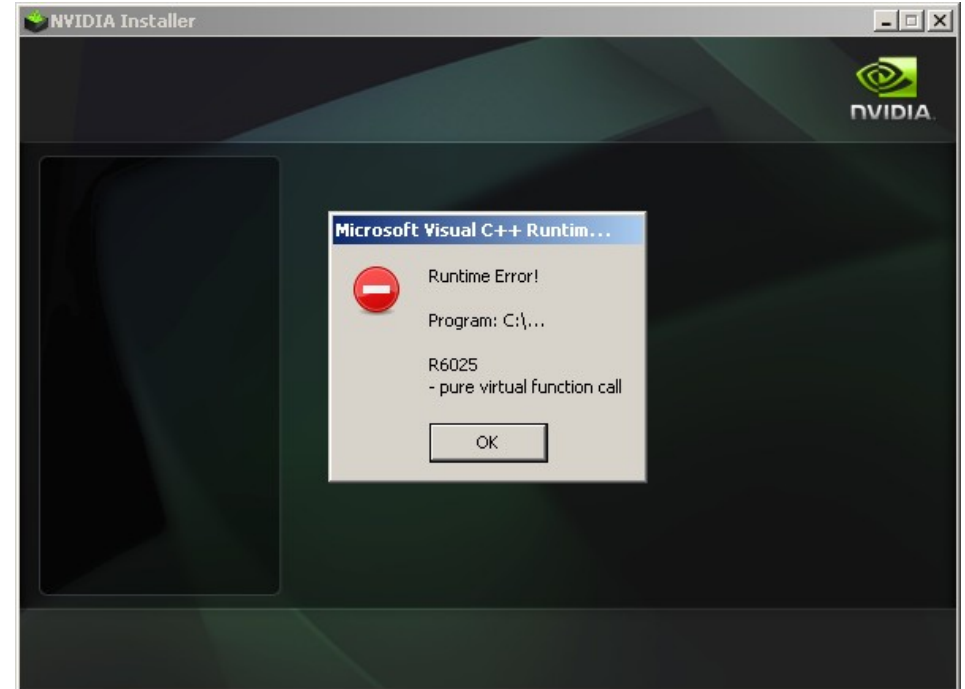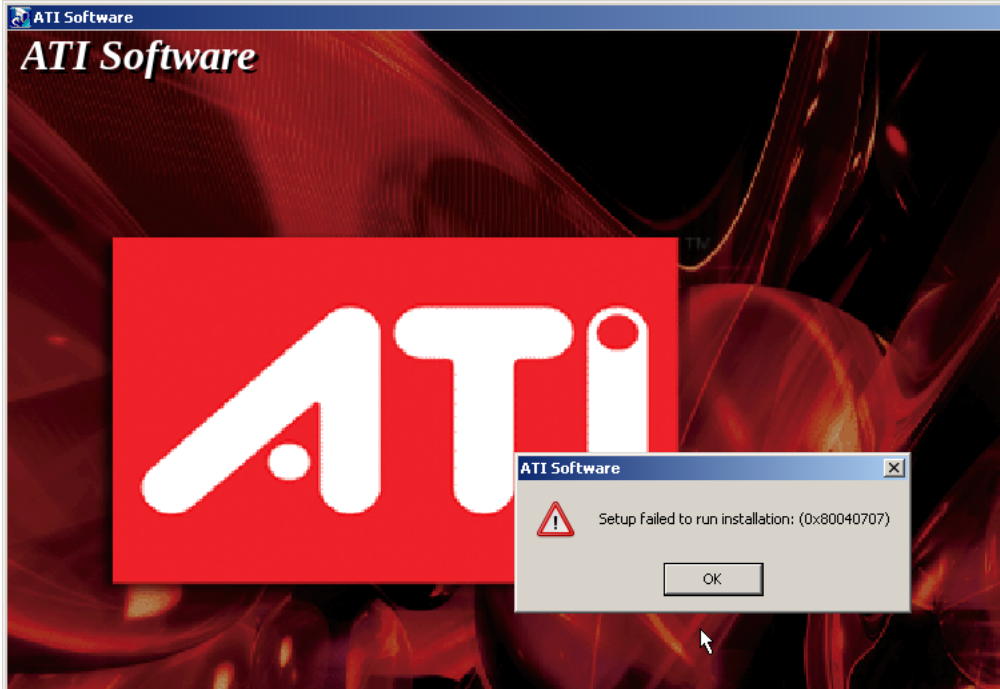# Introducing Kaasimir

GPU Testing Made Simple

Colin Finck <colin@reactos.org>

ReactOS
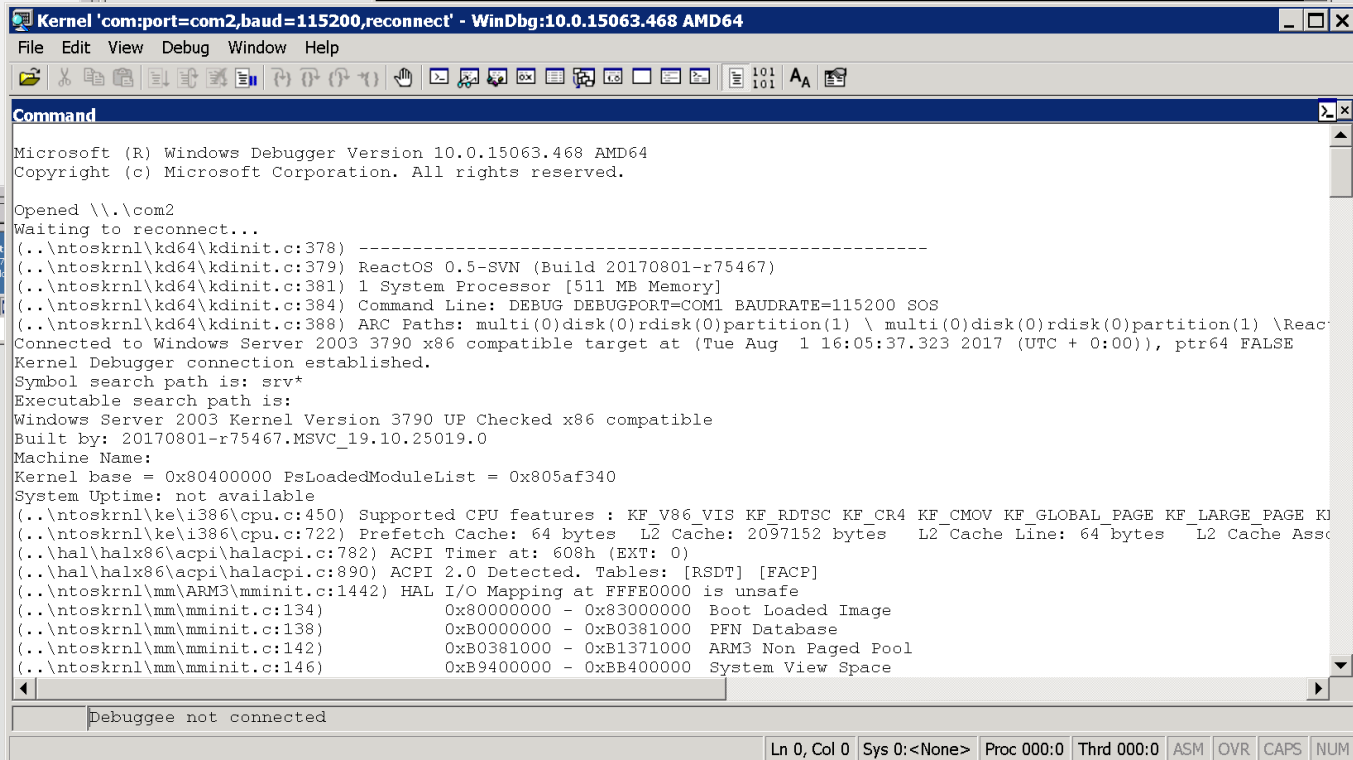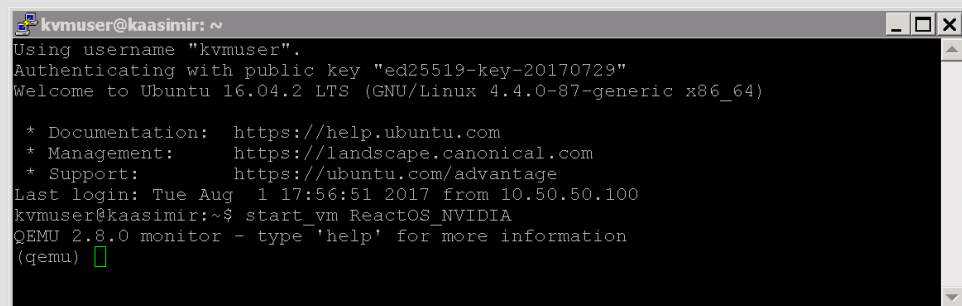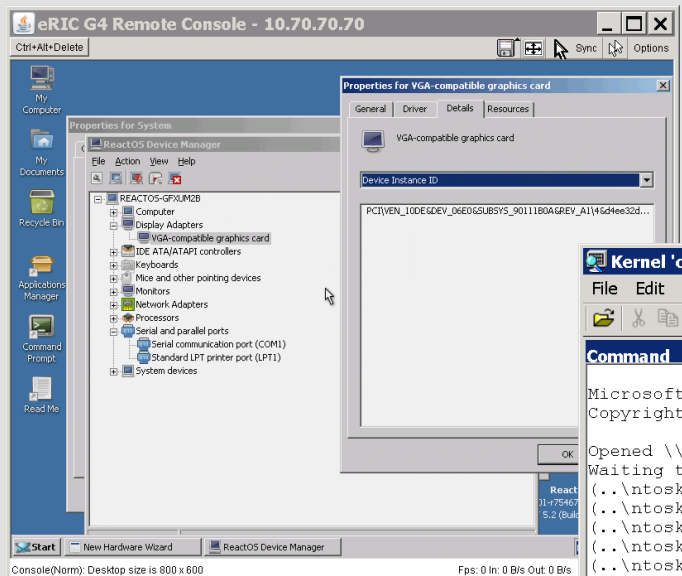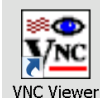
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The Problem

The Problem

- Major GPU Drivers still don't work under ReactOS

- Testing them on Real Hardware is tedious,
  and requires hardware

- If there only was a way to debug this like a VM...

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The Solution

Desktop Icons

- Computer
- WinDbg (X64)
- Recycle Bin
- KVM Browser
- KVM Shell
- Mozilla Firefox
- Visual Studio 2017
- VNC Viewer

eRIC G4 Remote Console - 10.70.70.70

Ctrl+Alt+Delete   Sync   Options

Properties for VGA-compatible graphics card

General | Driver | Details | Resources

VGA-compatible graphics card

Device Instance ID

PCI\VEN_10DE&DEV_06E0&SUBSYS_90111B0A&REV_A1\4&d4ee32d...

Properties for System

ReactOS Device Manager

File Action View Help

- REACTOS-GFXUM2B
  - Computer
  - Display Adapters
    - VGA-compatible graphics card
  - IDE ATA/ATAPI controllers
  - Keyboards
  - Mice and other pointing devices
  - Monitors
  - Network Adapters
  - Processors
  - Serial and parallel ports
    - Serial communication port (COM1)
    - Standard LPT printer port (LPT1)
  - System devices

OK

Console(Norm): Desktop size is 800 x 600   Fps: 0 In: 0 B/s Out: 0 B/s

Start | New Hardware Wizard | ReactOS Device Manager

kvmuser@kaasimir: ~

```
Using username "kvmuser".
Authenticating with public key "ed25519-key-20170729"
Welcome to Ubuntu 16.04.2 LTS (GNU/Linux 4.4.0-87-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage
Last login: Tue Aug  1 17:56:51 2017 from 10.50.50.100
kvmuser@kaasimir:~$ start_vm ReactOS_NVIDIA
QEMU 2.8.0 monitor - type 'help' for more information
(qemu)
```

Kernel 'com:port=com2,baud=115200,reconnect' - WinDbg:10.0.15063.468 AMD64

File Edit View Debug Window Help

Command

```
Microsoft (R) Windows Debugger Version 10.0.15063.468 AMD64
Copyright (c) Microsoft Corporation. All rights reserved.

Opened \\.\com2
Waiting to reconnect...
(..\ntoskrnl\kd64\kdinit.c:378) -----------------------------------------------------
(..\ntoskrnl\kd64\kdinit.c:379) ReactOS 0.5-SVN (Build 20170801-r75467)
(..\ntoskrnl\kd64\kdinit.c:381) 1 System Processor [511 MB Memory]
(..\ntoskrnl\kd64\kdinit.c:384) Command Line: DEBUG DEBUGPORT=COM1 BAUDRATE=115200 SOS
(..\ntoskrnl\kd64\kdinit.c:388) ARC Paths: multi(0)disk(0)rdisk(0)partition(1) \ multi(0)disk(0)rdisk(0)partition(1) \Reac
Connected to Windows Server 2003 3790 x86 compatible target at (Tue Aug  1 16:05:37.323 2017 (UTC + 0:00)), ptr64 FALSE
Kernel Debugger connection established.
Symbol search path is: srv*
Executable search path is:
Windows Server 2003 Kernel Version 3790 UP Checked x86 compatible
Built by: 20170801-r75467.MSVC_19.10.25019.0
Machine Name:
Kernel base = 0x80400000 PsLoadedModuleList = 0x805af340
System Uptime: not available
(..\ntoskrnl\ke\i386\cpu.c:450) Supported CPU features : KF_V86_VIS KF_RDTSC KF_CR4 KF_CMOV KF_GLOBAL_PAGE KF_LARGE_PAGE KI
(..\ntoskrnl\ke\i386\cpu.c:722) Prefetch Cache: 64 bytes  L2 Cache: 2097152 bytes  L2 Cache Line: 64 bytes  L2 Cache Asso
(..\hal\halx86\acpi\halacpi.c:782) ACPI Timer at: 608h (EXT: 0)
(..\hal\halx86\acpi\halacpi.c:890) ACPI 2.0 Detected. Tables: [RSDT] [FACP]
(..\ntoskrnl\mm\ARM3\mminit.c:1442) HAL I/O Mapping at FFFE0000 is unsafe
(..\ntoskrnl\mm\mminit.c:134)           0x80000000 - 0x83000000  Boot Loaded Image
(..\ntoskrnl\mm\mminit.c:138)           0xB0000000 - 0xB0381000  PFN Database
(..\ntoskrnl\mm\mminit.c:142)           0xB0381000 - 0xB1371000  ARM3 Non Paged Pool
(..\ntoskrnl\mm\mminit.c:146)           0xB9400000 - 0xBB400000  System View Space
```

Debuggee not connected

Ln 0, Col 0 | Sys 0:<None> | Proc 000:0 | Thrd 000:0 | ASM | OVR | CAPS | NUM

Taskbar

Start | Firefox | Kernel ... | Overvie... | eRIC G4... | kvmuse...

DE   4:10 PM   8/1/2017

eRIC G4 Remote Console - 10.70.70.70

Ctrl+Alt+Delete

Sync Options

My Computer

Recycle Bin

NVIDIA GeForce 9300 GE Properties

General | Driver | Details | Resources

NVIDIA GeForce 9300 GE

Display adapters
NVIDIA

PCI bus 1, device 0, function 0

...king properly.

...problems with this device, click Troubleshoot to ...oter.

Troubleshoot...

...ble)

OK   Cancel

DirectX Diagnostic Tool

System | DirectX Files | Display | Sound | Input | Network | More Help

Device

Name: NVIDIA GeForce 9300 GE
Manufacturer: NVIDIA
Chip Type: GeForce 9300 GE
DAC Type: Integrated RAMDAC
Approx. Total Memory: 256.0 MB
Current Display Mode: 1024 x 768 (32 bit) (60Hz)
Monitor: Default Monitor

Drivers

Main Driver: nv4_disp.dll
Version: 6.14.0013.2101 (English)
Date: 7/27/2017 11:19:06
WHQL Logo'd: n/a
Mini VDD: nv4_mini.sys
VDD: n/a
DDI Version: 9 (or higher)

DirectX Features

DirectDraw Acceleration: Enabled   Disable   Test DirectDraw
Direct3D Acceleration: Enabled   Disable   Test Direct3D
AGP Texture Acceleration: Enabled   Disable

Notes

• No problems found.
• To test DirectDraw functionality, click the "Test DirectDraw" button above.
• To test Direct3D functionality, click the "Test Direct3D" button above.

Help   Next Page   Save All Information...   Exit

Start | Device Manager | DirectX Diagnostic Tool   4:38 PM

Console(Norm): Desktop size is 1,024 x 768   Fps: 0 In: 0 B/s Out: 0 B/s

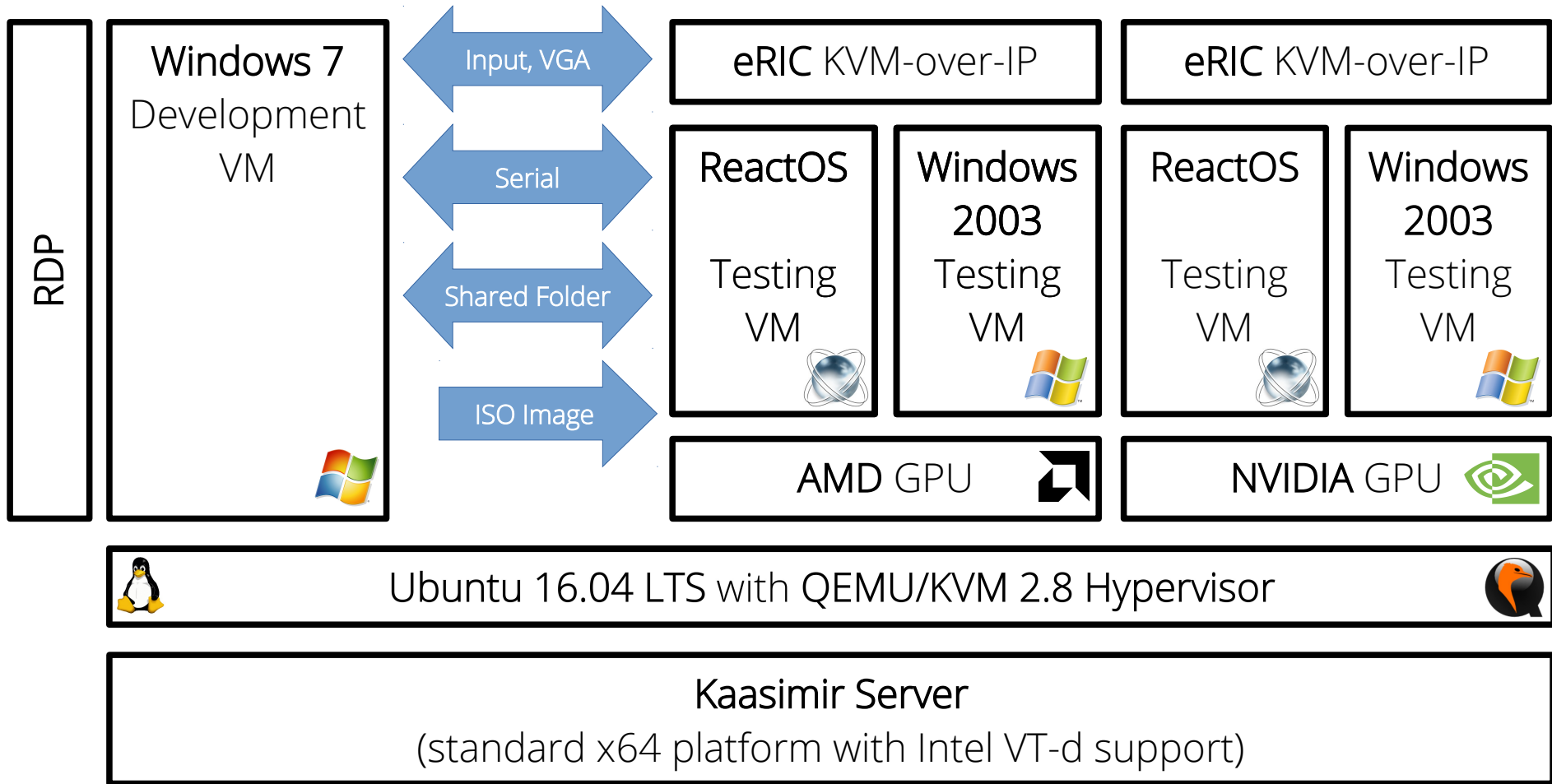eRIC G4 Remote Console - 10.70.70....

Ctrl+Alt+Delete   Sync Options

640 x 480, 60 Hz: Please press the Auto-Adjust button!

Microsoft
DIRECTX

Console(Norm): Desktop size is 640 x 480   Fps: 3 In: 122 KB/s Out: 34 B/s

RDP	Windows 7 Development VM	Input, VGA	eRIC KVM-over-IP	eRIC KVM-over-IP
		Serial	ReactOS Testing VM	Windows 2003 Testing VM	ReactOS Testing VM	Windows 2003 Testing VM
		Shared Folder		
		ISO Image	AMD GPU	NVIDIA GPU

Ubuntu 16.04 LTS with QEMU/KVM 2.8 Hypervisor

Kaasimir Server
(standard x64 platform with Intel VT-d support)

Finally an answer to the question
why you ever need 7 expansion slots ;-)

Other Use Cases

- Testing any PCIe card under ReactOS (e.g. USB 3.0)

- When you just quickly need a fast build machine or Windows VMs for testing

Cool! So where can I find it?

- Hosted privately by myself

- Developers and Testers can request an account

- You can even turn it on and off on demand

⏻ POWER	⚡ POWER HARD (4 SEC.)	🔄 RESET

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Thank you for your attention!
Questions?

Demonstration

ReactOS

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