

Universal Automotive Bus

Real-Time Plug&Play for E/E

With funding from the:

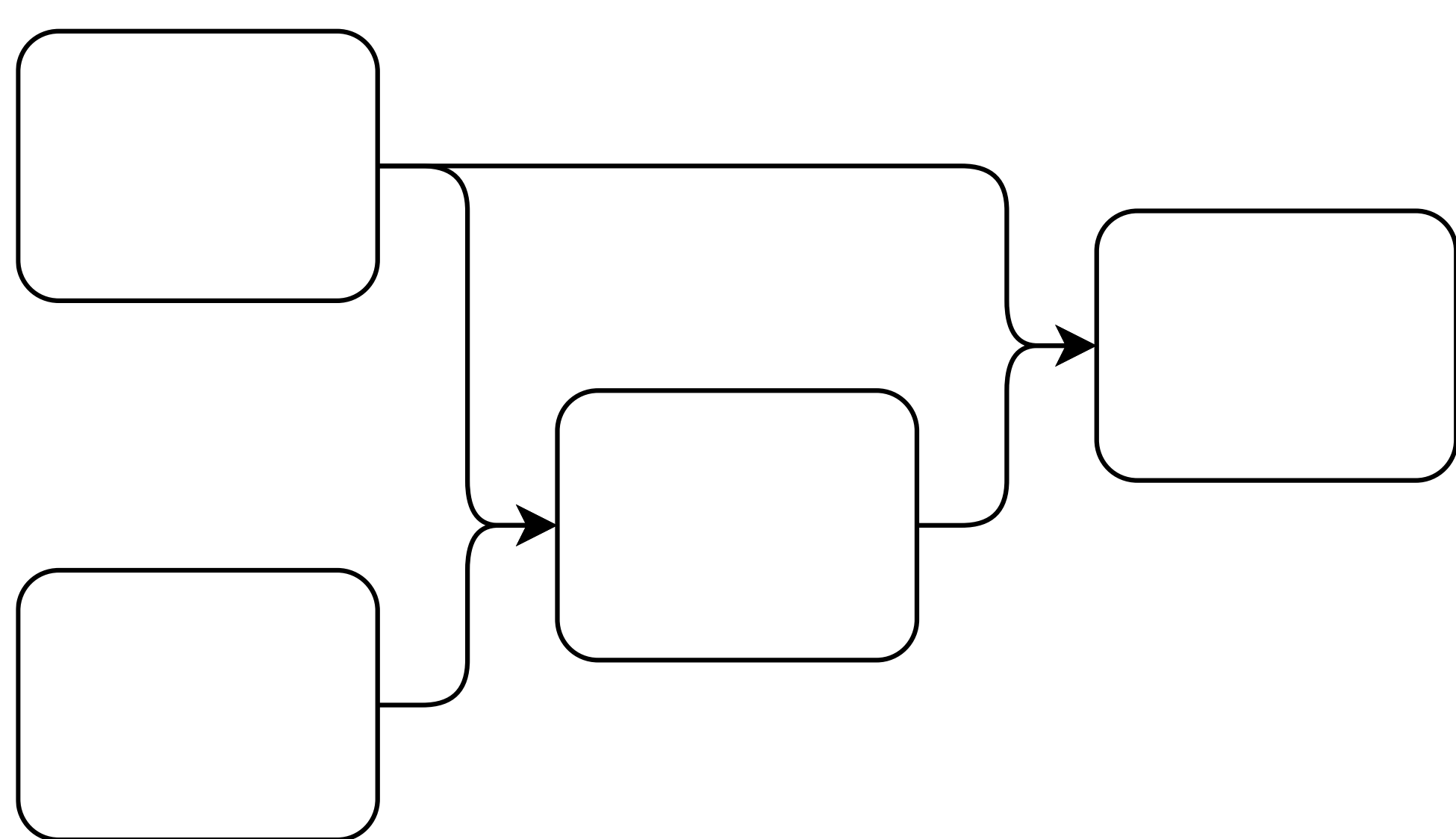


The Universal Automotive Bus (UAB) is a lean and real-time capable networking technology on which Middleware for Service-Oriented Architectures (SOA) can run directly. It features a unified connector, generic cabling and Plug&Play interoperability between all nodes with compatible service definitions. An interchangeable digital E/E-Twin resides inside a central UAB Host controller and establishes real-time E/E-functionality, after it has been “augmented” with physical hardware during the startup phase.

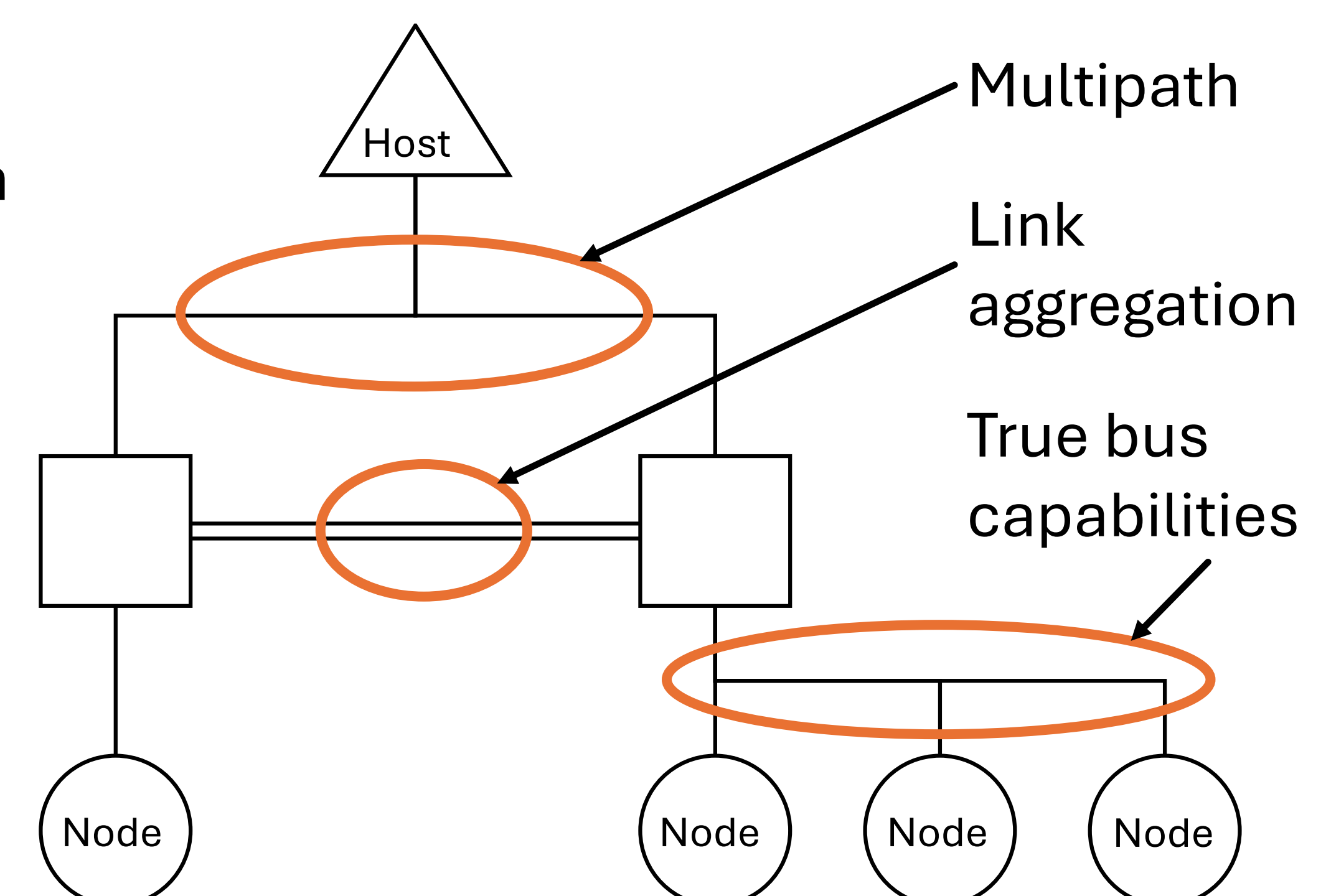
The digital E/E-Twin is created via a streamlined development process that tightly integrates with the definition of causal chains in the service middleware. Since real-time requirements ultimately stem from service chains, this integration limits the design space of network definitions to only those that can meet the requirements.

UAB targets all vehicle components that are not high power (drivetrain, AC) or ultra high bandwidth. It provides a 10 Mbit/s bandwidth (per port), 100 W power supply (per port), true physical bus capabilities, meshed networking, multipath transmission and link aggregation for scalability and redundancy.

Service chain



Digital E/E twin



State of the Art

The ongoing shift from signal-oriented to service-oriented architectures (SOA) is accompanied by a transition from traditional bus systems like CAN and Flexray towards Automotive Ethernet and service-oriented middleware. The promise of SOA is to alleviate system integration efforts in light of mounting software complexity and size.

Although this promise is kept on a service level, the effort is reintroduced on a hardware level when Time Sensitive Networking (TSN) configurations have to be found for real-time operation.

In sum, the benefits of SOA remain in the software world and do not yet reach the hardware level where real-time capabilities have to be ultimately met.

Technological Innovations

The Universal Automotive Bus (UAB) is tailor made for service-oriented architecture that alleviates development efforts on a hardware level by providing a streamlined development model for the deduction of network definitions from the services.

Its versatile networking topologies and the bundling of energy and data supply in a single cable enable cost and weight reduction of the wiring harness. The unified interface taps into scaling potential that further reduces costs.

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