

A wide-angle photograph of a coastal scene. In the foreground, there's dense green foliage and a winding asphalt road that follows the coastline. To the right, the ocean is a vibrant turquoise color with white-capped waves crashing against rocks. In the middle ground, a large, sandy beach stretches along the shore. Beyond the beach, a range of mountains or hills is visible under a clear blue sky.

# OpenNMS - Ausblick

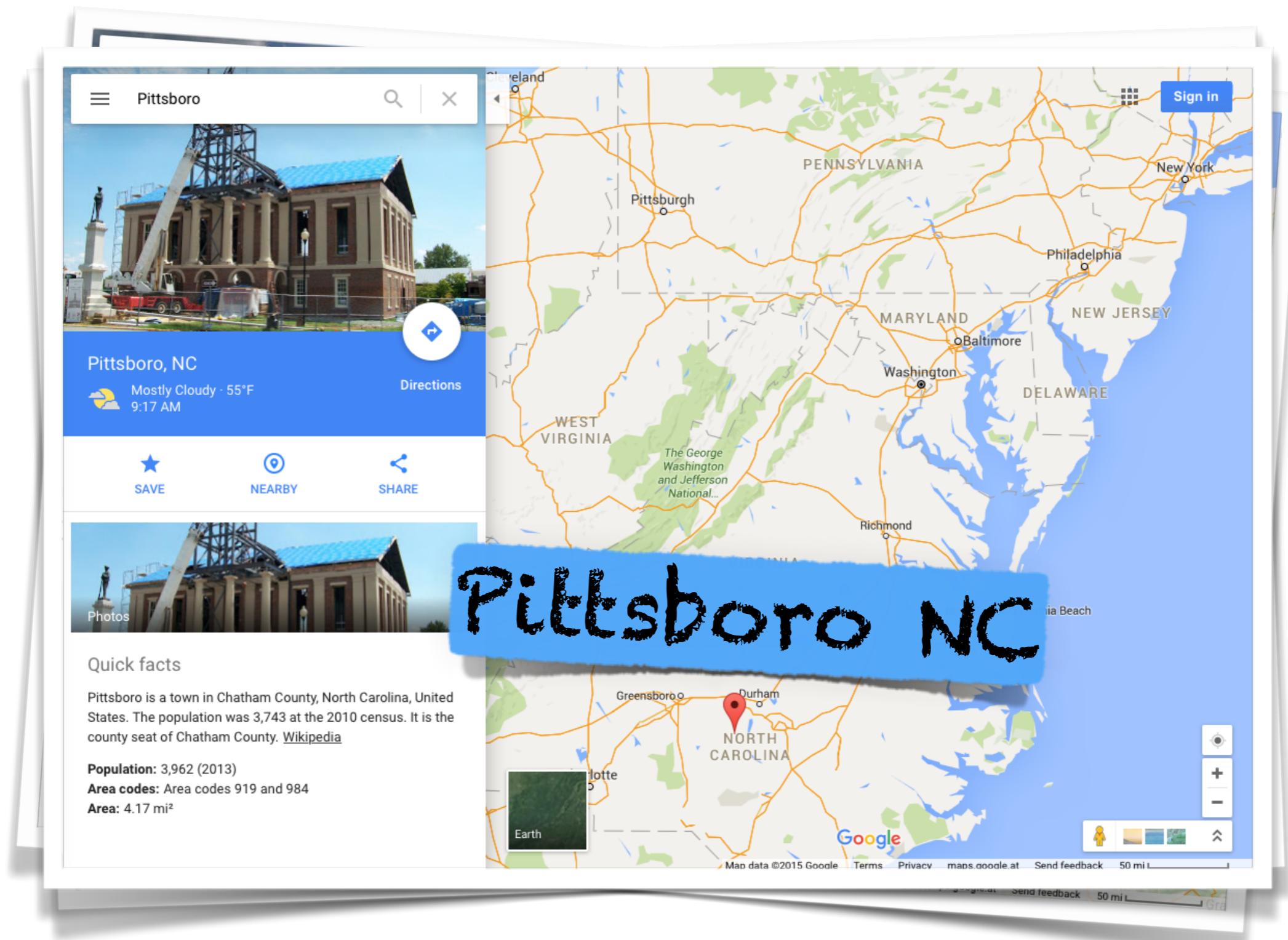
\$ whoami

Ronny Trommer  
Dipl.-Informatik  
Hochschule Angewandte Informatik  
Telekommunikation

Use OpenNMS since 2005  
Co-founder OpenNMS Foundation Europe e.V.  
Full time contributor since 2012

Anderes:  
Co-founder Mag-Lab Chaostreff in Fulda  
Freifunker

# ~ % locate



# ~ % locate

fulda

Fulda  
Germany

Sunny · 61°F  
3:11 PM

Directions

SAVE

NEARBY

SHARE

Photos

Photo Sphere

Quick facts

Fulda is a city in Hesse, Germany; it is located on the river Fulda and is the administrative seat of the Fulda district. In 1990, the town hosted the 30th Hessentag state festival. [Wikipedia](#)

Population: 64,008 (Jun 30, 2009)

Area: 40.17 mi<sup>2</sup>

Dialling codes: 0661

Sign in

Fulda

Netherlands

Germany

Belgium

Luxembourg

Switzerland

Austria

Map data ©2015 GeoBasis-DE/BKG (©2009), Google Terms Privacy maps.google.at Send feedback 50 mi

# ~ % locate





Motivation

Skalierbarkeit

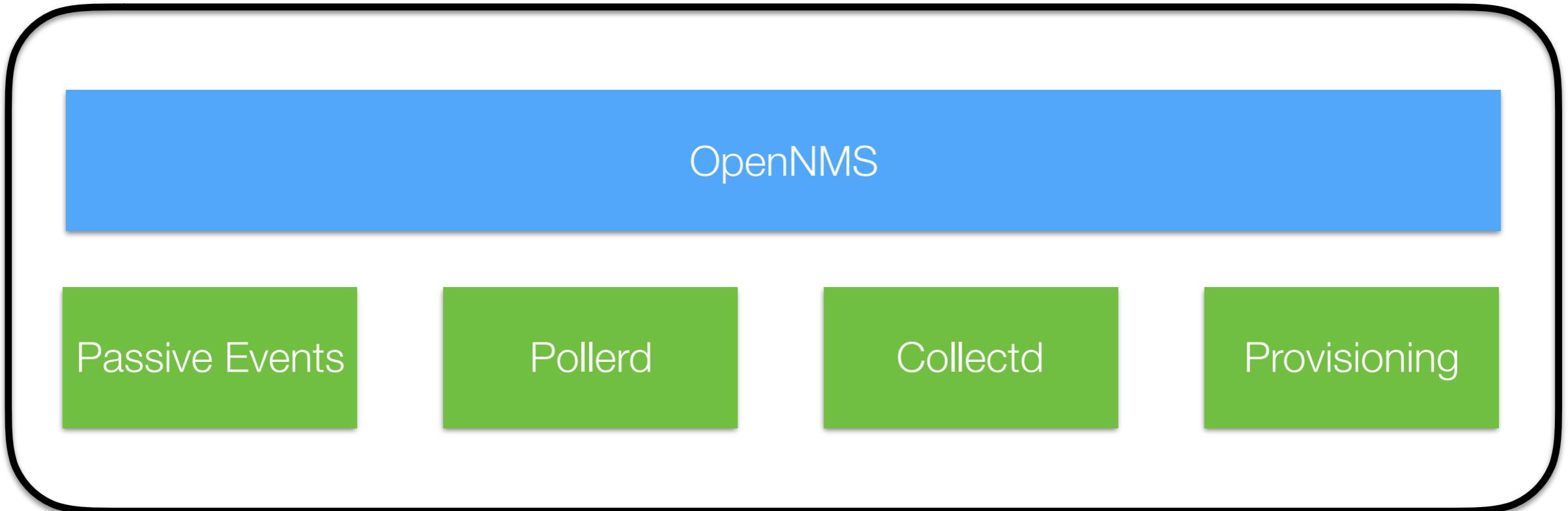
Resilienz

Business Needs

Open Source

OpenNMS Minion

# OpenNMS



OpenNMS Minion

Dominion

Web User Interface

OpenNMS Messaging

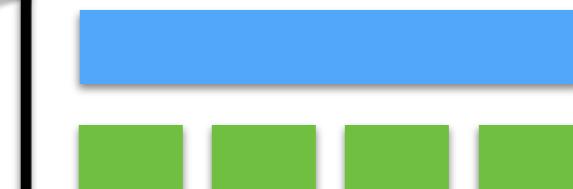


Apache  
Kafka

Minion

Minion

Minion



OpenNMS Minion

Web User Interface

# Verteilung Monitoring-Ressourcen

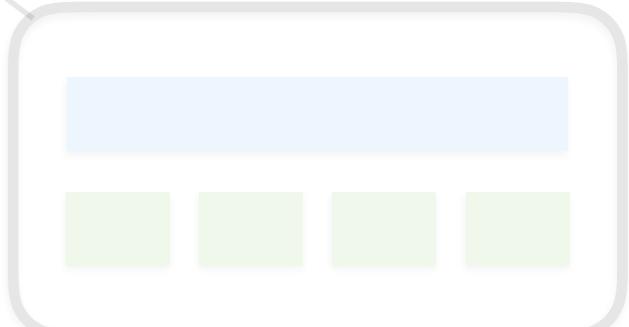
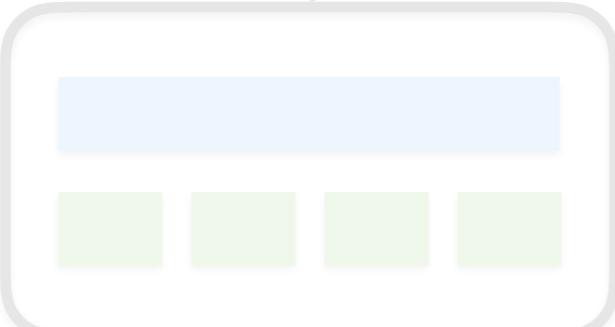
Lokationen

Lastverteilung

Ausfallsicherheit



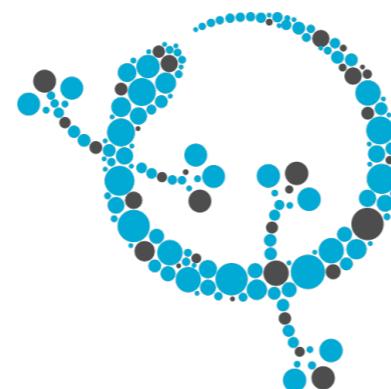
Apache  
Kaf



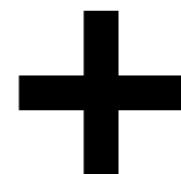
# Minion Themen in Horizon 18

- Messaging & API-Infrastruktur
- Collectd mit SNMP-Collector
- Syslog Receiver
- Node- und Service-Discovery

# Time Series on Scale

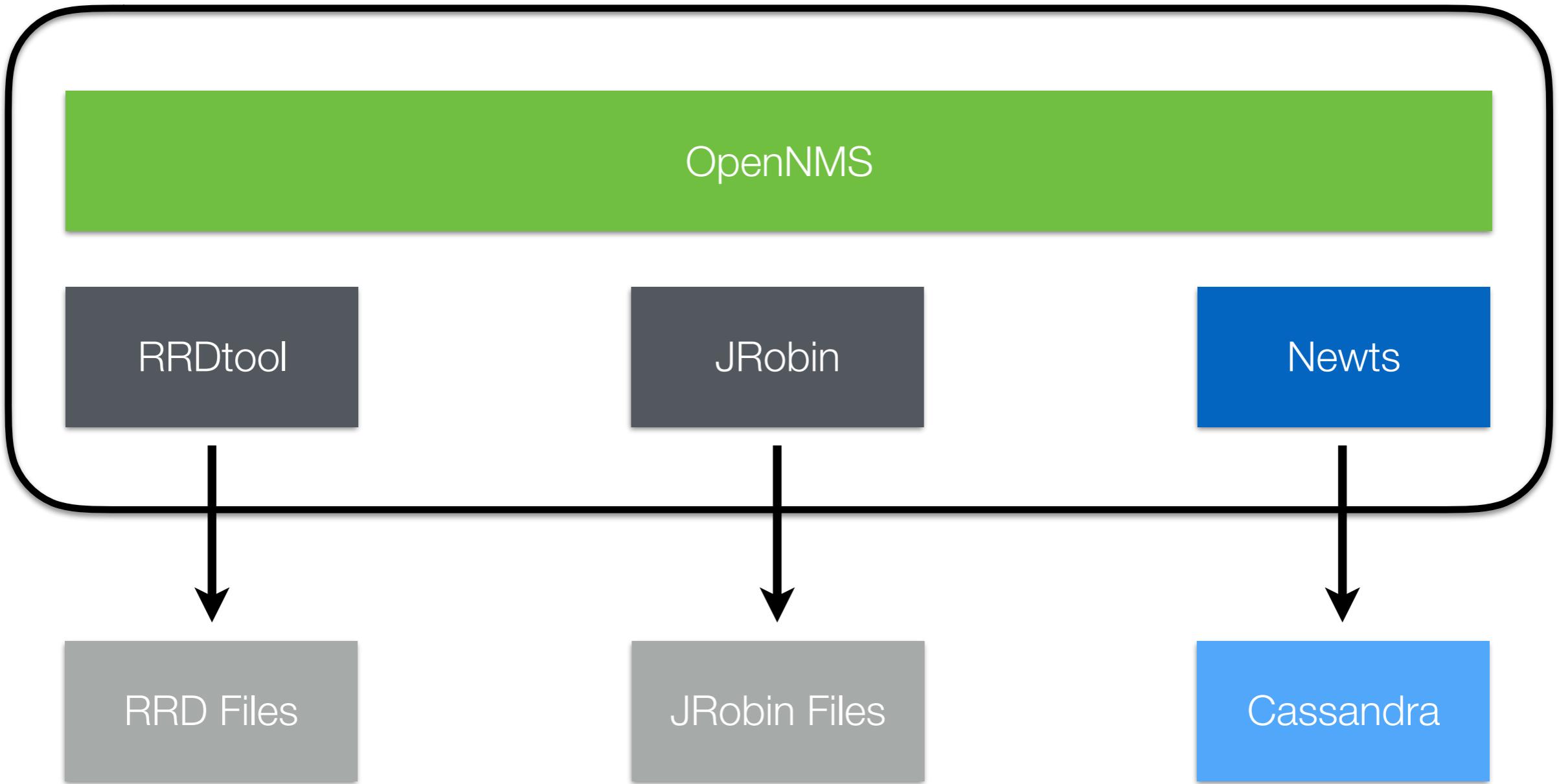


**Newts.io**

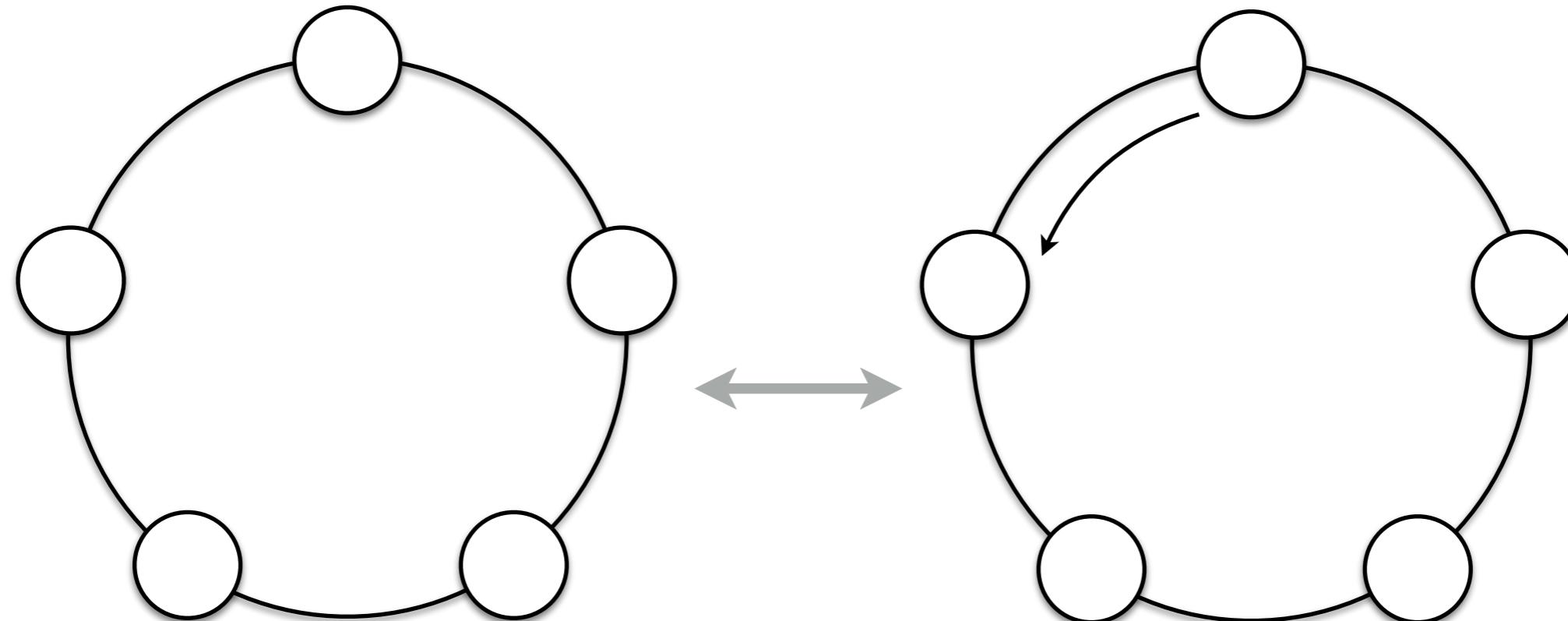


**Cassandra**

# Time Series Persistenz



# Warum Cassandra



- Optimiert für Schreiboperationen
- Topology-basierende Replikation
- Horizontal skalierbar
- Konfigurierbar bezüglich CAP

# Newts Themen in Horizon 18

- API Performanz verbessert
- Cassandra Support für 3.0.x
- Tools für Migration von RRDtool zu Newts
- Jasper Report Engine Support für Newts
- ReST API Verbesserungen

# Business Service Monitoring

# IT Resource vs. Business Process

- Modellierung
- Hierarchien und Abhängigkeiten
- Logik und Visualisierung
- Analyse “Root cause” und  
“Business Impact”

# Business Service Visualisierung

localhost:8980/opennms

OpenNMS Topology Map Manage Business Services | OpenNMS Web Console Apr 11, 2016 12:17 CEST

HORIZON openNMS

View Device Simulate Share

Search... Bsm: Web Portal Last update time: Mon Apr 11 2016 03:23 PM

⚠ Simulation Mode Enabled

Selection Context

Provider: bsm	Vertices	Edges
Focus	1	0
Selection	0	0
Context	11	10
Total	32	31

Web Portal

Web Frontend

Load Balancer

Database Server

web01 :: HTTP web03 :: HTTP web02 :: HTTP lb01 :: HTTPS lb02 :: HTTPS db02 :: Postgres db01 :: Postgres

Alarms Business Services Nodes Select All Deselect All Acknowledge Submit

ID	Severity	Node	UEI	Count	Last Event Time	Log Message
72	Major	lb01	uei.opennms.org/nodes/nodeDown	1	Apr 10, 2016 4:56:37 AM	Node lb01 is down.
71	Major	web01	uei.opennms.org/nodes/nodeDown	1	Apr 10, 2016 4:55:39 AM	Node web01 is down.
70	Major	dbserver01	uei.opennms.org/nodes/nodeDown	1	Apr 10, 2016 4:55:37 AM	Node dbserver01 is down.
69	Major	web02	uei.opennms.org/nodes/nodeDown	1	Apr 10, 2016 4:55:36 AM	Node web02 is down.
68	Major	web03	uei.opennms.org/nodes/nodeDown	1	Apr 10, 2016 4:55:36 AM	Node web03 is down.
67	Major	dbserver02	uei.opennms.org/nodes/nodeDown	1	Apr 10, 2016 4:55:34 AM	Node dbserver02 is down.
66	Major	lb02	uei.opennms.org/nodes/nodeDown	1	Apr 10, 2016 4:55:28 AM	Node lb02 is down.

# Root Cause Analysis

Time Series Graph Stock Photo | mac diagram - Google-Suche | OpenNMS/backshift: Time se | OpenNMS Topology Map | +

localhost:8980/opennms/topology#(0),(-187,150,674,300),(150.0,300.0),(1CE0D6A4),(8C979C38),(0),(6E1A12A2)

Apr 12, 2016 17:02 CEST

HORIZON openNMS

Search Info Status Reports Dashboards Maps admin

View Device Simulate Share

Last update time: Tue Apr 12 2016 05:06 PM

Search...  
Bsm: HTTP ✓ ✗  
Bsm: HTTP ✓ ✗  
Bsm: nodeLostService:HTTP ✓ ✗  
Bsm: nodeLostService:HTTP ✓ ✗  
Bsm: Web Frontend ✓ ✗

⚠ Simulation Mode Enabled

Selection Context  
Provider: bsm Vertices Edges  
Focus 5 0  
Selection 0 0  
Context 5 4  
Total 32 31

Web Frontend

web01 :: HTTP

nodeLostService:HTTP nodeLostService:HTTP

Change Icon  
Events/Alarms  
Impact Analysis  
Node Info  
Ping  
Remove From Focus  
Reset Icon  
Resource Graphs  
Root Cause Analysis

Alarms Business Services Nodes Select All Deselect All Acknowledge Submit

ID	Severity	Node	UEI	Count	Last Event Time	Log Message
71	Major	web01	uei.opennms.org/nodes/nodeDown	1	Apr 10, 2016 4:55:39 AM	Node web01 is down.
68	Major	web03	uei.opennms.org/nodes/nodeDown	1	Apr 10, 2016 4:55:36 AM	Node web03 is down.

# Service Impact Analyse

Time Series Graph Stock Photo | mac diagram - Google-Suche | OpenNMS/backshift: Time se | OpenNMS Topology Map | +

localhost:8980/opennms/topology#(0),(-349,50,899,400),(100.0,250.0),(1CE0D6A4),(974F784E),(0),(5963F92E)

Apr 12, 2016 17:02 CEST

HORIZON openNMS

Search Info Status Reports Dashboards Maps admin

View Device Simulate Share

Last update time: Tue Apr 12 2016 05:07 PM

Search...  
Bsm: HTTP ✅ ✗  
Bsm: Web Frontend ✅ ✗  
Bsm: Web Portal ✅ ✗  
Bsm: nodeLostService:HTTP ✅ ✗

⚠ Simulation Mode Enabled

Selection Context  
Provider: bsm Vertices Edges  
Focus 4 0  
Selection 0 0  
Context 4 3  
Total 32 31

Diagram:

```
graph TD; WebPortal[Web Portal] --- WebFrontend[Web Frontend]; WebFrontend --- web03["web03 :: HTTP"]; web03 --- nodeLostService[nodeLostService:HTTP]
```

Context menu for nodeLostService:

- Change Icon
- Events/Alarms
- Impact Analysis
- Node Info
- Ping
- Remove From Focus
- Reset Icon
- Resource Graphs

Log Message: Node web03 is down.

Alarms	Business Services	Nodes			
ID	Severity	Node	UEI	Count	Last Event
68	Major	web03	uei.opennms.org/nodes/nodeDown	1	Apr 10

# Benutzerdefinierte Icons

Screenshot of the openNMS web interface showing a custom icon selection dialog.

The top navigation bar includes tabs for "Time Series Graph Stock Photo", "mac diagram - Google-Suche", "OpenNMS/backshift: Time se", "OpenNMS Topology Map", and a plus sign for new tabs. The URL is "localhost:8980/opennms/topology#(2),(50,45,700,311),(400.0,200.0),(1CE0D6A4),(2D533C97),(0),(BAC182D3)". The date and time are "Apr 12, 2016 17:02 CEST".

The main interface shows a topology map with nodes and edges. A node on the right is labeled "Database Server" and has a tooltip "db02 :: Postgres". Below the map is a log message: "Node db02 is down.".

A "Change Icon" dialog is open in the center, titled "Change Icon". It contains a search bar and a table of icons categorized by provider:

Provider	Vertices	Edges
Focus	1	0
Selection	0	0
Context	11	10
Total	32	31

The icons are arranged in a grid:

- Row 1: Network graph, Briefcase with gear, Bell with gear, Penguin, Penguin with gear.
- Row 2: Server rack, Server with gear, Server with question mark, Server with red circle, Server with green play button.
- Row 3: Server with red circle, Server with orange pause button, Server with blue moon, Server with green play button, Server with yellow question mark.
- Row 4: Server rack, Earth globe, Blue cube.

Buttons at the bottom of the dialog are "Ok" and "Cancel".

The bottom left shows an "Alarms" table:

ID	Severity	Node
72	Cleared	lb01
71	Major	web01
70	Major	dbserver01
69	Major	web02
68	Major	web03

The bottom right shows a log message table:

Log Message
Node lb01 is down.
Node web01 is down.
Node dbserver01 is down.
Node web02 is down.
Node web03 is down.

## BSM Themen in Horizon 18

- Hierarchie Visualisierung
- Framework für Map & Reduce Funktionen
- Simulations Modus
- ReST API für Modellierung
- Benutzerdefinierte Iconssets
- “Info Panel” für alle Topologie
- Leistungsoptimierung

Open Source  
Community

# Welcome Guide

The screenshot shows a web browser window with the following details:

- Title Bar:** "Community Welcome Guide" is displayed in the title bar.
- Address Bar:** The URL "www.opennms.eu/welcome/" is shown.
- Toolbar:** Standard browser controls for back, forward, search, and refresh are visible.
- Table of Contents (Left Column):**
  - 1. Hello World
  - 2. What is OpenNMS
  - 3. Documentation
  - 4. Get in Contact
  - 5. Governance
    - 5.1. The OpenNMS Group, Inc.
    - 5.2. OpenNMS Foundation Europe e.V.
    - 5.3. Order of the Green Polo
  - 6. Contribution
  - 7. Development
    - 7.1. Code Contribution
    - Workflow
    - 7.2. Release management
    - 7.3. Bug tracking
    - 7.4. Continuous Integration
- Main Content Area (Right Column):**

# Community Welcome Guide

OpenNMS Foundation Europe e.V. – 0.0.5-SNAPSHOT, Last updated 2015-06-14 13:30:53 CEST

## 1. Hello World

Welcome to the *OpenNMS community* - the place of the world's first enterprise grade network management platform developed under the open source model. This document is meant for anyone interested in learning about the *OpenNMS* project and the surrounding eco system. It is intended for people who are new to the project and give information you are looking for to get oriented.

In this document you will learn the following topics:

  - What is OpenNMS
  - Where can you find documentation
  - How can you get in contact with users, developers in the community
  - Which organizational groups are involved and how is it governed
  - How to get involved and how to contribute in the project

**Link at the bottom:** <http://www.opennms.eu/welcome/>

# Some Numbers

Contributors 52

Commits > 30.000

Accepted Pull Requests > 400

SNMP MIB Objects for data collection > 2000

Trap MIBS > 200

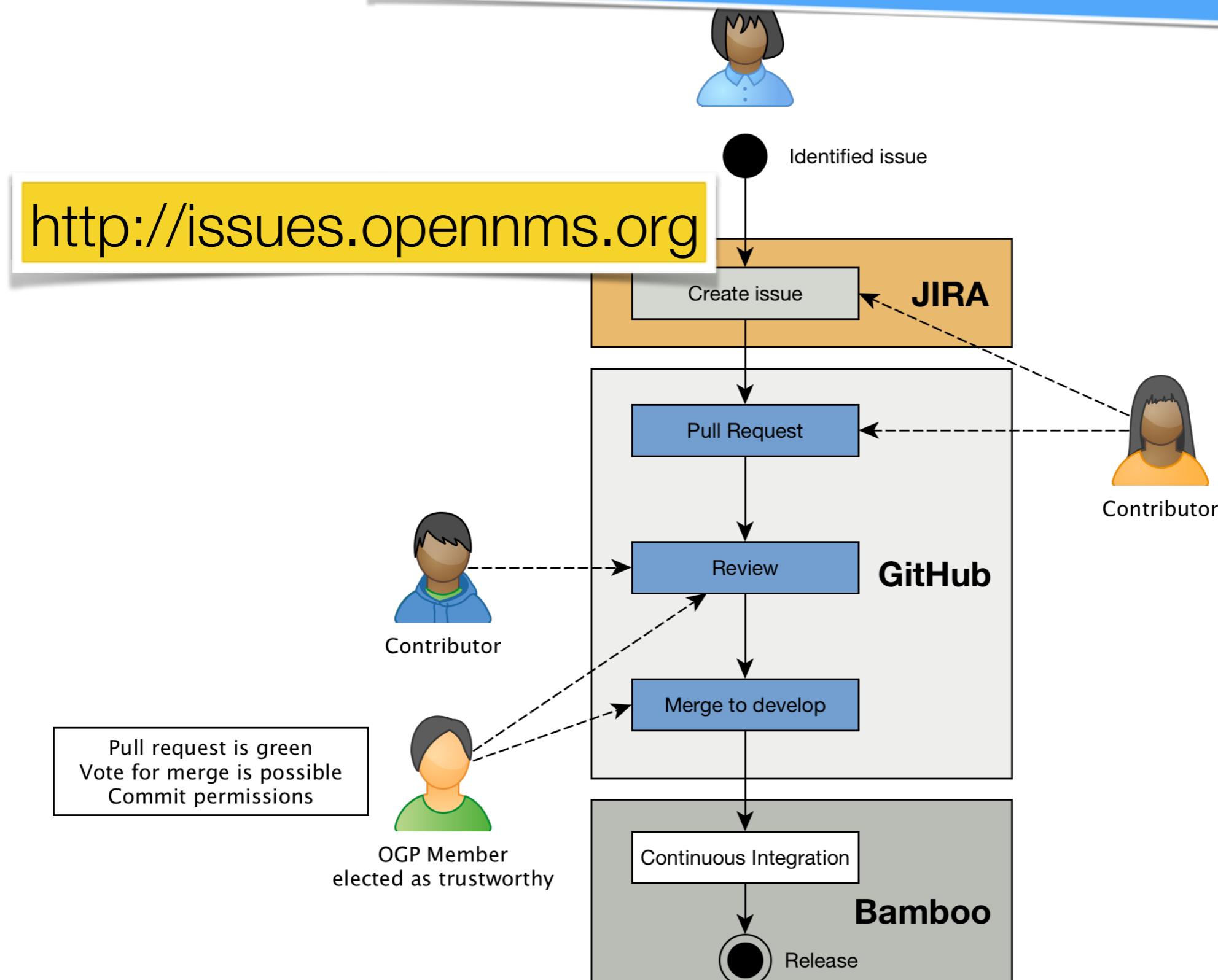
Downloads ~ 6000 / month

# OpenNMS auf GitHub



<https://github.com/opennms>

# Managed with JIRA + Bamboo



<http://bamboo.internal.opennms.com:8085>

# OUCE - Conference

Sc

YouTube AT

openNMS

OpenNMS Project G+

Subscribe 471

opennms

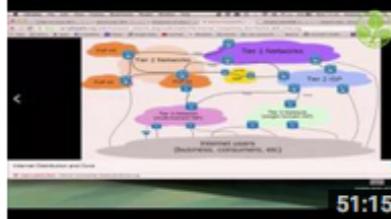
Home Videos Playlists Channels Discussion About

Uploads Date added (newest - oldest) Grid

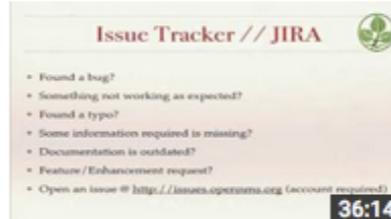
 43:32  
OUCE 2015 - yourCMDB and OpenNMS  
86 views • 1 month ago

 43:25  
OUCE 2015 - Provisioning Integration Server  
50 views • 1 month ago

 42:11  
OUCE 2015 - OpenNMS License Manager  
41 views • 1 month ago

 51:15  
OUCE 2015 - OpenNMS Map Use Cases 2015  
99 views • 1 month ago

 50:41  
OUCE 2015 - Business Cases Using OpenNMS  
39 views • 1 month ago

 36:14  
Issue Tracker // JIRA  
Found a bug?  
Something not working as expected?  
Found a typo?  
Some information required is missing?  
Documentation is outdated?  
Feature / Enhancement request?  
Open an issue at <https://issues.opennms.org> (Account required)

 33:15  
OUCE 2015 - OpenNMS meets Grafana  
56 views • 1 month ago

 27:28  
OUCE 2015 - We don't need no documentation  
26 views • 1 month ago

Persistence

<https://www.youtube.com/opennms>

# Web based Chat Mailing lists

The screenshot shows a web-based chat interface for OpenNMS. On the left, there's a sidebar with a user profile (@indigo OpenNMS), a channels list (including OpenNMS, OpenNMS Compass, OpenNMS Development, OpenNMS Discussion, OpenNMS Minion, TestOps, Town Square, and More...), private groups (Ansible Integration, marketing, OpenNMS IT, SD-Hoist-2016-01, The OpenNMS Group), and direct messages (agalue, alex, christian). The main area is titled "OpenNMS Discussion" and shows a conversation between users and a bot. The messages are:

- uberpinguin yesterday: I'm guessing that if opennms is restarted when that file is near its maximum size, the newly created file after the install will rapidly consume any remaining space
- irc-psilvao BOT 20 hours ago: Hmm interesting, is not clear the message, i was searching inside the log's files but nothing...
- irc-Khozmo BOT 20 hours ago: Okay what file do I look in to determine why icmp was not added in the first place to see its a req group policy? [\[...\]](#)
- irc-iChaz BOT 20 hours ago: jeffg we are thinking that NMS-8033 may affect us on some of the collector problems we are having <http://issues.opennms.org/browse/NMS-8033>
- jeffg 20 hours ago: iChaz, I think NMS-8033 stems from a misunderstanding. I noticed you have the "factory" parameter set to "SASL" in some places but not others, have you tried making that change?
- irc-iChaz BOT 20 hours ago:

At the bottom, there's a yellow bar with the URL <https://chat.opennms.com>.

[https://www.opennms.org/wiki/Mailing\\_lists](https://www.opennms.org/wiki/Mailing_lists)

# Documentation Project

The screenshot shows a web browser window with the URL [docs.opennms.org/opennms/branches/develop/guide-admin/guide-admin.html#ga-events-forwarding-elasticsearch-basic-config](http://docs.opennms.org/opennms/branches/develop/guide-admin/guide-admin.html#ga-events-forwarding-elasticsearch-basic-config). The page content is as follows:

- 5.1. Anatomy of an Event
- 5.2. Sources of Events
  - 5.2.1. SNMP Traps
  - 5.2.2. Syslog Messages
  - 5.2.3. TL1 Autonomous Messages
  - 5.2.4. XML-TCP
  - 5.2.5. ReST
- 5.3. The Event Bus
- 5.4. Forwarding Events to Elasticsearch
  - 5.4.1. A basic Elasticsearch configuration
  - 5.4.2. Troubleshooting
- 6. Provisioning
  - 6.1. Introduction
  - 6.2. Concepts
    - 6.2.1. Terminology
    - 6.2.2. Addressing Scalability
  - 6.3. Getting Started
    - 6.3.1. Provisioning the SNMP Configuration
    - 6.3.2. Automatic Discovery
    - 6.3.3. Enhanced Directed Discovery
  - 6.4. Import Handlers
    - 6.4.1. File Handler
    - 6.4.2. HTTP Handler
    - 6.4.3. DNS Handler
  - 6.5. Provisioning Examples
    - 6.5.1. Basic Provisioning

## 5.4.1. A basic Elasticsearch configuration

This section describes how to get a minimal working configuration with *OpenNMS* and *Elasticsearch*. Install *Elasticsearch* on the same host as *OpenNMS* and edit the `elasticsearch.yml` as follows:

*Example configuration for Elasticsearch*

```
cluster.name: opennms
network.host: 127.0.0.1
discovery.zen.ping.multicast.enabled: false
discovery.zen.ping.unicast.hosts: ["127.0.0.1"]
```

**i** Running *OpenNMS* and *Elasticsearch* on the same host is not recommended for production or busy environments.

## 5.4.2. Troubleshooting

If events are not reaching *Elasticsearch* check if *OpenNMS* is correctly configured, in particular review the `elasticsearchCluster` and `elasticsearchIp` parameters.

If those appear to be correct verify that *OpenNMS* can communicate with *Elasticsearch* over port 9300.

Review the OSGi log with `log:tail` or the `camel:*` commands.

## 6. Provisioning

<http://docs.opennms.org>

you can change it