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linux for your business

Samba as a Backup Domain Controller

Samba XP 2007

Agenda

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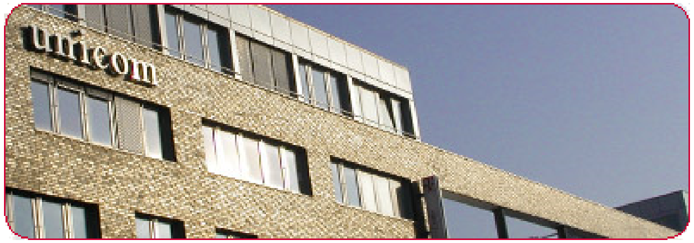
speaker - company

- studied Applied Computer Science in the Natural Sciences
- experiences in Linux and Open Source since 1998 (user, administrator, developer, consultant)
- joined Univention GmbH in 2004 as developer and project manager

- Univention GmbH was founded 2001 in Bremen/Germany
- one of the leading Open Source solution providers in Germany
- developer of „Univention Corporate Server“ (UCS), a Linux Distribution focused on management of heterogeneous networks



motivation

- long-time (several month) migration of a Windows NT domain with > 2.500 users to Linux
- synchronisation of NT users and passwords to POSIX accounts
- OpenLDAP based storage of users and groups
- no more windows after migration (no long-term dependency on windows-services)
- implement new concepts of group-membership while user-passwords are synchronized from Windows NT

why don't use „net rpc vampire“, „pwdump“ or ... ?

- transfers always the complete userbase, not only changes
  - may cause high load
  - may take several minutes (every object needs to be compared)
- not event driven
  - needs a schedule (i.e. cron job)
  - a new sync must not start while an old one is running
  - time between change and synchronisation not predictable

technical basics: code and patches

- original patch against Samba 3.0.11, posted in March 2005 by Richard Renard (www.idealx.com)
- being an interim solution Samba 3.0.11 was sufficient for this project
- the patch did not need any changes in terms of functionality or bugfixes

technical basics: installation

- patch, compile and install Samba (precompiled packages are only available for UCS)
- configure Samba as BDC (which means: like a Samba-PDC, but with "domain master = no")
- join into the Windows NT domain („net rpc join“)
- start new daemon "samsyncd" once in "one shot mode" for initial replication
- add „samsyncd“ to init-scripts to synchronize further changes

technical basics: operation

- each change on NT increases a „modcount“
- at startup samsyncd connects to its PDC, gets the actual modcount and replicates all changes since its last stored modcount
- afterwards it runs daemonized and waits for changes:
  - the Windows NT PDC announces changes to nmbd
  - nmbd informs samsyncd
  - samsyncd asks the modcount and replicates the changes

technical basics: configuration

- synchronisation interval is controlled on the PDC in „HKEY_LOCAL_MACHINE \ SYSTEM \ CurrentControlSet \ Services \ NetLogon \ Parameters“
  - Pulse: changes made within this time are send bundled to a BDC, if no change occured no pulse is send (default: 300 seconds)
  - PulseMaximum: time after which a pulse is always send, even if there are no changes made
- modcount.tdb stores the last replicated change-id (modcount) for samsyncd, if this file doesn't exist samsyncd will replicate all data
- everything else is configured like a Windows NT migration with „net rpc vampire“, in particular scripts like „add user script“ etc. should exist

project challenges: meet LDAP structure

- several add/del/modify scripts needed, in particular:
  - sync of machines, groups and group-membership needed to be disabled: deactivation of add group/machine script was sufficient
  - usernames which are upper-case in NT should be lower case in LDAP: implemented in add user script, samba-ldap-backend maps case-insensitive
  - rename of users in group-memberships: modifications like rename need to be done also in existing LDAP-groups (modify user script)
- one additional script-option was needed:
  - "post modify user script" to add kerberos-attributes based on the synced NT/LM-Password

project challenges: isolation

- Samba logon services must not be available:
  - group memberships are different
  - machine accounts don't exist
- Samba BDC must not be visible in the NT Domain because logon services are not available
- Configuration:
  - Samba is configured to only one interface
  - network activity is limited to communication with NT PDC (iptables): this means also TCP and UDP broadcasts, which need to be rewritten

project challenges: bidirectional synchronisation

- on Linux side password changes don't occur against the PDC
- password changes modify also NT/LM-hashes in LDAP
  - using PAM-modules if changed by an user
  - using scripts/tools if changed by an administrator
- by LDAP change notifications (part of UCS LDAP management system) new hashes are send to the NT PDC
- a daemon receives the new password hashes and announces them in NT with "pwdump"
  - users are disabled in NT if their password is set, further action is necessary (i.e. call cusrmgr.exe)

experiences in „real life“

- good experiences
  - easy integration in existing samba distribution
  - stable and reliable system for several month
  - found no bugs in the original patch
  - hanging syncs resulted always from wrong configuration or firewall-settings
- possible improvements
  - samsyncd uses stdout/stderr without timestamps, it should use logfiles

conclusion/discussion

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