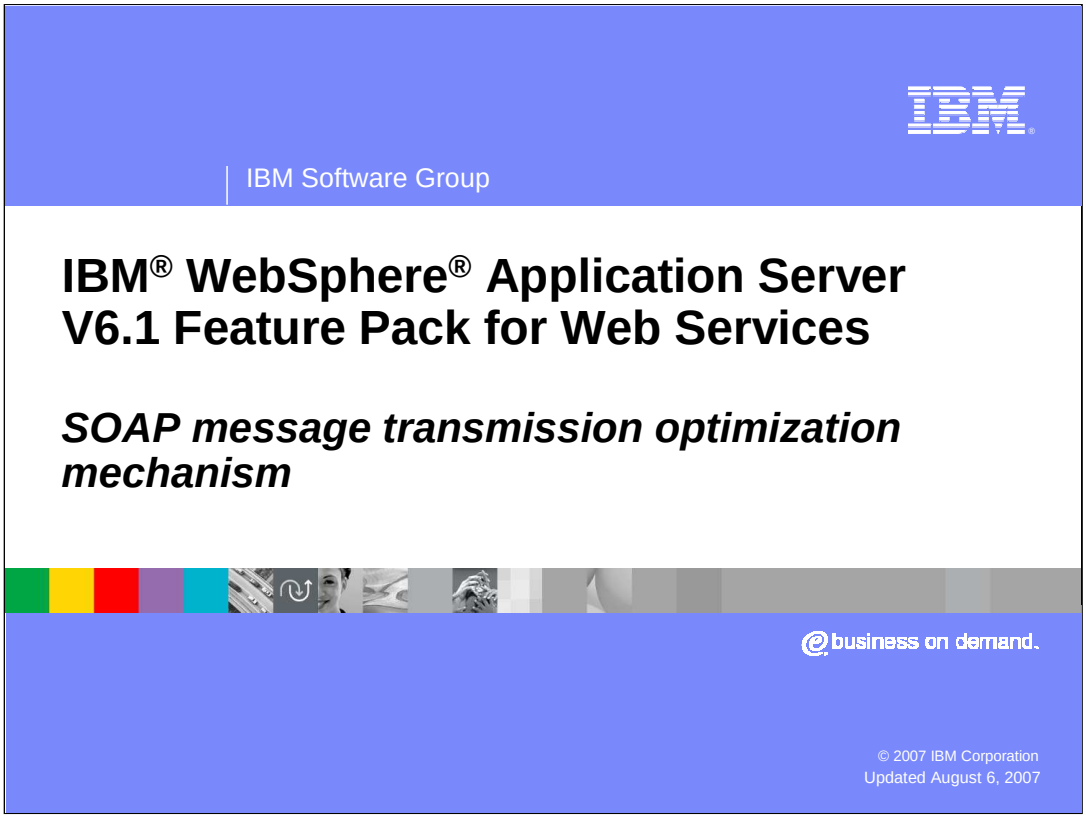


This presentation will provide an overview of the SOAP Message Transmission Optimization Mechanism technologies provided by the Feature Pack for Web Services.

Agenda

- SOAP message transmission optimization mechanism (MTOM)
- Problem determination

This presentation will explain the SOAP Message Transmission Optimization Mechanism support in the Feature Pack for Web Services, and explain problem determination for this component.

Section

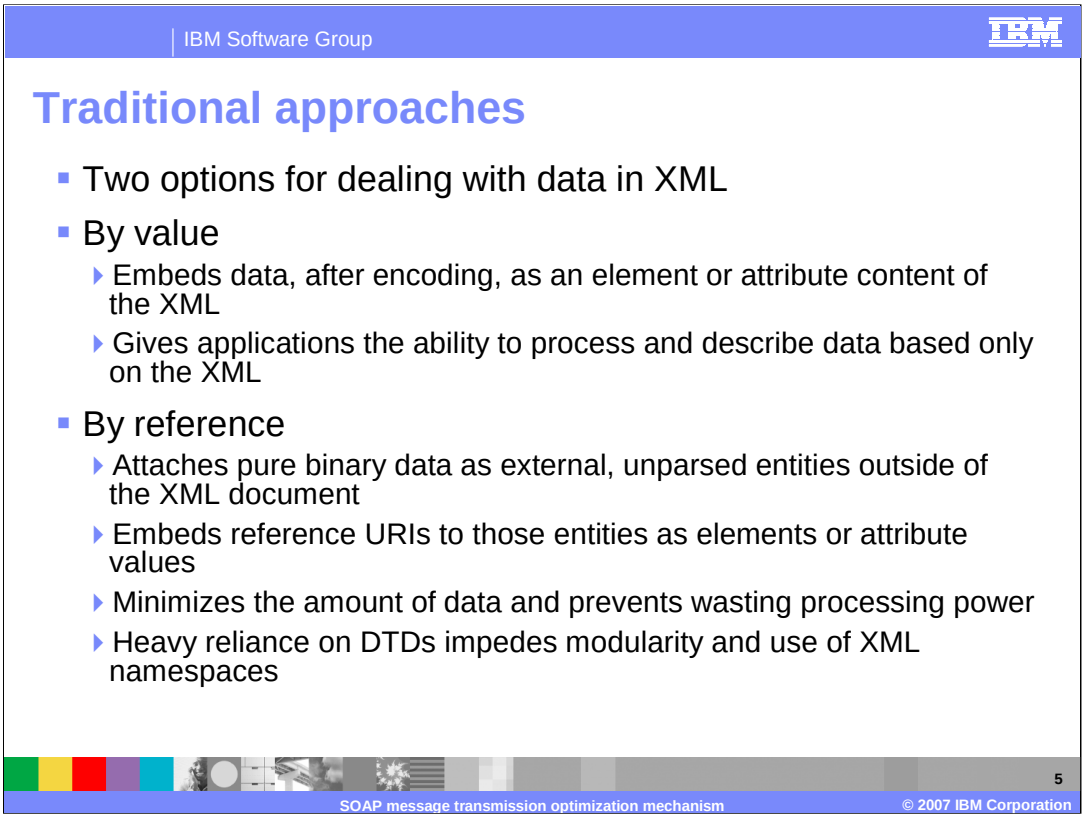
SOAP message transmission optimization mechanism

This section will provide an overview of the SOAP Message Transmission Optimization Mechanism.

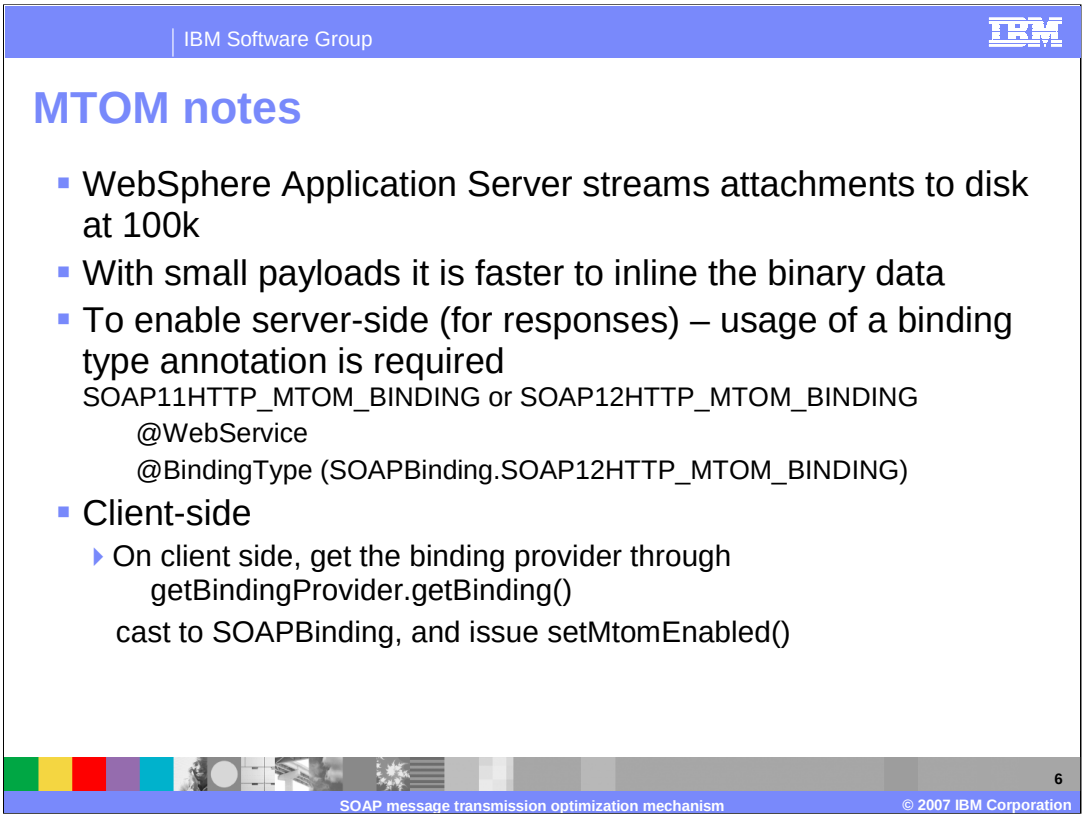
MTOM

- SOAP message transmission optimization mechanism is a specification that focuses on optimizing binary attachments
  - A W3C recommendation
  - Has both SOAP 1.1 and 1.2 bindings
- The format of an MTOM optimized message is the same as a SOAP with attachments message

MTOM is a specification to define an optimized way to attach binary data to a SOAP message, with support for both SOAP 1.1 and 1.2 bindings. MTOM uses the XML-binary Optimized Packaging or XOP to transmit binary data. Other methods of attaching the binary data have included encoding the data using base64encoding or referencing it with a URL. MTOM messages are compatible with SAAJ messages allowing for backward compatibility.

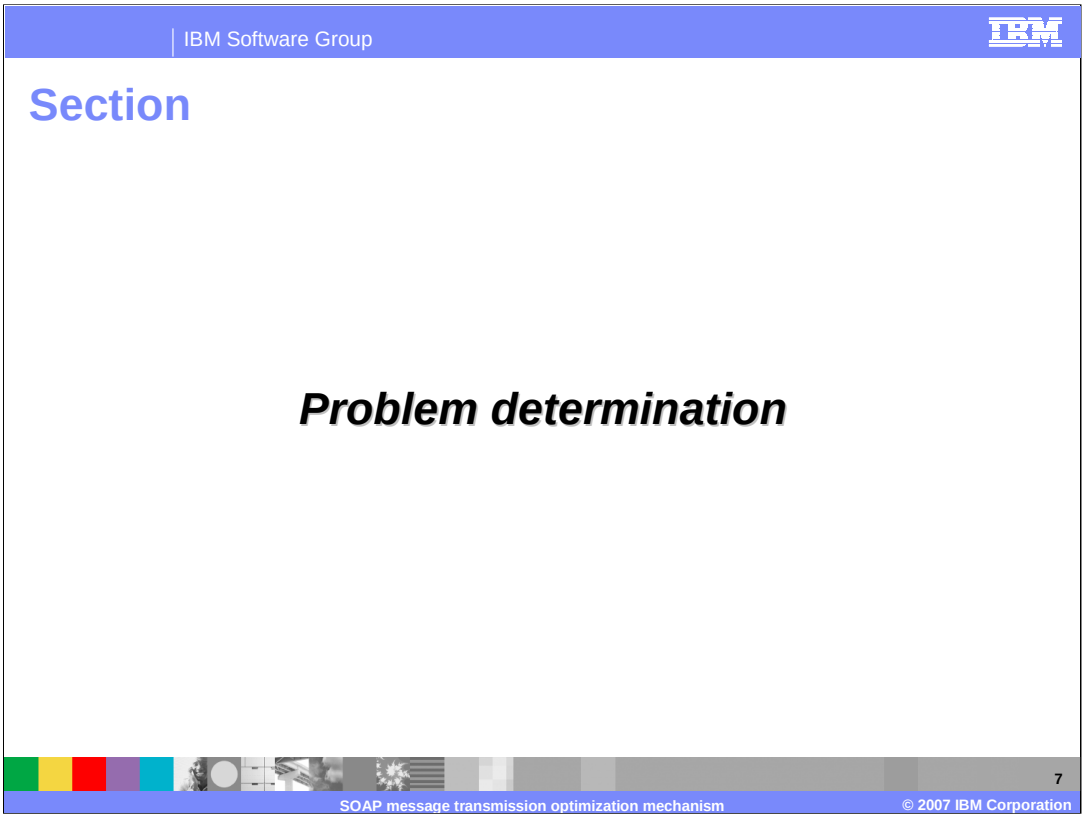


Traditional approaches have been either “by value” or “by reference”. To understand “by value”, XML supports opaque data as content through the use of either base64 or hexadecimal text encoding. Both these techniques bloat the size of the data. For UTF-8 underlying text encoding, base64 encoding increases the size of the binary data by a factor of 1.33x the original size, while hexadecimal encoding expands data by a factor of 2x. Above factors will be doubled if UTF-16 text encoding is used. Also of concern is the overhead in processing costs (both real and perceived) for these formats, especially when decoding back into raw binary. Alternatively, there were several specifications introduced in the Web services world to deal with this binary attachment problem using the "by reference" technique. SOAP with Attachments is one such example. Since SOAP prohibits document type declarations in messages, this leads to the problem of not representing data as part of the message information set, creating two data models. This scenario is like sending attachments with an e-mail message. Even though those attachments are related to the message content they are not inside the message.

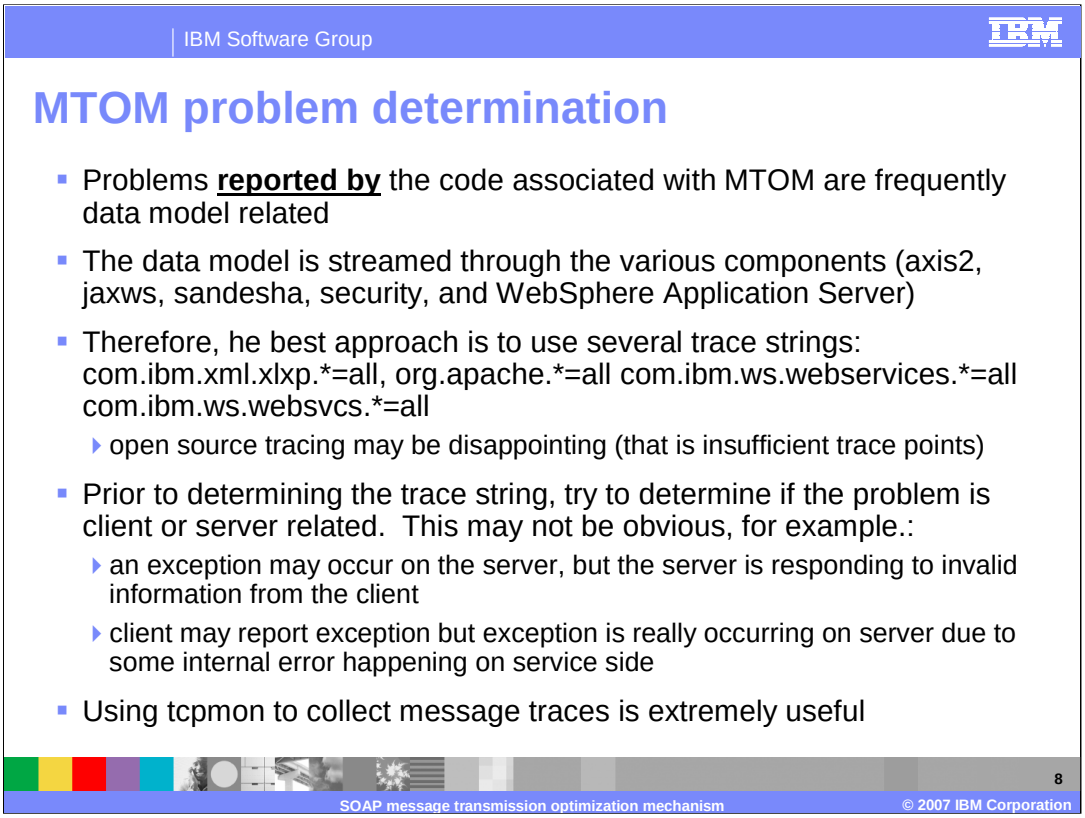


The Feature Pack for Web Services will keep the attachments in memory unless they are larger than 100k in which case they will be streamed to disk. This can result in odd performance behavior for an application that handles attachments around 100k, as some may be streamed to disk and others may not. With smaller attachment payloads, under 5k, it can be faster to inline the binary data in the message, rather than using an attachment.

In the Feature Pack for Web Services, MTOM is enabled in the Web Service by an annotation specifying the binding type (either SOAP11HTTP_MTOM_BINDING or SOAP12HTTP_MTOM_BINDING). On the client side, it is enabled using an API call.

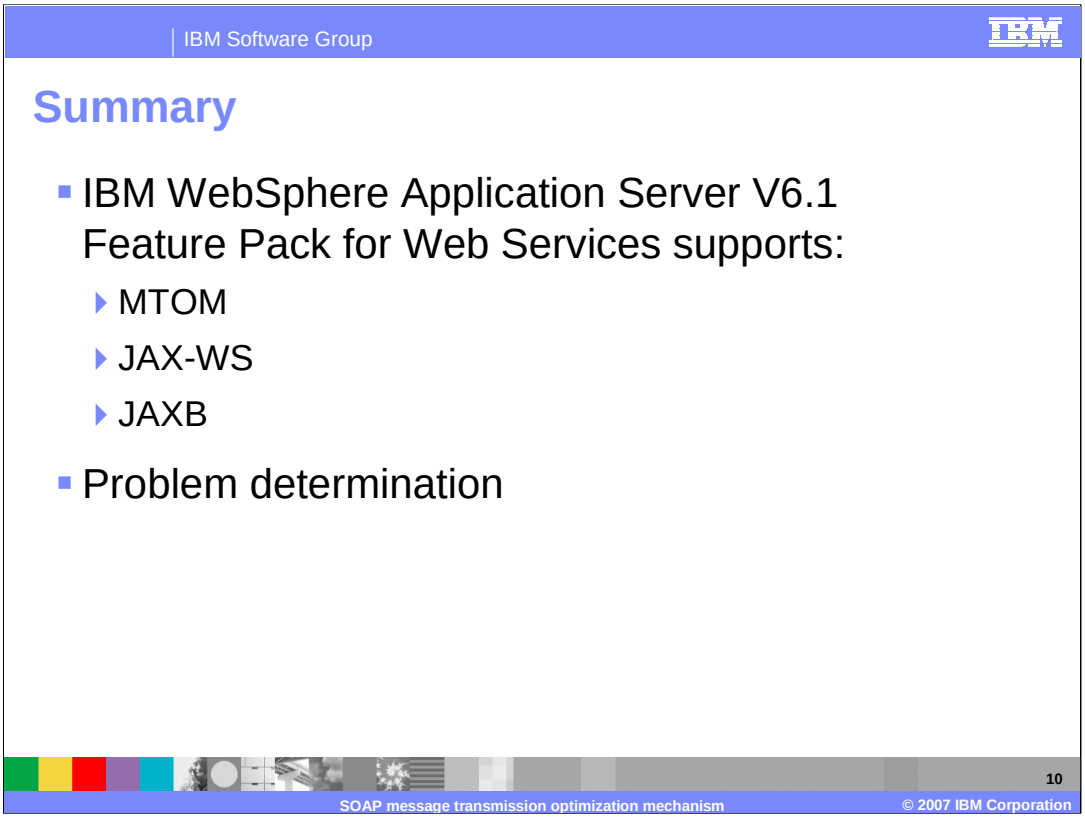


The next section will explain problem determination for the MTOM technologies.



Most problems related to MTOM will be related to the Data Model or form of the SOAP message. Some issues may also be encountered due to extremely large attachments being sent. Since the data is streamed through numerous components it is best to use multiple trace strings, capturing data for each of those components. Prior to running the trace, it is good practice to determine if the problem is specific to the client or service provider. Using a TCP monitor to view the SOAP message can help to determine where the problem originates.

Now for a summary of the information from this presentation.



In addition to introducing JAX-WS and JAXB technologies, IBM WebSphere Application Server V6.1 Feature Pack for Web Services supports the message transmission optimization mechanism, an attachment technology for binary data. This presentation has given some high level information on these technologies and some guidance for problem determination related to the MTOM technologies.

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