

Trabalho Final

Dados GNSS via NTRIP e FTP

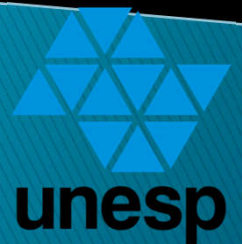
Aluno: Rogério Ramos Rodrigues do Carmo

Prof. Dr. Milton Hirokazu Shimabukuro

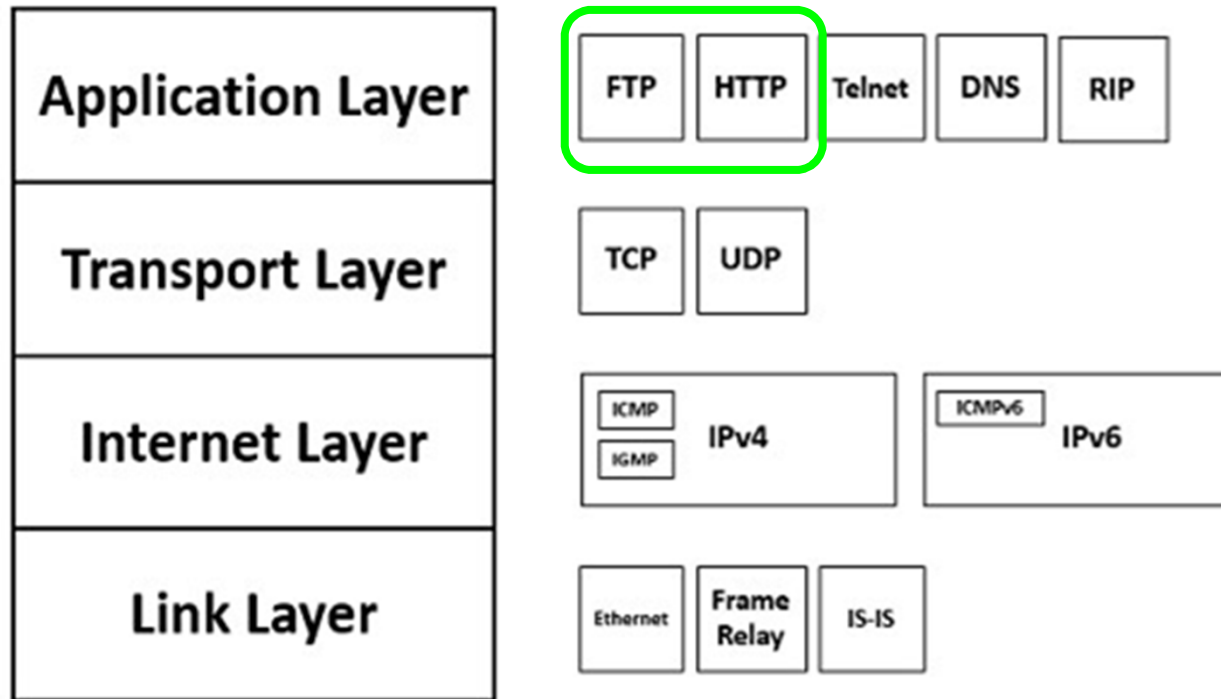
Disciplina: Técnicas de Programação

Aplicadas às Ciências Cartográficas

Programa de Pós Graduação em Ciências Cartográficas (PPGCC)

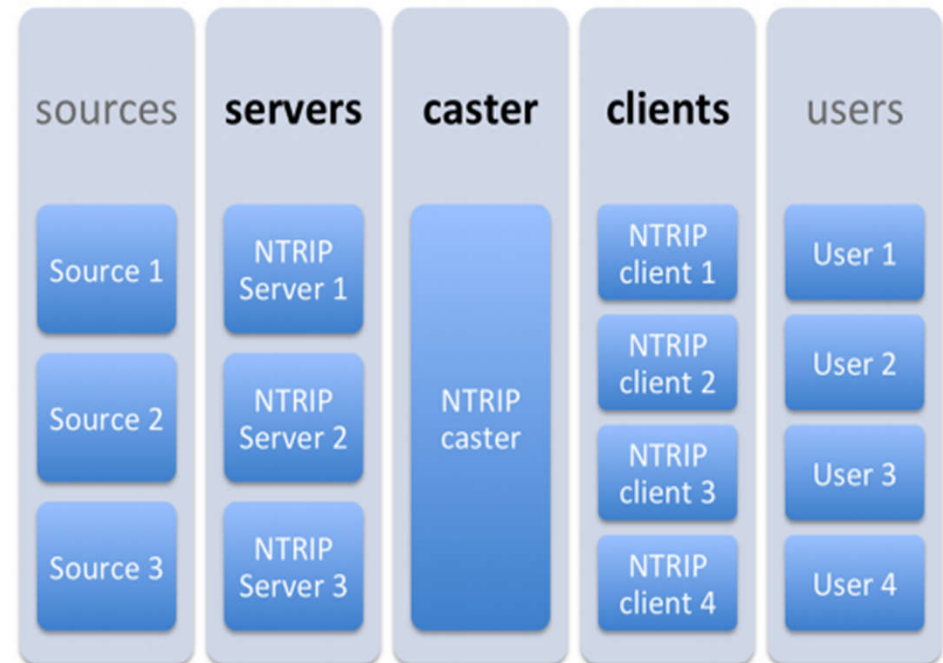
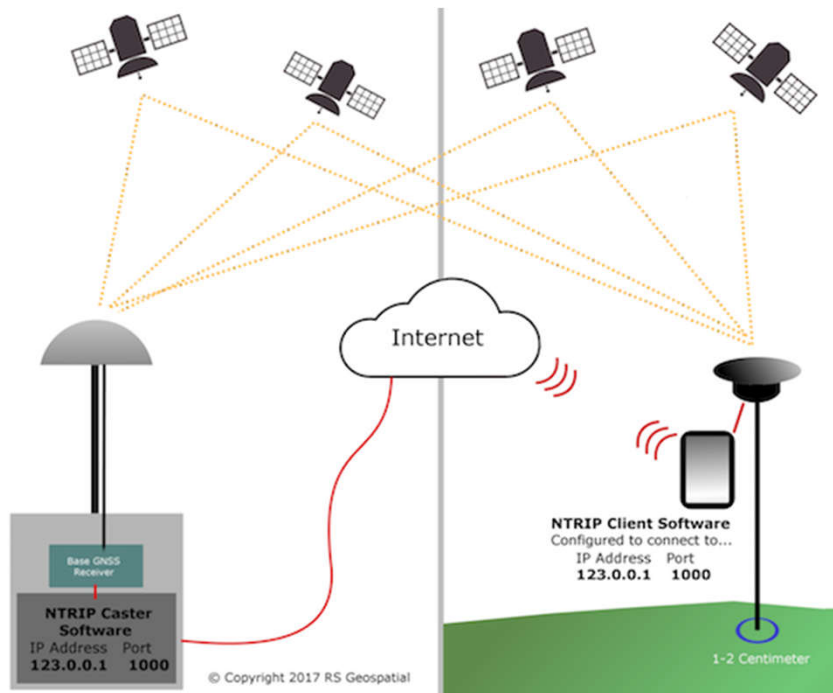


The TCP/IP Protocol Stack



<https://www.comparitech.com/net-admin/ultimate-guide-tcp-ip/>

Networked Transport of RTCM via Internet Protocol (Ntrip)



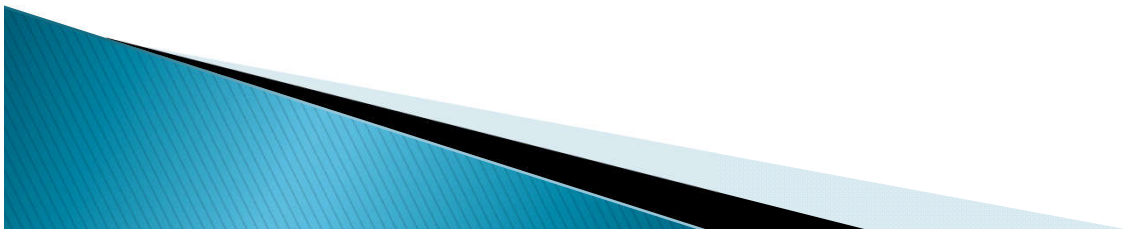
https://www.agsgis.com/What-is-NTRIP_b_42.html

<https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6831329>

Radio Technical Commission for Maritime Services (RTCM)

RTCM v3 Message Types

1019	GPS Broadcast Ephemeris
1020	GLONASS Broadcast Ephemeris
1045	Galileo Broadcast Ephemeris
1057	GPS orbit corrections to Broadcast Ephemeris
1058	GPS clock corrections to Broadcast Ephemeris
1059	GPS code biases
1060	Combined orbit and clock corrections to GPS Broadcast Ephemeris
1061	GPS User Range Accuracy
1062	High-rate GPS clock corrections to Broadcast Ephemeris
1063	GLONASS orbit corrections to Broadcast Ephemeris
1064	GLONASS clock corrections to Broadcast Ephemeris
1065	GLONASS code biases
1066	Combined orbit and clock corrections to GLONASS Broadcast Ephemeris
1067	GLONASS User Range Accuracy
1068	High-rate GLONASS clock corrections to Broadcast Ephemeris



Maven build automation tool



JFreeChart » 1.0.13

JFreeChart is a class library, written in Java, for generating charts. Utilising the Java2D APIs, it currently supports bar charts, pie charts, line charts, XY-plots and time series plots.

License	LGPL
Organization	JFree.org
HomePage	http://www.jfree.org/jfreechart/
Date	(Aug 17, 2009)
Files	pom (1 KB) jar (1.4 MB) View All
Repositories	Central Atlassian 3rd-P Old Hello2morrow IBiblio Liferay Public Mulesoft OSGeo
Used By	349 artifacts

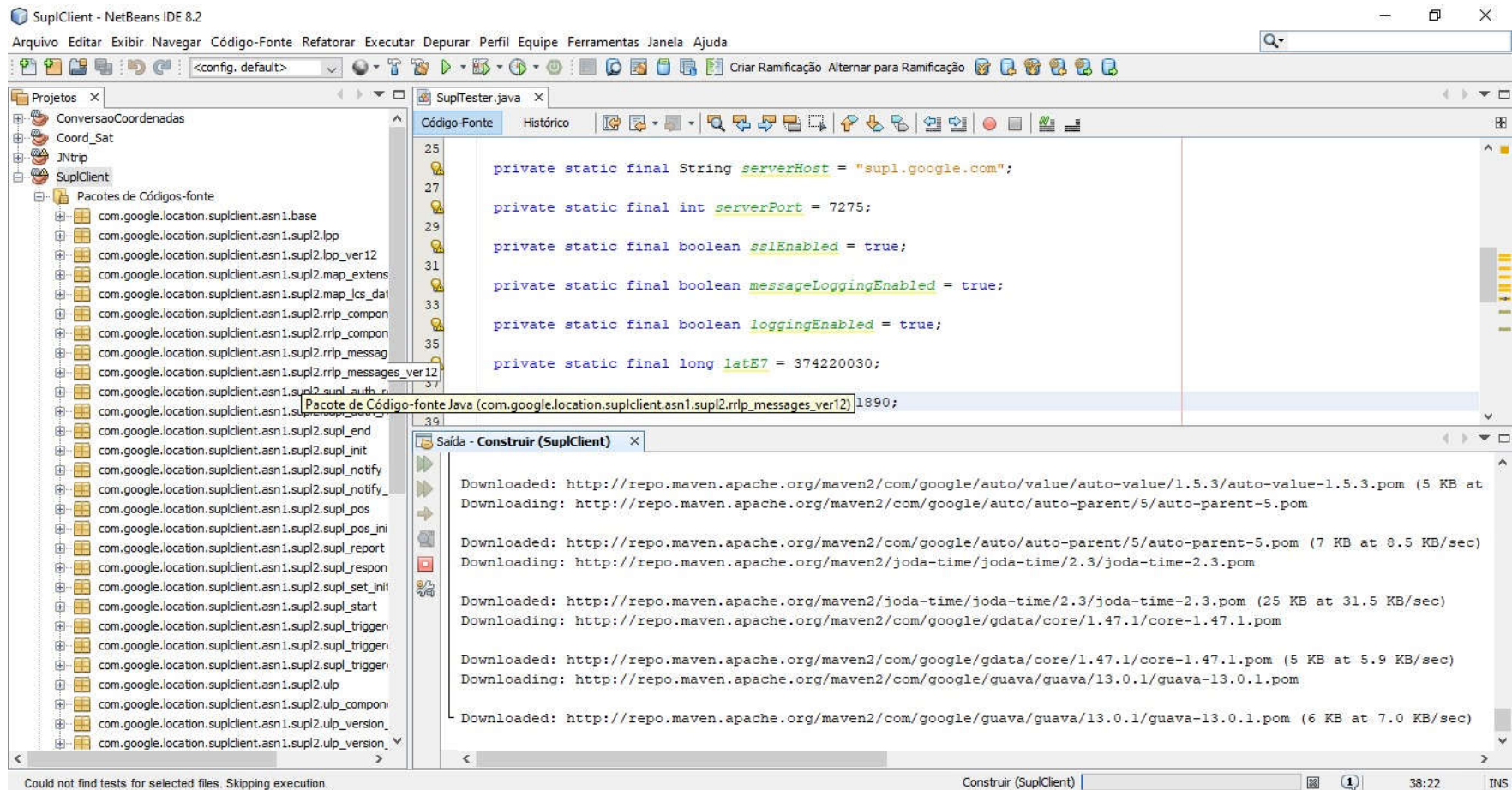
[Maven](#)[Gradle](#)[SBT](#)[Ivy](#)[Grape](#)[Leiningen](#)[Buildr](#)

```
<!-- https://mvnrepository.com/artifact/jfree/jfreechart -->
<dependency>
  <groupId>jfree</groupId>
  <artifactId>jfreechart</artifactId>
  <version>1.0.13</version>
</dependency>
```

☒ Include comment with link to declaration

<https://mvnrepository.com/artifact/jfree/jfreechart/1.0.13>

Maven build automation tool



Base64 Conversion

- ▶ To authenticate on Ntrip Caster

Home > Base64 > **Encode**

Decode Encode URL Decoder String Utilities HTML Escape

Encode to Base64 format

usuario:senha

☐ URL Safe **Encode**

dXN1YXJpbzpzZW5oYQ==

<https://www.base64code.com/encode>

Conversions to read RTCM messages

ASCII to Hex

...and other free text conversion tools

Text (ASCII / ANSI)	Binary
<div><div></div><div>Convert Highlight Text</div></div>	<div><div>10</div><div>Convert Highlight Text</div></div>
Hexadecimal	BASE64
<div><div>02</div></div>	<div><div>Ag==</div></div>

ASCII to Hex

...and other free text conversion tools

Text (ASCII / ANSI)	Binary
<div><div>2</div><div>Convert Highlight Text</div></div>	<div><div>00110010</div><div>Convert Highlight Text</div></div>
Hexadecimal	BASE64
<div><div>32</div></div>	<div><div>Mg==</div></div>

<https://www.asciitohex.com/>

Broadcast Ephemeris



← → ↻ 🏠 ⓘ Não seguro ftp://cddis.nasa.gov/gps/data/daily/2019/256/19n/		
📄 bake2560.19n.Z	42.0 kB	13/09/2019 17:13:00
📄 bamf2560.19n.Z	29.5 kB	13/09/2019 17:13:00
📄 barh2560.19n.Z	42.0 kB	18/09/2019 00:31:00
📄 bcov2560.19n.Z	34.7 kB	13/09/2019 17:08:00
📄 bcrk2560.19n.Z	37.0 kB	13/09/2019 17:07:00
📄 bhr32560.19n.Z	62.1 kB	13/09/2019 20:00:00
📄 bhr42560.19n.Z	62.0 kB	13/09/2019 20:00:00
📄 bill2560.19n.Z	32.5 kB	13/09/2019 17:35:00
📄 bjfs2560.19n.Z	32.4 kB	13/09/2019 20:00:00
📄 bogi2560.19n.Z	37.2 kB	13/09/2019 19:19:00
📄 bogt2560.19n.Z	26.9 kB	13/09/2019 17:57:00
📄 bor12560.19n.Z	35.0 kB	13/09/2019 17:28:00
📄 brdc2560.19n.Z	64.9 kB	14/09/2019 16:31:00
📄 brew2560.19n.Z	39.0 kB	13/09/2019 17:57:00
📄 brft2560.19n.Z	34.4 kB	13/09/2019 18:17:00
📄 brmu2560.19n.Z	36.0 kB	13/09/2019 18:21:00
📄 brst2560.19n.Z	34.7 kB	13/09/2019 21:11:00
📄 brux2560.19n.Z	42.2 kB	13/09/2019 17:10:00

Precise Ephemeris

← → ↻ 🏠 ⓘ Não seguro ftp://cddis.nasa.gov/gnss/products/2070/		
📄	igr20701.sp3.Z	94.6 kB 10/09/2019 10:05:00
📄	igr20701.sum.Z	6.4 kB 10/09/2019 10:05:00
📄	igr20702.clk.Z	949 kB 11/09/2019 10:05:00
📄	igr20702.cls.Z	11.0 kB 11/09/2019 10:05:00
📄	igr20702.erp.Z	389 B 11/09/2019 10:05:00
📄	igr20702.sp3.Z	94.9 kB 11/09/2019 10:05:00
📄	igr20702.sum.Z	6.4 kB 11/09/2019 10:05:00
📄	igr20703.clk.Z	926 kB 12/09/2019 10:05:00
📄	igr20703.cls.Z	10.7 kB 12/09/2019 10:05:00
📄	igr20703.erp.Z	394 B 12/09/2019 10:05:00
📄	igr20703.sp3.Z	94.8 kB 12/09/2019 10:05:00
📄	igr20703.sum.Z	6.5 kB 12/09/2019 10:05:00
📄	igr20704.clk.Z	940 kB 13/09/2019 10:05:00
📄	igr20704.cls.Z	10.9 kB 13/09/2019 10:05:00
📄	igr20704.erp.Z	393 B 13/09/2019 10:05:00
📄	igr20704.sp3.Z	94.9 kB 13/09/2019 10:05:00
📄	igr20704.sum.Z	6.5 kB 13/09/2019 10:05:00
📄	igr20705.clk.Z	1.0 MB 14/09/2019 10:05:00
📄	igr20705.cls.Z	11.4 kB 14/09/2019 10:05:00
📄	igr20705.erp.Z	391 B 14/09/2019 10:05:00
📄	igr20705.sp3.Z	95.0 kB 14/09/2019 10:05:00
📄	igr20705.sum.Z	6.5 kB 14/09/2019 10:05:00
📄	igr20706.clk.Z	1009 kB 15/09/2019 10:05:00
📄	igr20706.cls.Z	11.3 kB 15/09/2019 10:05:00
📄	igr20706.erp.Z	386 B 15/09/2019 10:05:00
📄	igr20706.sp3.Z	94.9 kB 15/09/2019 10:05:00

Wireshark software

- ▶ Analyze packets sent/received through each Internet adapter

Capture

...using this filter: All interfaces shown ▼

vEthernet (Opção Padrão)	
Ethernet 8	
Ethernet 5	
Ethernet	
vEthernet (DockerNAT)	
Ethernet 6	
Conexão Local* 2	
Conexão Local* 2	

Learn

[User's Guide](#) · [Wiki](#) · [Questions and Answers](#) · [Mailing Lists](#)

You are running Wireshark 3.0.3 (v3.0.3-0-g6130b92b0ec6). You receive automatic updates.



BKG Ntrip Client (BNC)

BKG Ntrip Client (BNC) Version 2.12.9

File Help

Feed Engine Serial Output Outages Miscellaneous PPP (1) PPP (2) PPP (3) PPP (4) Combine Corrections Upload Corrections

Precise Point Positioning - Input and Output.

Data source: Real-Time Streams

Corrections stream: SIRGAS200002

Corrections file:

Coordinates file: C:\Users\Rogério\Desktop\BNC\APRIORI.CRD

Logfile directory: C:\Users\Rogério\Desktop\BNC

SNX TRO directory:

RINEX Obs file:

RINEX Nav file:

ANTEX file: C:\Users\Rogério\Desktop\BNC\igs14_2045.atx

Version 3 filenames: ☐

NMEA directory: C:\Users\Rogério\Desktop\BNC

SNX TRO interval: 1 hour SNX TRO sampling: 1 sec

SNX TRO AC:

SNX TRO solution:

Streams:	resource loader / mountpoint	decoder	lat	long	nmea	ntrip	bytes
1	170.84.40.52:2101/PPTE1	RTCM_3.0	-22.12	-51.41	no	2	104.879 kB
2	170.84.40.52:2101/RTCM3EPH	RTCM_3	50.09	8.66	no	2	518.258 kB
3	170.84.40.52:2101/SIRGAS200002	RTCM_3.0	50.00	10.00	no	2	19.345 kB

Log Throughput Latency PPP Plot

Start 19:31:05

2.80 m

0.00 m

-2.80 m

19:32 19:33 19:34 19:35

Add Stream Delete Stream Map Start Stop

Help?=Shift+F1

Wireshark – Follow Stream

The image shows the Wireshark network protocol analyzer interface. The top menu bar includes File, Edit, View, Go, Capture, Analyze, Statistics, Telephony, Wireless, Tools, and Help. Below the menu is a toolbar with various icons. A filter bar at the top of the packet list shows the filter `tcp.port == 2101`. The packet list displays several packets, with packet 2733 highlighted in green. This packet is an HTTP GET request from 200.145.100.1 to 78.46.4.1. A right-click context menu is open over packet 2733, showing options like Mark/Unmark Packet, Ignore/Unignore Packet, Set/Unset Time Reference, Time Shift..., Packet Comment..., Edit Resolved Name, Apply as Filter, Prepare a Filter, Conversation Filter, Colorize Conversation, SCTP, Follow, Copy, Protocol Preferences, Decode As..., and Show Packet in New Window. The 'Follow' option is selected, and a sub-menu is open showing 'TCP Stream', 'UDP Stream', 'TLS Stream', and 'HTTP Stream', with 'HTTP Stream' selected. The bottom status bar shows 'Packets: 11773 · Displayed: 172 (1.5%)' and 'Profile: Default'.

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

tcp.port == 2101

No.	Time	Source	Destination	Protocol	Length	Info
7742	127.578809	78.46.41...	200.145...	TCP	1514	2101 → 45968 [ACK] Seq=48538 Ack=229 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
7743	127.583421	78.46.41...	200.145...	TCP	1514	2101 → 45968 [ACK] Seq=49998 Ack=229 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
7745	127.588274	78.46.41...	200.145...	TCP	1514	2101 → 45968 [ACK] Seq=51458 Ack=229 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
7746	127.593375	78.46.41...	200.145...	TCP	1514	2101 → 45968 [ACK] Seq=52918 Ack=229 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
7748	127.598481	78.46.41...	200.145...	TCP	1514	2101 → 45968 [ACK] Seq=54378 Ack=229 Win=30336 Len=1460 [TCP segment of a reassembled PDU]
7757	127.815586	78.46.41...	200.145...	TCP	676	2101 → 45968 [PSH, ACK] Seq=55838 Ack=229 Win=30336 Len=622 [TCP segment of a reassembled PDU]
2723	98.012067	200.145...	78.46.4...	TCP	66	45968 → 2101 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 WS=256 SACK_PERM=1
2732	98.306442	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=1 Ack=1 Win=65536 Len=0
2733	98.306659	200.145...	78.46.4...	HTTP	282	GET /RTCM3EPH HTTP/1.1
2743	98.790125	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
3059	102.196211	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
3062	102.205842	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
3065	102.215317	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
3068	102.260401	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
3111	102.478352	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
4552	107.429080	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
4555	107.438573	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
4558	107.448812	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
4562	107.494378	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
4568	107.712870	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
5088	112.263084	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
5091	112.273203	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
5095	112.282916	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
5099	112.328055	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
5103	112.544749	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
6016	117.496667	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
6019	117.507372	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
6023	117.517285	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
6025	117.564064	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
6032	117.779117	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
6707	122.332052	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
6711	122.345295	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0
6714	122.352355	200.145...	78.46.4...	TCP	54	45968 → 2101 [ACK] Seq=229 Ack=1 Win=65536 Len=0

Frame 2733: 282 bytes on wire (2256 bits) 282 bytes captured (2256 bits) on interface 0

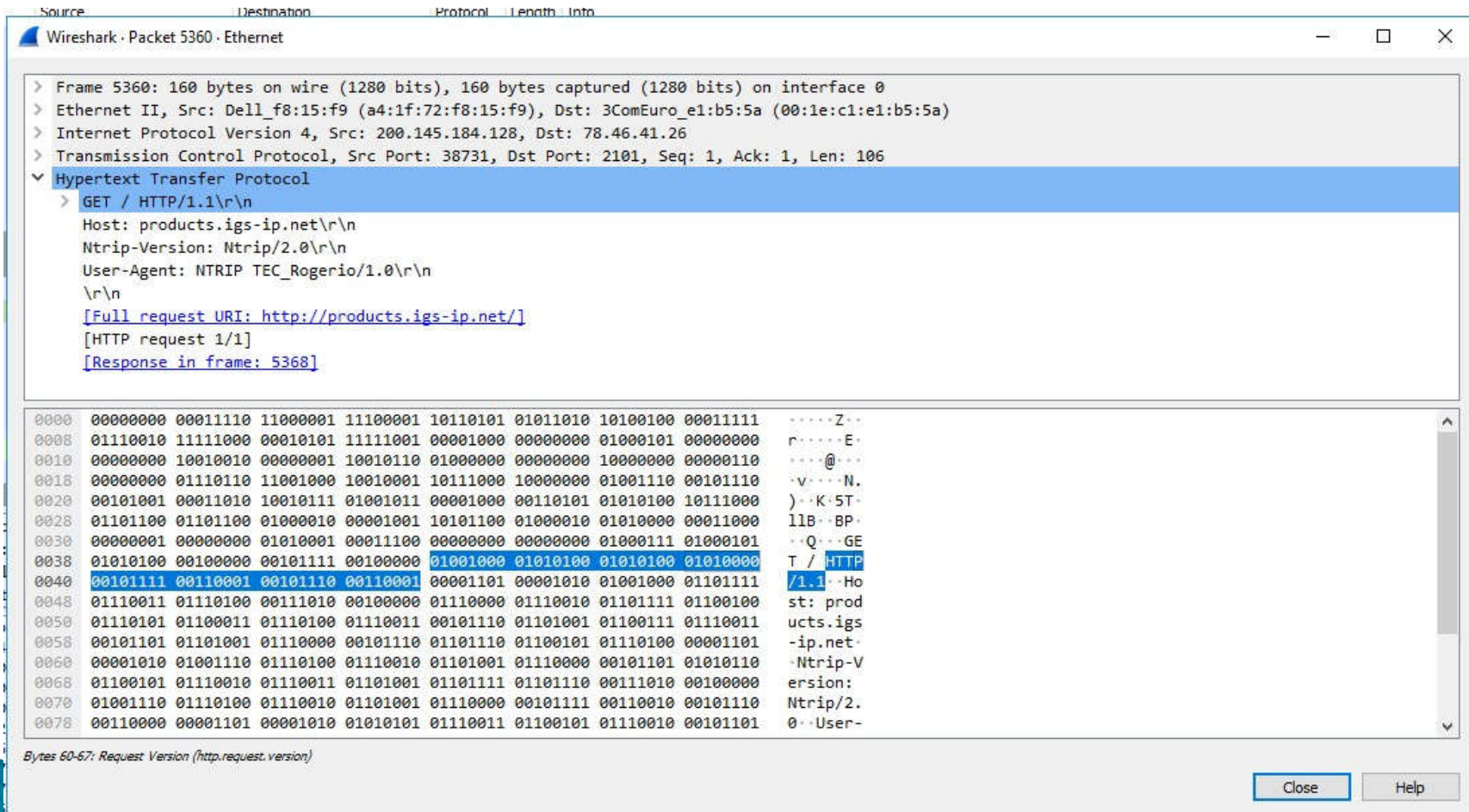
wireshark_Ethernet_20190919104845_a07196.pcapng

Packets: 11773 · Displayed: 172 (1.5%)

Profile: Default

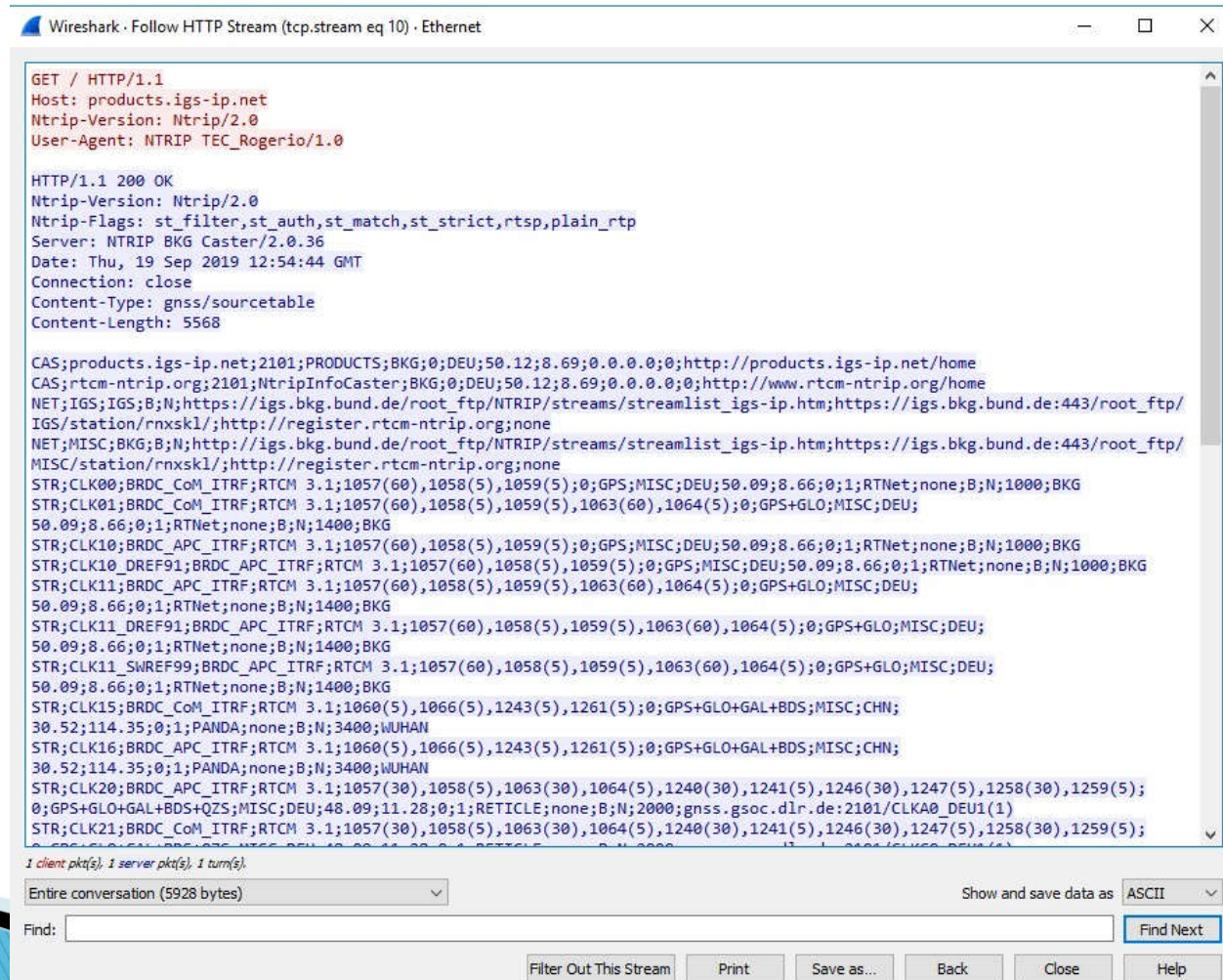
Wireshark – Ntrip

▶ Sourcetable



Wireshark – Ntrip

► Sourcetable – HTTP Stream



The screenshot shows the Wireshark interface with the 'Follow HTTP Stream (tcp.stream eq 10) · Ethernet' pane selected. The pane displays the raw HTTP data, including the request and response headers and the body content. The request is a GET / HTTP/1.1 to products.igs-ip.net. The response is an HTTP/1.1 200 OK from Ntrip-InfoCaster. The content type is gnss/sourcetable and the length is 5568 bytes. The body contains a list of Ntrip stations and their capabilities, including CAS, products, igs-ip, net, 2101, PRODUCTS, BKG, 0, DEU, 50.12, 8.69, 0.0.0.0, 0, http://products.igs-ip.net/home, CAS, rtm-ntrip.org, 2101, NtripInfoCaster, BKG, 0, DEU, 50.12, 8.69, 0.0.0.0, 0, http://www.rtm-ntrip.org/home, NET, IGS, IGS, B, N, https://igs.bkg.bund.de/root_ftp/NTRIP/streams/streamlist_igs-ip.htm;https://igs.bkg.bund.de:443/root_ftp/IGS/station/rnxsk1;http://register.rtm-ntrip.org;none, NET, MISC, BKG, B, N, http://igs.bkg.bund.de/root_ftp/NTRIP/streams/streamlist_igs-ip.htm;https://igs.bkg.bund.de:443/root_ftp/MISC/station/rnxsk1;http://register.rtm-ntrip.org;none, STR, CLK00, BRDC, CoM, ITRF, RTCM 3.1, 1057(60), 1058(5), 1059(5), 0, GPS, MISC, DEU, 50.09, 8.66, 0, 1, RTNet, none, B, N, 1000, BKG, 50.09, 8.66, 0, 1, RTNet, none, B, N, 1400, BKG, STR, CLK10, BRDC, APC, ITRF, RTCM 3.1, 1057(60), 1058(5), 1059(5), 0, GPS, MISC, DEU, 50.09, 8.66, 0, 1, RTNet, none, B, N, 1000, BKG, STR, CLK10, DREF91, BRDC, APC, ITRF, RTCM 3.1, 1057(60), 1058(5), 1059(5), 0, GPS, MISC, DEU, 50.09, 8.66, 0, 1, RTNet, none, B, N, 1000, BKG, STR, CLK11, BRDC, APC, ITRF, RTCM 3.1, 1057(60), 1058(5), 1059(5), 1063(60), 1064(5), 0, GPS+GLO, MISC, DEU, 50.09, 8.66, 0, 1, RTNet, none, B, N, 1400, BKG, STR, CLK11, DREF91, BRDC, APC, ITRF, RTCM 3.1, 1057(60), 1058(5), 1059(5), 1063(60), 1064(5), 0, GPS+GLO, MISC, DEU, 50.09, 8.66, 0, 1, RTNet, none, B, N, 1400, BKG, STR, CLK11, SWREF99, BRDC, APC, ITRF, RTCM 3.1, 1057(60), 1058(5), 1059(5), 1063(60), 1064(5), 0, GPS+GLO, MISC, DEU, 50.09, 8.66, 0, 1, RTNet, none, B, N, 1400, BKG, STR, CLK15, BRDC, CoM, ITRF, RTCM 3.1, 1060(5), 1066(5), 1243(5), 1261(5), 0, GPS+GLO+GAL+BDS, MISC, CHN, 30.52, 114.35, 0, 1, PANDA, none, B, N, 3400, WUHAN, STR, CLK16, BRDC, APC, ITRF, RTCM 3.1, 1060(5), 1066(5), 1243(5), 1261(5), 0, GPS+GLO+GAL+BDS, MISC, CHN, 30.52, 114.35, 0, 1, PANDA, none, B, N, 3400, WUHAN, STR, CLK20, BRDC, APC, ITRF, RTCM 3.1, 1057(30), 1058(5), 1063(30), 1064(5), 1240(30), 1241(5), 1246(30), 1247(5), 1258(30), 1259(5), 0, GPS+GLO+GAL+BDS+QZS, MISC, DEU, 48.09, 11.28, 0, 1, RETICLE, none, B, N, 2000, gnss, dlr.de:2101/CLKA0_DEU1(1), STR, CLK21, BRDC, CoM, ITRF, RTCM 3.1, 1057(30), 1058(5), 1063(30), 1064(5), 1240(30), 1241(5), 1246(30), 1247(5), 1258(30), 1259(5), 0, GPS+GLO+GAL+BDS+QZS, MISC, DEU, 48.09, 11.28, 0, 1, RETICLE, none, B, N, 2000, gnss, dlr.de:2101/CLKA0_DEU1(1).

1 client pkt(s), 1 server pkt(s), 1 turn(s).

Entire conversation (5928 bytes)

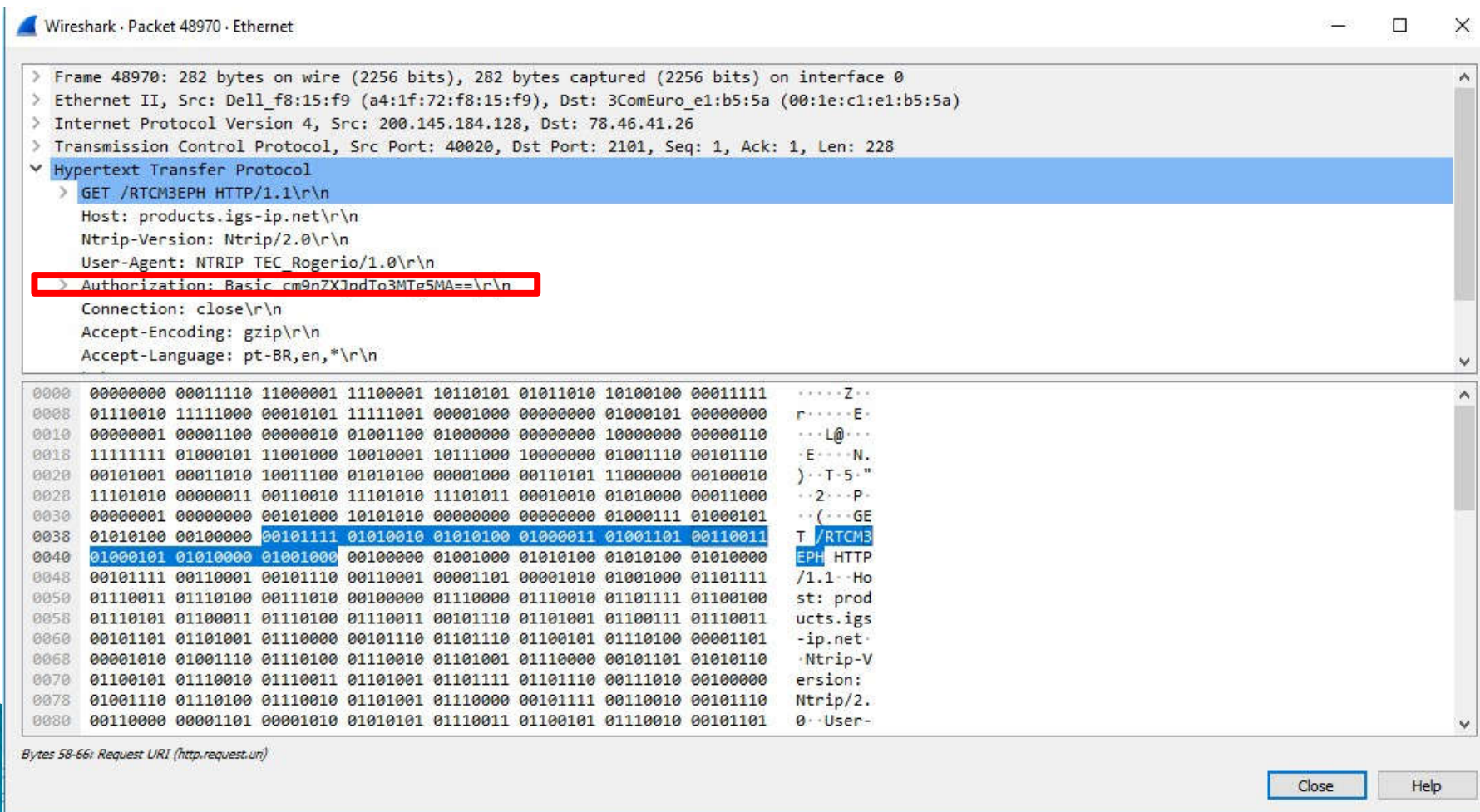
Show and save data as ASCII

Find: Find Next

Filter Out This Stream Print Save as... Back Close Help

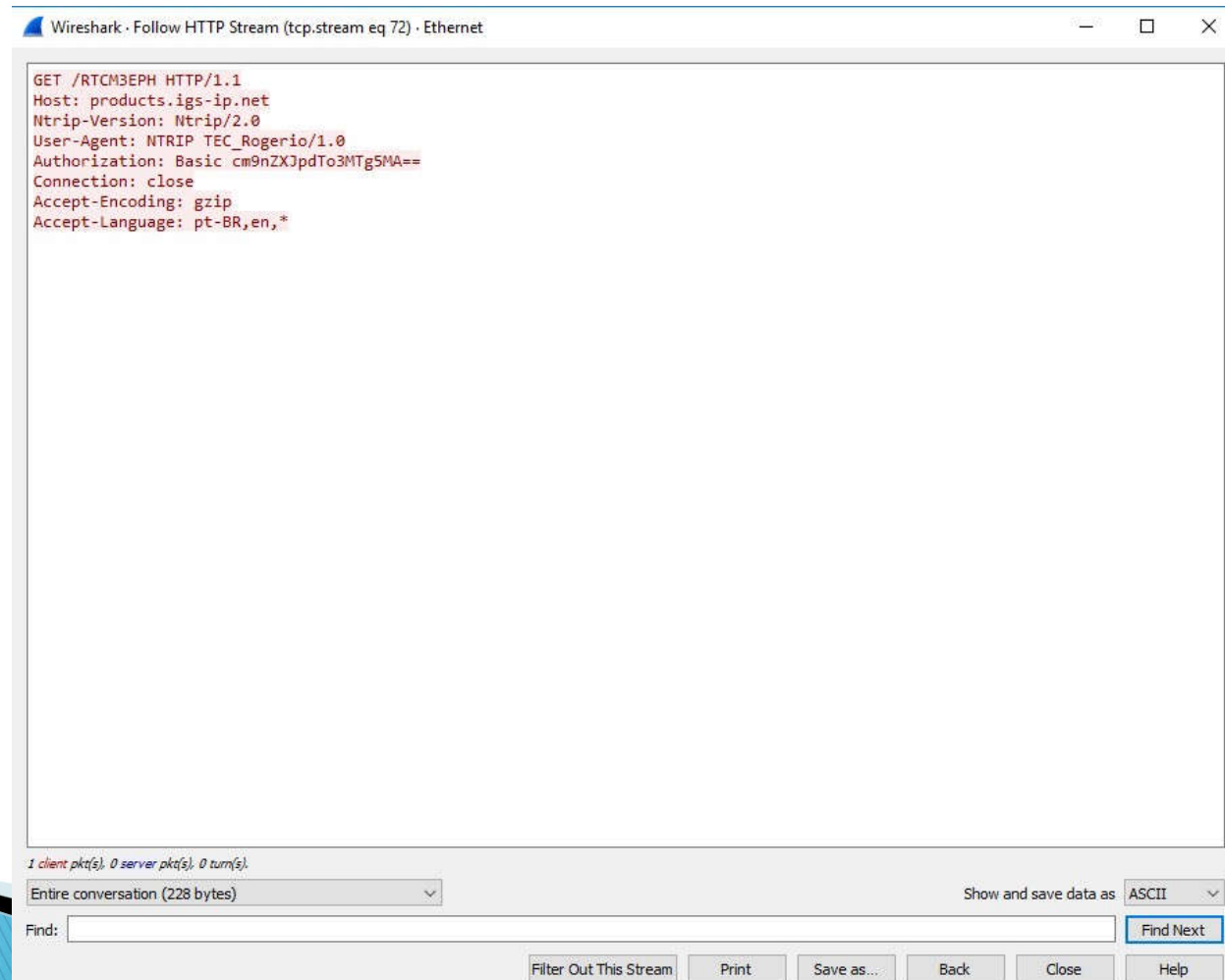
Wireshark – Ntrip

► Mountpoint



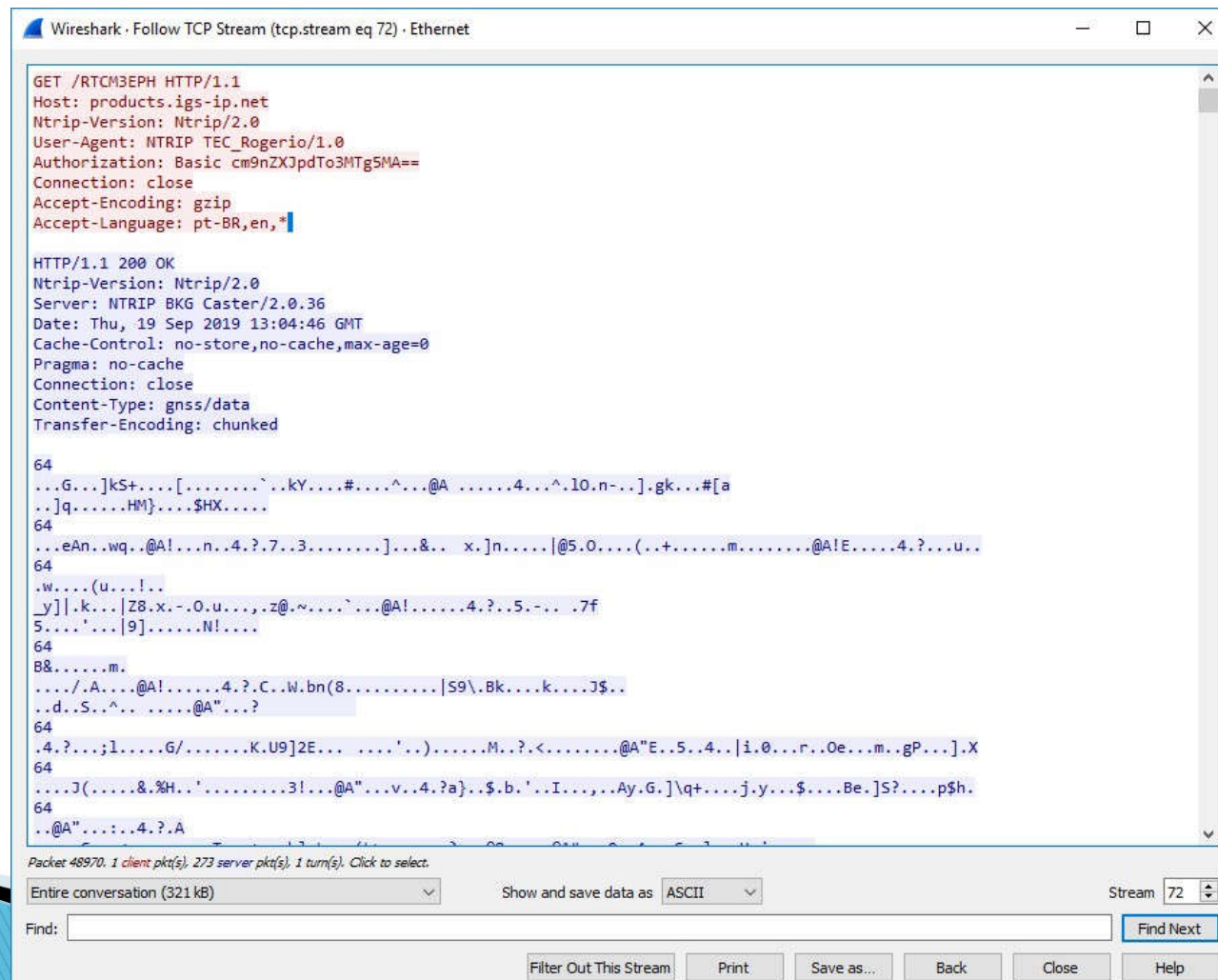
Wireshark – Ntrip

► Mountpoint – HTTP Stream



Wireshark – Ntrip

► Mountpoint – TCP Stream



Wireshark · Follow TCP Stream (tcp.stream eq 72) · Ethernet

```
GET /RTCM3EPH HTTP/1.1
Host: products.igs-ip.net
Ntrip-Version: Ntrip/2.0
User-Agent: NTRIP TEC_Rogerio/1.0
Authorization: Basic cm9nZXJpdTo3MTg5MA==
Connection: close
Accept-Encoding: gzip
Accept-Language: pt-BR,en,*

HTTP/1.1 200 OK
Ntrip-Version: Ntrip/2.0
Server: NTRIP BKG Caster/2.0.36
Date: Thu, 19 Sep 2019 13:04:46 GMT
Cache-Control: no-store,no-cache,max-age=0
Pragma: no-cache
Connection: close
Content-Type: gnss/data
Transfer-Encoding: chunked

64
...G...]kS+...[.....`..kY....#.....^...@A .....4...^.10.n-...].gk...#[a
..]q.....HM}....$HX.....
64
...eAn..wq..@A!...n..4.?..7..3.....].&.. x.]n....|@5.0....(+.....m.....@A!E.....4.?...u..
64
..w....(u...!..
_y]|.k...|Z8.x.-.0.u....,z@.~.....`...@A!.....4.?..5.-...7f
5....'...[9].....N!....
64
B&.....m.
..../.A....@A!.....4.?..C..W.bn(8.....|S9\..Bk....k....J$.
..d..S..^.. ..@A"....?
64
.4.?...;1....G/.....K.U9]2E... ..'..)......M..?<.....@A"E..5..4..|i.0...r..0e...m..gP...].X
64
....J(....&%H..'.....3!...@A"....v..4.?a)..$.b..'..I....Ay.G.]\q+...j.y...$.Be.]S?...p$h.
64
..@A"....:..4.?..A
```

Packet 48970: 1 client pkt(s), 273 server pkt(s), 1 turn(s). Click to select.

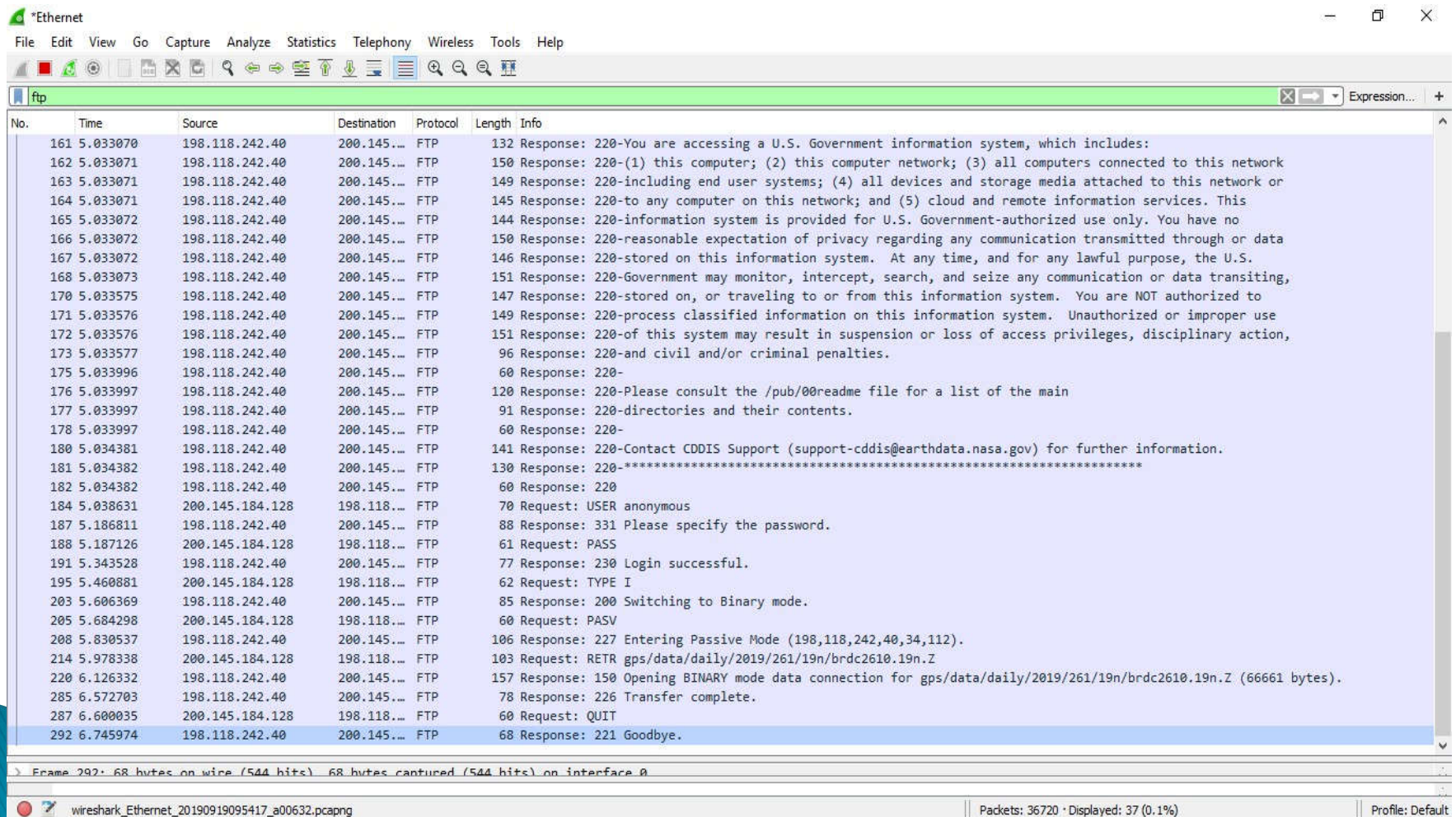
Entire conversation (321 kB) Show and save data as ASCII Stream 72

Find: Find Next

Filter Out This Stream Print Save as... Back Close Help

Wireshark – FTP

► Get ephemeris from FTP Server



Wireshark packet capture showing an FTP session. The packet list displays the following details:

No.	Time	Source	Destination	Protocol	Length	Info
161	5.033070	198.118.242.40	200.145....	FTP	132	Response: 220-You are accessing a U.S. Government information system, which includes:
162	5.033071	198.118.242.40	200.145....	FTP	150	Response: 220-(1) this computer; (2) this computer network; (3) all computers connected to this network
163	5.033071	198.118.242.40	200.145....	FTP	149	Response: 220-including end user systems; (4) all devices and storage media attached to this network or
164	5.033071	198.118.242.40	200.145....	FTP	145	Response: 220-to any computer on this network; and (5) cloud and remote information services. This
165	5.033072	198.118.242.40	200.145....	FTP	144	Response: 220-information system is provided for U.S. Government-authorized use only. You have no
166	5.033072	198.118.242.40	200.145....	FTP	150	Response: 220-reasonable expectation of privacy regarding any communication transmitted through or data
167	5.033072	198.118.242.40	200.145....	FTP	146	Response: 220-stored on this information system. At any time, and for any lawful purpose, the U.S.
168	5.033073	198.118.242.40	200.145....	FTP	151	Response: 220-Government may monitor, intercept, search, and seize any communication or data transiting,
170	5.033575	198.118.242.40	200.145....	FTP	147	Response: 220-stored on, or traveling to or from this information system. You are NOT authorized to
171	5.033576	198.118.242.40	200.145....	FTP	149	Response: 220-process classified information on this information system. Unauthorized or improper use
172	5.033576	198.118.242.40	200.145....	FTP	151	Response: 220-of this system may result in suspension or loss of access privileges, disciplinary action,
173	5.033577	198.118.242.40	200.145....	FTP	96	Response: 220-and civil and/or criminal penalties.
175	5.033996	198.118.242.40	200.145....	FTP	60	Response: 220-
176	5.033997	198.118.242.40	200.145....	FTP	120	Response: 220-Please consult the /pub/00readme file for a list of the main
177	5.033997	198.118.242.40	200.145....	FTP	91	Response: 220-directories and their contents.
178	5.033997	198.118.242.40	200.145....	FTP	60	Response: 220-
180	5.034381	198.118.242.40	200.145....	FTP	141	Response: 220-Contact CDDIS Support (support-cddis@earthdata.nasa.gov) for further information.
181	5.034382	198.118.242.40	200.145....	FTP	130	Response: 220-*****
182	5.034382	198.118.242.40	200.145....	FTP	60	Response: 220
184	5.038631	200.145.184.128	198.118....	FTP	70	Request: USER anonymous
187	5.186811	198.118.242.40	200.145....	FTP	88	Response: 331 Please specify the password.
188	5.187126	200.145.184.128	198.118....	FTP	61	Request: PASS
191	5.343528	198.118.242.40	200.145....	FTP	77	Response: 230 Login successful.
195	5.460881	200.145.184.128	198.118....	FTP	62	Request: TYPE I
203	5.606369	198.118.242.40	200.145....	FTP	85	Response: 200 Switching to Binary mode.
205	5.684298	200.145.184.128	198.118....	FTP	60	Request: PASV
208	5.830537	198.118.242.40	200.145....	FTP	106	Response: 227 Entering Passive Mode (198,118,242,40,34,112).
214	5.978338	200.145.184.128	198.118....	FTP	103	Request: RETR gps/data/daily/2019/261/19n/brdc2610.19n.Z
220	6.126332	198.118.242.40	200.145....	FTP	157	Response: 150 Opening BINARY mode data connection for gps/data/daily/2019/261/19n/brdc2610.19n.Z (66661 bytes).
285	6.572703	198.118.242.40	200.145....	FTP	78	Response: 226 Transfer complete.
287	6.600035	200.145.184.128	198.118....	FTP	60	Request: QUIT
292	6.745974	198.118.242.40	200.145....	FTP	68	Response: 221 Goodbye.

Frame 292: 68 bytes on wire (544 bits) 68 bytes captured (544 bits) on interface 0

wireshark_Ethernet_20190919095417_a00632.pcapng

Packets: 36720 · Displayed: 37 (0.1%)

Profile: Default

Maven Java Program

