mPlane – an Intelligent Measurement Plane for Future Network and Application Management

MPLANE for multilayer SLA

Cloud Computing SLAs in FP7 - Exploitation of Research Results Bruxelles, May 27, 2013 Luca Rea (Irea@fub.it)



The mPlane project

- mPlane is an FP7 Integrated Project
 - started in November 2012, 3 years project
 - □ 11.2+ M€ cost 7.2 M€ EC funding
 - 16 partners (8 industrial, 8 research)
- Goal: design and demonstration of an "intelligent measurement plane for the Internet"
 - mPlane is about large scale network measurements,
 - and intelligent analysis for troubleshooting support
 - embedding measurement into the Internet as an additional capability





Who we are



General Coordinator **Prof. Marco Mellia** Politecnico di Torino - IT

Technical Coordinator **Dr. Saverio Niccolini** NEC Europe

- 3 Constructors
- 3 Operators
- 2 SMEs
- 2 Research Centers
- 6 Research Groups





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mPlane motivation

- The Internet is a global interconnection of networks
 - No single organization operates, administers or governs it
 - It is omnipresent thanks to its diversity, but it is vulnerable and fragile w.r.t. performance
- In case of "failure", who can tell what's going wrong?
 - Each ISP may have a figure of what happens inside its network
 - But what if the failure depends on other ISPs? Or on the content provider? Or on the CDN? Or on user equipment?
- Today, the web is a tangle
 - Nobody really understands what happens today in the Internet
 - How to predict what will happen tomorrow?

We need an intelligent system that collects, analyzes, provides visibility to support better management: an oracle that provides answers!





mPlane in a slide

- Build a distributed, open, standard measurement infrastructure for the Internet
 - □ **Probes (WP2)** get the data
 - Build on existing tools/methodologies
 - Offer a flexible, programmable, open platform to run and collect passive, active, hybrid measurement
 - Repositories (WP3) store and preprocess the data
 - Collect measurements in a standard way
 - Pre-process large amounts of data in efficient ways
 - **Grant access to interested parties** (ISP, content providers, end-users, regulation agencies, etc.) subject to authorization rules
 - Intelligent reasoner (WP4) dig into the data
 - Mine automatically the data and extract useful information
 - Drill down to the root cause of a problem
 - Allows structured, iterative, and automated analysis











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MPLANE for SLA

- One of the aim of MPLANE is the Network monitoring for SLA
 - Contributions on definition of SLA according to OSI Layer
 - Layer 1-2 to verify the SLA between ISP and user (especially in terms of "channel capacity")
 - Layer 4 user necessities (throughput)
 - Layer 7 user perception (QoE) and App verification: A-SLA.
 - Es: YouTube; Skype; TV operators
 - Analysis on different QoE measurements:
 - MOS (objective and subjectives)



Active Probes for wide broadband access

- Access at 30 and 100 Mb/s are now available
- 1) How can we verify bandwidth offered by operators? this is a fundamental task also with legal considerations. SLA verification
- 2) How can we verify the skill in using such a capacity? Is my device able to exploit such a bandwidth?





SLA verification for GPON access



SLA for broadband mobile: You Tube (360p) vs HSPA



SEVENTH FRAMEWORI

Field trial with **3G-HSPA** dongle. Dongle is connected to PC by Wi-Fi. Dongle is located at home in a place with optimum HSPA signal.

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SLA for pay web TV let us see You tube case on HSPA



Due to statistical behaviour very hard to verify SLA L1 for broadband mobile, and as a consequence for higher Layers.

Conclusion: PC (or tablet) can be considered as good mobile standard (360p) TV in HSPA environment



Conclusions about mPlane SLA

- SLAs for all IP Stakeholders
- SLA according to 2-3 OSI Layers
- SLA measurement definition according to different accesses: xDSL, FTTx, 3G-4G;
- Statistical approach for 3G-4G



