



Citrix雲端服務應用傳遞與虛擬化技術整合方案

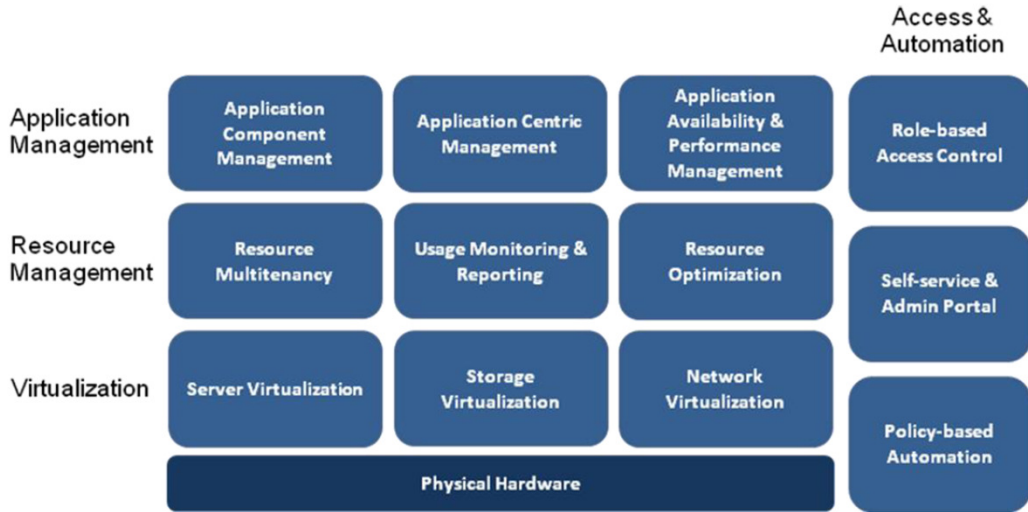
何浩祥(Jerry Ho)
台灣區技術顧問(Networking)
Citrix Systems

Citrix在雲端應用現況

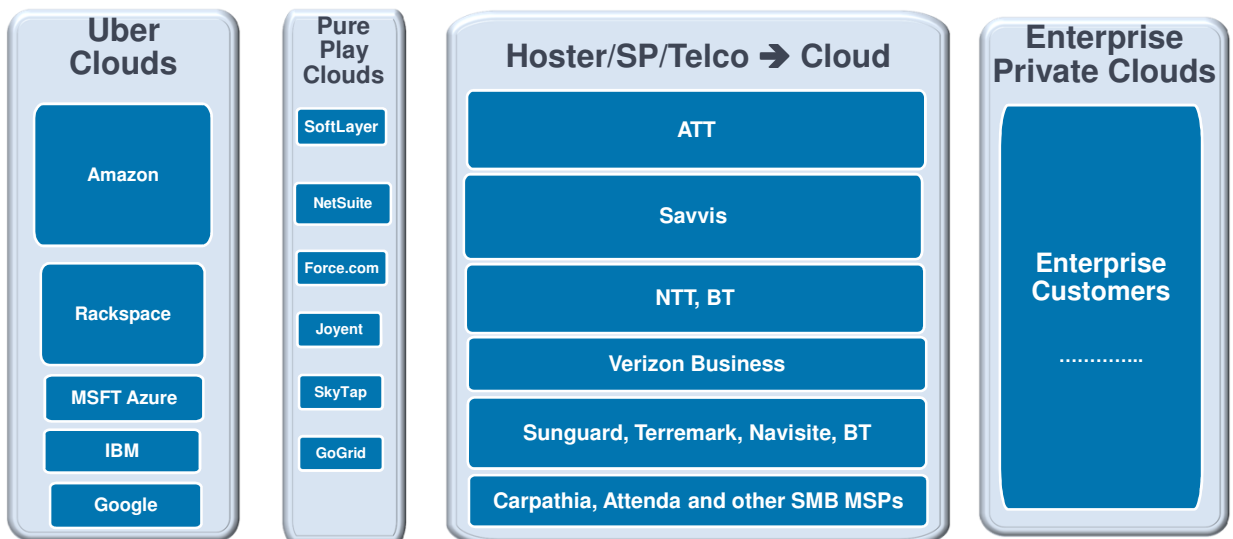


- Citrix NetScaler delivers the Cloud
 - 75% of Internet (cloud) traffic goes through a NetScaler
 - Cloud/Web 2.0 : Google, eBay, Yahoo!, e*trade, amazon.com, AOL, etc.
- Xen and Citrix XenServer power clouds
 - Largest cloud implementation built on open source Xen
 - Most common deployment platform for public clouds
- Citrix OnLine delivers Software as a Service
 - Citrix OnLine #5 SaaS offering
 - 100 Million Online SaaS Sessions

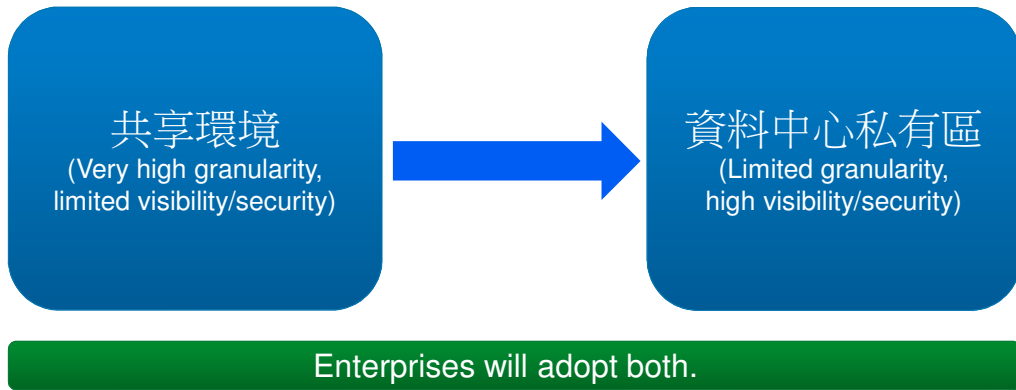
雲端建構藍圖



雲端市場類型



雲端服務的持續發展



發展雲端主要問題



資料中心轉變時的考量因素



企業資料中心

- 固定成本
- 完整控制
- IT 相關
- 固定容量
- 已知安全性

敏捷與可擴展的雲計算



1. 基礎設施改造成一個共享服務
2. 雲計算規模性能-無與倫比的實體縮放
3. 雲端Web 2.0與影音的加速
4. 支持簡單遷移與管理的應用程序基礎設施
5. 將企業的SLV要求帶到雲端



雲計算

- 實用成本模型
- 部份控制
- 自我服務
- 完全彈性
- 未知安全性

思杰雲計算的能量

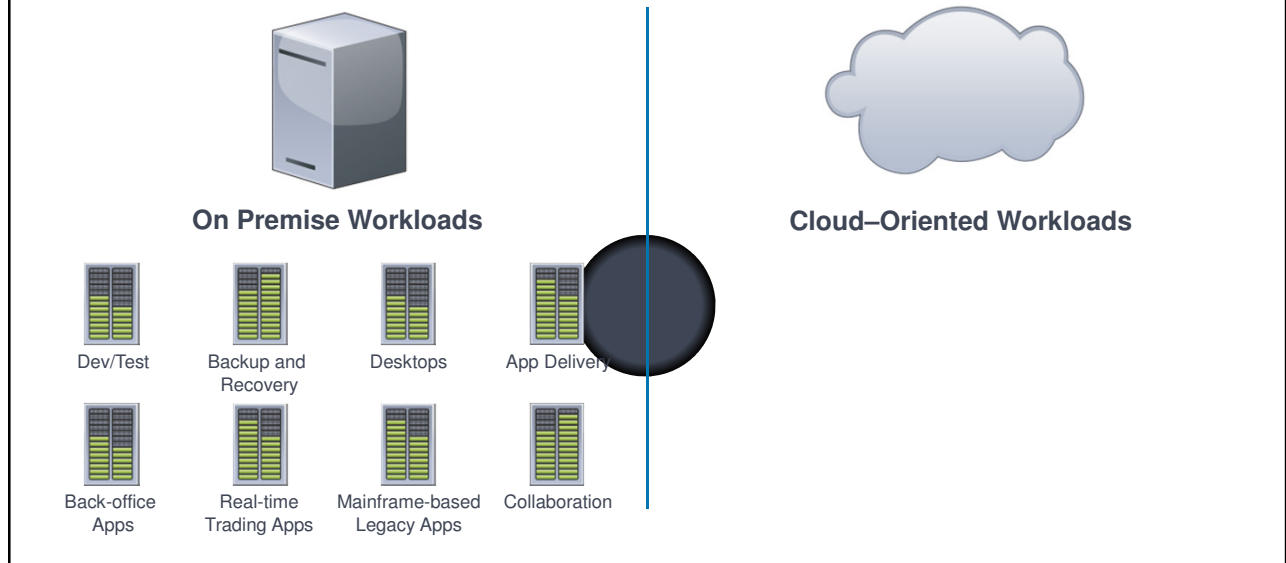
+600
Service Providers



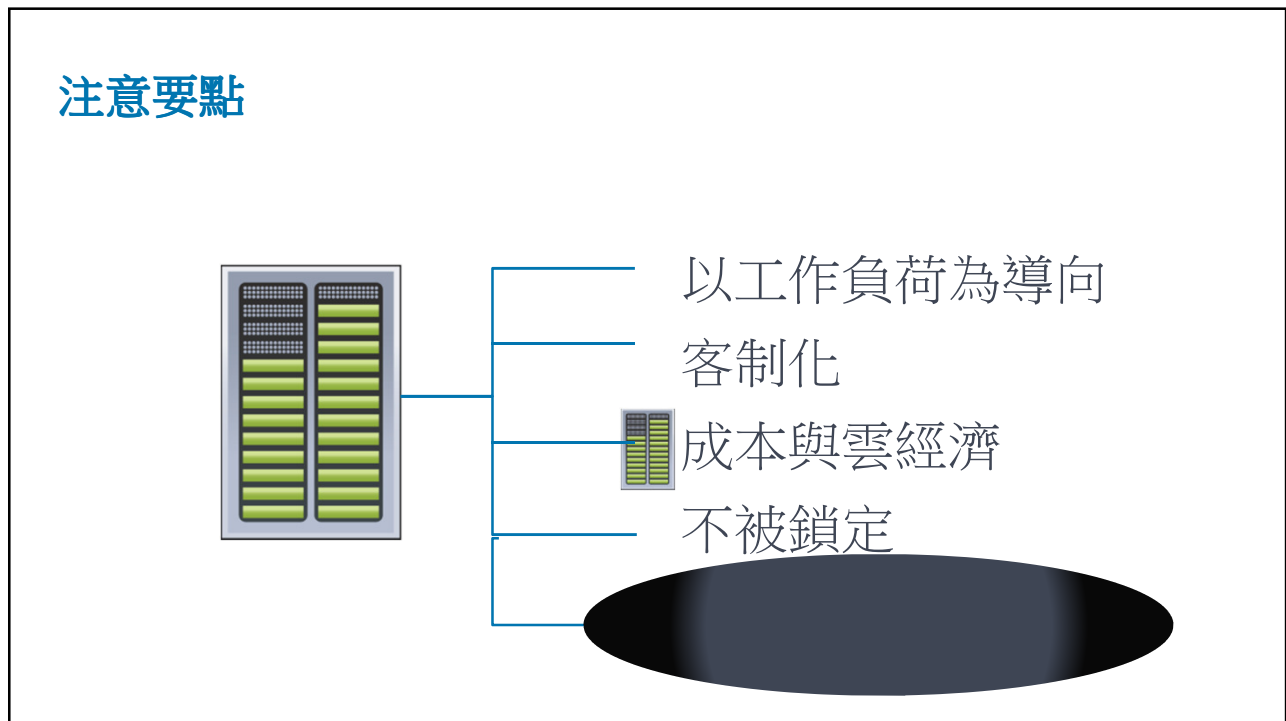
In < 3 quarters of launching
Citrix service provider program

- Apps on Demand → SaaS
- Compute and Networking on Demand → IaaS

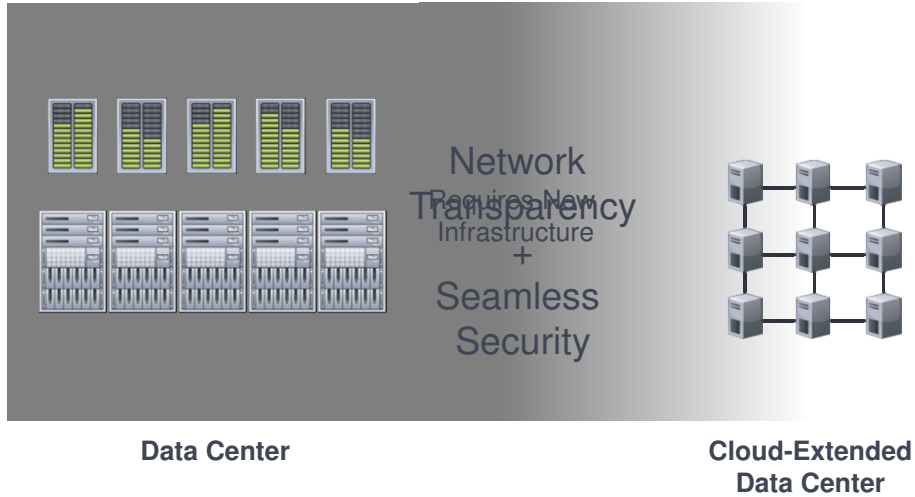
制定出一個務實的路徑：按照工作負荷



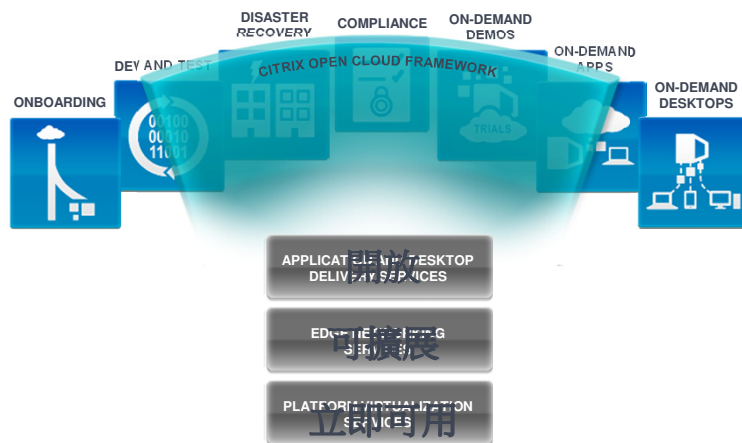
注意要點

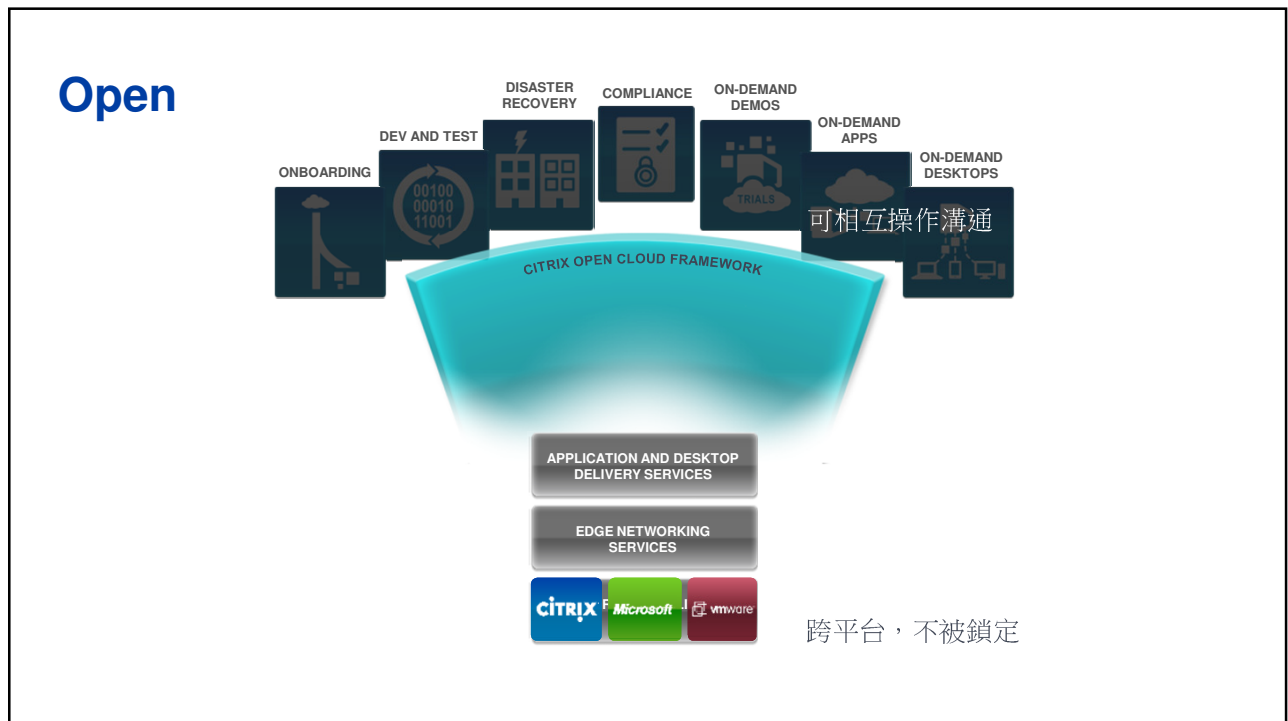
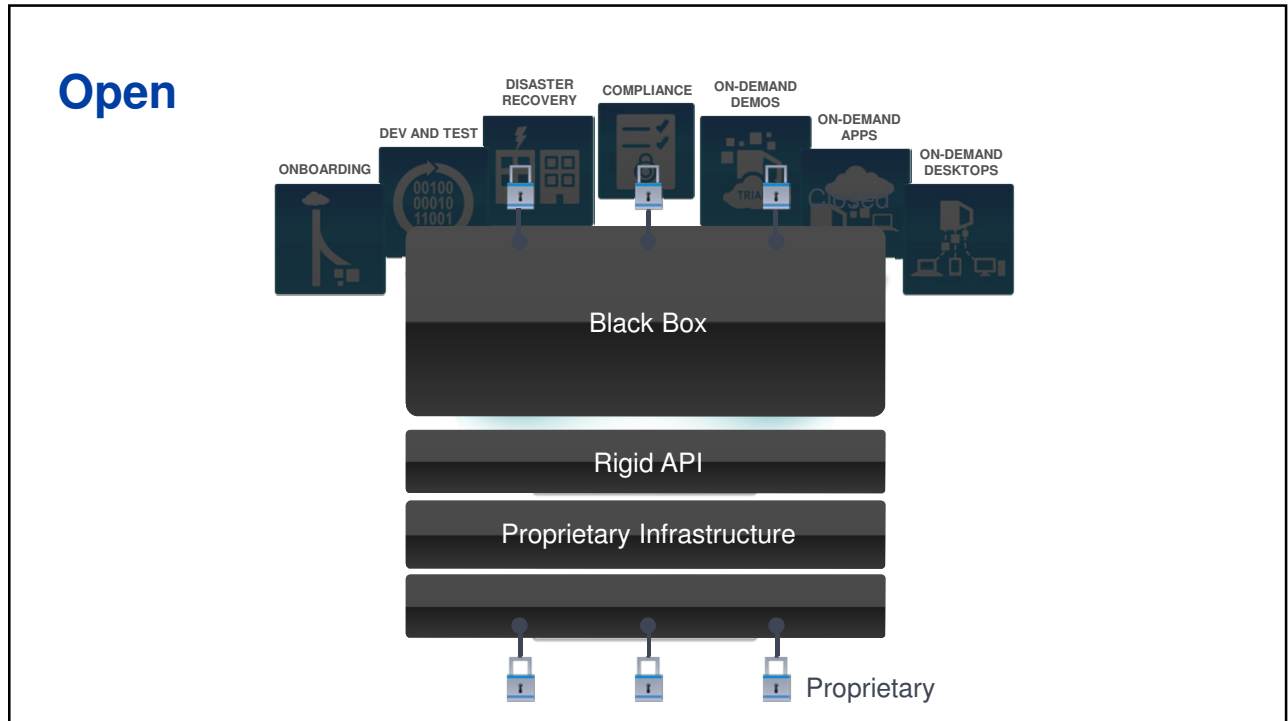


擴展至資料中心



思杰雲端服務解決方案

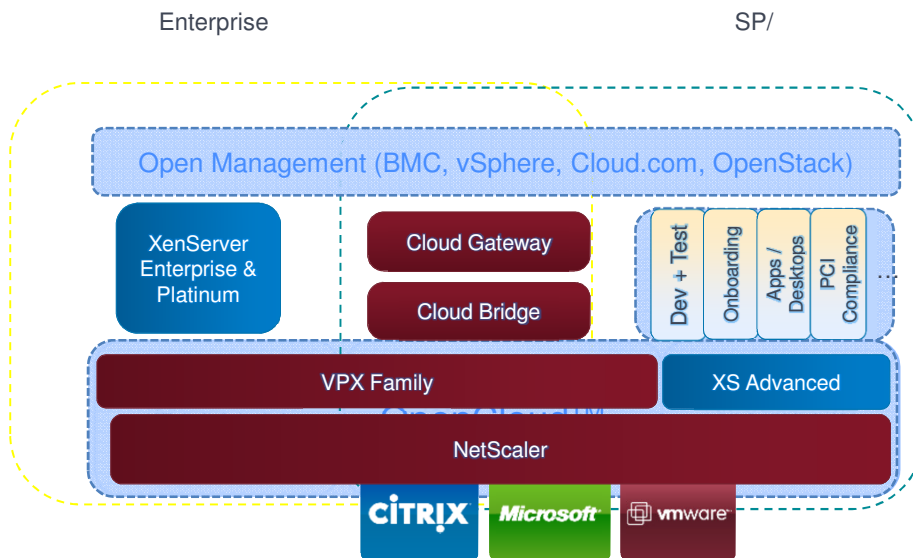






Delivering Cloud Services
with
Citrix Cloud Platform

應用架構



提供最嚴苛標準的應用傳遞服務



8,000+
Deployments Worldwide

75%
Of Internet Users

應用程式傳遞控制器的必要條件



NetScaler:簡化 Web應用交付

消除應用程序停機時間

提高性能達5倍

100%的WEB攻擊防護

有效降低Web服務器數量達60%

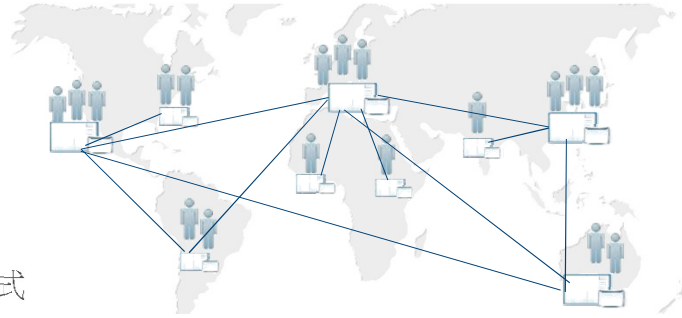


高可靠度

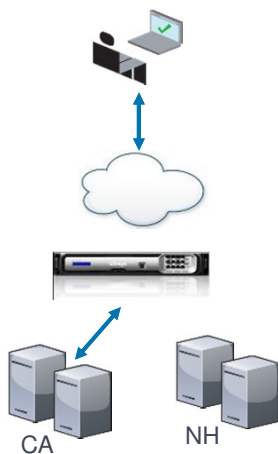


NetScaler最大限度地提高应用程序可用性

- 智慧型，站點間故障轉移
- 各站點間連線負載均衡
- 多樣式政策判斷條件：
 - 使用者連線數
 - 頻寬使用量
 - 站對健康狀態
- 支援“雲爆發”(Cloud Bursting)部署模式



七層內容交換

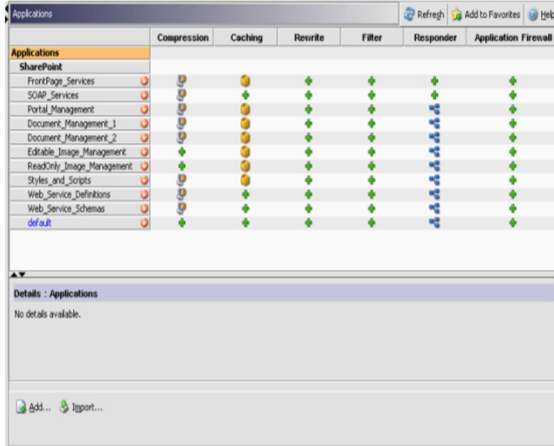


- L7 content switching
- HTTP header and body
- URL rewrite
- XML XPath support

`HTTP.REQ.Header("Accept-Language").CONTAINS("Chinese")`

NetScaler AppExpert 應用策略範本

AppExpert Templates



- Templates can be imported/exported
- Easily share/distributed app-specific configurations

Community.citrix.com



- Templates posted and shared
- Community participation

應用範例 – 客製化錯誤頁面

404 - Not found

go to root

HttpFileServer 2.2f
7/1/2011 12:50:40 PM

Started	Time	Sent	Received	Method	Result	Type	URL
00:00:08.501	0.070	323	125	GET	404	text/html	http://192.168.1.101/~img.txt
00:00:08.848	0.325	326	692	GET	200	image/gif	http://192.168.1.101/favicon.ico
00:00:08.899	0.534	326	692	GET	200	image/gif	http://192.168.1.101/favicon.ico

Request Header	Value	Response Header	Value
(Request-Line)	GET /~img.txt HTTP/1.1	(Status-Line)	HTTP/1.1 404 Not Found
Host	192.168.1.101	Content-Type	text/html
User-Agent	Mozilla/5.0 (Windows NT 6.1; rv:5.0) Gecko/20100101 Firefox/5.0	Accept-Ranges	bytes
Accept	text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8	Server	HFS 2.2f
Accept-Language	zh-tw,en-us;q=0.7,en;q=0.3	Content-Encoding	gzip
Accept-Encoding	gzip, deflate		
Accept-Charset	UTF-8,*		
Connection	keep-alive		

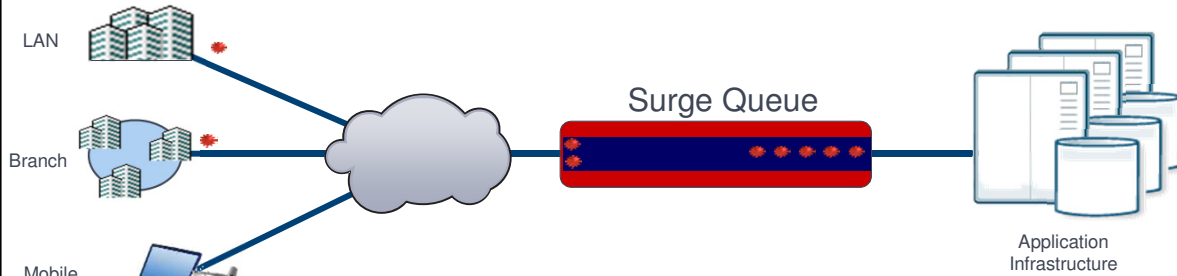
應用範例 – 客製化錯誤頁面

"The Content is not Exist, 物件不存在"

Started	Time	Sent	Received	Method	Result	Type	URL
00:00:01.769	0.053	323	40	GET	200	text/plain	http://192.168.1.101/~img.txt
00:00:01.857	0.277	326	692	GET	200	image/gif	http://192.168.1.101/favicon.ico
00:00:01.892	0.489	326	692	GET	200	image/gif	http://192.168.1.101/favicon.ico

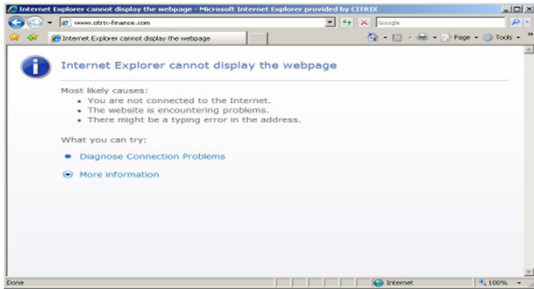
Request Header	Value	Response Header	Value
(Request-Line)	GET /~img.txt HTTP/1.1	(Status-Line)	HTTP/1.1 200 OK
Host	192.168.1.101	Host	192.168.1.101
User-Agent	Mozilla/5.0 (Windows NT 6.1; rv:5.0) Gecko/20100101 Firefox/5.0		
Accept	text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8		
Accept-Language	zh-tw,en-us;q=0.7,en;q=0.3		
Accept-Encoding	gzip, deflate		
Accept-Charset	UTF-8,*		
Connection	keep-alive		

流量激增防護



- Maintains optimal traffic rate to the server
- Does not drop valid traffic surges
- Results in optimal end user response time

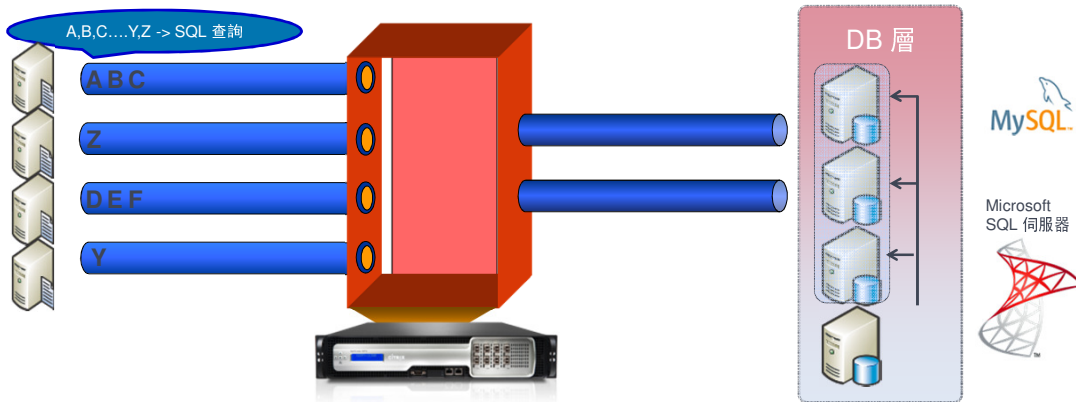
NetScaler SureConnect



Before NetScaler

After NetScaler

Datastream – 資料庫負載均衡



效能提昇

橫向擴容

高可用

NetScaler Datastream效益

效能提昇



- SQL 多工
 - 擴展 TCP 連結
 - 在伺服器上託管更多資料庫 (DB)
 - 減少 SQL 許可證數量
- SQL 連接卸載
 - 節約記憶體/CPU
 - 更快速查詢執行

橫向擴容

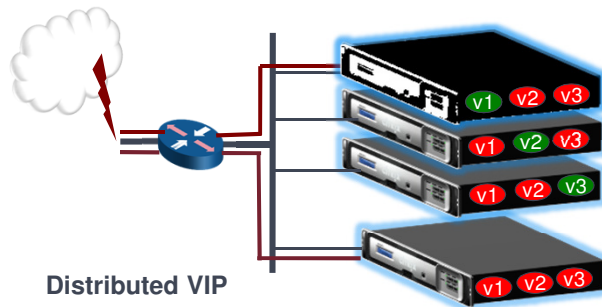
- 本地 SQL 負載均衡
 - 請求交換
 - 應用程式回應速度更快
- SQL 感知策略
 - 讀/寫分離
 - 細微性控制

高可用

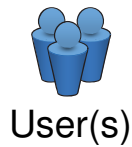
- 自動 IP 故障恢復
 - 虛擬基礎 IP
 - 更低成本的高可用性
- 智慧型監控
 - 同步狀態感知

N+1 High Availability

- All NetScaler nodes can actively pass traffic
- Optimizes utilization and increases capacity of NetScaler pools
- No configuration changes to upstream router
- Helps meet SLAs



AppExpert Rate Controls 幫助區隔關鍵應用資源



User(s)

- IP Address
- IP Range/Subnet
- Cookie Value
- Wildcards
- Any header or payload...



Rate

- Requests
- Packets
- Bandwidth



Time

- Measured in milliseconds



Object

- Vserver IP
- URL/URI
- Image
- File
- Any header or payload...



Action

- Throttle
- Invoke Policy
 - Responder
 - Rewrite
 - Cache
 - etc.
- Alert
 - Log
 - Trap



針對不同的應用和資源配置訪問策略

案例分析-線上交易網站

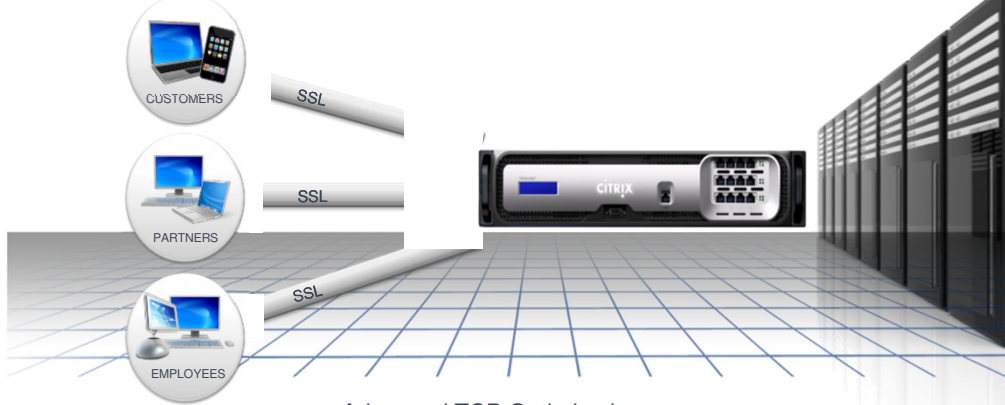
- 應用特點：
 - 利用Citrix NetScaler 內容交換技術實現差異性服務



服務加速與效能提昇



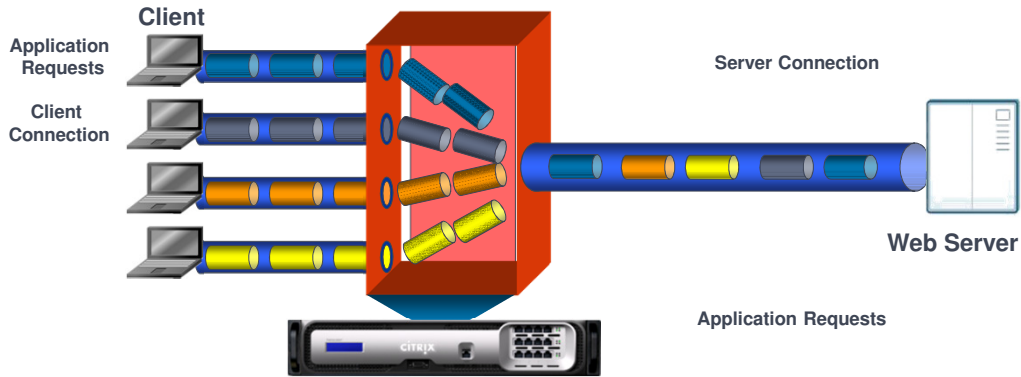
加速應用交付



- Advanced TCP Optimization
- Static and Dynamic Caching
- Hardware Compression

Enhanced User Productivity

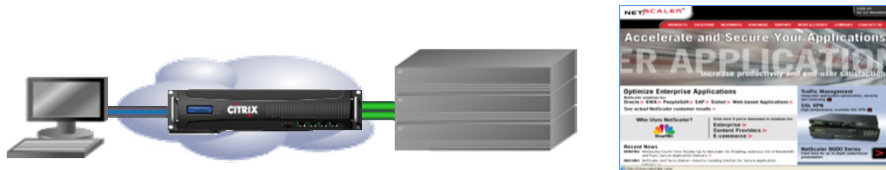
TCP Connection Offload and Multiplexing

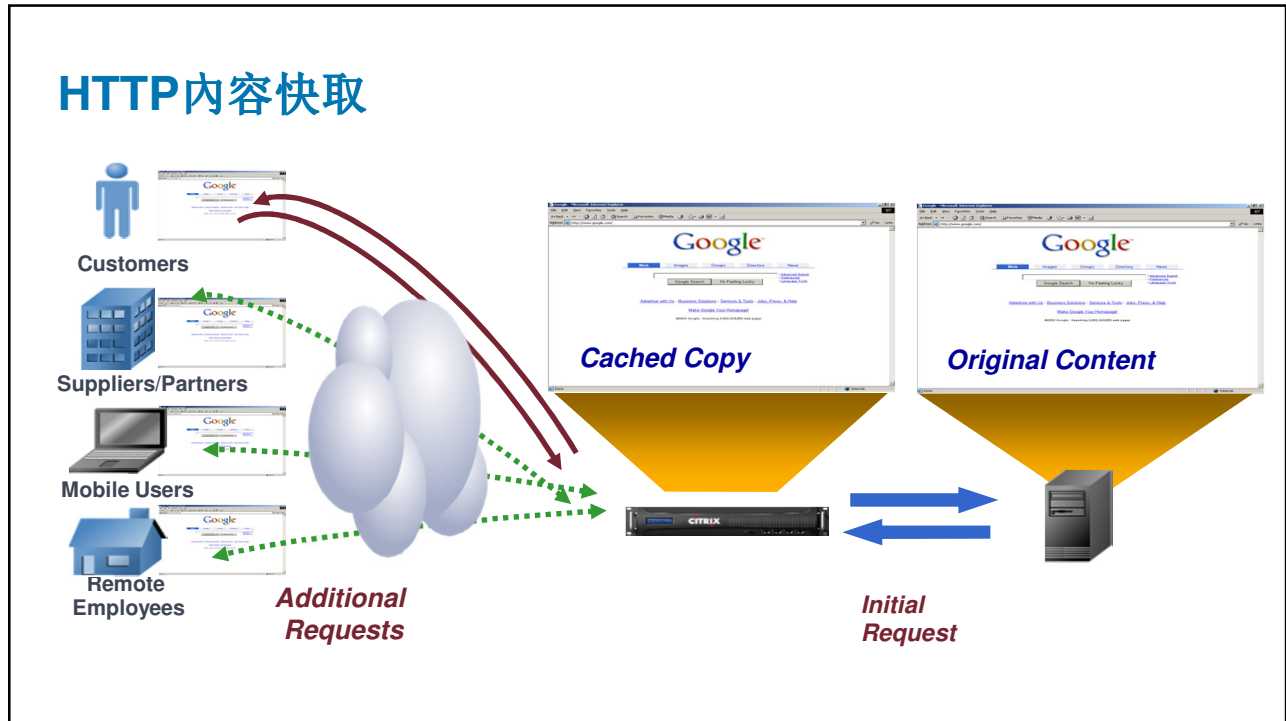


- NetScaler terminates connection
- Client transmits requests
- NetScaler establishes server connection
- NetScaler transmits client requests
- Other clients follow same procedure
- Multiple client requests are transmitted across common server connection

HTTP (Web) 壓縮

- NetScaler 通透式內容壓縮
 - Maximize payload per packet
 - Increase application performance





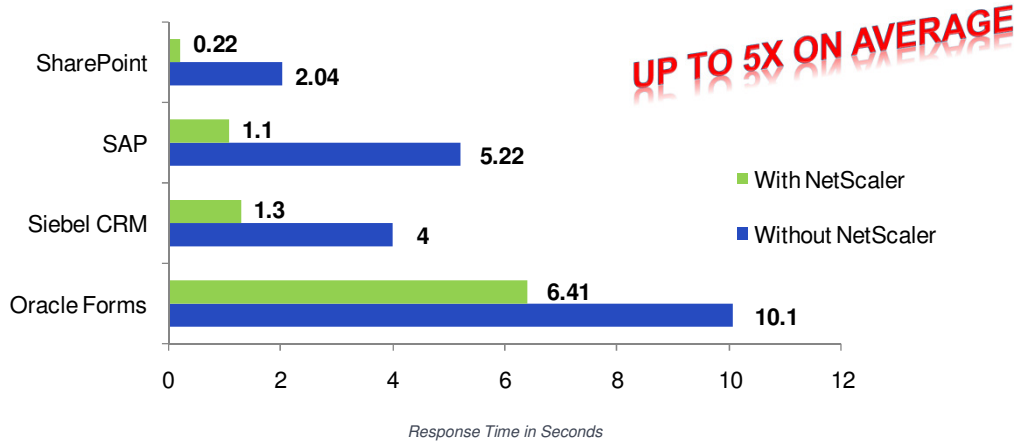
擴展Memory Cache

2GB Cache

Up to 24 GB Cache

- Optimize and offload delivery of multimedia files
- “Hot Content” – videos, podcasts, images
- “Long Tail” – marketing collateral, presentations, documents, enterprise apps (e.g. SharePoint, SAP, Oracle)

NetScaler加快應用交付

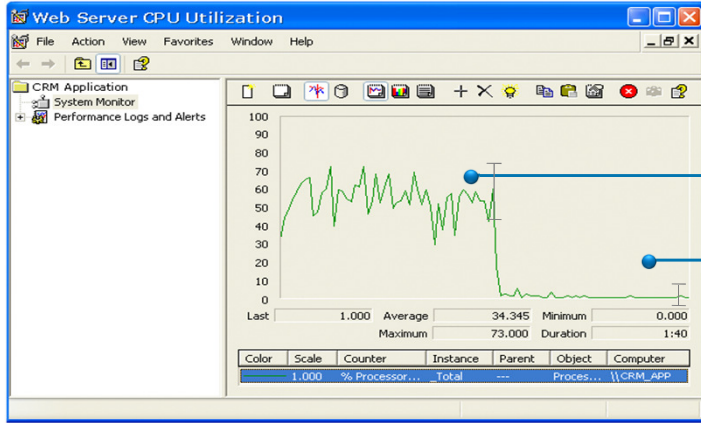


減少服務器上的負載



Supports greater user capacity and more apps with minimal investment

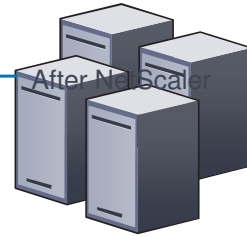
減少了60%的服務器



- SSL Offload
- TCP Multiplexing and Buffering
- Static and Dynamic Caching
- Compression

Before NetScaler

After NetScaler



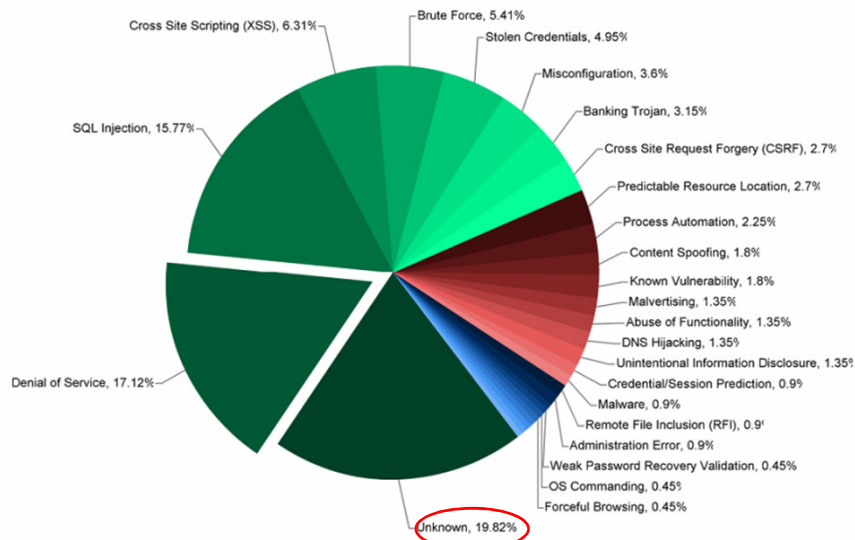
實際效益案例

客戶	服務器卸載	其它效益
dRemate	50%	<ul style="list-style-type: none"> • Improved response time by 110% • 40% savings on mgmt. costs
LiveNation	50%	<ul style="list-style-type: none"> • Capacity to support 100X traffic spikes
SINA	66%	<ul style="list-style-type: none"> • Significant decreases in application latency and mgmt. costs
Transport for London	95%	<ul style="list-style-type: none"> • 10X improvement in application performance • 60% reduction in application latency
Userplane	87%	<ul style="list-style-type: none"> • Estimated \$390K savings in capital investment

安全



2010網站攻擊手法



Source: Web Hacking Incident Database(WHID) in 2010 of WASC

Sony被攻擊後，轉而使用Citrix NetScaler

Whats that site running?

OS, Web Server and Hosting History for us.playstation.com

http://us.playstation.com was running Apache on Citrix Netscaler when last queried at 29-May-2011 09:52:32 GMT - refresh now Site Report [FAQ](#)

Try out the Netcraft Toolbar!

OS	Server	Last changed	IP address	Netblock Owner
Citrix Netscaler	Apache	27-May-2011	72.52.6.25	Prolexic Technologies, Inc.
unknown	Apache	15-May-2011	72.52.6.25	Prolexic Technologies, Inc.
Citrix Netscaler	Apache	14-May-2011	72.52.6.25	Prolexic Technologies, Inc.
unknown	Apache	12-May-2011	72.52.6.25	Prolexic Technologies, Inc.
Citrix Netscaler	Apache	6-May-2011	72.52.6.25	Prolexic Technologies, Inc.
Citrix Netscaler	Apache	5-May-2011	72.52.6.25	Prolexic Technologies, Inc.
Citrix Netscaler	Apache	17-Apr-2011	72.52.6.25	Prolexic Technologies, Inc.
Linux	Apache	15-Apr-2011	72.52.6.25	Prolexic Technologies, Inc.
Citrix Netscaler	Apache	9-Apr-2011	72.52.6.25	Prolexic Technologies, Inc.
Linux	Apache	5-Apr-2011	173.203.129.45	Sony Computer Entertainment

Citrix NetScaler融合多種應用安全



- 4th Gen Web App Firewall
- Fastest App Firewall (12 Gbps)
- Best Price-Performance

- First to implement learning (Teros)
- First to implement positive security
- Fine-grained policy driven



NetScaler MPX and VPX

功能特點

- 全功能的Web Application Firewall
 - HTTP 與 XML 攻擊防護
 - 資料洩漏防護
 - 混合式安全模型
 - 速率控制, 豐富的AAA, 政策導向
 - 榮獲FIPS, Common Criteria 與 ICISA 認證
- 集中化管理
 - 軟體式管理平台
 - 可透過APIs做自動化管理
 - Role-based administration
- 最快的 Web App Firewall (可達12 Gbps)
- 低延遲, inline 部署



02 Jun 2010 05:21 PM EDT
NetScaler Application Firewall and the OWASP Top 10 2010
 [Tags: security, application firewall, security, security, access-gateway]
 posted by [james.konradi](#)

The Open Web Application Security Project(OWASP) recently released the OWASP Top 10 for 2010 for web application security. This list documents the most common web application vulnerabilities and is a great starting point to evaluate web security. Here we detail how to configure the NetScaler Application Firewall to mitigate these flaws. The Application Firewall is available as an integrated module in the NetScaler Application Delivery Controller adding to the high performance load balancing functions. It is also available as a full range of firewall appliances on the same NetScaler NFX hardware appliances delivering the fastest Web Application Firewall in the market today.

The full OWASP Top 10 document is available at [OWASP Top 10 for 2010](#).

I assume some familiarity with the NetScaler Application Firewall configuration and features. Some of the OWASP Top 10 refer to the broader security environment (like Insecure configuration, SSL) etc but the relevant NetScaler specific configuration is noted. The OWASP Top 10 is best used as a starting point to gauge your web application security. NetScaler offers a much richer set of functionality beyond that covered by this list.

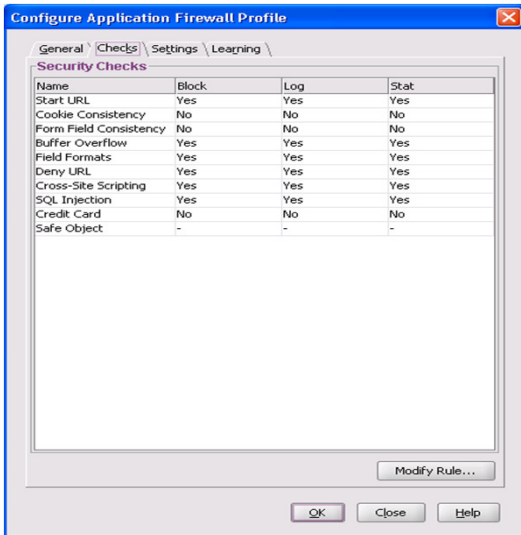
OWASP Top 10 – 2010	NetScaler feature
A1 - Injection	Injection attack prevention (SQL/Custom)
A2 - Cross Site Scripting (XSS)	XSS attack prevention
A3 - Broken Authentication and Session management	AAA, Cookie Tampering protection, CSRF tagging, Use SSL
A4 - Insecure Direct object references	Form field consistency, field format, AAA
A5 - Cross Site Request Forgery (CSRF)	CSRF form tagging, Referrer header validation
A6 - Security Misconfiguration	PCI reports
A7 - Failure to Restrict URL access	Start URL protection with URL closure
A8 - Unvalidated Redirects and Forwards	Policy control, field format protection configuration, Referrer header scrubbing
A9 - Insecure Cryptographic storage	Applicable to backend server infrastructure. FIPS compliant model available for securing keys on Firewall device itself
A10 - Insufficient Transport Layer protection	Use SSL with strong keys and ciphers.

The full document is available as a whitepaper for download ([NetScaler Application Firewall and the OWASP Top 10 2010](#)).

Hybrid Security Model



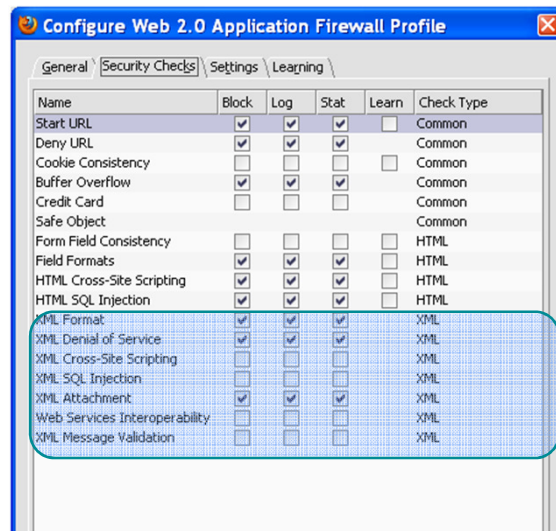
Protections



- Entry Points (Start URL)
- Cookie Consistency
- Form Field Consistency
- Buffer Overflow
- Field Formats
- Deny URLs
- XSS/SQL protection
- Credit Card Exit Control
- Safe Object

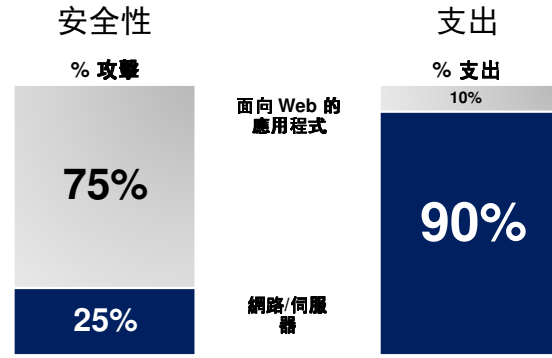
Integrated HTML and XML Security

- XML Security
 - Threat Protection
 - Content Validation
 - Data Leak Prevention
 - Reporting and Monitoring
- Secures all flavors of XML Applications (not just SOAP)
- Single devices for XML, HTML and Web 2.0 applications security
- Check types are categories as HTML, XML or Common
- Block, Log and Statistics can be enable for all checks.



整合 XML 保護

- 防止 XML 攻擊
- 確保 XML 標準合規性
- 與應用程式防火牆模組全面整合



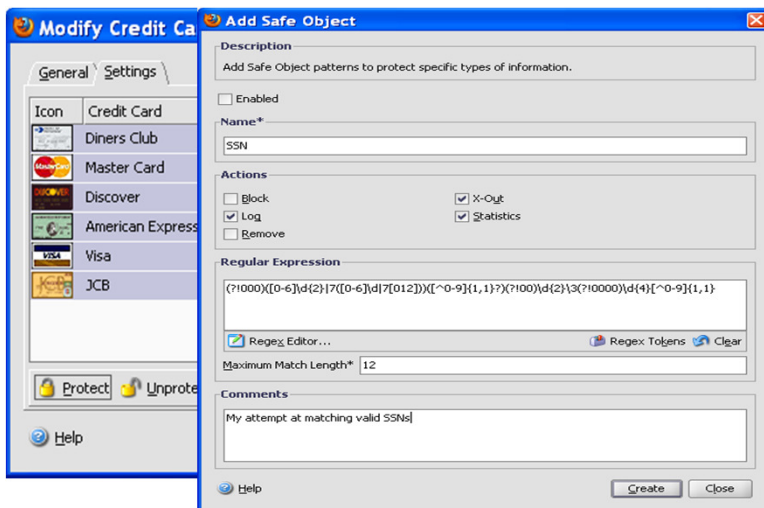
2/3 Web 應用程式皆存在安全漏洞

Gartner

利用現有基礎架構來保護 XML 應用程式

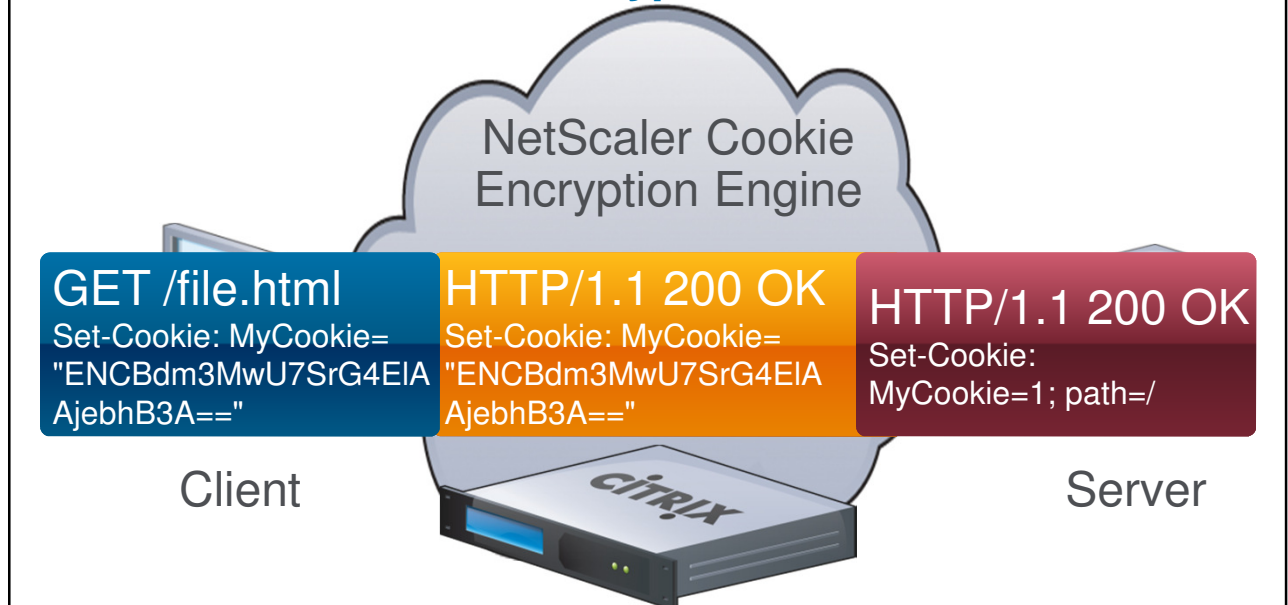
防止敏感性資料外洩

Prevent the inadvertent disclosure of customer or corporate data

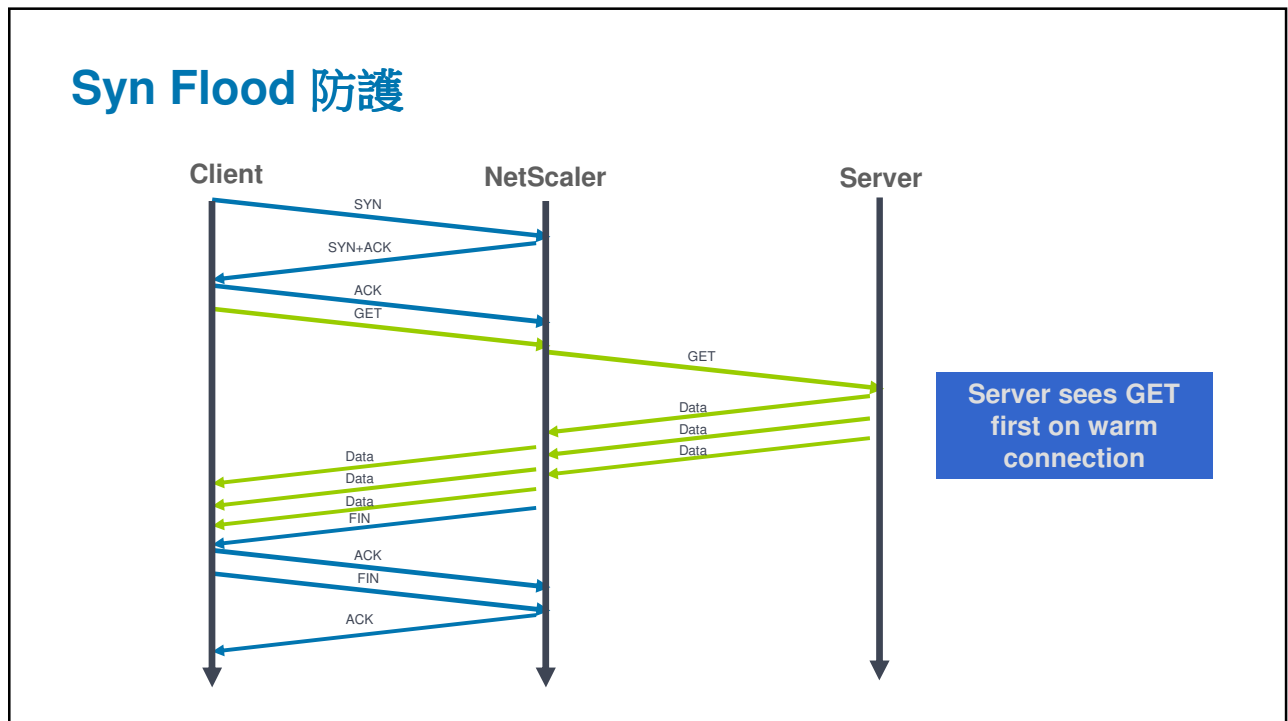


- Financial Theft Prevention
- Credit Card Numbers
- Configurable Protections
- Customer-defined Data Objects

防止資料外洩-Cookie Encryption

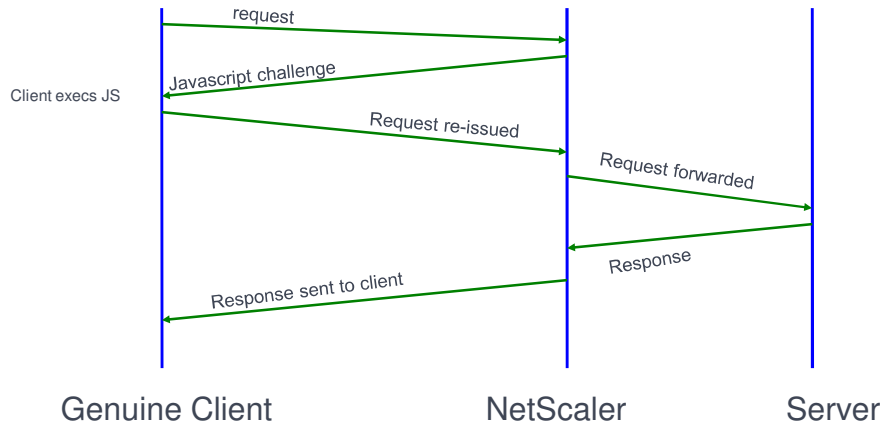


Syn Flood 防護



HTTP GET Floods防護

JavaScript based client challenge



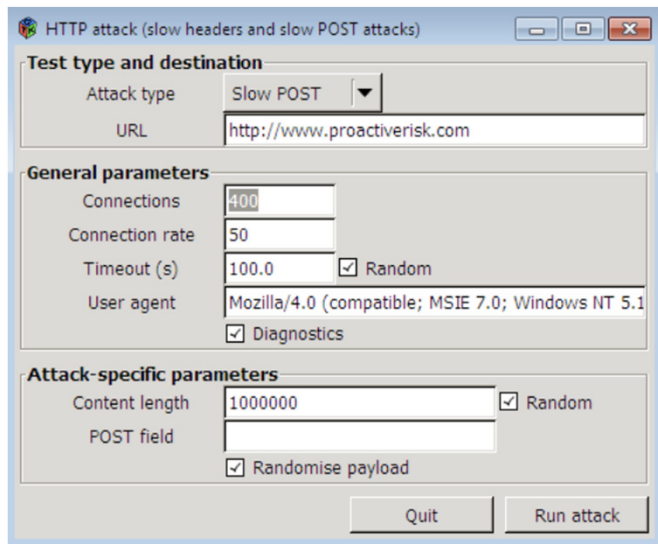
HTTP POST Flood

```

POST /dataform.pl HTTP/1.1
Connection:Keep-Alive
( Content-Length:10000 || Transfer-Encoding: chunked )
User-Agent: Mozilla/4.0
Content-Type: text
Host: 10.102.1.91
    
```

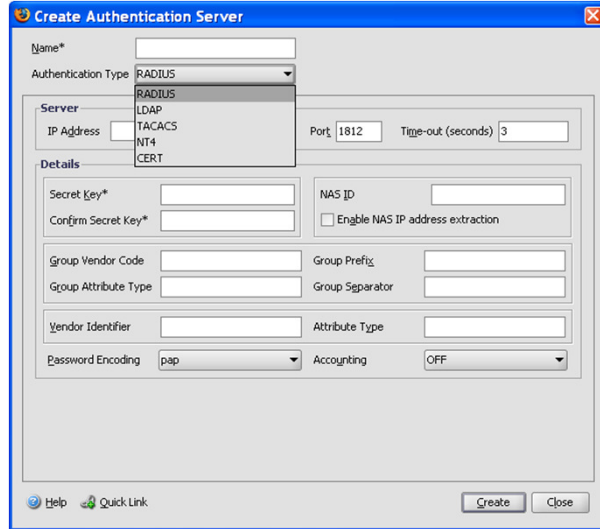
```

Abcdef      23 This is the data in the first chunk
Abcdef      23 This is the data in the first chunk
Abcdef      23 This is the data in the first chunk
Abcdef      23 This is the data in the first chunk
Abcdef      23 This is the data in the first chunk
Abcdef      23 This is the data in the first chunk
(.....n)   (.....n)
    
```



AAA 卸載應用程式式認證負荷

- Authentication servers : LDAP, RADIUS, TACACS, NT4, Smart card, Certificate based
- Two factor, Dual passwords, Cascading
- User / group awareness
- Fine grained policy based control
- Full Audit trail
- SSO: Basic, Digest, NTLM



Citrix Cloud 夥伴

SOFTLAYER

5X FASTER WEB APPS. NOW VIRTUAL.

Softlayer, powered by Citrix NetScaler, the all-in-one app acceleration, app firewall and load balancing solution.

SOFTLAYER | CITRIX

“Partnering with Citrix was an easy decision. It’s clear they are listening to enterprises and cloud service providers - these solutions meet and exceed the needs of this rapidly evolving IT segment.”
Nathan Day, CTO of Softlayer

CARPATHIA HOSTING, INC.

Compliance, Storage Mgmt, Dev/Test, On/Offboarding

Industry Compliance, Lifecycle Mgmt, Migration Services, Cloud Access, Cloud Bridge, XA/XD, NetScaler, XenServer

Carpathia InstantOn, Powered by:

Citrix NetScaler: ALL-IN-ONE APP ACCELERATION, APP SECURITY AND LOAD BALANCING

Citrix XenServer: ENTERPRISE CLASS SERVER VIRTUALIZATION

CARPATHIA | CITRIX

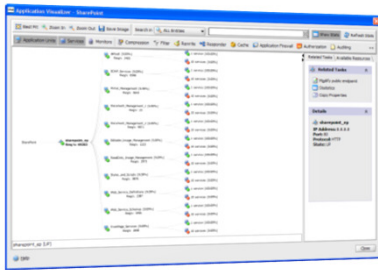
“Together, Carpathia Hosting and Citrix can deliver a robust suite of virtualization, networking and enterprise cloud services to our respective customers, aimed at delivering maximum application performance in the datacenter.”
Peter Weber, CEO of Carpathia Hosting

簡單易用的管理與監控平台

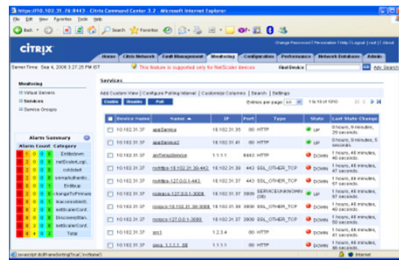
內建各式部署精靈

The screenshot displays the Citrix NetScaler VPX management console interface. The main content area shows the 'GSLB Configuration' wizard. The 'Getting Started' section includes links for 'GSLB wizard for Citrix XenApp', 'GSLB wizard for Citrix XenDesktop', and 'GSLB Visualizer'. The 'GSLB Configuration' section has options to 'View GSLB configuration' and 'Synchronize configuration on remote sites'. The 'Configuration Summary' section shows a list of settings: 'No GSLB VServer', 'No GSLB Service', 'No GSLB Site', and 'No Location'. The interface includes a navigation pane on the left with categories like System, Network, DNS, SSL, and Load Balancing. The top navigation bar contains tabs for Monitoring, Configuration, Dashboard, Reporting, Documentation, and Downloads. The status bar at the bottom indicates 'Citrix Confidential - Do Not Distribute' and 'Ready nsroot'.

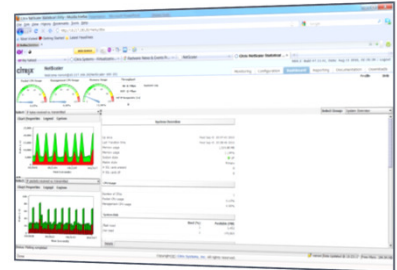
可視化管理



AppExpert Visualizer



Command Center

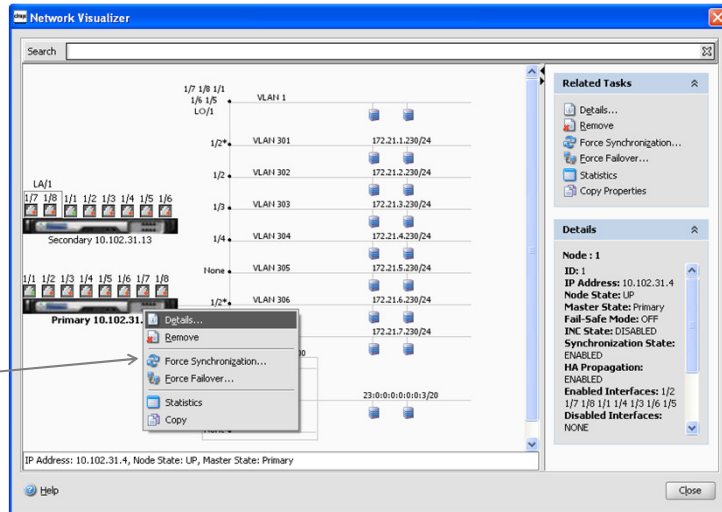


Dashboard

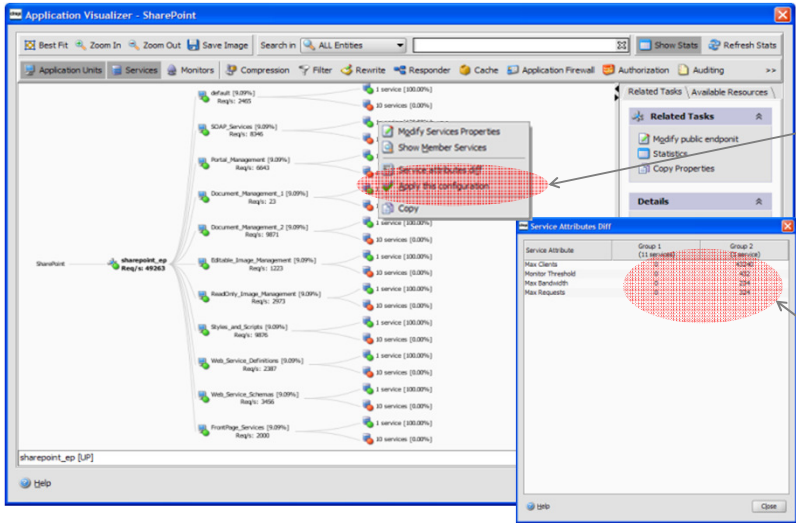
網路結構視覺化工具

Graphical View of Network

Configure and Pull Stats



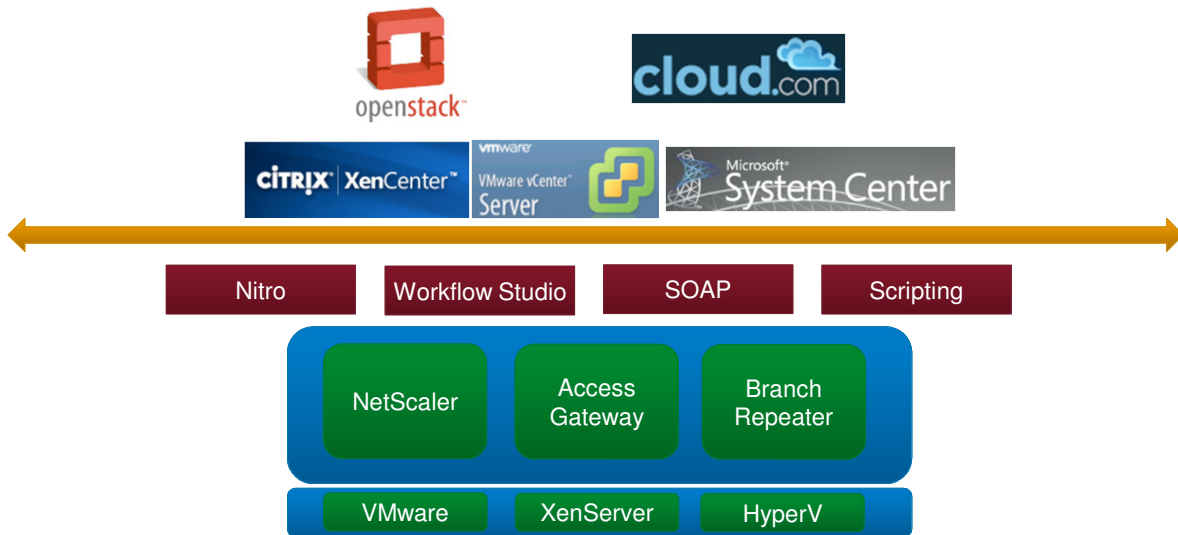
應用服務視覺化管理



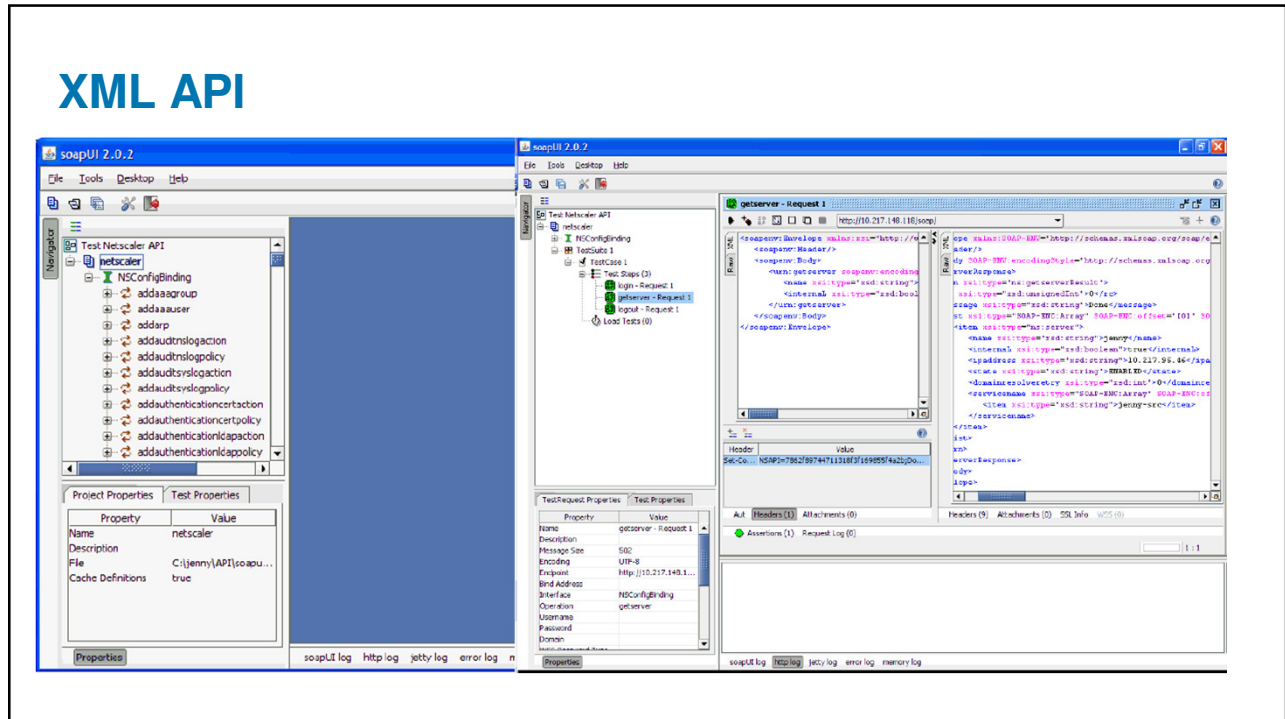
View /Resolve Config Drifts

View Overlay and Detailed Stats

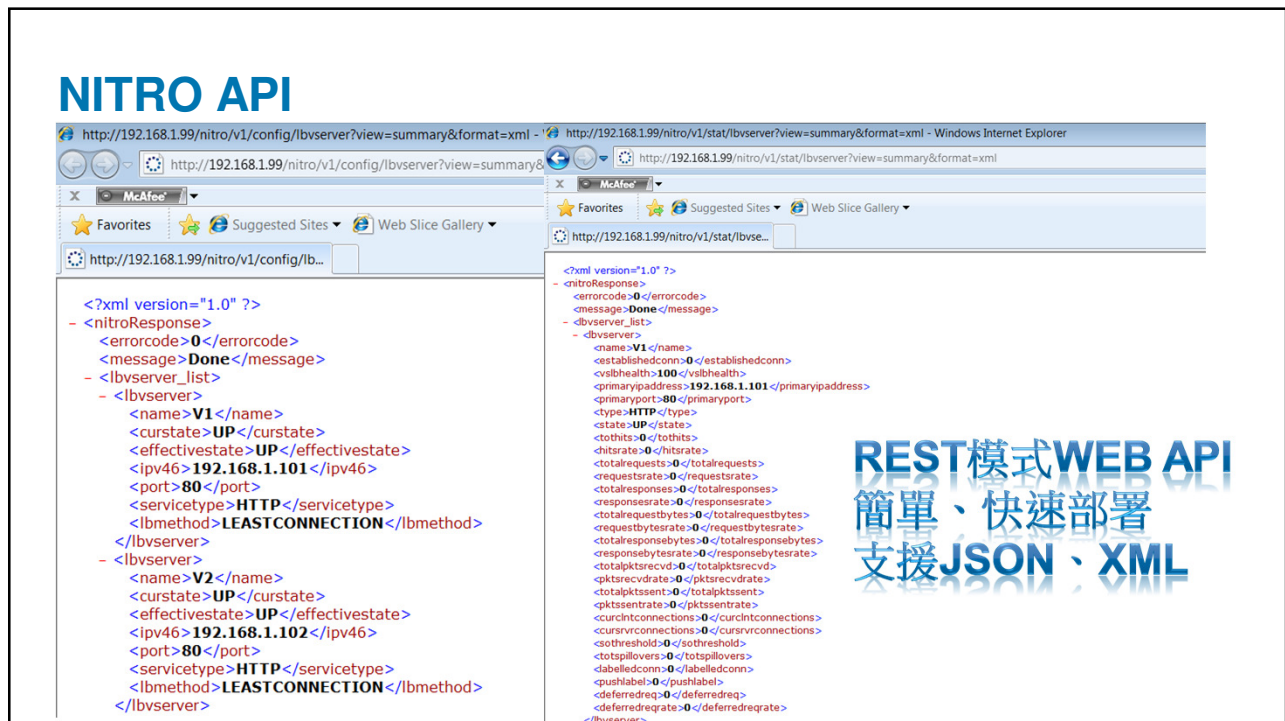
虛擬平台高度整合



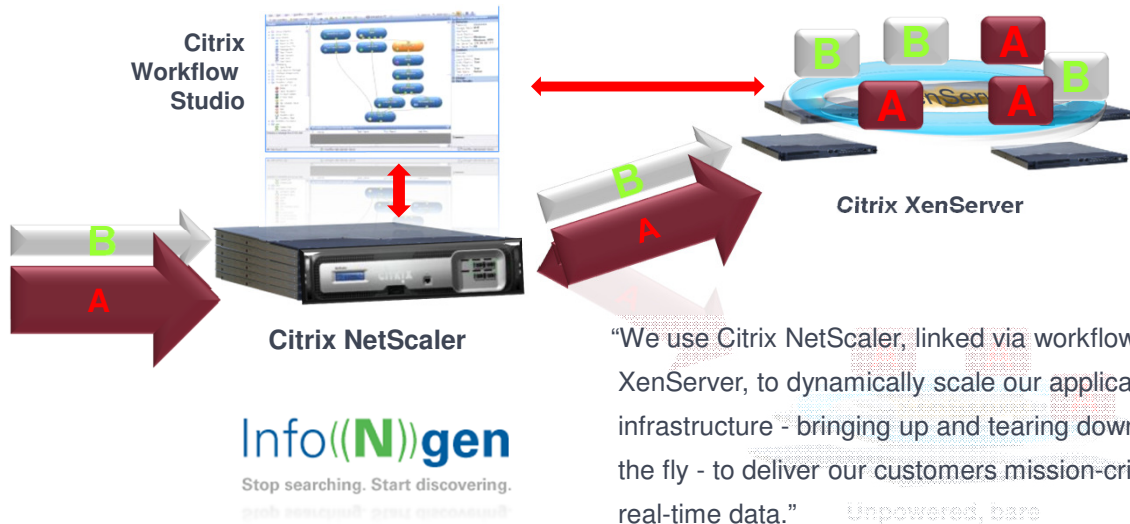
XML API



NITRO API



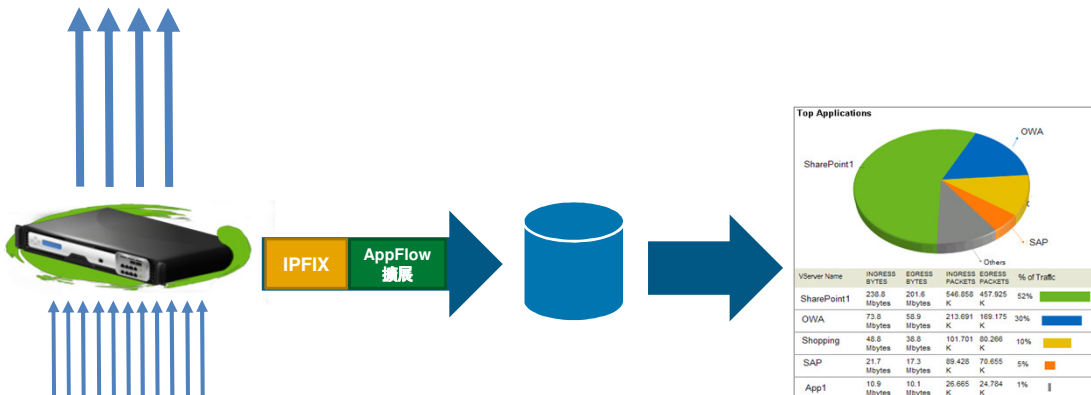
虛擬機遷移技術



“We use Citrix NetScaler, linked via workflow to XenServer, to dynamically scale our application infrastructure - bringing up and tearing down VMs on the fly - to deliver our customers mission-critical real-time data.”

Unpowered, bare
Eli Feldman, SVP Eng & Ops

AppFlow – 應用程式感知型網路報告



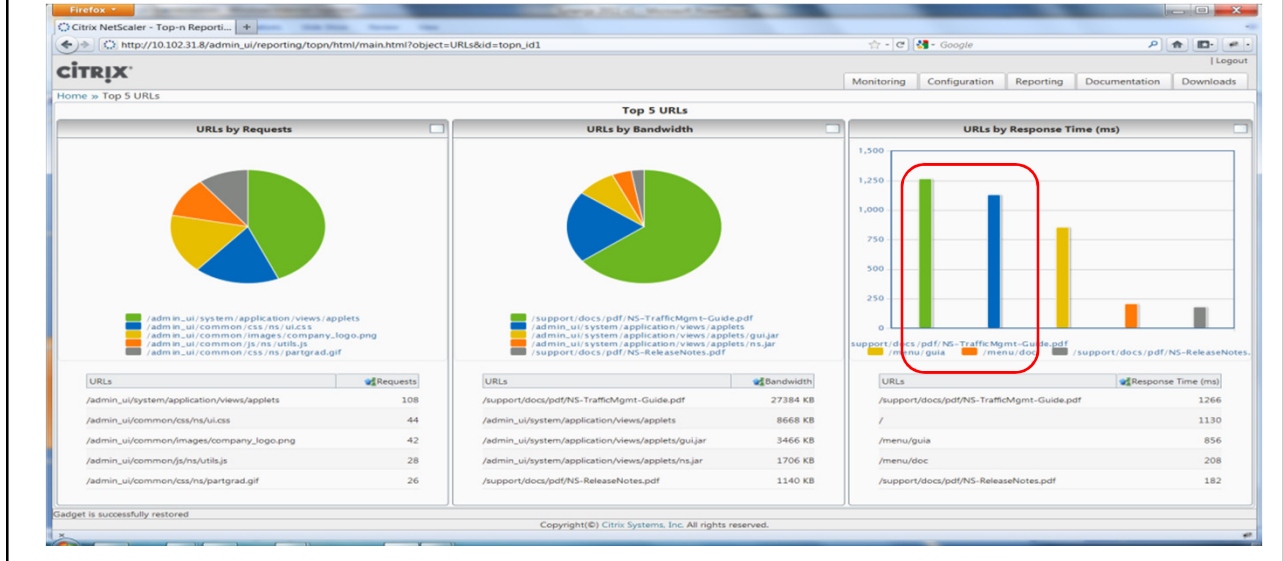
1. 來自終端使用者的流量進入
2. 生成 IPFIX 記錄
3. 在 IPFIX 上新增 AppFlow 擴展
4. 符合標準的分析軟體使用記錄



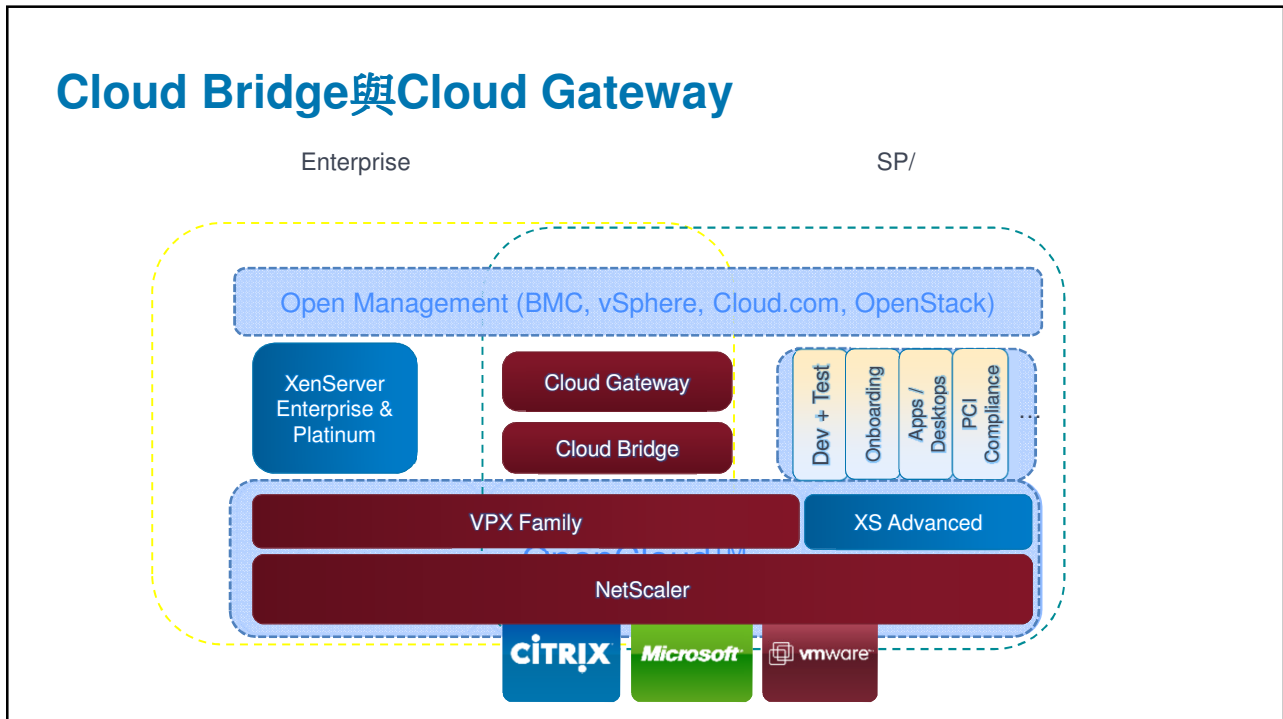
應用程式狀態監控

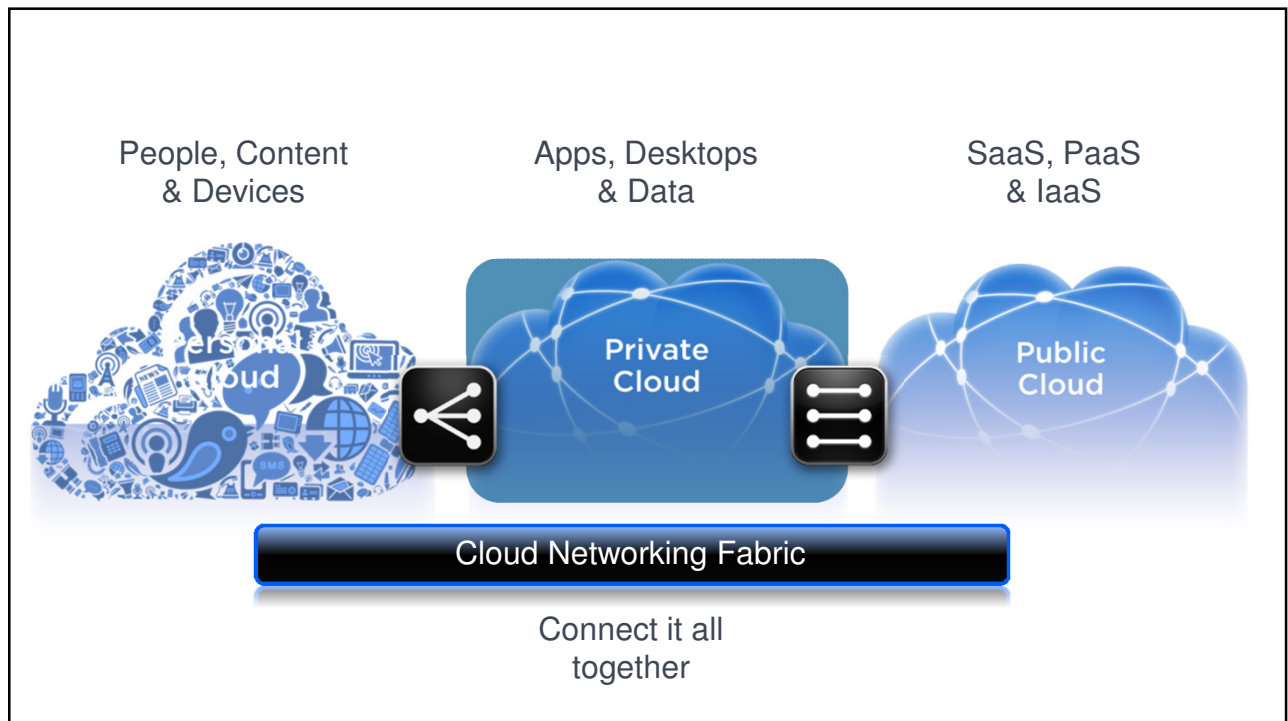
Site availability and responsiveness

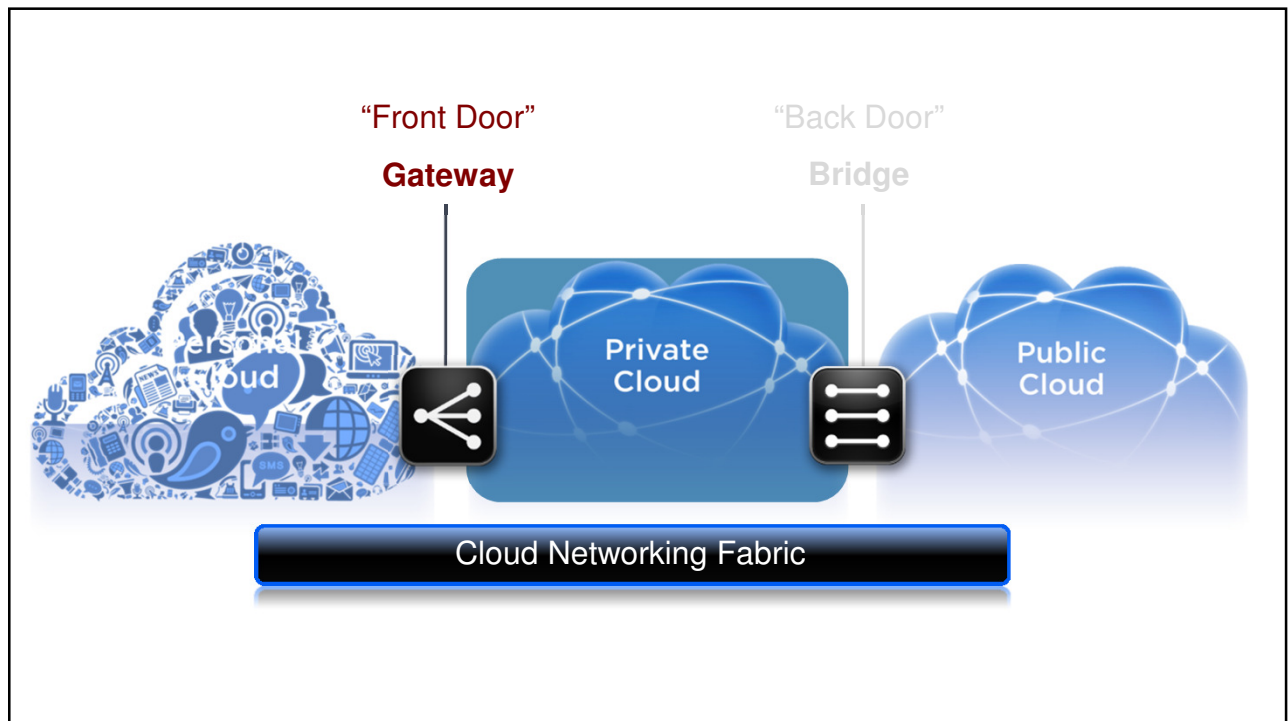
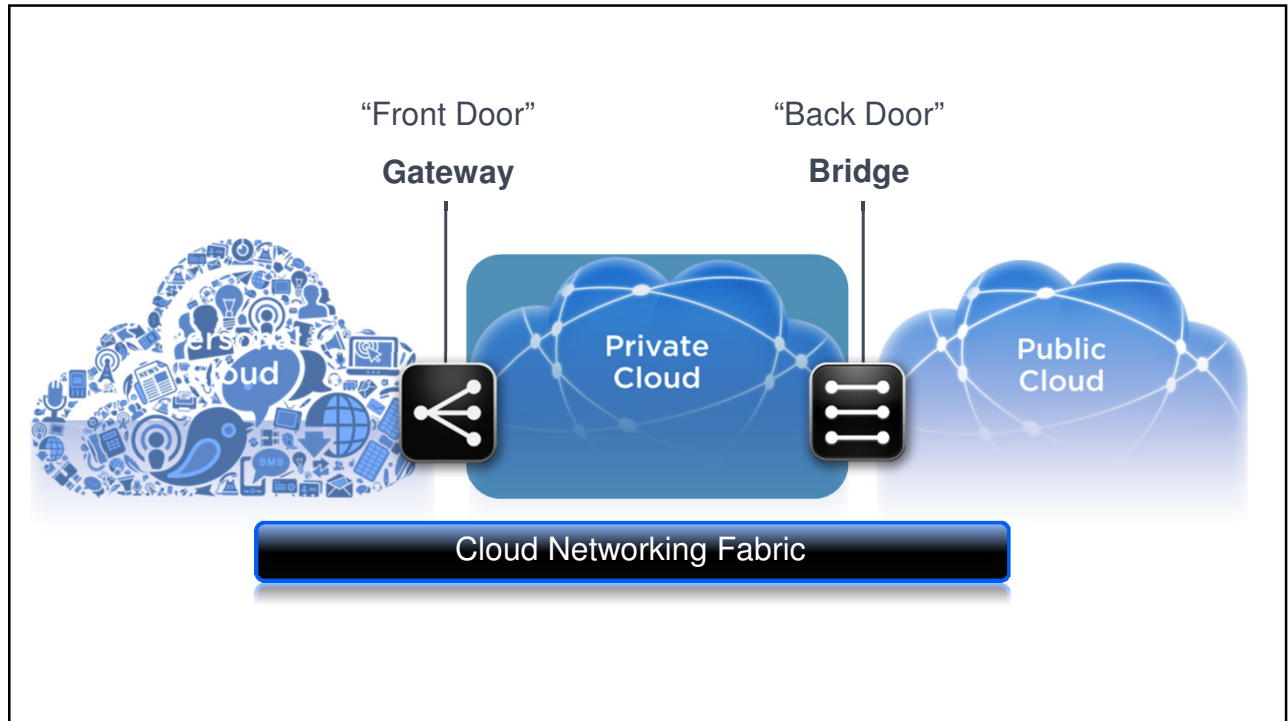
- Instantaneous, real time data on key URLs



Cloud Bridge與Cloud Gateway







企業應用程式轉變趨勢



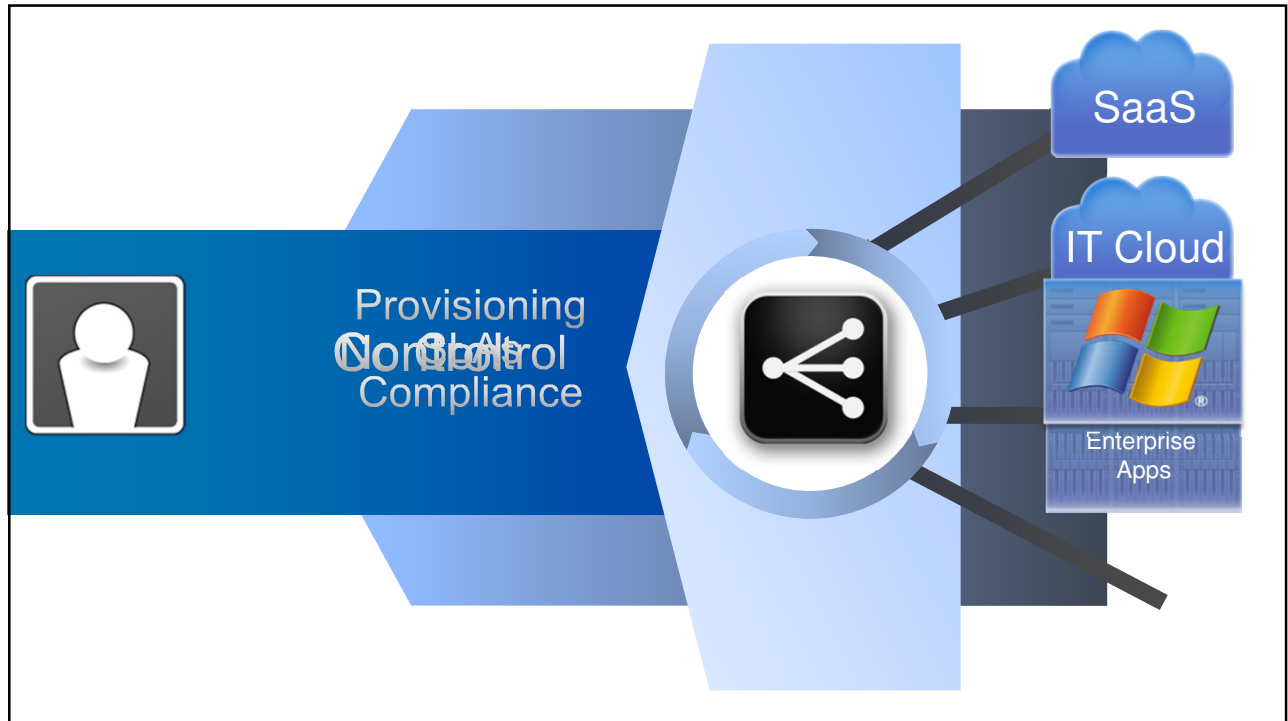
The enterprise network ~~is~~ the virtual enterprise



PROBLEM STATEMENT

不同的應用程式, 不同的使用者, 不同的裝置, 不同的連線方式



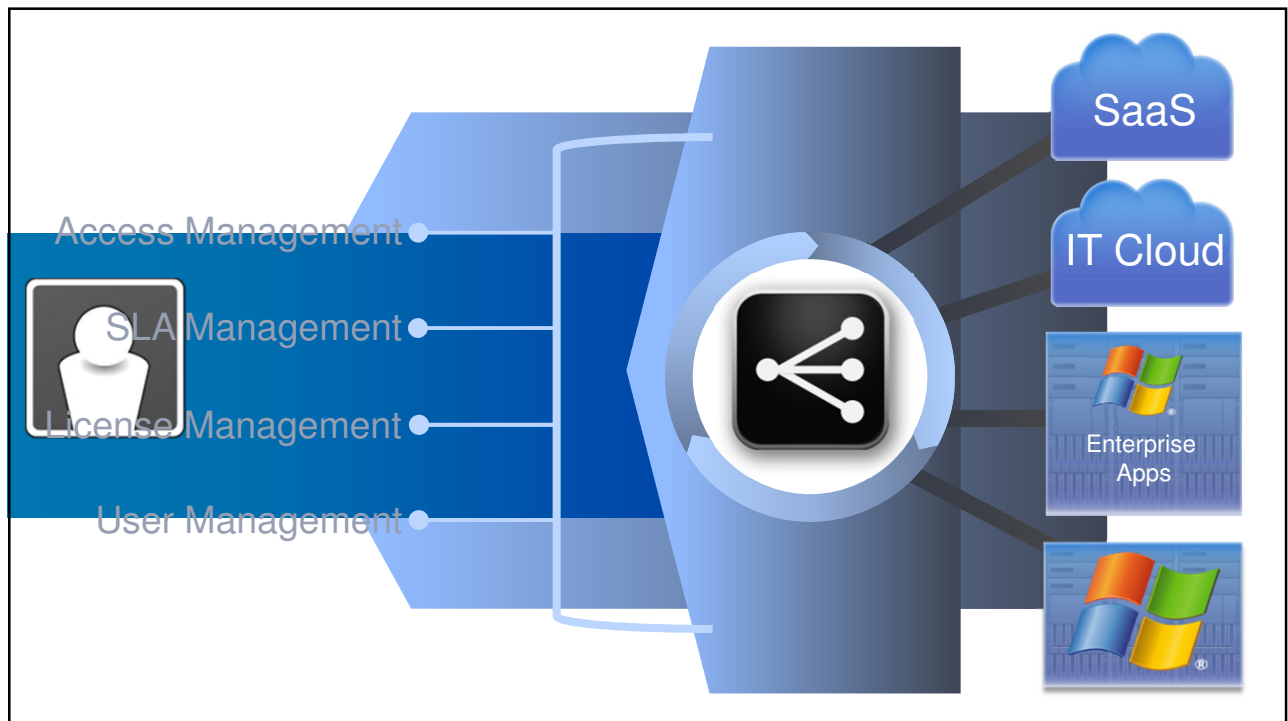


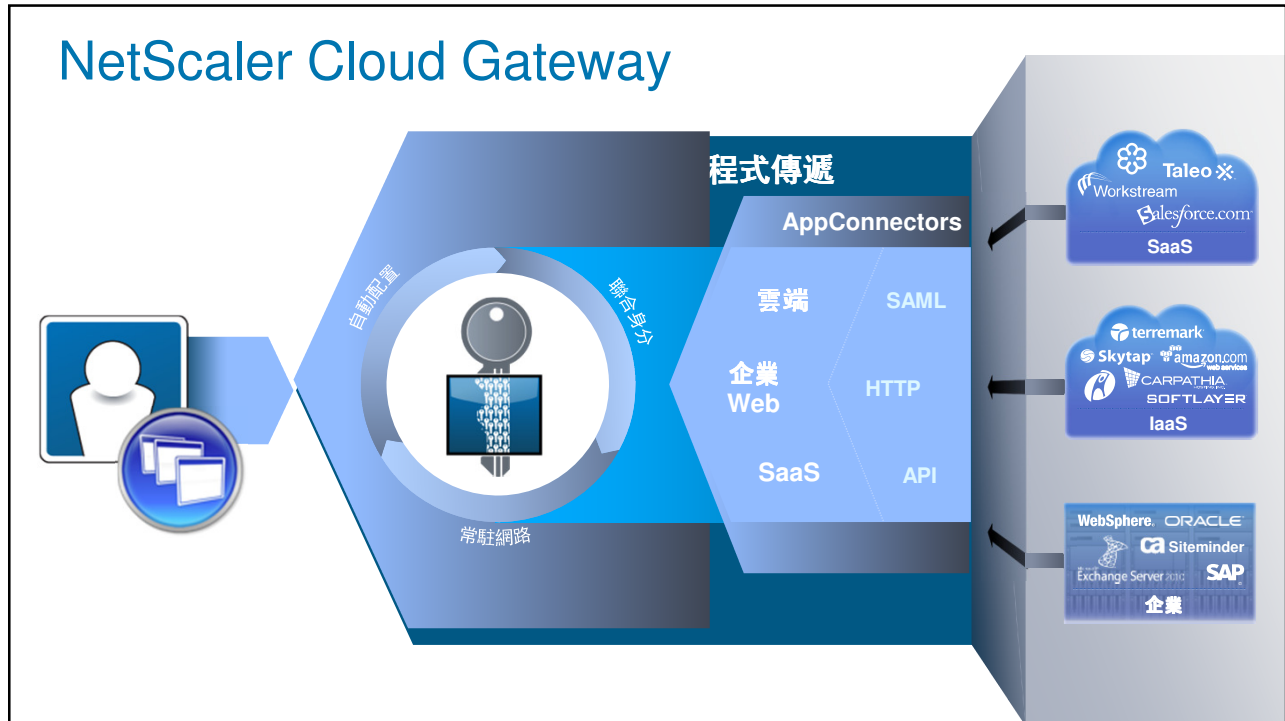
“

SOLUTION

The power of ONE

”



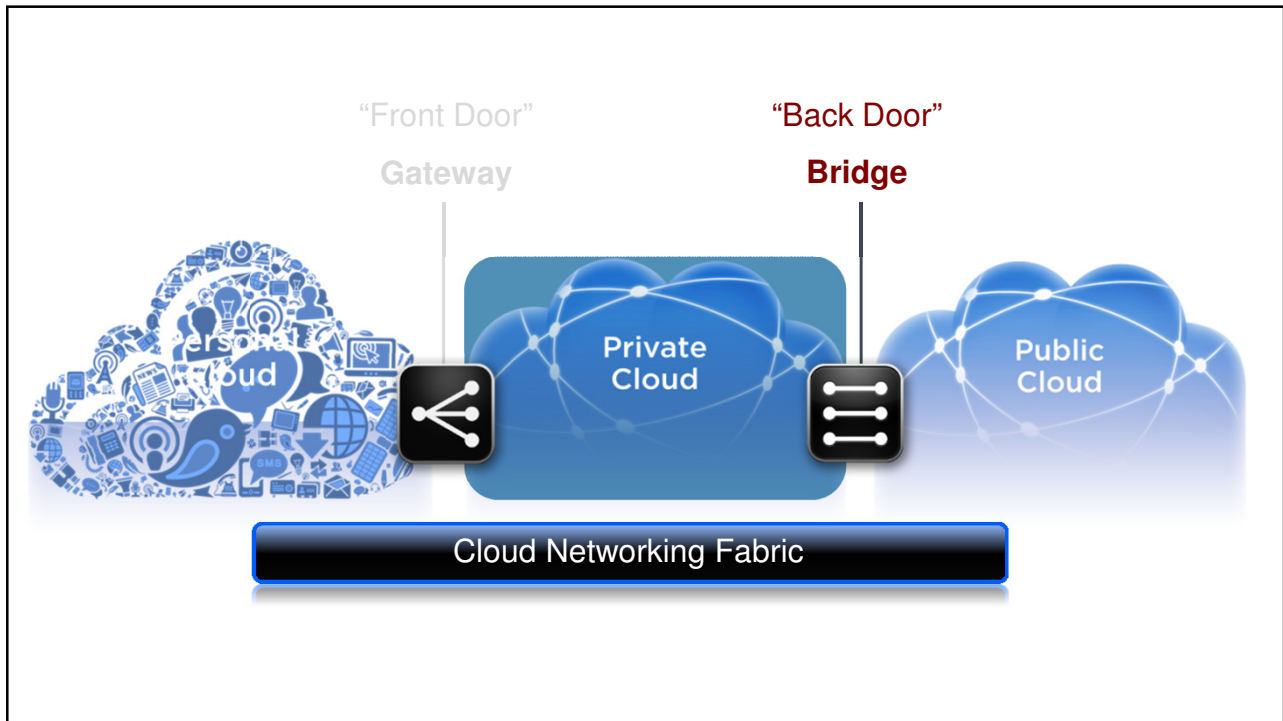


統一應用管理與控制

- SaaS, web and Windows apps
- Single sign-on
- User Provisioning
- App request workflow
- Licensing
- SLAs

Single view for end users on any device through Citrix Receiver

- Self-service apps
- Windows, web, SaaS
- One login
- Millions of devices



混合雲端



傳統
資料中心

- 在現場
- 極高固定成本
- 全面控制
- 已知安全性



傳統
資料中心
混合雲端

- 網站上/外
- 極低固定設施成本
- 自助服務
- 全面彈性
- 可靠安全性
- 全面企業控制

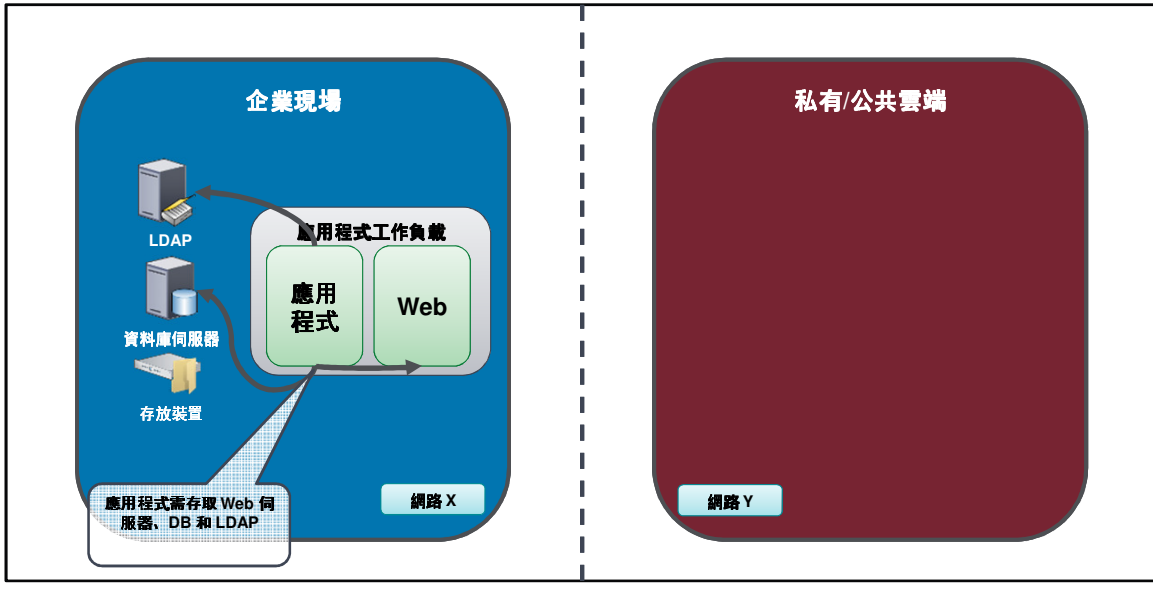


公共
雲端

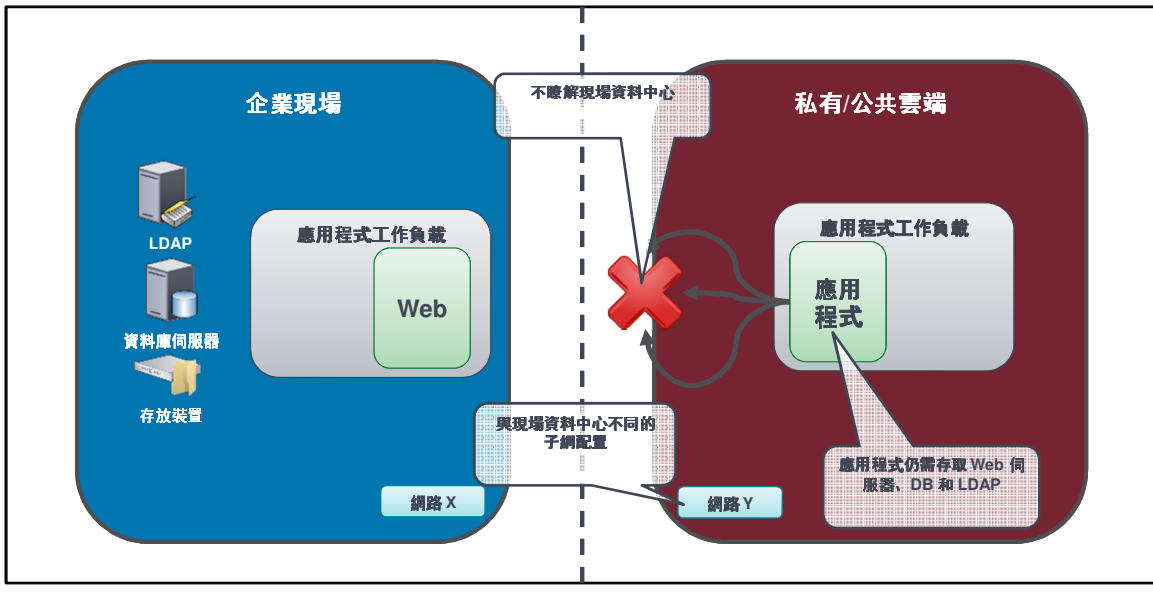
- 網站外
- 極低固定設施成本
- 自助服務
- 全面彈性



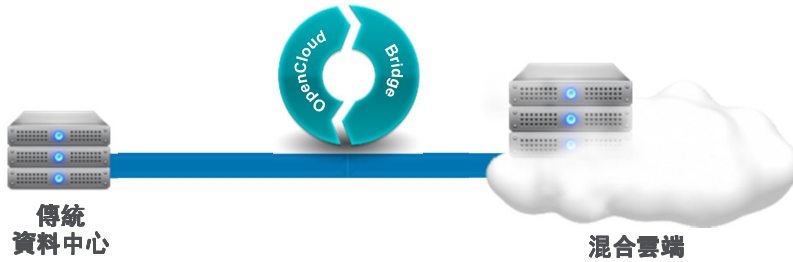
遷移到雲端運算之前



無網路透明性



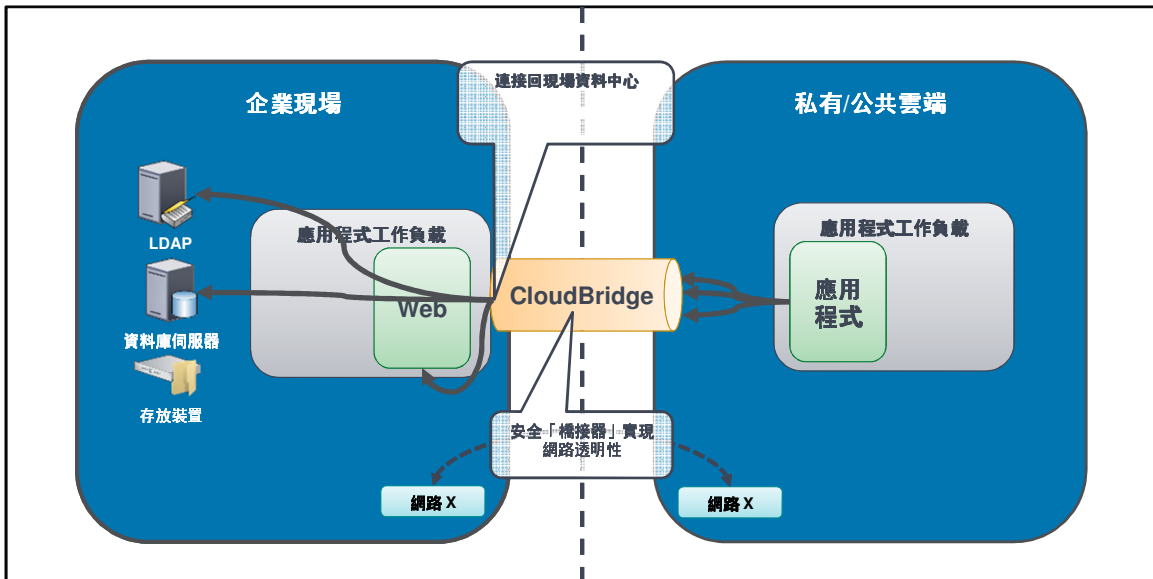
NetScaler Cloud Bridge 實現透明性



OpenCloud Bridge

- 不同網路的網路透明性
- 延遲透明性，確保相同使用者體驗
- 服務透明性，使服務水準協定 (SLA) 可預測
- 位置透明性，可隨時隨地存取
- 安全

有了 NetScaler Cloud Bridge



NEW NetScaler Cloud Bridge

Connect your datacenter to any cloud with full transparency, security and performance

Private Cloud Public Cloud

思杰雲端服務解決方案

Citrix OpenCloud™ solutions
Build IP to Differentiate

Citrix OpenCloud™ Bridge and Access
Citrix OpenCloud™ platform
Network Transparency Seamless Identity

Netscaler部署模式

NetScaler 產品平台

- NetScaler MPX
 - 高效能專用硬體
 - 強化網站
- NetScaler VPX
 - 虛擬裝置
 - 運行於標準x86硬體
 - 快速、彈性、價格低廉

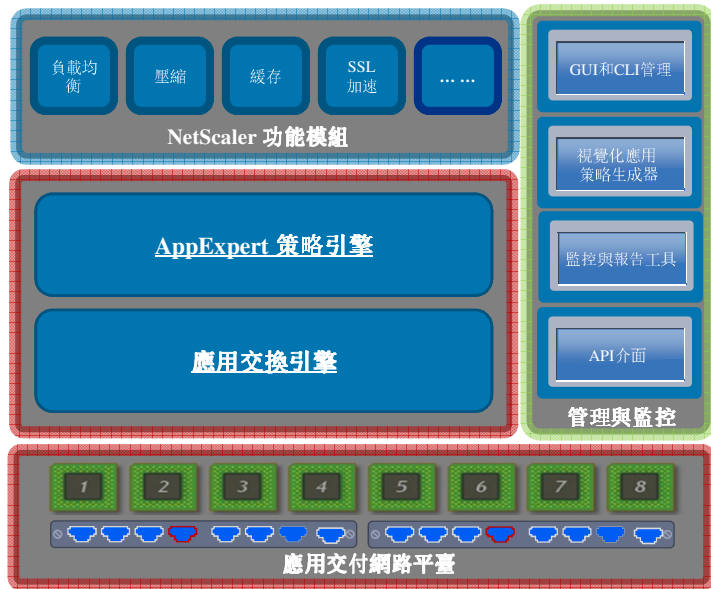


NetScaler 硬體架構

無縫集成各功能模組

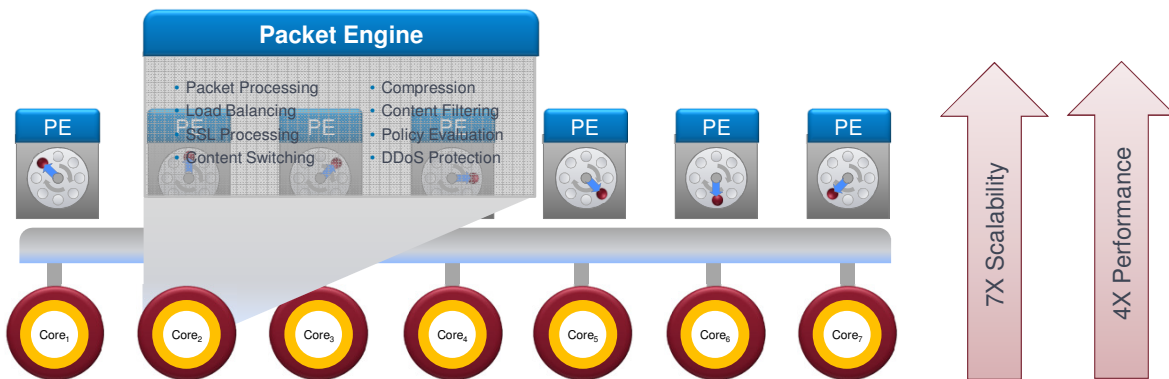


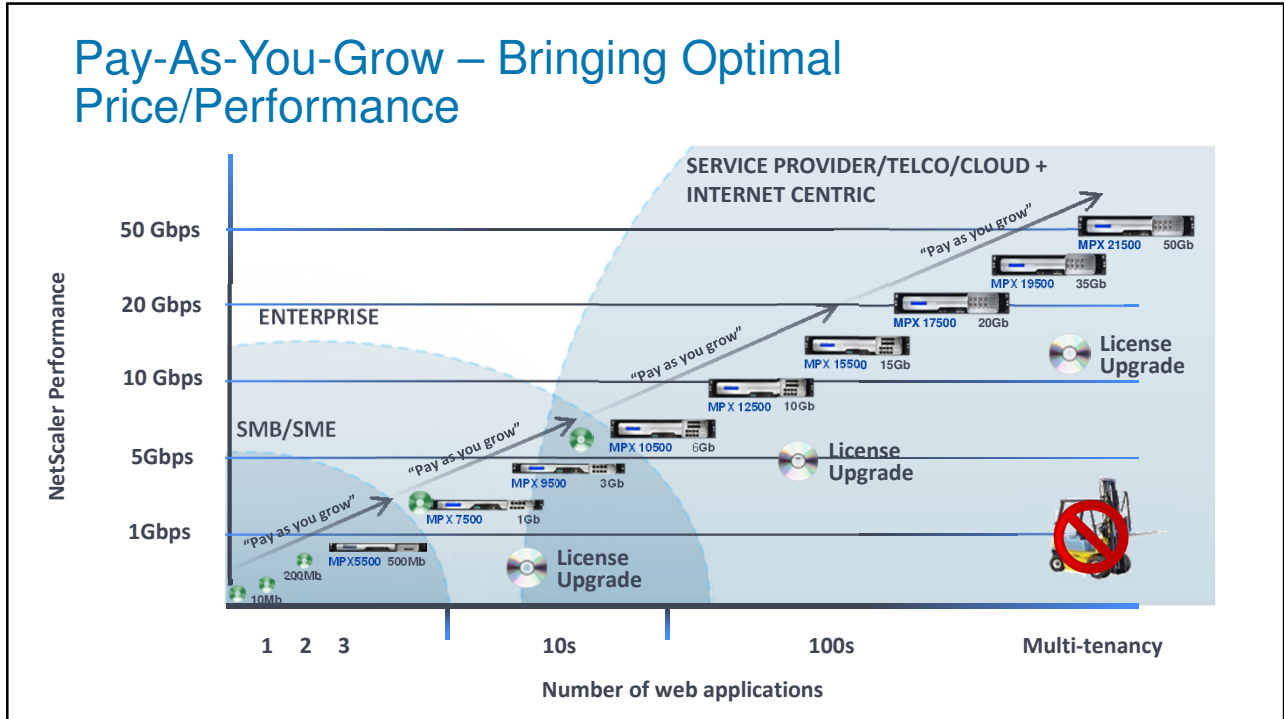
- 500Mbps – 50Gbps 7層吞吐
- 所有功能模組可同時啟用
- 各模組公用策略引擎
- 統一的管理介面



硬體平臺基於最主流的CPU多核並行處理技術

下一代應用交付產品架構





VPX 平台

VPX = MPX
Same Build, Same Features

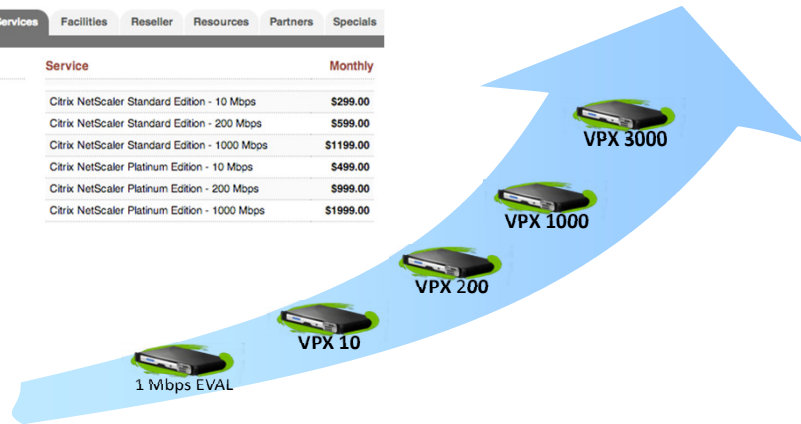
按需求使用平台

SOFTLAYER®

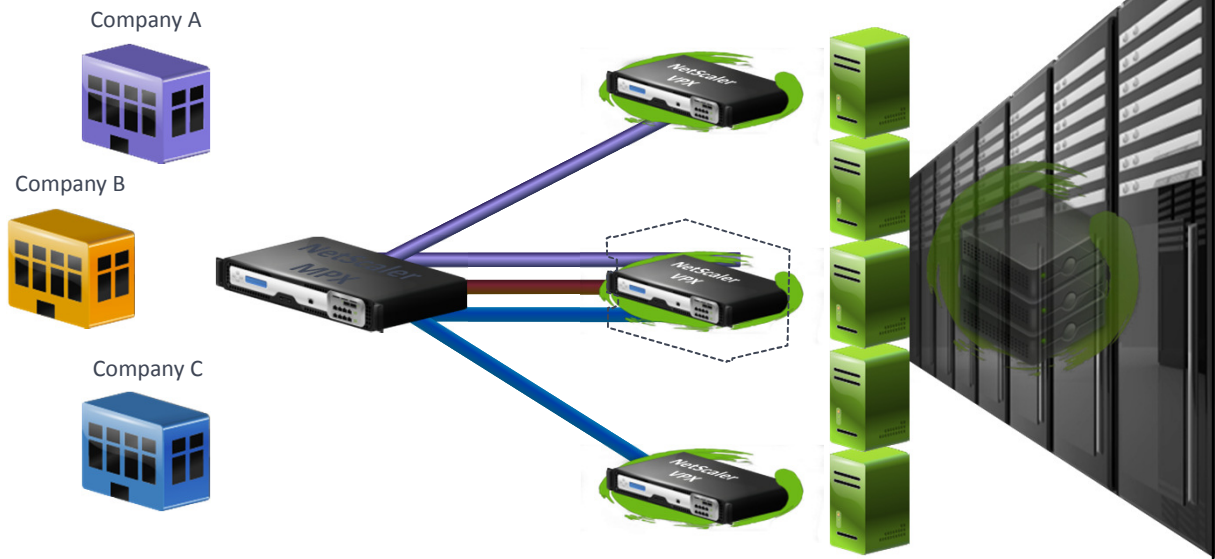
Home Dedicated CloudLayer™ Solutions **Services** Facilities Reseller Resources Partners Specials

Load Balancing: Local, Global & Citrix NetScaler

Service	Monthly
Citrix NetScaler Standard Edition - 10 Mbps	\$299.00
Citrix NetScaler Standard Edition - 200 Mbps	\$599.00
Citrix NetScaler Standard Edition - 1000 Mbps	\$1199.00
Citrix NetScaler Platinum Edition - 10 Mbps	\$499.00
Citrix NetScaler Platinum Edition - 200 Mbps	\$999.00
Citrix NetScaler Platinum Edition - 1000 Mbps	\$1999.00



彈性部署應用



NetScaler Family -- SDX

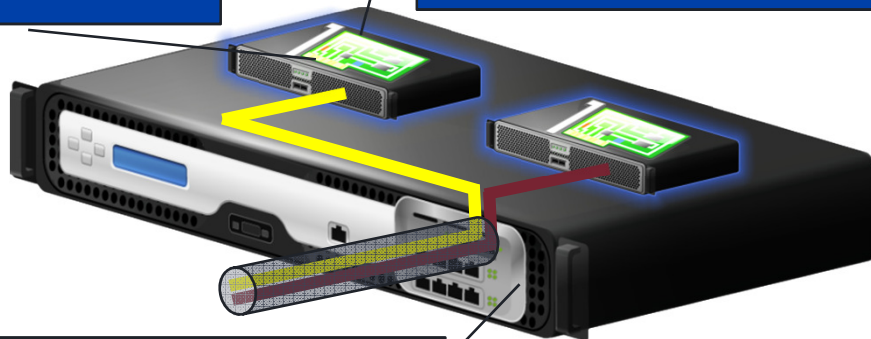
- Instances, not partitions
- Complete CPU isolation
- Complete memory isolation
- Version independence
- High availability independence
- Lifecycle independence



多租戶為中心設計

- Hardware accelerated SSL
- Dedicated SSL hardware per instance

- Full instance isolation
- Separate routing domain
- Independent routing, IP stack
- Independent connection table, ACLs, etc.



- Per instance network isolation
- Isolation can be enforced at the NIC



NetScaler MPX 21500

NetScaler SDX 21500

50 Gb/s
Single VIP

50 Gb/s
16 Instances

The image shows two Citrix NetScaler hardware units side-by-side, separated by a vertical orange line. The unit on the left is the NetScaler MPX 21500, and the unit on the right is the NetScaler SDX 21500. Below each unit, its model name is written. Underneath the MPX unit, the text '50 Gb/s' is written in a large, handwritten-style font, with 'Single VIP' written below it. Underneath the SDX unit, the text '50 Gb/s' is written in a large, blue-outlined, handwritten-style font, with '16 Instances' written below it.

Performance
OR
Multi-tenancy?



POWER OF ONE
Single VIP Throughput

Tenant Density

POWER OF MANY

The image contains a large text question 'Performance OR Multi-tenancy?' on the left, separated from a graph on the right by a vertical orange line. The graph plots 'Single VIP Throughput' on the y-axis (labeled 'POWER OF ONE') against 'Tenant Density' on the x-axis (labeled 'POWER OF MANY'). A blue line on the graph shows a downward curve, indicating that as the number of tenants increases, the throughput for a single VIP decreases.

Citrix Netscaler滿足下一代資料中心的趨勢

➤ 更多動態

- Modularity: rapid adoption to new Complex Web apps (SOA, Web 2.0, rich media-10X in processing)
- Extensibility: provide a wide variety of app delivery services for any application need
- Flexibility: deliver all types of applications with common infrastructure

➤ 虛擬化和多租戶

- Decouple application services from physical infrastructure elements
- Enabling single physical resource instances to be shared by multiple users
- “On the fly” provisioning and allocation of servers

➤ 企業經營利用多個同步功能

- Concurrent use of App F/W, compression, SSL VPN, XML Security, caching, content switching, GSLB

➤ 轉移到10G基礎設施建設

- Less network segmentation
- “Wire-speed” throughput

➤ 各資料中心與雲服務間網頁透通與無縫應用程式傳遞

- Cloud Bridge and Cloud Gateway

➤ 靈活的“按成長付費”設備選項

- Excess capacity for future feature support