PARSE

BACKEND AS A SERVICE

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CONTENTS

- What is Parse?
- Parse Data & Parse Push
- Android Demo
- Other services: Cloud code, Social, Analytics
- Evaluation & Summary

WHAT IS PARSE?

PARSE IS A MBAAS

Parse is a hosted closed-source, proprietary mobile-backend-as-a-service (mBaaS)

It offers BaaS over APIs for several platforms

SERVICE CATALOGUE

- Parse Database
- Parse Push notifications
- Parse User management and Social web integration
- Cloud Code server-side code hosting
- Parse Analytics

SUPPORTS MOST PLATFORMS

Main platforms: Android, iOS, OS X, JavaScript, Windows 8, Windows Phone 8, Unity, REST

3rd party libraries: .NET, Java, Clojure, jQuery, Node, PHP, Python, Objective-C, Qt, Ruby, ...

OWNED BY FACEBOOK

April 2013: "Facebook bought mobile cloud services company Parse for a reported $85 million"

readwrite.com/2013/04/29/parse-acquisition-makes-its-rivals-very-happy

Even when you are not in Facebook, you are part of Facebook?

SUBSCRIPTION LEVELS

Basic
Great for developers to get started

FREE

Requests	Pushes	Burst Limit
1 million/month	1 million/month	20/second

☁ Parse Core Platform

Your Current Plan

Pro
For production applications

POPULAR

$199
per month

Requests	Pushes	Burst Limit
15 million/month	5 million/month	40/second

☁ Parse Core Platform

- ⊕ Collaborators and security features
- ⊕ Powerful marketing features

30-day Free trial | Upgrade to Pro

Enterprise
The most advanced features at a custom annual price
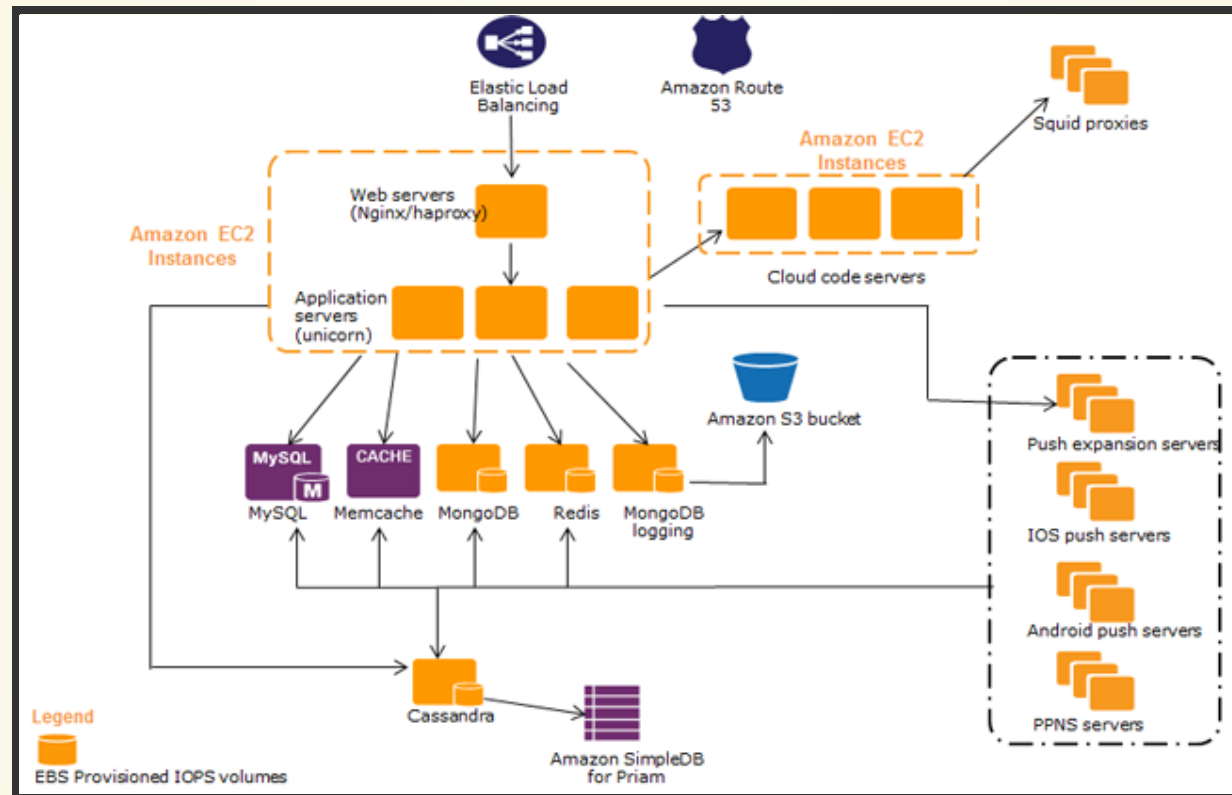
Discover all the benefits of the enterprise plan

Learn more

☁ Parse Core Platform

- ⊕ Parse Pro features
- ⊕ Enterprise-grade SLA
- ⊕ High performance infrastructure
- ⊕ Dedicated support

Upgrade to Enterprise

PARSE RUNS ON AMAZON WEB SERVICES

aws.amazon.com/solutions/case-studies/parse

PARSE SUPPORT

- Getting Started guides, Tutorials and API documentation
- StackOverflow (843 parse.com questions)
- Parse's own "StackOverflow clone" **parse.com/help**
- Parse Developer Day conference held in September 2013

APP BASICS

- A single Parse developer account can hold many Apps, paying customers can collaborate on an app
- Apps are isolated from each other
- Dashboard for simple management and monitoring

DASHBOARD

Parse

Welcome Ville

Baas ▾

| Analytics | Data Browser | Cloud Code | Push Notifications | Settings |

General settings
App name, delete your app

Application keys
App ID, Client key, Master key...

Push notifications
Manage your push settings

Web hosting
Manage your hosted domains

User authentication
User auth., Facebook, Twitter

Email settings
Manage your email templates

Collaborators
Share your app with others

Export data
Get all your app's data in a zip

((•)) Push Notification Settings

Configure your push notification settings here. For detailed instructions, take a look at the Push Notification Guide.

Client push enabled?   OFF

📄 Apple Push Certificate

This is only necessary if you plan on pushing to iOS devices. Having more than one push certificate for a single app is only supported by Pro and Enterprise accounts.

Certificate file (.p12)   Select your certificate

PARSE DATA

EFFORTLESS DATABASE

- JSON-based, auto-generated schema, semi-relational

- not real-time, not auto-syncing (started making a chat app around the db until I realized this)

- A Parse dev suggested creating sync with push notifications **parse.com/questions/real-time-updates-like-firebase**

- ParseObjects can only be 128kb, ParseFile object can be 10 megabytes

SMALLEST WORKING EXAMPLE

```java
// Init Parse and auto-generate an anonymous user for this installation
Parse.initialize(this, YOUR_APPLICATION_ID, YOUR_CLIENT_KEY);
ParseUser.enableAutomaticUser();

// Upload a new object to the Parse database
ParseObject gameScore = new ParseObject("GameScore");
gameScore.put("score", 1337);
gameScore.put("playerName", "Sean Plott");
gameScore.saveInBackground();
```

SUBCLASSING PARSEOBJECT

Instead of:

```
ParseObject shield = new ParseObject("Armor");
shield.put("displayName", "Wooden Shield");
shield.put("fireproof", false);
```

We can have:

```
Armor shield = new Armor();
shield.setDisplayName("Wooden Shield");
shield.setFireproof(false);
```

```
@ParseClassName("Armor")
public class Armor extends ParseObject { /* ... */ }

ParseObject.registerSubclass(Armor.class);
```

SPECIAL CLASS: USER

objectId String	username String	password...	authData authData	emailVerified Boolean	email String
yyGwZ1sTZR	3gmgovqojmypy...	(hidden)	Anonymous	(undefined)	(undefined)
OYrQGxHRZn	zmi2meg03d92...	(hidden)	Anonymous	(undefined)	(undefined)
vZRdkOnZ1p	mpame7mcq8s...	(hidden)	Anonymous	(undefined)	(undefined)
Jsculr2IYo	4heapgy53xan9...	(hidden)	Anonymous	(undefined)	(undefined)
9s8oGfyhq5	nod5w50p4or1n...	(hidden)	Anonymous	(undefined)	(undefined)
Mq4aZntAle	sndzm8zj8ta60d...	(hidden)	Anonymous	(undefined)	(undefined)
PK8Ap9QdLy	lr01s2l7zwcslho...	(hidden)	Anonymous	(undefined)	(undefined)
viUjHBhgle	d97bymkpxseke...	(hidden)	Anonymous	(undefined)	(undefined)
rGLk0iQ12p	9n3wjr53dvg8b...	(hidden)	Anonymous	(undefined)	(undefined)
D58ezQXT0Y	5rlmxkp1iia020k...	(hidden)	Anonymous	(undefined)	(undefined)
7mXlt2Wmoa	7w2vq1bv2fqk2...	(hidden)	Anonymous	(undefined)	(undefined)
siwxfB3PdC	mtryc9af20alpnj...	(hidden)	Anonymous	(undefined)	(undefined)
JiuNN1DHuY	rsje24q7vm2e4...	(hidden)	Anonymous	(undefined)	(undefined)
uV0B5mLQ5u	j02pmdfo9vnb6...	(hidden)	Anonymous	(undefined)	(undefined)
X6j89dUSYL	u7n4txlcz7qd6fi...	(hidden)	Anonymous	(undefined)	(undefined)

SPECIAL CLASS: INSTALLATION

objectId S...	appNam...	appV...	devic...	installationId...	owner Pointer<_User>	parse...	timeZone ...	createdAt Date ▾	updatedAt Date	ACL ACL
ke3SLvnhS0	Peekaboo	0.8.4	android	402912e0-cb...	yyGwZ1sTZR	1.3.4	Europe/Hel...	Oct 20, 2013, 18:33	Oct 20, 2013, 18:34	(undefined)
5tgqdAfOxM	Peekaboo	0.8.4	android	8dc01545-e7c...	OYrQGxHRZn	1.3.4	Europe/Hel...	Oct 20, 2013, 18:33	Oct 20, 2013, 18:33	(undefined)
s944H667Tp	Peekaboo	0.8.4	android	f219f8f7-1947...	vZRdkOnZ1p	1.3.4	Europe/Hel...	Oct 20, 2013, 18:32	Oct 21, 2013, 10:45	(undefined)
RaVpCOtmpA	Peekaboo	0.8.4	android	8ec152cd-486...	Jsculr2lYo	1.3.4	Europe/Hel...	Oct 20, 2013, 18:31	Oct 20, 2013, 18:38	(undefined)
T64BVUmruF	Peekaboo	0.8.2	android	f43d8612-fc3d...	9s8oGfyhq5	1.3.4	Europe/Hel...	Oct 20, 2013, 17:35	Oct 20, 2013, 17:49	(undefined)
6NG5kdtc4u	Peekaboo	0.8.1	android	0b1caf1f-0563...	Mq4aZntAle	1.3.4	Europe/Hel...	Oct 20, 2013, 17:31	Oct 20, 2013, 17:31	(undefined)
ohCkPouS2h	Peekaboo	0.8.1	android	14461c5b-17...	PK8Ap9QdLy	1.3.4	Europe/Hel...	Oct 20, 2013, 16:45	Oct 20, 2013, 16:48	(undefined)
PnIbF46ei3	Peekaboo	0.8.1	android	99189918-b7...	viUjHBhgle	1.3.4	GMT	Oct 20, 2013, 16:42	Oct 20, 2013, 18:25	(undefined)
YkFutHFY8S	Peekaboo	0.8.1	android	78b462ff-078f...	rGLk0iQ12p	1.3.4	Europe/Hel...	Oct 20, 2013, 16:41	Oct 20, 2013, 16:41	(undefined)
U0EzPh5UT4	Peekaboo	0.8.1	android	cad99ad3-cab...	D58ezQXT0Y	1.3.4	Europe/Hel...	Oct 20, 2013, 16:37	Oct 20, 2013, 17:27	(undefined)
1VBJGRLU...	Peekaboo	0.8	android	30e14413-bb...	siwxfB3PdC	1.3.4	Europe/Hel...	Oct 20, 2013, 16:05	Oct 20, 2013, 16:19	(undefined)
8ussx9oJlu	Peekaboo	0.8	android	db108fed-ea4...	JiuNN1DHuY	1.3.4	Europe/Hel...	Oct 20, 2013, 10:15	Oct 20, 2013, 16:03	(undefined)
7WS7pe18...	Peekaboo	0.6.5	android	e44c7043-cd0...	uV0B5mLQ5u	1.3.4	Europe/Hel...	Oct 18, 2013, 19:14	Oct 20, 2013, 16:09	(undefined)
1tF56CWpmp	Peekaboo	0.6.5	android	751d9cae-1e...	X6j89dUSYL	1.3.4	America/Ne...	Oct 18, 2013, 19:01	Oct 18, 2013, 19:01	(undefined)
kRzZYsbjWl	Peekaboo	0.6.5	android	e5844fc9-686...	k1hRQgxyn5	1.3.4	Europe/Hel...	Oct 18, 2013, 19:01	Oct 18, 2013, 19:01	(undefined)
iEs7HY3oaC	Peekaboo	0.6.6	android	39814f50-852...	TJbGX9J6zL	1.3.4	Europe/Hel...	Oct 18, 2013, 19:01	Oct 20, 2013, 09:39	(undefined)
KEOjeNeUat	Peekaboo	0.6.5	android	da20fe4e-44a...	2AOt8zXtCX	1.3.4	Europe/Hel...	Oct 18, 2013, 18:28	Oct 18, 2013, 18:51	(undefined)
eXpVy8haHy	Peekaboo	0.6.5	android	cc8ac367-f41...	xwoXcnO0Zt	1.3.4	Europe/Hel...	Oct 18, 2013, 15:05	Oct 18, 2013, 18:45	(undefined)
ViHn9pRb3T	Peekaboo	0.6.5	android	37306b72-17...	0mGCBUvsPx	1.3.4	Europe/Hel...	Oct 18, 2013, 10:55	Oct 18, 2013, 14:52	(undefined)
AejdLKdHQF	Peekaboo	0.6.1	android	7c1d640f-5ec...	QBPbq4As5V	1.3.4	Europe/Hel...	Oct 17, 2013, 19:19	Oct 18, 2013, 11:32	(undefined)

REST CALLS

```
curl --request GET \
    --header "X-Parse-Application-Id: Xlsvm0...WL4in" \
    --header "X-Parse-REST-API-Key: 0OPlRuE...5lk" \
    --get \
    --data-urlencode 'where={"playerName":"Sean Plott","cheatMode":false}' \
    https://api.parse.com/1/classes/GameScore
```

```json
{
  "results": [
    {
      "playerName": "Sean Plott",
      "updatedAt": "2011-08-21T18:02:52.248Z",
      "cheatMode": false,
      "createdAt": "2011-08-20T02:06:57.931Z",
      "objectId": "Ed1nuqPvcm",
      "score": 73453
    }
  ]
}
```

ACCESS CONTROL LISTS (ACL)

obj...	author Pointer<_User>	photo File	r...	title Str...	createdAt Date	u. ▲	ACL ACL
F9...	F4ori0jU9r	meal_photo.jpg	3	monkey	Sep 28, 2013, 14:52	...	{"*":{"read":true},"F4ori0jU9r":{"write":true,"read":true}}
VI4...	F4ori0jU9r	meal_photo.jpg	4	tasty ch...	Sep 28, 2013, 14:51	...	{"*":{"read":true},"F4ori0jU9r":{"write":true,"read":true}}
6jY...	F4ori0jU9r	meal_photo.jpg	5	sushi	Sep 28, 2013, 15:03	...	{"*":{"read":true},"F4ori0jU9r":{"write":true,"read":true}}
yPz...	F4ori0jU9r	meal_photo.jpg	2	rat burger	Sep 28, 2013, 14:56	...	{"*":{"read":true},"F4ori0jU9r":{"write":true,"read":true}}

Each object has its own ACL of users/roles/everyone and their read/write access rights

```
{
  "*":{
    "read":true
  },
  "F4ori0jU9r":{
    "write":true,
    "read":true
  }
}
```

CLASS-SPECIFIC ACCESS CONTROL

- Get: fetching an object by its objectId.
- Find: issuing a query to fetch objects.
- Update: saving an object that already exists and has been modified.
- Create: saving an object that is new and hasn't been created yet.
- Delete: deleting an object.
- Add fields: adding fields to the class.

ROLE-BASED ACCESS CONTROL

- Users can be grouped into roles
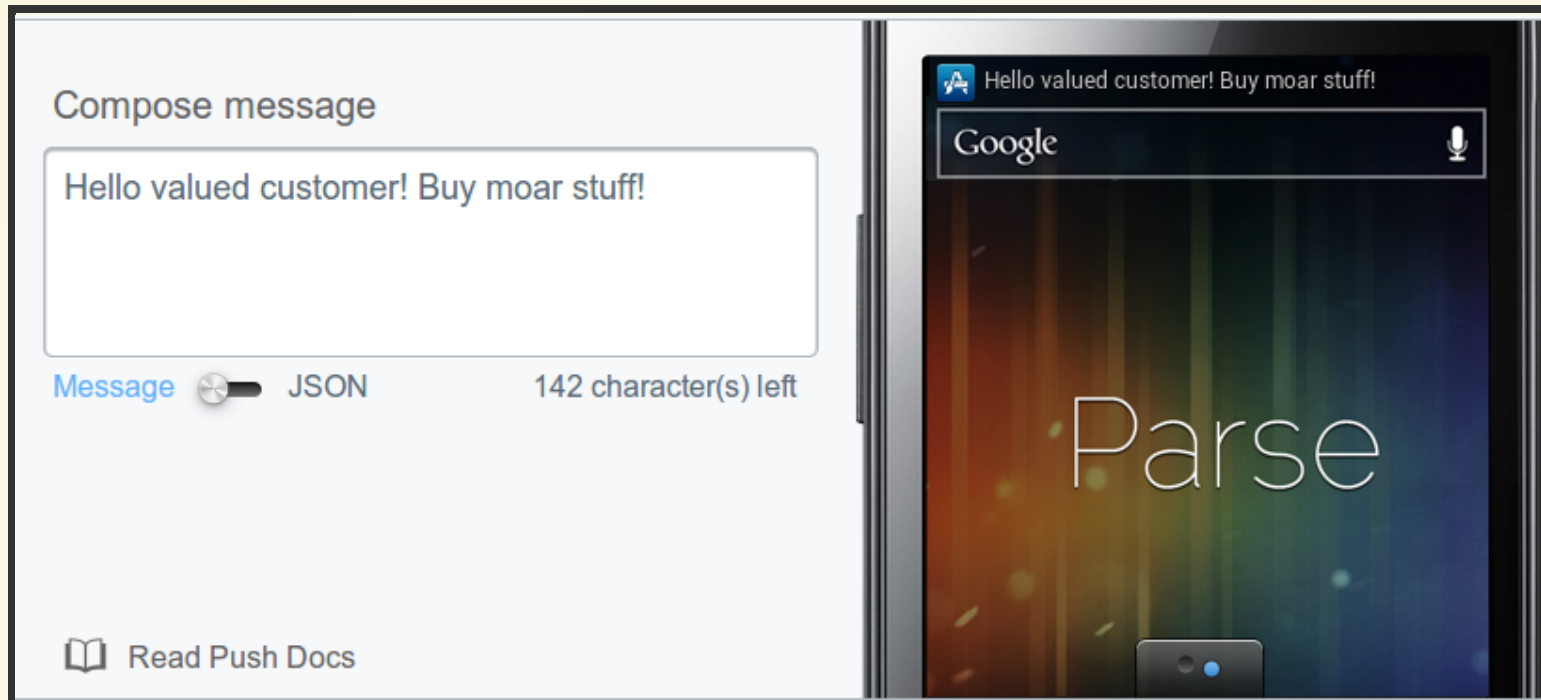- Subroles can be grouped into roles
- Roles can be referred to in ACLs

```java
// Create new role object
ParseACL roleACL = new ParseACL();
roleACL.setPublicReadAccess(true);
ParseRole role = new ParseRole("Administrator", roleACL);

// Add user and child role to role
role.getUsers().add(newUser);
role.getRoles().add(childRole);
role.saveInBackground();
```

PARSE PUSH

PUSH NOTIFICATION

PUSH NOTIFICATIONS

- Parse offers scheduling, expiration time and target segmenting
- Can be sent from the dashboard and from all SDKs, but only received in iOS, Android and Win8 "Metro"
- Requires Apple Push Certificate on iOS and Windows Push Credentials on Win8 apps. On Android Parse has its own service, with pros and cons

CUSTOMIZING PUSH NOTIFICATIONS

- **alert**: the notification's message.
- **badge**: (iOS only) the value indicated in the top right corner of the app icon. This can be set to a value or to Increment in order to increment the current value by 1.
- **sound**: (iOS only) the name of a sound file in the application bundle.
- **content-available**: (iOS only) if you are using Newsstand, set this value to 1 to trigger a background download (more here).
- **action**: (Android only) the Intent should be fired when the push is received. If not title or alert values are specified, the Intent will be fired but no notification will appear to the user.
- **title**: (Android only) the value displayed in the Android system tray notification.

PUSH CHANNELS

objectId String	appName ...	appVer...	channels Array	owner Pointer<_User>
ke3SLvnhS0	Peekaboo	0.8.4	["Control","user_yyGwZ1sTZR"]	yyGwZ1sTZR
5tgqdAfOxM	Peekaboo	0.8.4	["Control","user_OYrQGxHRZn"]	OYrQGxHRZn
s944H667Tp	Peekaboo	0.8.4	["Control","user_vZRdkOnZ1p"]	vZRdkOnZ1p
RaVpCOtmpA	Peekaboo	0.8.4	["Control","user_Jsculr2lYo"]	Jsculr2lYo
T64BVUmruF	Peekaboo	0.8.2	["Control","user_9s8oGfyhq5"]	9s8oGfyhq5
6NG5kdtc4u	Peekaboo	0.8.1	["Control"]	Mq4aZntAle
ohCkPouS2h	Peekaboo	0.8.1	["Control","user_PK8Ap9QdLy"]	PK8Ap9QdLy
PnIbF46ei3	Peekaboo	0.8.1	["Control","user_viUjHBhgle"]	viUjHBhgle
YkFutHFY8S	Peekaboo	0.8.1	["Control","user_rGLk0iQ12p"]	rGLk0iQ12p
U0EzPh5UT4	Peekaboo	0.8.1	["Control","user_D58ezQXT0Y"]	D58ezQXT0Y
1VBJGRLUgB	Peekaboo	0.8	["Control","user_siwxfB3PdC"]	siwxfB3PdC
8ussx9oJlu	Peekaboo	0.8	["Control","user_JiuNN1DHuY"]	JiuNN1DHuY
7WS7pe18Aw	Peekaboo	0.6.5	["Control","user_uV0B5mLQ5u"]	uV0B5mLQ5u
1tF56CWpmp	Peekaboo	0.6.5	["Control","user_X6j89dUSYL"]	X6j89dUSYL
kRzZYsbjWl	Peekaboo	0.6.5	["Control","user_k1hRQgxyn5"]	k1hRQgxyn5
iEs7HY3oaC	Peekaboo	0.6.6	["Control","user_TJbGX9J6zL"]	TJbGX9J6zL
KEOjeNeUat	Peekaboo	0.6.5	["Control","user_2AOt8zXtCX"]	2AOt8zXtCX
eXpVy8haHy	Peekaboo	0.6.5	["Control","user_xwoXcnO0Zt"]	xwoXcnO0Zt
ViHn9pRb3T	Peekaboo	0.6.5	["Control","user_0mGCBUvsPx"]	0mGCBUvsPx
AejdLKdHQF	Peekaboo	0.6.1	["Control","user_QBPbq4As5V"]	QBPbq4As5V

Installations (not users) subscribe to pushes

JAVASCRIPT PUSH

Send push message

```javascript
Parse.initialize("RNh7...vfJtTC", "1CdI01...21iU");

var recent = new Date(new Date().getTime() - (24 * 3600*1000));
var query = new Parse.Query(Parse.Installation);
query.equalTo('channels', 'Control');
query.greaterThanOrEqualTo("updatedAt", recent);

Parse.Push.send({
  where: query,
  data: {
    alert: "Hello JavaScript!"
  }
}, {
  success: function() { /* Push was successful */ },
  error: function(error) { /* Handle error */ }
});
```

JSON DATA PUSH

```json
{
  "title": "BaasChat",
  "alert": "Hello mobile client!",
  "myCustomData": "foobar"
}
```

EXECUTE (ANDROID) CLIENT CODE VIA PUSH

```json
{
  "action": "fi.vilsepi.peekaboo.TAKE_PHOTO",
  "sneakyPayload": "any parameters for our function call"
}
```

```xml
<!-- the function onReceive(context, intent) of this class will be called -->
<receiver android:name="fi.vilsepi.peekaboo.BackgroundPushReceiver">
    <intent-filter>
        <action android:name="fi.vilsepi.peekaboo.TAKE_PHOTO"></action>
    </intent-filter>
</receiver>
```

```java
UiPushReceiver pushReceiver = new UiPushReceiver(new Handler());
registerReceiver(pushReceiver, new IntentFilter("fi.vilsepi.peekaboo.PHOTO_TA

public class UiPushReceiver extends BroadcastReceiver {
  public void onReceive(final Context context, Intent intent) {
    String action = intent.getAction();
    String channel = intent.getExtras().getString("com.parse.Channel");
    JSONObject json = new JSONObject(intent.getExtras().getString("com.parse.
    // etc..
  }
}
```
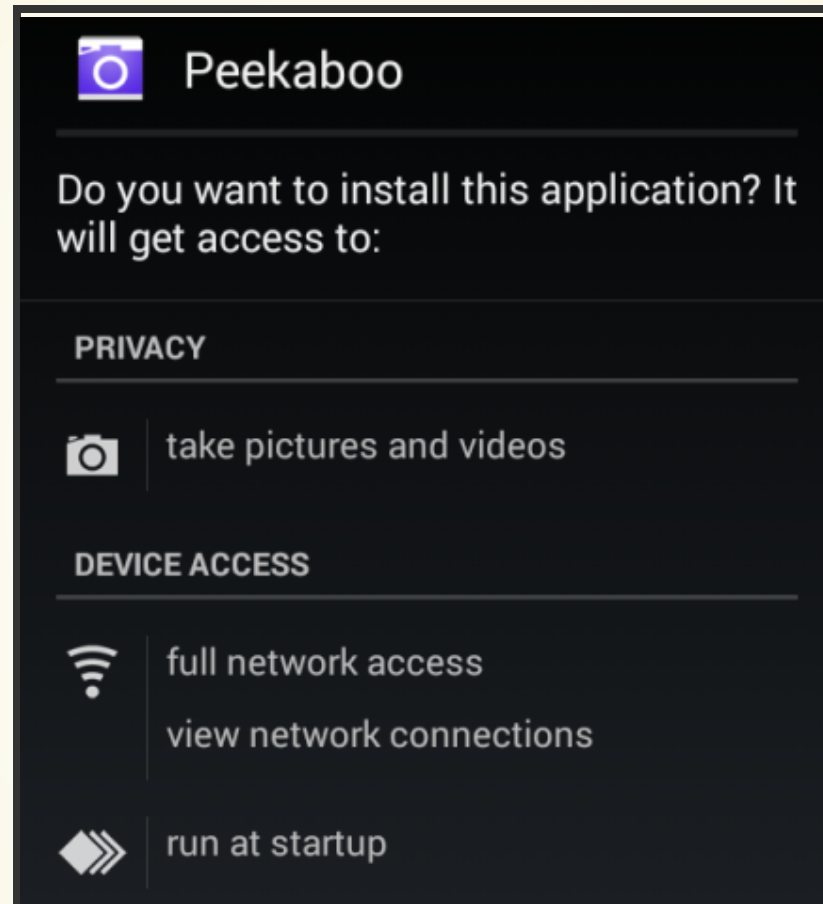
UNDER THE HOOD

- On Android, pushes use Parse's own background service
- Pushes are cleartext HTTP over open TCP connection from push.parse.com

```
{
    "time":"2013-10-17T12:33:00.224Z",
    "oauth_key":"RNh7DvetGOeZtifApJ2yTUrVg9wY0rq4ULvfJtTC",
    "data":{
        "alert":"Hello Wireshark!",
        "push_hash":"3616ff34c02d2e63b895ec112765f270"
    }
}
```
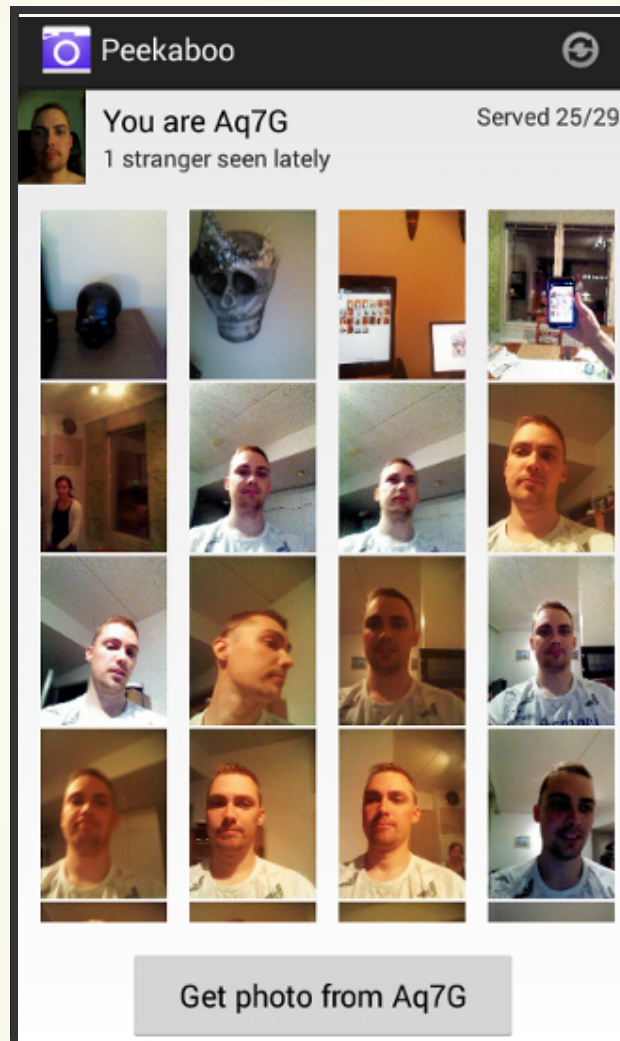
DEMO TIME!

ANDROID DEMO

1. Enable Settings -> Security -> Unknown sources
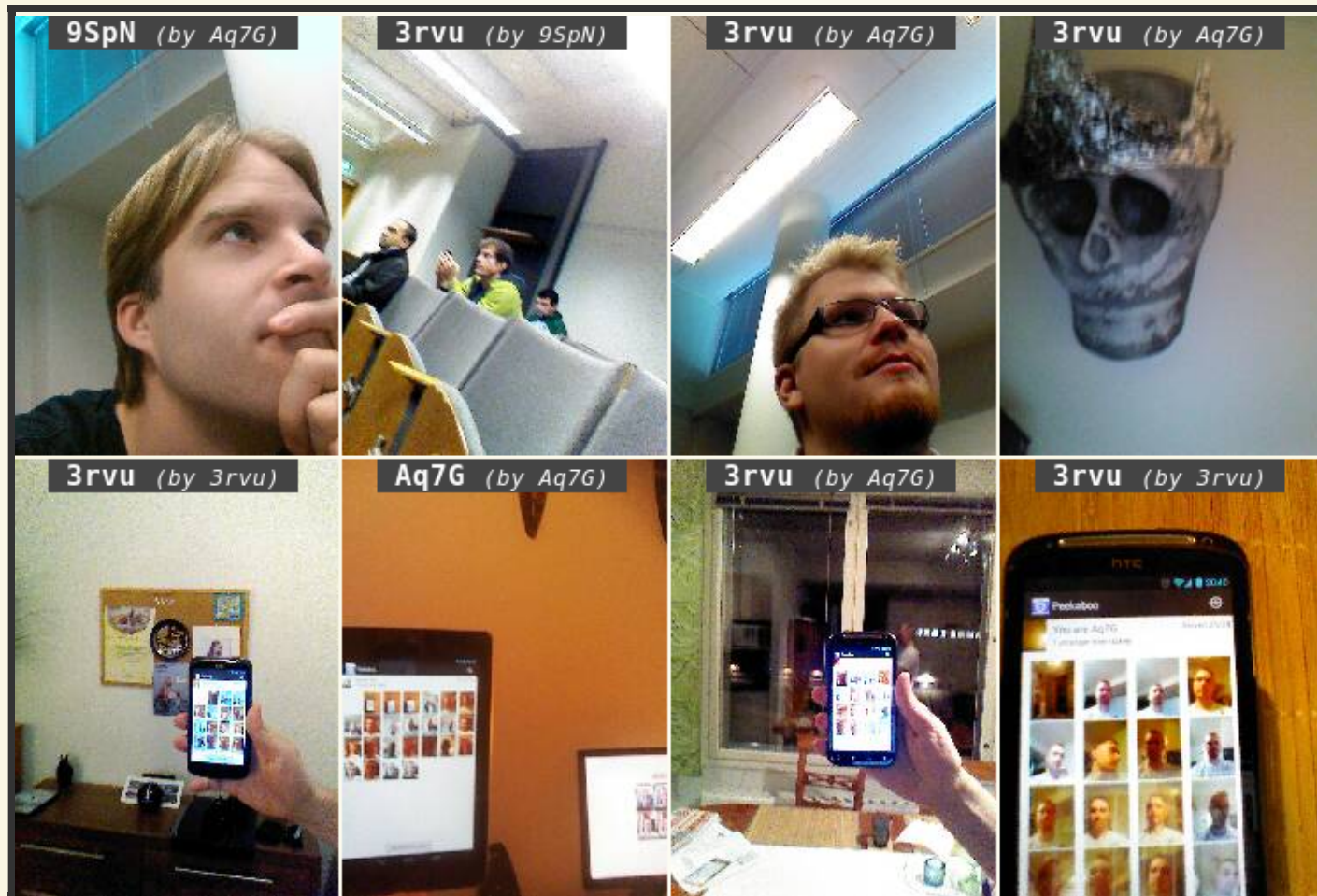2. Install ~~vilsepi.dyndns.org/baas~~

(tested on Gingerbread 2.3.3, Jelly Bean 4.2 and 4.3)

PEEKABOO: CAMERA SHARING APP

vilsepi.dyndns.org/baas

JAVASCRIPT CLIENT

Latest photos from all users

HOW IT WORKS

1. on first start, auto-generate an anonymous user
2. update the user into the database and subscribe to push channels
3. query for users that have been modified lately, pick one at random
4. send client push to the target via Parse
5. on receiving *TAKE_PHOTO*, take a photo with camera and upload it to Parse
6. once photo has been uploaded, send client push to requester via Parse
7. on receiving *PHOTO_TAKEN*, query for Photos that current user has requested

OTHER SERVICES

CLOUD CODE: HOSTED SERVER-SIDE CODE

- server-side Javascript programs
- code is uploaded to Parse using CLI tool (simple as "parse deploy")

BAASBLOG.PARSEAPP.COM

Vilperi

Demo blog for BaaS seminar

http://fi.lipsum.com/

October 22nd 2013, 12:20 pm

Lorem Ipsum on yksinkertaisesti testausteksti, jota tulostus- ja ladontateollisuudet käyttävät. Lorem Ipsum on ollut teollisuuden normaali testausteksti jo 1500-luvulta asti, jolloin tuntematon tulostaja otti kaljuunan...

baasblog.parseapp.com/posts/new

username: *baas* password: *baas*

NOT JUST WEB APPS

- Client apps can make function calls to server-side code **parse.com/docs/cloud_code_guide#functions**
- Cloud code can run scheduled jobs
- JS modules for 3rd party services: photochecking, email, credit cards, sms, voice calls

CLOUD CODE LIMITS

- Functions have strict time limits (15 seconds, 3 seconds for beforeSave and afterSave)
- Background jobs are killed in 15 minutes
- Only one job running at a time (pay for whopping two jobs), rest are queued
- This is not a computation IaaS but rather cleaning up the data that is stored

OTHER CLIENT SDK FEATURES

- Social and identity integration with Facebook and Twitter
- Convinience methods for adapting data queries into UI elements
- Geolocation helper functions
- Caching data in client devices (saveEventually, saveInBackground...)
- Analytics, custom metrics (errors, user behavior)

SUMMARY

EVALUATION

- database is not "real-time" and auto-syncing like Firebase
- data can be exported easily, but code is specific to the proprietary API

- Varying delay in push notifications
- ~~Sometimes~~ often the Android client's push service dies silently
  parse.com/questions/ios-push-notifications-very-unreliable
  citrrus.com/blog/what-going-on-with-parse-dot-com
  CloudCode snippet for Google Cloud Messaging
  parse.com/questions/gcm-support

- cannot change/reset API keys
- cannot easily copy/fork/clone an app
- can only view push statistics in the dashboard

WHAT PARSE IS GOOD FOR

- backend for (multi-plaform) mobile apps
- push notifications for marketing and user engagement
- probably not the best option if you only need a database

QUESTIONS?

da fuq did i just watch?

THANK YOU!