

Workshop

Netscaler VPX

from Express(free) to Platinum



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Citrix Netscaler VPX



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Introducing Netscaler

Netscaler VPX overview

Netscaler Use Cases

Q & A

Introducing NetScalr

NetScalr VPX overview

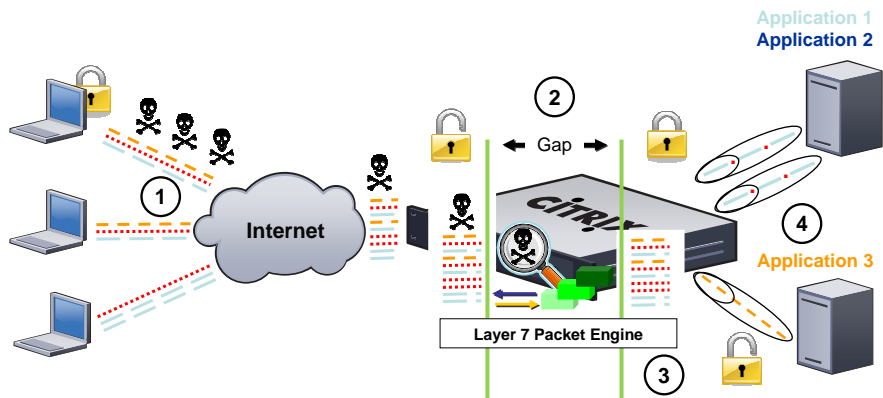
NetScalr Use Cases

Q & A

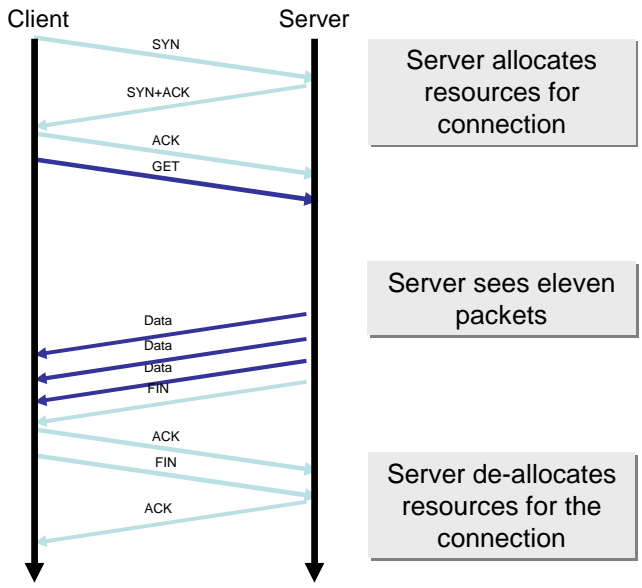
Introducing NetScalr

- NetScalr Request Switching decouples each application request/response flow from the underlying transport
- Request Switching ensures the most efficient use of transport protocols and resources
- The NetScalr system manages the complete life cycle of the request/response transaction

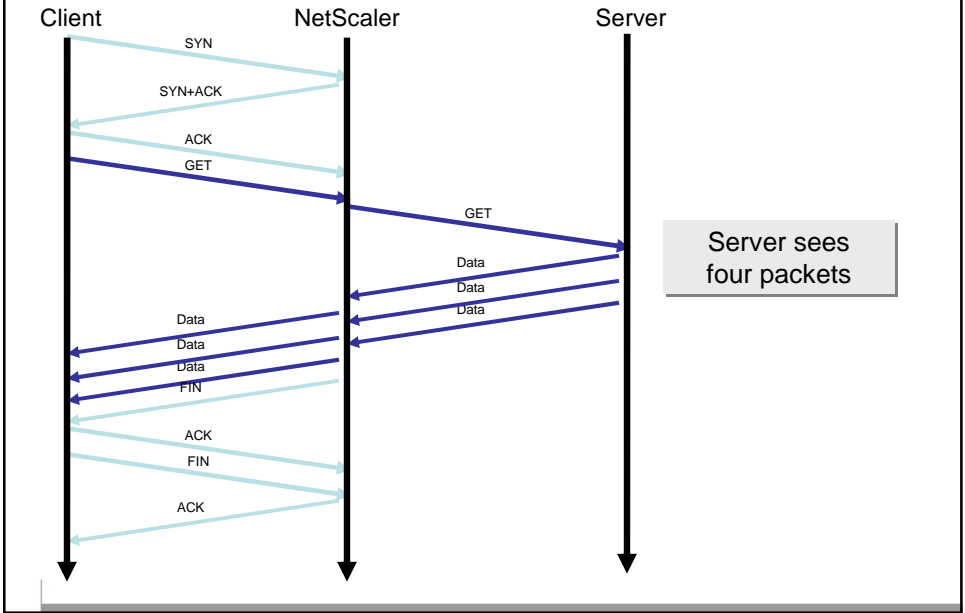
NetScaler Request Switching Architecture



HTTP 1.0 Transaction without a NetScaler System



TCP Transaction with a NetScaler System



GUI overview : Let's take a look!



NetScaler VPX: 172.32.0.5

System Overview

System Information

Version	N69.1: Build 100.3.r.1, Date: Dec 4 2009, 15:50:48
System IP	172.32.0.5
Netmask	255.255.255.0
Host Name	ns
Number of Mapped IP(s)	1
Node	Primary
Time Zone	GMT+02:00-CEST-Europe/Brussels

Hardware Information

Platform	NetScaler Virtual Appliance-450010
Manufactured on	9/30/2009
CPU	2495 MHz
Host ID	7198006
Serial no	ME3-R11U47
Encoded serial no	8914000d254307ee5a

HTTP Parameters

HTTP Ports	(none)
Max Connections	0
Max Requests	0 (Per Connection)
Client IP Insertion	Disabled
Client IP Header	
Cookie Version	0

Feature is disabled.

Introducing NetScaler

NetScaler VPX overview

NetScaler Use Cases

Content-Aware Traffic Compression

Server Load-Balancing

Q & A

Overview

Topics covered in these slides include:

- Overview of the NetScaler
- VPX Performance
- Differences Between MPX and VPX
- VPX Architecture
- Pay As You Grow Licensing

Overview of the NetScaler



NetScaler VPX

- Is a 32-bit virtual NetScaler system
- Is hosted on a XenServer
- Distributes, optimizes and secures Layer 4 to Layer 7 network traffic
- Performs application-specific traffic analysis
- Provides an effective execution of features, such as:
 - Load balancing
 - Compression
 - Secure Sockets Layer (SSL) offload
 - Application Firewall
 - Dynamic content caching

Identifying the Benefits of NetScaler VPX



NetScaler VPX can:

- Be deployed on-demand, anywhere
- Leverage dynamic data center processes
- Respond automatically to periods of high demand by dynamically provisioning more capacity for an existing Web application and vice versa
- Provide flexibility in licensing programs that meet the needs of the smallest business to the largest service providers

Identifying VPX Hardware Specifications



The recommended minimum hardware specifications to install NetScaler VPX on XenServer are:

- CPU: One or more x86 CPU with virtualization assist (Intel-VT or AMD-V) enabled and a 64-bit architecture

Note: It may be necessary to manually enable the CPU virtualization feature through the system BIOS configuration

- RAM: Minimum 2 GB
- Network interface cards (NICs):
 - A single one gigabit NIC is required
 - Two NICs of one gigabit each is recommended

VPX Performance



Citrix offers five performance-based offerings of NetScaler VPX

VPX Offering	Standa	Enterpri	Platinum
VPX-1000 (1 Gbps)	√	√	√
VPX-200 (200 Mbps)	√	√	√
VPX-10 (10 Mbps)	√	√	√
VPX-Express (1 Mbps)	√	No	No

Identifying VPX Performance Benchmarks



Performance benchmarks for NetScaler VPX

	NetScaler VPX Performance*
Maximum HTTP throughput	1 Gbps
Maximum compression	750 Mbps
Maximum Application Firewall	500 Mbps
Maximum SSL	500
Maximum SSL throughput	1 Gbps

*Max performance subject to server used and subject to change

Differences Between MPX and VPX



- Two main differences exist between NetScaler MPX and VPX:
 - System capacity
 - Performance
- NetScaler VPX system capacity:
 - Does not include hardware specifically designed to support SSL acceleration
 - Can still terminate sessions but, unlike with NetScaler systems, the associated processing is not offloaded to dedicated silicon

Identifying When to Use a Physical or a Virtual NetScaler Appliance



Physical NetScaler Appliances

- Gig + performance
- High volume SSL Offload
- >100 SSL VPN CCUs
- FIPS requirements
- Physical device security

NetScaler VPX

- Lab/test environments
- Development environments
- “Datacenter-in-a-box”
- CPU-intensive workloads
- Frequently moved applications
- Fast/remote deployment

Using VPX and MPX Together



- NetScaler VPX and NetScaler MPX can be deployed together to create a comprehensive, centrally managed web application delivery fabric
- NetScaler VPX instances can be deployed on an app-by-app basis, optimized specifically for the demands of each application
- NetScaler MPX appliances can be deployed at the datacenter edge to handle demanding network-wide tasks

Using VLANs on VPX



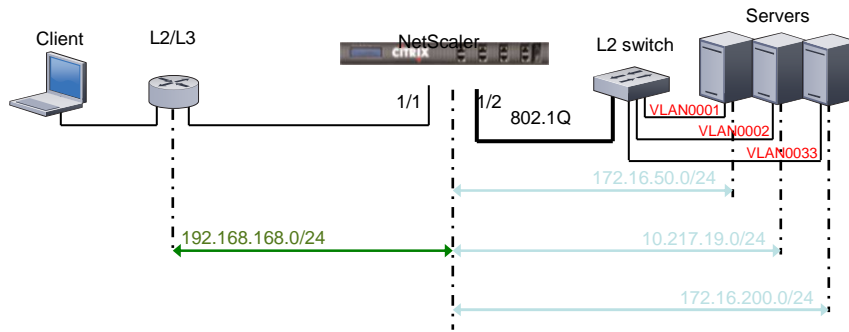
- NetScaler VPX supports port VLANs (Layer 2)
- VLAN configurations are useful when you need to restrict traffic to certain groups of stations
- When configured VLANs are bound to IP subnets and the VPX is the default router for these subnets, the NetScaler VPX performs IP forwarding between the VLANs

Using Tagged VLANs

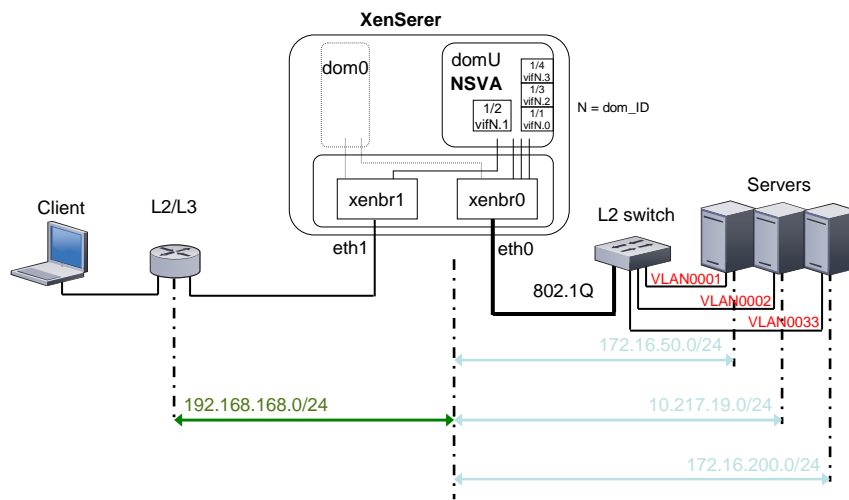


- NetScaler tagged VLANs are not supported on NetScaler VPX
- Administrators need to configure tagged VLANs at the Hypervisor level

Example: Physical NetScaler in Two-Arm Mode



Example: NetScaler VPX in Two-Arm Mode



Pay As You Grow Licensing for NetScaler VPX



- The “pay as you grow” is based upon the ability to upgrade from one license to another
- NetScaler VPX is sold by bandwidth
- Customers are able to buy VPX licenses providing 10 Mbps, 200 Mbps or 1 Gbps of throughput
- For example, if a customer initially buys the 200 Mbps license, and then needs a 1 Gbps license, the customer can upgrade the license, and does not need to buy a 1 Gbps license “from scratch”



LAB TIME !!

Introducing Netscaler

Netscaler VPX overview

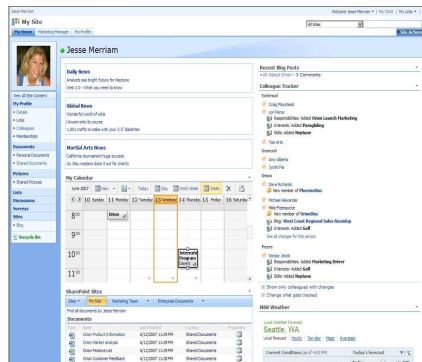
Netscaler Use Cases

Q & A

Challenge Example I

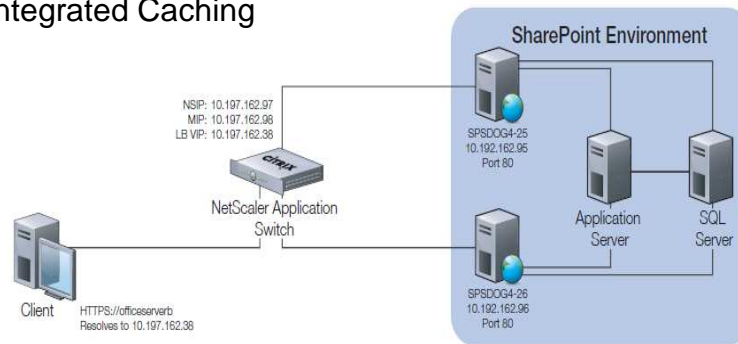
- Deliver SharePoint Applications toward users

- Optimize?
- Secure?
- Availability?



NetScaler in Sharepoint Environment

- Server Load Balancing
- HTTP Compression
- SSL Offload
- Integrated Caching



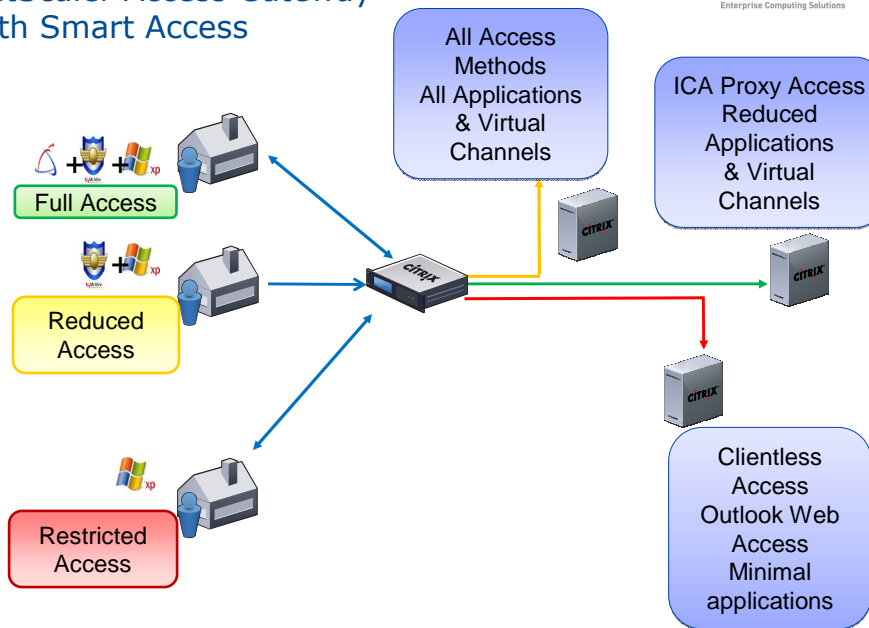
LAB TIME !!

Challenge example II

- Secure Access to XenApp Applications

- Control of User?
- Control of Device?
- Control of Location?
- Availability?

NetScaler Access Gateway with Smart Access

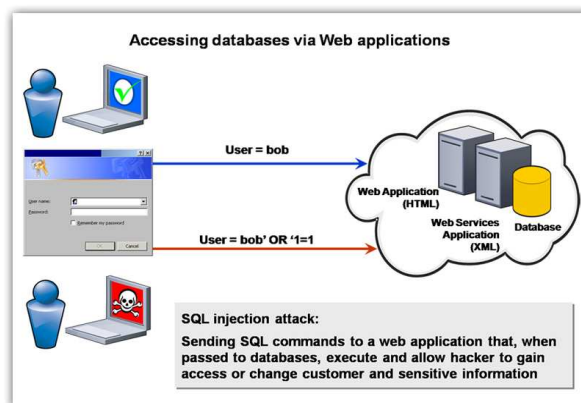


DEMO TIME !

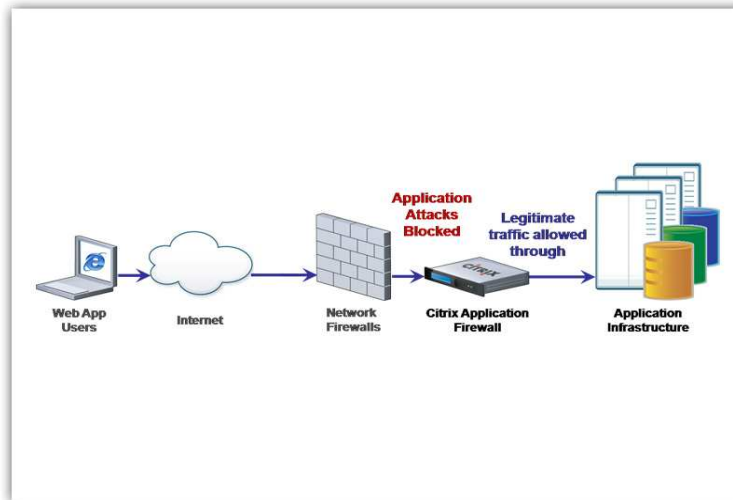
Challenge Example III

- Protect your Web server from hacking

- Secure?
- Inspecte?
- Availability?



The Application Firewall Solution



Positive Security Model

Security Models

Negative



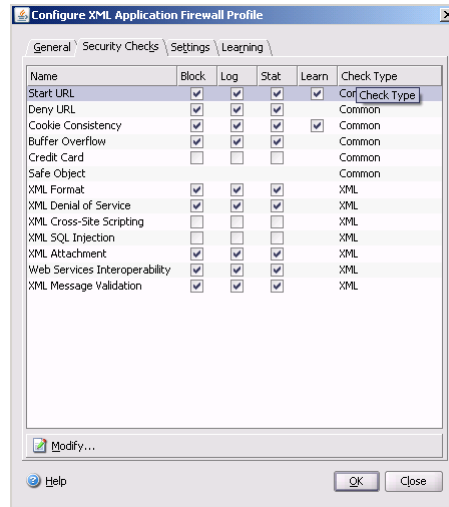
- Signature based
 - Requires regular updates
- Blocks only what you know
 - Cannot block what is not known
- Open to zero-day attacks
- Cannot terminate SSL session; traffic passes through without inspection

Positive



- Behavior based
 - No signatures to update
- Blocks anything not approved
 - Passes only "good" traffic
- Blocks all "Zero Day" attacks
- Terminates SSL sessions, then decrypts and inspects traffic before passing to web server

WAF Security checks

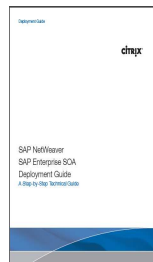


One More Thing

Simplified Installation & Configuration

- ISV Partners/Citrix Deployment Guides-optimized settings
- NetScaler App Templates: import/export complete configurations
- AppExpert Community: freely share with colleagues

Deployment Guides



Application Templates

Applications	Compression	Caching	Event	Filter	Requester	Authentication
app	✓	✓	✓	✓	✓	✓
S_content_type	✓	✓	✓	✓	✓	✓
SQL	✓	✓	✓	✓	✓	✓
SP	✓	✓	✓	✓	✓	✓
PDF	✓	✓	✓	✓	✓	✓
document.pdf	✓	✓	✓	✓	✓	✓
SP	✓	✓	✓	✓	✓	✓
serverE	✓	✓	✓	✓	✓	✓
http	✓	✓	✓	✓	✓	✓
http_page	✓	✓	✓	✓	✓	✓
sp_content	✓	✓	✓	✓	✓	✓
SQL_content	✓	✓	✓	✓	✓	✓
serverE	✓	✓	✓	✓	✓	✓
Oracle	✓	✓	✓	✓	✓	✓
file	✓	✓	✓	✓	✓	✓
file_attachment	✓	✓	✓	✓	✓	✓
document_attachment	✓	✓	✓	✓	✓	✓
SQL_SQL	✓	✓	✓	✓	✓	✓

AppExpert Community




Netscaler VPX 9.2 coming

- XML Attachment Checks Enhancements
- Entity Expansion Attack Protection
- Soap Fault Filtering
- WSDL Scanning Prevention
- XPath Injection Protection
- Learning
- Monitoring Web Services
- XPATH
- JSON
- And more ...

DEMO/LAB TIME ! Let's hack mybank

Q & A

Thank you and stay tuned for our next Workshops at
<http://www.arrowecs.be>

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Introduction

In this workshop we will like to give the attendees a brief overview of Netscaler functionality. Of course this is only a basic overview and introduction to the Netscaler's features and capabilities.

Environment

Connect to XenApp using <http://xenapp5>

Login : xxxxxx

Password : xxxxxx

Start a XenApp Desktop Session

The Netscaler VPX's run on a XenServer Hypervisor infrastructure :

XenServer IP's

192.168.1.23 for Netscaler VPX 1,2 & 3

192.168.1.24 for Netscaler VPX 4,5 & 6

192.168.1.25 for Netscaler VPX 7,8 & 9


Login : xxxxxx

Password : xxxxxx

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Netscaler IPs

Netscaler VPX1	NSIP :	92.168.3.11	
	Hostname :	NetscalerVPX1.arrowlabs.local	
	IP :	192.168.3.12	
	VIP1:	192.168.3.13 (for OWA SSL Offload)	VIP1 FQDN : owavpx1.arrowlabs.local
	Other IPs :	192.168.3.14 ...19	
Netscaler VPX2	NSIP :	92.168.3.21	
	Hostname :	NetscalerVPX2.arrowlabs.local	
	MIP :	192.168.3.22	
	VIP1 :	192.168.3.23 (for OWA SSL Offload)	VIP1 FQDN : owavpx2.arrowlabs.local
	Other IPs :	192.168.3.24 ...29	
Netscaler VPX3	NSIP :	192.168.3.31	
	Hostname :	NetscalerVPX3.arrowlabs.local	
	MIP :	192.168.3.32	
	VIP1:	192.168.3.33 (for OWA SSL Offload)	VIP1 FQDN : owavpx3.arrowlabs.local
	Other IPs :	192.168.3.34 ...39	
Netscaler VPX4	NSIP :	192.168.3.41	
	Hostname :	NetscalerVPX4.arrowlabs.local	
	MIP :	192.168.3.42	
	VIP1:	192.168.3.43 (for OWA SSL Offload)	VIP1 FQDN : owavpx4.arrowlabs.local
	Other IPs :	192.168.3.44 ...49	
Netscaler VPX5	NSIP :	192.168.3.51	
	Hostname :	NetscalerVPX5.arrowlabs.local	
	MIP :	192.168.3.52	
	VIP1:	192.168.3.53 (for OWA SSL Offload)	VIP1 FQDN : owavpx5.arrowlabs.local
	Other IPs :	192.168.3.54 ...59	
Netscaler VPX6	NSIP :	192.168.3.61	
	Hostname :	NetscalerVPX6.arrowlabs.local	
	MIP :	192.168.3.62	
	VIP1:	192.168.3.63 (for OWA SSL Offload)	VIP1 FQDN : owavpx6.arrowlabs.local
	Other IPs :	192.168.3.64 ...69	
Netscaler VPX7	NSIP :	192.168.3.71	
	Hostname :	NetscalerVPX7.arrowlabs.local	
	MIP :	192.168.3.72	
	VIP1:	192.168.3.73 (for OWA SSL Offload)	VIP1 FQDN : owavpx7.arrowlabs.local
	Other IPs :	192.168.3.74 ...79	
Netscaler VPX8	NSIP :	192.168.3.81	
	Hostname :	NetscalerVPX8.arrowlabs.local	
	MIP :	192.168.3.82	
	VIP1:	192.168.3.83 (for OWA SSL Offload)	VIP1 FQDN : owavpx8.arrowlabs.local
	Other IPs :	192.168.3.84 ...89	
Netscaler VPX9	NSIP :	192.168.3.91	
	Hostname :	NetscalerVPX9.arrowlabs.local	
	MIP :	192.168.3.92	
	VIP1:	192.168.3.93 (for OWA SSL Offload)	VIP1 FQDN : owavpx9.arrowlabs.local
	Other IPs :	192.168.3.94 ...99	

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Lab 1 : Netscaler VPX Initial Configuration and Setup

Upload Netscaler VPX to your Hypervisor (ESX or XenServer)

1. Download Netscaler VPX from the Citrix site :
<http://www.citrix.com/English/ss/downloads/results.asp?productID=21679>
There are 2 versions : 1 for vSphere 4 or ESX 3.5 and 1 for XenServer
2. Using this link you can also get a evaluation license
3. Uploading the Netscaler VPX to your hypervisor :
 - a. For XenServer <http://www.citrix.com/tv/#videos/535>
 - b. For ESX 3.5 <http://www.citrix.com/tv/#videos/1718>
 - c. For ESXi <http://www.citrix.com/tv/#videos/1284>

Configure Mgmt IP address

1. Login to your hypervisor and take over the console of your Netscaler VPX.
 - a. Open a session to the XenApp5 server (<http://XenApp5>)
 - b. Login with your credentials (see separate page)
 - c. Launch Desktop Session on XenApp5
(ICA-client/Citrix Online Plug-in is needed)
<http://www.citrix.com/English/ss/downloads/results.asp?productID=186&c1=sot2755>
2. Open Citrix XenServer 5.5 Mgmt tool on the desktop
 - a. Add your XenServer (see separate page for credentials and NSIP=NetScaler IP-address)
3. Go to the console of the virtual machine which runs your Netscaler and follow the wizard to configure the virtual appliance IP-address

Go through the initial setup wizard

1. Use a webbrowser and launch a HTTP or HTTPS session to your Netscaler VPX
(for IP-address you will use the NSIP)
Login : nsroot
Password : nsroot
2. Once logged in you will automatically get a setup wizard screen, if it will not come or afterwards you want to re-run it by clicking System → ...
3. Click "Next" and check the Mgmt interface(SNIP) configuration.

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4. Add a FQDN-hostname to the Netscaler (see separate page)
5. Add a SNIP or MIP (in this example use MIP see separate page)
6. Click "Next", choose "Skip", click "Next"
7. Double check the entered data in the summary page and click "Finish"
8. Click "Exit"

Configure NTP Server and Time Zone

1. Login to the Web based Mgmt interface
2. Open hive "System" and click "Settings"
3. Click "Change Time Zone ..."
4. Select "GMT+2:00-CEST-Europe/Brussels"
5. Click "Save"
6. Open hive "System" and click "NTP Servers"
7. Click "Add ..."
8. NTP server : 192.168.1.2
9. Click "Create"
10. change NTP server to : 192.168.1.3
11. Click "Create"
12. Click "Close"
13. Click "NTP Synchronisation ... OFF"
14. Click "Save"

Configure Licensing

1. Login to the Web based Mgmt interface
2. Open hive "System" and click "Licensing" and see which features are licensed.
3. Get License procedure :
How to obtain a license : <http://www.citrix.com/tv/#videos/1463>
using SSH : shell → Imutil Imhostid
4. Upload license
5. Reboot
6. See the difference ...

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Certificates

Create Certificates

If you create a certificate using a Windows CA you might need to convert it to the correct format. The next document describes how this works :

<http://support.citrix.com/article/CTX106028>

<http://support.citrix.com/article/ctx106631>

You might need the OpenSSL toolkit for Windows for this :

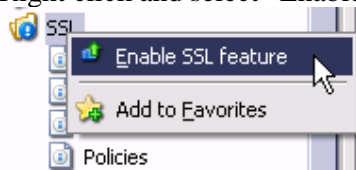
<http://gnuwin32.sourceforge.net/packages/openssl.htm>

Upload Certificates


On the XenApp5 server desktop SSL certificates are stored for each Netscaler VPX.

There are several ways on how to upload the certificates one of them is mentioned below:

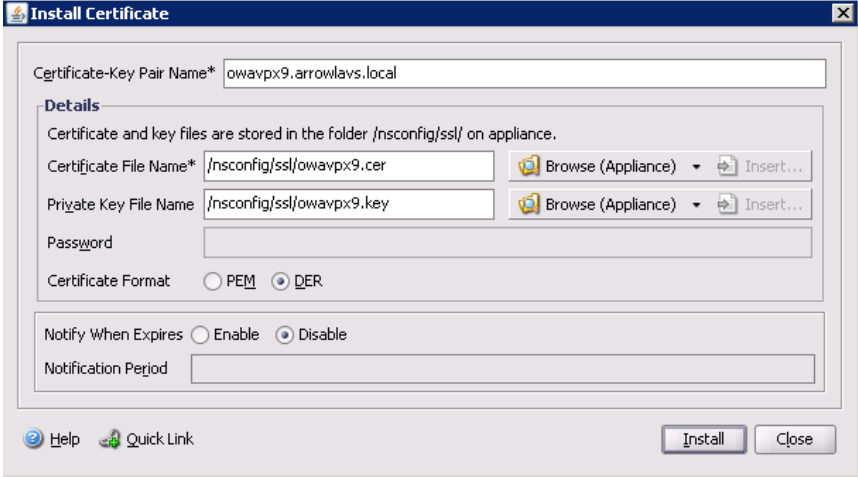
- Login to the Web based Mgmt interface
- Right click and select “Enable SSL feature”




- Click “Manage Certificates / Keys / CSRs” on the SSL configuration page
- Upload your Certificate files :
 - Private Key (which is normally generated locally on the box) :
owavpx1...9.key (you can find it on the XenApp desktop)
 - Public Key
owavpx1...9.cer (you can find it on the XenApp desktop)
- Open hive “SSL” and click on “Certificates”

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- Click “Add ...” and match the .key-file with the .cer-file.



- Click “Install” and close

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Lab 2 : Make SSL Offload configuration for Outlook Web Access using AppExpert

AppExpert Templates

AppExpert Templates are templates that define the way a web application works and how the loadbalancing, rewrite, cs, waf, compression, ... should be configured.

You can make a AppExpert Template Definition and export it, which you can share so other users can re-use it without the need to analyse the application themselves.

You can find existing Citrix Netscaler AppExpert Templates here :

<http://community.citrix.com/display/ns/AppExpert+Templates>

OWA, Sharepoint, SAP Enterprise SOA, Oracle EBS, Siebel, JD Edwards, ...

More documentation about the AppExpert functionality can be found here :


<http://support.citrix.com/article/ctx121835>

In the next little lab we will use an AppExpert template to SSL offload an Outlook Web Access .

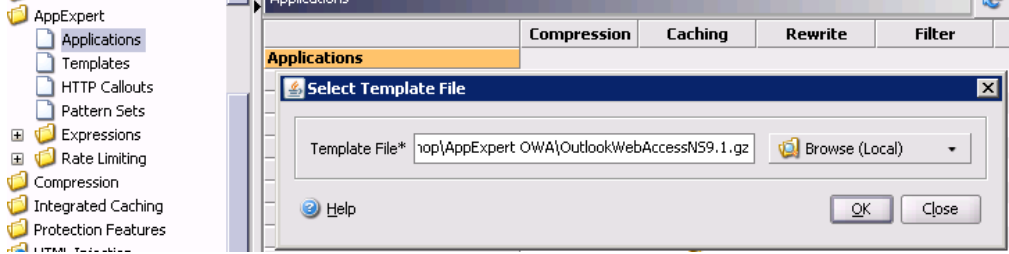
Import AppExpert Template

- Run batch (this step is not always needed but for OWA it is)
 - Open hive "System" and click "Diagnostics"
 - Click "Batch configuration"
 - Click "Browse Local"
 - Browse to the desktop folder "Netscaler Workshop" and open "AppExpert OWA"
 - Select "OWAvpx1...9.batch (make sure you have the matching number)"
 - And click "Run"
 - If you would like to see the output, you can browse to "System" → "Diagnostics" and click "Download core files..."
 - Your batch-output-logfile can be downloaded from there.

- Import template
 - Go to "AppExpert" → "Applications"
 - Click "Import"

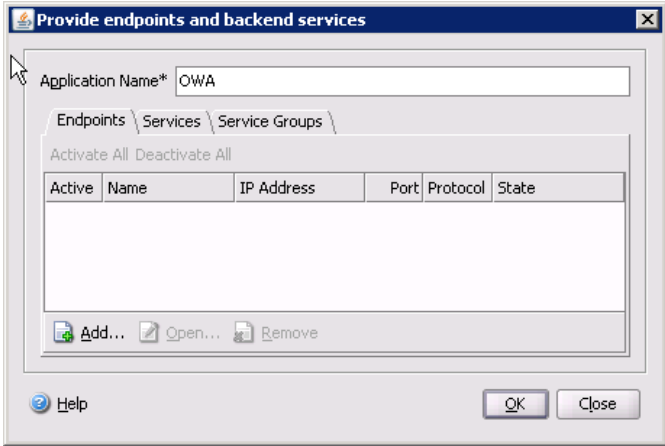
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- Select the “OutlookWebAccessNS9.1.gz” file on the XenApp Desktop “Netscaler Workshop” folder



- Click “OK”

- **Configure Endpoints :** This is the listener that will take the SSL-connections from the users.
- Configure Services :** This is the configuration link to the back-end servers (in this case the Exchange Servers)
- Configure Service Groups :** This is the configuration link Not needed in this config



- **Configure Endpoints (listener)**
 - Click “Add ...”
 - Name : owavpx1...9.arrowlabs.local
 - IP : 192.168.3.x3
 - Port : 443
 - Go to SSL Settings and link the correct certificate

Topic : Netscaler VPX from Express(free) to Platinum

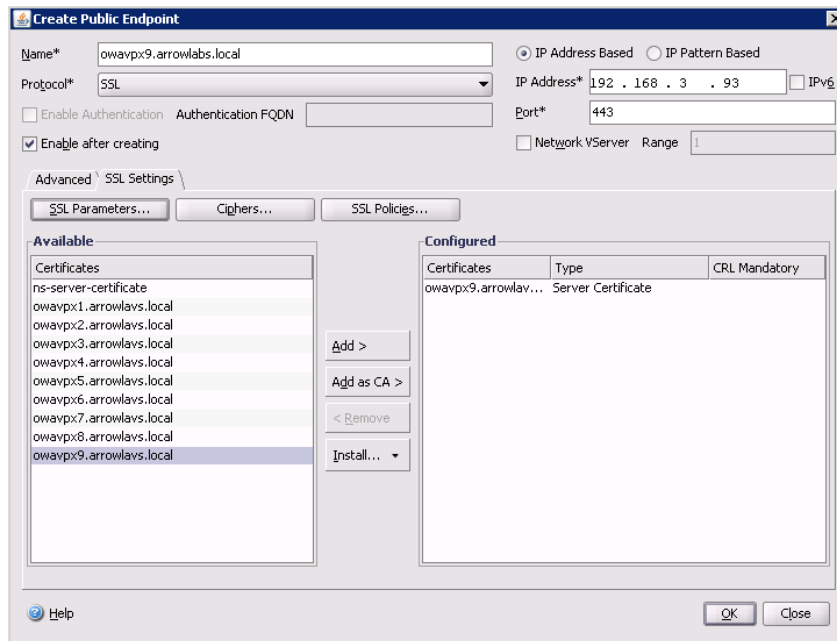
Date document : 26/02/2010

Consultant(s) :
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Mokrane Hellal

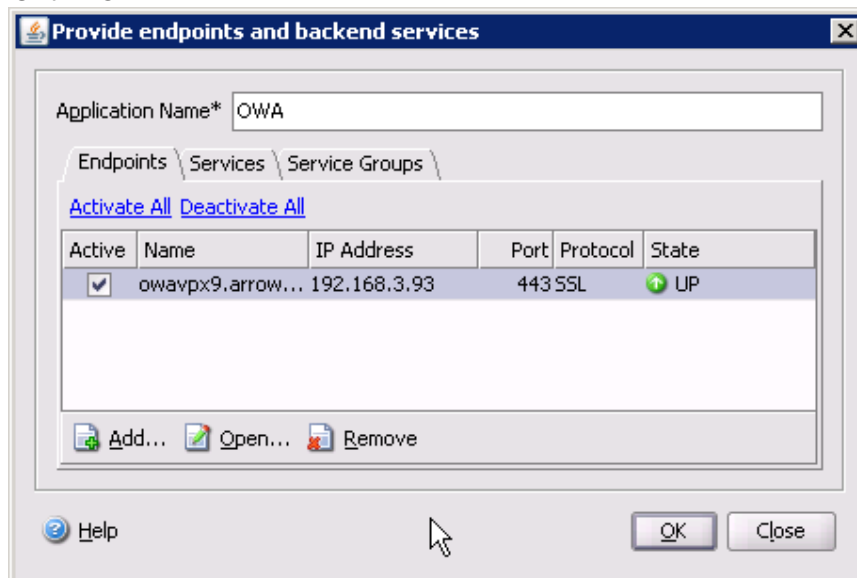
Customer (BP) :
-

Sent to :
Attendee's

Réf. document :
v.0.2



Click "OK"



- Configure Services (back-end)
 - Click "Services"
 - Click "Add ..."
 - Service Name : owaback-end
 - Server : 192.168.1.122 (IP of our Exchange server)

Topic : Netscaler VPX from Express(free) to Platinum

**Date document :
26/02/2010**

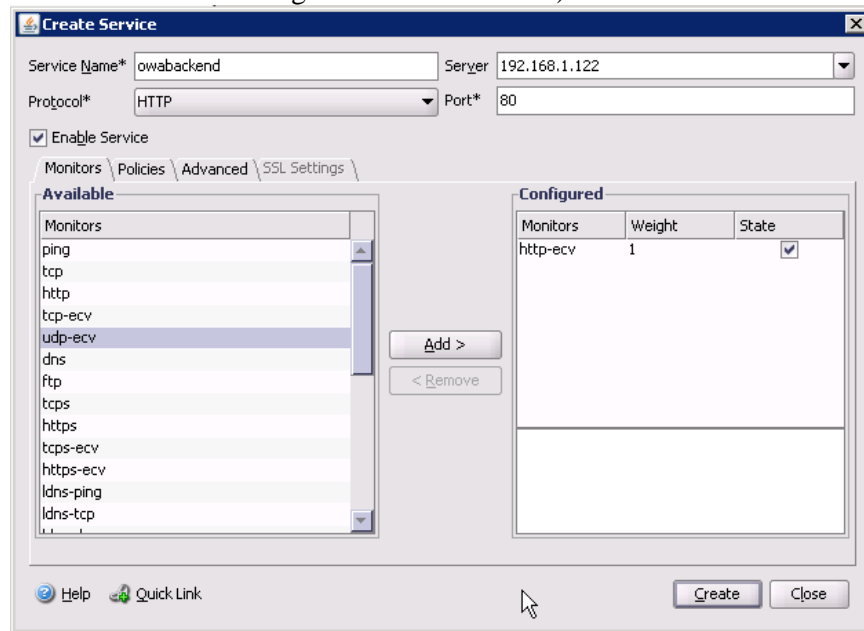
Consultant(s) :
Koen Warson
Mokrane Hellal

Customer (BP) :
-

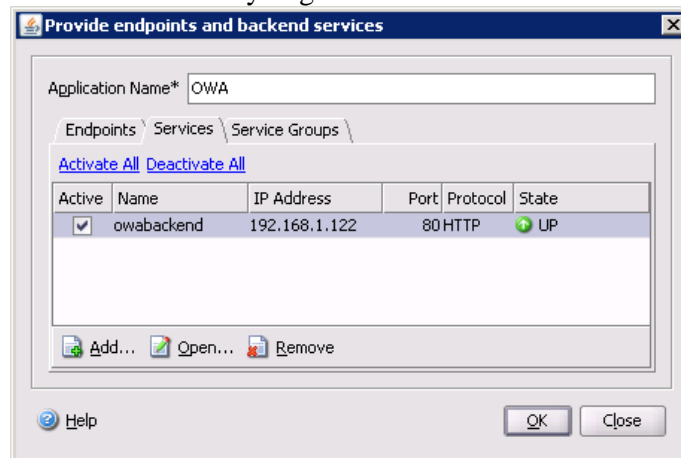
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Port : 80
 Add Monitor : http-ecv (This is a monitor which does more then just open a connection an port 80 but it checks for a proper http reponse, configurable in more detail)



- o Click “Create” and you get the screen below




- o Service Groups is not needed in this configuration.
- o Click “OK”

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- If you get a question to refresh, please do so by clicking “yes”.

Applications		Refresh	Add to Favorites			
Applications	Compression	Caching	Rewrite	Filter	Responder	Application
OWA						
RedirectToHTTPS	+	+	+	+	+	+
Certificates	+	+	+	+	+	+
ServerPages	+	+	+	+	+	+
Documents	+	+	+	+	+	+
StylesScripts	+	+	+	+	+	+
Images	+	+	+	+	+	+
DigitalMedia	+	+	+	+	+	+
ArchiveFiles	+	+	+	+	+	+
default	+	+	+	+	+	+

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Lab 3 : Web Application Firewall

Hack my bank site

In this lab we will show how to hack a badly protected website.

It is a demo-website : <http://demo.testfire.net>

The key example of a website full of vulnerabilities.

Let's hack it with a SQL-injection

- Use your browser to go to : <http://demo.testfire.net/>
- Click "Sign-in"
- Type Username : "jsmith"
- Type Password : "test' OR '1'='1"
- Thanks to this SQL injection you will see you can login without a password.

Let's protect

- Use your web browser to go to the MgMt GUI of your Netscaler
- Create the web service for the so-called back-end which is <http://demo.testfire.net>
 - Open hive "Load Balancing"
 - Click "Services"
 - Click "Add..."
 - Servicename : demo.testfire.net
Server : 65.61.137.117
Port : 80

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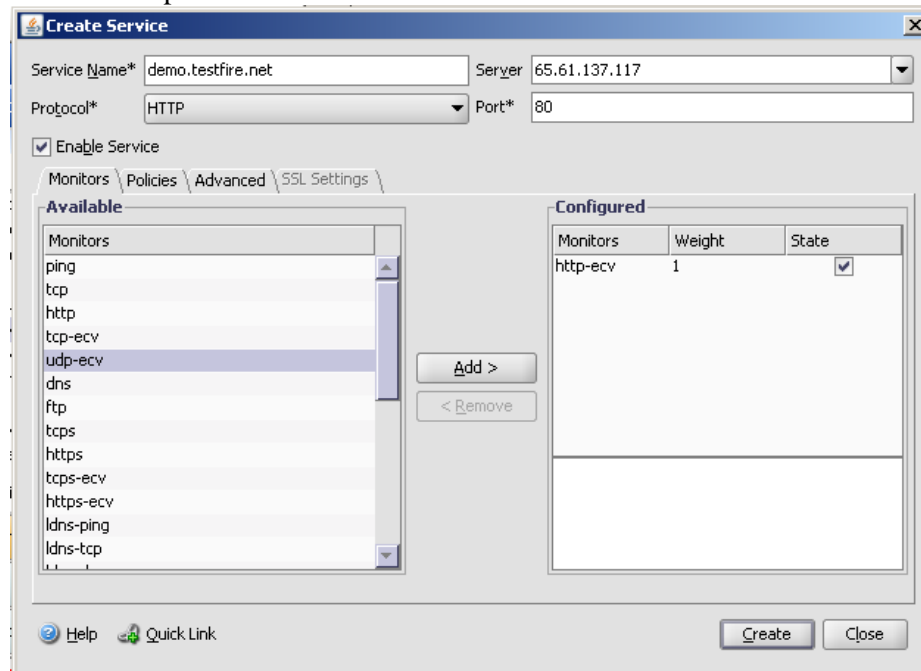
Consultant(s) :
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Mokrane Hellal

Customer (BP) :
-

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Monitor : http-ecv



- Click "Create"
- Click "Close"
- Create the LB-listener
 - Open hive "Load Balancing"
 - Click "Virtual Servers"

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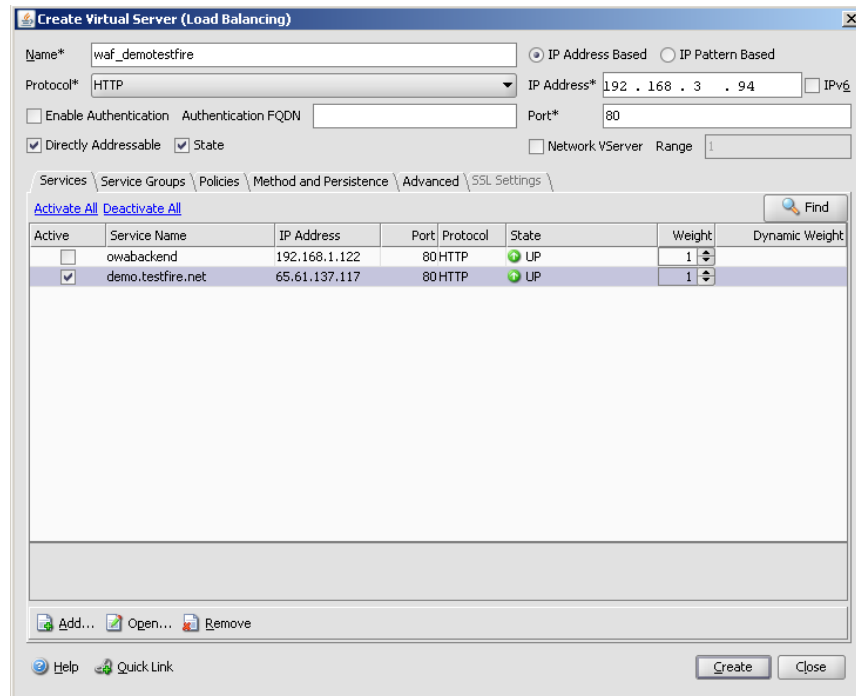
Consultant(s) :
Koen Warson
Mokrane Hellal

Customer (BP) :
-

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- Click “Add...”

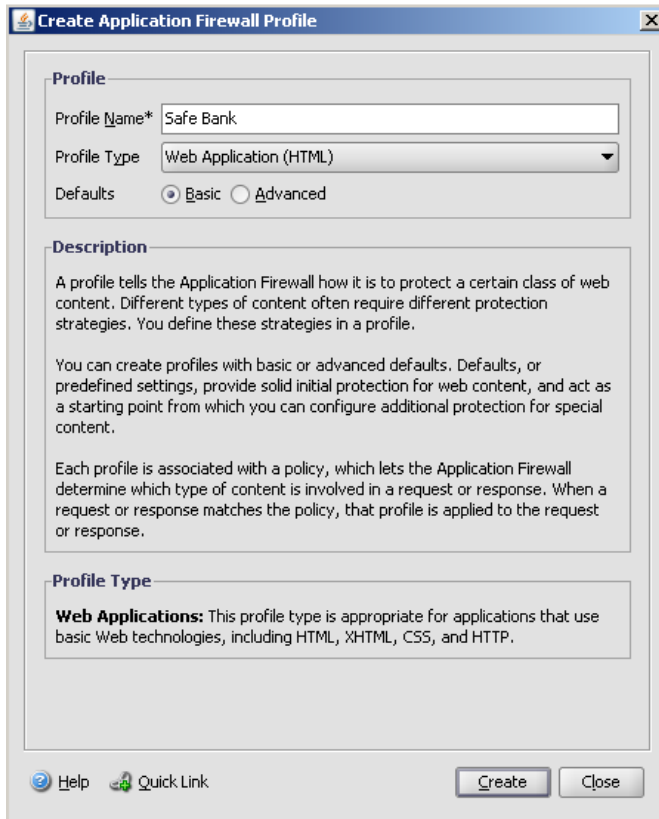


- Click “Create”
- Click “Close”

- Create WAF – Profile
 - Open hive “Application Firewall”
 - Click “Profiles”

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- Click “Add ...”



Create Application Firewall Profile

Profile

Profile Name*

Profile Type

Defaults Basic Advanced

Description

A profile tells the Application Firewall how it is to protect a certain class of web content. Different types of content often require different protection strategies. You define these strategies in a profile.

You can create profiles with basic or advanced defaults. Defaults, or predefined settings, provide solid initial protection for web content, and act as a starting point from which you can configure additional protection for special content.


Each profile is associated with a policy, which lets the Application Firewall determine which type of content is involved in a request or response. When a request or response matches the policy, that profile is applied to the request or response.

Profile Type

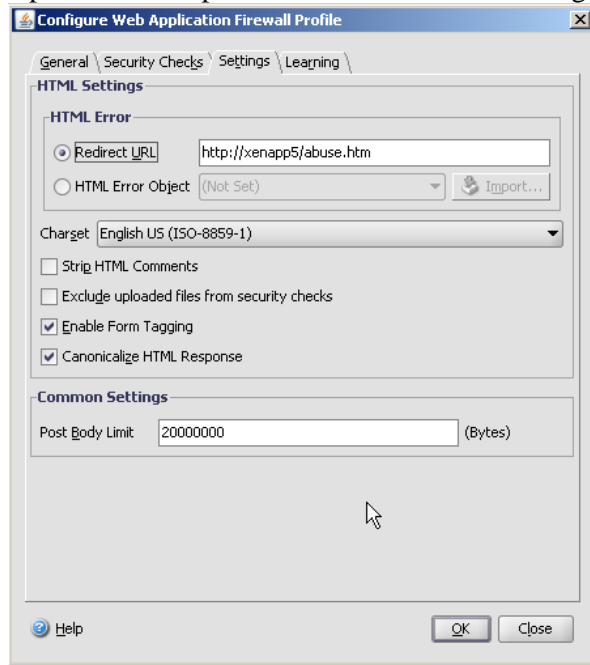
Web Applications: This profile type is appropriate for applications that use basic Web technologies, including HTML, XHTML, CSS, and HTTP.

[Help](#) [Quick Link](#)

- Fill in the dialog box and click “Create” and “Close”

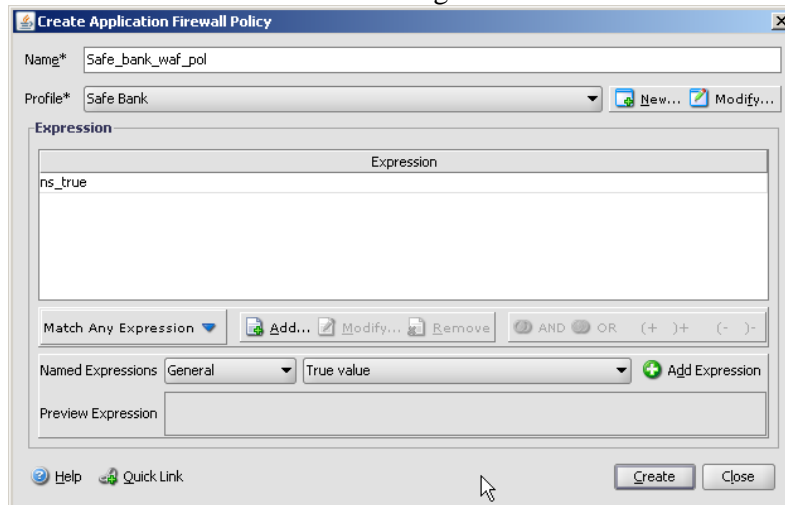
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- Open the WAF-profile and click on tab “Settings”



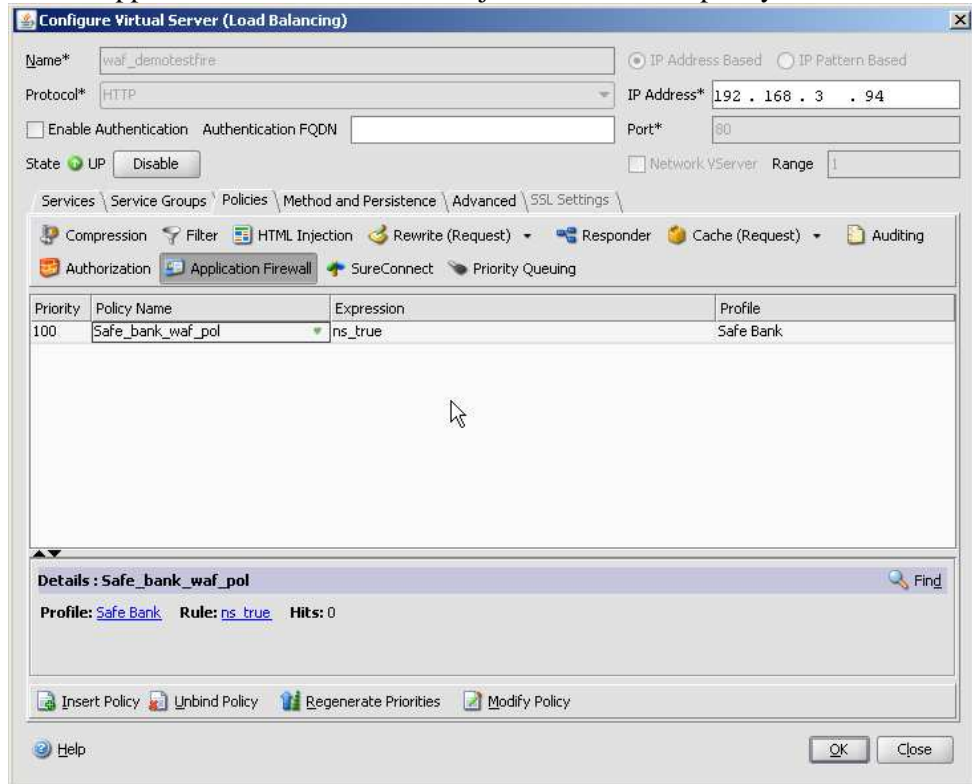
Add a redirect to : <http://xenapp5/abuse.htm>

- Click “OK”
- Create WAF – Policies
 - Click “Application Firewall”
 - Click “Policies”
 - Click “Add ...” and fill in the dialog as follows :



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- Click “Close”
- Link the Web Application Policy to the LB Virtual Server
 - Open hive “Load Balancing”
 - Open “Virtual Servers”
 - Open Virtual Server “waf_demotestfire” and click the tab “Policies”
 - Click “Application Firewall” and a the just created WAF policy.



- Click “OK”
- Click “Close”

Let's try to hack it again with a SQL-injection and see if the site is protected

- Use your browser to go to : <http://192.168.3.x4>
- Click “Sign-in”

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- Type Username : “jsmith”
- Type Password : “test’ OR ‘1’=’1”
- Will WAF intercept ?