2011-04-24b - The LinkedIn Bitemporal Data Group

On temporal referential integrity.

So consider a Customer version table, based on the Customer (non-temporal) table from an earlier comment. Here's a row in that table.

---Customer---
{ [C123] / [1/1/07] / [1/1/08] / Smith / 3 }

Braces delimit the row, slashes separate columns, and brackets delimit PK columns. We will also need a notation to indicate the column that makes the child-to-parent reference. In a non-temporal table, the reference is made by means of a FK. As we will see, in a temporal table, the reference is made by means of a TFK. In both cases, we will indicate such columns with a pound sign (#) prefix.

We use dates as our points in time, because they are shorter across the page and thus better for examples.

This row says that C123 uniquely identifies a customer who existed throughout 2007, and who, during that period of time, had the name "Smith" and a customer status of "3".

Now consider a Customer Contract version table, with one entry for every contract a customer has entered into with our company, and the date the contract was signed.

Normally, of course, this would be an associative table; and later on, we will treat it as such, and see how TRI works with associative tables. But for now, we'll just treat it as a child table in an RI relationship from the Customer table.

Here's a row in that table.

---Customer Contract---
{ [#C123] / [CX344] / [3/1/07] / [10/1/07] / 4-18-07 }

This row says that C123 together with CX334 uniquely identifier a contract which began on 3/1/07, which continued to exist for seven months, and which was signed on April 18th, 2007.

As an aside, note that the contract began to exist before it was signed. This tells us something about what "contract" means, as far as the company who owns this table is concerned. If instead that company defined a contract to begin on the day it was signed, then we could have used that date as the valid-time begin date.

Fortunately, the contract's time period is fully contained within the customer's time period. This is fortunate because this is exactly what TRI, the temporal form of referential integrity, requires. Just as an RI relationship from B to A expresses an existence dependency of B on A, a temporal RI relationship from B to A expresses an existence dependency of B on A for as long as B exists.

Next time, we'll see what happens when we try to extend the valid time during which the contract exists.