Introduction of
IFC Model Server Project

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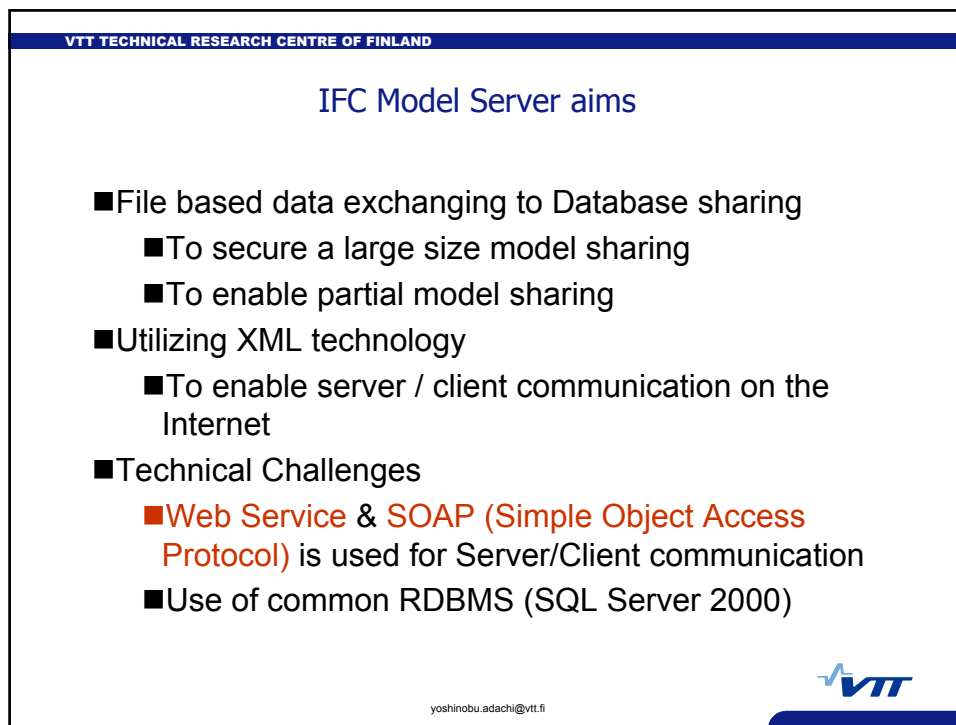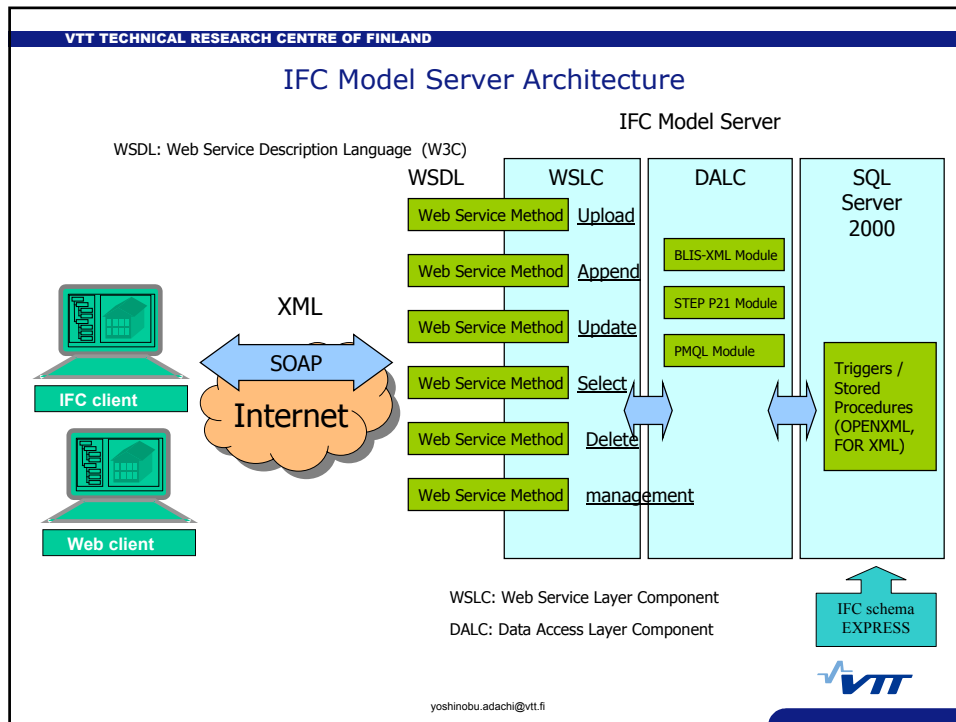

Key Concepts

- *IFC (Industry Foundation Classes)*
  - Object Model Data of Building Project
- *Model Server*
  - To enable model data sharing
- *Database*
  - To store IFC data
- *Web Service*
  - To enable Server/Client communication on the Internet
- *XML*
  - XML format of IFC data (BLIS-XML, etc)

IFC Model Server Architecture

IFC Model Server

WSDL: Web Service Description Language (W3C)

WSDL	WSLC	DALC	SQL Server 2000

Web Service Method | Upload

Web Service Method | Append

Web Service Method | Update

Web Service Method | Select

Web Service Method | Delete

Web Service Method | management

BLIS-XML Module

STEP P21 Module

PMQL Module

Triggers / Stored Procedures (OPENXML, FOR XML)

XML

SOAP

Internet

IFC client

Web client

WSLC: Web Service Layer Component

DALC: Data Access Layer Component

IFC schema EXPRESS

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IFC Model Server aims

- File based data exchanging to Database sharing
  - To secure a large size model sharing
  - To enable partial model sharing
- Utilizing XML technology
  - To enable server / client communication on the Internet
- Technical Challenges
  - Web Service & SOAP (Simple Object Access Protocol) is used for Server/Client communication
  - Use of common RDBMS (SQL Server 2000)

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Web Service & SOAP

❑ Web service is a programmable entity that provides a particular element of functionality, such as application logic, and is working on the Internet .

❑ Web service allows heterogeneous systems to work together.

❑ SOAP is an important part of Web Service.

❑ SOAP (Simple Object Access Protocol) is a W3C specification for invoking methods on servers, services, components and objects.

❑ SOAP is based on the existing technologies such as XML and HTTP as a method invocation mechanism.

❑ SOAP can go through Firewall.

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Example of SOAP Communication between IFC Model Server and Client software

❑Request: Get an IFC object

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
- <SOAP-ENV:Envelope SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/" xmlns:SOAP-
  ENV="http://schemas.xmlsoap.org/soap/envelope/">
  - <SOAP-ENV:Body>
    - <SOAPSDK1:GetObject xmlns:SOAPSDK1="http://tempuri.org/message/">
        <strUserName>user1</strUserName>
        <strPassword>user1</strPassword>
        <strProjectName>fortum_model</strProjectName>
        <strOID>7DD99129D5FD439DAF1D1E432B47CE62</strOID>
    </SOAPSDK1:GetObject>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Parameters of Web Service Method

Web Service Method on IFC Model Server

❑Response from Server

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
- <SOAP-ENV:Envelope SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/" xmlns:SOAP-
  ENV="http://schemas.xmlsoap.org/soap/envelope/">
  - <SOAP-ENV:Body>
    - <SOAPSDK1:GetObjectResponse xmlns:SOAPSDK1="http://tempuri.org/message/">
      - <Result>
        <IfcBuildingStorey GlobalId="bMt%s>|bZR:ESVe%K@e2"
          OwnerHistory="B2A44FD17EE64CD0874DF0DEEDF4EA26"
          LocalPlacement="430E79F9E88144DDB9F8CA8CE7C91D46" BuildingStoreyReference="ACID1"
          BuildingStoreyName="" Elevation="0" calcTotalHeight="0" calcTotalArea="0" calcTotalVolume="0" />
      </Result>
    </SOAPSDK1:GetObjectResponse>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

IFC Object data (Enhanced BLIS-XML format)

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3

Example of Quantity Take off
- Microsoft Excel VBA + SOAP SDK

Example of Java implementation for Client software (Apache-SOAP)

VTT Building and Transport : IMP System

4

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END

Thank you

More information: http://cic.vtt.fi/projects/ifcsvr/

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5