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# Cyclops

The ultimate billing framework for cloud services

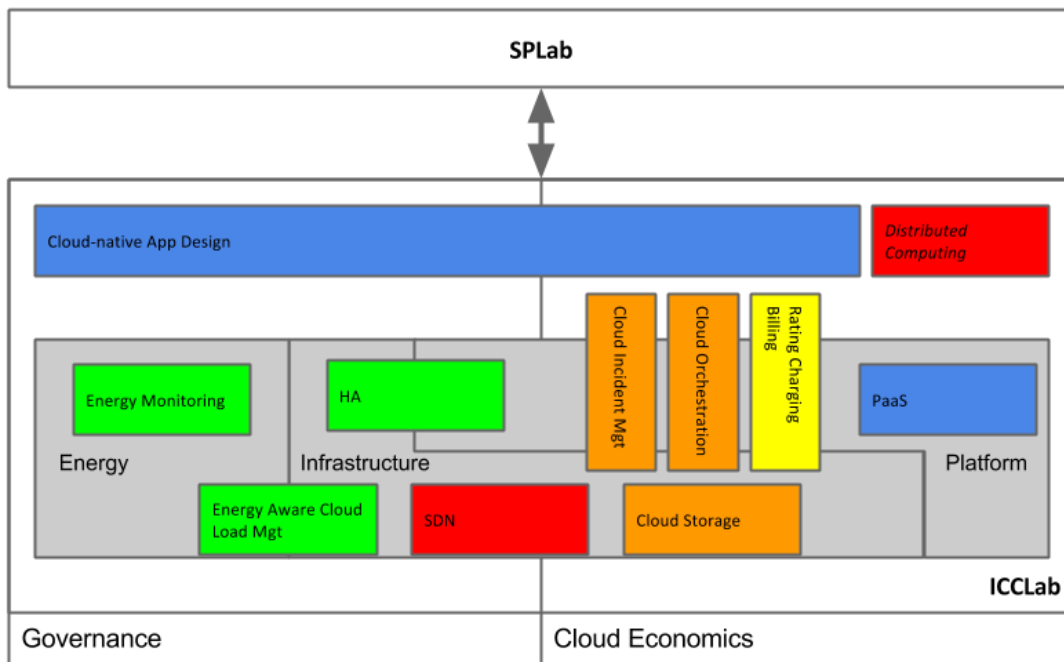
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ICCLab, Winterthur  
Switzerland

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# ICCLab - Who we are ?

## InIT Cloud Computing Lab (ICCLab)



# Cloud Services Today

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- Volume based service
  - Undifferentiated services like compute, storage & network
  - Prices & SLAs are similar to each other
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# Value addition propositions

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- Common basic service, differentiated VAS
  - Ability to respond quickly to changing business requirements
  - Similar approach for Rating, Charging & Billing (RCB) towards resellers, distributors, customer
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# What is RCB ?

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- R = Rating
  - C = Charging
  - B = Billing
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# RCB: How things are done today?

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- Semi automated process, rigid in nature
  - Changes in portfolio requires changes in RCB component
  - Many still do this process manually
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# RCB: How things should be done!

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RCB should be

- Generic
  - Support changes to service portfolio
  - Modular and not monolithic
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# Cyclops: USP

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A billing framework for clouds designed from grounds up

- Architecture - Micro Services
  - External applications - Plug n Play
  - Dynamic rates for cloud resources
  - Orchestration ready (RCBaaS)
  - Native support for OpenStack
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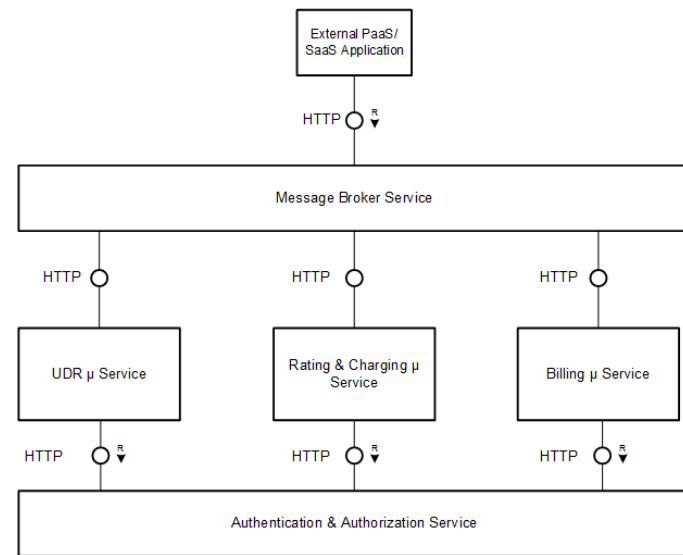
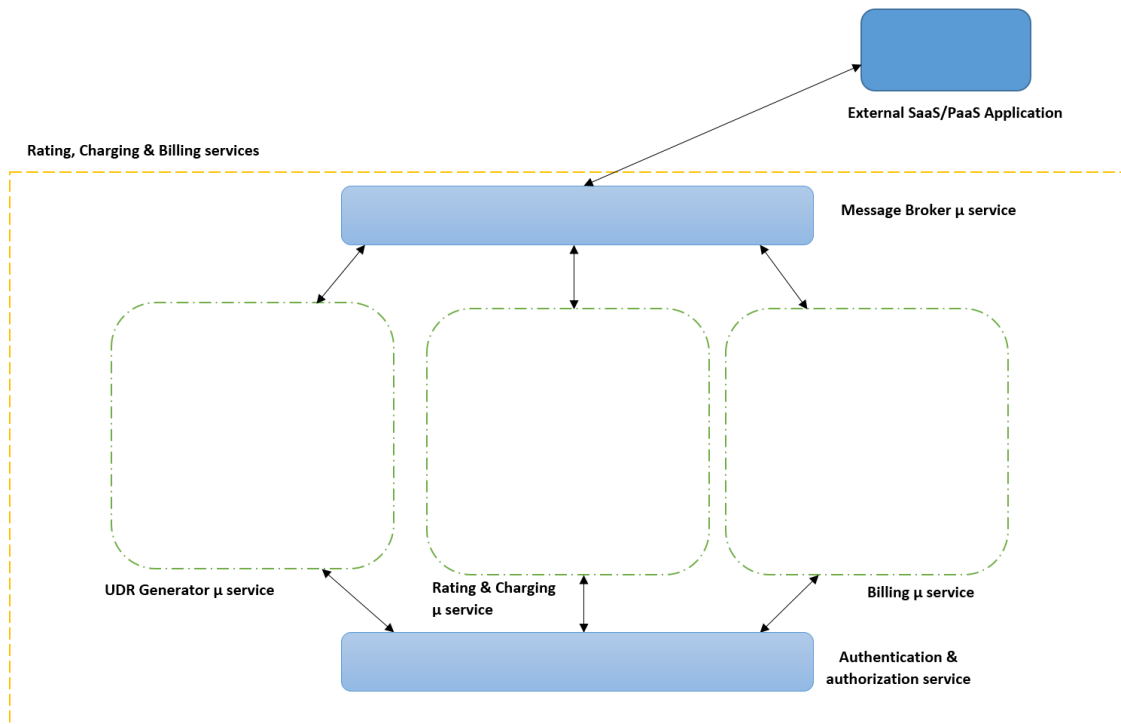


# Cyclops: RCBaaS

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- One step installation & configuration
  - Powered by OpenStack Heat
  - Standalone installation scripts for micro services
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# Cyclops: Architecture

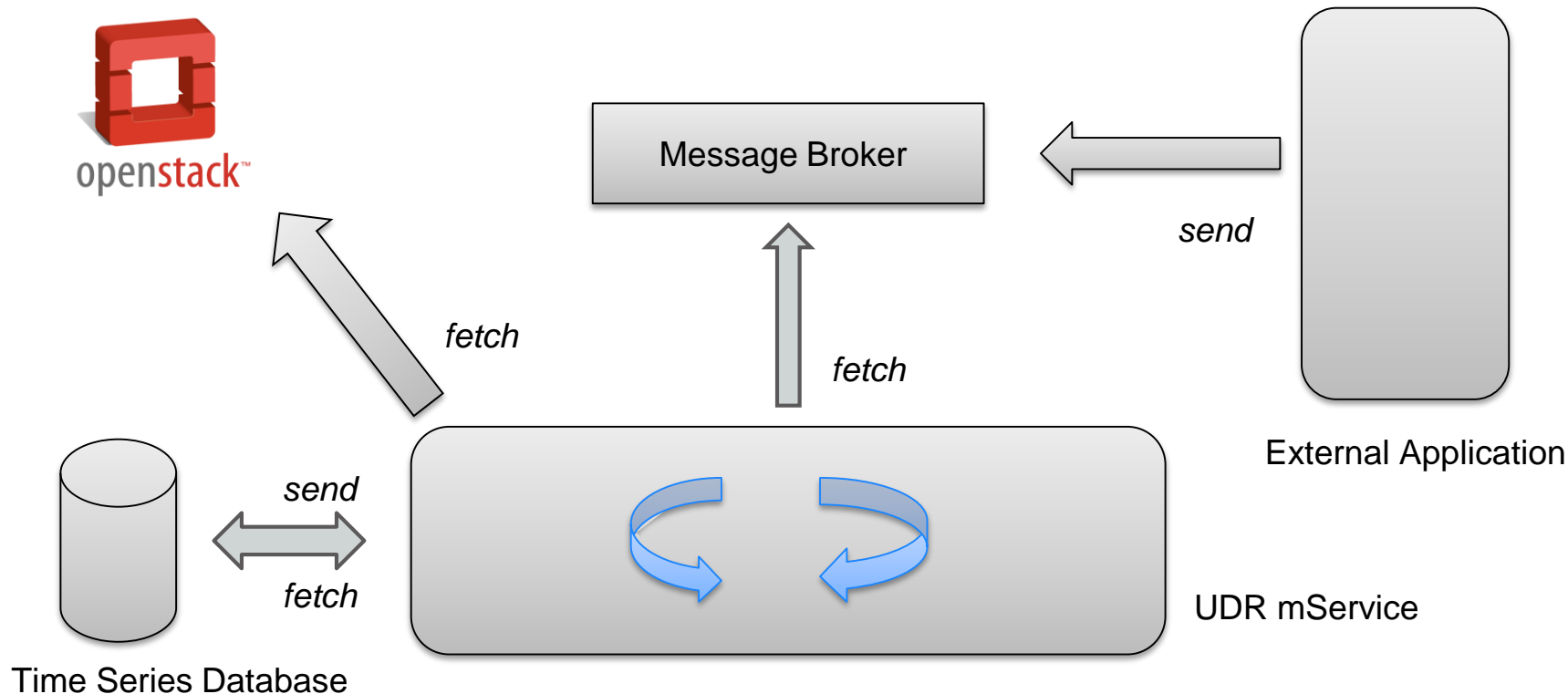


# Cyclops: UDR mService

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- Creation of Usage Data Records
  - Interfaces with IaaS (OpenStack, CloudStack, etc)
  - Gateway for external applications (PaaS/SaaS)
  - API for data visualization & analytics, usage reports
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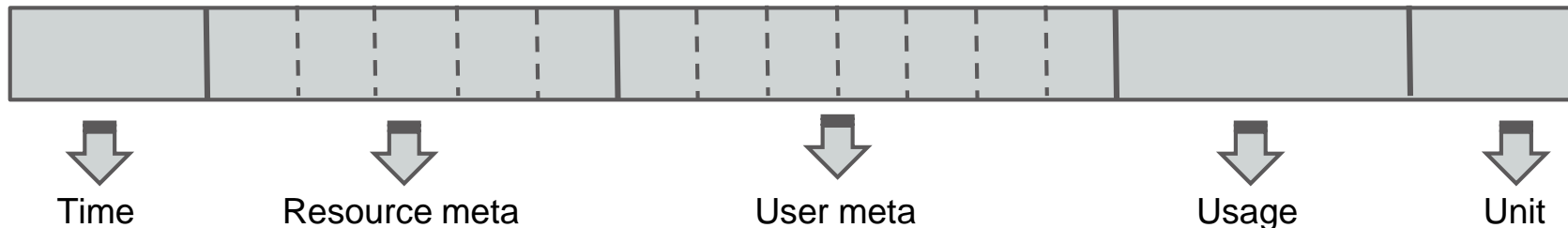
# Cyclops: UDR mService



# Cyclops: UDR mService

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## Usage Data Record

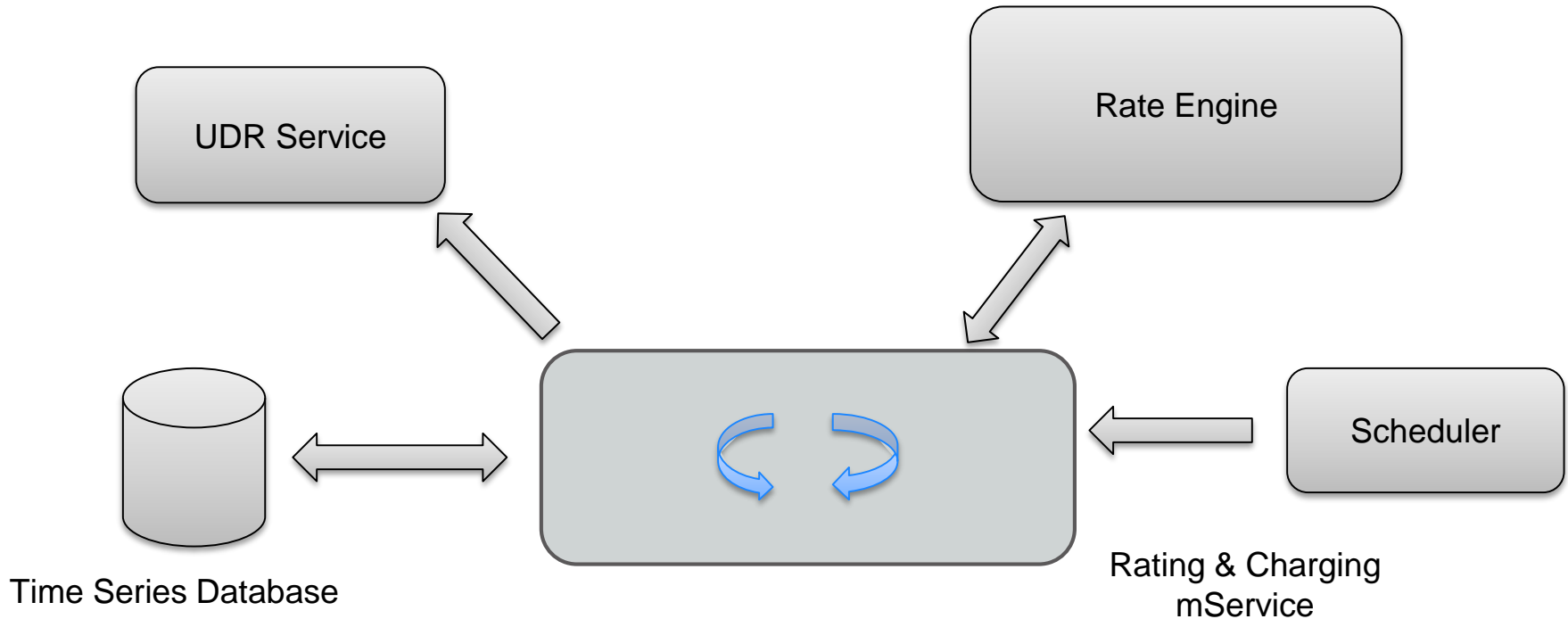


# Cyclops: RC mService

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- Generation of Charge Data Records (CDR)
  - Rating policy configuration (Dynamic/Static rating policy)
  - Interfaces with the rate engine
  - API for User's Charge & resource's rate report
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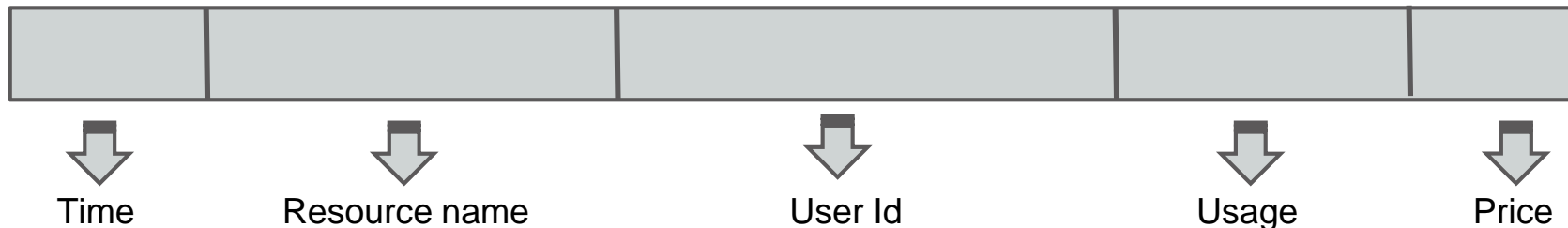
# Cyclops: RC mService



# Cyclops: RC mService

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## Charge Data Records



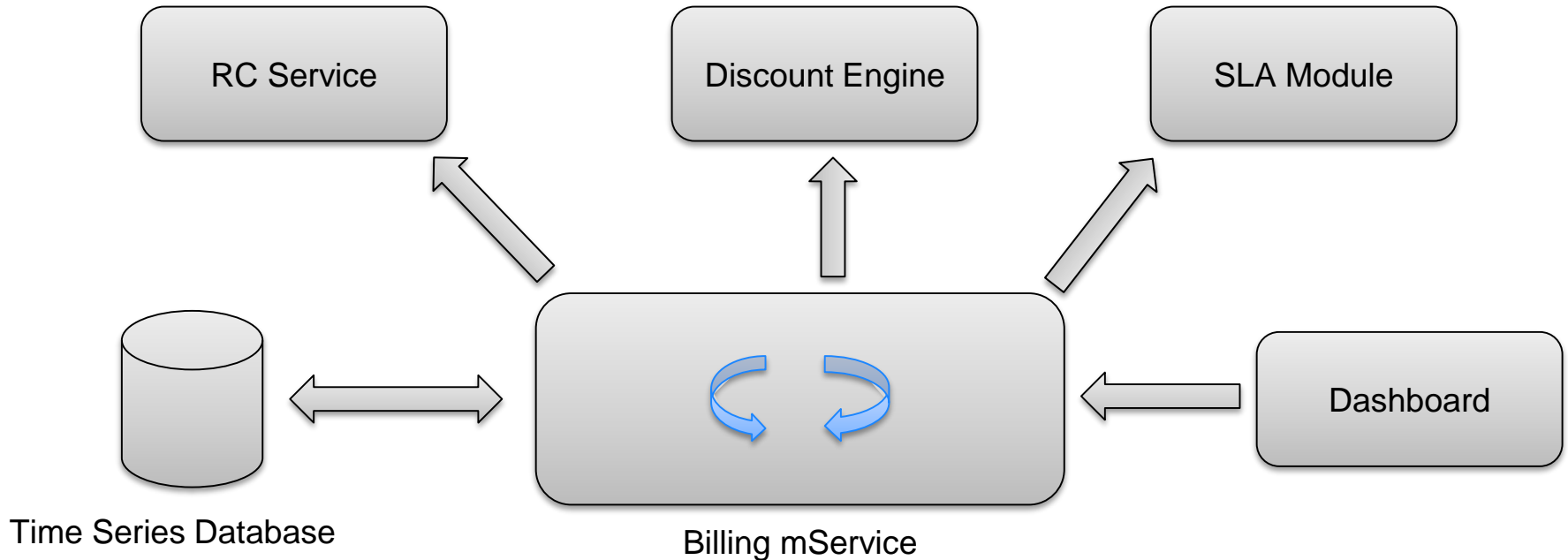


# Cyclops: Billing mService

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- Conversion of charge records into periodic bills
  - Factors in discounts, promotions, etc..
  - Integration with external SLA module
    - Support for Penalties
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# Cyclops: Billing mService



# Cyclops: Dashboard

- Unified web based interface
- Differentiated views for administrators & end-users
- Uses APIs from RCB micro services
- Integrated with OpenAM OpenID Connect

ICCLab - Monthly Resource Usage Summary

Billing Period: 01 December 2014 to 31 December 2014  
Start Date: 23/01/2015

Customer Name: Pivotal Bank  
Organization: MIT Service Engineering  
Billing Address: One Kendall Sq., Cambridge, MA 02139

Itemized Consumption Summary

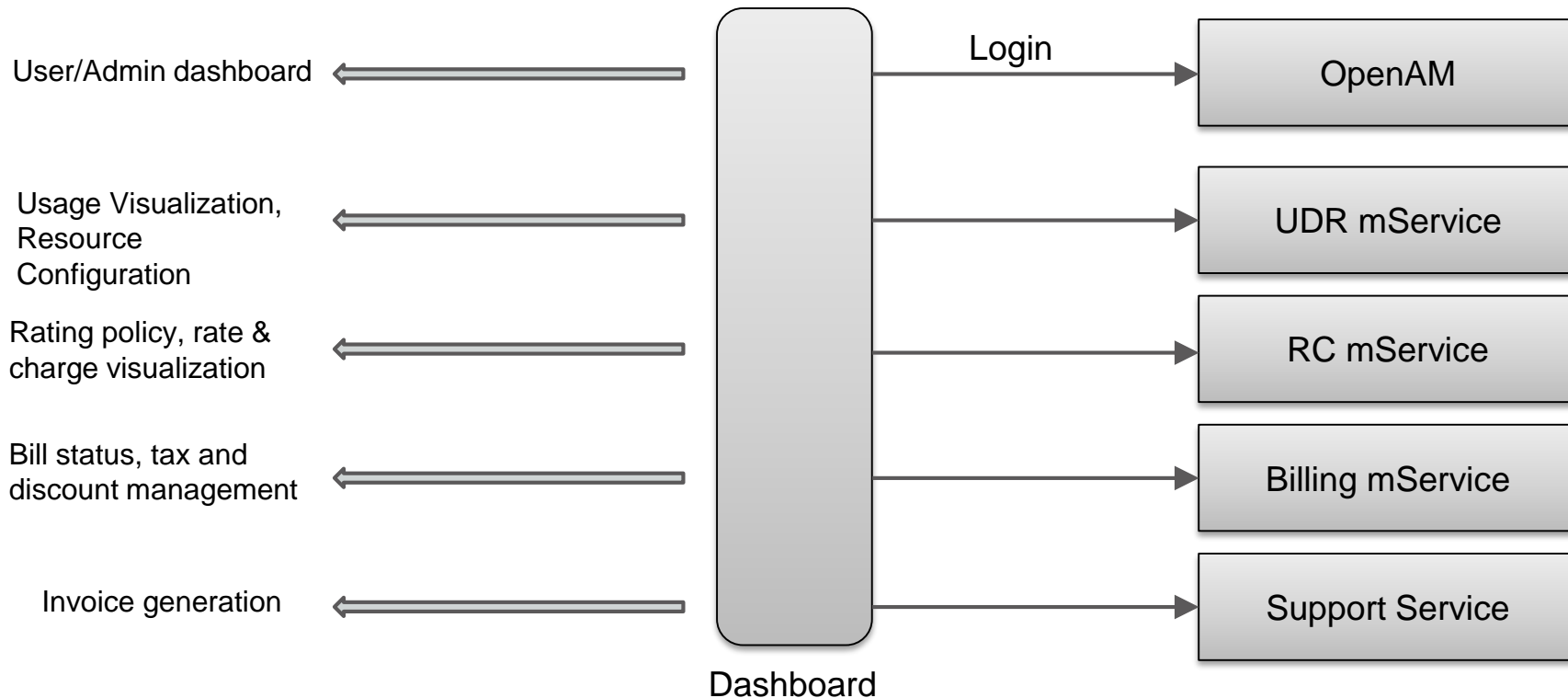
Resource Name	Usage Value	Unit	Resource Rate	Usage Cost
network.bytes.in	247932292	bytes	0.0000	0.0000
disk.write.bytes	27242822	bytes	0.00	0.00
network.bytes.out	2281862	bytes	0.00	0.00
disk.read.bytes	82722822	bytes	0.00	0.00
cpu	2429162287	sec	1.0000	242.89

Total Amount Due: 259.00 CHF

network.bytes.in discount:	0.00 %
disk.write.bytes discount:	0.00 %
network.bytes.out discount:	0.00 %
disk.read.bytes discount:	0.00 %
cpu discount:	0.00 %
overall discount:	0.00 %
<b>Grand Amount Due:</b>	<b>0.00 CHF</b>

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# Cyclops: Dashboard



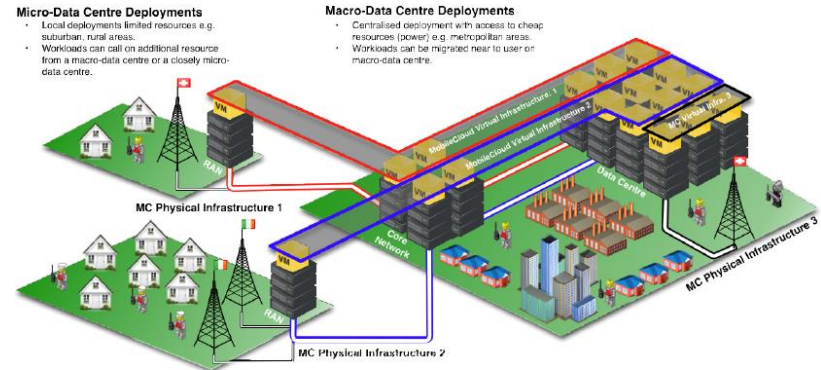
# Cyclops: USE CASES (MCN)

Consolidated billing for applications served out of cloud!

- Billing based on application specific metrics + usual cloud meters.

DSSaaS: Digital Signage System  
Billing based on: #Number of Active Screens.

- Content served and hosted out of OpenStack clouds
- Cyclops UDR allows external usage data to be sent in, rated and billed upon.



# Cyclops: USE CASES (TNova)

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- Multiple stakeholder support
    - Revenue sharing between SP & NF-Provider
  - Support for pay-as-you-go and subscription billing models
    - Subscription windows (begin/end) handled as events
    - UDR translates those events into time-based usage reports.
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# Cyclops: USE CASES (Product Catalog)

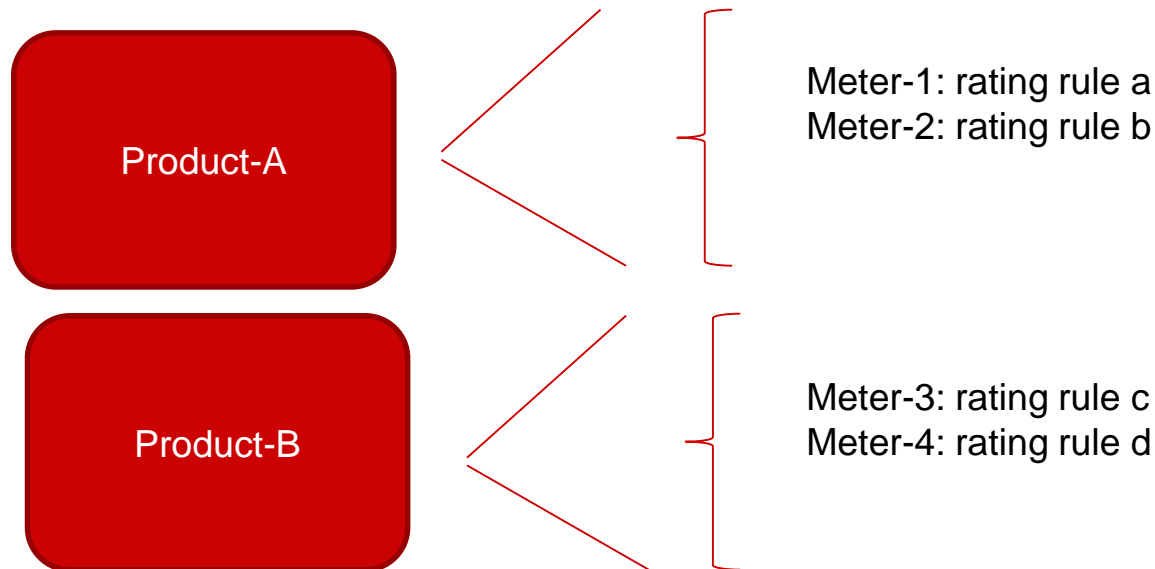
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Base meters -> product bundles

- Rules attached to the bundles are stored in the rule engine
  - Using bundles/products to offer different billing models such as Pay as you go (Usage based, Time based), Subscription
  - Aimed at B2C scenarios
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# Cyclops: USE CASES (Product Catalog)

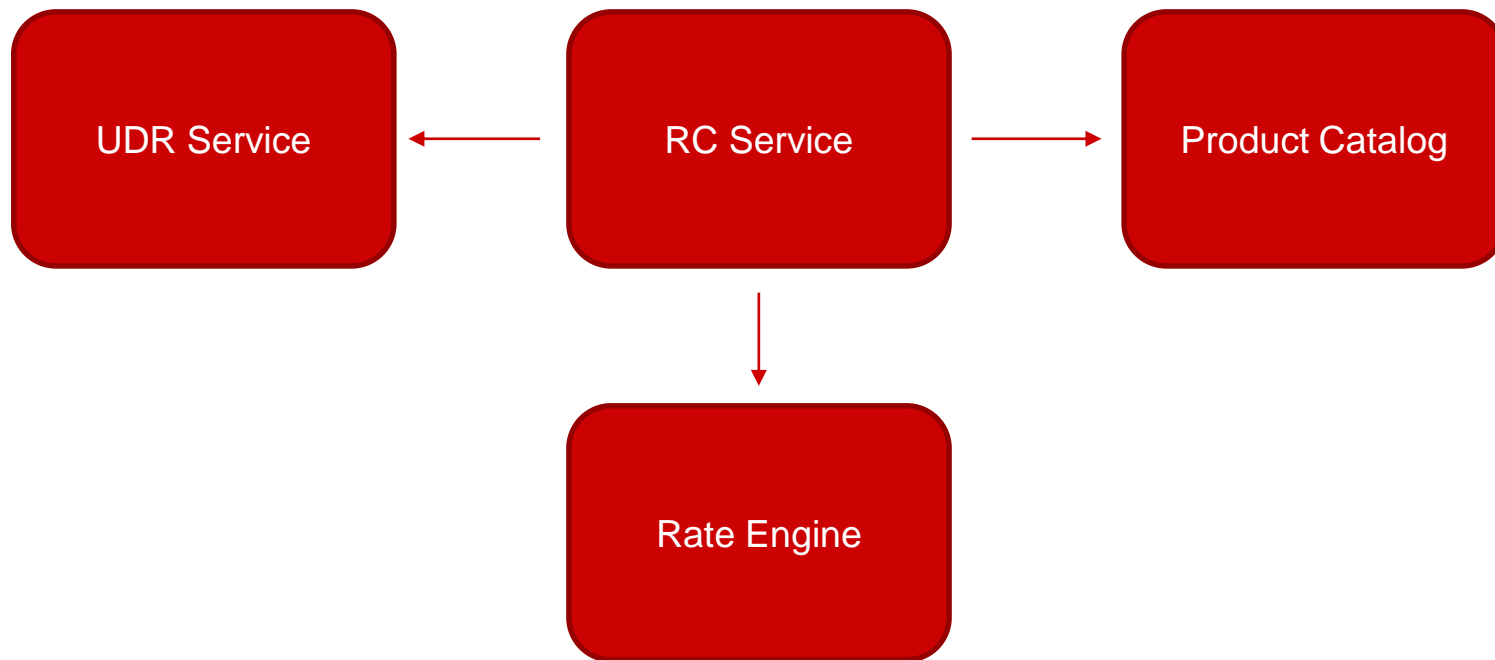
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# Cyclops: USE CASES (Product Catalog)

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# Cyclops: Short Demo

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Zürcher Hochschule  
für Angewandte Wissenschaften



# Upcoming Features

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- Security - Full integration with OpenAM
  - Intelligent caching
  - Auditability: WORM
  - Resource consumption forecasting
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# General Availability

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## CYCLOPS v1.0 Release – June 14<sup>th</sup> 2015

Apache Licence v2

<http://icclab.github.io/cyclops>

<https://github.com/icclab/cyclops-udr>

<https://github.com/icclab/cyclops-billing>

<https://github.com/icclab/cyclops-rc>

<https://github.com/icclab/cyclops-support>



# Questions?

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CYCLOPS is partly supported by



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# Backup Slides

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# Cyclops: USP

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1. Subscription based billing
  2. Resource Usage based billing
  3. Visualization: Usage metrics, charge and resource rate
  4. Invoice generation
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