SERVICE LOCATOR

PROVIDE A **GLOBAL POINT OF ACCESS** TO A SERVICE WITHOUT COUPLING USERS TO THE CONCRETE CLASS THAT IMPLEMENTS IT.
<<interface>>

Service

Concrete Service

Service Locator

- service

+ static Provide(Service)
+ static GetConcrete(Service)
What to do **when service is not there?**

**Check for null and exit early**

```csharp
private void OnCollisionEnter()
{
    var score = Services.Score;
    if (score == null)
        return;

    score.AddPoints(hitValue);
}
```

**Use NullService**

```csharp
private void OnCollisionEnter()
{
    ... Services.Score.AddPoints(hitValue);
}
```
How can the locator find services?

Dependency Injection
outside code registers it

- Very simple
- Can change during gameplay
- Very easy to break
- Locator depends on outside code
- Temporal coupling
How can the **locator** find services?

Set it during **compilation**

```csharp
public static class Services
{
    #if UNITY_EDITOR
    public static readonly GameScore Score = new LoggedGameScore();
    #else
    public static readonly Score Score = new GameScore();
    #endif
}
```
How can the **locator** find services?

- Configurable
- Can be reliable

---

Actually do the locating

*Configuration files and Reflection*

- Complicated
- Can be slow
<table>
<thead>
<tr>
<th></th>
<th>SINGLETON</th>
<th>SERVICE LOCATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GLOBAL ACCESS</strong></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>LIFECYCLE</strong></td>
<td>Single object</td>
<td>-</td>
</tr>
<tr>
<td><strong>NULL REFERENCE</strong></td>
<td>Never</td>
<td>Optional, NullObjects</td>
</tr>
<tr>
<td><strong>UNIT TESTING</strong></td>
<td>Detrimental</td>
<td>Decorators, NullObjects</td>
</tr>
<tr>
<td><strong>INITIALIZATION</strong></td>
<td>Lazy</td>
<td>Dependency injection</td>
</tr>
<tr>
<td><strong>RESPONSIBILITIES</strong></td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
HOMEWORK: 05.04 – 19.04

- **Read Service Locator chapter** from Game Programming Patterns
  [http://www.gameprogrammingpatterns.com/service-locator.html](http://www.gameprogrammingpatterns.com/service-locator.html)

- **Read Service Locator chapter** from CGLearn
  [https://cglearn.eu/student/materials](https://cglearn.eu/student/materials)

- **Do the Service Locator task** from CGLearn