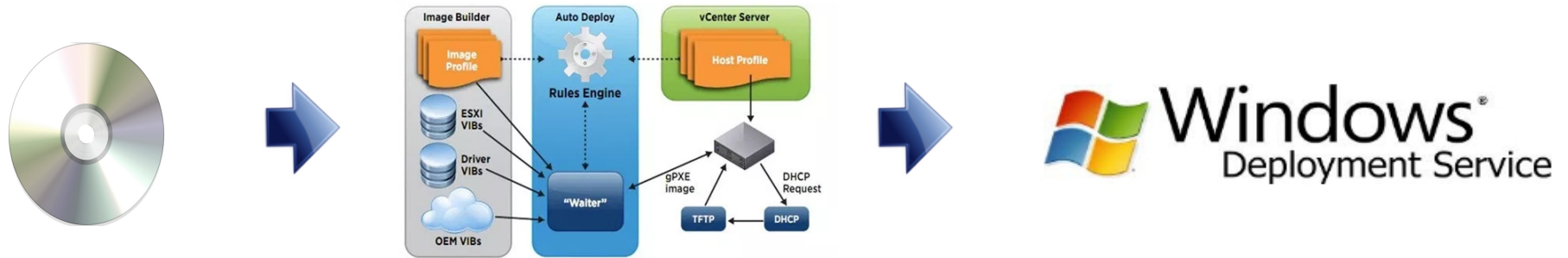# Auto Deploy for the average Joe!!

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Virtualization Service Architect

@AMikkelsenDK

Disclaimer

- All tweets are my own

- This presentation and it's content is my own thoughths and ideas and does not reflect the ones of the companies I work for

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"Old school"

Requirements:
- ISO / CDROM

"Old school"

Requirements:
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Pros:
- Supported
- Simple

"Old school"

Requirements:
- ISO / CDROM

Pros:
- Supported
- Simple

Cons:
- Manual
- Manual post config

Media

Poll

- How many uses ISO?
- How many uses Auto Deploy?
- Other solutions?

VMware Auto Deploy
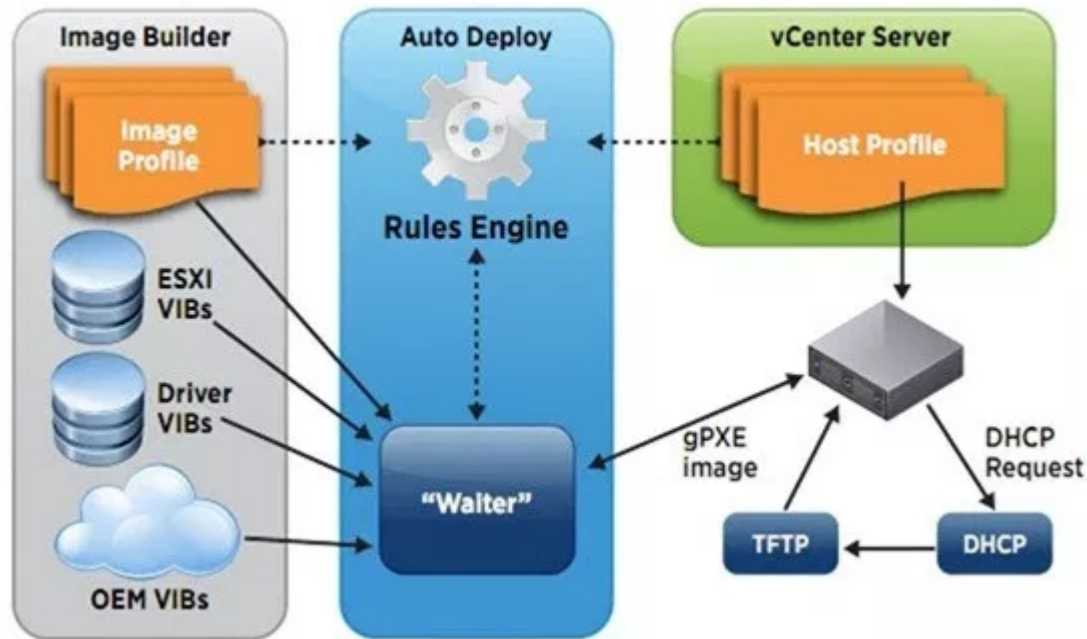
VMware Auto Deploy

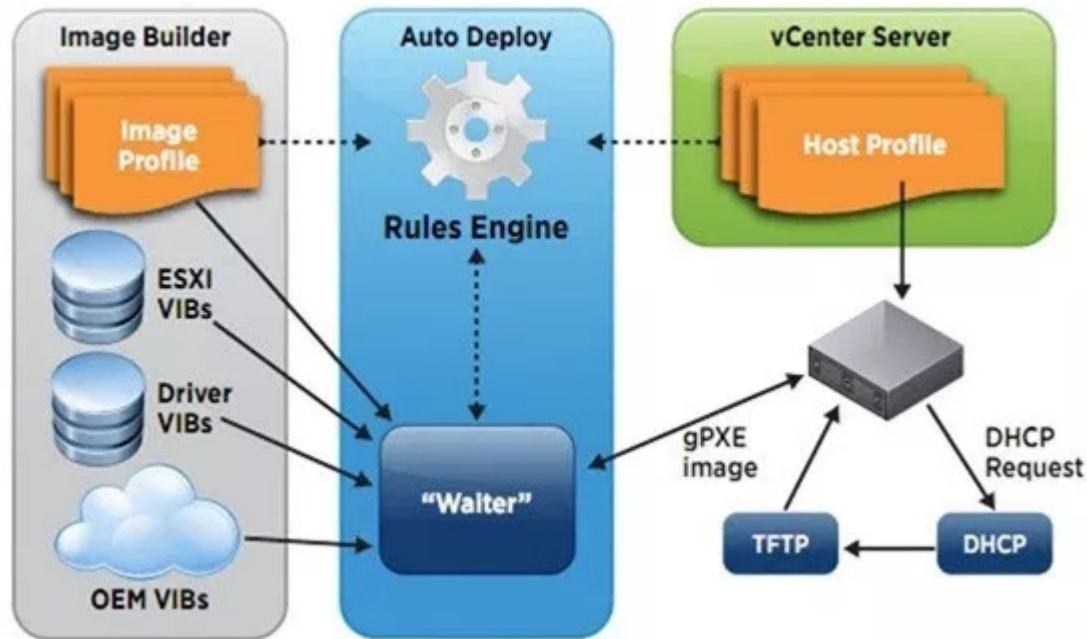Requirements:
- Enterprise Plus

Pros:
- Supported
- Integrated
- Uniform
- Stateless
- Automatic post config

Cons:
- Complex

ESXi through WDS

Requirements:
- AD, DNS, DHCP, WDS
- FTP & NFS
- Powershell
- KS.CFG
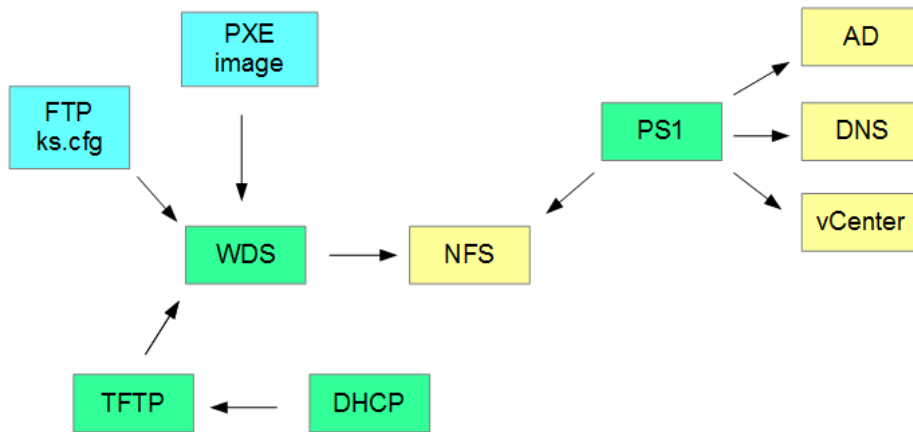
ESXi through WDS
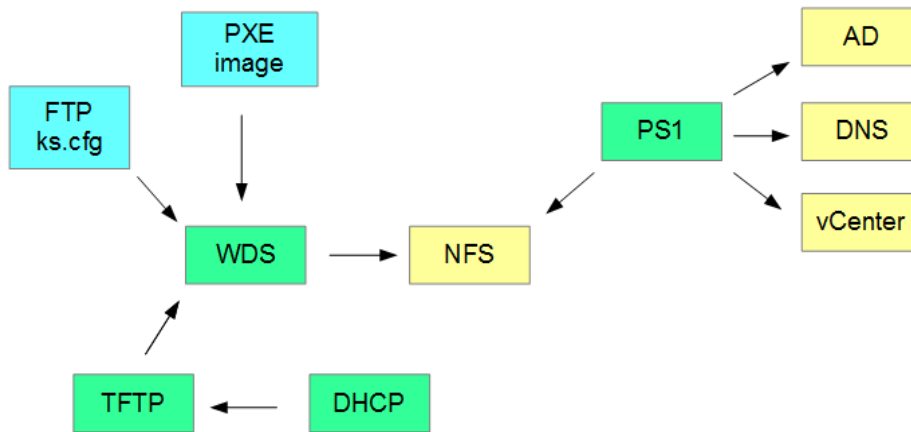
Requirements:
- AD, DNS, DHCP, WDS
- FTP & NFS
- Powershell
- KS.CFG

Pros:
- Uniform
- No additional license cost
- "Automatic" post config

ESXi through WDS

Requirements:
- AD, DNS, DHCP, WDS
- FTP & NFS
- Powershell
- KS.CFG

Pros:
- Uniform
- No additional license cost
- "Automatic" post config

Cons:
- Complex
- Custom scripting

ESXi through Open Source

Requirements:
AD, DNS, DHCP, TFTP, FTP & NFS
Powershell Core / Python
KS.CFG

Pros:
Open Source
Uniform
No additional license cost
"Automatic" post config

Cons:
Complex
Custom scripting

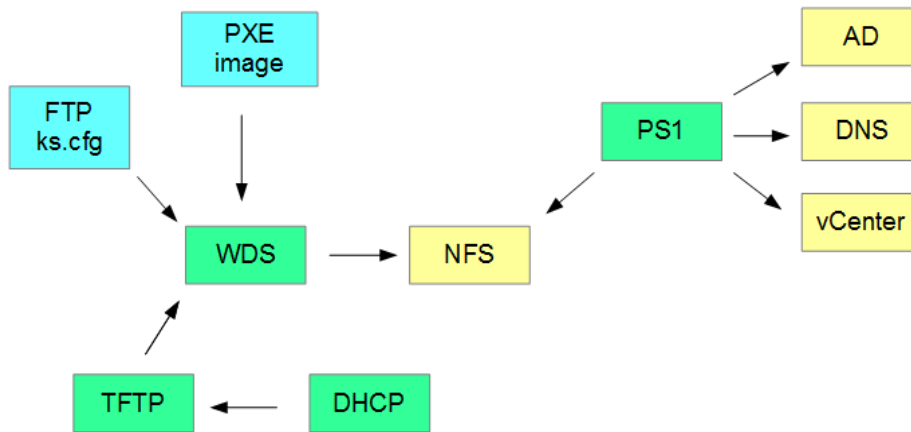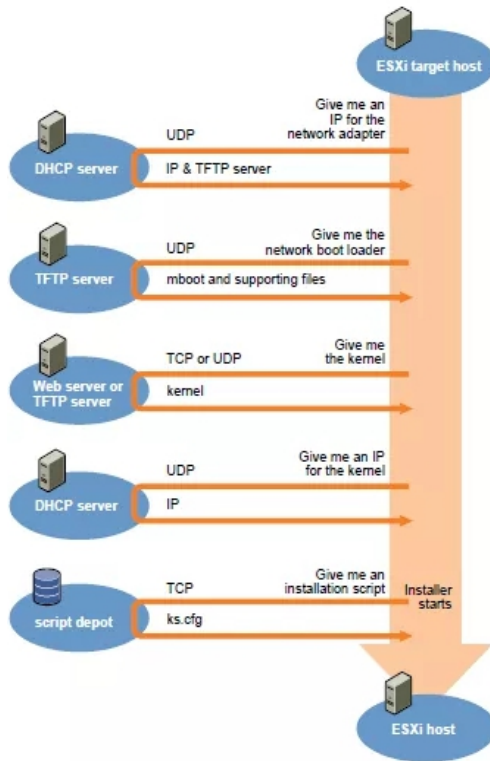VMware vSphere PowerCLI 5.1 Release 2

```
Once you've connected, display all virtual machines: Get-VM
If you need more help, visit the PowerCLI community: Get-PowerCLICommunity

        Copyright (C) 1998-2013 VMware, Inc. All rights reserved.


PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI> Add-EsxSoftwareDepot https://hostu
pdate.vmware.com/software/VUM/PRODUCTION/main/vmw-depot-index.xml

Depot Url
==========
https://hostupdate.vmware.com/software/VUM/PRODUCTION/main/vmw-depot-index.xml


PowerCLI C:\Program Files\VMware\Infrastructure\vSphere PowerCLI> Get-EsxImageProfile

Name                          Vendor        Last Modified     Acceptance Level
----                          ------        -------------     ----------------
ESXi-5.0.0-20120904001-no-t... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.0.0-20121202001-no-t... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.0.0-20120904001-stan... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.0.0-20121201001s-sta... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.1.0-799733-no-tools     VMware, Inc.  8/2/2012 3:0...   PartnerSupported
ESXi-5.0.0-20120604001-no-t... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.0.0-20120704001-stan... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.1.0-20121204001-stan... VMware, Inc.  11/18/2012 1...   PartnerSupported
ESXi-5.0.0-20120701001s-sta... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.1.0-799733-standard     VMware, Inc.  8/2/2012 3:0...   PartnerSupported
ESXi-5.0.0-20120404001-no-t... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.0.0-469512-no-tools     VMware, Inc.  8/19/2011 1:...   PartnerSupported
ESXi-5.0.0-20120604001-stan... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.0.0-20111104001-no-t... VMware, Inc.  10/13/2011 3...   PartnerSupported
ESXi-5.0.0-20120301001s-no-... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.0.0-20110904001-stan... VMware, Inc.  8/26/2011 1:...   PartnerSupported
ESXi-5.0.0-20120901001s-sta... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.0.0-20120701001s-no-... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.1.0-20121201001s-no-... VMware, Inc.  11/18/2012 1...   PartnerSupported
ESXi-5.0.0-20120504001-stan... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.1.0-20121204001-no-t... VMware, Inc.  11/18/2012 1...   PartnerSupported
ESXi-5.0.0-20120704001-no-t... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.1.0-20121001001-stan... VMware, Inc.  11/18/2012 1...   PartnerSupported
ESXi-5.0.0-20110904001-notools VMware, Inc.  8/26/2011 1:...   PartnerSupported
ESXi-5.0.0-20120404001-stan... VMware, Inc.  11/18/2012 9...   PartnerSupported
ESXi-5.0.0-20111104001-stan... VMware, Inc.  10/13/2011 3...   PartnerSupported
ESXi-5.0.0-20121202001-stan... VMware, Inc.  11/18/2012 9...   PartnerSupported
```
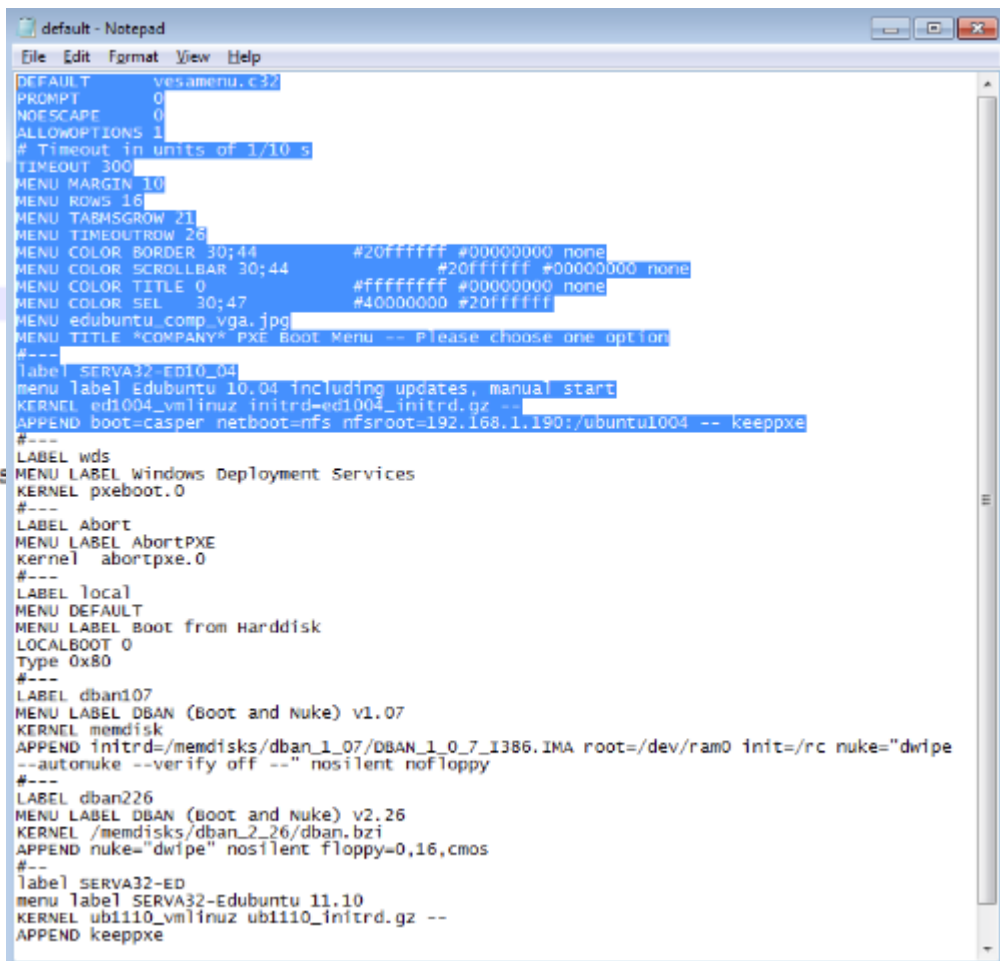
Terminal — ssh — bash — 91×24

```
bootstate=0
title=Loading ESXi installer
prefix=/esxi50/
kernel=tboot.b00
kernelopt=runweasel
modules=b.b00 --- useropts.gz --- k.b00 --- a.b00 --- ata-pata.v00 --- ata-pata.v01 --- ata
-pata.v02 --- ata-pata.v03 --- ata-pata.v04 --- ata-pata.v05 --- ata-pata.v06 --- ata-pata.
v07 --- block-cc.v00 --- ehci-ehc.v00 --- s.v00 --- weaselin.i00 --- ima-qla4.v00 --- ipmi-
ipm.v00 --- ipmi-ipm.v01 --- ipmi-ipm.v02 --- misc-cni.v00 --- misc-dri.v00 --- net-be2n.v0
0 --- net-bnx2.v00 --- net-bnx2.v01 --- net-cnic.v00 --- net-e100.v00 --- net-e100.v01 ---
net-enic.v00 --- net-forc.v00 --- net-igb.v00 --- net-ixgb.v00 --- net-nx-n.v00 --- net-r81
6.v00 --- net-r816.v01 --- net-s2io.v00 --- net-sky2.v00 --- net-tg3.v00 --- ohci-usb.v00 -
-- sata-ahc.v00 --- sata-ata.v00 --- sata-sat.v00 --- sata-sat.v01 --- sata-sat.v02 --- sat
a-sat.v03 --- scsi-aac.v00 --- scsi-adp.v00 --- scsi-aic.v00 --- scsi-bnx.v00 --- scsi-fni.
v00 --- scsi-hps.v00 --- scsi-ips.v00 --- scsi-lpf.v00 --- scsi-meg.v00 --- scsi-meg.v01 --
- scsi-meg.v02 --- scsi-mpt.v00 --- scsi-mpt.v01 --- scsi-mpt.v02 --- scsi-qla.v00 --- scsi
-qla.v01 --- uhci-usb.v00 --- tools.t00 --- imgdb.tgz --- imgpayld.tgz
build=
updated=0
~
~
~
~
~
— INSERT —
```

Zoom Out (Ctrl+Mouse Wheel Down)

```
1   bootstate=0
2   title=Loading ESXi installer
3   timeout=5
4   prefix=/VMUG/ESXi/6.5.0a
5   kernel=/VMUG/ESXi/6.5.0a/tboot.b00
6   kernelopt=runweasel
7   modules=/b.b00 --- /jumpstrt.gz --- /useropts.gz --- /features.gz --- /k.b00
8   build=
9   updated=0
10
```

```
1    DEFAULT        menu.c32
2    PROMPT         0
3    MENU TITLE VMUG Summer 2018 - WDS PXE Boot Menu (x64)
4    MENU AUTOBOOT Starting Local System in 10 seconds
5
6    # Option 1 - Exit WDS PXE Linux & Boot Normally
7    LABEL bootlocal
8         MENU LABEL ^Boot Normally
9         MENU default
10        LOCALBOOT 0
11        TIMEOUT 100
12        TOTALTIMEOUT 9000
13
14   # Option 2 - Run WDS
15   LABEL wds
16        MENU LABEL ^Windows Deployment Services Boot
17        KERNEL pxeboot.0
18
19   # Option 3 - Install ESXi 6.0 Update 2
20   LABEL ESXi6.0u2
21        MENU label ^ESXi6.0 Update 2 - Build 3620759 Ins
22        KERNEL /VMUG/ESXi/6.0u2/MBOOT.C32
23        APPEND -c /VMUG/ESXi/6.0u2/BOOT.CFG
24
```

default - Notepad

File Edit Format View Help

```
DEFAULT        vesamenu.c32
PROMPT         0
NOESCAPE       0
ALLOWOPTIONS 1
# Timeout in units of 1/10 s
TIMEOUT 300
MENU MARGIN 10
MENU ROWS 16
MENU TABMSGROW 21
MENU TIMEOUTROW 26
MENU COLOR BORDER 30;44          #20ffffff #00000000 none
MENU COLOR SCROLLBAR 30;44          #20ffffff #00000000 none
MENU COLOR TITLE 0              #ffffffff #00000000 none
MENU COLOR SEL   30;47          #40000000 #20ffffff
MENU edubuntu_comp_vga.jpg
MENU TITLE *COMPANY* PXE Boot Menu -- Please choose one option
#---
label SERVA32-ED10_04
menu label Edubuntu 10.04 including updates, manual start
KERNEL ed1004_vmlinuz initrd=ed1004_initrd.gz --
APPEND boot=casper netboot=nfs nfsroot=192.168.1.190:/ubuntu1004 -- keeppxe
#---
LABEL wds
MENU LABEL Windows Deployment Services
KERNEL pxeboot.0
#---
LABEL Abort
MENU LABEL AbortPXE
kernel  abortpxe.0
#---
LABEL local
MENU DEFAULT
MENU LABEL Boot from Harddisk
LOCALBOOT 0
Type 0x80
#---
LABEL dban107
MENU LABEL DBAN (Boot and Nuke) v1.07
KERNEL memdisk
APPEND initrd=/memdisks/dban_1_07/DBAN_1_0_7_I386.IMA root=/dev/ram0 init=/rc nuke="dwipe
--autonuke --verify off --" nosilent nofloppy
#---
LABEL dban226
MENU LABEL DBAN (Boot and Nuke) v2.26
KERNEL /memdisks/dban_2_26/dban.bzi
APPEND nuke="dwipe" nosilent floppy=0,16,cmos
#--
label SERVA32-ED
menu label SERVA32-Edubuntu 11.10
KERNEL ub1110_vmlinuz ub1110_initrd.gz --
APPEND keeppxe
```

```
1   # Sample kickstart for ESXi 5.1
2   # William Lam
3   # www.virtuallyghetto.com
4   ########################################
5
6   accepteula
7   install --firstdisk --overwritevmfs
8   rootpw vmware123
9   reboot
10
11  %include /tmp/networkconfig
12
13
14  %pre --interpreter=busybox
15
16
17  # extract network info from bootup
18  VMK_INT="vmk0"
19  VMK_LINE=$(localcli network ip interface ipv4 get | grep "${VMK_INT}")
20  IPADDR=$(echo "${VMK_LINE}" | awk '{print $2}')
21  NETMASK=$(echo "${VMK_LINE}" | awk '{print $3}')
22  GATEWAY=$(localcli network ip route ipv4 list | grep default | awk '{print $3}')
23  DNS="172.30.0.100,172.30.0.200"
24  HOSTNAME=$(nslookup "${IPADDR}" "${DNS}" | grep Address | grep "${IPADDR}" | awk '{print $4}')
25
26  echo "network --bootproto=static --addvmportgroup=false --device=vmnic0 --ip=${IPADDR} --netmask=${NETMASK}
27
28  %firstboot --interpreter=busybox
29
30
31  # enable VHV (Virtual Hardware Virtualization to run nested 64bit Guests + Hyper-V VM)
32  grep -i "vhv.enable" /etc/vmware/config || echo "vhv.enable = \"TRUE\"" >> /etc/vmware/config
33
34  # enable & start remote ESXi Shell  (SSH)
35  vim-cmd hostsvc/enable_ssh
36  vim-cmd hostsvc/start_ssh
37
38  # enable & start ESXi Shell (TSM)
39  vim-cmd hostsvc/enable_esx_shell
```
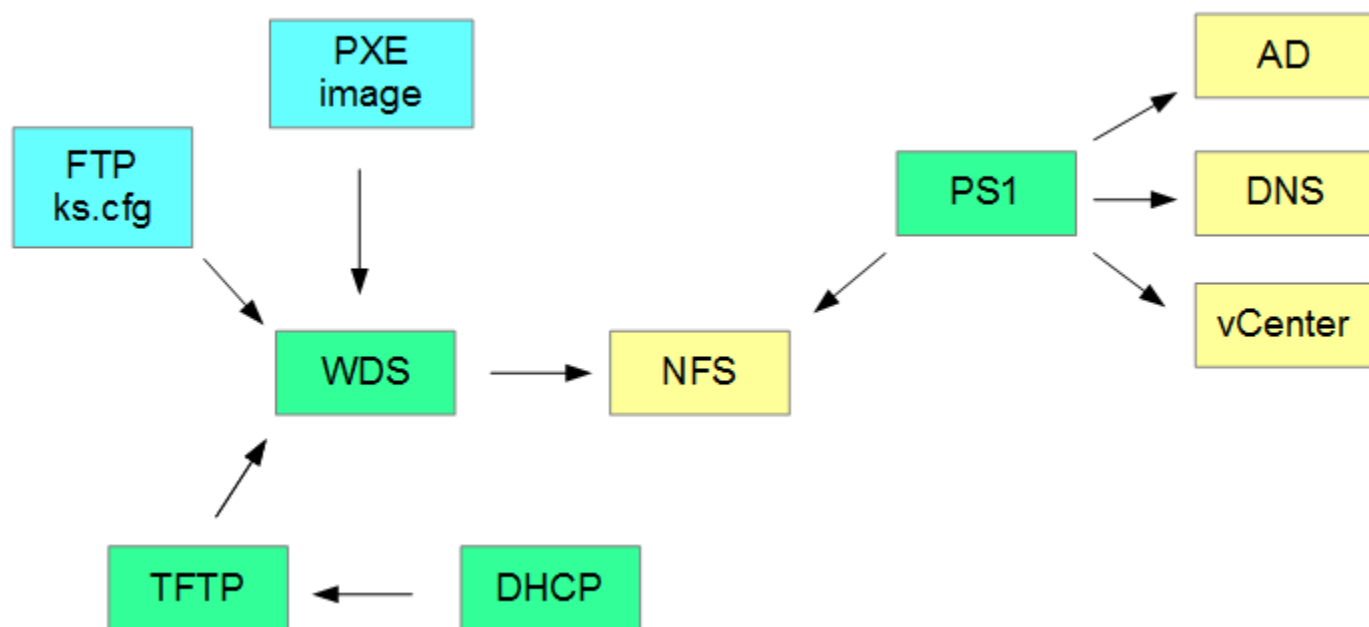
```
bootstate=0
title=Loading ESXi installer
kernel=/tboot.b00
kernelopt=ks=usb:/ks.cfg
modules=/b.b00 --- /jumpstrt.gz --- /useropts.
- /a.b00 --- /user.b00 --- /sb.v00 --- /s.v00
v01 --- /ata_pata.v02 --- /ata_pata.v03 --- /a
/ata_pata.v06 --- /ata_pata.v07 --- /block_cc.
```
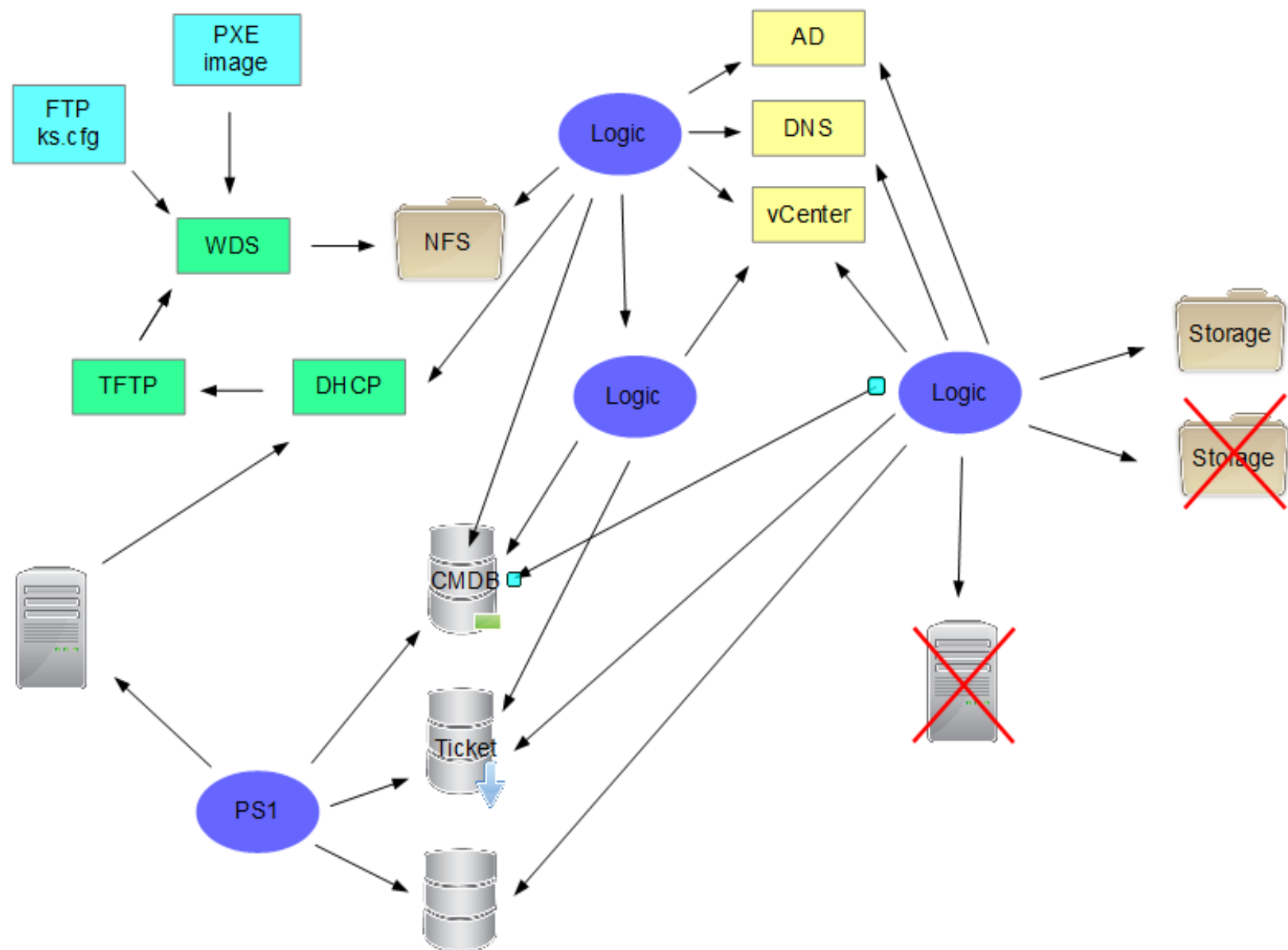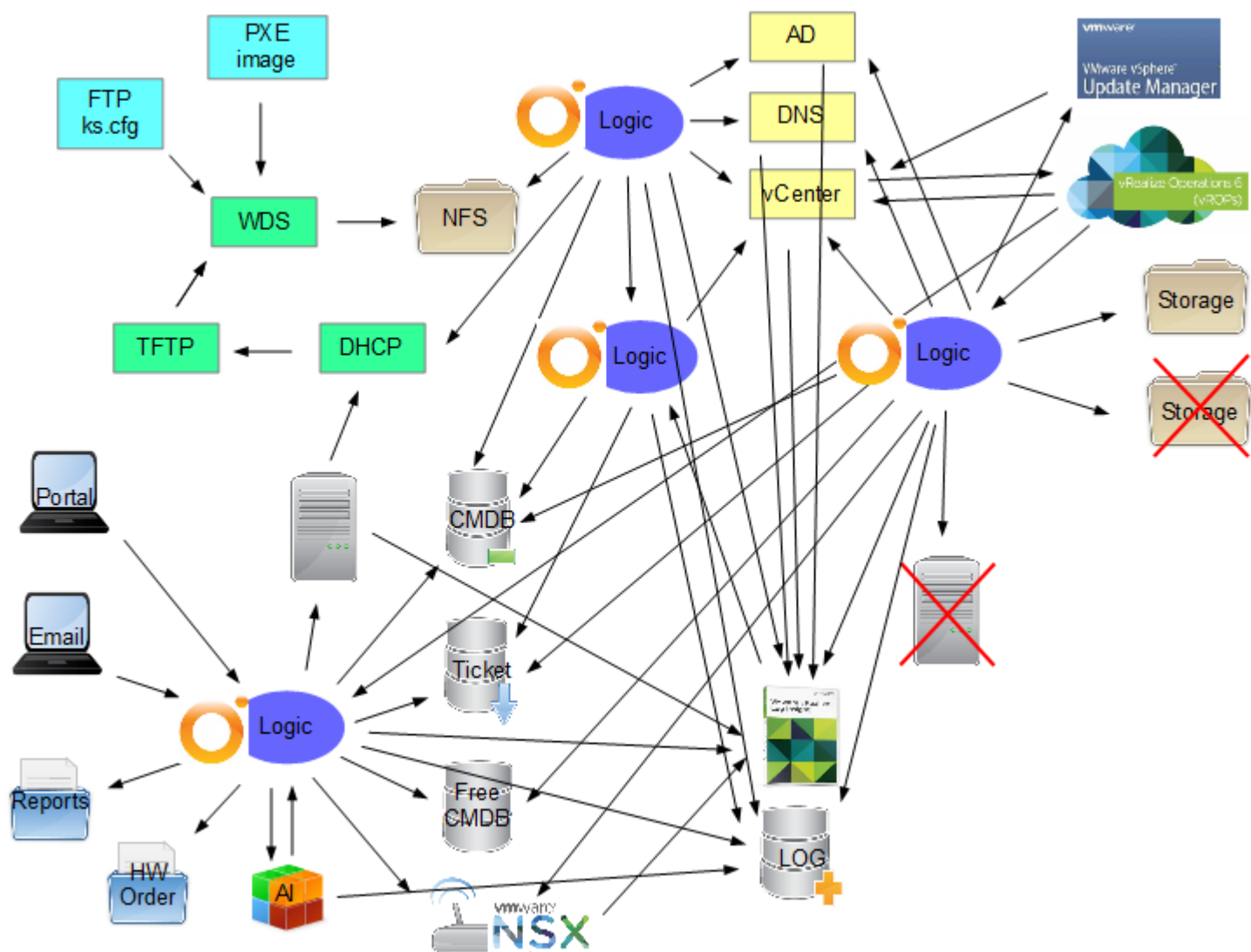
DEMO

© Can Stock Photo

```
          PXE                                        AD
          image

FTP                                          PS1 ────────→ DNS
ks.cfg
            │                                         vCenter
            ↓
           WDS ────────→ NFS

      ↑
     TFTP ←──── DHCP
```

- FTP ks.cfg → WDS
- PXE image → WDS
- WDS → NFS
- NFS ← PS1
- PS1 → AD
- PS1 → DNS
- PS1 → vCenter
- TFTP → WDS
- DHCP → TFTP

Resources

- ## WDS
  https://polarclouds.co.uk/windows-2012r2-wds/
  https://polarclouds.co.uk/deploying-vmware-esxi-via-wds/

- ## KS.cfg - Kickstart
  https://www.ivobeerens.nl/2011/09/20/create-vmware-esxi-5-pxe-unattended-scripted-installation-using-windows/
  https://www.virtuallyghetto.com/2012/09/automating-esxi-51-kickstart-tips-tricks.html

- ## Linux – PXE
  http://www.vstellar.com/2017/07/25/automating-esxi-deployment-using-pxe-boot-and-kickstart/

Credits

- Chris Hall - https://polarclouds.co.uk/

- Brett & Brian Jackson - https://theitbros.com

- Ivo Beerens - https://www.ivobeerens.nl

- William Lam - https://www.virtuallyghetto.com

- Alex Hunt – http://http://www.vstellar.com