

# Inside the Engine room

*Investigating Steam's Content Delivery Platform Infrastructure  
in the Era of 100GB Games*



Internet Initiative Japan

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IIJ - Research Lab

## Why gaming?

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- **Reduce latency**
- **Prevent DoS attack**
- **Increase availability**
- **Cloud Gaming**

# What's Caused The Biggest UK Broadband Traffic Spike In The Past Week? 'Call Of Duty,' Not Coronavirus

Barry Collins Contributor @

*I am a consumer tech expert writing about Windows, PCs, laptops, Mac, broadband and more.*

Home / Innovation / Cloud

## Last week's Fortnite update helped Akamai set a new CDN traffic record

Akamai said CDN traffic peaked at 106 Tbps last week, passing the 100 Tbps mark for the first time.



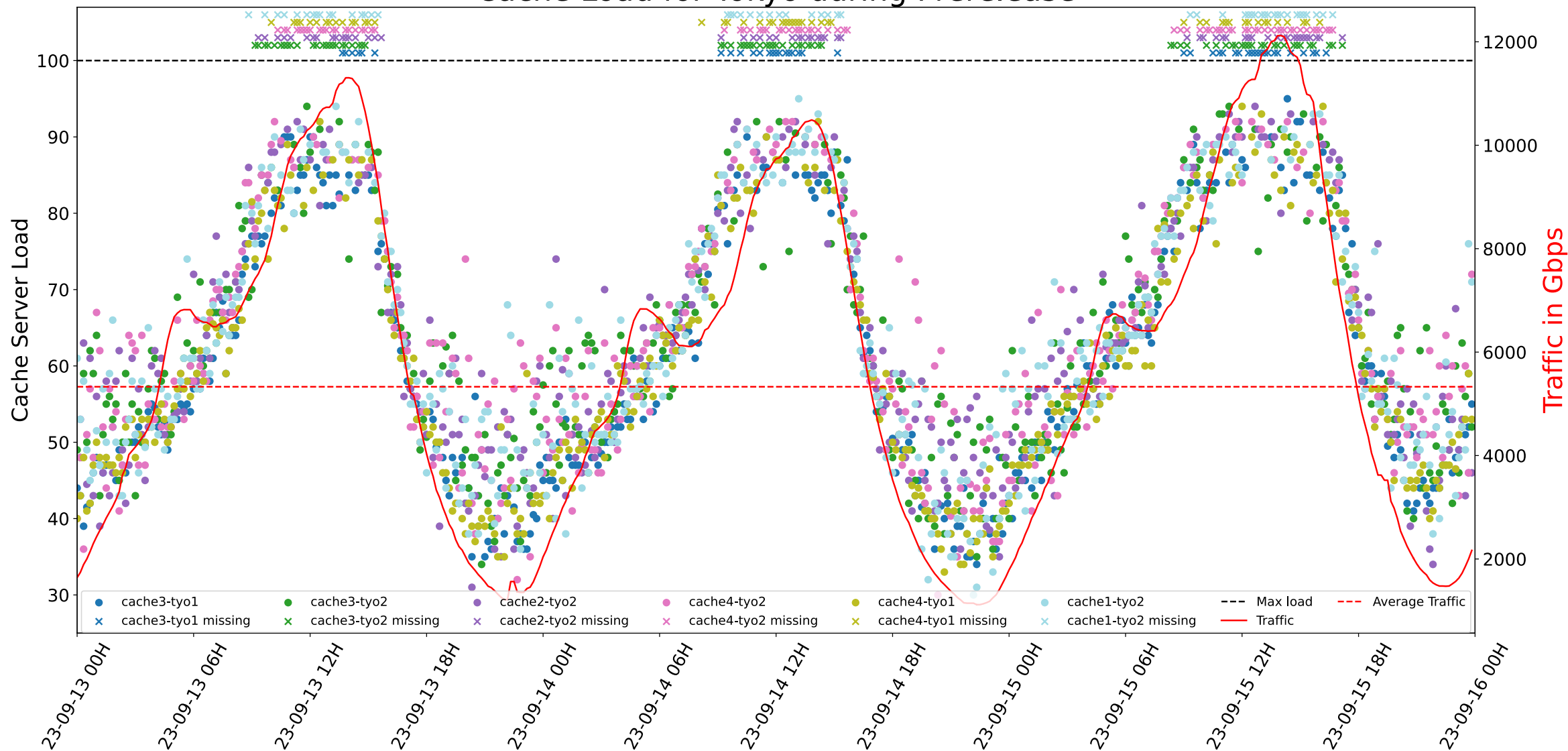
Written by **Catalin Cimpanu**, Contributor on Oct. 23, 2019

- Unique Cache requirements
- Wide variety of content
- Sufficient bandwidth for “Big game” releases
  - Big in size + popularity
- Global release time
- Full download required

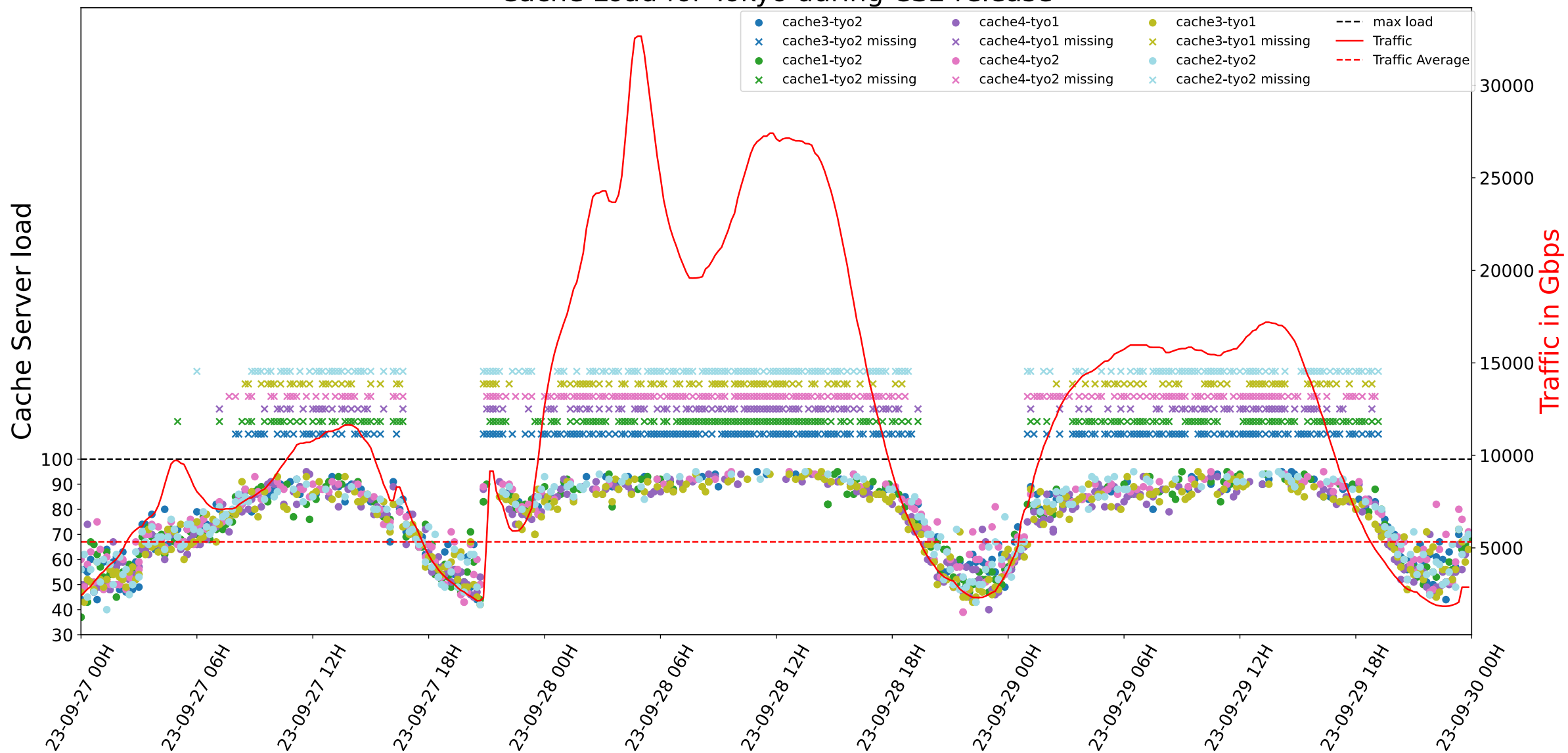
	Steam	Sports	Windows	Netflix
<b>Urgency</b>	ASAP	1h+/Streamed	‘Patch Tuesday’	1h+ / streamed
<b>Time</b>	World Sync On-Demand	World Sync	Rolling Update	On-demand
<b>Localization</b>	Steam Cache + CDN	Multi CDN	Multi CDN	Netflix Cache
<b>Catalogue</b>	++++	-	-	++
<b>Users</b>	132+ Million	3 Billion	1.4 Billion	232.5 Million
<b>Size</b>	Up to 150GB	1~7GB/h	114MB ~ 5.4GB	1~7GB/h
<b>Frequency</b>	1 shot	1 shot	Low frequency	Daily



# Cache Load for Tokyo during Prerelease

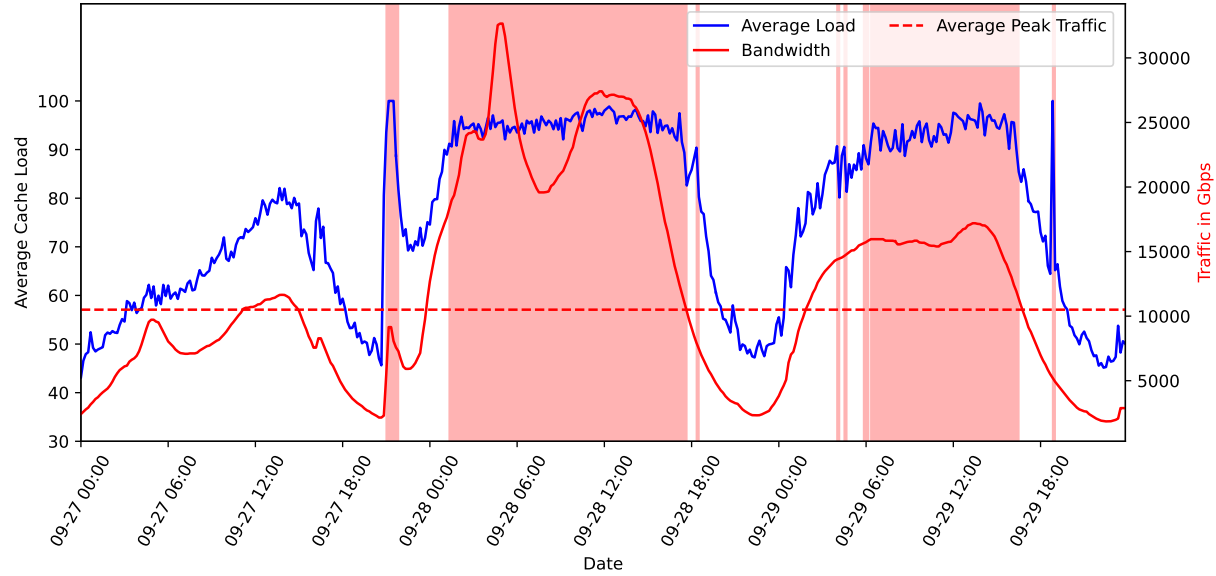


### Cache Load for Tokyo during CS2 release

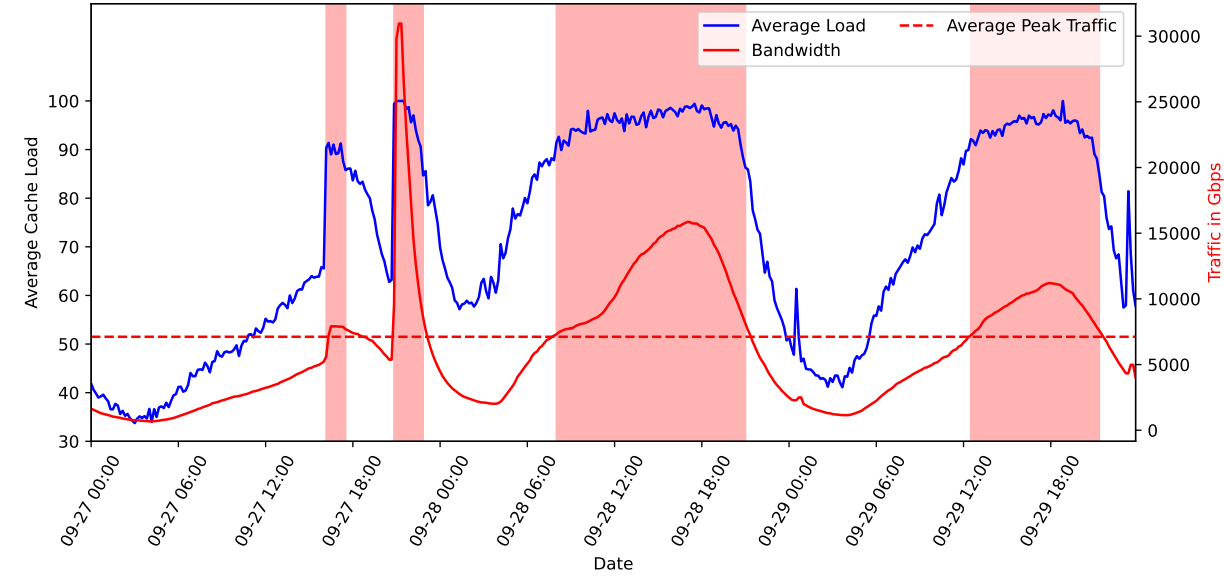


# Traffic load across regions

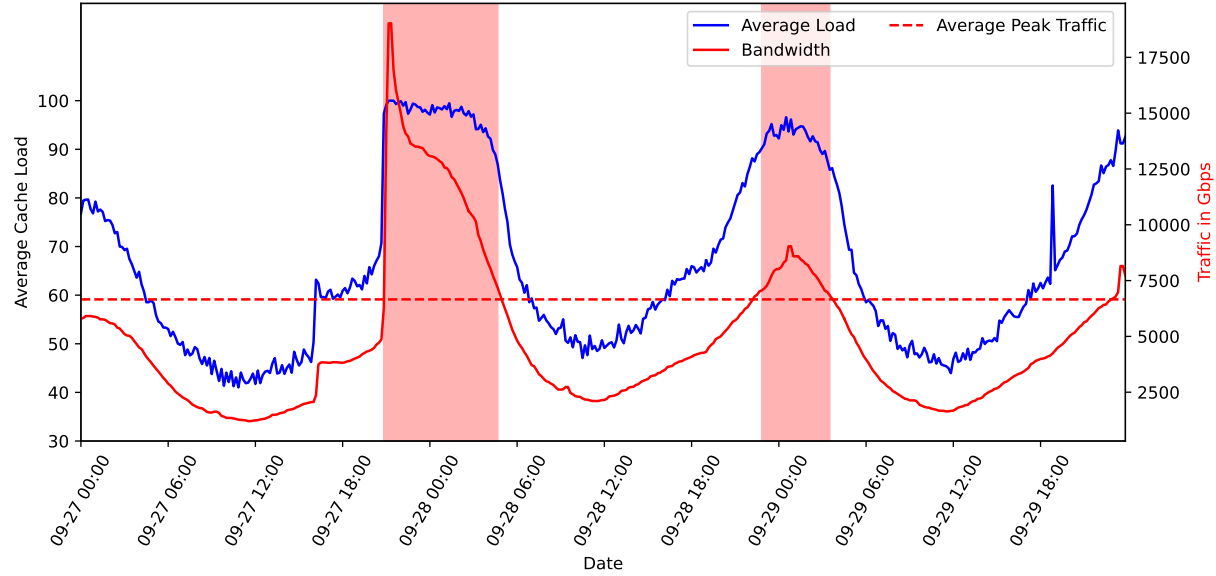
Traffic vs the average cache load for Asia



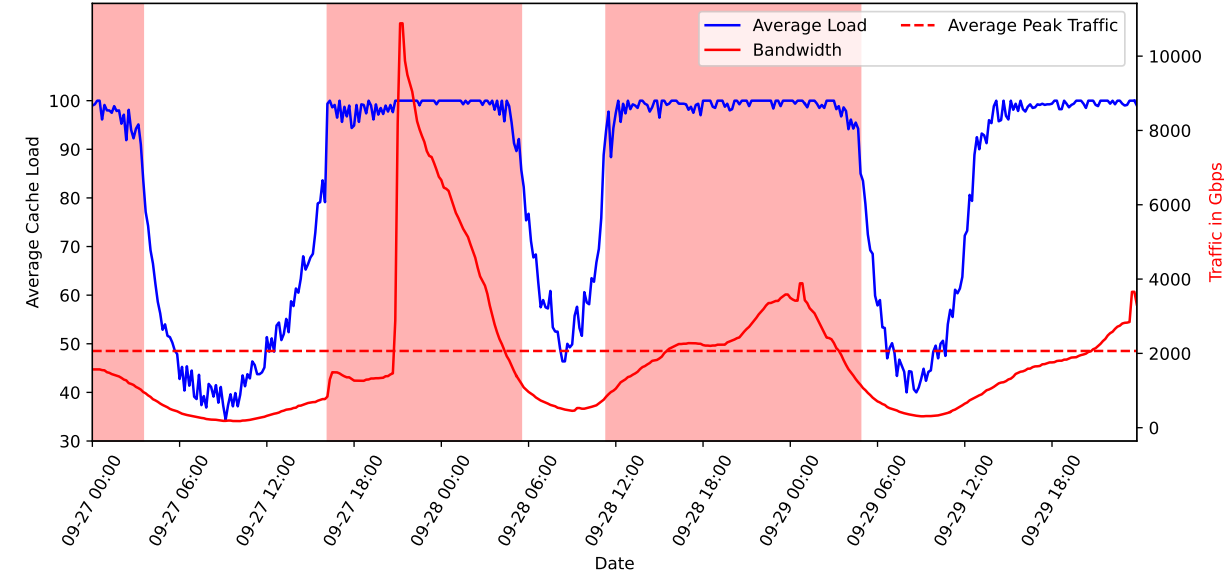
Traffic vs the average cache load for Europe



Traffic vs the average cache load for North America



Traffic vs the average cache load for South America



## Where does the traffic come from?

type	SteamCache
load	39
weighted_load	27.44
host	cache3-lhr1.steamcontent.com
preferred_server	true
type	SteamCache
load	47
weighted_load	60.89
host	cache7-lhr1.steamcontent.com
preferred_server	true
type	CDN
load	0
weighted_load	130
host	steampipe.akamaized.net
preferred_server	false
type	CDN
load	0
weighted_load	130
host	google2.cdn.steampipe.steamcontent.com
preferred_server	false

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## Where does the traffic come from?

type	CDN
load	0
weighted_load	130
host	google2.cdn.steampipe.steamcontent.com
preferred_server	false
type	CDN
load	0
weighted_load	130
host	steampipe.akamaized.net
preferred_server	false
type	CDN
load	0
weighted_load	130
host	alibaba.cdn.steampipe.steamcontent.com
preferred_server	false
type	CDN
load	0
weighted_load	130
host	level3.cdn.steampipe.steamcontent.com
preferred_server	false

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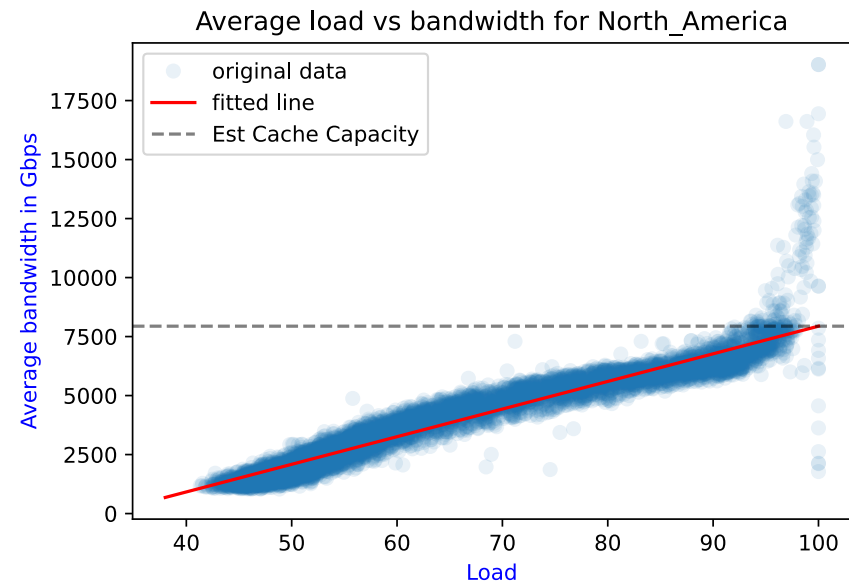
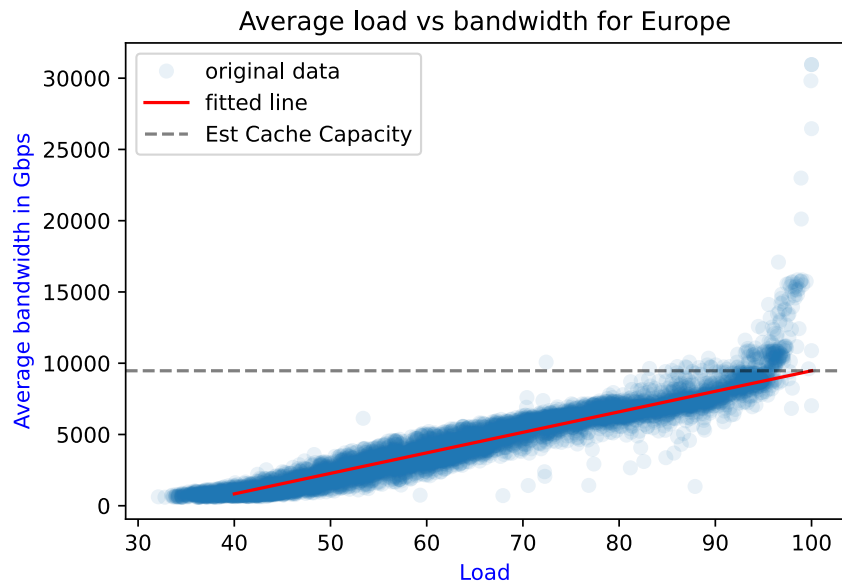
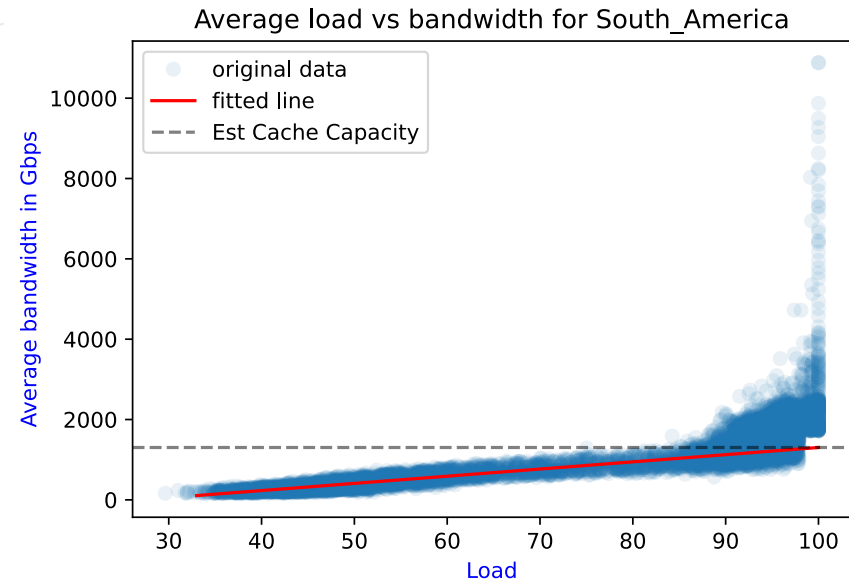
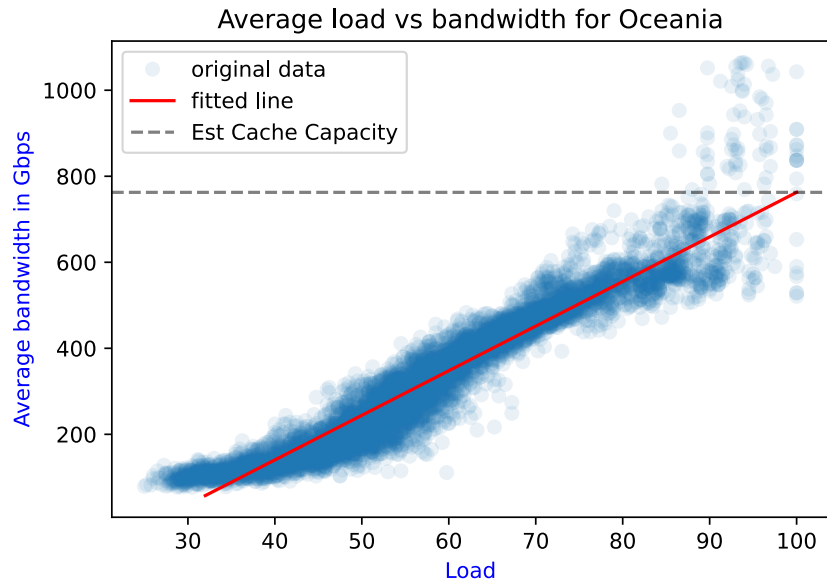
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## Steam Cache Capabilities

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Region	% Content served from Steam Cache	% Traffic served from Steam Cache	Estimated Cache Capacity (Gbps)	Peak Traffic Observed (Gbps)
<b>Africa</b>	90.95	82.88	106	281
<b>Asia</b>	96.09	89.50	13556	32657
<b>Europe</b>	97.75	93.42	9470	30954
<b>North America</b>	98.60	96.24	7940	19025
<b>Oceania</b>	99.17	97.66	763	1064
<b>South America</b>	59.22	33.79	1303	10883

- Identified and characterised game download traffic
  - On average, low impact but can spike during game releases
- Demonstrate the feasibility and benefits of a hybrid-CDN design
  - Demonstrate how Valve deals with these spikes
- Mapped out and identified Valve's point of presence at DCs
  - Identify regions that would benefit from more infrastructure
- Future work?
  - Building Dataset
    - Trends in top ASNs and traffic usage per country. infrastructure changes etc.
  - Continue observing the impact of games



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