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Fortier

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[54] **MERGE, COMMIT RECOVERY PROTOCOL FOR REAL-TIME DATABASE MANAGEMENT SYSTEMS**

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[52] **U.S. Cl.** **395/600**; 395/650; 395/726; 364/974; 364/962.1; 364/281.4; 364/281.5; 364/282.1; 364/285.1; 364/DIG. 1

[58] **Field of Search** 395/600, 726, 395/650

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[57] **ABSTRACT**

A computer database method using data organized data into atomic data sets and transactions separated into a plurality of statements called projections which operate on only one said atomic data set. Statements such as read commands, write commands, assignment commands, transaction delimiting commands, and projection delimiting commands are executed, and a depends on graph is created during execution of the statements. Projection recovery data is stored during operation. When a statement requests commit the depends on graph is analyzed to determine if the projection is related to another projection in the transaction. The projection is committed if it is not related to another projection and delayed if related to another projection. Likewise, the system determines related projections and aborts them together if a transaction error occurs. The method can recover to a consistent database state after projection abortion.

5 Claims, 5 Drawing Sheets

GIVEN: ADS A CONTAINS {a, b, c} AND ADS B CONTAINS {d, e,}

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Tbegin
S1:   sb(A)                /* CREATE LINK TO πA */
S2:       v1:= r(a)        /* S3 ∈ πA */
S3:       v2:= r(b)        /* S4 ∈ πA */
S4:       v3:= fi(v1,v2)   /* S4 DIRECTLY DEPENDS ON S2 AND S3 */
S5:       w(c,v3)          /* S5 ∈ πA AND S5 DEPENDS ON S4 */
S6:   sb(B)                /* CREATE LINK TO πB */
S7:       v4:= r(d)        /* S7 ∈ πB */
S8:       v4:= fj(v4,v3)   /* S8 DEPENDS ON S7, S2 AND S3 */
S9:       sc(A)            /* PREPARE TO COMMIT πA */
S10:      w(e,v4)          /* S10 ∈ πB AND S10 DEPENDS ON S7, S2 AND S3 */
S11:  sc(B)
Tend
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