# Migrating to the new C++ binding

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# Outline

- Summary of the benefits
- Command line and file name changes
- Programming changes
- Future plans

# Benefits of the UC++ binding

- Inheritance hierarchy of stubs matches SIDL inheritance
    - ►Automatic upcasting of method arguments
    - ►Catching a super class works
    - ►Overloading based on type is correct
- New babel_cast<>() operator for downcasts
- Call stub methods from Impl without the self pointer
- http://www.llnl.gov/CASC/components/docs/cca-050127-ucxx.pdf

# Command line changes (starting with Babel 0.11.0)

- To generate code using the new C++ binding
babel --{server|client}=uc++
- To generate code using the deprecated C++ binding
babel --{server|client}=dc++
- babel --{server|client}=c++
produces an error message

# Filename changes

| | Headers | Source |
|---|---|---|
| UC++ | .hxx | .cxx |
| DC++ | .hh | .cc |

# Programming Changes: Namespace

- UC++ currently puts everything in the ucxx namespace

  ```
  #ifdef SIDL_USE_UCXX
  using namespace ucxx;
  #endif
  ```

- In the future, we will drop the ucxx namespace. Use these for future compatibility

  ```
  #define UCXX  ::ucxx
  #define UCXX_LOCAL ucxx::
  ```

# Programming Changes: babel_cast<>

- **Here is an example of the new babel_cast**
  **UCXX ::sort::Integer int1 =**
  **UCXX ::sidl::babel_cast< UCXX ::sort::Integer>(i1);**
- **This does a “dynamic cast” to the sort.Integer type.**

# Programming Changes: No self in Impls

- **In your Impl code, no longer use self when an object makes a method call on itself**

  ***Deprecated C++***

  **cmp = self.getCompareCounter();**

  ***UC++***

  **cmp = getCompareCounter(); *// or***

  **cmp = this->getCompareCounter();**

- **The Impl class inherits from the stub class**

# Programming Changes: Delete extraneous casts

- **class CubeFunction implements-all gov.cca.Component {}**
- ***Deprecated C++ implementation of setServices***

```
{
  frameworkServices = services;
  TypeMap tm = services.createTypeMap();
  Port p = self; // Babel required casting
  services.addProvidesPort(p, “FunctionPort”, ...
```

- ***UC++ implementation***

```
{
  frameworkServices = services;
  TypeMap tm = services.createTypeMap();
  services.addProvidesPort(*this, “FunctionPort”,
...
```

# Programming Changes: Incidental changes

- Impl method names have “_impl” appended (no effect on Babel users)

# Future plans

- In Babel 1.0
  - UC++ becomes the default C++ binding
  - Drop ucxx namespace
  - Drop DC++ binding

# Contact Info

- **Project: http://www.llnl.gov/CASC/components**
- **Project Team Email: components@llnl.gov**
- **Mailing Lists: majordomo@lists.llnl.gov**
  **subscribe babel-users *[email address]***
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