

Dancing on the head
of a ping!

~~Dancing on the head
of a ping!~~

~~Dancing on the head
of a ping!~~

There and back again:
An echo reply time!



Ian “idn” Norton

Shadowcat Systems

shadow.cat

Building a SaaS Monitoring platform

Using OpenNMS!

What are we adding?

- Layers
- Integration
- Simplified UI

OpenNMS hosting

- 2 x 2GB Bytemark BigV instances
- Debian 6 (Wheezy)
- Ansible
- PostgreSQL
- OpenNMS 16.0.3

Ansible

Tom's github repos:

<http://github.com/TBSliver/OUCE-2015-Ansible-Config>
<http://github.com/TBSliver/OUCE-2015-Config-Files>

Ansible summary?

OpenNMS instance build?

Ansible summary?

OpenNMS instance build?

To live in 15 minutes

Why two instances?

- ShadowNMS front end & discovery
- Dedicated monitoring host

Let's talk front end!

Simplification of terms

- Device = OpenNMS node
- Benchmark = OpenNMS service

Adding a device

New Device

Name	<input type="text" value="Device Name"/>
IP Address	<input type="text" value="Device IP"/>

SaveCancel

Discovery

- Service discovery

Discovery

- Set device 'needs discovery' flag
- PRIS (PRovisioning Integration)

PRIS?

- Take a data source:
 - Database
 - Spreadsheet (shudder)
 - CSV file
- Generate provisioning requisition
 - Including categories

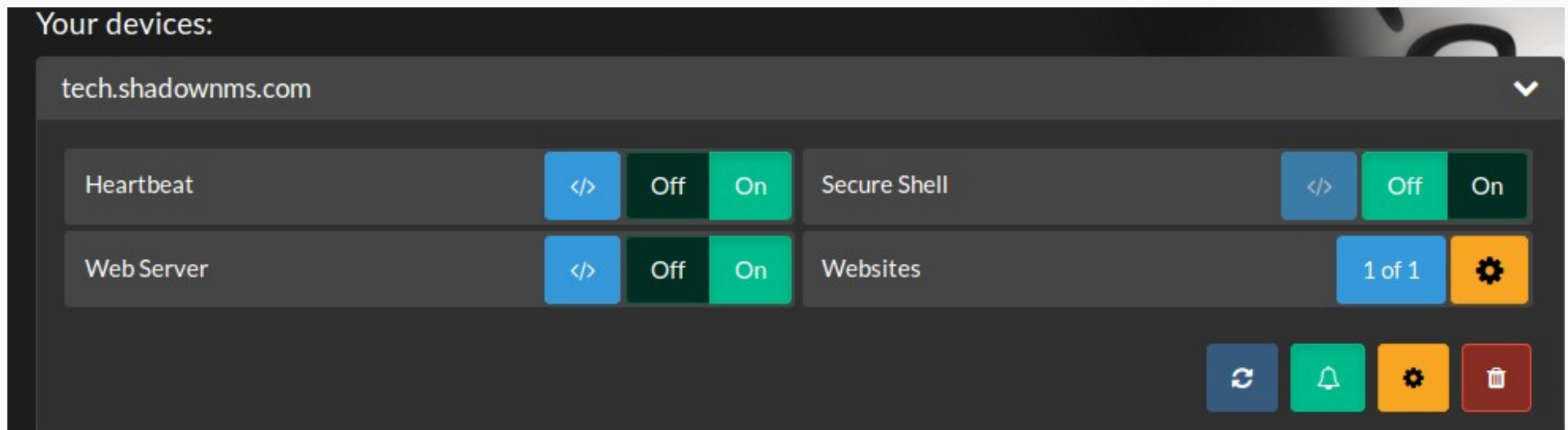
Discovery

- Watch for 'Completed' event
- ReST API:

```
/rest/events?limit=0&eventUei=uei.opennms.org/internal/provisiond/nodeScanCompleted
```

- Create benchmark records
 - ShadowNMS database

Discovered benchmarks



Allow user to enable / disable

Pushing that live?

- More PRIS!

Pushing that live?

- More PRIS!
- Seriously, Markus, 14:00 tomorrow
- Learn awesome things

Pushing that live?

- More PRIS!
- Seriously, Markus, 14:00 tomorrow
- Learn awesome things
- And then sync them.....

Getting status

- Collect node ID from monitor
- Add to ShadowNMS database
- Retrieve outages via ReST

```
/rest/outages?limit=0
```

Just our organisation?

- Set admin asset information
- Filter on this

Getting status

- Retrieve outages via ReST

```
/rest/outages?limit=0&query=this_.nodeid%20IN%20%28SELECT  
%20nodeid%20FROM%20assets%20WHERE%20admin%3D%27organisation_id%3A  
%20Cthulu%27%29%20AND%20this_.ifRegainedService%20IS%20NULL
```

Getting status

- Retrieve outages via ReST

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- For org id Cthulu...

Getting status

- Retrieve outages via ReST

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- For org id Cthulu...
- 

Lose your first
SAN point....

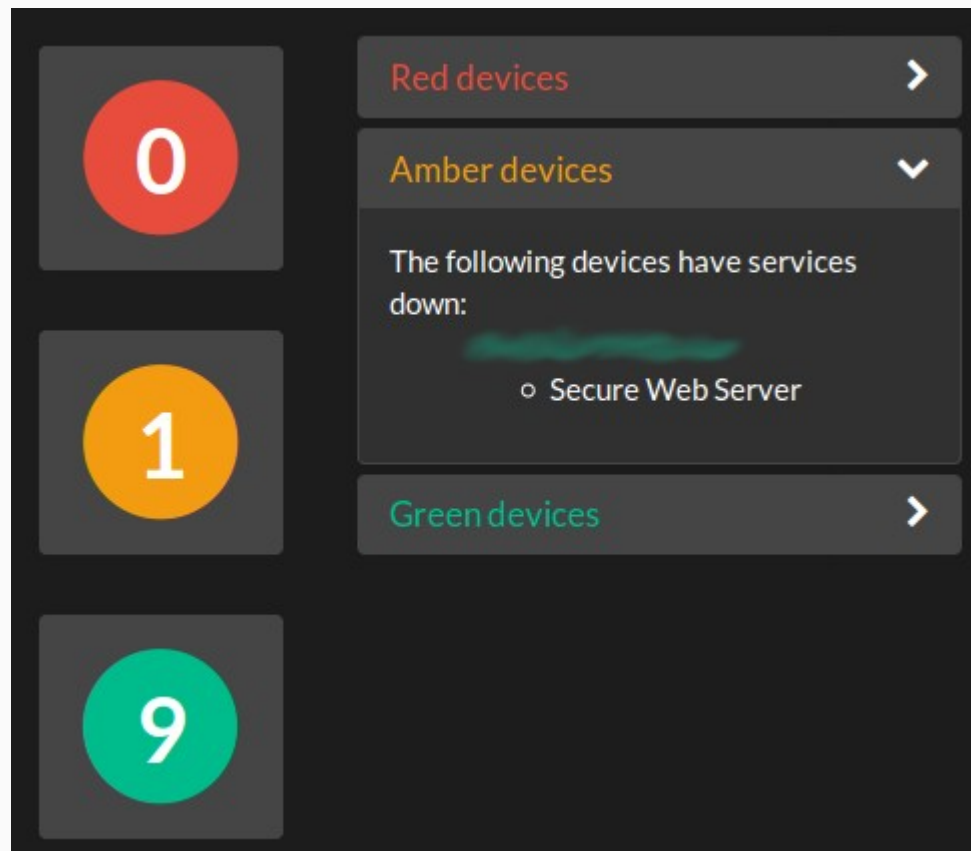
Lose your first
SAN point....

It's not the last...

Stick around for the next talk

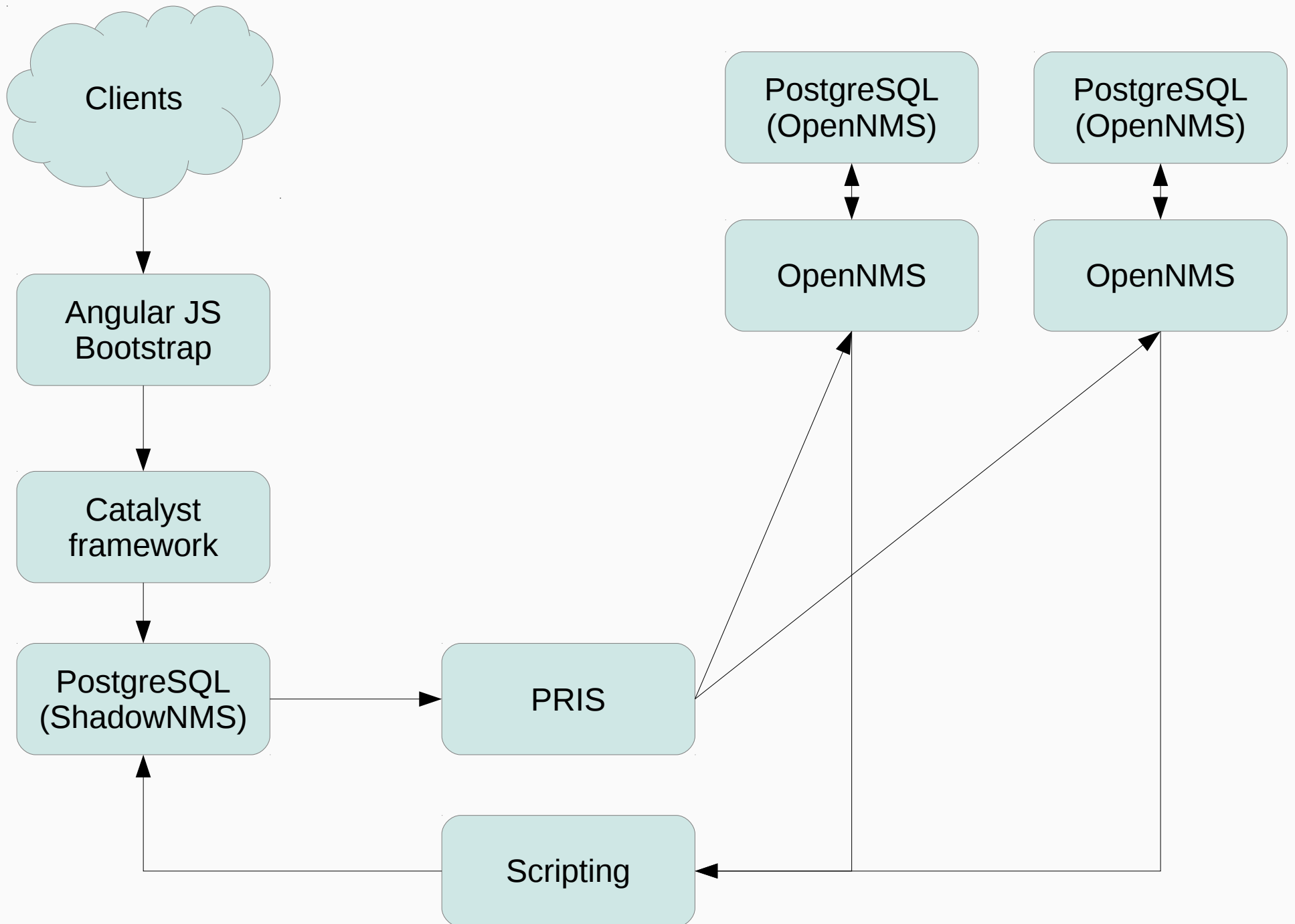
Seth is talking about:
Enhanced ReST searches

Status



So what tech is this?

- Perl!
- Catalyst web framework
- Angular JS & Bootstrap
- JSON API end points
- PostgreSQL



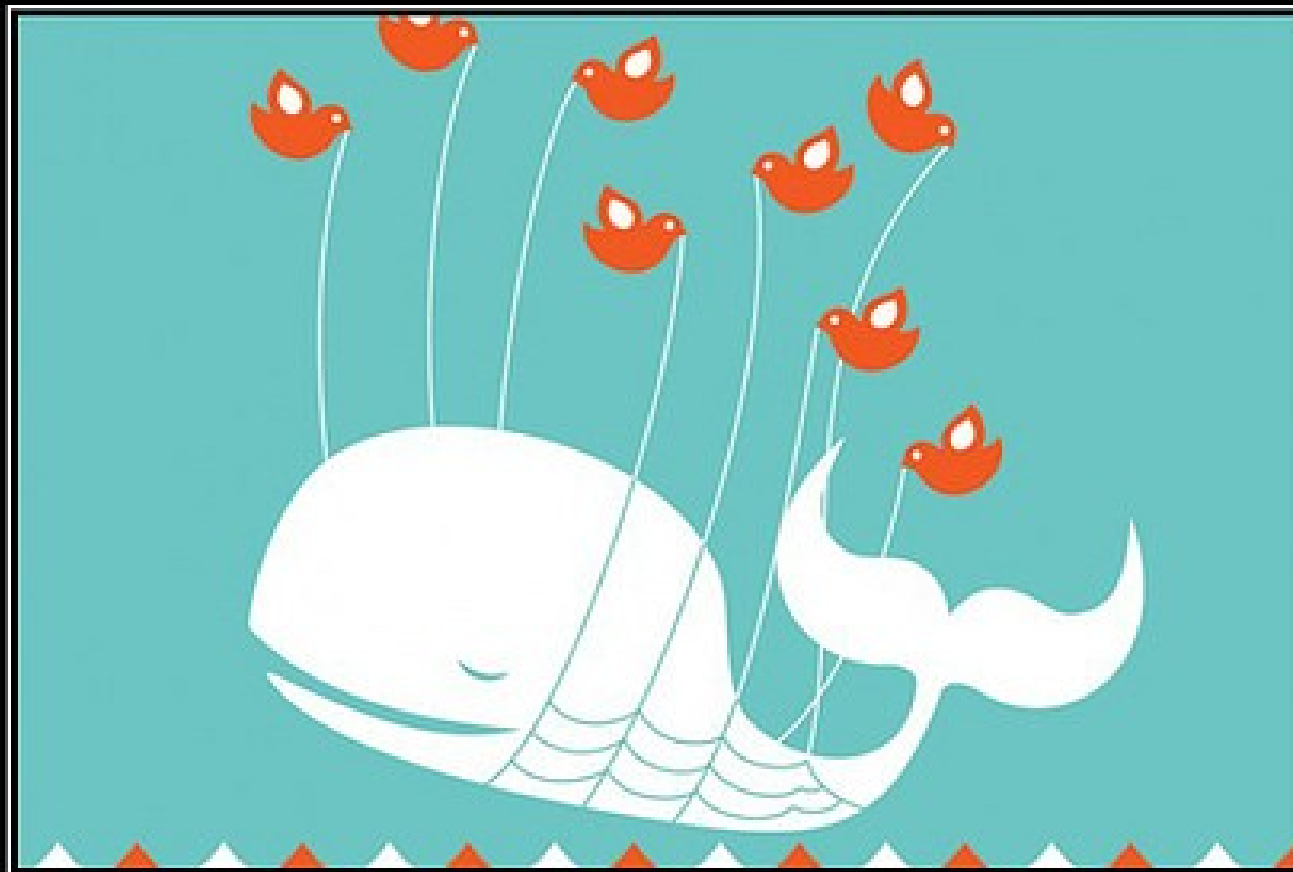
What services?

- ICMP
- HTTP / HTTPS
- ICMP
- SSH
- SMTP
- IMAP
- POP3
- DNS
- NTP

You gained 100 XP!

You gained 100 XP!

Ding!



FAIL WHALE

Twitter: Failure is an option. At least once a day, or whenever you need it.

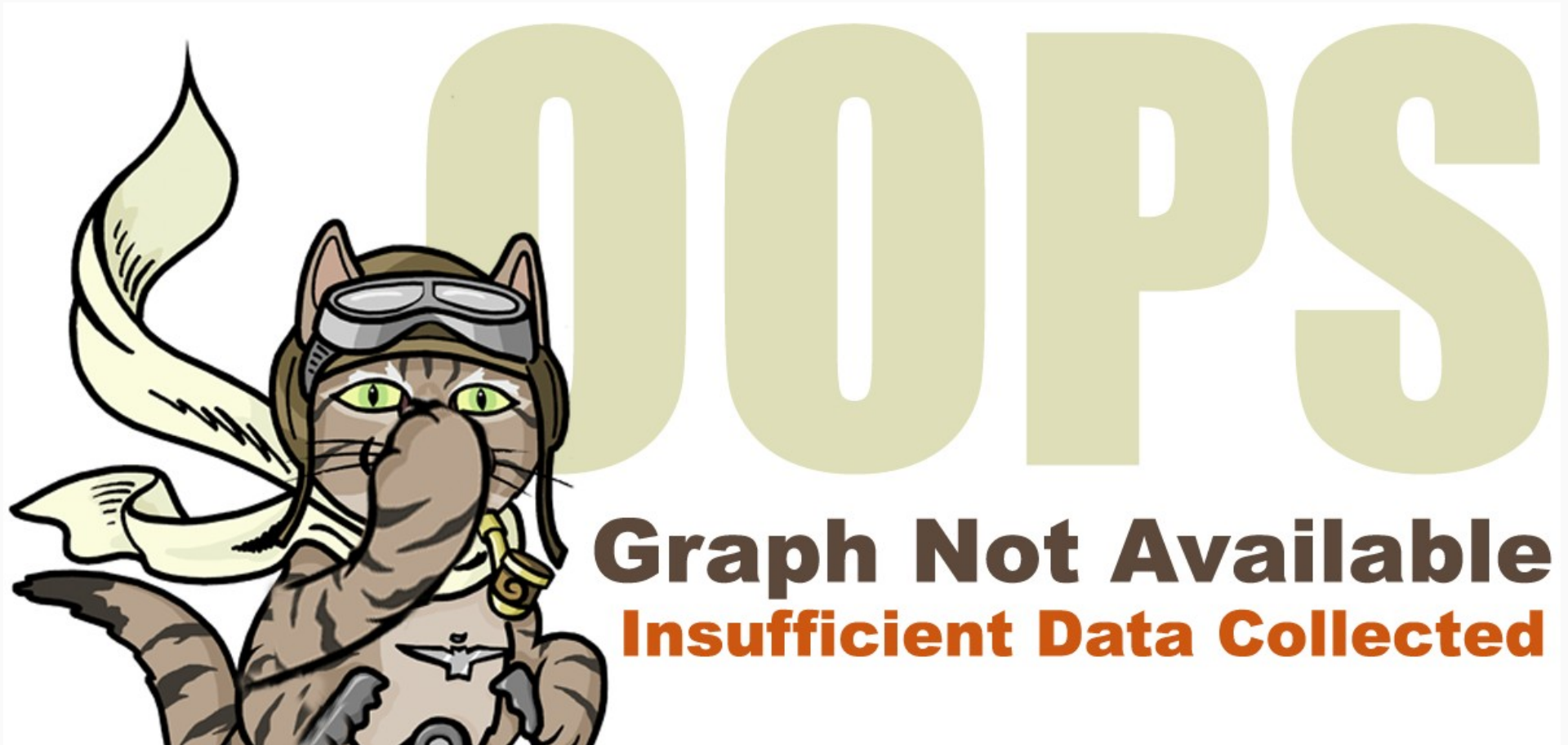
Moggles!



DOOPS

Graph Not Available
Insufficient Data Collected

Moggles!



Because failure is
Always an option

PRIS in Production

- We pull from PRIS every 5 mins
- Each time we get events:

uei.opennms.org/internal/importer/importStarted
uei.opennms.org/nodes/nodeUpdated
uei.opennms.org/internal/provisiond/nodeScanCompleted
uei.opennms.org/internal/importer/importSuccessful

PRIS in Production

- $288 \times 4 \times 300 = 345,600$
- Events per 24 hours
- 2.4M events per week

PRIS in Production

- Events hit ~5M records
- OpenNMS got a bit slow....

PRIS in Production

- Switched these to donotpersist:

uei.opennms.org/internal/importer/importStarted
uei.opennms.org/nodes/nodeUpdated
uei.opennms.org/internal/provisiond/nodeScanCompleted

- About 8 hours to delete records
- Much wailing

Website monitoring

- We want to monitor by name!
- We don't care about IP
- HTTP 1.1 vhosts

Website monitoring

- We want to monitor by name!
- We don't care about IP
- HTTP 1.1 vhosts
- OpenNMS cares about IP

Website monitoring

- Page Sequence Monitor
- Thanks to Markus & JeffG

Website monitoring

```
<service name="WEBSITEHTTP" interval="300000" user-defined="true" status="on">
  <parameter key="sequence-retry" value="2"/>
  <parameter key="timeout" value="8000"/>

  <parameter key="rrd-repository" value="/var/lib/opennms/rrd/response" />
  <parameter key="rrd-base-name" value="websitehttp" />
  <parameter key="ds-name" value="websitehttp" />

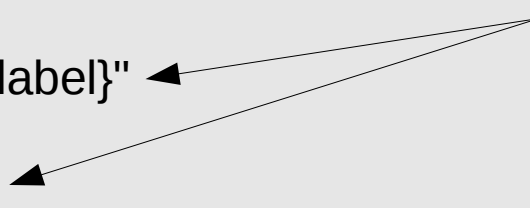
  <parameter key="page-sequence">
    <page-sequence>
      <page method="GET"
        http-version="1.1"
        virtual-host="{nodelabel}"
        scheme="http"
        host="{nodelabel}"
        disable-ssl-verification="true"
        port="80"
        path="/"
        response-range="100-399" />
      </page-sequence>
    </parameter>
  </service>
```

Website monitoring

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Magic here!

Website monitoring

- But OpenNMS still cares about IP
- It doesn't need it!

Website monitoring

- But OpenNMS still cares about IP
- It doesn't need it!
- Let's fake it.....

Website monitoring

- But OpenNMS still cares about IP
- It doesn't need it!
- Let's fake it.....
- IPv6 loopback addresses!

Website monitoring

- Use fe80::
- And the id..
- With a PostgreSQL function...

```
'fe80::' || to_hex(id)
```

Pretty Graphs!

Never underestimate a boss
who wants pretty graphs.....

HE KNOWS WHO HE IS.....

Graphs using N3 Chart

- Based on D3JS
- VERY pretty graphs
- Pull data from ReST API!

Pretty graphs

- We're using IPv6 node addresses

Pretty graphs

- We're using IPv6 node addresses
- But the ReST API is broken
- No data out for any IPv6 :(
- NMS-7189

Pretty graphs

- We're using IPv6 node addresses
- But the ReST API is broken
- No data out for any IPv6 :(
- NMS-7189
- Fixed in 16.0.4 (hopefully)

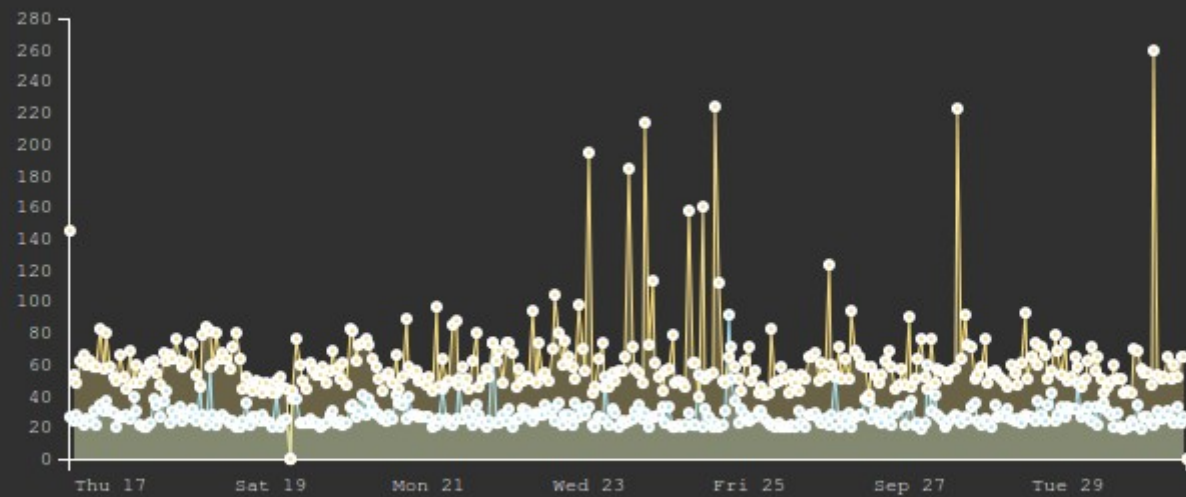
Pretty graphs

- Micro service for RRD data export
- JSON API
- ReST interface to rrdtool

Pretty graphs

- Micro service for RRD data export
- JSON API
- ReST interface to rrdtool
- Short term fix but long term gain

Heartbeat on TBSliver Personal Server



Heartbeat Web Server

Heartbeat

Web Server

Notifications!

Notifications by email

- Based on user record

Notifications by email

- Based on user record
- Can't set target address?

Notifications by email

- Based on user record
- Can't set target address?
- Best efforts at evil failed :(

Notifications by http

- HTTP GET or POST for event
- Looks ideal!
- Oddness....

Notification by http

- Resolution of event oddness
 - Timestamp is midnight of today
 - Severity is that of original event
 - Only as a number

Provisioning

- Nodes removed, aren't
- Can be removed via ReST API

The Future

- But you didn't use feature X!
- What about cool thing Y?!

The Future

- Website profiling using PhantomJS
- SNMP
- Distributed monitoring
- Minion!
- More cool things from OpenNMS

Questions?

Questions?

Stunned silence is also fine...



CONAN!

WHAT IS BEST IN LIFE?

To crush your enemies, to see them driven before you,
and to hear the lamentations of their women.

What is best in OpenNMS?

What is best in OpenNMS?

THE COMMUNITY!

Special thanks to

- JeffG
- Markus Neumann
- Ben (RangerRick)
- Keith Spragg (spraggle)
- OpenNMS Group
- #opennms on freenode!

Thanks to you!

Don't forget to fill in the
conference survey!