Open Guest Firmware/IPF Test Report

Contents

1 Test Objective

Open guest firmware can meet feature requirements for both Linux and Windows guest HVMs from the following check points:

- Loadability by Xen control panel
- Availabilities of basic system components in guest HVM
    a. SMP processors
    b. Memory
    c. NIC
    d. VGA
        1. stdvga
        2. cirrus logic
    e. legacy keyboard & mouse
    f. storage devices
        1. IDE disk

2. CD-ROM

- System performance of guest HVM

2 Test Scope

The open GFW is validated through the level of guest HVM by testing guest domain creation, basic functionalities with highlighting to VGA.

3 Evaluation Criteria

1. Guest HVM of both linux and windows OS type can be booted up based on open guest firmware.

2. Supported system components can be recognized and setup by guest OS as expected mode.
   - Correct information in system device management panel.
   - Pass all diagnostics testing. (Only available in windows guest OS)

3. Each system component can be controlled by guest OS by basic operations
   - Install/Uninstall
   - Enable/Disable

4. Basic functionalities of guest HVMs are achieved.
   - Xen/IPF nightly test suite (18 test cases)
   - Guest creation via installation
   - Nvram supporting

5. Basic VGA relating operations can work and accomplish within reasonable response time.
   - Screen resolution
   - Color quality

6. Basic VGA performance measurement.

   - Overdraw/HSR:
   - Fillrate
   - T&L/High polygon count static display list
   - High memory bandwidth load/texture cache efficiency

4 Test Resource

	Name	Description
Native OS	RHEL4u3	Native OS of test machine
Software	Xen_unstable_r16580	Xen install package
	OGW Cset#: 38	Open guest firmware
	RHEL5GA	Linux guest OS
	Windows2003_sp2	Windows guest OS
	Lspci	Linux command: check network card information & status
	device manager	Window tool: check network card information & status
	Fresh Diagnose	Windows system diagnostics tool
	Glextreme	Simple graphic adapter benchmark tool
Hardware	Tiger4-5 (IPF)	Linux test machine

5 Test Results Summary

Summary:

- Guest HVM of both linux and windows OS type can be launched with or without nvram file. No abnormity detection occurred during guest HVM booting phase based on open guest firmware.
- Each system component under observation can be correctly recognized and setup by OS with expected information and the basic functionalities are achieved.
- Screen resolution and color quality setting can efficiently take effect in guest HVMs. The actual screen quality can be achieved consistently as expected.

Issues:

- Standard VGA can't be supported in either linux or windows guest HVM when stdvga option was switched on in configuration file.
  a) Linux guest HVM
     X11 desktop can't launch and the following information was given by lspci command:
     "VGA compatible controller; Technical Corp. Unknown device 1111 (prog-if 00 [VGA])"
     "Flags: fast devsel"

“Memory at c0000000 (32bit, prefetchable) [size=8M]”

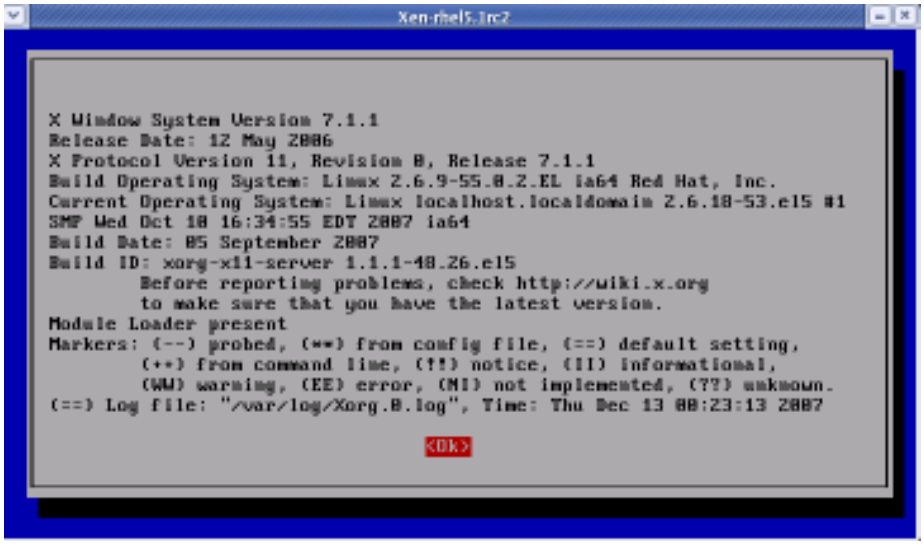

Figure1. Snapshot of linux guest HVM

b) Windows guest HVM
VGA device was recognized as Standard VGA Graphic Adapter although it failed to start.

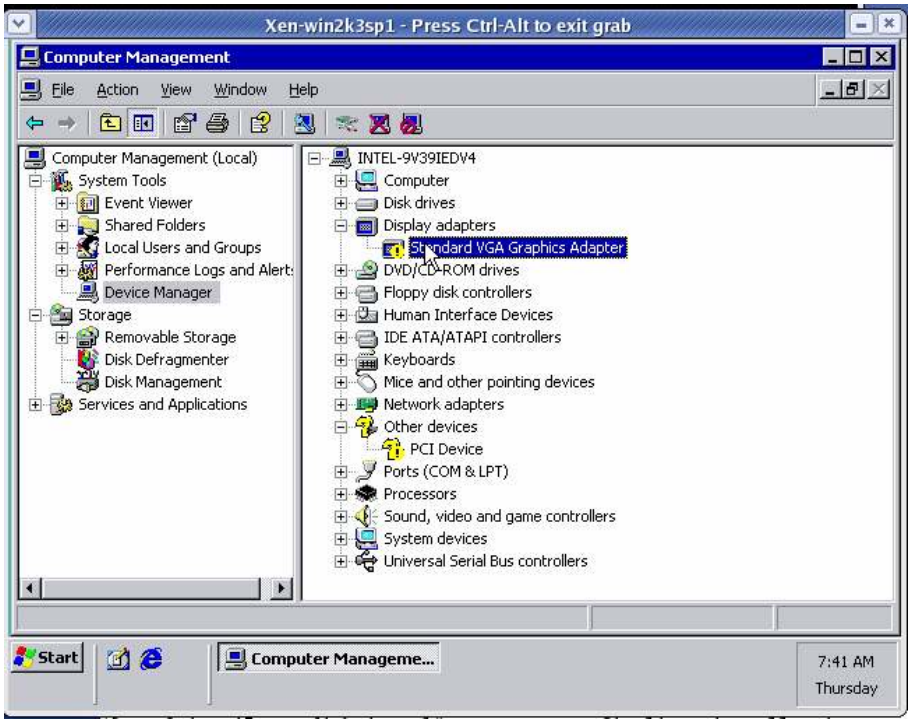

Figure2: Snapshot of windows guest HVM

- Even if configured with USB mouse in guest HVM, mouse’s behavior is too far from users’ expectation to tolerate, particularly to window guys.

6 Detailed Test Results

6.1 System Components Recognition, Setup & Controlling

ID	Check Points	Result	
		Linux	Window
1	SMP Processors	P	P
2	Memory	P	P
3	Standard VGA	F	F
4	Cirrus logic VGA	P	P
5	NIC	P	P
6	Legacy keyboard & mouse	P	P
7	IDE disk	P	P
8	CD-ROM	P	P

6.2 Basic Functionalities of Guest HVMs

ID	Check Points	Result	
		Linux	Window
1	XEN/IPF nightly test suite	P	P
2	Guest creation via installation	P	P
3	Nvram supporting	P	P

6.3 VGA Relating Operations

ID	Check Points	Result	
		Linux	Window
1	Screen resolution setting	P	P
2	Color quality setting	P	P
3	Screen quality	P	P

6.4 Basic System Diagnostics

ID	Check Points	Result	
		Linux	Window
1	Display Adapter	X	P
2	Drivers	X	P
3	Keyboard	X	P
4	Mouse	X	P
5	Ports	X	P
6	Plug & Play	X	P
7	Network & Internet	X	P
	X: Not Applicable		

6.5 Basic VGA Performance Measurement

6.5.1 Windows Guest HVM

Screen Resolution: 1024*768*24

Overdraw/HSR:

Overdraw factor 3, back to front: 123.05 fps
Overdraw factor 3, front to back: 158.66 fps
Overdraw factor 3, random order: 141.94 fps

Overdraw factor 8, back to front: 52.66 fps
Overdraw factor 8, front to back: 79.45 fps
Overdraw factor 8, random order: 70.68 fps

Fillrate:

Pixel fillrate: 298.93 MegaPixels / s
Texel fillrate: 597.79 MegaTexels / s

T&L/High polygon count static display list:

Pure transform: 7976426 vertices / s
2 point lights: 5877467 vertices / s
8 point lights: 2684247 vertices / s

2 directional lights: 7651185 vertices / s
8 directional lights: 3473590 vertices / s

High memory bandwidth load/texture cache efficiency:

One 1024x1024x32 texture: 298.31 fps
Four 1024x1024x32 textures: 298.91 fps