NAME

XGL_CTX_PICK_APERTURE – defines the area (2D) or volume (3D) used for picking tests

SYNOPSIS

#include <xgl/xgl.h>

Xgl_ctx ctx;

For a 2D Context:
xgl_object_set(ctx, XGL_CTX_PICK_APERTURE, Xgl_bounds_d2d *, 0);
xgl_object_get(ctx, XGL_CTX_PICK_APERTURE, Xgl_bounds_d2d *);

For a 3D Context:
xgl_object_set(ctx, XGL_CTX_PICK_APERTURE, Xgl_bounds_d3d *, 0);
xgl_object_get(ctx, XGL_CTX_PICK_APERTURE, Xgl_bounds_d3d *);

DESCRIPTION

This attribute defines the XGL *pick aperture*, which is the area (for a 2D Context) or the volume (for a 3D Context) where, to be picked, some part of the primitive must be located. Only one pick aperture can be active at any one time. The bounds of the aperture are specified in device coordinates (DC).

For a primitive to generate a pick event, the following conditions must be met:

- A pickable part of the primitive must be in the pick aperture (see discussion below).
- Any portion of the pickable part must pass the HLHSR test, if *z*-buffering is enabled. (Does not apply to 2D.) That is, only objects that are not completely obscured by closer objects can be picked.
- The current pick IDs must differ from the last entry in the pick buffer.

What Is a Pickable Part of a Primitive?

When point flag information is present for stroke rendering, only the enabled strokes are pickable (device-independent). The pickable part of a stroke, however, is device-dependent. (*Stroke* means any line-like primitive — for example, lines, edges, stroke text, annotation text, hollow polygons, markers, NURBS curve, and open arcs.)

When XGL_CTX_PICK_SURF_STYLE is XGL_PICK_SURF_AS_SOLID, all of the surface is pickable.

When XGL_CTX_PICK_SURF_STYLE is XGL_PICK_SURF_AS_FILL_STYLE, the pickable part of the surface is device-dependent for fill styles hollow and stipple. Please see your accelerator guide.

There are two kinds of device-dependent semantics: geometry and rasterization.

Geometry Semantic

In the geometry picking semantics, the pickable part is the geometric description. For lines and edges, for example, their mathematical center line is used. The line or edge style, cap, join, pattern, width, and anti-aliasing have no effect on picking. For hollow polygons, the bounding lines are picked. The surface stipple fill style picks no differently than the solid fill style does. The geometry semantic is preferred for performance reasons on devices that have no hardware picking support.

Rasterization Semantic

In the rasterization picking semantics, the pickable part is whatever would be rendered. The rasterization semantic is preferred for performance reasons on devices that provide hardware picking support.

Some examples comparing the two approaches appear below. Assume for this chart that the XGL_CTX_PICK_SURF_STYLE is XGL_PICK_SURF_AS_FILL_STYLE.

	PICK APERTURE	PICKED?	
OBJECT	IS PLACED EXCLUSIVELY ON...	GEOMETRY	RASTERIZATION
patterned stroke	Off part of line pattern	Y	N
wide stroke	Not over center line, over wide pixels	N	Y
anti-aliased stroke	Not over center line, just over outermost anti-aliased pixel	N	Y
stippled polygon	Part of polygon where stipple pattern is OFF	Y	N
any geometry where rop is XGL_ROP_NOOP or plane mask is 0	Over a pickable part of prim	Y	N
empty polygon	Over a pickable part of prim	N	N

When a *pick event* occurs, XGL stores a structure of type *Xgl_pick_info* into the Context *pick buffer*. The *Xgl_pick_info* structure contains the current values of the pick identifiers, **XGL_CTX_PICK_ID_1**(3) and **XGL_CTX_PICK_ID_2**(3), associated with the primitive that was picked. The value of the vertex flag copied into the *Xgl_pick_info* structure is undefined. The size of the pick buffer is specified by **XGL_CTX_PICK_BUFFER_SIZE**(3). *Xgl_pick_info* data are added to the pick buffer according to the method specified by **XGL_CTX_PICK_STYLE**(3).

The attribute **XGL_CTX_PICK_ENABLE**(3) must be TRUE for picking to occur.

The default value for a 2D Context is [-1,1] × [-1,1], and for a 3D Context it is [-1,1] × [-1,1] × [-1,1].

This attribute is not pushed by **xgl_context_push**(3).

SEE ALSO

xgl_object_set(3)
xgl_object_get(3)
xgl_pick_clear(3)
xgl_pick_get_identifiers(3)
XGL_CTX_PICK_BUFFER_SIZE(3)
XGL_CTX_PICK_ENABLE(3)
XGL_CTX_PICK_ID_1(3)
XGL_CTX_PICK_ID_2(3)
XGL_CTX_PICK_STYLE(3)
XGL_CTX_PICK_SURF_STYLE(3)