# Data exchange Systems Design between heterogeneous P2P system that use JXTA

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## Abstract

*If the management through the center server is unnecessary and JXTA is connected to a network, a communication with any kind of devices or some device is possible. And features that a communication with heterogeneous P2P systems is possible have. The important module of the designed Data exchange system an interworking between the P2P system which it is made we used API and the each other different protocol the possible data for replacement Data exchange system were designed this kind of a feature was to the utmost utilized may account for the XML Parser Component (XPC) which we use it parses the or about a request and the generated request, and the structure of the XML Making Component (XMC) which we use in generating the inappropriate a request and response.*

## 1. Introduction

When being like this, the JXTA technology was developed in order to the distributed computing of the present age, especially, the P2P computing or the networking which is area solve the problem of being widely generated in the SUN corp. with the network programming and computing platform [1][2].

Moreover, actually, there are various many P2P systems and it is not desirable to artificially run this with one standard.

Therefore, if the various systems are altogether integrated to one P2P application and a specificity between the heterogeneous P2P protocol can be excluded, the effect of unity that the huge internet connection of a now is similar to the comprised thing can be expected.

However, because of using its own protocol and API, each P2P systems are the very difficult task to integrate this.

In this paper, JXTA is used in order to provide these between intercoperabilities in the situation where different P2P systems are still existing. XML is used as the means which overcomes the difference of the system mutual and makes the massage exchanging.

Thus, in this paper, a purpose is put on the Data exchange system design between heterogenous P2P system that use JXTA technology.

The paper is structured as follows. We first describe JXTA technology and then discuss Data exchange system design between heterogenous P2P system that use JXTA in detail in section 3. Conclusions and future work are drawn in the last section

## 2. JXTA Technology

The JXTA project began in the summer of 2000 as a Sun Microsystems research project. Its aim is to examine the potential of P2P [3].

JXTA is a set of protocols for creating P2P applications.

It provides a simple and generic P2P platform to host generic network services, while most other P2P applications are built for delivering a single type of network service by using a specific protocol and infrastructure which isolate their users from other P2P applications. Main JXTA features are the followings [3][4]

- JXTA is programming-language neutral.
- JXTA is platform-independent.

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• JXTA is transport-independent.

## 2.1 JXTA Architecture

JXTA architecture consists of three layers: JXTA applications, JXTA services and JXTA core as shown in Figure 1 [2][3].
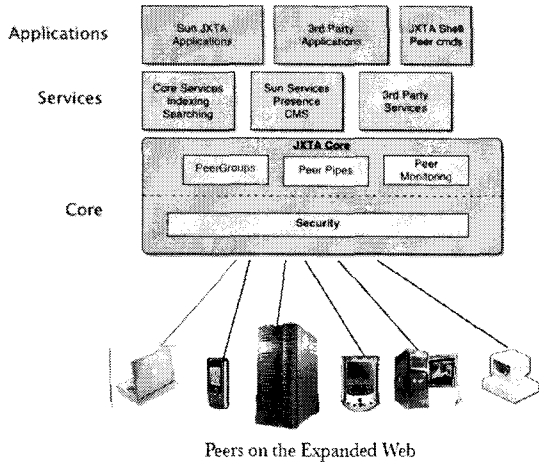


Peers on the Expanded Web

**Figure 1. JXTA architecture**

• JXTA Core

The JXTA core provides core support for P2P services and applications. In a multi-platform, a secure execution environment, mechanisms of peer groups, peer pipes, and peer monitoring are provided.
The peer groups establish a set of peers within a peer group with mechanisms to create policies for group creation and deletion, membership, advertisement, discovery, communication, security, and content sharing. The peer pipes provide communication channels among peers. Messages sent in peer pipes are structured with XML, and support transfer of data, content, and code in a protocol-independent manner — allowing a range of security, integrity, and privacy options. The peer monitoring enables controls of the behavior and activity of peers in a peer group and can be used to implement peer management functions including access control, priority setting, traffic metering, and bandwidth balancing.

• JXTA Services

JXTA services expand upon the capabilities of the core and facilitate application developments.
Facilities provided in this layer include mechanisms for searching, sharing, indexing, and caching code and content to enable cross-application bridging and translation of files. Searching capabilities include distributed and parallel searches across peer groups that are facilitated by matching an XML representation of a query to be processed with representations of the

responses that can be provided by each peer. These facilities can be used from simple searches like searching a peer's repository to complex searches of dynamically generated content that is unreachable by conventional search engines.

• JXTA Applications

JXTA applications are built using the peer services as well as the core layer. The JXTA project's philosophy is to support the fundamental levels broadly, and rely on the P2P development community to provide additional peer services and applications.

## 3. Data exchange system design between heterogeneous P2P system that use JXTA

### 3.1. System structure.

We design at this paper will design based on the P2P model having the referral server and look-up server. In this model, the role of a server carries out the function of providing the list of the connected peers with resources which we can use.
The system designed in this paper is comprised like the following Table 1.

**Table 1. Component**

| Component | Role |
|---|---|
| Listener | It processes that the connection request of a peer comes in. |
| Server | The database required in an application is managed. |
| Browser | A result is shown through the user interface to a peer and it affects as the interaction hierarchical layer for a client. |

It is as follows if the cross relation of the defined compositional components is looked into Table 1.
■ Listener-Server relation
A server stores a name, the IP address, and the information about the shared resource about all listeners in a database. Listener transmits file and name of folder with position after declare shared resources loging in to server.
The listener of a logout exclude and the list of the listeners which a server provides shows listeners, that is the on-line state.
■ Listener-browser relation

It is relation of request/response that browser replies all requests to listener, and receive response by processed query or topology of message.

A listener processes all requests of the listener level and a browser delivers the processed result to a client.

■ Browser-server relation

A browser brings the list of the listeners from a server. It confirms whether a listener shares the resources. Or not. A browser can deliver the search request of the root level with the thing obtaining the list of the listeners from a server.

It is like Figure 2. below if the overall structure of the system designed in this paper is looked into based upon a relation with the compositional element of a system and compositional element.
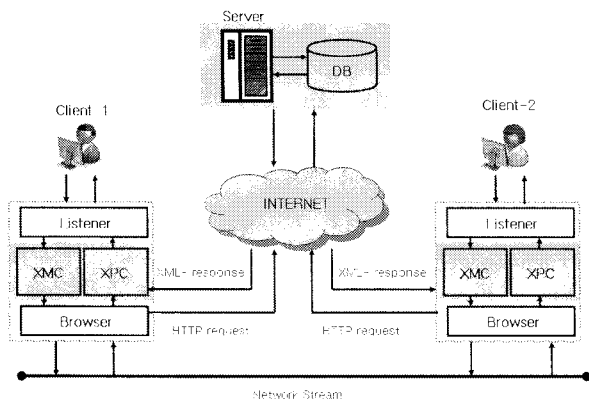


**Figure 2. System structure**

A foundation is put on the compositional element of the P2P system designed in this paper, a listener, a browser, and server 3 modules.

As shown in the above Figure 2. two the peers (a listener and browser) performed in the remote site shares the resources. And two a peers performs 2 operations(Request/Response) in order to attempt the resource sharing. Whereas the peer operated with a listener in this paper plays the role of responding about the request made by the other peers, a browser plays the role of the peer generating all requests.

A server manages the database owning information (the IP address, the log-in name, the information about the common resource, and etc.) of loginned all peers.

Moreover, by using XML, a server deals with the signal delivered from the P2P system. And the processing XML message is comprised of following 2 modules.

**Table 2. Module & Action**

| Module | Action |
|--------|--------|

| XML parser Component | A parsing the response about the generated request and request. |
|--------|--------|
| XML Making Component | A production the appropriate request and response. |

## 3.2 The communication between the compositional element module.
### 3.2.1 A communication between a server and a listener.

The login window is indicated if the listener application is started. And a user inputs the connection identifier. A listener delivers a list and log-in name of the resources which are shared in order to register its own information on a server, and its own IP address. After confirming received all factors, a server draws up the item of the corresponding listener. And the authentication XML message is delivered to the response about a request to a listener.
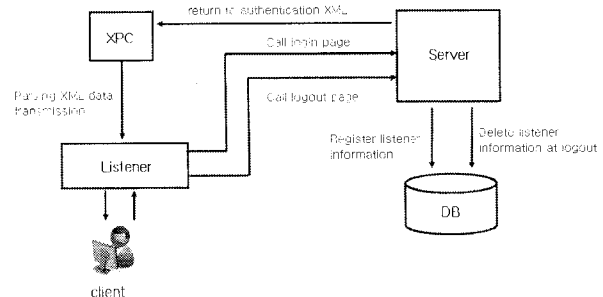


**Figure 3. Communication a server and listener**

### 3.2.2 A communication between a server and a browser

After a listener is successfully connected to a server, a browser communicates a server and communication. A browser gets practiced all listener lists and indicates in its own window. If a server receives a request from a browser, the list of practiced all listeners is searched in a database and a response is delivered to a browser in the form of the XML message. The Browser shows the result of parsing this XML response message to a user. A selection a browser establishes a selected listener and the socket connect the specified user in the user catalog in which a browser is returned.

That is, by using the IP address between a listener and browser, the direct communication is established.

All communications between the carried out with next listener and a browser don't go through a server and are directly accomplished through a socket.

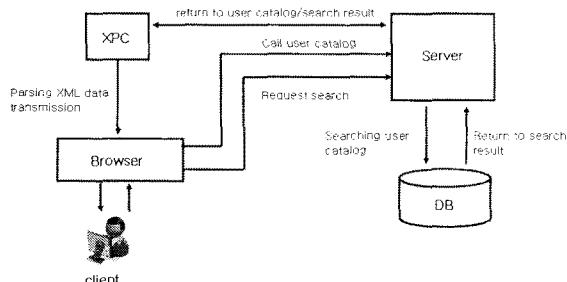Figure 4. below indicates a communication between a server and a browser.



**Figure 4. Communication a server and browser**

### 3.2.3 A communication between a browser and a listener.

The communication function of an application puts a foundation on a socket and a socket uses the network stream of a system in order to correspond.

A listener and browser carry out the task that reads data and that they use in each network stream.

A browser transmits a request with the mode of writing data in the network stream of a listener in the form of XML. A listener processes a request with the method capacitoring data from the network stream.

As to the following Figure 5. There are the request / response between a browser and a listener with the Turner ancient times.
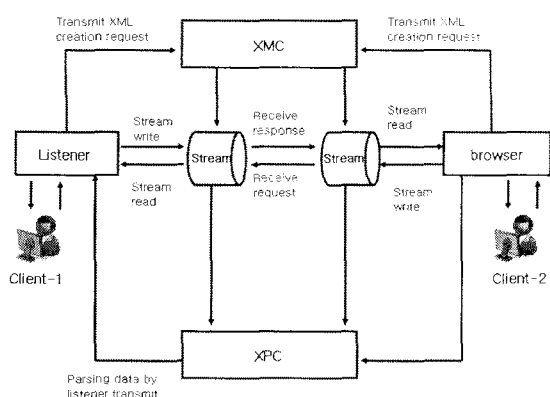


**Figure 5. Communication a browser and listener**

## 4. Conclusions and Future Work

JXTA projects center server the management which leads was not a necessity and if was connected in the network, the communication of different systems and is

possible from all systems and has the strong point where the communication of other P2P system and is possible.

The server which has an inquiry function in like this strong point bloomed on the center, in order to get the information whose capacity oneself is necessary bloomed respectively and did there not to make be a necessity which will visit in full, the communication which is actual to bloom and the field trade name to accomplish and qualitative possibility in order to be, planned. Also the protocol which differs each other and for the communication of P2P systems use API between which planned a data exchange system.

If the data exchange system which proposes from the present paper will lead and the interoperability characteristic will come to be maintained, will be able to expand the application area of P2P networks.

Will embody the data exchange system which is planned in future, the performance degradation will be able to occur with the neck of a bottle of P2P systems between the research will be necessary about neck of a bottle form prevention means.

## 5. References

[1] Project JXTA Home Page", http://www.jxta.org/

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