WebOTX Batch Server

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NEC Corporation,
Cloud Platform Division,
WebOTX Group
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1. Product Overview
Advantages to develop batch processing with Java

Enables high productivity and cost reduction by using Java as a single development language

Difference of development language between online processing and batch processing leads to low productivity and maintainability

Challenge

COBOL engineer reduced
- Difficulty to keep engineer
- Cost increase

Execution performance concern for batch processing with Java...

Java VM & H/W performance improve

Performance concern is resolved!

Advantage of Java implementation

- Easy to find Java engineers
- Some programs can be shared by unifying development language between online processing and batch processing
- Improved productivity and maintainability by integration with Java language
WebOTX Batch Server V8.4 Overview

Execution platform with improved performance & improved usability using Spring Batch* framework

Main Features
- Executes batch processing on the thread of resident Java VM.
- Controls Java resident process / thread parallelism, and realizes parallel execution of batch processing.
- Offers feature of batch container such as database connection pool, transaction control, and so on.

WebOTX Batch Server

Batch Container

Batch container process (Java resident process)

Thread
- Batch processing
- Spring Batch

Thread
- Batch processing
- Spring Batch

Database connection pool

WebOTX Batch Server main functions

- Job request control
- Job execution control
- Job request control
- Job execution control
- Job execution monitoring
- Job deployment control
- Java process management
- MasterScope JobCenter linkage
- Transaction control

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2. Solution with WebOTX Batch Server
Challenge of constructing batch processing with Java

Challenge of processing performance / development productivity in case system is implemented with Java

Challenge 1
Overhead of Java VM

Compared to native code such as C language, there are issues in memory consumption and execution time
- Java VM start/termination overhead
- Memory equal to Java VM is consumed per each batch processing

Challenge 2
Issue of resident Java VM

Ensures isolation of jobs on resident Java VM
- Minimizes batch processing failure at one user influencing other users
- Ensures isolation in terms of security

Challenge 3
Build for batch processing

Build is necessary for improving performance and operability specified in batch processing.
- Commits multiple records at one time (Chunk processing)
- Check point/restart function for shortening batch processing re-execution time
Challenge 1  Resolution for “Overhead of Java VM”

Executes batch processing on resident Java VM

- **Shortens execution time of batch processing**
  - **Java VM boots up every time batch processing is executed**
  - **Java VM becomes resident**
  - **Execution time is shortened**

- **Memory usage is not increased even in multiple batch processing**
  - Memory is used according to the number of Java VM process when multiple batch processing is executed.
  - Even in multiple batch processing, memory consumption is only for resident process.

Java process
- Java batch processing 1
  - Java VM boots up
- Java batch processing 2
  - Java VM boots up
- Java batch processing 3
  - Java VM boots up

Resident Java VM
- Thread
  - Java batch processing 1
  - Java batch processing 2
  - Java batch processing 3
Challenge 2  Resolution for “Issue of resident Java VM”

With WebOTX Batch Server function, isolation in user unit is ensured and failure can be localized.

- Failure in executing batch processing by one user does not influence batch processing of other users.
- Resource access to other users is not permitted by access control.

**WebOTX Batch Server**

- **Batch Container A (Java VM process starts at user A)**
  - Failure at user A does not influence other users.
  - Specify user A when job is started.
  - Batch container is dispatched per each user

- **Batch Container B (Java VM process starts at user B)**
  - Access to resource of other users is not permitted.
  - Specify user B when job is started.

- **WebOTX Batch Server feature**

- **Database connection pool**

- **Java batch processing**
  - 1
  - 2
  - 3
  - 4
Challenge 3  Resolution for “Build for batch processing”

Spring Batch improves development productivity by handling batch processing specific functions

Spring Batch is the Spring Framework based batch processing framework provided by SpringSource.

Developers only need to develop business logics as they can utilize common function of batch processing from framework (chunk processing, check point restart processing, and so on) leading to higher productivity.

Full scratch development

Concentrates on business logic utilizing Spring Batch
3. WebOTX Batch Server V8.4 enhanced features
Priority control of batch processing execution

Execute large scale of batch processing flexibly and stably

- **Job priority control** function to execute in order priority.
- **Job dispatch function** to dispatch to appropriate batch container job depending on the status.

Request queue makes the same priority jobs execute in order.

When job operator specifies some job priorities, higher priority job which is enqueued later. (e.g. 1>2...5)

Request queues dispatch appropriate batch container depending on the status.

Highest priority job (job A) is executed first, and job B is done next.
Batch App update without stopping batch processing

Continuous batch job operation in an uninterrupted operation system

- Achieves addition & update of batch App without stopping batch job.
- Achieves update of setting information (thread multiplicity, etc.) without stopping batch container.

➢ Dynamically increases threads to resolve overload of job execution.

**Update command**

Stop and restart of batch container is not required

Stop

Definition update

Batch App addition

Batch App update

Start

Addition and update of batch App is enabled without stopping batch job

Old version batch job (Ver1) during execution will be executed

From the next batch processing request, it is done with new version (Ver2)
Execution monitoring for batch processing

Stable operation by monitoring batch application

- **Alert log is output** if job is not completed by specified time.
- **Alert log is output** if monitored memory usage of batch container is over threshold.

- System administrator can prevent failure by working around when alert log is sent.

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**WebOTX Batch Server**

- **Request queue**
- **Batch container**
  - **Job**
  - **Job execution time monitoring**
  - **Memory usage monitoring**
- **System Monitoring**
- **System Administrator**
- **Job Execution**
- **Job Administrator**
- **Alert**

In response to the alert, system administrator works around in such a way as to terminate batch processing.

Alert log is output if the job is not completed by estimated time.

Sets completion estimated time in batch job.
Appendix
Product line of WebOTX Batch Server V8.4

2 models for the customer’s system requirements

Highly reliable batch platform is required to achieve stable operation of middle-to-large scale batch processing.

**BS V8.4 Standard**
High-value added model. For middle-to-large scale system requiring high reliability.

**BS V8.4 Express**
Entry model with easy implementation, and basic features.

Small scale system needs to be established with easy implementation. Only a few night batch processing are to be simultaneously operated.
# System Requirements

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware</strong></td>
<td>Express 5800, 5800/1000 series, PC/AT compatible machine</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>1 GB or more recommended (WebOTX Batch Server Express Edition, and Standard Edition)</td>
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<tr>
<td><strong>HDD</strong></td>
<td>200MB or more (WebOTX Batch Server Express Edition, and Standard Edition)</td>
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<tr>
<td><strong>OS</strong></td>
<td>Windows Server® 2008 R2 Standard (Intel x64)</td>
</tr>
<tr>
<td></td>
<td>Red Hat Enterprise Linux 5.x (Intel x86, Intel x86_64)</td>
</tr>
<tr>
<td></td>
<td>(Supported OS is expanding. Please contact us for latest information)</td>
</tr>
<tr>
<td><strong>Java execution environment</strong></td>
<td>Java SE 6 (*)</td>
</tr>
<tr>
<td></td>
<td>* Oracle Java SE Development Kit (JDK) Update 24 or later</td>
</tr>
<tr>
<td></td>
<td>* Oracle JRockit JVM is not supported</td>
</tr>
<tr>
<td></td>
<td>* Regarding Java SE 5, please contact us with implementation configuration</td>
</tr>
<tr>
<td><strong>Database</strong></td>
<td>Oracle Database 11g R1 or later (11g is required)</td>
</tr>
<tr>
<td></td>
<td>PostgreSQL 8.4.2 or later (must be 8.4)</td>
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Thank You

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