Entwicklercamp 2012

XPages – Extension Library

Viagra für die XPage

26. – 28..03.2012
Maritim Hotel, Gelsenkirchen
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About: Ulrich Krause

- Lotus Notes / Domino Administrator & Entwickler since 1993
- Business Application Developer
  is@web, Nürnberg / Ratingen
- OpenNTF http://openntf.org
  - !!HELP!!, Cebulon, Trigger Happy
  - XPages Custom Controls

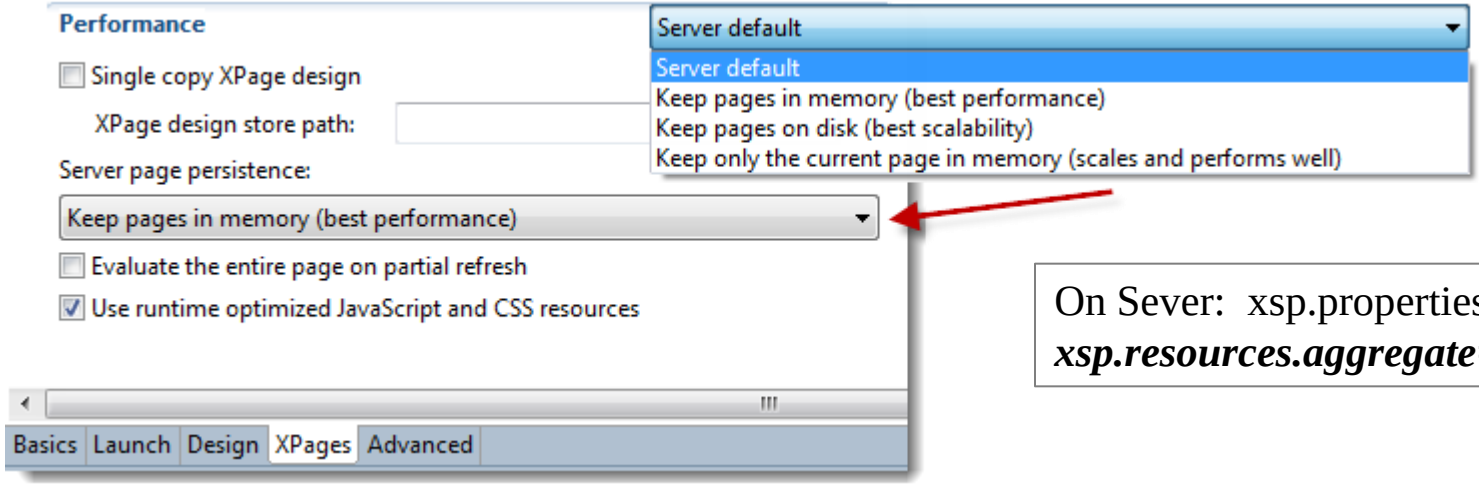
- IBM Champion 2011/2012
  - https://www-304.ibm.com/connections/blogs/socialbusiness/entry/announcing_the_2011_ibm_champions_for_collaboration_solutions4?lang=de
- Blog http://www.eknori.de
- Notes Forum (http://www.atnotes.de)

Agenda

- JavaScript/CSS Aggregation
- Pre-Load for Xpages
- JAVA / JAR Design Element
- Themes
- XPages Extension Library / Upgrade Pack
- XPages Relational Database Support
- Resources, Books of Interest

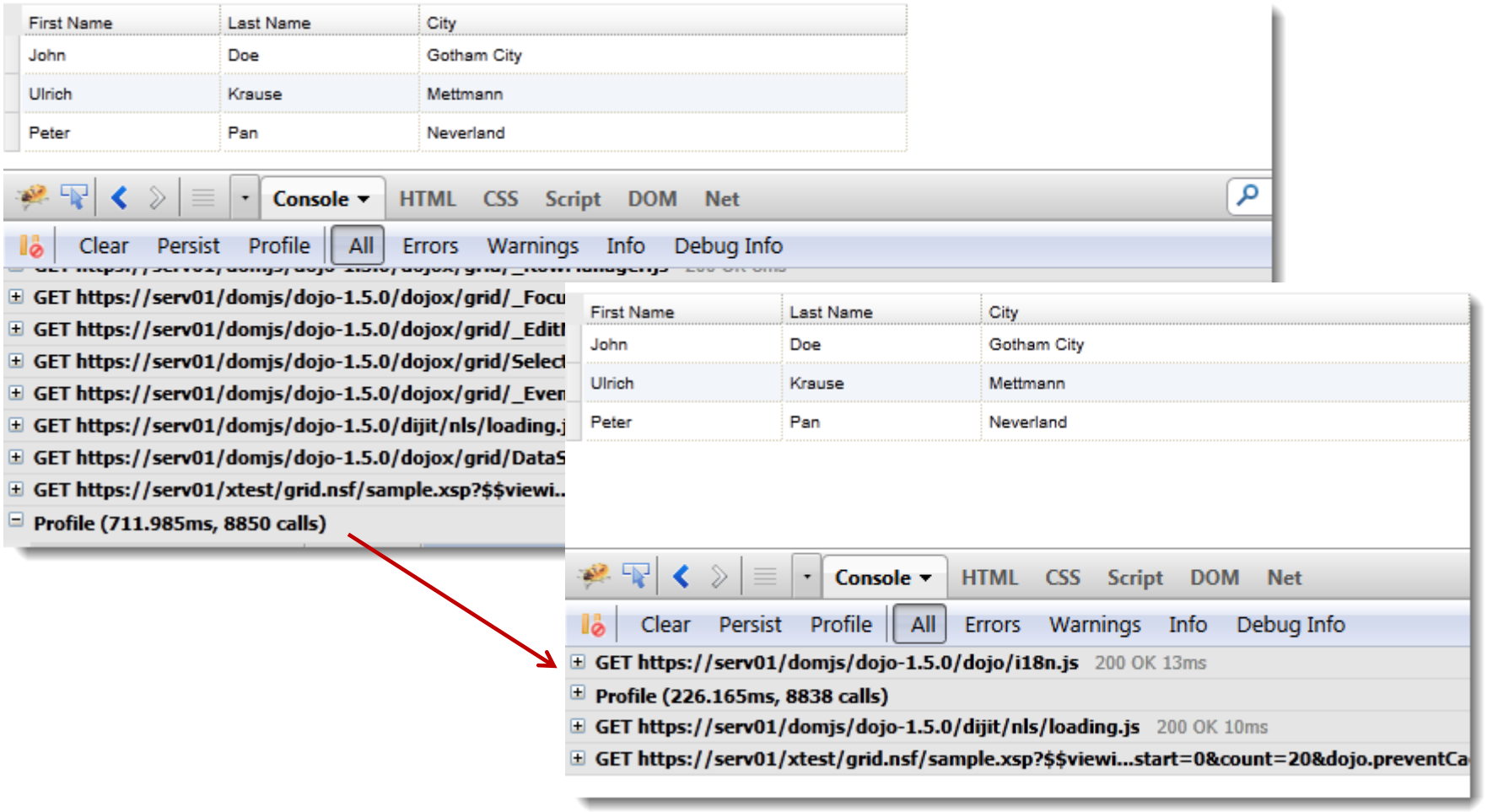
JavaScript/CSS Aggregation

- Aggregates multiple Dojo modules, or multiple CSSs into a single file
  - a decrease in requests sent from the browser to the server
  - an increase in user performance, particularly in the context of networks with high latency
  - an increase in the speed of JS/CSS parsing from the browser
  - the freeing up of server connections to fulfill other requests



On Sever: xsp.properties:
xsp.resources.aggregate=true

JavaScript/CSS Aggregation



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Enable Pre-Load for XPages

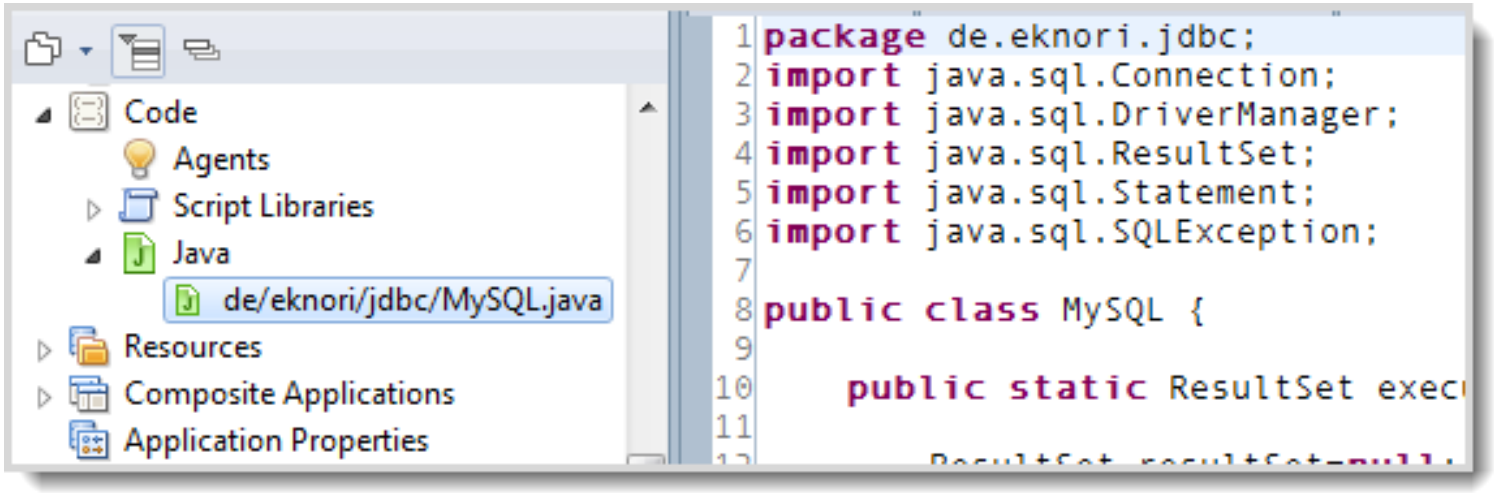
- New feature as of Notes / Domino 8.5.3

- Works on Server AND Client
- **XPagesPreload=1**
  - Loads XPages runtime components at server startup
- **XPagesPreloadDB**=Server!!Db.nsf/XPage.xsp,myLocalDb.nsf
  - Loads XPages runtime Java classes

```
09:33:41  XSP Command Manager initialized
09:33:41  HTTP JVM: Preloading XPages classes took 223ms
09:33:41  HTTP JVM: Preloading JSF config took 480ms
09:33:42  Lotus Traveler: Server started.
09:33:42  HTTP JVM: Preloading NSF Serv01!!cois_v2/cois_basic.nsf module took 883ms
09:33:44  HTTP JVM: Preloading NSF Serv01!!cois_v2/cois_crm.nsf module took 3038ms
09:33:45  HTTP Server: Started
```

JAVA Design Element (8.5.3)

- A Java design element is created just like you create any other design element.
- Categorization in the Designer views is shown by using the "/" character to demark levels
- In the virtual file system, the class file appears separate from the .java file, under WebContent\WEB-INF\classes



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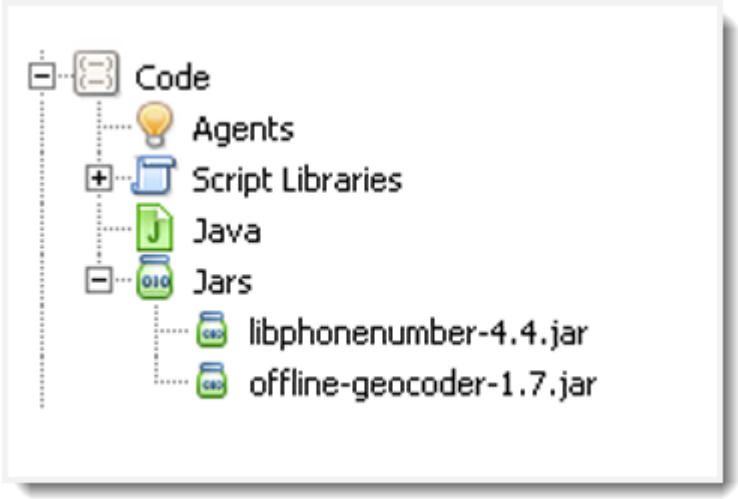
JAR Design Element (8.5.4)

- Work with packaged Java code/libraries that are included in the application NSF
- Frees you from having to deploy the JARS to a server and/or include the source files uniquely in the application database
- Automatically manages the **classpath** and places the JAR file into **web-inf/lib**
- Only available to XPages applications
  - automatically loaded by the XPages runtime



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Themes

- Single Document Containing References to all your CSS Resources
  - **resource sections** reference the CSS files used
  - **control section** define what CSS classes are applied to specific controls
- XML Based and Easy To Learn
  - creating a new theme document prefills sample content
- Can Extend Other Themes
  - <theme extends="webstandard">
  - will automatically include all the resource and control definitions from that theme
  - built-in themes to extend
    - webstandard, notes, oneUI

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Themes – Resources Basics

- Can be simple
  - Just reference an internal CSS resource

```
<theme extends="webstandard" xmlns:xsi="http://www.w3.org/2001/XMLSch
    <!--
        Use this pattern to include resources (such as style sheets
        and JavaScript files that are used by this theme.
    -->
    <!--
    <resource>
        <content-type>text/css</content-type>
        <href>mystylesheet.css</href>
    </resource>
    -->
```

- Can be complex
  - Multiple CSS Resources
    - Internal
    - External
  - Specify **client Side** JavaScript Resources
  - Specify ‘Rendered’ properties on resources
  - Send certain CSS resources to certain web browsers

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Themes - Complex

- Specify If A Resource Is Only Used When Dojo Controls Are detected.
  - <resource dojoTheme="true">

```
<control>
    <name>Tree.Tooltip</name>
    <property>
        <name>escape</name>
        <value>{false}</value>
    </property>
    <property>
        <name>contentType</name>
        <value>html</value>
    </property>
    <property>
        <name>value</name>
        <value>&lt;script type="dojo/method" e
        var id=helpStore.getValue(dijit.getEn
        loadTooltip(id,node.domNode);
    &lt;/script&gt;
    &lt;script type="dojo/method" event="_onN
        dijit.hideTooltip(dojo.byId(node.domN
    &lt;/script&gt;</value>
    </property>
</control>
```

- Browser / Client Detection
  - <resource rendered="#{javascript:context.getUserAgent().isFirefox()}">
- Reference Server Based / External Files
  - <href>/.ibmxspres/global/theme/oneui/iehacks.css</href>
  - <href>http://www.someserver.com/resources/application.css</href>

Theme Controls – The Basics

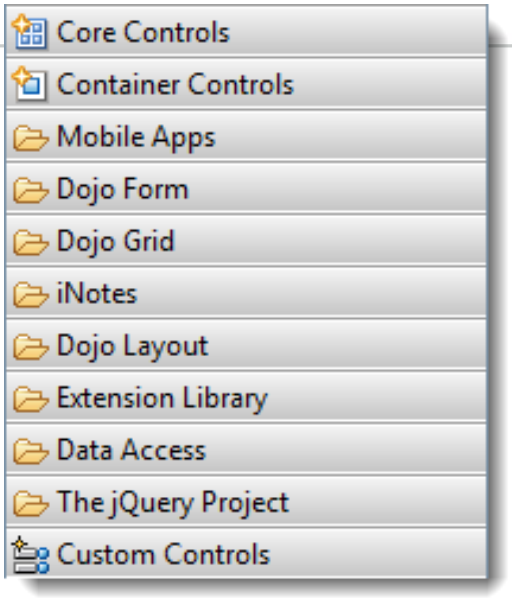
- Theme Controls are used to define default values for properties
  - mode="**concat**"
    - Will append the properties onto any existing properties
  - mode="**override**"
    - Will override the properties with those defined in the control
- Theme Control Names matchup with the types on controls on pages
  - or you can create your own Theme Control names
  - and then tell it what control to apply to using the **themeID** property

- C:\Program Files (x86)\IBM\Lotus\Notes\xsp\nsf\themes

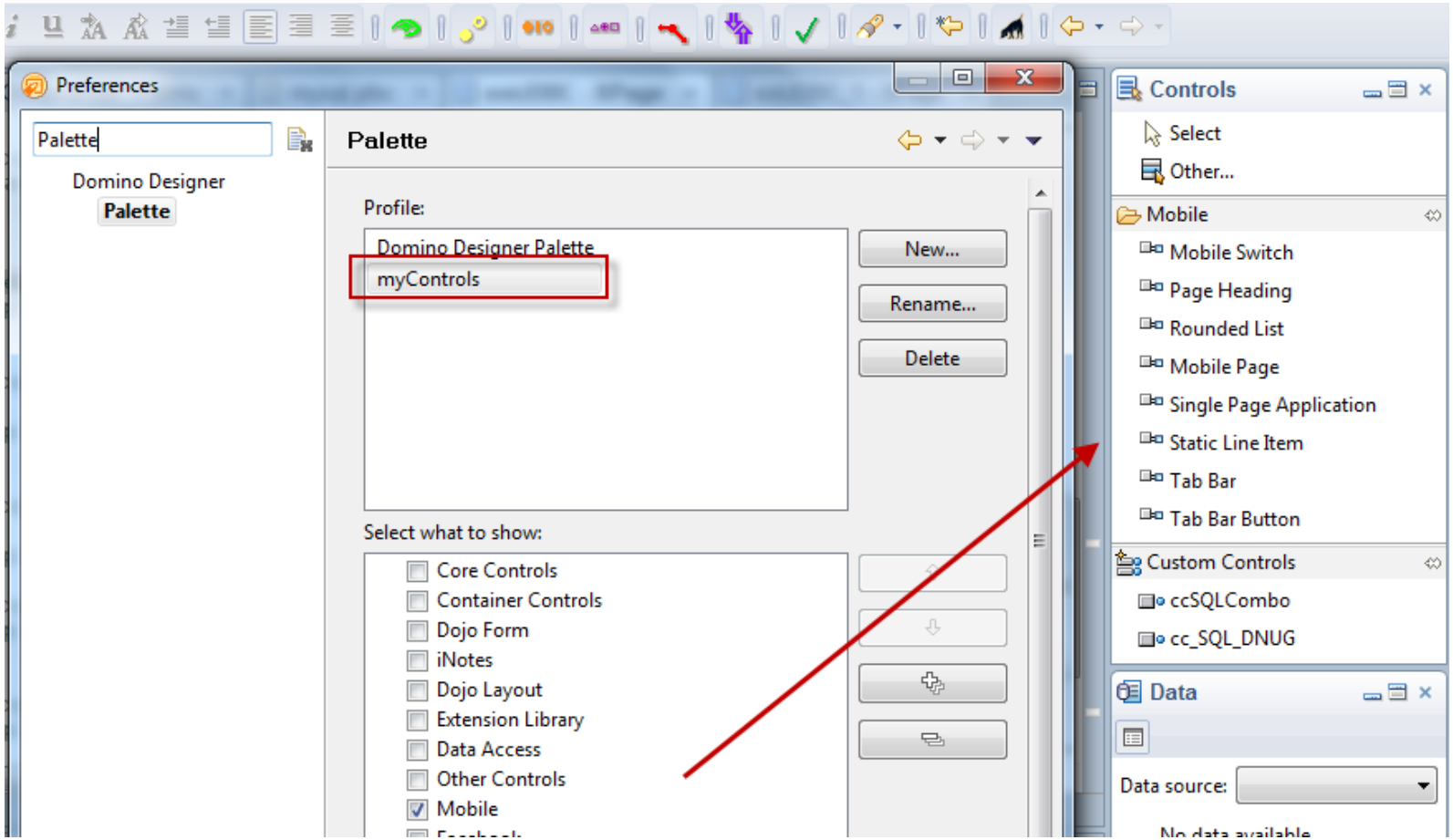
Demo

Extension Library

- The XPages Extension Library provides a set of new XPages artifacts that are ready to use. It contains a set of new XPages controls that supplement the existing ones by providing new capabilities like:
  - An application layout object for rendering the main frame
  - Improved UI components, like dialogs, in context forms, etc.
  - A set of data pickers (value and name pickers)
  - .... and a lot more!



Making Domino Designer work like you want



http://ntf.gbs.com/nathan/escape.nsf/d6plinks/NTFN-8GP6RP

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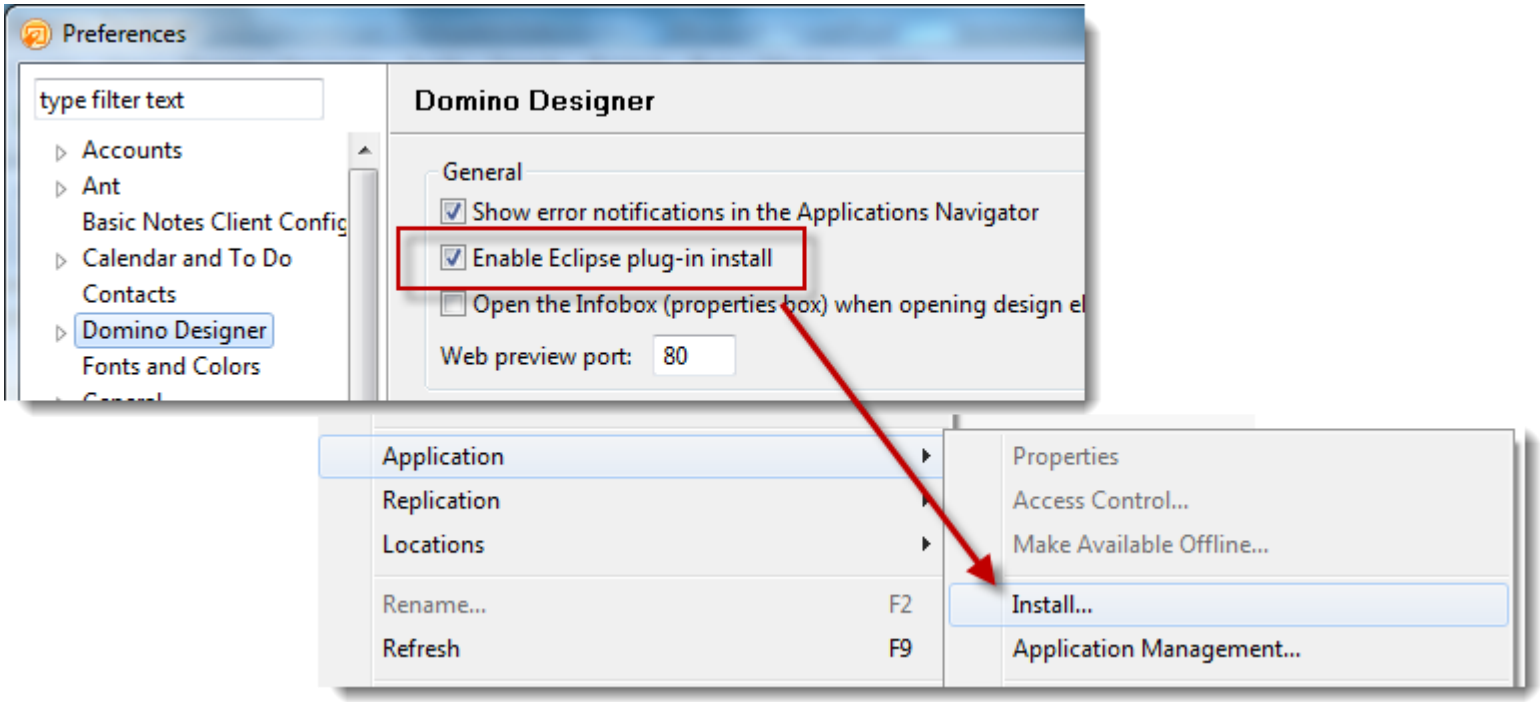
XPages Extension Library OpenNTF

- There are 2 sets of plugins included in OpenNTF delivery
  - “extlib” and “extlibx”
- Each set is wrapped into its own XPages specific library
  - com.ibm.xsp.extlib.library
  - com.ibm.xsp.extlibx.library
- The “extlibx” library contains eXperimental code
  - RDBMS support
  - Social Enabler and others
- Experimental code can get added to the “extlib” library
  - once the code has matured and there is sufficient customer demand
- XPages apps can depend on both the extlib and extlibx libraries
  - RDBMS access requires both dependencies

XPages ExtLib Deployment (Client)

- Open Domino Designer.
- In **File** -> **Preferences** for Domino Designer, check Enable Eclipse plug-in install if it is not already checked.
- Unpack downloaded file



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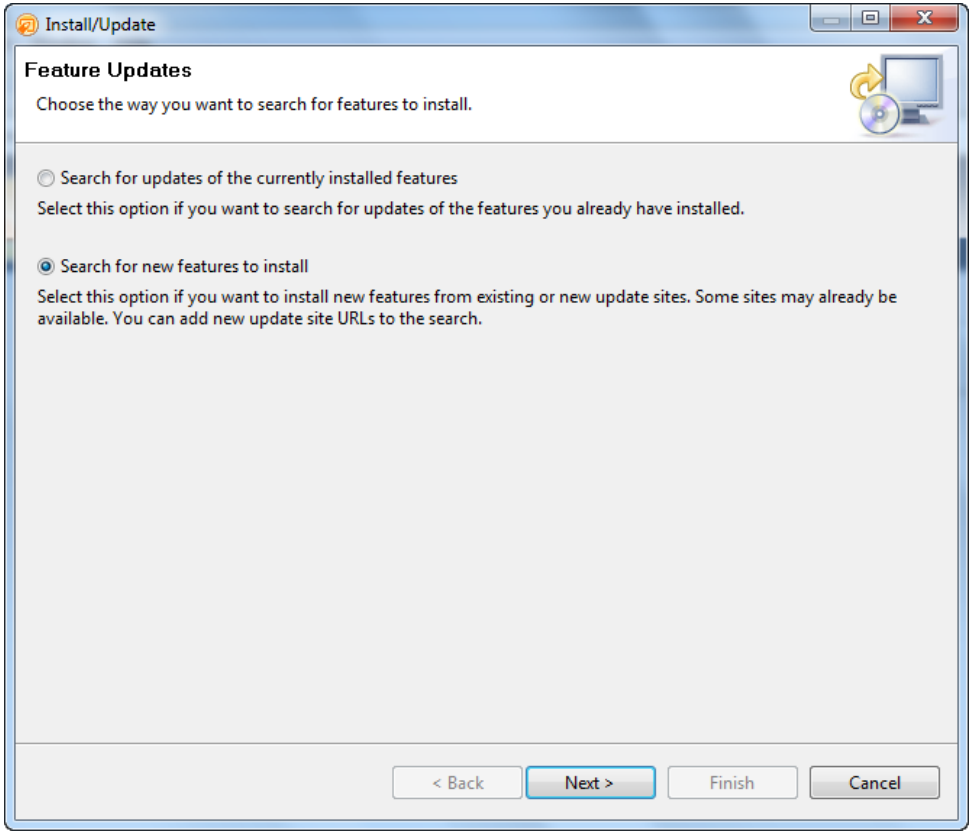
XPages ExtLib Deployment (Client)

- Click
  File -> **Application** -> **Install** to open the Install/Update dialog
- Select Search for new features to install and click **Next**



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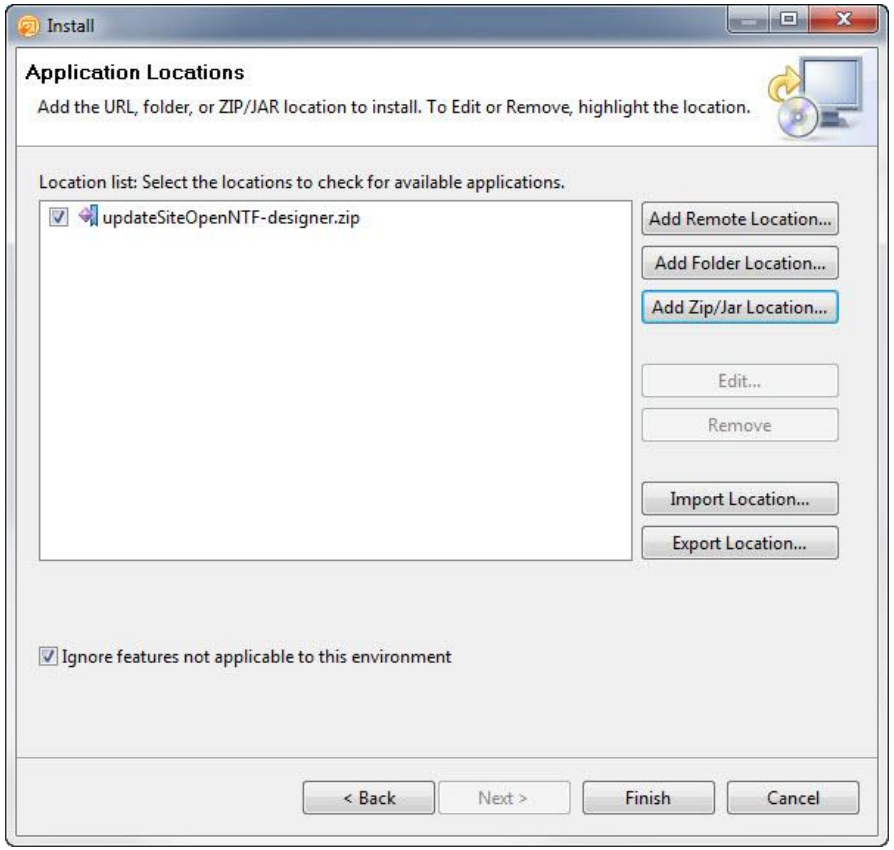
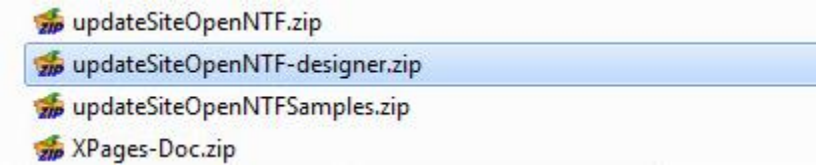
XPages ExtLib Deployment (Client)

- Use the **Add Zip/Jar Location** button to add updateSiteOpenNTF-designer.zip if it is not already there.
- Ensure that updateSiteOpenNTF-designer.zip is selected and click **Finish**





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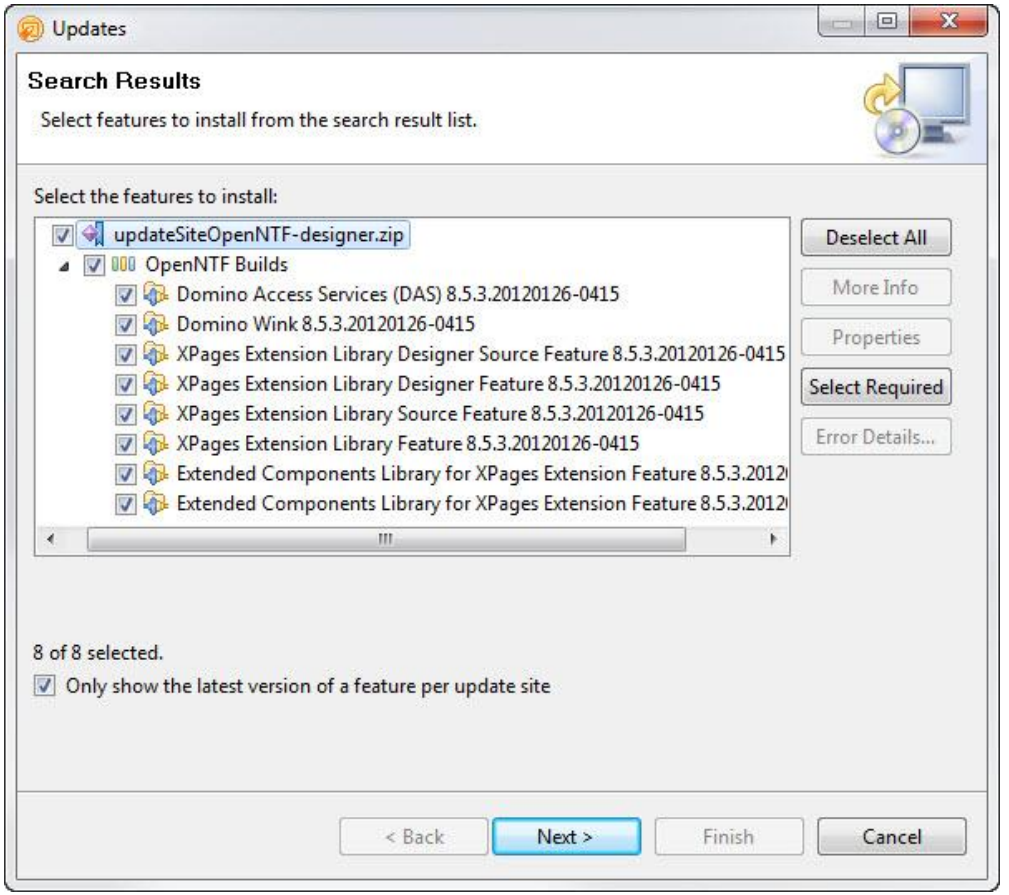
XPages ExtLib Deployment (Client)

- Select all features if asked
- Click the Next Button



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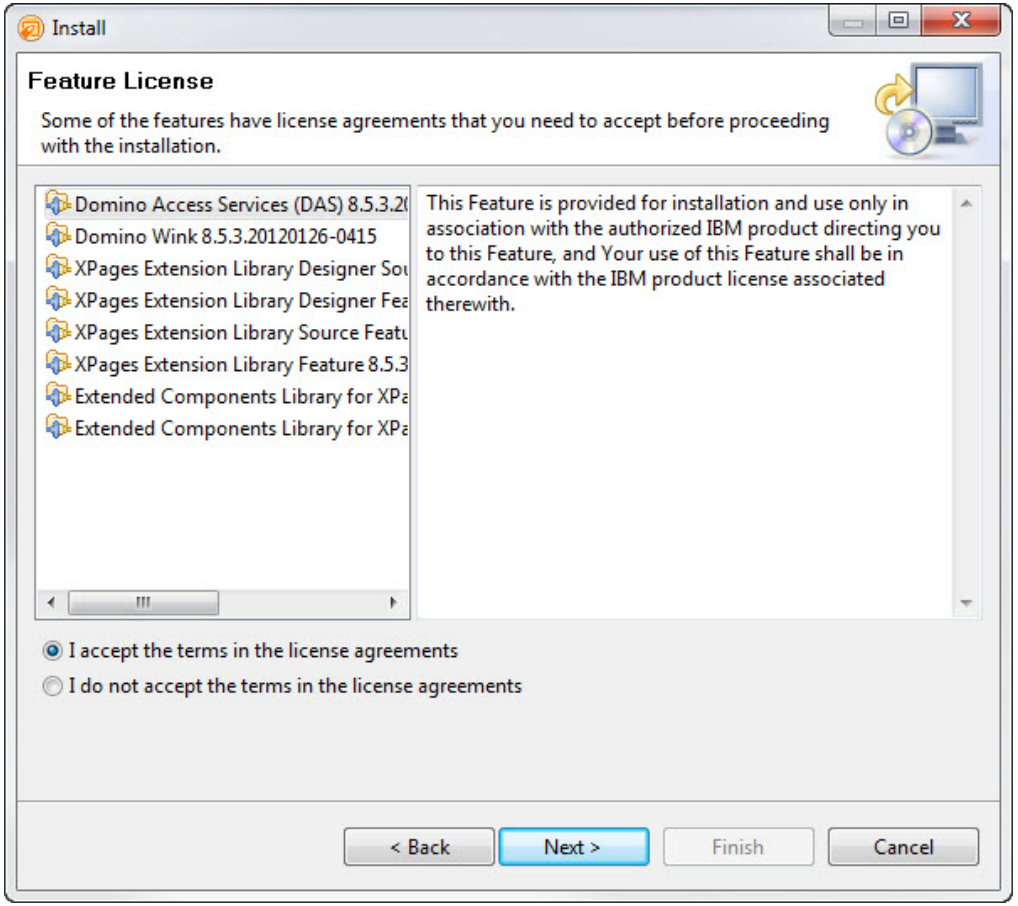
XPages ExtLib Deployment (Client)

- Accept the feature license
- Click the Next Button



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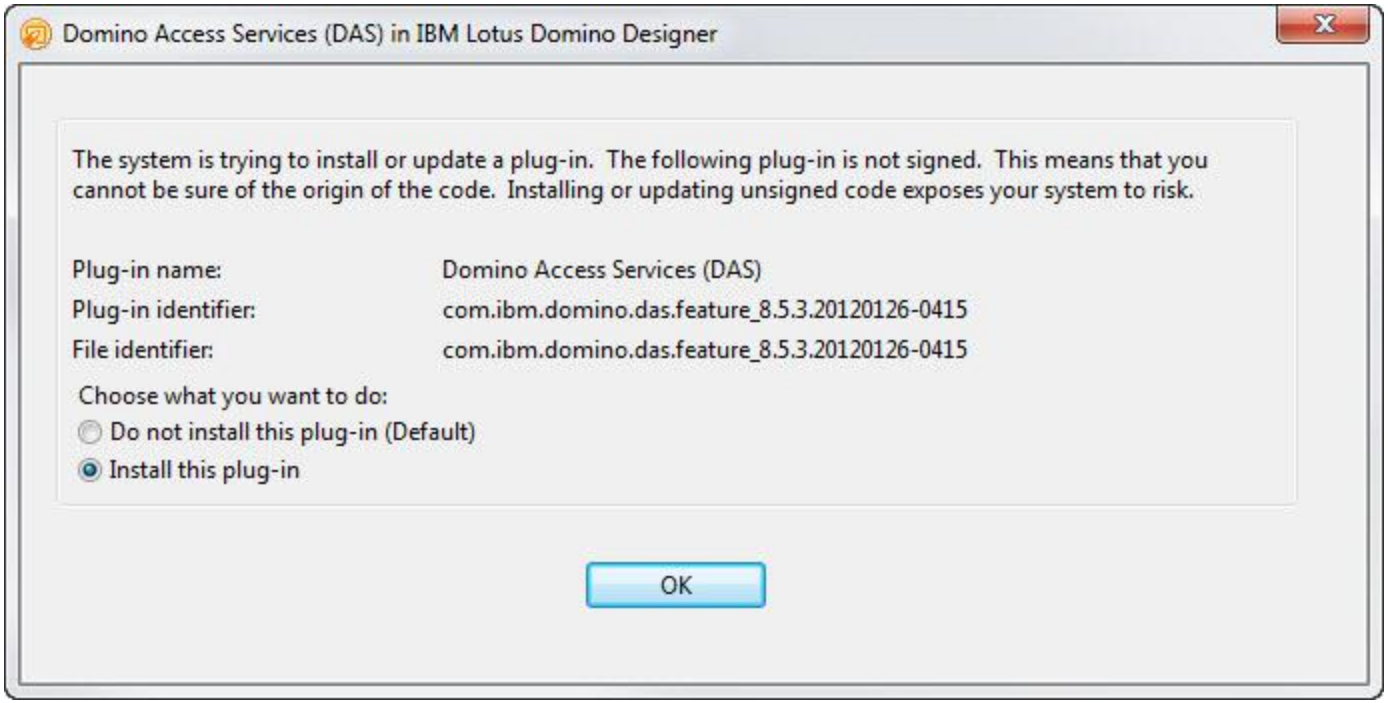
XPages ExtLib Deployment (Client)

- Select Install this plug-in for each unsigned plug-in
- Restart Domino Designer and Notes® after the update completes



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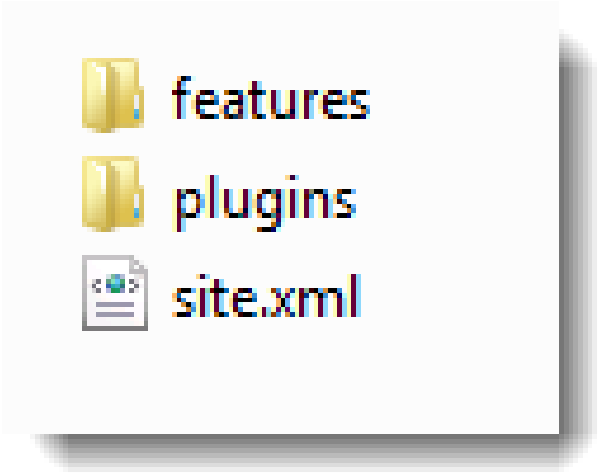
Previewing Ext Lib features in a browser

- Unpack updateSiteOpenNTF-designer.zip to **domino\workspace\applications\eclipse** in the **Domino data directory**.
- Take care to strictly respect the directory hierarchy.



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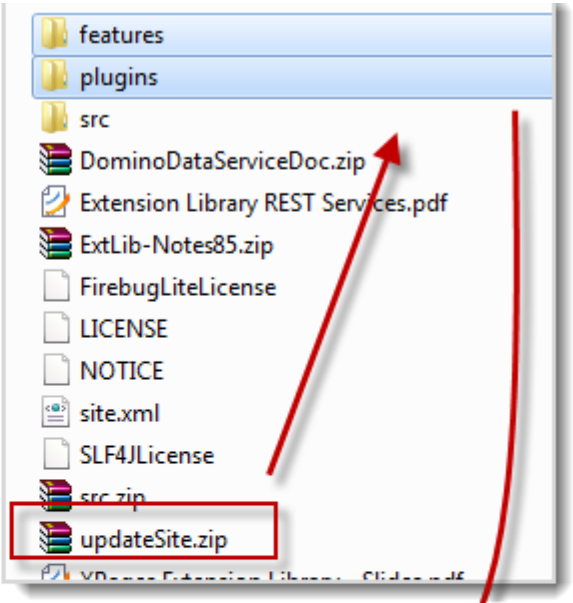
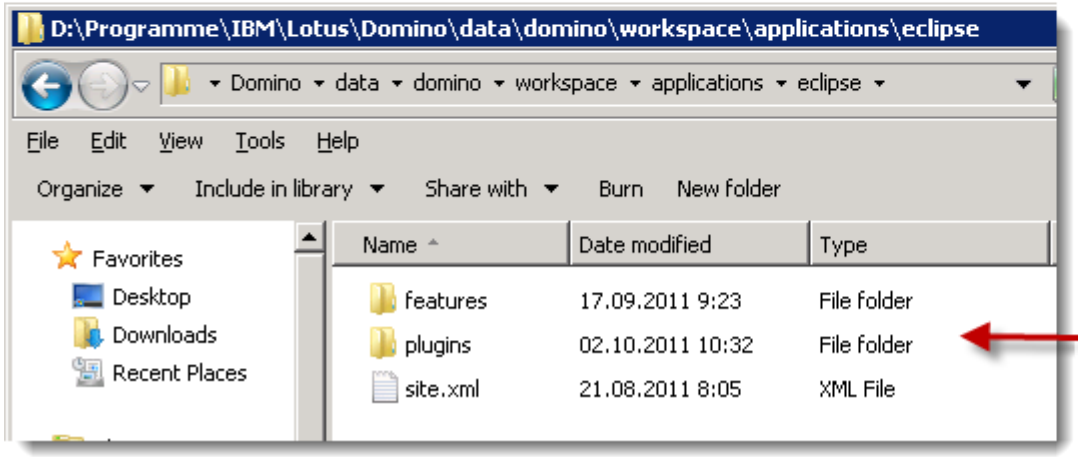
XPages ExtLib Deployment (Server)

- Unpack updatesite.zip
- Copy „features“ and „plugins“ to server
- Stop / Start HTTP task





<Domino-Data>\domino\workspace\applications\eclipse

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Verify Installation

- To verify the plugins for the extlib and extlibx XPages libraries are properly installed, you should use the OSGI command on the server console
- **tell http osgi ss com.ibm.xsp.extlib**

```
tell http osgi ss com.ibm.xsp.extlib
24.02.2012 16:55:22  Framework is launched.
24.02.2012 16:55:22  id State       Bundle
24.02.2012 16:55:22  10 ACTIVE      com.ibm.xsp.extlib.domino_8.5.3.20120126-0415
24.02.2012 16:55:22  11 ACTIVE      com.ibm.xsp.extlib.mobile_8.5.3.20120126-0415
24.02.2012 16:55:22  12 ACTIVE      com.ibm.xsp.extlib.core_8.5.3.20120126-0415
24.02.2012 16:55:22  13 ACTIVE      com.ibm.xsp.extlib.controls_8.5.3.20120126-0415
24.02.2012 16:55:22  15 INSTALLED   com.ibm.xsp.extlib.designer.tooling_8.5.3.20120126-0415
24.02.2012 16:55:22  17 RESOLVED    com.ibm.xsp.extlibx.source_8.5.3.20120126-0415
24.02.2012 16:55:22  18 RESOLVED    com.ibm.xsp.extlibx.relational.derby_8.5.3.20120126-0415
24.02.2012 16:55:22  19 RESOLVED    com.ibm.xsp.extlib.designer.tooling.feature.source_8.5.3.20120126-0415
24.02.2012 16:55:22  20 ACTIVE      com.ibm.xsp.extlib_8.5.3.20120126-0415
24.02.2012 16:55:22             Fragments=27
24.02.2012 16:55:22  21 ACTIVE      com.ibm.xsp.extlibx.sbt_8.5.3.20120126-0415
24.02.2012 16:55:22  22 <<LAZY>>    com.ibm.xsp.extlibx.core_8.5.3.20120126-0415
```


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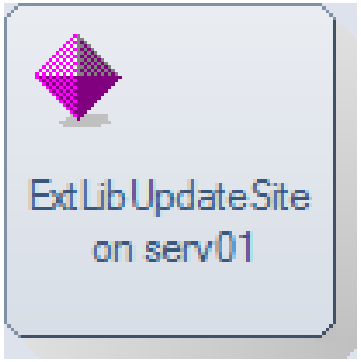
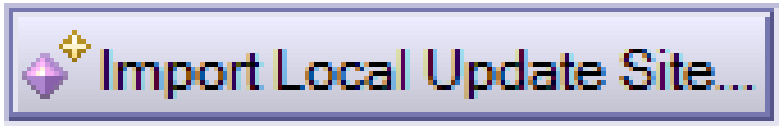
XPages ExtLib Deployment in Domino 8.5.3

- Unzip download
- Unzip "updateSiteOpenNTF-designer.zip„
- Create a new application dbname.nsf on server
  Use template (Eclipse Update Site)



- Modify ACL, Anonymous at least needs Reader Access.
- Open Application
- Click "Import Local Update Site„



- **OSGI_HTTP_DYNAMIC_BUNDLES=dbname.nsf**

```
set con OSGI_HTTP_DYNAMIC_BUNDLES=ExtLibUpdate.nsf
This system variable cannot be set via the server console. You must edit NOTES.INI to set this variable.
```

- Start / Stop HTTP task on server

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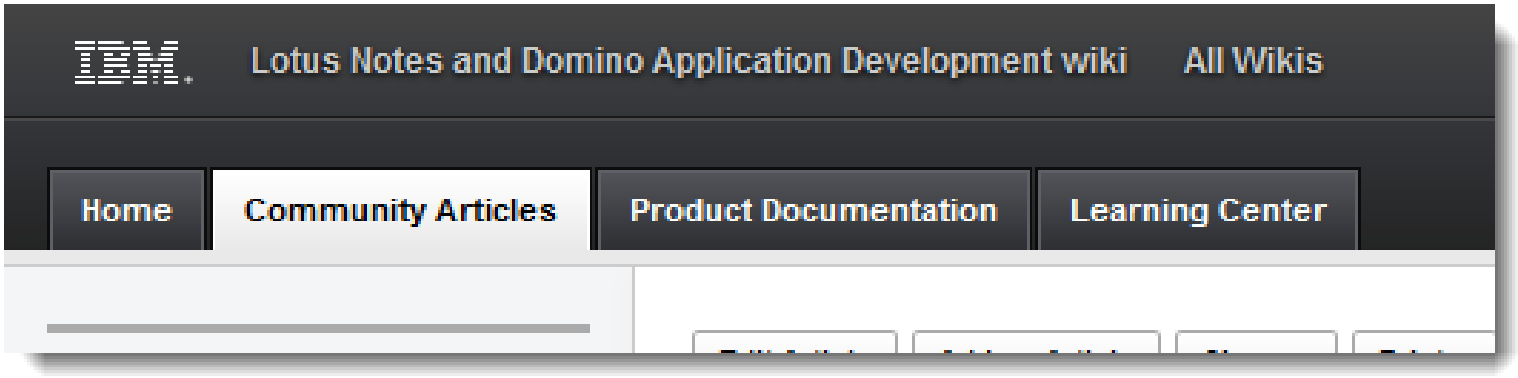
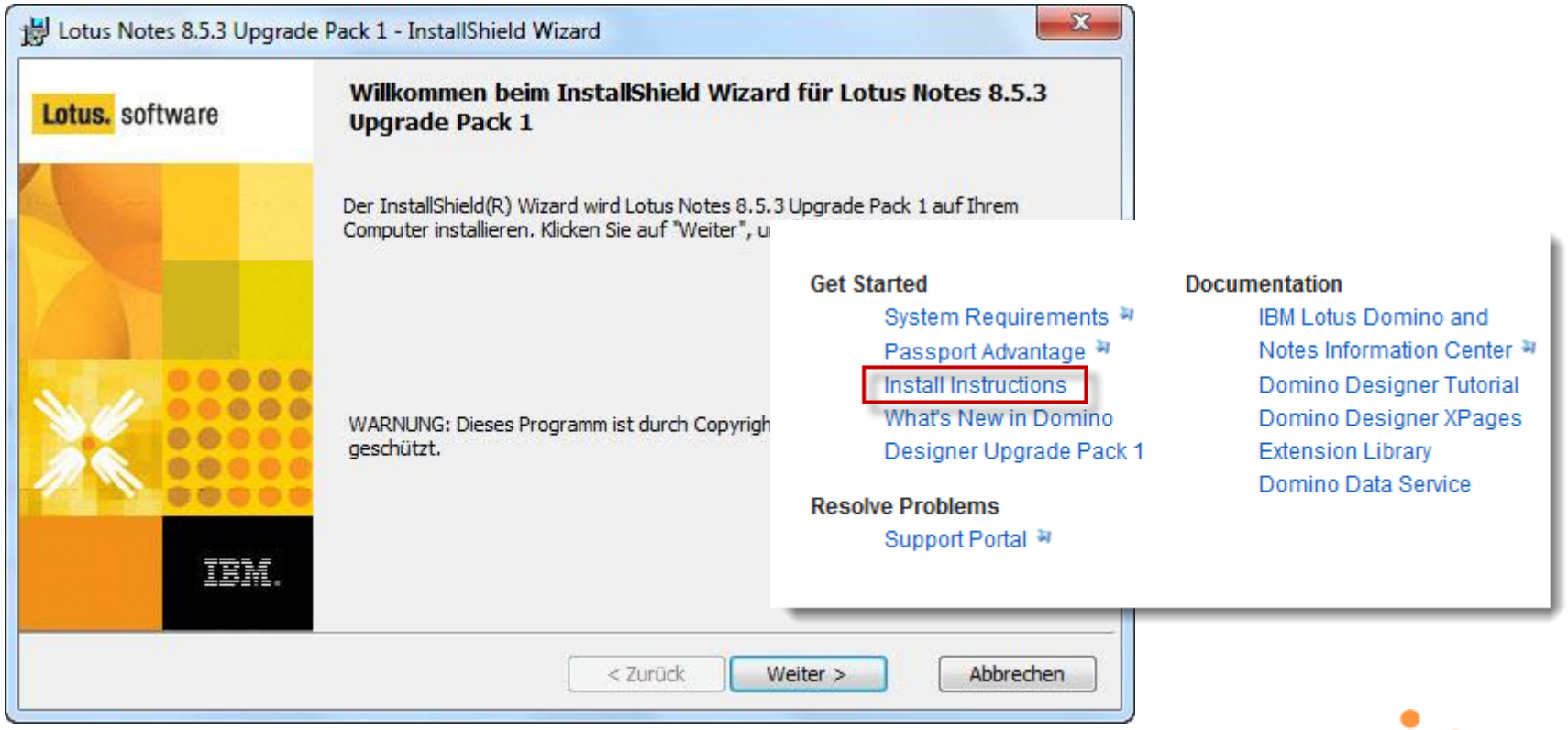
XPages ExtLib Deployment in Domino 8.5.3



- XPages Extension Library Deployment in Domino 8.5.3 and IBM XWork Server
  - http://www-10.lotus.com/ldd/ddwiki.nsf/dx/XPages_Extension_Library_Deployment

8.5.3 Upgrade Pack 1

- http://www-10.lotus.com/ldd/ddwiki.nsf/xpViewCategories.xsp?lookupName=What%20is%20new%20in%20Domino%20Designer%208.5.3%20Upgrade%20Pack%201



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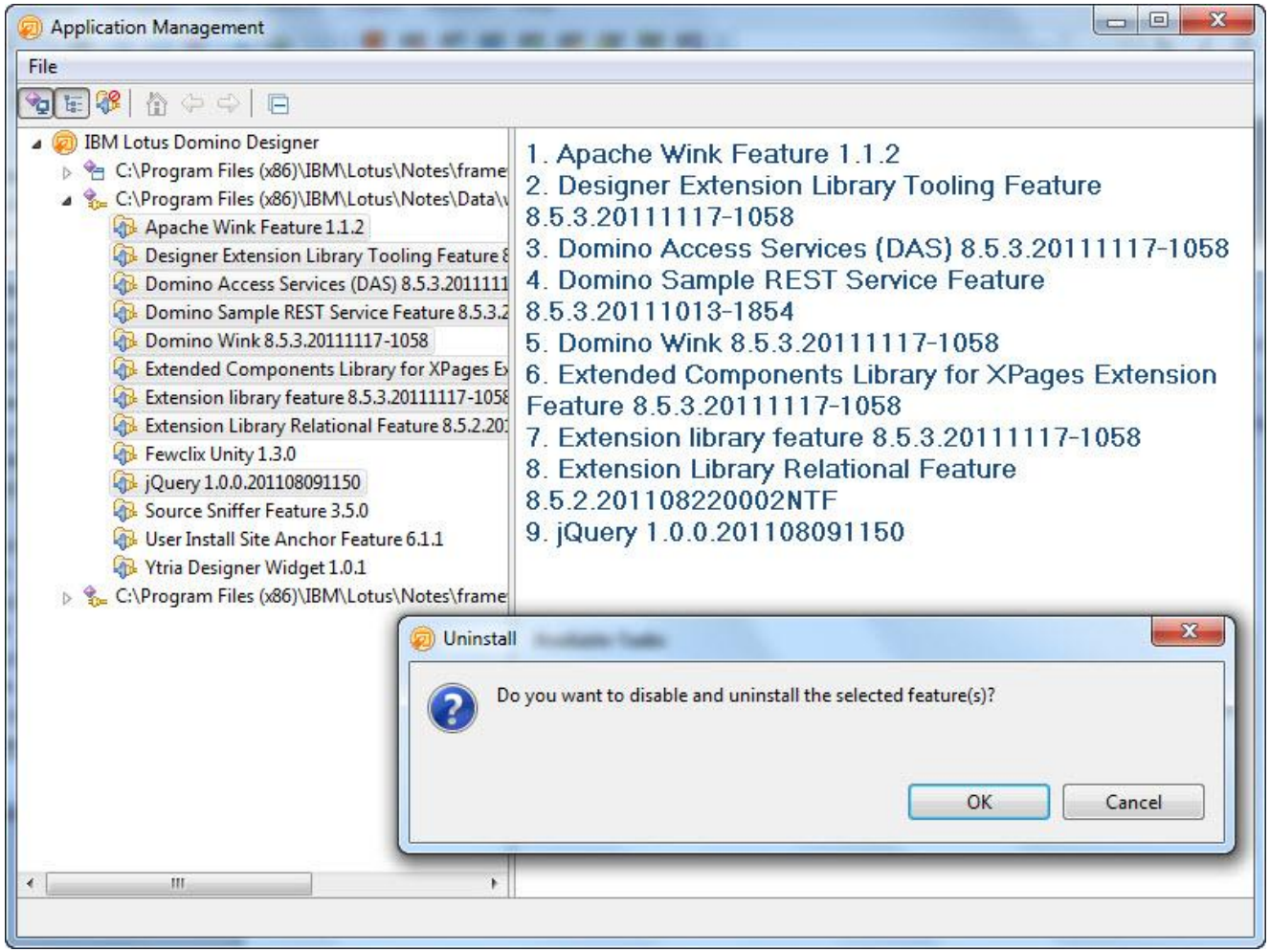
8.5.3 Upgrade Pack 1

- Uninstall existing components first !!



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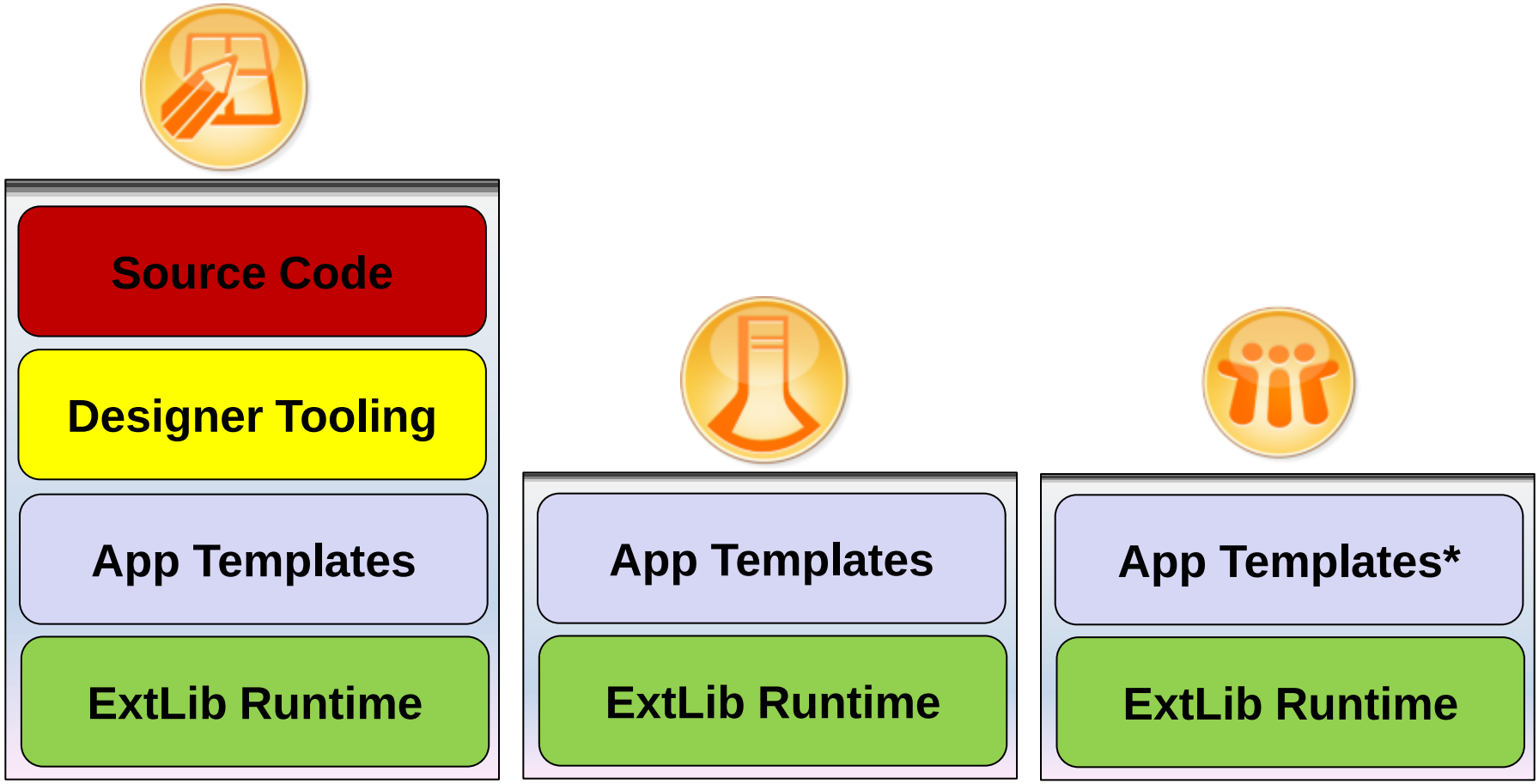
8.5.3 Upgrade Pack 1- What is installed?



* Discussion template installed with Notes client (no Teamroom)

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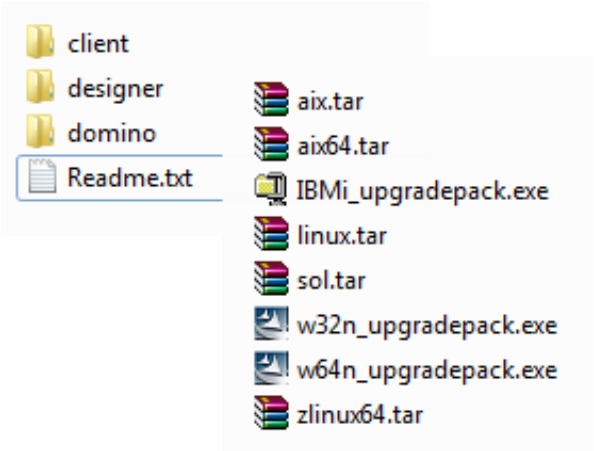
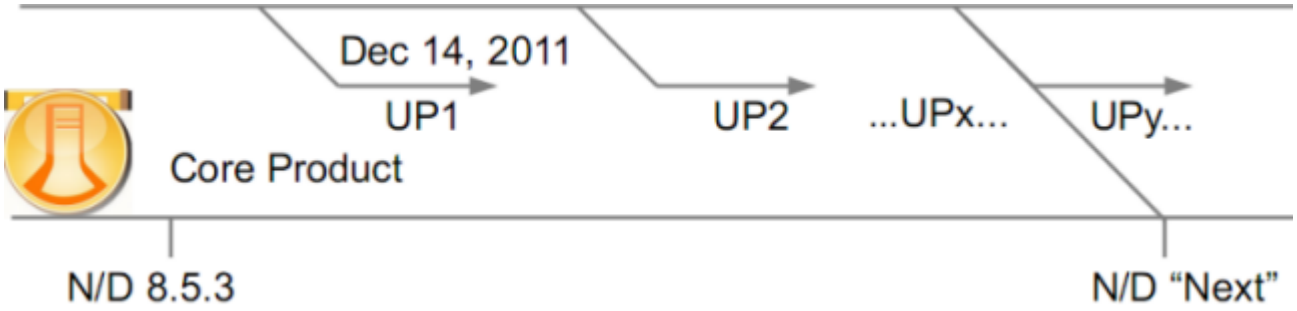
XPages Extension Library Upgrade Pack 1

- A set of Java plug-ins that greatly extend XPages functionality
- Works on **web**, Notes **client** and **mobile** devices
- Applicable to Domino, XWork Server, Notes, Domino Designer
- Cool new Domino Designer enhancements for Ext Lib controls
- Enhanced **TeamRoom** and **Discussion templates**
- A fully accessible runtime library and templates
- Implemented using the XPages Extensibility API
- Built to IBM globalization standards
- Online documentation
- Runtime is localized
- Officially **supported** by IBM
- Includes **source code** !



Product, OpenSource, Upgrade Pack

- Code is first released on OpenNTF
  - Available early and gives full transparency on what is being done
  - Facilitates quicker user evaluation, feedback and contributions
- Pieces from OpenNTF are selected and delivered as UP
- Upgrade Packs are supported by IBM
  - Upgrade Packs are delivered on a shorter release cycle than products
  - Upgrade Packs are integrated into the next revision of the product
  - Upgrade Packs do not modify the core base platform in any way !



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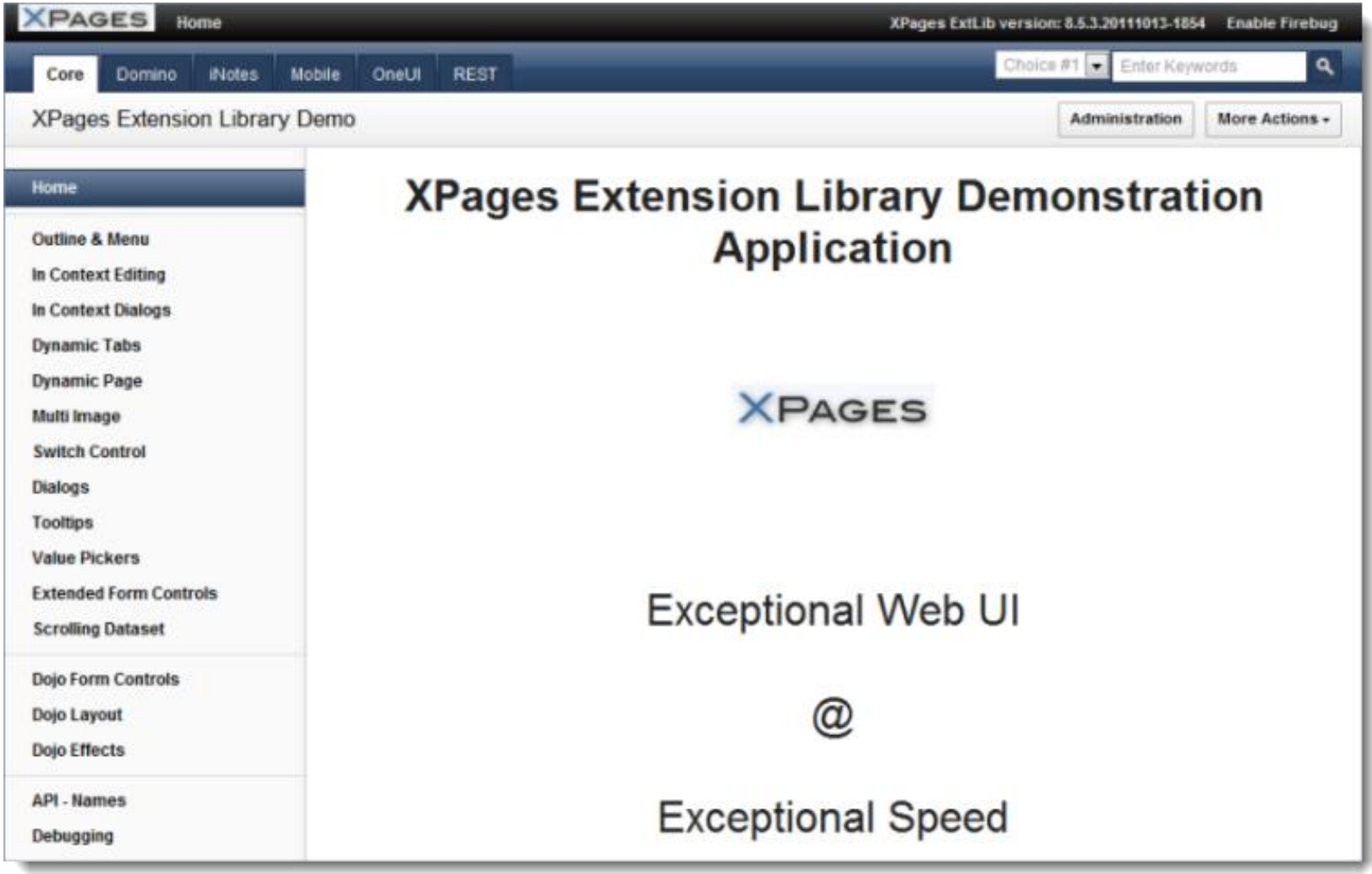
Extension Library Demo Application



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Knowledge Management

com.ibm.xsp.extlib.util.ExtLibUtil

- Get version of installed Extension Library

  - var v = com.ibm.xsp.extlib.util.ExtLibUtil.getExtLibVersion();
  - return "XPages ExtLib version: "+ v

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com.ibm.xsp.extlib.util.ExtLibUtil

- Contains many common methods
  - import static com.ibm.xsp.extlib.util.ExtLibUtil.*;
- *getCurrentSession(), getCurrentDatabase() …*
- *Many more to access scoped variables etc.*

```
private Database _db = getCurrentDatabase();
private DocumentCollection _dc;
private Session _session = getCurrentSession();
```


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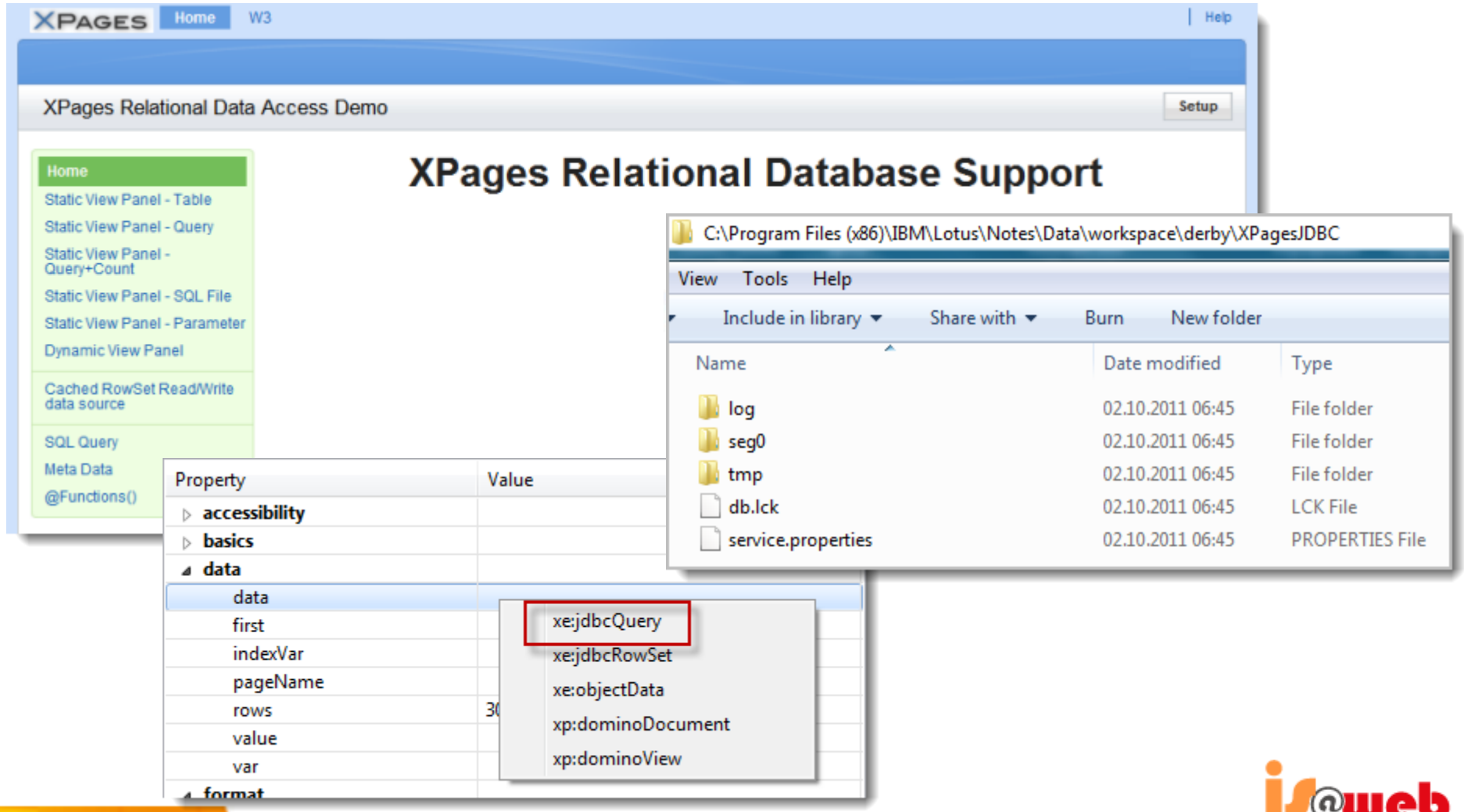
XPages Relational Database Support

- Leverages JDBC when connecting to relational databases
  - Accesses any database with a JDBC driver available
  - You could access
    - DB2,Oracle,MS SQL,MySQL,Derby... you name it!
  - You need to obtain the JDBC driver from the database vendor or third party provider
- RDBMS data is accessed directly – no synchronization is performed with NSF
- Xpages efficiently manages the connections through a connections pool
- Uses NSF specific connections
- The data is accessed using a set of dedicated data sources

XPages Relational Database Support

- extlibx library adds 2 new data sources:
  - JDBC Query for Read Only access
  - JDBC RowSet for CRUD (create/read/update/delete) access.
    - Current implementation is based on com.sun.rowset.CachedRowSetImpl
    - Could be configured to use your own via the rowSetJavaClass property
- Each of the provided new data sources could be easily utilized either by:
  - the core View Container Control (xp:viewPanel element)
  - the XPage itself (xp:view element)
- The new data sources are now available in the Domino Designer Property Panel

XPages Relational Database Support



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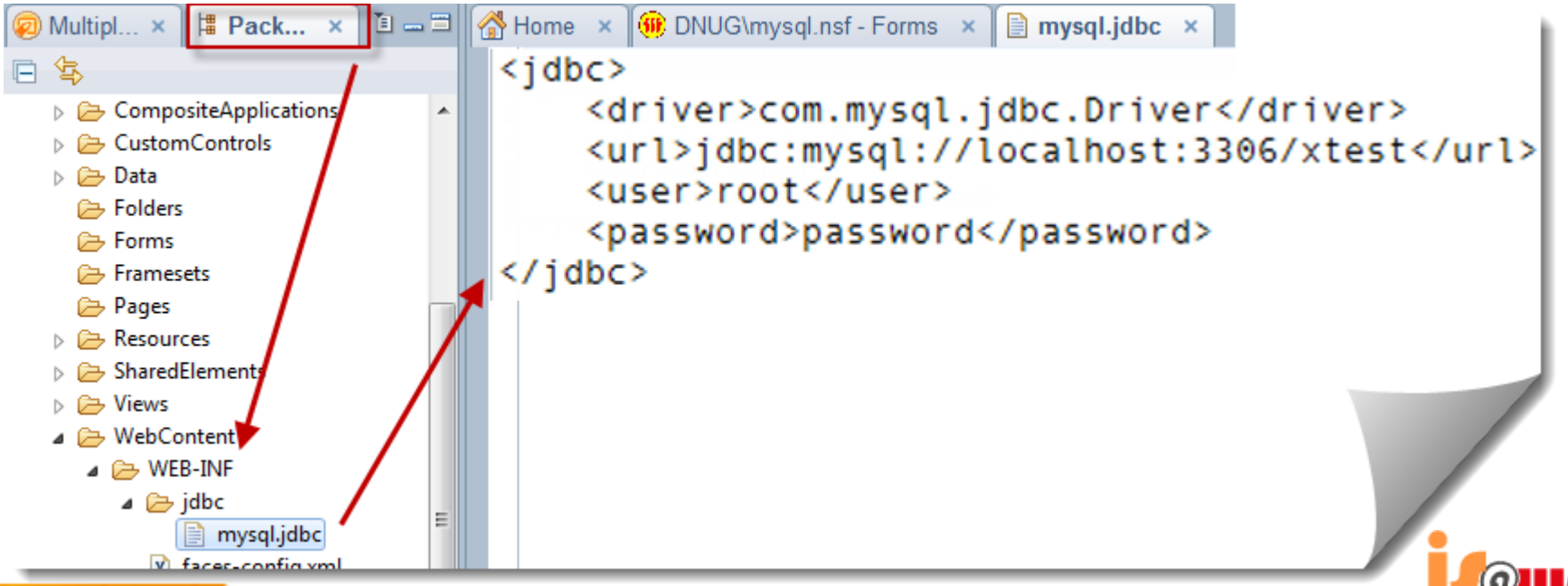
XPages Relational Database Support

- To connect to your RDBMS you need to create a special file resource
  - .jdbc” extension (for example “db2test.jdbc”)
  - specify the JDBC driver class to be used
  - the database host/port/name and users' credentials



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Server Side JavaScript APIs and @Functions

- Currently implemented @Functions:
  - **@JdbcInsert**
  - **@JdbcUpdate**
  - **@JdbcDelete**
  - **@JdbcExecuteQuery**
  - **@JdbcDbColumn**
  - **@JdbcGetConnection**

```
<xp:button value="Insert 'Homer'" id="button1">
    <xp:eventHandler event="onclick" submit="true"
        refreshMode="partial" refreshId="wrapper">
        <xp:this.action>
            <![CDATA[#{javascript:var v = {
                idpeople: "7",
                firstName: "Homer",
                lastName: "Simpson",
                country: "Springfield,USA",
                age: "100"
            }
            var c = @JdbcInsert("mysql","people",v)

            }]]>
        </xp:this.action>
    </xp:eventHandler>
</xp:button>
```

- Used to simplify various RDBMS operations
- Allows programmatic access to RDBMS data

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Demo

RDBMS Future

- XPages Extension Library OpenNTF and Relational support continues to evolve further and expected features in the pipeline include:
  - Global Domino server based RDBMS connection definition ability
  - Domino Designer tooling to work with the RDBMS tables' metadata
  - Even better JDBC connection pooling implementation using Apache DBCP
  - JDBC Query via REST services
  - Additional @Functions
- Another new interesting OpenNTF project
  - JDBC Access for IBM Lotus Domino (DomSQL)
    - http://www.openntf.org/internal/home.nsf/project.xsp?action=openDocument&name=JDBC%20Access%20for%20IBM%20Lotus%20Domino

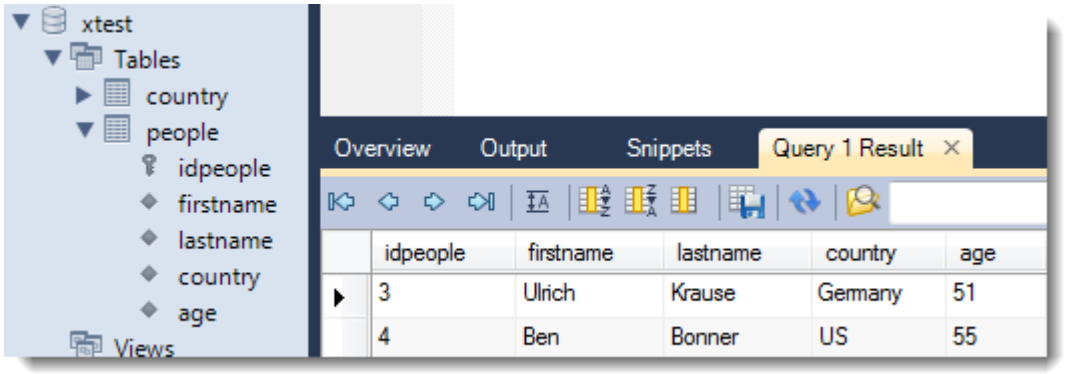
Domino JDBC Access (DomSQL)

- Exposes Domino data as relational tables and provides easy access to the tables using a JDBC driver
  - Expand the query capability of Note/Domino (N/D)
    - Native N/D views lack some key features like dynamic queries and joins between views. The features Domino views lack are exactly those at which SQL excels
  - Reporting – Data analytics
    - SQL is the de facto standard used by reporting/data analysis tools. Making N/D data behave like relational data suddenly opens it to a large set of tools that understand JDBC
- As of now, it only does read-only
- Uses another very popular open source project called **SQLite** (http://www.sqlite.org/)

XPages Relational Database Support

- Do I need the extension Library ?????? …

- What do we need??
- Application
- JDBC – Driver



  - MySQL http://dev.mysql.com/downloads/connector/j/
  - Available for all major databases

- Code to access the database using the driver (Query / Insert / Update / Delete)

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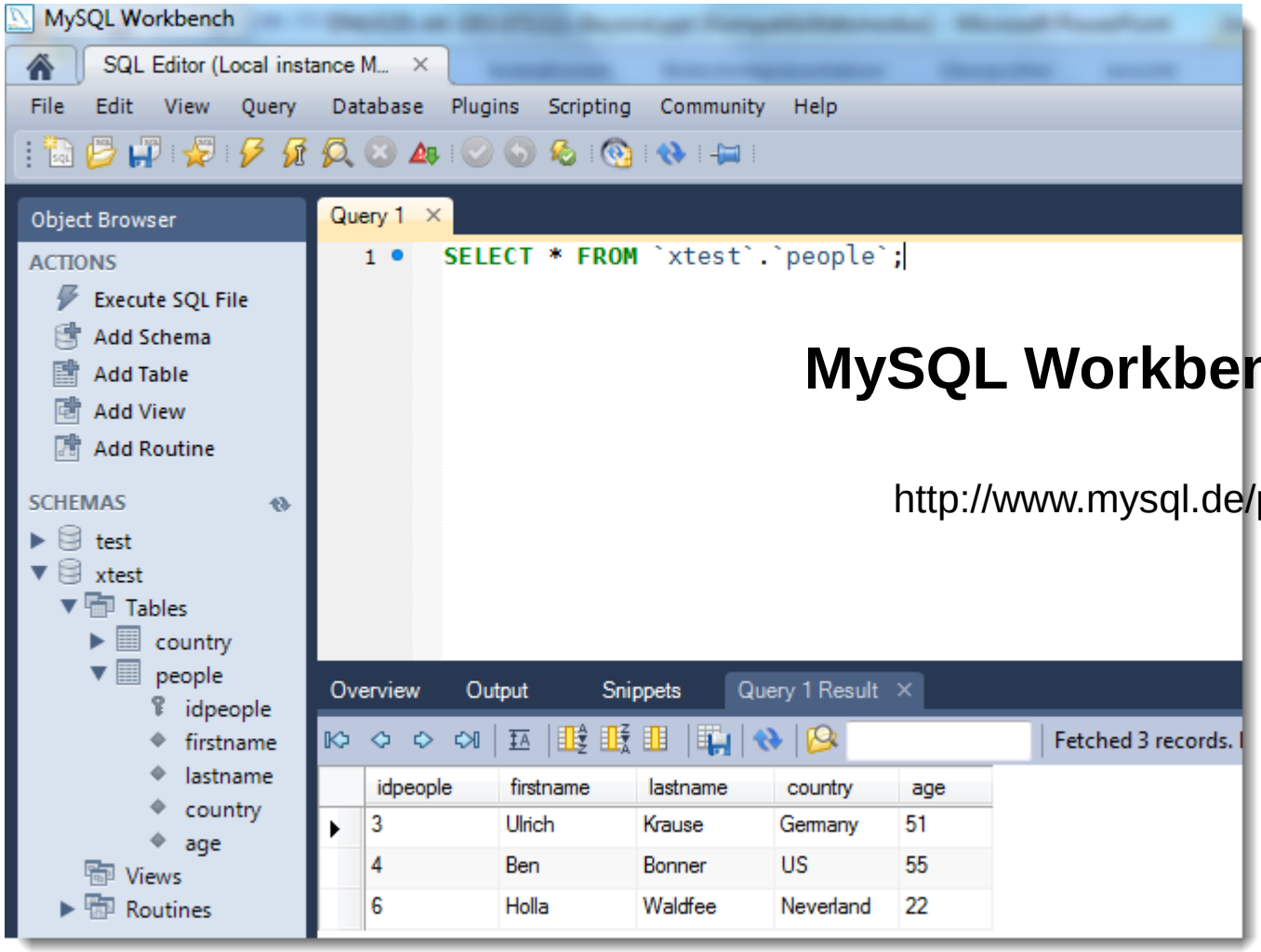
XPages Relational Database Support



MySQL Workbench

http://www.mysql.de/products/workbench/

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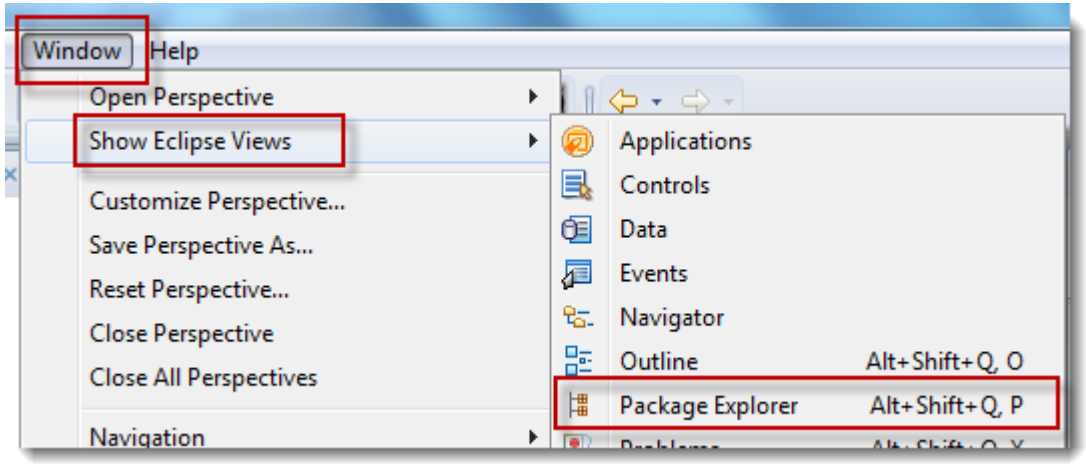
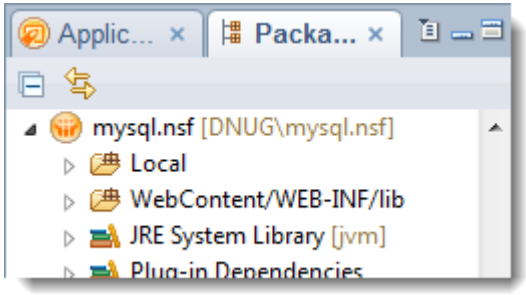
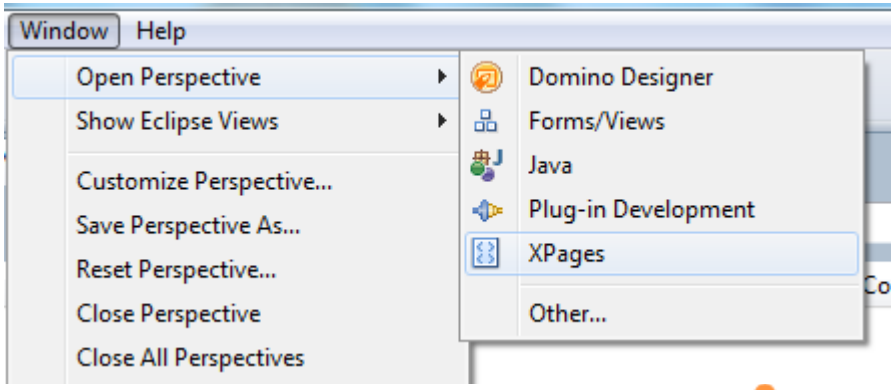
Java in XPages

- Package Explorer





- Predefined Perspectives



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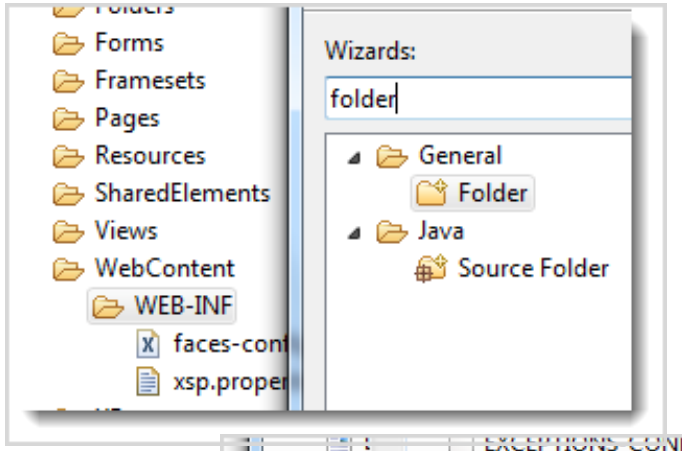
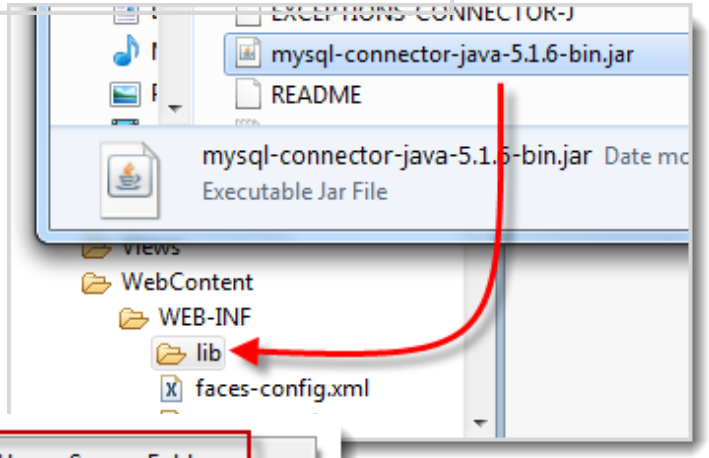
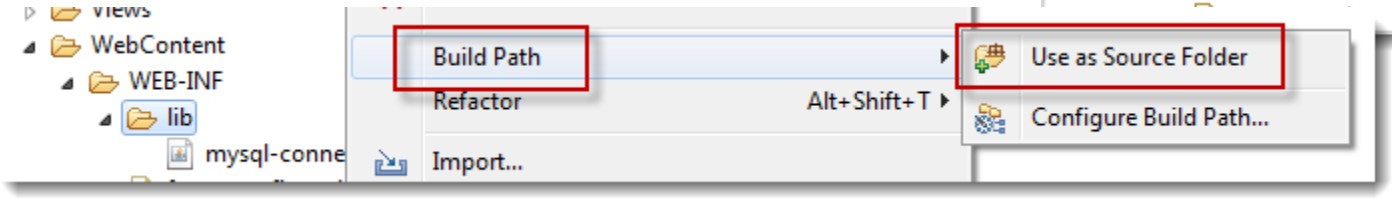
XPages Relational Database Support

- Install Driver (Client)
  - Open Package Explorer
  - Create Folder
    - WebContent →WEB-INF → lib
  - Drag/Drop driver file into folder
  - Buildpath
    - RightClick → Build Path → Use as Source Folder







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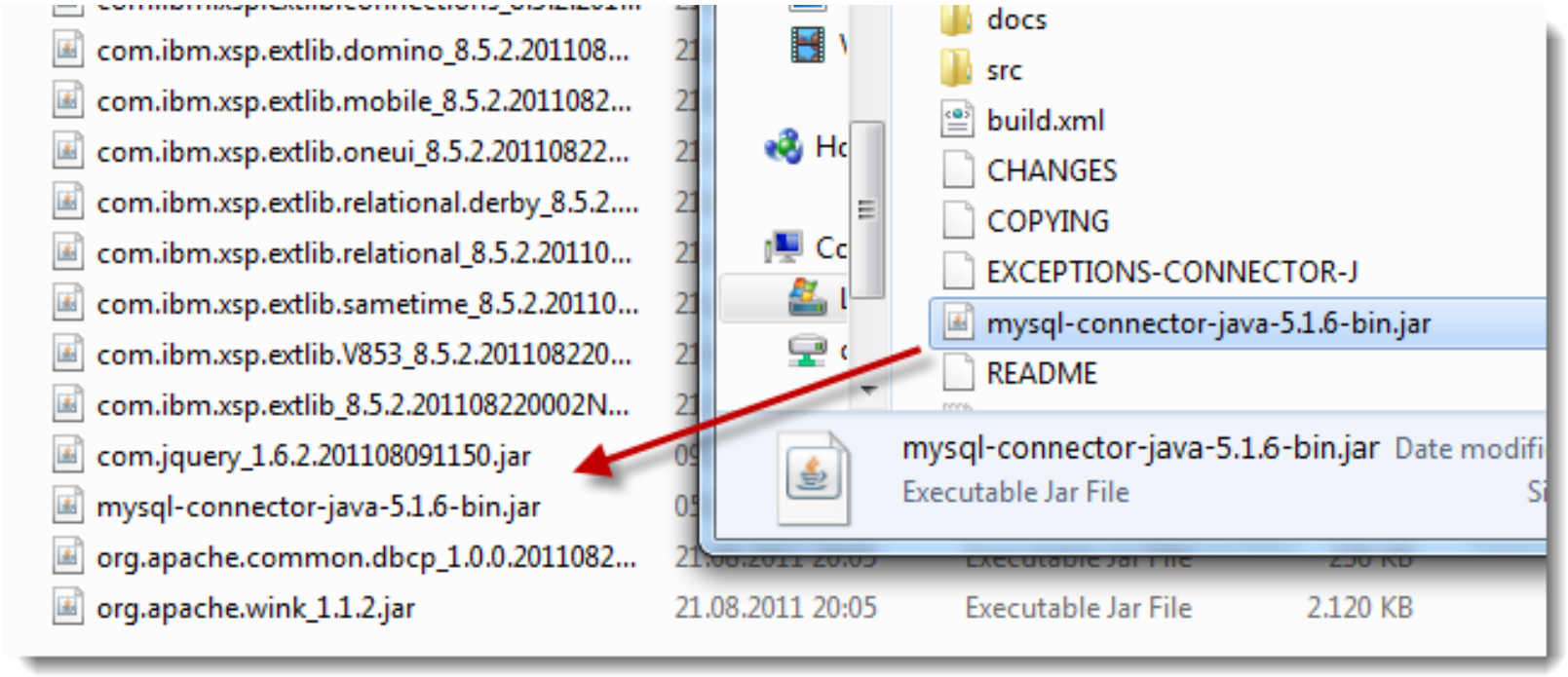
XPages Relational Database Support

- Install Driver (Server)
  - data\domino\workspace\applications\eclipse\plugins
  - Stop / Start HTTP task



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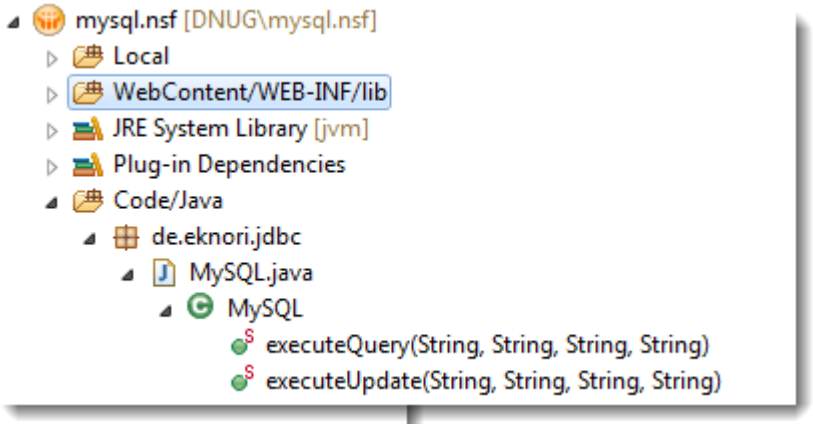
XPages Relational Database Support

- de.eknori.jdbc.MySQL
  - executeQuery()
  - executeUpdate()




```
1  package de.eknori.jdbc;
2  import java.sql.Connection;
3  import java.sql.DriverManager;
4  import java.sql.ResultSet;
5  import java.sql.Statement;
6  import java.sql.SQLException;
7
8  public class MySQL {
9
10     public static ResultSet executeQuery(String connString, String userName,
11
12         ResultSet resultSet=null;
13         Statement st = null;
14         Connection conn = null;
15
16         try {
17             Class.forName("com.mysql.jdbc.Driver").newInstance();
18             conn = DriverManager.getConnection(connString,userName,pwd);
19             st = conn.createStatement();
20             resultSet = st.executeQuery(query);
21         }
22         catch(Exception e){
```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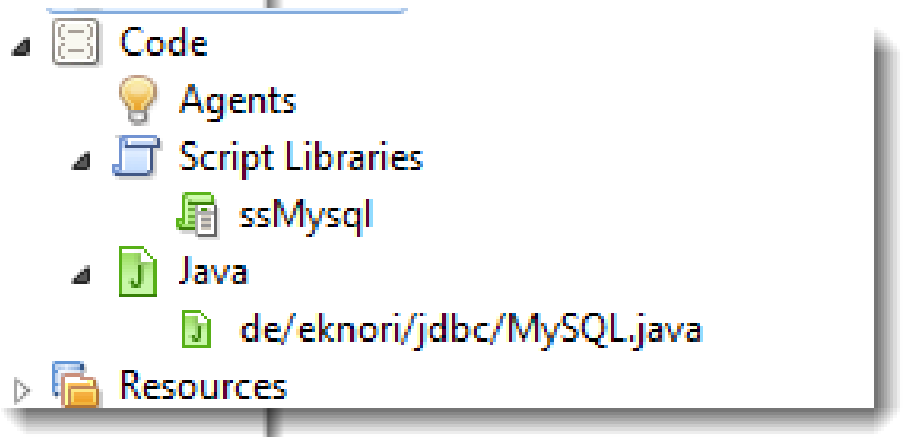
XPages Relational Database Support

- JavaScript Library

```
function getSQLData() {
    var query=compositeData.SQLQuery;
    var rs:java.sql.ResultSet = de.eknori.jdbc.MySQL.executeQuery(connS
    var rsmd:java.sql.ResultSetMetaData = rs.getMetaData();
    var out = new Array();
    while (rs.next()){
        var row = new Array();
        for (i=1; i<rsmd.getColumnCount()+1; i++) {
            switch (rsmd.getColumnType(i))
            { case 12: row.push(rs.getString(i));
                                break;
              case 4: row.push(rs.getInt(i));
                                break;
              default: row.push(rs.getString(i));
            }
        }
        out.push(row);
    }
    return out;
}

function setSQLData(query) {
    return de.eknori.jdbc.MySQL.executeUpdate(connString,userName,pwd,q
}
```



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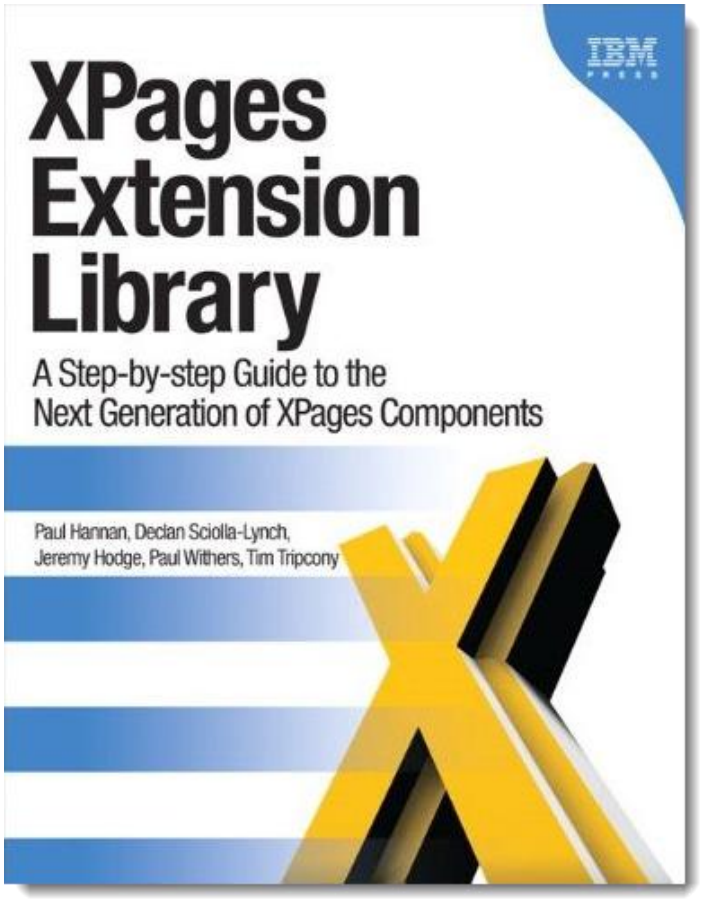
Demo

Resources

- Making Domino Designer work like you want
  - http://ntf.gbs.com/nathan/escape.nsf/d6plinks/NTFN-8GP6RP
- NotesIn9 (David Leedy)
  - http://notesin9.com/
- Xpages Development Forum
  - http://www-10.lotus.com/ldd/xpagesforum.nsf
- Xpages 101 (Matt White)
  - http://xpages101.net
- OpenNTF
  - http://openntf.org
- Planet Lotus
  - http://planetlotus.org

Books of Interest

- Publishing Date 19-May-2012
  - Declan Scolia-Lynch
  - Paul Hannan
  - Jeremy Hodges
  - Paul Withers
  - Tim Tripcony



http://www.amazon.com/XPages-Extension-Library-Step---Step/dp/0132901811/ref=sr_1_1?ie=UTF8&qid=1329839291&sr=8-1

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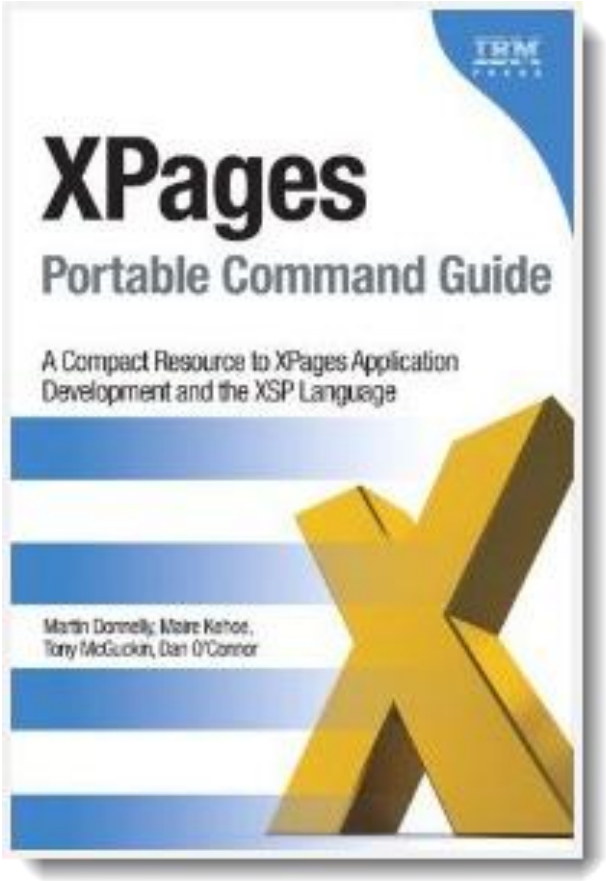
Books of Interest

- Publishing Date 15-Feb-2012
  - *Martin Donnelly*
  - *Maire Kehoe*
  - *Tony McGuckin*
  - *Dan O'Connor*
- *XPages Portable Command Guide* offers fast access to **working code**, **tested solutions**, **expert tips**, and example-driven **best practices**



http://www.amazon.com/XPages-Portable-Command-Guide-Application/dp/0132943050/ref=sr_1_1?s=books&ie=UTF8&qid=1329839422&sr=1-1

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Q & A

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FILL IN YOUR SESSION
EVALUATIONS*
Excellent
Good
Average
Poor
* or a kitten must die!