

NEW JERSEY CHIEF TECHNOLOGY OFFICER'S STUDY COUNCIL



Please join us at our next meeting:
Friday, November 14th, 2014 from 12:30pm to 3:00pm

November 14th

Featured Speakers:

Dan Riordan -  **UN-TECH** :
E-Rate Funding Guaranteed

What's the Word on the New Erate?

Ted Stanziale -  **vmware** :

Virtualization-Roadmap through K-12

Yuri Magalif (CDI) & **Ralph Barca** (Edison Public Schools)

Cisco Systems, Inc.
111 Wood Avenue South, 2nd Floor
Iselin, NJ

12:30-3:00pm
Lunch will be Served

We hope that you will consider attending our next meeting of the Chief Technology Officer's Study Council for the 2014-2015 school year. With ever increasing and rapidly changing demands for technology in our public schools, this organization seeks to bring together technology leaders in our schools to meet and learn from colleagues across New Jersey as well as our corporate partners.

The significant role of technology in public schools decisions has created the need for executives to come together to recognize how technology is impacting teaching and learning applications throughout classrooms in New Jersey. Currently, there is no formal structure in place within NJ for CTO's to network and learn and this new organization hopes to fill that void for such a critical group in the organization of public schools.

Please RSVP to NJCTOSC@gmail.com
or contact Dr. Richard O'Malley at
908-565-4894. In addition, our 2014-15
NJCTOSC Membership Application Form is
attached for your consideration.

SPONSORS



NEW JERSEY CHIEF TECHNOLOGY OFFICER'S STUDY COUNCIL

November 14, 2014



Welcome

Dr. Richard O'Malley,
Superintendent

Edison Public Schools

Email: njctosc@gmail.com



**NEW JERSEY CHIEF TECHNOLOGY
OFFICER'S STUDY COUNCIL**

November 14, 2014

- **ERATE 2.0 – *WHAT'S THE WORD ON THE
NEW ERATE***
- **VIRTUALIZATION – *ROADMAP
THROUGH K12***

Agenda & Guest Speakers



- Dan Riordan,
Owner, On-Tech Consulting, Inc.
Email: dan@on-tech.com
 - Erate 2.0
 - Question & Answers



- Stan Bednarz
Sr. Systems Engineer, VMware SLED – NJ
Email: sbednarz@vmware.com
 - VMware Technology & Business Roadmap
 - VMware & K12
 - Datacenter Virtualization



- Yury Magalif,
Practice Lead - End-User Computing (EUC) @ CDI *** Cloud, Virtual Desktops (VDI),
Virtualization, Storage, Data Center
Email: yury.magalif@cdillc.com
 - VDI & End User Computing / Demonstration



- Ralph Barca,
CTO – Edison Public Schools
Email: ralph.barca@edison.k12.nj.us
 - Group Discussion: Virtualization in K12

Erate 2.0

What's the Word on the New Erate



Dan Riordan,
Owner, On-Tech Consulting, Inc.
Email: dan@on-tech.com

- Erate 2.0
- Question & Answers

E-Rate 2.0

What Does It Mean to Me?

Dan Riordan
President
On-Tech Consulting, Inc.
www.on-tech.com



E-Rate Funding—Guaranteed

December 13, 2014

What is the E-Rate?

- Federal program to subsidize the cost of ~~telecommunications and Internet access~~ **broadband** to schools and libraries
- Applicants receive 20%-90% “discount” on costs for eligible services
- Not a competitive grant; all applicants receive some funding



E-Rate 2.0

The Origin

- In June 2013, President Obama called for an expansion of the E-Rate program to:
 - Bring 100 Mbps to 99% of schools nationwide
 - Put Wi-Fi in schools
- For a year, the FCC collected input
- In July 2014, the FCC adopted the E-Rate Modernization Order



E-Rate 2.0

The Goals

- Refocusing of funding on broadband
 - Removal or phase-down of non-broadband
- Increasing cost-effectiveness
- Simplifying the application process

E-Rate 2.0

Focus on Broadband

- No changes to eligibility of broadband
- Voice services phased out
- Voice equipment removed
- Video services and equipment removed
- Other non-broadband services removed
 - E-mail
 - Webhosting
 - Voicemail
- Caching added
- Managed Internal Broadband Services added



E-Rate 2.0

Priority 2 is now Category 2

- Voice, video and servers dropped
- Top discount dropped from 90% to 85%
- \$150-in-5 replaces 2-in-5 (\$2.30-in-5 for libraries)
- Caching added
- Managed internal broadband services
- \$1 billion available next 2 years, then ?



E-Rate 2.0

Maximizing Cost-Effectiveness

- Item 21 Attachment data will be public
- Lowest Corresponding Price
- Preferred Master Contract (e.g., GSA)
- Consortium purchasing encouraged



E-Rate 2.0

Simplifying the Process

- No tech plans
- Checks straight from USAC to applicants
- USAC processing changes
 - Speeding review
 - Improving online system
 - Improving access to data
 - Plain language review



E-Rate 2.0

Not Simplifying the Process

- Discount calculation simplified
 - Urban/rural criteria changed
- Must file electronically
 - New forms coming soon
- New Item 21 Attachment format
- New form for multi-year contracts ... later
- Contracts don't have to look like contracts; must be written
- Must consider Preferred Master Contracts
- No 470 for business-class Internet access
- Appeals must be filed with USAC first
- Documents must be retained for 10 years



What does it mean to me?

Voice Funding Withering

Base Discount	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	Increased Cost 2015
20%	-	-	-	-	-	25%
25%	5%	-	-	-	-	27%
40%	20%	-	-	-	-	33%
50%	30%	10%	-	-	-	40%
60%	40%	20%	-	-	-	50%
70%	50%	30%	10%	-	-	67%
80%	60%	40%	20%	-	-	100%
90%	70%	50%	30%	10%	-	200%



What does it mean to me?

C1 Services No Longer Funded

- Web hosting
- Email
- Voicemail
- Mobile data plans (except in unusual circumstances)
- Little charges on your phone bill that don't cost much but are going to be a real pain to remove, like Directory Assistance, 900/976 Call Blocking



E-Rate Funding—Guaranteed

December 13, 2014

What does it mean to me?

C2 Services No Longer Funded

- Voice equipment (PBX)
- Video equipment (Video server)
- Servers (DNS, DHCP, email)
- Antennas (let's hope they exclude access points)
- Interfaces / Gateways (IAD, media converter)
- Circuit cards



E-Rate Funding—Guaranteed

December 13, 2014

What does it mean to me?

New C2 Services

- **Caching:**
 - Web caching: commonly accessed pages stored locally
 - WAN caching: commonly accessed data stored locally
- **Managed Internal Broadband Services (MIBS)**
 - Operation, management, monitoring, repair of LAN
 - May include leased equipment
 - May include upfront charges
 - Ineligible components must be cost-allocated
 - Cloud WLAN controller charges



What does it mean to me?

Category 2 Budgets

- \$150/student for 5 years (libraries: \$2.30/sq.ft.), \$9,200 min.
- Spend it all in 1 year or spread it across up to 5 years
- Includes Basic Maintenance, MIBS
- Budget is per-location
 - Equipment which serves more than one location consumes budget from each location served
 - Based on tangible criteria
 - Provide a realistic result
 - Examples: per user, per square foot, per location, other (e.g., by usage)

What does it mean to me?

Will I Get Category 2 Funding?

- If all schools apply for the full \$150/student, and no libraries apply:
 - 2015-2016: 90% applicants only
 - 2016-2017: some 80% applicants
 - 2017-2018: more 80% applicants
 - 2018-2019: some 70% rural / 60% urban
 - 2019-2020: most 60% rural / 50% urban
 - 2020-2021: everybody else (oops! Year 6)

What does it mean to me?

What Will My Discount Be?

- One discount for all schools in the district
 - An 84% district will move to 80% or 90%
 - Most applicants will see no change
 - About a sixth of applicants will have a higher discount
 - About a third of applicants will have a lower discount
- Urban or Rural?
 - Now based on census maps, not counties
 - Some suburbs will become rural
 - If buildings are in urbanized areas of a rural county, district becomes urban
 - Tie goes to the urban



What does it mean to me?

New Gotchas

- Documents must be retained for 10 years
 - Most applicants will need to revise document retention policies
- Preferred Master Contracts
 - If one gets approved, you must consider it
- Cell phone data off-campus not eligible
- Your old Item 21 Attachment format won't work

What does it mean to me?

What Should I Do?

- Consider moving to internal VoIP if you own the phones
- Spend C2 funding as soon as you can get it
 - 80% and up: apply this year
 - Below 80%: throw the Hail Mary
- If you go MIBS, get a contract with large upfront costs, or buy equipment
- Consider MIBS instead of basic maintenance
- Stop paying for cell phones directly: stipend
- Try out the new 471 as soon as it's available (Nov. 4th?)

E-Rate 2.1: What's Next

- Funding increase?
- More consortium incentives?
- More funding for libraries?



Questions

dan@on-tech.com

732-530-5435



E-Rate Funding—Guaranteed

December 13, 2014

Thank you!

Dan Riordan

On-Tech Consulting, Inc.

www.on-tech.com



E-Rate Funding—Guaranteed

December 13, 2014

Virtualization *Roadmap through K12*



Stan Bedanz

Sr. Systems Engineer, VMware SLED – NJ

Email: sbednarz@vmware.com

- VMware Technology & Business Roadmap
- VMware & K12
- Datacenter Virtualization

The Software-Designed Enterprise

Stan Bedanrz (sbednarz@vmware.com)

Sr. Systems Engineer, VMware

Agenda

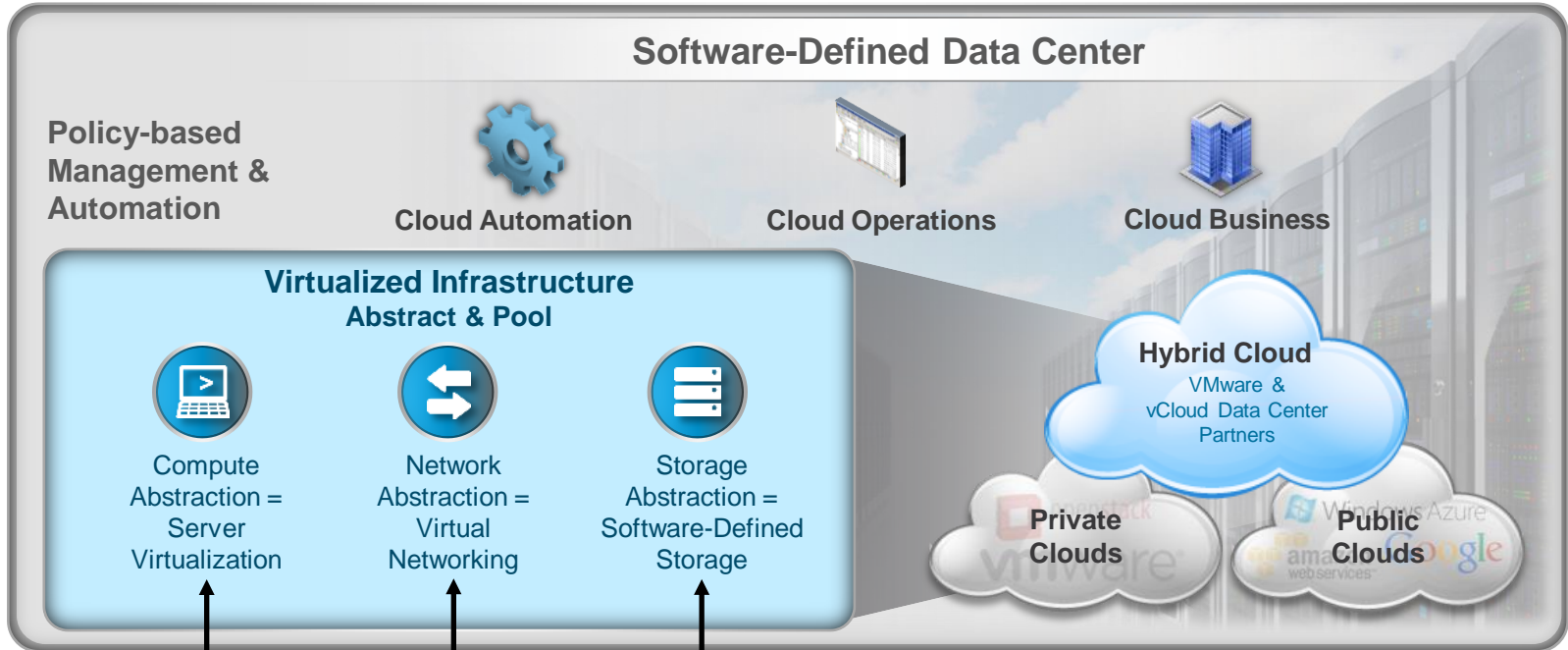
VMware's Software Defined Enterprise Overview

Business and IT Priorities

What Exactly is Virtualization?

How Will Virtualization Help Me Achieve My Goals?

VMware Delivers: The Foundation for the Software-Defined Enterprise



Physical Hardware



VMware Strategic Initiatives



Software-Defined Data Center

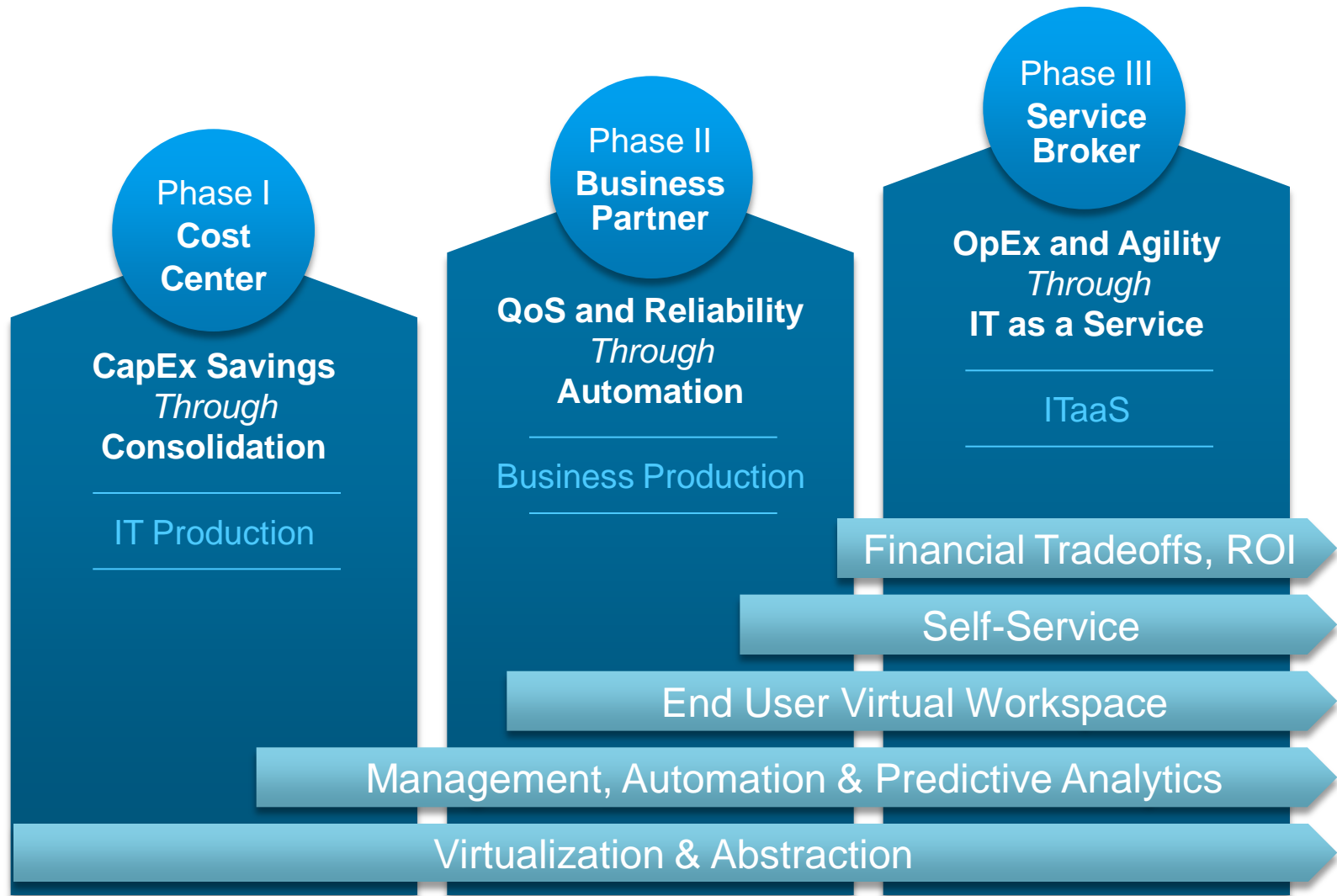


Hybrid Cloud



End-User Computing Virtual Workspace

The Journey to the Software-Defined Enterprise



Agenda

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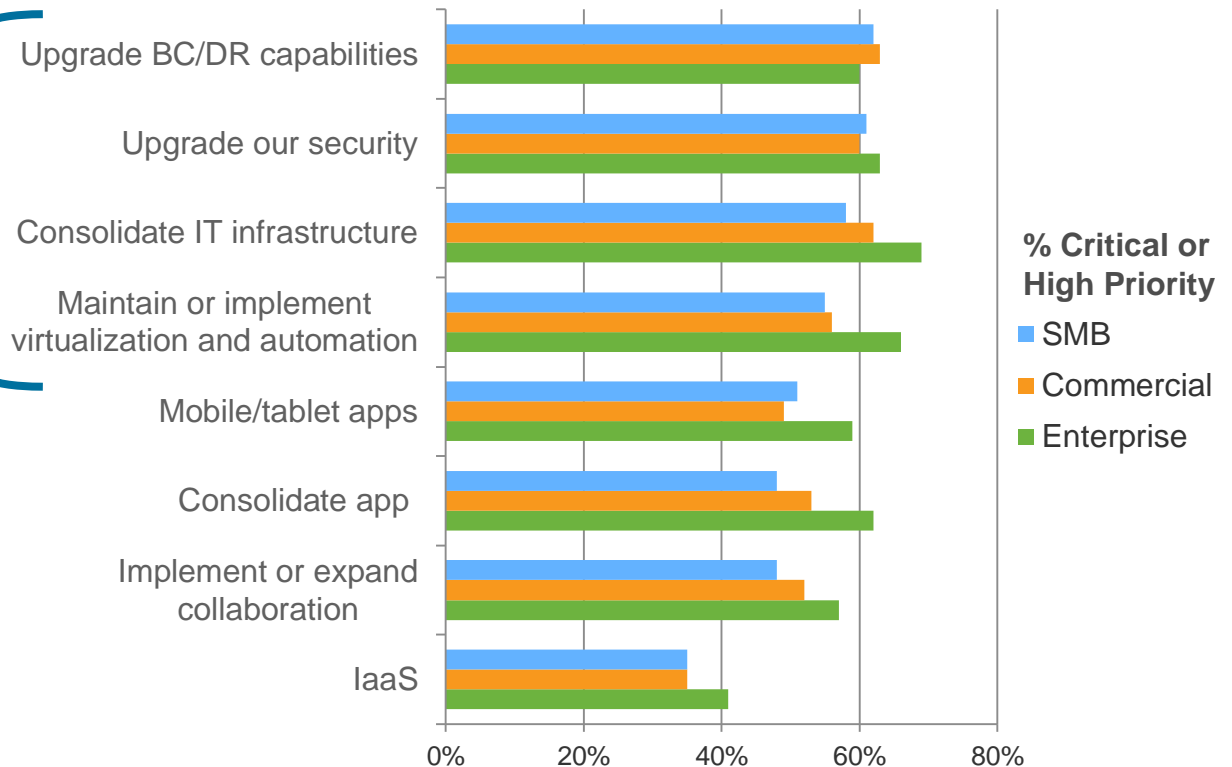
Top Technology Priorities

“While the majority of Global 1000 enterprises are heavily virtualized, many smaller enterprises and those in emerging economies are still early in their virtualization effort.” — *Gartner, 2012*

Top IT Priorities

- BC/DR
- Security
- Consolidation
- Virtualization and automation

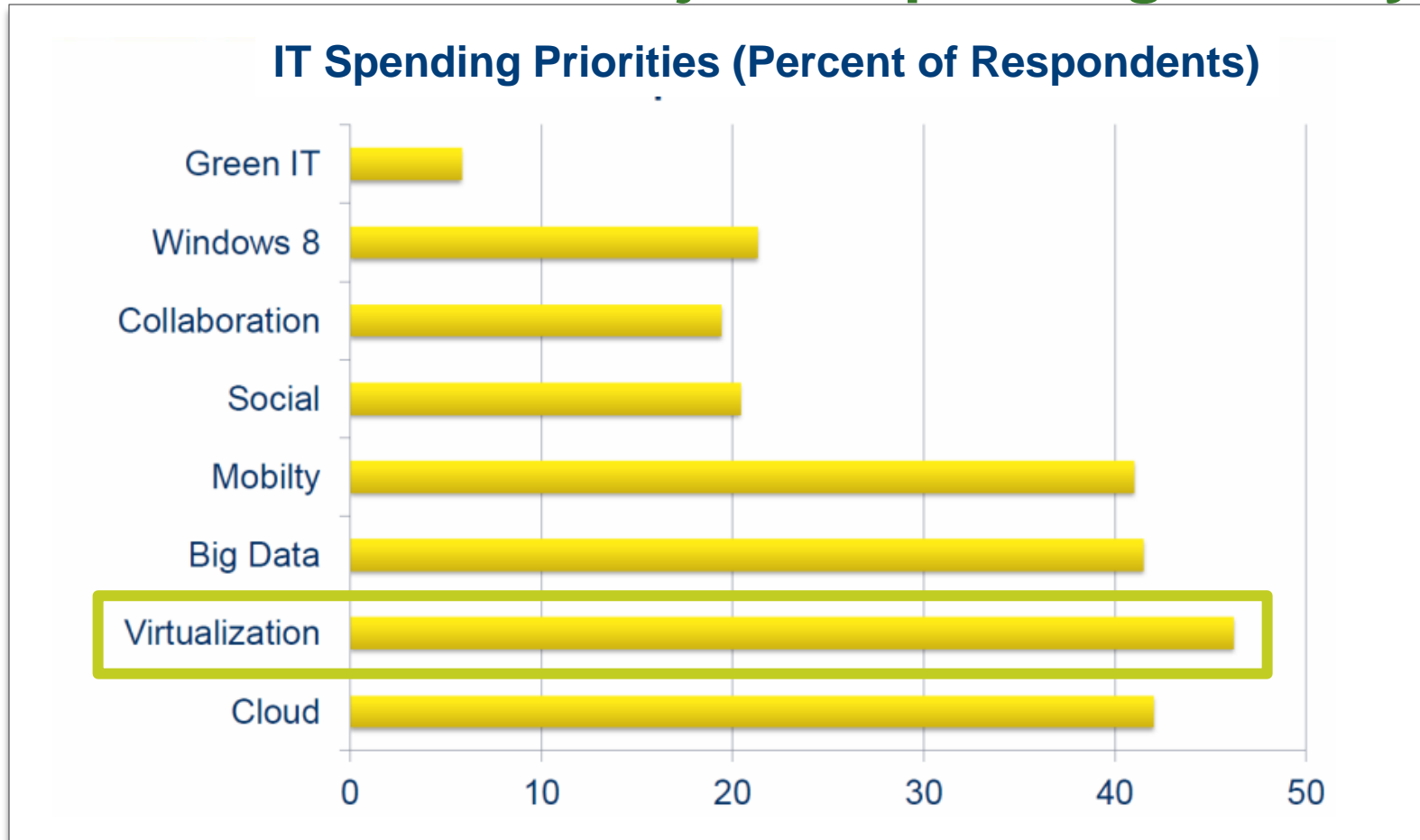
Q. Which of the following initiatives are likely to be your IT organization top technology priorities over the next 12 months?



Source: Forrsights Budgets And Priorities Tracker Survey, Q2 2012, Forrester Research, Inc, 2012

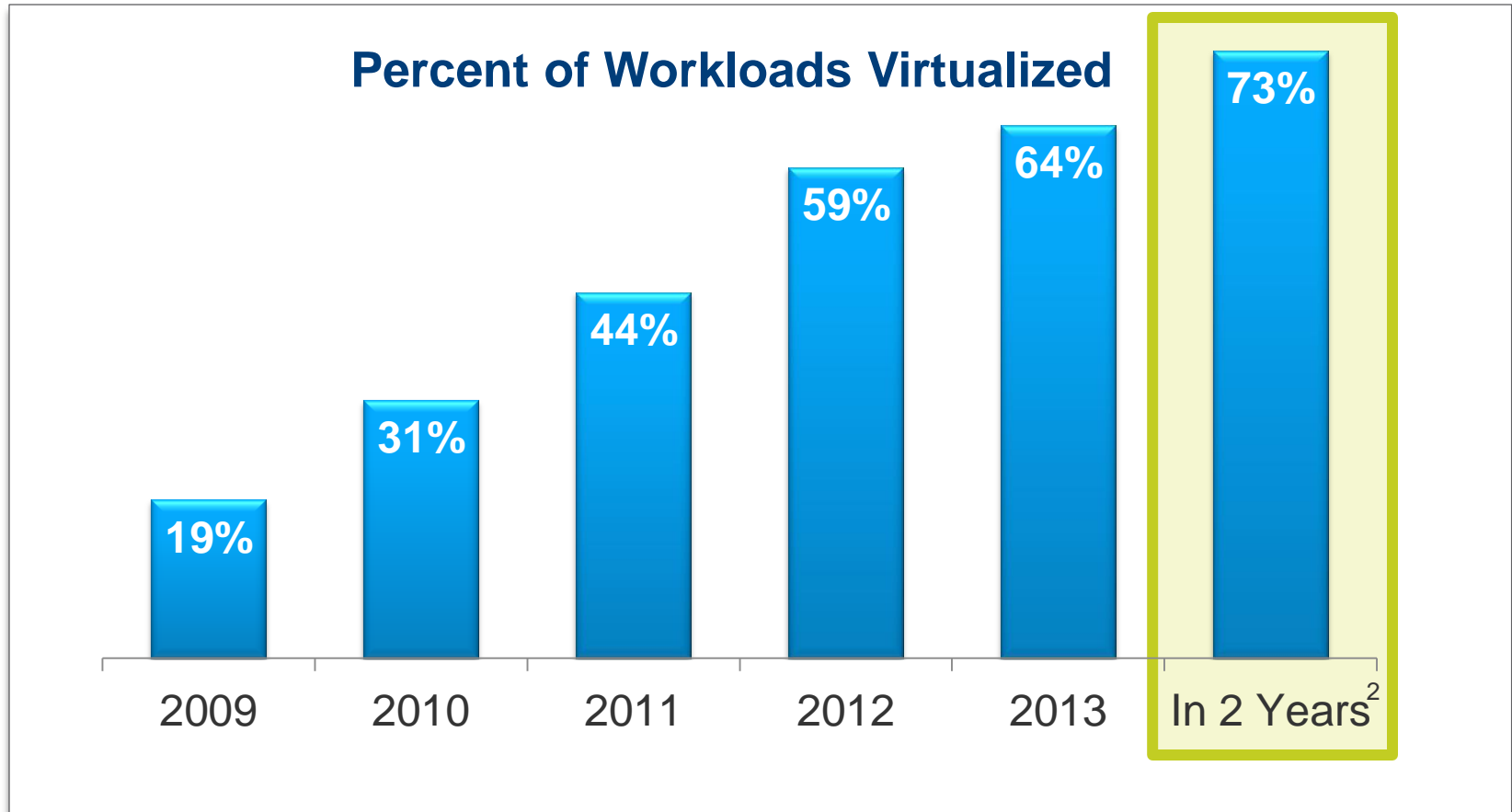
VMware market segment definition: SMB: 1-999 employees, Commercial: 1000-4999 employees, Enterprise: 5000+

Virtualization Still A Major IT Spending Priority



Source: IDC State of the Market: IT Spending Review & 2013 Outlook, November 2012

Momentum in Virtualization - Rates Continue to Increase



Source: VMware customer survey, Jan 2010, Jun 2011, Mar 2012, Jul 2013

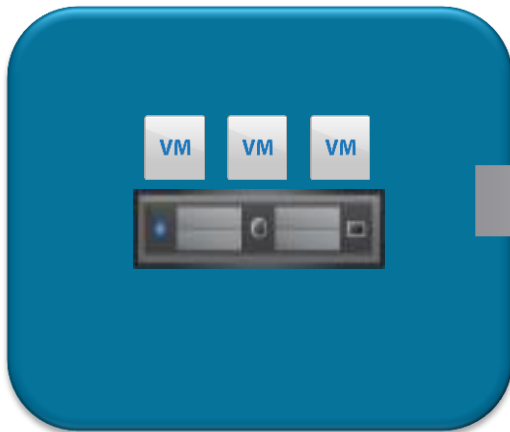
Question: Please indicate percentage of x86 server operating system instances (e.g., Windows, Linux) that run in virtual machines

Source 2: IDC Server Virtualization Forecast, Feb 2013

Evolution of Virtualization and VMware

Virtualization 1.0 (2003)

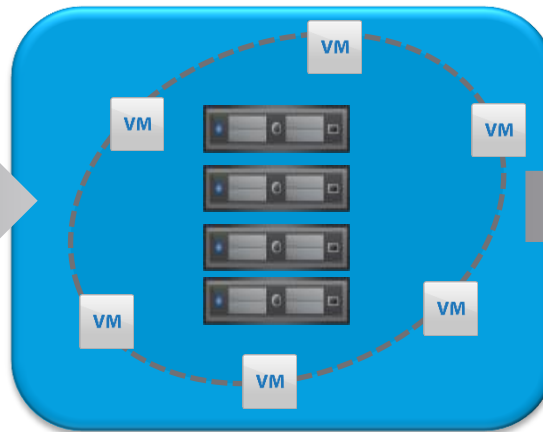
Server Virtualization



Virtual Machines
+ **Physical** Storage,
Network and Security

Virtualization 2.0 (2008)

Distributed Virtualization



Virtual Pools of Compute
+ **Physical** Storage,
Network and Security

Virtualization 3.0 (2013)

Hybrid Cloud



Software-Defined Data Center
+ **Virtualized** Storage,
Network and Security

- Server Consolidation
- Test / Development
- CAPEX Savings

- Production Workloads
- VM Mobility
- High Availability
- CAPEX Savings

- Fully Virtualized Data Centers
- Internal & External Cloud
- Adaptive, Intelligent Infrastructure
- Service Oriented (IT as a Service)
- OPEX Savings

Benefits

Agenda

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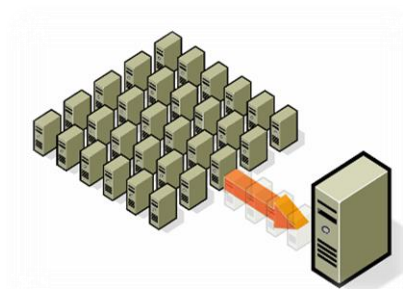
What is Virtualization?

Description

- Virtualization is a proven software technology that is rapidly transforming the IT landscape and fundamentally changing the way that people compute.
- Virtualization makes it possible to run multiple operating systems and multiple applications on the same SERVER at the same time.

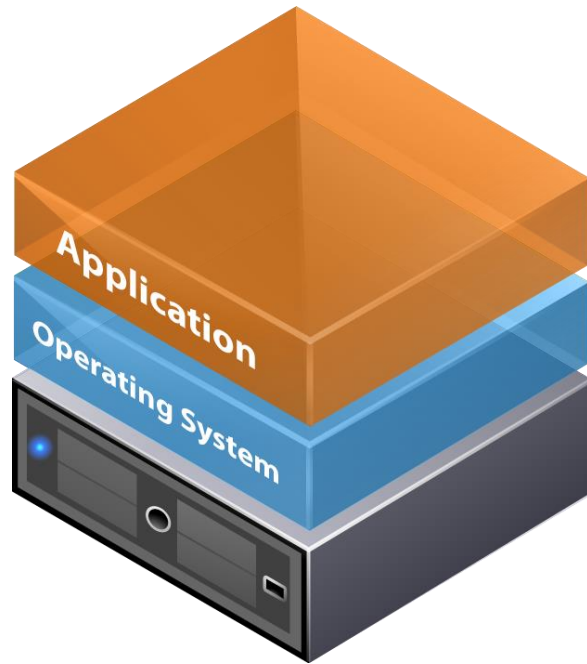
Benefit

- Virtualization allows you to reduce IT costs while increasing the efficiency, utilization and flexibility of your existing x86 computer hardware.

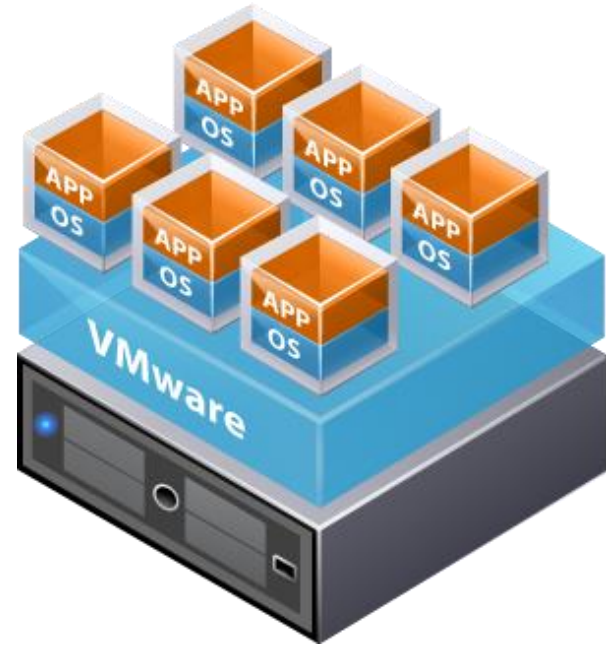
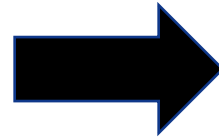


Virtualization Defined

For those more visually inclined...



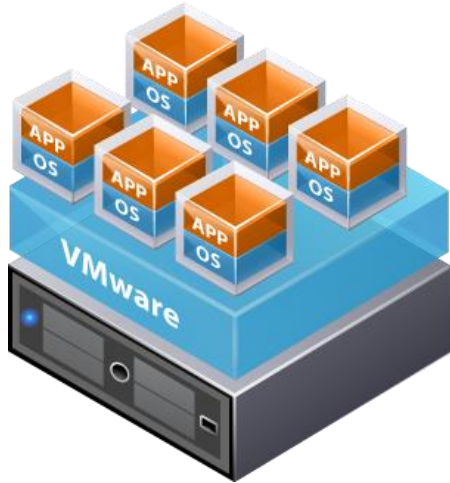
Traditional Architecture



Virtual Architecture

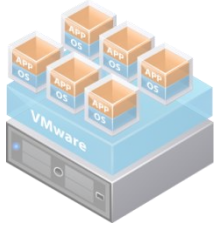
Key Properties of Virtual Machines

Partitioning



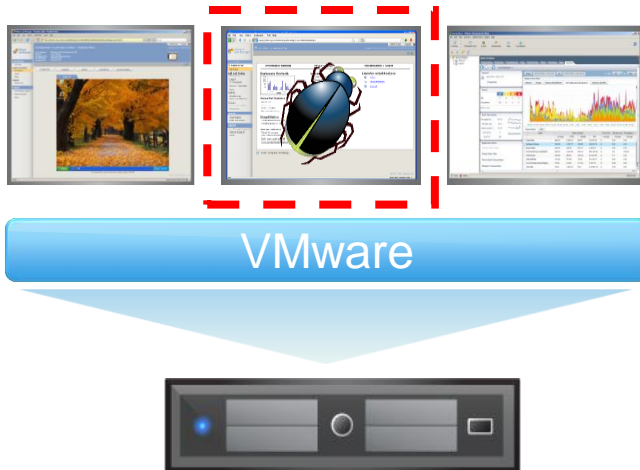
- Run multiple operating systems on one physical machine
- Divide system resources between virtual machines

Key Properties of Virtual Machines



Partitioning

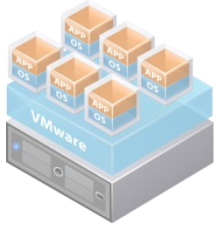
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Isolation

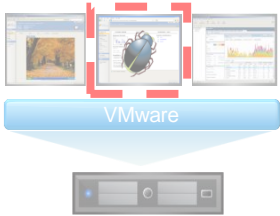
- Fault and security isolation at the hardware level
- Advanced resource controls preserve performance

Key Properties of Virtual Machines



Partitioning

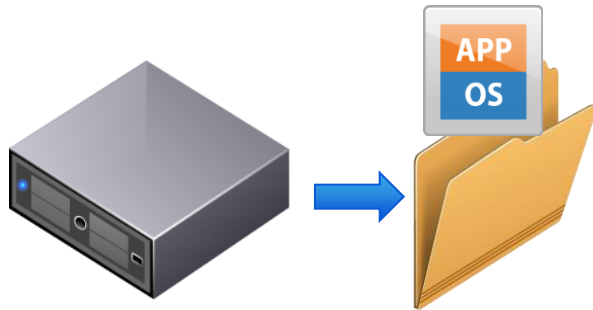
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Isolation

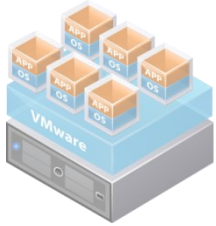
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Encapsulation



- Entire state of the virtual machine can be saved to files
- Move and copy virtual machines as easily as moving and copying files

Key Properties of Virtual Machines



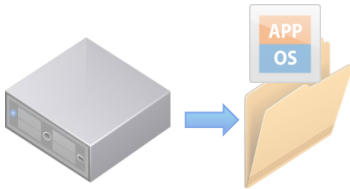
Partitioning

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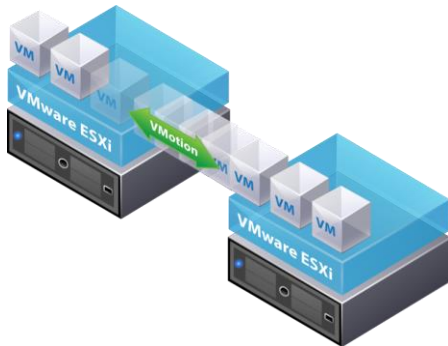
Isolation

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Encapsulation

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Hardware Independence

- Provision or migrate any virtual machine to any similar or different physical server

Agenda

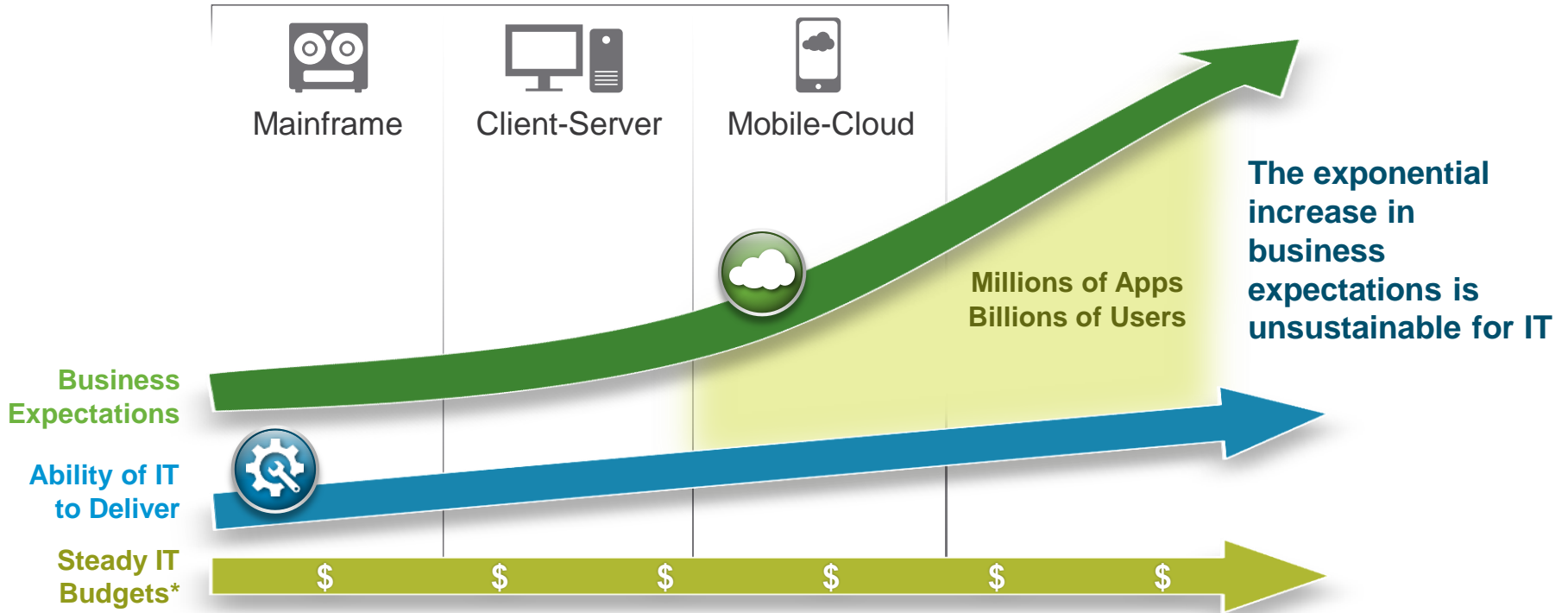
VMware's Software-Defined Enterprise Overview

Business and IT Priorities

What Exactly is Virtualization?

How Will Virtualization Help Me Achieve My Goals?

IT Technology Eras



* Source: Gartner, 2013: "Hunting and Harvesting in a Digital World: The 2013 CIO Agenda"

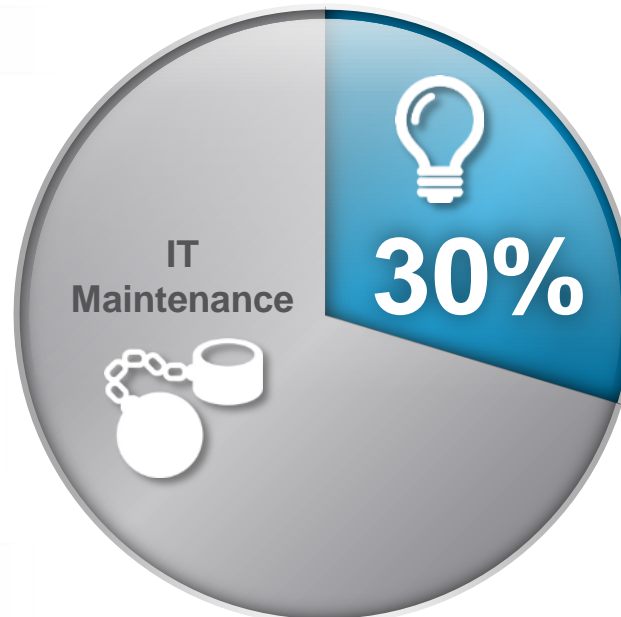
Liberating Resources to Drive Innovation

Apps take too long.

Device management
requires human
intervention.

Provisioning
takes weeks.

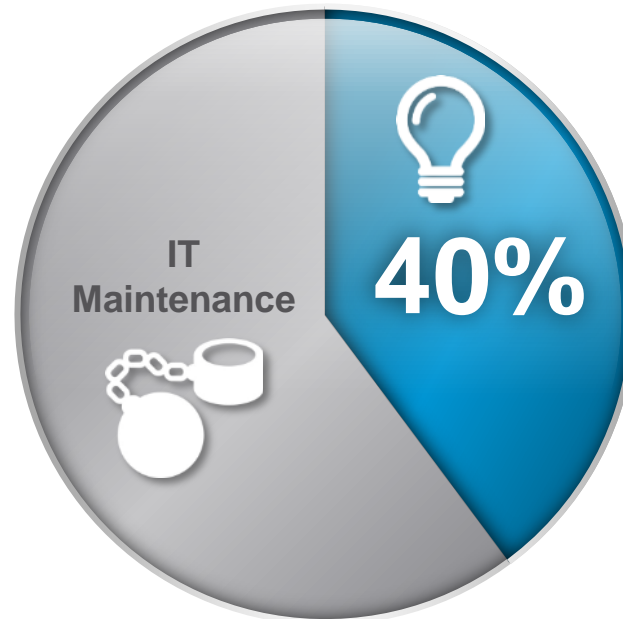
Production workloads
are managed via email.



Industry Average:
**IT Spend
on Innovation**

* Source: Gartner, 2013: "Hunting and Harvesting in a Digital World: The 2013 CIO Agenda"

Liberating Resources to Drive Innovation



VMware
Customer Average:
**IT Spend on
Innovation**

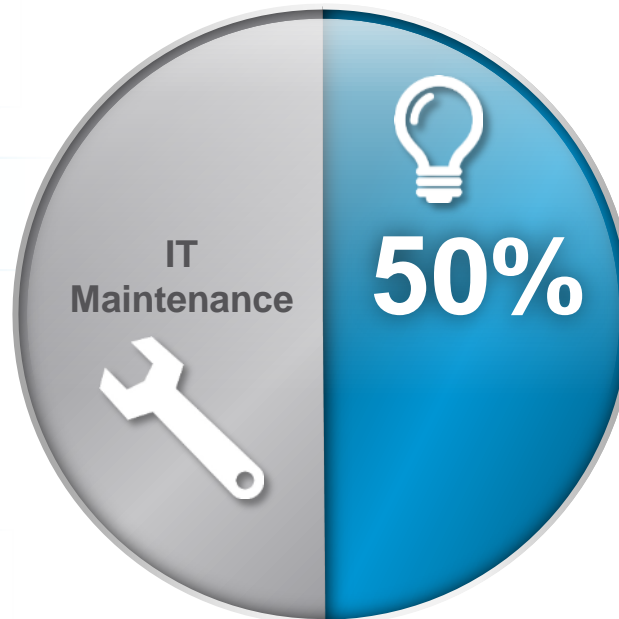
Liberating Resources to Drive Innovation

Any user, any device,
any app... automatically.

Apps get rolled out at
“the speed of business.”

Provisioning a
production environment
takes minutes.

You can routinely deploy
any workload...anywhere.

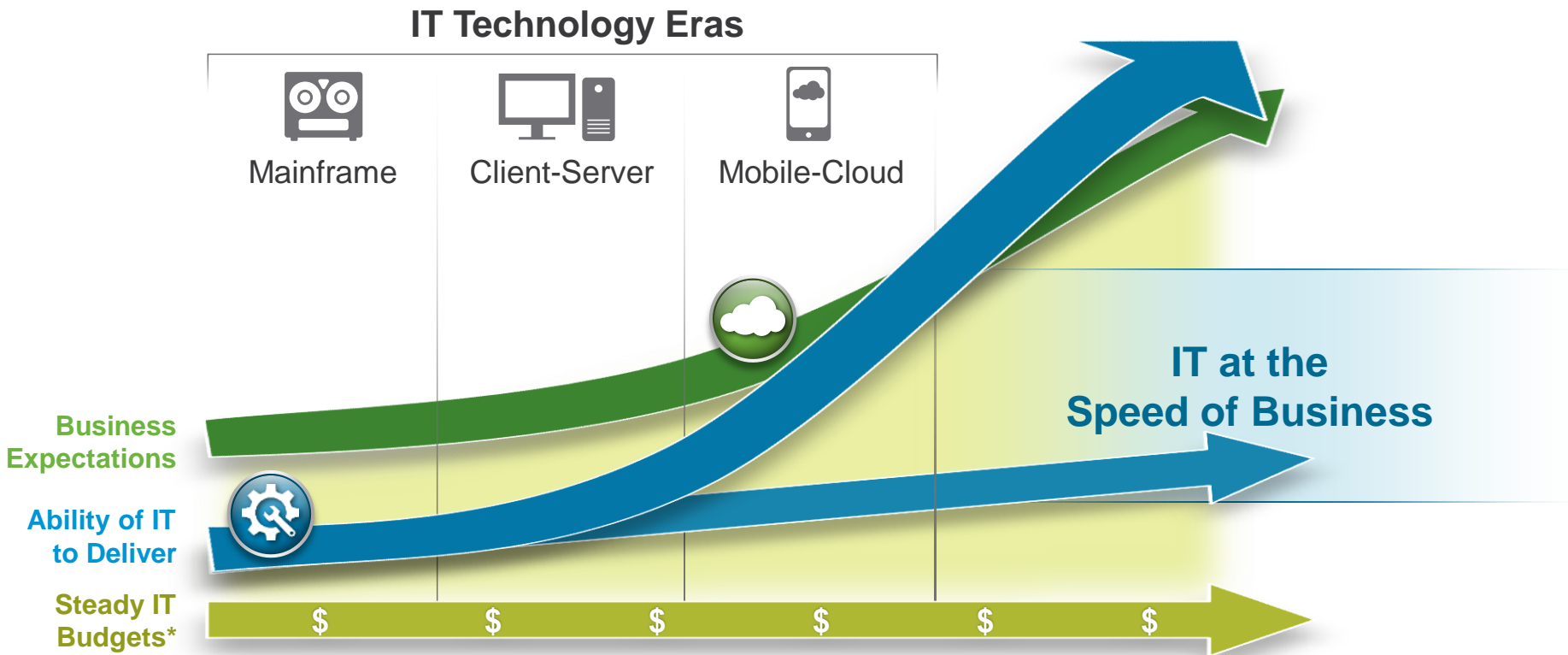


Goal:
**IT Spend on
Innovation**

**1/3 of VMware Customers
Have Already Achieved**

Source: VMware Journey Benchmark Survey, 4th Wave 2013

VMware Can Help Bridge the Gap

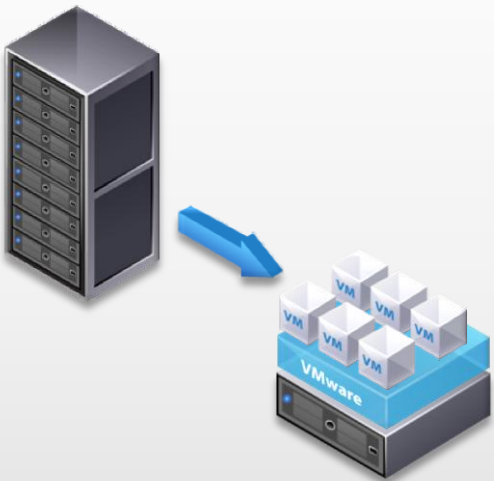


* Source: Gartner, 2013: "Hunting and Harvesting in a Digital World: The 2013 CIO Agenda"

Core Benefits

1. Reduce the Complexity

to simplify operations and maintenance



2. Dramatically Lower Costs

to redirect investment into value-add opportunities



3. Enable Flexible, Agile IT Service Delivery

to meet and anticipate the needs of the business



Drive IT Agility to Increase Business Value

Questions?

Virtualization *Roadmap through K12*



Yury Magalif,
Practice Lead - End-User Computing
(EUC) @ CDI *** Cloud, Virtual
Desktops (VDI), Virtualization,
Storage, Data Center
Email: yury.magalif@cdillc.com

- VDI & End User Computing /
Demonstration



NJ CTO's Study Council

Virtualization - Roadmap through K-12

Yury Magalif, Practice Lead – End-User Computing
Ralph Barca, Chief Information & Technology Officer

Who is CDI?

- We design and build IT Infrastructure
- Started in Bakker Family garage – Woman Owned
- Our 19th year
- 2013 Revenue - \$256 Million
- 200 Employees (120 engineers, 12 architects)
- Offices in Teterboro, Parsippany, NYC, Charlotte, Atlanta. Now -- Boston and Philadelphia.
- 2 Cloud Data Centers and 24/7 Managed Services
- Dedicated Government team and VDI team

500+ Clients, including:



Information
Technology &
Telecommunications



COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK



Be well



Memorial Sloan Kettering
Cancer Center™



COMPUTER
DESIGN &
INTEGRATION LLC

Major Partnerships

- #1 EMC Partner in the NY Metro Area, #4 Nationally
- Cisco Cloud Builder Partner of the Year - US
- Cisco Solutions Provider of the Year – East
- VMware vCloud Powered Service Provider
- #1 VCE vBlock partner in NY Metro

EMC²

where information lives[®]



vmware[®]



How you worked depended on a computer & phone:



Now it depends on many devices & technologies



Challenges for your Techs



- » Current staff – need to learn iPads, iPhones, Androids, Macs, PCs -- EVERYTHING
- » How to fix – physically walk to EACH device.

BYOD – Bring Your Own Device

**Percent of employees currently
Using Their Own Devices**

35%

SMARTPHONE

53%

LAPTOP

7%

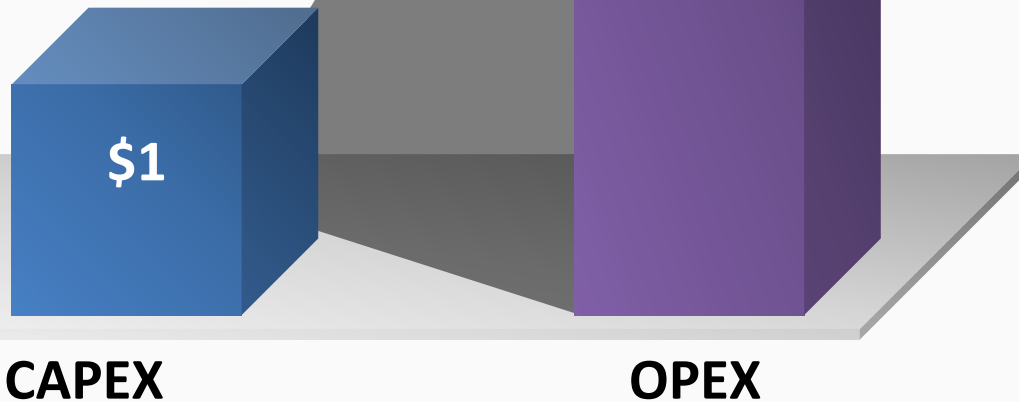
TABLET



Source: Yankee Group—June 2012

The costs of managing PCs

**For every \$1
spent on
hardware,
companies
spend \$3 to
manage**



Source: IDC Study 2009

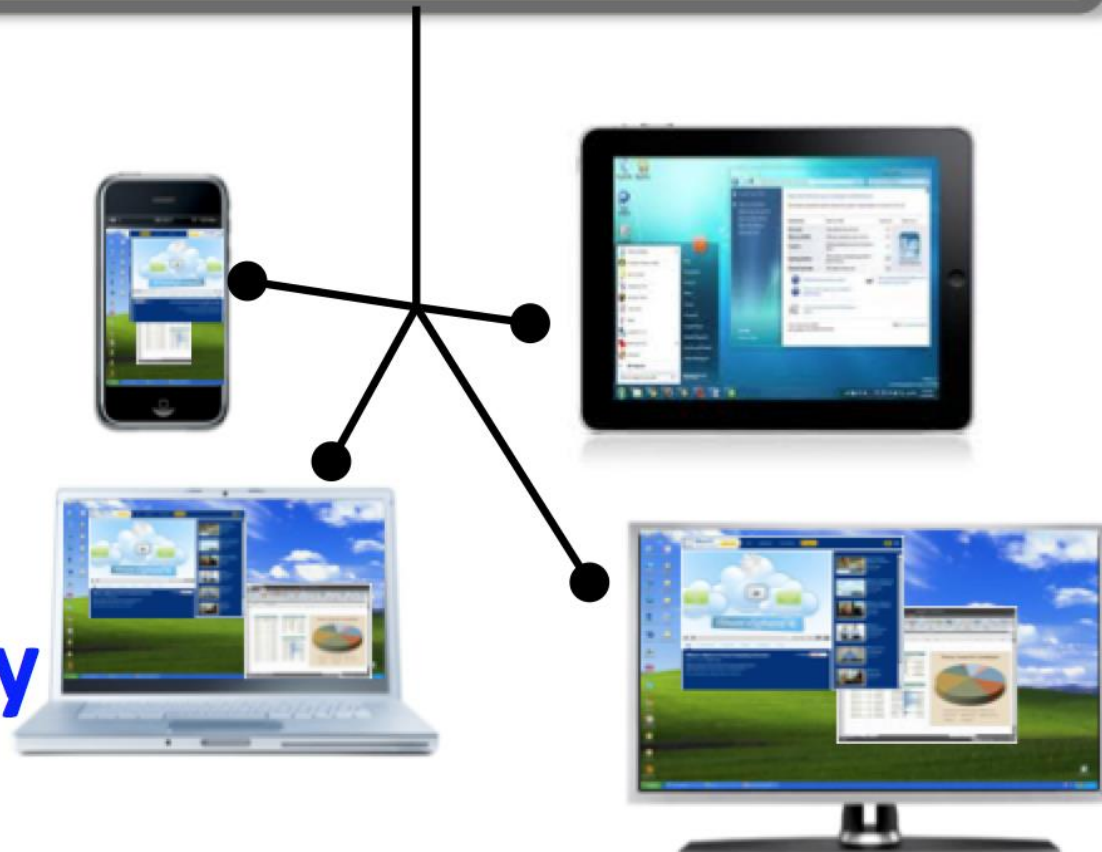
Increasing IT costs

What is a Virtual Desktop?

Desktop's Brain And Memory (in Data Center)



**Desktop Face Only
(on any device)**



How easy is the Virtual Desktop to use?

Connect your
USB devices
locally to where
you are.

Use up to 4
Monitors.

Call from your
Software
Phone



Play videos
and use 3D
graphics.

Print
locally to
where you
are.



What devices can you use to access your Virtual Desktop?

Desktop PC/Laptop



Windows, Mac OS or
Repurposed PCs

Thin Client/Zero Client



10zig zero client, 10Zig All-
in-one Monitor

Mobile Devices



iPad/Android/iPhone

How to Fix a Computer

Physical computer:

PC at the School is broken due to viruses. Tech tries to fix, then loads a CD to install OS & apps.

3 hours per PC



VMware View Virtual Desktop:

Technician tells the user to shut down and turn back on.

5 minutes per PC



How to build a new computer

Physical Computer:

New Computers arrive.
Install software to
computer or
Create/Update workstation
image to match new
hardware.



VMware View Virtual Desktop:

Tech sets up thin client on
the user's table and types
connection address

10 minutes per PC



Refresh/Imaging

Physical computer:

PCs are rebuilt with a fresh copy of the OS image & apps. Tech installs new image & enters info

1 hour per PC



VMware View Virtual Desktop:

No need to refresh. User's Virtual Desktops are always refreshed upon logging out
10 minutes per 100s of PCs



Security: Lost or Stolen Laptop

Old way:

1 Laptop missing. Laptop has 900 Social Sec. numbers. School has to notify students, audit data, provide identity theft monitoring.

Days to weeks per laptop



VMware View Virtual Desktop Way:

1 Mobile Thin Client missing. Thin client does NOT have a hard drive. Tech replaces hardware. All data is safe in the data center.

30 min per mobile thin client



Lab Repurposing

Physical computer:

Photoshop lab be repurposed to a Math lab. Tech removes Photoshop, installs Math software.

1 week

VMware View Virtual Desktop:

Tech asks to select Math virtual desktop. Lab is ready by next period.

5 minutes per lab

MATLAB[®]
The Language of Technical Computing



Adobe® Photoshop® 7.0

Thomas Knoll, Mark Hamburg, Seetharaman Narayanan, Marc Pawliger, Stephanie Schaefer, Sau Tam, Sandra Alves, Joe Ault, Vinod Balakrishnan, Jason Bartell, Scott Byer, Jeff Chien, Scott Cohen, Andrew Coven, Chris Cox, Todor Georgiev, Jerry Harris, Sarah Kong, Tai Luxon, Sean Parent, John Penn II, Tom Ruark, Cris Rys, Del Schneider, Russell Williams, Matt Wormley, John Worthington, Dave Rau, Michael Scarafone, Mike Leavy, Rick Wulff, Dave Howe, Karen Gauthier, Gwyn Weisberg

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Flood, Sandy, fire - disasters

Physical computer:

Building access and thus desktops are not available in disaster areas.

1 day to 1 week

VMware View Virtual Desktop:

Faculty can run class from a different building, even using mobile devices.

2 hours



SSD Prices falling, provide plentiful I/O (\$)

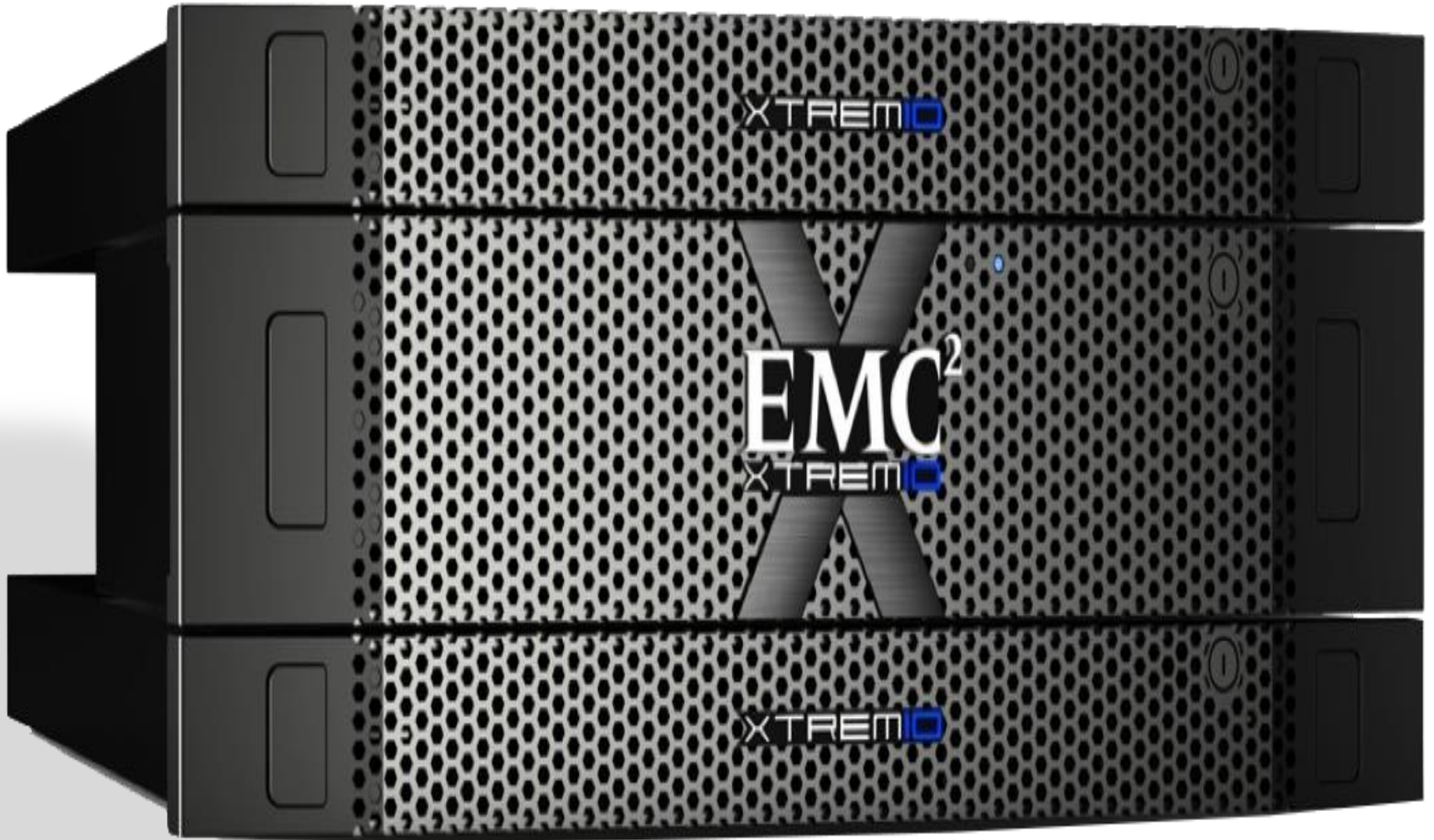
DYNAMITE DATA

SSD Price Per GB

2013 (c) Dynamite Data LLC



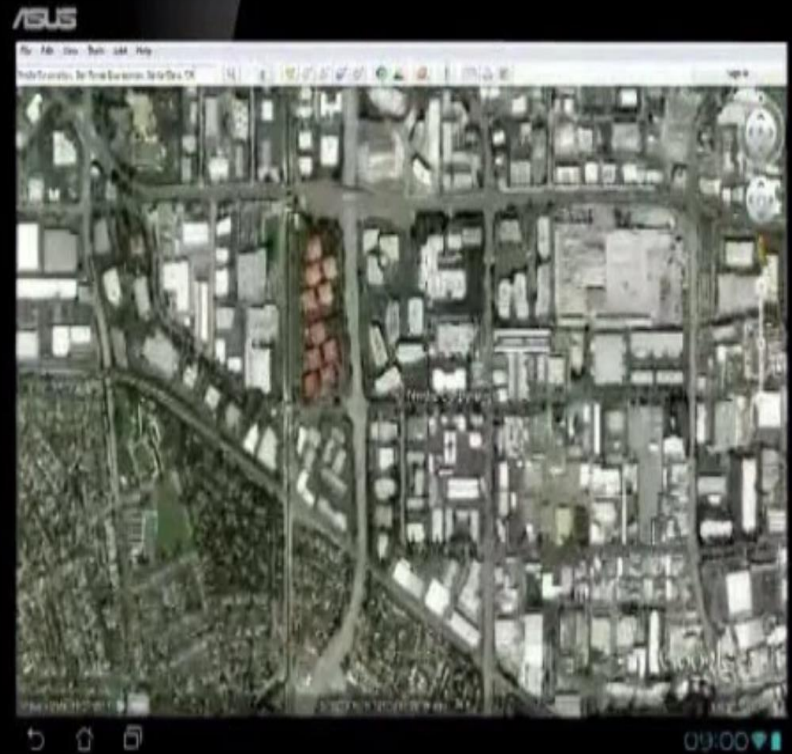
XtremIO X-brick – All Flash Block



Using Google Earth with VDI & GPU



Traditional VDI

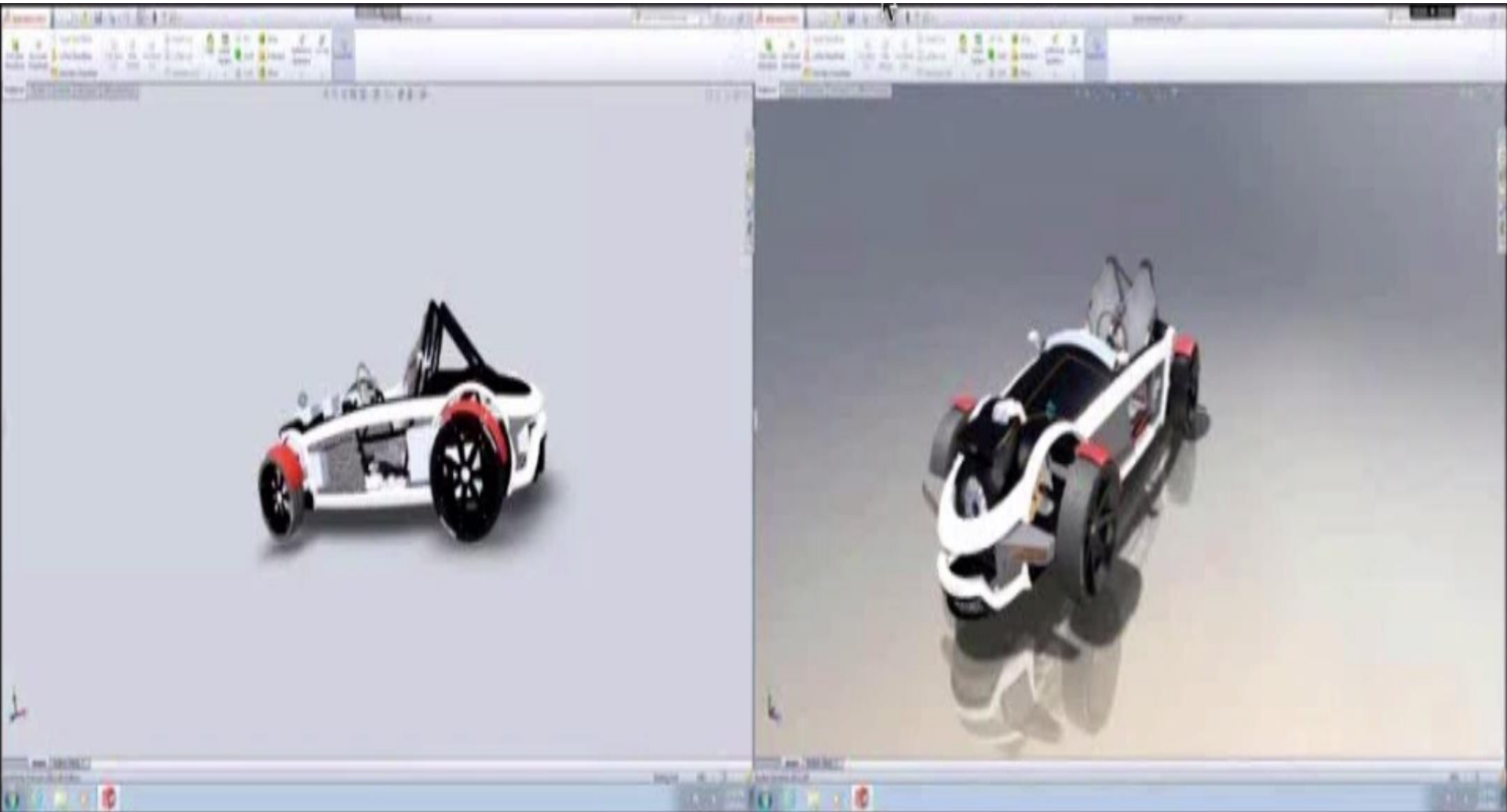


**NVIDIA GRID™
GPU-accelerated VDI**

Dassault Solidworks – 3D design

CPU graphics only

With NVIDIA GPU



What hardware & software do I need for Virt. Desktops?

**VMware Horizon
View software, Cisco
UCS blade servers and
EMC storage**

vmware®



CISCO™

EMC²
where information lives®

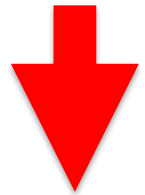
How can I afford Virtual Desktop Hardware?



1. Average 2014 Physical PC price is \$552



2. You have 1000 Physical PCs



3. \$552 times 1000 = \$552,000

4. Invest in Virt. Desktop Infrastructure for 1000 users instead of a 3 year hardware refresh

vmware®



EMC²

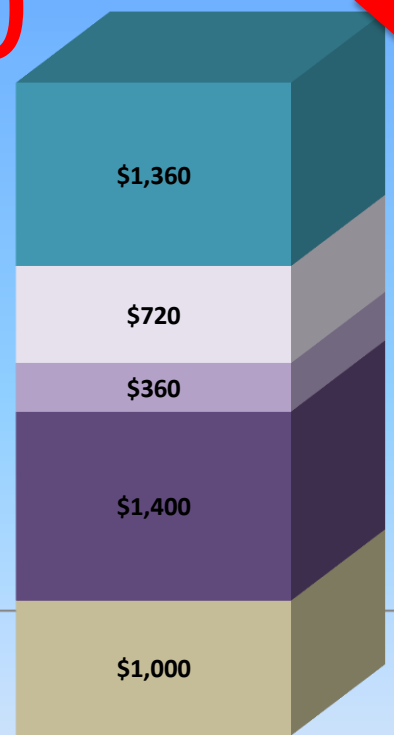
where information lives®

CISCO™

4 Year TCO (Total Cost of Ownership) for 1 PC

\$4880

\$5,000
\$4,500
\$4,000
\$3,500
\$3,000
\$2,500
\$2,000
\$1,500
\$1,000
\$500
\$0



\$2850



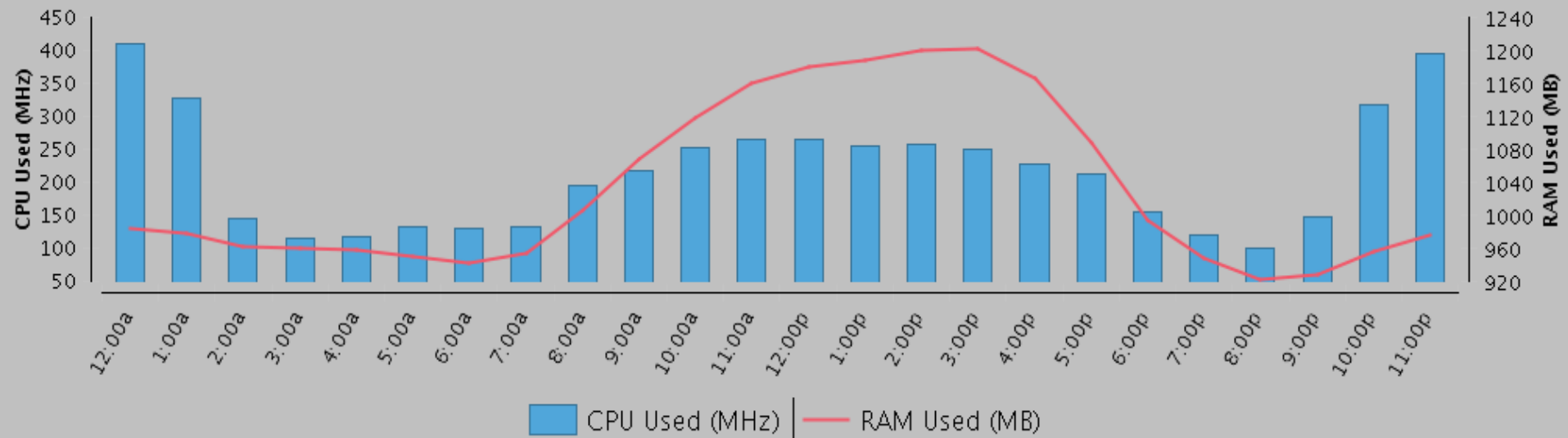
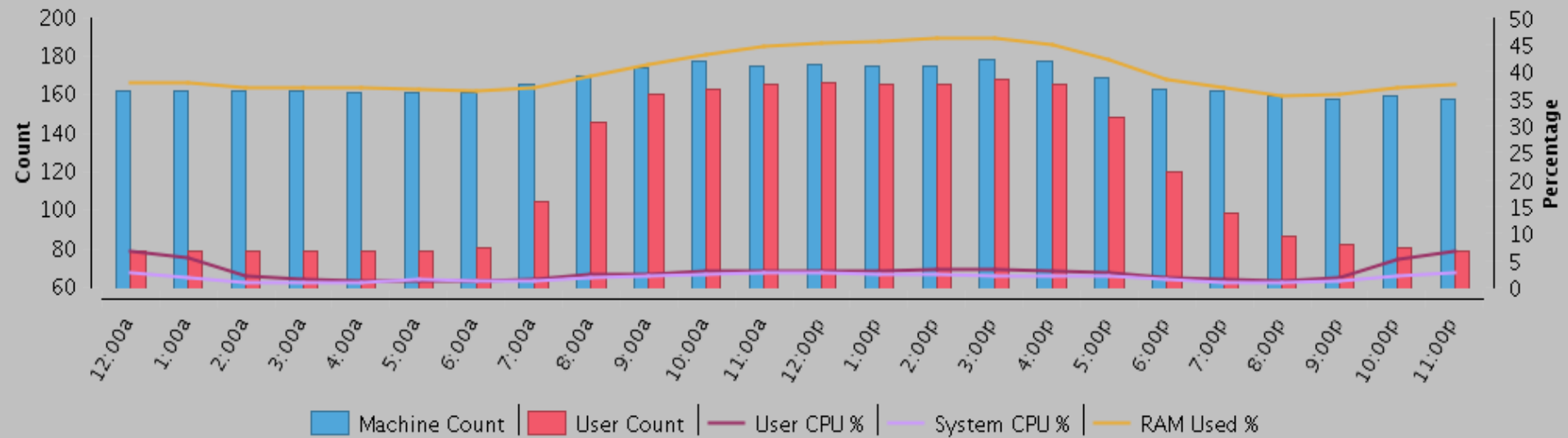
Savings of \$500 per PC per year

Traditional PC

With VMware View

- Device
- IT - Admin
- IT - Install
- IT - HelpDesk
- Downtime
- Server
- Storage
- Software

Key Metrics Avedged During Bus. Week



Thank you

- Thank you to Jeff Jackson and Ian Erikson for contributions to this presentation.

Contact Info & Questions

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www.youtube.com/user/ym640



Technical Questions:

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Let's Further The Discussion...



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CTO – Edison Public Schools
Email: ralph.barca@edison.k12.nj.us

Data Center Virtualization

- Smaller server foot print and Power Consumption
- Ability have server available on a 'Drop of a Dime'
- Allows Strategic & Budget Planning
- Look at Backup and DR differently
 - Hybrid Solution
 - Co-location with a Cloud Offering
 - Redundancy within District
 - Shared Service with your Neighbor
 - Build Relationship with a District across the State
- Ability to be 'Light on your Feet'

End User Computing

- Device Diversity
 - Legacy PC's, iPads, Chromebooks, etc.
 - Same User Experience
 - Leverage Existing Equipment
 - Anytime, Anywhere, Any device - Address users that travel
 - Remote Access to desktop / Data
 - EUD Management – Virus, Security, etc.
 - Address iPad Limitations
 - Chromebook Aware - partnerships
 - PARCC!!!

...With Some Questions & Answers



*On behalf of
New Jersey Chief Technology Officer's Study Council...*

THANK YOU!!