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Using XSLT transformations for CMIS eXtent

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***Abstract*- Today, the XML language is the standard data exchange format in Internet or Intranet environments and is accepted by the all higher level Frameworks. One frequently use case is when the applications communicate with each other or need to integrate the information from different heterogeneous data sources. When we consider the applications from an enterprise level, the ECM Systems are the frameworks that can meet the business needs of the today modern organizations and that can manage all the unstructured electronic information. CMIS is a XML standard that can assure interoperability between these ECM Systems. Recently, a new extension of this standard was proposed, aiming to bring the native XML databases into the same collaboration scenario. In this paper we will try to enlarge this proposal by adding a custom transformation module that will help the developers to integrate more easily new XML documents as new custom CMIS documents query able from CMIS Interface.**

***Index Terms*— XML, information exchange, CMIS, XSLT.**

I. Introduction

In this paper we will focus on a very important case of information exchange, the one of ECM systems [2]. Due to the increased number of the electronic documents stored in a business environment, an interoperability standard between these ECM systems was needed. Thus, the major ECM vendors developed the CMIS standard (Content Management Interoperability Services) [1] that can provide a common way for sharing and exchange information amongst various applications. On the other hand, many business environments was already considering the information exchange features and rely on XML databases in order to easily implement some data exchange operations. A CMIS eXtent has been recently proposed [3] to include an XML database into this kind of collaboration scenario. The rest of this paper is organized as follows. Section 2 describe the CMIS standard and the new eXtent approach that include a XML database in the collaboration scenario. Section 3 introduce a new custom transformation layer for CMIS eXtent that can facilitate the mappings of new custom types into the CMIS interface. Section 4 present the conclusion and some of the future works.

II. Including XML Databases into the CMIS Standard

Content Management Interoperability Services (CMIS) [2] is a specification that standardize the interoperability amongst ECM systems and has been approved as an OASIS specification on May 2010. CMIS offers a set of Web services and Web 2.0 interfaces through which various applications can access rich information from various document repositories. The main components of the CMIS standard are:

- A document management data model
- A set of business services that operate with the data model
- Protocol bindings for these business services (SOAP or REST)

The CMIS standard can cover three basic use cases: Repository-to-Repository, Application-to-Repository and Federated Repositories. In this paper we will address only the last one that can be classified as an information exchange use case. In this case, an application will have different repositories as data sources, and integrate the information in a common user interface. The iECM Committee [AIIM] developed a CMIS demo application for validation purposes. This application is a federated search interface that can query for documents from different ECM repositories: Alfresco, EMC, Nuxeo, SharePoint by using the CMIS collaboration standard. The data flow in the CMIS Demo application is depicted in figure 1.

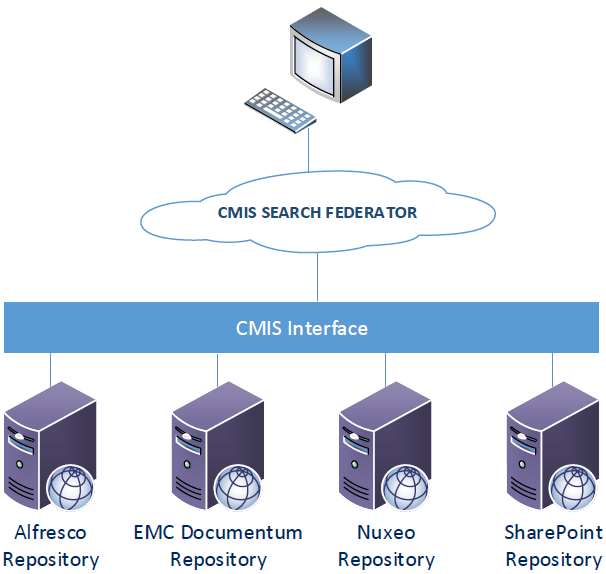

Figure 1. Collaboration data flow in CMIS Demo application

Recently, a new CMIS eXtent was proposed [3] in order to include a native XML database into this collaboration scenario. The CMIS eXtent's experiments included an ECM repository (EMC Documentum) and a XML database (EMC xDB). This collaboration scenario can be observed in figure 2.

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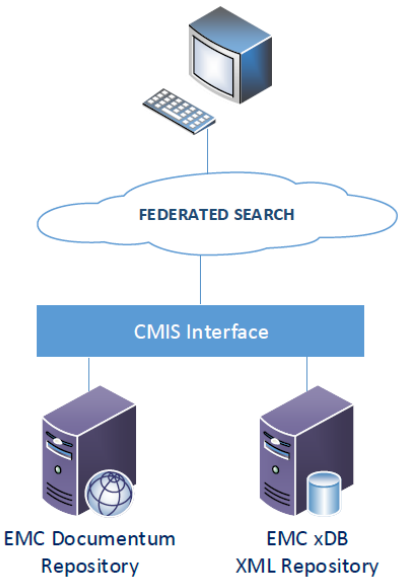

Figure 2. Collaboration scenario for CMIS eXtent

For xDB repository, the proposed extension included a SOAP implementation of the CMIS interface that can run XML specific code by the corresponding business services, transform the information into CMIS data model, and respond with a valid SOAP response to the CMIS client from the federated search application. A more detailed architecture of the xDB CMIS implementation is shown in figure 3.

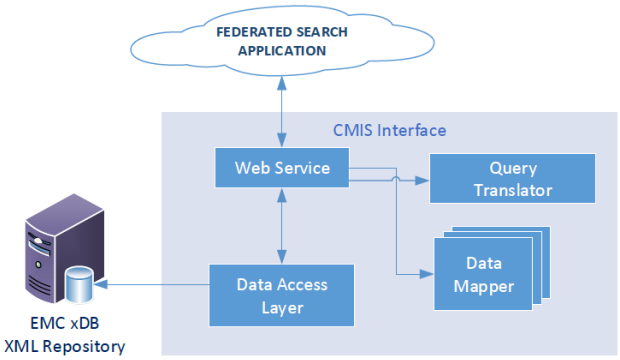

Figure 3. Detailed architecture of the xDB CMIS implementation

III. Custom Transformation Layer for CMIS Implementation

A major difference between the ECM systems and XML databases is the possibility to customize the ECM documents object types by extending them in an object oriented manner. By doing so, all the custom attributes defined can be available to CMIS interface by using a discoverable service. The major drawback of the xDB CMIS interface is that when you want to add new custom XML documents, you need to adapt the Data Mapper and the code from the CMIS interface. Taking this in consideration, we will look at the possibility to improve the customizing process by adding a custom transformation module. There are some transformation languages that can be considered [4], but for our case the XSLT [9] seem to be a good alternative, as the W3C recommendation for XML transformations. Even if the language doesn't provide an internal type checking system, there is several implementations that come with an external type checking system [5, 6 and 8]. Anyway, the type checking aspect in our case is trivial due to the very strict CMIS schema that must be the output of the transformation. The new custom transformation module included in the xDB CMIS interface is depicted in figure 4.

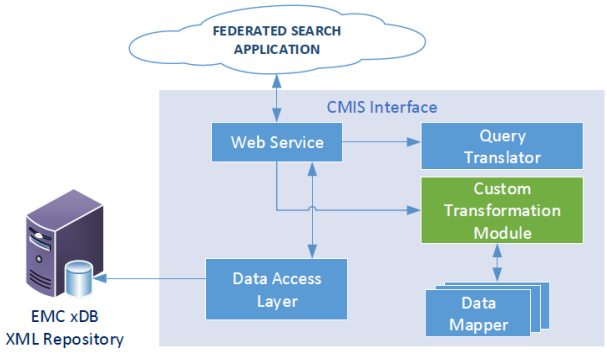

Figure 4. Custom transformation module

Additional type checking's was done at the execution time and concern the verifications of the ID - IDREF pair attributes that may appear on some ECM data model schemas, like container folder ID specified at document level etc.

IV. Conclusion and Future Work

This paper has dealt with the CMIS eXtent that has the purpose of including XML databases into CMIS collaboration scenario. In this way, various XML documents can be expose as ECM documents for information exchange applications that will benefit the integration with XML repositories. Additionally, it was developed a new module that will fasten up the integration of the of the new custom document types from XML repositories into such a collaborative scenario. The future research will include more testing experiments for the custom transformation module and the development of a visual tool for constructing the XSL files needed in the XML transformation process.

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