So Samba 4.0 is out ...
and what's next?

sambaXP 2013

Michael Adam (obnox@samba.org)
Stefan Metzmacher (metze@samba.org)

Samba Team / SerNet

2013-05-15

On December 11, 2012 ...

... around 6pm CET ...

... something
unexpected
happened! ...

Samba 4.0.0 was released!

How could that happen?

History (Part 1)

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- 2003-06-07: Samba 3.0.0 beta1
- 2003-08-13: First public commit of Samba 4 code (Tridge)
  - 773 files changed, 352638 insertions(+)
  - focus: Full protocol testing for SMB (there is no documentation yet)
  - focus: NTVFS - rewrite of SMB server
  - focus: make SMB clusterable?
- 2003-08-16: Samba 3.0.0 rc1
- 2003-10-24: Samba 3.0.0 released
- ... code repositories diverge ...
- 2004-03-31: LDB is introduced into Samba4
- 2004-04-25: PIDL is introduced into Samba4
- 2006-01-31: Release of Samba4WINS based on Samba 4

History (Part 2)

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- 2006: S4 focus changed: Implementation of AD/DC
  - The Samba Team worked out AD replication (without documentation)
- ... code repositories diverge ...
- 2007-12-19: Samba Team receives documentation from Microsoft
- 2007-2008: S3 is made cluster aware with CTDB
- 2008-05-08: Franky-idea is born
- 2008-07-01: Samba 3.2.0 released
  - GPLv3+
  - including PIDL from S4
  - experimental cluster support
- 2008-09-14: Merged branch for Samba3 and Samba4
  - v3-devel:source/ $\rightarrow$ master:source3/
  - v4-0-test:source/ $\rightarrow$ master:source4/
  - common/merged build

History (Part 3)

- ... reconsile commonly used components into top level ...
  - talloc, tdb, tevent, ldb
  - lib/util, libcli/smb, librpc/
- 2010-03-01: Samba 3.5.0 is released
  - experimental support for SMB 2.0
- 2011-08-09: Samba 3.6.0 is released
  - official support for SMB 2.0 (except for durable handles)
- ...

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Chronicle since sambaXP 2012

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- 2012-06-05: 4.0.0 beta1
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- 2012-08-31: 4.0.0 beta8
- 2012-09-13: 4.0.0 rc1
- ...
- 2012-12-04: 4.0.0 rc6
- 2012-12-11: 4.0.0 (2865 commits since beta1)
- 2013-01-14: 4.0.1
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  - daemon "samba"
  - integrated LDAP server
  - integrated Kerberos server (heimdal)
  - intergrated DNS server (or external bind)
  - SMB server: smbd (started automagically)
  - very simple to set up and run!
- classical:
  Standalone and domain member file server as known from Samba 3
  - daemons smbd, nmbd, winbindd
  - improved file server
    - SMB 2.0 now complete with durable hanldes
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  - requires python (waf)
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- Packages from SerNet: (Commercial-Alert!)
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AD/DC - Dirty Deeds Done Dirt Cheap!

- "officially" supported in 4.0:
  - forests: 1, domains: 1, domain controllers: 1*
- trusts:
  - Samba can be trusted
  - Samba can **not** trust (yet)
- replication:
  - directory replication works
  - sysvol replication **not** implemented yet
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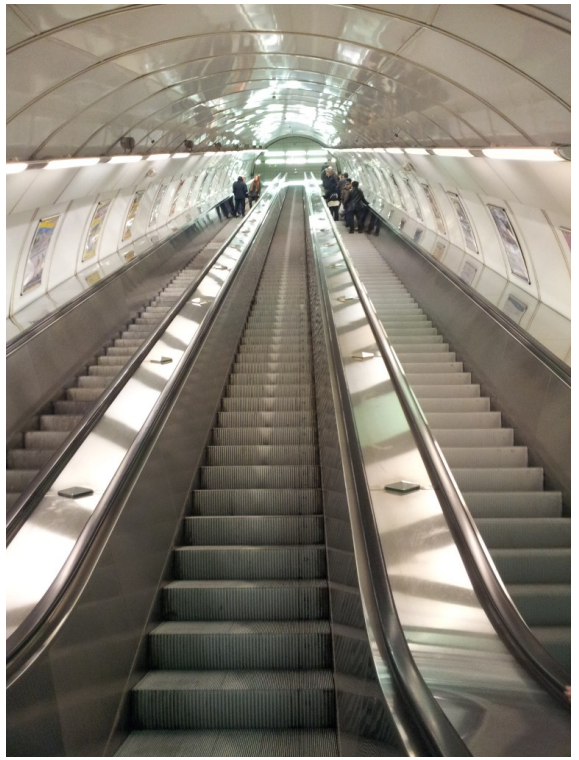
And what's next?

AD/DC TODOs

- subdomains
- trusts in general
- winbindd/idmap todos
- sysvol-replication (file system replication)
  - need async dcerpc server infrastructure
  - may require a better MS-FSA like abstraction in in the file server backend
- ... $\Rightarrow$ Matthieu Patou's talk



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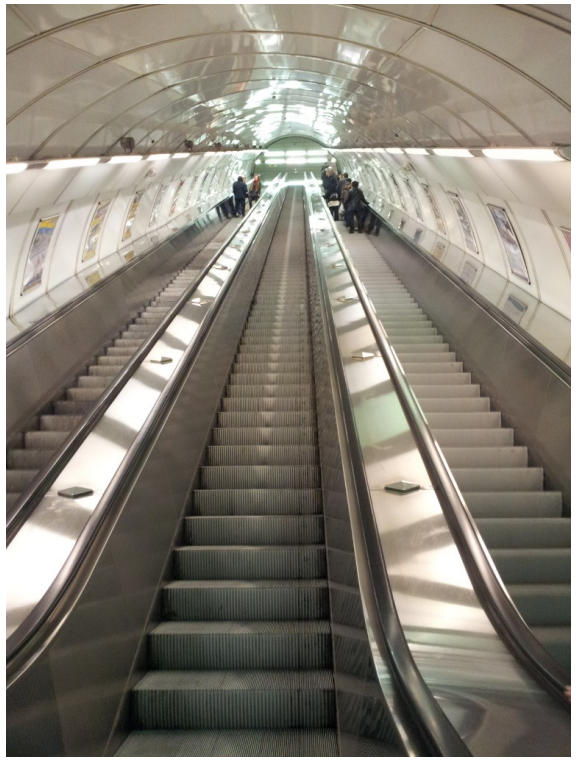

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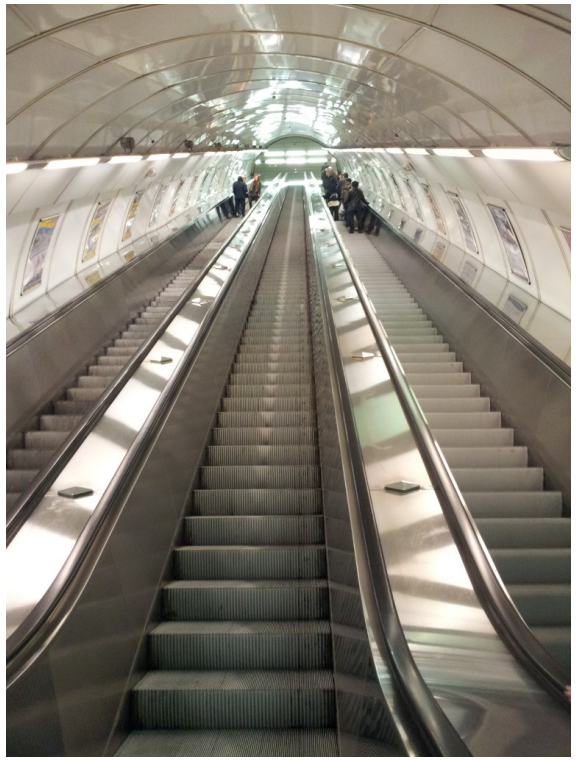

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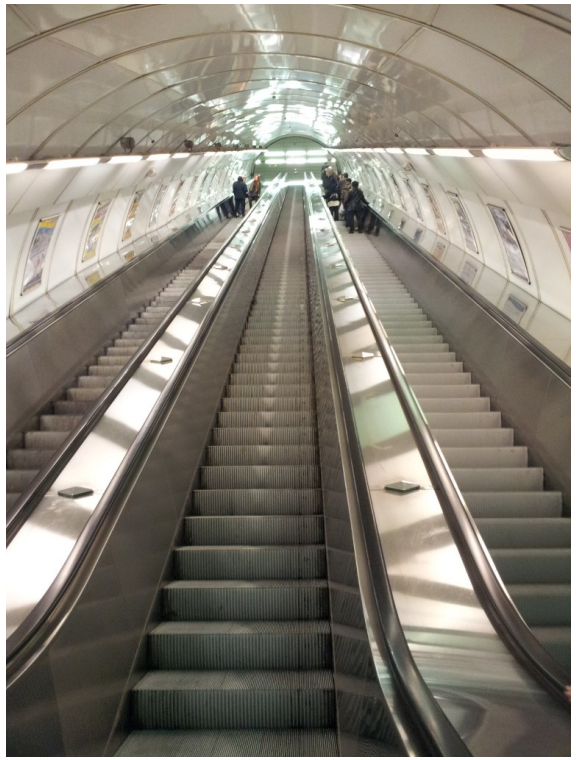

SMB server TODOs

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- SMB 2.1:
  - leases
- SMB 3.0:
  - directory leases
  - multi channel
  - RDMA
  - cluster concepts (scale-out/continuous availability)
  - persistent handles
  - witness
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SMB: Leases and Directory Leases

- Leases ⇒ oplocks done right (content caching)
- Directory Leases ⇒ change notify done right (metadata caching)

- extend FSA oplocks to cope with SMB oplocks and leases
- remove the 1:1 relation between open and oplock (locking.tdb)
- add support for oplock keys (empty for SMB 1)
- cleanup / preparation work was already started by Volker
- lease keys and client guid need to be maintained at the SMB layer

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SMB: Multi Channel

- bind multiple transport connections to one SMB session
- interface discovery:
  - new fsctl (FSCTL_QUERY_NETWORK_INTERFACE_INFO)
  - client just connect to one cluster node

- extend current 1:1 relation smbd $\leftrightarrow$ TCP connection
- transfer TCP-socket to smbd serving connections with the same ClientGUID in negprot (fd-passing)
- $\Rightarrow$ session bind automatically on correct smbd
- $\Rightarrow$ only one process has the file open for multi-channel sessions
- $\Rightarrow$ we only need to do book-keeping on the SMB level (replay/retry counters, channel sequence numbers, ...)
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- transport abstraction needed (TCP/NBT vs. RDMA)
- buffer abstraction needed in order to do zero-copy transfers
  - SMB_VFS_READ_BUFFER_SEND/RECV
  - SMB_VFS_WRITE_BUFFER_SEND/RECV
- there's already a hacked client implementation

- Problems with the current libibverbs/librdmacm libraries
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- server application workload
- need to make some DBs persistent (or by record)
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  - locking
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SMB: Witness

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  - using ncacn_ip_tcp as transport
  - heart beat link between a SMB 3.0 client and server cluster.
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