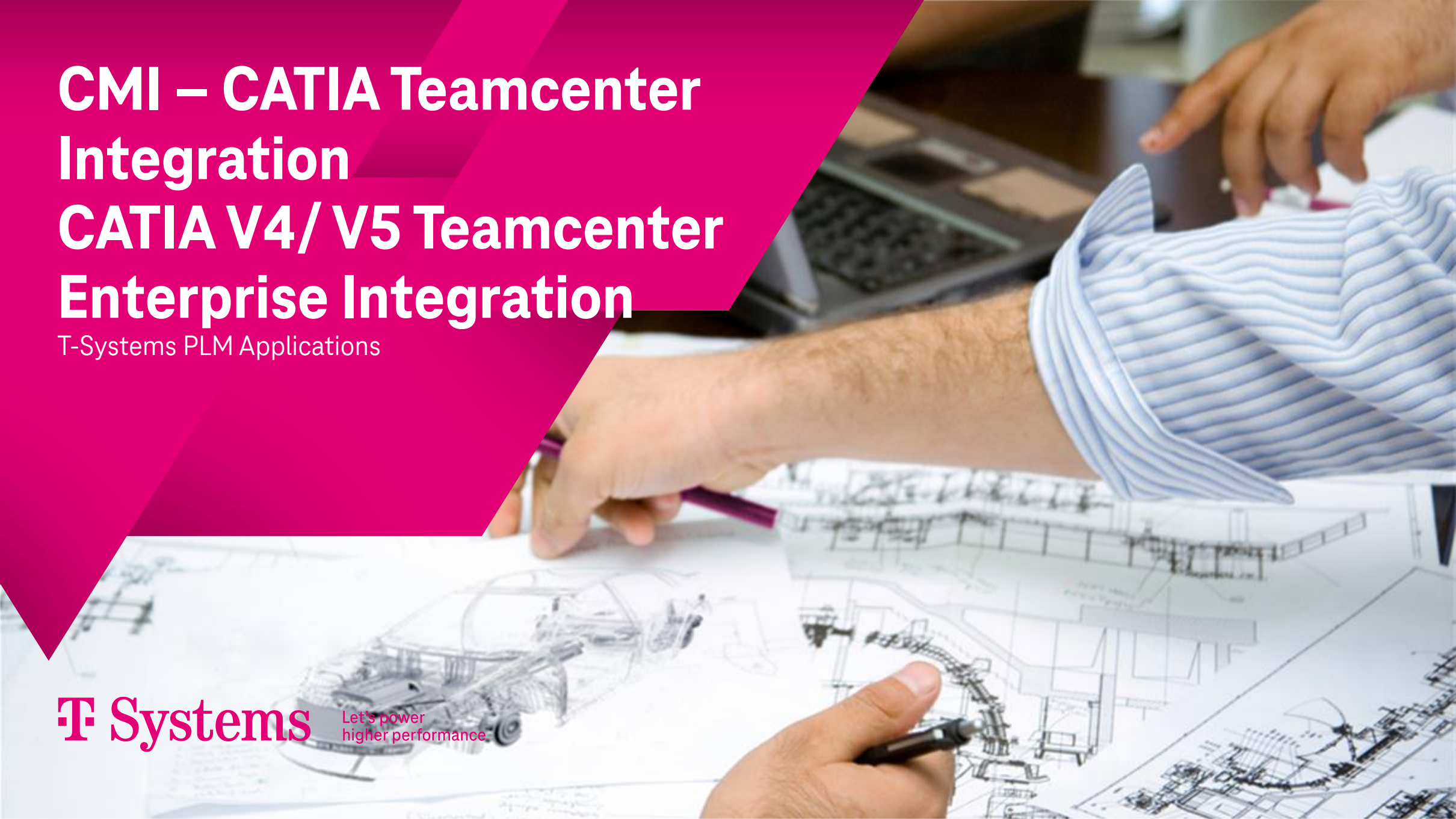


CMI – CATIA Teamcenter Integration CATIA V4/ V5 Teamcenter Enterprise Integration

T-Systems PLM Applications

T Systems

Let's power
higher performance

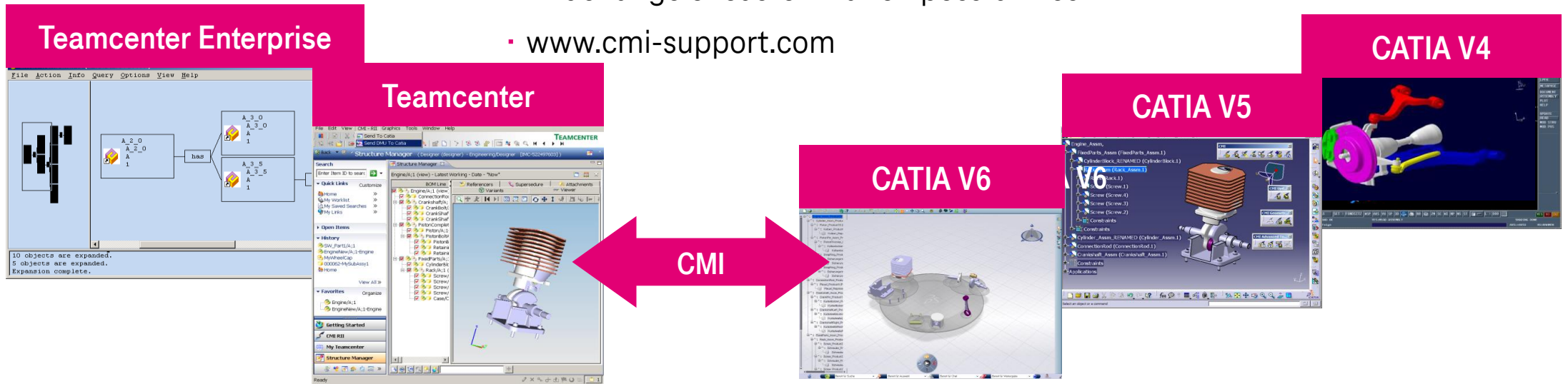


T-Systems' Teamcenter CATIA Integration

CATIA Teamcenter Integration – Overview



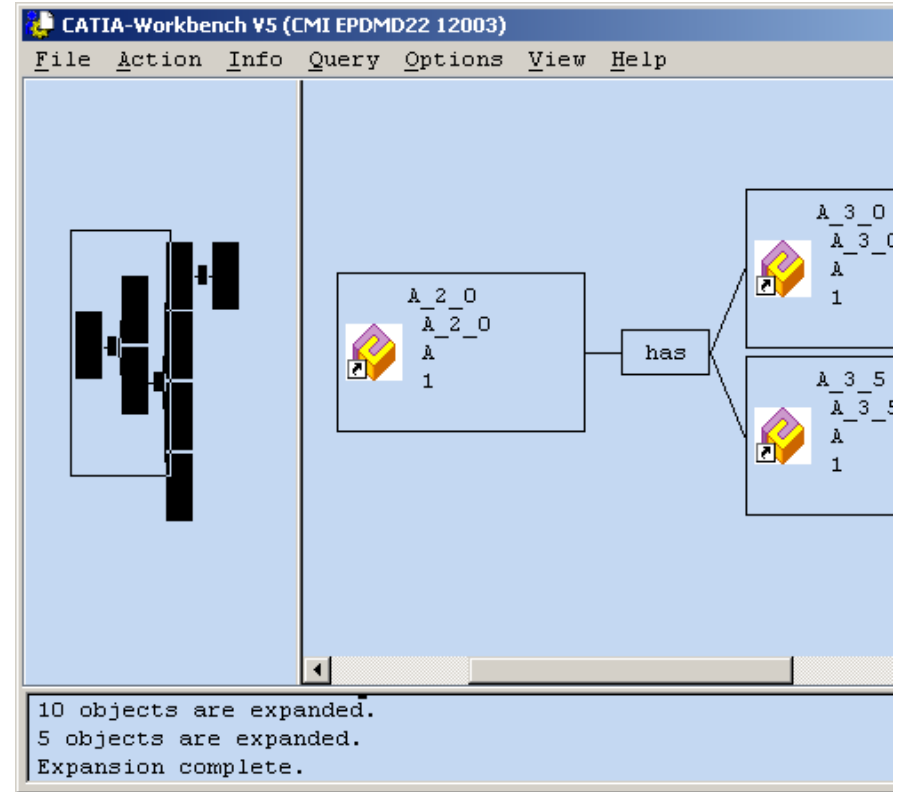
- Product since 1995
- Teamcenter as global PDM system
- Integration of CATIA V4 / V5 and Teamcenter
- Assembly functionality in CATIA V4
- Integration of bill of material and geometry data
- Wide range of customization possibilities
- www.cmi-support.com



CATIA V4/V5 Teamcenter Enterprise Integration

The CMI Workbench Concept (1/2)

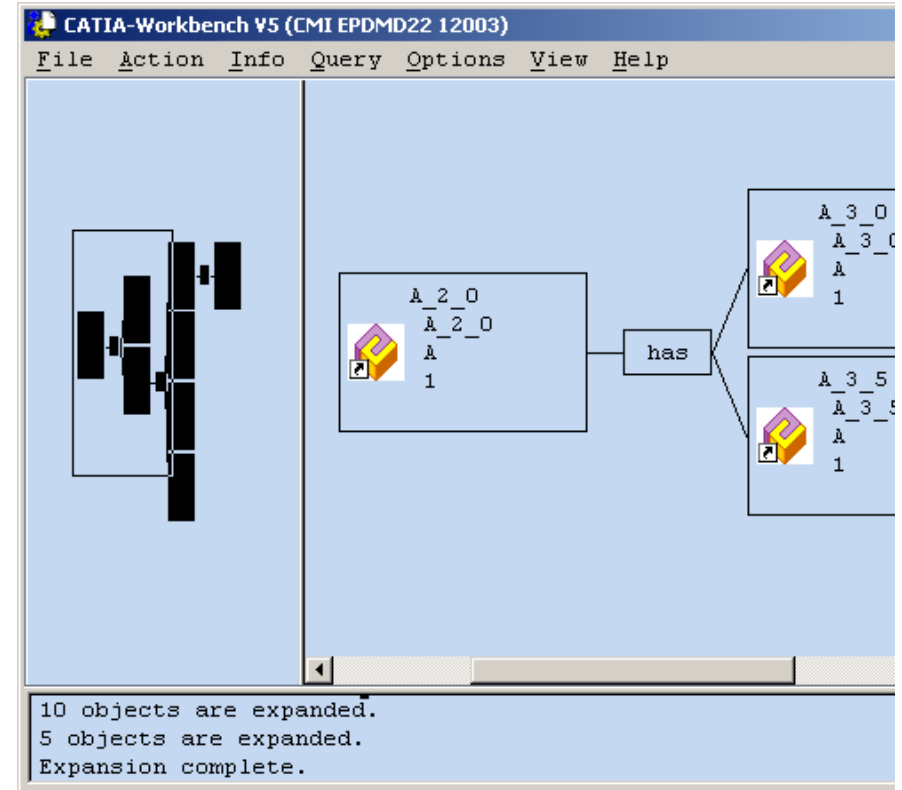
- The CATIA workbench represents the content of the CAD system CATIA.
- In CMI workbench the selected product structure can be tailored, expanded, inflated and items can be selected.
- Multiple product structures or single geometry objects can be located in the CMI workbench.



CATIA V4/V5 Teamcenter Enterprise Integration

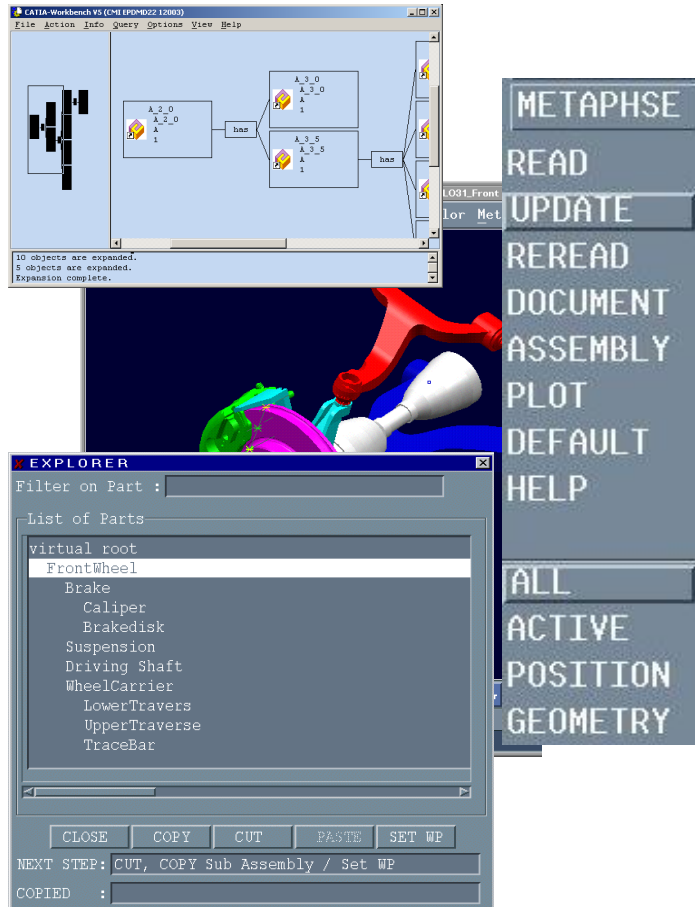
The CMI Workbench Concept (2/2)

- Information for each item in the CMI workbench can be displayed.
- The communication process with CATIA can be started directly from the CMI workbench.
- The displayed item icon gives information about the type and important properties of the represented Teamcenter Enterprise object and the related CATIA data.



CATIA V4/V5 Teamcenter Enterprise Integration

CATIA V4 Integration

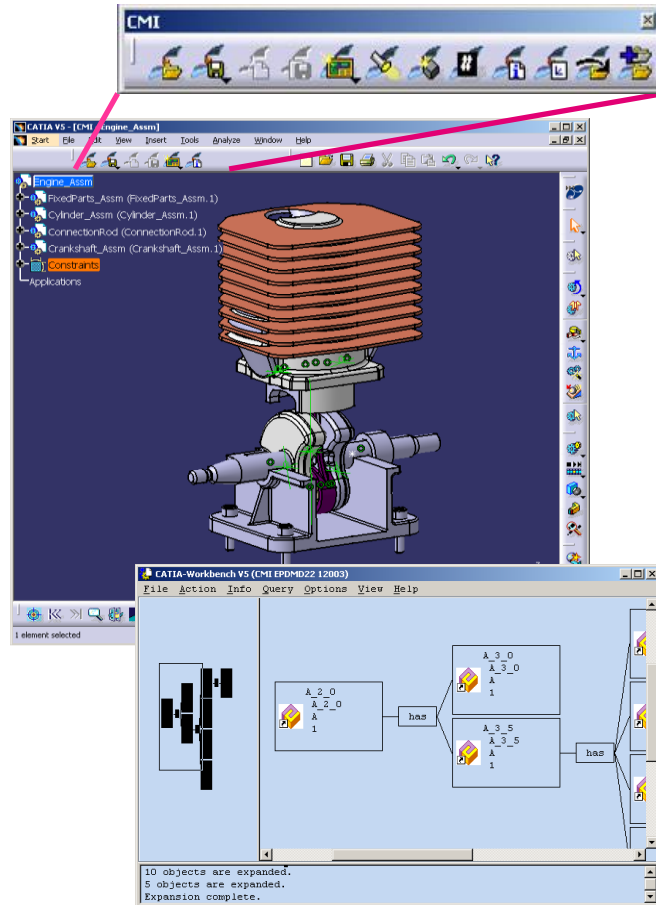


Technical Highlights

- In CATIA V4 CMI is visible through a menu.
- It provides a wide range of functions for update, creation and read actions to enable the transfer of CATIA V5 data from and to Teamcenter Enterprise.
- The main benefit of CMI in CATIA V4 is the sophisticated multilevel assembly functionality it provides to the CATIA V4 designer.
- With the CMI work plane concept the navigation in the product structure is an easy task.
- The highlight functionality enables the identification of models in CMI workbench and vice versa.

CATIA V4/V5 Teamcenter Enterprise Integration

CATIA V5 Integration (1/2)

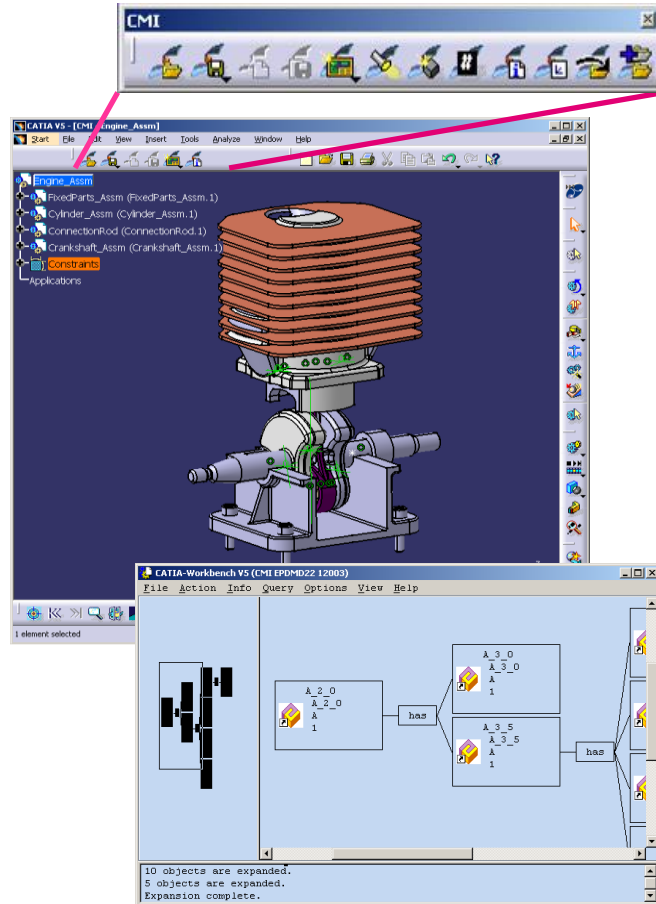


Key Features

- Ability to manage CATIA V5 models and structures in Teamcenter Enterprise
- Transfer of existing CATIA V4 models and structures (including positioning information) to CATIA V5
- Exchange of product structure information
- Ability to use PDM benefits of Teamcenter Enterprise (e.g. version/configuration/view control, access management, workflow)
- CATIA V5 caching support (CGR files, DMU Navigator)
- Support of CATDrawing, CATProcess and CATAnalysis document types

CATIA V4/V5 Teamcenter Enterprise Integration

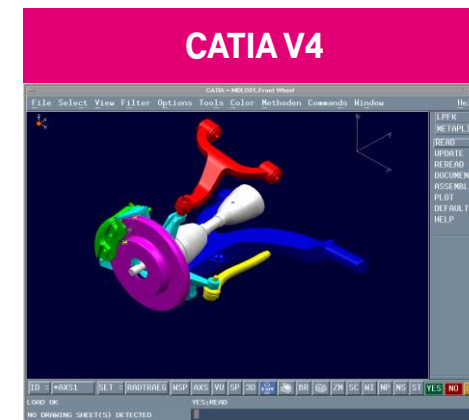
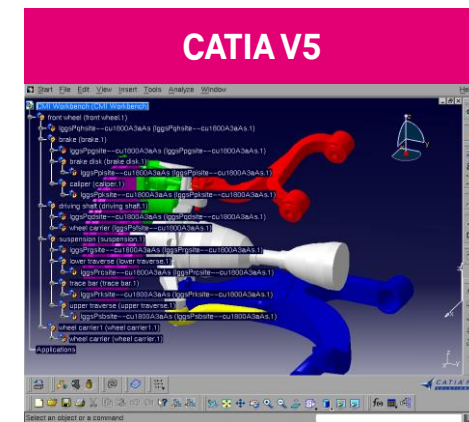
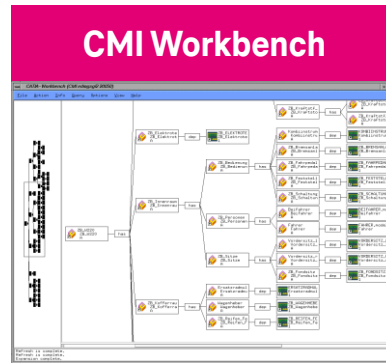
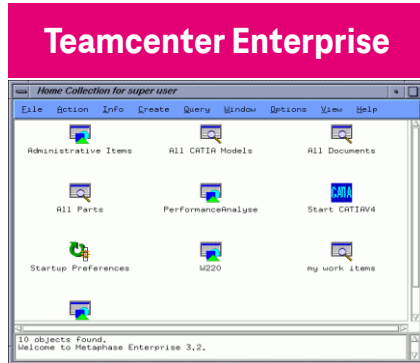
CATIA V5 Integration (2/2)



Technical Highlights

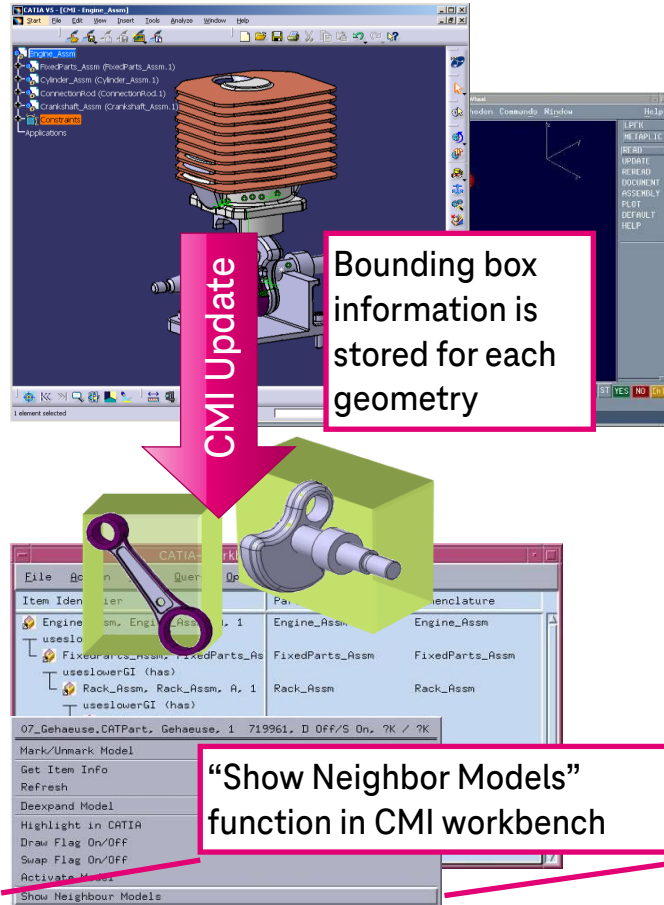
- CMI Workbench is the common PDM browser for to both CATIA V4 and V5
- DMU search facility for physical neighbored geometries and volume contents in Teamcenter Enterprise
- On-the-fly creation of CATIA V5 assemblies out of Teamcenter Enterprise BOM (PDM → CATIA V4/5)
- Creation of Teamcenter Enterprise BOM out of CATIA V5 (CATIA V5 → PDM)
- Bidirectional identification of nodes in structures between CATIA and Teamcenter Enterprise
- Virtual Workbench – to load several assemblies in a single CATIA V5 window
- CMI Archive to bundle non-BOM data in a single archive in PDM

CATIA V4/V5 Teamcenter Enterprise Integration Using CATIA V4 and V5 in Parallel



- Working within CATIA V4 and CATIA V5 by using the same CMI Workbench concept.
- In CATIA V4: Modification of V4 models and structured change of positions. Visualization of CATParts (V5).
- In CATIA V5: Full CATIA V5 functionality. Visualization of CATIA V4 geometry.

CATIA V4/V5 Teamcenter Enterprise Integration CMI DMU Functionality



Key Features

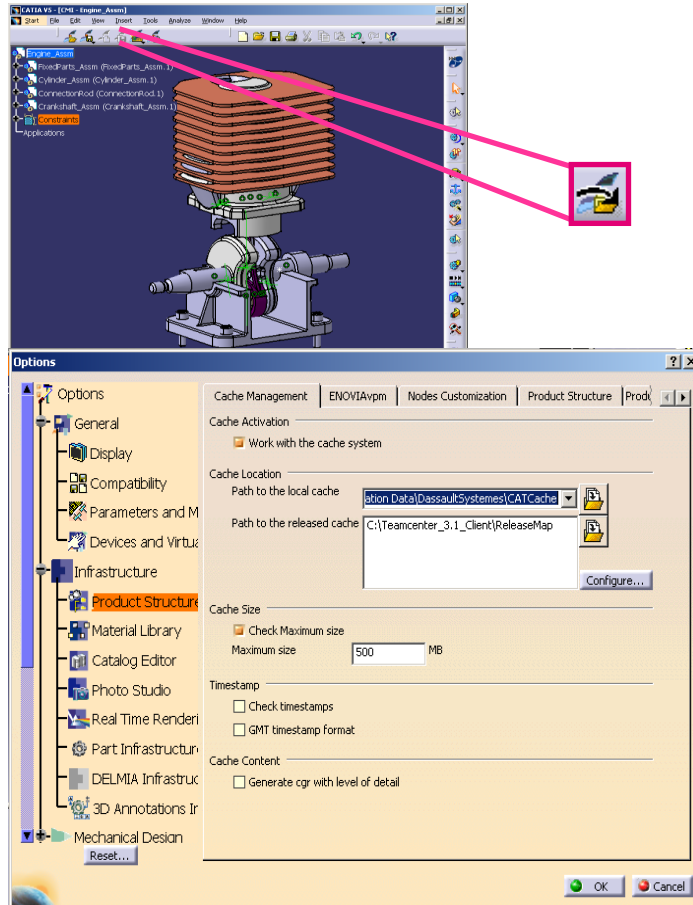
- Bounding box creation for CATIA V4/ V5 geometries
- Works with CATIA V4 and V5 models and with mixed product structures
- DMU results can be used in CATIA V4 and V5

Technical Highlights

- Model orientated, tightly wrapped bounding box
- Fast collision detection algorithm
- Recognition of multiple instances of a model
- Volume based search
- High performance multi-level expand
- Combination of geometrical researches
- Definition of an offset (clearance) for search
- Multi-instance selection support

CATIA V4/V5 Teamcenter Enterprise Integration

CMI CATIA V5 Caching Mode



Key Features

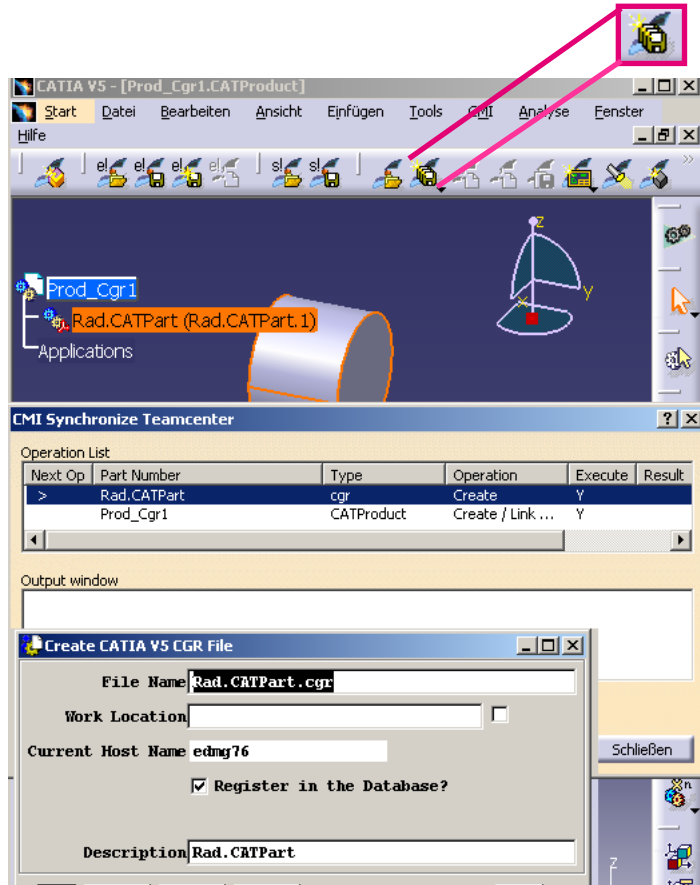
- Avoid CATIA V5 memory limitations with big sized geometries in a product structure
- Use of DMU Navigator functionality (e.g. clash detection)
- Visualize huge product structures with acceptable performance

Technical Highlights

- Global availability of tessellated CAD data (CGR) in Teamcenter Enterprise
- Local and global caching can be used together
- Transfer and switch into design mode with a single button click
- Access to PDM attributes in CATIA V5 visualization mode

CATIA V4/V5 Teamcenter Enterprise Integration

CMI CATIA V5 Synchronization in Teamcenter



Key Features

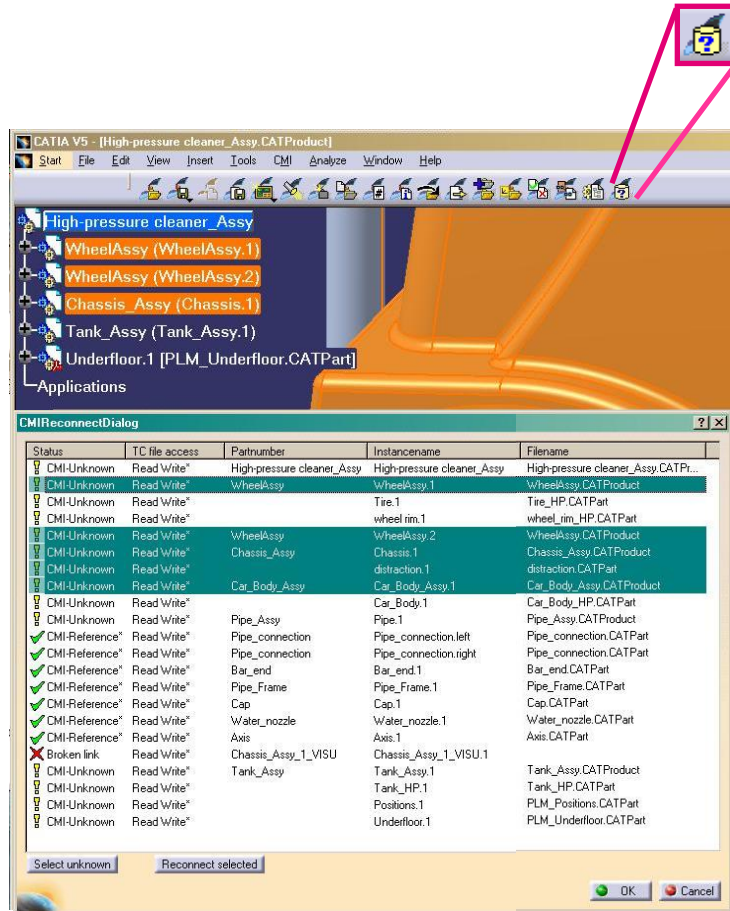
- Enables the user to update Teamcenter with any changes made in CATIA V5, this includes:
 - any geometry and position information changes
 - the creation of any new nodes (CATParts/CGR and CAT-Products) that have been added to your product structure
 - the creation of any new CATPart/CGR and CATProduct instances
 - the removal of any nodes from the product structure

Technical Highlights

- Display of status and result during the synchronization process in a comprehensive dialog
- Support of stepwise and automatic synchronization
- Automatic validation in Teamcenter
- Highlight of selected nodes

CATIA V4/V5 Teamcenter Enterprise Integration

CMI CATIA V5 Reconnect CATIA Data with Teamcenter



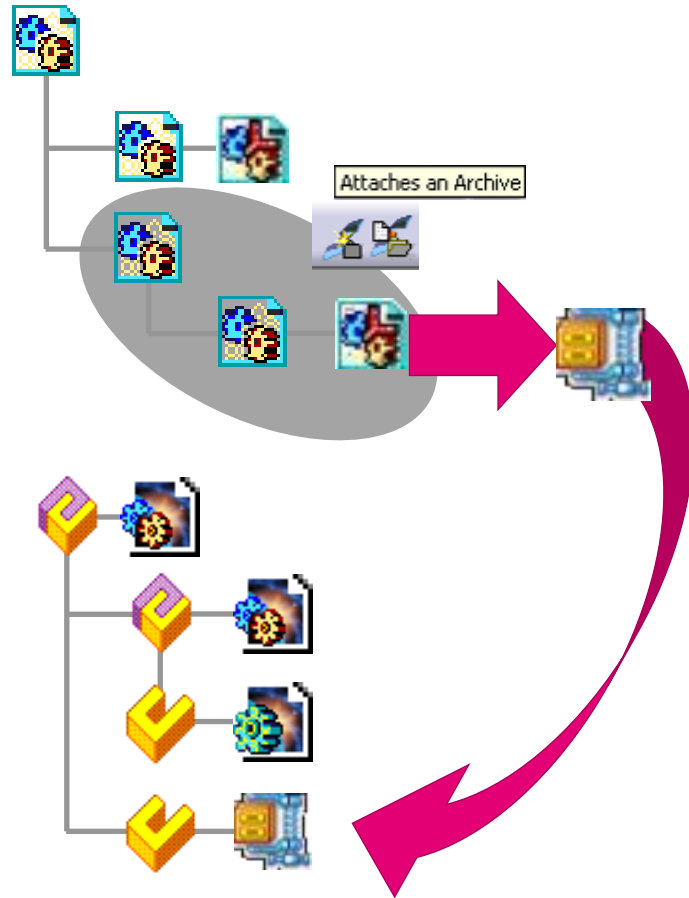
Key Features

- The CMI reconnect function links CATIA structures and documents loaded with native CATIA V5 to PDM BOM objects in Teamcenter
- Detects references as well as instances
- Works smoothly with CMI synchronize
- Displays file access rights to registered CATIA files
- Documents loaded with CMI can be disconnected

Technical Highlights

- Display of status and result after reconnect process in a comprehensive dialog
- User can select single/multiple documents line by line
- Highlight of selected nodes

CATIA V4/V5 Teamcenter Enterprise Integration CMI Archive



Key Features

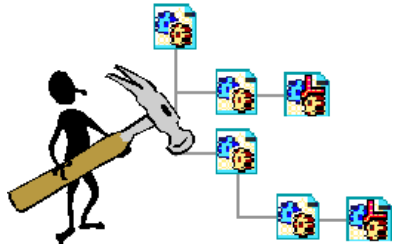
- Any CATIA V5 product structure can be selected with a single button click
- Each CMI Archive is assigned to a product structure
- CMI Archive supports:
 - CATIA V5 product structures
 - CATAnalysis structures
 - Non-CATIA documents (design tables, image files, ...)

Technical Highlights

- CMI Archive is handled like a CAD model in Teamcenter
- Any archive tool can be used (zip, tar, ...)
- The content of the CMI Archive is exposed in the Teamcenter via a structured XML file

CATIA V4/V5 Teamcenter Enterprise Integration

Healing of CATIA V5 Product Structures

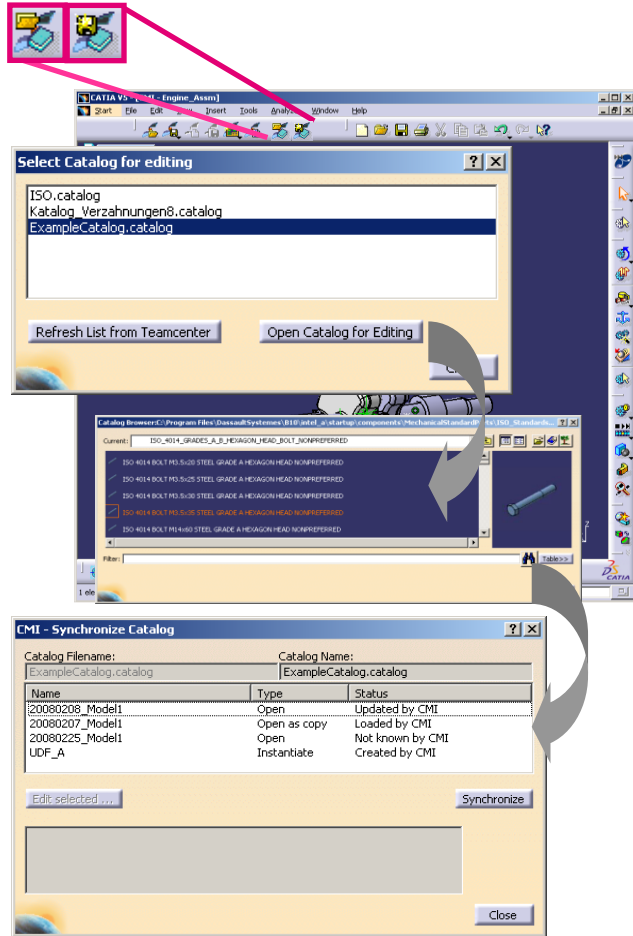


In a collaborative environment, especially when CAE data is exchanged with suppliers and partners and modified in parallel, CATIA V5 data structures may become invalid. CMI brings the CATIA V5 data in line with the PDM product structure again.

- Removes obsolete instances
- Adds new instances
- Reconnects broken instances
- Replaces CATIA models in the CATIA product structure
- Transfers and loads CATIA models in design mode on users demand when caching mode is active
- Transfers and loads CGRs from global caching vault when “Do not load default shape on open” is set

CATIA V4/V5 Teamcenter Enterprise Integration

CATIA Catalog Management in PDM



Key Features

- Archives and manages CATIA Catalogs in Teamcenter.
- Content of a CATIA Catalog is recognized by CMI as Teamcenter objects.
- Allows management of standard parts in PDM and in CATIA via Catalog mechanism.

Technical Highlights

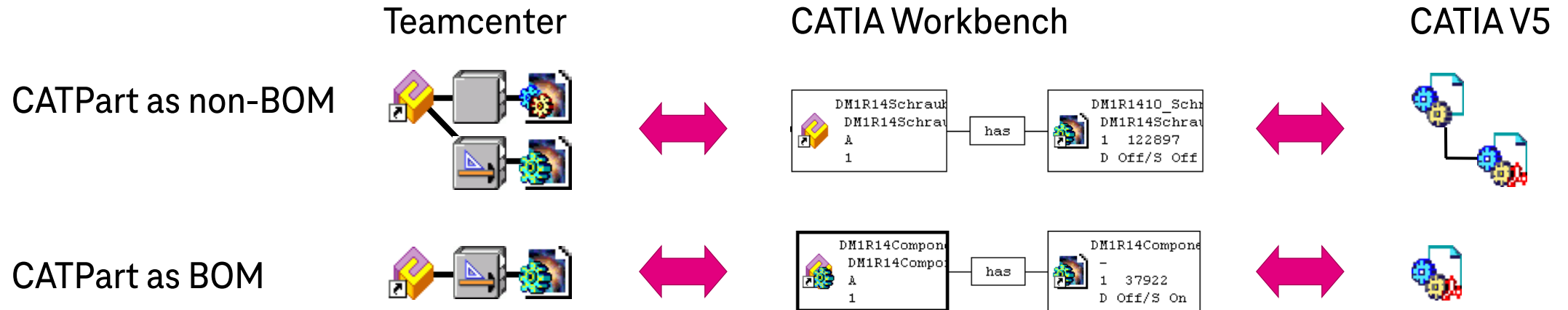
- CATIA Catalogs are managed as PDM objects.
- CMI opens Catalogs from Teamcenter for editing.
- CMI creates and updates Catalogs to Teamcenter.
- Batch tool available to create PDM-ready Catalogs out of Teamcenter Catalog structures.

CATIA V4/V5 Teamcenter Enterprise Integration

CATParts as BOM or Non-BOM Objects

Unification of Component and Classic CMI data model

- Since CMI 8.9 a CATPart can be handled in Teamcenter Enterprise in 2 ways:
- As a Component; the CATPart builds a unique entity with the Component it belongs to
- As an independent geometrical object; the CATPart might be related to any Assembly
→ Thus, a maximum of flexibility is provided to support all kinds of design methodologies.



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.16

- Supports CATIA V5-6R2023 (R33)



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.15

- Supports CATIA V5-6R2022 (R32)
- Bug fix



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.14

- Supports CATIA V5-6R2021 (R31)



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.13

- Supports CATIA V5-6R2020 (R30)



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.12

- Supports CATIA V5-6R2019 (R29)



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.11

- Supports CATIA V5-6R2018 (R28)



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.10

- Supports CATIA V5-6R2017 (R27)
- Improved support for Windows 10 clients



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.9

- Supports CATIA V5-6R2016 (R26)



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.8

- Bug fixes



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.7

- Supports CATIA V5-6R2015 (R25)



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.6

- Bug fixes



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.5

- Supports CATIA V5-6R2014 (R24)



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.4



- Compare functionality
- OOTB Delete for CATParts
- Support for CATIA V4 with Teamcenter 9.0



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.3

- Supports Teamcenter 9.0
- Supports CATIA V5-6R2013 (R23)



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.2



- Replace from Teamcenter
 - Administrative lock of CMI preferences
 - Support for CATProduct bounding boxes
 - CATIA V6 interoperability



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 10.1

- Support for CATAnalysis without CMI Archive
- Default Implementation of Delete for Non-BOM CATPart in CATIA
- Support for BOM-Parts assembled in a CMI Archive



CATIA V4/V5 Teamcenter Enterprise Integration




New Features in CMI 10.0

- Support of CATIA R21
- Read Only Support for 2D Formats (CGM)
- Customizable naming schemes for Export
- Management of CATIA Component
- Create PDFs for CATDrawings
- Win 7: CATIA Client installation without administration rights



CATIA V4/V5 Teamcenter Enterprise Integration



New Features in CMI 9.8 and 9.9

-  ▪ Designer oriented Reconnect with integrated Import functionality via mapping file
-  ▪ Synchronize for bulk data; support of pre-filled tables
-  ▪ Export/ Import functionality
 - CMI functionality available in context menu



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 9.6 and 9.7

-  ▪ PDM Centric Synchronize
 - Support of Reference Geometries
 - Multi-use Catalog Browser
 - Version check during Read
 - Support of TC Translation Services for JT and CGR creation
 - Comprehensive CATIA property exchange with PDM
 - Support for CATIAV5 "components"
-  ▪ Automatic CATDUA
 - Support for CATDrawing in Catalog
 - Dynamic Catalog / option to use Part Masters with catalog



CATIA V4/V5 Teamcenter Enterprise Integration





New Features in CMI 9.4 and 9.5

- User specific DMU file
- Restructured Synchronize with Display of CATIA Node Name
- Interoperation with VisMockup
- Support of TC Translation Services for JT and CGR creation
- Comprehensive CATIA property exchange with PDM
- Support for CATIAV5 "components"



CATIA V4/V5 Teamcenter Enterprise Integration



New Features in CMI 9.3

-  · Open CATCatalogs from Teamcenter for editing
-  · Create or Update Teamcenter managed CATCatalogs
-  · Improved user interface for CMI Synchronize
 - New CMI VB APIs for access to PDM in CATIA
-  · Get original geometries in visualization mode
 - Enhanced Attribute mapping options between CATIA and Teamcenter
 - Control BOM / Non BOM from Teamcenter
 - Enhanced customizing options for Workbench expands



CATIA V4/V5 Teamcenter Enterprise Integration


New Features in CMI 9.2

- Use of template files at Create in Teamcenter (CATPart, CATDrawing)
- Improved CMI cache content management
-  ▪ Local save and restore of CMI CATIA session
-  ▪ Multi-select support for CMI Info functionality
- Read inertia properties from CATIA
- Split CATIA V5 toolbars
- OOTB support for View Networks



CATIA V4/V5 Teamcenter Enterprise Integration


New Features in CMI 9.1

- Generic support for CATIA V5 Shape Representations, e.g. CATShape, 3dmap, stl, wrl, jt, ...)
-  ▪ Enhanced CMI Info
 - Enhanced CMI Reconnect– recognition of TC file access rights
 - Management of CATCatalog – use of TC data from CATCatalog browser
 - Set PDM-data in CATDrawings – automatic update of Title block information.
 - New LICMAN version with enhanced license administration capabilities is available
 - Customizing CATIA V5 API to retrieve PDM data for 3rd party applications



CATIA V4/V5 Teamcenter Enterprise Integration





New Features in CMI 9.0

-  Reconnect PDM objects and CATIA data
 - Support of design tables
 - Enhanced CATDrawing support
 - Viewing support for CMI archives
 - Support of 64 bit CATIA clients (AIX and Windows XP)



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 8.9

- CATParts can be mapped as BOM or non-BOM objects
-  ▪ New „Insert from Teamcenter“ functionality
-  ▪ New „Expand for Visualization“ functionality
- Support of version control (used with Team concept)
-  ▪ Bounding Box information for CMI Archive und CGR files
- Support of CATDrawing links in Teamcenter
- Global caching with Timestamp ON
- Cache management for CMI exchange map
-  ▪ Optional reset position function
- Enhanced Support for multiple CATIAV5 Installations
- Support of “Activate / Deactivate Component” functionality



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 8.8

- Viewer integration for JT (PLMXML) and CGR (3DXML)
- Multi-Model-Link support
- CATDrawing Link support
- Content update of CMI Workbench content with changed CATIA V5 product structure



- Enhancements for CMI Archive (support of CATAnalysis and CGR)



- Enhancements for CMI Synchronize



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 8.7






- CMI Archive functionality (zip file for non-BOM structures)
- Improved Window Management with CATIA V5
- CATIA V4: “Marked Items → Add to” functionality
- CATIA V4: TIFF file type support for Plot functionality
- Permanent CMI menu with CATIA R13 and above
- Update model dialog in CATIA V5
- Document Filter in CMI Workbench
- Global "Update CATParts" button in CMI Toolbar (useful for CATIA V5 VPM Session)
- CATAnalysis support
- CATProcess support



CATIA V4/V5 Teamcenter Enterprise Integration


New Features in CMI 8.6

-  ▪ Enhanced flexibility with CMI “Synchronize” functionality
 - Support of CGR data type in CATIA V5
 - Support of CATIA V5 user defined properties
-  ▪ Teamcenter attributes in CMI Info dialog in CATIA V5
 - Automatic detection of deleted product structure nodes
 - Support of User Defined Properties
 - Browse business items corresponding to CMI Workbench items
-  ▪ Extended Highlight functionality (highlight for Parts and CATProducts)
 - Option to use native CATProduct transformation
 - Optional “Restore Position” button in CMI Toolbar
 - “Store Position” and “Store Geometry” button in CMI Toolbar



CATIA V4/V5 Teamcenter Enterprise Integration

New Features in CMI 8.5

- Enhanced support for visualization mode in CATIA V5
- Optional released-cache handling in CATIA V5
-  ▪ Add Temp – show multiple versions of an Assembly
- CATIA V5 independent save management
- Standard Part Integration
- Add to CATIA V5 in CMI Workbench loads content in single CATIA V5 window

