ICCLAB

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Mobile Cloud Networking:

Hurtle, Cyclops, Gatekeeper

CYCLOPS

GateKeeper

Prof-Dr. Thomas Michael Bohnert (TMB)

Challenges

- Deliver your software as a service?
- How to compose existing services?
- How deliver and maintain reliability?
- How to monetise your software?

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How to offer your software as a service?”

- Automate the life-cycle management of your service, from deployment to disposal
- Recursive service composition
- Designed for Cloud-Native Applications
- Designed for Cross-Domain Orchestration

Implementation

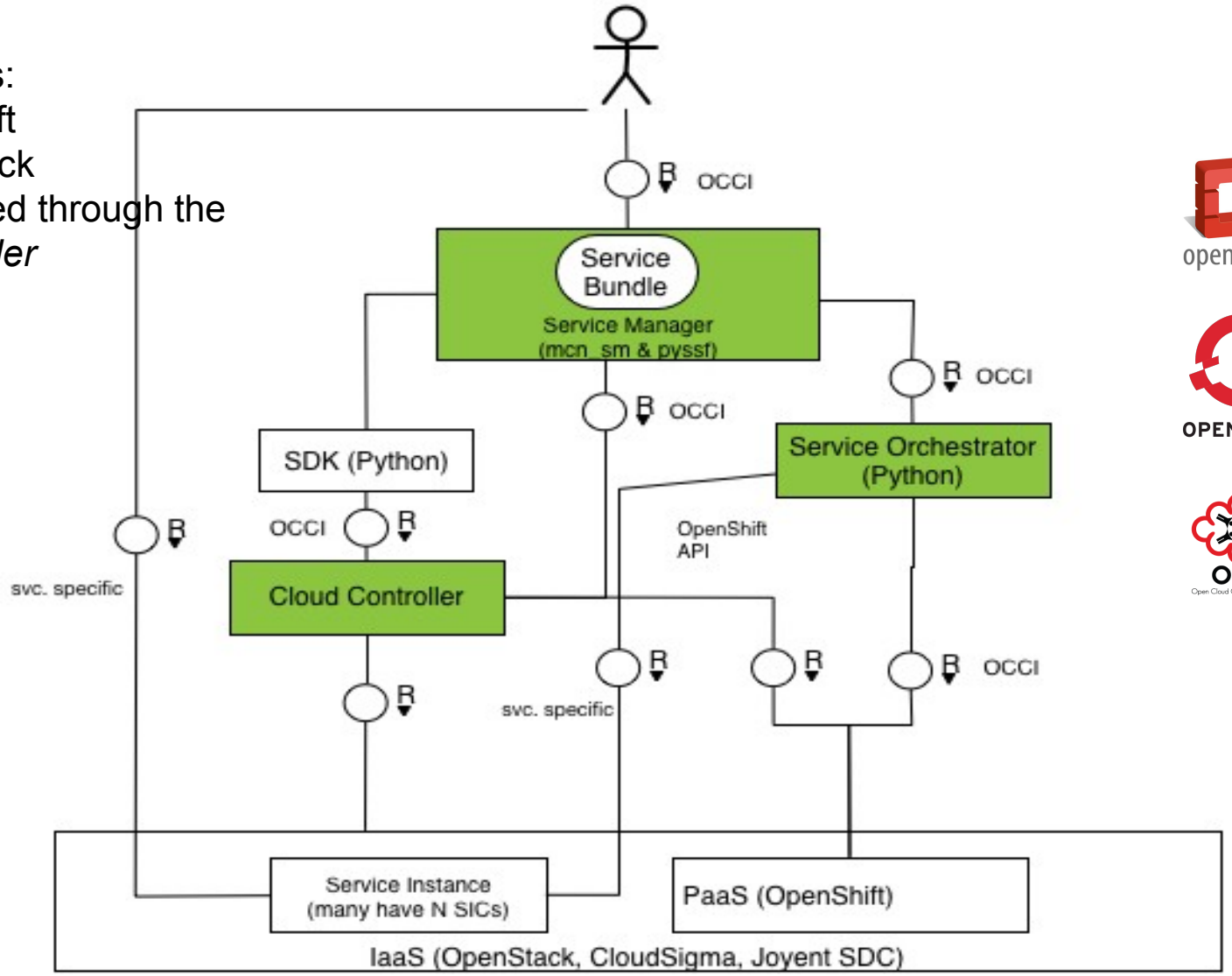
Dependencies:

- OpenShift
- OpenStack

→ Abstracted through the *Cloud Controller*

Standard:

- OCCI



Key Components of Hurtle

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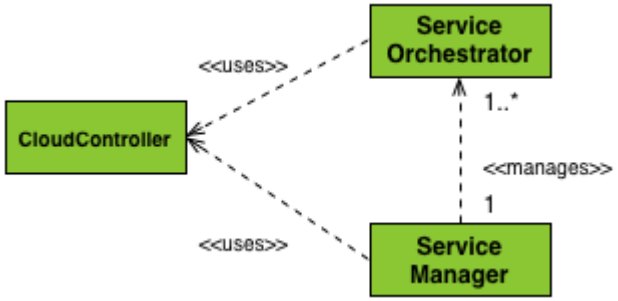

- **Service Manager (SM)**: receives requests for new tenant service instances
  - https://github.com/icclab/hurtle_sm
- **Service Orchestrator (SO)**: manages the lifecycle of a tenant service instance
  - sample https://github.com/icclab/hurtle_sample_so
- **CloudController (CC)**: manages and abstracts underlying resources and SOs
  - https://github.com/icclab/hurtle_cc_api

Features

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- Complete **orchestration of your software** lifecycle

  Easy implementation of your **service API** - See how to write your Hurtle Service

- Guided implementation of your **service manager**

  Many languages supported including Python, Java, Perl, PHP, Demo applications available

- Scalable **runtime management**

  Complete **end-to-end logging** of your software

- Integration with OpenStack, ICCLab's Joyent SDC contribs

- Handle potential **incidents of your software,**

  On-Going Integration with ICCLab's Watchtower (Cloud Incident Management)

- Leverages **Open Cloud Standards** (OCCI, OpenStack), Multi-dc/multi-region support

- **Bill for your software** and services,

  Integration with ICCLab's Cyclops (Rating, charging & Billing)

Roadmap

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- More examples including the cloud native Zurmo implementation from ICCLab
- Enhanced **workload placement**, dynamic policy-based
- ~~Support for **docker**-registry deployed containers: OpenShift v3~~
- **Runtime updates** to service and resource topologies
- **CI** and **CD** support
  - safe monitored dynamic service updates
- **TOSCA** support
- ~~Support for **VMware** and **CloudStack**~~
- **User interface** to visualise resource and services relationships
- Additional external service endpoint protocol support

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How to monetize your service?

- Provide a complete rating, charging, and billing service
- Able to deal with multi-domain/multi-provider service compositions
- Able to deal with dynamics inherent to metered cloud services (pay-as-you-go)
- Itself to be provided as a service – VAS for cloud operators

CYCLOPS

Key Components

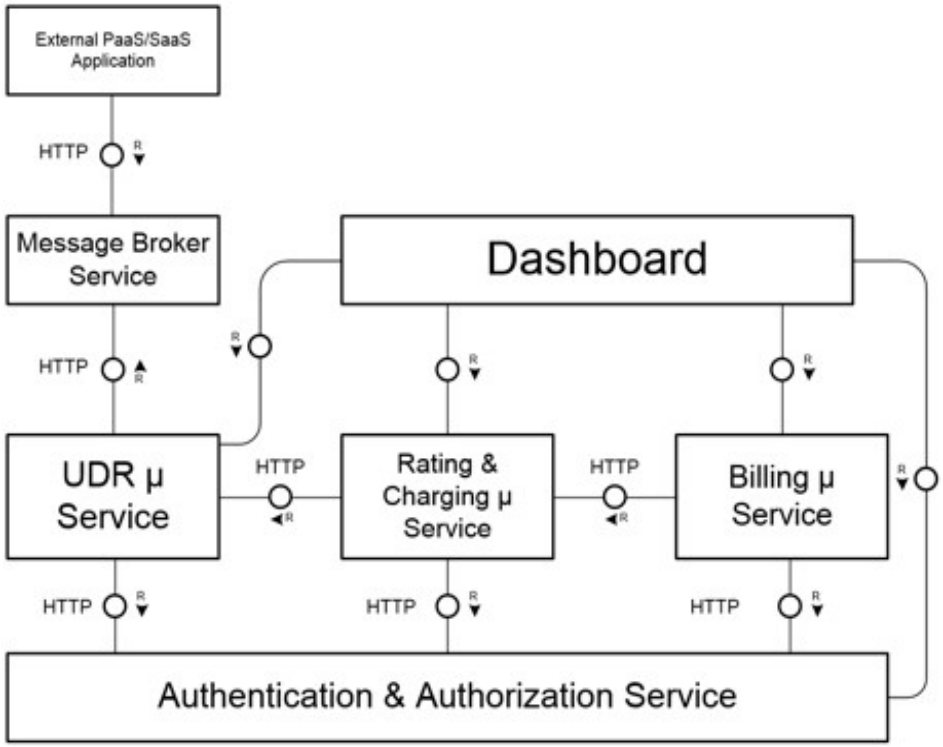
Gatekeeper: simple authentication/authorization micro-service

Event bus: rabbitmq based service for collecting key events, including SLA violations

udr-microservice: 'usage' data collection, transformation and storage + UDR generation

rc-microservice: rule based rating engine - rate generation, and CDR generation and storage

billing-microservice: CDR aggregation and bill generation (pull based), discounts, penalties, coupon processing, VAT rules, etc.



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GateKeeper

Technology Landscape

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Codebase mostly written in Java + Frontend written in Java & Angularjs

Gatekeeper code written in **go!**

Database: **Influxdb** (tsdb)

Rule engine: drools

Scheduler: **will be replaced by in-house scheduler**

REST interface developed using **restlet framework**

Message broker: **Rabbitmq**

Inter-microservice **line message format: json**

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GateKeeper

Roadmap

- Data collection failure tracking and recovery mechanism
  - Keeping track of failed collection periods
  - Lazy recovery attempts to fill usage data for missing timeline entries
- Light-weight marketplace in dashboard
  - for proof of concept and demonstrations
  - ISV /app developer view - revenue reports, deployments tracking and metrics visualization

Links

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HURTLE

GitHub: https://github.com/icclab/hurtle

- Architecture
- Implementation
- Write your own service

Website: http://hurtle.it/, **Twitter**: @hurtle_it , **Mailing List**: icclab-hurtle@dornbirn.zhaw.ch

Advanced Service Composition: https://www.youtube.com/watch?v=03YiBT3IM9s

CYCLOPS

All about RCB and CYCLOPS
http://blog.zhaw.ch/icclab/category/research-approach/themes/rating-charging-billing/

GitHub:
http://icclab.github.io/cyclops/ and http://icclab.github.io/gatekeeper/

CYCLOPS

GateKeeper

Questions

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http://blog.zhaw.ch/icclab/

Hurtle & the ICCLab

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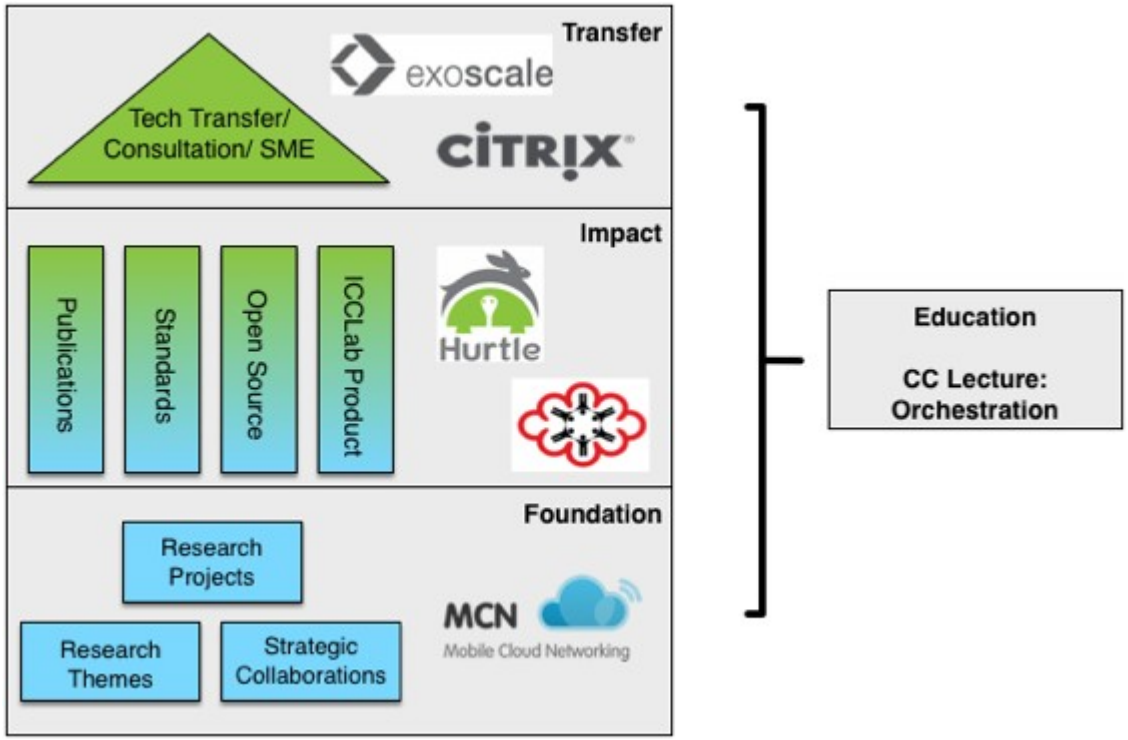

Implementation in Practice

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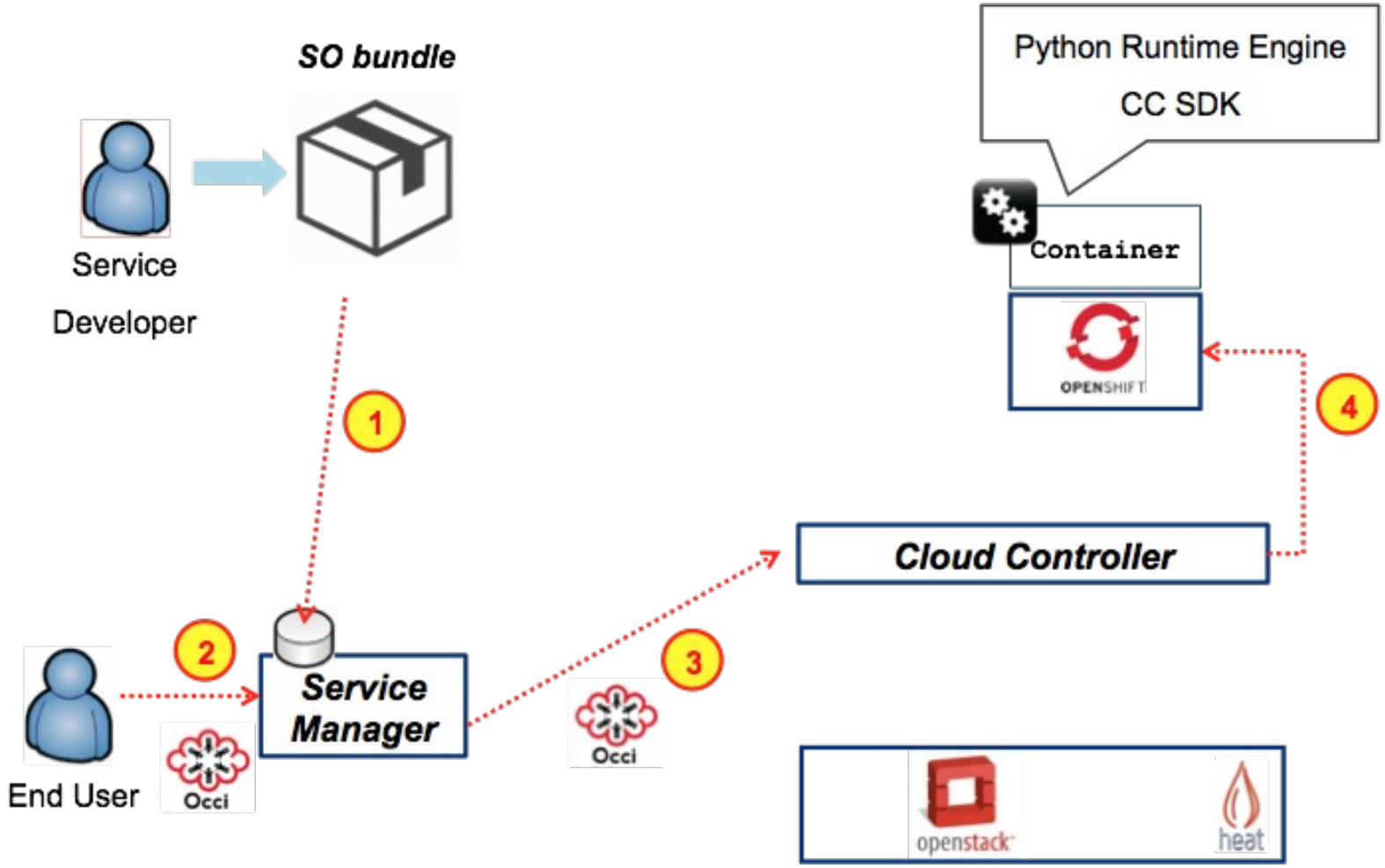

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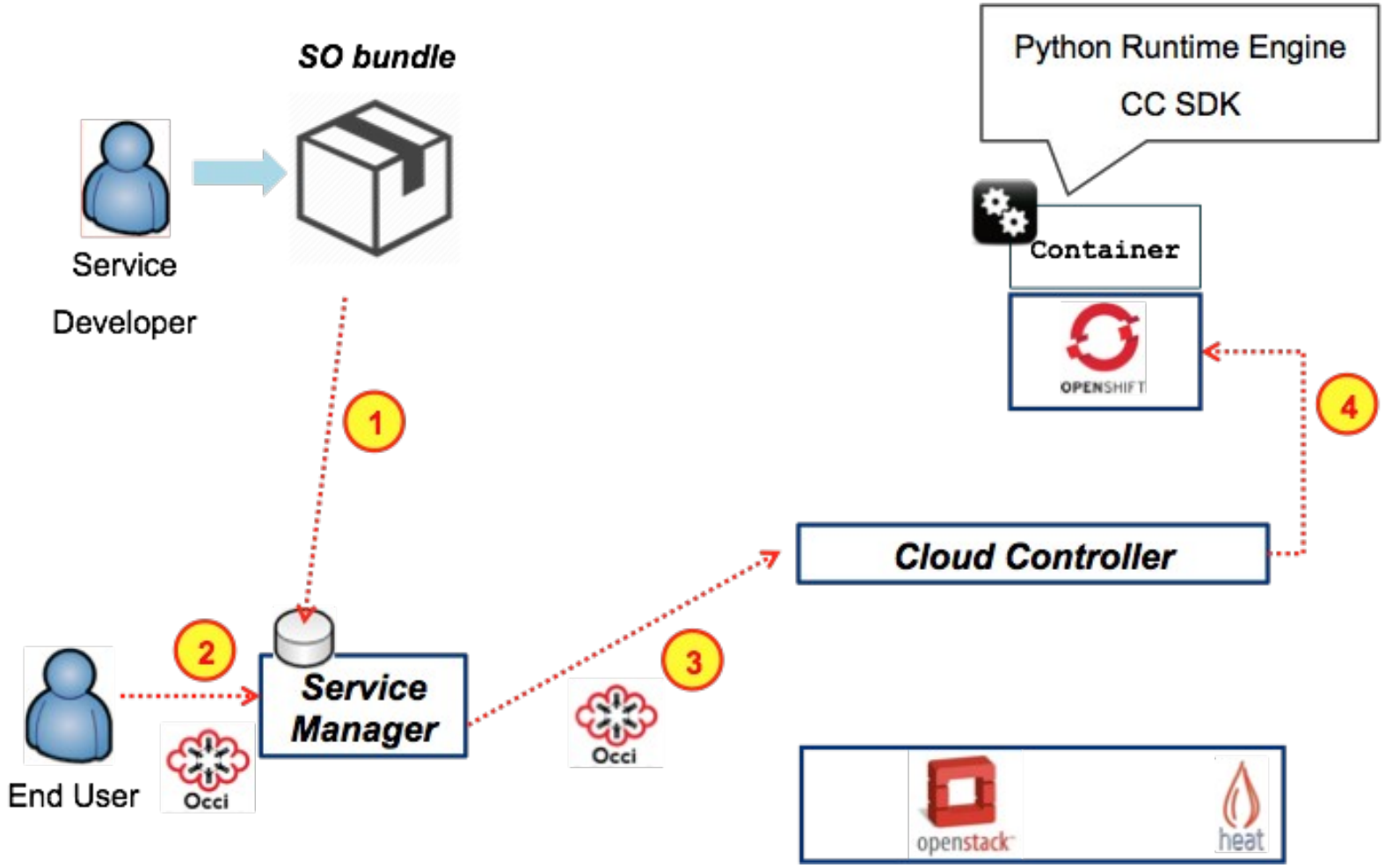
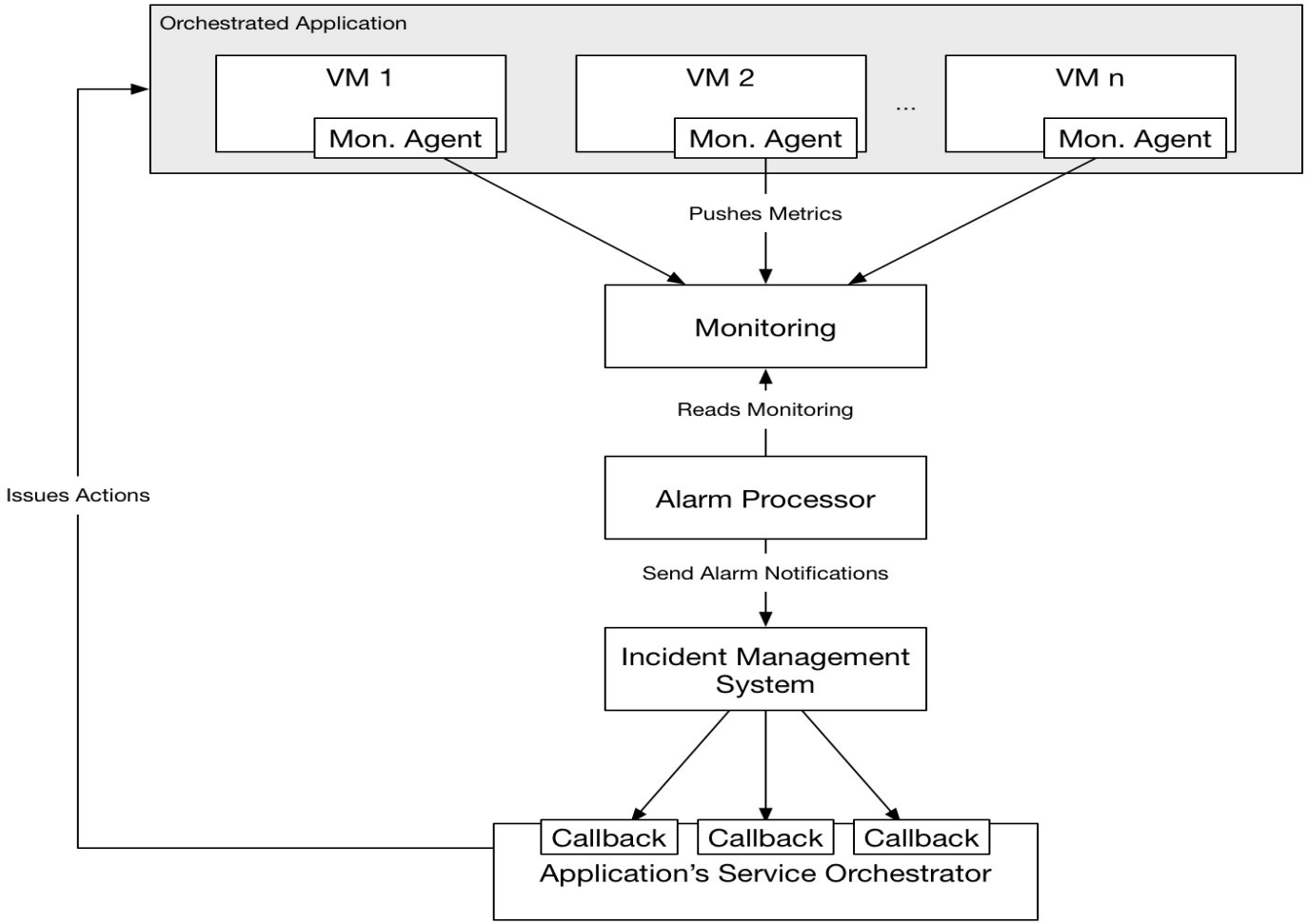


Runtime Module

Automatic alarm creation for each new service provisioning, with callback to the service orchestrator. Monasca as technology.



Write your own, easily!

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- To create a new service, write a *Service Definition* and a *Service Bundle*
  - Service Definition
  - Service Bundle
    - Service Orchestrator: Your service's logic
    - Service Manifest: Your service dependencies
    - Heat Template: The resources your service needs

- Testing is easy
  - Service Def. is an executable python app
  - run it, then send OCCI requests, e.g.
    - `curl -v -X POST http://localhost:8888/example/ -H 'Category: example; scheme="http://schemas.hurtle.it/occi/sm#"; class="kind";' -H 'content-type: text/occi' -H 'x-tenant-name: YOUR_TENANT_NAME' -H 'x-auth-token: YOUR_KEYSTONE_TOKEN'`