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Dovecot Solutions Oy

http://www.dovecot.org/

Talk Overview

- Quick introduction
- v2.1: Statistics, Full Text Search changes
- v2.1/v2.2: dsync-based replication
- v2.1: IMAP Adaptor
- Questions

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Dovecot?

- IMAP, POP3 mail server
- Mail delivery agent + LMTP
- Sieve mail filtering language + ManageSieve (by Stephan Bosch)
- (No SMTP. Postfix/Exim is fine)

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Dovecot Features

- High performance (low disk I/O usage)
- Highly configurable/flexible
- Modular code, plugins can do ~anything
- Easy migration from other servers
- Admin-friendly
  - All errors are logged
    - Error log should stay empty!
  - Understandable error messages
  - Automated fixing of (corruption) errors

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v2.1: Statistics gathering

- Keeps track of everything:
  - User & system CPU, page faults, context switches
  - /proc/pid/io: Disk input/output bytes (**real** I/O), read/write syscall counts+bytes
  - For mail data: open()/stat()/fstat()/read count/ read bytes/dovecot.index.cache hits

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v2.1: Statistics gathering

- stats plugin tells stats process per-session stats (every n secs)
- imap_stats plugin tells per-IMAP command stats
- stats process has max. memory usage limit
- doveadm stats dump: Dump per-domain/user/IP/session/command stats (tab-separated fields)
- http://dovecot.org/tools/stats-top.pl gives "top" for users
- Interactive web-based stats viewer with ability to zoom/sort/etc would be nice. Volunteers?
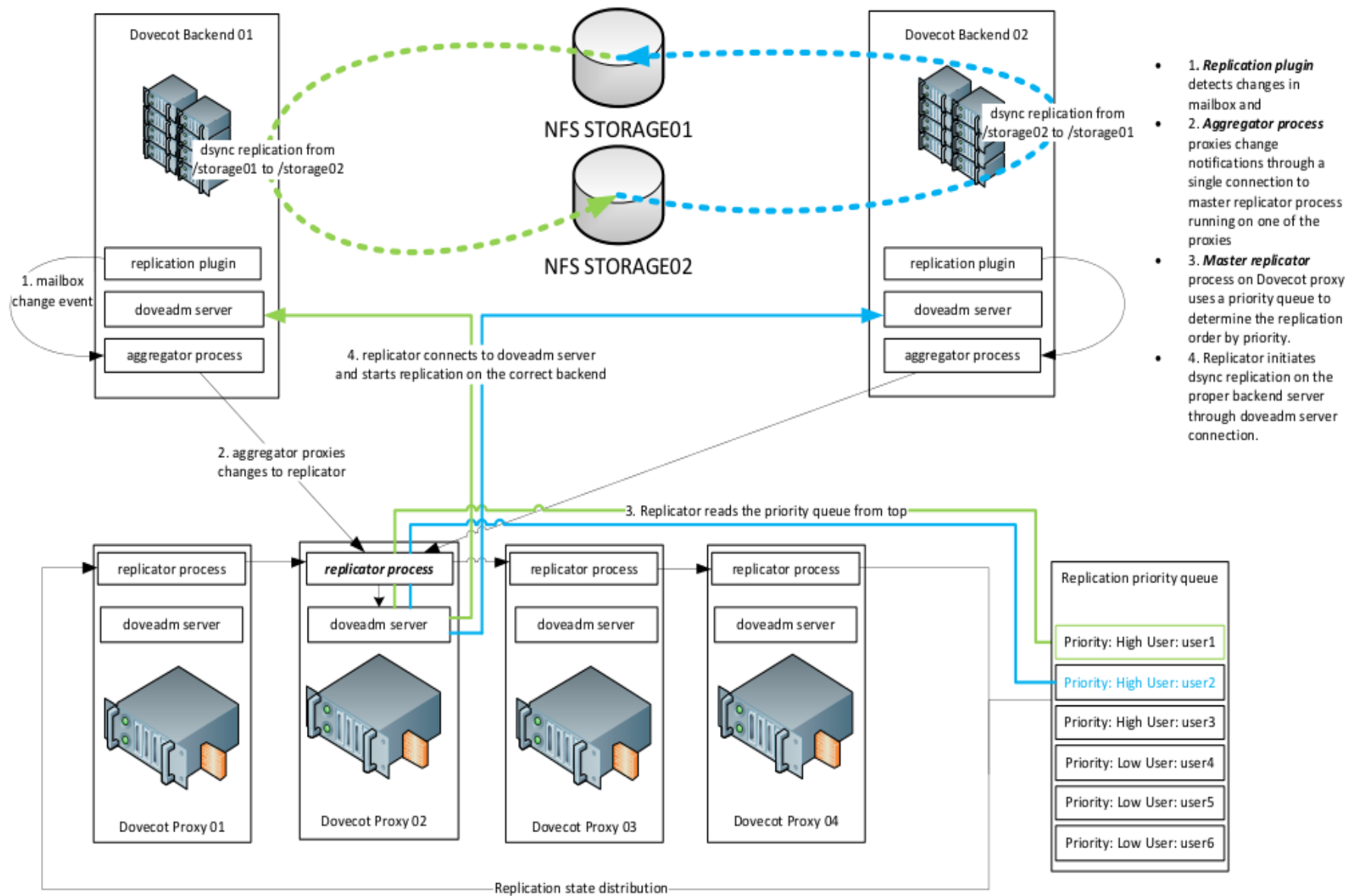
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v2.1: Full Text Search changes

- Two recommended backends:
  - Solr (Java server)
  - CLucene (library, each user has one index)
  - Squat is deprecated
- FTS plugin can finally optimize all IMAP searches (where useful)
- Attachments can be indexed
- Fuzzy search (IMAP FUZZY extension)

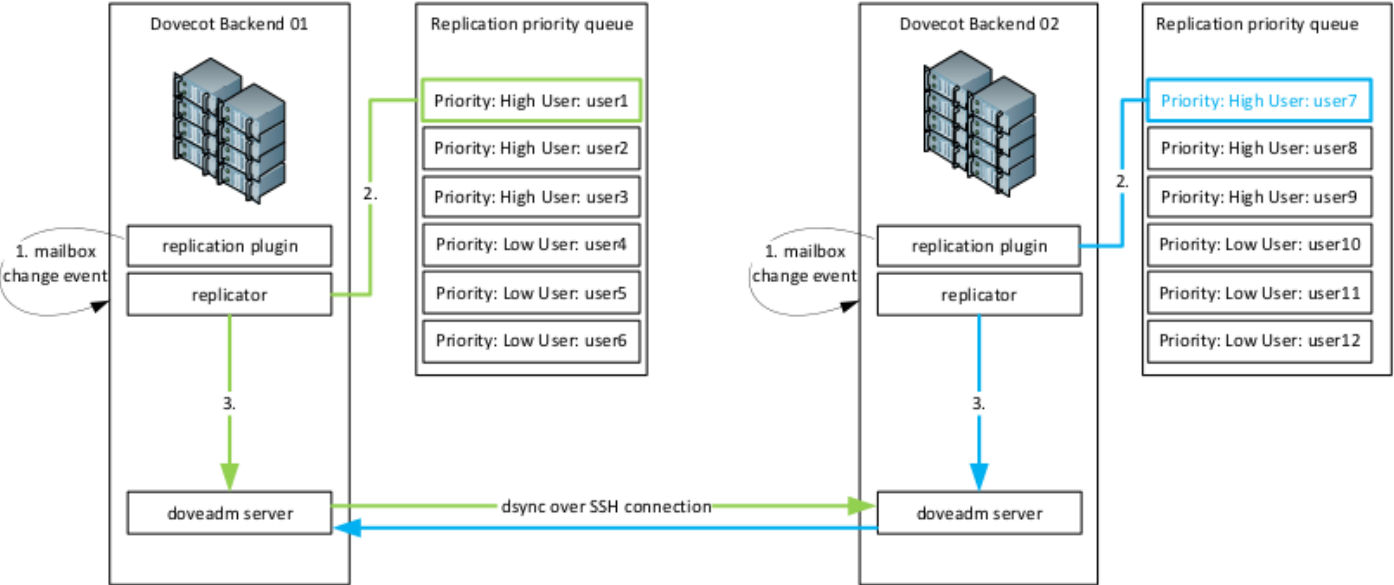DOVECOT

dsync-based replication

- dsync does two-way merging of mailboxes
  - Both sides can do changes -> no data loss
- v2.2: Redesigned dsync
- Replication triggers running dsync asynchronously when needed
- Mainly two ways to run:
  - Single site NFS cluster
  - Geographically distributed cluster
- Details: http://blog.dovecot.org/2012/02/dovecot-clustering-with-dsync-based.html

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Dovecot Clustering with dsync-based replication
(with Dovecot Directors)

Dovecot Backend 01

NFS STORAGE01

dsync replication from /storage01 to /storage02

NFS STORAGE02

Dovecot Backend 02

dsync replication from /storage02 to /storage01

replication plugin

doveadm server

1. mailbox change event

aggregator process

replication plugin

doveadm server

aggregator process

- 1. *Replication plugin* detects changes in mailbox and
- 2. *Aggregator process* proxies change notifications through a single connection to master replicator process running on one of the proxies
- 3. *Master replicator* process on Dovecot proxy uses a priority queue to determine the replication order by priority.
- 4. Replicator initiates dsync replication on the proper backend server through doveadm server connection.

4. replicator connects to doveadm server and starts replication on the correct backend

2. aggregator proxies changes to replicator

3. Replicator reads the priority queue from top

replicator process

doveadm server

Dovecot Proxy 01

replicator process

doveadm server

Dovecot Proxy 02

replicator process

doveadm server

Dovecot Proxy 03

replicator process

doveadm server

Dovecot Proxy 04

Replication priority queue

| Priority: High User: user1 |
| Priority: High User: user2 |
| Priority: High User: user3 |
| Priority: Low User: user4 |
| Priority: Low User: user5 |
| Priority: Low User: user6 |

Replication state distribution

Dovecot Clustering with dsync-based replication
(over SSH)

Dovecot Backend 01

Replication priority queue

Priority: High User: user1
Priority: High User: user2
Priority: High User: user3
Priority: Low User: user4
Priority: Low User: user5
Priority: Low User: user6

1. mailbox change event

replication plugin

replicator

2.

3.

doveadm server

Dovecot Backend 02

Replication priority queue

Priority: High User: user7
Priority: High User: user8
Priority: High User: user9
Priority: Low User: user10
Priority: Low User: user11
Priority: Low User: user12

1. mailbox change event

replication plugin

replicator

2.

3.

doveadm server

dsync over SSH connection

- 1. *Replication plugin* detects changes in mailbox and
- 2. *Replicator* process uses a priority queue to determine the replication order by priority.
- 3. Replicator initiates dsync replication through doveadm server connection.

dsync-replication failure handling

- Incoming connections go to Dovecot proxy
  a) From load balancer
  b) By giving multiple IP addresses to DNS record

- Dovecot proxy looks up user's backend server and proxies there
  – If the primary backend is down, use another backend
  – With geographic clusters prefer local backend

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dsync-replication advantages

- Advantages over block-level filesystem replication:
  - FS corruption is not replicated
  - Cold restart finds changes quickly
  - Split brain won't result in downtime or data loss
  - Possibility to operate in asynchronous multi-master mode

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v2.2 dsync redesign

- v2.1: One brain, two dummy workers

- v2.2: Two nearly identical brains
  - Export my changes
  - Import your changes
  - At the end of import the mailboxes are identical
    - Unless changes occurred during dsync. Then they will be identical after next sync.
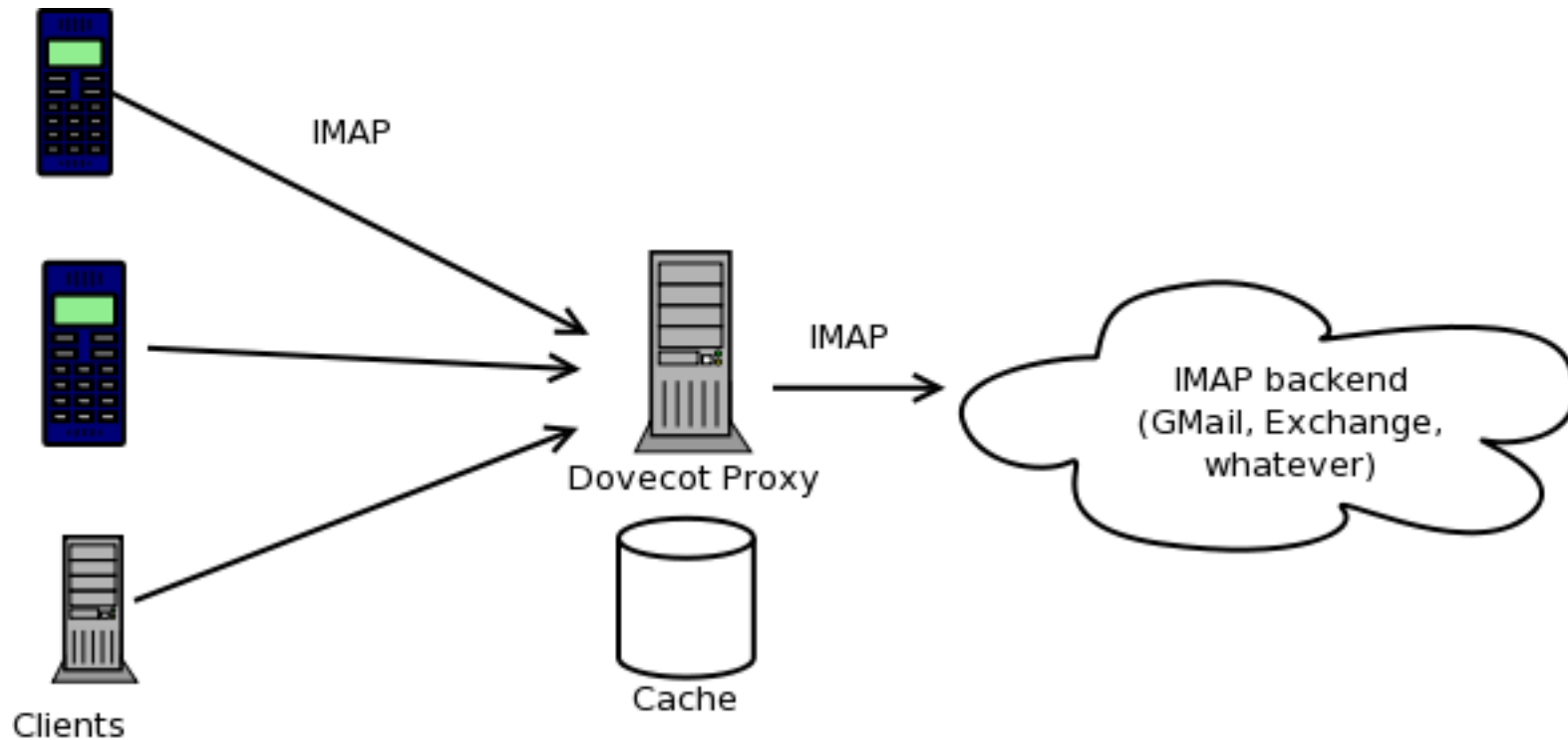
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v2.2 dsync redesign

- 3 dsync modes:
  - Export all mails in all mailboxes
  - Export all mails in changed mailboxes
    - Not 100% reliable if both sides have changed
  - Export only changes since last dsync
    - Saved state requires 32 bytes per mailbox
    - Very fast!

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v2.2 dsync redesign

- Latency vs. bandwidth
  - Message bodies can be sent when remote requests it, or always among metadata
- dsync ready for very high latency communication:
  - Earth-Mars!
  - Syncing via USB sticks
  - Incremental backups

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IMAP Adaptor

- mail_location=imapc:/var/cache/imapc/%u

Fixer IMAP Adaptor

- Dovecot is 100% IMAP RFC compliant (AFAIK)
- If client A doesn't work with server B, user can:
  - Try to convince client developer to fix it
  - Try to convince server developer to fix it
  - Switch client
- A new option: Dovecot IMAP Adaptor!

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Perfect Migration Tool

- dsync + imapc + pop3c = perfect migration from any IMAP/POP3 server to Dovecot
  - IMAP UIDVALIDITY, UIDs, MODSEQs
  - POP3 UIDLs
  - Avoids IMAP/POP3 clients redownloading mails
  - http://wiki2.dovecot.org/Migration/Dsync

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Exchange-killer?

- OpenChange implements Exchange MAPI
- SOGo groupware integrates OpenChange to provide native Outlook MAPI support
- Dovecot + SOGo + OpenChange = 100% open source Exchange-replacement
- We're planning an easy to install all-in-one package

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Questions?

Picture by *Cyril Thomas*