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PONTIFICIA UNIVERSIDAD CATÓLICA DEL PERÚ

FACULTAD DE CIENCIAS E INGENIERÍA

DISEÑO DE UNA RED CDN/P2P ORIENTADA AL STREAMING DE MATERIALES ACADÉMICOS EN EL PERÚ

Tesis para optar el Título de Ingeniero de las Telecomunicaciones, que presenta el bachiller:

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ASESOR: ING. JUAN OMAR SALOMÉ RESURECCIÓN

Lima, Julio del 2013

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Anexos

Anexo1: Estadísticas de las principales CDN

Se presenta en este anexo las gráficas con las estadísticas de la cantidad de sitios web que utilizan la CDN de Akamai y de Facebook.

Anexo2: Soporte de servidor dedicado.

Se presenta en este anexo el correo electrónico intercambiado con una empresa que alquila servidores dedicados.Esto con el objetivo de aproximar la cobertura de un servidor con un puerto de 10Gbps y con cierta memoria ram a 1Mbps de bitrate de video.

Anexo3: Soporte de Wowza con multicast.

Se presenta en este anexo los correos electrónicos intercambiados con el soporte de Wowza en el que se confirma que ,por un tema de compatibilidad de la tecnologia multicast en el lado del cliente,Telefonica usa unicast para sus streamings.

Anexo4: HP Tool

Se presenta en este anexo la herramienta usada para la estimación de los servidores HP de acuerdo a las características de requerimiento , como por ejemplo mayor memoria RAM, adaptadores de puertos de 10Gbps.

Anexo5: Servidores HP

Se presenta en este anexo las especifcaciones más importantes de los servidores serie DL 160 y DL 360e.

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Anexo6: Interconexión de servidores de la CDN

Se presenta en este anexo un gráfico que ayuda a entender como es la conexión de los servidores de la CDN con los ISP que puedan existir.

Anexo7: Parámetros en diseño de CDN

Se presenta en este anexo una tabla que indica los parámetros a tener en cuenta para el diseño y despliegue de una CDN.

Bibliografía

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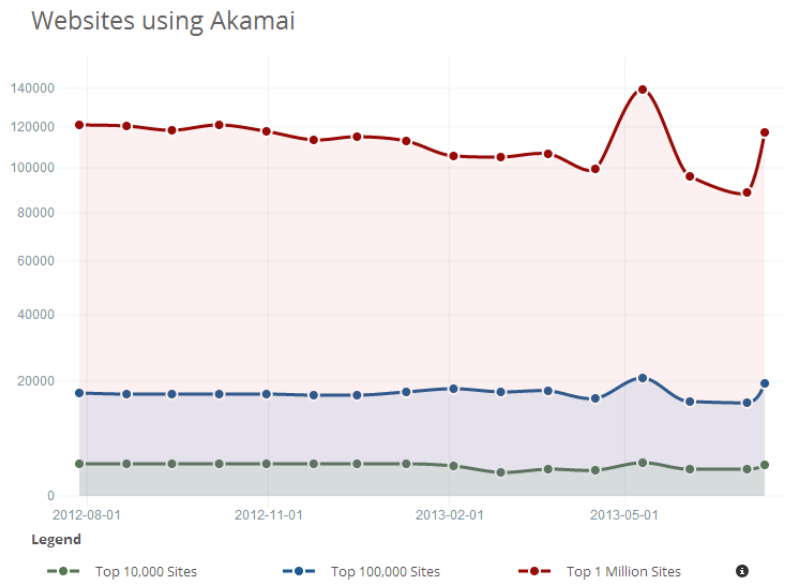
Anexos

Anexo 1: Estadísticas de las principales CDN



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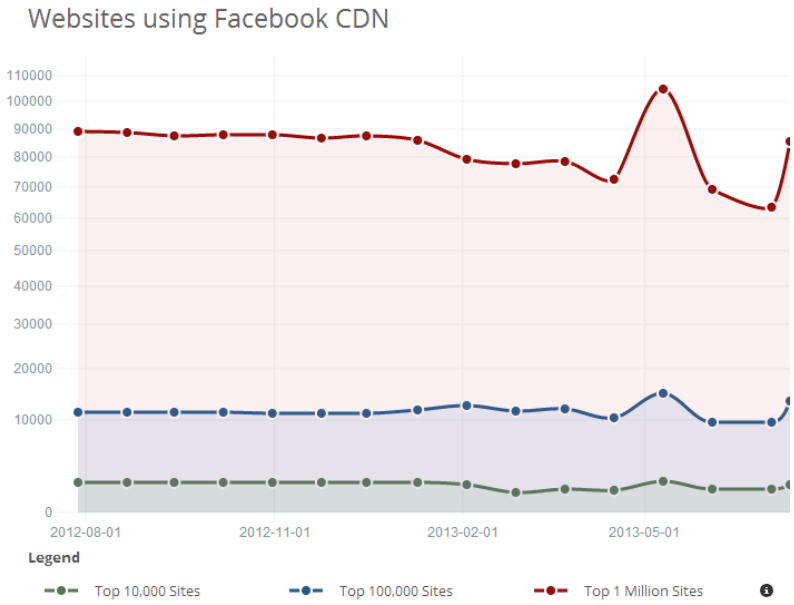

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Anexo 2: Soporte de servidor dedicado.

Servidores De Streaming [info@wowza.es]

Bandeja de entrada

domingo, 23 de junio de 2013 01:30 p.m.

Saludos Gianpierre,

En efecto Wowza es un software y nosotros realizamos las instalaciones, configuracion y soporte en servidores dedicados. Tambien tenemos planes para pequeños proyectos o concurrentes limitados como se ve en la web.

Sobre la propuesta podemos ofrecer servidores con wowza de 10 GB port, 78 GB de RAM ubicados en europa o estados unidos. En la web puede consultarlo como Dedicado 3. Dependiendo del bitrate en que se emitia podria llegar a la audiencia que indica, soportaria unos diezmil concurrentes a buena calidad de streaming (1 MB) , bajando el bitrate la posibilidad de concurrencia subiria.

Precio por server : 950€ + Licencia Wowza + Control Panel = 1050€ /mes.
Soporte 24/7
Trafico ilimitado

Un saludo cordial,

Max.

Servidores de Streaming Wowza.ES

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Anexo 3: Soporte de Wowza con multicast.

John West, May 31 11:24 pm (CDT):

Hello Gianpierre,

Thanks for providing that detail.

As you may already know, several divisions within Telefonica rely on our software. This includes:
- Telefonica's Global Deliver (CDN) group,
- the Terra Networks subsidiary,
- Telefónica Móviles of Spain, and
- the Tokbox subsidiary in the US.

There are also some divisions of O2 who use Wowza Server.

To the best of my knowledge, each of the teams at Telefonica who we currently work with are using our unicast features because the client side player software they target doesn't support multicast.

Please tell me more about what client side player software your customer is targeting and I'll provide more details on what our software can support in relation to that client.

If your customer doesn't yet have a player selected, then please note our software support traditional industry standard IP Multicast video. This type of stream can be played back using Apple's Quicktime application, the VLC open source application, and we also offer a Silverlight based player that's multicast enabled.

If you'd like to build a proof of concept demonstration using a free Developer Edition license, please let me know & I'll send you a set of tutorial guides to help get started.

Yours,

John West

[4]

John West, Jun 04 10:54 am (CDT):

Hi Gianpierre,

Our software offers support for both inbound and outbound standard IP Multicast video streams. We accept multicast input from a large number of commercial and open source live encoders. Our output streams are compatible with both VLC and Apple's Quicktime desktop player.

To alleviate the challenge to the IT teams at all your educational institutions to maintain VLC or Quicktime installations on all your desktops, we've also built and released a Silverlight based web player (no extra cost).

Just to double check: IP multicast streaming requires use of a private network since most public network routers don't pass through multicast packets.

Getting started:
I suggest you begin by setting up a proof of concept demo in your own lab where you have complete control of the IP multicast setting of the router hardware. Just use a regular PC or Mac to get some understanding of how our software helps deliver both live and pre-recorded video. Please see the links below my signature on this email to help get started with a FREE Trial license & our video tutorials.

Please let me know if you need further information. If your own web application development team is busy at the moment and you'd like to bring in external programming assistance, I'd be happy to recommend several independent consultants who have experience with our Wowza Server software and who offer in-depth development services.

Yours,

John West

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US: 888.778.7997 / International: +1.720.222.4744 / Fax: +1-408.904.5396
Wowza Media Systems, Inc. / Skype: WowzaJohnATX / WOWZA.com

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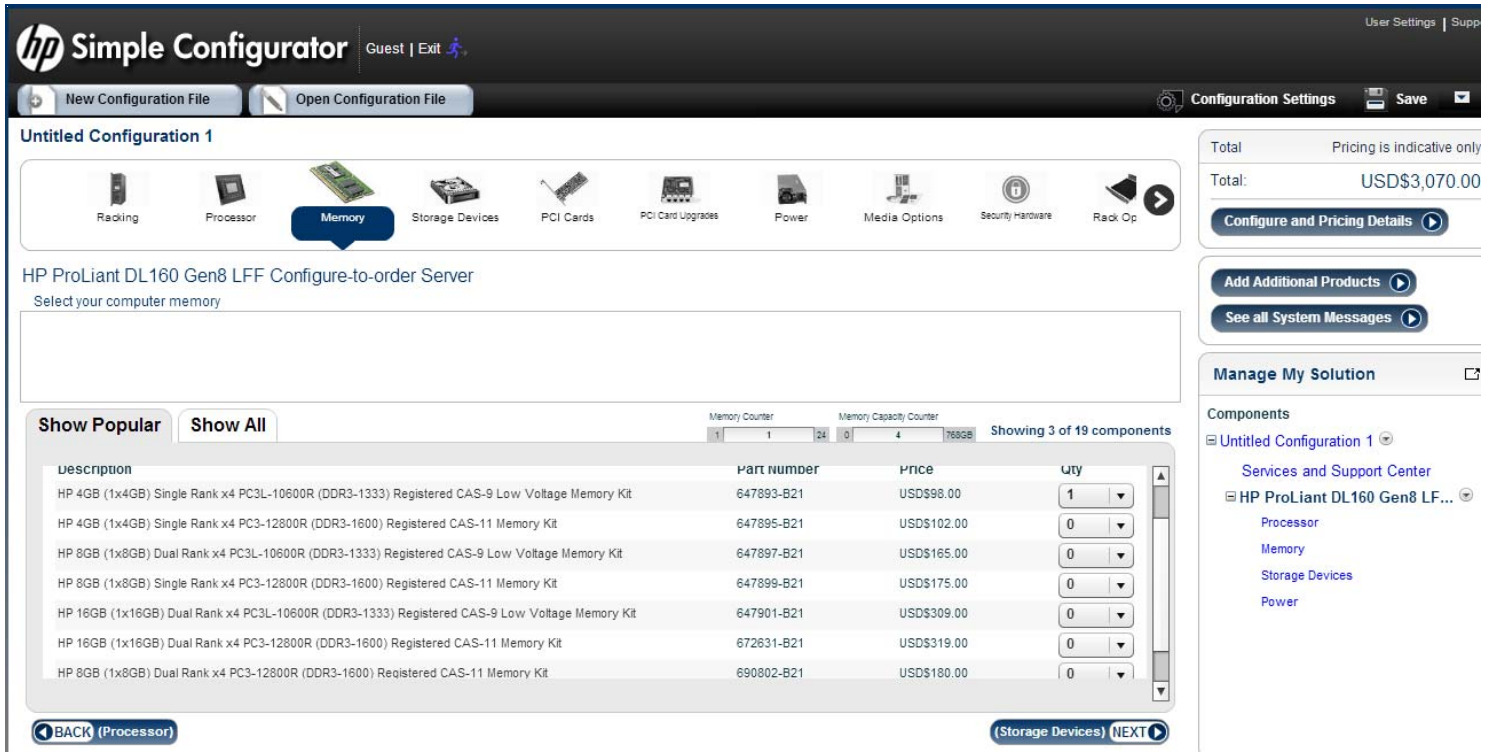
Anexo 4: HP Tool



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Anexo 5: Servidores HP

i)Servidor HP DL 160

QuickSpecs

HP ProLiant DL160 Generation 8 (Gen8)

Technical Specifications

System Unit	**Dimensions** (H x W x D) (with bezel)	4 LFF	1.7" (43.2mm) Height x 17.1" (434.6mm) Width x 29.5" (750mm) Length	
		8 SFF	1.7" (43.2mm) Height x 17.1" (434.6mm) Width x 27.5" (699mm) Length	
	Weight (approximate)	Maximum (all hard drives, power supplies, and processors installed)	33..00 lb (15.2kg)	
		Minimum (one hard drive, power supply, and processor installed)	31 lb (14.1kg)	
	Input Requirements (per power supply)	Rated Line Voltage	100 to 120 VAC, 200 to 240 VAC	
		Rated Input Current	10 A at 100 VAC 5 A at 200 VAC	
		Rated Input Frequency	50 Hz to 60 Hz	
	BTU Rating	Rated Input Power	562 W at 100V AC input 562 W at 200V AC input	
		Maximum	500W	1917 at 100 V AC 1898 at 115 V AC 1856 at 200 V AC 1850 at 230 V AC
			460W	1764 at 100V AC
HP Ethernet 1Gb 2-port 361i Adapter	**Network Interface**	10Base-T/100Base-TX/1000Base-TX		
	Capability	IEEE 802.3 10Base-T IEEE 802.3ab 1000Base-T IEEE 802.3u 100Base-TX IEEE 1588, IEEE 802.1AS		
	Data Transfer Method	PCI Express v 2.1, 5.0 GT/s and 2.5 GT/s bus speeds and supports for x1, x2, x4 links widths (Lanes)		
	Controller	I350 Powerville		
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s per port, 20 Mb/s Combined	
		10Base-T (Full-Duplex)	20 Mb/s per port, 40 Mb/S Combined	
		100Base-TX (Half-Duplex)	100 Mb/s per port, 200 Mb/s Combined	
		100Base-TX (Full-Duplex)	200 Mb/s per port, 400 Mb/s Combined	
		1000Base-TX (Half and Full-Duplex)	1000Mb/s per port, 2000 Mb/s Combined	
	Connector	RJ-45		
	Cable Support	10Base-T Categories 3, 4 or 5 UTP; up to 328 ft (100 m) 10/100/1000Base-TX Category 5 UTP; up to 328 ft (100 m)		

HP Dynamic Smart Array B120i Controller	**Dimensions**	Embedded
	Disk Drive Interface - Transfer rate	Up to 6Gb/s SATA (Serial ATA)
	SATA Connectors	6 internal connectors w/hot plug support
	Server Interface	PCIe 2.0
	SATA Speed	3Gb/s SATA links
	Logical Drives Supported	Zero Memory, Up to 2 logical volumes (6 physical drives)
	Host Memory Addressing	64-bit, supporting greater than 4GB server memory space
	Hot Plug Support	Yes
	RAID Support	RAID 0 (Striping), RAID 1 (Mirroring) RAID 1+0 (Striping & Mirroring) RAID 5 with optional 512MB FBWC **NOTE:** 512 MB cache is required to enable RAID 5 support. **NOTE:** NO SAS supported.

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i)Servidor HP DL 360

Technical specifications

	HP ProLiant DL360e Gen8
Drive description	8 SFF SAS/SATA/SSD or 4 LFF SAS/SATA/SSD
Storage type	Hot plug SFF 2.5-inch SAS Hot plug SFF 2.5-inch SATA Hot plug SFF 2.5-inch SSD Hot plug LFF 3.5-inch SAS Hot plug LFF 3.5-inch SATA Hot plug LFF 3.5-inch SSD
Cache	20 MB L3 15 MB L3 10 MB L3
Processor family	Intel® Xeon® E5-2400 family
Processor number	1 or 2
Processor core available	8, 6, or 4
Maximum processor speed	2.4 GHz
Memory slots	12 DIMM slots
Memory max	384 GB
Memory type	DDR3 RDIMM, LRDIMM, UDIMM
Memory protection features	Advanced ECC, online spare, memory lock-step mode
Network controllers	1Gb 4P 366i Ethernet adapter
Storage controllers	Smart Array B320i/ Smart Array B120i SATA RAID
Expansion slots	1x PCIe Gen3 slots for full height, half-length and 1x PCIe Gen2 low profile option cards
Remote management software	HP Insight Control with iLO Advanced
Form factor chassis	Rack
System fans features	Hot plug fully redundant
Power supply type	Hot plug redundant power supply
Graphic card	Quadro 4000
Full configuration form factor	1U
Warranty (parts-labor-onsite)	3/1/1

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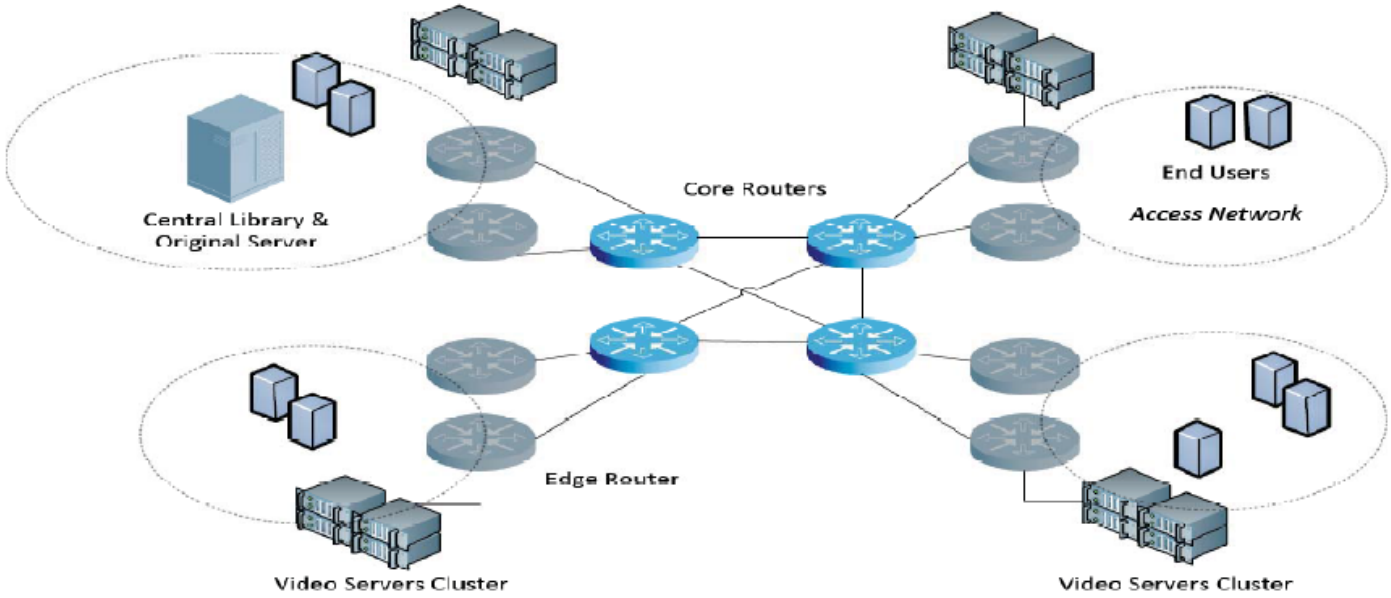
Anexo6: Interconexión de servidores de la CDN



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Anexo7: Parámetros en diseño de CDN

Input	Description
Video usage patterns	• At peak, how much play does the top video get compared to the least popular. Usage curves are very different for linear content with nDVR, VOD and Internet Video.
CDN and Video Operational characteristics	• How efficiently will the CDN pre-position content? • How many formats of video are stored and for what purposes? • What percentage of video requests are viewed in full?
Network topology	• How many national library locations, regional networks, local head-ends and hubs are there? • MSOs with many small locations will yield different results than those with fewer but larger locations.
Network costs	• Approximate costs for each network level must be stated in simple "$ / Mbps at peak" terms. • It is necessary to do this in order to make trade-offs between cache and network costs.
CDN costs	• CDN cache costs by network level must be known. • It is important to be able to express the cost of each cache in terms of a "loaded" $ / GB.

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