



Cloud deployment of M2M applications

OpenHAB, RabbitMQ and Storm use case

February 19, 2014

Eclipse IoT day - Grenoble

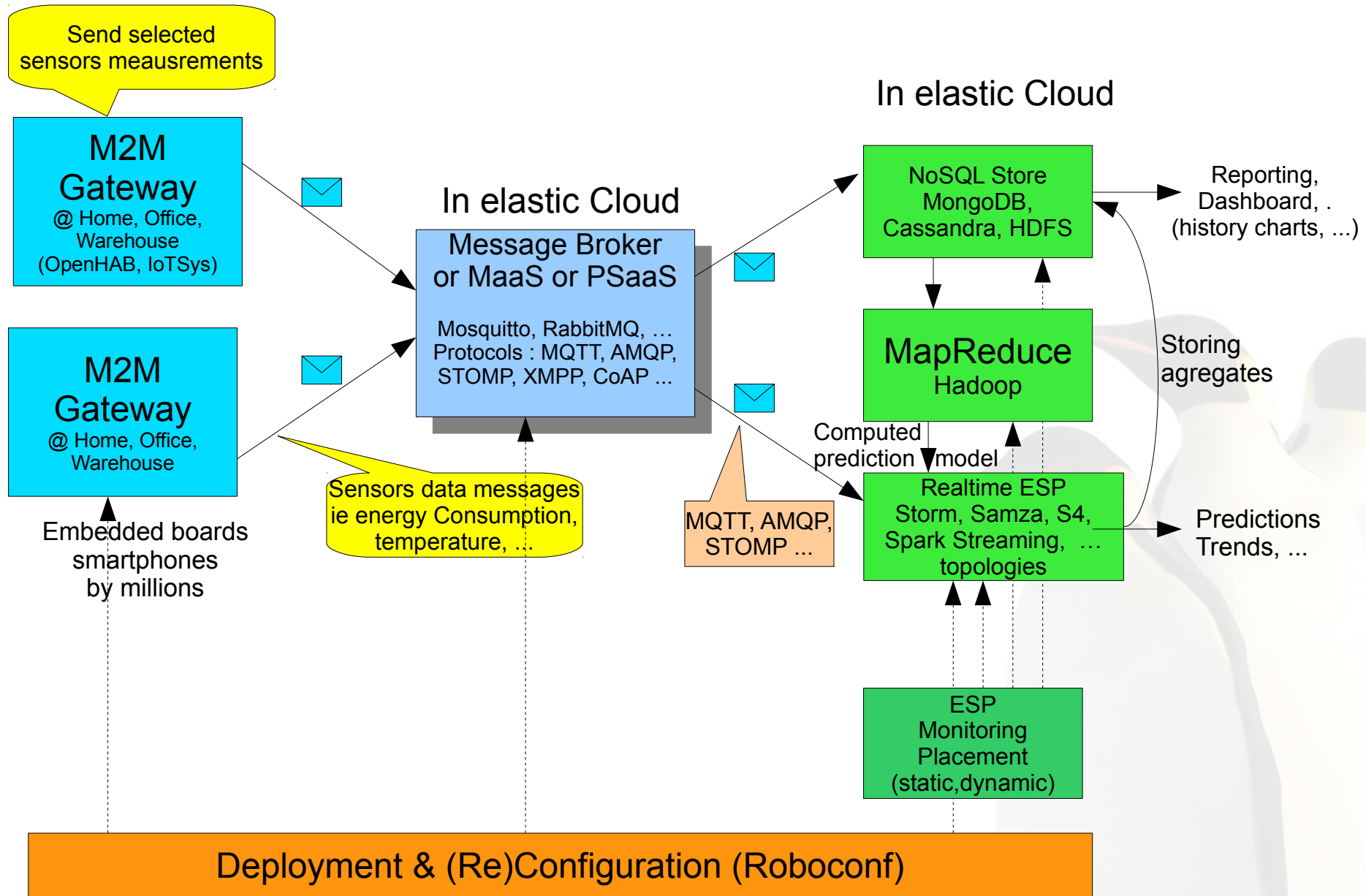
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- M2M "ubilytics" big picture
- Deployment issues
- A processing chain
- Roboconf dynamic (re)configuration
- Demo scenario

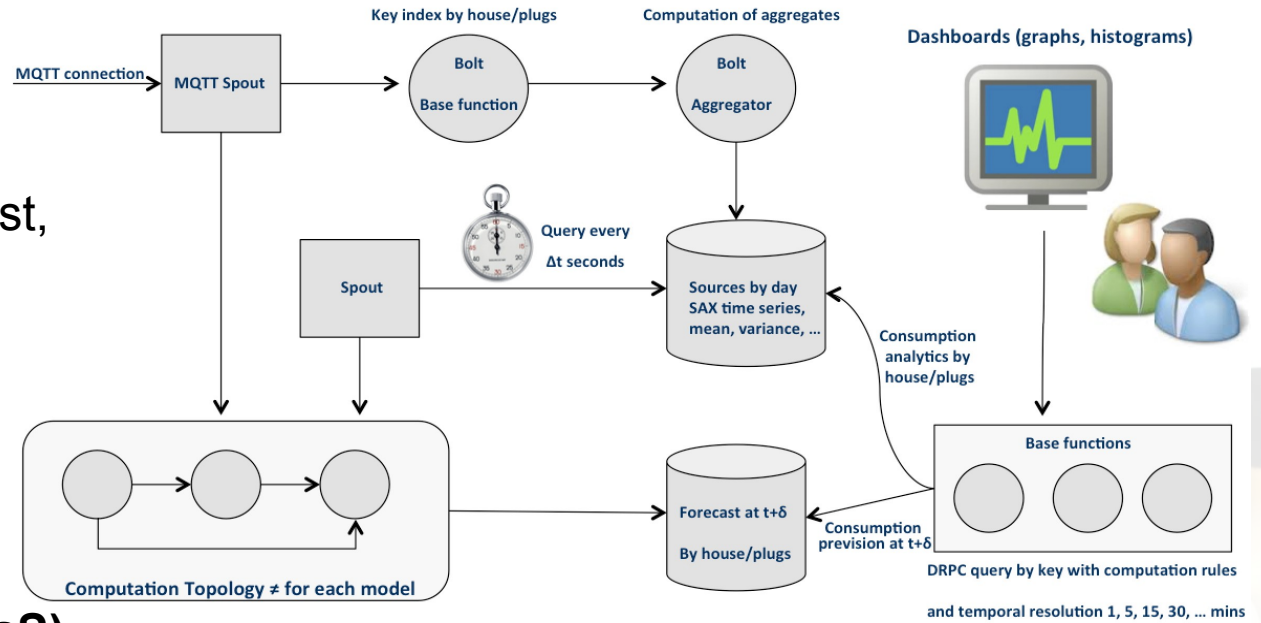


M2M "ubilytics" big picture



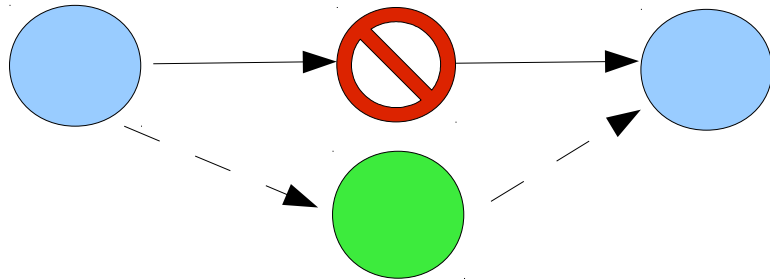
- **Multi-scale**
 - From embedded (box, sensor, card...) to cloud / IaaS
 - More and more devices while IoT emerges
- **Elastic & adaptative**
 - Add/remove components (eg. according to load patterns)
 - Adapt data flow (eg. load balancing)
 - Optimize (eg. co-locate)
- **Dependencies to be resolved at runtime**
 - Location of components (eg. where to send data)
 - Configuration information (eg. database credentials)

Example :
energy consumption forecast,
based on Storm.



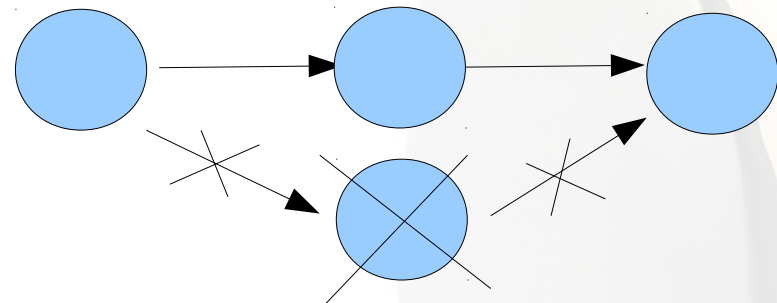
Dynamic elasticity (eg. on IaaS)

Bottleneck detection



Insert additional node(s) + reconfigure

Shrink when possible (lower flow)



Remove useless node(s) + reconfigure

- **Application model**

- Graph of components (eg. VMs or software packages) with dependencies (export/import of configuration variables)
- Initial deployment description (set of instances, deployed on VMs)

- **Deployment manager (DM)**

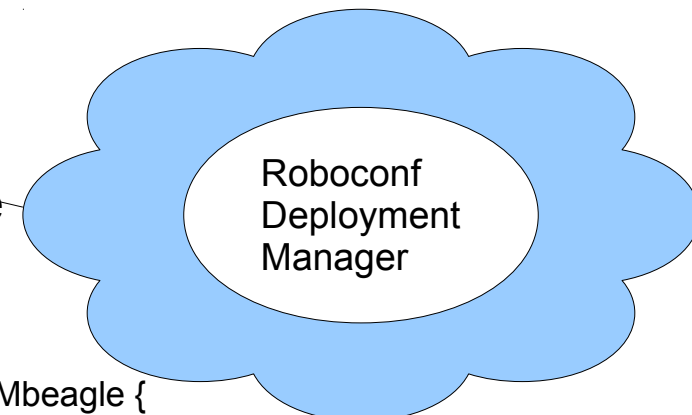
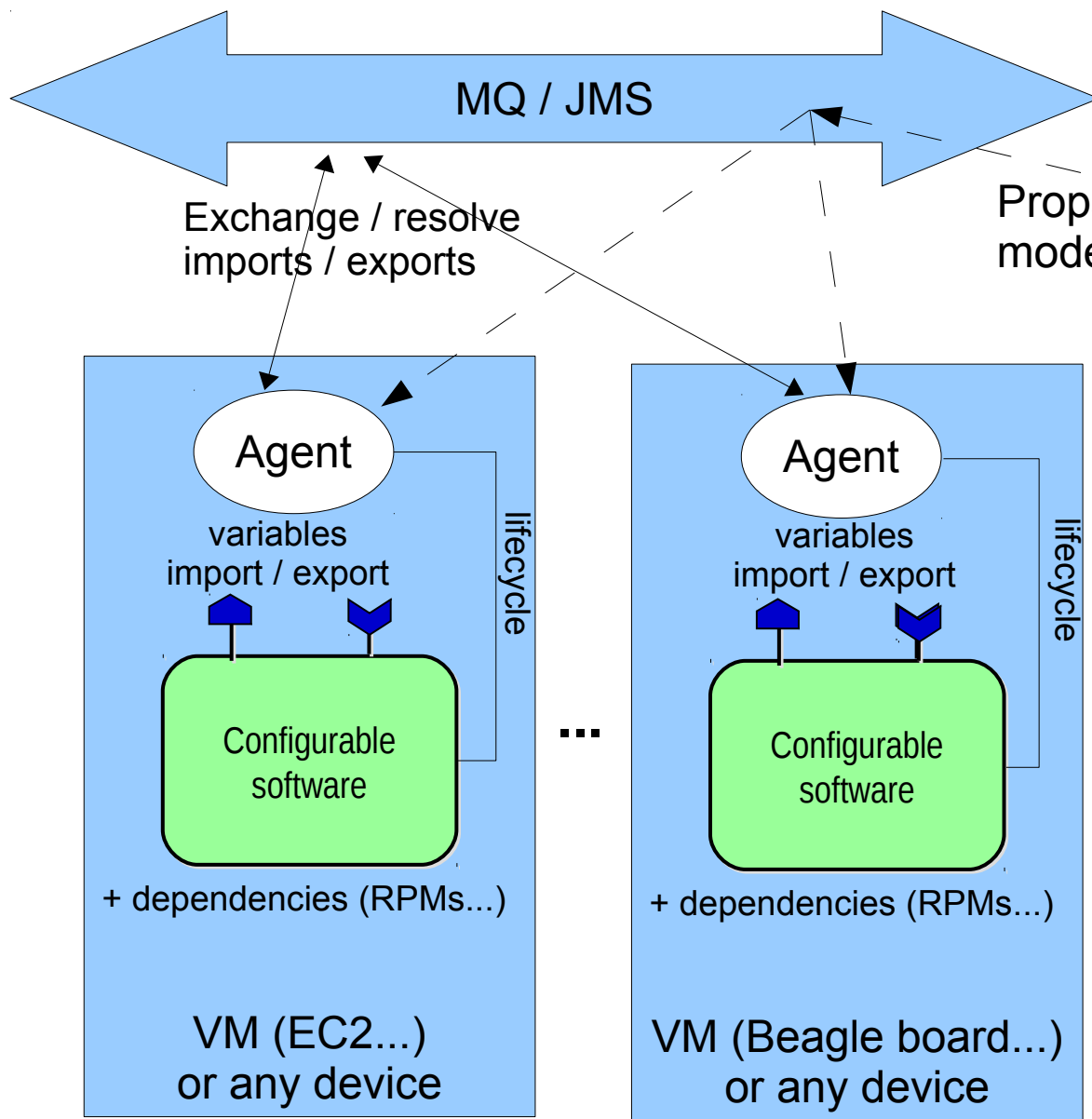
- Creates VMs on IaaS when necessary
- Deploys the model (including software packages) on VMs

- **Agent**

- Present on each VM
- Cross-instances communication (exchange of variables import/export)
- Admin communication with DM
- Lifecycle of software deployed on the VM (setup, start, stop...) according to dependency resolution

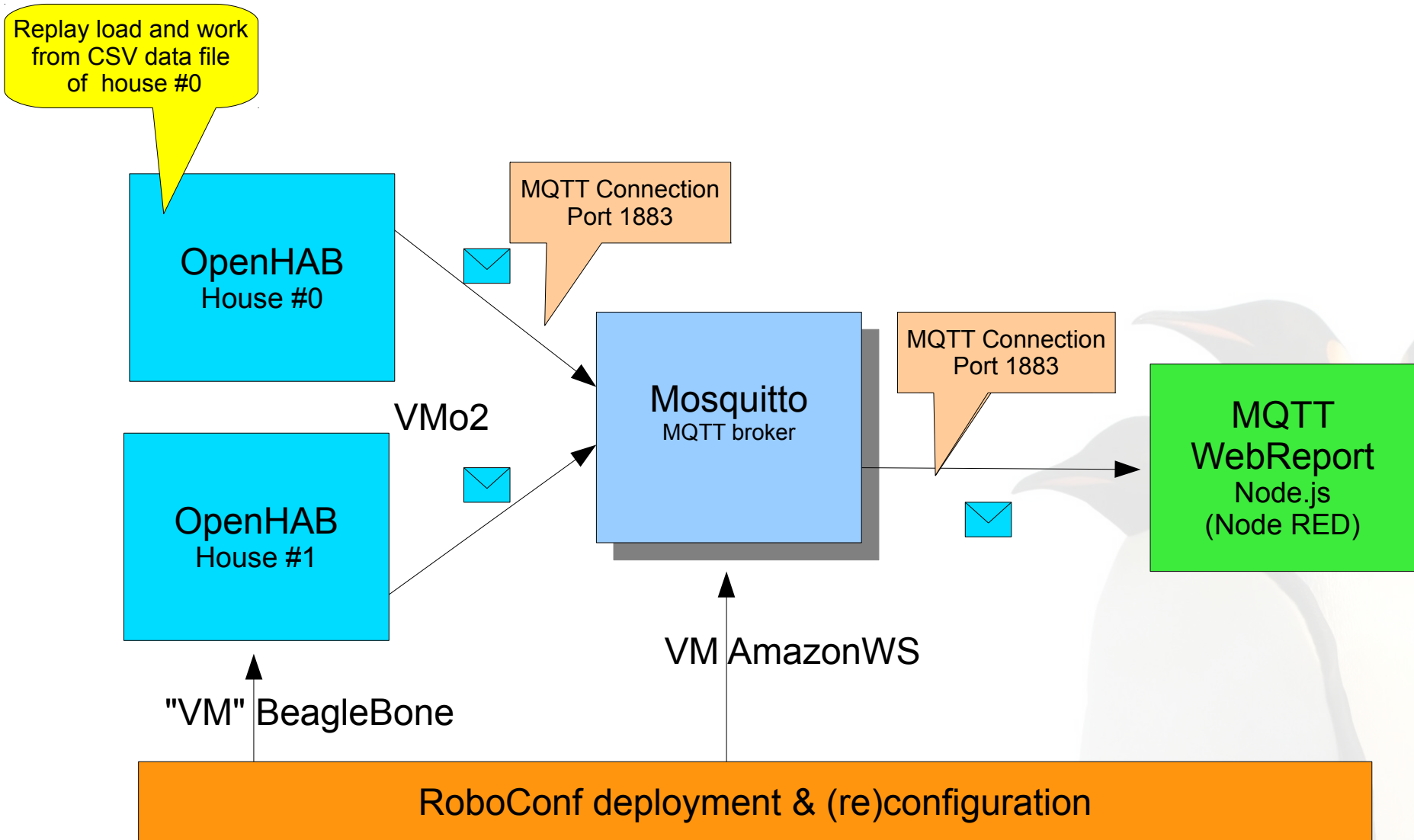
- **Asynchronous communication**

- Based on RabbitMQ

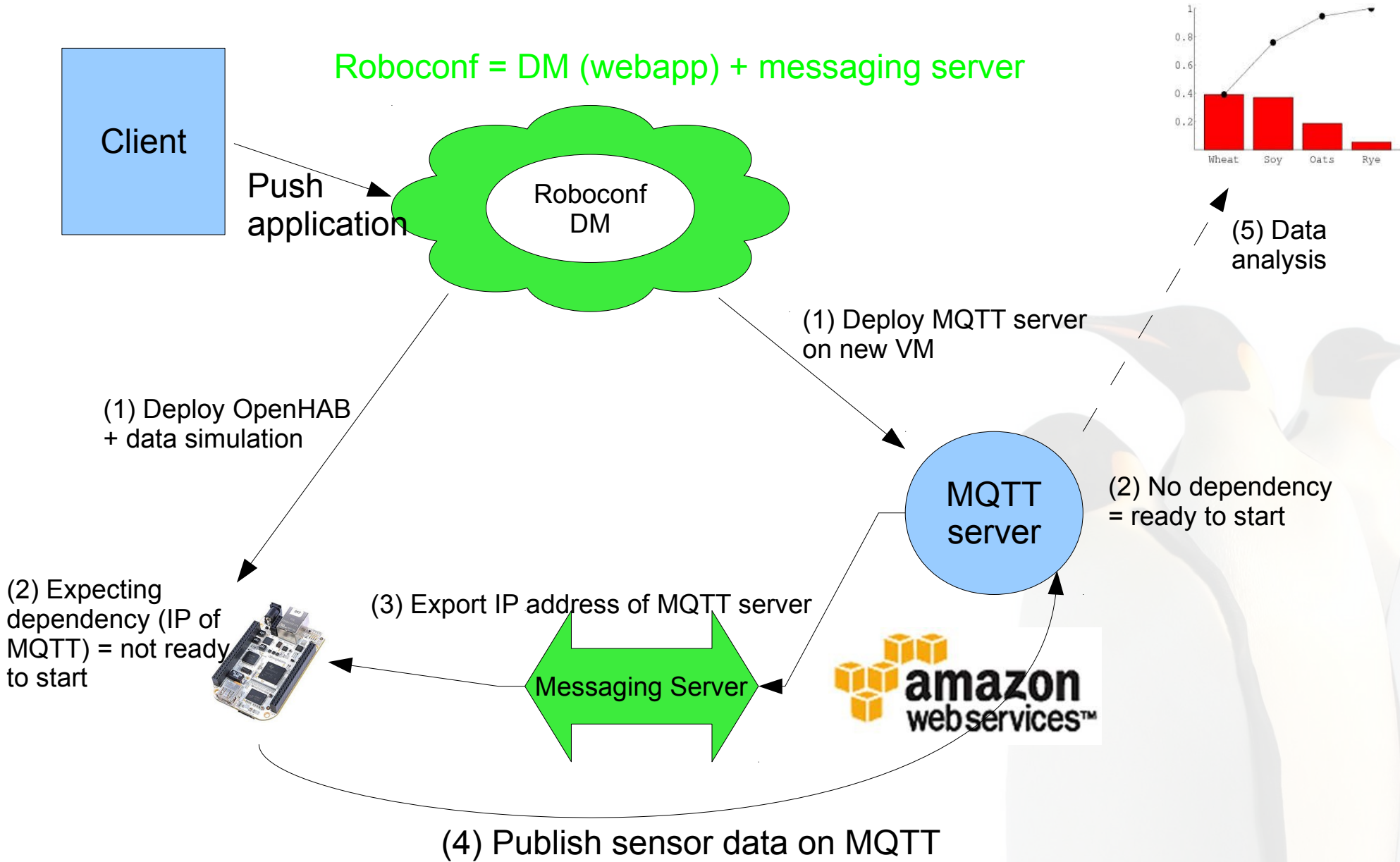


```

VMbeagle {
  alias: Beagle board;
  installer: iaas;
  children: openhab;
}
instanceof VMbeagle {
  name: Beagle1;
}
VMaws {
  alias: Virtual machine;
  installer: iaas;
  children: mqtt;
}
instanceof VMaws {
  name: VM_MQTT1;
}
openhab {
  installer: bash;
  exports: httpPort;
  imports: mqtt.ip;
}
instanceof openhab {
  name: openhab1;
  httpPort: 8080;
}
mqtt {
  installer: bash;
  exports: ip;
}
instanceof mqtt {
  name: MQTT1;
}
    
```



Roboconf = DM (webapp) + messaging server



Any question ?



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