



HDR Information Technology Group | *Connecting Technology & Business*

Applying The Big Picture

Multi-Screen Monitoring Center for Hydroelectric Power Plants

Clint Pearson – HDR, Infrastructure Systems Lead

The Main Point

- New Technology has dramatically changed the creative options available to help save the world from calamity!
- The NVIDIA GPU Technology Conference 2013 was the catalyst for overcoming the TVA Project challenges
- Application of what you learn here is exciting!

Disclaimers and Clarifications:

- Fellow IT Admin, sharing experiences at work
- Fellow Admin with new experiences daily.
 - Open to discussion and correction
- “I” means “we” It takes a Team!
- Not anti-Vendor A, B or C, just sharing experiences
- Sharing Limited Content ... and *very* fast!
 - More technical details are available
 - Ongoing collaboration is encouraged

INTRODUCTION – some extra info

What might we have in common?

Clint Pearson
of Kennard NE

22 years of IT experience:

Army Aviation

DeVry University – KC, MO

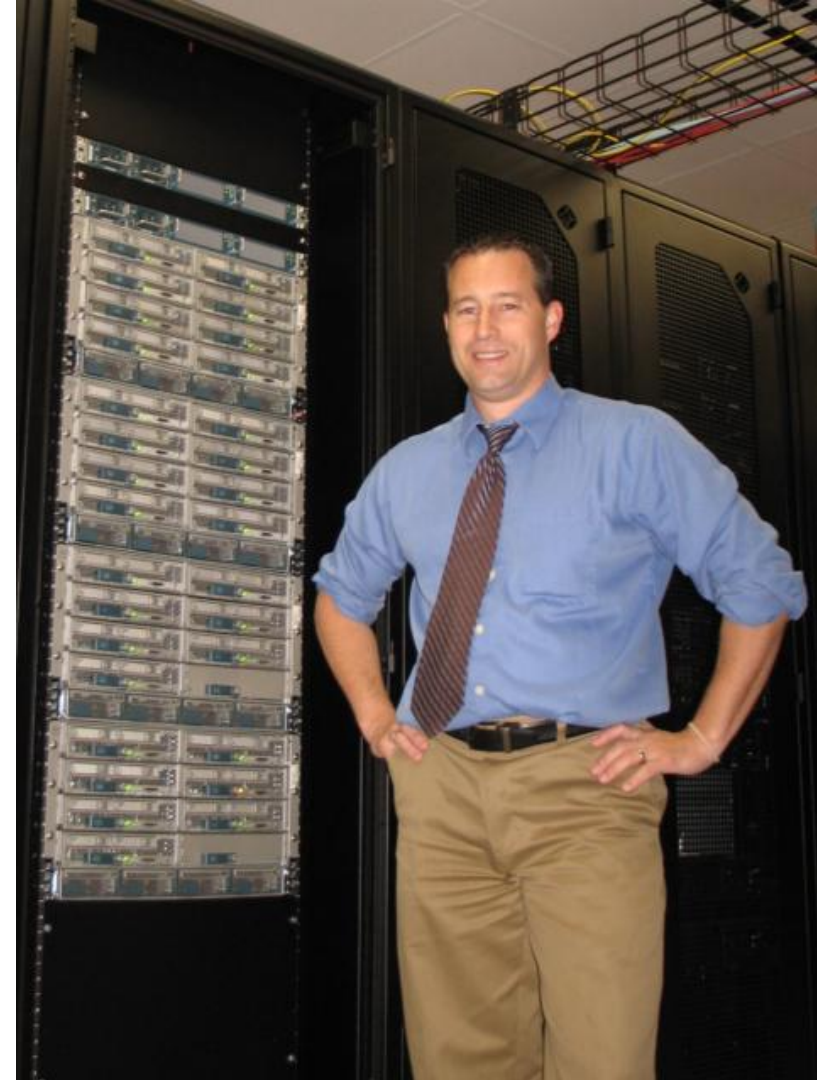
VTel – Austin, TX – the Novel Days

MACC – Blair, NE – SQL Admin

10th Year at HDR, IT Group

dba, sharepoint,

vmware, cisco ucs





Who We Are

What We Do



**NATIONAL CANCER INSTITUTE
ADVANCED TECHNOLOGY RESEARCH FACILITY**
FORT DETRICK, MARYLAND



RIVER MANAGEMENT

source: <http://www.tva.com/river>



Water used in energy production

LEARN MORE ABOUT:

Hydroelectric generation

Nuclear energy generation

Fossil generation

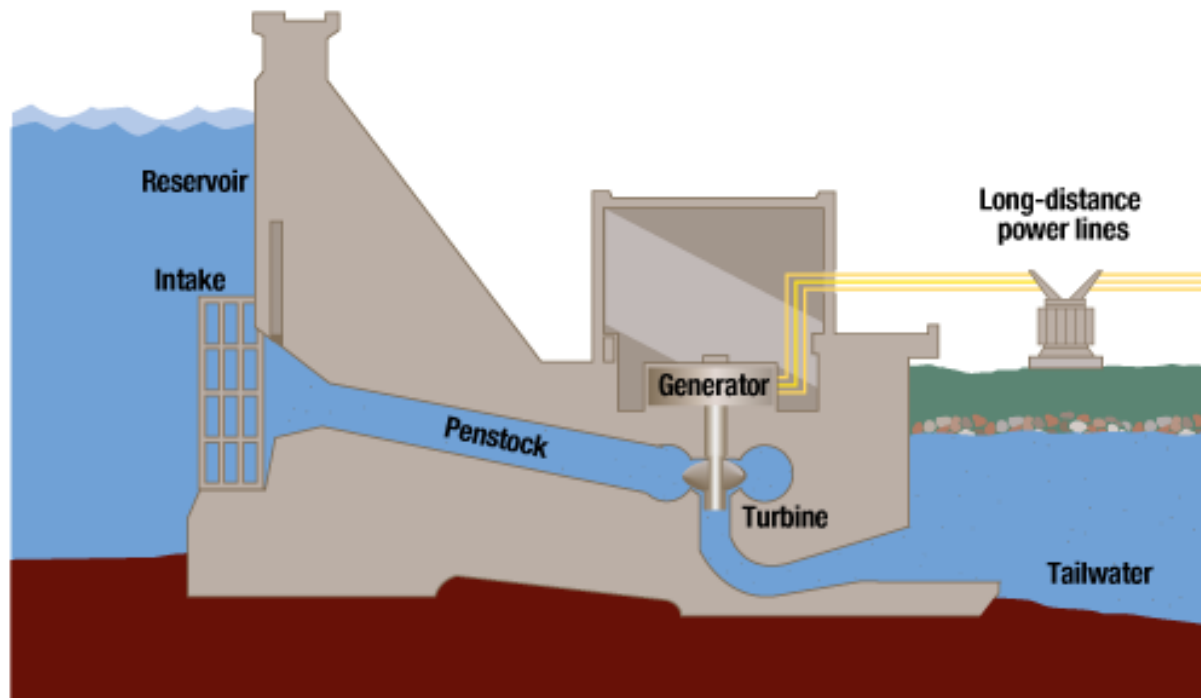
Working to balance: Energy Production Navigation Flood Control Recreation Water Supply

Source:

<http://www.tva.com/power/hydro.htm>

What is hydroelectric power?

Water is needed to run a hydroelectric generating unit. It's held in a lake behind the dam, and the force of the water being released from the lake through the dam spins the blades of a turbine. The turbine is connected to the generator that produces electricity. After passing through the turbine, the water reenters the river on the downstream side of the dam.



TVA Reservoirs and Power Plants

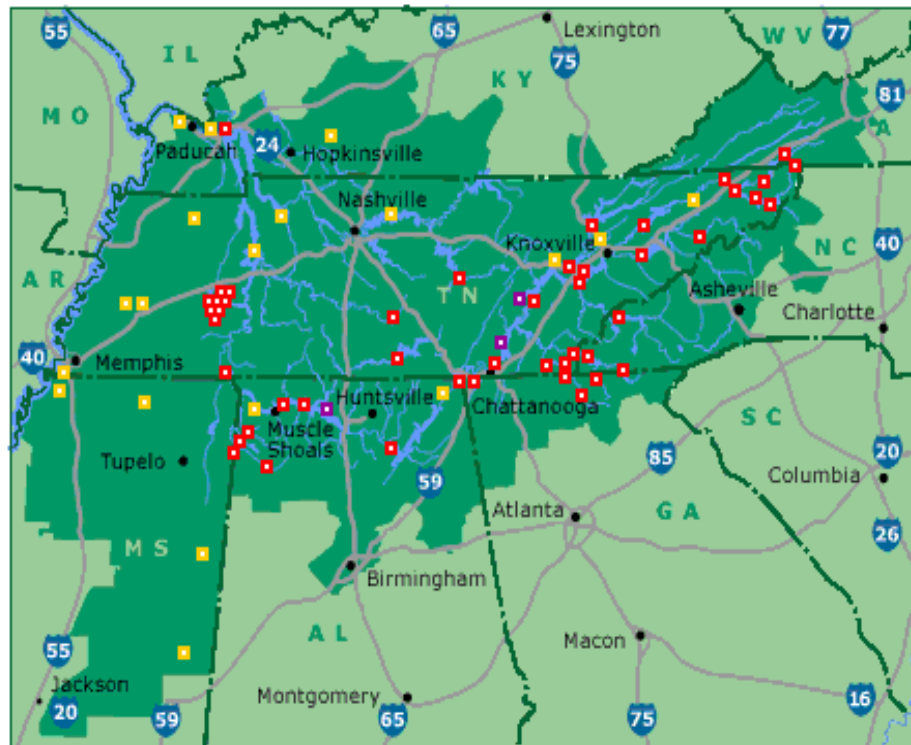
[Return to previous page](#)

Use this map to link to detailed information on all of TVA's facilities.

Point to a colored dot on the map to see the TVA site name. Click for more information.

or

Point to a name on the list to see the site location on the map. Click for more information.



Reservoirs

Apalachia
Bear Creek
Beaver Creek
Beech
Blue Ridge
Boone
Cedar
Cedar Creek
Chatuge
Cherokee
Chickamauga
Clear Creek
Dogwood
Douglas
Fontana *
Fort Loudoun
Fort Patrick Henry
Great Falls
Guntersville
Hiwassee
Kentucky *
Little Bear Creek
Lost Creek
Melton Hill

Nickajack

Nolichucky
Normandy
Norris *
Nottely
Ocoee 1
Ocoee 2
Ocoee 3
Pickwick
Pin Oak
Pine
Raccoon Mtn. *
Redbud
South Holston
Sycamore
Tellico
Tims Ford
Upper Bear Creek
Watauga
Watts Bar
Wheeler
Wilbur
Wilson

Fossil Plants

Allen
Bull Run
Brownsville
Caledonia
Colbert
Cumberland
Gallatin
Gleason
John Sevier
Johnsonville
Kemper
Kingston
Lagoon Creek
Magnolia
Marshall
Paradise
Shawnee
Southaven
Widows Creek

Nuclear Plants

Browns Ferry
Sequoyah
Watts Bar

Small TVA dams at John Sevier and Doakes Creek do not appear on this map.

source: http://www.tva.com/sites/sites_ie.htm

Remote
Sensor
Equipment

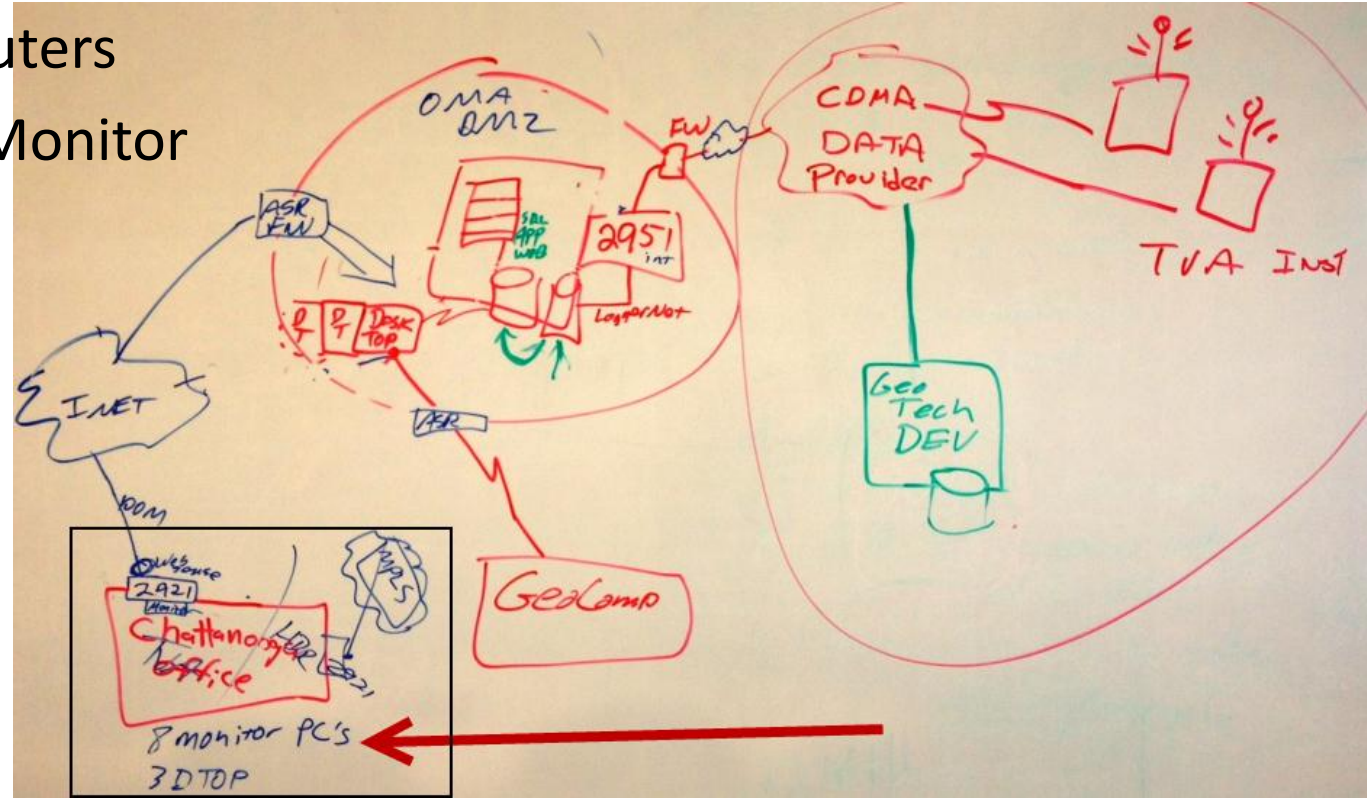


Timeline: 2012 Project Requirements

First Implementation

8 Individual Computers

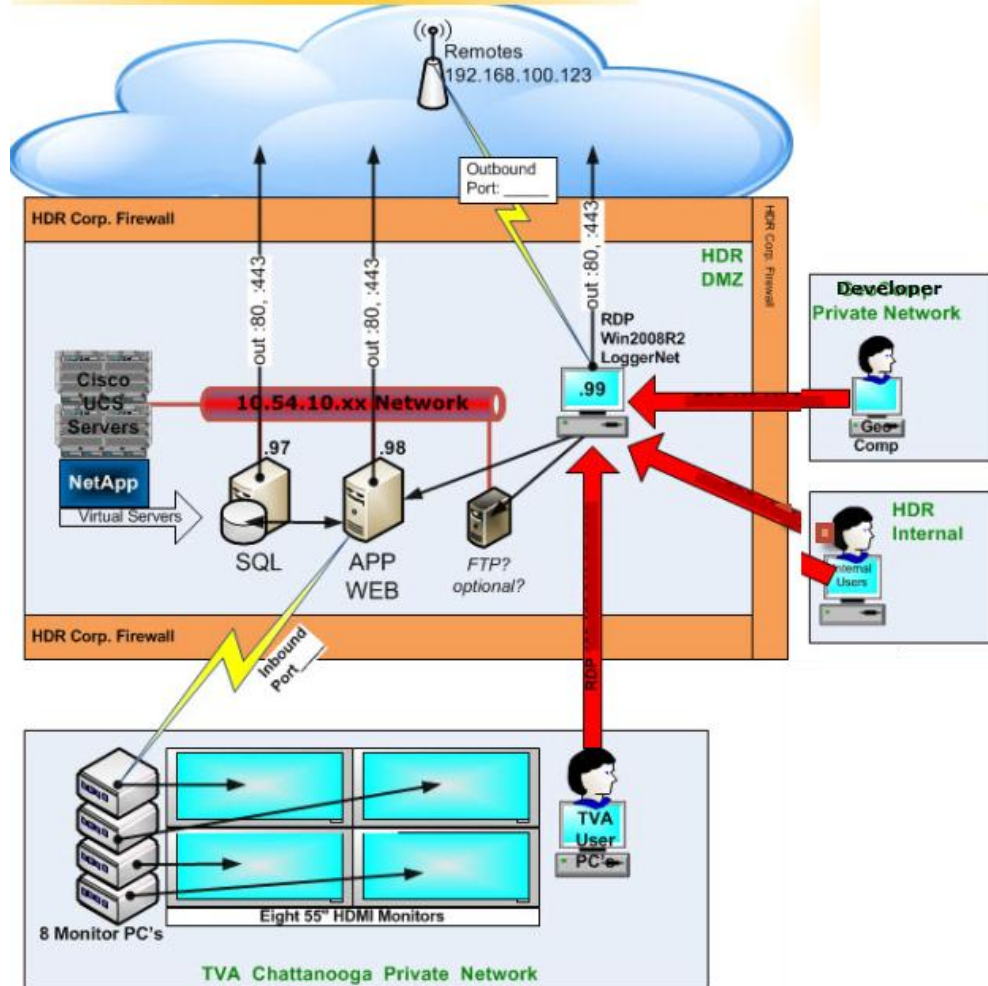
with HDMI to 1:1 Monitor



2012: First Design

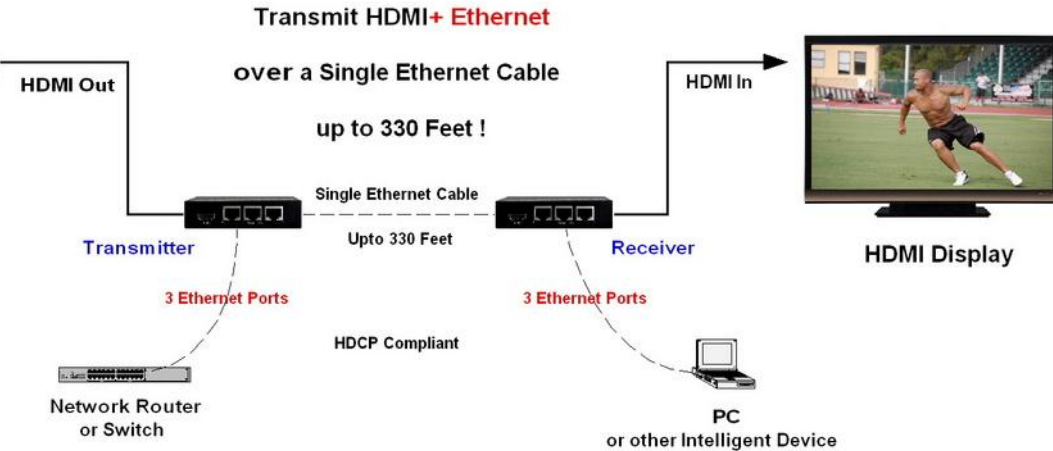
- From Whiteboard to **Visio**
- 8 Computers with 1:1 HDMI to 8 Monitors

TVA Collection System



2012: First Design – Computer Room

- From Whiteboard to Visio to **Reality**
- 8 Computers with HDMI to Ethernet

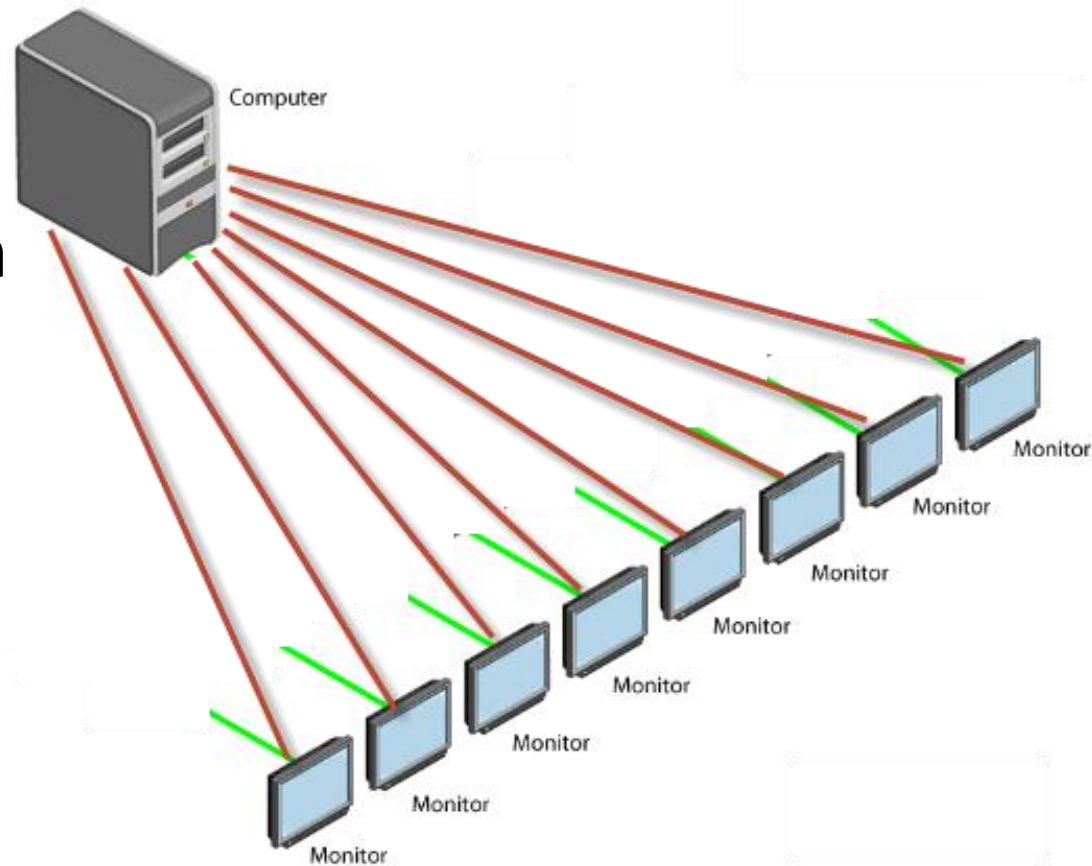


2012: First Design – Monitoring Room



Project Requirement Shift

- Client was quickly frustrated with the lack of control of each map
- Desire for 8 individual displays controlled by 1 computer, but able to become 1 large display



BEST OF GTC

Presentation

[See the Big Picture: Scalable Visualization Solutions for High Resolution Displays](#)

Doug Traill (NVIDIA)

Large format high resolution displays are being utilized everywhere from corporate conference rooms to Supercomputing facilities. NVIDIA Quadro SVS solutions provide many features to make it easier to install and utilize these large scale displa ... [Read More](#)

Keywords: Best of GTC, SIGGRAPH 2014 - ID SG4113

Media

Streaming:

[> Watch Now](#)

Download:

[> PDF](#)

COLLABORATIVE & LARGE RESOLUTION DISPLAYS

- GTC 2013 Day 1 – “Seeing The Big Picture”
- Multi-GPU System Selection Process
- Implementation of Boxx with K5000’s

GTC 2013 Demos



Timeline:

2013

- Rethinking Multi-Display for TVA
- Research and Project Adjustment Presentation
 - The cost was worth it for ability to go full screen!
- Multi-GPU System Selection Process
- Implementation of Boxx with K5000's

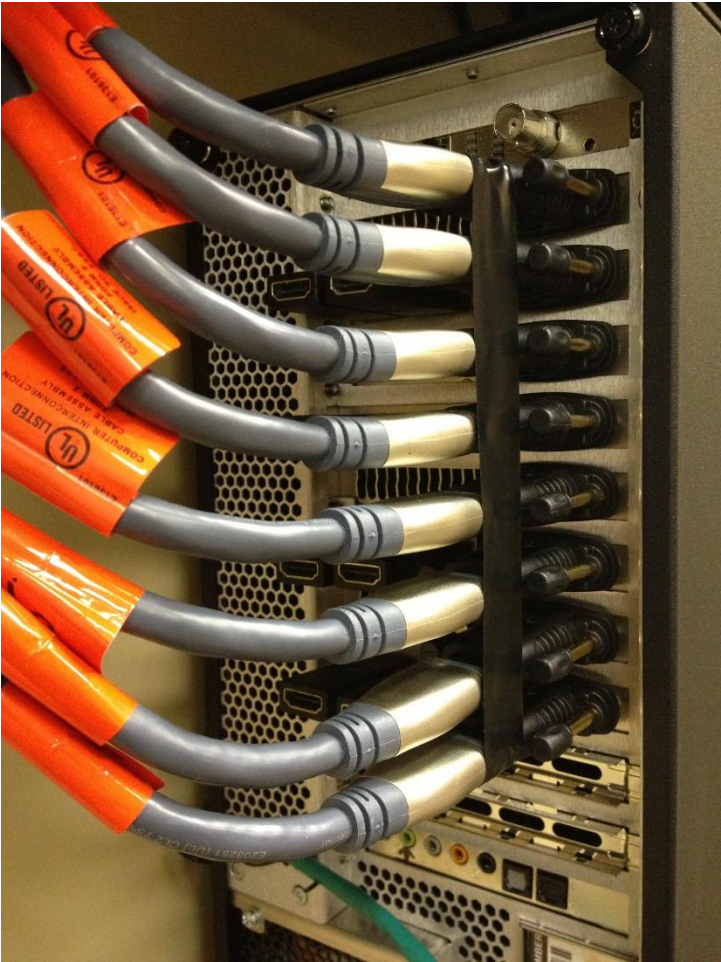
Implementation Details in Pics

Hardware



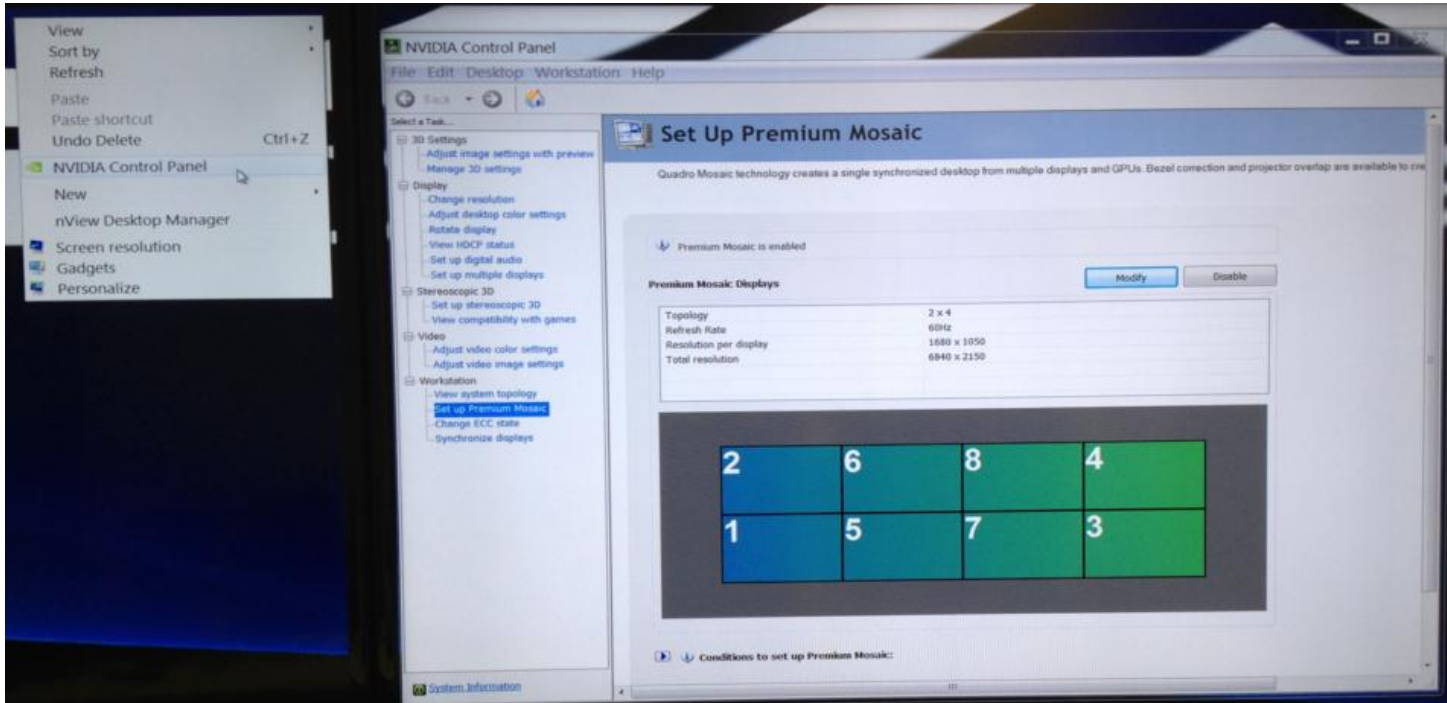
Implementation Details in Pics

Hardware



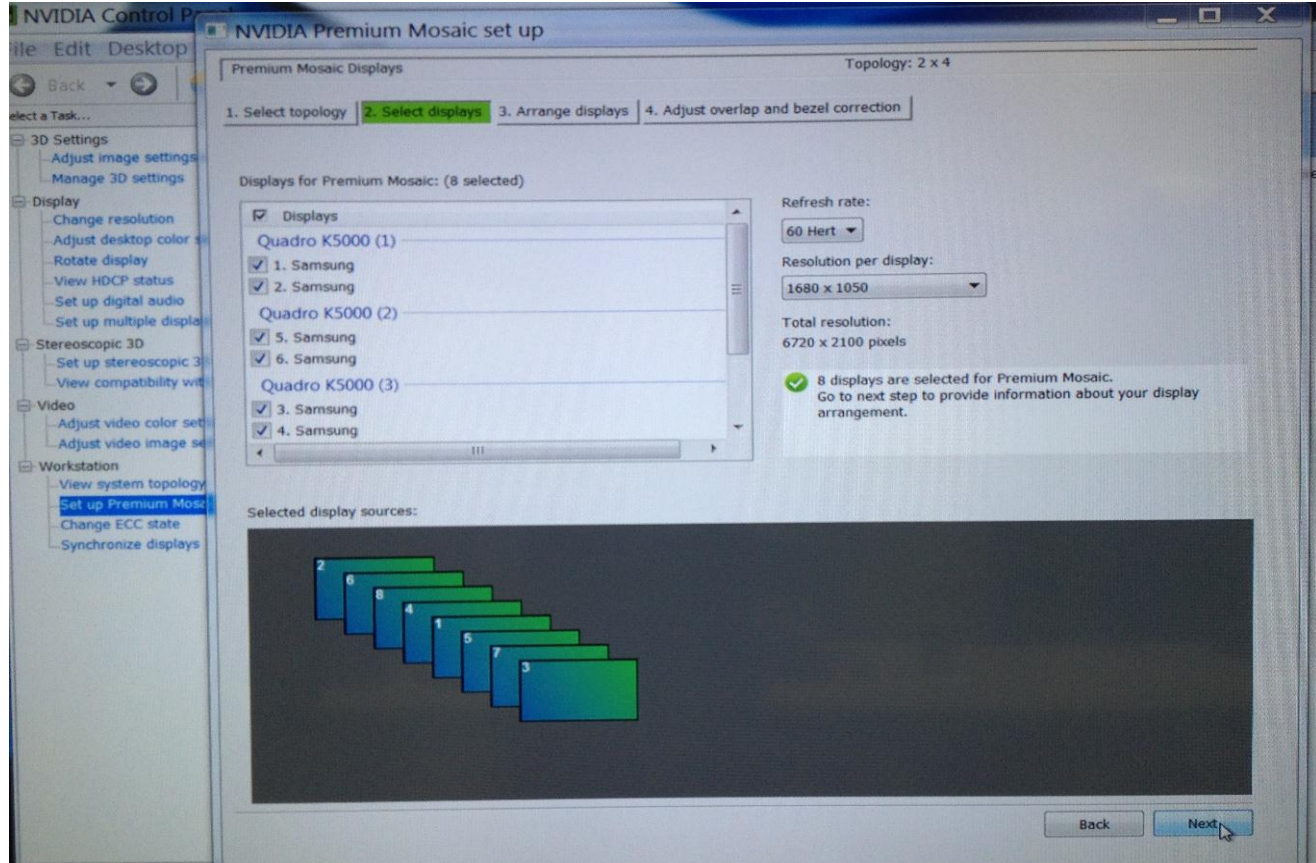
Software

Mosaic Control Panel



Default Display Arrangement

Software

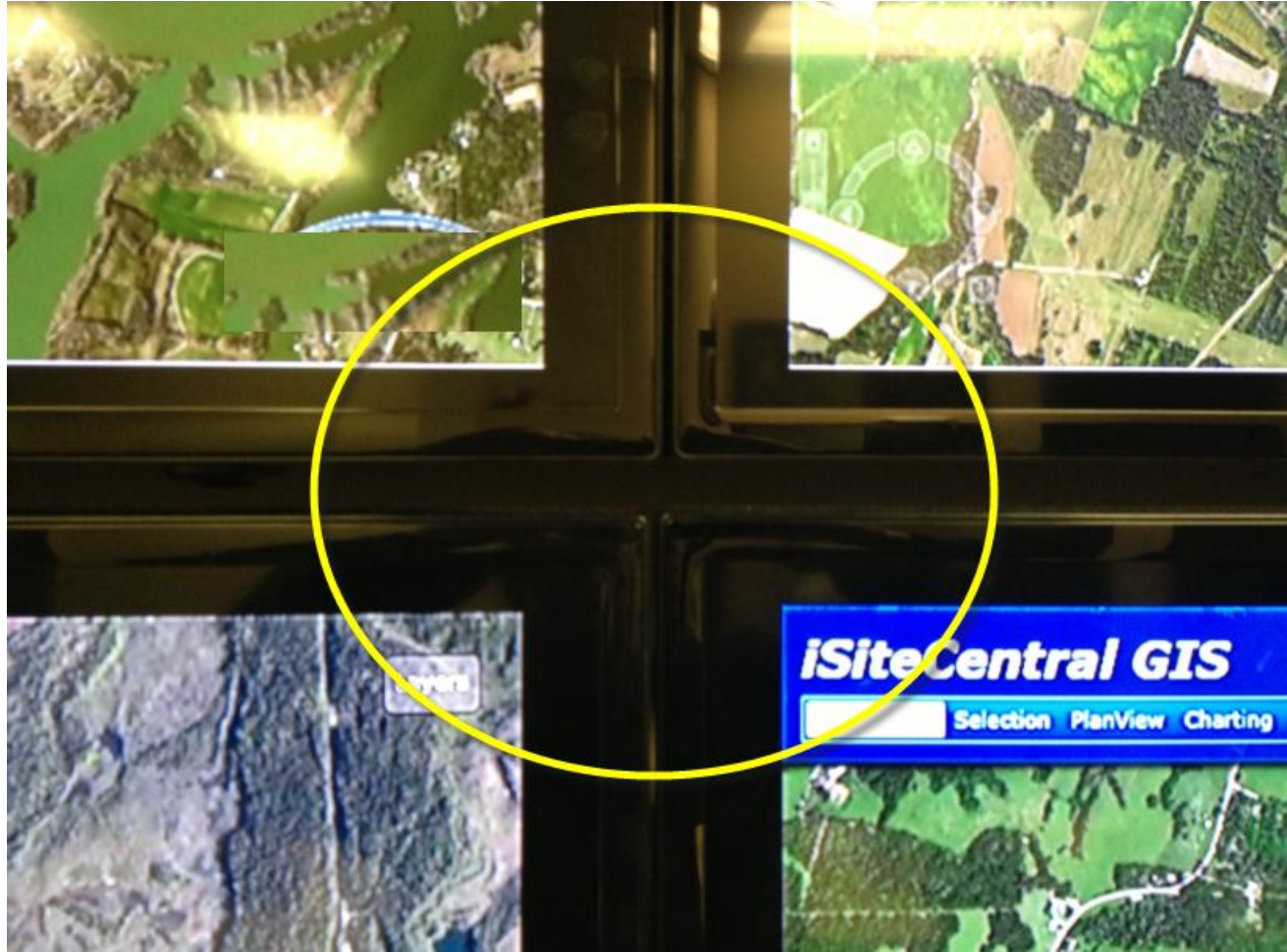


Arrange Displays – impressive wizard



Bezel Correction Needed

Software



Bezel Correction – Easy Peasy!!

Software

The screenshot shows the 'NVIDIA Premium Mosaic set up' window. The 'Premium Mosaic Displays' section is active, showing a 2x4 topology. The progress bar indicates the current step is '4. Adjust overlap and bezel correction'. Below this, a dropdown menu is set to 'Use the same setting for all vertical or horizontal edges'. A diagram shows eight numbered edges (1-8) on a 2x4 grid of displays. At the bottom, a table allows for setting correction values for selected edges.

Topology: 2 x 4

1. Select topology | 2. Select displays | 3. Arrange displays | 4. Adjust overlap and bezel correction

Select how overlap/bezel correction is applied
Use the same setting for all vertical or horizontal edges

Select edges for overlap/bezel correction

Total resolution: 6840 x 2150 pixels

Enter overlap/bezel correction values for selected edges:

Edges	Correction type	Correction value (pixels)
All Vertical	Bezel Correction	40
All horizontal	Bezel Correction	50

Excellent!



Simple Testing – very impressive



Ultimate Test: from 8 Individual Maps...



.... To One Big Display!

Success!!



Central Control



Able to control the entire room by 1 keyboard and mouse

Questions??

if time

Thank You!!

- Ways to contact us:
 - cpearson@hdrinc.com
 - @ClintP22
 - [LinkedIn.com/clintpearson](https://www.linkedin.com/in/clintpearson)

- Your feedback is important!
Please complete the Presenter Evaluation sent to you by email or through the GTC Mobile App.

