

# JBoss JCA

The Fungal kernel

jboss  
\_org

# Fungal

- Goals
- Features
- Use-case: JCA
- Future
- Links



# Fungal

## Goals

# Fungal - Goals

- POJO kernel
- Simplicity
- Performance
- Compatible with sub-set of the JBoss Microcontainer configuration



# Fungal

# Features

# Fungal - Features

- Bean definition language
- Lifecycle of beans
- Parallel deployment
- Dependency management
- Simple classloader architecture
- Simple deployer framework
- Communication protocol
- Core services



# Fungal – Bean Definition Language

- Defined in deployment.xsd
  - <bean>
  - <property>
  - <inject>
  - <constructor>
  - <parameter>
  - <factory>
  - <depends>
  - <install> / <uninstall>
  - <incallback> / <uncallback>

# Fungal – Bean Definition Language

- deployment.xsd (cont.)
  - <map>
  - <list>
  - <set>
  - <null>
  - <this>



# Fungal – Bean Definition Language

- Variable substitution in deployment files
  - `${jboss.jca.home}`
  - `${jboss.jca.address:localhost}`
- Kernel bootstrapped through `bootstrap.xsd`
  - Defines references to `deployment.xsd` based files

# Fungal – Bean Definition Language

```
<bean name="ThreadGroup" class="java.lang.ThreadGroup">  
  <constructor>  
    <parameter>workmanager</parameter>  
  </constructor>  
  <ignoreStop/>  
  <ignoreDestroy/>  
</bean>
```

```
<bean name="ThreadFactory" interface="java.util.concurrent.ThreadFactory"  
  class="org.jboss.threads.JBossThreadFactory">  
  <constructor>  
    <parameter><inject bean="ThreadGroup"/></parameter>  
    <parameter>>false</parameter>  
    <parameter>5</parameter>  
    <parameter>work</parameter>  
    <parameter><null/></parameter>  
    <parameter><null/></parameter>  
  </constructor>  
</bean>
```

```
<bean name="ShortRunningThreadPool">  
  <constructor factoryMethod="threadFactoryExecutor" factoryClass="org.jboss.threads.JBossExecutors">  
    <parameter><inject bean="ThreadFactory"/></parameter>  
  </constructor>  
</bean>
```

# Fungal - Lifecycle

- Support for lifecycle operations
  - create
  - start
  - stop
  - destroy
- Ignore lifecycle methods if needed
  - <ignoreCreate>
  - <ignoreStart>
  - <ignoreStop>
  - <ignoreDestroy>

# Fungal – Parallel deployment

- Start each bean in its own thread for maximum performance
- Bean states
  - NOT\_STARTED
  - STARTING
  - STARTED
  - STOPPING
  - ERROR

# Fungal – Classloader / Deployer

- Classloading (3 levels)
  - AppCL – Kernel
  - KernelCL – Container libraries
  - DeploymentCL – User deployment
- Deployment framework
  - Deployer (Interface)
  - Deployment (Interface)
  - DeployException (Exception)
  - CloneableDeployer (Interface / Advanced)



# Fungal - Communication

- Binary communication protocol
  - `java.net.Socket`
  - `java.io.ObjectInputStream`
  - `java.io.ObjectOutputStream`
- Commands
  - `deploy`
  - `undeploy`



# Fungal - Core Services

- Support libraries
  - File handling
  - JAR file handling
  - Injection

# Fungal – Example

```
import org.jboss.jca.fungal.api.Kernel;
import org.jboss.jca.fungal.api.KernelConfiguration;
import org.jboss.jca.fungal.api.KernelFactory;
import org.jboss.jca.fungal.api.MainDeployer;

// Create a kernel configuration and start the kernel
KernelConfiguration kernelConfiguration = new KernelConfiguration();
kernelConfiguration = kernelConfiguration.remoteAccess(false);

Kernel kernel = KernelFactory.create(kernelConfiguration);
kernel.startup();

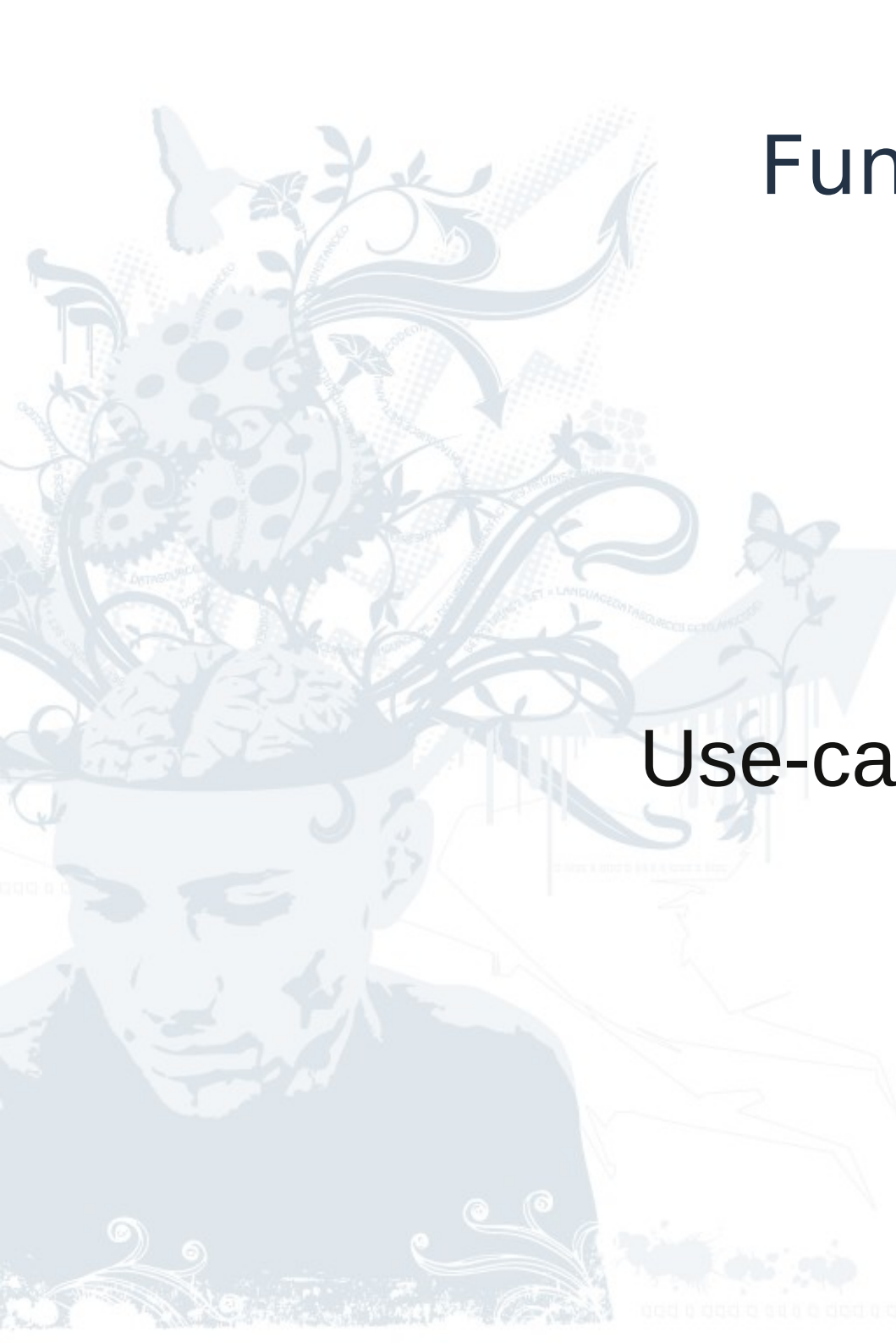
// Get the reference to the main deployer
MainDeployer mainDeployer = kernel.getMainDeployer();

// Reference to my deployment
URL myDeployment = ...;

mainDeployer.deploy(myDeployment);
```

# Fungal - Complexity

- Complexity
  - Kernel: 2984 LoC
  - Deployment framework: 175 LoC
  - Bean deployer: 4094 LoC
  - Core services: 768 LoC



# Fungal

## Use-case: JCA

# Fungal - JCA

- Boots the standalone JCA container
  - Logging
  - Remotable naming server
  - Transaction manager
  - JCA implementation
  - Resource adapter deployer
  - Web (Jetty + WARDeployer)
- 948ms
  - On Intel Dual T7500 @ 2.20GHz
  - 5400RPM disk





# Fungal

# Future

# Fungal - Future

- Extend bean definition language
  - as the use-cases appears
- Hot deployment (0.6)
- Advanced classloader architecture
  - maybe even OSGi / EE requirements
- Maven repository integration
  - Libraries / Deployments
- SPIs
  - allow integration into the various services



# Fungal

## Links

# Fungal - Links

- <http://www.jboss.org/jca>
- <http://docs.jboss.org/jca/developer/guide/en/html/>
  - Appendix A
- Fungal 0.5.1
  - Included in JBoss JCA 1.0.0.Alpha9
  - February 25<sup>th</sup>, 2010