Presentation of TC-3

Assistants 2009

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Overview of the tarball

The tree structure of TC-3

- Only ‘`src/bind`’ directory has been added.
- That is where the Binder lays.
- Implement it entirely.
- Pay attention to ’`break`’: it must be used in a loop only. If not, exit with a bind error code (4).

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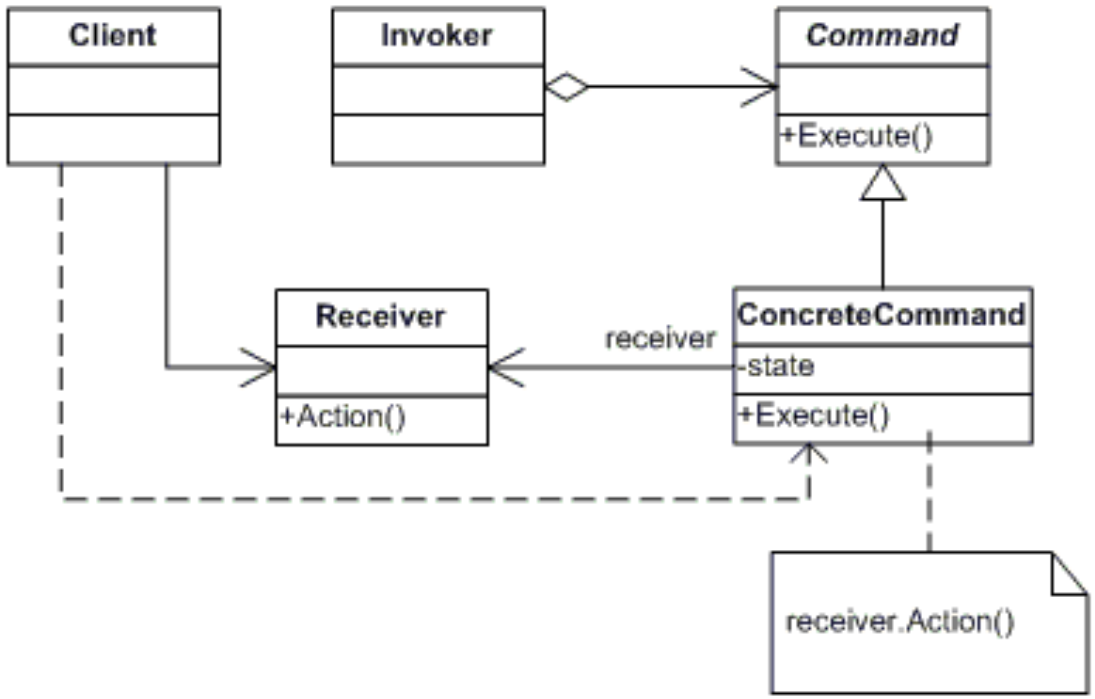
Task module

The tasks module

The design pattern *command*:

Encapsulate a request as an object, thereby letting you parameterize clients with different requests, queue or log requests, and support undoable operations.



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Syntax of function member pointers: declaration

```
/// Member manipulator signature.
typedef void (Error::*member_manip_type) ();

/// Hook for member manipulators.
Error& operator<< (member_manip_type f);
```

Syntax of method pointer: usage

```
// Calling a function member using a function member pointer.
inline Error&
Error::operator<< (member_manip_type f)
{
  (this->*f) ();
  return *this;
}

// Passing a function member pointer as argument
// (excerpt from scantiger.ll).
error_ << misc::Error::failure
 << program_name
 << ": cannot open `" << filename_ << "': "
 << strerror (errno) << std::endl
 << &misc::Error::exit;
```

Templates

Traits

Template parameterized by templates

- Templates can be parameterized by a scalar value, a type, ...
- ... and another template :)!
- Example [1]:

```
template <class T, template <class> class C>
class Xrefd
{
  C<T>  mems;
  C<T*> refs;
};

// This instanciates a vector of "Entries"
// and  a vector of "Entries*"
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Traits

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- Example: is a type a pointer type?
- First define default value (Excerpt from 'lib/misc/traits.hxx').

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/// Use is_pointer<T>::value.
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Traits: another example

- Traits can compute a type from another type. Here is a sample of 'misc/select-const.hh'

```
/// The iterator over a non const structure
/// is plain iterator.
template<typename T>
struct select_iterator
{
  typedef typename T::iterator type;
};

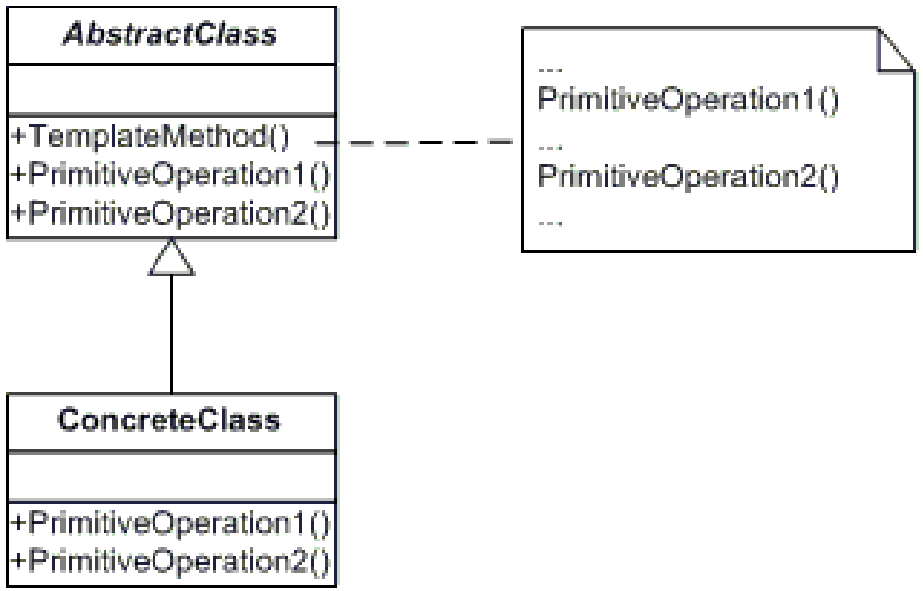
/// The iterator over a const structure
/// is a const_iterator.
template<typename T>
struct select_iterator<const T>
{
  typedef typename T::const_iterator type;
};
```

Template Methods

The design pattern *Template Method*

The design pattern *Template Method*:

Define the skeleton of an algorithm in an operation, deferring some steps to subclasses. Template Method lets subclasses redefine certain steps of an algorithm without changing the algorithm's structure.



The design pattern *Template Method*

- In the Tiger project it is used to visit the chunks.
- Visiting a chunk of types or functions is basically the same:
  1. Declare type or function prototypes.
  2. Process their definitions.
- warning: Implemented thanks to template, and not class inheritance as usual in C++.
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- Contain only pure function members.
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  - Code is completely factorized.
- Cons:
  - A bit harder to implement.

Bindable: one template interface!

- Each node referring to a type, function or variable implement respectively TypeBindable, FunctionBindable and VariableBindable, but those classes are written using a template.
- Pros:
  - Strong type checking.
  - Code is completely factorized.
- Cons:
  - A bit harder to implement.

Bindable: one template interface!

Same kind of declaration than for DefaultVisitor and DefaultConstVisitor.

```
template <class DefinitionClassType>
class Bindable
{
  // FIXME.
}
// Aliases for template classes.
typedef Bindable<FunctionDec> FunctionBindable;
```

Bibliography I


Bjarne Stroustrup.
The C++ programming language third edition, 1997.