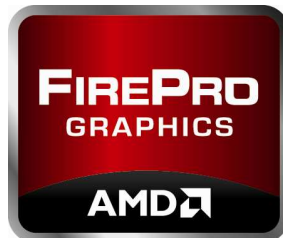


Configuring and Running a Large Video Wall using ATI FirePro™ Graphics

Revision 1.2



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Revision History

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1.0	28-Oct-2010	<ul style="list-style-type: none">Initial release by Max Ma
1.1	19-Nov-2010	<ul style="list-style-type: none">Additional input provided by Paul Janes and Alexis Mather
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Configuring and Running a Large Video Wall using ATI FirePro Graphics

The AMD workstation line of ATI FirePro graphics products allows users a variety of approaches for presenting their innovative and creative ideas.

One such approach is to configure and run a large video wall by utilizing AMD Eyefinity technology and AMD advanced synchronization technology.

This document will provide you the foundations of how to configure a large video wall and how to run an application on such a wall by using ATI FirePro V9800 along with ATI FirePro S400 synchronization modules. It is assumed that readers are familiar with and are already running cluster-aware software such as VizRT or Ventuz.

Although the sample configuration below is small, you can add more content systems to expand the display wall as required. In this example there are three workstation systems; two systems for content rendering containing two FirePro V9800 cards and one FirePro S400 sync module, and one system for control with one FirePro V8800 card and one FirePro S400 sync module.

1. Control System Configuration

The Control System (Timing Server) provides vertical frame signals which allow all the content systems (Timing Clients) to be output locked via the FirePro S400 modules. RJ45 cables connect the FirePro S400 cards which receive and output the frame signals. Therefore all the systems in the video wall cluster will be output locked, and all the displays in the cluster will scan their pixels and lines at the same time.

The Control System also sends commands to trigger rendering on content systems, and it also provides data commands during the vertical intervals to all content systems with details of which portion of data needs to be rendered. The commands are sent through a switch to each content system using RJ45 cables.

Here are the steps to configure the control system:

- a) Plug in a FrameLock/Genlock capable video card such as FirePro V8800 to provide frame signals. Since it is for control it is not necessary to use a FirePro V9800.
- b) Plug in the FirePro S400 into any available add-in slot and connect a SATA power connector into the board end of FirePro S400.
- c) Connect a sync ribbon cable from FirePro S400 to the FirePro V8800.
- d) Install the current AMD Display Driver which can be downloaded from the Support & Driver page of www.amd.com

- e) Install an application along with a data set. Run the application to make sure it installed properly.

2. Content System Configuration

Since this example configuration uses two FirePro V9800s, the motherboard/system must have two PCIe slots capable to hold the double-slot V9800, and one add-in slot in any format for holding FirePro S400 on that system.

Procedure for configuring the content system:

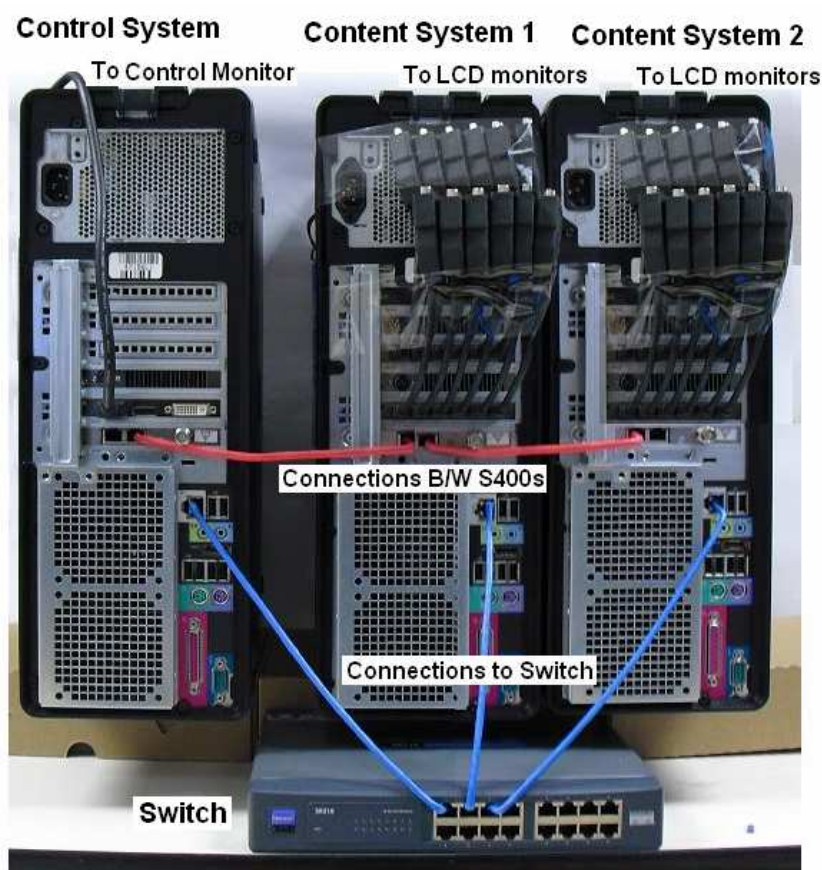
- a) Plug in two FirePro V9800s into two PCIe slots, connect one 2x3 and one 2x4 power cables into the board end of FirePro V9800 on each board
- b) Plug in the FirePro S400 into any spare add-in slot, connect the SATA power connector into the board end of FirePro S400
- c) Connect the sync ribbon cables from FirePro S400 to each FirePro V9800
- d) Connect six LCD monitors to each FirePro V9800 through mini-DisplayPort to DVI cables or through mini-DisplayPort to DisplayPort cables.
- e) Install the current AMD Display Driver which can be downloaded from the Support & Driver page of www.amd.com then reboot.
- f) Make sure the display driver installed properly by checking if the two FirePro V9800s are showing and the proper driver version is reported through:
ControlPanel → Settings → Advanced → Adapter, and through
ControlPanel → Settings → Advanced → Adapter → Properties → Driver
- g) Configure the six displays attached to each FirePro V9800 into a display group in tile style of 3x2 through AMD Catalyst Control Center → Graphics → Display Properties at resolution of 1920x1200x60Hz (user may select other resolutions and refresh rates), select one group as primary and the other group in extended, arrange the two groups either in a row or in a column.
- h) Check to make sure all the displays are presented through Catalyst Control Center → Graphics → Workstation → Synchronization
- i) Install an application along with a data set. Run the application to make sure it installed properly.

3. Cluster Configuration

In order to display all the content on different monitors at the same rate horizontally (pixel by pixel) and vertically (line by line), all the systems in the video wall cluster will have to be output locked.

In order to display different content on different monitors, as part of a large video wall, all the content systems will have to receive the data command for rendering from the control system during the vertical interval.

The figure below shows the links for synchronizing (red cables) and for networking (blue cables).



3.1 Cable connection

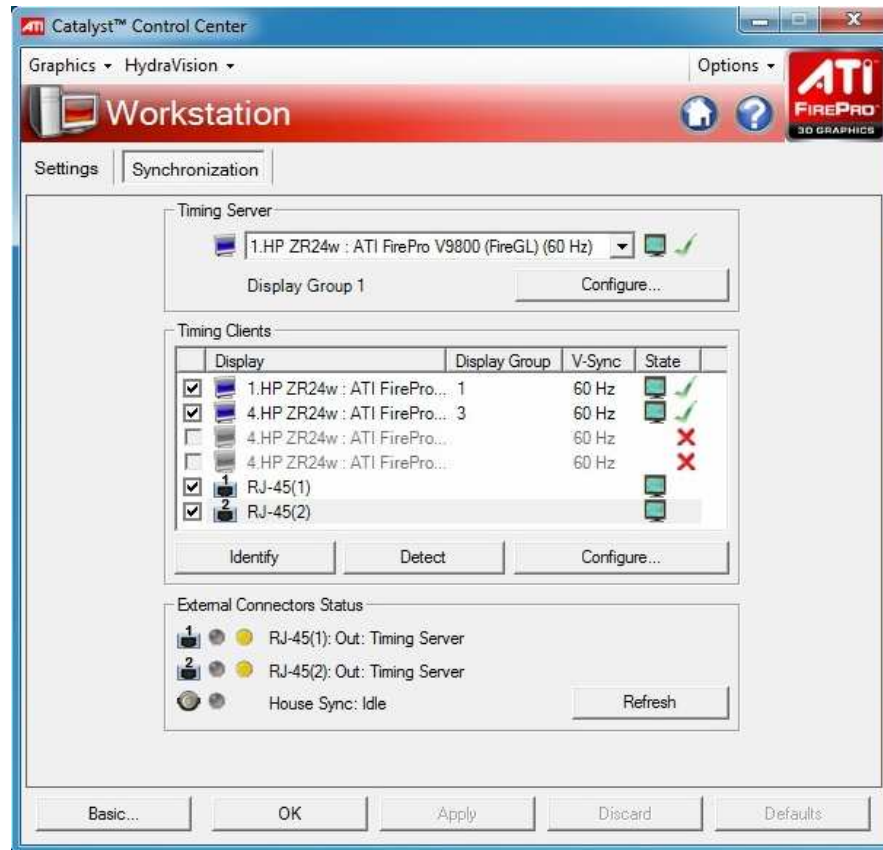
- Connect the RJ45 cables one after the other on the RJ45 connector of FirePro S400 on each system for synchronizing as shown in RED.
- Connect RJ45 cables to the switch from each system for networking as shown in BLUE.

3.2 Output Locking

- Power on all the systems and the switch in the wall cluster.
- Bring up AMD Catalyst Control Center on each system.
- Set the primary group on the control system as a “Timing Server”, so the primary group on the control system becomes the master for sending the frame signal to all other groups and systems.
- Set the extended group on the control system as the “Timing Client”.

- e) Set both primary group and extended group on the content systems as the “Timing Client” so both groups on both content systems are now output locked to the primary group on the control system.

Below is a screen-shot of the application window of AMD Catalyst Control Center → Graphics → Workstation → Synchronization:



3.3 Networking

- a) Make sure the drivers for the network interface devices on each system are installed properly by connecting to the internet and loading some websites of your choice.
- b) Disable the firewall on each system so networking between systems in the video wall cluster is allowed.
- c) Assign or re-assign the computer name for each system, for example, “Control” for control system, “Content1” for one content system and “Content2” for the other content system.
- d) Set IPs for each system as listed below:
 - 10.0.0.1 / 255.255.255.0 for Control
 - 10.0.0.2 / 255.255.255.0 for Content1
 - 10.0.0.3 / 255.255.255.0 for Content2

e) Add the following IPs and computer names into

Windows\system32\drivers\etc\Hosts:

10.0.0.1	Control
10.0.0.2	Content1
10.0.0.3	Content2

Now you should be able to ping the other systems in the video cluster, for example: “Ping Content1” from the Control system or the Content2 system.

4. Running Applications on the Video Wall

All the systems should be output locked as long as the synchronization settings are right and are maintained active as described in section 3.2 “Output Locking” above.

The Control system will send the command to start rendering on each content system, then the Control system will constantly send data commands during vertical intervals to each group on each content system, which lead to the proper portion of data to be rendered and output on the display monitors in the next vertical cycle or next couple of cycles.

Please follow the instructions from your software vendor if you desire to run a particular application.

5. Additional Notes

Some applications may take one system for two rules: Control and Content display as well. In this case more function keys may need to be created in order to provide interactive operations if the control menu will not be always seen.

Besides 3x2 tile style in configuring six displays with FirePro V9800, other configurations like 3x1, 1x3, 2x2, 2x1, and 1x2 will also be available.

Groups in different tile styles can be FrameLocked by AMD Eyefinity and AMD advanced FrameLock, but applications will have to manage each group with proper data commands so that the display on the video wall will function correctly.

Although this example explains the setup for a large video wall with 24 displays, the wall can be easily expanded by either adding two more FirePro V9800s into each content system, or cascade more content systems in the cluster.

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