Module 19: "Command"





Agenda

- Introductory Example: Toggling Lights
- Challenges
- Implementing the Command Pattern
- Pattern: Command
- Overview of Command Pattern
- ▶ .NET Framework Example: WPF Commands
- Command Extensions and Variations





Introductory Example: Moving Parts

```
Light light = new Light();

string input = Console.ReadLine();
if( input.ToLower() == "toggle" )
{
    light.Toggle();
}
```





Challenges

- How do we decouple the client from the actual light?
- What if we want to toggle more lights?
- What if we want to control other kinds of lights?
- What if we want to support timed controls?





Pattern: Command

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

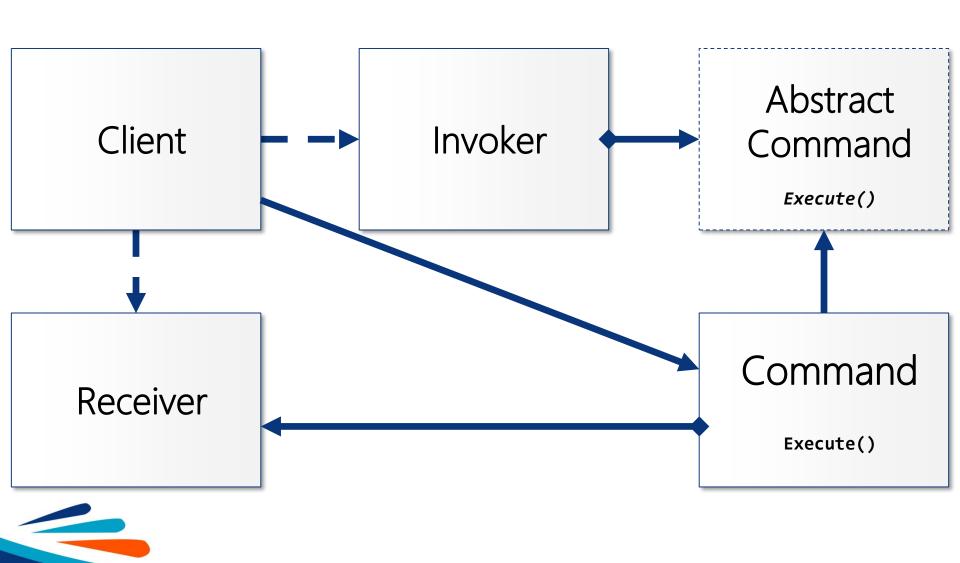
Outline

- A class delegates a request to command object instead of implementing directly
- Decouples the invoker of a request from how it is executed.
- Origin: Gang of Four



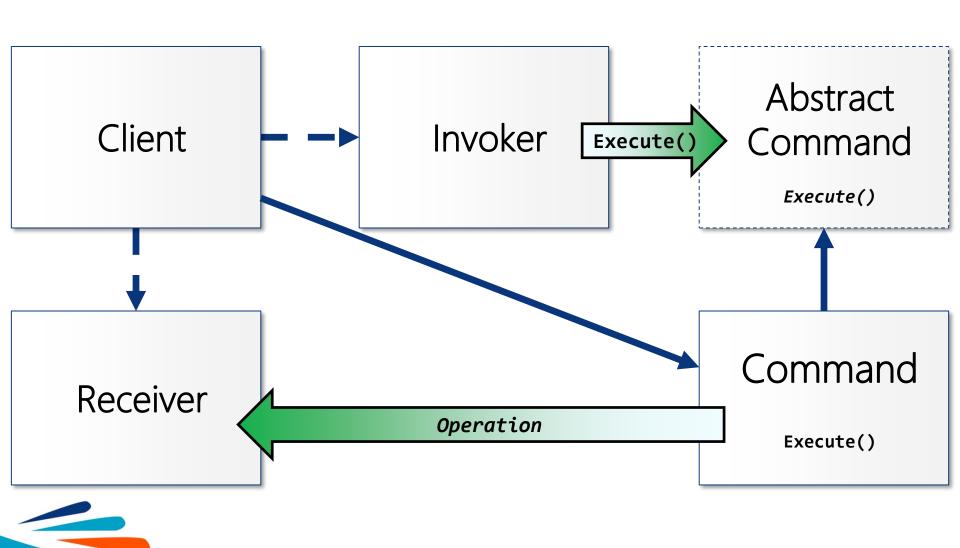


Overview of Command Pattern





Overview of Command Pattern





Overview of Command Pattern

- Client
 - Creates Command and Invoker and supplies Invoker with Command
- Abstract Command
 - Interface or abstract class defining general Execute() method
- Command
 - Concrete command class encapsulating action and parameter to Execute() at Receiver
- Invoker
 - Invokes Command without knowing contents of command object
- Receiver
 - Performs specified action when Invoker executes command object



.NET Framework Example: WPF Commands

- Commands have already been built into Windows Presentation Foundation
 - See Module 18: "Memento" Example

```
<Button Command="{Binding AddGuestCommand}">Add
<Button Command="{Binding UndoCommand}">Undo

''>Undo
```



Command Extensions and Variations

- Invocations often use parameters
 - These are stored within the Command object
- Commands are often constructed by factories
- ▶ Possible extensions to the **ICommand** interface
 - Validate()
 - Execute()
 - Undo()







Denmark

WWW:http://www.wincubate.net

