

FROGI

FRactal over OSGi

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Fractal over OSGi

■ Motivation

- Provisioning a Fractal application (composition) as a set of bundles
- Reuse legacy and standard OSGi-bundles
 - Example : Comanche HTTP server could use `org.osgi.service.log.LogService` compliant services
- Implements component-based bundles for legacy and standard contracts
 - Example : Comanche HTTP Service providing `org.osgi.service.http.HttpService` compliant services

■ Ideas

- Contract versioning and Implementation versioning
- Dynamic Install/Update/Uninstall
- SOA (Service Oriented Architecture)
 - Naming : `service.pid` property
 - Trading
- OSGi legacy
 - Services provided or required by existing OSGi

Fractal over OSGi

■ Provisioning

- Identified Composites are packaged as bundles
 - Contracts are provisioned in separate bundles to enable dynamic updates with the minimal refresh impact
- Deployment uses OSGi tools
 - Remote Shells, Scripts, OBR (dependencies installer, ...)

Fractal over OSGi

■ BootStrap

- One singleton per bundle started by the `Activator.start()`

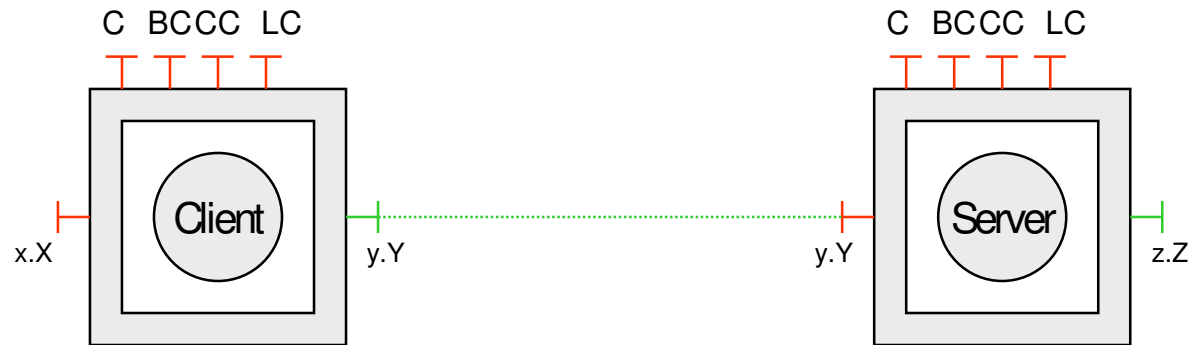
■ Services

- Provided Composites' services are registered in the FW
 - Services are identified with the `service.pid` property
- Required Composites' services are traded to the FW

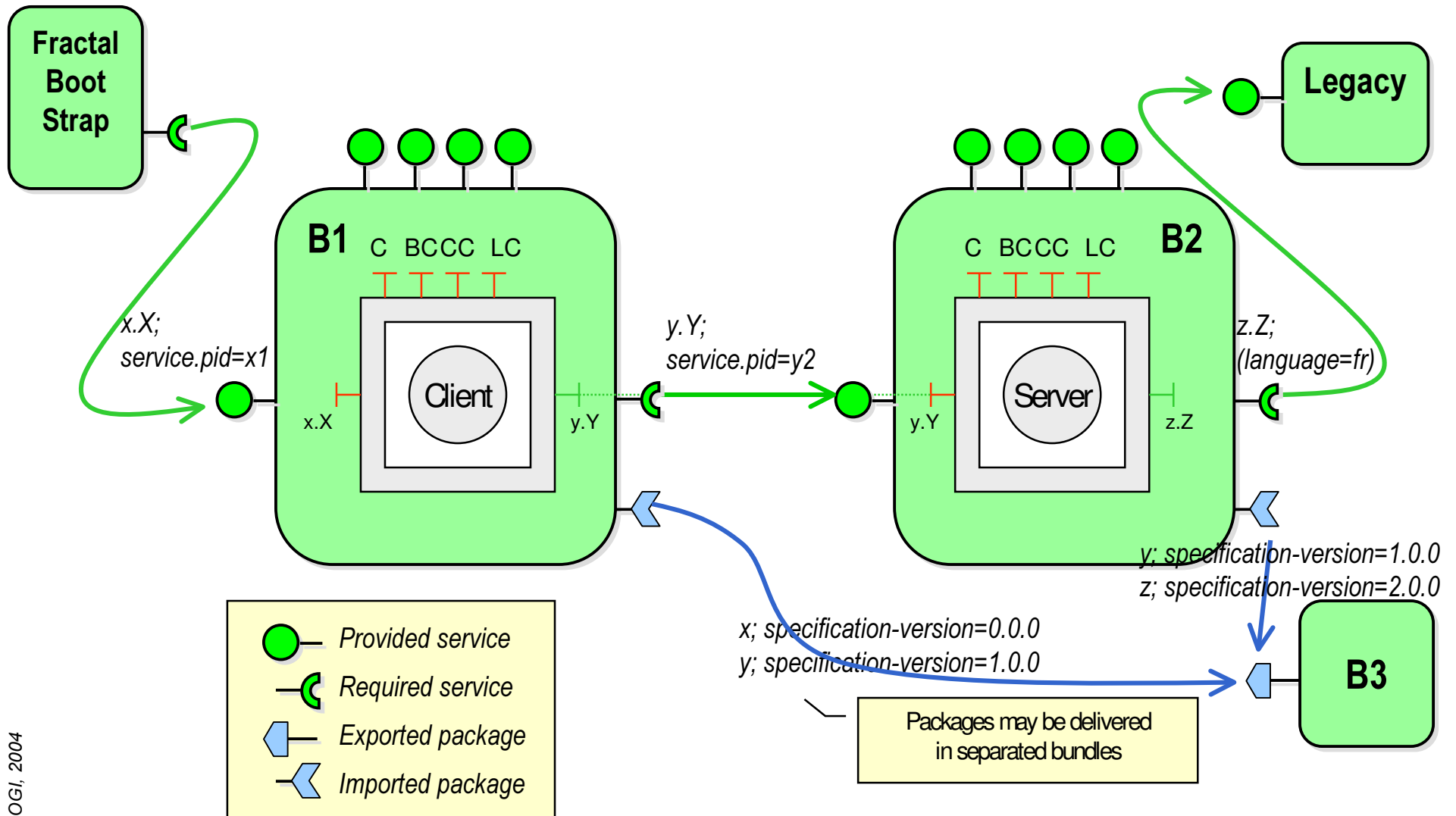
■ Controllers

- Root-composite Controllers are registered as services in the FW registry
- `BindingController` is bound/subjugated by FW service change events
 - Service registration / unregistration
- `LifeCycleController` is bound/subjugated by bundle change events
 - Bundle start and stop
- Other controllers may be mapped on standard OSGi services
 - `AttributeController` by JMX or Configuration Admin, ...

Example (i)



Example Bundle view



ADL Modules

■ OSGi related modules

- Definition of bundles frontiers

```
<?add ast="bundle" itf="frogi.bundle.Bundle"?>
```

- Contracts delivery

```
<?add ast="interface" itf="frogi.interface.Interface"?>
```

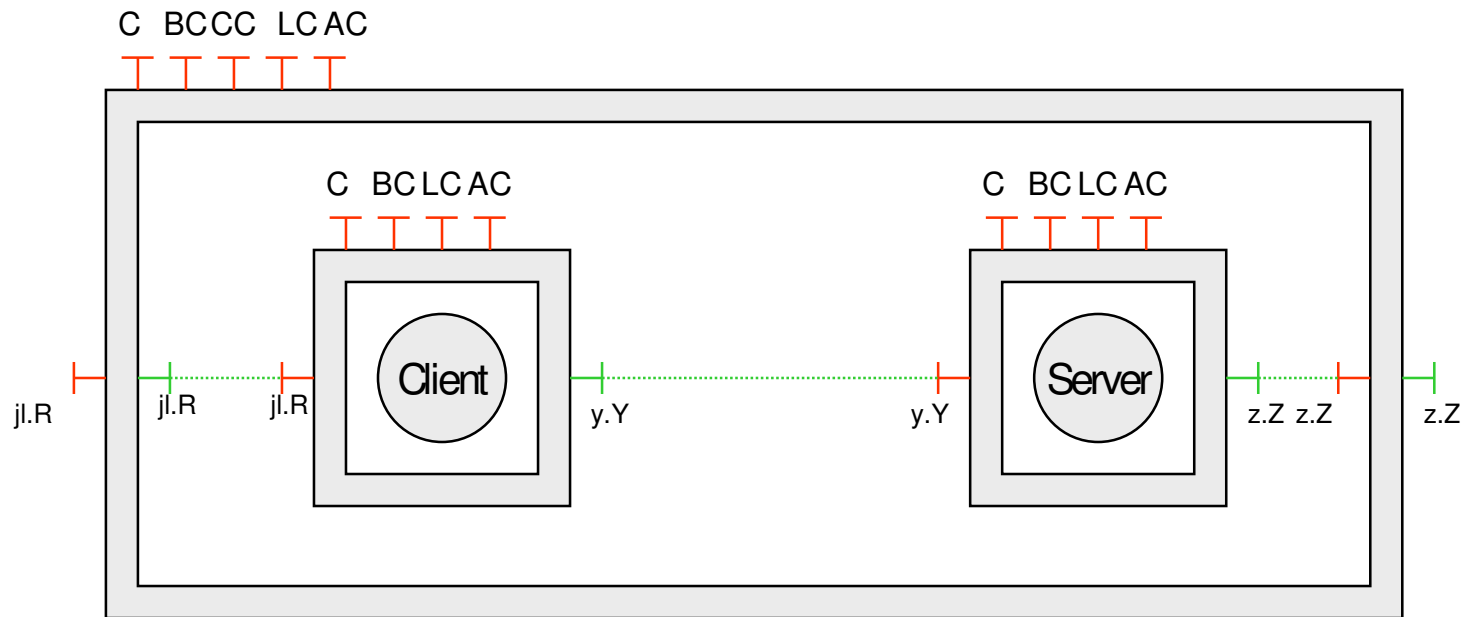
```
<?add ast="controller" itf="frogi.controller.Controller"?>
```

- SOP binding

```
<?add ast="trading" itf="frogi.trading.Trading"?>
```

```
<?add ast="property" itf="frogi.trading.Property"?>
```

Example with a composite



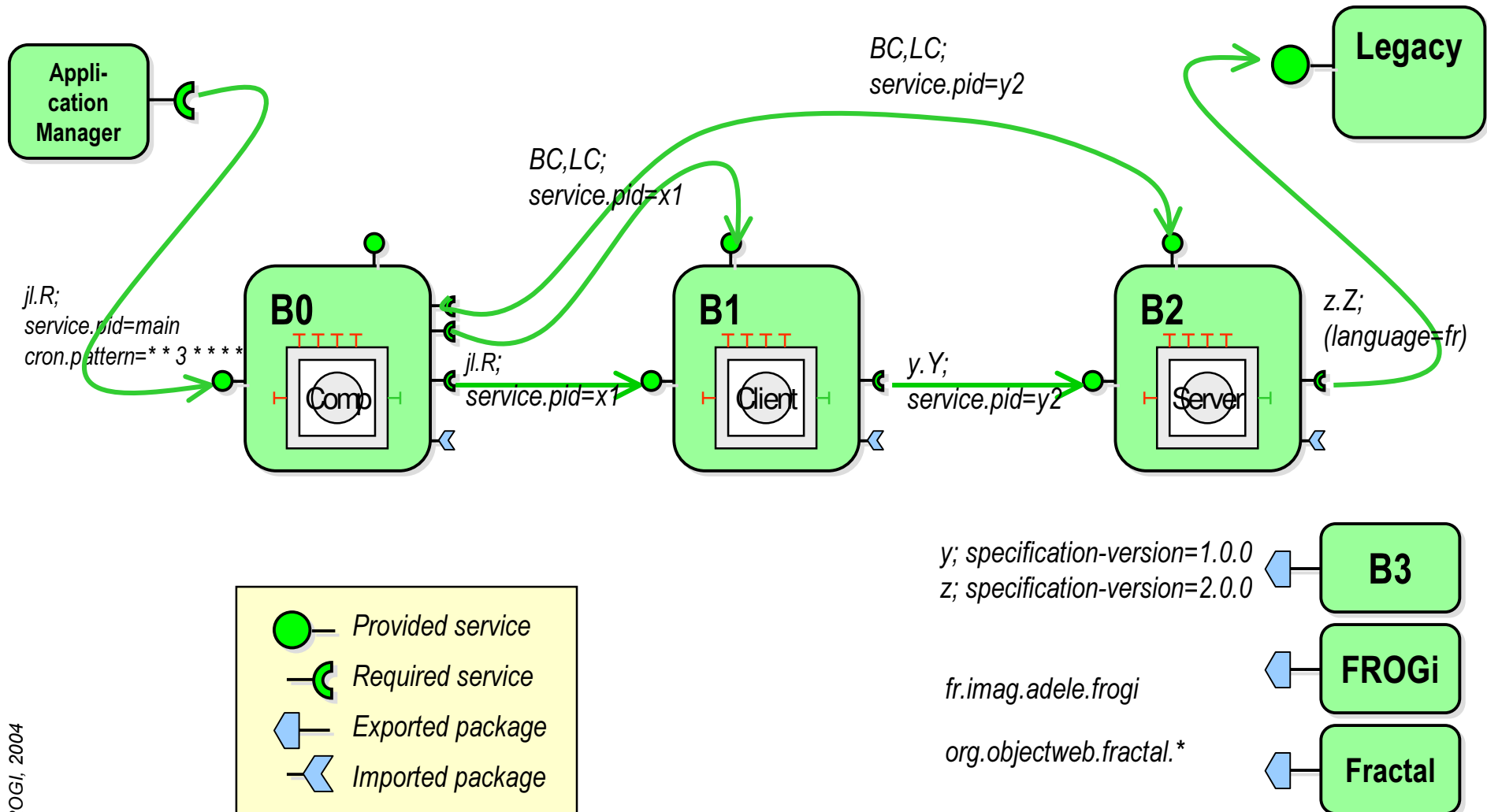
Example with a composite ADL

```

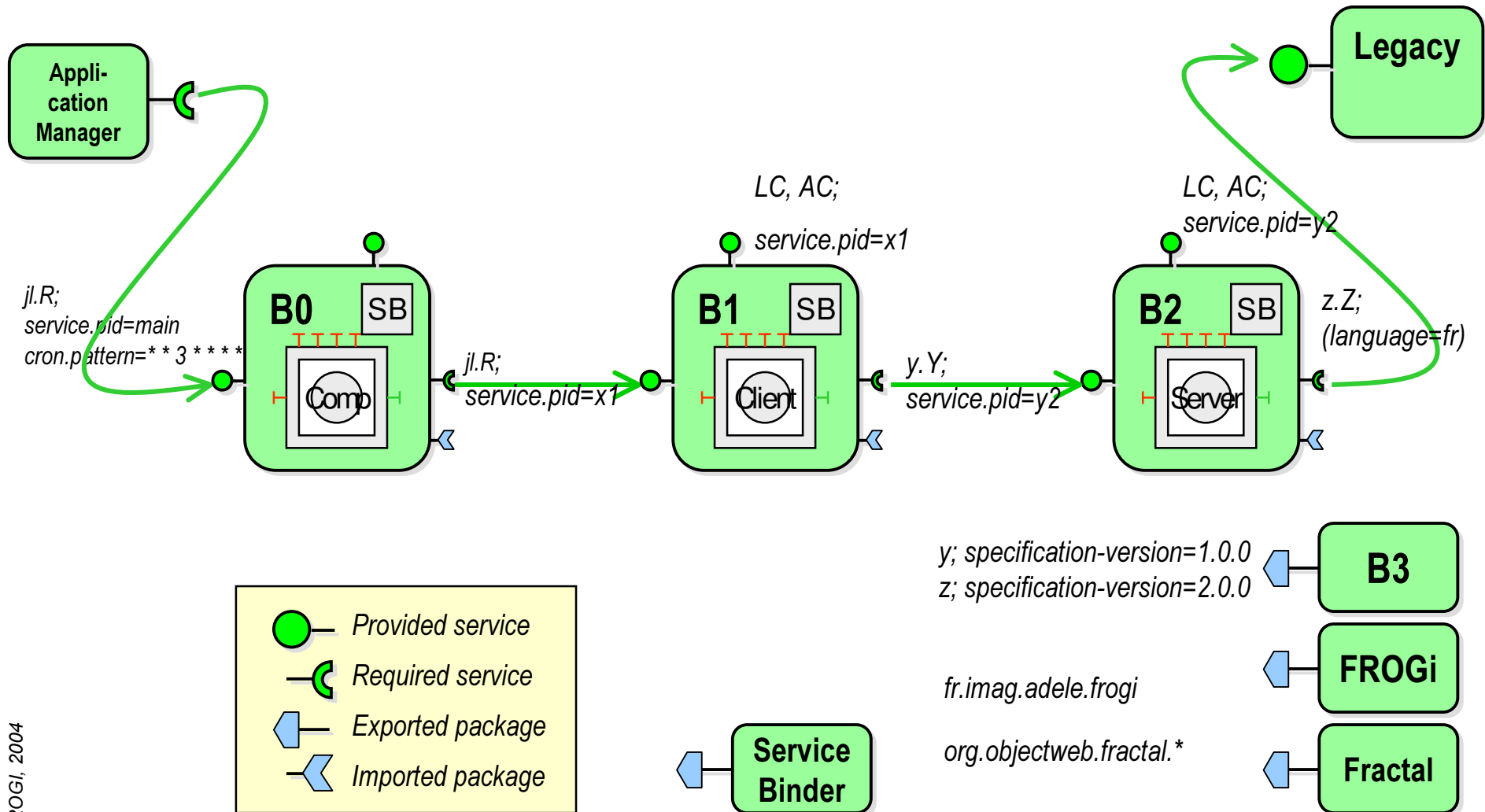
<definition name="HelloWorld">
  <bundle name="B0"/>
  <interface name="main" role="server" signature="java.lang.Runnable">
    <property name="cron.pattern" value="* * 3 * * * *"
              type="java.lang.String"/>
  </interface>
  <component name="client">
    <bundle name="B1"/>
    <interface name="x1" role="server" signature="java.lang.Runnable"/>
    <interface name="cy2" role="client" signature="y.Y"
              version="1.0.0" bundle="B3"/>
    <content class="ClientImpl"/> <!-- but could be a composite -->
  </component>
  <component name="server">
    <bundle name="B2"/>
    <interface name="y2" role="server" signature="y.Y"
              version="1.0.0" bundle="B3"/>
    <interface name="cz3" role="client" signature="z.Z"
              cardinality="collection" contingency="optional"
              version="2.0.0" bundle="B3"/>
    <content class="ServerImpl"/> <!-- but could be a composite -->
  </component>
  <binding client="this.x1" server="client.x1"/>
  <binding client="client.cy2" server="server.y2"/>
  <binding client="server.z3" server="this.cz3"/>
  <binding client="this.z3" serverfilter="(language=fr)"/>
</definition>

```

Example with a composite Bundle view : Driven bundles



Example with a composite Bundle view : Autonomous bundles



Limitations

■ OSGi release 3

- Only one version (specification) of a package in the same time
- ...