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Memorandum

Introduction of IFC Model Server

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1. Introduction

The IFC Model Server enables to share IFC model data on the Internet by IFC compliant software. The IFC Model Server stores IFC model data in relational database and provides Web service functions that enable to upload, append, update, delete and select IFC model data. SOAP (Simple Object Access Protocol) is used for the communication between IFC Model Server and client software.

The IFC Model Server prototype version will provide following functions:

- IFC data upload and download by SOAP based web service interface
- IFC data upload and download by STEP file on the web page interface
- Partial model append, update, delete and select

The IFC Model Server provides SOAP based web service interface and the client software can access the server by SOAP function call. Since the IFC Model Server also provides web page interface by ASP (Active Server Page), the client side user can use model server functions by web browser.

Basically, the IFC Model Server provides web service APIs that import and export IFC Model data between server and client. The basic operation seems to be as follows:

- The client software sends a request to IFC Model Server web service by SOAP. The request is written by XML and describes command sets such as IFC Model data upload, update, delete, select and so on.
- The IFC Model Server receives the request and interprets it. If the request is model data selection, Model Server retrieves required IFC model data from database and returns the data to client by SOAP. The returned IFC model data is also XML format.

The IFC Model Server seems to be a web service oriented middle ware except for web page interface, because the essential functions do not have any graphical user interface such as WebSTEP of Eurostep.

2. Overview

The overview of IFC Model Server and client software is shown below:

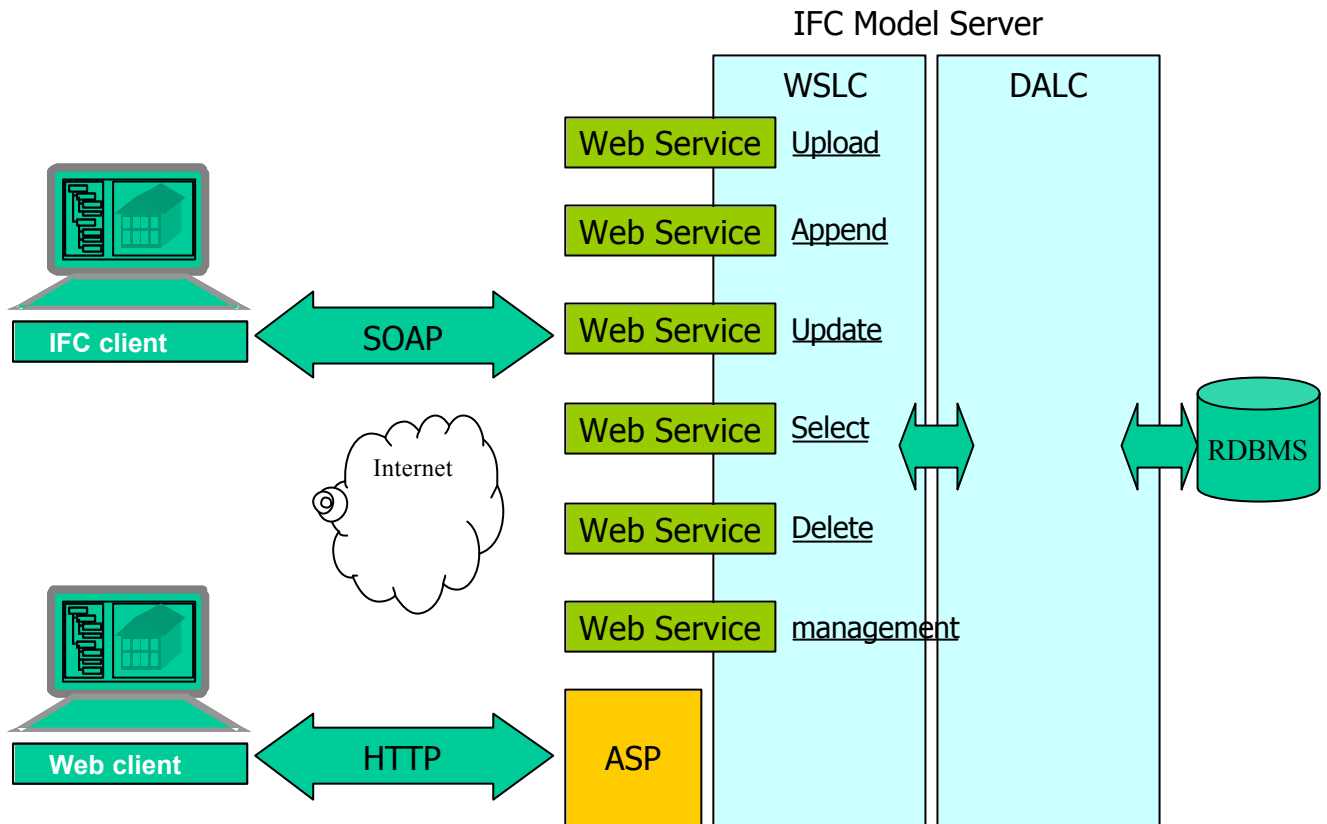


Figure 1. Overview of IFC Model Server and client software

3. Software Components

3.1 IFC Model Server Components

The IFC Model Server prototype consists of following software components:

- **Data Access Layer Component (DALC):**
DALC provides data access functions to database that stores IFC Model data. DALC imports and exports IFC data by XML format or STEP file. DALC creates, updates and select partial IFC model data in/out database.
- **Web Service Layer Component (WSLC):**
WSLC provides Web services to client software on the Internet. The client software can access to DALC functions through WSLC. The Web services are based on SOAP. WSLC also manages Active Server Page (ASP) user interface functions.
- **EXPRESS to XML Schema Converter (EXC):**
EXC converts EXPRESS schema format to the intermediate Meta Model XML data. The database schema of IFC Model Server is made by XSLT with the intermediate Meta Model XML data. The XSLT generates SQL DLL file to make tables.

3.2 Required software

The IFC Model Server prototype requires following software components:

- Microsoft SQL Server 2000
- Microsoft Internet Information Server (IIS) version 5
- Microsoft SOAP Toolkit SDK version 2
- Microsoft Windows 2000 Server

4. Availability

Basically, the client side user uses SOAP function call or web page interface to access IFC Model Server. However, the IFC Model Server stores IFC model data in relational database and the database schema is opened, then it is easy to utilize the IFC model stored in the database from any other application directly. In this prototype version, the database is Microsoft SQL Server 2000. SQL Server 2000 also provides powerful accessibility to the database from the Internet.

From client side view point, IFC Model Server looks like a group of SOAP based web services. IFC Model Server receives XML data of request from client and returns result by SOAP. Those XML formats are public and SOAP is also neutral technology from any platforms and any programming languages. This means you can make your own client application by, for example, Java on Linux system to access to IFC Model Server. When you get IFC model data as XML format, you can transform the XML data to STEP file format by XSLT or IFCsvr ActiveX Component.