

Thoughts on Bandwidth on Demand – Services, technologies –

November 27, 2006

BoD 2006 Panel discussion

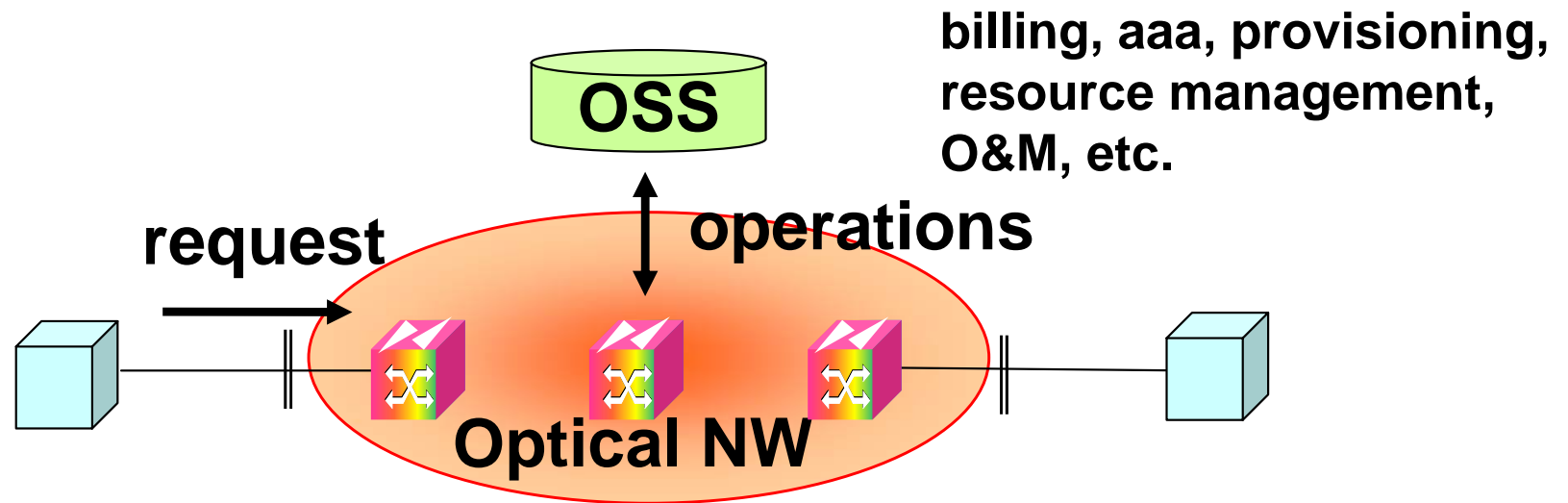
Kohei Shiomoto

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BoD services

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- Customer requests fat-pipe to network.
- Network performs operations for the request.
 - resource management, provisioning, billing, AAA, O&M, etc.

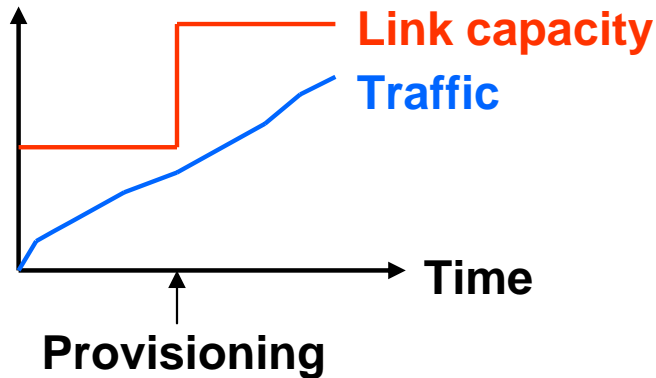


When BoD service?

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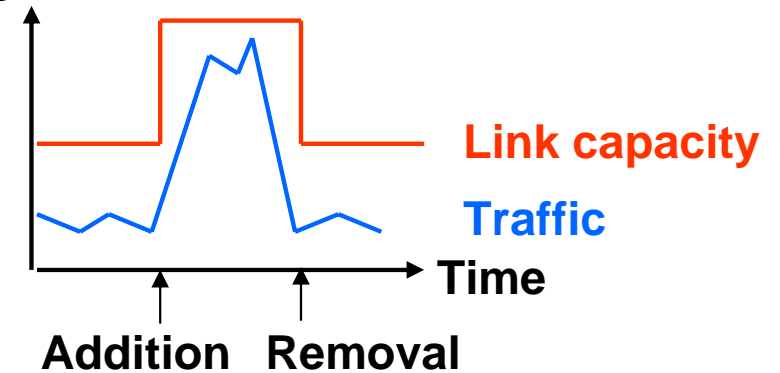
Provisioning

- Mid-to-Long term traffic growth



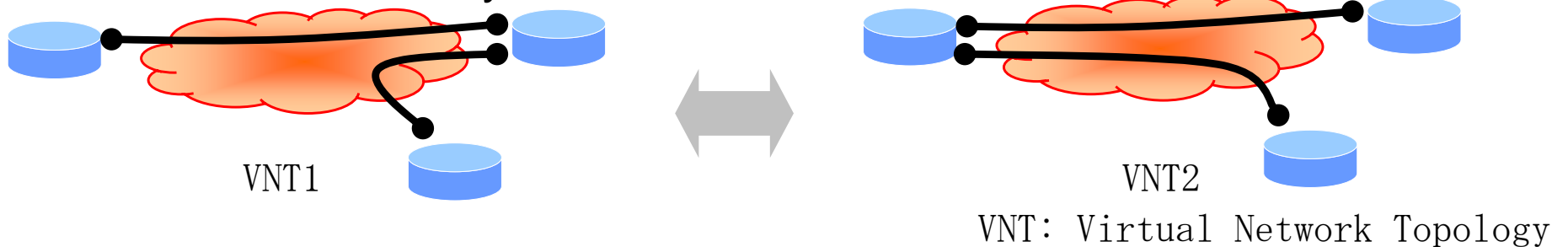
Temporal capacity addition

- Short-termed BW for sports, cultural events



Dynamic topology reconfiguration

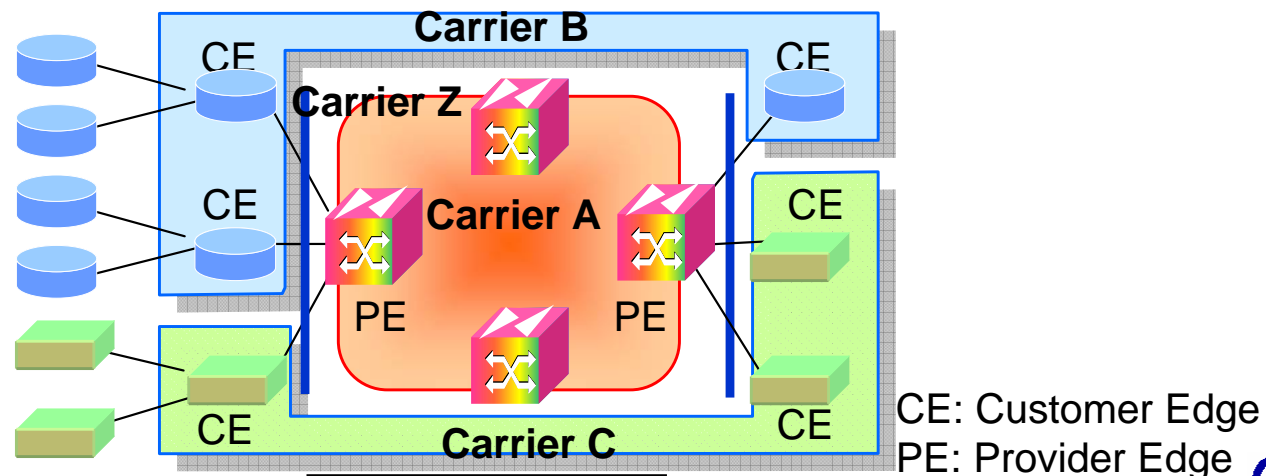
- Noon-to-night traffic variation
- Traffic variation caused by failure



Application case: carrier's carrier

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- Wholesale model
 - Carrier A offers fat-pipes to carriers B and C.
- Rationale
 - Carriers B and C do not have to invest transport networks.
 - Key question is how much do they reduce the CAPEX/OPEX?
 - Carriers B and C want to minimize CAPEX/OPEX (under constraints).
 - Ex., Minimize Cost(# of fat-pipes, # of topology changes)
 - Carrier A may save transport network investment by resource sharing.
 - Key question is How much do they expect?
 - Incentive will be needed to make traffic demand difference between networks (Adequate pricing mechanism may help).



Why is the BoD market still in its infancy?

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- Technologies
 - Complex OSS (billing, AAA, provisioning, user-friendly interface) is needed. R&D investment needs to be justified with a good size of market (Small start is tough).
- Service demand
 - Best-effort internet service is still dominant. Little incentive to avoid QoS degradation caused by traffic increase.
- Organization
 - Switched-connection is new in transport area.

Do we really have the demand?

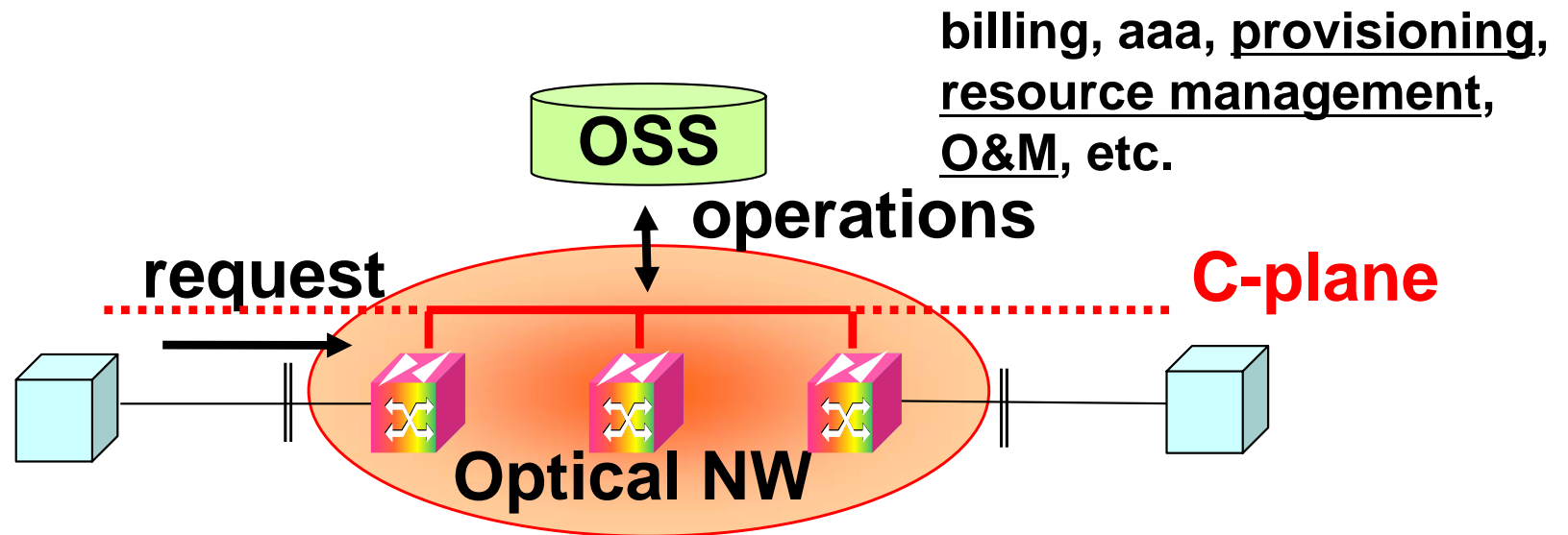
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- Business user
 - Contents transport (HD-Video, data center, etc.) will require short holding time and high-bandwidth.
- Consumer user
 - NGN may change the paradigm. Value of QoS may be realized by consumer user.
 - CAC rejects the call request when it would violate QoS. Bandwidth will be augmented to lower the call blocking ratio.

Does the control plane enable the BoD market?

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- Control plane will help to reduce the R&D cost of OSS for BoD. Small start could be feasible.
- Seamless interwork between customer and carrier could be possible.



Closing remarks

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- Good pricing mechanism.
- Control plane will reduce OSS R&D costs.
- Business model.

Thank you.

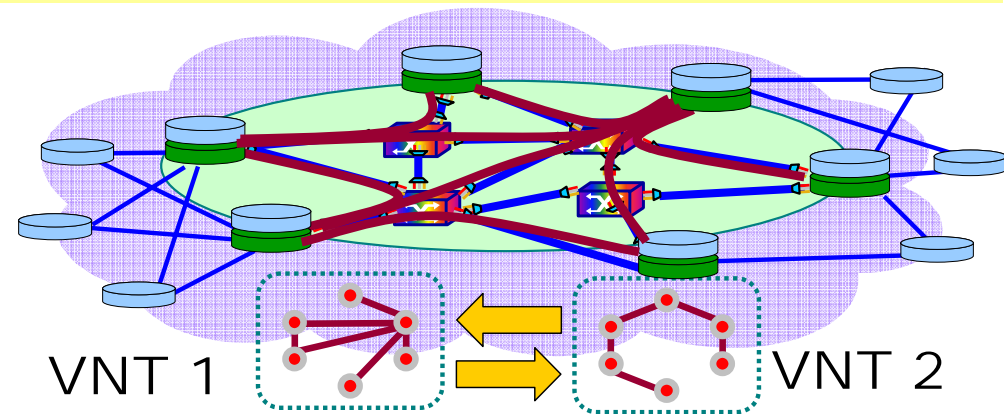
Backup slides

Virtual Network Topology (VNT)

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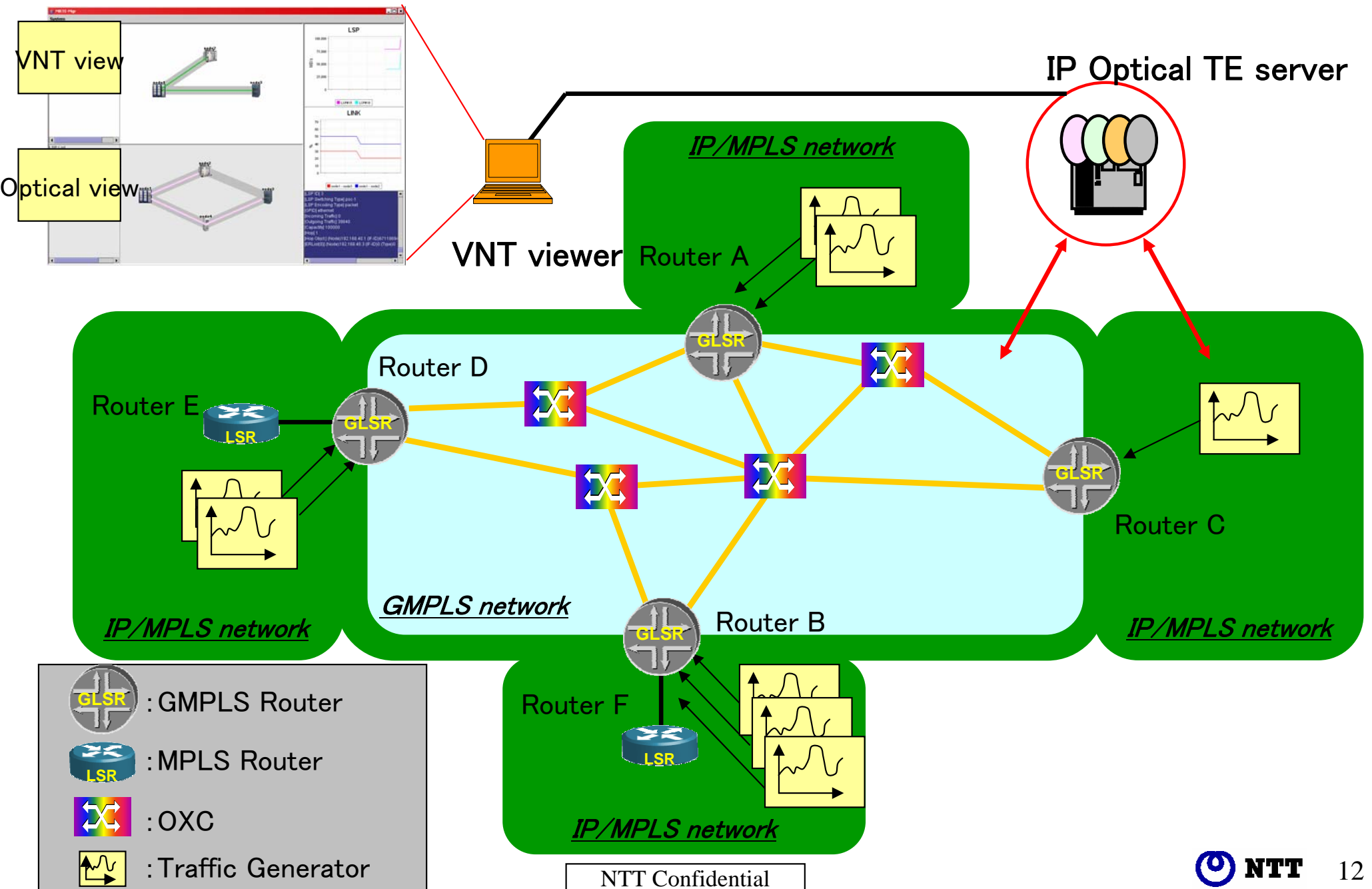
- VNT is a set of one or more of lower-layer LSPs, which provides information for efficient path handling in upper-layer
- Reconfiguration of the VNT may be triggered by traffic demand changes, topology configuration changes, signaling requests from the upper layer, and network failures

- Reconfiguration is performed by computing the new VNT from the traffic demand matrix and optionally from the current VNT.
- This method may be tailored according to the service provider's policy regarding network performance and quality of service (delay, loss/disruption, utilization, residual capacity, reliability).



VNT experimental network

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Layer 1 VPN

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- Logical separation of L1 network controlled by GMPLS
 - Separate address space
 - Network isolation (connectivity/resource/topology/fault information isolation)
 - Customer control of their VPN



- CAPEX/OPEX savings
- Fast service delivery

