

Analysis of pinger results

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About this document

Last run: 2016-05-04 01:11:17

This document was created using knitr in RStudio. Knitr allows the embedding of R code within markdown text documents allowing them to be updated and re-run. Things to note:

- Knitr will display warnings (but not errors) from R. The warnings may or may not be significant.
- Knitr is very clever but it does not always support pretty tables.

This code processes and analyses the results of running <https://github.com/dataknut/ping-log/blob/master/pinger.py>. The results will be a .csv file with the form:

```
timestamp,host,milliseconds, error
2016-04-28 10:53:56,www.google.co.uk,83.548, OK
2016-04-28 10:53:57,router,121.820, OK
2016-04-28 10:54:07,www.google.co.uk,71.019, OK
2016-04-28 10:54:07,router,9.875, OK
```

Introduction

Purpose:

- To test connectivity to:
 - a home router and
 - the wider internet
- in order to attempt to work out where connectivity problems are occurring.

Data:

- Any number of .csv files produced by pinger.py

Code:

- this code: https://github.com/databnut/ping-log/blob/master/pinger_process_results.Rmd

Warning:

- the code lines up the data files according to the datetime in them. If this is wrong (e.g. wrong timezone set or using UTC) then there will be mis-alignment.

Load any pinger results files

You may see file read warnings below. They are usually caused by:

- incorrect handling of ping response errors putting characters into the milliseconds field
- unexpected file ending - e.g. when the pinger process quit without closing the file

All of these are re-coded as different types of ‘error’ before any data analysis.

```
## [1] "# Loading: hamishpi_2016-04-29_13-54-42.csv"

## Warning in fread(f): Bumped column 3 to type character on data row 379,
## field contains 'From'. Coercing previously read values in this column from
## logical, integer or numeric back to character which may not be lossless;
## e.g., if '00' and '000' occurred before they will now be just '0', and
## there may be inconsistencies with treatment of ',,' and ',NA,' too (if they
## occurred in this column before the bump). If this matters please rerun and
## set 'colClasses' to 'character' for this column. Please note that column
## type detection uses the first 5 rows, the middle 5 rows and the last
## 5 rows, so hopefully this message should be very rare. If reporting to
## datatable-help, please rerun and include the output from verbose=TRUE.

## Warning in fread(f): Stopped reading at empty line 12456 but text exists
## afterwards (discarded):

## Warning: NAs introduced by coercion

## [1] "# Loading: hamishpi_on_etherent_2016-04-28_12-20-56.csv"

## Warning in fread(f): Bumped column 3 to type character on data row 7940,
## field contains 'From'. Coercing previously read values in this column from
## logical, integer or numeric back to character which may not be lossless;
## e.g., if '00' and '000' occurred before they will now be just '0', and
## there may be inconsistencies with treatment of ',,' and ',NA,' too (if they
## occurred in this column before the bump). If this matters please rerun and
## set 'colClasses' to 'character' for this column. Please note that column
```

```

## type detection uses the first 5 rows, the middle 5 rows and the last
## 5 rows, so hopefully this message should be very rare. If reporting to
## datatable-help, please rerun and include the output from verbose=TRUE.

## Warning in fread(f): NAs introduced by coercion

## [1] "# Loading: ms_mbp_2016-04-29_23-12-00.csv"
## [1] "# Loading: ms_mbp_kitchen_wifi_2016-04-28_19-17-44.csv"
## [1] "# Loading: msmbp_on_kitchen_wifi_2016-04-29_11-09-24.csv"
## [1] "# Loading: octomac_2016-04-29_14-50-08.csv"
## [1] "# Loading: octomac_2016-04-29_14-59-53.csv"
## [1] "# Loading: octomac_2016-05-04_00-30-23.csv"
## [1] "# Loading: octomac_on_annex_wifi_2016-04-28_13-22-59.csv"
## [1] "# Loading: pimine_2016-04-29_13-58-14.csv"

## Warning in fread(f): Bumped column 3 to type character on data row 351,
## field contains 'From'. Coercing previously read values in this column from
## logical, integer or numeric back to character which may not be lossless;
## e.g., if '00' and '000' occurred before they will now be just '0', and
## there may be inconsistencies with treatment of ',,' and ',NA,' too (if they
## occurred in this column before the bump). If this matters please rerun and
## set 'colClasses' to 'character' for this column. Please note that column
## type detection uses the first 5 rows, the middle 5 rows and the last
## 5 rows, so hopefully this message should be very rare. If reporting to
## datatable-help, please rerun and include the output from verbose=TRUE.

## Warning in fread(f): Stopped reading at empty line 848 but text exists
## afterwards (discarded):

## Warning: NAs introduced by coercion

## [1] "# Loading: pimine_on_bthub_2016-04-28_12-22-29.csv"

## Warning in fread(f): Stopped reading at empty line 14210 but text exists
## afterwards (discarded):

## [1] "# Loading: pimine_on_bthub_2016-04-29_15-24-09.csv"

## Warning in fread(f): Bumped column 3 to type character on data row 41,
## field contains 'From'. Coercing previously read values in this column from
## logical, integer or numeric back to character which may not be lossless;
## e.g., if '00' and '000' occurred before they will now be just '0', and
## there may be inconsistencies with treatment of ',,' and ',NA,' too (if they
## occurred in this column before the bump). If this matters please rerun and
## set 'colClasses' to 'character' for this column. Please note that column
## type detection uses the first 5 rows, the middle 5 rows and the last
## 5 rows, so hopefully this message should be very rare. If reporting to
## datatable-help, please rerun and include the output from verbose=TRUE.

## Warning in fread(f): NAs introduced by coercion

## [1] "# Loading: pimine_on_bthub_balcony_2016-04-28_12-22-29.csv"

```

```

## Warning in fread(f): Stopped reading at empty line 14210 but text exists
## afterwards (discarded):

## [1] "# Loading: pimine_on_bthub_kitchen_2016-04-29_09-59-29.csv"

```

Basic responses

Throughout the following NA usually means ping failed to return.

Files we processed:

```

## [1] "pinger_hamishpi_2016-04-29_13-54-42_DT.csv"
## [2] "pinger_hamishpi_on_ethernet_2016-04-28_12-20-56_DT.csv"
## [3] "pinger_ms_mbp_2016-04-29_23-12-00_DT.csv"
## [4] "pinger_ms_mbp_kitchen_wifi_2016-04-28_19-17-44_DT.csv"
## [5] "pinger_msmbp_on_kitchen_wifi_2016-04-29_11-09-24_DT.csv"
## [6] "pinger_octomac_2016-04-29_14-50-08_DT.csv"
## [7] "pinger_octomac_2016-04-29_14-59-53_DT.csv"
## [8] "pinger_octomac_2016-05-04_00-30-23_DT.csv"
## [9] "pinger_octomac_on_annex_wifi_2016-04-28_13-22-59_DT.csv"
## [10] "pinger_pimine_2016-04-29_13-58-14_DT.csv"
## [11] "pinger_pimine_on_bthub_2016-04-28_12-22-29_DT.csv"
## [12] "pinger_pimine_on_bthub_2016-04-29_15-24-09_DT.csv"
## [13] "pinger_pimine_on_bthub_balcony_2016-04-28_12-22-29_DT.csv"
## [14] "pinger_pimine_on_bthub_kitchen_2016-04-29_09-59-29_DT.csv"

```

How many rows (cases) & variables across all files?

```
## [1] 203756      10
```

	router	www.google.co.uk	NA
hamishpi	11017	11017	0
ms_mbp	33612	33612	0
octomac	11910	11910	0
pimine_bthub	45339	45339	0
NA	0	0	0

Distribution of milliseconds?

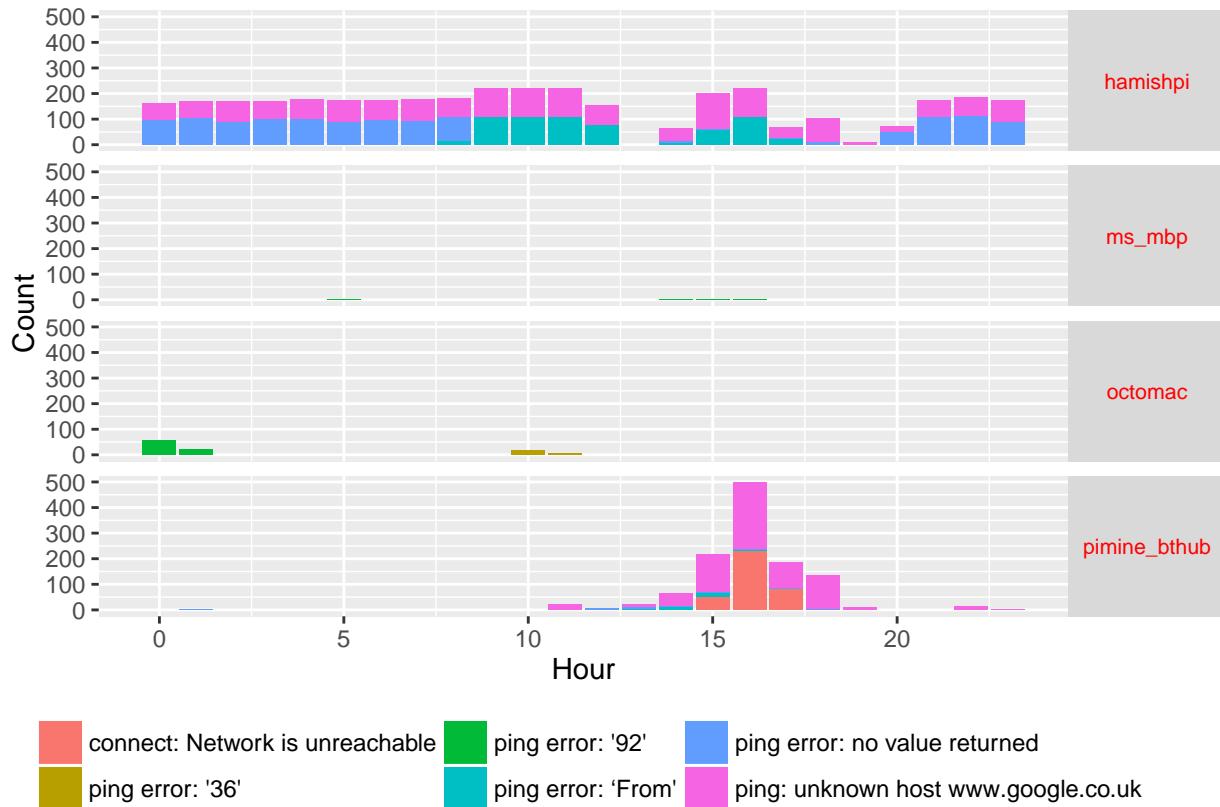
label	Mean	N	s.d
hamishpi	251.12219	18381	851.3859
ms_mbp	253.11869	66178	818.5563
octomac	419.96128	20126	1166.5941
pimine_bthub	41.37784	89486	321.0563

Ping error results

Did we get any errors?

	hamishpi	ms_mbp	octomac	pimine_bthub	NA
connect: Network is unreachable	0	0	0	364	0
OK	18381	66170	20022	89486	0
ping error: '36'	0	0	26	0	0
ping error: '92'	0	8	78	0	0
ping error: 'From'	624	0	0	34	0
ping error: no value returned	1269	0	0	39	0
ping: unknown host www.google.co.uk	1760	0	0	742	0
NA	0	1046	3694	13	0

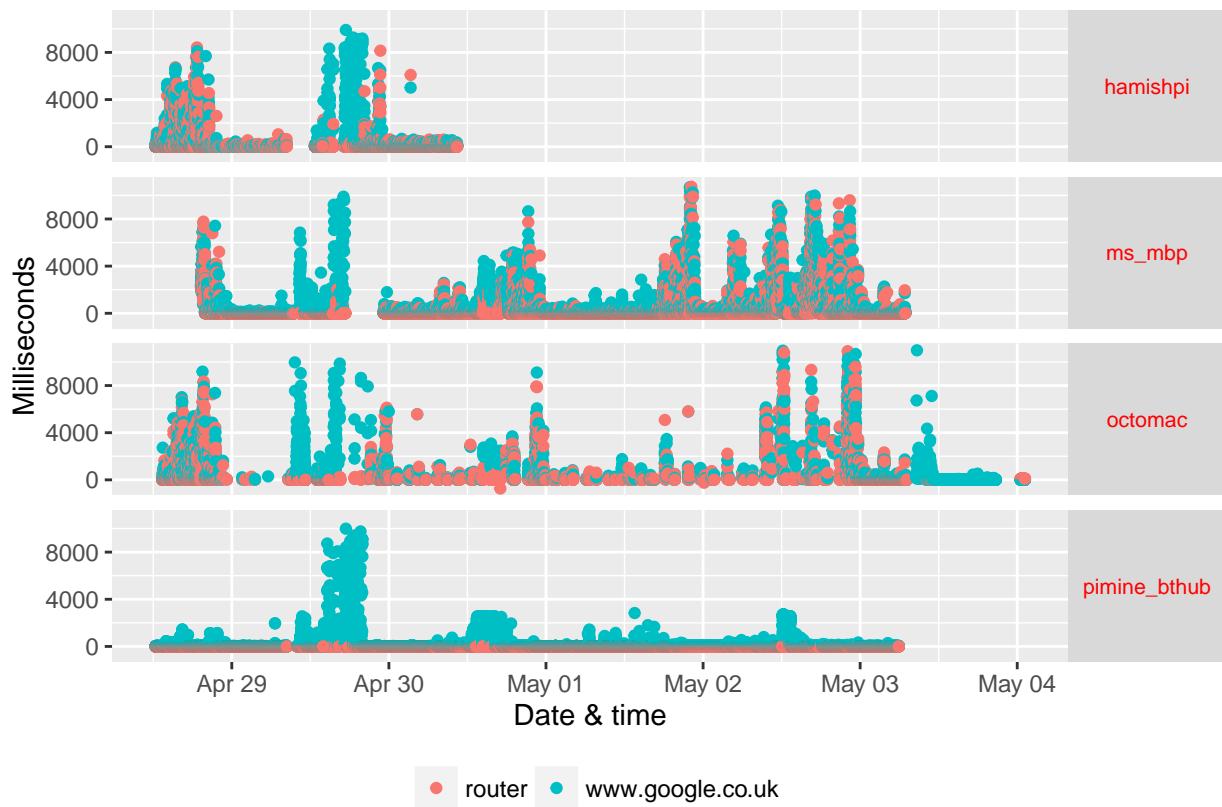
What time of day do we tend to get errors?



So, the bthub pinger seems to only see problems 15:00 - 16:00. As this Pi is 1 hour behind BST this equates to 16:00 - 17:00. HamishPi which sits on an internal ethernet segment fed by power line clearly has problems at most times of day.

Ping response time results

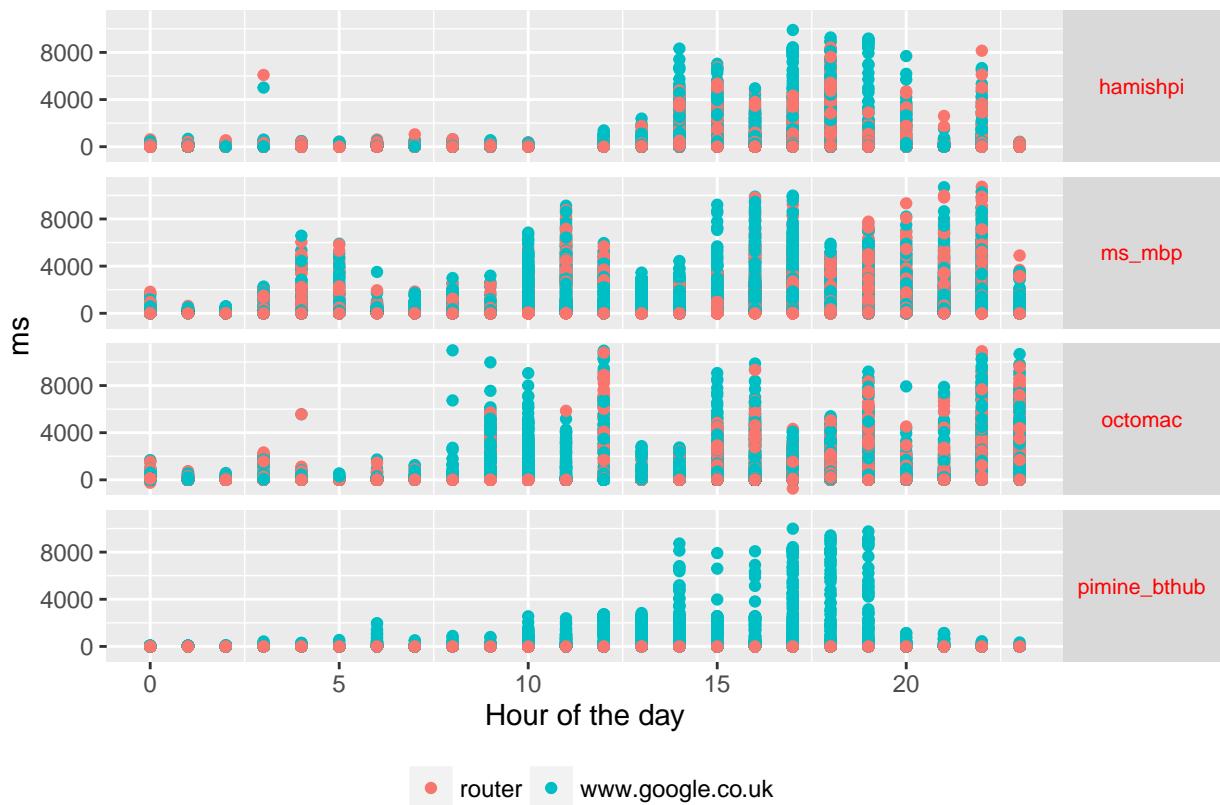
Ping data, key stats for 2016-04-28 12:20:57 to 2016-05-04 01:10:44 for all data sources. Beware datetime issues on the Raspberry Pi.



Fairly conclusively:

- there is rarely a problem with our broadband service - pimine on the bthub generally shows low response times
- most of the problems are internal (no s**t Sherlock)

If we now consider the results by hour of the day:



Equally conclusively:

- the period 16:00 - 21:00 is, in general, the problem period.

It is the *only* problem period for the bthub (noting that for some reason, pimine_on_bthub's clock is 1 hour behind BST). Strangely enough this is also the period when the iPads-belonging-to-teenagers have internet access.

Last run: 2016-05-04 01:12:35

Data tables in memory:

Analysis completed in: 1.308772 seconds using knitr & RStudio