DDoS Attack Trends Through 2009-2011

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Data Sources

- **Actual attack traffic**
  - Arbor Peakflow systems reporting
  - Self-selected group, global

- **'Bladerunner' botnet tracking project**
  - Botnet command, intended victims

- **Worldwide Infrastructure Security Report**
  - Survey data, dozens of participants, global

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Key Findings in the 2011 Survey

- **Any Internet Operator Can Be a Target for DDoS**
  - *Ideologically-motivated 'Hacktivism' and On-line vandalism DDoS attacks are the most commonly identified attack motivations*

- **Size and Scope of Attacks Continue to Grow at an Alarming Pace**
  - *High-bandwidth DDoS attacks are the 'new normal' as over 40% of respondents report attacks greater than 1 Gbps and 13% report attacks greater than 10Gbps*
  - *Increased sophistication and complexity of layer-7 DDoS attacks, multi-vector DDoS attacks becoming more common*

- **First-Ever Reports of IPv6 DDoS Attacks 'in the Wild' on Production Networks**

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Key Findings in the 2011 Survey

- **Attackers Are Going Where the Money Is**
  - *Rarity of IPv6-enabled attacks indicative of low IPv6 market penetration and lack of critical mass*

- **Continued Uncertainty Around Visibility & Security of Mobile/Fixed Wireless Networks**

- **Mobile Handsets and Devices Directly Impacted by DDoS Attacks**

- **Trust Issues Abound Across International Boundaries**

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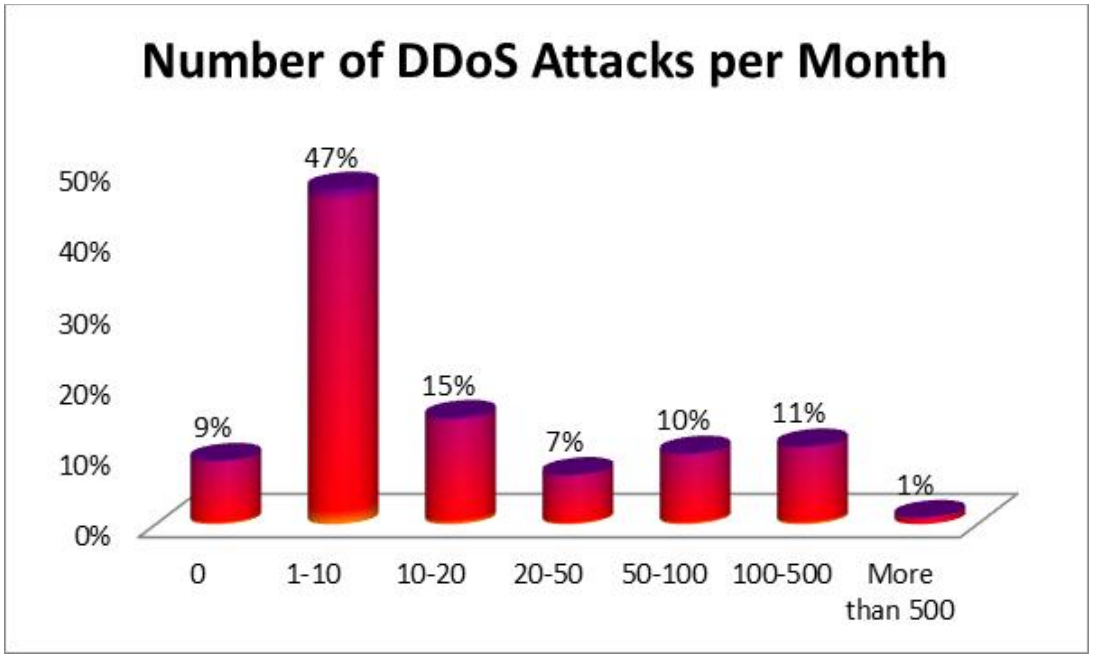
DDoS Attack Frequency over last 12 Months



- 91% of respondents see at least 1 DDoS attack per month up from 76% in 2010
- 44% of respondents see 10 or more attacks per month up from 35% in 2010

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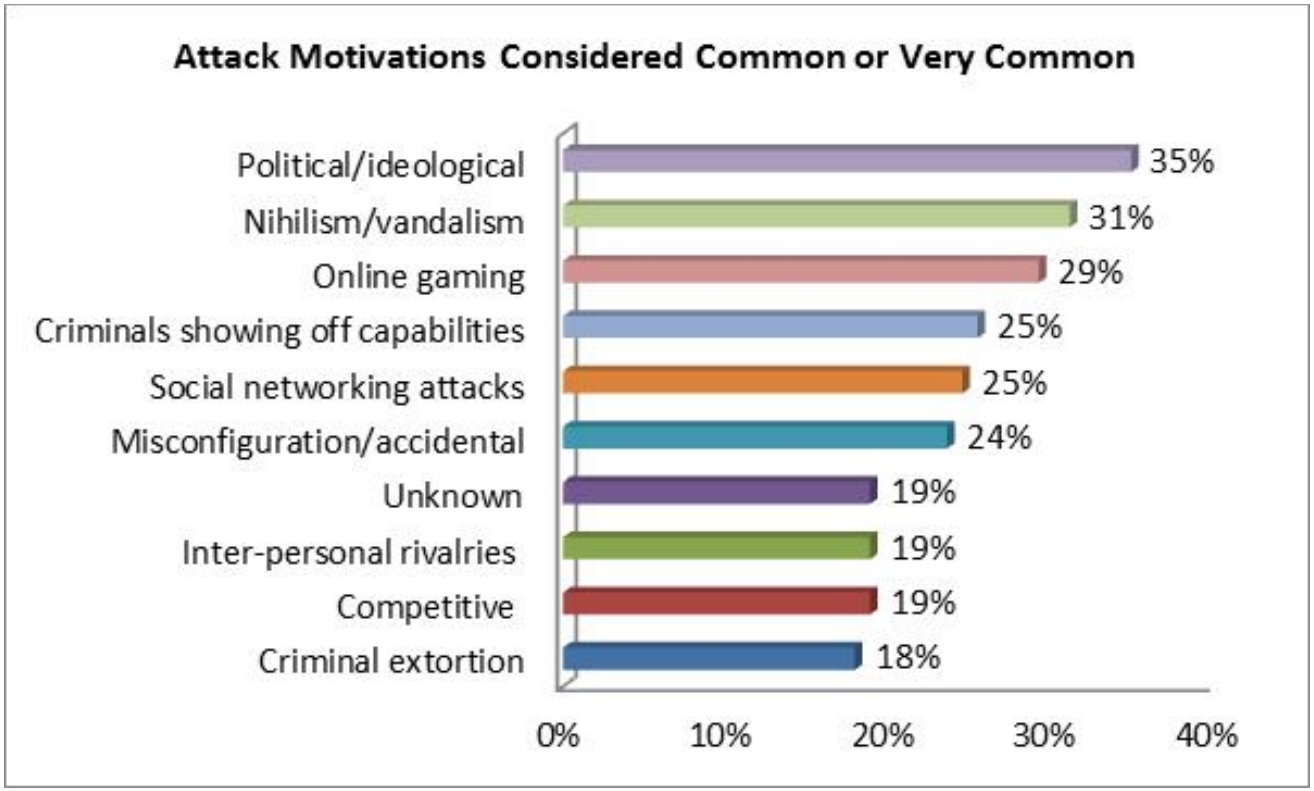
Top DDoS Motivations



- Top two attack motivation categories are fueled by personal beliefs and inclinations of attackers

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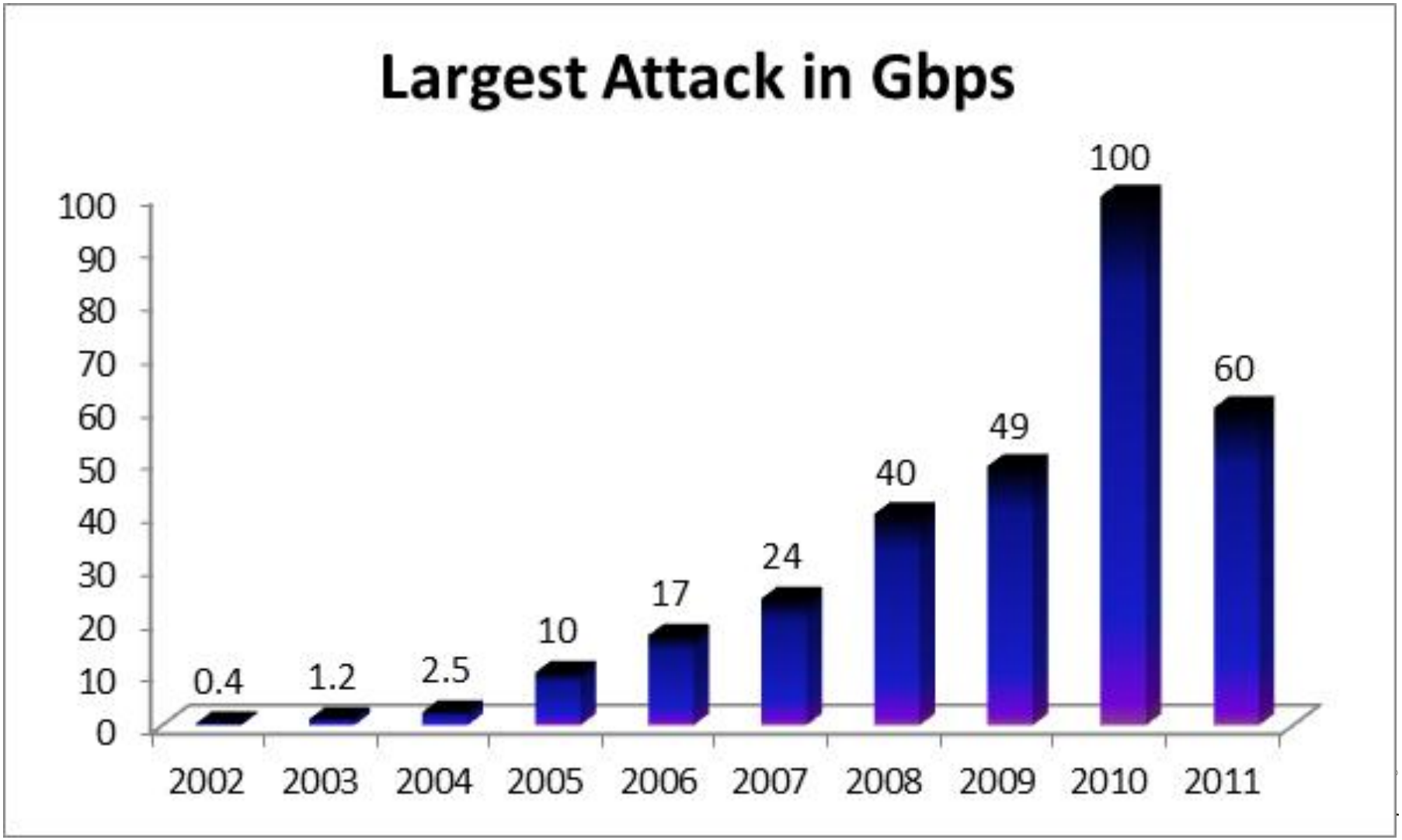
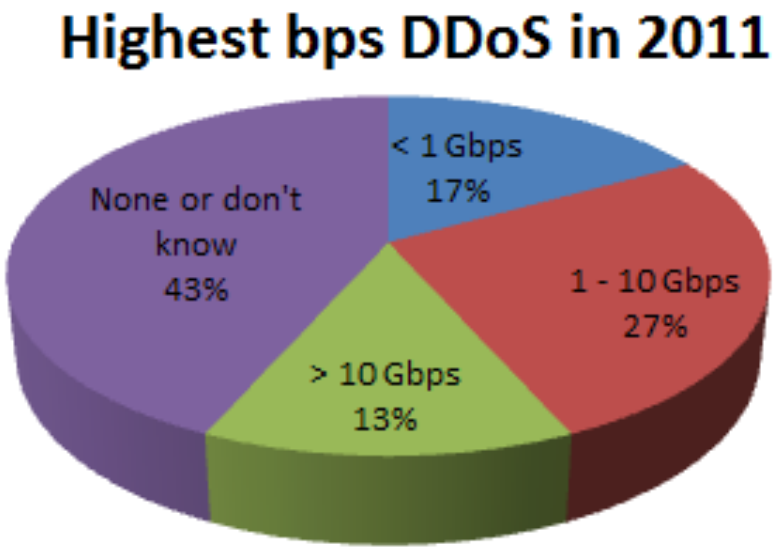
Peak Attack Sizes Down in 2011



Large Attacks are Now Commonplace

- Aggregate attack sizes have leveled off but remain at levels capable of overwhelming most Internet operators
- 13% of respondents report attacks above 10 Gbps
- 40% of respondents report attacks above 1 Gbps
- Largest pps attack reported is 35 Mpps keeping pace with 2010



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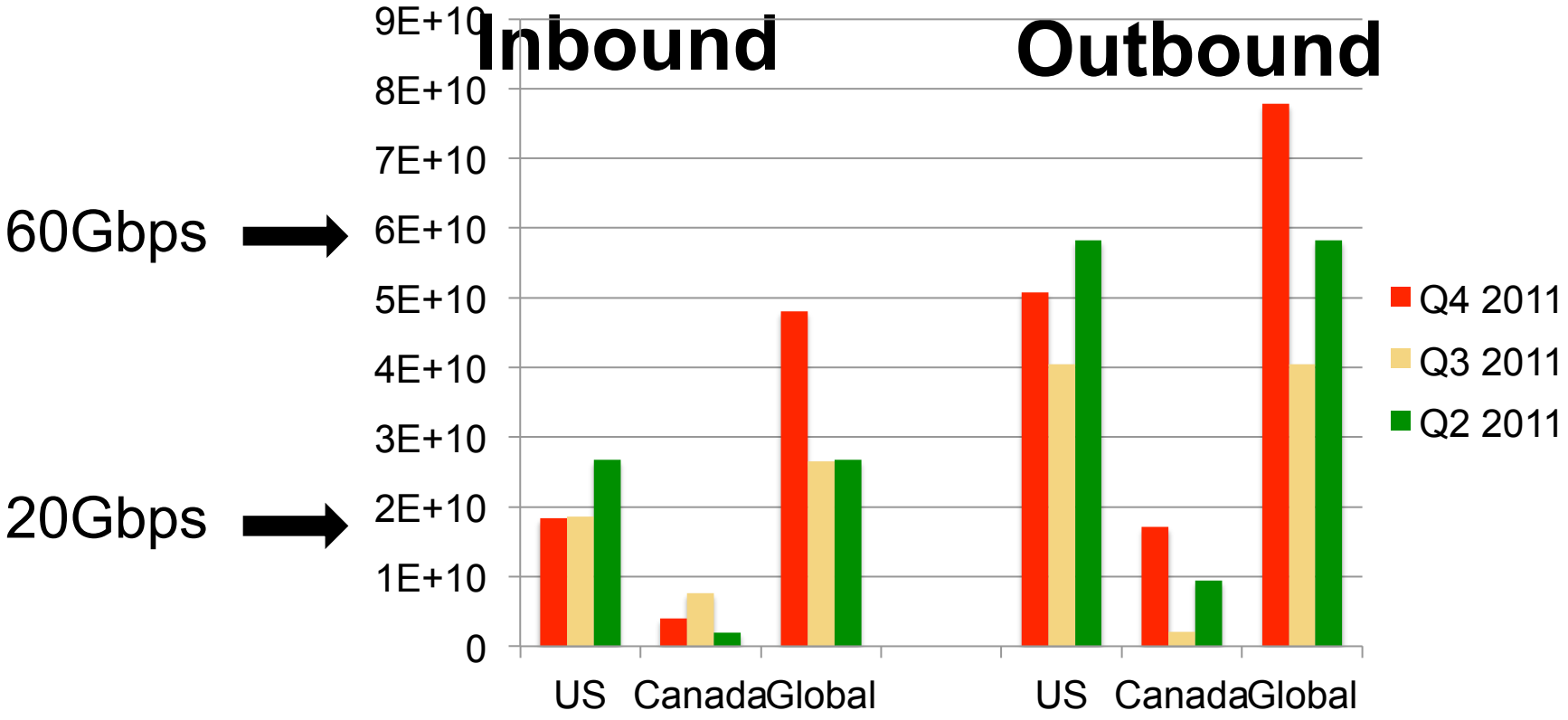
Measured Attacks in 2011 for US, Canada



- Data comes from Peakflow measurements

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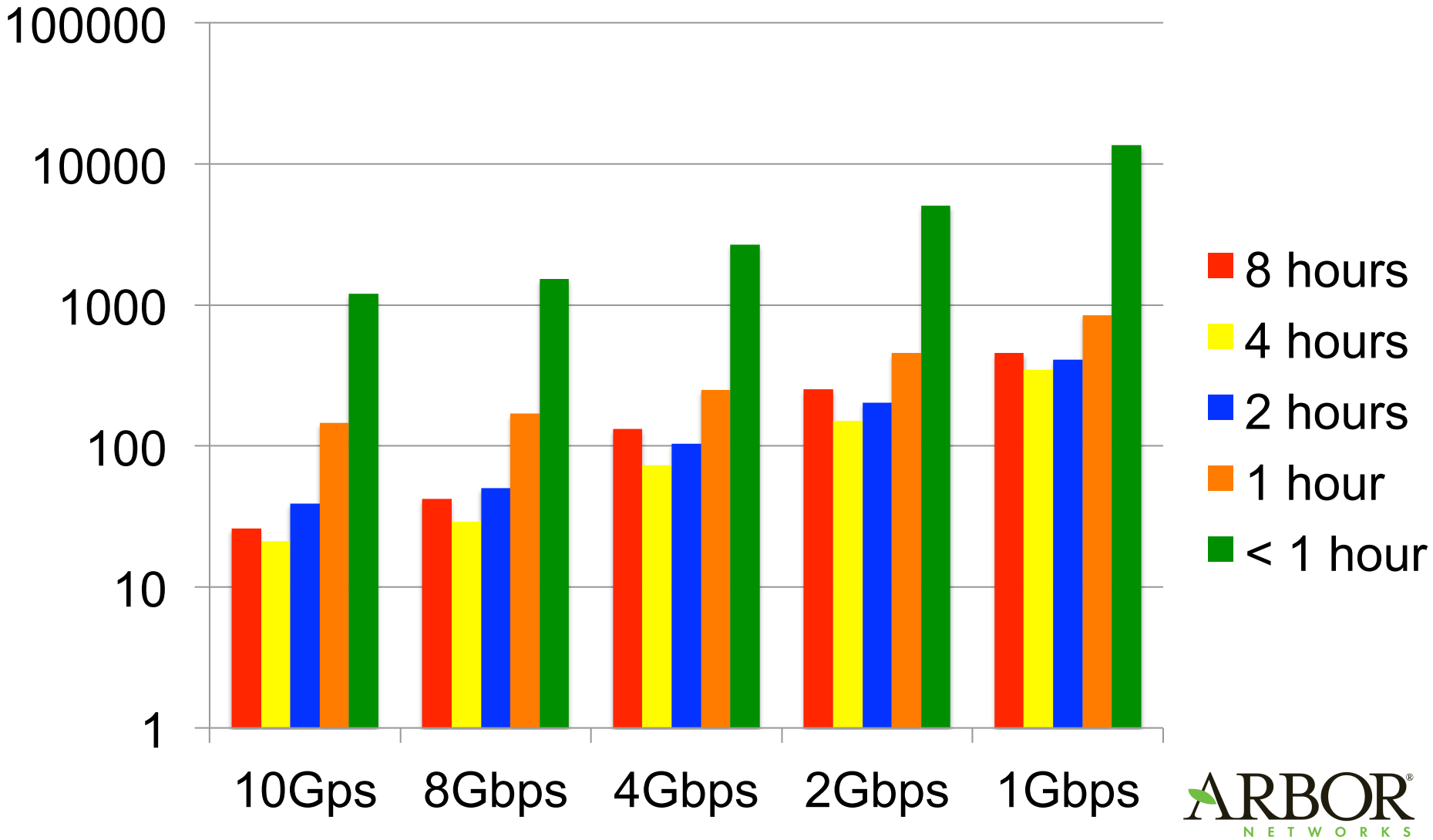
Attack Sizes and Durations (2011)



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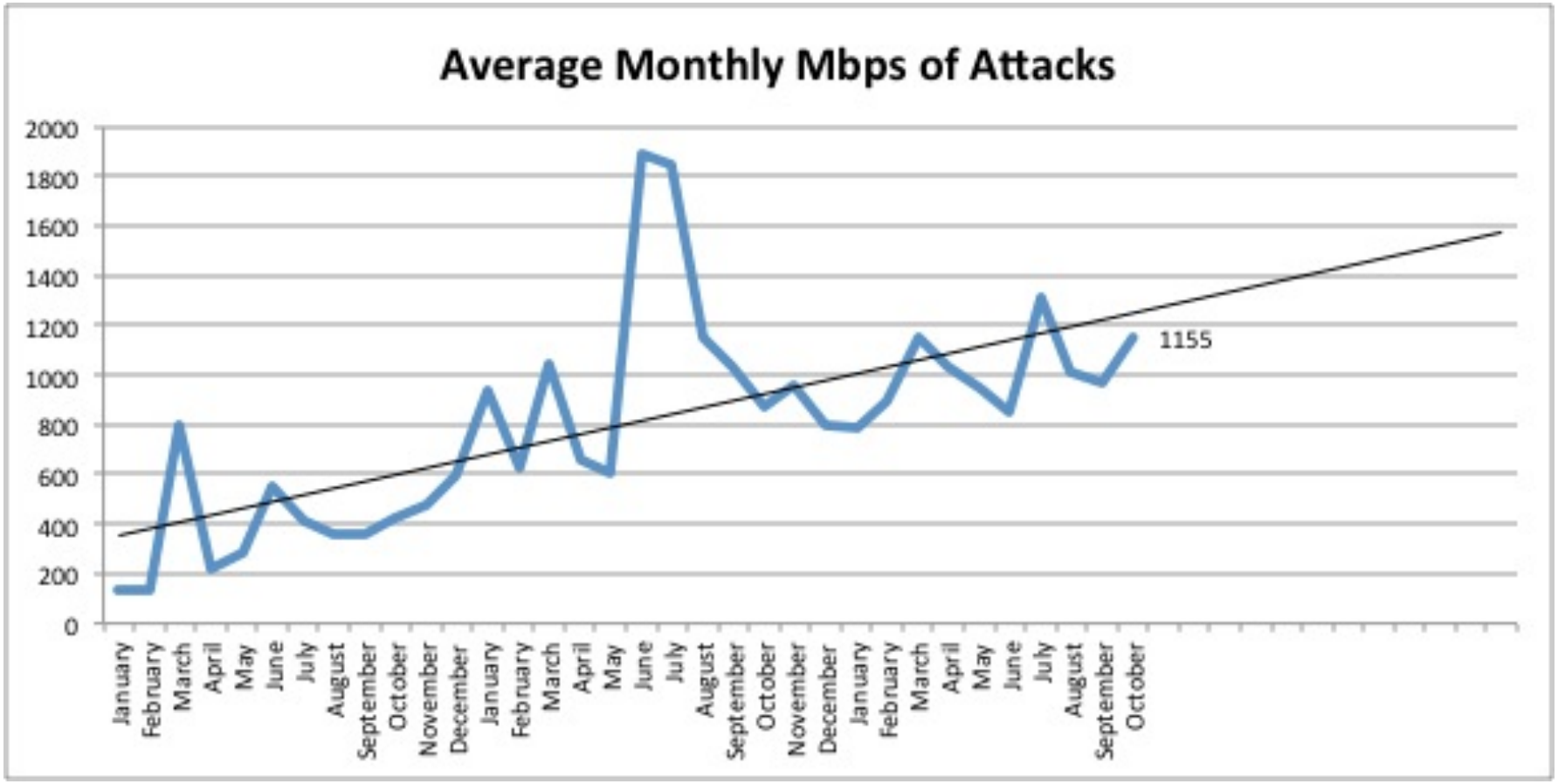
Average Attack Size Still Growing



Data from ATLAS via anonymous statistics

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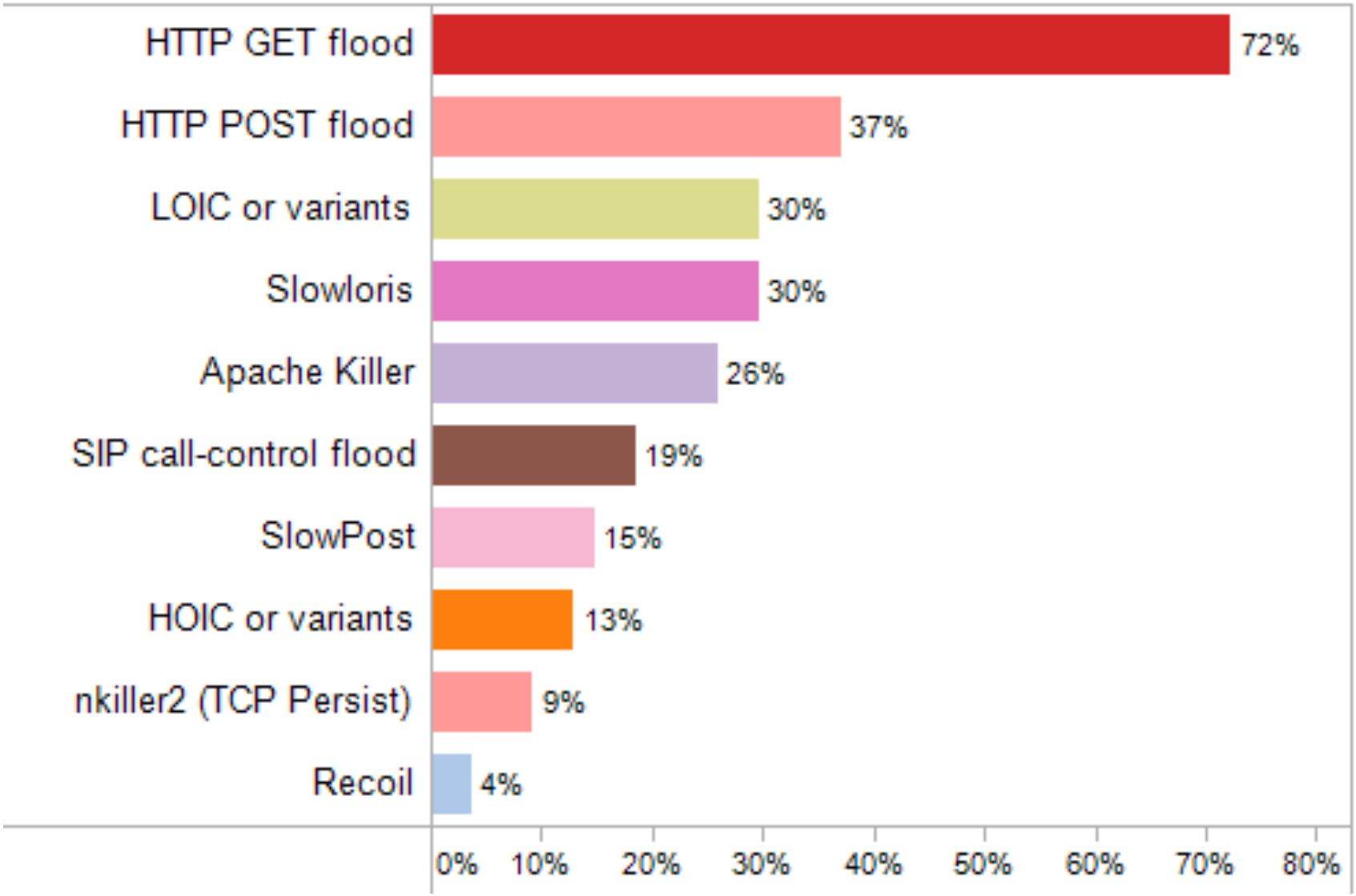
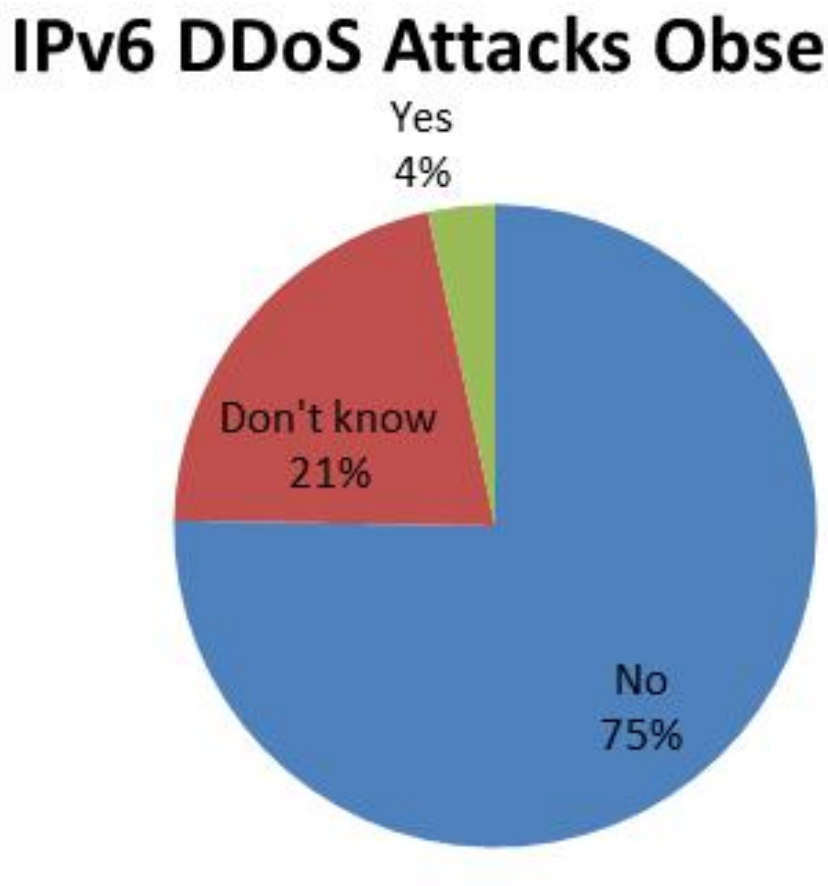
Most Common Application Layer Attacks Seen



IPv6 DDoS Attacks



- First report of an IPv6 DDoS attack in the history of the WISR
- Low frequency of attacks reflect low adoption of IPv6 for critical services

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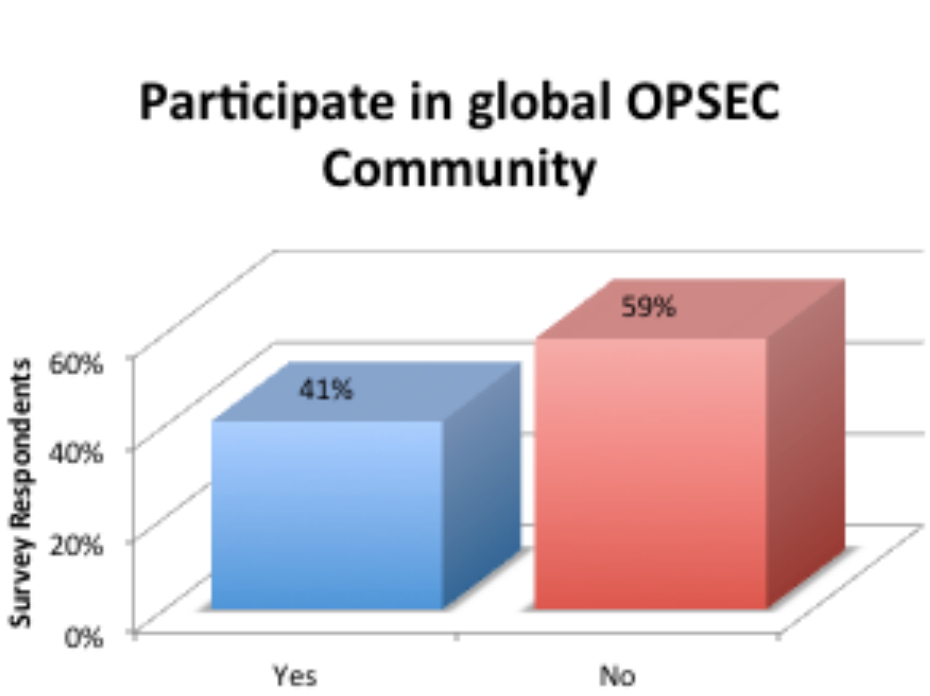
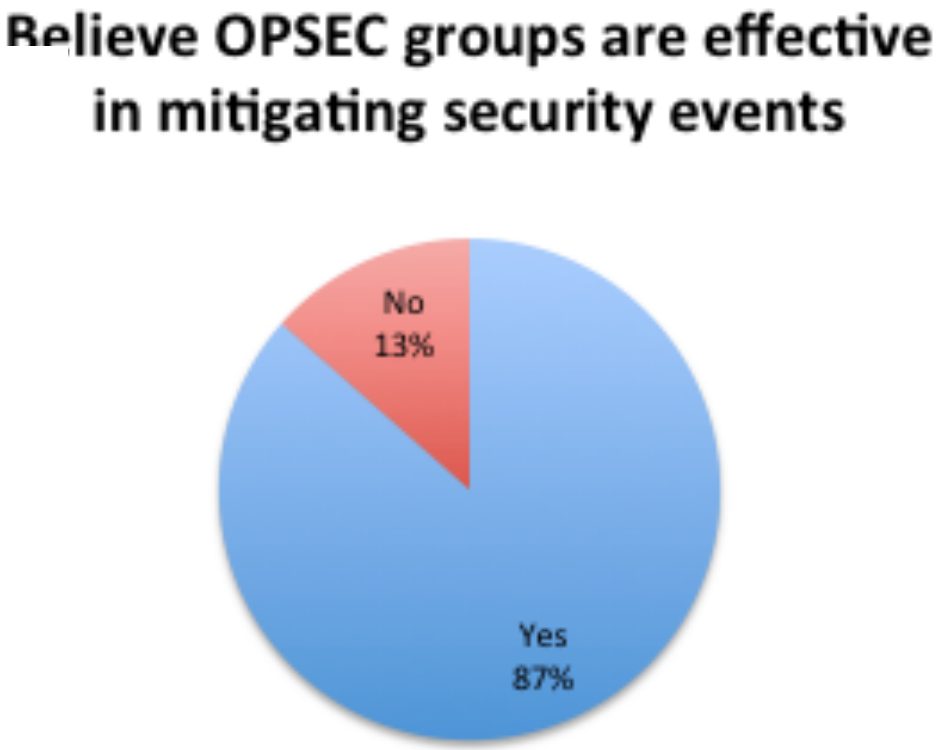
Use of OPSEC Communities

- More than half of respondents do not actively participate in the Global OPSEC Community, yet 87% of them believe that the OPSEC Community is effective





Summary

- IPv6 makes an appearance
- Peak bandwidth used in DDoS we see is down from 100Gbps (2010)
- HTTP GET floods becoming widely popular
- Ideological motivations now most prevalent

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