BDA system

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Software Specifiation

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Specs

Informal language:

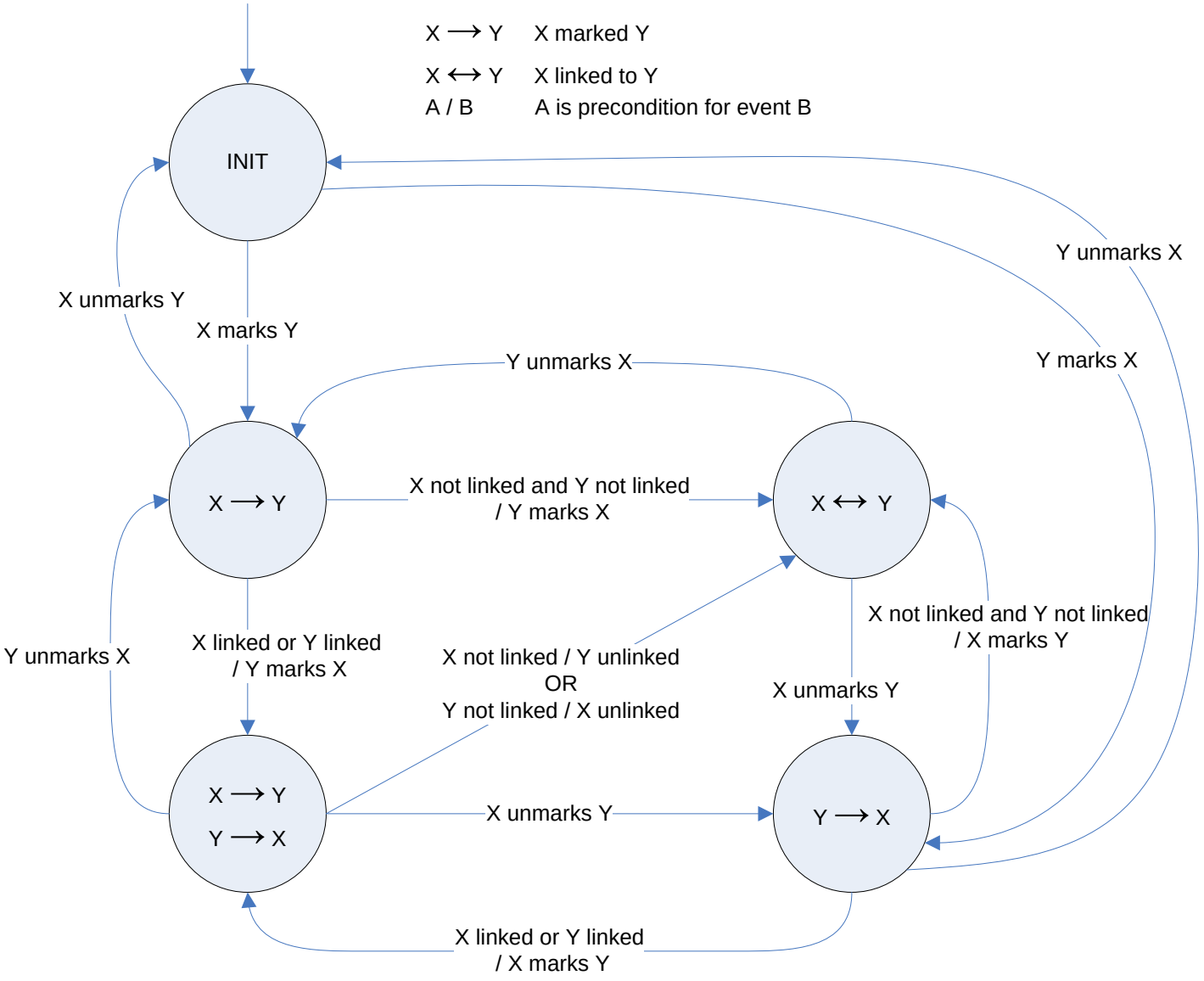
1. Users are only linked if and while there is mutual interest;
2. No user is multiply linked;
3. No user is left without link unless all mutually interested parties (if any) are already linked to someone else.

Specification in formal language:

1. $\forall u, v :: User \,.\, u \text{ linked } v \implies u \text{ marked } v \wedge v \text{ marked } u$
2. $\forall u, v, w :: User \,.\, u \text{ linked } v \wedge u \text{ linked } w \implies v \equiv w$
3. $\forall u, v :: User \; \exists w :: User \,.\, u \text{ marked } v \wedge v \text{ marked } u \wedge \neg u \text{ linked } v \implies u \text{ linked } w \vee v \text{ linked } w$

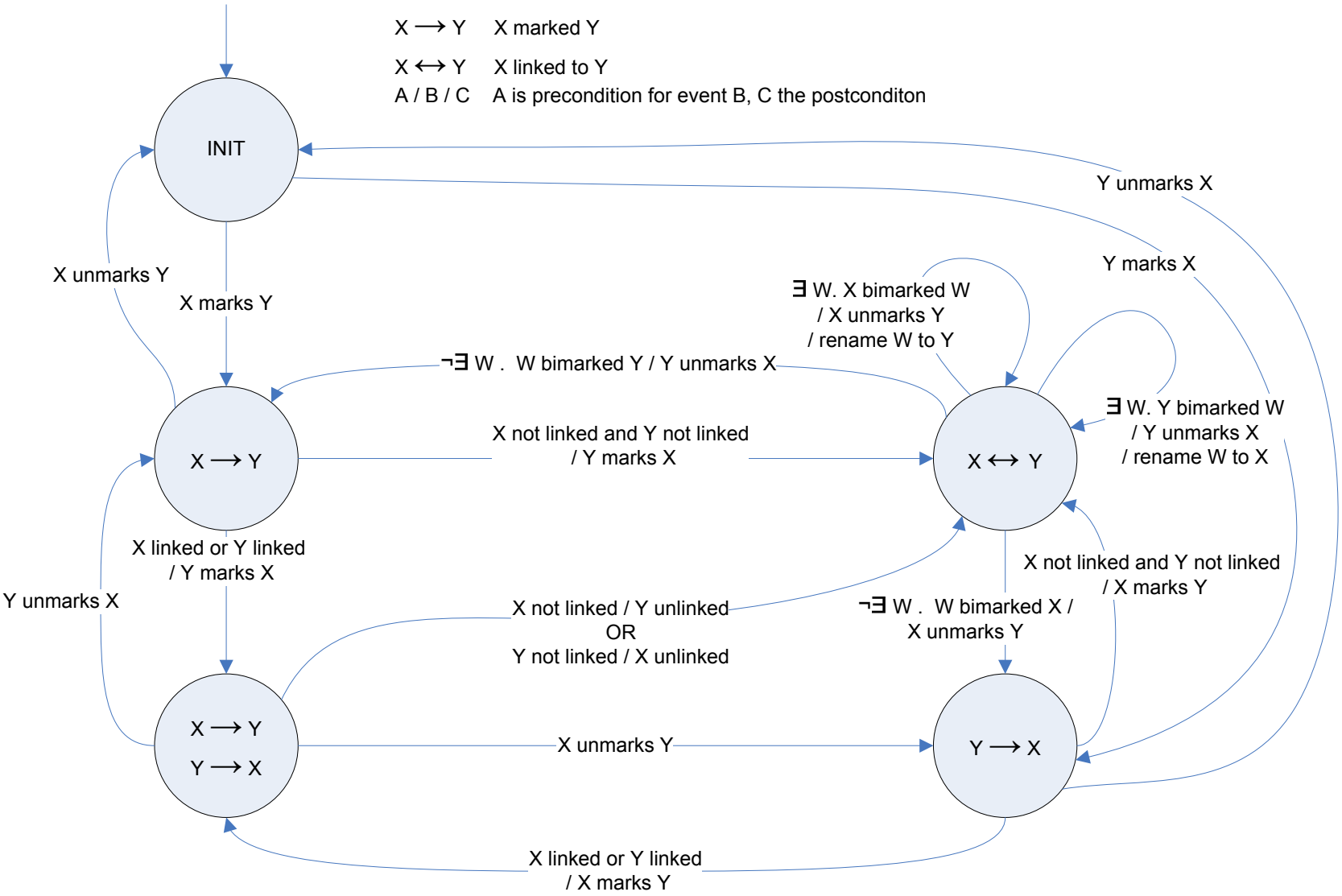
Basic version

- Defines marking/unmarking from the perspective of one user.
- $\forall X, Y :: User$
- Preconditions are used.


X ⟶ Y X marked Y
X ⟷ Y X linked to Y
A / B A is precondition for event B
INIT
X unmarks Y
X marks Y
Y unmarks X
Y marks X
Y unmarks X
X ⟶ Y
X not linked and Y not linked
/ Y marks X
X ⟷ Y
X not linked and Y not linked
/ X marks Y
Y unmarks X
X linked or Y linked
/ Y marks X
X not linked / Y unlinked
OR
Y not linked / X unlinked
X unmarks Y
X ⟶ Y
Y ⟶ X
X unmarks Y
Y ⟶ X
X linked or Y linked
/ X marks Y

Extended version

- Defines marking/unmarking from the perspective of one user.
- We were missing relinking: establish another link when someone unmarks.
- $\forall X, Y :: User$
- $W :: User$
- Post- & Preconditions are used.


X ⟶ Y X marked Y
X ⟷ Y X linked to Y
A / B / C A is precondition for event B, C the postconditon
INIT
X unmarks Y
X marks Y
Y unmarks X
Y marks X
∃ W. X bimarked W
/ X unmarks Y
/ rename W to Y
¬∃ W . W bimarked Y / Y unmarks X
X ⟶ Y
X not linked and Y not linked
/ Y marks X
X ⟷ Y
∃ W. Y bimarked W
/ Y unmarks X
/ rename W to X
X linked or Y linked
/ Y marks X
Y unmarks X
X not linked and Y not linked
/ X marks Y
X not linked / Y unlinked
OR
Y not linked / X unlinked
¬∃ W . W bimarked X /
X unmarks Y
X ⟶ Y
Y ⟶ X
X unmarks Y
Y ⟶ X
X linked or Y linked
/ X marks Y