NAME

xgl_context_copy_buffer – copies a block of pixels from one buffer to another

SYNOPSIS

#include <xgl/xgl.h>

```
void  xgl_context_copy_buffer (
        Xgl_ctx            dest_ctx,
        Xgl_bounds_i2d     *rectangle,
        Xgl_pt_i2d         *position,
        Xgl_ras            src_ras );
```

DESCRIPTION

This operator copies a rectangular block of pixels from a buffer in the *source* Raster to one or more of the Raster buffers associated with the *destination* Context.

For the simple case of copying from a memory raster with 1 buffer to a non-multi buffered window raster, the pixels are copied from the draw buffer of a source raster to a draw buffer of a raster associated with a destination Context.

For more complicated cases with multiple buffers, the application program must set attributes to specify the buffers to be used as the source buffer and the destination buffer. The buffer to be used as source in the source Raster *src_ras* is specified by the source raster's attribute **XGL_RAS_SOURCE_BUFFER**(3)**.** The buffer(s) to be used as destination in the Raster associated to the destination Context *dest_ctx* is determined by the destination context attribute **XGL_CTX_RENDER_BUFFER**(3)**.**

The area that is copied is specified by a rectangular region, *rectangle*, in the source buffer. It is copied into the destination buffer starting at the specified *position*. The rectangular region that is copied is not clipped to DC viewport. It is clipped by the maximum dimension of the draw buffer as defined by **XGL_DEV_MAXIMUM_COORDINATES**(3)**.** If the *position* is a NULL pointer, the top and left corner position is used. If the rectangle is a NULL pointer, the maximum area from the source buffer is copied.

Copying is only supported between buffers of the same type. That is, copying can be between image buffers or between Z buffers. The attribute **XGL_RAS_SOURCE_BUFFER**(3) of the source raster *src_ras* takes on values:

XGL_BUFFER_SEL_Z

For this attribute value, if the destination context attribute value for **XGL_CTX_-RENDER_BUFFER**(3) has XGL_RENDER_Z_BUFFER as one of the render buffers, then the destination buffer is the Z buffer of the raster associated with the destination Context *dest_ctx*. Thus, copying takes place from the source raster's Z buffer to the destination raster's Z buffer.

XGL_BUFFER_SEL_DRAW

For this attribute value, if the destination context attribute value for **XGL_CTX_-RENDER_BUFFER**(3) has XGL_RENDER_DRAW_BUFFER and/or XGL_RENDER_DISPLAY_-BUFFER, then copying takes place from the draw buffer to the image buffer(s) specified by attribute **XGL_CTX_RENDER_BUFFER**(3)**.**

A Value between 0 to N-1

If the destination context attribute value for **XGL_CTX_RENDER_BUFFER**(3) has XGL_-

RENDER_DRAW_BUFFER and/or XGL_RENDER_DISPLAY_BUFFER, then copying takes place from the buffer specified by attribute **XGL_RAS_SOURCE_BUFFER**(3) to the image buffer(s) specified by attribute **XGL_CTX_RENDER_BUFFER**(3).

Copy from a Z Buffer to another Z Buffer

When copying takes place between Z buffers, a plain copy is done. Specifically, the Z mask (specified by **XGL_3D_CTX_Z_BUFFER_WRITE_MASK**(3)) and the Z comparison function (specified by **XGL_3D_CTX_Z_BUFFER_COMP_METHOD**(3)) are ignored; the destination Z buffer is set to the value contained in the source Z buffer, given the precision limitations described below. In addition, the attribute **XGL_3D_CTX_HLHSR_MODE**(3) should be set to XGL_HLHSR_Z_BUFFER in the Context *dest_ctx*.

The Z buffers are assumed to have a depth up to a maximum of 24 bits or (2^{24} - 1).

(a) Copying is possible between memory Raster's Z buffers. (All memory Rasters have a Z buffer depth of 24).

(b) Copying is possible from a window Raster's Z buffer to another window Raster's Z buffer only if they are from the same physical frame buffer (which implicitly means they are of the same depth).

(c) When copying from a window raster to a memory raster, if the window raster's Z depth is less than 2^{24} - 1, then the window raster's Z buffers are copied into the least significant bits of the memory Raster's Z buffer.

(d) When copying from a memory raster to a window raster, if the window raster's Z depth is less than 2^{24} - 1, then the least significant bits of memory Raster's Z buffer are copied into the window Raster's Z buffer.

Copy from an Image Buffer to another Image Buffer

When copying takes place between image buffers, then the ROP mode, plane mask, and the fill rule defined in the destination Context with **XGL_CTX_ROP**(3), **XGL_CTX_PLANE_-MASK**(3) and **XGL_CTX_RASTER_FILL_STYLE**(3) attributes are enforced during this operation.

When copying to and from a memory raster, be sure that the memory raster has a Color Map which corresponds to its color type.

If the source raster of a copy operation is from a partially obscured window, the results of copying the obscured part is device dependent. This is true even if backing store is enabled. The application is responsible for repairing these areas if necessary.

Unobscured windows, on the other hand, will be properly clipped, even if the source rectangle extends beyond the window boundaries.

The following table specifies the supported configurations for copying between Raster Devices' image buffers.

From Source → To Destination

		Source						
Des		M1	M4i	M8i	Mrgb	W4i	W8i	Wrgb
t	M1	X	X	X	X	X	X	X
i	M4i	Y	Y	X	X	Y	X	X
n	M8i	Y	Y	Y	X	Y	Y	X
a	Mrgb	Y	X	Y	Y	X	Y	Y
t	W4i	Y	Y	X	X	Y∗	X	X
i	W8i	Y	Y	Y	X	X	Y∗	X
o	Wrgb	Y	X	Y	Y	X	X	Y∗
n								

Where: M1 = 1 bit deep memory raster
M4i = 4 bit deep memory raster whose color type is XGL_COLOR_INDEX
M8i = 8 bit deep memory raster whose color type is XGL_COLOR_INDEX
Mrgb = a memory raster whose color type is XGL_COLOR_RGB
W4i = 4 bit deep window raster whose color type is XGL_COLOR_INDEX
W8i = 8 bit deep window raster whose color type is XGL_COLOR_INDEX
Wrgb = a window raster whose color type is XGL_COLOR_RGB

Key: X : not supported
Y : supported
Y∗ : only supported if the src and dest window raster are the same.

When the source raster is a 1 bit memory raster, and depending on the *fill style* used, the following applies:

- When a pixel in the source raster is 1 and **XGL_CTX_RASTER_FILL_STYLE**(3) is XGL_RAS_FILL_COPY or XGL_RAS_FILL_STENCIL, the **XGL_CTX_SURF_FRONT_COLOR**(3) is written to the destination raster.
- When a source pixel is 0, and **XGL_CTX_RASTER_FILL_STYLE**(3) is XGL_RAS_FILL_COPY, the **XGL_CTX_BACKGROUND_COLOR**(3) is written. However, if the fill style is XGL_RAS_FILL_STENCIL, then the background color is unchanged.

The color type refers to **XGL_DEV_COLOR_TYPE**(3) of the corresponding devices.

SEE ALSO

XGL_3D_CTX_HLHSR_MODE(3)
XGL_3D_CTX_Z_BUFFER_COMP_METHOD(3)
XGL_3D_CTX_Z_BUFFER_WRITE_MASK(3)
XGL_CTX_BACKGROUND_COLOR(3)
XGL_CTX_PLANE_MASK(3)
XGL_CTX_RASTER_FILL_STYLE(3)
XGL_CTX_RENDER_BUFFER(3)
XGL_CTX_ROP(3)
XGL_CTX_SURF_FRONT_COLOR(3)
XGL_DEV_COLOR_TYPE(3)

XGL_DEV_MAXIMUM_COORDINATES(3)
XGL_RAS_SOURCE_BUFFER(3)

NOTES

Copying on a Z buffer is supported on a 3D Context only. During this operation, **XGL_3D_CTX_HLHSR_MODE**(3) should be set to XGL_HLHSR_Z_BUFFER. The Z buffer is created when the **XGL_3D_CTX_HLHSR_MODE**(3) is set to XGL_HLHSR_Z_BUFFER for the first time.

XGL_CTX_RENDER_BUFFER(3) is a logical OR of XGL_RENDER_DRAW_BUFFER, XGL_RENDER_DISPLAY_BUFFER, and XGL_RENDER_Z_BUFFER. In order for the operation to be performed on a Z-buffer, the application should only use XGL_RENDER_Z_BUFFER. This results in operation on the selected image buffer and the ignoring of the Z-buffer.