Using CGRateS as online Diameter/Radius AAA Server

Dan Christian Bogos
dan.bogos@itsyscom.com

Fosdem 2018

CGRATES
carrier grade realtime charging

Our Background

Located in Bavaria/Germany, over 10 years of experience with architecting server side solutions in VoIP environment

Platform implementations covering both wholesale and retail business categories

Responsibly understanding real-time processing constraints and the seriousness of live system outages

Real-time Enterprise Billing Suite

Pluggable into existing infrastructure
Accommodate new components into ISP/ITSP network (eg: new Comm switch, SMS Service)
Non-intrusive into existing setups

Open Source software

Full sources available on Github repository
No add-ons in private repositories
Consideration for community contributions

Performance Oriented

Built-in advanced cache system (transactional, LRU + TTL records)
Asynchronous processing with micro-threads

Test driven development

Over 4100 tests as part of the build system

CGRateS
carrier grade realtime charging
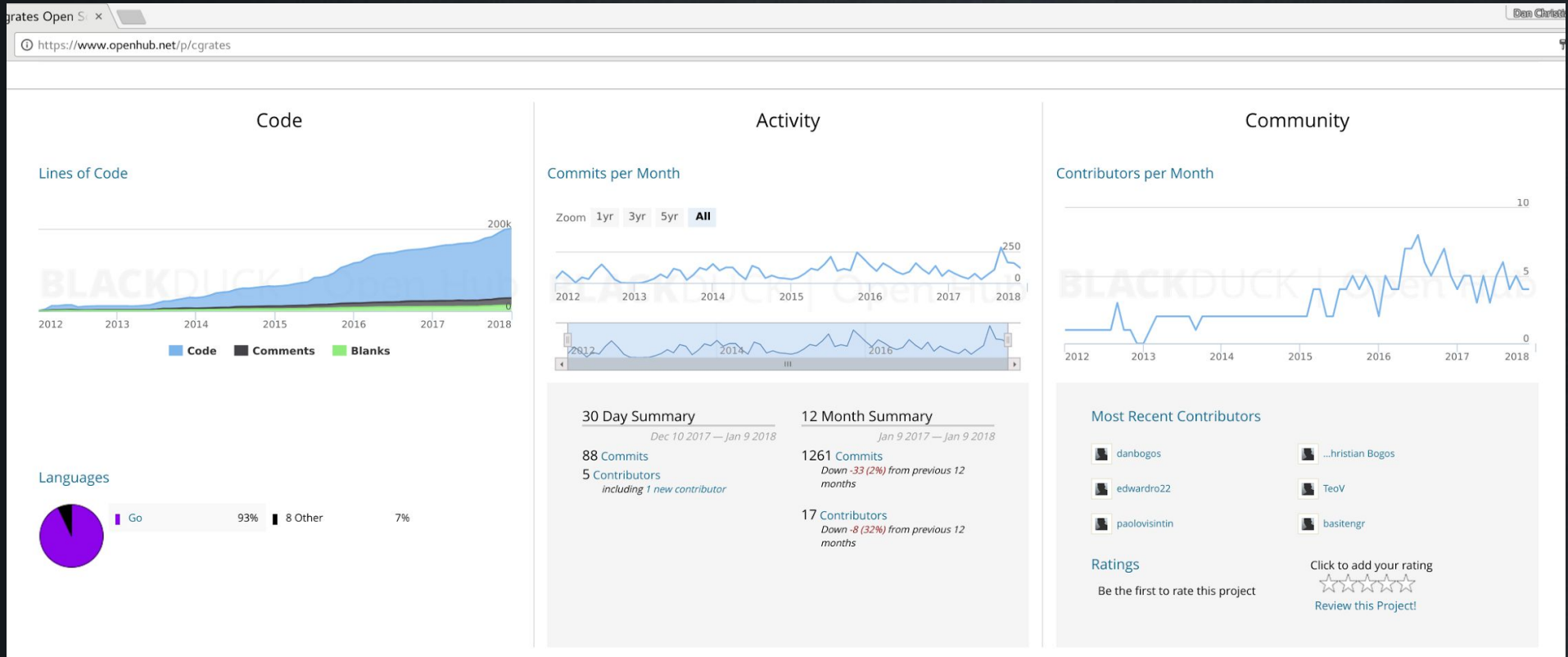
Modular architecture

Cloud-ready, micro-services with rich set of RPC APIs
Easy to enhance by rewriting specific components

Feature-rich

Online/Offline Charging System (OCS)
Multi-tenancy from day one
Rating Engine with Derived Charging and A-Number rating
Account Balances Management with Bundles
Session or Event Charging with balance reservation and refunds
Plugins/agents to major opensource VoIP systems
CDR logging with support for Interim Records and online exports
Fraud detection with automatic mitigation
LCR with QoS/Bundles
Event Statistics with pattern monitoring
Diameter/Radius Server with process templates (standard agnostic)
Resource allocation controller
Built-in High-Availability support
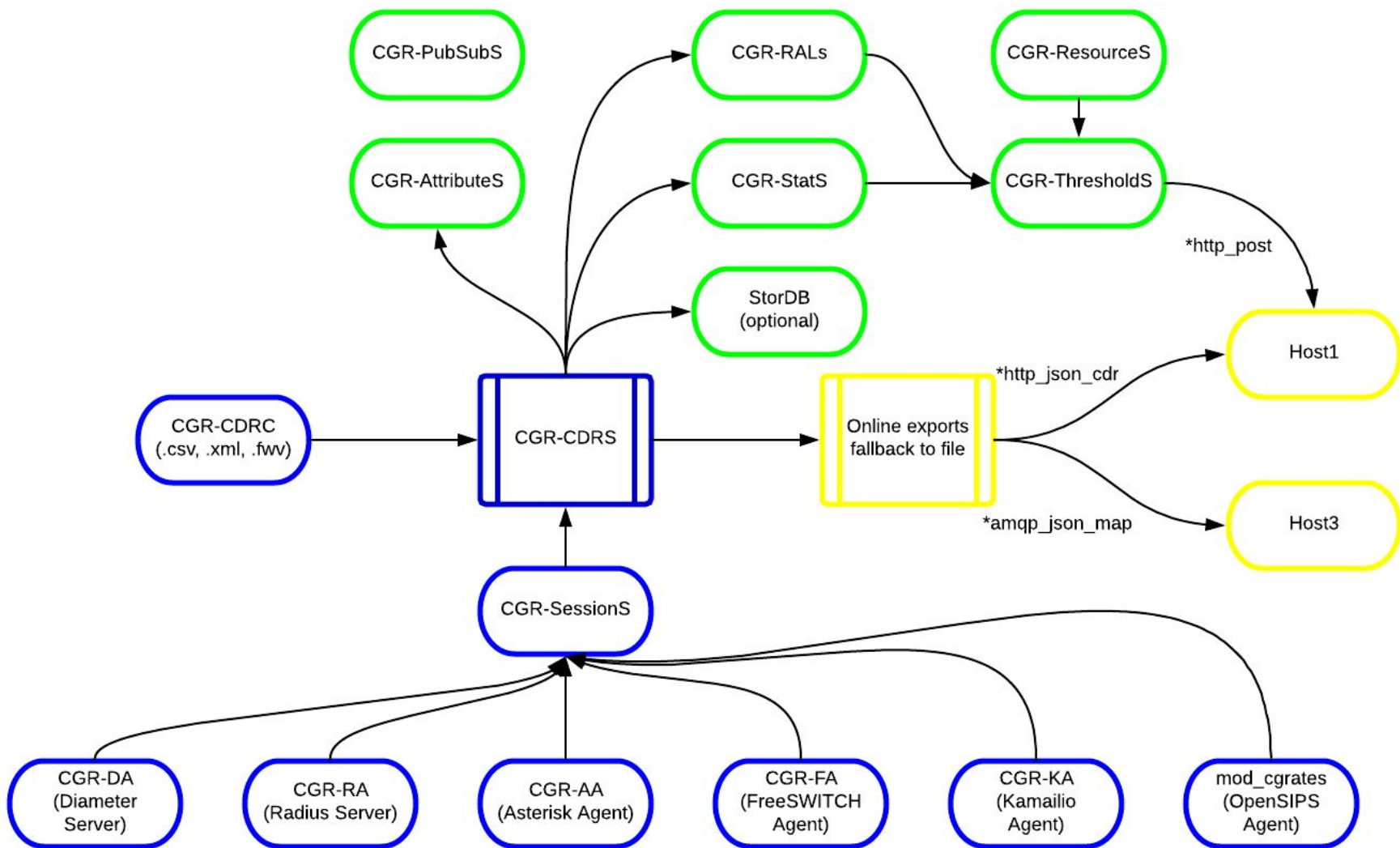Agile in developing new features

Actively maintained

*stats provided by openhub.net

CGRateS Subsystems interoperability

Diameter/Radius Agents

Generic protocol converter
Protocol agnostic
JSON processing templates

Multiple matching processors
Fallback logic between processors
Debug mode via dry_run
Processor variable overloading

RADIUS per client secrets/dictionaries
Attaching dictionaries (or secrets) per remote IP address or *default

MIT RADIUS client for GoLang
https://github.com/cgrates/radigo

CGRATES
carrier grade realtime charging

```json
"diameter_agent": {
  "request_processors": [
    {
      "id": "data_init",
      "dry_run": false,
      "request_filter": "Service-Context-Id(^gprs);CC-Request-Type(1)",
      "ccr_fields":[
        {"tag": "TOR", "field_id": "ToR", "type": "*composed",
          "value": "^*data", "mandatory": true},
        {"tag": "OriginID", "field_id": "OriginID", "type": "*composed",
          "value": "Session-Id", "mandatory": true},
        {"tag": "RequestType", "field_id": "RequestType", "type": "*composed",
          "value": "^*prepaid", "mandatory": true},
        {"tag": "Tenant", "field_id": "Tenant", "type": "*composed",
          "value": "^cgrates.org", "mandatory": true},
        {"tag": "Account", "field_id": "Account", "type": "*grouped",
          "value": "Subscription-Id>Subscription-Id-Data", "mandatory": true,
          "field_filter":"Subscription-Id>Subscription-Id-Type(0)"},
        {"tag": "Usage", "field_id": "Usage", "type": "*constant", "value": "2048"},
      ],
      "cca_fields": [
        {"tag": "ResultCode", "field_filter": "*cgrReply>MaxUsage(0)",
          "field_id": "Result-Code", "type": "*constant", "value": "4010"},
        {"tag": "ResultCode", "field_id": "Result-Code",
          "type": "*constant", "value": "^2001"},
        {"tag": "OfficeGroup", "field_id": "SampleLevel1>OfficeGroup",
          "type": "*composed", "value": "*cgrReply>Attributes>OfficeGroup"},
      ],
```

Sample Diameter template

```json
{
    "method": "SessionSv1.AuthorizeEvent",
    "params": [{
        "GetAttributes": true,
        "AuthorizeResources": true,
        "GetMaxUsage": true,
        "GetSuppliers": true,
        "Tenant": "cgrates.org",
        "ID": "TestSSv1ItAuth",
        "Context": null,
        "Time": null,
        "Event": {
            "ToR": "*data",
            "OriginID": "SampleAuth1",
            "RequestType": "*prepaid",
            "Tenant": "cgrates.org",
            "Account": "1001",
            "Destination": "1002",
            "Usage": "2048"
        },
        "Limit": null,
        "Offset": null,
        "SearchTerm": ""
    }],
    "id": 1
}
```

Sample JSON-RPC request

```json
{
    "id": 1,
    "result": {
        "Attributes": {
            "MatchedProfile": "ATTR_ACNT_1001",
            "AlteredFields": ["OfficeGroup"],
            "CGREvent": {
                "Tenant": "cgrates.org",
                "ID": "SampleAuth1",
                "Context": "*sessions",
                "Time": null,
                "Event": {
                    "ToR": "*data",
                    "OriginID": "SampleAuth1",
                    "RequestType": "*prepaid",
                    "Tenant": "cgrates.org",
                    "Account": "1001",
                    "Destination": "1002",
                    "Usage": "2048"
                    "OfficeGroup": "Marketing",                    }
                }
            },
            "ResourceAllocation": "RES_ACNT_1001",

...
```

Sample JSON-RPC reply (1)

```
...
        "MaxUsage": 300000000000,
        "Suppliers": {
            "ProfileID": "SPL_ACNT_1001",
            "Sorting": "*least_cost",
            "SortedSuppliers": [{
                "SupplierID": "supplier3",
                "SupplierParameters": "",
                "SortingData": {
                    "Cost": 0.02,
                    "RatingPlanID": "RP_SPECIAL_1002",
                    "Weight": 15
                }
            }, {
                "SupplierID": "supplier2",
                "SupplierParameters": "",
                "SortingData": {
                    "Cost": 0.46666,
                    "RatingPlanID": "RP_RETAIL1",
                    "Weight": 20
                }
            }
        },
        "error": null
}
```

Sample JSON-RPC reply (2)

CRATES

carrier grade realtime charging

Questions?

Website
http://www.cgrates.org

Documentation
http://cgrates.readthedocs.org

Code + issues tracker
https://github.com/cgrates/cgrates

Support
Google group: **CGRateS**
IRC Freenode: **#cgrates**

CGRATES
carrier grade realtime charging