G.C.E. O/L Grade 11 ICT · Lesson 3

3.1 The Internet: URL, IP Address, DNS, Client–Server and Internet Services

Syllabus 12.1. You use the Internet to check O/L results on doenets.lk, download a syllabus from nie.lk, learn on e-thaksalawa and watch lessons on YouTube. In this note you will learn what the **Internet** is, how a **URL** is built, what an **IP address** and a **domain name** are, how **DNS** turns names into numbers, how the **client–server** model works with **HTTP and HTTPS**, the main **Internet services**, how **search engines** work and how to search well, and how to decide whether a website can be **trusted**.

1. What is the Internet?

The **Internet** is a worldwide **network of networks**. Millions of computers, phones and servers in homes, schools, companies and governments are joined by cables, fibre, radio and satellites. They all follow the same rules, called **protocols** (mainly **TCP/IP**), so any device can talk to any other device. No single person or country owns the Internet. You join it through an **Internet Service Provider (ISP)** such as a mobile or broadband company.

> 💡 Think of the Internet as the **roads**, and websites, e-mail and video calls as the **vehicles** that use the roads.

2. URL – the address of a web page

A **URL (Uniform Resource Locator)** is the full address of a page or file on the Web. You type it in the browser's address bar. A URL has these parts: the **protocol** (how to connect), the **domain name** (which server), the **path** (which page on that server) and sometimes a **query** (extra information after a **?**).

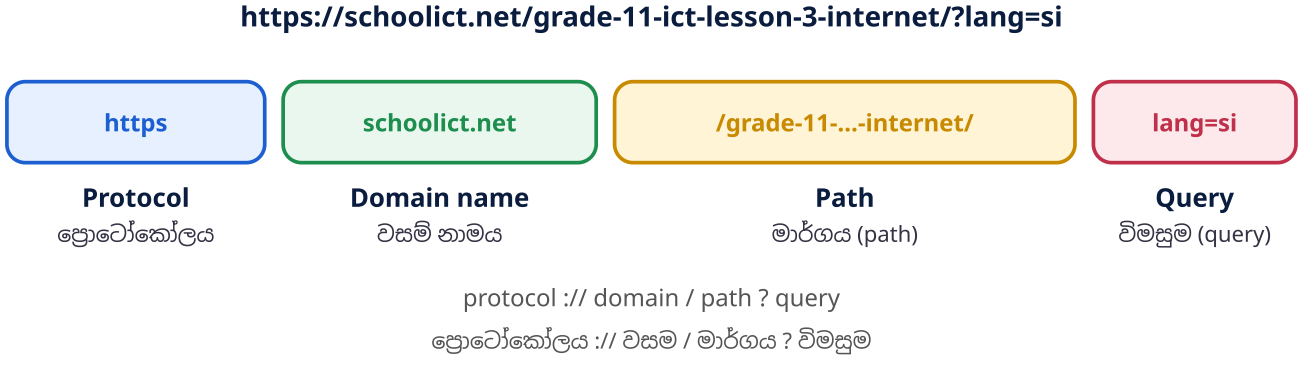


Figure 3.1 – The parts of a schoolict.net URL.

Part	In this URL	Meaning

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Protocol	https	How the browser and server talk (secure HTTP)
Domain name	schoolict.net	The name of the web server
Path	/grade-11-ict-lesson-3-internet/	Which page or file on that server
Query	lang=si	Extra information sent to the page (after ?)

3. IP addresses

Every device on the Internet has a number called an **IP address**, just like every house has an address. An **IPv4** address has **four numbers** separated by dots (**dotted decimal**), for example **192.168.1.10**. Each number (an **octet**, 8 bits) must be from **0 to 255**, so 256.10.1.1 is **not** valid. IPv4 has only about 4.3 billion addresses, which is not enough, so the newer **IPv6** uses 128 bits written in hexadecimal, e.g. **2001:db8:85a3::8a2e:370:7334**.

Address	Valid IPv4?	Why
192.168.1.10	Yes	4 numbers, each 0–255
8.8.8.8	Yes	4 numbers, each 0–255
10.0.0.255	Yes	4 numbers, each 0–255
256.10.1.1	No	256 is more than 255
192.168.1	No	Only 3 numbers
192.168.1.300	No	300 is more than 255
10.0.0.1.5	No	5 numbers

4. Domain names

Numbers are hard to remember, so we use **domain names** such as **moe.gov.lk**. A domain name is read from **right to left**: the last part is the **top-level domain (TLD)**, e.g. **.lk** for Sri Lanka or **.com**. In **e-thaksalawa.moe.gov.lk**, “lk” is the country, “gov” means government, “moe” is the Ministry of Education and “e-thaksalawa” is a sub-domain.

Ending	Used by
.lk	Sri Lanka (country code)
.gov.lk	Sri Lankan government
.edu.lk	Sri Lankan education
.ac.lk	Sri Lankan universities
.com	Commercial (businesses)
.org	Organisations (non-profit)

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Sri Lankan site	What it is
moe.gov.lk	Ministry of Education
doenets.lk	Department of Examinations – results
nie.lk	National Institute of Education – syllabi, teacher guides
e-thaksalawa.moe.gov.lk	e-thaksalawa – free e-learning for schools

5. DNS – the Internet's phone book

The **Domain Name System (DNS)** changes a domain name into its IP address, like looking up a name in a phone book to get the number. Without DNS you would have to type numbers for every website.

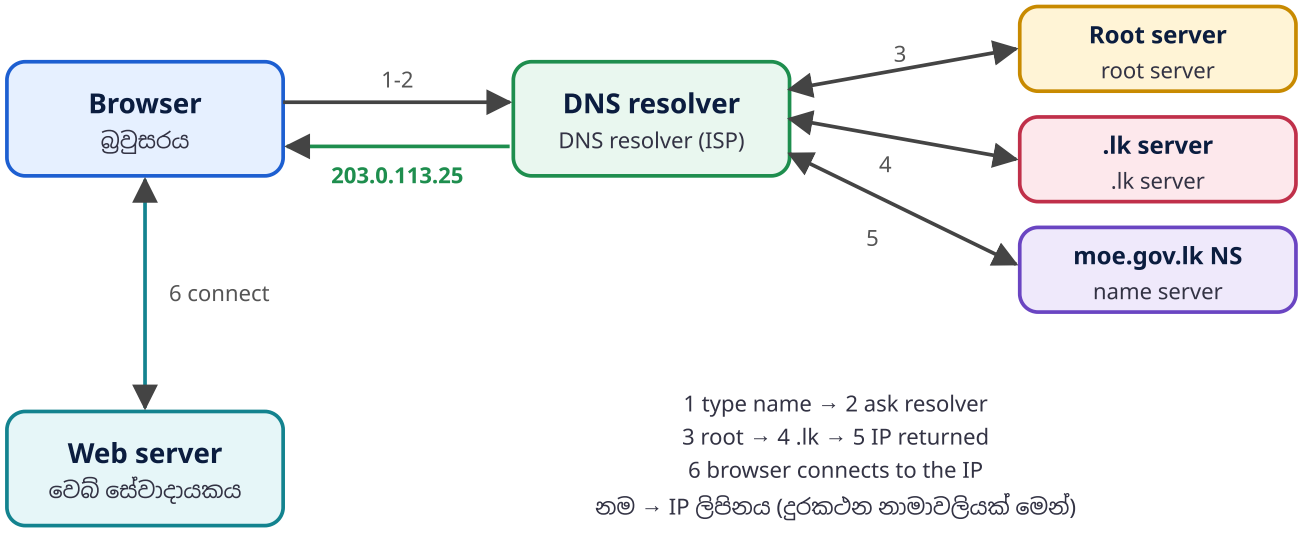


Figure 3.2 – A DNS lookup step by step (example IP 203.0.113.25).

- **Step 1:** You type moe.gov.lk in the browser.
- **Step 2:** The browser asks the DNS resolver (usually at your ISP).
- **Step 3:** The resolver asks a root server, which points to the .lk server.
- **Step 4:** The .lk server points to the name server for moe.gov.lk.
- **Step 5:** That name server replies with the IP address.
- **Step 6:** The browser connects to the web server at that IP.

> 💡 The answer is saved (**cached**) for a while, so the next visit is faster.

6. Client–server, HTTP and HTTPS

Your browser is a **client**: it asks for a page. The computer that keeps the website is a **web server**: it sends the page back. This is **two-way**: a **request** goes and a **response** comes back. They talk using **HTTP (HyperText Transfer Protocol)**. **HTTPS** is HTTP with **encryption**, so nobody in between can

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read passwords or card numbers. The **padlock** 🔒 beside the address means the connection is encrypted.



Figure 3.3 – The client sends a request and the server sends a response.

> 💡 The padlock means **private**, not **true**. A fake website can also have HTTPS. Always check the domain name.

7. Internet services

Service	What it does	Example
E-mail	Send messages and files to an e-mail address	Gmail, Outlook
World Wide Web (WWW)	Linked web pages you open in a browser	nie.lk, doenets.lk
FTP	Upload and download files to a server	Uploading a school website
Remote access	Use a computer from another place	SSH, Remote Desktop
File sharing	Let others open or download your files	A shared Drive folder
Media streaming	Watch or listen while it downloads	YouTube, Spotify
Cloud computing	Use software, storage or servers over the Internet	Google Drive, OneDrive
Search engines	Find web pages by keywords	Google, Bing

The Web is not the Internet. The **Internet** is the network (the roads). The **World Wide Web** is one service on it – pages joined by **hyperlinks** and opened in a browser. E-mail, FTP and video calls also use the Internet but are not the Web.

SaaS
SaaS

PaaS
PaaS

IaaS
IaaS

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8. How search engines work

- **Crawl:** Programs called crawlers (spiders) follow links and read pages.
- **Index:** The words on each page are stored in a huge index.
- **Rank:** Pages are ordered by how useful they are for your words.

Tip	Example	Result
"" quotes	"O/L ICT past papers"	Exact phrase only
- minus	python -snake	Leave out pages with that word
site:	site:nie.lk syllabus	Only pages from that site
filetype:	ICT syllabus filetype:pdf	Only that type of file

9. Can I trust this website?

Check	Ask yourself
Author	Who wrote it? Are they an expert or a known organisation?
Accuracy	Can you check the facts on two other good sites?
Currency (date)	When was it written or updated?
Purpose	Is it to inform, or to sell or persuade?
Domain and HTTPS	Official sites such as .gov.lk; padlock for safety (a padlock alone does not prove truth).

NEW 2026 **2026:** Most Sri Lankan homes connect by **4G** mobile data or **fibre**, and **5G** trials have started; new routers use **Wi-Fi 6** for faster, less crowded home networks. **AI search and chatbots** can summarise answers, but they can make mistakes and invent sources – always **fact-check** with an official site (e.g. nie.lk or doenets.lk) and do not copy AI answers as your own work. Look for **HTTPS** and the correct domain before typing a password, because **phishing** sites copy real ones.

Key Words

Internet – A worldwide network of networks using TCP/IP.

ISP – Internet Service Provider – a company that connects you to the Internet.

URL – The full address of a web page or file.

Protocol – A set of rules for communication, e.g. HTTPS.

IP address – A number that identifies a device on a network.

Domain name – An easy name for a server, e.g. nie.lk.

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DNS – The system that changes domain names into IP addresses.

Client – A device or program that asks for a service.

Server – A computer that provides a service or web pages.

HTTPS – Encrypted HTTP shown by a padlock.

World Wide Web – Linked web pages – one service on the Internet.

Search engine – A service that crawls, indexes and ranks pages.

Sample Q&A

1. What is the Internet?

> **Answer:** A worldwide network of networks that uses TCP/IP.

2. Name the four parts of https://schoolict.net/grade-11-ict-lesson-3-internet/?lang=si.

> **Answer:** Protocol https, domain schoolict.net, path /grade-11-ict-lesson-3-internet/, query lang=si.

3. Why is 256.10.1.1 not a valid IPv4 address?

> **Answer:** Each number must be 0–255, and 256 is too big.

4. What does DNS do?

> **Answer:** It changes a domain name into its IP address.

5. How is the Web different from the Internet?

> **Answer:** The Internet is the network; the Web is one service on it (linked pages).

6. What does the padlock in the address bar mean?

> **Answer:** The connection uses HTTPS and is encrypted.

MCQ

1. The Internet is best described as…

A. a worldwide network of networks
B. the same as the World Wide Web
C. one big computer in the USA
D. a program installed on a phone

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2. In https://schoolict.net/grade-11-ict-lesson-3-internet/?lang=si, the protocol is…

A. lang
B. schoolict.net
C. https
D. www

3. In https://schoolict.net/grade-11-ict-lesson-3-internet/?lang=si, the domain name is…

A. lang=si
B. https
C. schoolict.net
D. /grade-11-ict-lesson-3-internet/

4. In https://schoolict.net/grade-11-ict-lesson-3-internet/?lang=si, “lang=si” is the…

A. query
B. protocol
C. path
D. domain

5. Which is a valid IPv4 address?

A. 192.168.1.300
B. 192.168.1.10
C. 256.10.1.1
D. 192.168.1

6. Which is NOT a valid IPv4 address?

A. 8.8.8.8
B. 203.0.113.25
C. 10.0.0.255
D. 10.0.0.1.5

7. Each number in an IPv4 address must be between…

A. 1 and 100
B. 0 and 999
C. 0 and 255
D. 0 and 128

8. The top-level domain in moe.gov.lk is…

A. .com
B. .lk
C. moe
D. .gov

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9. DNS is used to…

A. change a domain name into an IP address
B. encrypt passwords
C. send e-mail attachments
D. block viruses

10. In the client–server model, the web browser is the…

A. ISP
B. server
C. client
D. DNS server

11. HTTPS is different from HTTP because it…

A. is always faster
B. only works on phones
C. needs no server
D. encrypts the data

12. Watching a lesson on YouTube while it downloads is…

A. streaming
B. remote access
C. DNS
D. FTP

13. Google Docs used in a browser is an example of…

A. IaaS
B. SaaS
C. an IP address
D. FTP

14. A search engine first…

A. deletes old pages
B. prints pages
C. ranks pages
D. crawls pages by following links

15. To find only PDF files about the ICT syllabus, search…

A. site:pdf ICT syllabus
B. ICT syllabus filetype:pdf
C. ICT syllabus -pdf
D. "ICT" pdf only

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Structured Questions

1. (i) What is a URL? (1 mark)
(ii) Write the protocol, domain name, path and query of https://schoolict.net/grade-11-ict-lesson-3-internet/?lang=si (4 marks) *(5 marks)*

> (i) The full address of a web page or file (1). (ii) Protocol https (1); domain schoolict.net (1); path /grade-11-ict-lesson-3-internet/ (1); query lang=si (1).

2. Which of these are valid IPv4 addresses? Give a reason for each invalid one. 192.168.1.10, 256.10.1.1, 192.168.1, 8.8.8.8 (4 marks) *(4 marks)*

> Valid: 192.168.1.10 (1) and 8.8.8.8 (1). 256.10.1.1 – 256 is more than 255 (1). 192.168.1 – only three numbers (1).

3. Explain, step by step, how DNS helps a browser open moe.gov.lk. (4 marks) *(4 marks)*

> The browser asks the DNS resolver (1); the resolver asks the root and .lk servers (1); the moe.gov.lk name server returns the IP address (1); the browser connects to the web server at that IP (1).

4. (i) Describe the client–server model. (2 marks)
(ii) Why should you check for HTTPS before entering a password? (1 mark) *(3 marks)*

> (i) The client (browser) sends a request (1) and the server sends back a response with the page (1). (ii) HTTPS encrypts the data so others cannot read the password (1).

5. (i) Name four Internet services and give one example of each. (4 marks)
(ii) Give two checks to decide whether a website is reliable. (2 marks) *(6 marks)*

> (i) E-mail – Gmail; WWW – nie.lk; streaming – YouTube; cloud – Google Drive; FTP – uploading a website; search engine – Google (any four, 4). (ii) Author, accuracy, date, purpose, official domain (any two, 2).

Summary

- Internet = network of networks using TCP/IP; join through an ISP.
- URL = protocol :// domain / path ? query.
- IPv4 = four numbers 0–255; IPv6 = 128 bits in hexadecimal.
- Domains read right to left: .lk, .gov.lk, .edu.lk, .com, .org.
- DNS changes names into IP addresses.
- Client requests, server responds; HTTPS = encrypted (padlock).
- Services: e-mail, WWW, FTP, remote access, file sharing, streaming, cloud, search.
- Search engines crawl, index, rank; check author, accuracy, date and purpose.

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MCQ answer key – 3.1

1. **A** – Many networks joined by TCP/IP.
2. **C** – The part before ://.
3. **C** – The server name after ://.
4. **A** – It comes after the ?.
5. **B** – Four numbers, each 0–255.
6. **D** – It has five numbers.
7. **C** – 8 bits give 256 values: 0–255.
8. **B** – Read from the right.
9. **A** – Like a phone book.
10. **C** – It sends the request.
11. **D** – S = secure (encrypted).
12. **A** – Media streaming.
13. **B** – Software as a Service.
14. **D** – Crawl → index → rank.
15. **B** – filetype: limits the file type.

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