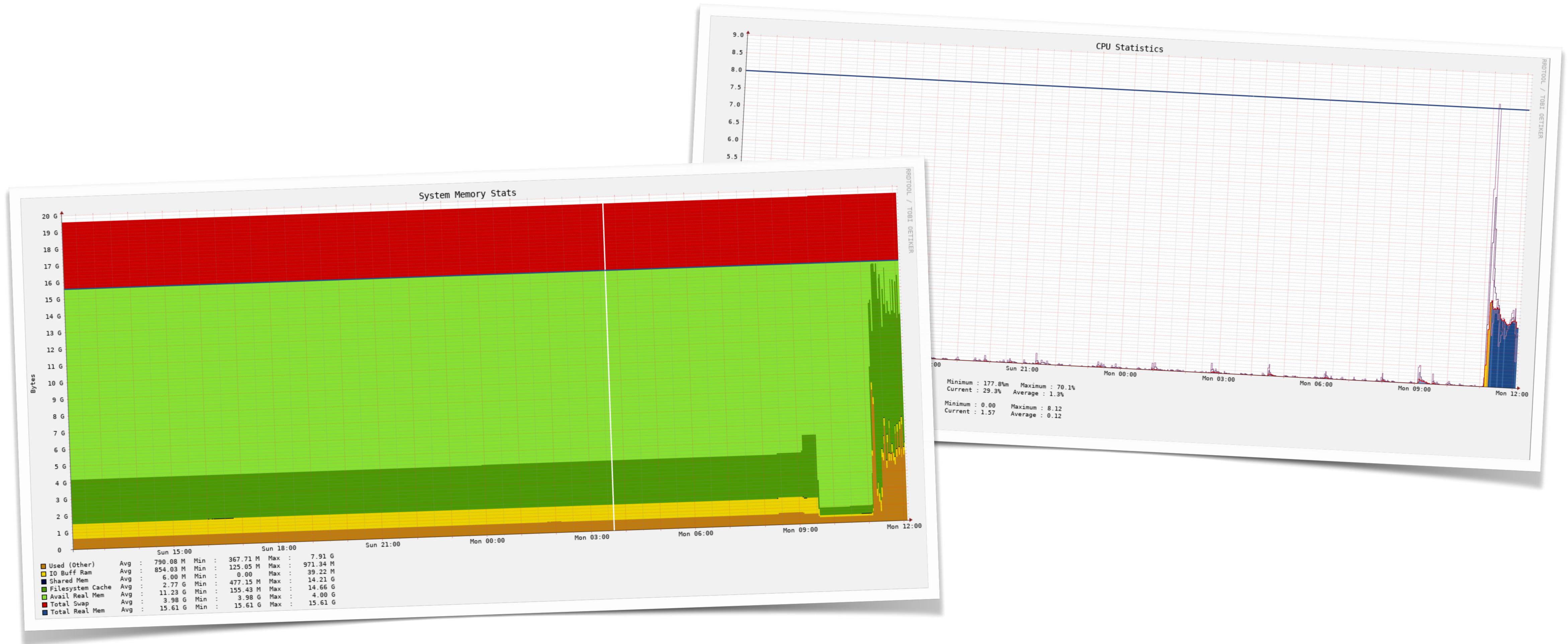


# Performance Management

Ronny Trommer, 19.02.2024

# What is in scope



# What is **not** in scope

Home / Search / Node

**Node: metrics** 56 Labmonkeys-HQ metrics Labmonkeys-HQ flow data

View Events View Alarms View Outages Asset Info Meta-Data Hardware Info Availability Resource Graphs Rescan Admin Update SNMP Schedule

**Node has no problems.**

**SNMP Attributes**

Name	metrics
sysObjectID	.1.3.6.1.4.1.8072.3.2.10
Location	Office Untergruppenbach
Contact	metrics.labmonkeys.tech
Description	Linux metrics 5.15.0-1046-raspi #49-Ubuntu SMP PREEMPT Thu Jan 18 12:45:41 UTC 2024 aarch64

**Availability**

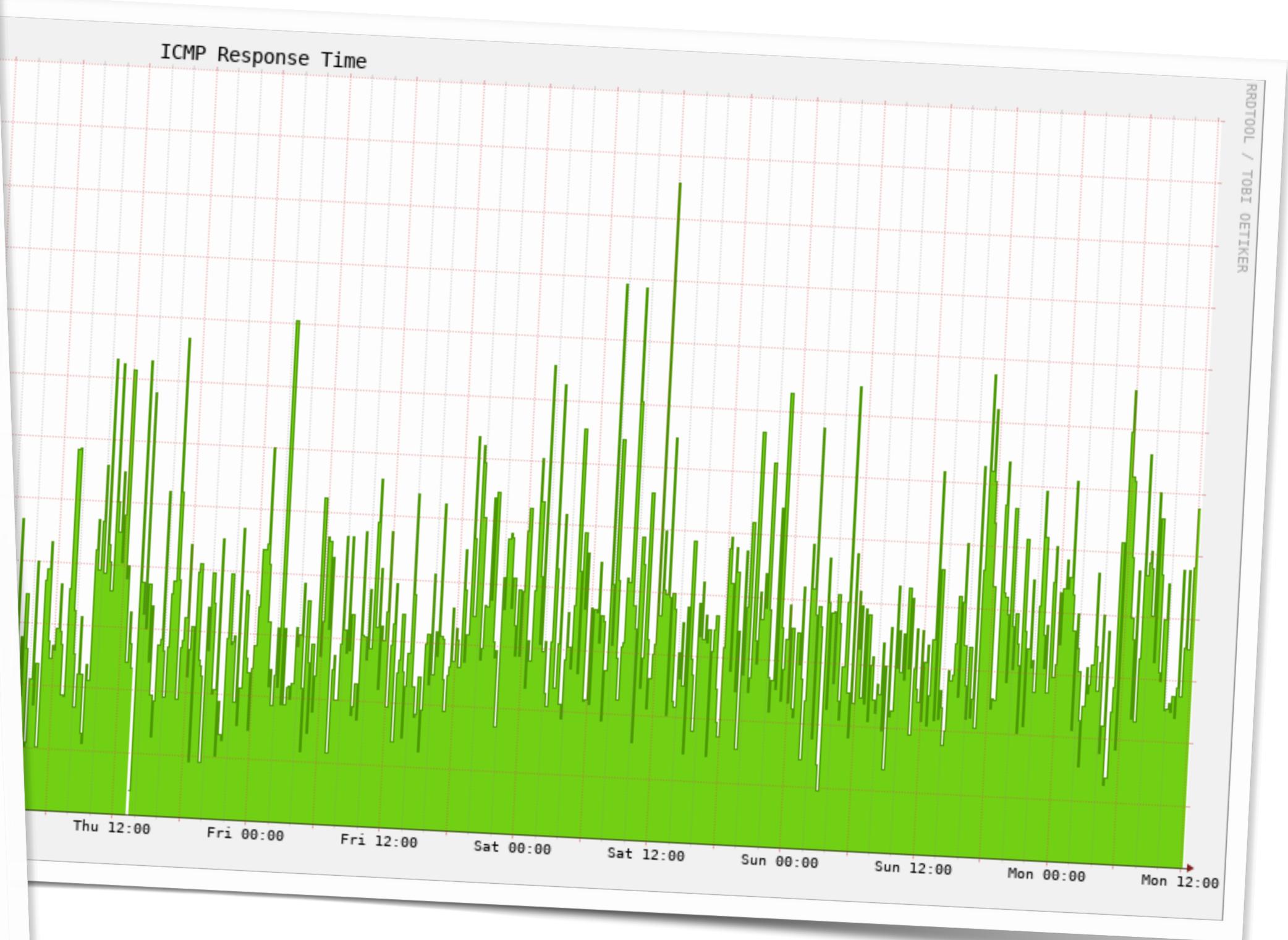
**Availability (last 24 hours)**

192.168.10.70

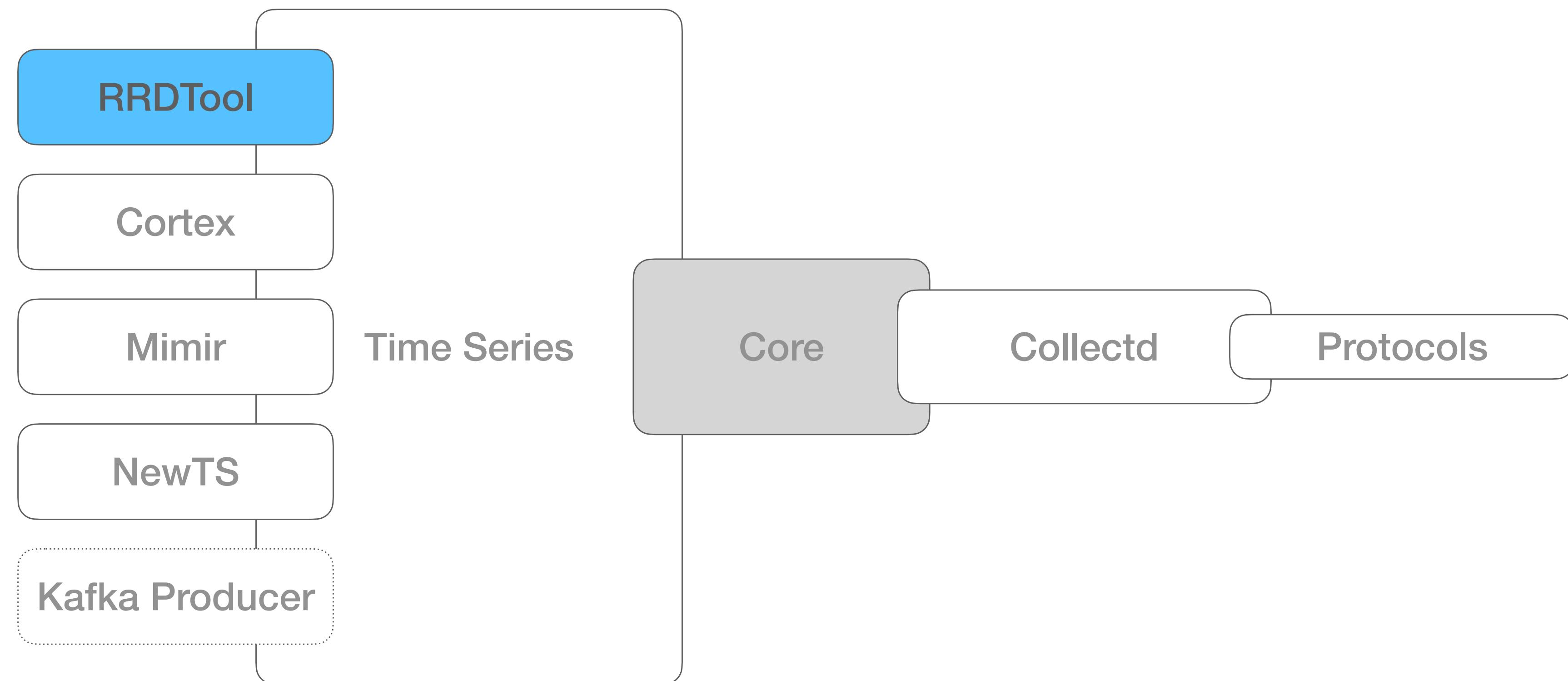
Chrony-Status	100.000%
ICMP	100.000%
Process-Monitoring	100.000%
SMART-Health	100.000%
SNMP	100.000%
System-Restart	100.000%

fdda:1a67:c46b:0010:ba27:ebff:fe78:9983

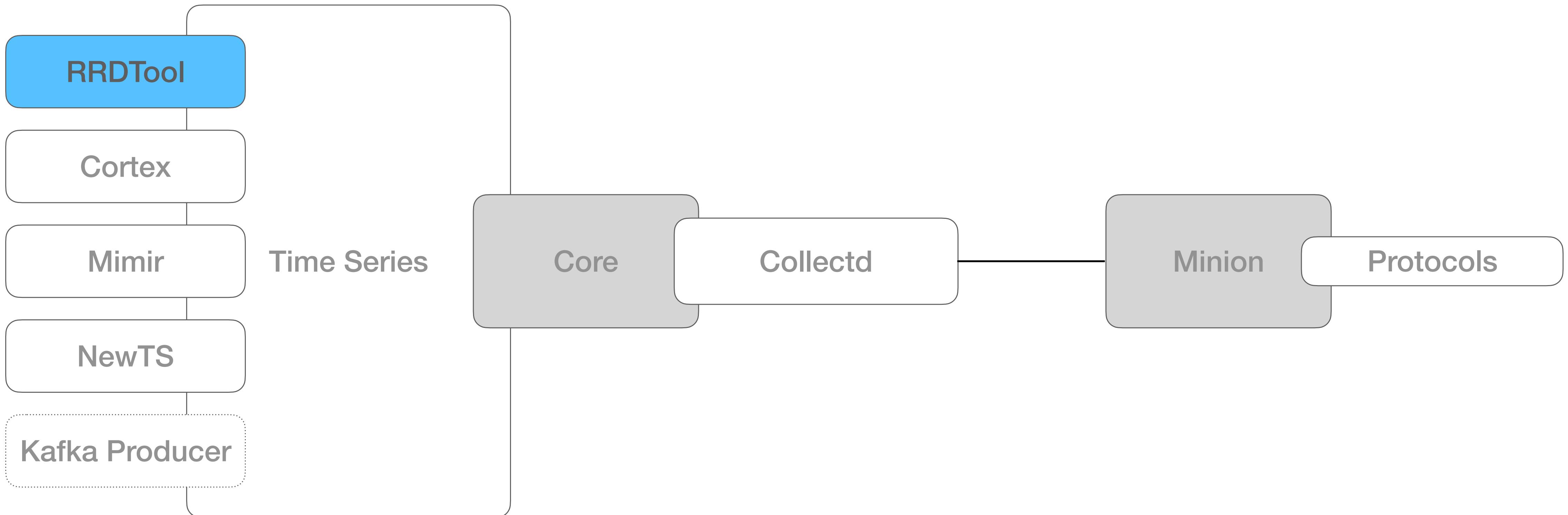
ICMP	100.000%
------	----------



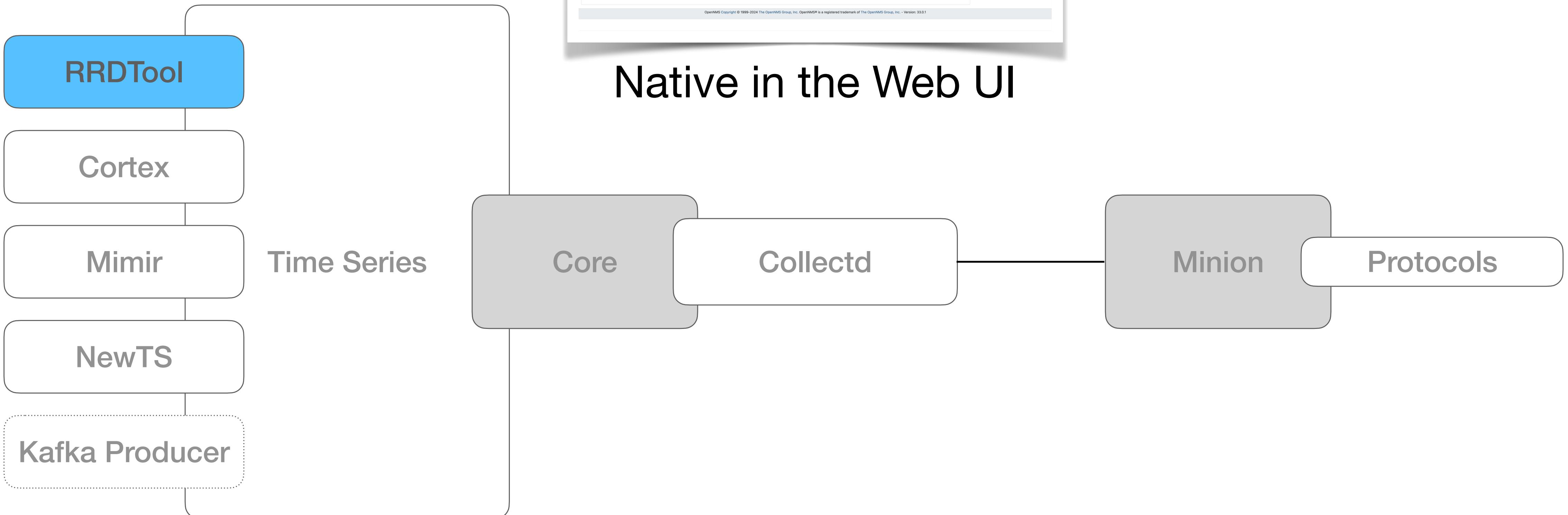
# Architecture



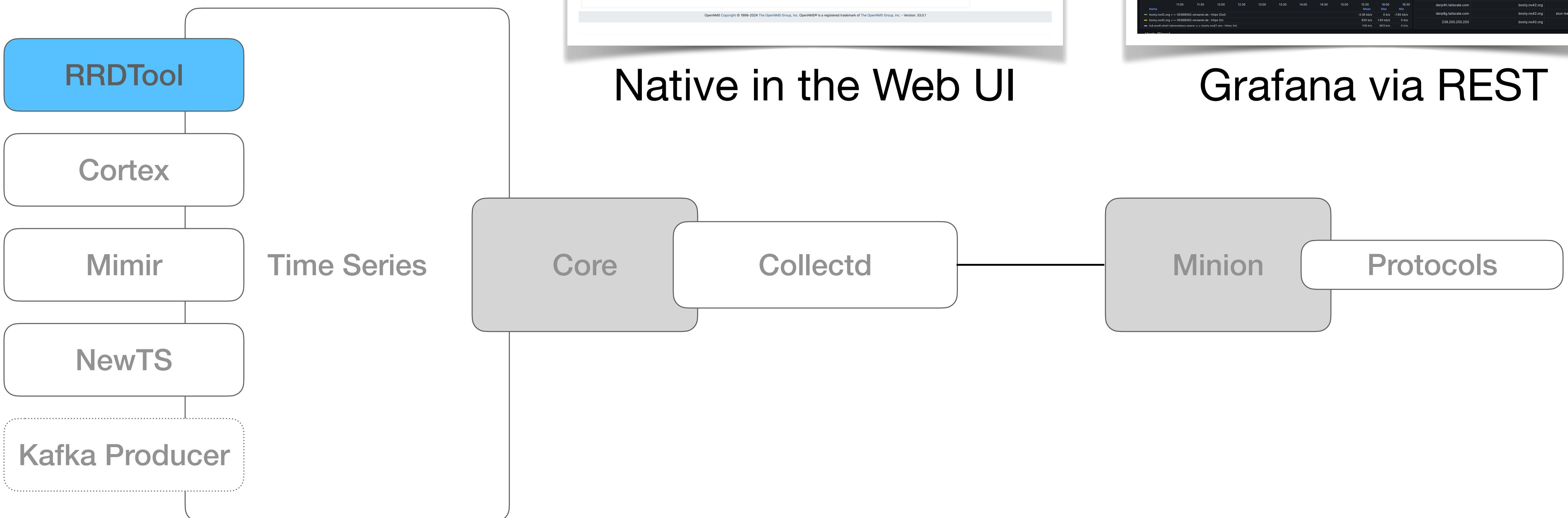
# Architecture



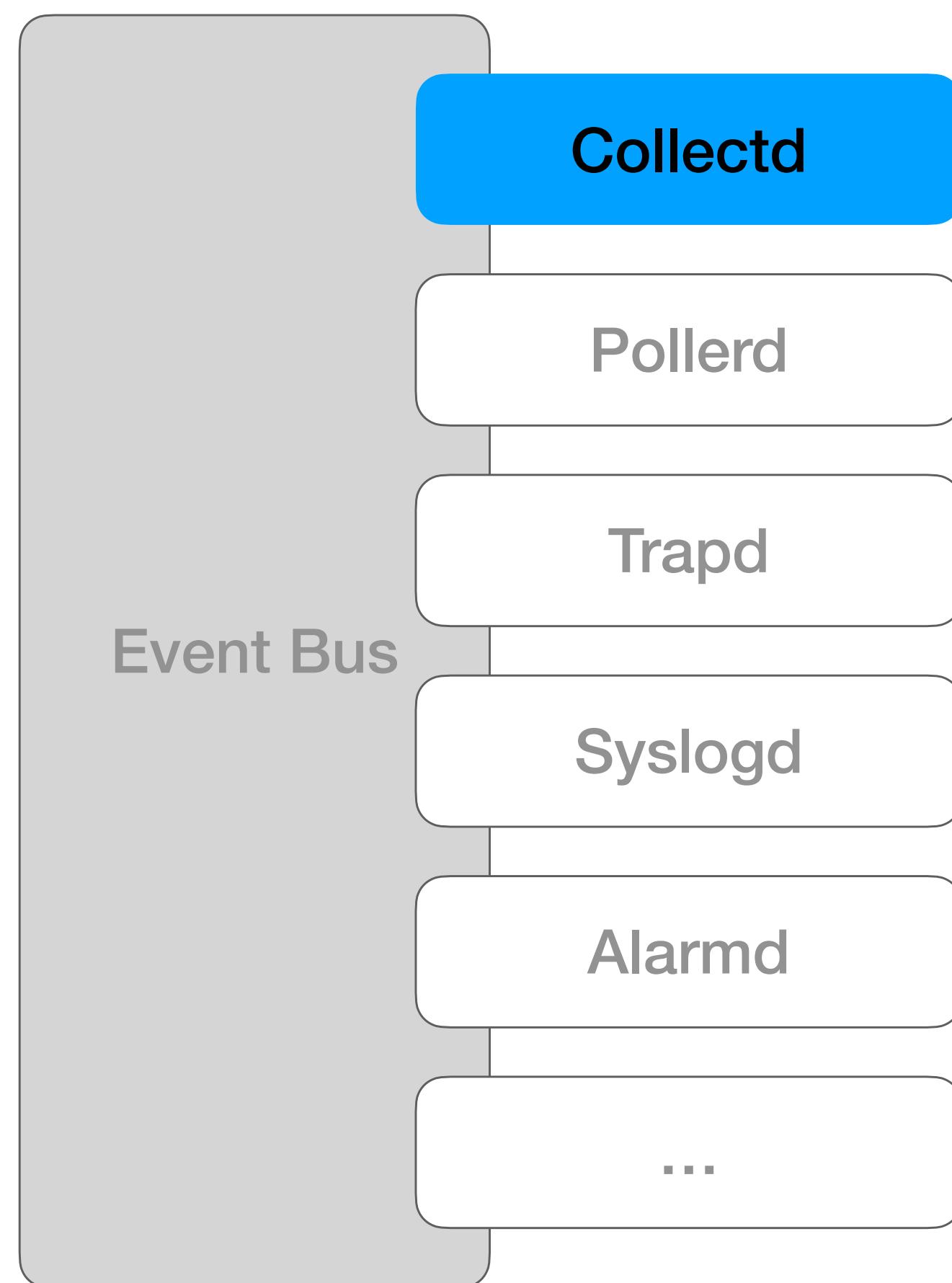
# Architecture



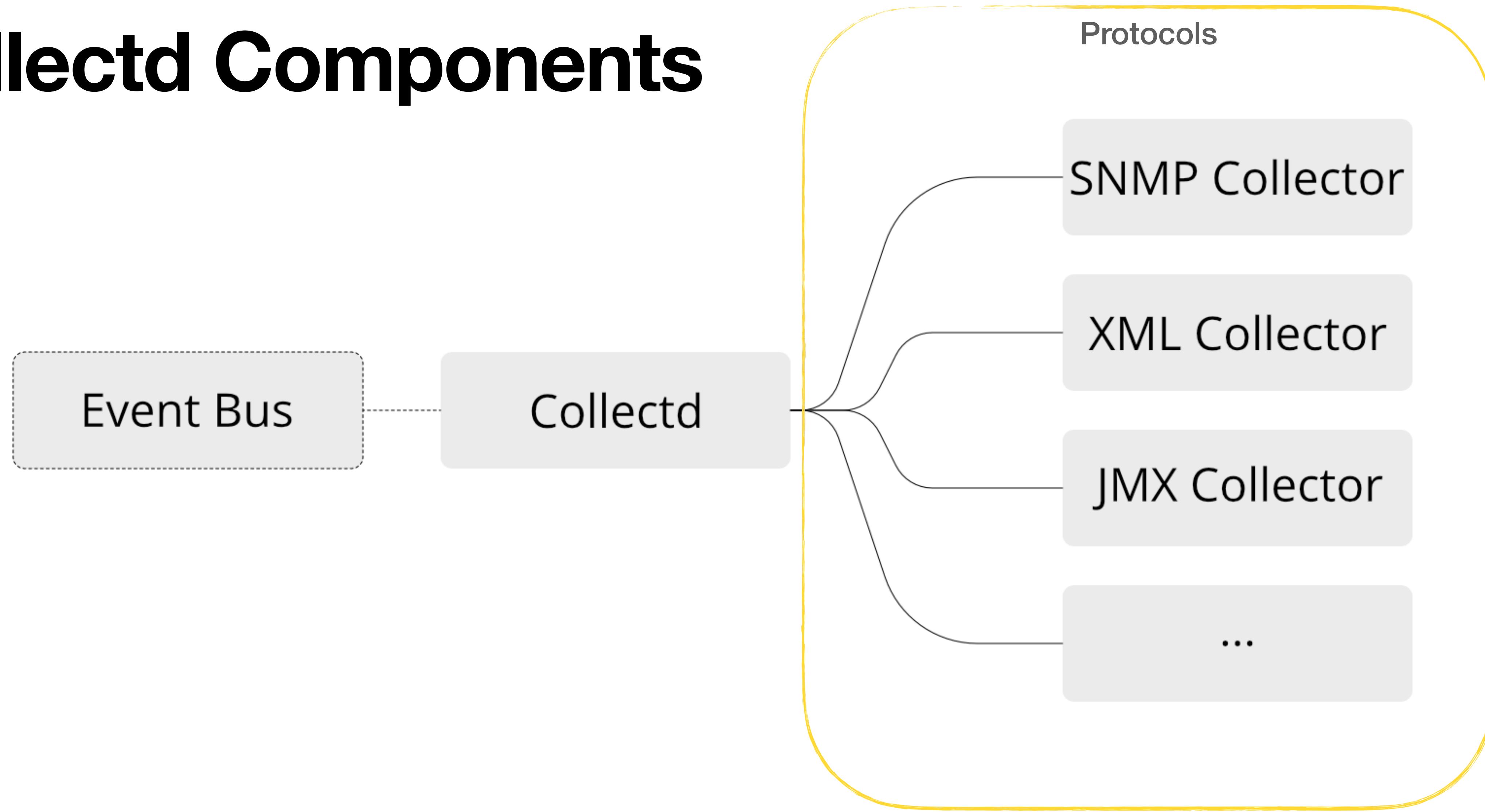
# Architecture



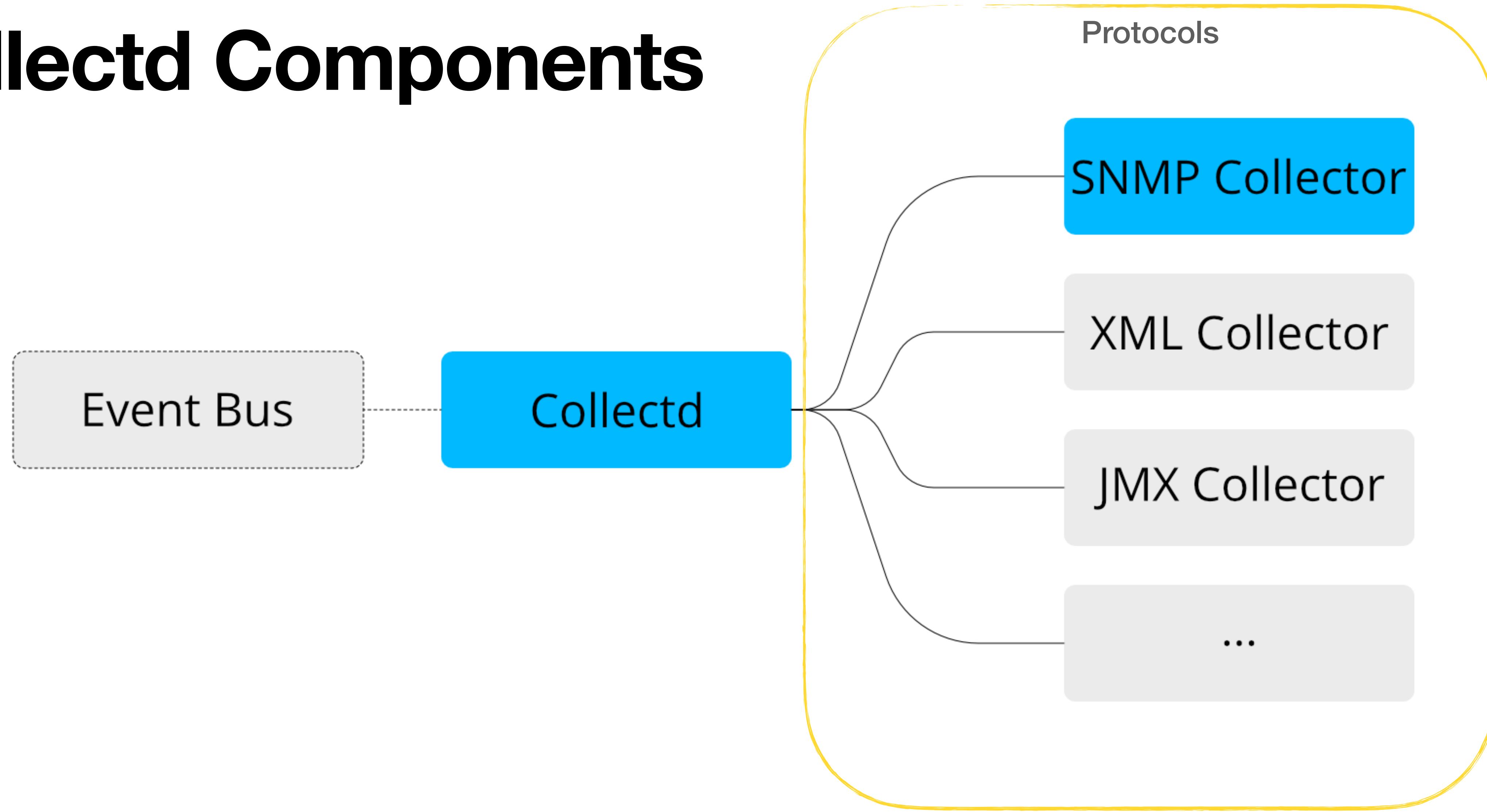
# Core Components



# Collectd Components



# Collectd Components



# Requirements for SNMP

1. Ability to talk to an SNMP enabled device (161/udp)
2. SNMP credentials in OpenNMS (snmp-config.xml)
3. We need the System Object Identifier to classify system

# Requirements for SNMP

OpenNMS Horizon 2024-02-19T16:50:04+01:00 🔍 Search... Search Status Reports Dashboards Maps Help ronny.trommer 0 0 + ⚙️

Home / Admin / Configure SNMP by IP

**SNMP Config Lookup**

IP Address

Location  Default

**Look up**

**Descriptions**

**SNMP Config Lookup:** You can look up the actual SNMP configuration for a specific IP and location. To do so enter the IP Address and location in the SNMP Config Lookup box and press "Look up". The configuration will then be shown in the "Updating SNMP Community Names" area.

**Updating SNMP Configuration:** In the boxes on the left, enter in a specific IP address and community string, or a range of IP addresses and a community string, and other SNMP parameters.

OpenNMS will optimize this list, so enter the most generic first (i.e. the largest range) and the specific IP addresses last, because if a range is added that includes a specific IP address, the community name for the specific address will be changed to be that of the range.

For devices that have already been provisioned and that have an event stating that data collection has failed because the community name changed, it may be necessary to update the SNMP information on the interface page for that device (by selecting the "Update SNMP" link) for these changes to take effect.

**Updating SNMP Configuration**

**General Parameters**

Version  v2c  
Default: v2c

First IP Address

Last IP Address

Location  Default

Timeout   
Default: 3000 ms

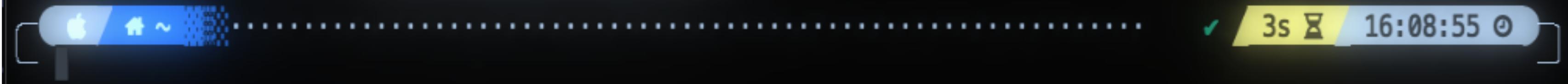
Retries   
Default: 1

Port   
Default: 161

# Requirements for SNMP

1. Ability to talk to an SNMP enabled device (161/udp)
2. SNMP credentials in OpenNMS (snmp-config.xml)
3. We need the System Object Identifier to classify a system

```
> ssh admin@localhost -p 8101 snmp-walk -l Default 192.168.42.34 .1.3.6.1.2.1.1.2
Warning: Permanently added '[127.0.0.1]:8101' (RSA) to the list of known hosts.
Password authentication
(admin@127.0.0.1) Password:
[.1.3.6.1.2.1.1.2].[0] = .1.3.6.1.4.1.8072.3.2.10
```



# Requirements for SNMP

1. Ability

2. SNMP

3. We need

```
> ssh admin@localhost  
Warning: Permanent  
Password authentication  
(admin@127.0.0.1)  
[.1.3.6.1.2.1.1.2]
```

Free Mib Browser Online

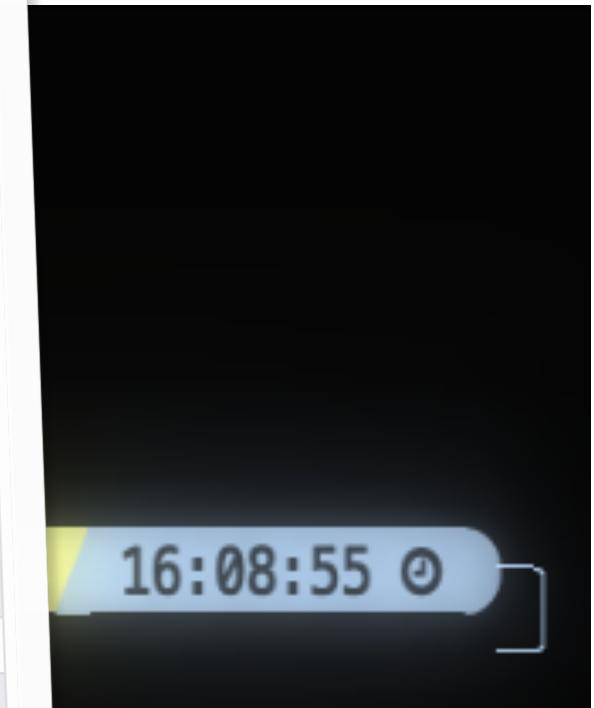
NET-SNMP-TC: View SNMP OID List / Download MIB  
VENDOR: NET-SNMP

Object Name	OID	Type	Access	Info
netSnmpTCs	1.3.6.1.4.1.8072.3.1.1			
hpx9	1.3.6.1.4.1.8072.3.2.1			
sunos4	1.3.6.1.4.1.8072.3.2.2			
solaris	1.3.6.1.4.1.8072.3.2.3			
osf	1.3.6.1.4.1.8072.3.2.4			
ultrix	1.3.6.1.4.1.8072.3.2.5			
hpx10	1.3.6.1.4.1.8072.3.2.6			
netbsd	1.3.6.1.4.1.8072.3.2.7			
freebsd	1.3.6.1.4.1.8072.3.2.8			
irix	1.3.6.1.4.1.8072.3.2.9			
linux	1.3.6.1.4.1.8072.3.2.10			
bsdi	1.3.6.1.4.1.8072.3.2.11			
openbsd	1.3.6.1.4.1.8072.3.2.12			
win32	1.3.6.1.4.1.8072.3.2.13			
hpx11	1.3.6.1.4.1.8072.3.2.14			
aix	1.3.6.1.4.1.8072.3.2.15			
macosx	1.3.6.1.4.1.8072.3.2.16			
dragonfly	1.3.6.1.4.1.8072.3.2.17			
unknown	1.3.6.1.4.1.8072.3.2.255			
netSnmpTCPDomain	1.3.6.1.4.1.8072.3.3.1			
netSnmpUnixDomain	1.3.6.1.4.1.8072.3.3.2			
netSnmpAAL5PVCDomain	1.3.6.1.4.1.8072.3.3.3			
netSnmpUDPIPv6Domain	1.3.6.1.4.1.8072.3.3.4			
netSnmpTCPIPv6Domain	1.3.6.1.4.1.8072.3.3.5			
netSnmpCallbackDomain	1.3.6.1.4.1.8072.3.3.6			
netSnmpAliasDomain	1.3.6.1.4.1.8072.3.3.7			
netSnmpDTLSUDPDomain	1.3.6.1.4.1.8072.3.3.8			
netSnmpDTLSSCTPDomain	1.3.6.1.4.1.8072.3.3.9			
netSnmpTLSTCPDomain	1.3.6.1.4.1.8072.3.3.10			

/udp)

.xml)

key system



# Collectd in OpenNMS

OpenNMS Horizon 2024-02-19T17:07:05+01:00

Search... Search Info Status Reports Dashboards Maps Help admin 0 0 + ⚙

Home / Search / Node

**Node: linux-03** 4 linux-server linux-03 Default

View Events View Alarms View Outages Asset Info Meta-Data Hardware Info Availability Resource Graphs Rescan Admin Update SNMP Schedule Outage Edit in Requisition View in Topology

**SNMP Attributes**

Name	linux-03
sysObjectID	.1.3.6.1.4.1.8072.3.2.10
Location	Sitting on the Dock of the Bay
Contact	Do not ask me!
Description	Linux linux-03 6.6.12-linuxkit #1 SMP Thu Feb 8 06:36:34 UTC 2024 x86_64

**Availability**

Availability (last 24 hours) 100.000%  
192.168.42.34 00 18:00 19:00 20:00 21:00 22:00 23:00 00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 100.000%  
ICMP 100.000%  
SNMP 100.000%

**Node Interfaces**

IP Address	IP Host Name	SNMP ifIndex	Managed
192.168.42.34	stack-linux-03-1.stack_net-onms	21	M

**General (Status: Active)**

View Node Link Detailed Info

**Surveillance Category Memberships (Edit)**

This node is not a member of any categories.

**Notifications**

Your outstanding notifications for this node  
Your acknowledged notifications for this node

**Recent Events**

49 2024-02-19T15:04:30+01:00	Normal	The hardware discovery (SnmpMetadataProvisioningAdapter) on node linux-03 (IP address 192.168.42.34) has been completed successfully.
48 2024-02-19T15:04:29+01:00	Normal	The Node with Id: 4; ForeignSource: linux-server; ForeignId:linux-03 has completed.
47 2024-02-19T15:04:29+01:00	Warning	SNMP information on 192.168.42.34 is being refreshed for data collection purposes.
46 2024-02-19T15:04:28+01:00	Warning	A services scan has been forced on this node.
45 2024-02-19T15:03:58+01:00	Normal	The hardware discovery (SnmpMetadataProvisioningAdapter) on node linux-03 (IP address 192.168.42.34) has been completed successfully.

More...

**Recent Outages**

CC BY SA

# Collectd in OpenNMS

OpenNMS Horizon 2024-02-19T17:09:04+01:00 🔍  Search Info Status Reports Dashboards Maps Help admin 0 0 + ⚙

Home / Search / Node / Interface / Service

## SNMP service on 192.168.42.34

[View Events](#) [Meta-Data](#) [Delete](#)

General		
Node	linux-03	
Interface	192.168.42.34	
Polling		
Polling Status	Managed	
Polling Package	example1	
Poller Name	SNMP	
Poller Pattern	N/A	
Monitor Class	org.opennms.netmgt.poller.monitors.SnmpMonitor	
Interval	300000	
Last Good	2024-02-19T17:05:46+01:00	
Last Fail	Unknown	
Collection		
Collection Status	Enabled	
Collection Package	example1	
Collection Interval	300000	
Collector Class	org.opennms.netmgt.collectd.SnmpCollector	
Overall Availability		
192.168.42.34	18:00 19:00 20:00 21:00 22:00 23:00 00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00	100.000%
SNMP	100.000%	
Pattern Variables		
Poller Service Parameters		
Parameter	Value	Effective
oid	`\${requisition:oid detector:oid 1.3.6.1.2.1.1.2.0}`	.1.3.6.1.2.1.1.2.0 ⓘ
Collectd Service Parameters		
Parameter	Value	Effective
collection	`\${requisition:collection detector:collection default}`	default ⓘ
thresholding-enabled	true	true
Recent Events		
32	2024-02-19T15:03:57+01:00	Warning The SNMP service has been discovered on interface 192.168.42.34.
More...		
Recent Outages		
There have been no outages on this service in the last 24 hours.		

# Collectd in OpenNMS

OpenNMS Horizon 2024-02-19T17:09:04+01:00 🔍 Search... Search Info Status Reports Dashboards Maps Help admin 0 0 + ⚙️

Home / Search / Node / Interface / Service

## SNMP service on 192.168.42.34

[View Events](#) [Meta-Data](#) [Delete](#)

General		
Node	linux-03	
Interface	192.168.42.34	
Polling		
Polling Status	Managed	
Polling Package	example1	
Poller Name	SNMP	
Poller Pattern	N/A	
Monitor Class	org.opennms.netmgt.poller.monitors.SnmpMonitor	
Interval	300000	
Last Good	2024-02-19T17:05:46+01:00	
Last Fail	Unknown	
Collection		
Collection Status	Enabled	
Collection Package	example1	
Collection Interval	300000	
Collector Class	org.opennms.netmgt.collectd.SnmpCollector	
Overall Availability		
192.168.42.34	18:00 19:00 20:00 21:00 22:00 23:00 00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00	100.000%
SNMP	18:00 19:00 20:00 21:00 22:00 23:00 00:00 01:00 02:00 03:00 04:00 05:00 06:00 07:00 08:00 09:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00	100.000%

Pattern Variables

Parameter	Value	Effective
oid	`\${requisition:oid detector:oid}.1.3.6.1.2.1.1.2.0`	.1.3.6.1.2.1.1.2.0 ⓘ

Collector Service Parameters

Parameter	Value	Effective
collection	`\${requisition:collection detector:collection default}`	default ⓘ
thresholding-enabled	true	true

Recent Events

32 2024-02-19T15:03:57+01:00	Warning	The SNMP service has been discovered on interface 192.168.42.34.
More...		

Recent Outages

There have been no outages on this service in the last 24 hours.

# Collectd in OpenNMS

OpenNMS Horizon 2024-02-19T17:09:04+01:00   Search... Search Info Status Reports Dashboards Maps Help admin 0 0 + ⚙️

Home / Search / Node / Interface / Service

### SNMP service on 192.168.42.34

[View Events](#) [Meta-Data](#) [Delete](#)

General	
Node	linux-03
Interface	192.168.42.34
Polling	
Polling Status	Managed
Polling Package	example1
Poller Name	SNMP
Poller Pattern	N/A
Monitor Class	org.opennms.netmgt.poller.monitors.SnmpMonit
Interval	300000
Last Good	2024-02-19T17:05:46+01:00
Last Fail	Unknown
Collection	
Collection Status	Enabled
Collection Package	example1
Collection Interval	300000
Collector Class	org.opennms.netmgt.collectd.SnmpC
Overall Availability	
192.168.42.34 00 18:00 19:00 20:00 21:00 22:00 23:00 00:00 01:00 02:00 03:00 04:00 05:00 06:00	
SNMP	

Pattern Variables

Parameter	Value	Effective
oid	\${requisition:oid detector:oid .1.3.6.1.2.1.1.2.0}	.1.3.6.1.2.1.1.2.0 ⓘ

Poller Service Parameters

Parameter	Value	Effective
oid	\${requisition:oid detector:oid .1.3.6.1.2.1.1.2.0}	.1.3.6.1.2.1.1.2.0 ⓘ

Collectd Service Parameters

Parameter	Value	Effective
collection	\${requisition:collection detector:collection default}	default ⓘ
		true

been discovered on interface 192.168.42.34.

## Collection Groups

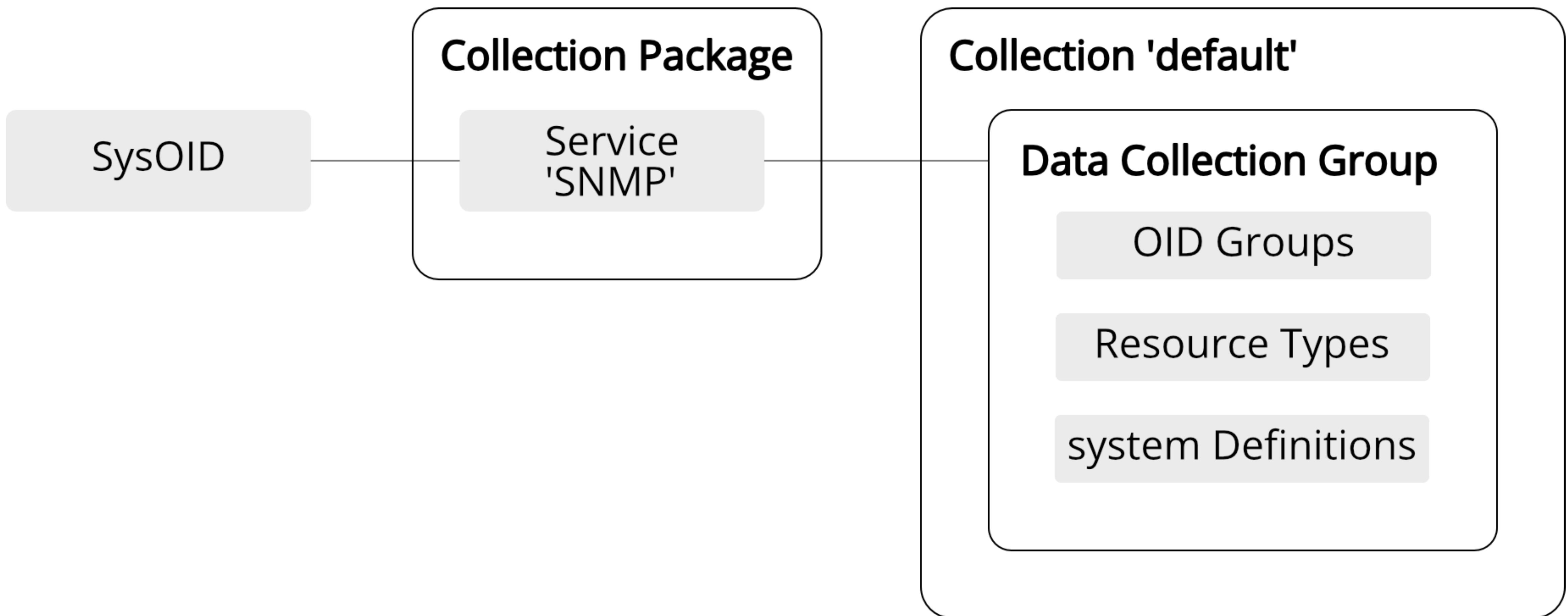
### datacollection/tutorial-snmp.xml

```
<group name="host-resources-storage" ifType="all">
    <mibObj oid=".1.3.6.1.2.1.25.2.3.1.2" instance="hrStorageIndex" alias="hrStorageType" type="string"/>
    <mibObj oid=".1.3.6.1.2.1.25.2.3.1.3" instance="hrStorageIndex" alias="hrStorageDescr" type="string"/>
    <mibObj oid=".1.3.6.1.2.1.25.2.3.1.4" instance="hrStorageIndex" alias="hrStorageAllocUnits" type="string"/>
    <mibObj oid=".1.3.6.1.2.1.25.2.3.1.5" instance="hrStorageIndex" alias="hrStorageSize" type="gauge"/>
    <mibObj oid=".1.3.6.1.2.1.25.2.3.1.6" instance="hrStorageIndex" alias="hrStorageUsed" type="gauge"/>
</group>

<systemDef name="Tutorial-SNMP-System">
    <sysoid>.1.3.6.1.4.1.61509.42.1</sysoid>
    <collect>
        <includeGroup>host-resources-storage</includeGroup>
    </collect>
</systemDef>
```

A red arrow points from the 'host-resources-storage' group definition in the XML to the 'host-resources-storage' entry in the 'Collectd Service Parameters' table.

# Collectd in OpenNMS



# Exercise 5.1

## Collect Load metrics via SNMP from an unknown device

```
> snmpwalk -On -v2c -c public localhost:1610 .1.3.6.1.2.1.1.2  
.1.3.6.1.2.1.1.2.0 = OID: .1.3.6.1.4.1.61509.42.1
```

```
> snmpwalk -On -v2c -c public localhost:1610 .1.3.6.1.4.1.2021.10.1.5  
.1.3.6.1.4.1.2021.10.1.5.1 = INTEGER: 317 Load average 1 minute  
.1.3.6.1.4.1.2021.10.1.5.2 = INTEGER: 335 Load average 5 minutes  
.1.3.6.1.4.1.2021.10.1.5.3 = INTEGER: 344 Load average 15 minutes
```