



# Large Scale Broadband Measurement

## Activities within the IETF, Broadband Forum and EU Leone project

Trevor Burbridge, 16th May 2013



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# Areas

- IETF
  - LMAP BoF held at IETF 86 Orlando. Working on charter
  - IPPM charter in revision
- Broadband Forum
  - WT-304 looking at large scale test control and reporting
  - Earlier work on specific one-off tests (TR-143)
- Leone
  - BT led EU 7th Framework ICT project
  - Commenced November 2012 – 2 ½ years duration



# ISP Use Cases

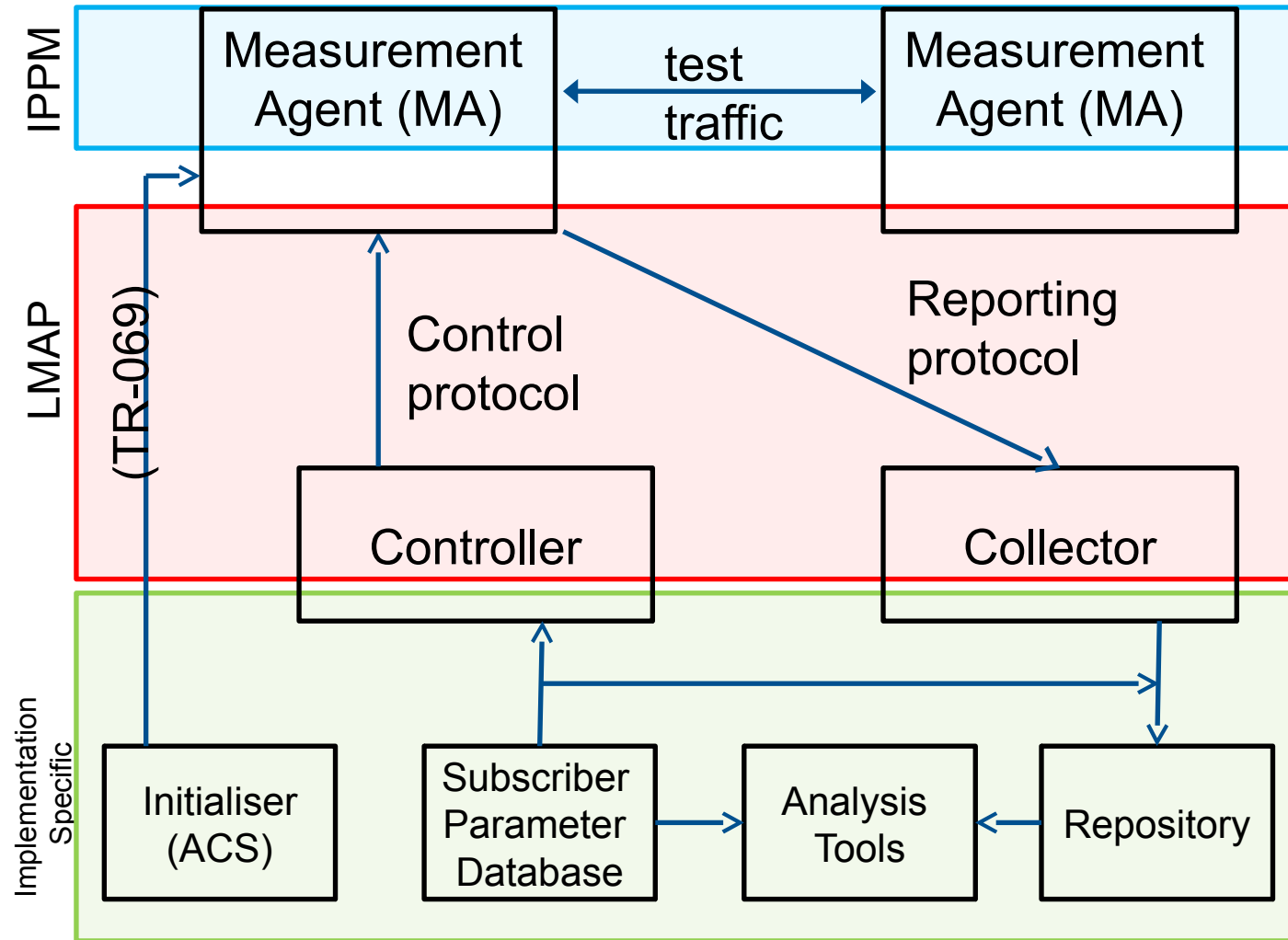
- Identifying, isolating and fixing problems in the network
  - Complement Test & Diagnostics tools
  - Identify degradations as well as failures
  - Identify issues affecting a group of customers (shared network element, equipment type, etc.), as well as individual line
  - Test network segments (including home network)
- Design and planning
  - To assist capacity and network planning
  - To monitor suppliers (upstream & downstream)
- Understanding the impact and operation of new devices, technology, products and services
  - IPv6, IPTV, Home Gateways, new line cards...
- Understanding the quality experienced by customers
  - End-to-end service experience (e.g. web browsing quality; reliability)
  - Solve issues with most customer impact

Also regulator and end-user use cases

# 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)
- Scheduled and on-demand tests
  - Scheduled reference tests
  - Flexibly configured test schedule (e.g. investigate different issues)
  - Operator can run tests with customer
  - Customer may also want to run tests

# Framework & Work Items



## Items:

- Use cases
- Tests (IPPM)
- Registry (IPPM)
- Path Definition (IPPM)
- Framework
- Terminology
- Information model
- Data model
- Control Protocol
- Reporting Protocol
- Initialisation (BBF)

# Scoping

- A single organisation operates the measurement system
  - Responsible for both data confidentiality/privacy and impact of tests on user experience
  - Simplifies solution as avoids policy decisions and coordination
- No explicit co-ordination between measurement systems
  - No federation, negotiation etc.
  - May share remote measurement points, especially for live services
- Measurement Agent associated with a single controller at any point
  - MA doesn't have to resolve conflicting schedules of tests
  - MA may have detection of user cross-traffic
- Can report to multiple Collectors
- Can use 3rd party MAs (at remote measurement point)
- Favour simple synchronisation type protocol (i.e. REST) common to any device type

# Open Requirement Discussions

- Line and subscriber information
  - Measurement data enhanced post-Collector
  - Is some line/subscriber data sent via MA?
  - 3rd party collectors & anonymous lines
  - Standard interface or specific to device?
- Admission control
  - Protect network and measurement points
  - Built into some test protocols (but not live services)
  - Controller or device management can instruct MA to stop testing (but may be limited by update method/schedule)
- Capabilities
  - Avoid negotiation over what tests can run
  - Not practical to schedule depending on MA system resources
  - MA could make decision
  - Retrieving installed tests could be useful for Controller
  - MA could receive error from remote measurement point if test not supported

# Conclusions

- Large-scale measurement is a hot topic in research and standards communities (not restricted to IETF, BBF)
- Standards and tools will enable ISPs (and other network/service providers) to invest and manage their networks more intelligently and improve real user experience
- More participation and views are welcome!