z/TPFDF V1.1

TPF Users Group Fall 2008

Application Development using SDO Access to z/TPFDF – Advanced Features

Name: Glenn Katzen
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AIM Enterprise Platform Software
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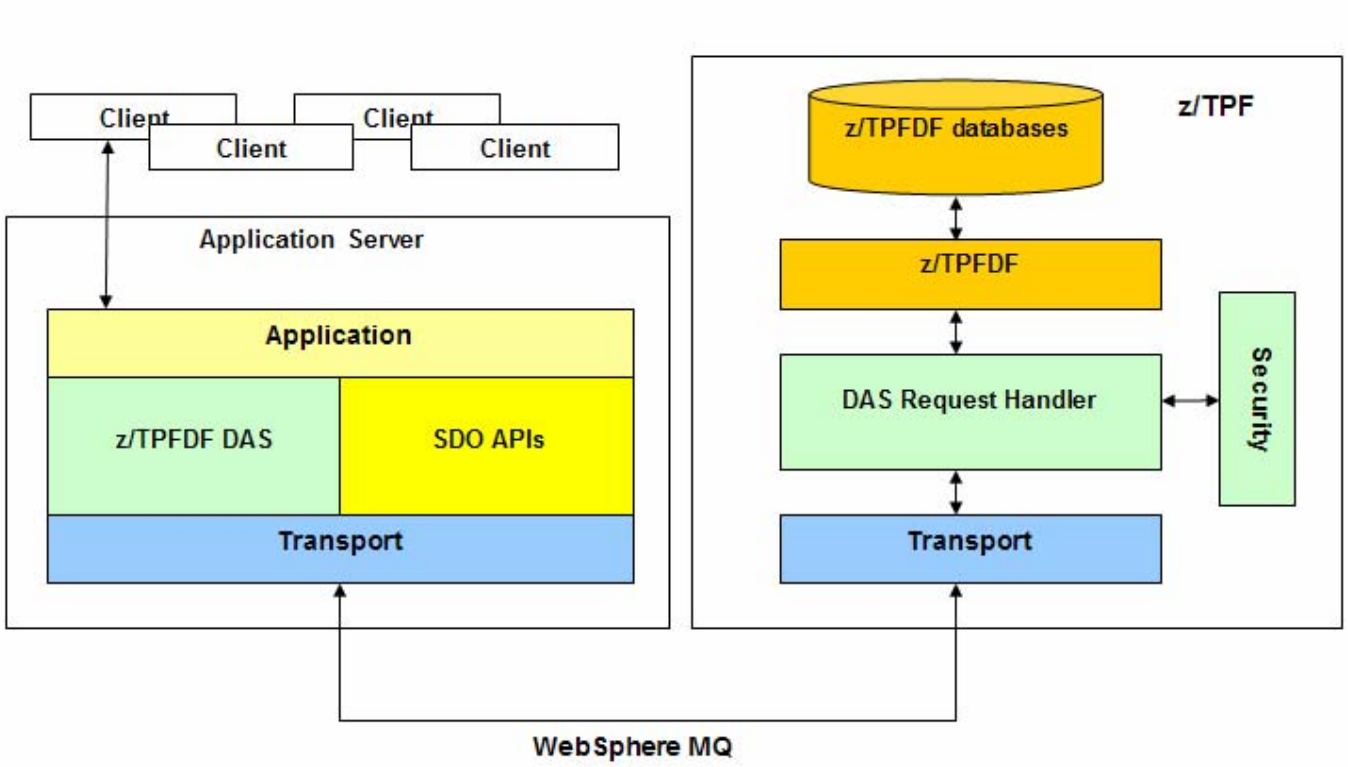
Agenda

- **SDO Access to z/TPFDF Overview**
- **Sample Scenario and Database**
- **Creating and Deleting Subfiles**
- **Indexing**
- **De-indexing**
- **Fullfile Data Requests**

SDO Access to z/TPFDF Overview



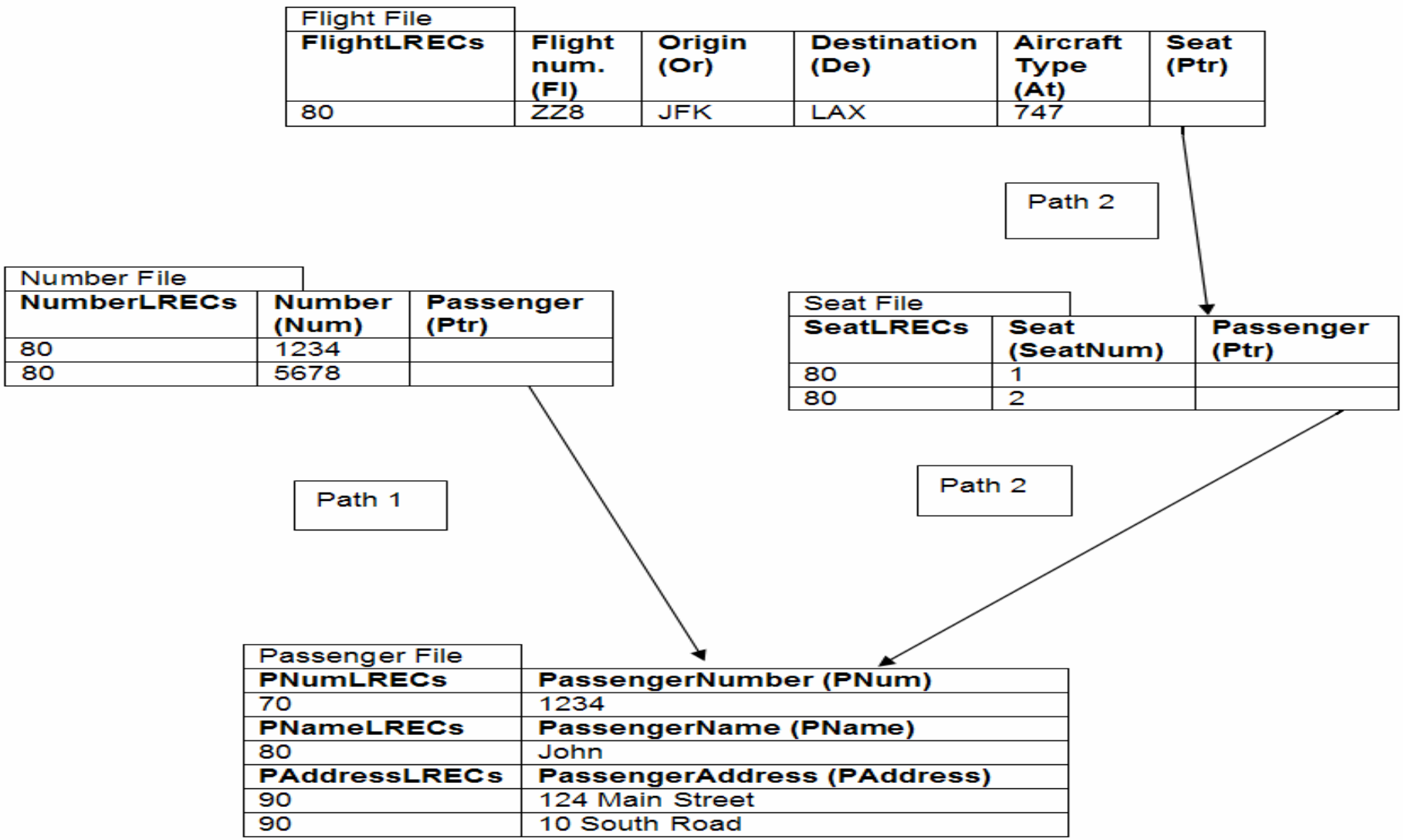
API Overview

- **z/TPFDF DAS Methods**
  - readData
  - applyChanges
  - copyDataObject
- **SDO DataObject Methods**
  - getXXX
  - setXXX
  - unset
  - createDataObject
  - delete

Scenario

- **A database containing flight information exists on z/TPFDF and metadata has been created.**
- **We will develop an application that can add and remove passenger subfiles, index and de-index passenger subfiles, and perform efficient queries for passenger data.**

Database



Instantiating a DAS

The first step in obtaining a DataGraph is to instantiate a z/TPFDF DAS.

```
DatabaseParameter databaseParam =
  new DatabaseParameter(  “Flight” );

AuthorizationModule authModule =
  new AuthorizationModule( “User1”, “Pass”, “Unencrypted”, null );

ZTPFDFDAS das =
  new ZTPFDFDAS( “ConfigFile.xml”, databaseParam, authModule );
```

Obtaining a DataGraph

The readData method of the z/TPFDF DAS is used to retrieve a DataGraph.

```
PathParameter pathParam = new PathParameter( “1”, 1234 );

SearchParameter searchParam = new SearchParameter();

PropertiesParameter propertiesParam = new PropertiesParameter( "*" );

DataGraph dataGraph = das.readData( “PassengerFile”, pathParam,
                                    searchParam, propertiesParam );
```

Creating Subfiles

A new subfile is created by calling the createDataObject method on the root DataObject of the DataGraph.

The code below creates a new passenger subfile.

```
DataObject root = dataGraph.getRootObject();

DataObject passengerSubfile =
  root.createDataObject( “PassengerFile” );
```

Deleting Subfiles

A subfile is deleted by calling the delete method on the subfile DataObject.

The code below deletes a passenger subfile.

```
passengerSubfile.delete();
```

Indexing Subfiles

A new subfile must be indexed by creating an index LREC and setting a reference to the subfile DataObject.

The code below indexes a passenger subfile in the Number File along Path 1.

```
DataObject numberSubfile =
  root.getDataObject( “NumberFile.0” );

DataObject numberIndexLREC =
  numberSubfile.createDataObject( “NumberLRECs” );

numberIndexLREC.setInt( “Num”, 1234 );
numberIndexLREC.setDataObject( “PassengerFile”,
                                    passengerSubfile );
```

Indexing Subfiles Continued

Subfiles may be indexed along additional paths using the copyDataObject method of the z/TPFDF DAS. First, a DataGraph for the desired path must be retrieved.

The code below obtains a DataGraph along Path 2 of the database.

```
PathParameter pathParam2 = new PathParameter( “2”, 1 );

SearchParameter searchParam2 = new SearchParameter();

PropertiesParameter propertiesParam2 = new PropertiesParameter( "*" );

DataGraph dataGraph2 = das.readData( “PassengerFile”, pathParam2,
                                     searchParam2, propertiesParam2 );
```

Indexing Subfiles Continued

The copyDataObject method is used to copy the subfile to be indexed over to the new DataGraph.

The code below places a passenger on a flight by copying the passenger subfile DataObject over to the DataGraph along Path 2 and indexing the subfile in the Seat File.

```
DataObject passengerSubfileCopy =
  das.copyDataObject( passengerSubfile, dataGraph2 );

DataObject seatIndexLREC =
  root.getDataObject( “FlightFile.0/FlightLRECs.0”
                      + “/SeatFile/SeatLRECs.0” );

seatIndexLREC.setDataObject( “PassengerFile”,
                             passengerSubfileCopy );
```

De-indexing Subfiles

A subfile is de-indexed by unsetting the reference to the subfile DataObject within the index LREC DataObject. A ChangeMadeDataGraphNotValidException will be thrown when applyChanges is called.

The code below removes a passenger from a flight by de-indexing the passenger subfile from the Seat File.

```
seatIndexLREC.unset( “PassengerFile” );

try {

  das.applyChanges( dataGraph2 );

} catch ( ChangeMadeDataGraphNotValidException e ) {}
```

De-indexing Subfiles Continued

If the database supports auto de-indexing, it can be activated by deleting all LREC DataObjects within a subfile DataObject and calling applyChanges. As with manual de-indexing, a ChangeMadeDataGraphNotValidException will be thrown.

The code below removes a passenger from all flights and other index files using auto de-indexing.

```
passengerSubfile.getList( “PNumLRECs” ).clear();
passengerSubfile.getList( “PNameLRECs” ).clear();
passengerSubfile.getList( “PAddressLRECs” ).clear();

try {

  das.applyChanges( dataGraph );

} catch ( ChangeMadeDataGraphNotValidException e ) {}
```

Fullfile Requests

If no top-level filter is specified on a readData request, all top-level subfiles with LRECs matching the provided search criteria will be returned in the DataGraph.

The code below performs an efficient query to retrieve all passengers with passenger numbers greater than 1234.

```
PathParameter pathParam = new PathParameter( “1” );

SearchParameter searchParam = new SearchParameter();
searchParam.addCondition( “NumberFile”, “Num”,
                                    SearchOperator.GREATER, 1234 );

PropertiesParameter propertiesParam = new PropertiesParameter( "*" );

DataGraph dataGraph = das.readData( “PassengerFile”, pathParam,
                                                searchParam, propertiesParam );
```

Fullfile Considerations

- **Indexing and de-indexing are not allowed with a DataGraph that has been retrieved through a fullfile request**
- **Search criteria is often necessary to avoid exceeding the 4 MB size limitation**
- **Fullfile may also be specified in the metadata**

Follow-up Information

- **PK60030**
  - z/TPFDF APAR
- **PJ32720**
  - Co-requisite z/TPF APAR
- **Java z/TPFDF DAS code is available for download on the TPF web site:**
  http://www-01.ibm.com/software/htp/tpf/download/ztpfsdo.htm
- **SDO libraries are freely available:**
  - http://www.eclipse.org/modeling/emf
  - http://incubator.apache.org/tuscany/

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