The Samba-3 Enchilada: Overview, Authentication, Integration

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About the speaker

- Long term Samba-Team member
- Author of official Samba documentation
  - The Official Samba-3 HOWTO and Reference Guide
    - ISBN: 0131453556 (Sept 2003)
    - Open Source version: Samba-HOWTO-Collection
  - Samba-3 by Example
    - ISBN: 0131472216 (Mar 2004)
    - Open Source version: Samba-Guide
- Author of additional books
  - Hardening Linux, ISBN: 0072254971 (Jul 2004)
  - OpenLDAP by Example, ISBN: 0131488732 (Nov 2004)
  - More in production

Agenda

- Overview of Samba-3.0.x
- Samba Administration
- CIFS Security
  - Security Modes / Models
  - Backend Choices
  - Infrastructure Tools
- Integrating Samba-3 into MS Windows Networks
  - NT4 Style Domains
  - Active Directory
- Finding Information

Overview Samba-3

- Components:
  - *smb.conf* file controls behavior
    - smbd, nmbd, winbindd are the operative daemons
  - *nsswitch.conf* file for identity management
  - Infrastructure tools
    - user and machine scripts
    - share management scripts
    - domain management tools
      - Eg: SRVTOOLS.EXE, NESUS.EXE, MMC
  - Group Management

Administration

- How do you want to manage Samba?
  - From MS Windows clients (workstations)
  - From UNIX server
- Management from MS Windows clients requires:
  - Interface scripts
    - Add / Delete / Modify users
    - Add / Delete / Modify groups
    - Add machines (Domain Member Servers / Clients)
    - Change User Group Membership
    - Create / Delete / Modify Shares
    - Printer control programs
  - Pre-execution Scripts
  - Windows Administration Tools

CIFS Security

- Security Modes affect network design
  - Network Operation Controls
    - Workgroups
    - Domains
  - Authentication Methods
  - Local UNIX security and Windows Users and Groups
  - Access Control Lists
    - Much abused
      - Need to understand HOW ACLs will be backed up and copied to other servers
      - Satisfy yourself that there is no other solution before using ACLs

Security Modes / Models

- There are only 2 security models
  - Share Mode
    - Like Windows for Workgroups
    - Has passwords for
      - Full Control
      - Read Only
  - User Mode
    - Like MS Windows NT/2K
    - Uses username and password

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Samba Security Modes

- Set via *smb.conf* file *[global]* parameter
  - ***security = XXXXX***
- security = SHARE
  - Accepts password from client, sequentially scans */etc/passwd* until the first match is found
- security = USER (default)
  - Uses *username* and *password* from client
- Encrypted Password Support
  - Default for all security modes

Share Mode *smb.conf* file

```
[global]
# Default workgroup = WORKGROUP, we want MIDEARTH
       workgroup = MIDEARTH
# Behavior like Windows for Workgroups
       security = share

# We want a read only anonymous file server
[Plans]
       path = /home/Plans
       read only = Yes
       guest ok = Yes
```

User Mode *smb.conf* file

```
# Global parameters
[global]
# Default is "security = USER"
       workgroup = BILLMORE

# The following are for CUPS printing support
       printcap name = CUPS
       disable spoolss = Yes
       printing = cups

# Get rid of the printer wizard in NT/200x
       show add printer wizard = No
```

Samba-Specific Security Modes

- security = SERVER
  - Obsoleted, uses pass-through authentication
  - Used with *password server* parameter to redirect authentication to a specified server
- security = DOMAIN
  - Machine is an NT4 style Domain Member Server (DMS)
    - Can be a workstation or a server
  - Does NOT mean it is a Domain Controller
- security = ADS
  - Machine is a member of an Active Directory Domain

NT4 Style Domains

- Samba-3 supports NT4 style Domain architecture
  - Can be an NT4 style PDC or BDC
  - Can NOT be a mixed:

  ie: Samba-3 PDC or BDC ***with*** NT4 BDC or PDC

NT4 Domain Controller (PDC)

```
# Global parameters
[global]
      workgroup = PROMISES

# Netbios name default is hostname
# We want name DIAMOND in browser
      netbios name = DIAMOND

# Maps UNIX root to Windows Administrator
      username map = /etc/samba/smbusers

# Netlogon server defines Domain Control
      domain logons = Yes
```

NT4 Domain Controller (BDC)

```
# Global parameters
[global]
        workgroup = PROMISES

# Netbios name default is hostname
# We want DIAMOND
        netbios name = DIAMOND

# Maps UNIX root to Windows Administrator
        username map = /etc/samba/smbusers
        domain logons = Yes

# Default domain master = Yes means is PDC,We want BDC
        domain master = No
```

Note: Must join the Domain!

```
        net rpc join -Uroot%password
```

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NT4 Domain Member (DMS)

- Can be (same configuration):
  - Domain Member Server (DMS)
  - Domain Member Client (DMS)

```
# Global parameters
[global]
       workgroup = BILLMORE

# The following means be a DMS
       security = DOMAIN
```

Samba is Scalable

- Samba-3 scales beyond MS Windows NT4
  - Can have LDAP directory behind it
  - NT4 can NOT have an LDAP directory behind it
    - For that you need Windows 200x Active Directory

Samba-3 Exclusions

- Samba-3 is NOT an Active Directory replacement
- Samba-3 is a unique entity that has emerged from years of wrestling with Windows networking issues
  - It is scalable and flexible
  - Requires appropriate backend

Scalability: Definition

- First and foremost:
  - Network clients can get uninterrupted services
    - Network logon service
    - File and Print service
    - etc.
- This means:
  - The right service in the right place at all times
    - Load distribution
    - Replication
    - Upset/disaster recovery

Scalability: Load Distribution

- Achieved by:
  - Sufficient network bandwidth
    - Either local or WAN
  - Distribution of servers
    - Network Logon services
    - File and Print services
    - Other hosted services
      - Web, Mail, Proxy, SQL, etc. (Not Samba issues)

Scalability: Network Logon

- Domain Control
  - The core of Network Logon provision (3A's):
    - Authentication
    - Authorization
    - Access Control

Enable Domain Control by:

```
    domain logons = Yes
```

On DMS machines: Use Winbind for IDMAP support

Scalability: Location of

- NT4 Style uses one PDC and BDCs
  - Not structured
    - Active Directory has LDAP based hierarchy
  - Rule of thumb is on DC per 30-50 workstations
    - This is an unreliable rule, some sites operate well with one DC for hundreds of workstations
  - Good advice:
    - network segment that has the PDC should have a BDC also

Backend Choices

- POSIX Only
  - Can be */etc/passwd* based, or through NSS
    - If NSS, can be in LDAP, NIS, etc.
- Plain Text *smbpasswd* file based
- *tdbsam*
  - Stores Security Account Manager (SAM) information in a binary file:

    /etc/samba/passdb.tdb OR
    /usr/local/samba/lib/private/passdb.tdb
- *ldapsam*
  - Stores POSIX and SAM data in LDAP

Auxiliary Backends

- Experimental / Special Interest Backends
  - XML
  - SQL

Backend Configuration

- Control is via the *smb.conf* parameter in *[global]* known as *passdb backend*
  - Recommended options:
    smbpasswd (default)
    tdbsam
    ldapsam

Infrastructure Tools

- Scripts provide glue between Windows network management environment and Samba host OS
  - Called by Samba (smbd)
- Three Classes of Scripts (see next slide)
  - Identity
  - Resource
  - Control

Script Class: Identity Mgmt

- Identity management
  - add/delete/modify user scripts
  - add/delete/modify group scripts
  - add machine script
  - change password

Scripts for POSIX Backend

- POSIX Backend means accounts in:
  - /etc/passwd, /etc/shadow, /etc/group
  - SMB Passwords in:
    - /etc/samba/smbpasswd *(passdb backend = smbpasswd)*
    - /etc/samba/passdb.tdb *(passdb backend = tdbsam)*
    - SMB passwords are maintained by Samba

```
add user script = /usr/useradd -m %u
delete user script = /usr/userdel -r %u
add group script = /usr/groupadd %g
delete group script = /usr/groupdel %g
add user to group script = /usr/usermod -G %g %u
add machine script = /usr/useradd -s /bin/false -d /dev/null %u
```

Scripts for LDAP Backend

- Must store both POSIX account information as well as Samba SAM information in LDAP
  - Does not work if only SAM info is stored in LDAP
- Requires LDAP Server (OpenLDAP is a good one)
- Requires LDAP Client tools
  - pam_ldap (for login only)
  - nss_ldap (for ID resolution)

smbldap_tools Scripts

```
add user script = /opt/idealx/smbldap-useradd -a -m '%u'
delete user script = /opt/idealx/smbldap-userdel '%u'
add group script = /opt/idealx/smbldap-groupadd -p '%g'
delete group script = /opt/idealx/smbldap-groupdel '%g'
add user to group script = /opt/idealx/smbldap-groupmod -m '%u' '%g'
delete user from group script = /opt/idealx/smbldap-groupmod -x '%u' '%g'
set primary group script = /opt/idealx/smbldap-usermod -g '%g' '%u'
add machine script = /opt/idealx/smbldap-useradd -w '%u'
```

Note: Macros need to be quoted

Configuration control file is in:
/etc/smbldap_tools/smbldap.conf

Script Class: Resource Mgmt

- Resource management
  - add/delete share
  - add/delete printer

Script Class: System Control

- System Control
  - shutdown
  - abort shutdown
  - etc.

Cross Domain Identity Management

- IDMAP Backend
  - Local storage OR LDAP based
- Used to store mappings of foreign domain / machine SIDs to local UID/GIDs
- If stored in LDAP can provide consistent UID/GIDs for each NT SID encountered
  - Needed for foreign machine SIDs and foreign domain SIDs

Configuration of IDMAP

- Local IDMAP file
  - Must run ***winbindd***
  - Usually located in:

    /var/spool/samba/winbindd_idmap.tdb

    or

    /var/cache/samba/winbindd_idmap.tdb

    or

    /usr/local/samba/var/locks/winbindd_idmap.tdb

```
[global]
...
        idmap uid = 15000-20000
        idmap gid = 15000-20000
...
```

Configuration of IDMAP

- Using LDAP backend
  - Must run winbindd
  - Stores mapping data in LDAP
  - Must have same UID/GID range on all clients

```
ldap suffix = dc=abmas,dc=biz
ldap admin dn = cn=Manager,dc=abmas,dc=biz
ldap idmap suffix = ou=Idmap
Idmap backend = ldap:ldap://frodo.abmas.biz:389
```

Integration into Window Networks

- Provides authentication integration
  - User logs onto machine (workstation or server) once
    - Has transparent access to resources
- Provides file and print sharing
- Samba can integrate into both Windows network designs
  - NT4
  - ADS

NT4 Style Domains

- Native support is built into Samba
- Requires use of *winbindd*
  - Use *NSS* for passwd, group resolution
  - Stores mapping table locally in *winbindd_idmap.tdb* file

NT4 Domain Member (DMS)

- Can be (same configuration):
  - Domain Member Server (DMS)
  - Domain Member Client (DMS)

```
# Global parameters
[global]
       workgroup = BILLMORE

# The following means be a DMS
       security = DOMAIN
```

Active Directory

- Requires compilation with ADS option
  - Requires Kerberos libraries
    - MIT 1.3.1 or later
    - Heimdal 0.61 or later
- Windows 2003 ADS requires the latest KRB versions
- Some UNIX and Linux vendors do NOT include ADS support in the Samba they ship!
  - Sun
  - Slackware
  - Others?

ADS Domain Membership

- Uses Kerberos authentication protocols
- Requires correct configuration
  - Example DC: *london.abmas.biz*

```
security = ADS
workgroup = LONDON
realm = abmas.biz
```

- Requires joining the Domain by:

```
net ads join -Uadministrator%password
```

Kerberos for ADS DMS

- Use default *krb5.conf* file
- Do NOT specify the encryption types!
  - If you do, be forewarned that you may break interoperability with Windows 200x
- Must use latest versions of MIT Kerberos or Heimdal
- If using Heimdal, you must have an */etc/krb5.conf* file to satisfy library needs

NSS Configuration for ADS DMS

- */etc/nsswitch.conf*

```
# /etc/nsswitch.conf

passwd:         files winbind
group:          files winbind

hosts:          files dns wins
```

PAM Configuration for ADS DMS

- *Example: /etc/pam.d/login*

```
#%PAM-1.0
auth sufficient       pam_unix2.so    nullok
auth sufficient       pam_winbind.so use_first_pass use_authtok
auth required        pam_securetty.so
auth required        pam_nologin.so
auth required        pam_env.so
auth required        pam_mail.so
account sufficient    pam_unix2.so
account sufficient    pam_winbind.so user_first_pass use_authtok
password required     pam_pwcheck.so nullok
password sufficient   pam_unix2.so nullok use_first_pass use_authtok
password sufficient   pam_winbind.so  use_first_pass use_authtok
session sufficient    pam_unix2.so    none
session sufficient    pam_winbind.so  use_first_pass use_authtok
session required      pam_limits.so
```

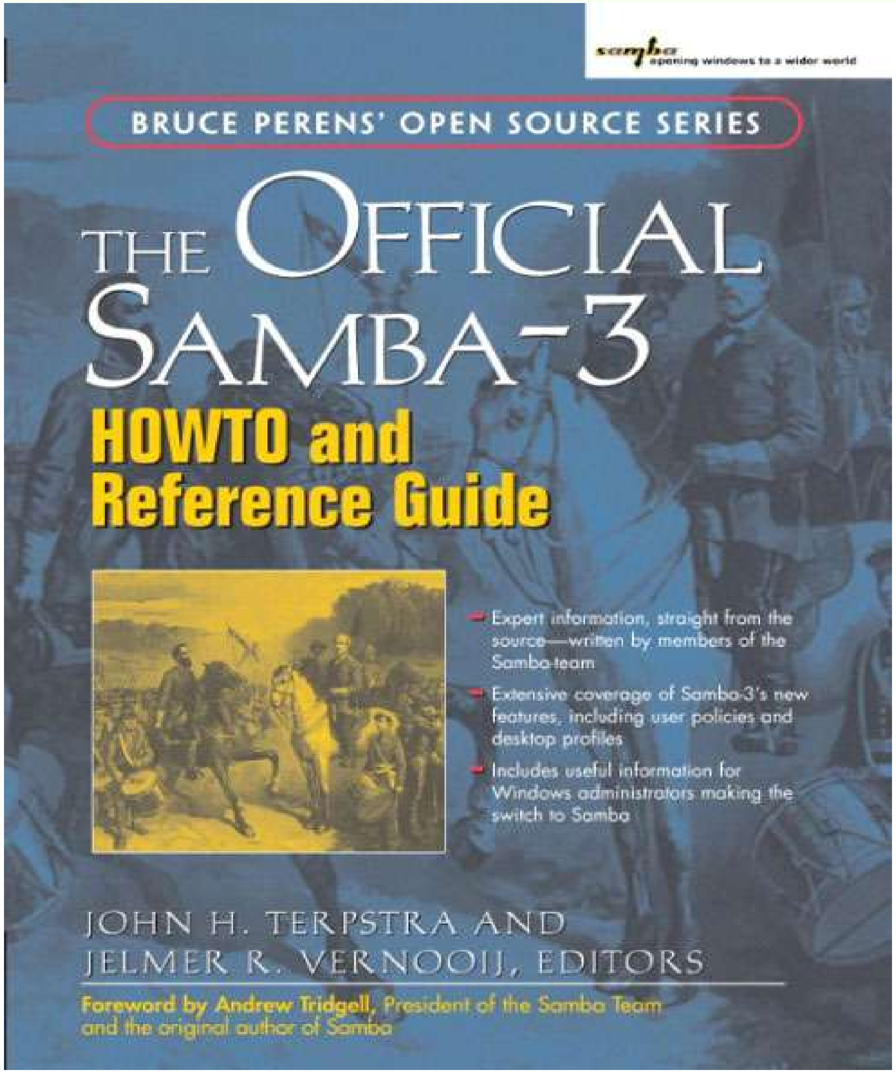
Finding Information

- ALWAYS Visit the Source!
  - http://www.samba.org/samba/
  - Documentation
    - Man pages
    - Official Books
    - Listing of published books
  - Mailing Lists
    - General, Technical
  - Bug Tracking System
    - http://bugzilla.samba.org/
  - Other Sources

Documentation

- Official (means part of Samba sources)
  - The Official Samba-3 HOWTO and Reference Guide
    - ISBN: 0131453556
    - Open source version: Samba-HOWTO-Collection (PDF and HTML)
  - Samba-3 by Example
    - ISBN: 0131472216
    - Open Source version: Samba-Guide (PDF and HTML)
  - Man Pages
  - Contributed Presentations, etc. on Samba.Org

The Official Samba-3 HOWTO



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THE OFFICIAL SAMBA-3

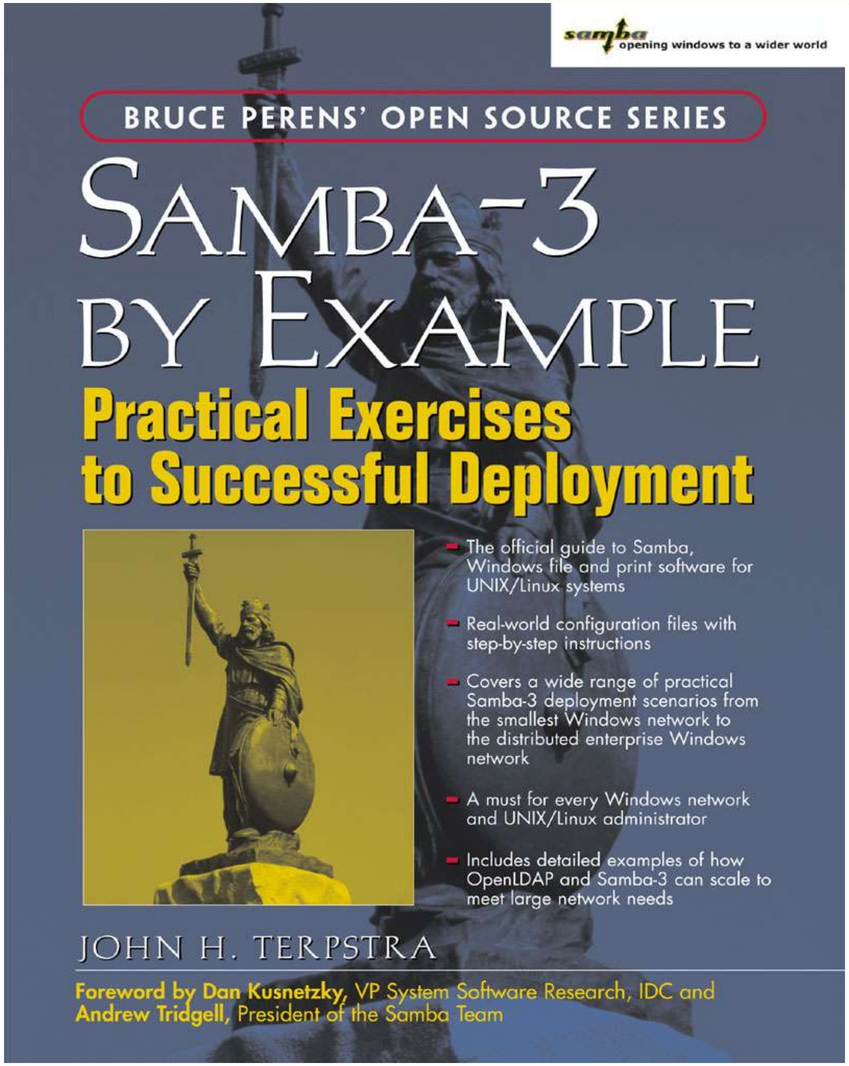
HOWTO and Reference Guide

- Expert information, straight from the source—written by members of the Samba team
- Extensive coverage of Samba-3's new features, including user policies and desktop profiles
- Includes useful information for Windows administrators making the switch to Samba

JOHN H. TERPSTRA AND
JELMER R. VERNOOIJ, EDITORS

Foreword by Andrew Tridgell, President of the Samba Team and the original author of Samba

Samba-3 by Example



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Practical Exercises to Successful Deployment

- The official guide to Samba, Windows file and print software for UNIX/Linux systems
- Real-world configuration files with step-by-step instructions
- Covers a wide range of practical Samba-3 deployment scenarios from the smallest Windows network to the distributed enterprise Windows network
- A must for every Windows network and UNIX/Linux administrator
- Includes detailed examples of how OpenLDAP and Samba-3 can scale to meet large network needs

JOHN H. TERPSTRA

Foreword by Dan Kusnetzky, VP System Software Research, IDC and **Andrew Tridgell,** President of the Samba Team

Documentation

- Unofficial
  - There is a lot of it
  - Most is of high quality
  - Much is out of date
    - It is time consuming to keep documentation up to date
- Many books
  - See: http://www.samba.org/samba/books.html
- Samba-Team encourage unofficial source work!
  - There is nothing exclusive in the title: “Official Documentation”

Q&A / Feedback

- Please send any questions or comments on this presentation to SNIA: (use your tutorial reflector address here) snia-snw-infrastructure@snia.org

END –» FINISHED –» DONE –» Questions

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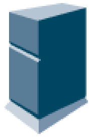
Graphics

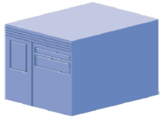
Users

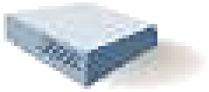

Servers

SAN Storage

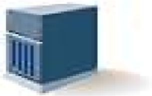
Disk Drive

HBA

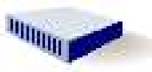

NAS Appliance


SAN Hubs, Switches, Routers

Disks or JBODs


Tape Drive

Network


Gateway

SANmark Compliance