Cloud Migration Whois Service

RIPE NCC Database Team

Ed Shryane | 14 May 2020 | RIPE 80

Activity Plan 2020

"As part of the strategy for investigating cloud storage solutions, we will **assess the suitability** of moving some RIPE Database elements onto third-party cloud infrastructure and **share our findings** with the RIPE community."

Activity Plan 2020

- **"Most of our services run on a complex technical infrastructure that we maintain entirely in-house.** This comes at a considerable cost to the membership in terms of CAPEX, OPEX and related obligations in terms of long-term contracts."

- "In 2020, we will investigate whether it would be beneficial to move some of our services to cloud-hosted solutions. This would have a number of obvious benefits in terms of **reduced costs and maintenance overhead**, allowing us to become more agile, and introducing **greater scalability and redundancy.**"

- "We will **discuss potential changes further** with the RIPE community before any significant actions are taken."

Activity Plan 2020

- "A series of projects in 2020 will investigate the suitability of moving technical infrastructure that is currently maintained in-house to a set of **cost-effective** cloud solutions."

- "The aim in all these projects will be to assess the potential for developing more agile, innovative data storage solutions capable of reducing time to insight whilst ensuring the **same high level of resilience** provided by the existing setup."

- "The Cloud Strategy and Revised Organisational Model projects do not result in notable budget increases for their parent activities, but nevertheless come with associated costs and are listed under the new **"Notable Investment"** category."

In-house
Infrastructure

Current Infrastructure

- Our current infrastructure has served us well but has limitations

- Large capital expenditure to maintain and upgrade hardware

- Physical hardware is inflexible

  - Cannot easily respond to changing requirements (disk, memory, etc.)

  - Cannot easily scale

- High Maintenance Cost

  - Doing everything in-house is very time-consuming and unproductive

- Opportunity Cost

- Additional infrastructure needed for disaster recovery

Cloud Migration

Data Protection

- There is a lot of personal data in the RIPE database

- We have implemented the GDPR recommendations presented at RIPE 76

- We must protect personal data in any cloud migration
  - Where the data is located must be covered by the GDPR
  - The cloud provider must comply with the GDPR

- Legal review of our cloud migration plan

Information Security

- We must minimise the risk of a data breach

  - Risk of personal data leak (2M person objects)

  - Risk of credentials leak (56K maintainers)

- Take measures to protect data

  - Cloud provider auditing and anomaly detection

  - Encrypt data at rest

  - Store secrets (credentials) securely

- Security review of our cloud migration plan

Scalability

- Cloud environment allows us to react to changing load levels

- Denial of Service (DOS) protection
  - A cloud provider can do DOS mitigation better than an in-house solution

- Content Delivery Network (CDN)
  - Distribute static content so it is closer to the user
    - Most of our website content is static
    - 70% of our website traffic is a visitor to a single page
  - Also takes traffic load away from the core servers

Reliability

- A cloud solution allows us to improve our reliability

  - Failover query servers in a pool

  - Failover update server to a standby

- Distribute servers geographically

  - Disaster recovery

- Failover to internal servers in the (unlikely) event of a cloud outage

Costs

- Cloud offers many features, pay for what you use

- During the transition, we may have double costs. We aim to remain within our existing operational costs, but we can expect an increase before we can downsize our own infrastructure.

- There will also be additional workload cost for the team

- How to keep cloud costs under control

  - Internal cost review before going live

  - Ongoing cost reviews to optimise our service

  - Trade-off between "rolling our own" vs. paying for a cloud service

Summary

In Summary: Next Steps

- Prepare a detailed functional assessment of a cloud migration

  - Legal review

  - Information Security review

  - Cost review

  - Architecture review

- Implement a test environment in the cloud

  - Release Candidate (with dummified data)

  - Validate the approach

- Share findings with the RIPE community

  - Aiming for RIPE 81 (September 2020)

Questions

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References

- Activity Plan 2020

    - https://www.ripe.net/publications/docs/ripe-735

- Our Approach to the Cloud (by Kaveh Ranjbar)

    - https://labs.ripe.net/Members/kranjbar/our-approach-to-the-cloud