Module 02:
"Abstract Factory"

Agenda

- Introductory Example: Devices for Employees
- Challenges
- Implementing the Abstract Factory Pattern
- Pattern: Abstract Factory
- Overview of Abstract Factory
- Variations and Related Patterns

Introductory Example: Devices for Employees

```
class Iphone7
{
    public int MemoryGb { get; }
    ...
}
```

```
class Ipad
{
    public string Version { get; }
    public double ScreenSize { get; }
    ...
}
```

```
Iphone7 phone = new Iphone7(32);
phone.Call("+45 12345678");

Ipad tablet = new Ipad("Air 3", 9.7);
tablet.PowerOn();
tablet.PowerOff();
```

Challenges

- How to we isolate client from concrete class and rely only on general interfaces (or general classes)?
- We don't want the New Employee Enrollment or other HR processes to require change whenever a new edition of a device emerges!
- How do we ensure that clients create object correctly?
- What if the company decide to change it's device vendor?

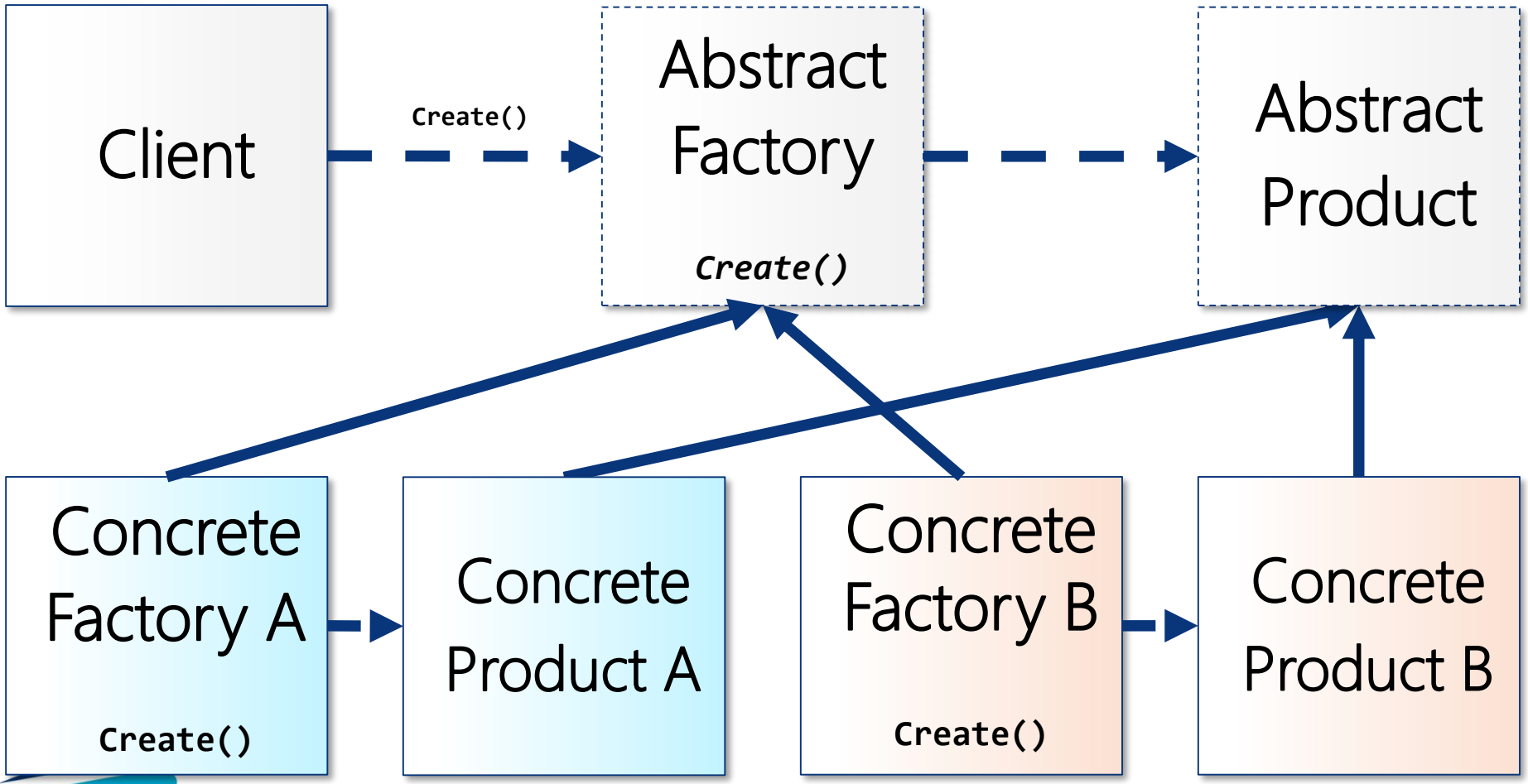
Pattern: Abstract Factory

- *Provide an interface for creating families of related or dependent objects without specifying their concrete classes.*

- Purpose
  - Encapsulate object creation in a factory object.
  - Define an interface (abstract factory) for creating objects
  - Implement that interface in concrete classes
  - Classes do not instantiate objects directly but delegate object creation to factory

- Origin: Gang of Four

Overview of Abstract Factory Pattern



Overview of Abstract Factory Pattern

- Client
  - Only depends upon Abstract Factory and Abstract Product
- Abstract Factory
  - Interface for object creation operations such as abstract `Create()`
- Concrete Factory
  - Concrete class implementing the Abstract Factory interface for creating Concrete Product objects in `Create()`
- Abstract Product
  - Interface or abstract class specifying a generalizes product
- Concrete Product
  - Concrete class implementing the Abstract Product interface

Variations and Related Patterns

- Each factory can created any number of products
  - `CreateXxx()`
  - `CreateYyy()`
- `Create()`
  - can optionally be supplied a product context parameter
  - can make use of the Builder Pattern
- Abstract Factory Pattern
  - Is often confused or combined with Factory Method Pattern


WINCUBATE
Jesper Gulmann Henriksen
PhD, MCT, MCSD, MCPD
Phone : +45 22 12 36 31
Email : jgh@wincubate.net
WWW : http://www.wincubate.net
Hasselvangen 243
8355 Solbjerg
Denmark