IPPM Working Group
Friday – Continental – 9-11:20am

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(A note about the minutes – action items that are captured in the minutes are denoted on new lines, prepended with "*", an owner name, and the action. They are grouped into the draft presentation where the action occurred.)**

Note Takers: Marius Georgescu, Sarah Banks

Agenda Bash

http://www.ietf.org/proceedings/92/agenda/agenda-92-ippm

WG Update

http://www.ietf.org/proceedings/92/slides/slides-92-ippm-9.pdf

(not formally on agenda, because there's no presenter – see notes below)
draft-ietf-ippm-checksum-trailer-00

- No presenter, no last last last comments

DSCP and ECN Monitoring in TWAMP
draft-ietf-ippm-type-p-monitor-01
Slides: http://www.ietf.org/proceedings/92/slides/slides-92-ippm-1.pdf

Presenter: Greg Mirsky

- Document is stable
- Sent to WGLC
- Comments are welcome
- Progress to be reported in Prague
- 4 people have read the document
- Will start WGLC on this draft today/Monday

Registry for Performance Metrics
draft-ietf-ippm-metric-registry-02
Slides: http://www.ietf.org/proceedings/92/slides/slides-92-ippm-8.pdf
Presenter: Marcelo Bagnulo

- 9th iteration of this draft
- Hope to be nearly done
- Drafts (with AI) might be converging
- Hope to have a final draft soon
- Added a new column, the URL, which will be a pointer to a txt file (presentation issue)
- Discussion of open issues
    - Want to provide a proper definition of the filter column
    - Provide some examples of passive metrics in different places of the document
    - Is there any part of the registry that should be machine parseable – the authors think the whole registry should be in a format, like a csv format, so that a device can download it and understand what different metrics are available, but beyond that, there's no need for further map, like an ASCII-map.
- Barbra Stark – there were a few parameters that stuck out ; the assignment of the fixed parameters could be really useful. Also, there should be consistency in the roles.
- Presenter: It's not trivial to introduce a schema, particularly when it's not generic
- Barbara Stark– what about a JSON type of naming convention for the parameters
- Brian Trammell – we need a 10th revision of this, Barbara's comment makes sense, but you might need a registry for that
- Barbara Stark – I think this could be doable
- Brian Trammell – so long as there's some text around what the parameter names are bound to, that's fine

- Al Morton – thanks Marcelo for this work. Fixed parameters are fixed for one metric, and they are very likely to change for another indexed metric, so there are still variables for implementers.
- Presenter - In my understanding we will need to provide some format for fixed and input parameters.
- Next Steps – a new version of the draft (by mid April), hope to do a WGLC on that last revision
- Al Morton – it's worthwhile to look at the initial set of entries that would be popular in the registry
- Barbara Stark – whether or not the purpose of this could be to provide the format that be used by registries across the internet
- Presenter – I'm not sure what the action is here
- Barbara Stark – the reading is all about the IANA registry, this is all about the entries that go into the registry – other than 1 term about proprietary term, there's no mention or suggestion about other registries, or no mention of other registries to use the statement
- Presenter – we could add a sentence or paragraph about this to the draft
- Barbara Stark – the doc implies that it's specific to IANA.
- *** Barbara Stark to propose text for the draft

Model Based Metrics

draft-ietf-ippm-model-based-metrics-04

Presenter: Matt Mathis

Slides: http://www.ietf.org/proceedings/92/slides/slides-92-ippm-7.pdf

- 2 talks
- Outline
- Document changes from -03 to -04
- Dropped CUBIC TCP model
- Believe the document is ready for WGLC
- Required Network Properties discussion
- (6 requirements) – see slides
- 2 people have read the draft (current)
- *** Chair – will start the WGLC, will do this after IP Monitor
- Al Morton does not object, as co-author, to WGLC

Why Model Based Metrics?

Presenter: Matt Mathis

Slides: http://www.ietf.org/proceedings/92/slides/slides-92-ippm-7.pdf

Status: New Work Proposal

- History

- 1990's debugging scenario
- End to end an app fails, but testing each section passes (using something like iperf)
- Basic performance measurements are not useful diagnostics
- vBNS research center
- Why are we building a parallel network when we could put this money and effort into the current internet?
- Designed an ISP-scale metric
- There were some things missing… what metrics to use, pick end points, do weighted aggregation
- This "missing stuff" led to a BOF and the formation of the IPPM WG
- The charter for this WG never talked about measuring transport capacity in the way we wanted to put it in – we knew the problem was too hard
- We also didn't understand, at the time, was that a lot of the measurements were obscured by TCP problems in a non-obscure way
- The lameness of TCP masks a lot of other problems – masked buffer bloat, that TCPRF doesn't work in the way you want it to work
- Model based metrics is about fixing that problem – testing with open loop TCP, where the traffic mimics TCP at the specified performance, and predict whether or not the path can support TCP at that rate.
- The question changes from how fast will TCP go, to can TCP support the flow at that particular speed?
- Al Morton – sounds worthwhile to work on, Al is willing to be a co-author.
- Brian Trammell (individual) – you want to build a framework around what was on the whiteboard – how much can you change about the endpoint behavior during the test?
- Presenter: Methodology is complete – replace congestion control, but nothing else
- Brian Trammel – if we're going to use new types of encapsulation for transport resolution… it would be extremely useful to have a test that asks exactly this question with the same congestion control and the same control loop on the outside but with different packet framing. I want to run MBM (model-based-metrics) over SPUD (Session Protocol Underneath Datagrams) and compare it with MBM over TCP.
- Presenter – this document says Type-P has to be specified elsewhere
- Brian Trammell – I'm a giant fan of this - probably don't have the cycles to coauthor
- Presenter – thank you in spirit
- Tim Shepard – I think you are thinking generally in throughput rate.
- Presenter – It would be easy to morph it into a jitter requirement for other kinds of applications.
- Tim Shepard – actually I don't think we care so much about jitter as we do about latency, and high throughput is the means to achieve low latency

- Presenter – almost all of this is clear in my mind, except for the influence of the path length on the metric. The answer should be that the parameter used in the model, the RTT (round trip time) is inflated by the path length. One can imagine people asking for minimum RTT requirements.
- Christian Huitema – How fast can I transmit – the big problem we have is latency
- Presenter – the draft in WGLC is about bulk capacity – a little language in there that the approach could be used for other properties
- Christian Huitema – I would love is this approach could be used
- Michael Todd – why measure properties, why not measure user experience?
- Presenter: This is true, although the problem with QoE metrics in general, they're hard to calibrate, define at scale, and measure. You need to measure at both layers, and you need to do the science to show the relation between the two layers
- Al Morton – bridge the gap between network performance and some distance up the stack
- Presenter: map between end to end transport performance, and IP performance, in real metrics. This will provide a way to do IP performance, in real metrics.
- *** Al Morton – there's a paper I wrote that looks at model-based metrics, and talks about them in the context of QoE. Al will share a link to that paper
- Brian Trammell (as chair) – Who thinks this doesn't fit in IPPM and wants Matt to take it elsewhere due to scope?
- No hands
- *** Brian Trammell – Matt, send us a draft. Matt agreed.

TWAMP Data Model (YANG for TWAMP)
Presenter: Al Morton
draft-cmzrjp-ippm-twamp-yang-00
Slides: http://www.ietf.org/proceedings/92/slides/slides-92-ippm-4.pdf

- Introduction
- Motivation (we know a bunch of new things, YANG is a popular modeling language for configuration and management)
- Summary – the challenges, one model, 4 main containers
- UML Classes for Control-Client
- An efficient tie in to the work happening in IPPM – why not ask for things from the registry, and get a response?
- Tree view – check the slides for detail
- Next steps – seeking reviewers from the TWAMP community – thanks to Greg for comments on the list. Eventually, seeking WG adoption, but want some reviewers first.
- Greg Mirsky - Would like the WG to discuss whether the modeling is a part of this effort?

- Presenter – any opinions on that?
- Rich – I would agree with that, I would like to see it modeled here
- Presenter – it would be interesting to see what about the standards track version would have to change
- In TWAMP-light, you don't have the control-client and server – the challenge would be, what about the session sender, reflector containers we currently have, is insufficient to get the session going?
- Greg Mirsky – there are at least 2 versions of the session reflector – stateless, stateful – everything else is the same. There are some differences on the treatment of DSCP – Happy to help work with authors on this model
- Brian Trammell – replace the TWAMP control plane with yang. Is that true?
- Greg Mirsky – yes
- Brian Trammell – that seems like a separate effort to me. It should harmonize with this one, although it's not clear on how that harmony could be achieves
- Greg Mirsky – the guidance in the appendix is to map it to the control of TWAMP control – but if it's a separate effort, I won't argue with that
- Presenter - if we structure the model right, it allows for proprietary extensions –
- Brian Trammell – continue this discussion on the list.
- Presenter – rather than initiate new efforts, review this current (presented) effort
- Brian Trammell – how done is this current work?
- Presenter – it's far enough along
- Matt Mathis – is one a subset of the other?
- Presenter – no
- Presenter – who else besides Greg is willing to review this?
- No hands in room
- Brian Trammell – keep working on this, and we'll take the discussion to the list, let's talk about this in Prague

Support of IEEE-1588 time stamp format in TWAMP
draft-mirskey-ippm-time-format-00
Presenter: Greg Mirsky
Slides: http://www.ietf.org/proceedings/92/slides/slides-92-ippm-5.pdf

- Problem Statement – OWAMP and TWAMP only allow use of 64-bit long NTP time stamp
- But IEEE-1588v2 has gained wide support
- Provides the ability to use other TS formats other than NTP
- This proposal gives OWAMP/TWAMP the possibility to use an alternative time stamp format
- Updates to control protocols

- Update to test protocols – propose to use z-bit (currently not defined) – 0 means NTP format, 1 means 1588v2 format
- TWANP light consideration – session sender/reflector may be informed
- Next steps – welcome comments, will continue to work on this proposal
- Al Morton – comment – maybe you only need 1 flag. NTP is already mandatory – you don't need a flag that says you don't need NTP – you can make this work with 1 flag – if you set PTP flag on the server and it wants to be used on the client, then PTP gets used.
- Presenter – we used 2 flags, because it gave the possibility to not use NTP, but still do TWAMP
- Matt Mathis – update to ensure the draft/work use NORMATIVE language
- Presenter – OK
- Al Morton – you can always choose to do a partial implementation – I don't think we can take away a mandatory capability
- Brian Trammell – if you rev the protocol, we can certainly have the ability to turn off NTP
- Brian Trammell – this is a 32-bit field – I don't like the idea of burning 2 flags here
- Al Morton – we can do this in 1 bit, and we only have 32 bits to use, let's be judicious
- Presenter – we will try to squeeze into 1 bit

Framework for IP Passive Performance Measurements
draft-zheng-ippm-framework-passive-03
Presenter: Greg Mirsky
Slides: http://www.ietf.org/proceedings/92/slides/slides-92-ippm-3.pdf

- Update
- Passive Measurement Methods – we have an implied understanding of what this means, but we are witnessing the dev of new layers and encapsulations (like service function chaining) – and we want to ensure that they accommodate OAM, for active measurements, but a certain format that'll support measurements like discovering marking.
- Hybrid Measurements Methods – a combination of active and passive methods
- Christian Huitema – how do we intend to make this work when the transport method is secret and encrypted?
- Presenter – in that case, there'll be a preso on the marking method later, but if something is encrypted, it cannot be used for marking
- Matt Mathis – I would imagine doing coloring as part of the tunnel, as a way of providing OAM for the tunnel, in order to facilitate instrumentation
- Nalini Elkins– depending on what's being used, for example, if you used ESP and IPSec the IP extension headers are not encrypted – there are things you can do, will be discussed later

- Al Morton – how can you guarantee that the network won't take action on the change in the packet?
- Presenter – because that's how the standard in this work will be written – only applies to new encapsulation, not existing encapsulations (like MPLS) – we will try to work with them, but that's a separate effort. Only greenfield efforts here
- Next Steps – comments from the WG, propose joint work with authors of draft-morton-ippm-active-passive

Active and Passive Measurements and Methods (and everything in-between)
draft-morton-ippm-active-passive-01
Presenter: Al Morton
Slides: http://www.ietf.org/proceedings/92/slides/slides-92-ippm-6.pdf

- We need a set of definitions for active and passive measurements
- Words and meanings – building on fundamental terms like performance metric, and method of measurement
- Lots of reviews, comments on the list
- Discussion around 2-dimensional version
- Discussion around the dimensions of categorization
- Matt Mathis – dual stream interaction tests, to measure jitter isolation – what if one stream is active, one passive; dual active, dual passive?
- Presenter – that's something we should talk about some more
- 2 classifications – PDM (Nalini's proposal), and coloring
- Next steps – continue adding examples, and consider WG adoption
- Brian Trammell – is that a call for adoption today
- Brian Trammell - who's read the draft? 6-8 hands
- Brian Trammell – we have 2 drafts in this space; do we want to use this as the basis, and bring in contributions from the other draft?
- Presenter – I'd like to move something faster, so that it can support the registry draft from Marcelo
- Matt Mathis – there's a lot of stuff here with the potential for hair splitting – some of these things might not be necessary
- Greg Mirsky – first discuss the merger of the docs before adoption
- Brian Trammell – only 2 folks have read the draft – we don't have the ability to resolve the request yet – we have a need to get something out to support LMAP. I'd prefer to use the draft that's had the most review as the basis of the document, to move us forward faster
- Michael Ackerman – likes the draft, all terms and acronyms in the draft need to be defined
- *** Al – will update the draft with terms and acronyms
- (Lady at the mic ☺) Maria Perez Carrero ??? – is there any plan to talk about how to analyze these measurements? Will take discussion offline

- Brian Trammell – call for hums on having 2 separate drafts, one with definitions, one with framework. Hums in favor of two separate drafts. Call for adoption will be taken to the mail list.
- *** Al to review the framework draft and ensure the there are no holes in the terminology doc

IP Flow Performance Measurement Framework
draft-chen-ippm-coloring-based-ipfpm-framework-03
Presenter: Mach Chen?
Slides: http://www.ietf.org/proceedings/92/slides/slides-92-ippm-2.pdf

- Motivation
- Discussion of IPFPM Components
- Packet delay measurement – only marking one packet in a certain period, and measure the packet delay based on THAT packet – time sync is required
- Multi point to multi point flow measurement model discussion
- Renamed, and split into 2 docs after Toronto (IETF90)
- Discussion of updates and changes within the document, and summary
- Mike Ackerman – in terms of implementation, is it still in the IP header in v4, and the extension header in v6?
- Presenter: This is better used with new types of encapsulation.
- Christian Huitema – we should adopt this work somehow, but we want to ensure we don't see conflicting use of bits, and work with related WGs to help ensure this
- Brian Haberman – everything v6 should be mentioned to 6MAN, and work out who does the work. IPv4 stuff should go to INT-Area as the last resort.
- Matt Mathis – the bit you propose using has already had proposals for its use shot down – so it might be difficult to get this proposal through the process. Do we as a WG want to invest time in something that's going to be difficult? Why not consider this instead, for things like OAM on tunnels?
- Presenter: This draft only talks about framework
- Brian Trammell (chair) there needs to be discussion on the list
- Brian Trammell (Individual) needs evaluations on how this would work on the open Internet? I suggest more discussion on the mailing list.

IPPM Considerations for the IPv6 PDM Destination Option
Presenter: Nalini Elkins
Slides: http://www.ietf.org/proceedings/92/slides/slides-92-ippm-0.pdf

- Questions from IETF91
- Does PDM have enough variables to make this happen? Yes!

- Are there too many fields in PDM? Are they all necessary? The authors believe they are
- Why do it in the v6 extension header? In the extension header, we cover the IP layer, and we cover the upper layers
- 16 bytes shouldn't be too much overhead; RTT is minimal
- Use is optional, you can enable or disable this as wished
- Doesn't only work for single server apps
- Brian Trammell (chair) - pull this back into a single doc, you're using the experimental bits?
- Authors – yes
- Matt Mathis – could put the draft name with both WG names – has to start in IPPM
- Brian Trammell – remerge the docs, call it into 6MAN's attention, and then IPPM can do a call for adoption on the list before Prague.

EOM