6WIND | Virtualized Networking Software

6WIND VSR and Sysrepo

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6WIND VSR

6WIND VSR

- 6WIND VSR is a product line comprising of high performance software routers
- Network functions: Security Gateway, Border Router, Provider Edge, Firewall, BNG, UPF
- Deployment model: Baremetal, VNF, CNF
- x86 and Arm
- Orchestrator: Openstack, Kubernetes, Red Hat Openshift, VMware
- More informations on *6WIND* website

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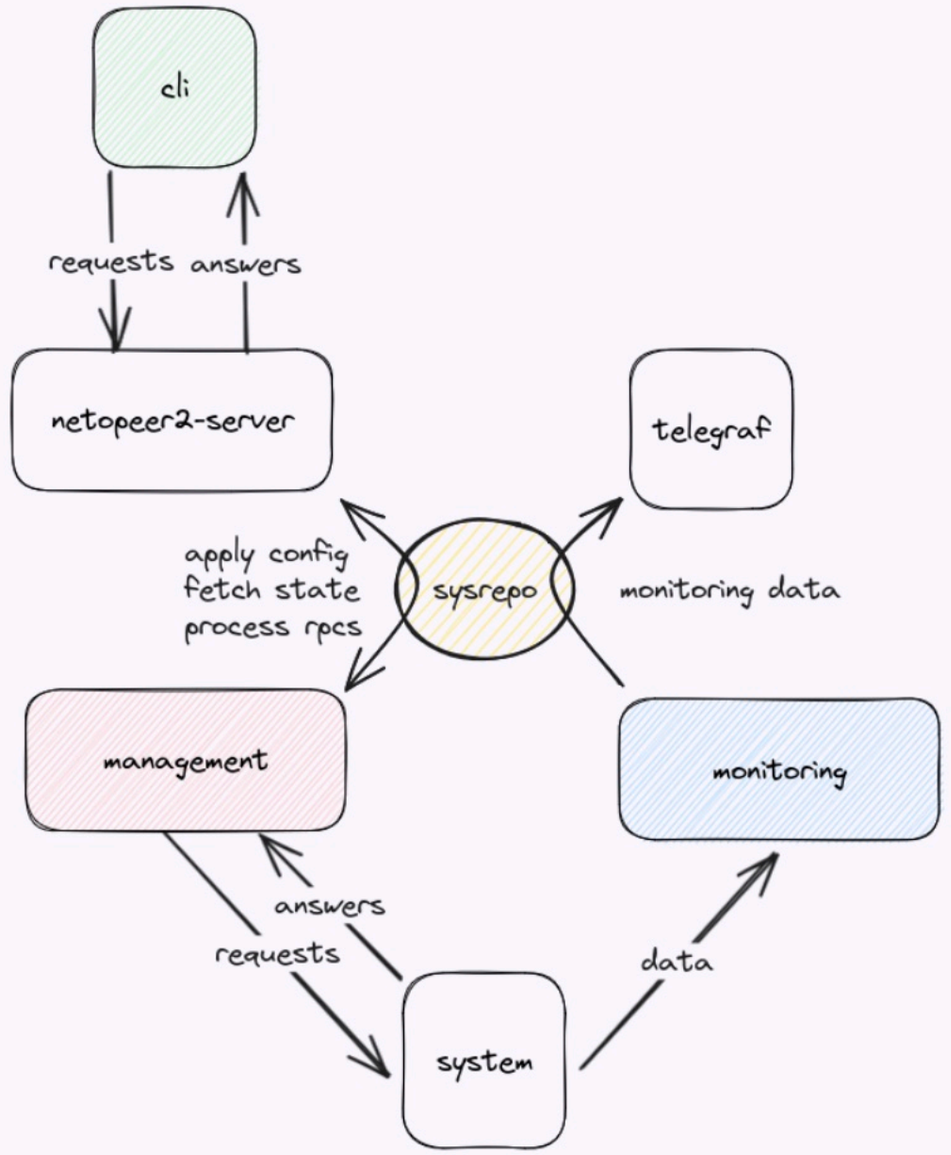
Our Sysrepo usage

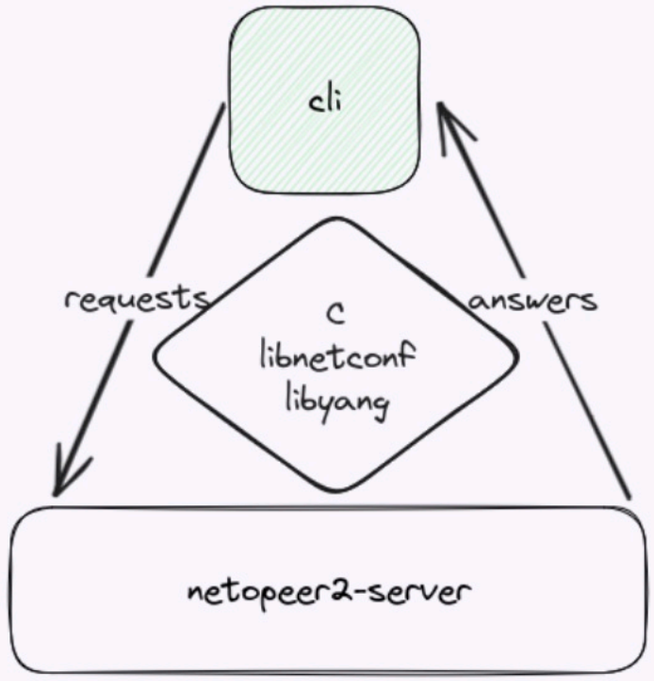
Global architecture

- users since 2017
- 3 components using the sysrepo suite
  - monitoring
  - cli
  - management



Zoom on cli

- role: user interface, issue configuration requests, rpcs, and fetch state
- NETCONF client, written in C, using libnetconf and libyang
- cli syntax derived from custom YANG models (completion, validation)
- hierarchical model (modules augment a root)
- two trees: each config leaf as its state counterpart



Zoom on cli - YANG

```
container config {
  list vrf {                // vrouter module
    container interface {  // vrouter-interface module
      list loopback {      // vrouter-loopback module
        container ipv4 {
          leaf address {
            type inet:ipv4-address;
          }
        }
      }
    }
  }
}
container state {
  list vrf {                // vrouter module
    container interface {  // vrouter-interface module
      list loopback {      // vrouter-loopback module
        container ipv4 {
          leaf address {
            type inet:ipv4-address;
          }
        }
      }
    }
  }
}
```

Zoom on cli - config

- Configure a `lo1` loopback with address `1.1.1.1/24`

```
vsr> edit running
vsr running config# / vrf main interface loopback lo1 ipv4 address 1.1.1.1/324
ERROR: Failed to parse command
   / vrf main interface loopback lo1 ipv4 address 1.1.1.1/324
Expected:
  <A.B.C.D/M>          The IPv4 address on the interface and optionally its prefix.
vsr running config# / vrf main interface loopback lo1 ipv4 address 1.1.1.1/24
vsr running config# commit
vsr running config# show config absolute xml vrf main interface loopback lo1
<config xmlns="urn:6wind:vrouter">
  <vrf>
    <name>main</name>
    <interface xmlns="urn:6wind:vrouter/interface">
      <loopback xmlns="urn:6wind:vrouter/loopback">
        <name>lo1</name>
        <ipv4>
          <address>
            <ip>1.1.1.1/24</ip>
          </address>
        </ipv4>
      </loopback>
    </interface>
  </vrf>
</config>
```

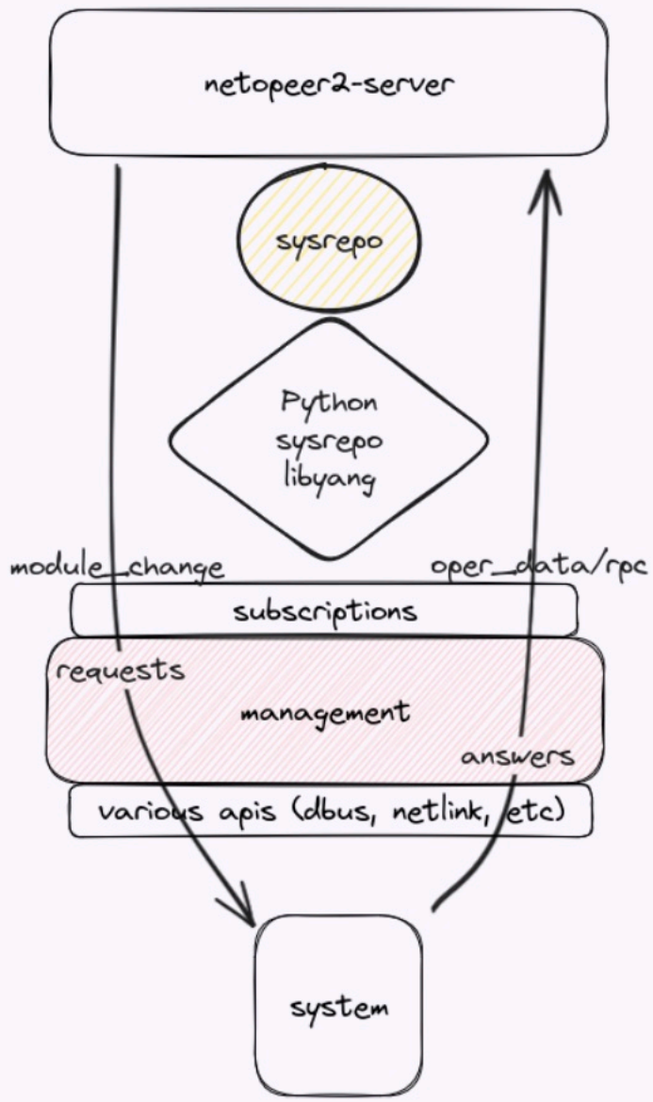
Zoom on cli - state

- Check that the interface address is in the right state, diff running config with state

```
vsr running config# show state vrf main interface loopback lo1
loopback lo1
    ipv4
        address 1.1.1.1/24
        ..
    (...)
vsr running config# diff running state vrf main interface loopback lo1
vsr running config#
```

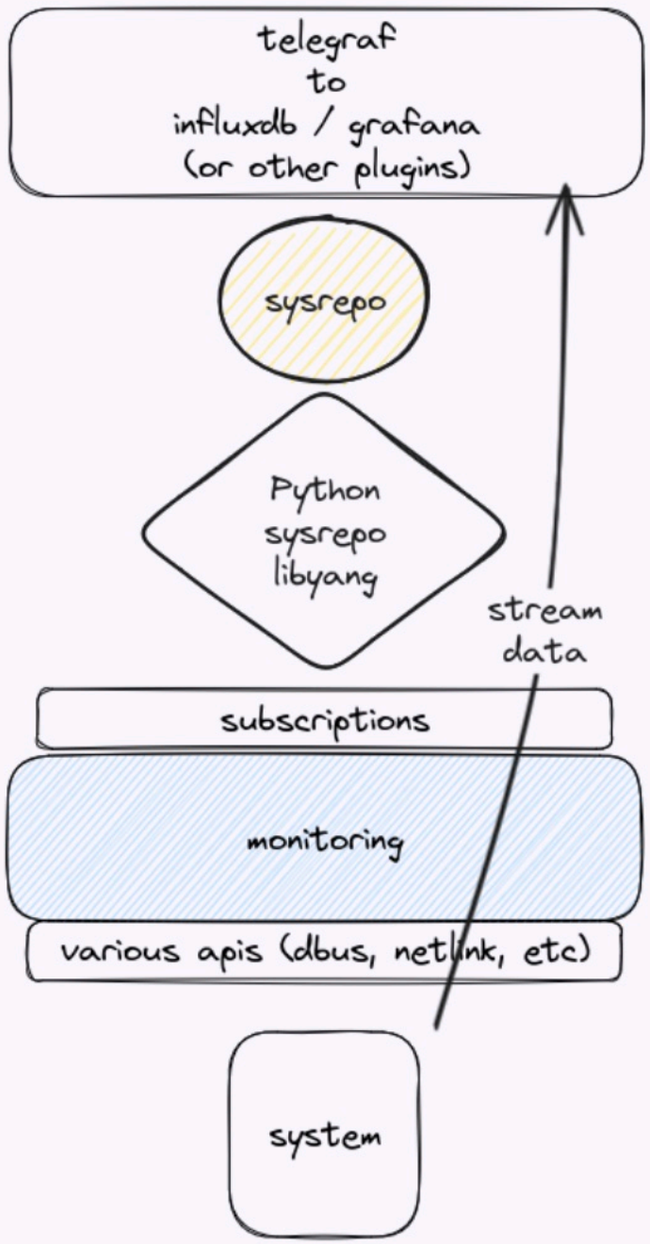
Zoom on management

- role: configure the system and fetch its state, process rpcs using sysrepo subscriptions
- written in Python (sysrepo and libyang wrappers)
- only one subscription for `module_change`, because we need a consistent tree for all modules, as there are dependencies between the modules
- push state on events from the system (e.g: network interfaces link status on netlink event)



Zoom on monitoring

- role: stream data to an analytics solution
- written in Python (sysrepo and libyang wrappers)
- streamed data are modeled using YANG
- `oper_data` subscriptions for each type of streamed data (network bandwidth, etc)
- telegraf gets the data via sysrepo, and outputs it to influxdb / grafana (or similar)



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Our Contributions

Contribution policy

- Our policy
  - 6WIND upstreams everything that makes sense on those projects
  - try to solve ourselves when a bug is found, else open an issue
- What we did
  - about 30 patches contributed so far
- What we will do
  - improvements in netopeer2-server notifications (Jeremie Leska)
  - bug fixes, optimizations and issues as we find them

Team's Feedback

- well documented
- amazing support
- receptive and helpful with contributions
- but
  - bottlenecks in libyang/sysrepo for big configs
  - some parts are complex, making it hard for us to contribute (libsysrepo/libyang internals for instance)
  - we did not find a statisfying way to manage YANG model updates

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Questions?