



Prozess- Know-how  
und Beratung



Individuelle  
Softwarelösungen



Standard  
Integrationsplattform



Standard  
Softwarelösungen

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# P|D|Tec

## Enterprise Simulation-Data-Management with **SimData Manager**



# Contents

- Company Overview
- SimData Manager
  - Product Overview (Slides)
  - Demonstration (via Movies – separate files)
- Summary



# PD Tec Company Overview



## ■ PD Tec

- Stands for ... **P**roduct **D**ata **T**echnology
- Founded 1998
- Headquartered at Technology Park Karlsruhe, Germany
- Focus on Engineering Data Management

## ■ Customer focus

- Automotive industry
- Maritime Industry, Aerospace
- Energy supply
- System vendors and integrators

## ■ 15+ yrs. profitable growth

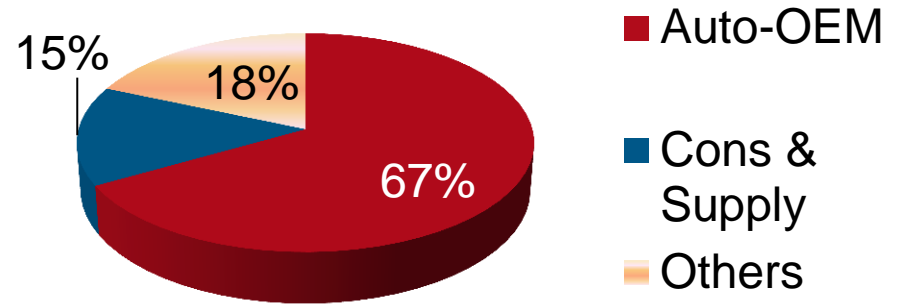


P|D|Tec.

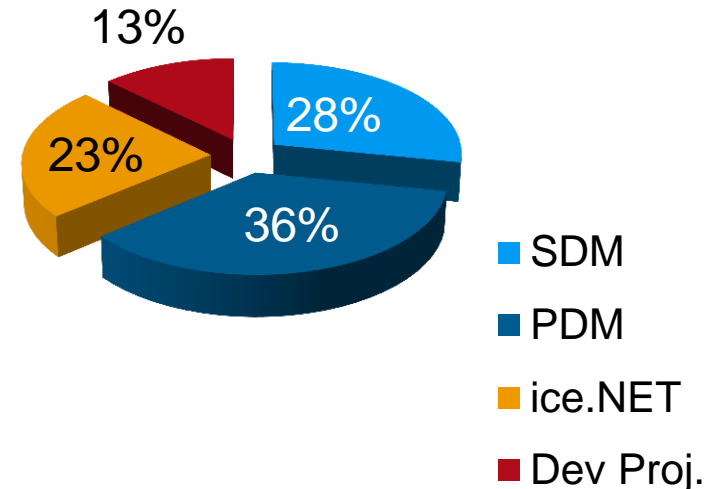
# Business Overview:

- Focus disciplines
  - Collaborative Engineering
  - CAE / Simulation
  - Supplier and Partner Integration
  - Systems Engineering
  - ECM - Engineering Change Management
  - Product Planning
  - DM - Digital Manufacturing

## Industries



## Revenue distribution



*“Innovation through Integration”*

# PD Tec Key Customers



DAIMLER



VDA



PORSCHE



MBtech

ODETTE  
SWEDEN

semcon



Netzdienste  
Rhein-Main

ΔiΔG

MAGNA

INTEVA  
PRODUCTS

50hertz



ArvinMeritor

JAMA

BOSCH

KEIPER



VOLVO



# Partner Network

PD Tec has a business & technology partner network



SIEMENS



T...Systems



**Microsoft Partner**  
Gold Application Development  
Silver Application Development



# Software and Service Portfolio





# Standard software solutions



Standard-

Softwarelösungen

- Engineering & Product data management solutions for selected activities and disciplines in the product lifecycle
  - **SimData Manager**
    - CAE Data and Process Management for Simulation and Virtual Engineering Analysis
  - **Collaboration Portal**
    - Easy to use, web based information platform to support cross-enterprise collaboration processes and information retrieval
    - Business objects and document management incl. partner data
    - As **CAD Portal** optimized for CAD data management
    - Continuous data exchange and synchronisation with customers / partners / suppliers



# Integration platform



## ■ ice.NET Integration & Collaboration Environment

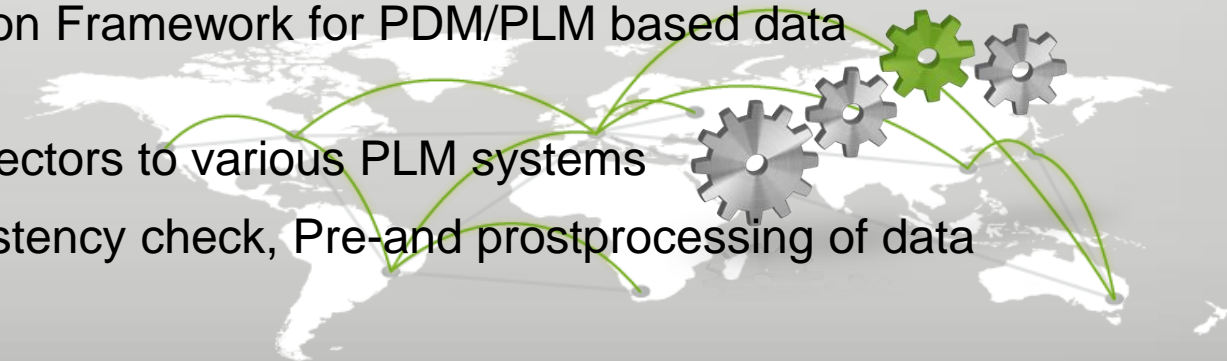
- Software platform to efficiently implement reliable information systems, data warehouses, portal solutions, and „collaboration spaces“ to support selected product lifecycle processes
- Use in own software applications and by partners and customers



Integration platforms  
and tools

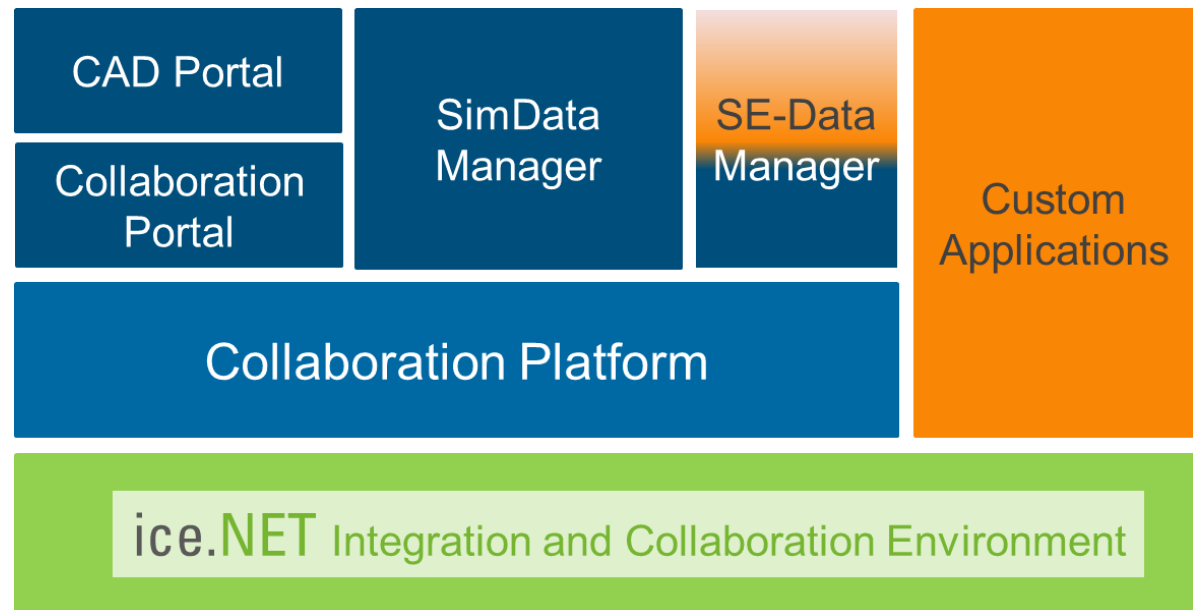
## ■ PDMconnect

- Flexible Communication Framework for PDM/PLM based data communication
- Adaptive PDM connectors to various PLM systems
- Visualisation, Consistency check, Pre-and postprocessing of data



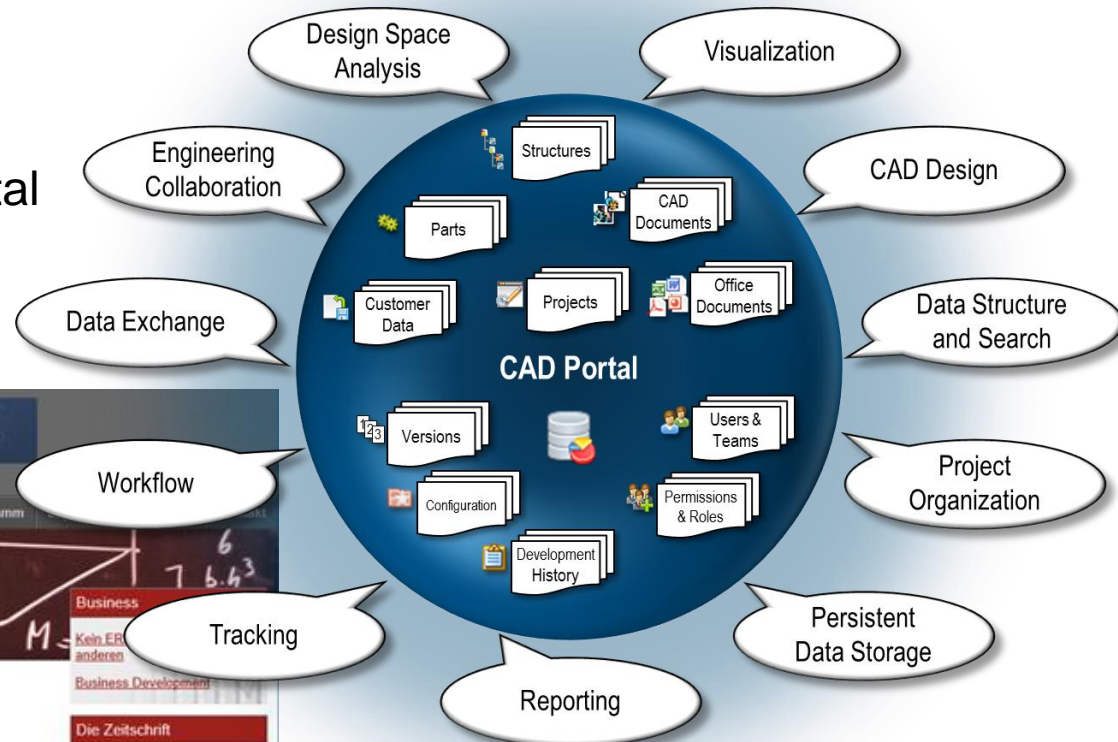
# PD Tec Software Stack

- ice.NET as common platform for various data management applications
- High synergy and quality through Re-use of components between multiple applications
- Mature Software Components through usage in multiple disciplines and application scenarios



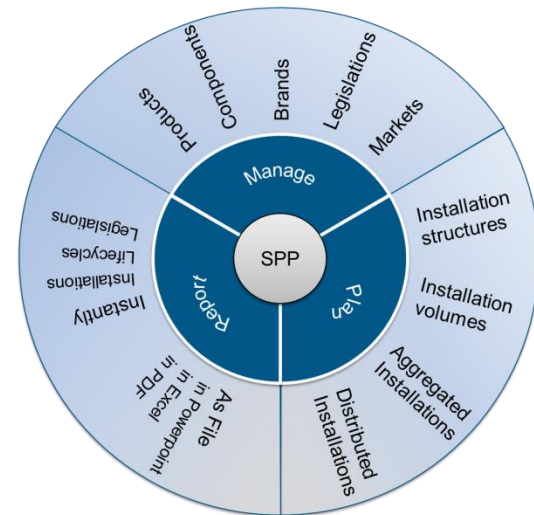
# Customer success: „EDAG - more than 800 users of CAD Portal“

- Leading Engineering Services Company
- Partners with many OEMs
- Data exchange via CAD Portal



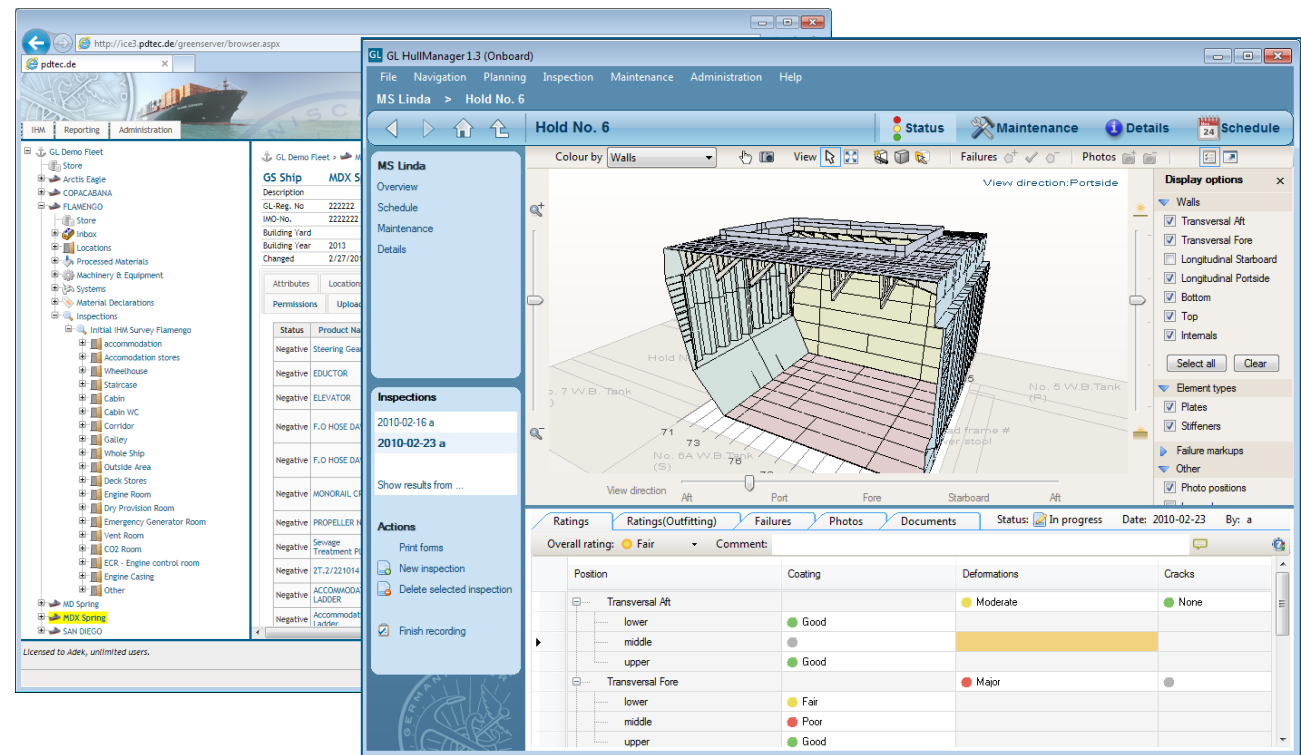
# Customer success: Daimler AG

- 15+ years partnership
- PDM, Data exchange, STEP, XML, JT, PDM/TDM Layout,...
- Developments for
  - Step Assembly Manager (SAM)
  - SAM4NX
  - SAMlight
  - Smaragd-STEP Schnittstelle
  - SmaragdView
  - PLMXML Tools
  - PLM2PLM TCUA
- Development of a Strategic Production-Planning System TP+
  - Exclusively for Daimler Trucks
  - ice.NET - Platform
  - Ongoing development projects



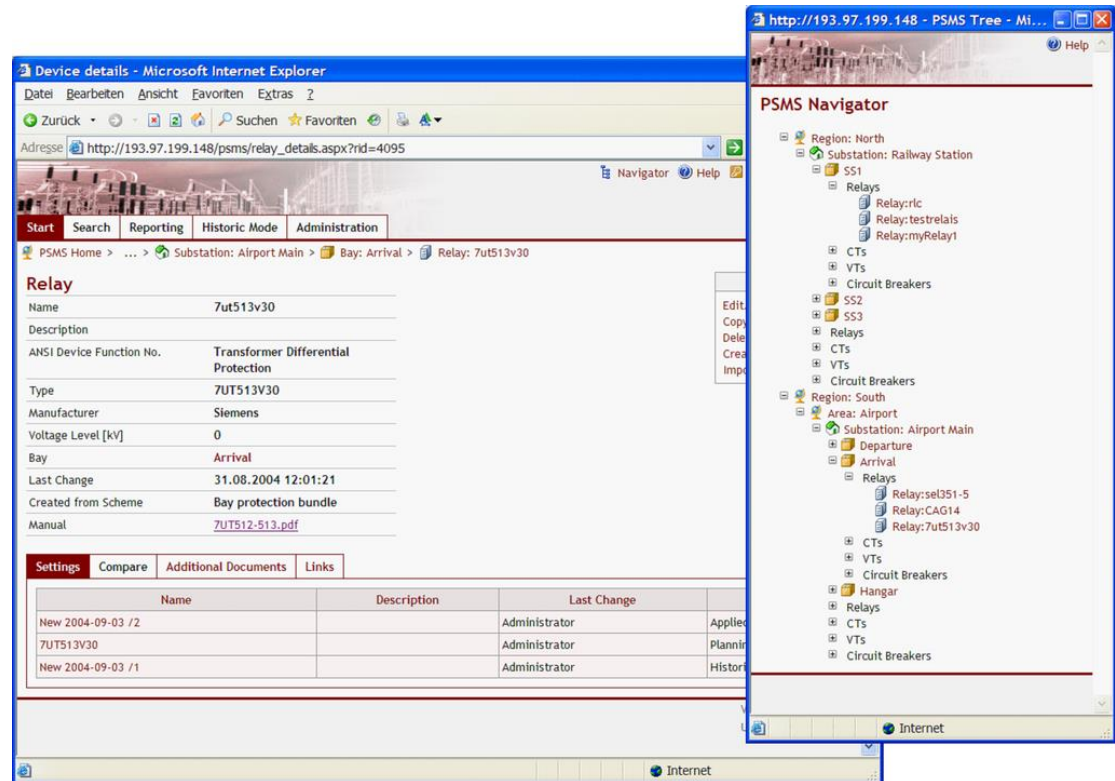
# Partner Success: DNVGL

- Leading global certification company (maritime, wind energy, ...)
- OEM business partnership
- ice.NET basis for mutiple products in shipbuilding & maintenance



# Partner Success: DIGSiLENT

- Leading global company managing Power Net
- OEM business partnership
- ice.NET basis for mutiple products in energy & distribution



# Customer Success: SimData Manager in Volkswagen Group



PORSCHE

## SDM solution

- Production since 2011
- Disciplines
  - Crash, Passenger Safety, Pedestrian Safety, CFD, NVH, Akustik, MBS, ...
- 170 seats



Audi

## PreSDM

- Production since 2013
- Disciplines: Crash, CFD
- KVS integration
- SDM Archive-System

## SDM solution



- PreSDM deployment
- In Production
- Disciplines
  - Phase 1: CCD
  - Phase 2: CONNECT & Crash
- Replacement of legacy system
- New IT security requirements
- Roadmap deployment
- All disciplines

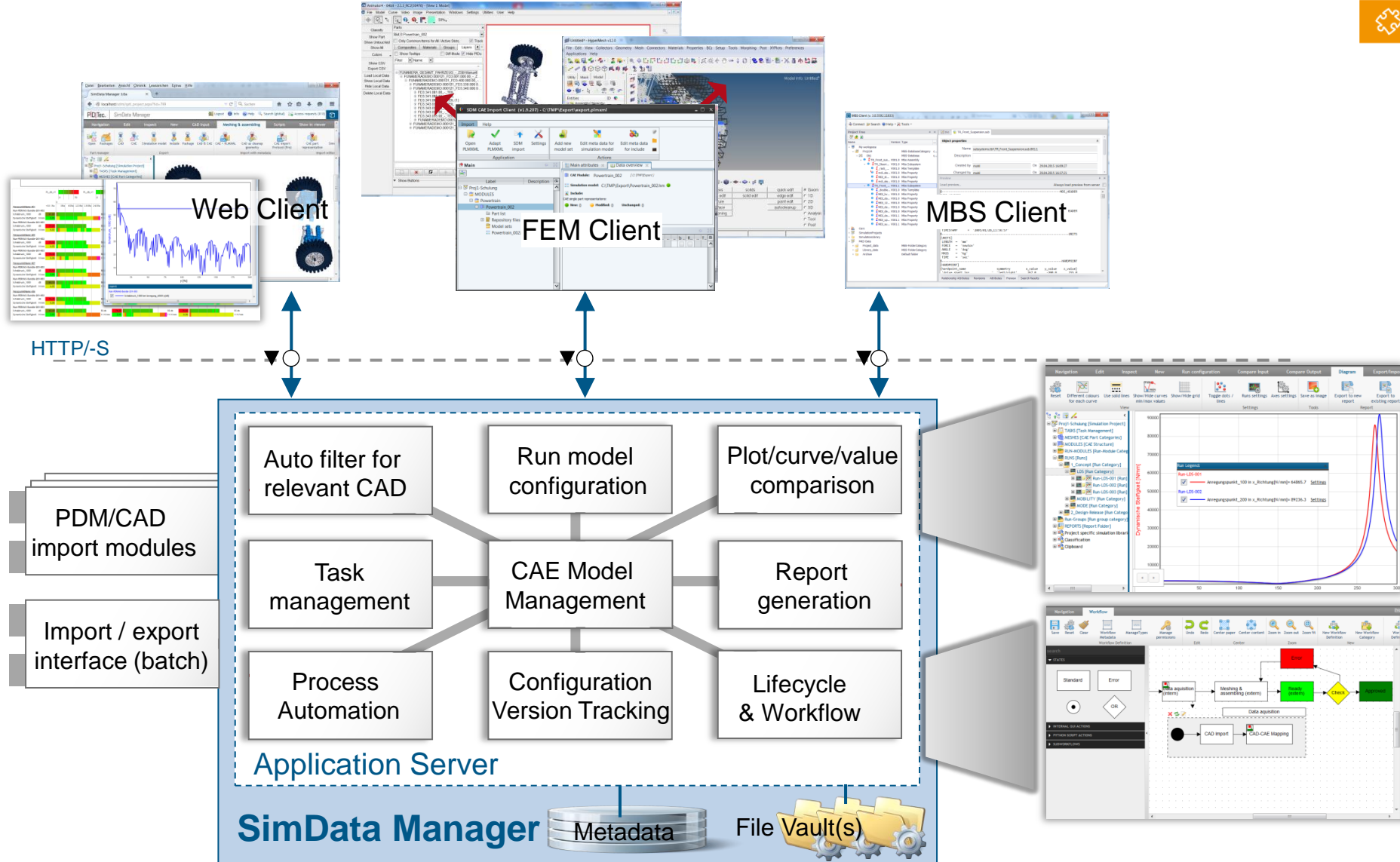


# Contents

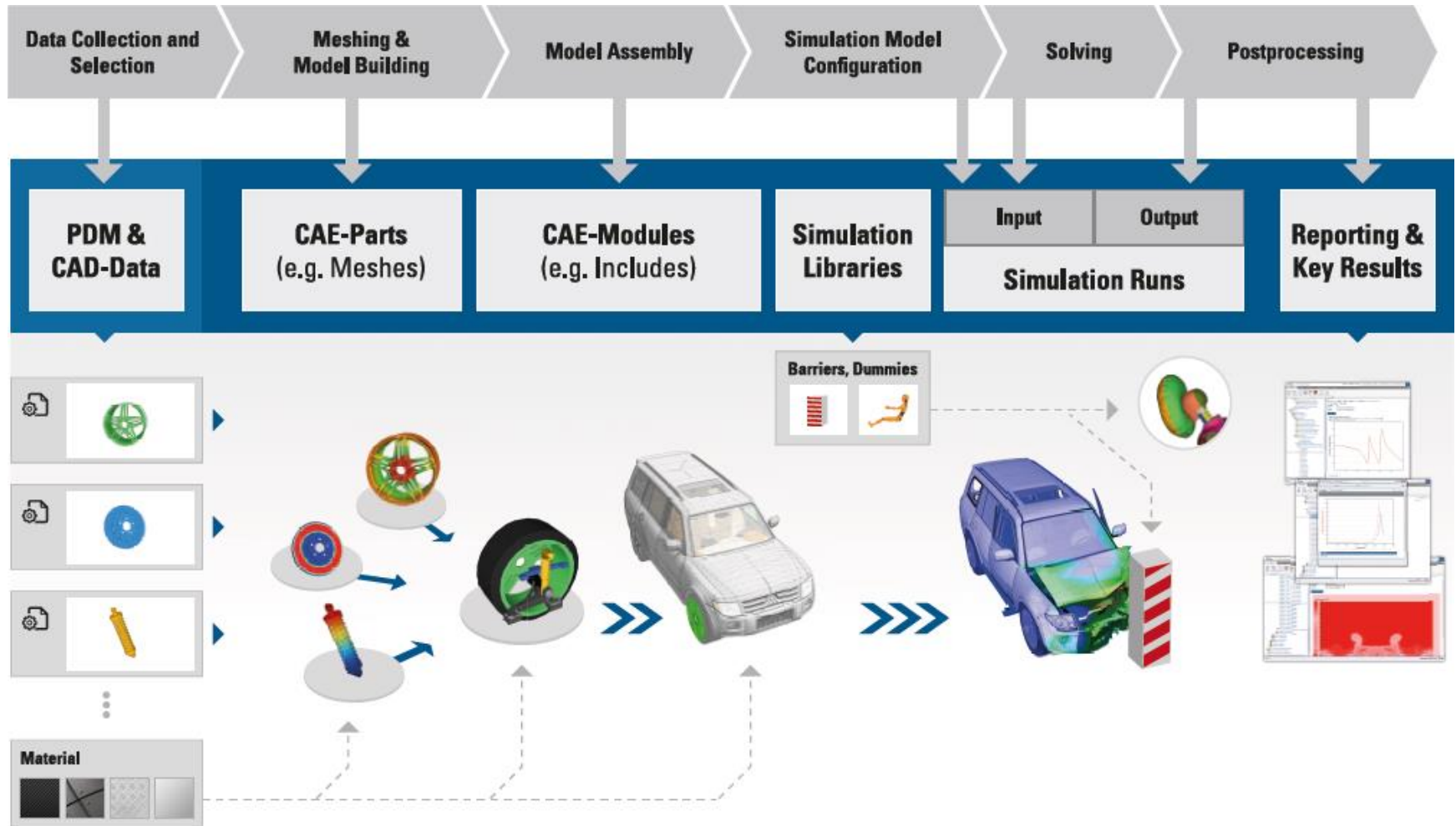
- Company Overview
- SimData Manager
  - Product Overview (slides)
  - Demonstration (via movies)
- Summary



# SimData Manager - for Simulation Process and Data Mgmt.



# Standard CAE Process in SimData Manager



# Existing PDM Interfaces for the Import of CAD/PDM-Data

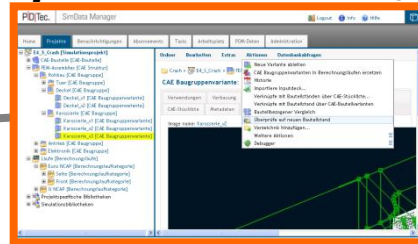


- OEM specific interfaces for the import of PDM data
  - Daimler: import on the basis of Smaragd/STEP data
  - Porsche: csv-file import from P-DMU
  - Audi: import based on meta data file from KVS/VPM
  - Volkswagen: Connect based on TeamCenter
  - Other OEM's: in preparation
- Standard interfaces
  - CSV Interface
  - PLMXML, STEP (different dialects)
  - Native CATIA, native NX
  - ENOVIA
- Mapping tools for dealing with import of proprietary PDM data formats

# Way of Working with SimData Manager



**SDM Cockpit** (Web Browser, e.g. Firefox or IE)



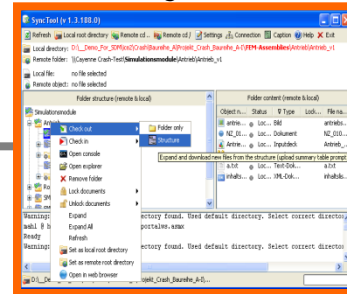
Web-Services

download

upload

e.g. Meshing,  
Model assembly  
with CAE-Tool (e.g.  
Hypermesh, Ansa,  
Medina, ...)

**SDM Sync-Tool**



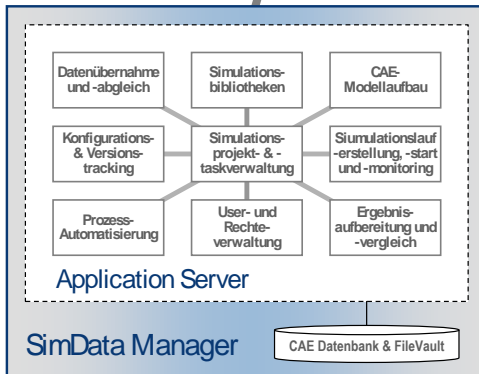
check-out

check-in

local  
work space  
(of CAE Engineer)

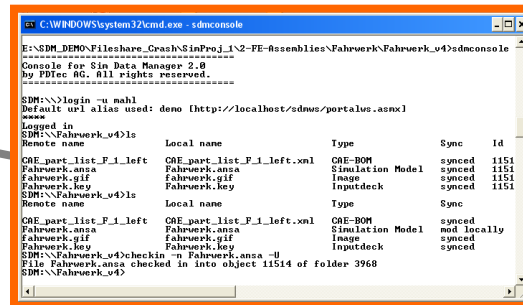
e.g. Solver run

e.g. Post processing  
& Report compilation



Web-Services

**SDM Console**



Web-Services

check-in

check-out

**SimData  
Manager**

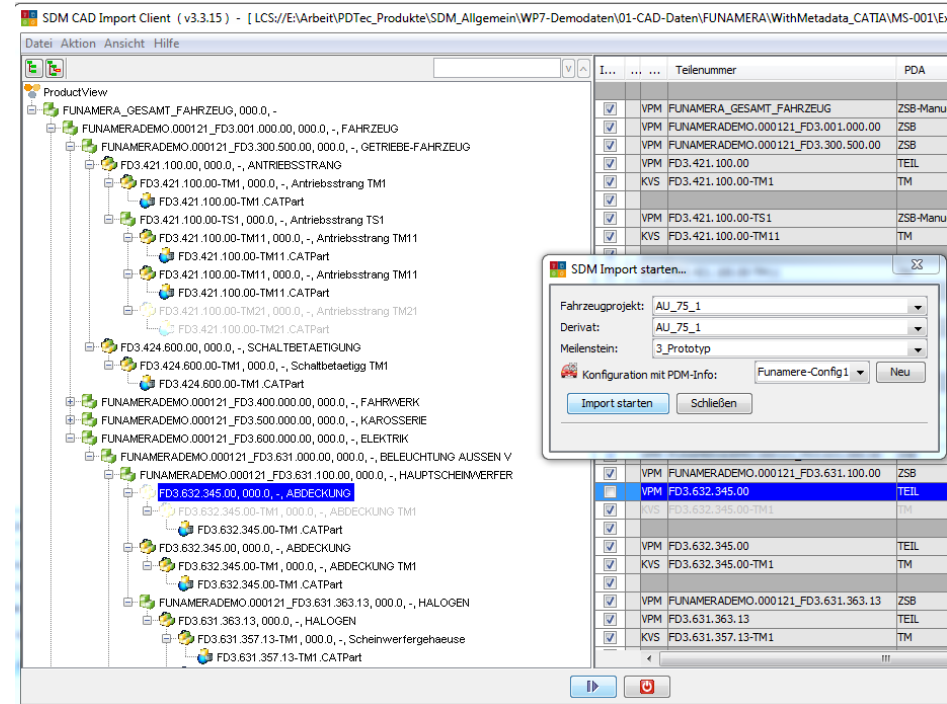


# Modules in SimData Manager

- SDM CAD Import Client
  - SDM CAE Import Client
  - SDM CAD-CAE Mapping Manager
  - SDM CAE Part Manager
  - SDM Workflow Builder
  - SDM MBS Client
  - SDM Console Interface
  - SDM SyncTool
  - SDM CryptoVault
  - SDM Python API
  - SDM Python Debugger
- Authoring Tool Integration
- HyperMesh Integration
  - Animator Integration
  - Medina Integration

# SDM CAD Import Client

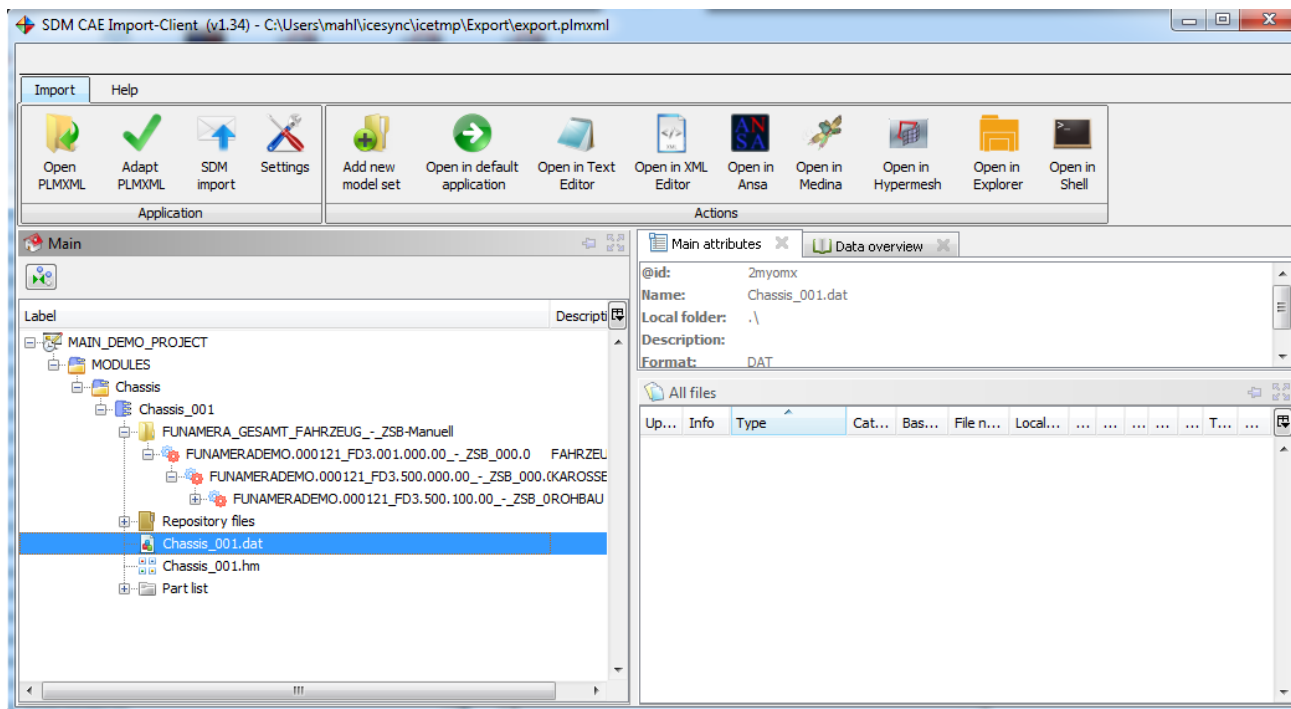
- Manual/interactive import of PDM/CAD data
- Extended mapping functionality/engine
- Adaptable for special application (format, PDM, etc.)
- Supports various metadata formats (csv, PLMXML)
- Provides preview of the CAD/PDM structure created in SDM
- Certain PDM data can be deselected and will not be imported





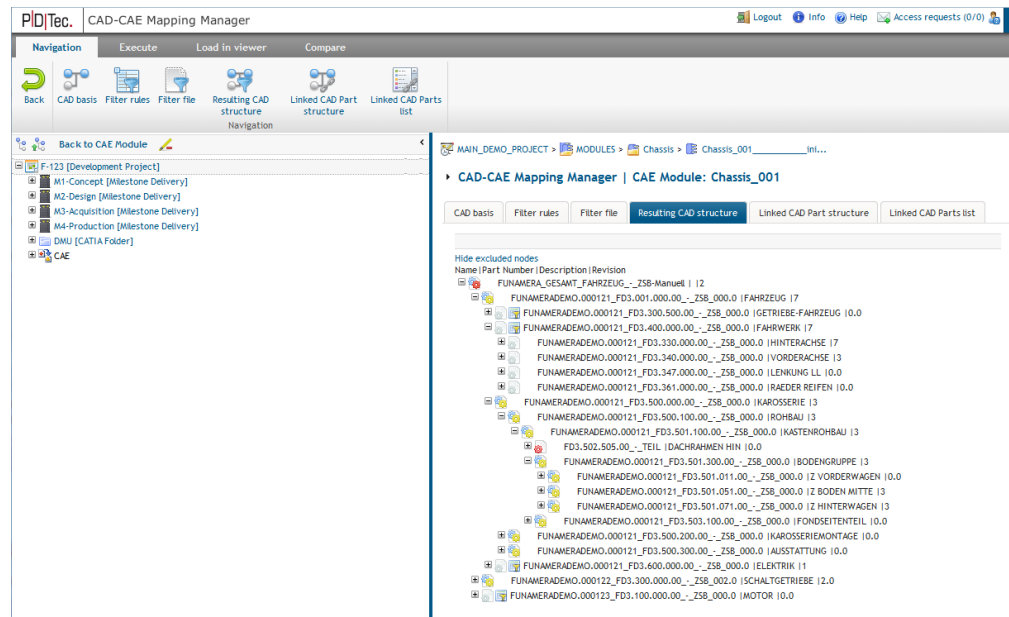
# SDM CAE Import Client

- Manual/interactive import of CAE data
- Supports the “offline” meshing process
- For outsourcing to external service providers
- Supports definition of attributes during upload



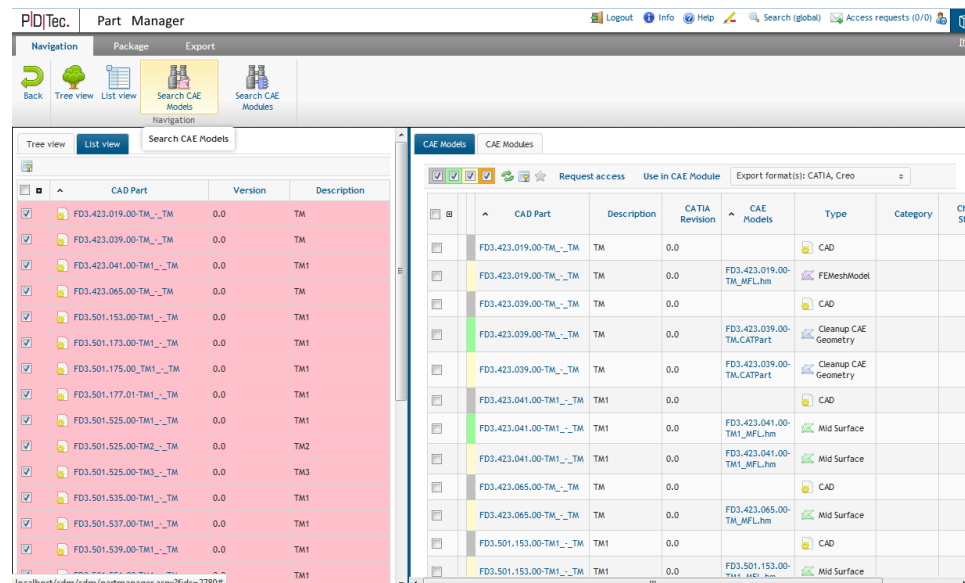
# SDM CAD-CAE Mapping Manager

- Automates recurring CAD-updates from PDM
- Template Builder to map CAD models from various Assemblies
- Build CAE Assembly from multiple CAD-Trees
- Reuse the CAD-Mapping Template
- Filter rules based on regular expressions



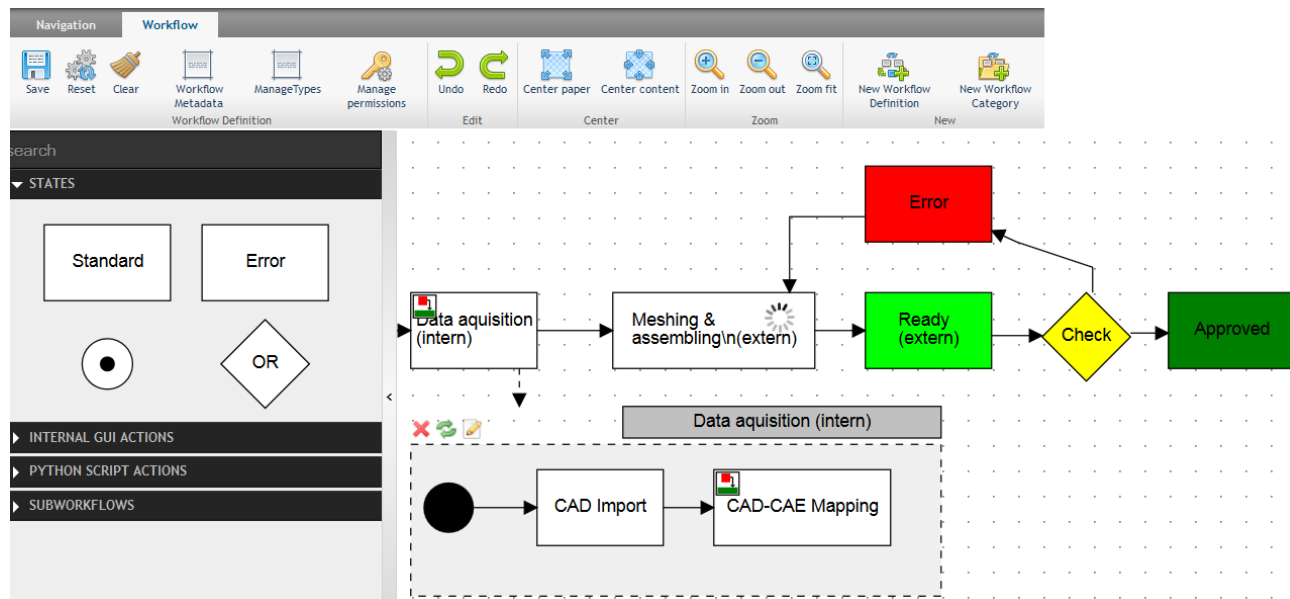
# SDM CAE Part Manager

- Reuse of existing CAE models
  - CAE representations of a single part (e.g. mid surface, cleanup geometry, various FE meshes (density, mesh type, properties,...))
  - CAE Assemblies (CAEmodule)
- Provides functionality to create packages (e.g. for suppliers, engineering service providers,...).



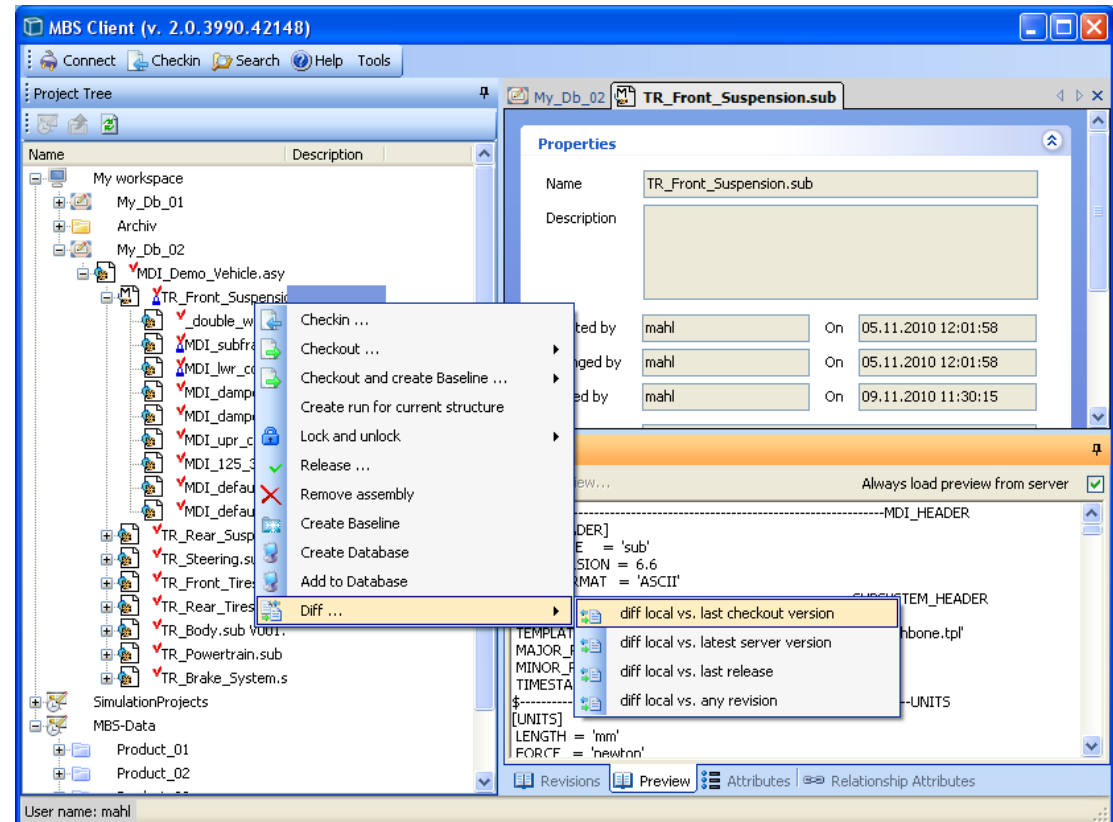
# SDM Workflow Builder

- Graphical interactive Workflow module
- Recurring processes for reuse
- Capture of standard methods (key users)
- Extensive logical decision criteria's
- Able to embed external scripts



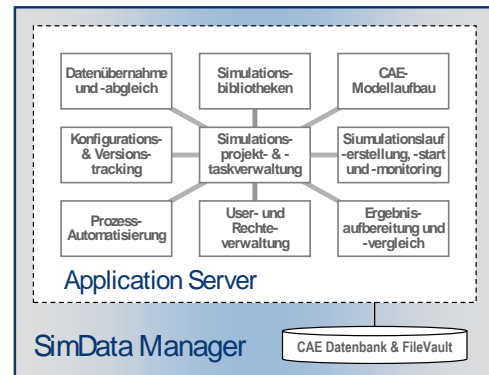
# SDM MBS Client

- Support the data storage of MBS models
- MSC.AdamsCar
- Version control of MBS models
- Compare MBS models
- Traceability
- Collaborative work
- Lock mechanism



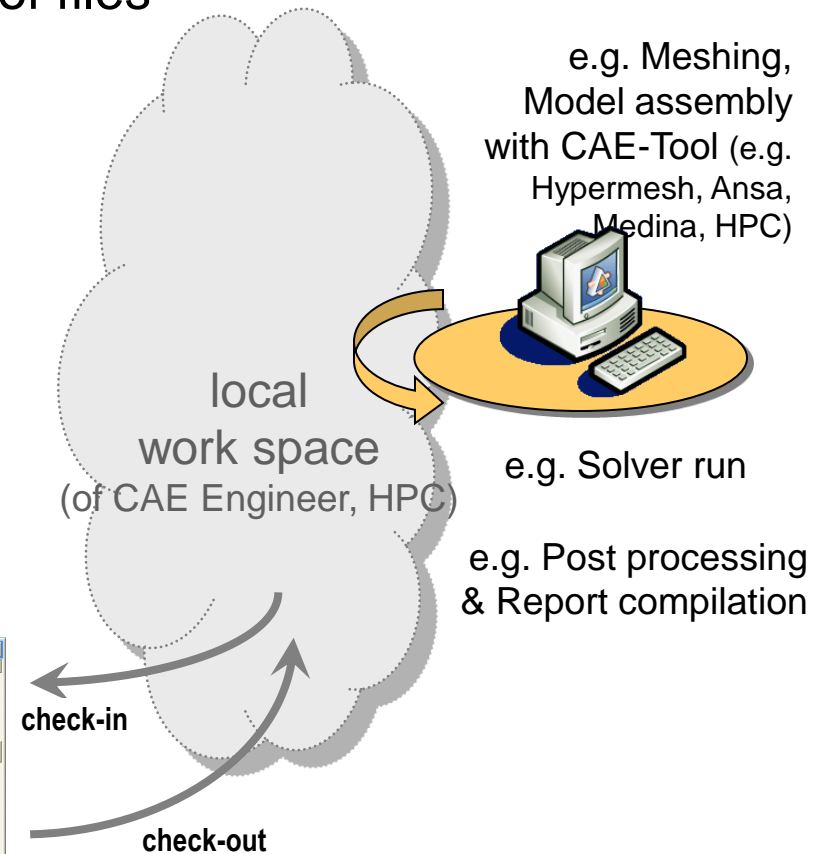
# SDM Console Interface (batch API)

- Access of SDM data (export/import) via batch interface (command line)
- Allows (automated) import and export of files



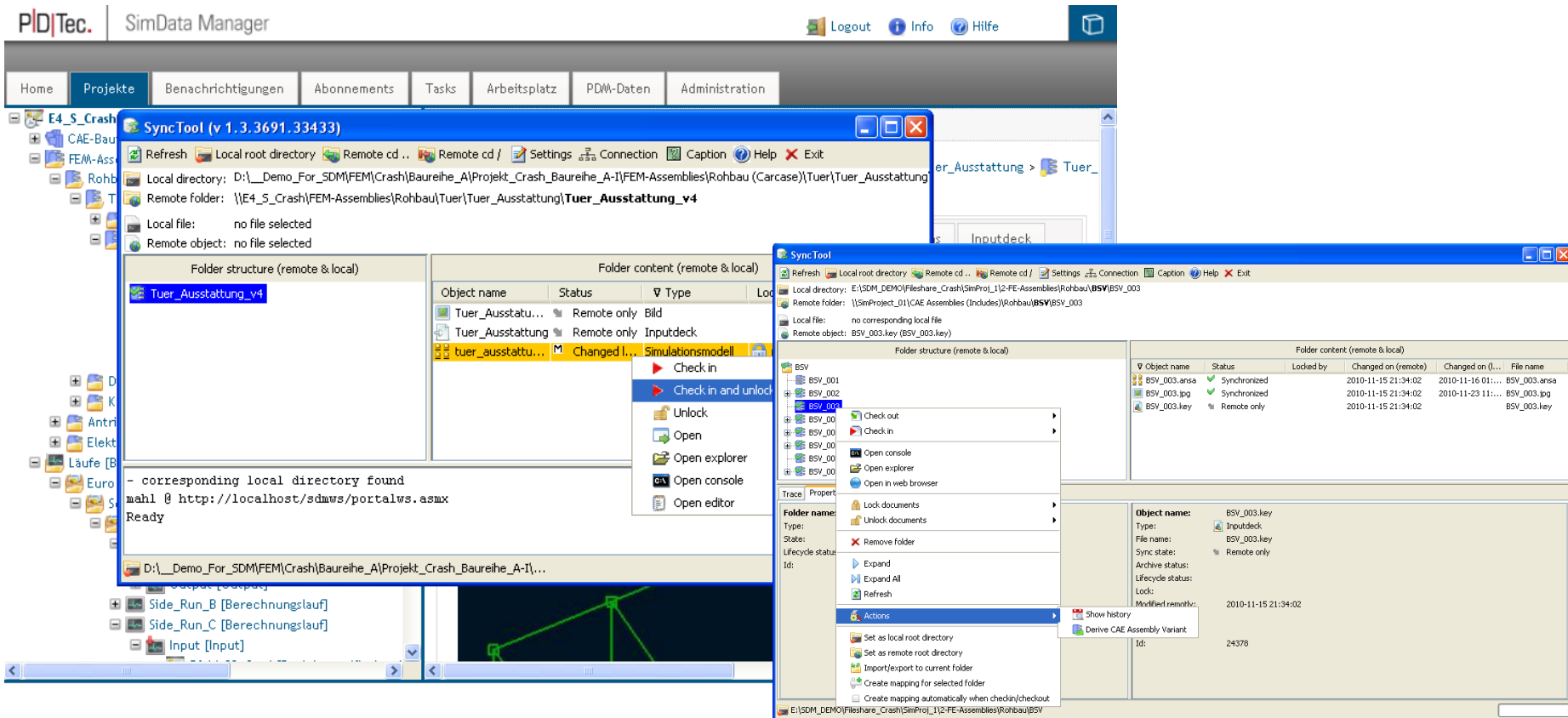
*SimData  
Manager*

```
C:\WINDOWS\system32\cmd.exe - sdmconsole
E:\SDM_DEMON\Files\share_CrashSimProj_1\2-PE-Assemblies\Fahrwerk\Fahrwerk_v4>sdmconsole
Console for Sim Data Manager 2.8
by PDtec AG. All rights reserved.
=====
SDM:\>login -u mahl
Default url alias used: demo [http://localhost/sdms/portalus.ansx1]
=====
Logged in
SDM:\Fahrwerk_v4>ls
Remote name      Local name      Type      Sync      Id
-----
CAE_part_list_F_1_left  CAE_part_list_F_1_left.xml  CAE-BOM   synced    1151
Fahrwerk.ansa         Fahrwerk.ansa      Simulation Model   synced    1151
Fahrwerk.gif          Fahrwerk.gif       Image       synced    1151
Fahrwerk.key          Fahrwerk.key       Inputdeck   synced    1151
SDM:\Fahrwerk_v4>ls
Remote name      Local name      Type      Sync
-----
CAE_part_list_F_1_left  CAE_part_list_F_1_left.xml  CAE-BOM   synced
Fahrwerk.ansa         Fahrwerk.ansa      Simulation Model   mod locally
Fahrwerk.gif          Fahrwerk.gif       Image       synced
Fahrwerk.key          Fahrwerk.key       Inputdeck   synced
SDM:\Fahrwerk_v4>checkin -u Fahrwerk.ansa -U
File Fahrwerk.ansa checked in into object 11514 of folder 3968
SDM:\Fahrwerk_v4>
```



# SDM Sync-Tool

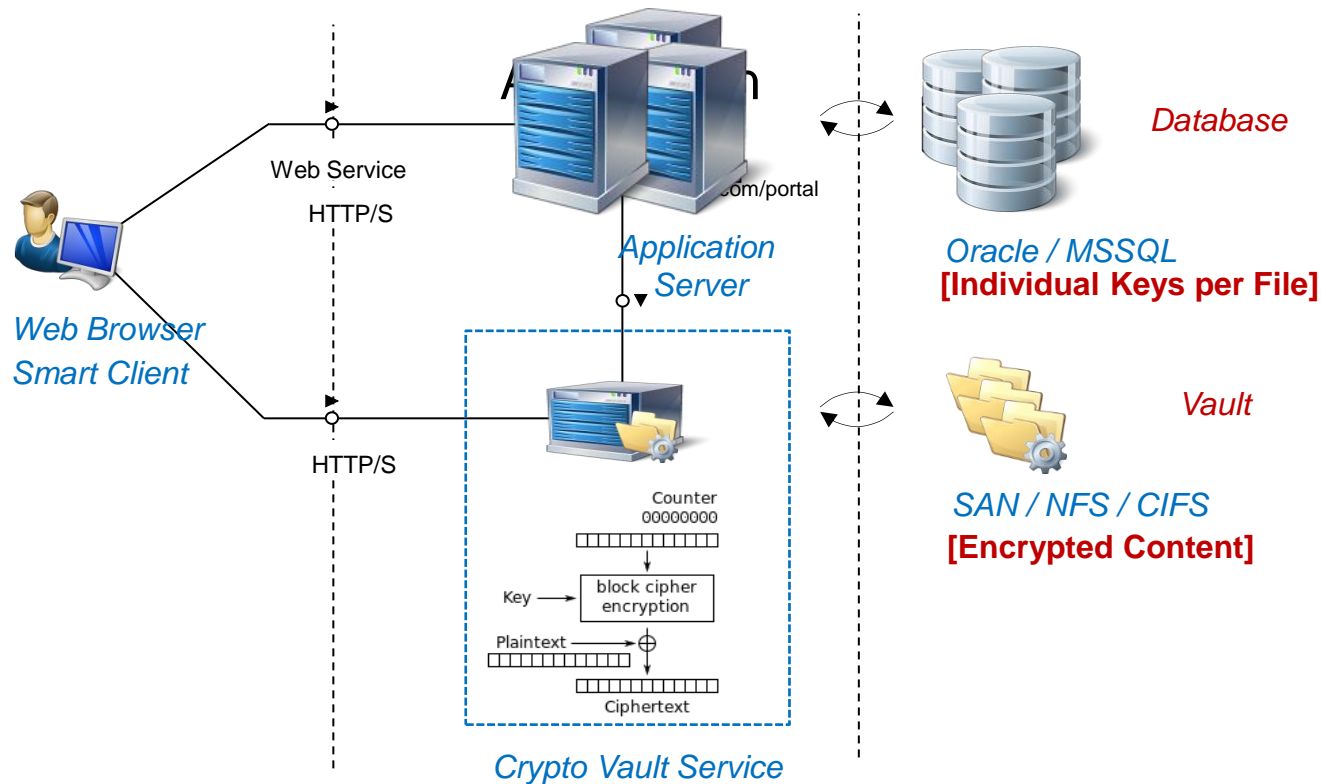
- Synchronization of authoring tools in offline mode
- Local folder checkout's will be in sync with the SDM db





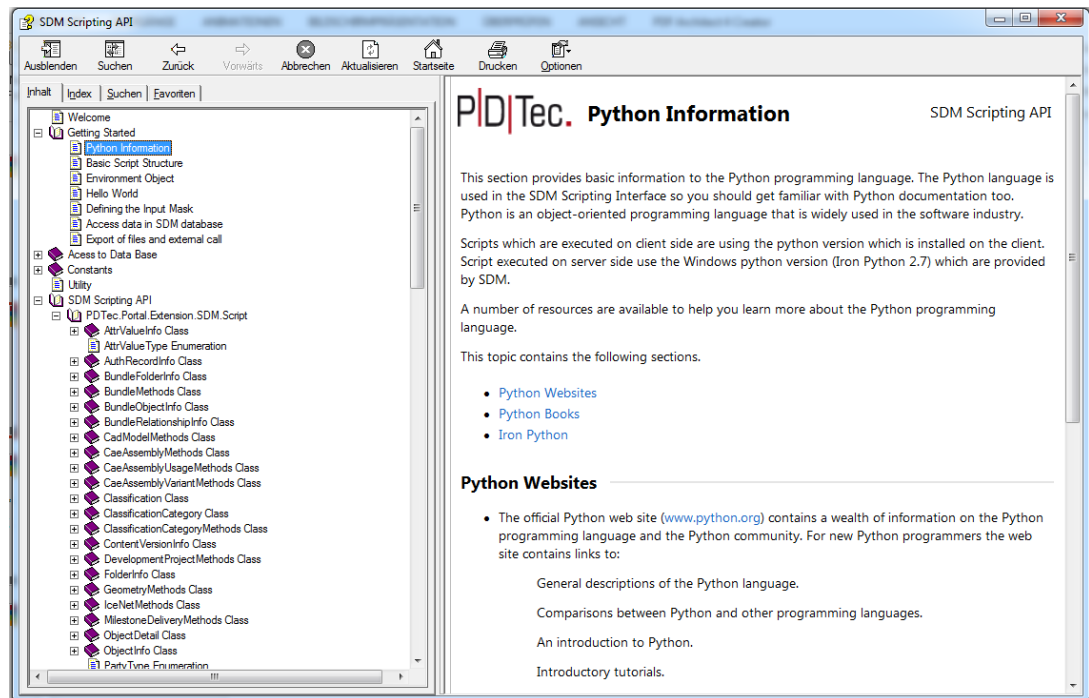
# SDM CryptoVault

- Storage of highly confidential data in a separate vault
- Supports high security & safety standards



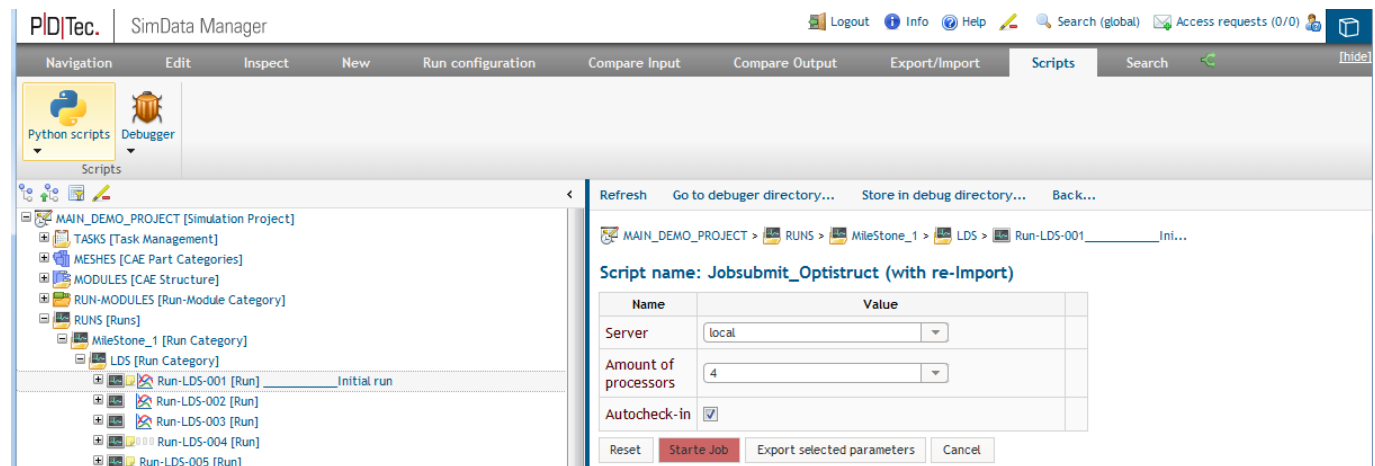
# SDM Python API

- Supports external Python scripts / applications
- API concept
- Supports the development of customer specific functions
- Supports the development of automation tools to capture domain-specific processes



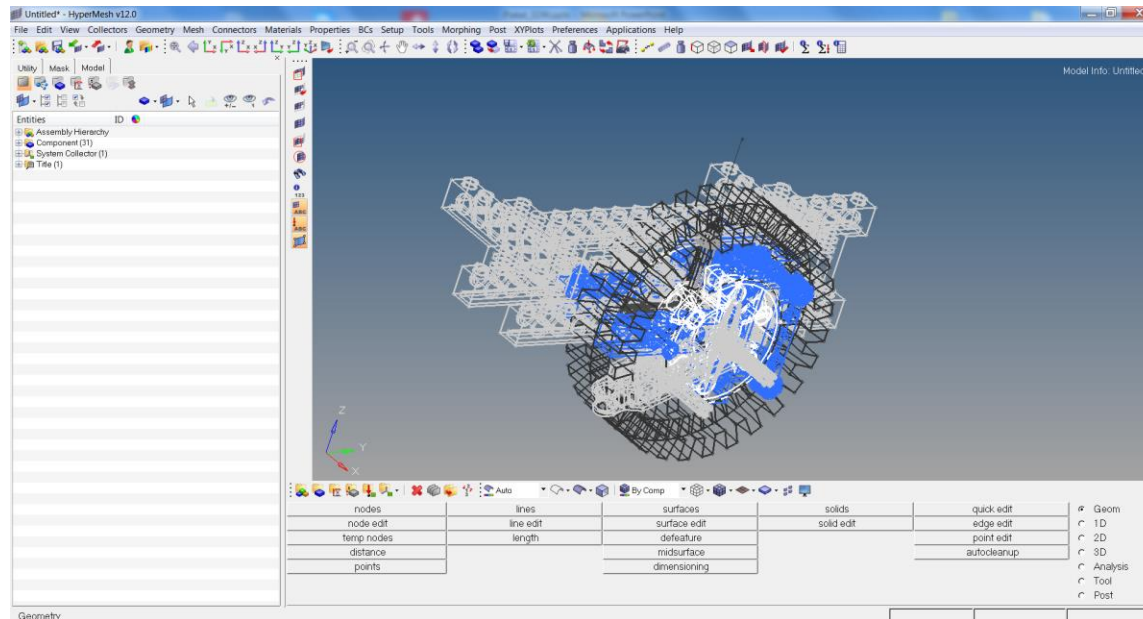
# SDM Python Debugger

- Development tool for Python scripts
- Supports debugging during development
- SimData Manager is a web application, debugging takes place on a “test server” (not at the production instance)
- Python Debugger can also provide 5 additional installations for SimData Manager, which might be installed locally on the computer of the developer (for this specific case, the full SDM installation would be on client).



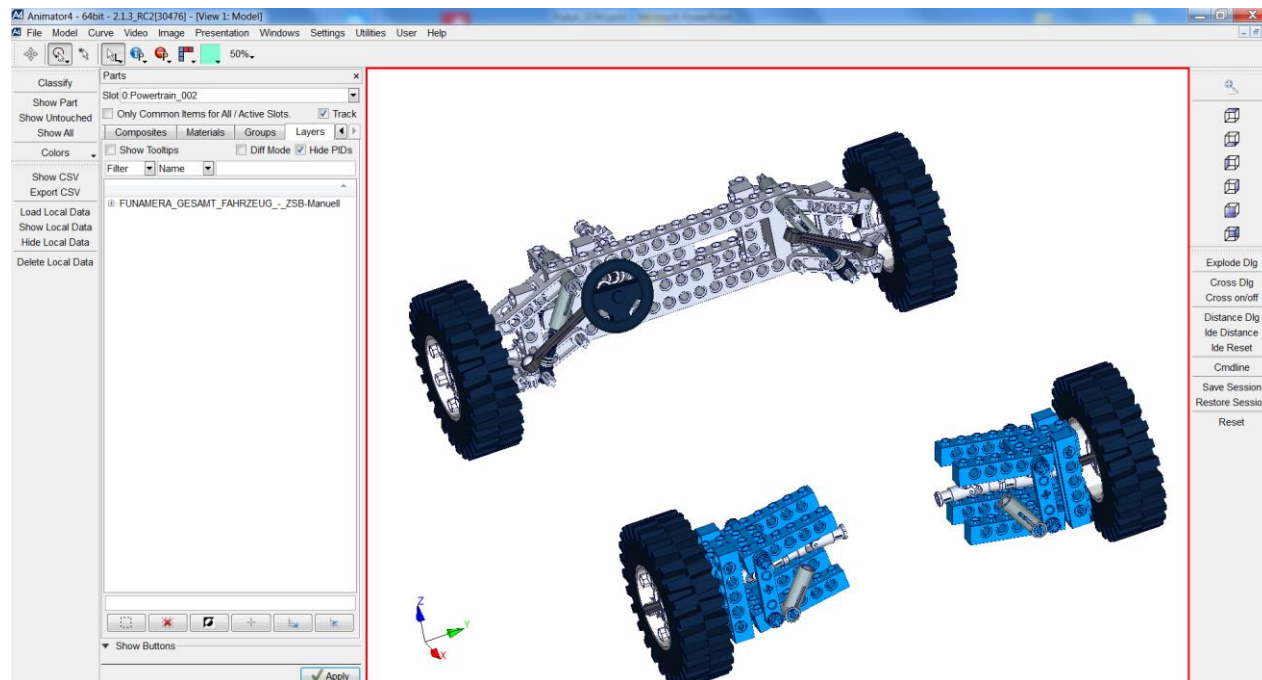
# HyperMesh Integration

- API Webservice integration of SimData Manager - HyperMesh
- Automatic launch of HM in SDM
- Browse of SDM in HM
- Open file in HM and save back
- Easy editing & visualization of CAE models



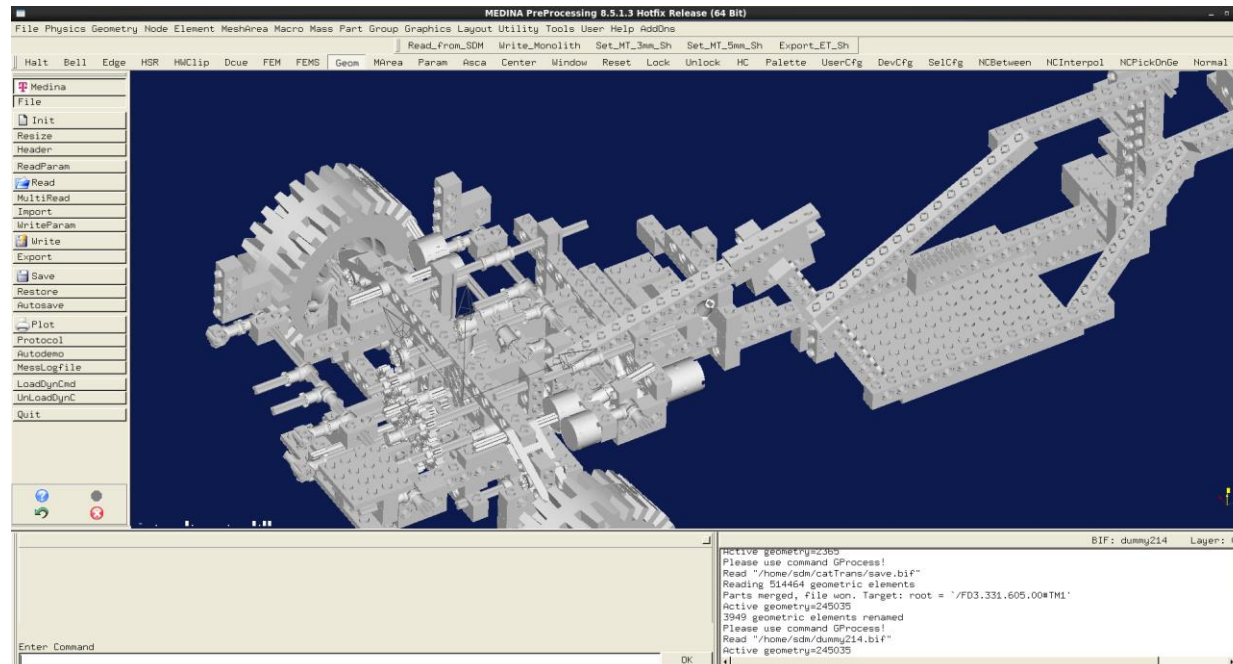
# Animator Integration

- Python integration of SimData Manager - Animator
- Automatic launch of Animator in SDM
- Open file in Animator and save back
- Easy visualization of CAE models



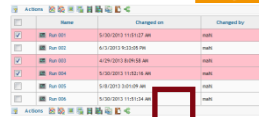
# Medina Integration

- Python integration of SimData Manager - Medina
- Automatic launch of Medina in SDM
- Open file in Medina and save back
- Easy editing & visualization of CAE models

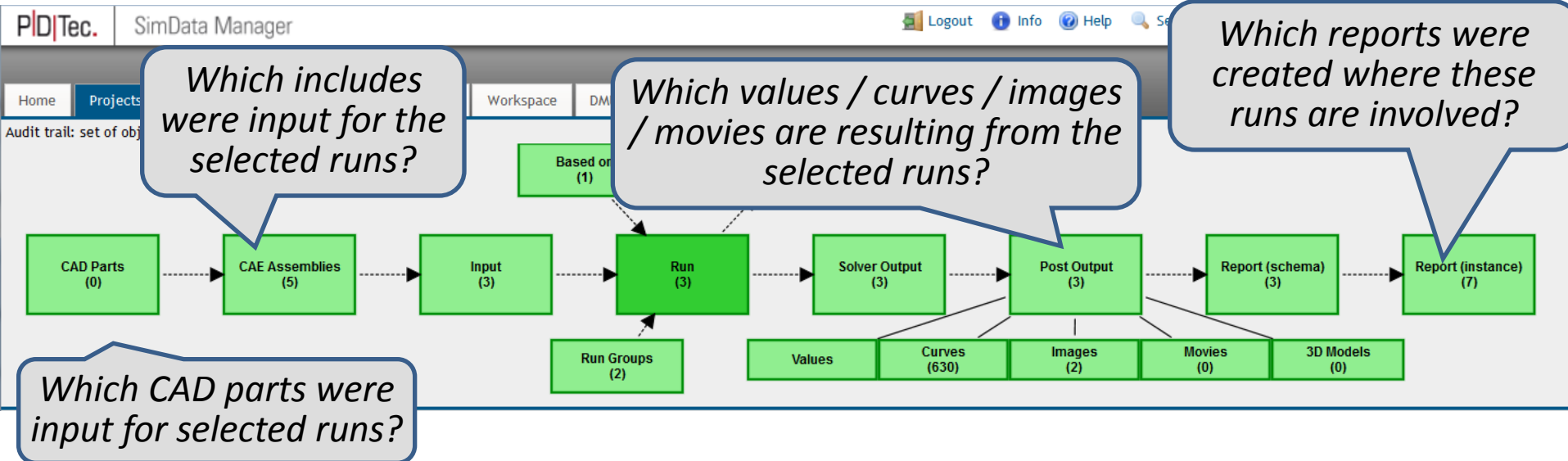


# Audit Trail from CAD to CAE Data to Reports

- Analyze the input and/or output of one or more simulation runs
- Select one or more runs and get needed information with one click



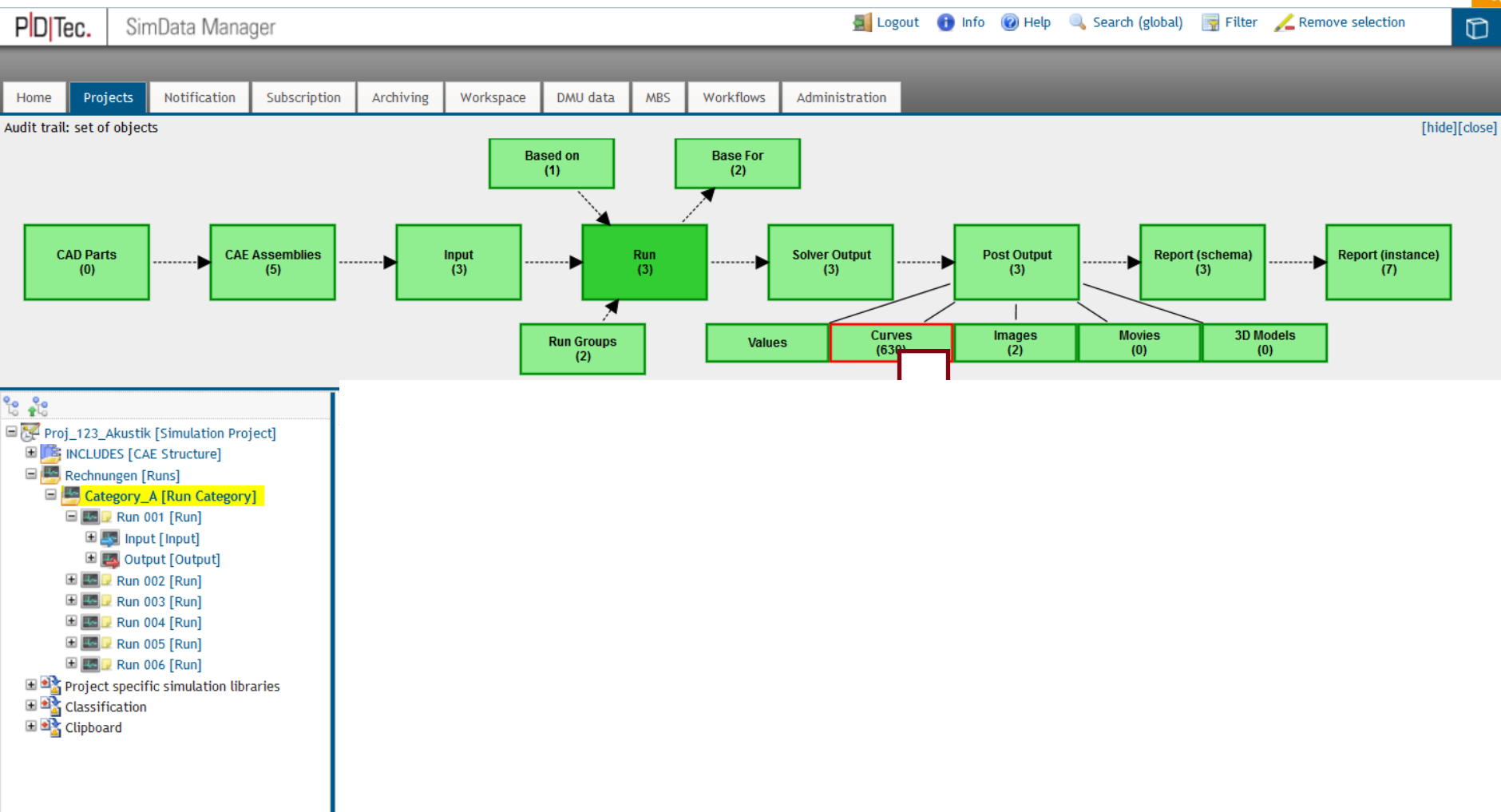
Run ID	Name	Changed on	Changed by
Run 001	1/30/2013 11:01:27 AM	john	1
Run 002	1/31/2013 11:01:28 AM	john	2
Run 003	1/31/2013 11:01:29 AM	john	3
Run 004	1/31/2013 11:01:30 AM	john	4
Run 005	1/31/2013 11:01:31 AM	john	5
Run 006	1/31/2013 11:01:32 AM	john	6
Run 007	1/31/2013 11:01:33 AM	john	7



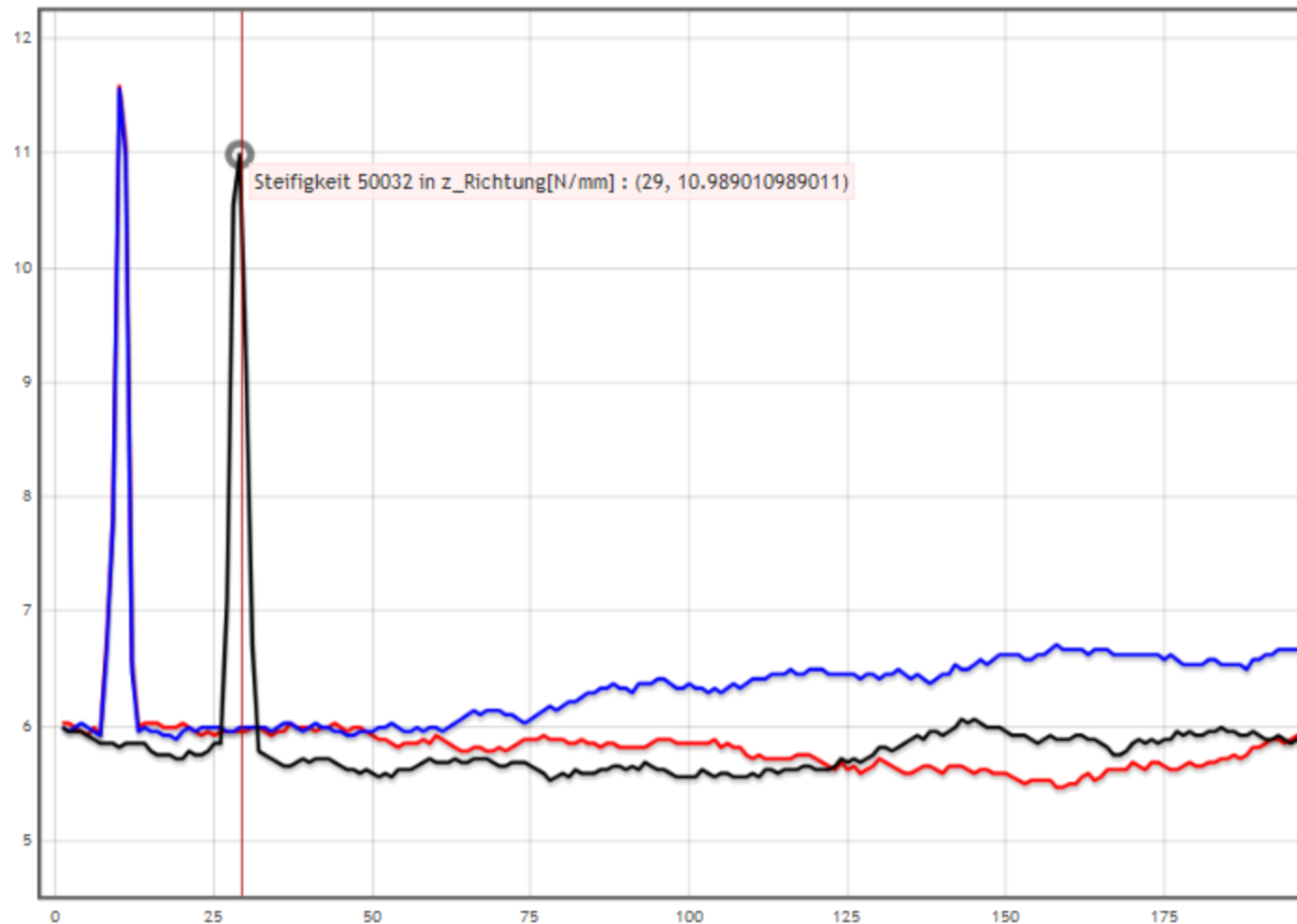
Trace line visualization is configurable in order to fit specific customer needs



# Easy Comparison of Curves, etc.



[Open in Zed Graph](#) [Open in new window](#) [Different colours for each curve](#) [Toggle dashes](#)  
[Reset](#)



#### Run Legend:

##### Run 001

☒ ■ Steifigkeit 50032 in z\_Richtung[N/mm]= 5.95238

##### Run 002

☒ ■ Steifigkeit 50032 in z\_Richtung[N/mm]= 5.98802

##### Run 003

☒ ■ Steifigkeit 50032 in z\_Richtung[N/mm]= 10.5213

PID|Tec. SimData

Home Projects Noti

Audit trail: set of objects

CAD Parts  
(0)

Proj\_123\_Akustik [Simu

INCLUDES [CAE Struc

Rechnungen [Runs]

Category\_A [Run

Run 001 [Ru

Input [Inpu

Output [Ou

Run 002 [Ru

Run 003 [Ru

Run 004 [Ru

Run 005 [Ru

Run 006 [Ru

Project specific simu

Classification

Clipboard

Remove selection

[hide][clos

Report (instance)  
(7)

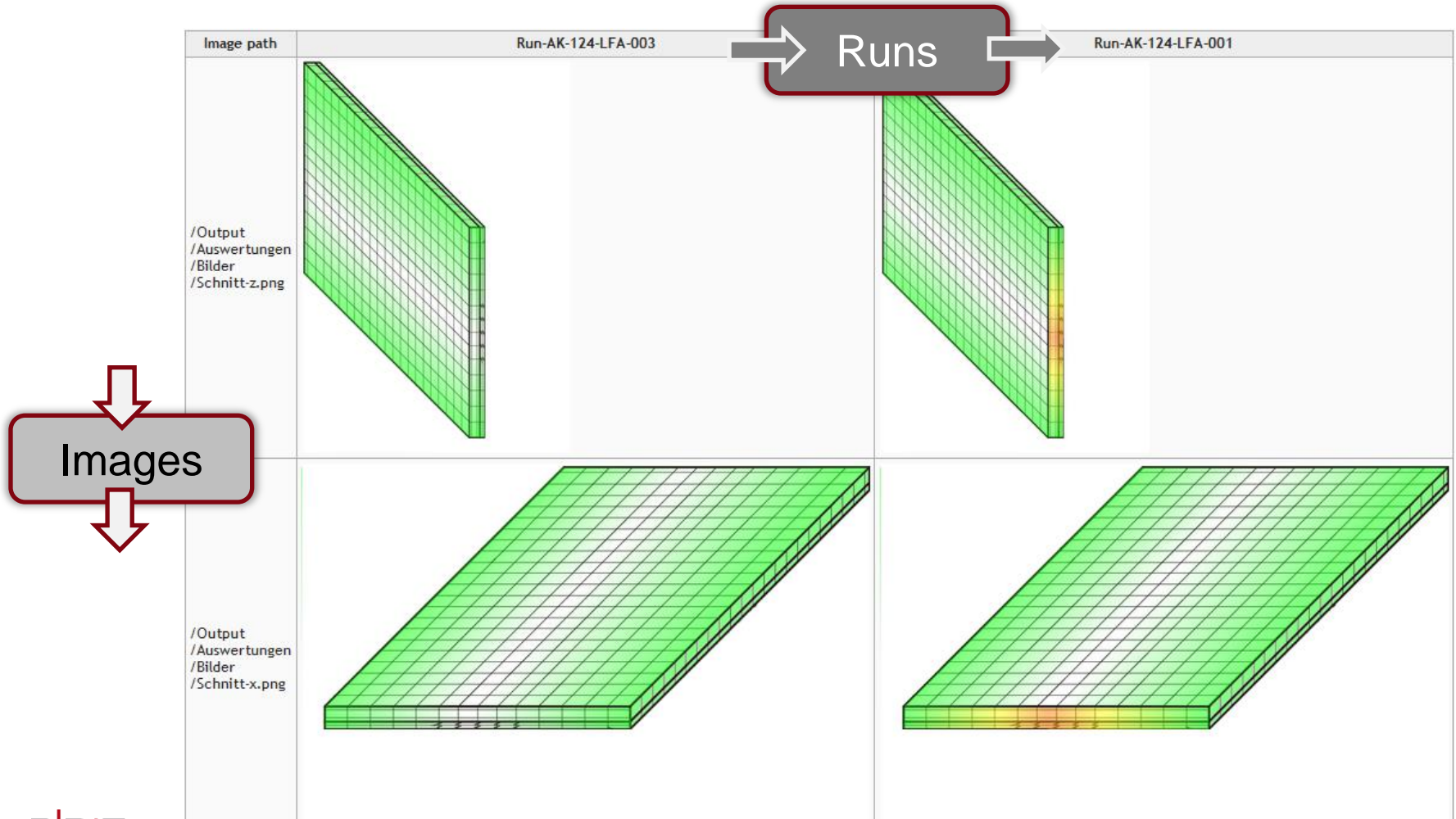
Description

PID|Tec.

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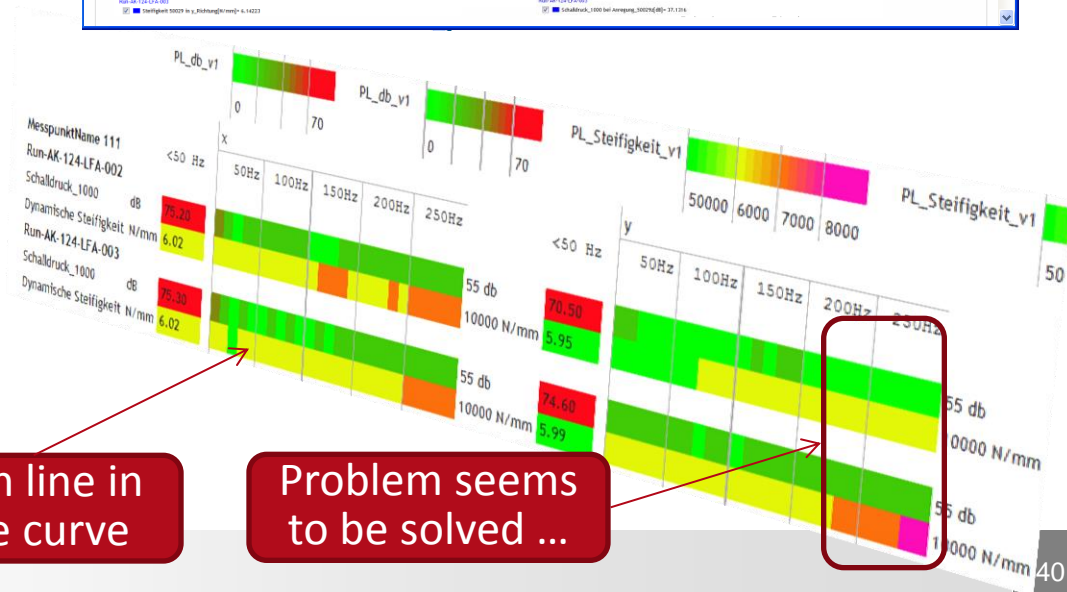
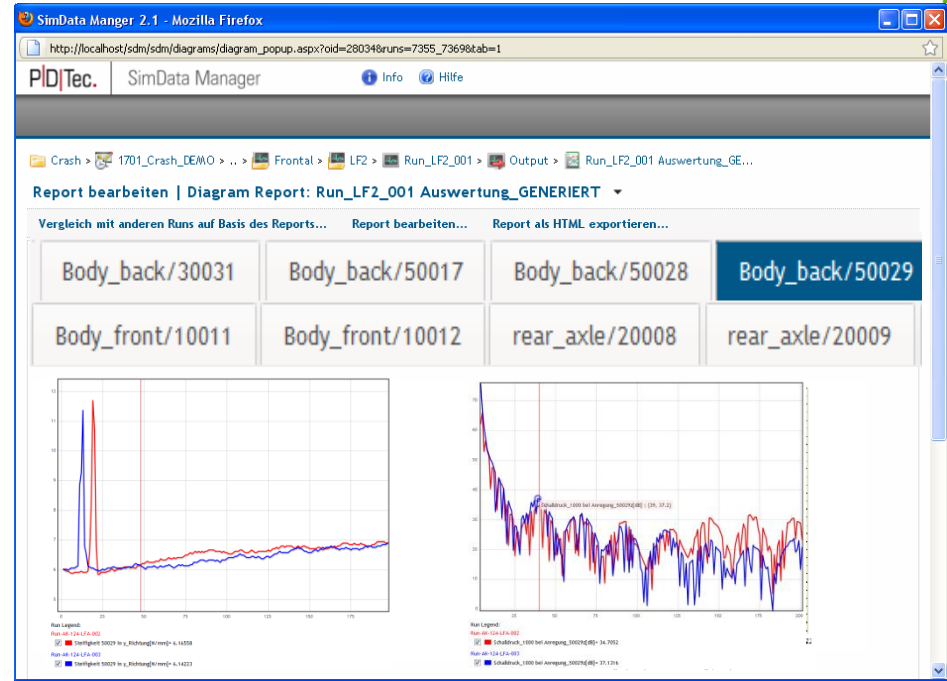
# Or compare images ...

- Analogue handling to start comparison

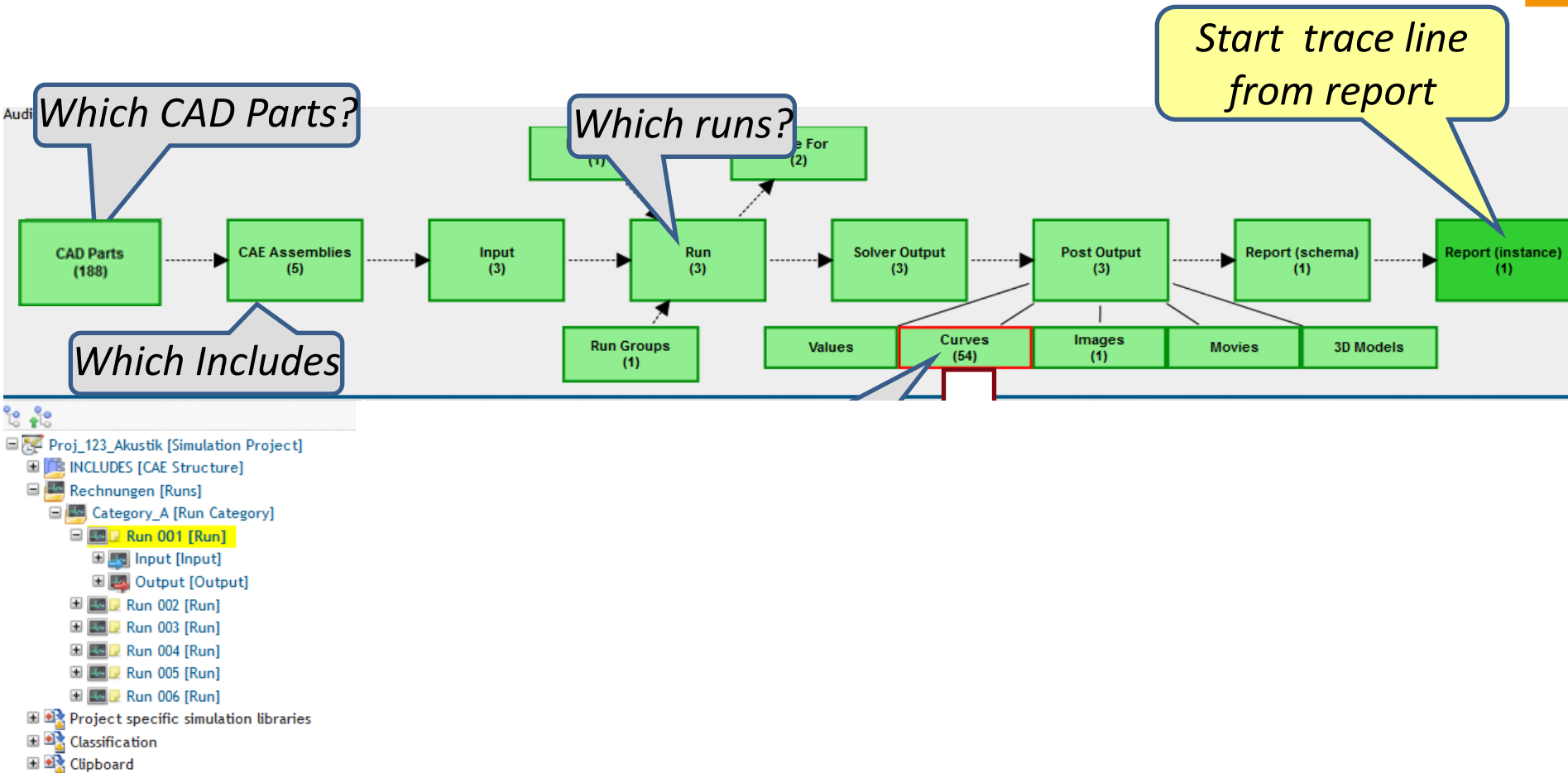


# API and GUI for Definition of (Standard-)Reports

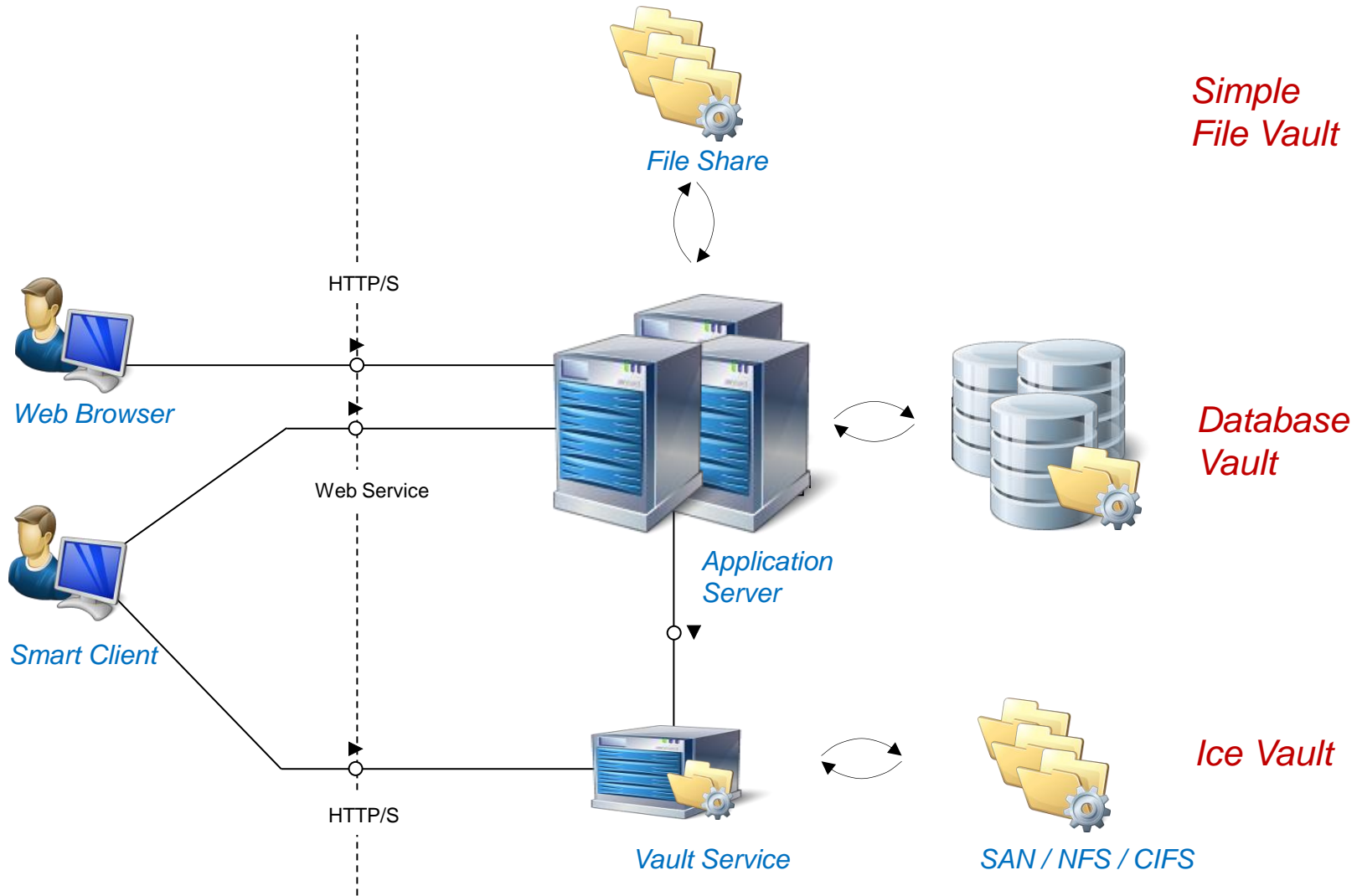
- GUI Editor and XML-API for definition of reports
- Comparison of multiple simulation runs based on report definition
- Several diagram types are supported
  - bar chart
  - for scalar values and tables
  - curve diagram
  - threshold analysis: compare many curves against threshold and see progress over time



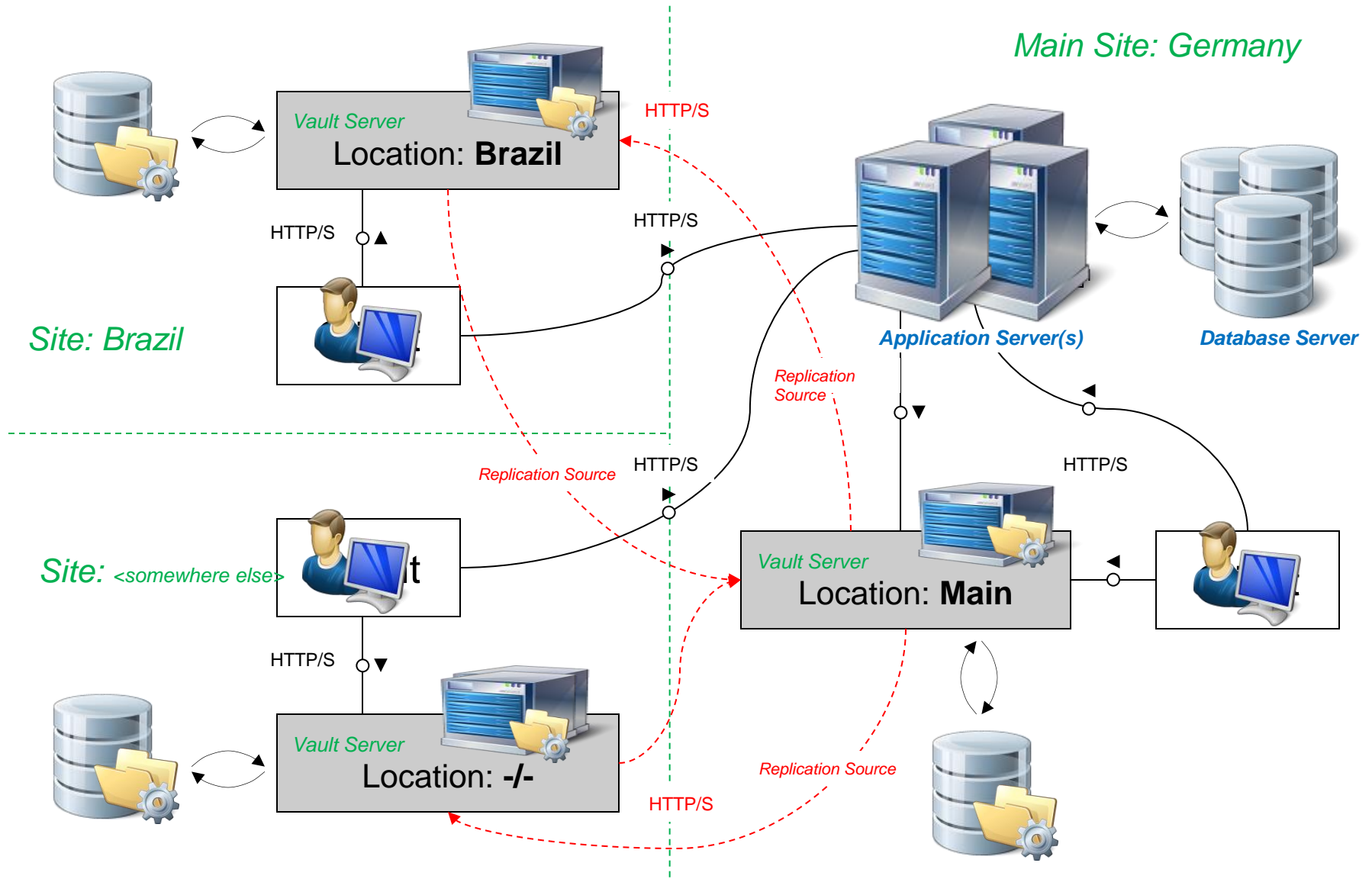
# Traceability: From Report to Runs (curves, images), Includes, and even CAD



# Vault and Content Management – Deployment Options



# Multisite – Vault Replication (Example)





# Summary



- Reduced effort for information provision, for model assembly and for generation of reports
- Synergies provided by an uniform data storage organization, even across different simulation disciplines (e.g. crash, aero dynamics)  
→ potential for in-house standardization
- Improved transparency and higher quality of the simulation process
  - immediate traceability of the simulation results
- Saving significant time in the simulation department
- Simple deployment within the company through usage of modern web technologies
- Straightforward integration of different locations as well as of external partners
  - CAE service providers, Subcontractors, Joint Ventures
- ...



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