



# Takes 2 to Tango Java and .NET Interoperability

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# Agenda

- What is Metro ?
- Features
- Community
- Roadmap
- Reference

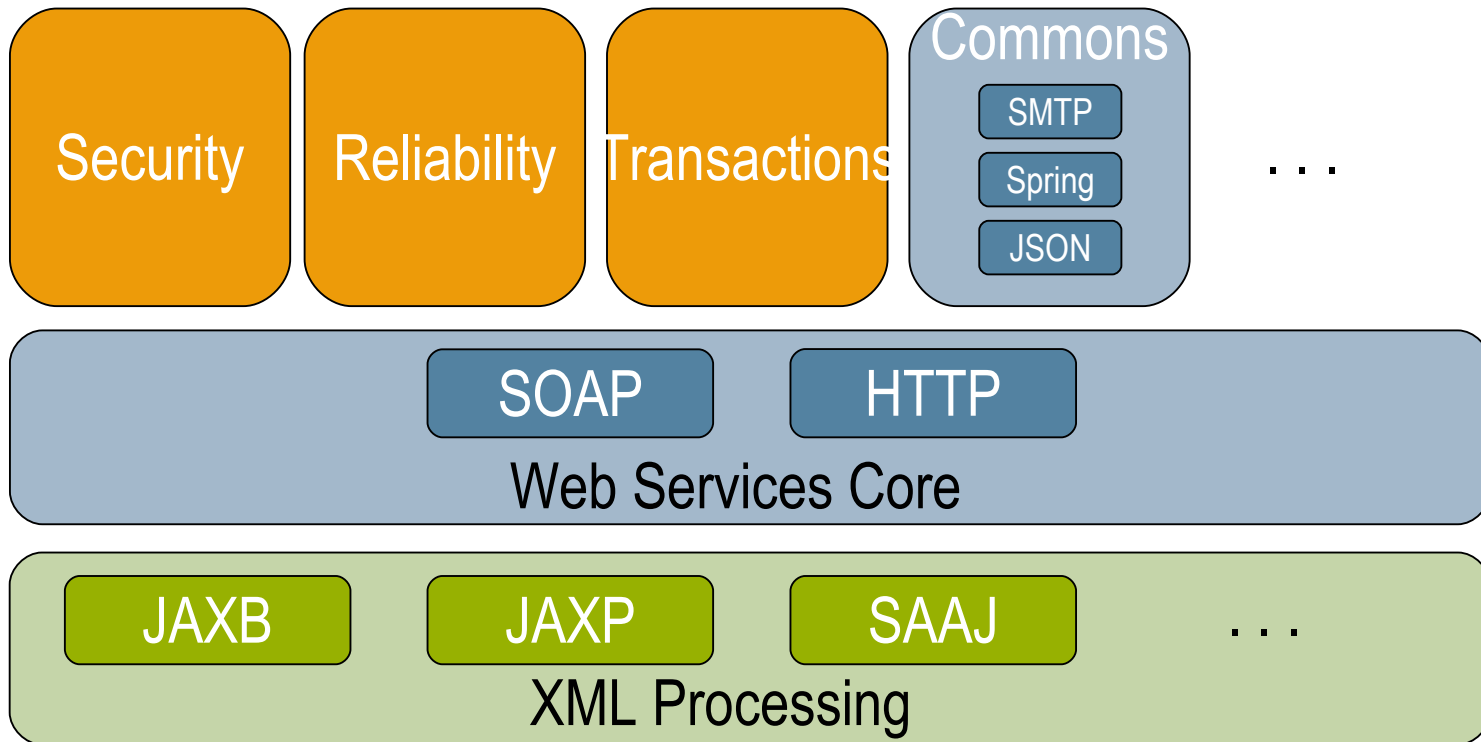
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- **What is Metro ?**
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# What is Metro ?

- Web Services stack from GlassFish community
- High-performance and production-quality one stop shop for all Web service needs
- Metro = JAX-WS “RI” + WSIT/Tango
- JAX-WS RI provides Core Web services support
  - > Extensible and pluggable architecture
- WSIT/Tango provides support for Security, Reliability, Transactions and Interoperability with .NET 3.0

# Metro Overview



**Metro – GlassFish Web Services Stack**  
[metro.dev.java.net](http://metro.dev.java.net)

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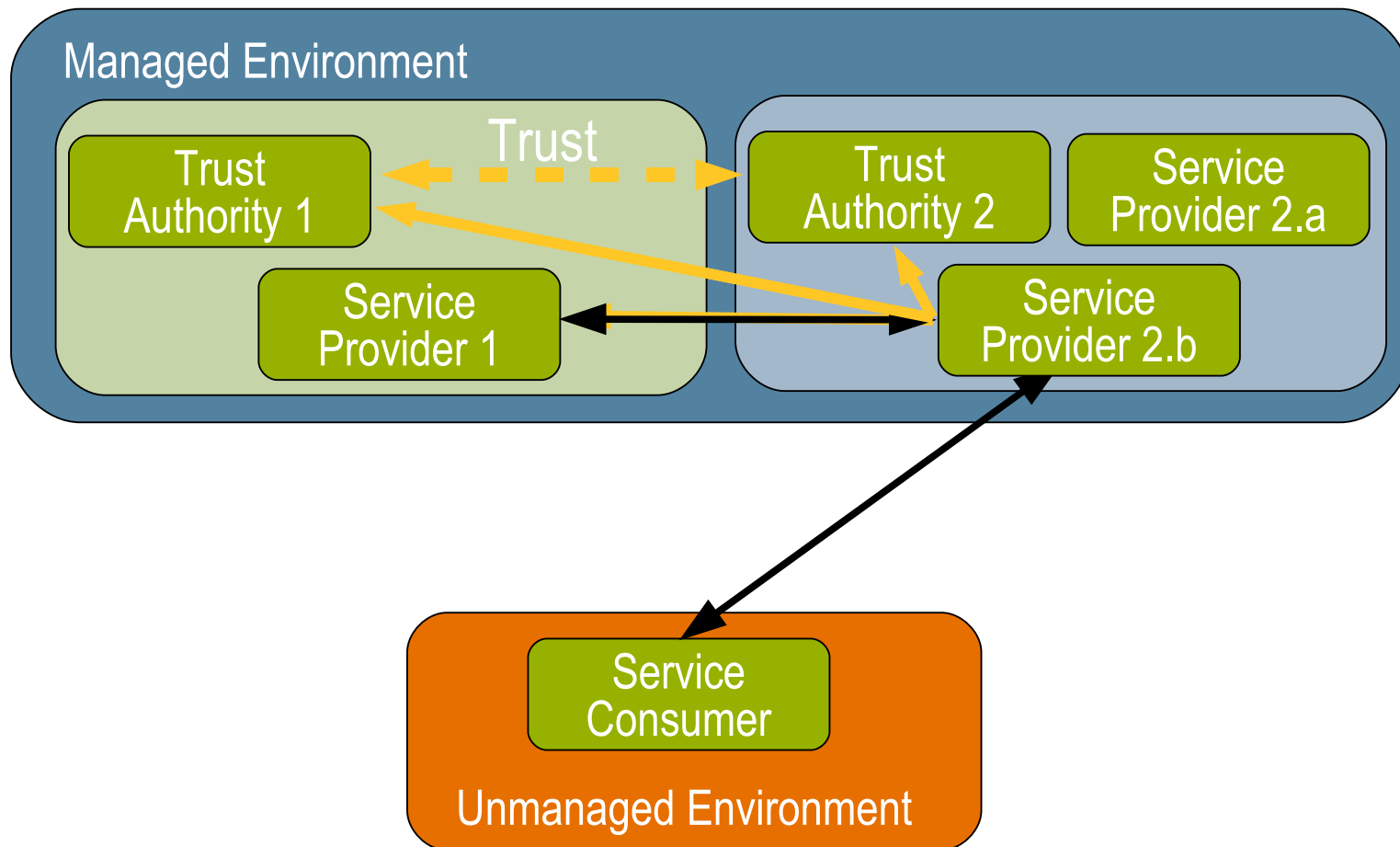
# Metro Features

- JAX-WS 2.1: Easy to use Web services API
  - > Replaces JAX-RPC
- Embrace POJO concepts via annotations
  - > Descriptor-free programming
- Protocol and Transport Independence
- Integrated data binding via Java API for XML Binding (JAXB)
  - > 100% XML Schema Support

# Metro Features

- End-to-end Security
  - > Point-to-point and Message-based
  - > Partial integrity and confidentiality
  - > Brokered trust relationships can be established

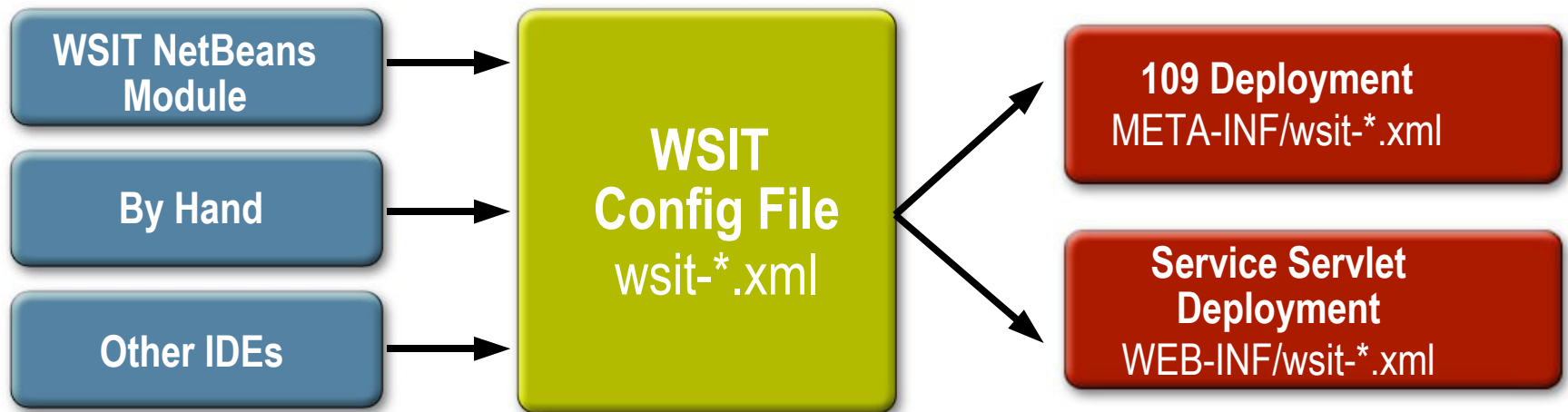
# Composite Service



# Metro Features

- Protocol-based Reliability
  - > Recovery from lost or mis-ordered messages
  - > Enable use of multiple transports
- Transactional Web services
  - > Same as EJB/RMI-IIOP Transactions
  - > All operations in TX boundary succeed or rollback

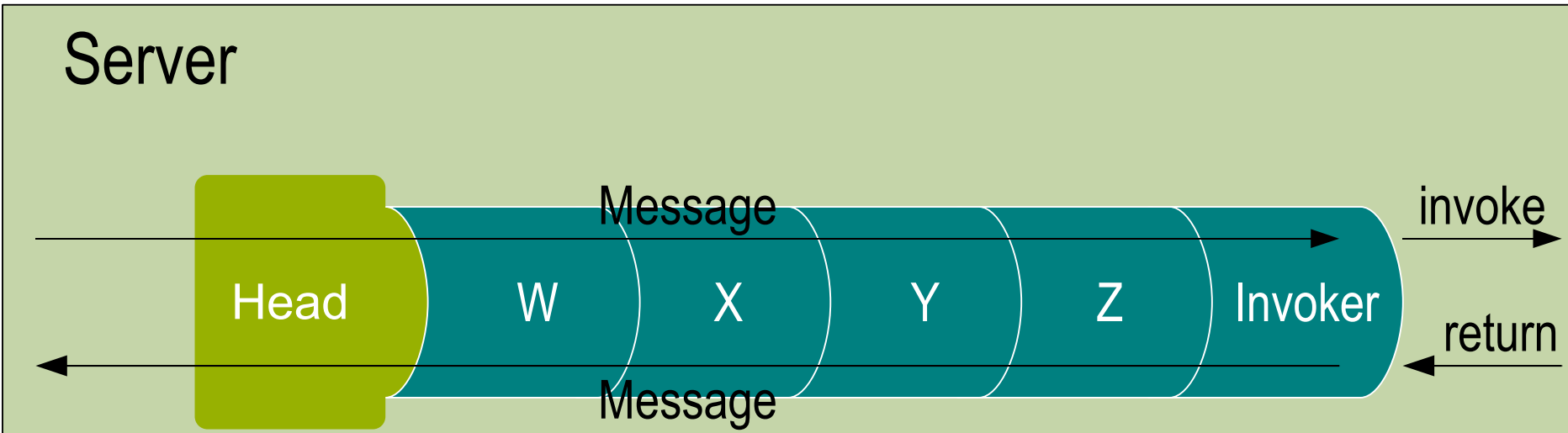
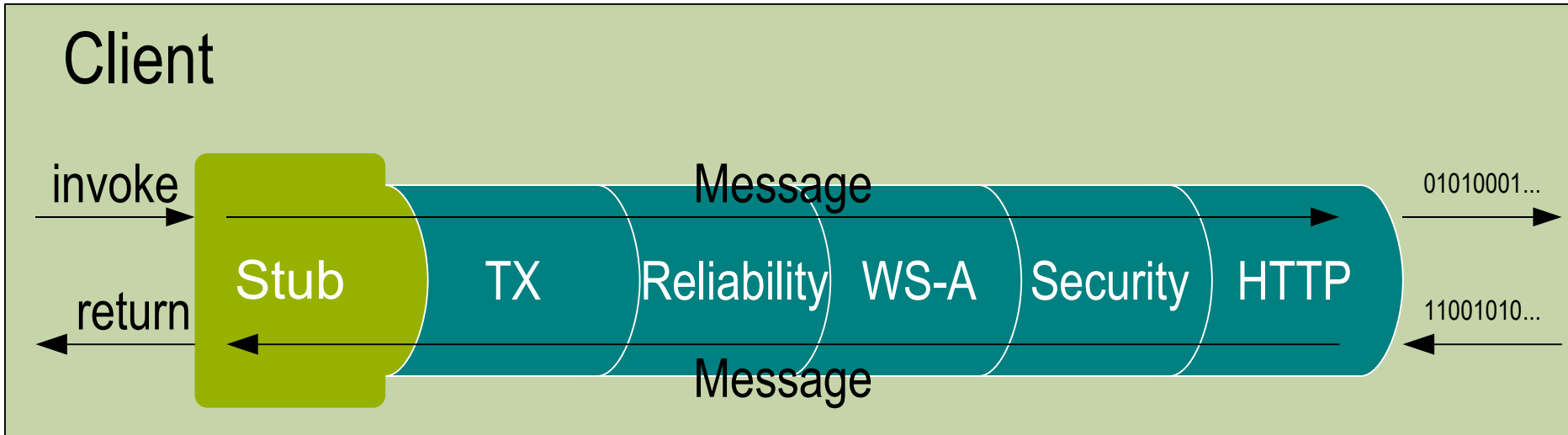
# Server-side Programming Model



# Demo

## Ease-of-use with NetBeans 6 IDE

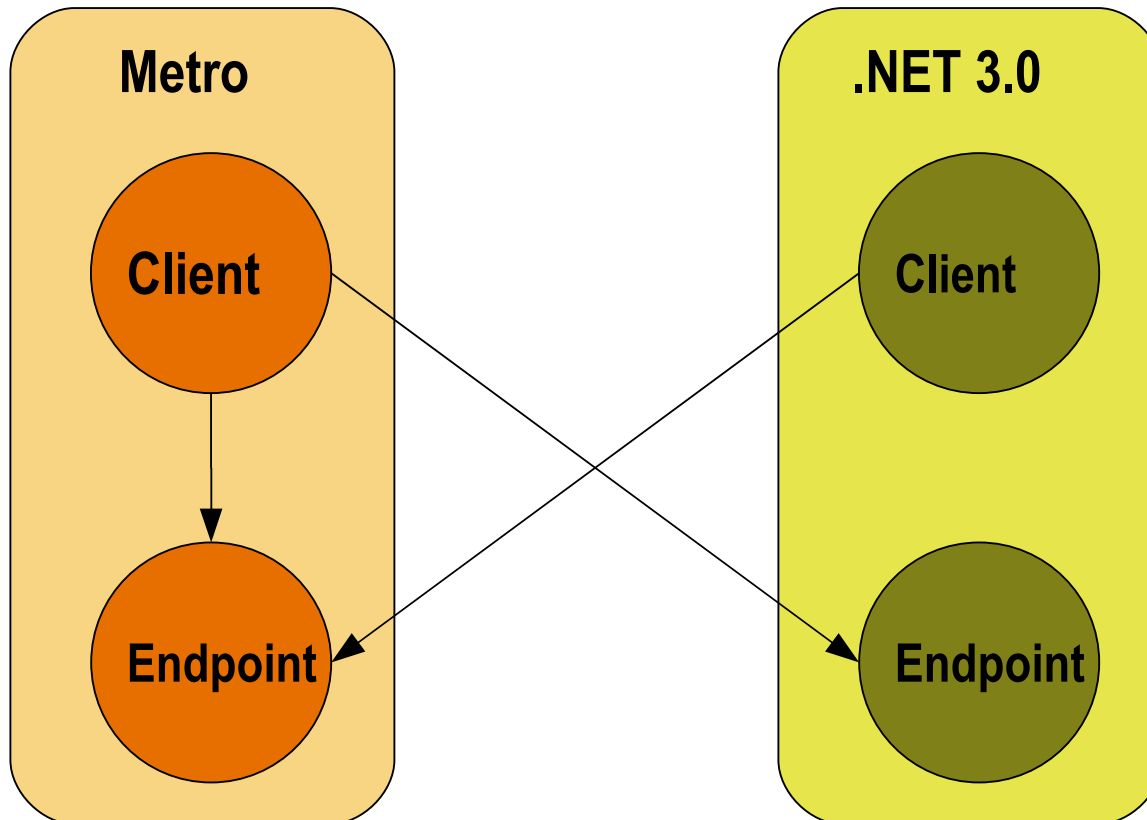
# Processing Pipeline



# Metro Interoperability

- Standards Compliant
  - > JAX-WS 2.1 & JAXB 2.1
  - > W3C SOAP 1.1/1.2, WSDL 1.1, WS-Addressing, MTOM
  - > WS-I Basic Profile 1.x, SSBP 1.0, AP 1.0
- .NET 3.0 interoperable
  - > WS-\* specs used by .NET 3.0
    - Reliable Messaging, Secure Conversation, Trust, Security, SecurityPolicy, MetadataExchange, Atomic Transaction, Coordination, Policy
  - > Secure, Reliable, Transactional

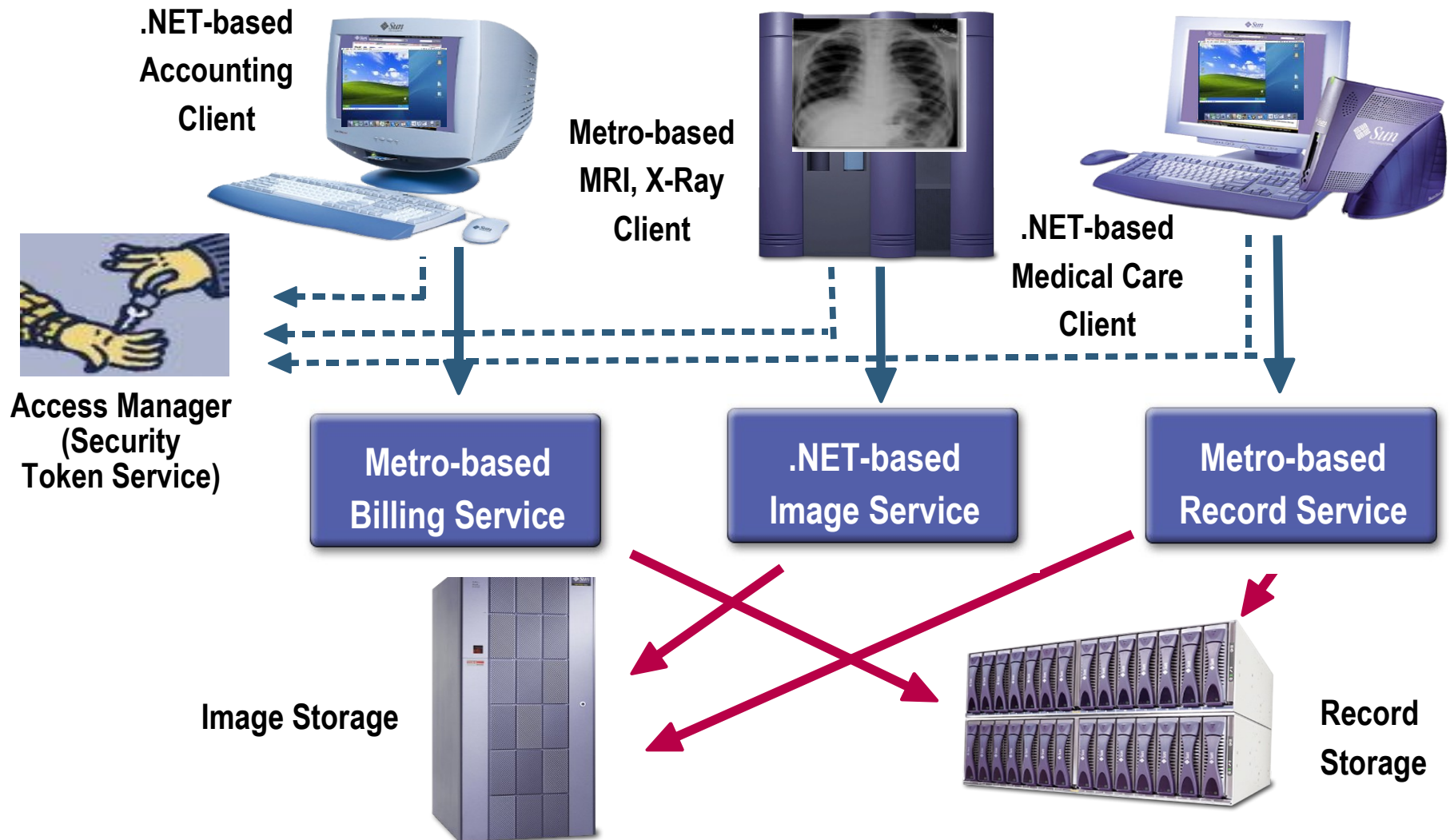
# Metro Interoperability



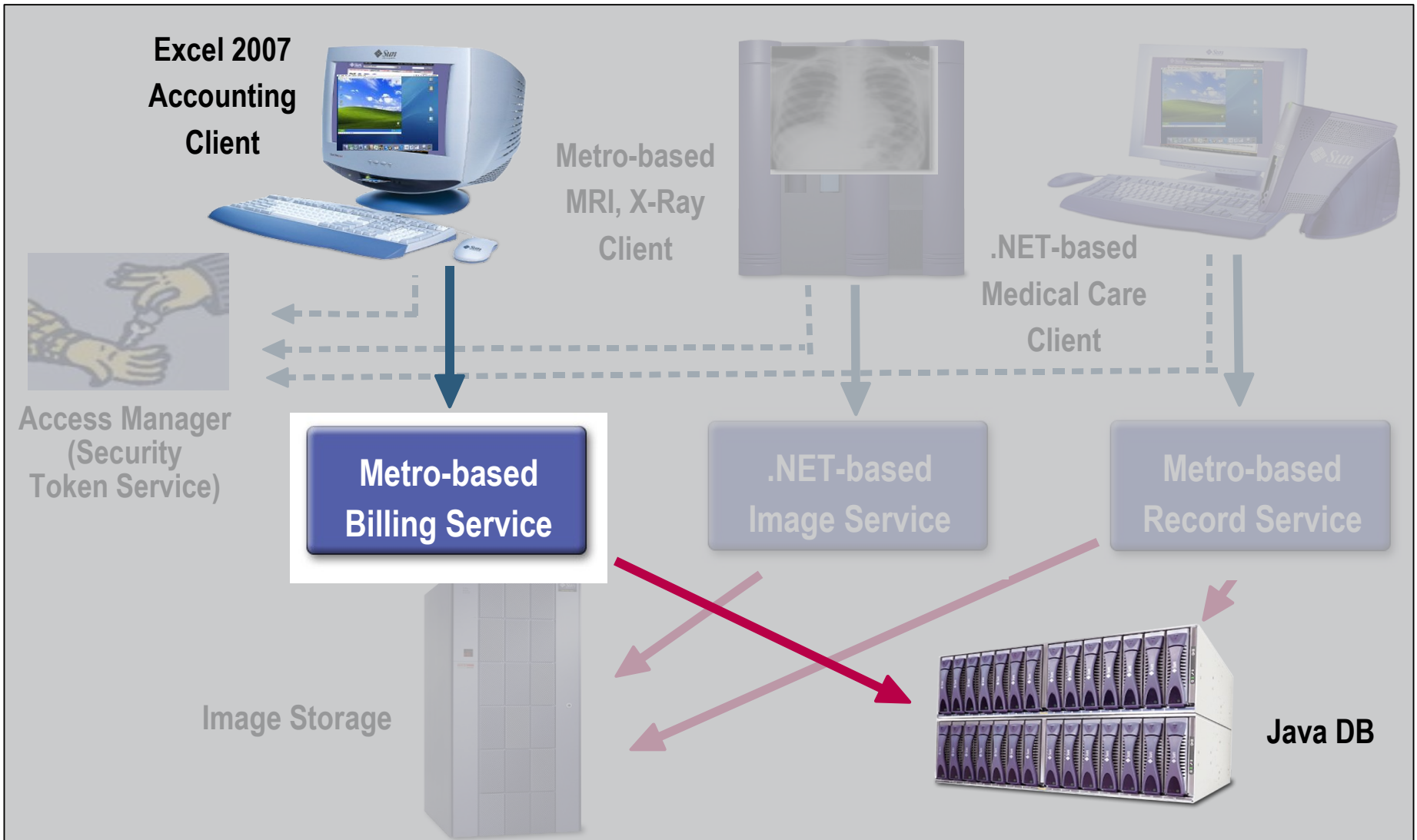
# Metro Runtime & Tools

- Containers (runtime)
  - > Integrated in GlassFish V2 and V3
  - > Light-weight HTTP server (Java SE 6)
  - > JBoss WS 2.1.0, BEA WLS 10, IBM JDK Version 6, TmaxSoft JEUS, Tomcat, Jetty
  - > Any Servlet-2.4 container
- Development Tools
  - > Command-line: wsimport, wsgen
  - > NetBeans IDE
  - > Maven plugins
  - > Eclipse (SOAP UI plugin)

# Demo Scenario: Health Care System



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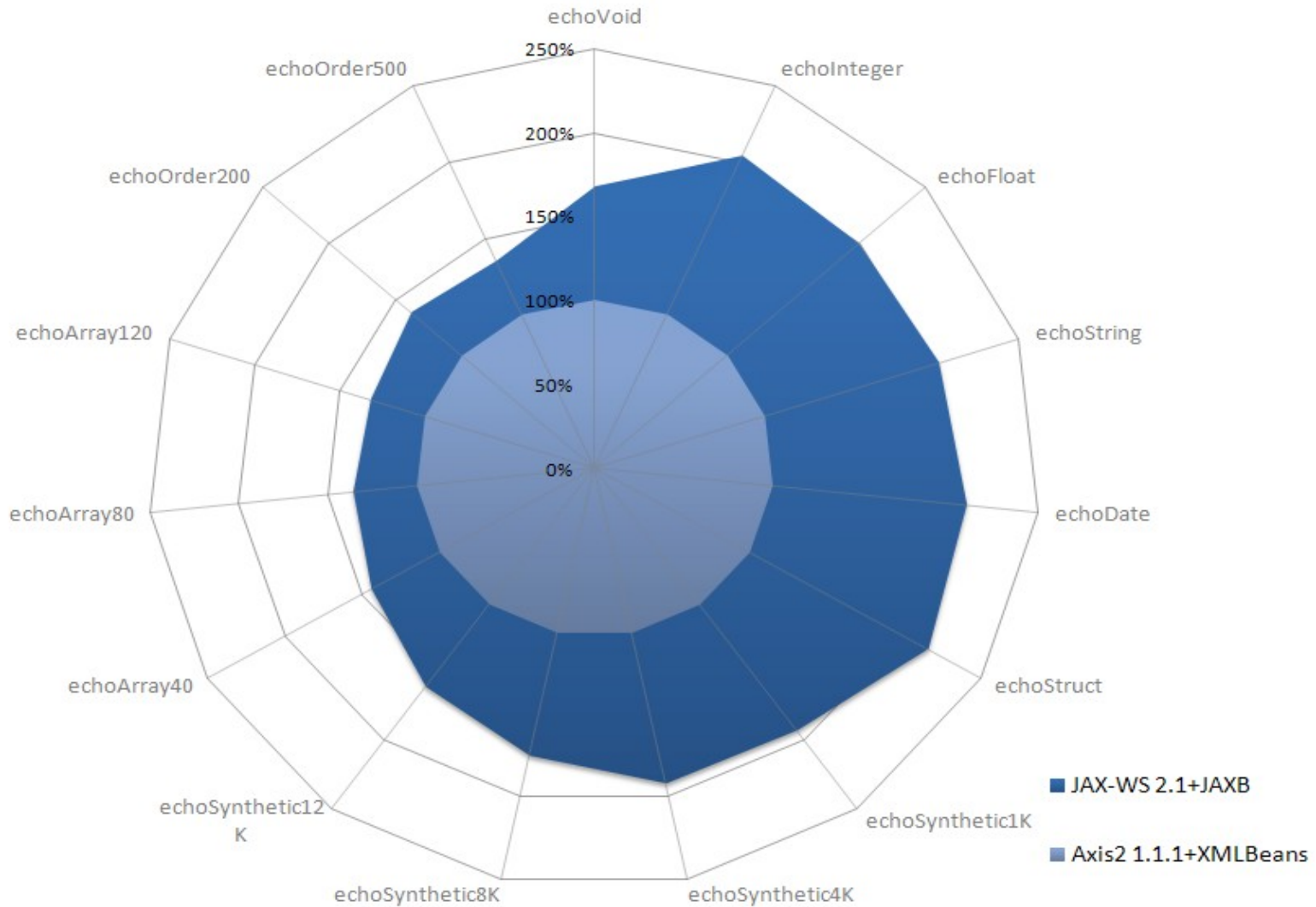
# Demo

## Excel to Sun Storage using Metro

# Performance

- Ran benchmark tests with JAX-WS 2.1 RI against Axis2 1.1.1
- Depending on the data size JAX-WS RI is 30% - 100% faster
- Details
  - > [http://weblogs.java.net/blog/kohsuke/archive/2007/02/jaxws\\_ri\\_21\\_ben.html](http://weblogs.java.net/blog/kohsuke/archive/2007/02/jaxws_ri_21_ben.html)

# Performance



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# Community

- Visible development at java.net
  - > metro, jax-ws, wsit, jax-ws-commons
  - > Continuous testing using Hudson
- Fully Open-source
  - > CDDL and GPL v2 license
  - > Source code, Emails, Forums
- Light-weight committer process to encourage external contributions
- Features driven by users and community
  - > Spring, SMTP, JSON, Stateful Web service, etc.

# Adoption

- BEA Web Logic Server 10
- JBoss WS 2.1.0
- IBM JDK Version 6
- Salesforce.com for APEX 8.0 toolkit
- Many others ...
  - > TmaxSoft, Worldspan, MailVision Ltd., MyUniPortal, Nortrop Grumman Corporation, Cordys, SLIB, Expeditors International, Cast Iron Systems, Covergence, National Science Foundation, etc.

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# Roadmap

- Metro 1.0
  - > Released with GlassFish V2
  - > Standalone download bundle
- Future plans
  - > Better REST support through JAX-RS (JSR 311)
  - > JMX agent for server (metrics, health of the system etc)
  - > XMPP Transport
  - > Very large attachment support
  - > Align with .NET 3.5
    - Update to standard version of WS-\* specs

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- Metro
  - > [metro.dev.java.net](http://metro.dev.java.net)
  - > [users@metro.dev.java.net](mailto:users@metro.dev.java.net)
  - > <https://forums.java.net/jive/forum.jspa?forumID=46>
  - > <http://feeds.feedburner.com/MetroBlogs>
- GlassFish ([glassfish.java.net](http://glassfish.java.net))
- TheAquarium ([blogs.sun.com/theaquarium](http://blogs.sun.com/theaquarium))

# Appendix

# Abstraction of SOAP Message

