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001A: ♦ 7+ Java integration styles & patterns interview questions & answers

Posted on [August 28, 2014](#) by [Arulkumaran Kumaraswamipillai](#)

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Architectural and integration style diagrams with 5 questions frequently asked in Java job interviews. The depth of the answers you provide with diagrams and design alternatives will go a long way.

[Part-2: Java architecture Interview Questions & answers Q3 – Q7 with conceptual diagrams](#)

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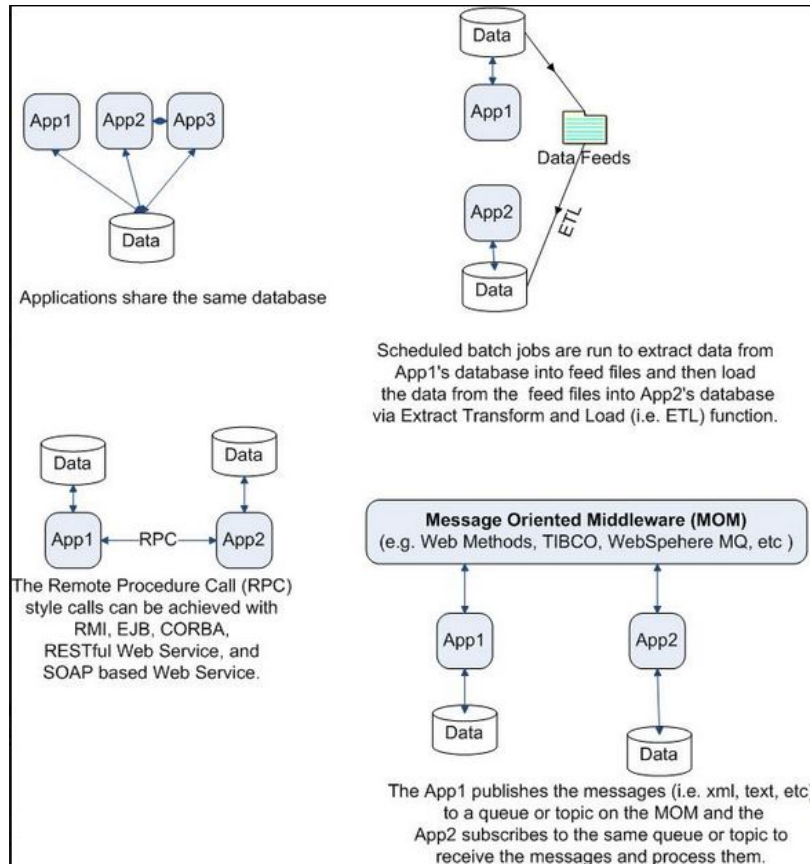
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Q1. What are the different application integration styles?

A1. There are a number of different integration styles like

1. Shared database
2. batch file transfer
3. Invoking remote procedures (RPC)
4. Exchanging asynchronous messages over a message oriented middle-ware (MOM).



Integration Styles

Q2. How does a Java EE application integrate with other systems?

A2. Using various protocols like HTTP(S), SOAP, RMI, FTP, TCP, proprietary, etc.

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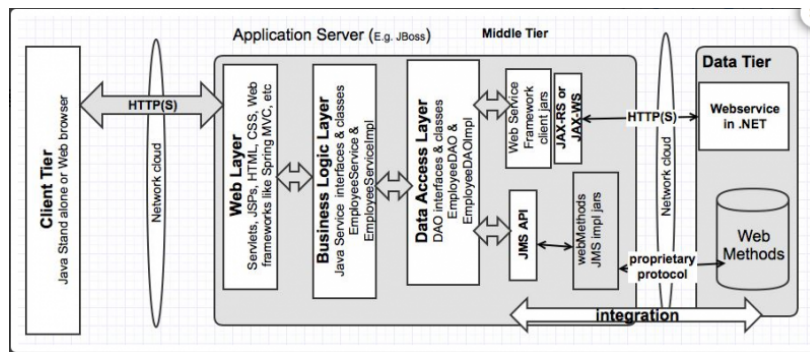
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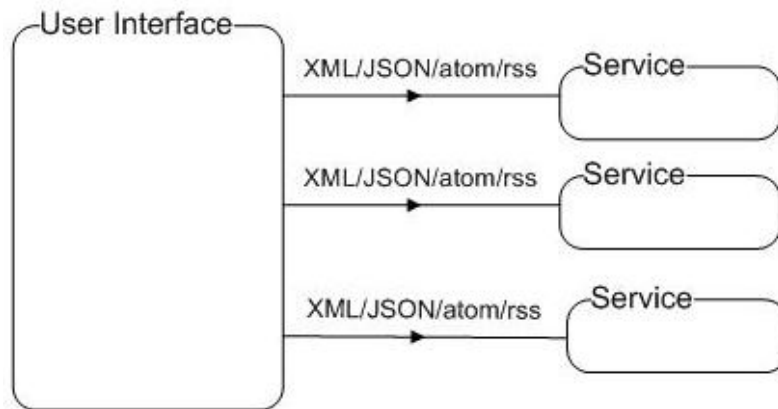
- Can you write code? (1)
- Complete the given code (1)
- Converting from A to B (1)
- Designing your class (1)
- Java Data Structures (1)
- Passing the unit tests (1)
- What is wrong with this code? (1)
- Writing Code Home Assignment (1)
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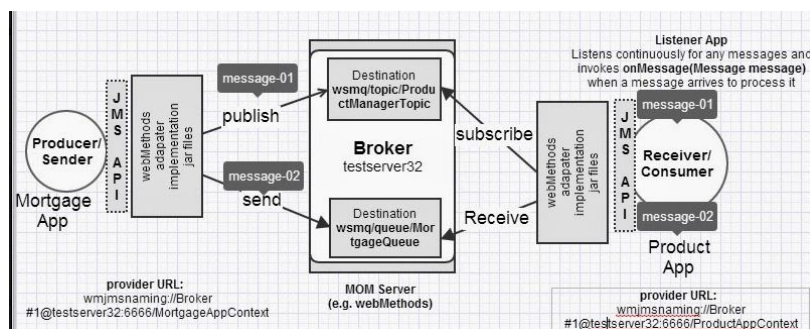
- Career Making Knowledge (1)
- Job Hunting & Resume (1)

1) **SOAP WS** (Apache CXF) and **RESTful** (Apache CXF, RESTEasy, Jersey, etc) Web Service. RESTful Web Service is more prevalent.



RESTful Service Calls

2) **Messaging** with JMS. With JMS, you can switch from one JMS compliant message broker (e.g. Web Methods) with another one (e.g. MQSeries or WebsphereMQ) with little or no changes to your source code.

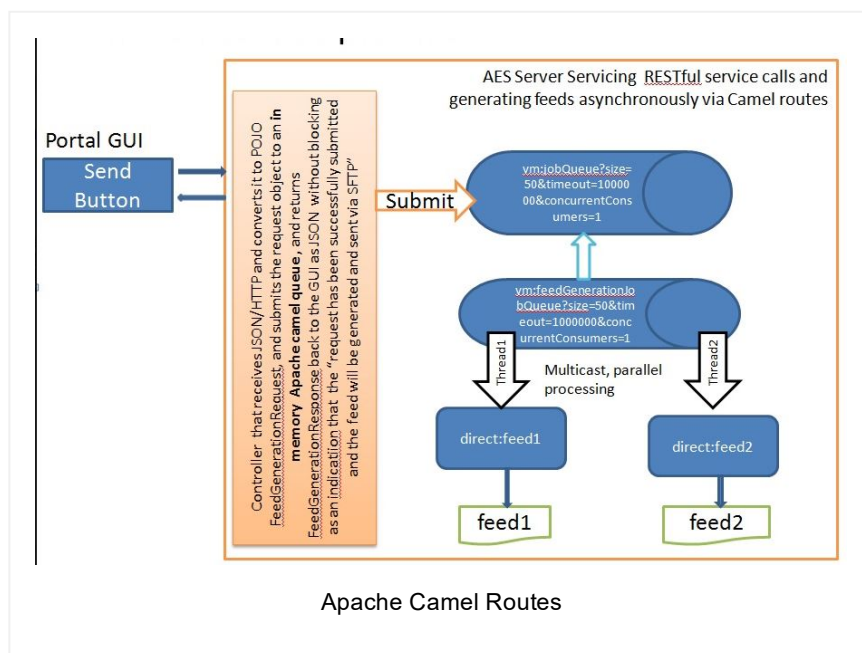


JMS

3) **JavaMail** for sending emails and Simplewire Java **SMS** to send SMSs.

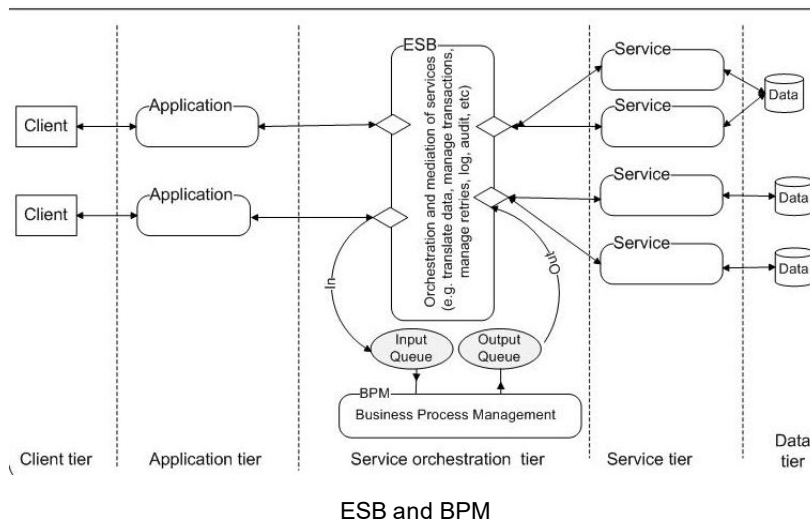
4) Overnight **batch job runs** to load data feeds with Spring batch or the new JEE batch jobs. These are ETL(Extract Transform and Load) tasks.

5) Using open source **integration frameworks** like Spring Integration or Apache Camel. This helps you integrate systems in a standardised way adhering to the enterprise integration patterns (EIP). Apache Camel is a light weight integration framework that allows you to use HTTP, FTP, JMS, EJB, JPA, RMI, JMS, JMX, LDAP, and Netty to name a few.

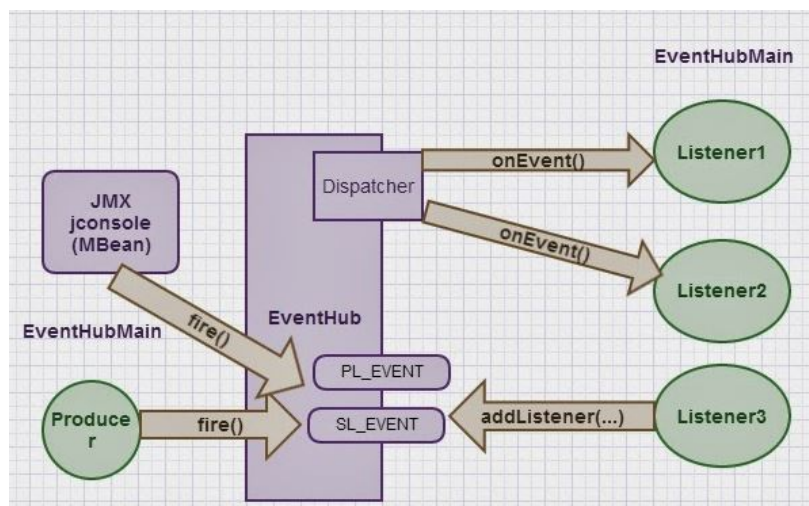


6) Using an **ESB** (Enterprise Service Bus) to integrate your applications. For example, Oracle Service Bus, TIBCO ESB, webMethods, Mule, etc. Under the hood, the ESB also uses an integration framework and provide more services and management functionalities like monitoring, high availability, clustering, graphical user interface for routing and configuring, etc. Usually, an ESB is a complex and powerful product with a higher learning curve. Suited for very large integration

projects. Projects requiring BPM (Business Process Management) integration and other integrated services like monitoring, clustering, etc. Mule does provide proprietary connector support for systems like SAP, Tibco Rendezvous, PayPal, Sibel CRM, IBM's CICS, etc.

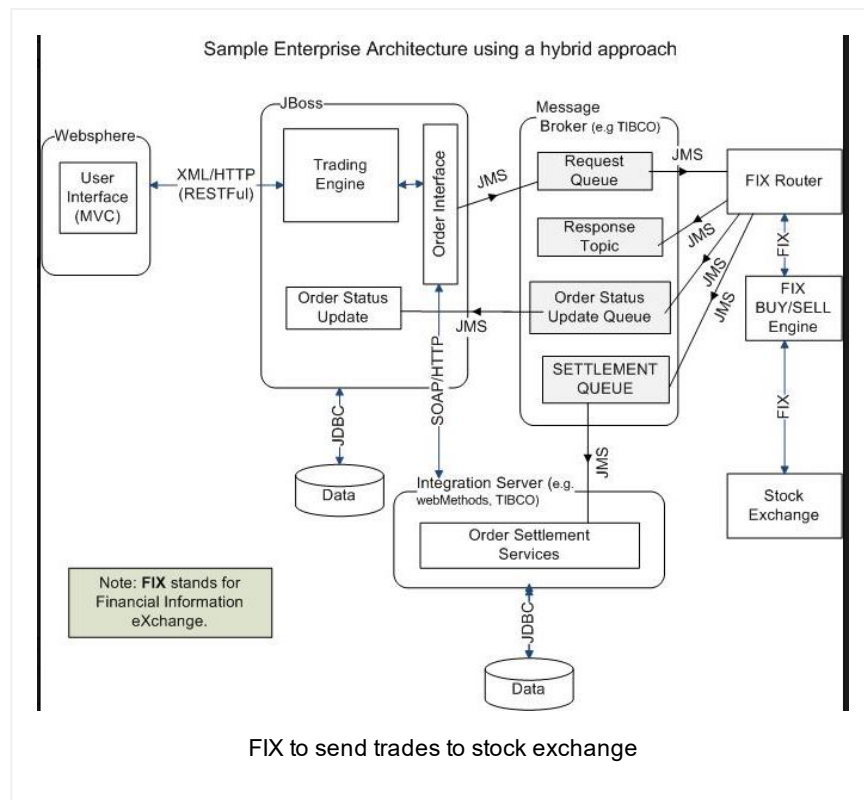


7) **TCP** based socket level integration. MINA is a popular framework for TCP based non blocking socket level communication. MINA is based on EDA (Event Driven Architecture). In EDA, Both the “Event” producers and listeners are loosely coupled via an “EventHub” and “Event”. An “EventHub” is used to register and unregister listeners.

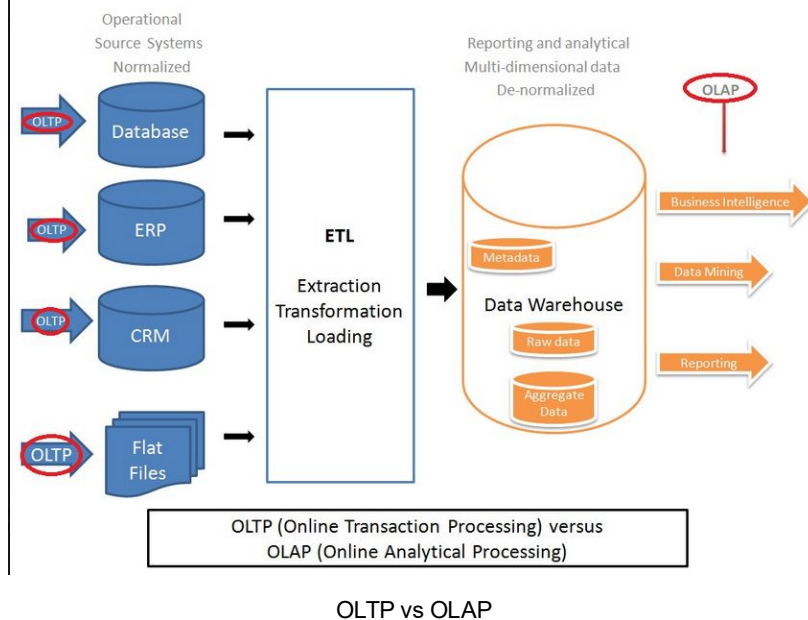


8) Invoking **remote procedures via RMI, Burlap, and Hessian**. Burlap/Hessian remote objects are just ordinary Java objects that implement some interfaces. They don't require special proxy, home, or remote classes. One of the inherent benefits of this object-and-interface model is that it promotes the good object-oriented design practice of design by interface.

9) **FIX protocol** to exchange financial information. FIX stands for Financial Information eXchange, which is an open protocol intended to streamline electronic communications in the financial securities industry. Most of the exchanges use this standard for communication like sending Order, Executions, MarketData, etc. QuickFIX/J and CameronFIX are popular FIX frameworks for Java.

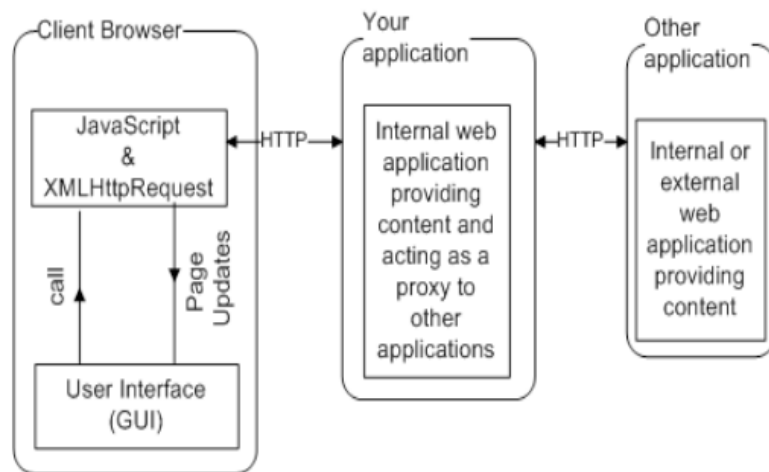


10) Integration with **data-warehouse** systems for multi-dimensional reporting. OLTP (OnLine Transaction Processing) data is summarised and sent to **OLAP** (OnLine Analytical Processing) systems for business intelligence, data mining, and complex reporting. IBM Cognos, JasperSoft, Oracle Enterprise BI server, etc are OLAP systems. There



11) Server side and client side **mashups**. Merging of services and content from multiple web sites in an integrated and coherent way is called a mashup.

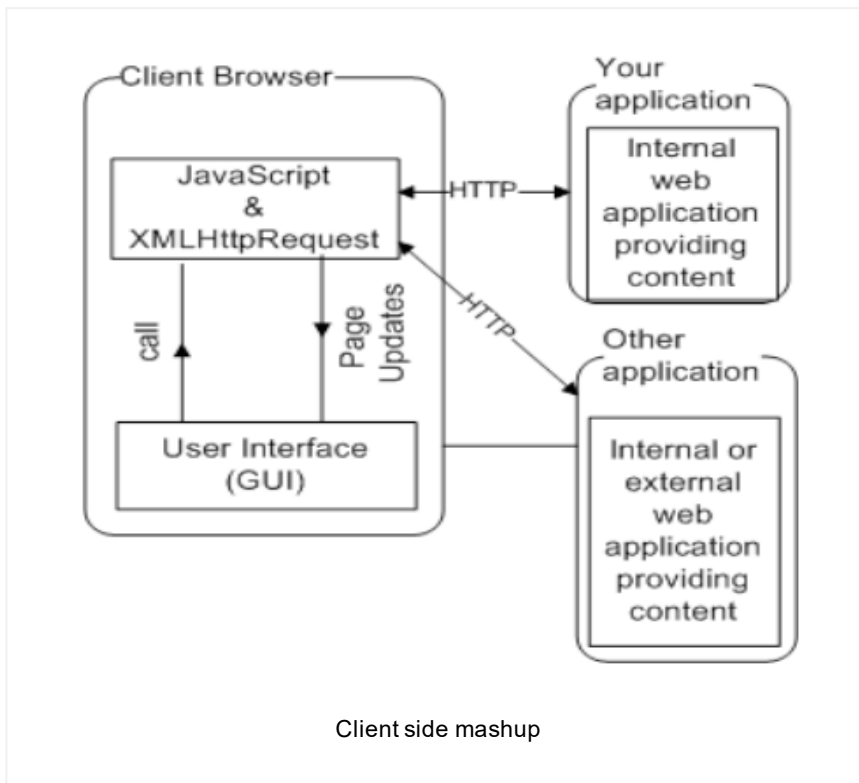
A **server-side mash-up** integrates content in the server and pass it to the client. Hence this style of mash-up is also called a proxy-style mash up because the server acts as a proxy.



Server side mashup

A **client side mash-up** integrate services and content on the client by mashing up directly with the other web applications' data or functionality. You also need to be aware of the cross

domain restrictions imposed by JavaScript for Ajax calls and you can overcome these restrictions with JSONP or CORS (Cross Origin Resource Sharing). The **CORS** is more industrial strength solution.



Part-2 covers following Java architecture Interview Questions & answers Q3 – Q7 with diagrams

- Q3. Can you discuss some of the high level architectures you are experienced with?
- Q4. In your experience, what are some of the common architectural and development mistakes?
- Q5. What causes performance issues in Java?
- Q6. In your experience, what are some of the key security considerations in an enterprise Java application?
- Q7. Can you list some key software design principles?

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- 1) What should be a typical Java EE architecture?

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