

An alternative
approach to view
Mikrotik PPPoE
interface historical
usage using Zabbix &
Grafana

Background

We Uday [A Brand of ADN Telecom Ltd] during initial development of our OSS/BSS due to some complexity on Radius Server, we had decided to use API based solution for Mikrotik B RAS.

Hardware & Software used for Retail network



Mikrotik Routers [CCR Series Mostly]



In-house developed OSS/BSS software billing & client management



Zabbix Server



Grafana Server

Operation Challenges

Widely used features like these

1. PPPoE users' session status
[Connection/Disconnection/Failed]
2. Usage history

Are missing

To resolve
Problem-2
[Usage
history]

1. Enabled SNMP at Mikrotik NAS/BRAS
2. Installed Zabbix Server and Start probing Mikrotik interfaces using built-in Mikrotik templates

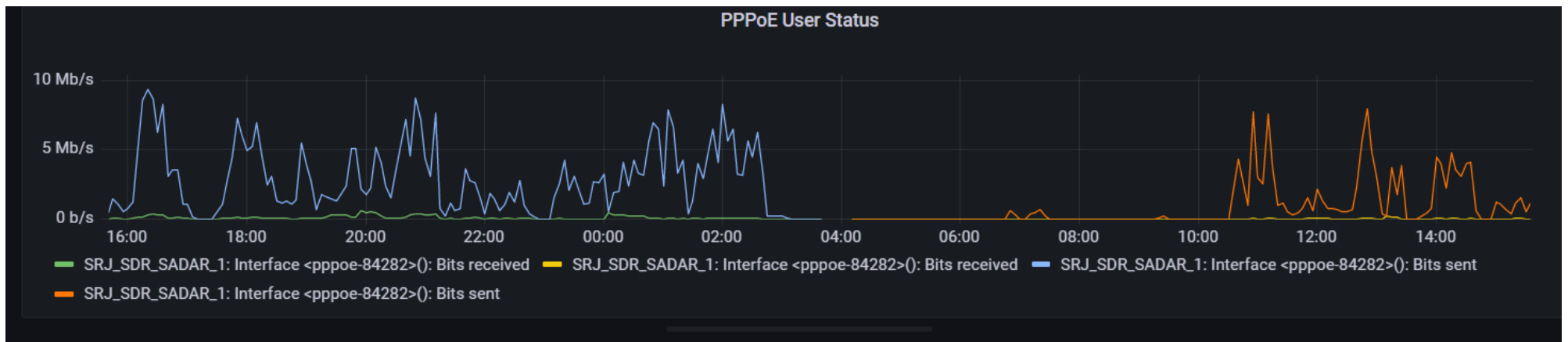
Configuration challenges

As PPPoE interfaces are created dynamically, their SNMP index values keep changing every time session starts. So its impossible to generate static graphs using rrd number.

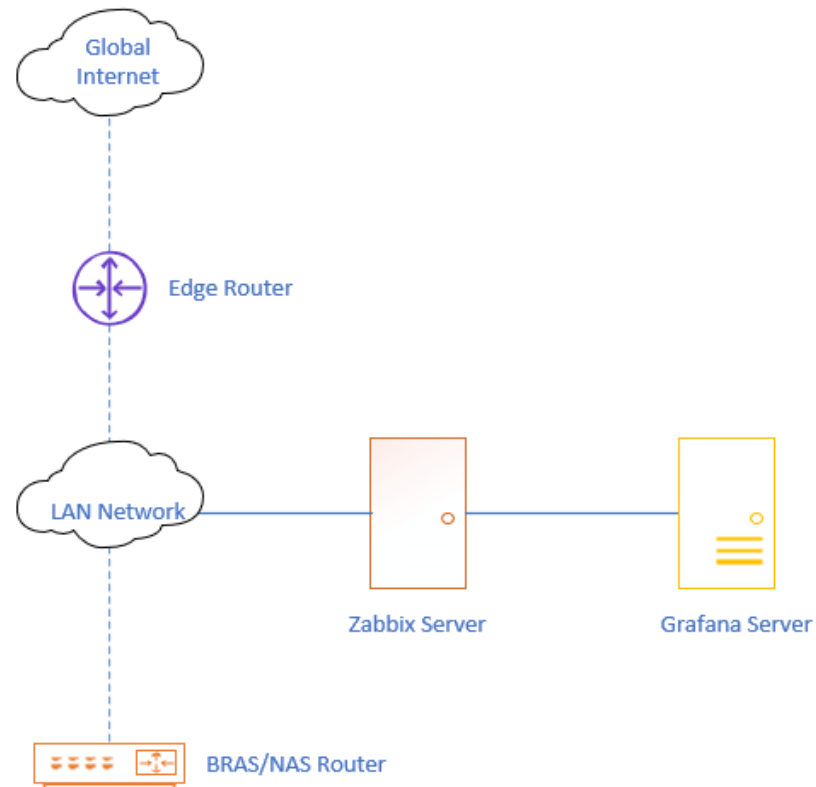
Interface <pppoe-84282>(): Bits received ?	11h 51m 3s	24 bps	-1.79 Kbps	component: network description interface: <pppoe-84282>	Graph i
Interface <pppoe-84282>(): Bits received ?	59s	34.64 Kbps	-30.47 Kbps	component: network description interface: <pppoe-84282>	Graph
Interface <pppoe-84282>(): Bits sent ?	11h 50m 58s	48 bps	-608 bps	component: network description interface: <pppoe-84282>	Graph i
Interface <pppoe-84282>(): Bits sent ?	55s	576.46 Kbps	-1.01 Mbps	component: network description interface: <pppoe-84282>	Graph
Interface <pppoe-84282>(): Interface type ?	23h 30m 34s	ppp (23)		component: network description interface: <pppoe-84282>	Graph i
Interface <pppoe-84282>(): Interface type ?	10h 30m 57s	ppp (23)		component: network description interface: <pppoe-84282>	Graph
Interface <pppoe-84282>(): Operational status ?	11h 51m 3s	up (1)		component: network description interface: <pppoe-84282>	Graph i
Interface <pppoe-84282>(): Operational status ?	1m 4s	up (1)		component: network description interface: <pppoe-84282>	Graph

Workaround

At this point we found Grafana provides excellent way to generate the time series graph which we are looking for



Setup scenario



Data Source & Template used for this

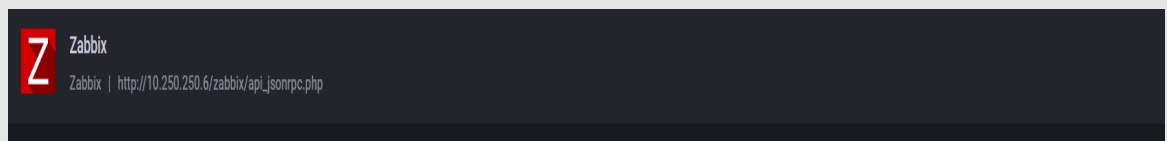
- Zabbix:

- Buiiltin Mikrotik Templates

<input type="checkbox"/>	Name ▲	Hosts	Items	Triggers	Graphs	Dashboards	Discovery	Web	Linked templates	Linked to templates	Tags
<input type="checkbox"/>	MikroTik CCR1009-7G-1C-1S+PC SNMP	Hosts 2	Items 18	Triggers 10	Graphs 1	Dashboards 1	Discovery 8	Web			class: network target: ccr1009-7g-1c-1... target: mikrotik
<input type="checkbox"/>	MikroTik CCR1009-7G-1C-1S+ SNMP	Hosts 13	Items 18	Triggers 10	Graphs 1	Dashboards 1	Discovery 8	Web			class: network target: ccr1009-7g-1c-1... target: mikrotik
<input type="checkbox"/>	MikroTik CCR1009-7G-1C-PC SNMP	Hosts	Items 18	Triggers 10	Graphs 1	Dashboards 1	Discovery 8	Web			class: network target: ccr1009-7g-1c-pc target: mikrotik
<input type="checkbox"/>	MikroTik CCR1016-12G SNMP	Hosts	Items 18	Triggers 10	Graphs 1	Dashboards 1	Discovery 8	Web			class: network target: ccr1016-12g target: mikrotik
<input type="checkbox"/>	MikroTik CCR1016-12S-1S+ SNMP	Hosts	Items 18	Triggers 10	Graphs 1	Dashboards 1	Discovery 8	Web			class: network target: ccr1016-12s-1spl... target: mikrotik
<input type="checkbox"/>	MikroTik CCR1036-8G-2S+EM SNMP	Hosts	Items 18	Triggers 10	Graphs 1	Dashboards 1	Discovery 8	Web			class: network target: ccr1036-8g-2spl... target: mikrotik
<input type="checkbox"/>	MikroTik CCR1036-8G-2S+ SNMP	Hosts 10	Items 18	Triggers 10	Graphs 1	Dashboards 1	Discovery 8	Web			class: network target: ccr1036-8g-2splus target: mikrotik
<input type="checkbox"/>	MikroTik CCR1036-12G-4S-EM SNMP	Hosts	Items 18	Triggers 10	Graphs 1	Dashboards 1	Discovery 8	Web			class: network target: ccr1036-12g-4s-em target: mikrotik
<input type="checkbox"/>	MikroTik CCR1036-12G-4S SNMP	Hosts 4	Items 18	Triggers 10	Graphs 1	Dashboards 1	Discovery 8	Web			class: network target: ccr1036-12g-4s target: mikrotik
<input type="checkbox"/>	MikroTik CCR1072-1G-8S+ SNMP	Hosts	Items 18	Triggers 10	Graphs 1	Dashboards 1	Discovery 8	Web			class: network target: ccr1072-1g-8splus target: mikrotik

- Grafana:

- Zabbix App



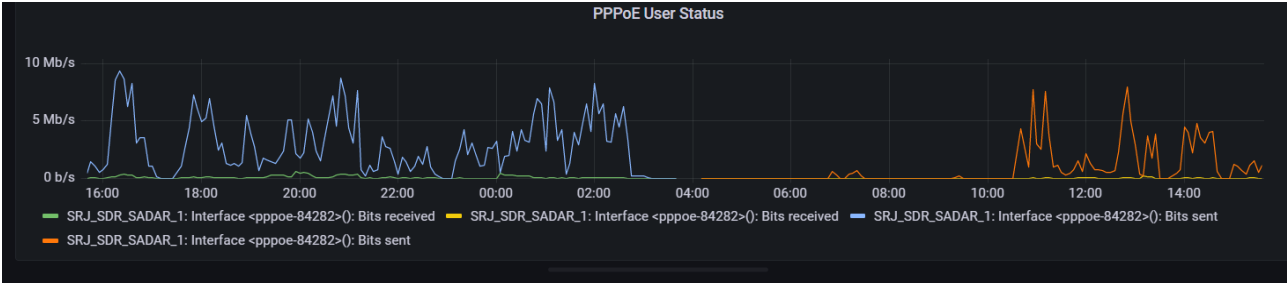
Grafana Query

Inspect: PPPoE User Status

2 queries with total query time of 1 s

```
Data  Stats  JSON  Query
Request: Object
  url: "api/ds/query"
  method: "POST"
  data: Object
    queries: Array[2]
      0: Object
        application: Object
        datasource: Object
        functions: Array[0]
        group: Object
        hide: false
        host: Object
          filter: "SRJ_SDR_SADAR_1"
        item: Object
          filter: "Interface <pppoe-84282>(): Bits received"
        itemTag: Object
          filter: "interface: <pppoe-84282>"
        options: Object
        proxy: Object
        queryType: "0"
        refId: "A"
        resultFormat: "time_series"
        table: Object
      1: Object
        application: Object
        datasource: Object
        functions: Array[0]
        group: Object
        hide: false
        host: Object
          filter: "SRJ_SDR_SADAR_1"
        item: Object
          filter: "Interface <pppoe-84282>(): Bits sent"
        itemTag: Object
          filter: "interface: <pppoe-84282>"
        options: Object
        proxy: Object
        queryType: "0"
        refId: "B"
        resultFormat: "time_series"
```

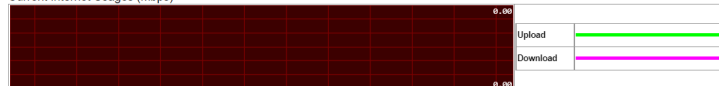
Outcome/Result at Grafana Dashboard



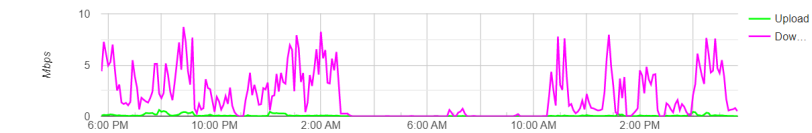
Result for Uday OSS/BSS

shared.udoyadn.com/OnuData/GetInternetUsages?id=mkB79VwfQG7ojCr7BpMXwawspfmpeawspfmpe

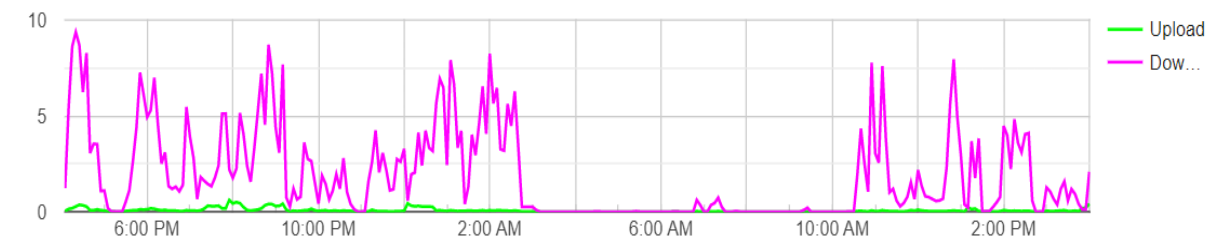
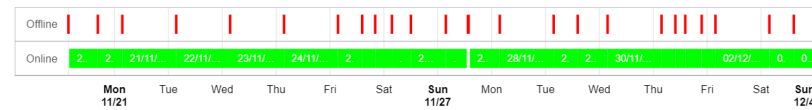
Subscriber Code:	09610300490	Customer Mac	28:87:BA:A3:19:D7, Vendor: TP-Link Corporation Limited, Country: HK
PPPOE UserID:	84282	Last connected time:	DEC 04 2022 03:46:31 (13H54...)
Session Expire:	36	Total upload during current session:	1.11 MB
		Total download during current session:	7.12 GB
Mikrotik Address: [id:*183,list:Padma,address:10.64.1.138,creation-time:jm:02/2022 13:28:05,dynamic:false,disabled:false,comment:84282]			
Mikrotik Secret: [id:*C47,name:84282,service:pppoe,password:046044,profile:Padma,local-address:10.64.1.1,remote-address:10.64.1.138,limit-bytes-in:0,limit-bytes-out:0,last-logged-out:dec 04 2022 03:45:33,last-caller-id:28:87:BA:A3:19:D7,last-disconnect-reason:nas-request,disabled:false]			



Subscriber usages graph for Last 24 Hours



Subscriber connect/disconnect timeline to router.



Special Notes

- Thanks Udoy Software Team for their excellent work on API
- Also Udoy Core team.

Thank You