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Standardizing DEVS Simulation Middleware

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Abstract: As discussed earlier in Chapter 16, there are two different interoperability objectives that one must consider when standardizing DEVS environments: (1) Standardizing DEVS model representation to allow a platform-independent DEVS model representation that can be executed by any DEVS-based simulation tool. (2) Standardizing Interoperability Middleware to interface different simulation environments and allow synchronization for the same simulation run across a distributed network regardless of their model representation. This chapter focuses on approaches by different groups to standardize the simulation middleware. All of the implementations discussed in this chapter are based on a Service Oriented Architecture (SOA) design, which employs the concept of deploying services so that they can be invoked by clients. This concept is applied in CORBA and SOAP/REST Web-services. This kind of middleware is of interest in order to overcome current distributed simulation challenges and to meet future expectations in this area. A standardized DEVS simulation protocol should enable different DEVS implementations to simulate the same DEVS model hierarchy partitioned between various DEVS engines in distributed fashion. Moreover, each DEVS domain in this distributed system should be able to execute its legacy models and, thus, perform distributed simulation experiments between different heterogeneous models and engines. The middleware designs showed in this chapter offer simulation resources as a set of services that can be invoked by simulators, and where these simulators act as peers (i.e., clients and servers at the same time) to each other to synchronize a simulation session.