TOR plus slow download

Slow HTTP GET analysis

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# Initial state

One of the goals of TORplus project is video “streaming” (probably ‘progressive download’)

The brief analysis shows slow download that prevents video viewing without buffering during playback

This leads to interrupts of the video playback

# Video file download speed test

all tests are done with the same media video file URI <https://www.dropbox.com/sh/gs1szwl0l3pvjmu/AADAMBNyTsvojHIIHN4yocmoa/Big_Buck_Bunny_1080p_surround_FrostWire.com.webm?dl=0>

the size is 358,65 Mbyte and the type is WEBM

the download is done via WGET command or via Chrome browser with TOR OP Extension and the results are similar

***NOTE***: this is **not** a good source for the testing, due to CDN. There should be another location for the test file to set both connections – direct and TOR tunneled – into the initially equalized conditions.

## Direct connection

~ 3.0to5.0MB/Sec

## Chutney test environment

~2.5to3.0MB/Sec

## Azure VM test environment

~1.5MB/Sec

# Chutney test environment setup

The setup is VMware 16 Workstation player running “Ubuntu 20.04.2 LTS” virtual machine

Use the following commands to **create**, **start**, **stop** and **view status** of the minimal TOR environment that is running on the same VM:

**cd** ~/Documents/Sources/chantey

**./chutney** *configure* networks/basic-min

This command should create several directories per TOR instance with different **torrc** files

**./chutney** *start* networks/basic-min

Should start all TOR instances

**./chutney** *stop* networks/basic-min

Will stop all running TOR instances

**./chutney** *status* networks/basic-min

Shows the running status of the TOR instances

To change the target **torrc** file during “configure” stage, torrc templates can be modified before configuring network.

**torrc** templates patterns are located at “~/Documents/Sources/chantey/torrc\_templates” folder and have “i” extension, i.e. ***authority.i***

# Azure VM test environment setup

The entry point of Azure Portal VMs is <https://portal.azure.com/#blade/HubsExtension/BrowseResourceBlade/resourceType/Microsoft.Compute%2FVirtualMachines>

There are ten VMs added to the portal named “TorPluseNode#{1-10}”

At least Ubuntu 18.04.5 LTS (GNU/Linux 5.4.0-1039-azure x86\_64) OS should be installed

**TODO**: To Enable Accelerated Networking vm should be of size at least “Standard\_F4”

Each VM should have an appropriate set of software installed.

To complete initial installations get the installation script called “tor-plus-dev-deploy.sh” from the <https://paidpiper2020@dev.azure.com/paidpiper2020/PaidPiper/_git/deployment> URL and run it on each VM.

This will install necessary dependencies, clone TORplus source base from “periodic-logs-via-signal” branch and build it.

For TOR test network, we should configure at least 3 different kind of OR.

All configurations are based on ‘torrc’ file located at the same <https://paidpiper2020@dev.azure.com/paidpiper2020/PaidPiper/_git/deployment> URL.

The location of the torrc file is /usr/local/etc/tor/torrc on all machines. This is default location.

The types are:

1. DirAthority – set “DataDirectory ~/tor” into torrc
2. TOR Relay (OR) – set “DataDirectory ~/.tor” into tor
3. Exit Node – set “DataDirectory ~/.tor” and “ExitPolicy accept \*:\*”

**torrc** file for all VM should contain “SafeLogging 0” to unscreened log sensitive data, otherwise we’ll get “[scrubbed]” string instead.

## TOR DirAuthority Configure

As a reference, follow this guide <https://ritter.vg/blog-run_your_own_tor_network.html>

Pay attention to “Start configuring a few Directory Authorities.” section.

All commands should be executed from the “~/tor/keys” directory.

Once authority\_\* files are created, open *authority\_certificate* file with nano and copy the HASH value of the fingerprint string, like “fingerprint ***4BE1C93253DCD229BEA47326BBB834474C4085BD***”

This is ***v3ident=*** value into **torrc** file, for example:

DirAuthority Auth2 orport=5037 no-v2 ***v3ident=4BE1C93253DCD229BEA47326BBB834474C4085BD*** 52.178.211.201:7001 ***EF8E7CA7CB4F57CE5FA4A0A1C84338485230A008***

The second HASH, here ***EF8E7CA7CB4F57CE5FA4A0A1C84338485230A008***, is the result of the “tor --list-fingerprint” command.

Generate all ‘DirAuthority \*’ strings, and add all of them into **torrc** file on each VM.

# Code base and DEV branch

The source code is GIT based project located at <https://paidpiper2020@dev.azure.com/paidpiper2020/PaidPiper/_git/tor_plus>

The dev branch called “**periodic-logs-via-signal**” and can be viewed at <https://dev.azure.com/paidpiper2020/PaidPiper/_git/tor_plus?version=GBperiodic-logs-via-signal>

The IDE is CLION and should be executed with **SUDO**

# Changes

**Place holder** for CIRCUIT\_WINDOW\* change: was changed and TOR NETWORK stopped to work.

# Periodic logs

Once in 5 seconds there is a signal **USRSIG1** sent to self-instance of tor application.

The result is detailed statistics log for connections, channels?, cells processing, handshake, average bandwidth, DNS.

Some metrics can be found in "tor\_plus/src/feature/stats/rephist.c" file.

**torrc** file can contain log files configuration. Currently, periodic logs are stored into the ‘notice’ log file. In case no file is defined, periodic logs are written to the terminal.

Typical periodic log output:

|  |
| --- |
| Mar 07 18:21:31.000 [notice] Dumping stats:  Mar 07 18:21:31.000 [notice] Conn 0 (socket 6) type 6 (Socks listener), state 0 (ready), created 162 secs ago  Mar 07 18:21:31.000 [notice] Conn 1 (socket 7) type 11 (Control listener), state 0 (ready), created 162 secs ago  Mar 07 18:21:31.000 [notice] Conn 2 (socket 8) type 3 (OR listener), state 0 (ready), created 162 secs ago  Mar 07 18:21:31.000 [notice] Conn 3 (socket 16) type 4 (OR), state 8 (open), created 160 secs ago  Mar 07 18:21:31.000 [notice] Conn 3 is to 52.178.211.201:5037.  Mar 07 18:21:31.000 [notice] Conn 3: 450 bytes waiting on inbuf (len 32768, last read 0 secs ago)  Mar 07 18:21:31.000 [notice] Conn 3: 0 bytes waiting on outbuf (len 0, last written 0 secs ago)  Mar 07 18:21:31.000 [notice] Conn 4 (socket 17) type 4 (OR), state 8 (open), created 131 secs ago  Mar 07 18:21:31.000 [notice] Conn 4 is to 20.52.131.126:5037.  Mar 07 18:21:31.000 [notice] Conn 4: 0 bytes waiting on inbuf (len 0, last read 83 secs ago)  Mar 07 18:21:31.000 [notice] Conn 4: 0 bytes waiting on outbuf (len 0, last written 83 secs ago)  Mar 07 18:21:31.000 [notice] Conn 5 (socket 19) type 4 (OR), state 8 (open), created 130 secs ago  Mar 07 18:21:31.000 [notice] Conn 5 is to 40.123.217.22:5037.  Mar 07 18:21:31.000 [notice] Conn 5: 0 bytes waiting on inbuf (len 0, last read 86 secs ago)  Mar 07 18:21:31.000 [notice] Conn 5: 0 bytes waiting on outbuf (len 0, last written 87 secs ago)  Mar 07 18:21:31.000 [notice] Conn 6 (socket 18) type 4 (OR), state 8 (open), created 119 secs ago  Mar 07 18:21:31.000 [notice] Conn 6 is to 104.47.164.245:5037.  Mar 07 18:21:31.000 [notice] Conn 6: 0 bytes waiting on inbuf (len 0, last read 82 secs ago)  Mar 07 18:21:31.000 [notice] Conn 6: 0 bytes waiting on outbuf (len 0, last written 82 secs ago)  Mar 07 18:21:31.000 [notice] Conn 7 (socket 20) type 4 (OR), state 8 (open), created 88 secs ago  Mar 07 18:21:31.000 [notice] Conn 7 is to 51.103.113.104:5037.  Mar 07 18:21:31.000 [notice] Conn 7: 0 bytes waiting on inbuf (len 0, last read 85 secs ago)  Mar 07 18:21:31.000 [notice] Conn 7: 0 bytes waiting on outbuf (len 0, last written 85 secs ago)  Mar 07 18:21:31.000 [notice] Conn 8 (socket 21) type 4 (OR), state 8 (open), created 88 secs ago  Mar 07 18:21:31.000 [notice] Conn 8 is to 104.47.148.87:5037.  Mar 07 18:21:31.000 [notice] Conn 8: 0 bytes waiting on inbuf (len 0, last read 85 secs ago)  Mar 07 18:21:31.000 [notice] Conn 8: 0 bytes waiting on outbuf (len 0, last written 85 secs ago)  Mar 07 18:21:31.000 [notice] Conn 9 (socket 23) type 7 (Socks), state 11 (open), created 83 secs ago  Mar 07 18:21:31.000 [notice] Conn 9 is to 127.0.0.1:60458.  Mar 07 18:21:31.000 [notice] Conn 9: 0 bytes waiting on inbuf (len 0, last read 0 secs ago)  Mar 07 18:21:31.000 [notice] Conn 9: 0 bytes waiting on outbuf (len 0, last written 0 secs ago)  Mar 07 18:21:31.000 [notice] Conn 9 has App-ward circuit: circID 0 (other side 3512900631), state 4 (open), born 1615134004:  Mar 07 18:21:31.000 [notice] exit circ (length 3): $EF8E7CA7CB4F57CE5FA4A0A1C84338485230A008(open) $4923C87E037D611DFD5CBC57FBDE70453B8C24AC(open) $3990A5457ACE23E8F8D900502F33CFBC9568BE0D(open)  Mar 07 18:21:31.000 [notice] Conn 10 (socket 22) type 7 (Socks), state 11 (open), created 73 secs ago  Mar 07 18:21:31.000 [notice] Conn 10 is to 127.0.0.1:60468.  Mar 07 18:21:31.000 [notice] Conn 10: 0 bytes waiting on inbuf (len 0, last read 11 secs ago)  Mar 07 18:21:31.000 [notice] Conn 10: 0 bytes waiting on outbuf (len 0, last written 11 secs ago)  Mar 07 18:21:31.000 [notice] Conn 10 has App-ward circuit: circID 0 (other side 3512900631), state 4 (open), born 1615134004:  Mar 07 18:21:31.000 [notice] exit circ (length 3): $EF8E7CA7CB4F57CE5FA4A0A1C84338485230A008(open) $4923C87E037D611DFD5CBC57FBDE70453B8C24AC(open) $3990A5457ACE23E8F8D900502F33CFBC9568BE0D(open)  Mar 07 18:21:31.000 [notice] Conn 11 (socket 24) type 7 (Socks), state 11 (open), created 58 secs ago  Mar 07 18:21:31.000 [notice] Conn 11 is to 127.0.0.1:60472.  Mar 07 18:21:31.000 [notice] Conn 11: 0 bytes waiting on inbuf (len 0, last read 57 secs ago)  Mar 07 18:21:31.000 [notice] Conn 11: 0 bytes waiting on outbuf (len 0, last written 57 secs ago)  Mar 07 18:21:31.000 [notice] Conn 11 has App-ward circuit: circID 0 (other side 3512900631), state 4 (open), born 1615134004:  Mar 07 18:21:31.000 [notice] exit circ (length 3): $EF8E7CA7CB4F57CE5FA4A0A1C84338485230A008(open) $4923C87E037D611DFD5CBC57FBDE70453B8C24AC(open) $3990A5457ACE23E8F8D900502F33CFBC9568BE0D(open)  Mar 07 18:21:31.000 [notice] Conn 12 (socket 25) type 7 (Socks), state 11 (open), created 37 secs ago  Mar 07 18:21:31.000 [notice] Conn 12 is to 127.0.0.1:60478.  Mar 07 18:21:31.000 [notice] Conn 12: 0 bytes waiting on inbuf (len 0, last read 36 secs ago)  Mar 07 18:21:31.000 [notice] Conn 12: 0 bytes waiting on outbuf (len 0, last written 35 secs ago)  Mar 07 18:21:31.000 [notice] Conn 12 has App-ward circuit: circID 0 (other side 3512900631), state 4 (open), born 1615134004:  Mar 07 18:21:31.000 [notice] exit circ (length 3): $EF8E7CA7CB4F57CE5FA4A0A1C84338485230A008(open) $4923C87E037D611DFD5CBC57FBDE70453B8C24AC(open) $3990A5457ACE23E8F8D900502F33CFBC9568BE0D(open)  Mar 07 18:21:31.000 [notice] Conn 13 (socket 26) type 7 (Socks), state 11 (open), created 5 secs ago  Mar 07 18:21:31.000 [notice] Conn 13 is to 127.0.0.1:60480.  Mar 07 18:21:31.000 [notice] Conn 13: 0 bytes waiting on inbuf (len 0, last read 4 secs ago)  Mar 07 18:21:31.000 [notice] Conn 13: 0 bytes waiting on outbuf (len 0, last written 4 secs ago)  Mar 07 18:21:31.000 [notice] Conn 13 has App-ward circuit: circID 0 (other side 3512900631), state 4 (open), born 1615134004:  Mar 07 18:21:31.000 [notice] exit circ (length 3): $EF8E7CA7CB4F57CE5FA4A0A1C84338485230A008(open) $4923C87E037D611DFD5CBC57FBDE70453B8C24AC(open) $3990A5457ACE23E8F8D900502F33CFBC9568BE0D(open)  Mar 07 18:21:31.000 [notice] Dumping statistics about 6 channels:  Mar 07 18:21:31.000 [notice] 6 are active, and 0 are done and waiting for cleanup  Mar 07 18:21:31.000 [notice] Channel 1 (at 0x557ef9f720a0) with transport TLS channel (connection 4) is in state open (2)  Mar 07 18:21:31.000 [notice] \* Channel 1 was created at 1615133931 (160 seconds ago) and last active at 1615134091 (0 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 1 says it is connected to an OR with digest EF8E7CA7CB4F57CE5FA4A0A1C84338485230A008  Mar 07 18:21:31.000 [notice] \* Channel 1 says its remote address is 52.178.211.201, and gives a canonical description of "52.178.211.201:5037" and an actual description of "52.178.211.201:5037"  Mar 07 18:21:31.000 [notice] \* Channel 1 has these marks: !bad\_for\_new\_circs canonical is\_canonical\_is\_reliable !client !local outgoing  Mar 07 18:21:31.000 [notice] \* Channel 1 has 0 active circuits out of 12 in total  Mar 07 18:21:31.000 [notice] \* Channel 1 was last used by a client at 1615134091 (0 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 1 last received a cell at 1615134091 (0 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 1 last transmitted a cell at 1615134091 (0 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 1 has received 115101048 bytes in 223932 cells and transmitted 3668932 bytes in 7138 cells  Mar 07 18:21:31.000 [notice] \* Channel 1 has averaged 719381.550000 bytes received per second  Mar 07 18:21:31.000 [notice] \* Channel 1 has averaged 1399.575000 cells received per second  Mar 07 18:21:31.000 [notice] \* Channel 1 has averaged 22930.825000 bytes transmitted per second  Mar 07 18:21:31.000 [notice] \* Channel 1 has averaged 44.612500 cells transmitted per second  Mar 07 18:21:31.000 [notice] Channel 14 (at 0x557ef9f7e6a0) with transport TLS channel (connection 31) is in state open (2)  Mar 07 18:21:31.000 [notice] \* Channel 14 was created at 1615133960 (131 seconds ago) and last active at 1615134008 (83 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 14 says it is connected to an OR with digest CB53D45B07ACACC7577504754F50C42F2FD68720  Mar 07 18:21:31.000 [notice] \* Channel 14 says its remote address is 20.52.131.126, and gives a canonical description of "20.52.131.126:5037" and an actual description of "20.52.131.126:5037"  Mar 07 18:21:31.000 [notice] \* Channel 14 has these marks: !bad\_for\_new\_circs canonical is\_canonical\_is\_reliable !client !local outgoing  Mar 07 18:21:31.000 [notice] \* Channel 14 has 0 active circuits out of 3 in total  Mar 07 18:21:31.000 [notice] \* Channel 14 was last used by a client at 0 (1615134091 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 14 last received a cell at 1615134008 (83 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 14 last transmitted a cell at 1615134008 (83 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 14 has received 138266 bytes in 269 cells and transmitted 9252 bytes in 18 cells  Mar 07 18:21:31.000 [notice] \* Channel 14 has averaged 1055.465649 bytes received per second  Mar 07 18:21:31.000 [notice] \* Channel 14 has averaged 2.053435 cells received per second  Mar 07 18:21:31.000 [notice] \* Channel 14 has averaged 70.625954 bytes transmitted per second  Mar 07 18:21:31.000 [notice] \* Channel 14 has averaged 7.277778 seconds between transmitted cells  Mar 07 18:21:31.000 [notice] Channel 16 (at 0x557ef9f805a0) with transport TLS channel (connection 34) is in state open (2)  Mar 07 18:21:31.000 [notice] \* Channel 16 was created at 1615133961 (130 seconds ago) and last active at 1615134005 (86 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 16 says it is connected to an OR with digest 05526F729D29337DEA351E1B14C8B257FFB9AE73  Mar 07 18:21:31.000 [notice] \* Channel 16 says its remote address is 40.123.217.22, and gives a canonical description of "40.123.217.22:5037" and an actual description of "40.123.217.22:5037"  Mar 07 18:21:31.000 [notice] \* Channel 16 has these marks: !bad\_for\_new\_circs canonical is\_canonical\_is\_reliable !client !local outgoing  Mar 07 18:21:31.000 [notice] \* Channel 16 has 0 active circuits out of 9 in total  Mar 07 18:21:31.000 [notice] \* Channel 16 was last used by a client at 0 (1615134091 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 16 last received a cell at 1615134005 (86 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 16 last transmitted a cell at 1615134004 (87 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 16 has received 280130 bytes in 545 cells and transmitted 152658 bytes in 297 cells  Mar 07 18:21:31.000 [notice] \* Channel 16 has averaged 2154.846154 bytes received per second  Mar 07 18:21:31.000 [notice] \* Channel 16 has averaged 4.192308 cells received per second  Mar 07 18:21:31.000 [notice] \* Channel 16 has averaged 1174.292308 bytes transmitted per second  Mar 07 18:21:31.000 [notice] \* Channel 16 has averaged 2.284615 cells transmitted per second  Mar 07 18:21:31.000 [notice] Channel 29 (at 0x557ef9f7e0d0) with transport TLS channel (connection 52) is in state open (2)  Mar 07 18:21:31.000 [notice] \* Channel 29 was created at 1615133972 (119 seconds ago) and last active at 1615134009 (82 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 29 says it is connected to an OR with digest 856D728E4786B611FD4F90285E6B8F0814B05061  Mar 07 18:21:31.000 [notice] \* Channel 29 says its remote address is 104.47.164.245, and gives a canonical description of "104.47.164.245:5037" and an actual description of "104.47.164.245:5037"  Mar 07 18:21:31.000 [notice] \* Channel 29 has these marks: !bad\_for\_new\_circs canonical is\_canonical\_is\_reliable !client !local outgoing  Mar 07 18:21:31.000 [notice] \* Channel 29 has 0 active circuits out of 3 in total  Mar 07 18:21:31.000 [notice] \* Channel 29 was last used by a client at 0 (1615134091 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 29 last received a cell at 1615134009 (82 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 29 last transmitted a cell at 1615134009 (82 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 29 has received 136210 bytes in 265 cells and transmitted 136210 bytes in 265 cells  Mar 07 18:21:31.000 [notice] \* Channel 29 has averaged 1144.621849 bytes received per second  Mar 07 18:21:31.000 [notice] \* Channel 29 has averaged 2.226891 cells received per second  Mar 07 18:21:31.000 [notice] \* Channel 29 has averaged 1144.621849 bytes transmitted per second  Mar 07 18:21:31.000 [notice] \* Channel 29 has averaged 2.226891 cells transmitted per second  Mar 07 18:21:31.000 [notice] Channel 47 (at 0x557ef9f7db70) with transport TLS channel (connection 75) is in state open (2)  Mar 07 18:21:31.000 [notice] \* Channel 47 was created at 1615134003 (88 seconds ago) and last active at 1615134006 (85 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 47 says it is connected to an OR with digest 3990A5457ACE23E8F8D900502F33CFBC9568BE0D  Mar 07 18:21:31.000 [notice] \* Channel 47 says its remote address is 51.103.113.104, and gives a canonical description of "51.103.113.104:5037" and an actual description of "51.103.113.104:5037"  Mar 07 18:21:31.000 [notice] \* Channel 47 has these marks: !bad\_for\_new\_circs canonical is\_canonical\_is\_reliable !client !local outgoing  Mar 07 18:21:31.000 [notice] \* Channel 47 has 0 active circuits out of 10 in total  Mar 07 18:21:31.000 [notice] \* Channel 47 was last used by a client at 1615134005 (86 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 47 last received a cell at 1615134006 (85 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 47 last transmitted a cell at 1615134006 (85 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 47 has received 395780 bytes in 770 cells and transmitted 394238 bytes in 767 cells  Mar 07 18:21:31.000 [notice] \* Channel 47 has averaged 4497.500000 bytes received per second  Mar 07 18:21:31.000 [notice] \* Channel 47 has averaged 8.750000 cells received per second  Mar 07 18:21:31.000 [notice] \* Channel 47 has averaged 4479.977273 bytes transmitted per second  Mar 07 18:21:31.000 [notice] \* Channel 47 has averaged 8.715909 cells transmitted per second  Mar 07 18:21:31.000 [notice] Channel 48 (at 0x557ef9fb54d0) with transport TLS channel (connection 76) is in state open (2)  Mar 07 18:21:31.000 [notice] \* Channel 48 was created at 1615134003 (88 seconds ago) and last active at 1615134006 (85 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 48 says it is connected to an OR with digest 4923C87E037D611DFD5CBC57FBDE70453B8C24AC  Mar 07 18:21:31.000 [notice] \* Channel 48 says its remote address is 104.47.148.87, and gives a canonical description of "104.47.148.87:5037" and an actual description of "104.47.148.87:5037"  Mar 07 18:21:31.000 [notice] \* Channel 48 has these marks: !bad\_for\_new\_circs canonical is\_canonical\_is\_reliable !client !local outgoing  Mar 07 18:21:31.000 [notice] \* Channel 48 has 0 active circuits out of 10 in total  Mar 07 18:21:31.000 [notice] \* Channel 48 was last used by a client at 1615134006 (85 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 48 last received a cell at 1615134006 (85 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 48 last transmitted a cell at 1615134006 (85 seconds ago)  Mar 07 18:21:31.000 [notice] \* Channel 48 has received 147004 bytes in 286 cells and transmitted 403490 bytes in 785 cells  Mar 07 18:21:31.000 [notice] \* Channel 48 has averaged 1670.500000 bytes received per second  Mar 07 18:21:31.000 [notice] \* Channel 48 has averaged 3.250000 cells received per second  Mar 07 18:21:31.000 [notice] \* Channel 48 has averaged 4585.113636 bytes transmitted per second  Mar 07 18:21:31.000 [notice] \* Channel 48 has averaged 8.920455 cells transmitted per second  Mar 07 18:21:31.000 [notice] Done spamming about channels now  Mar 07 18:21:31.000 [notice] No channel listeners to dump  Mar 07 18:21:31.000 [notice] Cells processed: 0 padding  61 create  43 created  225942 relay  (9130 relayed)  (224675 delivered)  21 destroy  Mar 07 18:21:31.000 [notice] Average packaged cell fullness: 28.038%  Mar 07 18:21:31.000 [notice] Average delivered cell fullness: 99.317%  Mar 07 18:21:31.000 [notice] ntor onionskins have averaged 261 usec overhead (30.43%) in cpuworker code  Mar 07 18:21:31.000 [notice] Average bandwidth: 117045464/162 = 722502 bytes/sec reading  Mar 07 18:21:31.000 [notice] Average bandwidth: 115479832/162 = 712838 bytes/sec writing  Mar 07 18:21:31.000 [notice] --------------- Dumping memory information:  Mar 07 18:21:31.000 [notice] In buffers for 14 connections: 450 used/32768 allocated  Mar 07 18:21:31.000 [notice] For 1 OR listener connections: 0 used/0 allocated  Mar 07 18:21:31.000 [notice] For 6 OR connections: 450 used/32768 allocated  Mar 07 18:21:31.000 [notice] For 1 Socks listener connections: 0 used/0 allocated  Mar 07 18:21:31.000 [notice] For 5 Socks connections: 0 used/0 allocated  Mar 07 18:21:31.000 [notice] For 1 Control listener connections: 0 used/0 allocated  Mar 07 18:21:31.000 [notice] In rephist: 864 used by 0 Tors.  Mar 07 18:21:31.000 [notice] In 7 live descriptors: 15884 bytes. In 12 old descriptors: 27314 bytes.  Mar 07 18:21:31.000 [notice] 0 cells allocated on 32 circuits. 0 cells leaked.  Mar 07 18:21:31.000 [notice] Our DNS cache has 0 entries.  Mar 07 18:21:31.000 [notice] Our DNS cache size is approximately 24 bytes.  Mar 07 18:21:31.000 [notice] mallinfo() said: arena=14675968, ordblks=243, smblks=348, hblks=1, hblkhd=2101248, usmblks=0, fsmblks=14160, uordblks=11704240, fordblks=2971728, keepcost=262848 |

# Findings

The link speed from the VM’s environment to the Azure VM is pretty slow: average ~2.5Mb/sec and often drops down to ~1.5Mb/sec

TOR has its state saved into {DATA\_DIR}/state file. This file contains Circuit build times histograms in format “CircuitBuildTimeBin {TIME in ms} {NUMBER of Circuits built}”.  
TotalBuildTimes = CircuitBuildAbandonedCount + **∑**CircuitBuildTimeBin

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| # Tor state file last generated on 2021-03-24 15:16:23 local time  # Other times below are in UTC  # You \*do not\* need to edit this file.  CircuitBuildTimeBin 225 4  CircuitBuildTimeBin 275 40  CircuitBuildTimeBin 325 22  …  CircuitBuildTimeBin 2125 1  CircuitBuildTimeBin 51075 1  CircuitBuildTimeBin 51225 1  …  BWHistoryReadEnds 2021-03-25 12:56:29  BWHistoryReadInterval 86400  BWHistoryReadMaxima 0  BWHistoryReadValues 0  BWHistoryWriteEnds 2021-03-25 12:56:29  BWHistoryWriteInterval 86400  BWHistoryWriteMaxima 0  BWHistoryWriteValues 0  CircuitBuildAbandonedCount 5  Dormant 0  Guard in=default rsa\_id=D4CE083281CBC35ED78E429C2510EAAE648BE4D3 nickname=ExitNode sampled\_on=2021-02-19T14:34:38 sampled\_by=0.4.3.5 unlisted\_since=2021-02-28T05:18:46 listed=0  Guard in=default rsa\_id=76767D9370C169BA1E8EF4CCE7FE768E62EA3D1A nickname=RelayNode sampled\_on=2021-02-19T03:09:16 sampled\_by=0.4.3.5 unlisted\_since=2021-03-04T15:42:07 listed=0  Guard in=default rsa\_id=EF8E7CA7CB4F57CE5FA4A0A1C84338485230A008 nickname=Auth2 sampled\_on=2021-02-18T08:22:40 sampled\_by=0.4.3.5 unlisted\_since=2021-03-13T12:31:32 listed=0 confirmed\_on=2021-02-24T23:09:59 confirmed\_idx=0 pb\_use\_attempts=1.000000 pb\_use\_successes=1.000000 pb\_circ\_attempts=194.500000 pb\_circ\_successes=33.500000 pb\_successful\_circuits\_closed=27.500000 pb\_collapsed\_circuits=6.000000 pb\_timeouts=410.500000  …  Guard in=default rsa\_id=5C5B78481B0F6AA013C7824EEC4A4D3CF60075AC nickname=Auth1 sampled\_on=2021-02-22T07:06:50 sampled\_by=0.4.3.5 unlisted\_since=2021-02-26T17:00:17 listed=0 pb\_timeouts=12.000000  Guard in=default rsa\_id=AB6A311787EE066FB567647AACA287AAC8BEE8AD nickname=ExitNode sampled\_on=2021-02-18T13:41:06 sampled\_by=0.4.3.5 unlisted\_since=2021-02-27T01:37:21 listed=0  Guard in=default rsa\_id=F14758B5BA9611F95CF27F0A176AE36A1A01A759 nickname=RelayNode sampled\_on=2021-02-21T04:22:58 sampled\_by=0.4.3.5 unlisted\_since=2021-02-26T06:30:33 listed=0  Guard in=default rsa\_id=4923C87E037D611DFD5CBC57FBDE70453B8C24AC nickname=RelayNode sampled\_on=2021-03-02T03:15:05 sampled\_by=0.4.3.5 listed=1 confirmed\_on=2021-03-07T22:17:59 confirmed\_idx=3 pb\_use\_attempts=1.000000 pb\_use\_successes=1.000000 pb\_circ\_attempts=79.000000 pb\_circ\_successes=38.000000 pb\_successful\_circuits\_closed=5.000000 pb\_collapsed\_circuits=33.000000 pb\_timeouts=3.000000  Guard in=default rsa\_id=3990A5457ACE23E8F8D900502F33CFBC9568BE0D nickname=ExitNode sampled\_on=2021-02-28T17:54:36 sampled\_by=0.4.3.5 listed=1 confirmed\_on=2021-02-28T20:57:29 confirmed\_idx=2 pb\_circ\_attempts=15.000000 pb\_circ\_successes=6.000000 pb\_successful\_circuits\_closed=4.000000 pb\_collapsed\_circuits=2.000000  LastRotatedOnionKey 2021-02-28 11:47:20  LastWritten 2021-03-24 13:16:23  TorVersion Tor 0.4.3.5 (git-9d0dd17616698bdc)  TotalBuildTimes 209 |

In the VM test environment average circuit creation time is ~107.5 ms, and it’s the subject to check.

# TODO

Verify possibility of **DPDK** usage with TORplus. This should optimize network buffers copy performance, thus may lead to speed up the network traffic.