# Samba and the need for Standardisation

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# Agenda

- Short history of Samba/MS Windows protocols
- Brief review of recent protocol changes
- The future of Samba
  - What must change
  - What may change
  - Preferred Action
- Summary

# Short History

- Server Message Block (SMB) protocol
  - Developed by IBM/3Com/Microsoft
  - Documented as in RFC1001/1002
  - Published by Xopen Committee
- Approx. 1992:
  - Windows NT3.1 protocol enhancements
- Approx. 1995:
  - Extended for NT4

## More Recent History

- Protocol Renamed to:
  - Common Internet File System (CIFS)
    - Provides significant extensions
    - Samba-Team helped to document protocol
      - Necessary for implementation
        - NT4 / 200x Domain Control Implementation
    - Microsoft Published Documentation
      - Does NOT cover DCE RPC Protocols
        - Does NOT cover the Domain Control Protocols that sit on top of them either



# **Recent Changes**

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- Original protocols very insecure
  - Uses anonymous connection to IPC\$ share
    - Trusted and can open possible exploits
  - Microsoft have implemented techniques to tighten security
- Original SMB protocols use: SMB / NetBIOS / TCP/IP == NetBT Uses B/Cast or WINS (NOT DNS)
- Also uses: DCE RPC / Named Pipes / NetBT

# More Recent Changes

- MS Windows 200x / XP
  - Can run without NetBIOS over TCP/IP
    - Can run: SMB / TCP/IP == NetBIOSless SMB
      - Heavily depends on DNS
  - Introduces Digital Signing
    - Encryption
      - schannel, sign'n'seal
    - Not the same as encrypted passwords!
  - New protocol extensions (DCE RPC)
    - Auto added with service packs

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### Futures – I

- What MUST change:
  - CIFS is not a standard
    - Constantly changing
      - Adding proprietary functionality
    - Protocol is extremely complex
    - Risk that after any service pack or on-line update an old protocol may be broken
      - Affects Microsoft clients as much as Samba
      - Means ALL systems must be kept up to date and at the same update / revision level



## Futures – II

- What MAY change
  - We need to understand the market to see what may happen

#### ... Let's look at some graphs



# The Installed Server Market





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# New Server Shipment OS Profile



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# Installed Desktop Market







## More Futures

Conclusion from market information:

- MS Windows is Dominant Server Platform
  - CIFS is the dominant File and Print Protocol
    - Is Insecure
      - Must be made more secure!!!!!
    - Is NOT UNIX/Linux oriented
      - Protocol addresses the needs of NTFS and Win200x/XP
- Windows 200x/XP server shipments exceeds UNIX+Linux
  - Therefore likely to remain dominant well into the future!



## **Even More Futures**

- CIFS is complex it is time to replace it
  - Session encryption built-in
    - Protected by legislation against reverse engineering
  - Opportunity for Microsoft to replace underlying file system architecture
    - If NTFS can be replaced with an object based technology that has dynamically expandable metadata capabilities:
      - Means new security measures can easily be added



## Futures – III

#### Action

- If we want MS Windows networking to be more UNIX/Linux enabled:
  - Need CIFS protocol extensions that are:
    - More POSIX oriented (NOT just Windows ACLs)
    - Semantically closer UNIX/Linux file system support
  - Need client drivers for MS Windows
- Need agreed public standards
  - So Businesses / Governments can specify them
- Need a clear roadmap to the future

## Summary

- The future of MS Windows networking protocols will remain uncertain and unpredictable
  - We need a roadmap for stability and interoperability
- Samba is threatened by changes to the protocols
  - We need publicly arbitrated standard protocols for all IT file and print services

