An introduction to the Java platform for .NET developers
My background is predominantly Java (client-server, websites, distributed systems, messaging, SOA, etc, etc)
I’ve been using .NET for 6 months

(Internet banking platform; ASP.NET, C#, Windows Communication Foundation, SQL Server, etc)
All technologies have benefits.
All technologies have trade-offs

... your project context will determine their importance
More and more systems seem to be heterogeneous.
Java projects are introducing .NET
.NET projects are introducing Java
Heterogeneous architectures are becoming more common...
The credit crunch is less choosy about technology.
Stakeholders need business benefit
And they want it faster and cheaper than ever.
As an industry, we have an odd tendency to be dogmatic about technology decisions.
In the current economic climate, we need to be pragmatic and open to change.
The goal of this session is to provide you with a jump-start into the Java platform.
This isn’t a session about how Java is better than .NET (case in point; Silverlight vs JavaFX!)
The first part of this session is \textit{presentation} and \textit{demos},
the second part is an opportunity for \textit{discussion}.
What is Java? Where do I get it from? How do I install and run it? How do I write apps? What development tools are available? How do I build a website? Where can I find more information?
Overview of Java
Like C#, Java is a high-level programming language that gets compiled down to an intermediate representation called bytecode.
That bytecode is run on a
Java virtual machine (JVM)
that just-in-time compiles it into
native executable instructions
(similar to the CLR; this is why and how Java can
run “anywhere”)

That bytecode is run on a 
Java virtual machine (JVM) 
that just-in-time compiles it into 
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(similar to the CLR; this is why and how Java can 
run “anywhere”)
Different editions, depending on runtime environment
Java Platform,
Standard Edition
(Java SE)
Desktop and server applications
Java Platform, Enterprise Edition

(Java EE, formerly J2EE)
“Enterprise-class” server-side applications
Java Platform,
Micro Edition
(Java ME, formerly J2ME)
Applications for mobile and embedded devices
JavaFX
(the new boy in town)
Rich user interfaces across desktops and mobile devices
The JVM can run more languages than just Java
Groovy, Scala, JRuby, Jython, JavaFX Script
(... plus implementations for lots of other programming languages)
Getting Java
Java SE Downloads

It's time
Download the complete platform and runtime environment » Get the JDK download

Overview | Technologies | Documentation | Community | Support | Downloads

Latest Release | Next Release (Early Access) | Embedded Use | Real-Time | Previous Releases

Java SE Runtime Environment (JRE)

JRE 6 Update 12
This release includes the highly anticipated 64-bit Java Plug-In (for 64-bit browsers only), Windows Server 2008 support, and performance improvements of Java and JavaFX applications. » Learn more

Java SE Development Kit (JDK)

JDK 6 Update 12
This JDK includes the JRE and command-line development tools that are useful for developing applets and applications. » Learn more

Java SE Development Kit (JDK) Bundles

JDK 6 Update 12 with Java EE
This distribution of the JDK is included in the Java EE 5 SDK, which contains the newly updated GlassFish v2.1 application server and provides web services, component-model, management, and communications APIs that make it the industry standard for implementing enterprise-class service-oriented architecture (SOA) and Web 2.0 applications. » Learn more

Related Resources
» Java SE for Business
» Compatibility
» Performance

Regional Downloads
Japanese 日本語版

Java EE SDK Fuels Efficiency

Java

Timezone Updates
Related Downloads
» XML and Web Services
» Java Media Framework

Popular Topics
» JDK 6 Adoption Guide
» Java Platform Migration Guide
» Garbage Collection
» Tuning
» Troubleshooting Java SE
Provide Information, then Continue to Download

Please note that the 64-bit JRE only works with the 64-bit browser plug-in, while the 32-bit JRE only works with 32-bit browser plug-in. If you use both 32-bit and 64-bit browsers interchangeably, you will need to have both 32-bit and 64-bit JRE's installed on your machine.

Select Platform and Language for your download:

- Platform: [Select...]
  - Linux
  - Linux Intel Itanium
  - Linux x64
  - Solaris SPARC
  - Solaris x64
  - Solaris x86
  - Windows
  - Windows Intel Itanium
  - Windows x64

- Language: [Select...]

- I agree to the Sun Microsystems License Agreement

Getting Started?
- New to Java Center
- New to Solaris Center
- Sun Studio

Download Resources
- FAQs
- Download History
- Sun Download Manager
- Download Center Customer Service

Related Resources
- Java.sun.com
- Solaris Developer Center
- JavaFX
- Web Developer Resource Center
- Developer Services
- JavaOne Online
- Sun Student Developer Program
- SunSolve
- Sun Microsystems Press
Testing the installation

Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.
C:\Documents and Settings\simon>java -version
java version "1.6.0_07"
Java(TM) SE Runtime Environment (build 1.6.0_07-b06)
Java HotSpot(TM) Client VM (build 10.0-b23, mixed mode, sharing)
C:\Documents and Settings\simon>
Like the .NET Framework, it is possible to install multiple versions of Java.
Unfortunately, each overwrites the Java registry settings
(this sometimes happens when you install applications that rely on Java)
Set the `JAVA_HOME` environment variable to point to the version you need.
Where is **JAVA_HOME**?
Set the `JAVA_HOME` environment variable to point to the version you need.
A quick Java console application
package console;

public class HelloWorld {
    public static void main(String args[]) {
        System.out.println("Hello Devweek");
    }
}
Compiling Java code

```
C:\devweek2009>javac console\HelloWorld.java
C:\devweek2009>_
```
Running Java code

C:\devweek2009>java console.HelloWorld
Hello DevWeek
C:\devweek2009>
Java code is typically packaged in a JAR file for deployment
In a similar way to adding assembly references to .NET projects, you add JAR files to the classpath for Java projects.
Development tools
You have a choice
Multiple IDEs, both open source and commercial
(Eclipse, IntelliJ IDEA and NetBeans)
<table>
<thead>
<tr>
<th>Supporting tools</th>
<th>MSBuild, NAnt</th>
<th>Ant, Maven</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUUnit, TestDriven.Net</td>
<td></td>
<td>JUnit, TestNG</td>
</tr>
<tr>
<td>NCover</td>
<td></td>
<td>Clover, Cobertura, Emma</td>
</tr>
<tr>
<td>CruiseControl.NET</td>
<td></td>
<td>CruiseControl, Continuum, Bamboo, Hudson</td>
</tr>
</tbody>
</table>
A quick Eclipse demo
Java web applications
Java EE web applications are comparable to ASP.NET web applications.
With the exception that Java EE applications are portable (Tomcat, Jetty, Resin, Glassfish, JBoss AS, Oracle AS, WebLogic, WebSphere, etc).
Dynamic content through JSP pages rather than ASP pages
Scripting syntax, special XML tags and an expression language are available to invoke Java code.
There are no code-behinds though
There are (too) many **MVC frameworks** available to build more modular applications (Struts 2, Spring MVC, Stripes, ...)

There are component frameworks that provide data-bound controls, AJAX controls, etc (JSF, Tapestry)
Java EE web applications can be further configured through a `web.xml` file (similar to `Web.config`).
Another quick Eclipse demo
Beyond the basics
Each Java Virtual Machine runs as a separate process (every time you run java.exe)
Each Java Virtual Machine has its own runtime options.
-server and -client
-Xms and -Xmx
Garbage collection tuning (serial/stop-the-world, concurrent, etc)
You have a choice of Java Virtual Machine
Java Virtual Machines can be monitored using JConsole.
<table>
<thead>
<tr>
<th>Timestamp</th>
<th>Type</th>
<th>Notification Count</th>
<th>Message</th>
<th>Event</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:13:18:390</td>
<td>i.c.m.batchpoller.poll</td>
<td>112</td>
<td>Didn't find batch, poll took 145ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:13:18:245</td>
<td>i.c.m.batchpoller.poll</td>
<td>111</td>
<td>Batch 13538 published</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:13:17:708</td>
<td>i.c.m.batchpoller.poll</td>
<td>109</td>
<td>Didn't find batch, poll took 5ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:57:522</td>
<td>i.c.m.batchpoller.poll</td>
<td>108</td>
<td>Found batch 13538, poll took 175ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:57:316</td>
<td>i.c.m.batchpoller.poll</td>
<td>107</td>
<td>Batch 13532 published</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:56:575</td>
<td>i.c.m.batchpoller.poll</td>
<td>106</td>
<td>Batch 13532, poll took 346ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:56:228</td>
<td>i.c.m.batchpoller.poll</td>
<td>105</td>
<td>Batch 13530 published</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:56:077</td>
<td>i.c.m.batchpoller.poll</td>
<td>104</td>
<td>Found batch 13530, poll took 67ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:46:002</td>
<td>i.c.m.batchpoller.poll</td>
<td>103</td>
<td>Didn't find batch, poll took 10ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:35:956</td>
<td>i.c.m.batchpoller.poll</td>
<td>102</td>
<td>Didn't find batch, poll took 10ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:35:956</td>
<td>i.c.m.batchpoller.poll</td>
<td>101</td>
<td>Batch 13528 published</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:35:816</td>
<td>i.c.m.batchpoller.poll</td>
<td>100</td>
<td>Found batch 13528, poll took 334ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:25:477</td>
<td>i.c.m.batchpoller.poll</td>
<td>99</td>
<td>Didn't find batch, poll took 21ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:25:455</td>
<td>i.c.m.batchpoller.poll</td>
<td>98</td>
<td>Batch 13522 published</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:24:846</td>
<td>i.c.m.batchpoller.poll</td>
<td>97</td>
<td>Batch 13522, poll took 501ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:24:344</td>
<td>i.c.m.batchpoller.poll</td>
<td>96</td>
<td>Batch 13519 published</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:24:090</td>
<td>i.c.m.batchpoller.poll</td>
<td>95</td>
<td>Found batch 13519, poll took 134ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:23:956</td>
<td>i.c.m.batchpoller.poll</td>
<td>94</td>
<td>Batch 13518 published</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:23:842</td>
<td>i.c.m.batchpoller.poll</td>
<td>93</td>
<td>Found batch 13518, poll took 80ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:13:754</td>
<td>i.c.m.batchpoller.poll</td>
<td>92</td>
<td>Didn't find batch, poll took 92ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:03:624</td>
<td>i.c.m.batchpoller.poll</td>
<td>91</td>
<td>Didn't find batch, poll took 324ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:03:298</td>
<td>i.c.m.batchpoller.poll</td>
<td>90</td>
<td>Batch 13511 published</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:12:02:672</td>
<td>i.c.m.batchpoller.poll</td>
<td>89</td>
<td>Batch 13511, poll took 627ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:11:52:034</td>
<td>i.c.m.batchpoller.poll</td>
<td>88</td>
<td>Didn't find batch, poll took 102ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:11:51:930</td>
<td>i.c.m.batchpoller.poll</td>
<td>87</td>
<td>Batch 13506 published</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:11:51:378</td>
<td>i.c.m.batchpoller.poll</td>
<td>86</td>
<td>Batch 13506, poll took 1861ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:11:49:517</td>
<td>i.c.m.batchpoller.poll</td>
<td>85</td>
<td>Batch 13501 published</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:11:49:386</td>
<td>i.c.m.batchpoller.poll</td>
<td>84</td>
<td>Found batch 13501, poll took 85ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:11:39:297</td>
<td>i.c.m.batchpoller.poll</td>
<td>83</td>
<td>Didn't find batch, poll took 13ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:11:39:283</td>
<td>i.c.m.batchpoller.poll</td>
<td>82</td>
<td>Batch 13498 published</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:11:39:053</td>
<td>i.c.m.batchpoller.poll</td>
<td>81</td>
<td>Batch 13498, poll took 148ms</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:11:38:905</td>
<td>i.c.m.batchpoller.poll</td>
<td>80</td>
<td>Batch 13496 published</td>
<td>javax.management.</td>
<td></td>
</tr>
<tr>
<td>13:11:38:771</td>
<td>i.c.m.batchpoller.poll</td>
<td>79</td>
<td>Batch 13496, poll took 80ms</td>
<td>javax.management.</td>
<td></td>
</tr>
</tbody>
</table>
### LCM and ROT management console

<table>
<thead>
<tr>
<th>Process</th>
<th>Component</th>
<th>Restart/Stop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Container lcm1</td>
<td>1</td>
<td>Started Tue Jan 30 13:00:18 GMT 2007</td>
</tr>
<tr>
<td>Container lcm2</td>
<td>2</td>
<td>Started Tue Jan 30 13:00:24 GMT 2007</td>
</tr>
<tr>
<td>Container lcm3</td>
<td>3</td>
<td>Started Tue Jan 30 13:00:37 GMT 2007</td>
</tr>
<tr>
<td>Container lcm4</td>
<td>4</td>
<td>Started Tue Jan 30 13:00:25 GMT 2007</td>
</tr>
<tr>
<td>UMK URL: service/mrm1/llitm/1</td>
<td>1</td>
<td>Stop</td>
</tr>
<tr>
<td>Version: 1.0-69, built 30 January 2007 09:18:55 +0000</td>
<td>1</td>
<td>Memory: Using 16.6MB of 100.3MB (max is 910.2MB)</td>
</tr>
<tr>
<td>ProblemPoller, instance 1</td>
<td>1</td>
<td>Stop</td>
</tr>
<tr>
<td>BatchPoller, instance 1</td>
<td>1</td>
<td>Stop</td>
</tr>
<tr>
<td>LcmcTradeEventScheduleHandler, instance 1</td>
<td>1</td>
<td>Stop</td>
</tr>
<tr>
<td>ROTConfigurationNotificationHandler, instance 2</td>
<td>1</td>
<td>Stop</td>
</tr>
<tr>
<td>UMK URL: service/mrm1/llitm/2</td>
<td>2</td>
<td>Stop</td>
</tr>
<tr>
<td>Version: 1.0-69, built 30 January 2007 09:18:55 +0000</td>
<td>2</td>
<td>Memory: Using 16.6MB of 100.3MB (max is 910.2MB)</td>
</tr>
<tr>
<td>ProblemPoller, instance 2</td>
<td>2</td>
<td>Stop</td>
</tr>
<tr>
<td>BatchPoller, instance 2</td>
<td>2</td>
<td>Stop</td>
</tr>
<tr>
<td>LcmcTradeEventScheduleHandler, instance 3</td>
<td>2</td>
<td>Stop</td>
</tr>
<tr>
<td>ROTConfigurationNotificationHandler, instance 2</td>
<td>2</td>
<td>Stop</td>
</tr>
<tr>
<td>UMK URL: service/mrm1/llitm/3</td>
<td>3</td>
<td>Stop</td>
</tr>
<tr>
<td>Version: 1.0-69, built 30 January 2007 09:18:55 +0000</td>
<td>3</td>
<td>Memory: Using 16.6MB of 100.3MB (max is 910.2MB)</td>
</tr>
<tr>
<td>ProblemPoller, instance 3</td>
<td>3</td>
<td>Stop</td>
</tr>
<tr>
<td>RiskServiceRequestHandler, instance 1</td>
<td>3</td>
<td>Stop</td>
</tr>
<tr>
<td>LcmcDealNotificationHandler, instance 1</td>
<td>3</td>
<td>Stop</td>
</tr>
<tr>
<td>RiskRotObservationNotificationHandler, instance 4</td>
<td>3</td>
<td>Stop</td>
</tr>
<tr>
<td>UMK URL: service/mrm1/llitm/4</td>
<td>4</td>
<td>Stop</td>
</tr>
<tr>
<td>Version: 1.0-69, built 30 January 2007 09:18:55 +0000</td>
<td>4</td>
<td>Memory: Using 16.6MB of 100.3MB (max is 910.2MB)</td>
</tr>
<tr>
<td>ProblemPoller, instance 4</td>
<td>4</td>
<td>Stop</td>
</tr>
</tbody>
</table>
If JVMs are separate processes, why do you need ClassLoaders?
Like AppDomains, ClassLoaders allow multiple applications to be run in isolation within a single process.
Where next?
If you’re looking at Java generic development...
Java SE tutorials
JDBC
Spring Framework
Ant/JUnit/CruiseControl
If you’re looking at Java web development...
Java EE (JSP and Servlets)
Struts 2 and Spring MVC (a couple MVC frameworks)
Grails and JSF
Apache Tomcat or Glassfish
If you’re looking at enterprise Java development...
Java EE (JMS, EJB, Web Services)
Spring Framework
Hibernate
If you’re looking at Java client development...
Swing
SWT
JavaFX

(make sure the technology decision is justified)
Some good resources are...
To finish...
.NET and Java; the same but different
They can be used in isolation and in harmony
They can be used to solve the same and different problems
As technologists we need to be pragmatic, choosing the right technology for the context.
Website
http://www.codingthearchitecture.com

Google Group
http://groups.google.com/codingthearchitecture