

Identify Technologies from a design problem: Task 1

Design Scenario:

A financial software system requires performing complex calculations and generates reports, which takes a long execution time due to the big amount of data. The architect decided to use the concurrency performance tactic as an architectural solution for optimization. To implement the concurrency tactic, he decided to divide the task on **different threads**, which should be executed on different machines to additionally improve system scalability. The concurrent threads have data input from another component, and send the output to an aggregation component, which store the results in a database, and generate reports. The architect is searching for the possible technologies to facilitate implementing the concurrency functionality for this scenario.

The architect has the following constraint: Due to team skills, the architect is constrained with Java technologies.

The architect would like to know all possible alternative technologies to implement the described concurrency functionality.

Find posts, which could support the architect fulfilling his request.

Starting time:

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Post ID	Time Found	Relevance to the Problem

Queries:

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Identify Technologies from an alternative: Task 2

An existing system is using ZeroMQ as the messaging queuing technology to act as a middleware and broker between several systems implemented with different technologies (Java, C++, and Python). After a year of development, the development team realized that debugging and development is becoming harder, because ZeroMQ depends on JNI. This influenced the delivery time and customer satisfaction. Thus, the architect started a reengineering initiative, where ZeroMQ will be replaced with another technology solution with better development features.

Before starting with the reengineering project, the architect search for other technologies, which could replace ZeroMQ and offer the same capabilities:

- A) High performance.
- B) Support for multiple programming languages.
- C) Free software license.

The architect would like to know all possible technologies, which could satisfy the previous requirements

Find posts, which could support the architect fulfilling his request.

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Evaluate and compare technologies: Task 3

Design Scenario:

A customer wants to create online virtual working room software. The software enables employees in the company to work together in a single environment. Therefore, it should support real-time updates about actions and changes made from each employee. In addition, employees could use mobile platforms as their clients during business travel. To achieve this goal, the architect proposed a client-server architecture shown down in the Figure. In this setup, employees (clients) use an interface to make their changes, and see changes from other clients. The communication between clients happens through a server in real-time.

Requirements:

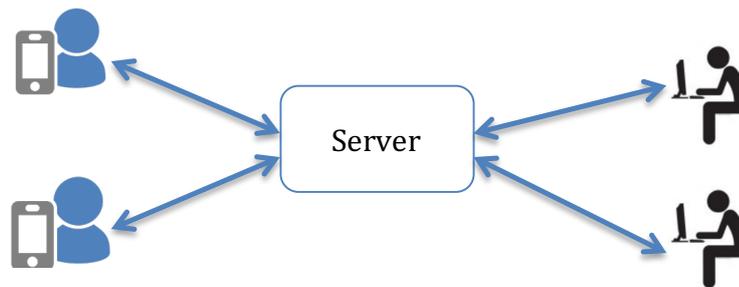
- **Performance:** Real-time communication, and better battery consumption for mobile users.
- **Security:** The clients need to be able to communicate through Internet, without blocks from the company firewalls.

The architect found three alternative technologies to choose from:

- 1) Use ZeroMQ.
- 2) Use Erlang server.
- 3) Use CouchDB.

The architect wants to compare between the three solutions regarding to their benefits and drawbacks to achieve the mentioned scenario and requirements.

Find posts, which could support the architect fulfilling his request.



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Compare and evaluate technologies: Task 5

A website for flight tickets reservations needs to be implemented. The process of reservation is done using two concurrent processes:

The first process gets the user information and reservation details, and store them in a data store. The second process reads the information in the data store and performs the reservations through additional calls to other systems to complete the reservation, perform security verification, and sends an email to the customer.

It is expected that reservations rate will be high before the summer season.

The architect is comparing between two main approaches:

- 1) Implement the data store as a Queue. In this case, the second process will read the reservations from the queue. To implement the queue, the architect is considering RabbitMQ and MSMQ.
- 2) Implement the data store as a normal database. In this approach the second process, need to identify the recently added records to execute the reservation.

The architect wants to compare between the proposed solutions and technologies regarding to their benefits and drawbacks.

Find posts, which could support the architect fulfilling his request.

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Determine technology feature - Task 6

A transportation software system needs to be developed. The architect created a conceptual design, which depends on using two architectural patterns: Message queuing and routing. The two patterns need to be implemented to guarantee the delivery of messages to the right destination system. The architect decided to use RabbitMQ technology, because of the availability of clients in different programming languages. In addition, its community support is better than other alternative technologies.

The architect would like to know, how do the routing and queue patterns interact with each other in RabbitMQ.

Find posts, which could support the architect fulfilling his request.

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- 4.

Search for architecture configuration - Task 8

Stock monitoring dashboard software need to be developed. The dashboard will be available on the Internet, and could be accessed through web browser. An important aspect of the dashboard is the presentation of lots of Stock records (thousands) on a single web page. In addition, the values of stocks will be changing by time, and updated continuously on the webpage.

The architect is searching for the right architecture by exploring all possible components structures and design. The proposed component design need to consider dealing with thousands of stock information, and its continues changes.

Find posts, which could support the architect fulfilling his request.

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Search for an architecture configuration - Task 9

The architect is designing a service-oriented architecture for a retail software system. The architect proposed a components design, which consists of the following:

- 1) Service component, which is responsible on exposing the methods used by the customer. It's also responsible on capturing the input from the users.
- 2) Business component, which is responsible on calculating and implementing the business logic, and workflow.
- 3) Data component, which is responsible on storing the data in a database.

The input from the user coming to the service component needs to be verified. The input is coming in different forms (Text, objects, boolean), which might contain invalid values. Thus verification functionality needs to be implemented.

The architect needs to determine at which component should the verification functionality be implemented.

Find posts, which could support the architect fulfilling his request.

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