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Prometheus: Unsung Heroes

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Maurice Hilleman

- Attributed to saving more lives than anyone else in history
- developed over 40 vaccines: measles, mumps, hepatitis A, hepatitis B, chickenpox, meningitis, pneumonia, among many others



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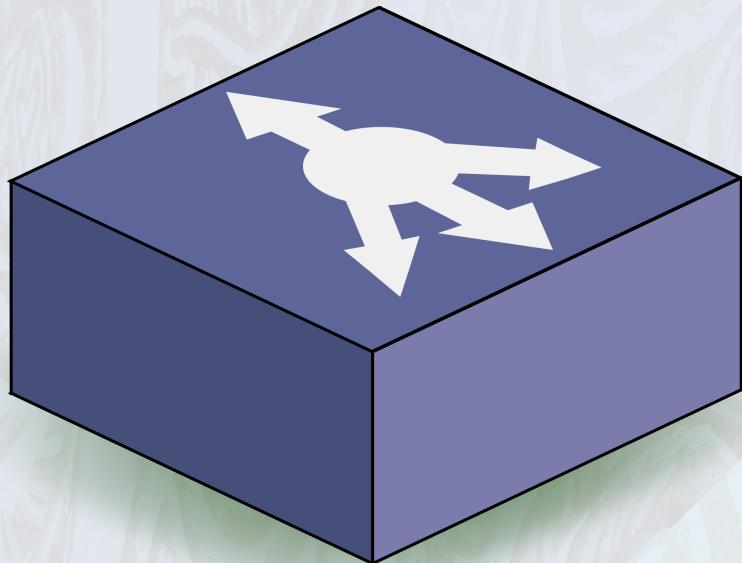
Norman Ernest Borlaug

- Credited with saving over a billion people worldwide from starvation.
- Led the introduction of these high-yielding varieties combined with modern agricultural production techniques to Mexico, Pakistan and India.



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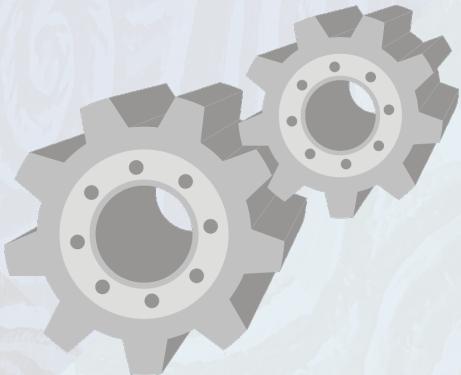
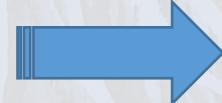
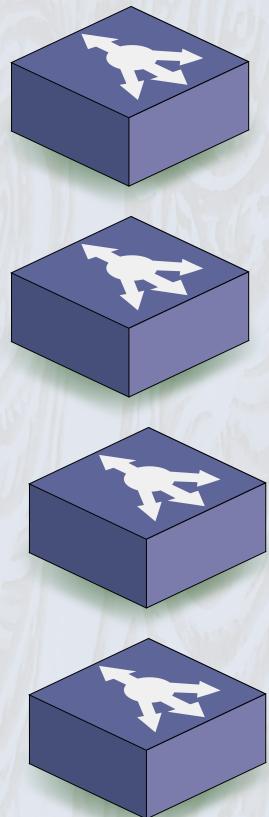
The Problem

- Closed sourced load balancer
- Reduced graphing capabilities
- No alert routing options
- Impossible to integrate out of the box to dashboards



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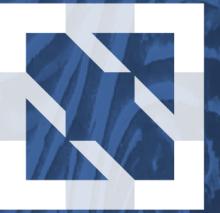
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syslog2carbon



graphite



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mtail



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mtail

- Tool for extracting metrics from application logs
- Uses regular expressions to extract information.
- Metrics are exported for scraping or they can be periodically pushed.



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counter line_count

```
/$/ {  
    line_count++  
}
```



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```
[2017-02-23 00:14:48] Beginning capuccino foam
[2017-02-23 00:14:52] Beginning latte foam
[2017-02-23 00:15:00] End capuccino foam
[2017-02-23 00:15:01] Beginning capuccino brew
[2017-02-23 00:15:26] End latte foam
[2017-02-23 00:15:27] Beginning latte brew
[2017-02-23 00:15:30] End capuccino brew
[2017-02-23 00:15:48] End latte brew
[2017-02-23 00:15:49] Please descale machine
```



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Exported vars, single definition

counter warnings

gauge duration by type, stage

hidden gauge start by type, stage

```
const LOGDATA /\s(?P<type>\w+)\s(?P<stage>\w+)/
```



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decorators

```
def fetchtime {
    /^\[(?P<date>\d+-\d+-\d+\s\d+:\d+:\d+)\]/
        strftime($date, "2006-01-02 03:04:05")
    next
}
```



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BONUS: Golang's time.Parse()



```
Mon Jan 2 15:04:05 MST 2006 #(MST is GMT-0700)
```

```
01/02 03:04:05PM '06 -0700
```

```
"2017-02-23 00:14:48" -> "2006-01-02 03:04:05"
```



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```
@fetchtime {
    /Beginning/ + LOGDATA {
        start[$type][$stage] = timestamp()
    }
    /End/ + LOGDATA {
        duration[$type][$stage] = timestamp() - start[$type][$stage]
        del start[$type][$stage]
    }
    otherwise {
        warnings++
    }
}
```



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demo



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counter balancer_http by vserver,code,datacenter,pool

```
// + BALANCER_LINE {
    $code >= 200 {
        $code <= 299 {
            balancer_http[$vserver]["2XX"][$dc][$pool]++
        }
    $code >= 400 {
        $code <= 499 {
            balancer_http[$vserver]["4XX"][$dc][$pool]++
        }
    $code >= 500 {
        $code <= 599 {
            balancer_http[$vserver]["5XX"][$dc][$pool]++
        }
    }
}
```

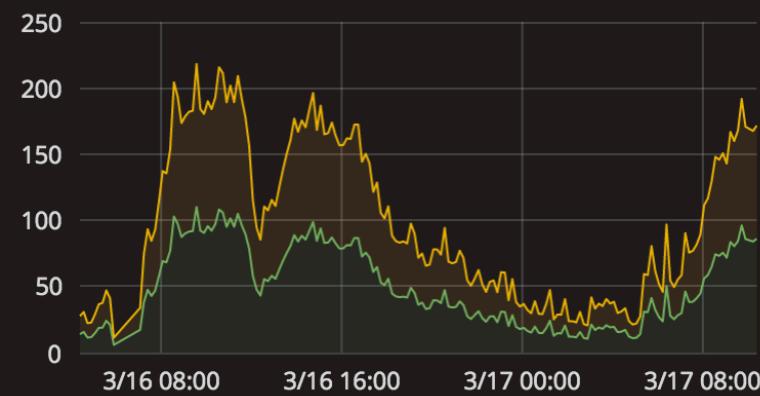


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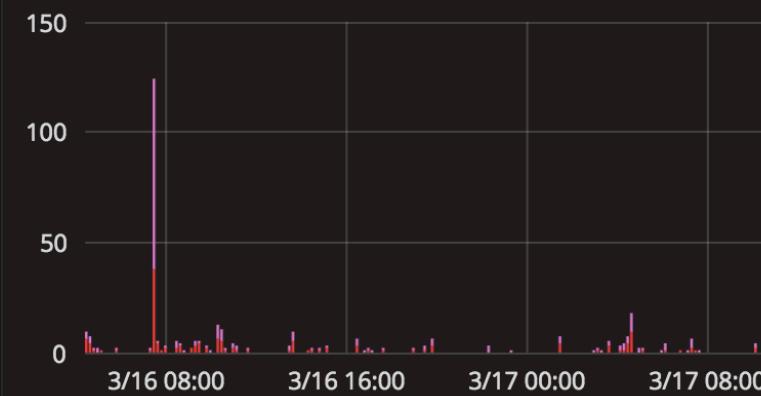
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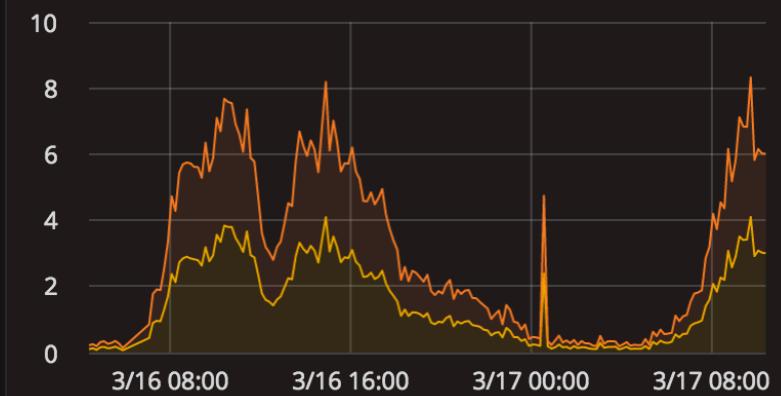
Rate Web LB HTTP 2XXs [5m]



Rate Web LB HTTP 5XXs [5m]



Rate Web LB HTTP 4XXs [5m]



Our results

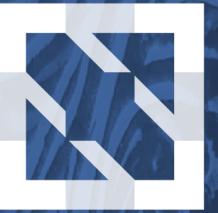


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Mtail wrap-up

- Is it perfect? NO
 - regular expression set somehow limited
 - currently if there is a parse error mtail will stop logging
 - no official releases
- Alternatives:
 - using fluentd/logstash to store data into elasticsearch.
 - grok exporter: https://github.com/fstab/grok_exporter



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snmp_exporter



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snmp_exporter

- exposes information gathered from SNMP for use by the Prometheus monitoring system
- Two components:
 - An **exporter** that does the actual scraping
 - A **generator** that creates the configuration



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SNMP

- Simple Network Monitoring Protocol
- Widely used protocol for collecting and organizing information about managed devices on IP networks
- 3 basic components: manager, managed device + agent
- `snmp_exporter` acts as a manager for fetching data.



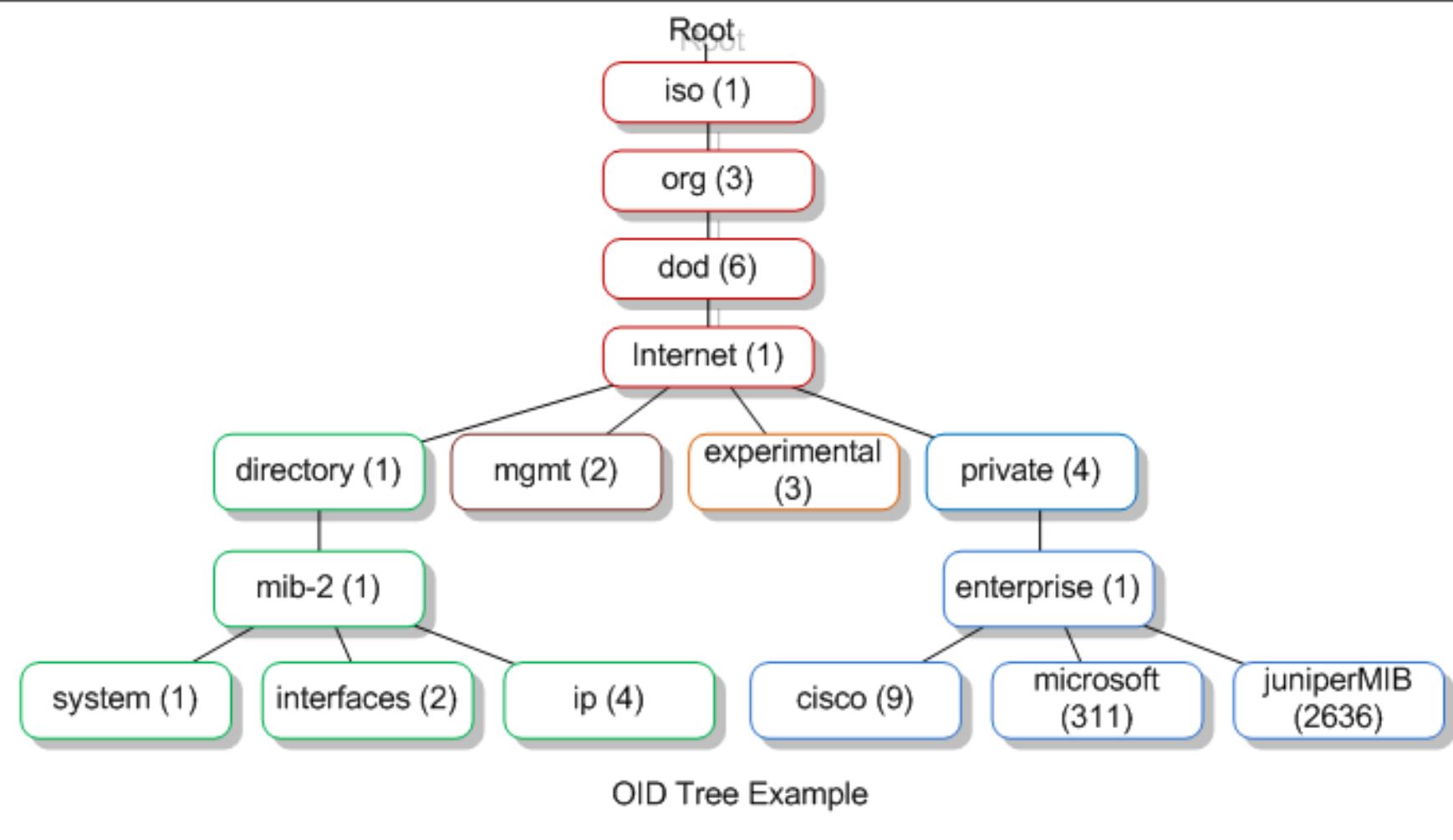
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Object Identifiers (OIDs)





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Management Information Database (MIB)

- Contains definitions and info about the properties of managed resources and the services that the agents support.
- Best guide to the real capabilities of an SNMP device



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Generator tool

- An extremely useful tool for configuring snmp_exporter
- Must be built separately from snmp_exporter as it depends on Net-SNMP set of tools, also your own MIB files must be provided
- Configure by a simple generator.yml file



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generator.yml

```
modules:  
zxtm:  
  version: 2  
  auth:  
    community: somecommunitystring  
walk:  
  - 1.3.6.1.4.1.7146.1.2.1.10 #totalConn  
  - 1.3.6.1.4.1.7146.1.2.2.2 #virtualserverTable  
  - 1.3.6.1.4.1.7146.1.2.3.2 #poolTable
```



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snmp_exporter: snmp.yml

```
zxtm:  
  walk:  
    - 1.3.6.1.4.1.7146.1.2.1.10  
    - 1.3.6.1.4.1.7146.1.2.2.2  
    - 1.3.6.1.4.1.7146.1.2.3.2  
  metrics:  
    - name: totalConn  
      oid: 1.3.6.1.4.1.7146.1.2.1.10  
      type: counter
```



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snmp_exporter

```
./snmp_exporter \
-log.format "logger:stdout?json=true" \
-log.level "debug" \
-config.file "snmp.yml" \
-web.listen-address "9116"
```



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Prometheus config

```
scrape_configs:
  - job_name: 'snmp'
    static_configs:
      - targets:
          - loadbalancer.internal.ch # SNMP device.
    metrics_path: /snmp
    params:
      module: [zxtm]
    relabel_configs:
      - source_labels: [__address__]
        target_label: __param_target
      - source_labels: [__param_target]
        target_label: instance
      - target_label: __address__
        replacement: 127.0.0.1:9116 # SNMP exporter.
```



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snmp_exporter wrap-up

- Alternatives:
 - A full fledged NMS like LibreNMS
 - Write your own script using some of the Net-SNMP based libraries

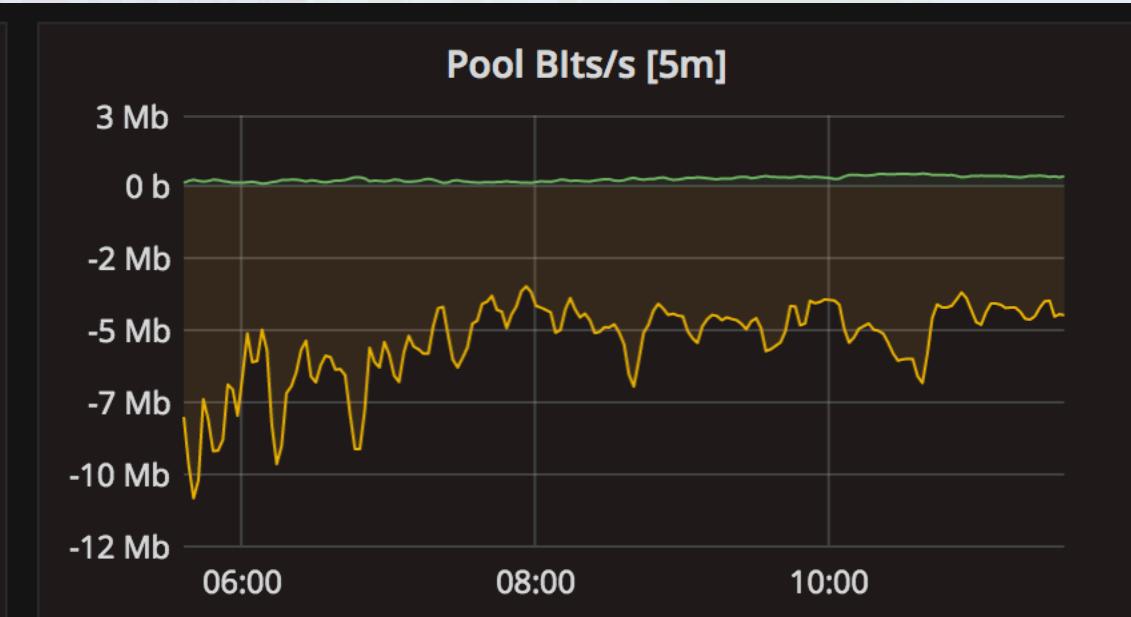
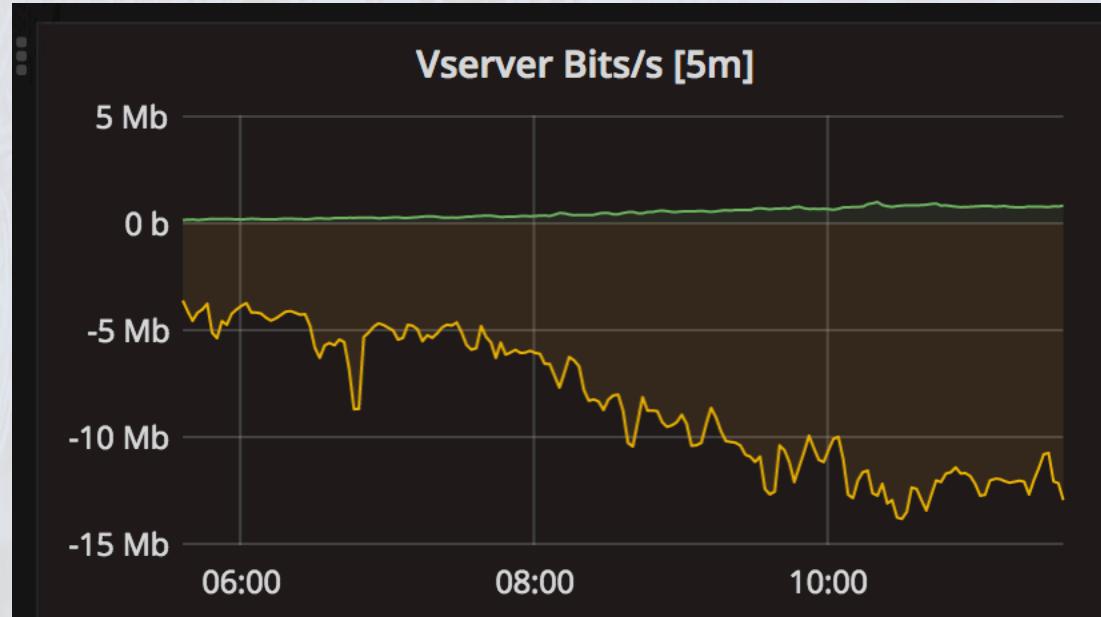


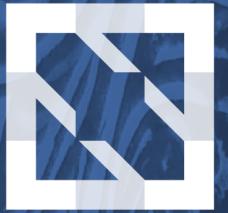
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Our results:





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Questions?



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Thank you!

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