

# Moving to Continuous

DEVOPS @ UC Berkeley

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CSG 01-14-2015

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**The Berkeley Desktop is the campus-wide standard environment for desktops and laptops.**

### SOFTWARE



### HARDWARE



### SERVICES

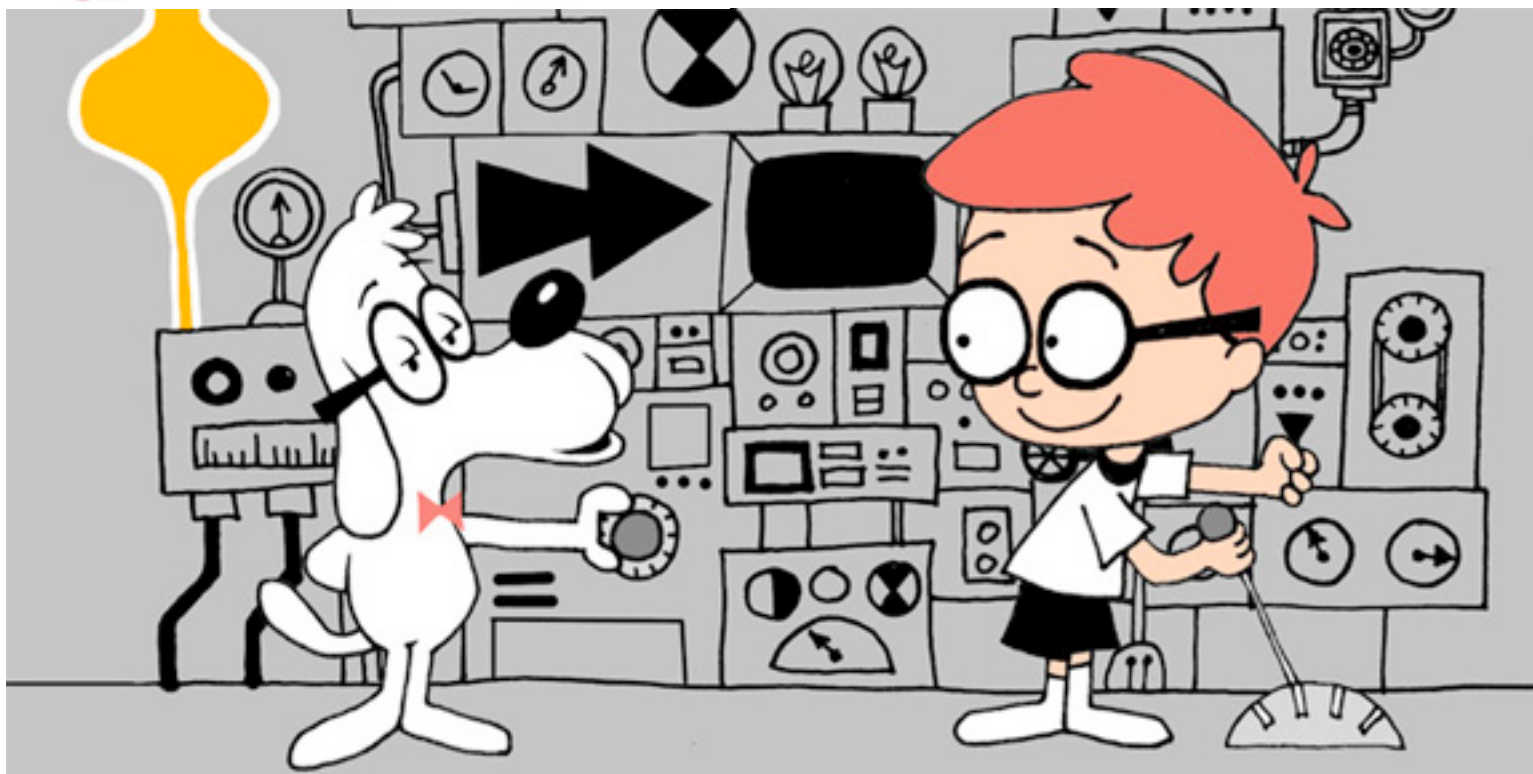


The Berkeley Desktop provides a reliable, secure, and integrated administrative computing environment that reduces the amount of time faculty and staff spend maintaining their computers. A standard environment combined with automated maintenance means you see fewer problems and are able to get help faster.

But that's today...

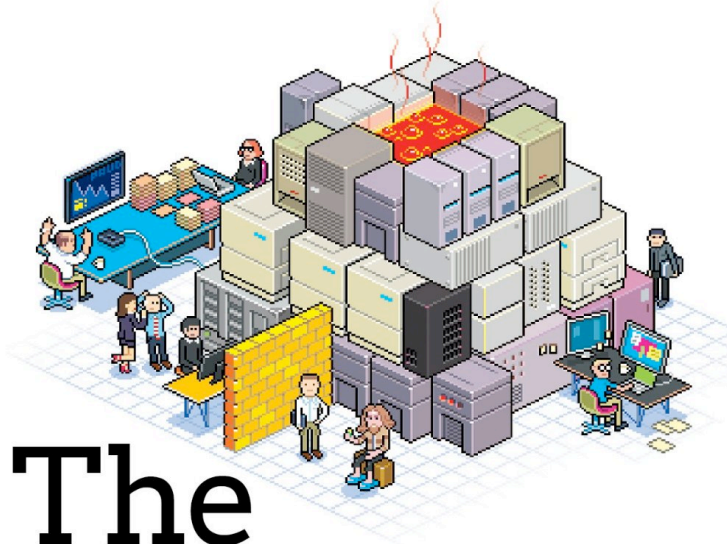
INTERNET ARCHIVE

WayBackMachine



# Let's start at the beginning...

From the authors of *The Visible Ops Handbook*



## *Cal* The Phoenix Project

A Novel About IT, DevOps,  
and Helping Your Business Win

Gene Kim, Kevin Behr, and George Spafford



# Fall 2011



# OMG Version 0.1

- Everything is broken or breaking all the time.
- No time for staff to work on solutions.
- “Owned (compromised) machines”
- “standard image” doesn’t work on laptops
- “standard image” too hard to change
- “standard image” BSOD, b/c new hardware, drivers
- Laptop users told to buy desktop w/ “standard image” to RDP into



# The Problem

Imaging a machine circa 2011:  
4 hours of senior tech time



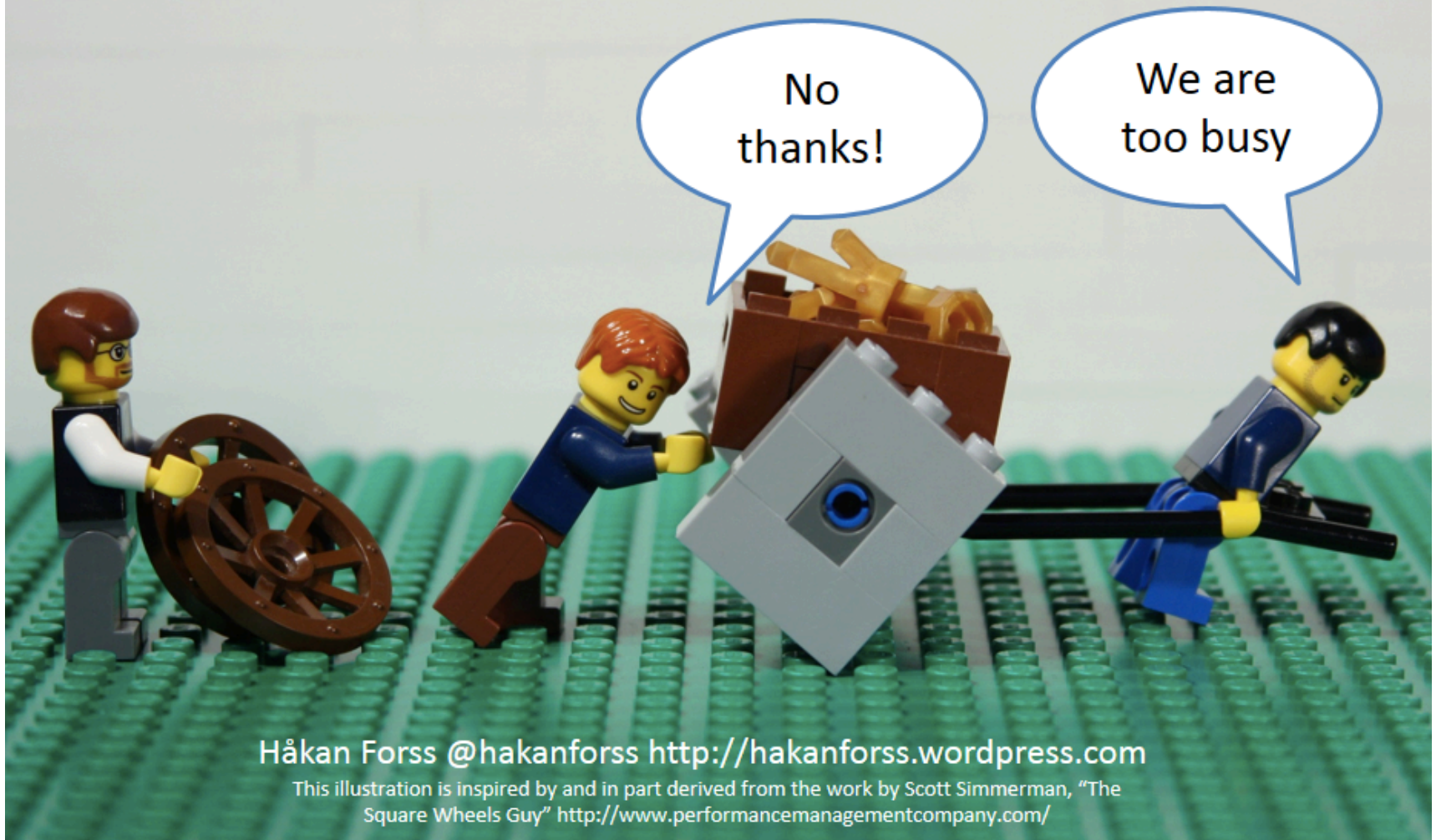
- ~~No~~ Varying hardware standards
- No significant automation
- Manual work; no checklists
- Frontline support team includes senior techs
- Frontline support diverts the Brents to support most important and/or loudest senior executives



# Are you too busy to improve?

No  
thanks!

We are  
too busy



Håkan Forss @hakanforss <http://hakanforss.wordpress.com>

This illustration is inspired by and in part derived from the work by Scott Simmerman, "The Square Wheels Guy" <http://www.performancemanagementcompany.com/>

# Spring 2012

## The Present State: “Planet Crazy”

Operational  
Excellence

SHARED SERVICES

D M A D V



Desktop PC support for haves; the rest do what they can

# The two sides of EUS



- Desktop Design and Engineering (IST-Lead)
  - What is the future state of desktop design at Berkeley? (e.g. “device neutral” environment, cloud computing, etc.)
  - What tools do we need to support the future state?
  - How do we get there?
- Operations and Support (CSSI – Lead)
  - What will Shared Services End User Support need to look like in order to support desktops/devices in the short and long term?

# Tackle the Things That Increase Costs

## **Labor**

costs to fix, maintain, design, and build

## **Productivity loss**

from inefficiencies or downtime

## **Change**

a constant in IT


## **Variance**

when it is high

# Finally... on the path to Devops

- Culture
- Automation
- Monitoring
- Instrumentation
- Reporting
- Agile

# Joint Administrative Computing Standard



Endpoint Engineering and Infrastructure  
Berkeley Desktop

Search

HOME OVERVIEW SOFTWARE HARDWARE SERVICES GET STARTED


HARDWARE

- Configurations
- How To Buy
- People

Home » Hardware » Configurations »  

## JACS Configurations


### Dell Models



#### Dell OptiPlex 9020 SFF – Standard Desktop

- Intel® Core™ i5-4570 Processor (Quad Core, 3.20GHz Turbo, 6MB, w/HD Graphics 4600)
- Windows 7 Professional, 64-bit, English
- 8GB (2x4GB), 1600MHZ DDR3 Memory
- 8X DVD+/-RW Drive
- AMD Radeon™ R5 240, 1GB, Half Height, (DP and DVI-I)
- 500GB 3.5" SATA (7200 RPM) Hard Drive

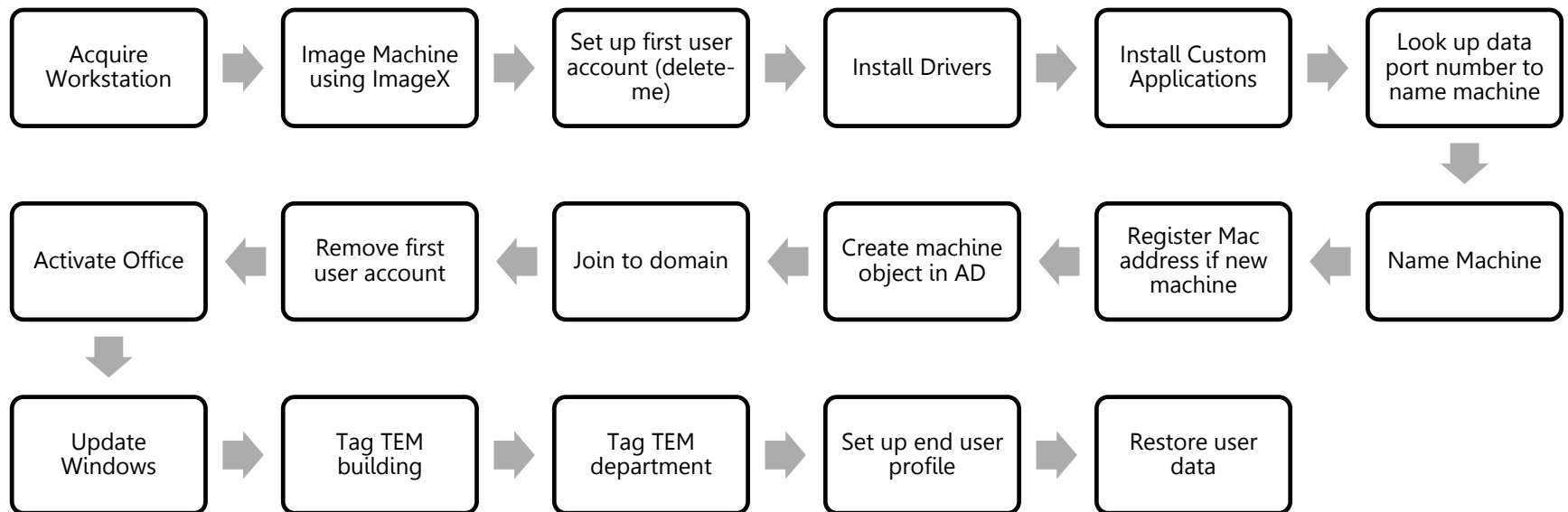
### Apple Models



#### iMac 21.5" – Desktop

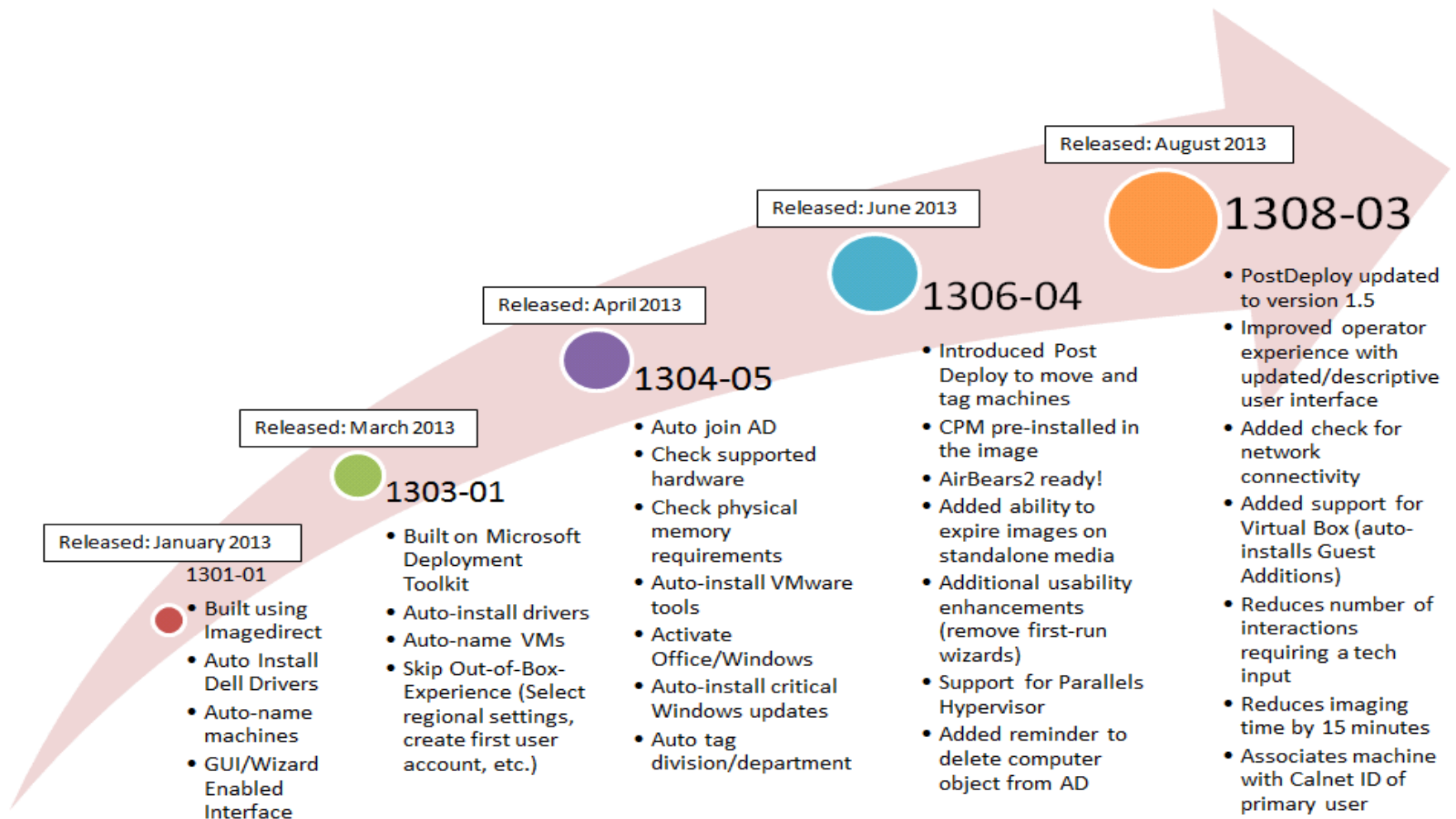
- 2.9GHz Quad-core Intel Core i5, Turbo Boost up to 3.6GHz
- 8GB 1600MHz DDR3 SDRAM - 2x4GB
- 1TB Serial ATA Drive @ 5400 rpm
- NVIDIA GeForce GT 750M 1GB GDDR5
- Magic Mouse
- Apple Wireless Keyboard (English)
- 3 year AppleCare Protection Plan

## Reimaging a Workstation in the Legacy Environment

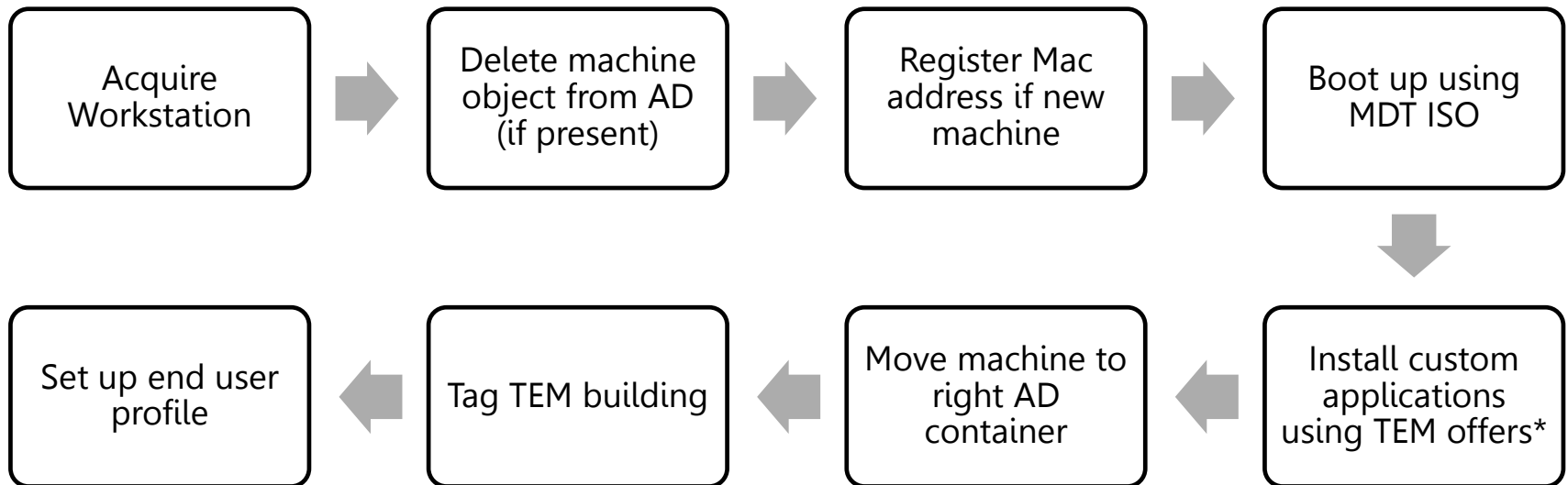


Number of steps it took to reimage a machine in the legacy environment = 17

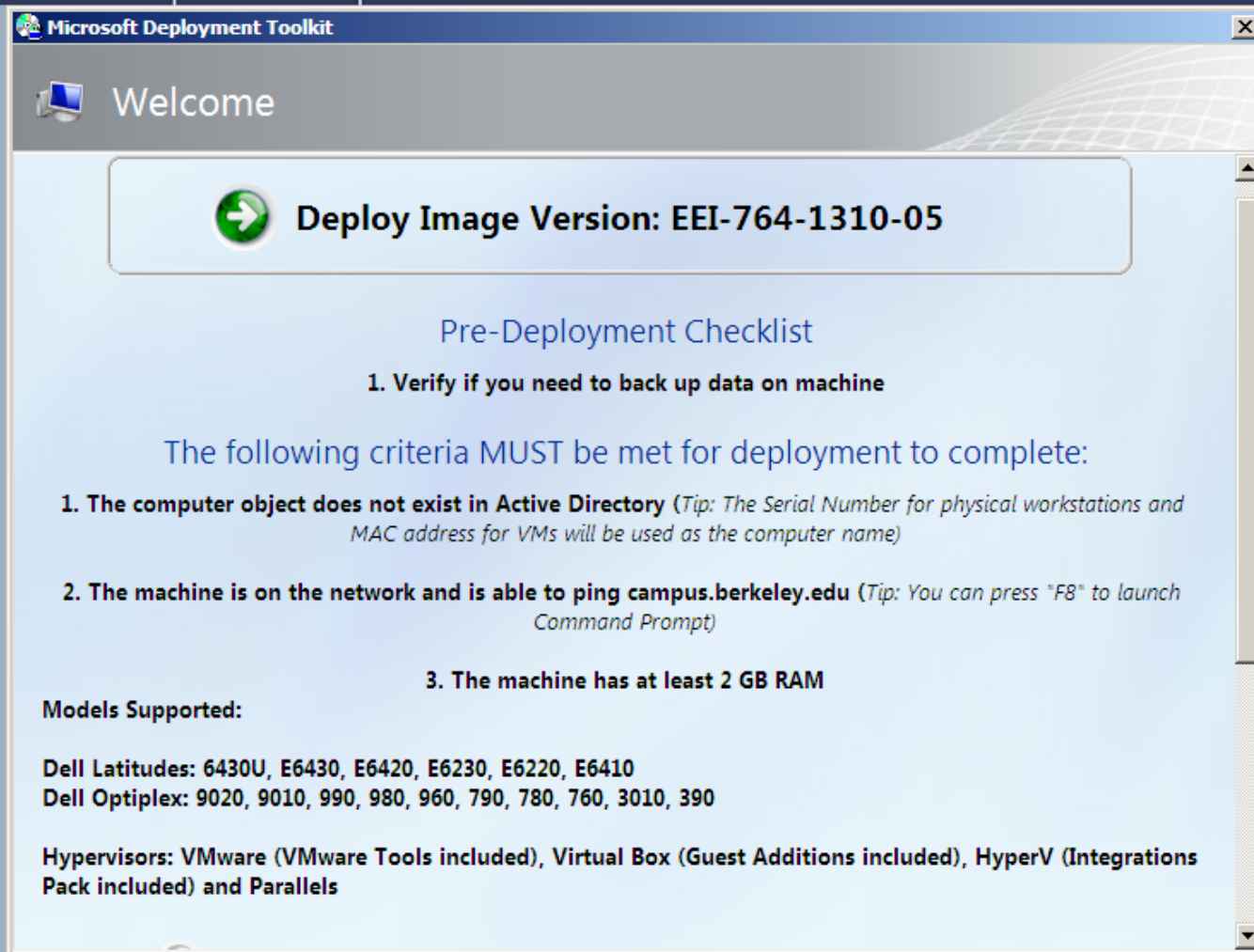
# EEI Image and Operating System Deployment Progression



## Reimaging a Workstation in the EEI Environment

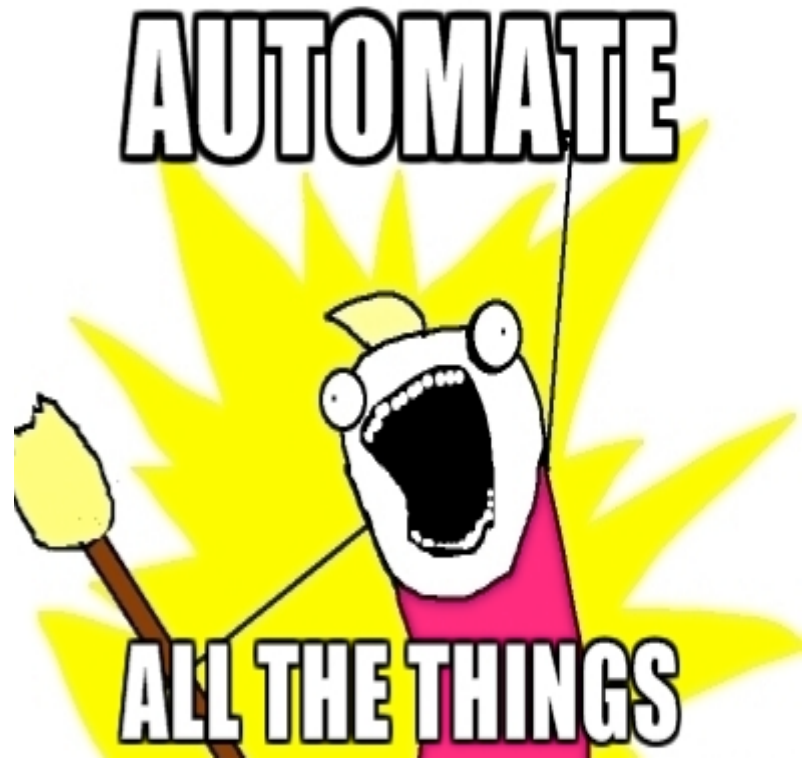


Number of steps it took to reimage a machine in the EEI environment = 8

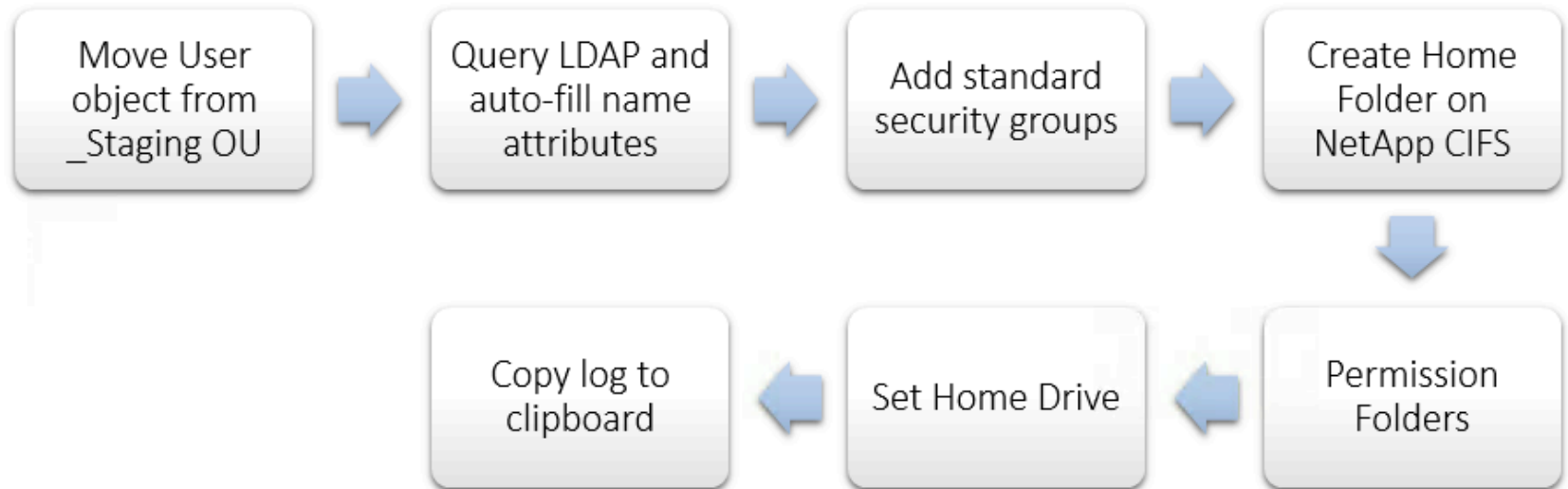


# Workflow Automation Tools

- New User Setups
- Deprovisioning Users
- Department On-Boarding
- Access Management



# New Employee Workflow Automation



# 2014

## PostDeploy 3.0

PostDeploy 3.0

**PD PostDeploy**

Primary user is now set!

CAMPUS\  
wallison

for shared computers, please use 'svc-sharedcomputer' and for unassigned computers, please use 'svc-unassignedcomp'

☐ Associate Mac with CalNet

Division OU/Tag is now set!

IST

Department OU/Tag is now set!

IST\_IO

Building Code is now set!

1095 (4 digits)

List of building codes

☐ Add to QA

☐ Self-Service Opt-Out

☐ Patching Opt-Out

Location is now set!

Hearst

Finish

Reboot Machine

Completed: William Allison's computer Division: IST

Completed: William Allison's computer Department: IST\_IO

Completed: Adding 1095 to UCBBuilding

Completed: Adding Hearst to UCBLocation

Thank you for completing all the steps...!

the Berkeley desktop

















IMAGE

the Berkeley desktop




















BIGFIX

the Berkeley desktop

USER

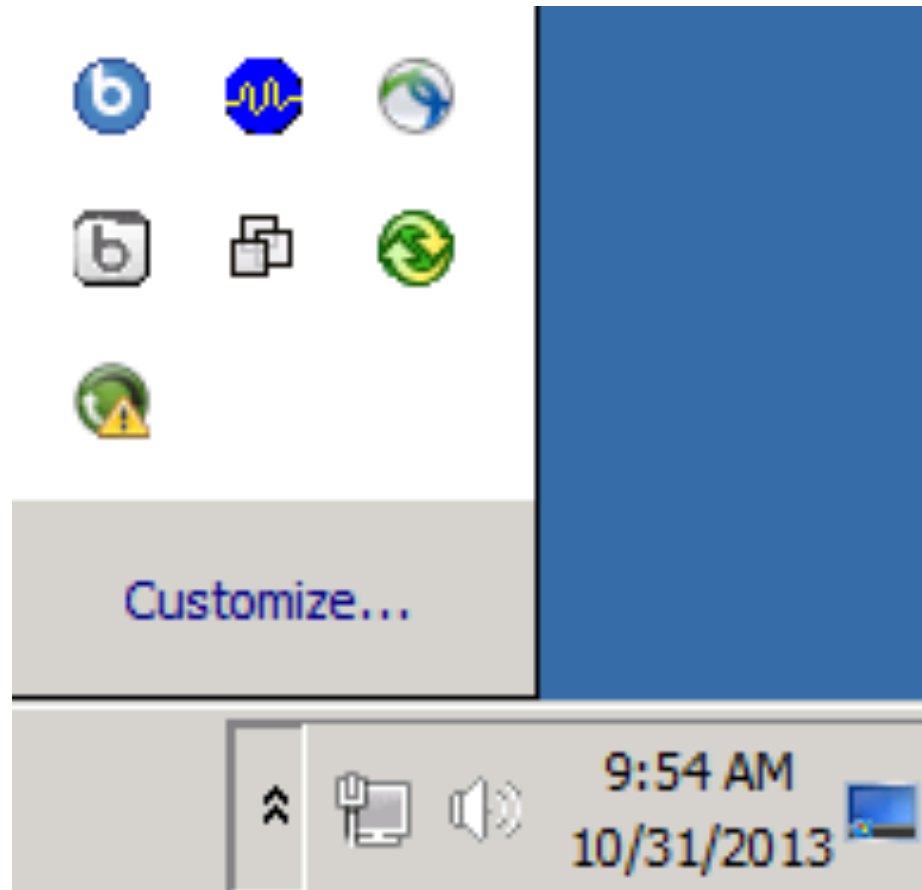
Name ▲	Type	Description
 G3V0GK1	Computer	1918 University - 3rd Floor - Julia Dysart - Optiplex 360
 u1918-400-2	Computer	Receptionist
 U1918-401-01	Computer	Julia Dysart 23602R1 Opti990 October 2011
 u1918-401-2	Computer	Julia Dysart
 u1918-401-3	Computer	CIDER Shared Workstation
 u1918-402-2	Computer	
 u1918-403-2	Computer	Jennifer Hunter
 u1918-404-10	Computer	
 u1918-404-12	Computer	
 u1918-404-14	Computer	
 u1918-404-8	Computer	
 u1918-404A-3	Computer	Cindy Lambdin
 u1918-405-2	Computer	Sheri Lippman
 u1918-406-2	Computer	Wayne Enanoria
 u1918-406-3	Computer	?????
 u1918-407-2	Computer	Tomas Aragon

Before PostDeploy

Name	Type	Description ^
 1FP8GZ1	Computer	ald, OptiPlex9020, pvt-dunlevy-da, EEI-764-1402-01
 3X9FZQ1	Computer	angelryono, OptiPlex990, pvt-dunlevy-da, EEI-764-1404-06
 6K94MM1	Computer	backstrom, OptiPlex 980, pvt-dunlevy-da, EEI-764-1406-01
 1FK8GZ1	Computer	ccary, OptiPlex9020, pvt-dunlevy-da, EEI-764-1402-01
 9K8DHX1	Computer	ccowden, OptiPlex9010, pvt-dunlevy-da, EEI-764-1404-06
 FLHFPM1	Computer	diannecho, OptiPlex 980, pvt-dunlevy-da, EEI-764-1406-01
 3XBBZQ1	Computer	elevine, OptiPlex 990, pvt-dunlevy-da, EEI-764-1405-04
 1FM6GZ1	Computer	gingko, OptiPlex9020, pvt-dunlevy-da, EEI-764-1402-01
 H4DPDX1	Computer	halperin, OptiPlex9010, pvt-dunlevy-da, EEI-764-1404-06
 1FC8GZ1	Computer	klc, OptiPlex9020, pvt-dunlevy-da, EEI-764-1402-01
 9K8CHX1	Computer	kobrien, OptiPlex9010, pvt-dunlevy-da, EEI-764-1404-06
 6C6LL02	Computer	kumi.hadler, OptiPlex9020, pvt-dunlevy-da, EEI-764-1404-02
 1CX6GZ1	Computer	lenfestey, OptiPlex9020, pvt-dunlevy-da, EEI-764-1402-01
 1FD9GZ1	Computer	mhb, OptiPlex9020, pvt-dunlevy-da, EEI-764-1402-01
 FLHCPM1	Computer	shinde, OptiPlex 980, pvt-dunlevy-da, EEI-764-1405-04
 D9Q2QL1	Computer	stellakwoh, OptiPlex960, pvt-dunlevy-da, EEI-764-1404-06
 BY123F1	Computer	svc-sharedcomputer, OptiPlex 755, pvt-dunlevy-da, EEI-764-1405-04
 5Y0SHX1	Computer	svc-sharedcomputer, OptiPlex 9010, pvt-dunlevy-da, EEI-764-1405-04
 F4TLYK1	Computer	svc-sharedcomputer, OptiPlex 960, pvt-charles.lam-da, EEI-764-1405-04
 1CZ6GZ1	Computer	svc-sharedcomputer, OptiPlex9020, pvt-dunlevy-da, EEI-764-1402-01
 1FC9GZ1	Computer	svc-sharedcomputer, OptiPlex9020, pvt-dunlevy-da, EEI-764-1402-01
 5S8SFZ1	Computer	svc-sharedcomputer, OptiPlex9020, pvt-dunlevy-da, EEI-764-1402-01
 3MZD5V1	Computer	svc-sharedcomputer, OptiPlex990, pvt-dunlevy-da, EEI-764-1402-01
 8KY3VR1	Computer	svc-sharedcomputer, OptiPlex990, pvt-dunlevy-da, EEI-764-1404-06
 3xb8zq1	Computer	tmachida, OptiPlex990, pvt-charles.lam-da, EEI-764-1404-02
 1FD8GZ1	Computer	ucbcheong01, OptiPlex9020, pvt-dunlevy-da, EEI-764-1402-01

# After PostDeploy

# Self Service IT

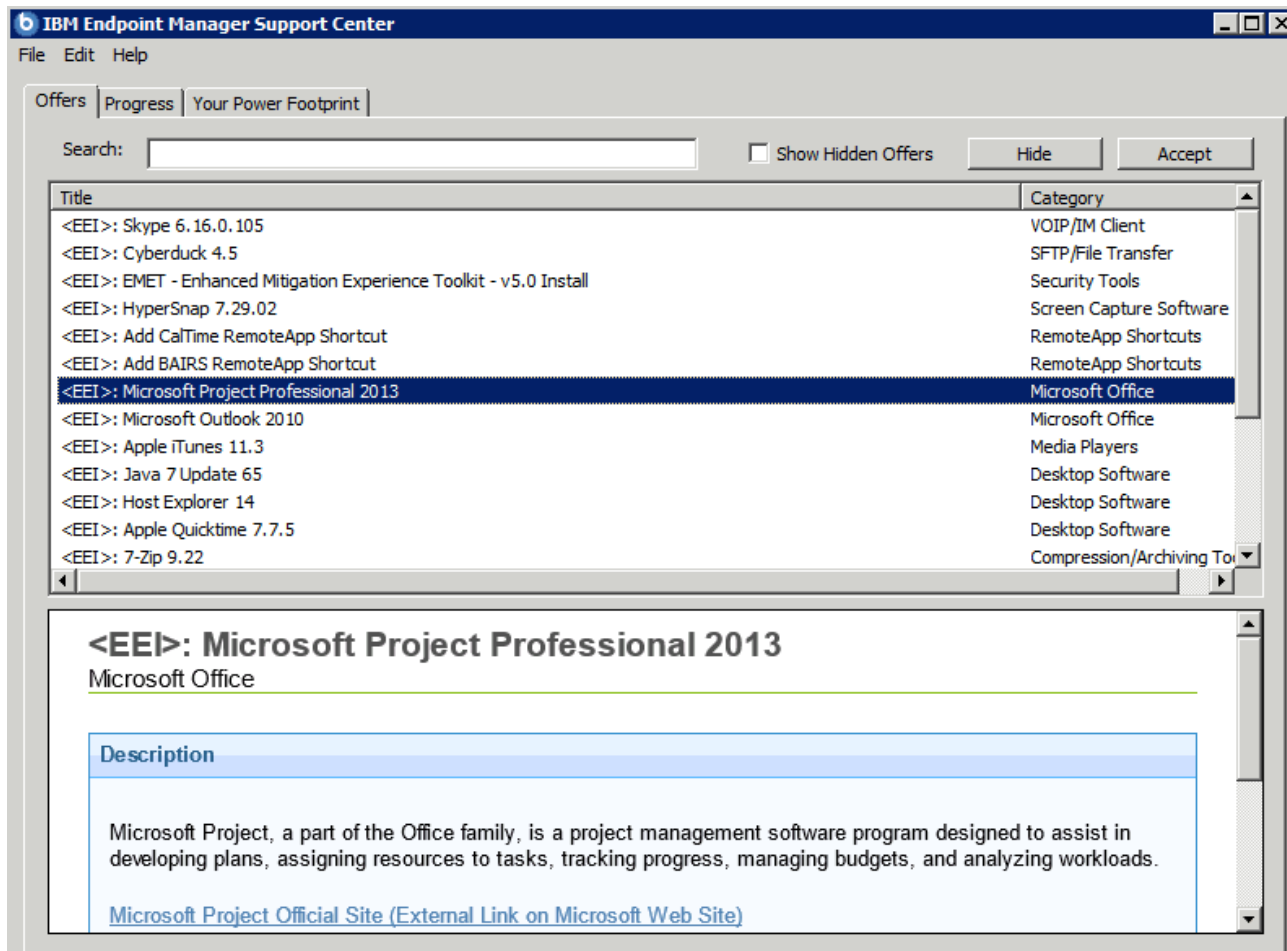


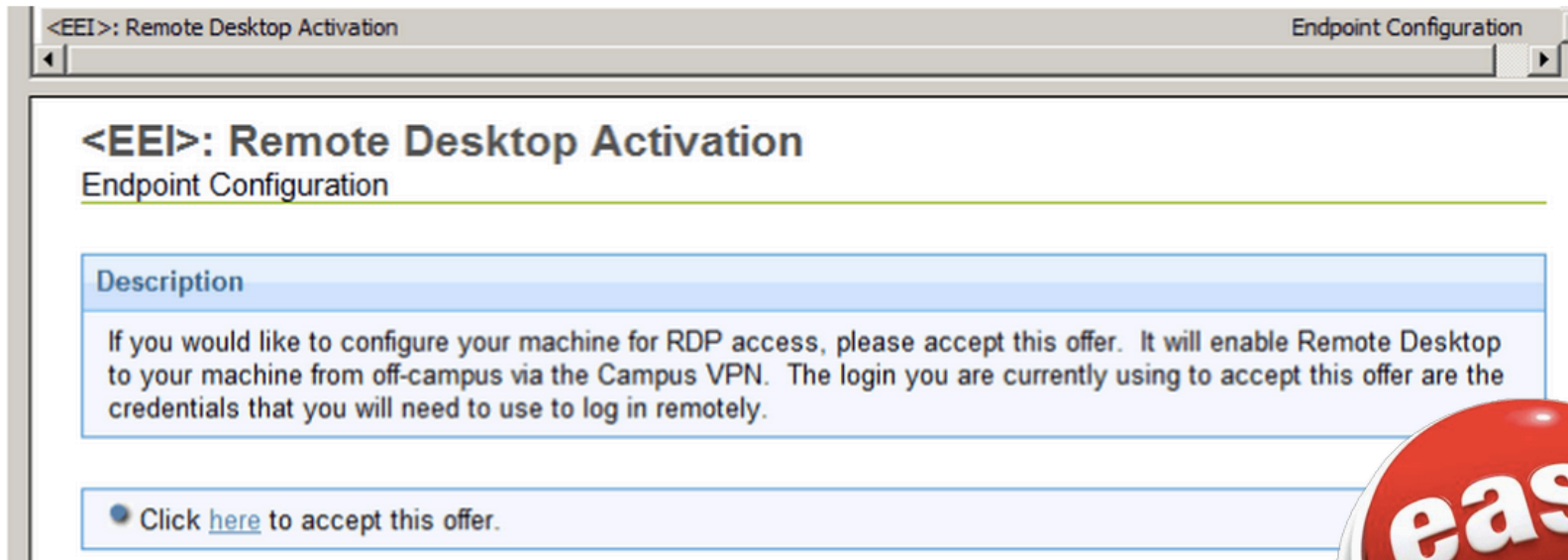
# Time to Manually Complete Tasks

Baseline task	Time to Complete Manually
Coordination in Building	15 minutes
Coordination Outside of Building	30 minutes

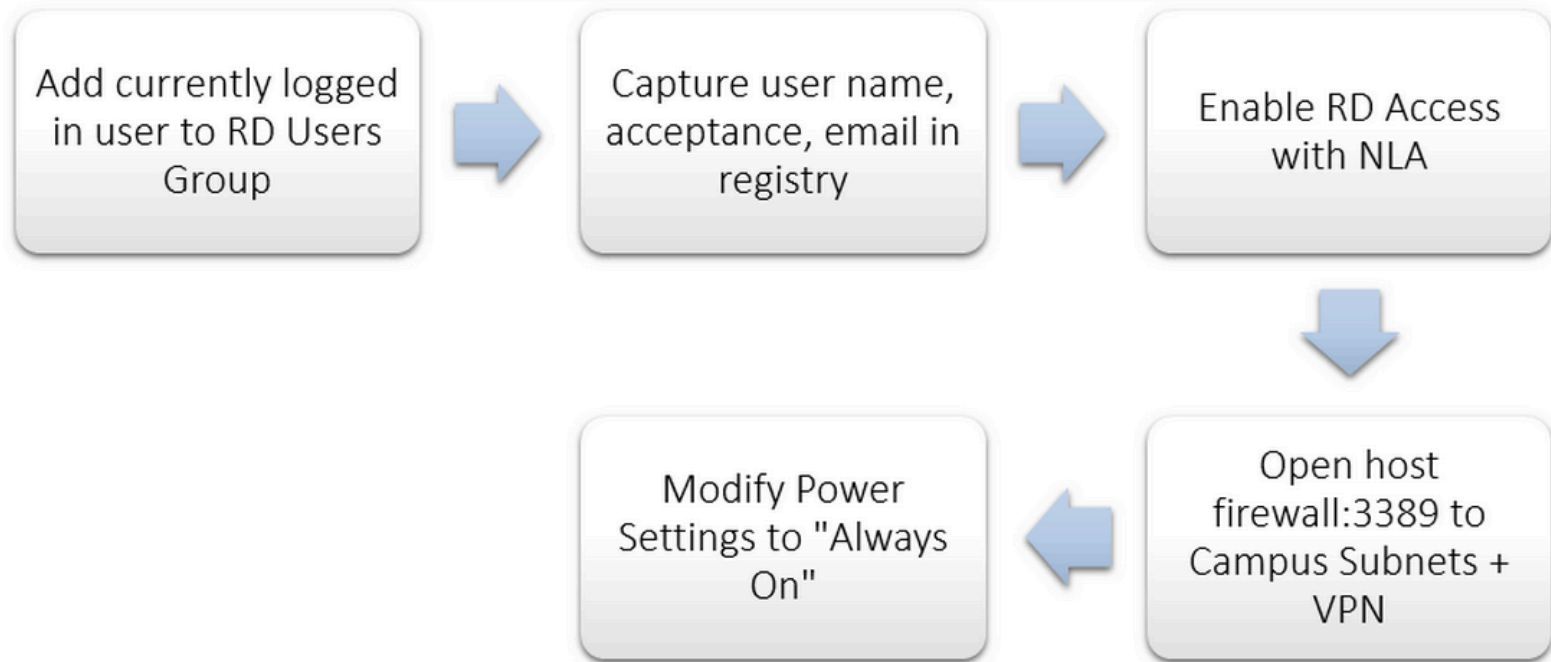
Task	Time to Complete Manually
Install Photoshop	30 minutes
Install Microsoft or Visio	15 minutes
Configure RDP	15 minutes
Configure Printers	5-15 minutes
Berkeley Desktop Image and Hardware	1 hours
Berkeley Desktop Image Other Hardware	2-3 hours
Other Image Other Hardware	At least 4-5 hours

# 2014 - Self-Service for Windows





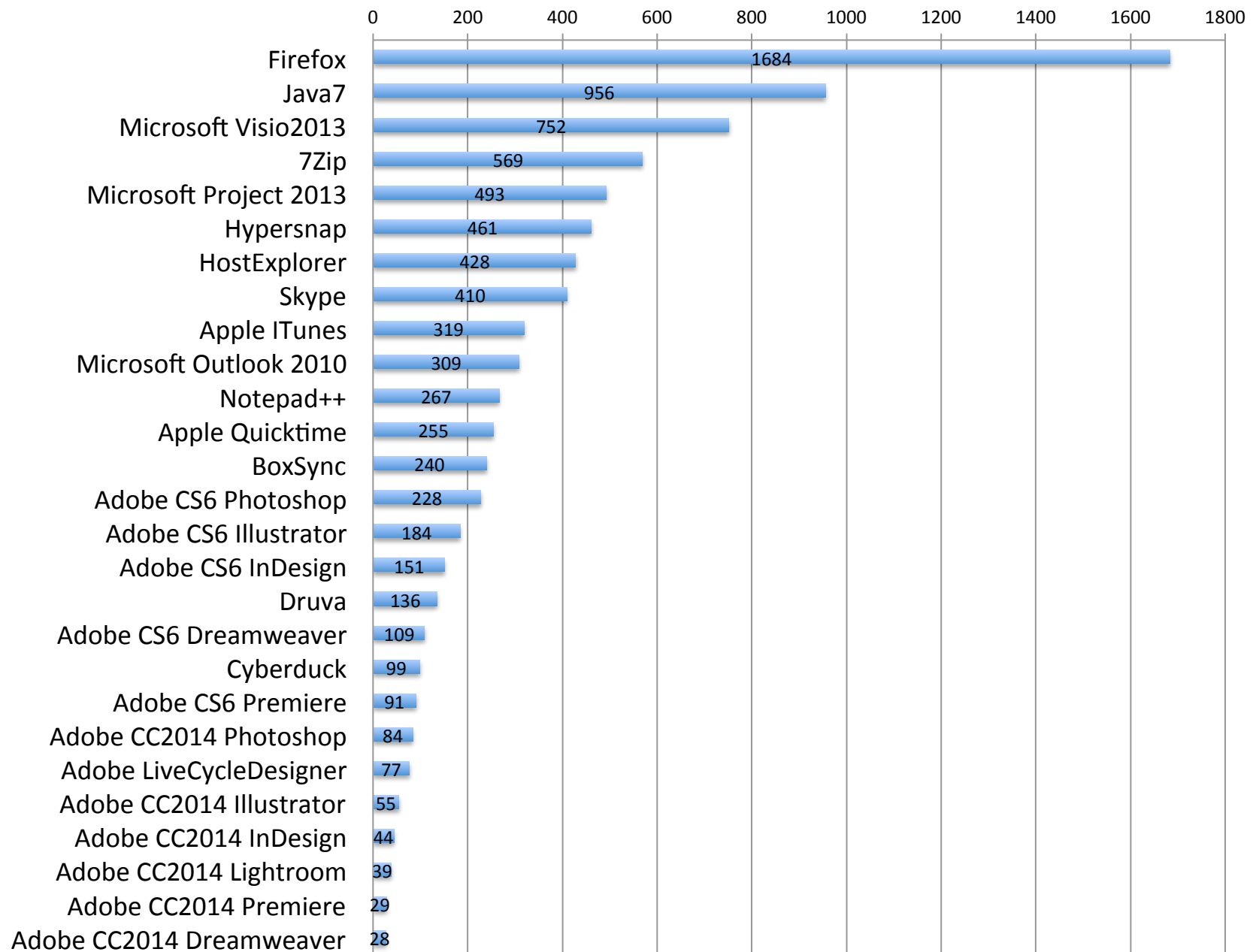
**One small step for an end-user...**



# ...giant leap for IT.



& a big win for CSS, Depts and campus. (Time for self service? 1 min, no ticket.)



# Device Types

Type of Device	Total
Desktop	7959
Laptop	2737
Server	170
Virtual	385

# OS Types

Type of OS	Total
Mac	1246
Windows	6333

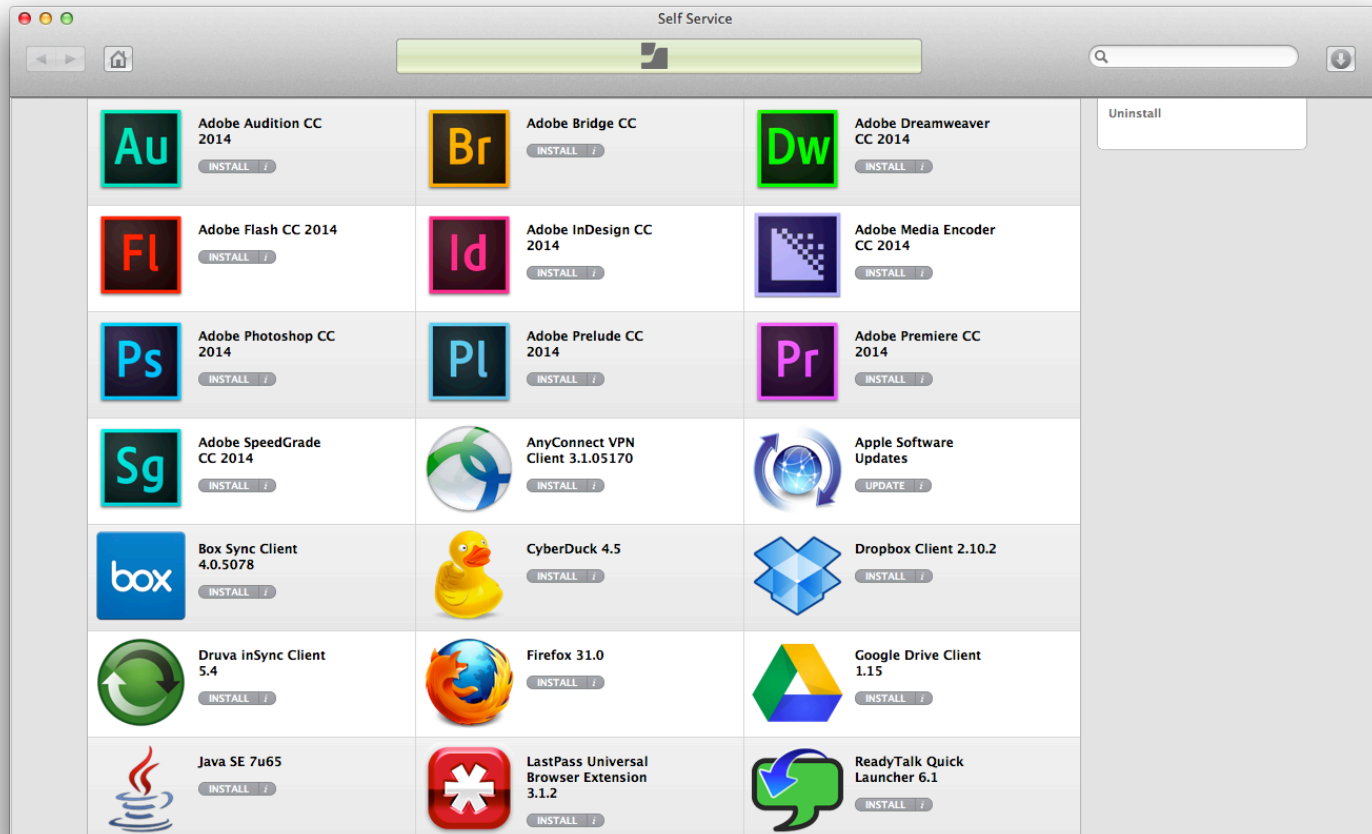
# Numbers of Berkeley Desktops

Type of Berkeley Desktop	Total
All	4794
Berkeley Windows Desktops	4323
Berkeley Mac Desktops	470
Berkeley Windows 7 Desktops	4234
Berkeley Windows 8 Desktops	89
Berkeley Mac 10.9 Desktops	430

# Historical Growth of Devices

Period of Time	Total
Last 24 Hours	69
Last 1 Week	244
Last 2 Weeks	363
Last 1 Month	723
Last 2 Months	1656
Last 3 Months	3223
Last 6 Months	4511
Last 1 Year	7525
Since TEM Went Into Production	10854

# Self-Service for OS X



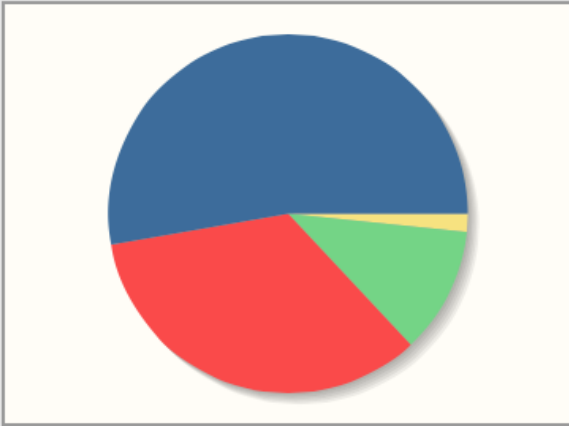
# Coming soon---



## Self Service Printer Installs

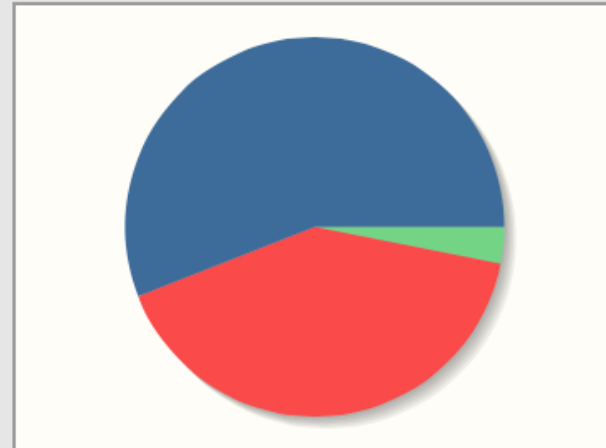
# Inventory

**Warranty Status Breakdown**



	EEI: Dell Warranty St...	Cou...	Perce...
■	Active	2465	52.8%
■	Expired	1598	34.2%
■	Future	533	11.4%
■	Other	76	1.6%

**Apple Warranty**



	EEI: Apple Warranty ...	Cou...	Perce...
■	AppleCare Repair Agreement	414	55.9%
■	Out Of Coverage	303	40.9%
■	Other	23	3.1%

# More Technical Components

- Monitoring: Zabbix
- Splunk: log correlation
- Powershell, Sapien Powershell studio: Post Deploy
- Github: source control
- Vagrant: managing VMs and testing
- Docker: coming, not in prod yet
- Jenkins CI: automatically build test VMs
- Ha-proxy: load balancing where needed
- Idonethis.com

# Bomgar



Endpoint Engineering & Infrastructure

Remote Desktop Support Portal

Representatives



Session Key



Submit

Issue Submission



Your Issue - Please choose an issue -

Your Name

Company Name

Describe Your Issue

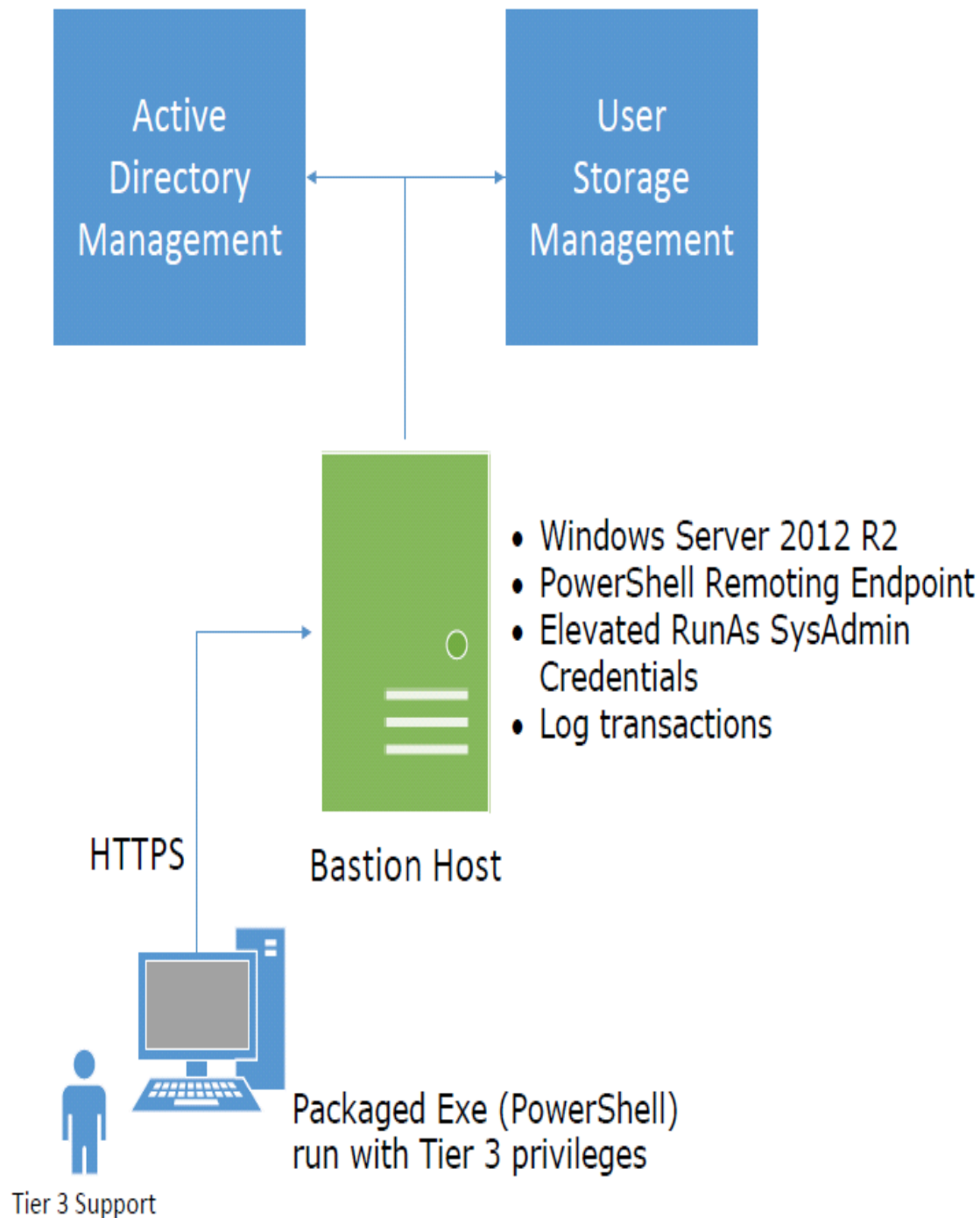
Submit

Managed by Endpoint Engineering and Infrastructure - IST

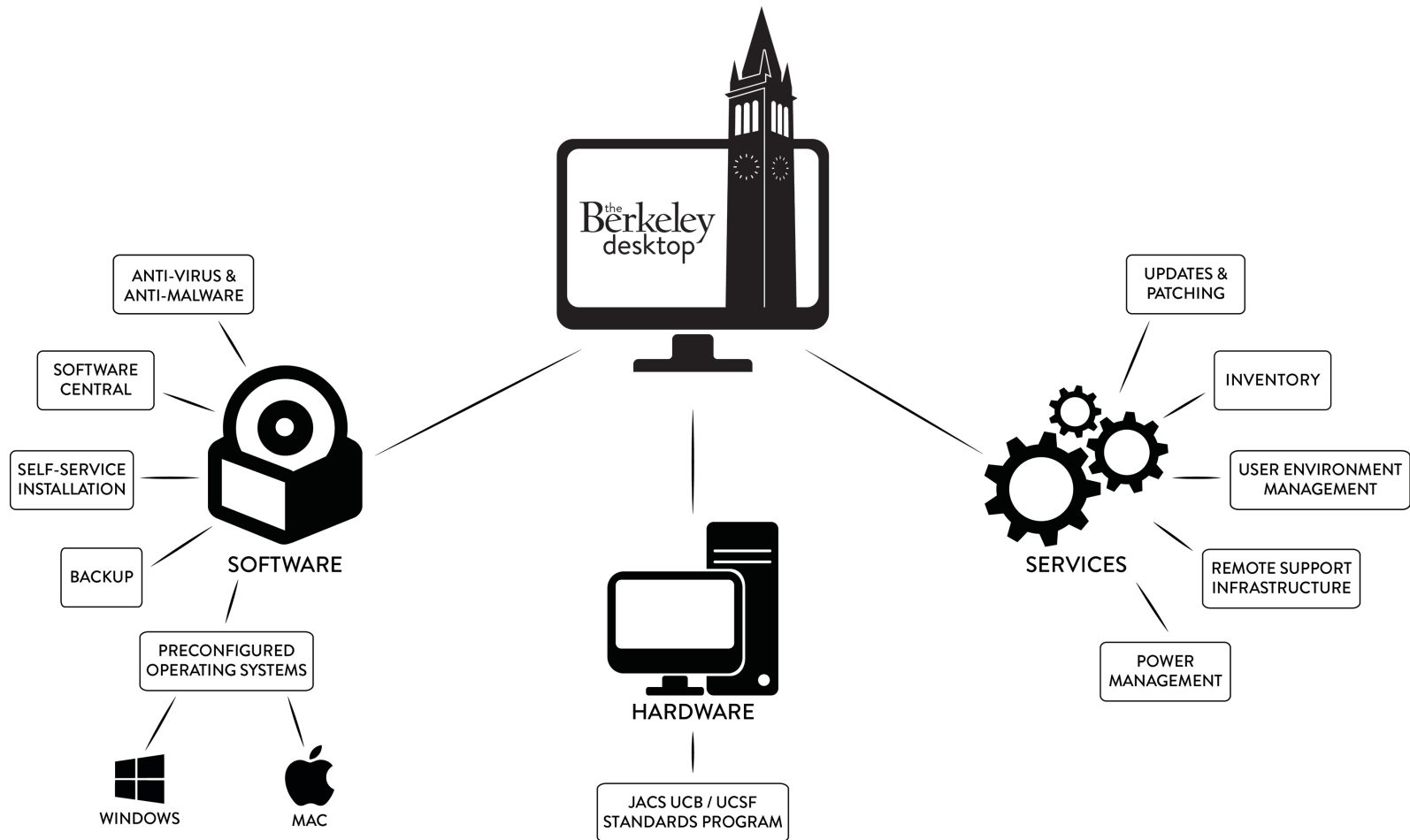
Powered By

**BOMGAR™**

Secure Remote Support for the Help Desk.



# The Berkeley Desktop Ecosystem



**IF YOU ASK ME QUESTIONS**

**THAT'D BE GREAT**

[makeameme.org](http://makeameme.org)

Email to: [wallison@berkeley.edu](mailto:wallison@berkeley.edu)