Large-Scale Measurement of Broadband Performance (LMAP) BOF

WEDNESDAY, March 13, 2013   1510-1710   Afternoon Session II
BOF Chairs: Al Morton, Dan Romascanu

These Meeting Minutes are divided in two parts: a Summary and Detailed Notes, based on input from the Note Takers, Mike De Leo and Andrea Soppera.

SUMMARY

The LMAP BoF was held in a 2 hour session with about 100 people in attendance.

Dan Romascanu and Al Morton chaired the meeting and prepared these meeting minutes. Official Note Takers were Mike De Leo and Andrea Soppera.

After presenting the agenda and framing the discussion with a guided BoF scope (illustrating the sub-set of the network path where the aspects of scale and complexity are most demanding, and designating that Metrics and Liaisons were out of scope), the chairs introduced a series of invited presentations selected from the authors of several Internet-Drafts produced after the IETF-85 LMAP side meeting. The first 3 talks described the Use Cases, the Problem Space/Framework, and the proposed IPPM Registry and LMAP Reference Path (which are key elements of the problem, but are likely to be worked elsewhere: the glue between IPPM and LMAP).

Several times, participants raised the issues of measurement accuracy and possibilities for "gaming the system" or specmanship approaches obtaining desired results, including identification of test traffic and giving it preferred treatment (comment: this is an IPPM issue, and is already treated in their literature). Some of the problems are problems for lawyers and a code of conduct has been useful in the past, but many integrity issues cannot be engineered beyond the realm of the possible.

There was desire (in this meeting) to address the Multi-provider-use case, but this term has many possible descriptions and definitions. For example, Measurement Agents (MA)/Devices could have multiple owners, but they could be measuring a single network and be operated by a single entity. Alternatively, an LMAP system (control/collection/measurement) might have a single owner, but make measurements of multiple network providers from different vantage points. It will be helpful to determine what specific multiple-entity case is needed first, and which can be deferred when the complexity of the solution grows because of their presence.

In the context of the proposed Framework for LMAP, it was clarified that the meaning of Large-Scale is 10k to 100k MA. Load-Balancing between MA and other systems has not yet been considered, but appears valuable. Each MA would be located in a single domain, but the current proposal is to unify control of any MA from a single organization's control/reporting protocol at any point in time. A comment from the Security area supported the single domain scope, indicating that much complexity can emerge for protocols in the multi-domain case, and these need to be thought-through carefully.

There is a need to carefully define terms, such as test and metric (which have very generic definitions in normal use).

There are several IETF specifications and protocols which can be leveraged for the LMAP problem. IPFIX Information elements have options to reduce the reporting traffic when repeating measurements are involved. NETCONF has several issues to overcome, such as NAT transversal and PUSH of results from and MA. YANG has been considered as Data Modeling Language for configuration of tests. All protocols proposed are at this point in time examples that demonstrate feasibility but they are not necessarily the solutions that will be adopted. The charter will reflect the strong preference given to re-utilization of already existing protocols whenever these meet the requirements.

The charter presented for discussion is a first step and will undergo several iterations of changes and editing if the formation of a WG will be approved. The limitation of the scope to a manageable subset for the first phase of the WG has been considered as a good thing. The aspects of 'cheating' when reporting internal results should be considered out of scope, as well as these aspects of the muti-provider use case where entities do not collaborate. One control aspect has emerged several times (as expected): IETF'ers clearly want to initiate their own measurements and it's likely that on-demand measurement will be important to any user who experiences a problem.

Conclusions:

- There was strong support to take-up this work in IETF indicated by a hum, and complete silence in opposition. There was a weak hum from those in the room who had no opinion.
- 20 people present indicated their intent to participate by writing code, writing drafts, reading and reviewing drafts, and participating on the mailing list.

DETAILED NOTES

Framing the Topic, chairs - Al Morton, Dan Romascanu - 10 min

Al Morton – Intro - IPR Policy, aim is to narrow LMAP to IETF problem, policy decisions and coordination out of scope, the aim is an access Infrastructure measurements

General Use Cases - Marc Linsner - 10 min

- End User Use Case
    - = Ad-hoc, on demand testing
    - = Can be scheduled
    - = Work with 3rd party Measurement Controller, or end user supplied infrastructure
    - = Measurement Agent can perform testing
- 3rd Party Use Case (summarized together)
    - - Multi-provider
    - - Regulator
- 3ed Party Use Cases Attributes
    - = Only testing layer 3 and up
    - = Results may be shared among multiple interested parties
    - = test data must meet high level of verifiability, accuracy and fairness
- Security and Privacy

- TBD

Lars Eggert – Netapp : test data must be verifiable – there is an incentive for ISP to cheat and to show their product being better. In particular when regulator plays a role in the picture.

Henning Schulzrinne's response: LMAP cannot address all issues – we need to identify the entities that make the measurement and possibly apply code of conduct.

Wolfgang Beck - DT – fairness is a nice goal but hard to achieve – nationwide provider always have a disadvantage compared to providers focused on city areas.

Henning - FCC – It is beyond the scope of LMAP to define who you measure, when you measure – there is work on this area but out of scope for today discussion – we are not doing a world-wide measurement project.

Benoit Claise – Wondering what you want to do with the use case of multi-provider? What do you want to achieve?

Mark Linsner – it is a single provider with ability to share data across multiple providers.

Shane Amante - L3 – Multi-provider Sharing is about end to end measurements where external servers from the last mile provider can be used to support end to end measurement

ISP Use case, Framework: Problem Statement, Gaps, Requirements - Phil Eardley - 15 min

- ISP Use case
        = Identifying, isolating and fixing problems in the network
        = Design and planning
        = Understand the impact and operations of new devices, technolog, products and services
        = Understanding the quality experienced by customers
- LMAP characteristics for SP use case
        = Large-scale
        = Standardized
        = Diversity
        = On-demand stats
- LMAP Framework diagram
- Technical Gaps (work for LMAP)
        = Define how the Controller instructs an MA about the test
        = Define how the MA reports the results to the Collector (Report)
        which requires
        = information model
        = data model
        = protocols
- Contsraint #1: Measurement system under the control of one organization
- Constraint #2: Measurement Agent has a single Controller at any one moment
- Constraint #3: Measurement Agent acts autonomously

Brian Nedstrom – Cable Labs – Q: Did you mention the Metro Ethernet Forum as a partner? We should be liaisoning with the MEF. Layer 2 MEF testing - we need SAP PDU testing – we need to align the testing.

Al Morton –I'm very aware of the MEF work, but they have defined Out-of-Service Testing for Ethernet Services. LMAP is intended to be In-service testing, and we plan to work at the IP layer: these are predominantly IP-based services for Internet Access.

Benoit Claise – Question regarding MA - How many MAs per controller? Phil: 10k 100k

Question - Is IPPM only active measurement? (Brian Trammell) IPPM will also consider passive tests

Questions – Restriction on instruct and collect test? Does not need to be restricted

Wolfang Beck – DT How do you differentiate your device per product type, resources, etc.? How do you assure the reports are in a consistent format?

Phil more work is required on this area.

Lars Eggert – Multi-party – I am paranoid that people will cheat – Henning: Not in the US in the BB Measurement America project.

Ken Ko – Adtran In the draft the interfaces Controller-Controller, Controller-MA, MA-MA are mentioned as "in scope",   they should be in scope for the LMAP. Have you considered the issue of load balancing that deal with a large number of agents? (Not yet)

Necessary to have interface that categorise the data? Assumption of single ownership control.

More than 1 domain for MA in the Internet? Not for the MA, yes for the controller.

Samita Chakrabarti –Ericsson Controller/collector can be same box? Yes.

Wolfgang Beck – DT Concern that in Germany there is a risk of measurement traffic prioritization by the network providers.

Leif Johanson – Supports the single domain scope to start. Multi Domain will affect your security – Multi-party delegation – need to think about those aspects carefully

Foundation Blocks - Marcelo Bagnulo - 10 min

IPPM Registry

- IPPM and LMAP: the glue
        = LMAP defines protocols
        = IPMM defines the metrics
        = The glue: a registry for metrics/tests so that the LMAP protocols can refer to specific IPPM metric/test
- Protocol Independent Registry
- What is the registry?
        = New registry, narrowly defined

= Reduced number of metrics proven useful

= Side benefits

The Registry allow definition of metric to instruct the Measurement Agent **-** Less is more in this case, a small set of metrics that have proved to be useful.

Benoit - What is a metric and what is a test? –

Marcelo - Metric is widely defined in the IPPM RFC – the problem is they have too many open parameters. The definitions for these things in IPPM might not be specific enough, but the metrics are defined in IPPM.

Michael Bughenagen (Century Link) – Test will be standardised yes or no??

Marcelo YES, in IPPM. This is the correct way to do it and environment factors should be included – Clarification of environment is critical –: IPPM registry draft covers these points.

Marcelo – Reference Path Draft

There are many places where the Measurement Agent can be placed – we have defined the first version of a generic reference path – access, demarcation points, etc. The reference path draft helps defining what we are talking about when considering parts of the communications path.

Solution Candidates - 30 min total

IPFIX - Brian Trammell - 10+ min

Benoit Claise comment - – USE CASE – FOCUS not on SOLUTION

Dan Romascanu – We show that there is work at the IETF in this area.

Brian presented - IPFIX in 180 sec

= IPFIX + LMAP

= Example

= Template example

= Data Record example

= Applying options with common properties to reduce duplicated info

= Template w/Options

= Other considerations for efficiency, representation complexity and collector in-

degree/federation via mediators

Henning – How did you do geo-location? Answer is that we stayed away from it for privacy concerns – Possible to use "new Information element"

Brian Hedstrom – Where IPFIX is used in operators?

Brian Trammell - The largest deployment is Netflow 9 large scale, in IPDR there are other solution with large scale deployment

NETCONF/YANG - Juergen Schoenwaelder - 10+ min

Brian Hedstrom – Data model of being YANG – is this an advantage? YANG is one possible implementation.

Leif Johanson – experiment to architect netconf for low power device? Leif mentioned that it could be done but low power device could provide a challenge.

ALTO - Jan Seedorf - 5+ min

Samita Chackrabarti – Ericsson - IPFIX, ALTO, NETCONF – should we use them all to implement LMAP? Answer - These are just examples.

Henning – reinforce that IPFIX, NETCONF are just example – there are maybe better solution but we are not too far away – data model, configuration protocol

Jan – we do not want to start from scratch we want to reuse protocols.

Scope Discussion - 10 min

Benoit Claise – One confusion – Two or Four Use Cases ? is the multi-provider solution in there ? Answer not at the moment.

Michael Bugenaghen – Century Link who owns the whole framework? Answer: The framework belongs to LMAP – Concurrent work in progress in other SDO – Question: security needs to be addressed? Answer: Yes it falls in LMAP and it will be addressed. All RFCs have a Security Considerations Section!

Chane Amante – L3 – Lars discussed concerning on gaming the system? In BB Measuring America different parts own different parties and so it is basically very hard to cheat – data analysis should be able to understand if there issues in the system.

Lars Eggart – I would be interested in the un-gamed accurate measurement – This is the use case that I would prioritise higher – detect gaming? Prevent? ISP can do big data analysis and identify any other type of traffic – What is acceptable?

Test traffic to measure bugs? Yes, we want to measure bugs in performance. Pass Failed testing? yes

Marc Linsner – why these two use cases? Managing framework and make sure extensible – large

Chunshan Xiong – 2 MAs (home agent) and server – why operator MAs and not user operated? There are multiple aspects and user wants to have visibility and what the data wants to be verifiable and credible.

Al Morton – asked Henning to comment on gaming the measurement

Henning – gaming – There are lawyer problems and there are Engineer problems – In Measure Broadband America – non cooperative MAs - code of conduct spell out to everybody what is going on and increase transparency - so it is difficult for large scale cheating to go undetected – for most providers the risk of bad publicity – we should explicitly consider that OUT OF SCOPE – to L3/Lars' points

Henning - Scoping – difficulties with Multi Provider case – there are aspect of multi providers already device in the home, device in network, and MA (Test Server) this is provided by Level 3 in BB measurement America – These entities are not competing and already provide diversity.

Marcelo Bagnulo – Multi provider instructing measurement agent (Probes) – that is a problem that we do not want to solve – the MA test server could be owned by multiple organization – Controller/Reporting to MA Probes is the protocol we want to focus

Jason Weil – Is user initiated test included in the LMAP work? Yes it is included

Brian Trammel – MA on CPE we need to have some ways to manage and way to discover something of this need to be included

Samita – Mobile BB use case measurement is in scope? We are looking at it (reply from Al Morton)

Hannes TSCOFENIG – 3 entities – is a laptop outside the scope? No it is not.

Henning – we want a cooperative model – he gives example of the mobile phone measurement Platform

Al Morton –when there is an issue, operators need to find the network segment with the problem as a first step.

VOTE

DAN ROMASCANU

SHOULD IETF TAKE UP the WORK ? POSITIVE HMM – strong consensus in favour

ACTIVELY Contribute to the IETF WORK Group ? 20+ counted roughly

BENOIT CLOSING WORDS – pleased with constraint input from Phil – Happy with energy in the room a good point where to start.

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