
SystemC IP Interfaces

Jon Connell, ARM

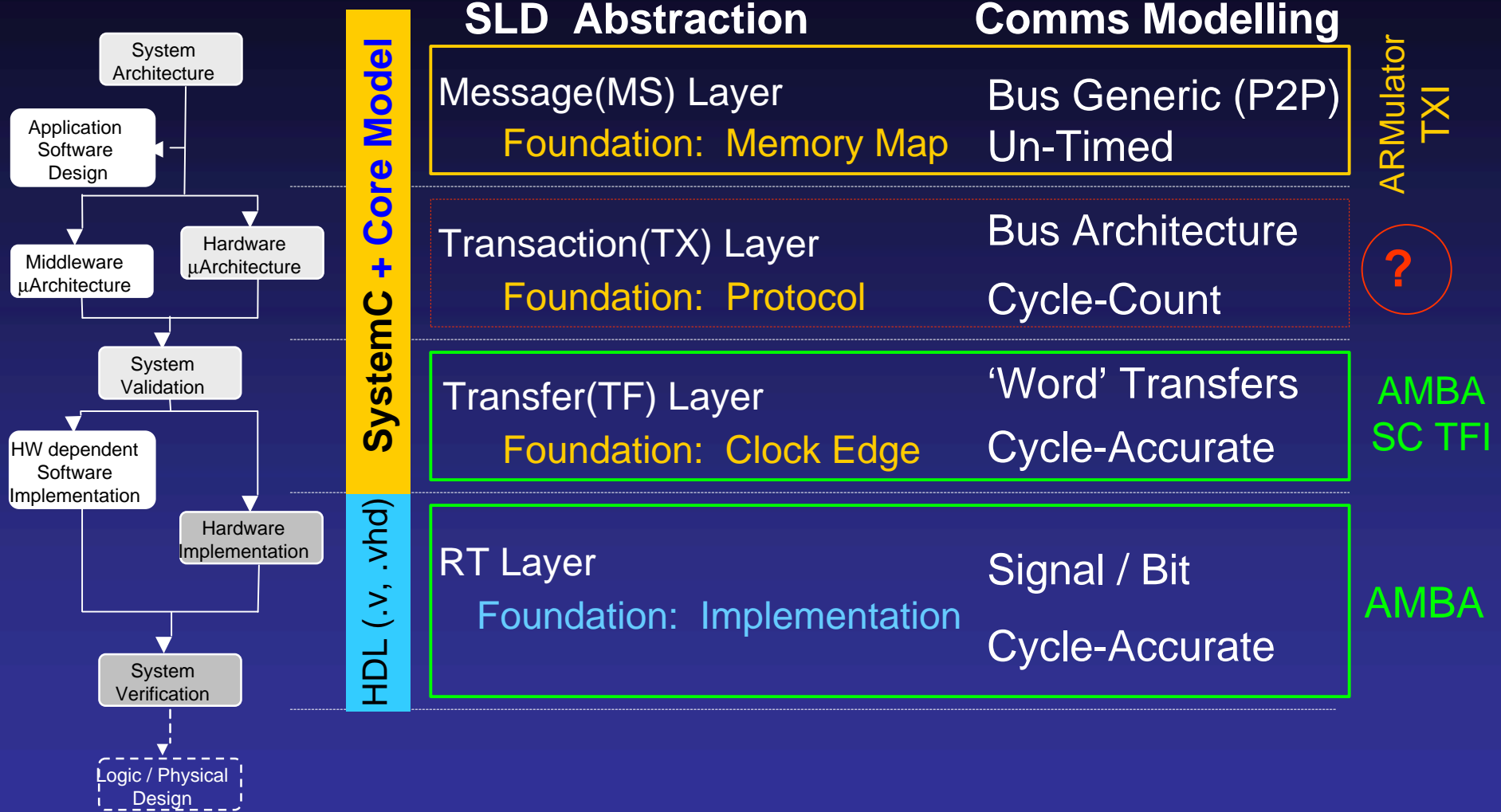
ARM

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What should the IP provider support?

- Industry adoption of SystemC will require modelling support from IP-providers
- What motivates and enables IP support:
 - Design Context:
 - Defined usage requirements for models
 - Integration Standards:
 - Standardised (open) interface protocols
 - Standardised (open) language support
 - Tool Support:
 - Design entry and debug
 - Verification / validation support across abstractions

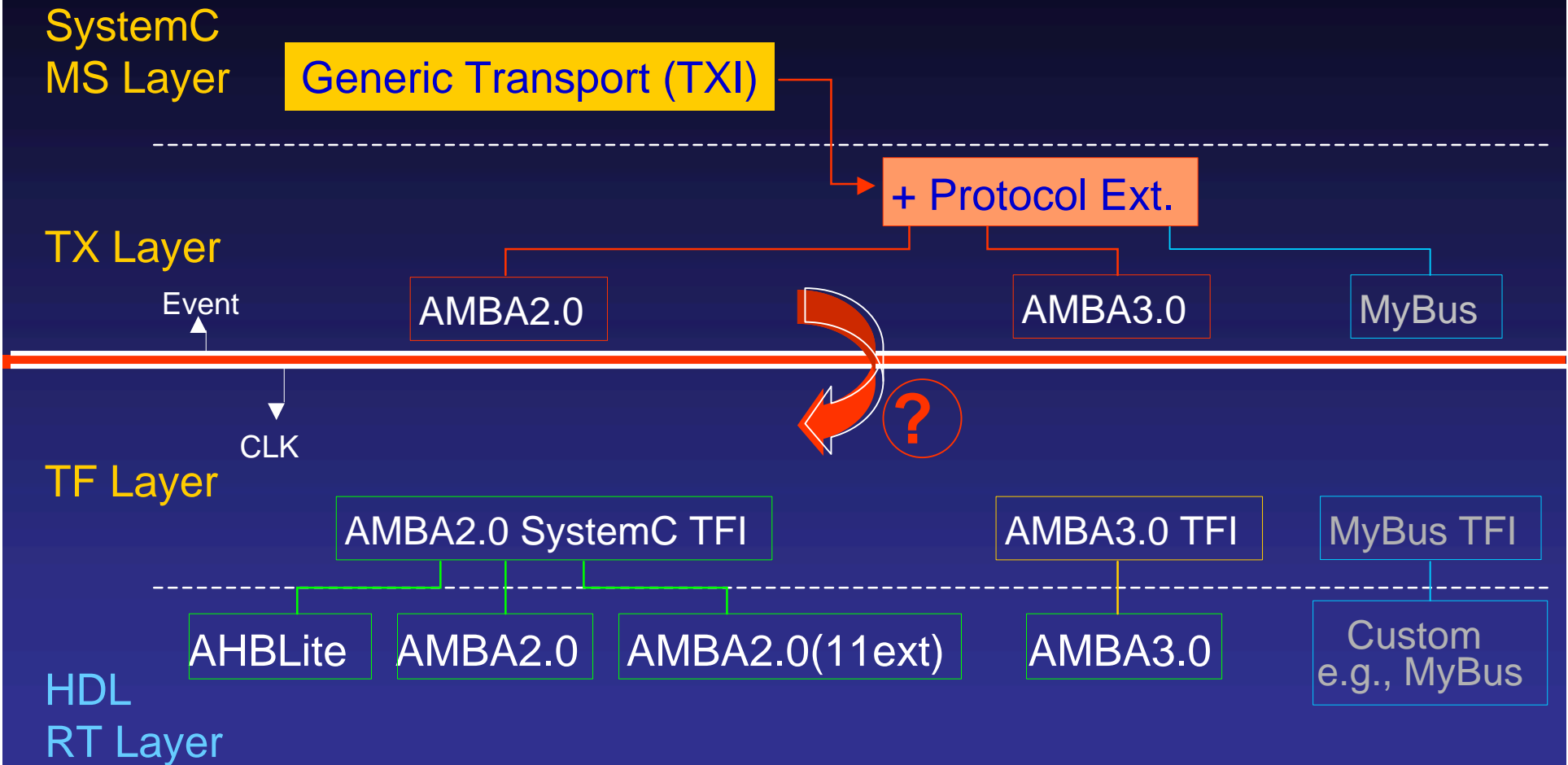
A Design Context for TLM:



Where does SystemC fit?

- System-level is broken into 3 design abstractions
 - Message-level for SW development
 - Transaction-level for micro-architecture design
 - Transfer-level for co-validation
- SystemC can span each of these design views
 - ARM will deliver IP into each of these abstractions
- But we will need to define interfaces
 - This must map into a V&V refinement process

SystemC standard interfaces for IP



Methods of computation

- TF level must have a direct mapping into RT
 - Precise timing accuracy is paramount
 - Hence it is clocked
- TX and MS must support efficient, abstract modeling
 - Simulation efficiency is paramount
 - Hence it is not clocked, but event-based
 - Using large data packets increases performance

Interface standardization

- AMBA proven model for interface collaboration
 - Collaboration between IP providers, tools providers and systems companies
- TF SystemC interfaces developed under AMBA
 - Partners: Synopsys, Cadence, CoWare, Mentor Graphics, Verisity, STMicroelectronics, Motorola, Philips Semiconductor
- TX/MS SystemC interfaces are next
 - Building reference IP models
 - Collaboration starts in Q2

How does SystemC hold up?

- An open language, so model extensibility can be defined
- A proven fit for co-validation at TF level
 - Demonstrated 100x speed-up for SoC
- Best candidate for TX level
 - ARM reference designs using SystemC
 - Still needs wide-scale demonstration of efficiency
 - Debugging interfaces need investigation
- For MS level, threading models are not sufficiently rich