SOA Middleware –
High Volume Scenarios with
SAP NetWeaver Process Integration

Solution Management Rollout SAP NetWeaver SOA Middleware
SAP Technology Group
SAP AG

March 2009

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Agenda

Introduction

High Volume Customer Scenarios with SAP NetWeaver XI 3.0 / PI 7.0
Performance Enhancements with SAP NetWeaver PI 7.1
High Volume Customer Scenario with SAP NetWeaver PI 7.1
Performance Test Results with SAP NetWeaver PI 7.1 EHP1

Further Information
End-to-end SOA Infrastructure - TODAY
Enabling Managed Process Flexibility

User Interface
- Portal
- Desktop
- Mobile
- Forms
- Wiki/Blog
- Pervasive
- Voice
- Search

Composition Environment
- Enterprise SOA Composition
  - Business Process Management
  - Business Rules Management
  - UI Composition
  - Service & Event Composition
  - Information Composition

SOA Interoperability
- Service Bus
- SOA Management

Process Integration
- Enterprise SOA Provisioning
  - Service & Event Enablement
  - Connectivity & Integration

Service-enabled Applications
- Process Components
  - Order Mgmt.
  - SAP Business Suite
- Platform Services
  - MDM
  - BI
- SAP NetWeaver Components
- Customer & Partner Applications
- Non SAP & Legacy
- B2B Partner

End-to-End Solution Operations

© SAP AG 2009, SAP Technology Group, SAP NetWeaver SMR SOA Middleware / Page 3
SAP NetWeaver Process Integration 7.1
Overview

Repository-based Modeling and Design
- Enterprise Services Repository
- Services Registry - UDDI V3.0
- BPEL modeling enhancements
- User-defined mapping function library
- Business Activity Monitoring (BAM) infrastructure

Service Bus-based Integration
- WS–RM 1.1, WS Policy 1.2, WS Security 1.0, SAML 1.1
- XML validation
- Local processing in Advanced Adapter Engine (AAE)
- Message packaging
- Improved performance for ccBPM

SOA Management
- Next steps towards central configuration and administration
- Enhanced configuration for AAE
- Reduced Sizing
SAP NetWeaver Process Integration Today
Delivery and Adoption

User group survey (DSAG, ASUG, SDN)
- 89% use it for business-critical processes
- 75% automate processes with BPEL
- 70% implement high availability
- 45% plan migration from another infrastructure
- Volumes grow (100 million+ messages per month, message sizes up to 120 MB)

Majority of scenarios are SAP to non-SAP

Currently in ramp-up

Enhancement Package 1 for SAP NetWeaver Process Integration 7.1
- Superior SOA design governance
- Performance enhancements
- Extended SOA Management

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Possible Performance Requirements

Two possible motivations:
- Message Processing Speed
  - Typical for synchronous scenarios
  - Aims to decrease elapsed time for request/response cycle.
- Throughput
  - Increment the volume of information processed in a determined period of time.
  - Not necessarily decrease global message processing elapsed time.
  - Typically achieved by parallel processing.

Influence Factors on Performance:
- SAP NetWeaver Application Server (OS, DB, ABAP + Java Stack Basis Components)
- Related back-end systems
- Network infrastructure and topology (Firewalls)
- Integration design
- System and environment configuration
- Configuration options with SAP NetWeaver PI
### Agenda

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<tr>
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<td>Performance Test Results with SAP NetWeaver PI 7.1 EHP1</td>
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<td>Further Information</td>
</tr>
</tbody>
</table>
Agenda

Case Study – Customer 1
Case Study – Customer 2
Case Study – Post Denmark
Customer Case Study 1 – Introduction

- One of the largest producers of steel in Asia
- Operates from 3 different locations
- Manufactures:
  - Heavy steel plates
  - Deformed bars
  - Sections
Customer Case Study 1 – System Landscape

High Volume Scenarios
- Production Planning and Execution
- Raw Material Purchasing
- Order Management
- MRO (Maintenance Repairing Operation)
- Material Purchasing

Low Volume Scenarios
- Leave Request
- Travel Request
- Daily Time Recording
Customer Case Study 1 – Production Planning and Execution

Communication via SAP NetWeaver Process Integration
### Customer Case Study 1 – Performance Data

<table>
<thead>
<tr>
<th>Release</th>
<th>SAP NetWeaver XI 3.0 (SPS 18)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Message Volume</strong></td>
<td></td>
</tr>
<tr>
<td>Head quarters (Location 1)</td>
<td>104,859 / Day</td>
</tr>
<tr>
<td>Location 2</td>
<td>433,730 / Day</td>
</tr>
<tr>
<td>Location 3</td>
<td>38,150 / Day</td>
</tr>
<tr>
<td>Total</td>
<td>576,739 messages / Day</td>
</tr>
<tr>
<td><strong>Adapters Used</strong></td>
<td>IDOC</td>
</tr>
<tr>
<td></td>
<td>HTTP</td>
</tr>
<tr>
<td></td>
<td>FILE</td>
</tr>
<tr>
<td></td>
<td>JDBC</td>
</tr>
<tr>
<td></td>
<td>RFC</td>
</tr>
<tr>
<td><strong>Type of Mapping</strong></td>
<td>JAVA</td>
</tr>
<tr>
<td></td>
<td>ABAP</td>
</tr>
<tr>
<td></td>
<td>XSLT</td>
</tr>
<tr>
<td><strong>Routing</strong></td>
<td>Sender based routing</td>
</tr>
<tr>
<td></td>
<td>Content based routing</td>
</tr>
<tr>
<td><strong>Type of Messaging</strong></td>
<td>Synchronous and Asynchronous</td>
</tr>
</tbody>
</table>
# Customer Case Study 1 – Hardware

![Hardware Image]

<table>
<thead>
<tr>
<th>Location 1</th>
<th>Productive System</th>
<th>CPU Type</th>
<th>GHz</th>
<th>No. of CPU’s</th>
<th>Memory (GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROD #1</td>
<td>Itanium2</td>
<td>1.6</td>
<td>6</td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>PROD #2</td>
<td>Itanium2</td>
<td>1.6</td>
<td>4</td>
<td></td>
<td>24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location 2</th>
<th>Productive System</th>
<th>CPU Type</th>
<th>GHz</th>
<th>No. of CPU’s</th>
<th>Memory (GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROD #1</td>
<td>Itanium2</td>
<td>1.6</td>
<td>8</td>
<td></td>
<td>28</td>
</tr>
<tr>
<td>PROD #2</td>
<td>Itanium2</td>
<td>1.6</td>
<td>4</td>
<td></td>
<td>28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location 3</th>
<th>Productive System</th>
<th>CPU Type</th>
<th>GHz</th>
<th>No. of CPU’s</th>
<th>Memory (GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROD #1</td>
<td>Itanium2</td>
<td>1.6</td>
<td>2</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>PROD #2</td>
<td>Itanium2</td>
<td>1.6</td>
<td>2</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Agenda</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>--------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Study – Customer 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Case Study – Customer 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Study – Post Denmark</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Customer Case Study 2 – Introduction

- One of the largest producers of energy in United States
- Operates in more than 20 states
- Produces natural gas and power
Customer Case Study 2 – System Landscape

SAP NetWeaver Process Integration

- VMI and Order Processing
  - Planning Schedule
  - Orders
  - Change Orders
  - Order Request
  - Order Response
  - Advance Shipment Notice

- Purchase Order Processing
  - Check Material Levels
  - Inventory Quantities
  - Inventory Transactions
  - PO Extract
  - Open Requisitions
  - PM Order
  - Material Reservation

- Treasury Payments
  - Cash Payment

- Directory Services
  - Employee Telephone Directory Information
  - Personal Data
Vendor Managed Inventory and Order Processing with External Marketplaces

- **SAP ERP system** gets reservations from the Work Management System.
  - MRP (Material Resource Planning) creates the planning schedule and sends it to SAP NetWeaver PI via the IDOC adapter.

- In SAP NetWeaver PI, an xCBL document is created and sent to the Marketplace adapter:
  - Marketplace adapter translates the xCBL document into MML.
  - This is sent to Marketplace.

- At Marketplace, the MML document is sent to the vendor.

- The vendor creates an SO and sends back an order request which is forwarded to SAP ERP via the SAP NetWeaver PI.

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**Diagram Details**:

- SAP ERP System
- Work Management System
- SAP NetWeaver PI
- SAP Web Dispatcher in DMZ
- Firewall
- Https (MML)
- Http (MML)
- RFC/JMS / SOAP
- IDoc
- Marketplace
- Vendor System

**Notes**:

- **Reservation*:**
  - Planning Schedule
  - Order Request
  - Change Orders
  - Order Response
  - Advance Shipment Notice

---

44,000 Messages/Hour
# Customer Case Study 2 – Performance Data

<table>
<thead>
<tr>
<th>Release</th>
<th>SAP NetWeaver PI 7.0 (SPS 13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Message Volume</td>
<td>Peak: 44,000 messages per hour from 11 AM – 2.30 PM  &lt;br&gt; Average: 528,000 messages per day</td>
</tr>
<tr>
<td>Adapters Used</td>
<td>IDOC  &lt;br&gt; RFC  &lt;br&gt; SOAP  &lt;br&gt; JMS  &lt;br&gt; Marketplace</td>
</tr>
<tr>
<td>Type of Mapping</td>
<td>XSLT  &lt;br&gt; ABAP  &lt;br&gt; Message Mapping</td>
</tr>
<tr>
<td>Routing</td>
<td>Content based routing</td>
</tr>
<tr>
<td>Type of Messaging</td>
<td>Asynchronous</td>
</tr>
<tr>
<td>Message Size</td>
<td>Average: 10 KB – 12 KB  &lt;br&gt; Peak: 60 KB</td>
</tr>
<tr>
<td>Hardware Used</td>
<td>4 Processors with 8 GB RAM each</td>
</tr>
</tbody>
</table>
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Case Study – Customer 1
Case Study – Customer 2
Case Study – Post Denmark
Post Denmark provides basic postal services in Denmark, such as express deliveries, courier services, facility services, 10 o'clock service and electronic mailbox.

- It employs about 22,000 people.
- Delivers approximately a billion letters and 37 million parcels every year on a day-to-day basis.
- Corporate headquarters: Denmark.
Customer Case Study (1) – System Landscape

- Purchase Order Processing
- Sales Order Processing
- Processing invoices and printing using FormScape
- Bank Payment
- Account details
Customer Case Study (1) – Invoice Processing

- Enterprise Portal makes a synchronous web-service call to SAP ERP
- Invoices are generated in SAP ERP and sent to the Print System (FormScape) via SAP NetWeaver PI
- In FormScape, invoices are edited and printed
- These invoices are sent to the SAP content server
- They have 60,000 customers producing 60,000 invoices per month
- 380,000 sales order with 2.5 million order lines
### Customer Case Study (1) – Performance

#### Message Volume
- Peak: 210,000 message per hour during the invoicing process, reoccurring 2 times every month
- Average: 25,000 messages per hour

#### Adapters Used
<table>
<thead>
<tr>
<th>Type of Mapping</th>
<th>Messaging Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDOC</td>
<td>JMS</td>
</tr>
<tr>
<td>RFC</td>
<td>FILE</td>
</tr>
<tr>
<td>JAVA</td>
<td>XSLT</td>
</tr>
</tbody>
</table>

#### Routing
- Sender based routing

#### Type of Messaging
- Synchronous and Asynchronous

#### Hardware Used
- 8 processors with 40GB RAM each
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<tr>
<td>Performance Test Results with SAP NetWeaver PI 7.1 EHP1</td>
</tr>
<tr>
<td>Further Information</td>
</tr>
</tbody>
</table>
What is it about?
- Process a bulk of messages in one service call
- Reduce context switches (pipeline program context is loaded once and bulk is processed within that context)
- Enable mass operations on database (read, write, commit bulk of messages instead of doing it individually)
- For asynchronous scenarios (Exactly Once and Exactly Once In Order), inbound and outbound queues

What are the benefits?
- Throughput gains: 1.5 – 3.0 times compared to non-packaging (depends on scenario)
## Message Packaging:
### Scenario: IDoc ⇆ SAP NetWeaver PI ⇆ Flat File

<table>
<thead>
<tr>
<th>Message size</th>
<th>11 KB</th>
<th>32 KB</th>
<th>245 KB</th>
<th>2.37 MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corresponding number of line items</td>
<td>2</td>
<td>10</td>
<td>100</td>
<td>1000</td>
</tr>
<tr>
<td>Expected number of messages with 66% system usage (as calculated by Quicksizer)</td>
<td>200,000 ~ 56 m/s</td>
<td>180,000 ~ 50 m/s</td>
<td>110,000 ~ 31 m/s</td>
<td>21,500 ~ 6 m/s</td>
</tr>
<tr>
<td>Calculated possible number of messages with 100% usage (without message packaging)</td>
<td>300,000 ~84 m/s</td>
<td>270,000 ~75 m/s</td>
<td>155,000 ~66 m/s</td>
<td>32,000 ~9 m/s</td>
</tr>
<tr>
<td>Number of messages with message packaging set on Integration Server to 10 seconds, 100 messages, and 1 MB maximum package size</td>
<td>790,000 = 220 m/s = 8.7 GB/h</td>
<td>630,000 = 175 m/s = 20.2 GB/h</td>
<td>207,000 = 58 m/s = 50.7 GB/h</td>
<td></td>
</tr>
<tr>
<td>Number of messages with message packaging set on Integration Server to 10 seconds, 100 messages, and 5 MB maximum package size</td>
<td>Up to 33,000 = 9 m/s = 78 GB/h</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improvement factor with message packaging compared to expected values from Quicksizer</td>
<td>2.6</td>
<td>2.33</td>
<td>1.34</td>
<td></td>
</tr>
</tbody>
</table>

**HW:** 16 CPU Itanium/2 (~ 25,000 SAPS); **SW:** SAP NetWeaver PI 7.0 SP12
### Message Packaging: ccBPM Collect Scenario

<table>
<thead>
<tr>
<th>Messages per collection (totally 11.6 KB)</th>
<th>10</th>
<th>50</th>
<th>100</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected number of messages with 66% system usage (as calculated by Quicksizer)</td>
<td>90,000 in and 9,000 with 61.3 KB out</td>
<td>100,000 in and 2,000 with 281 KB out</td>
<td>100,000 in and 1,000 with 555 KB out</td>
<td>100,000 in and 1,000 with 555 KB out</td>
</tr>
<tr>
<td>Outgoing messages with 100% usage</td>
<td>13,500</td>
<td>3,000</td>
<td>1,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Number of messages with message packaging (25 messages per package), parallel queues (up to 25), and new ccBPM transaction handling</td>
<td>400,000 in and 40,000 with 61.3 KB out</td>
<td>700,000 in and 14,000 with 281 KB out</td>
<td>600,000 in and 6,000 with 555 KB out</td>
<td>700,000 in and 7,000 with 555 KB out with 5 MB package size</td>
</tr>
<tr>
<td>GB per hour</td>
<td>2.5</td>
<td>3.94</td>
<td>3.3</td>
<td>3.88</td>
</tr>
<tr>
<td>Improvement factor with message packaging compared to expected values from Quicksizer</td>
<td>3</td>
<td>4.7</td>
<td>4</td>
<td>4.7</td>
</tr>
</tbody>
</table>

**HW: 16 CPU Itanium/2 (~ 25,000 SAPS); SW: SAP NetWeaver PI 7.0 SP12**
What is it about?
- Natural evolution of the adapter engine (SAP NetWeaver PI 7.0)
- Provides mapping, routing to by-pass the Integration Server
- Adapter-to-adapter communication
- For synchronous and asynchronous scenarios

What are the benefits?
- Gain of throughput and speed (less latency time) up to factor 10 (depending on scenario)
- Reduction of resources consumption
Local Processing in advanced adapter engine

- Example:
  - 4Kb message size
  - SOAP to SOAP scenario
  - No mapping

**Throughput Test**

<table>
<thead>
<tr>
<th>Throughput [msg/sec]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>Local Processing in AAE</td>
</tr>
</tbody>
</table>

Up to 10 times boost factor!
General Performance Improvement Methods

In accordance with the preliminary performance tests:

- Packaging is boosting performance up to 300% (3x) best case.
- AAE local processing performance boost up to 1000% (10x).

For scenarios where local processing in the AAE is supported, it is the best choice!

* Refer to analysis scope slide
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Further Information
Who is Swiss Post, what do they produce?

- Swiss Post is a Switzerland based logistics company that deals with Postal, logistics, and transportation services. They have around 58,000 employees and an annual revenue of about CHF 8,712 bn
- They have around 2500 post offices

System landscape at Swiss Post

- Over 65% of their applications are non SAP
- Several Microsoft .Net custom built applications
- 15 scenarios where pure non SAP to non SAP integration already running on PI 7.1
- Development teams familiar with .Net, Oracle, SUN, BEA technologies
SAP NetWeaver PI 7.1 Ramp-up Project - Swiss Post Billing Process Scenario

Challenge
- Increased competition in a deregulated Postal market
- Substitutes and hybrid mail services
- Changing customer behavior - Customer demands more flexible and reliable services
- Emerging of new technologies for customer service and operations

Business Goal
- Shift from paper based billing towards electronic delivery
- Invoice send and receive process including e-document generation
- “eInvoicing” of supplier invoices and invoicing of logistic services providers of Post Logistics

Business Case
- Several individual interfaces were replaced by two enterprise services compliant to SAP enterprise SOA development standards
- SAP System connection via PI is now based on reusable services and user interfaces
- PI’s Enterprise Services Repository used as central repository for non SAP SOA assets
- Reduced processing time and processing cost including “e-Document” approach
- Easy replacement of existing BEA Web Logic solution
- Faster integration of external customers and partners for billing processes (B2B and B2C)
Target System Architecture with the full enterprise SOA Product Portfolio

Realized Services
SAP NetWeaver PI 7.1 – Ramp-up Project Feedback (2)

What are your high level scenarios and business problems solved with SAP NetWeaver PI 7.1?

- Integration between non-SAP system and non-SAP system
- Use PI for both A2A, B2B including EDI and service enabling legacy applications
- Benefit from performance enhancements for high volume scenarios
- Extensively use the Enterprise Services Repository for SOA design governance
- Leverage pre-packaged integration content delivered for SAP applications

Key benefits of using SAP NetWeaver PI 7.1

- **Three weeks to go live** on their PI 7.1 implementation project starting with a fresh installation
- High performance for business critical processes
  - 1.2 million messages processed overnight.
  - Response time of 200ms for an end to end B2B transaction
- Enterprise Services Repository used to define re-useable services rather than classical interfaces
- Enterprise Services Repository and Services Registry delivering profitability at every step of the Service lifecycle
Do you use SAP NetWeaver PI as your Enterprise wide Service Bus?
- Yes
- PI is used to create abstraction between heterogeneous sender and receiver systems based on SOA standards to provide unified access to legacy systems
- Content from BEA Weblogic technologies easily migrated to PI to save IT platform costs
- All web services and enterprise services that are available to their customers go through SAP NetWeaver PI

Do you use mainly synchronous or asynchronous scenarios?
- A mix of synchronous and asynchronous scenarios
SAP NetWeaver PI 7.1 – Ramp-up Project Feedback (4)

Future plans with SAP NetWeaver PI

- SAP NetWeaver PI will play a key role driving innovation at Swiss Post
  - Provision new web services in a technology independent way
  - Reduce development and integration efforts by two thirds through reuse of enterprise services
  - Long-term goal is to link all of their non-SAP systems – about 65% using SAP NetWeaver PI
- Consolidate communications, as well as support flexible adoption of business processes to meet changing business requirements
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</tr>
<tr>
<td>Further Information</td>
</tr>
</tbody>
</table>
### Performance Test Results - Highlights

| SOA Scenario (synch) | Throughput of 325 msg/sec has been achieved  
<table>
<thead>
<tr>
<th></th>
<th>Corresponds to ~ 28 million messages processed per day*</th>
</tr>
</thead>
</table>
| SOA Scenario (asynch, one to one) | Throughput of 23.5 MB/sec can be realized  
|                                    | Corresponds to ~ 2 GB processed per day* |
| SOA Scenario (asynch, one to many) | 33% more messages can be processed with message split for the second receiver |
| Batch Data Transfer (IDoc/File)    | Improvement of factor 2 to 3 when using end-to-end packaging |
| Mediated Integration Process (ccBPM) | Highest throughput when combining performance features (transaction handling, parallel processing, message packaging) |

### System Set Up
- Medium sized hardware used for SAP NetWeaver PI 7.1 (~ 50% SAPS as of the last performance test with SAP NetWeaver PI 7.0)
- Mainly 10 CPU with 47 GB RAM CPU were used. The CPU has been utilized up to 70 to 80% only in order to ensure a stable message processing over a long time.
- SAP NetWeaver PI has been configured according to the recommendations from SAP (e.g. PI Tuning Guide)

* Projected number
SOA Scenario (synchronous)
Test Results

KEY MESSAGE
■ 325 messages per second can be processed ➔ over 28 million messages per day*

Test Results

<table>
<thead>
<tr>
<th>No. of CPUs</th>
<th>Message size</th>
<th>Msg per second</th>
<th>Msg per hour*</th>
<th>Msg per day*</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1</td>
<td>220</td>
<td>792,000</td>
<td>19,008,000</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>325</td>
<td>1,170,000</td>
<td>28,080,000</td>
</tr>
</tbody>
</table>

Scenario Details
■ Quality of service: Best effort
■ Adapter: SOAP (XI 3.0 protocol)
■ Message format: XML
■ Mediation: Static routing
■ Interface pattern: Request & reply
■ Sender & receiver: SAP ECC 6.0

Performance Features
■ Advanced adapter engine

* Projected number
SOA Scenario (asynchronous, one-to-one)

Test Results

**KEY MESSAGE**
- Over 23.5 MB per second can be processed ➔ ~ 2,000 GB per day*
- Highest throughput can be realized with medium sized messages (1 MB to 5 MB)

Test Results

<table>
<thead>
<tr>
<th>Message Size in KB</th>
<th>Messages per second</th>
<th>Processed MB per second</th>
<th>Processed GB per hour*</th>
<th>Processed GB per day*</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>260</td>
<td>2.28</td>
<td>8.03</td>
<td>192.81</td>
</tr>
<tr>
<td>113</td>
<td>152</td>
<td>16.77</td>
<td>58.97</td>
<td>1,415.26</td>
</tr>
<tr>
<td>1097</td>
<td>22</td>
<td>23.57</td>
<td>82.86</td>
<td>1,988.58</td>
</tr>
</tbody>
</table>

**Scenario Details**
- Quality of service: Exactly Once
- Adapter: SOAP (XI 3.0 protocol)
- Message format: XML
- Mediation: Static routing
- Interface pattern: Notification
- Sender & receiver: SAP ECC 6.0

**Performance Features**
- Advanced adapter engine

* Projected number

© SAP AG 2009, SAP Technology Group, SAP NetWeaver SMR SOA Middleware
SOA Scenario (asynchronous, one-to-many)

Test Results

<table>
<thead>
<tr>
<th>Message Size in KB</th>
<th>Messages per second in case of one receiver</th>
<th>Messages per second in case of two receivers</th>
<th>Throughput gains for second receiver</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>192</td>
<td>2 x 128</td>
<td>+33%</td>
</tr>
<tr>
<td>113</td>
<td>152</td>
<td>2 x 97</td>
<td>+28%</td>
</tr>
<tr>
<td>1097</td>
<td>22</td>
<td>2 x 12</td>
<td>+9%</td>
</tr>
</tbody>
</table>

Scenario Details

- Quality of service: Exactly Once
- Adapter: SOAP (XI 3.0 protocol)
- Message format: XML
- Mediation: Static routing, message split
- Interface pattern: Notification
- Sender & 2 receiver: SAP ECC 6.0

Performance Features

- Advanced adapter engine

*compared to separate message processing per receiver
Batch Data Transfer Scenario

Test Results

**KEY MESSAGE**
- Performance boost up to factor 3 when using end-to-end message packaging
- Highest benefits can be achieved in case of small messages

### Test Results

<table>
<thead>
<tr>
<th>Message package size in KB</th>
<th>No. of message packages processed per sec</th>
<th>No. of message packages processed per sec</th>
<th>Improvement factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>102</td>
<td>320</td>
<td>3.14</td>
</tr>
<tr>
<td>42</td>
<td>78</td>
<td>160</td>
<td>2.05</td>
</tr>
</tbody>
</table>

### Scenario Details
- Quality of service: Exactly Once
- Adapter: IDoc (in) & File (out)
- Message format: IDoc (in), CSV (out)
- Mediation: Static routing
- Sender & receiver: SAP ECC 6.0, file system

### Performance Features
- End-to-end message packaging
**KEY MESSAGE**

- Highest throughput can be achieved when collecting many messages: 400,000 messages per hour* for the collection of 100 messages each
- Combine all performance features for ccBPM in order to achieve best results

**Test Results**

<table>
<thead>
<tr>
<th>Collection of 10 messages</th>
<th>Collection of 50 messages</th>
<th>Collection of 100 messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of msg/h in</td>
<td>No. of msg. bundles/h out</td>
<td>No. of msg/h in</td>
</tr>
<tr>
<td>230,400 with 10 KB each</td>
<td>23,040 with 61.3 KB each</td>
<td>360,000 with 10 KB each</td>
</tr>
</tbody>
</table>

**Scenario Details**

- Quality of service: Exactly Once
- Adapter: SOAP
- Message format: XML
- Mediation: Static routing, ccBPM collection pattern
- Sender & receiver: SAP ECC 6.0

**Performance Features of ccBPM**

- Message packaging
- Transaction handling
- Parallel queue processing

* Projected number
Agenda

Introduction

High Volume Customer Scenarios with SAP NetWeaver XI 3.0 / PI 7.0
Performance Enhancements with SAP NetWeaver PI 7.1
High Volume Customer Scenario with SAP NetWeaver PI 7.1
Performance Test Results with SAP NetWeaver PI 7.1 EHP1

Further Information
Further Information about Performance with SAP NetWeaver PI

SDN: Guides, Presentations, Blogs
- High Volume Support in SAP NetWeaver PI 7.1
- Advanced Adapter Engine
- Message Packaging
- Performance Report SAP NetWeaver PI 7.0
- -> Stay tuned for upcoming performance tests with SAP NetWeaver PI 7.1 EHP1

SDN: Webinars
- Quicksizing SAP NetWeaver PI 7.1
- Quicksizing SAP XI 3.0/7.0
- Performance Analysis for SAP XI 3.0/7.0
- Packaging with SAP PI 7.0

TechEd 2008 Sessions
- SOA212: High Volume Readiness of SAP NetWeaver PI 7.1
- SOA265: Processing High Volume Messages on SAP NetWeaver PI 7.1

SAP Service Marketplace
- XI Tuning guide http://service.sap.com/instguides -> NetWeaver04 -> Operations
- XI Performance check, SAP Note 894509
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