ITU Kaleidoscope 2015

Trust in the Information Society

A unified framework for Internet Speed Measurements

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9-11 December 2015

Outline

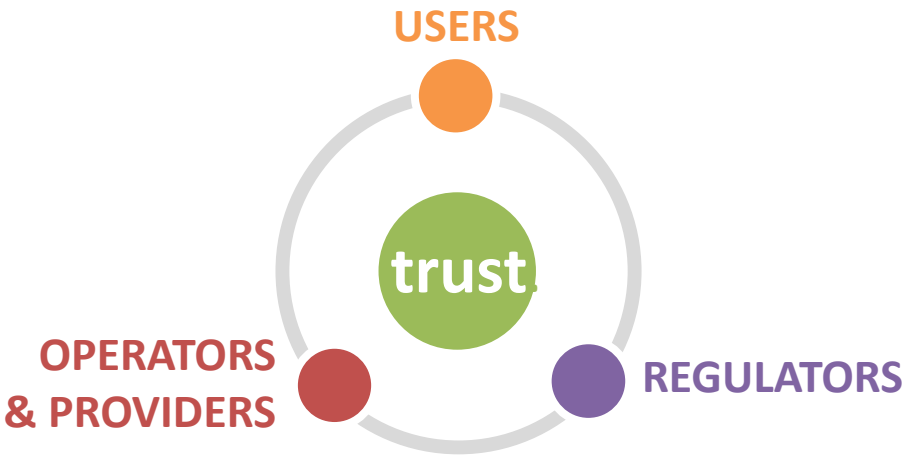
- Introduction
- Background
- Framework
- Test procedure
- Conclusions

Introduction

- **Introduction**
- Background
- Framework
- Test procedure
- Conclusions

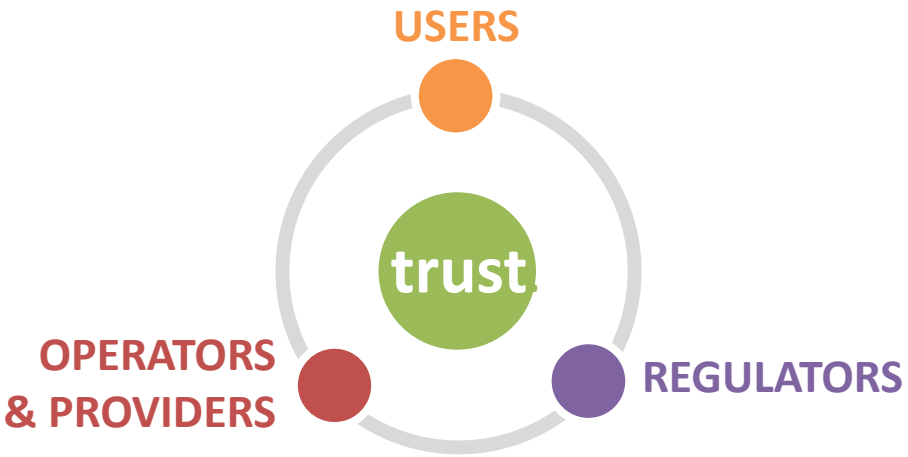
Introduction

- The challenge:
  - Users demand QoS
  - ICT players verify SLAs
  - Providers: ensure users trust



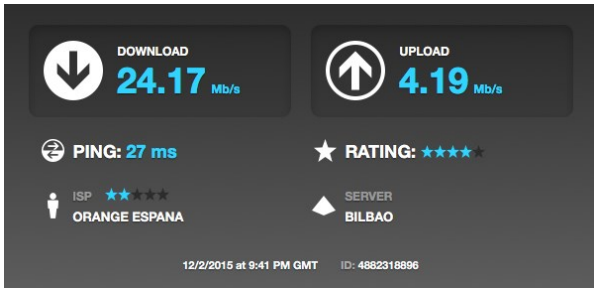
Introduction

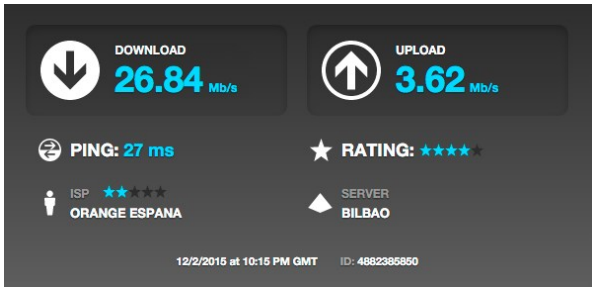
- The challenge:
  - Users demand QoS
  - ICT players verify SLAs
  - Providers: ensure users trust

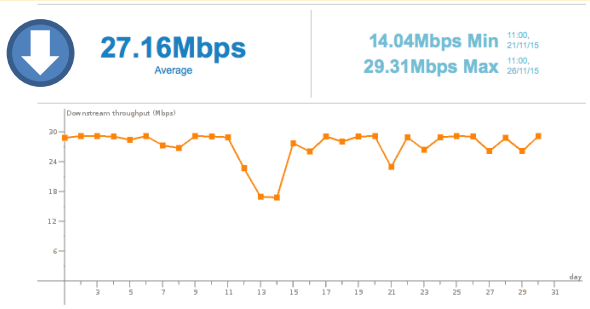


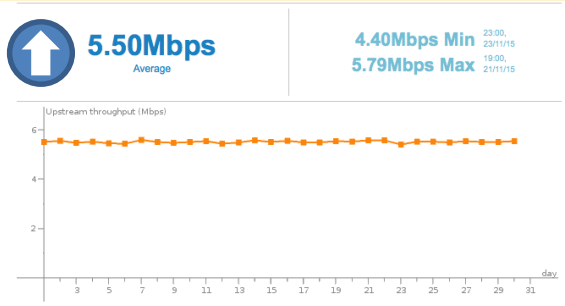
Introduction

Sample Case: Orange Spain – FTTH 30Mbps/5Mbps









BILBAO (ES)	MADRID (ES)	AMSTERDAM (NL)	VIRGINIA (US)
↓	20.412 Mbps	10.105 Mbps	6.788 Mbps
↑	4.047 Mbps	3.871 Mbps	2.802 Mbps

OOKLA SPEEDTEST

Sam Knows

velocimetro QoSMETER beta .org

Background

- Introduction
- **Background**
- Framework
- Test procedure
- Conclusions

Background

- Lack of standardization on Internet speed measurement

- ITU-T SG11:

Internet Speed Measurement by End-Users

ITU-T Draft
Q. Int_Speed_Test

ITU-T Draft
Q. FW_Sp_Test

Framework & Test Procedure

ITU-T Draft
Q. TM_Sp_Test

Testing Methodologies

The Framework

- Introduction
- Background
- **Framework**
- Test procedure
- Conclusions

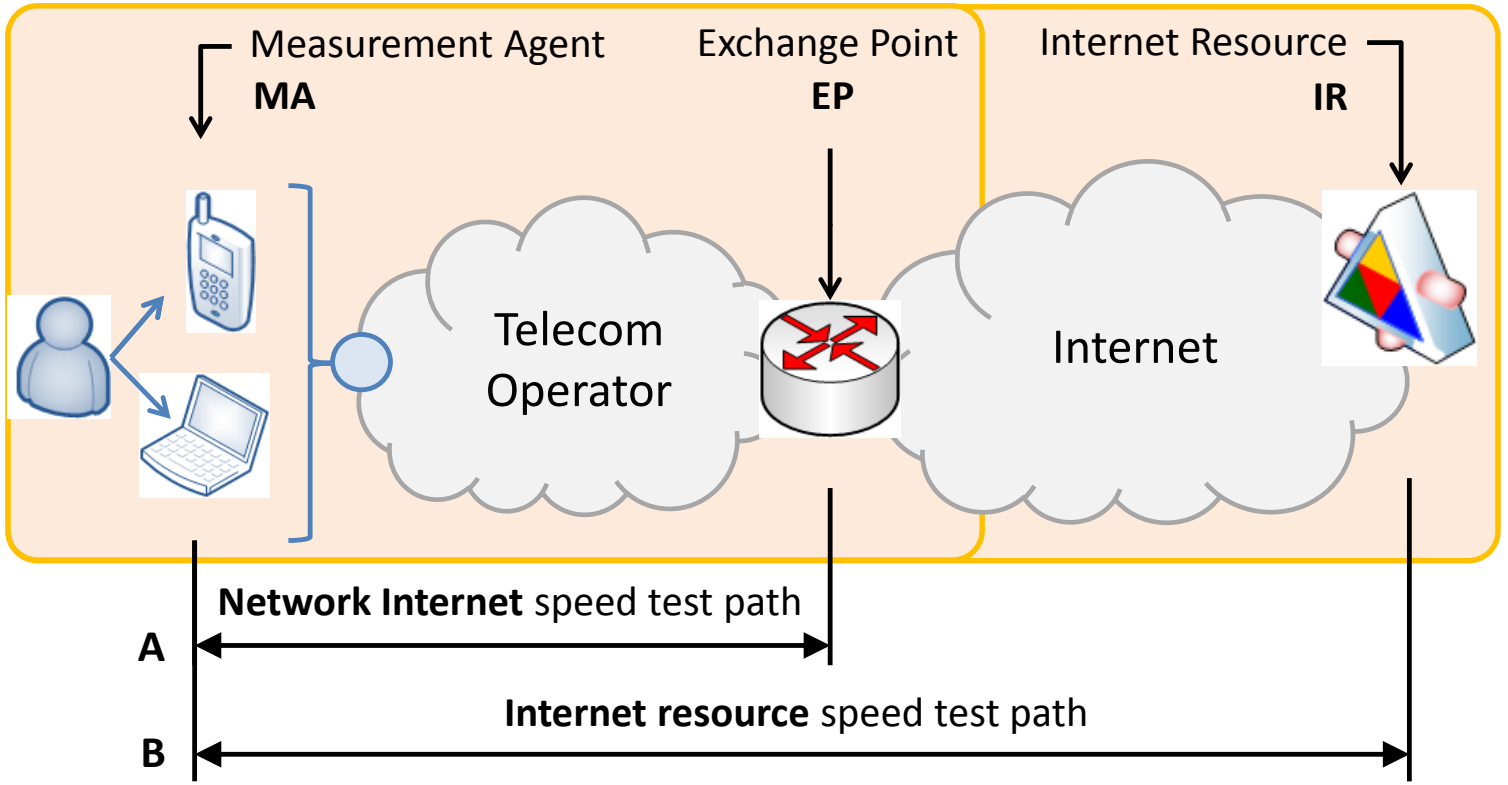
The Framework
Scope

- Measurement scenarios
- Measurement parameters
- Measurement procedures
- Requirements for the measurement algorithm

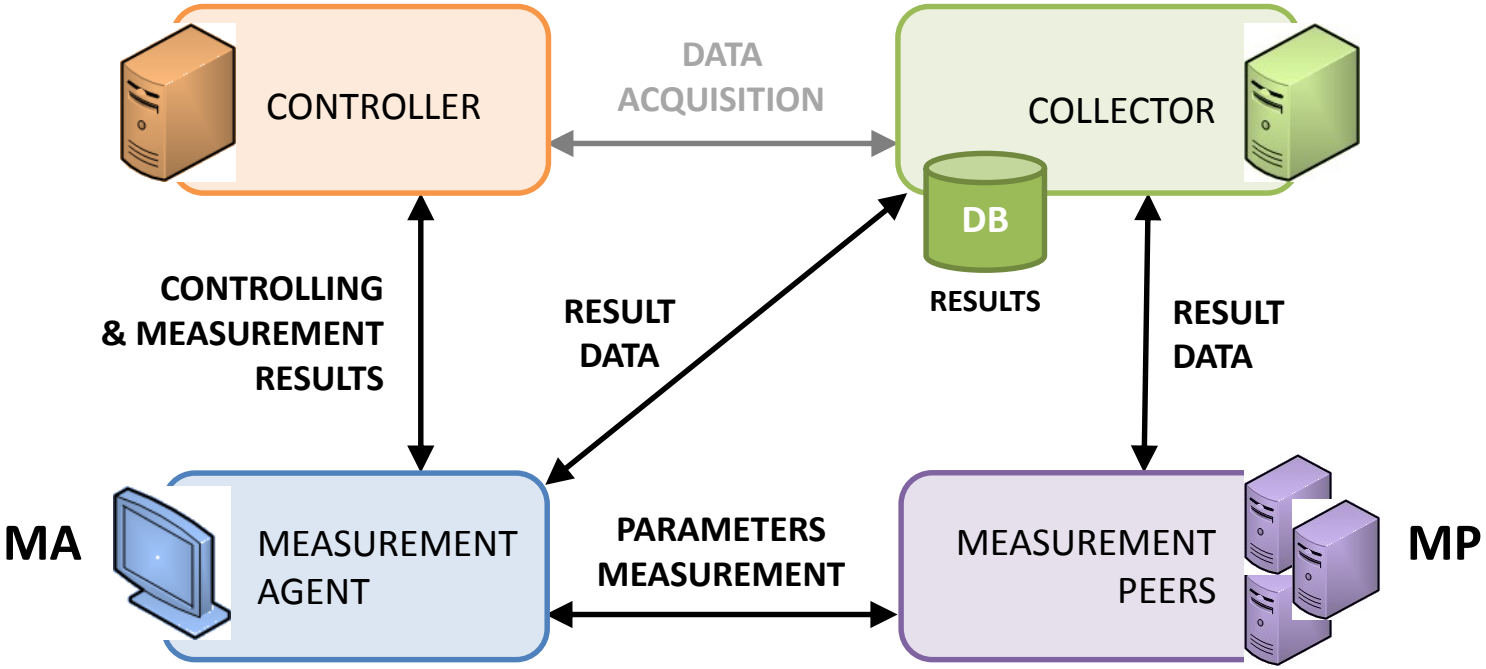
The key goal of the framework is to provide **transparent, trust-based** measurement results that can be **accepted by all ICT players**.

ITU-T Q.FW_Sp_Test Draft

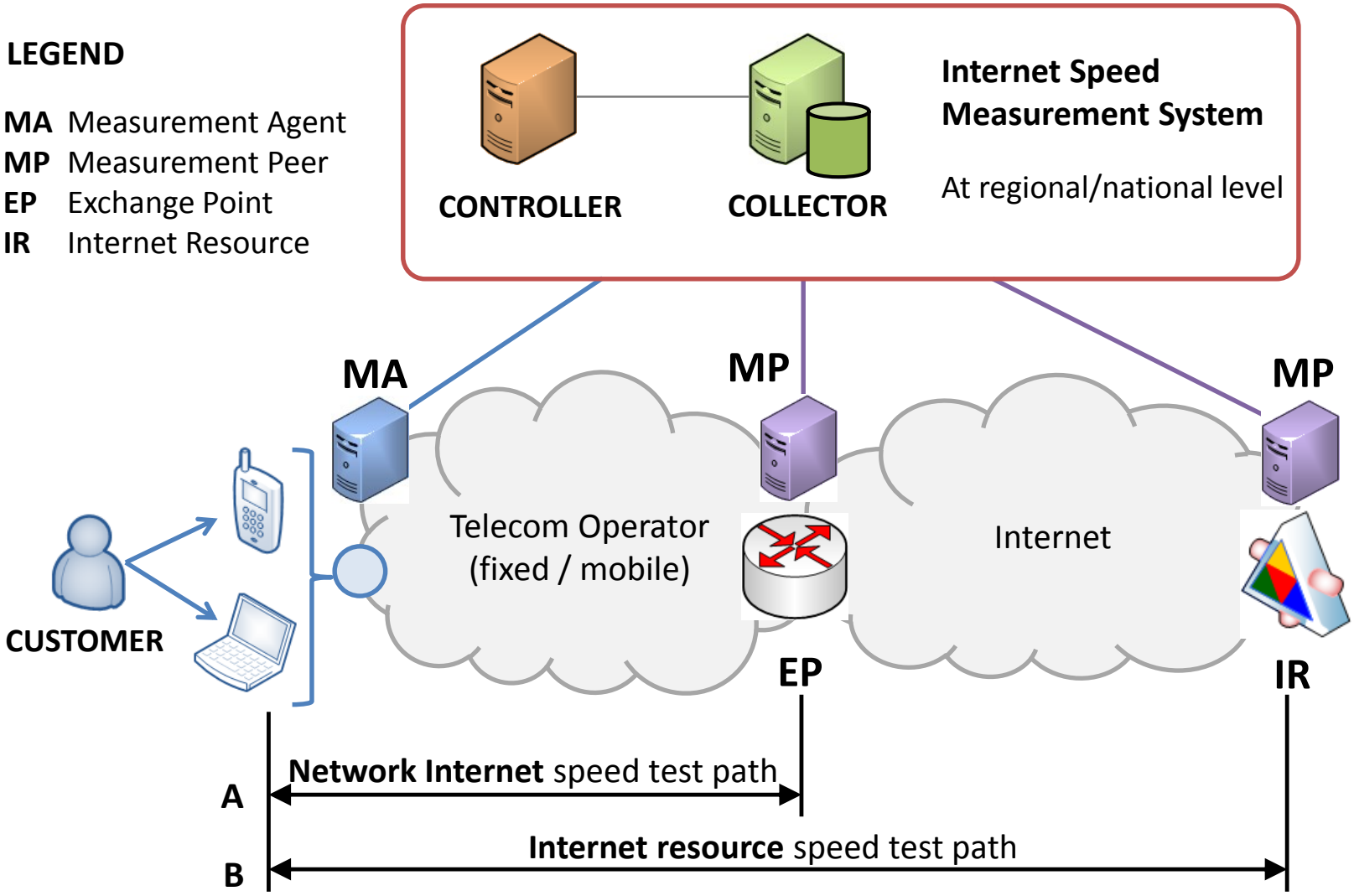
The Framework
Global scenario



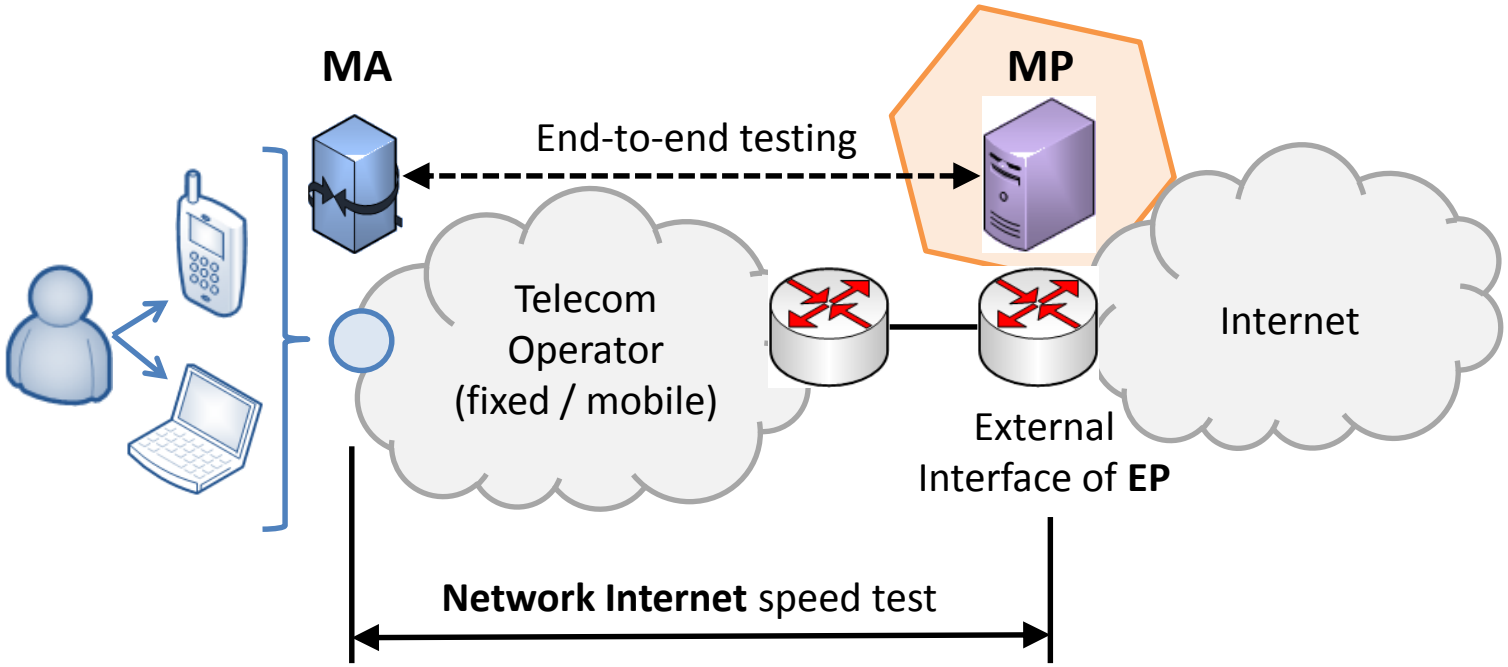
The Framework
Test Facilities



The Framework
System Architecture



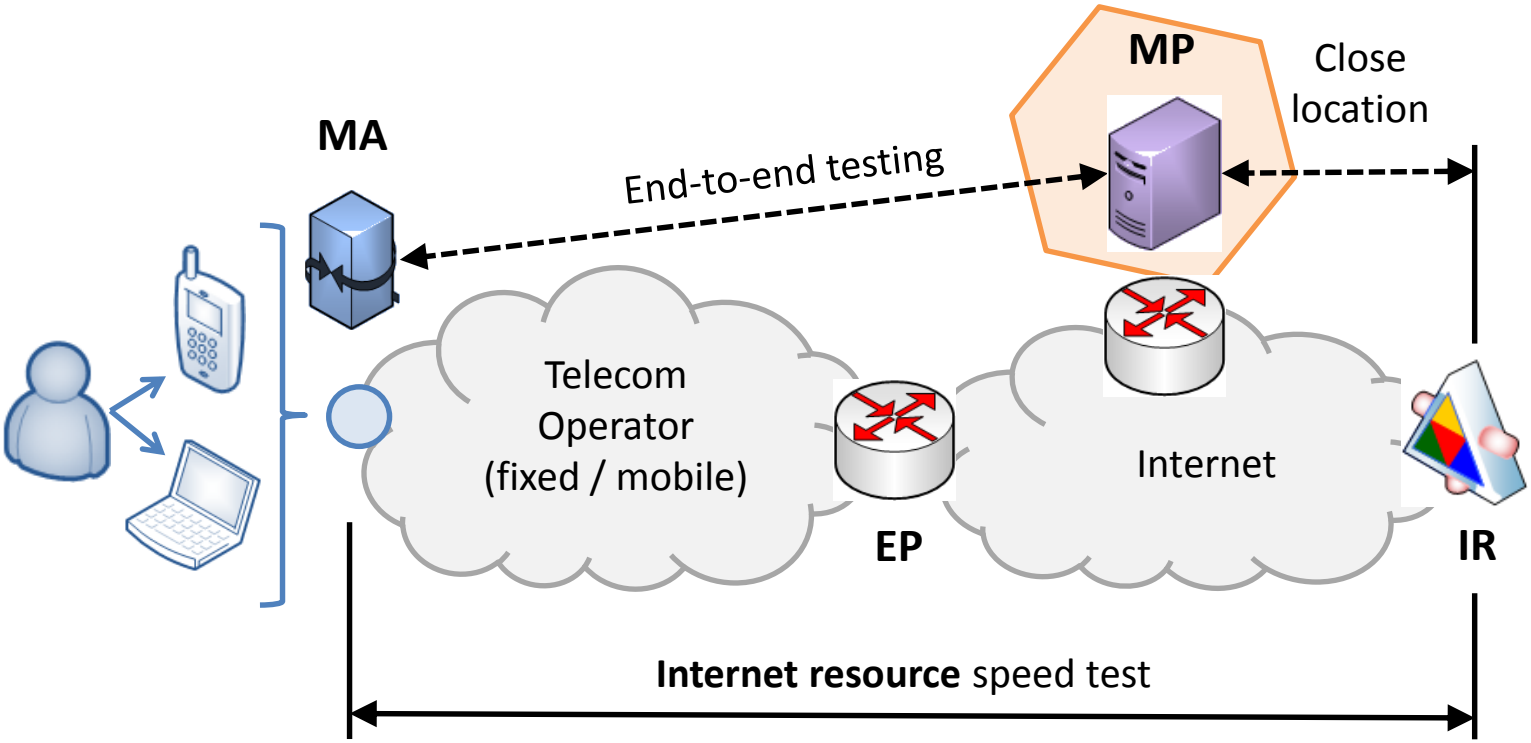
The Framework
A. Network Internet speed test



LEGEND

MA Measurement Agent
MP Measurement Peer
EP Exchange Point
IR Internet Resource

The Framework
B. Internet resource speed test



LEGEND

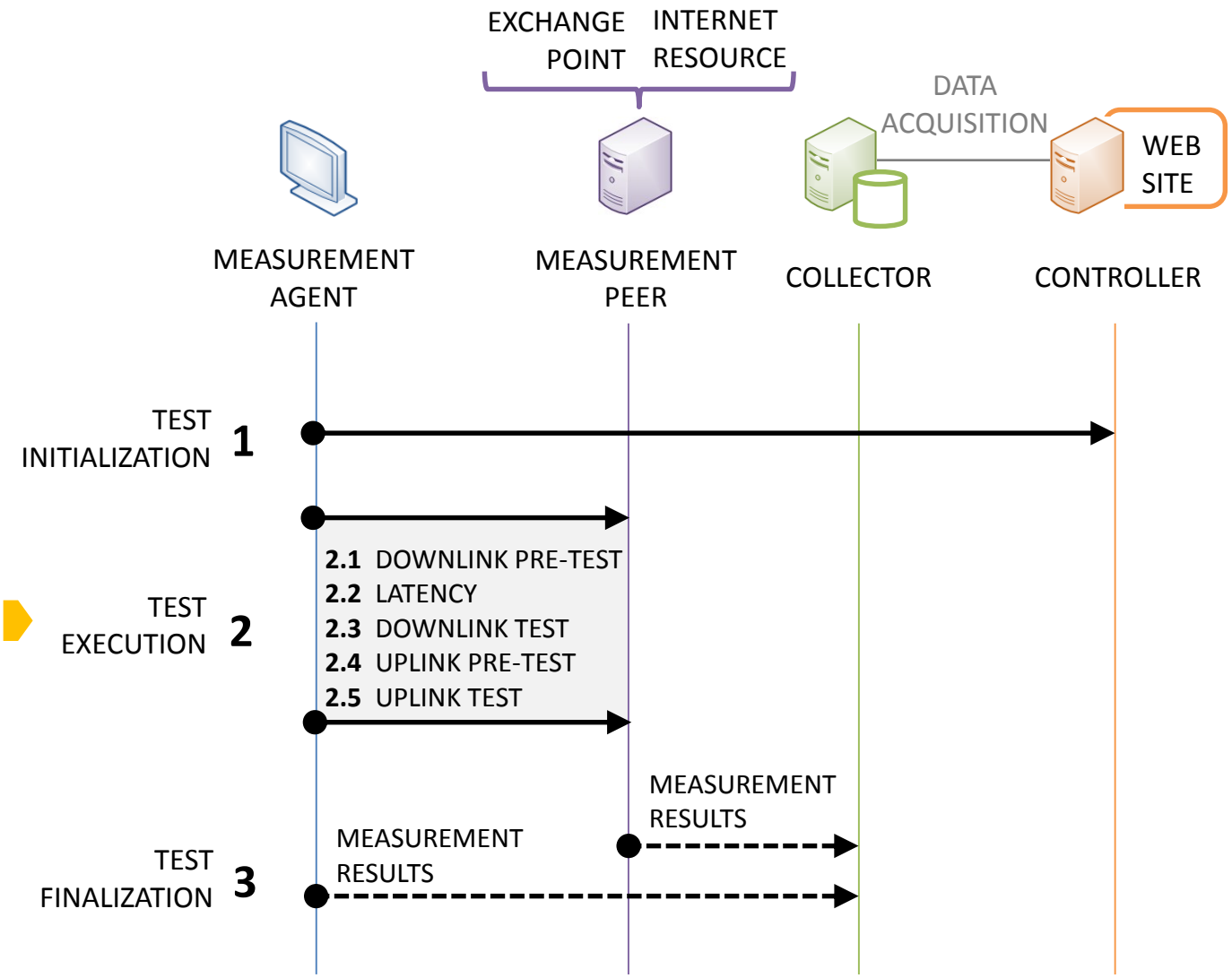
MA Measurement Agent
MP Measurement Peer
EP Exchange Point
IR Internet Resource

Test procedure

- Introduction
- Background
- The Framework
- **Test procedure**
- Conclusions

Test procedure
Test Phases

ITU-T Draft
Q. TM_Sp_Test



Test procedure
Test Parameters

- Download data transmission speed

- Upload data transmission speed

- Two-way delay (RTT)
  - Twice "*the time required for a packet to traverse the network or a segment of the network*" (ITU-T G.1050)

Test procedure
Issues under study

ITU-T Draft
Q. TM_Sp_Test

Testing Methodologies

Limited data Max timeout	Adaptable data Max timeout	Unlimited data Limited time	Unlimited data Until stabilized

Test procedure
Methodology concerns

ITU-T Draft
Q. TM_Sp_Test

Testing Methodologies
Under study (2016)

Limited data Max timeout	Adaptable data Max timeout	Unlimited data Limited time	Unlimited data Until stabilized

- Protocols to be used
- Additional/optional parameters to be measured
- Impact of different OS & browsers…

Conclusions

- Introduction
- Background
- The Framework
- Test procedure
- **Conclusions**

Conclusions

- Framework:
  - Neutral and **trust-based** approach to **unify** Internet Speed estimation
    - **Operators:** Reliable tool for SLA verification
    - **Users:** Valuable information, comparative results
  - Global QoS observatory
    - Strengths and weaknesses of operator's network
    - Extendable to other Internet based services

THANK YOU

A unified framework for Internet Speed Measurements

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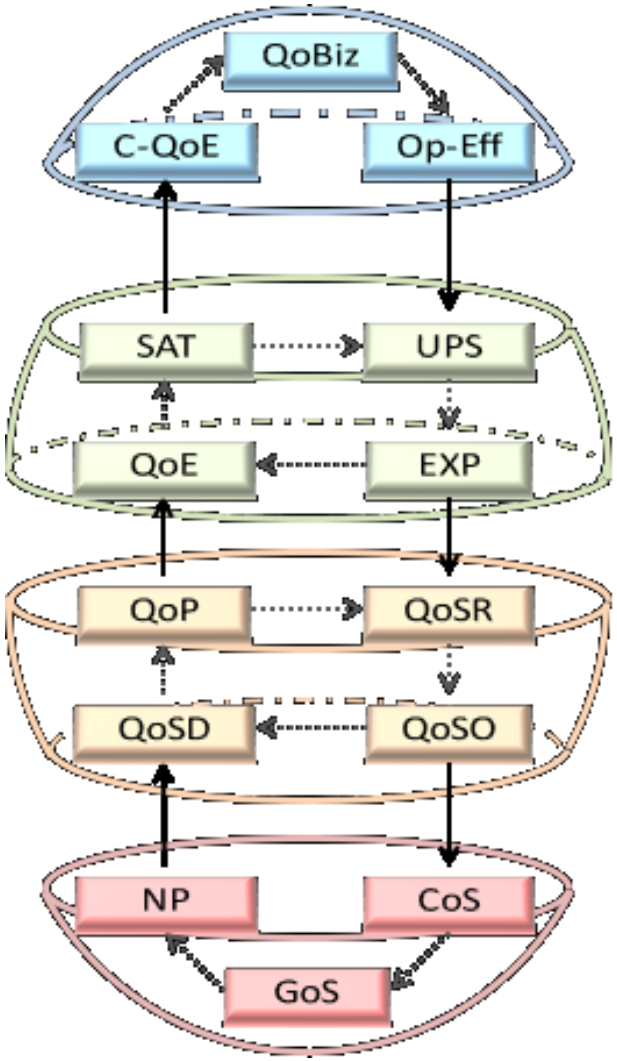
QoXphere
(ITU-T Kaleidoscope 2013)



QoS BUSINESS

C-QoE: Customer Experience
QoBiz: Revenue & Margin
Op-Eff: Operational Efficiency

ASSESSED QoS

QoE: Quality of Experience
SAT: Satisfaction
UPS: User Provider Selection
EXP: Expectation

PERCEIVED QoS

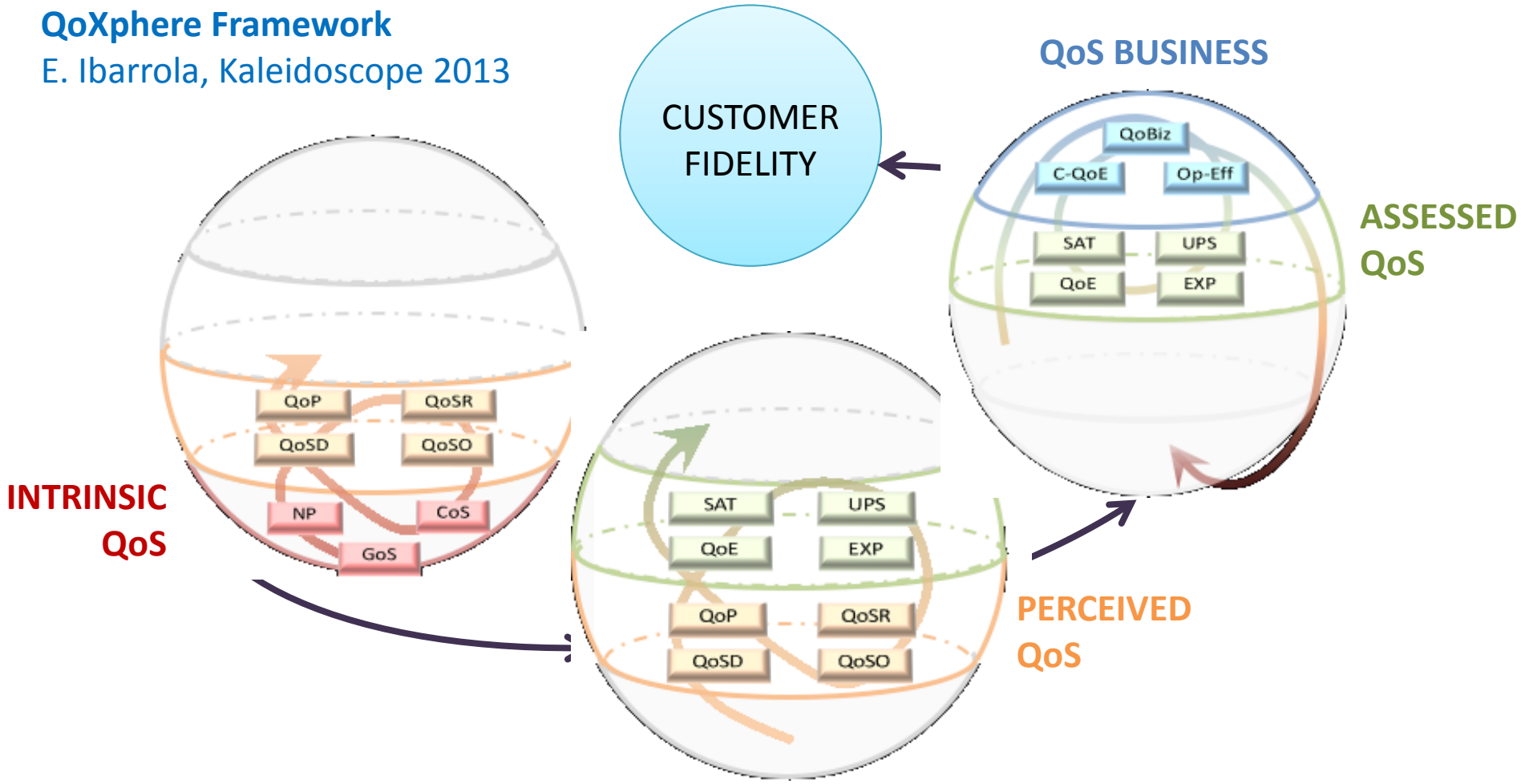
QoP: QoS Perceived
QoSR: QoS Required
QoSO: QoS Offered
QoSD: QoS Delivered

INTRINSIC QoS

NP: Network Performance
CoS: Class of Service
GoS: Grade of Service

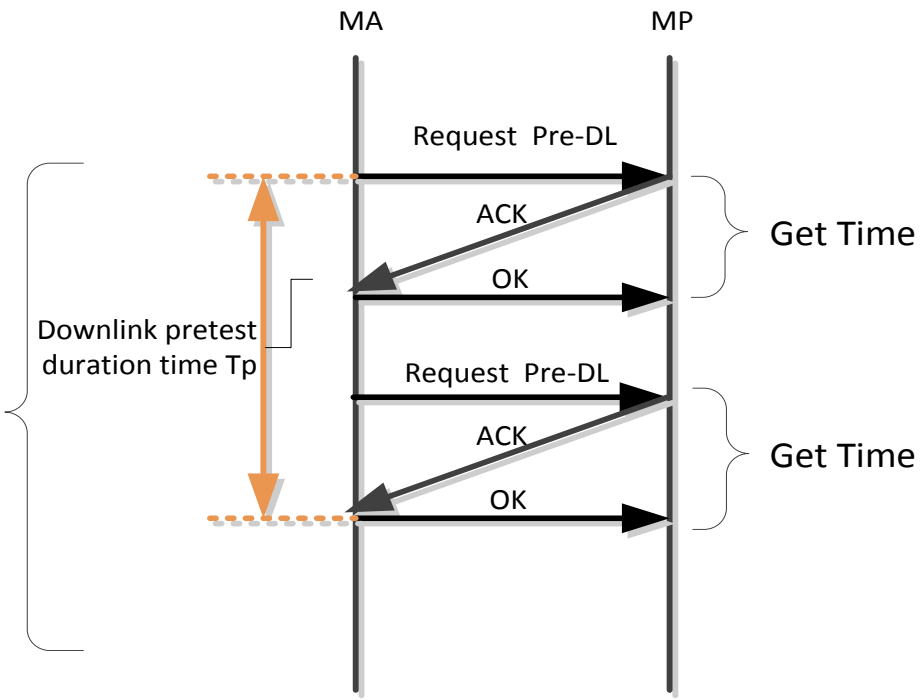
Introduction
Trust: User fidelity

QoXphere Framework
E. Ibarrola, Kaleidoscope 2013



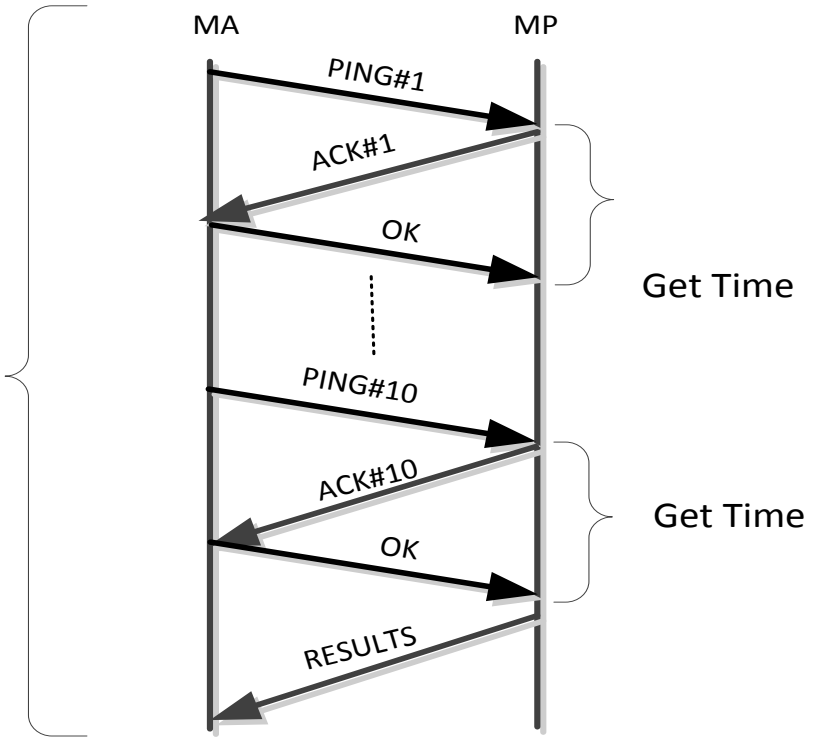
Basic methodology
Test Execution: Steps

Step 2.1
Downlink Pre-test



STEP 1. DOWNLINK PRE-TEST

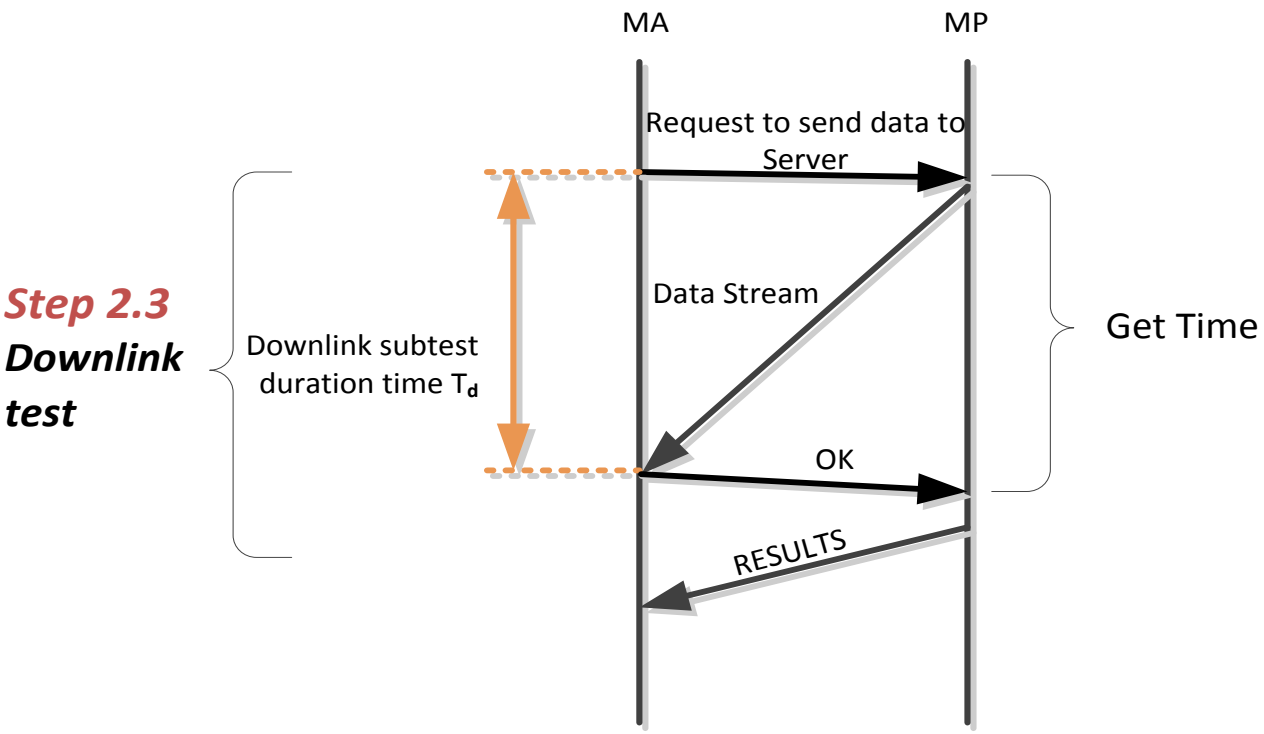
Basic methodology
Test Execution: Steps



Step 2.2
Latency
Subtest

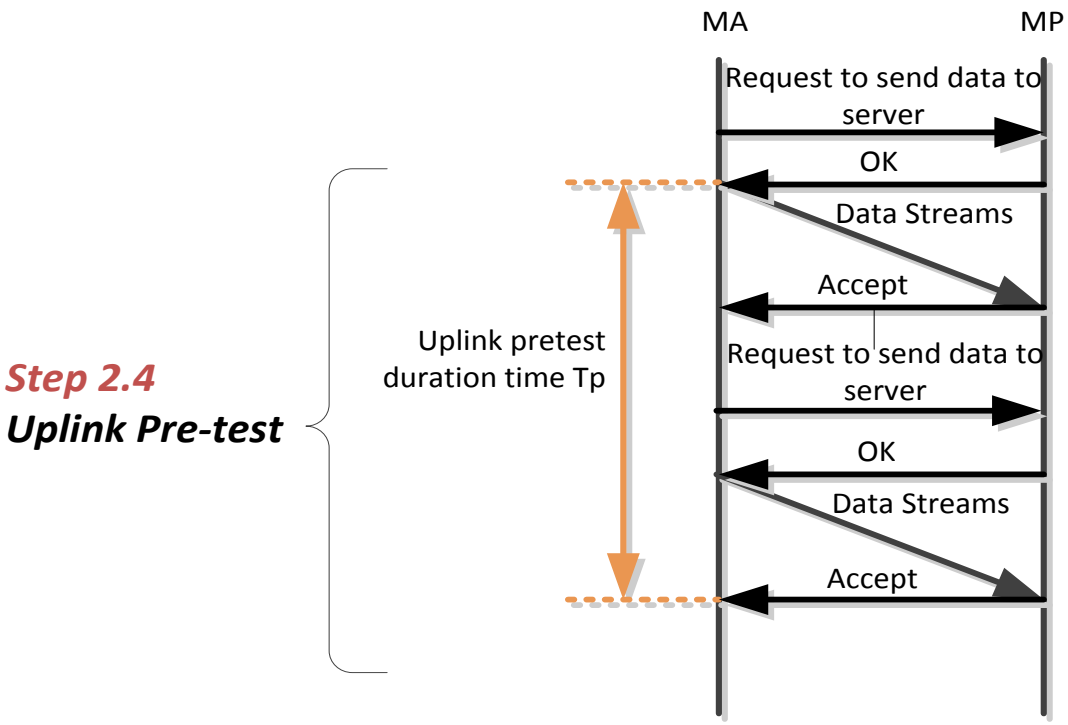
STEP 2. LACENCY SUBTEST

Basic methodology
Test Execution: Steps



STEP 3. DOWNLINK TEST

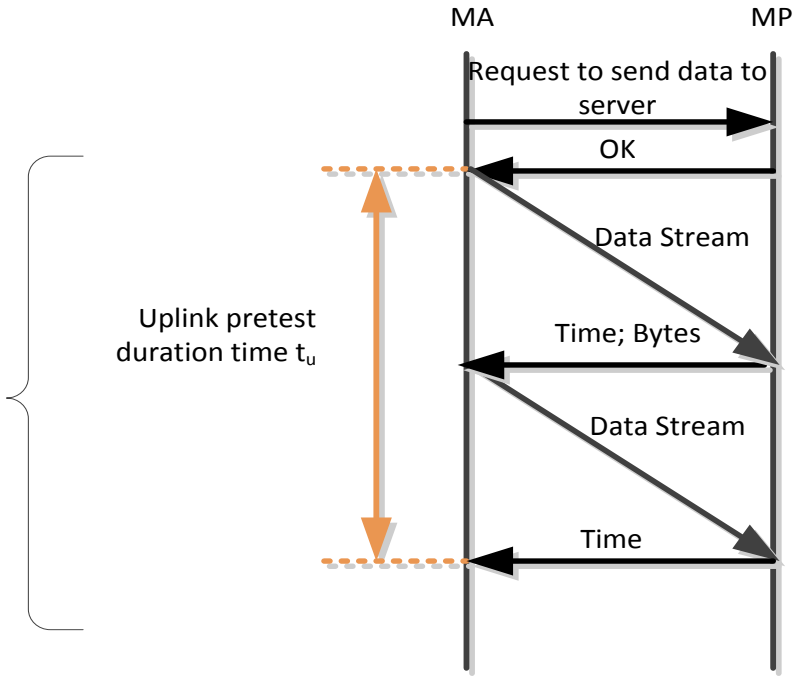
Basic methodology
Test Execution: Steps



STEP 4. UPLINK PRE-TEST

Basic methodology
Test Execution: Steps

Step 2.5
Uplink Test



STEP 5. UPLINK TEST