

T H E C O M P L E T E S O C K E T

Response from OCP-IP about OSCI's TLM 2.0 draft 2 for review

OCP-IP SLD Working Group
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Purpose of Review

- Determine if the OCP protocol can be modelled using the OSCI-TLM2-proposal
- Determine if the OSCI-TLM2-proposal is valuable to OCP-IP
 - Form a basis for our code to reduce our effort
 - Reduce cost of bridging OCP-IP SLD to other APIs
 - If there is such a benefit, can we remain backwards-compatible?

OCP-IP SLD / OSCI TLM 2 Draft 2

- OCP is a highly configurable and extensible protocol
 - There are many many different OCPs
 - They are not all compatible with each other
- OCP-IP currently provides TLM (SLD) technology for modelling any OCP, at the following abstraction levels
 - TL1: cycle accurate
 - TL2: approximate with intra-burst timing
 - TL3: approximate with inter-burst timing
- OSCI TLM2 draft 2 provides
 - Transport functions
 - Generic memory-mapped-bus base payload
 - Extension mechanism for the payload
 - (Replaceable) “protocols” for loosely-timed and approx-timed interface modelling

Generic Payload, Extensions, Configuration

- Could we use the generic payload for OCP interfaces?
 - Yes, but at least the following extensions would be needed to cover all possible OCPs:
 - Locking and exclusive accesses with appropriate responses
 - Broadcasts
 - Some more addressing modes within transactions
 - Transactions with multiple addresses
 - Transaction ordering information (only for approx-timed)
 - A few other attributes: address-space, conn-ID, atomic-length
- How is a richly configurable protocol to be supported?
 - Each OCP bus interface has a configuration
 - TLM2 offers no configuration system for sockets
 - Compatibility rules between OCP configs exist
 - Too complex for compile-time checking
 - TLM2 offers no mechanism for run-time post-binding checking
- TLM2 package contains no technology or guidelines for monitoring of bus activity
 - Must-have in practice

TL3

- This is the OCP level that TLM 2.0 is most closely aimed at.
- There is a good alignment between OCP TL3 API and the OSCI TLM2 non-blocking transport+approximate-timed generic payload
 - Functionality is equivalent allowing for the extensions needed (see above)
 - Timing phase protocols defined by OSCI are adequate
- OSCI TLM2 draft 2 is adequate for many OCPs and could be used in those cases *as it is*, with no need for anything from OCP-IP.
 - For OCPs with OCP-IP-defined functionality beyond OSCI-TLM2, OCP-IP would define extensions to generic payload
 - Some such extensions would be generic (not OCP-specific) and could be provided by OSCI in the longer term
 - OCP-IP could offer them to OSCI when they are ready
 - For OCPs with user-defined extensions, the user must be responsible

TL1 and TL2

- Note: This is outside the understood scope of OSCI-TLM2.
- Features of OCP-IP-TL1 transport that are not present in OSCI-TLM2:
 - separate timing for each beat of a burst
 - different flow control protocol models, that may not be possible simply with extra phases
 - even more extensions to the generic payload (for some detailed timing-related parameters) - superset of the extensions defined for TL3
 - concepts for clock-synchronisation, needed for modelling a clocked protocol
 - methodology for supporting combinatorial dependencies between one bus and another
 - methodology for supporting clocked protocols where calls may not be exactly synchronised to the clock
- Features of OCP-IP-TL2 transport that are not present in OSCI-TLM2:
 - static timing parameters for modelling burst duration
- Summary
 - OSCI kit is a good basis for TLM technology at these levels of accuracy. We've done a study to prove this
 - But not complete.
 - OSCI can provide a lot of generic and concepts for flow control, clock-synchronisation, combinatorial dependencies, etc, etc
 - OCP-IP will support OSCI in going there
 - But a generic cycle-accurate kit will never be enough for any OCP. OCP-IP will continue to provide TL1 and TL2 kits to OCP users
 - The more technology we can get from OSCI the better
 - Reduces our support effort and hence improves quality
 - Improves interoperability with other (non OCP-IP) modelling activities