

Inside the Bird's Nest: Measurements of Large-Scale Live VoD from the 2008 Olympics

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Coverage

- ▶ instrumented ChinaCache, a major Chinese CDN
- ▶ dataset covers all of mainland China
- ▶ videos access through official site, unnamed social network, and syndication

Content Provider	# Log entries (millions)	# Unique IPs (millions)	# Connxns / Sessions (millions)	# Videos accessed (thousands)
<i>Soc</i>	118	2.5	14/14.2	20
<i>Off</i>	47	1	4/5.8	13.7
<i>Synd</i>	5	0.12	0.15/0.4	0.05

Architecture

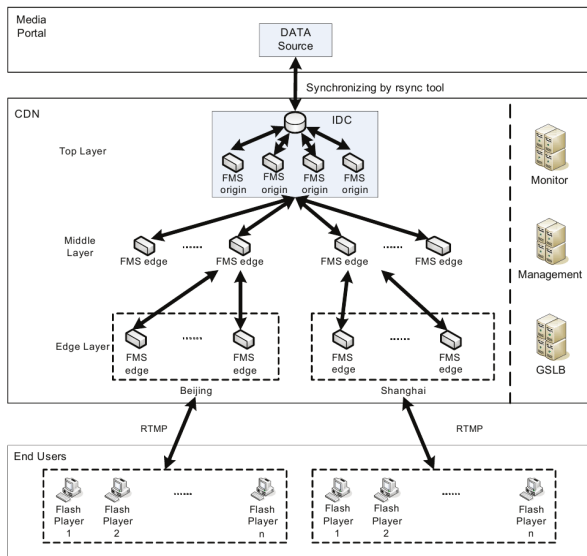


Figure 1: Architecture of the VoD system

Rush Hour

- ▶ define “rush hour” as the hour that contributed most to each day
- ▶ accounted for ~10% of each day’s traffic

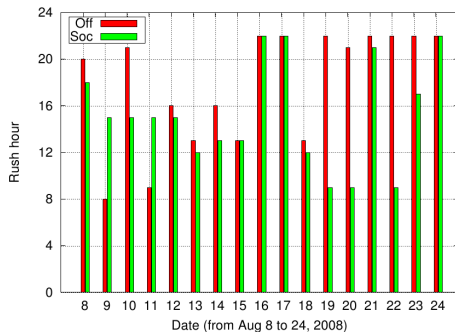


Figure 9: When did the rush hours occur?

Popular videos

- ▶ popular videos change rapidly
- ▶ up to quintuple the churn of regular VoD services
- ▶ select few events get more than their 15 minutes

User behavior

- ▶ users rarely watch more than 10 minutes of a video

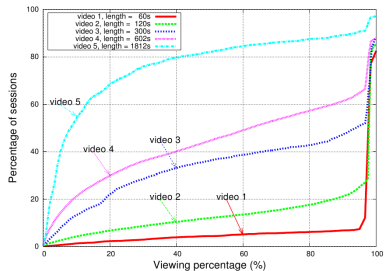


Figure 12: CDF of viewing percentage of different sessions

- ▶ very little use of playback control other than pause

Flash mobs

Date	Events		Rush Hour		% Contribution to daily accesses	
	<i>Off</i>	<i>Soc</i>	<i>Off</i>	<i>Soc</i>	<i>Off</i>	<i>Soc</i>
Aug.8	Opening ceremony	Opening ceremony	20:00	18:00	16.6%	12.4%
Aug.12	Diving: Women's Synchronized Platform	Diving: Women's Synchronized Platform	16:00	15:00	10.6%	14.4%
Aug.13	Gymnastics: Women's Team Competition	Gymnastics: Women's Team Competition	13:00	12:00	9.6%	17.6%
Aug.16	Basketball: men's China vs Germany	Athletics: Men's 100m	22:00	22:00	8.5%	16.3%
Aug.17	Shooting: Men's 50m Rifle bronze	Diving: Women's Individual Springboard	22:00	22:00	9.5%	10.0%
Aug.18	Liu Xiang's withdrawal	Liu Xiang's withdrawal	13:00	12:00	11.8%	10.4%
Aug.24	Closing ceremony	Closing ceremony	22:00	22:00	13.8%	9.6%

Table 4: Specific events in the Olympics that triggered large flash crowds

Flash mobs, cont.

- ▶ social networking gets hit faster than official channels

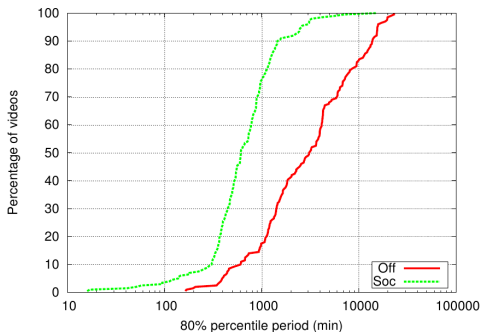


Figure 19: CDF of 80% percentile period across *Off* and *Soc* for their top 200 hot videos

Effects of advertising

- ▶ ads caused much more significant viewer loss on *Synd* than *Off*

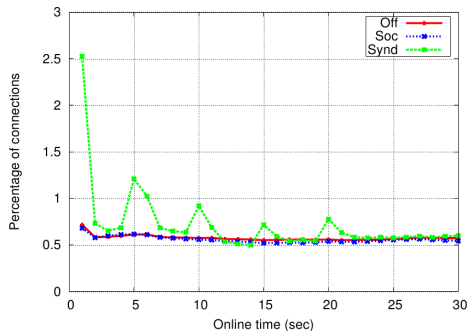


Figure 21: Connections between 1s and 30s

Effects of advertising, cont.

- ▶ them: difference due to type of data
- ▶ me: difference due to context and user expectations

