Siemens PLM Connection

Benefits of Teamcenter’s Services
Oriented Architecture (SOA)
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Web Services
Teamcenter’s SOA for Web Services
Benefits of Teamcenter’s SOA
Summary
What is a “Web Service”?

A programmable application component accessible via standard Internet protocols

- Web services are defined in terms of the formats and ordering of messages not in implementation terms.
- Application components are built using open Internet protocols (such as SOAP).
- You can ask a site for a description of its Web Services (WSDL), or use a directory service (UDDI).

Universal Description, Discovery and Integration
Web Services Description Language
Simple Object Access Protocol
XML, HTTP, SMTP

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Why use Web Services?

They are a new way for applications to present their functionality:

- Applications can be truly global
  - Applications can scale to serve many concurrent end users at many different locations
  - Application services can be delivered as safely on the public internet (the world wide web) as on corporate internets
  - Application services can be efficiently delivered on slow Wide Area Networks
- Application services can be re-used and re-purposed
  - To new end user clients
  - To new system to system use cases
- Applications from different vendors may communicate
  - Combining services to solve new problems
How are Web Services built?

Web services are built and deployed with industry standards

- Standards that are designed for web access, re-use and interoperability
  - Most web services use SOAP via HTTP to ensure interoperability and web accessibility
  - Services are defined with the Web Services Deployment Language (WSDL) for ease in re-use and re-purposing
- Standards are supported by virtually all vendors
- Standards are “IT Department-friendly”
  - Fit well into individual customers’ system configurations
  - Do not require expensive third-party licenses
Teamcenter’s SOA for Web Services
Teamcenter 2007 (unified architecture) includes a complete SOA technology foundation throughout the entire portfolio, delivering the industry’s first fully unified PLM suite.

Teamcenter 2007 sets a new standard for an easy-to-configure PLM environment, enabling companies to eliminate costly implementations and significantly reduce the time necessary to deploy a production-ready system.

“SOA-based PLM reduces the cost and complexity of deploying and maintaining a distributed PLM environment,” says Ed Miller, President of industry consulting and research firm CIMdata.
Teamcenter Application Solutions

SYSTEMS ENGINEERING & REQUIREMENTS MANAGEMENT
PORTFOLIO, PROGRAM & PROJECT MANAGEMENT
ENGINEERING PROCESS MANAGEMENT
BOM MANAGEMENT
COMPLIANCE MANAGEMENT
SUPPLIER RELATIONSHIP MANAGEMENT
MECHATRONICS
MANUFACTURING
SIMULATION
MRO: MAINTENANCE REPAIR & OVERHAUL
LIFECYCLE VISUALIZATION
REPORTING & ANALYTICS
COMMUNITY COLLABORATION
ENTERPRISE KNOWLEDGE MANAGEMENT
Web Services and Teamcenter

Teamcenter application service components and web-enabled 4-Tier Architecture deliver all the business benefits of Web Services to meet business needs

- Applications can be truly **global**
  - Applications can scale to serve many concurrent end users at many different locations
  - Application services can be delivered as safely on the public internet (the world wide web) as on corporate internets
- Application services can be **re-used** and **re-purposed**
  - To new end user clients
  - To new system to system use cases
- Applications from different vendors may communicate
  - Combining services to solve new problems
- IT-friendly – use of standards to fit in well with a variety of customer deployment architectures
Teamcenter Architecture

Client Tier
- Thin Client
- Rich Client
- Visualization
- CAx
- MS Office
- J2EE
- .NET
- WSDL

Web Tier
- PLM Private Services
- PLM Web Services

Enterprise Tier
- PLM UI Framework
- SOA Framework
- PLM XML Framework
- PLM Business Logic
- Business Modeler Extension Framework
- PLM Data Model
  - Product
  - Process
  - Plant
  - Resource
  - Model
  - Analysis

Resource Tier
- Database
- File Systems

Supplier & Partner Applications
- Office
- CAx
- CRM
- SRM
- ERP
- PDM
- Legacy

Plant

May 2008

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Teamcenter’s SOA - Easier to Use and Easier to Re-purpose

WSDL definitions require use of tools to generate programming for re-use

Re-use, re-purposing and service aggregation is made easier and quicker by Teamcenter’s alternative services bindings for multiple types of clients, server to server interactions and import–export use cases

Standard WSDL also available
Teamcenter’s SOA Faster Performance

Performance is enhanced by configuration choice to use *faster* standard web protocols (REST over HTTP)
Flexible and Reuseable Core Services
(A small sample now available)

System
- Login (with and without SSO)
- Get/set Preferences
- Get/set Role and Group

Identity and Rights Management
- Get accessors rights
- Get/ set/ delete ACL
- Set privilege
- Get extra detail

Reservation
- Check in/out
- Cancel
- Get history

Query
- Get saved queries
- Describe queries
- Execute queries

Data Management
- Get Home Folder
- Create Folder(s)
- Create Item, Dataset
- Revise, SaveAs
- Follow relationships
- Create relationships

File Management
- Get read/write tickets
- Commit file

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Teamcenter 2007 (unified architecture) was developed with a focus on lowering the total cost of PLM ownership

- Enhancements and features that simplify and accelerate implementations, enhance productivity, streamline collaboration and expand control of the entire product lifecycle process

One of the most powerful examples of this lower cost of ownership is Business Modeler Integrated Development Environment (BMIDE)

- Enables software configuration versus customization along with rapid deployment of changes to remote sites through implementation templates and live server synchronization
Teamcenter services are defined and extended by using the graphical Teamcenter “Business Modeler IDE” extension tool

- Siemens uses for development
- Customers and partners may use for extensions (Planned for Teamcenter 8 unified architecture)

Teamcenter services can be published or unpublished

- Published services go through a deprecation policy to guarantee “upward compatibility”
Productivity

Teamcenter further lowers cost of ownership with Global Services - a package of comprehensive fully integrated services and tools supporting:

- Automated information transfer between business systems
- Automated information transfer between partners
- Coordinated business processes across independent business applications
- Delivery of information the way organizations use it rather than the way applications manage it
- Teamcenter to Teamcenter data exchange - bridging dissimilar data models and product versions
- Teamcenter to external application data exchange
Global Services is based on Teamcenter’s SOA architecture, industry-standard middleware, messaging and web orchestration standards.

Global Services supports many use cases:

- Real-time data aggregation
- Data exchange across dissimilar systems (such as Teamcenter to Oracle Manufacturing)
- Replication/Synchronization of objects across like systems
- Replication/Synchronization of objects between dissimilar systems
  - Teamcenter 2007 (unified architecture) with Teamcenter Enterprise
  - Teamcenter 2007 (unified architecture) with Teamcenter Engineering
  - Supply-chain, OEM Teamcenter 2007 (unified architecture) to suppliers Teamcenter 2007 (unified architecture) via offline transfers “Briefcase”
By leveraging Web Services and SOA, Teamcenter 2007 (unified architecture) goes beyond the delivery of individual software applications and establishes a truly integrated PLM solution across disciplines, project phases and programs.

Teamcenter 2007 significantly lowers the total cost of ownership for PLM technology and establishes greater productivity for manufacturers through a single source of product and process knowledge exposed and re-used across technology and organizational boundaries.
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