

Nick Grattan Consultancy Ltd

Custom Workflow Activity Pack

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The Custom Workflow Activity Pack Actions

The “Custom Workflow Activity Pack” implements a number of custom activities which add new actions to a Microsoft SharePoint Designer workflow. Of special interest is the ability to start other workflows and a set of string manipulation functions.

The custom activities can be used in Microsoft SharePoint Services 3.0 and Microsoft Office SharePoint Server 2007, Standard and Enterprise edition installations.

The following actions are included in the Custom Workflow Activity Pack:

Custom Activity	Purpose
Start Workflow	Starts another workflow on the item or document. Note that a workflow cannot start itself and a workflow can only be started once for a given item or document.
Call Workflow	Starts another workflow and does not return until the called workflow finishes. This allows another workflow to be called like a sub-routine.
While Call Workflow	While a condition on a field in the current item remains true, continue calling another workflow
Halt Workflow	Halts (cancels) another running workflow. If the other workflow is not running the call is ignored.
IsWorkflowRunning	Returns a value indicating whether the workflow with the given name is running or not.
Restart This Workflow	Restarts the current workflow executing at the first step
Send To Records Center	Sends the current item/document to the configured records center
String Left	Returns the “n” left most characters from a string
String Length	Returns the length of a string
String LowerCase	Returns a string in lower case
String Mid	Returns a string starting at position “n” of length “l” characters from a string
String Position	Returns the location of one string in another string, or 0 if the string is not found
String Right	Returns the “n” right most characters from a string
String Trim	Returns a string trimmed of leading and trailing blanks (spaces)
String UpperCase	Returns a string converted to upper case
Write to Trace Log	Write a string to the SharePoint trace log, typically located in the folder \Program Files\Common Files\Microsoft Shared\web server extensions\12\LOGS

Note: The character locations are “1” based and not “0” based. This means that the first character in a string is numbered “1”, the second “2” etc.

Installation Instructions

The Custom Activities can be installed through a SharePoint solutions package using the stsadm tool.

WARNING: If you are not the SharePoint administrator for your farm please ask an administrator to complete these steps

Note: If you have installed a previous version of NGCCustomActivities with a manual (non-wsp) installation please follow the instructions at the end of this document to perform a manual uninstall before installing with the wsp package.

- Download the NGCCustomActivities.zip file and extract out the file NGCCustomActivities.wsp.
- Run a command shell on the SharePoint server.
- Navigate to the folder C:\Program Files\Common Files\Microsoft Shared\web server extensions\12\BIN where, by default, stsadm.exe is located.
- Issue the following command to add the solution – you will need to fully qualify the location of NGCCustomactivities.wsp:

```
stsadm -o addsolution -filename ngccustomactivities.wsp
```

- Issue the following command to deploy the solution (note: you do not need to qualify the file ngccustomactivities.wsp with a path):

```
stsadm -o deploysolution -name ngccustomactivities.wsp -allowgacdeployment -immediate
```

What the Installation does

The following steps are performed by the installation process – you do not need to perform them but they are provided here as a record of what is changed on your SharePoint installation.

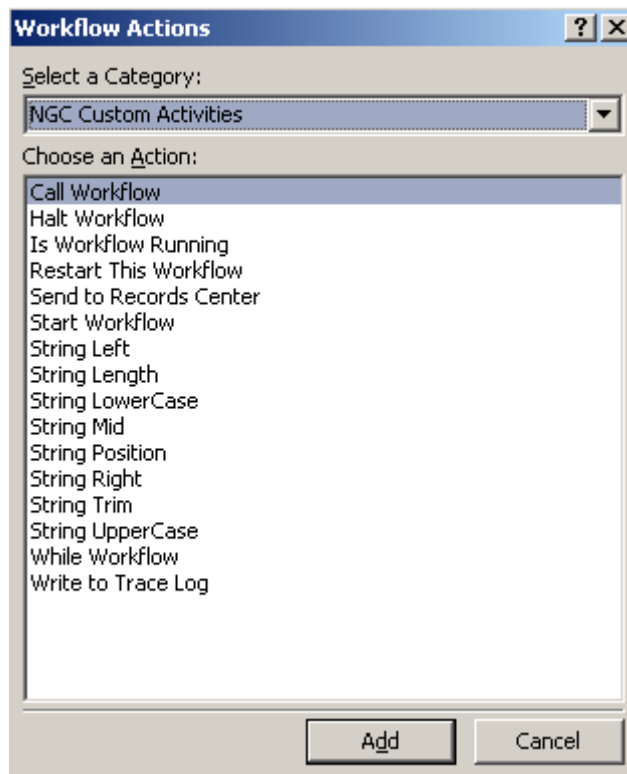
1. **NGCCustomActivities.dll copied into the GAC.**
2. **NGCCustomActivities.ACTIONS copied into TEMPLATE\1033\Workflow folder.**
3. **Update Web.Config to add an authorization Type to Web.Config in each web application:**

```
<authorizedType Assembly="System.Workflow.Runtime, Version=3.0.0.0, Culture=neutral, PublicKeyToken=31bf3856a
<authorizedType Assembly="NGCCustomActivities, Version=1.0.0.0, Culture=neutral, PublicKeyToken=55285224b7719
</authorizedTypes>
```

Testing the Installation

You can check that the installation completed correctly by creating a workflow in Microsoft SharePoint Designer and ensuring the custom activities are listed. To do this:

1. Run the SharePoint designer.
2. Open a web site in the web application in which the custom activities have been installed.
3. Create a new workflow for a list or document library.
4. Drop down the menu on **Actions** button and select **More Actions...** This displays the “Workflow Actions” dialog.
5. Select “NGC Custom Activities” from the **Select a Category** list. This displays the list of custom activities:



If the “NGC Custom Activities” category does not appear check:

1. That the “authorizedType” element has been correctly inserted in the Web.Config file.
2. Ensure you are opening a site in a web application onto which the Custom Activity Pack has been installed.

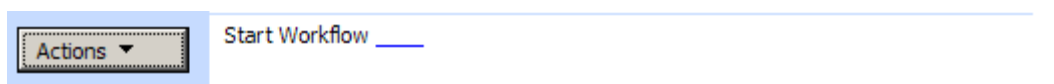
The Custom Activities

This section describes each of the custom activities and how they are used as actions in a Microsoft SharePoint Designer workflow.

Start Workflow

This action allows a workflow to be started on the current item or document against which the current workflow is operating. The next step/action in the workflow will be immediately executed after the “Start Workflow” action has completed. To use this action:

- Add a “Start Workflow” action by dropping down the menu from the **Actions** button and selecting “Start Workflow”:



- Type in the name of the workflow to be started. Ensure that the name of the workflow is entered correctly.



Note the following limitations apply:

1. A workflow cannot restart itself. This is because a workflow can only be running once against a given item or document.
2. A workflow cannot start another workflow that is already running for the same reason.
3. The workflow must be installed in the current list or library – workflows in other lists or libraries cannot be started using this action.

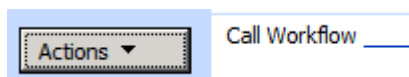
In the event of an error the status of the workflow will be “Error Occurred”. An error will be written to the event log in \Program Files\Common Files\Microsoft Shared\web server extensions\12\LOGS. Example errors include:

Error		
04/25/2008 13:58:06.85 StartWorkflow	NGCCustomActivities (0x087C) 0 High	0x0318 NGCCustomActivities Workflow 'MyWorkflow' generated an exception:Workflow 'MyWorkflow' does not exist or could not be loaded.
04/25/2008 14:02:07.40 StartWorkflow	NGCCustomActivities (0x087C) 0 High	0x0DACNGCCustomActivities The Workflow is already running. Note a Workflow cannot start itself. Workflow:'UT1' Exception: Exception from HRESULT: 0x8102009B

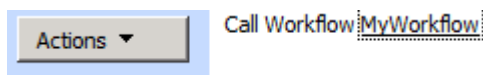
Call Workflow

The “Call Workflow” action will start another workflow, but the action will not return until the called workflow has been completed. The “Call Workflow” action calls the other workflow like a sub-routine. The limitations documented for “Start Workflow” apply to “Call Workflow” too.

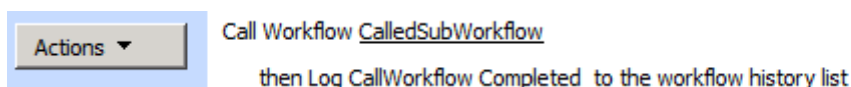
- Add a “Call Workflow” action to the workflow:



- Type in the name of the workflow to call:



In the following example the workflow “CalledSubWorkflow” is started and an entry is logged to the workflow history once the workflow “CalledSubWorkflow” has completed:



NOTE: The action “Call Workflow” may not return immediately after the called sub routine completes. The action uses a “delay” to periodically wake up and test if the called workflow is still running. In SharePoint, the OWSTimer process manages this “wake up” and by default this happens every five minutes.

While Workflow

This action allows you to specify a condition based on a column in the current item, and while this condition remains true, the specified workflow will be called. The workflow will be called repeatedly until the condition returns false.

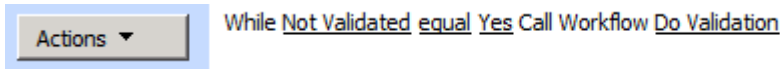
When the “While Workflow” action is added to a workflow it will be displayed like this:



The action requires you to specify:

- The field in the current item to test (“Field”).
- The condition (“equal”).
- The value to test against (“value”).
- The workflow to call while this condition remains true.

For example, if the current list or library has a “Yes/No” column called “Not Validated”, the following action will continue executing the workflow “Do Validation” until the field’s value changes to “No”:

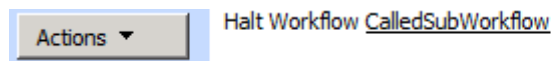


Note that the workflow will not be called if the condition return “false” when the action is executed. In general, the workflow being called (e.g. “Do Validation”) will change the field being tested (“Not Validated”) at some point, otherwise the workflow being called will be continuously called for ever.

Note that if the target workflow is already running, the “While” action will *generate an error* and the workflow will terminate.

Halt Workflow

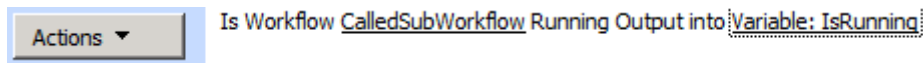
The “Halt Workflow” action will immediately halt the workflow, setting its status to “Cancelled”. The action takes a single parameter which is the name of the workflow to cancel:



If the workflow is not running the “Halt Workflow” is ignored and does not generate an error.

Is Workflow Running

The “Is Workflow Running” action will return a “Yes” / “No” value indicating whether the given workflow is running or not. The action looks like the following in SharePoint Designer:



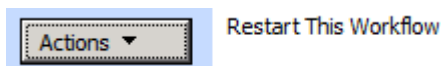
The output variable is of type “Boolean” and the default creates a workflow variable called “IsRunning”.

Restart Workflow

The “Restart Workflow” action will cause the current workflow to cancel and then to restart executing at the first step.

Note that this is not a “goto” within the currently executing workflow – the workflow is cancelled and then restarted. This will be reflected in the workflow history.

The action takes no parameters:



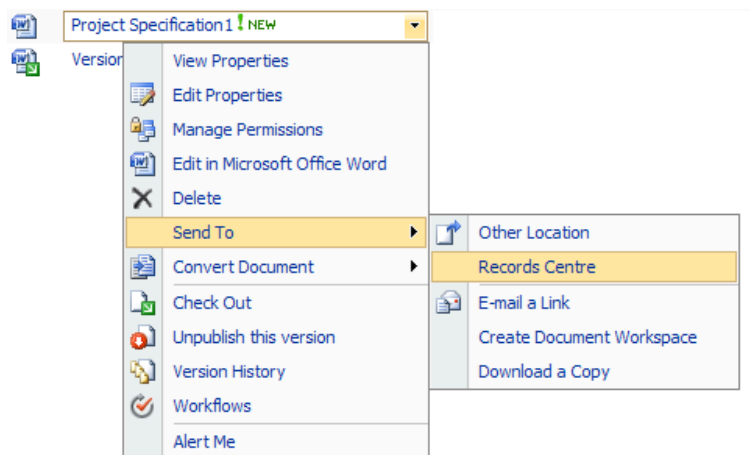
This activity will allow you to emulate stateful workflows with SharePoint Designer. You can create a “choice” field type in the library or list to maintain the current state. The workflow can take different actions based on the

current state, and possibly then update the current state. Then, when started, the whole process can be started again.

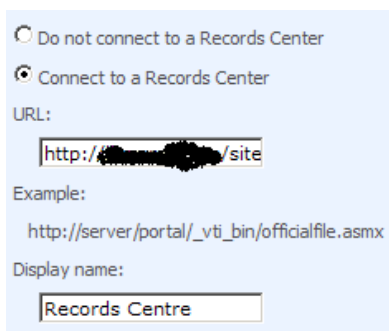
Send To Records Centre

This action will send the current item or document to the configured records centre:

This will perform the same action as the user selecting the **Send To + Records Centre** configured menu item for an item:

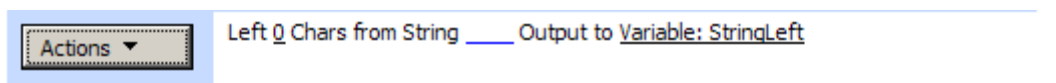


This menu item should be configured as part of your Records Center setup and implementation, and is configured in Central Administration:



String Left

This action returns the 'n' left most characters from a string.



Parameters:

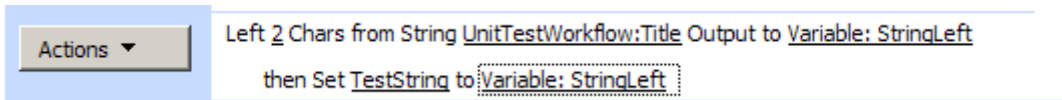
Parameter	Type	Description	In/Out
Number of characters	Number/Double	Defines the number of characters to return	In
Input String	String	The string from which the sub-string will be extracted	In
Output String	String	The extracted string	Out

Notes:

- The “Number of characters” can be constant, workflow variable or list/document library item.
- In the input string can be a constant, workflow variable or list/document library item.
- The output string is saved to a workflow variable, the default name for this variable is “StringLeft”
- If the requested length is longer than the string the entire string will be returned.
- Errors are written to the log (see example for “Start Workflow”)

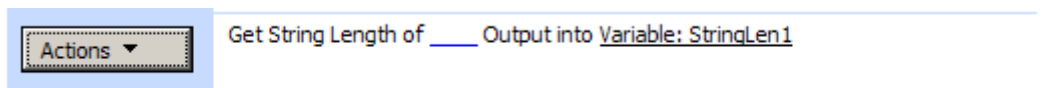
Example:

In this example the left two most characters are returned from the “UnitTestWorkflow” list’s “Title” column and placed in a workflow variable called “StringLeft”. The contents of this workflow variable are then placed into a column called “TestString” in the current list “UnitTestWorkflow”:



String Length

This action returns the length of a given string.



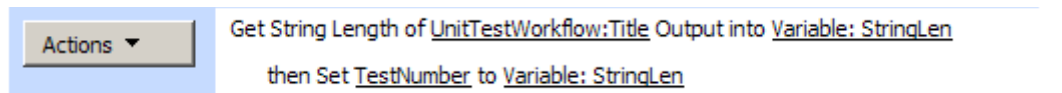
Parameters:

Parameter	Type	Description	In/Out
Input String	String	The string whose length is to be returned	In
Output Length	Number/Double	The string length	Out

Notes:

- In the input string can be a constant, workflow variable or list/document library item.
- The output length can be a workflow variable, the default name for this variable is “StringLen”
- Errors are written to the log (see example for “Start Workflow”)

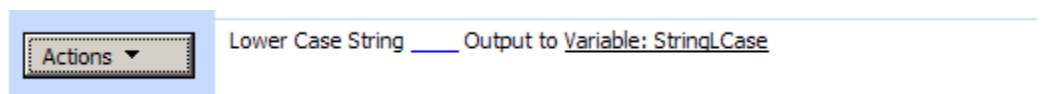
Example:



This example finds the string length of the column “Title” for the current item and writes the length to the workflow variable “StringLen”. The contents of “StringLen” is then written to the column “TestNumber” in the current list called “UnitTestWorkflow”.

String LowerCase

This action returns the lower case version of a string.



Parameters:

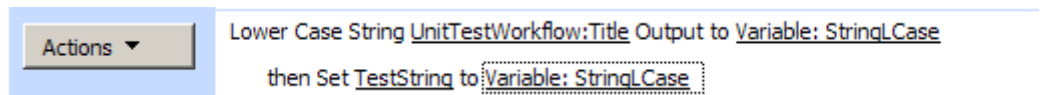
Parameter	Type	Description	In/Out
Input String	String	The string whose lower case	In

Output String	String	version is to be returned The string lower case version of the string	Out
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Notes:

- In the input string can be a constant, workflow variable or list/document library item.
- The output string can be a workflow variable, the default name for this variable is “StringLCCase”
- Errors are written to the log (see example for “Start Workflow”)

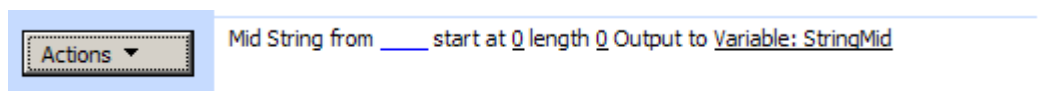
Example:



This example outputs the lower case version of the “Title” column in the current list called “UnitTestWorkflow” to the workflow variable “StringLCCase”. The contents of the workflow variable “StringLCCase” are then saved in the column “TestString” for the current list.

String Mid

This action returns a substring from another string with a given starting position and length.



Parameters:

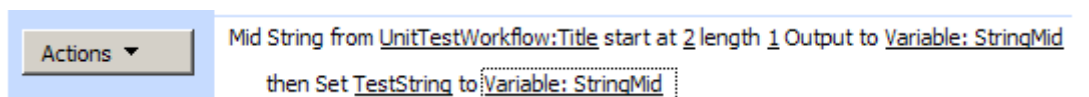
Parameter	Type	Description	In/Out
Input String	String	The string from which the sub-string will be extracted	In
Starting Position	Number/Double	Defines the start position	In
Number of characters	Number/Double	Defines the number of characters to return	In
Output String	String	The extracted string	Out

Notes:

- The “Starting Position” and “Number of characters” can be constant, workflow variable or list/document library item.
- In the input string can be a constant, workflow variable or list/document library item.
- The output string is saved to a workflow variable; the default name for this variable is “StringMid”.
- An error will be generated if the start position is outside the length of the string.
- If the start position plus the number of characters is longer than the string the entire string from the start position will be returned.
- Errors are written to the log (see example for “Start Workflow”).

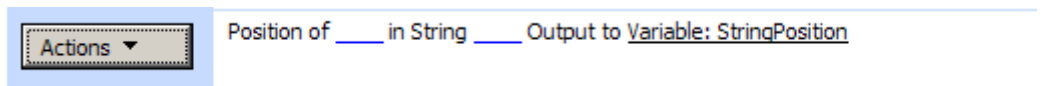
Example:

In this example a single character string is returned from the “UnitTestWorkflow” list’s “Title” column starting at position 2 and placed in a workflow variable called “StringMid”. The contents of this workflow variable are then placed into a column called “TestString” in the current list “UnitTestWorkflow”:



String Position

This action returns the character position of the first occurrence of a string in another string. "-1" is returned if the string cannot be found.



Parameters:

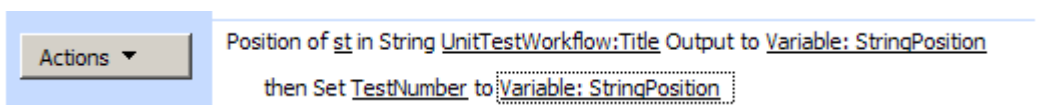
Parameter	Type	Description	In/Out
String to be found	String	The String being searched for	In
Input String	String	The string in which the search takes place	In
Output Position	Number/Double	The position of the string	Out

Notes:

- In the string to be found and input string can be a constant, workflow variable or list/document library item.
- The output position is saved to a workflow variable; the default name for this variable is "StringPosition".
- Errors are written to the log (see example for "Start Workflow")

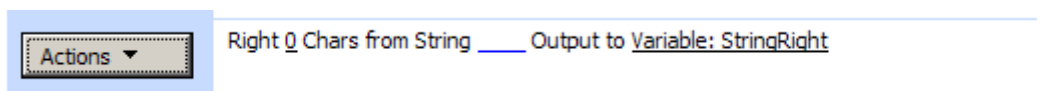
Example:

In this example the "Title" column for the current list "UnitTestWorkflow" is searched for the string constant "st". The string position is returned in the workflow variable "StringPosition", the contents of which are then stored in the column "TestNumber" in the current list:



String Right

This action returns the 'n' right most characters from a string.



Parameters:

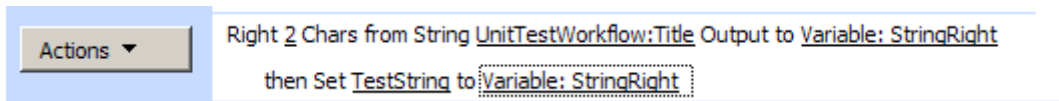
Parameter	Type	Description	In/Out
Number of characters	Number/Double	Defines the number of characters to return	In
Input String	String	The string from which the sub-string will be extracted	In
Output String	String	The extracted string	Out

Notes:

- The "Number of characters" can be constant, workflow variable or list/document library item.
- In the input string can be a constant, workflow variable or list/document library item.
- The output string is saved to a workflow variable, the default name for this variable is "StringRight"
- The entire string will be returned if "number of characters" is longer than the "input string".
- Errors are written to the log (see example for "Start Workflow")

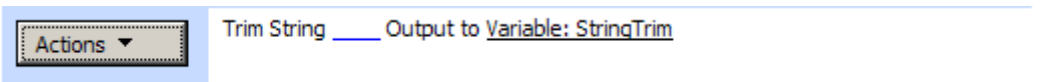
Example:

In this example the right two most characters are returned from the “UnitTestWorkflow” list’s “Title” column and placed in a workflow variable called “StringRight”. The contents of this workflow variable are then placed into a column called “TestString” in the current list “UnitTestWorkflow”:



String Trim

This action returns a string with leading and trailing spaces removed.



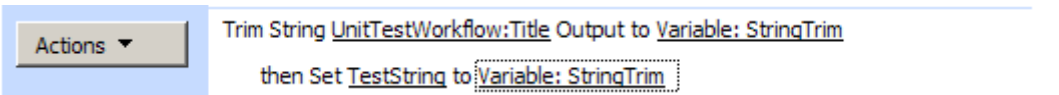
Parameters:

Parameter	Type	Description	In/Out
Input String	String	The string whose trimmed version is to be returned	In
Output String	String	The string trimmed of spaces	Out

Notes:

- In the input string can be a constant, workflow variable or list/document library item.
- The output string can be a workflow variable, the default name for this variable is “StringTrim”
- Errors are written to the log (see example for “Start Workflow”)

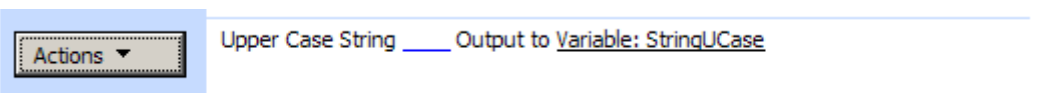
Example:



This example outputs the trimmed version of the “Title” column in the current list called “UnitTestWorkflow” to the workflow variable “StringTrim”. The contents of the workflow variable “StringTrim” are then saved in the column “TestString” for the current list.

String UpperCase

This action returns the upper case version of a string.



Parameters:

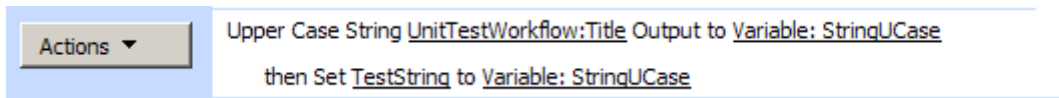
Parameter	Type	Description	In/Out
Input String	String	The string whose upper case version is to be returned	In
Output String	String	The string upper case version of the string	Out

Notes:

- In the input string can be a constant, workflow variable or list/document library item.

- The output string can be a workflow variable, the default name for this variable is “StringUCCase”
- Errors are written to the log (see example for “Start Workflow”)

Example:

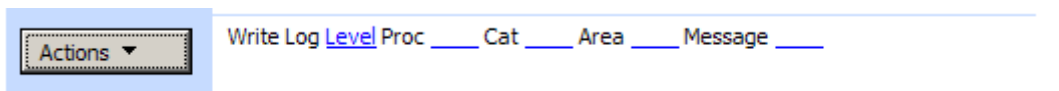


This example outputs the upper case version of the “Title” column in the current list called “UnitTestWorkflow” to the workflow variable “StringUCCase”. The contents of the workflow variable “StringUCCase” are then saved in the column “TestString” for the current list.

Write to Trace Log

This action writes a trace log string to the current SharePoint trace log file which is normally located in the following folder:

\\Program Files\\Common Files\\Microsoft Shared\\web server extensions\\12\\LOGS



Parameters:

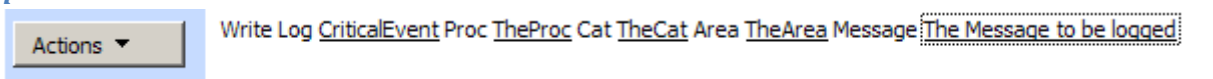
Parameter	Type	Description	In/Out
Level	Choice	Trace log severity level. One of: Critical; High; Medium; WarningEvent; InformationEvent; Verbose; Monitorable; Unassigned; Exception; Assert; Unexpected	In
Proc	String	The “Proc” string, free text	In
Cat	String	The “Cat” string, free text	In
Area	String	The “Area” string, free text	In
Message	String	The message to be written	

Warning: The current logging level configured in Central Administration for the web application determines which log events will be written to the log based on the “Level” parameter. Depending on the currently configured level the log events written by “Write to Trace Log” may not appear in the log.

Notes:

- “Proc”, “Cat” and “Area” define the text that appears in the columns with the same name in the trace log file.

Example:



This example will write the following string to the event log:

```
Timestamp          Process          TID      Area
Category           EventID Level      Message      Correlation
```

Uninstall

Warning: After uninstalling all workflows that use the custom actions will fail when attempting to use the custom actions.

To uninstall:

- Run a command shell on the SharePoint server.
- Navigate to the folder C:\Program Files\Common Files\Microsoft Shared\web server extensions\12\BIN where, by default, stsadm.exe is located.
- Issue the following command to retract the solution:

```
stsadm -o retractsolution -name ngccustomactivities.wsp -immediate
```

- Issue the following command to delete the solution:

```
stsadm -o deletesolution -name ngccustomactivities.wsp
```

Warning: After uninstalling all workflows that use the custom actions will fail when attempting to use the custom actions.

Manual Uninstall

A Manual Uninstall may be performed if you had manually installed a previous version of NGCCustomActivities (that is, without using a WSP package). To do this:

1. Remove NGCCustomActivities.dll from the Global Assembly Cache (GAC). To do this, simply delete the file from the \Windows\Assembly folder using Windows Explorer.
2. Remove the file NGCCustomActivities.ACTIONS file from the folder \Program Files\Common Files\Microsoft Shared\web server extensions\12\TEMPLATE\1033.
3. Remove the "AuthorizedType" entry from the Web Config file for the SharePoint web application.