Service Oriented Architecture and Ethernet design

PREEvision
Agenda

- Service Oriented Architecture
  - Ethernet design
  - Summary
Service Oriented Architecture

Service Oriented Architecture is a way of designing software where the participating components provide and consume services through a defined protocol over a network.

- Separates functionality into different units or services.
- Promotes combination and reuse.
- The functionality is distributed in several ownership domains.
- Promotes interoperability through well-defined interfaces.
A Service is a discrete unit of functionality which can be remotely accessed and independently changed or updated.

- Represents functional unit
- Is self-contained
- Is stateless
- Can consist of underlying services
- Reusability
- Is a black box for consumers
- Uses standardized interfaces to communicate
Example of a Service Oriented Architecture

I know the weather for a city code

I can inform you the weather for some position but I need help...

I know the city code of one specific position

Want to know the weather of my current position!
Service Interface (1/2)

Service interface is the mean to access to the functionality of a service
A **method** represents a function that is executed by a provider on request of one or more consumer(s).

A **property** (field, attribute) represents a piece of data hosted by a provider that exposes to one or more consumer(s) a get and/or a set method. Consumers can optionally receive notifications of changes of the field’s value.

An **event** represents an update to a piece of data. The provider decides when to send this update and the occurrence of it is transmitted from a to one or more consumer(s).
Agenda

Service Oriented Architecture

- Ethernet design

Summary
Technology mapping

AUTOSAR Adaptive
- Machine 1
  - Ad SWC1
  - Switch
- Machine 2
  - Ad SWC2

AUTOSAR Classic
- ECU 1
  - CI SWC1
  - Switch
- ECU 2
  - CI SWC2

Ethernet design
Software synthesis

Ethernet design

AUTOSAR Adaptive

AUTOSAR Classic

Client Server Interface
Sender Receiver Interface (F&B with arguments)
Trigger Interface (F&B without arguments)

Client Server Interface (get and set operations)
Sender Receiver Interface (notifier)
Sender Receiver Interface
Ethernet design

**AUTOSAR Classic workflow**

- Service definition and service interface design
- Virtual function bus (derived from service definition)
- Switched topology definition
- Deployment of service provider and service consumer
- Communication design
  - VLAN configuration
  - Switch configuration
  - Socket communication

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<thead>
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<th>Port 1</th>
<th>Port 2</th>
<th>Port 3</th>
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T = send tagged, U = send untagged
Ethernet design

AUTOSAR Adaptive workflow
Agenda

Service Oriented Architecture
Ethernet design

Summary
Service Oriented Architectures provide flexible, open and dynamic distributed systems.

Services represent simple functional units which can be combined for creating more complex ones.

Service Interface is the means by which services communicate to each other.

PREEvision supports the modeling of Service Oriented Architectures and their implementation in

- AUTOSAR Classic
- AUTOSAR Adaptive

Based on the service definition, PREEvision synthesizes several parameters of the Ethernet configuration offering a good base for the detailed configuration.
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