HostView: Annotating end-host performance measurements with user feedback

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Why did we build HostView?

Goal: Automatically detect network performance disruptions as perceived by end-users

Only performance disruptions that affect end-users

Performance of any networked application

HostView: Collect network traces from end-hosts annotated with user feedback
HostView data collection

- Network performance
  - Packet headers (anonymized IP source)

- User environment and system performance
  - CPU load, OS, time zone, country

- Application-level context
  - Content-type for HTTP responses
  - Application (process names)

- User feedback
  - System-triggered questionnaires (3 times a day)
  - I’m annoyed button
Recruiting volunteers

- **Publicity**
  - Leaflets at IMC 2010
  - CS Mailing lists in November 2010

- **Incentives**
  - 50 USD Amazon gift cards
  - Real-time feedback about network connection
Some numbers from the deployment

- A total of 78 downloads
  - 37 Linux and 41 MAC OS
  - 25 users ran it for at least a month

- Users per country

  - France, 17
  - United States, 10
  - Germany, 9
  - Sweden, 6
  - Portugal, 5
  - Lebanon, 4
  - Switzerland, 3
  - Italy, 3
  - Indonesia, 3
  - Brazil, 3
  - Australia, 2
  - Spain, 2
  - Finland, 2
  - United Kingdom, 2
Top ten applications in terms of network bytes

- Google Chrome
- Safari
- Firefox
- SSH
- Chromium browser
- WebKit Plugin Host
- Skype
- FTP
- Mail
- iTunes

Fraction of network traffic (bytes)
Locality of users’ connections

Users by country

%local traffic

bytes
colors
country
connections
destination IPs

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HostView user feedback detailed

- “I am annoyed” button
  - Click when a networked application is misbehaving

- Experience sampling mechanism (ESM)
  - Fill in a questionnaire about your network connection at most three times a day
    - Rate internet speed from 1 to 5
    - List applications if any that experienced network problems
    - Additional comments in free-from text box
How were feedback mechanisms used?

<table>
<thead>
<tr>
<th>ESM</th>
<th>I am annoyed!</th>
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<tbody>
<tr>
<td>Completed</td>
<td></td>
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<tr>
<td>Deferred</td>
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<td>Not answered</td>
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<td>825</td>
<td>813</td>
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<td>5102</td>
<td>44</td>
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How would you describe your Internet speed?
Challenges

- **HostView performance**
  - Trace upload when user connection is slow
    - Adaptive upload algorithm
  - CPU
    - Changed HostView startup mechanism

- **User feedback**
  - Pop-ups are distracting
    - Bypass when network connection is good
    - Disable questionnaires, just use “I am annoyed” button
We need your help!

- Please download HostView at:
  
  http://cmon.lip6.fr/EMD

- Platforms: Mac OS 10.5, 10.6 and Linux
- Amazon gift cards still available!

Thank you!