Use of rose-storage package?

distributed storage as one of its use cases

Hello!

I am Martin Pína

I'm a certified MikroTik trainer and my trademark is that I'm on a time slip most of the time, so let's get to it. :-)

01

Rose-storage package

What is rose-storage package?

Why and when to use it?

What is rose storage package?

- one of „extra" packages
- aims for improved disk management, officially „adds additional enterprise data center functionality"
    - RAID (JBOD, RAID 0,1,4,5,6, 1+0)
    - iSCSI (both target and initiator)
    - file services over NFS (client and server, only v4)
    - NVMe over TCP
    - encryption (SED and dmcrypt)
    - (SMB - moved to main package since 7.14)
    - (RAM disk)

Current status of rose-storage

- added in 7.8

- supported architectures are ARM, ARM64, x86 and TILE

- rose-storage support page
  - missing descriptions
  - not updated since 21st March 2023

- only for additional storage? (i.e. excluding system disk)

Dashboard / RouterOS / Extended features

ROSE-storage

- Summary
- General inteface properties
- Partitions
- RAID
  - RAID levels
    - RAID 0
    - RAID 1
    - RAID 4
    - RAID 5
    - RAID 6
    - Linear
    - Nested RAID

https://help.mikrotik.com/docs/display/ROS/ROSE-storage

Why to use rose-storage?

- RAID - e.g. mirror for Dude storage, but… …devices with multiple drive options are rare

- NFS - e.g. good to have common „repository", but… …limited to supported architectures

- encryption - up to your own paranoia…

- iSCSI/NVMe over TCP - block devices over network?

- (r)sync - nice add-on feature for small setups, probably coupled with SMB/ NFS

What is appropriate hardware?

- for „client" applications
  - whatever of supported architecture
  - with enough processing power
- for „server" applications (despite of supported architectures)
  - NVMe slot
  - SATA port
  - USB (preferably 3+) port
- hardware matrix

MIKROTIK

Products

Product filters   ◎ Hide

Show products
- ◉ Current
- ○ New
- ○ Archived

Option range   +

Use filters

Reset filter

Useful links
- Product catalog (PDF)
- Product matrix
- What is RouterOS?
- Wireless link calculator
- Selection guide for PtP links

Result?

- good idea
- not much in focus
- poor hardware choice

02

Real world application

Vision versus reality

Just an idea…

- Premise
  - there are lots of devices out there
  - they run anyway
  - consumption of attached storage is close to negligible
- Is there any way how to benefit/take advantage of it?

Vision

Many devices with even more storage devices connected creating one big pool of high available, resilient, geo-distributed storage…

Vision versus reality

Pros

- distribution is nature geo-"backup"
- no additional storage hardware
- reduced electricity cost ?

Cons

- worse reliability/availability
- MikroTik hardware is not primarily built for storage
- worse/storage replacement
- speed limited to network

What else to think of…

- If some kind of proxy/controller is needed, or end device should connect to storage service in RouterOS directly?

- If controller, where to locate it?
  controller can handle redundancy/replicas
  - another RouterOS?
  - virtual machine?
  - docker?
- Where to do the encryption
- Serviceability

Adoption to real world

- due to speed of network and storage used - cold storage is safe bet
- number of replicas may be a challenge (ceph uses 3 by default)
- find appropriate hardware
  - RB1100AHx4 Dude edition (4x SATA)
  - some boards with 1 USB3 slot (RBM33G is not supported architecture)
  - CCR2116 (1x NVMe slot)

Disadvantages from the start

- it is complicated/not possible to do all operations with disks as we are used to from full-featured OSes

- monitoring of disk heath may be a problem

- no native rose-storage bandwidth management (but yes, it is RouterOS, so there are plenty of options)

- advanced features missing (like authentication)
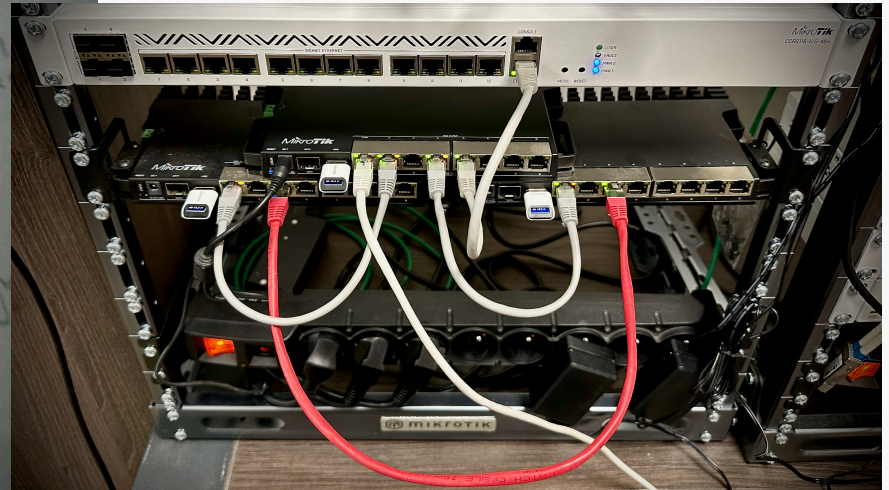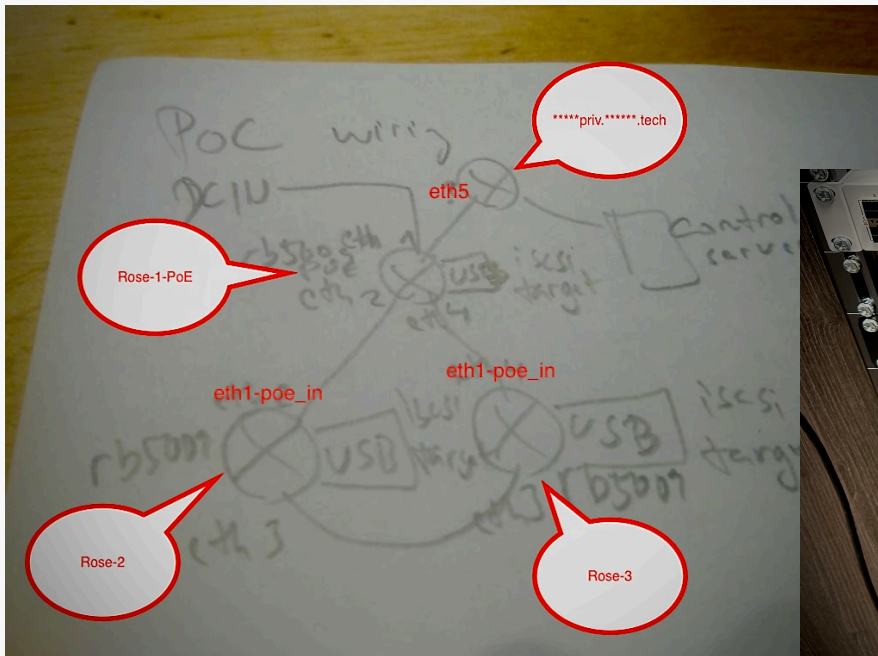
- mature enough? (7.14)

03

PoC

Three routers and three storage devices in the LAB.

Setup

- PoC wiring - from analog to digital.:-)

Outcome

- attach iSCSI succeeded

- attach NVMe over TCP (with USB) succeeded

- create RAID locally in controller succeeded

- export created array succeeded

- attach imported disks as CEPH OSD - work in progress (succeeded for bluestore)

Possible enhancements

- tunnels used to connect to controller

- anycast addresses used to adapt to network changes
(both for storage nodes and for controller)

- final redundancy option should be CEPH (but not really created for network
attached storage at first place) or something similar in features
(redundancy, self-healing, scrubbing)

- something else? I'm sure we could find more, but time is running out and
therefore....

Thanks for your attention.

mikrotik
professionals conference