WORKSHEET

F10.6 The internet, DNS and the cloud

BugBotLab

Networks · GCSE · OCR J277 1.3.1, Edexcel 1CP2 4.1.3 · about 20 min

Name _____ Class _____ Date _____

What this lesson is about

The internet and the web, DNS, web servers and hosting, and the cloud.

- DNS: names to addresses
- Web servers and clients
- The cloud
- A DNS server on the mat

Questions

5 marks in all

1. What does DNS do? [1 mark]

- ☐ **A** Turns a domain name into an IP address
- ☐ **B** Encrypts web pages
- ☐ **C** Stores websites
- ☐ **D** Connects a LAN to the internet

2. Put the steps in order. [1 mark]

Number the lines 1 to 4 to put them in the right order.

___ `The user types a URL into the browser`

___ `The browser asks a DNS server for the IP address`

___ `The DNS server returns the IP address`

___ `The browser requests the page from the web server`

3. What is the difference between the internet and the World Wide Web? [1 mark]

- ☐ **A** The internet is the network; the web is a service of pages that runs on it
- ☐ **B** They are the same thing
- ☐ **C** The web is the cables; the internet is the pages
- ☐ **D** The internet is only for email

4. What is web hosting? [1 mark]

- ☐ **A** Storing a website on a server that is always connected to the internet
- ☐ **B** Visiting a website
- ☐ **C** Designing a website
- ☐ **D** Searching the web

5. Which is a disadvantage of the cloud? [1 mark]

- ☐ **A** It needs an internet connection
- ☐ **B** Files can be reached from any device
- ☐ **C** The provider handles backups
- ☐ **D** Storage can grow as needed

The task: look it up

Two robots are on the mat: `scout.bot` and `rover.bot`. Look up `scout.bot` with the DNS robot, then take the IP address from its reply. Send `to <address>: where` and the Scout answers `at <x>,<y>`. Drive to about 13 cm in front of it, into the green square, without touching anything. The helpers `ask`, `numbers_in`, `go_to` and `near` are ready to use.

```
# the two lines every program starts with: the commands, then the robot
from bugbot import *
connect()
import math

def ask(question, seconds=1.0):
    # send a question and return the first reply that arrives within `seconds`, or None
    send(question)
    for tick in range(int(seconds * 10)):
        wait(0.1)
        for sender, text in messages():
            return text
    return None

def numbers_in(text):
    # every number in a message, as floats: "at 25,55" -> [25.0, 55.0]
    out = []
    for word in text.replace(",", " ").split():
        try:
            out.append(float(word))
        except ValueError:
            pass
    return out

def wrapped(h):
    return (h + 180) % 360 - 180

def go_to(x, y, speed=60):
    # one step of driving towards (x, y), measured from the start; call it in a loop
    px, py = position()
    a = math.radians(wrapped(math.degrees(math.atan2(x - px, y - py)) - heading()))
    drive(speed * math.cos(a), speed * math.sin(a), wrapped(0 - heading()) * 3)

def near(x, y, cm=4):
    px, py = position()
    return math.hypot(x - px, y - py) < cm
```

Plan your program here, then type it in and press Run.

Do it on the robot

www.bugbotlab.com/learn/f10-6-the-internet-dns-and-the-cloud/

The simulator checks it and tells you when it passes. Nothing to install, no account.

Challenges

1. Keep a DNS cache: a dictionary of names you have already looked up, so you only ask once.
2. Look up `rover.bot` too, and print both robots' positions.
3. Why does a DNS server ask other DNS servers rather than knowing every name itself?