A Highly Available Generic Billing Architecture for Heterogeneous Mobile Cloud Services

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Talk Outline

1. Introduction to Mobile Cloud Networking project
2. Accounting Process
3. Platform Architectures
4. Current Implementation Status
5. Future Roadmap & Conclusion
Mobile Cloud Networking

The motivation

Cloud computing principles beyond datacenters …

… towards the mobile end users.

- On-demand and self service
- Elastic
- Multi-tenant
- Pay-as-you-go

Offered as a single end-to-end service

Mobile Connectivity
Decentralized Computing
Smart Storage
Mobile Cloud Networking

http://mobile-cloud-networking.eu/

Micro-Data Centre Deployments
- Local deployments limited resources e.g. suburban, rural areas.
- Workloads can call on additional resource from a macro-data centre or a closely micro-data centre.

Macro-Data Centre Deployments
- Centralised deployment with access to cheap resources (power) e.g. metropolitan areas.
- Workloads can be migrated near to user on macro-data centre.
Mobile Cloud Networking
High Level Architecture
A few use-case scenarios
Motivating the need for a generic RCBaaS …

Pure IaaS operator scenario

Cloud + Telco integrated scenario

MCN ecosystem scenario

Rating-charging-billing solution needed from the cloud provider’s perspective …

Rating-charging-billing solution needed in a composite service offering

Rating-charging-billing solution needed in a multi-stake holder scenario …
How things are done typically …

- You have a service …
- You design a billing mechanism for this service
- The platform is highly specialized for your need
- In future, you expand your service offerings
- The old billing platform is now no longer relevant
- You redesign your billing strategy
- You make new tools and integrate with the service portfolios
- And the process continues …
But the unifying principle is …

You bill customers based on resources and services they have consumed.

- You measure what was consumed
- You fix the price strategy
- You bill your customers based on the usage data and the pricing strategies!

So why not do the generic rating-charging-billing platform (correctly) where everything is parameterized and configurable?
Accounting process
Our basic guiding force ...
High level architecture

- Closely aligned with accounting process
- Highly modular.
- Distributed design very conducive for HA solutions
Individual Components …

Mediation Module Architecture

Charging Module Architecture
Individual Components ...

Billing Module Architecture

UI Architecture
First MCN prototype

Policy DB contains
- Meters / metrics list
- Rating / pricing rules
- Discount conditions / SLA violation penalties
- RCB Logic execution parameters
Provisioning on demand
Rating charging billing as a service

Aligned to the MCN orchestration design recommendations.
State of the development
Roadmap, next steps (MCN perspective)

What is in the code today –

✓ OpenStack usage data extraction through telemetry-client
✓ Ability to receive resource usage data from other services (legacy services)
✓ Storage of CDRs into a CDR store
✓ Forwarding of CDRs to the billing software (jBilling)

What is planned in the near future –

✓ Common interface with the MCN monitoring service
  ✓ All metrics and usage data to be extracted from this monitoring service
✓ Service customization and management endpoint (REST interface)
✓ RCB policy engine implementation (decision trees, rule based inference …)
State of the development...
Roadmap from CYCLOPS development perspective

Release 1.0
- July 30 2014
  - Full Support for Openstack Ceilometer
  - Ability to use basic meters
  - Ability to specify generic pricing function (static) for users individually
  - Generation of simple bills

Release 1.1
- Oct. 30 2014
  - Support for mediation, external services
  - Support for all types of meters
  - System components health measurement

Release 1.5
- Feb. 30 2015
  - Dynamic, rule based pricing
  - Support for credits, discounts
  - Initial support for automated failure recovery

Release 2.0
- June 30 2015
  - Support for rating-charging-billing setup as-a-service
  - Basic support for other cloud platforms such as cloudstack
  - Improved failure detection and recovery algorithm
  - Data security, support for encrypted records
  - Support for non-repudiation from external reporters
Further information …
Code repositories, project deliverable reports…

- Code Repositories
  - [https://git.mobile-cloud-networking.eu/wp5/rcbaas](https://git.mobile-cloud-networking.eu/wp5/rcbaas) (restricted at the moment)
  - [https://github.com/icclab/cyclops-web](https://github.com/icclab/cyclops-web) (ICCLab’s OpenStack RCB engine front-end, open source)
  - [https://github.com/icclab/cyclops-web](https://github.com/icclab/cyclops-web) (ICCLab’s OpenStack RCB engine, open source)

- Documents, Deliverables
  - [http://mobile-cloud-networking.eu/site/](http://mobile-cloud-networking.eu/site/) (Project site)

- Demo Sites / Videos
  - Cyclops demo: [https://www.youtube.com/watch?v=ZIwwVxqCio0](https://www.youtube.com/watch?v=ZIwwVxqCio0)
  - Online demo site: [http://cyclops.cloudcomplab.ch/](http://cyclops.cloudcomplab.ch/)

More about InIT Cloud Computing Lab @ [www.cloudcomp.ch](http://www.cloudcomp.ch)
Twitter: [@ICC_Lab](https://twitter.com/ICC_Lab)
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