

Introduction to JNode

A Java New OS Design Effort



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Goals (1)

- Create a modern OS entirely in Java
 - Easy to install & maintain
- Suitable for modern “simple” devices:
 - Desktop PC’s
 - Tablets
 - PDA’s



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Goals (2)

- Support for modern hardware
 - PCI
 - USB
 - Firewire



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Goals (3): **NOT** our goals

- Replace Windows within a year
- Replace Linux within a year
- Support every device ever invented



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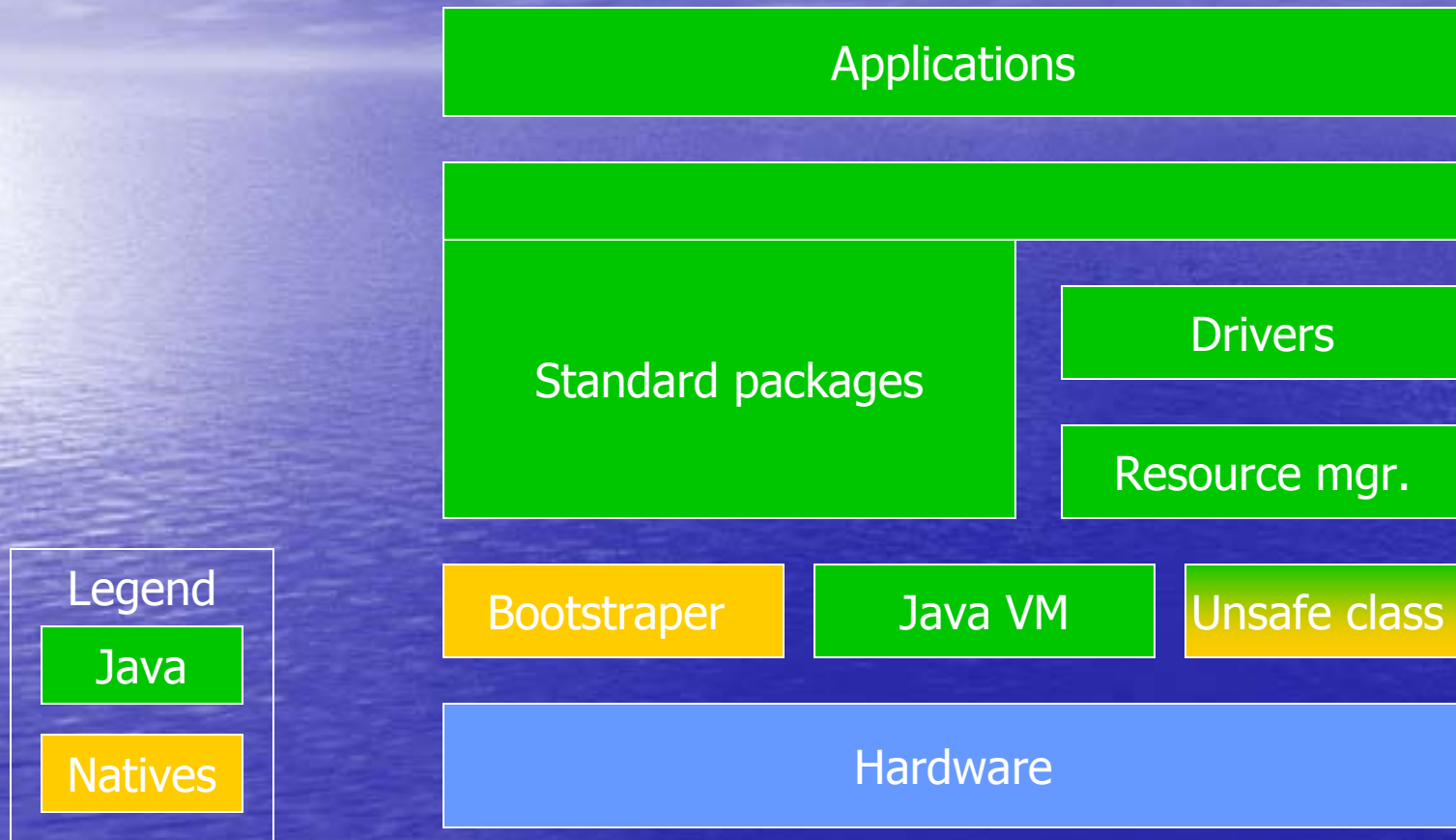
Why do we do it?

- To prove that it can be done
- Because we believe it is the best way for future OS's
- To have fun doing it



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Global Architecture



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JNode Java Virtual Machine

- Written in Java
- 90% platform independent
- Interpreter & Native code compiler (JIT)
- Memory management in Java
- Compilation of “hot” methods only



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Plugins

- “Everything is a plugin”
- Plugins provide
 - Classes & resources
 - Extension points
 - Extension connected to extension points
- A plugin is described by a descriptor



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Plugins: Extension points

- An extension point is a well known point in the system, where other plugins can “hook” extensions into
- Examples:
 - Device finders
 - Shell commands



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Plugins: Descriptor sample

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE plugin SYSTEM "jnode.dtd">

<plugin id="org.jnode.driver.net.3c90x"
  name="JNode 3Com 90x driver"
  version="0.1.4"
  provider-name="JNode.org">

  <requires>
    <import plugin="org.jnode.driver"/>
    <import plugin="org.jnode.driver.net.ethernet"/>
    <import plugin="org.jnode.net"/>
  </requires>

  <runtime>
    <library name="jnode.jar">
      <export name="org.jnode.driver.net._3c90x.*"/>
    </library>
  </runtime>

  <extension point="org.jnode.driver.mappers">
    <mapper class="org.jnode.driver.net._3c90x._3c90xDeviceToDriverMapper"/>
  </extension>

</plugin>
```



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Devices & Drivers

- The device framework is modeled around:
 - Device, Bus, Driver, API
- Device discovery & initialization is done via:
 - Device finders & Device to Driver mappers



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Device

- Is a Software representation of Hardware device
- Is connected to a bus
- Is controlled by a driver
- Provides API's to the rest of the system
- Is identified by a unique ID
- Is a Java class that extends Device



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Bus

- Is a Software representation of a Hardware bus
- Can be connected to other busses
- Can find devices connected to itself
- Is a Java class that extends Bus



Driver

- Is the controller of a Device
- Is the implementor of API's provides by the Device
- Is created by a Device to driver mapper
- Is never called directly
- Is a Java class that extends Driver



API

- Is a well know programming interface towards Devices
- Is targeted to a specific range of devices
- Is a generic (within the range of devices)
- Is a Java interface that extends DeviceAPI



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Device finder

- Is responsible for finding devices on a specific Bus
- Instantiates Device instances
- Registers devices with the DeviceManager
- Is a Java class that implements DeviceFinder
- Is an extension of the "org.jnode.driver.finders" extension point



Device to Driver mapper

- Is responsible for finding a suitable Driver for a Device
- Instantiates Driver instances
- Is a Java class that implements DeviceToDriverMapper
- Is an extension of the "org.jnode.driver.mappers" extension point



Status (nov-2003)

- JNode is becoming a workable OS for developers
- Progress is fast and exciting
- Keep informed by our website or mailing lists



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Currently supported: (nov-2003)

- Some video drivers
- Some network drivers
- TCP/IP stack
- Extensible command shell
- Initial FAT filesystem



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Contact

- Website: <http://jnode.org>
- Email: jnode-devel at lists.sourceforge.net
- Admin: epr at users.sourceforge.net

Help is always welcome!



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