Cloud Forward 2015

Automated deployment of a microservice-based monitoring infrastructure

Augusto Ciuffoletti

6 ottobre 2015

Introducing two topics

- The title:
  Automated deployment of a microservice-based monitoring infrastructure
- Microservices
- Monitoring on demand

Let us see how the two stories merge...

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  - a book in O'Reilly "animal series" by S Newman
- Principles:
  - each component in the system is designed to provide one small, well defined service
  - each component is a stand alone entity that interacts with others across a network with a well defined interface

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  - e.g., upgrade one single component
- agility in deployment
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- each component may use a different technology
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Find a match

- Monitoring is by nature split into small components (remember Nagios)
  - monitoring probes are small components, possibly embedded
  - monitoring data crosses a pipe of processors (anonymization, aggregation etc)
  - data is finally published using an endpoint reachable from the outside (database, web service)
- Each component is supported by a specific technology
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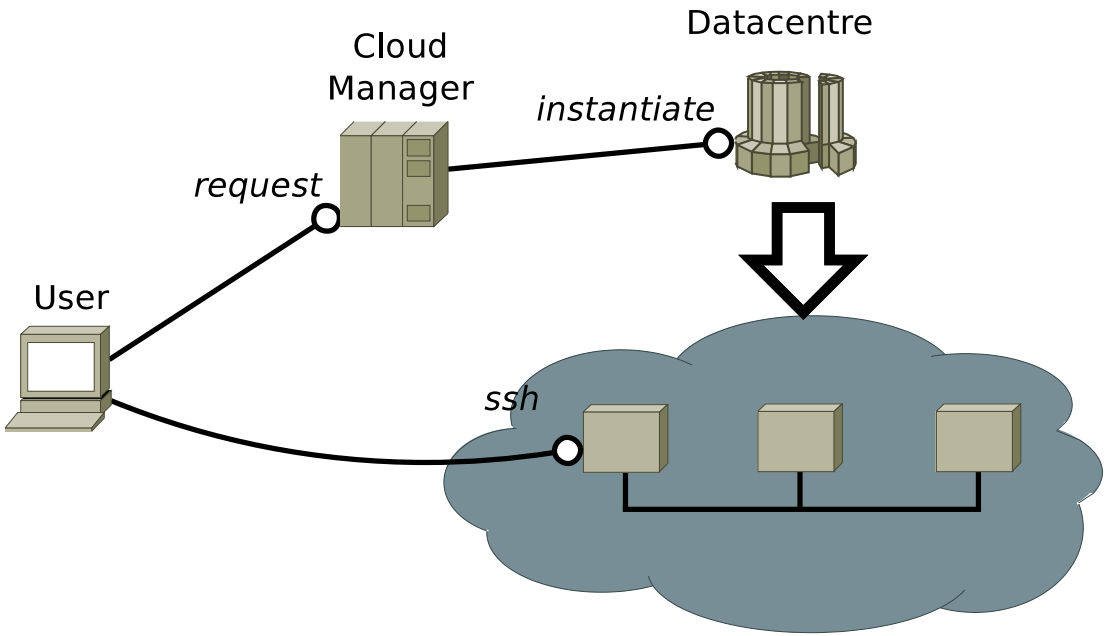
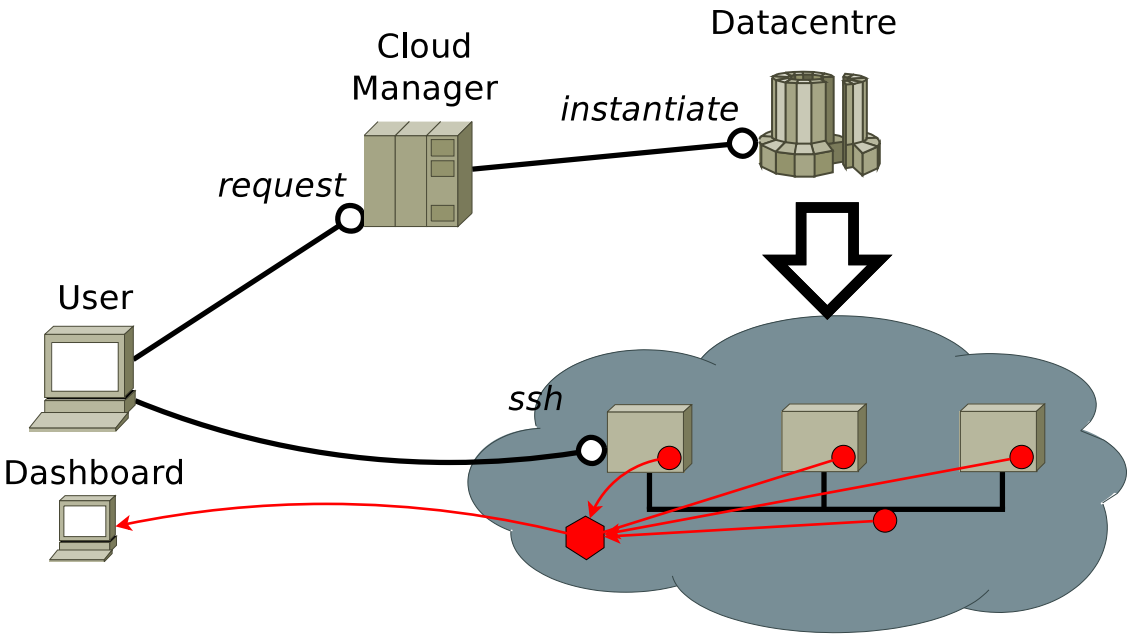
Summarizing: a IaaS provisioning



- IaaS is just for the example: could be PaaS or anything else

A monitoring infrastructure



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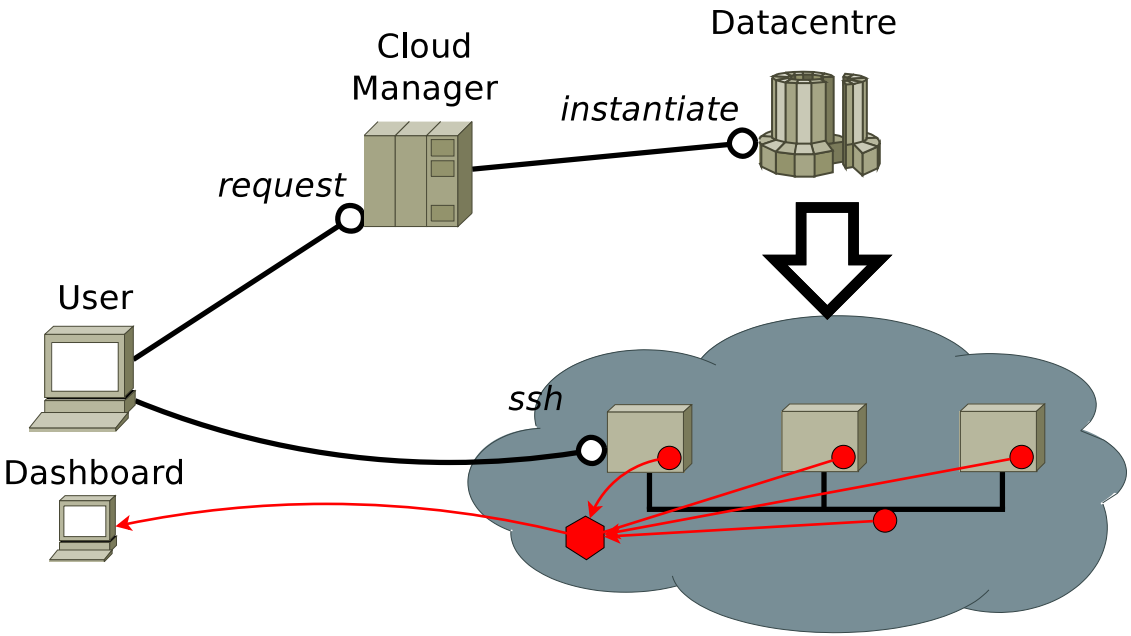

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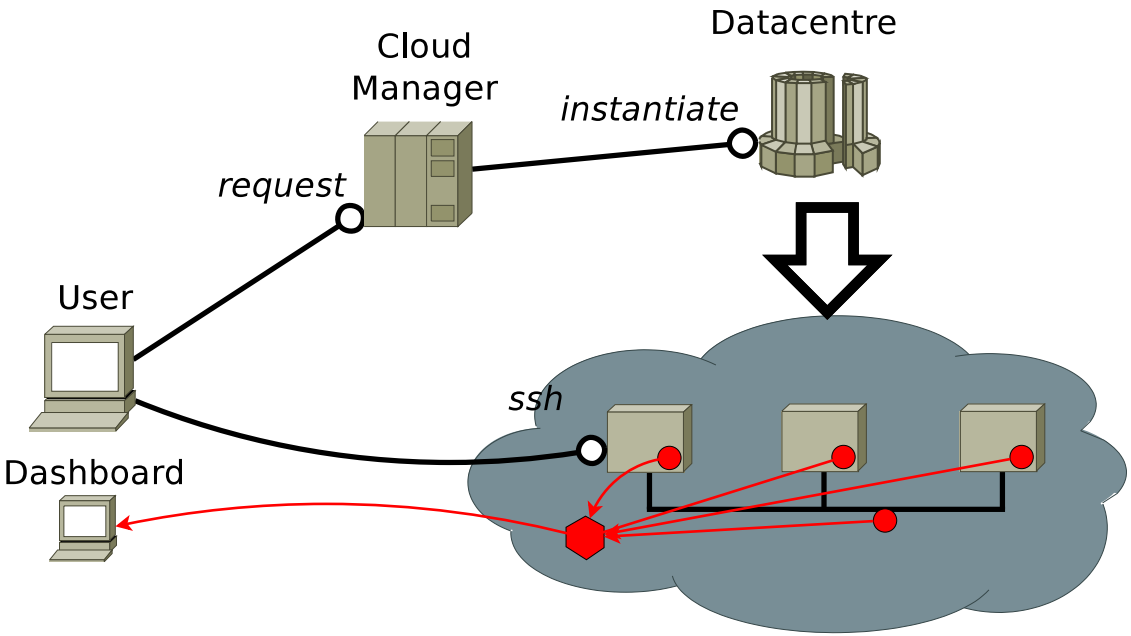

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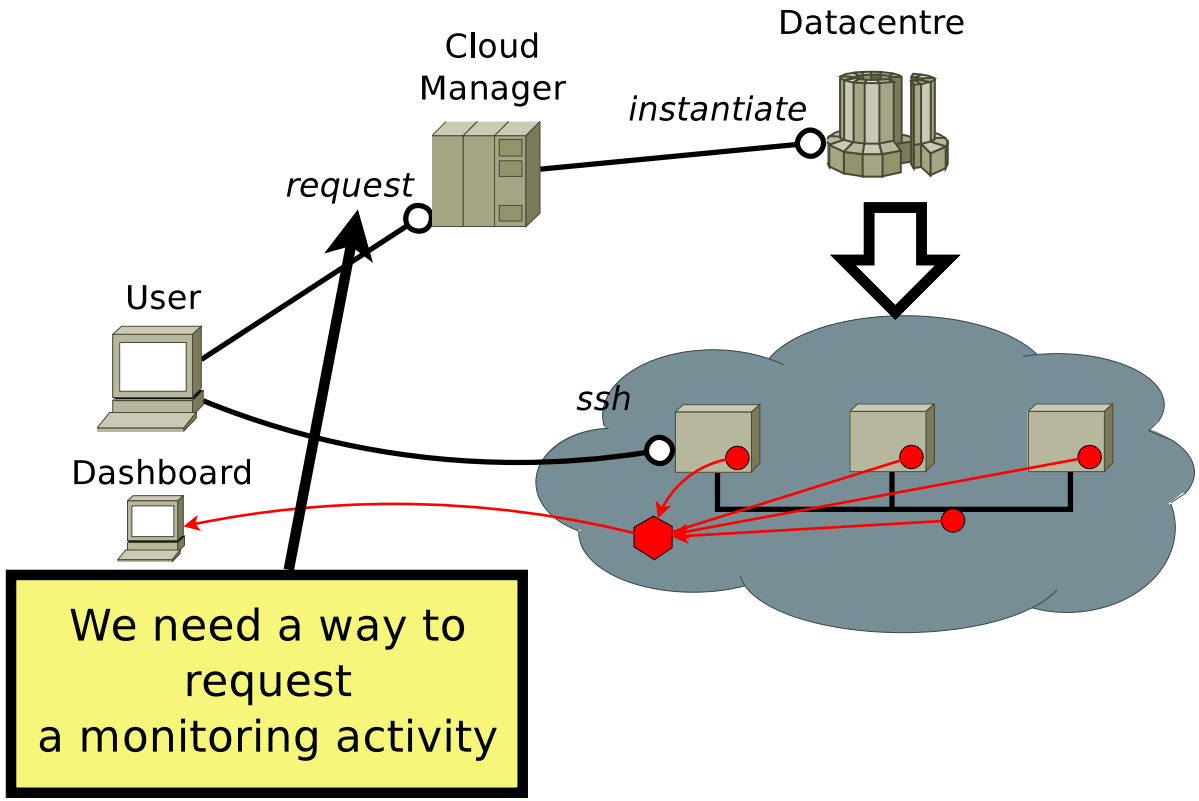

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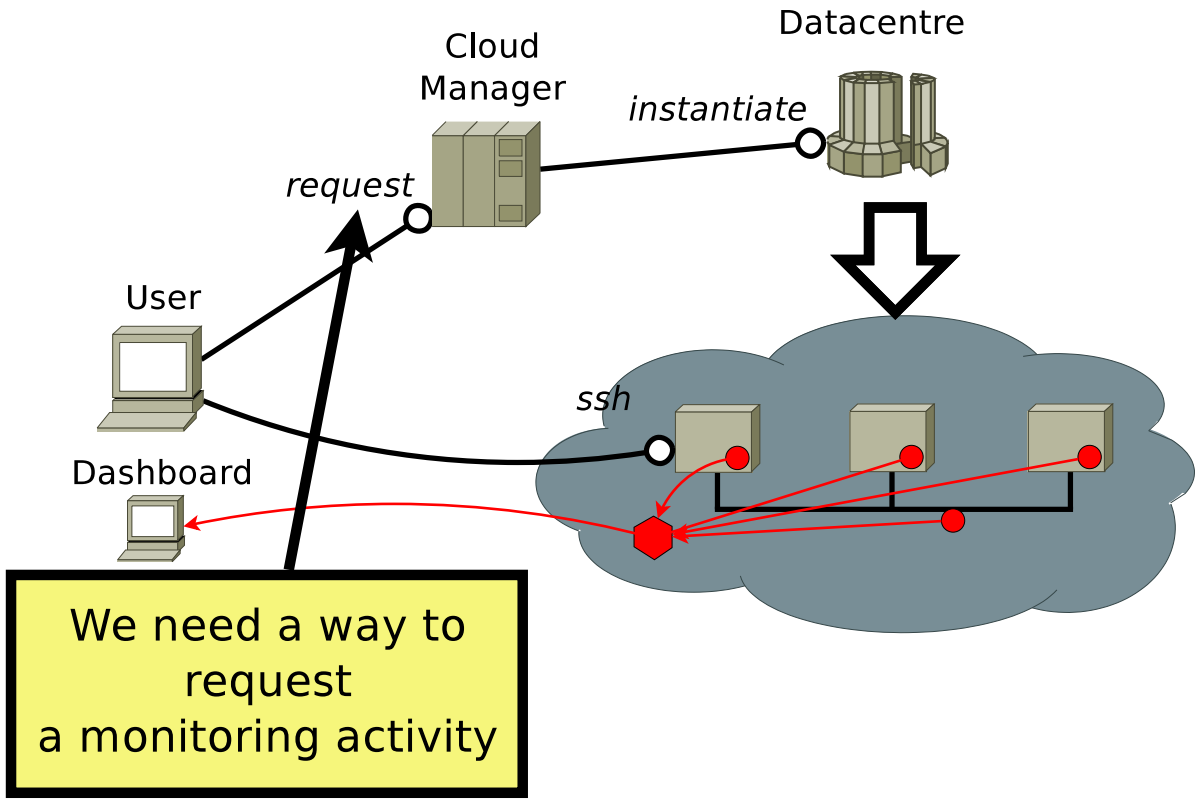

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- The interface is REST, therefore web-oriented
- The items accessed across the interface are entities
- One type of entity is the resource
- Another is the link, that connects two resources
- A type is characterized by standard features of the instances

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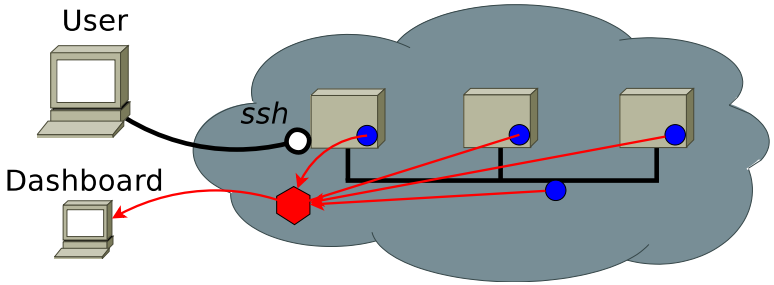

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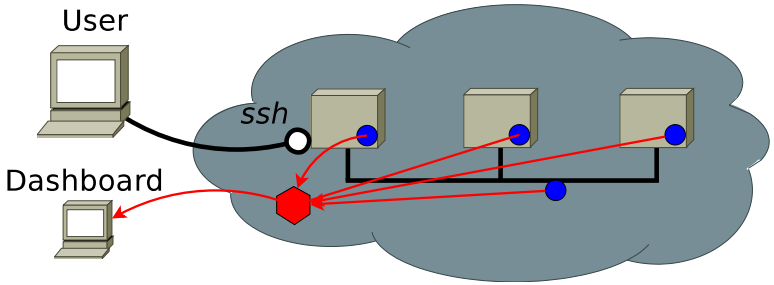

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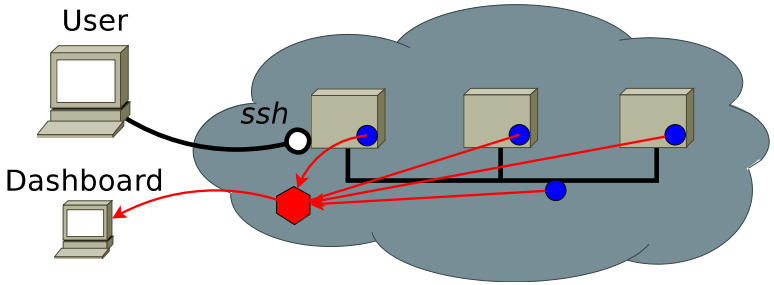

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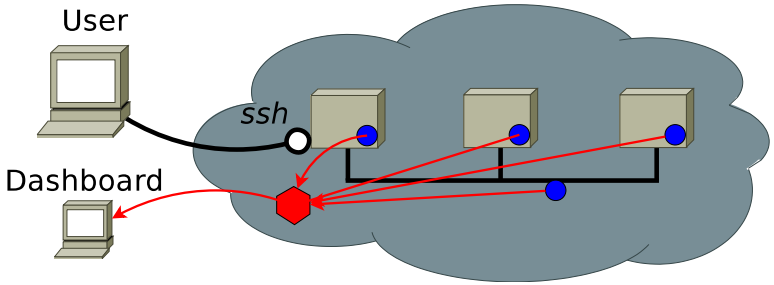

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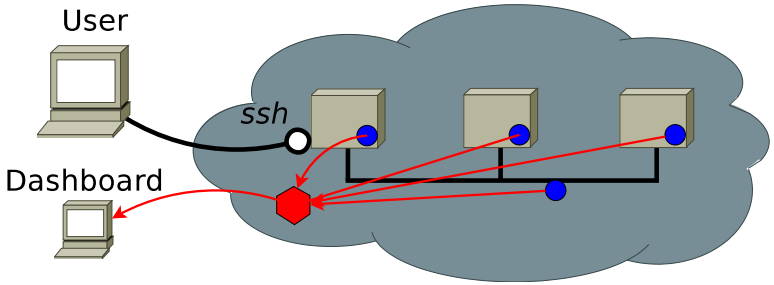

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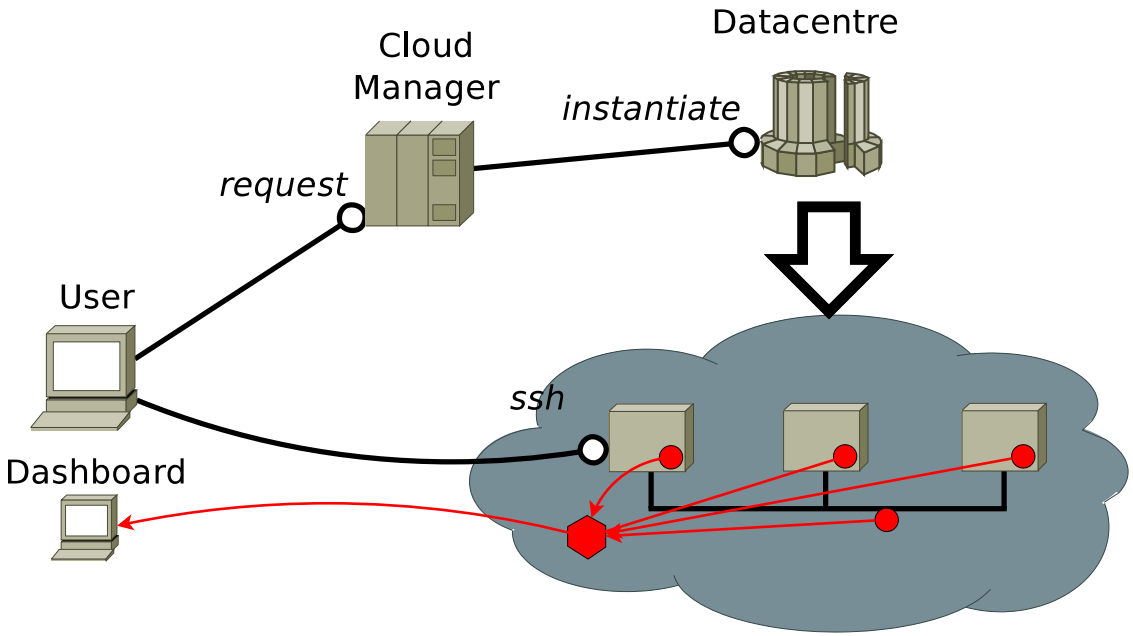

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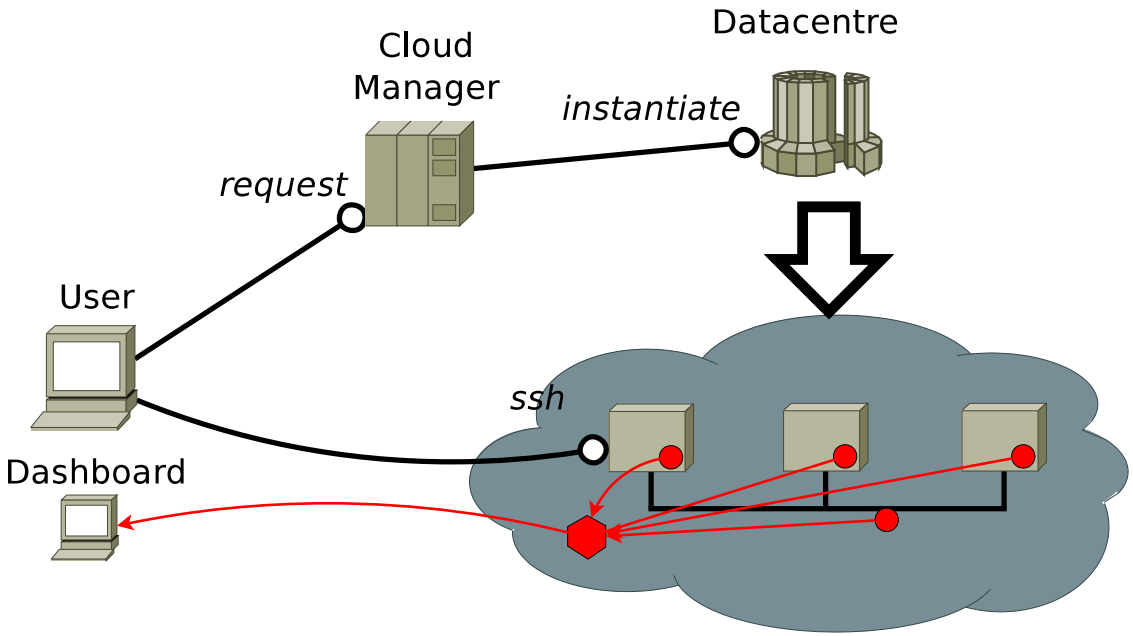

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  - upgradeable to a real deployment

Vintage programming but...

- For an early prototype we selected seasoned technologies: Java/Unix sockets/Unix Pipes
  - not bound to specific programming tools
  - better solutions do exist
- As a virtualization platform we selected Docker
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Deploying a demo infrastructure

- The minimal architecture (4 dockers):
  - one HTTP server to host the OCCI entities descriptions
  - one dashboard to display monitoring data
  - one monitored compute resource
  - one sensor resource
- In OCCI view

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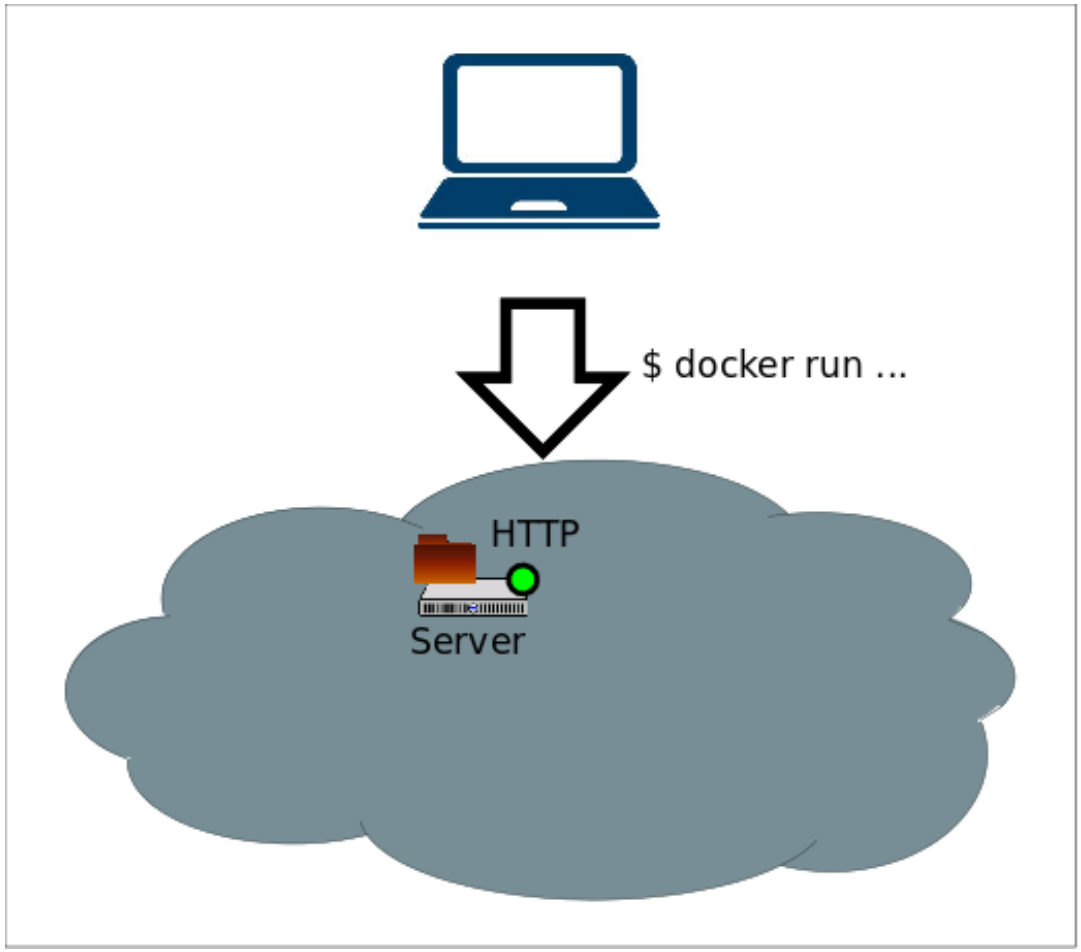
The web server



- The web server is deployed (with OCCI docs)
- this is part of the cloud infrastructure

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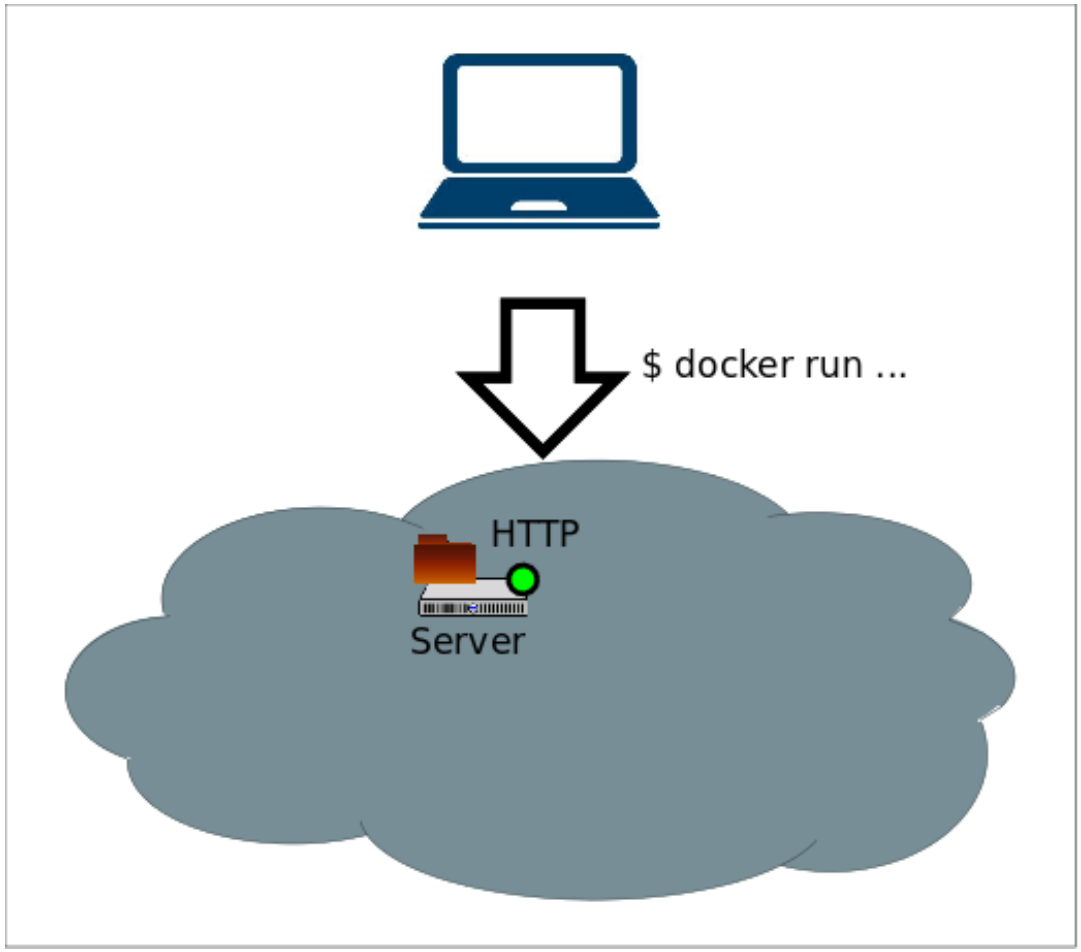

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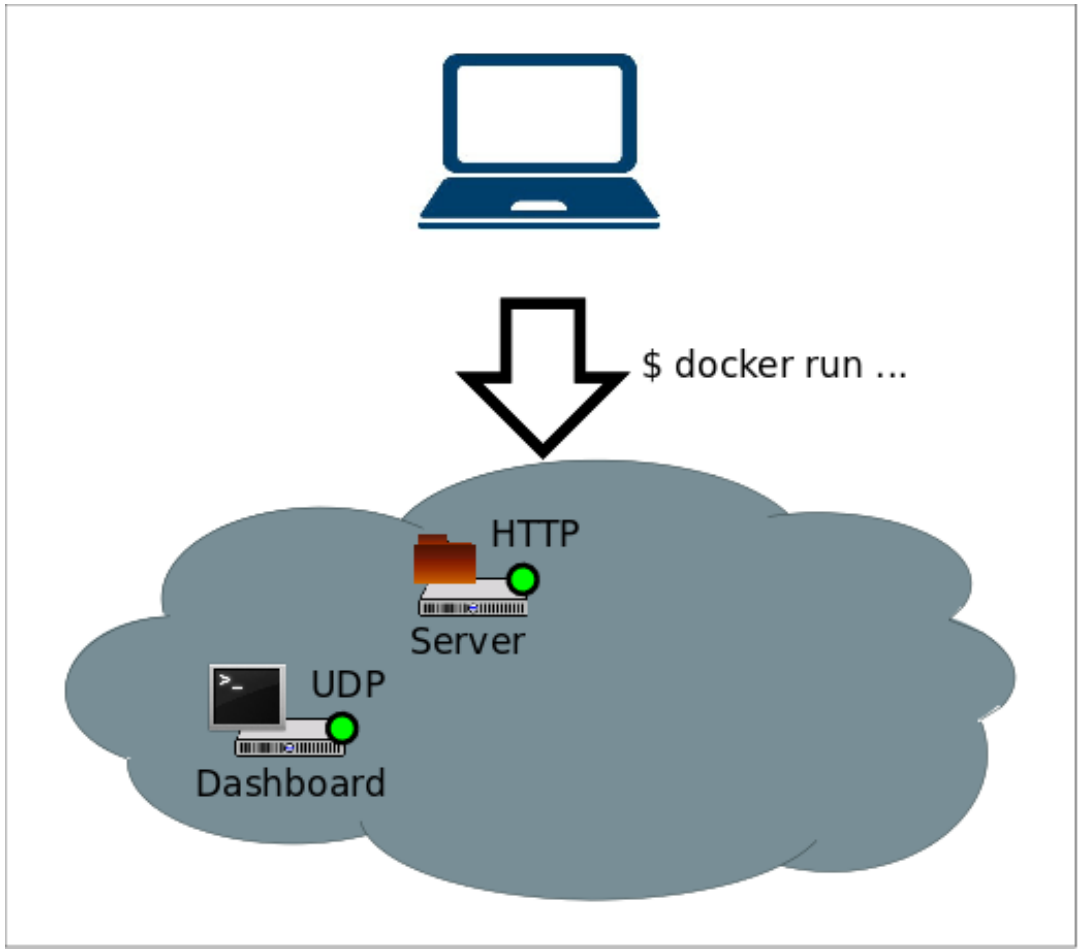

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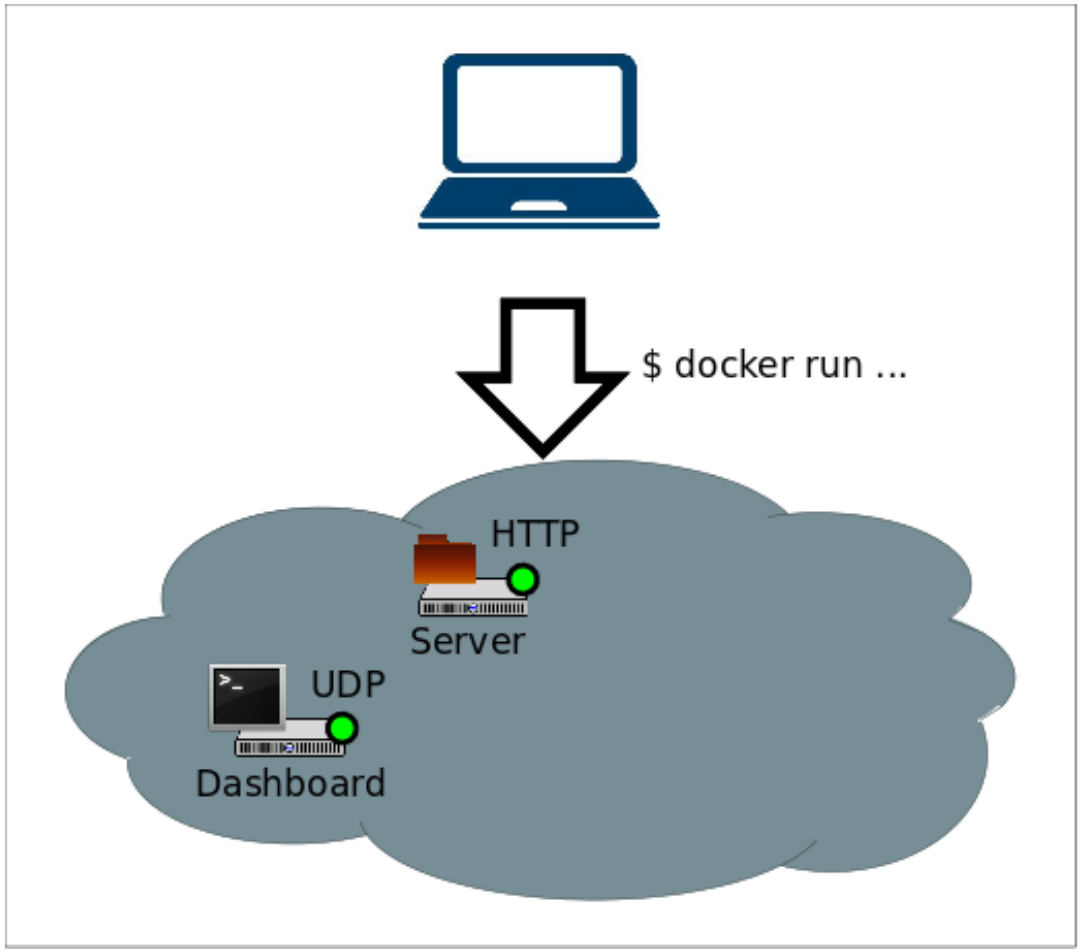

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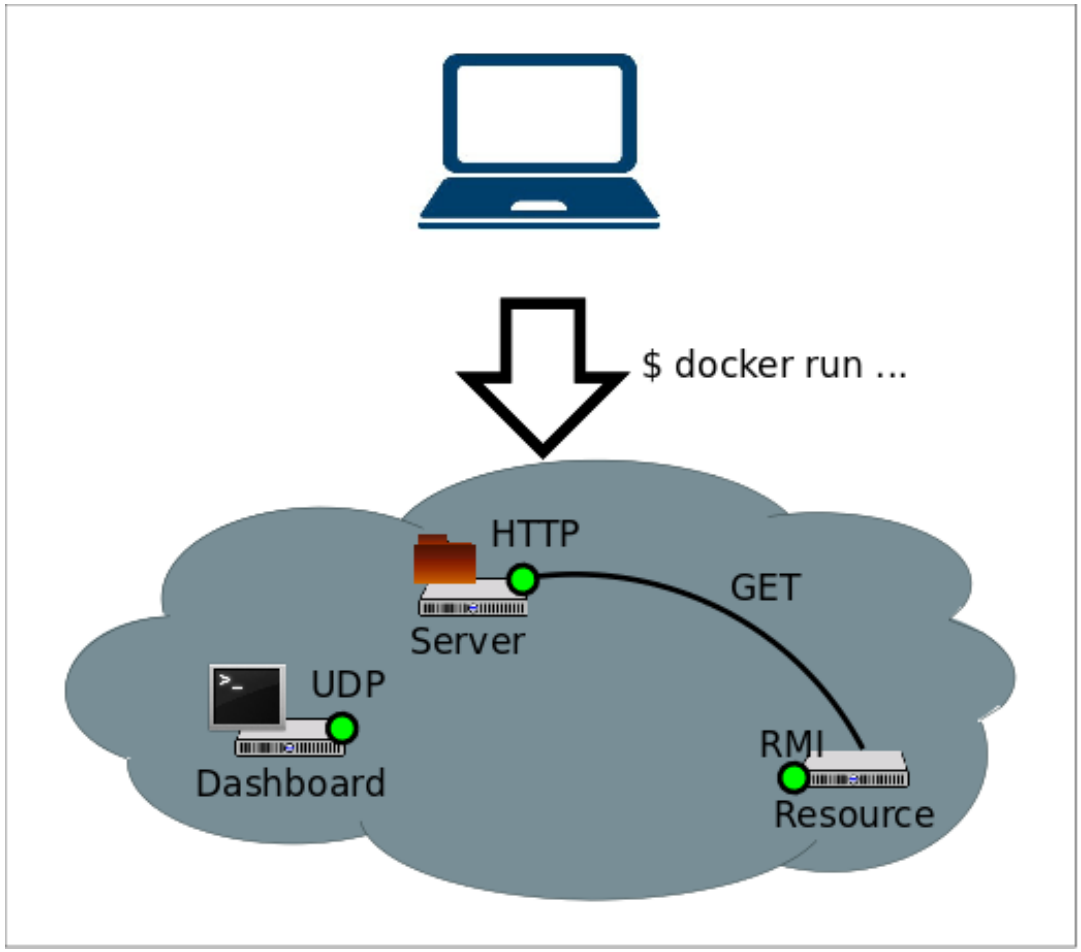
The computing resource



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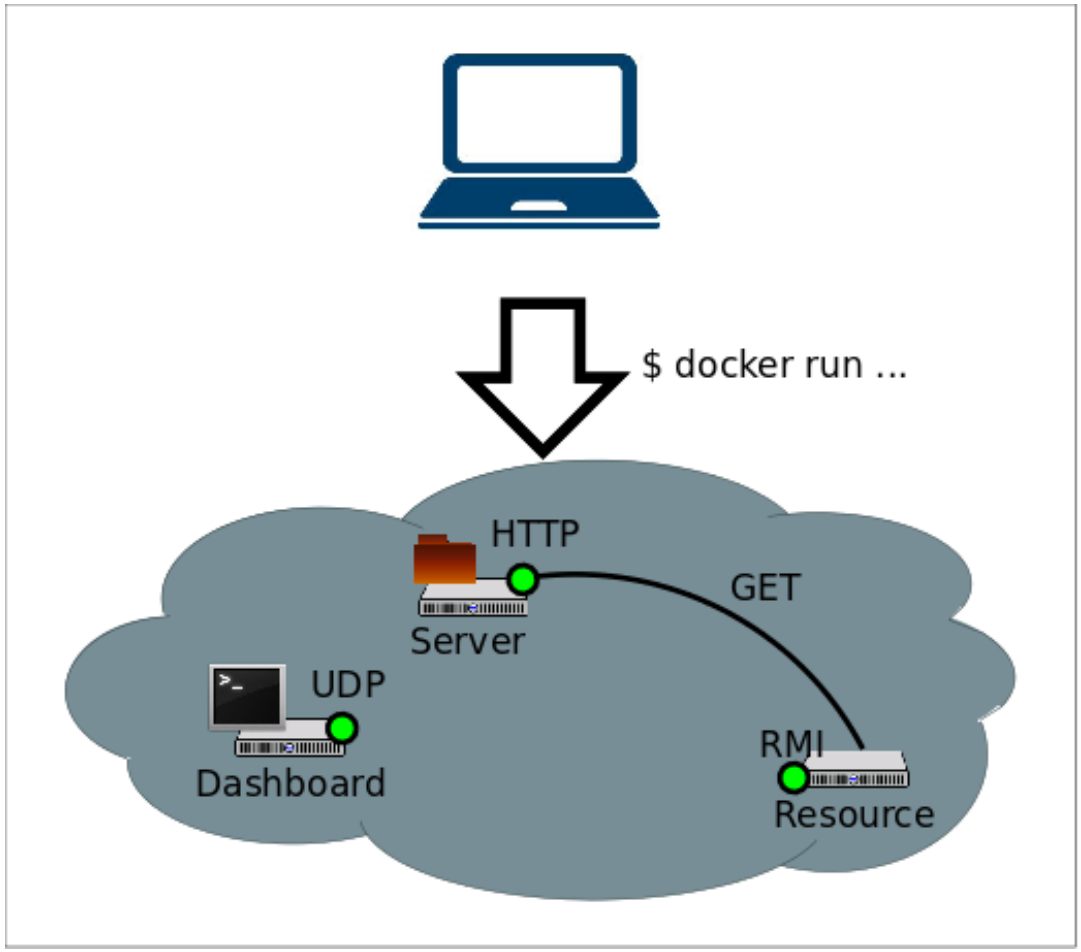

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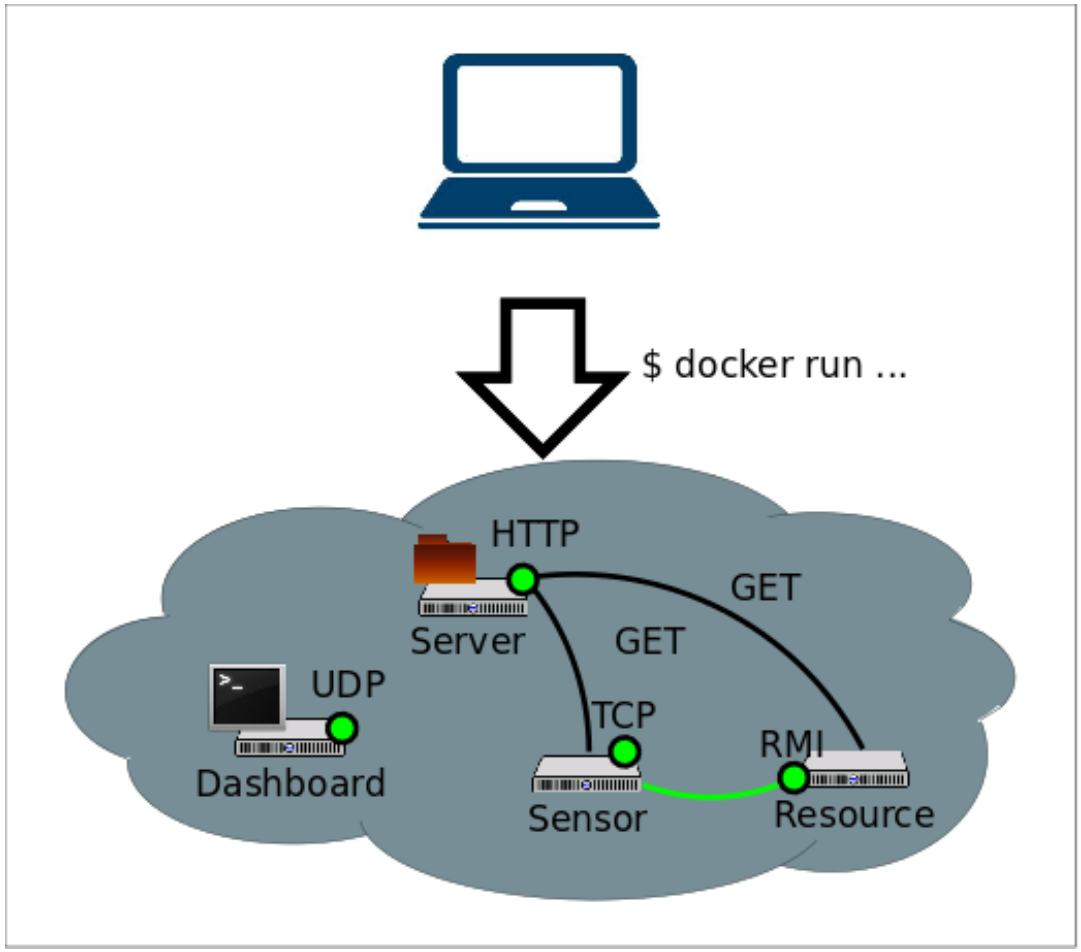

- It is the resource that implements the monitoring
- uploads the collector across the RMI interface

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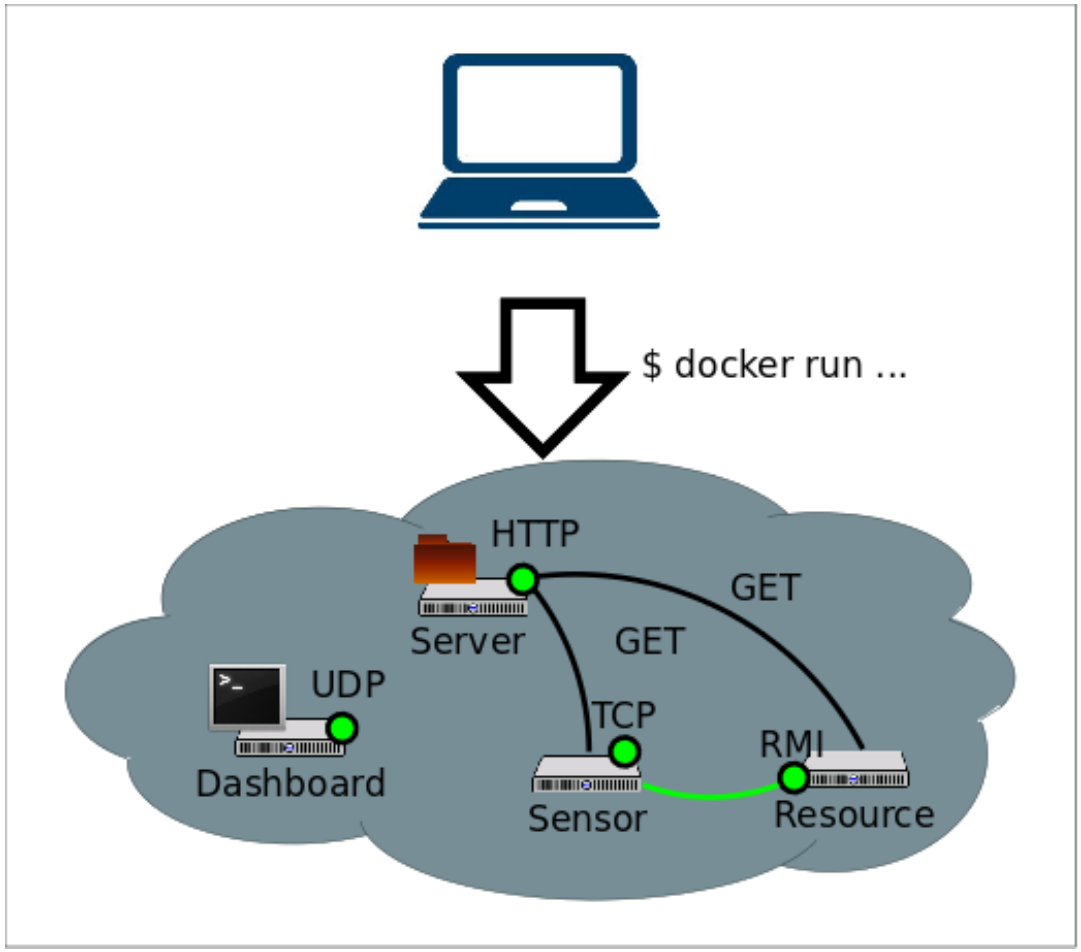

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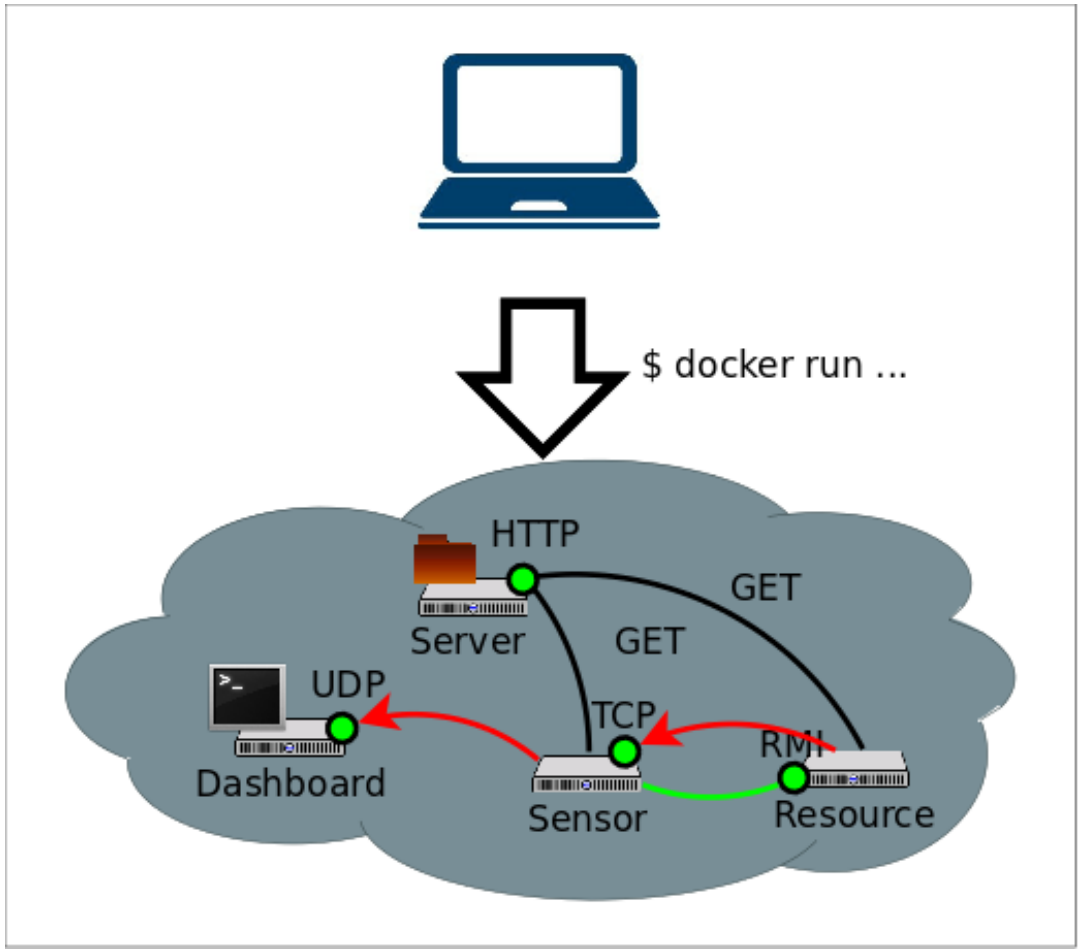

- The dashboard receives the probe measurements...
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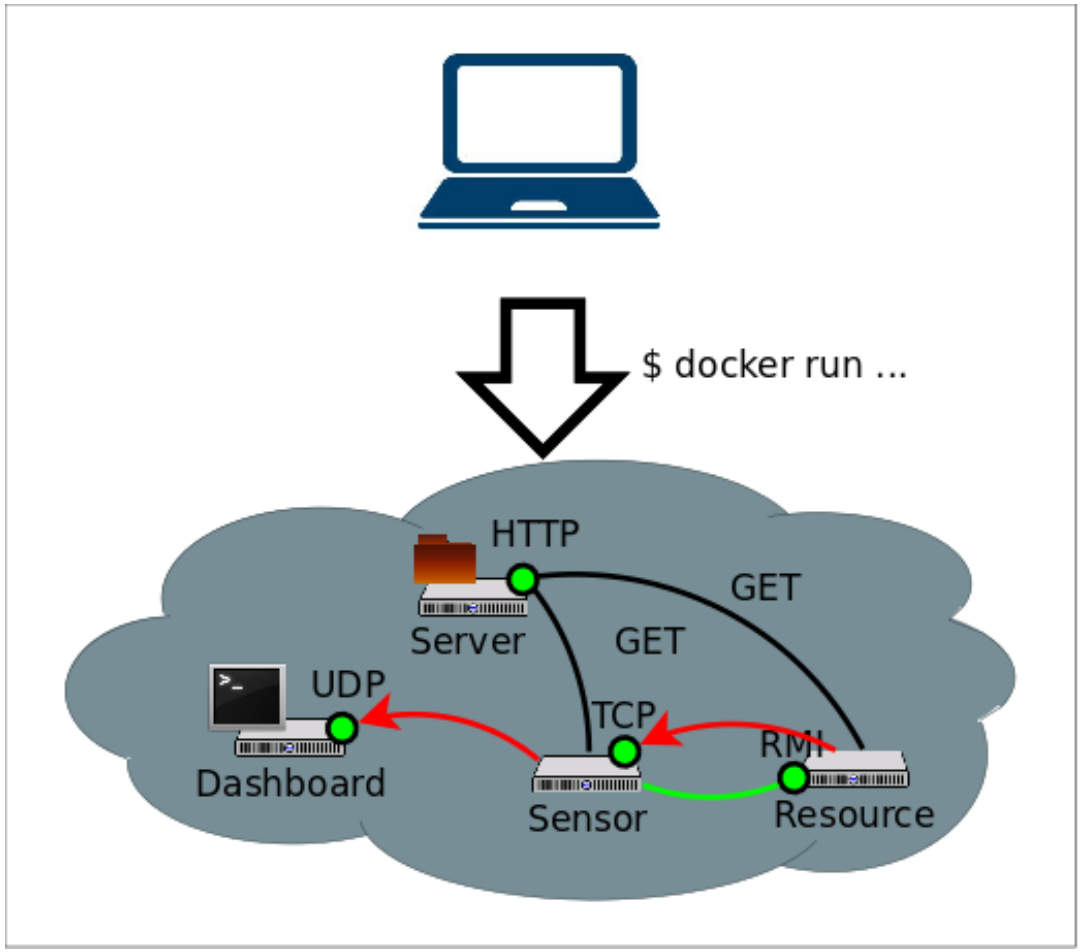

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