

EPON System Issues

A Sanity Check

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Motivation

- ePON and Optics subtask forces accomplishments to date
 - consensus
 - solid baseline proposals.
- IEEE 802.3ah PAR and 5 criteria issues in mind
 - Broad Market Potential
 - Interoperability/Compatibility
 - Technical Feasibility

Sanity check: Are we specifying the product that our customers want?

- *Technical Feasibility: Traffic Simulation & Performance*
 - The IEEE has had a history of demonstrating the feasibility and limitations of a protocol through simulations.
 - To date, we have had very good theoretical analysis, however we have had limited simulation of the protocol over varied conditions of traffic.
 - Interesting things to look at in simulation include:
 - Latency of the system
 - Throughput of the system
 - How quickly can the system react to new allocation under traffic stress
 - Not asking to specify the scheme but look at the limitations
- We are at a unique time where we are significantly down the development process to have a baseline that we can simulate and early enough that we can “tweak” it.

Sanity check: Are we specifying the product that our customers want?

- *Broad Market Potential: Why is this important?*
 - While we do not want to certify, specify or limit ourselves to a particular application, we do want to be smart and assess our solution as our customers will see it and evaluate it. I.e. are we addressing the customer requirements.
 - Hence, it is important to evaluate the performance and limitations of the protocol as they relate to latency, allocation etc.
- *Interoperability*
 - Specmanship aside, will our OLT and ONU devices really interoperate.
 - For instance, will an ONU from Vendor X work with OLT from Vendor Y in a low latency environment ?
 - Perhaps we need to look at this more closely

Are there any other system issues to consider ?

- *Security*

- The security scheme used may be outside the scope of the standard, however, is there anything we can do in the protocol or emulation layers to inherently make the system more secure.
- For instance, does shared media emulation make a basic compliant system more vulnerable. Do we make it optional ?
- Making this optional would not violate our PAR

“As a supplement to IEEE Std 802.3, the proposed project will remain in conformance with the 802 Overview and Architecture with the possible exception of the peer to peer key concept for Ethernet over PON.”

- *Testability*

- This crosses all parts of the EPON specification from physical to protocol
- Are there any test suites that the service providers have been using to bench mark the system which we could leverage.

Conclusion & Summary

- Ultimately the 802.3ah standard will be used to deploy a large number of EPON systems.... *hopefully*
- Thus, lets be careful that we specify something useful.
 - *While we do not want to certify, specify or limit ourselves to a particular application, we do want to be smart and assess our solution as our customers will see it and evaluate it.*
- Lets consider the performance and limitations of the solution as they apply to our customers
 - Throughput
 - Latency
 - Limitations on Bandwidth Allocation
 - Security
- Lets ensure interoperability and leverage some of the existing testability specifications
- The good news: We have a solid baseline that we can simulate and “tweak” if necessary.