

New QGIS functions for power users

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- › **Version history**
- › **Live Layer effects**
- › **New geometry classes**
- › **Geometry checker**

Version history

› QGIS 2.8 LTS 20.02.2015

› QGIS 2.10 26.06.2015

› QGIS 2.12 23.10.2015

› Visual changelogs:

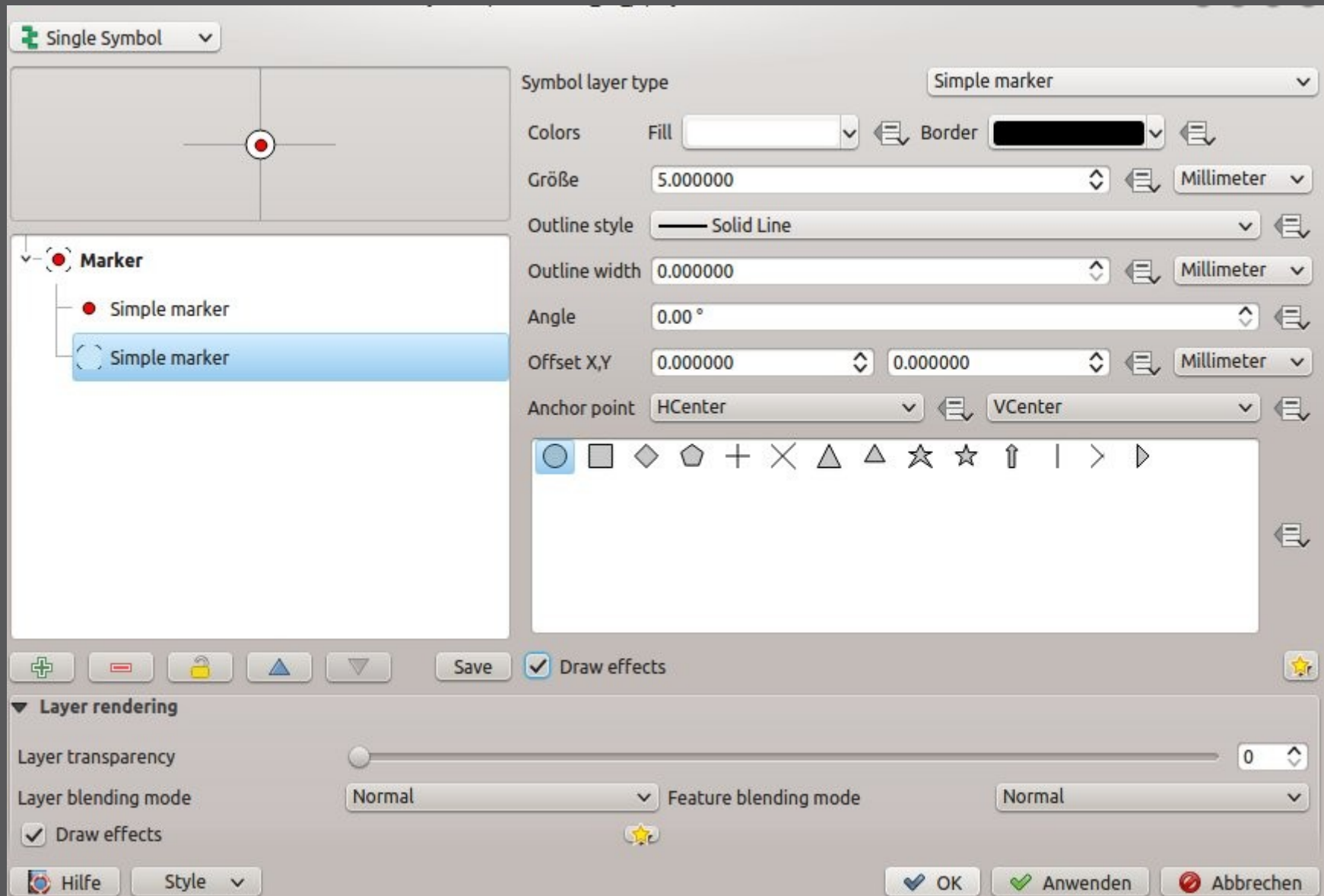
› https://www.qgis.org/en/site/forusers/visual_changelog28/index.html

› https://www.qgis.org/en/site/forusers/visual_changelog210/index.html

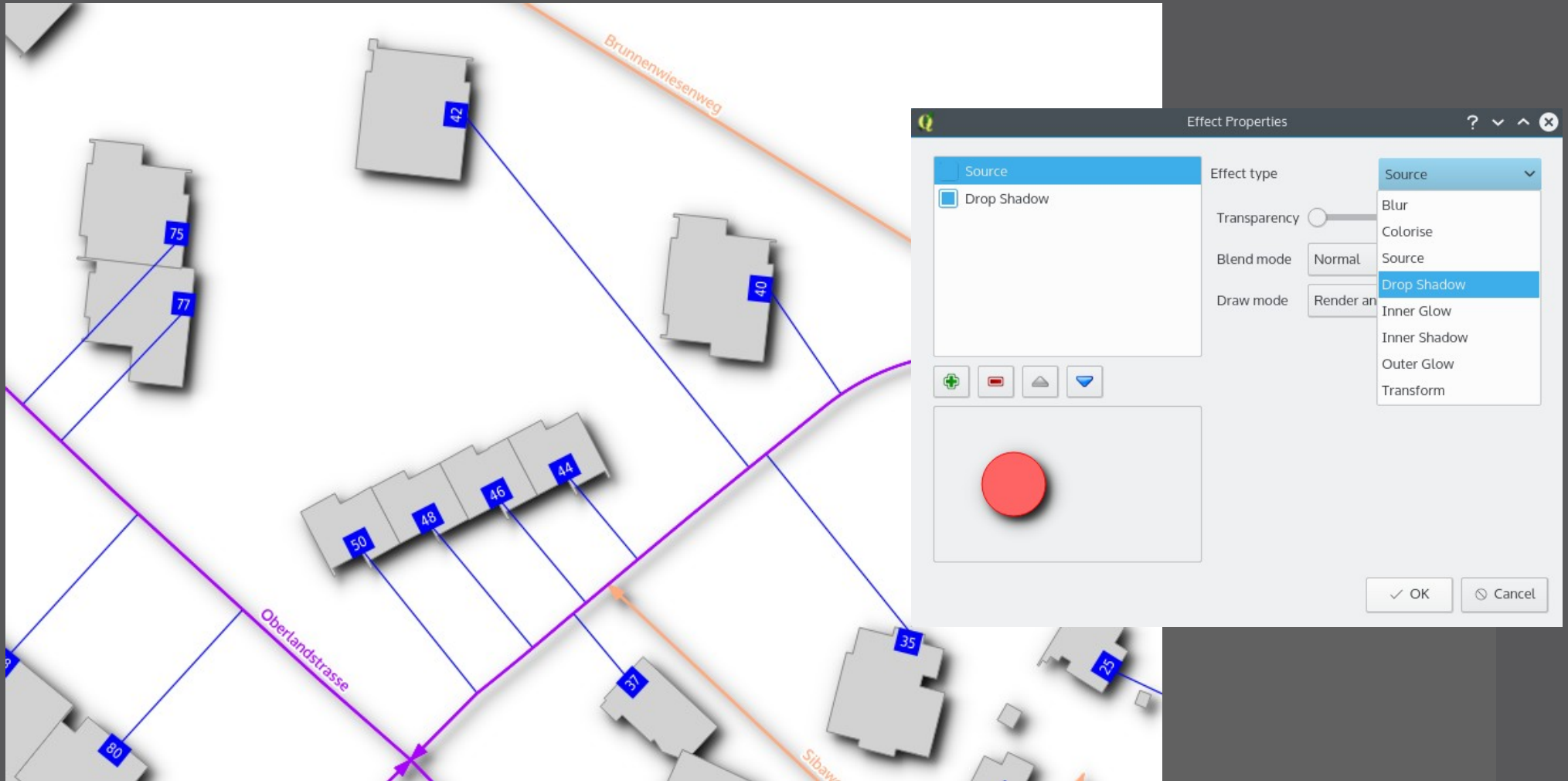
Live layer effects (2.10)

- Image modifications based on symbol or symbol layer
- 'Photoshop' for QGIS
- Chainable sequence of:
 - Source
 - Transform
 - Blur
 - Drop shadow / inner shadow
 - Inner glow / outer glow
 - Colorize
- Combination with transparency and blend modes

Live layer effects (2.10)

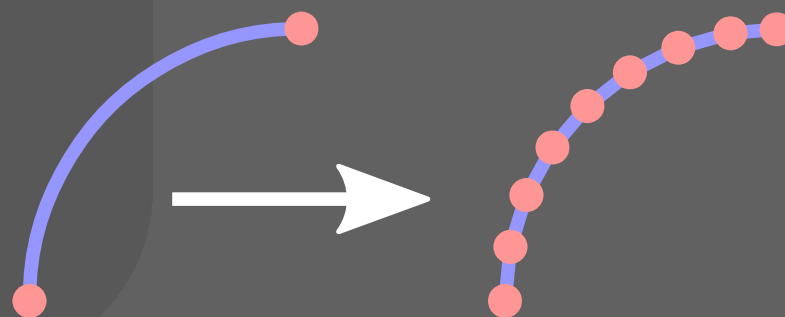
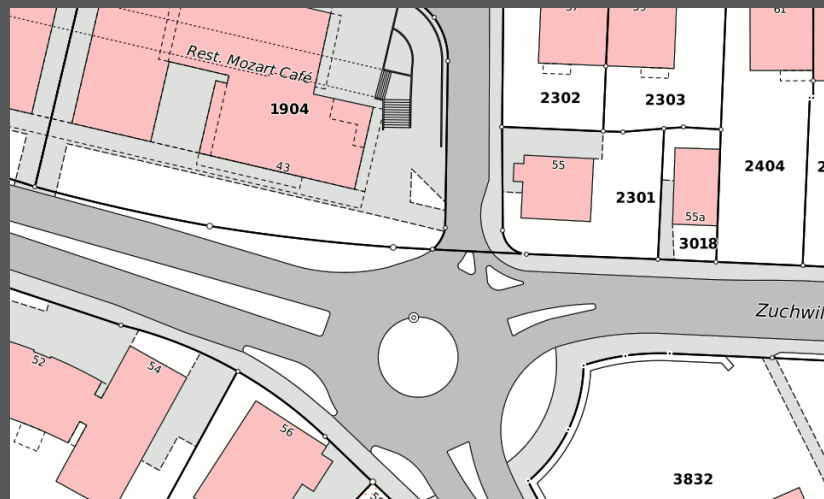


Live layer effects (2.10)



New Geometry Core - Motivation

- QgsGeometry works fine, but difficult to extend
- Limited to points and linear geometries
- Curved geometries can only be displayed using `ST_CurveToLine`
- Problem: curve is lost when editing



New Geometry Core - Goals

- **Support for SQL/MM curved geometries**
 - CircularString
 - CompoundCurve
 - CurvePolygon
 - MultiCurve
 - MultiSurface
- **Z and M values**
- **Should be extensible with new types (e.g. Bézier-Splines)**
- **Compatibility with current OgsGeometry interface**

New Geometry Core - Support



Data Sources



Providers

QgsPostgresProvider

QgsOgrProvider

QgsOracleProvider

...

Core

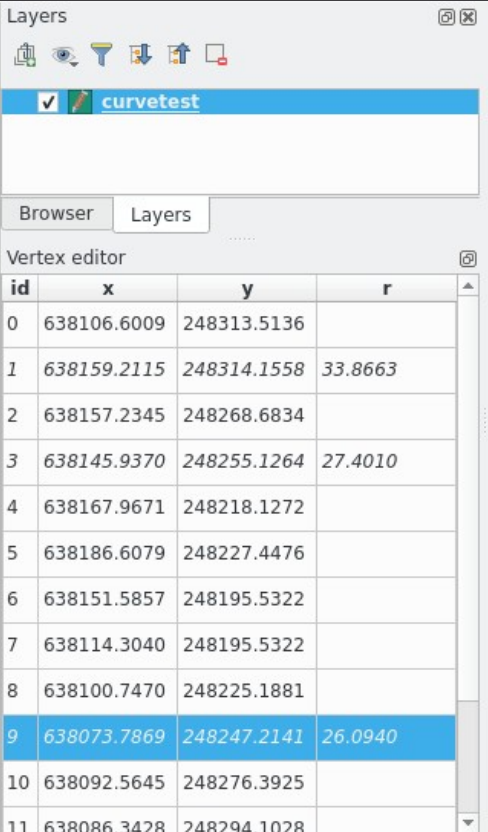
- Support depends on provider and data source

New Geometry Core – State QGIS 2.10

- New geometry kernel (XYZM/Curves)
- QGSGeometry compatibility class
- Segmentation for geometry processing (intersection, buffering, etc.)
- Support in PostGIS provider
- Python bindings

State QGIS 2.12

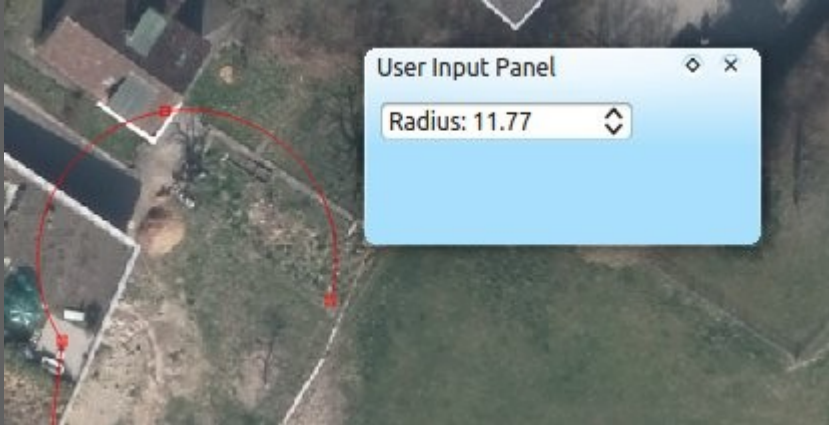
- Visualization, measurement of length / area directly on curve (if planar measurement)
- Construction tools:
 - Arc with start point / curve point / endPoint
 - Arc with start point / end point / radius
- Support in marker line renderer
- Node editor as part of node tool



The screenshot shows the QGIS interface with a 'curvetest' layer selected in the Layers panel. The Vertex editor table displays the following data:

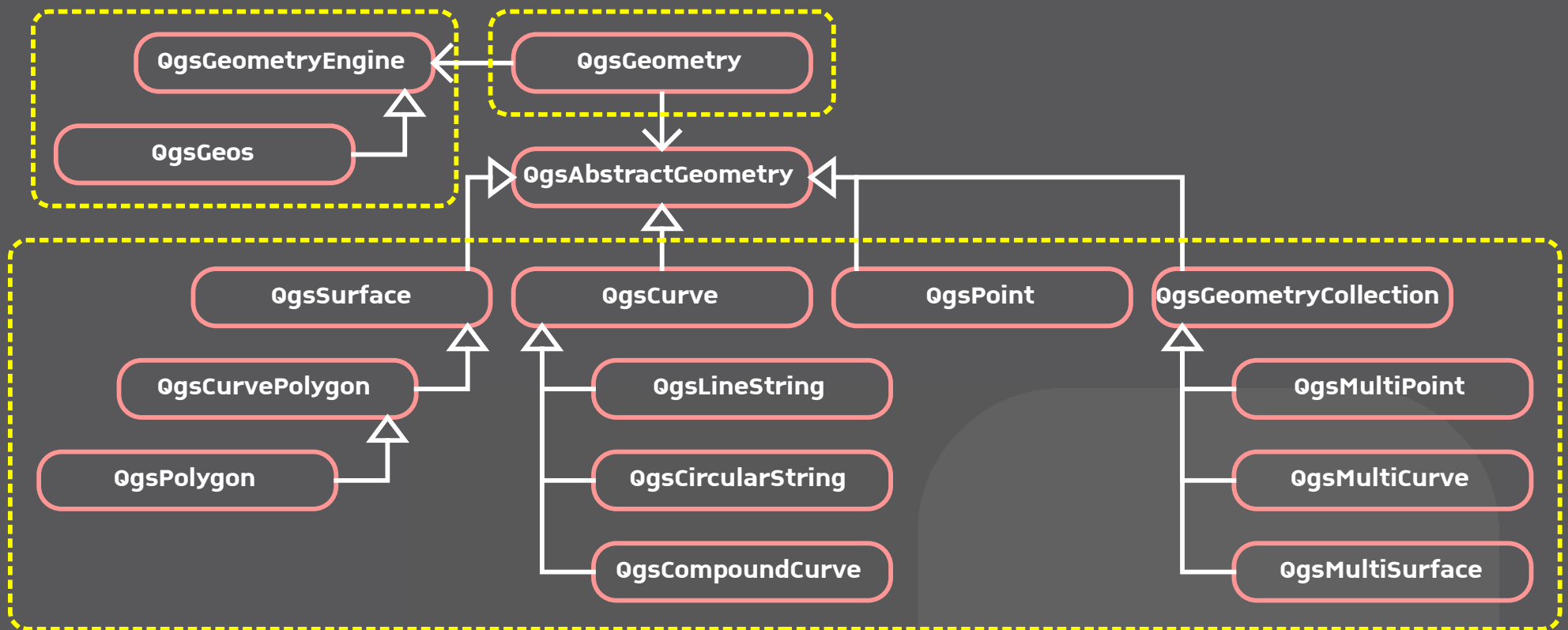
id	x	y	r
0	638106.6009	248313.5136	
1	638159.2115	248314.1558	33.8663
2	638157.2345	248268.6834	
3	638145.9370	248255.1264	27.4010
4	638167.9671	248218.1272	
5	638186.6079	248227.4476	
6	638151.5857	248195.5322	
7	638114.3040	248195.5322	
8	638100.7470	248225.1881	
9	638073.7869	248247.2141	26.0940
10	638092.5645	248276.3925	
11	638086.3428	248294.1028	

The right side of the image shows a map view with a green polygon and a red arc drawn along its boundary. The arc is defined by three points: a start point, a curve point, and an end point.



The screenshot shows an aerial view of a field with a red arc drawn across it. A 'User Input Panel' dialog box is open, displaying 'Radius: 11.77' with a spin button.

New Geometry Core - Architecture



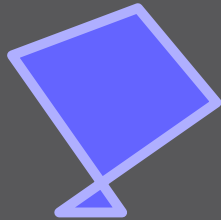
- Retains **QgsGeometry** interface
- Easily extensible with new geometry types
- Abstract geometry engine

New Geometry Core - Conclusions

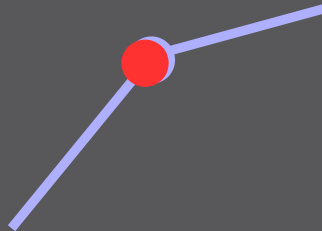
- ✓ Support for curves, Z and M values
 - ✓ Easily extensible
 - ✓ Compatibility with legacy interface
 - Existing plugins will keep working
 - ✓ Opens up the possibility for 3D functionality
-
- ⚠ **Geometry engine (GEOS) limitations:**
 - Segmentation for analysis operations
 - Missing M values support (patch available)

Geometry Checker - Errors

Self intersections



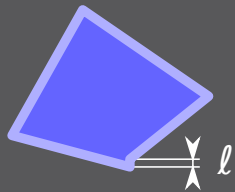
Duplicate nodes



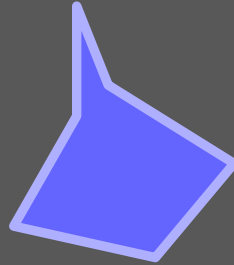
Holes



Segment length



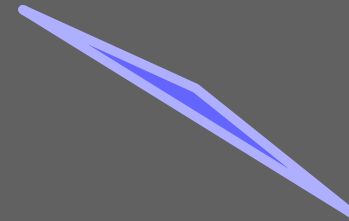
Minimum angle



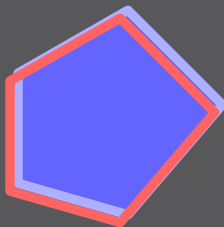
Minimum area



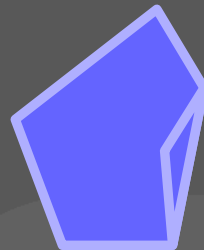
Sliver polygons



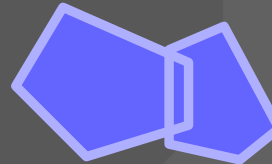
Duplicates



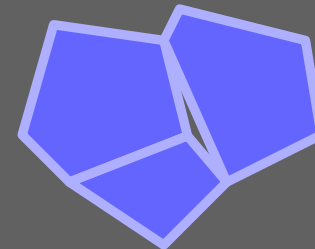
Feature within feature



Overlaps



Gaps



Geometry Checker - Setup

➤ Select checks to perform

Check Geometries

Setup Result

Input vector layer
demo
 Only selected features

Geometry validity:
 Self intersections
 Duplicate nodes
 Polygon with less than 3 nodes

Allowed geometry types:
 Point Line Polygon
 Multipoint Multiline Multipolygon

Geometry properties:
 Polygons and multipolygons may not contain any holes
 Multipart objects must consist of more than one part

Geometry conditions:
 Minimal segment length (map units): 0.005000
 Minimum angle between segments (deg): 10.000000
 Minimal polygon area (map units sqr.): 0.010000
 No sliver polygons: Maximum thinness: 1
 Max. area (map units sqr.): 70.000000

Topology checks:
 Check for duplicates
 Check for features within other features
 Check for overlaps smaller than (map units sqr.): 1.000000
 Check for gaps smaller than (map units sqr.): 1.000000

Tolerance: 1E-8

Output vector layer
 Modify input layer
 Create new layer Browse

Run

Close

Geometry Checker – Errors overview

QGIS Enterprise 1c400d3

Check Geometries

Setup Result

Geometry check result:

Object ID	Error	Coordinates	Value	Resolution
	Gap	638284.80, 248287.89	0.000752629	
7	Minimal area	638089.91, 248256.89	0.00102234	
8	Minimal area	638089.92, 248256.62	0.00105286	
9	Minimal area	638089.93, 248256.35	0.0010376	
10	Minimal area	638089.96, 248256.07	0.00100708	
11	Minimal area	638090.23, 248254.73	0.000946045	
18	Minimal area	638090.84, 248253.23	0.00088501	
19	Minimal area	638090.97, 248252.99	0.000686646	
20	Minimal area	638091.29, 248252.48	0.00167847	
21	Minimal area	638091.56, 248252.10	0.000808716	
22	Minimal area	638091.81, 248251.79	0.000747681	
23	Minimal area	638092.03, 248251.54	0.00152588	
24	Minimal area	638092.36, 248251.21	0.000717163	
25	Minimal area	638093.93, 248250.04	0.0012207	
		638094.15		

Export Total errors: 73, fixed errors: 1

When a row is selected, move to:

Error Feature Don't move

Highlight contour of selected features

Show selected features in attribute table

Fix selected errors using default resolution

Fix selected errors, prompt for resolution method

Error resolution settings

Attribute to use when merging features by attribute value: id

Close

Coordinate: 638090.1412,248254.7822 Scale 1:2 Render EPSG:21781

Geometry Checker – Fix error

QGIS Enterprise 1c400d3

Check Geometries

Setup Result

Geometry check result:

Object ID	Error	Coordinates	Value	Resolution
	Gap	638284.80, 248287.89	0.000752629	
7	Minimal area	638089.91, 248256.89	0.00102234	
8	Minimal area	638089.92, 248256.62	0.00105286	
9	Minimal area	638089.93, 248256.35	0.0010376	
10	Minimal area	638089.96, 248256.07	0.00100708	
11	Minimal area	638090.23, 248254.73	0.000946045	
18	Minimal area	638090.84, 248253.23	0.00088501	
19	Minimal area	638090.97, 248252.99	0.000686646	
20	Minimal area	638091.29, 248252.48	0.00167847	
21	Minimal area	638091.56, 248252.48	0.00167847	
22	Minimal area	638091.56, 248252.48	0.00167847	
23	Minimal area	638091.56, 248252.48	0.00167847	
24	Minimal area	638091.56, 248252.48	0.00167847	
25	Minimal area	638091.56, 248252.48	0.00167847	

Fix errors

Select how to fix error "Minimal area":

- Merge with neighboring polygon with longest shared edge
- Merge with neighboring polygon with largest area
- Merge with neighboring polygon with identical attribute value, if any, or leave as is
- Delete feature
- No action

When a

Error

High

Fix

Skip

Abort

0%

Show selected features in attribute table

Fix selected errors using default resolution

Fix selected errors, prompt for resolution method

Error resolution settings

Attribute to use when merging features by attribute value: id

Close

Coordinate: 638090.1470,248254.7466 Scale 1:2 Render EPSG:21781

Geometry Checker – Error tracking

The screenshot shows the QGIS Enterprise 1c400d3 interface. The main window displays a map with a green line and a red circle indicating an error. The Check Geometries dialog box is open, showing a table of errors and a Summary window.

Check Geometries - Result

Object ID	Error	Coordinates	Value	Resolution
	Gap	638284.80, 248287.89	0.000752629	
	Gap	638090.23, 248254.73	0.000965495	
7	Minimal area	638089.91, 248256.89	0.00102234	
8	Minimal area	638089.92, 248256.62	0.00105286	
9				
10				
11				
18				
19				
20				
21				
22				
23				
24				

Summary

1 errors were fixed

Object ID	Error	Coordinates	Value
11	Minimal area	638090.23, 248254.73	0.000946045

1 new errors were found

Object ID	Error	Coordinates	Value
	Gap	638090.23, 248254.73	0.000965495

Coordinate: 638090.1465,248254.7374 Scale: 1:2 Render: EPSG:21781

Thank you!



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