SDC Overview

Service-oriented Device Connectivity –
A quick walkthrough
History and origins
The operating theatre – past and nowadays

1956

„Interoperability is an almost non-existent feature of medical devices.“
Lesh et al. 2007

Today
History and origins
Research and development activities

- **TeKoMed**
- **Lead vision SOMIT**
- **FUSION**
- **Horizontal project „Integration“**
- **OrthoMIT**

**Phases**
- **DOOP Phases I & II**
- **SmartOR**
- **BMBF-OR.NET**
- **OR.NET ev.**

Timeline:
- **2009**
- **2010**
- **2011**
- **2012**
- **2013**
- **2014**
- **2015**
- **2016**
History and origins
Public demonstrations

OR.NET, Berlin, 15/04/2015

Demonstrator, 2009

DOOP Demonstrator, Lübeck, 11/12/2013

Demonstrator, 2011
SDC
Design goals

Interoperable medical devices in clinical environments with the capability to

- exchange physiological and technical information between communication endpoints
- safely control each other from remote
- run without tight coupling
SDC
Conceptual model

SOMDA – Service-oriented Medical Device Architecture
• Based on enterprise SOA paradigm
• Difference
  • Safety
  • Dynamic device grouping
  • Influenced by regulatory affairs
SDC
SOMDA instance

Conceptual view of a SOMDA for a clinical workplace.

Concept of a clinical workplace SOMDA does not make any assumptions of the underlying network topology.
SDC
Layered model

Device X

App

Ext. X
Ext. Y
BICEPS

SDC

MDPWS

NTP
DiffServ
DPWS

Device Y

Application-specific protocol

Device-specific extensions

Streaming, Safe Data transmission

Service-oriented Device Connectivity

Domain and message model

Service Discovery, Interface description Messaging, Security, Event propagation,
Standardization activities
IEEE 11073

- IEEE = Institute of Electrical and Electronics Engineers
- Association of technical professionals with the objectives of “educational and technical advancement of electrical and electronic engineering, telecommunications, computer engineering and allied disciplines”.
- Example: IEEE 802.11, WLAN
- The IEEE also hosts a sequence of standards prefixed with 11073
- Those standards deal with medical device interoperability and efficient exchange of care device data

IEEE Headquarter in New York
Standardization activities
IEEE 11073

- 0[xxxx] Primers
- 1[xxxx] Base standards/device specializations
- 2[xxxx] Application layer profiles
- 3[xxxx] Physical transport profiles
Standardization activities
Standardized SDC protocols

SDC

11073-20702
• MDPWS
• Transport via Web Services
• ~50 pages
• Approved fall 2016

11073-10207
• BICEPS
• Device modelling via XML-Schema
• ~400 pages
• Approved fall 2017

11073-20701
• Glue
• Connects MDPWS to BICEPS
• ~50 pages
• Approved fall 2018
General approach
Medical data on the wire

Medical Data Information Base

- VentVmd : VMD
- AirwayMultiParam : VMD
- VentContexts : Context
- VentClock : Clock
- VentAlerts : AlertSystem
- VentChan : Channel
- AirwayPressure : Channel
- LocationCtx : LocationContext
- Beep : AlertSignal
- Phigh : AlertCondition
- VentMode : Metric
- PEEP : Metric
- PIP : Metric
- MAP : Metric

Get  Set  Event Report

SDC network
General approach
Advanced topics

- DPWS
- Streaming
- Safety

- General approach
- Domain layer
- Message layer

- Numerics,
  - Waveforms,
  - Enumerations
  - Strings

- Condition and signals
- Alert signal delegation

- Patient demographics
- Location information
- Device grouping

- MDIB version
- Descriptor version
- State version

- Operation types
  - Transaction pattern

- Time synchronization
  - Battery status

- Model binding
  - Security & trust
  - QoS

- Versioning
- Remote Control
- Clock & Battery
- SDC Glue
Thank you for your attention!

Contact information

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