Re-installing and upgrading Stratum-1 @ RAL: Lessons learned

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Context

- Stratum-1 hosts at RAL were updated to SL7.
- During the process, service was also updated to latest version:

    `2.6.2 ⇒ 2.7.4`

    - Most probably every Stratum-1 has already done it.
    - Still, the lessons learned may be helpful for similar interventions in the future.

Apache: [No] backward compatibility 2.2 → 2.4

- Several issues after the upgraded related to the fact that httpd was updated from 2.2 and 2.4, and previous configuration didn't work anymore.
- Documentation used to fix some of the problems is:

  https://httpd.apache.org/docs/2.4/upgrading.html

- Issues:
  - Listening port 80 was set twice, in two different config files. That is not allowed anymore.
  - Not valid anymore mixing *options* with +/- signs and *options* with no sign:

    ```
    Options -MultiViews FollowSymLinks -Indexes ⇒ Options -MultiViews +FollowSymLinks -Indexes
    ```

  - syntax for authorization directives has changed:

    ```
    Order allow,deny    ⇒  Require all granted
    Allow from all
    ```

CVMFS configuration to disable GeoIP

WARNING: this is not about whether the GeoIP functionality is relevant or not !!

- After upgrade, CVMFS server refused to work.

```
[root@stratum-1 ~]# cvmfs_server add-replica -p -o root <url> <pub key>
Installing GeoIP Database... CVMFS_GEO_LICENSE_KEY not set
fail
```

- Solved, for the time being, with configuration:

```
[root@stratum-1 ~]# cat /etc/cvmfs/server.local
CVMFS_GEO_DB_FILE=NONE
```

- If GeoIP is not a mandatory requirement for the CVMFS server, maybe the default configuration should be to NOT require it, and let the sys admins to change it when being used ?

Heartbeat

NOTE: this is only relevant for those sites with 2 hosts in a High Availability (HA) setup.

- Red Hat stop support for HA package **heartbeat** on version 6. Not available anymore for RH 7.
- Replacement seems to be **pacemaker**:

  https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/7/html/high_availability_add-on_administration/ch-startup-haaa

- For the time being (hopefully!), we keep using **heartbeat** from a yum repo at CERN:

  http://frontier.cern.ch/dist/heartbeat-el7/RPMS/

Does anyone have experience with pacemaker?

Passwords, secrets, ...

- After re-installing both Stratum-1 hosts, the files not being managed by the Content Management System (usually for security reasons) were gone:

    - ssh public keys to allow hosts to talk to each other.
    - The **awstats** password file:

        ```
        [root@stratum-1 ]# cat /var/log/squid/squidcron.log
        ...
        ...
        Calling /etc/awstats/run_awstats.sh /var/log/squid/access.log
        ERROR: password is missing: /etc/awstats/password-file. Leaving
        ...
        ...
        ```

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...
...
```

Wrong caching policies (another Apache issue)

- Another problem, apparently as a consequence of the non-backward compatibility of apache, was the caching policy for the .**cvmfspublished** file.
- This file contains several pieces of information, like the revision number.
- With the previous configuration in **/etc/httpd/conf.d/cvmfs.conf**, after upgrading apache 2.2 ⇒ 2.4, the caches were keeping that file up to 5 days. As a consequence, clients didn't update repos.

```
[root@client ~]# attr -g revision /cvmfs/alice.cern.ch/
Attribute "revision" had a 4 byte value for /cvmfs/alice.cern.ch/:
8069
[root@stratum-1 ~]# cat -v /storage/cvmfs/alice.cern.ch/.cvmfspublish | grep ^S
S8079

[root@client ~]# curl -vs http://<url>/cvmfs/alice.cern.ch/.cvmfspublished 2>&1|grep Cache
< Cache-Control: max-age=259200
< X-Cache: MISS from stratum01.gridpp.rl.ac.uk
```

Wrong caching policies (another Apache issue)

- Solution
  - change the syntax in apache config file **/etc/httpd/conf.d/cvmfs.conf**
    From

    ```
    AddType application/x-cvmfs .cvmfspublished .cvmfswhitelist
    ```

    To

    ```
    <FilesMatch "^\.cvmfs">
        ForceType application/x-cvmfs
    </FileMatch>
    ```

  - Stop & restart the frontier-squid servers.

Other considerations

- The data is stored in a secondary partition **/dev/sdb1**, so it is not delete during the re-installation process of the hosts.

- After each host is re-installed, copy the content of **/etc/cvmfs/keys.**
  - Some sort of backup is needed.
    - In the case of a HA setup, each host is the backup for the another one.

- Run command **cvmfs_server add-replica -p -o root <repo> <url> <keys dir>** for each repo.