

Alarming

Julien Danjou

jd__@Freenode // @juldanjou
julien@danjou.info

Nick Barcet

nijaba@Freenode // @nijaba
nick@enovance.com

Eoghan Glynn

eglynn@Freenode
eglynn@redhat.com

Speakers



Nick Barcet co-founded the Ceilometer project at the Folsom summit and led the project through incubation



Julien Danjou has been a core Ceilometer contributor from the outset, taking over the PTL reins for Havana



Eoghan Glynn drove the addition of the Alarming feature to Ceilometer over the Havana cycle

Two seemingly disjoint projects intersect

- **Heat** is a template-driven orchestration engine
 - automates complex deployments via declarative configuration
- **Ceilometer** is a metering infrastructure
 - collects data measuring resource usage and performance
- Appear on the surface to have minimal commonality ...

Ceilometer Workflow



Collect

Transform

Publish

Store

Aggregate

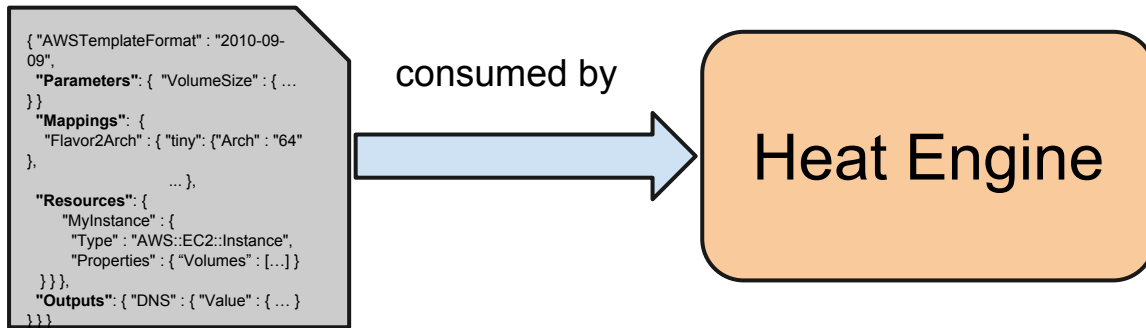
- Collect from OpenStack components
- Transform metering data if necessary
- Publish meters to any destination (including Ceilometer itself)
- Store received meters
- Aggregate samples via a REST API

Heat Workflow

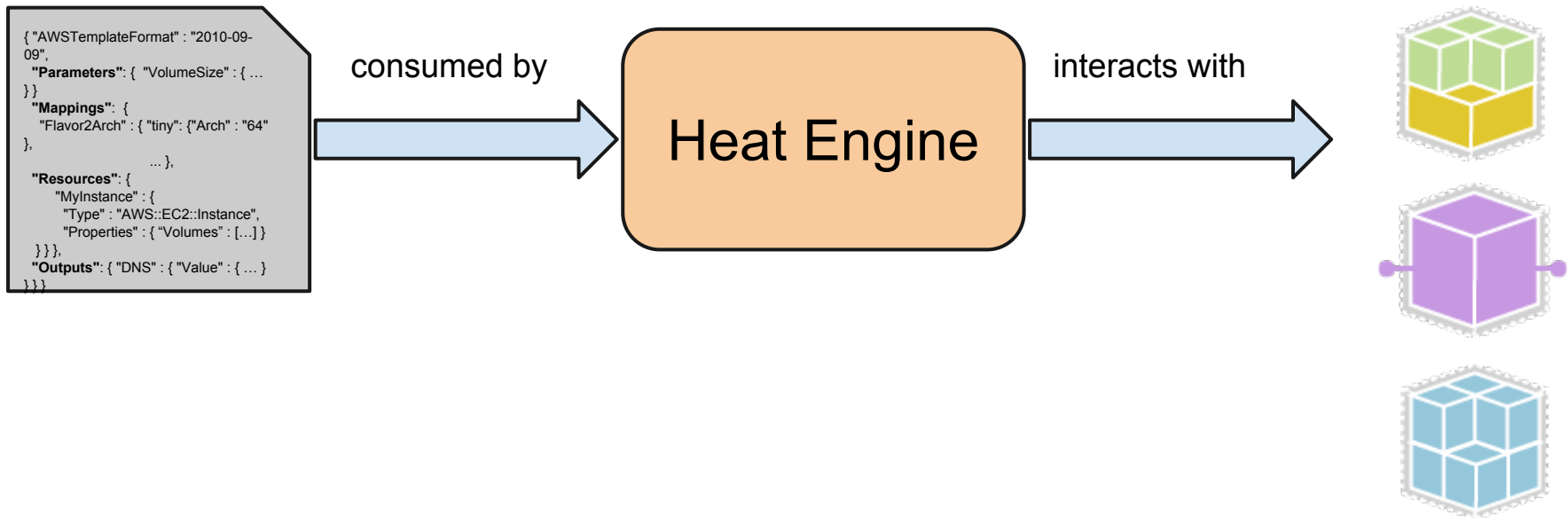
my_stack.template

```
{ "AWSTemplateFormat" : "2010-09-09",  
  "Parameters": { "VolumeSize" : { ... } }  
  "Mappings": {  
    "Flavor2Arch" : { "tiny": { "Arch" : "64" },  
                      ... },  
  "Resources": {  
    "MyInstance" : {  
      "Type" : "AWS::EC2::Instance",  
      "Properties" : { "Volumes" : [...] }  
    }  
  }  
},  
  "Outputs": { "DNS" : { "Value" : { ... } } } }
```

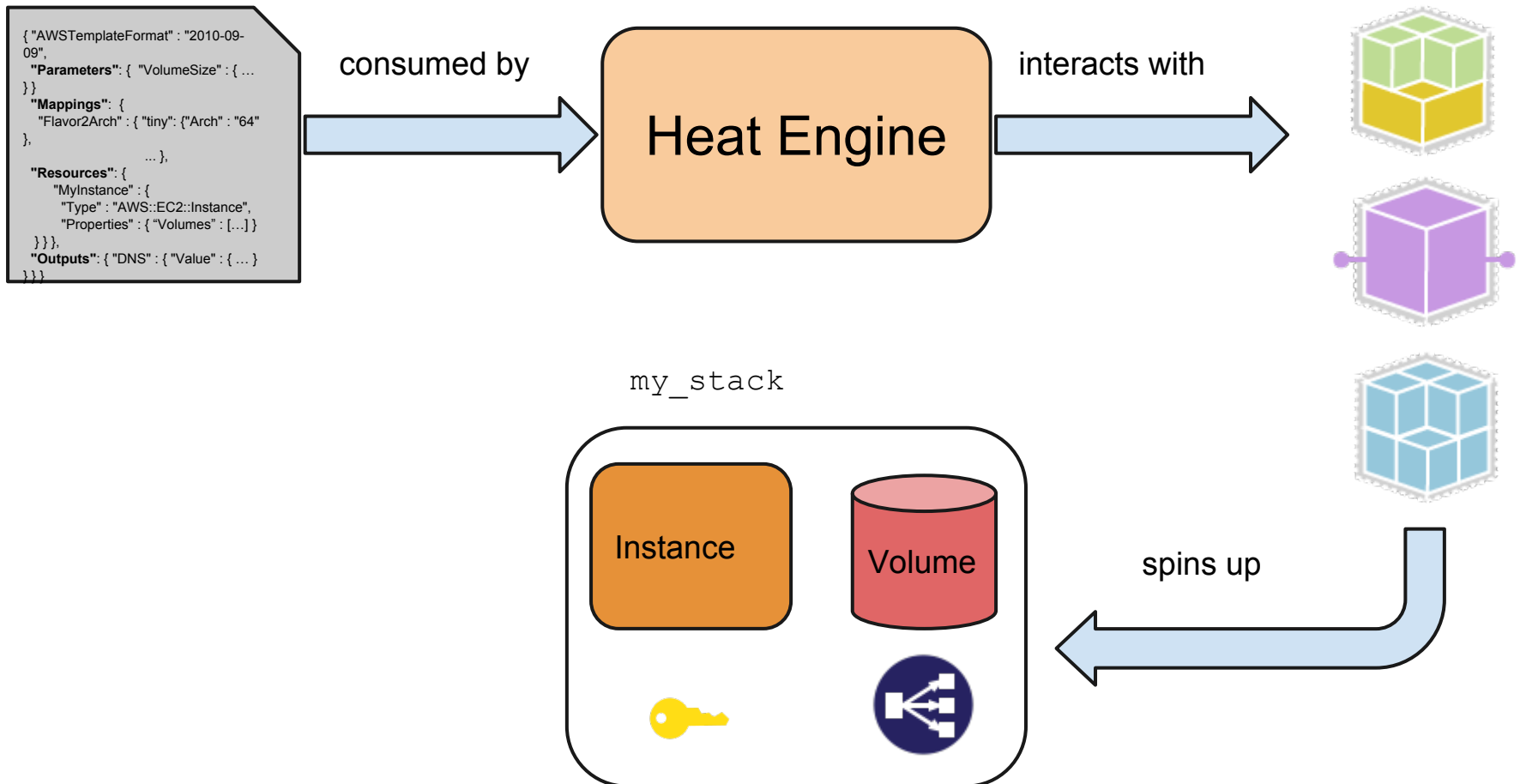
Heat Workflow



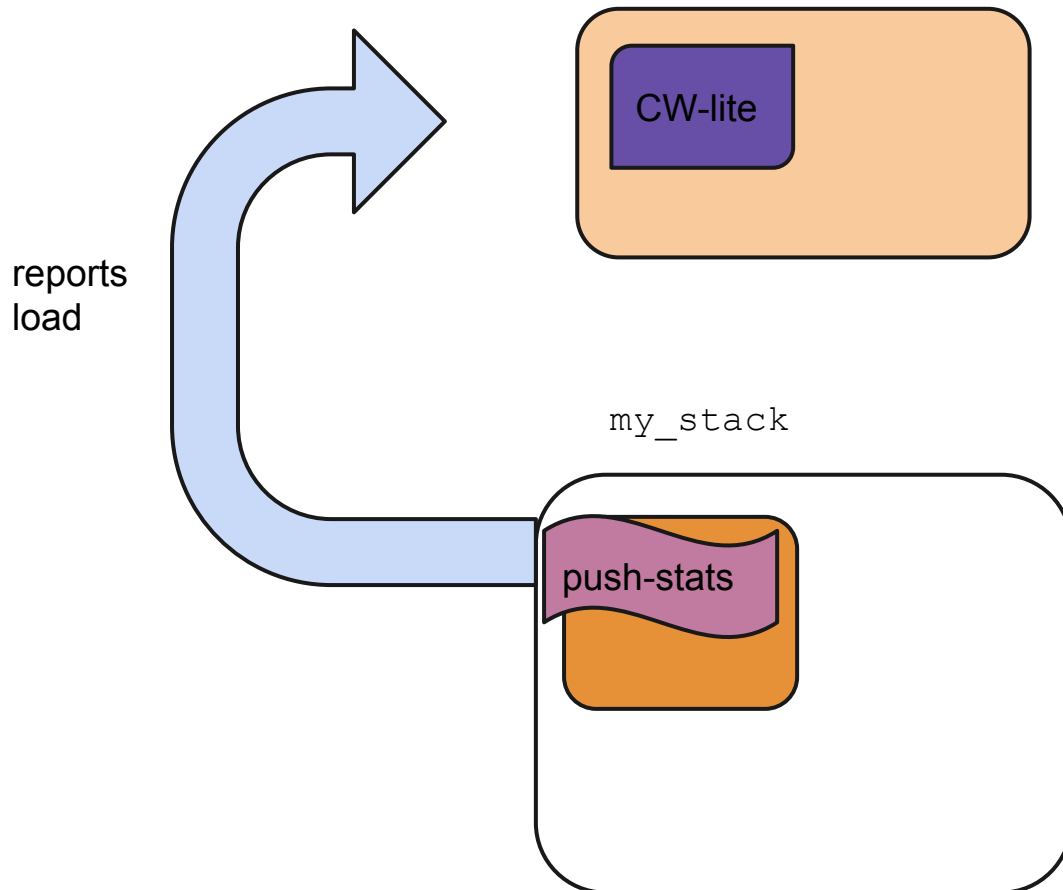
Heat Workflow



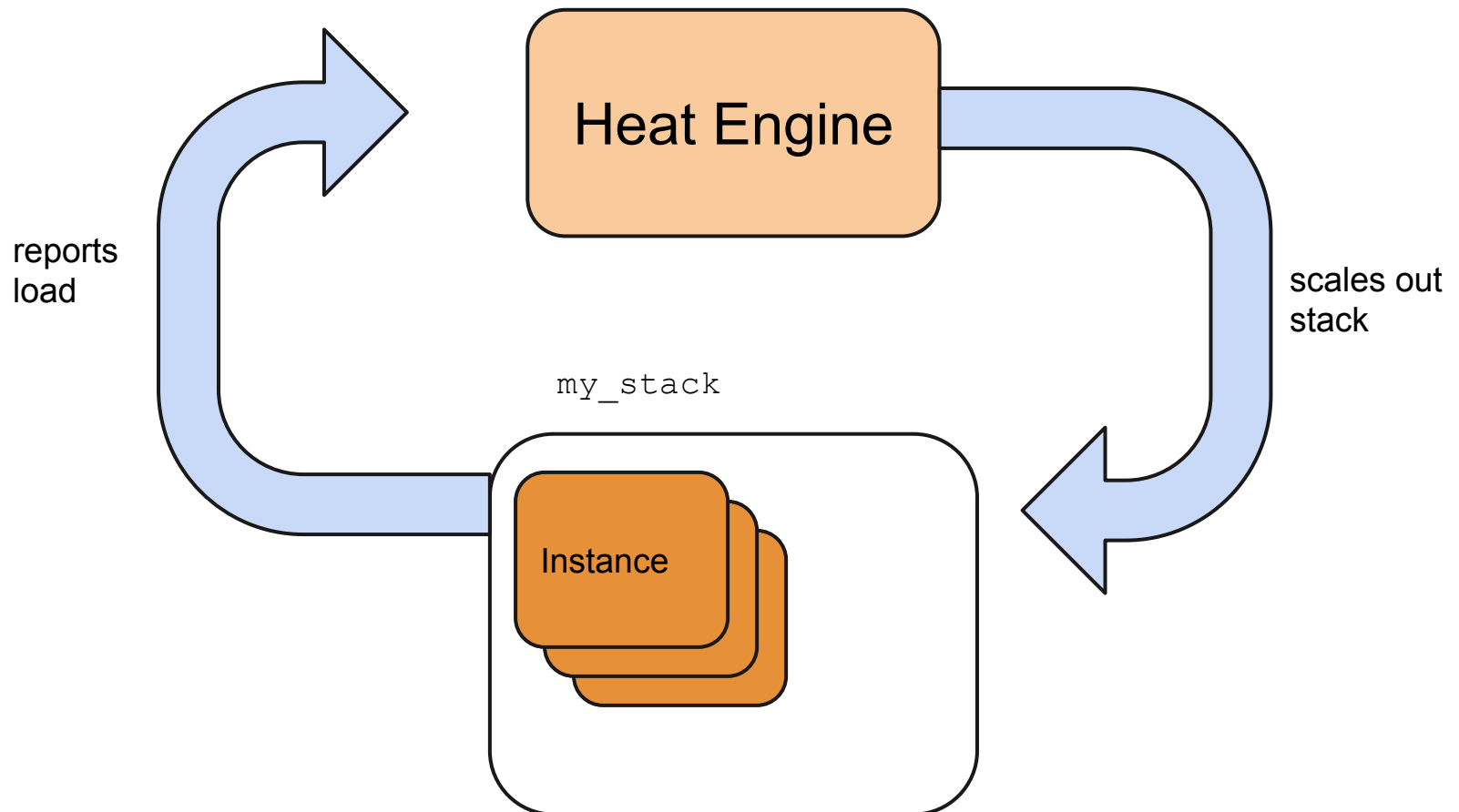
Heat Workflow



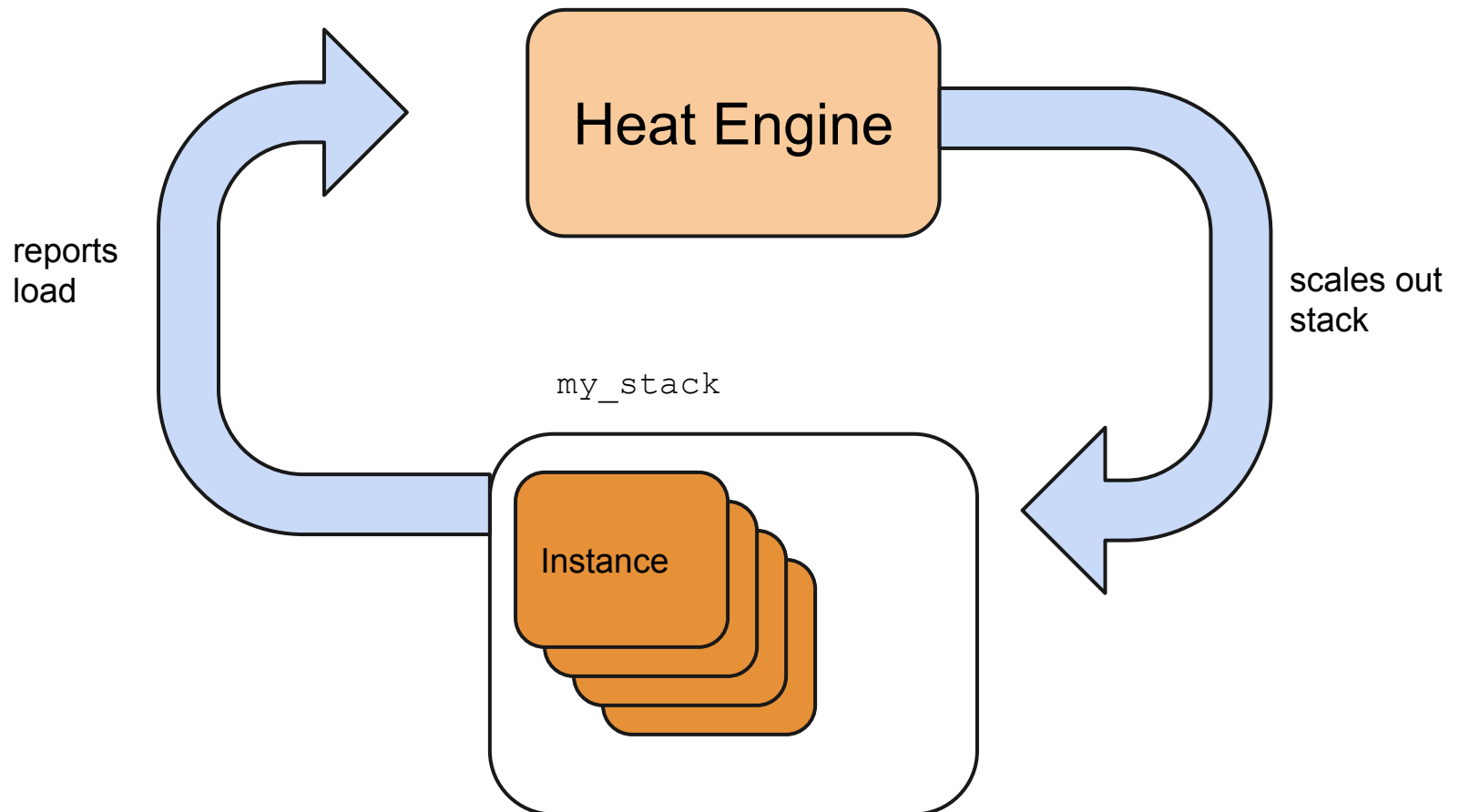
Heat Autoscaling v1.0



Heat Autoscaling v1.0



Heat Autoscaling v1.0



Ceilometer to the rescue!

- compute agent already collects most relevant stats from *outside* the instance
- API service exposes aggregation over the evaluation window
- define new API exposing alarm lifecycle
- provide new service to evaluate alarms against their defined rules
- additional service driving asynchronous notifications when alarms fire

How it all hangs together

```
{ "AWSTemplateFormat" : "2010-09-09",
  "Parameters": { "VolumeSize" : { ...
  }}
  "Mappings": {
    "Flavor2Arch" : { "tiny": { "Arch" : "64"
    },
    ... },
  "Resources": {
    "MyInstance": {
      "Type" : "AWS::EC2::Instance",
      "Properties" : { "Volumes" : [...]
    }
  }
  "Outputs": { "DNS" : { "Value" : { ...
  }
  }
}
```

added to template

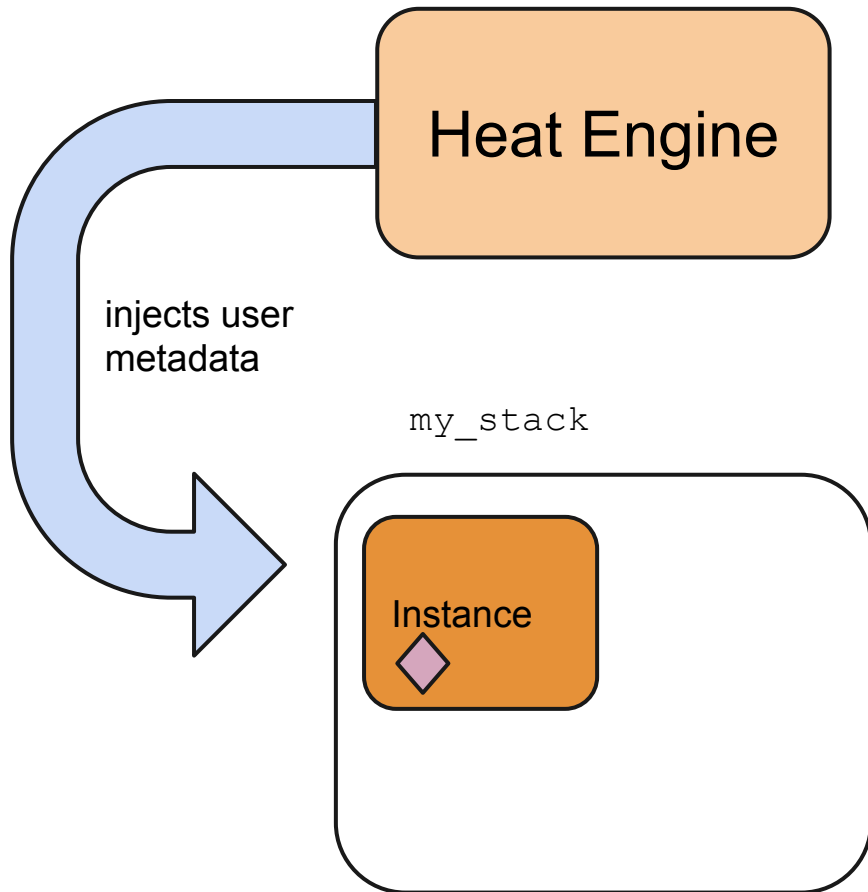


- alarms bounding busy/idleness of instances
- membership of autoscale group represented via user metadata
- alarm actions refer to scale up/down policies
- action URLs are pre-signed
- policies define adjustment step size & cooldown period

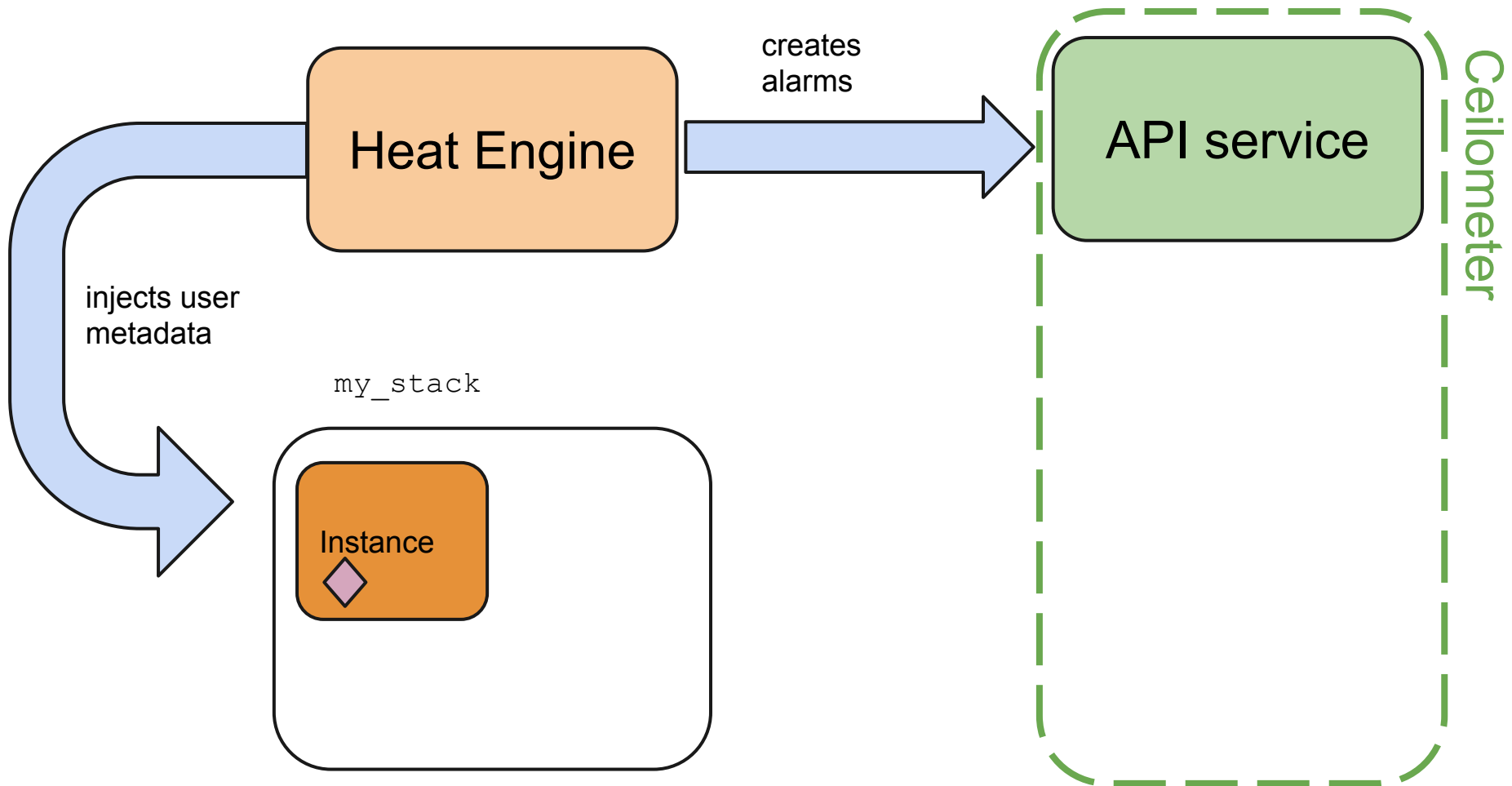
How it all hangs together

```
"CPUAlarmHigh": {  
  "Type": "OS::Metering::Alarm",  
  "Properties": {  
    "meter_name": "cpu_util",  
    "description": "Scale-up if CPU > 50%",  
    "evaluation_periods": "1", "period": "60",  
    "statistic": "avg", "comparison_operator": "gt",  
    "alarm_actions": [..."ScaleUpPolicy", "AlarmUrl"...],  
    "matching_metadata": {  
      "metadata.user_metadata.server_group":  
        "WebServerGroup"  
    }  
  }  
}
```

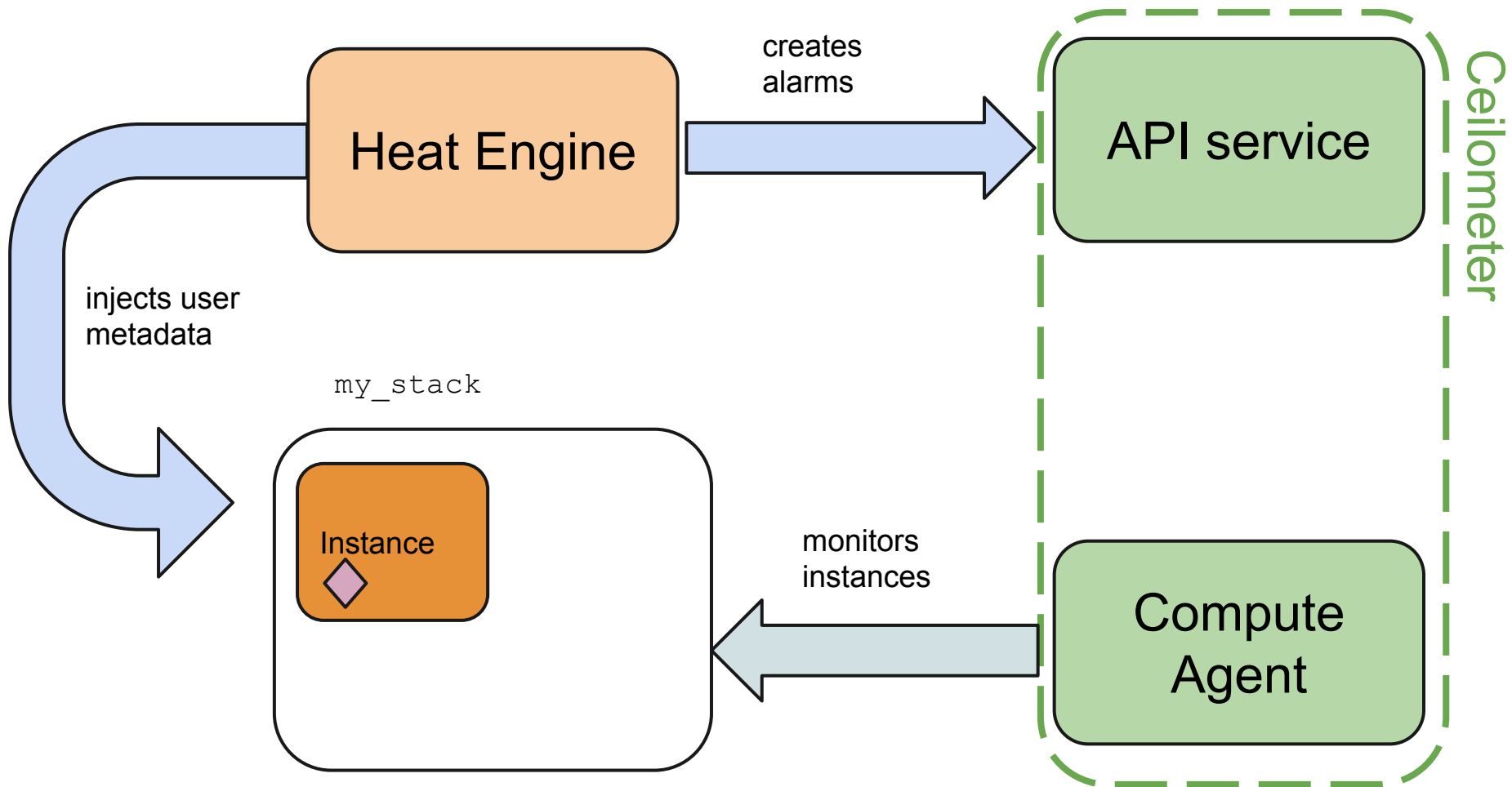
How it all hangs together



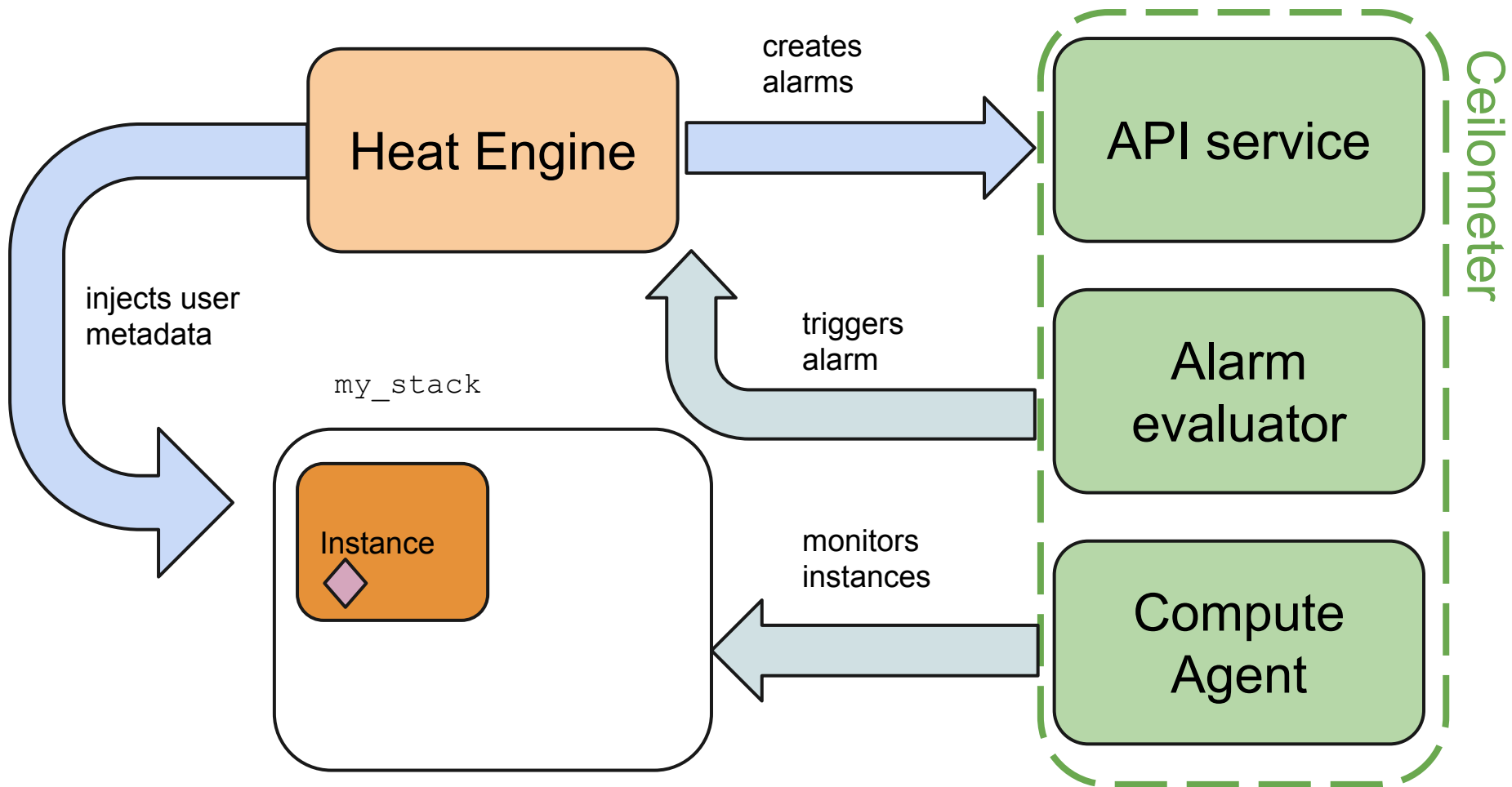
How it all hangs together



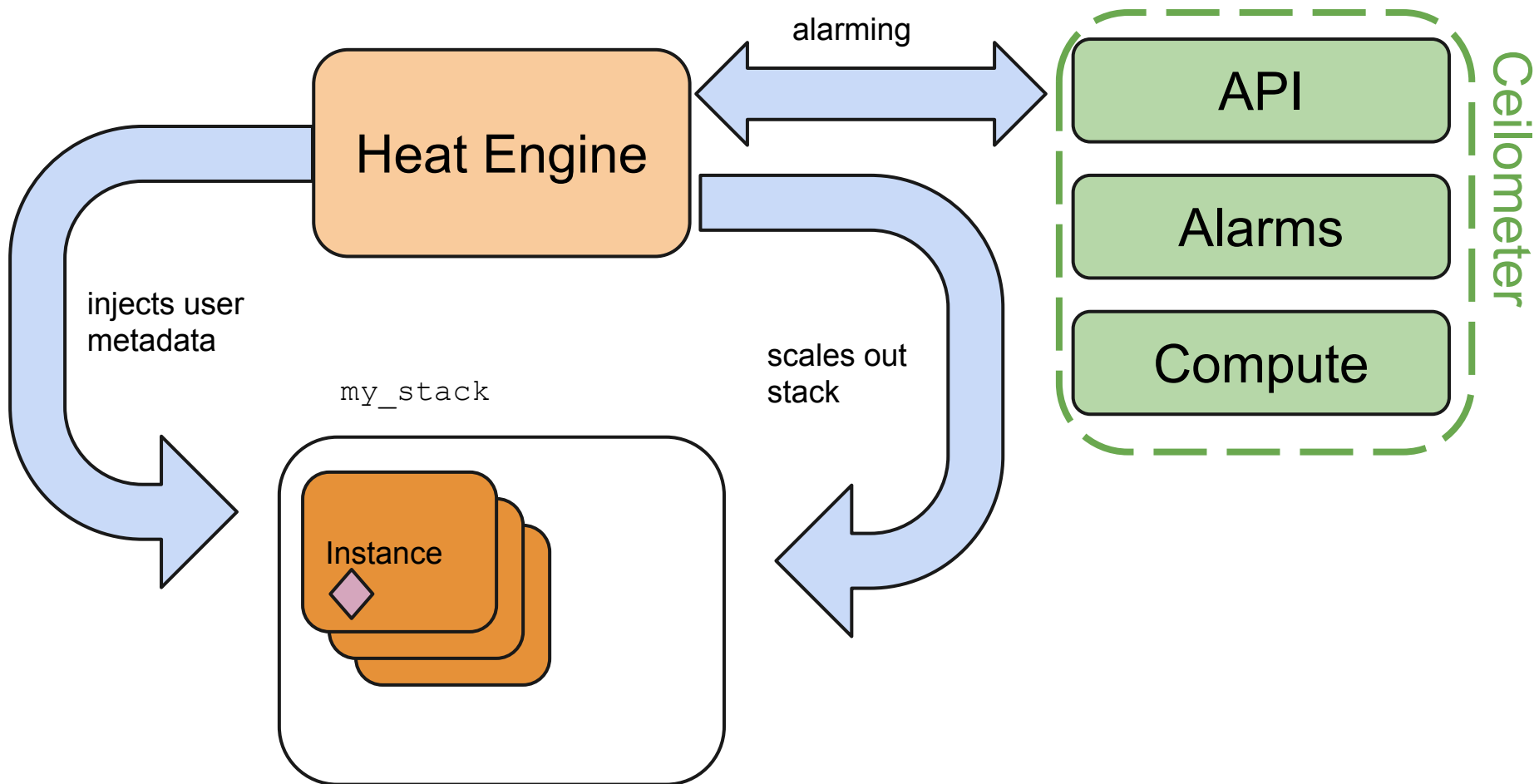
How it all hangs together



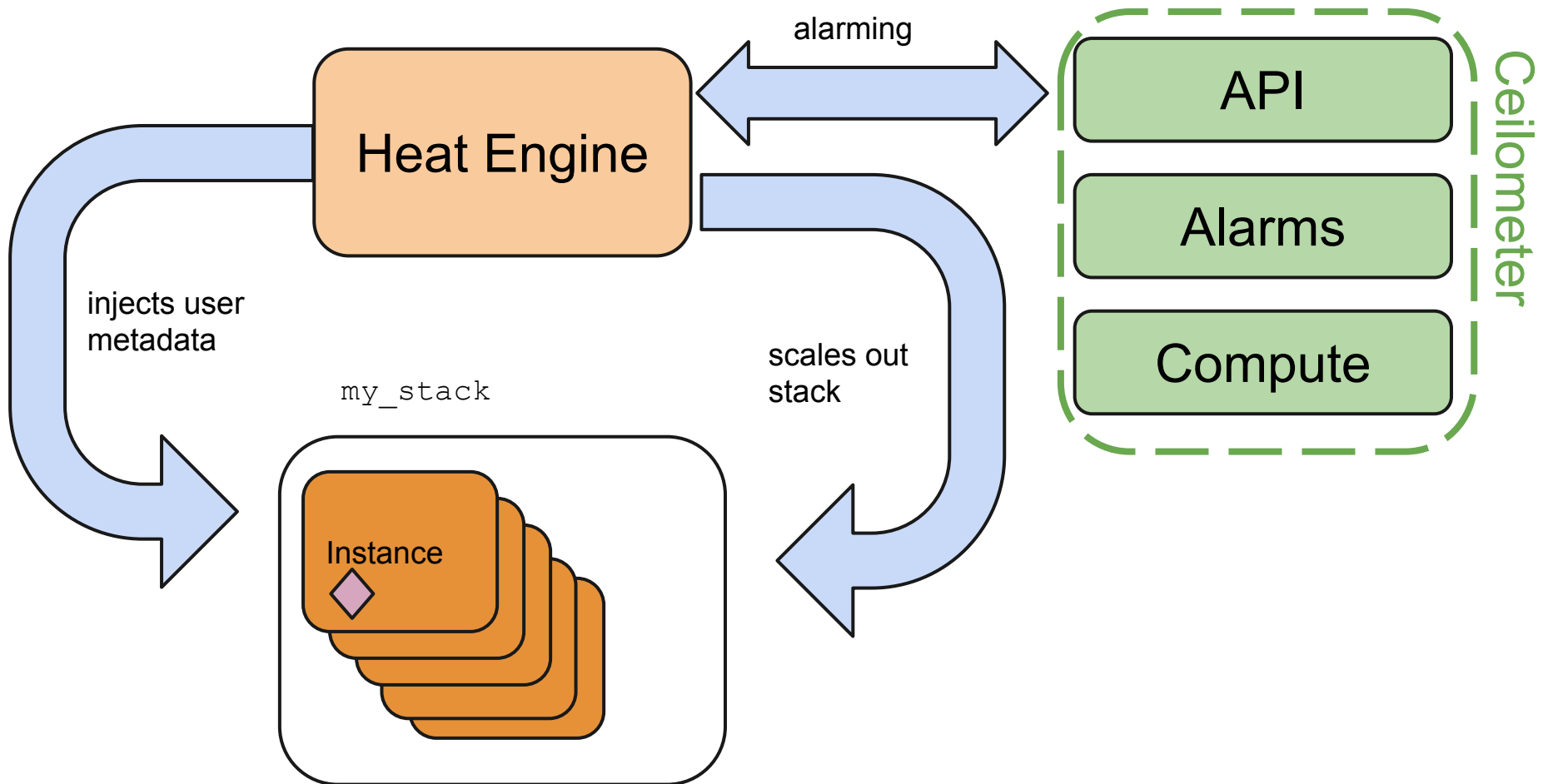
How it all hangs together



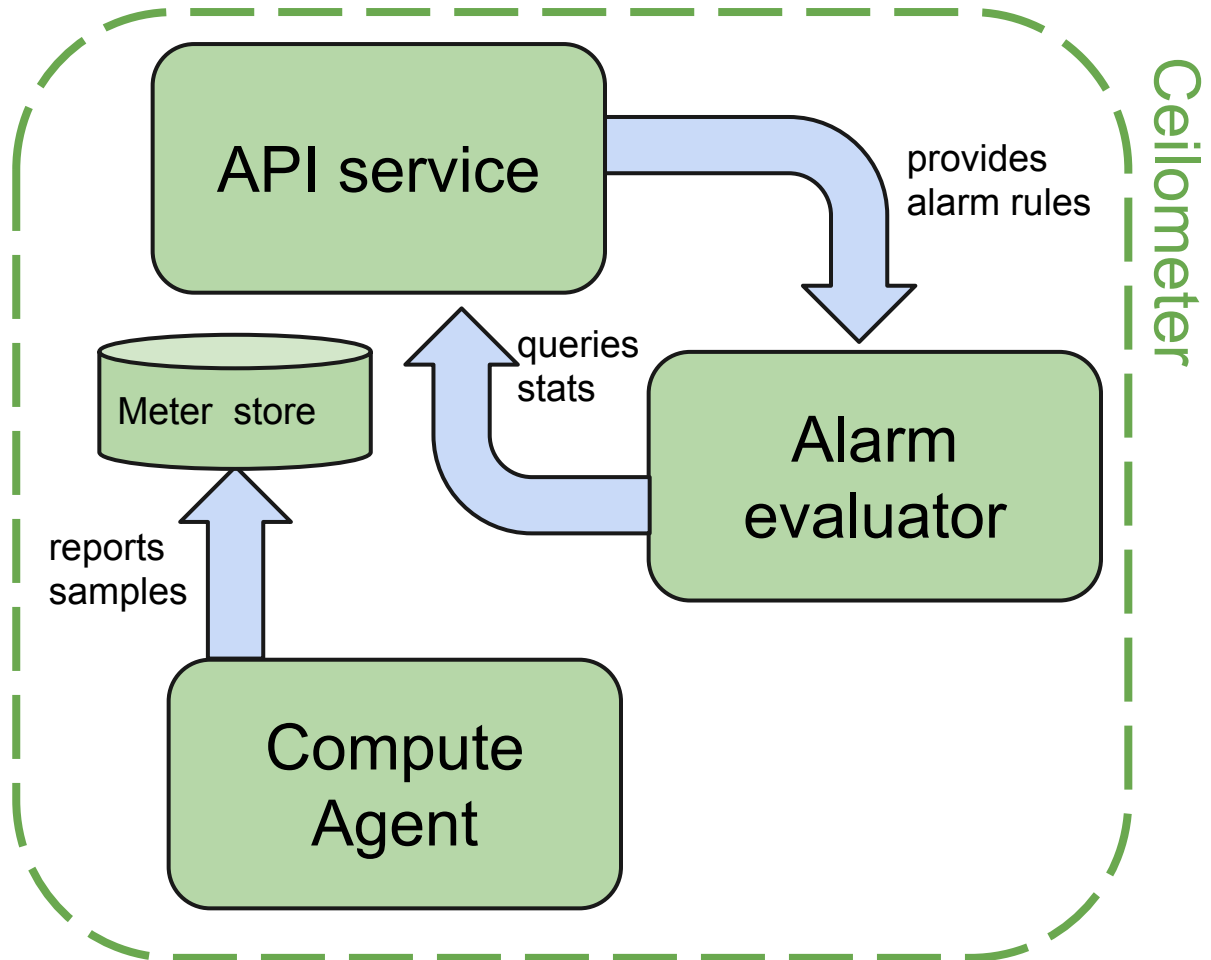
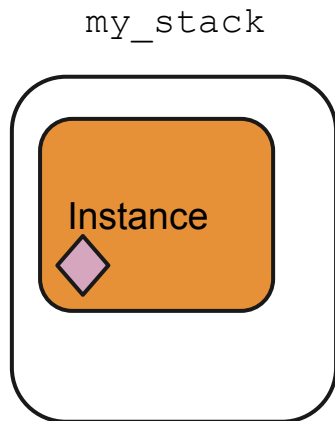
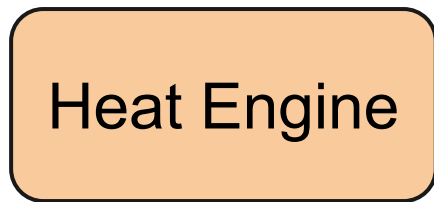
How it all hangs together



How it all hangs together



How it all hangs together



Lessons learned

Keys to successful intra-project interactions:

- buy-in from stakeholders on both sides
- early validation and proof-points
- protect consuming project from churn during the development cycle
- split deliverables into bite-sized separately consumable chunks

Future directions

- wider metering coverage (RAM utilization)
- constraints based on time-of-day/day-of-week
- exclusion of low-quality datapoints
- IPMI/SNMP-based monitoring of baremetal
- Keystone trusts for credential delegation

Further questions?

- Chat on Freenode:
 - #openstack-metering
 - #heat
- Mail the dev list:
 - openstack-dev@lists.openstack.org
- Harangue us via Launchpad:
 - <https://launchpad.net/ceilometer/+filebug>