

STORAGE DEVELOPER CONFERENCE



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BY Developers FOR Developers

A  SNIA Event

SMB Client Synergy

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Panel members:

- Jeremy Allison - Google / Samba Team
- Brad Suinn - Apple
- Lilia Wasserman – Visuality Systems
- Steven French – Microsoft
- Genghis Karimov - Microsoft
- Meng Li - Microsoft

Background

- Anything can be an SMB client
- Connect to the same SMB server
- Good examples downstairs
- SMB3.1.1 secured



SMB today

- SMB3 highlights:
 - End-to-end encryption
 - Transparent Failover
 - Scale Out
 - MultiChannel
 - Directory Leasing
 - QUIC
 - Compression



SMB CLIENTS AVAILABLE TODAY

Microsoft Client



- Platforms:
 - Windows operating systems
- Usage:
 - Desktops, laptops, smart devices, cloud based VMs

Apple Client



- **Platforms:**
 - Mac OS (client + server), iOS (client)
- **Usage:**
 - Desktops, laptops, iPads, iPhones

SMB Client– Samba team



- Platforms:
 - Unix/Linux/Android/ChromeOS
- Usage:
 - Desktops, laptops, web devices
- Available as a library plug-in for other programs
- Free Software under GNU GPLv3 license

Linux Kernel Client (cifs.ko)

- Platforms:

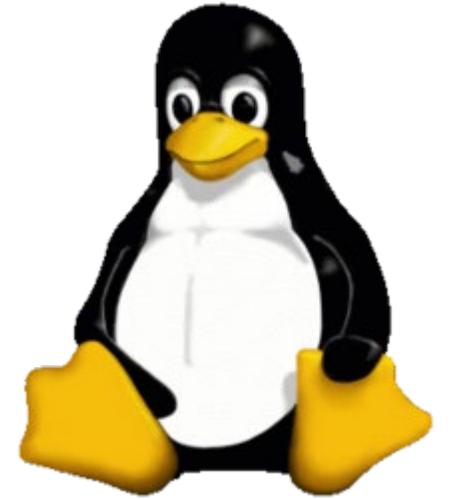
- Linux

- Usage:

- File system driver, can also be run as loopback device for block device emulation. Used on Desktops, laptops, embedded devices and more

- Free Software under GNU GPLv2 license

- “cifs-utils” repo also includes various user space utilities and tools



libsmb2– Samba team



- Free Software under GNU LGPLv2.1 (or later) license

What is libsmb2

- Libsmb2 is a small footprint SMB2/3 client that runs in userspace.
- Libsmb2 is highly portable. It builds and runs on Windows/Linux/BSD/MacOS/iOS/Android/WatchOS/... and even on some micro-controllers.
- It also builds on UWP so if you want that XBOX application you are building to have SMB2/3 access ...

NQ Client – Visuality Systems



- Platforms:
 - Portable to any platform
- Usage:
 - Embedded / IOT
 - Storage/cloud systems
 - Java Applications
 - Mobile
- Commercial license

SMB over QUIC

smb_over_quic.pcapng

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

quic && smb2

No.	Time	Source	Destination	Protocol	Length	Msg_id	Info
355	9.784483811	10.0.4.15	172.16.1.183	SMB2	170	11	Close Request File: TestCases_Euq1hqaYsJ
356	9.806225270	172.16.1.183	10.0.4.15	SMB2	202	11	Close Response
357	9.808993776	10.0.4.15	172.16.1.183	SMB2	271	12	Create Request File: TestCases_Euq1hqaYsJ
358	9.825433317	172.16.1.183	10.0.4.15	SMB2	286	12	Create Response File: TestCases_Euq1hqaYsJ
361	9.826509591	10.0.4.15	172.16.1.183	SMB2	191	13	GetInfo Request FILE_INFO/SMB2_FILE_BASIC_INFO File: TestCa
362	9.841688835	172.16.1.183	10.0.4.15	SMB2	190	13	GetInfo Response
363	9.842599711	10.0.4.15	172.16.1.183	SMB2	191	14	GetInfo Request FILE_INFO/SMB2_FILE_STANDARD_INFO File: Tes
364	9.858880276	172.16.1.183	10.0.4.15	SMB2	174	14	GetInfo Response
365	9.860973716	10.0.4.15	172.16.1.183	SMB2	191	15	GetInfo Request FILE_INFO/SMB2_FILE_INTERNAL_INFO File: Tes
366	9.875924863	172.16.1.183	10.0.4.15	SMB2	158	15	GetInfo Response
367	9.878337254	10.0.4.15	172.16.1.183	SMB2	175	16	Close Request File: TestCases_Euq1hqaYsJ
368	9.893248930	172.16.1.183	10.0.4.15	SMB2	202	16	Close Response
369	9.894992561	10.0.4.15	172.16.1.183	SMB2	327	17	Create Request File: TestCases_Euq1hqaYsJ
370	9.909594574	172.16.1.183	10.0.4.15	SMB2	286	17	Create Response File: TestCases_Euq1hqaYsJ
371	9.911800978	10.0.4.15	172.16.1.183	SMB2	184	18	SetInfo Request FILE_INFO/SMB2_FILE_DISPOSITION_INFO File:
372	9.929653039	172.16.1.183	10.0.4.15	SMB2	144	18	SetInfo Response
373	9.931794113	10.0.4.15	172.16.1.183	SMB2	175	19	Close Request File: TestCases_Euq1hqaYsJ

> Frame 371: 184 bytes on wire (1472 bits), 184 bytes captured (1472 bits) on interfa...

> Ethernet II, Src: PcsCompu_08:17:cf (08:00:27:08:17:cf), Dst: RealtekU_12:35:02 (52...

> Internet Protocol Version 4, Src: 10.0.4.15, Dst: 172.16.1.183

> User Datagram Protocol, Src Port: 53134, Dst Port: 443

QUIC IETF

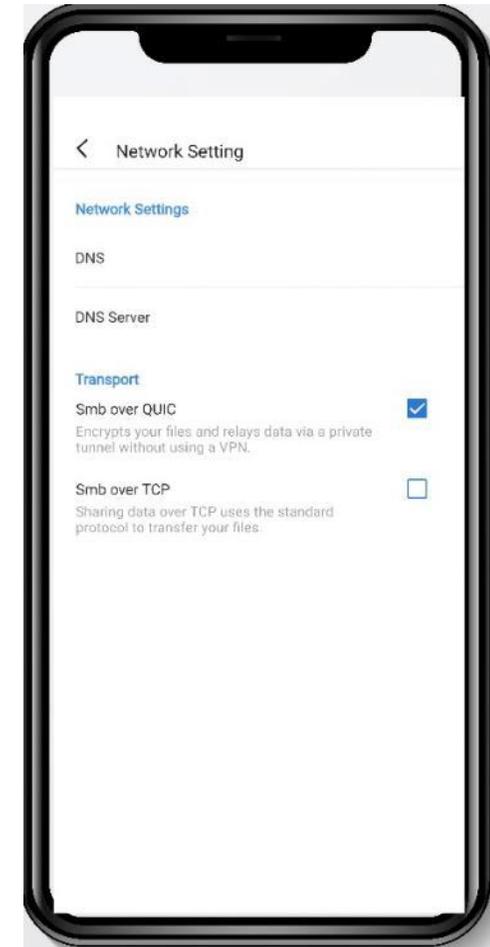
- QUIC Connection information
 - [Packet Length: 142]
 - QUIC Short Header DCID=517bff47e82a17bd55 PKN=37
 - ACK
 - STREAM id=0 fin=0 off=3128 len=101 dir=Bidirectional origin=Client-initiated
- NetBIOS Session Service
 - Message Type: Session message (0x00)
 - Length: 97
- SMB2 (Server Message Block Protocol version 2)
 - SMB2 Header
 - SetInfo Request (0x11)
 - StructureSize: 0x0021
 - Class: FILE_INFO (0x01)

```

0000 52 54 00 12 35 02 08 00 27 08
0010 00 aa 64 3c 40 00 40 11 1a 3:
0020 01 b7 cf 8e 01 bb 00 96 bc 7:
0030 2a 17 bd 55 2f a2 63 17 40 8:
0040 a9 76 cd 67 15 b9 2e 4a af 3:
0050 c3 48 1f d9 8c 2b 98 7a e7 a:
0060 71 f7 33 b1 7b 97 f4 29 be 7:
0070 79 ed 7d 03 6e 8b c3 1f d8 1:
0080 5a e3 ed 46 b9 fe b5 fe 50 c:
0090 12 00 b7 7f a9 e4 3c 96 71 0:
00a0 71 f9 ee 0a 8e 0b 7e 4d 02 4:
00b0 4a 89 58 95 6e e0 2a 16
    
```

Frame (184 bytes) Decrypted QUIC (112 bytes)

QUIC IETF (quic), 142 bytes



Connecting to Azure SMB server

- Biggest SMB server in the world in terms of usage
- Port 445 outbound must be open
- Accepting only encrypted connections from the internet. Within the data center unencrypted allowed if the client doesn't support it.
- SMB Over QUIC





Let's begin...



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