



# **Cross-organizational distributed systems and Clouds**

Solution for Exercise 2

Christopher B. Hauser

Institute of Information Resource Management

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## Lesson 1: Monitoring with InfluxData

You should have two instances in Openstack:

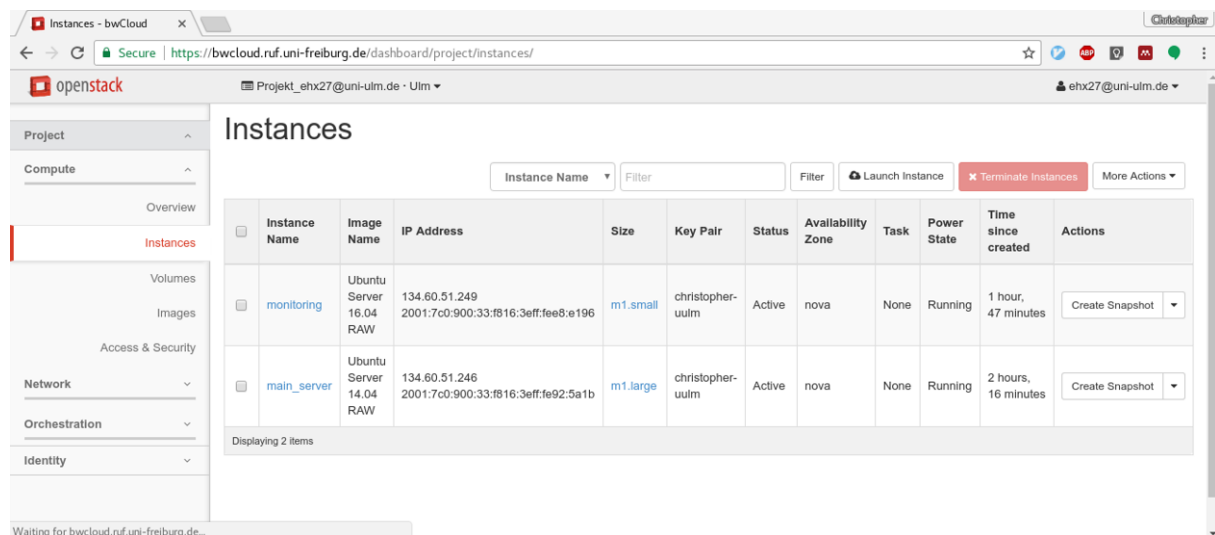


Figure 1: Instances in OpenStack

The Chronograf dashboard for your main-server instance should look like follows:

### Question: Parts and responsibilities of the TICK stack

### Question: What ports are used by influxdb?

By default, InfluxDB uses the following network ports: - TCP port 8086 is used for client-server communication over InfluxDB's HTTP API - TCP port 8088 is used for the RPC service for backup and restore

```
ubuntu@monitoring:~$ sudo netstat -tulpen
```

```
sudo: unable to resolve host monitoring
```

Active Internet connections (only servers)

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State	User	In
tcp	0	0	0.0.0.0:22	0.0.0.0:*	LISTEN	0	13017
tcp6	0	0	:::8086	:::*	LISTEN	999	18068
tcp6	0	0	:::22	:::*	LISTEN	0	13025
tcp6	0	0	:::8888	:::*	LISTEN	998	18308
tcp6	0	0	:::8088	:::*	LISTEN	999	18066
udp	0	0	0.0.0.0:68	0.0.0.0:*		0	13398

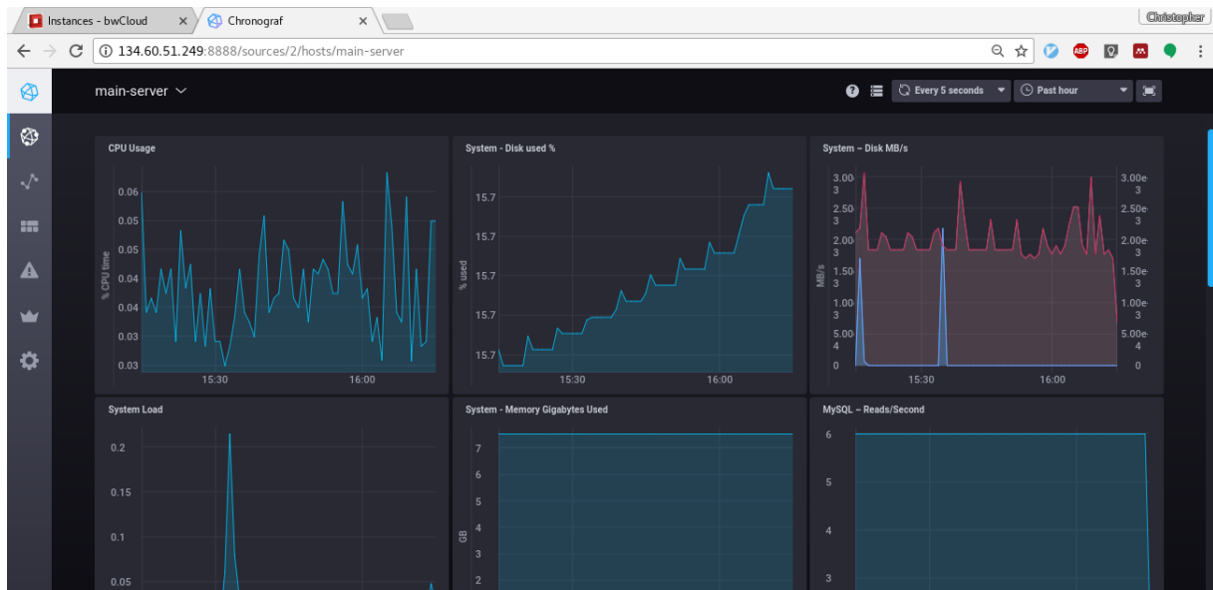


Figure 2: Chronograf Dashboard

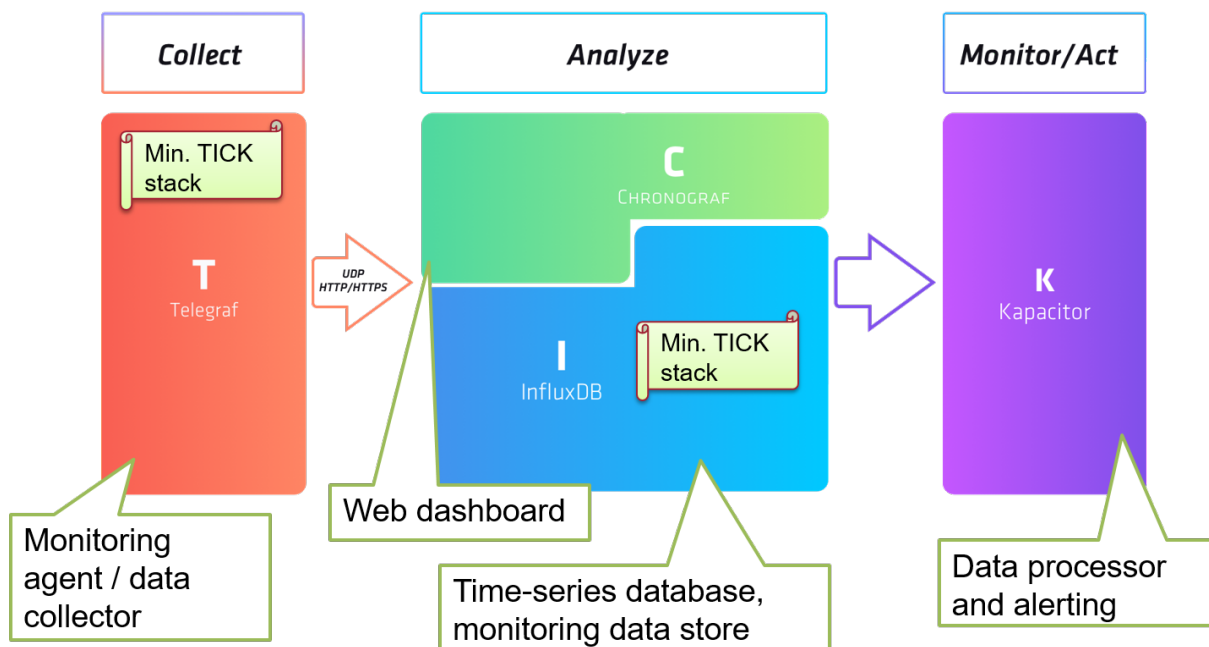


Figure 3: Components of InfluxData TICK stack

## Lesson 2: Vertical Scaling

### Stressing Mediawiki with small flavor

With a single thread on client side:

```

Concurrency Level:      1                      <<<<
Time taken for tests:    618.219 seconds
Complete requests:      5000
Failed requests:        4958
    (Connect: 0, Receive: 0, Length: 4958, Exceptions: 0)
Non-2xx responses:      5000
Total transferred:      58650042 bytes
HTML transferred:       56685042 bytes
Requests per second:    8.09 [#/sec] (mean)
Time per request:       123.644 [ms] (mean)
Time per request:       123.644 [ms] (mean, across all concurrent requests)
Transfer rate:          92.65 [Kbytes/sec] received

```

#### Connection Times (ms)

	min	mean[+/-sd]	median	max
Connect:	0	0 0.8	0	12
Processing:	101	123 21.5	121	1124
Waiting:	55	71 14.2	68	813
Total:	101	124 21.5	121	1124

#### Percentage of the requests served within a certain time (ms)

50%	121
66%	125
75%	127
80%	129
90%	135
95%	142
98%	152
99%	162
100%	1124 (longest request)



With ten concurrent client side threads:

```

Concurrency Level:      10                <<<<
Time taken for tests:   165.952 seconds
Complete requests:      5000
Failed requests:        4
    (Connect: 0, Receive: 0, Length: 4, Exceptions: 0)
Non-2xx responses:      5000
Total transferred:      58654996 bytes
HTML transferred:       56689996 bytes
Requests per second:    30.13 [#/sec] (mean)
Time per request:       331.903 [ms] (mean)
Time per request:       33.190 [ms] (mean, across all concurrent requests)
Transfer rate:          345.16 [Kbytes/sec] received
  
```

#### Connection Times (ms)

	min	mean[+/-sd]	median	max
Connect:	0	0 0.5	0	11
Processing:	89	332 57.8	333	501
Waiting:	76	284 50.9	285	442

Total:            90   332   57.8       333       501

Percentage of the requests served within a certain time (ms)

50%	333
66%	357
75%	372
80%	380
90%	406
95%	425
98%	447
99%	459
100%	501 (longest request)



## Stressing Mediawiki after vertical scaling

With a single thread on client side:

Concurrency Level:	1
Time taken for tests:	604.299 seconds
Complete requests:	5000
Failed requests:	4904

(Connect: 0, Receive: 0, Length: 4904, Exceptions: 0)

Non-2xx responses: 5000

Total transferred: 58650096 bytes

HTML transferred: 56685096 bytes

Requests per second: 8.27 [#/sec] (mean)

Time per request: 120.860 [ms] (mean)

Time per request: 120.860 [ms] (mean, across all concurrent requests)

Transfer rate: 94.78 [Kbytes/sec] received

#### Connection Times (ms)

	min	mean[+/-sd]	median	max
Connect:	0	0 0.1	0	2
Processing:	101	121 20.6	117	915
Waiting:	53	69 19.6	65	801
Total:	101	121 20.6	117	916

#### Percentage of the requests served within a certain time (ms)

50%	117
66%	121
75%	124
80%	126
90%	132
95%	140
98%	159
99%	177
100%	916 (longest request)



With ten concurrent client side threads:

```

Concurrency Level:      10
Time taken for tests:    79.773 seconds
Complete requests:      5000
Failed requests:        1324
    (Connect: 0, Receive: 0, Length: 1324, Exceptions: 0)
Non-2xx responses:      5000
Total transferred:      58653676 bytes
HTML transferred:       56688676 bytes
Requests per second:    62.68 [#/sec] (mean)
Time per request:       159.547 [ms] (mean)
Time per request:       15.955 [ms] (mean, across all concurrent requests)
Transfer rate:          718.02 [Kbytes/sec] received
  
```

Connection Times (ms)

	min	mean	mean[+/-sd]	median	max
Connect:	0	0	0.1	0	2
Processing:	61	159	36.8	156	313
Waiting:	53	134	28.8	132	272



Total:            61   159   36.8       156       314

Percentage of the requests served within a certain time (ms)

50%	156
66%	171
75%	182
80%	190
90%	209
95%	225
98%	243
99%	258
100%	314 (longest request)



## Conclusion

CPU cores	Threads	Requests / s
2	1	8 Req/s

CPU cores	Threads	Requests / s
2	10	30 Req/s
4	1	8 Req/s
4	10	60 Req/s

- Application is CPU bound
- For concurrent requests more vCPUs are improving a lot!
- Virtual scaling is limited to the largest available flavor.
- => unlimited scalability is not vertical.