Deciphering the buzz: Trying to succeed with SD-WAN IRL

Efficiency

- Application based
- QoS/QoE
- Seamless MultiLink
- HA/redundancy
- Software defined feature implementation

Safety

- Role & template based mgmt.
- Integrated FW
  - NG (App/URL rep.)
  - UTM (IDS/IPS/AV/AM/IP rep.)

Visibility

- Full network overview
- Real-time
- WYSIWYG documentation
- Self-service reporting

Flexibility

- Local internet breakout
- In cloud vCPE deployable
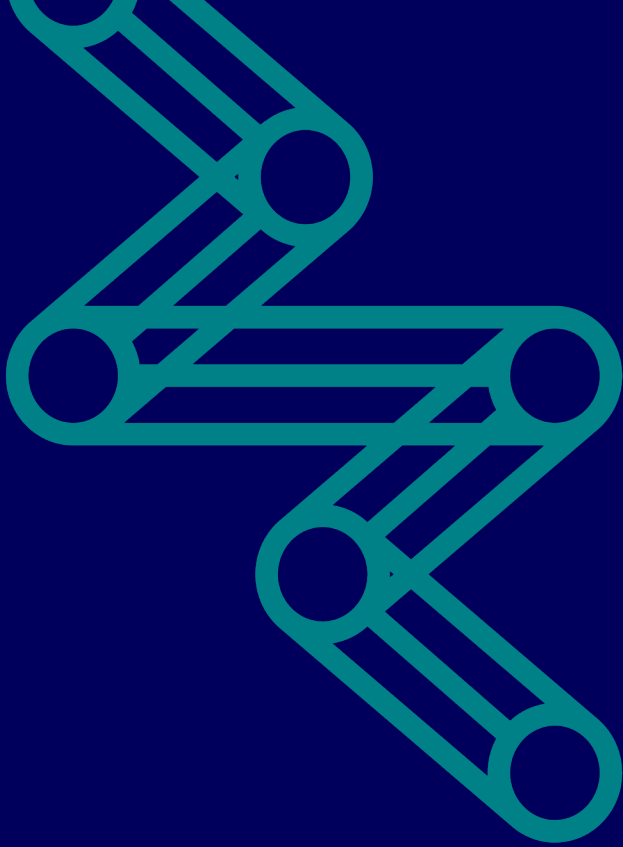- Underlay independent
- Central mgmt.

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SD-WAN RFI/-Q/PoC learnings

Feature differentiators

- Remember the assumed basics: NAT, SF FW/SPI, VRRP/BGP, Multicast, ...

- And the future basics: IPv6

- Security, security, security: MFA, RBAC, tunnel SHA/AES auth/enc, key rotation, segmentation, NG/UTM FW, ...

- Provisioning process (more on that later)

- 3 periphery focuses (none does it all - yet)
  - NG/UTM FW (security)
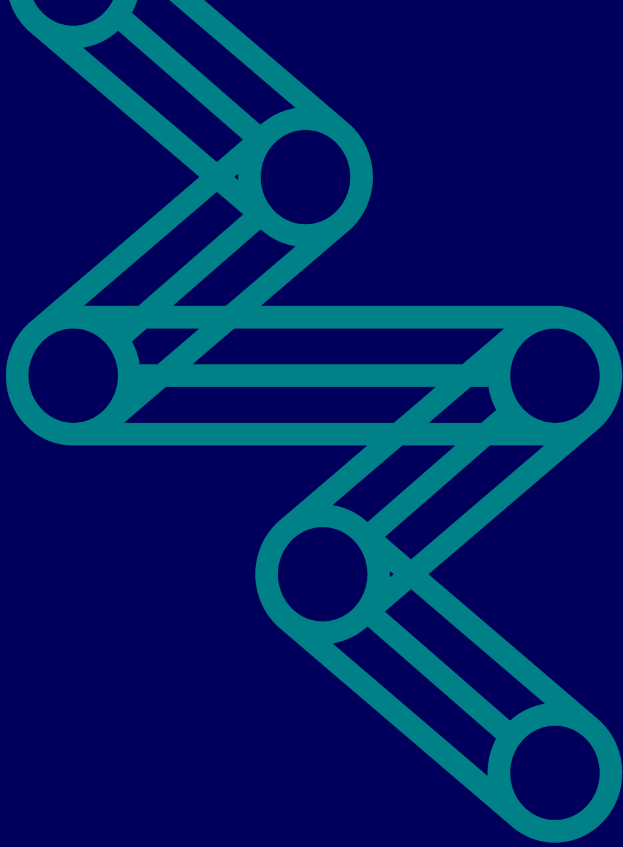 - SD-LAN/WiFi (branch)
  - SDN (data center)

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SD-WAN RFI/-Q/PoC learnings

SD-WAN technology economics

- Sofware license based price model:
  - Feature tiers
  - Speed tiers (consumed! vs. provisioned, site vs. solution)
  - (No link speed relation)

- CPE schemes: Vendor lock-in vs. support
  - Branded: Hard & high
  - Certified 3rd party: Some & some
  - DIY white label: None & none
  - (Combinations of above)

- VNF service chaining – more fuzz than reasonable TCO

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SD-WAN RFI/-Q/PoC learnings

High level differentiators

- Existing synergies
- Brand recognition
- Feature qualification
  - NG/UTM FW vs. SD-LAN/WiFi vs. SDN
- CPE scheme
- CPE logistics & support
- CPE performance
- Multi-tenancy (mgmt. and CPE)
- Role integration (operator vs. customer)
- Feature integration (native vs. assembled solutions)
- Competing reseller channels (DYI vs. SI vs. SP)
- Local ressource presence

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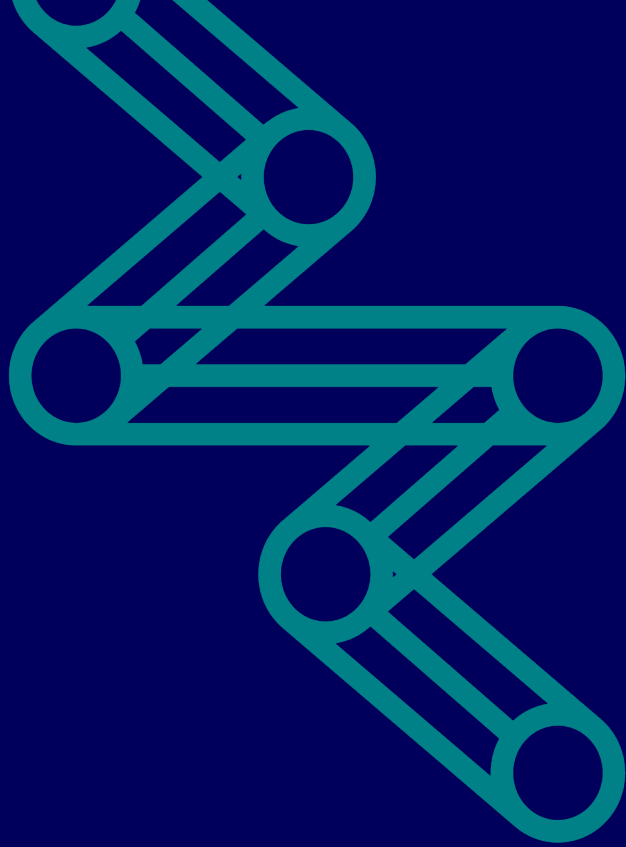
SD-WAN RFI/-Q/PoC conclusions

How to nail it:

- In reality no acknowledged industry standard (vendor sales do not care about MEF/ONUG)

- You need to decide and prioritise your requirements:

    - No matter your role/segment

    - Features vs. use cases

    - Features vs. TCO

    - Control vs. risk mgmt.

    - DYI vs. managed

    - It's still somewhat new higher risk technology
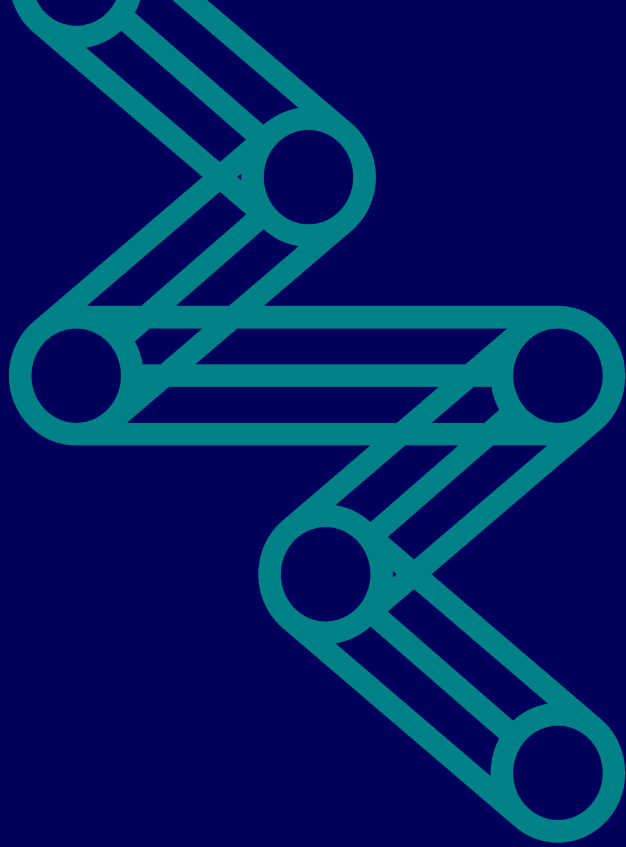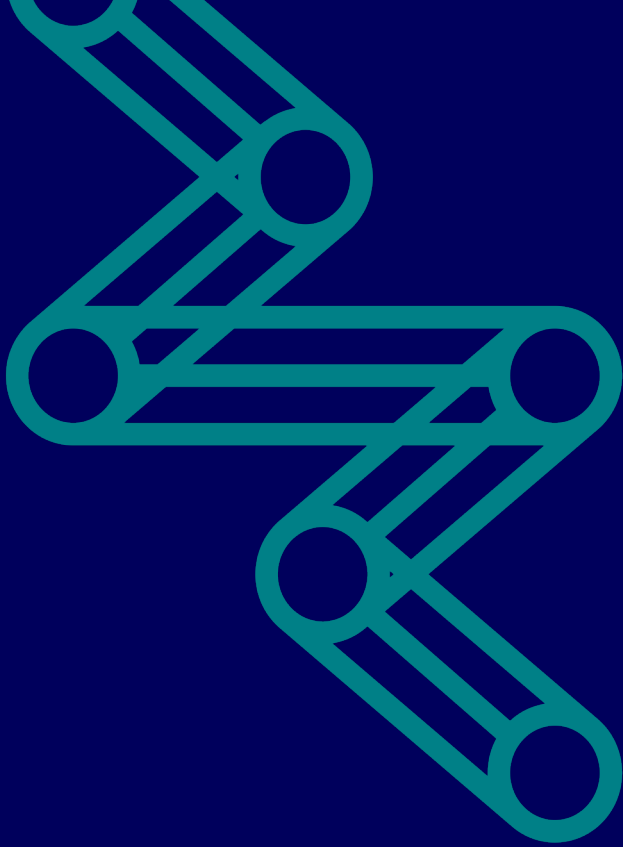
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SD-WAN RFI/-Q/PoC conclusions

GlobalConnect's chosen preferences:

... for providing (co-)managed SD-WAN

- Versa Networks

- Feature qualification
    - Full WAN + NG/UTM FW security
- CPE scheme (combined branded & certified options)
- CPE performance
- Multi-tenancy (mgmt. and CPE)
- Role integration
- Feature integration
- Competing reseller channels (not competing with SI's)
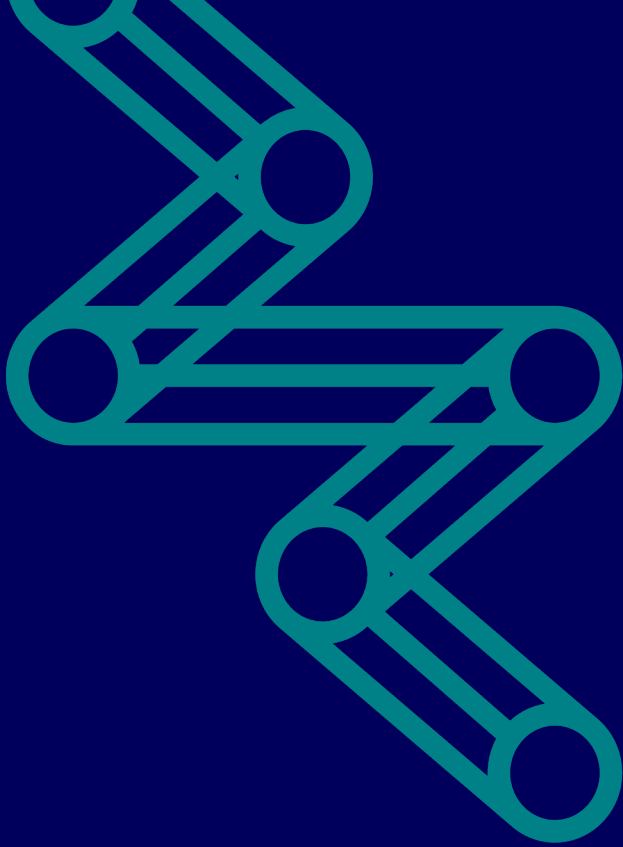- TCO (of course)

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SD-WAN RFI/-Q/PoC conclusions

What did we miss out on:

... For now at least

- SD-LAN/WiFi (and SDN)
- Existing synergies
- Brand recognition
- CPE logistics & support
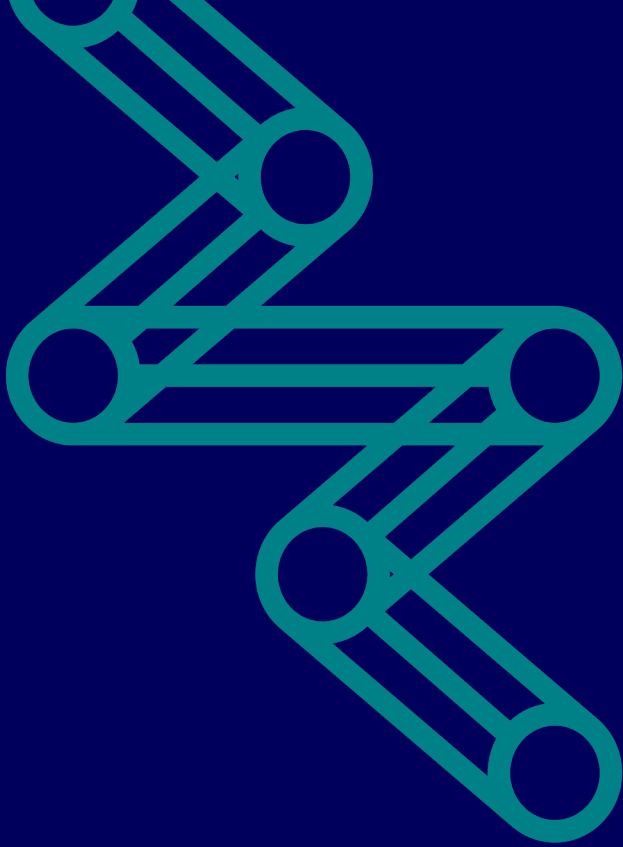- Local ressource presence
- ...

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GlobalConnect company integration

- Separate division to accelerate time to market

- Independant of other business units incl. Tech and prod.mgmt.

- Opportunity to re-invent processes and take chances

- Understand your integration points with legacy systems
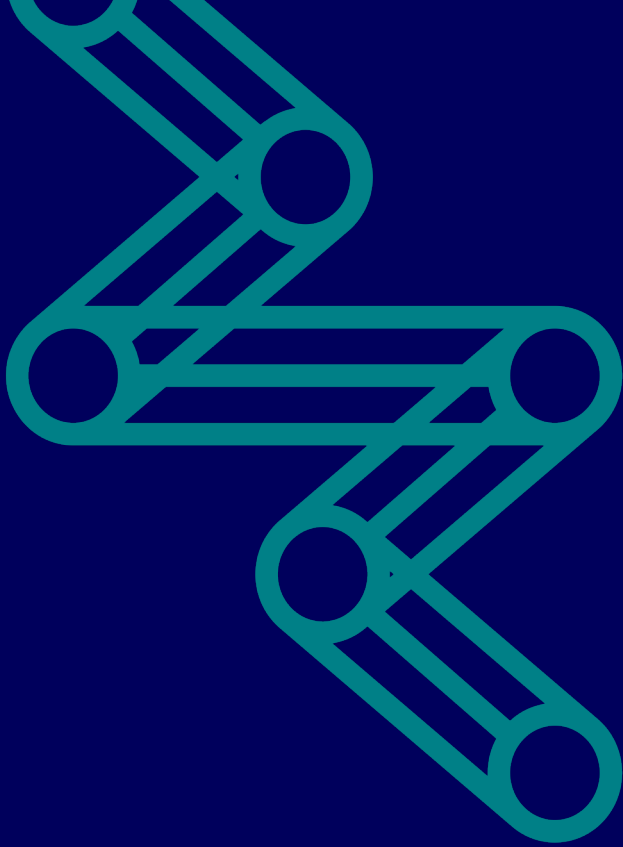
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GlobalConnect deployment

- Legacy WAN concepts/products on new bottles

  - Buzz creates confusing expectations

  - Limited documentation & knowledgebase

  - Demystify expectations and provide tangible results

  - Understand to separate the levels of complexity

    - Reminder to self: People will always understand technology on multiple levels!
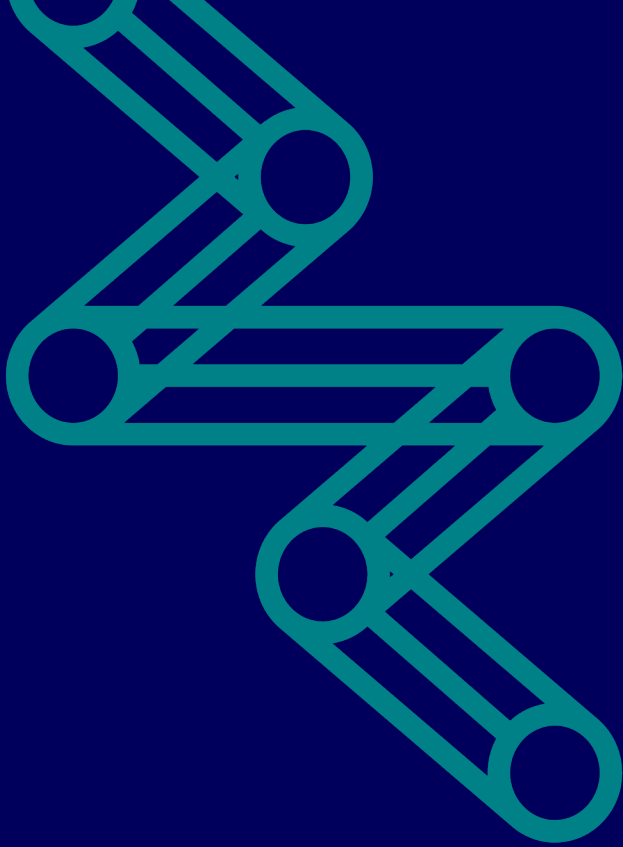
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GlobalConnect deployment

- Infrastructure is just Infrastructure

  - Datacenter: Physical & Virtual

    - Rack, Power, Hardware, Hypervisor

  - Network: Routing, Switching, Security

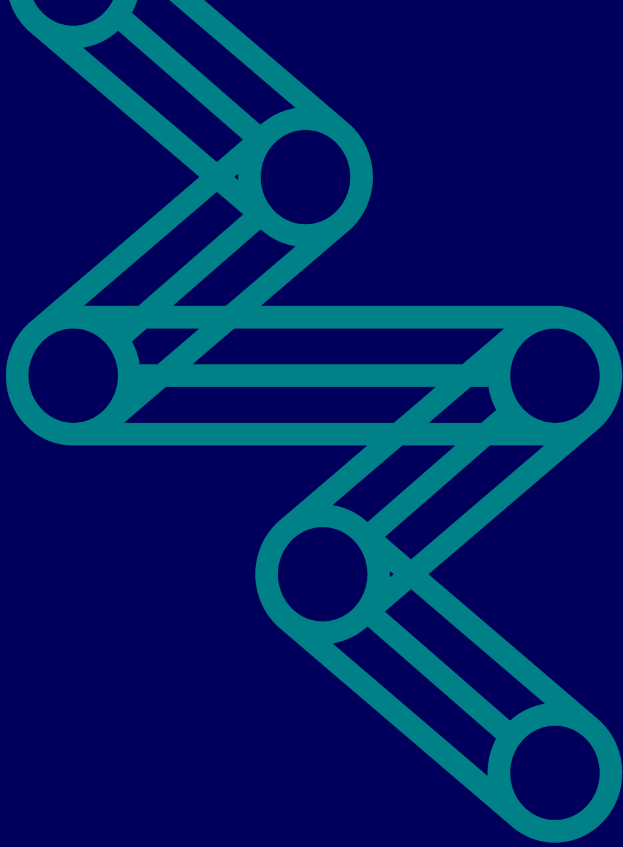   - BGP, LACP, VLAN, NAT & Policies

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GlobalConnect deployment

- The "Software Defined" WAN

  - Central Control-Plane / Local Data-plane

    - Management from controller

    - Decision power in the branch(CPE)

  - Tunnels, Tunnels, Tunnels

    - IKE, IPSEC, VTEP & SDWAN(Proprietary)

  - Automation

    - Multiple levels of automation

      - Frontend: GUI, API

      - Backend: Tunnels, Routing & MPLS

        - Endless routing instances

  - Understand the automation

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GlobalConnect deployment

Zero Touch Provisioning (ZTP):

- Nothing is just plug-in-play
    - Existing logistics processes broken
    - Provisioning requires Authentication
        - Know your Serial Numbers!
    - Outsourcing manual tasks, is not ZTP
    - One-TP != ZTP
        - URL based
        - WiFi/BT based
- True efficient ZTP would require
    - DHCP (potentially through LTE link)
        - How-to-be underlay independent?
    - Global vendor managed pre-staging / staging
    - New internal processes
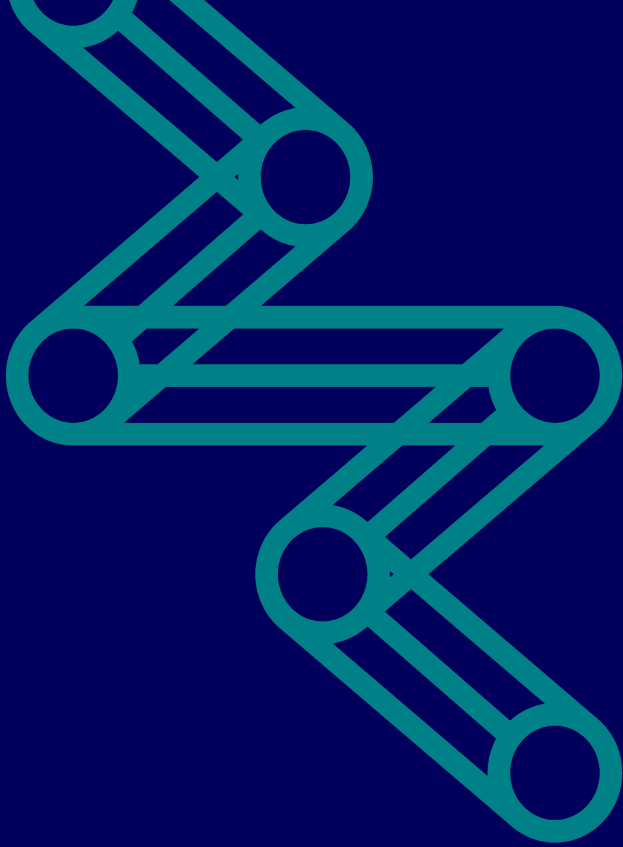
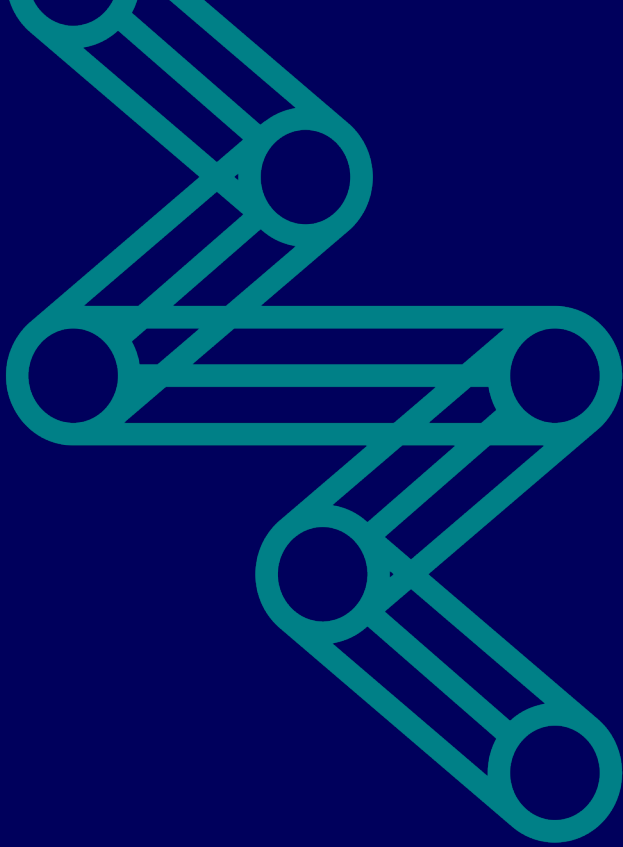**GlobalConnect**

GlobalConnect deployment

- New software, new possibilities

  - Feature complexity vs template simplicity

  - Hardware independent

    - Linux based software distribution

  - Applications & traffic steering

    - Quality of Service vs Quality of Experience

  - Security functions everywhere

    - NGFW, UTM – Yes, No, Maybe?

- Understand to limit yourself

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Corona-bonus: The uCPE

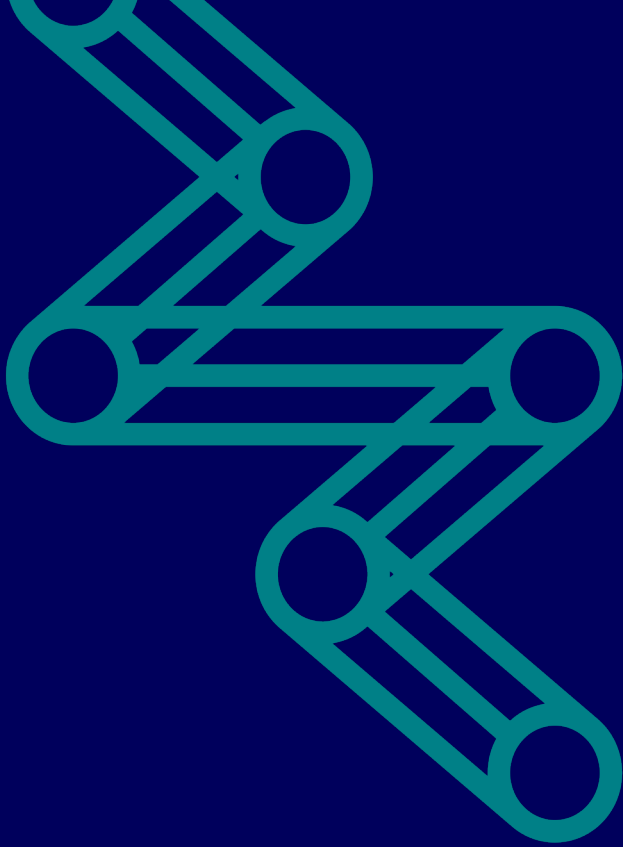- Reminding the schemes:
  - Branded
  - Certified 3rd party
  - DIY white label
- The software concepts:
  - Bare metal, hopefully full feature
  - Bare metal with limited hypervisor/orchestrator + select VNF's
  - True uCPE: Dedicated hypervisor/orchestrator + VNF's
- X86 (general purpose) + QAT (encryption acc.) + DPDK (packet fwd acc.)
- Mostly assembled and built upon source (Linux)

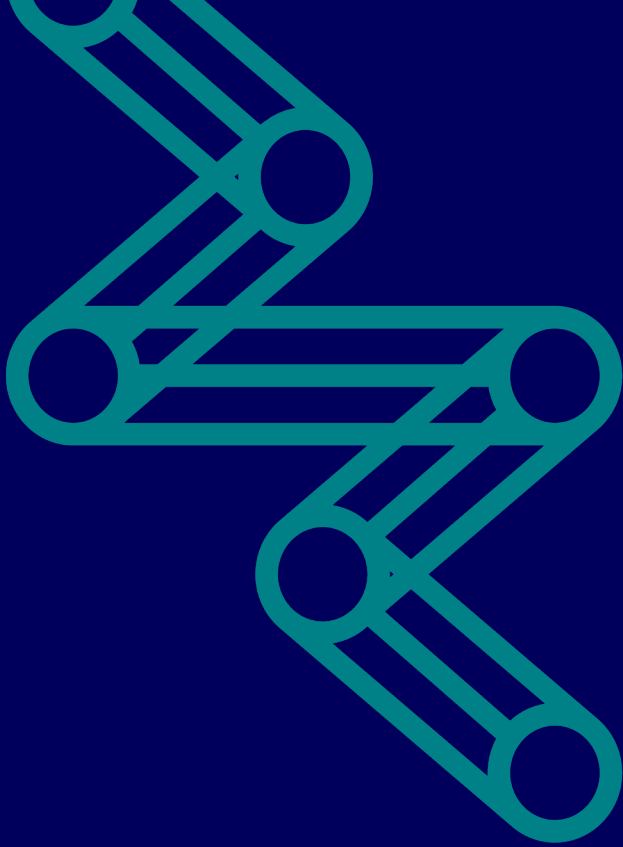**GlobalConnect**

Corona-bonus: The uCPE

The classic branch:

- Atom Rangeley C2XXX or Denverton C3XXX

- 2-8(-16) cores:

- 2-8 GB RAM

- 32-128 GB SSD:

    - UTM ~32-64 GB+

    - VNF's ~64-128 GB+

- ~2xSFP + 8 GbE: True uCPE: Any port can have any WAN/LAN purpose

- LTE CAT6+WiFi

- 4C C3XXX on Versa: 2,5G routing, 1,3G L7 FW, 800Mb VPN, 150Mb UTM, 100K sessions, 1K VPN's

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Corona-bonus: The uCPE

The mid-high end:

- Intel Xeon D D-21XXNT 2nd gen Skylake DE

- More RAM, SSD, ports

DC/Multi tenant class:

- Intel Xeon Gold Cascade Lake

  - N series to bypass speed/power scaling based latency fluctuations

- More RAM, SSD, ports

Vendors:

- Not so much classic network equipment vendors but more OEM PC

- E.g. Advantech, Caswell, Dell, Lanner, Jabil, Silicom

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