XMOS®

Application Note: AN10112

How to specify a loop count in the XTA

This application note is a short how-to on programming/using the xTIMEcomposer tools. It shows how to specify a loop count in the XTA.

Required tools and libraries

This application note is based on the following components:

- xTIMEcomposer Tools - Version 14.0.0

Required hardware

Programming how-tos are generally not specific to any particular hardware and can usually run on all XMOS devices. See the contents of the note for full details.

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1 How to specify a loop count in the XTA

In many cases the XTA will know the number of iterations for a given loop. However, in some cases, this information cannot be deduced by the tools so you must supply it.

This example shows how to set up both a 'global' and a 'local' loop count for a given loop. (Note: The loop count is defined as the number of times the body of the loop is executed).

'Global' in this context means that once set, this loop count is applied to all routes subsequently created that contain this loop.

However, 'Local' means that this loop count is only applied to a given pre-existing route, and will have no effect on either other pre-existing routes, or subsequently created routes that contain this loop.

For example, compile the following code:

```
int f() {
  int i, j = 0;
  for (i = 0; i < 10; ++i) {
    #pragma xta label "loop_label"
    j += i;
  }
  return j;
}

int main() {
  f();
  return 0;
}
```

2 Setting a global loop count

Load the resulting executable into the XTA then click the 'Add define' button in the toolbar. In the dialog, enter 'loop_label' in the reference section and '10' in the num iterations section. Now time the function 'f'. By considering the tree constructed for this route you can see that the loop count of 10 has been correctly applied to this route.

To add a global loop count using the command line XTA, or from an XTA script/embedded source command, the following can be used:

```
add loop loop_label 10
```

3 Setting a local loop count

Load the resulting executable into the XTA then time the function 'f'. This will create the route. Right-click in the left hand side border of the editor on the source line inside the loop (j += i), and select 'Set loop iterations'. In the resulting dialog enter '10' in the num iterations section.

To add a local loop count using the command line XTA, or from an XTA script/embedded source command, the following can be used:

```
set loop 0 loop_label 10
```

This will set a loop count of 10 on the loop containing 'loop_label' for the route with an id of 0.