
White Paper

Web Acceleration with Nebula 6

The following white paper takes a look at some of the advanced web acceleration techniques the Nebula 6 platform utilises to rapidly accelerate applications and websites on both a local and a global basis.

Acceleration Algorithms

Highly efficient acceleration algorithms help ensure superb page delivery times even whilst under significant load. Nebula 6 can accelerate HTML, SHTML, DHTML, JHTML, PHTML, SOAP, J2EE, JSP, ASP, ASPX, CSS, Javascript, XML, Office Documents (DOC, XLS, PPT, etc.) as well as configurable MIME types and more.

Dynamic Data Compression

Typically an average web page, whether dynamically generated or static content, can be reduced in size by 80-90%. This means that there is significantly less data to send across the internet to the end user. Rule based compression detects and compensates for browser behavioural differences and defects, helping guarantee accelerated pages are correctly displayed by the client's browser.

SSL Offload

SSL termination is an extremely CPU intensive task, putting significant load on servers and meaning scaling services means expensive scaling of the backend infrastructure. Instead, Nebula 6 are able to offload SSL processing from our customers' web servers and onto our high performance Cloud platform, vastly improving transactions rate and speeding up download times by up to 20 times. With ever increasing security concerns and more and more web pages being delivered over HTTPS, and at stronger levels of encryption than before, the importance of offloading SSL termination is undoubtedly set to grow.

Our Services

- Application Acceleration
- Global Load Balancing
- Cloud Load Balancing
- Global Content Delivery
- Website Resilience & Acceleration

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Enterprises should incorporate application acceleration as an integral requirement for any cloud-computing service.

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Gartner
Optimising Applications from Cloud Services: The Old Issues, but more challenging to solve.

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Gartner believes that, through 2013, at least 60% of enterprises will experience slow or inconsistent application performance issues from externally placed applications.

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Bjame Munch, Gartner.
Is Your Network Design the Weak Link in Cloud Computing?



Content Caching

By caching frequently requested content on behalf of the backend servers, Nebula 6 reduces server load and accelerates the delivery of applications and website to their end users.

The dual benefits of content caching are that (i) less web servers are required because Nebula 6 are now doing much of the work of serving end users (ii) users will get a much better response time as Nebula 6 doesn't have to go the web server to retrieve the requested content.

In addition, because we're able to cache content at multiple Points of Presence around the world, Nebula 6 are able to ensure applications and websites can be rapidly delivered to users across the planet, irrespective of where the backend services are physically located.

This in turn represents significant cost savings on the traditional alternatives for delivering content worldwide, namely replicating infrastructure around the world or using a traditional Content Delivery Network.

Content Compression

Web pages tend to be highly compressible. An average web page, whether static content or dynamically generated, can be typically reduced in size by 80-90%. Simply put, using Nebula 6 to compress content means that there's a lot less data to send across the internet to end users.

Nearly all browsers can accept compressed content automatically without the end user having to make any changes and Nebula 6's platform is intelligent enough to recognise what level and type of compressed content browsers can accept, thus ensuring reliable page renditions.

The end result is that web pages will be delivered faster, using less bandwidth and less server resource. It's worth noting here that Nebula 6 doesn't compress absolutely all types of content - images such as JPG, PNG etc are already compressed and as such they see very little benefit from additional compression.

Key Features

- Enhance End User Experience & Adoption
- Reduce Infrastructure & Bandwidth Requirements
- Enable Rapid Scaling and Growth
- Achieve Inter-Site Resilience
- Use Geo-Location to Reduce Latency
- Work With Us To Build Customise Solutions To Meet Complex Requirements
- Serve Users Around the World Without Deploying Local Infrastructure
- A Fraction of Traditional CDN Costs
- Multiple Interconnected Datacentres
- Worldwide Points-of-Presence



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As enterprises move more applications into external data centres, it has become more difficult to manage application traffic flow and, subsequently, application performance for users placed in branch offices and remote users.

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Bjarn Munch, Gartner.
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The screenshot below was taken from our internal system monitoring on a customer's e-commerce site.

- The "Content Compression to Date" is 85% - this means that out of the content that can be compressed, the average level of compression is 85%. Without compression, 1.12 TB would have been sent over the network but due to compression only 164GB was sent.
- The "Overall Compression to Date" is 81%. As we can see, a high degree of compression has been achieved and, assuming all traffic is going through Nebula 6, the overall reduction in bandwidth is 81%. Instead of 1.17TB worth of data being sent, Nebula 6 has reduced this to only 0.25Tb of data.
- We can see that in this example the maximum throughput for the site was 34.51Mbps with peak connections hitting 202. In total, Nebula 6 has processed 50 million hits to the site.

Content Compression to Date	=	85%	
Throughput Before Compression	=	1,126 GB	
Throughput After Compression	=	164.4 GB	
Overall Compression to Date	=	81%	Current Values
Throughput Before Compression	=	1,177 GB	85%
Throughput After Compression	=	215.4 GB	34.51 Mbps (data)
Throughput From Cache	=	966.0 GB	4.95 Mbps (data)
			0.00 Mbps (data)
			Total: 39.46 Mbps (data)
Overall Hits Counted	=	50,157,432	
Total Connections	=	60,594,370	162.81 Connections per Second
Peak Connections	=	202	0 Current Connections

- The complementary screenshot below shows that 81% of all hits are actually being served from Nebula 6, not from the customer's backend servers. This would potentially mean that the customer needed a quarter of the amount of web servers to serve the same number of hits. Clearly this can lead to significant cost savings in terms of web servers, hardware, software licenses, support and maintenance. In addition, in terms of global delivery, this would mean Nebula 6 could serve the majority of content from a global PoP, far closer to the user and at much lower latency, instead of from a distant central location where the main services themselves are

Content Caching	Hits	Bytes
From Cache	= 10436922 / 16.3%	966.0 GB / 81.8%
From Server	= 53443687 / 83.7%	215.4 GB / 18.2%
Cache Contents	= 16 entries	609.5 KB / 1.2%
CPU Usage	=	19.0%
Disk Usage	=	26%
Memory Usage	=	5.2% (51.2MB of 986.1MB)



About Nebula 6

Nebula 6 offers a revolutionary new way to deploy cutting-edge web acceleration technology.

Built with the brief of making world-class web acceleration and optimisation available as a flexible, scalable, highly resilient service, Nebula 6 takes the complexity and cost out of deploying technology that's traditionally been the preserve of only the largest enterprise businesses.

Utilising Nebula 6 allows businesses to quickly and cost effectively accelerate applications and websites, whether that be on a local or global basis, and to intelligently load balance between servers and datacentres.

Our Cloud platform is built to the highest specifications, delivering highly available services from multiple interconnected core datacentres and a series of global points-of-presence. Fault tolerant and built with no single points of failure, the Nebula 6 Cloud is capable of accelerating applications and websites on a global basis, as well as helping deliver true high availability.

To learn more, contact us on by phone on +44 (0) 870 382 5050 or via email to info@nebula6.com. Alternately, please visit our website at www.nebula6.com



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