PostgreSQL upgrades

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Versioning policy

```
9.4.5
   .5 - minor version
9.4  - major version
```

▶ First number gets incremented when we think we have cool new feature.
▶ 8 - Windows support, 9 - Replication, 10 - ???

Compatibility of minor versions

- ▶ Minor versions contain only bug fixes.
- ▶ We try our best to not break compatibility within minor versions.
- ▶ Not 100% guaranteed, one mans bug is anothers feature.

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- ▶ Transaction log is incompatible between major versions.
- ▶ Data directory is also incompatible. . .
- ▶ . . . but data file layout is upwards compatible. Starting from 8.3
- ▶ We still try to not break applications unless we have a pretty good reason.

Upgrading

- pg_dump, pg_restore
- Slooooooooooow

pg_upgrade

- ▶ Takes a logical backup of database schema in old version, restores it in new version.
- ▶ Uses a special version of backup-restore that preserves object IDs.
- ▶ Copies or hard links data files from old data dir to the new one.

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- ▶ initdb new data directory using the **NEW** versions initdb command.
- ▶ Port config files from old version to new. Watch out for changed params.
- ▶ Use the pg_upgrade binary from the **NEW** version.
- ▶ ```
  /usr/pgsql-$old/bin/pg_ctl -D /path/to/old-data -m fast
  /usr/pgsql-$new/bin/initdb /path/to/new-data && \
  /usr/pgsql-$new/bin/pg_upgrade \
      -d /path/to/old-data -D /path/to/new-data \
      -b /usr/pgsql-$old/bin -B /usr/pgsql-$new/bin \
      --link
  ```

- Install new version of PostgreSQL
- `systemctl` stop postgresql-9.4
  `/usr/pgsql-9.5/bin/postgresql95-setup` upgrade
  `systemctl` start postgresql-9.5
- **Don't forget to disable the old version!!!**

# HA upgrade

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- ▶ Sometimes there is no option to get a maintenance window for upgrade.
- ▶ Not even 5 minutes.
- ▶ Solution is to use logical replication from old to new version and do a switchover.

- Before 9.4, slony is your best bet
- As of 9.4 UDR can be used (wait for news in this area)
- With either option, automate and test EVERYTHING!