Panorama de l'écosystème Capella

Journées NEPTUNE 2017 - 2 juin 2017

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Capella

- An open source Model Based System Engineering workbench
- Developed by Thales
- To helps engineers formalize the specification of systems and master architectural design
- Relies on the Arcadia method

Sustainable and adaptable

- Provides methodological guidance, intuitive model editing and viewing capabilities
- Already been deployed in a wide variety of industrial contexts (aerospace, communication, transportation, etc.)
- Based on Eclipse Sirius and KitAlpha, it can also be extended to support particular engineering concerns
Eclipse Is...
An amazing open source community of Tools, Projects and Collaborative Working Groups. Discover what we have to offer and join us.
Open source

WHAT DOES IT MEANS
A bit of history

Capella

- Developed and used by Thales since several years
- in 2015 OSS of Thales Melody workbench as Capella
  - Prerequisite: OSS of all subcomponents (including Sirius)

2007: First Obeo/Thales prototype to validate the concepts

2008: Thales UML/SysML inspired modeling tool

2009-Present: Robustness

2008: Specification and development of Sirius foundations

2009: First operational pilot projects, launch of Sirius-based Obeo Designer product

2015 1st Capella release
... now open source

http://www.polarsys.org/capella

Initial 3-year (French) collaborative project

Larger industry consortium currently being initiated
Shape the future of Capella

- **2014**: Import of Requirements (REQIF)
- **2016**: Modes and States
- **2018**: Documentation Generation (M2DOC)

Your own use case
Your own evolution
Your own contribution

Your own contribution
Adjust your Capella to your objectives and context

Public APIs, forums, wiki (tutorials, development guides)

Commercial offers
Results

MAJOR OUTCOMES
Core components

Available on https://polarsys.org/capella/download.html

Capella

- 12 releases from 0.8.1 to 1.1.1

Capella Studio

- 4 releases from 0.8.3 to 1.1.0

Details: https://wiki.polarsys.org/Capella/Release_Notes

Sample models & Documentation
Example 1: « TMB(S)E » : Truly Model-Based (Systems) Engineering

Capella Add-ons
- Basic viewpoints (Mass, Price and Performance)
- XHTML Documentation generation
- Document generation: **M2Doc**
  - [https://github.com/ObeoNetwork/Capella-Extensions](https://github.com/ObeoNetwork/Capella-Extensions)
- Excel Import/Export: To be OSS (Obeo)
- Model requester: To be OSS (Thales)
Example 2: Capella – Engineering Continuity

System physical Architecture

Capella Addon
System to Subsystem Transition
Automatically Initialized and Maintained Subsystem
### Example 3: Capella – Modes & States

#### Mission
<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
<th>Phase 5</th>
<th>Phase 6</th>
</tr>
</thead>
</table>

#### System
<table>
<thead>
<tr>
<th>Subsystems</th>
<th>Mode 1</th>
<th>Mode 2</th>
<th>Mode 3</th>
<th>Mode 4</th>
<th>Mode 2</th>
<th>Mode 3</th>
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</thead>
<tbody>
<tr>
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<td>Mode A</td>
<td>Mode B</td>
<td>Mode C</td>
<td>Mode A</td>
<td>Mode C</td>
<td>Mode A</td>
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<td>2</td>
<td>Mode X</td>
<td>Mode Y</td>
<td>Mode Z</td>
<td>ModeX</td>
<td>Mode Y</td>
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<tr>
<td>3</td>
<td>Mode I</td>
<td>Mode J</td>
<td>Mode I</td>
<td>Mode J</td>
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</tbody>
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#### Study of the system during its operation
Example 4: Capella – Safety Architect (All4Tec)

Feared event added to Capella dataflows (viewpoint)

In Safety Architect, analysis of block local failure conditions

Functional Hazard Analysis (FHA)

In Capella, visualization of fault trees as critical functional chains

In Safety Architect, automated generation of fault-trees
Example 5: Capella – Citrus (Artal)

Tool chain from V&V Objectives definition & allocation to TestMean to Simulation & Simulation model specification

Test Means definition → Simulation architecture → Simulation Model design
Example 6: Team for Capella (Obeo)

Allows users to collaborate on remotely shared models and representations
Other important (and addressed) aspects of engineering

**Modes and states**
Analyzing the variability of the system during its operation

**Model-based V&V**
Driving v&v activities by expected functional content

**Product Line**
Variability management based on feature models
Community

https://www.polarsys.org/capella/

Capella

A graphical modeling workbench...

The Capella workbench is an Eclipse application implementing the Arcadia method providing both a Domain Language (DSL) and toolset which is dedicated to guidance, productivity and quality. Intuitive model-viewing capabilities help engineers focus on the design and description of the system and its architecture.

Dedicated to efficient architectural design

The capabilities of Capella focus on helping engineers design better architectures through

- An embedded methodology browser

News

- Please visit the wiki page for Latest News

About this project

- Consult the Capella forum and ask questions about the tool or the Arcadia method.
- User documentation (draft, under refactoring).
- Wiki providing additional resources to follow and contribute to Capella.
- Subscribe to the developers mailing list to be warned about technical announcements.
Main outcomes => Operational deployments
## Industrial deployments

### Prepare

Benefit from the expertise of professionals to develop your team’s skills with the MBSE methodology and tooling.

### Adapt

Customize and extend Capella for your own particular engineering concerns and integrate it with your other tools.

### Deploy

Leverage collaborative features and count on the commitment of experts to successfully deploy Capella across large teams.
User driven

SPECIFIED (AND MONITORED) BY ITS END-USERS
Companions Components

Thales MSBE Community

Thales need capture

Open Source Community

Shared repositories

Partnerships

Thales end-user needs

Clarity CCB

Ad-hoc funded evolutions

Capella IC Collaborative projects
Eclipse Foundation – Pillars of open collaborations

- Governance
- Projects & Process
- Ecosystem Development
- Infra-structure
- IP Mgt & Licensing
Next Steps

LET’S TALK ABOUT THE FUTURE
eClarity

- eClarity
  - Clarity continuation at European level

- ECSEL agenda
  - Full Project Proposal: September 2017
  - Project start: beginning of 2018 (TBC)

- Metrics
  - 48 partners (including 8 without requesting funding)
  - 9 Nationality
    - France, Germany, Belgium, Netherland, Hungary, Norway, Spain, Austria & Canada*

*Canada*
Capella Industrial Consortium

- **Knowledge sharing**
  - case studies, technology watch, private exchange workshops on N&N
- **Promotion**
  - Promote Capella as a leading solution, Provide material to executive
- **Product Management**
  - Requirements co-creation, Discuss the roadmap
- **Governance**
  - Coordinate investments to reduce development time, risks, and cost, and maximize ROI
- **Development of the community**
  - collaboration between research/academia, suppliers, end-users
- **Joint development financing**

Scope: Capella, Capella Studio, Underlying technologies, Add-ons
Announcement: Webinar

The Capella Open Source Ecosystem and its Industry Consortium

TUES. JUNE 6th | 4PM - 5PM (CEST)
by Gaël Blondelle (Eclipse Foundation)

Details: https://lnkd.in/dPp8sdP
Registration: https://lnkd.in/dnBR7uiVo
Some references

EVENTS & LINKS
Upcoming events

Eclipse
- **EclipseCon France**: June 21 – 22, 2017 – Toulouse, France
- **EclipseCon Europe**: 24 – 26 October, 2017 – Ludwigsburg, Germany

Sirius
- **SiriusCon**: mid–November, 2017 – Paris, France

Capella
- **Capella Day**: 20th June 2017 – Toulouse, France

MBSE
- **INCOSE Symposium**: from 17th to 20th July 2017 – Adelaide, Australia
- **CSDM 2017**: December 2017 – Paris, France

Webinars
- Series of **webinars during 2017**
To know more

Capella website:
http://www.polarsys.org/capella/

LinkedIn
http://www.linkedin.com/company/capella-modelling-workbench

Twitter
https://twitter.com/capella_arcadia

Arcadia forum:
https://polarsys.org/forums/index.php/f/12/

Capella forum:
https://polarsys.org/forums/index.php/f/13/

IFE model & doc.:
http://www.polarsys.org/capella/start.html
QUESTIONS ?