



Citrix NetScaler and e-gaming data centres



Introduction

There is currently a boom in e-gaming across most of Europe. Research has shown that the rise in internet sites for placing bets and the popularisation of playing games online means that an ever increasing proportion of the population now take part in some form of gaming or other. Whilst this is great for the business it comes with a series of challenges that need to be solved.

More players translates into more revenue and profit for the e-gaming sites, however, this is not without difficulties. Leaving aside the myriad of legal issues about where to set up businesses and host data centres, there is a mountain of technical challenges to overcome in order to maintain a presence that offers a superior experience to the competition and ensures repeat visits from customers.

The data centre remains one of the largest capital and operating expenses for any e-gaming business and increased traffic means increases in infrastructure to cope with it. Establishing a dynamic solution initially makes this scalability cheaper and allows a quicker reaction to market conditions. Further, and, as always, getting the best value for money with technology remains paramount in the minds of the CIOs.

In the internet gaming world the application and the user experience are key. Building the data centre infrastructure to support, secure and monitor these components around a proven and well-respected Application Delivery Controller (ADC) such as Citrix NetScaler™ allows the gaming applications to be delivered to the users efficiently, while ensuring availability, performance and security as well as reducing the overall infrastructure costs by as much as 60%.

What is NetScaler?

Citrix NetScaler application delivery appliances combine application intelligence with a high degree of networking savvy. Citrix NetScaler's success is based on its ability to integrate multiple acceleration, availability and security functions – at both the networking and the application layers – into a single, integrated appliance. The unique architecture and software design allows the range of NetScaler MPX devices to offer from 500 Mbps up to 50 Gbps throughput on a single platform without performance degradation on feature concurrency. This enhances availability and performance of gaming as well as providing great capital and operating savings in data centre infrastructure.



In addition, NetScaler is available as a virtual device. Sharing the same feature set and capabilities as the hardware devices, Citrix NetScaler VPX™ can be used in testing, development and staging environments to ensure smooth application change processes and reduce costs. Coupled with Citrix's Pay-as-you-Grow licensing structure for NetScaler hardware and software that allows customers to purchase only the throughput levels they need and upgrade later as required, deploying NetScaler has never been most cost effective or compelling.

Availability solved

One of the biggest problems with internet businesses is down-time. If you're not available to do business with your customers online then they will go somewhere else. NetScaler can mitigate the availability issue through the use of its fine-grained traffic management of client requests to ensure optimal distribution of traffic locally and across multiple data centres world-wide. Even when your site is under heavy load NetScaler Surge Protection can protect and smooth the flow of requests to the resources to ensure that no server is brought down by sudden traffic. This helps guarantee that your business is up and running 24 hours a day.

Reduce infrastructure costs

In the internet gaming world the data centre is generally a very large proportion of the cost of doing business. This is composed of many factors including: servers, power, cooling and connectivity. Citrix NetScaler can reduce these costs significantly.

Perhaps the biggest contribution to datacentre costs is related to servers. Provision needs to be made for the maximum capacity in terms of servers. Often they sit needlessly consuming resources when they are not required or they operate inefficiently. If you can get rid of a few servers your costs come down. Not only are the capital expenses reduced but the running costs in terms of power and cooling drop also. Citrix NetScaler can reduce the workload placed on each server significantly, thus minimising the number of servers required to deliver your e-gaming applications



Reduce the number of servers – reduce the cost!

Through a combination of intelligent offload technologies the NetScaler can significantly reduce the number of servers required to deliver a particular application.

Multiplexing

Innovative use of TCP Multiplexing technology can reduce the TCP connection overhead on the server. Connection multiplexing shifts the burden of managing connections from the web server to the NetScaler device. This allows the NetScaler to maintain a small number of long-lived connections to the web server and multiplex many client connections through them. This cuts the workload on the back-end servers and allows them to focus on delivering content.

This multiplexing capability is built-in to NetScaler by design and has a huge impact on the number of servers needed, especially for today's Web 2.0 gaming applications where actual data transfers can be small but connections are often very numerous.

SSL Offload

SSL acceleration hardware built into every NetScaler device means that the compute-intensive encryption and decryption required for secure connections is not passed on to web servers, thereby reducing their CPU utilisation and freeing them up for other tasks. The devices in the NetScaler range offer excellent price/performance value with the MPX21500 device capable of 12 Gbps sustained SSL throughput.

Compression offload

The ability to deliver compressed content to users is useful in minimising the delivery time and improving the end-user experience as well as cutting the bandwidth requirements. The associated computing overhead with this is large when done on the back-end servers. Because the NetScaler compresses the data in its specialised processing engine the number of servers required can be reduced still further.

Caching

Citrix NetScaler incorporates static and dynamic caching capability and can reduce the number of calls placed on a server thus reducing the number of servers necessary for delivering an application. More than this, however, it is possible to accelerate application delivery even further by caching content close to users in one geography and only forwarding the user specific requests to the origin servers further away.

Essentially, Citrix NetScaler allows you to substantially reduce the number of servers required in the back-end by removing tasks that server are not optimised to carry out. This capability can reduce infrastructure and bandwidth costs by up to 60%.

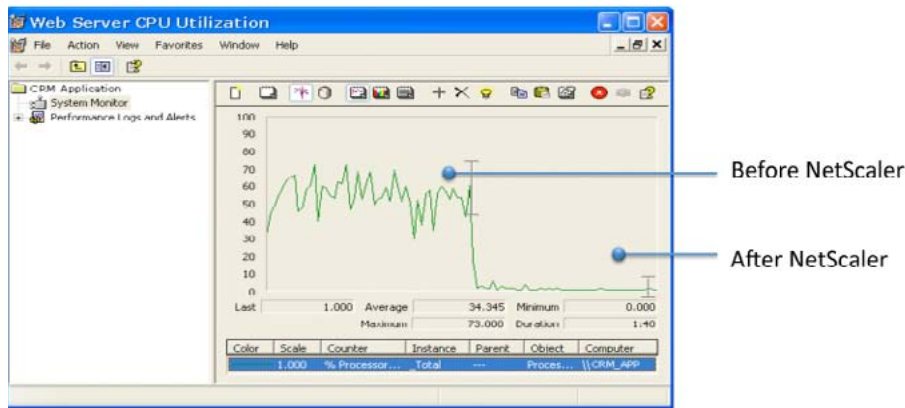


Figure 1: NetScaler reduces the CPU load on back servers

Differentiated services

The ability to offer different levels of services to different users is something that is extremely useful to internet gaming. Directing preferred clients to designated areas within your site and offering them a better user experience is made very easy through NetScaler's ability to look deep within user requests for identifying features and managing them accordingly. This may be something as mundane as the preferred language setting in the browser, allowing multi-language gaming within one site, or some token issued to users on registration. Once assigned to a resource NetScaler can ensure that the user is sent back to the same resource as required through rule-based persistence, effectively allowing the creation of your very own "high-rollers" club or "Platinum club" within your gaming site.

Extensibility

Citrix NetScaler offers application extensibility through the use of HTTP call-outs. This means that additional information can be called upon in order to help make decisions about the traffic management without it having to be hard-coded into the policy. For example, a company may pay for a database of changeable IP addresses that are black listed by the gaming world as known bot addresses. Instead of having to plug these in manually and manage them on a specific device, the information can be called upon by the NetScaler as required in order to determine whether an incoming connection is from a legitimate source. There are, of course, many other uses for this type of application extensibility beyond the realm of enhanced security, for example passing data to an external transformation engine.

Ease of Use – One console many capabilities

Operating costs can be reduced through the use of Citrix NetScaler. The intuitive AppExpert Visual Policy Builder enables application delivery policies to be created without the need for coding complex programs or scripts. In addition, NetScaler also reduces ongoing operational expenses by consolidating multiple capabilities such as content compression, content caching, application security and SSL offload into a single integrated solution.

For those that prefer direct control over their hardware NetScaler has a fully equipped command line interface that is speedily learnt and can ease configuration for the power user. The CLI commands are also available through the well-defined XML API to allow integration into already existing business services for fully automated configuration and change logging.

Of course for managing multiple NetScaler appliances, the separately available Citrix Command Centre provides centralized administration of multiple NetScaler Appliances enabling more efficient system configuration, event management, performance management and SSL certificate administration.

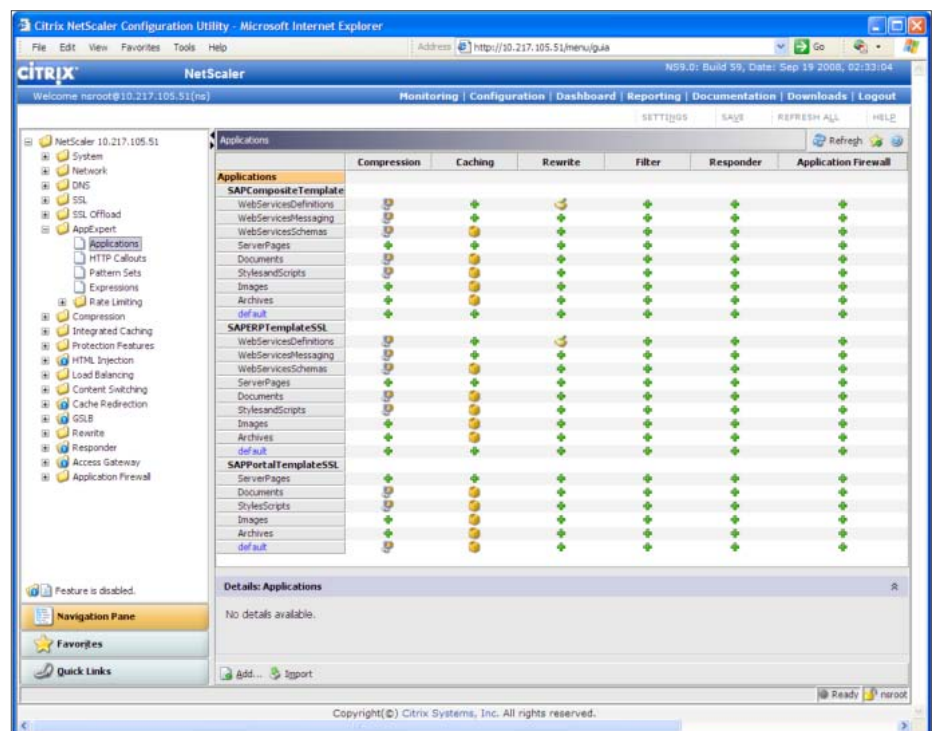


Figure 2: AppExpert provides an integrated approach to multiple optimisation technologies on NetScaler

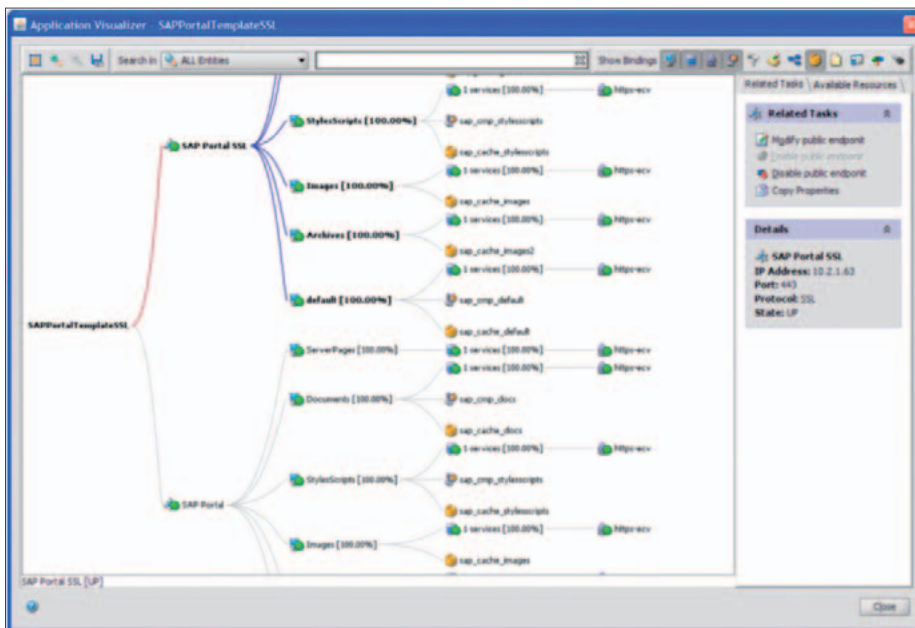


Figure 3: See configurations at a glance using Citrix AppVisualizer™. The graphical interface is totally interactive and helps reduce misconfiguration

Web 2.0 Server push technologies

Today's gambling applications are getting more complicated and are often built upon various Web 2.0 technologies such as AJAX, JSON etc. These technologies improve user interaction and make applications more interesting and easier to adapt but they can be heavy on resources.

Fronting Web2.0 applications with traditional ADCs is useful for scaling the performance to cope with more users. However, the nature of Web2.0 and, in particular, the server-push technologies employed to serve content based on subscription models, mean that client connections must be maintained to the origin servers whether there is new data to send or not. The overhead on the server of managing all these client connections is very high. It also means that the full benefit of an ADC is not realised. Until now that is.

Citrix NetScaler has new functionality that allows it to sit in front of the web servers and manage the client connections. After all, this is what an ADC is designed to do. This means that the servers can get on with the job of serving content to the users. When there is new content the NetScaler can then push this to all the relevant clients requesting the information.

The end result of allowing the NetScaler to manage the connections in Web 2.0 environments is to reduce the number of servers dramatically. Where 200 servers were required previously to deliver an application, as few as 20 might be needed in conjunction with a single NetScaler. This reduces capital expenditure as well as operating expense in terms of rack space, power and cooling.



Security

One of the biggest headaches that internet gambling sites face is security. Almost daily there is mention of a new Denial of Service (DoS) attack on an Internet gaming site. Many other attacks go unreported such is their regularity. The NetScaler device itself is a hardened appliance that offers high-performance security for web applications and web-services.

Denial of Service prevention

By its nature and its processing power, Citrix NetScaler is capable of preventing many of the common DoS and DDoS attacks. Simply by acting as a proxy and monitoring the connections in and out, it is possible to stop SYN flood attacks, for example and ensure that new, half-opened, connections do not go above unacceptable limits and consume precious server resources. This has proven invaluable to many of our existing customers already in protecting their gaming sites.

Hidden resources

Naturally, NetScaler has full capabilities to rewrite traffic (including whole URLs) and redirect it in response to changing conditions. Thus Citrix NetScaler can help cloak your data centre from external attack and screen-scraping from competitors.

Of course, this masking technique can be used for other purposes. Rewriting URLs is a great way to promote a new service or to localise existing URLs to fit more conveniently into new markets.

Rate limiting

In addition to the normal policy decision criteria such as “who”, “when”, “what” and “where”, NetScaler understands the concept of “rate”. For example, requests per second, packets per second or bandwidth consumption over time. This allows the NetScaler to put constraints on users’ activity within configurable parameters. This will help prevent attacks by invoking different behaviour if a rate threshold is crossed. With the concept of rate in-built into the policy engine the limiting can be applied to any policy decision, for example, to guarantee a level of service to certain applications or redirect to other resources if things get busy.

Application Firewalling

Citrix NetScaler takes security further however, offering integrated Application Layer Firewall capabilities. Augmenting the protection offered by the network firewall and security devices, NetScaler has in-built capabilities that allow full traffic inspection on a session basis. Working on a positive security model the NetScaler is fully HTTP aware and firewalls traffic that deviates from the standard rather than just looking up a list of known signatures. This offers comprehensive protection against SQL injection, Cross-site scripting and other existing, as well as new, attacks. On top of this, the NetScaler Application Firewall offers integrated, comprehensive protection against XML attacks, checking schemas as well as the content.

In addition to preventing attacks NetScaler's Application Firewall can ensure sensitive user data is secured. All gaming sites will be involved in online financial transactions and protecting that information in transit is vitally important. Citrix Application Firewall prevents loss of sensitive user information, such as credit card numbers, in Web application responses, either by blocking the transmission entirely or by masking the majority of digits in a credit card number itself.

Citrix Application Firewall™ performs the critical functions needed to secure Web applications. With its comprehensive set of security features, Citrix Application Firewall guards against all of today's most dangerous application attacks and can help with any PCI-DSS compliance obligations through its audit reporting.

End-user Experience Visibility

In the gaming world, poor user experience equals lost users. This might only be while the site is slow, but more often "lost" means "lost for good". It is obviously better to ensure that the experience of a user is never subject to deterioration through monitoring, then the site or application can be proactively scaled appropriately.

Citrix NetScaler integrates Citrix EdgeSight™ for NetScaler end-user experience monitoring, providing page-level visibility of Web application performance. EdgeSight for NetScaler transparently instruments HTML pages, monitoring Web page response time from the application users' perspective. Response time measurements are combined with detailed statistics on the trip durations of requests and responses across the Web site infrastructure, providing granular visibility into how Web applications are behaving from the end user's perspective. Now it is possible to discover problems with capacity before they are reported or customers are lost.

Summary

The technical challenges and costs of delivering gambling and gaming applications to the growing number of clients demanding them are many and rising. Citrix NetScaler combines the right capabilities to increase performance, enhance availability and offer bullet-proof security required to the data centres of the largest Internet gaming sites. It provides for full application extensibility through HTTP call-outs and allows the latest Web 2.0 server push applications to be optimised and accelerated. The unique implementation of multiple offload technologies and integrated features mean that all of the acceleration benefits are provided while at the same time substantial cost reductions to the infrastructure capital and operation expenses can be offered. NetScaler really is the best solution when building or improving an e-gaming data centre.

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About Citrix

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