

# Infinity: In-Network Storage for Mobile Devices

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# Data access on mobile device is extremely popular

- Mobile data traffic is rapid growing
  - Cisco forecasts **6.3 Exabytes** per month of mobile data traffic by 2015 (Source: Cisco VNI Mobile, 2011)
- Social networks are exploding
  - Facebook has **~350 million** active **mobile** users
- File hosting and syncing services are popular
  - Dropbox has **25 million** users and **200 million** files are saved daily

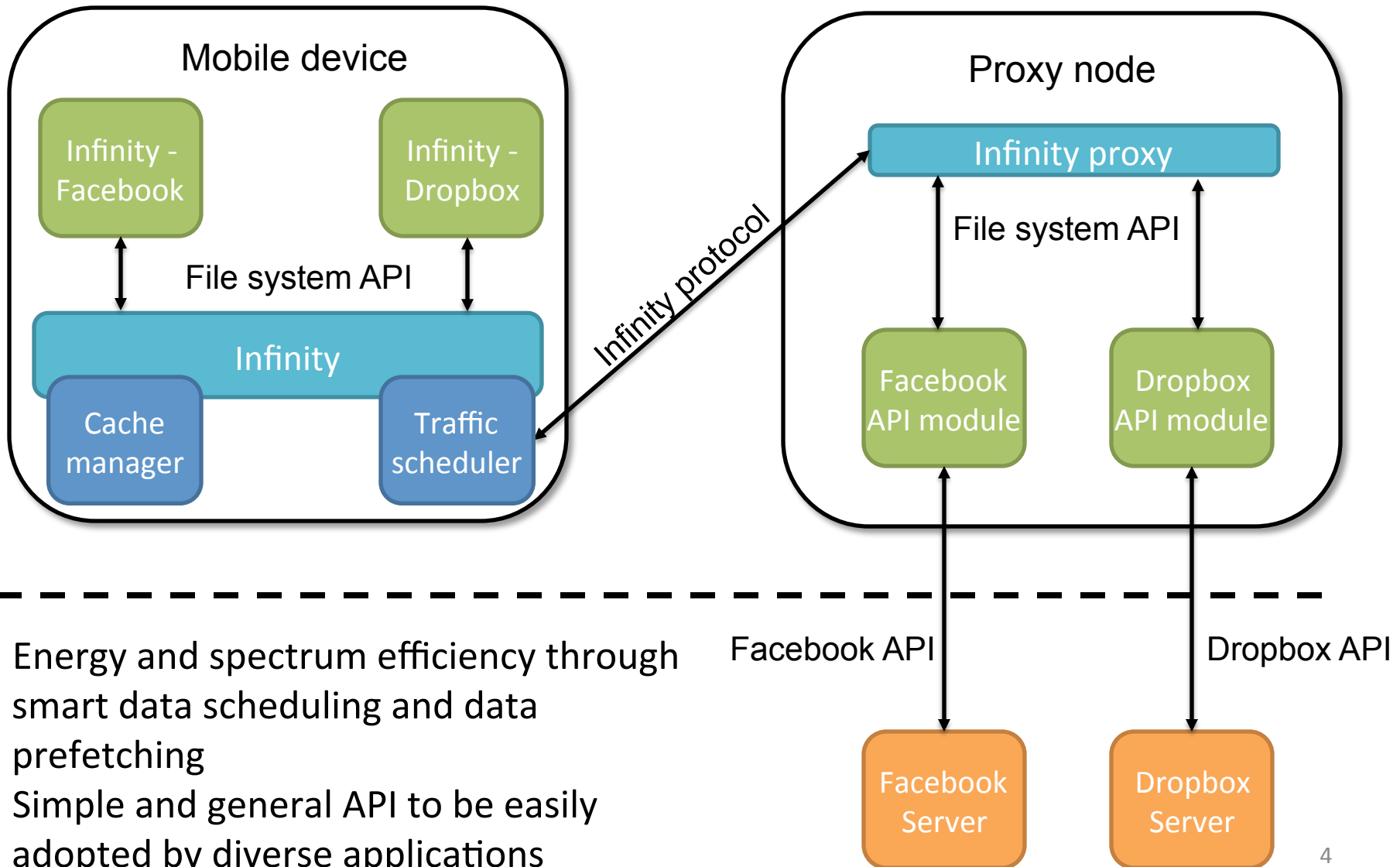


iCloud

# Existing data storage and sharing support are inefficient!

- On device
  - Limited resources (e.g., storage, network, memory, power)
  - Not reliable (e.g., failure, stolen)
- On service providers
  - Ignorance of the characteristics of mobile devices
- Short battery life, long access delay, degraded user experience
- **Infinity** improves the **efficiency of data delivery** for mobile devices!

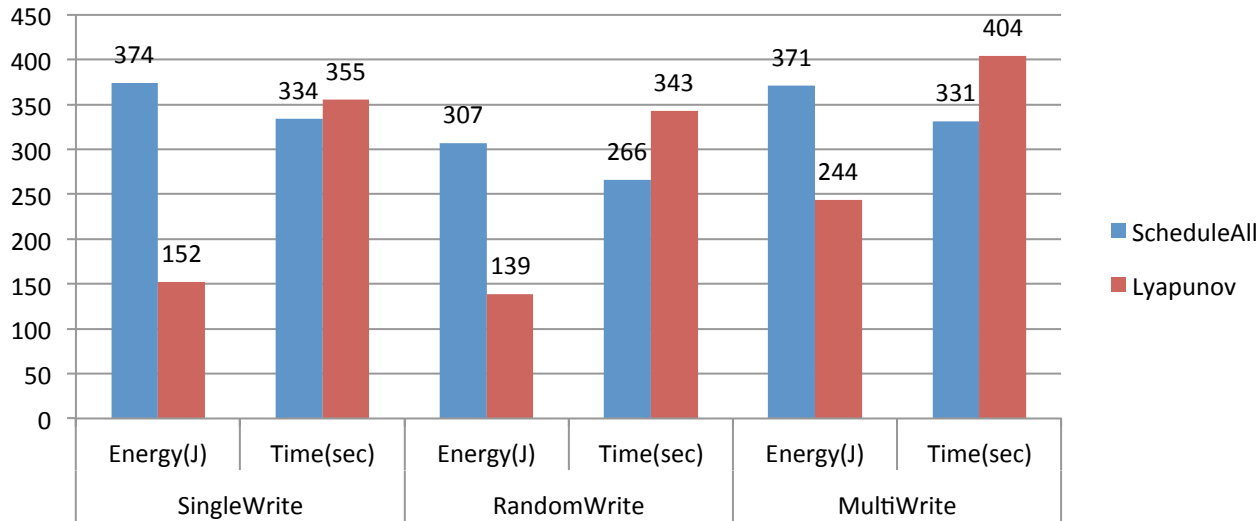
# Infinity architecture



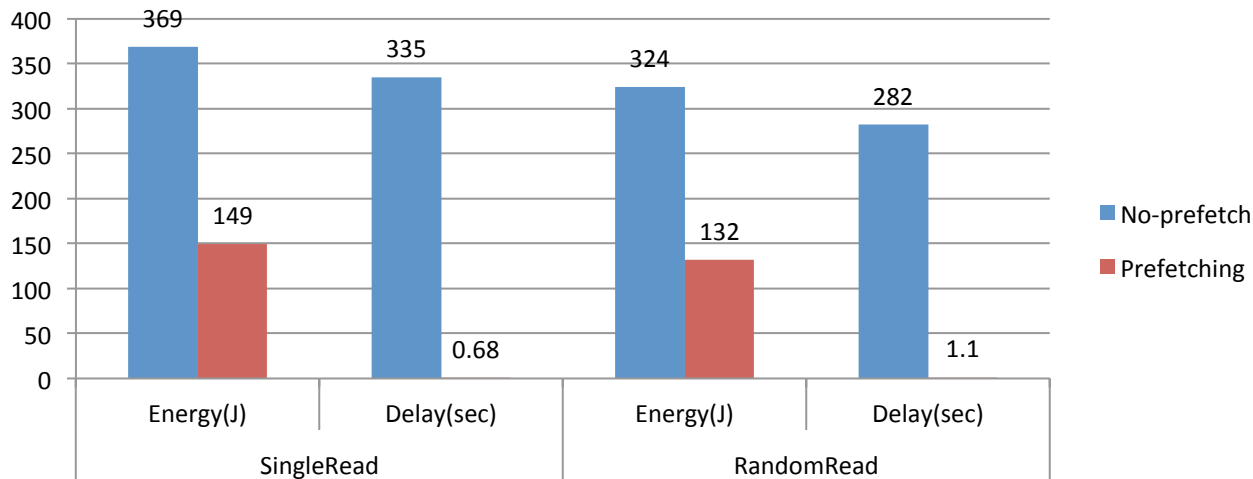
# Infinity features

- File system API
  - Flexible policy support
- Smart data scheduling
  - Uplink
    - Delay scheduling to avoid uploading with high cost
    - Bound the delay to avoid queuing data forever
  - Downlink
    - Prefetch when beneficial
    - Leverage the characteristics of the applications, e.g., social links
  - Notification
    - Dynamic switch between pull and push to minimize the overhead of maintaining the notification channel
    - Batching and piggybacking requests

# Infinity performance with local experiments over 3G



Uplink trace:  
50% of energy saving while increasing the delay by 16% on average.



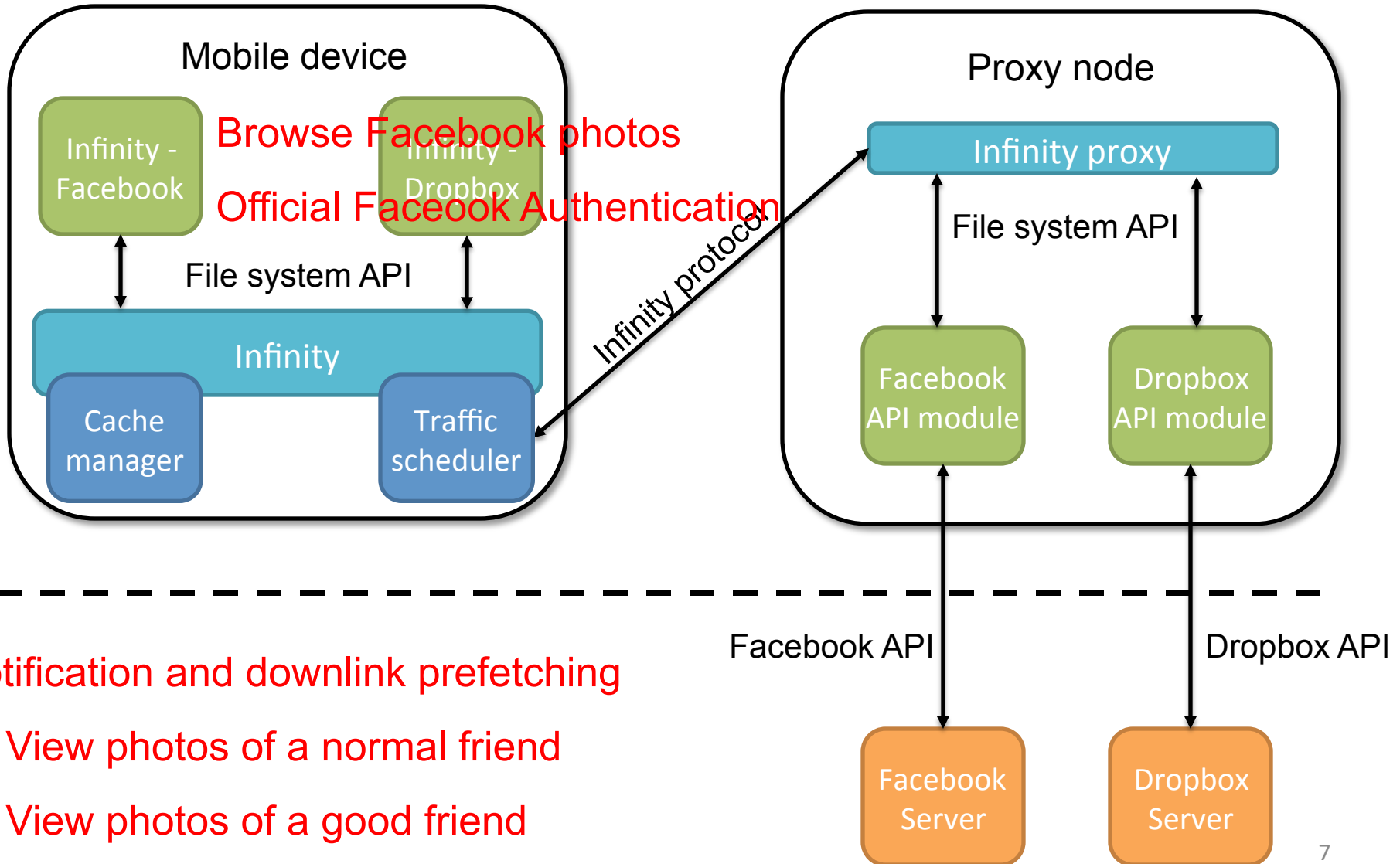
Downlink trace:  
60% of energy saving and reduce the access delay by 99%.

# Demo setup

Nexus One

WiFi

ProtoGENI on GPO site



# Next step

- Scale up the back-end
  - Deployment on more ProtoGENI sites
  - Performance improvement
- Release the Infinity Android App
  - Please try and help evaluate Infinity! 😊
- Support other services
  - Dropbox, Google+, Flickr.....

Thanks!



**BACKUP SLIDES**

# Infinity architecture

