amsix
amsterdam internet exchange

GRX and IPX

RIPE 66

16-May-2013

Thomas O'Sullivan

Agenda

-GRX brief background and setup

-GRX to IPX, what's changing?

-IPX GSMA recommendations

-IPX Implementation AMS-IX Amsterdam

GRX

(a slightly lesser known AMS-IX service)

So what is GRX ?

- GRX = GPRS roaming exchange.
- Exchanging GPRS and 3G roaming data.
- Private IP network (separate from the internet).
- Limited to GSM operator community.

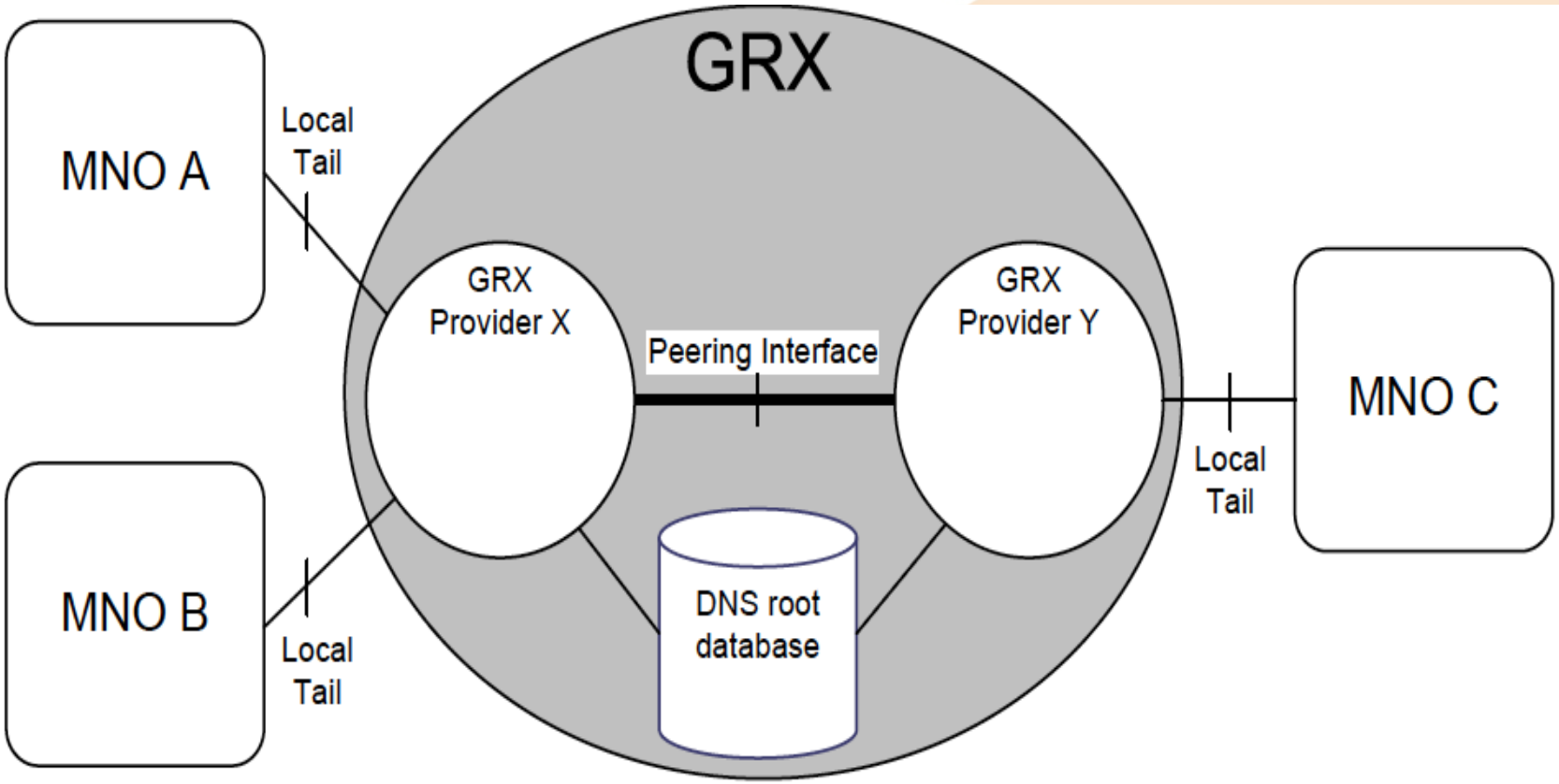
GRX

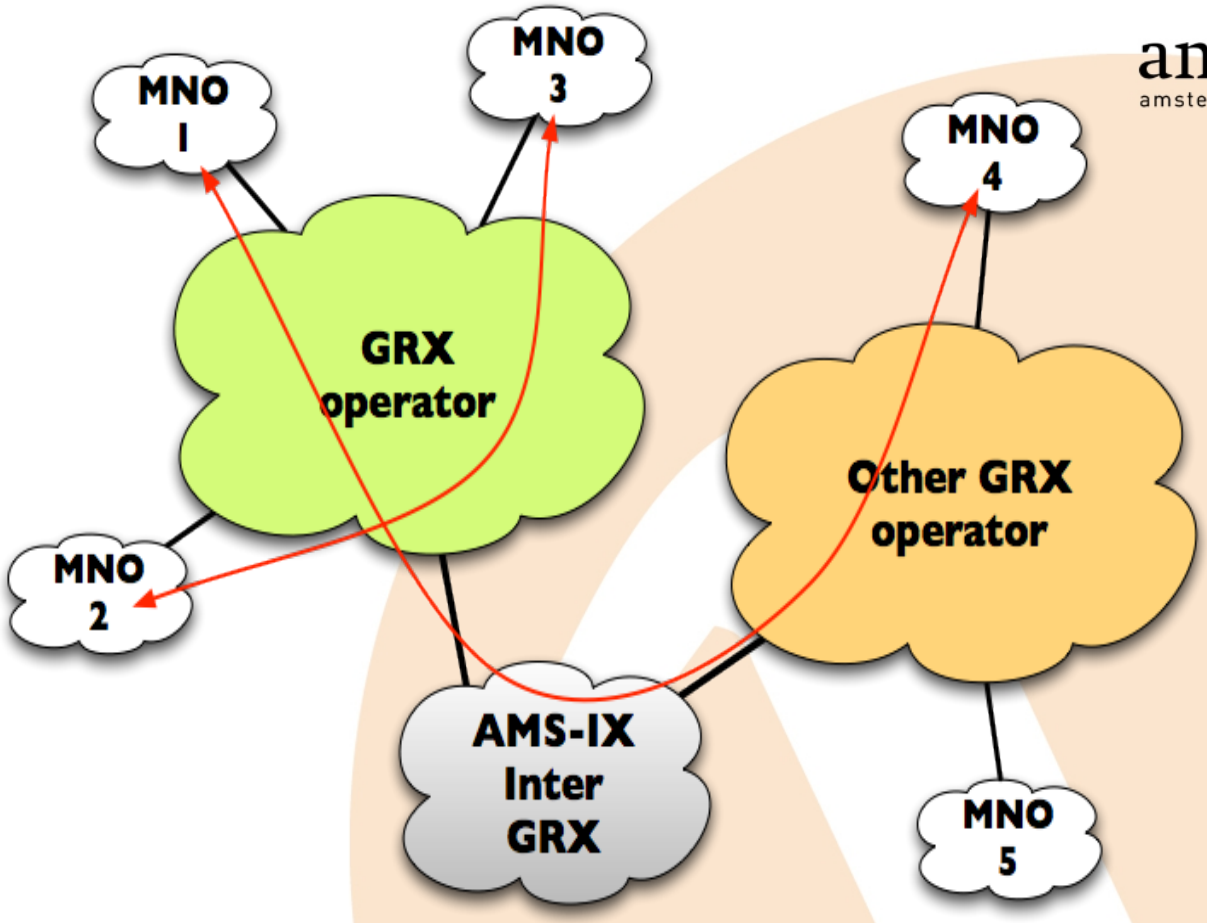
- Since 2002 AMS-IX offers its GRX platform (CUG) to carriers that interconnect MNO'S for **data roaming** purposes:

- Technical: GRX VLAN, GSMA supplied Root DNS and dedicated equipment and connection

- Administrative ('accreditation'): Memorandum of Understanding

- AMS-IX the main GRX peering point globally, interconnecting 25 GRX providers.


GRX
MNO A
Local
Tail
GRX
Provider X
Peering Interface
GRX
Provider Y
MNO C
Local
Tail
MNO B
Local
Tail
DNS root
database



AMS-IX 'Inter-GRX' platform to allow for data roaming

GRX members on AMS-IX platform

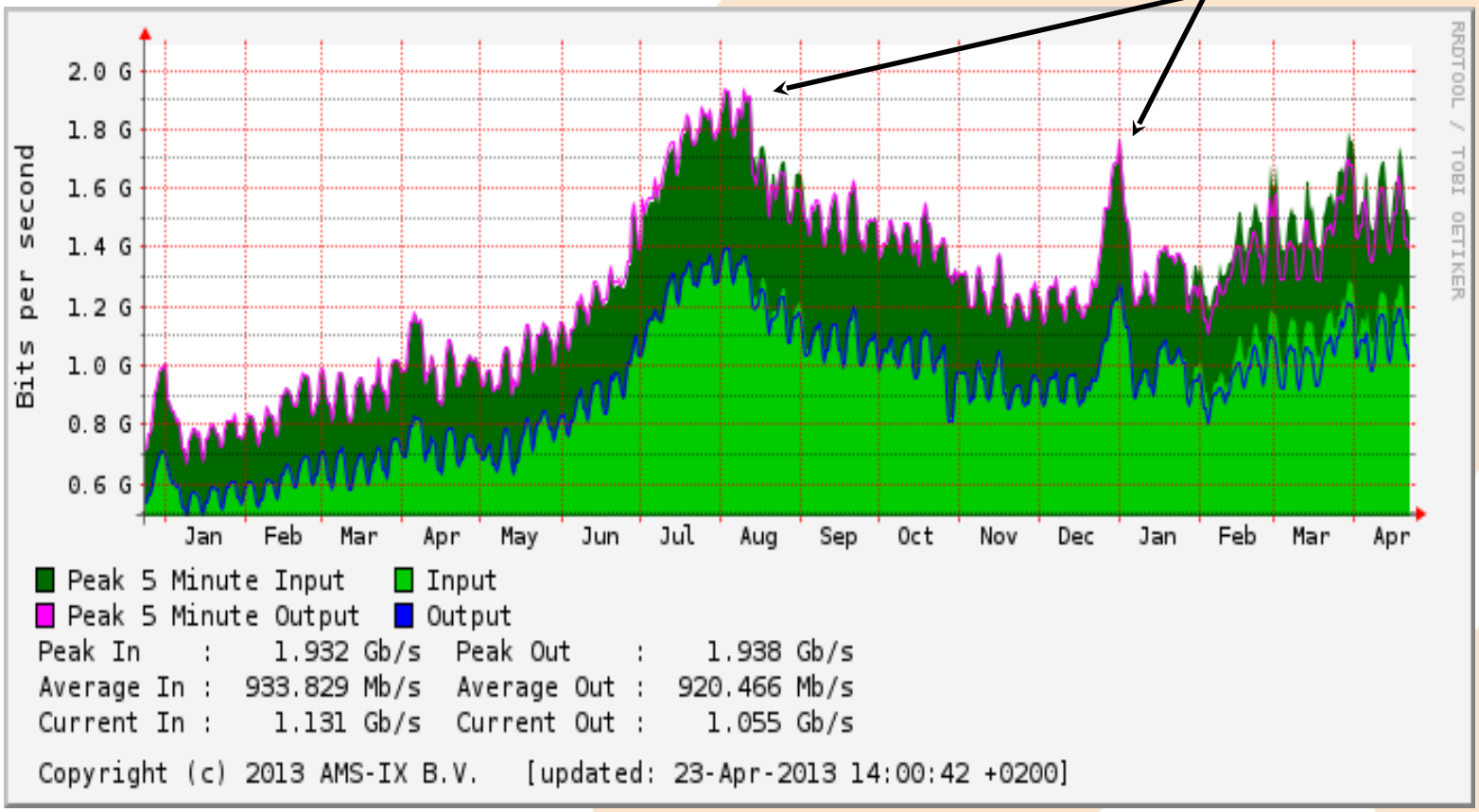
Aicent
Astelnet
Belgacom ICS
CITIC Telecom
Comfone AG
Deutsche Telekom
Emirates Telecommunications
France Telecom
iBasis
MTT
MTX Communications
NTT Communications
OTEGlobe
Portugal Telecom
SAP (form. Sybase 365)
Syniverse
Tata Communications
TDC Solutions
Tele 2
Telecom Italia Sparkle
Telefonica IWS
Telekom Austria
Telenor Global Services
TeliaSonera ICS
Telstra

https://www.ams-ix.net/connected_parties

These 'GRX providers' interconnect their customers, MNOs

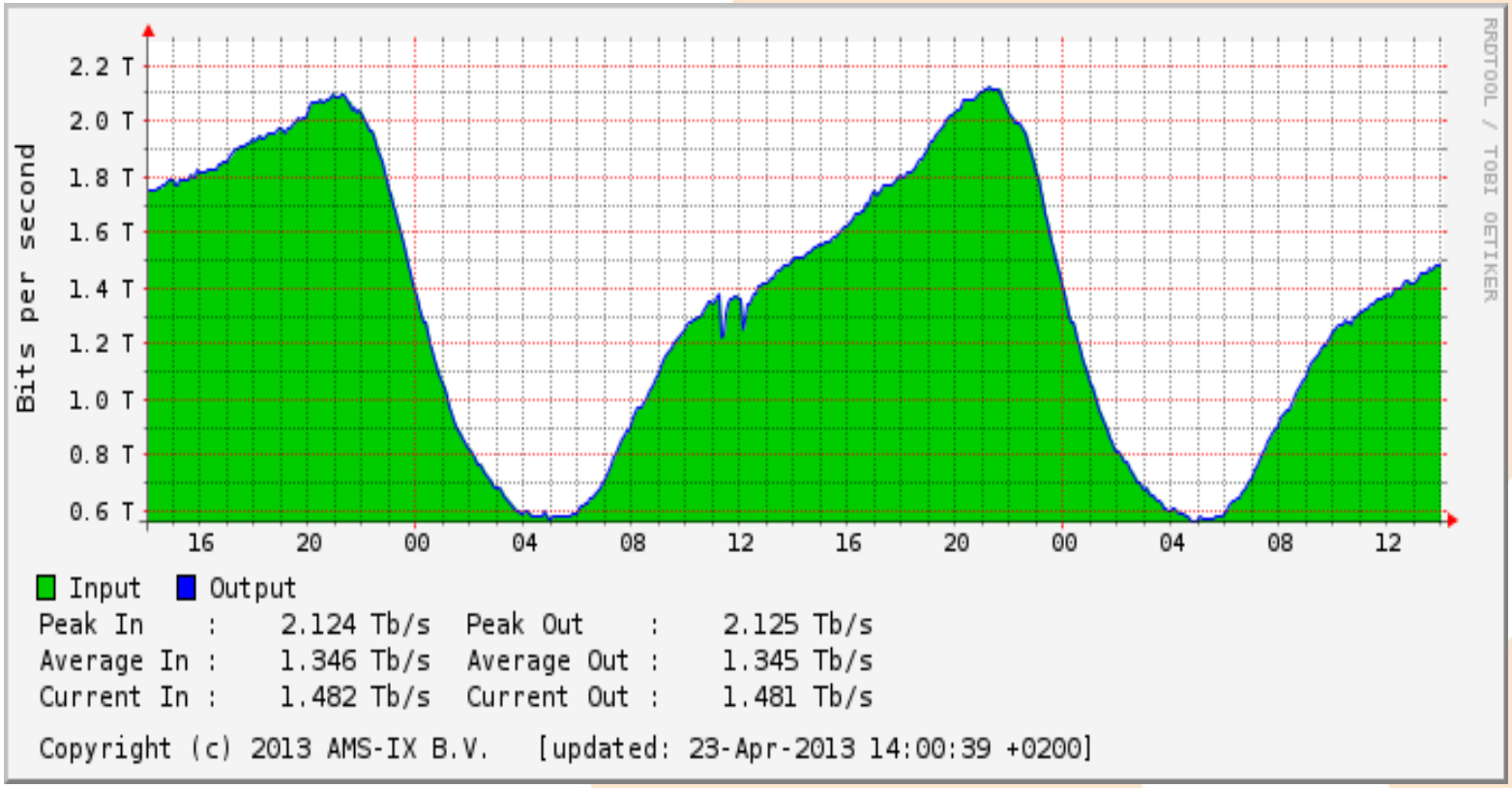
GRX Traffic

Peaking during summer and new years' eve



https://www.ams-ix.net/technical/statistics/grx-statistics

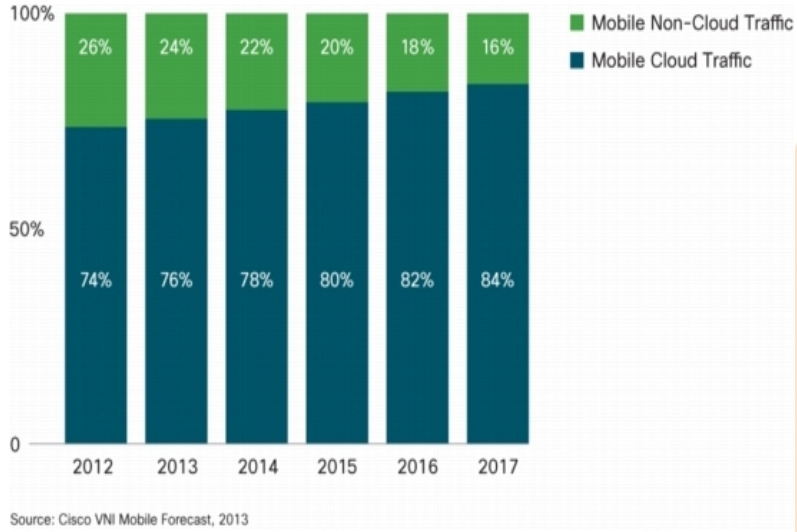
To put this into perspective...

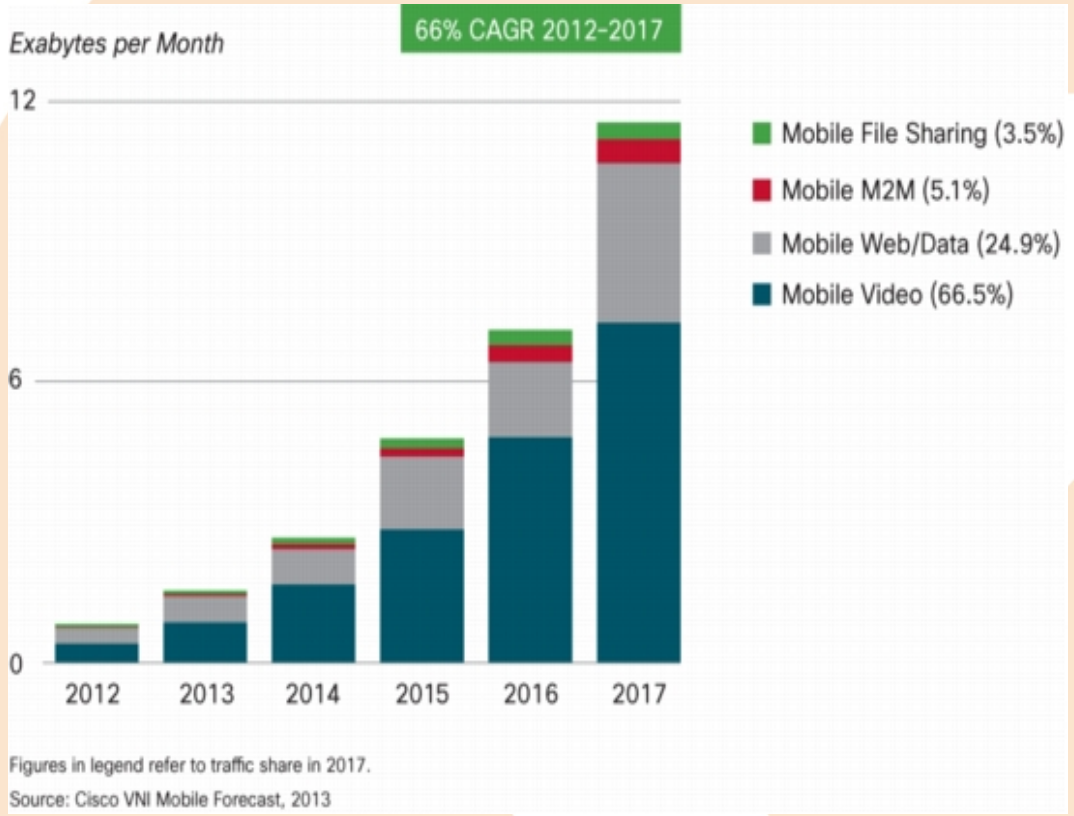


So GRX traffic does not even amount to 0.1 % of the total amount of traffic passing through the AMS-IX switch fabric...

https://www.ams-ix.net/technical/statistics

Growth of Mobile Internet Traffic continues to explode





From Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update, 2012–2017

At AMS-IX GRX traffic growth is twice that of 'regular' internet traffic

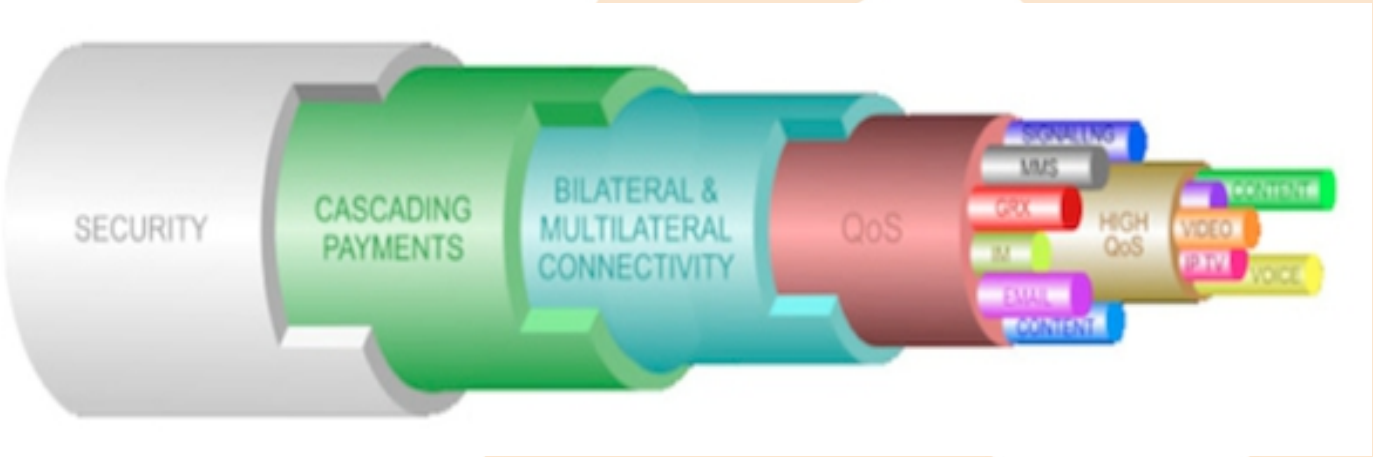
However, what about the long term ‘best effort’ GRX-business case?

- Roaming rates under (regulatory) pressure.
- Volume of voice minutes continues to drop.
- End users using OTT players.
- Multimedia ip-services need to be accessible to end-users ‘securely’ and without ‘delay’, no matter how and where they connect: not supported by GRX
- Does future (roaming over) **LTE** require **QoS?**

‘Broadening the scope’

GRX “evolved” to IPX

So in 2007 GSMA defined the IP eXchange, the ‘IPX’:



“ Inter-Service Providers IP Backbone Guidelines PRD IR.34”

Core Enhancements GRX to IPX

- Introduces additional stakeholders –content providers, FNOs, ASP's etc
- IPX requires 'end to end' guaranteed QoS and security: cascading SLA's and billing
- Different service classes are defined - GRX is just one of the services within the IPX environment, in a 'lower' service class

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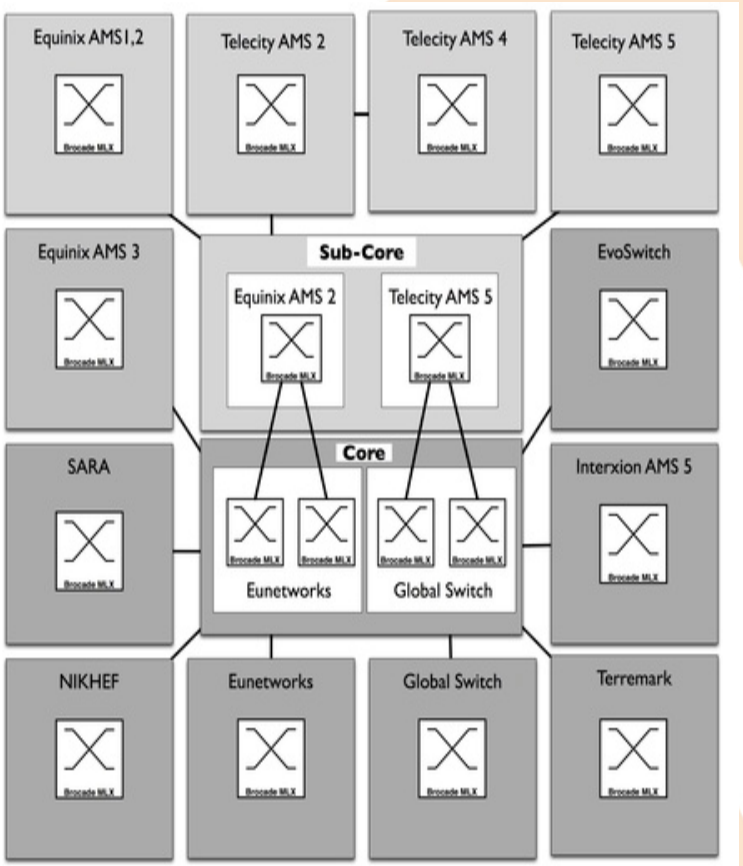
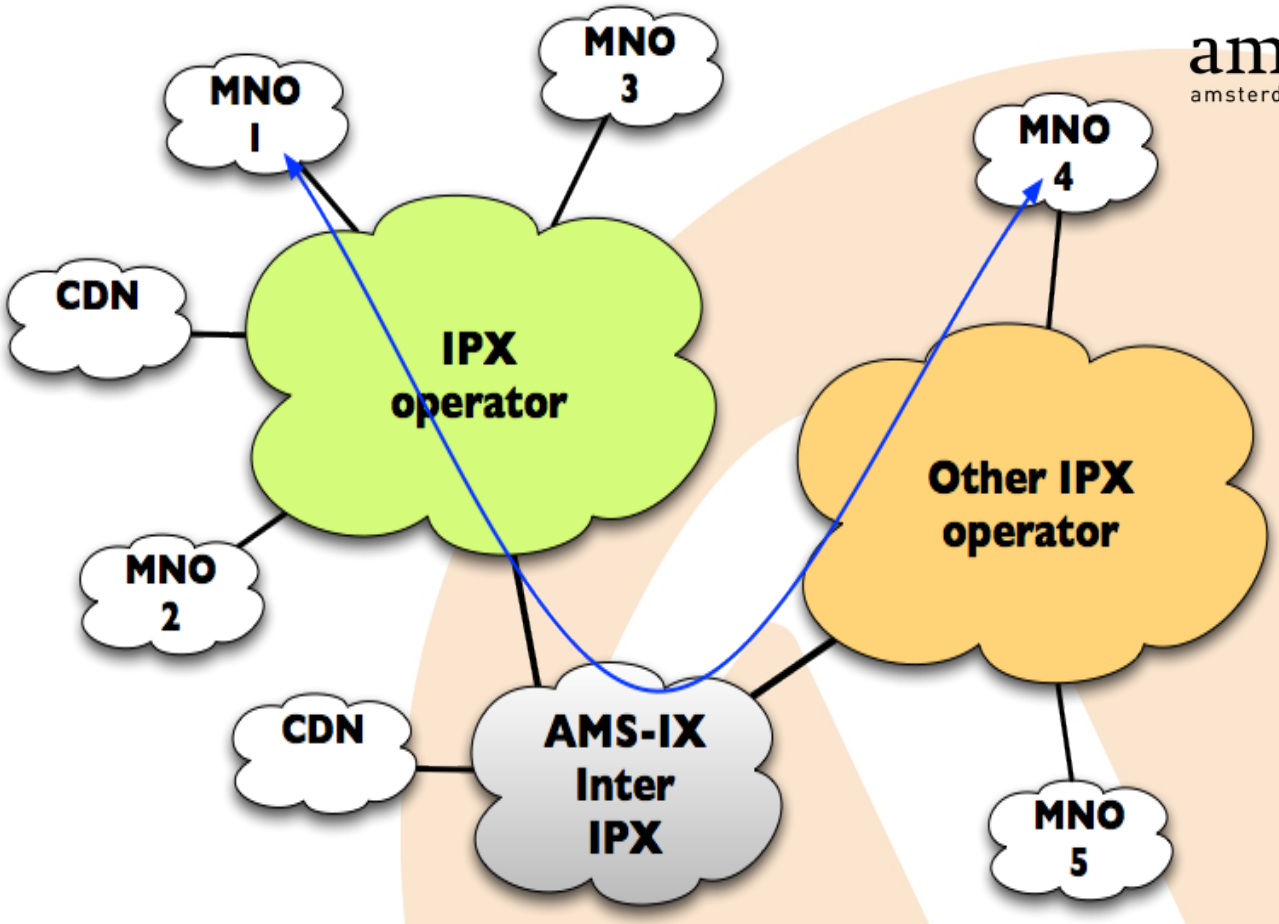
Idea in 2010: AMS-IX as a catalyst for IPX?



Excellent historic ‘best effort’ track record of neutral one-stop-shop AMS-IX: platform performance and availability of service, as well as capability to handle expected traffic growth



AMS-IX Inter-IPX

- AMS-IX created an IPX Interconnect peering platform, according to industry requirements:

- Separate IPX VLAN, minimum of two (redundant) customer ports per connection, on different ‘certified’ AMS-IX co-locations

- AMS-IX committed to KPI’s as mentioned in IR.34, based on highest service class (‘conversational’) requirements

- Introduce one AMS-IX IPX Interconnect SLA

- Monitoring and reporting to show SLA compliance: probe set-up
- http://www.ams-ix.net/inter-ipx/

Traffic Classes (GSMA IR34)

Application	protocol	PHB	Potential QoS class name
VideoShare	N/A	EF	Conversational
VoIP	RTP	EF	Conversational
Push to talk	N/A	AF4	Streaming
Video streaming	N/A	AF4	Streaming
Unrecognized GTP traffic	N/A	AF3	Interactive
DNS	DNS	AF3	Interactive
Online gaming	N/A	AF3	Interactive
WAP browsing	GTP_C, GTP_U	AF2	Interactive
WEB browsing	N/A	AF2	Interactive
Instant messaging	N/A	AF1	Interactive
Remote conn.	SSH, telnet	AF1	Interactive
Email sync	N/A	BE	Background
MMS	SMTP	BE	Background

AMS-IX will not distinguish between service classes but will focus on the aggregate KPI's that apply to the highest class : ('conversational' /EF)

GSMA IR.34 QoS Parameters

- Service Availability
- Packet loss
- Delay
- Jitter

GSMA IR.34

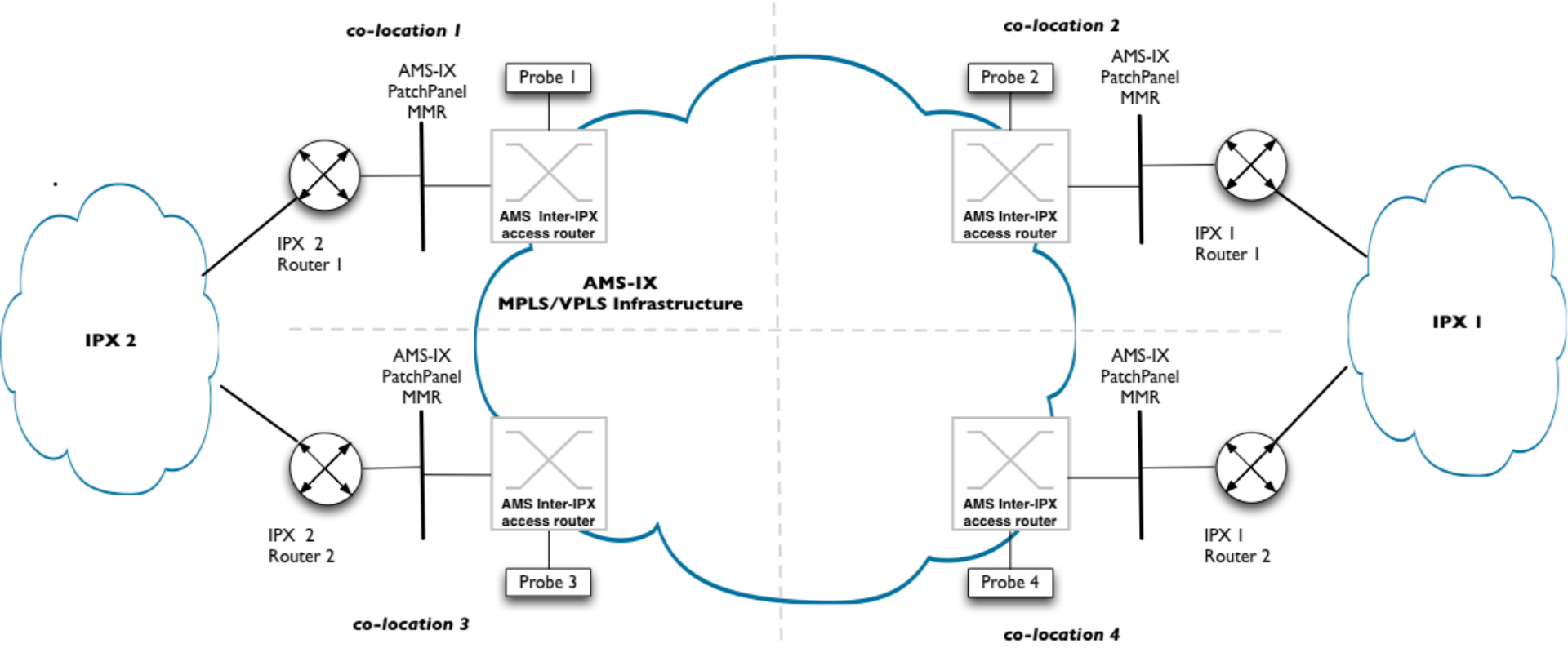
Availability : 99.995% per month

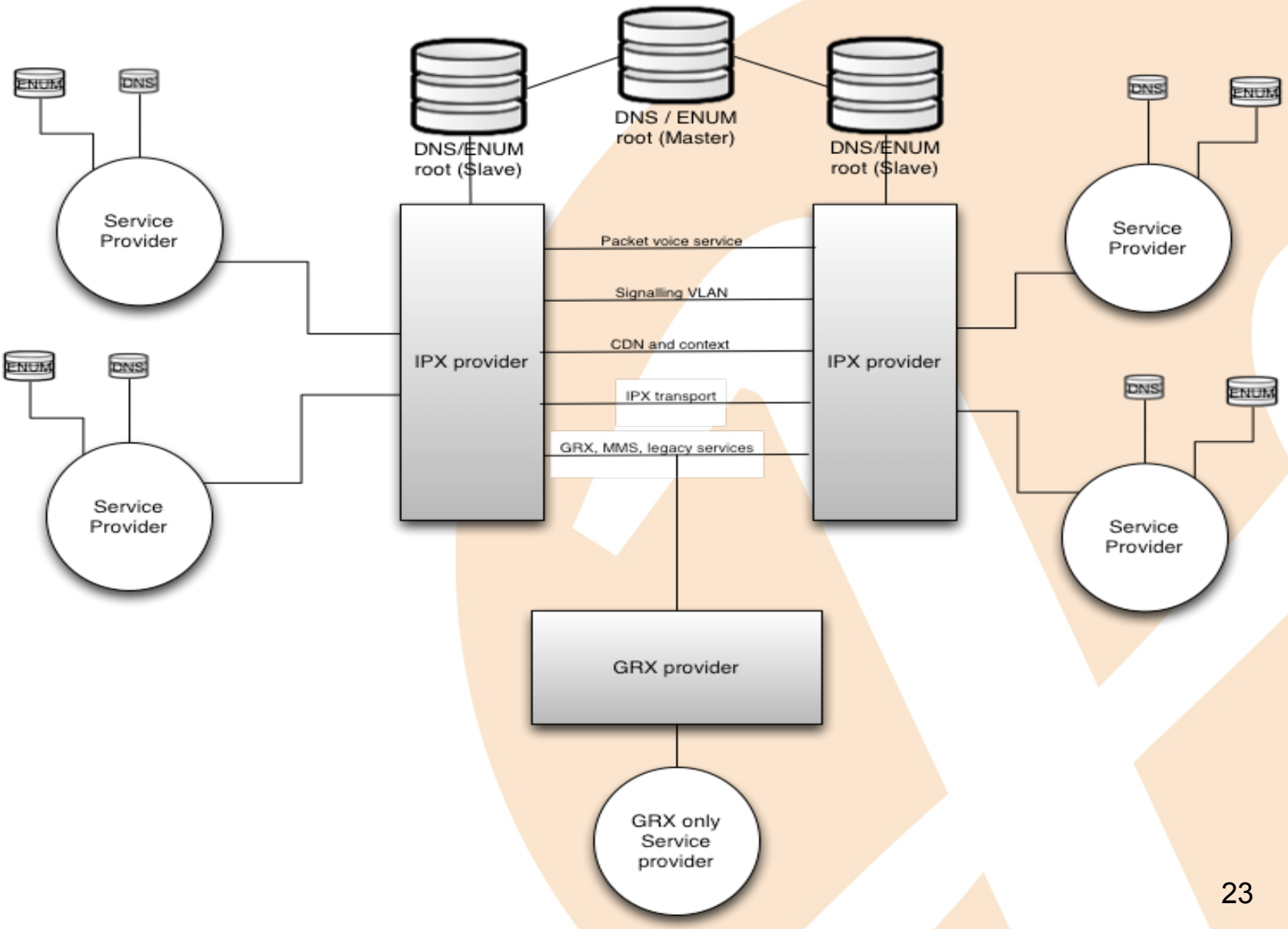
Packet loss: < 0.1% Highest service
(EF +AF4)

Jitter : Intra-continent - **5mS**

: Inter-continent - **10mS**

AMS-IX Amsterdam I-IPX




DNS/ENUM root (Slave)
DNS / ENUM root (Master)
DNS/ENUM root (Slave)
Service Provider
Service Provider
Service Provider
Service Provider
IPX provider
IPX provider
Packet voice service
Signalling VLAN
CDN and context
IPX transport
GRX, MMS, legacy services
GRX provider
GRX only Service provider

What happened since 2011 service launch?

- Slow process, old business models, still very much focus on voice
  - billing and control: e.g. no local break-out for GRX
- By now 8 carriers connected and using the AMS-IX Inter-IPX service and -SLA
  - (roaming over) LTE seems to be main driver of current momentum
- Others expected to follow soon
    - 'Critical Mass'

AMS-IX Inter-IPX Service

- Inter-IPX now also available in AMS-IX Hong Kong and AMS-IX Caribbean Exchanges.

Thank you

- Questions ?

Thomas O'Sullivan
thomas.osullivan@ams-ix.net