A NEW APPROACH TO SAVE ENERGY AND INCREASE SCALABILITY IN MOBILE COMPUTING

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Abstract- In this paper we propose an energy efficient encoding technique called Lineage encoding for XML dissemination by means of a novel unit structure called G-node. Lineage encoding is a light-weighted encoding scheme which represents the parent-child relationship among the XML element by generating Lineage Code (V, H) and to support Twig pattern queries. This supports dynamic XML dissemination by which the mobile clients can have live updation of the data. And also the mobile clients can receive data without sending request messages that consumes much energy. Thus by implementing this approach we achieve effective utilisation of bandwidth and achieve scalability.

Keywords- Twig Pattern Matching. Dynamic Broadcasting. XML Dissemination.

I. INTRODUCTION

With the fast development of wireless network technologies, wireless mobile computing has become fashionable. Users communicate in the wireless mobile environment using their mobile devices such as smart phones and laptops while they are moving. So, we define a novel unit structure called G-node for streaming XML data in the wireless environment. It exploits the benefits of the structure indexing and attributes summarization that can integrate relevant XML elements into a group. It provides a way for selective access of their attribute values and text content. We also propose a lightweight and effective encoding scheme, called Lineage Encoding, to support evaluation of predicates and twig pattern queries over the stream. We need to consider energy conservation of mobile clients when disseminating data in the wireless mobile environment, because they use mobile devices with limited battery-power (i.e., energy-efficiency). The overall query processing time must also be minimized to provide fast response to the users. The goals of conventional query processing on streamed XML data are to minimize computation costs and filtering time.

Fig 1 shows the architecture of the wireless XML broadcasting system. In case of broadcasting the XML document in a wireless environment, the server retrieves the XML data from the XML repository which is to be broadcasted. Then the XML data is being parsed and XML stream is generated in the wireless environment. The XML stream is incessantly disseminated via a broadcast channel. If the query is issued by the mobile client in the client-side, selective tuning is done which tunes to the appropriate broadcast channel and selectively downloads the XML stream for query processing. The XML Broadcasting is completed expeditiously in such the simplest way the server will support dynamic dissemination of a G node with none interruption in Broadcasting.

II. XML DATA MODEL AND XPATH QUERY PROCESSING

The XML document can be represented in the form of rooted, ordered and a labelled tree. Nodes represent the elements, attributes and texts.

Fig 1. Wireless XML broadcasting architecture

Fig 2 Sample XML document
The Parent-child relationship are represented by the edges in the XML tree. Fig. 2 shows a simple XML document that will be used as a running example in the paper. Client has to pass a request to server to get their appropriate Record. Conventional XML query processing methods are used in the native XML DBMS. On the other hand, the target of our work is the wireless mobile environment.

We evaluate the performance of our scheme by conducting extensive experiments using both the real data set and the synthetic data set and its performance not much satisfied. Systems were proposed so that the stream can support only static XML rendered from repositories. However their designs are not efficient for dynamic broadcasting of XML data over the stream. To prevent Structural overheads of the XML data methodologies like Structured Indexing have been already done so that the XML is ready for broadcasting with its attribute summarized values. The server retrieves the XML document to be disseminated from the XML repository and generates the wireless XML stream using SAX (Simple API for XML), which is an event driven API. SAX invokes the content handlers during the parsing of an XML document. Structured Indexing approach integrate multiple elements of the same path into one node, thus, the size of data stream can be reduced by eliminating redundant tag names thereby enabling Twig Pattern Query Processing. For example, a query that finds cities located in Belgium can be represented by the following XPath expression:

$$Q1://\text{count[@name='Belgium']}/\text{province/city}$$

III. G-NODE AND XML DISSEMINATION

IV. QUERY TREE FORMATION AND SELECTIVE TUNING

In this section we discuss about 1) Simple Query tree Processing and 2) Twig pattern query processing

Simple Query tree Processing: In this type of query processing, first the mobile client constructs a query tree and finds the relevant G-nodes. The group descriptor of the G-node is downloaded. If the current node is the leaf node then the mobile client downloads the attributes and text by using the AI and TI. Twig pattern query processing: This type of query processing involves three phases namely Tree traversal phase, Subpaths traversal phase and Main path traversal phase. The Query tree is traversed in the depth-first manner, and then selectively downloads the group descriptor of the relevant G-node. Selective tuning is a dynamic approach that makes the client’s work easier by reducing the tuning time and the access time. And also it dynamically chooses between the Twig pattern Query and simple query processing. Tuning is optimized with the help of the XPath Query pattern which holds the predicates.

V. ENHANCEMENT

Our XML Automation tool is used for customized XML creation enables the server to Broadcast the customized data’s as and when needed without relying on the third party for XML files. Our Implementation support to dynamic customized XML is a major advantage of the wireless streaming in mobile environment. Dynamic addition of GNode ensures the credibility of the Broadcast system efficiently proposed by our approach. AVL tree and Structured Indexing process will be handled that will probably affect the XML document in temporary buffer. Dynamic modification of Attribute value enables to change any data on the broadcast stream whenever needed and is achieved by the Attribute summarization mechanisms and the Structured Indexing of XML data handled in our system.

CONCLUSION AND FUTURE WORK

Twig pattern queries containing complicated conditions are popular and significant in wireless XML streaming method which supports twig pattern queries is proposed. Lineage encoding and twig pattern matching is proposed. Relevant operators and functions to efficiently process twig pattern matching are defined.

The mobile client will retrieve the desired information by satisfying the given twig pattern and by performing the bit-wise operations on the Lineage Codes in the relevant G-nodes. Thus, our scheme supports the twig pattern query processing whereas providing each
energy and latency efficiencies. We demonstrated our scheme is effective and efficient. We also showed that the typical XML query processing strategies are inefficient within the wireless mobile environment owing to their immense indices.

In future, we plan to analyze the following issues: First, depth-first traversal of components increases the access time for specific queries. Second, as the communication isn’t stable in the wireless broadcasting environment, the indexing mechanism should consider network failures like tail drops and packet losses.

REFERENCES


