THE NETWORKED SOCIETY

ERICSSON

DEPLOYING IPv6 IN MOBILE NETWORKS

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National IPv6 Event of Vietnam
"IPv6 – Application and Technology for Vietnam"

Hanoi 31 May – 1 June 2012

LET'S START WITH SOME IP(HILOSOPHY)

- IP would be nothing without the content it delivers.
- Some content would not even be there without IP delivering it.
  - No websites, blogs, wikis, tweets, social media and no search engine advertisement!
- Is it important which IP version is used to deliver content, or is simply the fact that content get delivered?

- Has Internet become a content delivery network?
- Can it be more than that?

- Can it actually be used for communication? ;-)

IPv6 READINESS -
IPv6 IN MOBILE PACKET CORE HISTORY

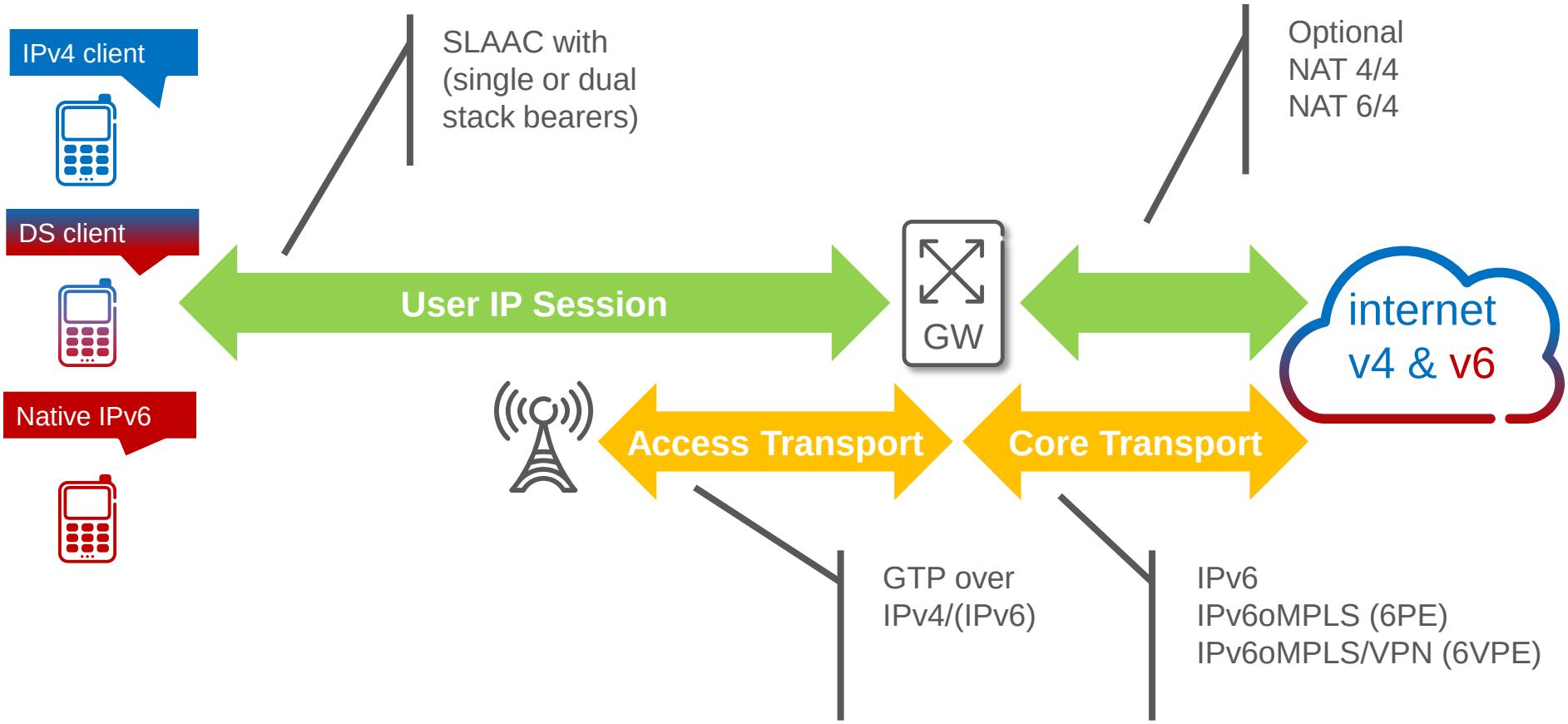
3GPP IPv6 User Plane defined in Release 97

Main driver was IMS (Initially IPv6 transport only, but changed to include IPv4)

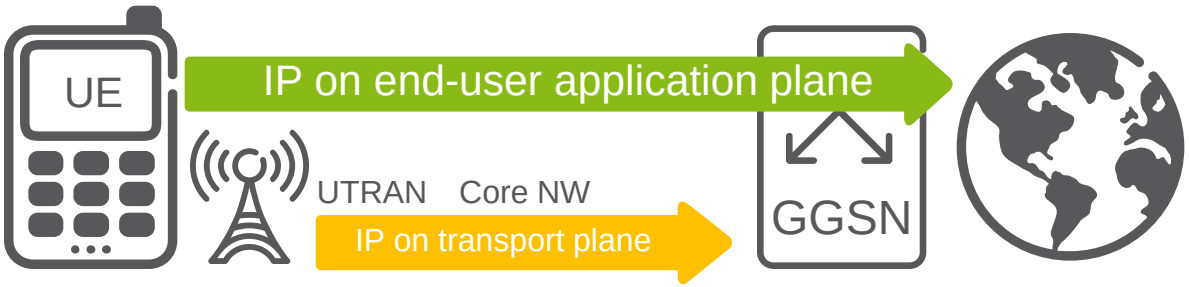
Ericsson GPRS Mobile Packet Core introduced IPv6 User Plane in 2002 (ref GGSN 3.0)

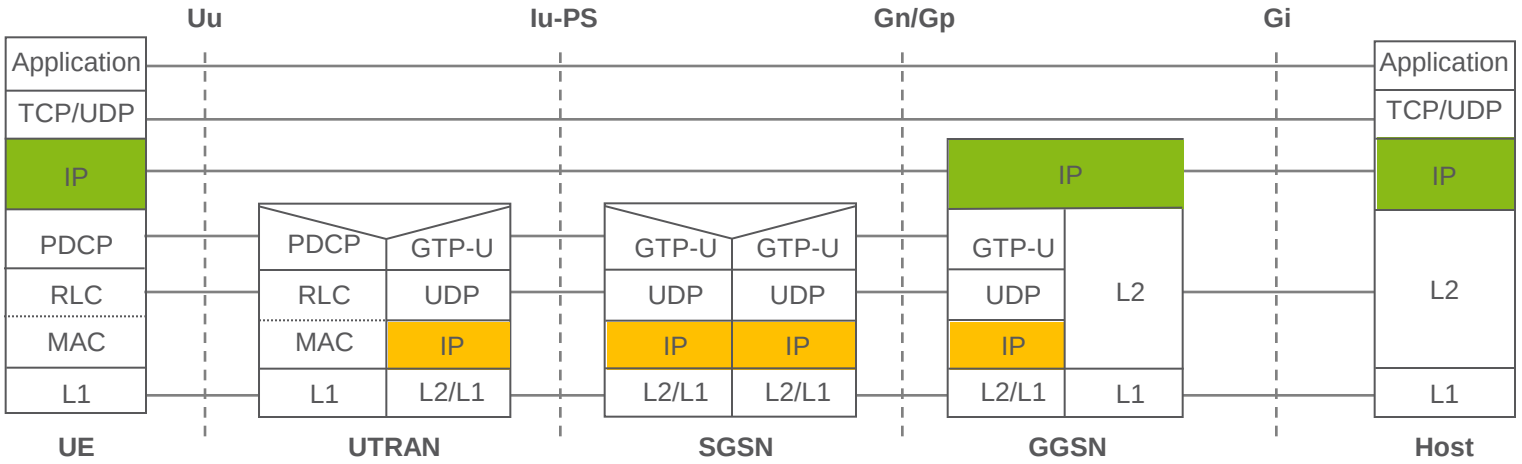
IPv6 for ”Always on” was mandated in EPC architecture.

IPv6 COMPONENTS – MOBILE WELL DEFINED ARCHITECTURE

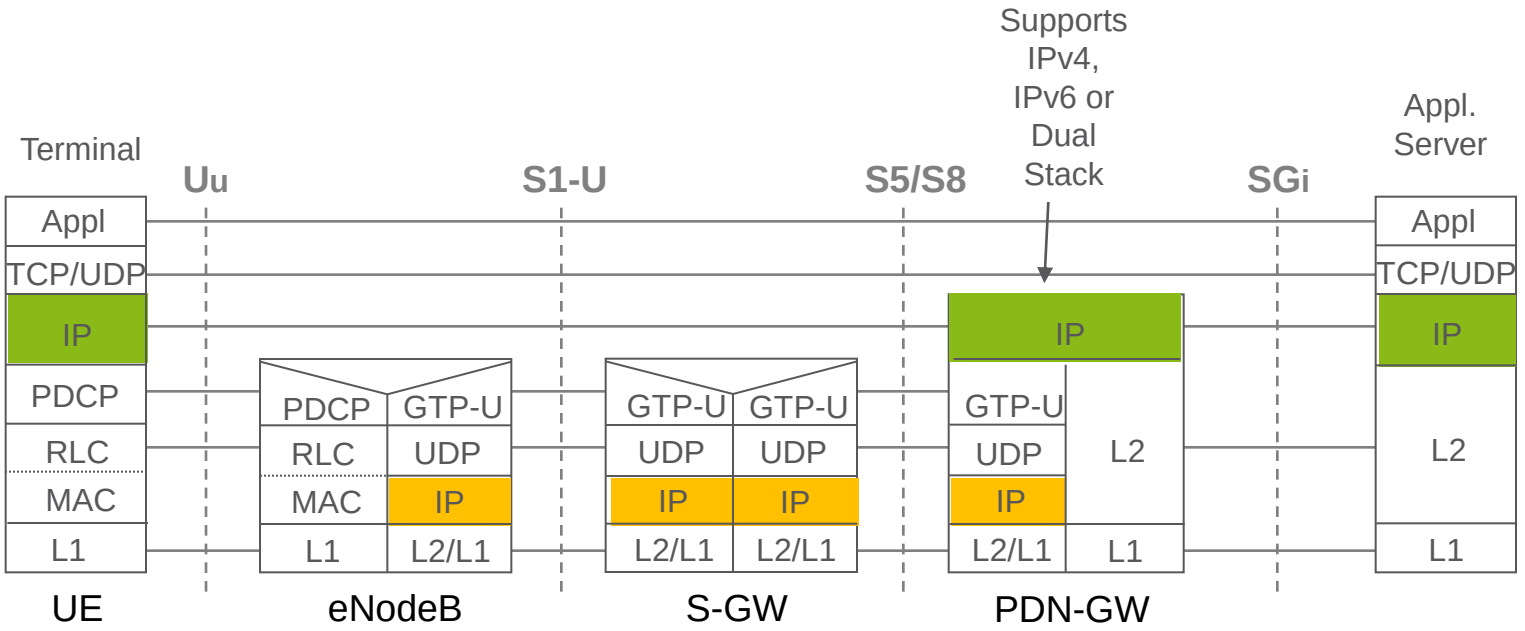


SEPARATION OF IP PLANES





THE TWO LEVELS OF IP IN EPC EXPLAINED THE TECHIE WAY



...and in 3GPP standards
IP is not only IPv4
but also IPv6!

… AND EXPLAINED THE SEVEN-YEAR-OLD WAY

Mobile network core Transport IP packet

Encapsulated User Payload IP packet

GTP-U / UDP Encapsulation headers

3GPP MOBILE NETWORKS END USER IPv6 DEPLOYMENT STRATEGY

3GPP and IETF has concluded on the following options:

› Native Dual-Stack as supported from 3GPP Release 99
  – Optimized in Release 8 (EPC) and Release 9 (GPRS) to Single bearer/PDP Context operations

› IPv6-only as supported from 3GPP Release 99, possibly combined with DNS64 and Stateful NAT64 to support reaching IPv4-only networks

WHY GO IPv6?

MOBILE SUBSCRIPTIONS AROUND 6 BILLION GLOBALLY

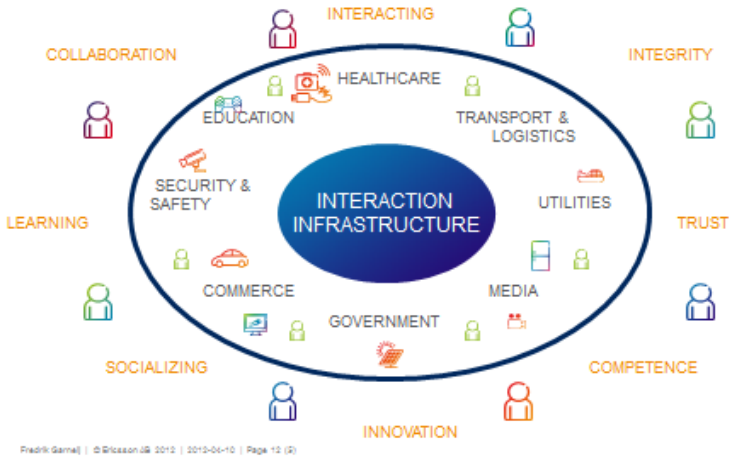
India and China accounted for 35 percent of net additions

Mobile broadband subscriptions at 1 billion

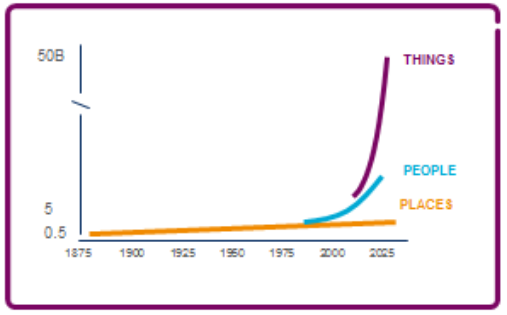
Figure: Mobile Subscriptions Q4 2011

EMERGING A NEW ICT INDUSTRY INTERNET IS GOING MOBILE

NETWORKED SOCIETY



50 BILLION CONNECTED DEVICES



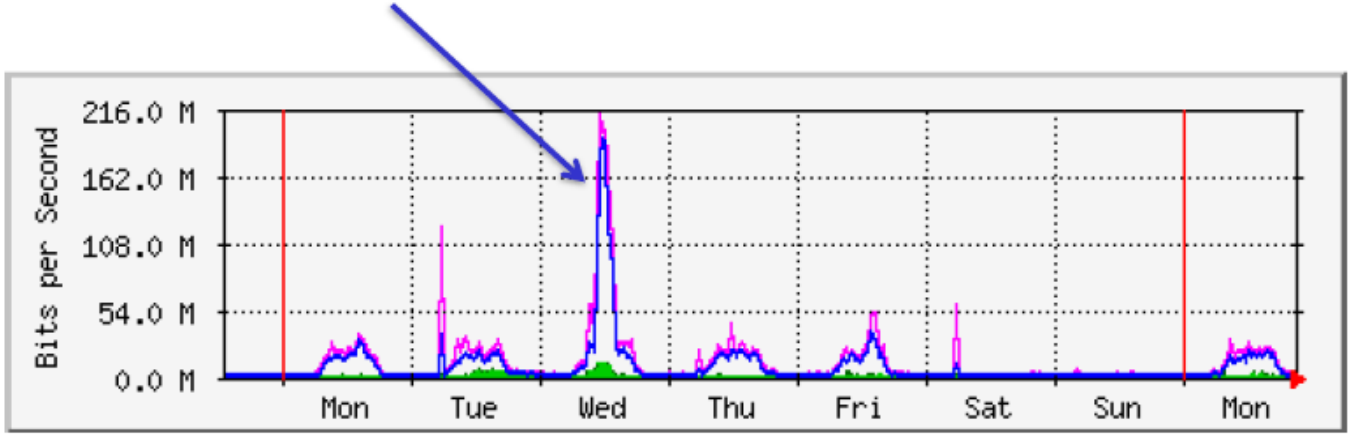
Everything that benefits from being connected will be connected

IPv6 DEPLOYMENT DRIVERS
WHY SHOULD WE BE BOTHERED?

"But IPv6 traffic is still less than a percent of total internet traffic"

Percentage of Internet traffic over IPv6

- 1% (2009, before Google whitelisting)
- 2.5% (Google whitelisted)
- 10% (late Jan 2010, Youtube added)
- World IPv6 day… (peak at 68%)



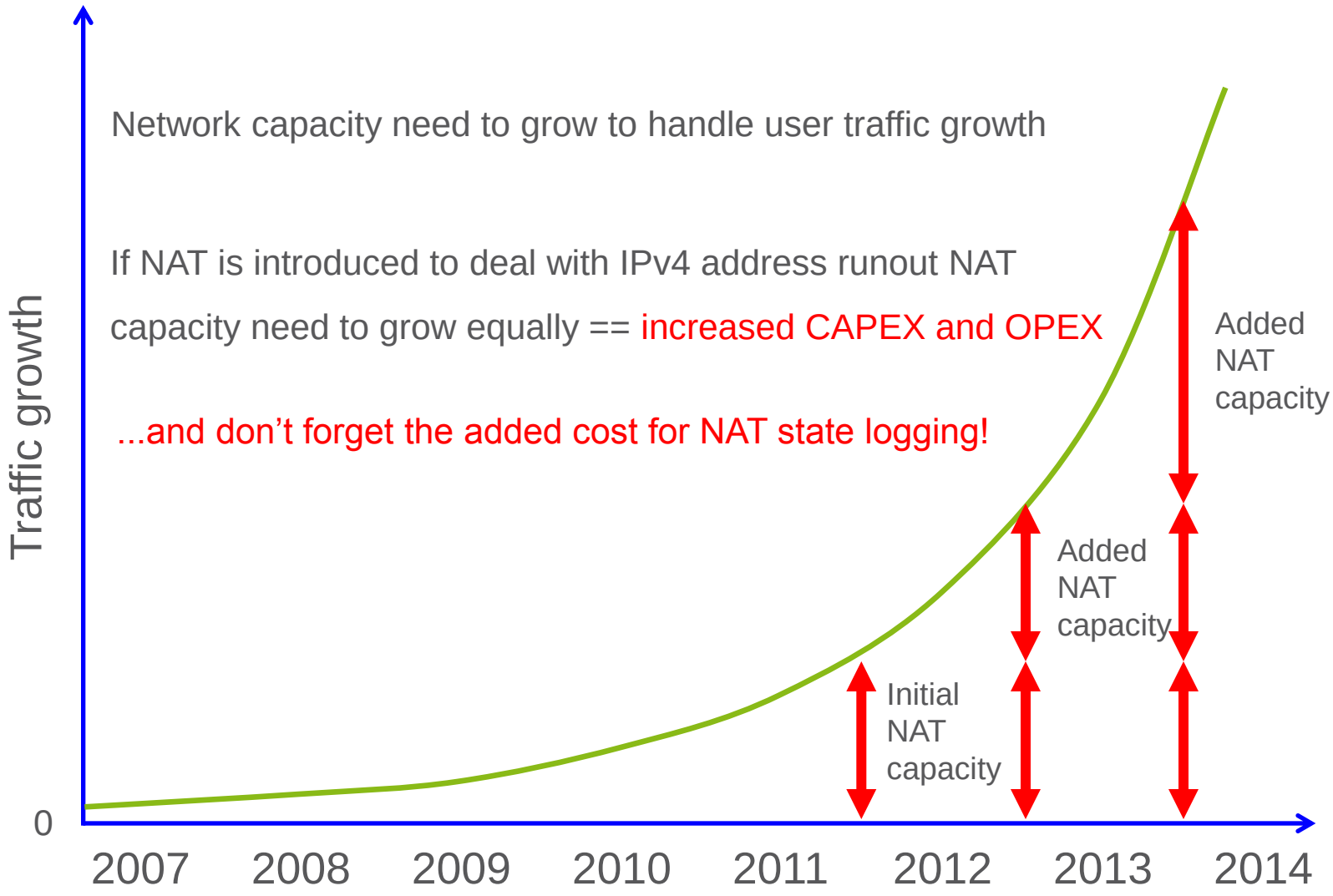
"Which % will we see after World IPv6 Launch?"

EVIDENTLY…

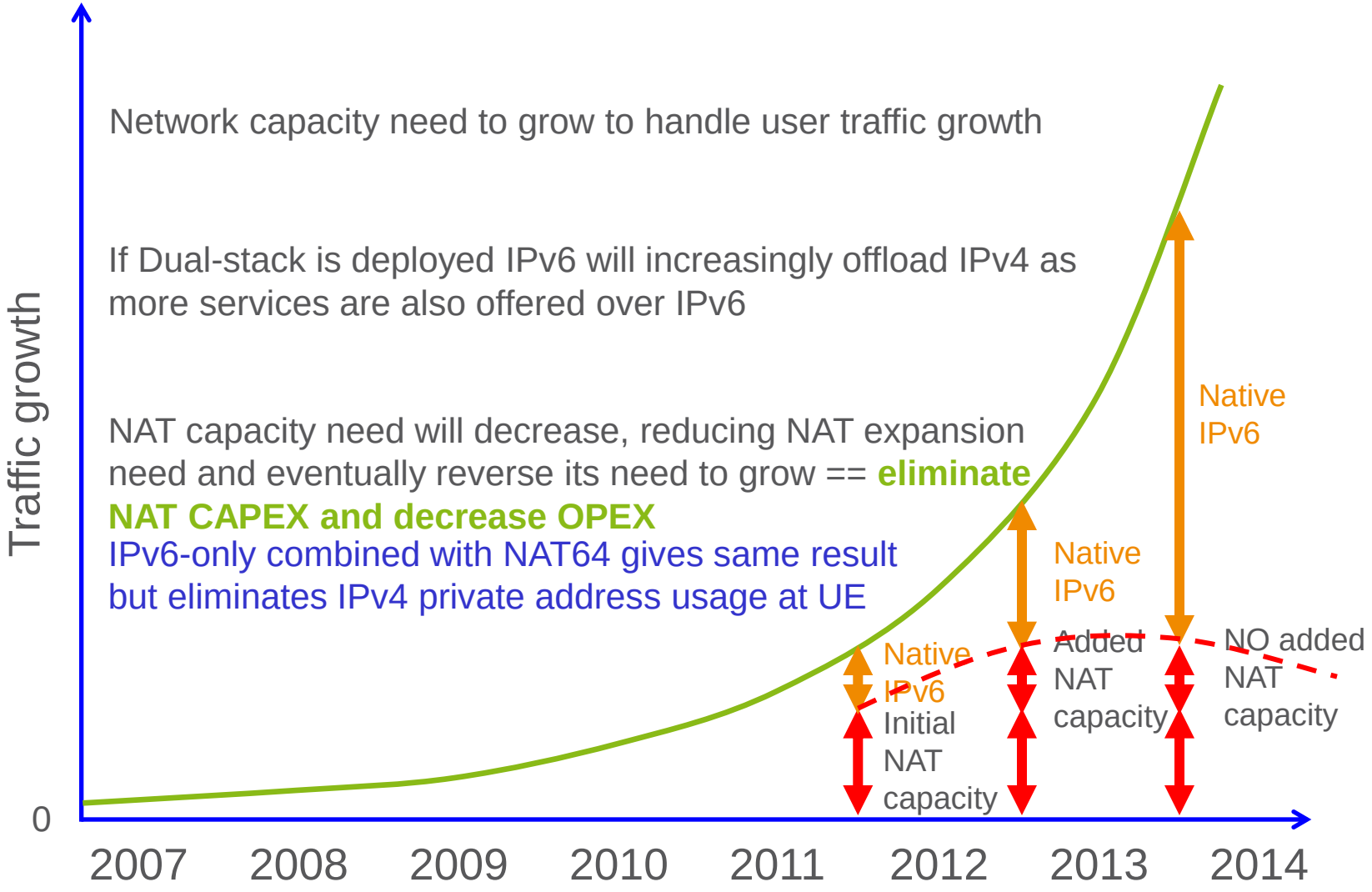
"IPv6 Deployment draws traffic"

TRANSITION ECONOMICS

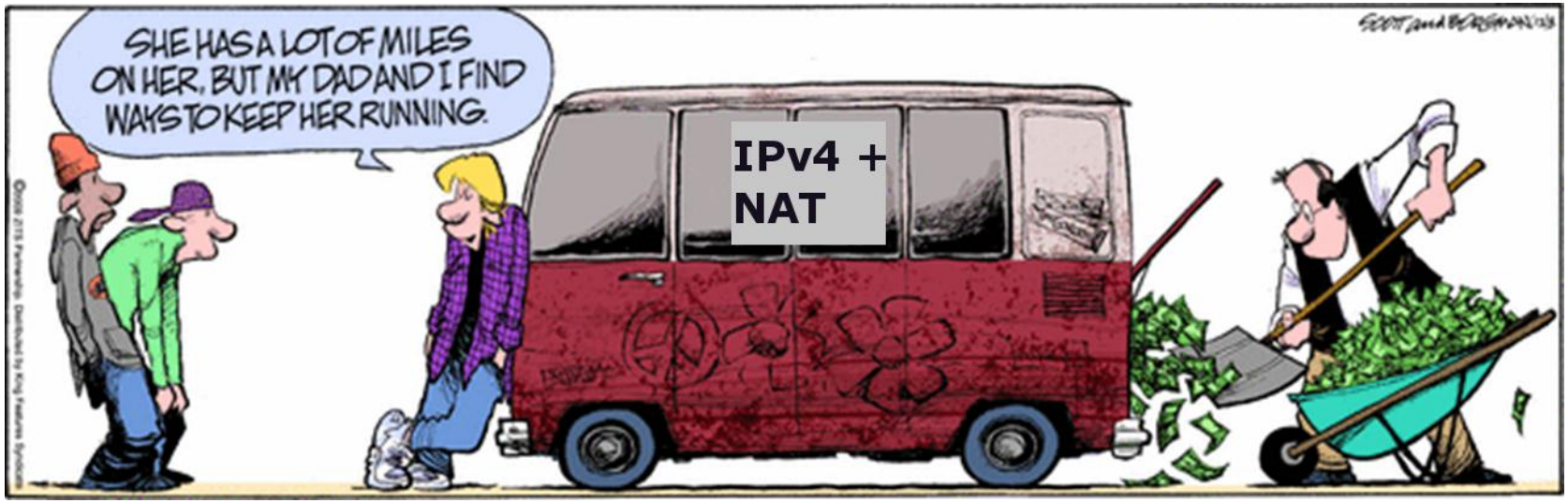
TRAFFIC GROWTH
NAT IMPACT

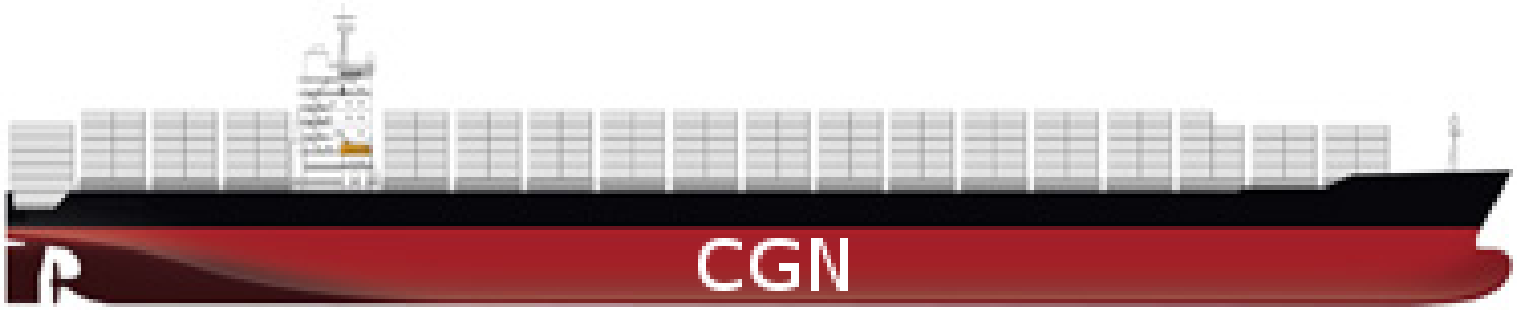


IPv6 BUSINESS CASE
CGN BYPASS BY DUAL-STACK



DUAL-STACK AND THE DEATH OF NAT





REAL WORLD DEPLOYMENT WHY AND WHEN?

› FEAR - Main reason for old interest is due to IPv4 being almost in use in terms of allocation running out of IP addresses

Running out of rails

Exploring new frontiers

› OPPORTUNITIES - Advantages of using IPv6 such as restoring Internet end to end capability is finally being explored – Gaining new business

IPv6 JUSTIFICATION BY SIMPLIFICATION

- 3GPP M2M standardization
  - 3GPP TS 23.221 “Architectural requirements” clause 5.1 “IP version issues”
    For UEs used for Machine-Type Communications (MTC) IPv6 addressing as described in TS 23.401 [27] & TS 23.060 [2] should be the primary mechanism for IP addressing. IPv4 based addressing is considered a transition solution and is deprecated for MTC used over 3GPP accesses.

- IETF
  - draft-george-ipv6-support-01 “IPv6 Support Within IETF work”
    IETF work MAY support IPv6-only applications and protocols, especially in cases where supporting the protocol or feature in IPv4 would be difficult or impossible.

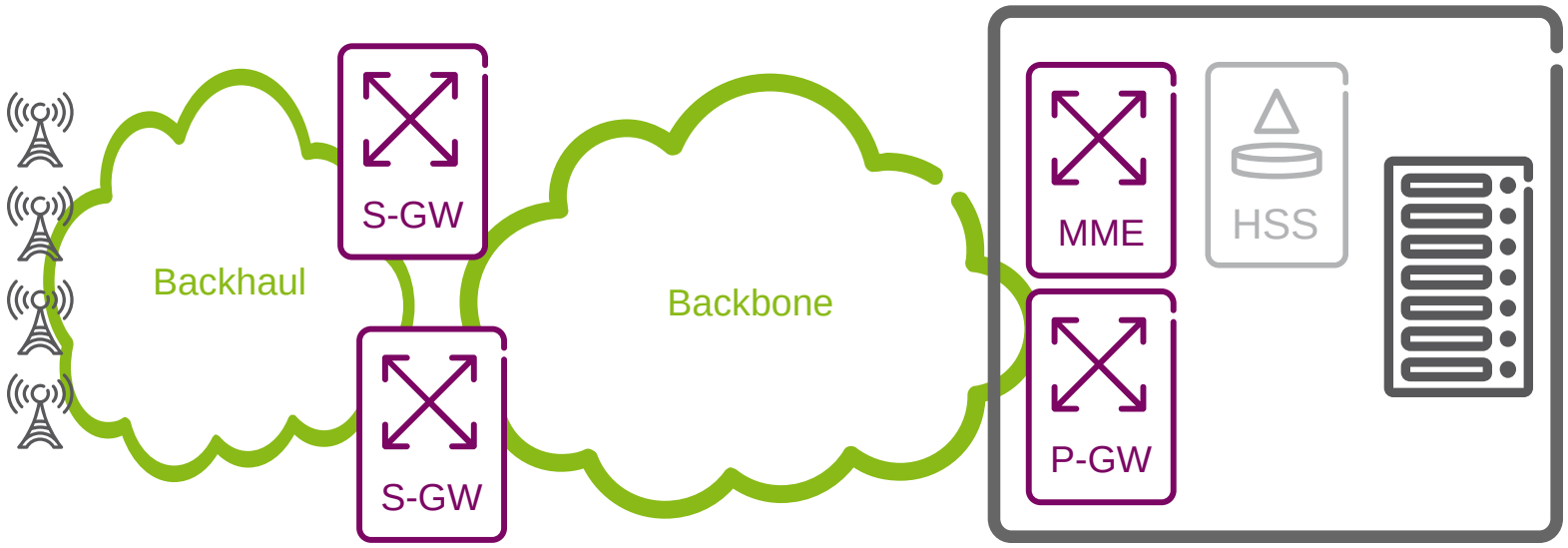
OPERATOR DEPLOYMENT STRATEGIES

PHASED INTRODUCTION OF IPv6

MOBILE OPERATOR

- Migration to IPv6 is a step-by-step process
- Parts of the network can be migrated “independently” of others

- User plane
- IP transport between packet core nodes
- IP transport in radio access network
- IP backbone
- IP transport of O&M traffic



OPTIONS FOR LACK OF ADDRESSES

- Stay on IPv4
  - Deploy NAT and address sharing
  - Partition network
- Deploy and switch to IPv6-only
  - Most services are still IPv4 only but this is about to change – World IPv6 Launch 2012-06-06
- Coexistence between IPv4 and IPv6
  - Dual-stack
  - Enable moving traffic to IPv6 transport – CGN offload

Lack of addresses is a user plane problem

OPERATORS SUMMARY

- Most operators are planning for Dual-Stack deployments but also targeting IPv6-only
  - M2M and capable handsets/appliances may use IPv6-only combined with DNS64/NAT64 when accessing IPv4-only services
- LTE launches, a trigger for IPv6
  - LTE Terminals are day-one including IPv6
  - Part of major operators launches or planed launches
- IPv4 depletion announcement trigger/drive live deployment
- Node IP transport within Packet Core and RAN stay on IPv4.

IPv6 CAPABLE SMARTPHONE UPDATE

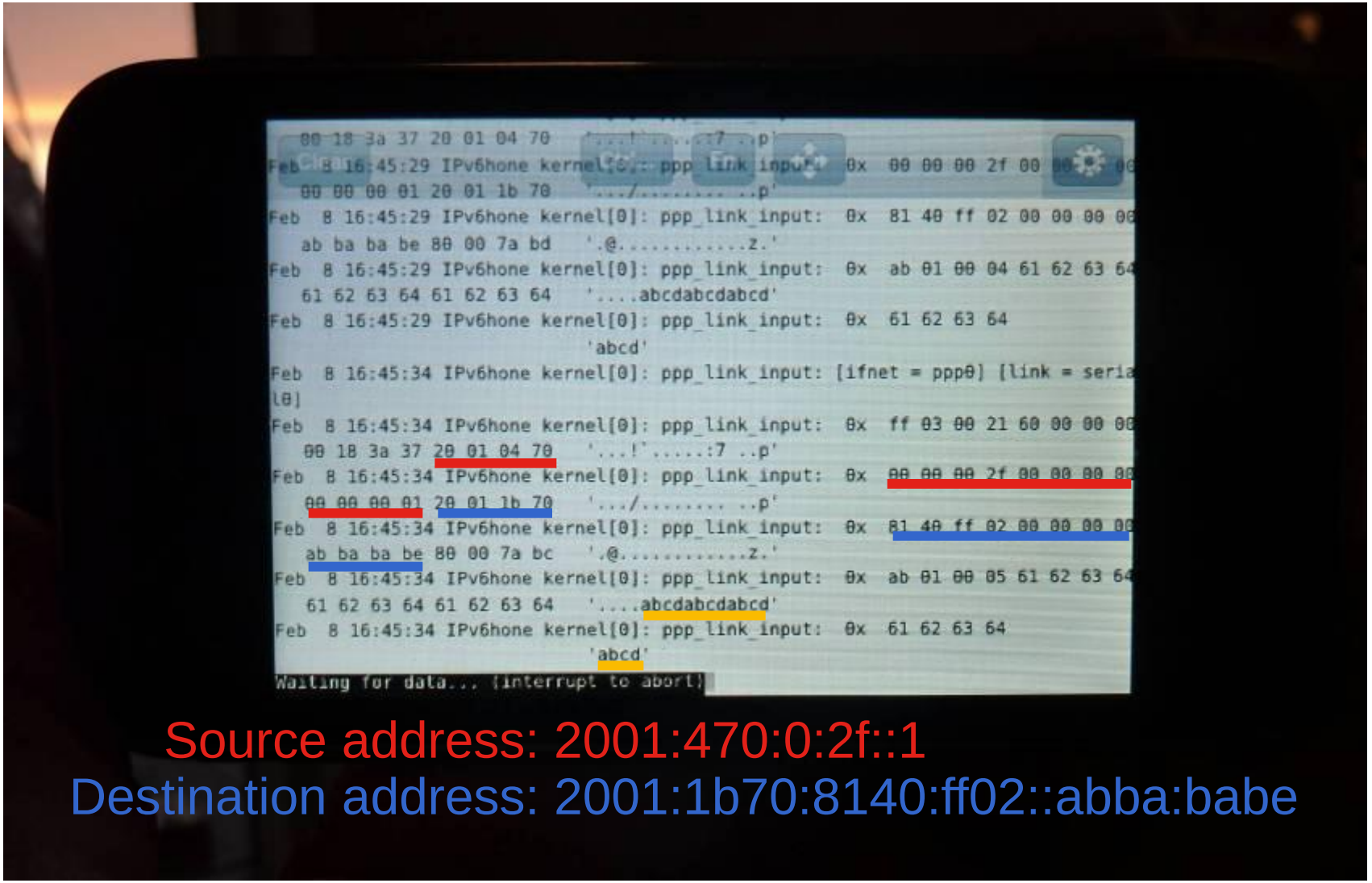
FIRST ANDROID 2.1 IPv6 CONNECTED OVER 3G MOBILE NETWORK. "I MAKE IT SO!"

Nvidia Tegra 2 and Ericsson Mobile Broadband Module F3607gw

gingerbread.zip

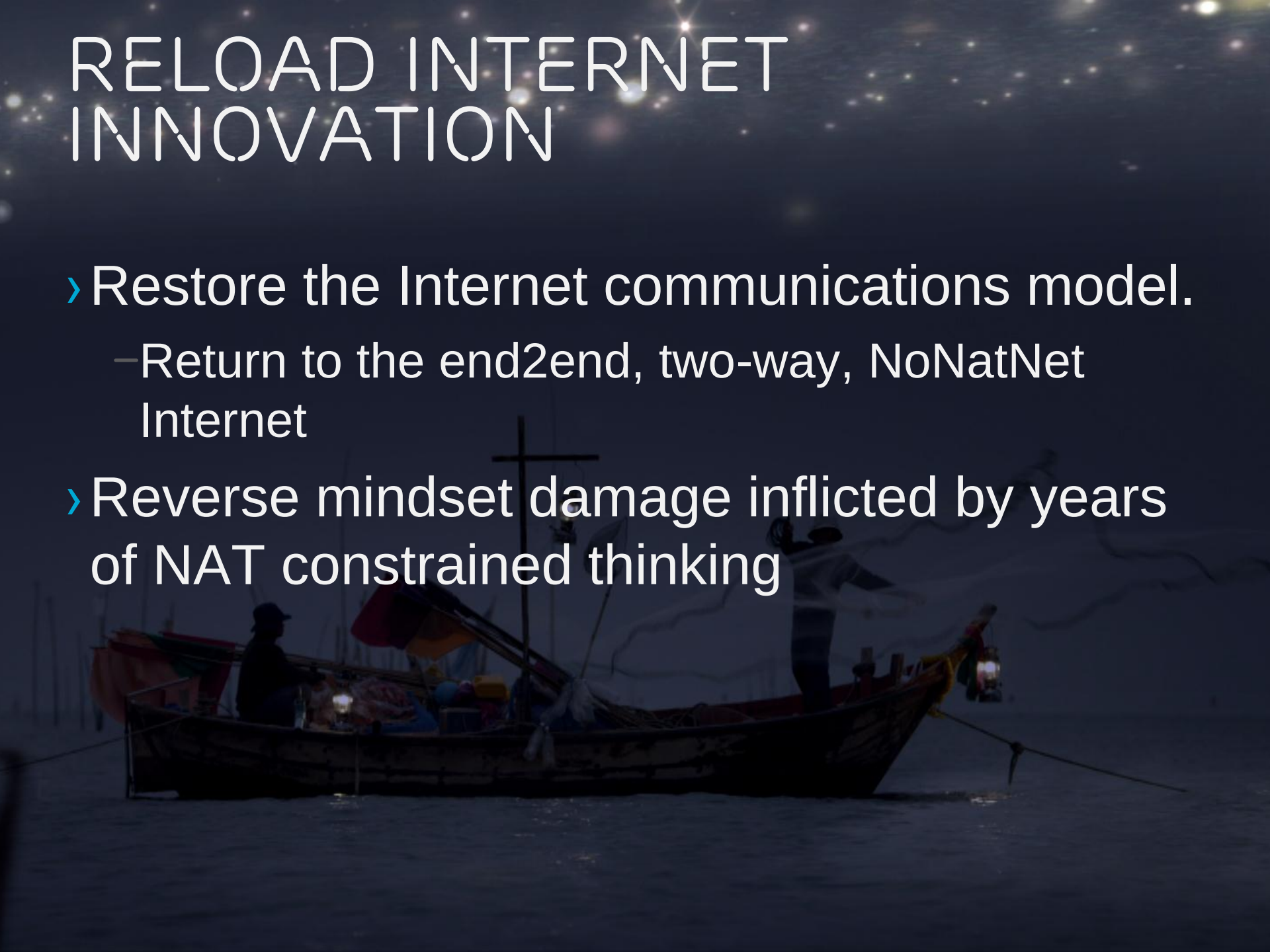
IPv6 READY USER DEVICES

MY IPHONE GET VISITED BY IPv6 PING OVER 3G!

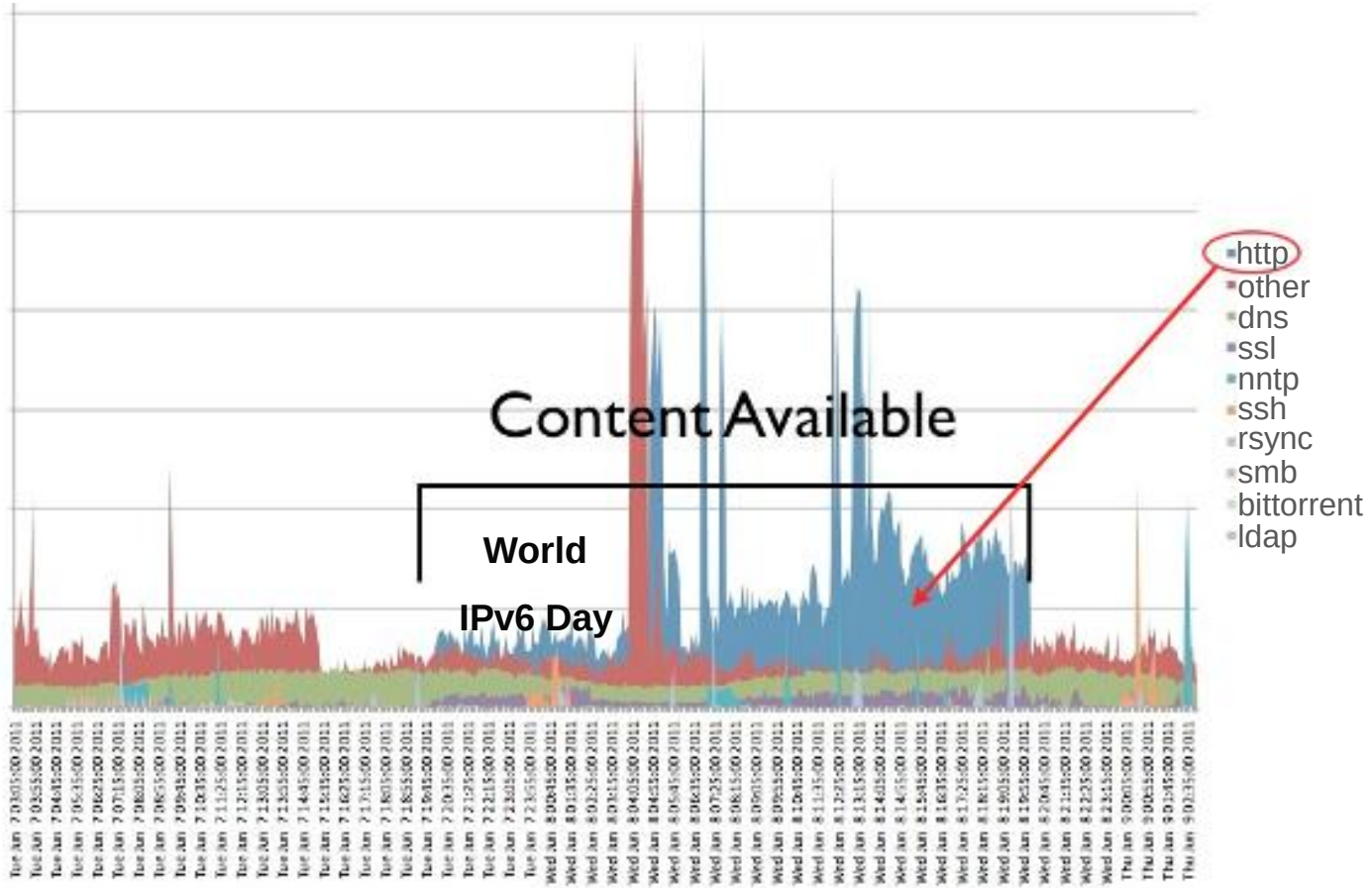


RELOAD INTERNET INNOVATION

- Restore the Internet communications model.
  - Return to the end2end, two-way, NoNatNet Internet
- Reverse mindset damage inflicted by years of NAT constrained thinking



PROTOCOL DIVERSITY STARVATION



Where did all the video traffic go?

NAT induced HTTP traffic domination

RELOAD INTERNET INNOVATION

- Restore the Internet communications model.
  - Return to the end2end, two-way, NoNatNet Internet
- Reverse mindset damage inflicted by years of NAT constrained thinking
- Break free from IP address space conservation thinking

SO…

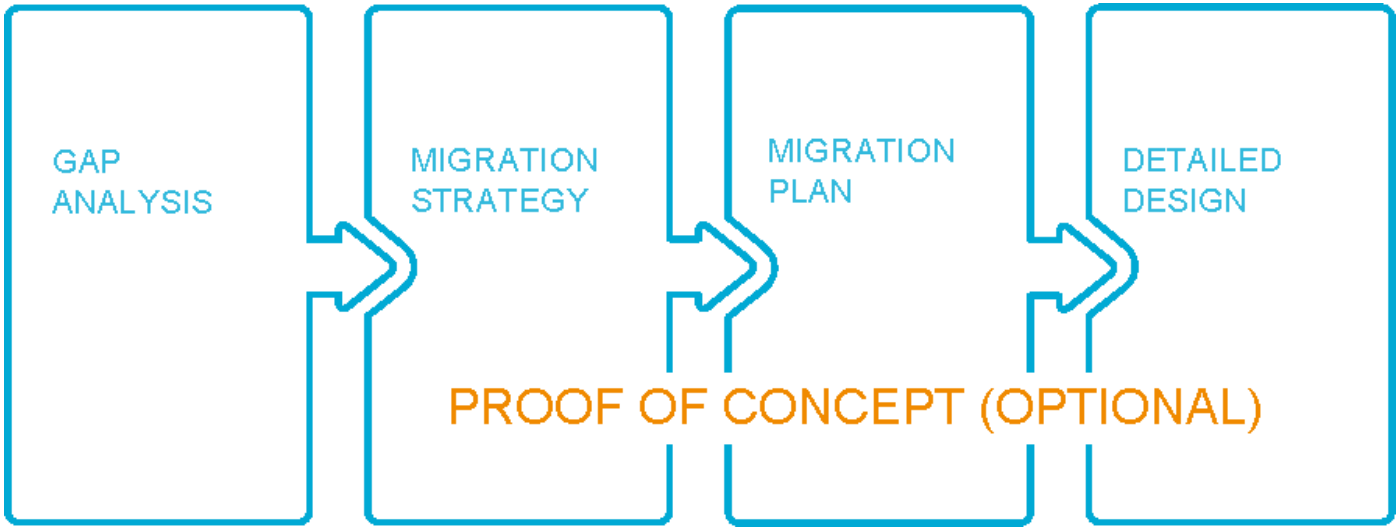
…WHICH VERSION WILL YOU GO FOR?

STAY ON...

HEAD FOR...

PRE-PACKAGED SERVICE OFFERINGS

› Smooth introduction of IPv6 into customer's network, combining Ericsson's thought leadership and best in class competence



Along with:

› Migration Project & Rollout with no end user impact
› Post-Migration Support for quick time to respond
› IPv6 Competence Development Plan and Training

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