Low? cost disk storage with CephS, Swifts, Scalitys etc.

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TERENA TF-Storage meeting in Vienna

OpenDiscussion
Cost categories

• CAPEX vs OPEX
  - cost structure in your organisation
  - CAPEX covered by separate budget than OPEX?
  - OPEX to be paid during 3-5 years from investment

• The known and the unknown/unpredictable
  - ...
Cost factors

- **CAPEX**
  - hardware costs:
    - servers:
      - platforms: mainboards, CPUs, RAM, NICs
      - disks!
        - HDDs for capacity
        - SSDs for performance: journals, caching, tiers?
      - network connectivity
  - environment:
    - racks, PDUs, PSUs
    - computing room (if you build it not rent)
  - Staff: FTE for installation, configuration, testing,... before launch into production
Cost factors

• OPEX
  – Hardware: maintenance: servers / network
  – Software maintenance?
  – Environment costs:
    • power
    • cooling (+30%?)
    • the more CPUs the more power to be used
  – Staff!
    • ‘do it in the background, guys’ is not always an option
    • 0,5 FTE per 30PB Ceph (according to Taco)?
Cost factors

• OPEX
  – Hardware maintenance
    (5-10% of CAPEX year? 30% of CAPEX?)
    • Depends on type of SLA with the vendor
    • A-brand servers vs low-cost servers…
      • the better the hardware
      • the higher the support cost
      • the lower the personnel cost
    • Do you buy a support for HDD drives or for platform only?
    • Do you see a need to purchase support for a platform?
      • better to put these 10%/year into a hardware
        => more redundancy?
        => more relaxed hardware replacement regime?
Cost factors

• OPEX
  – Software maintenance *(XYZ% of CAPEX yearly?*
    • fully BIY vs supported approach...
    • what are SLAs available?
      • how the support changes your situation
    • constant fee / vs ‘per-case’ support?
Cost factors

• OPEX
  – Room space cost (~8% of OPEX)
    • the more dense the servers the better room space usage
    • BUT very dense platform rarely are hot-swappable
      => better to use small nodes (12-20hdd/node)?
  – Electricity cost? (20%-30% of CAPEX)
    • important cost factor!
      ~200W/1U/ 12 HDD/ 1CPU? server (average)
      ~ 0,1 EUR/kWh (Poland)
    • redundant PSUs cost you sth...
    • typical CPUs if you Erasure Code, low-power for replication?
Cost factors

- **OPEX**
  - Staff cost (even 40% of CAPEX)
    - Do you dedicate people for dev/maintenance of the low-cost storage? what FTE fraction?
    - It’s important part of the overall costs (depending on country: 4kEUR-7kEUR/PM?)
    - You must go to large scale so the the costs is distributed across the large capacity
How we can work together

- Work out / document the methodology for cost computation
- Share the numbers or not…. BUT share the logic

- Make up the tool: excel / google doc sheet
- Write a short cost calculation how to?

- Write a ‘white-label’ storage building handbook? (covering hardware, and possible software)

- Tender for HDDs/SSDs/servers/licenses? together?
How we can work together

• HDD tendering:
  – agree a list of drive types and (vendor-neutral) specs:
    • HDDs for capacity
    • SSDs for performance
  – run a large volume tender?
    • valid for 0,5-1 year
    • coordinated by a trusted partner (Geant?)
    • not sure how much we can get...
How we can work together

• Building the low cost storage howto
  – hardware configurations and concepts
    • take the Inktank hardware... guide as input
    • optimised for particular criteria
    • tuned for the software you plan to run
  – software solutions overview / comparison?
  – maintenance / support organisation
  – process implementation tips:
    • e.g. the tendering procedure related
    • acceptance testing tools / tips
      (we could ask large organizations
to share their methodology)
How we can work together

- Low-cost storage servers list / specs?
- The vendor neutral building block?
Conclusions (1)

- Low-cost storage is not always low-cost
- We need to share the knowledge / know-how how to optimise costs depending on the use case

- Let’s start with costs calculator
- Then attach the cost calculation howto

- Volunteers needed!

- Another possible work would be the low-cost storage howto covering the experience from the whole process
Storage row in PSNC’s data center in 2 years © - see: blog.backblaze.org