



Optimizing Editing Workflows with Attribute Assistant

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GIS
INSPIRING
WHAT'S
NEXT

A tool to...

Streamlining your editing experience In ArcMap

- Increased productivity
- Reduces button clicks
- Ensures data entry
- Simplifies complex operations
- Standardize editing procedures

Attribute Assistant

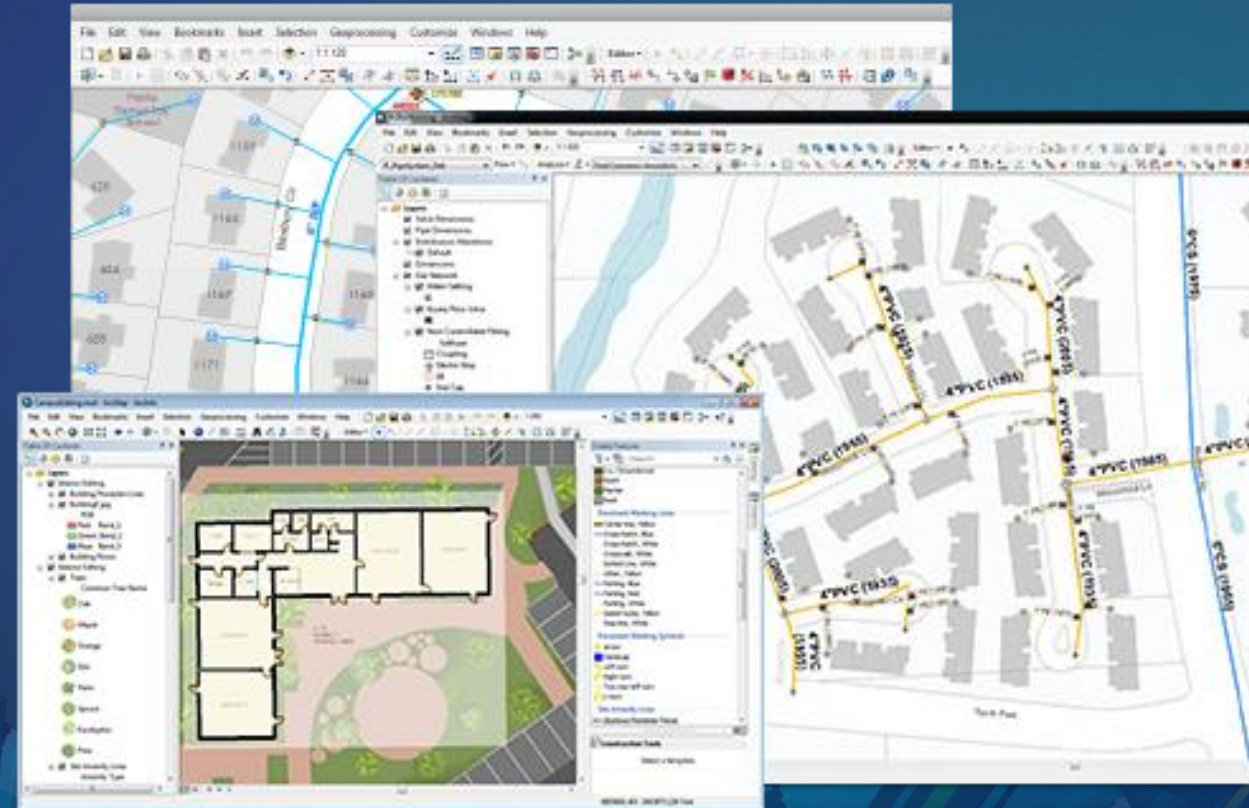
ArcMap Add-in

- Editor Extension
- Configured through a GDB table
- 71 methods that can be triggered when
 - Feature created
 - Geometry modified
 - Attribute updated
 - Manually
- Source code available on github
 - <https://github.com/Esri/local-government-desktop-addins/>

Available as part of ArcGIS Solutions

Preconfigured for your industry workflows

- Available by itself
 - <http://solutions.arcgis.com/shared/help/attribute-assistant/>
- Included with
 - Water Utility Network Editing
 - Gas As-Built Editing
 - Nighttime Flow Analysis
 - Pre-incident Planning
 - Campus Editing
 - Road Network Management
 - Street Furniture Inventory
 - Street Tree Inventory
 - Streetlight Inventory



Attribute Rules

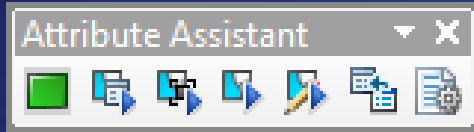
- Rules defined using an Arcade Expression and stored in an Enterprise Geodatabase
- Includes
 - Calculation Rules
 - Expression that populate attributes based on attributes on a single feature or other related feature
 - Constraint Rules
 - Expressions that specify permissible attribute configuration on a feature
 - Features that violate constraint rules cannot be committed
 - Sequence (New at 2.2/10.6.1)
 - Use next number in a sequence for unique IDs
- Planned capabilities
 - Inheritance
 - Populate attribute values based on same value from feature snapped to
 - Overlay
 - Populate attribute based on intersection with another layer

Field Name	Value Method	Value Info	Create	Change	On Manual
FLOOR	INTERSECTING_FEATURE	BuildingFloor FLOOR	True	True	False
BASEELEV	INTERSECTING_FEATURE	BuildingFloor BASEELEV	True	True	False
FACILITYID	EXPRESSION	("FAC-" & [OBJECTID])	True	False	False
NAME	CASCADE_ATTRIBUTE	FacilitySitePoint NAME	False	True	False
FACILITYID	INTERSECTING_FEATURE	FacilitySite FACILITYID	True	False	False
NAME	INTERSECTING_FEATURE	FacilitySite NAME	True	False	False
SUBTYPEFIELD	INTERSECTING_FEATURE	FacilitySite SUBTYPEFIELD	True	False	False
FEATURECODE	INTERSECTING_FEATURE	FacilitySite FCODE	True	False	False
FACAREA	INTERSECTING_FEATURE	FacilitySite SHAPE_Area	True	False	False
FULLADDR	NEAREST_FEATURE_ATTRIBUTES	SiteAddressPoint FULLADDR FULLADD	True	True	False
OWNTYPE	INTERSECTING_FEATURE	FacilitySite OWNTYPE	True	False	False
FLOODIMPID	GENERATE_ID	IMPACTID 0 IMPA-[seq]	True	False	False
FACILITYID	INTERSECTING_FEATURE	FacilitySite FACILITYID	True	True	False
FACILITYID	GENERATE_ID	LEVEEID 0 Levee-[seq]	True	False	False
FLOODIMPID	INTERSECTING_FEATURE	FloodImpactArea FLOODIMPID	True	False	False
CUBYRD	EXPRESSION	((([SHAPE_Length]*[HEIGHT])*([SIDESLO	True	True	False
TOTCOST	EXPRESSION	(([CUBYRD]*[CSTCUBYRD])	True	True	False
FULLNAME	EXPRESSION	[ROADPREDIR] + " " + [ROADNAME] + "	True	True	False
STATUS	LAST_VALUE	<Null>	True	True	False
FULLNAME	CASCADE_ATTRIBUTE	RoadCenterline FULLNAME	False	True	False
FULLNAME	CASCADE_ATTRIBUTE	SiteAddressPoint FULLNAME	False	True	False
FACILITYID	INTERSECTING_FEATURE	FacilitySite FACILITYID	True	True	False
FACILITYID	INTERSECTING_FEATURE	FacilitySite FACILITYID	True	True	False
FACILITYID	GENERATE_ID	POLEID 0 POLE-[seq] True	False	False	True

The Components

Four key pieces

- Attribute Assistant Toolbar
- Dynamic Value Table
- Generate ID Table
- Configuration file



```
loaded aa.config
14 | WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
15 | See the License for the specific language governing permissions and
16 | limitations under the License.
17 --->
18
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20 <configuration>
21   <Name>Attribute Assistant Release</Name>
22   <appSettings>
23     <!--Options for the Attribute Assistant-->
24     <!--Option to turn on the AA on startup-->
25     <add key="AttributeAssistant_EnabledOnStartup" value="True" />
26     <!--Option to turn on the AA on when editing is started-->
27     <add key="AttributeAssistant_EnabledOnStartEditing" value="False" />
28     <!--The name of the table that defines the functions for the Attribute Assistant-->
29     <add key="AttributeAssistant_TableName" value="DynamicValue" />
30     <!--The table used for Unique ID Generation-->
31     <add key="AttributeAssistant_GenerateId_TableName" value="GenerateId" />
32     <!--Activate the debug mode which writes a log file-->
33     <add key="AttributeAssistant_Debug" value="false" />
34     <!--Path to store the log file, do not include the file name. The default location is %USERPROFILE%\ArcGISSO
35     <add key="AttributeAssistant_Debug_Path" value="" />
36     <!--Option to clear the last values between toggling it on and off-->
37     <add key="AttributeAssistant_ClearLastValue" value="False" />
38     <!--Option to clear the last value array when you switch a version-->
39     <add key="AttributeAssistant_ClearLastValueStopEdit" value="False" />
40
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42     <!--The geocoder used by the AA for the Get_Address rule-->
43     <add key="Geocoder" value="http://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer/" />
44
45     <!--Field names in the Generate ID Table-->
46     <add key="SequenceName" value="SEQNAME" />
47     <add key="SequenceCounter" value="SEQCOUNTER" />
48     <add key="IntervalValue" value="EQINTERV" />
49
50     <!--AA processing related records. If True, delete operations will be much
51     <add key="DeleteOperations" value="True" />
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53     <!--of On Change Geometry when a line or polygon is split using the Split Tool
54     <add key="OnChangeGeometry" value="False" />
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OBJECTID*	Table Name	Field Name	Value Method	Value Info	Create	Change	On Manual	Comments	Rule Wei	On Chang
128	BuildingInteriorSpace	FLOOR	INTERSECTING_FEATURE	BuildingFloor\FLOOR	True	True	False	<Null>	<Null>	True
129	BuildingInteriorSpace	BASEELEV	INTERSECTING_FEATURE	BuildingFloor\BASEELEV	True	True	False	<Null>	<Null>	True
90	FacilitySite	FACILITYID	EXPRESSION	(["FAC-" & {OBJECTID}])	True	False	False	<Null>	<Null>	False
97	FacilitySite	NAME	CASCADE_ATTRIBUTE	FacilitySitePoint\NAME	False	True	False	<Null>	<Null>	False
91	FacilitySitePoint	FACILITYID	INTERSECTING_FEATURE	FacilitySite\FACILITYID	True	False	False	<Null>	<Null>	True
92	FacilitySitePoint	NAME	INTERSECTING_FEATURE	FacilitySite\NAME	True	False	False	<Null>	<Null>	True
93	FacilitySitePoint	SUBTYPEFIELD	INTERSECTING_FEATURE	FacilitySite\SUBTYPEFIELD	True	False	False	<Null>	<Null>	True
94	FacilitySitePoint	FEATURECODE	INTERSECTING_FEATURE	FacilitySite\FCODE	True	False	False	<Null>	<Null>	True
95	FacilitySitePoint	FACAREA	INTERSECTING_FEATURE	FacilitySite\SHAPE_Area	True	False	False	<Null>	<Null>	True
96	FacilitySitePoint	FULLADDR	NEAREST_FEATURE_ATTRIBUTES	SiteAddressPoint\FULLADDR\FULLADD	True	True	False	<Null>	<Null>	False
98	FacilitySitePoint	OWNTYPE	INTERSECTING_FEATURE	FacilitySite\OWNTYPE	True	False	False	<Null>	<Null>	True
99	FloodImpactArea	FLOODIMPID	GENERATE_ID	IMPACTID\IMPACT-[seq]	True	False	False	<Null>	<Null>	False
121	LandscapeArea	FACILITYID	INTERSECTING_FEATURE	FacilitySite\FACILITYID	True	True	False	<Null>	<Null>	True
100	Levee	FACILITYID	GENERATE_ID	LEVEEID\Levee-[seq]	True	False	False	<Null>	<Null>	False
101	Levee	FLOODIMPID	INTERSECTING_FEATURE	FloodImpactArea\FLOODIMPID	True	False	False	<Null>	<Null>	True
102	Levee	CUBYRD	EXPRESSION	((["SHAPE_Length"]*["HEIGHT"]*["SIDESLO	True	True	False	<Null>	<Null>	False
103	Levee	TOTCOST	EXPRESSION	(["CUBYRD"]*["CSTCUBYRD"])	True	True	False	<Null>	<Null>	False
17	MasterStreetName	FULLNAME	EXPRESSION	(["ROADPREDIR"] + " " + ["ROADNAME"] + "	True	True	False	<Null>	1	False
18	MasterStreetName	STATUS	LAST_VALUE	<Null>	True	True	False	<Null>	<Null>	False
49	MasterStreetName	FULLNAME	CASCADE_ATTRIBUTE	RoadCenterline\FULLNAME	False	True	False	<Null>	1	False
50	MasterStreetName	FULLNAME	CASCADE_ATTRIBUTE	SiteAddressPoint\FULLNAME	False	True	False	<Null>	1	False
124	PavementMarkingLine	FACILITYID	INTERSECTING_FEATURE	FacilitySite\FACILITYID	True	True	False	<Null>	<Null>	True
125	PavementMarkingPoint	FACILITYID	INTERSECTING_FEATURE	FacilitySite\FACILITYID	True	True	False	<Null>	<Null>	True
140	Pole0	FACILITYID	GENERATE_ID	POLEID\POLE-[seq]	True	False	False	<Null>	10	False

OBJECTID*	Sequence Name	Sequence Counter	Comments	Interval Value
9	ADDRESSPOINTID	52	<Null>	1
10	ADDRESSSTRANCHED	4	<Null>	1
11	SITEADDRESSID	11	<Null>	1
12	PSTLADDID	5	<Null>	1
13	CENTERLINED	12	<Null>	1
14	IMPACTID	1	<Null>	1
15	LEVEED	1	<Null>	1
16	PREPLAN	3	<Null>	1
17	PRECOMPLEX	1	<Null>	1
18	STREETID	300	<Null>	1
19	STREETINTD	88	<Null>	1
20	WHYDRANT	1439	<Null>	1
21	MANHOLE	2493	<Null>	1
22	WSYSTEMVALVE	4817	<Null>	1
23	WMETER	8193	<Null>	1
24	WCONTROLVALVE	6	<Null>	1
25	PICLEANOUT	36	<Null>	1
26	WATERMAIN	4280	<Null>	1
27	WATERLATERAL	19659	<Null>	1
28	POLED	7	<Null>	1
29	SIGNID	16	<Null>	1
30	SIGNALD	1	<Null>	1
31	STREETLIGHTD	1	<Null>	1

Attribute Assistant Configuration File

- Change startup behavior
- Change split behavior
- Enable the log file

```
loaded.aa.config
14 | WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
15 | See the License for the specific language governing permissions and
16 | limitations under the License.
17 --->
18
19
20 <configuration>
21   <Name>Attribute Assistant Release</Name>
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44
45     <!--Field names in the Generate ID Table-->
46     <add key="SequenceName" value="SEQNAME"/>
47     <add key="SequenceCounter" value="SEQCOUNTER"/>
48     <add key="SequenceInterval" value="SEQINTERV"/>
49
50     <!--Option to delete features without AA processing related records. If True, delete operations will be much
51     <add key="BypassEditOperationCheck" value="True"/>
52
53     <!--Option to call on create instead of On Change Geometry when a line or polygon is split using the Split To
54     <add key="OnCreateWhenSplit" value="False"/>
```

Demonstration: Enabling the log file

Attribute Assistant Methods

A look at the rules by common operations

- Attribute operations
- Editor tracking
- Feature creation
- Geometric Network
- Intersecting features
- Location
- Related table
- Sequences and ID
- Shape updates
- Spatial operations
- Validation

Attribute Assistant - Attribute operations methods

- **Angle**
 - Calculates the geographic or arithmetic angle of a line feature.
- **Cascade Attributes**
 - Updates all occurrences of a value when the corresponding value in another table is changed.
- **Expression**
 - Executes a VBScript evaluated by the MSScriptControl. Can be used to access built-in functions and conditional logic (if statements).
- **Feature Statistics**
 - Summarizes the attribute values of the affected feature as a series of statistics or a single calculated value.
- **Field**
 - Copies the value from one field to another within the same feature class.
- **Field Trigger**
 - Updates a field to a specified value when the value of another field is updated.
- **Junction Rotation**
 - Stores the rotation angle of a junction feature based on connected edge features.
- **Last Value**
 - Repeats the last value used in a field.
- **Map Info**
 - Stores information from the current map document metadata or the version info of the layer being edited.
- **Previous Value**
 - Monitors a field, and when it is changed, stores the previous value in another field.
- **Prompt**
 - Identifies records containing null values. If the field uses a subtype or domain, those options are presented in the dialog box for the user to select.
- **Side**
 - Determines if a point feature is to the left or right of a corresponding line feature.

Demonstration: Last Value, Prompt, Expression

Attribute Assistant - Editor tracking methods

- **Current Username**
 - Populates the current user name.
- **Map Info**
 - Stores information from the current map document metadata or the version info of the layer being edited.
- **Timestamp**
 - Populates the current date and time.

Attribute Assistant - Feature creation methods

- **Copy Features**
 - Copies a feature when an attribute is updated to a specified value.
- **Create Linked Record**
 - Creates a new record in a feature layer with a relationship to a table using a primary/foreign key relationship.
- **Create Perpendicular Line**
 - Constructs a perpendicular line from the input point and an intersecting line. The line's length is specified by the Length parameter.
- **Create Perpendicular Line to Line**
 - Constructs a perpendicular line from the input point to the nearest line.

Attribute Assistant - Geometric Network methods

- **Edge Statistics**

- Provides statistics on a specified field for all connected edges in a geometric network.

- **From Edge Field**

- Copies a field value from a connected From Edge feature to a connected junction feature.

- **From Edge Multiple Field Intersection**

- Copies values for all From Edges connected to a junction to a series of fields in the source layer.

- **From Edge Statistics**

- Calculates statistics on a specified field for all features connected to From Edges in a geometric network.

- **From Junction Field**

- Copies a field value from a connected From Junction feature to a connected edge feature. Can also copy the name of the feature class at the start of the currently edited line.

- **Junction Rotation**

- Stores the rotation angle of a junction feature based on connected edge features.

- **To Edge Field**

- Copies a field value from a connected To Edge feature to a connected junction feature.

- **To Edge Multiple Field Intersect**

- Copies values for all To Edges connected to a junction to a series of fields in the source layer.

- **To Edge Statistics**

- Calculates statistics on a specified field for all features connected to To Edges in a geometric network.

- **To Junction Field**

- Copies a value from a connected To Junction feature to a connected edge feature. Can also copy the name of the feature class at the end of the currently edited line.

Continued on next slide

Attribute Assistant - Geometric Network methods

- **Trigger Attribute Assistant Event From Edge**
 - Triggers the Attribute Assistant for the From Edge feature.
- **Trigger Attribute Assistant Event From Junction**
 - Triggers the Attribute Assistant for the From Junction feature.
- **Trigger Attribute Assistant Event To Edge**
 - Triggers the Attribute Assistant for the To Edge feature.
- **Trigger Attribute Assistant Event To Junction**
 - Triggers the Attribute Assistant for the To Junction feature.
- **Update From Edge Field**
 - Copies a field value from a junction to a connected From Edge feature.
- **Update From Junction Field**
 - Copies a field value from a connected edge to a connected From Junction feature.
- **Update To Edge Field**
 - Copies a field value from a junction to a connected To Edge feature.
- **Update To Junction Field**
 - Copies a field value from a connected edge to a connected To Junction feature.

Demonstration: From Junction Field, To Junction Field, Junction Rotation

Attribute Assistant – Intersecting Features methods

- **Intersecting Boolean**
 - Stores a value if the triggering feature intersects a feature in the specified layer.
- **Intersecting Count**
 - Calculates the number of intersecting features and stores the count in the specified field.
- **Intersecting Edge**
 - Copies a field value from the first intersecting edge feature.
- **Intersecting Feature**
 - Copies a value from an intersecting feature in the specified layer.
- **Intersecting Feature Distance**
 - Calculates the distance along a line feature where a line is intersected by another feature.
- **Intersecting Layer Details**
 - Extracts the name or file path of an intersecting layer.
- **Intersecting Raster**
 - Extracts a raster cell value at a feature location. If the feature is a line or polygon, the raster value at the feature centroid is used.
- **Intersecting Statistics**
 - Calculates statistics on a specified field for intersecting features.
- **Multiple Field Intersecting Values**
 - Copies values from new intersecting features into a target layer.
- **Nearest Feature**
 - Copies a value from the nearest feature in a specified layer.
- **Nearest Feature Attributes**
 - Copies a series of values from the nearest feature in a specified layer.
- **Split Intersecting Feature**
 - Splits features that intersect with features in a source layer.
- **Trigger Attribute Assistant Event Intersecting Feature**
 - Triggers the Attribute Assistant for the intersecting features.
- **Update Intersecting Feature**
 - Updates a field in an intersecting feature with a value or a field value from the modified or created feature.

Demonstration: Intersecting Feature, Nearest Feature, Intersecting Raster

Attribute Assistant – Location methods

- **Get Address From Centerline**
 - Extracts address information from the closest point on a road. It is similar to a reverse geocode, but a locator service is not used.
- **Get Address Using ArcGIS Service**
 - Performs a reverse geocode using a specified ArcGIS service.
- **Get Address Using Geocoder**
 - Performs a reverse geocode using a geocoder.
- **Latitude**
 - Stores the y-coordinate value projected to WGS84 decimal degrees.
- **Longitude**
 - Stores the x-coordinate value projected to WGS84 decimal degrees.
- **X Coordinate**
 - Calculates the x-coordinate of a feature in database units.
- **Y Coordinate**
 - Calculates the y-coordinate of a feature in database units.

Demonstration: Get Address Using ArcGIS Service, X Coordinate, Y Coordinate

Attribute Assistant – Related Table methods

- **Copy Linked Record**
 - Updates an attribute of a feature with a value from a related table.
- **Create Linked Record**
 - Creates a new record in a feature layer with a relationship to a table using a primary/foreign key relationship.
- **Link Table Asset**
 - Updates a field in the table or layer with a value from a selected feature.
- **Update Linked Record**
 - Finds the related records in another table or layer and updates a field in those records.

Demonstration: Create Linked Record

Attribute Assistant – Sequence and ID methods

- **Autonumber**
 - Finds the largest value in a field and calculates the next sequential value.
- **Generate ID**
 - Increments a row in an unversioned table and stores that newly incremented value.
- **Generate ID By Intersect**
 - Generates unique identifiers for features based on the identifiers of intersecting grid features.
- **GUID**
 - Creates a globally unique identifier (GUID).

Attribute Assistant – Shape Update methods

- **Length**
 - Calculates the length of line features and the area of polygon features.
- **Set Measures**
 - Populates the m-coordinates of line features. M-values can be used to add route events to point and line events dynamically along line features.

Demonstration: Set Measures

Attribute Assistant – Spatial Operations methods

- **Nearest Feature**
 - Copies a value from the nearest feature in a specified layer.
- **Nearest Feature Attributes**
 - Copies a series of values from the nearest feature in a specified layer.
- **Offset**
 - Populates the location of a point a specified distance from the nearest line feature.

Attribute Assistant – Validation methods

- **Minimum Length**
 - Rejects a newly created line feature if the length of the line is less than the specified distance.
- **Validate Attribute Lookup**
 - Verifies field values against entries in a lookup table.
- **Validate Attributes**
 - Compares values in the input fields to all feature templates for the feature class.
- **Validate Connectivity**
 - Validates the number of connections on a feature and rejects the edits if the criteria are not met.
- **Validate Domain**
 - Validates data entry on field with domains against the domain. If the value is outside the range or not in the coded value list, the edit is aborted.

Demonstration: Minimum Length, Validate Attribute Lookup

Back to the log file

Demonstration: Minimum Length, Validate Attribute Lookup

Summary

Designed to save time, improve accuracy and streamline data maintenance

- Use the solution apps and help to learn the rules
- Start with a blank Dynamic Value Table
- Iterate when developing your rule base
 - Use the log file
- Does work in a versioned environment
 - Do not version the Generate ID Table