Energy Efficient Ethernet
Setting the bar

A system developer's view of new PHY proposals

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New study group ☺

The Study Group will define the scope for the EEE project…

The starting point of discussions is the CFI material

- Focused on rapid PHY selection

Some discussion has started regarding new PHY definitions

- Hugh's strawman suggested no new operational modes
- Others suggested changing operating modes or adding new ones

What hurdles must we clear to justify a new operational mode?

- (from this system vendor's perspective)

Bringing a PHY to market

Bringing a PHY to market can be problematic –

- Even long after a standard is published and widely adopted
- Qualifying a PHY device and then the system that uses it is hard

Extensive testing is required, failures are common

- Most new implementations of 10/100/1000 PHYs require respins…
- … even with experienced developers & known processes
- Failures occur in all 3 speeds – including 10BASE-T operation

Historical “incompatibility / compatibility” makes matters worse

- Interaction with known mis-implementations in the field is often required – based on database of field issues

A new PHY / a new mode

A new operational mode of a PHY is the same as a new PHY

- Testing must cover the new mode with the same rigor

New, subtle, incompatibilities will emerge

- The database of field issues will grow

Both the old and new modes must be supported by devices & systems – for backward compatibility

- Device size, complexity & power will grow to add new modes
- Work will grow multiplicatively

Adding a function outside of the operational mode is less work

- e.g. RPS requires only change to startup, shorter test time
- Less risk of backward compatibility issues

Therefore – a hurdle

The Study Group should not start a project to define a new PHY unless it can be justified against the following

The device cost addition must be very low or nil

- Compared to existing PHY & assuming dual mode support

The proposal must be easy to standardize

- Widely accepted amongst technology developers

The power saving must be significant, in both relative & absolute terms …

- Bear in mind that much of the power is in the system – not the PHY

… or the new mode must offer significant usage or deployment benefits

- Looking at lifetime, 24x7 costs

In conclusion

The costs of developing a new PHY are huge (for any speed)

(a new mode is a new PHY)

The costs of adding the new PHY into systems are significant

Testing and support, along with increased risk

If the benefit is not sufficient, the market will not adopt

Whether or not a standards projects is started

Proponents of a new PHY project must demonstrate benefits

Not simply new technology “because we can”

Questions…

… or comments