The Bootstrapper

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The Bootstrapper

- **The "magic" starts here**
- **Like global.asax**
  - But Better!!
- **Handles:**
  - Application configuration
  - Application startup
  - Request configuration
  - Request startup
  - Coordinating startup task

The Bootstrapper

- **Inversion of Control container**
  - Compose application components
  - Nancy has default implementations of:
    - View Engines
    - Startup Tasks
    - Model Binders
    - Default FavIcon
    - Deserializers
    - Diagnostics Conventions
  - Can also replace or enhance these implementations

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The Bootstrapper

TinyIoc

- Default Inversion of Control container
- Baked into the Nancy framework
- https://github.com/grumpydev/TinyIoC

- Like the other components…

The Bootstrapper

We are free to swap it out!

- **Existing Nancy IoC adapters include:**
  - Windsor
  - Unity
  - StructureMap
  - Ninject
  - AutoFac

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Demo: Dependency Injection

Requirements:

- Replace static repository class methods with non-static versions
- Use constructor injection to instantiate the repository class
- Use repository instance in route functions
- Use built-in Inversion of Control framework, TinyIoC

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Application Startup

- **Automatic:**
  - Initialize and configure inversion-of-control container
  - Scan assembly and register types, collections, and instances
  - Scan and register all modules
  - Run startup tasks
  - Initialize the request pipelines (before, after, error)

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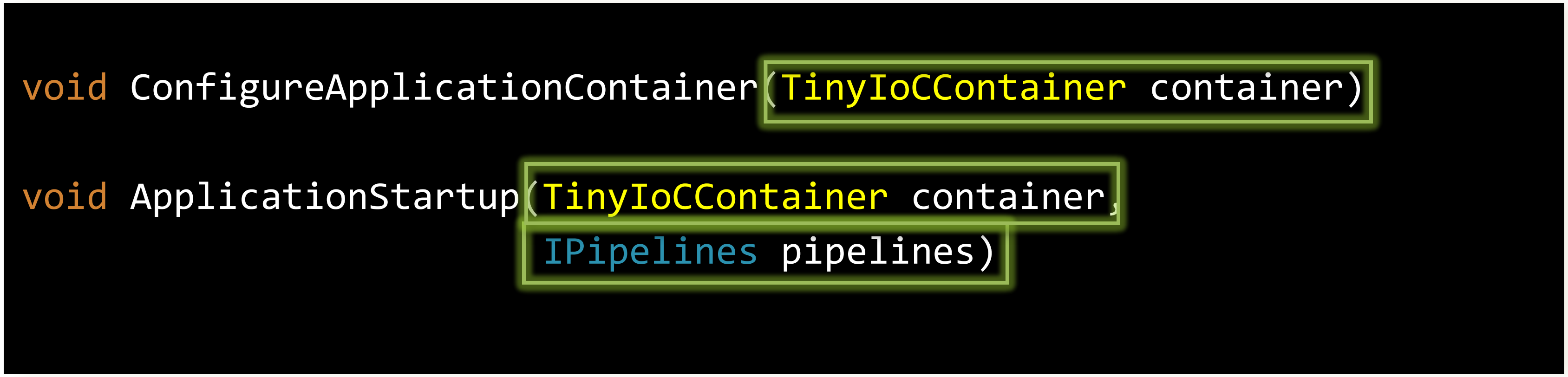
Application Startup

Manual:

Register custom types

Add application initialization tasks



```
void ConfigureApplicationContainer(TinyIoCContainer container)

void ApplicationStartup(TinyIoCContainer container,
                        IPipelines pipelines)
```

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Request Startup

- **Automatic:**
    - Create and configure **nested** container
        - Derived from application container
        - Scoped to the request
        - All application singletons are still scoped at application level
        - At the end of the request, all object in the nested container are dereferenced.

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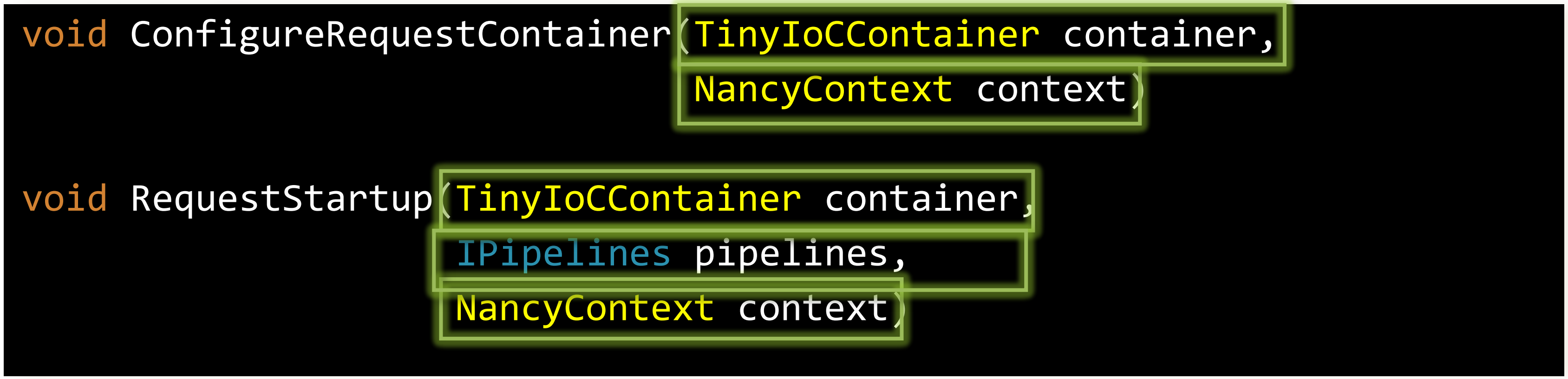
Request Startup

Manual:

Add request initialization tasks

Register custom types



```
void ConfigureRequestContainer(TinyIoCContainer container,
                               NancyContext context)

void RequestStartup(TinyIoCContainer container,
                    IPipelines pipelines,
                    NancyContext context)
```

The Bootstrapper

- **To tap into these methods, we just override the default bootstrapper**

- **Nancy will find the first overriden bootstrapper in your project.**

The Bootstrapper

To create custom bootstrapper based on TinyIOC:

Derive from DefaultNancyBootstrapper

```
public class PluralsightBootstrapper :
             DefaultNancyBootstrapper
{
}
```

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The Bootstrapper

To create custom bootstrapper based on another IOC container:

Reference Nancy.Bootstrapper.[*IOCFramework]*

Derive from *[IOCFramework]*NancyBootstrapper

```
using Nancy.Bootstrappers.StructureMap;

public class PluralsightBootstrapper :
             StructureMapNancyBootstrapper
{
}
```

Demo: Add logging to the application

Requirements:

Add and initialize a rolling file appender using log4net

Log all incoming requests

Log all successful requests

Log all errors

Tasks:

Add log4net to solution and configure rolling file appender

Initialize log4net configuration in the application startup

Add required logging to the pipeline items

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The Bootstrapper

There is another way…

We can remove all of the code out of the bootstrapper and implement a class that implements IStartup instead.

The Bootstrapper

```
public interface IStartup
{

  void Initialize(IPipelines pipelines);

  IEnumerable<TypeRegistration>
    TypeRegistrations { get; }

  IEnumerable<CollectionTypeRegistration>
    CollectionTypeRegistrations { get; }

  IEnumerable<InstanceRegistration>
    InstanceRegistrations { get; }
}
```

The Bootstrapper

When to use the IStartup interface:

1. **Need to configure a one time initialization**
2. **Need to add behavior to the pipeline**
3. **Need to register types for your plugin**
4. **Do not need to access the IoC container**

Cassette.Nancy is an awesome example of creating a reusable component with the IStartup interface.

https://github.com/ChrisMH/Cassette.Nancy

Demo: Refactor Logging using IStartup

Requirements:

Log all incoming requests

Log all successful requests

Log all errors

Tasks:

Initialize log4net configuration

Add required logging to the pipeline items

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The Bootstrapper

- **Defining Static Content**
  - Modify the StaticContentsConventions in the Bootstrapper
  - Allows mapping a virtual folder to a physical folder
    - Define a virtual or requested path
    - Define the physical content path
    - Optionally provide file extensions to allow
  - Use the StaticContentConventionBuilder
    - Add Directory
    - Add File

Demo: Update Static Content Convention

Requirements:

Add a `public` directory, which houses custom javascript, to the static content conventions

Tasks:

Override the existing StaticContentConventions

Use StaticContentConventionBuilder to add the `public` virtual directory

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Summary

- **The Bootstrapper**
  - Inversion of Control (TinyIoC)
  - ApplicationStartup()
  - RequestStartup()
  - Override the default bootstrapper
  - IStartup