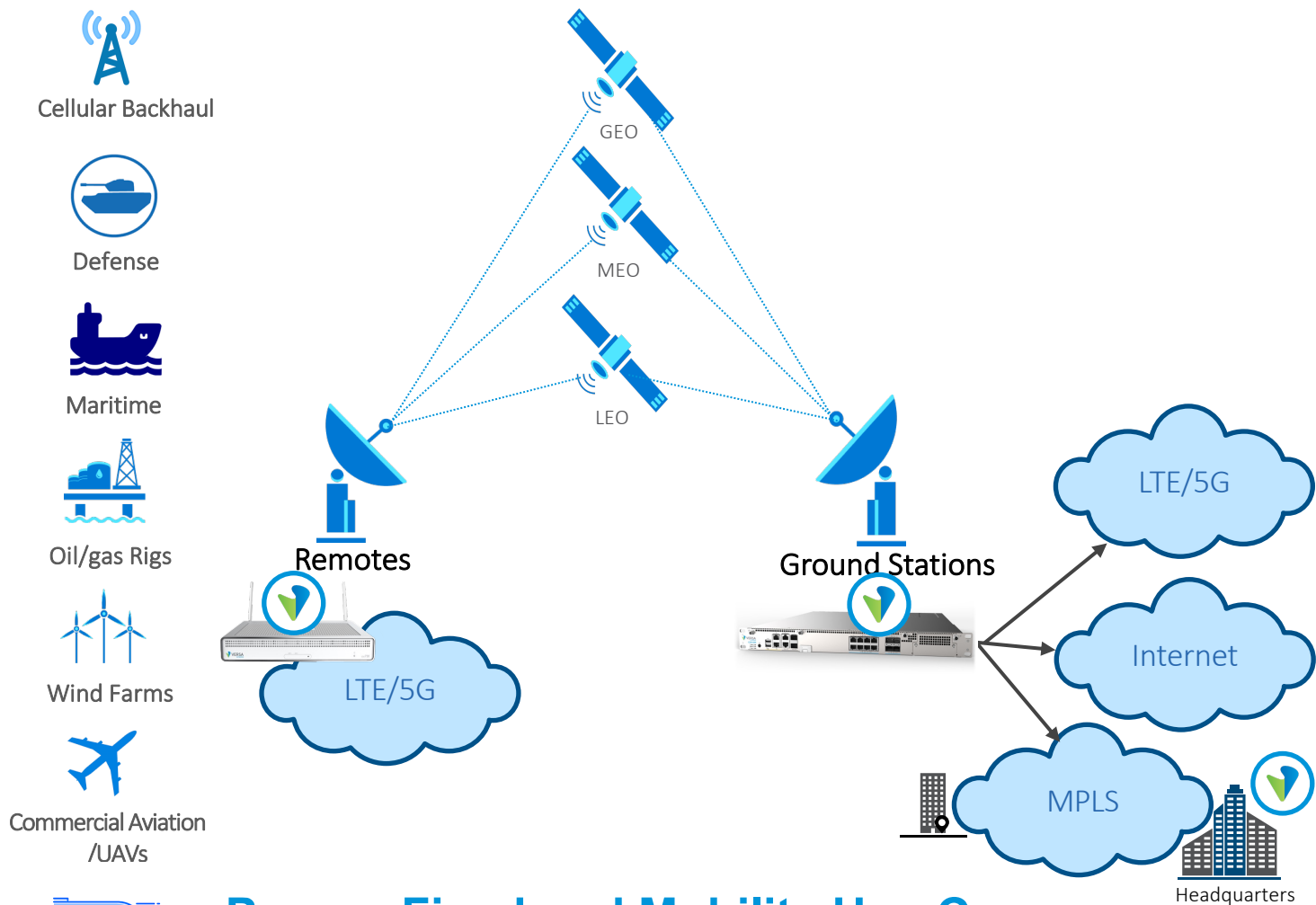
The largest commercial shipping fleet in the world, relies on Versa

Proven Fixed and Mobility Use-Cases

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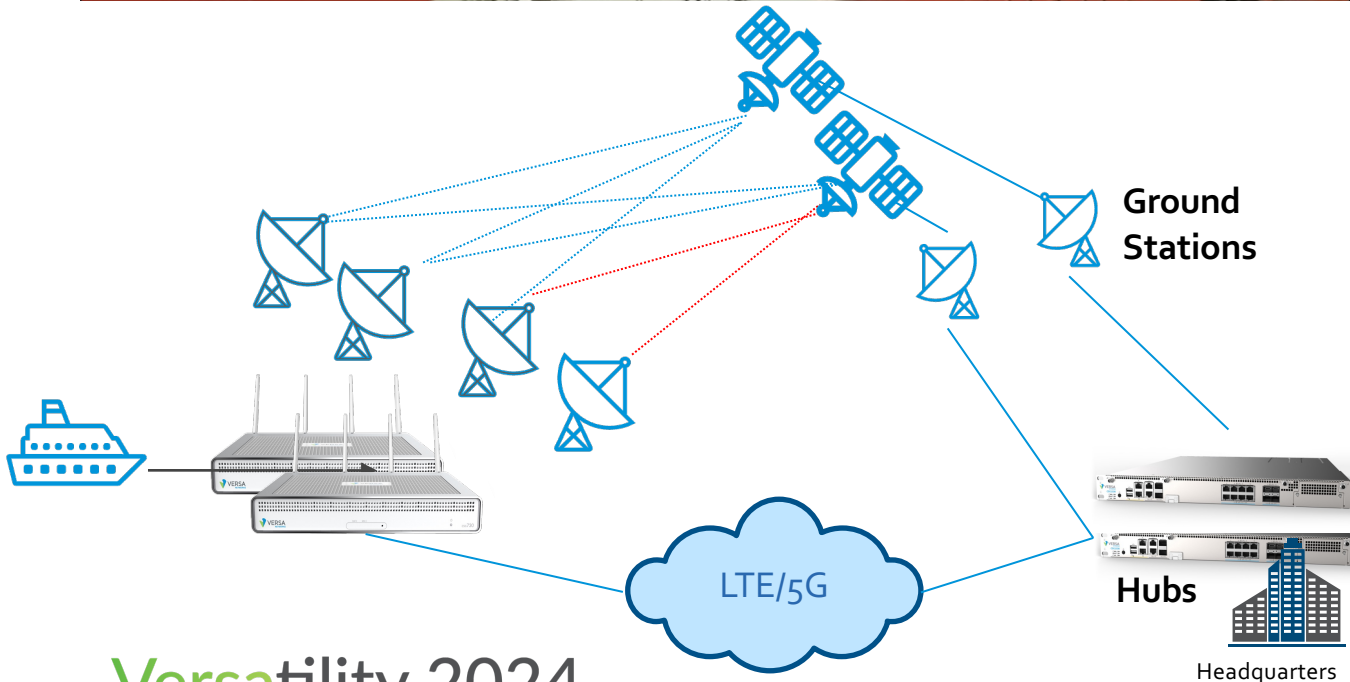
Proven Fixed and Mobility Use-Cases



Critical Services: Australia Antarctic Division -AAD



- Deployment for critical maritime infrastructure.
- HA Deployment for all components in the the Network
- App-QOS for critical applications
- CGNAT and NGFW for Internet Access
- Per-path load balancing
- 8 Highly diverse Active WAN links in the HA Pair (LTE, LEO, GEO, etc.)



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Questions



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Thank you

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