Reusable Type Definitions and Templates

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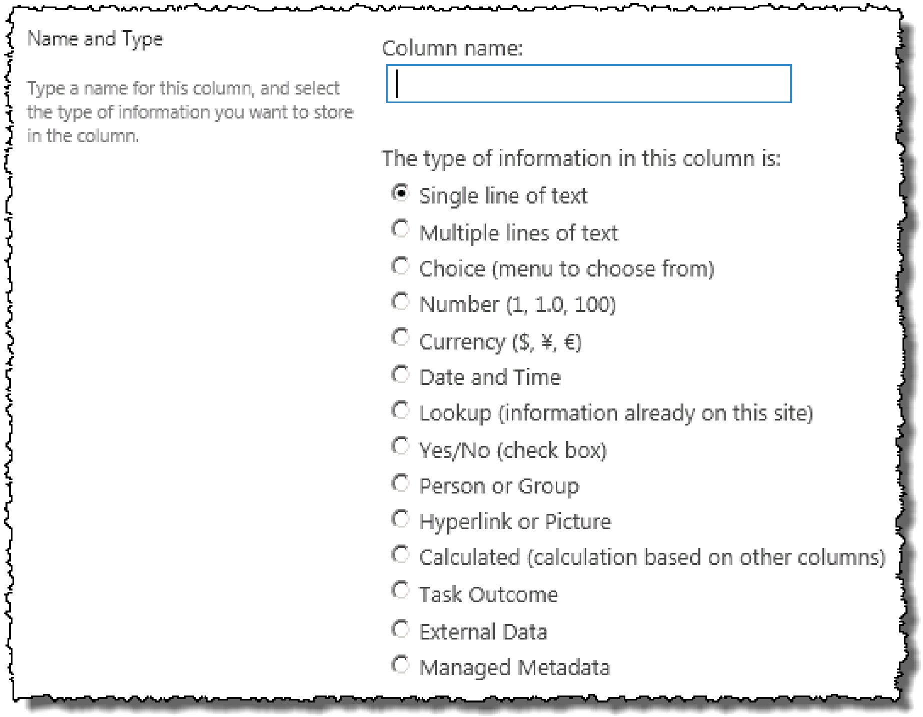
Agenda

- Field Types & Controls
- Site Columns & Content Types
- List Definitions & Templates
- Site Definitions
- Web Templates

SharePoint Included Field Types & Controls

- **File types in SharePoint are column data types**
- **Defined in various XML files:**
  - □ `[..]\15\TEMPLATE\XML\fldtypes[*].xml`
- **Field controls = display & new/edit rendering of field type**
- **Developers can create custom field types and/or controls**
- **Only possible in on-prem & deployed using farm solutions**



Name and Type

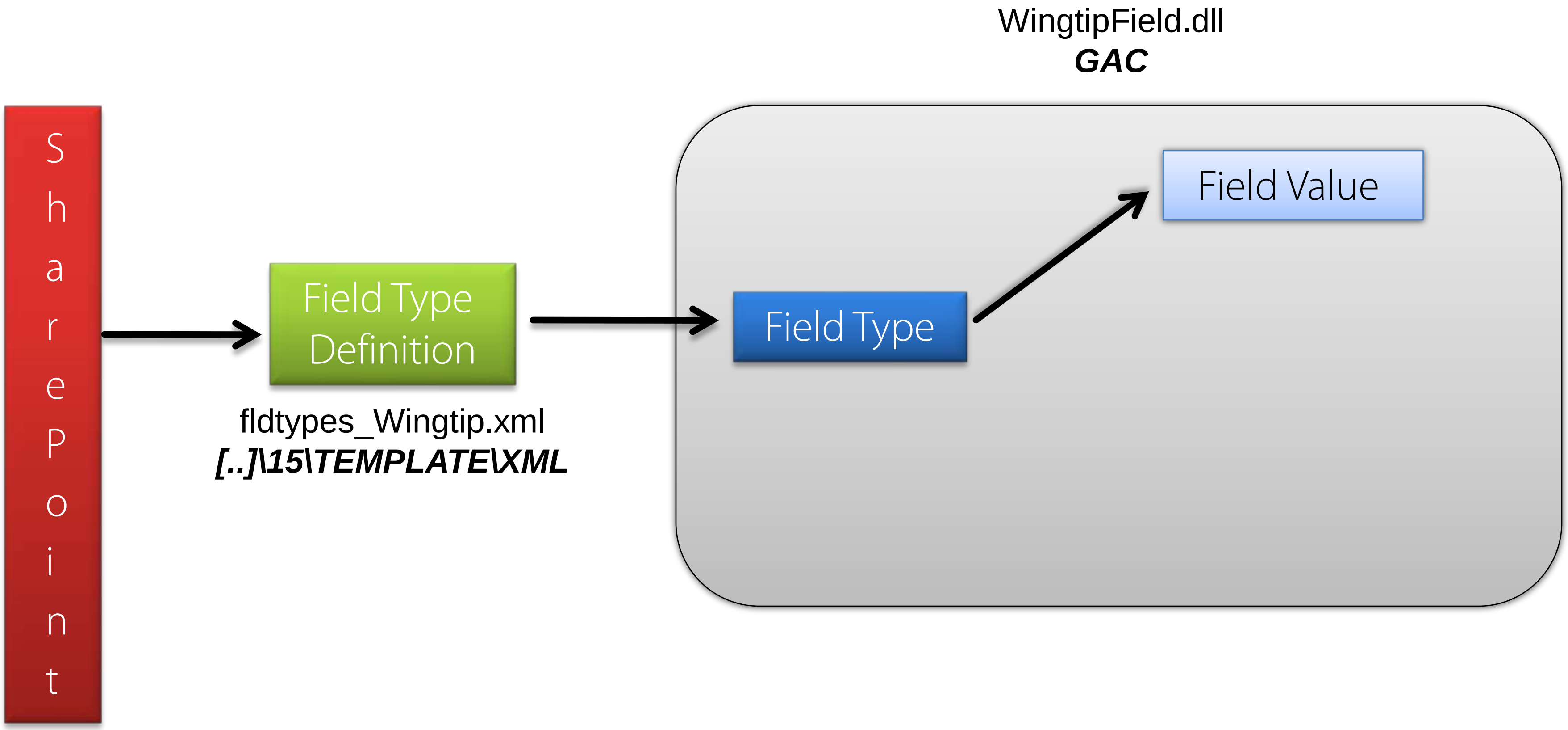
Type a name for this column, and select the type of information you want to store in the column.

Column name:

The type of information in this column is:

● Single line of text
○ Multiple lines of text
○ Choice (menu to choose from)
○ Number (1, 1.0, 100)
○ Currency ($, ¥, €)
○ Date and Time
○ Lookup (information already on this site)
○ Yes/No (check box)
○ Person or Group
○ Hyperlink or Picture
○ Calculated (calculation based on other columns)
○ Task Outcome
○ External Data
○ Managed Metadata

Custom Field Type



SharePoint

Field Type Definition

fldtypes_Wingtip.xml
[..]\15\TEMPLATE\XML

WingtipField.dll
GAC

Field Type

Field Value

Creating Custom Field Types Requirements

- **Create a custom field type class inheriting from a base field type class:**

SPFieldBoolean	SPFieldMultiChoice	SPFieldText
SPFieldChoice	SPFieldMultiLineText	SPFieldUrl
SPFieldCurrency	SPFieldNumber	SPFieldUser
SPFieldDateTime	SPFieldRatingScale	SPFieldMultiColumn
SPFieldLookup		

  - Must be deployed to GAC as a strong-named assembly

- **Create a field type definition:**
  - XML file making SharePoint aware of the field type
  - Contains pointer to class & assembly containing type
  - Contains rendering logic & default values

Custom Field Values Type

- **When base field types do not support a special data structures required by your custom field type, you can create your own**
- **Requirements:**
  - Must be serializable – should implement `ToString()`
  - Must implement two constructors (can simply call the base value type class):

```
public class NaAddressFieldValue : SPFieldMultiColumnValue {
  private const int NumberOfColumns = 5;

  public NaAddressFieldValue() : base(NumberOfColumns) { }
  public NaAddressFieldValue(string value) : base(value) { }

  public string Street1 {
    get { return this[0]; }
    set { this[0] = value; }
  }
  public string Street2 { /* .. */ }
  public string City { /* .. */ }
  public string StateCode { /* .. */ }
  public string ZipCode { /* .. */ }
}
```

Custom Field Values Type (ctd.)

- **Custom field type values require overriding one method on the field type class:**
  - `GetFieldValue()`
    - Called when SharePoint makes a call to `SPListItem[“CustomFieldType”]`

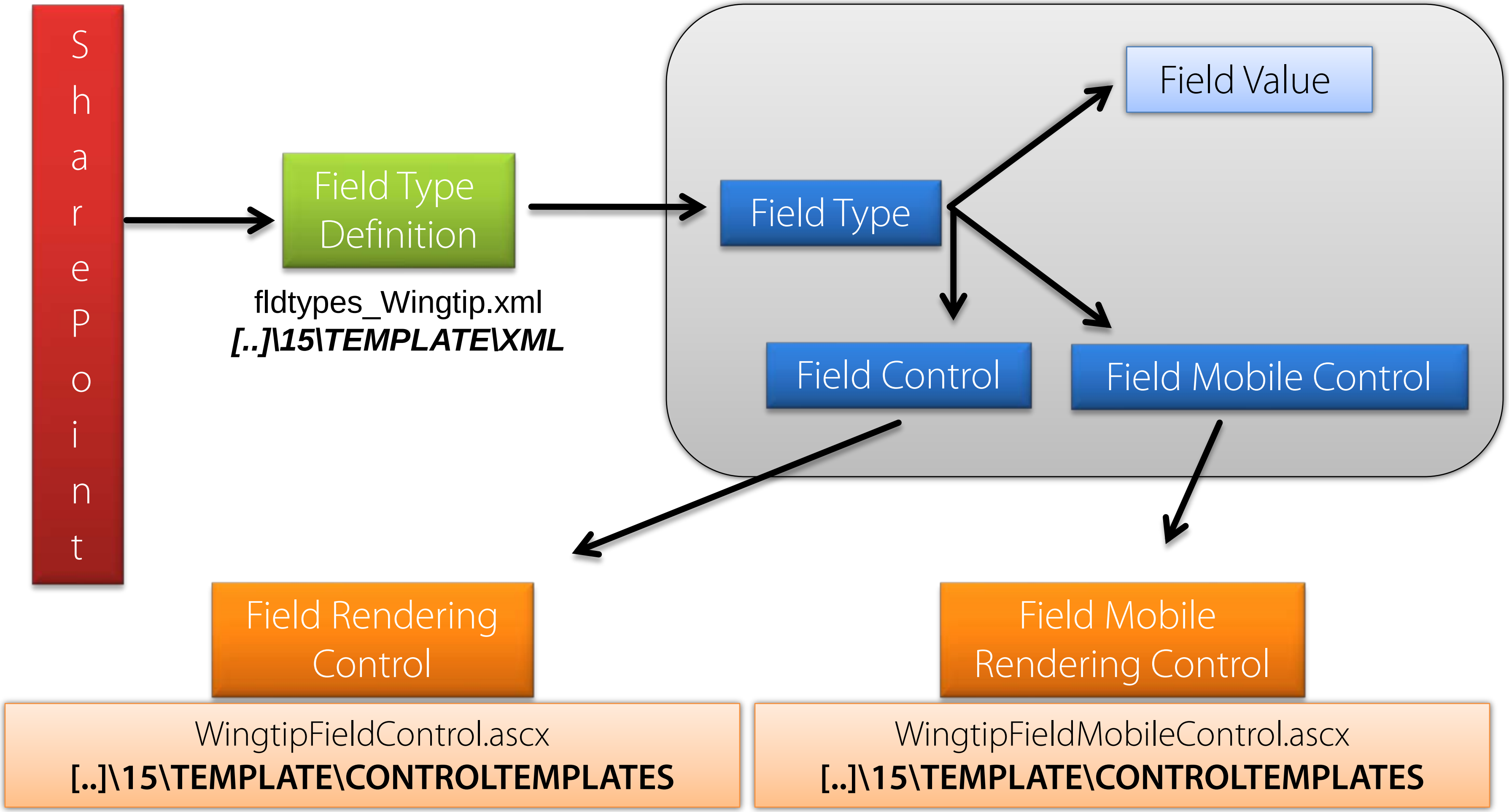
Customizing Behavior of Custom Field Types

- **`GetFieldValueAsText()`**, **`GetFieldValueAsHtml()`** & **`GetFieldValueAsEdit()`**
  - □ Returns the field as either text / HTML or for editing
- **`GetFieldValue()`**
  - □ Use this when the type contains a custom value type
- **`IDesignTimeHtmlProvider.GetDesignTimeHtml()`**
  - □ Used to display the field type in design mode (SPD)
- **`OnAdded`** / **`OnUpdated`** / **`OnDeleting`**
  - □ Events enabling developers to add custom logic on conditions

Validating Custom Field Types

- **Validation can be defined in rendering control using ASP.NET 2.0 validation controls**
  - □ Downside: bypassed when working with the field through code
- **Can override the `GetValidatedString()` method on the custom field class**
  - □ If data is not valid, throw exception of type `SPFieldValidationException`
  - □ **Make sure to include logic if the field is required** (indicated by the `Required` property on the
    base field class)

Custom Field Control



WingtipField.dll
GAC

SharePoint

Field Type Definition

fldtypes_Wingtip.xml
[..]\15\TEMPLATE\XML

Field Type

Field Value

Field Control

Field Mobile Control

Field Rendering Control

WingtipFieldControl.ascx
[..]\15\TEMPLATE\CONTROLTEMPLATES

Field Mobile Rendering Control

WingtipFieldMobileControl.ascx
[..]\15\TEMPLATE\CONTROLTEMPLATES

Custom Field Controls

- Use custom field controls when the edit experience of a field does not meet business requirements
- Do not need to create a custom field type when creating a custom field control
  - Can leverage an existing field type
- Create an ASCX file for the new / edit experience
- Can include ASP.NET 2.0 validation controls for client-side validation

Creating Custom Field Controls

- **Create an `*.ASCX` file containing a `<SharePoint:RenderingTemplate>` tag**
- **Create class that inherits from:**
  - □ `Microsoft.SharePoint.WebControls.BaseFieldControl`
- **Override following methods & properties:**
  - □ `DefaultTemplateName` – specifies the ID of the rendering template
  - □ `CreateChildControls()` – associate & init any Web controls in rendering template
  - □ `Value` – get / set properties on the Web controls

Agenda

- ✓ Field Types & Controls
- ➢ Site Columns & Content Types
- List Definitions & Templates
- Site Definitions
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Site Columns

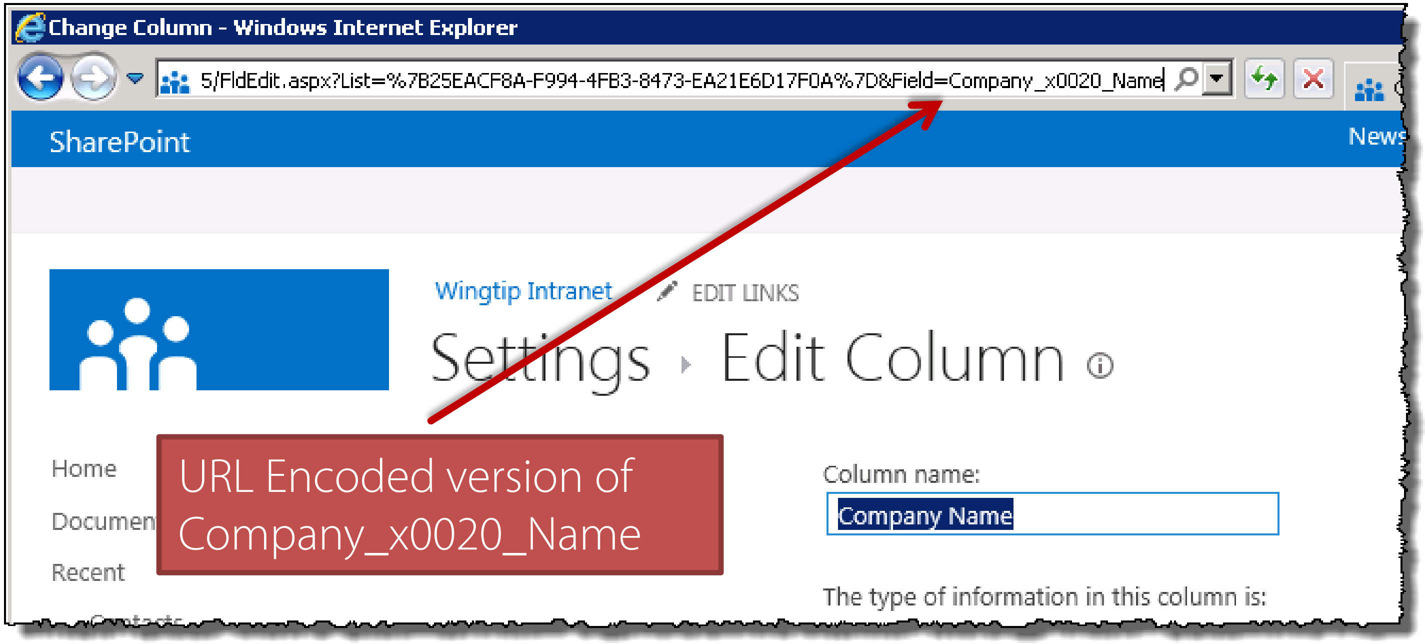
- **Reusable column template for use within lists and content types**
- **Specify:**
  - □ Name & description
  - □ Data type
  - □ Site column group
- **Scoped at the site level**
  - □ Available to child sites
- **Adding to a list / content type creates a copy**
- **To manage, must have Web designer rights**

Creating & Managing Site Columns

- **Create / manage many ways:**
  - □ Browser-based user interface
  - □ SharePoint Designer 2013
  - □ SharePoint object model (server-side / CSOM)
  - □ Feature XML `<Field>`
- **Features & object model provide most control**
  - □ Easy to version in virtually all source control systems
  - □ Highest level of reuse

The Feared & Dreaded _x0020_ !!!

- When creating columns with spaces in the names, the internal name (ID) converts spaces to encoded spaces (x0020)
- To avoid this, explicitly set the internal name within a the XML definition



Change Column - Windows Internet Explorer

5/FldEdit.aspx?List=%7B25EACF8A-F994-4FB3-8473-EA21E6D17F0A%7D&Field=Company_x0020_Name

URL Encoded version of Company_x0020_Name

Column name: Company Name

The type of information in this column is:

Creating Site Columns with Features

```xml
<?xml version="1.0" encoding="utf-8"?>
<Elements xmlns="http://schemas.microsoft.com/sharepoint/">
  <Field ID="{41f2138d-f9d7-4bd8-a369-54054b016c22}"
       Name="ReferringCompany"
       DisplayName="Referring Company"
       Group="Wingtip Site Columns"
       Type="Text"
       Hidden="FALSE"
       Required="FALSE"
       ReadOnly="FALSE"
       Sealed="FALSE"
       DisplaceOnUpgrade="TRUE">
  </Field>
</Elements>
```

Content Types

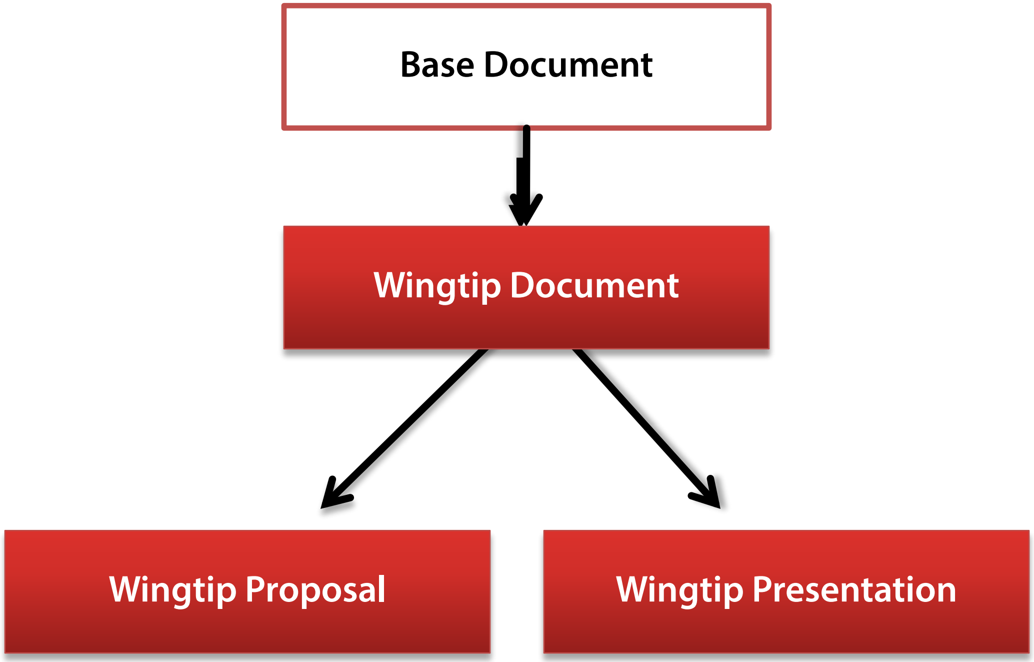
- **Used to define a type of data**
- **Enable storage of different types of content in same list or library**
- **Specify:**
  - Name & description
  - Site columns, workflows, event receivers, policies, etc.
  - Content type group
- **Scoped at the site level**
  - Available to child sites
- **Adding to a list creates a copy**
- **To manage, must have Web designer rights**

Creating & Managing Content Types

- **Create / manage many ways:**
  - Browser-based user interface
  - SharePoint Designer 2013
  - SharePoint object model (server-side / CSOM)
  - Feature XML `<ContentType>`
- **Features & object model provide most control**
  - Easy to version in virtually all systems
  - Highest level of reuse

Inheriting Content Types

- **Allows base definition reuse across multiple types**
  - □ Core properties can be defined in base content types
  - □ The Base content type is inherited by more specific content types



Creating Content Types with Features

```xml
<?xml version="1.0" encoding="utf-8"?>
<Elements xmlns="http://schemas.microsoft.com/sharepoint/">
  <!-- Parent ContentType: Contact (0x0106) -->
  <ContentType ID="0x010600ADFF3A525118400BA1271AAAAB3A7F4B"
               Name="SalesLead" Group="Custom Content Types"
               Description="My Content Type"
               Inherits="TRUE"
               Version="0">
    <FieldRefs>
      <FieldRef ID="{41f2138d-f9d7-4bd8-a369-54054b016c22}"
                Name="ReferringCompany"
                DisplayName="Referring Company"
                Required="FALSE" />
    </FieldRefs>
  </ContentType>
</Elements>
```

Upgrading Content Types

- Upgrading content types has always been hard
- New `<UpgradeActions>` element in Feature schema
- One of the action is `<AddContentTypeField>`
- Enables developers to easily upgrade content types

```xml
<?xml version="1.0" encoding="utf-8" ?>
<Feature xmlns="http://schemas.microsoft.com/sharepoint/">
  <UpgradeActions>
    <VersionRange BeginVersion="1.0.0.0" EndVersion="2.0.0.0">
      <AddContentTypeField
              ContentTypeId="0x010600ADFF3A525118400BA1271AAAAB3A7F4B"
              FieldId="{41f2138d-f9d7-4bd8-a369-54054b016c22}"
              PushDown="TRUE"/>
    </VersionRange>
  </UpgradeActions>
</Feature>
```

Upgrading Content Types – Special Note

- **Upgrading content types should be thoroughly tested in each scenario**
- **Strongly recommended to read the following resources:**
  - □ Patterns & Practices: SharePoint Guidance http://msdn.microsoft.com/en-us/library/ff770300.aspx
  - □ P&P: SharePoint Guidance: Columns, Lists & Content Types http://msdn.microsoft.com/en-us/library/ff798404.aspx
  - □ MSDN Documentation: Updating Content Types http://msdn.microsoft.com/en-us/library/aa543504.aspx

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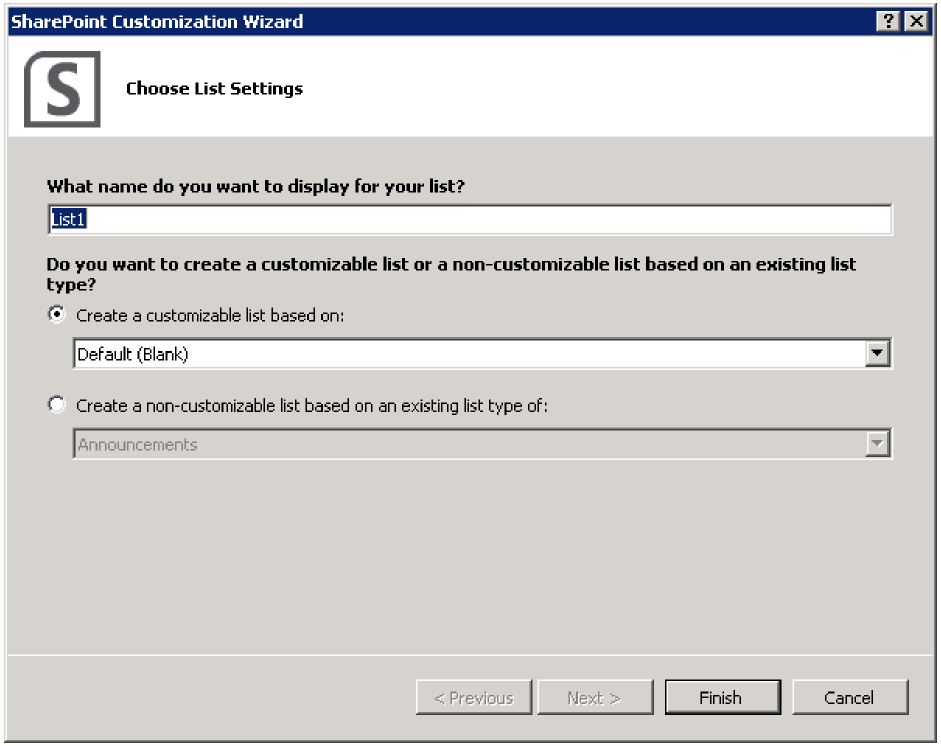
List Definitions & Visual Studio

- **Visual Studio 2010:**
  - Included 3 project template types:
    - List Definition
    - List Definition with Content Type
    - List Instance
- **Visual Studio 2012:**
  - Includes one project template type with a wizard



Choose List Settings

What name do you want to display for your list?

List1

Do you want to create a customizable list or a non-customizable list based on an existing list type?

● Create a customizable list based on:

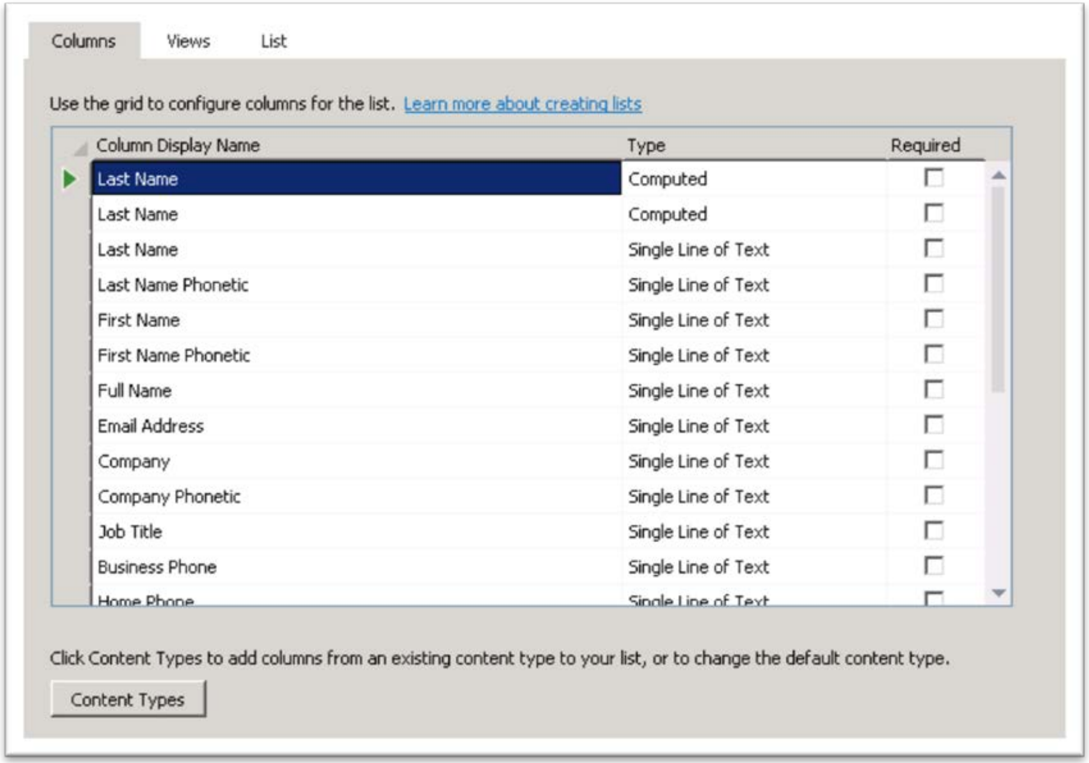
Default (Blank)

○ Create a non-customizable list based on an existing list type of:

Announcements

List Definition Designer

- Visual Studio 2012 introduces a new list designer
- Add columns to the list
- Add columns to views
- Create views
- Modify list settings



Use the grid to configure columns for the list. Learn more about creating lists

Column Display Name	Type	Required
Last Name	Computed	□
Last Name	Computed	□
Last Name	Single Line of Text	□
Last Name Phonetic	Single Line of Text	□
First Name	Single Line of Text	□
First Name Phonetic	Single Line of Text	□
Full Name	Single Line of Text	□
Email Address	Single Line of Text	□
Company	Single Line of Text	□
Company Phonetic	Single Line of Text	□
Job Title	Single Line of Text	□
Business Phone	Single Line of Text	□
Home Phone	Single Line of Text	□

Click Content Types to add columns from an existing content type to your list, or to change the default content type.

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Site Definition

- **Top-level component for site provisioning**
  - □ Used to create site templates
  - □ Aggregates smaller, more modular definitions
- **Every site is provisioned from a site definition**
  - □ The association remains in place for lifetime of site
  - □ Each site definition has one or more configurations
  - □ Each configuration can serve as creatable site template

Site Definition Contents

- **`ONET.XML`**
  - □ Acts as manifest for site definition
- **`WEBTEMP.XML`**
  - □ Language-specific file used to activate site definition
- **Page template files**
  - □ Used to provision home page and secondary pages

Create A Site From A Site Definition

- **Create a new site from Team Site template**
  - Using default configuration for STS site definition

```
$newSite = New-SPSite -Url "http://intranet.wingtip.com/sites/sitename"
                      -OwnerAlias "wingtip\administrator"
                      -Template "STS"
                      -Name "Site Title"
```

- **Create a new site from Blank Site template**
  - Using explicit configuration from STS site definition

```
$newSite = New-SPSite -Url "http://intranet.wingtip.com/sites/sitename"
                      -OwnerAlias "wingtip\administrator"
                      -Template "STS#1"
                      -Name "Site Title"
```

Global Site Definition

- **Contains global provisioning instructions**
  - What's inside affects provisioning for every site in farm
  - Eliminates redundant markup required in all templates

- **Global Site Definition defines and provisions**
  - Master Page Gallery and `default.master`
  - Web Part Gallery
  - List Template Gallery
  - Site Template Gallery
  - Solution Gallery
  - User Information Profile list

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- ✓ Site Definitions
- ➢ **Web Templates**

Web Template

- **Introduced in SharePoint 2010**
- **Provides a way to define a site template without using farm solutions**
  - □ Web Templates can be deployed in sandbox solutions
- **Doesn’t require the `webtemp.xml` that is required with site definitions**
- **Can be included in SharePoint Apps**

Creating Custom Web Templates

- Must derive & reference an existing base template
- Registered using `WebTemplate` in a Feature's element manifest file
- Include `onet.xml` to define template

Summary

- ✓ Field Types & Controls
- ✓ Site Columns & Content Types
- ✓ List Definitions & Templates
- ✓ Site Definitions
- ✓ Web Templates