Transactional Web Services

Jboss XTS Bridge

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Disclaimer

Jboss XTS Bridge is an on-going research project and is still under heavy development. The current version of framework is intended for tests only and should not be used in production environments. Information about future releases, changelog, discovered bugs, new functionality and all other information directly related to the framework can be found on the framework's website. Questions and remarks concerning the framework can be sent directly to the framework's author or posted to the JBoss Transactions Developer Forum.

1 Introduction

This document describes the module "JBoss XTS Bridge". Provides information on how to use the module to connect the transaction manager running on the platform JBossAS (JTA / JTS), a transaction manager for web sites (JBossXTS). He was also describes how to achieve compatibility between the modules transactions JBossJTA and JbossJTS, as well as specifications for WS-AT 1.0 and WS-AT 1.1.

1.1 Acknowledgements

Waldemar Kłaczyński (wklaczynski@sabaservice.pl) has provided a valuable technical input into development of the JBoss XTS Bridge.

1.2 Documentation

More information concerning transactional Web Services can be found in [1]. Questions, requests and comments are more than welcome and can be directed to the author of the framework or posted to the JBoss Transactions Developer Forum [2].

2 Jboss XTS Bridge

At this point, writing a transaction on the Web Services platform EJB is associated with a large problem. The developer has to manually run the WS-AT transactions on the part of the client application, and then also manually handle the transaction on the part of the application service site. Such action does not guarantee the consistency of transactions with the local manager of transactions used by the EJB container, and even worse combination transaction becomes completely impossible to manage the transaction by the container.

Suggested solutions included in the JBoss XTS Bridge greatly facilitate the use of web services transactions and liberate developers from manual management of these transactions, and complex techniques of the merger transaction with the local manager of transactions used by the EJB container (JBossJTA / JBossJTS), both as a client applications and on the service application. They can use simple message handles in web services to launch the automatic creation of a subordinate transaction web service to the already existing local transactions on the client application side, as well as the creation of a new local transaction in the web service subordinate transaction on the service application site. These mechanisms ensure the approval of the transaction according to the rules of 2PC, which guarantees consistency of the data, which can not be obtained when using a separate transaction.

In addition, the client module is able to determine whether the current transaction is a local subordinate transaction created under a different transaction from parent web service, which will automatically create a subordinate transaction to the transaction from parent web service bypassing local transaction, which eliminates redundancy switching transactions between intermediaries services.

2.1 Programmer's API

API "Jboss XTS Bridge" has two handles for handling messages web services. It consists of the following classes:

- ¬ `WSTransactionBridgeClientHandler`– This handle is used to handle transactions on the part of the bridge the client application;

- ¬ `WSTransactionBridgeServiceHandler`–implements SOAPHandler. This handle is used to handle transactions at the bridge site applications. The handle automatically creates podwładną local transactions to an existing web service transactions. The handle is in two packages, "org.jboss.wst.xts.WSTransactionBridgeServiceHandler" implementation of WS-T 1.0 and org.jboss.wst11.xts.WSTransactionBridgeServiceHandler "implementation of WS-T 1.1;

2.2 Implementation

Jboss XTS Bridge has been built on top of the XTS (XML Transaction Service) component, which is a part of the JBoss Transaction Service .

3 XTS Bridge Web Service Metadata

API Jboss XTS Bridge is based on the Message Handlers. To use the Web Services package XTS Bridge with just define handles both the service and client. There is no need to write code to manage web service transaction. The next sections of this document provide more details on the use of these handles.

1. Class: WSTransactionBridgeClientHandler

Qualified name: `org.jboss.wst.xts.WSTransactionBridgeClientHandler`

Qualified name: `org.jboss.wst11.xts.WSTransactionBridgeClientHandler`

Handler type: **optional**

Implements: **SOAPHandler<SOAPMessageContext>**

3.2.1 Description

This handle is used to handle transactions on the part of the bridge the client application. The handle automatically creates subordinate transactions to the existing local transaction or transaction parent web service, if the current process is part of another web site and the local transaction has been established as a subordinate transaction this service. The handle is in two packages, "org.jboss.wst.xts.WSTransactionBridgeClientHandler" implementation of WS-T 1.0 and org.jboss.wst11.xts.WSTransactionBridgeClientHandler "implementation of WS-T 1.1;

3.2.2 Definitions

Handler definition:

```
<?xml version="1.0" encoding="UTF-8"?>

<bindings
```

```
    xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns:jaxb="http://java.sun.com/xml/ns/jaxb"
    xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
    xmlns="http://java.sun.com/xml/ns/jaxws"
    wsdlLocation="../wsdl/127.0.0.1_8080/test/Client.wsdl">

    <bindings node="wsdl:definitions" xmlns:jws="http://java.sun.com/xml/ns/javaee">
        <jws:handler-chains>
            <jws:handler-chain>
                <jws:handler>
                    <jws:handler-name>WSTransaction Bridge Handler</jws:handler-name>
                    <jws:handler-class>
                        org.jboss.wst.xts.WSTransactionBridgeClientHandler
                    </jws:handler-class>
                </jws:handler>
                <jws:handler>
                    <jws:handler-name>WSTransaction Handler</jws:handler-name>
                    <jws:handler-class>
                        com.arjuna.mw.wst.client.JaxWSHeaderContextProcessor
                    </jws:handler-class>
                </jws:handler>
            </jws:handler-chain>
        </jws:handler-chains>
    </bindings>
</bindings>
```

3.2.3 Example

Java source code:

```
List<Handler> handlers = new ArrayList<Handler>();
handlers.add(new WSTransactionBridgeClientHandler());
handlers.add(new JaxWSHeaderContextProcessor());
bindingProvider.getBinding().setHandlerChain(handlers);
```

2. Class: WSTransactionBridgeServiceHandler

Qualified name: `org.jboss.wst.xts.WSTransactionBridgeServiceHandler`

Qualified name: `org.jboss.wst11.xts.WSTransactionBridgeServiceHandler`

Handler type: **optional**

Implements: SOAPHandler<SOAPMessageContext>

3.2.1 Description

This handle is used to handle transactions at the bridge site applications. The handle automatically creates podwładną local transactions to an existing web service transactions. The handle is in two packages, "org.jboss.wst.xts.WSTransactionBridgeServiceHandler" implementation of WS-T 1.0 and org.jboss.wst11.xts.WSTransactionBridgeServiceHandler "implementation of WS-T 1.1;

3.2.2 Definitions

Handler definition:

```
<?xml version="1.0" encoding="UTF-8"?>
<handler-chains xmlns="http://java.sun.com/xml/ns/javaee">
  <handler-chain>
    <handler>
        <handler-name>WSTransaction Bridge Handler</handler-name>
        <handler-class>
            org.jboss.wst.xts.WSTransactionBridgeServiceHandler</handler-class>
```

```
      </handler>
      <handler>
        <handler-name>WSTransaction Handler</handler-name>
        <handler-class>
            com.arjuna.mw.wst.service.JaxWSHeaderContextProcessor
        </handler-class>
      </handler>
    </handler-chain>
</handler-chains>
```

3.2.3 Example

Java source code:

```
@WebService()
@HandlerChain(file = "handler.xml")
public class Service {
    // ...
}
```
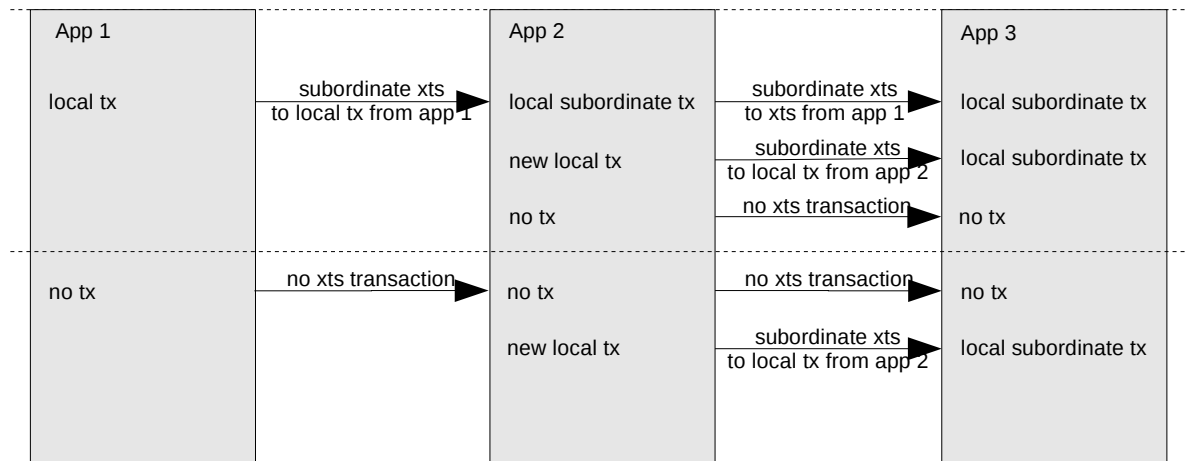
4 Transaction Handle Model

JBoss XTS Bridge automatically creates a subordinate transactions, taking the time to the parent transaction, thus all sub transactions have the same time critical to complete the transaction.

In the case of web service transaction is the primary transaction XTS as a result of which the object is created and recorded implemented Durable2PCParticipant coordinator in calling the customer service. Then, create a local sub transaction and use interface XATerminator object implemented Durable2PCParticipant is responsible for the transaction.

In the case of web service transaction, the transaction is the primary local or XTS. The system recognizes that the primary transaction is a transaction XTS depending on whether the current local transaction, in which the bridge is created, as a subordinate transaction transaction XTS and this is when the process was triggered by another web site which is also in the transaction and current transaction is still the same transaction, which was formed as a subordinate transaction to the transaction XTS previous web site. Then create a new subordinate transaction XTS and its registration shall be made on the customer's transaction coordinator calling the previous web site. In contrast, the local transaction is still governed by an object that implements Durable2PCParticipant registered in the customer's transaction coordinator the previous transaction XTS. When the local transaction is the result of a transaction to create a subordinate XTS transactions, and therefore was not in the process of being caused by the web site or as a new transaction processing components in the mechanism session EJB, etc. ..., created a new sub XTS transaction, connected to the current transaction as a local object XAResorce and is managed by the local transaction.

App 1

local tx

subordinate xts
to local tx from app 1 →

App 2

local subordinate tx

new local tx

no tx

subordinate xts
to xts from app 1 →

subordinate xts
to local tx from app 2 →

no xts transaction →

App 3

local subordinate tx

local subordinate tx

no tx

---

no tx

no xts transaction →

no tx

new local tx

no xts transaction →

subordinate xts
to local tx from app 2 →

no tx

local subordinate tx

Equipment for JBoss server module "Jboss XTS Bridge" allows the coordination of the same transaction by multiple application servers, moving the transaction from the server to the server in turn caused by using web services, combining the internal transaction processing engine in the session EJB, while not requiring too much knowledge on the operation of mechanisms for the operation from the user's programming EJB applications.

5 Instalation

To install the module, you must copy the file jbossxts-bridge.jar directory common/lib server JBoss. The module automatically detects the type of local business transactions between the JTA and JTS, examining the file and declared arjuna.properties file conf jbossjts-properties.xml or jbossjta-properties.xml. You can, however, affect those when he set the "xts" in jboss (jta/jts)- properties.xml.

JTA:

```
<properties depends="arjuna" name="xts">

        <property name="org.jboss.wst.xts.TransactionType" value="JTA"/>

</properties>
```

JTS:

```
<properties depends="arjuna" name="xts">

        <property name="org.jboss.wst.xts.TransactionType" value="JTS">"/>

</properties>
```

6 References

[1] Halliday J.J. et al. JBoss XML Transaction Service. http://labs.jboss.com/jbosstm/

[2]JBoss Transactions Developer Forum. http://www.jboss.com/index.html?module=bb&op=
viewforum&f=164