

iiRT on the PS3™

Joaquin Madruga (Quasar Advanced Apps Group)

iRT Overview

- From the Quasar Advanced Apps Group
 - Barry Minor, Mark Nutter and Joaquin Madruga
- An interactive Ray Tracer
 - Handles large models (millions of triangles)
 - Interactive frame rates
 - High Def output (1080P)
 - Scalable across multiple Cell Blades and/or PS3s
 - Supports textures, super sampling, reflection, refraction, ambient occlusion, shadows and custom shaders
 - Written using an open toolchain (Cell SDK)

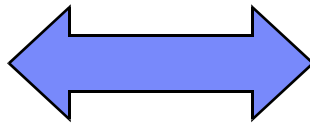


iRT on PS3

- ◆ Can run both Client or Server
- ◆ Client
 - ◆ Runs YDL5, FC5, FC6 (NOT GameOS).
 - ◆ Runs the Cell SDK 2.0.
 - ◆ Can decode 1080P images at interactive rates.
 - ◆ Uses SIXAXIS for user input.
 - ◆ Uses its six SPE's to decode image data
 - ◆ Does not use any GPU Acceleration
- ◆ Server
 - ◆ Renders images using 5 SPE's and Compresses images with 6th



System Architecture



Gigabit Network



Clients Supported

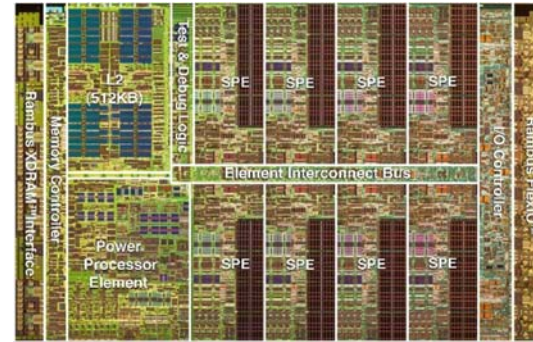
- PS3
- x86

Servers Supported

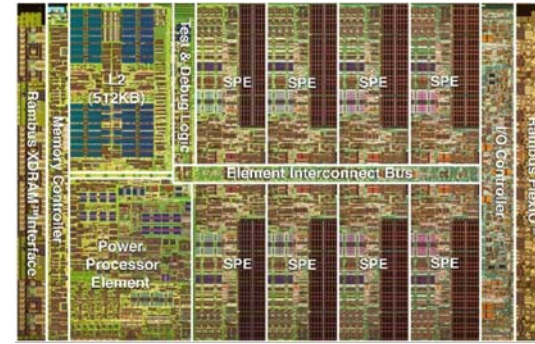
- QS20 Cell Blades
- PS3 (YDL 5, FC5, FC6)

The Server

- ◆ Multiple server and server types supported.
- ◆ The same binary works across QS20 Cell Blades and PS3s
- ◆ The PPE
 - ◆ Rebalances rendering work across the SPEs
 - ◆ Balances work across all SPE's in the system
 - ◆ Handles network I/O
 - ◆ Receives region and input data.
 - ◆ Sends compressed image data
- ◆ The SPE
 - ◆ N-1 SPE's render the scene
 - ◆ 1 SPE uses a JPEG like image compression to compress the image



The Client



- ◆ Divides the image and distributes work across the servers
- ◆ Can be compiled to run on a PS3 or x86 box.
- ◆ Multithreaded
 - ◆ Rebalances rendering work across the Servers.
 - ◆ Decompresses image. Copies image data to framebuffer.
 - ◆ Handles user input.
- ◆ The SPE (PS3 only)
 - ◆ 6 SPEs decompress image data.
 - ◆ Renders into a framebuffer (No GPU Acceleration Involved)

PS3 Tips

- ◆ Limited amount of memory
 - ◆ ~200MB of usable ram
- ◆ Runs Linux
 - ◆ Yellow Dog Linux 5 (YDL5)
 - ◆ Fedora Core 5, Fedora Core 6
- ◆ Simple Install
 - ◆ YDL 5 DVD + USB Flash Drive (temp)
 - ◆ FC5/FC6 PPC DVD + PS3 Addon Pack + USB Flash Drive (temp)
 - ◆ High Def HDCP Display
 - ◆ USB Keyboard/Mouse
- ◆ HDCP Compliant Monitor **REQUIRED!!!!**
 - ◆ Can use HDMI->DVI Cable, but HDCP is required
 - ◆ Requires that the monitor support a PS3 output resolution/refresh rate
 - ◆ NOT All monitors with HDCP support PS3 output resolutions.



PS3 Tips (Cont)

- ◆ Select your resolution with 'ps3videomode'
- ◆ Should use a “lightweight” window manager.
 - ◆ XFCE4 or Enlightenment (or don't launch X)
 - ◆ Gnome/KDE are heavy weight
- ◆ No accelerated access to the RSX (GPU)
 - ◆ OpenGL is done in software through Mesa
 - ◆ Can write to framebuffer with documented ioctl calls
- ◆ SIXAXIS can be used
 - ◆ No motion support enabled yet.
 - ◆ Must be connected with USB cable
- ◆ Wireless is not currently supported.
- ◆ Odd partitioning scheme
 - ◆ 10GB for GameOS or Linux
 - ◆ Rest goes to the other. (Regardless of drive size)



Power.ORG ™