

Connection Pool Features

Jagadish Ramu
Kshitiz Saxena

Agenda

- Overview
- User Experience Issues
- New Features
- Open Issues
- Q & A

Overview

- Connection Pool & Resource
- Usages
- Configuration
- Pool Life-cycle
- Optional Features
- Monitoring

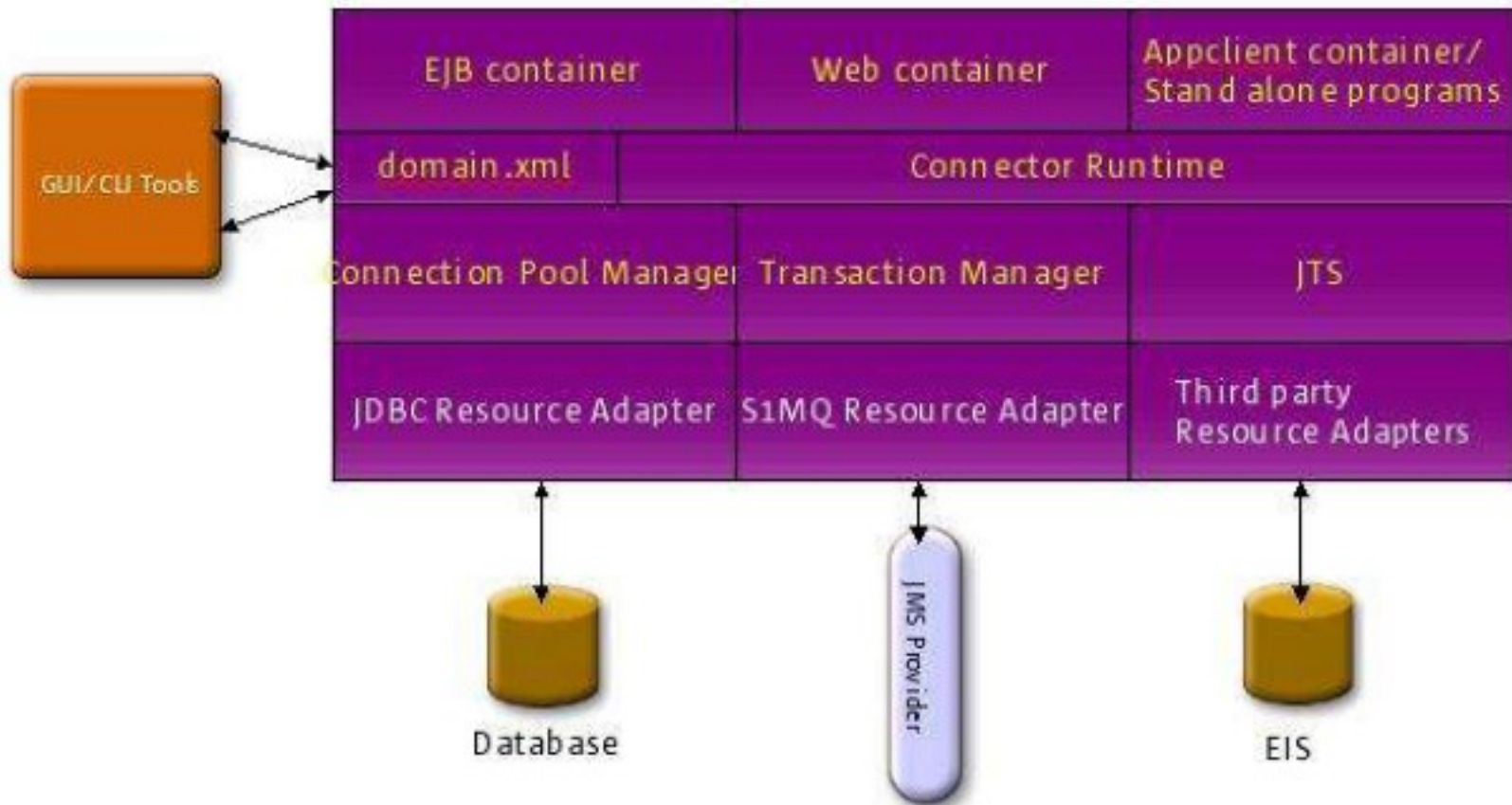
Connection Pool & Resource

- Connection pool creates & manages the connections to external system
 - > Improves response time
 - > Connection re-usability
- Resource – JNDI binding for connection pool
 - > Applications use resources to connect to external systems
- Every resource will be mapped to a connection pool

Usages

- Where it is used ?
 - > Connectors
 - > JDBC
 - > JMS
- How it works ?
 - > With the aid of contracts from Connector Architecture
 - > Callback from Resource Adapter to Connection manager of Application Server

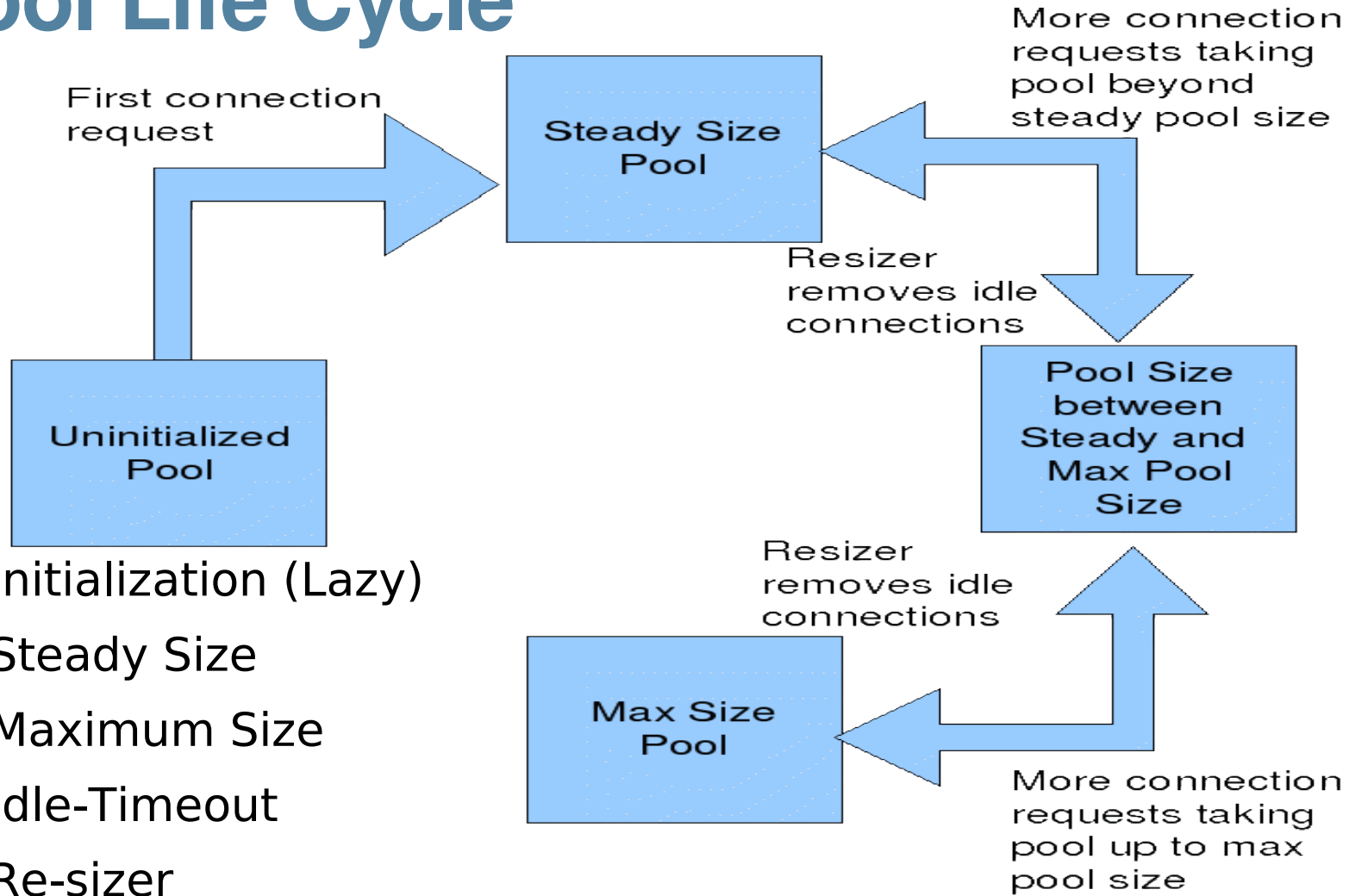
Usages Contd..



Configuration

- Admin GUI/ CLI
 - > create-jdbc-connection-pool --user admin --passwordfile passwords.txt --datasourceclassname org.apache.derby.jdbc.ClientDataSource --restype javax.sql.XADataSource --property url=jdbc:derby:testDB DerbyPool
 - > create-jdbc-resource --user admin --passwordfile passwords.txt --connectionpoolid DerbyPool jdbc/DerbyResource
- Resource – Pool relationship
 - > Many -> One

Pool Life Cycle



- Initialization (Lazy)
- Steady Size
- Maximum Size
- Idle-Timeout
- Re-sizer
- Max-Wait-time

Optional Features

- Validation
- Fail Connections
- LazyConnectionEnlistment
- LazyConnectionAssociation
- AssociateWithThread

Monitoring Statistics

- Some of the statistics are
 - > NumConnUsed
 - > NumConnFree
 - > NumConnCreated
 - > NumConnAcquired
 - > NumConnDestroyed
 - > NumConnReleased
 - > AverageConnWaitTime
 - > WaitQueueLength
- For complete list, check Application Server's Administration Guide Chapter : Monitoring Components & Services

User Experience Issues

- Creation of pool as a mandatory step before resource creation
- Segregation of pool-specific & driver specific properties in GUI/CLI
- Ability to detect connection leaks
- Template sun-resources files for various databases that users could use as the input to asadmin add-resources
- No graphical representation of pool monitoring statistics
- Switch off connection pooling in Application Client Container

New Features

- Clustered-Pools
- Configurable Properties
 - > Leak-Tracing
 - > Connection-Creation-Retry
 - > Validate-Atmost-Period
 - > Statement-Timeout
- Switch-Off pooling in ACC
- Merging Connection Pool & Resource
- Ease of use – Separation of pool-specific & driver specific features in GUI/CLI

New Features Contd..

- **Clustered-Pools**

- > Use Case – Oracle RealApplicationCluster
- > Policies
 - > Load Balancing
 - > Fail-Over
- > CLI Sample
 - > `asadmin> create-jdbc-resource --user admin --passwordfile passwords.txt --connectionpoolid node-1-pool, node-2-pool, node-3-pool jdbc/ClusterResource`

New Features Contd..

- **Leak Tracing**
 - > Detect potential connection leaks
 - > Policies
 - > Connection Leak Timeout
 - > Max-Wait-Time expiration
- **Connection Creation Retry**
 - > Connection creation failures during pool initialization/ new connection requests
 - > Parameters
 - > Re-try Attempts
 - > Re-try Interval

New Features Contd..

- **Validate Atmost Period**
 - > By-passing validation for recently validated connections
 - > Reduced overhead
- **Statement-Timeout**
 - > Long running SQL queries might stall the system, make the caller to wait forever

New Features Contd..

- **Switch-Off pooling in ACC**
 - > Application clients can switch off connection pooling using this property
 - > `com.sun.enterprise.Connectors.SwitchoffACC
ConnectionPooling`

New Features Contd..

- **Merging Resource & Connection Pool**
 - > Make connection pooling implicit
 - > Option to disable pooling
 - > Resource Adapters themselves pool the connections
 - > Resource Adapters where connections can not be pooled. (JAXR-RA)
 - > CLI Sample
 - > `asadmin> create-jdbc-resource --user admin --passwordfile passwords.txt --connectionpool=false --datasourceclassname datasource-classname --restype xa-datasource --property url=jdbc-url jdbc/Resource`

New Features Contd..

- **Merging Resource & Connection Pool**
 - > Ability to create resource & connection pool using single command
 - > CLI for resource creation can take pool attributes and parameters
 - > GUI resource creation page can be linked with connection pool creation
 - > CLI Sample
 - > `create-jdbc-resource --user admin --passwordfile passwords.txt --connectionpool=true --connectionpoolid jdbc/ConnectionPool --datasourceclassname datasource-classname --restype xa-datasource --steadypoolsize 20 --maxpoolsize 100 --maxwait 120000 --poolresize 5 --property url=jdbc-url jdbc/Resource`

New Features Contd..

- **Ease of use**

- > Differentiate DB-driver specific, AS-specific features during pool creation
 - > CLI - new attribute eg: sun-specific-property
 - > GUI – segregated tabs
- > CLI Sample
 - > `asadmin> create-jdbc-connection-pool --user admin --passwordfile passwords.txt --datasourceclassname datasource-classname --restype xa-datasource --property url=jdbc-url --sun-specific-property LazyConnectionAssoc=true:LeakTracing=true:ConnectionLeakInterval=300:PollInterval=300 jdbc/ConnectionPool`

Open Issues

- **RFE**

- > **CR 6435324** : Detecting Data Source class name from the jdbc-driver file during jdbc-conn-pool configuration
- > **CR 6436557** : Change request for Sun AppServer to provide load balancing for jdbc connections
- > **CR 6436558** : Change Request to control common application connection leak problem
- > **IT 582** : Provide templates suitable for add-resources

Q & A

References

- One Pager
- Administration Guide
- Developer Guide
- J2EE Connector Architecture

Connection Pool Features

dev@glassfish.dev.java.net
users@glassfish.dev.java.net