

# Application Note: AN10083 How to use variable length arrays

This application note is a short how-to on programming/using the xTIMEcomposer tools. It shows how to use variable length arrays.

#### **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 use variable length arrays

In xC, array declarations need to be a constant size. The exception to this is a local array that can be declared as a variable size based on a parameter, provided that parameter is marked both static and const:

```
void f(static const int n)
{
 printf("Array length = %d\n", n);
 int arr[n];
 for (int i = 0; i < n; i++) {
    arr[i] = i;
    for (int j = 0; j < i; j++) {
     arr[i] += arr[j];
    }
 }
 printf("-----\n");
 for (int i = 0; i < n; i++) {
    printf("Element %d of arr is %d\n", i, arr[i]);
 }
 printf("-----\n\n");
}
```

When calling functions with static parameters, the argument has to be either:

```
• a constant expression
```

• a static const parameter to the caller function

```
void g(static const int n)
{
   // static parameter can be called with a constant expression argument
  f(2);
   // or passing on a static const parameter
   f(n);
}
```

These restrictions mean that the compiler can still statically track stack usage despite the local array having variable size.

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