

XML Support

This section covers the following topic:

- Natural XML Toolkit
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Natural XML Toolkit

The Natural XML Toolkit is a set of tools for XML processing which will provide functionality required for the integration of XML processing into Natural. It will improve the integration of Natural application with XML, without requiring external software products like "msxml".

The XML Toolkit can be considered an intermediate step towards the integration of XML processing into Natural. The next step would be the full integration of XML functionality in the Natural programming language.

The XML Toolkit consists of a set of Natural programs, some of which will be made available in source-code form. The XML Toolkit programs may be integrated into your Natural applications, thus providing access to XML data or supplying data from Natural in XML format.

The XML Toolkit will provide the following functions:

- Mapping of Natural data definitions to DTDs, and vice versa.
DTDs (document type descriptions) are most commonly used to describe the structure of an XML document.
- XML Token -> Natural Data
After creating the Natural data structure, the XML document has to be parsed and saved into the data structure. An implementation for the delivered XML "tokenizer" will be generated. This tokenizer assigns the value of a data element to the corresponding data structure.
- Natural Data -> XML Document ("Serialization")
Serialization is the process of taking the data stored in the Natural data structures and creating an XML document according the description in the DTD.
- Check data structure for:
 - alternative elements,
 - range of values for attributes,
 - occurrences and boundaries of elements.

Mapping Natural Data Definitions to DTD

The mapping of Natural data definitions to a DTD is the first step to bind Natural data structures to XML tags, and is required to implement a representation of Natural data as XML tags. The generated DTD will be used later during the serialization to an XML document.

Serializing the Data to XML

During the execution of a Natural program, the fields defined in the DEFINE DATA statement will be filled with real contents. During serialization, this contents will be written to a dynamic variable in XML format using the previously generated DTD as input. The XML Toolkit will also generate the program for the serialization of the data.

Mapping DTD to Natural Data Definitions

The mapping of a DTD to Natural data structures show the differences between the two. As the DTD does not specify how many records are to be included in the XML document, the XML Toolkit will assume a maximum number to be included. The application programmer may know the precise number and can adapt the data structure accordingly. A similar limitation exists with the length of the data: The DTD does not contain information about the

length of the data in a record; therefore, the XML Toolkit will generate fields in the data structure with a length of 253 (the current maximum length).

Parsing the XML File and Assigning the Contents to Natural Data Structure

The XML Toolkit will generate Natural code based on the DTD. This code represents a subroutine which will be invoked from the Toolkit's "tokenizer" to assign the contents of the tags in the XML document to the corresponding Natural data structure.