

# Smart Client Deployment with ClickOnce

Brian Noyes

IDesign, Inc. ([www.idesign.net](http://www.idesign.net))

brian.noyes@idesign.net

# About Brian

- Principal Software Architect, IDesign Inc. ([www.idesign.net](http://www.idesign.net))
- Microsoft MVP in ASP.NET
- Writing
  - MSDN Magazine, asp.netPRO, Visual Studio Magazine, .NET Developer's Journal
  - Building Windows Forms Data Applications with .NET 2.0, Addison-Wesley, expected release spring 2005
- Speaking
  - Microsoft TechEd, Visual Studio Connections, DevEssentials, VSLive!, INETA Speakers Bureau
- Participates in Microsoft design reviews
- E-mail: [brian.noyes@idesign.net](mailto:brian.noyes@idesign.net)
- Blog: <http://www.softinsight.com/bnoyes>

# Agenda

- ClickOnce Overview
- Deploying with ClickOnce
- Updating Apps with ClickOnce
- Elevating Security for Deployed Apps
- On-Demand Updates
- Under the Covers – Manifests
- Wrap up

# What is a Smart Client?

- Rich user interface (WinForms)
- Connects to back-end services
- Runs securely on the client
- Supports disconnected operations
- Supports auto-deployment and update over the network

# Smart Client Deployment Challenge

- **Conflicting goals:**
  - Richest possible user experience
  - Support disconnected / mobile application use
  - Deploy with minimal cost and effort
  - Keep up to date
- **Deployment and Maintenance are significant costs in any distributed application life cycle**

# ClickOnce Deployment Technology

- Microsoft® Windows Smart Client deployment technology
- Microsoft® .NET 2.0 Feature
- Addresses all the previous challenges
- Further enhanced in Longhorn
- Goals:
  - Rich client experience of a Windows-based app
  - Ease of deployment and update of a Web app

# ClickOnce Concept

- Single user action triggers deployment and execution
- Download and run from cache
- Install and execute in secure sandbox
- Auto detect and apply updates
- Allow offline / disconnected operations

# Target Applications

- **Line-of-Business applications**
  - Customer Resource Management
  - Personnel management
  - Business analysis tools
- **Consumer applications**
  - Games
  - Multimedia apps
- **Microsoft® Office Documents**
  - Visual Studio® Tools for Office System 2003

# Application Requirements

- No code requirements
- No class derivation
- No interface implementation
- Optional: On demand update code
- Can even deploy Microsoft® .NET 1.X apps

# Architecture Requirements

- **Client machine:**

- Must have Microsoft® .NET Framework 2.0 or later on it
- Can be deployed through bootstrapper, but user must be admin
- Enhanced experience in Longhorn

- **Server:**

- No .NET required
- Can be any web or file server
- Place the files + manifests in a folder

# ClickOnce Bootstrapper

- Installs prerequisites on the client
  - .NET Framework
  - MDAC
  - Windows Installer
  - Custom Requirements
- Requires Admin privilege
- Separate install URL

## ClickOnce vs. MSI

- Not a replacement for Microsoft® Windows® Installer (MSI)
  - Complements for Smart Client scenarios
- Still may need Windows Installer for many apps

# Agenda

- ClickOnce Overview
- Deploying with ClickOnce
- Updating Apps with ClickOnce
- Elevating Security for Deployed Apps
- On-Demand Updates
- Under the Covers – Manifests
- Wrap up

# Deployment Models

- “Launched”
  - Available online only
  - App files cached under user profile for speedy launch
    - C:\Documents and Settings\\Local Settings\Apps

# Deployment Models

- “Installed”
  - Available online or offline
  - Files cached under user profile on local machine
  - Start menu item for subsequent launch
  - Add/Remove Programs item added

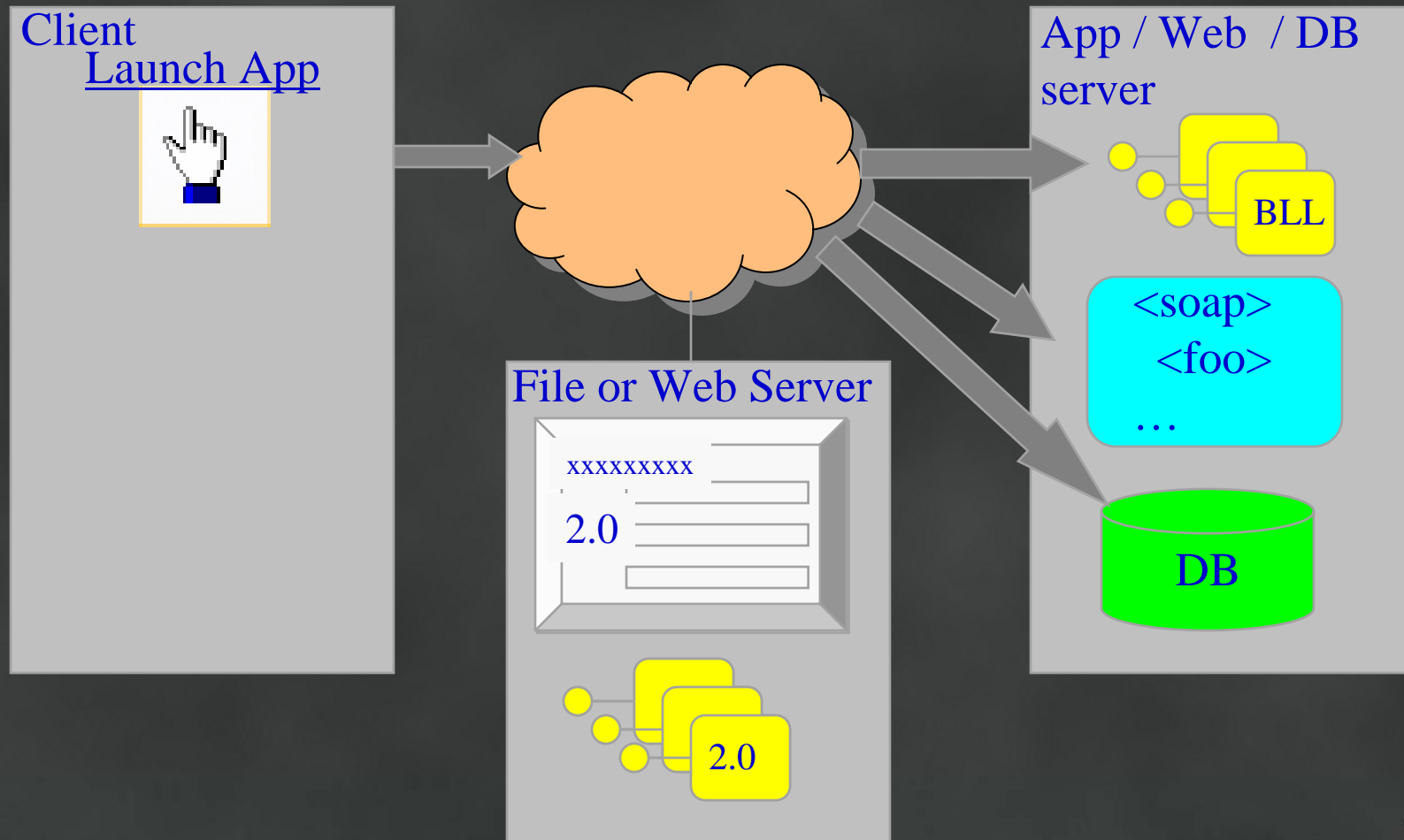
# Agenda

- ClickOnce Overview
- Deploying with ClickOnce
- Updating Apps with ClickOnce
- Elevating Security for Deployed Apps
- On-Demand Updates
- Under the Covers – Manifests
- Wrap up

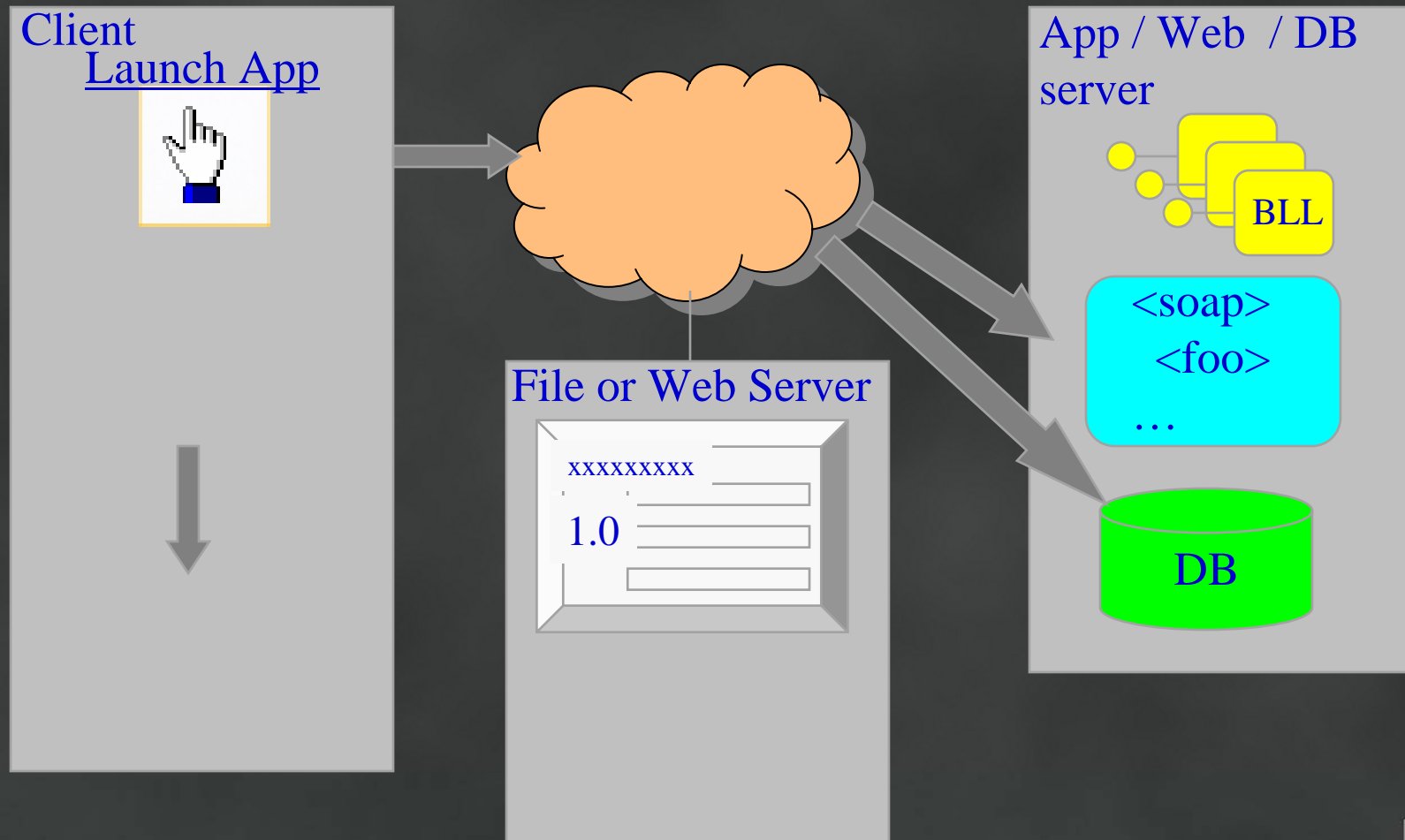
# Update options

- **Launched apps**
  - Always check for new versions and download before running
- **Installed apps**
  - Check for updates
  - Optional / Required
  - Check before run / background while running
  - Check every time / every XX interval
  - Check for updates at location XX
  - On-demand with API

# ClickOnce in Action



# Scaling Out with ClickOnce



# Demo #1

## ClickOnce Deployment and Update

# Agenda

- ClickOnce Overview
- Deploying with ClickOnce
- Updating Apps with ClickOnce
- Elevating Security for Deployed Apps
- On-Demand Updates
- Under the Covers – Manifests
- Wrap up

# Security Features

- Zero-impact installation
  - Files cached under user profile
  - Cannot touch shared resources on machine
- Code Access Security sandbox execution
  - Based on origin of files (deployment server)
  - Can elevate permissions through user prompting
  - Can elevate permissions automatically through trusted publisher
- XML Signature
  - Signed manifests to ensure authentication and integrity

## Demo #2

# Elevating Security Permissions

# Agenda

- ClickOnce Overview
- Deploying with ClickOnce
- Updating Apps with ClickOnce
- Elevating Security for Deployed Apps
- On-Demand Updates
- Under the Covers – Manifests
- Wrap up

# On Demand Updates

- **System.Deployment** namespace
  - ApplicationUpdaterService class
    - CheckForUpdates
    - Update
    - Application.Restart
    - Async versions available

# Demo #3

## On Demand Updates

# Agenda

- ClickOnce Overview
- Deploying with ClickOnce
- Updating Apps with ClickOnce
- Elevating Security for Deployed Apps
- On-Demand Updates
- Under the Covers – Manifests
- Wrap up

# Manifest Files

- **Deployment manifest**
  - Describe deployment model and update policy
  - Point to application manifest
  - Digital signature
- **Application manifest**
  - Describe application
  - Identify application files and dependencies
  - Declare security permission requirements
  - Digital signature

# Demo #4

## Behind the Scenes

# Agenda

- ClickOnce Overview
- Deploying with ClickOnce
- Updating Apps with ClickOnce
- Elevating Security for Deployed Apps
- On-Demand Updates
- Under the Covers – Manifests
- Wrap up

# Visual Studio Tools

- Debug in Zone
  - Run in specified context to simulate deployed environment
- Permissions Calculator
  - Analyze your code and tell you exactly what permissions it requires

# ClickOnce Enhancements in Longhorn

- Background Intelligent Transfer Service (BITS) download
- Secure Execution Environment
  - More tightly integrated with the OS
  - Options to run within IE context or as standalone app
- Windows Shell Integration
- More to follow?

# What Can You Do Today?

- **No Touch Deployment**
  - Like a launched ClickOnce application
  - Must configure security on user machine
  - Can use local machine bootstrap app to circumvent security
- **Updater Application Block**
  - Automatic checking for available updates
  - Download and apply
  - Have to write a little code + reference the block

# Resources

- Trustworthy Smart Client Deployment with ClickOnce, Brian Noyes, MSDN Magazine, May 2004.  
<http://www.msdn.microsoft.com/msdnmag/issues/04/05/ClickOnce/default.aspx>
- .NET Rocks! interview:  
<http://www.franklins.net/fnetdotnetrocks/dotnetrocks.aspx?showid=48>
- Updater Application Block:  
<http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnbda/html/updater.asp>
- No Touch Deployment:  
[http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dv\\_vstechart/html/vbtchno-touchdeploymentinnetframework.asp](http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dv_vstechart/html/vbtchno-touchdeploymentinnetframework.asp)

E-mail: [brian.noyes@idesign.net](mailto:brian.noyes@idesign.net)

Blog: <http://www.softinsight.com/bnoyes>

