Implementing KDE-pim support for google calendar and contacts

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why?
Why google and KDE?

- beautiful!
- documentation
- PoC
- KDE: community
What is community?

community

n 1: a group of people living in a particular local area; "the team is drawn from all parts of the community"
2: a group of people having ethnic or cultural or religious characteristics in common; "the Christian community of the apostolic age"; "he was well known throughout the Catholic community"
3: common ownership; "they shared a community of possessions"
4: a group of nations having common interests; "they hoped to join the NATO community"
5: the body of people in a learned occupation; "the news spread rapidly through the medical community" [syn: profession]
6: agreement as to goals; "the preachers and the bootleggers found they had a community of interests" [syn: {community of interests}]
7: a district where people live; occupied primarily by private residences [syn: residential district, residential area]
8: (ecology) a group of interdependent organisms inhabiting the same region and interacting with each other [syn: {biotic community}]

Instituto Nokia de Tecnologia
<Savago> hello there!
<Savago> How are you doing, man?
<Savago> By the way... thanks for the tip concerning the KUrl.
<krake> you're welcome :)
<krake> I have new tips :)
<Savago> Great, please send them. :-)
<krake> the comparison in line 205 needs to be updated. entry_id is no longer just the contact_id
<Savago> checking...
<Savago> Ouch! You are right.
<Savago> A leftover from previous implementation.
<krake> the comment about the "const guy" in itemAdded() and friends:
<krake> you need to tell Akonadi that you have committed the change using changeCommitted()
<krake> this method takes a new item, quite like itemRetrieved
<krake> see http://websvn.kde.org/trunk/KDE/kdepim/akonadi/resources/vcard/vcard_resource.cpp?revision=879139&view=markup
<Savago> ah... so is it just a matter of creating a new Item object and then using itemRetrieved.
<Savago> cool!
<krake> yes
<Savago> Could you give some hints about how to use kwallet? Is there a place with documentation? And any sample code?
<Savago> :-)
<lemma> hi, are you still around?
<lemma> just got home :)
<lemma> well, in case I'm not longer around when you get back, check this link: http://www.staikos.net/~staikos/papers/2003/kwallet-kastle-2003.ps
<lemma> I think that's the closest to a "tutorial" we have. but if you have specific questions, feel free to ask
* Savago back from lunch.
<Savago> Thanks a lot for the return, I will check it.
<lemma> alright
<lemma> do you already have the resource in playground?
<Savago> Yep!
<lemma> nice. where is it, and will it eat my google calendar if I try it? :)
<Savago> Is on playground/plm/google_data
<lemma> thanks!
<Savago> For while only google contacts.
Good community: where it is easy for new coders, designers, users to contribute.
Video: gcontacts + KAddressbook
Video: gcalendar + Kontakt
KDE + libgcal

Akonadi resource

| DONE | Akonadi | Google calendar and contacts resource | Adenilson Cavalcanti <cavalcantii@gmail.com> |

http://techbase.kde.org/Schedules/KDE4/4.3_Feature_Plan#kdepim

KDE planet and commits digest!

**Brazilian overlords**
Submitted by kroake on Wed, 04/08/2009 - 21:48

In case you thought that reading about the Akonadi developer sprint on the dot gave you an all encompassing overview of stuff happening around Akonadi, you forgot our brazilian friends.

Adenilson Cavalcanti, also featured in one of Danny’s excellent commit digests, has been working like a mad man (or a genius, thin line and all that 😊) on the Akonadi resources for Google’s data services.

http://www.kdedevelopers.org/node/3931
Gcalendar and contacts

*rip off from EA...
## Top 10 bugs: 2009-06-16

2887 bugs found.

<table>
<thead>
<tr>
<th>ID</th>
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Tip: be open to newcomers
How google data protocol works?

- REST + atom (i.e. HTTP + XML)
- Allows: get all, add/edit/delete, query, others
- Sync: tricky!
Authentication

- HTTPS POST to feed (clientlogin)

- You get:

```plaintext
SID=DQAAAG8AAABj5g0YUwq6qTouiHU61bqJAKWWV-HxC9GpZ4rr7VAlfl1PlhXazCR5ZNeMCT4_tU6tUOEPTJ1vwpfHeqnEesg1JGTaMBZ2p8hZzXkJPEe0vKBAoW1zpVHeeOT91MbiDPwfeL3Aa-gs92ykA-bGMjLL
LSID=DQAAAHAAAbh9oh-UHneBqtisDPxgG65p3RWNEHd1-SQbZ-MeEdT3YSTPCDzGfjkwG-Vsv83X0UjwFTMHGCmzypMmF1BbuP2LDjKWKJ4eu0RYDbxHxhB50scxMXjug4HI48QpABn04ovaT7n0R0V6kpZM_qQHMNNZYlodSmjv2B6V7_maD0w
Auth=DQAAAHAAAbh9oh-UHneBqtisDPxgG65p3RWNEHd1-SQbZ-MeEdT3YSTPCDzGfjkwG-Vsv83X0Wn35gYADT9ZX7YR5FZUPIjc5tyfyszDPWcauz0na3XAV0991f43WNU0YH1ZwqoVfgpr0JFBAXUBucpFnLVpni
```
Add

<table>
<thead>
<tr>
<th>Frame 26 (1025 bytes on wire, 1025 bytes captured)</th>
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<tbody>
<tr>
<td>Transmission Control Protocol, Src Port: 36074 (36074), Dst Port: http (80), Seq: 1, Ack: 1, Len: 959</td>
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</table>

- Hypertext Transfer Protocol
  - POST /calendar/feeds/default/private/full HTTP/1.1
    - Host: www.google.com
    - Accept: */*
    - GData-Version: 2
    - Content-Type: application/atom+xml
    - Content-Length: 601
    - Authorization: GoogleLogin auth=DQAAHAAAAADTNyWq8f2xvPnP-PlskUQ28AJ4Evz3Q6TChAcXKibRrJh_6DZ2s8k8Az8Z
      
- Media Type
  - Media Type: application/atom+xml (601 bytes)
Frame 51 (1317 bytes on wire, 1317 bytes captured)

- Ethernet II, Src: Apple_f3:04:b1 (00:1f:5b:f3:04:b1), Dst: DellEsgP_94:cc:e0 (00:0b:db:94:cc:e0)
- Transmission Control Protocol, Src Port: 36076 (36076), Dst Port: http (80), Seq: 1, Ack: 1, Len: 1251

Hypertext Transfer Protocol

```
PUT /calendar/feeds/default/private/full/lnb7vl8iqooqjroauhj16fij50 HTTP/1.1\r\nHost: www.google.com\r\nAccept: */*\r\nGData-Version: 2\r\nContent-Type: application/atom+xml\r\nContent-Length: 854
Authorization: GoogleLogin auth=DQAAHAAADTNyWqh7Ewq2xvDoP-PlskUQ28HAJ4Evz3ZQ6TChAcXKLbRrJh_6DZ2s8k8Az8Y\r
If-Match: *\r\n\r
```

Media Type

```
Media Type: application/atom+xml (854 bytes)
```
Delete
Who implements gdata protocol?
libgcal

- dependencies: libxml, libcurl
- BSD license
- features
- origin: opensync python plugin by Ehabkost
Syncml + libgcal
Libgcal: unit tests

```
/home/edemilson/akonadi/safe/utests/utest_screw.c:96: warning: passing argument 2 of `gcal_get_contacts' from incompatible pointer type

[ 84%] Building C object utests/CMakeFiles/testgcal.dir/utest_userapi.c.o
[ 89%] Building C object utests/CMakeFiles/testgcal.dir/utest_xmlnode.c.o
[ 94%] Building C object utests/CMakeFiles/testgcal.dir/utest_xmlnode.c.o
[100%] Building C object utests/CMakeFiles/testgcal.dir/utils.c.o

Linking C executable testgcal
[100%] Built target testgcal

adenilson@macblack:/~akonadi/safe/build$ GCAL=user make test

[ 42%] Built target gcal
[100%] Built target testgcal
Running suite(s): userapi
100% Checks: 9, Failures: 0, Errors: 0

/home/edemilson/akonadi/safe/utests/utest_userapi.c:44:P:gcuserapi:test_get_calendar:0: Passed
/home/edemilson/akonadi/safe/utests/utest_userapi.c:124:P:gcuserapi:test_access_calendar:0: Passed
/home/edemilson/akonadi/safe/utests/utest_userapi.c:169:P:gcuserapi:test_get_event:0: Passed
/home/edemilson/akonadi/safe/utests/utest_userapi.c:204:P:gcuserapi:test_query_event_updated:0: Passed
/home/edemilson/akonadi/safe/utests/utest_userapi.c:220:P:gcuserapi:test_get_contacts:0: Passed
/home/edemilson/akonadi/safe/utests/utest_userapi.c:314:P:gcuserapi:test_access_contacts:0: Passed
/home/edemilson/akonadi/safe/utests/utest_userapi.c:363:P:gcuserapi:test_add_contact:0: Passed
/home/edemilson/akonadi/safe/utests/utest_userapi.c:414:P:gcuserapi:test_query_contact_updated:0: Passed
/home/edemilson/akonadi/safe/utests/utest_userapi.c:482:P:gcuserapi:test_contact_deleted:0: Passed
[100%] Built target test

 adenilson@macblack:/~akonadi/safe/build$ 
```
Libgcal: unit tests

**LTP GCOV extension - code coverage report**

<table>
<thead>
<tr>
<th>Filename</th>
<th>Coverage</th>
<th>Instrumented lines</th>
<th>Executed lines</th>
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<tbody>
<tr>
<td>atom_parser.c</td>
<td>83.4 %</td>
<td>146 / 175 lines</td>
<td></td>
</tr>
<tr>
<td>gcal.c</td>
<td>83.8 %</td>
<td>599 / 715 lines</td>
<td></td>
</tr>
<tr>
<td>gcal_parser.c</td>
<td>87.2 %</td>
<td>239 / 274 lines</td>
<td></td>
</tr>
<tr>
<td>gcal_status.c</td>
<td>81.2 %</td>
<td>13 / 16 lines</td>
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<tr>
<td>gcalendar.c</td>
<td>89.5 %</td>
<td>248 / 275 lines</td>
<td></td>
</tr>
<tr>
<td>gcont.c</td>
<td>82.6 %</td>
<td>128 / 155 lines</td>
<td></td>
</tr>
<tr>
<td>gcontact.c</td>
<td>86.0 %</td>
<td>180 / 185 lines</td>
<td></td>
</tr>
<tr>
<td>xml_aux.c</td>
<td>82.0 %</td>
<td>41 / 50 lines</td>
<td></td>
</tr>
</tbody>
</table>

Generated by: **LTP GCOV extension version 1.5**
Libgcal: unit tests

```c
int gcal_update_event(gcal_t gcal_obj, gcal_event event)
{
    int result = -1;
    struct gcal_event updated;

    if (!gcal_obj || (!event))
        goto exit;

    result = gcal_edit_event(gcal_obj, event, &updated);
    if (result)
        goto exit;

    /* Swap updated fields: edit_uri and updated */
    if (event->common.updated)
        free(event->common.updated);
    event->common.updated = updated.common.updated;
    updated.common.updated = NULL;

    if (event->common.edit_uri)
        free(event->common.edit_uri);
    event->common.edit_uri = updated.common.edit_uri;
    updated.common.edit_uri = NULL;

    /* Cleanup updated event */
    gcal_destroy_entry(&updated);
    exit:
    return result;
}
```
Have it your way: Create a client library in your favorite language!
Tuesday, August 19, 2008 at 4:52 PM
Posted by Eric Bidelman & Austin Chau, Google Data APIs Team

The Google Data team has developed client libraries in .NET, Java, JavaScript, Python, PHP, and Objective-C. With the popularity of other languages like Ruby, many developers have taken it upon themselves to build libraries for their favorite Google Data API. Here are two examples:

**Base 4 Ruby:**
A ruby gem that allows developers to create, update, and delete items using the Google Base Data API.

**libgcal:**
A C/C++ library to interact with the Google Calendar and Contacts APIs.

For those of you who want to get involved in open source development, feel free to contribute to these projects or help us to improve Google's officially supported client libraries. If you're interested in starting fresh, checkout Jeff Scudder's presentation on [Creating a Google Data API Client](#).

Hack away!

Implemented your own client? Leave a comment.

[Permalink](#)
KDE4 + PIM = akonadi
# Akonadi support

<table>
<thead>
<tr>
<th>protocol</th>
<th>support</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMAP</td>
<td>++</td>
</tr>
<tr>
<td>POP3</td>
<td>+++</td>
</tr>
<tr>
<td>vcard</td>
<td>+++</td>
</tr>
<tr>
<td>ical</td>
<td>+++</td>
</tr>
<tr>
<td>googledata</td>
<td>+++</td>
</tr>
<tr>
<td>Exchange</td>
<td>++</td>
</tr>
<tr>
<td>Kolab</td>
<td>++</td>
</tr>
</tbody>
</table>

GSoC: Syncml.
Akonadi (mis)features

**good:** D-BUS, LGPL, asynchronous, Qt

**BAD:** mysql

branch/akonadimobile has support for sqlite!
How difficult is akonadi?

Coding:
- Gcontacts: 3 weeks
- gcalendar: 3 days

question? ALT+F2
KDE devel

- distro really up-to-date (e.g. OpenSuse)

- run the trunk! YMMV
Sync considerations
What time is it?
Inclusive query
Added or edited? Can't tell!
Bugs X Programmers
How to add?

```
35 1.701856 192.168.209.37 209.85.195.99 TCP 36075 > http [ACK] Seq=1 Ack=1 Win=64
36 1.702026 192.168.209.37 209.85.195.99 HTTP POST /calendar.feeds/default/private/full?gsessionid=xaCYC1XvPGd7t5cJYSXIkc HTTP/1.1
------
Frame 36 (1059 bytes on wire, 1059 bytes captured)

Transmission Control Protocol, Src Port: 36075 (36075), Dst Port: http (80), Seq: 1, Ack: 1, Len: 993

Hypertext Transfer Protocol

POST /calendar.feeds/default/private/full?gsessionid=xaCYC1XvPGd7t5cJYSXIkc HTTP/1.1
Host: www.google.com
Accept: */*
GData-Version: 2
Content-Type: application/atom+xml
Content-Length: 601
Authorization: GoogleLogin auth=DQAAAHAADTNyWqh7Ewq2xvDoP-PlskUQ28HAJ4Evz3ZQ6TChAcXKibRrJh_6DZ2s8k8Az8

Media Type

Media Type: application/atom+xml (601 bytes)
```
Documentation may be wrong...

Written: If you received the redirect, then send the same POST request again, with the same Authorization header and the same content, but with the gsessionid parameter appended.

Should be: When you receive the redirect, send the same POST request, with the same Authorization header, to the location specified in the response location.
Parsing is the root of evil...

result = org.xml.sax.SAXParseException: The processing instruction target matching "[xX][mM][IL]" is not allowed.
Parsing is the root of evil...

commit blfbd7a04c28c3f323077f6e238e6283a7349045
Author: Adenilson Cavalcanti <adenilson@t60ade.(none)>
Date:   Tue May 6 21:20:35 2008 -0400

Fix for the dreaded 'add event' bug. It was caused by a bug in the 'gcal_get_authentication' function: it copied the \r\n in the end of string.

*Very* special thanks to Eduardo Habkost (a.k.a. Boto) for uncovering the bug and pointing it to me.

:-)

The whole history is covered in the link:
http://groups.google.com/group/google-calendar-help-dataapi/browse_thread/thread/b0bd9804ab68a6e5
Sync or Async?
Sync or Async?

commit f0652dbcbc07615526608213de69d1366d198869
Author: Adenilson Cavalcanti <adenilson@t60ade.(none)>
Date: Mon Feb 16 13:03:58 2009 -0400

Implementing akonadi resource stressed libgcal in new ways. Since I'm doing a lot of different operations with the same gcal context, some funny things are happening (bugs that were not detected in the unit tests).

One of them is failure to perform an ADD just after doing a DELETE. I discovered that since libcurl requires use of CUSTOMREQUEST to do HTTP DELETE, this state was kept inside of curl context.

From the man page: "Restore to the internal default by setting this to NULL."
Sync or Async?

diff --git a/src/gcal.c b/src/gcal.c
index 2e53a2d..4172680 100644
--- a/src/gcal.c
+++ b/src/gcal.c
@@ -1021,6 +1021,9 @@ int gcal_delete_event(struct gcal_resource *gcalobj,
    h_auth,
    h_auth,
    NULL, NULL, GCAL_DEFAULT_ANSWER);

+    /* Restores curl context to previous standard mode */
+    curl_easy_setopt(gcalobj->curl, CURLOPT_CUSTOMREQUEST, NULL);
+
cleanup:

    if (h_auth)

diff --git a/src/gcont.c b/src/gcont.c
index e84b23b..c1b9be9 100644
--- a/src/gcont.c
+++ b/src/gcont.c
@@ -247,6 +247,9 @@ int gcal_delete_contact(struct gcal_resource *gcalobj,
    h_auth,
    h_auth,
    NULL, NULL, GCAL_DEFAULT_ANSWER);

+    /* Restores curl context to previous standard mode */
+    curl_easy_setopt(gcalobj->curl, CURLOPT_CUSTOMREQUEST, NULL);
+
    if (h_auth)
    free(h_auth);
Rant1: is XML or iCalendar?

```xml
<entry xmlns='http://www.w3.org/2005/Atom'
       xmlns:gd='http://schemas.google.com/g/2005'>
    <category scheme='http://schemas.google.com/g/2005#kind'
               term='http://schemas.google.com/g/2005#event'></category>
    <title type='text'>Tuesday Tennis Lessons with Jane</title>
    <content type='text'>Meet on Tuesdays for a quick lesson.</content>
    <gd:transparency
         value='http://schemas.google.com/g/2005#event.opaque'>
    </gd:transparency>
    <gd:eventStatus
         value='http://schemas.google.com/g/2005#event.confirmed'>
    </gd:eventStatus>
    <gd:where valueString='Rolling Lawn Courts'></gd:where>
    <gd:recurrence>DTSTART:VALUE=DATE:20070501
                  DTEND:VALUE=DATE:20070502
                  RRULE:FREQ=WEEKLY;BYDAY=Tu;UNTIL=20070904
    </gd:recurrence>
</entry>
```
Rant2: dichotomy cal x contacts
Rant3: is 2.0 == 2.1?

shit happens
<table>
<thead>
<tr>
<th>Source IP</th>
<th>Destination IP</th>
<th>Protocol</th>
<th>Request Method</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>64.233.163.147</td>
<td>10.4.2.145</td>
<td>HTTP</td>
<td>GET</td>
<td>/calendar/feeds/gcalntester%40gmail.com/private/full?max-results=999999999&amp;updated-min=2009-05-01T22:52:33.901Z</td>
</tr>
<tr>
<td>64.233.163.147</td>
<td>10.4.2.145</td>
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<td>GET</td>
<td>/calendar/feeds/gcalntester%40gmail.com/private/full?max-results=999999999&amp;updated-min=2009-05-01T22:52:33.901Z</td>
</tr>
<tr>
<td>64.233.163.147</td>
<td>10.4.2.145</td>
<td>HTTP</td>
<td>HTTP/1.0</td>
<td>302 Moved Temporarily (text/html)</td>
</tr>
<tr>
<td>64.233.163.147</td>
<td>10.4.2.145</td>
<td>HTTP</td>
<td>GET</td>
<td>/calendar/feeds/gcalntester%40gmail.com/private/full?max-results=999999999&amp;updated-min=2009-05-01T22:52:33.901Z</td>
</tr>
<tr>
<td>64.233.163.147</td>
<td>10.4.2.145</td>
<td>HTTP</td>
<td>HTTP/1.0</td>
<td>410 Gone (text/html)</td>
</tr>
</tbody>
</table>

*Tests on wire, 463 bytes captured*
Rant4: Pessimisation

HTTP/1.0 410 Gone (text/)

HTTP/1.0 410 Gone
Date: Thu, 25 Jun 2009 22:44:29 GMT
Content-Type: text/html; charset=UTF-8
Cache-Control: private, max-age=0
X-Content-Type-Options: nosniff
Server: GFE/2.0
X-Cache: MISS from proxy.fis10.org.br
Via: 1.0 proxy.fis10.org.br (squid/3.0.STABLE15)
Proxy-Connection: close

Rant4: Pessimisation

/* XXX: google server has a bug where a 2.0 protocol request
 * is being met with a 2.1 protocol behaviour
 * (if updated-min > 30 days, return a HTTP 410 error).
 * Further details:
 * http://code.google.com/p/gdata-issues/issues/detail?id=1036 */

    int gBug = gcal_status_httpcode(gcal);
    if (gBug != 410) {
        qDebug() << "Failed querying by updated";
        return result;
    } else {
        qDebug() << "Workarounding bug: HTTP 410 Gone...";

        // Calculate a date up to 30 days ago */
        QDateTime original, now, newtime;
        original = original.fromString(timestamp, 
                                    QDateTime::ISODate);
        now = now.currentDateTime(QDateTime::Spec::ClockTime);
        int delta = original.daysTo(now);
        newtime = original.addDays(delta);
        newtime = newtime.addDays(-10);
        qDebug() << "delta: " << delta << "\timestamp: " 
                << newtime.toString(QDateTime::ISODate);

        temp = newtime.toString(QDateTime::ISODate);
        t_byte = temp.toByteArray();
        if ((result = gcal_get_updated_events(gcal, 
                                &all_events, 
                                t_byte.data()))) {
            qDebug() << "Failed querying by updated";
            return result;
        }
    }
The end?
Special thanks

- Kevin Krammer, Igor Trindade, Mike Arthur
- Friends
- INdT