

# XML data specification

**XML data** is the part of [XML file](#) that contains the object configuration of D2000 System or its sections.

## Reserved sections

1. [REFERENCES](#) - the section includes the **structures** representing the **object** and **column references** of object
2. [CFGRECORDS](#) - the section includes the **structure** representing the **data** of object
3. [MEMBEROFLOGGROU](#)P - the section includes **member** elements defining the **logical group** which the given object belongs to
4. [MEMBEROFRESGROU](#)P - the section includes **member** elements defining the **group of object** which the given object belongs to
5. [CRC](#) - the section includes the **MD5 hash of data**
6. [OBJLIFELOGS](#) - the section includes the **logs about the object history**

The detailed information about the structures defining the objects of D2000 System, the attributes of structures, the [value types](#) of attributes and the values the attributes can acquire, can be find by [the program to show the actual structure](#). This listing includes the unsupported objects and enumerated types.

## REFERENCES reserved section

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The example of section:  
(the complete example is [here](#))

```
<HOBJ_REF>
  <uid>A25DED0E4DA94B4895A119370E3AF4FB</uid>
  <name>SV.Limits</name>
  <objType>D2RECORD</objType>
  <valType>Rec</valType>
</HOBJ_REF>
<COL_REF>
  <col_idx>1</col_idx>
  <col_name>VHL</col_name>
  <col_valType>Int</col_valType>
</COL_REF>
<HOBJ_REF>
  <uid>USER_VAR</uid>
  <name>USER_VAR</name>
  <objType>SYSTEM</objType>
  <valType>NAN</valType>
</HOBJ_REF>
```

It includes the structures:

- **HOBJ\_REF** - they represent the **object references** of object
- **COL\_REF** - they represent the **column references** of object (object must be a structure definition or the object refers to it)

Properties of the **object references**:

- minimal attribute **name** must be set in each object reference
- **uid**, **objType** and **valType** attributes are optional
- **uid** attribute has a priority to the **name** attribute at [object references matching](#)

Properties of the **column references**:

- the column reference follows the object reference
- minimal attribute **col\_name** must be set in each column reference
- **col\_idx** and **col\_valType** attributes in column reference are optional
- **col\_idx** attribute has the priority to the **col\_name** attribute at [column references matching](#)

## CFGRECORDS reserved section

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The example of section:  
(the complete example is [here](#))

```

<TObjItemData>
  <Id>0</Id>
  <Name>U.TimeSlice</Name>
  <Descript>Time Slice</Descript>
  <Typ>USER_VAR</Typ>
  <ParentId>USER_VAR</ParentId>
  <Value_Type>TmR</Value_Type>
  <CreateTime>08.10.2009 08:10:31.366</CreateTime>
  <ModifyTime>08.10.2009 08:18:02.938</ModifyTime>
  ...
  <uuid>5CB809E9342B7A46BD790A8C7D14C69E</uuid>
</TObjItemData>
<tUserVarData_Full>
  <tUserVarData>
    <MANUAL>True</MANUAL>
    <MANUAL_VAL/>
    <FLAGS/>
    <VALUE_TIME>08.10.2009 08:10:31.379</VALUE_TIME>
    <MONITOR>False</MONITOR>
    <SAVE_VALUE>True</SAVE_VALUE>
  </tUserVarData>
  <startVal/>
</tUserVarData_Full>

```

This section must contain just the one structure **TObjItemData** at the beginning. It **identifies the object** uniquely. The configuration of this object is saved in [XML file](#).

This structure is followed by another structures, they count and name depends on a particular type of object. See the example: the object is of USER\_VAR type and contains the structure **tUserVarData\_Full**.

Properties of **identification structure**:

- **Id** attribute represents an **Id** of object (it is important at [XML Import](#))
- **Name** attribute need always to be set
- **uuid** attribute has a priority to the **Name** attribute at [object matching](#)

## MEMBEROFLOGGROUP reserved section

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The example of section:  
(the complete example is [here](#))

```
<member>SELT\CD8FD25EF8A690341B111F5274CDB5AB</member>
```

Properties of **member** value:

- it represents the object classification in the logical groups
- it must contain the name of logical group (before the sign '\')
- it can also contain **uid** of logical group (after the sign '\')

**Note:** This value affects the object membership in the logical groups at [XML Import](#).

## MEMBEROFRESGROUP reserved section

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The example of section:  
(the complete example is [here](#))

```
<member>Home_\04CB44144B2CD8E46955D846D30B0F72</member>
```

Properties of **member** value:

- it represents the object classification in the object groups
- it must contain the name of object group (before the sign '\')
- it can also contain **uid** of the object group (after the sign '\')
- if the name of object group is enclosed in '[' and ']' the object with children was inserted into group

## CRC reserved section

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The example of section:  
(the complete example is [here](#))

```
a7a8bda021932a3547e6553cb8980273
```

The **CRC** value represents **MD5 hash** formed from the contents of XML file. It includes data from <ROOT> element (<ROOT> element inclusive) to the row before CRC section (the signs CR, LF or both inclusive). The evaluation of CRC value is important for [XML Import](#) and [XML Repository](#).

The evaluation of CRC value:

- the section is **included** in data  
:
  - MD5 hash **corresponds** to this value - data have not been modified
  - MD5 hash **differs** from this value - data have been modified
- the section is **not included** in data - it is not possible to define whether data have been modified

The evaluation of CRC value influences the validity of **ModifyTime** attribute in *TObjItemData* structure of **<CRGRECORDS>** section. It becomes evident at **XML Import** as follows:

- if the CRC value is valid the modify time of object is set on the value of *ModifyTime* attribute from XML file
- if the CRC value is invalid the modify time of object is set on the time of XML file or on the current time (if the time of XML file was undefined)
- if the CRC value was invalid or was not in XML file and, before the XML Import, the time to be changed is equal to the primary modify time of object the XML Import will change this modify time to the current time

## OBJLIFELOGS reserved section

The example of section:  
(the complete example is [here](#))

```
<tObjLifeLogData>
  <name>U.TimeSlice</name>
  <state>OLA_CREATED</state>
  <modify_time>08.10.2009 08:16:23.761</modify_time>
  <user_name>s</user_name>
  <process_name>WS1JSTF2.CNF</process_name>
  <computer_name>WS1JSTF2</computer_name>
  <log_type>OLT_CONFIG</log_type>
  <comment_text/>
</tObjLifeLogData>
```

**tObjLifeLogData** structures represent the [logs about the object history](#).

Properties of **log structure**:

- name** in logs can differ from **name** of object (as the object could has been renamed)
- uid** and **id** are not in log, because they are directly in object
- only those logs are [imported](#) to the target configuration that have not been inserted in it for the given object

## Supported value types of structure attributes

A supported value types of the structure attributes are:

| Enumerated type    | Description of value                                                                                                                                                  | Example of element in XML file                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| T_RECORD_NAME      | Internal name of structure.                                                                                                                                           | Tag name of structure                                  |
| T_RECORD           | Value of structure type.                                                                                                                                              | Nested structure <tCalcData> in <tCalcData_Full>.      |
| T_ARRAY            | Value of structure array type of the same type.                                                                                                                       | Nested structure array <Tprvok_pola_?> v <STRIP_DATA>. |
| T_HOBJ             | Object name.                                                                                                                                                          | <ParentId>DIAGRAMS</ParentId>                          |
| T_HOBJ_KEY         | Object name which is a key item.                                                                                                                                      | <ID_RESOURCE>Home_Pjanko</ID_RESOURCE>                 |
| T_VOBJ             | Object name, row and column.                                                                                                                                          | <CtrlObject>P.IF500_RS_WatchDog</CtrlObject>           |
| T_BOOLEAN          | Enumerated type (True or False).                                                                                                                                      | <Read_Only>False</Read_Only>                           |
| T_BITSET           | Array of enumerated types (enumerated values).                                                                                                                        | <IsValueDelay>Off</IsValueDelay>                       |
| T_ENUM             | Enumerated type (enumerated values).                                                                                                                                  | <Typ>POINT</Typ>                                       |
| T_SIGNED_INT       | Integer value <-2147483647 .. 2147483648>.                                                                                                                            | <TransPalIdx>0</TransPalIdx>                           |
| T_UNSIGNED_INT     | Integer value <0 .. 4294967295>.                                                                                                                                      | <Id>200449</Id>                                        |
| T_SIGNED_INT_KEY   | Integer key value <-2147483647 .. 2147483648>.                                                                                                                        | <grObjectNr>1163</grObjectNr>                          |
| T_UNSIGNED_INT_KEY | Integer key value <0 .. 4294967295>.                                                                                                                                  | <Row>0</Row>                                           |
| T_FLOAT            | Floating point. The values greater than 1.0E+38 will be interpreted as the value 1.0E+38 and the values less than -1.0E+38 will be interpreted as the value -1.0E+38. | <BaseValue>1.00000000000000E+00</BaseValue>            |

|                    |                                   |                                                         |
|--------------------|-----------------------------------|---------------------------------------------------------|
| T_D2TIME           | Value modifying a time and date.  | <ModifyTime>18.07.2003 11:52:09.674</ModifyTime>        |
| T_STRING           | Text with defined length.         | <PassCode>ROOT_CFGRECORDS_TUserData_PassCode</PassCode> |
| T_BOUNDED_STRING   | Text with defined maximal length. | <Name>D.PIPA_CHSO2_Mh</Name>                            |
| T_UNBOUNDED_STRING | Text with unlimited length.       | <statement>TextTextTextTextText</statement>             |

Value types can be:

- **structured** - T\_RECORD and T\_ARRAY
- **simple** - all the others

The string values T\_STRING, T\_BOUNDED\_STRING or T\_UNBOUNDED\_STRING can be:

- **SDT\_NORMAL** - normal string
- **SDT\_EXPRESSION** - string of expression type
- **SDT\_RAW\_DATA** - string defining the binary data

Properties of **SDT\_RAW\_DATA** type:

- attribute of SDT\_RAW\_DATA type indicates that XML file has the binary file
- data of binary file represents the real value of the attribute of SDT\_RAW\_DATA type
- the value of attribute of SDT\_RAW\_DATA file, stated in XML file, contains the nesting of attribute (it is ignored)
- [XML Export](#) saves the binary file with name <object\_name>\_<attribute\_nesting>.bin
- [XML Import](#) searches the binary file with name <xml\_file\_name>\_<attribute\_nesting>.bin
- if the object name in XML file is not renamed (element <Name>), then both **XML Export** and **XML Import** works with the binary file of the same name (e.g. *U.UserVar\_ROOT\_CFGRECORDS\_TUserData\_PassCode.bin*) that is placed in the same directory as XML file (it is its necessary part)

Properties of **T\_ARRAY** type:

- item name is in form ItemName\_[X] (instead of [X] is either a value range from 0..N or the values of enumerated type)
- the items can be of T\_RECORD type or single type

## Example of XML file representing of object of D2000 System

The following example demonstrates the saving of the object of USER\_VAR type with the name **U.TimeSlice** into XML file:

```

<?xml version="1.0" encoding="windows-1250"?>
<!--$Date: 2012/07/04 05:05:23 $ $Revision: 1.10 $ $Author: pbrezina $ $ExpSubDir: Common\Planner $-->
<ROOT>
  <REFERENCES>
    <HOBJ_REF>
      <uid>A25DED0E4DA94B4895A119370E3AF4FB</uid>
      <name>SV.Limits</name>
      <objType>D2RECORD</objType>
      <valType>Rec</valType>
    </HOBJ_REF>
    <COL_REF>
      <col_idx>1</col_idx>
      <col_name>VHL</col_name>
      <col_valType>Int</col_valType>
    </COL_REF>
    <HOBJ_REF>
      <uid>USER_VAR</uid>
      <name>USER_VAR</name>
      <objType>SYSTEM</objType>
      <valType>NAN</valType>
    </HOBJ_REF>
  </REFERENCES>
  <CFGRECORDS>
    <TObjItemData>
      <Id>0</Id>
      <Name>U.TimeSlice</Name>
      <Descript>Time Slice</Descript>
      <Type>USER_VAR</Type>
      <ParentId>USER_VAR</ParentId>
      <Value_Type>TmR</Value_Type>
      <CreateTime>08.10.2009 08:10:31.366</CreateTime>
      <ModifyTime>08.10.2009 08:18:02.938</ModifyTime>
      <Text_Palette/>
      <Read_Only>False</Read_Only>
      <TECH_UNIT/>
      <UseLimits>False</UseLimits>
      <VHL>1.000000000000000E+38</VHL>
      <HL>1.000000000000000E+38</HL>
      <LL>-1.000000000000000E+38</LL>
      <VLL>-1.000000000000000E+38</VLL>
      <VHL_ID>SV.Limits[1]^VHL</VHL_ID>
      <HL_ID/>
      <LL_ID/>
      <VLL_ID/>
      <Hysterezia>0.000000000000000E+00</Hysterezia>
      <TransPalIdx>0</TransPalIdx>
      <Hidden>False</Hidden>
      <uuid>5CB809E9342B7A46BD790A8C7D14C69E</uuid>
    </TObjItemData>
    <tUserVarData_Full>
      <tUserVarData>
        <MANUAL>True</MANUAL>
        <MANUAL_VAL/>
        <FLAGS/>
        <VALUE_TIME>08.10.2009 08:10:31.379</VALUE_TIME>
        <MONITOR>False</MONITOR>
        <SAVE_VALUE>True</SAVE_VALUE>
      </tUserVarData>
      <startVal/>
    </tUserVarData_Full>
  </CFGRECORDS>
  <MEMBEROFLOGGROUP>
    <member>SELT\CD8FD25EF8A690341B111F5274CDB5AB</member>
  </MEMBEROFLOGGROUP>
  <MEMBEROFRESGROUP>
    <member>Home_s\04CB44144B2CD8E46955D846D30B0F72</member>
  </MEMBEROFRESGROUP>
  <CRC>a7a8bda021932a3547e6553cb8980273</CRC>
  <OBJLIFELOGS>
    <tObjLifeLogData>
      <name>U.TimeSlice</name>
      <state>OLA_CREATED</state>
      <modify_time>08.10.2009 08:16:23.761</modify_time>
      <user_name>s</user_name>
      <process_name>WS1JSTF2.CNF</process_name>
      <computer_name>WS1JSTF2</computer_name>
      <log_type>OLT_CONFIG</log_type>
      <comment_text/>
    </tObjLifeLogData>
  </OBJLIFELOGS>
</ROOT>

```



**Related pages:**

[D2000 XML](#)

[XML file structure](#)

[Actual structure of XML](#)