

# Home

## Wiki Modernization In Progress

 The content on this Wiki is in the process of being updated to reflect modern WebObjects development. Pages that refer to old development techniques, e.g. Xcode, WOBUILDER, etc., will be either updated to reflect the current toolset, or be moved to the [Deprecated](#) section. An [RSS Feed](#) is available for those that want to be updated as pages are modified. **If you have a favorite page that you want to make sure you are in-the-loop on any changes**, you can easily Watch it by selecting *Watch* from the *Tools* popup menu on that page. If you wish to participate in an effort to improve this documentation, send an email to [docs-group-on@wocommunity.org](mailto:docs-group-on@wocommunity.org).

**Special Note:** URLs are changing as part of this effort. Confluence does a good job of guessing what page you wanted if the link you requested no longer exists, so pain should be minimal. This site replaces the [wikibook](#), which has been deprecated.

**WebObjects** is an integrated suite of Java frameworks for rapidly developing scalable, sophisticated Internet and Enterprise applications. It is the most mature platform available for enterprise-level web, web service and java client (three-tier client-server) application development.


It provides a powerful and mature set of Object-Oriented frameworks for managing Object-Relational Mapping ([ORM](#)) to any JDBC-compliant database, Session Management, Undo/Redo/Revert, Ajax, Web Services, full Java Client applications, Rapid Application Development, Streaming Media, file upload/download and many other popular internet and enterprise application technologies.

Originally developed by NeXT Computer Inc., in the mid 1990s, it was ported by Apple to Mac OS X and Mac OS X Server in Objective-C and then completely translated to Java for version 5.0. The latest available release of WebObjects is version 5.4.3, made available as Mac OS X installer package in September, 2008.

It is an incredibly flexible set of frameworks exemplified by Apple's own use of it for such varied applications as the [iTunes Music Store](#), the on-line [Apple Store](#), the [MobileMe](#) group of services including Web-Mail and Calendaring and their [website](#).

It has a very active [developer community](#) and offers excellent support through the very popular [WebObjects Development](#) and [WebObjects Deployment](#) email lists.

## Download WebObjects Here!

 The [WebObjects543.dmg](#) file is the last WebObjects installer package available from Apple (dated September 2008). It installs the WebObjects frameworks and support files as four sub-packages ("WebObjectsDevelopment", "WebObjectsDocumentation", "WebObjectsExamples" and "WebObjectsRuntime"), into the appropriate directories on a Mac OS X system for incorporation into Apple's Xcode 3.1 IDE.

The "WebObjectsRuntime" sub-package is the critical one because it contains the Java libraries (in both "Framework" and jar packaging) required to develop and deploy a WebObjects application. Since such applications are now developed using the multi-platform Eclipse IDE, and not Xcode, and are deployed on as many, or more, platforms, the "WebObjectsRuntime" package is also available for multi-platform use from the community that brings you the page you are reading now!

The currently recommended WebObjects installation procedure for **all** platforms is at Step 2.2 on the [Project Wonder Installation](#) page.



[Contents](#)

- [Introduction](#)
- [License](#)
- [Foundation](#)
- [Enterprise Object Framework \(EOF\)](#)
  - [Introduction](#)
  - [Modeling](#)
  - [Using EOF](#)
- [Web Applications](#)
  - [Introduction](#)
  - [Development](#)
  - [Deployment](#)
- [Web Services](#)
- [Direct To Web \(D2W\)](#)
- [Java Client, Direct to Java Client \(D2JC\)](#)
- [Complementary Frameworks](#)
  - [Project WONDER](#)
  - [WireHose](#)
  - [LEWOSTuff](#)
  - [GVC Frameworks and GVC.SiteMaker](#)
  - [Houdah WebObjects Frameworks](#)
  - [WOGWT \(Google Web Toolkit Integration\)](#)
  - [JBND Data binding](#)
  - [Validation Next Generation \(enhanced validation\)](#)
- [Development Tools](#)
- [Case Studies](#)
- [Integration with other clients](#)
- [Testing](#)
- [Database Compatibility / Comparisons](#)
- [Alternative Technologies Pros / Cons](#)
- [Additional Resources](#)

## Introduction

- [What is WebObjects?](#)
- [History](#)
- [Foundation](#)
- [Objective-C to Java Transition](#)
- [Scratch Setup of WebObjects Development on a Mac](#)
- [Hands On Hello World - Your First WebObjects Application](#)
- [Recent Changes](#)
- [WebObjects for Database Developers](#)
- [Naming Conventions](#)

## License

As of WebObjects 5.3, the deployment of WebObjects-based server applications is now permitted on any platform. The Xcode 3.1 license (The last that included any reference to WebObjects) stated this:

*D. WebObjects Software. Subject to the terms and conditions of this License, you may incorporate the WebObjects Software included in the Developer Software into application programs (both client and server) that you develop on an Apple-branded computer. You may also reproduce and distribute the WebObjects Software unmodified, in binary form only, on any platform but solely as incorporated into such application programs and only for use by end-users under terms that are at least as restrictive of those set forth in this License (including, without limitation, Sections 2, 6 and 7 of this License). For avoidance of doubt, you may not distribute the WebObjects Software on a stand-alone basis, and you may not develop application programs using the WebObjects Software (or any portion thereof) on any non-Apple branded computer.*

## Foundation

- [Foundation](#)
- [Key-Value Coding](#)

## Enterprise Object Framework (EOF)

### Introduction

- [Overview](#)

## Modeling

- [Overview](#)
- [Required Reading](#)
  - [Entities](#)
  - [GlobalIDs](#)
  - [Attributes](#)
  - [Relationships](#)
  - [Entity Inheritance](#)
  - [Fetch Specifications](#)
  - [SQL Generation](#)
  - [Code Generation](#)
  - [Reverse Engineering](#)
  - [Common Pitfalls and Troubleshooting](#)
  - [EOModeler](#)
  - [EOModeler on Windows](#)
  - [Booleans](#)
- [Advanced](#)
  - [JDBC](#)
  - [JNDI](#)
  - [Stored Procedures](#)
  - [Prototypes](#)
  - [Multiple Models](#)
  - [Custom Attributes](#)
  - [Strategy Design Pattern as an Alternative to Entity Inheritance](#)
- [Examples](#)

## Using EOF

- [Overview](#)
- [Required Reading](#)
  - [The EOF Commandments](#)
  - [EO Enterprise Object](#)
  - [EO Editing Context](#)
  - [EO Object Store](#)
  - [EO Database](#)
  - [EO Adaptor](#)
  - [Context and Database Locking](#)
  - [Faulting](#)
  - [Fetching](#)
  - [Updating](#)
  - [Deleting](#)
  - [Caching and Freshness](#)
  - [Optimistic Locking](#)
  - [Memory Management](#)
  - [EOF Best Practices](#)
  - [Configuration Settings](#)
  - [Common Pitfalls and Troubleshooting](#)
- [Advanced](#)
  - [EOGenerator](#)
  - [Logging](#)
  - [EOF Performance Tuning](#)
  - [Primary Keys](#)
  - [Compound Primary Keys](#)
  - [Concurrency](#)
  - [Validation](#)
  - [Database Adaptors and Plugins](#)
  - [Undo and Redo](#)
  - [EO's and Multiple Editing Contexts](#)
  - [EOSharedEditingContext](#)
  - [Raw Rows](#)
  - [Batch Fetching](#)
  - [Fetch Limits](#)
  - [Bulk Operations](#)
  - [Schema Changes](#)
  - [Delegates and Notifications](#)
  - [Multiple Stacks or Instances](#)
  - [Custom Qualifiers](#)
  - [Localization and Internationalization](#)
  - [Default Values](#)
  - [Custom EOAdaptor](#)
  - [EOF Traces](#)
  - [Problems](#)
- [Tips and Tricks](#)
- [Examples](#)

- [Help!\\_EOF\\_is\\_Doing\\_Strange\\_Things!](#)

# Web Applications

## Introduction

- [Overview](#)

## Development

- [Overview](#)
- [Beginner's Guide](#)
- [Required Reading](#)
  - [Apache](#)
  - [WO Adaptor](#)
  - [WO Application](#)
  - [WO Session](#)
  - [WO Component](#)
    - [Binding Synchronization](#)
    - [Code, Templates, and WODs](#)
    - [Built-in Components](#)
  - [Component Actions](#)
  - [Direct Actions](#)
  - [Request-Response Loop](#)
  - [Using EOF in a WOA](#)
  - [Authentication and Security](#)
  - [General Best Practices](#)
  - [WOForm Best Practices](#)
  - [WODisplayGroup](#)
  - [Debugging Techniques](#)
  - [Direct Connect](#)
  - [Frameworks](#)
  - [Ajax](#)
  - [CSS](#)
  - [Sending Emails](#)
  - [The Build Products](#)
  - [Errors and Explanations](#)
  - [Common Pitfalls and Troubleshooting](#)
- [Advanced](#)
  - [Application Server URL Creation](#)
  - [Audit Trails](#)
  - [Backtracking](#)
  - [Concurrency](#)
  - [Image Thumbnailing](#)
  - [Database vs Filesystem \(aka Images in the Database?\)](#)
  - [WOLongResponsePage](#)
  - [Stateless Components](#)
  - [Non-HTML WO's](#)
  - [WOEvents and Logging](#)
  - [PDF Generation](#)
  - [Excel Generation](#)
  - [SSL](#)
  - [Localization and Internationalization](#)
  - [Testing and JUnit](#)
  - [Custom Error Handling](#)
  - [Custom Request Handlers](#)
  - [Custom Templates](#)
  - [Calling Commandline Applications](#)
  - [High Performance WOA's and WO's](#)
  - [Profiling WO Apps](#)
  - [J2EE Integration](#)
  - [Third Party Jars](#)
  - [Generating Static Pages](#)
  - [Cocoa EO Applications](#)
  - [Custom Resource Manager](#)
  - [Persistent Sessions](#)
  - [How Forms Work](#)
- [Development on Windows](#)
- [Tips and Tricks](#)
- [Examples](#)
  - [Hands On Hello World](#)
  - [Page Layout](#)
  - [List Components](#)
  - [Calendar Component](#)
  - [Path Inspector](#)
  - [Alphabetic List](#)

- [Login](#)
- [Anchors](#)
- [Open Link in New Window](#)
- [Return a File](#)

## Deployment

- [Overview](#)
- [Required Reading](#)
  - [Apache](#)
  - [Memory Settings](#)
  - [Standard Deployment](#)
  - [wotaskd](#)
  - [Java Monitor](#)
  - [Logging](#)
  - [Split Install](#)
  - [Common Pitfalls and Troubleshooting](#)
- [Advanced](#)
  - [WOStats](#)
  - [Additional Monitoring](#)
  - [Troubleshooting wotaskd and JavaMonitor on OS X](#)
  - [Scheduled Restart](#)
  - [Clustering and Load Balancing](#)
  - [Tomcat Deployment](#)
  - [High-Performance Configuration](#)
  - [Killing WOA Processes](#)
  - [Debugging Frozen Deployed Instances](#)
  - [WOAdaptorInfo](#)
- [Platform Specifics](#)
  - [Mac OS X Server](#)
  - [Linux](#)
  - [Solaris WO5.3.3](#)
  - [FreeBSD WO5.2](#)
  - [FreeBSD WO5.3](#)
  - [FreeBSD 6.2 WO 5.3.3](#)
  - [FreeBSD 6.x WO 5.3.3 using port system with many options](#)
  - [Legacy Windows \(WO 5.1/5.2 on WinNT/2000\)](#)
  - [Current Windows \(WO 5.4 on Win2003\)](#)
  - [Amazon EC2](#)
- [Helpful Tools & Shellscripts](#)
  - [Capistrano \(Overview\)](#)

## Web Services

- [Overview](#)
- [Required Reading](#)
  - [WO as a Web Service Provider](#)
  - [WO as a Web Service Consumer](#)
  - [Interoperability](#)
  - [Common Pitfalls and Troubleshooting](#)
- [General Info](#)
  - [Instructions for .NET consuming Direct to WebServices](#)
  - [Testing Services with Terminal](#)
- [Advanced](#)
  - [Sending Large Data](#)
  - [How to Trust Any SSL Certificate](#)
  - [Problems](#)
  - [Controlling Enterprise Object Serialisation](#)
  - [Controlling WSDL Service Location](#)
  - [Integration with WebServicesCore on MacOS-X](#)
  - [Working With Temporary GlobalIDs](#)
- [Examples](#)

## Direct To Web (D2W)

Unable to render {include} The included page could not be found.

## Java Client, Direct to Java Client (D2JC)

- [Overview](#)
- [Direct to Java Client](#)
  - [Getting Started with Direct to Java Client \(D2JC\)](#)
- [Required Reading](#)
- [Building](#)
  - [Client-Side Classes JAR](#)
  - [WebStart WOLips Incremental Builder](#)
  - [Additional Java Client files and settings](#)
- [Trouble-Shooting](#)
- [Complimentary Frameworks](#)
- [Advanced](#)
- [Interface Builder](#)
- [svn](#)
- [Examples](#)

## Complementary Frameworks

### Project WONDER

- [Overview](#)
- [Required Reading](#)
  - [Installing](#)
  - [Quickstart](#)
  - [History](#)
  - [Properties File Settings](#)
  - [Frameworks](#)
    - [Ajax](#)
    - [AjaxLook](#)
    - [BTBusinessLogic](#)
    - [DRGrouping](#)
    - [DerbyPlugIn](#)
    - [ERAttachment](#)
    - [ERCaching](#)
    - [ERCalendar](#)
    - [ERCaptcha](#)
    - [ERChangeNotificationJMS](#)
    - [ERChronic](#)
    - [ERCoreBusinessLogic](#)
    - [ERDirectToWeb](#)
    - [ERDivaLook](#)
    - [ERDivaliteLook](#)
    - [ERExcelLook](#)
    - [ERExtensions](#)
    - [ERIMAdaptor](#)
    - [ERUI](#)
    - [ERIndexing](#)
    - [ERJGroupsSynchronizer](#)
    - [ERJQuery](#)
    - [ERJars](#)
    - [ERJavaMail](#)
    - [ERXNavigation](#)
    - [ERMoviesLogic](#)
    - [ERNeutralLook](#)
    - [EROpenID](#)
    - [EROraclePlugIn](#)
    - [ERPDFGeneration](#)
    - [ERPlot](#)
    - [ERPrototaculous](#)
    - [ERPrototypes](#)
    - [ERRest](#)
    - [ERSelenium](#)
    - [ERTaggable](#)
    - [ERWorkerChannel](#)
    - [ExcelGenerator](#)
    - [FrontBasePlugIn](#)
    - [GoogleChart](#)
    - [JavaFSAdaptor](#)
    - [JavaMemoryAdaptor](#)
    - [JavaMonitorFramework](#)
    - [JavaRESTAdaptor](#)
    - [JavaWOExtensions](#)
    - [PostgresqlPlugin](#)
    - [SproutCore](#)
    - [Validity](#)
    - [WOJavaRebel](#)
    - [WOLips](#)

- [WOOgnl](#)
- [WOPaypal](#)
- [WRReporting](#)
- [YUI](#)
- [Adaptors](#)
- [Plugins](#)
- [Advanced](#)
- [Examples](#)
- [Troubleshooting](#)

## WireHose

- [Overview](#)
- [Basic Concepts](#)
  - [Content Management](#)
  - [Personalization](#)
  - [Access Control](#)
  - [Dynamic Layouts](#)
  - [Rapid Development](#)
- [Reference](#)
  - [Installation](#)
  - [Online Reference Library](#)
    - [Developer Overview](#)
    - [Java API Reference](#)
    - [Properties Reference](#)
    - [Database setup](#)
    - [Regular Expressions](#)
- [Recently Deployed Sites](#)
  - [Paizo.com](#)
  - [Eurovision Song Contest Store](#)
  - [Bilka Music Download Store](#)
  - [Jubii Music Download Store](#)
  - [Uziing \(Scandanavian "Toys-R-Us"\) Music Store \(UI is all in Flash\)](#)

## LEWOSTuff

- [Overview](#)

## GVC Frameworks and GVC.SiteMaker

- [Overview](#)

## Houdah WebObjects Frameworks

- [Overview](#)
- [HoudahFoundation](#): Extensions and additions to the Foundation framework
- [HoudahEOControl](#): Extensions and additions to the EOControl framework
- [HoudahEOAccess](#): Extensions and additions to the EOAccess framework
- [HoudahRuleEngine](#): Rule engine used by several of the below frameworks
- [HoudahEOValidation](#): Rule based validation
- [HoudahMessages](#): Rule based localizable error messages
- [HoudahAuditTrail](#): Tracks user and timestamp of last change
- [HoudahViewComponents](#): High level, large grain view components using stateless cells
- [HoudahControlComponents](#): Control layer for EOF based CRUD applications
- [HoudahAgileComponents](#): Rule based control layer for CRUD application (D2W replacement)

## WOGWT (Google Web Toolkit Integration)

- [WOGWT Website](#)

## JBND Data binding

- [JBND Website](#)
- [JBND Wikipedia](#)

## Validation Next Generation (enhanced validation)

[Validation Next Generation](#)

## Development Tools

- [Overview](#)
- [Eclipse and WOlips](#)
- [Browser as a Development Tool](#)
- [Xcode](#)
- [EOModeler](#)
- [WOBuilder](#)
- [Running Through Apache](#)
- [WebObjects and Subversion](#)
- [Hudson](#)
- [JRebel](#)

## Case Studies

- [iTunes Music Store](#)
- [.Mac](#)
- [Apple Store](#)
- [Original Dell Store](#)
- [Radar](#)
- [ShopTolt.ca](#)
- [EverLearn](#)
- [WebObjects Showcase](#)
- [WebObjects Sites](#)

## Integration with other clients

- [Flex](#)
- [Open Laszlo](#)
- [Mozilla XUL](#)
- [Cocoa](#)
- [Eclipse Rich Client Platform \(RCP\)](#)

## Testing

- [JUnit and TestNG](#)
- [Load Testing WO Apps with JMeter](#)
- [WJUnitTest](#)

## Database Compatibility / Comparisons

- [FrontBase](#)
- [OpenBase](#)
- [MySQL](#)
- [PostgreSQL](#)
- [Oracle](#)
- [Sybase](#)
- [SQLServer](#)
- [Data Migration](#)
- [Informix](#)

## Alternative Technologies Pros / Cons

- [ASP.NET](#)
- [ASP.NET + Monorail](#)
- [JSP and Taglibs](#)
- [EJB](#)
- [Hibernate](#)
- [Core Data](#)
- [Cayenne](#)
- [Tapestry](#)
- [Ruby on Rails](#)
- [Struts](#)
- [WebWork](#)
- [SOPE](#)



## Additional Resources

- [Websites](#)
- [Mailing Lists](#)
- [Tutorials](#)
- [Books](#)
- [Periodicals](#)
- [Authors](#)
- [Training](#)
- [User groups](#)
- [Known Bugs](#)