Application Note: AN10113

How to specify an exclusion in the XTA

This application note is a short how-to on programming/using the xTIMEcomposer tools. It shows how to specify an exclusion 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.

1 How to specify an exclusion in the XTA

Not all paths of execution in a route may be timing-critical. For example, the route may contain cases to handle errors where the timing of the code is not important. You can tell the XTA to ignore these paths by adding exclusions. Exclusions tell the tool to ignore all paths which pass through that code point. Exclusions can be added either *globally* or *locally*.

Global in this context means that once set, this exclusion is applied to all routes subsequently created that contain this code path.

However, *local* means that this exclusion 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 code path.

For example, compile the following code:

```
int add_if_not_equal(int a, int b) {
  if (a == b) {
    #pragma xta label "error_case"
    return -1;
  }
  return a + b;
}

int main() {
  add_if_not_equal(1, 2);
  return 0;
}
```

2   Setting a global exclusion

Load the resulting executable into the XTA then right-click in the left hand side border of the editor on the source line inside the conditional (return -1), and select *Add to exclusion list*. Now analyze the function 'add_if_not_equal'. The resulting route will now only contain a single code path, i.e. the "error_case" code path will have been excluded.

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

```
add exclusion error_case
```

3 Setting a local exclusion

Load the resulting executable into the XTA then time the function *Add to exclusion list*. This will create the route. Right-click in the left-hand side border of the editor on the source line inside the conditional (return -1), and select 'Exclude'. The code path containing "error_case" will now be removed from the route.

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

```
set exclusion 0 error_case
```

This will set an exclusion on the code path containing "error_case" for the route with an id of 0.

Note: Although functionally equivalent, global exclusions can result in faster, and more memory efficient, route creation. This is because the global exclusions can be taken into account during route creation, so the search space can be reduced. For local exclusions, the complete route is created before any pruning occurs.