RESEARCH @ ECLIPSE FOUNDATION

Open Research Webinars

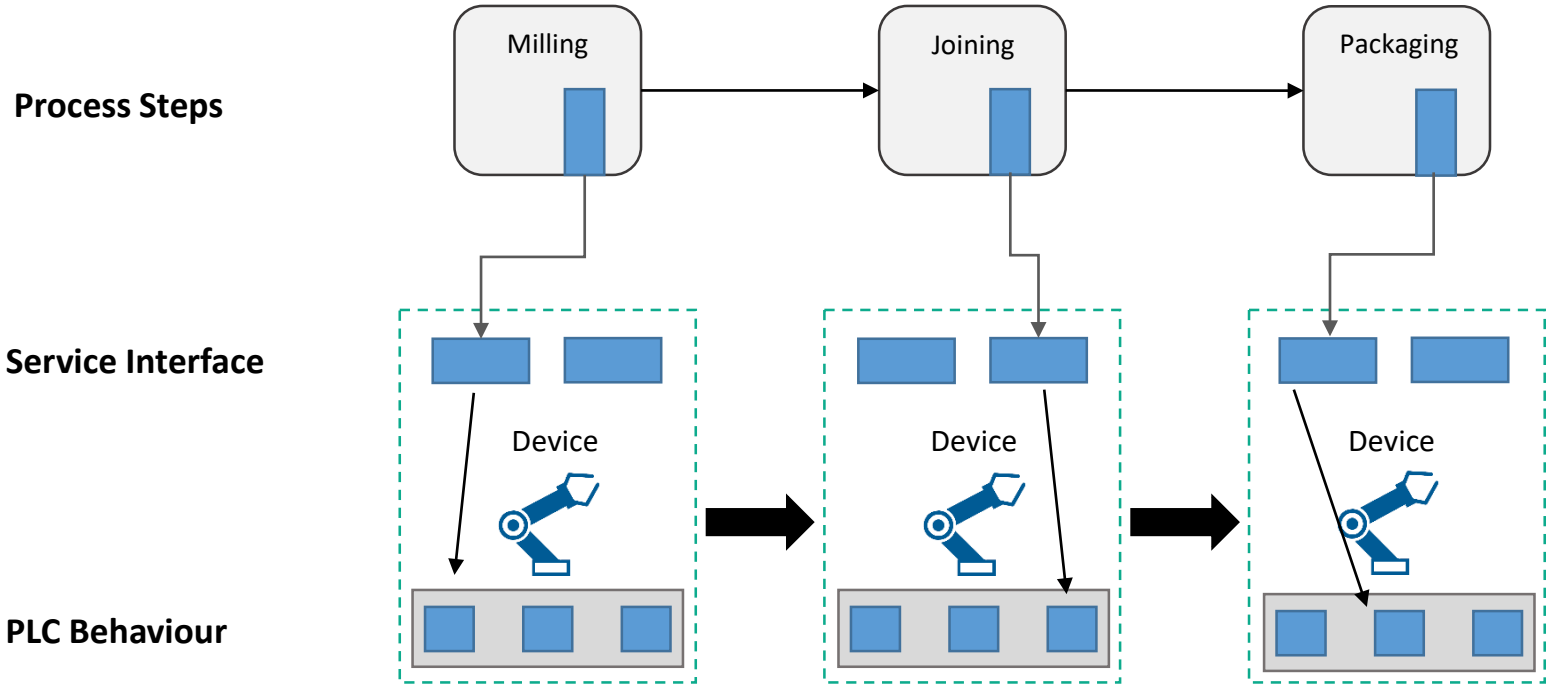
OW2

Making Industry 4.0 easy with Eclipse BaSyx

Frank Schnicke, Fraunhofer IESE

It is not the strongest or the most intelligent who will survive but those who can best manage **change**.
— Charles Darwin

Service-based Production



What is BaSys 4.2?

National Reference Project

- 19 partners, coordinated by Fraunhofer IESE
- Goal: Manufacturer independant interoperability based on Asset Administration Shells
- Runtime: 07/2019 – 06/2022

Open Source

- Eclipse Open-Source Projekt: www.eclipse.org/basyx

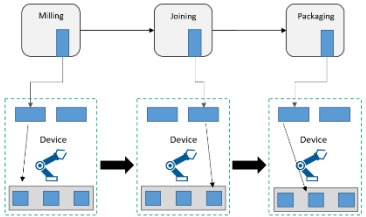
BaSys 4.2 Building Blocks

Virtual Automation Bus

- End-to-end communication
- Communication spanning different networks and protocols

Control Components

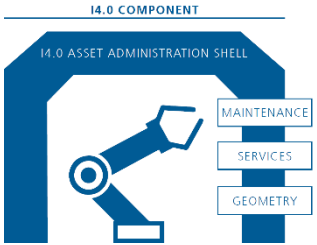
- Changeable production



Asset Administration Shell

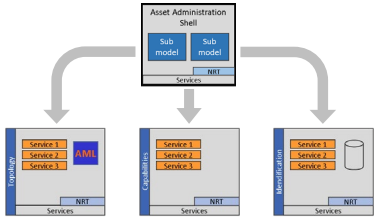
(Digital Twin)

- Digital representation of assets
- Independent of manufacturer
- Standardized



Sub Models

- Provide information in a structured way
- Topology
- Device Services



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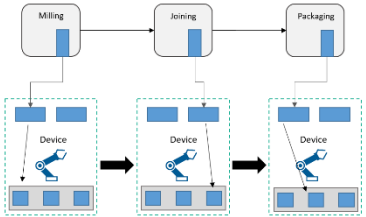

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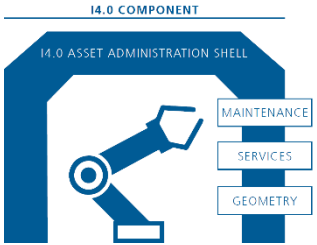

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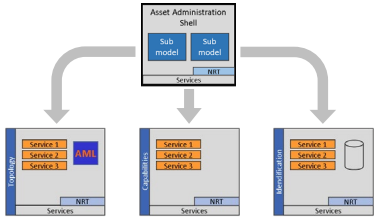

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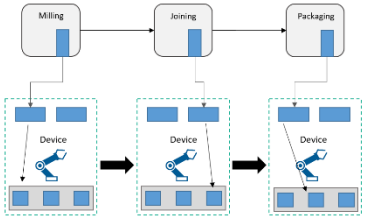

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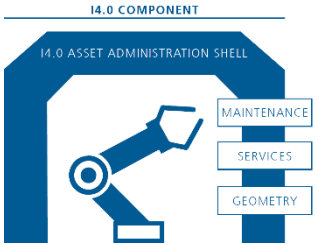

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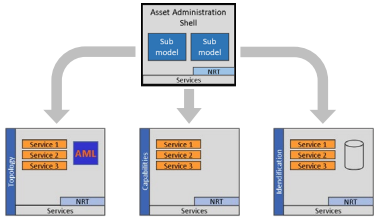

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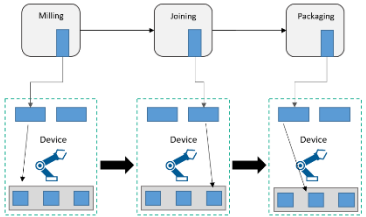

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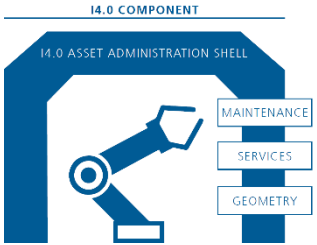

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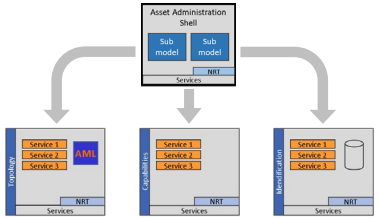
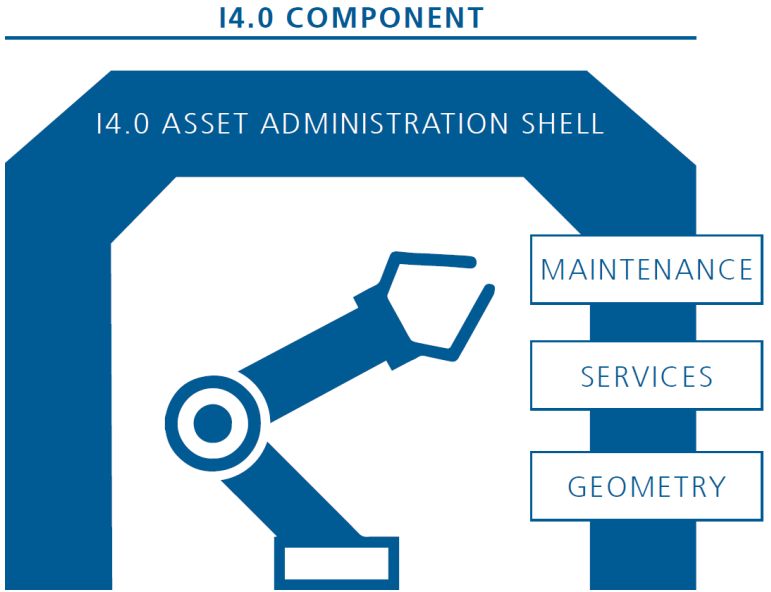


BaSys 4.0 – Asset Administration Shell

Digital representation of assets

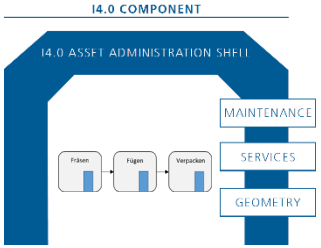
- ***Independent of Manufacturer***
  - Standardized Interface

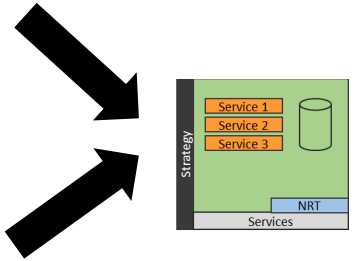
- ***For all relevant entities***
  - Product, Devices, Worker
  - Central Industrie 4.0 component

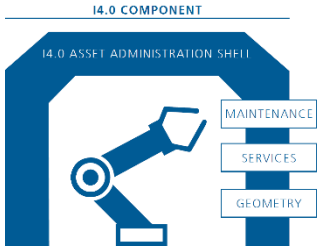


BaSys 4.0 – Changeable Production

- Required services (=Recipe)
- Service Parameters

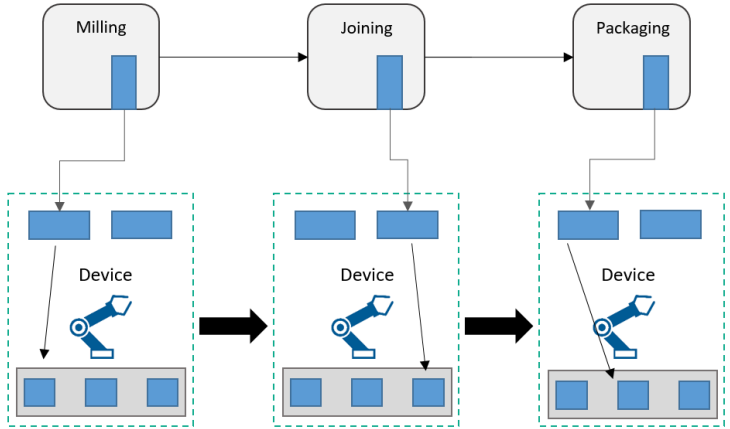






- Provided Services

- Mapping between recipe and device services



Eclipse BaSyx

Open Source

- Eclipse Open-Source Projekt: www.eclipse.org/basyx
- License: Eclipse Public License 2.0

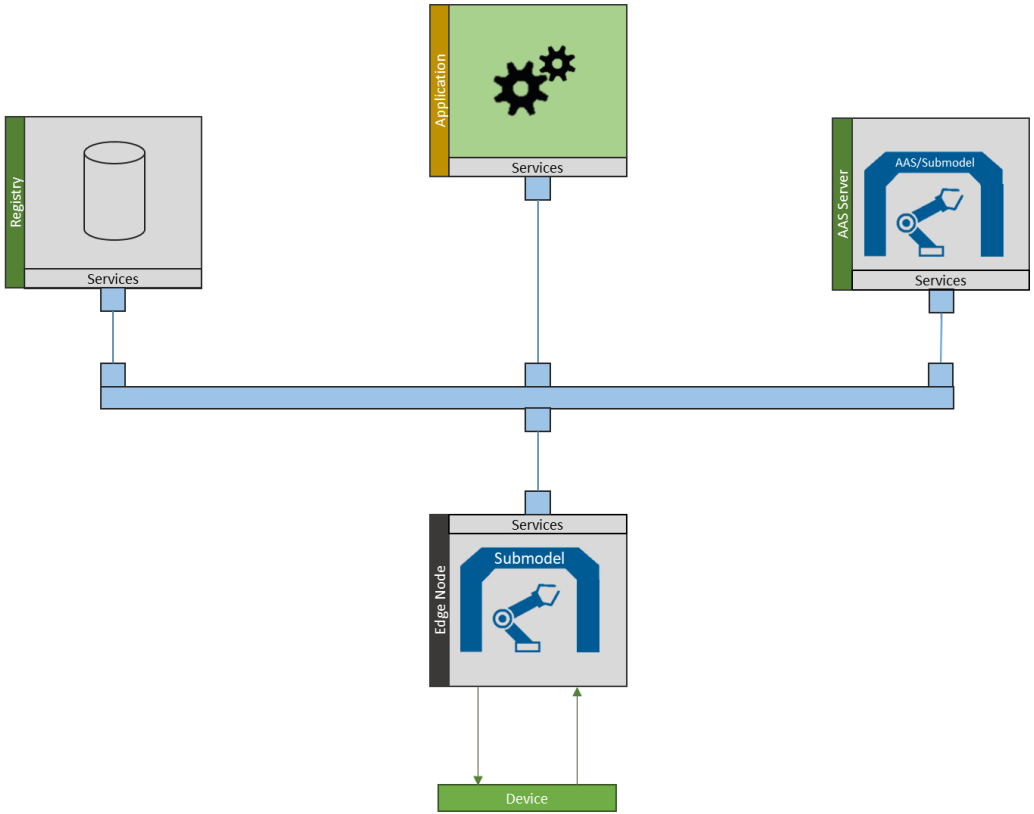
SDK (Java/C++/C#)

- Asset Administration Shell
- Communication

Off-the-Shelf Komponenten

- Registry
- AAS Server

Asset Administration Shell Infrastructure



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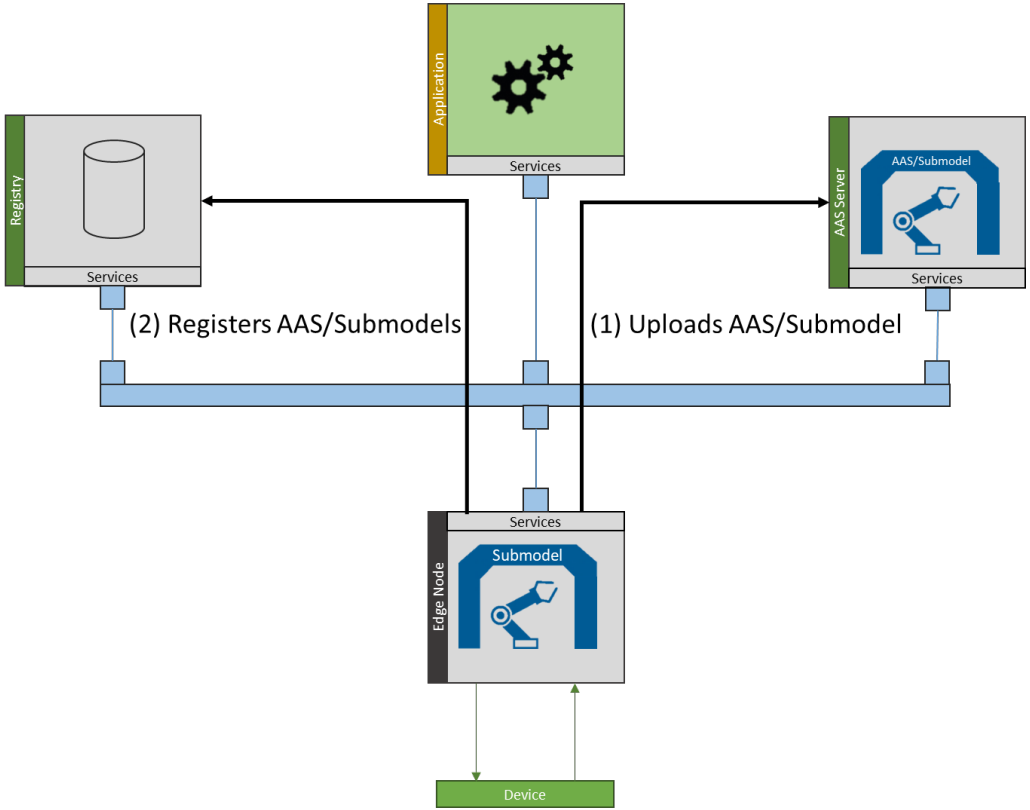

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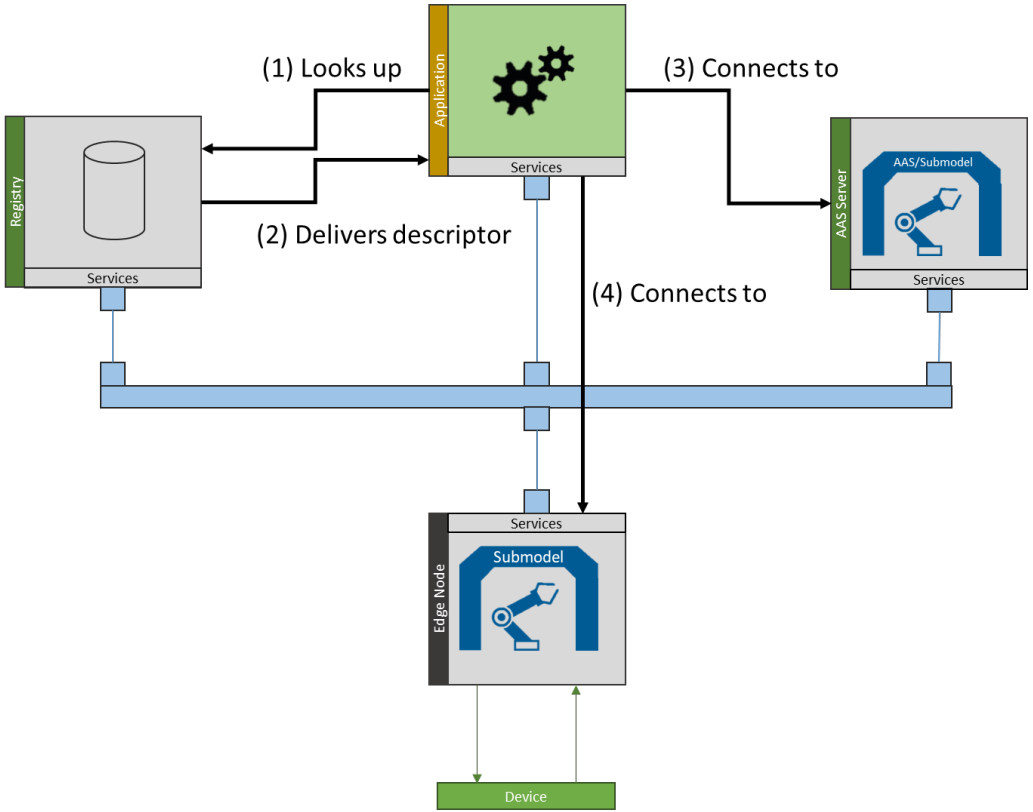
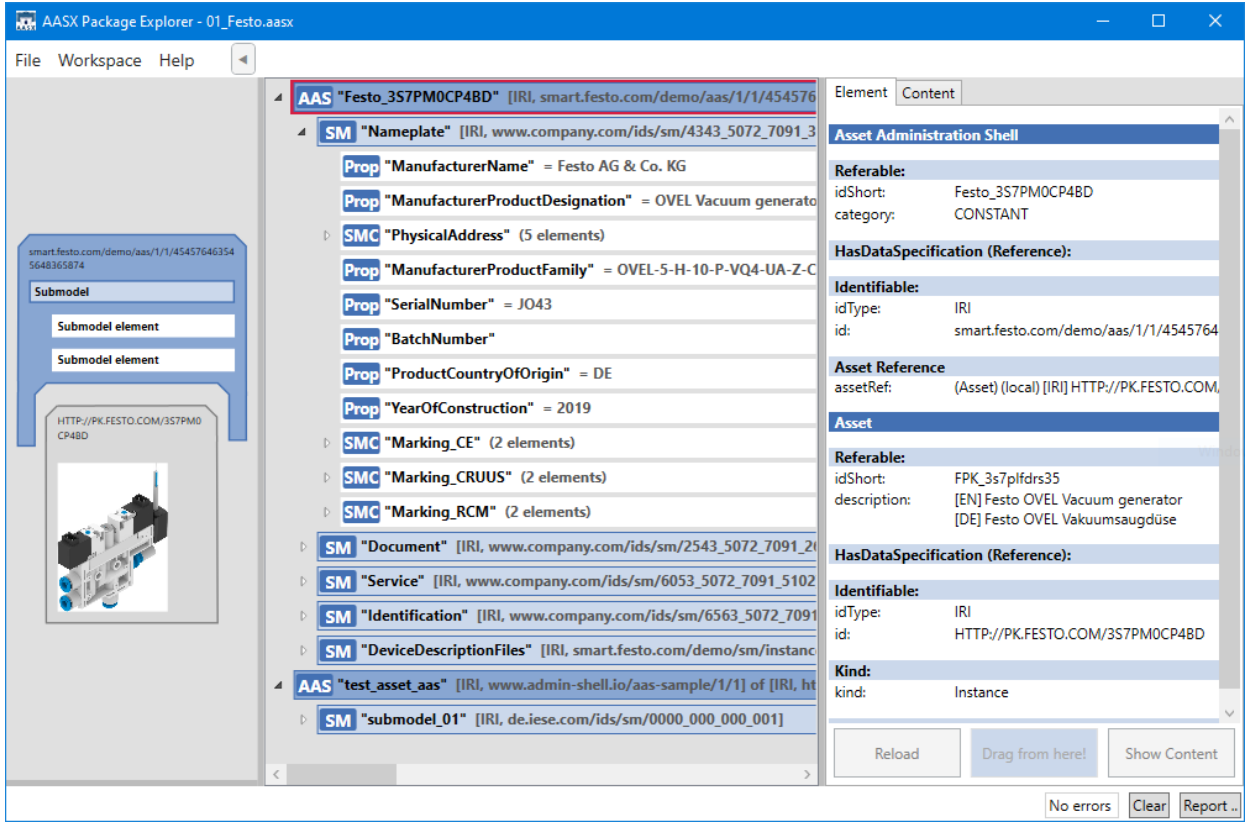


Artifacts of Eclipse BaSyx

- SwaggerHub: OpenAPI Documentation of all Components
- Maven Central (Java): SDK/Component Jar
- NuGet (C#): SDK
- DockerHub
  - Registry-Image
  - VWS-Server-Image
- Technology Compatibility Kit
  - Registry-TCK
  - AAS-Server-TCK
- Introductory Videos

Tooling – AASX Package Explorer



Summary

- Eclipse BaSyx enables quick start with Asset Administration Shells
- Lots of resources that enable easy start
- Usable in commercial products
- Easy adaptation due to open source