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Moving into (and out of) the Cloud
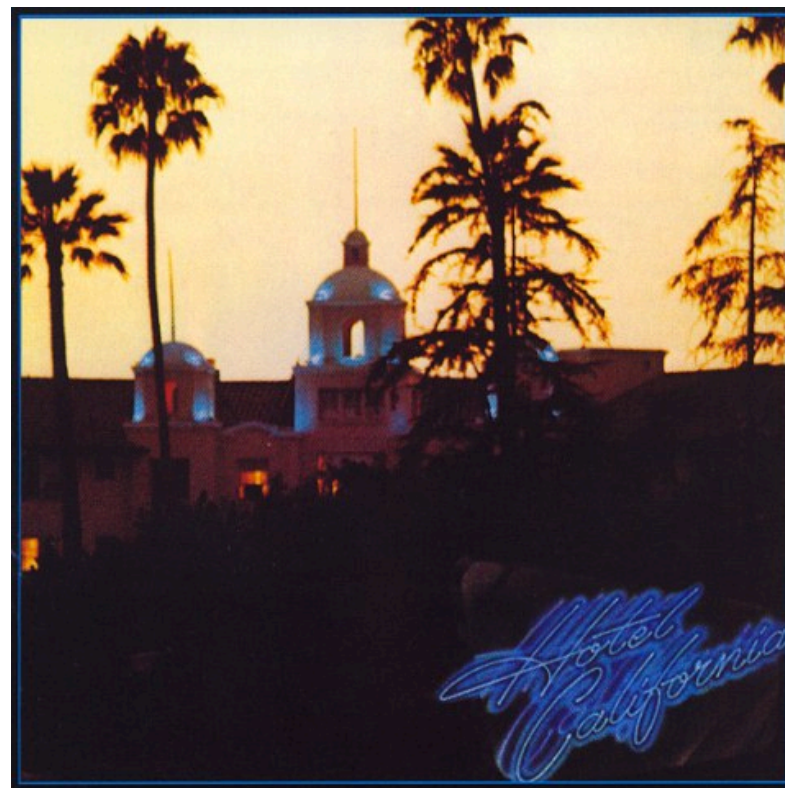
Geoff Shukin, Senior Engineer VMWare

WHAT IS THE CLOUD

And Where?

There is no cloud
it's just someone else's computer

But Consider the public cloud

- You have no control over what hardware they use
- Or what Neighbors you get
- Or when that server has an outage
- Or if the pricing changes
- Or if you have a run away process $$$

- And it does not always run the same virtualization stack that you do in house

Converting to Cloud Native

Web tier	Web Server x3, Database x3, Content, DNS
App tier	Load Balancer, Session Store, Authentication, Licensing
DB tier	Provisioning, Monitoring, ...

Can you Convert

- Will all legacy applications convert from 2nd Generation (Client – Server) to 3rd Generation?
  - NO!

- BiModal IT is here for at least a little while
  - Does anyone remember how long it took to get rid of Mainframes and Mini Computers?

Shocking Truth

- Legacy Applications are not always a good fit for the cloud!

- Yes its true but that isn't going to stop me

- So what can be done?

HOW DID WE GET HERE

How did we get here

- How in the world did we get here?
  - It took years and years but

- Session Persistence or Stickiness is to blame
- And along came VMWare and changed the data center
  - But we also gave you vMotion
  - and large, flat layer 2 networks

Shopping Cart Problem

- The shopping cart problem is a well known issue that has shaped Application development for many years

- State inside an application is handled by the application
    - I loose my shopping cart if I change servers in the middle of a transaction
   - Or worse – I get some else's cart or order

Load Balancers

- The Application Load Balancer really solves this issue ensuring that session persistence is maintained as well as ensuring that the server is healthy and can maintain the transaction.

- This is also why I can't add a new server to the pool and have the pool instantly rebalanced
    - Poor performance continues despite adding additional resources for established sessions

IT's Solution

- So we have really not solved this issue in any significant way. We upgrade to the latest and greatest hardware, add more hardware and focus on keeping it running
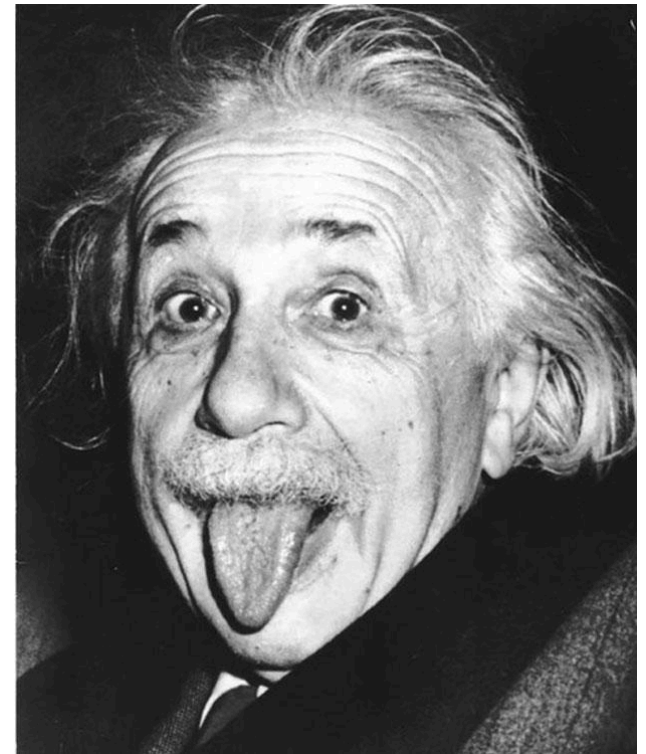
And Along came the Cloud

- It began a while ago. AWS and others started to gain traction without the knowledge or blessing of IT
  - Shadow IT

- And it wasn't enough that our Data was out there but it gave rise to a new kind of IT

I WANT TO MOVE TO THE CLOUD

Define Cloud

- Let's define this first
  - Private Cloud
  - Public Cloud
  - Hybrid Cloud

Private Cloud

- This is a cloud that you build yourself or someone builds for you
  - Under your direct Control
- Gives you the flexibility to choose the hardware and software that is used

- Likely the best option when your running legacy (3-Tier) applications

Public Cloud

- This is the Self Service model for IT going forward
- AWS, Google and Azure are the most popular options

- Likely the best choice to facilitate the 3rd Platform applications

Hybrid Cloud

- Some combination of both Public and Private cloud options.

- This easily seems like the best option to me but....

Why does this seem so Difficult?

- VMWare!

- How can I balloon into and out of the public cloud at will?
  - Vmotion and other technologies will allow this as long as you have VMWare in the pubic cloud

- There are providers offering exactly this today
  - o Vcloud Air and the Vcan Partners
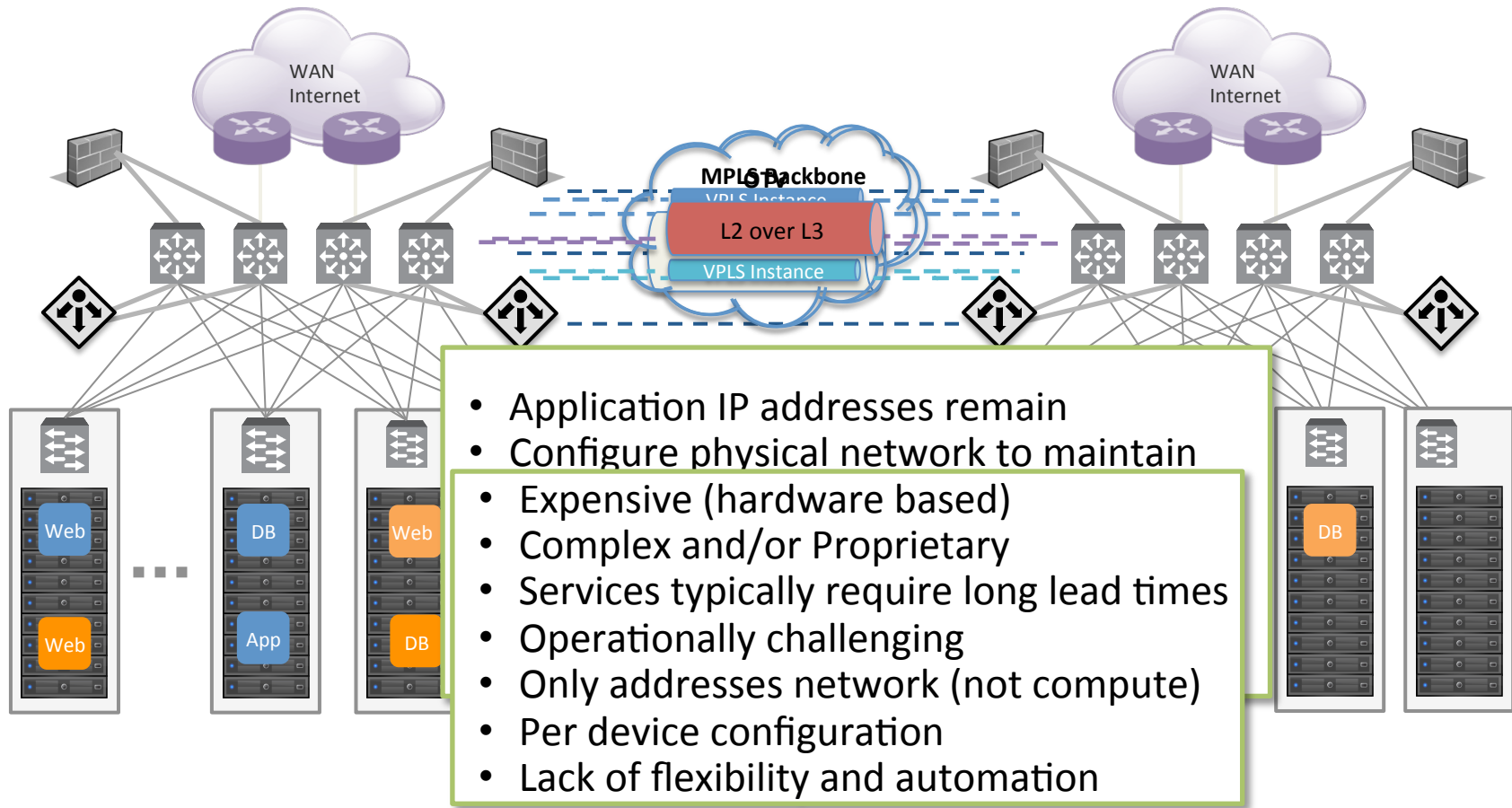
Other Options

- Are there other options?
  - YES!

- Consider what is holding us back from doing this
  - It is difficult to setup the required network and security constructs at these remote sites.
  - We do want this to be as seamless as possible
  - And remember that vMotion expects to be able to use the same IP Address

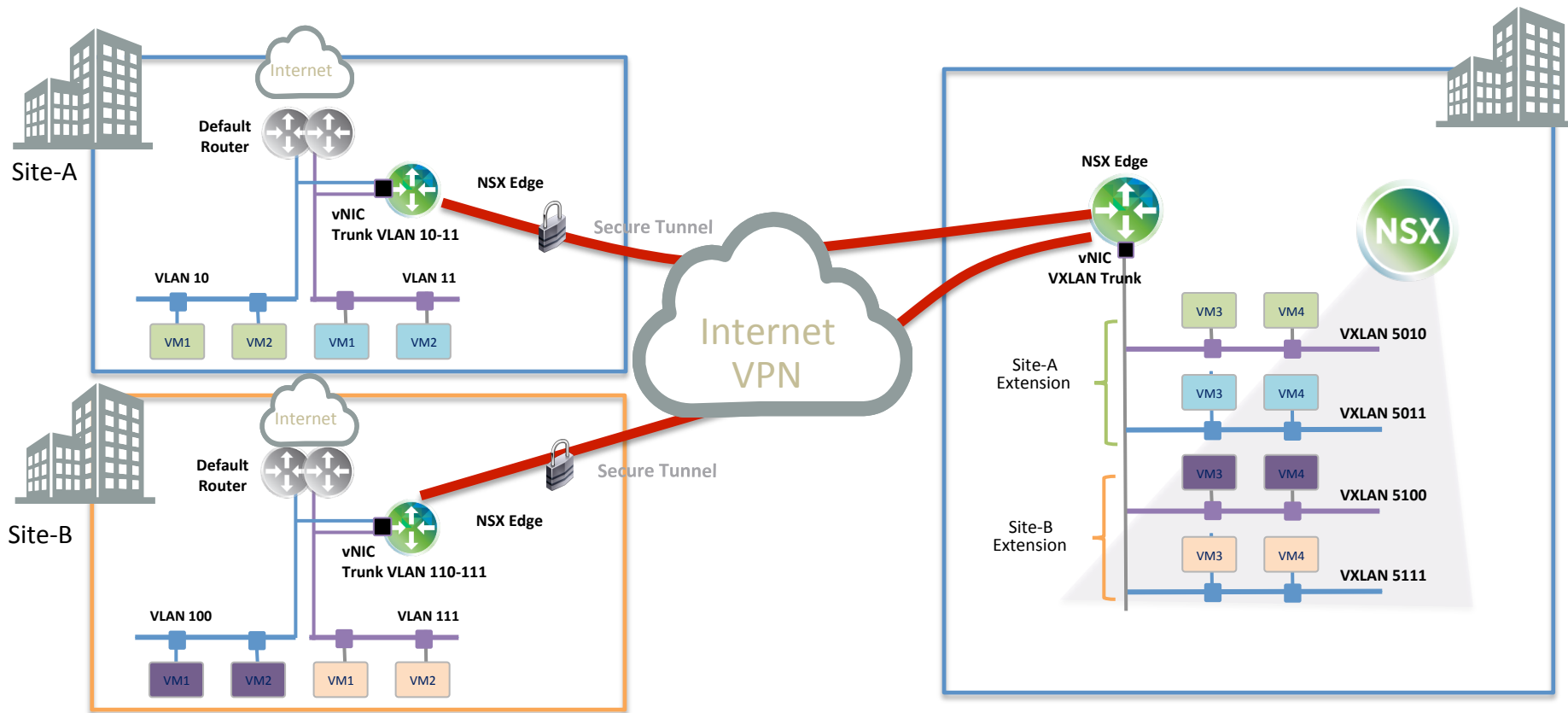**BCNET**
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Extending the Network

- There are ways to extend the private data center network to remote sites
    - MPLS, OTV, GRE, VXLan

- The trick here is to be able to replicate the layer two network so that a VM does not have to move and readdress itself.
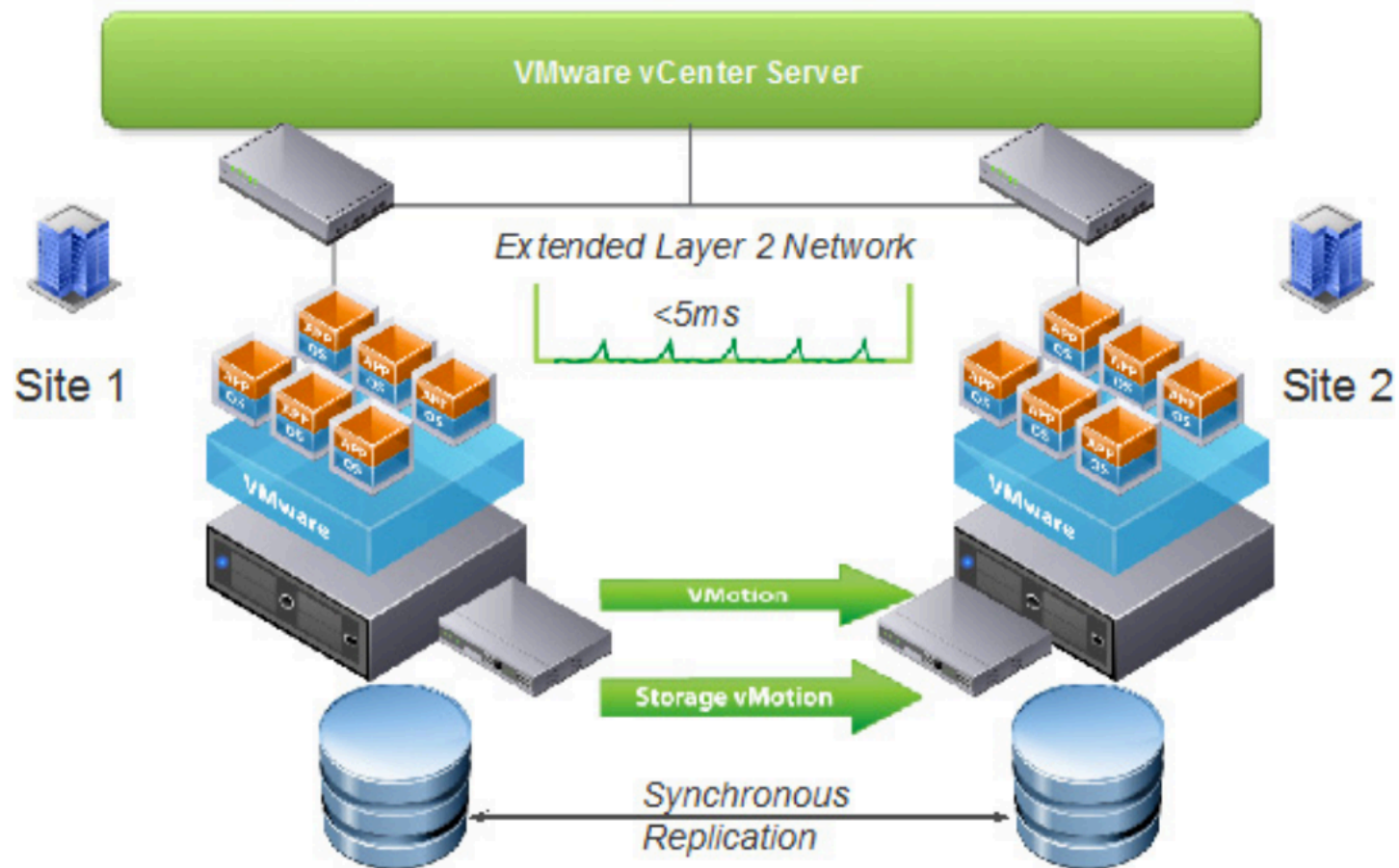
True Hybrid Cloud

WAN
Internet

MPLS Backbone
L2 over L3
VPLS Instance

WAN
Internet

Web
DB
Web
DB

Web
App
DB

DB

- Application IP addresses remain
- Configure physical network to maintain
- Expensive (hardware based)
- Complex and/or Proprietary
- Services typically require long lead times
- Operationally challenging
- Only addresses network (not compute)
- Per device configuration
- Lack of flexibility and automation

Multi-Site – L2VPN

Site-A

Internet

Default Router

NSX Edge

vNIC Trunk VLAN 10-11

Secure Tunnel

VLAN 10

VLAN 11

VM1 VM2 VM1 VM2

Site-B

Internet

Default Router

NSX Edge

vNIC Trunk VLAN 110-111

Secure Tunnel

VLAN 100

VLAN 111

VM1 VM2 VM1 VM2

Internet VPN

NSX Edge

vNIC VXLAN Trunk

NSX

Site-A Extension

VM3 VM4 **VXLAN 5010**

VM3 VM4 **VXLAN 5011**

Site-B Extension

VM3 VM4 **VXLAN 5100**

VM3 VM4 **VXLAN 5111**

Stretched Cluster

Another Option with NSX network virtualization

Primary site

Virtual Network
10.0.30/24

Snapshot VM

1

VM 10.0.30.21

NSX Controller

SAN

10.0.10/24

Physical network infrastructure

2b

Snapshot
network
security

2a

Replicate
VM and storage

Step 1 & 2
(e.g VMware SRM)

Secondary Site

Network and security
already exists

NSX Controller

3

Recover
the VM

Virtual Network
10.0.30/24

VM 10.0.30.21

SAN

Physical network infrastructure

10.0.20/24

80%
RTO

Workload Mobility into AWS/Azure

- In the next release, VMWare will be able to provision and control VMs running in AWS as well as Azure
  - NSX will enable the Network infrastructure as well as the security policy to be controlled centrally
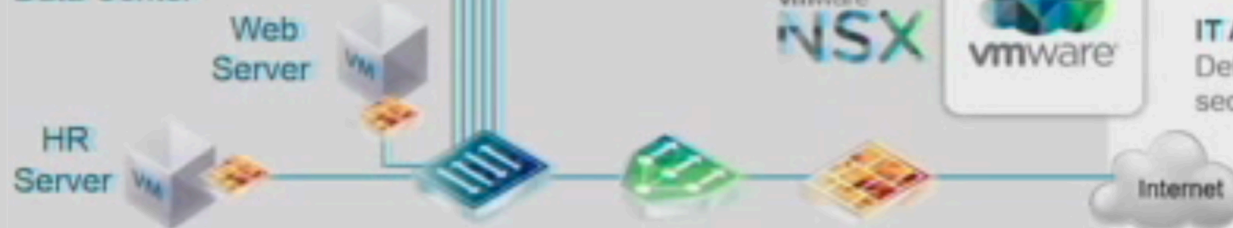
- Recent enhancements to vSphere have provided new design options for enabling Hybrid Cloud

  o vMotion Enhancements

  – Up to 150 ms latency tolerance

  o Cross vCenter vMotion

  – Move a VM from one Vcenter to another (and back)

  o Automation suite

  – vRA and its ability to ensure that network and security components are provisioned as required

CAN IT BE DONE

Yes

- It is truly possible to move in (and back out of) the cloud today
- There are benefits that can be quickly realized

- And you won't get stuck in the Hotel California!

THANK YOU