LMAP BoF
1. ISP use case
2. Framework

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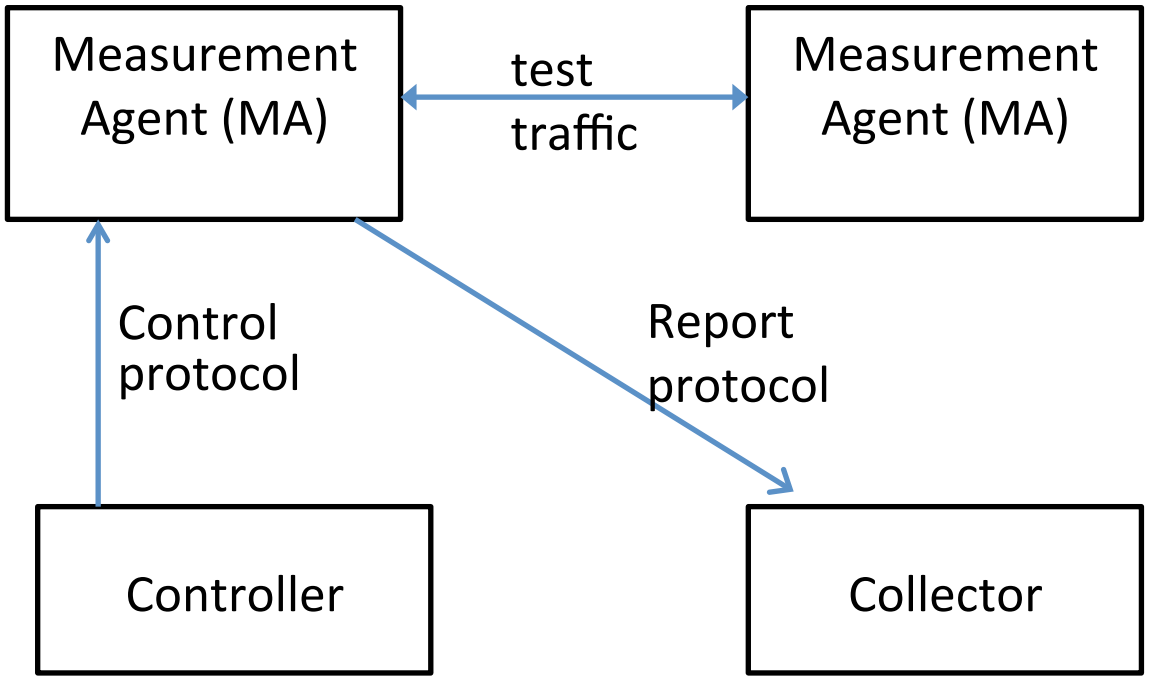
ISP use case

- Identifying, isolating and fixing problems in the network
  - Assist Test and Diagnostics tools
  - Identify degradations as well as failures
  - Identify issues affecting a group of customers (shared network element, equipment type, etc)
  - Test network segments, as well as access line
  - Scheduled and ad hoc tests needed
- Design and planning
  - To assist capacity planning & monitor suppliers
- Understanding the impact and operation of new devices, technology, products and services
  - IPv6, CGNAT, IPTV, new line cards…
- Understanding the quality experienced by customers
  - End-to-end service experience

LMAP characteristics from ISP use case

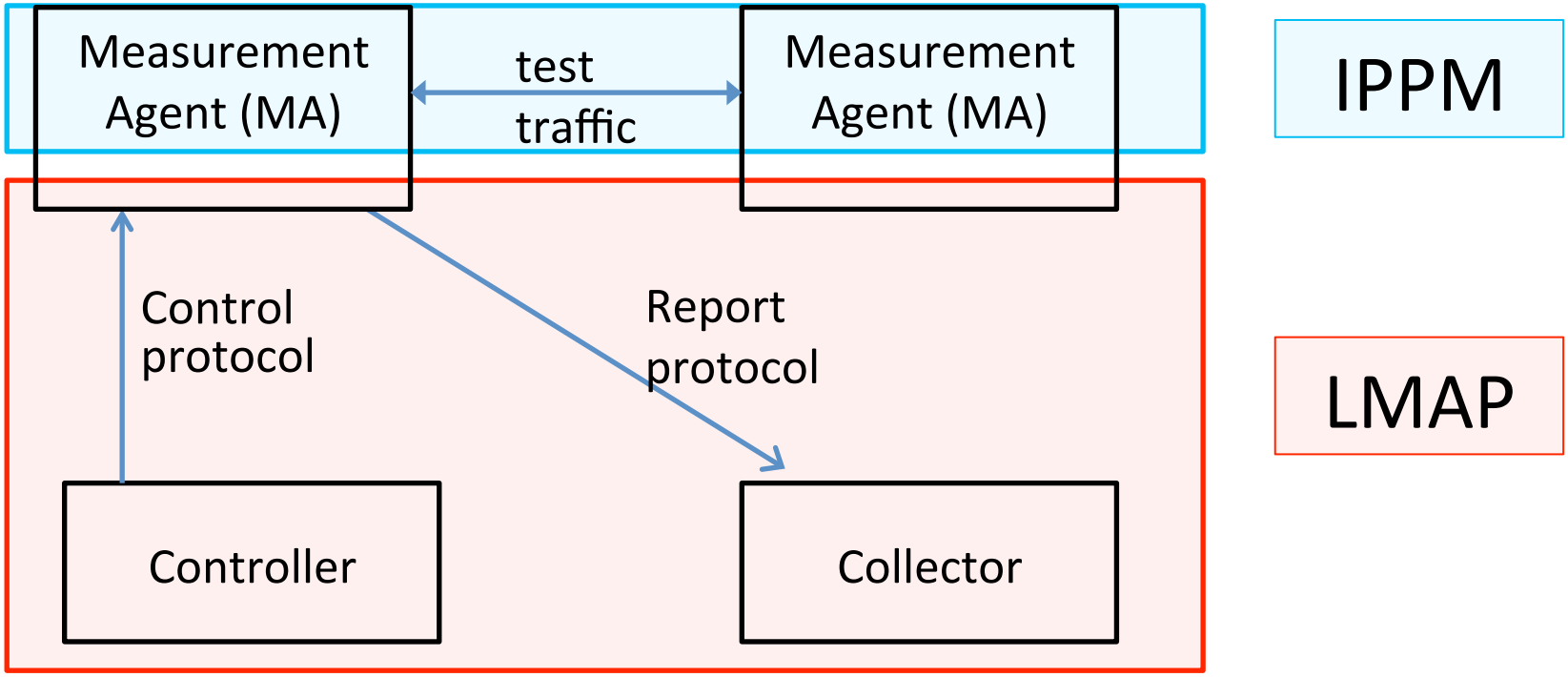
- Large-scale
  - Capable of running tests on individual lines (panel is not enough)
  - Potentially Measurement Agent in every edge and end device
- Standardised
  - Meaningful to compare measurements of same metric
  - Allow operators to use multiple vendors for Measurement Agents
- Diversity
  - Measurement Agents in different devices (home hubs, set top boxes, edge devices), from different vendors, with different capabilities (wired, wireless)
- On-demand tests
  - By operator and by end user

LMAP framework



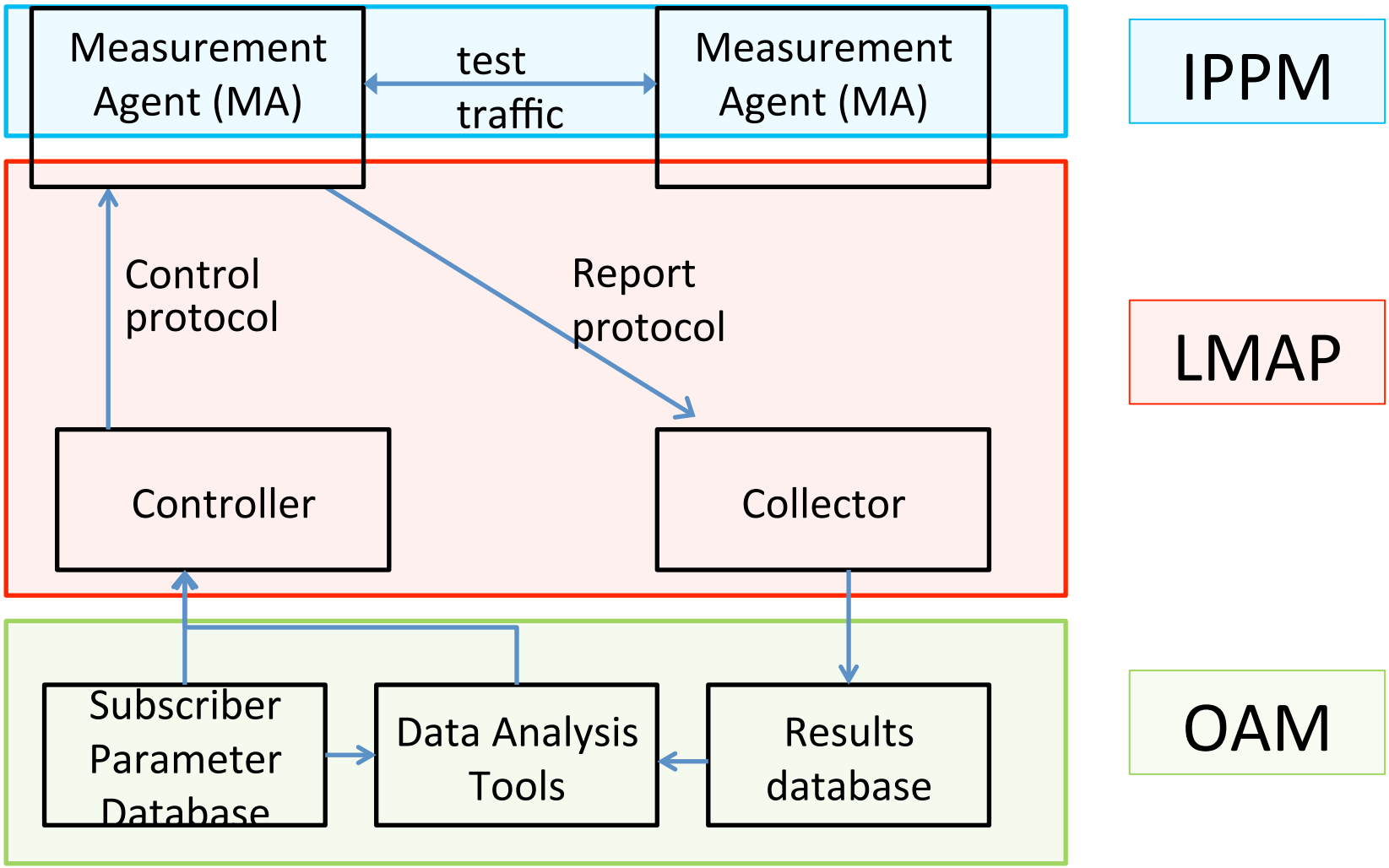
- Measurement Agents
  - Perform the test
- Controller
  - Manages MA (instructs what test to do & when; how to report results)
- Collector
  - Accepts results from MA

Overall measurement framework



- LMAP should be open about what metrics are measured
  - Use IPPM tests, referenced via the proposed IPPM registry

Overall measurement framework



- LMAP should be open about use of measurement results
  - After collection: used by ISP, regulator…

Technical gaps (work for LMAP)

- Define how the Controller instructs an MA about a test (Test /Report Schedule)
  - What metric to measure (with what parameters), when, what conditions, how to report (where to and when).
- Define how the MA reports results to the Collector (Report)
  - What was measured, when, the actual results

… which requires …

- Information model: abstract definition of Test /Report Schedule and of Report
  - We want exactly one
- Data model: instantiates the information model in a particular language.
  - Eg JSON or YANG or (for the Report) IPFIX. Or non-IETF standard like XML.
- Protocols: how to deliver the Test /Report Schedule and the Report.
  - Eg NETCONF or a RESTful interface or (for the Report) IPFIX. Or a non-IETF protocol, like TR-69
  - Reflect diversity of types of Measurement Agent

Solution Constraints

- To help meet the required characteristics
  - especially large-scale
- To simplify initial work whilst allowing future extensions

Constraint #1: Measurement system under control of one organisation

- Single organisation responsible for both data and user experience
- Inter-organisation coordination is not precluded
  - Interesting but raises additional issues (policy etc)

Constraint #2: Measurement Agent has a single Controller at any one moment

- Single Controller determines MA's Schedule
  - So MA does not have to manage contention between multiple, conflicting Schedules
  - Simplifies MA design and deployment
- Note, an operator may have several Controllers
  - For different device types, scalability, resilience etc

Constraint #3: Measurement Agent acts autonomously

- MA operates tests and reports results without further reference to Controller (once it gets Schedule)
  - Avoids frequent checks with Controller
  - MA (on edge /end device) knows when not to run test due to user activity