

Siemens PLM Connection

Global Services – Technical Overview

Reiner Kaiser
SIEMENS PLM

Siemens
PLM Connection



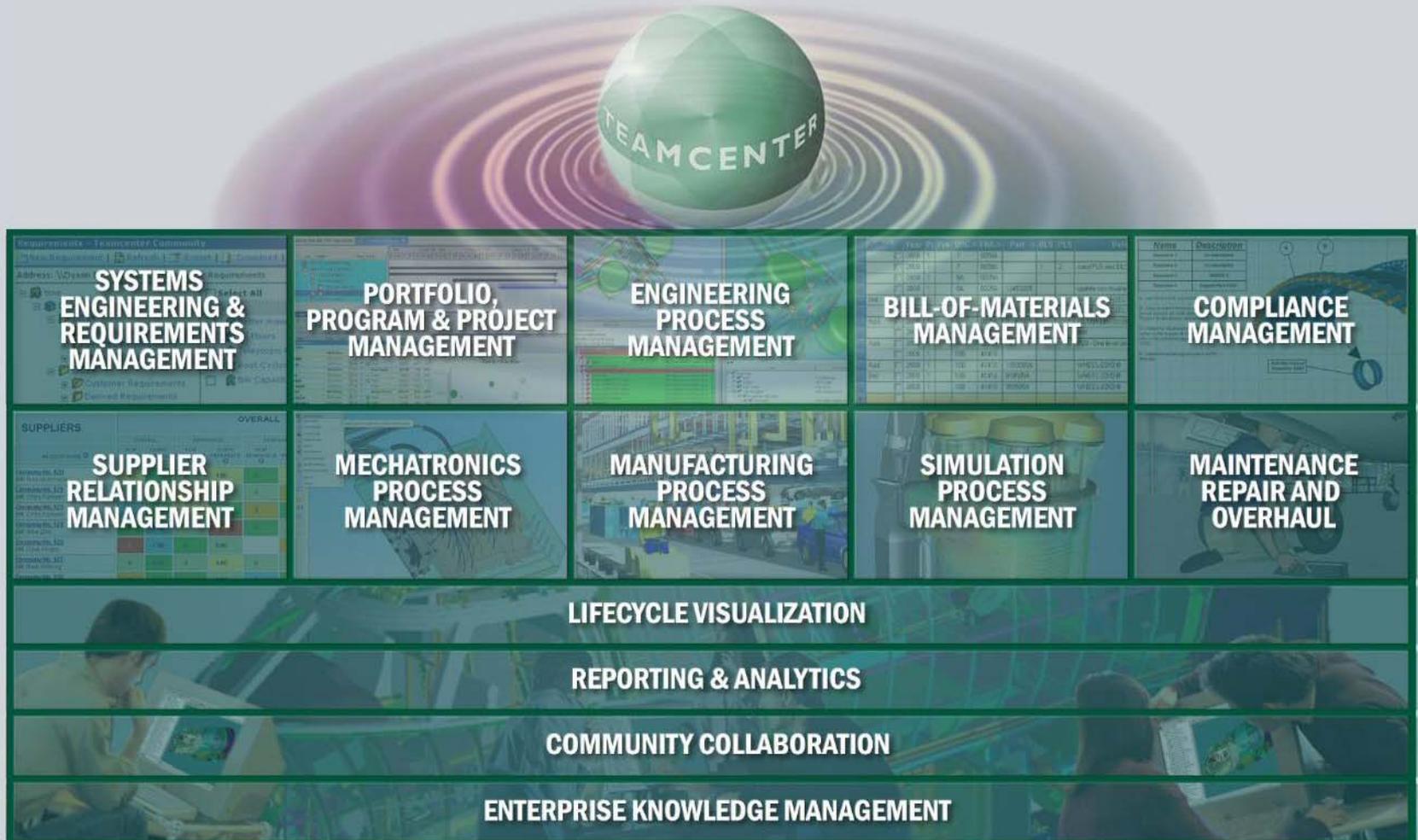
Americas 2008

PLM Software

Answers for industry.

SIEMENS

Teamcenter Digital Lifecycle Management Solutions



Enterprise Knowledge Management Global Multi-Site in Teamcenter 2007

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Next Generation Technology to facilitate federation of Teamcenter deployments (Teamcenter's unified architecture, Enterprise, 3rd party systems, Supplier integration)



2007 Teamcenter Global Multi-Site

Supporting

- Data Exchange between Teamcenter's unified architecture <-> Teamcenter Enterprise, **maintaining concepts of object identity, object site ownership and object referential integrity across sites**
- 3rd party systems supplier integration (**co-existence and migration**)
- Teamcenter 2007 supplier integration via the "briefcase"

Other Related Sessions

Session	Track	Date/Time	Speaker
Mapping Designer (Global Services)	Tc 2007 – Unified System Admin	Tues 11:00	John Whelan
Enterprise of Tomorrow	Tc Enterprise	Tues 4:30	Steve O’Lear
Global Services - Distributing Data..	Tc Unified Architecture	Wed 11:15	Alan Weatherall
Global Services Framework	Integration with Teamcenter	Wed 10:15	John Whelan
Global Services Overview	Tc Unified Architecture	Wed 1:00	Reiner Kaiser
Teamcenter Enterprise in GMS World	Tc Enterprise	Thur 11:00	Mark Ludwig

Teamcenter 2007.1 Global Multi-Site Features

1. TC XML payload: **high flexibility** providing open mapping between dissimilar data models, allowing customization of data model and simplifying data model upgrades (bi-directional).
 - Teamcenter can produce/ consume TC XML, **high level of data model coverage**
 - Flexible and customizable data scoping to address individual customer needs on a business process level, customization interface **tightly integrated with business modeler application**
 - Data model equivalence by defining class/attribute mappings between “similar but different” data model constructs, **using powerful mapping tool**

TC XML vs. PLM XML

TC XML: very close to Teamcenter data model, used for “*federation-internal*” data transfer with or without data mapping, and briefcase / supplier integration.

```
<Item item_id="NML00000026" last_mod_date="2008-05-08" object_name="test"
      revision_list="#id8" revision_number="0" uom_tag="">
  <GSIdentity elemId="id1" label="xXPhiwm1AAgcRD"/>
</Item>
```

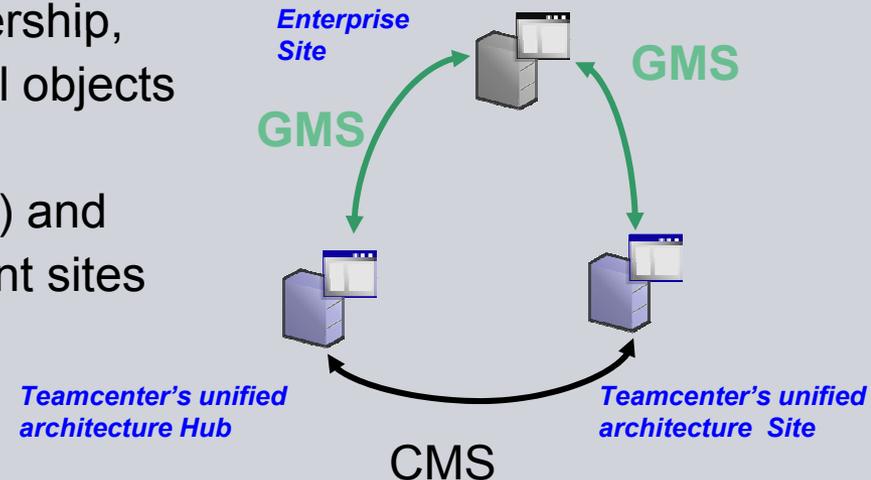
PLM XML: object model independent, basis of a *rich interoperability pipeline* connecting Siemens PLM Software products and 3rd party adopters.

```
<ProductRevision id="id12" name="asm"accessRefs="#id5"masterRef="#id20"
  revision="A">
  <UserData id="id15">
    <UserValue value="02-Dec-2003 12:37" title="last_mod_date"/>
  </UserData>
</ProductRevision>
```

Teamcenter 2007.1 Global Multi-Site Features

2. Message-based process flow Orchestration (BPEL)
 (see John Whelan's presentation on TcGS ("Global Services Framework").
 Transaction Monitor GUI provides easy access to transaction status. Logs are centrally located.

3. Data transfer paradigm is consistent with classic Multi-Site (same approach for site ownership, site referential integrity, required/optional objects on transfer, ODS / HUB concepts etc.
 Co-existence of Classic Multi-Site (CMS) and Global Multi-Site (GMS) between different sites is guaranteed.



Teamcenter 2007.1 Global Multi-Site Features:

4. **Built-in Transaction Integrity** (two-stage commit) guarantees ownership consistency of transferred objects even in case of unforeseen failure modes
5. **Efficient data synchronization** between sites. Only modified data is transferred.
6. Global Multi-Site framework is **inherently scalable** and supports high throughput by parallelizing data transfer processes

Coexistence with Teamcenter Enterprise

Pre-requisite

- Teamcenter Enterprise 2005 SR1 MP2C

Supports meta-data, JT and other files

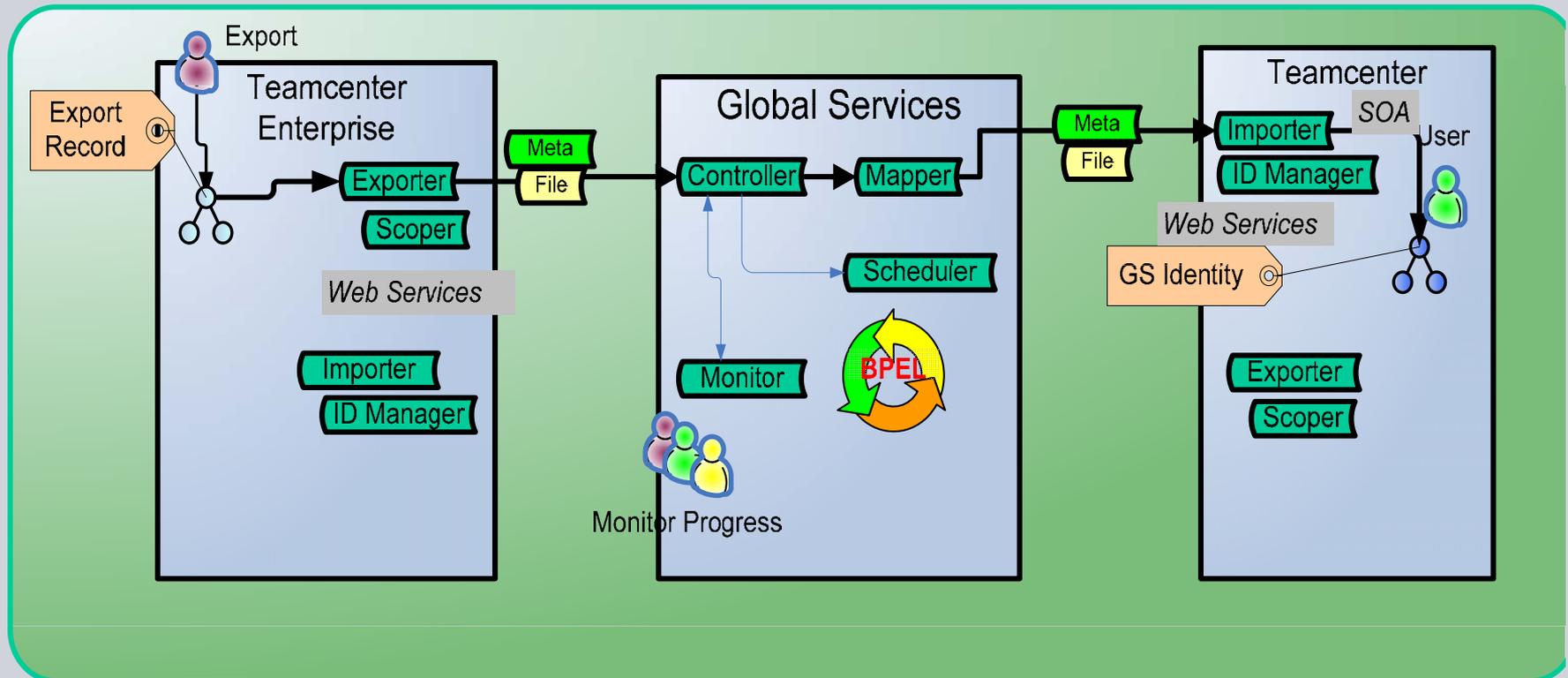
- Supports variability of data models on both ends
- Supports transfer of ownership or modification rights
- Referential integrity and stable identity similar to Teamcenter Classic Multi-Site paradigm

Supports batch and event based transfers

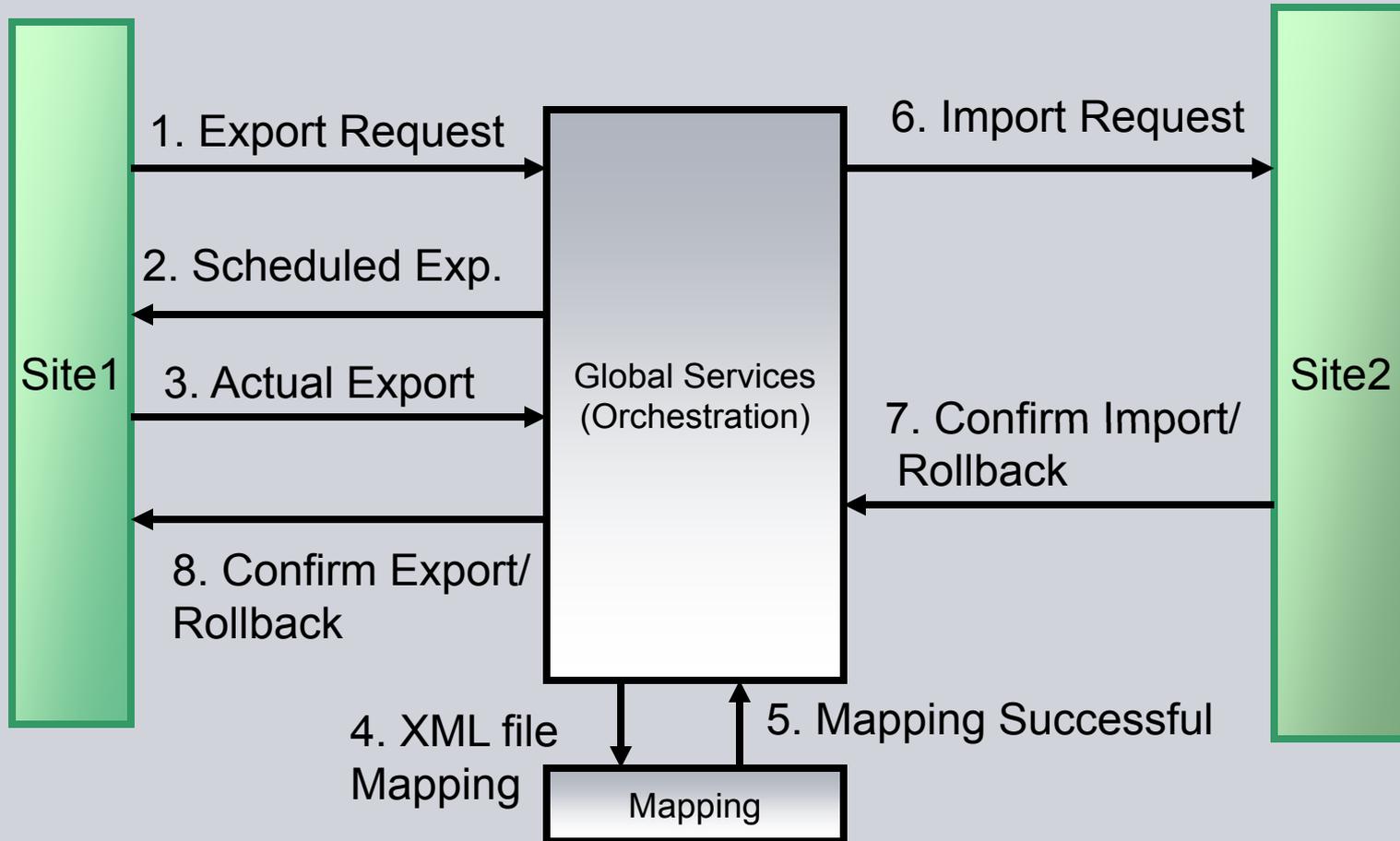
- Scheduled, workflow or user initiated

Interactions for Teamcenter to Enterprise transfer

Global Services controls and orchestrates data transfer and mapping steps using BPEL:



Sequence Diagram and Transaction Coordination for a typical GMS data transfer



Supplier Integration via the Briefcase

Supports non-networked Teamcenter 2007 to Teamcenter 2007 data sharing

- Supports variability of data models on both ends
- Supports meta-data, JT, and NX
- Reference only



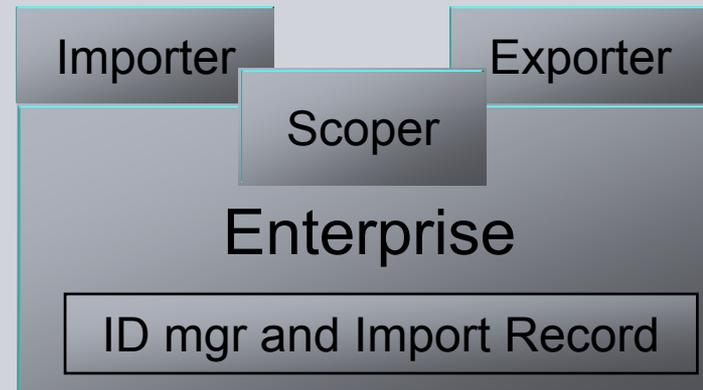
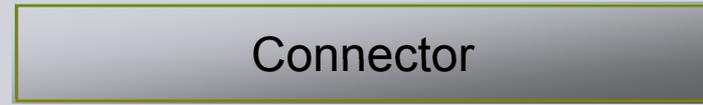
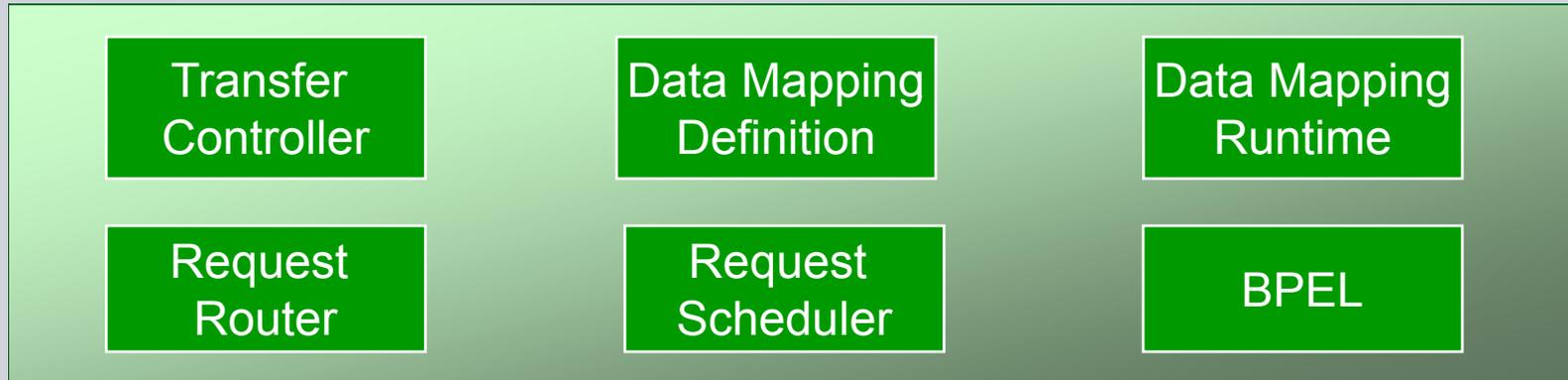
Considerations

- Non Teamcenter 2007 suppliers can receive and return data using PLM XML
- Currently not a full replacement for Teamcenter Multi-Site for companies exchanging non NX CAD data or manufacturing data

Teamcenter 2007 Global Services

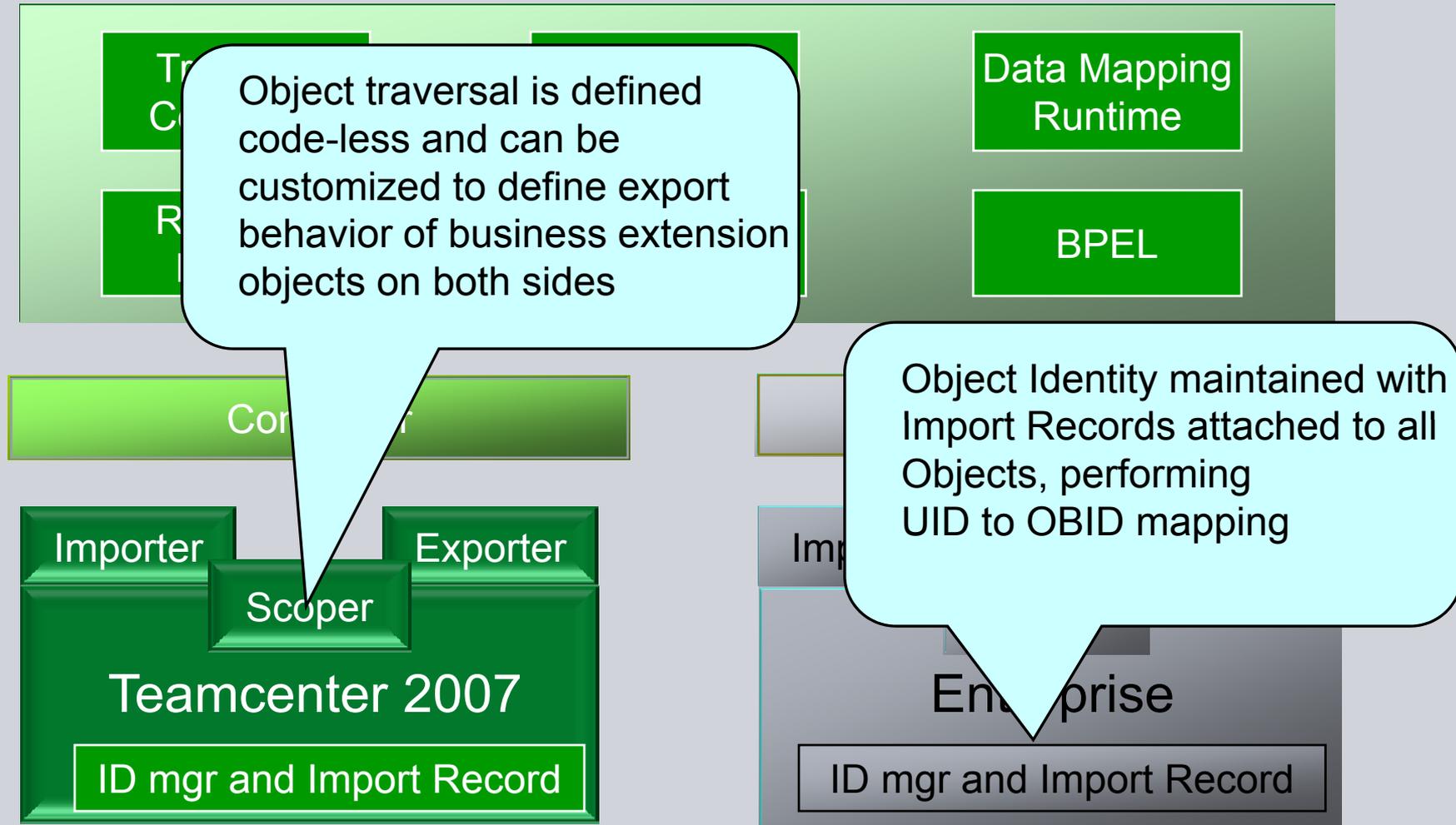


Component View, example Enterprise to Teamcenter



Teamcenter 2007 Global Services

Component View, example Enterprise to Teamcenter



Data Scoper: easily customize data transfer behavior, including custom classes/types

The screenshot shows the 'PLM XML Export Import Administration' window. The 'ClosureRule' configuration is set to 'TIEUnconfiguredExportDefault' with a description 'Closure Rules for TIE Unconfigured Data Export'. The scope is 'Export' and the output schema format is 'TC PLMXML'.

CLASS	ItemRevision	TYPE	DirectModel	RELATIONP25	*	SKIP	\$opt_jt_ds=="false"
CLASS	ItemRevision	TYPE	UGMASTER	RELATIONP25	*	SKIP	\$opt_nx_ds=="false"
CLASS	ItemRevision	TYPE	UGPART	RELATIONP25	IMAN_specif...	SKIP	\$opt_nx_ds=="false" \$opt_nx_spec==...
CLASS	ItemRevision	TYPE	UGPART	RELATIONP25	IMAN_manif...	SKIP	\$opt_nx_ds=="false" \$opt_nx_manif=...
CLASS	ItemRevision	TYPE	UGALTREP	RELATIONP25	*	SKIP	\$opt_nx_ds=="false"
CLASS	ItemRevision	TYPE	UGSCENARIO	RELATIONP25	*	SKIP	\$opt_nx_ds=="false" \$opt_nx_scen==...
CLASS	ItemRevision	TYPE	UGSimulation	RELATIONP25	*	SKIP	\$opt_nx_ds=="false" \$opt_nx_sim=="...
CLASS	ItemRevision	CLASS	ItemRevision	RELATIONP25	IMAN_UG_p...	SKIP	\$opt_nx_ds=="false" \$opt_nx_tmpl==...

Below the table, there are buttons for 'Create', 'Modify', 'Delete', and 'Clear'. The bottom part of the screenshot shows a list of transfer modes and their configurations.

Transfer Modes, Closure rules, Option sets and Property sets are easily customizable to honor business logic while conforming to boundary conditions imposed by Teamcenter data model

Transfer Modes, Closure Rules, and Option/Property Sets

Transfer Modes

Transfer Mode objects combine rules and property sets to define the context of the TC XML import or export operation

Closure Rules

Closure rules control the scope of the data translation on both input and output. They specify how the data structure is traversed by specifying which relationships are of interest and what should be done when these relationships are encountered. Example:

```
CLASS.ItemRevision:TYPE.UGPART:RELATIONP2S.IMAN_manifestation:SKIP:$opt_nx_ds=="false"
```

Property Sets

Property sets provide a code-less way to control what is placed inside the TC XML representation of each serialized object.

Data Mapping:

Global Services Mapping technology supports the transformation of PDM data from a source schema to a destination schema.

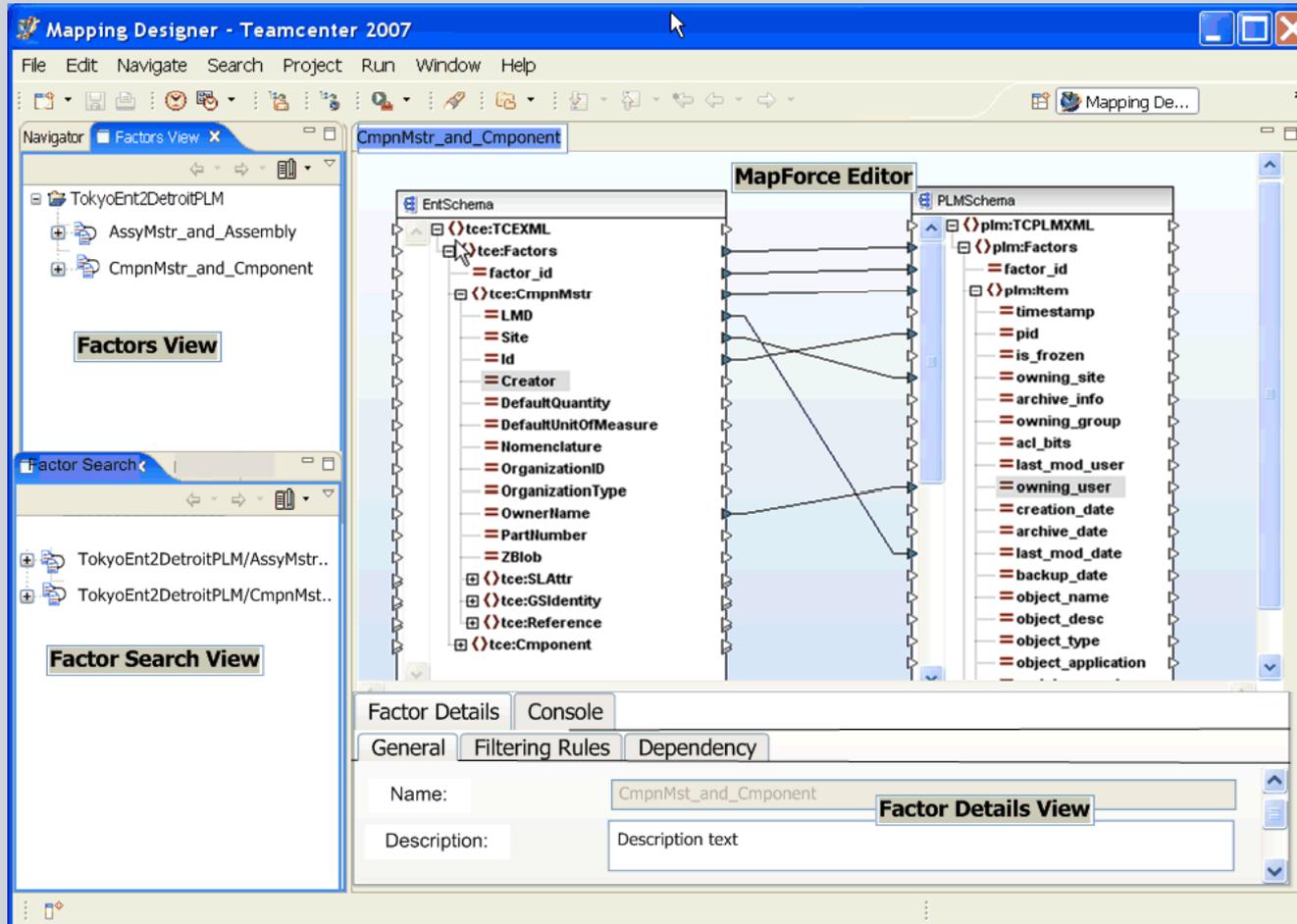
Utilize Mapping Designer to easily define mappings:

- Integrated into BMIDE
- Based on MapForce, generates XSL output
- See John Whelan's presentation *"Mapping Designer"*

During data transfer the Orchestration piece invokes Mapping engine to execute transformation of data between schemas.

OOTB Mapping from Teamcenter Enterprise to Teamcenter Unified Architecture is provided. Tool is flexible enough to define complex round-trip mappings to other third-party PDM systems as well.

Data Mapping – Designer:



Establish equivalence between “similar but different” objects being mapped while maintaining concepts of

- object identity
- well-defined site ownership
- Referential integrity across sites

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