Traffic Management, use cases & trends

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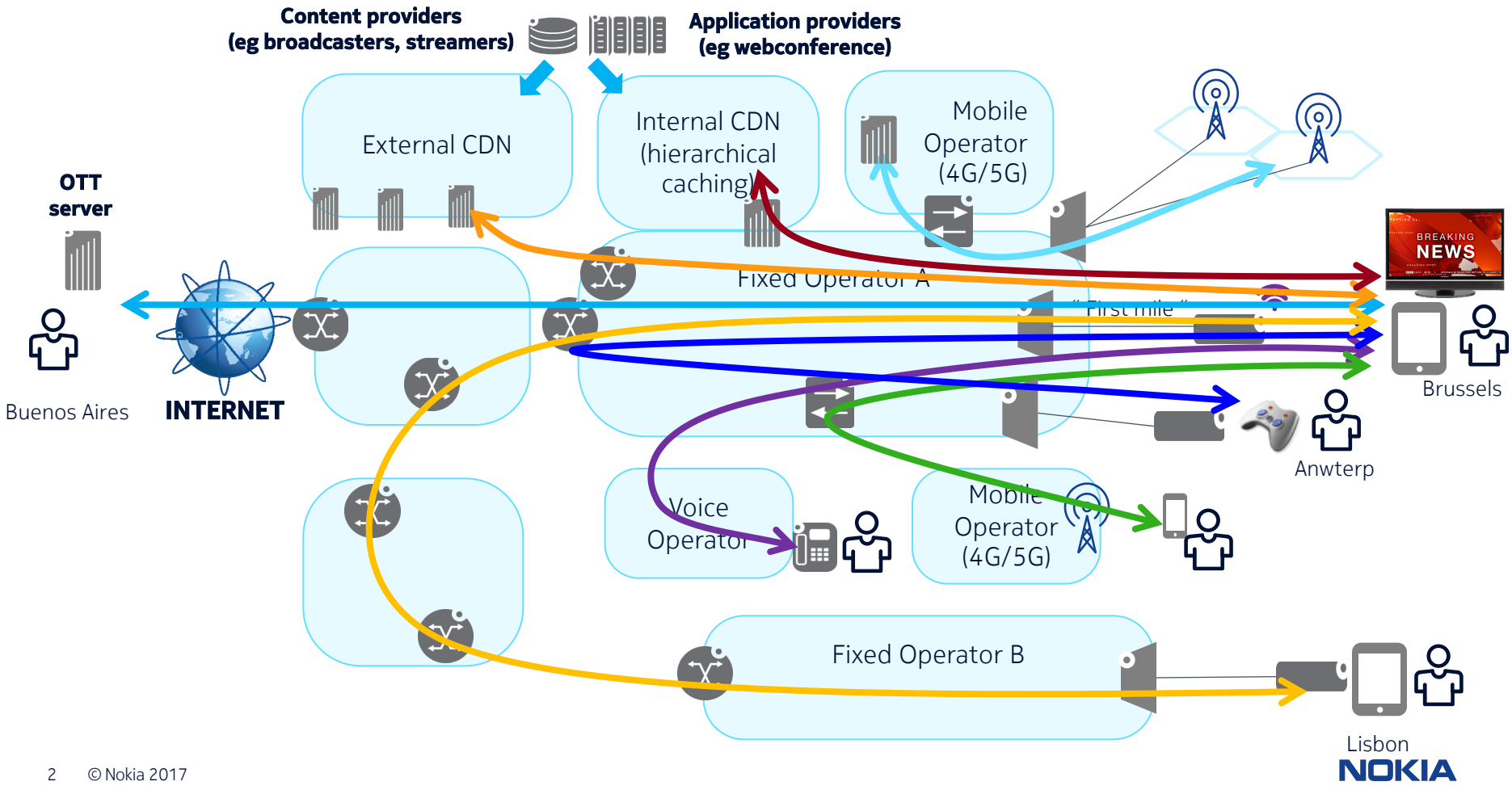
Multi-service network ➔ different connectivities and quality requirements



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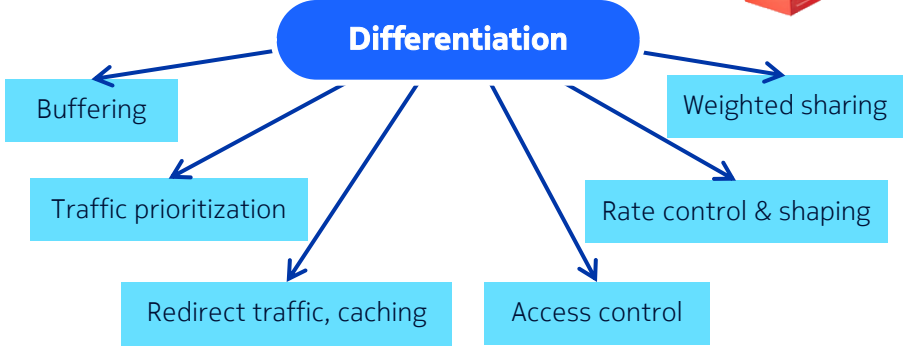
Congestion happens … but its impact is controlled by Traffic Management (TM)

GUIDELINES

- Ensure QoE per “service”
- Flexible deployment of services
- Offer traffic guarantees per user
- Fairness between users
- Dimension properly
- Protect resources against misuse

Traffic Management TOOLBOX



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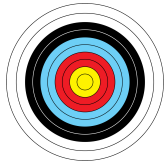
Common use cases of TM in networks

Residential
Business
Carrier

	Differentiation	Prioritization	Dedicated buffering	Access control	Rate control	Weighted sharing
Internet Access Service 	✓	Low	✓		✓	✓
Voice over IP 	✓	High-est	✓	✓	✓	N/A
Broadcast IPTV 	✓	High	✓	✓		N/A
Video on Demand (Pay TV) 	(✓)	High	✓	✓		
Business VPN 	✓	De-pends	✓	✓	✓	✓
Mobile xhaul 	✓	De-pends	✓	N/A		



Bandwidth (latency, jitter)

Low latency, low jitter

Bandwidth (Low loss)

Bandwidth (Low loss)

SLA guarantees (BW, latency, loss)

SLA guarantees (BW, latency, loss)

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Trends and innovations

Cloudification

Edge computing

Network Function Virtualization

Software Defined Networks

Goal: virtualize, centralize and reprogram network functions for higher flexibility and scalability

Rely on TM for high performance in the network (eg control plane needs low latency and zero loss)

Slicing

Per service slicing (eg optical highway for IAS)

Per VNO (open access) for infrastructure sharing

Goal: lower barrier of entry for VNO, while gaining deep control over its network slice

Rely on opening up TM (QoS control) by Infrastructure Provider to VNOs

Protocols

Data Center TCP

Adaptive streaming protocols over TCP

Goal: improve performance (lower bitrate needs, lower latency) and QoE

Rely on TM for differentiation and HW support

Quick summary

- **Networks are designed to carry multiple services**
- **Congestion is unavoidable, but can be mitigated by Traffic Management**
- **TM is applied in networks today for many services and their requirements**
- **… and will continue to accompany trends and innovations**

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