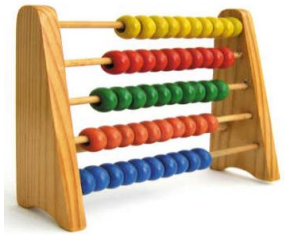
CLOUDFOUNDRY

brief introduction to CF-Abacus

what is it, its architecture, and its future



pic credit: http://www.tecmaths.com

CF-Abacus team

https://github.com/cloudfoundry-incubator/cf-abacus

v0.5.0
Feb. 3rd, 2016

agenda

CLOUDFOUNDRY

- what is CF-Abacus? and what it’s not
- examples of users of CF-Abacus
- architecture
  - overview - μservices
  - service provider APIs
- team and process
- status
- how you can contribute?
- references

what is CF-Abacus?

CLOUDFOUNDRY

what are its main design points?

- pipeline of micro-services (μservices) processing data
- usage metering and aggregation functions are customizable
- usage submitted by service and runtime providers (anytime)
- usage processed by μservices pipeline for metering, rating...

what is it used for? usage reports useful for customer billing

what are some alternatives? none (comprehensive, OSS, for CF)

what CF-Abacus is not

CLOUDFOUNDRY

what problems are we not solving

- billing or charging customers (need external billing service)
- making all service brokers usage common

what you should not use it for? bill directly to customers

where is CF-Abacus used today

IBM Bluemix

- Originally extracted from initial Bluemix public codebase
- Bluemix dedicated (slices of Softlayer)
- Bluemix local (installed on customer premises)

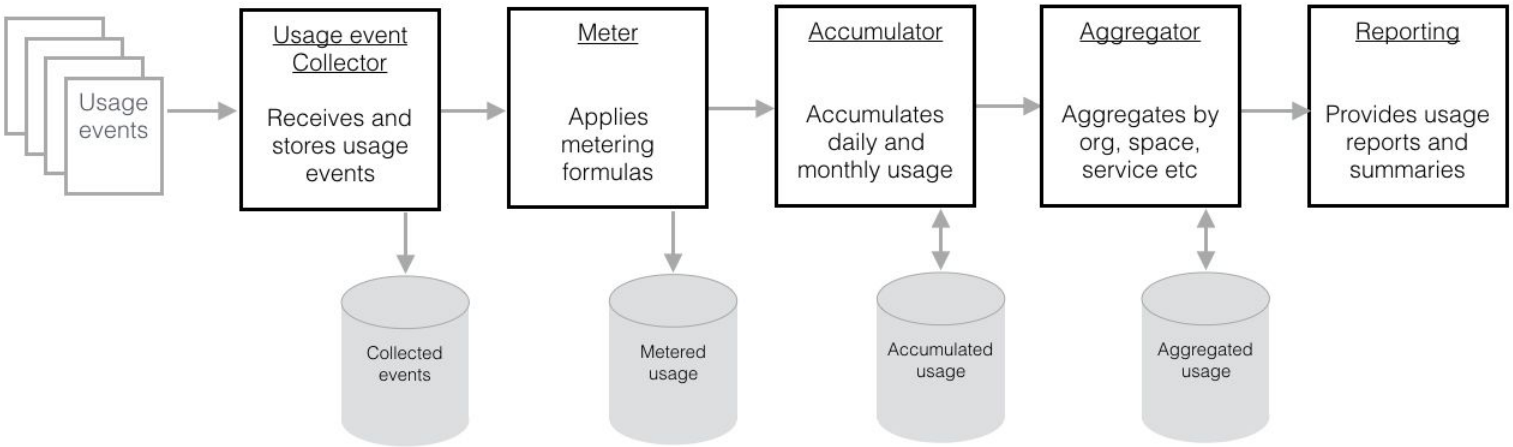
SAP-Hana - integration prototype moving to production in 2016

Others? various “kicking the tires”

architecture overview

CLOUDFOUNDRY

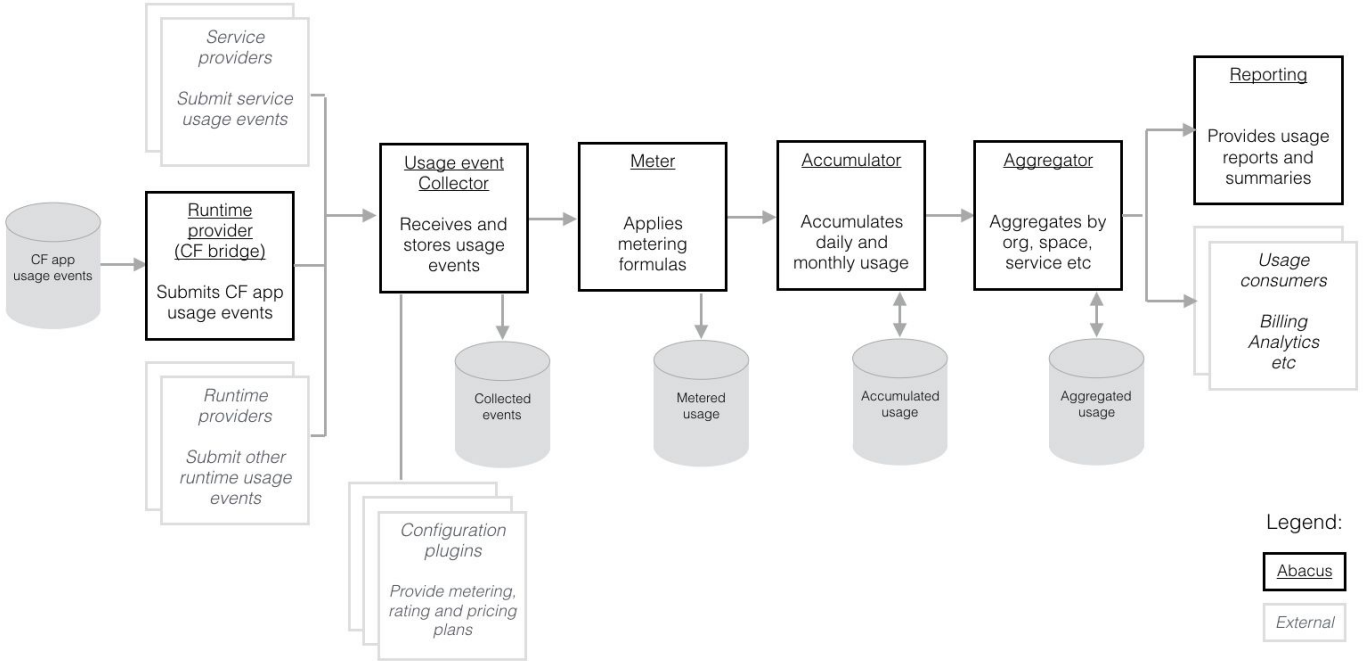
data processing pipeline architecture style



architecture overview (*cont.*)

CLOUDFOUNDRY

cloud platform integration



CLOUDFOUNDRY

demo

```
cd cf-abacus

# Point CF CLI to your local Cloud Foundry deployment and
# create a CF security group for the Abacus apps
bin/cfsetup

# Run cf push on the Abacus apps to deploy them to Cloud Foundry
npm run cfpush

# Check the state of the Abacus apps
cf apps

# You should see something like this
Getting apps in org <your organization> / space <your space>...
OK

name                       requested state   instances   memory   disk   urls
abacus-usage-collector     started           1/1         512M     512M   abacus-usage-c
abacus-usage-meter         started           1/1         512M     512M   abacus-usage-m
abacus-usage-accumulator   started           1/1         512M     512M   abacus-usage-a
abacus-usage-aggregator    started           1/1         512M     512M   abacus-usage-a
abacus-usage-rate          started           1/1         512M     512M   abacus-usage-r
abacus-usage-reporting     started           1/1         512M     512M   abacus-usage-r
abacus-provisioning-stub   started           1/1         512M     512M   abacus-provisi
abacus-account-stub        started           1/1         512M     512M   abacus-account
abacus-dbserver            started           1/1         1G       512M   abacus-dbserve
```

architecture overview (*cont.*)

technology

- JavaScript using Node.js (node >= v5.3 and npm >= 3.3)
- development version is self-contained with PouchDB
- JSON for all data representation and output

deployment style

- deploy CF-Abacus μservices as CF apps into your CF env
- use a full CouchDB backend for production

service resource configuration

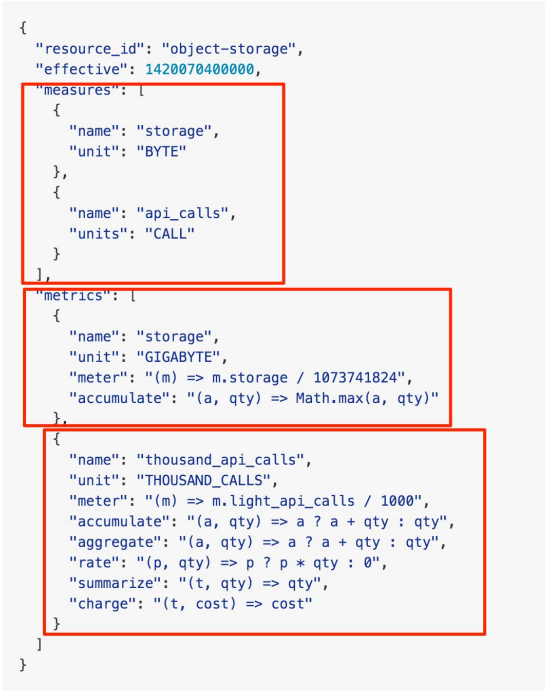
CLOUDFOUNDRY

service providers

1. onboarding to CF env
2. submit usage metering plans
3. create security token
4. submit usage

CF env operator

- enable service usage



```
{
  "resource_id": "object-storage",
  "effective": 1420070400000,
  "measures": [
    {
      "name": "storage",
      "unit": "BYTE"
    },
    {
      "name": "api_calls",
      "units": "CALL"
    }
  ],
  "metrics": [
    {
      "name": "storage",
      "unit": "GIGABYTE",
      "meter": "(m) => m.storage / 1073741824",
      "accumulate": "(a, qty) => Math.max(a, qty)"
    },
    {
      "name": "thousand_api_calls",
      "unit": "THOUSAND_CALLS",
      "meter": "(m) => m.light_api_calls / 1000",
      "accumulate": "(a, qty) => a ? a + qty : qty",
      "aggregate": "(a, qty) => a ? a + qty : qty",
      "rate": "(p, qty) => p ? p * qty : 0",
      "summarize": "(t, qty) => qty",
      "charge": "(t, cost) => cost"
    }
  ]
}
```

`POST|GET|PUT /v1/provisioning/resources/:resource_id/config`

service provider APIs - resource usage

POST /v1/metering/collected/usage

```
{
  "usage": [
    {
      "start": 1396421450000,
      "end": 1396421451000,
      "organization_id": "us-south:54257f98-83f0-4eca-ae04-9ea35277a538",
      "space_id": "d98b5916-3c77-44b9-ac12-04456df23eae",
      "consumer_id": "app:d98b5916-3c77-44b9-ac12-045678edabae",
      "resource_id": "object-storage",
      "plan_id": "basic",
      "resource_instance_id": "d98b5916-3c77-44b9-ac12-04d61c7a4eae",
      "measured_usage": [
        {
          "measure": "storage",
          "quantity": 10
        },
        {
          "measure": "api_calls",
          "quantity": 10
        }
      ]
    }
  ]
}
```

service provider APIs - resource pricing

CLOUDFOUNDRY

`POST /v1/pricing/resources/:resource_id/config/:time`


```
{
  "resource_id": "object-storage",
  "effective": 1420070400000,
  "plans": [
    {
      "plan_id": "basic",
      "metrics": [
        {
          "name": "storage",
          "prices": [
            {
              "country": "USA",
              "price": 1
            },
            {
              "country": "EUR",
              "price": 0.7523
            },
            {
              "country": "CAN",
              "price": 1.06
            }
          ]
        },
        {
          "name": "thousand_light_api_calls",
          "prices": [
            {
              "country": "USA",
              "price": 0.03
            },
            {
              "country": "EUR",
              "price": 0.0226
            },
            {
              "country": "CAN",
              "price": 0.0317
            }
          ]
        },
        {
          "name": "heavy_api_calls",
          "prices": [
            {
              "country": "USA",
              "price": 0.15
            },
            {
              "country": "EUR",
              "price": 0.1129
            },
            {
              "country": "CAN",
              "price": 0.1585
            }
          ]
```

service provider APIs - usage reporting

CLOUDFOUNDRY

`GET /v1/metering/organizations/:organization_id/aggregated/usage/:time`


```
{
  "start": 1435622400000,
  "end": 1435708799999,
  "processed": 1435708800000,
  "organization_id": "us-south:a3d7fe4d-3cb1-4cc3-a831-ffe98e20cf27",
  "charge": 46.09,
  "id": "k-a3d7fe4d-3cb1-4cc3-a831-ffe98e20cf27-t-0001435622400000",
  "spaces": [
    {
      "space_id": "aaeae239-f3f8-483c-9dd0-de5d41c38b6a",
      "charge": 46.09,
      "consumers": [
        {
          "consumer_id": "app:d98b5916-3c77-44b9-ac12-045678edabae",
          "charge": 46.09,
          "resources": [
            {
              "resource_id": "object-storage",
              "charge": 46.09,
              "aggregated_usage": [
                {
                  "metric": "storage",
                  "quantity": 1,
                  "summary": 1,
                  "charge": 1
                },
                {
                  "metric": "thousand_light_api_calls",
                  "quantity": 3,
                  "summary": 3,
                  "charge": 0.09
                },
                {
                  "metric": "heavy_api_calls",
                  "quantity": 300,
                  "summary": 300,
                  "charge": 45
                }
```

```
              ],
              "plans": [
                {
                  "plan_id": "basic",
                  "charge": 46.09,
                  "aggregated_usage": [
                    {
                      "metric": "storage",
                      "quantity": 1,
                      "summary": 1,
                      "cost": 1,
                      "charge": 1
                    },
                    {
                      "metric": "thousand_light_api_calls",
                      "quantity": 3,
                      "summary": 3,
                      "cost": 0.09,
                      "charge": 0.09
                    },
                    {
                      "metric": "heavy_api_calls",
                      "quantity": 300,
                      "summary": 300,
                      "cost": 45,
                      "charge": 45
                    }
                  ]
                }
              ]
            }
          ]
        }
      ],
      "resources": [
        {
          "resource_id": "object-storage",
          "charge": 46.09,
          "aggregated_usage": [
```

project process and current team

incubation project - created to explore and test (optional to core)

distributed commit process

IBM engineers (@jsdelfino, @betafood, @kruely)

SAP engineers (@hsiliev & @georgethebeatle)

Independent (@sasrin)

Own tracker for all work items and Github issues

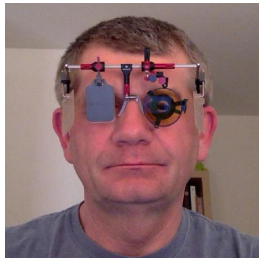
team

CLOUDFOUNDRY

Jean-Sebastien Delfino
IBM
Committer

Hristo Iliev
SAP
Committer

Saravanakumar Srinivasan 'Assk'
Committer



Piotr Przybylski
IBM - Bluemix

Benjamin Cheng
IBM
Committer

Georgi Sabev
SAP
Committer

Kevin Yudhiswara
IBM
Committer

Rajkiran Balasubramanian
IBM - Bluemix

status and future

CLOUDFOUNDRY

recent updates

- flexible metering and rating plan configuration API
- dynamic usage reporting using GraphQL
- usage accumulation in time windows

near-term

- Mongo-DB support
- async queuing for multi-datacenter deployments
- usage processing failure management

status (*cont.*)

CLOUDFOUNDRY

near-term (*cont.*)

- concourse build pipeline

longer-term

- built-in default UIs (on-boarding and usage reporting)
- CF-Abacus-as-a-Service (via service broker)
- consuming and providing usage notifications
- dynamic rolling and slack time windows

how can you contribute

CLOUDFOUNDRY

integrator

- “kick the tires” - try deploying CF-Abacus into your env
- create UI for onboarding and usage report presentation
- integrate with your CF service brokers that report usage

service developer

- support submitting usage to CF-Abacus
- implement the usage submission API

how can you contribute (*cont.*)

developer

- “kick the tires” - try deploying CF-Abacus into your env
- create any new issues you find on Github
- write code, tests, and submit pull requests

tester and documentation

- test with other brokers
- documentation needs improvements

references

CLOUDFOUNDRY

https://github.com/cloudfoundry-incubator/cf-abacus

CF-Abacus Tracker project

IRC channel, Slack and Gitter, and CF mailing list

project README and FAQs

APIs doc for integration overview

thank you

CLOUDFOUNDRY

credit: http://knowyourmeme.com/photos/522333-language