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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

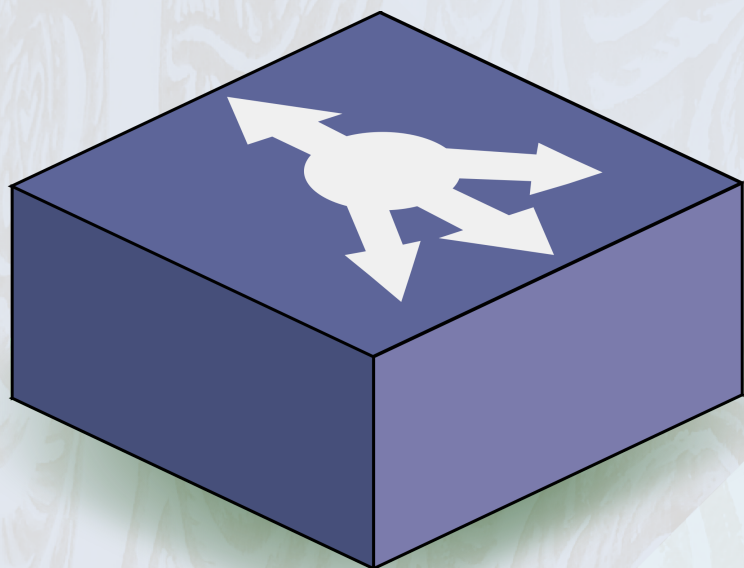
- Credited with saving over a billion people worldwide from starvation.
- Led the introduction of these high-yielding varieties combined with modern agricultural production techniques to Mexico, Pakistan and India.



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## The Problem

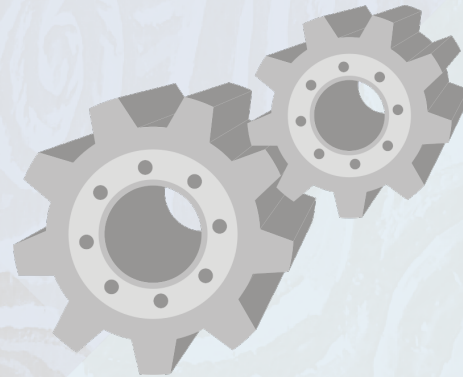
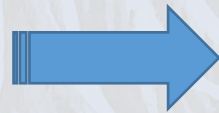
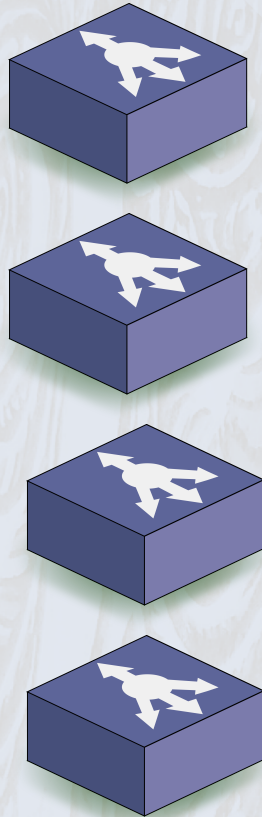
- Closed sourced load balancer
- Reduced graphing capabilities
- No alert routing options
- Impossible to integrate out of the box to dashboards



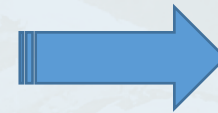
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syslog2carbon



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 {  
  /^\[ (?P<date> \d+ - \d+ - \d+ \s \d+ : \d+ : \d+) \]/ {  
    strptime($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]++
    }
  }
}
```



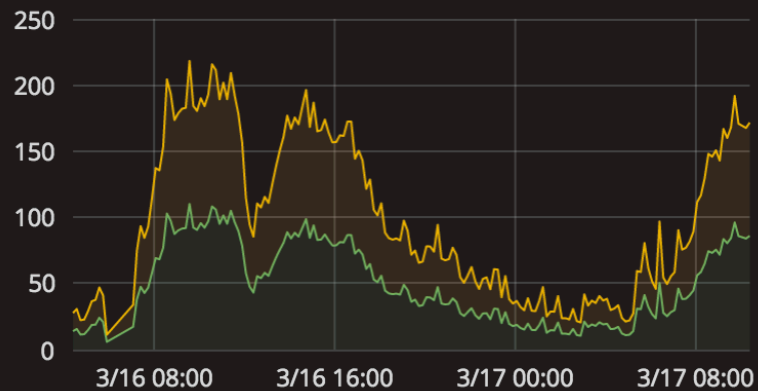
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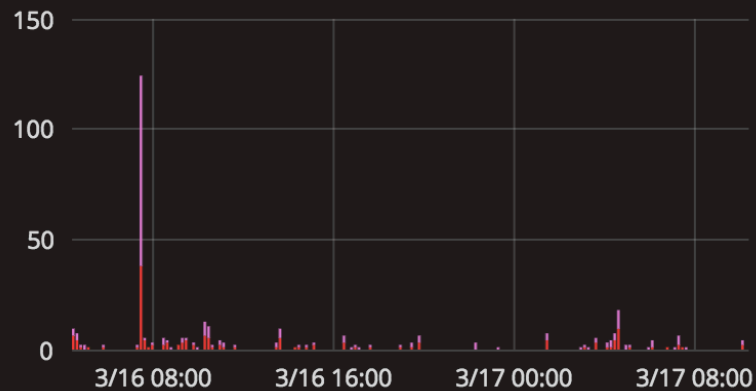
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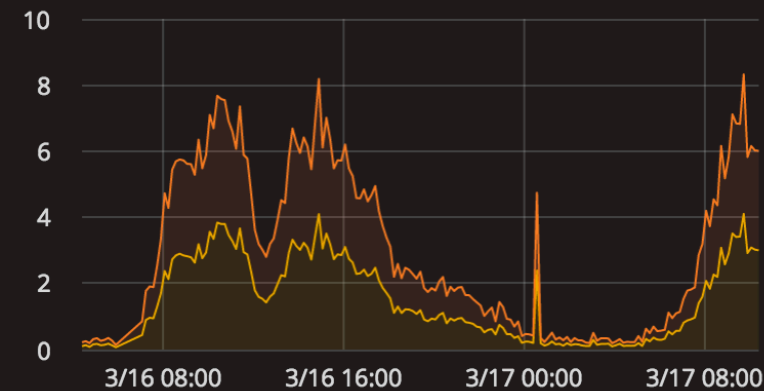
Rate Web LB HTTP 2XXs [5m]



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](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.



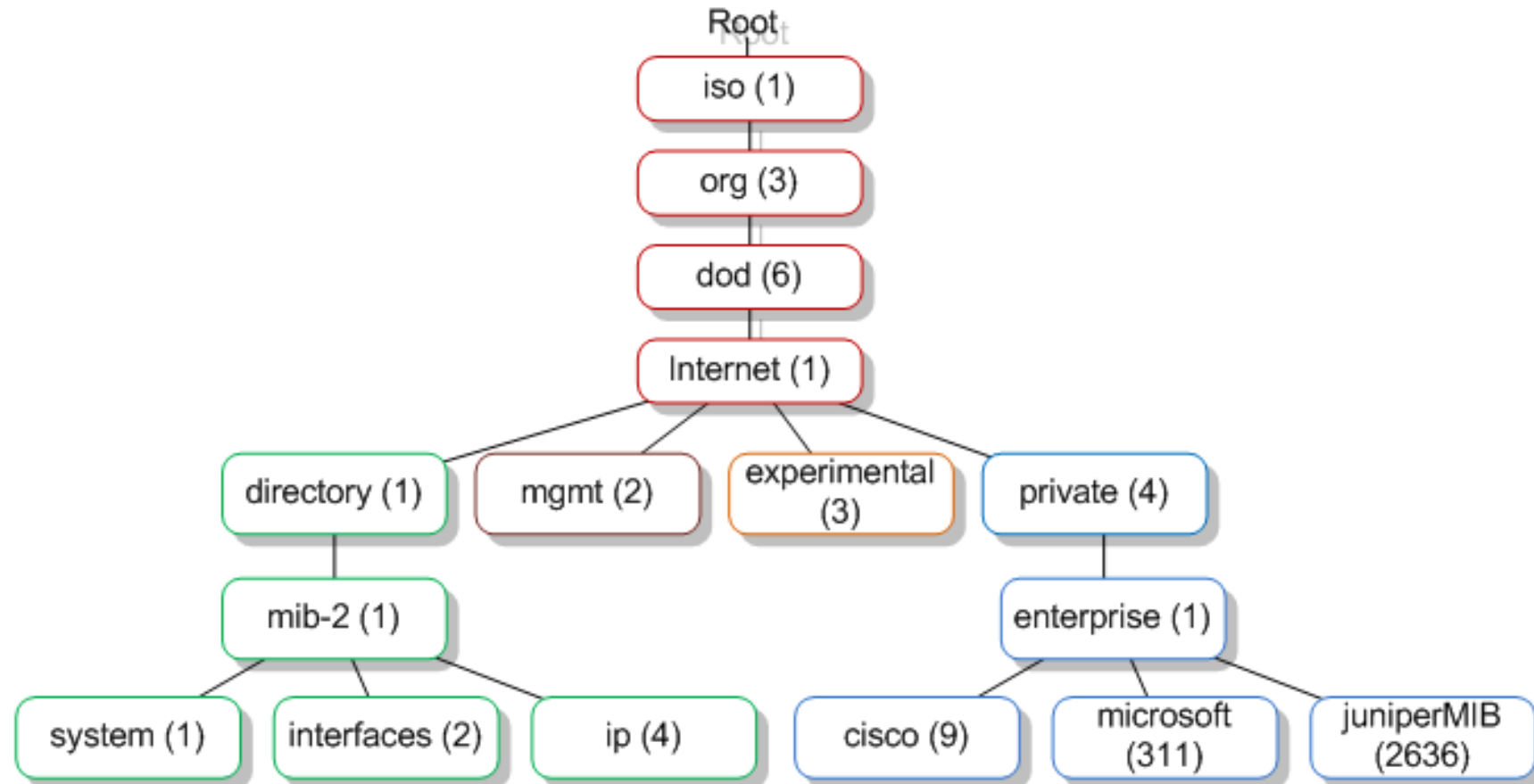
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# Object Identifiers (OIDs)



OID Tree Example



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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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**DEMO**



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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



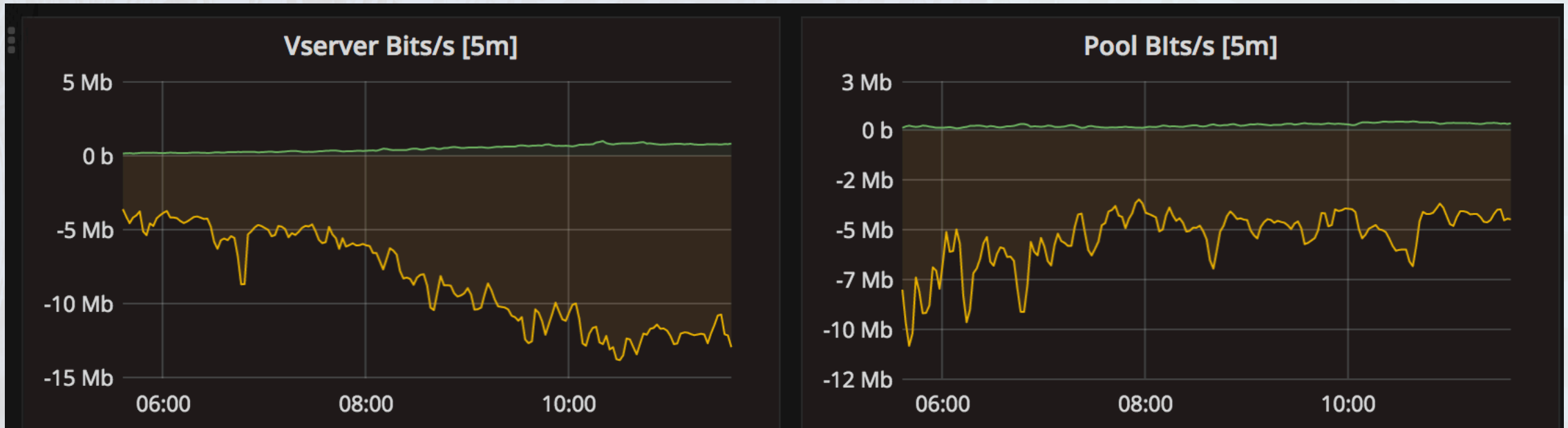
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## Our results:





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# Questions?



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Thank you!

@alexrrr