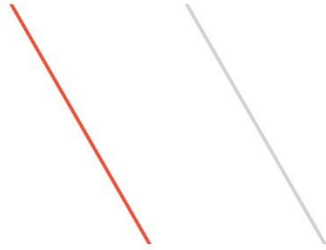


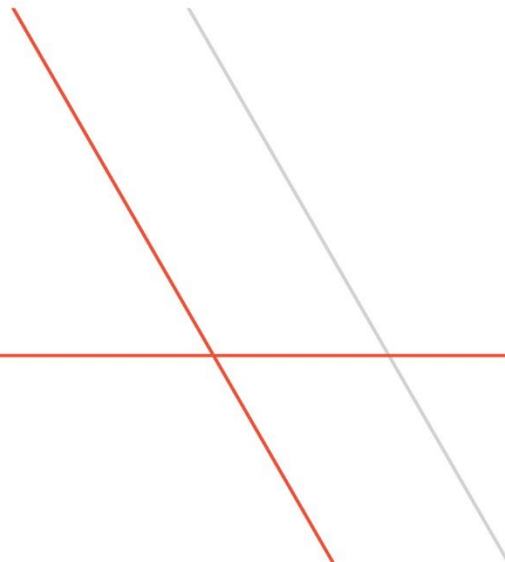
IBM z Systems



TPFUG – Data Format Description Language (DFDL) Support

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Why Data Format Description Language (DFDL)?

- There are a number of data formats used today including some more popular ones like XML and JSON.
- There was no universal standard for modeling data (both text and binary).
 - A number of products created their own proprietary method for modeling data which prevented integration across the products.
 - TPF examples: Debugger XML files, business events TPF Data Model.

What is Data Format Description Language (DFDL)?

- DFDL is to C structures and assembler DSECTs what XML/JSON is to data.
- A universal, shareable, non-prescriptive description for general text and binary data formats.
- An open standard from the Open Grid Forum
- NOT a data format.
- DFDL uses a subset of XML schema which describes the **logical format** of the data and adds DFDL annotations to describe the **native format**.

Example: Native Format description

STDHDR&CG1	DS	0CL16	HEADER UP TO STDBCH
STDBID&CG1	DS	CL2	FILE ID
STDCHK&CG1	DS	X	BLOCK CHECK CHARACTER
STDCTL&CG1	DS	B	CONTROL BYTE
STDPGM&CG1	DS	F	LAST FILING PROGRAM STAMP
STDFCH&CG1	DS	F	FORWARD CHAIN ADDRESS
STDBCH&CG1	DS	F	BACKWARD CHAIN ADDRESS

Example: Logical Format description

Name	Type	Min Occurs	Max Occurs
[-] [e] StdFileHdr			
[-] ... sequence		1	1
... [e] RecordID	hexBinary	1	1
... [e] RecordCode	byte	1	1
... [e] DataControl	hexBinary	1	1
... [e] ProgramName	string	1	1
... [e] ForwardChain	unsignedInt	1	1
... [e] BackChain	unsignedInt	1	1

XML Schema: Logical Format description

```
<xs:element name="StdFileHdr">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="RecordID" type="xs:hexBinary"/>

      <xs:element name="RecordCode" type="xs:byte"/>

      <xs:element name="DataControl" type="xs:hexBinary"/>

      <xs:element name="ProgramName" type="xs:string"/>

      <xs:element name="ForwardChain" type="xs:unsignedInt"/>

      <xs:element name="BackChain" type="xs:unsignedInt"/>

    </xs:sequence>
  </xs:complexType>
</xs:element>
```

DFDL: Native Format description

```
<xs:element name="StdFileHdr">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="RecordID" type="xs:hexBinary"
        dfdl:length="2"/>
      <xs:element name="RecordCode" type="xs:byte"
        dfdl:length="1"/>
      <xs:element name="DataControl" type="xs:hexBinary"
        dfdl:length="1"/>
      <xs:element name="ProgramName" type="xs:string"
        dfdl:length="4"/>
      <xs:element name="ForwardChain" type="xs:unsignedInt"
        dfdl:length="4"/>
      <xs:element name="BackChain" type="xs:unsignedInt"
        dfdl:length="4"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>
```


What supports DFDL?

- Websphere Message Broker v8.0
- Integration Bus v9.0
- Rational Developer for System z v8.5
- Infosphere Master Data Management v11
- TPF Business Events (PJ42280,PI18980)
- TPF support for MongoDB (future)

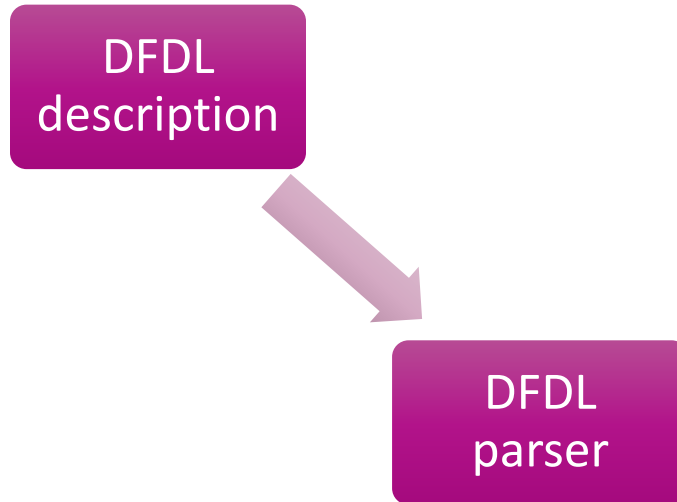
How can it be used on TPF today?

- Converting data to XML or JSON
 - easy (very few API calls needed)
 - TE/Workload License Charge(WLC) eligible
- Accessing data by logical format
 - No assembler DSECT or C structure required
 - No reassemble/recompile needed if data format changes

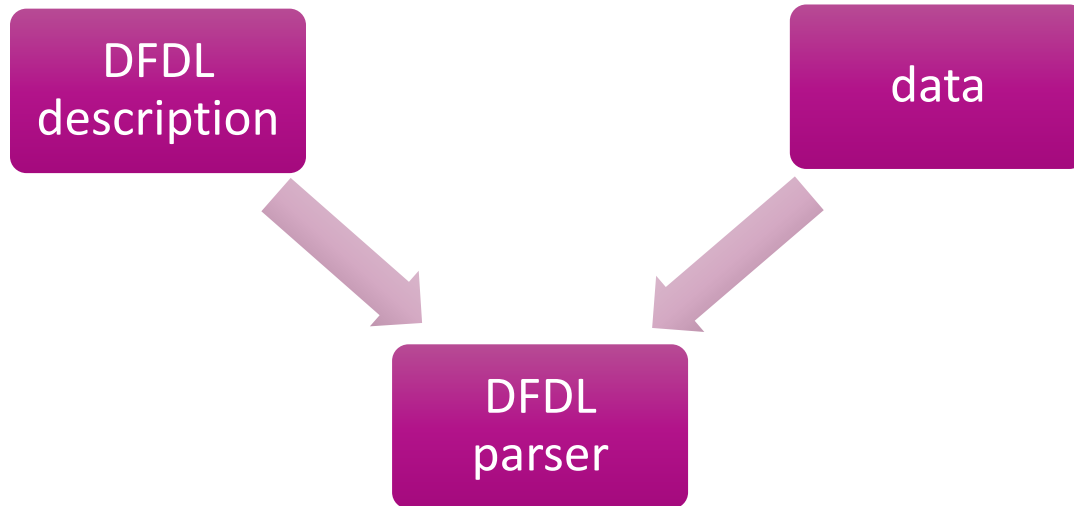


Converting data to XML/JSON

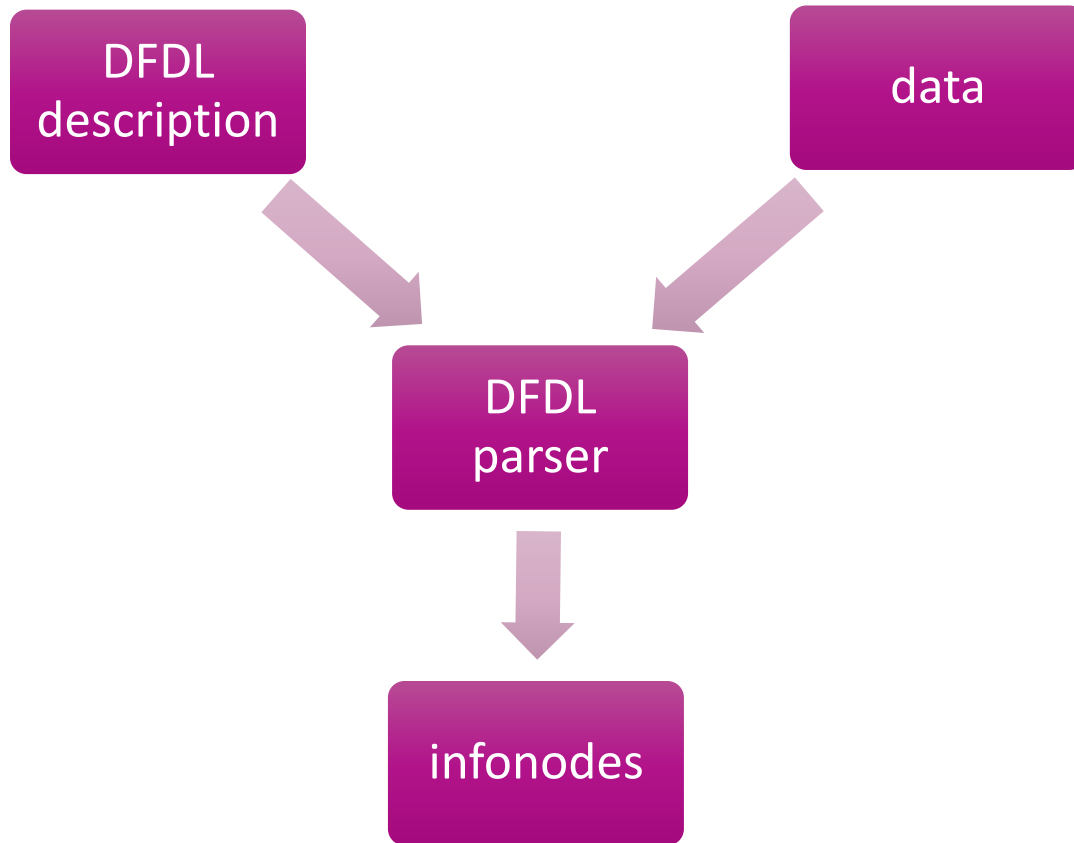
Converting data to XML/JSON



Converting data to XML/JSON



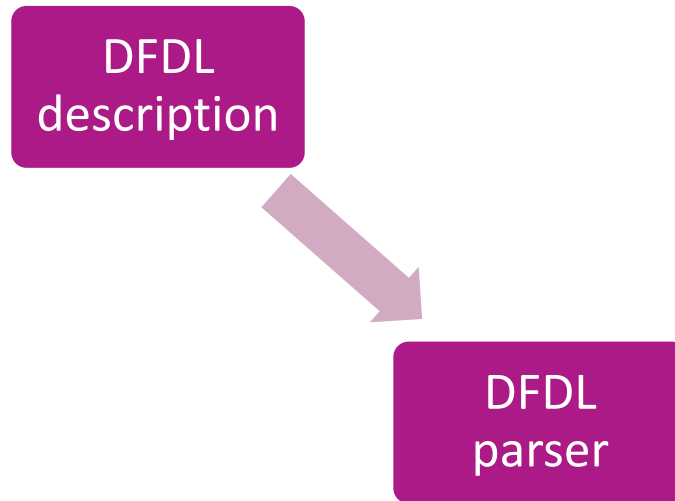
Converting data to XML/JSON



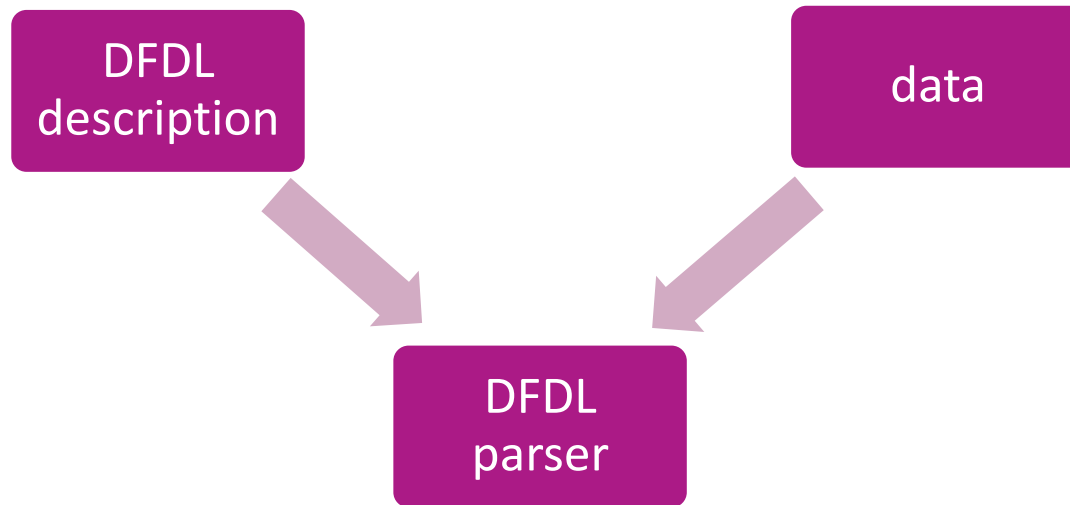


Accessing data by logical format

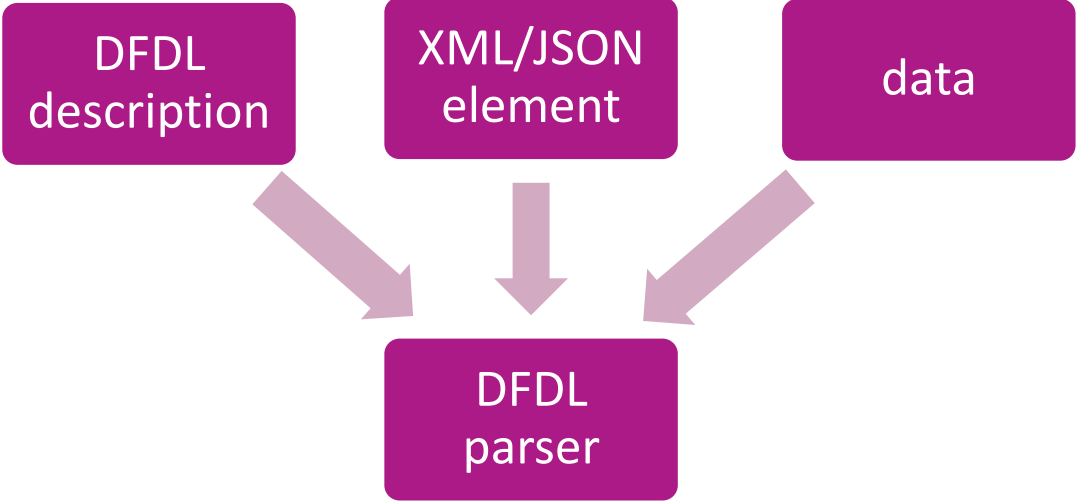
Accessing data by logical format



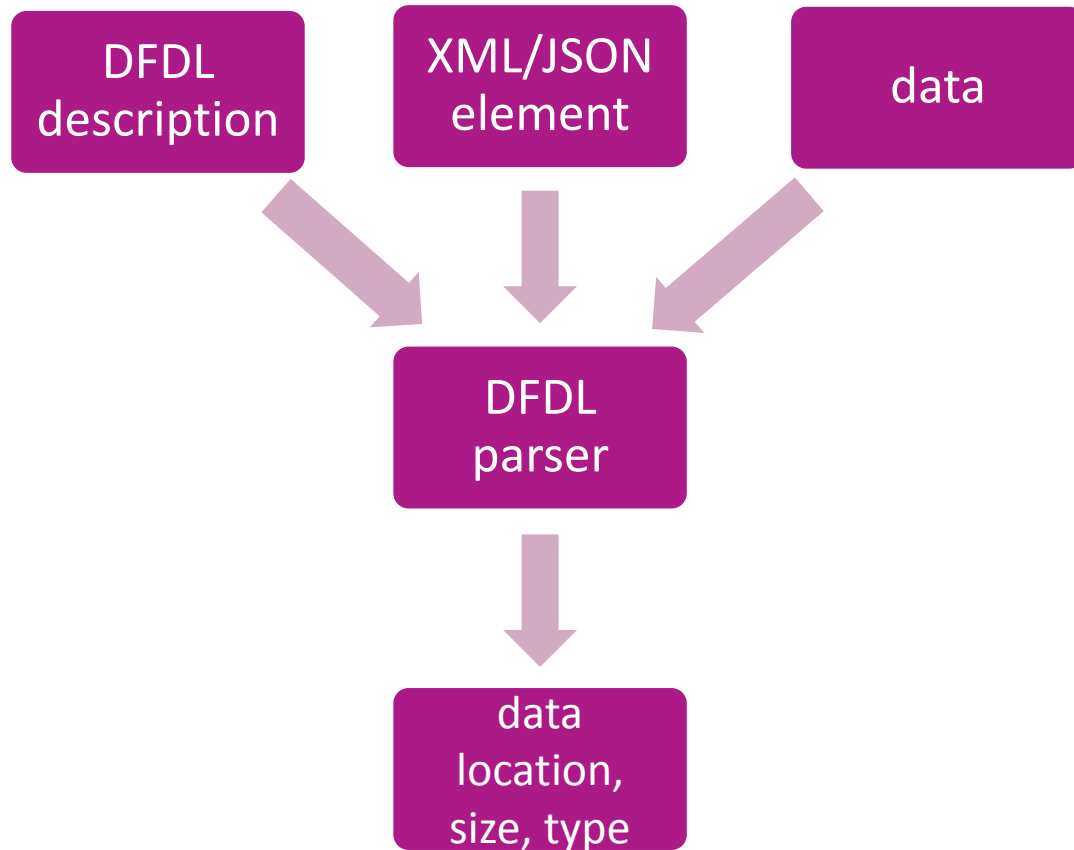
Accessing data by logical format



Accessing data by logical format



Accessing data by logical format



Example: Logical format access

Standard Header (Native Format):

c1 d3 01 00 c4 c6 c4 d3 00 00 00 00 00 00 00 00

Request for “ProgramName” within a “StdFileHdr”:

DFDL information:

Offset: 4

Length: 4

Type: String

Value: “DFDL”

References

- DFDL tutorials created by the DFDL Working Group at the Open Grid Forum
 - http://redmine.ogf.org/dmsf/dfdl-wg?folder_id=5485
- DFDL developerWorks tutorials
 - <http://ibm.biz/startdfdl>
- DFDL specification reference
 - <http://www.ogf.org/dfdl>

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