Network Impact of P2P-TV Zapping

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Introduction

- ▶ Strong increase of audio/video services in the Internet
  - ▷ wide distribution by expensive CDN infrastructure
  - ▷ local distribution by residential operators
- ▶ Alternative with P2P-TV applications
  - ▷ different from usual file sharing P2P : hard time constraints
  - ▷ P2P-TV overlay depend on content and user behavior
- ▶ IPTV user behaviors are zapping or steady [Cha & all, IMC'08]
  - ▷ most previous P2P-TV analysis works focus on steady state
  - ▷ our work focuses on **transient state** and **zapping behavior**

Experimentation

- ▶ 4 popular P2P-TV applications
  - ▷ SOPCast, PPStream, PPLive and UUSee
- ▶ 5 popular TV channels
  - ▷ CCTV1, CCTV2, CCTV4, CCTV10 and CCTV13
- ▶ 2 different locations: Paris and Tokyo (broadband access)
- ▶ 2 measurement periods (June and September 2011)

Measurement

- ▶ Black-box analysis
  - ▷ proprietary applications (internal mechanisms unknown)
  - ▷ capture of all the traffic of one peer
- ▶ One channel preliminary results
  - ▷ active peers (other peers with whom the measured peer exchange)
  - ▷ traffic split (upload/download, signaling/video...)
  - ▷ traffic distribution (top ten peers)
- ▶ Five channel capture
  - ▷ peer and traffic distribution among channels
- ▶ Anonymised traces availables at
  - ▷ http://content.lip6.fr/traces/

Conclusion and further works

- ▶ Overload estimation in transient state: only preliminary results
- ▶ France and Japan results similar
- ▶ Further works
  - ▷ statistical results over the whole dataset
  - ▷ deeper application behavior analysis
  - ▷ combination with adverse network situations

Example with SOPCast, 1 channel (CCTV1)

- ▶ Measurement done on Tuesday, June 30, 2011 at 14h GMT
- ▶ Chronogram used with 1 channel:
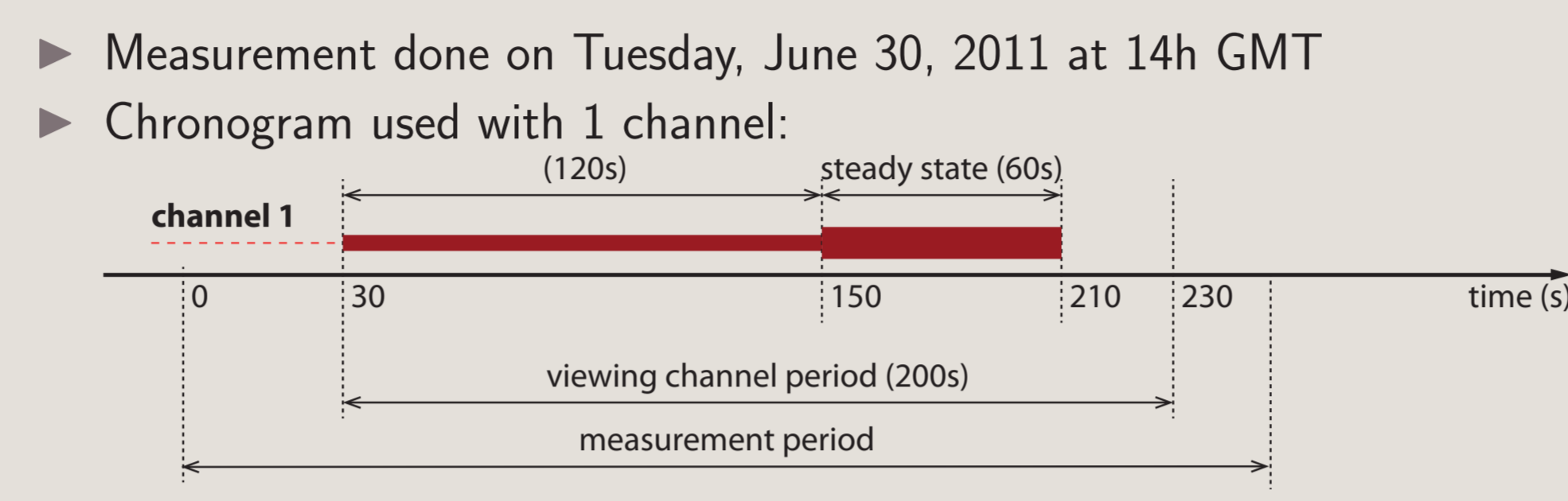
- ▶ Numerical results (simple signaling/video split based on packet size):

Trace	Total data (KB)	Duration (s)	Download (KB)	Upload (KB)
Full	41894	238	18215	22697
60s	8073	60	4042	3841

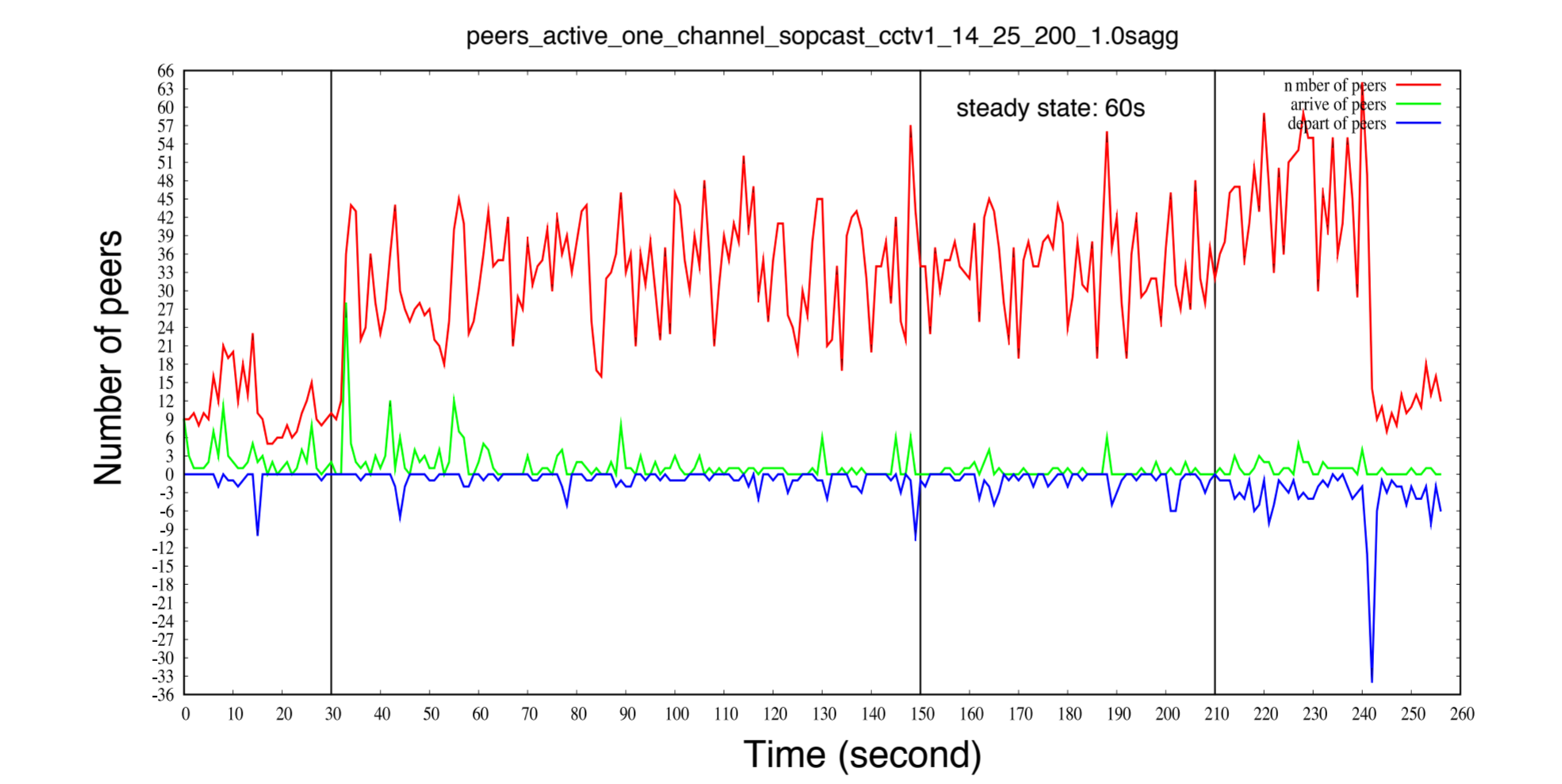| Trace	Sig.Dl.(KB)	Vid.Dl.(KB)	%	Sig.Up.(KB)	Vid.Up.(KB)	%
Full	2165	16049	12	15216	7481	49
60s	419	3623	10	2632	1209	46

Fig. 1. Active peers associated with one SOPCast channel
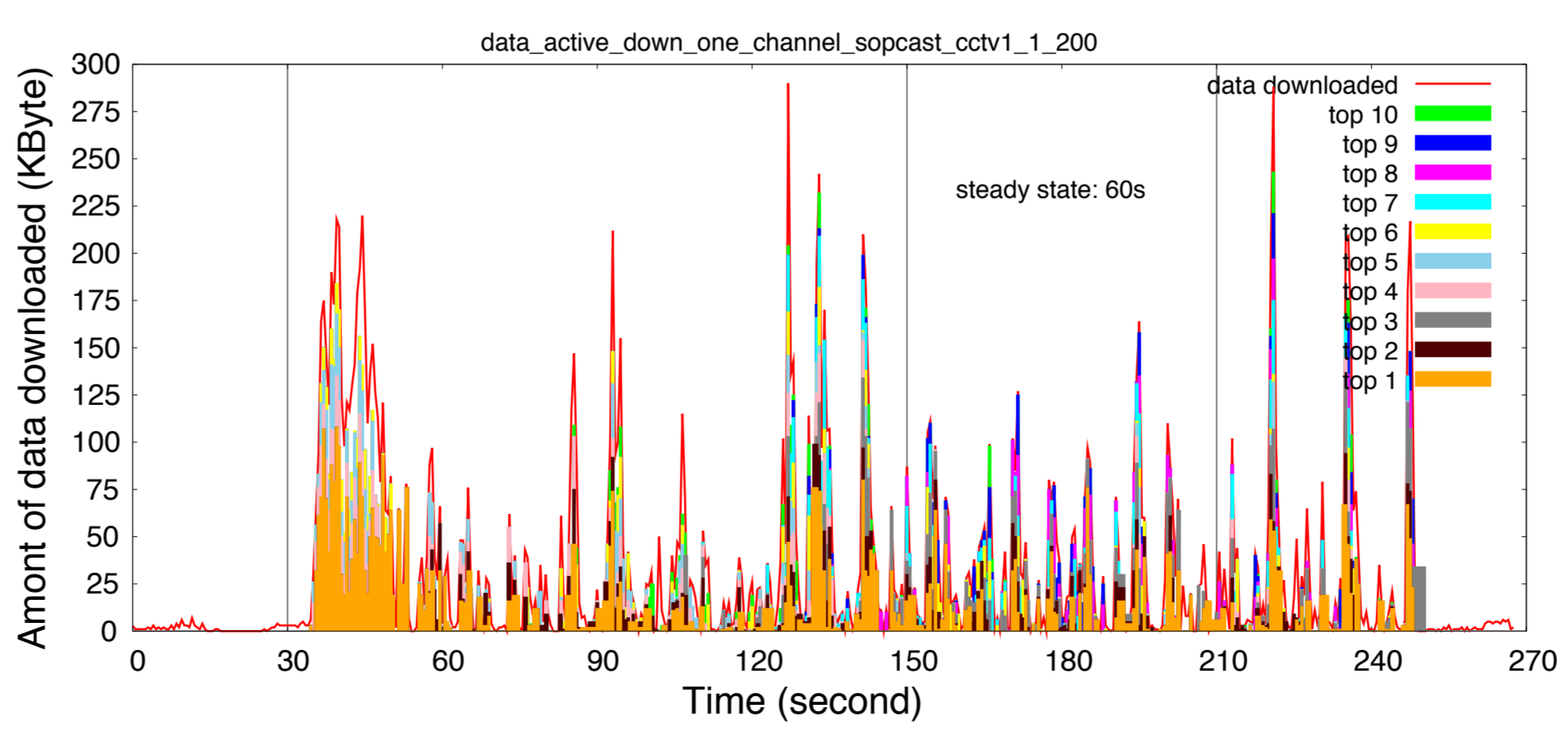
Fig. 2. Data downloaded with one SOPCast channel

Example with SOPCast, 5 channels, zapping time = 25s

- ▶ Measurement done on Tuesday, June 30, 2011 at 14h GMT
- ▶ Chronogram used with 5 channel:
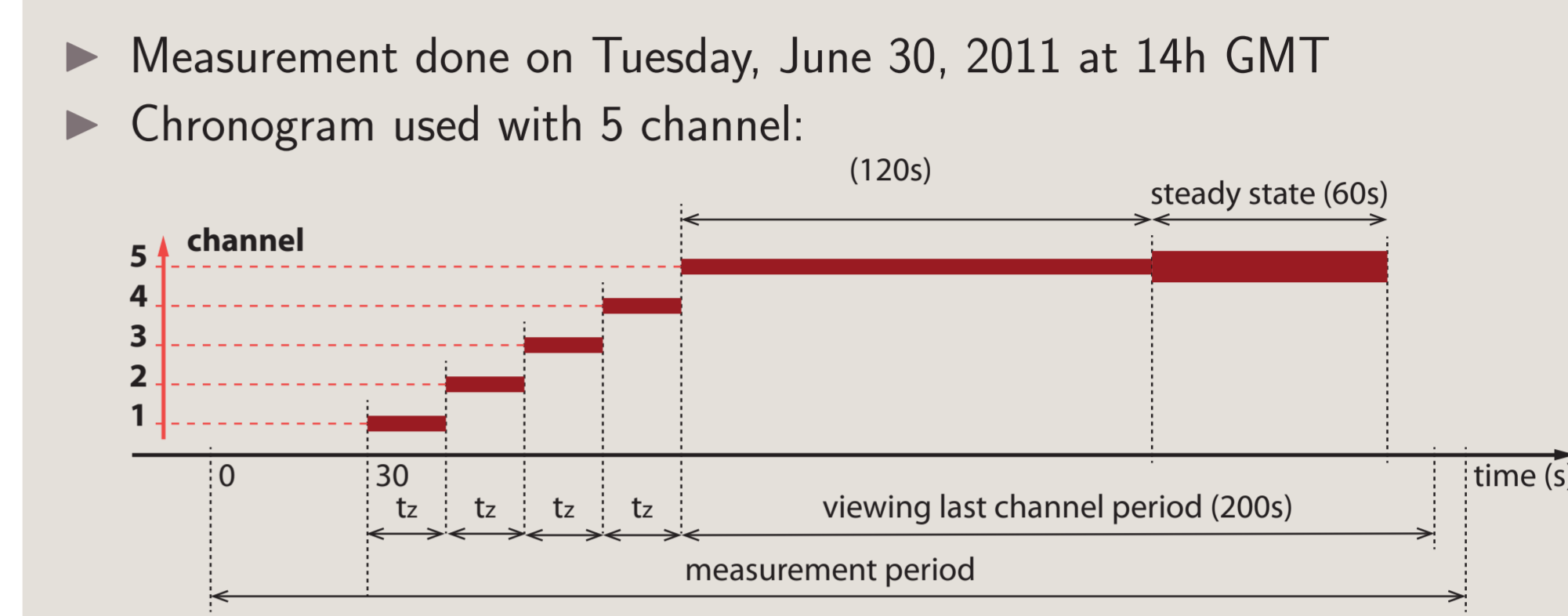
- ▶ Peer distribution among channels:

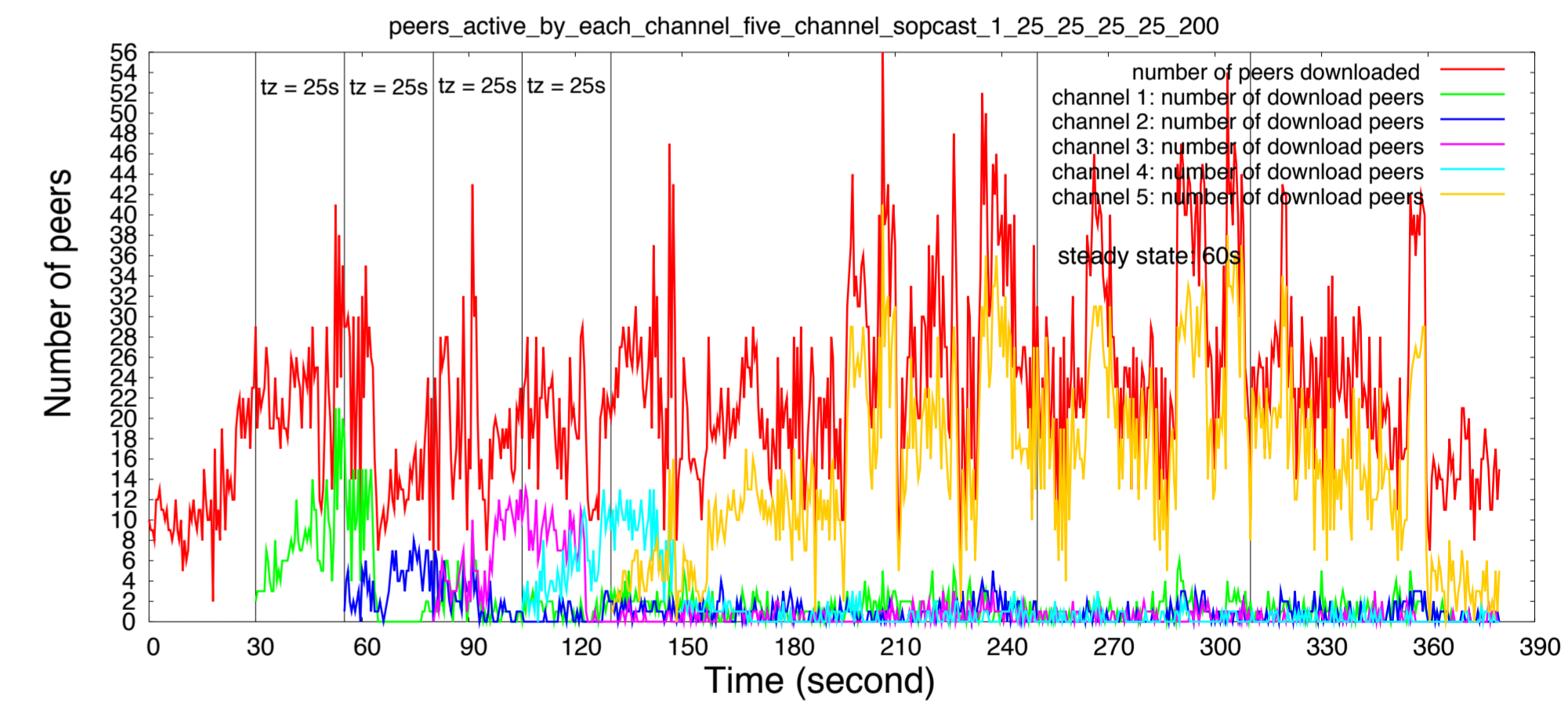| Full	CH 1	CH 2	CH 3	CH 4	CH 5
601	74	48	50	50	228

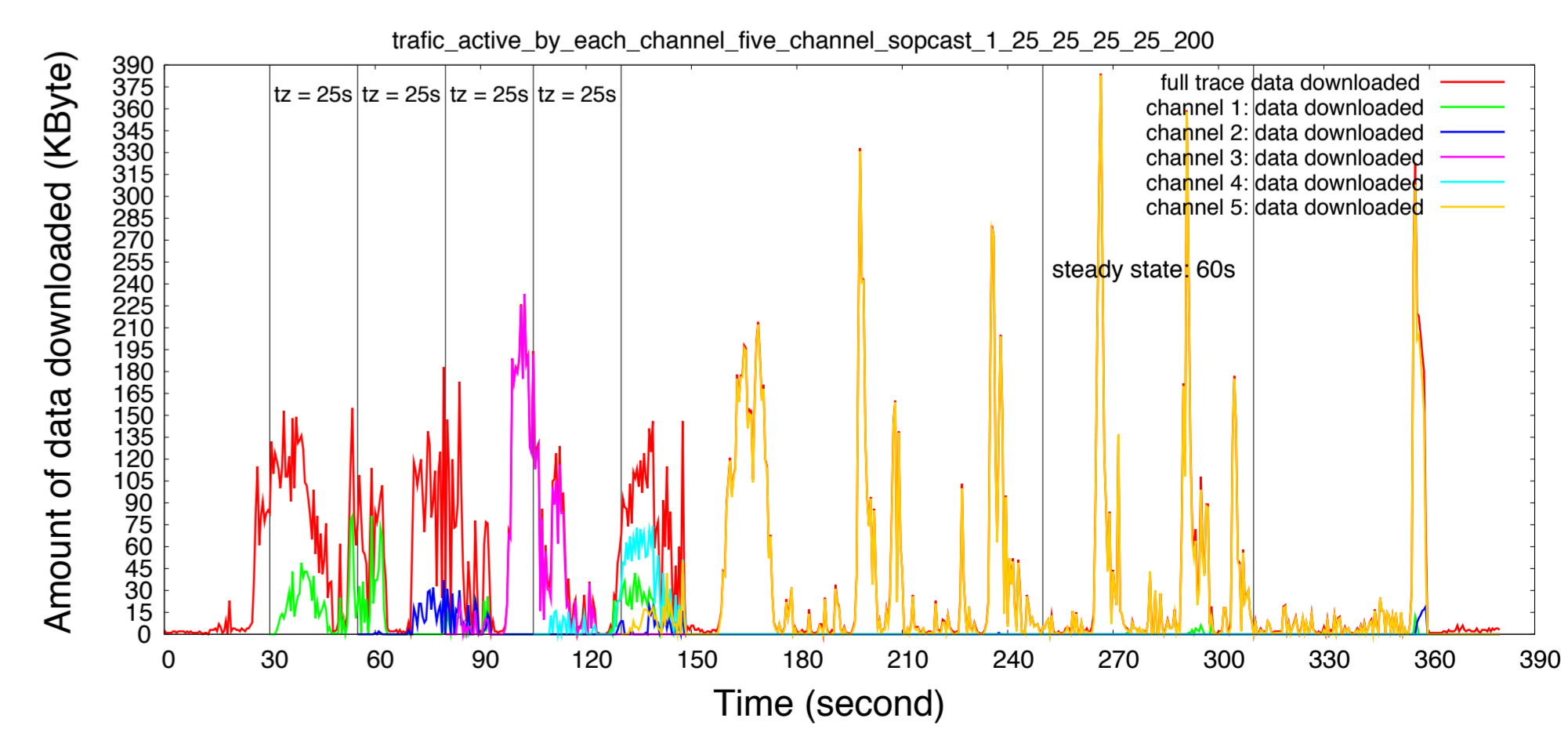Fig. 3. Active peer per channel with SOPCast zapping among 5 channels

Fig. 4. Traffic per channel with SOPCast zapping among 5 channels

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