HYDRA

Multi-cloud application discovery, management and balancing

http://innotech.github.io/hydra/

What is Hydra?

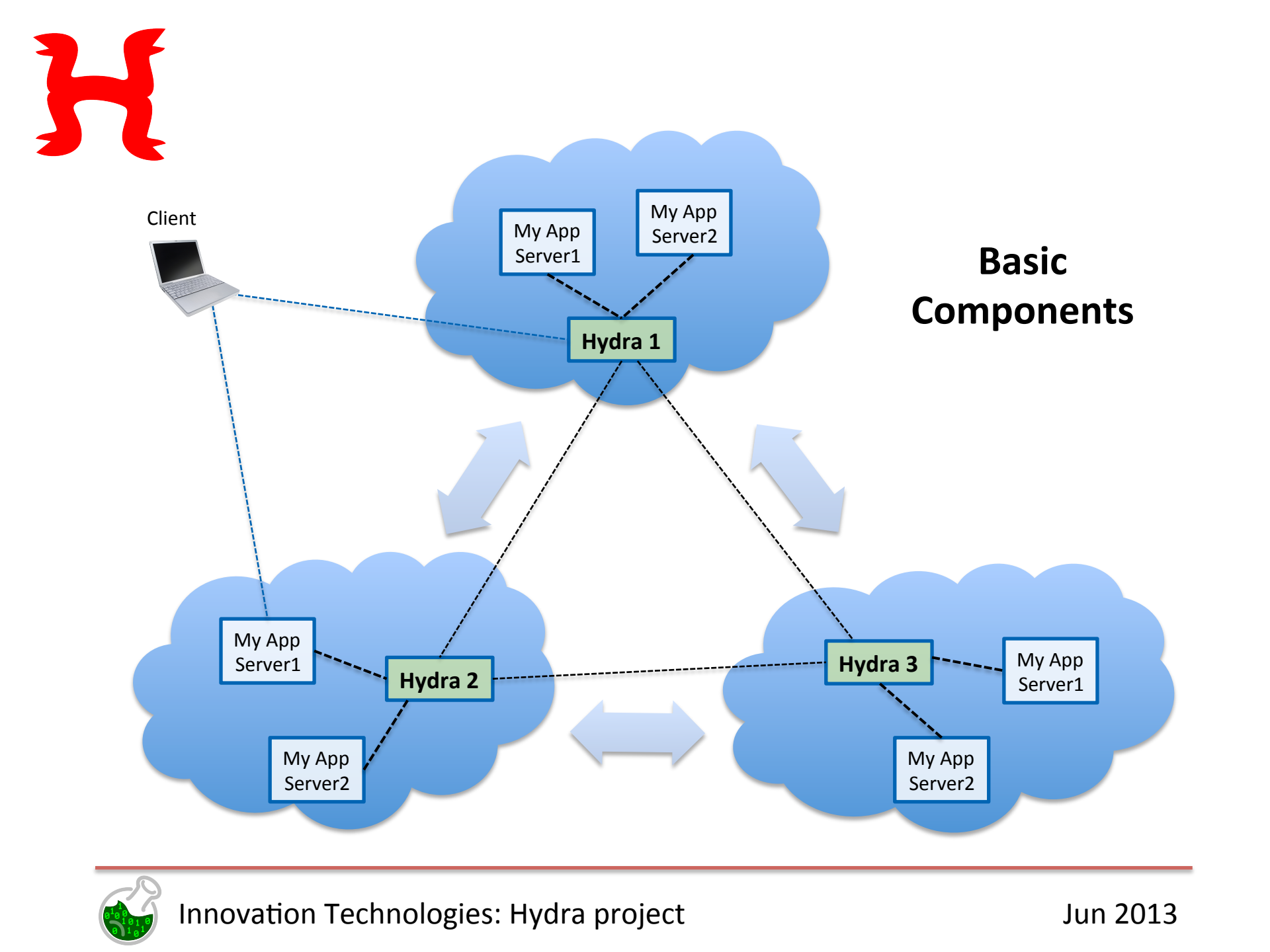
Hydra is an application that collect information about running servers and services and allow to potential users to discover and use these services efficiently.

Why Hydra?

- The big amount of web services available in Internet needs to be managed.
- The use of public and private clouds encourage the development of distributed web services.
- Hydra address the challenge by providing fast responses to “where is a service?” and “what server should I use?”.

How Hydra works?

- Collects data from applications by installing a probe in each server.
- The data is processed and stored in the Hydra server.
- Hydra server share information with other Hydra servers.
- Clients ask for information about an application to an Hydra server.
- Clients directly connect with the right server.


Client
My App Server1
My App Server2
Hydra 1
Basic Components
My App Server1
Hydra 2
My App Server2
Hydra 3
My App Server1
My App Server2

Basic Components

- App Manager Probe (Server -> App Manager)
- App Manager (App -> Hydra communication)
- Hydra Server
  - Server API (Hydra <- Hydra)
  - Client API (Client <- Hydra)
- Hydra Client
- Hydra System Monitor

Working example videos

- Hydra and service Time set up and Synchronization.
- Service Time and basic Balance.
- Advance balance.
- Fault tolerance.

http://www.youtube.com/user/InnotechHydraProject

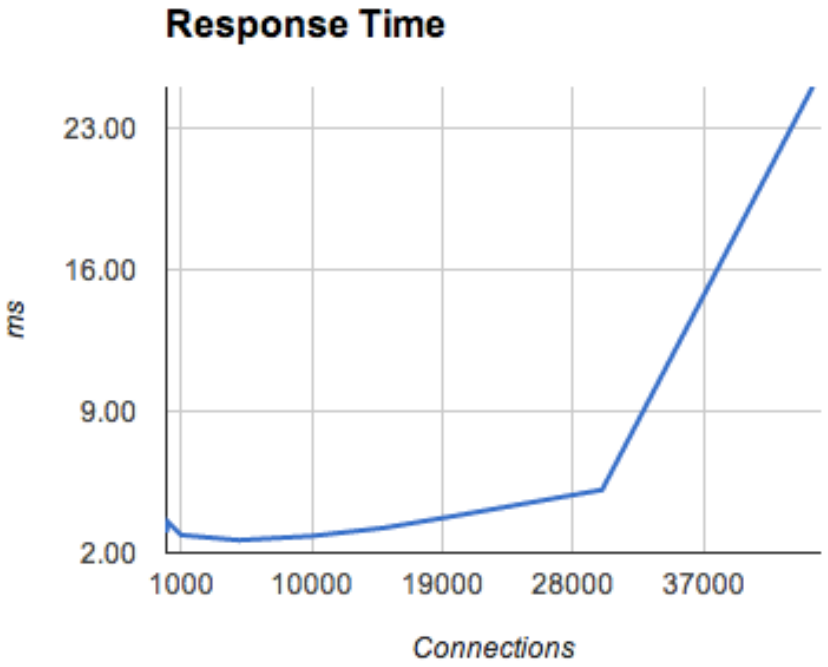
Balance Policies (Cloud & Local)

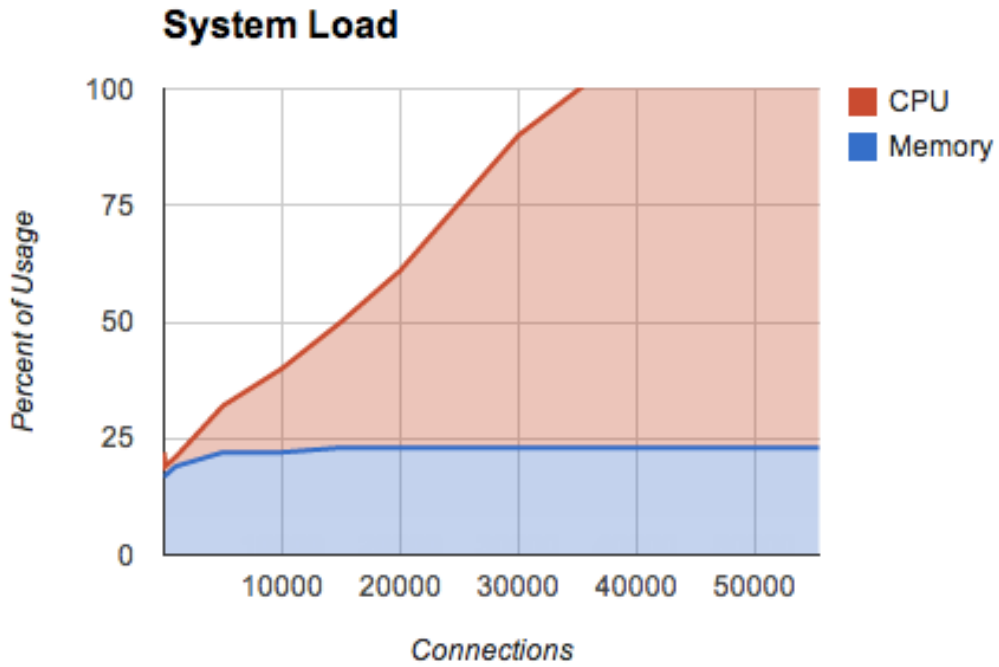
- Random
- Round Robin (See video example)
- Load (See video example)
- Cheapest (See video example)
- And ready for new policies…

Hydra Server Performance

Ubuntu 12.04 Server in Vbox 1 core, 1 Gb Ram, Mongo 2.4.4, Node 0.10.6 Up to 3 clients making random requests inside hypervisor along 1 minute			Testing an hydra server in this scenario: 2 clouds, 1 hydra per cloud, 2 servers per cloud Balancing: Cloud cheaper, local load			
Connectior	CPU usage (%)	Mem usage (%)	All Resp Time (ms)	Avg Resp Time (ms)	Resp/s	Resp/h
1	5	17	3	3,00	333	1.200.000
100	2	17	354	3,54	282	1.016.949
1000	2	19	2.880	2,88	347	1.250.000
5000	10	22	13.116	2,62	381	1.372.370
10000	18	22	28.283	2,83	354	1.272.849
15000	27	23	48.510	3,23	309	1.113.173
20000	38	23	76.812	3,84	260	937.354
30000	67	23	153.398	5,11	196	704.051
45000	96	23	1.158.352	25,74	39	139.854
55456	100	23	389.936.774	7.031,46	0	512

Hydra Server Performance





Conclusions

- Very easy to monitor and manage servers.
- Unique capability of Cloud balancing.
- Local balancing without expensive hardware or premium additional services.
- Inherit Fault Tolerance.
- Hydra balance itself.
- Only one hydra server per cloud is enough.

Future work

- User management.
- Improve system monitor.
- Blacklist for hydra synchronization.
- More balance strategies.
- Real cloud performance tests.