

Service Oriented Architecture in Teamcenter

White Paper

Drive your mainstream business processes effortlessly with Teamcenter's Service Oriented Architecture

Leveraging maximum benefits using minimal IT investment is what today's companies are demanding. Service Oriented Architecture (SOA) is one of the key software architecture design pattern with which software application functionality is provided as a service to another applications. Using these functionalities as services enables customers to perform their business processes efficiently and effectively in terms of both investment and maintenance.

Digital product design and development using SOA further helps customers to reduce their IT investments and use existing functionalities as it is.

Teamcenter® software's SOA services provide an open, high performance, coarse-grained interface to the Teamcenter Business Logic Server which can be used within Teamcenter or by some other client. This enables you to access Teamcenter-driven capabilities and integrate them with your existing business processes – as well as to create customized, task-specific programs to meet your business needs.

Summary

The biggest challenge for today's corporate IT organizations is to provide improved real-time visibility into their company's business operations. IT leadership is especially concerned with managing the software application lifecycle and controlling its cost. According to research it has been found that companies implemented SOA as the technological foundation for key computing environments (such as the product design and development environment) have succeeded in making their business more agile and flexible. SOAs are able to facilitate these improvements with less IT investments.

To capture the maximum benefits of SOA while not opening up the enterprise to additional challenges, companies are adopting SOA governance frameworks.

Enforce, Set up, Deploy and Regiment is the simple process for implementing a successful SOA Governance framework.

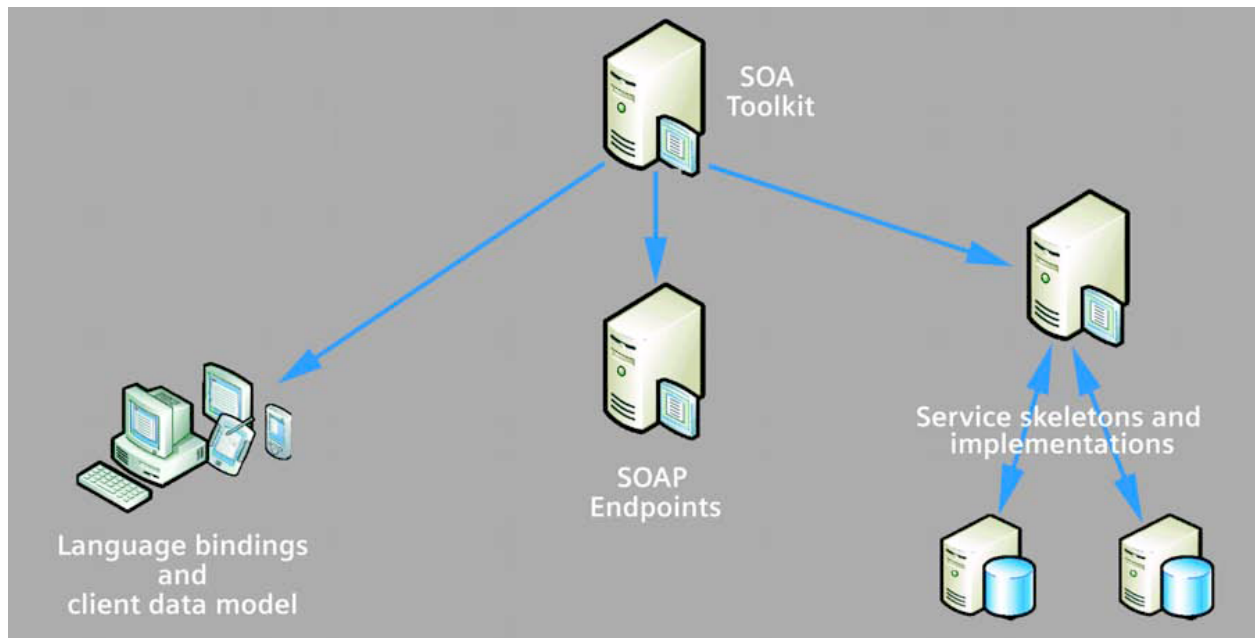
To address current rising IT requirements, Siemens PLM Software has developed an SOA infrastructure for Teamcenter. Teamcenter is industry's most widely used PLM solution with an integrated suite of applications that leverage technologies such as 3D visualization, community collaboration, supplier management and collaborative product data management (cPDM) to drive business productivity. Teamcenter's SOA services provide a new coarse grained interface to Teamcenter's Business Logic Server.

Teamcenter SOA framework enables customers to integrate Teamcenter capabilities into existing business process and create task specific programs. This framework also can be used to publish Teamcenter managed information in any legacy or new client, portals or executive dashboards. It also allows to integrate all external (CAD/other office tools) applications to Teamcenter thus enabling single cohesive platform to manage product data and thus justifies the term "**Right knowledge at Right Time to Right People**".

SOA - An Overview

Service-oriented architecture (SOA) is a software design and software architecture design pattern based on distinct pieces of software providing application functionality as services to other applications. This is known as service-orientation. It is independent of any vendor, product or technology.

A service is a self-contained unit of functionality, such as retrieving an online bank statement. Services can be combined by other software applications to provide the complete functionality of a large software application. SOA makes it easy for computers connected over a network to cooperate. Every computer can run an arbitrary number of services, and each service is built in a way that ensures that the service can exchange information with any other service in the network without human interaction and without the need to make changes to the underlying program itself.



Salient Features

- Appropriate functional granularity appropriate to the task at hand.
- Separation of the interface definition from its implementation.
- Support for the concept of service providers and service consumers who are distinct from each other.
- Standards-driven compliance.

Teamcenter's SOA services

Teamcenter's SOA is a coarse-grained API that openly exposes Teamcenter's Business Logic Server capabilities to Web Services, as well as to language specific programs. This provides an ideal solution for enabling a wide range of applications to access your Teamcenter environment's product design, development & process information. Teamcenter itself functions as the engine and repository that connects all of your environment's design and product development information in a flexible and loosely coupled manner – while providing your entire global environment with a single point of access to these connected assets.

Advantage

Organizations that adopt Teamcenter's SOA gain the advantages inherent in the use of a consistent, comprehensive set of interfaces that leverage Teamcenter's powerful product design and development services. Regardless of what language you use to call these services (and that choice is entirely up to you), the business logic and results received from Teamcenter's SOA will be the same. You no longer need to worry about your project teams' skill sets or any language-related dependencies. Teamcenter's SOA provides a single set of entry points for use by all clients and applications.

As new services are exposed via Teamcenter's SOA, they will be immediately available in all supported programming languages, as well as through industry standard WSDL.

Teamcenter's SOA - Introduction

Teamcenter's SOA functionality is built upon a framework consisting of the entire client and service infrastructure that contributes to consistent, reliable and high performance interaction between the application clients, service consumers and Teamcenter Business Logic Server.

This framework enables application developers to concentrate on creating specific business functionality rather than worrying about the low-level communications and data management activities going on beneath them.

Teamcenter's SOA characteristics reflect two additional factors:

- Messaging via standard protocols
- Message content formats

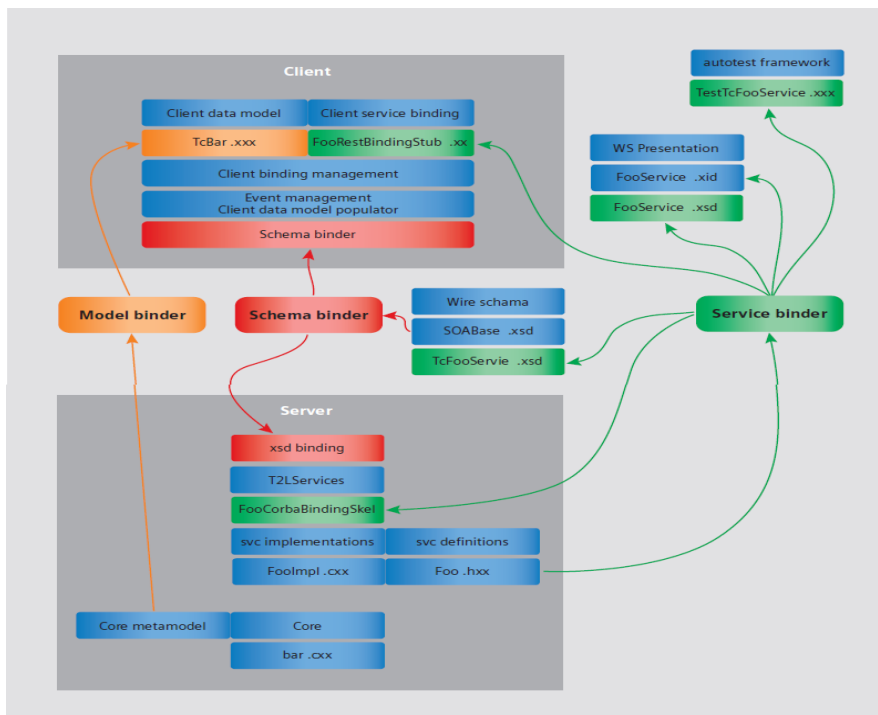
Like the implementations of most service oriented architectures, Teamcenter's SOA uses standard HTTP/S communications protocols to send XML documents back and forth between the service provider and the service consumer. Use of these standards contributes to the openness, flexibility and scalability necessary for both the local and global deployment of Teamcenter. It is this open, standards-based messaging environment that allows service providers and service consumers to be implemented in differing technologies while retaining their interoperability.

This messaging environment also allows existing applications in one technology to be quickly adapted so that they can interact with newer and richer technologies and programming languages – which helps your company preserve its investments in existing programs and processes. As a result of this flexibility, you can incrementally enhance your product design and development environment at a speed that virtually matches your business' real-world evolution. This alignment is largely facilitated by the arms-length, loosely coupled relationship that exists between service providers (like Teamcenter's Business Logic Server) and service consumers (like Teamcenter clients, CAD systems, Microsoft Office and your own portal and dashboard applications).

Teamcenter's SOA - A technical look

Teamcenter's SOA consists of the following client-side and server-side components that follow well-defined patterns using standards-based protocols, languages and data formats.

- SOA Framework provides the communications and infrastructure functionality that enables application developers to concentrate on creating business solutions rather than dealing with underlying communications/messaging issues.
- SOA Language Bindings provide language-specific functions (.NET, C++, and Java) used by service consumers to invoke an SOA service and properly handle the ensuing response.
- SOA Client Data Model (CDM) and Data Model Manager provide managed type-safe storage on the service consumer side for all data returned by service responses from Teamcenter's Business Logic Server.
- SOA Toolkit provides tools that enable Teamcenter developers to auto-generate all of the artifacts necessary for exposing new Teamcenter business logic as SOA services.



(Courtesy : Siemens PLM Software)

Teamcenter's SOA service areas

Teamcenter's SOA services are organized into the following six functional areas.

- Platform
- Application support
- Applications
- Application integration
- System administration
- System definition

Conclusion

By applying an effective SOA to their PLM processes, companies can support more business capabilities, reduce IT complexity and accelerate IT implementation – as well as re-use more applications (via web services) and better align their PLM initiatives with other business activity.

Teamcenter's SOA services provide a robust, flexible and highly-scalable interface into your digital design and development processes and their related information assets. The SOA's secure, WAN-friendly and firewall-friendly attributes are especially appropriate for meeting the most rigorous demands of both large and small companies.