

EXPRESS와 데이터베이스 구현

유상봉
인하대학교 자동화공학과

Contents

- **WG 11 소개**
- **WG 11 Working Items**
 - EXPRESS-X
 - EXPRESS Version 2
 - IDL & Java Binding to SDAI
 - International Character Set Issue
- **STEP Tools 현황**
 - ST-Developer, EXPRESS Data Manager, PSstep_Caselib
- **관련 Projects**
 - OMG RFP for PDM Enablers
 - EXPRESS-HLDAI Mapping Language
 - PDM Schema

ISO TC184 SC4 WG11

- **EXPRESS language, implementation methods, and conformance testing methods**
 - Enabling Technologies (wgl1@cme.nist.gov)
 - Christophe Viel (cviel@club-internet.fr)
- **Parts**
 - 11 (EXPRESS, IS), 12 (EXPRESS-I, Technical Report)
 - 21 (STEP File, IS), 22 (SDAI, FDIS)
 - 23 (SDAI C++ Binding), 24 (SDAI C Binding), 26 (SDAI IDL Binding)
 - 31 (Conformance testing methodology and framework: General concepts, IS)
 - 32 (Requirements on testing laboratories and clients)
 - 33 (Structure and use of abstract test suites), 34 (Abstract test methods)
 - 35 (Abstract test methods for SDAI implementations)

EXPRESS-X

- **High Level Mapping Language**
 - EXPRESS-M과 EXPRESS-V의 기능을 합친 표준 매핑 언어
 - Proposed syntax on SOLIS (WG11 N002)
- **응용 분야**
 - STEP AP간 매핑 (서로 다른 AP's, 같은 AP의 서로 다른 버전)
 - Native Data를 STEP AP 데이터로 매핑
 - Native Data 간의 매핑
 - 서로 다른 표준 간의 매핑 (예, STEP <-> EDIF)
 - ARM과 AIM 간의 매핑
- **Status**
 - Preliminary Working Item, M. Hardwick (STEP tools), Ian Bailey (EuroSTEP)
 - Commercial Tools 지원 (ST-Developer, EXPRESS Data Manager)

EXPRESS Version 2

- **Purpose**

- EXPRESS 수정, 보완
 - Schema 인터페이스 기능 보완
 - 재사용 데이터 구조 정의 (templates)
 - 제약 조건 정의 기능 강화
- Behaviour 모델링 기능 포함
 - 엔티티, 타입의 동작
 - Dynamic Environment의 모델링 (Transaction model, Triggers, Concurrency 등)
 - Process 정의

- **Status**

- Phil Spiby (project leader)
- Working Draft on SOLIS (WG11 N018)

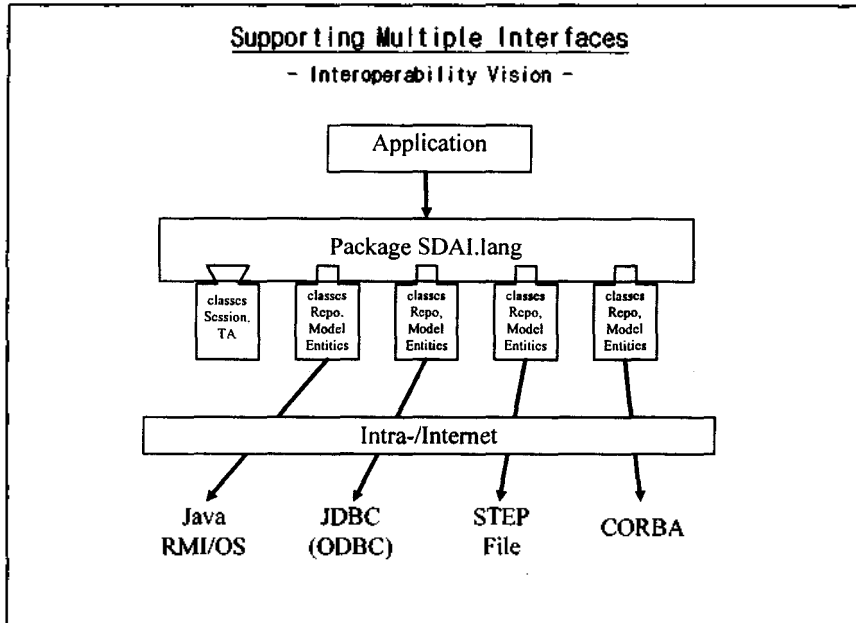
IDL & Java Binding to SDAI

- **IDL Binding (Part 26)**

- Tom Rando (NIHP Consortium)
- Committee draft (SC4 N571)
- IDL Binding of SDAI operations
 - Session, Transaction, Schema_instance, Repository, Model, Scope 등

- **Java Binding**

- RPI, STEP Tools, TU Munchen, Daimler-Benz
- Stage 0
- Mapping EXPRESS to Java
 - SCHEMA <sName> -> Package SDAI.S<Sname>
 - ENTITY <entName> -> Interface SDAI.S<Sname>.E<Entname>
 - ENUM <eName> -> Class SDAI.S<Sname>.C<Ename>
 - SELECT <selName> -> Interface SDAI.S<Sname>.E<Selname>



- ### Character Set Issues
- 문제점
 - Part 11과 21에서 Latin alphabet만 지원
 - 고유명사 또는 주석에 다양한 문자 사용 필요
 - Person.name := 김철수;
 - Mfg.site.city := 군산;
 - Code Sets
 - ISO 646: Basic 7-bit code
 - ISO 8859: 8-bit graphic character sets
 - ISO 2022: Character extension techniques (현재 산업체에서 사용)
 - ISO 10646: Universal Multiple-Octet Coded Character Set (Future Standard)
 - Status
 - 국제 문자 수용에 합의
 - Amendment, EXPRESS V2

ST-Developer V1.6

- **STEP Tools Inc. (<http://www.steptools.com>)**
- **Platforms**
 - UNIX (Sun, Silicon Graphics, DEC, HP, IBM), Windows NT/95
- **EXPRESS-X Compiler**
 - beta version
- **Programming Libraries**
 - C, C++, Tcl/Tk, Java, SDAI (DIS)
- **Conformance Testing**
 - AP 203
- **File Conversion Utilities**
 - IGES <-> STEP, DXF <-> STEP
- **EXPRESS-G Tools**

EXPRESS Data Manager

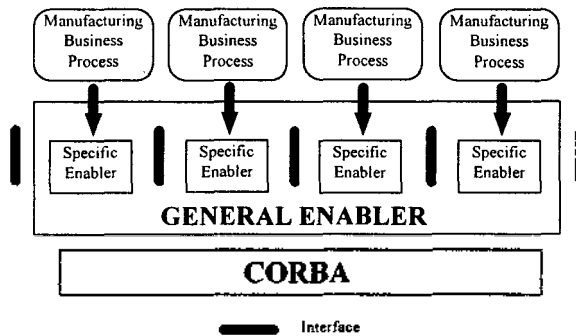
- **EPM Technology (<http://www.epmtech.jotne.com>)**
 - UNIX, Windows
- **EXPRESS Compiler**
- **SDAI Database Interface**
- **EXPRESS-G**
- **Model Converter**
 - EXPRESS-X
 - GUI
- **Model Checker**
 - EXPRESS의 제약조건 확인
- **HTML 포맷으로 EXPRESS 스키마 표현**
 - Links

PSstep_Case1 ib

- **ProSTEP** (<http://www.prostep.darmstadt.gmd.de>)
 - UNIX, Windows 95/NT
- **EXPRESS Compiler**
- **SDAI**
 - C late binding
- **STEP File Scanner/Parser**
- **Converters**
 - IGES <-> STEP
 - VDAFS <-> STEP
 - ACIS-SAT <-> STEP
- **Mathematical Conversions of Curves and Surfaces**

OMG RFP for PDM Enablers

- **OMG** (www.omg.org)/ **MDTF (Manufacturing Domain Task Force)**
 - 8 Enablers (Request for Engineering Actions, Engineering Change, Manufacturing Implementation, Document Management, Product Structure, Effectivity of Products, Configuration management, Test, Maintenance, and Diagnostics)



OMG PDM RFPO에 대한 제안서

- **Dassault Systems (Eric Retraint, eric_restraint@ds-fr.com) & NIIP Consortium (Tom Rando, trando@ebmail.gdeb.com)**
- **설계 원칙**
 - Product Structure, Effectivity of Products, and Configuration Management 대상
 - PDM Schema위해 STEP AP 203 ARM 확장 (AIM 속성 포함)
 - OMG BODTF (Business Object Domain Task Force)의 Business Object Facility의 객체 프레임워크 활용
 - OMG의 객체의 네트워크 기술과 STEP의 정보 모델링 기술 결합
- **기존 OMG 규격과의 관계**
 - CORBA services 이용 (Transaction, Query, Event, Collections)
 - SDA1 IDL 인터페이스 이용 (STEP Part 26)
 - ARM, AIM 간의 매핑 (EXPRESS-X) 가능

EXPRESS-HLDA1 Mapping Language

- **High Level Data Access Interface**
 - Japan STEP Center, Masao Ando (ando@jstep.jipdec.or.jp)
- **ARM 정보 모델을 이용한 STEP 데이터 인터페이스**
 - EXPRESS-X 확장
 - 라이브러리 구현
- **응용 시스템 구현 예**
 - Drawing data translation
 - IGES <-> AP 202 AIM (AP 202 ARM을 이용한 매핑 정의)
 - Interactive PDM data sharing
 - AP 203 AIM 데이터 <-> PDM 시스템
 - AP 203 ARM을 이용한 매핑 정의

PDM 스키마 Project

- **International Joint Project (1997. 11. 4)**
 - ProSTEP (machner@prostep.darmstadt.gmd.de)
 - PDES Inc.(rosche@scra.org)
 - JSTEP (oku@jstep.jipdec.or.jp)
 - 지원 AP's: 203, 210, 214, 212, 232.
- **스키마 범위**
 - item master data (part identification, approval of part version, management data)
 - item structure
 - item classification
 - item properties (mass, costs, others)
 - document management (id, revision, representation, structures, approvals)
 - work management (engineering change request, EC order, project)

Summary

- **표준 진행 사항**
 - Part 22 (SDAI): FDIS
 - Part 12 (EXPRESS-I): Technical Report Type II
- **새로운 기술, 표준 접목 노력**
 - CORBA
 - Java
 - SGML
- **활용 기술 개발 및 구현**
 - CALS 및 PDM 관련 응용 제품
 - 일본 STEP Center의 적극적 참여