Core to Lotos Translation User Guide

The program is used for Core to Lotos translation. It takes a program in Core (XML or text) and creates two output files: Lotos equivalent program(XML or text) and XLINK file that contains additional information about all non-trivial conversions between the languages.

Run the program:
In Windows:
Use the project file Core2Lotos/src/XmlCore2Lotos.jbx in Jbuilder In order to build the program.
To run the *XmlCore2Lotos* program after building use this command :
> java *XmlCore2Lotos <core input xml file> <Lotos output xml file>*

In UNIX:
To Build the program use the Makefile (see the Makefile for more options).
>make
To run the program use the script Run_unix:
> Run_unix [-t *coreTextFileName* | -x *coreXmlFileName*] [-t *outputTextFileName* | -x *outputXmlFileName*]
where –t option for text file and –x for xml file for both the input and the output files.

Notes:
1. The xlinke file name that will be created given input file name “input” is input_core2lotos_addInfo.
2. For translating core text program to xml version use the program Core2Lotos/core2xml /core2xml (see usage note while run).
3. For translating lotos xml to a text lotos program use the Core2Lots/xslt/xml2LOTOS.xslt you will get an html version of the code ,to transform it to text version use the Core2Lotos/html2text/html2text program (see usage note while run).

The information about the structure of XLINK file with additional information you can find at the veritech directory or you can see the DTD of the file in the core2lotos\dtd\add_info.dtd.

Assumptions:
1. The core input program may include in the TYPE section TYPE of sort “Range” or “Enum”, TYPE of anther sort are not supported (error massage will be shown).
2. The core input program may not include renames.
3. We transform the Range of the core program to integer assuming that the Core program is correct and not go out of the Range.

The Xlink File:
Contains additional information about all non-trivial conversions between the languages, these conversions are:
1. Enable goes to guard's value (in pre condition).

2. cojoin goes in the guard's value (in pre condition).
3. Assignment goes to Expr in post condition guard.
4. Global varDefs goes to formal Params of Global process.
5. Constants go to a parameter for all the processes.
6. Partial Synchronization goes in two Partial Synchronization with HelpProcess.
7. Enum goes to a parameter for all the processes.

How to read the xlink file:

In the xlink file you will find collection of sources ,targets an connections ,the source contains the ID of the source element and a description for It ,
The target contains the ID of the target element and a description for it,
The connection contains the ID of the source the target, and words describing the relation between them.

For example in translating this the following core program to lotos program :

```
HOLD_PREVIOUS

VAR
        Y:BOOLEAN INITVAL FALSE;

MODULE M1 (I:INTEGER) {
        TRANS A:
                enable: I<5;
                assign: I':=6;
}

MODULE M2 (B:BOOLEAN) {
        TRANS B:
                enable: !B;
                assign: B':=TRUE;
}

MODULE SYSTEM () {
  VAR
X:INTEGER INITVAL 5;
  (M1(X) || M2(Y))
}
```

```
<Change xmlns:xlink="http://www.w3.org/1999/xlink" xlink:type="extended">
        <Source xlink:type="locator" xlink:title="Enable Field" xlink:role="Enable Field"
xlink:label="Enable_21" xlink:href="examples/params_core/params_core_xml.xml#Enable_21"/>
        <Target xlink:type="locator" xlink:title="Guard Field" xlink:role="Guard Field"
xlink:label="Expr_1000" xlink:href="examples/params_core/params_lotos_xml.xml#Expr_1000"/>
        <Connection xlink:type="arc" xlink:title="Enable goes to guard's value" xlink:show="other"
xlink:actuate="onRequest" xlink:from="Enable_21" xlink:to="Expr_1000"/>
    </Change>
```

This is a part of the XLink which describes the transformation of the **enable:I<5;** section below in the left we have the xml element for enable section (taken from the core xml program) and in the left we have the translation of this section to lotos in xml version, this xlinlk element (the Change element) show that the source title and role is “Enable Field” and the label (the ID of the element) is “Enable_21” and in the href we have the source file name+ the ID of the source element ,the same fields we have in the target section , title and role is “Guard Field”, the label is “Expr_1000” and in the href the target xml file name + the ID of the target element,
in the connection section we have the connection between the source element and the target element while “from” is the source ID and “to” is the target ID, the title gives an explanation of the translation.

```
<Enable ID="Enable_21">
    <Expr ID="ID_22">
        <LT ID="LT_23">
            <Expr ID="ID_24">
                <Constant ID="Constant_25">
                    <Genconst ID="Genconst_26">
                        <Atom ID="Atom_27">
                            <ATOM ID="ATOM_28">I</ATOM>
                        </Atom>
                    </Genconst>
                </Constant>
            </Expr>
            <Expr ID="ID_29">
                <Constant ID="Constant_30">
                    <Genconst ID="Genconst_31">
                        <Number ID="Number_32">5</Number>
                    </Genconst>
                </Constant>
            </Expr>
        </LT>
    </Expr>
</Enable>
```

```
<Expr ID="Expr_1000">
    <PAR_EXPR ID="PAR_EXPR_1072">
        <Expr ID="Expr_1073">
            <LT ID="LT_1074">
                <Expr ID="Expr_1075">
                    <Constant ID="Constant_1076">
                        <Genconst ID="Genconst_1077">
                            <Atom ID="Atom_1078">I</Atom>
                        </Genconst>
                    </Constant>
                </Expr>
                <Expr ID="Expr_1079">
                  <Constant ID="Constant_1080">
                    <Genconst ID="Genconst_1081">
                        <Number ID="Number_1082">5</Number>
                    </Genconst>
                  </Constant>
                </Expr>
            </LT>
        </Expr>
    </PAR_EXPR>
</Expr>
```