



## Assessed Coursework

Course Name	Networked Systems (H)			
Coursework Number	Exercise 2			
Deadline	Time:	4:30pm	Date:	18 March 2022
% Contribution to final course mark	10%			
Solo or Group ✓	Solo	✓	Group	
Anticipated Hours	10			
Submission Instructions	Submit via Moodle			
<b>Please Note: This Coursework cannot be Re-Assessed</b>				

### Code of Assessment Rules for Coursework Submission

Deadlines for the submission of coursework which is to be formally assessed will be published in course documentation, and work which is submitted later than the deadline will be subject to penalty as set out below.

The primary grade and secondary band awarded for coursework which is submitted after the published deadline will be calculated as follows:

- (i) in respect of work submitted not more than five working days after the deadline
  - a. the work will be assessed in the usual way;
  - b. the primary grade and secondary band so determined will then be reduced by two secondary bands for each working day (or part of a working day) the work was submitted late.
- (ii) work submitted more than five working days after the deadline will be awarded Grade H.

Penalties for late submission of coursework will not be imposed if good cause is established for the late submission. You should submit documents supporting good cause via MyCampus.

**Penalty for non-adherence to Submission Instructions is 2 bands**

You must complete an "Own Work" form via <https://studentltc.dcs.gla.ac.uk/> for all coursework

# Networked Systems (H) 2021-2022 – Exercise 2

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3 March 2022

## Introduction

The material in lectures 8 and 9, and lab 5, of the Networked Systems (H) course, review naming and network topology. **This assessed exercise, worth 10% of the marks for the course, aims to further explore that material.**

## Assessed Exercise 2

This assessed exercise is based on the material in Laboratory Exercise 5, on Naming and Network Topology. Complete that lab exercise, as follows:

- Prepare a program, `dnslookup.c`, that can perform DNS lookups and that runs on the `stlinux` machines in the lab.
- Lookup the IP addresses for popular sites using your `dnslookup` program, use `traceroute` to find the paths to those sites, and plot topology visualisations showing those paths, for both IPv4 and IPv6 network paths. Save the results as PDF files in `router-topology-v4.pdf` and `router-topology-v6.pdf`.
- Prepare a report that discusses the specified points relating to IP addresses, router-level topology maps, IPv4 and IPv6, and the `traceroute` tool, and save it as `report.pdf`.

Submit these four files as described below.

## Submission

Create a directory named `ns-ex2-GUID`, where `GUID` is replaced by your GUID (your student number followed by the first letter of your surname). Put copies of the following four files into this directory: the source code for your `dnslookup.c` program; the two PDF files, `router-topology-v4.pdf` and `router-topology-v6.pdf` that contain your network topology maps; and the PDF file of your report, `report.pdf`. Create a zip archive of the directory, as a file called `ns-ex2-GUID.zip`. Submit the zip archive via Moodle.

For example, if your GUID was 1234567a, you would perform the following steps to create your zip archive:

```
mkdir ns-ex2-1234567a
cp dnslookup.c ns-ex2-1234567a/
cp router-topology-v4.pdf ns-ex2-1234567a/
cp router-topology-v6.pdf ns-ex2-1234567a/
cp report.pdf ns-ex2-1234567a/
zip -r ns-ex2-1234567a.zip ns-ex2-1234567a/
```

If you have prepared your archive correctly, then running “`unzip -lqq ns-ex2-GUID.zip`” should produce output like the following:

```
$ unzip -lqq ns-ex2-1234567a.zip
 0 16-01-2022 22:54 ns-ex2-1234567a/
1359 16-01-2022 22:54 ns-ex2-1234567a/dnslookup.c
14315 16-01-2022 22:54 ns-ex2-1234567a/router-topology-v4.pdf
15354 16-01-2022 22:54 ns-ex2-1234567a/router-topology-v6.pdf
172851 16-01-2022 22:54 ns-ex2-1234567a/report.pdf
$
```

Check carefully that your zip archive extracts into the correct subdirectory, and contains only the requested files.

## Assessment and Marking Scheme

This is an assessed exercise, worth 10% of the marks for this course. The deadline for submissions is 4:30pm on Friday 18 March 2022. The Code of Assessment allows late submission up to 5 working days beyond this deadline, subject to a penalty of 2 bands for each working day, or part thereof, the submission is late. Submissions received more than 5 working days after the due date will receive an H (band value of 0).

Submissions that are not made via Moodle, that have the wrong filename, that have a zip archive that extracts into the wrong directory or that contains the wrong files, or that otherwise do not follow the submission instructions will be subject to a 2 band penalty. This is in addition to any late submission penalty. Marks will be awarded as follows:

- **[7 marks]** for `dnslookup.c`, comprising [1 mark] for compiling without errors or warnings using the command `clang -W -Wall dnslookup.c -o dnslookup` on the `stlinux` machines; and up to [6 marks] for correctly looking up domain names and printing results.
- **[4 marks]** for `router-topology-v4.pdf`, comprising [2 marks] for readable formatting and [2 marks] for picking a set of addresses that illustrate the network topology.
- **[4 marks]**, similarly, for `router-topology-v6.pdf`.
- **[15 marks]** for `report.pdf`, comprising [4 marks] for discussion of IP addresses, [4 marks] for discussion of router-level topology maps, [2 marks] for discussion of IPv4 and IPv6, and [5 marks] for explanation of the `traceroute` tool. Marks are assigned for reasoned, clearly explained, and technically correct discussion of the points noted in Part 3 of the lab 5 handout.

The result will be a numeric mark out of 30. This numeric mark will be converted to a percentage, then the percentage will be converted to a band on the 22-point University of Glasgow scale using the standard translation table for the School of Computing Science. Any applicable penalty for late submission and/or for not following submission instructions will then be applied, and a band will be returned. A brief written justification for the band will also be supplied.