Contribution to the W3C WS-Choreography group on Transaction Requirements

From: Tony Fletcher and Bob Haugen, Choreology Ltd

The Web Services Choreography Requirements document contains a section 4.10 entitled 'Transaction'. We request that the following requirements be added to this section. Any choreography concerned with state modification in more than one party (as distinct from purely information-gathering choreographies) will commonly need some kind of coordination mechanism. There is therefore a need for a choreography language to be able to express that messages in a choreography are associated with a coordinated interaction - aka "business transaction" - and hence to define when a business transaction is initiated and completed.

Thus support for these requirements can probably be derived from any of the existing use cases. However, the following from the draft WS-Choreography Requirements document seem particularly pertinent:

3.2.3 D-UC-003 - Travel agent
3.2.4 D-UC-004- Alternative paths based on business rules
(It's an order-to-cash cycle and requires at least 3 transactions.)
3.2.5 D-UC-005 - Exception Handling Across Domains of Control
3.2.7 D- UC-007 - Choreography Dependency
3.2.8 D- UC-008 - Quote Request
(especially if extended to accept quote and order quoted products)
3.2.10 D-UC-010 - Interconnection of Document Management Systems
(would be much better with transactions than reliable messaging)
3.2.11 D- UC-11 _ Supporting collaboration

Business transaction Requirements

An instance of use of the Choreography language describes some kind of application protocol that can be played out between two, or more, roles in different systems. These application protocols can have a wide range of purposes. However, independent of the nature and purpose of the protocol, in all cases, there is common requirement that at the end of an application protocol exchange, or a set phase thereof, each of the roles has a common understanding of the outcome. More specifically each role needs to be in an application protocol state that is complimentary to the application protocol state(s) of the other role(s), there needs to be a common understanding of the state changes of any resources affected, and most importantly this shared 'understanding' needs to be assured at each role. This assurance of the outcome with respect to protocol state and resource state can be achieved by an 'agreement' protocol that is used in conjunction with the application protocol, but is independent of it. Current examples of such agreement or transaction protocols include the OASIS Business Transaction Protocol (BTP), WS-C/T and its successors, and WS-TXM.

The actually protocol used will only appear in the binding of an instance of a choreography description to the underlying protocols, not in the choreography description itself. However, the

choreography description does need to be able to control the use of the underlying transaction protocol. Thus the choreography language requires features that allow choreography descriptions to indicate precisely

1) the point at which a transaction is started (and whether it is the initiator or receiver),

2) the point at which an existing transaction is propagated to another role (if at all), and

3) the point at which a transaction is terminated and how the outcome affects the choreography.

4) As part of transaction termination it should be possible for some roles to be included in positive confirmation and others in negative cancellation, according to the logic of the application.

Note 1: These features are required of the Choreography language, but their use shall be optional in any particular choreography description.

Note 2: The outcome of a transaction at a role can be one of confirmation, cancellation, and hazard (which means that the role neither conformed nor cancelled properly).

Note 3: The use of the compensation technique within a transaction is but one of several techniques that can be used to achieve cancellation of a transaction. The use of compensation to reverse the effects of a transaction after it has completed is fraught with practical problems and needs to be distinguished from the use of compensation within a transaction.