

Cisco VXi

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Sistem inženjer



HVD/VDI Market Transition Is Accelerating

A broad deployment enabled by the next generation virtual workspace

Global hosted virtual desktop (HVD) market will accelerate through 2014

- 70 million units or 15% of Enterprise desktops/laptops*

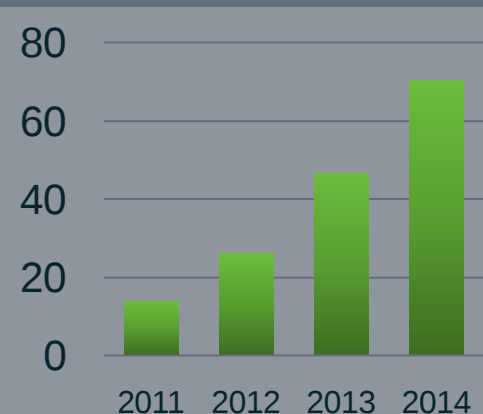
In 2011 47% of Enterprises initiated Desktop Virtualization projects

- Only 3% desktop penetration*

7 Billion new wireless devices by 2015

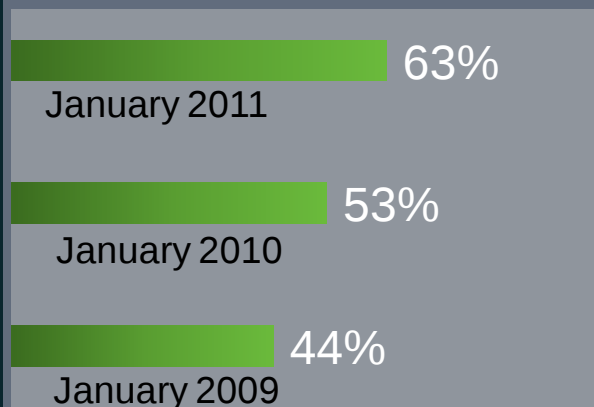
* Gartner Group

HVD Forecast in Millions



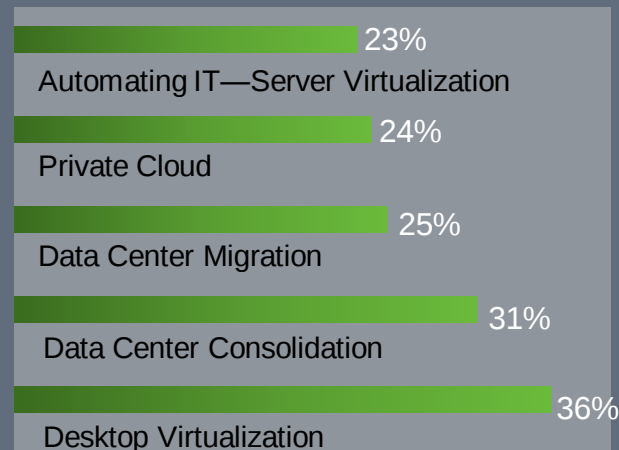
Source: Gartner HVD Forecast 2010-2014, December 2010

Percent of Respondents w/ VDI Projects Planned



Source: Morgan Stanley CIO Survey, Jan 2010 & 2011

Which are important IT initiatives for your organization for the next 12–24 months?



Source: Enterprise Strategy Group, Dec., 2010

May 20, 2010

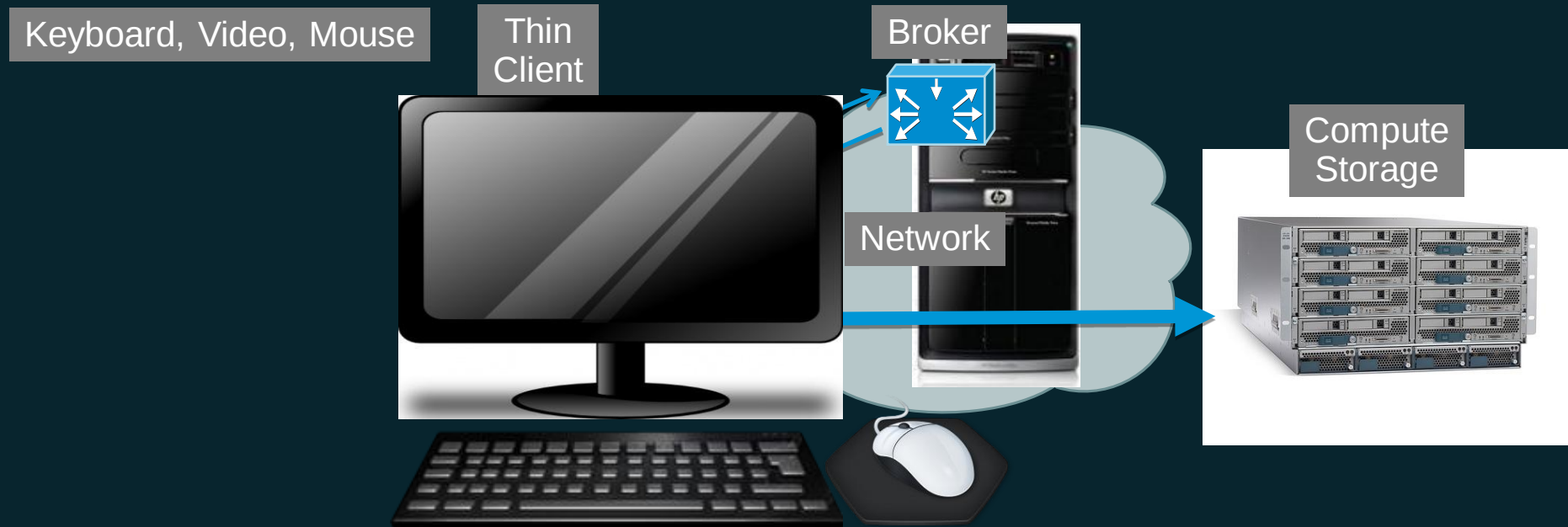
Agenda

- Fundamentals of Desktop Virtualization & Cisco VXi
- Virtualized Data Center
- VDI Aware Borderless Network
- Virtualization Experience Clients

Fundamentals of Desktop Virtualization & Cisco VXi



The Network is the Desktop



- Personal Computer is disaggregated
- Keyboard, Video, and Mouse stay with user
- Compute and storage move to the data center
- Network availability is required for all application access
- Network performance is critical to user experience

Zero Clients

- Zero clients are the simplest devices
- They have embedded operating systems that are not exposed to the user
- Zero clients have reduced local capabilities and depend heavily on the resources available within the virtual desktop
- This class of devices is typically slated toward the task worker since it provides no enhancements for media streaming
- Because there is no exposed OS, there is no virus infection, making them a very secure endpoint



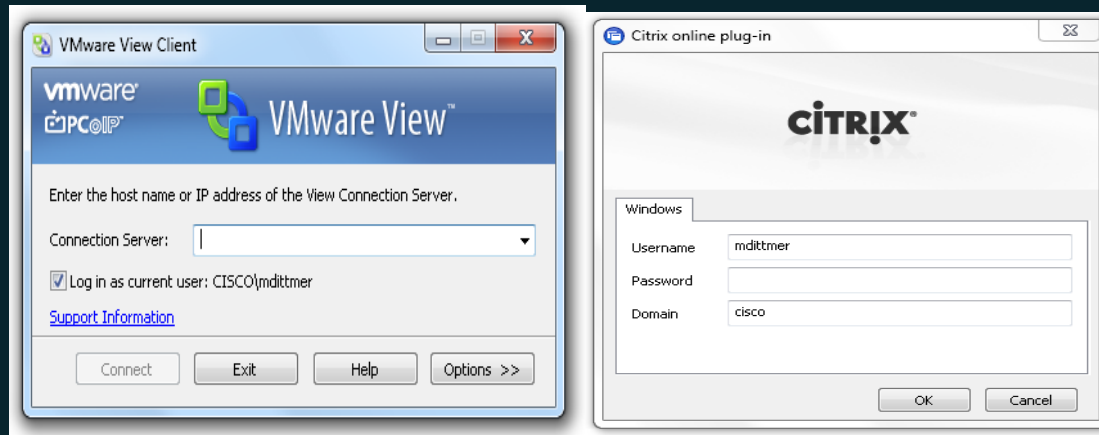
Thin Clients



- Thin client devices usually contain more local capabilities and often have a customizable local embedded operating system (usually Linux or Windows)
- This class of endpoint provides greater flexibility
- They are generally customized by the system administrators and then locked down
- Thin clients are typically used by power users who need access not only to browsers, email clients and office automation tools, but also additional features such as streaming audio and video

Thick Clients

- Thick client devices refer to standard PC or Laptops running a standard OS, but have similar software as the thin client, installed as an application

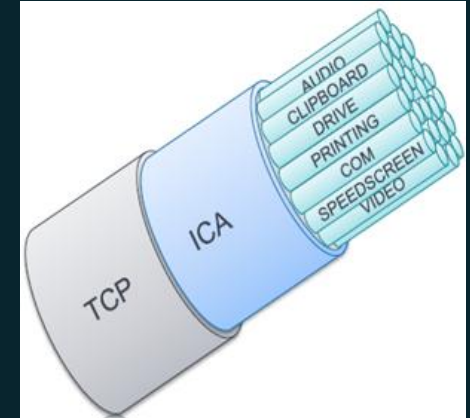


- Thick client devices allow users to work offline and are often the choice of the “Road Warrior” user

Desktop Virtualization Protocols

- ICA/HDX

- Citrix Proprietary – Supports many advanced features
- 32 virtual channels
- TCP transport
- If the latency is greater than 30ms, Flash content is rendered on the server
- Encryption and compression on by default



- PCoIP/Teradici

- VMware software and hardware – Highly efficient
- Adaptive - compensates latency and bandwidth variations
- Supports 4 monitors and resolution upto 2560 x 1600
- 128-bit AES (On by default)
- UDP Transport – Most Security servers support TCP only



- RDP

- Protocol by Microsoft
- Citrix/VMware VDI deployment support
- TCP transport and AES support

Cisco Virtualization Experience Infrastructure

Desktop Virtualization

Suite of Technologies

- Desktop Streaming
- Application Virtualization
- Terminal Services

VDI

**Virtual Desktop
Infrastructure**

Industry Terms for VDI:

- Gartner: “Hosted Virtual Desktop” (HVD)
- IDC: “Centralized Virtual Desktop”



- End-to-End Architecture & Validation
- Supporting Rich Media /UC
- Enhanced Security
- Application Acceleration
- POE / Energy Wise



**Cisco
VXI**

Cisco VXi

Virtualized End-to-End Solution

Virtualized Data Center

Applications/Desktop OS

Cisco Collaboration
Applications

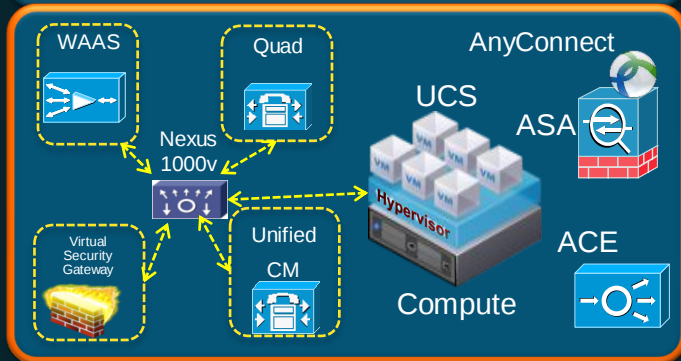
MS Office

Desktop Virtualization Software

CITRIX **vmware**

Hypervisor

CITRIX **vmware** **Microsoft**



Storage

EMC² **NetApp**

Virtualization-Aware Borderless Network

Cisco®
Identity
Services
Engine



WAAS



Switching



Virtualized Collaborative Workspace

Cisco Virtualization
Experience Clients



AnyConnect



Cisco VXC 6215
Thin Client



Cisco VXC 4000
PC Client



Cisco VXC
22xx &
21xx Zero
Client



Cius
Business
Tablet

WYSE

End-to-End Management and Optimization

AppSense

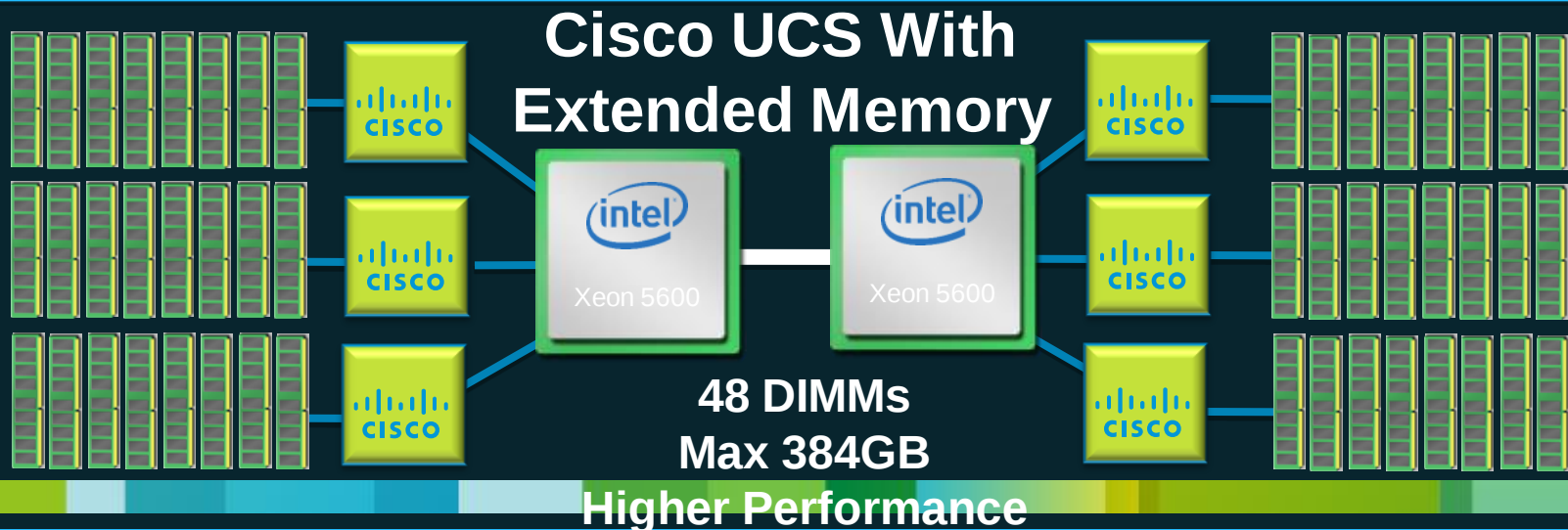
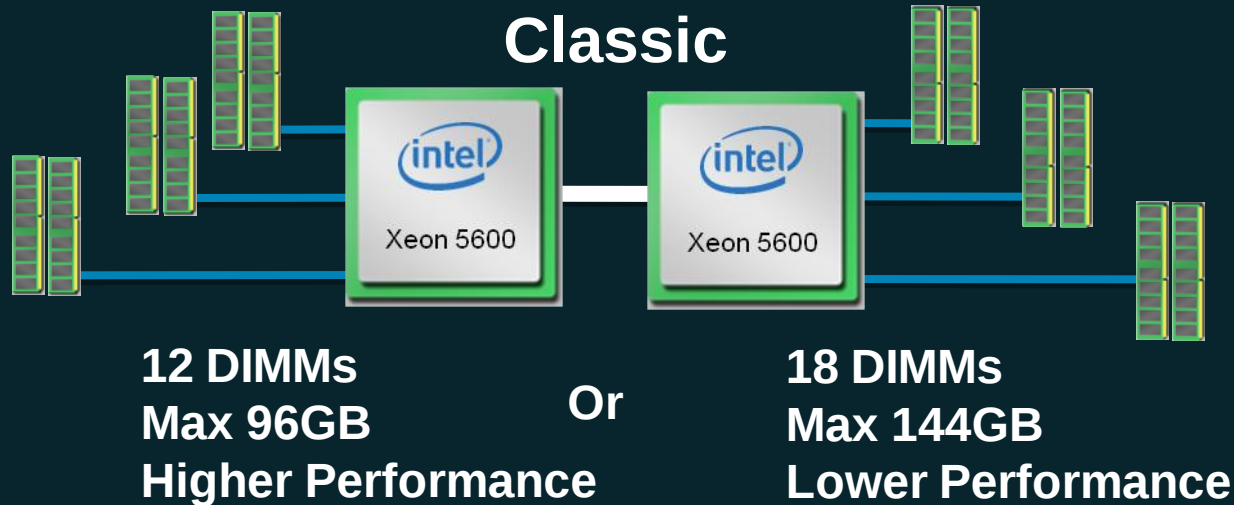
atlantis **Liquidware Labs**
COMPUTING Dedicated to the ART & Science of Virtualization™

unidesk
VDI, Uncompromised.

Virtualized Data Center



Optimizing Memory for Desktop Virtualization



Scaling Cisco VXi: PCoIP Offload Card

Offloads PCoIP image processing to reduce CPU load, enable more users per server



APEX 2800
PCoIP Offload Card



Cisco UCS C Series

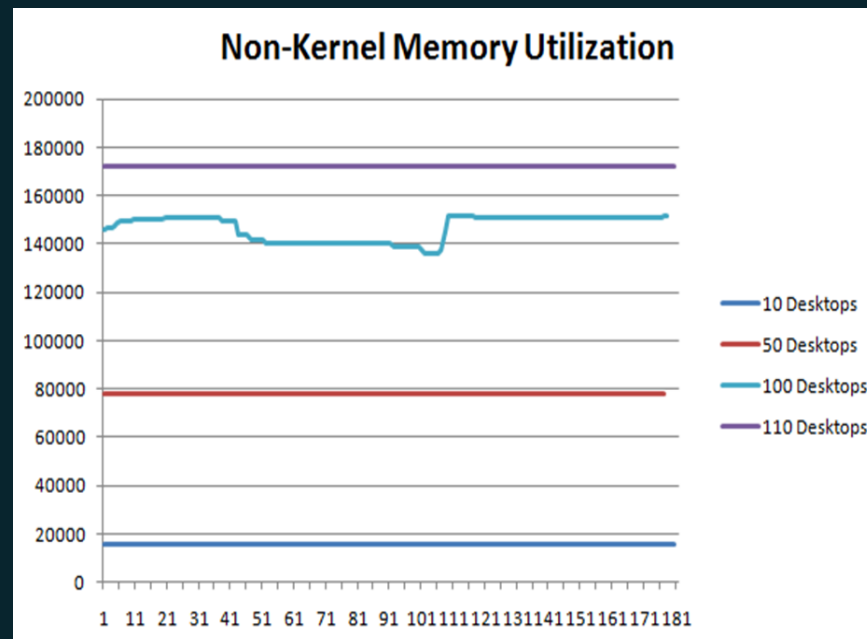
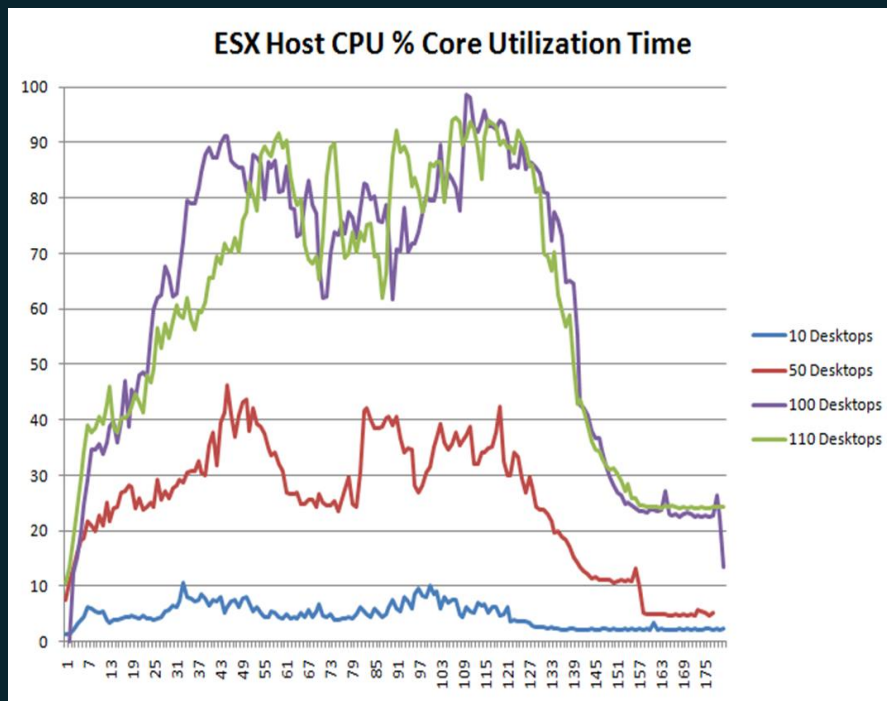
- Insures consistent, reliable user experience regardless of server demand
- Reduces server CPU utilization up to 50%; adapts to fluctuating workloads
- Supports up to 64 displays
- Validated with Cisco UCS C Series Rack Mount Servers
- Offload card plugs directly into server
- Can increase user density, enable existing users to run intensive apps

How many Virtual Machines per blade or Server?

- Numbers fluctuate based on worker profile

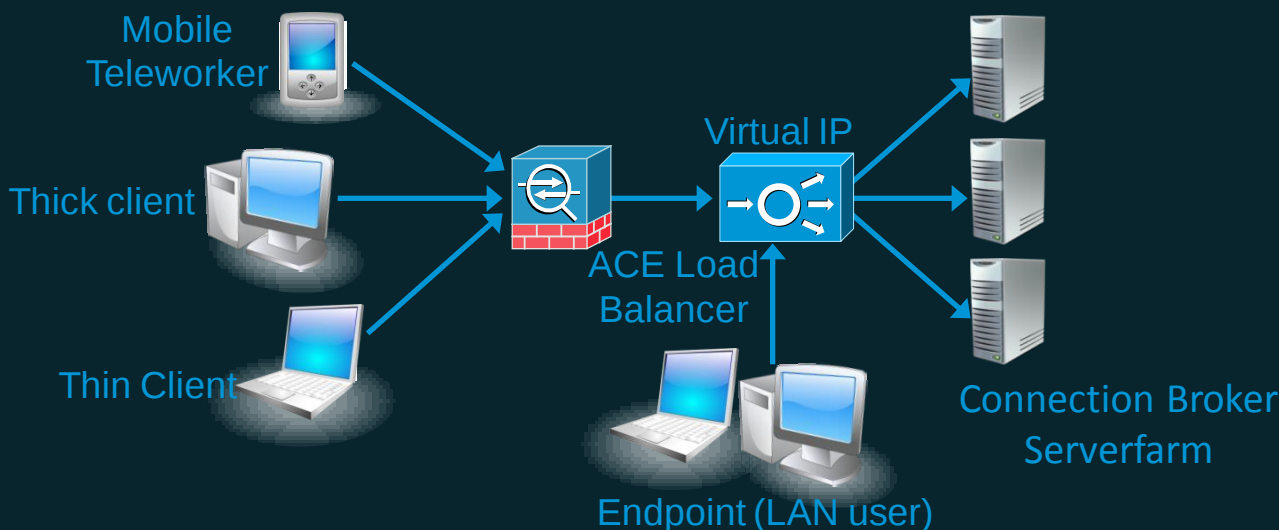


Cisco UCS B250 with 192GB memory



Logon Storms (Scale from rapid concurrent or simultaneous user logons)

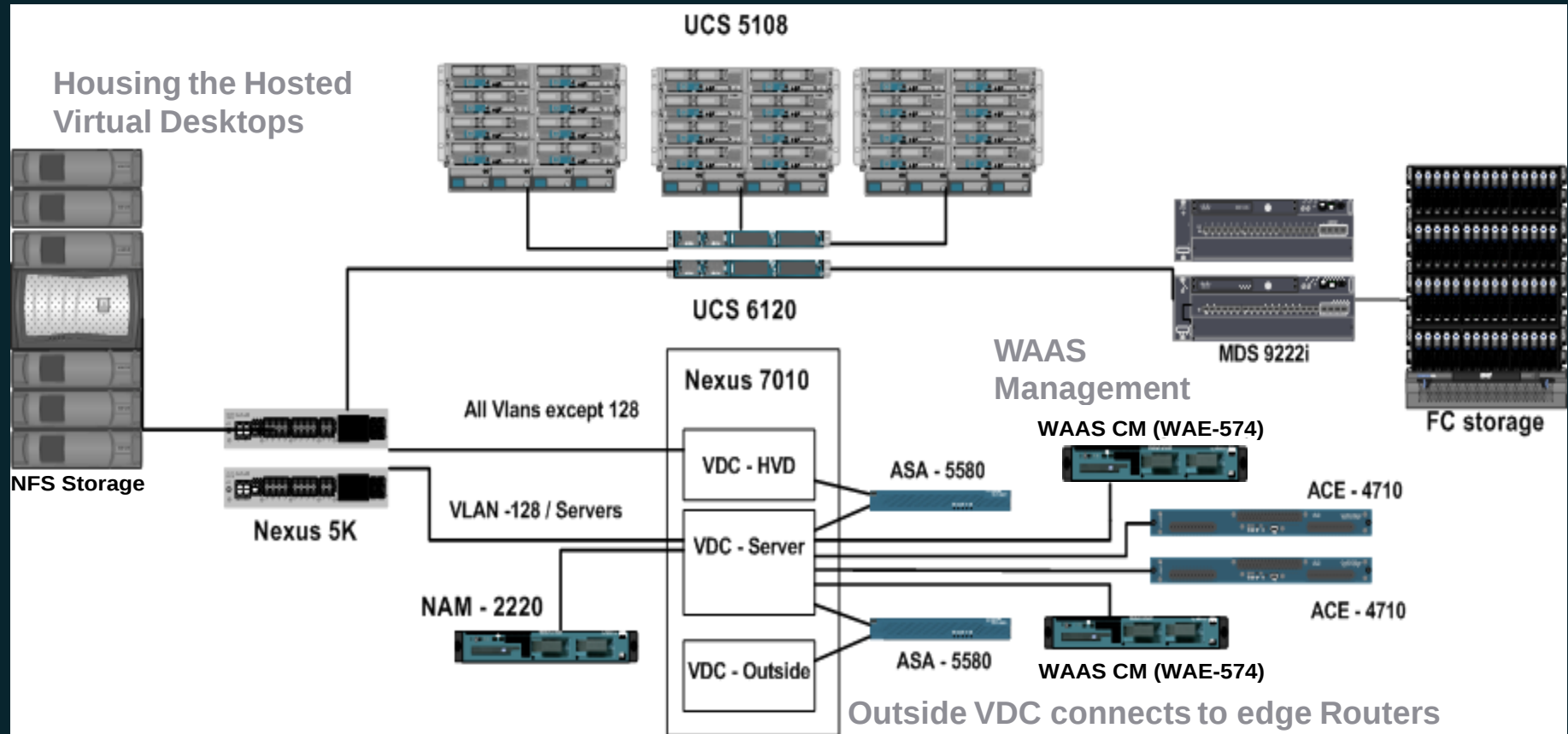
- Cisco Application Control Engine (ACE) to accelerate and scale connection broker



- Offloading SSL processing from the connection broker
- One Armed mode suggested when not using SSL offloading
- Cisco ACE supports virtual contexts

Virtualized Datacenter Components for Cisco VXI Physical Deployment

- Cisco VXI Validated Design



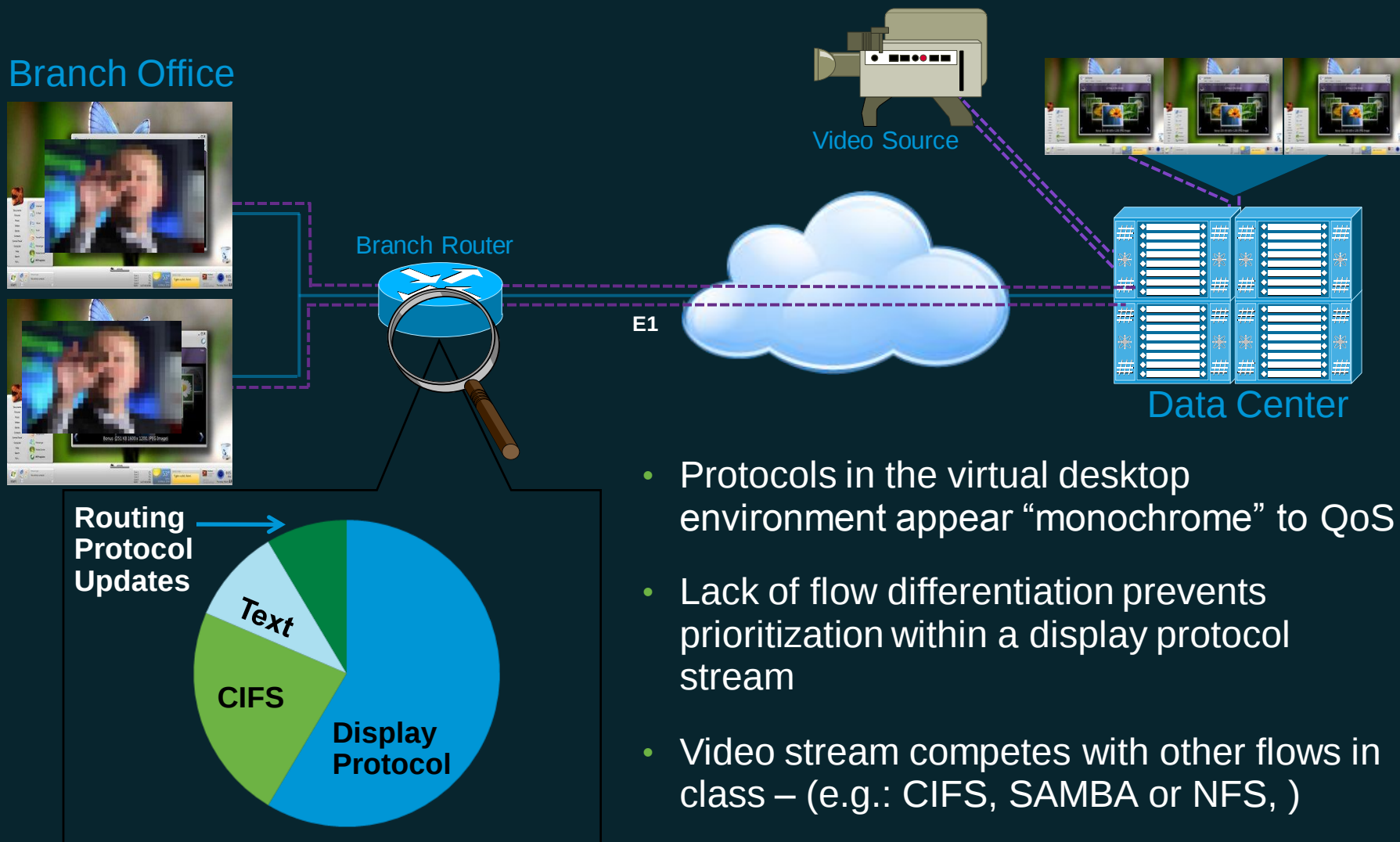
Cisco VXI CVD on Design Zone

http://www.cisco.com/en/US/netsol/ns742/networking_solutions_program_category_home.html

VDI Aware Borderless Network



Display Protocol Opaque to the Network



QoS in VXI*

End User Workspace

Campus or WAN Network

Data Center

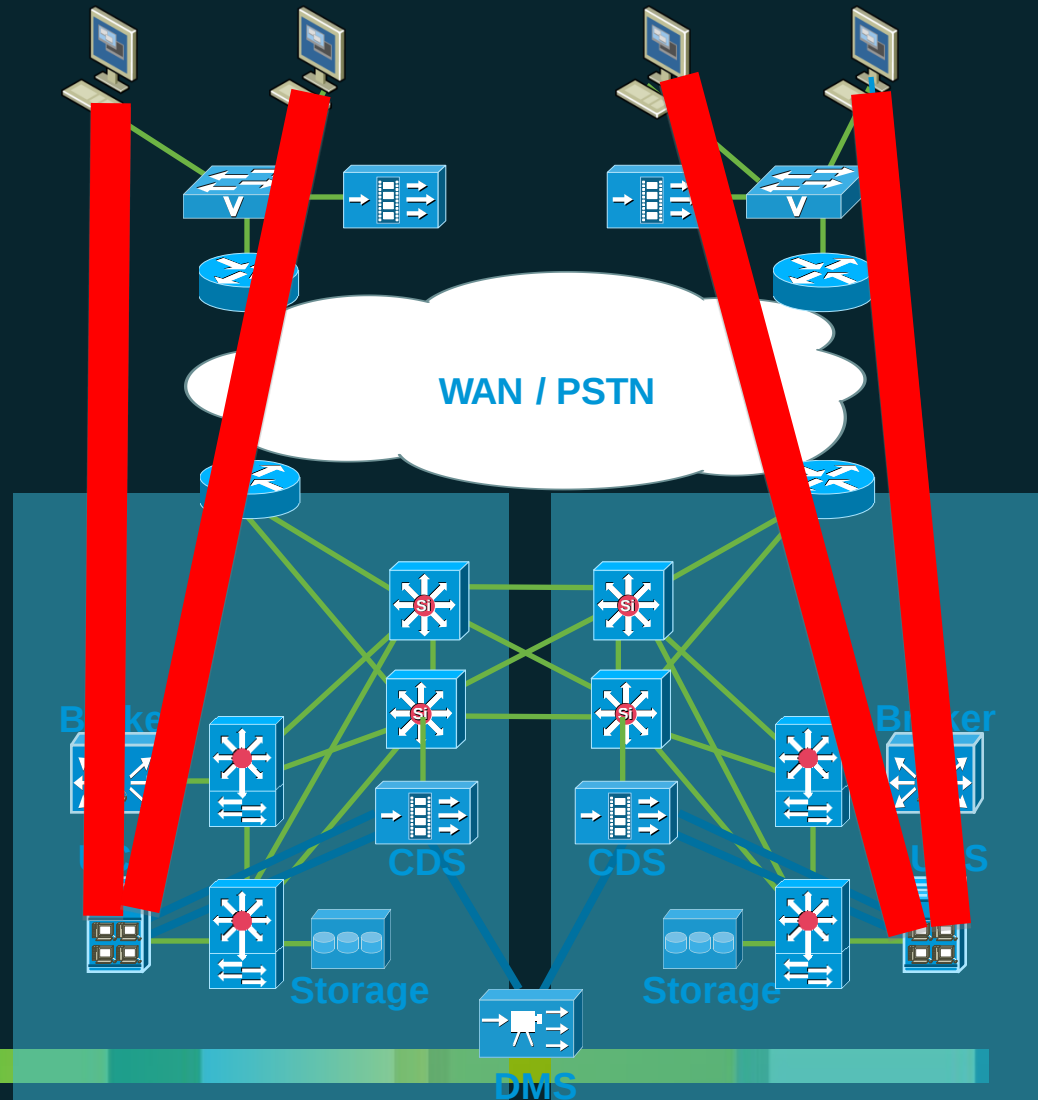


Protocol	TCP/UDP Port	DSCP/CoS Value
RDP 7	TCP 3389	DSCP af21 and CoS2
ICA	TCP 1494	DSCP af21 and CoS 2
PC over IP (PCoIP)	TCP & UDP 4172	DSCP af21 and CoS 2
SCCP	TCP 2000	DSCP cs3 and CoS 3
SIP	TCP 5060	DSCP cs3 and CoS 3
CTI	TCP 2748	DSCP cs3 and CoS 3
Media (RTP, sRTP)	UDP 16384 to 32767	DSCP ef (audio only), DSCP af41 (audio/video) and CoS 5

•Local DC flows (Storage, Hypervisor management, etc) not shown
 •QoS models for latest endpoints use TRP or Flow based classification. Details coming soon.

Live Streaming Video With VDI

- Unified Communications
 - Zero/thin client with display protocol
 - client only needs capacity to decode
- Borderless Network
 - CDS and multicast cannot split video in a display protocol resulting in one stream per user on the WAN
 - Bandwidth/experience varies depending on display protocol & streaming format
 - No QoS so entire experience suffers if congestion
- Data Center
 - Stream sourced from encoder
 - Servers are loaded by transcoding and/or transrating
 - Server farm is loaded by all streams



Multi-Media Redirection (MMR)

- MMR enables non-Interactive multimedia streams to be decoded on the endpoint, thereby freeing up processing power on the ESX host/cluster
- MMR makes bandwidth optimization over the WAN possible for corporate video-delivery
- Appropriate Codecs and MMR support on the endpoints is required
- MMR technologies

Citrix HDX

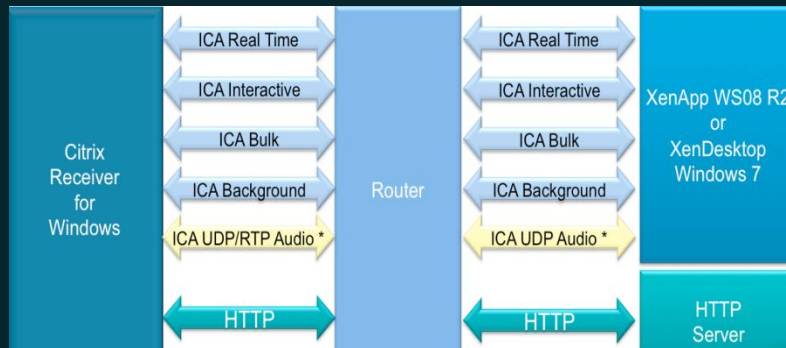
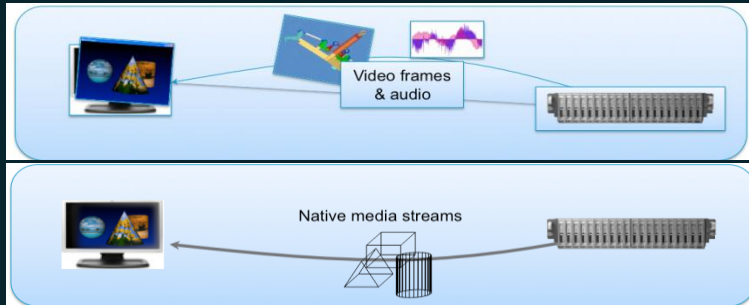
VMware View

Wyse TCX

RemoteFX (MS RDP 7.1)

Note: In View Manager 4.5, MMR supported on Windows XP & Vista, but not on Windows 7 – Workaround use RDP

Citrix XenDesktop and ICA/HDX



Real-Time	Interactive	Bulk	Background
Audio	ThinWire	MediaStream (Windows Media and Flash)	Printing
	Seamless	USB Redirection	COM Port Mapping
	MSFT TS Licensing	Clipboard	LPT Port Mapping
	SmartCard Redirection	Client Drive Mapping	Legacy OEM Virtual Channels
	Control Virtual Channel		
	End User Experience Monitoring		

- Latest release: XenDesktop 5.5 – Improved HDX for WAN, better management
- HDX MediaStream and Adaptive Orchestration
 - Leverage client-side resources
 - Better server scalability
 - More simultaneous users over WAN (Controlling Bandwidth Explosion)
 - Handle changing network conditions

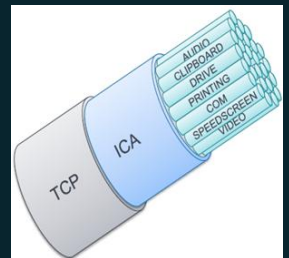


- HDX Flash Redirection
 - Now can handle 300 ms RTL
 - Linux now supported
 - Fallback to Server-side rendering adaptively



- HDX VoIP-Over-ICA
 - Inline with Cisco VXi approach of separating media
 - SDKs for VOIP providers
 - Multi-Stream ICA
 - Larger Audio Jitter buffers

- Basic Characteristics
 - 64 Virtual Channels
 - TCP based protocol
 - Encryption/Compression



PCoIP Optimizations – View 5.0

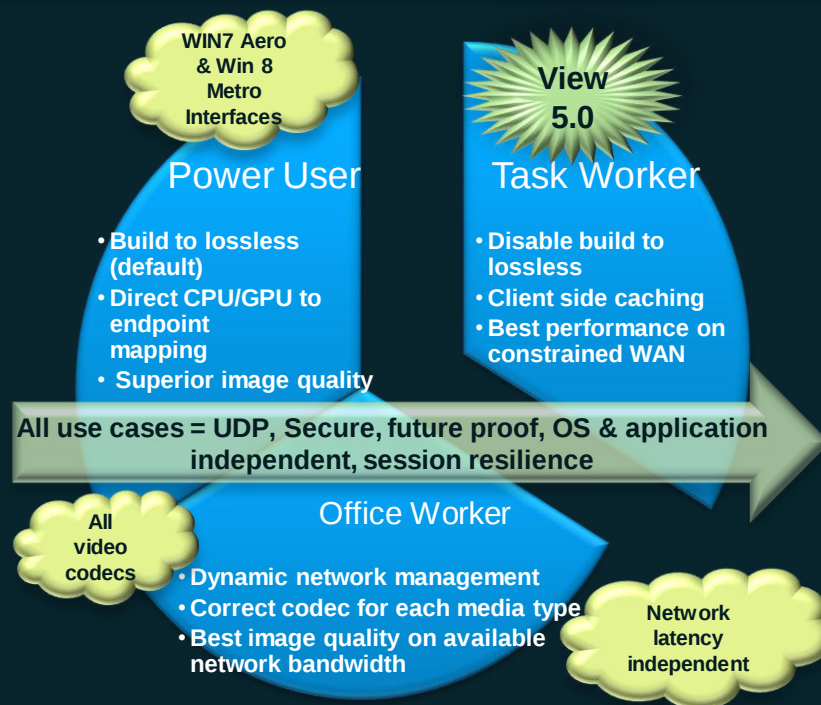
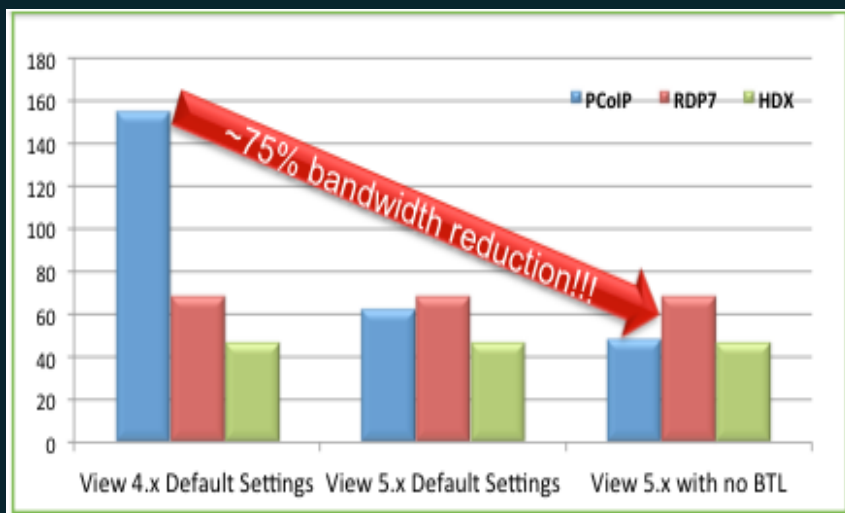


Description

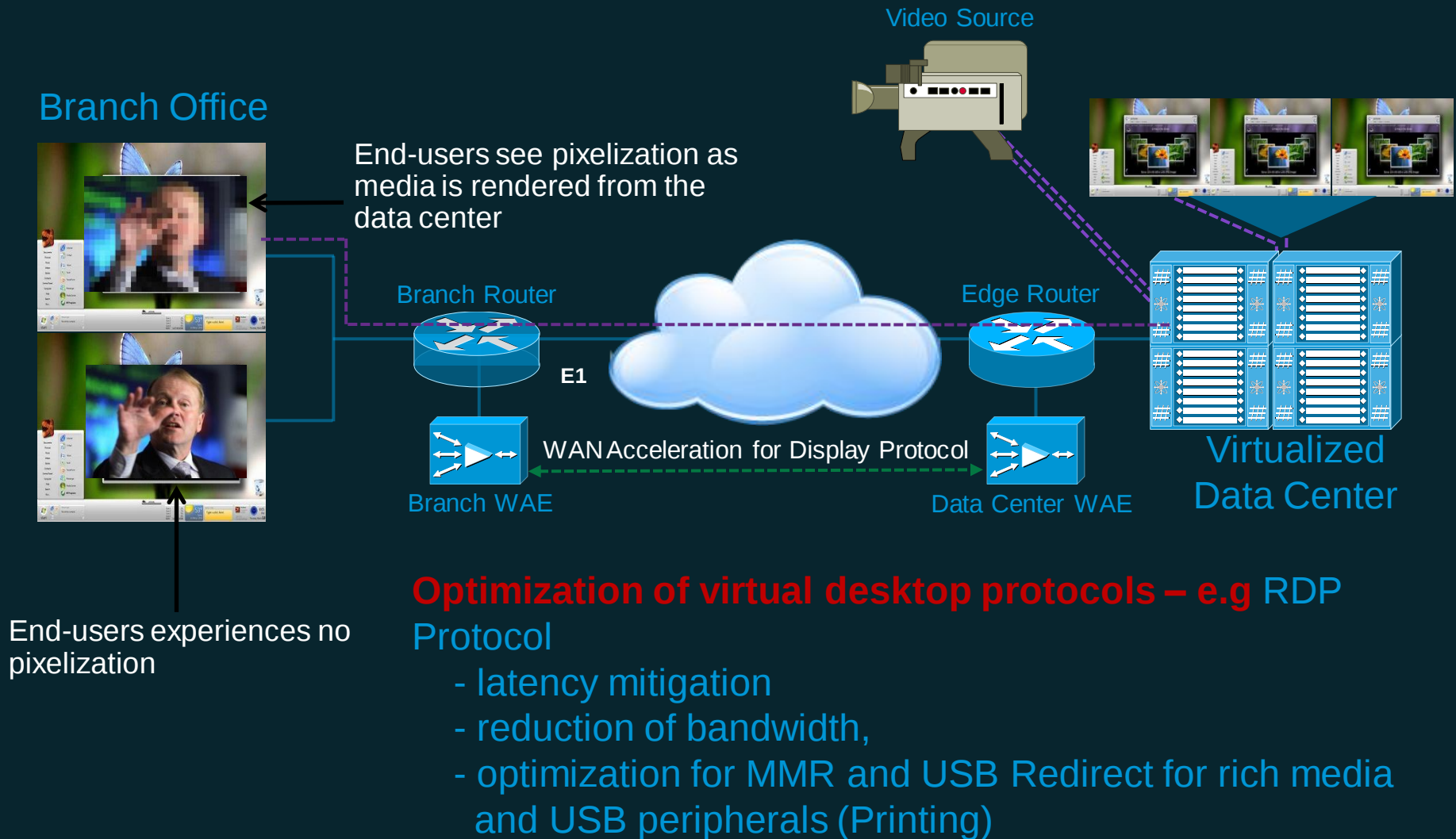
- New optimization controls to reduce bandwidth
 - Client Side Caching
 - Lossless CODEC
 - Build to Lossless GPO
- Customize to reduce bandwidth usage on both the LAN and WAN
- Optimization Controls available in GPO

Benefits

- Up to 75% reduction in bandwidth usage
- Improve scalability on WAN links
- Increase user density on WAN
- Configure by user case, user expectation and network requirements



Improving user experience through WAAS in Virtualization Aware Network



Bandwidth Reduction with WAAS*

Protocol	Vendor	Transport	Bandwidth without WAAS (Approx) Cisco KW+	Bandwidth without WAAS (Approx) Task Worker	Bandwidth with WAAS (Approx) Task Worker
Remote Desktop Protocol (RDP)	Microsoft	TCP 3389	1.5 Mbps	384 Kbps	96 Kbps
Independent Computing Architecture (ICA)	Citrix XenDesktop 4.0/5.0/5.5	TCP 2598 CGP TCP 1494	967 Kbps	120 Kbps	60 Kbps
PC over IP (PCoIP)	Teradici / VMware	Media – UDP 50002/4172 Control – TCP 50002/4172	1.5 Mbps	192 Kbps	192 Kbps

Note: PCoIP can't be optimized by WAAS

* Some Caveats apply, refer to Cisco VXi CVDs for more details

WAAS Optimization for MMR and USB Redirection

- WAAS providing 72% optimization for Wyse-MMR while providing 47% optimization for USB-Redirection

Cisco Wide Area Application Services

admin | Home | Help | Logout | About

WAAS Central Manager

My WAN > Devices > vxi-branch-4-waas

Switch Device

Connections Summary Table For Device: vxi-branch-4-waas

Items 1-3 of 3 | Rows per page: 50 | Go

Filter Settings

Source IP: Source Port:
Destination IP: Destination Port:

Source IP:Port	Dest IP:Port	Peer Id	Applied Policy / Bypass Reason	Connection Start Time	Open Duration (hh:mm:ss)	Org Bytes	Opt Bytes	% Comp	Classifier Name
10.1.4.22:1038	10.0.242.102:3389	vxi-wan-2-waas		17-Aug-10 18:23	0:6:13	14.6789 MB	14.9048 MB	-	MS-Terminal-Services
10.1.4.22:1039	10.0.242.102:3211	vxi-wan-2-waas		17-Aug-10 18:23	0:6:9	6.5439 KB	3.4492 KB	47%	USB-Redirection
10.1.4.22:1044	10.0.242.102:9427	vxi-wan-2-waas		17-Aug-10 18:28	0:1:32	4.4309 MB	1.2221 MB	72%	Wyse-MMR

WAAS Print Optimization

- WAAS providing 26% optimization (TFO, LZ and DRE) for the first print request

My WAN > Devices > vxi-branch-2-waas

Connections Summary Table For Device: vxi-branch-2-waas

Items 1-11 of 11 | Rows per page: 50 | Go

Filter Settings

Source IP: Source Port:
Destination IP: Destination Port:

Source IP:Port	Dest IP:Port	Peer Id	Applied Policy / Bypass Reason	Connection Start Time	Open Duration (hh:mm:ss)	Org Bytes	Opt Bytes	% Comp	Classifier Name
10.1.2.35:1350	10.0.233.225:1494	vxi-wan-1-waas		12-Aug-10 19:46	0:43:21	2.6313 MB	2.944 MB	-	Citrix-ICA
10.0.233.225:3135	10.1.2.201:445	vxi-wan-1-waas		12-Aug-10 20:29	0:0:48	882.5576 KB	652.2705 KB	26%	CIFS
10.1.2.201:1967	10.0.233.225:139	vxi-wan-1-waas		12-Aug-10 20:29	0:0:23	4.5801 KB	3.2461 KB	29%	CIFS
10.15.254.202:14794	10.0.2.62:7878	vxi-wan-1-waas		12-Aug-10 20:30	0:0:13	788 Bytes	745 Bytes	5%	WAAS-FlowMonitor
10.0.254.59:18195	10.15.254.202:443	vxi-wan-1-waas		12-Aug-10 20:30	0:0:0	1.0693 KB	1.0693 KB	-	HTTPS

- WAAS providing 55% optimization for the second print request

Connections Summary Table For Device: vxi-branch-2-waas

Items 1-9 of 9 | Rows per page: 50 | Go

Filter Settings

Source IP: Source Port:
Destination IP: Destination Port:

Source IP:Port	Dest IP:Port	Peer Id	Applied Policy / Bypass Reason	Connection Start Time	Open Duration (hh:mm:ss)	Org Bytes	Opt Bytes	% Comp	Classifier Name
10.1.2.35:1350	10.0.233.225:1494	vxi-wan-1-waas		12-Aug-10 19:46	0:47:28	5.3934 MB	5.7679 MB	-	Citrix-ICA
10.0.233.225:3135	10.1.2.201:445	vxi-wan-1-waas		12-Aug-10 20:29	0:4:55	1.7267 MB	790.7324 KB	55%	CIFS
10.15.254.202:14794	10.0.2.62:7878	vxi-wan-1-waas		12-Aug-10 20:30	0:4:20	6.8945 KB	3.4648 KB	50%	WAAS-FlowMonitor
10.1.2.201:1987	10.0.233.225:139	vxi-wan-1-waas		12-Aug-10 20:33	0:0:28	4.3262 KB	3.1494 KB	27%	CIFS
10.0.254.59:18657	10.15.254.202:443	vxi-wan-1-waas		12-Aug-10 20:34	0:0:0	1.0693 KB	1.0693 KB	-	HTTPS

Cisco VXi Virtual Workspace with UPOE

VXi Workspace with UPoE

Integrated Display Client

High availability (Power Backup)

Minimize workspace clutter

Power Efficiency/Management

EnergyWise Management

Low TCO

Today's Workspace with PoE+

Multiple Power Management Points

Cabling Overhead

Desktop Clutter

High Availability only for phone

Obsolete equipment management

High TCO

VXI Security Use cases and deployment scenarios

Access Security

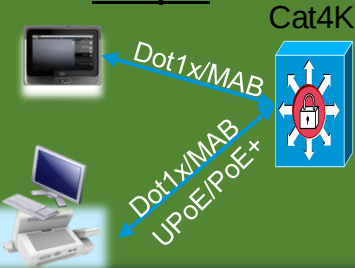
VXI Network

Data Center

Remote/Home User



Campus



Branch One



Branch Two



- ASA and Anyconnect provide single secure remote access solution for large device footprint
- Device profiling and posture assessment using ISE ensures conformance
- UPoE and PoE+ provide de-cluttered and energy efficient virtual workspace
- 802.1x based device and user authentication
- Trustsec allows policy based access to specific applications in Data Center
- Unmanaged devices (BYOD) only allowed access to specific Virtual desktop pools and applications
- DMVPN allows secure, dynamic and direct branch to branch collaboration
- WAAS and ISR together accelerate performance

McAfee MOVE-AV

Virtualization Experience Clients



Virtualization Experience Client (VXC) Portfolio

<i>New Client Additions in v2.5</i>				
				
Zero Clients	Zero Clients	Software Appliance	Thin Client	Enterprise Tablet
VXC 2100 Series	VXC 2200 Series	VXC 4000	VXC 6215	Cisco Cius
Shipping	Shipping	Available Q4 CY11	Available Q4 2011/ Q1 2012	Shipping

Cisco VXC 2100 Series (Integrated)

- Zero client endpoints
- Integrated form factor for Cisco Unified IP Phone 8961, 9951*, 9971
- VXC-2212 supports HDX/ICA, RDP
- VXC-2211 supports PCoIP
- Powered via Phone – Leverages existing Power over Ethernet (PoE+), or PWR-CUBE-4
- Works with Cisco IP Phones to deliver voice, video, virtual desktop

** NOTE: 9951 IP Phone must have Serial Number FCH153681E0 and above, OR VID V05 and above*

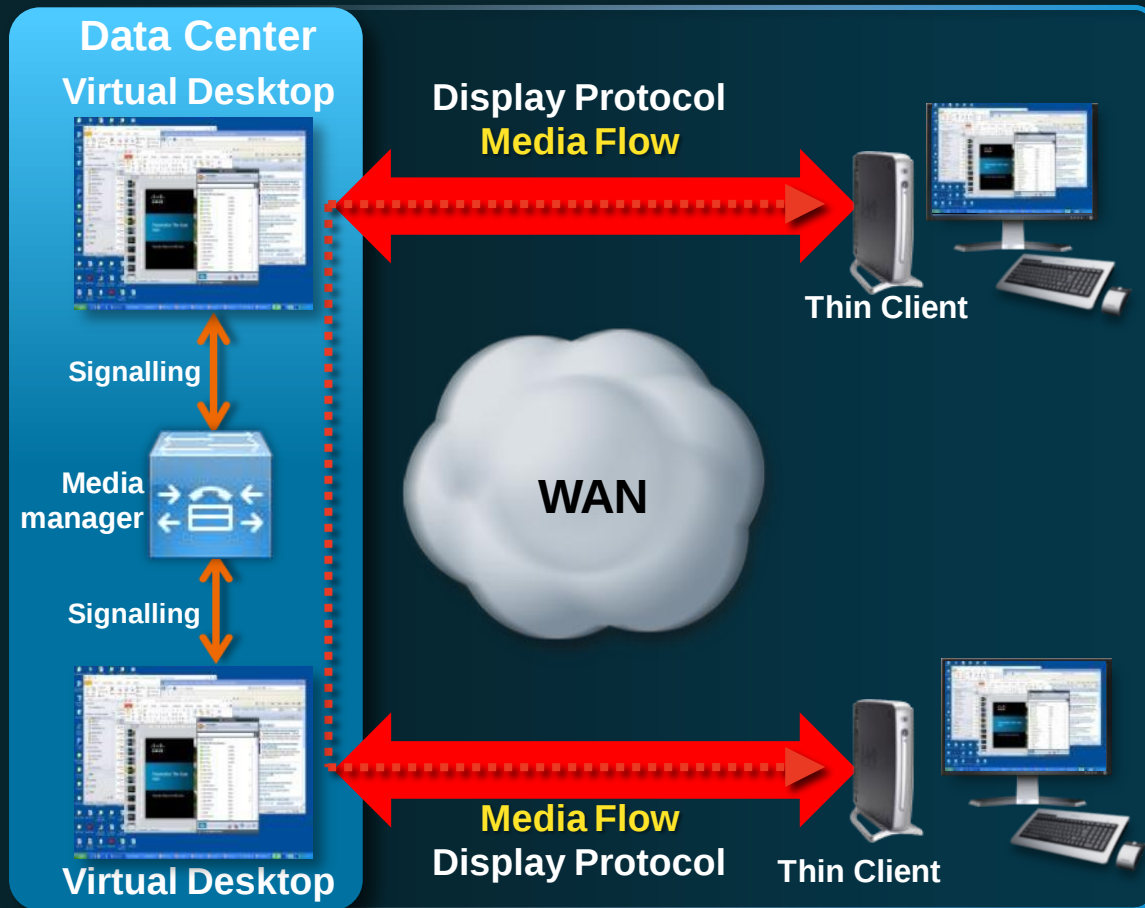


Cisco VXC 2200 Series (Standalone)

- Zero client endpoints
- Standalone form factor
- VXC-2212 supports HDX/ICA, RDP
- VXC-2211 supports PCoIP
- Powered with Power over Ethernet (PoE+ - 30W) or with PWR-CUBE-4
- Works with Cisco IP Phones to deliver voice, video, virtual desktop

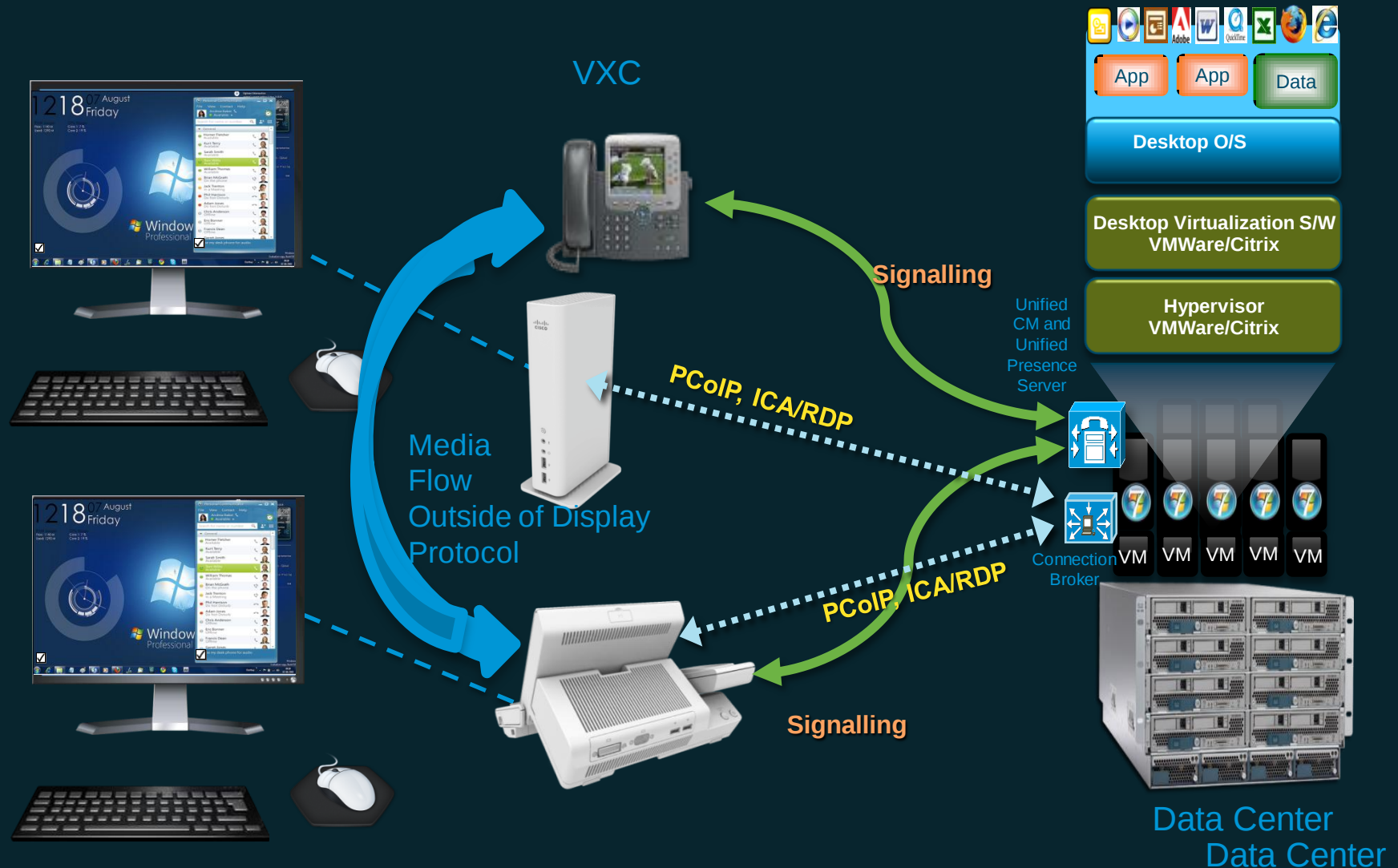


Voice, Video, Virtual Desktop Challenge



- Unusable experience
 - Hairpin effect
- Increased cost and resource utilization
 - Bandwidth explosion
 - Heavy virtual machine processing in data center

Rich Media UE (User Experience) restored by VXC 2x00 & VXi



Cisco VXC 6215

- A thin client that unifies voice, video and virtual desktop in one device
- Supports high quality, scalable voice and video, delivering optimal user experience
- Introduces unique voice, video processing capabilities to eliminate the hairpin effect
- Linux based platform supports HDX/ICA, PCoIP/RDP
- Target Availability: Q4 2011/Q1 2012



Cisco VXC 4000

- Enables UC voice capabilities for repurposed windows PCs for virtual desktops
- Introduces unique voice processing capabilities that efficiently use network and data center CPU resources, eliminating the hairpin effect
- Supports Citrix XenDesktop and VMware View
- Based on CIPC (Cisco IP Communicator)
- Endpoint support: WinXP, Win7
- Target Availability: Q4CY11



Rich Media UE restored by VXC 6215/4000&VXI

- Video & Voice Support
- Linux based endpoint
- Monitors
Single:2560x1600
Dual:1920x1200
- No PoE



End User

- Software Appliance on XP and Windows 7
- **Voice Support only**
- Enables VXI Collaboration for refurbished PCs



VXC 4000



VXC 6215

Signalling

ICA

Signalling

PCoIP, ICA/RDP



Desktop O/S

Desktop Virtualization S/W
VMWare/Citrix

Hypervisor
VMWare/Citrix

Unified CM and
Unified Presence
Server



Connection
Broker



Data Center

Media Flow outside of Display Protocol

Cisco Cius

- Enterprise tablet that combines voice, video, collaboration, and VDI
- Supports external Bluetooth/USB mouse & keyboard when docked
- Supports external display in “mirror mode”
- Supports VMware View, Citrix Receiver and Wyse PocketCloud



Cius: Hosted Virtual Desktop



High-definition Video

Video Interoperability

TelePresence, Cisco Video
Endpoints & UC clients

Native Point to Point
- CTS Release

Multi Point
- TP Server, CTMS

H.264 Standard

720p Video



Built-in Cameras

Front and Rear - 720p

Still & Video Capture

Rear Camera – 5 Mpixel

Camera Swap

Front to Rear

Dual Displays

Mirror then Independent

Cisco WebEx and Cius



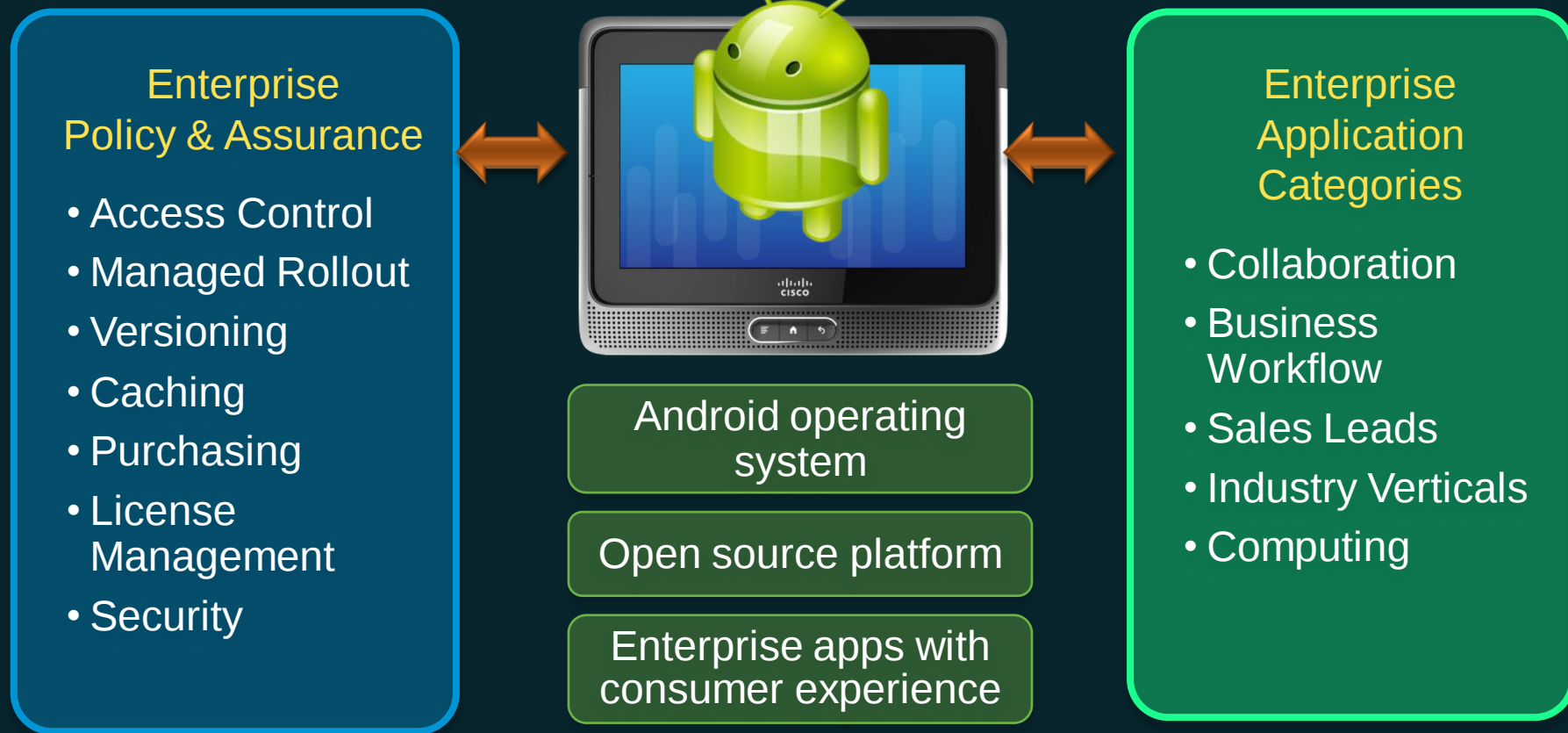
- Meet face-to-face anywhere, anytime
- Exclusive to Cius
 - Join meetings from email or calendar invite
 - Book meetings from contact's info
 - Start meetings from IM

Cisco Jabber IM and Cius

- View contacts, availability and click to IM
- Click to call, email and video chat from IM
- Join instant WebEx meeting
- Flexible deployment on-premises or cloud



Cius – Application Strategy



VXC Feature Comparison



	VXC 2100 Series	VXC 2200 Series	VXC 4000*	VXC 6215*	Cisco Cius
Form Factor	"Backpack" Integrated	"Tower" Standalone	PC Software	"Tower" Standalone	Enterprise Tablet
Availability	Shipping	Shipping	Q4 2011	Q4 2011/Q1 2012	Shipping
Platform	Zero Client	Zero Client	Win7, XP	Linux	Android (x86)
HVD Protocol Support	2111 – PCoIP 2112 – HDX,RDP	2211 – PCoIP 2212 – HDX,RDP	Citrix XenDesktop, VMware View	HDX	Citrix XenDesktop, VMware View
UC Protocol Support (add on)	N/A	N/A	Software Appliance	HDX, RDP (Q4CY11) PCoIP (Q1CY12)	N/A
UC Client Support*	CUPC, Connect	CUPC, Connect	CUPC, CUCILync	CUPC, CUCILync	Native
Voice	IP Phone 8961, 9951, 9971	N/A, can be used with IP Phone	Yes	Yes	Yes
Video	IP Phone 9971, 9951	N/A, can be used with IP Video Phone	No	Yes	Yes
Monitor Support	Single or Dual, 1920x1200	Single or Dual, 1920x1200	Varies based on underlying HW	Single:2560x1600 Dual:1920x1200	Single Mirror, 1024x600 (on the roadmap for dual monitor support)
PoE	PoE	PoE	N/A	No	PoE
Encoding & Decoding	Via IP Phone	Via IP Phone	Audio only. Video on the roadmap.	Standard Video HD Capable*	HD Capable (720p)

For More Information

Partners

[https://communities.cisco.com/
community/partner/crossarc/vxi](https://communities.cisco.com/community/partner/crossarc/vxi)

The screenshot shows the Cisco Communities website interface. At the top, the Cisco logo and 'Cisco Communities' text are visible, along with a 'Directory' dropdown menu. Below the header, the breadcrumb trail reads 'Cisco Communities > Partners > Connected Architecture Solutions > VXI'. The main content area is titled 'VXI' and includes a navigation bar with tabs for 'Overview', 'All Content (6)', 'Discussions (4)', 'Documents (2)', 'Polls', and 'Videos'. A sub-header reads 'ANNOUNCEMENT: VXI Top 5 - Technical Guides Show Details'. On the left, a 'Navigator' sidebar lists 'Connected-Architecture Solutions' and 'Architecture Components'. The main content area features a 'Welcome to the VXI Partner Community' section with a video thumbnail and text describing the Virtual Experience Infrastructure (VXI) as a new way to deliver an End-User experience. Below this, a 'Get Started with VXI' section includes a 'VXI JumpStart Today!' button and text about Cisco's Virtual Experience Infrastructure.

Customers

<http://www.cisco.com/go/VXI>

The screenshot shows the Cisco website's 'Virtualization Strategies' page. The top navigation bar includes 'Products & Services', 'Support', 'How to Buy', 'Training & Events', and 'Partners'. The main content area is titled 'Virtualization Strategies' and features a 'University Controls Applications' section with a 'Read Case Study' button. Below this, there are several sections: 'VXI Solution Overviews' (including 'Virtualization Experience Infrastructure Overview', 'Cisco Desktop Virtualization Overview', 'Cisco VDI Services Overview', 'Raising the Bar on Desktop Virtualization', and 'VXI Ecosystem Partners'), 'Enterprise Resource Center', 'Cisco VDI Strategies for the CIO', 'Create a Strategic Asset for IT and End Users', 'Data Center Business Advantage', 'Cisco VDI for the IT Architect', and 'Reduce Risk with Validated Reference Architectures'. A 'Cisco Data Center Blog' section is also visible on the right side.

