Handling Binary Content and Large Documents in Oracle SOA Suite 11g and OSB

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Program Agenda

- Overview
- Common usage patterns
- Data flavors and Processing patterns
- Relevant Product Configurations
- Management and Monitoring
What does “Handling” mean?

- “Gracefully" process payloads of larger than "usual" message sizes, volumes and concurrencies within the current server capacity and resources.

- Servers are still responsive and processing other requests.
How large is “Large”?

There is no hard and fast rule on what is considered a “large payload”!
Planning for Large Message Processing

- Sizing and Capacity Planning
- Application Design and Architecture
- Performance Tuning Cycles
- Configuration
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Common use-cases

- Moving GIS data from a remote FTP Server to a local file system
- Receiving Purchase Orders via SOAP/HTTP, with additional documents and artifacts coming in as attachments.
- Receiving a Bulk submission of Automobile orders (1000s in one)
- Moving Media between storage and transcoding FTP Servers.
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Data Sources

- Over HTTP
- From Local and Remote File servers
- Database repositories
- Messaging servers
Data Flavors

- Binary Data
- Complex XML Document
- XML Documents with repeating sections
- XML + Binary
- Native delimited or positional text file
Data Usage Patterns

- Pass through processing
- Partial Data Extraction (For XML and native Messages)
  - Query for Content based Routing
  - Smaller target documents populated from few source nodes
- Full Message Transformation (for XML and native messages)
Use-cases

- Large XML Messages (SOAP, XML, File, DB)
  - Complex Non-Repeating
  - Repeating, Batch-able
- Large Native/Delimited Messages (File System)
- Large Binary Messages
  - File System
  - Arriving on SOAP over HTTP (XML + Binary)
  - Data read from a DB table/AQ queue
Case 1 – Large XML – Complex Non-Repeating

- Leverage streaming features of File/FTP/DB/AQ adapters
- Leverage content streaming feature of OSB
- Read as Attachment if pass-through for file/ftp
- Streaming is optimal for small queries, but ineffective for full XML Transformations.
- If you are using XSLT, ensure you use “streamResultToTempFile” while generating large Documents.
- Appropriately scope all BPEL Variables
Case 1 – Large XML – Complex Non-Repeating - Screenshots
Terms to understand

- Streaming
- Scalable DOM
- Debatching
- Chunked Read
Scalable DOM

- Feature of XDK 11g – Scalable and Pluggable DOM
- Pluggable DOM Support
  - DOM API split from data (plug-in/internal)
- Lazy Materialization
- Configurable DOM Settings
  - PARTIAL_DOM
  - ACCESS_MODE
    - STREAMING, FORWARD_READ
Case 2 – Large XML – Repeating Structure

- Streaming transformations now available from PS3 for processing large XML Documents.
- Debatching
- Chunked Read Interactions
Case 3 – Large Native Data – Repeating Structure

- Streaming and Non-Streaming Translator Xpath functions available.
- Chunked Read for Native Data
Case 4 – Large Binary Files – File System

- “Read as Attachment” option on inbound File/FTP adapter.
- Mediator can pass through these attachments without materializing the file. BPEL will dehydrate attachments.
- “Use streaming” option enables partial to more complex data access and transformations within the large file at reduced cost by virtue of Scalable DOM feature.
Processing the Large Binary Files

- Xpath Functions
- Pass-through
- Retrieving Attachment content
- Sending attachment content to other Composites
Case 5 - Large Binary Attachments over SOAP

- **SwA - SOAP with Attachments**
  - Useful for larger-sized payloads
  - Does not materialize the message like MTOM does
  - SOA Mediator can pass through attachments
  - SOA 11g supports streaming of attachments on inbound and outbound. Streaming of attachments is not supported for MTOM.
  - Not supported for use with Spring component today.
Case 6 - Large Binary Attachments over SOAP

● MTOM
  ● Useful for mid to large sized payloads
  ● Defined as a simple policy assertion on the service or reference.
  ● Available only on WS Bindings.
Usage of Opaque Translation

Random access updates to XML Documents on Streaming transformations.
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Server Configurations

- Dedicated Domain?
- Audit Levels
- JVM
  - Heap 32 v/s 64 bit
  - Garbage Collection
- Max Message Size
- Transaction Timeouts
- Stuck Thread Max Time
- Max Test Wait Seconds (For dehyd store)
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Administrative Tasks

- Tablespace and Data files for large Attachments in Dehydration Store
- Data Retention and Purge Policy
- Configure Rejection of very large messages