Suggested Future Enhancements to CPPA Negotiation Specification

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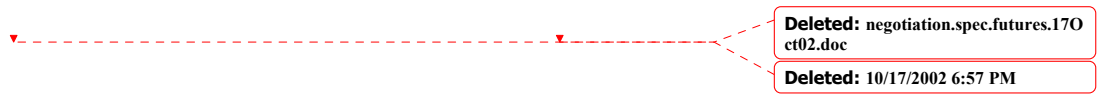**Deleted:** negotiation.spec.futures.17Oct02.doc

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33 # 1 Negotiation Protocol

34 ## 1.1 Negotiate directly with CPPs and both Parties' "CPP" NDDs

35 Negotiating with both Parties' CPPs and "CPP" NDDs is a purer peer to peer negotiating system
36 than working with a CPA template and corresponding NDD prepared by one Party. However,
37 see the discussion in the CPPA Negotiation specification of the advantages of the CPA template.

38 ### 1.1.1 Introduce new NDD during negotiation of a CPA template

39 Permit a counter offer from the party that received an initial offer to include its *NDD* in its
40 counter offer. In version 1, the party receiving the initial offer can introduce its *NDD* only by
41 rejecting the initial offer and then making an initial offer of its own.
42
43 Introducing the second party's *NDD* during the negotiation amounts to "logically" merging the
44 two *NDDs* into a combined set of negotiable items. However, there might well be
45 incompatibilities between the two *NDDs*. The specification will have to state how to resolve
46 such incompatibilities.

47 ### 1.1.2 Full Peer to Peer Negotiation with CPPs and "CPP" NDDs

48 Neelakantan Kartha proposed the following procedure:
49
50 Party A has CPP_A and and NDD_A that points to CPP_A. Party B has CPP_B and NDD_B
51 that points to CPP_B.
52
53 1. Party A and Party B negotiate on elements that are in the CPP and come to an agreement on
54 them. NDD_A and NDD_B are used during this process.
55
56 2. One of the Parties (say, Party A) now makes a CPA template that contains the agreed upon
57 values produced in step 1, as well as elements that are specific to the CPA (such as start, end
58 etc.). Party A also produces an NDD1_A that points to the CPA template. Note that NDD1_A
59 does NOT refer to the elements of the CPP, since they already have been negotiated and agreed
60 upon. NDD1_A only points to the CPA specific requirements that may be put in. NDD1_A
61 might depend on the first negotiation.
62
63 3. Consequently Party B also produces a similar NDD1_B.
64
65 4. Party A and B negotiate on the elements that are in the CPA template and come to an
66 agreement on them. NDD1_A and NDD1_B are used in this process.
67

68 ## 1.2 Negotiating about which BPSS Instance is to be used

69 There was some discussion Sept. 17-18, 2002 about whether a counter offer can propose a
70 different BPSS instance (for the business process) from the one proposed in the initial offer. If it
71 is decided not to permit this in version1, it should be considered later.

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1.3 Re-opening Previously Agreed Items

72

73 It is possible that later agreement on part of the *CPA* might require reopening something that was
74 previously agreed to. This would require removing the prohibition against reopening previously
75 agreed items.

1.4 Reinstating A Prior Offer or Counter Offer

76

77 • Problem: *Party* A receives a counter offer from *Party* B and replies with a counter offer of its
78   own. Based on the response to the counter offer, *Party* A then decides to reconsider *Party*
79   B's original counter offer. How is this offer put back on the table? Possibilities:
80   1. *Party* A issues *Party* B's offer as a counter offer. This might confuse *Party* B since it is
81   really *Party* B's counter offer.
82   2. *Party* B somehow gets initiative to re-issue the offer. Given the general rules about not
83   repeating identical offers, how does *Party* B recognize that it would be fruitful to reissue
84   the counter offer?
85 • The solution could be provided by broadening the function of the counter-pending message
86   into a more general response. One value would open the way to *Party* B's reissuing the prior
87   counter offer. Possible values, assuming *Party* B sent an offer to *Party* A are:
88   ♦ Counter pending: *Party* B's offer is partly acceptable. *Party* A is going to send a counter
89   offer next.
90   ♦ Conditionally accepted: This offer might be acceptable but *Party* A wants to do better
91   and is going to issue a counter offer next.
92   ♦ Firmly declined: This cannot work. Do not reissue it. Reissue would be an error
93   condition. *Party* A is going to send a counter offer next.
94   ♦ Re-send prior offer (accompanied by its offer ID): *Party* A wants to reconsider the prior
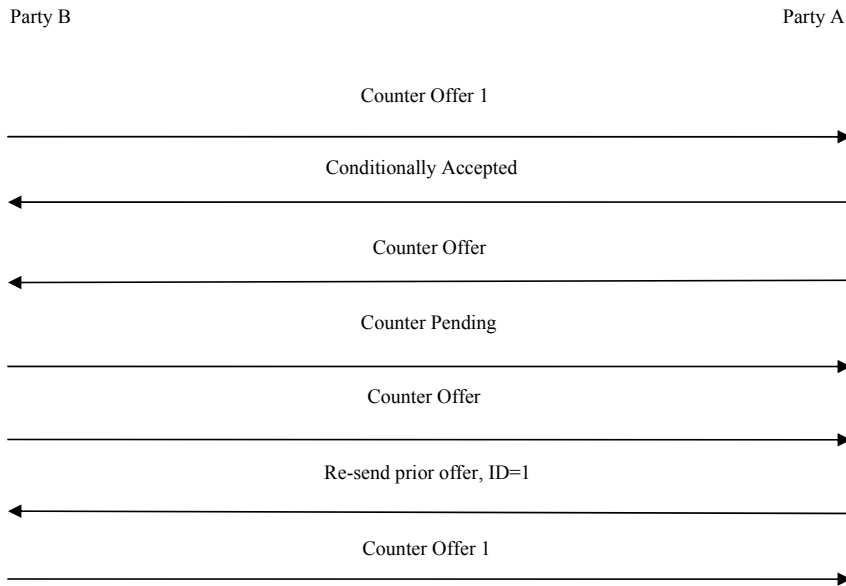95   offer. *Party* B has initiative to re-send that counter offer.

96

97 **Figure 1** illustrates the offer-reinstatement scenario.

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Party B   Party A

Counter Offer 1

Conditionally Accepted

Counter Offer

Counter Pending

Counter Offer

Re-send prior offer, ID=1

Counter Offer 1

99

100

101   **Figure 1, Offer Reinstatement Scenario**

102   **1.5 Determining whether Anything Remains to be Negotiated**

103   There may be cases where Party B accepts a counter offer and has nothing further to propose but
104   knows that there may still open subjects and that Party A should submit proposals on them. This
105   can happen if each party has its own strategy for order of negotiation. Sending the acceptance
106   without "counter pending offer" could pass initiative to Party A to submit the next counter offer.
107   To enable this case, we would need to provide a message by which Party A tells Party B that he
108   is finished. The response to a counter offer would consist of either a confirmation of acceptance
109   or a counter offer from A to B. This is similar to the previously proposed case where Party B
110   wants Party A to re-present a previous counter offer

111

112   The above is essentially the same function as the proposed procedure (see section 1.4) for asking
113   the other party to put a prior counter offer (or the original offer) back on the table.

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114

115   See also section 1.4

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116   **1.6 Ordering Dependencies among Negotiable Items**

117   If version 1 does not define ordering dependencies among negotiable items, this should be
118   considered for a future version.

119

120   The negotiable items may not be able to be negotiated in an arbitrary order because there may be
121   dependencies among them that fix the order of negotiation. Security aspects of some of the
122   protocols may be one example. Certificate details cannot be negotiated until it has been agreed
123   that certificate-based security will be used for message exchanges.   Any ordering dependencies

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124 will have to be expressed in the NDD. Ordering dependencies also mean that a counter offer will
125 omit items that cannot be negotiated until after the items in that counter offer are agreed to.

1.7 Order of Negotiating the Negotiable Items

127 Version 1 defines the following responses from Party B to an offer or counter offer from Party A.
128   1.   Success (a complete CPA has been achieved)
129   2.   Fail (Party B has unresolvable problems with the draft)
130   3.   Counter pending offer: Party B is going to present a counter offer to Party A.
131
132 This flow requires that:
133
134   1.   The initial offer must include proposals for all negotiable items.
135   2.   Each counter offer must include proposals for all open items.
136
137 *Party* A might have a private negotiation strategy that includes the order of negotiating the
138 negotiable items and may not wish to show the whole ordering structure to *Party* B. Can this
139 strategy be kept secret without compromising interoperability? A problem could arise if *Party* B
140 does not wish to negotiate in the same order. *Party* B could use the procedure below to defer the
141 offer or counter offer. See section 1.8

142

143 Should we allow the negotiation of some items to be deferred until later? This would mean that
144 an offer or counter offer might not include proposals for all open items. If Party A sends such a
145 counter offer to Party B, Party B might accept all the items in the proposal but there are still open
146 items. If so, who goes next? Possibilities:
147
148   1.   Party B responds with an additional response, "accept", which means "I accept your
149   proposals and await your next counter offer for the open items".
150   2.   Party B has to respond with "counter pending offer" and then submit a counter offer for
151   some or all of the open items. The problem here is that there may be some question of
152   which party is in a position to submit the next counter offer for some or all open items.
153   3.   Both of the above are allowable.
154
155 Note that both specific ordering dependencies (Section 1.6) and the negotiation strategy question
156 discussed above probably have the same protocol solution

1.8 Order of Negotiation, Dependency Graphs

158 It is possible that negotiation of some items depends on the results of negotiating other items.
159 These dependencies can be expressed as a tree and negotiated from the root downward. For
160 example:

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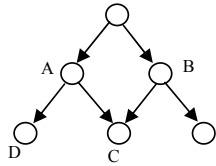
161
162 In general, negotiation can proceed from the root downward until a node is reached that cannot
163 be negotiated without completing others first. At that point, the navigation can proceed left to
164 right. For example, in the above drawing, node C has dependencies on both node A and node B.
165 Both A and B have to be negotiated before C can be negotiated. So, node A will be negotiated,
166 followed by node D. Since node C cannot be negotiated yet, the navigation will back up to the
167 top and negotiate node B followed by node C.
168
169 If each *Party* has its own private dependency graph, there is the possibility of deadlocks caused
170 by differences in ordering of the two *Parties'* graphs. The simplest solution is to require that the
171 dependency graph be known to both *Parties*. It could be included in the NDD or referenced by it.
172
173 The dependency graph should include only those items that are involved in dependencies; it
174 should not include items where the order of negotiation does not matter.
175
176 There is also the possibility of an impasse as shown below.
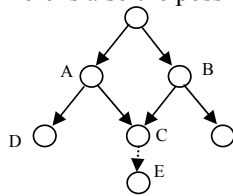
177
178 The dotted arrow between nodes C and E is intended to illustrate an impasse. Although nodes A,
179 B, and C, have all been negotiated, node E cannot be negotiated. This is presumably a
180 negotiation impasse between the two *Parties* that required human contact to resolve.

181 **1.9 Doing Better than an Acceptable Proposal**

182 Here is an example of a proposal that is acceptable, but recipient thinks he can do better.
183
184 Two parties have transport preferences ordered as shown below. *Party1* proposes using FTP,
185 which is acceptable to *Party2*. *Party2*, however, notices that SMTP would be only marginally
186 less desirable to Party1 but much more desirable to himself.
187

Party1	*Party2*
FTP	SMTP
SMTP	HTTP
HTTP	FTP

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190   *Party2* should be able to "table" *Party1's* original (FTP) proposal long enough to propose
191   SMTP. If *Party1* accepts, fine. Otherwise, *Party2* can then un-table the FTP proposal and agree
192   to it without having to start over.

193

194   This can be done using the above procedure of responding to *Party1's* counter offer with
195   "conditionally accepted", counter-offering with SMTP and then, if *Party1* rejects SMTP,
196   requesting "re-send prior offer".

1.10 Going Back to Previously Agreed Items

198   Version 1 states that once agreement has been reached on any part of the *CPA,* those elements
199   and attributes SHALL NOT be reopened for negotiation. However, there may be cases in which
200   multiple negotiable items interact. For such a case, backtracking might be a necessary part of
201   converging the negotiation of the set of interacting items.

1.11 Detection of Lack of Forward Progress in the Negotiation

203   Consider defining the meaning of "no forward progress" and the protocol for detecting this
204   condition.

1.12 Packaging of Messages

206   Consider physically packaging the response message with the counter offer if one is being
207   issued, in order to save message traffic. Can this be done using existing business signals for the
208   response indicator (in order to avoid CPPA changes)?

1.13 Need for Human Input

210   Negotiation of some items may require human input. This should be indicated in the *NDD* for
211   those items. We have to define how to indicate that human input is needed.

1.14 Suspending and Resuming the Negotiation Dialog

213   It may be worthwhile to provide a protocol for suspending and later resuming a *Negotiation*
214   *Dialog*. Suspension would be used whenever it is necessary for one *Party* to pause for a longer
215   period than permitted by the BPSS timing values defined in the NCPA.

216

217   The *Conversation* ends when the negotiation is suspended. When the negotiation is resumed at a
218   later time, a new *Conversation* is started. Suspending and resuming a negotiation requires that
219   the applications persist all the state information needed for resuming the negotiation later. The
220   *Party* that issues the *Message* which causes the negotiation to resume MUST include the
221   *Negotiation-Dialogue Identifier* in the *Message*. When the *Negotiation Dialog* is resumed,
222   the *Negotiation-Dialogue Identifie*r SHALL be used to obtain the state information necessary to
223   resume the negotiation.

224

225   The statement in the specification that relates a *Negotiation Dialog* to a *Conversation* should be
226   modified to state: "A single *Negotiation Dialogue* (executed without being suspended and
227   resumed) corresponds to a single ebXML *Conversation*".

228

229   It will be necessary to define a complete protocol for suspension and resumption and add it to the
230   Negotiation BPSS Instance. Following are some suggestions:
231   •   Suspension is used when the party that has the initiative to reply to an offer or counter offer

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232   needs more time than is permitted by the time attribute that governs the response.

233 • The *Party* that has the initiative to reply to an offer or counter offer can send a "suspend"
234   message. This satisfies whatever time limit is in effect and lets the other party know that the
235   reply will come later.

236 • The same *Party* then has the initiative to send the counter offer later.

237 • When the negotiation is suspended, both *Parties* shall use the negotiation identifier to keep
238   track of the state information about the suspended negotiation.

239 • Something should be said about the BPSS-level time attributes for the suspension case.

240 ## 1.15 Alternative Specifications of Collaboration Protocol

241 Future versions of the specification could support alternative forms of specifying either the
242 choreography of the business collaboration that the *Parties* will execute in place of the BPSS or
243 the negotiation choreography. One possibility is the collaboration protocol used with Web
244 services.

245

246 For the business collaboration protocol that the *Parties* will execute in doing business, the CPPA
247 specification already states that alternatives to BPSS may be used. However it leaves it to the
248 *Parties* to the *CPA* to agree on the meaning of the elements and attributes under the
249 CollaborationRole element. The CPPA negotiation specification would have to define how to
250 negotiate about the elements and attributes under the CollaborationRole element when an
251 alternative to BPSS is used.

252

253 For negotiation, the choreography description is part of the negotiation protocol and has to be
254 specified normatively. In order to use an alternative negotiation choreography, the CPPA
255 negotiation specification would have to be extended to provide a normative description of the
256 choreography and negotiation protocol based on the alternative to the BPSS.

257 ## 1.16 Bounding theTime to Complete Negotiation

258 Is there a way of specifying the maximum time to complete a negotiation from initial offer to
259 completion? Is there a BPSS time attribute that can be used? BPSS attributes cannot be
260 negotiated without negotiating the Negotiation CPA.

261

262 One possibility is to define a time that could be expressed in the NDD and can be negotiated.

263

264 Another possibility is to define an iteration count in the NDD, such as the maximum number of
265 offer-counter cycles permitted.

266

267 If a negotiation time or iteration count is to be negotiated, the specification should probably
268 define that this negotiation shall take place immediately following the initial offer and be limited
269 to, say, 2 iterations.

270

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272 # 2 Negotiability

273 ## 2.1 CPAId

274 Is there any need to negotiate the CPAId format as well as its value? For this purpose, "format"
275 refers to whether the CPAId is a URI or some other format. The CPPA specification
276 RECOMMENDs but does not REQUIRE the use of a URI.

277 ## 2.2 CPA Extensibility Elements

278 CPA extensions should be negotiable.

279 ## 2.3 Negotiating Delivery Channels

280 We might want to provide for negotiating new delivery channels, i.e. new combinations of the
281 Transport and DocExchange elements that are in the *CPPs*. This would involve dynamic
282 reconfiguration of the server, which may or may not be possible. If reconfiguration is possible, it
283 may involve software changes, etc., in order to accommodate the change.

284 ## 2.4 Interrelations Between Different Numeric Parameters

285 One commenter suggested an example of interrelation between price ranges and quantity ranges.
286 This example is applicable if and when the team includes business-level quantities in the
287 negotiation process.

288 ## 2.5 Direct Modification of BPSS Instance Document

289 Direct modification of the BPSS instance document could be supported as part of the negotiation
290 process if the BPSS team defines how to do it.

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3   Negotiation Algorithm

The negotiation algorithm is out of scope for version 1. It is described as part of the private process at each party. The specification may have to prescribe aspects of the negotiation algorithms that ensure interoperability.

4   Negotiation Intermediaries

Consider enhancing the specification to support negotiation intermediaries. A negotiation intermediary plays an active role in the negotiation. It is not just a message-forwarding intermediary. It functions as a broker in support of a negotiation between two *Parties*.

The broker receives offers, counter offers and responses and passes them on to the other *Party*, perhaps performing some processing of the offer or counter offer. The negotiating *Parties* might tell the broker things that are not to be told to the other *Party*. The *Parties* might reveal aspects of their private negotiation strategies to a trusted broker that they would not directly reveal to the other *Party*. Some examples are upper and lower limits of negotiable values and what a *Party* is really in the market for.

Enhancing the specification to support brokers would include defining broker-specific function and the protocol and choreography to support it. There would have to be a *CPA* between each *Party* and the broker in addition to the *NCPA* between the two *Parties*.