

FME® Transformer

Reference Guide



FME and Data Transformation

Moving data between different formats and applications often involves more than a format-to-format translation. Datasets can contain more complex components that may not fit the requirements of the destination system. To preserve key aspects of the data and load it seamlessly into the target application, you may need to adjust the data model, contents, descriptive elements, and/or the coordinate system. This is known as **data transformation** and it is one of FME's core capabilities.

FME® contains over 500 transformers that perform different types of data operations. In the FME Workbench interface, transformers are stored in the Transformer Gallery and grouped in categories based on their function. You can also search for transformers by keyword.

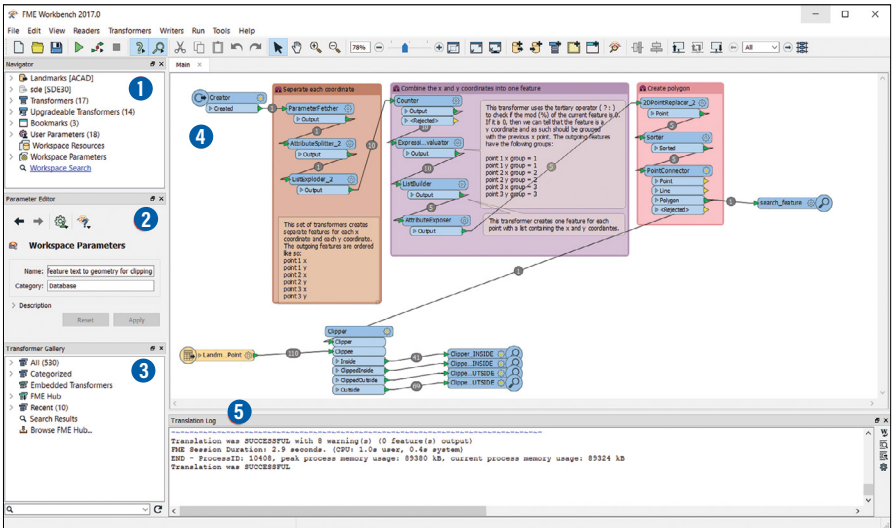


This guide provides a high-level summary of FME Workbench, data inspection, and each transformer's functionality. For detailed information, select FME Transformers from the FME Workbench Help menu, select a transformer on the canvas and press F1, or visit community.safe.com/s/documentation.

FME Workbench Overview

FME Workbench is a powerful tool for data conversion, sharing, transformation, validation, and integration.

Workbench elements are represented graphically on the Workbench canvas, and saved as a **workspace**. By default, the workspace workflow reads from left to right: the **reader** (source data) is on the left, the transformers are in the center, and the **writer** (destination data) is on the right. Connections between each item represent the flow of data: connections can branch in different directions, and through different objects.

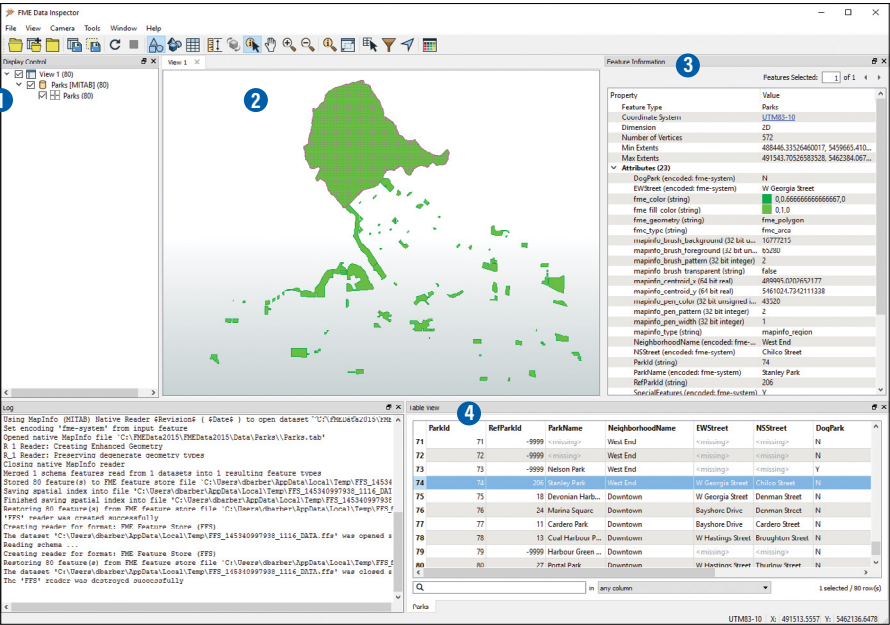


- 1 Navigator:** Shows a hierarchical view of workspace objects.
- 2 Parameter Editor:** Shows configurable settings for any object selected on the canvas.
- 3 Transformer Gallery:** Contains over 500 transformers to restructure features between source and destination data.
- 4 Canvas:** Displays a graphical workflow of the objects and connections that represent data and data transformation.
- 5 Translation Log:** Contains details about the workspace translation.

FME Data Inspector Overview

The FME Data Inspector is used primarily to preview data before translation and verify data after translation, but it can also be used to check data at any point during translation.

One of FME's key abilities is the communication between Workbench and the Data Inspector – an Inspector transformer can start the Data Inspector at almost any point while a workspace is running, and inspection tools allow feature-by-feature analysis.



- 1 **Display Control:** Shows a list of open datasets and their feature types.
- 2 **View:** Displays a single dataset, or multiple datasets at the same time.
- 3 **Feature Information:** Displays information about a queried feature, including feature type, attributes, and geometry details.
- 4 **Table View:** Displays the Feature Information values that are exposed to the end user, in tabular format.

Components of a Simple FME Workspace

In a workspace, translation components are represented in a visible, related hierarchy. Hierarchy is important because it affects how components are added to a translation and, more importantly, how they are controlled. Components consist of (but are not limited to):

- Readers (source format and data)
- Writers (destination format and output data location)
- Reader and Writer Feature Types (in FME, feature types represent a subset of records; for example, layer, table, or sheet)
- Attributes
- Transformers

This guide is primarily a transformer resource – but it's also important to see why transformers are key to FME's power and versatility. A very simple workspace example on page 4 shows how transformers work; and the rest of this guide describes what each transformer can do.

The Basics: Placing and Editing Transformers

There are many ways to place a transformer on the Workbench canvas. To start, however, you can simply double-click a transformer name in the Transformer Gallery and it will appear in the workspace.

Every transformer has a Properties button. This button is color-coded to show the status of its parameters.



If the Properties button is the same color as the transformer, you can use the transformer with its existing parameters.



A yellow Properties button indicates that the transformer contains default settings, but you have not yet accepted them. You can use the transformer in this state, but your workspace might produce unexpected results.



A red Properties button means that there is at least one parameter for which FME cannot supply a default value. You must provide a value for all required fields before you can use the transformer in the workspace.

When you click a Properties button, the dialog that appears will usually have some of the common elements shown in this example. The content of this dialog depends on the transformer, and sometimes even on connections to the transformer. Most transformers have some common user interface elements, however, and those are described here.

The screenshot shows the 'Reprojector Parameters' dialog box. It has a title bar with a close button. The main area is divided into sections: 'Transformer' with a 'Transformer Name' field set to 'Reprojector'; 'Coordinate Systems' with 'Source Coordinate System' set to 'Read from feature' and 'Destination Coordinate System' highlighted in red; and 'Raster Parameters' with 'Interpolation Type' set to 'Nearest Neighbor', 'Cell Size' set to 'Preserve Cells', and 'Tolerance (cells)' set to '0.0'. At the bottom are 'Help', 'Defaults' (with a dropdown arrow), 'OK', and 'Cancel' buttons. Annotations with arrows point to specific elements: 'You can edit the default transformer name.' points to the 'Transformer Name' field; 'Required parameters are highlighted.' points to the red 'Destination Coordinate System' field; 'Transformer parameter menu button.' points to the dropdown arrow next to 'Interpolation Type'; 'The Defaults menu gives you options for using default values.' points to the 'Defaults' button; and 'Click OK to accept changes and close the dialog. (This button is disabled if required parameters have not been populated.)' points to the 'OK' button.

You can edit the default transformer name.

Required parameters are highlighted.

Transformer parameter menu button.

The Defaults menu gives you options for using default values.

Click OK to accept changes and close the dialog. (This button is disabled if required parameters have not been populated.)

Working with Transformer Parameters

Most transformer parameters can be integrated with other pieces of a workspace. This means that the parameters can be easily configured to work with elements of the source data as well as with other transformers. More advanced functions, such as text and arithmetic editors, are also available in some transformers.

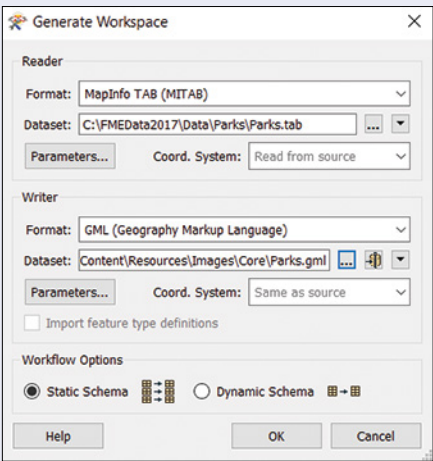
In most cases, you can use a transformer with its displayed default values.



For detailed information on transformer parameters, see the *FME Transformers help*, or select a transformer on the Workbench canvas and view the *Help* tab in the bottom pane.

The Basics: Setting up and Running a Simple Workspace

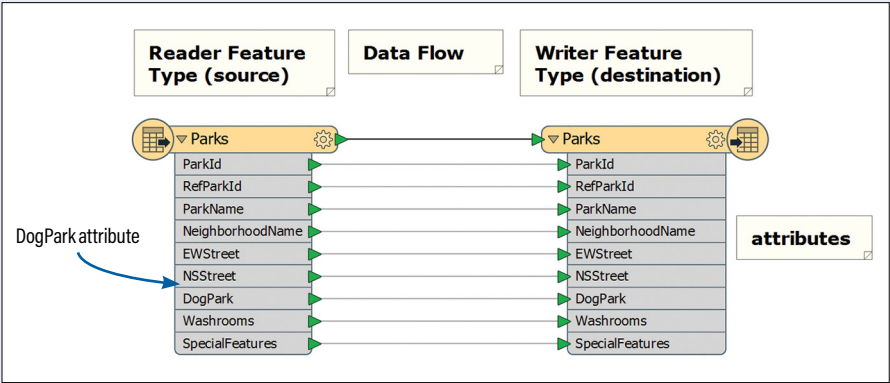
This simple example shows how to set up a new workspace. The source data used for this example contains information about 80 city parks.



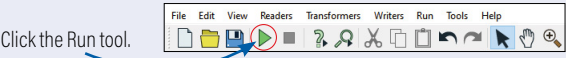
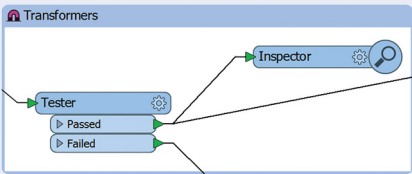
- Set up a new workspace by clicking **File > Generate Workspace**. Then:
1. Select the format and location of the source data (the Reader),
 2. Specify the format and location for the destination data (the Writer), and
 3. Accept the defaults in the remaining dialog fields.

Click **OK**. Workbench reads the data, and generates the initial workspace.

The objects on the canvas represent the data and data flow. The **Reader Feature Type** shows that the data contains an **attribute** called *DogPark*.

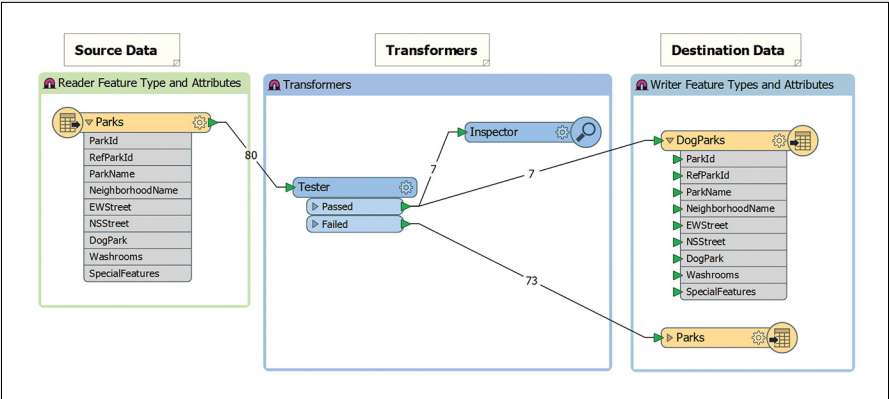


Because we want to determine which parks allow dogs, we add two transformers: a Tester transformer (to filter data) and an Inspector transformer (to view results). The Tester parameters are set to filter only parks that allow dogs, and the Inspector transformer opens the **Data Inspector** to show the results on a map.

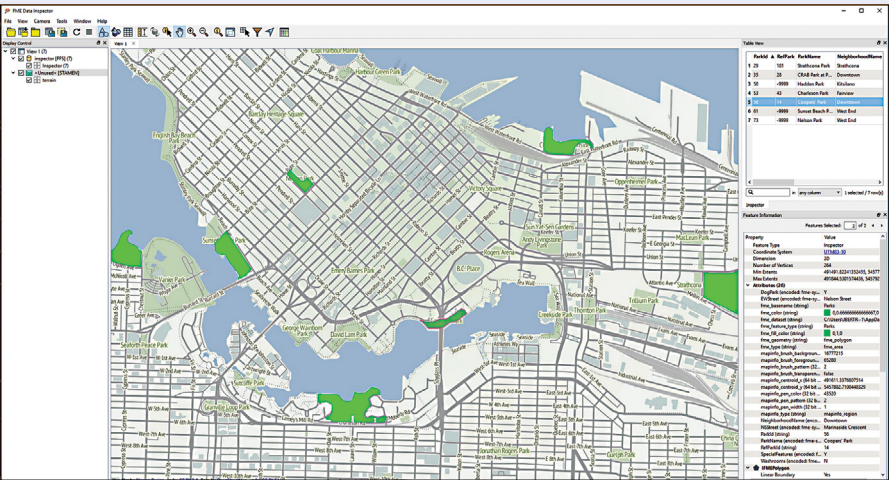


The resulting workspace shows that 7 parks allow dogs. These results are sent through the **Passed** port of the Tester transformer to a Writer Feature Type that we have added and named *DogParks*.

The workspace also shows that 73 parks do not allow dogs, and we have directed these results through the **Failed** port of the Tester transformer to the original Parks writer feature type.



Because we added an Inspector transformer to the Tester transformer's Passed port, the Data Inspector opens automatically. Here, the Background Map option allows us to view the exact locations of the 7 dog parks.



Workbench Keyboard Shortcuts *for Windows and Mac*

General Viewung		
Task	Shortcut (PC)	Shortcut (Mac)
New (create a new workspace)	Ctrl+n	command ⌘+n
Generate workspace	Ctrl+g	Shift+command ⌘+n
Open (workspace)	Ctrl+o	command ⌘+o
Exit (workbench)	Ctrl+q	command ⌘+q
Close (workspace)	Ctrl+w	command ⌘+w
Change to next tab	Ctrl+Tab	
Change to previous tab	Ctrl+Shift+Tab	
Select tab number	Ctrl+number_key	
Close current tab	Ctrl+F4	command ⌘+w
Open containing folder (datasets)	Ctrl+o	command ⌘+o
Maximize canvas to current window size	Shift+F11	shift+F11
Maximize canvas to full screen	F11	F11
Zoom-in	Ctrl+	command ⌘+
Zoom-out	Ctrl-	command ⌘-
Zoom 100%	Ctrl+0	command ⌘+0
Zoom in and out	Ctrl+scroll wheel	command ⌘+scroll wheel
Zoom to next/previous bookmark	Space/Ctrl+Space Note: Show Bookmark Navigator must be enabled on the toolbar.	
Pan	Click scroll wheel (or middle mouse button) and drag cursor.	
Return cursor to action arrow	Right-click anywhere on the canvas.	Right-click anywhere on the canvas.
Search: - Workspace if the focus is in the workspace or the Navigator - Log if the focus is in the Log window	Ctrl+f F3	command ⌘+f
Connection Style	Ctrl+Shift+C	command⌘+Shift+C
Print	Ctrl+p	command ⌘+p
Help	Select an object, then F1	Select an object, then F1

Viewing Data in Visual Preview		
Task	Shortcut (PC)	Shortcut (Mac)
Toggle automatic inspect on selection	Ctrl+Alt+A	option ⌘+command ⌘+A
Toggle Display Control	Ctrl+Alt+`	option ⌘+command ⌘+`
Toggle Table View	Ctrl+Alt+1	option ⌘+command ⌘+1
Toggle graphics View	Ctrl+Alt+2, Ctrl+Alt+3, Ctrl+Alt+4	option ⌘+command ⌘+2, option ⌘+command ⌘+3, option ⌘+command ⌘+4
Show/hide Feature Information window	Ctrl+Alt+F	option ⌘+command ⌘+F
Open in Data Inspector	Ctrl+Alt+D	command ⌘+Shift+D

General Editing		
Cut	Ctrl+x	command ⌘+x
Copy	Ctrl+c	command ⌘+c
Paste	Ctrl+v	command ⌘+v
Redo	Ctrl+y	shift+command ⌘+z
Save	Ctrl+s	command ⌘+s
Select All	Ctrl+a	command ⌘+a
Undo	Ctrl+z	command ⌘+z
Smart Delete (repair connections)	Delete key	delete key
Delete (without repair)	Shift+Delete key	Shift+delete key

Readers, Writers, and Transformers		
Add Reader	Ctrl+Alt+r	option ⌘+command ⌘+r
Add Writer	Ctrl+Alt+w	option ⌘+command ⌘+w
Show Parameters	Select an object, then Enter	Select an object, then Enter.
Connect Inspector	Select the object(s), then Ctrl+Shift+I	Select the object(s), then control+shift+i
Connect Logger	Select the object(s), then Ctrl+Shift+L	Select the object(s), then control+shift+l
Create custom transformer	Select one or more transformers, then Ctrl+t	Select one or more transformers, then command ⌘+t

Task	Shortcut (PC)	Shortcut (Mac)
Duplicate transformer	Ctrl+d <i>Using Quick Add:</i> If you add a transformer and want to add the same transformer again, press the slash "/" key. The Quick Add box will appear showing the last selected transformer. Press Return to include it, then press Return again to edit its parameters.	command ⌘+d
Rename	Select an object, then F2	Select the object, then F2
Search for a transformer by name	Slash "/" key.	Slash "/" key.
Other Workspace Authoring		
Add Bookmark	Ctrl+b	command ⌘+b
Attach annotation	Select the object(s), then Ctrl+k	Select the object(s), then command ⌘+k
Show summary annotation	Select the object(s), then Ctrl+Shift+K	Select the object(s), then shift+command ⌘+k
Insert Junction	Ctrl+Shift+J	shift+command ⌘+j
Enable/disable objects (including links and feature types)	Ctrl+e	command ⌘+e
Running Workspaces		
Run translation	F5	F5
Rerun entire workspace	Shift+F5	Shift+F5
Enable Prompt for User Parameters	Ctrl+Alt+F5	
Prompt and run	Ctrl+r	command ⌘+r
Enable feature caching	Ctrl+F5	command ⌘+F5
Run with feature caching + "Run From This"	F6	F6
Run with breakpoints	Ctrl+Shift+F5	command ⌘+Shift+F5
Toggle breakpoints	Select connection, then F9	

Transformer Categories

3D

3DAffiner 15
3DArcReplacer 15
3DForcer 15
3DInterpolator 15
3DRotator 15
AppearanceExtractor 16
AppearanceMerger 16
AppearanceRemover 16
AppearanceSetter 16
AppearanceStyler 16
Bufferer 21
CityEngineModelGenerator 23
Creator 25
CSGBuilder 25
CSGEvaluator 25
DEMDistanceCalculator 26
DEMGenerator 26
DimensionExtractor 26
ElevationExtractor 28
Extruder 28
FaceReplacer 28
GeometryInstantiator 31
GeometryPartExtractor 31
GeometryPropertyExtractor 31
GeometryPropertyRemover 31
GeometryPropertyRenamer 31
GeometryPropertySetter 31
IFCPropertySetDefinitionCreator 33
IFCQuantitySetDefinitionCreator 33
MeshMerger 39
MeshSimplifier 39
MRF3DCleaner 40
Offsetter 42
PipeReplacer 42
PlanarityFilter 43
PointCloudSurfaceBuilder 44
RasterDEMGenerator 47
RasterHillshader 48
RasterSlopeCalculator 50
Scaler 51
SecondOrderConformer 51
SharedItemAdder 51
SharedItemIDExtractor 52
SharedItemIDSetter 52
SharedItemRetriever 52
SolidBuilder 53
SurfaceBuilder 55
SurfaceDissolver 55
SurfaceDraper 55
SurfaceFootprintReplacer 56
SurfaceModeller 56
SurfaceOnSurfaceOverlayer 56
SurfaceSplitter 56
TINGenerator 57
VolumeCalculator 59

Attributes

Aggregator 16
AttributeCompressor 18
AttributeCopier 18
AttributeCreator 18
AttributeDecompressor 18
AttributeDereferencer 18
AttributeExploder 19
AttributeExposer 19
AttributeFileReader 19
AttributeFileWriter 19
AttributeKeeper 19
AttributeManager 19
AttributeRemover 19
AttributeRenamer 19
AttributeSplitter 20
BulkAttributeRemover 21
BulkAttributeRenamer 21
DatabaseJoiner 25
Deaggregator 26
ListBuilder 37
ListConcatenator 37
ListCopier 37
ListExploder 38
ListExpressionPopulator 38
ListIndexer 38
ListPopulator 38
ListRenamer 38
ListSorter 38
NullAttributeMapper 41

Calculated Values

Aggregator 16
AngleConverter 16
AngularityCalculator 16
ArcPropertyExtractor 17
AreaCalculator 18
AttributePivoter 19
AttributeRounder 19
BaseConverter 21
BoundsExtractor 21
CenterPointExtractor 22
CircularityCalculator 23
CoordinateConcatenator 24
CoordinateExtractor 24
Counter 25
CRCCalculator 25
DateTimeCalculator 26
DateTimeConverter 26
DateTimeStamper 26
DecimalDegreesCalculator 26
DEMDistanceCalculator 26
DensityCalculator 26
DimensionExtractor 26
DMSCalculator 27
ElevationExtractor 28

EllipsePropertyExtractor 28
ExpressionEvaluator 28
GeometryExtractor 30
GOIDGenerator 32
H3HexagonalIndexer 32
HoleCounter 32
LeftRightSpatialCalculator 36
LengthCalculator 36
LengthToPointCalculator 36
ListHistogrammer 38
ListRangeExtractor 38
MeasureExtractor 39
MeasureGenerator 39
ModuloCounter 39
NetworkCostCalculator 41
NetworkTopologyCalculator 41
OrientationExtractor 42
PartCounter 42
PointCloudExpressionEvaluator 43
PointCloudPropertyExtractor 44
PointCloudStatisticsCalculator 44
PointPropertyExtractor 45
RandomNumberGenerator 45
RasterAspectCalculator 45
RasterBandMinMaxExtractor 46
RasterBandPropertyExtractor 46
RasterCellValueCalculator 47
RasterExpressionEvaluator 47
RasterPropertyExtractor 49
RasterSingularCellValueCalculator 50
RasterStatisticsCalculator 50
ReprojectAngleCalculator 50
ReprojectLengthCalculator 50
StatisticsCalculator 54
StreamOrderCalculator 54
StreamPriorityCalculator 54
StringLengthCalculator 55
SubstringExtractor 55
TempPathnameCreator 56
TextLocationExtractor 57
TextPropertyExtractor 57
TextureCoordinateSetter 57
UUIDGenerator 58
VertexCounter 59
VolumeCalculator 59

Cartography and Reports

AreaAmalgamator 17
ChartGenerator 23
CommonLocalReprojector 23
Curvefitter® 25
DGNStyler 26
Displacer 27
DWGStyler 28

- ExcelStyler 28
- FeatureColorSetter 28
- Generalizer 30
- GeometryColorSetter 30
- HTMLLayouter 33
- HTMLReportGenerator 33
- ImageRasterizer 34
- KMLPropertySetter 35
- KMLRegionSetter 35
- KMLStyler 35
- KMLTimeSetter 35
- KMLTourBuilder 35
- KMLViewSetter 35
- Labeller 35
- LabelPointReplacer 36
- MapboxStyler 38
- MapInfoStyler 38
- MapnikRasterizer 39
- MapTextLabeller 39
- MapTextStyler 39
- MSWordStyler 40
- NumericRasterizer 41
- PDFPageFormmatter 42
- PDFStyler 42
- PowerPointStyler 45
- RasterHillshader 48
- SherbendGeneralizer 52
- TextAdder 57
- TextPropertySetter 57
- TextStroker 57
- WebMapTiler 59

Coordinates

- 2DForcer 15
- 3DAffiner 15
- 3DForcer 15
- Affiner 15
- AttributeReprojector 19
- BMGRReprojector 21
- CenterPointExtractor 22
- CommonLocalReprojector 23
- CoordinateConcatenator 24
- CoordinateExtractor 24
- CoordinateRounder 24
- CoordinateSwapper 24
- CoordinateSystemDescription
Converter 24
- CoordinateSystemExtractor 24
- CoordinateSystemRemover 24
- CoordinateSystemSetter 24
- CsmmapAttributeReprojector 25
- CsmmapReprojector 25
- DecimalDegreesCalculator 26
- DimensionExtractor 26
- DMSCalculator 27
- ElevationExtractor 28
- EsriReprojector 28
- GridInquestIIReprojector 32
- GridInquestReprojector 32
- GransAttributeReprojector 32

- GransReprojector 32
- LatLongToMGRSConverter 36
- LocalCoordinateSystemSetter 38
- MGRSToLatLongConverter 39
- PROJAttributeReprojector 45
- PROJReprojector 45
- RasterGCPExtractor 47
- RasterGCPSetter 47
- RasterGeoreferencer 48
- ReframeReprojector 50
- ReprojectAngleCalculator 50
- ReprojectLengthCalculator 50
- Reprojector 51
- RubberSheeter 51
- Scaler 51
- SecondOrderConformer 51
- TextureCoordinateSetter 57
- VertexCounter 59
- VertexRemover 59

Data Quality

- AngularityCalculator 16
- AreaGapAndOverlapCleaner 18
- AttributeValidator 20
- ChangeDetector 22
- CircularityCalculator 23
- ClosedCurveFilter 23
- CommonSegmentFinder 24
- ConvexityFilter 24
- CRCCalculator 25
- DimensionExtractor 26
- DuplicateFilter 27
- ElevationExtractor 28
- FeatureTypeFilter 29
- GeometryFilter 30
- GeometryValidator 31
- HoleCounter 32
- Inspector 34
- JSONValidator 35
- ListDuplicateRemover 37
- ListElementCounter 38
- ListHistogrammer 38
- Matcher 39
- MRF2DCleaner 40
- MRF2DConflator 40
- MRF2DDangleRemover 40
- MRF2DDuplicateRemover 40
- MRF2DExtender 40
- MRF2DGeneralizer 40
- MRF2DIntersection 40
- MRF2DJoiner 40
- MRF2DShortGeometryRemover 40
- MRF3DCleaner 40
- NullAttributeMapper 41
- PartCounter 42
- PlanarityFilter 43
- Sampler 51
- Snapper 52
- Snipper 52
- SpatialFilter 53
- SpatialRelator 53
- SpikeRemover 53
- SummaryReporter 55
- Tester 56
- TestFilter 56
- VertexCounter 59

Filters and Joins

- AggregateFilter 16
- Aggregator 16
- AreaOnAreaOverlayer 18
- AttributeFilter 19
- AttributePivoter 19
- AttributeRangeFilter 19
- ChangeDetector 22
- ClosedCurveFilter 23
- ConvexityFilter 24
- DatabaseJoiner 25
- Deagggregator 26
- DuplicateFilter 27
- FeatureJoiner 28
- FeatureMerger 29
- FeatureReader 29
- FeatureTypeFilter 29
- GeometryFilter 30
- LineOnAreaOverlayer 37
- LineOnLineOverlayer 37
- ListBasedFeatureMerger 37
- MultipleGeometryFilter 40
- NeighborhoodAggregator 41
- NLPClassifier 41
- NLPTrainer 41
- PlanarityFilter 43
- PointCloudFilter 43
- PointCloudMerger 43
- PointOnAreaOverlayer 44
- PointOnLineOverlayer 44
- PointOnPointOverlayer 44
- RasterMosaiccker 48
- Sampler 51
- SpatialFilter 53
- SpatialRelator 53
- Tester 56
- TestFilter 56
- TraitMerger 58

Format Specific

- AttributeFileReader 19
- AttributeFileWriter 19
- DatabaseDeleter 25
- DatabaseUpdater 26
- DGNStyler 26
- DWGStyler 28
- EsriReprojector 28
- ExcelStyler 28
- FeatureReader 29
- FeatureWriter 29
- GeometryExtractor 30
- GeometryReplacer 31
- GeoRSSFeatureComposer 31

GeoRSSFeatureReader 32
 GMLFeatureComposer 32
 HTMLLayouter 33
 HTMLReportGenerator 33
 HTMLToXHTMLConverter 33
 IFCPropertySetDefinitionCreator 33
 IFCQuantitySetDefinitionCreator 33
 JSONExtractor 34
 JSONFlattener 34
 JSONFormatter 34
 JSONFragmenter 34
 JSONTemplater 34
 JSONUpdater 35
 JSONValidator 35
 KMLPropertySetter 35
 KMLRegionSetter 35
 KMLStyler 35
 KMLTimeSetter 35
 KMLTourBuilder 35
 KMLViewSetter 35
 MapboxStyler 38
 MapInfoStyler 38
 MapTextLabeller 39
 MapTextStyler 39
 PDFPageFormatter 42
 PDFStyler 42
 RCaller 50
 WebMapTiler 59
 XMLAppender 59
 XMLFeatureMapper 59
 XMLFlattener 60
 XMLFormatter 60
 XMLFragmenter 60
 XMLNamespaceDeclarer 60
 XMLSampleGenerator 60
 XMLTemplater 60
 XMLUpdater 60
 XMLValidator 60
 XMLXQueryExploder 60
 XMLXQueryExtractor 60
 XMLXQueryUpdater 60
 XSLTProcessor 60

Geometries

2DArcReplacer 15
 2DBoxReplacer 15
 2DEllipseReplacer 15
 2DForcer 15
 2DGridAccumulator 15
 2DGridCreator 15
 3DArcReplacer 15
 3DForcer 15
 3DInterpolator 15
 3DRotator 15
 AffineWarper 16
 AnchoredSnapper 16
 AngleConverter 16
 ArcEstimator 17
 ArcPropertySetter 17
 ArcStroker 17

AreaAmalgamator 17
 AreaBuilder 17
 AreaGapAndOverlapCleaner 18
 BoundingBoxReplacer 21
 CenterLineReplacer 22
 CenterPointReplacer 22
 Chopper 23
 CityEngineModelGenerator 23
 CoordinateRounder 24
 CoordinateSwapper 24
 CSGBuilder 25
 Curvefitter* 25
 Densifier 26
 Displacer 27
 Dissolver 27
 DonutBridgeBuilder 27
 DonutBuilder 27
 DonutHoleExtractor 27
 EllipsePropertySetter 28
 FaceReplacer 28
 Generalizer 30
 GeometryCoercer 30
 GeometryExtractor 30
 GeometryRefiner 31
 GeometryRemover 31
 GeometryReplacer 31
 H3HexagonalIndexer 32
 HullReplacer 33
 Intersector 34
 LabelPointReplacer 36
 LineBuilder 36
 LineCloser 36
 LineCombiner 37
 LineExtender 37
 MeasureRemover 39
 MeasureSetter 39
 MeshMerger 39
 MeshSimplifier 39
 MinimumAreaForcer 39
 MinimumSpanningCircle
 Replacer 39
 MultipleGeometrySetter 40
 OffsetCurveGenerator 42
 Orientor 42
 PathBuilder 42
 PathSplitter 42
 PipeReplacer 42
 PointCloudSurfaceBuilder 44
 PointPropertySetter 45
 Rotator 51
 RubberSheeter 51
 Scaler 51
 SherbendGeneralizer 52
 Snapper 52
 Snipper 52
 SolidBuilder 53
 SpikeRemover 53
 SurfaceDissolver 55
 SurfaceFootprintReplacer 56
 SurfaceSplitter 56

TextAdder 57
 Tiler 57
 TINGenerator 57
 Triangulator 58
 VertexCreator 59
 VertexRemover 59

Integrations

ArcGISOnlineConnector 17
 AutodeskA360Connector 20
 AutodeskBIM360Docs
 Connector 20
 AzureBlobStorageConnector 20
 AzureFileStorageConnector 20
 AzureQueueStorageConnector 20
 BMGReprojector 21
 BoxConnector 21
 CityEngineModelGenerator 23
 CKANConnector 23
 CsmmapAttributeReprojector 25
 CsmmapReprojector 25
 Curvefitter* 25
 DatabaseDeleter 25
 DatabaseUpdater 26
 DirectTweeter 26
 DropboxConnector 27
 Emailer 28
 EsriReprojector 28
 EthereumConnector 28
 FMEServerJobSubmitter 29
 FMEServerJobWaiter 29
 FMEServerLogFileRetriever 29
 FMEServerNotifier 29
 FMEServerResourceConnector 30
 FTPCaller 30
 Geocoder 30
 GoogleCloudStorageConnector 32
 GoogleDriveConnector 32
 GridInquestIRReprojector 32
 GridInquestReprojector 32
 GtransAttributeReprojector 32
 GtransReprojector 32
 HDFSCConnector 32
 HTMLExtractor 33
 JMSReceiver 34
 JMSSender 34
 KinesisReceiver 35
 KinesisSender 35
 MRF2DCleaner 40
 MRF2DConflator 40
 MRF2DDangleRemover 40
 MRF2DDuplicateRemover 40
 MRF2DExtender 40
 MRF2DGeneralizer 40
 MRF2DIntersector 40
 MRF2DJoiner 40
 MRF2DShortGeometryRemover 40
 MRF3DCleaner 40
 OneDriveConnector 42
 PROJAttributeReprojector 45

- ProjectWiseWSGConnector 45
- PROJReprojector 45
- RabbitMQConnector 45
- RCaller 50
- ReframeReprojector 50
- S3Connector 51
- SalesforceConnector 51
- SharePointOnlineConnector 52
- SlackConnector 52
- SNSSender 53
- TCPIPReceiver 56
- TCPIPSender 56
- TransporterReceiver 58
- TransporterSender 58
- TrelloConnector 58
- Tweeter 58
- TweetSearcher 58
- TweetStreamer 58
- TwitterStatusFetcher 58
- WhiteStarLeaseBuilder 59

Point Clouds

- DEMGenerator 26
- GeometryCoercer 30
- PointCloudCoercer 43
- PointCloudCombiner 43
- PointCloudComponentAdder 43
- PointCloudComponentCopier 43
- PointCloudComponentKeeper 43
- PointCloudComponentRemover 43
- PointCloudComponentRenamer 43
- PointCloudComponentTypeCoercer 43
- PointCloudConsumer 43
- PointCloudCreator 43
- PointCloudExpressionEvaluator 43
- PointCloudExtractor 43
- PointCloudFilter 43
- PointCloudMerger 43
- PointCloudOnRasterComponentSetter 44
- PointCloudPropertyExtractor 44
- PointCloudReplacer 44
- PointCloudSimplifier 44
- PointCloudSorter 44
- PointCloudSplitter 44
- PointCloudStatisticsCalculator 44
- PointCloudSurfaceBuilder 44
- PointCloudThinner 44
- PointCloudTransformationApplier 44
- SurfaceDraper 55
- SurfaceModeller 56

Rasters

- AppearanceExtractor 16
- AppearanceMerger 16
- AppearanceRemover 16
- AppearanceSetter 16
- AppearanceStyler 16

- ChartGenerator 23
- DEMDistanceCalculator 26
- GoogleVisionConnector 32
- ImageFetcher 34
- ImageRasterizer 34
- MapnikRasterizer 39
- NumericRasterizer 41
- PointCloudOnRasterComponentSetter 44
- PointOnRasterValueExtractor 45
- RasterAspectCalculator 45
- RasterBandAdder 45
- RasterBandCombiner 45
- RasterBandInterpretationCoercer 45
- RasterBandKeeper 46
- RasterBandMinMaxExtractor 46
- RasterBandNameSetter 46
- RasterBandNodataRemover 46
- RasterBandNodataSetter 46
- RasterBandOrderer 46
- RasterBandPropertyExtractor 46
- RasterBandRemover 46
- RasterBandSeparator 46
- RasterCellCoercer 46
- RasterCellOriginSetter 46
- RasterCellValueCalculator 47
- RasterCellValueReplacer 47
- RasterCellValueRounder 47
- RasterCheckpointter 47
- RasterConsumer 47
- RasterConvolver 47
- RasterDEMGenerator 47
- RasterExpressionEvaluator 47
- RasterExtentsCoercer 47
- RasterExtractor 47
- RasterGCPExtractor 47
- RasterGCPSetter 47
- RasterGeoreferencer 48
- RasterHillshader 48
- RasterInterpretationCoercer 48
- RasterMosaicker 48
- RasterNumericCreator 48
- RasterObjectDetectionModelTrainer 48
- RasterObjectDetector 48
- RasterObjectDetectorSampleGenerator 48
- RasterObjectDetectorSamplePreparer 49
- RasterPaletteAdder 49
- RasterPaletteExtractor 49
- RasterPaletteGenerator 49
- RasterPaletteInterpretationCoercer 49
- RasterPaletteNodataSetter 49
- RasterPaletteRemover 49
- RasterPaletteResolver 49
- RasterPropertyExtractor 49
- RasterPyramider 49

- RasterRegisterer 49
- RasterReplacer 49
- RasterResampler 49
- RasterRGBCreator 49
- RasterRotationApplier 49
- RasterSegmenter 49
- RasterSelector 49
- RasterSharpenner 50
- RasterSingularCellValueCalculator 50
- RasterSlopeCalculator 50
- RasterStatisticsCalculator 50
- RasterSubsetter 50
- RasterTiler 50
- RasterToPolygonCoercer 50
- RCaller 50
- TextStroker 57
- VectorOnRasterOverlayer 59
- WebMapTiler 59

Spatial Analysis

- AffineWarper 16
- AnchoredSnapper 16
- AreaAmalgamator 17
- AreaBuilder 17
- AreaOnAreaOverlayer 18
- BoundingBoxAccumulator 21
- Bufferer 21
- CenterLineReplacer 22
- CenterPointReplacer 22
- Clipper 23
- ContourGenerator 24
- DEMDistanceCalculator 26
- Displacer 27
- Dissolver 27
- DonutBridgeBuilder 27
- FeatureReader 29
- HullAccumulator 33
- Intersector 34
- NeighborFinder 41
- NeighborhoodAggregator 41
- NeighborPairFinder 41
- NetworkCostCalculator 41
- NetworkFlowOrientor 41
- NetworkTopologyCalculator 41
- Offsetter 42
- PointOnAreaOverlayer 44
- PointOnLineOverlayer 44
- PointOnPointOverlayer 44
- PointOnRasterValueExtractor 45
- SectorGenerator 51
- ShortestPathFinder 52
- Snapper 52
- SpatialFilter 53
- SpatialRelator 53
- SpatialSorter 53
- SurfaceBuilder 55
- SurfaceDissolver 55
- SurfaceDraper 55

SurfaceOnSurfaceOverlayer 56
TopferIndexCalculator 58
TopologyBuilder 58
VectorOnRasterOverlayer 59
VoronoiCellGenerator 59
VoronoiDiagrammer 59

Strings

AngleConverter 16
AttributeCompressor 18
AttributeDecompressor 18
AttributeEncoder 18
AttributeExploder 19
AttributePivoter 19
AttributeRangeMapper 19
AttributeReprojector 19
AttributeRounder 19
AttributeSplitter 20
AttributeTrimmer 20
AttributeValidator 20
AttributeValueMapper 20
BaseConverter 21
BinaryDecoder 21
BinaryEncoder 21
CharacterCodeExtractor 22
CharacterCodeReplacer 22
CoordinateConcatenator 24
CoordinateSystemDescription
 Conver 24
DateTimeConverter 26
DimensionExtractor 26
ElevationExtractor 28
ExpressionEvaluator 28
FilenamePartExtractor 29
HTMLExtractor 33
HTMLToXHTMLConverter 33
ListDuplicateRemover 37
ListSearcher 38
ListSummer 38
NLPClassifier 41
NLPTrainer 41
NullAttributeMapper 41
RandomNumberGenerator 45
StringCaseChanger 54
StringConcatenator 54
StringFormatter 54
StringLengthCalculator 55
StringPadder 55
StringPairReplacer 55
StringReplacer 55
StringSearcher 55
SubstringExtractor 55
TextDecoder 57
TextEncoder 57

Web

AmazonAthenaConnector 16
ArcGISOnlineConnector 17
AttributeEncoder 18
AutodeskA360Connector 20

AutodeskBIM360Docs
 Connector 20
AWSIoTConnector 20
AzureBlobStorageConnector 20
AzureComputerVision
 Connector 20
AzureFileStorageConnector 20
AzureIoTConnector 20
AzureQueueStorageConnector 20
AzureTextAnalyticsConnector 20
BoxConnector 21
CesiumIonConnector 22
ChartGenerator 23
CKANConnector 23
ComprehendConnector 24
Decelerator 26
DirectTweeter 26
DropboxConnector 27
Emailer 28
EthereumConnector 28
FMEServerJobSubmitter 29
FMEServerJobWaiter 29
FMEServerLogFileRetriever 29
FMEServerNotifier 29
FMEServerResourceConnector 30
FTPCaller 30
Generalizer 30
Geocoder 30
GeoRSSFeatureComposer 31
GeoRSSFeatureReader 32
GoogleBigQueryConnector 32
GoogleCloudPubSubConnector 32
GoogleCloudStorageConnector 32
GoogleDriveConnector 32
GoogleIoTConnector 32
GoogleLanguageConnector 32
GoogleVisionConnector 32
HDFSConnector 32
HTMLExtractor 33
HTMLLayouter 33
HTMLReportGenerator 33
HTMLToXHTMLConverter 33
HTTPCaller 33
IBMIoTConnector 33
JMSReceiver 34
JMSSender 34
JSONExtractor 34
JSONFlattener 34
JSONFormatter 34
JSONFragmenter 34
JSONTemplater 34
JSONUpdater 35
JSONValidator 35
KafkaConnector 35
MQTTConnector 39
OneDriveConnector 42
ParameterFetcher 42
ProjectWiseWSGConnector 45
RabbitMQConnector 45
RasterPyramider 49

RecognitionConnector 50
S3Connector 51
SalesforceConnector 51
SharePointOnlineConnector 52
SlackConnector 52
SNSSender 53
SQSConnector 54
TCPIPReceiver 56
TCPIPSender 56
TrelloConnector 58
Tweeter 58
TweetSearcher 58
TweetStreamer 58
TwitterStatusFetcher 58
WebMapTiler 59
WebSocketReceiver 59
WebSocketSender 59
XMLAppender 59
XMLFeatureMapper 59
XMLFlattener 60
XMLFormatter 60
XMLFragmenter 60
XMLNamespaceDeclarer 60
XMLSampleGenerator 60
XMLTemplater 60
XMLUpdater 60
XMLValidator 60
XMLXQueryExploder 60
XMLXQueryExtractor 60
XMLXQueryUpdater 60
XSLTProcessor 60

Workflows

ArcGISOnlineConnector 17
AttributeFileReader 19
AttributeFileWriter 19
AutodeskA360Connector 20
AutodeskBIM360Docs
 Connector 20
AzureBlobStorageConnector 20
AzureFileStorageConnector 20
AzureQueueStorageConnector 20
BoxConnector 21
CKANConnector 23
Cloner 23
Creator 25
DatabaseDelete 25
DatabaseUpdater 26
Decelerator 26
DropboxConnector 27
EnvironmentVariableFetcher 28
EthereumConnector 28
FeatureHolder 28
FeatureReader 29
FeatureTypeExtractor 29
FeatureWriter 29
FMEFunctionCaller 29
FMEServerJobSubmitter 29
FMEServerJobWaiter 29
FMEServerLogFileRetriever 29

FMEServerNotifier 29	TimeWindower 57
FMEServerResourceConnector 30	TransporterReceiver 58
FTPCaller 30	TransporterSender 58
GeometryExtractor 30	TrelloConnector 58
GeometryReplacer 31	VariableRetriever 58
GoogleCloudStorageConnector 32	VariableSetter 58
GoogleDriveConnector 32	WebSocketReceiver 59
HDFSConnector 32	WebSocketSender 59
HTMLExtractor 33	WorkspaceRunner 59
HTTPCaller 33	XSLTProcessor 60
ImageFetcher 34	
InlineQuerier 34	
Inspector 34	
LicenseChecker 36	
Logger 38	
LogMessageStreamer 38	
OneDriveConnector 42	
ParameterFetcher 42	
Player 43	
ProjectWiseWSGConnector 45	
PythonCaller 45	
PythonCreator 45	
RabbitMQConnector 45	
RasterCheckpoint 47	
Recorder 50	
S3Connector 51	
SalesforceConnector 51	
Sampler 51	
SchemaMapper 51	
SharePointOnlineConnector 52	
SlackConnector 52	
Sorter 53	
SpatialSorter 53	
SQLCreator 54	
SQLExecutor 54	
SummaryReporter 55	
SystemCaller 56	
TclCaller 56	
TCPIPReceiver 56	
TCPIPSender 56	
TempPathnameCreator 56	
Terminator 56	

Symbol Reference



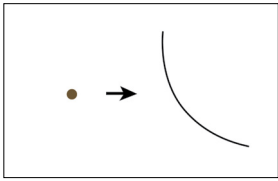
Transformers with this symbol are available at extra cost. Please contact Safe Software for more information.

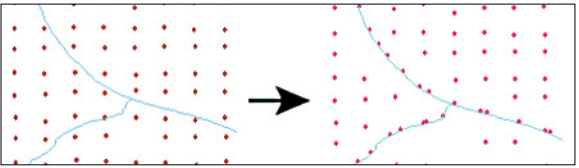


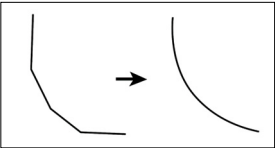
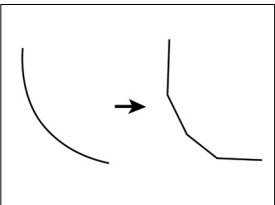
Transformers with this symbol are downloadable from FME Hub.

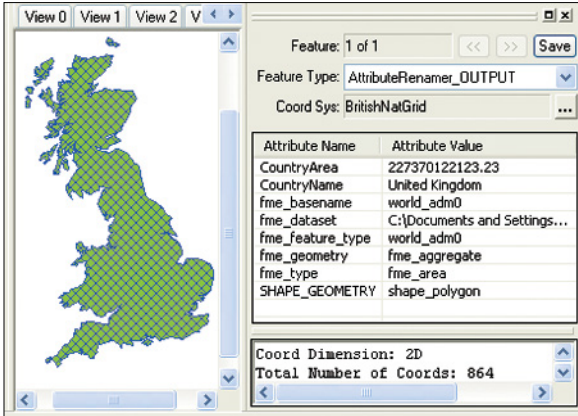


Transformers with this symbol are new in this version of FME.

2D		
2DArcReplacer	Replaces the geometry of the feature with a two-dimensional arc whose shape is set by the parameters, which can be either constant floating point values or the values of existing attributes. <i>(Geometries category)</i>	 A diagram within a rectangular frame. On the left, there is a small brown dot representing a point. To its right is a black arrow pointing to a curved line segment representing an arc.
2DBoxReplacer	Replaces the geometry of the feature with a two-dimensional box whose minimums and maximums are fixed values or are taken from attributes in the original feature. <i>(Geometries category)</i>	
2DEllipseReplacer	Replaces the feature's geometry with a two-dimensional ellipse whose shape is set by the parameters, values, or the values of existing attributes. <i>(Geometries category)</i>	
2DForcer	Removes any elevation (Z) coordinates which may (or may not) have been present on the original feature. <i>(Coordinates, Geometries categories)</i>	
2DGridAccumulator	Replaces the input features with a grid of two-dimensional point or polygon features that have the specified spacing and which cover (at least) the bounding box area of all features that enter the transformer. <i>(Geometries category)</i>	
2DGridCreator	Creates a grid of two-dimensional point or polygon features, at the origin and uses the offsets specified. Each created feature has a row and column attribute that indicates its position in the grid. <i>(Geometries category)</i>	
3D		
3DAffiner	Performs 3D affine transformation on the coordinates of the feature. An affine transformation preserves parallelism of lines and planes in geometry. Affine transformations include translations, rotations, scalings, and reflections. <i>(3D, Coordinates categories)</i>	
3DArcReplacer	Replaces the feature's geometry with a two-dimensional arc whose shape is set by the parameters, which can be either constant floating point values or the values of existing attributes. <i>(3D, Geometries categories)</i>	
3DForcer	Turns two-dimensional data into three-dimensional data by adding a z-value to every coordinate. <i>(3D, Coordinates, Geometries categories)</i>	
3DInterpolator	Interpolates elevation values along a non-aggregated linear feature from a starting value to an ending value. The resulting feature's elevation monotonically increases (or decreases) from the starting value to the ending value. If the feature was two-dimensional, it becomes three-dimensional. If the feature was three-dimensional, its previous elevations are removed and replaced. <i>(3D, Geometries categories)</i>	
3DRotator	Rotates features according to the right-hand rule, and in a counter-clockwise direction about the specified axis of rotation. <i>(3D, Geometries categories)</i>	
A		
Affiner	Performs an affine transformation on the coordinates of the feature. <i>(Coordinates category)</i>	

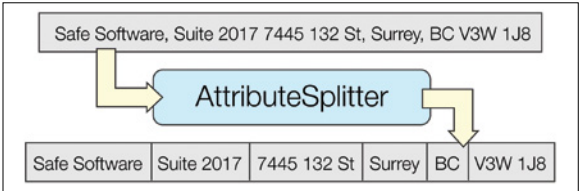
AffineWarper	Performs warping operations on the spatial coordinates of features. It is used to adjust a set of observed input features according to a spatial transform defined by a set of control vectors. <i>(Geometries, Spatial Analysis categories)</i>
AggregateFilter	Routes features differently depending on whether their geometry consists of an aggregate of several primitive geometries or a simple, single piece of geometry. <i>(Filters and Joins category)</i>
Aggregator	Combines feature geometries into heterogeneous or homogeneous aggregates. Alternatively, combines feature attributes without any geometry. <i>(Attributes, Calculated Values, Filters and Joins categories)</i> 
AmazonAthenaConnector 📄	Accesses Amazon's Athena service to run queries on S3 datasets. <i>(Web category)</i>
AnchoredSnapper	Takes a series of features that match the input specification and performs snapping on the features that lie within the specified tolerance from other features that match the input specification. <i>(Geometries, Spatial Analysis categories)</i> 
AngleConverter	Converts angles of a feature's geometry and/or attributes from one representation to another. <i>(Calculated Values, Geometries, Strings categories)</i>
AngularityCalculator	Calculates the "angularity" of a linear or area feature. Angularity indicates the degree of curvature of a feature. The higher the value, the more curved its geometry. <i>(Calculated Values, Data Quality categories)</i>
AppearanceExtractor	Extracts appearance style(s) from the front and/or back side of the geometries. <i>(3D, Rasters categories)</i>
AppearanceMerger	Sets the front and/or back appearance style(s) of specified geometries to be identical to that which is on a specific source geometry. <i>(3D, Rasters categories)</i>
AppearanceRemover	Removes appearances from the front and/or back side of geometries. Removing the appearance of a geometry causes that geometry to inherit its appearance from its parent, if a parent with an appearance exists. <i>(3D, Rasters categories)</i>
AppearanceSetter	Sets appearance style(s) onto the front and/or back sides of geometries. <i>(3D, Rasters categories)</i>
AppearanceStyler	Creates an appearance style that can later be applied to a surface (using the AppearanceSetter, for instance). <i>(3D, Rasters categories)</i>

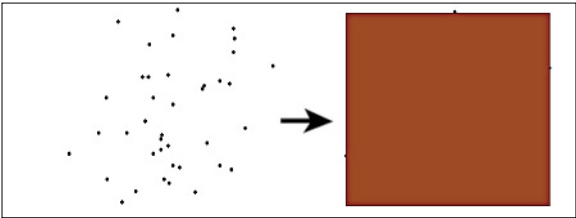
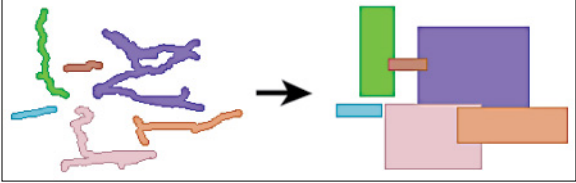
NEW	ArcEstimator	Replaces the geometry of the feature with a two-dimensional circular arc whose shape is estimated from the first, middle, and last point of the linear feature passed in. (<i>Geometries category</i>)	
	ArcGISOnlineConnector 📁	Accesses the Esri ArcGIS Online content stored by a user as a file storage service to upload, update, download, delete, or list information about items from a user's Esri ArcGIS Online content. It can also be used to change the sharing settings of an item or publish items as hosted feature layers. (<i>Integrations, Web, Workflows categories</i>)	
	ArcPropertyExtractor	Sets the given attributes to the properties of an arc geometry and works on a single feature at a time. (<i>Calculated Values category</i>)	
	ArcPropertySetter	Sets the properties of an arc geometry to those specified. (<i>Geometries category</i>)	
	ArcStroker	Converts arc features into lines replacing the feature geometry with a series of edges interpolated along the arc boundary. Ellipse features are converted into polygons by interpolating edges along the elliptical boundary. (<i>Geometries category</i>)	
	AreaAmalgamator	Generalizes polygonal input by connecting nearby geometries. The AreaAmalgamator accepts polygonal geometries – including donuts – as input, and produces triangles that join input features into connected pieces, or amalgams. (<i>Cartography and Reports, Geometries, Spatial Analysis categories</i>)	
	AreaBuilder	Takes a set of topologically connected linework and creates topologically correct polygon features where the linework forms closed shapes. (<i>Geometries, Spatial Analysis categories</i>)	

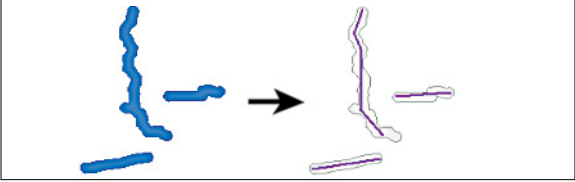
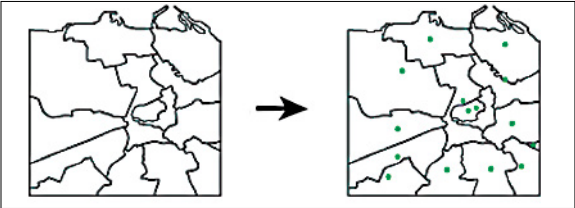
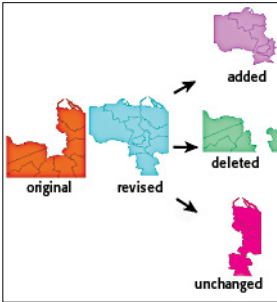
AreaCalculator	Calculates the area of a polygonal object and stores the value in an attribute. The area is calculated in square map units, whatever they are. (<i>Calculated Values category</i>) 
AreaGapAndOverlap Cleaner	Repairs area topologies by resolving gaps and overlaps between adjacent areas. An overlap occurs where two or more areas intersect each other, creating an region covered by multiple areas. A gap occurs where two or more areas fail to meet at a boundary. (<i>Data Quality, Geometries categories</i>)
AreaOnAreaOverlayer	Performs an area-on-area overlay so that all input areas are intersected against each other and resultant area features are created and output. The resultant areas have all the attributes of all the original features in which they are contained. (<i>Filters and Joins, Spatial Analysis categories</i>) 
AttributeCompressor	Compresses and (optionally) encrypts the values of the specified attributes. (<i>Attributes, Strings categories</i>)
AttributeCopier	Copies existing attributes to new attributes with user-specified names. The existing attribute remains intact and a new attribute is created that has a different name, but the same values. (<i>Attributes category</i>)
AttributeCreator	Adds one or more attributes to the feature and optionally assigns a value derived from constants, attribute values, and expressions. Values can reference adjacent features. (<i>Attributes category</i>)
AttributeDecompressor	Decompresses and decrypts the values of the specified attributes that were compressed and encrypted by the AttributeCompressor. (<i>Attributes, Strings categories</i>)
AttributeDereferencer	Copies the value of the attribute whose name is held in the source attribute to a newly created attribute. (<i>Attributes category</i>)
AttributeEncoder	Encodes the values of the specified attributes to the desired encoding. (<i>Strings, Web categories</i>)

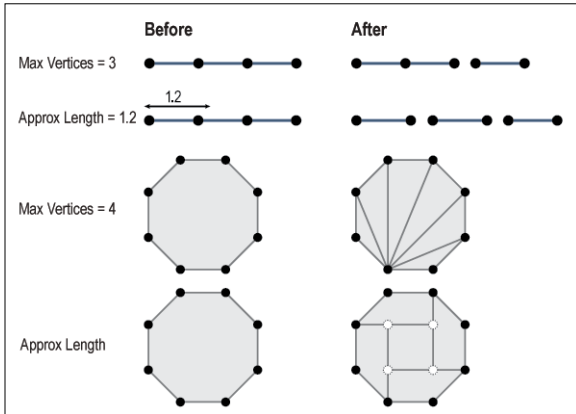
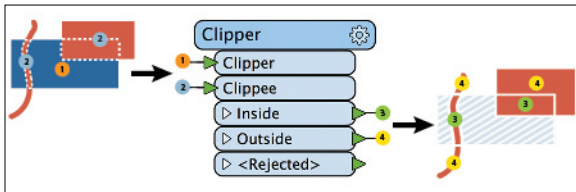
AttributeExploder	Creates a new pair of attributes (attribute name/attribute value) from each attribute on the input feature and either outputs these on a new feature or adds them as a list element to the original feature. In both cases, it is possible to either conserve or delete the original attributes and geometry. <i>(Attributes, Strings categories)</i>
AttributeExposer	Exposes attributes in Workbench so they can be used by downstream transformers and writers. <i>(Attributes category)</i>
AttributeFileReader	Reads the contents of a file and stores them as the value for the specified attribute. <i>(Attributes, Format Specific, Workflows categories)</i>
AttributeFileWriter	Writes the contents of the specified attribute to a file. <i>(Attributes, Format Specific, Workflows categories)</i>
AttributeFilter	Routes features to different output ports depending on the value of an attribute. <i>(Filters and Joins category)</i>
AttributeKeeper	Removes all attributes and list attributes, except the specific ones you specify to be retained. <i>(Attributes category)</i>
AttributeManager	Alters multiple attributes through adding, renaming, copying, deleting and re-ordering. Sets values for new, existing, and modified attributes to any combination of constants, attribute values, conditionals, expressions, and parameters. Values can reference adjacent features. <i>(Attributes category)</i>
AttributePivoter	Restructures and regroups incoming features based on specified "Group by attributes" and calculates summary statistics based on a designated "Attribute To Analyze" in order to form a Pivot table output. <i>(Calculated Values, Filters and Joins, Strings categories)</i>
AttributeRangeFilter	Performs a lookup on a range-based lookup table and routes the feature to the appropriate output port. <i>(Filters and Joins category)</i>
AttributeRangeMapper	Performs a lookup on a range-based lookup table and stores the resulting value, or writes the value to, a new output attribute. <i>(Strings category)</i>
AttributeRemover	Removes the selected attributes and list attributes from the feature. <i>(Attributes category)</i>
AttributeRenamer	Renames one or more attributes, retaining the attribute's current values. <i>(Attributes category)</i>
AttributeReprojector	Reprojects attributes from one coordinate system to another. <i>(Coordinates, Strings categories)</i>
AttributeRounder	Rounds off an attribute to the specified number of decimal places. <i>(Calculated Values, Strings categories)</i>

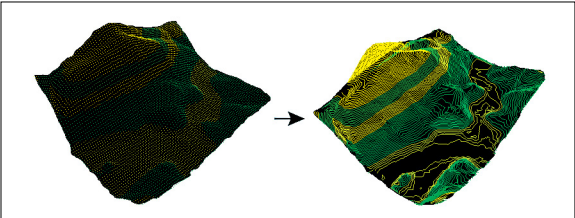
143.178435 —→ 143.18

AttributeSplitter	Splits a selected attribute into a list attribute. Each item in the list will contain a single token split from the list. You would use this transformer, for example, to separate an attribute that has a comma-separated value list into its component pieces. (<i>Attributes, Strings categories</i>) 
AttributeTrimmer	Removes leading and trailing trim characters from the selected attributes. (<i>Strings category</i>)
AttributeValidator	Validates any number of attributes against specific test conditions and routes the feature according to the outcome of the test(s). Features that fail one or more tests will have the reasons for failure documented on an attribute and list attribute on the output feature. (<i>Data Quality, Strings categories</i>)
AttributeValueMapper	Looks up and assigns attribute values based on other attributes, and stores the looked-up value in a new attribute. (<i>Strings category</i>) 
AutodeskA360Connector	Accesses the Autodesk A360 file storage service to upload or download files or list file and folder information from a Autodesk A360 account. (<i>Integrations, Web, Workflows categories</i>)
AutodeskBIM360 DocsConnector 📄	Accesses BIM 360 Docs to upload, download, or delete files and folders or list file/folder information. (<i>Integrations, Web, Workflows categories</i>)
AWSIoTConnector 📄	Connects to the AWS IoT Core messaging broker. Supports sending (producing) and receiving (consuming) messages. (<i>Web category</i>)
AzureBlobStorage Connector 📄	Accesses the Azure Blob Storage file storage service to upload, download, or delete files and folders or list file/folder information from an Azure account. (<i>Integrations, Web, Workflows categories</i>)
AzureComputerVision Connector 📄	Accesses the Azure Computer Vision Service to detect objects in images. (<i>Web category</i>)
AzureFileStorage Connector 📄	Accesses the Azure File Storage file storage service to upload, download, or delete files and folders or list file/folder information from an Azure account. (<i>Integrations, Web, Workflows categories</i>)
AzureIoTConnector 📄	Connects to Azure's IoT Hub through the MQTT protocol. Supports publishing device-to-cloud messages and receiving cloud-to-device messages as a device. (<i>Web category</i>)
AzureQueueStorage Connector 📄	Accesses the Azure Queue Storage service to send or receive messages. (<i>Integrations, Web, Workflows categories</i>)
AzureTextAnalytics Connector 📄	Accesses Azure's Text Analytics Service for natural language processing on text. (<i>Web category</i>)

B	
BaseConverter	Converts an attribute's value from one numeric system (base) to another, putting the resulting value in a new attribute. (<i>Calculated Values, Strings categories</i>) Decimal 958713 → Hex EA0F9
BinaryDecoder	Decodes Base64 or HEX text to binary data.(<i>Strings category</i>)
BinaryEncoder	Encodes binary data to text using Base64 or HEX encoding methods. (<i>Strings category</i>)
BMGReprojector	Reprojects feature coordinates from one coordinate system to another using the Blue Marble Geographic Calculator library. (<i>Coordinates, Integrations categories</i>)
BoundingBoxAccumulator	Takes a set of point, linear, polygonal, and/or aggregate features and creates a two-dimensional bounding box, which contains all features. (<i>Spatial Analysis category</i>) 
BoundingBoxReplacer	Replaces the geometry of the feature with either its two-dimensional bounding box or its two-dimensional minimum oriented bounding box. (<i>Geometries category</i>) 
BoundsExtractor	Extracts the minimum and maximum values of the feature's coordinates into new attributes.(<i>Calculated Values category</i>)
BoxConnector	Accesses the Box file storage service to upload, download, or delete files and folders or list file/folder information from a Box account. (<i>Integrations, Web, Workflows categories</i>)
Bufferer	Creates a buffer zone of specified size around or inside input geometry.(<i>3D, Spatial Analysis categories</i>)
BulkAttributeRemover	Removes all attributes on incoming features that match a given regular expression. It can also be used to remove large numbers of attributes that have common naming.(<i>Attributes category</i>)
BulkAttributeRenamer	Renames attributes by adding or removing prefixes or suffixes, or replacing text in regular expressions or character strings.(<i>Attributes category</i>)

C	
CenterLineReplacer	Replaces area geometries with their approximate center lines, medial axes, or straight skeletons. This transformer works best with long, narrow areas. (<i>Geometries, Spatial Analysis categories</i>) 
CenterPointExtractor	Extracts and outputs the specified x, y, z attributes of a feature's point that is either in the center of the feature's bounding box, somewhere inside the feature's bounding box or at the center of mass of the feature. (<i>Calculated Values, Coordinates categories</i>)
CenterPointReplacer	Replaces the geometry of the feature with a point that is either in the center of the feature's bounding box, somewhere inside the feature's bounding box or replaces the geometry of the feature with a point at the center of mass of the feature. (<i>Geometries, Spatial Analysis categories</i>) 
CesiumIonConnector 📁	Uploads a folder dataset to the Cesium ion service as a new asset. (<i>Web category</i>)
ChangeDetector	Detects changes between two sets of input features. (<i>Data Quality, Filters and Joins categories</i>) 
CharacterCodeExtractor	Extracts the integral character code of the first character in the source string attribute, and adds its integer value in the character set to the feature as another attribute. This can be used to obtain the integer code of any Unicode character (from Basic Multilingual Plane), including non-printable ones. (<i>Strings category</i>)
CharacterCodeReplacer	Sets the result attribute to the character whose numeric code was contained in the source code attribute (or the entered integer). (<i>Strings category</i>)

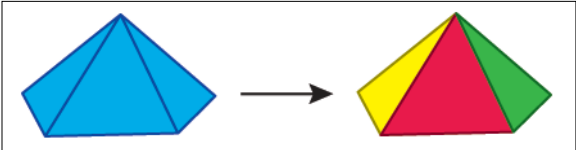
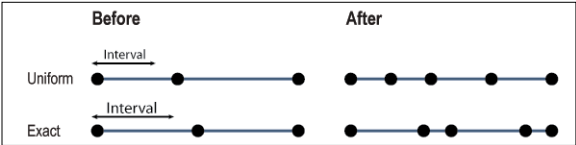
ChartGenerator	Creates a raster Line, Bar, Scatter, Histogram or Pie chart based on the values of selected attributes. (<i>Cartography and Reports, Rasters, Web categories</i>)
Chopper	Breaks input features into points, lines, or areas. Chopped features contain the same set of vertices as input features. (<i>Geometries category</i>) 
CircularityCalculator	Calculates the circularity of an area feature, which indicates how elongated the feature is. (<i>Calculated Values, Data Quality categories</i>)
CityEngineModel Generator 	Generates 3D models from input geometries and ArcGIS CityEngine rule packages (*.rpk). (<i>3D, Geometries, Integrations categories</i>)
CKANConnector 	Connects to a CKAN open data portal using the CKAN Action REST API. Supports reading and writing CKAN Dataset and Resource metadata, downloading of file-based Resources, and uploading files to the CKAN FileStore. Does not support row-based operations against CKAN DataStore Resources. (<i>Integrations, Web, Workflows categories</i>)
Clipper	Performs a geometric clipping operation. (<i>Spatial Analysis category</i>) 
Cloner	Makes the specified number of copies of the input features and outputs all copies through its single output port. (<i>Workflows category</i>)
ClosedCurveFilter	Checks if curves form closed loops. Curves include lines, arcs, and paths. This transformer can also check aggregates of curves. An aggregate is closed if all of its elements are closed. If any element of an aggregate is not a curve, the aggregate is rejected. (<i>Data Quality, Filters and Joins categories</i>)
CommonLocalReprojector	Reprojects a set of features to a local coordinate system with units of meters centered on the bounding box of the features. (<i>Cartography and Reports, Coordinates categories</i>)

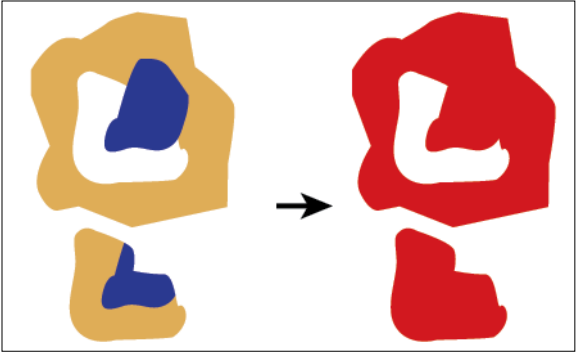
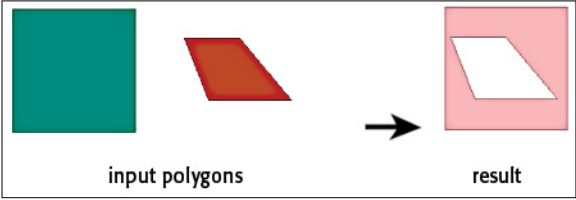
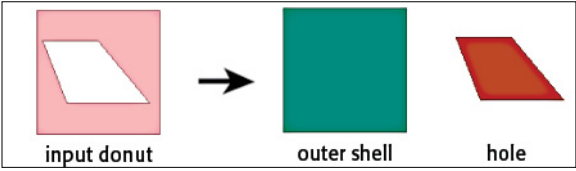
CommonSegmentFinder	Tests to see which of the Candidate features have even one line segment in common with any Base feature. (<i>Data Quality category</i>)
ComprehendConnector 📄	Accesses the Amazon AI Comprehend Service for natural language processing on text. (<i>Web category</i>)
ContourGenerator	Constructs a Delaunay triangulation based on input points and breaklines. Contour lines are then generated from the triangulation. (<i>Spatial Analysis category</i>) 
ConvexityFilter	Determines whether areas, surfaces, and solids are convex or concave. A polygon is simple when it is not self-intersecting and has a non-zero area. Simple polygons are convex if every internal angle is less than or equal to 180 degrees. All other polygons are considered concave. (<i>Data Quality, Filters and Joins categories</i>)
CoordinateConcatenator	Retrieves the value of all of the feature's coordinates into an attribute, separated by the delimiter characters. (<i>Calculated Values, Coordinates, Strings categories</i>)
CoordinateExtractor	Retrieves the value of the x, y, and z coordinates at the specified index into attributes. (<i>Calculated Values, Coordinates categories</i>)
CoordinateRounder	Rounds off the feature's coordinates to the specified number of decimal places. Any consecutive points that become duplicates as a result of the rounding are thinned by removing the redundant points. (<i>Coordinates, Geometries categories</i>) 
CoordinateSwapper	Swaps coordinate axes of the input features. (<i>Coordinates, Geometries categories</i>)
CoordinateSystemDescription Converter	Converts coordinate systems between FME and AutoDesk WKT, EPSG, Esri WKT, Esri WKID, MapInfo, OGC WKT, Oracle SRID, and PROJ.4 representations. (<i>Coordinates, Strings categories</i>)
CoordinateSystemExtractor	Retrieves the feature's coordinate system into an attribute. (<i>Coordinates category</i>)
CoordinateSystemRemover	Removes the coordinate system from all input features. This transformer does not reproject features or otherwise modify their geometry. (<i>Coordinates category</i>)
CoordinateSystemSetter	Tags all features with the specified coordinate system. It does not reproject features or otherwise modify their geometry. (<i>Coordinates category</i>)

Counter	Adds a numeric attribute to a feature and assigns a value. (<i>Calculated Values category</i>)
CRC Calculator	Calculates a CRC (Cyclic Redundancy Check) value for a feature and places the calculated CRC value into the attribute specified. (<i>Calculated Values, Data Quality categories</i>)
Creator	Creates features using the parameters supplied and sends them into the workspace for processing. (<i>3D, Workflows categories</i>)
CSG Builder	Creates Constructive Solid Geometry (CSG) from pairs of solid geometry features which are input through the A and B ports. (<i>3D, Geometries categories</i>)
CSG Evaluator	Recursively replaces the geometry of a feature that has CSG (Constructive Solid Geometry) by evaluating the tree of the CSG solid, effectively removing the constructive aspect of the geometry. (<i>3D category</i>)
CsmapAttributeReprojector	Reprojects attributes from one coordinate system to another using the CS-MAP library. (<i>Coordinates, Integrations categories</i>)
CsmapReprojector	Reprojects feature coordinates from one coordinate system to another using the CS-MAP library. (<i>Coordinates, Integrations categories</i>)
Curvefitter®	Smooths lines derived from line segments, points, or raster data, and replaces a series of line segments with the optimal combination of straight lines and embedded arc segments required to create smooth curving lines. This process provides a truer representation of real-world features and can reduce file sizes by up to 80%. In addition to processing simple line features, the Curvefitter preserves feature topology when smoothing boundaries of adjacent area features. (<i>Cartography and Reports, Geometries, Integrations categories</i>)

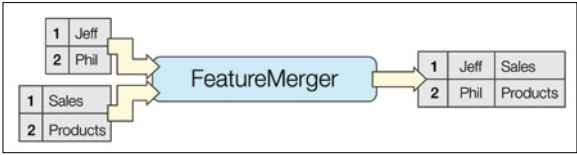
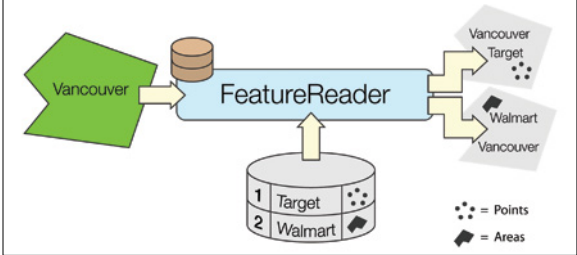
D

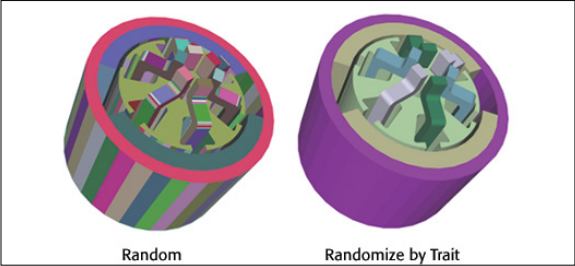
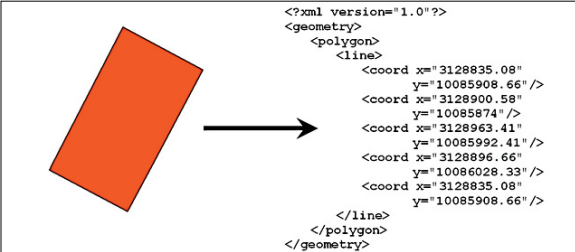
DatabaseDeleter	Delete rows in a database table based on the condition specified. (<i>Format Specific, Integrations, Workflows categories</i>)
DatabaseJoiner	Joins attributes from an external table to incoming features as they are being processed through a translation. (<i>Attributes, Filters and Joins categories</i>)

DatabaseUpdater	Update fields in a database table based on the condition specified. (<i>Format Specific, Integrations, Workflows categories</i>)
DateTimeCalculator	Performs arithmetic on date, time, datetime, and interval values. (<i>Calculated Values category</i>)
DateTimeConverter	Converts a set of input date/time attributes from one format to another, in place. (<i>Calculated Values, Strings categories</i>)
DateTimeStamper	Adds a timestamp to a feature as a new attribute in the form of a date, time (with or without UTC offset), or datetime (with or without UTC offset), in local or UTC time. (<i>Calculated Values category</i>)
Deagggregator	Decomposes an aggregate feature into its components. (<i>Attributes, Filters and Joins categories</i>)
	
Decelerator	Slows down the flow of features through the workspace. (<i>Web, Workflows categories</i>)
DecimalDegreesCalculator	Calculates a decimal degree value from separate degrees, minutes, and seconds (DMS) values, stored in attributes. (<i>Calculated Values, Coordinates categories</i>)
DEMDistanceCalculator	Calculates the distance between a number of input vector lines and the elevation values of a reference DEM raster. Outputs a new DEM raster per input line. The data contained in the resulting DEM consists of the 3D distance between the line being considered and the corresponding point on the reference DEM. (<i>3D, Calculated Values, Rasters, Spatial Analysis categories</i>)
DEMGenerator	Constructs a Delaunay triangulation based on input points and breaklines. That triangulation is then uniformly sampled to produce a digital elevation model (DEM points). (<i>3D, Point Clouds categories</i>)
Densifier	Adds vertices to each feature by interpolating new coordinates at fixed intervals. (<i>Geometries category</i>)
	
DensityCalculator	Determines the density of a group of Candidate features based on the area of a corresponding Area feature. (<i>Calculated Values category</i>)
DGNStyler	Prepares features for output to Bentley® Microstation® Design V7/V8 by providing a convenient interface to set a variety of format-specific attributes. (<i>Cartography and Reports, Format Specific categories</i>)
DimensionExtractor	Returns the dimension of the feature as a new attribute. (<i>3D, Calculated Values, Coordinates, Data Quality, Strings categories</i>)
DirectTweeter	Sends a Twitter™ direct message from FME. (<i>Integrations, Web categories</i>)

Displacer	Solves proximity conflicts between features using a variant of the Nickerson displacement algorithm. (<i>Cartography and Reports, Geometries, Spatial Analysis categories</i>)
Dissolver	Dissolves area features by removing common boundaries to create larger areas. Input attributes may be accumulated. (<i>Geometries, Spatial Analysis categories</i>) 
DMSCalculator	Calculates degrees, minutes, and seconds (DMS) from a decimal degrees value stored in an attribute. (<i>Calculated Values, Coordinates categories</i>)
DonutBridgeBuilder	Builds connections between donut holes with the outer boundary of a donut, resulting in a polygon-equivalent representation of the input donut. (<i>Geometries, Spatial Analysis categories</i>)
DonutBuilder	Cuts holes in polygonal features by making polygons completely enclosed in other polygons into holes of the containing polygon. (<i>Geometries category</i>) 
DonutHoleExtractor	Splits an area feature that has holes into its component rings. (<i>Geometries category</i>) 
DropboxConnector	Accesses the Dropbox file storage service to upload, download, or delete files and folders or list the contents of a folder from a Dropbox account. (<i>Integrations, Web, Workflows categories</i>)
DuplicateFilter	Detects duplicate features based on the value of one or more key attributes. (<i>Data Quality, Filters and Joins categories</i>)

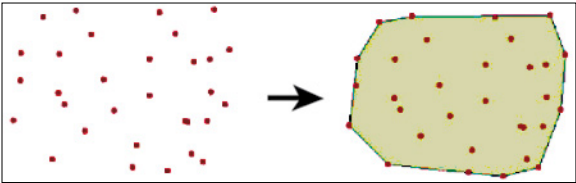
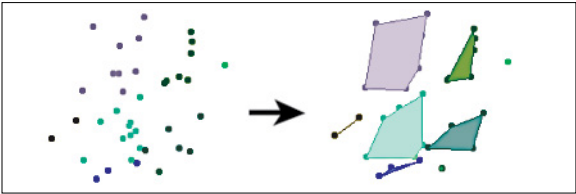
DWGStyler	Prepares features for output to AutoCAD® DWG™/DXF™ by providing a convenient interface to set a variety of AutoCAD DWG/DXF format-specific attributes. <i>(Cartography and Reports, Format Specific categories)</i>	
E		
ElevationExtractor	Extracts the elevation of the first coordinate and assigns it to the named attribute. <i>(3D, Calculated Values, Coordinates, Data Quality, Strings categories)</i>	
EllipsePropertyExtractor	Sets the given attributes to the properties of an ellipse geometry. <i>(Calculated Values category)</i>	
EllipsePropertySetter	Sets the properties of an ellipse geometry. <i>(Geometries category)</i>	
Emailer 📧	Sends one email per input feature via Simple Mail Transfer Protocol (SMTP). Both HTML and Plain Text emails may be sent, each with one or more attachments. <i>(Integrations, Web categories)</i>	
EnvironmentVariableFetcher	Fetches the specified environment variable and includes it in a new attribute. <i>(Workflows category)</i>	
EsriReprojector	Reprojects feature coordinates from one coordinate system to another using the Esri reprojection library. <i>(Coordinates, Format Specific, Integrations categories)</i>	
EthereumConnector 📡	Interacts with the Ethereum blockchain network. The functions include reading transaction, address, or block information, sending transactions, or interaction with deployed contracts. <i>(Integrations, Web, Workflows categories)</i>	
ExcelStyler	Sets common Excel style attributes for a group of features destined for the Excel Writer. <i>(Cartography and Reports, Format Specific categories)</i>	
ExpressionEvaluator	Performs a mathematical calculation on an expression that consists of FME Feature Functions, String Functions, Math Functions, and Math Operators. <i>(Calculated Values, Strings categories)</i>	
Extruder	Creates line, surface or solid geometries with a fixed cross-sectional profile taken from the original geometry of the feature. <i>(3D category)</i>	
F		
FaceReplacer	Replaces the geometry of a feature from donut, raster or polygon to face. <i>(3D, Geometries categories)</i>	
FeatureColorSetter	Assigns colors to incoming features. <i>(Cartography and Reports category)</i>	
FeatureHolder	Stores incoming features until they have all arrived and then releases them in their original order. <i>(Workflows category)</i>	
FeatureJoiner	Joins features by combining the attributes/geometry of features based on common attribute values, like a SQL join operation. <i>(Filters and Joins category)</i>	

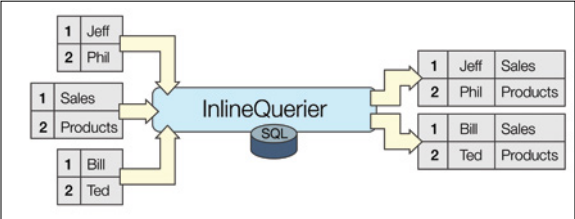
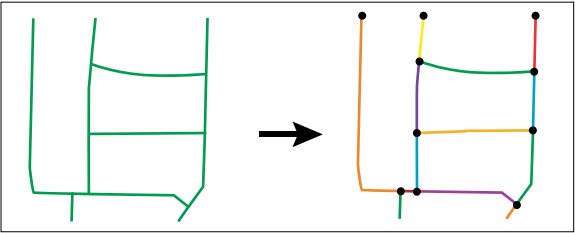
FeatureMerger	Copies and merges the attributes/geometry from one feature (or multiple features) onto another feature (or multiple features). (<i>Filters and Joins category</i>)  The diagram shows two input feature sets on the left. The first set has two rows: '1 Jeff Phil' and '2 Phil'. The second set has two rows: '1 Sales' and '2 Products'. Arrows from these sets point to a central blue box labeled 'FeatureMerger'. An arrow from the 'FeatureMerger' box points to an output feature set on the right with two rows: '1 Jeff Sales' and '2 Phil Products'.
FeatureReader	Reads features from any FME-supported format. (<i>Filters and Joins, Format Specific, Spatial Analysis, Workflows categories</i>)  The diagram shows a central blue box labeled 'FeatureReader'. Arrows point into it from three sources: a green polygon labeled 'Vancouver', a database cylinder, and another 'FeatureReader' box. An arrow points out from the 'FeatureReader' box to a set of outputs: a 'Vancouver Target' area, a 'Walmart' area, and a 'Vancouver' area. A legend indicates that dots represent 'Points' and a polygon represents 'Areas'. The database cylinder has two rows: '1 Target' with a point icon and '2 Walmart' with an area icon.
FeatureTypeExtractor	Adds an attribute containing the original feature type of a feature. (<i>Workflows category</i>)
FeatureTypeFilter	Routes input features to different output ports based on their original feature type. (<i>Data Quality, Filters and Joins categories</i>)
FeatureWriter	Writes features to any FME-supported Writer. (<i>Format Specific, Workflows categories</i>)
FilenamePartExtractor	Extracts specified parts of a filename path and returns the results as string attributes. (<i>Strings category</i>)
FMEFunctionCaller	Calls the specified FME function, optionally putting the resulting value in the Result Attribute. (<i>Workflows category</i>)
FMEServerJobSubmitter	Submits FME jobs to be run on an FME Server. A job consists of a workspace (housed within a repository on an FME Server) together with values for each of its published parameters. (<i>Integrations, Web, Workflows categories</i>)
FMEServerJobWaiter	Waits until submitted FME jobs are completely processed by an FME Server. The list of jobs to wait for is identified by the job IDs of the input features. When a job that the transformer is waiting for is completed, it outputs the corresponding feature immediately. (<i>Integrations, Web, Workflows categories</i>)
FMEServerLogFileRetriever	Accesses the translation log for a specified FME Server-run translation. The translation log to access is identified by the job ID input parameter. (<i>Integrations, Web, Workflows categories</i>)
FMEServerNotifier	Sends a notification to a specified FME Server. The notification may be used for a variety of actions, such as triggering a downstream workspace, or sending an email message to subscribed clients. (<i>Integrations, Web, Workflows categories</i>)

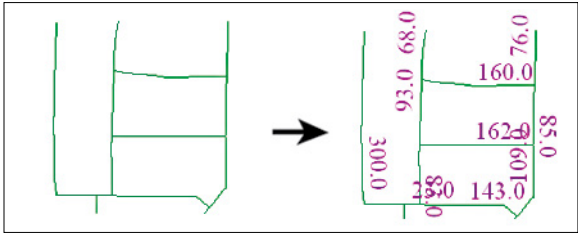
FMEServerResourceConnector	Accesses the FME Server file storage service to upload, download, or delete files and folders or list information about files/folders from a FME Server account. (<i>Integrations, Web, Workflows categories</i>)
FTPCaller	Uploads and downloads data from an FTP server. (<i>Integrations, Web, Workflows categories</i>)
G	
Generalizer	Transforms or measures geometry features based on a specified algorithm. There are four algorithm types: - Generalizing algorithms reduce the density of coordinates by removing vertices. - Smoothing algorithms determine a new location for each vertex. - Measuring algorithms calculate the location of points and return a list of these points (for example, to measure the sinuosity of a feature). - Fitting algorithms replace the original geometry completely, with a new feature fitted to a specified line (for example, to minimize the orthogonal distance to the original). (<i>Cartography and Reports, Geometries, Web categories</i>)
Geocoder	Uses various external web services to convert addresses to latitude/longitude coordinates, or to find the closest addresses to latitude/longitude coordinates (reverse geocode). Some services have additional information available, such as time zone or elevation. (<i>Integrations, Web categories</i>)
GeometryColorSetter	Sets colors, via appearances, on geometries (such as surfaces) that support appearances, and match a Geometry XQuery. (<i>Cartography and Reports category</i>) 
GeometryCoercer	Resets the geometry type of the feature. (<i>Geometries, Point Clouds categories</i>)
GeometryExtractor	Extracts the geometry of a feature according to the setting of the geometry encoding parameter. The resulting encoded geometry is added to the feature in an attribute. This attribute can later be restored as the feature's geometry using the GeometryReplacer transformer. (<i>Calculated Values, Format Specific, Geometries, Workflows categories</i>)  <pre> <?xml version="1.0"?> <geometry> <polygon> <line> <coord x="3128835.08" y="10085908.66"/> <coord x="3128900.58" y="10085874"/> <coord x="3128963.41" y="10085992.41"/> <coord x="3128896.66" y="10086028.33"/> <coord x="3128835.08" y="10085908.66"/> </line> </polygon> </geometry> </pre>

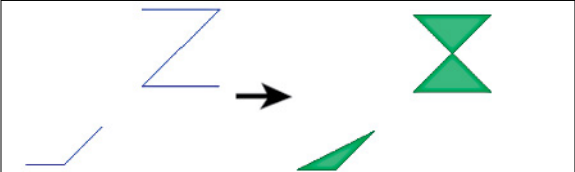
GeometryFilter	Routes a feature based on its geometry type. (<i>Data Quality, Filters and Joins categories</i>)
GeometryInstantiator	Replaces a geometry definition with independent geometry instances that are copies of the original geometry definition. The affine transformation that defined the position of each instance in the geometry definition, including position, scale, and rotation, is applied to each instance. (<i>3D category</i>)
GeometryPartExtractor	Extracts or removes selected geometry parts based on a Geometry XQuery. (<i>3D category</i>)
GeometryPropertyExtractor	Extracts selected geometry names or traits to feature attributes. (<i>3D category</i>)
GeometryPropertyRemover	Removes selected geometry names or traits. (<i>3D category</i>)
GeometryPropertyRenamer	Renames geometry names or traits. (<i>3D category</i>)
GeometryPropertySetter	Sets selected geometry names or traits from feature attributes or constants. (<i>3D category</i>)
GeometryRefiner	Performs the following refinements on the feature's geometry: - Any homogeneous IFMEAggregate becomes a multi (IFMEMultiCurve, IFMEMultiArea, IFMEMultiPoint, or IFMEMultiText). - Any IFMEAggregate or multi with only one member is replaced by its single part. - Any IFMEDonut with no holes becomes an IFMEPolygon or IFMEEllipse. - Any IFMEPath with only one segment is replaced by that segment. - Consecutive IFMELine segments within an IFMEPath are combined (<i>Geometries category</i>)
GeometryRemover	Completely removes the geometry of the feature, for example, if you want to turn spatial data into non-spatial data. (<i>Geometries category</i>)
GeometryReplacer	Replaces the feature's geometry according to the setting of the geometry encoding parameter. This transformer is typically used to restore geometry previously extracted into an attribute by the GeometryExtractor. (<i>Format Specific, Geometries, Workflows categories</i>)
GeometryValidator	Detects selected issues in input features, and optionally repairs detected issues. Each input feature is processed individually. (<i>Data Quality category</i>)
GeoRSSFeatureComposer	Constructs GeoRSS documents from the input features and stores them in the specified attribute for the features that are output by the GeoRSS port. (<i>Format Specific, Web categories</i>)

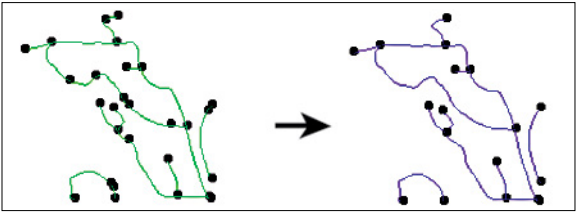
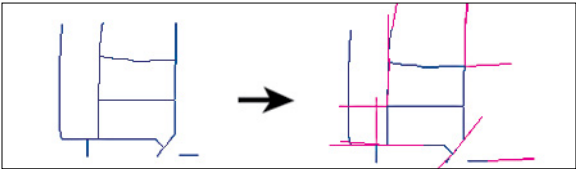
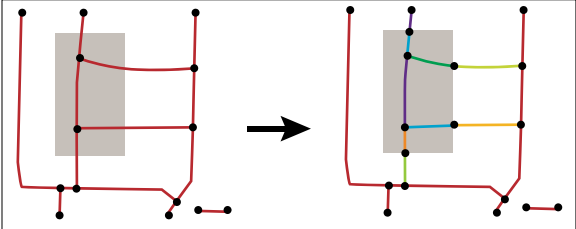
	GeoRSSFeatureReader	Constructs features out of GeoRSS documents/URLs that are stored in a specified attribute of the input features. The features from the GeoRSS document/URL are output with the attributes from the original feature and are merged, if desired. (<i>Format Specific, Web categories</i>)
	GMLFeatureComposer	Writes out GML features corresponding to feature types from existing GML application schema. (<i>Format Specific category</i>)
	GOIDGenerator	Calculates a GOID (Geographic Object Identifier) for each incoming feature, and adds it as a new attribute. The GOID is a unique 128-bit number that incorporates the position of a feature with other numbers. The result is a unique value that may be used to distinguish features from each other. (<i>Calculated Values category</i>)
	GoogleBigQueryConnector 📡	Accesses the Google BigQuery service to load or query tables from a Google Cloud account. (<i>Web category</i>)
	GoogleCloudPub SubConnector 📡	Connects to the Google Cloud Pub/Sub service. Supports creation of topics and subscriptions and sending or receiving messages. (<i>Web category</i>)
NEW	GoogleCloudStorage Connector 📡	Accesses the Google Cloud Storage file storage service to upload, download, or delete files and folders or list file/folder information from a Google Cloud Storage account. (<i>Integrations, Web, Workflows categories</i>)
	GoogleDriveConnector	Accesses the Google Drive file storage service to upload, download, or delete files and folders or list the contents of a folder from a Google Drive account. (<i>Integrations, Web, Workflows categories</i>)
NEW	GoogleIoTConnector 📡	Connects to the Google IoT Core. Supports sending (producing) and receiving (consuming) messages. (<i>Web category</i>)
	GoogleLanguageConnector 📡	Accesses the Google Natural Language and Google Cloud Translation API for text analysis, such as language and sentiment detection. (<i>Web category</i>)
	GoogleVisionConnector 📡	Accesses the Google Vision AI API for image recognition. (<i>Rasters, Web categories</i>)
	GridInQuestIIReprojector	Reprojects feature coordinates from one coordinate system to another using the Grid InQuestII reprojection library. (<i>Coordinates, Integrations categories</i>)
	GridInQuestReprojector	Reprojects feature coordinates from one coordinate system to another using the Grid InQuest reprojection library. (<i>Coordinates, Integrations categories</i>)
	GtransAttributeReprojector	Reprojects attributes holding coordinate values from one coordinate system to another using the Gtrans reprojection library (from the National Land Survey of Sweden), and the specified translation file. (<i>Coordinates, Integrations categories</i>)
	GtransReprojector	Reprojects features from one coordinate system to another using the Gtrans reprojection library (from the National Land Survey of Sweden) and the specified translation file. (<i>Coordinates, Integrations categories</i>)
H		
NEW	H3HexagonalIndexer	Computes and manipulates numeric indexes from the hexagonal hierarchical global spatial index grid known as Uber H3. Allows spatial data to be grouped into hexagon grid cells for analysis and visualization. (<i>Calculated Values, Geometries categories</i>)
	HDFSConnector	Accesses a HDFS (Hadoop Distributed File System) to upload, download, or delete files and folders or list the contents of a folder from a HDFS service. (<i>Integrations, Web, Workflows categories</i>)
	HoleCounter	Adds a new attribute whose value is the number of holes in the feature. (<i>Calculated Values, Data Quality categories</i>)

HTMLExtractor	Extracts structured data from web page or other HTML sources that are formatted for human readability (screen scraping), using CSS selectors to extract portions of HTML content into feature attributes. (Integrations, Strings, Web, Workflows categories)
HTMLayouter	Allows users to combine web reports generated by the HTMLReportGenerator into a bootstrap grid or vertical layout. (Cartography and Reports, Format Specific, Web categories)
HTMLReportGenerator	Allows users to create a basic web report of vertically-stacked elements using the geometry and selected attributes from features. (Cartography and Reports, Format Specific, Web categories)
HTMLToXHTMLConverter	Converts HTML document into valid XHTML document. (Format Specific, Strings, Web categories)
HTTPCaller	Accesses a URL via HTTP or HTTPS, performing a GET, PUT, POST, DELETE, HEAD, PATCH or OPTIONS operation. (Web, Workflows categories)
HullAccumulator	Creates convex or concave hulls for groups of features. One hull feature is output for each unique combination of values of the attributes specified in the Group By parameter. (Spatial Analysis category) 
HullReplacer	Replaces the geometry of the feature with a polygon representing its hull. (Geometries category) 
I	
IBMIoTConnector 	Connects to IBM's Watson IoT Platform through the MQTT protocol. Supports sending (producing) and receiving (consuming) messages. (Web category)
IFCPropertySetDefinition Creator	Creates a feature whose attributes contain the definition of an IFC property set. The features output from this transformer are similar to the PropertySetDefinition features produced by the IFC reader. (3D, Format Specific categories)
IFCQuantitySetDefinition Creator	Creates a feature whose attributes contain the definition of an IFC quantity set. The features output from this transformer are similar to the QuantitySetDefinition features produced by the IFC reader. (3D, Format Specific categories)

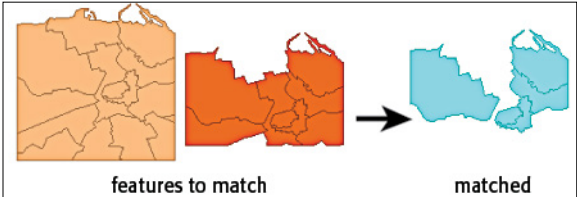
ImageFetcher	Fetches an image by performing an HTTP GET operation on the specified URL, and then returning the resulting data as the geometry of a raster feature. (<i>Rasters, Workflows categories</i>)
ImageRasterizer	Draws input point, line, and polygon features onto a color raster filled with the background color. (<i>Cartography and Reports, Rasters categories</i>)
InlineQuerier	Executes SQL queries against a temporary database consisting of tables created from incoming features, returning the results as new features. (<i>Workflows category</i>) 
Inspector	Sends features to the FME Data Inspector for display. (<i>Data Quality, Workflows categories</i>)
Intersector	Computes intersections between all input features, and breaks lines and polygons wherever an intersection occurs. (<i>Geometries, Spatial Analysis categories</i>) 
J	
JMSReceiver	Using the Java Message System (JMS), receives messages from a message broker. (<i>Integrations, Web categories</i>)
JMSSender	Using the Java Message System (JMS), sends messages to a message broker. (<i>Integrations, Web categories</i>)
JSONExtractor	Extracts portions of JSON (JavaScript Object Notation) formatted text into feature attributes. (<i>Format Specific, Web categories</i>)
JSONFlattener	Flattens JSON objects, extracting the object keys and values into FME feature attributes. (<i>Format Specific, Web categories</i>)
JSONFormatter	Provides options for formatting JSON text. (<i>Format Specific, Web categories</i>)
JSONFragmenter	Extracts portions of JSON formatted text into new FME features. (<i>Format Specific, Web categories</i>)
JSONTemplater	Populates a JSON document with FME feature attribute values. (<i>Format Specific, Web categories</i>)

JSONUpdater	This transformer creates, modifies, replaces or deletes object and array values in a JSON document. <i>(Format Specific, Web categories)</i>
JSONValidator	Validates the syntax of JSON text. <i>(Data Quality, Format Specific, Web categories)</i>
K	
KafkaConnector 📡	Connects to an Apache Kafka cluster. Supports sending (producing) and receiving (consuming) messages. <i>(Web category)</i>
KinesisReceiver	Using the Amazon Kinesis service, receives data records from an Amazon Kinesis stream. <i>(Integrations category)</i>
KinesisSender	Using the Amazon Kinesis service, sends data records to an Amazon Kinesis stream. <i>(Integrations category)</i>
KMLPropertySetter	Sets common properties for groups of vector and raster features destined for the OGCKML Writer. <i>(Cartography and Reports, Format Specific categories)</i>
KMLRegionSetter	Sets the region-related KML attributes for a group of features destined for the OGCKML Writer. <i>(Cartography and Reports, Format Specific categories)</i>
KMLStyler	Creates a common style for a group of features destined for the OGCKML writer. <i>(Cartography and Reports, Format Specific categories)</i>
KMLTimeSetter	Sets the time-related KML attributes for a group of features destined for the OGCKML Writer. <i>(Cartography and Reports, Format Specific categories)</i>
KMLTourBuilder	Generates a KML Tour from the input features. The tour consists of tour stops that correspond to each input feature. <i>(Cartography and Reports, Format Specific categories)</i>
KMLViewSetter	Sets the view-related KML attributes for a group of features that are destined for the OGCKML Writer. Creation of LookAt or Camera views are supported. <i>(Cartography and Reports, Format Specific categories)</i>
L	
Labeller	Interpolates labels along a linear or polygonal feature. <i>(Cartography and Reports category)</i> 

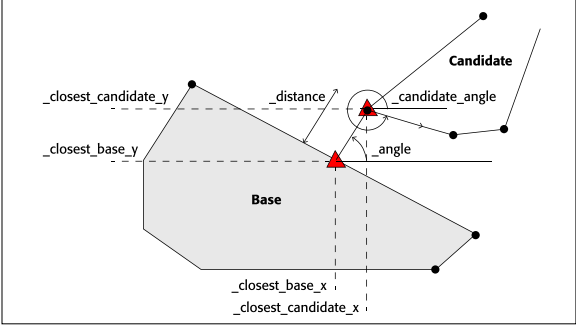
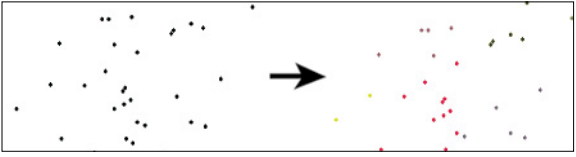
LabelPointReplacer	Replaces the geometry of the feature with a label point. The insertion point of the text is guaranteed to be inside (in case of polygons) or on (lines and points) the original object. Note that since the text itself may be larger than an input area feature, the bounds of the label may exceed the bounds of the area. (<i>Cartography and Reports, Geometries categories</i>) 
LatLongToMGRSConverter	Calculates a Military Grid Reference System (MGRS) code based on the latitude and longitude values supplied in a feature's attributes. (<i>Coordinates category</i>)
LeftRightSpatialCalculator	Computes relative position of CANDIDATE input features relative to BASE input features. The geometry of a BASE feature is restricted to lines. (<i>Calculated Values category</i>)
LengthCalculator	Calculates the length of a feature and adds it as a new attribute. (<i>Calculated Values category</i>)
LengthToPointCalculator	Calculates the length of a feature from its start until the closest spot to a point and adds it as a new attribute. The point coordinates are taken from attributes in the original feature. (<i>Calculated Values category</i>)
LicenseChecker	Checks whether the license file is valid and the specified product name is licensed, based on a vendor key and vendor registration code. (<i>Workflows category</i>)
LineBuilder	Connects input point features in the order they enter, forming linear or polygonal features. (<i>Geometries category</i>) 
LineCloser	Turns input linear features into areas by adding their start point as the end point. (<i>Geometries category</i>) 

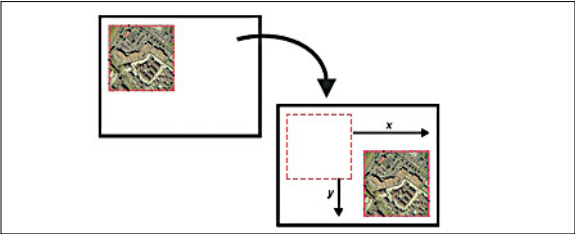
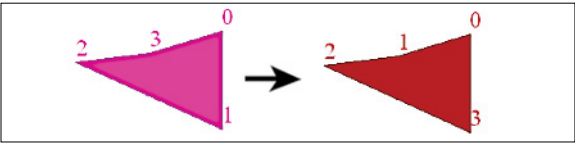
LineCombiner	Takes lines and connects them to form longer lines. Each connecting line must meet at the exact same start/end point, but otherwise they must not intersect. (<i>Geometries category</i>) 
LineExtender	Creates two-point extensions to linear features that extend the feature by a user-specified length. This transformer can also output the original feature with the first and last segments stretched by a user-specified amount. (<i>Geometries category</i>) 
LineOnAreaOverlayer	Performs a line-on-area overlay. Each input line is split at any area boundaries it intersects. (<i>Filters and Joins category</i>) 
LineOnLineOverlayer	Performs a line-on-line overlay in which all input lines are intersected against each other and resultant line features are created and output. (<i>Filters and Joins category</i>)
ListBasedFeatureMerger	Copies and merges the attributes/geometry from one feature (or multiple features) onto another feature (or multiple features). (<i>Filters and Joins category</i>)
ListBuilder	Combines attributes of the input features into a single list structure. (<i>Attributes category</i>)
ListConcatenator	Concatenates all values of a list into a single attribute. (<i>Attributes category</i>)
ListCopier	Copies a complete attribute list, including all nested attributes, from one list name to another. (<i>Attributes category</i>)
ListDuplicateRemover	Removes all duplicate values from a list attribute. In the resulting list, only distinct values for the list attribute will be present. (<i>Data Quality, Strings categories</i>)

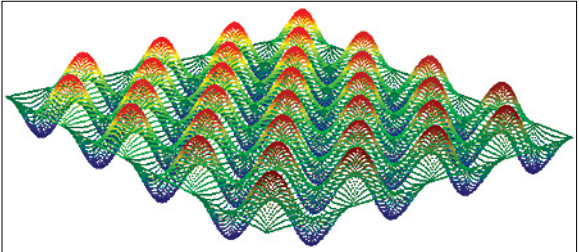
ListElementCounter	Stores the number of member elements found in the specified list into an attribute. <i>(Data Quality category)</i>
ListExploder	Explodes each list member on each input feature out into its own feature. <i>(Attributes category)</i>
ListExpressionPopulator	Populates a new list from a series of attributes, specified using a regular expression. <i>(Attributes category)</i>
ListHistogrammer	Computes a histogram of the values found in a list and returns these in a new list attribute on the feature. <i>(Calculated Values, Data Quality categories)</i>
ListIndexer	Copies the attributes of the list element specified by the index to become main attributes of the feature. <i>(Attributes category)</i>
ListPopulator	Populates a new list from a series of attributes. The attributes to be used are specified by the prefix parameter. <i>(Attributes category)</i> Example: <i>myattrib0</i> <i>myattrib1</i> <i>myattrib2</i> becomes a list <i>myattrib{}</i> containing entries <i>myattrib{0}, myattrib{1}, myattrib{2}</i>
ListRangeExtractor	Extracts the minimum and maximum values found in a list. <i>(Calculated Values category)</i>
ListRenamer	Renames or promotes list names or components. <i>(Attributes category)</i>
ListSearcher	Searches a list to find a value and returns the index of the value in the list. <i>(Strings category)</i>
ListSorter	Sorts the elements of the given list into a new list. <i>(Attributes category)</i>
ListSummer	Computes the sum of all elements of a list. <i>(Strings category)</i>
LocalCoordinateSystemSetter	Tags all features with the local coordinate system defined by the specified parameters. It does not reproject features, or otherwise modify their geometry. <i>(Coordinates category)</i>
Logger	Logs each feature to the translation log. All attributes and geometry of the feature will be output. <i>(Workflows category)</i>
LogMessageStreamer	Captures messages from the FME logfile and/or the Logger transformer. The messages are loaded onto features created by the transformer. Limitations: Messages outside the lifetime of the transformer cannot be captured. <i>(Workflows category)</i>
M	
MapboxStyler	Creates a common style for a group of features destined for the GeoJSON writer. <i>(Cartography and Reports, Format Specific categories)</i>
MapInfoStyler	Prepares features for output to Mapinfo® MIF/MID or MapInfo TAB by providing a convenient interface to set a variety of format-specific attributes. <i>(Cartography and Reports, Format Specific categories)</i>

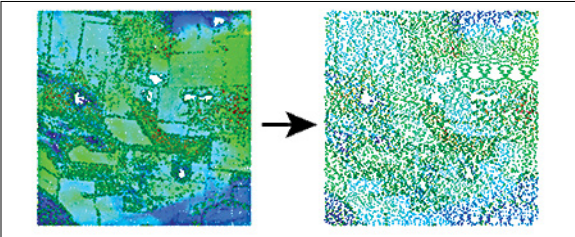
MapnikRasterizer	Draws input point, line, polygon, and raster features onto a raster using the Mapnik toolkit. (<i>Cartography and Reports, Rasters categories</i>)
MapTextLabeller 🗲	Creates text labels for features using the MapText Label Manager. (<i>Cartography and Reports, Format Specific categories</i>)
MapTextStyler	Prepares features for labelling by the MapTextLabeller by specifying no-label zones around features. (<i>Cartography and Reports, Format Specific categories</i>)
Matcher	Detects features that are matches of each other. Features are declared to match when they have matching geometry, matching attribute values, or both. (<i>Data Quality category</i>) 
MeasureExtractor	Extracts the measures of geometries that match the given type, and places them in attributes or list attributes. (<i>Calculated Values category</i>)
MeasureGenerator	Creates a set of measures attached to the geometry of the feature, where each value is the distance from the start of the line to that vertex, multiplied by the given Multiplier. (<i>Calculated Values category</i>)
MeasureRemover	Removes measures from a feature's geometry. (<i>Geometries category</i>)
MeasureSetter	Sets measure(s) on a point, line, arc, area geometry or a vertex of a linear geometry to attribute value(s) of given attribute(s) or list attribute. (<i>Geometries category</i>)
MeshMerger	Merges mesh features (features with IFMEMesh geometries) into a single output mesh. (<i>3D, Geometries categories</i>)
MeshSimplifier	Simplifies mesh features (features with IFMEMesh geometries) to a reduced level of detail. The amount of simplification can be specified as a ratio or as a limit on the number of vertices. (<i>3D, Geometries categories</i>)
MGRSToLatLongConverter	Converts Military Grid Reference System (MGRS) code to longitude and latitude coordinates. (<i>Coordinates category</i>)
MinimumAreaForcer	Ensures that features with polygon geometry have an area that is equal to, or in excess of, the specified minimum area. (<i>Geometries category</i>)
MinimumSpanningCircle Replacer	Replaces the geometry of the feature with a polygon representing its minimum spanning circle. The minimum spanning circle is defined as the smallest circle that encloses all vertices of the passed-in feature. (<i>Geometries category</i>)
ModuloCounter	Adds an attribute holding the next integer in a sequence, restarting the count at 0 whenever the sequence reaches the specified maximum value. (<i>Calculated Values category</i>)
MQTTConnector 📡	Connects to an MQTT broker. Supports sending (producing) and receiving (consuming) messages. (<i>Web category</i>)

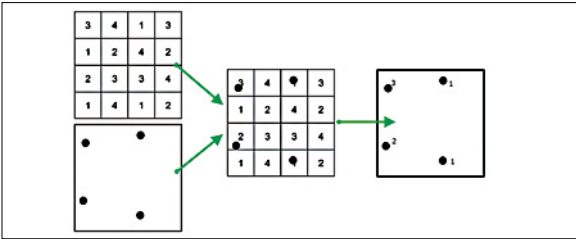
MRF2DCleaner 	Fixes geometric problems in input data, such as line overshoots and undershoots within the user-specified tolerance. It is useful for multi-layer and multi-tolerance two-dimensional data cleaning. <i>(Data Quality, Integrations categories)</i>
MRF2DConflator 	Changes the geometry of a feature to match that of another, if the two have approximately the same shape and location, and have matching endpoints. <i>(Data Quality, Integrations categories)</i>
MRF2DDangleRemover 	Removes features that have at least one free endpoint and have lengths smaller than (Dangle Factor * Cleaning Tolerance) or (Dangle Factor * value of Feature Tolerance Attribute). <i>(Data Quality, Integrations categories)</i>
MRF2DDuplicateRemover 	Deletes duplicated features. Features are considered to be duplicates if their geometries are within tolerance and only features with a smaller tolerance will remain after cleaning. <i>(Data Quality, Integrations categories)</i>
MRF2DExtender 	Extends arcs and lines that are within the specified tolerance to correct undershoots while maintaining line-work direction. <i>(Data Quality, Integrations categories)</i>
MRF2DGeneralizer 	Removes a number of vertices from lines. The number of vertices removed is controlled by a weeding tolerance. <i>(Data Quality, Integrations categories)</i>
MRF2DIntersector 	Computes intersections between all input features, breaking arcs and lines wherever an intersection occurs. <i>(Data Quality, Integrations categories)</i>
MRF2DJoiner 	Joins connected features to form longer ones. A pair of linear features become candidates for joining only when the two are connected at a given node or end point. <i>(Data Quality, Integrations categories)</i>
MRF2DShortGeometry Remover 	Removes features that have lengths smaller than the specified tolerance, if Short Geometry Action is set to Remove. <i>(Data Quality, Integrations categories)</i>
MRF3DCleaner 	Fixes geometric problems in input data such as line overshoots and undershoots within the user-specified tolerance. It is useful for multi-layer and multi-tolerance three-dimensional data cleaning. <i>(3D, Data Quality, Integrations categories)</i>
MSWordStyler	Prepares features for output to Microsoft Word Writer by providing a convenient interface to set a variety of MSWord format-specific attributes. <i>(Cartography and Reports category)</i>
MultipleGeometryFilter	Filters aggregate features based on the type of aggregate. <i>(Filters and Joins category)</i>
MultipleGeometrySetter	Provides the ability to set up an aggregate where each part is independent from the others and is its own complete geometry. <i>(Geometries category)</i>

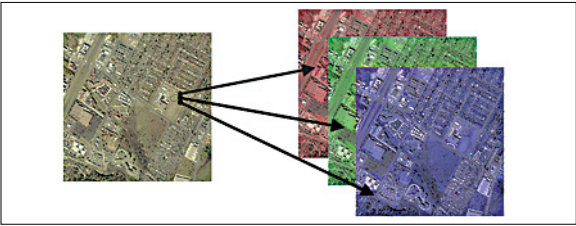
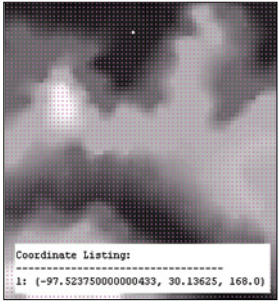
N	
NeighborFinder	Finds the closest Candidate feature within a specified maximum distance of each Base feature. <i>(Spatial Analysis category)</i> 
NeighborhoodAggregator	Creates aggregates of features based on their proximity to each other. <i>(Filters and Joins, Spatial Analysis categories)</i> 
NeighborPairFinder	Finds the closest two Candidate features within some maximum distance of each Base feature and some minimum separation in heading between the Candidates and the Base. <i>(Spatial Analysis category)</i>
NetworkCostCalculator	Computes and assigns the cost of the shortest path from a source object to each connected object as the Z-values or measure values of the input features. <i>(Calculated Values, Spatial Analysis categories)</i>
NetworkFlowOrientor	Fixes the flow (direction) of each edge or linear feature in the network to fit the downstream direction to the destination node. <i>(Spatial Analysis category)</i>
NetworkTopologyCalculator	Finds the connected lines that belong to the same network graph. <i>(Calculated Values, Spatial Analysis categories)</i>
NLPClassifier 📄	Classifies natural language text into different categories using a trained model. <i>(Filters and Joins, Strings categories)</i>
NLPTrainer 📄	Trains a natural language processing (NLP) classification model based on the user's specifications and the provided data. <i>(Filters and Joins, Strings categories)</i>
NullAttributeMapper	Maps specified attributes on a feature to specified values. This transformer is capable of mapping to and from null values, empty strings, and missing attributes. <i>(Attributes, Data Quality, Strings categories)</i>
NumericRasterizer	Draws input point, line, and polygon features onto a numeric raster filled with the background value. The z coordinates of the input vector features are used to generate pixel values. <i>(Cartography and Reports, Rasters categories)</i>

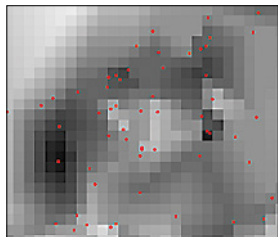
0	
OffsetCurveGenerator	Offsets the segments of linear features, and if necessary, connects them using stroked arcs. (<i>Geometries category</i>)
Offsetter	Adds offsets to the feature's coordinates so that the feature shifts by the specified amount. (<i>3D, Spatial Analysis categories</i>) 
OneDriveConnector	Accesses the Microsoft OneDrive file storage service to upload, download, or delete files and folders or list the contents of a folder from a Microsoft OneDrive account. (<i>Integrations, Web, Workflows categories</i>)
OrientationExtractor	Returns a feature's orientation. This will have different possible return value, based on the input geometry type. (<i>Calculated Values category</i>)
Orienter	Adjusts the orientation of a polygonal feature or the direction of a linear feature. (<i>Geometries category</i>) 
P	
ParameterFetcher	Adds an attribute to the feature and supplies it with the value of a previously published parameter. (<i>Web, Workflows categories</i>)
PartCounter	Returns the number of parts in the geometry. For multis and aggregates, this is the number of parts, and for paths, this is the number of segments. (<i>Calculated Values, Data Quality categories</i>)
PathBuilder	Connects input linear features (arcs and lines) in the order they enter, forming path features. (<i>Geometries category</i>)
PathSplitter	Decomposes a path feature into its component segments. Each output feature contains a copy of the source feature's attributes. (<i>Geometries category</i>)
PDFPageFormatter	Prepares features for output to PDF by providing a convenient interface to set the scale and location of features on a page. (<i>Cartography and Reports, Format Specific categories</i>)
PDFStyler	Sets the common Adobe® PDF style attributes for a group of features destined for the GeoSpatial PDF Writer. (<i>Cartography and Reports, Format Specific categories</i>)
NEW PipeReplacer	Replaces the geometry of the feature with a three-dimensional pipe created by sweeping a stroked disk along the input curve. (<i>3D, Geometries categories</i>)

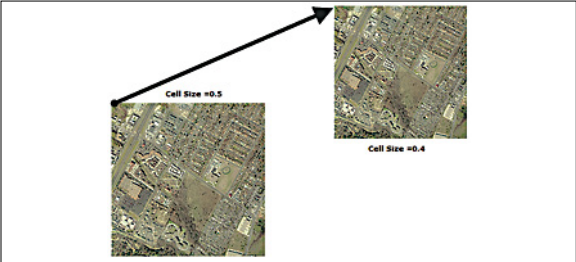
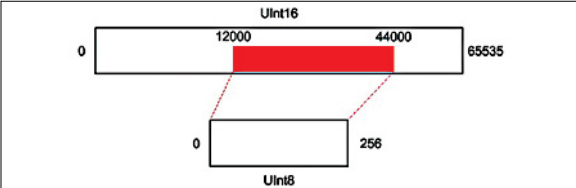
PlanarityFilter	Filters features based on their planarity. To be planar, a geometry must have all of its points situated in the same plane. (3D, Data Quality, Filters and Joins categories)
Player	Retrieves features stored in an FME Feature Store file and outputs them into the workspace. (Workflows category)
PointCloudCoercer	Coerces point cloud geometries into points or multipoints. This transformer can be used to write a point cloud to a format that does not support point clouds. (Point Clouds category)
PointCloudCombiner	Combines multiple geometries into a single point cloud. (Point Clouds category)
PointCloudComponent Adder	Adds new components with constant values to a point cloud. (Point Clouds category)
PointCloudComponent Copier	Copies an existing component to a new component with the specified name. The existing component remains and a new component is created that has a different name, but the same values. (Point Clouds category)
PointCloudComponent Keeper	Removes all components from a point cloud, except for the specified ones. (Point Clouds category)
PointCloudComponent Remover	Removes specified components from a point cloud. (Point Clouds category)
PointCloudComponent Renamer	Renames an existing component. (Point Clouds category)
PointCloudComponent TypeCoercer	Converts the type of point cloud components. (Point Clouds category)
PointCloudConsumer	Requests the point(s) from the point cloud geometry but no actual operations are performed on the point(s). (Point Clouds category)
PointCloudCreator	Creates a new point-cloud feature with the specified size and components and sends it into the workspace for processing. (Point Clouds category) 
PointCloudExpression Evaluator	Evaluates expressions, such as algebraic operations or conditional statements, to set point cloud component values. (Calculated Values, Point Clouds categories)
PointCloudExtractor	Serializes the geometry of the feature into the Blob Attribute based on the selected writer format. (Point Clouds category)
PointCloudFilter	Filters a point-cloud feature into one or more parts based on evaluating expressions. (Filters and Joins, Point Clouds categories)
PointCloudMerger	Merges component values from one point cloud to another. (Filters and Joins, Point Clouds categories)

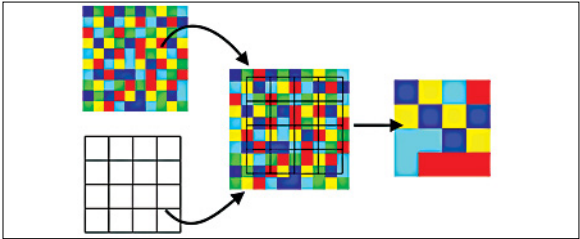
PointCloudOnRasterComponentSetter	Sets point cloud component values by overlaying a point cloud on a raster. <i>(Point Clouds, Rasters categories)</i>
PointCloudPropertyExtractor	Extracts the properties of a point-cloud feature and exposes them as attributes. <i>(Calculated Values, Point Clouds categories)</i>
PointCloudReplacer	Replaces the geometry of the feature with the geometry held in the Blob Attribute. The blob is decoded according to the selected point cloud format. <i>(Point Clouds category)</i>
PointCloudSimplifier	Outputs point cloud features that have fewer points than the original input features while maintaining the original shape. <i>(Point Clouds category)</i>
PointCloudSorter	Sorts a point cloud by the values of components. <i>(Point Clouds category)</i>
PointCloudSplitter	Splits a single point cloud feature into multiple point cloud features, each having a homogeneous value for the point component that governs the split. <i>(Point Clouds category)</i>
PointCloudStatisticsCalculator	Calculates statistics on point cloud components and exposes them as attributes. <i>(Calculated Values, Point Clouds categories)</i>
PointCloudSurfaceBuilder	Takes an input point cloud and reconstructs it into an output mesh. <i>(3D, Geometries, Point Clouds categories)</i>
PointCloudThinner	Outputs point-cloud features that have fewer points than the original input features. <i>(Point Clouds category)</i> 
PointCloudTransformationApplier	Applies transformations on a point cloud. <i>(Point Clouds category)</i>
PointOnLineOverlayer	Performs an overlay of points on lines. Each input line is split at its closest place to any point within the specified point tolerance. <i>(Filters and Joins, Spatial Analysis categories)</i>
PointOnAreaOverlayer	Performs an overlay of points on areas. <i>(Filters and Joins, Spatial Analysis categories)</i>
PointOnPointOverlayer	Performs an overlay of points on points. <i>(Filters and Joins, Spatial Analysis categories)</i>

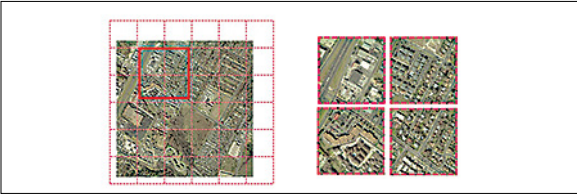
PointOnRasterValueExtractor	Extracts the band and palette values from a raster at the location of each input point and sets them as attributes on the feature. (<i>Rasters, Spatial Analysis categories</i>) 
PointPropertyExtractor	Extracts point orientation to feature attributes. (<i>Calculated Values category</i>)
PointPropertySetter	Adds or removes point orientation. (<i>Geometries category</i>)
PowerPointStyler	Prepares features for output to the PowerPoint Writer by providing a convenient interface to set a variety of Microsoft PowerPoint format-specific attributes. (<i>Cartography and Reports category</i>)
PROJAttributeReprojector	Reprojects attributes from one coordinate system to another using the PROJ library. (<i>Coordinates, Integrations categories</i>)
ProjectWiseWSGConnector	Accesses ProjectWise through a Bentley Web Services Gateway (WSG) (<i>Integrations, Web, Workflows categories</i>)
PROJReprojector	Reprojects feature coordinates from one coordinate system to another using the PROJ library. (<i>Coordinates, Integrations categories</i>)
PythonCaller	Executes a Python script to manipulate the feature. A Python script can perform specialized and complex operations on a feature's geometry, attributes, and coordinate system. (<i>Workflows category</i>)
PythonCreator	Creates features using the Python script supplied, and sends them into the workspace for processing. (<i>Workflows category</i>)
R	
NEW RabbitMQConnector 	Connects to an AMQP 0-9-1 broker. Supports sending (producing) and receiving (consuming) messages. (<i>Integrations, Web, Workflows category</i>)
RandomNumberGenerator	Generates a uniformly distributed random number. The random number is x, where Minimum Value <= x <= Maximum Value. (<i>Calculated Values, Strings categories</i>)
RasterAspectCalculator	Calculates the aspect (direction of slope) for each cell of a raster. Aspect is measured in degrees from 0 to 360, starting clockwise from the north. (<i>Calculated Values, Rasters categories</i>)
RasterBandAdder	Adds a new band to a raster. The added band will have the same value in all cells, and the same raster-level properties as other bands in the raster (that is, number of rows/columns, cell spacing, cell origin, etc.). (<i>Rasters category</i>)
RasterBandCombiner	Merges multiple overlapping raster features into a single raster feature. (<i>Rasters category</i>)
RasterBandInterpretation Coercer	Alters the underlying interpretation of the selected bands of the raster geometry on the input features, using the specified conversion options. (<i>Rasters category</i>)

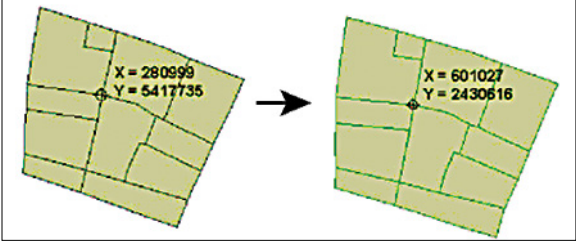
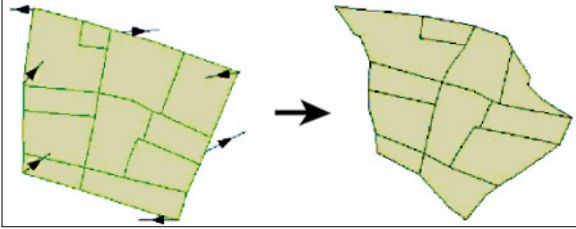
RasterBandKeeper	Removes all bands of a raster, except for those that are selected. The RasterSelector can be used to modify the selection. <i>(Rasters category)</i>
RasterBandMinMaxExtractor	Extracts the band minimum and maximum values, palette minimum and maximum keys, and palette minimum and maximum values of a raster feature, and exposes them as attributes. <i>(Calculated Values, Rasters categories)</i>
RasterBandNameSetter	Sets the name of selected bands on a raster. <i>(Rasters category)</i>
RasterBandNodataRemover	Removes the existing nodata identifier from the selected bands of a raster feature. That is, any values that were previously equal to the nodata value will now be considered valid data. <i>(Rasters category)</i>
RasterBandNodataSetter	Identifies a value to act as a nodata identifier on a raster feature at the band level. That is, values equal to the specified value will now be considered invalid, and will not be affected by many operations (e.g. offsetting or scaling). <i>(Rasters category)</i>
RasterBandOrderer	Specifies the order of bands in a raster. Bands are reordered according to the input band indices. <i>(Rasters category)</i>
RasterBandPropertyExtractor	Extracts the band and palette properties of a raster feature and exposes them as attributes. <i>(Calculated Values, Rasters category)</i>
RasterBandRemover	Removes the selected band(s) of a raster. <i>(Rasters category)</i>
RasterBandSeparator	Separates the bands and palettes from each input raster feature into one or more output raster features based on the number of input bands and palettes. <i>(Rasters category)</i> 
RasterCellCoercer	Decomposes all input numeric raster features into individual points or polygons. One vector feature is output for each cell in the band. <i>(Rasters category)</i> 
RasterCellOriginSetter	Sets the raster's cell origin. <i>(Rasters category)</i>

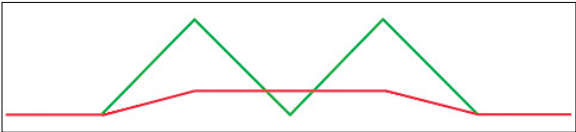
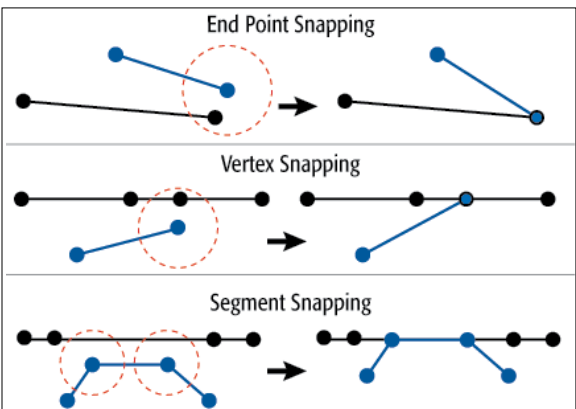
RasterCellValueCalculator	Performs an arithmetical operation on a pair of rasters. The first selected band of raster A is combined with the first selected band of raster B, the second selected band of raster A is combined with the second selected band of raster B, and so on. (<i>Calculated Values, Rasters categories</i>)																																																																																
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RasterCellValueReplacer	Replaces a range of values in the source raster with a new single value. (<i>Rasters category</i>)																																																																																
RasterCellValueRounder	Rounds off raster cell values. (<i>Rasters category</i>)																																																																																
RasterCheckpointier	Sets a checkpoint in the raster processing which forces previous processing to occur immediately. Once complete, it saves the current state to disk. (<i>Rasters, Workflows categories</i>)																																																																																
RasterConsumer	Requests the tile(s) from the raster geometry but no actual operations are performed on the tile(s). (<i>Rasters category</i>)																																																																																
RasterConvolver	Accepts input features containing a raster geometry and outputs the features after applying a convolution filter to all the bands. (<i>Rasters category</i>)																																																																																
RasterDEMGenerator	Constructs a Delaunay triangulation based on input points and breaklines. That triangulation is then uniformly sampled to produce a raster digital elevation model (DEM raster). (<i>3D, Rasters categories</i>)																																																																																
																																																																																	
RasterExpressionEvaluator	Evaluates expressions on each cell in a raster, such as algebraic operations or conditional statements. (<i>Calculated Values, Rasters categories</i>)																																																																																
RasterExtentsCoercer	Replaces the geometry of input raster features with a polygon that covers the extents of the raster. (<i>Rasters category</i>)																																																																																
RasterExtractor	Serializes the geometry of the feature into the Raster Blob Attribute based on the selected writer format. (<i>Rasters category</i>)																																																																																
RasterGCPExtractor	Extracts the coordinate system and the Ground Control Points (GCPs) from the raster feature and exposes them as attributes. (<i>Coordinates, Rasters categories</i>)																																																																																
RasterGCPSetter	Sets the GCP on a raster with the specified Column (pixel), Row (line), X Coordinate, Y Coordinate and Z Coordinate. (<i>Coordinates, Rasters categories</i>)																																																																																

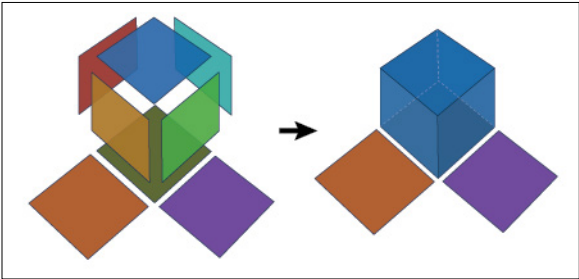
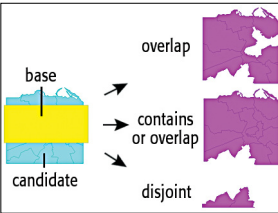
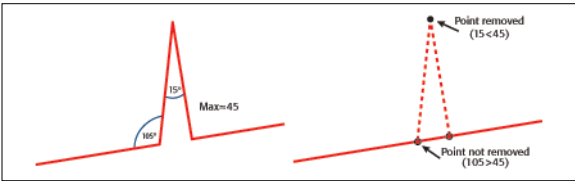
RasterGeoreferencer	Georeferences a raster with the specified parameters. (<i>Coordinates, Rasters categories</i>) 
RasterHillshader	Generates a shaded relief effect, useful for visualizing terrain. (<i>3D, Cartography and Reports, Rasters categories</i>)
RasterInterpretationCoercer	Alters the underlying interpretation of the bands of the raster geometry on the input features, using the specified conversion options. (<i>Rasters category</i>) 
RasterMosaicker	Mosaics multiple raster features into a single raster feature. (<i>Filters and Joins, Rasters categories</i>) 
RasterNumericCreator	Creates a feature with a raster of the specified size with a numeric value and sends it into the workspace for processing. This transformer is useful for creating a very large image with a user-specified width and height. (<i>Rasters category</i>)
NEW	RasterObjectDetectionModelTrainer 📄 Trains a custom raster object detection model based on the positive and negative samples. (<i>Rasters category</i>)
RasterObjectDetector	Accepts a raster input and outputs rectangular geometries outlining the detected object(s). (<i>Rasters category</i>)
NEW	RasterObjectDetectorSampleGenerator 📄 Aids in generation and preparation of positive and negative samples to be used by the RasterObjectDetectionModelTrainer. (<i>Rasters category</i>)

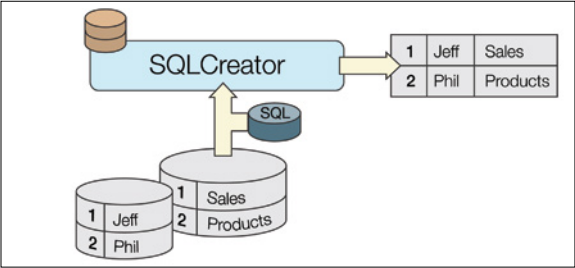
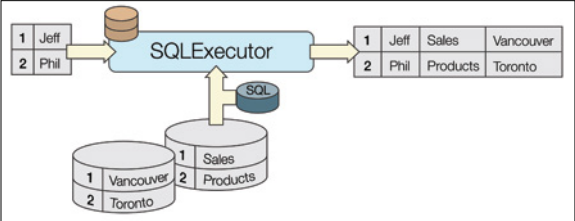
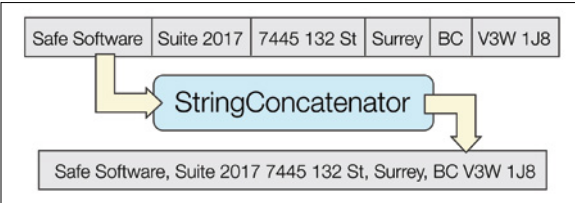
NEW	RasterObjectDetector 📌 SamplePreparer	Aids in preparation of positive and negative samples provided by the user to be used by the RasterObjectDetectionModelTrainer. (<i>Rasters category</i>)
	RasterPaletteAdder	Creates a palette from an attribute and adds this palette to all selected bands on a raster. (<i>Rasters category</i>)
	RasterPaletteExtractor	Creates a string representation of an existing palette and saves it to an attribute. (<i>Rasters category</i>)
	RasterPaletteGenerator	Generates a palette out of the selected band(s) of a raster. (<i>Rasters category</i>)
	RasterPaletteInterpretation Coercer	Alters the underlying interpretation of the palettes of the raster geometry on the input features, using the specified conversion options. (<i>Rasters category</i>)
	RasterPaletteNodataSetter	Identifies the nodata value on a raster feature at the palette level. (<i>Rasters category</i>)
	RasterPaletteRemover	Removes the selected palette(s) of a raster. (<i>Rasters category</i>)
	RasterPaletteResolver	Resolves the palettes of the selected bands of the input raster features by using the band cell values to look up the corresponding palette values, which then replace the original band cell values in the raster. (<i>Rasters category</i>)
	RasterPropertyExtractor	Extracts the geometry properties of a raster feature and exposes them as attributes. (<i>Calculated Values, Rasters categories</i>)
	RasterPyramider	Creates a series of pyramid levels for each input raster feature by specifying either the smallest pyramid level size or the number of pyramid levels to generate. (<i>Rasters, Web categories</i>)
	RasterRegisterer	Transforms an image to minimize its difference with another. (<i>Rasters category</i>)
	RasterReplacer	Replaces the feature's geometry with the geometry held in the Raster Blob Attribute. The blob is decoded according to the selected raster format. (<i>Rasters category</i>)
	RasterResampler	Resamples an input raster using the desired dimensions, the desired cell size in ground units, or a percentage of the size. (<i>Rasters category</i>) 
	RasterRGBCreator	Creates a feature with a raster of the specified size with an RGB value and sends it into the workspace for processing. (<i>Rasters category</i>)
	RasterRotationApplier	Applies the raster rotation angle on the input raster properties to the rest of the raster properties and data values. (<i>Rasters category</i>)
	RasterSegmenter	Partitions a raster image into arbitrarily sized groups of cells from the input image based on intensity differences in the input raster image cells. (<i>Rasters category</i>)
	RasterSelector	Selects specific bands and palettes of a raster for subsequent transformer operations. (<i>Rasters category</i>)

RasterSharpen	Enhances the features of a raster image. The RasterSharpen enhances the borders, lines, and curves while reducing noise in the flat areas of the raster image. <i>(Rasters category)</i>
RasterSingularCellValue Calculator	Performs an arithmetic operation on two operands: the cell values of a raster and a numeric value. <i>(Calculated Values, Rasters categories)</i>
RasterSlopeCalculator	Calculates the slope (maximum rate of change in z) for each cell of a raster. <i>(3D, Rasters categories)</i>
RasterStatisticsCalculator	Calculates statistics on raster bands and exposes them as attributes. Bands with palettes are valid. <i>(Calculated Values, Rasters categories)</i>
RasterSubset	Reduces a raster to a subset of its original size. This is essentially a clipping operation using pixel bounds instead of ground coordinates. <i>(Rasters category)</i>
RasterTiler	Splits each input raster into a series of tiles by specifying either a tile size or a number of tiles. <i>(Rasters category)</i> 
RasterToPolygonCoercer	Creates polygons from input raster features. One polygon is output for each contiguous area of pixels with the same value in the input raster. <i>(Rasters category)</i>
RCaller	Executes an R script that has the ability to access feature data from a temporary R data frame. Input data is set up in the form of tables that will become R data frames. R data frames are tables similar to those of a relational database that support columns of varying types. <i>(Format Specific, Integrations, Rasters categories)</i>
Recorder	Saves a copy of all features that enter to a disk file. <i>(Workflows category)</i>
ReframeReprojector	Reprojects feature coordinates from one coordinate system to another using the REFRAME library. <i>(Coordinates, Integrations categories)</i>
RekognitionConnector 	Accesses the Amazon Rekognition Service AI computer vision service to detect objects, faces, and text in images and to describe image contents and faces. <i>(Web category)</i>
ReprojectAngleCalculator	Converts a given angle from one coordinate system to another. The transformer calculates the reprojected angle of a line starting at the first coordinate in the feature, with the given length and angle. <i>(Calculated Values, Coordinates categories)</i>
ReprojectLengthCalculator	Converts a given distance from one coordinate system to another. The transformer calculates the reprojected length of a line starting at the first coordinate in the feature, with the given length and angle. <i>(Calculated Values, Coordinates categories)</i>

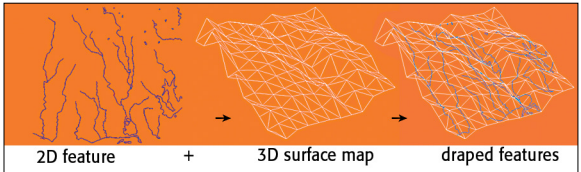
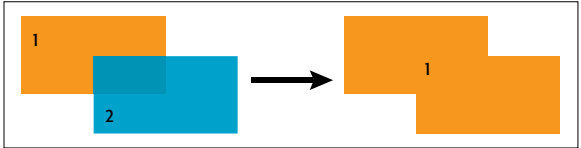
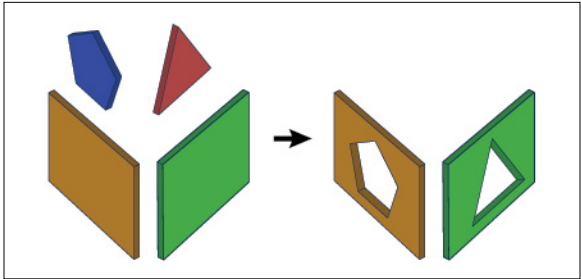
Reprojector	Reprojects feature coordinates from one coordinate system to another. (<i>Coordinates category</i>) 
Rotator	Rotates features in a counterclockwise direction about the specified point by the rotation angle (measured in degrees). (<i>Geometries category</i>)
RubberSheeter	Performs warping operations on the spatial coordinates of features. It is used to adjust a set of observed features so they more closely match a set of reference features. (<i>Coordinates, Geometries categories</i>) 
S	
S3Connector 📁	Accesses the Amazon Simple Storage Service (S3) file storage service to upload, download, or delete files and folders or list file/folder information from an S3 account. (<i>Integrations, Web, Workflows, categories</i>)
SalesforceConnector	Retrieves data from the Salesforce customer relationship platform using Salesforce Object Query Language (SOQL) queries. (<i>Integrations, Web, Workflows categories</i>)
Sampler	Preserves either a total number of features or a sampling of features, depending on the Sampling Type selection. (<i>Data Quality, Filters and Joins, Workflows categories</i>)
Scaler	The Scaler scales objects to make them bigger or smaller. (<i>3D, Coordinates, Geometries categories</i>)
SchemaMapper	Converts the existing schema (data model) of features to a new structure, based on mappings defined in an external lookup table. (<i>Workflows category</i>)
SecondOrderConformer	Performs a second-order conformal transformation on the feature's geometry. Depending on the input geometry, a 2D or 3D transformation is performed. (<i>3D, Coordinates categories</i>)
SectorGenerator	Outputs circular sectors of influence for point features that have directions defined by azimuths (degrees clockwise from North). (<i>Spatial Analysis category</i>)
SharedItemAdder	Adds or replaces Appearances, Textures, Rasters, or Geometry Definitions in the internal FMELibrary. (<i>3D category</i>)

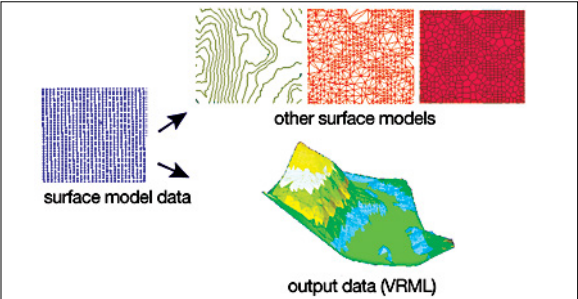
SharedItemIDExtractor	Extracts Shared Item IDs from the front and/or back side of geometries and adds them as traits or a list attribute. <i>(3D category)</i>
SharedItemIDSetter	Sets Shared Object IDs onto the front and/or back sides of geometries. <i>(3D category)</i>
SharedItemRetriever	Retrieves Appearances, Textures, Rasters, or Geometry Definitions from the internal FMELibrary. <i>(3D category)</i>
SharePointOnlineConnector 	Accesses SharePoint Online to upload, download, or delete files and folders or list file/folder information. <i>(Integrations, Web, Workflows categories)</i>
SherbendGeneralizer	Uses the Sherbend algorithm to simplify lines by reducing unnecessary details based on the analysis of the line's bends. The generalization process may eliminate, reduce, or combine bends, while resolving conflicts. In this example, three bends are combined into one: <i>(Cartography and Reports, Geometries categories)</i> 
ShortestPathFinder	Computes the shortest path of a line or lines containing a source and destination node in a network based on the length of the input or the cost (specified in an attribute) of each of the edges. <i>(Spatial Analysis category)</i>
SlackConnector	Posts a message or uploads a file to the Slack group chat service. <i>(Integrations, Web, Workflows categories)</i>
Snapper	Brings lines, segments, end points or vertex points of features together if they are within a certain distance of each other and (optionally) if they have one or more attributes in common. <i>(Data Quality, Geometries, Spatial Analysis categories)</i> 
Snipper	Shortens the geometry of a line feature from the ends by snipping specified distances, indices, or measure values. It operates on features with simple line geometry and polygons without holes. <i>(Data Quality, Geometries categories)</i>

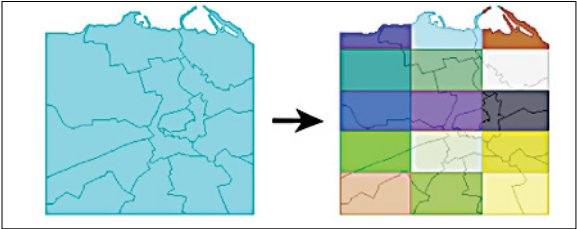
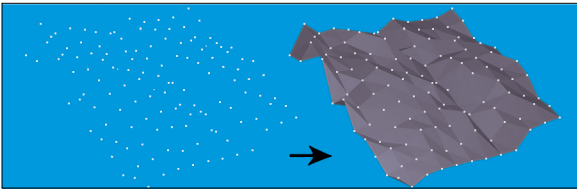
SNSSender	Using the Amazon Simple Notification Service (SNS), sends messages to an Amazon SNS topic. (<i>Integrations, Web categories</i>)
SolidBuilder	Constructs solids from surfaces and cuts hollow regions, or voids, in solid features with other solid features. A solid that is cut by another solid must contain that second solid. (<i>3D, Geometries categories</i>) 
Sorter	Sorts features by an attribute's value. (<i>Workflows category</i>)
SpatialFilter	Filters point, line, area, and text features based on spatial relationships. Each input Candidate feature is compared against all Filter features, based on the given spatial tests to meet. (<i>Data Quality, Filters and Joins, Spatial Analysis categories</i>) 
SpatialRelator	Determines topological (spatial) relationships between sets of features. It tags – but does not otherwise change – features when they have certain relationships, such as touches, overlays, intersects, and so forth. (<i>Data Quality, Filters and Joins, Spatial Analysis categories</i>)
SpatialSorter	Sorts features geographically (by location). (<i>Spatial Analysis, Workflows categories</i>)
SpikeRemover	Cleans up feature geometries by removing spikes. (<i>Data Quality, Geometries categories</i>) 

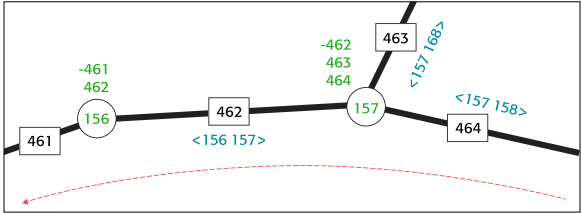
SQLCreator	Generates FME features from the results of a SQL query against a database. One FME feature is created for each row of the results of the SQL Query. (<i>Workflows category</i>) 
SQLExecutor	Performs SQL queries against a database. (<i>Workflows category</i>) 
SQSConnector 📡	Accesses the Amazon Simple Queue service to send or receive messages. (<i>Web category</i>)
StatisticsCalculator	Calculates statistics based on a designated attribute or set of attributes of the incoming features and adds the results as attributes. (<i>Calculated Values category</i>)
StreamOrderCalculator	Computes the Strahler order and/or Horton order of streams in a river network. (<i>Calculated Values category</i>)
StreamPriorityCalculator	Calculates the primary and secondary streams of multiple stream networks. (<i>Calculated Values category</i>)
StringCaseChanger	Changes the case of text attributes to UPPERCASE, lowercase, Title case, or Full Title Case. (<i>Strings category</i>)
StringConcatenator	
StringFormatter	Reformats the data held in each specified attribute according to the Tcl <i>format</i> command, which is similar to the C <i>printf</i> function. Attribute values can be formatted into strings, characters, or numbers. (<i>Strings category</i>)

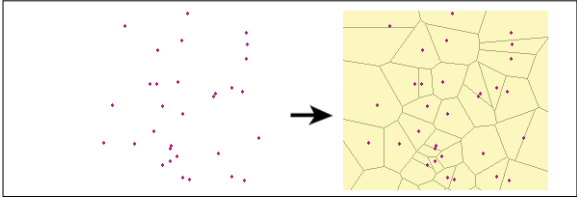
StringLengthCalculator	Calculates the length of strings and the number of bytes in a blob. (<i>Calculated Values, Strings categories</i>)
StringPadder	Pads the selected attributes with a specified character, either on the right or left side. (<i>Strings category</i>)
StringPairReplacer	Replaces characters in the value contained in the source attribute based on the replacement key-value pairs. (<i>Strings category</i>)
StringReplacer	Replaces substrings matching a string or regular expression in the string contained in the source attribute. (<i>Strings category</i>)
StringSearcher	Performs a regular expression match on the specified expression. (<i>Strings category</i>)
SubstringExtractor	Extracts a substring from the source attribute. (<i>Calculated Values, Strings categories</i>)
SummaryReporter	Writes a summary report of incoming features to a disk file. Features are sorted before they are summarized. (<i>Data Quality, Workflows categories</i>)
SurfaceBuilder	Cuts holes in surface features with other surface features. A surface that is cut by another surface must be co-planar with that second surface, have compatible orientation, and contain that second surface. (<i>3D, Spatial Analysis categories</i>)
SurfaceDissolver	Detects coplanar regions of input surfaces and dissolves them into single faces. The output faces retain the attributes, traits, and appearances of the input. (<i>3D, Geometries, Spatial Analysis categories</i>)
SurfaceDraper	Constructs a Delaunay triangulation based on input points and breaklines. Input drape features will be overlaid onto the surface model, and output as draped features. (<i>3D, Point Clouds, Spatial Analysis categories</i>)



SurfaceFootprintReplacer	Replaces the geometry of a feature with a planar representation of the feature's shadow. <i>(3D, Geometries categories)</i>
SurfaceModeler	Constructs a Delaunay triangulation based on input points and breaklines. It is useful when you need multiple representations of the same model. <i>(3D, Point Clouds categories)</i> 
SurfaceOnSurfaceOverlayer	Performs a surface-on-surface overlay so that all input surfaces are intersected against each other and resultant surface features are created and output. The output surfaces can retain all the attributes of the input features in which they are contained. <i>(3D, Spatial Analysis categories)</i>
SurfaceSplitter	Splits a double-sided input surface geometry into two single-sided surfaces – one equal to the front side of the input surface and one equal to the back side of the input surface. <i>(3D, Geometries categories)</i>
SystemCaller	Runs a program or operating system command, and waits for it to exit before continuing the translation. <i>(Workflows category)</i>
T	
TclCaller	Runs a Tool Command Language (Tcl) command and assigns its return value to an attribute. <i>(Workflows category)</i>
TCPIPReceiver	Receives raw data over TCP/IP. Produces a feature each time a specified number of bytes is received or a particular sequence is detected. <i>(Integrations, Web, Workflows categories)</i>
TCPIPSEnder	Sends raw data to the specified host, which may be another FME workspace running in a different process (located on the same machine or on a different machine), or any client application that communicates over TCP/IP. <i>(Integrations, Web, Workflows categories)</i>
TempPathnameCreator	Reserves and returns a temporary file or directory path that will be deleted upon translation completion. An optional basename and extension can be supplied to further refine the filename portion of the resulting pathname. <i>(Calculated Values, Workflows categories)</i>
Terminator	Stops a translation when it detects detect non-valid situations or input data conditions that should not exist. <i>(Workflows category)</i>
Tester	Evaluates one or more tests on a feature, and routes the feature according to the outcome of the test(s). The tests can consist of any FME-allowed operands. <i>(Data Quality, Filters and Joins categories)</i>
TestFilter	Filters features by test conditions to one or more output ports. <i>(Data Quality, Filters and Joins categories)</i>

TextAdder	Sets the feature's geometry to text using the previous geometry as the text location. <i>(Cartography and Reports, Geometries categories)</i>
TextDecoder	Decodes a string from a number of different text encodings into plain text. <i>(Strings category)</i>
TextEncoder	Encodes a text string using URL, Unicode, XML, HTML, Base64, HEX, or Octal methods. <i>(Strings category)</i>
TextLocationExtractor	Sets a text feature's geometry to the location of the text. <i>(Calculated Values category)</i>
TextPropertyExtractor	Extracts the values of text attributes from input text geometry features. <i>(Calculated Values category)</i>
TextPropertySetter	Sets the properties of a text geometry to the specified properties. <i>(Cartography and Reports category)</i>
TextStroker	Takes as input a font name, text padding and width multiplier, and outputs aggregates that describe the outline of the text. <i>(Cartography and Reports, Rasters categories)</i> 
TextureCoordinateSetter	Assigns texture coordinates to surfaces. <i>(Calculated Values, Coordinates categories)</i>
Tiler	Chops the input features into a series of tiles. This transformer works with raster, vector and point cloud data. <i>(Geometries category)</i> 
TimeWindower	Allows features in FME to be grouped based upon a period of time defined by the user. <i>(Workflows category)</i>
TINGenerator	Constructs a Delaunay triangulation based on input points and breaklines. The surface model may be output in a number of representations: a triangulated irregular network (TIN), TIN vertices, TIN edges, and triangles. <i>(3D, Geometries categories)</i> 

TopferIndexCalculator	Takes a set of point, linear, polygonal, and/or aggregate features, and calculates the Topfer Index based on the bounding box of the input features. <i>(Spatial Analysis category)</i>
TopologyBuilder	Computes topology on input point, line, and/or area features. <i>(Spatial Analysis category)</i> 
TraitMerger	Moves the traits from one geometry onto another geometry. It can also move the attributes from a feature onto a geometry as traits, or the traits from a geometry onto a feature as attributes. <i>(Filters and Joins category)</i>
TransporterReceiver	Receives features from another FME workspace running in a different process, which may be located on the same or a different machine. Used in conjunction with the TransporterSender. <i>(Integrations, Workflows categories)</i>
TransporterSender	Sends features to another FME workspace running in a different process, which may be located on the same machine or on a different machine. Used in conjunction with the TransporterReceiver. <i>(Integrations, Workflows categories)</i>
TrelloConnector	Accesses the Trello web service to create, update, archive, or list the contents of Trello Boards, Lists, and Cards. <i>(Integrations, Web, Workflows categories)</i>
Triangulator	Breaks an input geometry into triangular units or a mesh. <i>(Geometries category)</i>
Tweeter	Sends a Twitter™ status update from Workbench. <i>(Integrations, Web categories)</i>
TweetSearcher	Runs a search for Twitter™ entries that contain the given query. <i>(Integrations, Web categories)</i>
TweetStreamer	Connects to a Twitter™ stream and outputs a new feature for each tweet. <i>(Integrations, Web categories)</i>
TwitterStatusFetcher	Retrieves the timeline for a particular Twitter™ user or list. <i>(Integrations, Web categories)</i>
U	
UUIDGenerator	Calculates a Universally Unique Identifier (UUID) for each incoming feature, and adds it as a new attribute. An example UUID looks like: 7672aac8-fa0b-464c-b0b8-3efa9ae9cd86 <i>(Calculated Values category)</i>
V	
VariableRetriever	Reads the specified variable and puts its value into the specified attribute. This variable must have been previously set using the VariableSetter transformer. <i>(Workflows category)</i>
VariableSetter	Creates and sets the specified variable to the specified value. The variable can later be read back into an attribute using the VariableRetriever transformer. <i>(Workflows category)</i>

VectorOnRasterOverlayer	Overlays vector features onto a single raster feature by drawing them onto the resulting output raster. The properties of the output raster are identical to that of the input raster. <i>(Rasters, Spatial Analysis categories)</i>
VertexCounter	Stores the number of a feature's vertices into an attribute. <i>(Calculated Values, Coordinates, Data Quality categories)</i>
VertexCreator	Appends coordinates to null, point, text, line, and arc geometry, or replaces existing geometry with point geometry. <i>(Geometries category)</i>
VertexRemover	Removes one or more coordinates from the geometry of the feature. <i>(Coordinates, Geometries categories)</i>
VolumeCalculator	Calculates the volume of a solid object and stores the value in an attribute. <i>(3D, Calculated Values categories)</i>
VoronoiCellGenerator	Outputs circular sectors of influence for point features that have directions defined by azimuths (degrees clockwise from North). <i>(Spatial Analysis category)</i>
VoronoiDiagrammer	Generates a Voronoi diagram or Thiessen polygon. Each polygon in the diagram defines the area of space that is closest to a particular input point. <i>(Spatial Analysis category)</i>
	
W	
WebMapTiler	Creates a series of image tiles that can be utilized by web mapping applications such as Bing™ Maps, Google Maps™, or Web Map Tile Service. <i>(Cartography and Reports, Format Specific, Rasters, Web categories)</i>
WebSocketReceiver	Receives WebSocket messages from the specified WebSocket server. Produces a feature each time a message is received, and places the contents of the message into the specified attribute. <i>(Web, Workflows categories)</i>
WebSocketSender	Sends WebSocket messages to the specified WebSocket server. <i>(Web, Workflows categories)</i>
WhiteStarLeaseBuilder	Posts a query to a WhiteStar Legal2Map™ WebServices (W3) server to obtain points or polygons that match a list of legal land descriptions. <i>(Integrations category)</i>
WorkspaceRunner	Runs another FME Workbench workspace on the local computer by spawning a new FME process. This transformer is useful for batch processing, especially in conjunction with the Directory and File Reader. <i>(Workflows category)</i>
X	
XMLAppender	Assembles several XML documents into one. <i>(Format Specific, Web categories)</i>
XMLFeatureMapper	Constructs features from XML documents via xfMaps. <i>(Format Specific, Web categories)</i>

XMLFlattener	Flattens content of XML element(s) into feature attributes. (<i>Format Specific, Web categories</i>)
XMLFormatter	Provides various options for formatting and cleaning up XML documents. (<i>Format Specific, Web categories</i>)
XMLFragmenter	Maps elements from an XML document into XML fragments. Can decompose large XML documents into parts, where these parts may be further operated on via downstream XML, XQuery, XSLT or generic text processing transformers. (<i>Format Specific, Web categories</i>)
XMLNamespaceDeclarer	Declares missing namespaces in XML documents by matching prefixes from another sample XML file whose namespaces are fully declared. (<i>Format Specific, Web categories</i>)
XMLSampleGenerator	This transformer generates an XML document based on an XML Schema (XSD) file. While the sample document may not pass a schema validation, it will provide a generate outline of what a valid XML document looks like. The XML generated by this transformer can be used as a base for an XML template used in the XMLTemplater transformer. (<i>Format Specific, Web categories</i>)
XMLTemplater	Populates an XML document with FME feature attribute values. The document is provided as a template, and the transformer will use XQuery to insert attribute values and geometry information into the template. (<i>Format Specific, Web categories</i>)
XMLUpdater	This transformer creates, modifies, replaces, or deletes XML elements and attributes in an XML document. (<i>Format Specific, Web categories</i>)
XMLValidator	Validates the syntax or schema of an XML file or text. (<i>Format Specific, Web categories</i>)
XMLXQueryExploder	Uses XQuery expression to extract portions of XML text into new FME features. (<i>Format Specific, Web categories</i>)
XMLXQueryExtractor	Uses XQuery expressions to extract portions of XML text into feature attributes. (<i>Format Specific, Web categories</i>)
XMLXQueryUpdater	Provides updates to an XML document using XQuery Update expressions. (<i>Format Specific, Web categories</i>)
XSLTProcessor	The XSLTProcessor uses an XSL (eXtensible Stylesheet Language) stylesheet to convert an XML document. Common output formats include text, RSS, SVG, and CSV. (<i>Format Specific, Web, Workflows categories</i>)



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Version 2021.0

FME® Transformer Reference Guide



FME and Data Transformation

Moving data between different formats and applications often involves more than a format-to-format translation. Datasets can contain more complex components that may not fit the requirements of the destination system. To preserve key aspects of the data and load it seamlessly into the target application, you may need to adjust the data model, contents, descriptive elements, and/or the coordinate system. This is known as **data transformation** and it is one of FME's core capabilities.

FME® contains over 500 transformers that perform different types of data operations. In the FME Workbench interface, transformers are stored in the Transformer Gallery and grouped in categories based on their function. You can also search for transformers by keyword.

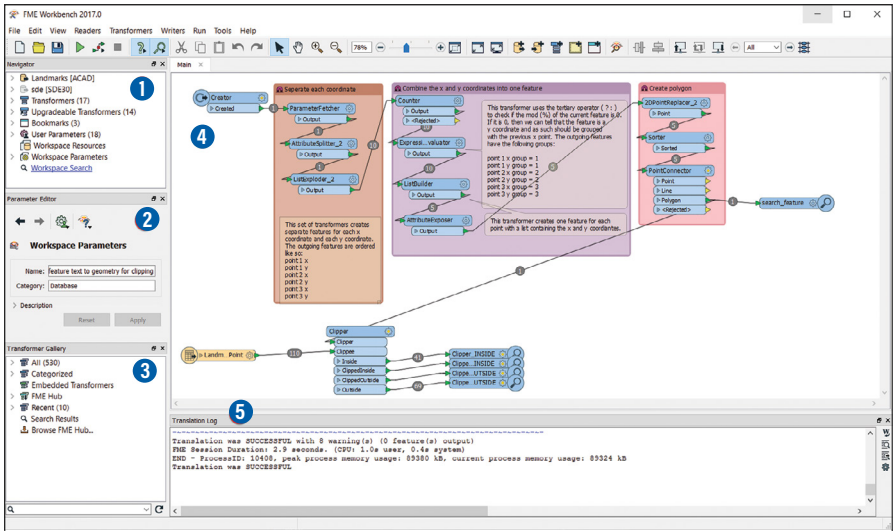


This guide provides a high-level summary of FME Workbench, data inspection, and each transformer's functionality. For detailed information, select FME Transformers from the FME Workbench Help menu, select a transformer on the canvas and press F1, or visit community.safe.com/s/documentation.

FME Workbench Overview

FME Workbench is a powerful tool for data conversion, sharing, transformation, validation, and integration.

Workbench elements are represented graphically on the Workbench canvas, and saved as a **workspace**. By default, the workspace workflow reads from left to right: the **reader** (source data) is on the left, the transformers are in the center, and the **writer** (destination data) is on the right. Connections between each item represent the flow of data: connections can branch in different directions, and through different objects.

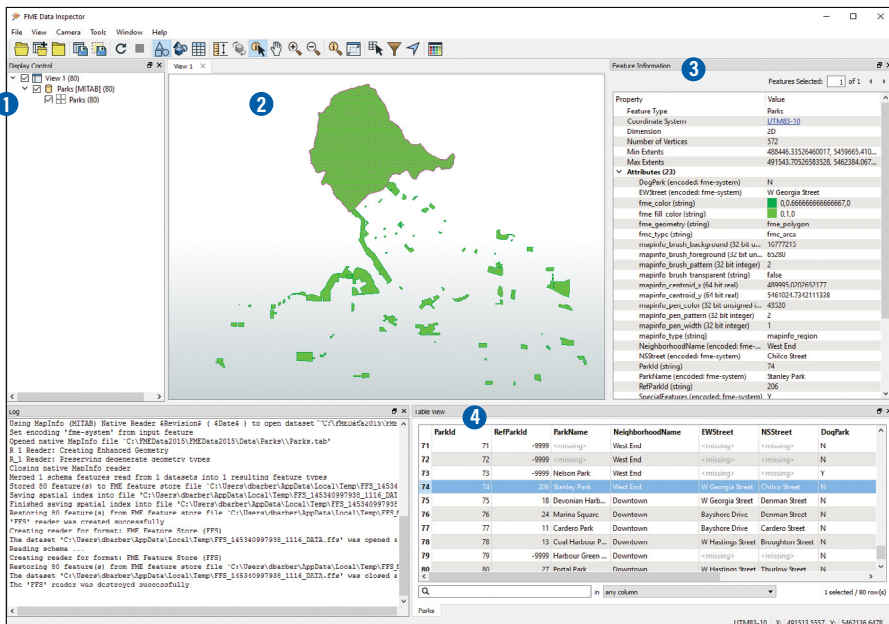


- 1 **Navigator:** Shows a hierarchical view of workspace objects.
- 2 **Parameter Editor:** Shows configurable settings for any object selected on the canvas.
- 3 **Transformer Gallery:** Contains over 500 transformers to restructure features between source and destination data.
- 4 **Canvas:** Displays a graphical workflow of the objects and connections that represent data and data transformation.
- 5 **Translation Log:** Contains details about the workspace translation.

FME Data Inspector Overview

The FME Data Inspector is used primarily to preview data before translation and verify data after translation, but it can also be used to check data at any point during translation.

One of FME's key abilities is the communication between Workbench and the Data Inspector – an Inspector transformer can start the Data Inspector at almost any point while a workspace is running, and inspection tools allow feature-by-feature analysis.



- 1 Display Control:** Shows a list of open datasets and their feature types.
- 2 View:** Displays a single dataset, or multiple datasets at the same time.
- 3 Feature Information:** Displays information about a queried feature, including feature type, attributes, and geometry details.
- 4 Table View:** Displays the Feature Information values that are exposed to the end user, in tabular format.

Components of a Simple FME Workspace

In a workspace, translation components are represented in a visible, related hierarchy. Hierarchy is important because it affects how components are added to a translation and, more importantly, how they are controlled. Components consist of (but are not limited to):

- Readers (source format and data)
- Writers (destination format and output data location)
- Reader and Writer Feature Types (in FME, feature types represent a subset of records; for example, layer, table or sheet)
- Attributes
- Transformers

This guide is primarily a transformer resource – but it's also important to see why transformers are key to FME's power and versatility. A very simple workspace example on page 4 shows how transformers work; and the rest of this guide describes what each transformer can do.

The Basics: Placing and Editing Transformers

There are many ways to place a transformer on the Workbench canvas. To start, however, you can simply double-click a transformer name in the Transformer Gallery and it will appear in the workspace.

Every transformer has a Properties button. This button is color-coded to show the status of its parameters.



If the Properties button is the same color as the transformer, you can use the transformer with its existing parameters.



A yellow Properties button indicates that the transformer contains default settings, but you have not yet accepted them. You can use the transformer in this state, but your workspace might produce unexpected results.



A red Properties button means that there is at least one parameter for which FME cannot supply a default value. You must provide a value for all required fields before you can use the transformer in the workspace.

When you click a Properties button, the dialog that appears will usually have some of the common elements shown in this example. The content of this dialog depends on the transformer, and sometimes even on connections to the transformer. Most transformers have some common user interface elements, however, and those are described here.

Transformer

Transformer Name:

Coordinate Systems

Source Coordinate System:

Destination Coordinate System:

▼ Raster Parameters

Interpolation Type:

Cell Size:

Tolerance (cells):

Help Defaults OK Cancel

You can edit the default transformer name.

Required parameters are highlighted.

Transformer parameter menu button.

The Defaults menu gives you options for using default values.

Click OK to accept changes and close the dialog. (This button is disabled if required parameters have not been populated.)

Working with Transformer Parameters

Most transformer parameters can be integrated with other pieces of a workspace. This means that the parameters can be easily configured to work with elements of the source data as well as with other transformers. More advanced functions, such as text and arithmetic editors, are also available in some transformers.

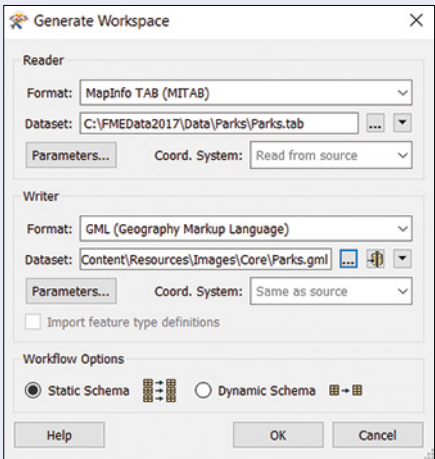
In most cases, you can use a transformer with its displayed default values.



For detailed information on transformer parameters, see the *FME Transformers help*, or select a transformer on the Workbench canvas and view the *Help* tab in the bottom pane.

The Basics: Setting up and Running a Simple Workspace

This simple example shows how to set up a new workspace. The source data used for this example contains information about 80 city parks.

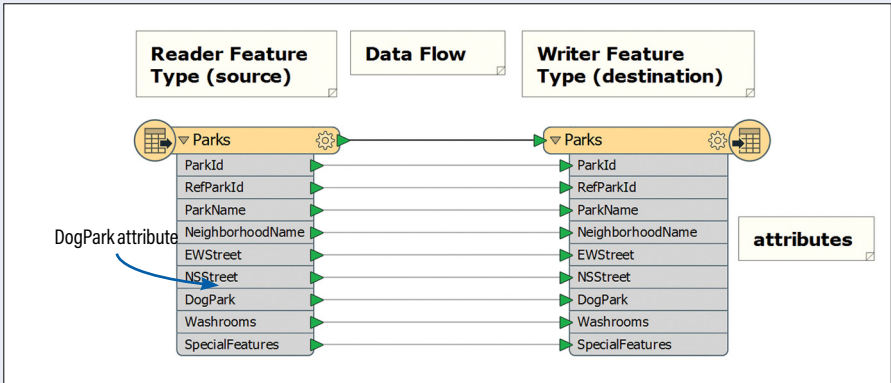


Set up a new workspace by clicking **File > Generate Workspace**. Then:

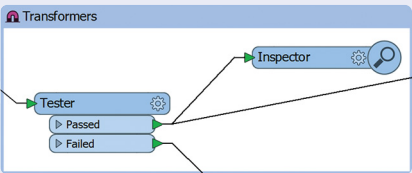
1. Select the format and location of the source data (the Reader),
2. Specify the format and location for the destination data (the Writer), and
3. Accept the defaults in the remaining dialog fields.

Click **OK**. Workbench reads the data, and generates the initial workspace.

The objects on the canvas represent the data and data flow. The **Reader Feature Type** shows that the data contains an **attribute** called *DogPark*.



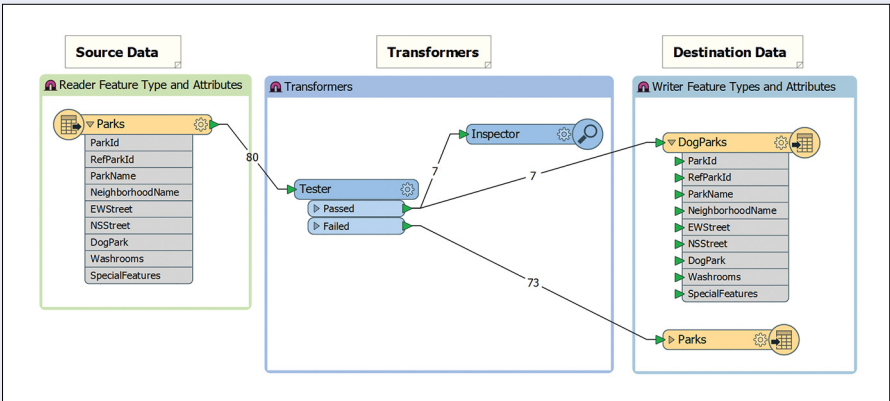
Because we want to determine which parks allow dogs, we add two transformers: a Tester transformer (to filter data) and an Inspector transformer (to view results). The Tester parameters are set to filter only parks that allow dogs, and the Inspector transformer opens the **Data Inspector** to show the results on a map.



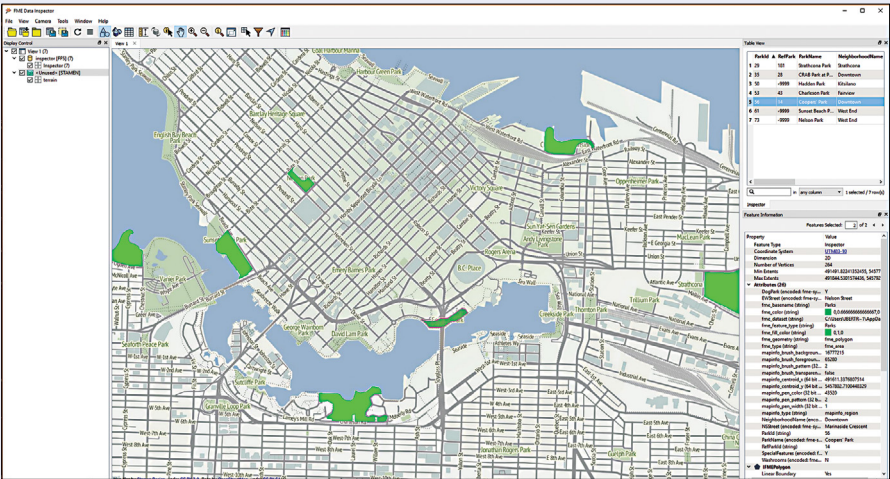
Click the Run tool.

The resulting workspace shows that 7 parks allow dogs. These results are sent through the **Passed** port of the Tester transformer to a Writer Feature Type that we have added and named *DogParks*.

The workspace also shows that 73 parks do not allow dogs, and we have directed these results through the **Failed** port of the Tester transformer to the original Parks writer feature type.



Because we added an Inspector transformer to the Tester transformer's Passed port, the Data Inspector opens automatically. Here, the Background Map option allows us to view the exact locations of the 7 dog parks.



Workbench Keyboard Shortcuts *for Windows and Mac*

General Viewing		
Task	Shortcut (PC)	Shortcut (Mac)
New (create a new workspace)	Ctrl+n	command ⌘+n
Generate workspace	Ctrl+g	Shift+command ⌘+n
Open (workspace)	Ctrl+o	command ⌘+o
Exit (workbench)	Ctrl+q	command ⌘+q
Close (workspace)	Ctrl+w	command ⌘+w
Change to next tab	Ctrl+Tab	
Change to previous tab	Ctrl+Shift+Tab	
Select tab number	Ctrl+number_key	
Close current tab	Ctrl+F4	command ⌘+w
Open containing folder (datasets)	Ctrl+o	command ⌘+o
Maximize canvas to current window size	Shift+F11	shift+F11
Maximize canvas to full screen	F11	F11
Zoom-in	Ctrl+	command ⌘+
Zoom-out	Ctrl-	command ⌘-
Zoom 100%	Ctrl+0	command ⌘+0
Zoom in and out	Ctrl+scroll wheel	command ⌘+scroll wheel
Zoom to next/previous bookmark	Space/Ctrl+Space Note: Show Bookmark Navigator must be enabled on the toolbar.	
Pan	Click scroll wheel (or middle mouse button) and drag cursor.	
Return cursor to action arrow	Right-click anywhere on the canvas.	Right-click anywhere on the canvas.
Search: - Workspace if the focus is in the workspace or the Navigator - Log if the focus is in the Log window	Ctrl+f F3	command ⌘+f
Connection Style	Ctrl+Shift+C	command ⌘+Shift+C
Print	Ctrl+p	command ⌘+p
Help	Select an object, then F1	Select an object, then F1

Viewing Data in Visual Preview		
Task	Shortcut (PC)	Shortcut (Mac)
Toggle automatic inspect on selection	Ctrl+ Alt+A	option ⌘+command ⌘+A
Toggle Display Control	Ctrl+Alt+`	option ⌘+command ⌘+`
Toggle Table View	Ctrl+Alt+1	option ⌘+command ⌘+1
Toggle graphics View	Ctrl+Alt+2, Ctrl+Alt+3, Ctrl+Alt+4	option ⌘+command ⌘+2, option ⌘+command ⌘+3, option ⌘+command ⌘+4
Show/hide Feature Information window	Ctrl+Alt+F	option ⌘+command ⌘+F
Open in Data Inspector	Ctrl+Alt+D	command ⌘+Shift+D

General Editing		
Cut	Ctrl+x	command ⌘+x
Copy	Ctrl+c	command ⌘+c
Paste	Ctrl+v	command ⌘+v
Redo	Ctrl+y	shift+command ⌘+z
Save	Ctrl+s	command ⌘+s
Select All	Ctrl+a	command ⌘+a
Undo	Ctrl+z	command ⌘+z
Smart Delete (repair connections)	Delete key	delete key
Delete (without repair)	Shift+Delete key	Shift+delete key
Readers, Writers, and Transformers		
Add Reader	Ctrl+Alt+r	option ⌘+command ⌘+r
Add Writer	Ctrl+Alt+w	option ⌘+command ⌘+w
Show Parameters	Select an object, then Enter	Select an object, then Enter.
Connect Inspector	Select the object(s), then Ctrl+Shift+I	Select the object(s), then control+shift+i
Connect Logger	Select the object(s), then Ctrl+Shift+L	Select the object(s), then control+shift+l
Create custom transformer	Select one or more transformers, then Ctrl+t	Select one or more transformers, then command ⌘+t

Task	Shortcut (PC)	Shortcut (Mac)
Duplicate transformer	Ctrl+d <i>Using Quick Add:</i> If you add a transformer and want to add the same transformer again, press the slash "/" key. The Quick Add box will appear showing the last selected transformer. Press Return to include it, then press Return again to edit its parameters.	command ⌘+d
Rename	Select an object, then F2	Select the object, then F2
Search for a transformer by name	Slash "/" key.	Slash "/" key.
Other Workspace Authoring		
Add Bookmark	Ctrl+b	command ⌘+b
Attach annotation	Select the object(s), then Ctrl+k	Select the object(s), then command ⌘+k
Show summary annotation	Select the object(s), then Ctrl+Shift+K	Select the object(s), then shift+command ⌘+k
Insert Junction	Ctrl+Shift+J	shift+command ⌘+j
Enable/disable objects (including links and feature types)	Ctrl+e	command ⌘+e
Running Workspaces		
Run translation	F5	F5
Rerun entire workspace	Shift+F5	Shift+F5
Enable Prompt for User Parameters	Ctrl+Alt+F5	
Prompt and run	Ctrl+r	command ⌘+r
Enable feature caching	Ctrl+F5	command ⌘+F5
Run with feature caching + "Run From This"	F6	F6
Run with breakpoints	Ctrl+Shift+F5	command ⌘+Shift+F5
Toggle breakpoints	Select connection, then F9	

Transformer Categories

3D

3DAffiner 15
3DArcReplacer 15
3DForcer 15
3DInterpolator 15
3DRotator 15
AppearanceExtractor 16
AppearanceMerger 16
AppearanceRemover 16
AppearanceSetter 16
AppearanceStyler 16
Bufferer 21
CityEngineModelGenerator 23
Creator 25
CSGBuilder 25
CSGEvaluator 25
DEMDistanceCalculator 26
DEMGenerator 26
DimensionExtractor 26
ElevationExtractor 28
Extruder 28
FaceReplacer 28
GeometryInstantiator 31
GeometryPartExtractor 31
GeometryPropertyExtractor 31
GeometryPropertyRemover 31
GeometryPropertyRenamer 31
GeometryPropertySetter 31
IFCPropertySetDefinitionCreator 33
IFCQuantitySetDefinitionCreator 33
MeshMerger 39
MeshSimplifier 39
MRF3DCleaner 40
Offsetter 42
PipeReplacer 42
PlanarityFilter 43
PointCloudSurfaceBuilder 44
RasterDEMGenerator 47
RasterHillshader 48
RasterSlopeCalculator 50
Scaler 51
SecondOrderConformer 51
SharedItemAdder 51
SharedItemIDExtractor 52
SharedItemIDSetter 52
SharedItemRetriever 52
SolidBuilder 53
SurfaceBuilder 55
SurfaceDissolver 55
SurfaceDraper 55
SurfaceFootprintReplacer 56
SurfaceModeller 56
SurfaceOnSurfaceOverlayer 56
SurfaceSplitter 56
TINGenerator 57
VolumeCalculator 59

Attributes

Aggregator 16
AttributeCompressor 18
AttributeCopier 18
AttributeCreator 18
AttributeDecompressor 18
AttributeDereferencer 18
AttributeExploder 19
AttributeExposer 19
AttributeFileReader 19
AttributeFileWriter 19
AttributeKeeper 19
AttributeManager 19
AttributeRemover 19
AttributeRenamer 19
AttributeSplitter 20
BulkAttributeRemover 21
BulkAttributeRenamer 21
DatabaseJoiner 25
Deaggregator 26
ListBuilder 37
ListConcatenator 37
ListCopier 37
ListExploder 38
ListExpressionPopulator 38
ListIndexer 38
ListPopulator 38
ListRenamer 38
ListSorter 38
NullAttributeMapper 41

Calculated Values

Aggregator 16
AngleConverter 16
AngularityCalculator 16
ArcPropertyExtractor 17
AreaCalculator 18
AttributePivoter 19
AttributeRounder 19
BaseConverter 21
BoundsExtractor 21
CenterPointExtractor 22
CircularityCalculator 23
CoordinateConcatenator 24
CoordinateExtractor 24
Counter 25
CRCCalculator 25
DateTimeCalculator 26
DateTimeConverter 26
DateTimeStamper 26
DecimalDegreesCalculator 26
DEMDistanceCalculator 26
DensityCalculator 26
DimensionExtractor 26
DMSCalculator 27
ElevationExtractor 28

EllipsePropertyExtractor 28
ExpressionEvaluator 28
GeometryExtractor 30
G0IDGenerator 32
H3HexagonalIndexer 32
HoleCounter 32
LeftRightSpatialCalculator 36
LengthCalculator 36
LengthToPointCalculator 36
ListHistogrammer 38
ListRangeExtractor 38
MeasureExtractor 39
MeasureGenerator 39
ModuloCounter 39
NetworkCostCalculator 41
NetworkTopologyCalculator 41
OrientationExtractor 42
PartCounter 42
PointCloudExpressionEvaluator 43
PointCloudPropertyExtractor 44
PointCloudStatisticsCalculator 44
PointPropertyExtractor 45
RandomNumberGenerator 45
RasterAspectCalculator 45
RasterBandMinMaxExtractor 46
RasterBandPropertyExtractor 46
RasterCellValueCalculator 47
RasterExpressionEvaluator 47
RasterPropertyExtractor 49
RasterSingularCellValue
Calculator 50
RasterStatisticsCalculator 50
ReprojectAngleCalculator 50
ReprojectLengthCalculator 50
StatisticsCalculator 54
StreamOrderCalculator 54
StreamPriorityCalculator 54
StringLengthCalculator 55
SubstringExtractor 55
TempPathnameCreator 56
TextLocationExtractor 57
TextPropertyExtractor 57
TextureCoordinateSetter 57
UUIDGenerator 58
VertexCounter 59
VolumeCalculator 59

Cartography and Reports

AreaAmalgamator 17
ChartGenerator 23
CommonLocalReprojector 23
Curvefitter® 25
DGNStyler 26
Displacer 27
DWGStyler 28

- ExcelStyler 28
- FeatureColorSetter 28
- Generalizer 30
- GeometryColorSetter 30
- HTMLayouter 33
- HTMLReportGenerator 33
- ImageRasterizer 34
- KMLPropertySetter 35
- KMLRegionSetter 35
- KMLStyler 35
- KMLTimeSetter 35
- KMLTourBuilder 35
- KMLViewSetter 35
- Labeller 35
- LabelPointReplacer 36
- MapboxStyler 38
- MapInfoStyler 38
- MapnikRasterizer 39
- MapTextLabeler 39
- MapTextStyleer 39
- MSWordStyler 40
- NumericRasterizer 41
- PDFPageFormatter 42
- PDFStyler 42
- PowerPointStyler 45
- RasterHillshader 48
- SherbendGeneralizer 52
- TextAdder 57
- TextPropertySetter 57
- TextStroker 57
- WebMapTiler 59
- GtransReprojector 32
- LatLongToMGRSConverter 36
- LocalCoordinateSystemSetter 38
- MGRSToLatLongConverter 39
- PROJAttributeReprojector 45
- PROJReprojector 45
- RasterGCPExtractor 47
- RasterGCPSetter 47
- RasterGeoreferencer 48
- ReframeReprojector 50
- ReprojectAngleCalculator 50
- ReprojectLengthCalculator 50
- Reprojector 51
- RubberSheeter 51
- Scaler 51
- SecondOrderConformer 51
- TextureCoordinateSetter 57
- VertexCounter 59
- VertexRemover 59

Coordinates

- 2DForcer 15
- 3DAffiner 15
- 3DForcer 15
- Affiner 15
- AttributeReprojector 19
- BMGReprojector 21
- CenterPointExtractor 22
- CommonLocalReprojector 23
- CoordinateConcatenator 24
- CoordinateExtractor 24
- CoordinateRounder 24
- CoordinateSwapper 24
- CoordinateSystemDescription Converter 24
- CoordinateSystemExtractor 24
- CoordinateSystemRemover 24
- CoordinateSystemSetter 24
- CsmmapAttributeReprojector 25
- CsmmapReprojector 25
- DecimalDegreesCalculator 26
- DimensionExtractor 26
- DMSCalculator 27
- ElevationExtractor 28
- EsriReprojector 28
- GridInquestIIReprojector 32
- GridInquestReprojector 32
- GtransAttributeReprojector 32

Data Quality

- AngularityCalculator 16
- AreaGapAndOverlapCleaner 18
- AttributeValidator 20
- ChangeDetector 22
- CircularityCalculator 23
- ClosedCurveFilter 23
- CommonSegmentFinder 24
- ConvexityFilter 24
- CRCCalculator 25
- DimensionExtractor 26
- DuplicateFilter 27
- ElevationExtractor 28
- FeatureTypeFilter 29
- GeometryFilter 30
- GeometryValidator 31
- HoleCounter 32
- Inspector 34
- JSONValidator 35
- ListDuplicateRemover 37
- ListElementCounter 38
- ListHistogrammer 38
- Matcher 39
- MRF2DCleaner 40
- MRF2DConflator 40
- MRF2DDangleRemover 40
- MRF2DDuplicateRemover 40
- MRF2DExtender 40
- MRF2DGeneralizer 40
- MRF2DIntersector 40
- MRF2DJoiner 40
- MRF2DShortGeometryRemover 40
- MRF3DCleaner 40
- NullAttributeMapper 41
- PartCounter 42
- PlanarityFilter 43
- Sampler 51
- Snapper 52
- Snipper 52
- SpatialFilter 53

- SpatialRelator 53
- SpikeRemover 53
- SummaryReporter 55
- Tester 56
- TestFilter 56
- VertexCounter 59

Filters and Joins

- AggregateFilter 16
- Aggregator 16
- AreaOnAreaOverlayer 18
- AttributeFilter 19
- AttributePivoter 19
- AttributeRangeFilter 19
- ChangeDetector 22
- ClosedCurveFilter 23
- ConvexityFilter 24
- Databaselooser 25
- Deaggregator 26
- DuplicateFilter 27
- FeatureJoiner 28
- FeatureMerger 29
- FeatureReader 29
- FeatureTypeFilter 29
- GeometryFilter 30
- LineOnAreaOverlayer 37
- LineOnLineOverlayer 37
- ListBasedFeatureMerger 37
- MultipleGeometryFilter 40
- NeighborhoodAggregator 41
- NLPClassifier 41
- NLPTrainer 41
- PlanarityFilter 43
- PointCloudFilter 43
- PointCloudMerger 43
- PointOnAreaOverlayer 44
- PointOnLineOverlayer 44
- PointOnPointOverlayer 44
- RasterMosaicker 48
- Sampler 51
- SpatialFilter 53
- SpatialRelator 53
- Tester 56
- TestFilter 56
- TraitMerger 58

Format Specific

- AttributeFileReader 19
- AttributeFileWriter 19
- DatabaseDeleter 25
- DatabaseUpdater 26
- DGNStyler 26
- DWGStyler 28
- EsriReprojector 28
- ExcelStyler 28
- FeatureReader 29
- FeatureWriter 29
- GeometryExtractor 30
- GeometryReplacer 31
- GeoRSSFeatureComposer 31

GeoRSSFeatureReader 32
 GMLFeatureComposer 32
 HTMLLayouter 33
 HTMLReportGenerator 33
 HTMLToXHTMLConverter 33
 IFCPropertySetDefinitionCreator 33
 IFCQuantitySetDefinitionCreator 33
 JSONExtractor 34
 JSONFlattener 34
 JSONFormatter 34
 JSONFragmenter 34
 JSONTemplater 34
 JSONUpdater 35
 JSONValidator 35
 KMLPropertySetter 35
 KMLRegionSetter 35
 KMLStyler 35
 KMLTimeSetter 35
 KMLTourBuilder 35
 KMLViewSetter 35
 MapboxStyler 38
 MapInfoStyler 38
 MapTextLabeller 39
 MapTextStyler 39
 PDFPageFormatter 42
 PDFStyler 42
 RCaller 50
 WebMapTiler 59
 XMLAppender 59
 XMLFeatureMapper 59
 XMLFlattener 60
 XMLFormatter 60
 XMLFragmenter 60
 XMLNamespaceDeclarer 60
 XMLSampleGenerator 60
 XMLTemplater 60
 XMLUpdater 60
 XMLValidator 60
 XMLXQueryExploder 60
 XMLXQueryExtractor 60
 XMLXQueryUpdater 60
 XSLTProcessor 60

Geometries

2DArcReplacer 15
 2DBoxReplacer 15
 2DEllipseReplacer 15
 2DForcer 15
 2DGridAccumulator 15
 2DGridCreator 15
 3DArcReplacer 15
 3DForcer 15
 3DInterpolator 15
 3DRotator 15
 AffineWarper 16
 AnchoredSnapper 16
 AngleConverter 16
 ArcEstimator 17
 ArcPropertySetter 17
 ArcStroker 17

AreaAmalgamator 17
 AreaBuilder 17
 AreaGapAndOverlapCleaner 18
 BoundingBoxReplacer 21
 CenterLineReplacer 22
 CenterPointReplacer 22
 Chopper 23
 CityEngineModelGenerator 23
 CoordinateRounder 24
 CoordinateSwapper 24
 CSGBuilder 25
 Curvefitter* 25
 Denifier 26
 Displacer 27
 Dissolver 27
 DonutBridgeBuilder 27
 DonutBuilder 27
 DonutHoleExtractor 27
 EllipsePropertySetter 28
 FaceReplacer 28
 Generalizer 30
 GeometryCoercer 30
 GeometryExtractor 30
 GeometryRefiner 31
 GeometryRemover 31
 GeometryReplacer 31
 H3HexagonalIndexer 32
 HullReplacer 33
 Intersector 34
 LabelPointReplacer 36
 LineBuilder 36
 LineCloser 36
 LineCombiner 37
 LineExtender 37
 MeasureRemover 39
 MeasureSetter 39
 MeshMerger 39
 MeshSimplifier 39
 MinimumAreaForcer 39
 MinimumSpanningCircle
 Replacer 39
 MultipleGeometrySetter 40
 OffsetCurveGenerator 42
 Orientor 42
 PathBuilder 42
 PathSplitter 42
 PipeReplacer 42
 PointCloudSurfaceBuilder 44
 PointPropertySetter 45
 Rotator 51
 RubberSheeter 51
 Scaler 51
 SherbendGeneralizer 52
 Snapper 52
 Snipper 52
 SolidBuilder 53
 SpikeRemover 53
 SurfaceDissolver 55
 SurfaceFootprintReplacer 56
 SurfaceSplitter 56

TextAdder 57
 Tiler 57
 TINGenerator 57
 Triangulator 58
 VertexCreator 59
 VertexRemover 59

Integrations

ArcGISOnlineConnector 17
 AutodeskA360Connector 20
 AutodeskBIM360DocsConnector 20
 AzureBlobStorageConnector 20
 AzureFileStorageConnector 20
 AzureQueueStorageConnector 20
 BMGRProjector 21
 BoxConnector 21
 CityEngineModelGenerator 23
 CKANConnector 23
 CsmmapAttributeProjector 25
 CsmmapProjector 25
 Curvefitter* 25
 DatabaseDeleter 25
 DatabaseUpdater 26
 DirectTweeter 26
 DropboxConnector 27
 Emailer 28
 EsriProjector 28
 EthereumConnector 28
 FMEServerJobSubmitter 29
 FMEServerJobWaiter 29
 FMEServerLogFileRetriever 29
 FMEServerNotifier 29
 FMEServerResourceConnector 30
 FTPCaller 30
 Geocoder 30
 GoogleCloudStorageConnector 32
 GoogleDriveConnector 32
 GridInquestIIProjector 32
 GridInquestProjector 32
 GtransAttributeProjector 32
 GtransProjector 32
 HDFSCConnector 32
 HTMLExtractor 33
 JMSReceiver 34
 JMSender 34
 KinesisReceiver 35
 KinesisSender 35
 MRF2DCleaner 40
 MRF2DConflator 40
 MRF2DDangleRemover 40
 MRF2DDuplicateRemover 40
 MRF2DExtender 40
 MRF2DGeneralizer 40
 MRF2DIntersector 40
 MRF2DJoiner 40
 MRF2DShortGeometryRemover 40
 MRF3DCleaner 40
 OneDriveConnector 42
 PROJAttributeProjector 45
 ProjectWiseWSGConnector 45

PROJReprojector 45
RabbitMQConnector 45
RCaller 50
ReframeReprojector 50
S3Connector 51
SalesforceConnector 51
SharePointOnlineConnector 52
SlackConnector 52
SNSSender 53
TCPIPReceiver 56
TCPIPSender 56
TransporterReceiver 58
TransporterSender 58
TrelloConnector 58
Tweeter 58
TweetSearcher 58
TweetStreamer 58
TwitterStatusFetcher 58
WhiteStarLeaseBuilder 59

Point Clouds

DEMGenerator 26
GeometryCoercer 30
PointCloudCoercer 43
PointCloudCombiner 43
PointCloudComponentAdder 43
PointCloudComponentCopier 43
PointCloudComponentKeeper 43
PointCloudComponentRemover 43
PointCloudComponentRenamer 43
PointCloudComponentType
 Coercer 43
PointCloudConsumer 43
PointCloudCreator 43
PointCloudExpressionEvaluator 43
PointCloudExtractor 43
PointCloudFilter 43
PointCloudMerger 43
PointCloudOnRasterComponent
 Setter 44
PointCloudPropertyExtractor 44
PointCloudReplacer 44
PointCloudSimplifier 44
PointCloudSorter 44
PointCloudSplitter 44
PointCloudStatisticsCalculator 44
PointCloudSurfaceBuilder 44
PointCloudThinner 44
PointCloudTransformationApplier 44
SurfaceDraper 55
SurfaceModeller 56

Rasters

AppearanceExtractor 16
AppearanceMerger 16
AppearanceRemover 16
AppearanceSetter 16
AppearanceStyler 16
ChartGenerator 23
DEMDistanceCalculator 26

GoogleVisionConnector 32
ImageFetcher 34
ImageRasterizer 34
MapnikRasterizer 39
NumericRasterizer 41
PointCloudOnRasterComponent
 Setter 44
PointOnRasterValueExtractor 45
RasterAspectCalculator 45
RasterBandAdder 45
RasterBandCombiner 45
RasterBandInterpretationCoercer 45
RasterBandKeeper 46
RasterBandMinMaxExtractor 46
RasterBandNameSetter 46
RasterBandNodataRemover 46
RasterBandNodataSetter 46
RasterBandOrderer 46
RasterBandPropertyExtractor 46
RasterBandRemover 46
RasterBandSeparator 46
RasterCellCoercer 46
RasterCellOriginSetter 46
RasterCellValueCalculator 47
RasterCellValueReplacer 47
RasterCellValueRounder 47
RasterCheckpointter 47
RasterConsumer 47
RasterConvolver 47
RasterDEMGenerator 47
RasterExpressionEvaluator 47
RasterExtentsCoercer 47
RasterExtractor 47
RasterGCPExtractor 47
RasterGCPSetter 47
RasterGeoreferencer 48
RasterHillshader 48
RasterInterpretationCoercer 48
RasterMosaicker 48
RasterNumericCreator 48
RasterObjectDetectionModel
 Trainer 48
RasterObjectDetector 48
RasterObjectDetectorSample
 Generator 48
RasterObjectDetectorSample
 Preparer 49
RasterPaletteAdder 49
RasterPaletteExtractor 49
RasterPaletteGenerator 49
RasterPaletteInterpretation
 Coercer 49
RasterPaletteNodataSetter 49
RasterPaletteRemover 49
RasterPaletteResolver 49
RasterPropertyExtractor 49
RasterPyramider 49
RasterRegisterer 49
RasterReplacer 49
RasterResampler 49

RasterRGBCreator 49
RasterRotationApplier 49
RasterSegmenter 49
RasterSelector 49
RasterSharpener 50
RasterSingularCellValueCalculator 50
RasterSlopeCalculator 50
RasterStatisticsCalculator 50
RasterSubsetter 50
RasterTiler 50
RasterToPolygonCoercer 50
RCaller 50
TextStroker 57
VectorOnRasterOverlayer 59
WebMapTiler 59

Spatial Analysis

AffineWarper 16
AnchoredSnapper 16
AreaAmalgamator 17
AreaBuilder 17
AreaOnAreaOverlayer 18
BoundingBoxAccumulator 21
Bufferer 21
CenterLineReplacer 22
CenterPointReplacer 22
Clipper 23
ContourGenerator 24
DEMDistanceCalculator 26
Displacer 27
Dissolver 27
DonutBridgeBuilder 27
FeatureReader 29
HullAccumulator 33
Intersector 34
NeighborFinder 41
NeighborhoodAggregator 41
NeighborPairFinder 41
NetworkCostCalculator 41
NetworkFlowOrientor 41
NetworkTopologyCalculator 41
Offsetter 42
PointOnAreaOverlayer 44
PointOnLineOverlayer 44
PointOnPointOverlayer 44
PointOnRasterValueExtractor 45
SectorGenerator 51
ShortestPathFinder 52
Snapper 52
SpatialFilter 53
SpatialRelator 53
SpatialSorter 53
SurfaceBuilder 55
SurfaceDissolver 55
SurfaceDraper 55
SurfaceOnSurfaceOverlayer 56
TopferIndexCalculator 58
TopologyBuilder 58
VectorOnRasterOverlayer 59

VoronoiCellGenerator 59
VoronoiDiagrammer 59

Strings

AngleConverter 16
AttributeCompressor 18
AttributeDecompressor 18
AttributeEncoder 18
AttributeExploder 19
AttributePivoter 19
AttributeRangeMapper 19
AttributeReprojector 19
AttributeRounder 19
AttributeSplitter 20
AttributeTrimmer 20
AttributeValidator 20
AttributeValueMapper 20
BaseConverter 21
BinaryDecoder 21
BinaryEncoder 21
CharacterCodeExtractor 22
CharacterCodeReplacer 22
CoordinateConcatenator 24
CoordinateSystemDescription
 Conver 24
DateTimeConverter 26
DimensionExtractor 26
ElevationExtractor 28
ExpressionEvaluator 28
FilenamePartExtractor 29
HTMLExtractor 33
HTMLToXHTMLConverter 33
ListDuplicateRemover 37
ListSearcher 38
ListSummer 38
NLPClassifier 41
NLPTrainer 41
NullAttributeMapper 41
RandomNumberGenerator 45
StringCaseChanger 54
StringConcatenator 54
StringFormatter 54
StringLengthCalculator 55
StringPadder 55
StringPairReplacer 55
StringReplacer 55
StringSearcher 55
SubstringExtractor 55
TextDecoder 57
TextEncoder 57

Web

AmazonAthenaConnector 16
ArcGISOnlineConnector 17
AttributeEncoder 18
AutodeskA360Connector 20
AutodeskBIM360DocsConnector 20
AWSIoTConnector 20
AzureBlobStorageConnector 20
AzureComputerVisionConnector 20

AzureFileStorageConnector 20
AzureIoTConnector 20
AzureQueueStorageConnector 20
AzureTextAnalyticsConnector 20
BoxConnector 21
CesiumIonConnector 22
ChartGenerator 23
CKANConnector 23
ComprehendConnector 24
Decelerator 26
DirectTweeter 26
DropboxConnector 27
Emailer 28
EthereumConnector 28
FMEServerJobSubmitter 29
FMEServerJobWaiter 29
FMEServerLogFileRetriever 29
FMEServerNotifier 29
FMEServerResourceConnector 30
FTPCaller 30
Generalizer 30
Geocoder 30
GeoRSSFeatureComposer 31
GeoRSSFeatureReader 32
GoogleBigQueryConnector 32
GoogleCloudPubSubConnector 32
GoogleCloudStorageConnector 32
GoogleDriveConnector 32
GoogleIoTConnector 32
GoogleLanguageConnector 32
GoogleVisionConnector 32
HDFSConnector 32
HTMLExtractor 33
HTMLLayouter 33
HTMLReportGenerator 33
HTMLToXHTMLConverter 33
HTTPCaller 33
IBMIoTConnector 33
JMSReceiver 34
JMSSender 34
JSONExtractor 34
JSONFlattener 34
JSONFormatter 34
JSONFragmenter 34
JSONTemplater 34
JSONUpdater 35
JSONValidator 35
KafkaConnector 35
MQTTConnector 39
OneDriveConnector 42
ParameterFetcher 42
ProjectWiseWSGConnector 45
RabbitMQConnector 45
RasterPyramid 49
RekognitionConnector 50
S3Connector 51
SalesforceConnector 51
SharePointOnlineConnector 52
SlackConnector 52
SNSSender 53

SQSConnector 54
TCPIPReceiver 56
TCPIPSender 56
TrelloConnector 58
Tweeter 58
TweetSearcher 58
TweetStreamer 58
TwitterStatusFetcher 58
WebMapTiler 59
WebSocketReceiver 59
WebSocketSender 59
XMLAppender 59
XMLFeatureMapper 59
XMLFlattener 60
XMLFormatter 60
XMLFragmenter 60
XMLNamespaceDeclarer 60
XMLSampleGenerator 60
XMLTemplater 60
XMLUpdater 60
XMLValidator 60
XMLXQueryExploder 60
XMLXQueryExtractor 60
XMLXQueryUpdater 60
XSLTProcessor 60

Workflows

ArcGISOnlineConnector 17
AttributeFileReader 19
AttributeFileWriter 19
AutodeskA360Connector 20
AutodeskBIM360DocsConnector 20
AzureBlobStorageConnector 20
AzureFileStorageConnector 20
AzureQueueStorageConnector 20
BoxConnector 21
CKANConnector 23
Cloner 23
Creator 25
DatabaseDeleter 25
DatabaseUpdater 26
Decelerator 26
DropboxConnector 27
EnvironmentVariableFetcher 28
EthereumConnector 28
FeatureHolder 28
FeatureReader 29
FeatureTypeExtractor 29
FeatureWriter 29
FMEFunctionCaller 29
FMEServerJobSubmitter 29
FMEServerJobWaiter 29
FMEServerLogFileRetriever 29
FMEServerNotifier 29
FMEServerResourceConnector 30
FTPCaller 30
GeometryExtractor 30
GeometryReplacer 31
GoogleCloudStorageConnector 32
GoogleDriveConnector 32

HDFSConnector 32
HTMLExtractor 33
HTTPCaller 33
ImageFetcher 34
InlineQuerier 34
Inspector 34
LicenseChecker 36
Logger 38
LogMessageStreamer 38
OneDriveConnector 42
ParameterFetcher 42
Player 43
ProjectWiseWSGConnector 45
PythonCaller 45
PythonCreator 45
RabbitMQConnector 45
RasterCheckpointter 47
Recorder 50
S3Connector 51
SalesforceConnector 51
Sampler 51
SchemaMapper 51
SharePointOnlineConnector 52
SlackConnector 52
Sorter 53
SpatialSorter 53
SQLCreator 54
SQLExecutor 54
SummaryReporter 55
SystemCaller 56
TclCaller 56
TCPIPReceiver 56
TCPIPSender 56
TempPathnameCreator 56
Terminator 56
TimeWindower 57
TransporterReceiver 58
TransporterSender 58
TrelloConnector 58
VariableRetriever 58
VariableSetter 58
WebSocketReceiver 59
WebSocketSender 59
WorkspaceRunner 59
XSLTProcessor 60

Symbol Reference



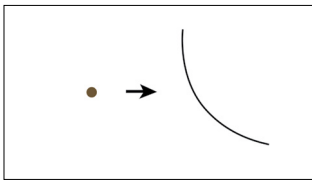
Transformers with this symbol are available at extra cost. Please contact Safe Software for more information.

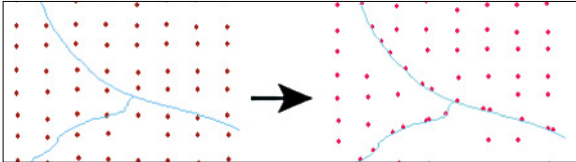


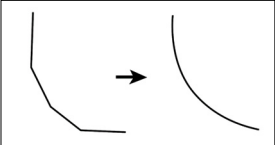
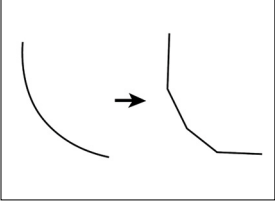
Transformers with this symbol are downloadable from FME Hub.

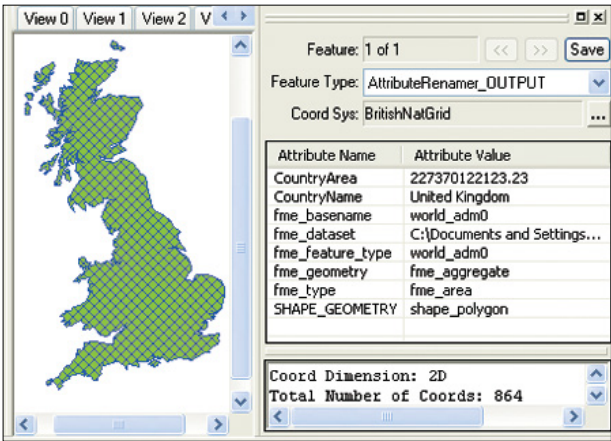
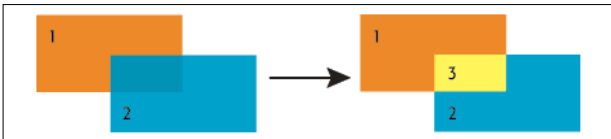


Transformers with this symbol are new in this version of FME.

2D		
2DArcReplacer	Replaces the geometry of the feature with a two-dimensional arc whose shape is set by the parameters, which can be either constant floating point values or the values of existing attributes. (<i>Geometries category</i>)	 The diagram shows a small brown dot on the left, followed by a right-pointing arrow, and then a curved line segment on the right, illustrating the replacement of a point feature with an arc geometry.
2DBoxReplacer	Replaces the geometry of the feature with a two-dimensional box whose minimums and maximums are fixed values or are taken from attributes in the original feature. (<i>Geometries category</i>)	
2DEllipseReplacer	Replaces the feature's geometry with a two-dimensional ellipse whose shape is set by the parameters, values, or the values of existing attributes. (<i>Geometries category</i>)	
2DForcer	Removes any elevation (Z) coordinates which may (or may not) have been present on the original feature. (<i>Coordinates, Geometries categories</i>)	
2DGridAccumulator	Replaces the input features with a grid of two-dimensional point or polygon features that have the specified spacing and which cover (at least) the bounding box area of all features that enter the transformer. (<i>Geometries category</i>)	
2DGridCreator	Creates a grid of two-dimensional point or polygon features, at the origin and uses the offsets specified. Each created feature has a row and column attribute that indicates its position in the grid. (<i>Geometries category</i>)	
3D		
3DAffiner	Performs 3D affine transformation on the coordinates of the feature. An affine transformation preserves parallelism of lines and planes in geometry. Affine transformations include translations, rotations, scalings, and reflections. (<i>3D, Coordinates categories</i>)	
3DArcReplacer	Replaces the feature's geometry with a two-dimensional arc whose shape is set by the parameters, which can be either constant floating point values or the values of existing attributes. (<i>3D, Geometries categories</i>)	
3DForcer	Turns two-dimensional data into three-dimensional data by adding a z-value to every coordinate. (<i>3D, Coordinates, Geometries categories</i>)	
3DInterpolator	Interpolates elevation values along a non-aggregated linear feature from a starting value to an ending value. The resulting feature's elevation monotonically increases (or decreases) from the starting value to the ending value. If the feature was two-dimensional, it becomes three-dimensional. If the feature was three-dimensional, its previous elevations are removed and replaced. (<i>3D, Geometries categories</i>)	
3DRotator	Rotates features according to the right-hand rule, and in a counter-clockwise direction about the specified axis of rotation. (<i>3D, Geometries categories</i>)	
A		
Affiner	Performs an affine transformation on the coordinates of the feature. (<i>Coordinates category</i>)	

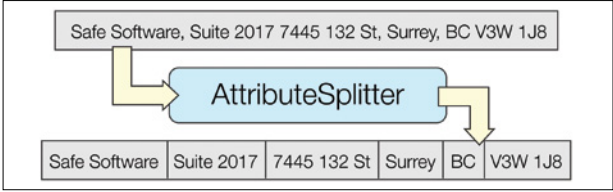
AffineWarper	Performs warping operations on the spatial coordinates of features. It is used to adjust a set of observed input features according to a spatial transform defined by a set of control vectors. <i>(Geometries, Spatial Analysis categories)</i>
AggregateFilter	Routes features differently depending on whether their geometry consists of an aggregate of several primitive geometries or a simple, single piece of geometry. <i>(Filters and Joins category)</i>
Aggregator	Combines feature geometries into heterogeneous or homogeneous aggregates. Alternatively, combines feature attributes without any geometry. <i>(Attributes, Calculated Values, Filters and Joins categories)</i> 
AmazonAthenaConnector 🗑️	Accesses Amazon's Athena service to run queries on S3 datasets. <i>(Web category)</i>
AnchoredSnapper	Takes a series of features that match the input specification and performs snapping on the features that lie within the specified tolerance from other features that match the input specification. <i>(Geometries, Spatial Analysis categories)</i> 
AngleConverter	Converts angles of a feature's geometry and/or attributes from one representation to another. <i>(Calculated Values, Geometries, Strings categories)</i>
AngularityCalculator	Calculates the "angularity" of a linear or area feature. Angularity indicates the degree of curvature of a feature. The higher the value, the more curved its geometry. <i>(Calculated Values, Data Quality categories)</i>
AppearanceExtractor	Extracts appearance style(s) from the front and/or back side of the geometries. <i>(3D, Rasters categories)</i>
AppearanceMerger	Sets the front and/or back appearance style(s) of specified geometries to be identical to that which is on a specific source geometry. <i>(3D, Rasters categories)</i>
AppearanceRemover	Removes appearances from the front and/or back side of geometries. Removing the appearance of a geometry causes that geometry to inherit its appearance from its parent, if a parent with an appearance exists. <i>(3D, Rasters categories)</i>
AppearanceSetter	Sets appearance style(s) onto the front and/or back sides of geometries. <i>(3D, Rasters categories)</i>
AppearanceStyler	Creates an appearance style that can later be applied to a surface (using the AppearanceSetter, for instance). <i>(3D, Rasters categories)</i>

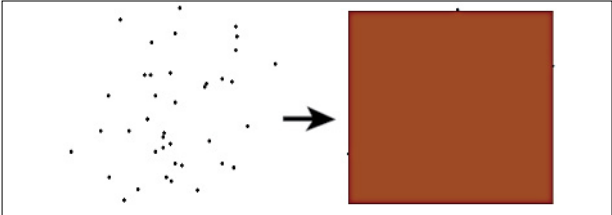
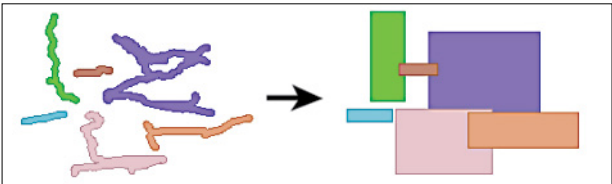
	ArcEstimator Replaces the geometry of the feature with a two-dimensional circular arc whose shape is estimated from the first, middle, and last point of the linear feature passed in. <i>(Geometries category)</i>	
NEW	ArcGISOnlineConnector 📁 Accesses the Esri ArcGIS Online content stored by a user as a file storage service to upload, update, download, delete, or list information about items from a user's Esri ArcGIS Online content. It can also be used to change the sharing settings of an item or publish items as hosted feature layers. <i>(Integrations, Web, Workflows categories)</i>	
	ArcPropertyExtractor Sets the given attributes to the properties of an arc geometry and works on a single feature at a time. <i>(Calculated Values category)</i>	
	ArcPropertySetter Sets the properties of an arc geometry to those specified. <i>(Geometries category)</i>	
	ArcStroker Converts arc features into lines replacing the feature geometry with a series of edges interpolated along the arc boundary. Ellipse features are converted into polygons by interpolating edges along the elliptical boundary. <i>(Geometries category)</i>	
	AreaAmalgamator Generalizes polygonal input by connecting nearby geometries. The AreaAmalgamator accepts polygonal geometries – including donuts – as input, and produces triangles that join input features into connected pieces, or amalgams. <i>(Cartography and Reports, Geometries, Spatial Analysis categories)</i>	
	AreaBuilder Takes a set of topologically connected linework and creates topologically correct polygon features where the linework forms closed shapes. <i>(Geometries, Spatial Analysis categories)</i>	

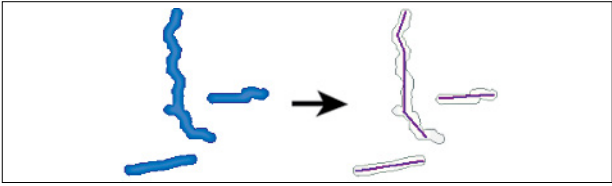
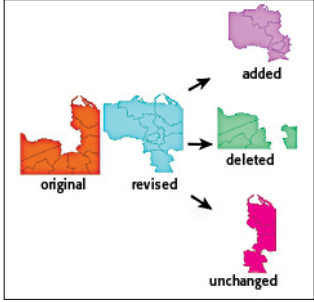
AreaCalculator	Calculates the area of a polygonal object and stores the value in an attribute. The area is calculated in square map units, whatever they are. (<i>Calculated Values category</i>) 
AreaGapAndOverlap Cleaner	Repairs area topologies by resolving gaps and overlaps between adjacent areas. An overlap occurs where two or more areas intersect each other, creating a region covered by multiple areas. A gap occurs where two or more areas fail to meet at a boundary. (<i>Data Quality, Geometries categories</i>)
AreaOnAreaOverlayer	Performs an area-on-area overlay so that all input areas are intersected against each other and resultant area features are created and output. The resultant areas have all the attributes of all the original features in which they are contained. (<i>Filters and Joins, Spatial Analysis categories</i>) 
AttributeCompressor	Compresses and (optionally) encrypts the values of the specified attributes. (<i>Attributes, Strings categories</i>)
AttributeCopier	Copies existing attributes to new attributes with user-specified names. The existing attribute remains intact and a new attribute is created that has a different name, but the same values. (<i>Attributes category</i>)
AttributeCreator	Adds one or more attributes to the feature and optionally assigns a value derived from constants, attribute values, and expressions. Values can reference adjacent features. (<i>Attributes category</i>)
AttributeDecompressor	Decompresses and decrypts the values of the specified attributes that were compressed and encrypted by the AttributeCompressor. (<i>Attributes, Strings categories</i>)
AttributeDereferencer	Copies the value of the attribute whose name is held in the source attribute to a newly created attribute. (<i>Attributes category</i>)
AttributeEncoder	Encodes the values of the specified attributes to the desired encoding. (<i>Strings, Web categories</i>)

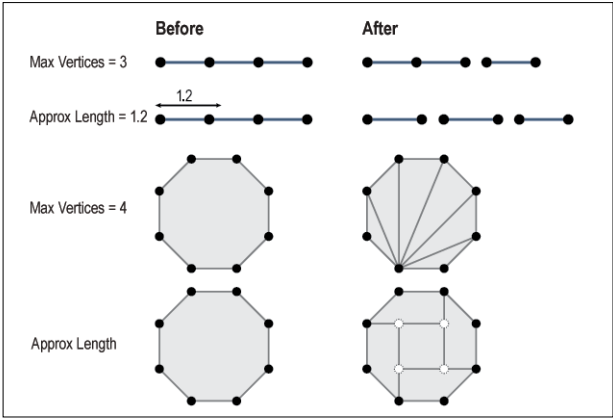
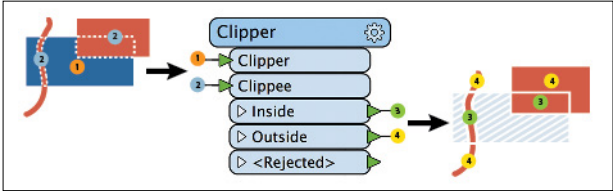
AttributeExploder	Creates a new pair of attributes (attribute name/attribute value) from each attribute on the input feature and either outputs these on a new feature or adds them as a list element to the original feature. In both cases, it is possible to either conserve or delete the original attributes and geometry. <i>(Attributes, Strings categories)</i>
AttributeExposer	Exposes attributes in Workbench so they can be used by downstream transformers and writers. <i>(Attributes category)</i>
AttributeFileReader	Reads the contents of a file and stores them as the value for the specified attribute. <i>(Attributes, Format Specific, Workflows categories)</i>
AttributeFileWriter	Writes the contents of the specified attribute to a file. <i>(Attributes, Format Specific, Workflows categories)</i>
AttributeFilter	Routes features to different output ports depending on the value of an attribute. <i>(Filters and Joins category)</i>
AttributeKeeper	Removes all attributes and list attributes, except the specific ones you specify to be retained. <i>(Attributes category)</i>
AttributeManager	Alters multiple attributes through adding, renaming, copying, deleting and re-ordering. Sets values for new, existing, and modified attributes to any combination of constants, attribute values, conditionals, expressions, and parameters. Values can reference adjacent features. <i>(Attributes category)</i>
AttributePivoter	Restructures and regroups incoming features based on specified "Group by attributes" and calculates summary statistics based on a designated "Attribute To Analyze" in order to form a Pivot table output. <i>(Calculated Values, Filters and Joins, Strings categories)</i>
AttributeRangeFilter	Performs a lookup on a range-based lookup table and routes the feature to the appropriate output port. <i>(Filters and Joins category)</i>
AttributeRangeMapper	Performs a lookup on a range-based lookup table and stores the resulting value, or writes the value to, a new output attribute. <i>(Strings category)</i>
AttributeRemover	Removes the selected attributes and list attributes from the feature. <i>(Attributes category)</i>
AttributeRenamer	Renames one or more attributes, retaining the attribute's current values. <i>(Attributes category)</i>
AttributeReprojector	Reprojects attributes from one coordinate system to another. <i>(Coordinates, Strings categories)</i>
AttributeRounder	Rounds off an attribute to the specified number of decimal places. <i>(Calculated Values, Strings categories)</i>

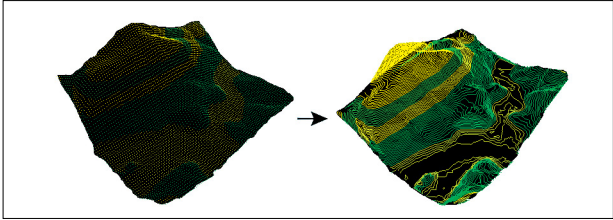
143.178435 —→ 143.18

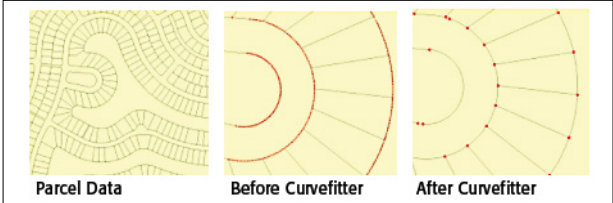
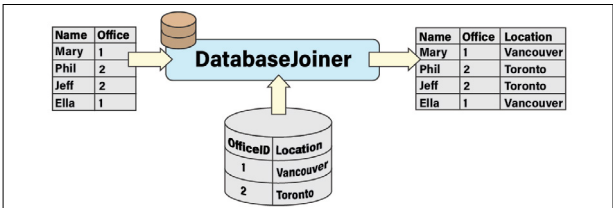
AttributeSplitter	Splits a selected attribute into a list attribute. Each item in the list will contain a single token split from the list. You would use this transformer, for example, to separate an attribute that has a comma-separated value list into its component pieces. (<i>Attributes, Strings categories</i>) 
AttributeTrimmer	Removes leading and trailing trim characters from the selected attributes. (<i>Strings category</i>)
AttributeValidator	Validates any number of attributes against specific test conditions and routes the feature according to the outcome of the test(s). Features that fail one or more tests will have the reasons for failure documented on an attribute and list attribute on the output feature. (<i>Data Quality, Strings categories</i>)
AttributeValueMapper	Looks up and assigns attribute values based on other attributes, and stores the looked-up value in a new attribute. (<i>Strings category</i>) 
AutodeskA360Connector	Accesses the Autodesk A360 file storage service to upload or download files or list file and folder information from a Autodesk A360 account. (<i>Integrations, Web, Workflows categories</i>)
AutodeskBIM360 DocsConnector 📄	Accesses BIM 360 Docs to upload, download, or delete files and folders or list file/folder information. (<i>Integrations, Web, Workflows categories</i>)
AWSIoTConnector 📄	Connects to the AWS IoT Core messaging broker. Supports sending (producing) and receiving (consuming) messages. (<i>Web category</i>)
AzureBlobStorage Connector 📄	Accesses the Azure Blob Storage file storage service to upload, download, or delete files and folders or list file/folder information from an Azure account. (<i>Integrations, Web, Workflows categories</i>)
AzureComputerVision Connector 📄	Accesses the Azure Computer Vision Service to detect objects in images. (<i>Web category</i>)
AzureFileStorage Connector 📄	Accesses the Azure File Storage file storage service to upload, download, or delete files and folders or list file/folder information from an Azure account. (<i>Integrations, Web, Workflows categories</i>)
AzureIoTConnector 📄	Connects to Azure's IoT Hub through the MQTT protocol. Supports publishing device-to-cloud messages and receiving cloud-to-device messages as a device. (<i>Web category</i>)
AzureQueueStorage Connector 📄	Accesses the Azure Queue Storage service to send or receive messages. (<i>Integrations, Web, Workflows categories</i>)
AzureTextAnalytics Connector 📄	Accesses Azure's Text Analytics Service for natural language processing on text. (<i>Web category</i>)

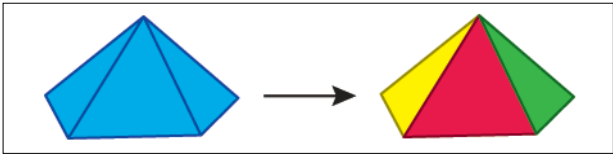
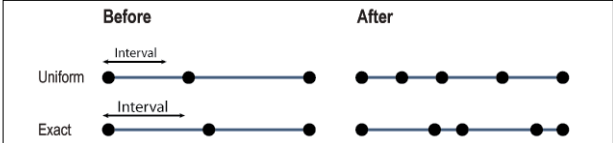
B	
BaseConverter	Converts an attribute's value from one numeric system (base) to another, putting the resulting value in a new attribute. (<i>Calculated Values, Strings categories</i>) Decimal 958713 → Hex EA0F9
BinaryDecoder	Decodes Base64 or HEX text to binary data.(<i>Strings category</i>)
BinaryEncoder	Encodes binary data to text using Base64 or HEX encoding methods. (<i>Strings category</i>)
BMGReprojector	Reprojects feature coordinates from one coordinate system to another using the Blue Marble Geographic Calculator library. (<i>Coordinates, Integrations categories</i>)
BoundingBoxAccumulator	Takes a set of point, linear, polygonal, and/or aggregate features and creates a two-dimensional bounding box, which contains all features. (<i>Spatial Analysis category</i>) 
BoundingBoxReplacer	Replaces the geometry of the feature with either its two-dimensional bounding box or its two-dimensional minimum oriented bounding box. (<i>Geometries category</i>) 
BoundsExtractor	Extracts the minimum and maximum values of the feature's coordinates into new attributes. (<i>Calculated Values category</i>)
BoxConnector	Accesses the Box file storage service to upload, download, or delete files and folders or list file/folder information from a Box account. (<i>Integrations, Web, Workflows categories</i>)
Bufferer	Creates a buffer zone of specified size around or inside input geometry. (<i>3D, Spatial Analysis categories</i>)
BulkAttributeRemover	Removes all attributes on incoming features that match a given regular expression. It can also be used to remove large numbers of attributes that have common naming. (<i>Attributes category</i>)
BulkAttributeRenamer	Renames attributes by adding or removing prefixes or suffixes, or replacing text in regular expressions or character strings. (<i>Attributes category</i>)

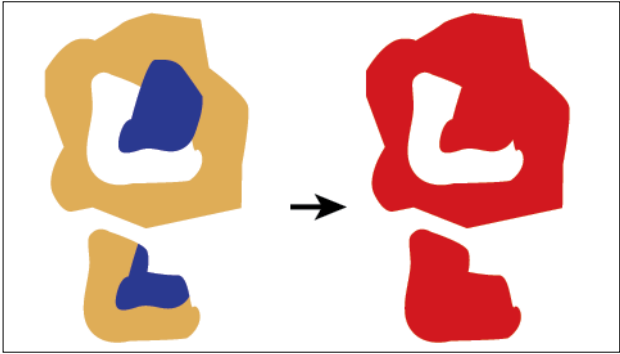
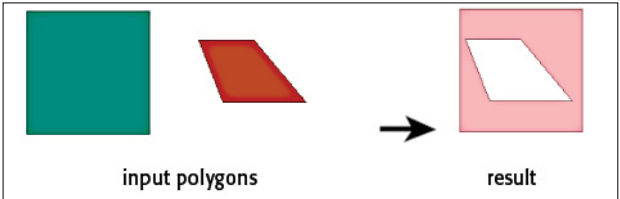
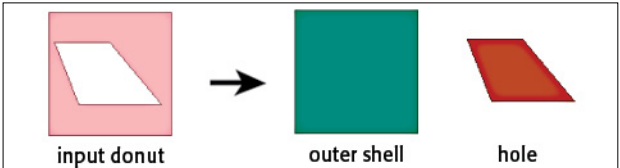
C	
CenterLineReplacer	Replaces area geometries with their approximate center lines, medial axes, or straight skeletons. This transformer works best with long, narrow areas. <i>(Geometries, Spatial Analysis categories)</i> 
CenterPointExtractor	Extracts and outputs the specified x, y, z attributes of a feature's point that is either in the center of the feature's bounding box, somewhere inside the feature's bounding box or at the center of mass of the feature. <i>(Calculated Values, Coordinates categories)</i>
CenterPointReplacer	Replaces the geometry of the feature with a point that is either in the center of the feature's bounding box, somewhere inside the feature's bounding box or replaces the geometry of the feature with a point at the center of mass of the feature. <i>(Geometries, Spatial Analysis categories)</i> 
CesiumIonConnector 📁	Uploads a folder dataset to the Cesium ion service as a new asset. <i>(Web category)</i>
ChangeDetector	Detects changes between two sets of input features. <i>(Data Quality, Filters and Joins categories)</i> 
CharacterCodeExtractor	Extracts the integral character code of the first character in the source string attribute, and adds its integer value in the character set to the feature as another attribute. This can be used to obtain the integer code of any Unicode character (from Basic Multilingual Plane), including non-printable ones. <i>(Strings category)</i>
CharacterCodeReplacer	Sets the result attribute to the character whose numeric code was contained in the source code attribute (or the entered integer). <i>(Strings category)</i>

ChartGenerator	Creates a raster Line, Bar, Scatter, Histogram or Pie chart based on the values of selected attributes. (<i>Cartography and Reports, Rasters, Web categories</i>)
Chopper	Breaks input features into points, lines, or areas. Chopped features contain the same set of vertices as input features. (<i>Geometries category</i>) 
CircularityCalculator	Calculates the circularity of an area feature, which indicates how elongated the feature is. (<i>Calculated Values, Data Quality categories</i>)
CityEngineModel Generator 	Generates 3D models from input geometries and ArcGIS CityEngine rule packages (*.rpk). (<i>3D, Geometries, Integrations categories</i>)
CKANConnector 	Connects to a CKAN open data portal using the CKAN Action REST API. Supports reading and writing CKAN Dataset and Resource metadata, downloading of file-based Resources, and uploading files to the CKAN FileStore. Does not support row-based operations against CKAN DataStore Resources. (<i>Integrations, Web, Workflows categories</i>)
Clipper	Performs a geometric clipping operation. (<i>Spatial Analysis category</i>) 
Cloner	Makes the specified number of copies of the input features and outputs all copies through its single output port. (<i>Workflows category</i>)
ClosedCurveFilter	Checks if curves form closed loops. Curves include lines, arcs, and paths. This transformer can also check aggregates of curves. An aggregate is closed if all of its elements are closed. If any element of an aggregate is not a curve, the aggregate is rejected. (<i>Data Quality, Filters and Joins categories</i>)
CommonLocalReprojector	Reprojects a set of features to a local coordinate system with units of meters centered on the bounding box of the features. (<i>Cartography and Reports, Coordinates categories</i>)

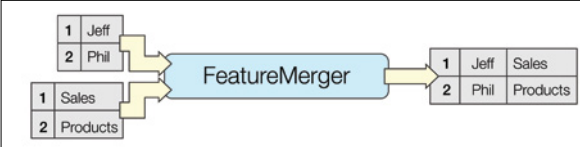
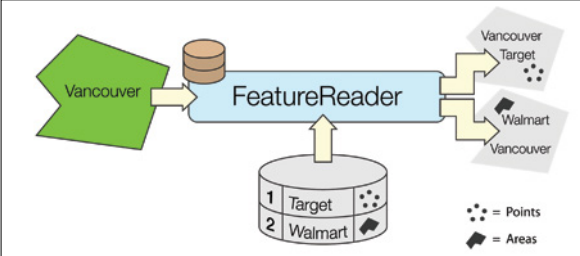
CommonSegmentFinder	Tests to see which of the Candidate features have even one line segment in common with any Base feature. (<i>Data Quality category</i>)
ComprehendConnector 	Accesses the Amazon AI Comprehend Service for natural language processing on text. (<i>Web category</i>)
ContourGenerator	Constructs a Delaunay triangulation based on input points and breaklines. Contour lines are then generated from the triangulation. (<i>Spatial Analysis category</i>) 
ConvexityFilter	Determines whether areas, surfaces, and solids are convex or concave. A polygon is simple when it is not self-intersecting and has a non-zero area. Simple polygons are convex if every internal angle is less than or equal to 180 degrees. All other polygons are considered concave. (<i>Data Quality, Filters and Joins categories</i>)
CoordinateConcatenator	Retrieves the value of all of the feature's coordinates into an attribute, separated by the delimiter characters. (<i>Calculated Values, Coordinates, Strings categories</i>)
CoordinateExtractor	Retrieves the value of the x, y, and z coordinates at the specified index into attributes. (<i>Calculated Values, Coordinates categories</i>)
CoordinateRounder	Rounds off the feature's coordinates to the specified number of decimal places. Any consecutive points that become duplicates as a result of the rounding are thinned by removing the redundant points. (<i>Coordinates, Geometries categories</i>) 
CoordinateSwapper	Swaps coordinate axes of the input features. (<i>Coordinates, Geometries categories</i>)
CoordinateSystemDescription Converter	Converts coordinate systems between FME and AutoDesk WKT, EPSG, Esri WKT, Esri WKID, MapInfo, OGC WKT, Oracle SRID, and PROJ.4 representations. (<i>Coordinates, Strings categories</i>)
CoordinateSystemExtractor	Retrieves the feature's coordinate system into an attribute. (<i>Coordinates category</i>)
CoordinateSystemRemover	Removes the coordinate system from all input features. This transformer does not reproject features or otherwise modify their geometry. (<i>Coordinates category</i>)
CoordinateSystemSetter	Tags all features with the specified coordinate system. It does not reproject features or otherwise modify their geometry. (<i>Coordinates category</i>)

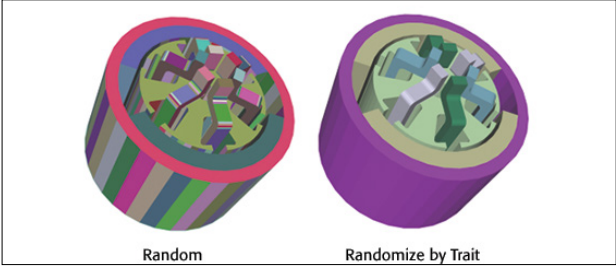
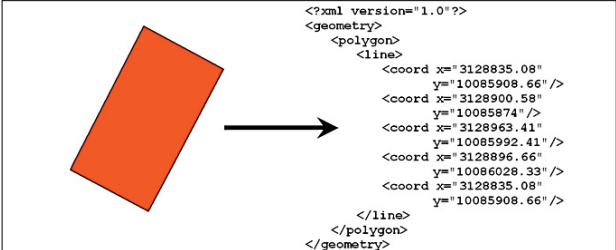
Counter	Adds a numeric attribute to a feature and assigns a value. (<i>Calculated Values category</i>)
CRCCalculator	Calculates a CRC (Cyclic Redundancy Check) value for a feature and places the calculated CRC value into the attribute specified. (<i>Calculated Values, Data Quality categories</i>)
Creator	Creates features using the parameters supplied and sends them into the workspace for processing. (3D, <i>Workflows categories</i>)
CSGBuilder	Creates Constructive Solid Geometry (CSG) from pairs of solid geometry features which are input through the A and B ports. (3D, <i>Geometries categories</i>)
CSGEvaluator	Recursively replaces the geometry of a feature that has CSG (Constructive Solid Geometry) by evaluating the tree of the CSG solid, effectively removing the constructive aspect of the geometry. (3D <i>category</i>)
CsmapAttributeReprojector	Reprojects attributes from one coordinate system to another using the CS-MAP library. (<i>Coordinates, Integrations categories</i>)
CsmapReprojector	Reprojects feature coordinates from one coordinate system to another using the CS-MAP library. (<i>Coordinates, Integrations categories</i>)
Curvefitter®	Smooths lines derived from line segments, points, or raster data, and replaces a series of line segments with the optimal combination of straight lines and embedded arc segments required to create smooth curving lines. This process provides a truer representation of real-world features and can reduce file sizes by up to 80%. In addition to processing simple line features, the Curvefitter preserves feature topology when smoothing boundaries of adjacent area features. (<i>Cartography and Reports, Geometries, Integrations categories</i>)  The image shows three maps illustrating the Curvefitter process. The first map, labeled 'Parcel Data', shows a complex set of yellow lines representing parcel boundaries. The second map, labeled 'Before Curvefitter', shows the same boundaries but with some segments highlighted in red, indicating areas where smoothing is needed. The third map, labeled 'After Curvefitter', shows the final result where the red segments have been replaced with smooth, curved lines, resulting in a more realistic and aesthetically pleasing representation of the parcel boundaries.
D	
DatabaseDeleter	Delete rows in a database table based on the condition specified. (<i>Format Specific, Integrations, Workflows categories</i>)
DatabaseJoiner	Joins attributes from an external table to incoming features as they are being processed through a translation. (<i>Attributes, Filters and Joins categories</i>)  The diagram illustrates the DatabaseJoiner tool. On the left, a table with columns 'Name' and 'Office' contains data for Mary (Office 1), Phil (Office 2), Jeff (Office 2), and Ella (Office 1). An arrow points from this table to a central blue box labeled 'DatabaseJoiner'. Below the box, a database cylinder icon represents a table with columns 'OfficeID' and 'Location', containing data for Office 1 (Vancouver) and Office 2 (Toronto). An arrow points from the database to the 'DatabaseJoiner' box. Finally, an arrow points from the 'DatabaseJoiner' box to a resulting table on the right. This table has columns 'Name', 'Office', and 'Location', and contains the joined data: Mary (Office 1, Vancouver), Phil (Office 2, Toronto), Jeff (Office 2, Toronto), and Ella (Office 1, Vancouver).

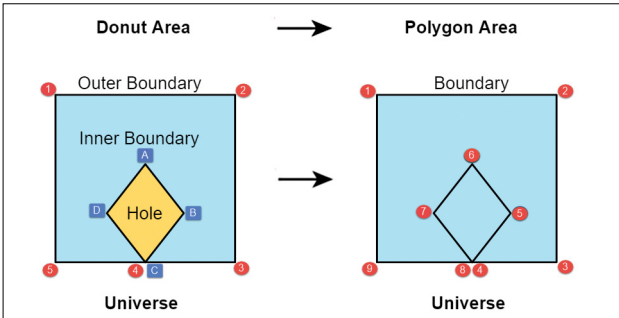
DatabaseUpdater	Update fields in a database table based on the condition specified. (<i>Format Specific, Integrations, Workflows categories</i>)
DateTimeCalculator	Performs arithmetic on date, time, datetime, and interval values. (<i>Calculated Values category</i>)
DateTimeConverter	Converts a set of input date/time attributes from one format to another, in place. (<i>Calculated Values, Strings categories</i>)
DateTimeStamper	Adds a timestamp to a feature as a new attribute in the form of a date, time (with or without UTC offset), or datetime (with or without UTC offset), in local or UTC time. (<i>Calculated Values category</i>)
Deaggregator	Decomposes an aggregate feature into its components. (<i>Attributes, Filters and Joins categories</i>)
	
Decelerator	Slows down the flow of features through the workspace. (<i>Web, Workflows categories</i>)
DecimalDegreesCalculator	Calculates a decimal degree value from separate degrees, minutes, and seconds (DMS) values, stored in attributes. (<i>Calculated Values, Coordinates categories</i>)
DEMDistanceCalculator	Calculates the distance between a number of input vector lines and the elevation values of a reference DEM raster. Outputs a new DEM raster per input line. The data contained in the resulting DEM consists of the 3D distance between the line being considered and the corresponding point on the reference DEM. (3D, <i>Calculated Values, Rasters, Spatial Analysis categories</i>)
DEMGenerator	Constructs a Delaunay triangulation based on input points and breaklines. That triangulation is then uniformly sampled to produce a digital elevation model (DEM points). (3D, <i>Point Clouds categories</i>)
Densifier	Adds vertices to each feature by interpolating new coordinates at fixed intervals. (<i>Geometries category</i>)
	
DensityCalculator	Determines the density of a group of Candidate features based on the area of a corresponding Area feature. (<i>Calculated Values category</i>)
DGNStyler	Prepares features for output to Bentley® Microstation® Design V7/V8 by providing a convenient interface to set a variety of format-specific attributes. (<i>Cartography and Reports, Format Specific categories</i>)
DimensionExtractor	Returns the dimension of the feature as a new attribute. (3D, <i>Calculated Values, Coordinates, Data Quality, Strings categories</i>)
DirectTweeter	Sends a Twitter™ direct message from FME. (<i>Integrations, Web categories</i>)

Displacer	Solves proximity conflicts between features using a variant of the Nickerson displacement algorithm. (<i>Cartography and Reports, Geometries, Spatial Analysis categories</i>)
Dissolver	Dissolves area features by removing common boundaries to create larger areas. Input attributes may be accumulated. (<i>Geometries, Spatial Analysis categories</i>) 
DMSCalculator	Calculates degrees, minutes, and seconds (DMS) from a decimal degrees value stored in an attribute. (<i>Calculated Values, Coordinates categories</i>)
DonutBridgeBuilder	Builds connections between donut holes with the outer boundary of a donut, resulting in a polygon-equivalent representation of the input donut. (<i>Geometries, Spatial Analysis categories</i>)
DonutBuilder	Cuts holes in polygonal features by making polygons completely enclosed in other polygons into holes of the containing polygon. (<i>Geometries category</i>) 
DonutHoleExtractor	Splits an area feature that has holes into its component rings. (<i>Geometries category</i>) 
DropboxConnector	Accesses the Dropbox file storage service to upload, download, or delete files and folders or list the contents of a folder from a Dropbox account. (<i>Integrations, Web, Workflows categories</i>)
DuplicateFilter	Detects duplicate features based on the value of one or more key attributes. (<i>Data Quality, Filters and Joins categories</i>)

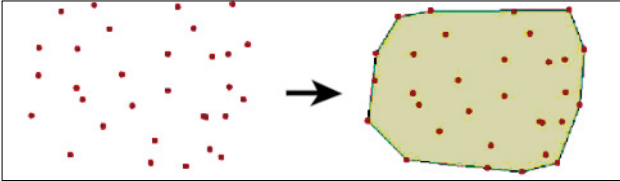
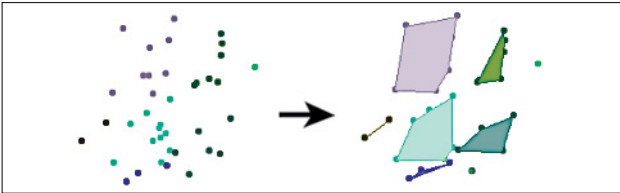
DWGStyler	Prepares features for output to AutoCAD® DWG™/DXF™ by providing a convenient interface to set a variety of AutoCAD DWG/DXF format-specific attributes. (<i>Cartography and Reports, Format Specific categories</i>)
E	
ElevationExtractor	Extracts the elevation of the first coordinate and assigns it to the named attribute. (<i>3D, Calculated Values, Coordinates, Data Quality, Strings categories</i>)
EllipsePropertyExtractor	Sets the given attributes to the properties of an ellipse geometry. (<i>Calculated Values category</i>)
EllipsePropertySetter	Sets the properties of an ellipse geometry. (<i>Geometries category</i>)
Emailer 📧	Sends one email per input feature via Simple Mail Transfer Protocol (SMTP). Both HTML and Plain Text emails may be sent, each with one or more attachments. (<i>Integrations, Web categories</i>)
EnvironmentVariableFetcher	Fetches the specified environment variable and includes it in a new attribute. (<i>Workflows category</i>)
EsriReprojector	Reprojects feature coordinates from one coordinate system to another using the Esri reprojection library. (<i>Coordinates, Format Specific, Integrations categories</i>)
EthereumConnector 📡	Interacts with the Ethereum blockchain network. The functions include reading transaction, address, or block information, sending transactions, or interaction with deployed contracts. (<i>Integrations, Web, Workflows categories</i>)
ExcelStyler	Sets common Excel style attributes for a group of features destined for the Excel Writer. (<i>Cartography and Reports, Format Specific categories</i>)
ExpressionEvaluator	Performs a mathematical calculation on an expression that consists of FME Feature Functions, String Functions, Math Functions, and Math Operators. (<i>Calculated Values, Strings categories</i>)
Extruder	Creates line, surface or solid geometries with a fixed cross-sectional profile taken from the original geometry of the feature. (<i>3D category</i>)
	
F	
FaceReplacer	Replaces the geometry of a feature from donut, raster or polygon to face. (<i>3D, Geometries categories</i>)
FeatureColorSetter	Assigns colors to incoming features. (<i>Cartography and Reports category</i>)
FeatureHolder	Stores incoming features until they have all arrived and then releases them in their original order. (<i>Workflows category</i>)
FeatureJoiner	Joins features by combining the attributes/geometry of features based on common attribute values, like a SQL join operation. (<i>Filters and Joins category</i>)

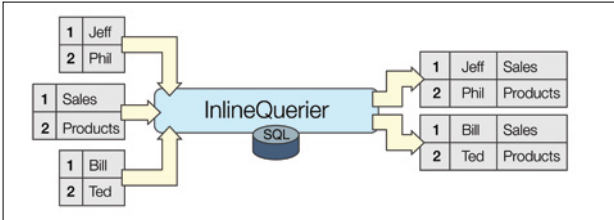
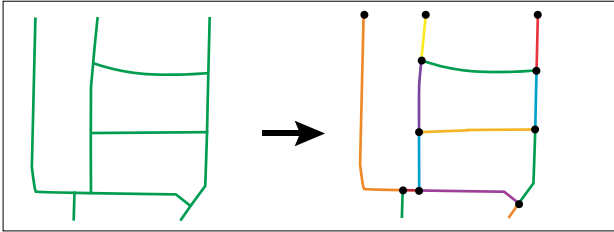
FeatureMerger	Copies and merges the attributes/geometry from one feature (or multiple features) onto another feature (or multiple features). (<i>Filters and Joins category</i>) 
FeatureReader	Reads features from any FME-supported format. (<i>Filters and Joins, Format Specific, Spatial Analysis, Workflows categories</i>) 
FeatureTypeExtractor	Adds an attribute containing the original feature type of a feature. (<i>Workflows category</i>)
FeatureTypeFilter	Routes input features to different output ports based on their original feature type. (<i>Data Quality, Filters and Joins categories</i>)
FeatureWriter	Writes features to any FME-supported Writer. (<i>Format Specific, Workflows categories</i>)
FilenamePartExtractor	Extracts specified parts of a filename path and returns the results as string attributes. (<i>Strings category</i>)
FMEFunctionCaller	Calls the specified FME function, optionally putting the resulting value in the Result Attribute. (<i>Workflows category</i>)
FMEServerJobSubmitter	Submits FME jobs to be run on an FME Server. A job consists of a workspace (housed within a repository on an FME Server) together with values for each of its published parameters. (<i>Integrations, Web, Workflows categories</i>)
FMEServerJobWaiter	Waits until submitted FME jobs are completely processed by an FME Server. The list of jobs to wait for is identified by the job IDs of the input features. When a job that the transformer is waiting for is completed, it outputs the corresponding feature immediately. (<i>Integrations, Web, Workflows categories</i>)
FMEServerLogFileRetriever	Accesses the translation log for a specified FME Server-run translation. The translation log to access is identified by the job ID input parameter. (<i>Integrations, Web, Workflows categories</i>)
FMEServerNotifier	Sends a notification to a specified FME Server. The notification may be used for a variety of actions, such as triggering a downstream workspace, or sending an email message to subscribed clients. (<i>Integrations, Web, Workflows categories</i>)

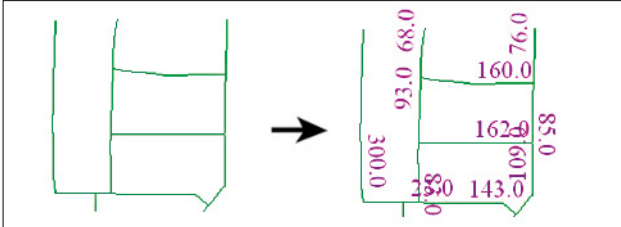
	FMEServerResourceConnector	Accesses the FME Server file storage service to upload, download, or delete files and folders or list information about files/folders from a FME Server account. (<i>Integrations, Web, Workflows categories</i>)
	FTPCaller	Uploads and downloads data from an FTP server. (<i>Integrations, Web, Workflows categories</i>)
	G	
	Generalizer	Transforms or measures geometry features based on a specified algorithm. There are four algorithm types: - Generalizing algorithms reduce the density of coordinates by removing vertices. - Smoothing algorithms determine a new location for each vertex. - Measuring algorithms calculate the location of points and return a list of these points (for example, to measure the sinuosity of a feature). - Fitting algorithms replace the original geometry completely, with a new feature fitted to a specified line (for example, to minimize the orthogonal distance to the original). (<i>Cartography and Reports, Geometries, Web categories</i>)
NEW	Geocoder	Uses various external web services to convert addresses to latitude/longitude coordinates, or to find the closest addresses to latitude/longitude coordinates (reverse geocode). Some services have additional information available, such as time zone or elevation. (<i>Integrations, Web categories</i>)
	GeometryColorSetter	Sets colors, via appearances, on geometries (such as surfaces) that support appearances, and match a Geometry XQuery. (<i>Cartography and Reports category</i>)
		 Random Randomize by Trait
NEW	GeometryCoercer	Resets the geometry type of the feature. (<i>Geometries, Point Clouds categories</i>)
	GeometryExtractor	Extracts the geometry of a feature according to the setting of the geometry encoding parameter. The resulting encoded geometry is added to the feature in an attribute. This attribute can later be restored as the feature's geometry using the GeometryReplacer transformer. (<i>Calculated Values, Format Specific, Geometries, Workflows categories</i>)
		 <pre> <?xml version="1.0"?> <geometry> <polygon> <line> <coord x="3128835.08" y="10085908.66" /> <coord x="3128900.58" y="10085874" /> <coord x="3128963.41" y="10085992.41" /> <coord x="3128896.66" y="10086028.33" /> <coord x="3128835.08" y="10085908.66" /> </line> </polygon> </geometry> </pre>

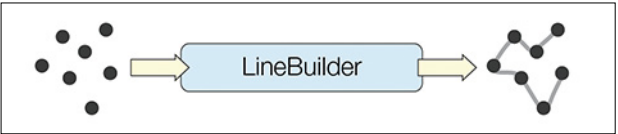
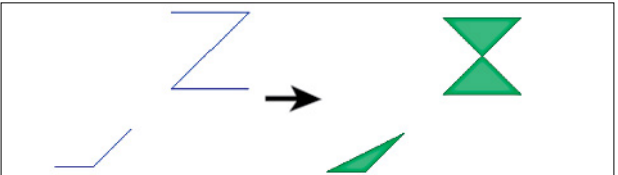
GeometryFilter	Routes a feature based on its geometry type. (<i>Data Quality, Filters and Joins categories</i>)
GeometryInstantiator	Replaces a geometry definition with independent geometry instances that are copies of the original geometry definition. The affine transformation that defined the position of each instance in the geometry definition, including position, scale, and rotation, is applied to each instance. (<i>3D category</i>)
GeometryPartExtractor	Extracts or removes selected geometry parts based on a Geometry XQuery. (<i>3D category</i>)
GeometryPropertyExtractor	Extracts selected geometry names or traits to feature attributes. (<i>3D category</i>)
GeometryPropertyRemover	Removes selected geometry names or traits. (<i>3D category</i>)
GeometryPropertyRenamer	Renames geometry names or traits. (<i>3D category</i>)
GeometryPropertySetter	Sets selected geometry names or traits from feature attributes or constants. (<i>3D category</i>)
GeometryRefiner	Performs the following refinements on the feature's geometry: - Any homogeneous IFMEAggregate becomes a multi (IFMEMultiCurve, IFMEMultiArea, IFMEMultiPoint, or IFMEMultiText). - Any IFMEAggregate or multi with only one member is replaced by its single part. - Any IFMEDonut with no holes becomes an IFMEPolygon or IFMEEllipse. - Any IFMEPath with only one segment is replaced by that segment. - Consecutive IFMELine segments within an IFMEPath are combined (<i>Geometries category</i>)
GeometryRemover	Completely removes the geometry of the feature, for example, if you want to turn spatial data into non-spatial data. (<i>Geometries category</i>)
GeometryReplacer	Replaces the feature's geometry according to the setting of the geometry encoding parameter. This transformer is typically used to restore geometry previously extracted into an attribute by the GeometryExtractor. (<i>Format Specific, Geometries, Workflows categories</i>)
GeometryValidator	Detects selected issues in input features, and optionally repairs detected issues. Each input feature is processed individually. (<i>Data Quality category</i>) 
GeoRSSFeatureComposer	Constructs GeoRSS documents from the input features and stores them in the specified attribute for the features that are output by the GeoRSS port. (<i>Format Specific, Web categories</i>)

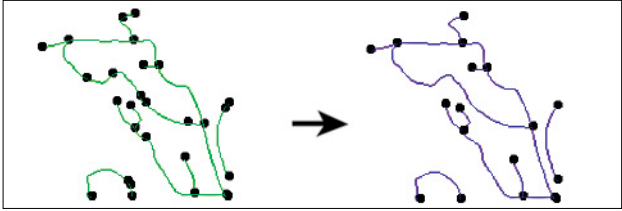
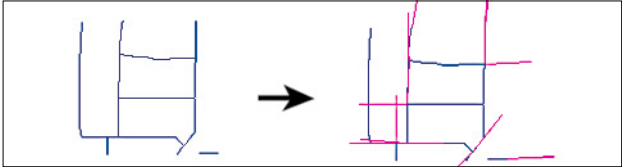
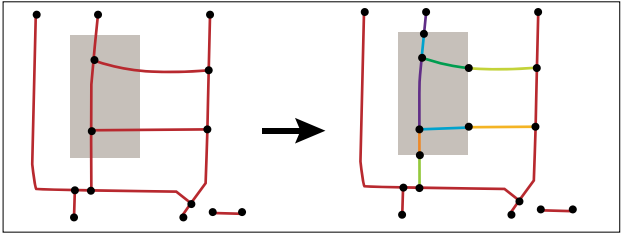
	GeoRSSFeatureReader	Constructs features out of GeoRSS documents/URLs that are stored in a specified attribute of the input features. The features from the GeoRSS document/URL are output with the attributes from the original feature and are merged, if desired. <i>(Format Specific, Web categories)</i>
	GMLFeatureComposer	Writes out GML features corresponding to feature types from existing GML application schema. <i>(Format Specific category)</i>
	GOIDGenerator	Calculates a GOID (Geographic Object Identifier) for each incoming feature, and adds it as a new attribute. The GOID is a unique 128-bit number that incorporates the position of a feature with other numbers. The result is a unique value that may be used to distinguish features from each other. <i>(Calculated Values category)</i>
	GoogleBigQueryConnector ⬇	Accesses the Google BigQuery service to load or query tables from a Google Cloud account. <i>(Web category)</i>
	GoogleCloudPub SubConnector ⬇	Connects to the Google Cloud Pub/Sub service. Supports creation of topics and subscriptions and sending or receiving messages. <i>(Web category)</i>
NEW	GoogleCloudStorage Connector ⬇	Accesses the Google Cloud Storage file storage service to upload, download, or delete files and folders or list file/folder information from a Google Cloud Storage account. <i>(Integrations, Web, Workflows categories)</i>
	GoogleDriveConnector	Accesses the Google Drive file storage service to upload, download, or delete files and folders or list the contents of a folder from a Google Drive account. <i>(Integrations, Web, Workflows categories)</i>
NEW	GoogleIoTConnector ⬇	Connects to the Google IoT Core. Supports sending (producing) and receiving (consuming) messages. <i>(Web category)</i>
	GoogleLanguageConnector ⬇	Accesses the Google Natural Language and Google Cloud Translation API for text analysis, such as language and sentiment detection. <i>(Web category)</i>
	GoogleVisionConnector ⬇	Accesses the Google Vision AI API for image recognition. <i>(Rasters, Web categories)</i>
	GridInQuestIIReprojector	Reprojects feature coordinates from one coordinate system to another using the Grid InQuestII reprojection library. <i>(Coordinates, Integrations categories)</i>
	GridInQuestReprojector	Reprojects feature coordinates from one coordinate system to another using the Grid InQuest reprojection library. <i>(Coordinates, Integrations categories)</i>
	GtransAttributeReprojector	Reprojects attributes holding coordinate values from one coordinate system to another using the Gtrans reprojection library (from the National Land Survey of Sweden), and the specified translation file. <i>(Coordinates, Integrations categories)</i>
	GtransReprojector	Reprojects features from one coordinate system to another using the Gtrans reprojection library (from the National Land Survey of Sweden) and the specified translation file. <i>(Coordinates, Integrations categories)</i>
H		
NEW	H3HexagonalIndexer	Computes and manipulates numeric indexes from the hexagonal hierarchical global spatial index grid known as Uber H3. Allows spatial data to be grouped into hexagon grid cells for analysis and visualization. <i>(Calculated Values, Geometries categories)</i>
	HDFSConnector	Accesses a HDFS (Hadoop Distributed File System) to upload, download, or delete files and folders or list the contents of a folder from a HDFS service. <i>(Integrations, Web, Workflows categories)</i>
	HoleCounter	Adds a new attribute whose value is the number of holes in the feature. <i>(Calculated Values, Data Quality categories)</i>

HTMLExtractor	Extracts structured data from web page or other HTML sources that are formatted for human readability (screen scraping), using CSS selectors to extract portions of HTML content into feature attributes. (Integrations, Strings, Web, Workflows categories)
HTMLayouter	Allows users to combine web reports generated by the HTMLReportGenerator into a bootstrap grid or vertical layout. (Cartography and Reports, Format Specific, Web categories)
HTMLReportGenerator	Allows users to create a basic web report of vertically-stacked elements using the geometry and selected attributes from features. (Cartography and Reports, Format Specific, Web categories)
HTMLToXHTMLConverter	Converts HTML document into valid XHTML document. (Format Specific, Strings, Web categories)
HTTPCaller	Accesses a URL via HTTP or HTTPS, performing a GET, PUT, POST, DELETE, HEAD, PATCH or OPTIONS operation. (Web, Workflows categories)
HullAccumulator	Creates convex or concave hulls for groups of features. One hull feature is output for each unique combination of values of the attributes specified in the Group By parameter. (Spatial Analysis category) 
HullReplacer	Replaces the geometry of the feature with a polygon representing its hull. (Geometries category) 
I	
NEW IBMIoTConnector 	Connects to IBM's Watson IoT Platform through the MQTT protocol. Supports sending (producing) and receiving (consuming) messages. (Web category)
IFCPropertySetDefinition Creator	Creates a feature whose attributes contain the definition of an IFC property set. The features output from this transformer are similar to the PropertySetDefinition features produced by the IFC reader. (3D, Format Specific categories)
IFCQuantitySetDefinition Creator	Creates a feature whose attributes contain the definition of an IFC quantity set. The features output from this transformer are similar to the QuantitySetDefinition features produced by the IFC reader. (3D, Format Specific categories)

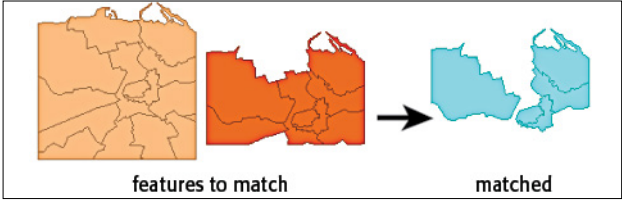
ImageFetcher	Fetches an image by performing an HTTP GET operation on the specified URL, and then returning the resulting data as the geometry of a raster feature. (<i>Rasters, Workflows categories</i>)
ImageRasterizer	Draws input point, line, and polygon features onto a color raster filled with the background color. (<i>Cartography and Reports, Rasters categories</i>)
InlineQuerier	Executes SQL queries against a temporary database consisting of tables created from incoming features, returning the results as new features. (<i>Workflows category</i>) 
Inspector	Sends features to the FME Data Inspector for display. (<i>Data Quality, Workflows categories</i>)
Intersector	Computes intersections between all input features, and breaks lines and polygons wherever an intersection occurs. (<i>Geometries, Spatial Analysis categories</i>) 
J	
JMSReceiver	Using the Java Message System (JMS), receives messages from a message broker. (<i>Integrations, Web categories</i>)
JMSSender	Using the Java Message System (JMS), sends messages to a message broker. (<i>Integrations, Web categories</i>)
JSONExtractor	Extracts portions of JSON (JavaScript Object Notation) formatted text into feature attributes. (<i>Format Specific, Web categories</i>)
JSONFlattener	Flattens JSON objects, extracting the object keys and values into FME feature attributes. (<i>Format Specific, Web categories</i>)
JSONFormatter	Provides options for formatting JSON text. (<i>Format Specific, Web categories</i>)
JSONFragmenter	Extracts portions of JSON formatted text into new FME features. (<i>Format Specific, Web categories</i>)
JSONTemplater	Populates a JSON document with FME feature attribute values. (<i>Format Specific, Web categories</i>)

JSONUpdater	This transformer creates, modifies, replaces or deletes object and array values in a JSON document. <i>(Format Specific, Web categories)</i>
JSONValidator	Validates the syntax of JSON text. <i>(Data Quality, Format Specific, Web categories)</i>
K	
KafkaConnector 📡	Connects to an Apache Kafka cluster. Supports sending (producing) and receiving (consuming) messages. <i>(Web category)</i>
KinesisReceiver	Using the Amazon Kinesis service, receives data records from an Amazon Kinesis stream. <i>(Integrations category)</i>
KinesisSender	Using the Amazon Kinesis service, sends data records to an Amazon Kinesis stream. <i>(Integrations category)</i>
KMLPropertySetter	Sets common properties for groups of vector and raster features destined for the OGCKML Writer. <i>(Cartography and Reports, Format Specific categories)</i>
KMLRegionSetter	Sets the region-related KML attributes for a group of features destined for the OGCKML Writer. <i>(Cartography and Reports, Format Specific categories)</i>
KMLStyler	Creates a common style for a group of features destined for the OGCKML writer. <i>(Cartography and Reports, Format Specific categories)</i>
KMLTimeSetter	Sets the time-related KML attributes for a group of features destined for the OGCKML Writer. <i>(Cartography and Reports, Format Specific categories)</i>
KMLTourBuilder	Generates a KML Tour from the input features. The tour consists of tour stops that correspond to each input feature. <i>(Cartography and Reports, Format Specific categories)</i>
KMLViewSetter	Sets the view-related KML attributes for a group of features that are destined for the OGCKML Writer. Creation of LookAt or Camera views are supported. <i>(Cartography and Reports, Format Specific categories)</i>
L	
Labeller	Interpolates labels along a linear or polygonal feature. <i>(Cartography and Reports category)</i> 

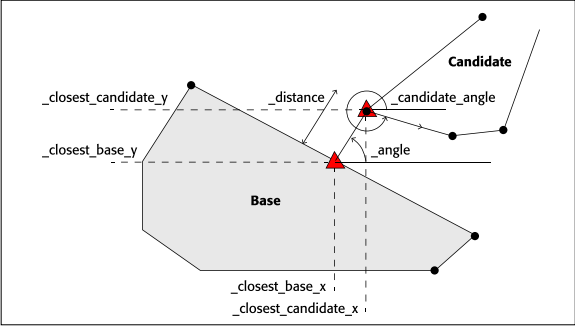
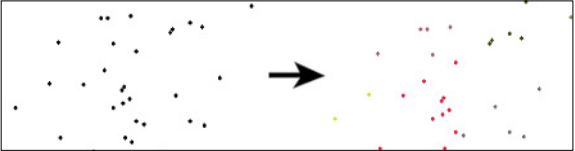
LabelPointReplacer	Replaces the geometry of the feature with a label point. The insertion point of the text is guaranteed to be inside (in case of polygons) or on (lines and points) the original object. Note that since the text itself may be larger than an input area feature, the bounds of the label may exceed the bounds of the area. (<i>Cartography and Reports, Geometries categories</i>) 
LatLongToMGRSConverter	Calculates a Military Grid Reference System (MGRS) code based on the latitude and longitude values supplied in a feature's attributes. (<i>Coordinates category</i>)
LeftRightSpatialCalculator	Computes relative position of CANDIDATE input features relative to BASE input features. The geometry of a BASE feature is restricted to lines. (<i>Calculated Values category</i>)
LengthCalculator	Calculates the length of a feature and adds it as a new attribute. (<i>Calculated Values category</i>)
LengthToPointCalculator	Calculates the length of a feature from its start until the closest spot to a point and adds it as a new attribute. The point coordinates are taken from attributes in the original feature. (<i>Calculated Values category</i>)
LicenseChecker	Checks whether the license file is valid and the specified product name is licensed, based on a vendor key and vendor registration code. (<i>Workflows category</i>)
LineBuilder	Connects input point features in the order they enter, forming linear or polygonal features. (<i>Geometries category</i>) 
LineCloser	Turns input linear features into areas by adding their start point as the end point. (<i>Geometries category</i>) 

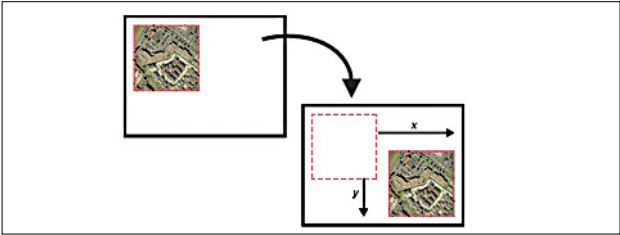
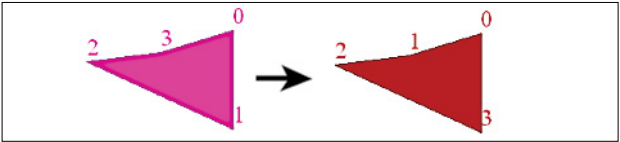
LineCombiner	Takes lines and connects them to form longer lines. Each connecting line must meet at the exact same start/end point, but otherwise they must not intersect. (<i>Geometries category</i>) 
LineExtender	Creates two-point extensions to linear features that extend the feature by a user-specified length. This transformer can also output the original feature with the first and last segments stretched by a user-specified amount. (<i>Geometries category</i>) 
LineOnAreaOverlayer	Performs a line-on-area overlay. Each input line is split at any area boundaries it intersects. (<i>Filters and Joins category</i>) 
LineOnLineOverlayer	Performs a line-on-line overlay in which all input lines are intersected against each other and resultant line features are created and output. (<i>Filters and Joins category</i>)
ListBasedFeatureMerger	Copies and merges the attributes/geometry from one feature (or multiple features) onto another feature (or multiple features). (<i>Filters and Joins category</i>)
ListBuilder	Combines attributes of the input features into a single list structure. (<i>Attributes category</i>)
ListConcatenator	Concatenates all values of a list into a single attribute. (<i>Attributes category</i>)
ListCopier	Copies a complete attribute list, including all nested attributes, from one list name to another. (<i>Attributes category</i>)
ListDuplicateRemover	Removes all duplicate values from a list attribute. In the resulting list, only distinct values for the list attribute will be present. (<i>Data Quality, Strings categories</i>)

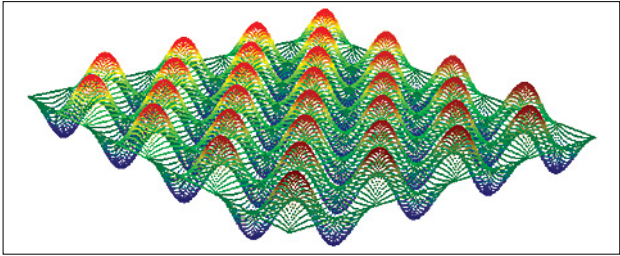
ListElementCounter	Stores the number of member elements found in the specified list into an attribute. <i>(Data Quality category)</i>
ListExploder	Explodes each list member on each input feature out into its own feature. <i>(Attributes category)</i>
ListExpressionPopulator	Populates a new list from a series of attributes, specified using a regular expression. <i>(Attributes category)</i>
ListHistogrammer	Computes a histogram of the values found in a list and returns these in a new list attribute on the feature. <i>(Calculated Values, Data Quality categories)</i>
ListIndexer	Copies the attributes of the list element specified by the index to become main attributes of the feature. <i>(Attributes category)</i>
ListPopulator	Populates a new list from a series of attributes. The attributes to be used are specified by the prefix parameter. <i>(Attributes category)</i> Example: <i>myattrib0</i> <i>myattrib1</i> <i>myattrib2</i> becomes a list <i>myattrib[]</i> containing entries <i>myattrib{0}, myattrib{1}, myattrib{2}</i>
ListRangeExtractor	Extracts the minimum and maximum values found in a list. <i>(Calculated Values category)</i>
ListRenamer	Renames or promotes list names or components. <i>(Attributes category)</i>
ListSearcher	Searches a list to find a value and returns the index of the value in the list. <i>(Strings category)</i>
ListSorter	Sorts the elements of the given list into a new list. <i>(Attributes category)</i>
ListSummer	Computes the sum of all elements of a list. <i>(Strings category)</i>
LocalCoordinateSystemSetter	Tags all features with the local coordinate system defined by the specified parameters. It does not reproject features, or otherwise modify their geometry. <i>(Coordinates category)</i>
Logger	Logs each feature to the translation log. All attributes and geometry of the feature will be output. <i>(Workflows category)</i>
LogMessageStreamer	Captures messages from the FME logfile and/or the Logger transformer. The messages are loaded onto features created by the transformer. Limitations: Messages outside the lifetime of the transformer cannot be captured. <i>(Workflows category)</i>
M	
MapboxStyler	Creates a common style for a group of features destined for the GeoJSON writer. <i>(Cartography and Reports, Format Specific categories)</i>
MapInfoStyler	Prepares features for output to Mapinfo™ MIF/MID or MapInfo TAB by providing a convenient interface to set a variety of format-specific attributes. <i>(Cartography and Reports, Format Specific categories)</i>

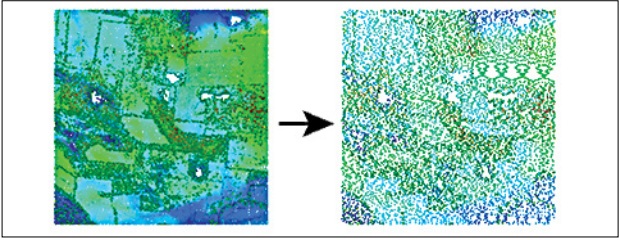
MapnikRasterizer	Draws input point, line, polygon, and raster features onto a raster using the Mapnik toolkit. (<i>Cartography and Reports, Rasters categories</i>)
MapTextLabeler 📌	Creates text labels for features using the MapText Label Manager. (<i>Cartography and Reports, Format Specific categories</i>)
MapTextStyler	Prepares features for labelling by the MapTextLabeler by specifying no-label zones around features. (<i>Cartography and Reports, Format Specific categories</i>)
Matcher	Detects features that are matches of each other. Features are declared to match when they have matching geometry, matching attribute values, or both. (<i>Data Quality category</i>)  features to match matched
MeasureExtractor	Extracts the measures of geometries that match the given type, and places them in attributes or list attributes. (<i>Calculated Values category</i>)
MeasureGenerator	Creates a set of measures attached to the geometry of the feature, where each value is the distance from the start of the line to that vertex, multiplied by the given Multiplier. (<i>Calculated Values category</i>)
MeasureRemover	Removes measures from a feature's geometry. (<i>Geometries category</i>)
MeasureSetter	Sets measure(s) on a point, line, arc, area geometry or a vertex of a linear geometry to attribute value(s) of given attribute(s) or list attribute. (<i>Geometries category</i>)
MeshMerger	Merges mesh features (features with IFMEMesh geometries) into a single output mesh. (<i>3D, Geometries categories</i>)
MeshSimplifier	Simplifies mesh features (features with IFMEMesh geometries) to a reduced level of detail. The amount of simplification can be specified as a ratio or as a limit on the number of vertices. (<i>3D, Geometries categories</i>)
MGRSToLatLongConverter	Converts Military Grid Reference System (MGRS) code to longitude and latitude coordinates. (<i>Coordinates category</i>)
MinimumAreaForcer	Ensures that features with polygon geometry have an area that is equal to, or in excess of, the specified minimum area. (<i>Geometries category</i>)
MinimumSpanningCircle Replacer	Replaces the geometry of the feature with a polygon representing its minimum spanning circle. The minimum spanning circle is defined as the smallest circle that encloses all vertices of the passed-in feature. (<i>Geometries category</i>)
ModuloCounter	Adds an attribute holding the next integer in a sequence, restarting the count at 0 whenever the sequence reaches the specified maximum value. (<i>Calculated Values category</i>)
MQTTConnector 📡	Connects to an MQTT broker. Supports sending (producing) and receiving (consuming) messages. (<i>Web category</i>)

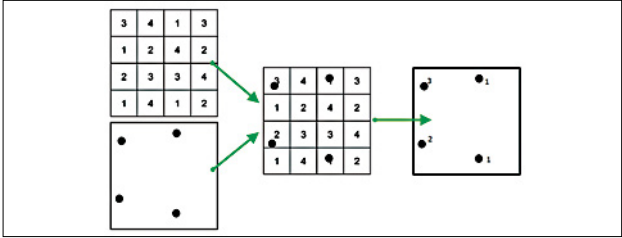
MRF2DCleaner 	Fixes geometric problems in input data, such as line overshoots and undershoots within the user-specified tolerance. It is useful for multi-layer and multi-tolerance two-dimensional data cleaning. <i>(Data Quality, Integrations categories)</i>
MRF2DConflator 	Changes the geometry of a feature to match that of another, if the two have approximately the same shape and location, and have matching endpoints. <i>(Data Quality, Integrations categories)</i>
MRF2DDangleRemover 	Removes features that have at least one free endpoint and have lengths smaller than (Dangle Factor * Cleaning Tolerance) or (Dangle Factor * value of Feature Tolerance Attribute). <i>(Data Quality, Integrations categories)</i>
MRF2DDuplicateRemover 	Deletes duplicated features. Features are considered to be duplicates if their geometries are within tolerance and only features with a smaller tolerance will remain after cleaning. <i>(Data Quality, Integrations categories)</i>
MRF2DExtender 	Extends arcs and lines that are within the specified tolerance to correct undershoots while maintaining line-work direction. <i>(Data Quality, Integrations categories)</i>
MRF2DGeneralizer 	Removes a number of vertices from lines. The number of vertices removed is controlled by a weeding tolerance. <i>(Data Quality, Integrations categories)</i>
MRF2DIntersector 	Computes intersections between all input features, breaking arcs and lines wherever an intersection occurs. <i>(Data Quality, Integrations categories)</i>
MRF2DJoiner 	Joins connected features to form longer ones. A pair of linear features become candidates for joining only when the two are connected at a given node or end point. <i>(Data Quality, Integrations categories)</i>
MRF2DShortGeometry Remover 	Removes features that have lengths smaller than the specified tolerance, if Short Geometry Action is set to Remove. <i>(Data Quality, Integrations categories)</i>
MRF3DCleaner 	Fixes geometric problems in input data such as line overshoots and undershoots within the user-specified tolerance. It is useful for multi-layer and multi-tolerance three-dimensional data cleaning. <i>(3D, Data Quality, Integrations categories)</i>
MSWordStyler	Prepares features for output to Microsoft Word Writer by providing a convenient interface to set a variety of MSWord format-specific attributes. <i>(Cartography and Reports category)</i>
MultipleGeometryFilter	Filters aggregate features based on the type of aggregate. <i>(Filters and Joins category)</i>
MultipleGeometrySetter	Provides the ability to set up an aggregate where each part is independent from the others and is its own complete geometry. <i>(Geometries category)</i>

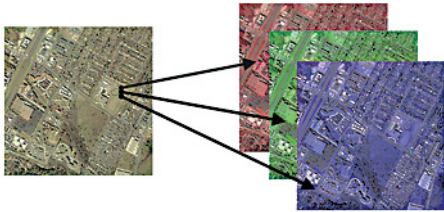
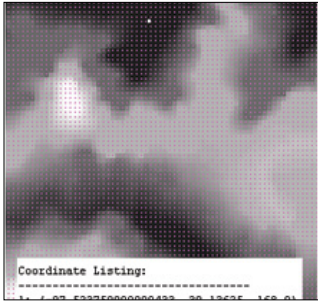
N	
NeighborFinder	Finds the closest Candidate feature within a specified maximum distance of each Base feature. <i>(Spatial Analysis category)</i> 
NeighborhoodAggregator	Creates aggregates of features based on their proximity to each other. <i>(Filters and Joins, Spatial Analysis categories)</i> 
NeighborPairFinder	Finds the closest two Candidate features within some maximum distance of each Base feature and some minimum separation in heading between the Candidates and the Base. <i>(Spatial Analysis category)</i>
NetworkCostCalculator	Computes and assigns the cost of the shortest path from a source object to each connected object as the Z-values or measure values of the input features. <i>(Calculated Values, Spatial Analysis categories)</i>
NetworkFlowOrientor	Fixes the flow (direction) of each edge or linear feature in the network to fit the downstream direction to the destination node. <i>(Spatial Analysis category)</i>
NetworkTopologyCalculator	Finds the connected lines that belong to the same network graph. <i>(Calculated Values, Spatial Analysis categories)</i>
NLPClassifier 📄	Classifies natural language text into different categories using a trained model. <i>(Filters and Joins, Strings categories)</i>
NLPTrainer 📄	Trains a natural language processing (NLP) classification model based on the user's specifications and the provided data. <i>(Filters and Joins, Strings categories)</i>
NullAttributeMapper	Maps specified attributes on a feature to specified values. This transformer is capable of mapping to and from null values, empty strings, and missing attributes. <i>(Attributes, Data Quality, Strings categories)</i>
NumericRasterizer	Draws input point, line, and polygon features onto a numeric raster filled with the background value. The z coordinates of the input vector features are used to generate pixel values. <i>(Cartography and Reports, Rasters categories)</i>

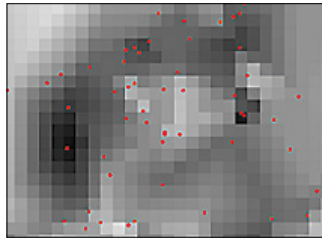
O	
OffsetCurveGenerator	Offsets the segments of linear features, and if necessary, connects them using stroked arcs. (<i>Geometries category</i>)
Offsetter	Adds offsets to the feature's coordinates so that the feature shifts by the specified amount. (<i>3D, Spatial Analysis categories</i>) 
OneDriveConnector	Accesses the Microsoft OneDrive file storage service to upload, download, or delete files and folders or list the contents of a folder from a Microsoft OneDrive account. (<i>Integrations, Web, Workflows categories</i>)
OrientationExtractor	Returns a feature's orientation. This will have different possible return value, based on the input geometry type. (<i>Calculated Values category</i>)
Orienter	Adjusts the orientation of a polygonal feature or the direction of a linear feature. (<i>Geometries category</i>) 
P	
ParameterFetcher	Adds an attribute to the feature and supplies it with the value of a previously published parameter. (<i>Web, Workflows categories</i>)
PartCounter	Returns the number of parts in the geometry. For multis and aggregates, this is the number of parts, and for paths, this is the number of segments. (<i>Calculated Values, Data Quality categories</i>)
PathBuilder	Connects input linear features (arcs and lines) in the order they enter, forming path features. (<i>Geometries category</i>)
PathSplitter	Decomposes a path feature into its component segments. Each output feature contains a copy of the source feature's attributes. (<i>Geometries category</i>)
PDFPageFormatter	Prepares features for output to PDF by providing a convenient interface to set the scale and location of features on a page. (<i>Cartography and Reports, Format Specific categories</i>)
PDFStyler	Sets the common Adobe® PDF style attributes for a group of features destined for the GeoSpatial PDF Writer. (<i>Cartography and Reports, Format Specific categories</i>)
NEW PipeReplacer	Replaces the geometry of the feature with a three-dimensional pipe created by sweeping a stroked disk along the input curve. (<i>3D, Geometries categories</i>)

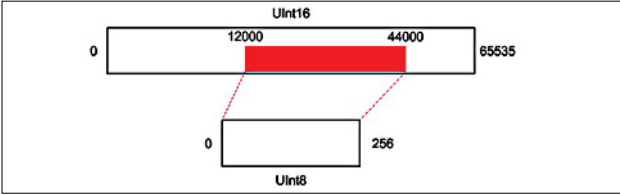
PlanarityFilter	Filters features based on their planarity. To be planar, a geometry must have all of its points situated in the same plane. (3D, Data Quality, Filters and Joins categories)
Player	Retrieves features stored in an FME Feature Store file and outputs them into the workspace. (Workflows category)
PointCloudCoercer	Coerces point cloud geometries into points or multipoints. This transformer can be used to write a point cloud to a format that does not support point clouds. (Point Clouds category)
PointCloudCombiner	Combines multiple geometries into a single point cloud. (Point Clouds category)
PointCloudComponent Adder	Adds new components with constant values to a point cloud. (Point Clouds category)
PointCloudComponent Copier	Copies an existing component to a new component with the specified name. The existing component remains and a new component is created that has a different name, but the same values. (Point Clouds category)
PointCloudComponent Keeper	Removes all components from a point cloud, except for the specified ones. (Point Clouds category)
PointCloudComponent Remover	Removes specified components from a point cloud. (Point Clouds category)
PointCloudComponent Renamer	Renames an existing component. (Point Clouds category)
PointCloudComponent TypeCoercer	Converts the type of point cloud components. (Point Clouds category)
PointCloudConsumer	Requests the point(s) from the point cloud geometry but no actual operations are performed on the point(s). (Point Clouds category)
PointCloudCreator	Creates a new point-cloud feature with the specified size and components and sends it into the workspace for processing. (Point Clouds category) 
PointCloudExpression Evaluator	Evaluates expressions, such as algebraic operations or conditional statements, to set point cloud component values. (Calculated Values, Point Clouds categories)
PointCloudExtractor	Serializes the geometry of the feature into the Blob Attribute based on the selected writer format. (Point Clouds category)
PointCloudFilter	Filters a point-cloud feature into one or more parts based on evaluating expressions. (Filters and Joins, Point Clouds categories)
PointCloudMerger	Merges component values from one point cloud to another. (Filters and Joins, Point Clouds categories)

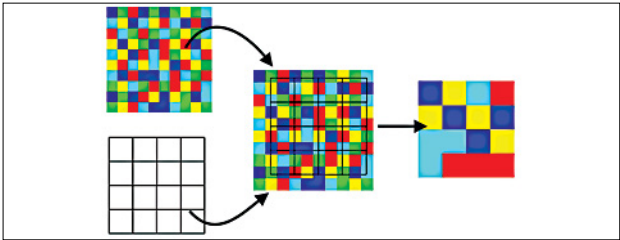
PointCloudOnRasterComponentSetter	Sets point cloud component values by overlaying a point cloud on a raster. (<i>Point Clouds, Rasters categories</i>)
PointCloudPropertyExtractor	Extracts the properties of a point-cloud feature and exposes them as attributes. (<i>Calculated Values, Point Clouds categories</i>)
PointCloudReplacer	Replaces the geometry of the feature with the geometry held in the Blob Attribute. The blob is decoded according to the selected point cloud format. (<i>Point Clouds category</i>)
PointCloudSimplifier	Outputs point cloud features that have fewer points than the original input features while maintaining the original shape. (<i>Point Clouds category</i>)
PointCloudSorter	Sorts a point cloud by the values of components. (<i>Point Clouds category</i>)
PointCloudSplitter	Splits a single point cloud feature into multiple point cloud features, each having a homogeneous value for the point component that governs the split. (<i>Point Clouds category</i>)
PointCloudStatisticsCalculator	Calculates statistics on point cloud components and exposes them as attributes. (<i>Calculated Values, Point Clouds categories</i>)
PointCloudSurfaceBuilder	Takes an input point cloud and reconstructs it into an output mesh. (<i>3D, Geometries, Point Clouds categories</i>)
PointCloudThinner	Outputs point-cloud features that have fewer points than the original input features. (<i>Point Clouds category</i>) 
PointCloudTransformationApplier	Applies transformations on a point cloud. (<i>Point Clouds category</i>)
PointOnLineOverlayer	Performs an overlay of points on lines. Each input line is split at its closest place to any point within the specified point tolerance. (<i>Filters and Joins, Spatial Analysis categories</i>)
PointOnAreaOverlayer	Performs an overlay of points on areas. (<i>Filters and Joins, Spatial Analysis categories</i>)
PointOnPointOverlayer	Performs an overlay of points on points. (<i>Filters and Joins, Spatial Analysis categories</i>)

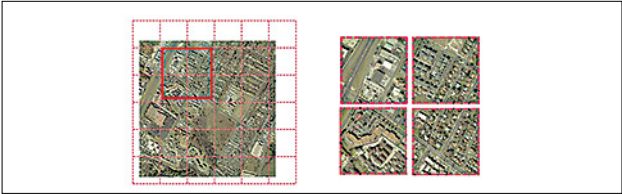
PointOnRasterValueExtractor	Extracts the band and palette values from a raster at the location of each input point and sets them as attributes on the feature. (<i>Rasters, Spatial Analysis categories</i>) 
PointPropertyExtractor	Extracts point orientation to feature attributes. (<i>Calculated Values category</i>)
PointPropertySetter	Adds or removes point orientation. (<i>Geometries category</i>)
PowerPointStyler	Prepares features for output to the PowerPoint Writer by providing a convenient interface to set a variety of Microsoft PowerPoint format-specific attributes. (<i>Cartography and Reports category</i>)
PROJAttributeReprojector	Reprojects attributes from one coordinate system to another using the PROJ library. (<i>Coordinates, Integrations categories</i>)
ProjectWiseWSGConnector	Accesses ProjectWise through a Bentley Web Services Gateway (WSG) (<i>Integrations, Web, Workflows categories</i>)
PROJReprojector	Reprojects feature coordinates from one coordinate system to another using the PROJ library. (<i>Coordinates, Integrations categories</i>)
PythonCaller	Executes a Python script to manipulate the feature. A Python script can perform specialized and complex operations on a feature's geometry, attributes, and coordinate system. (<i>Workflows category</i>)
PythonCreator	Creates features using the Python script supplied, and sends them into the workspace for processing. (<i>Workflows category</i>)
R	
NEW	RabbitMQConnector 📩 Connects to an AMQP 0-9-1 broker. Supports sending (producing) and receiving (consuming) messages. (<i>Integrations, Web, Workflows category</i>)
	RandomNumberGenerator Generates a uniformly distributed random number. The random number is x, where Minimum Value <= x <= Maximum Value. (<i>Calculated Values, Strings categories</i>)
	RasterAspectCalculator Calculates the aspect (direction of slope) for each cell of a raster. Aspect is measured in degrees from 0 to 360, starting clockwise from the north. (<i>Calculated Values, Rasters categories</i>)
	RasterBandAdder Adds a new band to a raster. The added band will have the same value in all cells, and the same raster-level properties as other bands in the raster (that is, number of rows/columns, cell spacing, cell origin, etc.). (<i>Rasters category</i>)
	RasterBandCombiner Merges multiple overlapping raster features into a single raster feature. (<i>Rasters category</i>)
	RasterBandInterpretation Coercer Alters the underlying interpretation of the selected bands of the raster geometry on the input features, using the specified conversion options. (<i>Rasters category</i>)

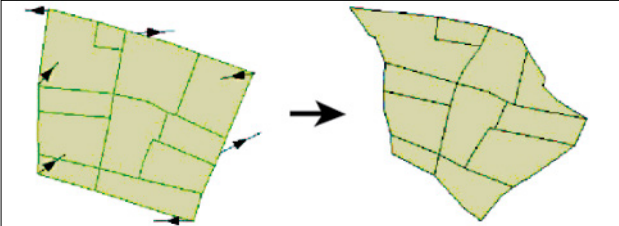
RasterBandKeeper	Removes all bands of a raster, except for those that are selected. The RasterSelector can be used to modify the selection. <i>(Rasters category)</i>
RasterBandMinMaxExtractor	Extracts the band minimum and maximum values, palette minimum and maximum keys, and palette minimum and maximum values of a raster feature, and exposes them as attributes. <i>(Calculated Values, Rasters categories)</i>
RasterBandNameSetter	Sets the name of selected bands on a raster. <i>(Rasters category)</i>
RasterBandNodataRemover	Removes the existing nodata identifier from the selected bands of a raster feature. That is, any values that were previously equal to the nodata value will now be considered valid data. <i>(Rasters category)</i>
RasterBandNodataSetter	Identifies a value to act as a nodata identifier on a raster feature at the band level. That is, values equal to the specified value will now be considered invalid, and will not be affected by many operations (e.g. offsetting or scaling). <i>(Rasters category)</i>
RasterBandOrderer	Specifies the order of bands in a raster. Bands are reordered according to the input band indices. <i>(Rasters category)</i>
RasterBandPropertyExtractor	Extracts the band and palette properties of a raster feature and exposes them as attributes. <i>(Calculated Values, Rasters category)</i>
RasterBandRemover	Removes the selected band(s) of a raster. <i>(Rasters category)</i>
RasterBandSeparator	Separates the bands and palettes from each input raster feature into one or more output raster features based on the number of input bands and palettes. <i>(Rasters category)</i> 
RasterCellCoercer	Decomposes all input numeric raster features into individual points or polygons. One vector feature is output for each cell in the band. <i>(Rasters category)</i> 
RasterCellOriginSetter	Sets the raster's cell origin. <i>(Rasters category)</i>

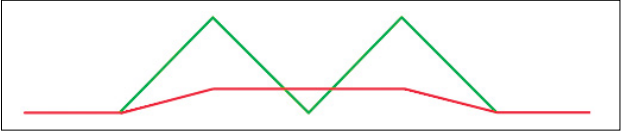
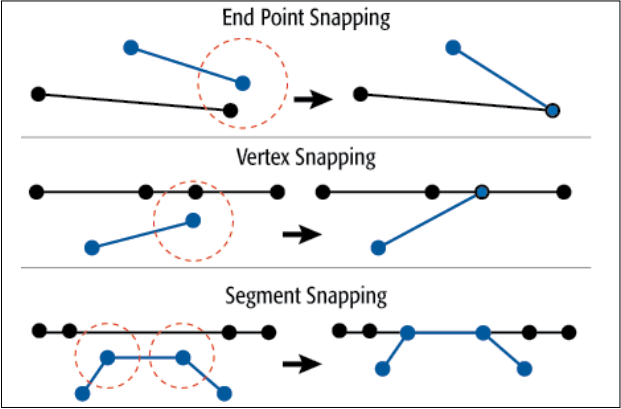
RasterCellValueCalculator	Performs an arithmetical operation on a pair of rasters. The first selected band of raster A is combined with the first selected band of raster B, the second selected band of raster A is combined with the second selected band of raster B, and so on. <i>(Calculated Values, Rasters categories)</i>	<table><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>7</td><td>7</td><td>0</td></tr><tr><td>0</td><td>0</td><td>7</td><td>7</td><td>0</td></tr><tr><td>0</td><td>0</td><td>7</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table> + <table><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>3</td><td>3</td><td>3</td><td>0</td><td>0</td></tr><tr><td>3</td><td>3</td><td>3</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table> = <table><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>7</td><td>7</td><td>0</td></tr><tr><td>3</td><td>3</td><td>10</td><td>0</td><td>0</td></tr><tr><td>3</td><td>3</td><td>10</td><td>0</td><td>0</td></tr><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr></table>	0	0	0	0	0	0	0	7	7	0	0	0	7	7	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3	3	0	0	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7	0	3	3	10	0	0	3	3	10	0	0	0	0	0	0	0
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RasterCellValueReplacer	Replaces a range of values in the source raster with a new single value. <i>(Rasters category)</i>																																																																												
RasterCellValueRounder	Rounds off raster cell values. <i>(Rasters category)</i>																																																																												
RasterCheckpointer	Sets a checkpoint in the raster processing which forces previous processing to occur immediately. Once complete, it saves the current state to disk. <i>(Rasters, Workflows categories)</i>																																																																												
RasterConsumer	Requests the tile(s) from the raster geometry but no actual operations are performed on the tile(s). <i>(Rasters category)</i>																																																																												
RasterConvolver	Accepts input features containing a raster geometry and outputs the features after applying a convolution filter to all the bands. <i>(Rasters category)</i>																																																																												
RasterDEMGenerator	Constructs a Delaunay triangulation based on input points and breaklines. That triangulation is then uniformly sampled to produce a raster digital elevation model (DEM raster). <i>(3D, Rasters categories)</i>																																																																												
RasterExpressionEvaluator	Evaluates expressions on each cell in a raster, such as algebraic operations or conditional statements. <i>(Calculated Values, Rasters categories)</i>																																																																												
RasterExtentsCoercer	Replaces the geometry of input raster features with a polygon that covers the extents of the raster. <i>(Rasters category)</i>																																																																												
RasterExtractor	Serializes the geometry of the feature into the Raster Blob Attribute based on the selected writer format. <i>(Rasters category)</i>																																																																												
RasterGCPExtractor	Extracts the coordinate system and the Ground Control Points (GCPs) from the raster feature and exposes them as attributes. <i>(Coordinates, Rasters categories)</i>																																																																												
RasterGCPSetter	Sets the GCP on a raster with the specified Column (pixel), Row (line), X Coordinate, Y Coordinate and Z Coordinate. <i>(Coordinates, Rasters categories)</i>																																																																												

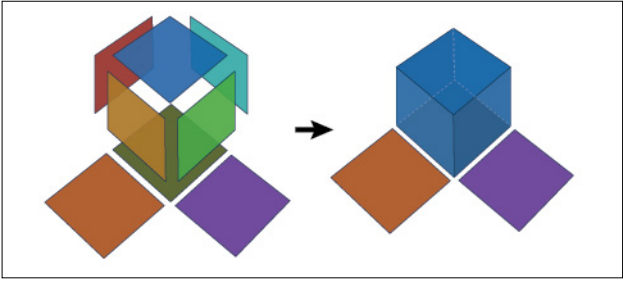
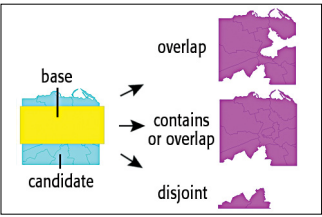
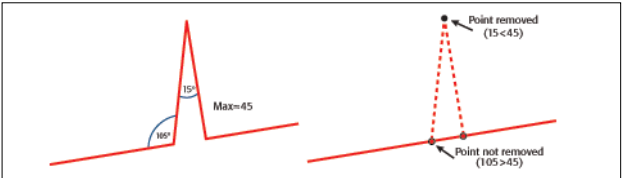
	RasterGeoreferencer Georeferences a raster with the specified parameters. <i>(Coordinates, Rasters categories)</i> 
	RasterHillshader Generates a shaded relief effect, useful for visualizing terrain. <i>(3D, Cartography and Reports, Rasters categories)</i>
	RasterInterpretationCoercer Alters the underlying interpretation of the bands of the raster geometry on the input features, using the specified conversion options. <i>(Rasters category)</i> 
	RasterMosaicker Mosaics multiple raster features into a single raster feature. <i>(Filters and Joins, Rasters categories)</i> 
	RasterNumericCreator Creates a feature with a raster of the specified size with a numeric value and sends it into the workspace for processing. This transformer is useful for creating a very large image with a user-specified width and height. <i>(Rasters category)</i>
NEW	RasterObjectDetectionModelTrainer  Trains a custom raster object detection model based on the positive and negative samples. <i>(Rasters category)</i>
	RasterObjectDetector Accepts a raster input and outputs rectangular geometries outlining the detected object(s). <i>(Rasters category)</i>
NEW	RasterObjectDetectorSampleGenerator  Aids in generation and preparation of positive and negative samples to be used by the RasterObjectDetectionModelTrainer. <i>(Rasters category)</i>

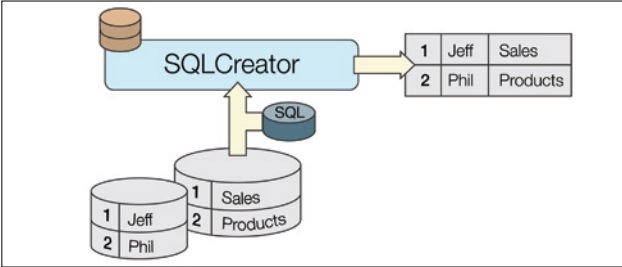
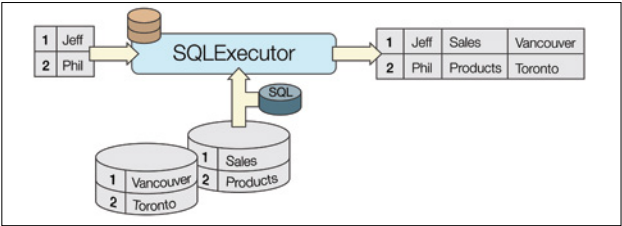
NEW	RasterObjectDetector 📌 SamplePreparer	Aids in preparation of positive and negative samples provided by the user to be used by the RasterObjectDetectionModelTrainer. <i>(Rasters category)</i>
	RasterPaletteAdder	Creates a palette from an attribute and adds this palette to all selected bands on a raster. <i>(Rasters category)</i>
	RasterPaletteExtractor	Creates a string representation of an existing palette and saves it to an attribute. <i>(Rasters category)</i>
	RasterPaletteGenerator	Generates a palette out of the selected band(s) of a raster. <i>(Rasters category)</i>
	RasterPaletteInterpretation Coercer	Alters the underlying interpretation of the palettes of the raster geometry on the input features, using the specified conversion options. <i>(Rasters category)</i>
	RasterPaletteNodataSetter	Identifies the nodata value on a raster feature at the palette level. <i>(Rasters category)</i>
	RasterPaletteRemover	Removes the selected palette(s) of a raster. <i>(Rasters category)</i>
	RasterPaletteResolver	Resolves the palettes of the selected bands of the input raster features by using the band cell values to look up the corresponding palette values, which then replace the original band cell values in the raster. <i>(Rasters category)</i>
	RasterPropertyExtractor	Extracts the geometry properties of a raster feature and exposes them as attributes. <i>(Calculated Values, Rasters categories)</i>
	RasterPyramider	Creates a series of pyramid levels for each input raster feature by specifying either the smallest pyramid level size or the number of pyramid levels to generate. <i>(Rasters, Web categories)</i>
	RasterRegisterer	Transforms an image to minimize its difference with another. <i>(Rasters category)</i>
	RasterReplacer	Replaces the feature's geometry with the geometry held in the Raster Blob Attribute. The blob is decoded according to the selected raster format. <i>(Rasters category)</i>
	RasterResampler	Resamples an input raster using the desired dimensions, the desired cell size in ground units, or a percentage of the size. <i>(Rasters category)</i>
		
	RasterRGBCreator	Creates a feature with a raster of the specified size with an RGB value and sends it into the workspace for processing. <i>(Rasters category)</i>
	RasterRotationApplier	Applies the raster rotation angle on the input raster properties to the rest of the raster properties and data values. <i>(Rasters category)</i>
	RasterSegmenter	Partitions a raster image into arbitrarily sized groups of cells from the input image based on intensity differences in the input raster image cells. <i>(Rasters category)</i>
	RasterSelector	Selects specific bands and palettes of a raster for subsequent transformer operations. <i>(Rasters category)</i>

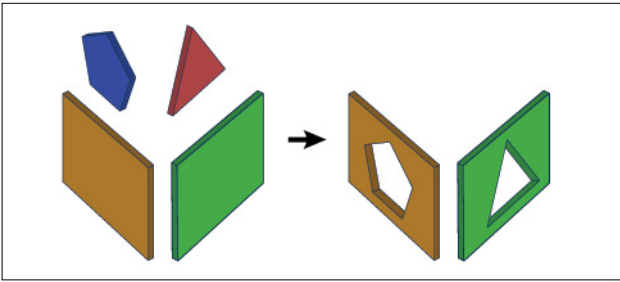
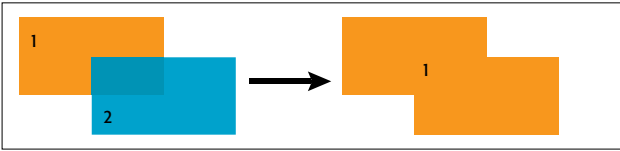
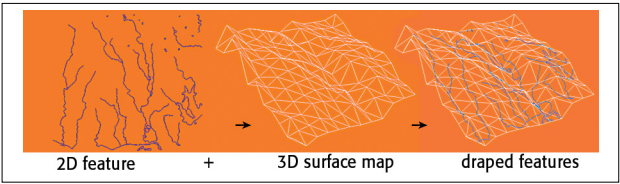
RasterSharpener	Enhances the features of a raster image. The RasterSharpener enhances the borders, lines, and curves while reducing noise in the flat areas of the raster image. <i>(Rasters category)</i>
RasterSingularCellValue Calculator	Performs an arithmetic operation on two operands: the cell values of a raster and a numeric value. <i>(Calculated Values, Rasters categories)</i>
RasterSlopeCalculator	Calculates the slope (maximum rate of change in z) for each cell of a raster. <i>(3D, Rasters categories)</i>
RasterStatisticsCalculator	Calculates statistics on raster bands and exposes them as attributes. Bands with palettes are valid. <i>(Calculated Values, Rasters categories)</i>
RasterSubsetter	Reduces a raster to a subset of its original size. This is essentially a clipping operation using pixel bounds instead of ground coordinates. <i>(Rasters category)</i>
RasterTiler	Splits each input raster into a series of tiles by specifying either a tile size or a number of tiles. <i>(Rasters category)</i> 
RasterToPolygonCoercer	Creates polygons from input raster features. One polygon is output for each contiguous area of pixels with the same value in the input raster. <i>(Rasters category)</i>
RCaller	Executes an R script that has the ability to access feature data from a temporary R data frame. Input data is set up in the form of tables that will become R data frames. R data frames are tables similar to those of a relational database that support columns of varying types. <i>(Format Specific, Integrations, Rasters categories)</i>
Recorder	Saves a copy of all features that enter to a disk file. <i>(Workflows category)</i>
ReframeReprojector	Reprojects feature coordinates from one coordinate system to another using the REFRAME library. <i>(Coordinates, Integrations categories)</i>
RecognitionConnector 📄	Accesses the Amazon Rekognition Service AI computer vision service to detect objects, faces, and text in images and to describe image contents and faces. <i>(Web category)</i>
ReprojectAngleCalculator	Converts a given angle from one coordinate system to another. The transformer calculates the reprojected angle of a line starting at the first coordinate in the feature, with the given length and angle. <i>(Calculated Values, Coordinates categories)</i>
ReprojectLengthCalculator	Converts a given distance from one coordinate system to another. The transformer calculates the reprojected length of a line starting at the first coordinate in the feature, with the given length and angle. <i>(Calculated Values, Coordinates categories)</i>

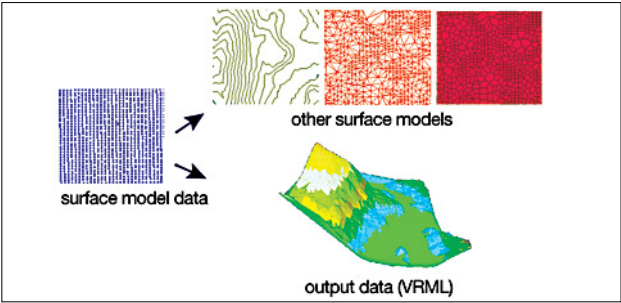
Reprojector	Reprojects feature coordinates from one coordinate system to another. (<i>Coordinates category</i>) 
Rotator	Rotates features in a counterclockwise direction about the specified point by the rotation angle (measured in degrees). (<i>Geometries category</i>)
RubberSheeter	Performs warping operations on the spatial coordinates of features. It is used to adjust a set of observed features so they more closely match a set of reference features. (<i>Coordinates, Geometries categories</i>) 
S	
S3Connector 	Accesses the Amazon Simple Storage Service (S3) file storage service to upload, download, or delete files and folders or list file/folder information from an S3 account. (<i>Integrations, Web, Workflows, categories</i>)
SalesforceConnector	Retrieves data from the Salesforce customer relationship platform using Salesforce Object Query Language (SOQL) queries. (<i>Integrations, Web, Workflows categories</i>)
Sampler	Preserves either a total number of features or a sampling of features, depending on the Sampling Type selection. (<i>Data Quality, Filters and Joins, Workflows categories</i>)
Scaler	The Scaler scales objects to make them bigger or smaller. (<i>3D, Coordinates, Geometries categories</i>)
SchemaMapper	Converts the existing schema (data model) of features to a new structure, based on mappings defined in an external lookup table. (<i>Workflows category</i>)
SecondOrderConformer	Performs a second-order conformal transformation on the feature's geometry. Depending on the input geometry, a 2D or 3D transformation is performed. (<i>3D, Coordinates categories</i>)
SectorGenerator	Outputs circular sectors of influence for point features that have directions defined by azimuths (degrees clockwise from North). (<i>Spatial Analysis category</i>)
SharedItemAdder	Adds or replaces Appearances, Textures, Rasters, or Geometry Definitions in the internal FMELibrary. (<i>3D category</i>)

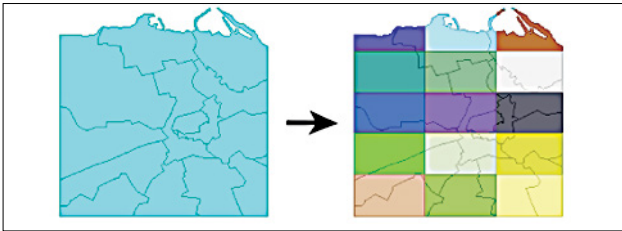
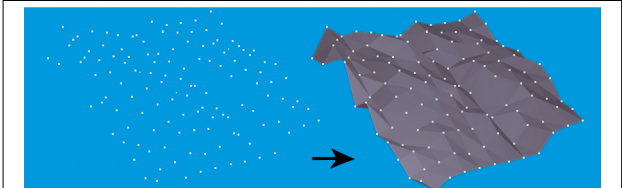
SharedItemIDExtractor	Extracts Shared Item IDs from the front and/or back side of geometries and adds them as traits or a list attribute. <i>(3D category)</i>
SharedItemIDSetter	Sets Shared Object IDs onto the front and/or back sides of geometries. <i>(3D category)</i>
SharedItemRetriever	Retrieves Appearances, Textures, Rasters, or Geometry Definitions from the internal FMELibrary. <i>(3D category)</i>
SharePointOnlineConnector 	Accesses SharePoint Online to upload, download, or delete files and folders or list file/folder information. <i>(Integrations, Web, Workflows categories)</i>
SherbendGeneralizer	Uses the Sherbend algorithm to simplify lines by reducing unnecessary details based on the analysis of the line's bends. The generalization process may eliminate, reduce, or combine bends, while resolving conflicts. In this example, three bends are combined into one: <i>(Cartography and Reports, Geometries categories)</i> 
ShortestPathFinder	Computes the shortest path of a line or lines containing a source and destination node in a network based on the length of the input or the cost (specified in an attribute) of each of the edges. <i>(Spatial Analysis category)</i>
SlackConnector	Posts a message or uploads a file to the Slack group chat service. <i>(Integrations, Web, Workflows categories)</i>
Snapper	Brings lines, segments, end points or vertex points of features together if they are within a certain distance of each other and (optionally) if they have one or more attributes in common. <i>(Data Quality, Geometries, Spatial Analysis categories)</i> 
Snipper	Shortens the geometry of a line feature from the ends by snipping specified distances, indices, or measure values. It operates on features with simple line geometry and polygons without holes. <i>(Data Quality, Geometries categories)</i>

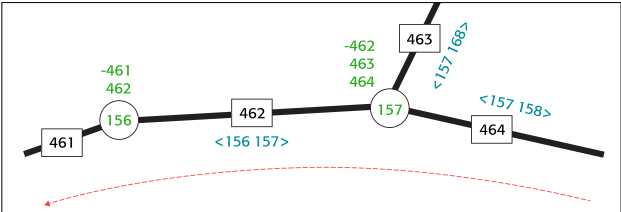
SNSSender	Using the Amazon Simple Notification Service (SNS), sends messages to an Amazon SNS topic. (<i>Integrations, Web categories</i>)
SolidBuilder	Constructs solids from surfaces and cuts hollow regions, or voids, in solid features with other solid features. A solid that is cut by another solid must contain that second solid. (<i>3D, Geometries categories</i>) 
Sorter	Sorts features by an attribute's value. (<i>Workflows category</i>)
SpatialFilter	Filters point, line, area, and text features based on spatial relationships. Each input Candidate feature is compared against all Filter features, based on the given spatial tests to meet. (<i>Data Quality, Filters and Joins, Spatial Analysis categories</i>) 
SpatialRelator	Determines topological (spatial) relationships between sets of features. It tags – but does not otherwise change – features when they have certain relationships, such as touches, overlaps, intersects, and so forth. (<i>Data Quality, Filters and Joins, Spatial Analysis categories</i>)
SpatialSorter	Sorts features geographically (by location). (<i>Spatial Analysis, Workflows categories</i>)
SpikeRemover	Cleans up feature geometries by removing spikes. (<i>Data Quality, Geometries categories</i>) 

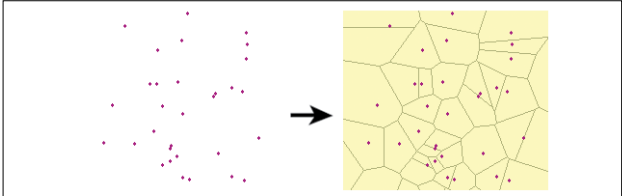
SQLCreator	Generates FME features from the results of a SQL query against a database. One FME feature is created for each row of the results of the SQL Query. (<i>Workflows category</i>)  The diagram shows a database with two tables: 'Sales' (rows: 1 Jeff, 2 Phil) and 'Products' (rows: 1 Sales, 2 Products). A SQL query is input into the SQLCreator tool, which outputs a table with two rows: (1, Jeff, Sales) and (2, Phil, Products).
SQLExecutor	Performs SQL queries against a database. (<i>Workflows category</i>)  The diagram shows a database with two tables: 'Sales' (rows: 1 Jeff, 2 Phil) and 'Products' (rows: 1 Sales, 2 Products). A SQL query is input into the SQLExecutor tool, which outputs a table with two rows: (1, Jeff, Sales, Vancouver) and (2, Phil, Products, Toronto).
SQSConnector 📩	Accesses the Amazon Simple Queue service to send or receive messages. (<i>Web category</i>)
StatisticsCalculator	Calculates statistics based on a designated attribute or set of attributes of the incoming features and adds the results as attributes. (<i>Calculated Values category</i>)
StreamOrderCalculator	Computes the Strahler order and/or Horton order of streams in a river network. (<i>Calculated Values category</i>)
StreamPriorityCalculator	Calculates the primary and secondary streams of multiple stream networks. (<i>Calculated Values category</i>)
StringCaseChanger	Changes the case of text attributes to UPPERCASE, lowercase, Title case, or Full Title Case. (<i>Strings category</i>)
StringConcatenator	 The diagram shows a table with six columns: 'Safe Software', 'Suite 2017', '7445 132 St', 'Surrey', 'BC', and 'V3W 1J8'. These are input into the StringConcatenator tool, which outputs a single row with the concatenated string: 'Safe Software, Suite 2017 7445 132 St, Surrey, BC V3W 1J8'.
StringFormatter	Reformats the data held in each specified attribute according to the Tcl format command, which is similar to the C printf function. Attribute values can be formatted into strings, characters, or numbers. (<i>Strings category</i>)

StringLengthCalculator	Calculates the length of strings and the number of bytes in a blob. (<i>Calculated Values, Strings categories</i>)
StringPadder	Pads the selected attributes with a specified character, either on the right or left side. (<i>Strings category</i>)
StringPairReplacer	Replaces characters in the value contained in the source attribute based on the replacement key-value pairs. (<i>Strings category</i>)
StringReplacer	Replaces substrings matching a string or regular expression in the string contained in the source attribute. (<i>Strings category</i>)
StringSearcher	Performs a regular expression match on the specified expression. (<i>Strings category</i>)
SubstringExtractor	Extracts a substring from the source attribute. (<i>Calculated Values, Strings categories</i>)
SummaryReporter	Writes a summary report of incoming features to a disk file. Features are sorted before they are summarized. (<i>Data Quality, Workflows categories</i>)
SurfaceBuilder	Cuts holes in surface features with other surface features. A surface that is cut by another surface must be co-planar with that second surface, have compatible orientation, and contain that second surface. (<i>3D, Spatial Analysis categories</i>) 
SurfaceDissolver	Detects coplanar regions of input surfaces and dissolves them into single faces. The output faces retain the attributes, traits, and appearances of the input. (<i>3D, Geometries, Spatial Analysis categories</i>) 
SurfaceDraper	Constructs a Delaunay triangulation based on input points and breaklines. Input drape features will be overlaid onto the surface model, and output as draped features. (<i>3D, Point Clouds, Spatial Analysis categories</i>) 

SurfaceFootprintReplacer	Replaces the geometry of a feature with a planar representation of the feature's shadow. (3D, Geometries categories)
SurfaceModeller	Constructs a Delaunay triangulation based on input points and breaklines. It is useful when you need multiple representations of the same model. (3D, Point Clouds categories) 
SurfaceOnSurfaceOverlayer	Performs a surface-on-surface overlay so that all input surfaces are intersected against each other and resultant surface features are created and output. The output surfaces can retain all the attributes of the input features in which they are contained. (3D, Spatial Analysis categories)
SurfaceSplitter	Splits a double-sided input surface geometry into two single-sided surfaces – one equal to the front side of the input surface and one equal to the back side of the input surface. (3D, Geometries categories)
SystemCaller	Runs a program or operating system command, and waits for it to exit before continuing the translation. (Workflows category)
T	
TclCaller	Runs a Tool Command Language (Tcl) command and assigns its return value to an attribute. (Workflows category)
TCPIPReceiver	Receives raw data over TCP/IP. Produces a feature each time a specified number of bytes is received or a particular sequence is detected. (Integrations, Web, Workflows categories)
TCPIPSender	Sends raw data to the specified host, which may be another FME workspace running in a different process (located on the same machine or on a different machine), or any client application that communicates over TCP/IP. (Integrations, Web, Workflows categories)
TempPathnameCreator	Reserves and returns a temporary file or directory path that will be deleted upon translation completion. An optional basename and extension can be supplied to further refine the filename portion of the resulting pathname. (Calculated Values, Workflows categories)
Terminator	Stops a translation when it detects detect non-valid situations or input data conditions that should not exist. (Workflows category)
Tester	Evaluates one or more tests on a feature, and routes the feature according to the outcome of the test(s). The tests can consist of any FME-allowed operands. (Data Quality, Filters and Joins categories)
TestFilter	Filters features by test conditions to one or more output ports. (Data Quality, Filters and Joins categories)

TextAdder	Sets the feature's geometry to text using the previous geometry as the text location. (<i>Cartography and Reports, Geometries categories</i>)
TextDecoder	Decodes a string from a number of different text encodings into plain text. (<i>Strings category</i>)
TextEncoder	Encodes a text string using URL, Unicode, XML, HTML, Base64, HEX, or Octal methods. (<i>Strings category</i>)
TextLocationExtractor	Sets a text feature's geometry to the location of the text. (<i>Calculated Values category</i>)
TextPropertyExtractor	Extracts the values of text attributes from input text geometry features. (<i>Calculated Values category</i>)
TextPropertySetter	Sets the properties of a text geometry to the specified properties. (<i>Cartography and Reports category</i>)
TextStroker	Takes as input a font name, text padding and width multiplier, and outputs aggregates that describe the outline of the text. (<i>Cartography and Reports, Rasters categories</i>)
	
TextureCoordinateSetter	Assigns texture coordinates to surfaces. (<i>Calculated Values, Coordinates categories</i>)
Tiler	Chops the input features into a series of tiles. This transformer works with raster, vector and point cloud data. (<i>Geometries category</i>)
	
TimeWindower	Allows features in FME to be grouped based upon a period of time defined by the user. (<i>Workflows category</i>)
TINGenerator	Constructs a Delaunay triangulation based on input points and breaklines. The surface model may be output in a number of representations: a triangulated irregular network (TIN), TIN vertices, TIN edges, and triangles. (<i>3D, Geometries categories</i>)
	

TopferIndexCalculator	Takes a set of point, linear, polygonal, and/or aggregate features, and calculates the Topfer Index based on the bounding box of the input features. (<i>Spatial Analysis category</i>)
TopologyBuilder	Computes topology on input point, line, and/or area features. (<i>Spatial Analysis category</i>) 
TraitMerger	Moves the traits from one geometry onto another geometry. It can also move the attributes from a feature onto a geometry as traits, or the traits from a geometry onto a feature as attributes. (<i>Filters and Joins category</i>)
TransporterReceiver	Receives features from another FME workspace running in a different process, which may be located on the same or a different machine. Used in conjunction with the TransporterSender. (<i>Integrations, Workflows categories</i>)
TransporterSender	Sends features to another FME workspace running in a different process, which may be located on the same machine or on a different machine. Used in conjunction with the TransporterReceiver. (<i>Integrations, Workflows categories</i>)
TrelloConnector	Accesses the Trello web service to create, update, archive, or list the contents of Trello Boards, Lists, and Cards. (<i>Integrations, Web, Workflows categories</i>)
Triangulator	Breaks an input geometry into triangular units or a mesh. (<i>Geometries category</i>)
Tweeter	Sends a Twitter™ status update from Workbench. (<i>Integrations, Web categories</i>)
TweetSearcher	Runs a search for Twitter™ entries that contain the given query. (<i>Integrations, Web categories</i>)
TweetStreamer	Connects to a Twitter™ stream and outputs a new feature for each tweet. (<i>Integrations, Web categories</i>)
TwitterStatusFetcher	Retrieves the timeline for a particular Twitter™ user or list. (<i>Integrations, Web categories</i>)
U	
UUIDGenerator	Calculates a Universally Unique Identifier (UUID) for each incoming feature, and adds it as a new attribute. An example UUID looks like: 7672aac8-fa0b-464c-b0b8-3efa9ae9cd86 (<i>Calculated Values category</i>)
V	
VariableRetriever	Reads the specified variable and puts its value into the specified attribute. This variable must have been previously set using the VariableSetter transformer. (<i>Workflows category</i>)
VariableSetter	Creates and sets the specified variable to the specified value. The variable can later be read back into an attribute using the VariableRetriever transformer. (<i>Workflows category</i>)

VectorOnRasterOverlayer	Overlays vector features onto a single raster feature by drawing them onto the resulting output raster. The properties of the output raster are identical to that of the input raster. <i>(Rasters, Spatial Analysis categories)</i>
VertexCounter	Stores the number of a feature's vertices into an attribute. <i>(Calculated Values, Coordinates, Data Quality categories)</i>
VertexCreator	Appends coordinates to null, point, text, line, and arc geometry, or replaces existing geometry with point geometry. <i>(Geometries category)</i>
VertexRemover	Removes one or more coordinates from the geometry of the feature. <i>(Coordinates, Geometries categories)</i>
VolumeCalculator	Calculates the volume of a solid object and stores the value in an attribute. <i>(3D, Calculated Values categories)</i>
VoronoiCellGenerator	Outputs circular sectors of influence for point features that have directions defined by azimuths (degrees clockwise from North). <i>(Spatial Analysis category)</i>
VoronoiDiagrammer	Generates a Voronoi diagram or Thiessen polygon. Each polygon in the diagram defines the area of space that is closest to a particular input point. <i>(Spatial Analysis category)</i> 
W	
WebMapTiler	Creates a series of image tiles that can be utilized by web mapping applications such as Bing™ Maps, Google Maps™, or Web Map Tile Service. <i>(Cartography and Reports, Format Specific, Rasters, Web categories)</i>
WebSocketReceiver	Receives WebSocket messages from the specified WebSocket server. Produces a feature each time a message is received, and places the contents of the message into the specified attribute. <i>(Web, Workflows categories)</i>
WebSocketSender	Sends WebSocket messages to the specified WebSocket server. <i>(Web, Workflows categories)</i>
WhiteStarLeaseBuilder	Posts a query to a WhiteStar Legal2Map™ WebServices (W3) server to obtain points or polygons that match a list of legal land descriptions. <i>(Integrations category)</i>
WorkspaceRunner	Runs another FME Workbench workspace on the local computer by spawning a new FME process. This transformer is useful for batch processing, especially in conjunction with the Directory and File Reader. <i>(Workflows category)</i>
X	
XMLAppender	Assembles several XML documents into one. <i>(Format Specific, Web categories)</i>
XMLFeatureMapper	Constructs features from XML documents via xfmMaps. <i>(Format Specific, Web categories)</i>

XMLFlattener	Flattens content of XML element(s) into feature attributes. (<i>Format Specific, Web categories</i>)
XMLFormatter	Provides various options for formatting and cleaning up XML documents. (<i>Format Specific, Web categories</i>)
XMLFragmenter	Maps elements from an XML document into XML fragments. Can decompose large XML documents into parts, where these parts may be further operated on via downstream XML, XQuery, XSLT or generic text processing transformers. (<i>Format Specific, Web categories</i>)
XMLNamespaceDeclarer	Declares missing namespaces in XML documents by matching prefixes from another sample XML file whose namespaces are fully declared. (<i>Format Specific, Web categories</i>)
XMLSampleGenerator	This transformer generates an XML document based on an XML Schema (XSD) file. While the sample document may not pass a schema validation, it will provide a generate outline of what a valid XML document looks like. The XML generated by this transformer can be used as a base for an XML template used in the XMLTemplater transformer. (<i>Format Specific, Web categories</i>)
XMLTemplater	Populates an XML document with FME feature attribute values. The document is provided as a template, and the transformer will use XQuery to insert attribute values and geometry information into the template. (<i>Format Specific, Web categories</i>)
XMLUpdater	This transformer creates, modifies, replaces, or deletes XML elements and attributes in an XML document. (<i>Format Specific, Web categories</i>)
XMLValidator	Validates the syntax or schema of an XML file or text. (<i>Format Specific, Web categories</i>)
XMLXQueryExploder	Uses XQuery expression to extract portions of XML text into new FME features. (<i>Format Specific, Web categories</i>)
XMLXQueryExtractor	Uses XQuery expressions to extract portions of XML text into feature attributes. (<i>Format Specific, Web categories</i>)
XMLXQueryUpdater	Provides updates to an XML document using XQuery Update expressions. (<i>Format Specific, Web categories</i>)
XSLTProcessor	The XSLTProcessor uses an XSL (eXtensible Stylesheet Language) stylesheet to convert an XML document. Common output formats include text, RSS, SVG, and CSV. (<i>Format Specific, Web, Workflows categories</i>)

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