MEDIATEK

Exchange Smart Push

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Specifications are subject to change without notice.

Document Revision History

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1 Background

1.1 Background

Push mail is very important to people who want to receive E-mails as soon as possible. But push mail drains power very fast. Although the more we use push mail, the user could receive emails sooner but it also consumes more power. This Smart Push feature will study user's habits and know when the push mail should be used to make the user satisfied. It will reduce unnecessary usage of push mails and eventually helps in saving batter power.

1.2 Operating Environment

- Android KK, L, M and N

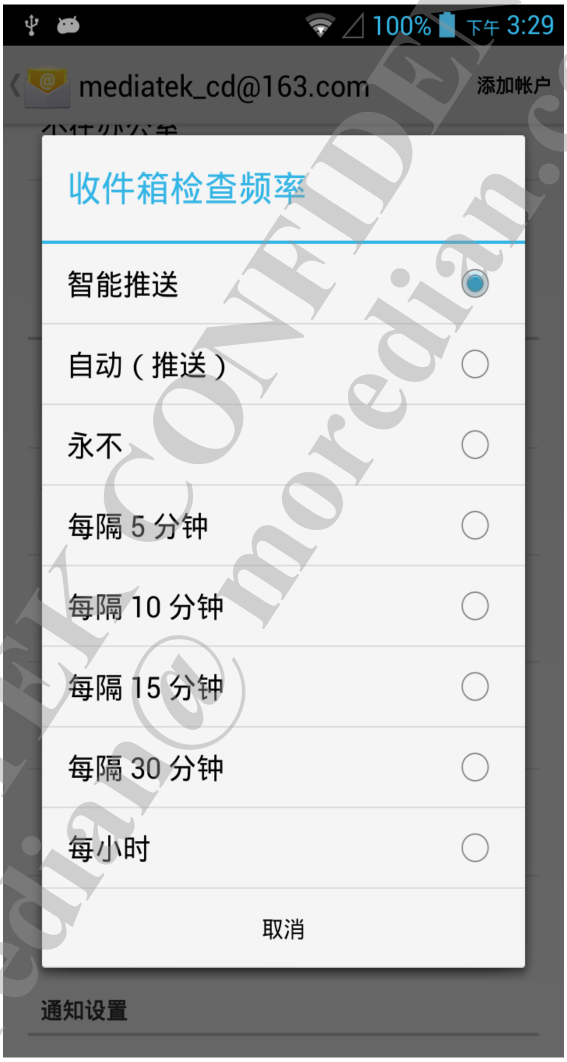
1.3 Source Folder

Complete Email source code contains two folders:
"packages/apps/Email" and "packages/apps/Exchange" (for KK, L and M)
"packages/apps/Email" and "vendor/mediatek/proprietary/packages/apps/Exchange" (N onwards)

2 Smart Push Feature/Algorithm Analysis

Smart Push is a totally new feature on Mediatek turnkey solution. It is a feature to record people's habit of using Email and tune the *smart sync interval* according to the habit. Thus, people who are more concerned with power consumption will get benefitted from this feature without even feeling any delay in receiving mails.

This can be enabled by selecting "Smart Push" in sync interval settings of the account.



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mediatek_cd@163.com

收件箱检查频率

● 智能推送
○ 自动（推送）
○ 永不
○ 每隔 5 分钟
○ 每隔 10 分钟
○ 每隔 15 分钟
○ 每隔 30 分钟
○ 每小时

2.1 How Smart Push works?

It records three main user actions:

- Launch time of Email Application to check emails
- Time duration spent by user in Email Application to check emails
- Mails of each unit time received

Based on the above data, it calculates and adjusts the sync interval.

2.2 How much power is saved?

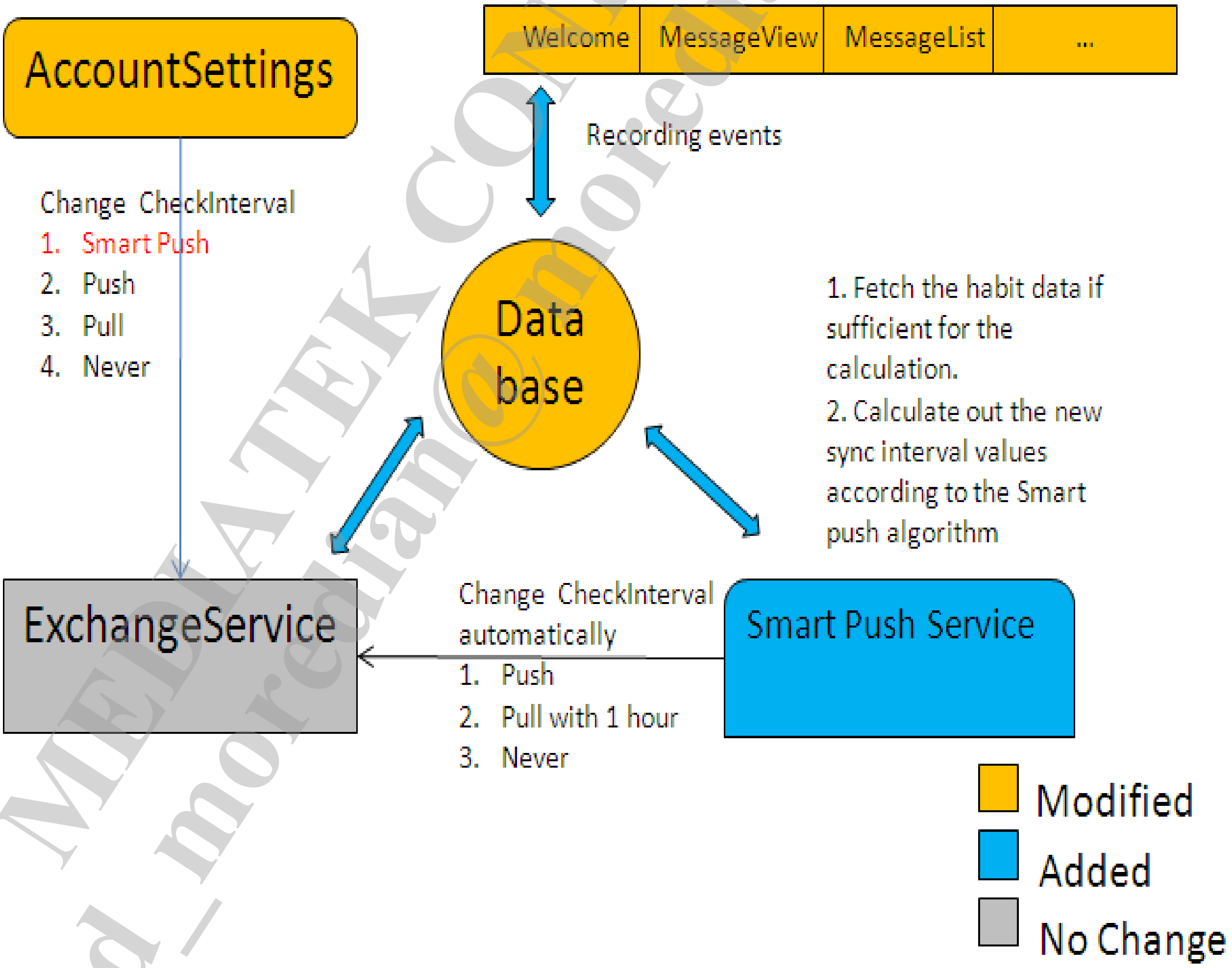
Let’s assume User uses an Email Application for 8 hours in a day i.e. Push Mail is used only for 8-hours period in a day. Therefore, the left 16 hours of a day we can use Pull or ‘Smart Sync’ to save on power.
Hence, using Smart sync, we can estimate approx. power consumption as:

Power Consumption = Push Mail consumption * 8 hours + Pull consumption * 8 hours + Email Stopped * 8 hours

However, Original power consumption = Push Mail consumption * 24 hours

Seeing above, we can say that, comparing with original power consumption, approx. 1/3 power can be saved.

2.3 Smart Push Design



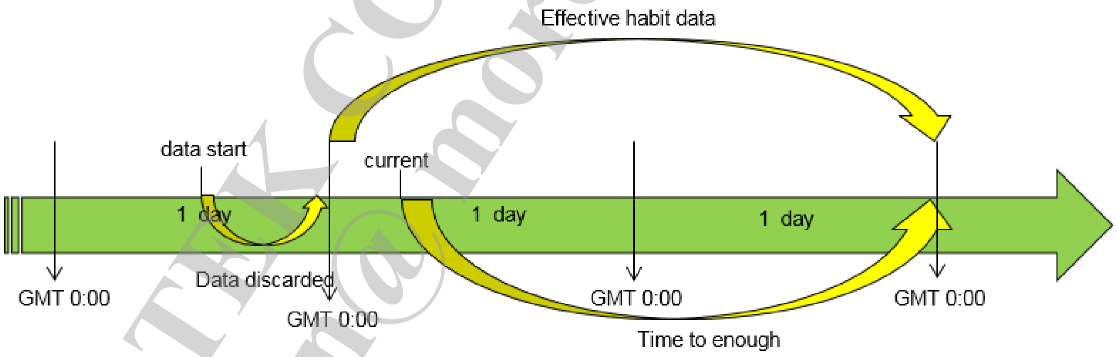
2.4 Smart Push Implementation

Firstly, it requires collecting user habit data:

- There is a database table responsible for storing the user daily use habit data.
- The habit data involves 3 types*:*
  - *User launching Email*
  - *One mail received*
  - *The duration for one time usage*
- We are gathering these events by calling special recording methods at proper points like onResume(), onPause() of EmailActivity and MessageCompose

Secondly, calculate and adjust the sync interval and we use *Service* to do all these things:

- Monitor if the user habit data is enough for calculations
- Regularly calculate the time-scaled sync interval according to the habit data, normally once a day
- Adjust the sync interval of the Inbox, Contacts, and Calendar accordingly (every 2 hours)
- Delete the stale habit data (over than 2 weeks) in order to save database space
- We need *at least 2 integral days'* habit data records before doing the calculation. We may use 2 weeks habit data at most. The date is based on GMT.



- We use a series of formulas with the habit data, then the 12 sync interval values will be come out, each sync interval value is for a 2-hours' time scale i.e. 2hours * 12 = 24hours = 1day

2.5 Merits and Limitation

Of course, the biggest merit of Smart Push feature is to save power. But it also has some limitation:

Firstly, suppose the user does not use Email regularly, the habit data collected will not be able to stand for the actual using habit of that user, the calculation result will be inaccurate, then the user may not be satisfied with the auto adjusted values.

Secondly, if 2 days habit data comes from a weekend, user might not have used Email at this time, so the Monday's sync interval value which will be coming from the habit data can also be inaccurate.

In conclusion, Smart Push feature is better for the user who use Email client regularly.