OpenMetrics

Standing on the shoulders of Titans

Richard Hartmann,
RichiH@{freenode,OFTC,IRCnet},
richih@{fosdem,debian,richih}.org,
@TwitchiH

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'whoami'

- Richard "RichiH" Hartmann
- Swiss army chainsaw at SpaceNet
    - Currently responsible for building one of the most modern datacenters in Europe
    - ...and always looking for nice co-workers in the Munich area
- FOSDEM, DebConf, DENOGx, PromCon staff
- Author of https://github.com/RichiH/vcsh
- Debian Developer
- Prometheus team member

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Prometheus

What's Prometheus?

You can't talk about OpenMetrics without mentioning Prometheus

Prometheus

What's Prometheus?

Show of hands: Who has heard of Prometheus?

Problem statement

Before Prometheus

- Historically, the monitoring landscape has been highly fragmented
- Many solutions based on ancient technology
- Most data formats are proprietary, hard to implement, or both
- ..and most with hierarchical data models
- Almost none with a focus on metrics

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Problem statement

Before Prometheus

- Only thing approaching a standard: SNMP
- Who has heard of SNMP?
- Who likes SNMP?
- XKCD 927 applies

Problem statement

After Prometheus

- Prometheus has become a de-facto standard in cloud-native metric monitoring
- Ease of exposing data has lead to an explosion in compatible metrics endpoints
- Prometheus' exposition format is based on a lot of operational experience, but has been designed between few people
- Some other projects & vendors are torn about adopting something from a "competing" product
- Especially traditional vendor prefer to support official standards

Problem statement

Goldrush

- So about fragmentation...
- Cloud native is in the buzz phase
- Explosive growth always equals goldrush and stake claiming, aka fragmentation
- I don't have a profit motive, so I can easily decide to try and consolidate this space without profit loss
  - ..so that's what I decided to do

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People

Acknowledgements

- Main work has been done by
  - Prometheus team
    - Ben Kochie
    - Brian Brazil
    - myself
  - Google
    - Sumeer Bhola
  - Uber
    - Jerome Froelich
    - Rob Skillington

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People

First commitments, too many for full list

- Cloudflare
- CNCF at large
- GitLab
- Google
- Grafana
- InfluxData
- Prometheus ;)
- RobustPerception
- SpaceNet
- Uber

Plans

Approach

- Spin out Prometheus exposition format into its own standard
    - Neutral brand
    - Umbrella for wider cooperation in FLOSS and industry
- Broadening designer base ensures covering of many/all use cases
- Official standard (work in progress)
    - IETF RFC
    - Registered content-type/MIME-type
    - Maybe IANA port assignment

Plans

Current status

- We finished the discussion phase and moved into implementation
  - Still finding minor bugs during implementation
- RFC currently blocked on me finding time
- Prometheus: experimental support since 2.5.0
- Python client library: experimental support since 0.4.0
- Test your own OM output:
  robustperception.io/checking-openmetrics-output-is-valid
  - Google and Uber want to create another reference parser to weed out bugs

Plans

Next steps

- Full OpenMetrics support in Prometheus, InfluxDB, OpenCensus, M3DB, etc
- Spreading the word
- CNCF sandbox to incubating

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Plans

Beyond cloud

- OpenMetrics is intended to go beyond "just" cloud-native fields
- Want to get more traditional projects and vendors on board
  - Arista already on board
  - Vertiv very interested

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Beyond metrics

- OpenMetrics supports more than just metrics
- Every single data point in a time series can point to one single event
- Especially useful if you emit one trace id per histogram bucket, i.e. exemplars
- Some integrations already support this concept, e.g. OpenCensus
- Ingestors are free to discard this optional data, e.g. Prometheus

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Plans

Bringing observability back together

- IT architectures breathe
- Out/Insourcing, Mainframe/client-server/containers, etc
- You solve the current problem, and then face another
- By focussing on Metrics, Prometheus breathed in
- OpenMetrics intends to breathe out by creating one consistent user story encompassing all events in the next version
    - OpenStats - OpenMetrics for push
    - Events - Logs, Traces, Coredumps, whatever

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Looks

Prometheus

```
http_requests_total{env="prod",method="post",code="200"} 1027
http_requests_total{env="prod",method="post",code="400"} 3
http_requests_total{env="prod",method="post",code="500"} 12
http_requests_total{env="prod",method="get",code="200"} 20
http_requests_total{env="test",method="post",code="200"} 372
http_requests_total{env="test",method="post",code="400"} 75
```

Looks

OpenMetrics

```
http_requests_total{env="prod",method="post",code="200"} 1027
http_requests_total{env="prod",method="post",code="400"} 3
http_requests_total{env="prod",method="post",code="500"} 12
http_requests_total{env="prod",method="get",code="200"} 20
http_requests_total{env="test",method="post",code="200"} 372
http_requests_total{env="test",method="post",code="400"} 75
```

Looks

OpenMetrics

Prometheus

```
http_requests_total{env="prod",method="post",code="200"} 1027 1544554800000
```

OpenMetrics

```
http_requests_total{env="prod",method="post",code="200"} 1027 1544554800

histogram_bucket{le="1"} 123 # {foo="bar"} 42 1544554800
histogram_bucket{le="2"} 234 # {foo="bar"} 23 1544554799.123
histogram_bucket{le="3"} 345 1544554800 # {foo="bar"} 11 1544554799
```

Further reading

- Prometheus 2017 Dev Summit: `https://docs.google.com/document/d/1DaHFao0saZ3MDt9yuuxLaCQg8WGadO8s44i3cxSARcM/edit`
- OpenMetrics: `https://github.com/OpenObservability/OpenMetrics`
- OpenMetrics mailing list: `https://groups.google.com/forum/#\protect\kern-.1667em\relaxforum/openmetrics`
- This and other talks: `https://github.com/RichiH/talks/`

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Thanks!

Thanks for listening!

Questions?

Email me if you want a job in Munich.

See slide footer for contact info.