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**JAVA™**



JavaOne  
Sun and Network on Business Systems

# Composable Web Services Using Interoperable Technologies From Sun's Project Tango

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**TS-4661**

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[java.sun.com/javaone/sf](http://java.sun.com/javaone/sf)

# Goal of This Session



Learn about Sun's "Project Tango" and see how it will enable the next generation of Web Services.

# Agenda

What is “Project Tango”?

What should developers know?

What are the key deliverables?

Programming model

Roadmap

Call to Action

Resources

# Agenda

## What is “Project Tango”?

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# Project Tango... Background

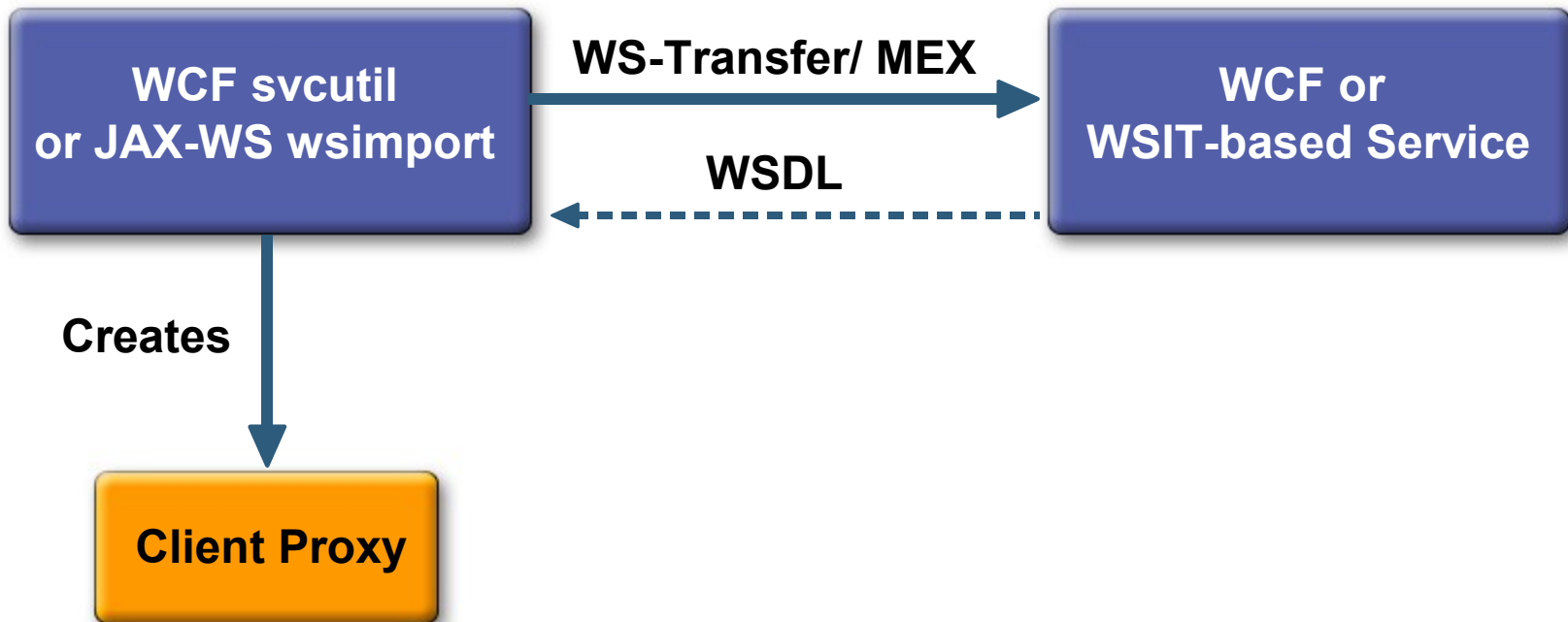
- Goal
  - Deliver next-generation Web Services technologies enabling first-class interoperability between Sun's Java™ Technology Products and Windows Operating environments supporting WCF[1]
- Implementation strategy
  - Build on Java API for XML-based Web Services (JAX-WS) and Java™ Architecture for XML Binding (JAXB) technologies
  - Work closely with Microsoft and perform product-level testing
  - Build an active Open Source community centered around the Project GlassFish community

[1] Windows Communications Foundation aka "Indigo"

# Project Tango Features

- Bootstrapping Communication
- Optimizing Communication
- Enabling Reliability
- Enabling Atomic Transactions
- Securing Communication

# Bootstrapping Communication



# Optimizing Communication

- Wire format optimization (MTOM/XOP)
  - Transmit binary data as MIME attachments
  - Transparent to the application
- Security optimization (WS-SecureConversation)
  - Establish shared context on multi-message exchange
  - Use context to generate derived keys on subsequent msgs
  - Increases security and performance



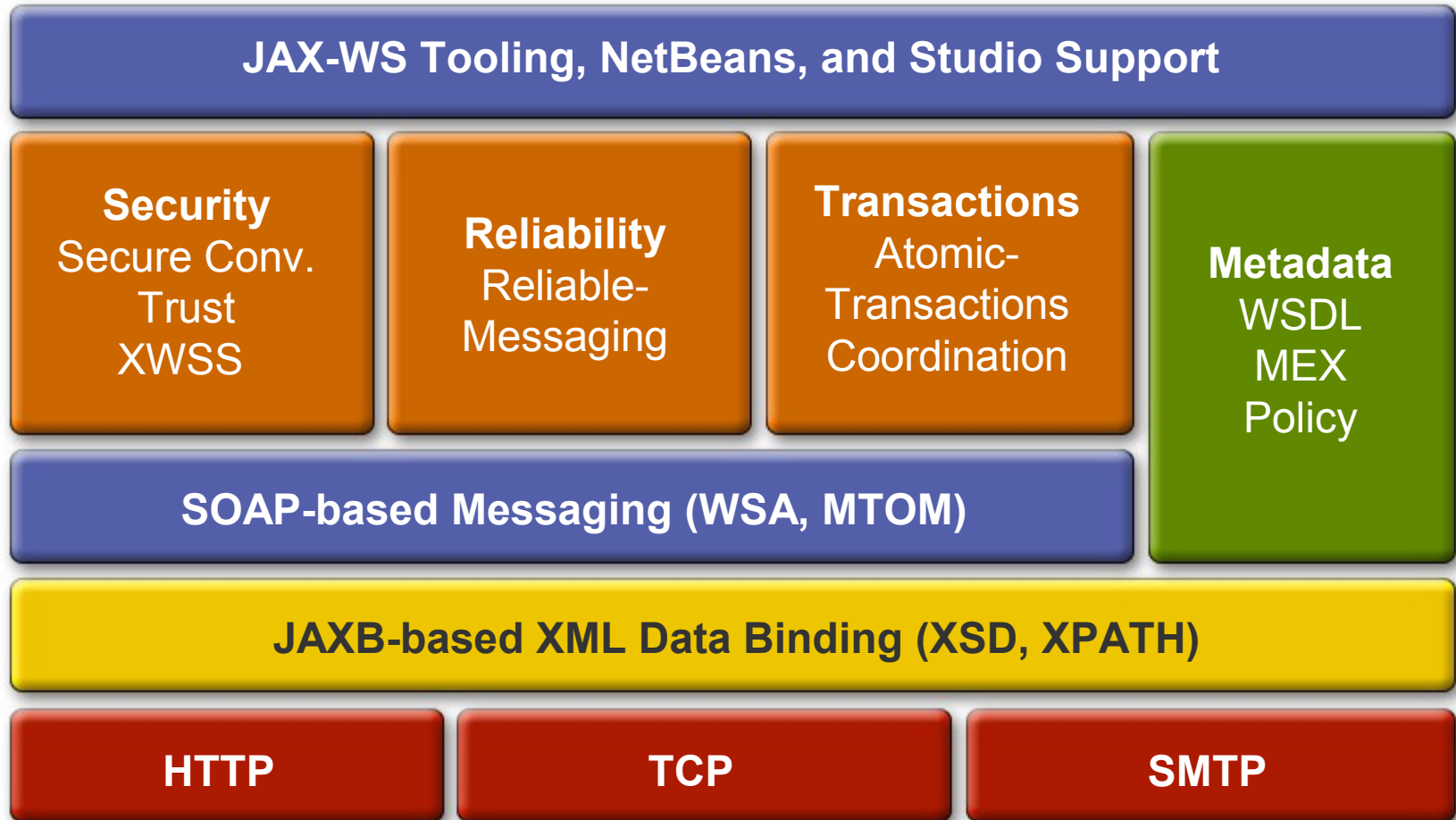
# Enabling Reliable Messaging

- **WS-ReliableMessaging**
  - Recovery from messages lost or misordered in transit
  - Transparent to application
- **Enabling Atomic Transactions**
  - WS-Coordination and WS-AtomicTransactions
  - All operations in TX boundary succeed or rollback
  - New to Web Services

# Securing Communication

- **WS-Security**
  - Web Services previously only point-to-point via SSL
  - Now end-to-end by encrypting/signing message before transport
- **WS-Trust**
  - Establish and broker trust relationships
  - Issuing, renewing, validating security tokens used by WS-Security

# Layered View



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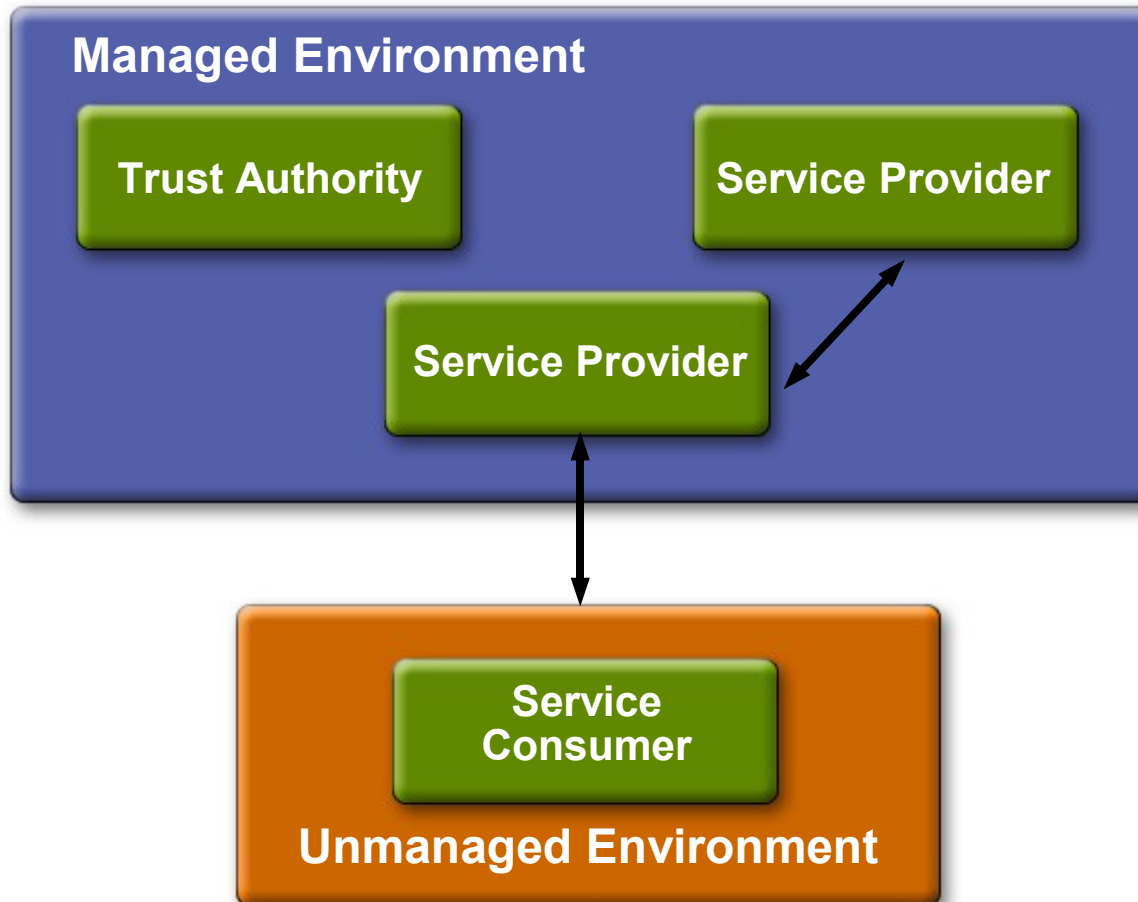
# Core WS\* Concepts

- Service opacity
  - Information hiding
- Configurable stack
- Wire-protocol centric
  - Minimal assumptions about end nodes
- Service isolation
  - Independent Service design, development, deployment, and versioning
- Message oriented
  - Long-lived messages
  - Transient MEPs

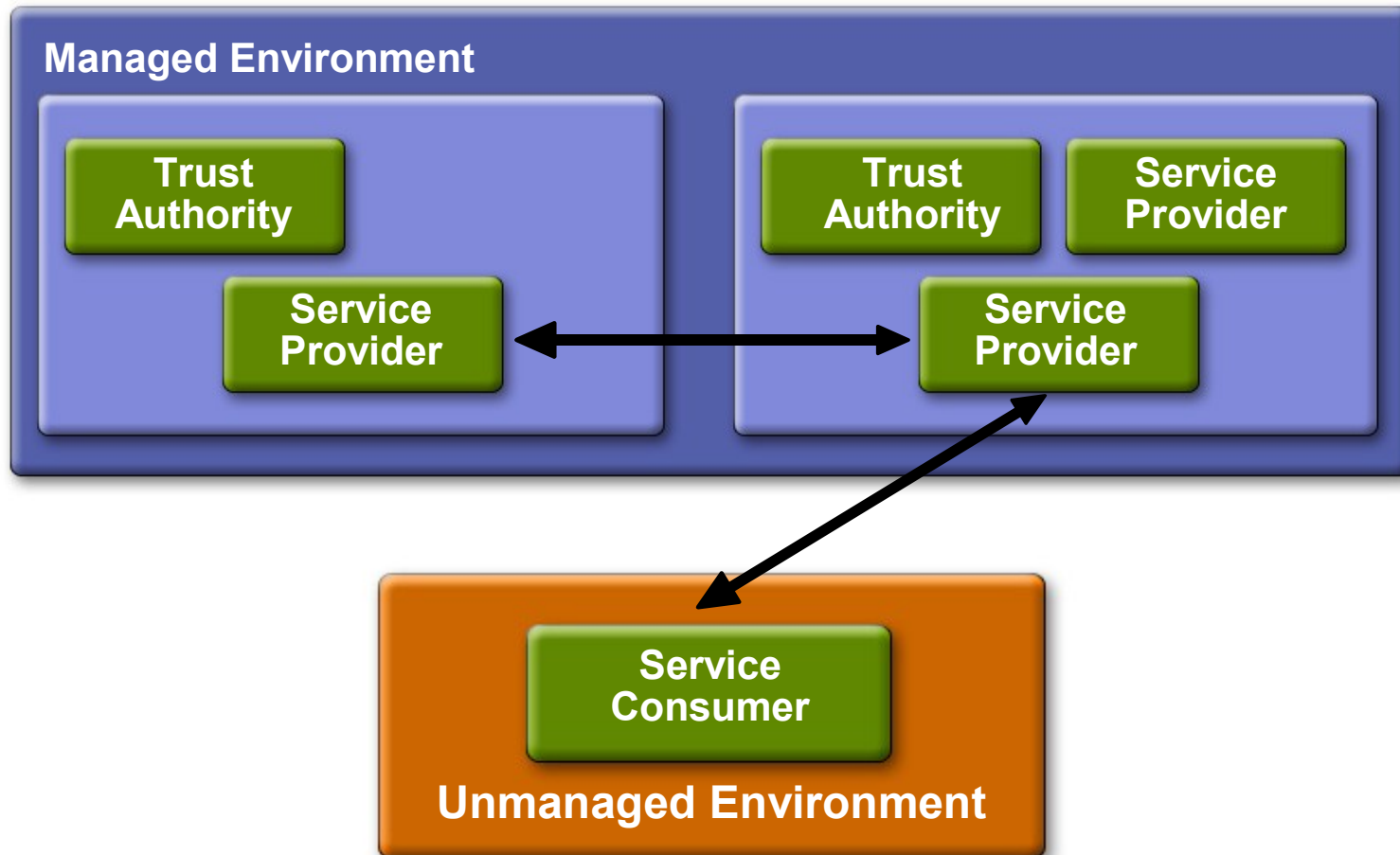
# Levels of Interoperability

- Transport Bindings
  - HTTP, SMTP, TCP, and others
- Data bindings
  - XSD-based Type mappings (early and late binding)
  - Common encoding schemes
- Common Infosets
- Language-agnostic wire protocols
- Common policy vocabularies
- Security and Trust models
- Common application semantics

# Homogenous Service Integration



# Heterogeneous Service Composition





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# Relevant Specifications

- Messaging
  - WS-Addressing, MTOM
- Metadata
  - WS-MetadataExchange, WS-Policy, WSDL
- Security
  - WS-SecurityPolicy, WS-SecureConversation, WS-Trust, WS-Security
- Reliability
  - WS-ReliableMessaging
- Transactions
  - WS-Coordination, WS-AtomicTransaction

# Web Services Interop. Tech. (WSIT)

- Phase I:
  - Priority is early delivery of implementations of a select set of WS\* specification
    - WSA, MEX, Trust, Secure Conversation, RM, Policy
  - Community development and technical evangelism
    - Visible Development in Project GlassFish
- Phase II:
  - Deliver additional enterprise class WS\* technologies
    - Transaction, Coordination
  - Produce and Analyze performance benchmarks
  - Align with Java Platforms and Sun Tools

# Project Tango Deliverables on Java.net

- WSIT\* 1.0 EA  
(JavaOne<sup>SM</sup> 06)
  - Basic Messaging
    - JAX-WS 2.0.1 EA
    - JAXB 2.0.1 EA
    - WS-ReliableMessaging
    - WS-Addressing
  - Tooling
    - NetBeans plugin
  - Meta Data
    - WS-MetaData Exchange
    - WS-SecurityPolicy
    - WS-Policy

- Security
  - WS-SecureConversation
  - WS-Trust
  - WS-Security
- WSIT 1.x EA  
(post JavaOne 06)
  - WS-AtomicTransaction
  - WS-Coordination

\* Web Services Interoperability Technology

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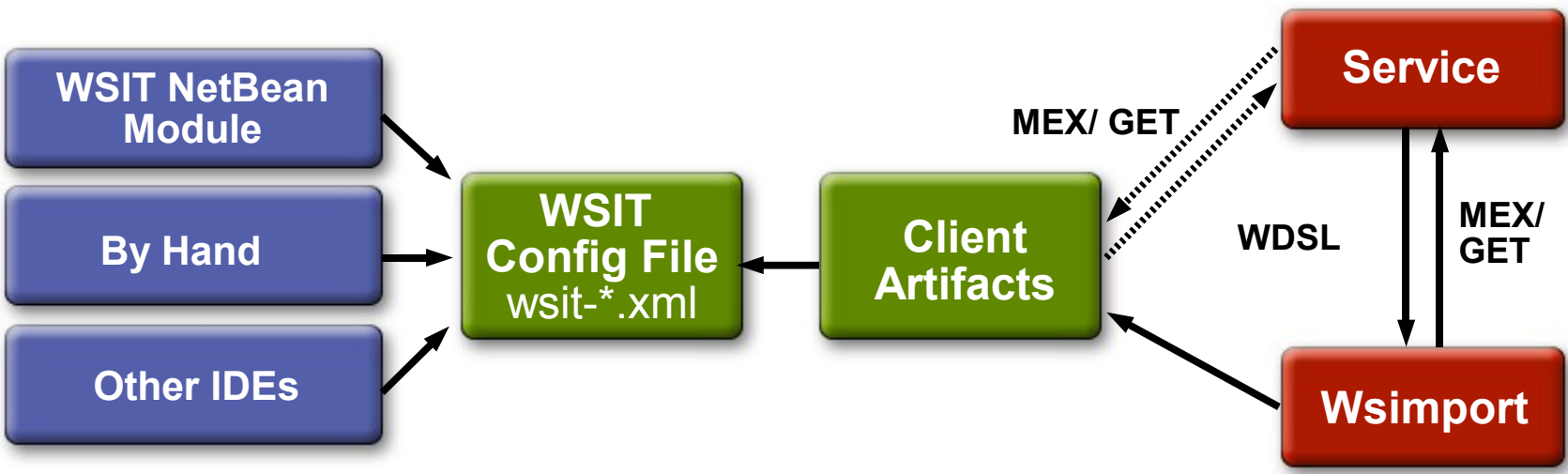
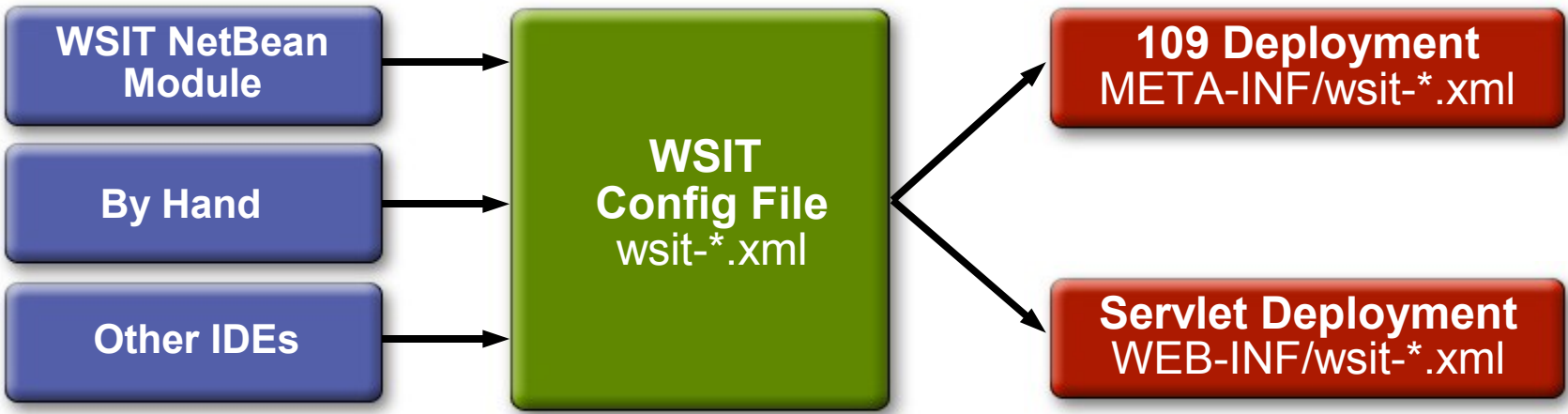
Call to Action

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# WSIT Programming Model

- **No runtime APIs** for Project Tango
- Developer writes consumers/providers via JAX-WS and EJB APIs
- Developer/deployer supplies **config file** to enable/control Project Tango components
- Config file written by hand or produced by Project Tango NetBeans™ module

# Summary of WSIT Programming Model



Security | Messaging

- [-] Security Binding Configuration
  - [-] Token configuration
  - [-] Other binding attributes
- [-] Targets to sign and encrypt
- [-] Client/Service WSS Requirements
  - WSS Version: 1.1
  - Key Identifier References
  - Issuer Serial References
  - External URI References
  - Embedded Token References
  - Thumbprint References
  - EncryptedKey References
  - Signature Confirmation
- [-] Client/Service Trust Requirements
  - MustSupportClientChallenge
  - MustSupportServerChallenge
  - MustSupportIssuedToken
  - RequireClientEntropy
  - RequireServerEntropy
- [-] Advanced Configuration
  - Timestamp Freshness Limit:
  - Maximum Clock Skew:
  - Maximum nonce age:



# Implications for Developers of Java-based Applications

- Sun has worked hard to minimize impact (if any) on existing APIs, e.g., JAX-WS and JAX-B
- Enterprise developers (Java EE) will see no changes in their programming model
- Interoperability with WCF should be achievable with minimal pain
- Performance issues are being looked at very closely and the relationship between Fast Infoset, TCP-bindings and Project Tango is getting particular attention

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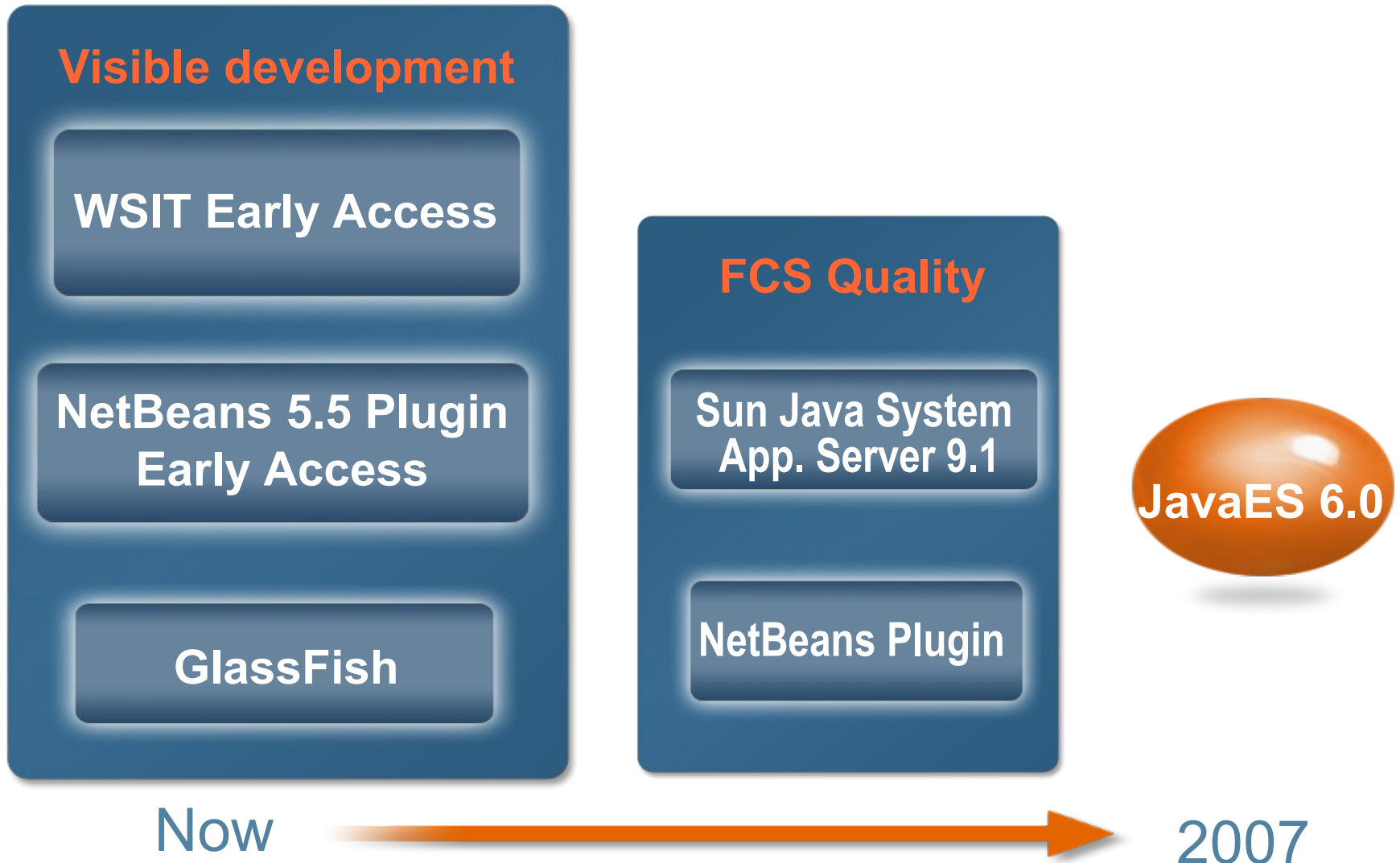
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# Technology and Product Delivery Plans



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# Call to Action

- Test Drive Web Services Interoperability
  - [java.sun.com/webservices/interop](http://java.sun.com/webservices/interop)
- WSIT (whiz-it): Download! Contribute!
  - [wsit.dev.java.net](http://wsit.dev.java.net)
- Get the FREE GlassFish Open Source App Server
  - [java.sun.com/javaee/glassfish](http://java.sun.com/javaee/glassfish)
- Download NetBeans Module
  - [websvc.netbeans.org/wsit](http://websvc.netbeans.org/wsit)
- Visit “The Aquarium”—Virtual watercooler for WSIT and GlassFish
  - [Blogs.sun.com/theaquarium](http://Blogs.sun.com/theaquarium)

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# For More Information

## Don't Miss:

- TS-3473
- TS-1603
- BOF-2477
- BOF-2953
- Hands-on Lab
- Q&A @ Argent Hotel

# Project GlassFish



Supports > **20** frameworks and apps

**Open source** CDDL license

Basis for the **Sun Java System Application Server PE 9**

**Free** to download and **free** to deploy

Over **1200** members and **200,000** downloads

Integrated with **NetBeans** module

[Java.sun.com/javaee/GlassFish](http://Java.sun.com/javaee/GlassFish)

## Building a Java EE 5 Open Source Application Server



# Summary

- WSIT is the work product of Project Tango
- Initial focus is WCF interop
  - As specs mature focus will broaden
- Java.net and visible development Key to Project Tango's strategy to engage developers

# Q&A

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