Introducing Grasshopper
Grasshopper Overview

- **What is Grasshopper**
  - AKA: Visual MainWin for J2EE
  - Goal: Extend .NET development tools and framework to the J2EE platform.

- **Committed to pure J2EE runtime**

- **Focus on server technologies only**
  - System.Web – yes, Windows.Forms – no

- **Provide full .NET developer experience**
  - Development on Windows only
  - Provide full Visual Studio functionality
  - Based on a Visual Studio VSIP plug-in
Grasshopper Current Status

- **Grasshopper 1.8.1**
  - Visual Studio 2003
  - .NET Framework 1.1
  - Supported application servers: WebSphere Portal 6, WebSphere, Tomcat, and others.

- **Grasshopper 2.0 Technology Preview**
  - Visual Studio 2005
  - .NET Framework 2.0
  - Technology preview limitations: No VB support, No debugger, partial framework support.
Grasshopper Technical Overview

- **Byte code compiler (CIL $\rightarrow$ JBC)**
  - Use CECIL, ASM

- **Visual Studio integration including source level debugger (C# and VB, even Java)**

- **Core library**
  - Mscorlib implementation based on J2SE features

- **.NET Framework shared with Mono**
  - System.Web hosted on top of Java Servlets and JSR 168 Portlets
  - System.Data connected mode using JDBC
  - System.Drawing using Java2D
Mainsoft Focus on Mono

- **Mono class libraries recompiled to Java Byte code**
  - Focus on .NET class libraries
  - Full code sharing: no more GH/Mono synch-in and synch-out
  - Focus today exclusively on .NET 2.0 framework
  - Use of #if TARGET_JVM when Java runtime requires different implementation

- **Specific libraries**
  - System.Web – with some changes regarding hosting, ASPX Parsing, and PageMapper
  - System.Web.Services
  - System.Data: Connected mode is Java specific using JDBC
  - System.XML
  - Remoting, SOAP
  - DirectoryServices
  - System.Drawing – some sharing, based on Java2D.
  - Core lib (mscorlib) is not shared: Too Java specific
Team working within Mono

- Tal, Yoni, Merav, Hagit – Test development
- Rafi, Guy, Boris – Visual Basic
- Roeie – Remoting, Soap
- Eyal – System, CECIL
Mainsoft Recent Areas of work

Year 2006: Focus only on .NET framework 2.0

- **System Web 2.0 Development**
  - Unit testing and integrative testing
  - Quality improvement
  - Feature development

- **VB .NET new Runtime implementation**
  - Checked with several test suites
  - Quality boost compared to previous implementation
  - Contains 2.0 features
System.Web: Initial analysis

- Started in Q2Y06

- Prove System.Web 2.0 quality through a small but ASP.NET 2.0 focus application

- PWS (Personal Web Site) is a starter kit written by Microsoft (Available www.asp.net site).

- PWS was chosen as an externally written application that purposefully demonstrates System.Web 2.0 features but is fairly simple.
Succeeded porting PWS to Mono

Not a short exercise:
- More than 50 bugs identified and fixed.
- Themes and skins were not functional.
- Implement on the fly CreateUserWizard control.

Unwanted dependency on MS SQL Express
- For Membership & Role providers.

Conclusions:
- Launched a methodological unit testing effort
- Required a cross-platform solution for ASPNETDB
System.Web 2.0: Current Status & Prioritization

- **Methological unit-testing**
  - New testing framework, providing lifecycle and post-back functionality.
  - Cover almost all ASP.NET 2.0 implemented controls
  - Investment: over 2.5 staff-years on both test creation and fixing.

- **Results at** [www.mono-project.com/ASPTests](http://www.mono-project.com/ASPTests)

- **Currently 758 tests, 151 failures.**

- **Still lots of work remaining:**
  - Easy to contribute, take a control with failures and fix them
System.Web 2.0 Missing features

- User Profiles (work in progress)
- Internationalization features
  - Auto detection of browser language
  - Localize control
- WebParts
- Encrypted view state
- Tracing extension
Visual Basic current status

- New implementation introduced last August
- Fully unit-test driven: ~12,000 tests
  - mbas, vbnc, NUnit and stand-alone (Mainsoft)
- Major quality improvement
  - Pass rate progress increased by ~60%
- Integration with new vbnc VB compiler
- New 2.0 features
  - Essentially new 2.0 types, some new late binding capacities
- Yet to be done:
  - ‘My’ features
  - Compete late binding
  - FileSystem, ...
.NET Framework – some missing features

- **Data: yet to be done**
  - Detailed unit testing plan (already begun)
  - DataTable ReadXml/WriteXml
  - Provider independent programming

- **Web Services: yet to be done**
  - SOAP 1.2 support
  - WS-I Profile 1.1. compliance