

Agenda

- 1 Protocol background
- 2 Samba Versions
 - Samba 3
 - Samba 4
- 3 Branching issues
 - Conflict
 - Reconciliation
- 4 Current status
- 5 Conclusion

Jelmer Vernooij

- Samba developer and team member
 - *Samba 4* developer
- Other contributions to Free Software projects:
 - CUPS
 - OpenChange
- Bazaar developer at Canonical

Samba 4

- Started in 2003
- Single goal: Active Directory Domain Controller support
- NLUUG 2004: “Expected release date: probably somewhere in 2005”
- 2011: No stable release yet

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where did it all go wrong?

What is CIFS?

- Filesharing in DOS/Windows
- Most Windows operations that are network-based
- “File and Printer sharing for Microsoft Networks”

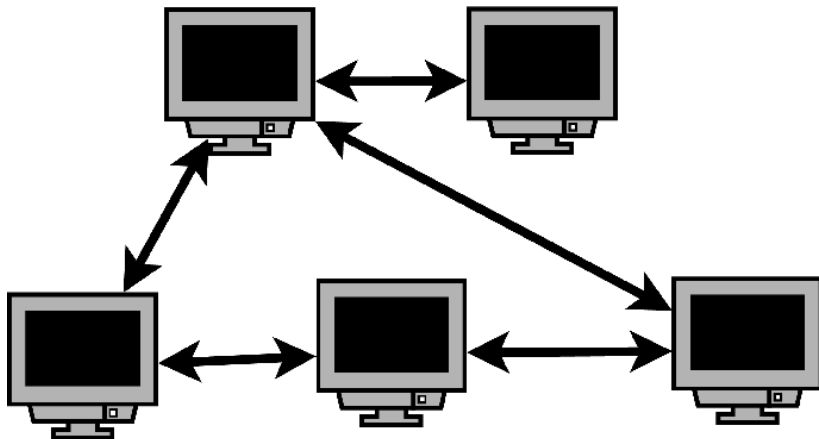
Generation 1: A long time ago, in a land far away...

- File and printer sharing
- Per-machine credentials

Timeline

- 1984: Barry Feigenbau develops “BAF”
- IBM, Microsoft, Intel and 3Com expand the protocol and rename it to “SMB”
- Part of OS/2 and “Windows for Workgroups”
- Various other extensions by Microsoft for Windows 9x and NT, enabling remote management

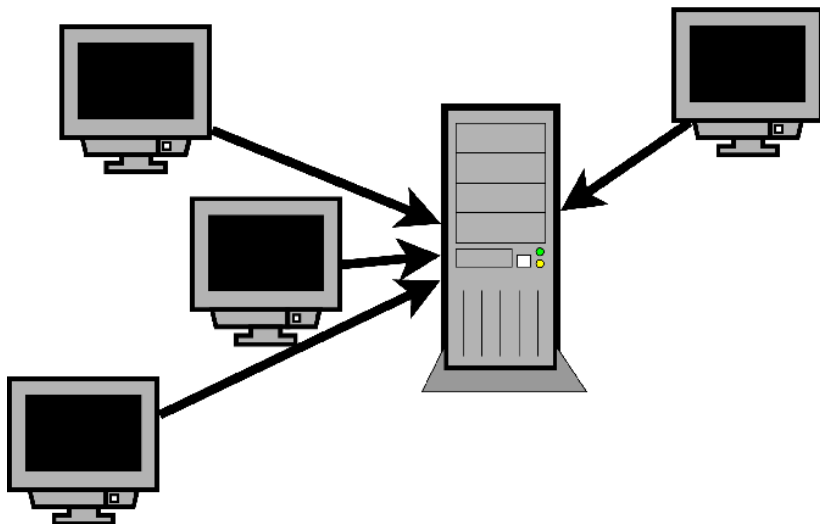
Generation 1



Generation 2: NT4-style domains

- Introduced in Windows NT4
- Single domain controller
 - Central user database
 - Basic policy management
 - Optional backup domain controller
- Up to a few hundred members per domain
- Protocols: NetBIOS, SMB, RAP, DCE/RPC

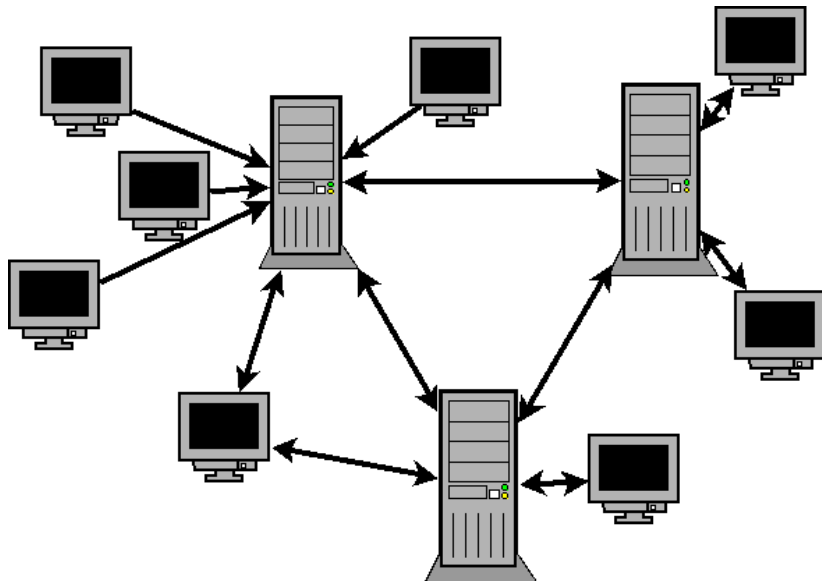
Generation 2



Generation 3: Active Directory

- Multiple Domain Controllers per domain
- Company-wide domains
- Thousands of domain member machines
- Up to a million users

Generation 3



Active Directory

based on various standardised protocols

- DNS
- Kerberos
- DHCP
- LDAP
- CIFS
- NTP

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... with Microsoft-specific extensions

Specifications

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— Andrew Bartlett

Specifications

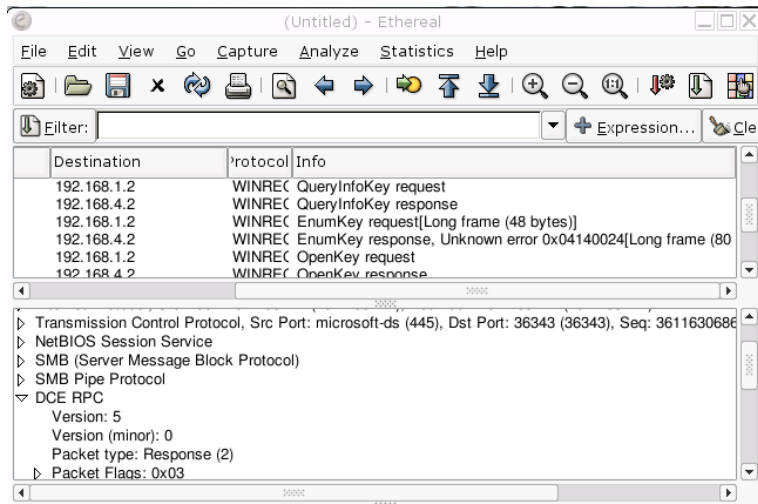
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Specifications

- Originally no specifications beyond '94
- New specs in 2006 — <http://msdn.microsoft.com/>

Network Analysis

- Not the same as reverse engineering
- Still a good tool to use for debugging



Short Samba Timeline

- 1991: Started by Andrew “tridge” Tridgell
- 1993: “nbserver”
- 1996: Code in CVS
- 1999: Versie 2.0
- 2003: Versie 3.0

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Samba 3

- Stable
- Used in production
- Old design (targetted at fileserving)
- Support for NT4-style domains
- Support for being a member of AD domain

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Samba 4

- Started in 2003
- More generated code
- Heavy use of Python
- Playground for new features
 - Support for Active Directory Domain Controllers
 - WMI (WBEM implemented on top of DCOM)
 - Good DCE/RPC infrastructure
 - Basis for OpenChange client/server
 - Relatively well tested (code coverage: 50%)

Generated code

- Easier to debug
- Easier to understand
- Less prone to bugs
 - or at least a place to fix them all at once
- Quicker to write

Languages

- C: *1,116,626*
- Python: *85,488*
- Perl: *28,123*
- Shell: *14,249*

Infrastructure improvements

- Full test coverage
- New build system: waf (<http://code.google.com/p/waf/>)
 - Significant time-saver during development
- Test infrastructure now uses Subunit protocol (<http://launchpad.net/subunit>)

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Issues

- Samba 4 changed too much
 - Too experimental to be the next release
 - Very ambitious goal: AD support
- Several developers kept working on the Samba 3 branch
 - ... including adding new features

The dark years (2005-2009)

- Split development team
 - Feature work happening in both branches
 - Often the same features, done by different people
- Limited communication between 3.x and 4.x teams
- No clear direction for project as a whole
- Samba 3 developers regarding Samba 4 as “a toy project”
- Samba 4 developers regarding Samba 3 as obsolete

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“Franky” and other efforts

- 2007/2008: Several “complete” features backported to Samba 3
 - New DCE/RPC subsystem
 - Test infrastructure
- 2008: Frankenstein “Franky” effort to build a combined Samba3/Samba4 server
- 2010-2011: More duplicate library code eliminated
- 2011: Ability to build and install Samba 3 and Samba 4 at the same time

Franky

<http://wiki.samba.org/index.php/Franky>

- Effort to make Samba 3 and Samba 4 work together
- Started after SambaXP 2008
- Development has stalled in its current form
- Some very positive outcomes though
 - Easy to build *smbtorture4* from Samba 3
 - Putting both branches in a single tree
 - Several subsystems are now shared between both branches

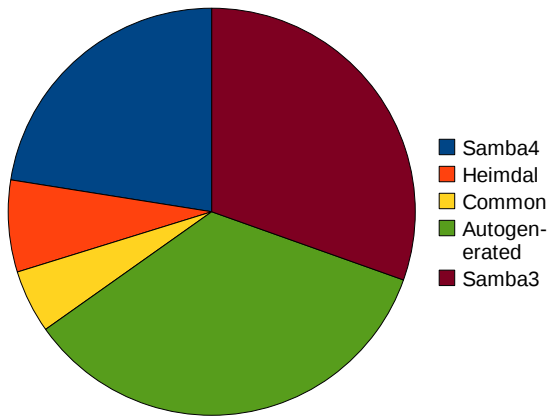
Further work

- Several subsystems now shared
- Merging is a tedious job
 - which implementation to pick?

Common code

	2009	2010	2011
Common	536,251	801,266	1,050,005
. Autogenerated	468,634	652,881	769,808
Samba 3	410,452	401,457	460,434
Samba 4	401,692	382,358	499,680
. Heimdal	98,398	102,436	115,572

Sharing code



2011 has been a good year

- More merge work
- Stand-alone DC works well
 - Several dozen production users
- Directory replication works
- Significantly more external contributions
 - Samba 4 users scratching itches
 - Python code is easier to contribute to

Towards a common codebase

- Merge work continues
 - still a lot of tension, but making progress
- 4.0 will be a combination of the existing *source3/* and *source4* codebases
- Samba 4 directory server
- Samba 3 fileserver and printing
 - “samba” daemon handling Active Directory-related protocols
 - “smbd” daemon handling filesharing/printing ...

Samba 4 Release Status

http://wiki.samba.org/index.php/Samba4/Andrew_and_Jelmers_Fantasy_Page

- Alpha release stage
 - plans to release alpha18 soon
 - stable, but unpolished
- More early adopters and testers
- Database changes have slowed down
 - Needs further integration between Samba 3 and Samba 4
 - Upgrade script is available to upgrade between revisions
 - Release by May 2011 (?)

Lessons

- There should be a single trunk, and it should always work
- Feature work belongs in feature branches
 - Independent features should be developed independently, so they can land independently
- Question processes and technologies
- Technology is not always the solution to social problems
- Don't stop talking to each other
- Don't tie features to releases

More information

Please let us know when you hit bugs:

IRC [samba-technical on irc.freenode.net](https://irc.freenode.net)

E-Mail samba-technical@samba.org

Bugzilla <https://bugzilla.samba.org/>

Help us improve the Samba 4 documentation:

Howto <http://wiki.samba.org/index.php/Samba4/HOWTO>

Wiki <http://wiki.samba.org/index.php/Samba4>