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Access control implementation method in XML inquiry

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XML is data form that A complex data structure is enabled. Recently, it is known to be used for the system that manages private information such as XML data bases and EHR widely. Needing it in managing private information is an access control. But, It differs from the data form managed by the relational database, and in the XML data, the data item is complex and irregular. Thus, The access judgment becomes complex. There are two techniques method "After it transforms it into the one not accessed beforehand, execute it in the place where the inquiry type cannot be accessed" and "Information on the right of access is added to data, and the part of not being possible to access it by examining the information whenever accessing data is excluded from the solution" the technique of the access control of a past relational database. The merit and the weak point of both are enumerated.After the inquiry is transformed beforehand, the inquiry becomes very complex on the condition of the inquiry and the access control, and it might take the former the processing time rather though there is advantageous respect when the processing cost for the access control is not proportional to the size of data, and data is large only because it inquires usually.On the other hand, when the treated data size is a lot of, it is the weak points because it examines the right of access of the data about the latter whenever accessing data that the processing cost grows. It is devised in general that the thing that can be described by

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using the passing type of the access policy that describes an accessible part of data and the part of not being possible to access it is necessary, and has not been established the method of the access control of the XML data that does the access control based on such a passing type in the access control for the XML data yet though these are the implementing techniques of a general access control in the relational database. Then, an efficient implementing method when the access control is done by a complex passing type is researched in this research. In the approach of this research, it thinks both the access control that uses the inquiry transformation and the access control that uses information added to data are used properly according to the situation. In the approach of this research, it thinks both the access control that uses the inquiry transformation and the access control that uses information added to data are used properly according to the situation. In the experiment that had been done to evaluate the efficiency of the technique for proposing it, it stored it in the relational database by reading data by making the XML test data for the bench mark with different data size by using XMark that was experimental use XML data generation software, and using SAX, encoding to CSV by the processing program that used Java, and using SQL*Loader. The access policy set the pattern that variously changed the ratio of an accessible node of the obtained solution and a node not acceptable to access and set both a simple access policy based on only passing the node and a complex access policy of which the condition was the value of the node two or more patterns. To inquire the relational database, XPath is converted into SQL. When converting it into SQL that applies the access policy from the inquiry type, three kinds of approaches are used and converted. The feature of each approach is as follows.

1. Method converted into one SQL bringing inquiry type and access policy together
2. Method converted from solution obtained by inquiry type into SQL that does processing that exclude part of not being possible to access it by access policy
3. Method converted into SQL that does processing to which access judgment is done by using information added to each node

The technique that can be processed more efficiently than the access policy of the pattern set by using these approaches properly is found, and the condition of using the technique and node information on the access control by the inquiry transformation properly is investigated.Moreover, the influence on efficiency by cash was considered, and the case division was done by the presence of cash about the measurement of the processing time. When the technique is used properly according to the following conditions, the access control is efficiently possible as the result of the experiment.

- Kind of access polycy
- Presence of cash
- Data size
- Number of inquiry types from user

It did not consist as a condition about the point that the ratio of the numbers of nodes of being not able access to the solution of the inquiry it became the condition of the switch of the technique in the case that had been assumed this time. The problem in the future is to find a boundary condition that is clearer to use the development of the system to do conversion from XPath to SQL by the automatic operation, the measurement at the processing time including the transformation time, and the technique properly.