Understand Instant Video Clip Sharing on Mobile Platforms: Twitter’s Vine as a Case Study

Lei Zhang, Feng Wang, and Jiangchuan Liu

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Outline

- Introduction
- Twitter’s Vine: Architecture and Features
- Datasets and Analysis
- Discussions and Conclusions
The 3-stage evolution for video sharing service

• 1st generation: video sharing sites
  
  ![YouTube](https://i.imgur.com/YouTube.png)  ![Youku](https://i.imgur.com/Youku.png)

• 2nd generation: online social networks
  
  ![Facebook](https://i.imgur.com/Facebook.png)  ![Renren](https://i.imgur.com/Renren.png)

• 3rd generation: mobile platforms (instant video clips)
  
  ![Vine](https://i.imgur.com/Vine.png)  ![Instagram](https://i.imgur.com/Instagram.png)  ![Periscope](https://i.imgur.com/Periscope.png)
• Mobile is the trend:
  • 526 million mobile devices and connections were added in 2013 globally (smartphones account for 77%)
  • Global mobile data traffic will increase nearly 11-fold between 2013 and 2018
Twitter’s Vine

- **Vine**: A representative
  - Exclusive for mobile platforms
  - Maximum video length: six seconds
  - Recently released:
    - iOS, January 2013
    - Android & Windows Phone, June 2013
  - Popular: over 40 million registered users
Twitter’s Vine

- The interface:
  - Home
    - Posts from followings
  - Explore
    - Promotion channels
      - Popular posts
    - User channels
      - Different topics

- Key behaviors (screen scrolling):
  - Batch view
  - Passive view
A Closer Look at Vine

- Unveil Vine's architecture (reverse engineering):
- Packet sniffing & SSL interception

**Diagram:**
- Smartphone
- Tablet
- Mobile Terminals
- Base Station
- Access Point
- Mobile/Wireless Networks

**Traffic Flow:**
1. HTTPS Requests
2. Response
3. HTTP GET
4. Videos & Thumbnails

**Cloud:**
- Vine Server on EC2 (api.vineapp.com)
- CDN of Akamai/Fastly (v.cdn.vine.co mtd.cdn.vine.co)
- CloudFront (xxx.cloudfront.net)
- S3 Server
A Closer Look at Vine

• What’s the internal process when a user vines?
  • Application runtime monitoring
  • Trace-driven analysis

Diagram:
- Recording Toolkit
  - Record
  - Raw Video
  - Process
  - Compressed Video
  - Mobile Device
  - Update Timeline and Distribute through CDN
  - Post
  - Upload the .mp4 and .jpg to EC2
  - Upload
  - Cloud
  - Delete the video & start over
Datasets

• Develop customized crawlers, and collect data from November 16 to December 14, 2013

• Repost traces of over 50,000 video clips
  • 2 promotion channels: 8,891 posts
  • 16 user channels: 47,794 posts

• Over 1,000,000 user profiles (follower, following, posts)
• Extremely skewed
  • User channels: the top 5% video clips accounts for more than 99% reposts!
Comparison

- **1st generation**
  - YouTube: 10%-80% (Cha, IMC’07)

- **2nd generation**
  - Renren: 2%-90%, 5%-95% (Li, NOSSDAV’12)

- **3rd generation**
  - Vine: 2%-95%, 5%-99%
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• Vine decays faster

• Mobile nature:
  • Ubiquitous
• Degrees of nodes:
  • 244.4 followers and 102.4 followings in average

• Still evolving:

<table>
<thead>
<tr>
<th>username</th>
<th>number of followers</th>
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<tbody>
<tr>
<td>KingBach</td>
<td>4,327,113</td>
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<tr>
<td>JEROME JARRE</td>
<td>3,603,981</td>
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<tr>
<td>Marcus Johns</td>
<td>3,565,338</td>
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<tr>
<td>Josh Peck</td>
<td>3,547,111</td>
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<tr>
<td>Nicholas Megalis</td>
<td>3,398,624</td>
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<tr>
<td>DEM_WHITE_BOYZ</td>
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<tr>
<td>Curtis Lepore</td>
<td>3,067,646</td>
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<td>Kc James</td>
<td>2,978,526</td>
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<tr>
<td>Alx James</td>
<td>2,859,786</td>
</tr>
<tr>
<td>Rudy Mancuso</td>
<td>2,686,820</td>
</tr>
</tbody>
</table>

Table 1: Top 10 of the most followed users
• Follower vs. Following

  • No strong correlation
    • Correlation coefficient is only 0.0254

  • Small probability for mutual friends
• Taking Vine as a case:
  • The first work on instant video clip sharing service
    • unique behaviors, architecture, video properties, social network
  • Our findings about instant video clips
    • high skewness, fast decay

• Potential topics:
  • Distribute effectively and effectively
    • Popularity prediction
  • Energy saving for mobile systems
    • Batch transmission
    • Smart scheduling
Thank you!