Incremental Updater

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Abstract--Incremental updater is a method of creating and deploying update patches by first unpacking the Android Application Package and then compressing its elements individually. Instead of downloading the full Android App, the user can download a patch and update to the latest version. This reduction in Android application-update size could bring in a 50 percent decrease Google's solution and this could also help in reducing the global cellular traffic to a significant level.in total application update size compared to

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1. Introduction

Incremental updater can be used as an effective method for reducing android application update size as well as cellular traffic caused due to regular updates of android applications. Android application updates adds considerable traffic to cellular network and increase the load on the data center handling them.. Each application is different and as its own features and bugs. On an average an update is released in every 30 days for android applications.

To reduce Android Update Traffic, Google developed Google Smart Application Update which makes use of compression techniques for both server side and user side. Modifications to Google Play Apps and server software enabled Google Play to develop patches, which are send to the user's Android device for updating an App to the newer version. This method had reduced the data traffic but its compression methods were not optimal .The encoding was done on the APK level and it had a negative impact on the compression techniques.

To improve on the compression techniques the encoding can be done at file modules(called Incremental updater) instead of Apk by unpacking the Apk to its individual modules. On an average Incremental updater can reduce the application update traffic by 75%.

Incremental updater is a third party application software.When an updation is available for an application in client's Android device, Incremental updater installed in the device checks the updated version of that application in server side. If the updated version is found, a utility called bsdiff encoding tool is used to compute the difference between old and new versions and sends only the patch difference to the user's smartphone. This patch is merged with old version of the application to make the updated version by bspatch tool in the Android device.

2. Scope of the work

In the beginning, for updating an app the user had to download the full new version and then need to install the app in the device. This was a cumbersome method.

Application update System which exist today uses compression methods for both app developers and users. This was much easier method. Modifications to the Google Play app and the server enabled the server to construct an updated application by applying a patch to the old version on the user's device**.**

The patch was developed by taking the difference of the old and new app versions. Though this method gives solution to traffic reduction, its compression methods are not optimal. Here encoding is done at the Android Application Package (APK) level only, which limits the possible reduction in patch size.

2.1 Statistics of app updates

In [2], the author explains about the statistics of android updation and its management.The number of applications (or apps) in the Android Market exceeded 450,000 in 2015 with more than 11 billion total downloads. The necessity to fix bugs and add new features leads to frequent app updates. For each update, a full new version of the app is downloaded to the user's smart phone; this generates significant traffic in the network. He used some encoding algorithms and to download only the difference between two versions of an app. He shows that app update traffic can be reduced by about 33%, this can lead to significant cost and energy savings.

2.2 Smart downloads

In[3], author says about the existing system. Google has enabled a Google Play feature that promises to save Android app users time and bandwidth. The Web giant is now offering the ability for app users to download delta updates from its Google Play, the folks over at the Android Police blog have discovered. Previously, an updated app meant downloading it again in full, which could put a strain on a device's battery if the app was large and the connection slow. The new smart downloads allows users to avoid downloading the app in total, send only the incremental difference between the old and new versions, thereby saving data for the app user and Google. He also says about engineers predicted that small updates would be about a third of the size of a full download, easing the pressure on users' batteries and bandwidths.

2.3 Security in Updation

In[4],author reveals about the increasing frequency with which serious security flaws are discovered and the increasing rapidity with which they are exploited have made it necessary for programs to be updated far more frequently than in the past. While binary updates are generally far more convenient than source code updates, the distribution of pointers throughout executable files makes it much harder to produce compact patches. In contrast to earlier work which relies upon knowledge of the internal structure of a particular platform’s executable files, we describe a naïve method which produces competitively small patches for any executable files.

2.4 App Updation in iphones

In[5],it’s a data guzzler. Owners use them like minicomputers, which they are, and use them a lot. Not only do iPhone owners download applications, stream music and videos and browse the Web at higher rates than the average smartphone user, but the average iPhone owner can also use 10 times the network capacity used by the average smartphone user. They don’t even realize how much data they’re using and the result is dropped calls, spotty service, delayed text and voice messages and glacial download speeds as AT&T’s cellular network strains to meet the demand. Another result is outraged customers. Cellphone owners using other carriers may gloat now, but the problems of AT&T and the iPhone portend their future. Other networks could be stressed as well as more sophisticated phones encouraging such intense use become popular, analysts say.

2.5 Global mobile networks

In[6], the author reveals about the how the different generation connections makes traffic problems in networks. Latest one, Fourth-generation (4G) connection generated 10 times more traffic on average than a non-4G connection. Although 4G connections represent only 15 percent of mobile connections today, they already account for 60 percent of mobile data traffic. He also explains about the data traffic for the next few years. He has statistical calculations on the mobile data traffic network. By 2019, mobile-connected tablets will generate nearly double the traffic generated by the entire global mobile network in 2014. The amount of mobile data traffic generated by tablets by 2019 will be 1.3 times higher than the total amount of global mobile data traffic in 2014 .

The average smartphone will generate 4.0 GB of traffic per month by 2019, a fivefold increase over the 2014 average of 819 MB per month and overall mobile data traffic is expected to grow to 24.3 exabytes per month by 2019, nearly a tenfold increase over 2014.

3. Proposed System

Incremental updater unpacks the APK and then compresses its individual file modules unlike Google Smart Application Update which calculate the difference at the APK level only. This system can predate the release Google Smart Application Update, Incremental updater could successfully decrease application update traffic .

The algorithm used in new system are bsdiff and bspatch algorithms. Bsdiff algorithm are used to calculate the difference between two versions of an app. Bspatch algorithm is used for merging the patch difference to the older version of an app in user’s device. This application software constructs update patches in server side whenever an update for an app is available. In the client side device(Android app) it gives a notification about the updated version. On user’s request the server sends the patch to the android device and merges the patch with the old version to create the new version of the app.

As an Update application, it deploys the patches from server side in client device and updates the installed application.

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The proposed system (Incremental updater) encodes at APK file level while the existing android application update which encodes only at APK level. Our experimental results show that Incremental updater can reduce application update size by 75 percent on average, relative to a 55 percent average size reduction possible with Google Smart Application Update.

Although Incremental updater is clearly superior to Google Smart Application Update in patch size and traffic reduction, its advantage in deployment time is less straightforward.

4. Conclusion

The increase in smartphone which host various applications leads to enormous increase in network traffic in its updation. This new software Incremental updater is a great solution for this network traffic. In addition to this, Apple iPhone applications could greatly increase the 1.7 percent savings in cellular traffic (Android application updates only).This new solution is experimentally shows more performance than the existing one. Incremental updater can reduce android application updates by 75 percent on average. Changing technologies could change our traffic savings estimates, the new method will surely benefit to the reduction in network traffic.

Reference

1. N. Samteladze and K. Christensen, “DELTA: Delta Encoding for Less Traffic for Apps,” *Proc. IEEE Conf. Local Computer Networks*, 2012, pp. 212–215.

2. S. Musil, “Google Play Enables Smart App Updates, Conserving Batteries,” *CNET News*, 16 Aug. 2012; http:// news.cnet.com/8301-1023_3-57495096-93/google-playenables-smart-app-updates-conserving-batteries/.

3. C. Percival, “Naive Differences of Executable Code,” draft, 2003; www.daemonology.net/bsdiff.

4. J. Wortham, “Customers Angered as iPhones Overload AT&T,” 26 Sept. 2009; www.nytimes.com/2009/09/03/technology/companies/03att.html.

5. “State of the Media: Mobile Media Report Q3 2011,” Nielsen, 15 Dec. 2011; www.nielsen.com/us/en/reports/2011/stateof-the-media--mobile-media-report-q3-2011.html
.
6. “Cisco Visual Networking Index: Global Mobile Data Traf_c Forecast Update, 2012–2017,” Cisco, 6 Feb. 2013;

www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11- 520862.html.

7 “comScore Reports July 2012 US Mobile Subscriber Market Share,” comScore, 4 Sept. 2012; www.comscore.com/Insights/Press_Releases/2012/9/comScore_Reports_July_2012_US_Mobile_Subscriber_Market_Share
.

8. “Background on CTIA’s Semi-Annual Wireless Industry Survey,” CTIA, 2012; http://_les.ctia.org/pdf/CTIA_Survey_MY_2012_Graphics-__nal.pdf.