



C:\WINDOWS\system32\spoolsv.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccSetlgr.exe
C:\Program Files\Kerio\Personal Firewall 4\Kp
C:\Program Files\Norton AntiVirus\navapsvc.exe
C:\Program Files\Norton AntiVirus\IWP\NPFMntd
C:\Program Files\Norton AntiVirus\AdvTools\N
C:\Program Files\Fichiers communs\Symantec S
C:\Program Files\Kerio\Personal Firewall 4\kp
C:\Program Files\Fichiers communs\Symantec S
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Fichiers communs\Symantec S
C:\WINDOWS\system32\Ati2evxx.exe
C:\Program Files\Fichiers communs\Symantec S
C:\WINDOWS\Explorer.EXE
C:\WINDOWS\SOUNDMAN.EXE
C:\Program Files\Microsoft IntelliPoint\point
C:\Program Files\Lavasoft\Ad-Aware SE Profess
C:\Program Files\Fichiers communs\Symantec S
C:\Program Files\QuickTime\qttask.exe
C:\Program Files\Logitech\Video\LogiTray.exe
C:\Program Files\MSN Messenger\msnmsgr.exe

SDN



OWASP
Open Web Application
Security Project



LogFile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.2180)

Running processes:
C:\WINDOWS\System32\smss.exe
C:\WINDOWS\system32\winlogon.exe
C:\WINDOWS\system32\services.exe
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\Ati2evxx.exe
C:\WINDOWS\system32\svchost.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Stardock\Object Desktop\WindowBlinds\wbload.exe
C:\WINDOWS\system32\spoolsv.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccSetMgr.exe
C:\Program Files\Kerio\Personal Firewall 4\kpff4ss.exe
C:\Program Files\Norton AntiVirus\navapsvc.exe
C:\Program Files\Norton AntiVirus\IWP\NPFMntor.exe
C:\Program Files\Norton AntiVirus\AdvTools\NPPORTFIREWALL.EXE
C:\Program Files\Kerio\Personal Firewall 4\kpff4gui.exe
C:\Program Files\Fichiers communs\Symantec Shared\CCPD-LC\synalcsvc.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Fichiers communs\Symantec Shared\CCPD-LC\synalcsvc.exe
C:\WINDOWS\system32\Ati2evxx.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccEvtMgr.exe
C:\WINDOWS\Explorer.EXE
C:\WINDOWS\SOUNDMAN.EXE
C:\Program Files\Microsoft IntelliPoint\point32.exe
C:\Program Files\Lavasoft\Ad-Aware SE Professional\Ad-Watch.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccApp.exe
C:\Program Files\QuickTime\qtask.exe
C:\Program Files\Logitech\Video\LogiTray.exe
C:\Program Files\MSN Messenger\msnmsgr.exe
C:\Program Files\SAGEM\SAGEM F@st 800-840\dsimon.exe
C:\Program Files\WinZip\WZQKPICK.EXE
C:\Program Files\Kerio\Personal Firewall 4\kpff4gui.exe
C:\WINDOWS\System32\LVComS.exe
C:\Program Files\Logitech\Video\LowLight.exe
C:\Program Files\Internet Explorer\IEXPLORE.EXE
C:\Program Files\Outlook Express\msimian.exe

Is it really that bad out there ???

White Hat Help

In 2014 we saw the highest number of reported vulnerabilities (CVEs) ever, reaching 7945. Over 2000 vulnerabilities have been reported in 2015.



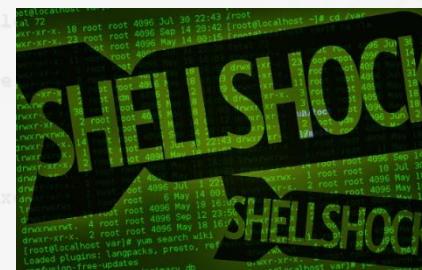
2014 Top 10 Web Hacks

1. Heartbleed
2. ShellShock
3. POODLE
4. Rosetta Flash
5. Misfortune Cookie
6. Hacking PayPal Accounts with 1 Click
7. Google Two-Factor Authentication Bypass
8. Apache Struts ClassLoader Manipulation Remote Code Execution
9. Facebook Hosted DDoS with Notes App.
10. Covert Timing Channels based on HTTP Cache Headers



Tens of Alexa Top 1,000 Websites Vulnerable to Heartbleed Attacks

Yahoo, Flickr, Imgur and KAT are still vulnerable, experts found



```
#!/bin/bash
```

```
~root: env X="() { :;}; echo shellshock" /bin/sh -c "echo completed"
```

POODLE Attack and SSLv3 Deployment

Good News! Your browser does not support SSLv3.

LogFile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows
MSIE: Internet Exp...
...er 7.0.5723.1112

A photograph of a computer keyboard where the keys have been replaced by small white blocks. The blocks are labeled with country names: China, Russia, Israel, and USA. The labels are rotated to fit the shape of the keys. The original keyboard keys are visible in the background, showing paths like C:\WINDOWS\System32 and C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe.



OPM Breach Just Put America's Spies 'At High Risk'

JUNE 12, 2015 BY PATRICK TUCKER

Hackers may now have detailed biographical information and a virtual phonebook of virtually every United States intelligence asset. Intelligence ▾



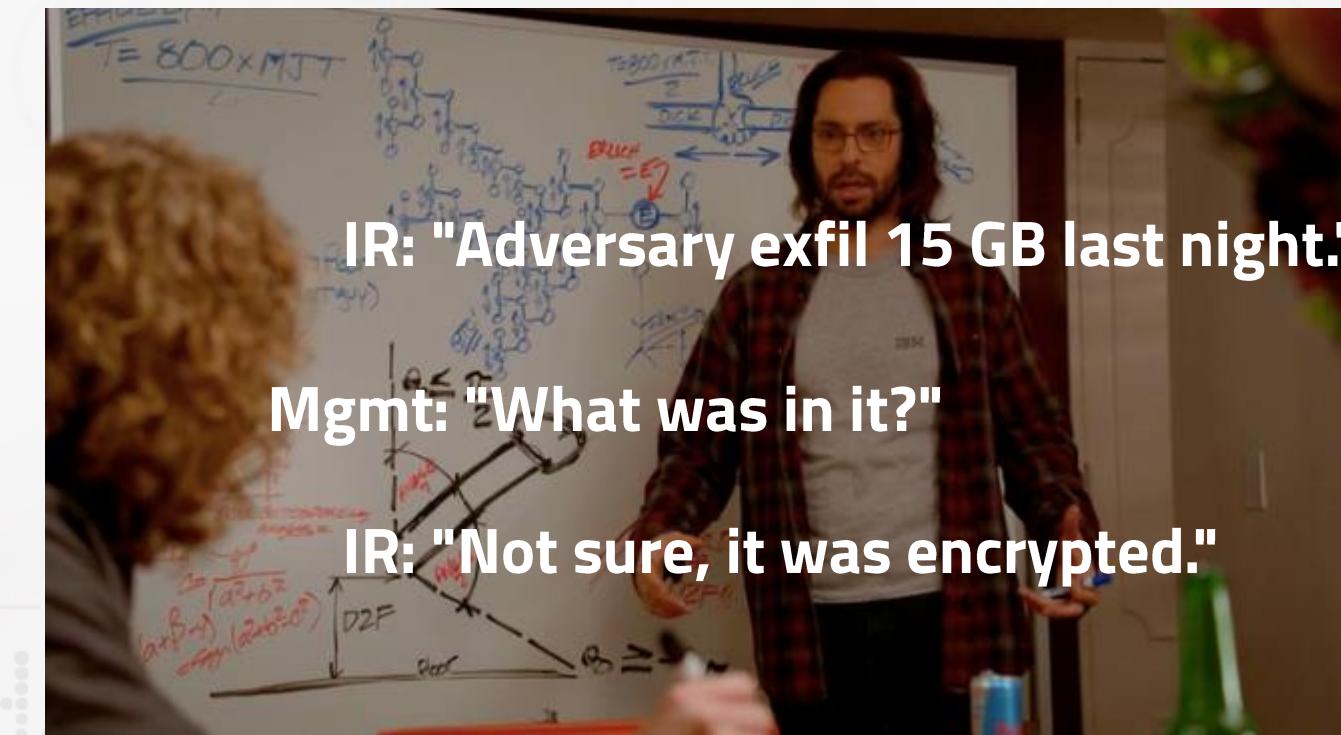
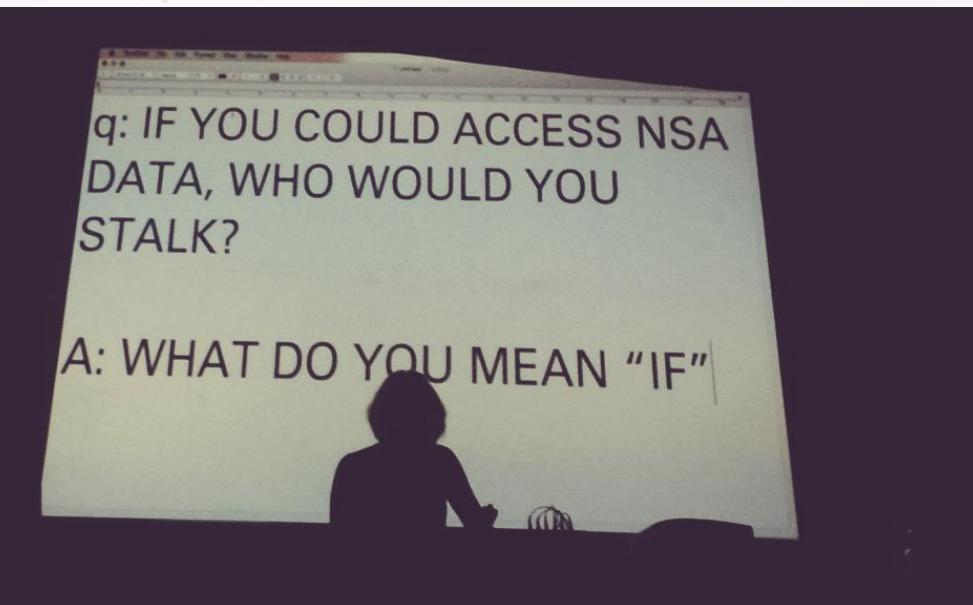
Emails blamed for Bundestag cyberattack

The cyberattack on Germany's parliament has been traced to a link contained in at least two emails, according to a newspaper report. Parliamentarians left unaware of the breach for three weeks have slammed the delay.



Security Mindset Have Changed But rarely implemented

- Zero-Trust
- Assume breached





YAHOO!

AppSec is Eating Security

PRESENTED BY **Alex Stamos** | AppSec Cali | January 27, 2015

Alex Stamos - Yahoo's CISO and VP of InfoSEC

```
C:\Program Files\Fichiers communs\Symantec Shared\ccSetMgr.exe
C:\Program Files\Kerio\Personal Firewall 4\kpf4ss.exe
C:\Program Files\Norton AntiVirus\IWP\NPFIIntor.exe
C:\Program Files\Norton AntiVirus\AdvTools\NPROTECT.EXE
C:\Program Files\Fichiers communs\Symantec Shared\SNDSrvc.exe
C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe
C:\Program Files\Fichiers communs\Symantec Shared\SPBBC\SPBBCSvc.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Fichiers communs\Symantec Shared\CCPD-LC\synalcsvc.exe
```

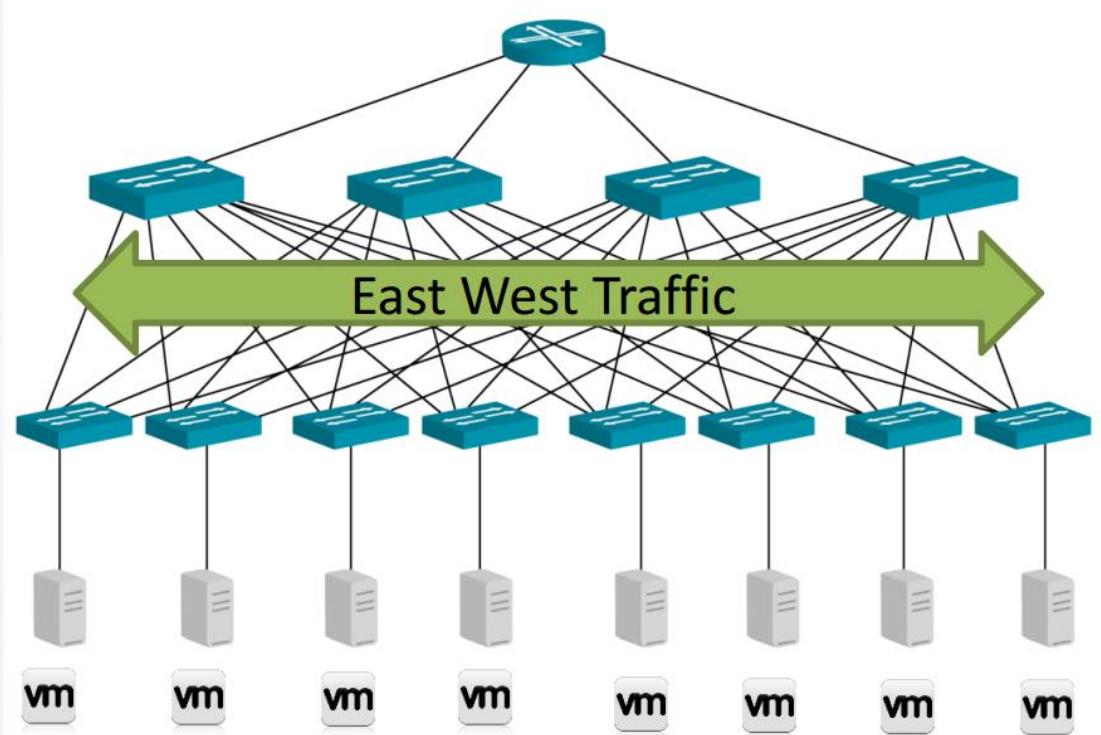
Security hardware is becoming un-buyable



Arista 7508E
1152 x 10GbE
30Tbps backplane
5kW



Palo Alto 7050
120Gbps throughput
2.4kW



Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.2180)

Running processes:

C:\WINDOWS\System32\smss.exe
C:\WINDOWS\system32\winlogon.exe
C:\WINDOWS\system32\services.exe
C:\W...

C:\...

Compare Search terms ▾**Software-defined networking**

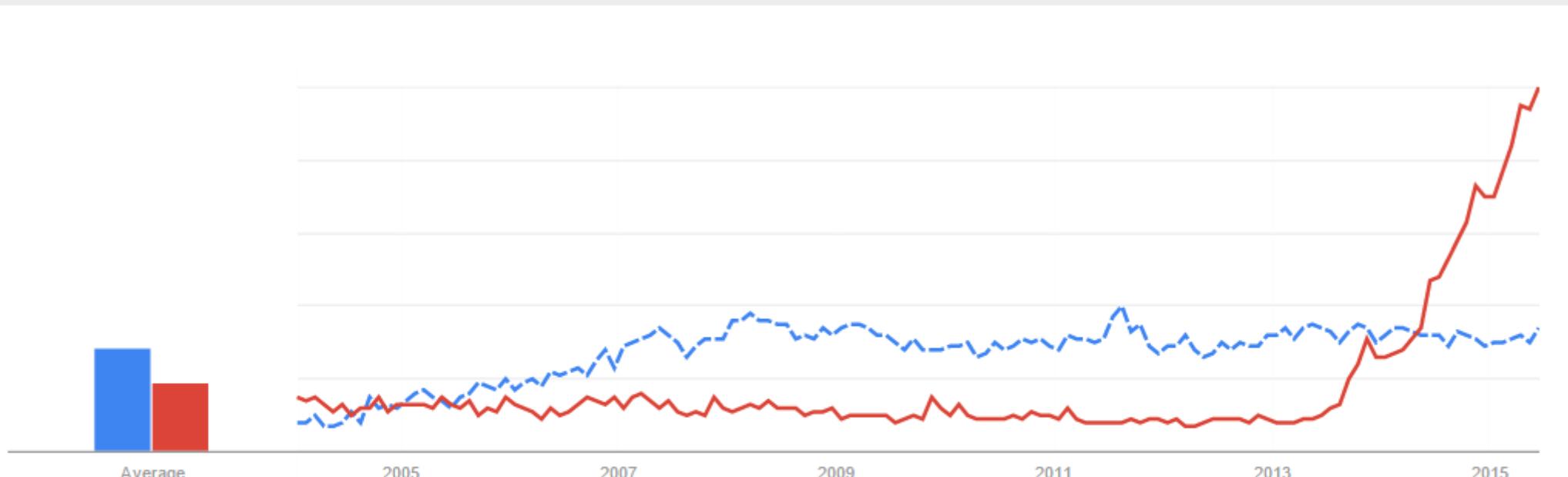
Topic

docker

Search term

[+ Add term](#)

Beta: Measuring search interest in *topics* is a beta feature which quickly provides accurate measurements of overall search interest. To measure search interest for a specific *query*, select the "search term" option. [?](#)

Interest over time [?](#) News headlines Forecast [?](#)

Average

</>

Misconceptions

OpenFlow Management

Automation Buzzword NFV

Protocol Controller API





```

C:\Program Files\Fichiers communs\Symantec Shared\ccSetMgr.exe
C:\Program Files\Kerio\Personal Firewall 4\knf4ee.exe
C:\Program Files\Norton AntiVirus\navapsvc.
C:\Program Files\Norton AntiVirus\IWP\NPFWr
C:\Program Files\Norton AntiVirus\AdvTools
C:\Program Files\Fichiers communs\Symantec
C:\Program Files\Kerio\Personal Firewall 4
C:\Program Files\Fichiers communs\Symantec
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Fichiers communs\Symantec
C:\WINDOWS\system32\Ati2evxx.exe
C:\Program Files\Fichiers communs\Symantec
C:\WINDOWS\Explorer.EXE
C:\WINDOWS\SOUNDMAN.EXE
C:\Program Files\Microsoft IntelliPoint\poi
C:\Program Files\Lavasoft\Ad-Aware SE Prof
C:\Program Files\Fichiers communs\Symantec
C:\Program Files\QuickTime\qtask.exe
C:\Program Files\Logitech\Video\LogiTray.e
C:\Program Files\MSN Messenger\msnmsgr.exe
C:\Program Files\SAGEM\SAGEM F@st 800-840\c
C:\Program Files\WinZip\WZQKPICK.EXE
C:\Program Files\Kerio\Personal Firewall 4
C:\WINDOWS\system32\LVComS.exe
C:\Program Files\Logitech\Video\LowLight.e
C:\Program Files\Internet Explorer\IEXPLORE
C:\Program Files\Outlook Express\msiann.exe

```



1996

```

Router> enable
Router# configure terminal
Router(config)# enable secret cisco
Router(config)# ip route 0.0.0.0 0.0.0.0 20.2.2.3
Router(config)# interface ethernet0
Router(config-if)# ip address 10.1.1.1 255.0.0.0
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)# interface serial0
Router(config-if)# ip address 20.2.2.2 255.0.0.0
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)# router rip
Router(config-router)# network 10.0.0.0
Router(config-router)# network 20.0.0.0
Router(config-router)# exit
Router(config)# exit
Router# copy running-config startup-config
Router# disable
Router>

```

Terminal Protocol: **Telnet**

2013

```

Router> enable
Router# configure terminal
Router(config)# enable secret cisco
Router(config)# ip route 0.0.0.0 0.0.0.0 20.2.2.3
Router(config)# interface ethernet0
Router(config-if)# ip address 10.1.1.1 255.0.0.0
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)# interface serial0
Router(config-if)# ip address 20.2.2.2 255.0.0.0
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)# router rip
Router(config-router)# network 10.0.0.0
Router(config-router)# network 20.0.0.0
Router(config-router)# exit
Router(config)# exit
Router# copy running-config startup-config
Router# disable
Router>

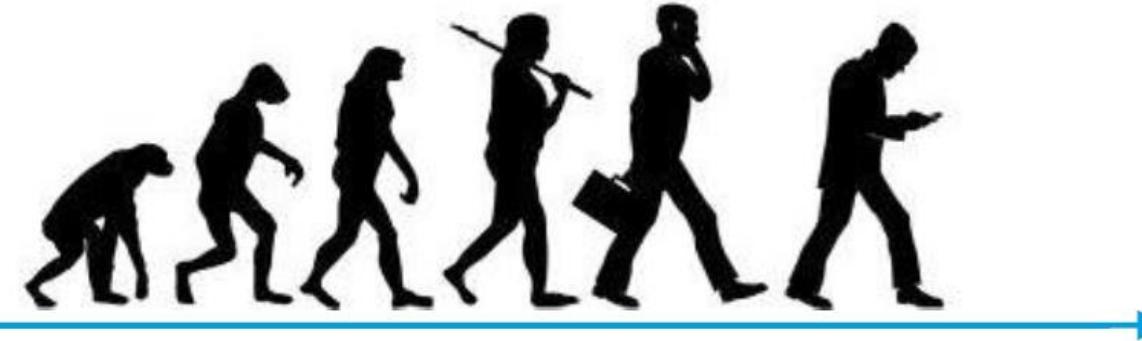
```

Terminal Protocol: **SSH**

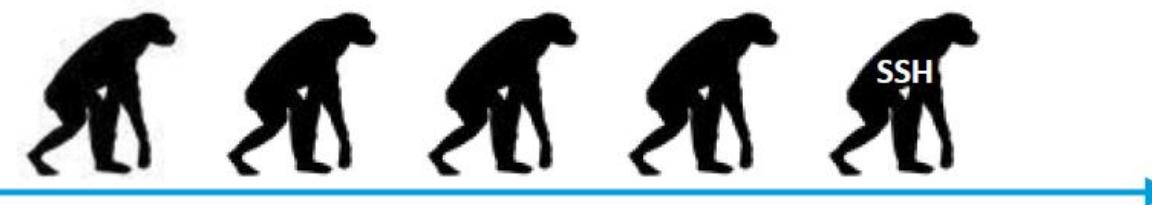
Logfile of HijackThis v1.7.0
Scan saved at 09:36:29, on
Platform: Windows XP SP2
Browser: Internet Explorer v6.0

Running processes:
C:\WINDOWS\System32\smss.exe
C:\WINDOWS\system32\winlogon.exe
C:\WINDOWS\system32\services.exe
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\Ati2evn.dll
C:\WINDOWS\system32\svchost.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Stardock\SDTaskbar.exe
C:\WINDOWS\system32\spooler.exe
C:\Program Files\Fichiers\Kerio\Pe...
C:\Program Files\Norton Antivirus\N...
C:\Program Files\Norton Antivirus\N...
C:\Program Files\Norton Antivirus\N...
C:\Program Files\Fichiers\Kerio\Pe...
C:\Program Files\Fichiers\Kerio\Pe...
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Fichiers\Kerio\Pe...
C:\WINDOWS\system32\Ati2evn.dll
C:\Program Files\Fichiers\Kerio\Pe...
C:\WINDOWS\System32\ccEvtMgr.exe
C:\WINDOWS\Explorer.EXE
C:\WINDOWS\SOUNDMAN.EXE
C:\Program Files\Microsoft\...
C:\Program Files\Lavasoft\...
C:\Program Files\Fichiers\Kerio\Pe...
C:\Program Files\QuickTime\...
C:\Program Files\Logitech\...
C:\Program Files\MSN Messenger\...
C:\Program Files\SAGEM\SA...
C:\Program Files\WinZip\W...
C:\Program Files\Kerio\Pe...
C:\WINDOWS\system32\LVCom...
C:\Program Files\Logitech\...
C:\Program Files\Internet...
C:\Program Files\Outlook

COMPUTE EVOLUTION



NETWORKING EVOLUTION



Compute



Storage



Network



Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.1800)
Run Task: Tasklist
C:\WINDOWS\System32\smss.exe
C:\WINDOWS\System32\winlogon.exe
C:\WINDOWS\System32\services.exe
C:\WINDOWS\System32\spoolsv.exe
C:\WINDOWS\System32\svchost.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Stardock\Object Desktop\WindowBlinds\wbload.exe
C:\WINDOWS\System32\spoolsv.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccSetMgr.exe
C:\Program Files\Kaspersky\Kaspersky Internet Security\kpif4ss.exe
C:\Program Files\Kaspersky\Kaspersky Internet Security\kpif4ss.exe
C:\Program Files\Norton AntiVirus\IWP\NPFIHntor.exe
C:\Program Files\Norton AntiVirus\AdvTools\NPROTECT.EXE
C:\Program Files\Fichiers communs\Symantec Shared\SNDSrvc.exe
C:\Program Files\Kaspersky\Kaspersky Internet Security\kpif4gui.exe
C:\Program Files\Kaspersky\Kaspersky Internet Security\kpif4gui.exe
C:\Program Files\Symantec Shared\SPBBC\SPBBCSvc.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Fichiers communs\Symantec Shared\CCPD-LC\synalcsvc.exe
C:\WINDOWS\System32\Ati2evxx.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccEvtMgr.exe
C:\WINDOWS\SOUNDMAN.EXE
C:\Program Files\Microsoft IntelliPoint\point32.exe
C:\Program Files\Lavasoft\Ad-Aware SE Professional\Ad-Watch.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccApp.exe
C:\Program Files\Logitech\Video\logigrlm.exe
C:\Program Files\MSN Messenger\msnmgr.exe
C:\Program Files\SAGEM\SAGEM F@st 800-840\dsimon.exe
C:\Program Files\WinZip\WZQKPICK.EXE
C:\Program Files\Kaspersky\Kaspersky Internet Security\kpif4gui.exe
C:\WINDOWS\System32\LVComS.exe
C:\Program Files\Logitech\Video\LowLight.exe
C:\Program Files\Internet Explorer\IEXPLORE.EXE
C:\Program Files\Outlook Express\msimn.exe

In terms of Deployment SDN is Slightly different for:

- Service Provider

- Data Center

- Enterprise

- Campus networks

- Cloud

- WAN and Metro Links

© 2012 Networked
Software Engineering

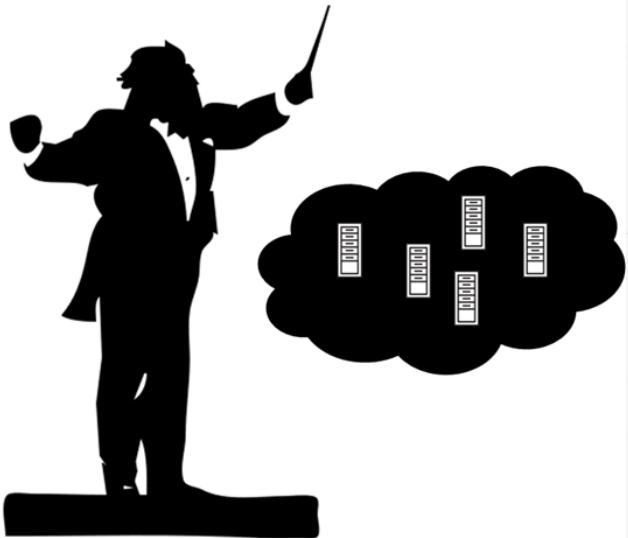
LogFile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer 6.00 SP2 (6.00.2900.2150)
Run Task Manager: 0
C:\WINDOWS\System32\cmd.exe
C:\WINDOWS\system32\winlogon.exe
C:\WINDOWS\system32\services.exe
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\spooler.exe
C:\WINDOWS\System32\spoolsv.exe
C:\WINDOWS\System32\spooler.exe
C:\Program Files\Start Menu\Programs\Windows
C:\WINDOWS\system32\spooler.exe
C:\Program Files\Firefox\firefox.exe
C:\Program Files\Keyboard\Keyboard.exe
C:\Program Files\Notepad\Notepad.exe
C:\Program Files\Notepad\Notepad.exe
C:\Program Files\Notepad\Notepad.exe
C:\Program Files\Find\Find.exe
C:\Program Files\Keyboard\Keyboard.exe
C:\Program Files\Find\Find.exe
C:\WINDOWS\System32\spooler.exe
C:\Program Files\Keyboard\Keyboard.exe
C:\WINDOWS\system32\spooler.exe
C:\Program Files\Find\Find.exe
C:\WINDOWS\Explorer.exe
C:\WINDOWS\SOUNDMAN\soundman.exe
C:\Program Files\Microsoft\Windows
C:\Program Files\Let's Encrypt\letsencrypt.exe
C:\Program Files\Firefox\firefox.exe
C:\Program Files\QuickTime\QuickTime.exe
C:\Program Files\Logic\Logic.exe
C:\Program Files\HCL\HCL.exe
C:\Program Files\SAO\SAO.exe
C:\Program Files\WinRAR\WinRAR.exe
C:\Program Files\Keyboard\Keyboard.exe
C:\WINDOWS\system32\spooler.exe
C:\Program Files\Logic\Logic.exe
C:\Program Files\Intego\Intego.exe
C:\Program Files\Outlook\Outlook.exe

Ok, please tell me what is SDN, Please...



© HBO / DRnPhoto Jaimie Trueblood

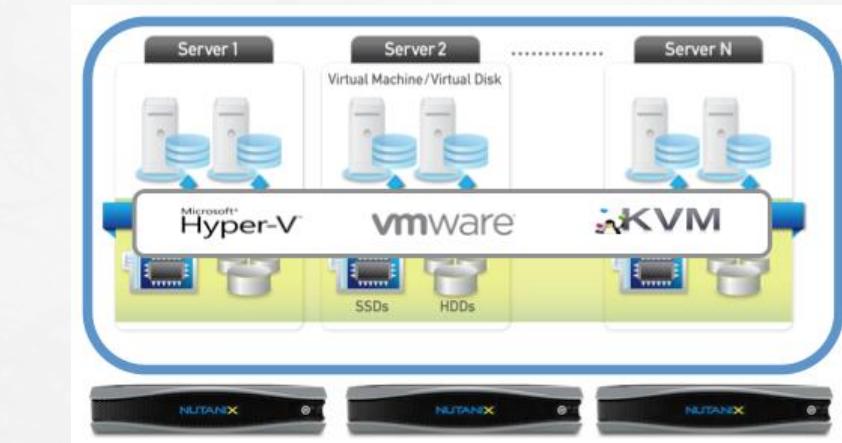
Orchestration



Programmabilit



Hypervisors



Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.2180)

How did Amazon AWS build its cloud?

AWS API (EC2, S3, ...)

Programmability

Amazon Orchestration Software

Orchestration

Open Source Xen Hypervisor

Hypervisors

Networking

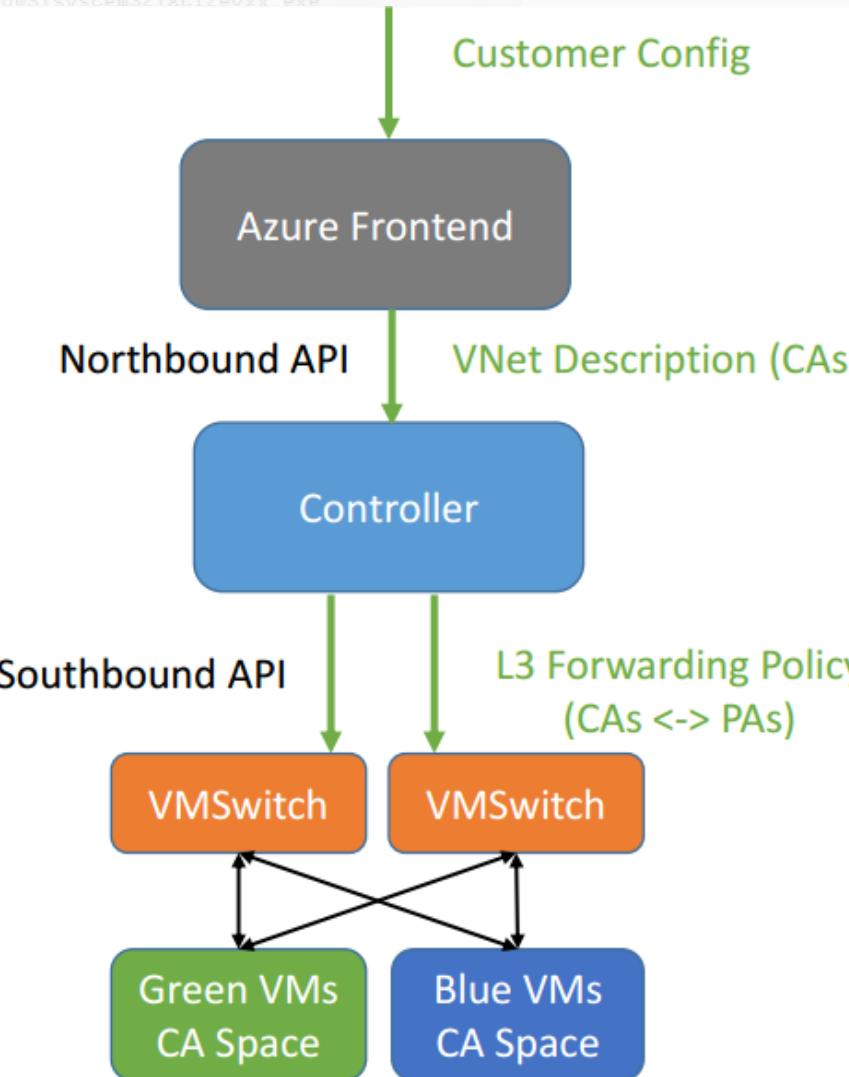
Commodity
Servers

Commodity
Storage



Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.2180)

How Microsoft build its cloud?



Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.2180)

How companies can build their SDN network?

- **Vmware NSX**

- **Openstack**

- **Cisco ACI**

- **CloudStack**

- **Juniper Contrail**

- **Microsoft azure pack**

- **There are some more...**



LogFile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer 6.00 SP1 (6.00.2900.2180)
Run:

C:\WINDOWS\system32\smss.exe
C:\WINDOWS\system32\winlogon.exe
C:\WINDOWS\system32\services.exe
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\AtiZevxx.exe
C:\WINDOWS\system32\svchost.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\St
C:\WINDOWS\system3
C:\Program Files\K
C:\Program Files\N
C:\Program Files\N
C:\Program Files\N
C:\Program Files\N
C:\Program Files\T
C:\Program Files\K
C:\Program Files\T
C:\WINDOWS\System3
C:\Program Files\T
C:\WINDOWS\system3
C:\Program Files\T
C:\WINDOWS\Explor
C:\WINDOWS\SOUNDMA
C:\Program Files\MI
C:\Program Files\LI
C:\Program Files\T
C:\Program Files\Q
C:\Program Files\LI
C:\Program Files\N
C:\Program Files\SI
C:\Program Files\W
C:\Program Files\K
C:\WINDOWS\system3
C:\Program Files\LI
C:\Program Files\I
C:\Program Files\O

Now let's see the magic



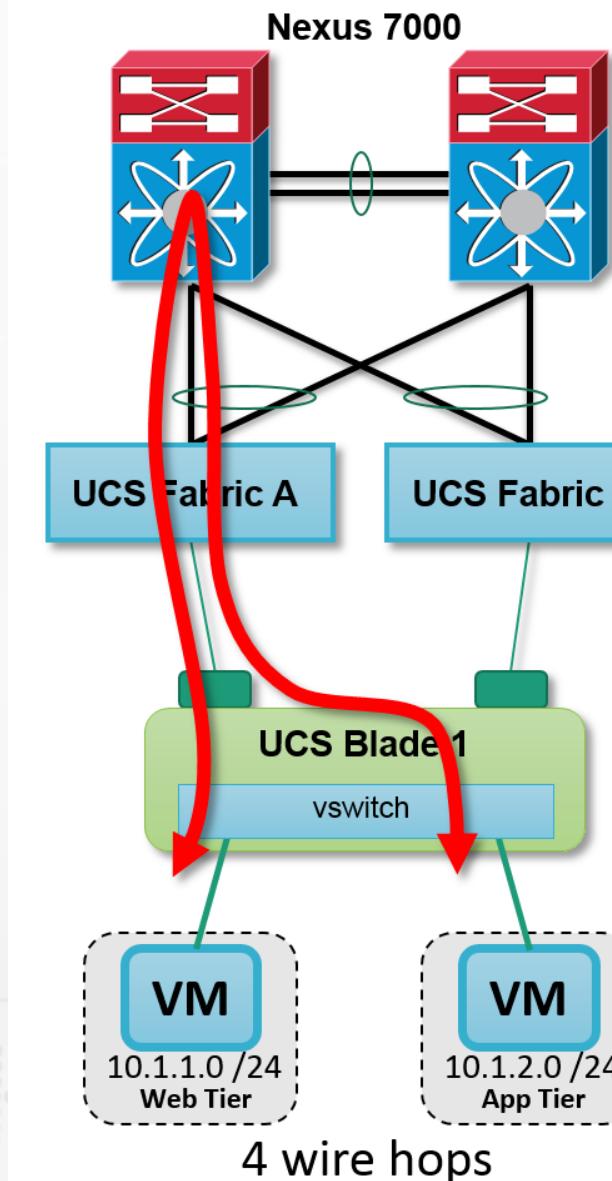
Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.2180)

Running processes:
C:\WINDOWS\System32\smss.exe
C:\WINDOWS\system32\winlogon.exe
C:\WINDOWS\system32\services.exe
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\Ati2evxx.exe
C:\WINDOWS\system32\svchost.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Stardock\Object Desktop\WindowBlinds\wbload.exe
C:\WINDOWS\system32\spoolsv.exe
C:\Program Files\Richies\comm\Shared\ccSetMgr.exe
C:\Program Files\Richies\comm\Shared\ccEvtMgr.exe
C:\Program Files\Richies\comm\Shared\ccEvtMgr.exe
C:\Program Files\Norton AntiVirus\IWP\NPFI Monitor.exe
C:\Program Files\Norton AntiVirus\AdvTools\NPROTECT.EXE
C:\Program Files\Richies\comm\Symantec Shared\SNDSrv.exe
C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe
C:\Program Files\Richies\comm\Symantec Shared\SPBBC\SPBBCSVC.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Richies\comm\Symantec Shared\CCPD-LC\synalcsvc.exe
C:\WINDOWS\system32\ccEvtMgr.exe
C:\WINDOWS\Explorati...
C:\WINDOWS\SOUNDMAN.EXE
C:\Program Files\Microsoft IntelliPoint\point32.exe
C:\Program Files\Lavasoft\Ad-Aware SE Professional\Ad-Watch.exe
C:\Program Files\Richies\comm\Symantec Shared\ccApp.exe
C:\Program Files\QuickTime\qttask.exe
C:\Program Files\Logitech\Video\LogiTray.exe
C:\Program Files\MSN Messenger\msnmsgr.exe
C:\Program Files\SAGEM\SAGEM F@st 800-840\dsimon.exe
C:\Program Files\WinZip\WZQKPICK.EXE
C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe
C:\WINDOWS\system32\LVComS.exe
C:\Program Files\Logitech\Video\LowLight.exe
C:\Program Files\Internet Explorer\IEXPLORE.EXE
C:\Program Files\Outlook Express\msimian.exe

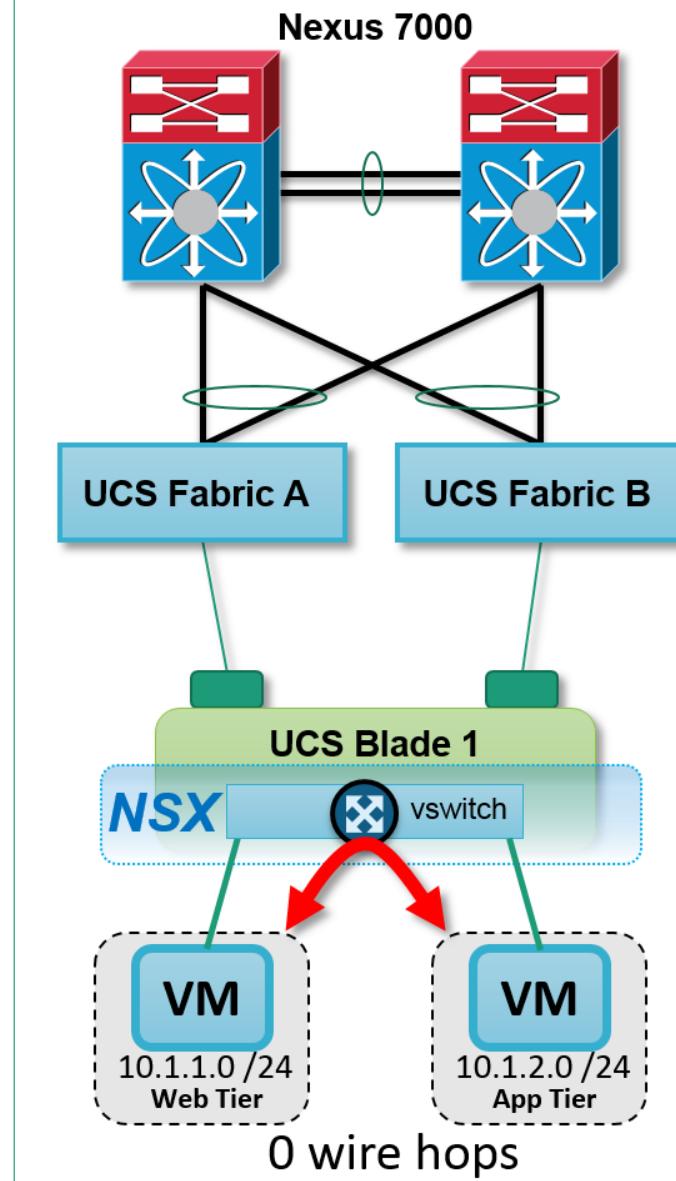
Before/After SDN

East-West Layer 3 / Same host

Before NSX



With NSX Distributed Logical Routing



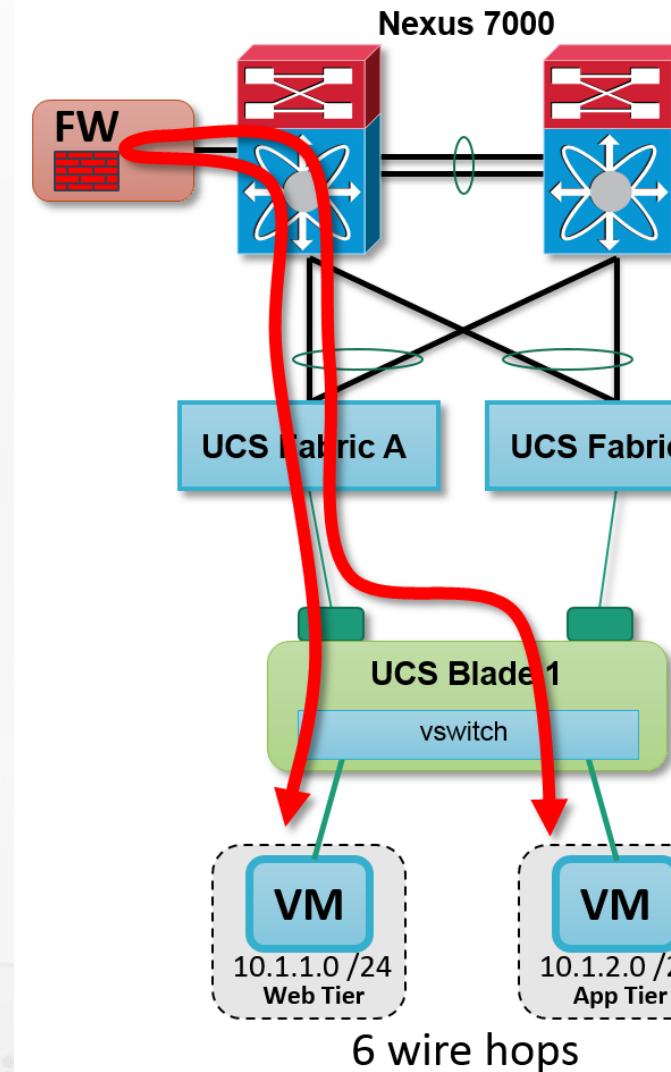
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Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.2180)

Running processes:
C:\WINDOWS\System32\smss.exe
C:\WINDOWS\system32\winlogon.exe
C:\WINDOWS\system32\services.exe
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\AtiEvxx.exe
C:\WINDOWS\system32\svchost.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Stardock\Object Desktop\WindowBlinds\wbload.exe
C:\WINDOWS\system32\spoolsv.exe
C:\Program Files\Norton AntiVirus\ccSetMgr.exe
C:\Program Files\Norton AntiVirus\NPFLMntor.exe
C:\Program Files\Fichiers communs\Symantec Shared\SNDSrv.exe
C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe
C:\Program Files\Fichiers communs\Symantec Shared\SPBBC\SPBBCSVC.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Fichiers communs\Symantec Shared\CCPD-LC\synalcsvc.exe
C:\WINDOWS\system32\ccEvtMgr.exe
C:\WINDOWS\Explorati...
C:\WINDOWS\SOUNDMAN.EXE
C:\Program Files\Microsoft IntelliPoint\point32.exe
C:\Program Files\Lavasoft\Ad-Aware SE Professional\Ad-Watch.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccApp.exe
C:\Program Files\QuickTime\qttask.exe
C:\Program Files\Logitech\Video\LogiTray.exe
C:\Program Files\MSN Messenger\msnmsgr.exe
C:\Program Files\SAGEM\SAGEM F@st 800-840\dsimon.exe
C:\Program Files\WinZip\WZQKPICK.EXE
C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe
C:\WINDOWS\system32\LVComS.exe
C:\Program Files\Logitech\Video\LowLight.exe
C:\Program Files\Internet Explorer\IEXPLORE.EXE
C:\Program Files\Outlook Express\msimian.exe

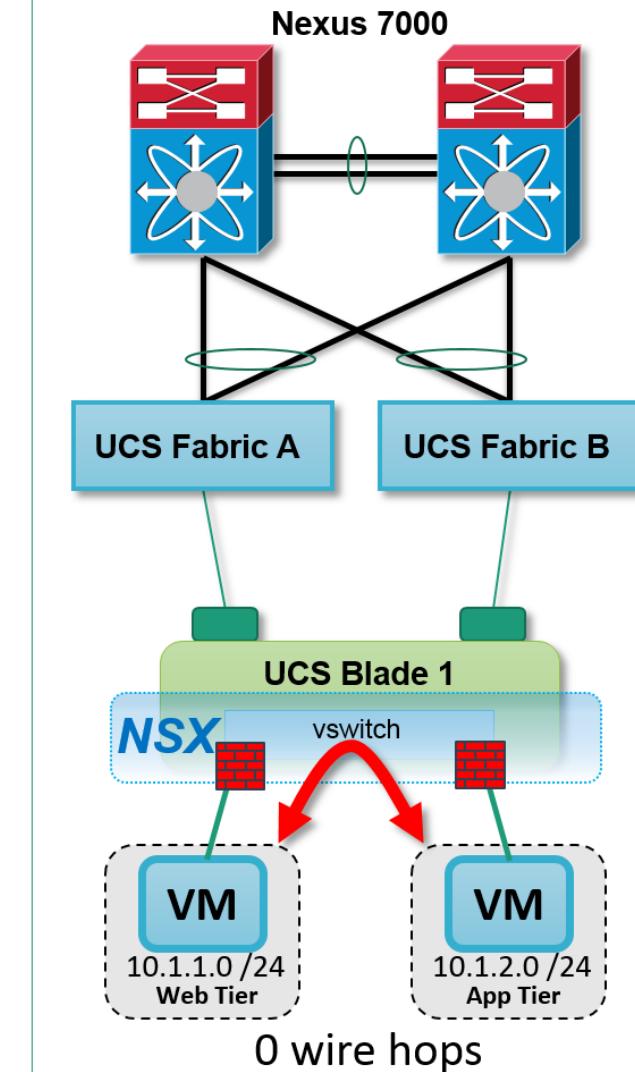
Before/After SDN

East-West Firewalling / Same host

Before NSX



With NSX Distributed Virtual Firewall

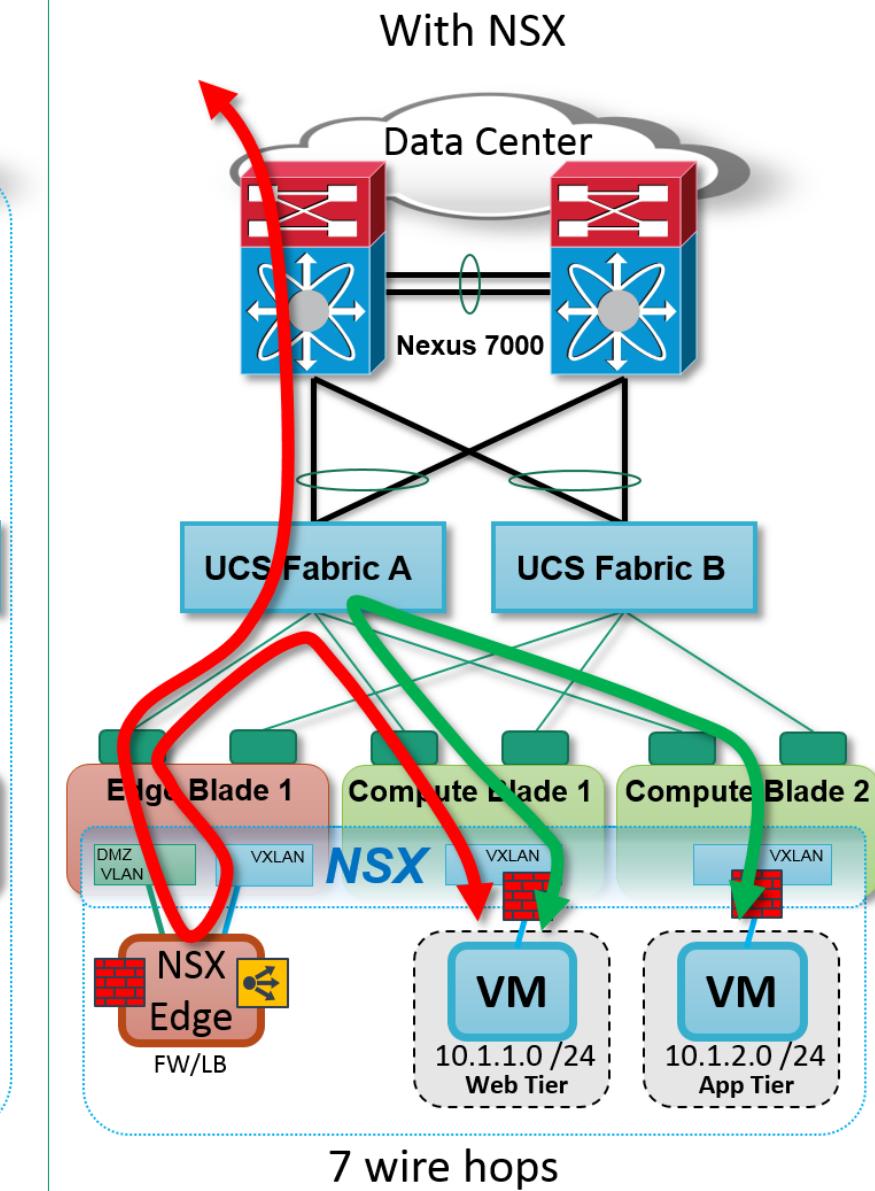
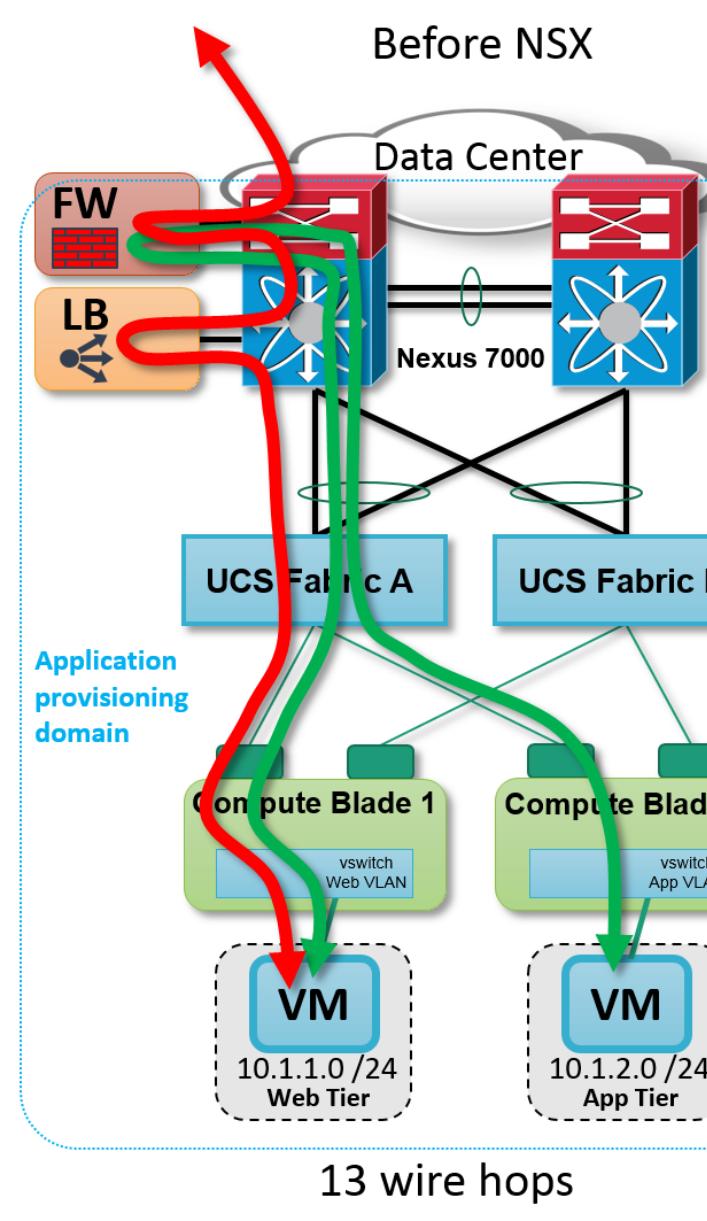


Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.2180)

Before/After SDN

Running processes:
C:\WINDOWS\System32\smss.exe
C:\WINDOWS\system32\winlogon.exe
C:\WINDOWS\system32\services.exe
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\AtiEvxx.exe
C:\WINDOWS\system32\svchost.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Stardock\Object Desktop\WindowBlinds\wbload.
C:\WINDOWS\system32\spoolsv.exe
C:\Program Files\Norton AntiVirus\IWP\NPFMonitor.exe
C:\Program Files\Norton AntiVirus\AdvTools\NPROTECT.EXE
C:\Program Files\Fichiers communs\Symantec Shared\SNDSrvc.exe
C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe
C:\Program Files\Fichiers communs\Symantec Shared\SPBBC\SPBBC
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Fichiers communs\Symantec Shared\CCPD-LC\syn
C:\WINDOWS\system32\l2l2.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccEvtMgr.exe
C:\WINDOWS\Explorati...
C:\WINDOWS\SOUNDMAN.EXE
C:\Program Files\Microsoft IntelliPoint\point32.exe
C:\Program Files\Lavasoft\Ad-Aware SE Professional\Ad-Watch.e
C:\Program Files\Fichiers communs\Symantec Shared\ccApp.exe
C:\Program Files\QuickTime\qttask.exe
C:\Program Files\Logitech\Video\LogiTray.exe
C:\Program Files\MSN Messenger\msnmsgr.exe
C:\Program Files\SAGEM\SAGEM F@st 800-840\dsimon.exe
C:\Program Files\WinZip\WZQKPICK.EXE
C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe
C:\WINDOWS\system32\LVComS.exe
C:\Program Files\Logitech\Video\LowLight.exe
C:\Program Files\Internet Explorer\IEXPLORE.EXE
C:\Program Files\Outlook Express\msimian.exe

North-South & East-West Traffic Flow

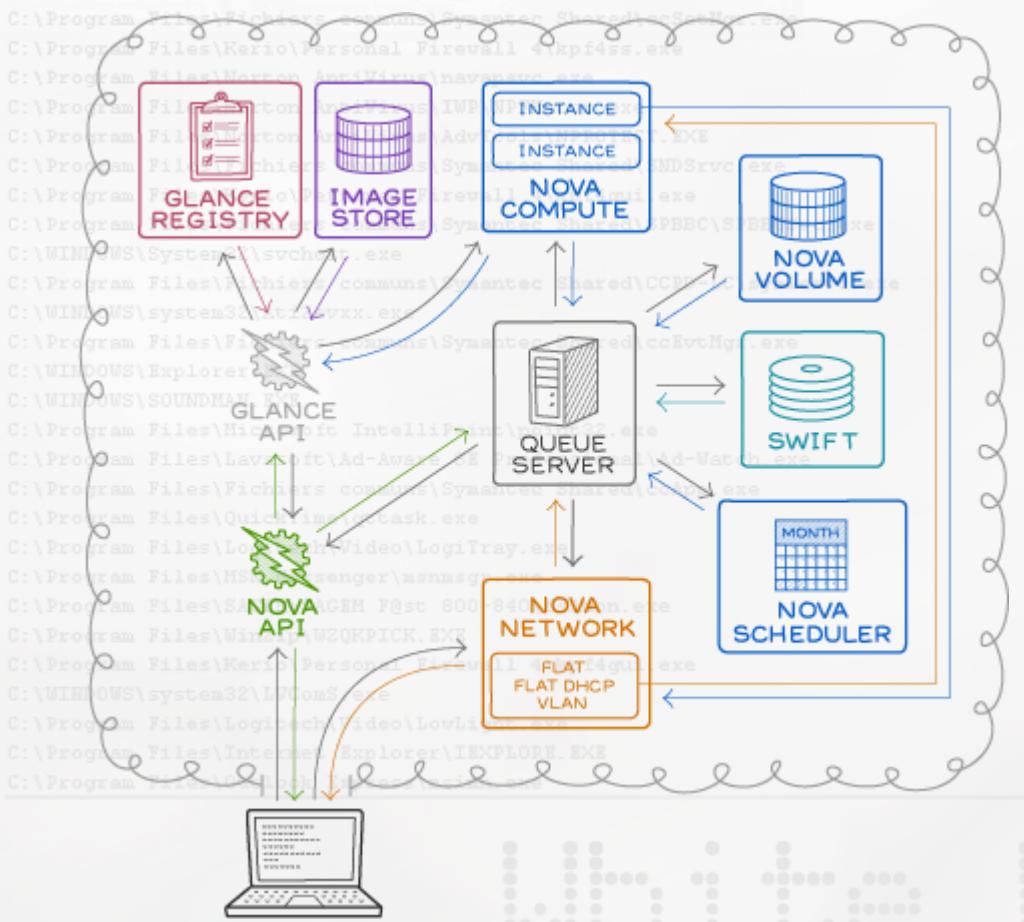


Logfile of HijackThis v1.26.1
Scan saved: 2009-04-04 2009
Platform: Windows 7 (6.1.7601.17514)
NSIE: Internet Explorer 8.0.600.2180

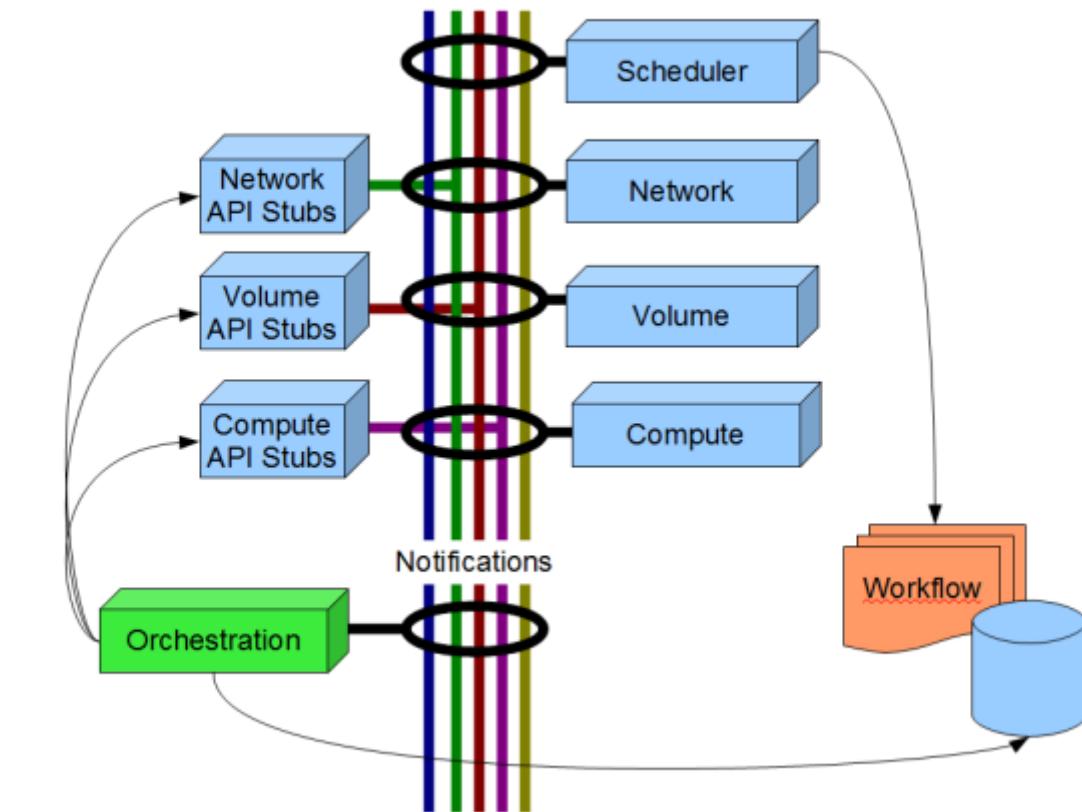


openstack™

C:\Program Files\Stardock\Object Desktop\WindowBlinds\wbload.exe
C:\WINDOWS\system32\spoolsv.exe



RabbitMQ Queues



LogFile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.2180)

Running processes:
C:\WINDOWS\System32\smss.exe
C:\WINDOWS\system32\winlogon.exe
C:\WINDOWS\system32\services.exe
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\Ati2evxx.exe
C:\WINDOWS\system32\svchost.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Stardock\Object Desktop\WindowBlinds\wbload.exe
C:\WINDOWS\system32\spoolsv.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccSetMgr.exe
C:\Program Files\Kerio\Personal Firewall 4\kpf4ss.exe
C:\Program Files\Norton AntiVirus\navapsvc.exe
C:\Program Files\Norton AntiVirus\IWP\NPFMntor.exe
C:\Program Files\Norton AntiVirus\AdvTools\NPFMntor.EXE
C:\Program Files\Norton AntiVirus\NPFMntor.exe
C:\Program Files\Norton AntiVirus\NPFMntor.exe
C:\Program Files\Norton AntiVirus\NPFMntor.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Fichiers communs\Symantec Shared\CCPD-LC\synalcsvc.exe
C:\WINDOWS\system32\Ati2evxx.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccEvtMgr.exe
C:\WINDOWS\Explorer.EXE
C:\WINDOWS\SOUNDMAN.EXE
C:\Program Files\Microsoft IntelliPoint\point32.exe
C:\Program Files\Lavasoft\Ad-Aware SE Professional\Ad-Watch.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccApp.exe
C:\Program Files\QuickTime\qtask.exe
C:\Program Files\Logitech\Video\LogiTray.exe
C:\Program Files\MSN Messenger\msnmsgr.exe
C:\Program Files\SAGEM\SAGEM F@st 800-840\dsimon.exe
C:\Program Files\WinZip\WZQKPICK.EXE
C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe
C:\WINDOWS\System32\LVComS.exe
C:\Program Files\Logitech\Video\LowLight.exe
C:\Program Files\Internet Explorer\IEXPLORE.EXE
C:\Program Files\Outlook Express\msimian.exe

Micro-Segmentation using SDN

White Hat Hack

Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (WinNT 5.01.2600)

Before SDN

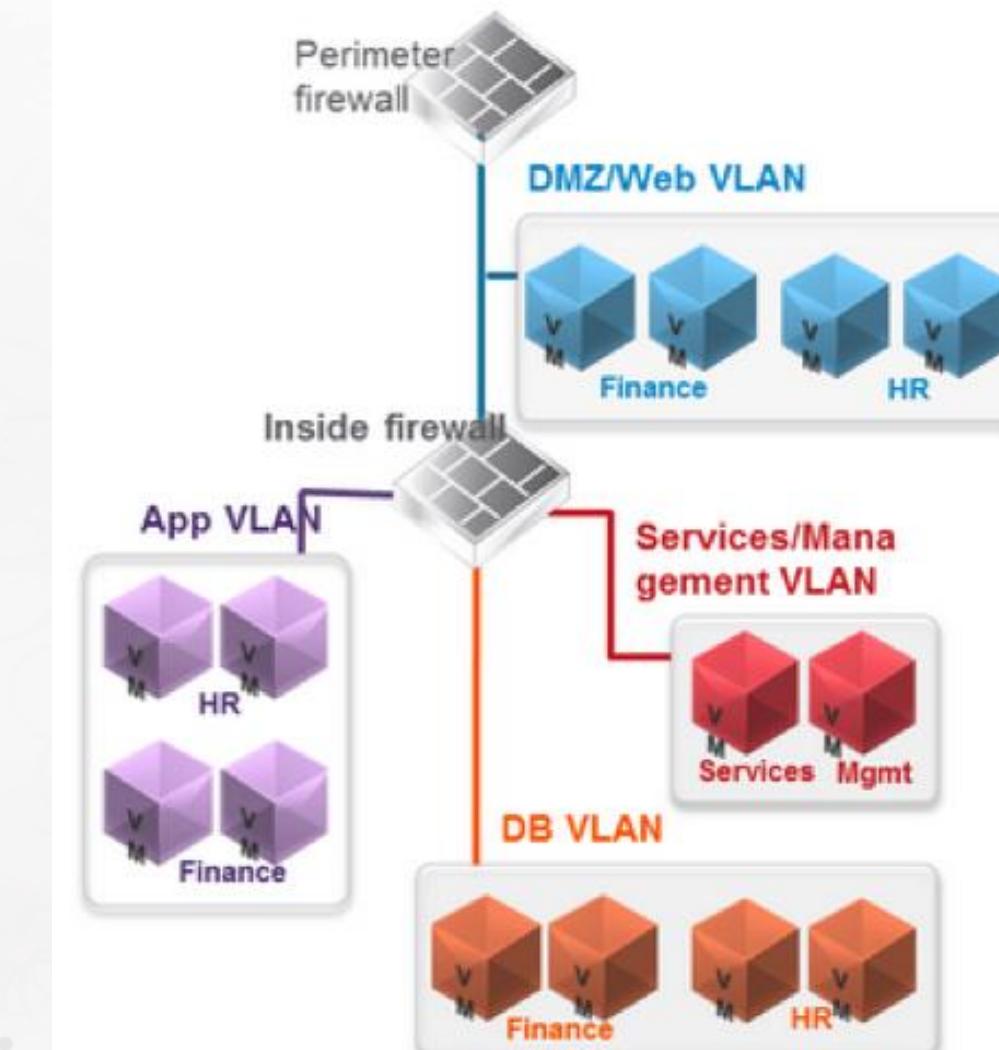
- Vlan oriented

- Choke points

- Unmanageable

- Big attack surface

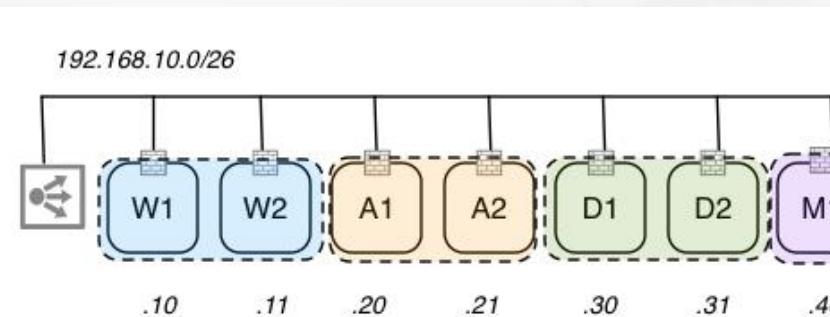
Traditional Data Center



Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Microsoft Internet Explorer v6.0.2900.2180

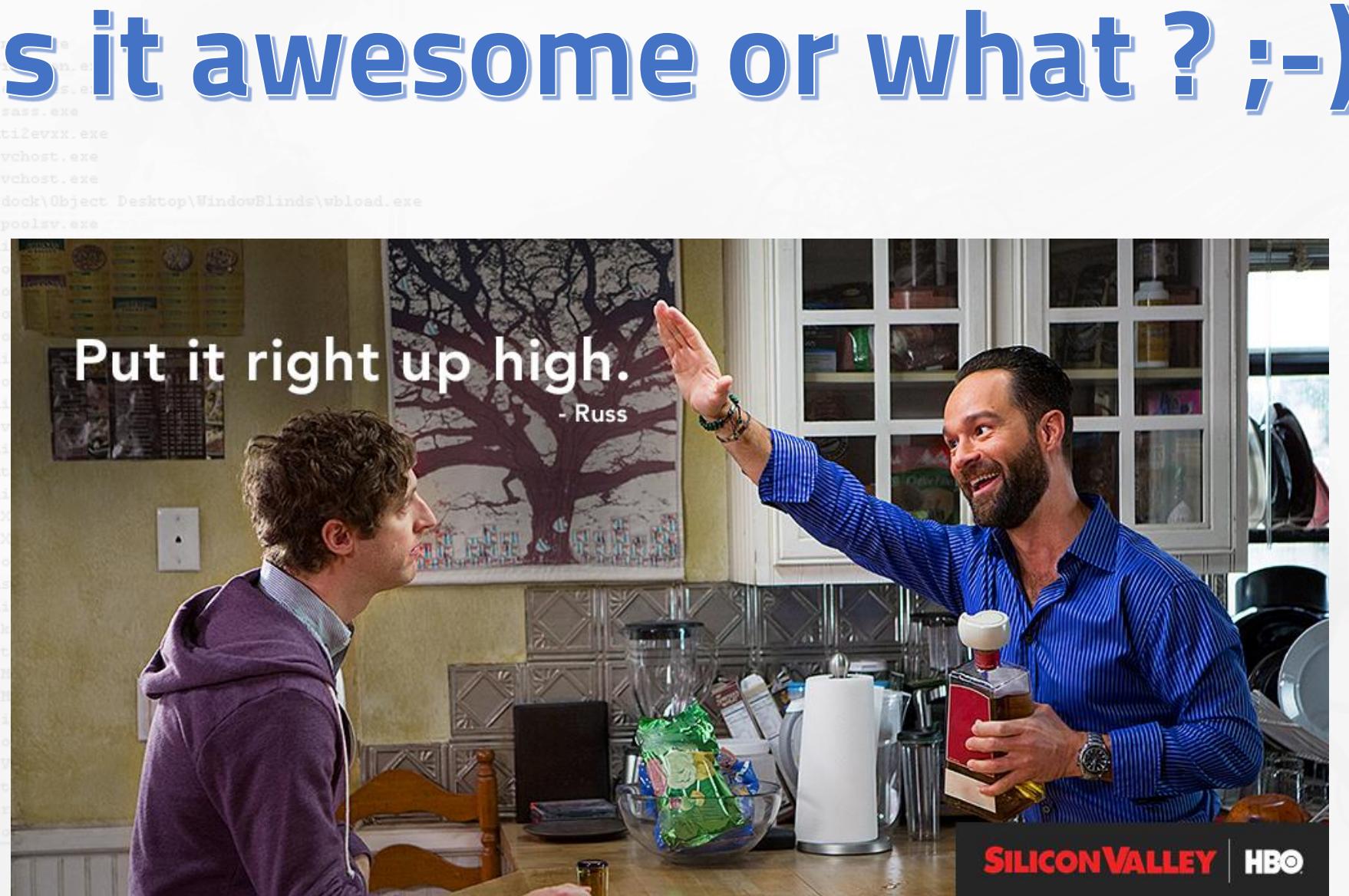
After SDN

- Smaller attack surface, small domains
- Distributed Firewall
- Hypervisor's in-kernel L2/L3/FW
- Simplified deployment



Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.2180)

Running processes:
C:\WINDOWS\System32\RPCRT4.dll
C:\WINDOWS\system32\ole32.dll
C:\WINDOWS\system32\RPC.dll
C:\WINDOWS\system32\oleaut32.dll
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\Ati2evxx.exe
C:\WINDOWS\system32\svchost.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Stardock\Object Desktop\WindowBlinds\wbload.exe
C:\WINDOWS\system32\spoolsv.exe
C:\Program Files\RichEdit.dll
C:\Program Files\Kerio\Kerio Connect\Kerio Connect.exe
C:\Program Files\Norton\Norton Internet Security\Norton Internet Security.exe
C:\Program Files\Norton\Norton Internet Security\Norton Internet Security.exe
C:\Program Files\Norton\Norton Internet Security\Norton Internet Security.exe
C:\Program Files\RichEdit.dll
C:\Program Files\Kerio\Kerio Connect\Kerio Connect.exe
C:\Program Files\RichEdit.dll
C:\WINDOWS\System32\svchost.exe
C:\Program Files\RichEdit.dll
C:\WINDOWS\system32\Ati2evxx.exe
C:\Program Files\RichEdit.dll
C:\WINDOWS\Explorer.EXE
C:\WINDOWS\SOUNDMAN.EXE
C:\Program Files\Microsoft\Windows\Windows Media\Windows Media Player\wmplayer.exe
C:\Program Files\Lavasoft\Anti-Spyware\AS.exe
C:\Program Files\RichEdit.dll
C:\Program Files\QuickTime\QTKit.dll
C:\Program Files\LoginVista\LoginVista.exe
C:\Program Files\MSN\MSN.exe
C:\Program Files\SAGE\SAF.exe
C:\Program Files\WinZip\WinZip.exe
C:\Program Files\Kerio\Kerio Connect\Kerio Connect.exe
C:\WINDOWS\system32\LV.dll
C:\Program Files\LoginVista\LoginVista.exe
C:\Program Files\Internet Explorer\iexplore.exe
C:\Program Files\Outlook\Outlook.exe



LogFile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.2180)

Running processes:

C:\WINDOWS\System32\smss.exe
C:\WINDOWS\system32\winlogon.exe
C:\WINDOWS\system32\services.exe
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\Ati2evxx.exe
C:\WINDOWS\system32\svchost.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Stardock\Object Desktop\WindowBlinds\wbload.exe
C:\WINDOWS\system32\spoolsv.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccSetMgr.exe
C:\Program Files\Kerio\Personal Firewall 4\kpf4.exe
C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe
C:\Program Files\Kerio\Antivirus\SPB\SPB.exe
C:\Program Files\Kerio\Antivirus\SPB\SPBPRO.exe
C:\Program Files\Fichiers communs\Symantec Shared\SNDSrvc.exe
C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe
C:\Program Files\Fichiers communs\Symantec Shared\SPBBC\SPBBCSvc.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Fichiers communs\Symantec Shared\CCPD-LC\synalcsvc.exe
C:\WINDOWS\system32\Ati2evxx.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccEvtMgr.exe
C:\WINDOWS\Explorer.EXE
C:\WINDOWS\SOUNDMAN.EXE
C:\Program Files\Microsoft IntelliPoint\point32.exe
C:\Program Files\Lavasoft\Ad-Aware SE Professional\Ad-Watch.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccApp.exe
C:\Program Files\QuickTime\qtask.exe
C:\Program Files\Logitech\Video\LogiTray.exe
C:\Program Files\MSN Messenger\msnmngr.exe
C:\Program Files\SAGEM\SAGEM F@st 800-840\dsimon.exe
C:\Program Files\WinZip\WZQKPICK.EXE
C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe
C:\WINDOWS\System32\LVComS.exe
C:\Program Files\Logitech\Video\LowLight.exe
C:\Program Files\Internet Explorer\IEXPLORE.EXE
C:\Program Files\Outlook Express\msimn.exe

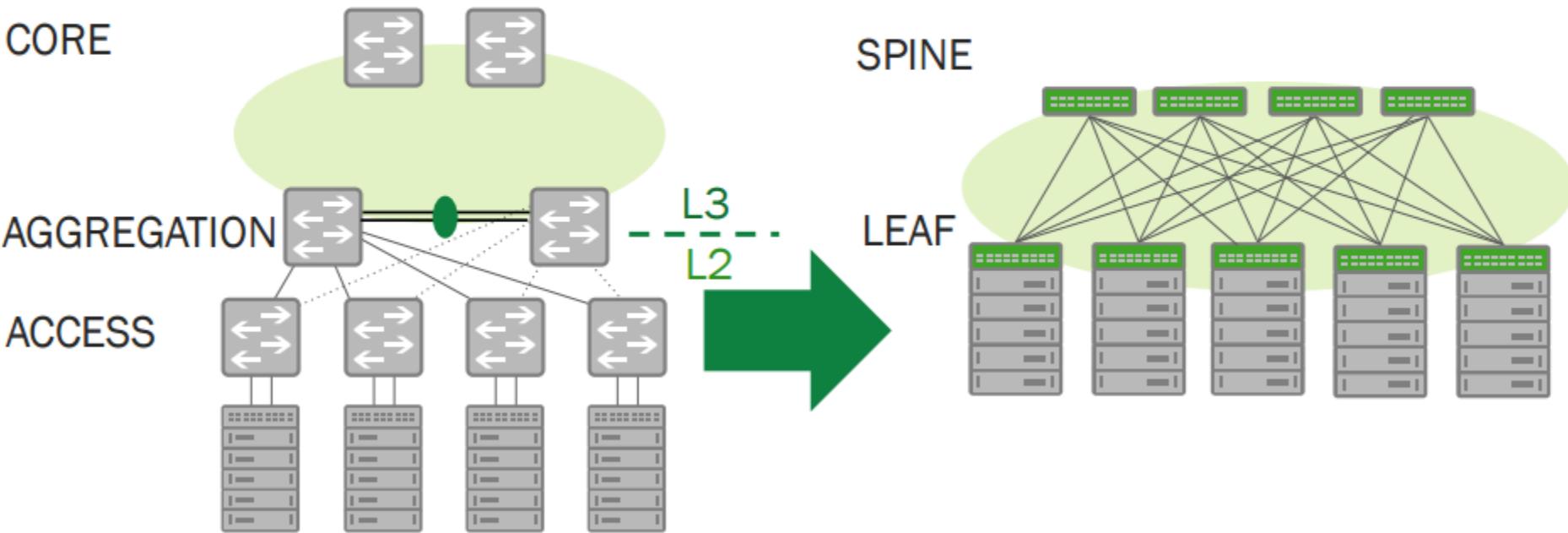
If we have some more time

White Hat Has Been

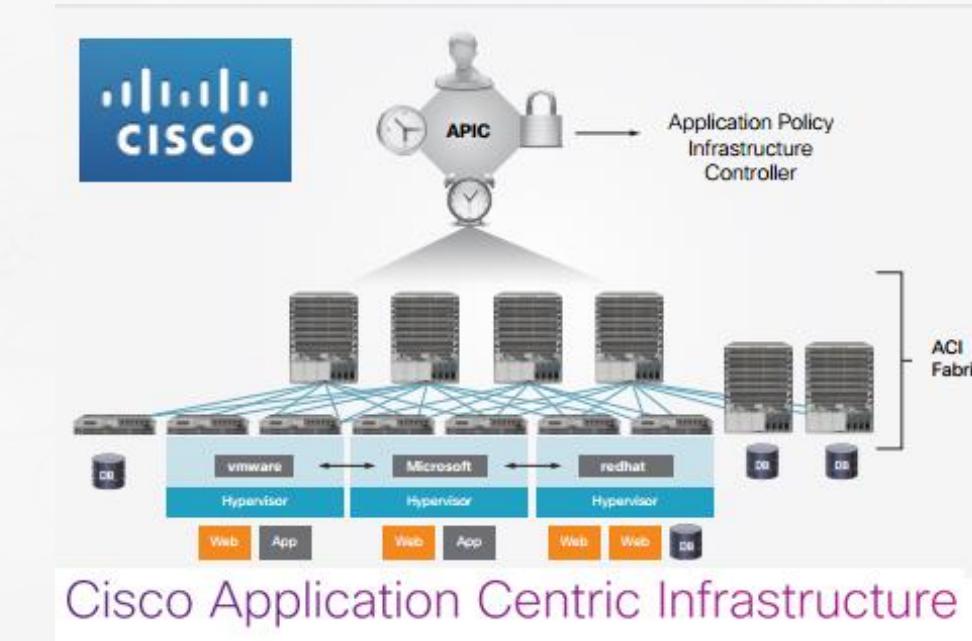
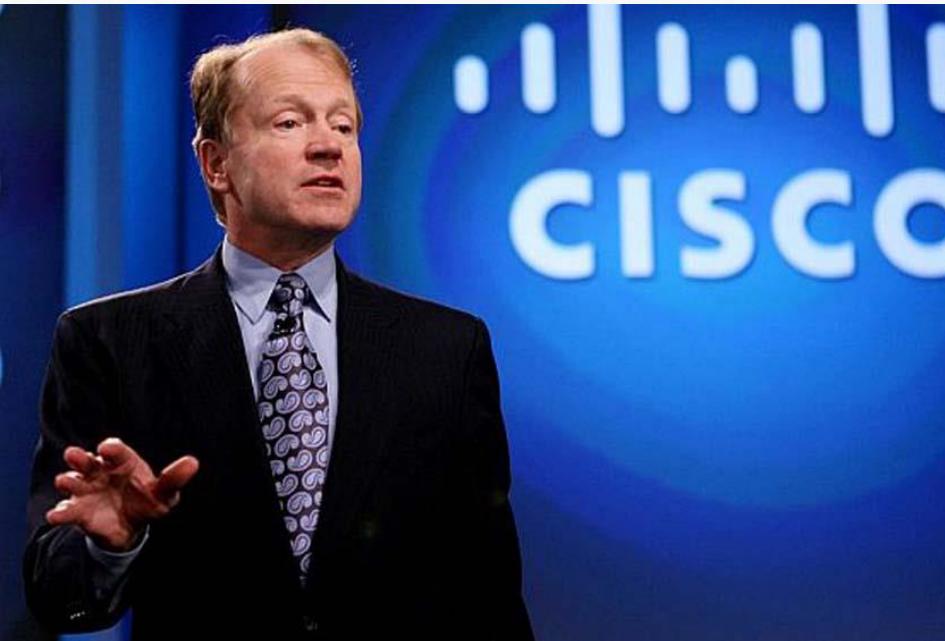
Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer v6.00 SP2 (6.00.2900.2180)

- Nobody care anymore about the underlying networking
- Hypervisor is the new  king!!!

A Key Transformation



IMHO, biggest loser would be



```
LogFile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Microsoft Internet Explorer 00 SP1 (6.0.2900.2180)
```

IMHO, biggest winner would be



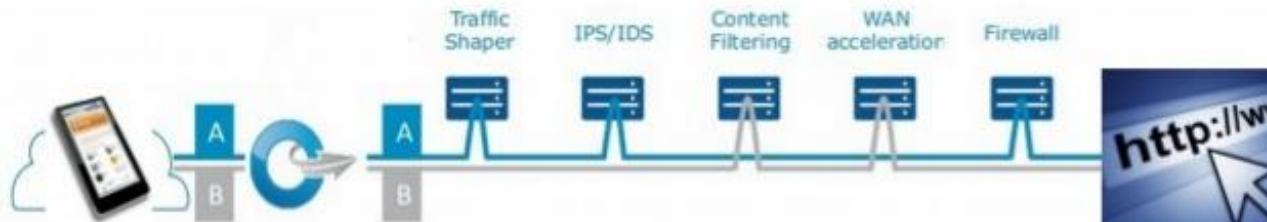
- **Currently VP, GM & CTO in Vmware**
- **King of the valley**
- **Nicira was acquired by VMWare for \$1.26 billion**
- **Invented the network virtualization**

Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows Vista (winNT 5.0, 32bit)
MSIE: Internet Explorer 7.00.520
Running processes:
C:\WINDOWS\System32\smss.exe
C:\WINDOWS\system32\winlogon.exe
C:\WINDOWS\system32\services.exe
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\RPCSS.exe

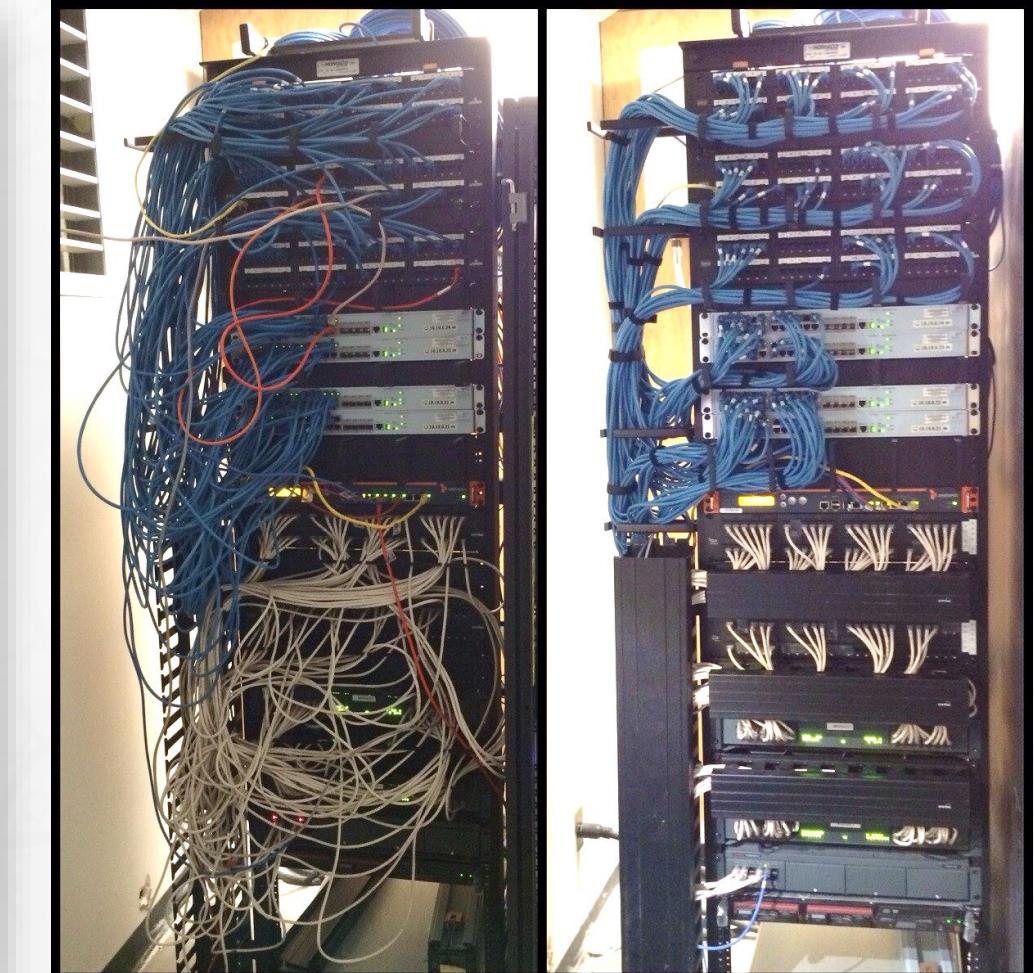
NFV - Network functions virtualization

Service Chaining

Moving network functions into software means that building a service chain no longer requires acquiring hardware.



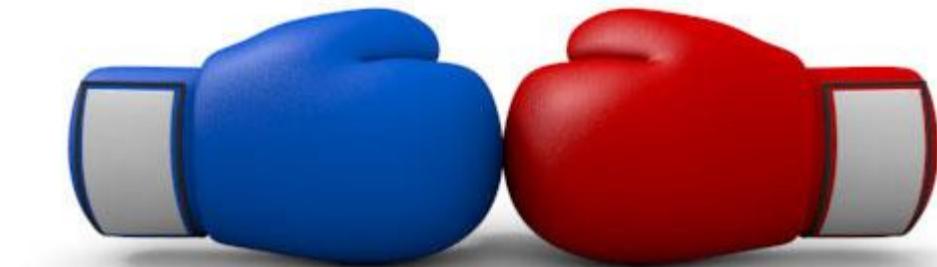
Source: Dynamic Service Chaining, SDN OpenFlow World Congress, Oct 2013, Jan Lindblad, Telia



Logfile of HijackThis v1.99.1
Scan saved at 09:36:29, on 28/04/2009
Platform: Windows XP SP2 (WinNT 5.01.2600)
MSIE: Internet Explorer 7.0.5723.1180
Running processes:
C:\WINDOWS\System32\smss.exe
C:\WINDOWS\system32\winlogon.exe
C:\WINDOWS\system32\services.exe
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\Ati2evxx.exe
C:\WINDOWS\system32\svchost.exe
C:\WINDOWS\system32\spoolsv.exe
C:\Program Files\Fichiers communs\Symantec Shared\ccSetMgr.exe
C:\Program Files\Kerio\Personal Firewall 4\kpf4ss.exe
C:\Program Files\Kerio\Personal Firewall 4\kpf4ui.exe
C:\Program Files\Kaspersky Anti-Virus\AdvTools\NPROTECT.EXE
C:\Program Files\Fichiers communs\Symantec Shared\SNDSrvc.exe
C:\Program Files\Kaspersky Anti-Virus\Proxy\Proxy\Proxy.exe
C:\Program Files\Kaspersky Anti-Virus\Proxy\Proxy\Proxy.exe
C:\WINDOWS\System32\svchost.exe
C:\Program Files\Fichiers communs\Symantec Shared\CCPD-LC\synalcsvc.exe
C:\WINDOWS\system32\Ati2evxx.exe
C:\Program Files\Microsoft IntelliPoint\point32.exe
C:\Program Files\JavaSoft\Ad-Aware SE Professional\Ad-Watch.exe
C:\Program Files\JavaSoft\Ad-Aware SE Professional\Ad-Watch.exe
C:\Program Files\QuickTime\qtcish.exe
C:\Program Files\Logitech\Video\LogiTray.exe
C:\Program Files\MSN Messenger\msnmsgr.exe
C:\Program Files\SAGEM\SAGEM F@st 800-840\dsimon.exe
C:\Program Files\WinZip\WZQKPICK.EXE
C:\Program Files\Kerio\Personal Firewall 4\kpf4gui.exe
C:\WINDOWS\system32\LVComS.exe
C:\Program Files\Logitech\Video\LowLight.exe
C:\Program Files\Internet Explorer\IEXPLORE.EXE
C:\Program Files\Outlook Express\msimian.exe

Business Impact

- **Chip hardware - switches, storage, etc..**
- **Smaller physical space, less hardware**
 - **Less operational guys**
- **Fast services for end-users**
 - **Pay as you grow**



CapEx vs. OpEx

C:\WINDOWS\System32\Any
C:\WINDOWS\system32\Any
C:\WINDOWS\system32\Any
C:\WINDOWS\system32\lsass.exe
C:\WINDOWS\system32\Ati2evxx.exe

Any Questions ?

