

***Quality of service control:  
a manageable and innovative approach***

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international ip interconnection



# Why QoS?

- Willingness to offer high quality routes
  - Especially strong request from mobile operators for IPX
- There is a need to evaluate QoS:

## Key Performance Indicators

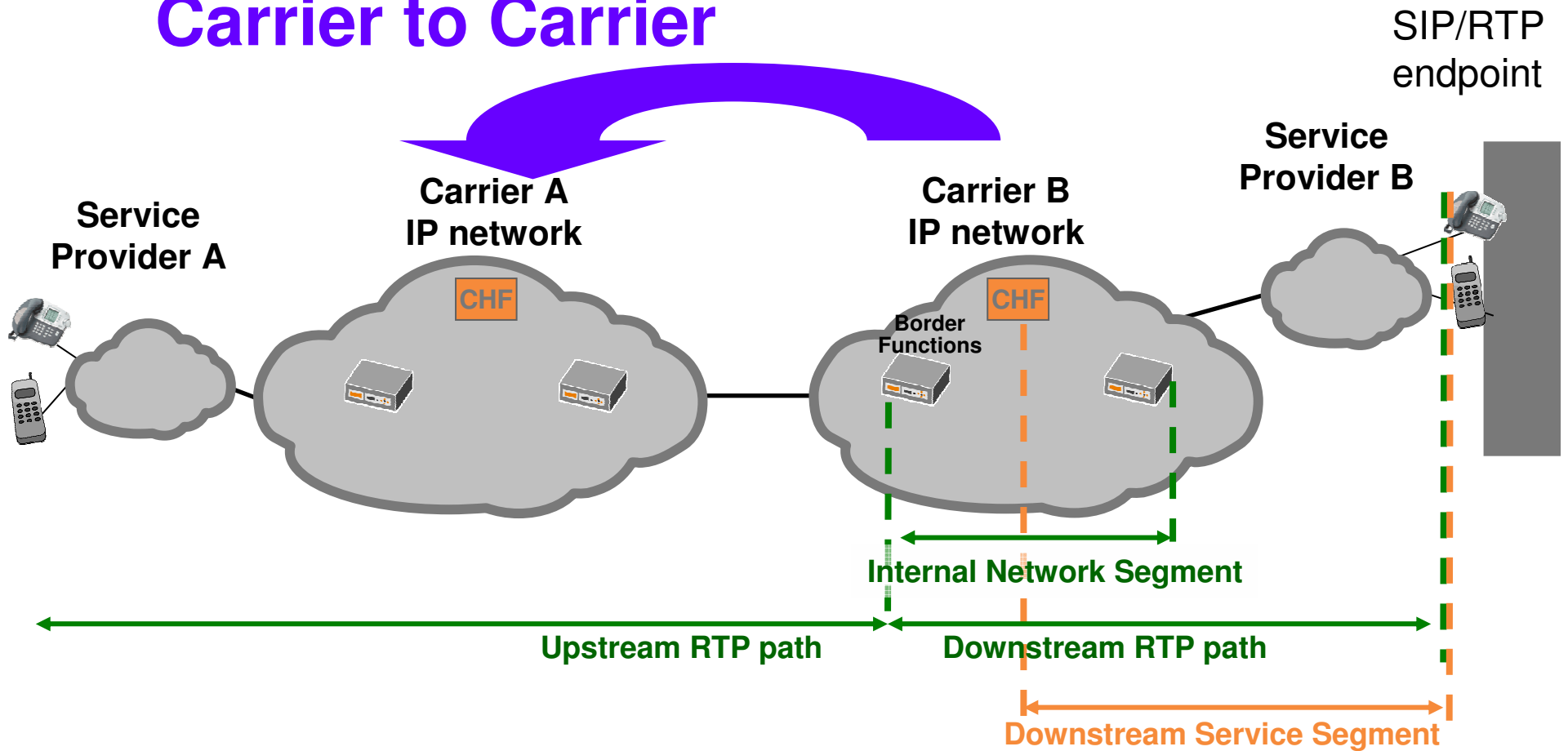
- Monitoring
- Troubleshooting
- Service Level Agreement (SLA) and Quality of Service reporting
  - => responsibility, dispute...

# Carriers' relationship

- The carrier offers a service to
  - A Service Provider
  - Another carrier upstream

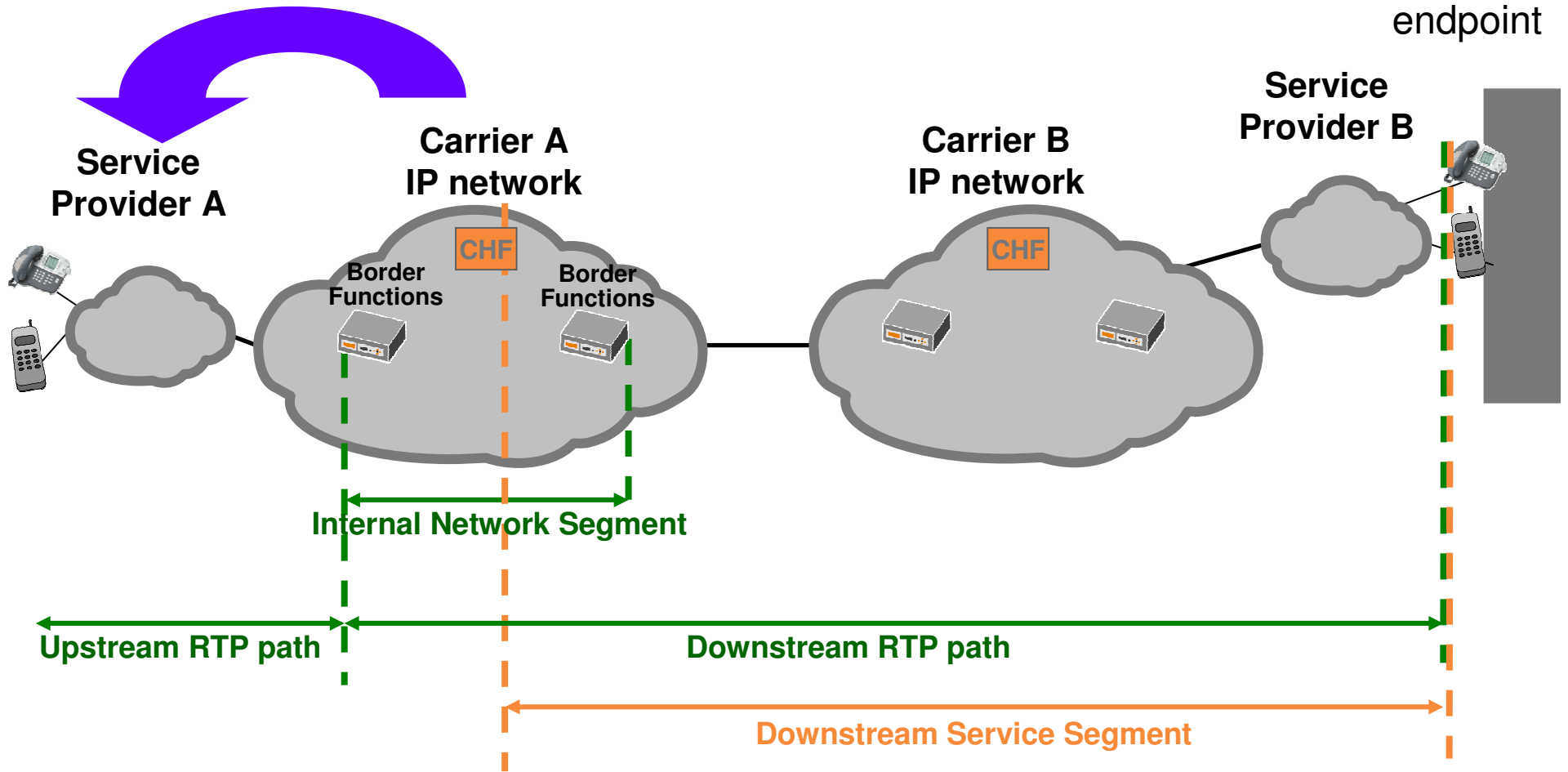


# Carrier to Carrier



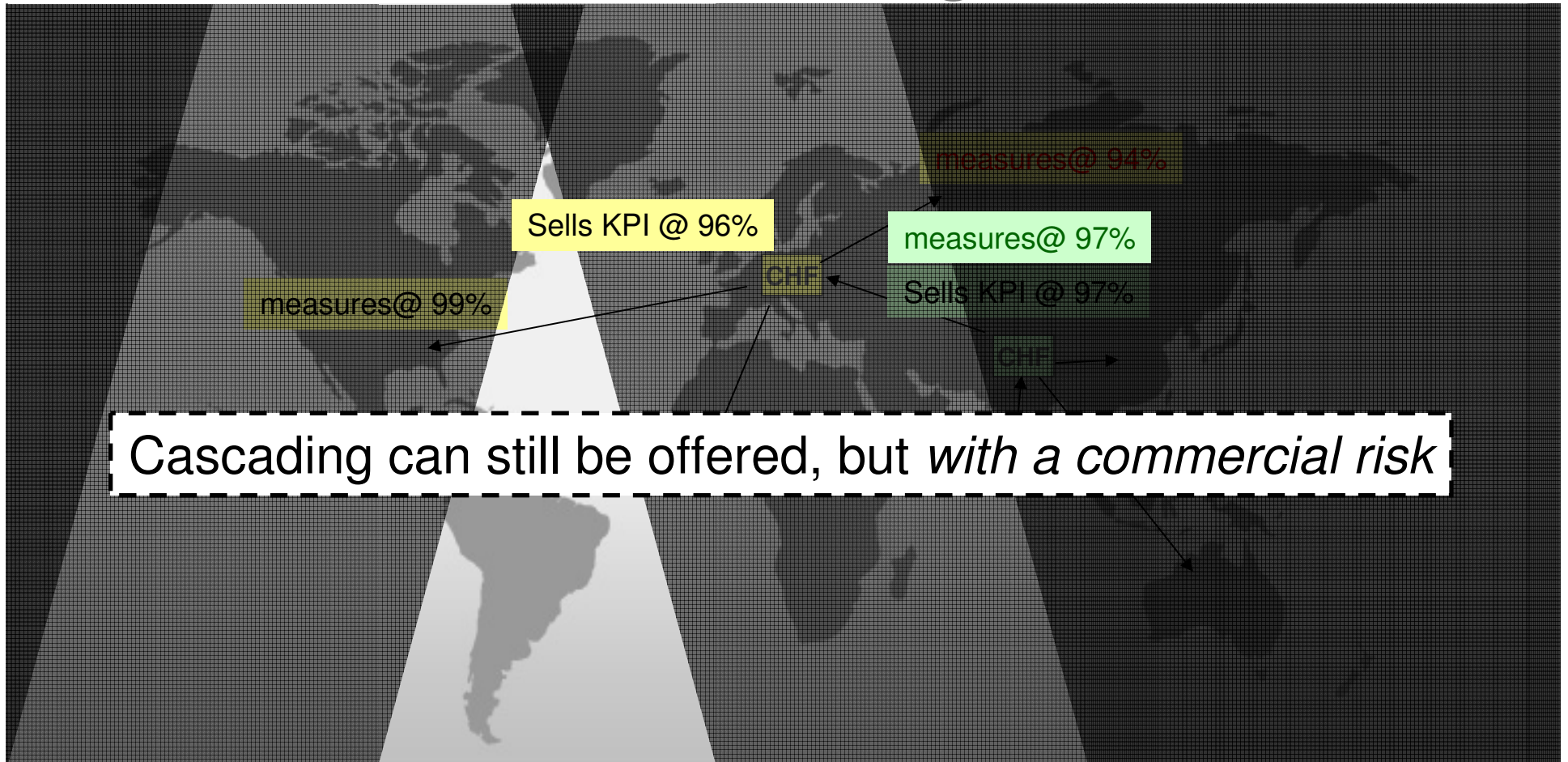
- Depending on the KPI, different segments are relevant

# Carrier to Service Provider



- The carrier could report KPIs for its own network and for the full path down to the final destination
  - No need for the customer to check central database
  - Responsibility can be cascaded

# Limitations of cascading



Cascading can still be offered, but *with a commercial risk*

# KPIs @ i<sup>3</sup>forum

*Dependent on Carriers and SPs*

## Service parameters

NER	<i>fully</i>	Call setup
ASR	<i>partially</i>	(Signalling behaviour)
PGRD	<i>fully</i>	

ALOC	<i>partially</i>	Conversation quality
MOS	<i>fully</i>	

## Call attributes

CLI Transparency	<i>fully</i>	Call setup
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## Transport parameters

Round-Trip Delay	<i>fully</i>	Conversation quality
Jitter	<i>fully</i>	(transport behaviour)
Packet Loss	<i>fully</i>	

## Operations parameters

MTRS - Maximum Time to Restore the Service	Network operation
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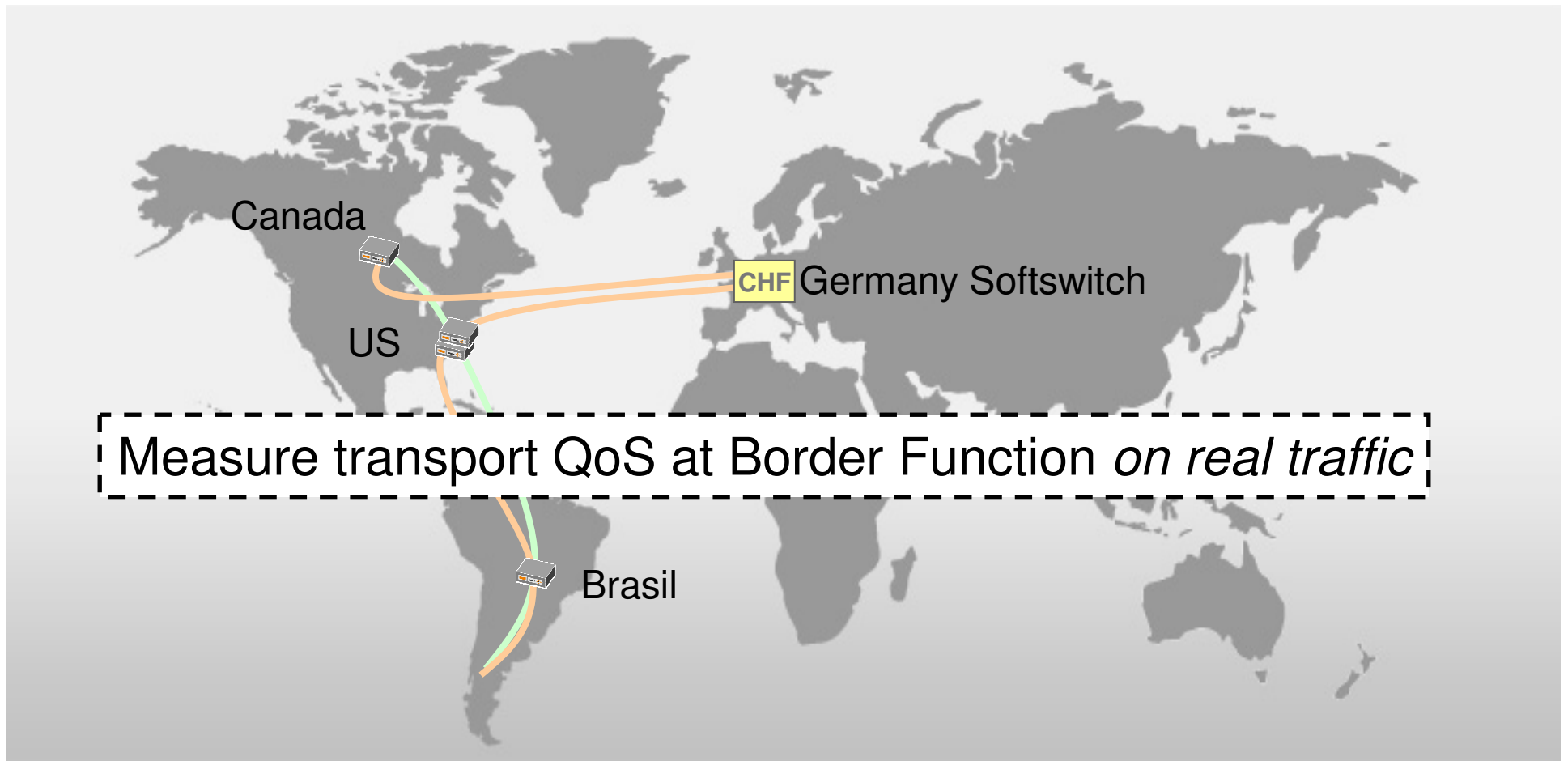


# KPIs @ i<sup>3</sup>forum

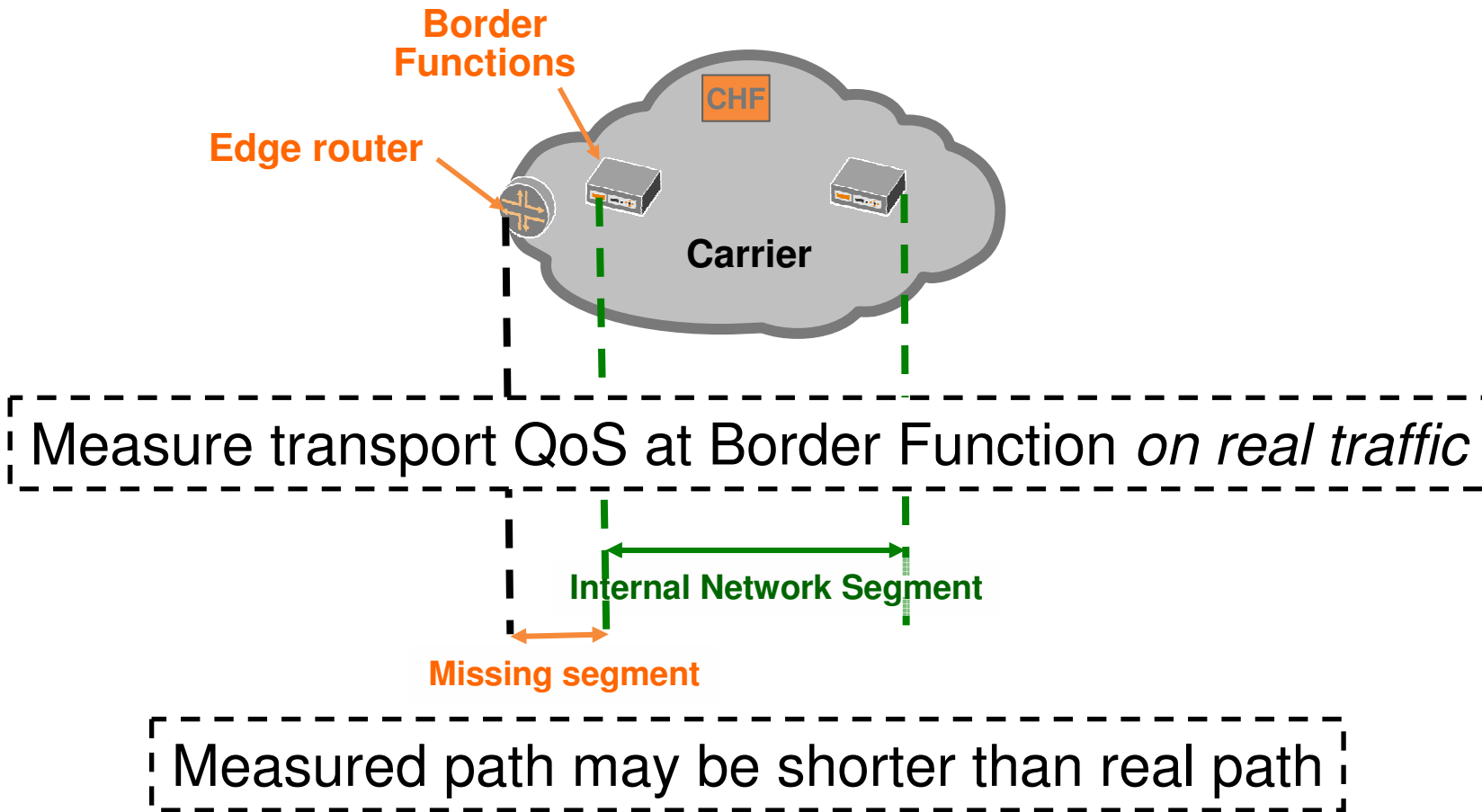
- CLI transparency not considered a technical KPI as such
- But it is strongly recommended that international carriers will pass on CLI unaltered
- MTRS is also not a technical KPI as such



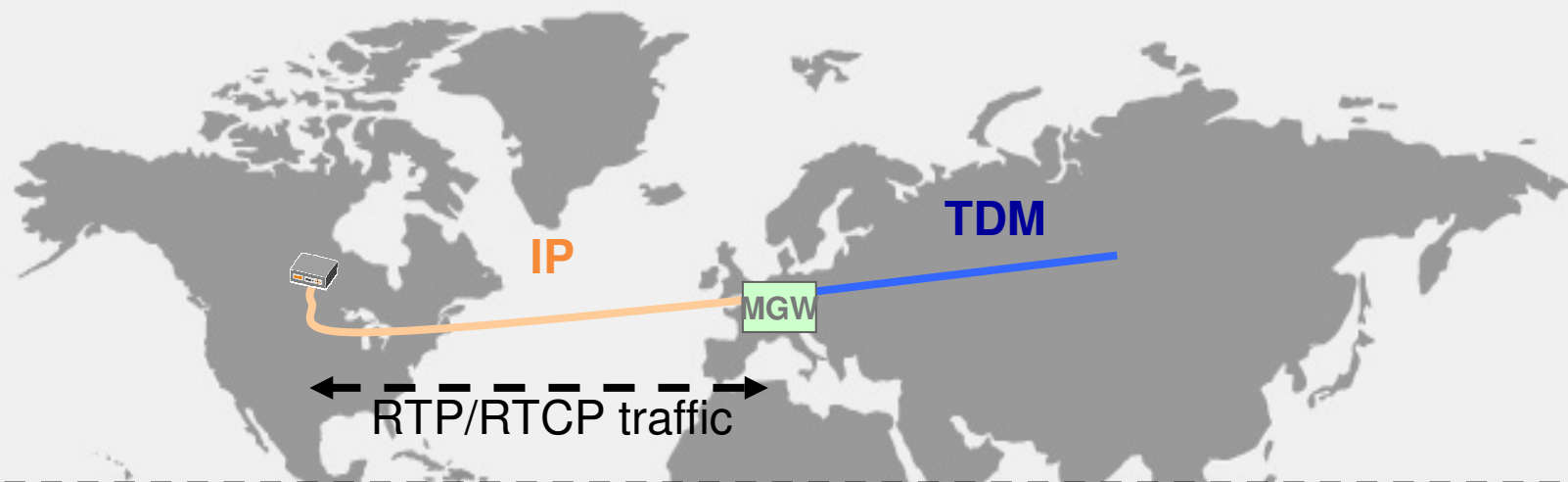
# Mere **IP traffic** vs. **VoIP traffic**: where to measure



# Mere IP traffic vs. VoIP traffic: where to measure



# Media measures

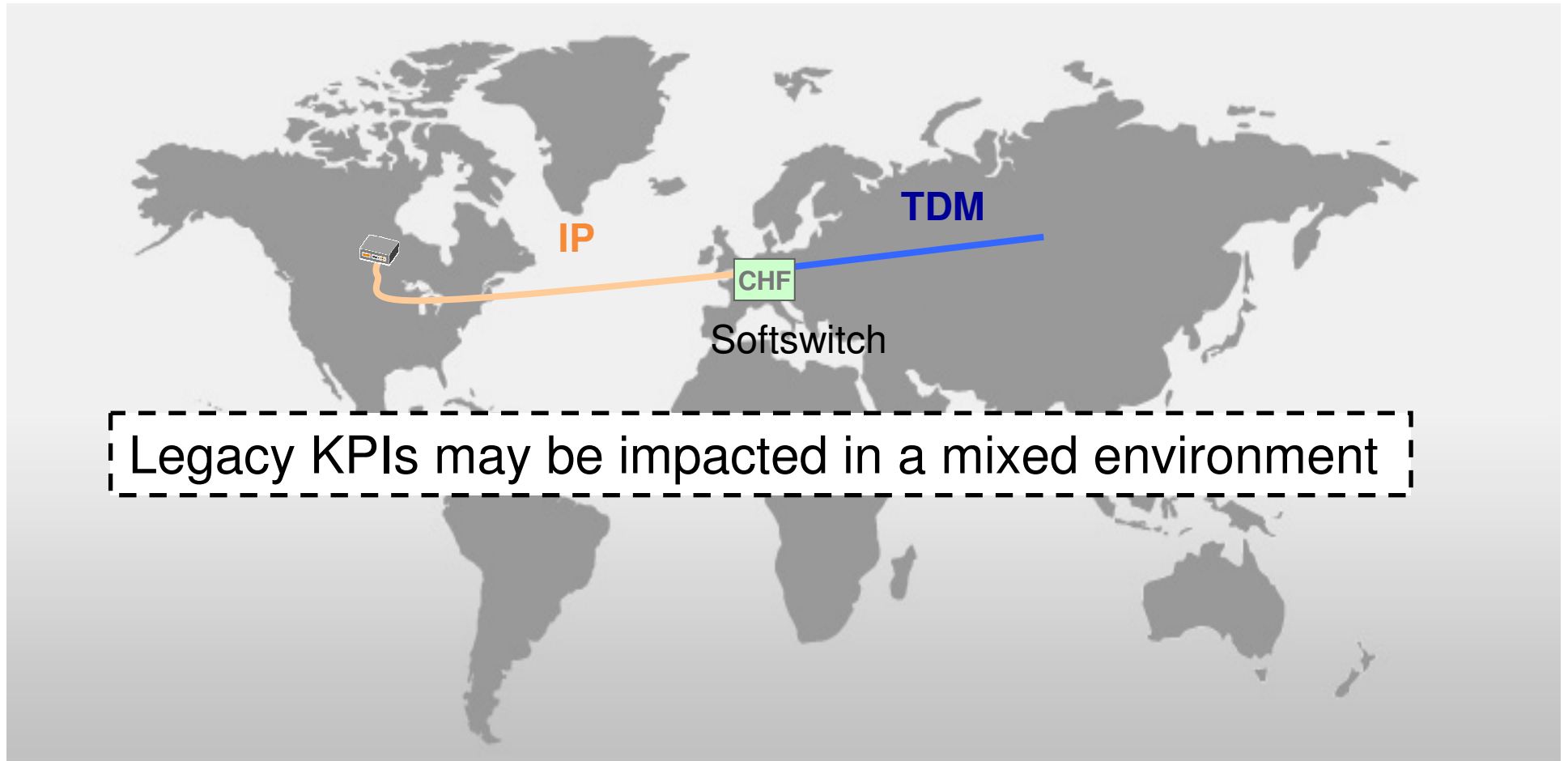


IP transport measures are limited to IP (including MOS)

KPI measures may require RTCP (e.g. MOS)

➤ source needs to send RTCP, and transit to let it through

# Mixed IP-TDM environment: signalling



# Other related activity

- **GSMA** has defined similar KPIs
  - AA.80 & AA.81 Service Schedule
- **IETF** “Basic Telephony SIP End-to-End Performance Metrics”
  - draft-ietf-pmol-sip-perf-metrics
- **3GPP** “Key Performance Indicators (KPIs) for IMS”
  - Key Performance Indicators (KPIs) for IMS
- **MSF** “MSF Whitepaper on Quality of Service (QoS) over the Network-to-Network Interface (NNI)”
  - Overview of the SDO approaches

# Conclusion

- Service Providers are looking for **better than the Internet**
  - although Service Providers may have different requirements
- **SLAs are a commercial matter** under responsibility of each carrier
  - i<sup>3</sup>forum does not define SLAs
  - i<sup>3</sup>forum gives tools to build SLAs
- Pragmatic approach.
  - It is important to understand **the meaning of KPIs**
    - in particular in a mixed IP-TDM environment
    - i<sup>3</sup>forum helps share a common understanding

# Thank you!



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i<sup>3</sup> forum

