The TAPS charter
(as of 18 July 2014)

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R / T E
REDUCING INTERNET TRANSPORT LATENCY

First, consider: rinse and repeat?

We've been zig-zagging through charter land:
83 revisions since 27 August 2013 before inserted in IETF datatracker!

- Please look at our history!
  - All available via:
    https://sites.google.com/site/transportprotocolservices/
  - List archives before March 2014:
    https://sympa.uio.no/ifi.uio.no/arc/transport-services
  - Since: https://www.ietf.org/mailman/listinfo/taps

The Charter

Introduction

In the TAPS charter, the term "Transport Service" means any service provided by the transport layer that can only be correctly implemented with information from the application.

Slightly refined old text that introduces the problem

Applications are asking for behaviors from stuff that's underneath.

The vast majority of Internet applications make use of the Transport Services provided by TCP (a reliable, in-order stream protocol) or UDP (an unreliable datagram protocol).

Explaining the problem

Other transport protocols such as SCTP, DCCP, MPTCP, UDP-Lite and the LEDBAT congestion control mechanism extend the set of available Transport Services beyond those provided to applications by TCP and UDP. For example, SCTP provides potentially faster reliable delivery for applications that can accept blocks of data out of order, and LEDBAT provides low-priority "scavenger" communication.

Explaining the problem /2

Application programmers face difficulty when they use protocols other than TCP or UDP. Most network stacks only support TCP and UDP, and many firewalls only pass TCP and UDP, so using other transport protocols risks having an application not work in many environments. Applications, therefore, must always be able to fall back to TCP or UDP, and once the application programmer has committed to making an application work on TCP or UDP, there is little incentive to try other transport protocols before falling back. Further, different protocols can provide the same services in different ways. Layering decisions must be made (for example, whether a protocol is used natively or tunneled through UDP).

This explains: today, the incentives aren't quite right.

Explaining the problem /3

Because of these complications, programmers often resort to either using TCP or implementing their own customized "transport services" over UDP. When application developers re-implement transport features already available elsewhere, they open the door to problems that simply TCP would have avoided, and ensure that the applications can't benefit from other transport protocols as they become available.

Incentives, cont'd.

Explaining the problem /4

Alternatively, programmers may simply give up on using transport protocols direcly, relying instead on "HTTP as a Substrate". BCP 56 identified many issues with this strategy, but assuming that if "any protocol is available on a given network path and on the hosts that will be communicating, that protocol will be HTTP" is a reasonable strategy for today's Internet. The IESG has agreed with this viewpoint enough to publish the Websockets protocol on the standards track.

New paragraph, after IESG review. This ends the problem description.

Deliverables

The Working Group deliverables will help *an* application programmers identify the important Transport Services for applications and determine if those Transport Services are available on the end points and along the path in the network. The Working Group will not define a richer set of Transport Services for applications, although the TAPS deliverables could inform proposals for future chartered work on Transport Services.

I see a nit!

So this is just about existing IETF transports.

"The WG will…"

- Identify Transport Services provided by existing IETF protocols and congestion control mechanisms. The resulting document will provide guidance on making a choice among available mechanisms and protocols to obtain a certain Transport Service. As a starting point, the working group will consider: ordering/sequence preservation, degree of reliability, and latency vs throughput, but is not prohibited from considering others.

This is an example list that we managed to agree on.

"The WG will..." /2

- Specify the subset of those Transport Services, as identified in item 1, that end systems supporting TAPS will provide, and give guidance on choosing among available mechanisms and protocols.

  List 1 will be too large to handle.

- Specify experimental mechanisms to provide a given Transport Service. This document will explain how to select and engage an appropriate protocol and how to discover which protocols are available for a given connection. Futher, it will provide a basis for incremental deployment.
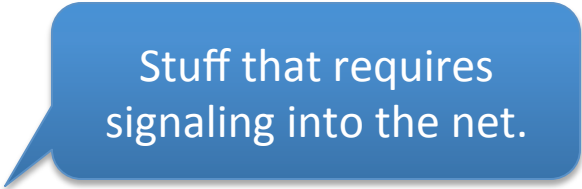
  I see a nit!

  This is Happy Eyeballs etc.

Out of scope

- The following topics are out of scope for this Working Group:

  > Stuff that requires signaling into the net.

- Quality-of-Service (QoS) and tunneling mechanisms and services

- Definition of new encapsulations and tunneling mechanisms

- Extension or modification of transport protocols

- Language-specific APIs

  > A new addition, to address IETF API-o-phobia :-)

Security

TAPS is not chartered to perform detailed analysis of the security aspects of transport protocols, but TAPS is being chartered almost simultaneously with TCPINC, which is developing the TCP extensions to provide unauthenticated encryption and integrity protection of TCP streams, and TAPS will work with TCPINC to ensure that TAPS will be able to accommodate the protocol extensions that TCPINC defines.

New paragraph, after IESG review. We had inserted and removed security before.

Some comments from IETF review

Stewart Bryant

- Stewart: There needs to be some discussion about the overlap with SFC.

- Response: This is good input to add a liaison with SFC in the charter.

Stewart Bryant /2

- On what the WG will deliver (1st item, doc identifying Transport Services)
  - Stewart: I think you need ECMP in there. I think you also need to consider that a service may require a spectrum. As a example in IPFIX we needed both a reliable channel for passing the template and a low overhead channel to pass the data.
  - You probably need to widen the scope to ensure that you cover network layer - transport layer interaction.
  - Is foo over MPLS in or out of scope? Or is this really just TCP/UDP over IP focussed?
  - My own response to "service may require a spectrum": true; but services can also be considered to be composable of sub-services, and have dependencies. Recommend deferring this to the terminology section of the first group document.
  - Response based on London BOF to everything else: TAPS is not about how the stuff underneath is implemented.

Stewart Bryant /3

- On "TAPS is not chartered to perform detailed analysis of the security aspects of transport protocols,"

  - Stewart: This is concerning since this is a service parameter.
    [re-ordered] What if the transport service requirement were maximal privacy?

  - Response based on prior list discussion: We maintain the status quo regarding security; "not chartered to perform detailed analysis" doesn't mean we won't use the mechanisms that are provided by transports. Indeed, e.g. "max. privacy" transport service requirement should be in scope with the charter as it stands.

Stewart Bryant /4

- On the end (after para discussing security)
  - Stewart: Well, what about the other transport protocols? You surely need to consider the extent to which metadata in transport is the key used in flow observation and hence conflicts with the goals of perpass? You also need to consider that one might want to do exactly the opposite and enhance observation within some types of network, perhaps selectively.
  - Response: Yes, observability does seem to be a behavior that an application may want to request from below

Toerless Eckert

- Toerless: The text does not state if/how the WG will take the impact of known unavoidable network path issues (NAT/FW/Proxy) and known application domain architectures (eg: browser as middleware, "web" centric applications) into account. IMHO, TAPS must not create ivory tower analysis that ignore these aspect or create recommendations / directions incompatible with them, and this should be in the charter.

- Response to "network path issues" based on London BOF: TAPS is not about how the stuff underneath is implemented.

- Response to "known application domain architectures" based on London BOF: Out of scope for TAPS, see IAB IP Stack Evolution Program.

Toerless Eckert /2

- Toerless: I can not understand how QoS can be outside the scope of the WG when a lot of transport protocol services differences are exactly about that. What other than QoS mechanisms are the congestion control mechanisms mentioned upfront ? LEDBAT is a transport for a specific QoS experience. Is TAPS planning to ignore all protocol/queuing differences in transport meant to deal with QoS ? Why?

- My own response: This is good input; to have a reasonable initial scope limit, we would like to leave it out for now, but add a statement to the charter that we will revisit the WG scope once the initial documents are done.