

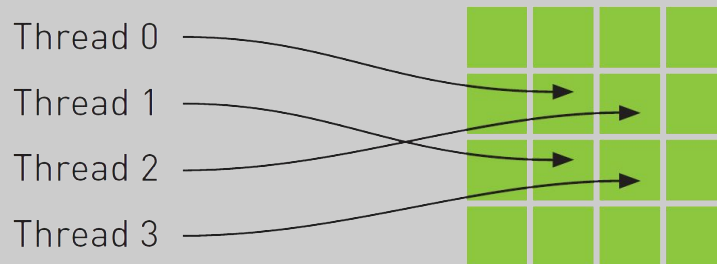
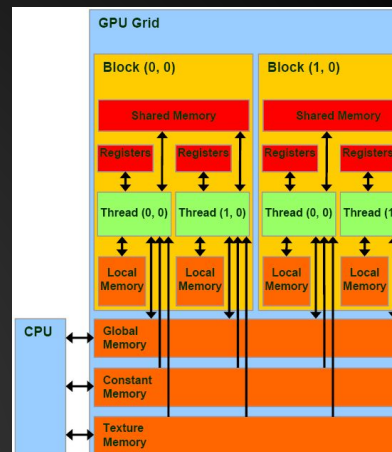
CUDA Texture Memory

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Texture Memory

- **texture**
- Read-only
- memoria utilizada en OpenGL/DirectX rendering Pipeline
- Reduce el uso de la banda ancha de memoria
- Cached on-chip per SM
- **Memory access pattern**



Texture Memory

- Utilizando Texture memory 1D
 - Definimos 3 texturas : variables globales
 - texture<type>
 - texConstSrc -> lena

```
texture<float> texConstSrc;
```



Texture Memory - Heat Transfer

- Utilizando Texture memory
 - `cudaBindTexture`
 - Definir un buffer
 - Ej : `d_pic`
 - Definir un nombre
 - Ej : `texConstSrc`

```
cudaMalloc( (void**) &d_pic, imageSize );
```

```
cudaBindTexture( NULL, texConstSrc, d_pic, imageSize );
```



Texture Memory - Heat Transfer

- Utilizando Texture memory
- Leer en la textura
 - `tex1Dfetch(texture,offset)`

```
unsigned char c = tex1Dfetch(texConstSrc,offset);
```



Texture Memory - Heat Transfer

- Cleanup

```
cudaUnbindTexture ( texConstSrc );  
cudaFree ( d_pic );
```



Texture Memory - Heat Transfer

- Utilizando Texture memory 2D

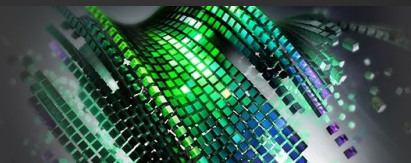
```
texture<float,2> texConstSrc;  
texture<float,2> texIn;  
texture<float,2> texOut;
```



Texture Memory - Heat Transfer

- Utilizando Texture memory 2D
 - Acceso simplificado `tex2D(texture,idx,idy)`

texture 2D	texture 1D
<pre>c = tex2D(texIn,x,y);</pre>	<pre>c = tex1Dfetch(texIn,offset);</pre>



Texture Memory - Heat Transfer

- Utilizando Texture memory 2D
 - `cudaBindTexture2D`
 - `cudaCreateChannelDesc`
 - Channel format Descriptor -> float

Texture 2D

```
//Once  
cudaChannelFormatDesc desc =  
cudaCreateChannelDesc<unsigned char>();  
  
cudaBindTexture2D( NULL, texConstSrc,  
                  d_pic, desc, imgw, imgh,  
                  sizeof(unsigned char) * DIM  
);
```

Texture 1D

```
cudaBindTexture( NULL, texConstSrc,  
                d_pic,  
                imageSize );
```



Texture Memory

- Texture 1D / Texture 2D
 - Escoger entre 1D y 2D depende del caso estudiado
 - Mismo rendimiento
 - Access pattern

