NAME

xgl_context_check_bbox – calculates the geometry status of a bounding box

SYNOPSIS

#include <xgl/xgl.h>

```
void xgl_context_check_bbox (
        Xgl_ctx              ctx,
        Xgl_primitive_type   prim_type,
        Xgl_bbox             *bbox,
        Xgl_geom_status      *geom_status );
```

DESCRIPTION

Purpose

This operator calculates the geometry status of the bounding box *bbox*, using the transformations in the Context *ctx*. A geometry status can be used by XGL to optimize the clipping operations when rendering primitives.

Parameters

ctx The XGL Context containing the graphics state used when processing xgl_-context_check_bbox.

prim_type
The bounding box primitive type.

bbox A pointer to a bounding box which can be one of the following structures (see **xgl_struct**(3) for a complete description of the possible data structures).

Xgl_bbox_i2d
Xgl_bbox_f2d
Xgl_bbox_d2d
Xgl_bbox_f3d
Xgl_bbox_d3d

geom_status
A pointer to *Xgl_geom_status* in which the calculated geometry status is stored. The calculated geometry status is a combination of the following flags:

XGL_GEOM_STATUS_VIEW_ACCEPT
This flag is set if the bounding box is completely inside the view clip planes - that is, not clipped.

XGL_GEOM_STATUS_VIEW_REJECT
This flag is set if the bounding box is completely outside the view clip planes - that is, totally clipped.

XGL_GEOM_STATUS_VIEW_SMALL
This flag is set if the bounding box is completely inside the view clip planes, and the area occupied by the bounding box after transformation to device coordinates is less than or equal to the context threshold value for the primitive type prim_type. The XGL_GEOM_STATUS_VIEW_ACCEPT flag is set when this flag is set. See **XGL_CTX_THRESHOLD**(3) for more information about the usage of the context threshold values.

XGL_GEOM_STATUS_MODEL_ACCEPT
: This flag is set if model clip planes exist and the bounding box is completely inside the model clip planes - that is, not clipped. If no model clip planes exist, this flag is always set.

XGL_GEOM_STATUS_MODEL_REJECT
: This flag is set if model clip planes exist and the bounding box is completely outside the model clip planes - that is, totally clipped.

If none of the above flags are set (e.g. the geometry status is zero), the bounding box will be partially clipped by the view clip planes and the model clip planes.

Most XGL drawing primitives accept bounding box information. For these primitives, the application can either pass the bounding box or its geometry status to XGL. If the application wants to pass the geometry status to XGL, it can first call xgl_context_check_bbox to find out the geometry status of the bounding box and then pass the status to XGL using the *Xgl_bbox_status* structure. The following is an example of how to use xgl_context_check_bbox to calculate the geometry status of a bounding box and pass the status to an XGL primitive:

```
{
Xgl_ctx              ctx;
Xgl_primitive_type   prim_type;
Xgl_bbox_f2d         bbox_f2d;
Xgl_bbox_status      bbox_status;
Xgl_geom_status      geom_status;
Xgl_pt_list          pl;

prim_type = XGL_PRIM_MULTIMARKER;

/* set up the bounding box for the 2d markers */
bbox_f2d.bbox_type = XGL_BBOX_F2D;
bbox_f2d.box.f2d.xmin = bbox_f2d.box.f2d.ymin = 100.0;
bbox_f2d.box.f2d.xmax = bbox_f2d.box.f2d.ymax = 200.0;

xgl_context_check_bbox(ctx, prim_type, (Xgl_bbox *)(&bbox_f2d),
&geom_status);

/* set up the Xgl_bbox_status structure */
bbox_status.bbox_type = XGL_BBOX_STATUS;
bbox_status.box.status = geom_status;

pl.bbox = (Xgl_bbox *)(&bbox_status);
xgl_multimarker(ctx, &pl);
}
```

The geometry status calculated by xgl_context_check_bbox only applies to XGL non-gcache primitives such as **xgl_multimarker**(3). For XGL gcache operators, such as **xgl_gcache_multimarker**(3), applications should use one of the following bounding box structures, instead of *Xgl_bbox_status*, to pass bounding box information to XGL:

Xgl_bbox_i2d
Xgl_bbox_f2d
Xgl_bbox_d2d
Xgl_bbox_f3d
Xgl_bbox_d3d

For polygonal primitives, if the application knows that the primitives contained in the bounding box are all front facing (or back facing), it can give this hint to XGL by logically OR'ing the flag XGL_GEOM_STATUS_FACING_FRONT (or XGL_GEOM_STATUS_FACING_BACK) with the geometry status calculated by xgl_context_check_bbox, before the application passes the geometry status to XGL non-gcache drawing operators using the Xgl_bbox_status structure.

It is the application's responsibility to ensure that all geometry statuses it passes to XGL operators are correct. Thus, if any of the XGL context attributes affecting the MC to DC transformation and clipping (or affecting the front/back facing status) is modified, the geometry status needs to be re-calculated.

If the application does not want to take advantage of the optimization provided by the geometry status feature, it can always set the geometry status to zero.

RETURN VALUE

Nothing is returned.

SEE ALSO

xgl_struct(3)
XGL_CTX_THRESHOLD(3)