ALM Integration with Blueprint 10.1

Configuration Guide

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2019-05-07

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Overview

This *ALM Integration Configuration Guide* is applicable if you want to integrate Blueprint with an Application Lifecycle Management (ALM) system, such as HP ALM, or Microsoft Team Foundation Server (TFS).

This guide provides instructions for configuring ALM integration so users can export artifacts from Blueprint to the ALM system.

Note: ALM integration is a separately licensed component. Please contact customer support if you wish to purchase a license to use this functionality.

Important: As of Blueprint 5.1.1, ALM adapter licensing has changed to provide license enforcement based on your specific license details. Please contact Blueprint customer support if you experience issues with ALM integration after upgrading to Blueprint 5.1.1.

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System Requirements

Application Requirements

> **Note:** Integration with the following versions of HP ALM is only available if the HP legacy 32-bit connector has been installed.

Blueprint supports integration with the following ALM systems:

- HP ALM 11

  > **Note:** The Blueprint REST API does not support HP ALM version 11. Native support for HP ALM 11 is available through the COM library and CloudConnect.

- HP ALM 11.5
- HP ALM 11.52
- HP ALM 12
- Microsoft Team Foundation Server 2010
- Microsoft Team Foundation Server 2012
- Microsoft Team Foundation Server 2013

User Requirements

Microsoft TFS Integration

If you want to integrate Blueprint with TFS, the Blueprint Server User must have read/write permissions to the following location:

`C:\ProgramData\Microsoft\Team Foundation`

> **Note**: These permissions are required because the Microsoft TFS APIs require access to this folder.

HP ALM Integration

No additional user requirements have been identified at this time.

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Configuration

ALM Integration with Blueprint requires some configuration of both the ALM system and Blueprint:

- Step 1: Configure the ALM system so Blueprint can access it
- Step 2: Configure Blueprint to connect to the ALM system

Step 1: Configure the ALM system so Blueprint can access it

The configuration of the ALM system differs slightly depending on whether you are using the hosted Blueprint cloud solution or an on-premise installation of Blueprint:

- Configuring ALM Integration (with Blueprint Cloud): Follow these configuration instructions if you use blueprintcloud.com. These configuration instructions are applicable for integration with HP ALM and TFS.
- Configuring HP ALM Integration (with On-Premise Blueprint Installation): Follow these configuration instructions if you have an on-premise installation of Blueprint and you want to integrate Blueprint with HP ALM.
- Configuring Microsoft TFS Integration (with On-Premise Blueprint Installation): Follow these configuration instructions if you have an on-premise installation of Blueprint and you want to integrate Blueprint with TFS.

Configuring ALM Integration (with Blueprint Cloud)

The only way to integrate your ALM system with Blueprint cloud is to open your firewall to allow Blueprint cloud to access your internal ALM server.

Important: The HP ALM libraries are web server specific. The default Blueprint Cloud servers are currently configured to ONLY work with HP ALM11.

To configure ALM Integration with Blueprint Cloud:

Note: These changes require modifications to the firewall and need to be performed by your network administrator.

1. Obtain a public accessible Internet IP address for your organization.
2. Create a NAT rule on the external firewall to allow access from external IP addresses to your internal ALM server.

   Allow the ALM port (default: 8080) access to the internal ALM server.
3. Test your connection from an External IP.
4. (Optional) In order to secure the connection (while maintaining communication between the Blueprint Cloud servers to your ALM server), change the firewall rule to only allow Blueprint Cloud IP address access through the NAT rule. You can obtain the Blueprint Cloud external IP address by pinging the site name (example: ping customer.blueprintcloud.com).

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Configuring HP ALM Integration (with On-Premise Blueprint Installation)

To integrate an on-premise installation of Blueprint with HP ALM, you must install some DLL files that facilitate communication between the Blueprint server and your ALM server.

To configure HP ALM, install the DLL files by performing the following steps:

1. Right-click Internet Explorer and select **Run As Administrator**.
2. Launch the HP client site from the Blueprint web server. Example: **`http://<servername>/almbin/`**
3. Click **Tools**.

   > **Note:** On the HP ALM version 11 client site, click **Add-ins page**.

4. Click **HP ALM Connectivity**.

   > **Note:** For HP ALM version 11, click **HP Quality Center Connectivity**.

5. Click the **Download** link.
6. Download and install **`TDConnect.exe`**.

Configuring Microsoft TFS Integration (with On-Premise Blueprint Installation)

To integrate an on-premise installation of Blueprint with TFS, you must install some DLL files that facilitate communication between the Blueprint server and TFS server.

To configure TFS, install the DLL files by performing the following steps:

1. Install Visual Studio Team Explorer. This package contains the DLL files that are required for exporting Blueprint artifacts to TFS.
2. Install Visual Studio Test Manager. This add-in contains the DLL files that are required for exporting generated tests to TFS.
3. (Recommended) Turn off the Just-In-Time (JIT) debugger:

   > **Note**: After you install Team Explorer, the JIT debugger is enabled by default. We highly recommend that you disable this feature. If the JIT debugger is enabled, it attempts to catch and debug any Unhandled Exceptions, sometimes causing the process to hang.

   1. Launch Visual Studio Team Explorer as the Administrator (that is, using the **Run as administrator** option).
   2. Click the **Debug** menu and select **Options and Settings**.
   3. Under *Debugging*, select **Just-In-Time**.
   4. Clear the following options:

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- **Managed**
- **Native**
- **Script**

5. Click **OK** to save your changes.

4. Complete the following if you are running Visual Studio 2012 Team Explorer on the Blueprint Web Application Server:

> **Important**: These additional steps are only required if you are *only* running Visual Studio 2012 Team Explorer on the Blueprint Web Application Server. These steps are **not** required if you are running *both* Visual Studio 2010 Team Explorer and Visual Studio 2012 Team Explorer on the Blueprint Web Application Server.

1. Stop the Blueprint application pool and Blueprint web site.

> **Note**: Your Blueprint application pool and Blueprint web site may have different names, depending on what you chose during installation.

2. Open the Blueprint **`Web.config`** file in a text editor and verify that you have permissions to edit the file.

> **Note**
>
> The **`Web.config`** file is located in the **`Web`** folder where you installed Blueprint. The default path is:
>
> **`C:\Program Files\Blueprint Software Systems\Blueprint\Web\Web.config`**

3. Uncomment the elements in the **<runtime>** section at the bottom of the file by removing the **<!--** and **-->** text shown below:

```
<runtime>
<assemblyBinding xmlns="urn:schemas-microsoft-com:asm.v1">
<dependentAssembly>
<assemblyIdentity name="log4net"
publicKeyToken="1b44e1d426115821" culture="neutral" />
<bindingRedirect oldVersion="0.0.0.0-1.2.10.0"
newVersion="1.2.11.0" />
</dependentAssembly>
<!--Enable the code block below to use TFS version 2012 instead
of version 2010-->
<!--
<dependentAssembly>
<assemblyIdentity name="Microsoft.TeamFoundation.Client"
publicKeyToken="b03f5f7f11d50a3a" culture="neutral" />
<bindingRedirect oldVersion="10.0.0.0-10.65535.65535.65535"
newVersion="11.0.0.0" />
</dependentAssembly>

<dependentAssembly>
```

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```
<assemblyIdentity name="Microsoft.TeamFoundation.Common"
publicKeyToken="b03f5f7f11d50a3a" culture="neutral" />
<bindingRedirect oldVersion="10.0.0.0-10.65535.65535.65535"
newVersion="11.0.0.0" />
</dependentAssembly>

<dependentAssembly>
<assemblyIdentity
name="Microsoft.TeamFoundation.VersionControl.Client"
publicKeyToken="b03f5f7f11d50a3a" culture="neutral" />
<bindingRedirect oldVersion="10.0.0.0-10.65535.65535.65535"
newVersion="11.0.0.0" />
</dependentAssembly>

<dependentAssembly>
<assemblyIdentity
name="Microsoft.TeamFoundation.TestManagement.Common"
publicKeyToken="b03f5f7f11d50a3a" culture="neutral" />
<bindingRedirect oldVersion="10.0.0.0-10.65535.65535.65535"
newVersion="11.0.0.0" />
</dependentAssembly>

<dependentAssembly>
<assemblyIdentity
name="Microsoft.TeamFoundation.TestManagement.Client"
publicKeyToken="b03f5f7f11d50a3a" culture="neutral" />
<bindingRedirect oldVersion="10.0.0.0-10.65535.65535.65535"
newVersion="11.0.0.0" />
</dependentAssembly>

<dependentAssembly>
<assemblyIdentity
name="Microsoft.TeamFoundation.WorkItemTracking.Client"
publicKeyToken="b03f5f7f11d50a3a" culture="neutral" />
<bindingRedirect oldVersion="10.0.0.0-10.65535.65535.65535"
newVersion="11.0.0.0" />
</dependentAssembly>
-->
</assemblyBinding>
</runtime>
```

4. Save the **`Web.config`** file.
5. First start the Blueprint application pool and then start the Blueprint web site.

Step 2: Configure Blueprint to connect to the ALM system

Project administrators with the applicable privileges can configure ALM targets so users can export Blueprint artifacts to other Application Lifecycle Management (ALM) systems.

Project administrators with the applicable privileges can set the ALM security settings to control which users have access to ALM targets.

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When users are performing an ALM Export or generate a Test Plan, they can choose from a pre-populated list of ALM Targets. The ALM Targets that appear in the list is different for each user, depending on whether they have access to the targets. ALM Security allows project administrators to control which ALM Targets appear for each user.

Setting up ALM Targets in Blueprint is a two step process:

1. Add the ALM target to Blueprint
2. Grant users access to the ALM target

Adding ALM Targets to Blueprint

To create a new ALM target:

1. Open the *ALM Targets* tab.
    1. Open the *Project Administration Console*.
    2. Click **ALM** > **ALM Targets** on the ribbon (*Project Admin* tab, *Project* group).
2. Click the **New** button on the ribbon (*Project Admin* tab, *Actions* group) and then select one of the following options:
    - **HP ALM-COM**: Creates a new target connecting Blueprint to HP ALM versions 11 and later.
    - **HP ALM-REST**: Creates a new target that allows you to connect Blueprint to HP ALM versions 11.5 and later using the Blueprint REST API.
    - **TFS Target**: Creates a new TFS target.
    - **From Existing Project**: Creates a new ALM target based on an existing target in another project. If you select this option, you must choose a specific target from another project.

    either or .

    A new ALM Target is added. The details appear on the rightmost side of the screen.
3. Type a **Name** for the new target.
4. Set the target **Location**:
    1. Click the ... button. The *ALM Connection Editor* dialog appears.
    2. Type the **URL** of the ALM server (example: **`http://bps-alm10:8080/almbin`** or **`http://vmdev:8080/tfs`**)

        > **Note**: If you are accessing the ALM server from the Blueprint Cloud, ensure that you specify the external IP address (instead of the internal IP).

    3. Specify a valid **User Name**.
    4. Specify a valid **Password**.
    5. Click the **Connect** button.

        If you are creating an HP ALM Target, the **Connect** button pre-populates the **Domain** and **Project** fields with valid options.

        If you are creating a TFS Target, the **Connect** button pre-populates the **Team Project Collection** and **Team Project** fields with valid options.
    6. Perform one of the following actions:

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- If you are creating an HP ALM Target:
  - Select the appropriate **Domain** and **Project**
  - Select your desired behavior for deleted artifacts:
    - **How do you want Blueprint to handle artifacts that are deleted when exporting to HP ALM?**: There are two options:
      - **Flag them only (via 'Blueprint Deleted')**: This option sets the **Blueprint Deleted** field to **Y** in your ALM system if items are deleted in Blueprint. In other words, artifacts are not deleted in your ALM system even if they are deleted in Blueprint.

        > **Note**: This option requires that you have a **Blueprint Deleted** field configured in your ALM system. For more information, refer to the section titled 'Configuring the Blueprint Deleted field in your ALM system'.

      - **Delete them**: This option deletes artifacts in your ALM system when artifacts are deleted in Blueprint and the changes are exported to the ALM system.
- If you are creating a TFS Target:
  - Select the appropriate **Team Project Collection** and **Team Project**

7. Click **OK**.

5. Configure your target options by clicking the **Target Options** button.

   The following options are available for HP ALM Targets:

   - **How do you want Blueprint to handle artifacts that are deleted when exporting to HP ALM?**: There are two options:
     - **Flag them only (via 'Blueprint Deleted')**: This option sets the **Blueprint Deleted** field to **Y** in your ALM system if items are deleted in Blueprint. In other words, artifacts are not deleted in your ALM system even if they are deleted in Blueprint.

       > **Note**: This option requires that you have a **Blueprint Deleted** field configured in your ALM system. For more information, refer to the section titled 'Configuring the Blueprint Deleted field in your ALM system'.

     - **Delete them**: This option deletes artifacts in your ALM system when artifacts are deleted in Blueprint and the changes are exported to the ALM system.
   - **Do you want Blueprint to create a hyperlink for each Blueprint relationship so you can easily access related Blueprint artifacts from the ALM system?**: If enabled, each exported artifact will contain a hyperlink to each related artifact in Blueprint. If disabled, the exported artifacts will still contain a hyperlink back to the artifact in Blueprint, but will not contain hyperlinks to related artifacts.
   - **Do you want Blueprint to export the full artifact hierarchy from the root level?**: If enabled, Blueprint exports all folders needed to show the artifact hierarchy from the root level to each

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exported artifact.

- **Do you want the Change Summary to only report conflicts related to artifacts that are being exported to the ALM system?**: If enabled, conflicts are only reported if you are exporting that particular artifact to the ALM system.
- **Do you want Blueprint to maintain the Blueprint hierarchy of artifacts after exporting to HP ALM?**: If enabled, Blueprint exports artifacts without impacting a modified artifact hierarchy in ALM. In other words, you can move or alter the hierarchy of artifacts in ALM and maintain that structure after re-exporting the artifacts from Blueprint. This feature allows you to maintain a custom structure in ALM and still take advantage of Blueprint's ability to export artifact changes.
- **Do you want to export text fields with Rich Text formatting?**: If enabled, Blueprint exports text fields with full rich text formatting. If this option is not enabled, Blueprint exports plain text only.
- **What would you like the "Export Path" set to by default in the Export Wizard?**: Allows you to make the export easier for users by setting a default export path. If the user does not explicitly set an export path, this default will be used for the export.

The following options are available for TFS Targets:

- **Do you want Blueprint to create a hyperlink for each Blueprint relationship so you can easily access related Blueprint artifacts from the ALM system?**: If enabled, each exported artifact will contain a hyperlink to each related artifact in Blueprint. If disabled, the exported artifacts will still contain a hyperlink back to the artifact in Blueprint, but will not contain hyperlinks to related artifacts.
- **Do you want Blueprint to export the full artifact hierarchy from the root level?**: If enabled, Blueprint exports all folders needed to show the artifact hierarchy from the root level to each exported artifact.
- **Do you want the Change Summary to only report conflicts related to artifacts that are being exported to the ALM system?**: If enabled, conflicts are only reported if you are exporting that particular artifact to the ALM system.
- **Do you want to export text fields with Rich Text formatting?**: If enabled, Blueprint exports text fields with full rich text formatting. If this option is not enabled, Blueprint exports plain text only.
- **What would you like the "Area Path" set to by default in the Export Wizard?**: Allows you to make the export easier for users by setting a default area path. If the user does not explicitly set an area path, this default will be used for the export.

6. Configure the mapping details:

   The mapping details allow you map each artifact type to a data field in your ALM system.

   1. For each *Artifact Type*, click the drop-down in the *External Type* column and select a data type.

      Tip: If the ⊗ icon appears, there is a conflict you must resolve. Resolve the issue and click the **Validate Target** button to re-validate your settings.

   2. For each *Artifact Type*, click the **Edit...** button and configure the property mappings on the ALM Field Mapping Editor dialog.

      The ALM properties are displayed on rightmost side. Using the drop-down options, map each Blueprint property (on the left) to an ALM property (on the right).

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Note: You can map the same Blueprint properties to multiple ALM properties.

Below are the high-level mapping rules for Blueprint to HP ALM:

		HP QC Types				
Blueprint Types		String	Number	DateTime	List	Group List
	String		(1)		(2)	
	Number				(2)	
	DateTime				(2)	
	Choice		(1)		(2)	
	User/Group		(1)		(2)	

(1) Will only work If string converts to the underlying data type.
(2) When value checking is turned on in QC, export will only succeed if the value is in the QC list.

Below are the high-level mapping rules for Blueprint to TFS:

		TFS Types						
Blueprint Types		String	Integer	Double	DateTime	PlainText	Html	TreePath
	String		(1)	(1)				(2)
	Number							
	DateTime							
	Choice		(1)	(1)				(2)
	User/Group		(1)	(1)				

(1) Will only work if string converts to underlying data type.
(2) Will only work if value is in list of TFS values.

3. When you are finished, click **OK** to close the dialog.

7. Click **Save**.

Granting access to ALM Targets

To grant access to an ALM target:

1. Open the *ALM Security* tab.
    1. Open the *Project Administration Console*.
    2. Click **ALM** > **ALM Security** on the ribbon (*Project Admin* tab, *Project* group).
2. Click the target (on the left side) for which you want to configure security.

    The users and groups that have access to the target are displayed on the right side of the screen.
3. Click the **Add** button.

    The Select Identity dialog appears.
4. Select the users and/or groups that you want to grant access to, and then click **OK**.

    Click the *Users* and *Group* tabs to toggle between the list of users and groups.

    Tip: You can select multiple users and/or groups by holding the **`Ctrl`** key and clicking multiple users and groups. You can also click **`Ctrl-A`** to select all.
5. Click **Save**.

After the configuration is complete, you can verify that ALM integration is working by exporting artifacts to your ALM system.

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Appendix

Verifying the ALM Integration Configuration

A user can export artifacts to an ALM system provided that:

- an ALM target exists in the project
- ALM security has been configured such that the user has been granted access to the ALM target

If the above conditions are met, you can test the ALM export feature by performing the steps below.

To set up the export to an ALM target:

1. Click the **ALM Export** button on the ribbon (*Import/Export* tab, *Export* group).

   The *Source Project* screen of the *ALM Export Wizard* appears.

2. Select the project that contains the artifact(s) you want to export to an ALM target, and then click **Next**.

   The *Select Target* screen appears.

3. Select the target that you want to export the artifacts to, modify the export options, and then click **Next**.

   The following options can be set:

   - What would you like to do?
     - **Export all artifacts that changed since last publish**: Allows you to export all artifacts that have changed since the last export.
     - **Export all artifacts selected**: Allows you to export only the selected artifacts.
   - **Export Path**: Defines the path in the HP ALM system where the artifacts will be exported. To change the path, click the ... button to open the *Location Picker* dialog. The *Location Picker* dialog displays the directory structure of your ALM system. Choose the directory where you want to export the artifacts and then click **OK** to close the dialog.

     > **Note**: This option is only available for HP ALM targets.

   - **Generate images for document output**: Defines whether or not you want to generate images for graphic artifacts that you are exporting, such as diagrams. If this option is disabled, images are not exported.

     If this option is disabled, images (that is, graphic artifacts) are not exported to the ALM system.

   After you click **Next**, the *Select Revision* screen appears.

4. Select whether you want to export data from live artifacts, or data from a baseline or review and then click **Next**.

   The *Artifacts to Export* screen appears.

5. Select the artifacts you want to export and click **Next**.

   Select the artifact(s) that you want to include in the document. Simply select the artifacts and click the **Add** button.

   The *Map Area Path* screen appears if you chose a TFS target.

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6. Specify the area path to which the artifacts should be exported and click **Next**.

   This option is only applicable when you are exporting to a TFS target. This option is not applicable for ALM targets.

After you click **Next**, your setup job is scheduled to run in the queue.

To check the status of your job: click the **Menu** button (on the ribbon), point to *Manage* and then click **Job Management**.

When the status of your job changes, a **notification** icon ( ) appears in the lower left corner of the screen. When your job has completed, click the **Completed** status in the notification to proceed to the next step: Performing the export.

Configuring the Blueprint Deleted field in your ALM system

When you create an ALM target, you must decide what happens if you delete an artifact in Blueprint and then export your changes to the ALM target. When you click the **Target Options** button on the *ALM Targets* tab in the *Project Administration Console*, the following dialog appears:

You can either have the artifacts deleted in your ALM system, or you can simply flag them as deleted. If you want to flag the artifacts as deleted in the ALM system, but not actually delete them, you must create a field in your ALM system called **Blueprint Deleted**.

Creating the Blueprint Deleted field in HP ALM

You only have to create the **Blueprint Deleted** field if you want to flag artifacts as deleted in your ALM system instead of actually deleting them. Here are the values that you must set to create the **Blueprint Deleted** field in HP ALM:

- Field Name: Blueprint Deleted
- Field Type: Lookup List
- History: Enabled (Optional)
- Lookup List Values: YesNo
- Verify Values: Yes
- Allow Multiple Values: No

Creating the Blueprint Deleted field in TFS

If the following custom fields are present in TFS, Blueprint automatically maps to them:

- **Blueprint.Deleted**
- **Blueprint.Folder**

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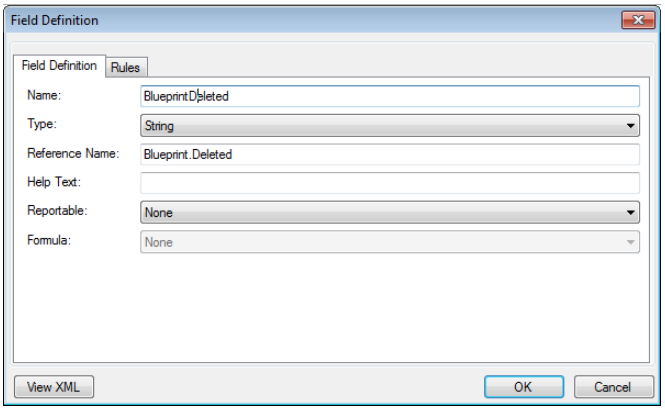
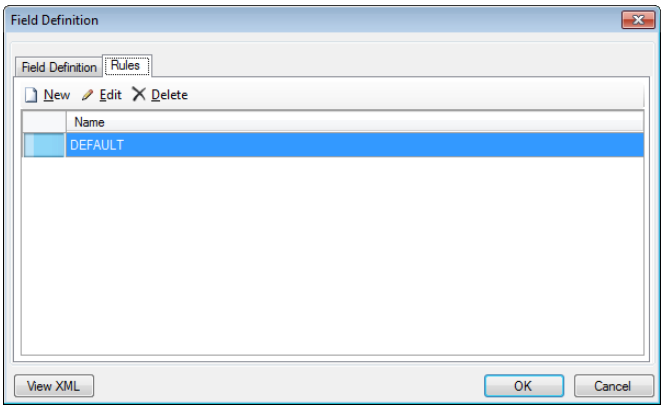
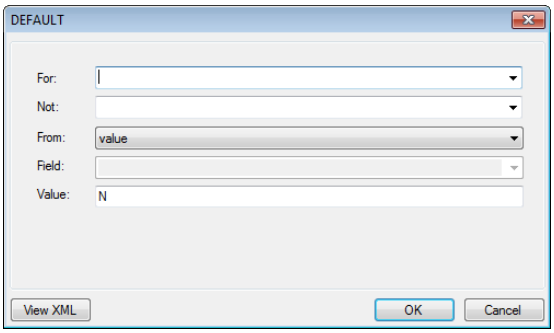
Blueprint.Deleted Field

You can use the **Blueprint.Deleted** field to flag a work item as *Deleted* when the corresponding artifact in Blueprint is deleted or removed from scope. This field defaults to **N** and then changes to **Y** when and artifact is deleted in Blueprint and exported to TFS.

Here's the **Blueprint.Deleted** field definition information:







Blueprint.Folder Field

The **Blueprint.Folder** custom field provides a way to easily determine if an exported item is a folder artifact in Blueprint. This solution provides an alternative to creating a separate custom work item for mapping the folder artifact type in Blueprint. In addition, it is easy to filter these work items in TFS queries. After this field is configured, Blueprint changes the value of this field to **Y** when you export folder artifacts. A default value for this field is not required.

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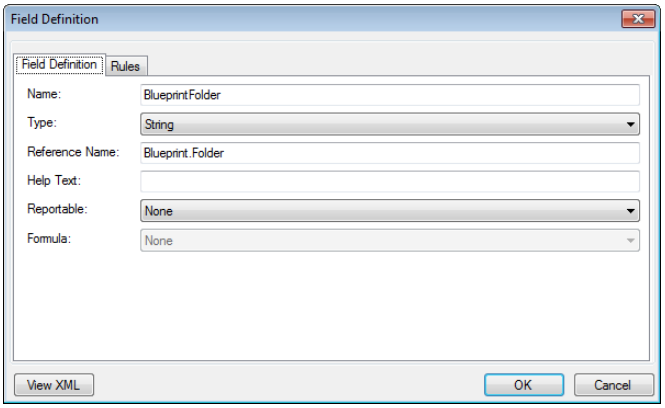
Here's the **Blueprint.Folder** field definition information:



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