



**NVIDIA® NVS™**  
**Commercial Graphics**

**September 2011**



# History of NVIDIA® Commercial Graphics

2001 – 2003



## Quadro NVS Launched

- *Designed & Built in collaboration with the financial community*
- *nView desktop manager launched*
- *TTM: AGP & PCI Solutions*
- *Enterprise Support Launched - 2002*

2003 – 2006



- *TTM: Win XP & Linux drivers*
- *1<sup>st</sup> PCIE based Quadro NVS*
- *1<sup>st</sup> Quadro NVS in Blades*

2006 – 2009



- *TTM: Vista Drivers*
- *Extended Taskbar support (VISTA) for Financials*
- *TTM : Win7 Divers*

2010 -



## NVIDIA NVS Brand launched

- *Stand-alone brand for Commercial Graphics*
- *NVS ~50% of NVIDIA Professional Business*
- *Continued investment in NVS & supporting Tools*

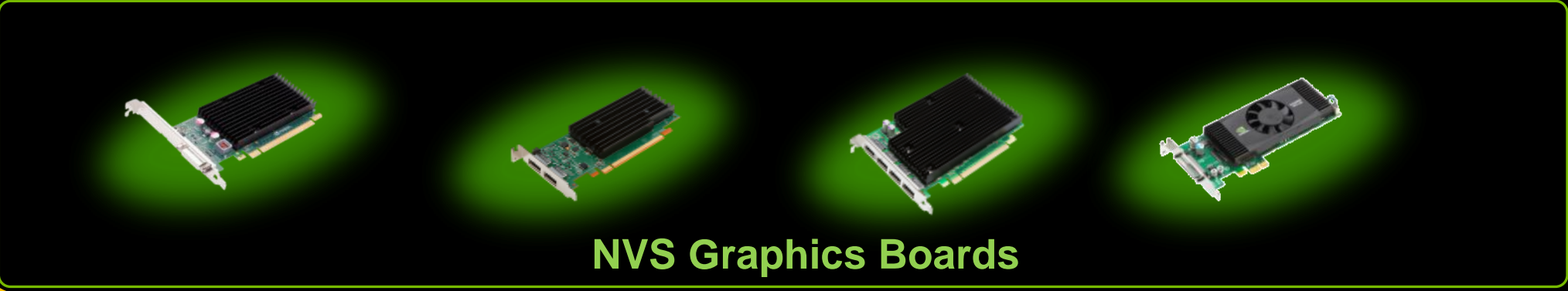
# NVIDIA® NVS™

## The Standard for Commercial Graphics

### Enterprise Sales & Support



Mosaic Technology	nVIEW Desktop Management	Installer 2.0	Enterprise Management Tools	UDA Drivers
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NVS Graphics Boards

# NVIDIA® NVS™

## The Standard for Commercial Graphics

- Best in Class Display Connectivity Options
- Built for highest reliability & minimal power/acoustics
- Enhanced Productivity and Flexibility in multi-display environments
  - *NVIEW Advanced Desktop Management*
  - *Mosaic Multi-Display Technology*
- Robust Enterprise Management Tools
- Flexible Form Factor
- World Class NVIDIA Enterprise Sales/ Support
- Extended Life-Cycle Management



# NVIDIA NVS

## Leading Solution for Business Graphics



9 out of 10 Global Financial Institutes standardize on NVS



Defacto Graphics Option for Multi Display business environments

Bank of America



Goldman Sachs



BARCLAYS



HSBC

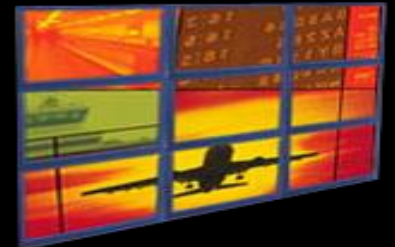
Morgan Stanley

NOMURA

JPMorganChase

# NVIDIA NVS – Aligned to Commercial Markets

- **Quality**
  - Designed and supported by NVIDIA to the highest standards
- **Productivity**
  - Low Acoustics, Energy Star, MTBF and Duty Cycle Testing for Maximum Uptime and highest Reliability
- **Long Life Cycle**
  - 24 - 36 months life cycles; driver performance and feature INCREASES over time
- **Continuous Investment**
  - NVIDIA is committed to the Business Graphics & SMB Markets and is making ongoing investments in Hardware, Software, Systems, and Industry Solutions
- **Usability**
  - Optimized Application and Usability Performance for Windows based systems



# Enterprise Support

## General Overview

- **Dedicated team at NVIDIA for *Enterprise Customers* in Core Software Engineering Group**
  - Help customers quickly resolve problems
  - High priority response rate (*sub-10 minute average*)
  - Help drive customer requests through engineering processes
    - ESupport tailored for personal service with immediate access to engineering resources
  - Facilitate Major Rollouts
  - Support IT specific tools such as Enterprise management Tools
  - Available (7:00 am to 5:00 pm PST and 9:00 am to 5:00 pm Central Europe)
- **Basic services offered**
  - Issue escalation
  - Case and bug submission
  - Enterprise Customer extranet sites
  - Driver drops
  - Release notes, tech docs and videos
  - Early adopter hardware/software programs



# Growing Markets

## TRADITIONAL MARKETS

- Finance
- Trading Floors
- Corporate Desktops
- Insurance
- Call Centers



## NEW MARKETS

### Traditional Markets Plus:

- Digital Signage
- Banking Centers
- Education
- Medical Industry
- Emergency Response
- Government Agencies
- Process Control





# NVIDIA Product Segmentation

	Target Segments	Enterprise Sales	Enterprise Support	Advanced Desktop Mgmt	Productivity Apps Testing	Multi Display Technology	Prof 3D Apps ISV Cert	Product Lifecycle	OEM Fulfillment	NVIDIA Warranty
<b>NVIDIA Quadro</b>	Workstation Professional	Yes	Yes	NVIEW	Yes	Mosaic	Yes	36 months	Direct	3-yr
<b>NVIDIA NVS</b>	Business Professional & Commercial	Yes	Yes	NVIEW	Yes	Mosaic	No	36 months	Both	3-yr
<b>NVIDIA GeForce</b>	Consumer	No	No	No	No	Surround	No	9-12 months	Virtual	1-yr

# NVIDIA Commercial Graphics Line-up - 2011



**NVIDIA Quadro  
NVS 450**  
(ATX profile PCIe x16)



Quad DisplayPort  
Quad DVI-D (Single/Dual-Link)  
Quad VGA

**NVIDIA Quadro  
NVS 420**  
(Low Profile PCIe x16 & x1)



Quad DisplayPort  
Quad DVI-D (Single-Link)



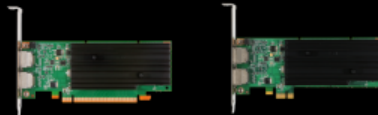
**NVIDIA  
NVS 300**  
Low Profile (PCIe x16 and x1)



Dual DVI-I(Single Link)  
Dual VGA  
Dual Display Port



**NVIDIA Quadro  
NVS 295**  
Low Profile (PCIe x16 and x1)



Dual DisplayPort  
Dual DVI-D (Single/Dual Link)  
Dual VGA

# NVIDIA® NVS™ 300

- Multiple & Cost effective Display Connectivity Options
- Intelligent Power Management
- Enhanced Productivity in multi-display environments
- Robust Enterprise Management Tools
- Flexible Form Factor
- Improved Compatibility with Quadro Professional Graphics

25% less power\*



\* Max Power of NVS 300 is approx. 25% less than the prev gen NVS 295

# NVIDIA NVS 300


## Technical Specifications

Model	NVS 300
CUDA Cores	16
Memory Size	512 MB DDR3
Memory Bandwidth	12.6 GB/s (64-bit)
Power	17.5 W
Form Factor	2.731" x 5.7" PCIE Gen2 Available in x16 or x1 PCIE
Display IO	DMS-59 (1)
Supported Displays	VGA, SL-DVI-I, DisplayPort, HDMI
Thermal	Passive (Fanless) Heatsink
Energy Star	Yes



- **Drives a wide selection of display connectors**
- **Intelligent Power Management**
- **Flexible form factor**
  - Installs into small form factors and full height systems
  - x1 and x16 Solutions

# Connect to Wide Range of Displays Using Variety of DMS-59 Cables

- DMS59 to VGA
- DMS59 to DVI
- DMS59 to Display Port 
- **Seamless Upgrade for NVS 290 Based Installations**

## NVIDIA NVS 300 DMS59 Connector





# NVIDIA Quadro NVS 295 (PCIe x16 & x1)

- 8-core CUDA Parallel Computing Processor
- **Form Factor:**
  - Low profile; 2.731 (H)" x 6.600 (L)"
  - Single Slot – PCIe Gen 2
- **Frame Buffer:**
  - 256MB (16Mx32 GDDR3)
- **Connectors:**
  - DisplayPort + DisplayPort
  - HDMI, DVI, VGA over DisplayPort
- **Power:**
  - 23W
- **Cooling:**
  - Passive heatsink
- **Availability: Now**



# Dual NVS Comparison

<b>Product Features</b>	 <b>NVS 295</b>	 <b>NVS 300</b>
<b>PCIe Generation</b>	Gen 2	Gen 2
<b>Memory Size &amp; Type</b>	256MB GDDR3	<b>512 MB DDR3</b>
<b>Memory Bandwidth</b>	11.2 GB/s	12.6 GB/s
<b>Power</b>	23 Watts	<b>17.5 Watts</b>
<b>Supported Displays (Native)</b>	Display Port	SL-DVI-I VGA <b>Display Port (with audio)</b>
<b>Max Digital Display Resolution</b>	2560x1600	2560x1600
<b>HDMI Support</b>	Yes	Yes
<b>Audio Support</b>	Yes (HDMI thru SPDIF only)	Yes (DP & HDMI over PCIe)

# NVIDIA Quadro NVS 450 (PCIe x16)

- 2x 8-core CUDA Parallel Computing Processors
- **Form Factor:**
  - Full ATX; 4.376 (H)" x 6.600 (L)"
  - Single Slot – PCIe Gen 2
- **Frame Buffer:**
  - 512MB (4pcs 32Mx32 GDDR3)
- **Connectors:**
  - 4x DisplayPort
- **Max Power:**
  - 35W
- **Cooling:**
  - Passive heatsink
- **Availability: Now**







# NVIDIA Quadro NVS 420 (PCIe x16 & x1)

- 2x 8-core CUDA Parallel Computing Processors
- **Form Factor:**
  - Low profile; 2.731 (H)" x 6.600 (L)"
  - Single Slot - PCIe Gen 2
- **Frame Buffer:**
  - 512MB (4pcs 32Mx32 GDDR3)
- **Connectors:**
  - Single VHDCI with additional dongle options
    - Single VHDCI to Quad DisplayPort
    - Single VHDCI to Quad DVI-SL (digital)
- **Max Power:**
  - 40W
- **Cooling:**
  - Active fansink (4-pin control)
- **Availability: Now**



# Quad NVS Comparison

Product Features	 <b>NVS 450</b>	 <b>NVS 420</b>
<b>Form Factor</b>	Full Height ATX Graphics card with Passive Heat sink	Low Profile Graphics Card with Active Fan sink
<b>PCIe Generation</b>	Gen 2	Gen 2
<b>Memory Size &amp; Type</b>	512MB GDDR3	512MB GDDR3
<b>Memory Bandwidth</b>	11.2 GB/s	11.2 GB/s
<b>Power</b>	35 Watts	40 Watts
<b>Supported Displays</b>	DisplayPort (4) SL/DL DVI-D (4) VGA (4)	Display Port (4) SL-DVI-D (4)
<b>Max Digital Display Resolution</b>	2560x1600	2560x1600

# Business/Commercial Graphics needs in Enterprises

Enterprise Needs	NVS Products
<i>Reliable &amp; Stable</i>	NVS Unified Software Drivers have been tried and tested in the field for <a href="#">10+ years</a>
<i>Ease of Installation &amp; Manageability</i>	<ul style="list-style-type: none"> <li>• <a href="#">Single Unified Driver</a> for easy large scale deployment</li> <li>• <a href="#">WMI Tools</a> for Enterprise Management (incl. enterprise mgmt. for Graphics &amp; Displays)</li> <li>• NVIDIA Installer</li> </ul>
<i>Maximize Uptime</i>	<ul style="list-style-type: none"> <li>• Dedicated <a href="#">Enterprise Support</a> for NVS Solutions</li> <li>• MTBF &amp; Duty Cycle testing to maximize system uptime</li> <li>• NVS Business Application compatibility testing <a href="#">reduces System Qualls</a> at Enterprises</li> </ul>
<i>Drive Multi Display Desks</i>	<ul style="list-style-type: none"> <li>• Can drive 2/4 displays simultaneously up to a maximum resolution of 2560x1600</li> <li>• NVS provides <a href="#">Client Productivity tools</a> (nView, Mosaic) for best in class multi display experience</li> </ul>
<i>Best in class Image Quality</i>	<ul style="list-style-type: none"> <li>• Support for Dual Analog or Dual Digital Displays</li> <li>• Minimal flicker for driving multi display as NVS products can drive up to two display of the <a href="#">same connector type, refresh rates and display resolution</a></li> </ul>
<i>Flexible Solution</i>	<ul style="list-style-type: none"> <li>• Low Profile Solution fits into different Workstations and Desktops</li> <li>• Qualified to drive <a href="#">multiple display connector</a> seamlessly</li> </ul>
<i>Enhance Productivity</i>	<ul style="list-style-type: none"> <li>• Low Acoustics, <a href="#">Energy Star</a></li> <li>• <a href="#">nView Desktop Management Tools</a>: Enhance productivity Multi Display Environments</li> </ul>
<i>Long Life Cycle</i>	NVS has a 3 year warranty, and will be <a href="#">available for 3+ years</a>

# Client & Enterprise Solutions for NVS Commercial Graphics



# Client and Enterprise Solutions

- **Client Solutions**
  - NVIEW Desktop Manager
  - NVIDIA Mosaic Technology
- **Enterprise Management Solutions**
  - Installer 2.0
  - Enterprise Mgmt Tools using WMI\*



# NVIEW Desktop Manager

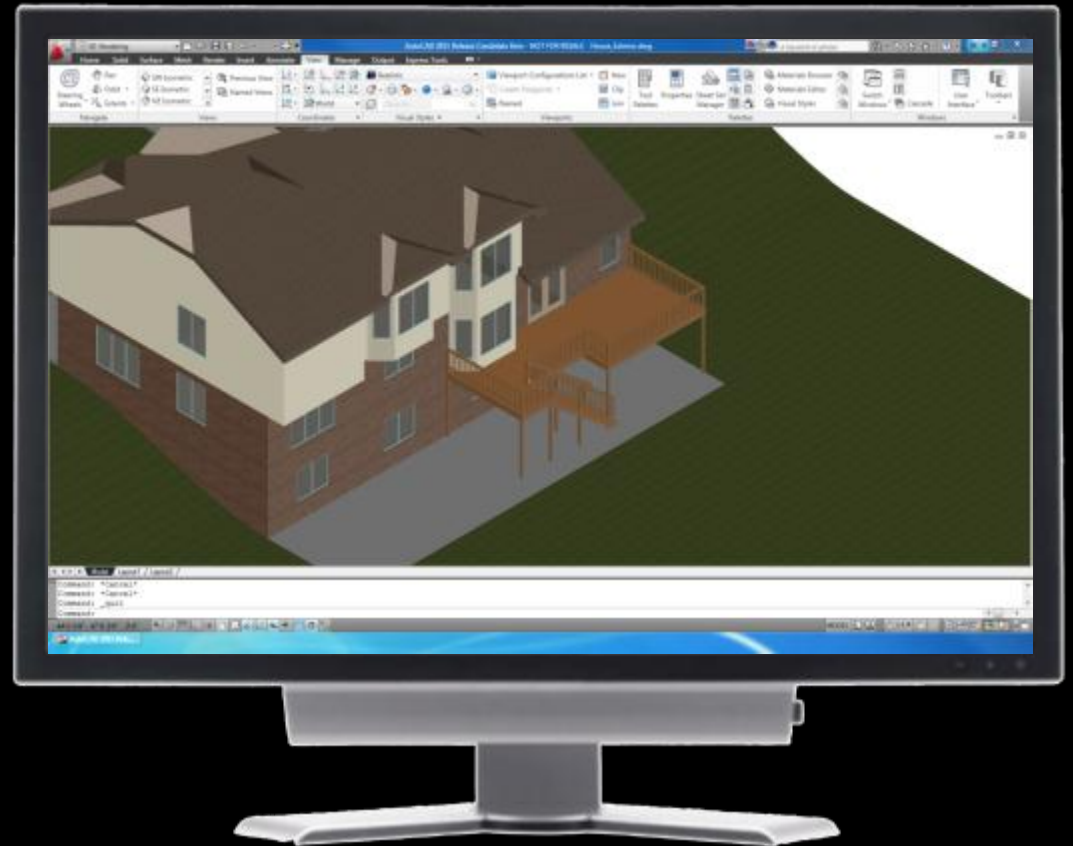
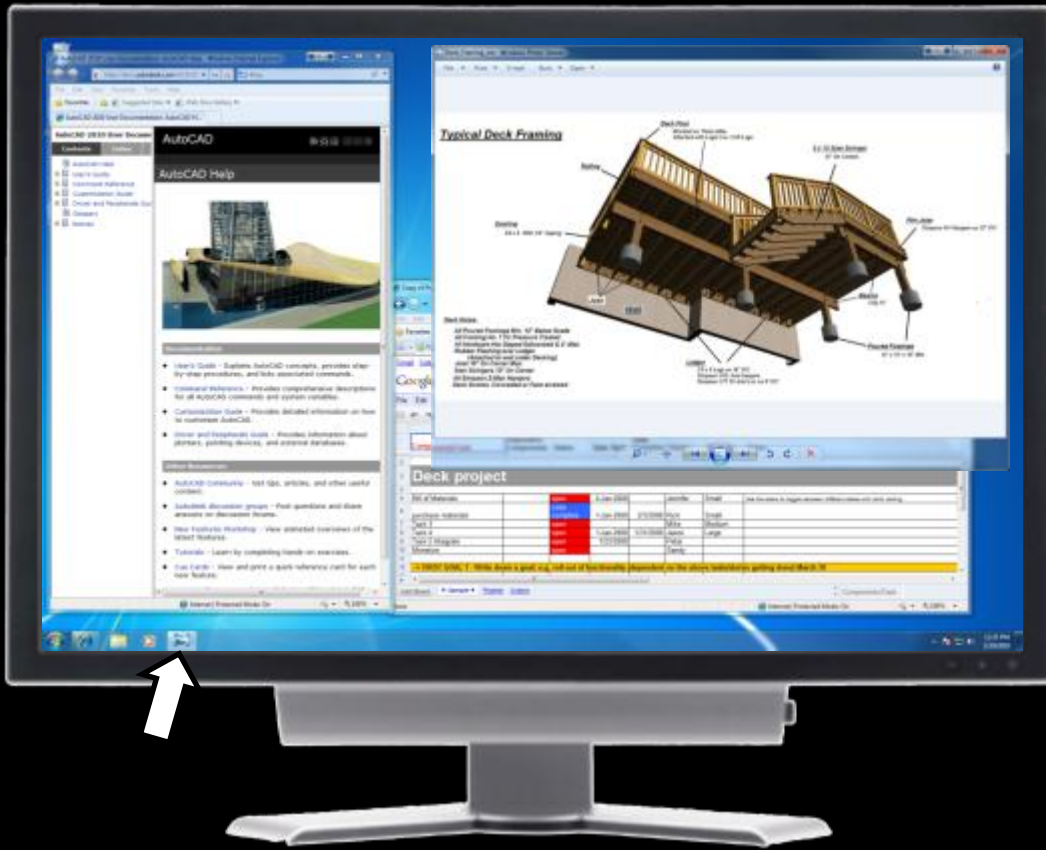
- Taskbar spanning across multiple displays
- Application/Window/Dialog Box Repositioning
- Virtual Desktops
- Display Gridlines
- nView Profiles
- and many more...



**A User-friendly Way To Manage Your  
High-resolution Desktop For Increased Productivity**

# Better Way to Work: NVIDIA® nView™

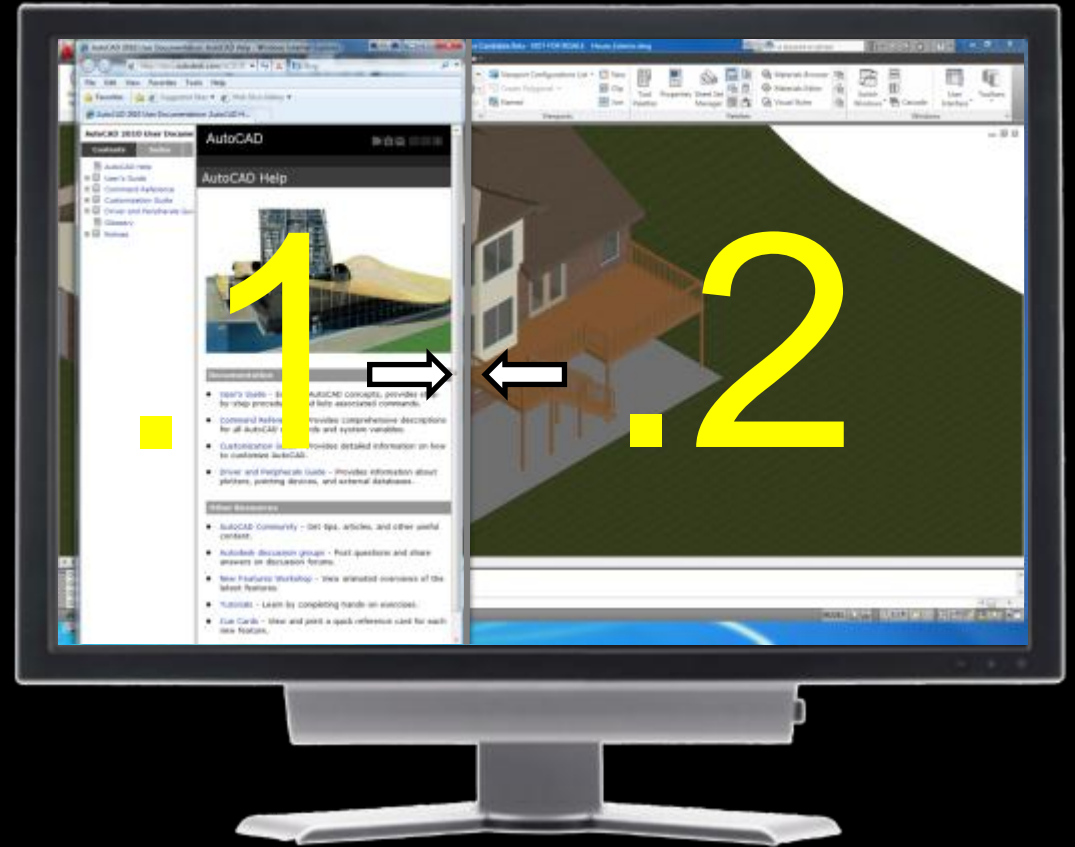
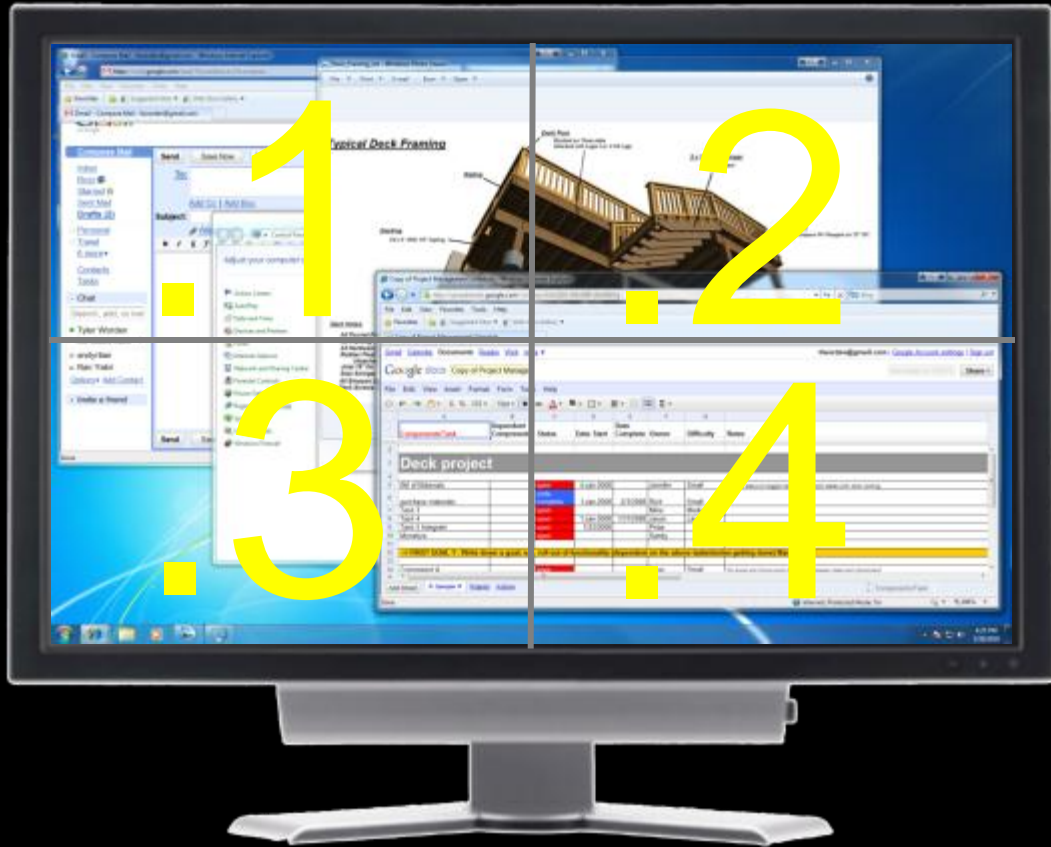
Eliminate clutter by extending the taskbar across multiple displays



**EXTENDED TASKBAR**  
NVIDIA Confidential

# Better Way to Work: NVIDIA® nView™

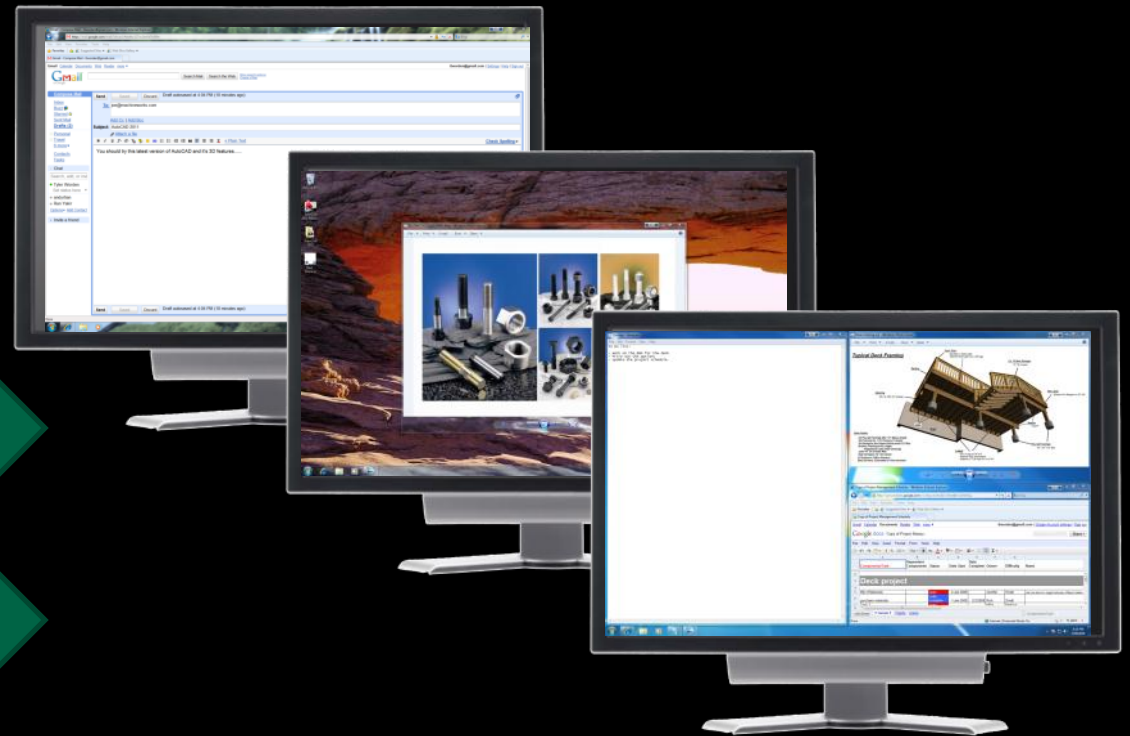
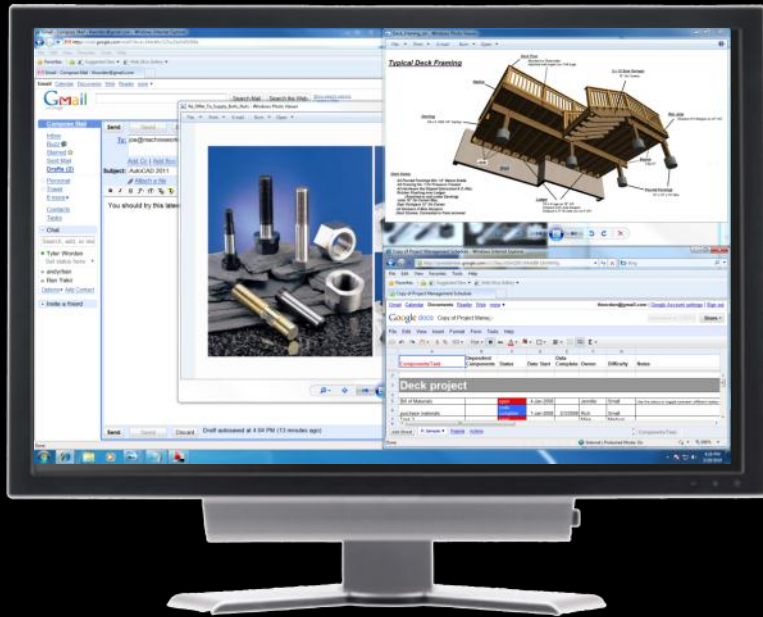
Gridlines: Divide monitors into sub-screen for efficient use of screen real estate





# nView™ Feature Spotlight: *Virtual Desktops*

Create, customize & switch between different virtual desktops



CLUTTERED DESKTOPS

'n' VIRTUAL DESKTOPS

# NVIDIA® Mosaic™ Multi-Display Technology

- Unified desktop
- Seamless Image
- Up to 8 displays or projectors
- Professional Performance and Features



# Mosaic Technology

## Single Unified Desktop

**✘ Without Mosaic:** 4 Independent Displays



**✔ With Mosaic:** Single Unified Desktop & Taskbar



# Multi-Display Financial Trader Desktop

## Viewing more data drives better decisions



# Multi Display Desktop

## See everything... in context



Image courtesy of Barco

# Mosaic Features

## Scale with NVIDIA Professional Graphics Solutions

### Key Features

- Easy Configuration
- Unified Desktop (up to 8 display devices\*)
- Application Spanning
- Taskbar Spanning
- Bezel Correction
- Windows 7 Support



\* All displays require matching timings and resolution

# Enterprise Management Tools

## Installer 2.0

- Improved performance with minimal reboots
- Failure Logging
- Less Disruptive - Silent install

## Enterprise Mgmt Tools using WMI\*

- Configure graphics system (WMI)
- Save/Restore a configuration
- Graphics System Monitoring
- Display topology (modes, layout, ...)

\* Will be available in Q1 2012

# Enterprise Tools: NVWMI

- WMI based interface
- Query static and changing state
- Configure graphics system
- Commandline availability through WMIC
- Delivery started in R275
- Focus is Windows 7 & future OS's
- *NVWMI – Optional Install in NVIDIA Driver*

*Replaces and enhances NVIEW profiles for system setup*



# NVWMI – upcoming in 2012

- Save, configure and load/set profiles
- Save, configure and load/set topology
- Configure graphics state
- Query monitor vendor, firmware, ... connection type
- Perfmon support for temperature, memory consumption, ...
- Enterprise tools
- ...

***Access to everything available in NV control panel and NVIEW.***

***Full support ~R310 for NVS***

# Optimal Driver for Enterprise (ODE)

## What is it?

- **Stable and long life drivers for ...**
  - **Broader support for Quadro, NVS, and Tesla configurations**
  - **Broader support for all OS combinations**
  - **OEM install**
  - **Enterprise image development**



## When?

- **Target two drivers per year**
- **Aligned with major GPU or platform refreshes**

# What about the non-ODE drivers?

## What are they?

- **Examples: R280, R285 and R290**
- **Fully supported, production drivers**
  - For SW developers who need a new feature
  - For advanced users who need the latest features
- **Not all OS combinations and HW combinations will be posted**



## When?

- **Six to Eight weeks between new releases**



# CUDA: Accelerates Most Popular Software applications

## On the Web



Internet Explorer 9

## Creativity



Photoshop CS5  
Premiere CS5

## At Play



## At Work



Microsoft Office 2010

## Watch & Enjoy



Flash Player 10.2

## Operating System



Windows 7



# #1 PC App Now GPU-Accelerated



**Internet Explorer 9**

(Beta Now, Production 1Q'11)



**Mozilla Firefox 4**

(Beta Now, Production 1Q'11)



**Google Chrome**

(Beta Now, Production 1Q'11)

HTML 5  
Video

Scalable  
Vector  
Graphics

Direct 2D

Flash 10.2

WebGL

HTML 5  
Canvas

# A More Reliable Way to Work

Maximize System Uptime: NVS<sup>®</sup> Built By NVIDIA

Engineered, Built,  
and Tested by NVIDIA



Optimized GPU  
architecture and Drivers



High Reliability & Productivity



Extended Product Life Cycle



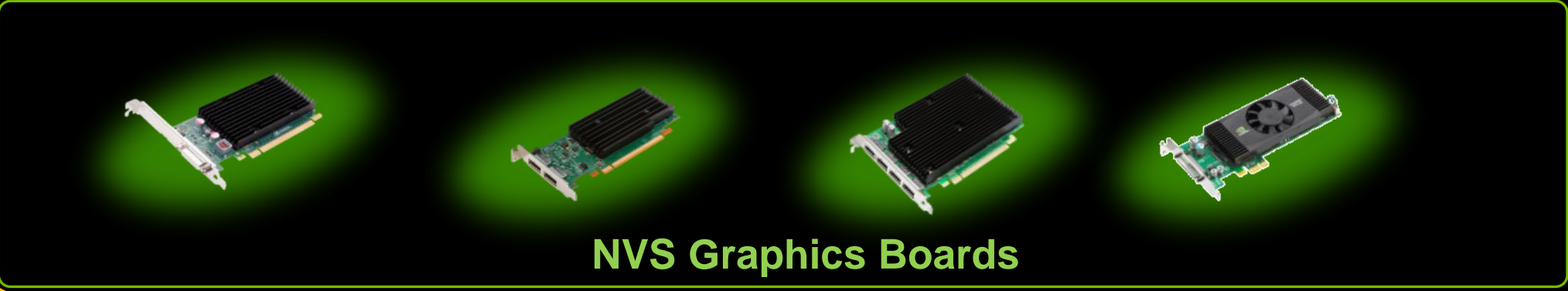
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NVS Graphics Boards

**Thank You...**

