



**XML DOCUMENT-TO-RDBMS
REFERENCE IMPLEMENTATION
SETUP INSTRUCTIONS**

Systems Integration

Version 2.0

August 5, 2003

FINAL

*This report is confidential and intended solely for the use and
information of the client to whom it is addressed.*

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Record Of Changes

Version Number	Date of Change	Made By	Description of Change
1.0	7/29/2003	System Integration	Original
2.0	8/06/2003	Systems Integration	Formatting/Revisions



1. Software Download and Installation Procedures

The following sections describe the steps to download, install, and configure the required open source tools that are used in the development and execution of the XML Document-to-RDBMS Reference Implementation application. Note that the installation of the open source tools is only a one-time process.

2. System Requirements

The instructions assume you will be deploying and executing the Reference Implementation application on a Windows platform. The instructions given in this document are also applicable, to a great extent, if you intend to use a UNIX/Linux platform.

The application uses the following software:

- MySQL Database, version 4.0
- Tomcat Servlet Container, version 4.1.24
- J2SE 1.4.2
- J2EE 1.4 Beta 2 Release (optional). The application uses JSP's and servlets, and thus the some recent version of J2EE is required to run the application
- Certain JAXB and JAXP .jar files from the Java Web Services Developer's Pack (JWSDP), version 1.2.

3. Reference Implementation

1. Download and save the *refImpl.zip* file containing the Reference Implementation application files and documentation.
2. Extract the *refImpl.zip* file into a folder of your own choosing, such as `c:\refImpl`. The path to this folder will be referred to as “[REFIMPL_HOME]” for the remainder of this document.

4. MySQL Database

1. Download and save MySQL Version 4.0 database zip file for Windows from <http://www.mysql.com/downloads/mysql-4.0.html>
2. Download and save MySQL Control Center zip file for Windows from <http://www.mysql.com/downloads/mysqlcc.html>
3. Install MySQL and the Control Center by following the instruction from <http://www.mysql.com/doc/en/index.html>.
4. Below are the steps and the SQL script that will create the proper database tables based on the Entity Relationship Diagrams that are shown below:
 - Start the MySQL database server by going to `mysql\bin` folder and double clicking on “*mysqld-max-nt.exe*”.
 - Run “*install.bat*” found in the `[REFIMPL_HOME]\db` folder. This will create the *grants.gov* database with its 15 tables as described below. **Note:** first edit “*install.bat*” to reflect your MySQL installation directory path.



Entity Relationship Diagrams

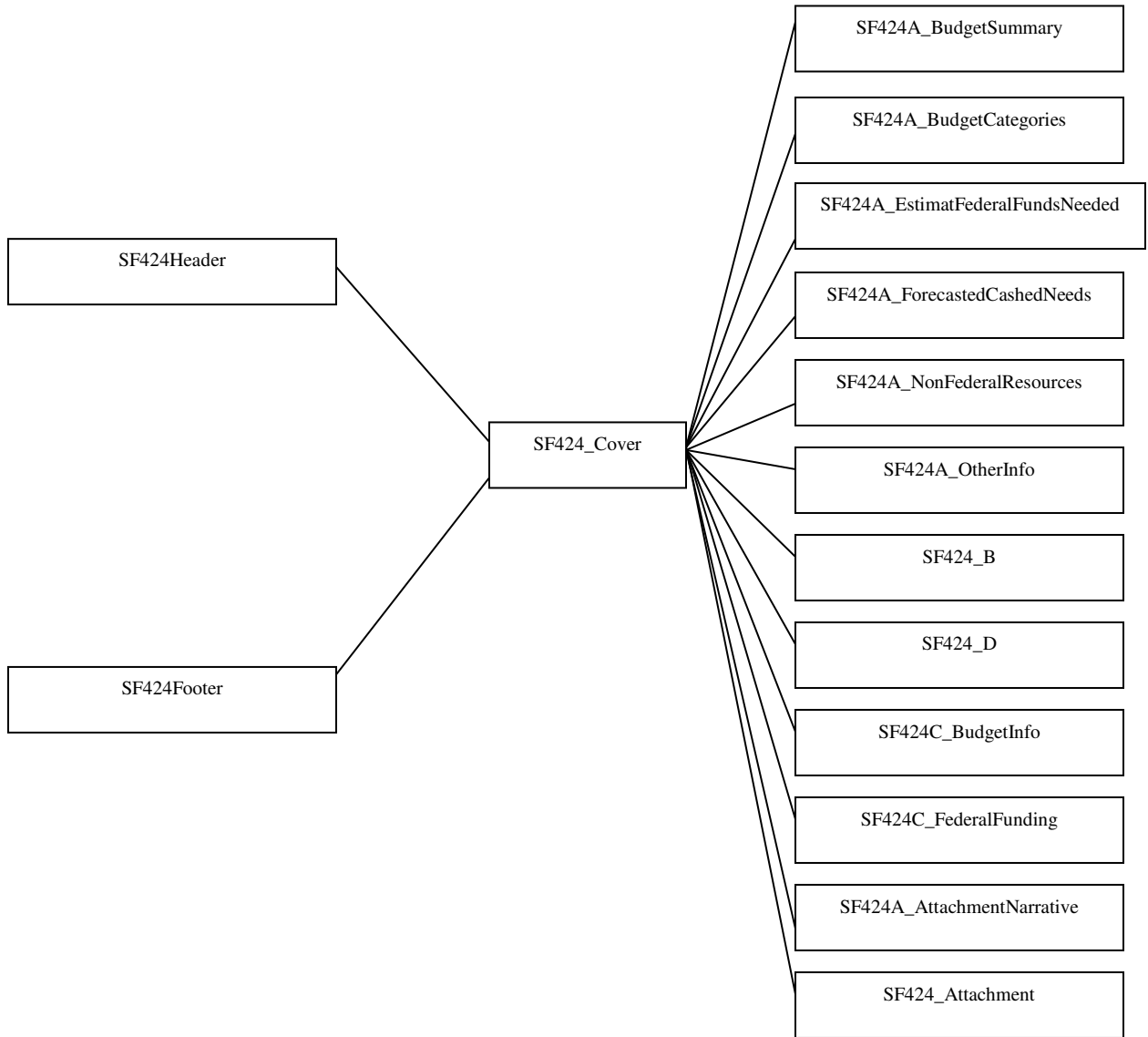


Figure 4-1. Entity Relationship Diagrams

The *grants_gov* database contains the following tables:

TABLE sf424_attachment

Field Name	Data Type
Grants_govTrackingNumber	varchar(240)
FileName	varchar(60)
FileMimeType	varchar(30)

TABLE sf424_attachmentnarrative

Field Name	Data Type
Grants_govTrackingNumber	varchar(240)
PageSequenceNumber	int(11)
NarrativePage	longtext

TABLE sf424a_budgetcategories

Field Name	Data Type
<u>BudgetCategoryIndex</u>	Int(11)
FormVersionIdentifier	varchar(30)
Grants_govTrackingNumber	varchar(240)
GrantActivity	float
BudgetPersonnelRequestedAmount	float
BudgetFringeBenefitsRequestedAmount	float
BudgetTravelRequestedAmount	float
BudgetEquipmentRequestedAmount	float
BudgetSuppliesRequestedAmount	float
BudgetContractualRequestedAmount	float
BudgetConstructionRequestedAmount	float
BudgetOtherRequestedAmount	float
BudgetTotalDirectChargesAmount	float
BudgetIndirectChargesAmount	float
BudgetTotalAmount	float
ProgramIncomeAmount	float

TABLE sf424a_budgetsummary

Field Name	Data Type
<u>BudegetSummaryIndex</u>	int(11)
FormVersionIdentifier	varchar(30)
Grants_govTrackingNumber	varchar(240)
ActivityTitle	varchar(120)
CFDANumber	varchar(15)
BudgetFederalEstimatedUnobligatedAmount	float
BudgetNonFederalEstimatedUnobligatedAmount	float
BudgetFederalNewOrRevisedAmount	float
BudgetNonFederalNewOrRevisedAmount	float
BudgetTotalNewOrRevisedAmount	float



TABLE sf424a_estimatfederalfundsneeded

Field Name	Data Type
EstimateFederalFundsNeededIndex	int(11)
FormVersionIdentifier	varchar(30)
Grants_govTrackingNumber	varchar(240)
GrantAcitivity	varchar(100)
BudgetFirstYearAmount	float
BudgetSecondYearAmount	float
BudgetThirdYearAmount	float
BudgetBudgetFourthYearAmount	float

TABLE sf424a_forecastedcashneeds

Field Name	Data Type
ForecastedCashNeedsIndex	int(11)
FormVersionIdentifier	varchar(30)
Grants_govTrackingNumber	varchar(240)
TimeFrame	varchar(100)
BudgetFederalForecastedAmount	float
BudgetNonFederalForecastedAmount	float
BudgetTotalForecastedAmount	float

TABLE sf424a_nonfederalresources

Field Name	Data Type
NonFederalResourcesIndex	Int(11)
FormVersionIdentifier	varchar(30)
Grants_govTrackingNumber	varchar(240)
GrantActivity	varchar(100)
BudgetApplicantContributionAmount	float
BudgetStateContributionAmount	float
BudgetOtherContributionAmount	float
BudgetTotalContributionAmount	float

TABLE sf424a_otherinfo

Field Name	Data Type
OtherInfoIndex	Int(11)
FormVersionIdentifier	varchar(30)
Grants_govTrackingNumber	varchar(240)
OtherDirectChargesExplanation	varchar(100)
OtherIndirectChargesExplanation	varchar(100)
Remarks	varchar(250)



TABLE sf424b

Field Name	Data Type
TableIndex	Int(11)
FormVersionIdentifier	varchar(30)
Grants_govTrackingNumber	varchar(240)
RepresentativeName	varchar(30)
RepresentativeTitle	varchar(45)
ApplicantOrganizationName	varchar(60)
SubmittedDate	date
ProgramType	varchar(100)

TABLE sf424c_budginfo

Field Name	Data Type
BudgetInfoIndex	Int(11)
FormVersionIdentifier	varchar(30)
Grants_govTrackingNumber	varchar(240)
CostClassification	varchar(100)
BudgetEstimatedCostAmount	float
BudgetNonAllowableCostAmount	float
BudgetTotalAllowableCostAmount	float

TABLE sf424c_federalfunding

Field Name	Data Type
FederalFundingINdex	Int(11)
FormVersionIdentifier	varchar(30)
Grants_govTrackingNumber	varchar(240)
FederalFundingPercentageShareValue	float
BudgetEstimatedCostAmount	float
Contingencies	float
CostSubtotalBeforeContingencies	float
CostSubtotalAfterContingencies	float
ProgramIncome	float
TotalProjectCosts	float

TABLE sf424cover

Field Name	Data Type
FormVersionIdentifier	varchar(30)
Grants_govTrackingNumber	varchar(240)
AuthorizedRepresentativeSignature	varchar(144)
SignedDate	date
AgencySchemaVersion	varchar(3)
SubmissionTypeCode	varchar(100)
SubmittedDate	date
ApplicationTypeCode	varchar(100)



Field Name	Data Type
AgencyName	varchar(60)
AgencyReceivedDate	date
StateReceivedDate	date
StateID	varchar(30)
FederalID	varchar(30)
CFDANumber	varchar(15)
ActivityTitle	varchar(120)
Assurance	tinyint(1)
StateReviewCode	varchar(100)
StateReviewDate	date
RevisionCode1	varchar(100)
RevisionCode2	varchar(100)
RevisionOtherExplanation	varchar(45)
ApplicantID	varchar(30)
ApplicantTypeCode	varchar(100)
ApplicantTypeCodeOtherExplanation	varchar(50)
OrganizationName	varchar(120)
DUNSID	varchar(13)
DepartmentName	varchar(30)
DivisionName	varchar(30)
EmployerID	varchar(30)
Street	varchar(110)
City	varchar(35)
County	varchar(30)
StateCode	varchar(2)
ZipCode	varchar(15)
Country	varchar(3)
DelinquentFederalDebtIndicator	tinyint(1)
DelinquentFederalDebtExplanation	longtext
OrganizationCongressionalDistrict	varchar(30)
ProjectTitle	varchar(200)
Location	varchar(45)
ProposedStartDate	date
ProposedEndDate	date
ProjectCongressionalDistrict	varchar(30)
FederalEstimatedAmount	float
ApplicantEstimatedAmount	float
StateEstimatedAmount	float
LocalEstimatedAmount	float
OtherEstimatedAmount	float
ProgramIncomeEstimatedAmount	float
TotalEstimatedAmount	float
ApplicantNamePrefix	varchar(10)
ApplicantGivenName1	varchar(35)



Field Name	Data Type
ApplicantGivenName2	varchar(25)
ApplicantFamilyName	varchar(60)
ApplicantNameSuffix	varchar(10)
ApplicantTelephoneNumber	varchar(25)
ApplicantFaxNumber	varchar(25)
ApplicantEmail	varchar(80)
AORNamePrefix	varchar(10)
AORGivenName1	varchar(35)
AORGivenName2	varchar(25)
AORFamilyName	varchar(60)
AORNameSuffix	varchar(10)
AORTelephoneNumber	varchar(25)
RepresentativeTitle	varchar(45)

TABLE sf424footer

Field Name	Data Type
Grants_govTrackingNumber	varchar(240)
ReceivedDateTime	datetime
SubmittedName	varchar(240)
HashValue	longtext
HashAlgorithm	varchar(100)
SchemaVersion	varchar(100)

TABLE sf424header

Field Name	Data Type
Grants_govTrackingNumber	varchar(240)
AgencyName	varchar(60)
CFDANumber	varchar(15)
ActivityTitle	varchar(120)
OpportunityID	varchar(100)
OpportunityTitle	varchar(255)
CompetitionID	varchar(100)
OpeningDate	date
ClosingDate	date
SubmissionTitle	varchar(240)
HashValue	longtext
HashAlgorithm	varchar(100)
SchemaVersion	varchar(100)



5. Java 2 Platform, Standard Edition

1. Go to <http://java.sun.com>.
2. Click on “J2SE Standard Edition”.
3. On the next page, click on “J2SE Downloads”.
4. On the next page, click on “J2SE 1.4.2” link.
5. On the download page, click on “DOWNLOAD” link for Windows.
6. Go to the bottom of the next page and click the “No thank you, continue” button.
7. Go to the bottom of the next page and click on “ACCEPT” button.
8. On the next page, click on “Download j2sdk-1.4.2-nb-3.5-bin-windows.exe”.
9. Download and save the .exe file. This file will take a bit longer to download than others due to its size.
10. Create a *java* directory on your C:\ drive. Alternatively, use some other location where you normally install your Java 2 Platform software.
11. Find and execute the “*j2sdk-1_4_2-windows-i586-iftw.exe*” file. Install j2sdk into the directory you have created/selected in step 10. The path to your installation directory is referred to as “[JAVA_HOME]”.
12. Once the installation is complete, copy the contents of the [REFIMPL_HOME]\jwsdp\jaxp\endorsed folder, (supplied to you as part of the Reference Implementation download) to the [JAVA_HOME]\jre\lib\endorsed folder. This is required as the JAXP (not JAXB) classes are built into the JDK 1.4.x JRE.
13. Create a System variable for Java from Control Panel→System→Advanced with “Variable Name” of JAVA_HOME and “Variable Value” of “c:\java\j2sdk1.4.2” (i.e., the path to the folder where you installed J2SE 1.4.2). Alternatively, use the supplied “*jakarta-tomcat-4_1_24.bat*” file, which sets the JAVA_HOME, J2EE_HOME, and CATALINA_HOME environment variables prior to invoking Tomcat’s “*startup.bat*”.

6. Java 2 Platform, Enterprise Edition

1. Go to <http://java.sun.com>.
2. Click on “J2EE, Enterprise Edition”.
3. On the next page, Click on “J2EE Downloads”.
4. On the next page, go to “J2EE Platform Implementations”.
5. On the next page, go to “1.4 Beta 2 Release” and click on “Software and Documentation”.
6. Go to the middle of the next page and in the second download option, select “Windows Install” and click on “Download” button.
7. Go to the bottom of the next page and click “Yes” to agree with the Software Evaluation Statement.



8. On the next page, click on the “Download j2eesdk-1 4-beta2-windows-eval.zip”.
9. Download and save the .zip file.
10. Find and unzip “j2eesdk-1 4-beta2-windows-eval.zip” file into a temp folder
14. Run the setup.exe file. Install *j2eesdk* into the directory you have created/selected in step 10 of section 5 above. The path to your installation directory is referred to as “[J2EE_HOME]”.
15. Create a System variable for J2EE from Control Panel → System → Advanced with “Variable Name” of J2EE_HOME and “Variable Value” of “C:\java\j2eesdk1.4_beta2” (i.e., the path to the folder where you installed J2EE 1.4.2). Alternatively, use the supplied “jakarta-tomcat-4_1_24.bat” file, which sets the JAVA_HOME, J2EE_HOME, and CATALINA_HOME environment variables prior to invoking Tomcat’s “startup.bat”.

Note: The installation of the “1.4 Beta 2 Release” of J2EE is *optional*, but recommended as it will be used in the second reference implementation that contains Web Services.

7. Java Web Services Developer’s Pack, version 1.2

The Reference Implementation application is based upon the reference implementation of JAXB provided in the Java Web Services Developer’s Pack (JWSDP), version 1.2. Although you only need four jar files to work with JAXB, you are not able to only download just these four files at this time. Normally, you would be required to download and install the entire JWSDP.

However, the required .jar files have been extracted and are made available to you as part of the Reference Implementation download in the [REFIMPL_HOME]\lib folder. As such, installation of JWSDP 1.2 is not technically required. However, you may want to install it at this time in preparation for phase 2 of the Reference Implementation, which uses Web Services. Sun’s umbrella site for Web Services is <http://java.sun.com/webservices/>.

8. Tomcat Servlet Container

1. Go to <http://Jakarta.apache.org/site/binindex.cgi/binbuilds>.
2. Go to the middle of the page and click on “Tomcat 4.1.24” link.
3. On the index page, click on “tomcat-4.1.24.exe”.
4. Download and save the .exe file.
5. Find and run the .exe file to create the Tomcat servlet container. Make sure the install is using *j2sdk1.4.2* that you installed in step 5 above. When choosing install options, set the type of install to *normal*. Don’t install into the default directory, which is typically *C:\Program Files\Apache Group\Tomcat 4.1*. Instead, use *C:\tomcat\jakarta-tomcat-1.4.24* (remove the appended *Tomcat 4.1* suffix) or some other folder that does not contain spaces, as users have reported getting a ‘*File Not Found*’ exception when trying to import a sample XML file.



9. Deploying the XML Document-to-RDBMS Application

The XML Document-to-RDBMS Reference Implementation application is packaged in a Web application ARchive (WAR) file named *refImpl.war*. To deploy the application, follow the step below.

1. Copy the *refImpl.war* file provided as part of the Reference Implementation application download to the *webapps* directory of the Tomcat Servlet Container. The application files will automatically be expanded upon the next startup of Tomcat.

10. Starting the XML Document-to-RDBMS Application

To start and use the application, follow the steps below. Note that these steps must be followed each time your PC or laptop is restarted (rebooted).

1. Right click on “Start” and click on “Explore”.
2. Click on C:\ drive.
3. Click on MYSQL directory and then “bin” folder.
4. Double-click on “mysql-max-nt.exe”. This should start the database server.
5. Double-click on the supplied “*jakarta-tomcat-4_1_24.bat*” file to startup Tomcat.
Note: First edit “*jakarta-tomcat-4_1_24.bat*” to ensure that the JAVA_HOME, J2EE_HOME, and CATALINA_HOME variables properly reflect your environment.
6. Open a web browser and enter <http://localhost:8080/refImpl/xmlToDB/jsp/Import.jsp>. Note that the address is case sensitive. This should bring up the XML Document-to-Database “Import” screen, as shown below:



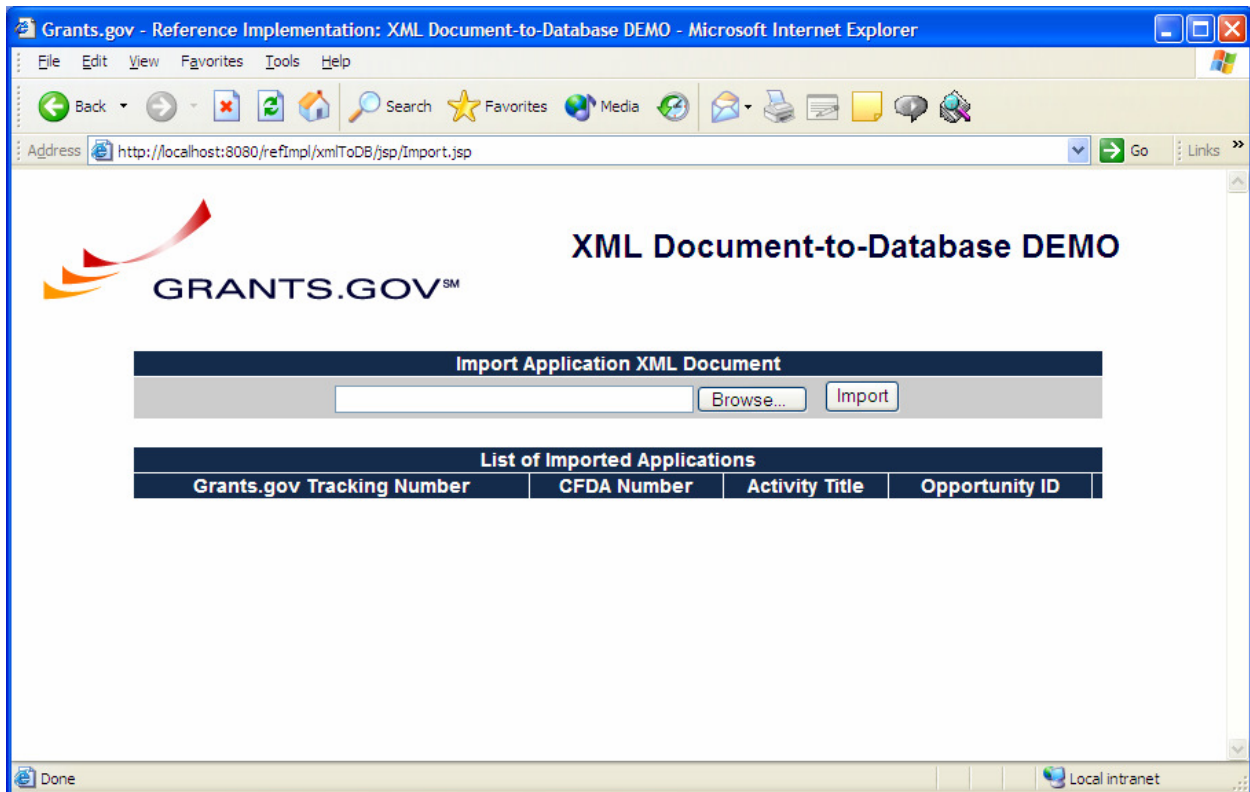


Figure 10-1. XML Document-to-Database “Import” screen

7. To Import and View some of the details of an XML Document:
 - Click on the “Browse” button, and then navigate to the “REFIMPL_HOME\sample XML files” folder provided as part of the Reference Implementation download. Your screen should look something like the following:

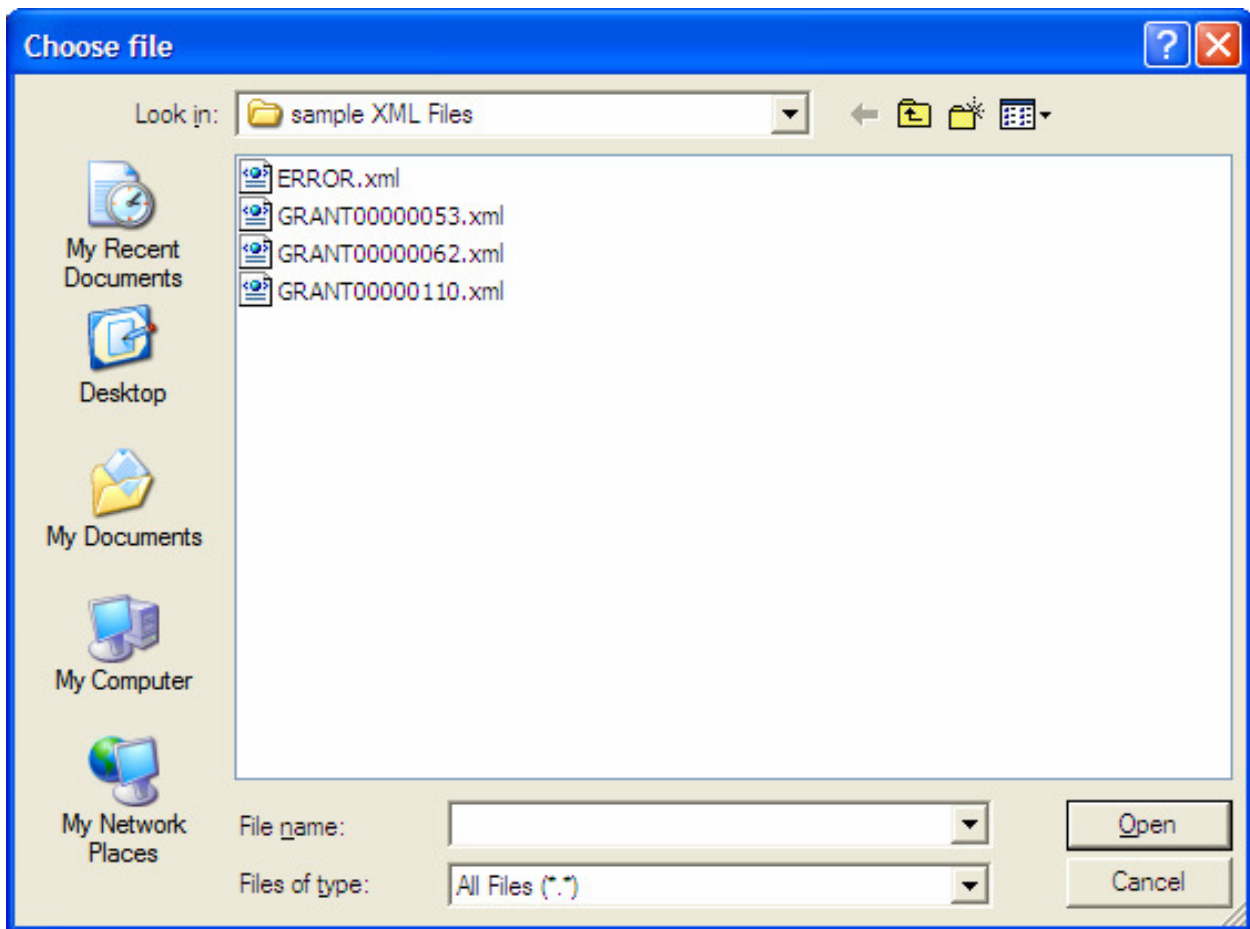


Figure 10-2. Import and View Details of an XML Document

- Select one of the XML Documents that have been provided, and then press “Open”.
- Once the “browse” window closes, the original “Import” screen will be redisplayed with the path to the selected XML document inserted in the field next to the “Browse” button. Click on the “Import” button. The application will now import the XML Document into the database, then refresh to the same Demo screen. A new row for the imported XML Document should now be visible in the “List of Imported Applications” on the same page, as shown below. Repeat the process for any other XML documents you may wish to import.



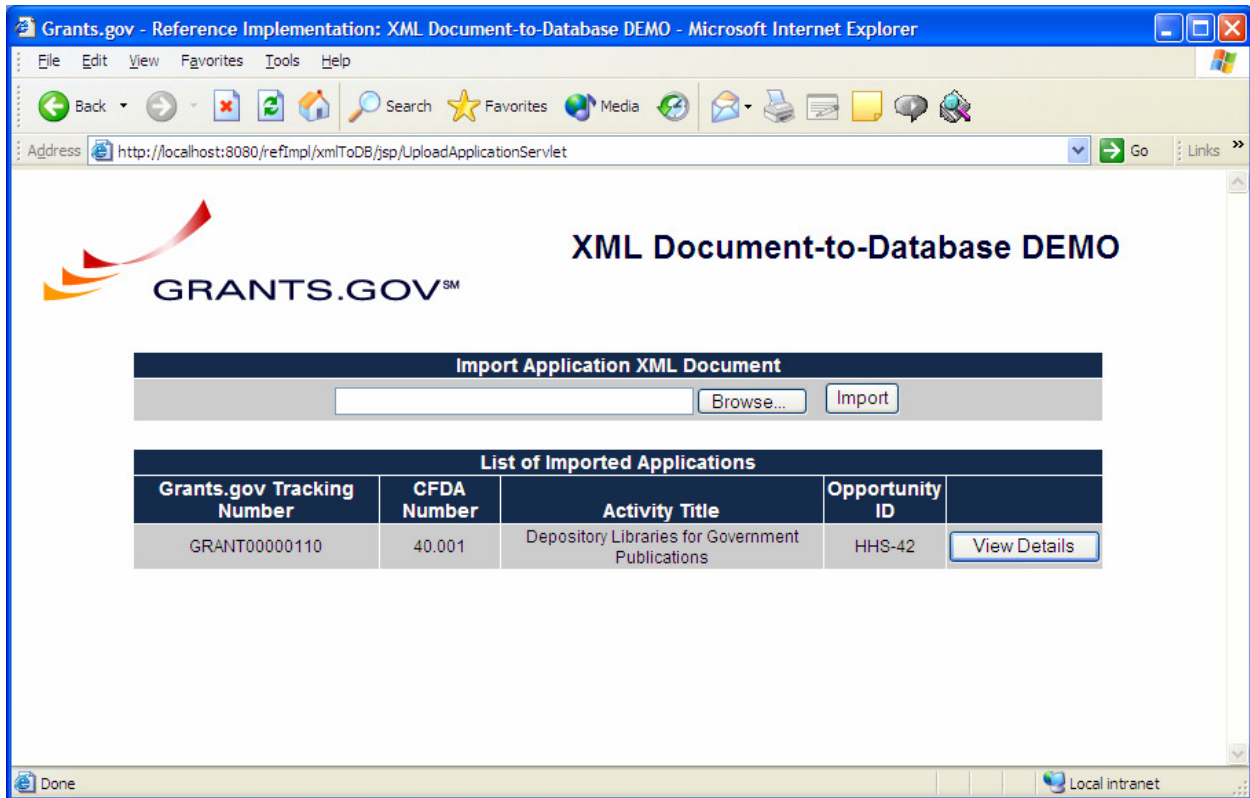


Figure 10-3. Select one of the XML Documents

- To view some of the details of the document, click on the “View Details” button, which will direct you to a “View Details” screen similar to the one below. The details displayed on this screen have been retrieved from the database.

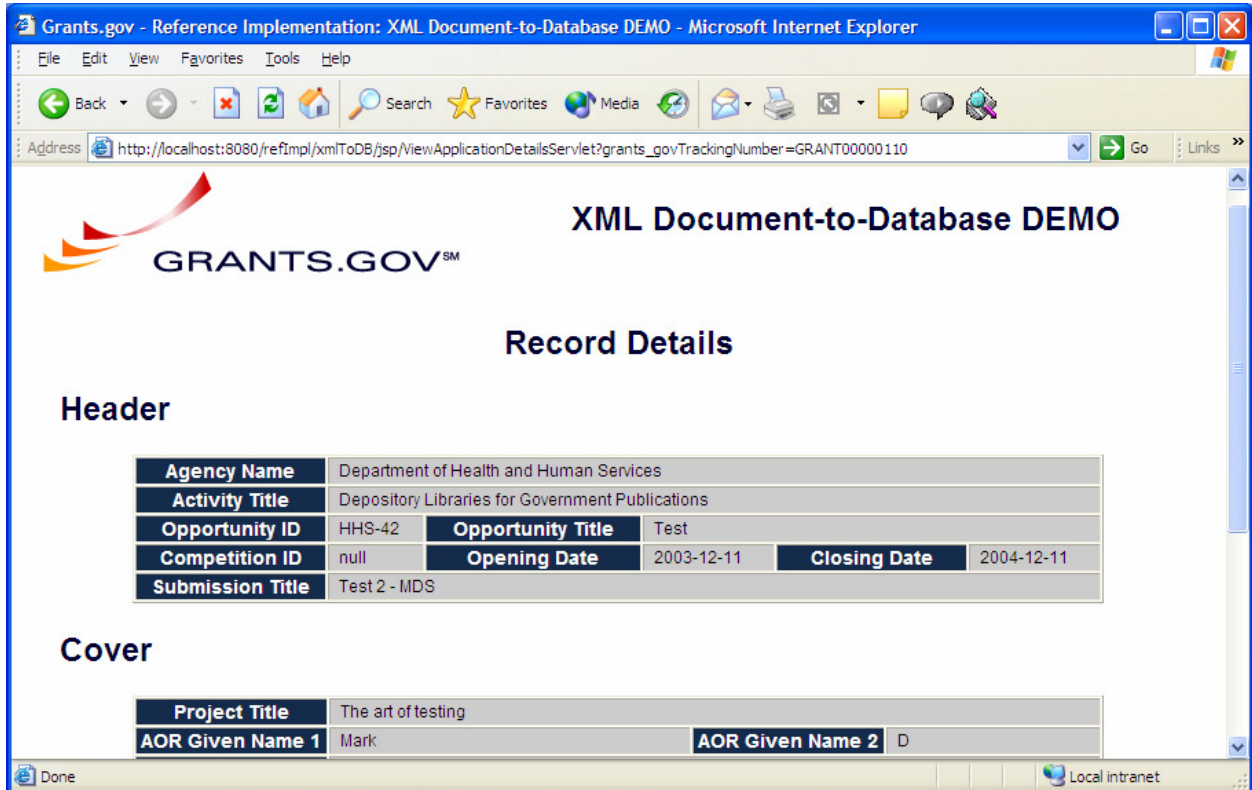


Figure 10-4. View Details of the Document

- At this point, you can get back to the original “Import” screen by clicking on the “Return to List” link at the bottom of the View Details screen.