



z/TPFDF V1.1

# TPF Users Group Spring 2008 SDO z/TPFDF Data Access Service Setup and Administration

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Venue: Database Subcommittee

AIM Enterprise Platform Software  
IBM z/Transaction Processing Facility Enterprise Edition 1.1.0

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# Agenda

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- **Metadata creation and modification**
- **Metadata validation**
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- **z/TPF-side setup**
- **z/TPFDF SDO Data Collection**

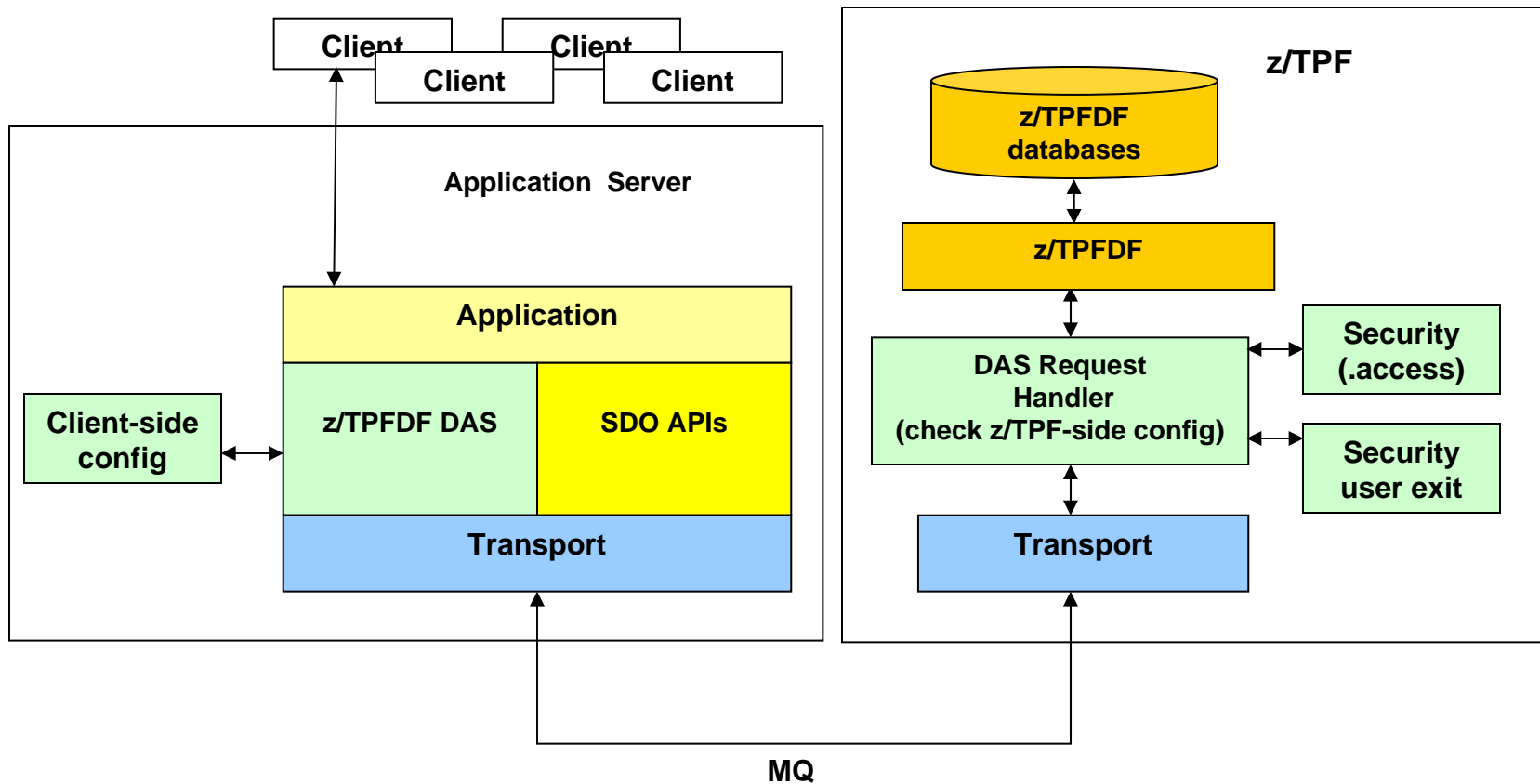
# Terminology

- **SOA**
  - Service-Oriented Architecture
- **SDO**
  - Service Data Objects, part of SOA
- **EMF**
  - Eclipse Modeling Framework
- **Database**
  - Collection of related z/TPFDF files
  - Specified as a DBDEF parameter

## Service Data Objects (SDO)

- **See main tent presentation**
  - New model of data access
  - Complementary technology for SOA
  - Developed jointly by IBM and BEA
  - Standardized using Java Specification Request (JSR) 235
  - Supported by Open SOA
    - <http://www.osoa.org/>
    - IBM, BEA, Oracle, SAP, Sun, Sybase etc

# SDO Access to z/TPFDF databases – general flow



# Components

- **Client side**
  - ZTPFDFDAS.jar – main code
    - Should be in the Java classpath along with other required packages (WebSphere MQ and EMF)
  - Configuration file
    - General restrictions (timeout, maximum data size)
    - For each database
      - Transport options (MQ parameters)
      - Location (database, subsystem, subsystem user)

## Components (cont.)

- **z/TPF-side**
  - Metadata
    - XML files on z/TPF filesystem
    - Subsystem-unique
    - Database-unique
  - Security file - /etc/ztpfdf/.access
    - Subsystem-unique
    - Defines access user has for a specific database (read or write)
  - Security user exit
  - Configuration file on z/TPFDF - /etc/ztpfdf/ztpfdf.config
    - Controls number of ECBs, amount of CPU time and I/Os per SDO-based ECB allowed

# DBDEF modification

- **New DBDEF parameters**
  - **DATABASE** – database name for a given file
    - Files within the same database have the same value
    - Maximum 8 characters
  - **ALIAS** – meaningful alias for a given file name
    - Maximum 16 characters
    - For example, file name DR21ED can be assigned alias FlightFile
  - **VERSION** – current DBDEF version
    - 4-byte integer
    - Default is 0



# Metadata creation and modification

- **Update DBDEFs to specify/update database names**
  - Optionally assign/update aliases to files
  - Increment VERSION on each update
- **ZUDFM METADATA CREATE DB-*dbname***
  - Creates an XML file *dbname.xml* on z/TPF filesystem
  - XML metadata needs to be updated
    - Easier to accomplish away from z/TPF (e.g., FTP to workstation and update using XML editor)
    - Remember to increment metadata version on each update

# Metadata creation and modification (cont.)

```

<?xml version="1.0" encoding="iso-8859-1" ?>
<DF>
  <SchemaVersion>1</SchemaVersion>
  <MetadataVersion>6</MetadataVersion>
  <File Name="DR43ED" Alias="AddCurrentFile" FileID="B243" AllowLLR="No">
    <Version>0</Version>
    <Algorithm DFType="04" Length="1" ReadOnly="No">
      <AlgField Displacement="0" AlgDisplacement="0" Length="1" Type="Hex"/>
    </Algorithm>
    <LREC PrimaryKey="0x50" PrimaryKeyOrganization="NoOrg">
      <Switch>
        <Displacement>0</Displacement>
        <Length>0</Length>
      </Switch>
      <Layout SWvalue="0" SWtype="String" Alias="DR43ED50">
        <Field Name="DR43SEQ" Alias="DR43SEQAlias" ClientType="int" TPFTType="F" UniqueKey="No" Variable="No">
          <Displacement>4</Displacement>
          <Length>4</Length>
          <Organization>NoOrg</Organization>
          <KeyOrder>2</KeyOrder>
          <ReadOnly>No</ReadOnly>
          <Visible>Yes</Visible>
          <MultiplicationFactor>1</MultiplicationFactor>
        </Field>
        <Field Name="DR43TXT" Alias="DR43TXTAlias" ClientType="String" TPFTType="C" Preset=" " Padding="R" UniqueKey="No"
          Variable="No">
          <Displacement>4</Displacement>
          <Length>4</Length>
          <Organization>NoOrg</Organization>
          <KeyOrder>2</KeyOrder>
          <ReadOnly>No</ReadOnly>
          <Visible>Yes</Visible>
          <MultiplicationFactor>1</MultiplicationFactor>
        </Field>
      </Layout>
    </LREC>
  </File>
</DF>

```

## Metadata validation

- **ZUDFM METADATA VALIDATE DB-*dbname***
  - Optional, but highly recommended
  - Does XML parsing
  - Does basic checks on validity of parameters
  - Does NOT check XML metadata against the XSD Schema
  - Once the metadata is validated, it can be used on the system

## Client-side setup

- **Configuration file**
  - Sample is shipped
  - Timeout in seconds
  - Maximum message size in Kbytes
    - Maximum possible value is 4096
  - Transport information (MQ)

# Client-side setup (cont.)

```
<CONFIG>
  <ComponentName>zTPFDF</ComponentName>
  <TimeOut>100</TimeOut>
  <TotalDataLength>4096</TotalDataLength>
  <DBInfo DBName="CREDIT" Subsystem="BSS">
    <MQInfo>
      <remoteQueueMgrName>TPFQM</remoteQueueMgrName>
      <remoteQueueName>SDOQ</remoteQueueName>
      <remoteHost>9.57.13.190</remoteHost>
      <remotePort>1414</remotePort>
      <replyToQueueName>SDOQ_REPLY2Q</replyToQueueName>
      <channelName>CHL1</channelName>
    </MQInfo>
  </DBInfo>
  <DBInfo DBName="FLIGHT" Subsystem="WP" SubsystemUser="WP2">
    <MQInfo>
      <remoteQueueMgrName>TPFQM</remoteQueueMgrName>
      <remoteQueueName>SDOQ</remoteQueueName>
      <remoteHost>9.57.13.190</remoteHost>
      <remotePort>1414</remotePort>
      <replyToQueueName>SDOQ_REPLY2Q</replyToQueueName>
      <channelName>CHL1</channelName>
    </MQInfo>
  </DBInfo>
</CONFIG>
```

# z/TPF-side setup

- **/etc/ztpfdf/access**

```
# Format:
# User;Database name;SS;SSU;Permissions;Method
USER1;hotel;WP;WP2;r;ident
USER1;flight;WP;WP2;w;ident
USER2;hotel;WP;WP1;r;ident
USER2;hotel;WP;WP3;w;trust
USER3;all;WP;WP3;w;trust
USER4;all;WP;;w;trust
USER5;all;WP;WP2;r;ident
USER5;all;WP;WP3;w;trust
```

- **Security user exit**

- ufs0.cpp
- Inputs - user name, password, encryption method, authentication method
- Output – allow or disallow database access

- **/etc/ztpfdf/ztpfdf.config**

```
MAX_SDO_IO;0;
MAX_SDO_CPU;1000;
MAX_SDO_ECB;5;
```

# z/TPFDF SDO Data Collection

- **ZUDFC SDO**
  - Collects data pertinent to SDO-based applications
  - Similar format to standard ZUDFC
  - Data can be displayed based on users and databases
- **Output results to XML**
  - Automatically generated when ZUDFC SDO STOP is issued
    - /etc/ztpfdf/SDOdatacollection/
  - XSL stylesheet provided
    - Convert output XML into HTML
    - Output can be opened in popular spreadsheet or HTML browser

# z/TPFDF SDO Data Collection (cont.)

ZUDFC SDO DISPLAY

CSMP0097I 15.10.04 CPU-B SS-BSS SSU-HPN IS-01

UDFC0065I 15.10.04 SDO DATA COLLECTION DISPLAY

IDENTIFICATION: SUMMARY

START DATE AND TIME 06Mar08 14:40:27

STOP DATE AND TIME 06Mar08 15:08:35

ECBS:	3730	Rate/sec:	2.210
readData:	1513	Rate/sec:	0.896
applyChanges:	2216	Rate/sec:	1.313
getMetadata:	1	Rate/sec:	0.001
IO Rejections:	0	Rate/sec:	0.000
CPU Rejections:	0	Rate/sec:	0.000
SDO Postponements:	0	Rate/sec:	0.000

TPFDF API COUNTS:

DBADD:	0	DBCRE:	0	DBCLS:	15045
DBDEL:	779	DBDIX:	658	DBIDX:	0
DBKEY:	11376	DBMOD:	0	DBOPN:	13158
DBRED:	75158	DBREP:	779		

TPFDF API RATES PER SECOND:

DBADD:	0.000	DBCRE:	0.000	DBCLS:	8.913
DBDEL:	0.461	DBDIX:	0.390	DBIDX:	0.000
DBKEY:	6.739	DBMOD:	0.000	DBOPN:	7.795
DBRED:	44.525	DBREP:	0.461		

I/Os:	131865	Rate/ECB:	35.353
FINDS:	127231	Rate/ECB:	34.110
FILES:	4634	Rate/ECB:	1.242

END OF DISPLAY +



# z/TPFDF SDO Data Collection (cont.)

## SDO/DF Data Collection

	Date	Time
Data Collection start	2/7/2008	17:39:06
Data Collection end	2/7/2008	17:39:31

ECB Information	Rate per second
Total ECBs	0.92
readData ECBs	0.92
applyChanges ECBs	0
getMetadata ECBs	0

ECB Actions	Rate per second
IO Rejections	0
CPU Rejections	0
SDO Postponements	0

I/O Information	Rate per ECB
Total I/Os	77.739
FINDs	77.739
FILEs	0

### SUMMARY

z/TPFDF Functions	z/TPFDF Counts	Rate per second
DBADD	0	0
DBCRC	0	0
DBCLS	93	3.72
DBDEL	0	0
DBDIX	0	0
DBIDX	0	0
DBKEY	93	3.72
DBMOD	0	0
DBOPN	93	3.72
DBRED	1137	45.48
DBREP	0	0

# Summary

- **z/TPFDF DAS provided**
- **Metadata in XML format provides additional controls**
- **Configurable on both sides**
- **Security controls**
- **z/TPFDF SDO Data Collection**
- **More information**
  - Application Development Subcommittee
    - “Application Development using SDODF” by Glenn Katzen