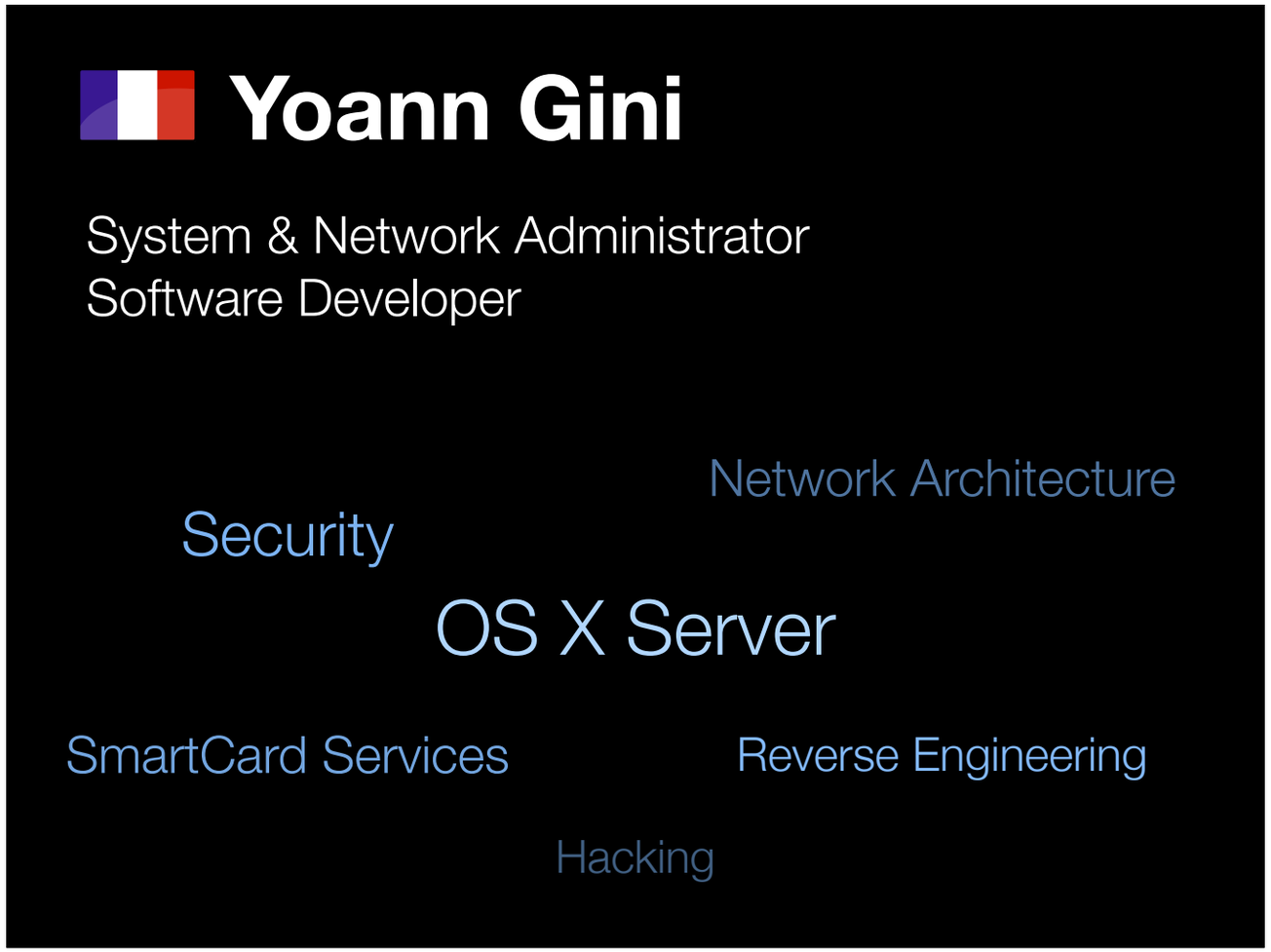
The aim of this talk is to discover why and how you can use OS X and vSphere together



I’m french freelancer, working as consultant on different topics like system administration, network administration and software development.

I’m an Apple Certified Master Trainer and a Certified Ethical Hacker.

You can usually find my in the usual suspects list for topics related to OS X Server like Security, Network Architecture, SmartCard Services, Reverse Engineering and Hacking.

Overview

Is it legal?

Architecture and Support

Success Stories

Keys features

New way to work

Xsan

Is it legal?

No virtualization? Only 2 VMs per Mac?

I'M NOT A LAWYER

If it's not strictly forbidden…

OS X 10.10.3 SLA

The stuff you never read…

OS X 10.10.3 SLA

2. Permitted License Uses and Restrictions.

A. Preinstalled and Single-Copy Apple Software License

B. Mac App Store License

C. Volume or Maintenance License

H. Remote Desktop Connections

I. Other Use Restrictions

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OS X 10.10.3 SLA

Preinstalled on Mac ?

one copy

on original hardware

OS X 10.10.3 SLA

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- (ii) If you are a commercial enterprise or educational institution, to download, install, use and run one (1) copy of the Apple Software for use either:
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  - (b) testing during software development;
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  - (b) by multiple individuals on a single shared Mac Computer that you own or control. For example, a single employee may use the Apple Software on both the employee's desktop Mac Computer and laptop Mac Computer, or multiple students may serially use the Apple Software on a single Mac Computer located at a resource center or library; and
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OS X 10.10.3 SLA

From the Mac App Store ?

Software assigned to **user** or **hardware**

Two additional copies of the installed one **in VM** for

Development

Testing

OS X Server

OS X 10.10.3 SLA

Terminal Server usage **strictly forbidden**

Nothing about multiple **distinct** copies **on one hardware**

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OS X 10.10.3 SLA

Scenario **not covered** by SLA:

Apple hardware but **no** installed OS X

Multiple **dedicated licences**, one **hardware**

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OS X 10.10.3 SLA

H. Remote Desktop Connections

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- (i) only one (1) Device may remotely connect at any one time, whether directly or indirectly, to control the graphical desktop session of the Apple Software that is running and being displayed on the Home Mac; and
- (ii) a reasonable number of Devices may remotely connect at the same time for the sole purpose of simultaneously observing the same graphical desktop session of the Apple Software that is running and being displayed on the Home Mac, as long as they do not control the Apple Software in any way; but
- (iii) only one (1) Apple-branded Device may remotely connect at any one time, whether directly or indirectly, to control a separate graphical desktop session of the Apple Software that is different from the one running and being displayed on the Home Mac, and such connection may only be made through the Screen Sharing feature of the Apple Software.

Except as expressly permitted in this Section 2H, or except as otherwise licensed by Apple, you agree not to use the Apple Software, or any of its functionality, in connection with service bureau, time-sharing, terminal sharing or other similar types of services, whether such services are being provided within your own organization or to third parties.

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OS X 10.10.3 SLA

NO TERMINAL SERVER

ALLOWED AT ALL

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OS X 10.10.3 SLA

No Terminal Server

No « Apple product as a Service »

OS X Server 4.1 SLA

OS X Server 4.1 SLA

No occurence of the word **virtual**

One copy per user or per computer

No specifications for multiple distinct copies on one hardware

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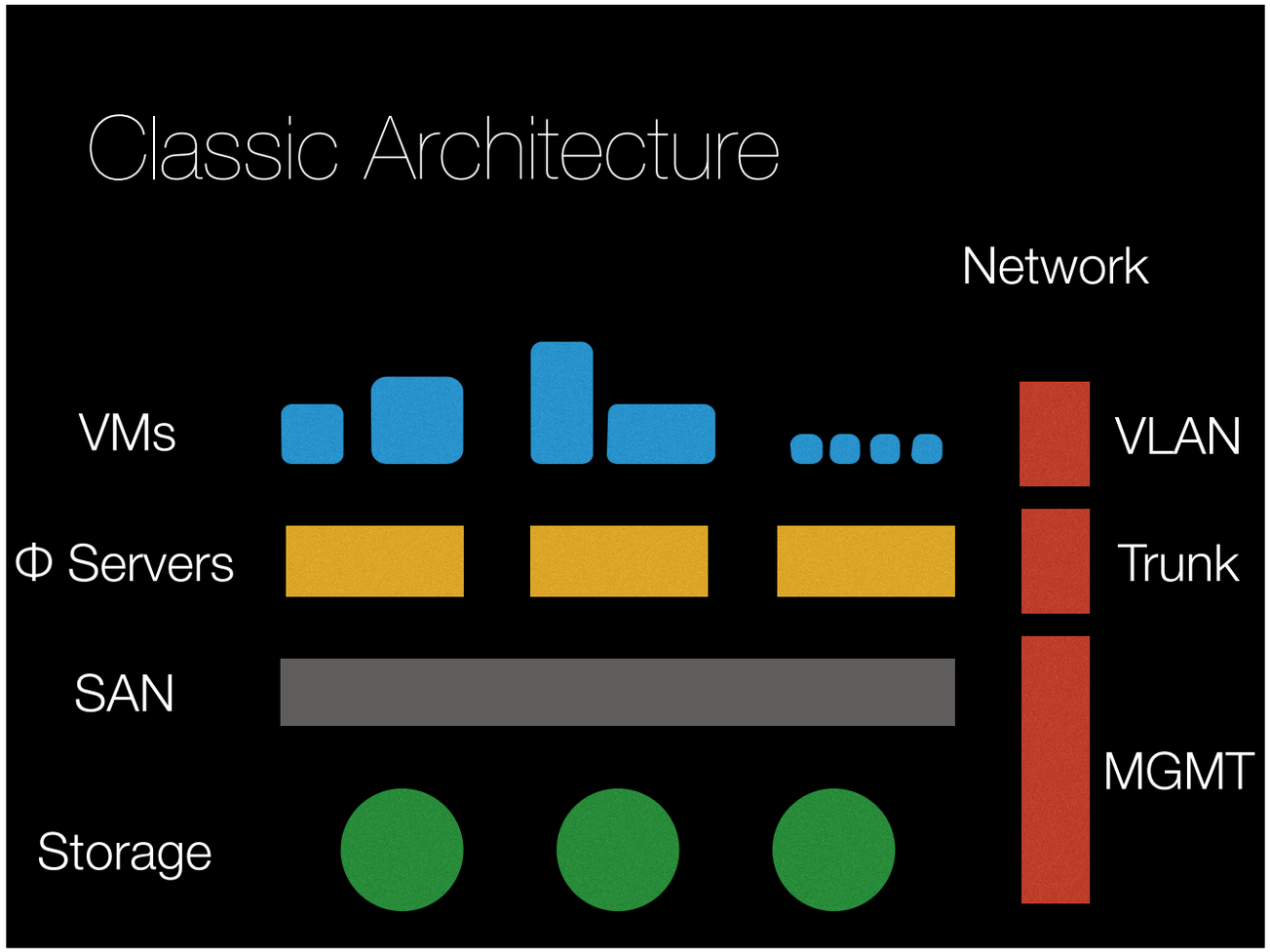
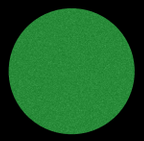
Ask your legal department to read the SLA and make your own opinion

Architecture and Support

How to do it right


Classic Architecture
Network
VMs
VLAN
Φ Servers
Trunk
SAN
MGMT
Storage

Storage



iSCSI or FC based

Store all VM images and settings

Mandatory for advanced scenario

Sessions from multiple initiator must be enabled

SAN

FC, FCoE, IP based

Bottleneck for virtual disk I/O

Φ Servers

ESXi (VMware Hypervisor)

- Any 64-bit x86 CPUs
- A lot of RAM
- Multiple ethernet interface
  - 10Gbps is better

Φ Servers

OS X VMs?

Apple Hardware

Virtual Machines

Any OS running on x86 CPU

Support EFI and BIOS boot mode

Network

IP based

Should support VLANs

10G Ethernet is better

Trunk to the ESXi host

Virtual access switch inside ESXi

Official ESXi Support

	5.5	5.5 U1	5.5 U2	6.0
MacPro 5,1	✔	✔	✔	✔
MacPro 6,1 with 4-core			✔	✔
MacPro 6,1 with 6-core			✔	✔
MacPro 6,1 with 8-core			✔	✔
MacPro 6,1 with 12-core			✔	✔

Hardware Catalog

	Sonnet	ATTO	Promise
Enclosure	RackMac Pro		
FC		ThunderLink FC 8 or 16 Gb	SanLink2 FC 8 or 16 Gb
10Gb/s Eth	Twin 10G	ThunderLink NT/NS Base-T or SFP+	SanLink2 10Gb Base-T or SFP+
Official Statment	Work Doc in progress	No support Wait for demand	No support Wait for demand

Sonnet, ATTO and Promise has been contacted for the purpose of this slide.

Sonnet Twin 10G use network chipset compatible out of box with ESXi, a documentation do configure it with ESXi should be available soon.

ATTO and Promise are interested by this market but haven’t make any move at this time. They wait for more customer demand.

Price comparaison

	MacPro	PowerEdge R730
CPU	E5-2697 (12x2.7 GHz)	E5-2697 (14x2.6 GHz)
RAM	2x32 Gb	2x32 Gb
SAN	ATTO Celerity FC-82EN (2x8 Gb FC)	QLogic 2562 (2x8 Gb FC)
Ethernet	ATTO FastFrame NT12 (2x10 Gb Base-T)	QLogic 57800 (2x10 Gb Base-T)
Rack	xMac Pro Server	Included
List Price	$ 11 588	$ 11 509

Virtualization with Mac Mini ?

You bet.

Virtualization with Mac Mini ?

No ECC memory

No official support

Too few memory for massive usage

Still many people using it…

Virtualization with Mac Mini ?

Install on MacMini easily possible thanks to William Lam

http://www.virtuallyghetto.com/apple

@lamw

Success Stories

How people are using this solution today?

Success Stories

	Hardware	Use case
VMware	Mac Mini	Developer forge
My customers	Mac Mini	Forge & Infra
Adobe	Mini & Pro	Testing
AutoTrader.com	Mac Mini	Testing
Artwork Systems	Mac Pro	Infrastructure

Source: http://www.virtuallyghetto.com/apple

Success Stories

	Hardware	Use case
K-12	Xserve	Infrastructure
Fortune 150	Mac Pro	Infrastructure
Mid-Pacific Institute	Mac Pro	Infrastructure
Connell Insurance	Mac Mini	Infrastructure
Fitstar	Mac Mini	Forge & Infra

Source: http://www.virtuallyghetto.com/apple

Success Stories - Hardware

xMac Pro Server

ARC-8050T2
TB SAS RAID

Pegasus R6

xMac Mini Server

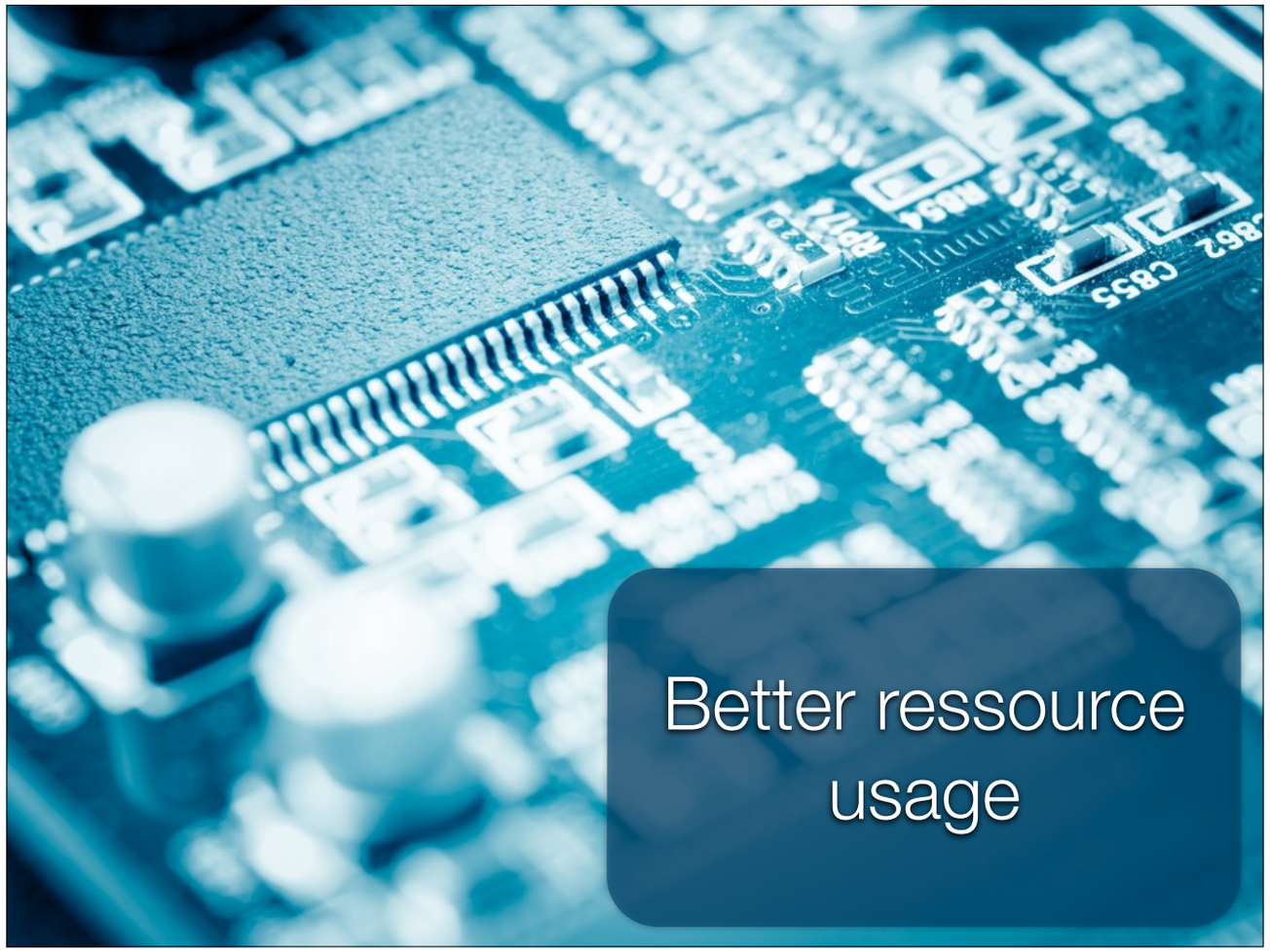
LaCie Rugged
TB Drives

Sonnet Echo
Express III-R

http://www.virtuallyghetto.com/2015/01/thunderbolt-storage-for-esxi.html

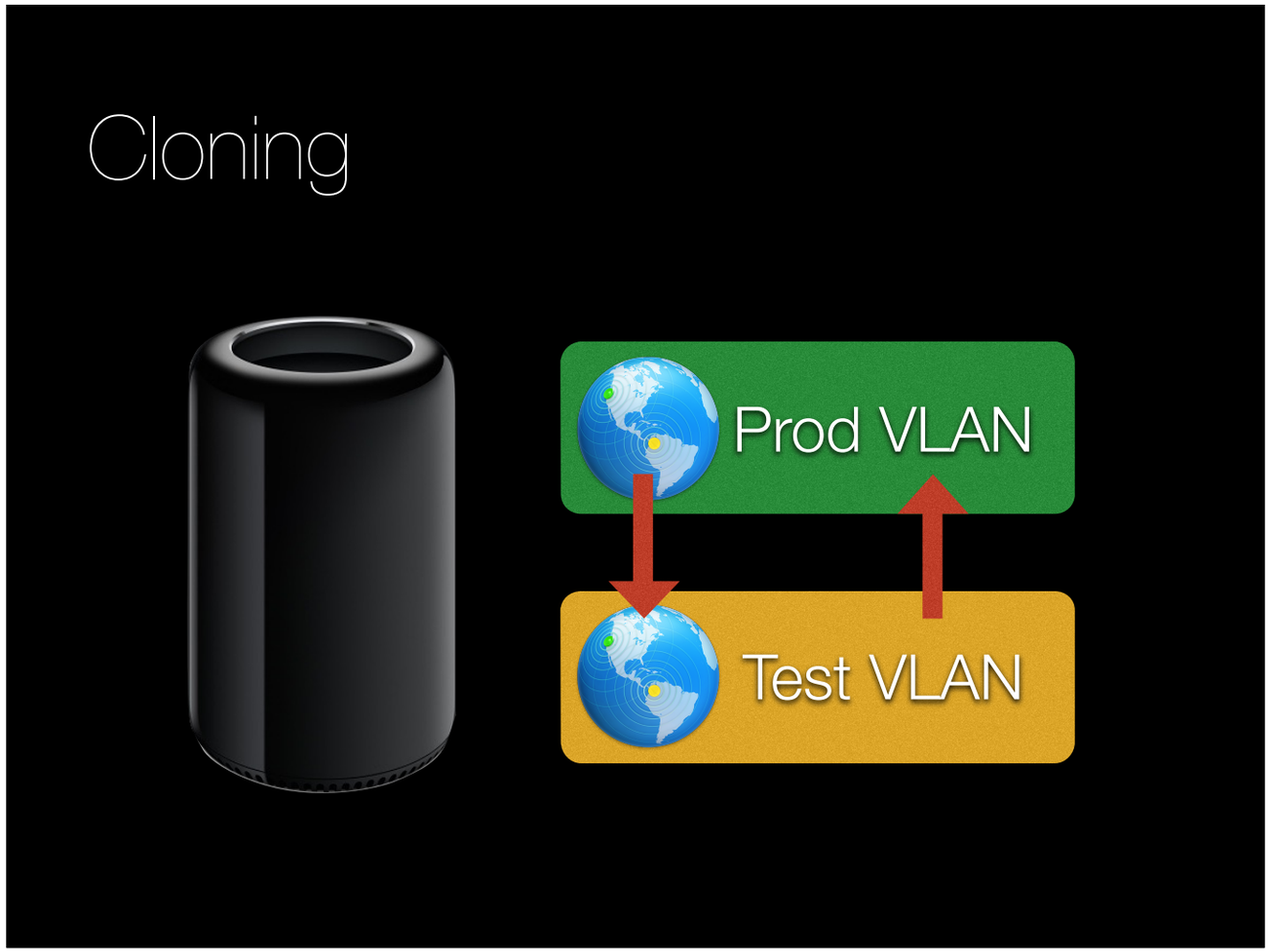
Keys features

Why should you want it now

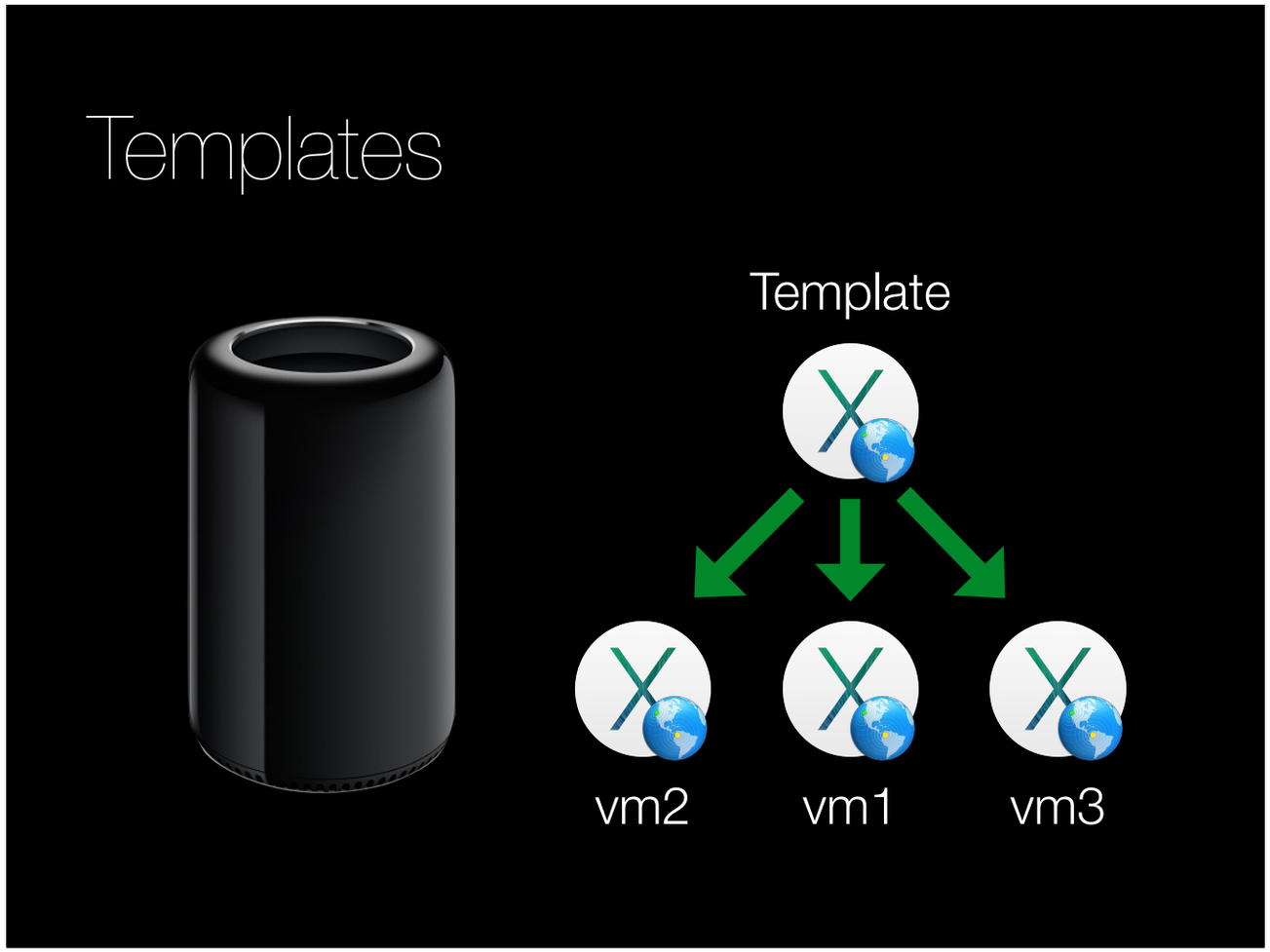


The first key feature is the hardware usage. You can use your hardware at full power even with basic needs.

Multiple logical server on one physical one allow you to optimize your Total Cost of Ownership.



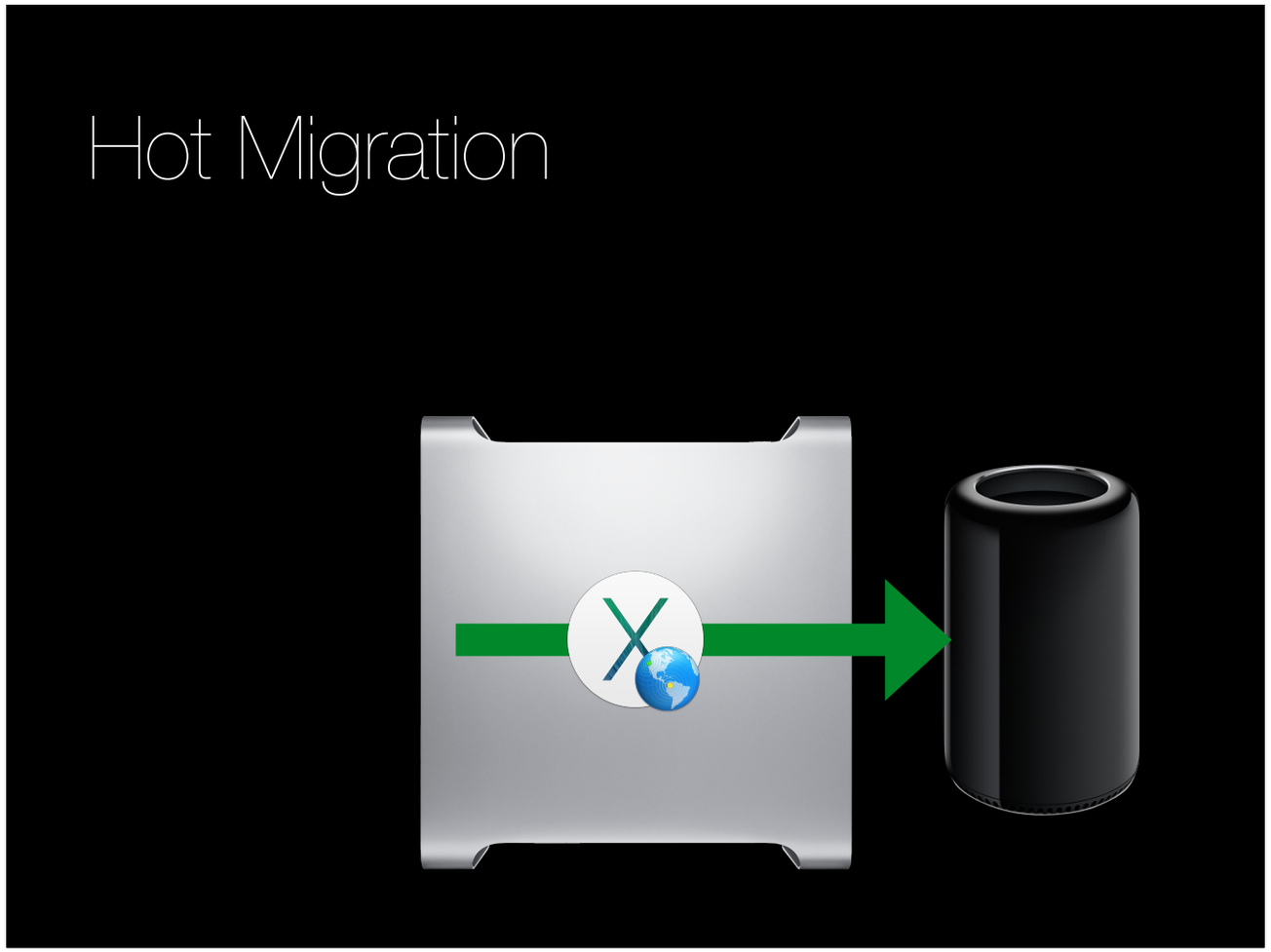
Where ever you want, you can clone an existing VM. This allow you to run an exact copy of you production system on a pre-prod VLAN to prepare your modifications on the real system without any influence on it.



Create your base image for you server (your server OS with all your updates done) and transform it to be a template for any new VM.

Whenever you need a new OS X you just have to create a new instance. More faster than every with else, and no need to spare computer for your labs.

Hot Migration



If you need to replace a server, you don’t have to interrupt your services to do it. without having to manage a complexe clustered service you just have to move your VM to an other physical server. It can be done when the services are running.

And even for those service who don’t have any High Availability feature.

Old OS, new hardware

You still use 10.6 for your OD Master?
You still have old PowerPC apps?

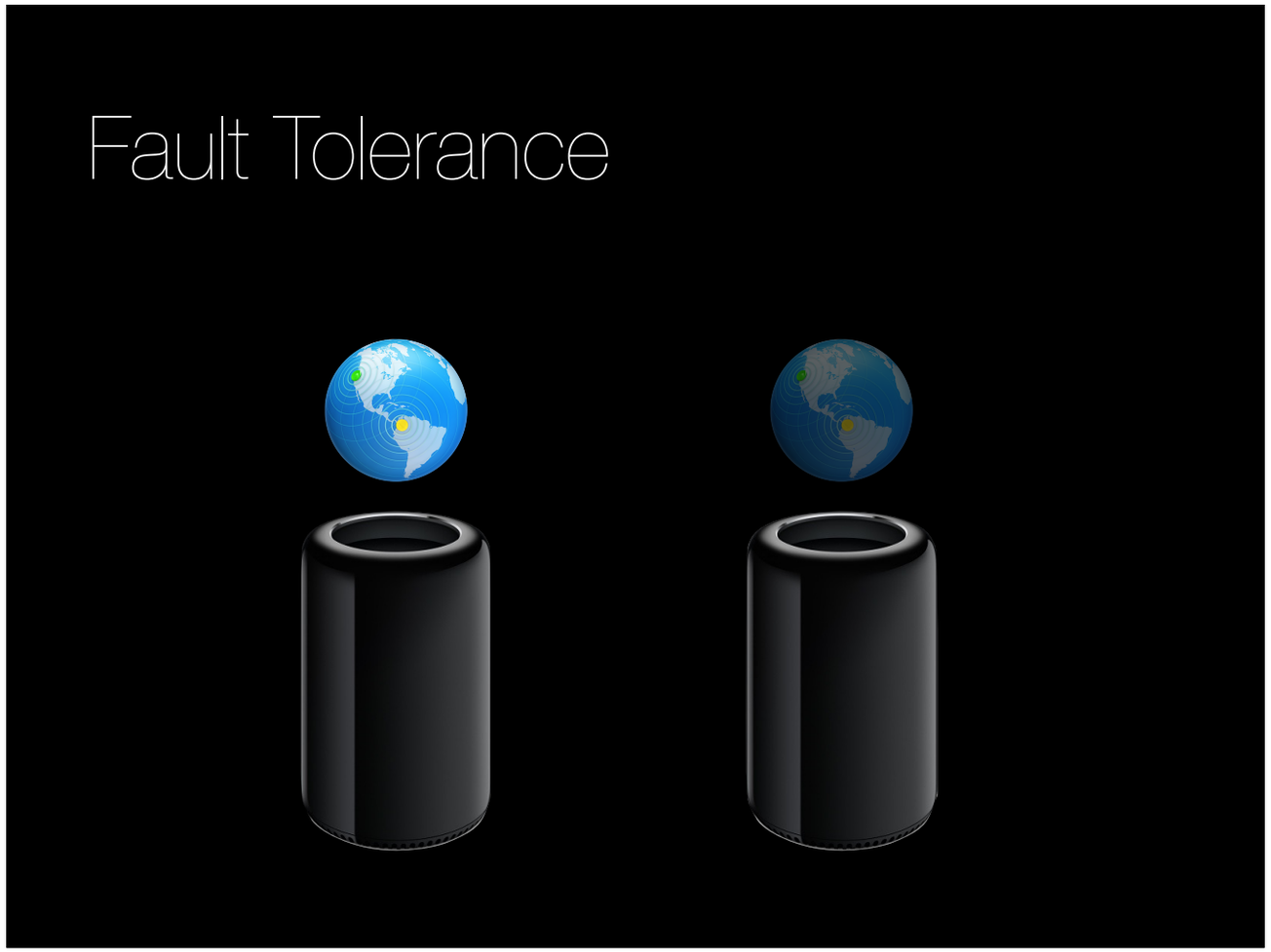
The upgrade path is too expensive for you at this time?

Now you can make them run on last gen MacPro and MacMini!

If your ESXi host fail, associated guest VMs are automatically restarted on an other host.

From the guest system point of view, it’s a power failure (with all consequences on BDD).

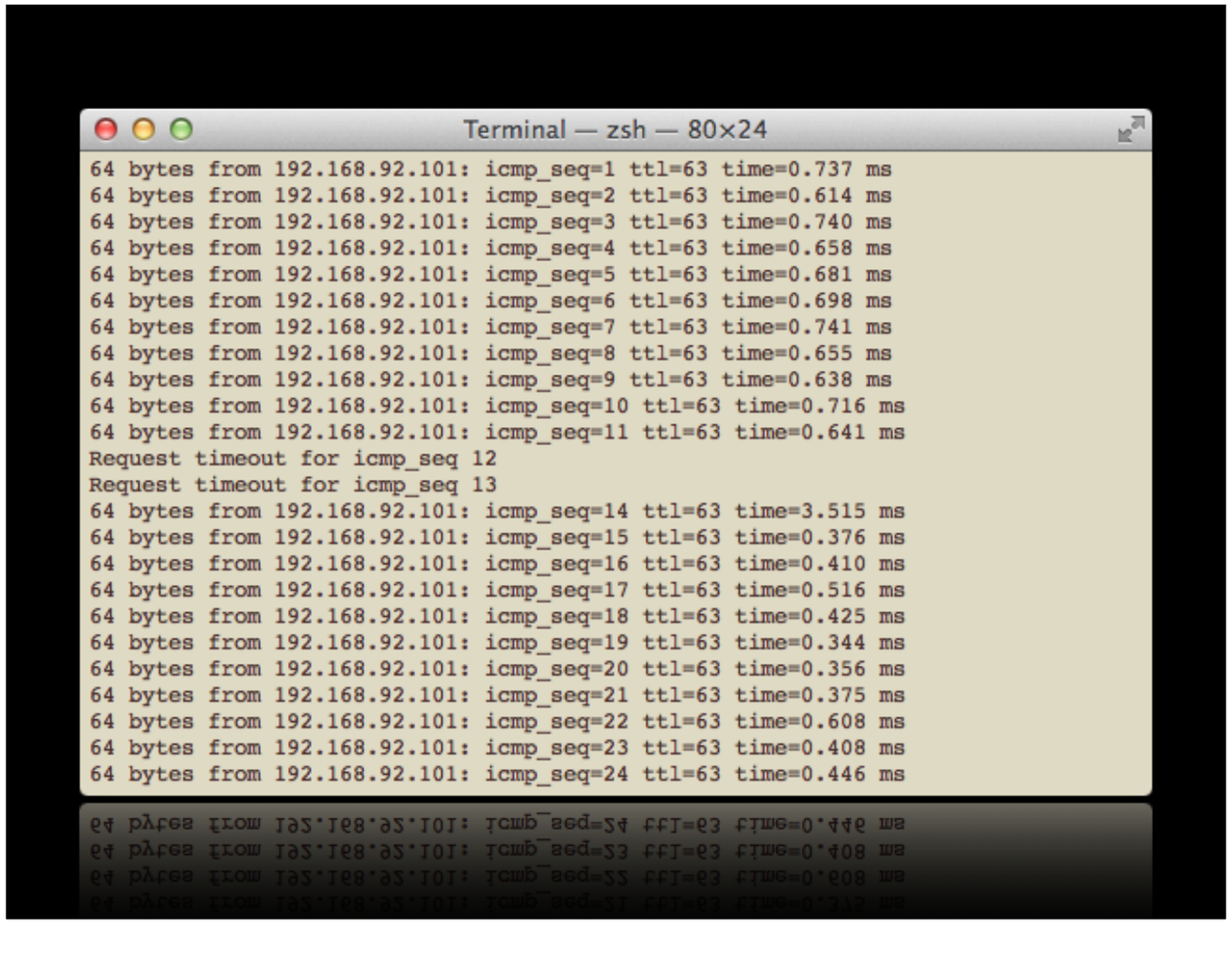
Configured at the ESXi cluster level, automatically enabled for all VMs included.



Per VM settings.

Your VM is started on two ESXi host in the same time and do the same things. One instance is the active one, with read and write access to the storage. The other is passive, in read only until the heartbeat is lost.

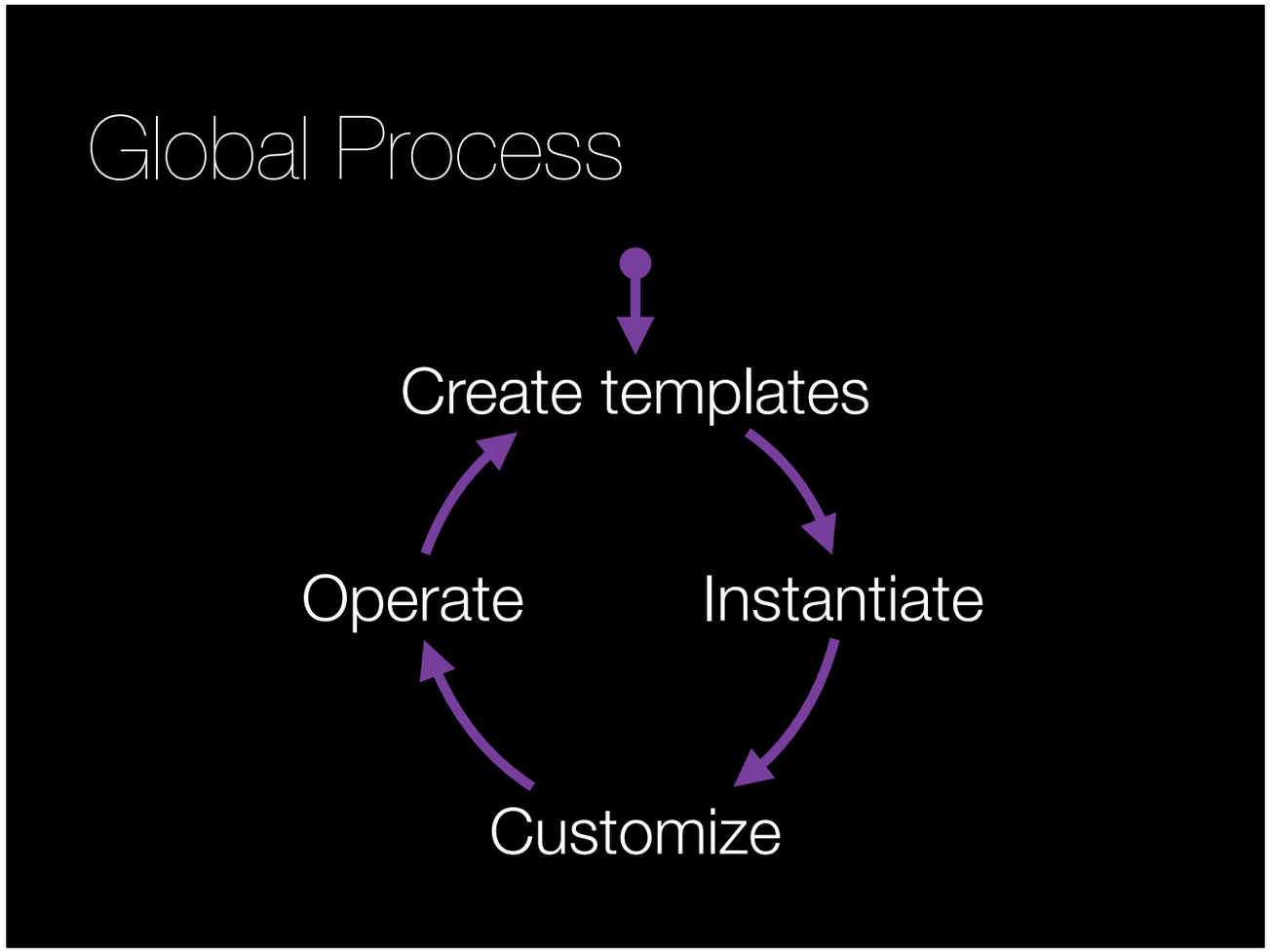
When the main server fail, the other instance take the lead and no service interruption are seen.



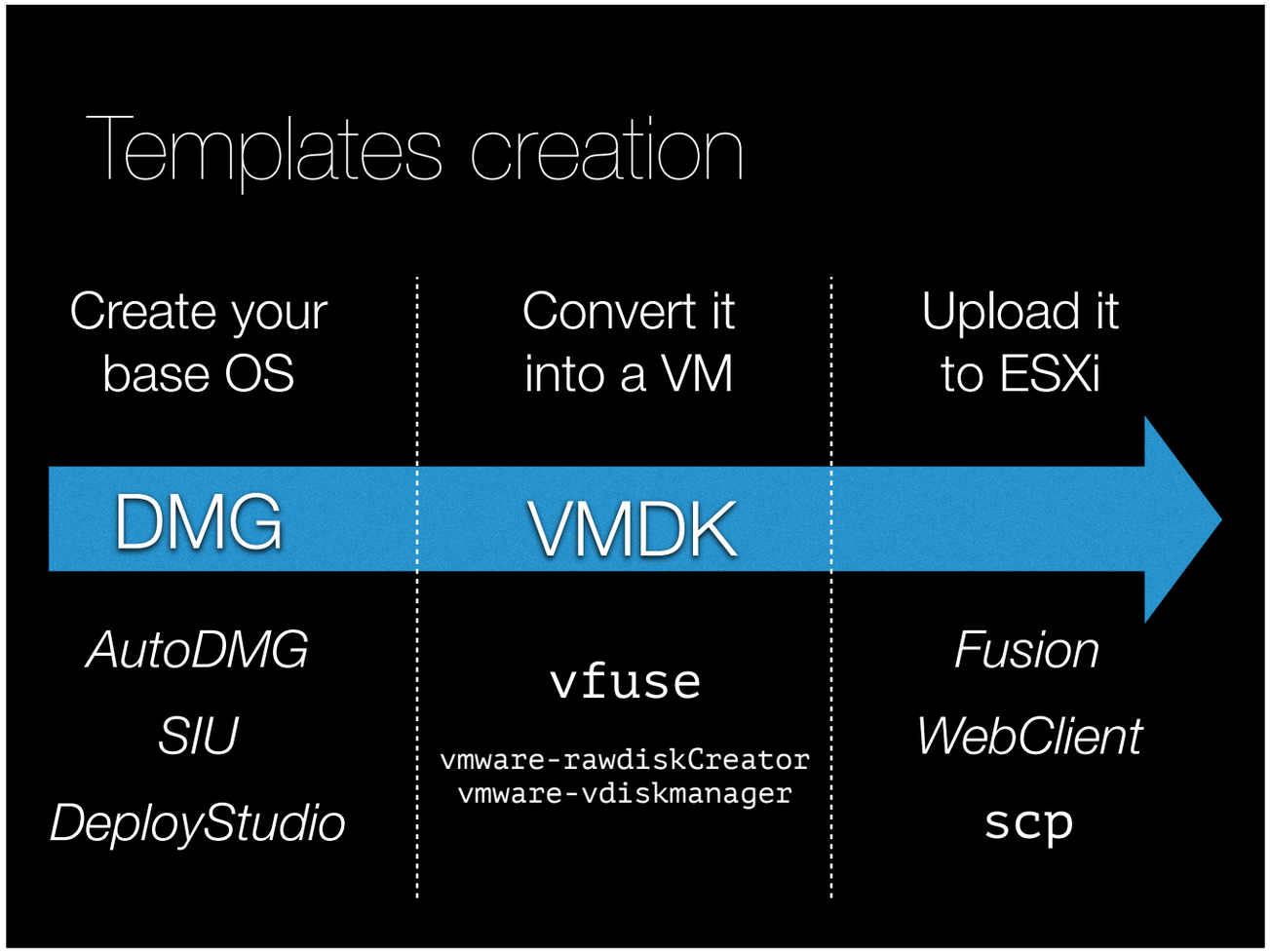
This is what happen when I’ve unplugged the power outlet

New ways to work

New processes and scenarios



Create Template -> Instantiate -> Customize -> Operate



Create Template -> Instantiate -> Customize -> Operate

vfuse is a tool made by Joseph Chilcote who use vmware command line for you.

Instantiation

VMware vSphere Web Client

Create Template -> Instantiate -> Customize -> Operate

Customization

Create Template -> Instantiate -> Customize -> Operate

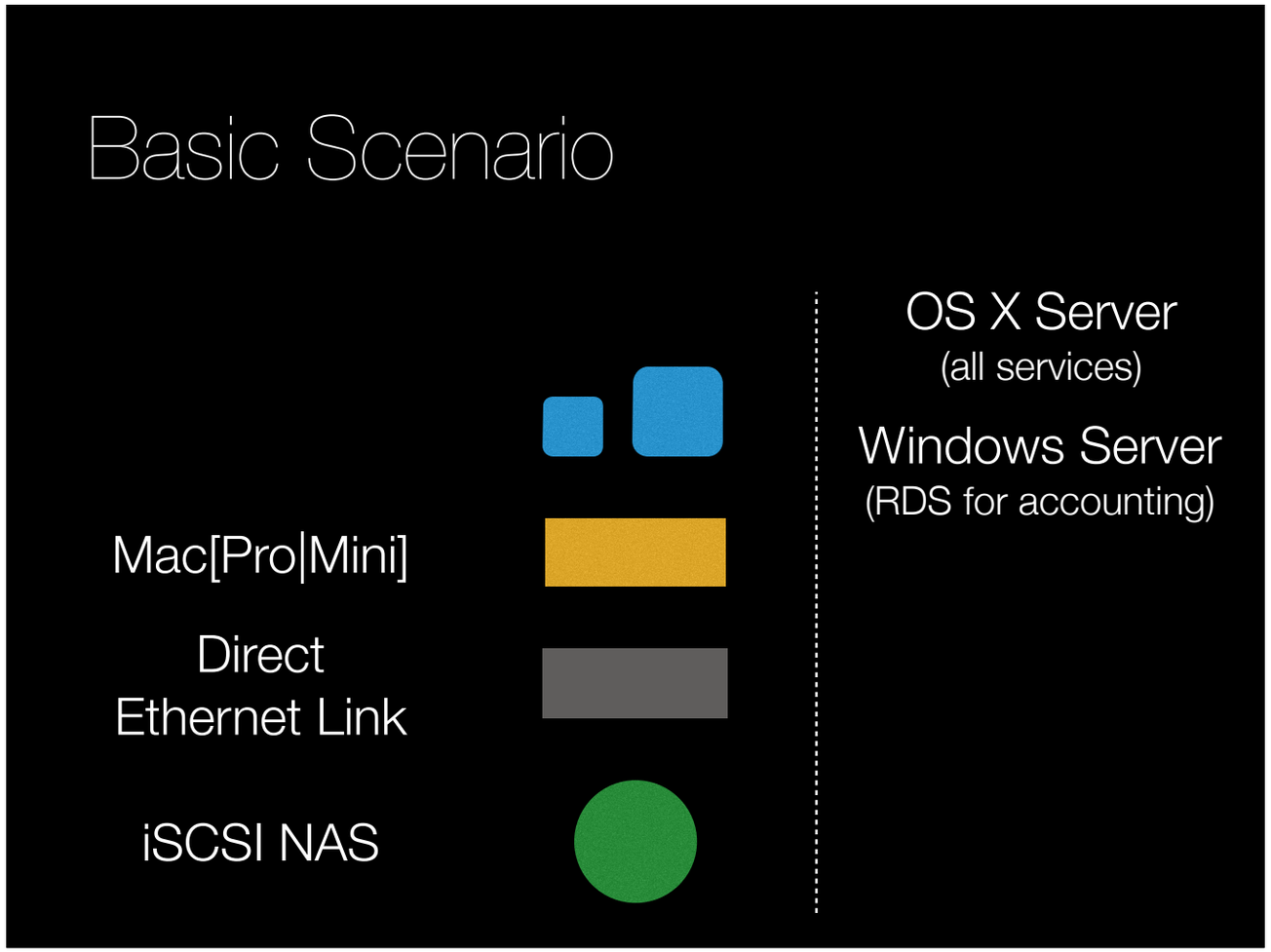
ARD, Custom Script, Puppet, Deploy Studio, First Boot Package, Munki

Operate

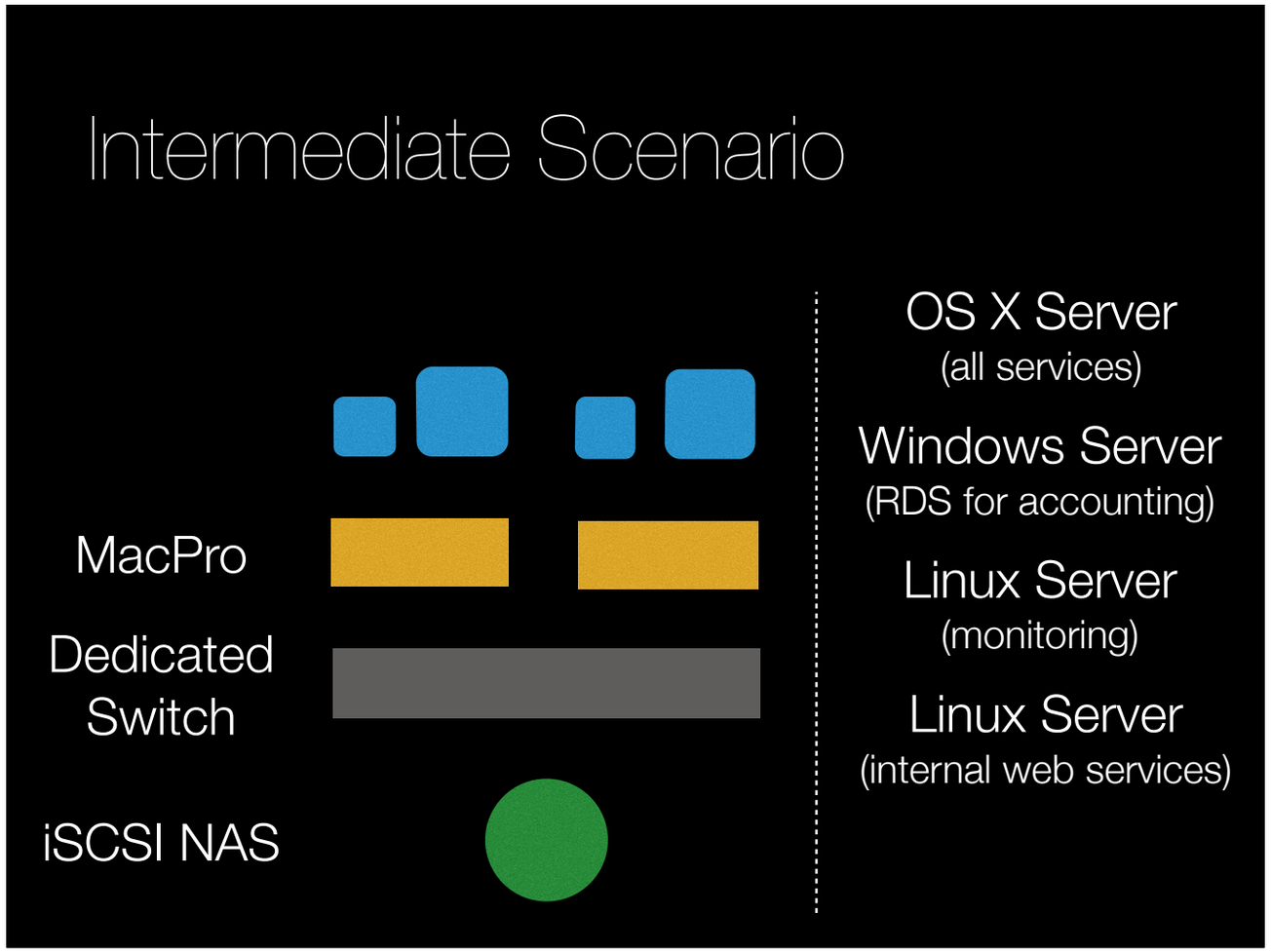
Apple Remote Desktop
VMware vSphere Web Client

Create Template -> Instantiate -> Customize -> Operate

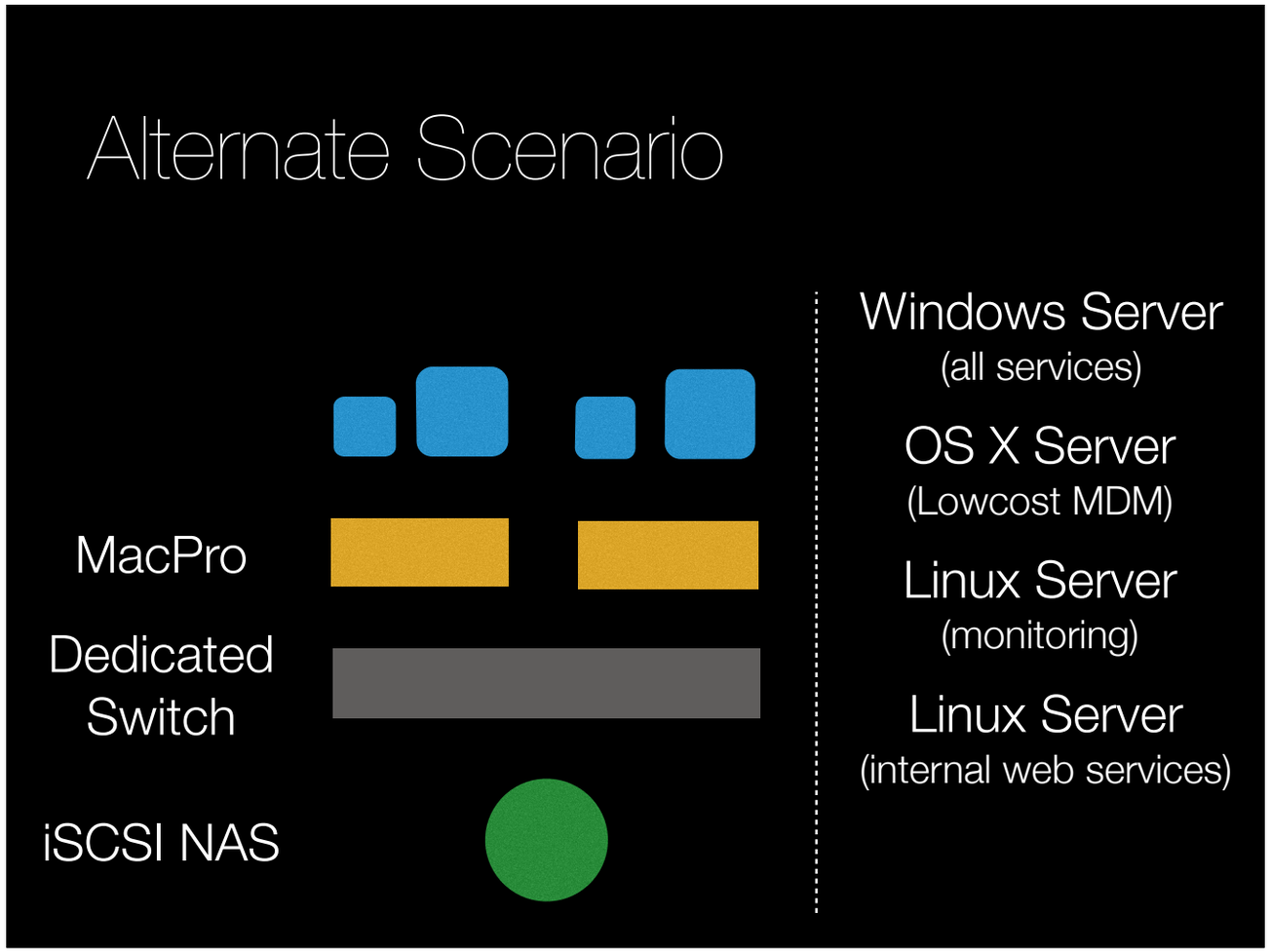
Basic Scenario



Intermediate Scenario



Alternate Scenario



Xsan

Xsan pad with a simple Mac Mini?

What is Xsan?

Cluster File System

Officially FC based

Just need shared SCSI target in reality

Cluster FS and ESXi?

VMs Constraints	Virtual Disk	LUN Mapping
Single ESXi host	✔	✔
Multiple ESXi host		✔
LSI Controller Mode	Virtual	Physical

Tested with 10.9 and LSI Logic Parallel adapter in virtual mode

Cluster FS and ESXi?

Take care to SCSI index

Setup for Failover Clustering and Microsoft Cluster Service

Related talks

Subject	Presenter	Room	Date
Life in a post Xserve world	Lucas Hall Sean Kaiser	208	Today 15:15
Automated testing with VMware Fusion	Joseph Chilcote	Deans Hall I	Tomorrow 09:00
Virtualization and OS X Testing	Rich Trouton	Deans Hall I	Tomorrow 14:45

Thank you !

http://j.mp/psumac2015-49