PDM Workbench for Aras Innovator

T-Systems PLM Applications

T··Systems

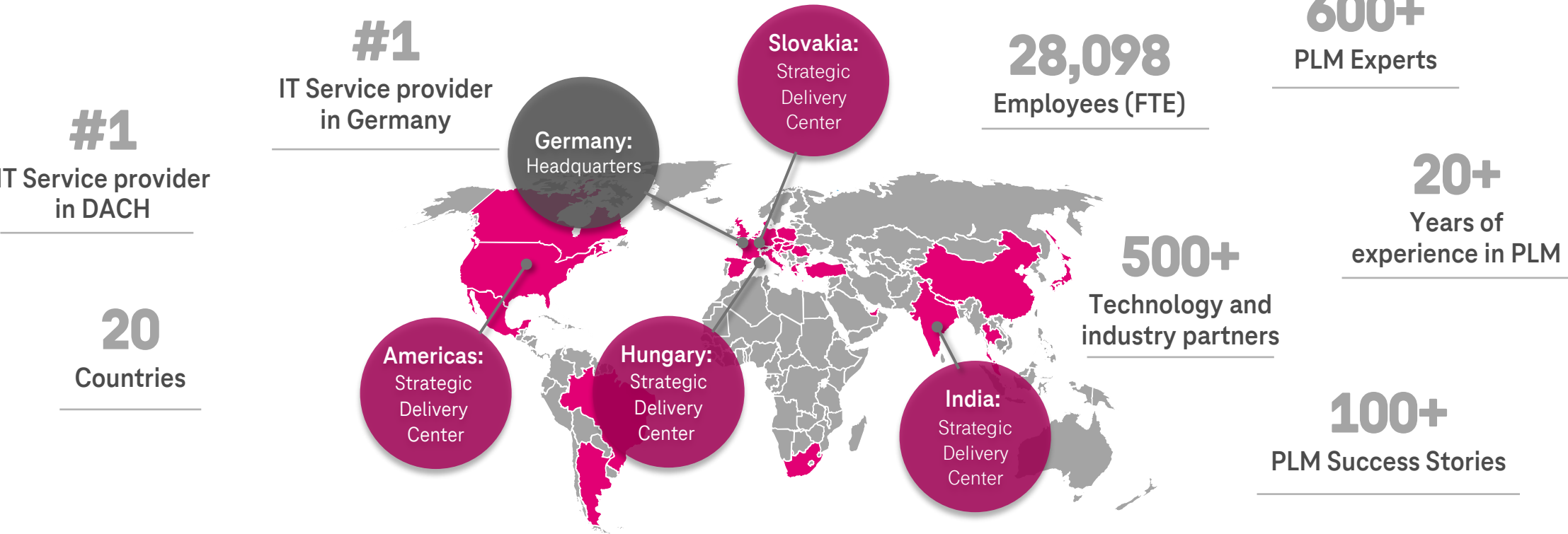# About T-Systems

T-Systems – Trusted Partner in Digital Transformation

Advisory

Security

Cloud Services

Digital Enabler

#1
IT Service provider in DACH

20
Countries

#1
IT Service provider in Germany

Germany: Headquarters

Slovakia: Strategic Delivery Center

Americas: Strategic Delivery Center

Hungary: Strategic Delivery Center

India: Strategic Delivery Center

28,098
Employees (FTE)

500+
Technology and industry partners

600+
PLM Experts

20+
Years of experience in PLM
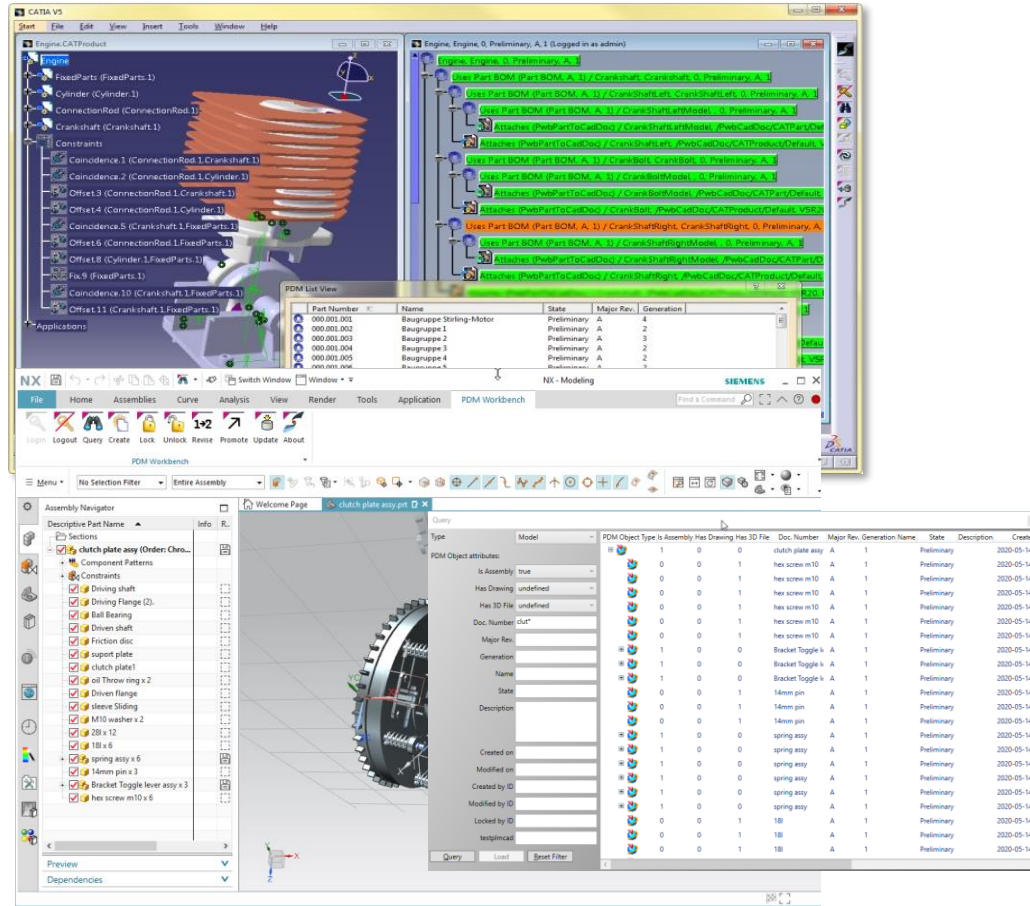
100+
PLM Success Stories

01

PDM Workbench Connector Family

PDM Workbench for Aras Innovator
The immersive PDM integration for CATIA V5, NX and Creo

The PDM Workbench is a comprehensive integration of major CAD systems into Aras Innovator.

It enables access to and full control of CAD data through the Aras Innovator PLM system.

· Enables Aras Innovator as collaborative platform for designers

· Access to design is controlled by Aras Innovator

· The PDM Workbench integrates advanced PDM capabilities into CAD

· CAD files are managed in the context of PDM product structures (BOM and CAD)

· The integration can be tailored by configuration and customization

· Supports customized data models

T-Systems' CAD Connectors share a common technology
Benefits of T-Systems as CAD Integration Vendor

Unified data model for all CAD integrations	✓ robust and easy to maintain
Single server module with same business logic	✓ one server-side implementation for all CAD systems
Similar User Interface in CAD	✓ same user experience, reduced training costs
Similar PDM integration functionality in CAD	✓ same methodology / same approach
One single support channel for all CAD integrations	✓ single point of contact
Project team has **direct access to CAD integration team**	✓ project requirements can be directly addressed

PDM Workbench CAD Connectors for Aras Innovator Support

Direct support by T-Systems by 2nd level hotline:

- Analyze use cases of customers

- Best practice and use cases from aerospace and automotive industry

- Customization support

- Fix pack releases

- Single point of contact for customer requirements

Continuously developed product:

- Support of the three latest CAD system releases
  older CAD system releases are available on request

- Support of active Aras Innovator releases including the latest available release,
  older Aras Innovator releases are supported for active subscribers

- Two PDM Workbench releases are issued per year + specific releases for customers

PDM Workbench for Aras Innovator
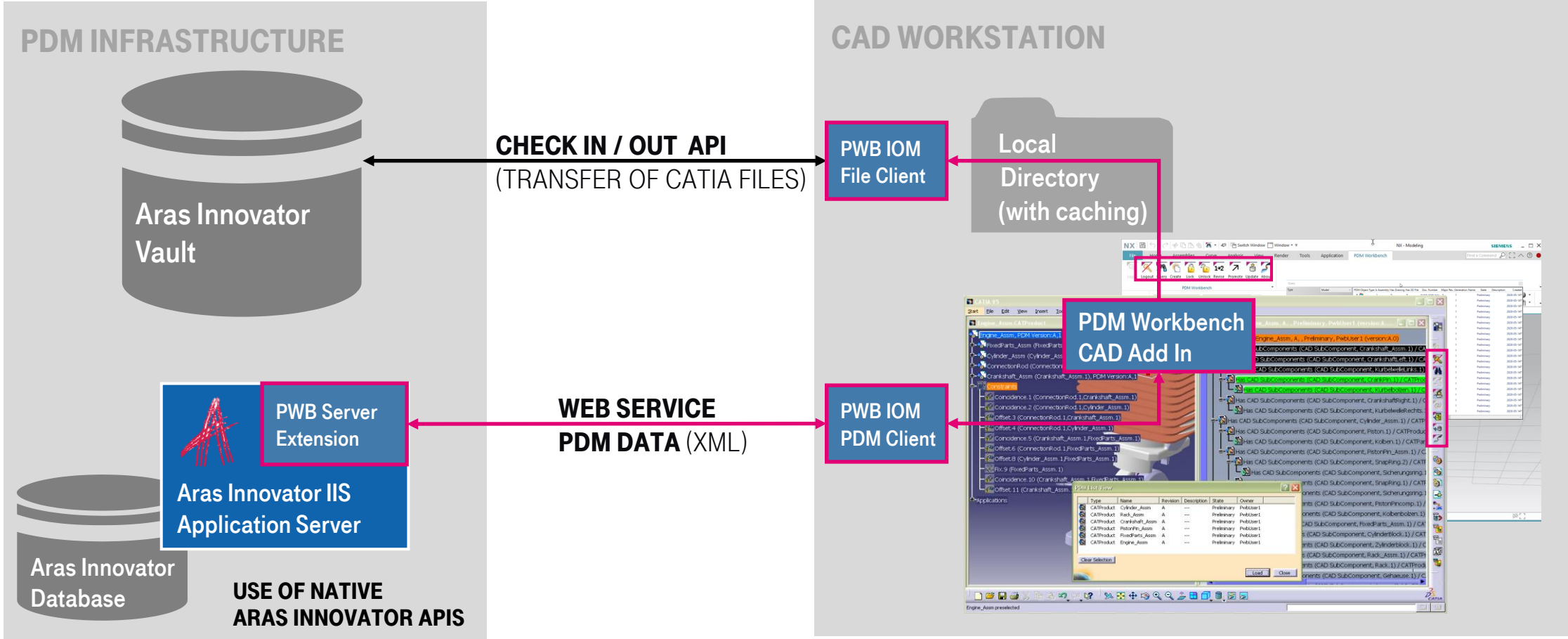# License Model and Commercial Aspects

T-Systems offers a flexible license model

- Concurrent Licenses can freely float in the network allowing flexible usage of the licenses.

- License prices are discounted based on the total installation number.

- Subscription model offers maximum flexibility: number of licenses can be annually adapted to the actual demand.

02

PDM Workbench Connector Family
Integration Concept

PDM Workbench for Aras Innovator Architecture Overview

PDM INFRASTRUCTURE

Aras Innovator Vault

Aras Innovator Database

PWB Server Extension

Aras Innovator IIS Application Server

USE OF NATIVE ARAS INNOVATOR APIS

CAD WORKSTATION

PWB IOM File Client

Local Directory (with caching)

PDM Workbench CAD Add In

PWB IOM PDM Client

CHECK IN / OUT API
(TRANSFER OF CATIA FILES)

WEB SERVICE PDM DATA (XML)

PDM Workbench for Aras Innovator Common Connector Features

Authentication (People & Organization)

· Login / logout / single sign on

Accessing PDM and CAD data

· Query, Expand and Load
  (in Aras Innovator web client and CAD client)

Collaborative Engineering

· Claim / Un-Claim / Auto-versioning

Creating and modifying data

· Update to Aras Innovator, creation of new versions, templates, derived files

Aras Innovator Integration

· Attribute and object mapping

· Dynamic Workflow and Life Cycle: Promote, Revise

Enhanced functionality

· Replace and insert of design structures

· Create Part and Part CAD relationship

· Synchronize CAD Structure to Part BOM

· Construction Space

· Dynamic creation dialogs

· Save of derived CAD files

· CAD Connector Server API for customization

· Save Bounding Box and position transformation

· Server-side validation before update to Aras Innovator

· Align versions in CAD Structure for "As Saved" load option

PDM Workbench for Aras Innovator CATIA-specific Connector Features

Enhanced functionality

- Duplication of structures
- Reconnect external design to Aras Innovator
- Drawing / Title block attribute mapping
- CATIA link management (save and load)
- Design Tables
- Standard Parts management with CATIA Catalogs
- CATIA Components
- Store Inertia information
- CATProcess support
- Icon, Text and Tooltip in CATIA PSN

- CATIA Visualization mode and Released Cache mode
- Scripting API in CATIA for custom business logic
- Automatic save of PWB CATIA session and local Load
- Asynchronous File Upload at Update to Aras Innovator
- Apply of configuration filters at load
- PDM Client in CATIA

PDM Workbench for Aras Innovator
NX-specific Connector Features

Enhanced functionality

- Reconnect external design to Aras Innovator

- Management of Wave Links

- Family Parts with NX Libraries

* server method can be customized

03
Advanced CAD Connector Functionality

PDM Workbench CATIA Integration Highlights

· Built-in PDM Client provides PLM functionality in CATIA: Life Cycle, Access Control, Version Management

· Updates Instance information (instance name, position matrix) to Aras Innovator

· Server-side validation before update to Aras Innovator

· Supports Spatial Filtering (based on bounding box) and Construction Space

· Comprehensive CAD-model link management (save and load)

· Automatic replace of conflicting versions at load in CATIA session

· Enhances CATIA UI with instant PDM information in PSN Tree: Overlay Icons, Tooltip and Text*

· Supports CATIA released cache mechanism for high performance load of huge structures

· Automatic creation of new versions based on access status (e.g., Claim, Life Cycle state)*

· Duplication wizard allows reuse of existing design structures and drawings

· Alternative configuration for direct EBOM support in CAD

· Dynamic server-defined dialogs in CAD*

· CATIA API to use by customer's CATIA macros / tools

* server method can be customized
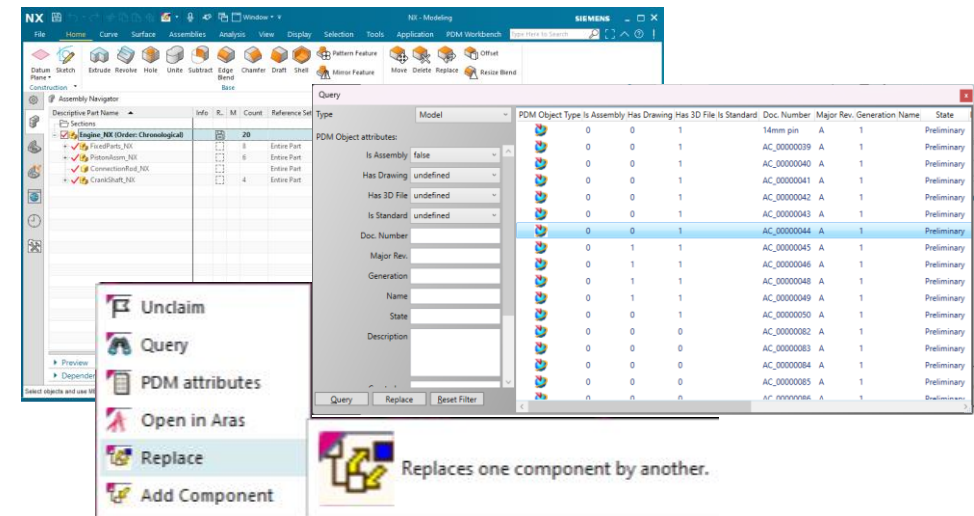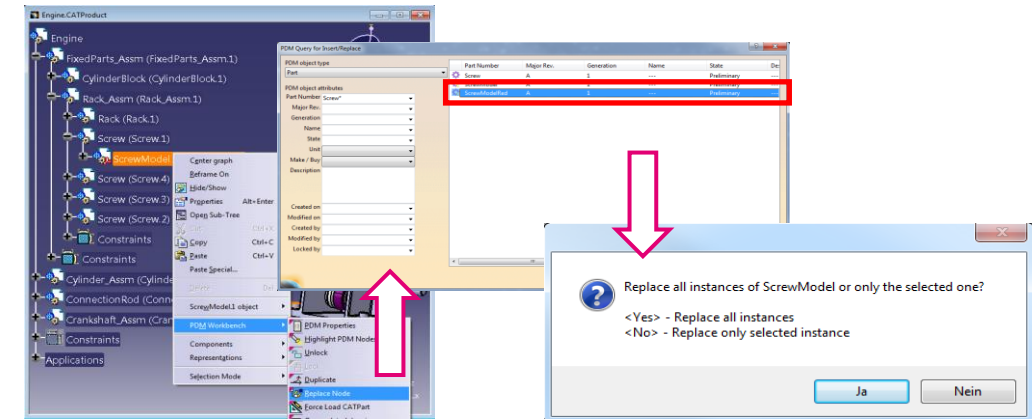
PDM Workbench CAD Integration
Highlight: Replace and Insert in CAD

Selected Nodes can be replaced by other objects from Aras Innovator:

- Select the node and use "Replace..."
- Select the object to be replaced with
- Specify whether all instances should be replaced

Objects from Aras Innovator can be inserted in CAD:

- Select the structure node and use "Add ..."
- Select the object to be inserted

PDM Workbench CATIA Integration
Highlight: Comprehensive Management of CATIA Links in PDM

from \ to	CATPart	CATProduct	CATDrawing	CATShape, CGR, model, ...	DesignTable (TXT, XLS, XLSX)	CATMaterial
CATPart	Design	Contextual	Design	Product	DesignTable	Reference
CATProduct	Design Reference Product	Design Reference Product	Design	Product	DesignTable	Reference
CATDrawing	Design Downstream	Design Downstream		Design Downstream		
CATCatalog	IsComposedOf	IsComposedOf	IsComposedOf	IsComposedOf	IsComposedOf	
CATProcess	Downstream	Downstream				

Geometrical links are directional between Source and Target documents.

Class Structure for CAD Structure

File

+ −

- CAD Structure
  - Contextual
  - Design
  - Downstream
  - Drawing
  - IsComposedOf
  - managed by ARAS
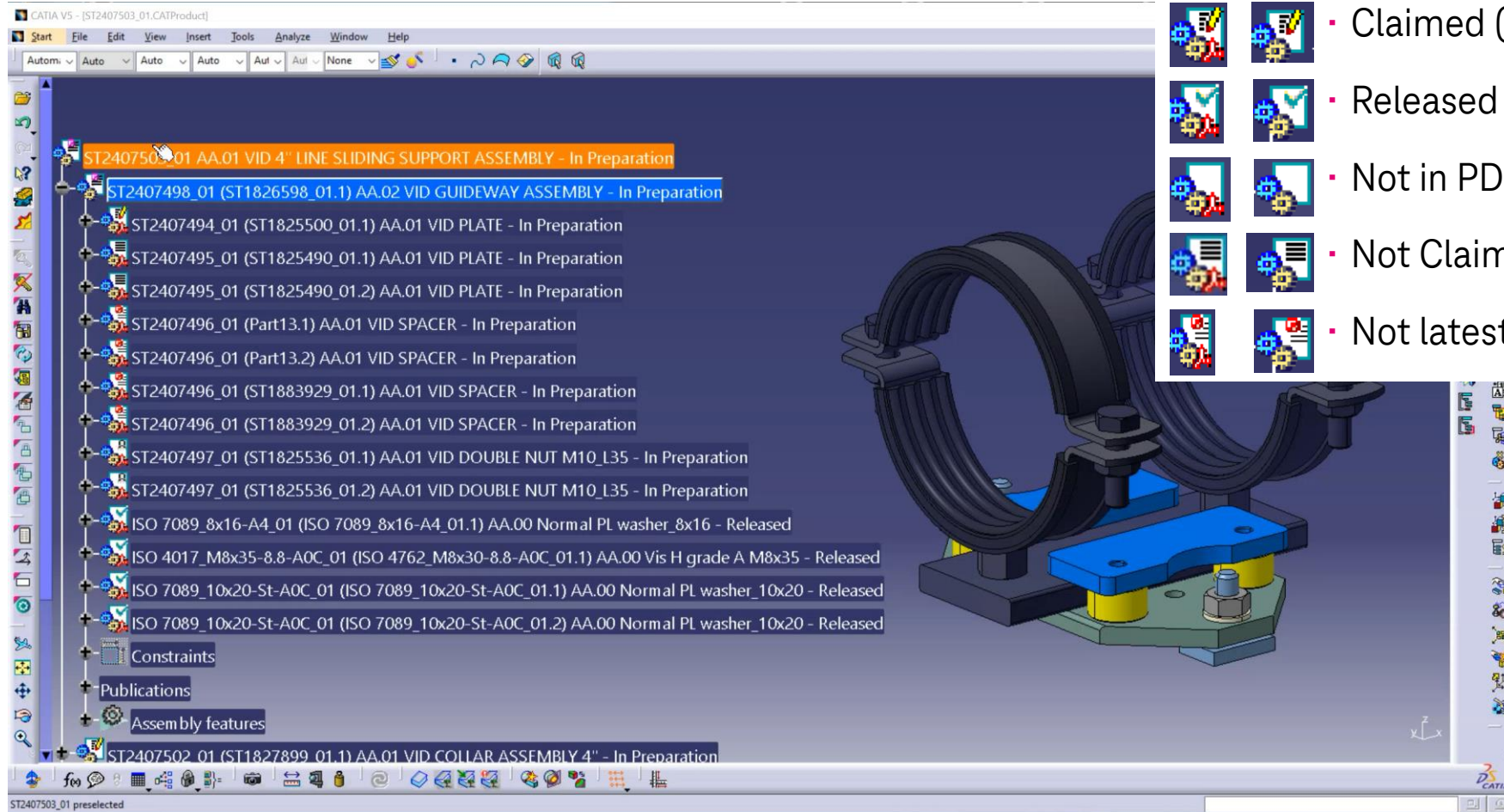 - Product
  - Reference
  - Result
  - RuleBase
  - Structure
  - Variant

Distinguished CATIA link types in Aras Innovator

PDM Workbench CATIA Integration
Highlight: Configurable Text, Tooltips and Icon Overlays in PSN

- Claimed (by me)
- Released
- Not in PDM
- Not Claimed / Claimed by other
- Not latest

PDM Workbench CATIA Integration
Highlight: PDM Client in CATIA

The PDM Workbench comes with a PDM client embedded in CATIA

Structure explorer

- Multilevel expand structures
  - CAD Structure and Part BOM
  - Sub-Structure and Used in Structure
  - Part – CAD relationships
  - Creating relations with Copy / Paste
- Accessing Documents
- Access, life cycle and workflow actions
- Display color code for status, access rights, modification state
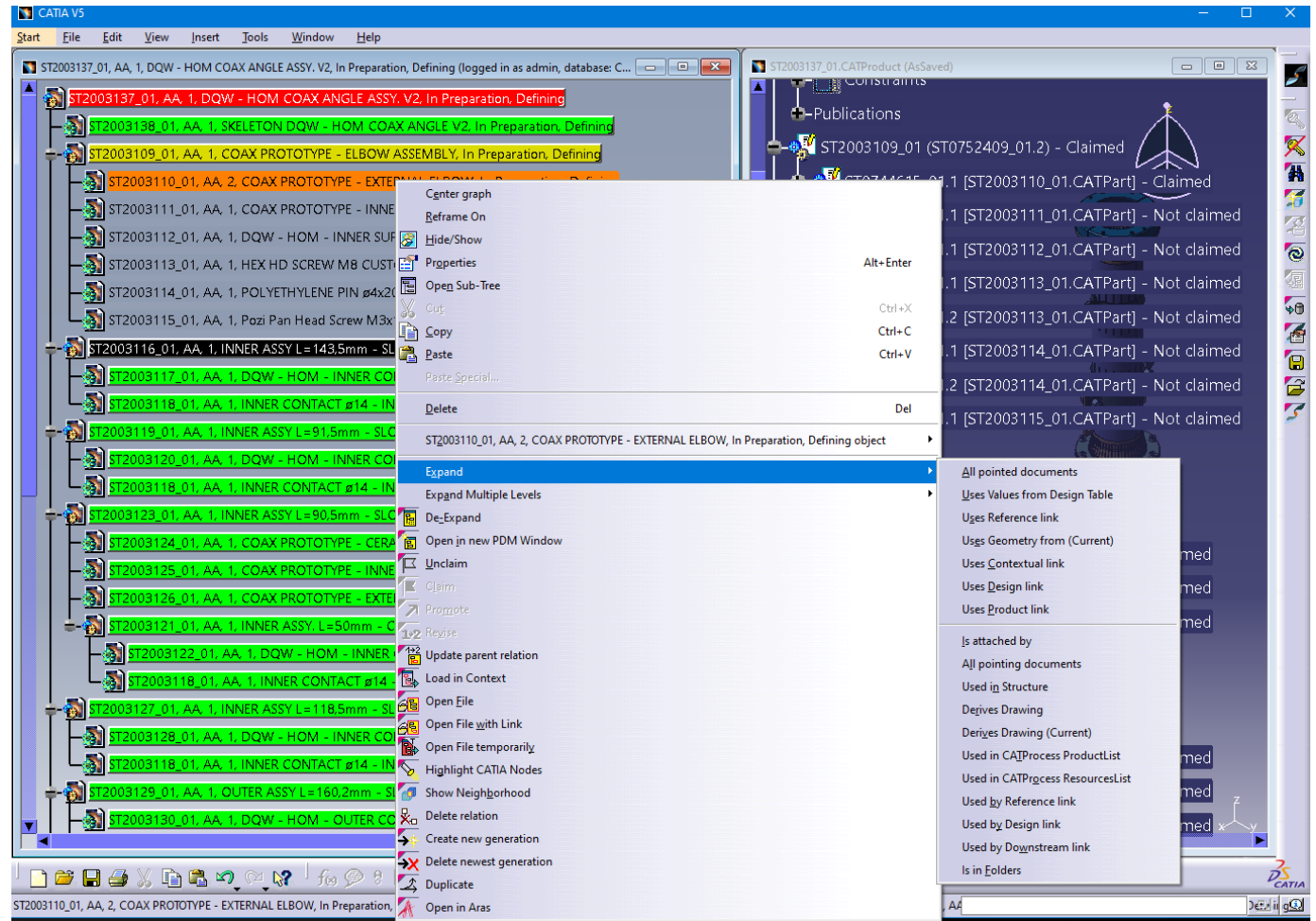
PDM Workbench CATIA Integration
Highlight: Duplication of Structures

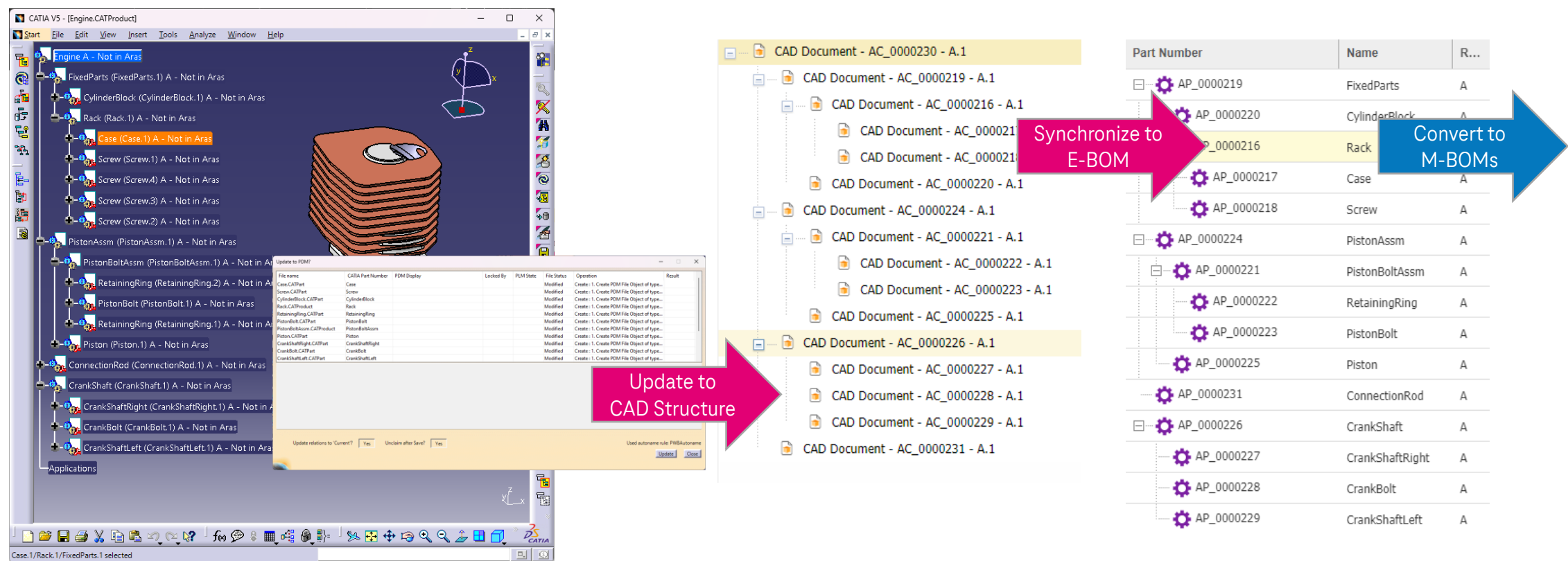## Convenient copying of structures

- Preselection of the list of documents

- Selecting and deselecting single nodes

- Defining naming rules

- Select a path to be renamed with one click
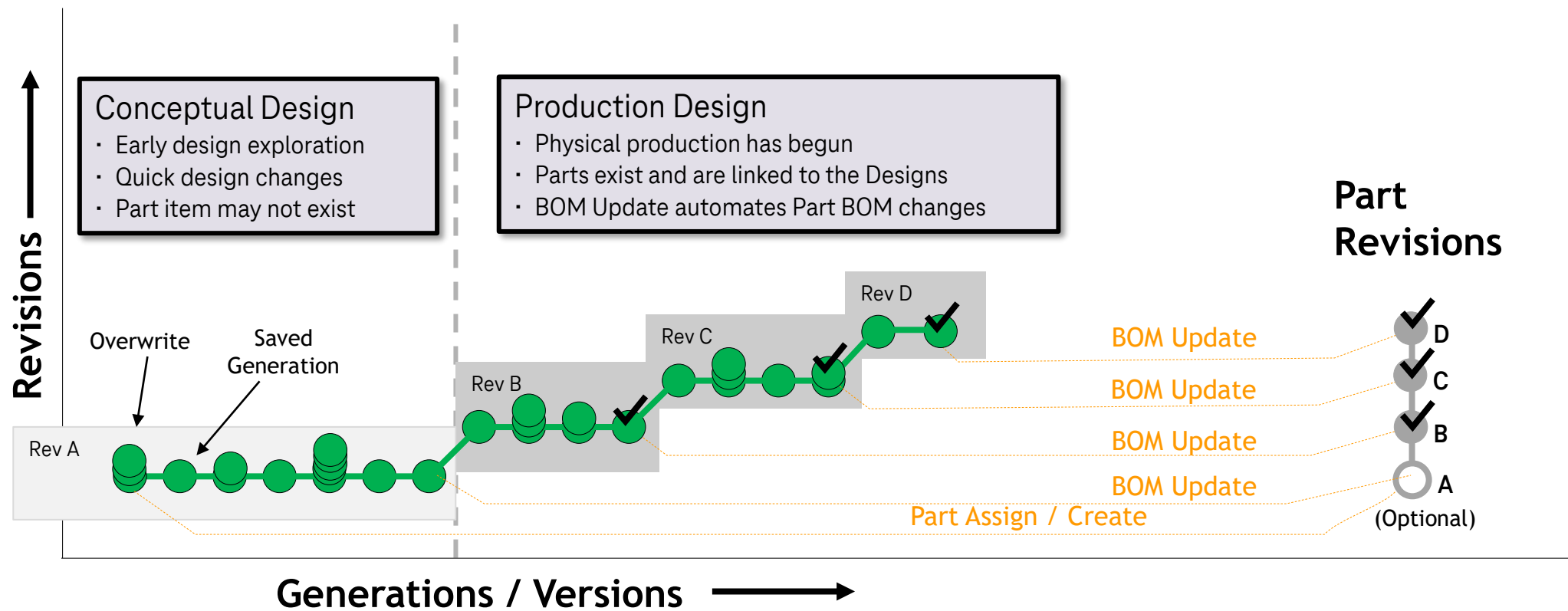
- Includes Drawings

- Detection of Standard Parts
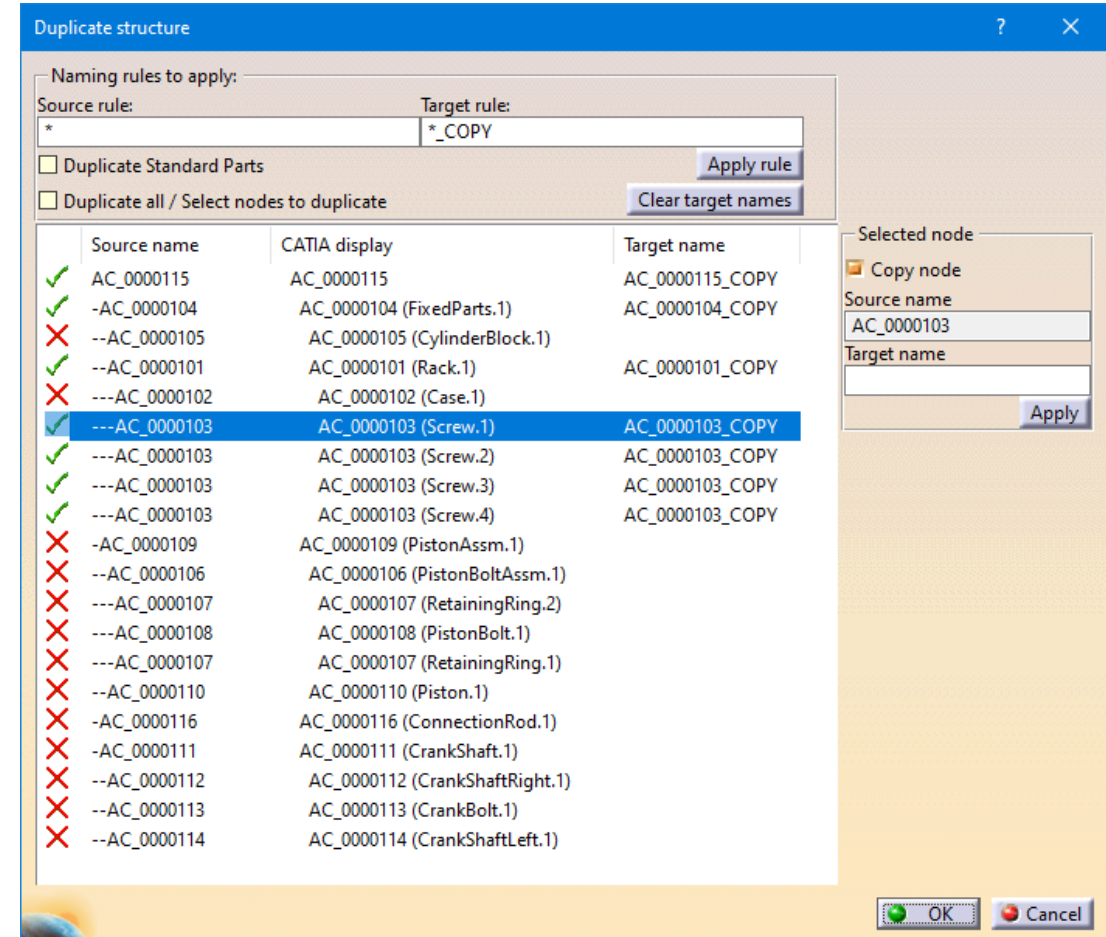
04

How the Connector integrates to the
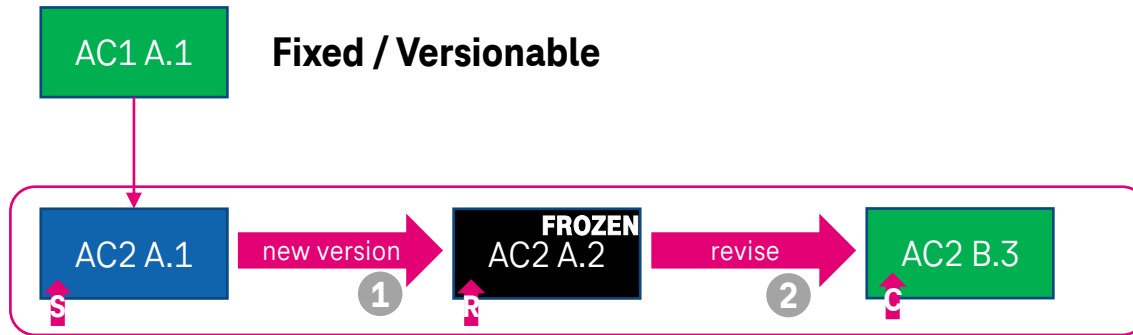Aras Innovator PLM data model

Sync CAD Content to EBOM

Synchronize to E-BOM

Convert to M-BOMs

Update to CAD Structure

CAD Document Structure Mode
Unified Part / CAD Change Process

Conceptual Design
- Early design exploration
- Quick design changes
- Part item may not exist

Production Design
- Physical production has begun
- Parts exist and are linked to the Designs
- BOM Update automates Part BOM changes

Part Revisions

Revisions

Overwrite

Saved Generation

Rev A

Rev B

Rev C

Rev D

BOM Update

BOM Update

BOM Update

BOM Update

Part Assign / Create

D

C

B

A

(Optional)

Generations / Versions

CAD Structure Float behavior and Connector Load Options

Fixed / Versionable

AC1 A.1 → AC2 A.1 —new version①→ **FROZEN** AC2 A.2 —revise②→ AC2 B.3

S = AC2 A.1, R = AC2 A.2, C = AC2 B.3

Load Structure in CAD:

As Saved	Latest Released	Current
AC1 A.1 → AC2 A.1	AC1 A.1 → AC2 A.2	AC1 A.1 → AC2 B.3
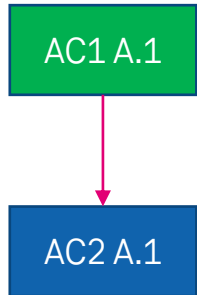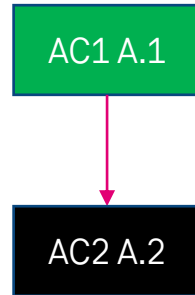
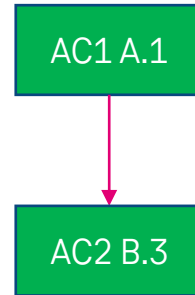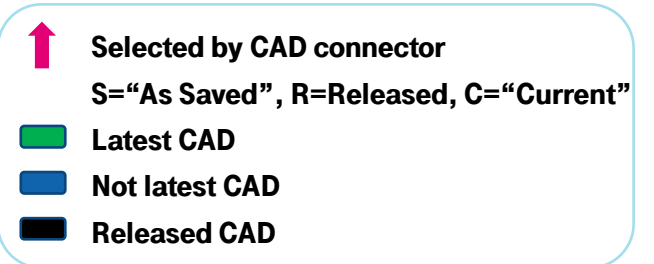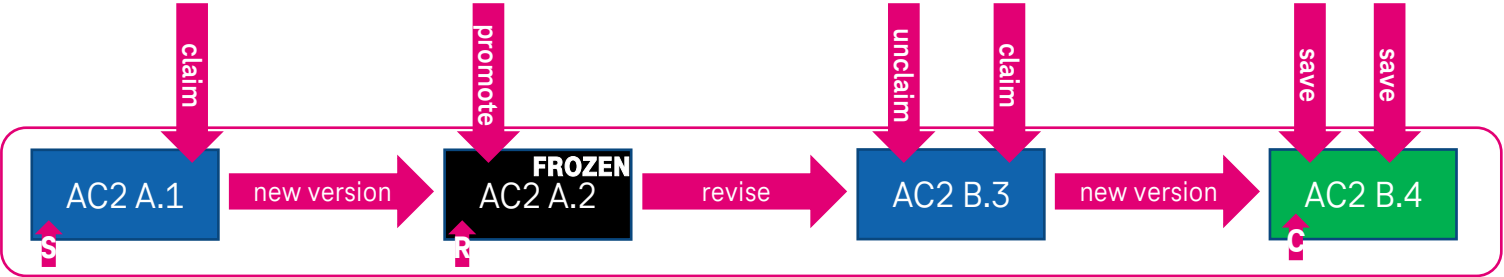## CAD Structure relationship is Fixed (default behavior)

- The CAD Structure relationship will stay "fixed" when a new version of the child CAD was created.
- Thus, new child versions are not assembled but kept together by a "config id".
- With the CAD Connector different load options are available:
  - As Saved
  - Latest Released
  - Current

Legend:
- ↑ Selected by CAD connector S="As Saved", R=Released, C="Current"
- 🟩 Latest CAD
- 🟦 Not latest CAD
- ⬛ Released CAD

CAD Structure Float behavior and Connector Load Options

claim → **AC2 A.1** (S)

new version →

promote → **FROZEN AC2 A.2** (R)

revise →

unclaim / claim → **AC2 B.3**

new version →

save / save → **AC2 B.4** (C)

Legend:

↑ Selected by CAD connector
S="As Saved", R=Released, C="Current"

■ Latest CAD
■ Not latest CAD
■ Released CAD

CAD Document Structure Mode
CAD Structure and CAD Instance Relationships

Instances of the CAD product structure are mapped to *CAD Structure* relationships and *CAD Instances*

· *CAD Structure* is a singe relationship between a specific CAD Document (Assembly) and a specific child CAD Document

· *CAD Structure* manages all instances of this specific child part by *CAD Instances*

Structure | Parents | Files | Changes | PwbCadDesignTable

CAD Documents

	Seque...	Document Nu... ↑	Revi...	Name	Type	Dependency	External Owner	State
⚑	512	AC_0000187	A	Case	Mechanical/Part	Structure	T-Systems.Mechanical.CATIA	Preliminary
⚑	384	AC_0000188	B	Screw	Mechanical/Part	Structure	T-Systems.Mechanical.CATIA	Preliminary

· A *CAD Instance* holds all information about a specific CATIA Instance, like instance name and position matrix

Instances

CAD Instances

Sequen...	Name	Description ↑	Transformation Matrix
128	Screw.1		1 0 0 0 0 1 0 0 0 0 1 0 -35.00000000000016 -30.18101391196255 50.44062423706055 1
256	Screw.2		1 0 0 0 0 1 0 0 0 0 1 0 35.99999999999984 -30.18101391196255 50.44062423706055 1
384	Screw.3		1 0 0 0 0 1 0 0 0 0 1 0 35.99999999999984 24.81898608803745 50.44062423706055 1
512	Screw.4		1 0 0 0 0 1 0 0 0 0 1 0 -35.00000000000016 24.81898608803745 50.44062423706055 1

05
References

PDM Workbench for Aras Innovator
References Overview: Automotive, Aerospace, Defense

T-Systems PLM Solutions
F.X. Meiller Aras Innovator Migration Project

F.X.Meiller - Business Case

VPM to Aras Innovator migration project:

- Development of specific customer requirements
- Improved usability and performance
- Reduced maintenance costs for the PDM system
- Phase out of legacy UNIX/VPM server platforms

Locations

- Munich, Germany (Headquarter)
- Products: Dumpers, Elevator Doors
- Markets and customers: automotive and construction industry

Specific Requirements

- Enhanced query UI capabilities
- Promote and revise
- Customer specific:
  - Advanced search capabilities
  - Duplication of Parts and Drawings

Applications

- CATIA V5 R32
- Aras Innovator 31
- 95 PDM Workbench Licenses

T-Systems PLM Solutions
BAE Systems Aras Innovator CATIA V5 Integration Project

BAE Systems - Business Case

Replacement of home grown PDM system (PDA):

- Development of specific customer requirements
- CAD BOM alignment UI in CATIA
- Security concepts (ITAR)
- STEP import

Locations

- Örnsköldsvik, Sweden

Specific Requirements

- Q-Checker integration
- Alternative and derived CAD file management
- Customer specific:
  - Document and Part types
  - Type dependent expand

Applications

- CATIA V5-6R2023
- Aras Innovator 29
- 310 PDM Workbench Licenses

T-Systems PLM Solutions
Customer Reference Project @

Kawasaki
Powering your potential

Kawasaki Heavy Industries - Business Case

Replacement of legacy Dassault Systèmes PDM system VPM:

· Development of specific customer requirements

· Support of migration with specific tools and PDM Workbench functionality

· For large scale airplane programs

· Large-scale assembly DMU

Locations

· Gifu, Japan

Specific Requirements

· Serial number filtering

· Compare Structure Tree

· Representation Type filter

· Support for migrated V4 documents

· Enhanced Query Functionality

Applications

· CATIA V5 R25

· Aras Innovator 11

· 240 PDM Workbench Licenses

T-Systems PLM Solutions
Central eBOM project @ ⟡ LEONARDO HELICOPTERS

Leonardo Helicopters Division - Business Case

- Setup of a central Aras Innovator instance to manage configured product structures for a multitude of helicopter lines

- Transfer all relevant information for eBOM management from multiple sources into one system

- Potential for central cross-over (multi-line) part management

- Potential for multiple BOM management (pBOM, mBOM etc.)

Solution

- Data synchronization with COMPDM from Enovia VPM V4 to Aras Innovator (initial and delta) incl. configuration data, maintaining reference to source system

- Store customer orders persistently in Aras incl. history (interface to SAP)

- Synchronize parts, CAD models (CATIA V4/V5), documents, EO, effectivities and merge into single data model

- Detect MUL* structures and register MUL master in Aras

- Customization of CATIA V5 to Aras Innovator integration

Installation Base

- 6 helicopter programs

- Potential rollout in Leonardo Group

- 50 PDM Workbench Licenses

- COMPDM to serve VPM to Aras data exchange

*MUL = multi-line components and structures

T-Systems PLM Solutions
Customer Reference Project @

CERN - Challenge

- New central Product Lifecycle Management (PLM) platform supporting the CERN engineering department with the Lifecycle Management of components

- Support of current and future business processes

- Seamless integration of multi-CAD systems

- Extensive data migration from legacy systems

Solution

- New PLM platform based on the web application **Aras Innovator**

- Agile implementation project with GIT hub, Docker and Continuous Integration (CI) environment to support CERN business processes such as Versioning, Workflow and Lifecycle in a generic way

- **Seamless integration to the CAD system CATIA V5 with custom icons, tooltips and node text in CATIA Product Structure Nodes**

- E2E service (implementation, consulting, migration, training & support service)

Customer Benefits

- Highly flexible PLM platform

- Open for customizations done by CERN

- 350 CATIA V5 users

- „Team mode" collaboration model with continuous knowledge transfer to CERN

- Support and release management secured over 10 years
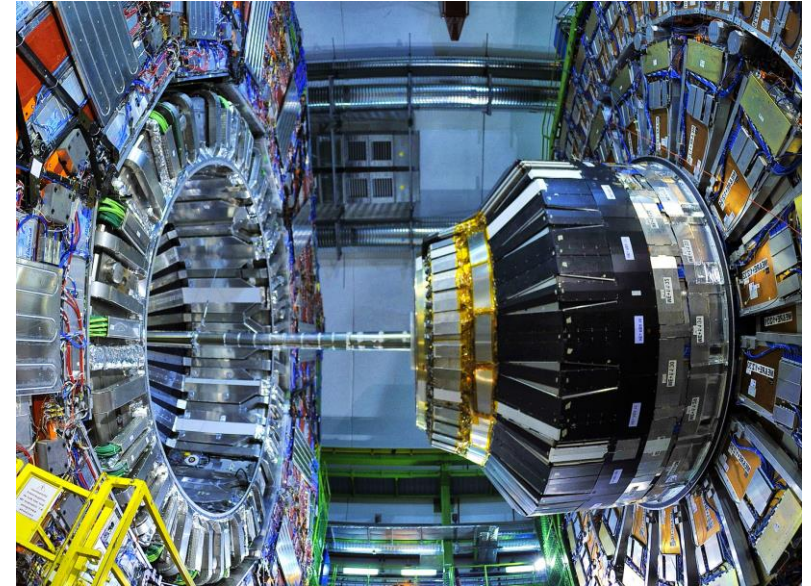
06
Roadmap

PDM Workbench for Aras Innovator: CATIA V5, NX, Creo Parametric Roadmap 2025

Software Version	Delivery Date	Supported Platforms	Base Software	Functionality/Changes
PDM Workbench Release 21.0	November 2025	CATIA / NX client: Windows 10 (64 Bit)[3] Windows 11 (64 Bit)[3] Aras Innovator Server: Server OS and database see respective "Aras Innovator Installation Guide" in chapter "Prerequisites" Aras Cloud Server	Supported PDM systems: • Aras Innovator 2023 • Aras Innovator 22 and higher[1] please check on: https://www.aras.com/en/roadmap Supported CATIA V5 releases: • V5-6R2020, V5-6R2021, V5-6R2022, V5-6R2023, V5-6R2024, V5-6R2025 • other releases on request (oldest version: R21) Supported NX releases: • 10[2], 11[2], 12[2] • Continuous: from 1847[2] - 2212[2], 2306, 2312, 2406, 2412 Supported Creo Parametric releases: • 9.x, 11.x, other release on demand	**General** • Support Effectivities • Support of Multi-CAD structures **NX** • Duplicate Structure, SSO **Creo Parametric** • Reconnect external design • Replace and Insert from Aras
PDM Workbench Release 20.0	July 2025			**General** • Revise, Promote with complex workflows in CAD • Synchronization of "Part BOM" to "CAD Structure" **CATIA** • Comprehensive CATIA Scripting API • Show modified status in PSN Text **NX** • Drawing Title Block **Creo Parametric** • Autoname, SSO, Claim/UnClaim with auto-versioning

(1) With availability (+6 weeks after issuing)
(2) On demand
(3) Only for CATIA V5 releases which are officially supported by Dassault Systèmes as target platform

PDM Workbench for Aras Innovator: CATIA V5, NX, Creo Parametric Roadmap 2024/2025

Software Version	Delivery Date	Supported Platforms	Base Software	Functionality/Changes
PDM Workbench Release 19.0	March 2025	CATIA / NX client: Windows 10 (64 Bit)[3] Windows 11 (64 Bit)[3] Aras Innovator Server: Server OS and database see respective "Aras Innovator Installation Guide" in chapter "Prerequisites" Aras Cloud Server	Supported PDM systems: • Aras Innovator 2023 • Aras Innovator 22 and higher[1] please check on: https://www.aras.com/en/roadmap Supported CATIA V5 releases: • V5-6R2019, V5-6R2020, V5-6R2021, V5-6R2022, V5-6R2023, V5-6R2024 • other releases on request (oldest version: R21) Supported NX releases: • 10[2], 11[2], 12[2] • Continuous: 1847[2], 1872[2], 1899[2], 1926[2], 1953[2], 1980[2], 2007[2], 2206[2], 2212[2], 2306, 2312	**General** • Construction Space for Send to CAD **CATIA** • Show modified status in PSN Text **NX** • Server defined dynamic Update dialogs • Configurable menus **Creo Parametric** • First version
PDM Workbench Release 18.0	May 2024			**CATIA** • Server defined dynamic Update dialogs • Support of complex workflows in CATIA PDM Client **CATIA + NX** • Make BOM Sync available in Aras PDM Client

(1) With availability (+6 weeks after issuing)
(2) On demand
(3) Only for CATIA V5 releases which are officially supported by Dassault Systèmes as target platform

PDM Workbench for Aras Innovator: CATIA V5, NX
Roadmap 2022/2023

Software Version	Delivery Date	Supported Platforms	Base Software	Functionality/Changes
PDM Workbench Release 17.0	June 2023	CATIA / NX client: Windows 10 (64 Bit)[3] Windows 11 (64 Bit)[3] Aras Innovator Server: Server OS and database see respective "Aras Innovator Installation Guide" in chapter "Prerequisites"	Supported PDM systems: · Aras Innovator 12 up to latest available SP[2] · Aras Innovator 2023 · Aras Innovator 22 and higher[1] Supported CATIA V5 releases: · V5-6R2018, V5-6R2019, V5-6R2020, V5-6R2021, V5-6R2022, V5-6R2023[4] · other releases on request (oldest version: R21) Supported NX releases: · 10[2], 11[2], 12[2] · Continuous: 1847[2], 1872[2], 1899[2], 1926[2], 1953[2], 1980[2], 2007[2], 2206, 2212, 2306[4]	CATIA · Asynchronous file upload CATIA + NX · CAD-centric mode: Load CAD Structures using instance information from CAD Assembly file NX · Part Family and Standard Part support · Reconnect Enhancements
PDM Workbench Release 16.0	October 2022			· Comprehensive support of all kinds of CATIA links with save and load · Support of additional shape representations at CATProducts and CATParts · Support of Multi-Shape CAD for Part BOM mode · Replace with other version of same file in CATIA session · Custom versioning of a CAD Document per 'Claim' Action

(1) With availability (+6 weeks after issuing)
(2) On demand
(3) Only for CATIA V5 releases which are officially supported by Dassault Systèmes as target platform
(4) For PDM Workbench 17.0

Thank you!

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PDM Workbench

https://plm.t-systems.net/pdm-workbench