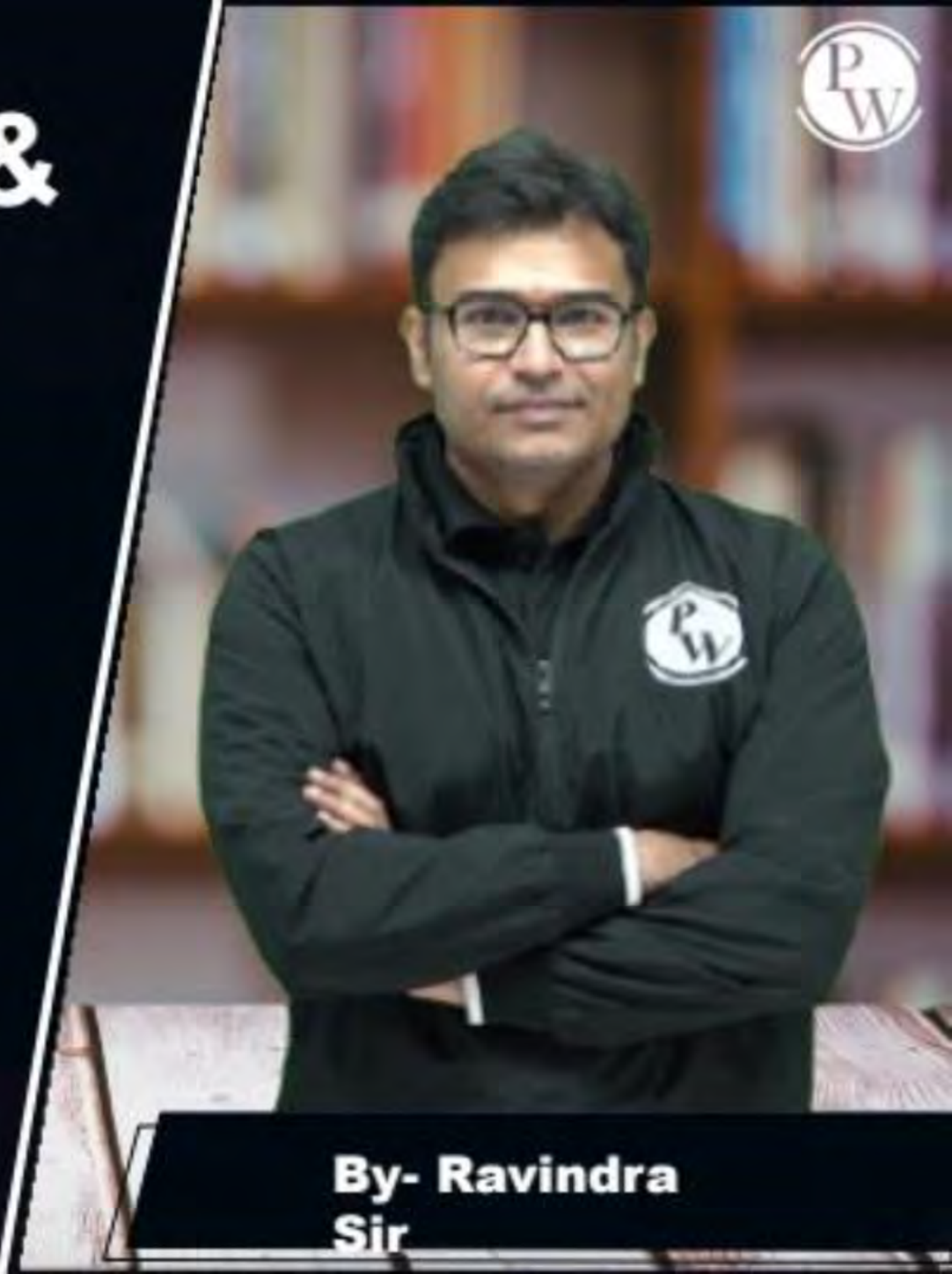
Computer Science & IT

Computer Networks

(CN)

IP address Subnetting, Supernetting

Lecture No. 1



By- Ravindra Sir

Topics to be Covered

Topic
IP address Subnetting, Supernetting

Unstoppable Indians: Stories to Ignite Student Motivation

Jagadish Chandra Bose (1858–1937) built his own coherer and transmitter in Calcutta to demonstrate wireless communication in 1895, predating Marconi's experiments. Working on a modest budget, he innovated detectors sensitive to electromagnetic waves. Not satisfied with physics alone, he invented the crescograph—a device measuring plant growth movements at micrometer precision, revealing that plants respond to stimuli. Using clock parts, glass tubing, and metal, Bose presented biological curves like sound waves and published his work in English and Bengali.

Lesson: Perseverance and resourcefulness can drive groundbreaking innovation even under constraints.

Unstoppable Indians: Stories to Ignite Student Motivation

C. V. Raman (1888–1970) **discovered the Raman effect in 1928, proving that light scattering in molecules shifts wavelengths in discrete patterns. At the Indian Association for the Cultivation**
of Science in Calcutta, he crafted a custom spectrometer from a telescope, mirrors, and diffraction grating to capture subtle spectral changes. His meticulous experiments on crushed crystals and liquids confirmed inelastic light scattering. Awarded the 1930 Nobel Prize, Raman's work underscored the power of careful observation and experimental design.

Lesson: **Meticulous attention to detail and unwavering dedication yield profound scientific discoveries.**

Unstoppable Indians: Stories to Ignite Student Motivation

Homi Jehangir Bhabha (1909–1966) laid the foundation for India's atomic energy program. After earning his doctorate at Cambridge, he returned to propose peaceful nuclear energy for India's development. As founding director of the Tata Institute of Fundamental Research and Atomic Energy Establishment, Trombay, he built world-class research facilities from scratch. Navigating funding and bureaucratic challenges, he recruited top scientists and fostered collaboration. His pioneering work in cosmic rays and quantum mechanics earned global recognition, and his legacy endures in India's nuclear institutions.

Lesson: A clear vision and institution-building can catalyze national progress in science and technology.

Unstoppable Indians: Stories to Ignite Student Motivation

Vikram Ambalal Sarabhai (1919–1971) is known as the father of India's space program. After completing his doctorate in the UK, he returned to establish the Physical Research Laboratory in Ahmedabad and the Indian National Committee for Space Research. Sarabhai believed space technology could tackle real-world problems like communication and weather forecasting. Under his leadership, India launched its first rocket in 1963 and its first satellite, Aryabhata, in 1975. His social purpose-driven approach inspired generations of Indian scientists and engineers.

Lesson: Directing scientific endeavors toward societal benefits creates lasting impact.

Syllabus

99% → Notes

ASR 5k → Routin

↘ Routing algo

MITG

Bible of CN

~~Forouzan~~

~~Tanenbaum~~

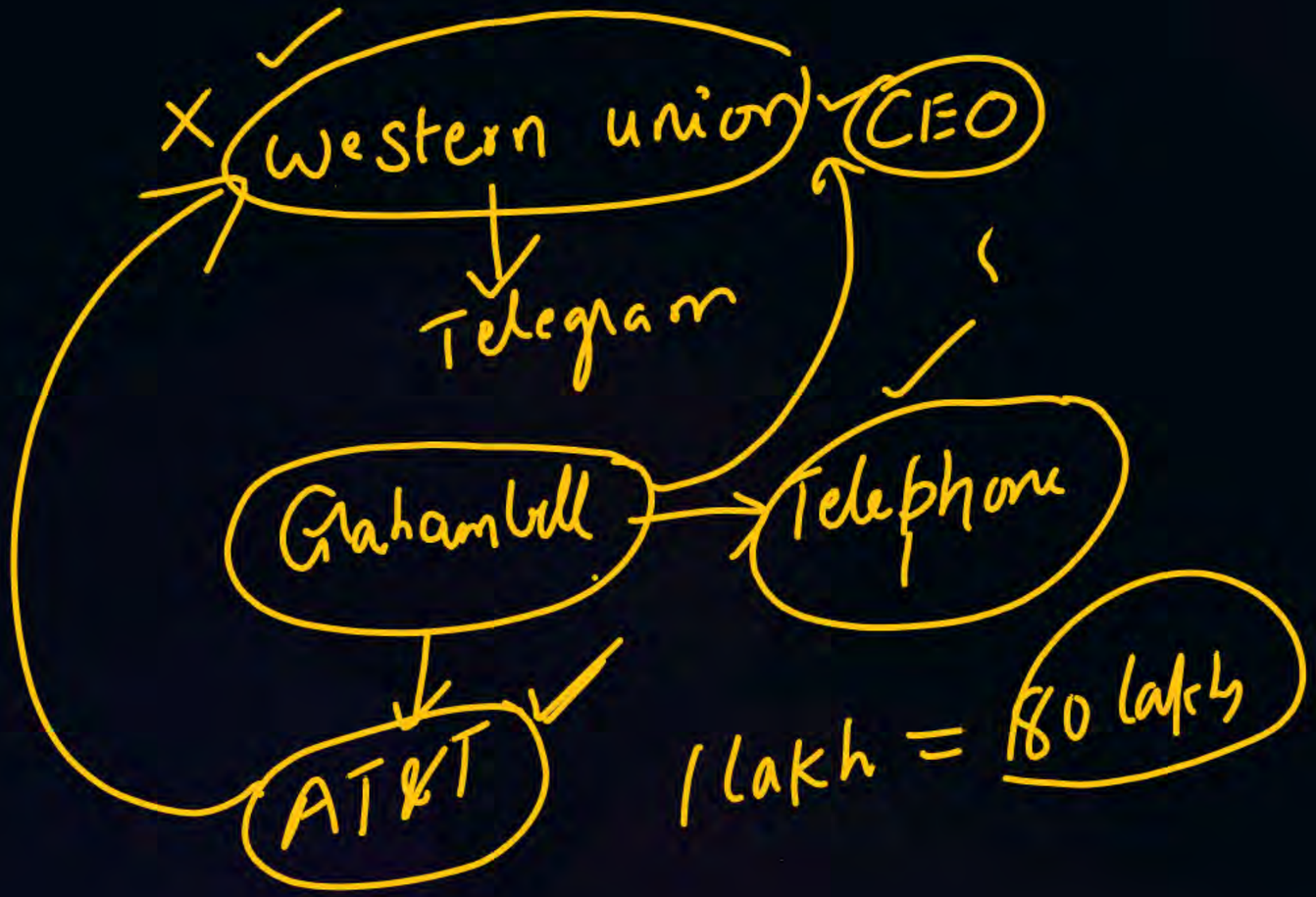
~~Kurose~~

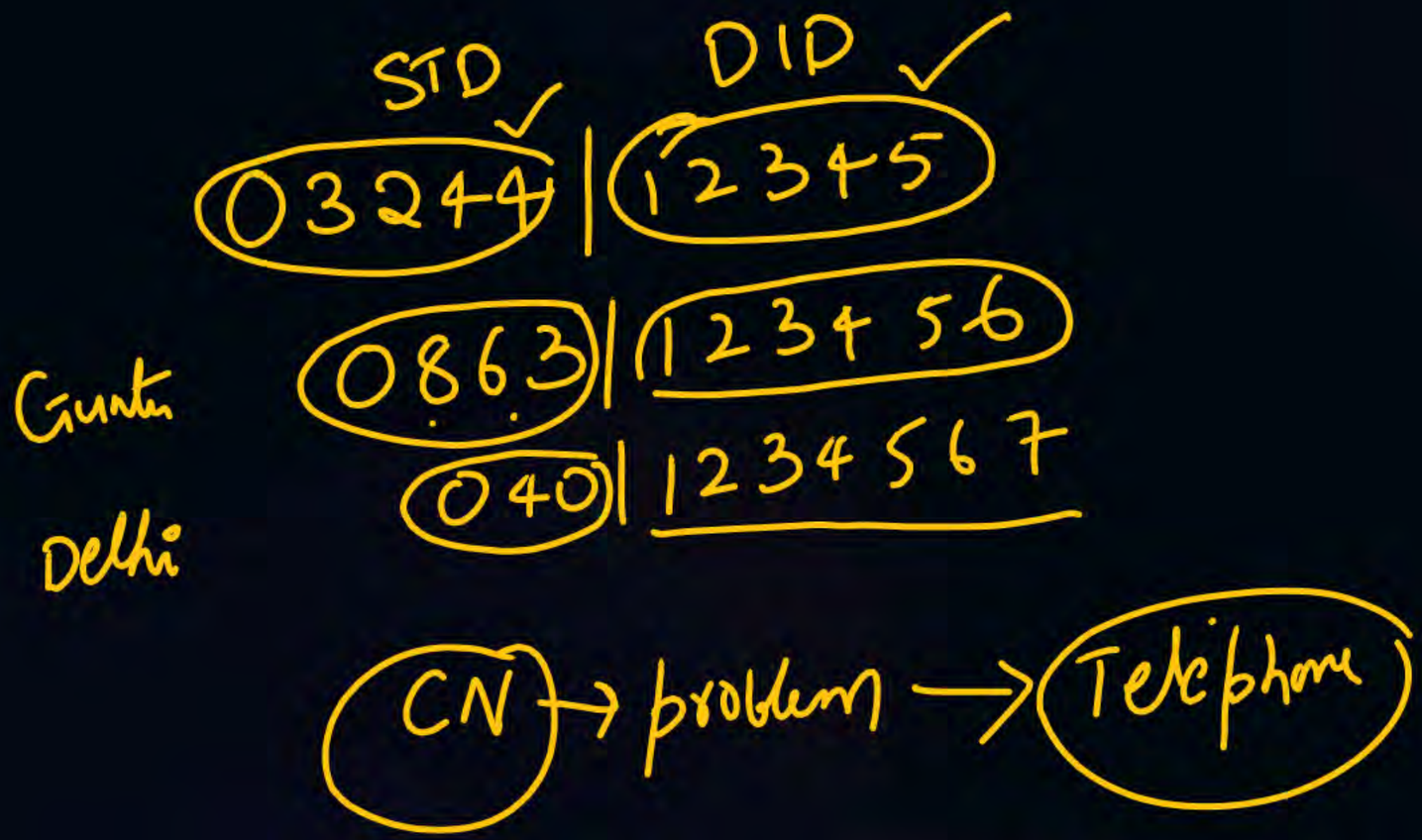
RFC

↙ Request for Comments

ARP RFC

Story of CN :-


X
Western union
CEO
Telegram
Graham bell
Telephone
AT&T
1 Lakh = 80 Lakh


STD
DID
03244
123455
0863
123456
Guntur
040
1234567
Delhi
CN
problem
Telephone

My Story

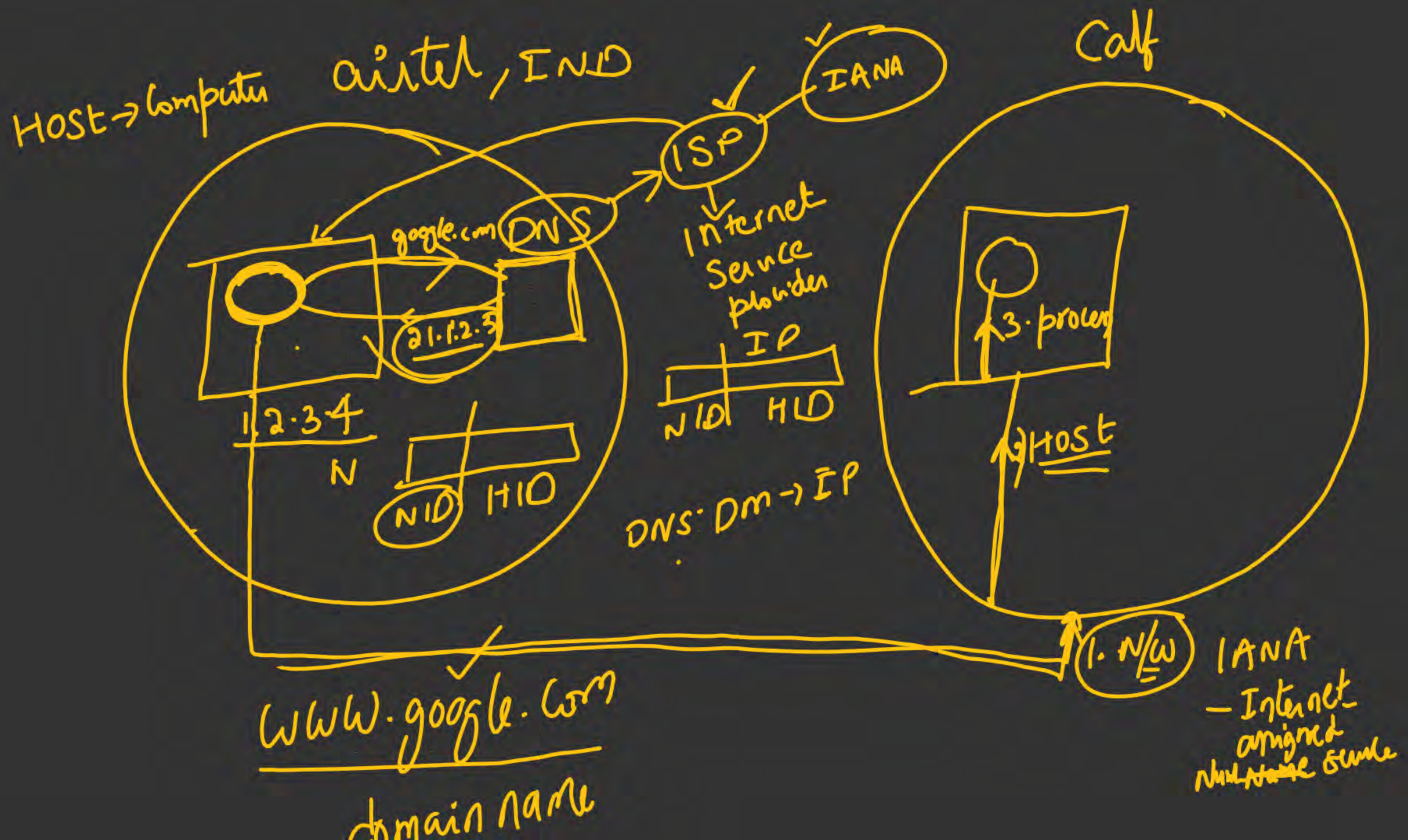
2010 → ME → IISc

2010 – Gate Coaching ×

2011 – CISCO

L1 |

L5 2016 – Cisco


Host → computer
airtel, IND
IANA
ISP
Internet Service provider IP
NID HID
google.com
DNS
21.1.2.3
1.2.3.4
N
NID HID
DNS: Dm → IP
Calf
3. proces
Host
1. N/W
www.google.com
domain name
IANA
– Internet assigned

→ Who provides IP address to a Host?

ISP

RBR Sir PW

CN → Pwa Syllabus

CN → Revision → short note

1) Textbook CN
2) Handwritten
   21-07
   21-08 → Text. book
3) Short note

→ who provids IP addrss to ISP ?

IANA (Internet assigned number authority)

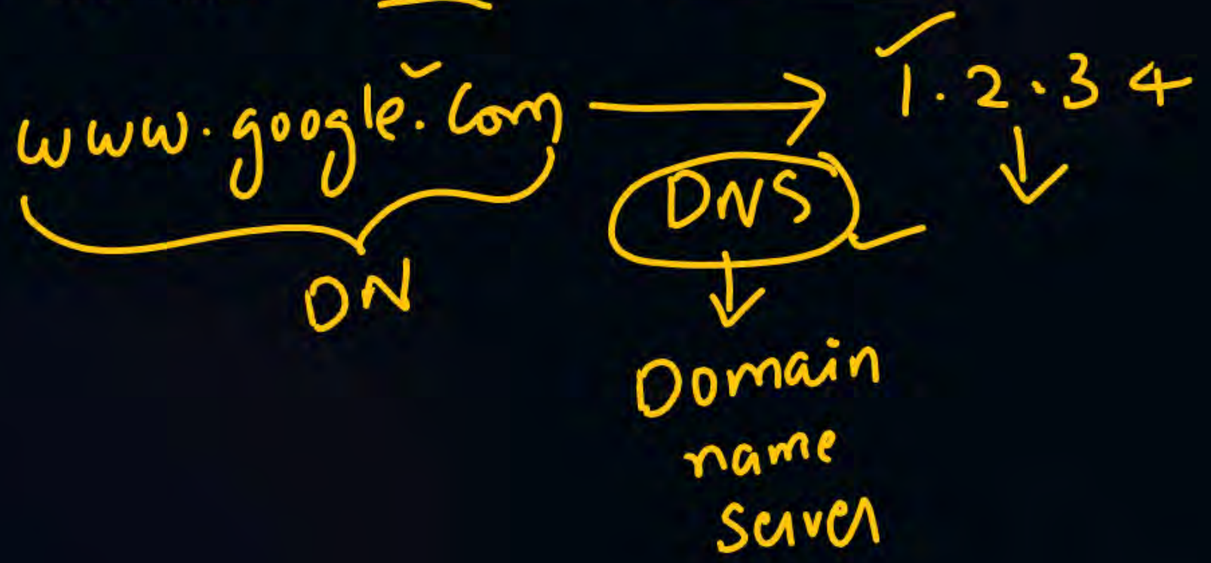
↓ (by)

ISP

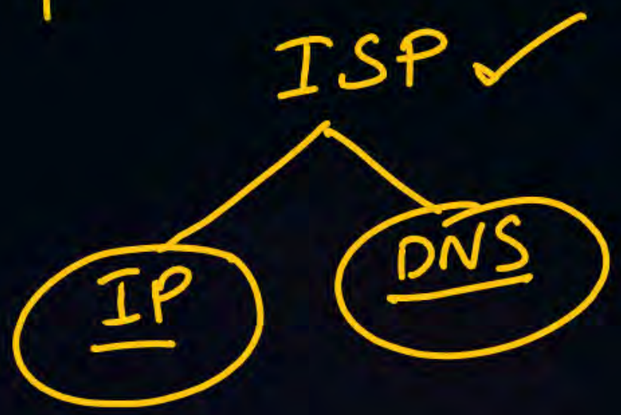
↓

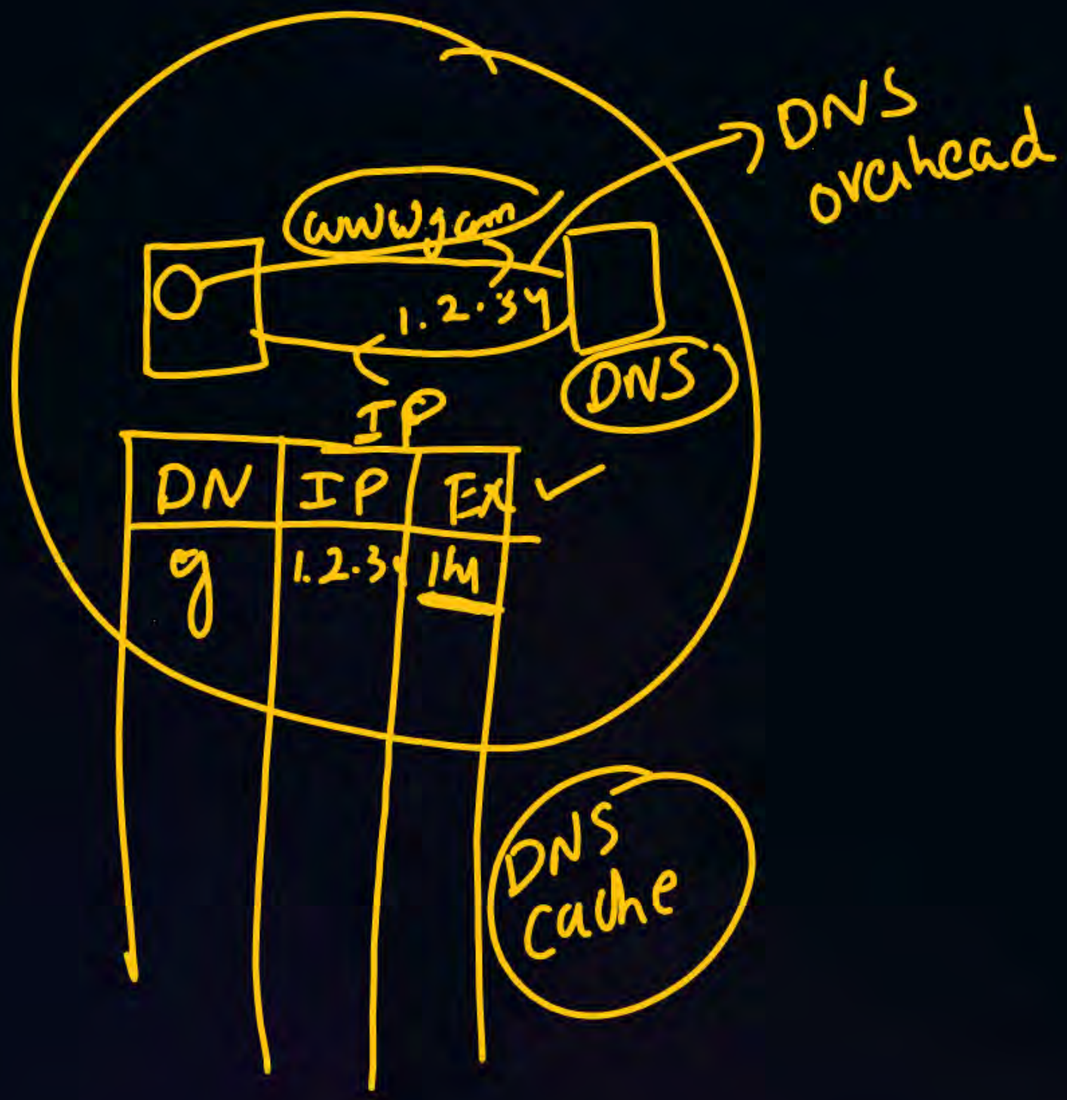
Host

→ How to Convat DN to IPadd



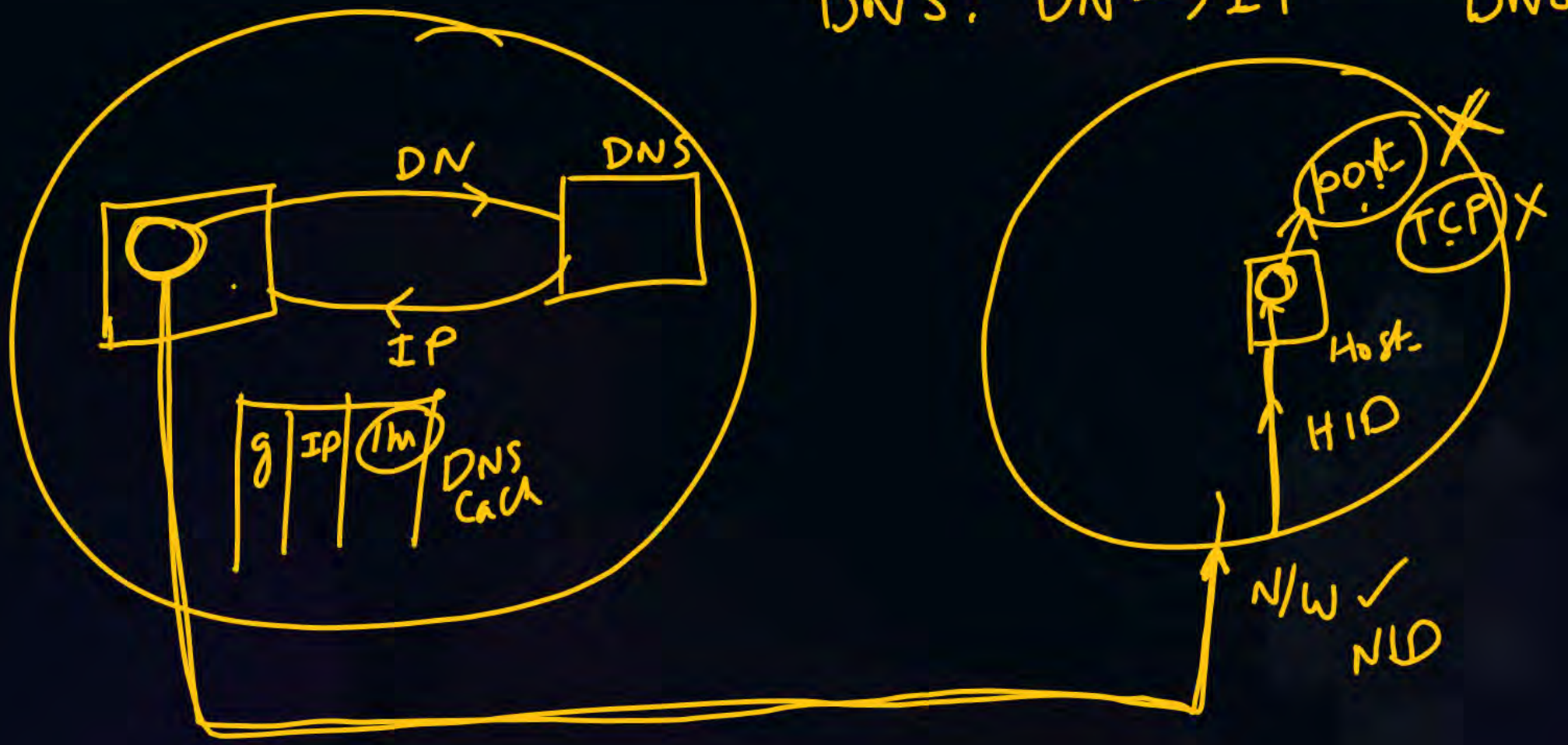
→ who provides DNS to a host?

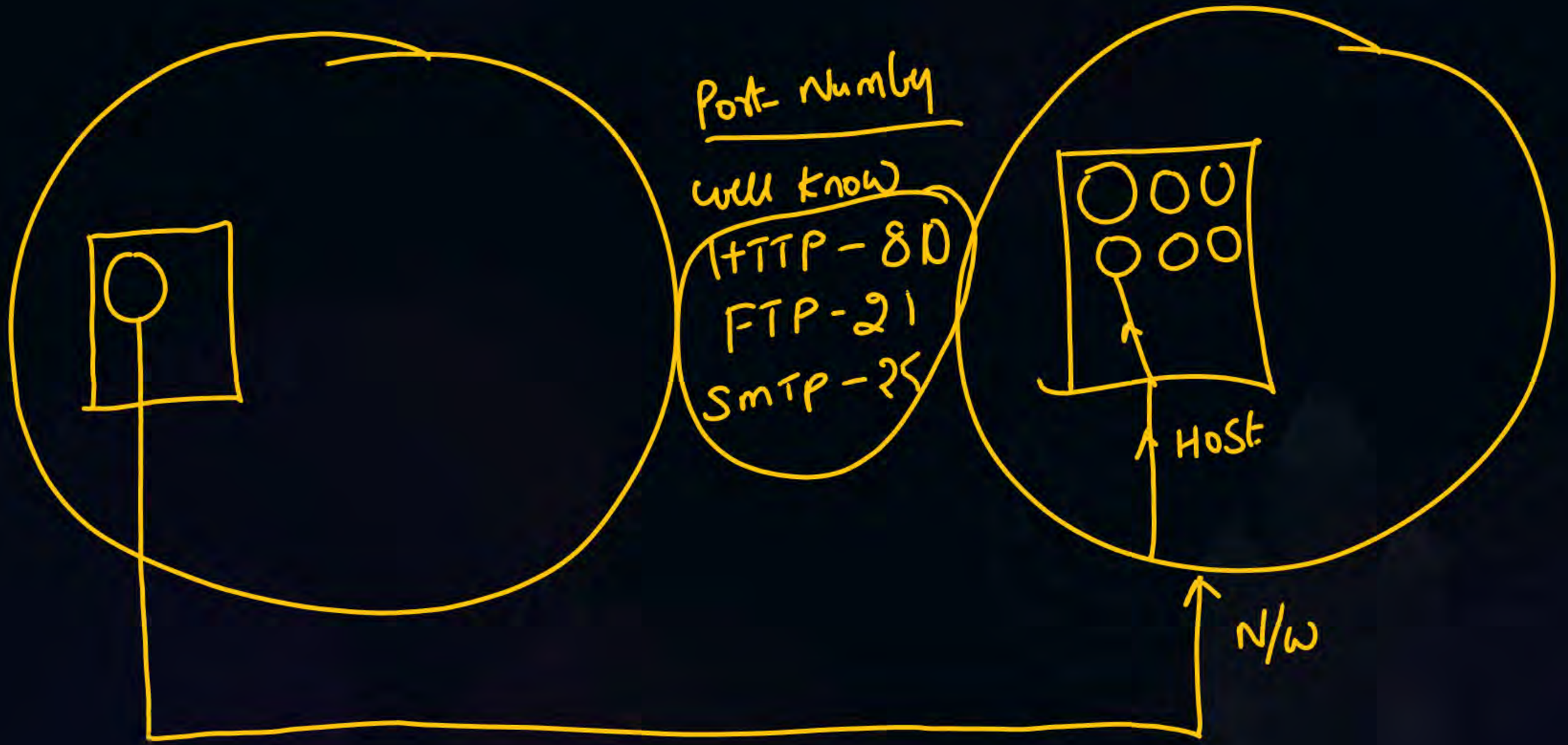



DNS overhead
www.g.com
1.2.3.4
DNS
IP
DN
IP
Ex
g
1.2.3.
1h
DNS cache

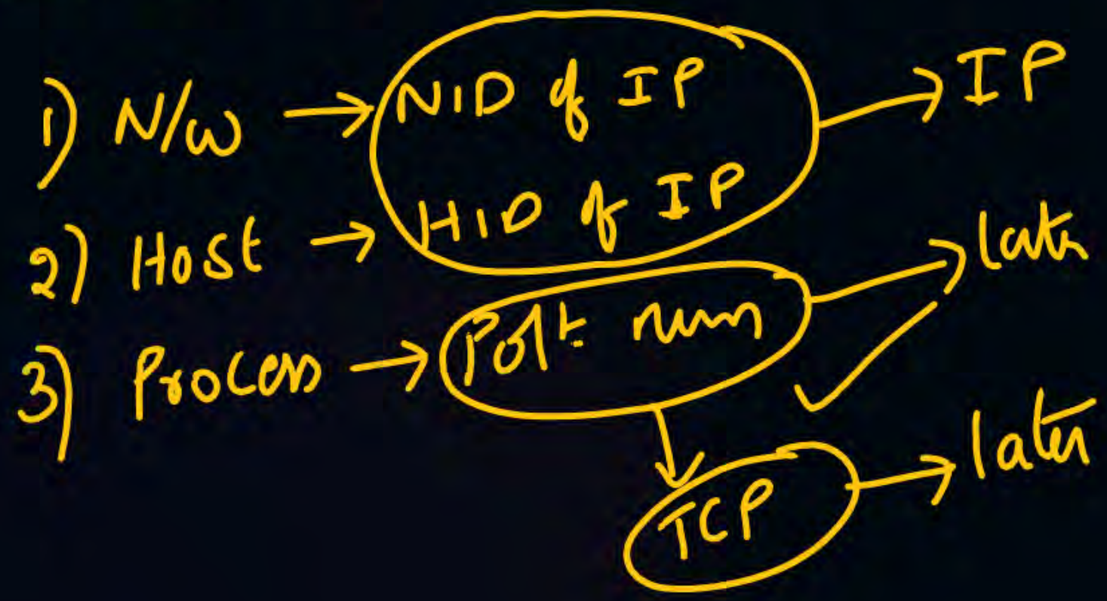
What is DNS overhead? Whenever a host needs IP add of a Server, it will go to DNS Server

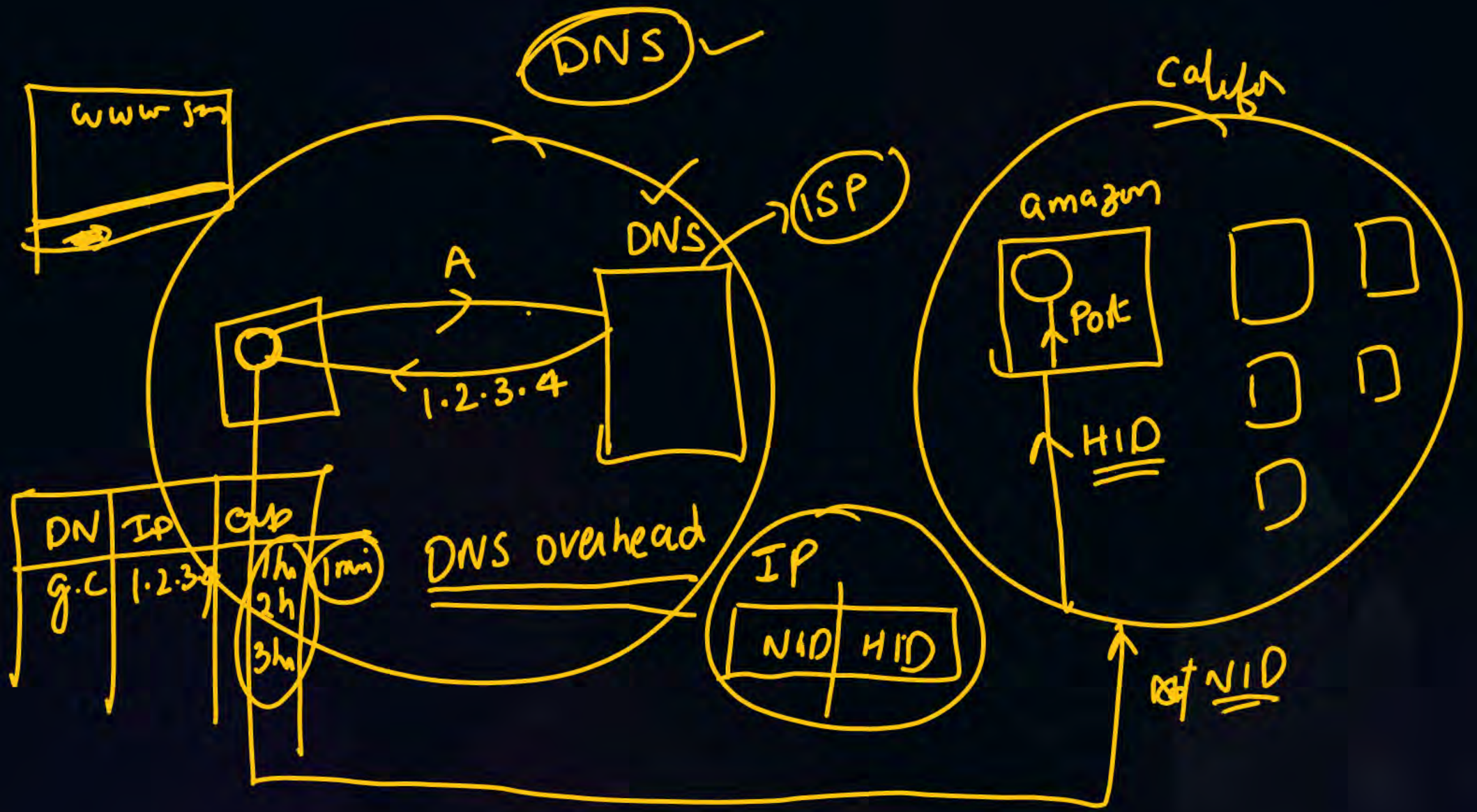
DNS: DN → IP DNS overhead



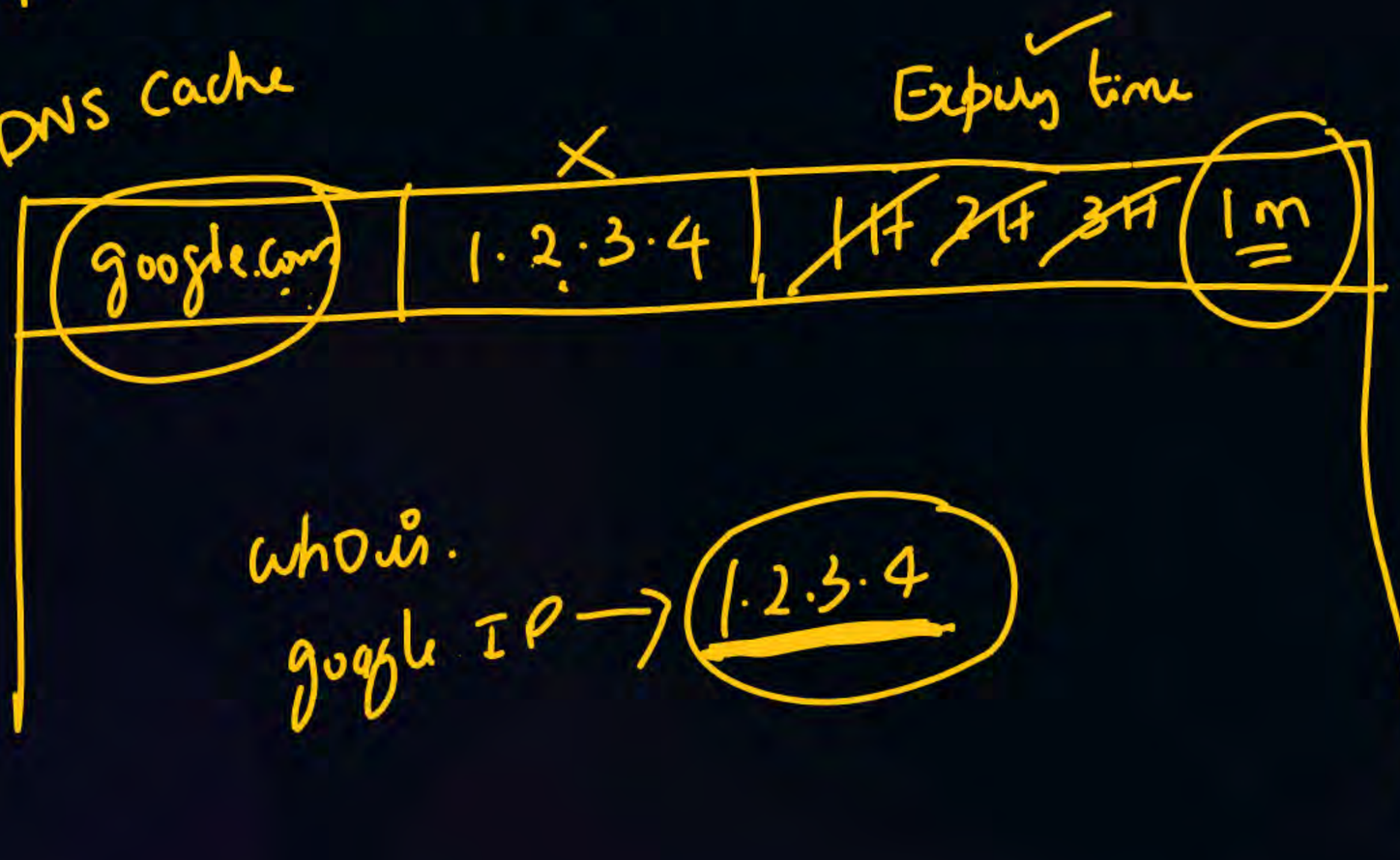

Port- Numby
well know
HTTP - 80
FTP - 21
SMTP - 25
Host
N/W

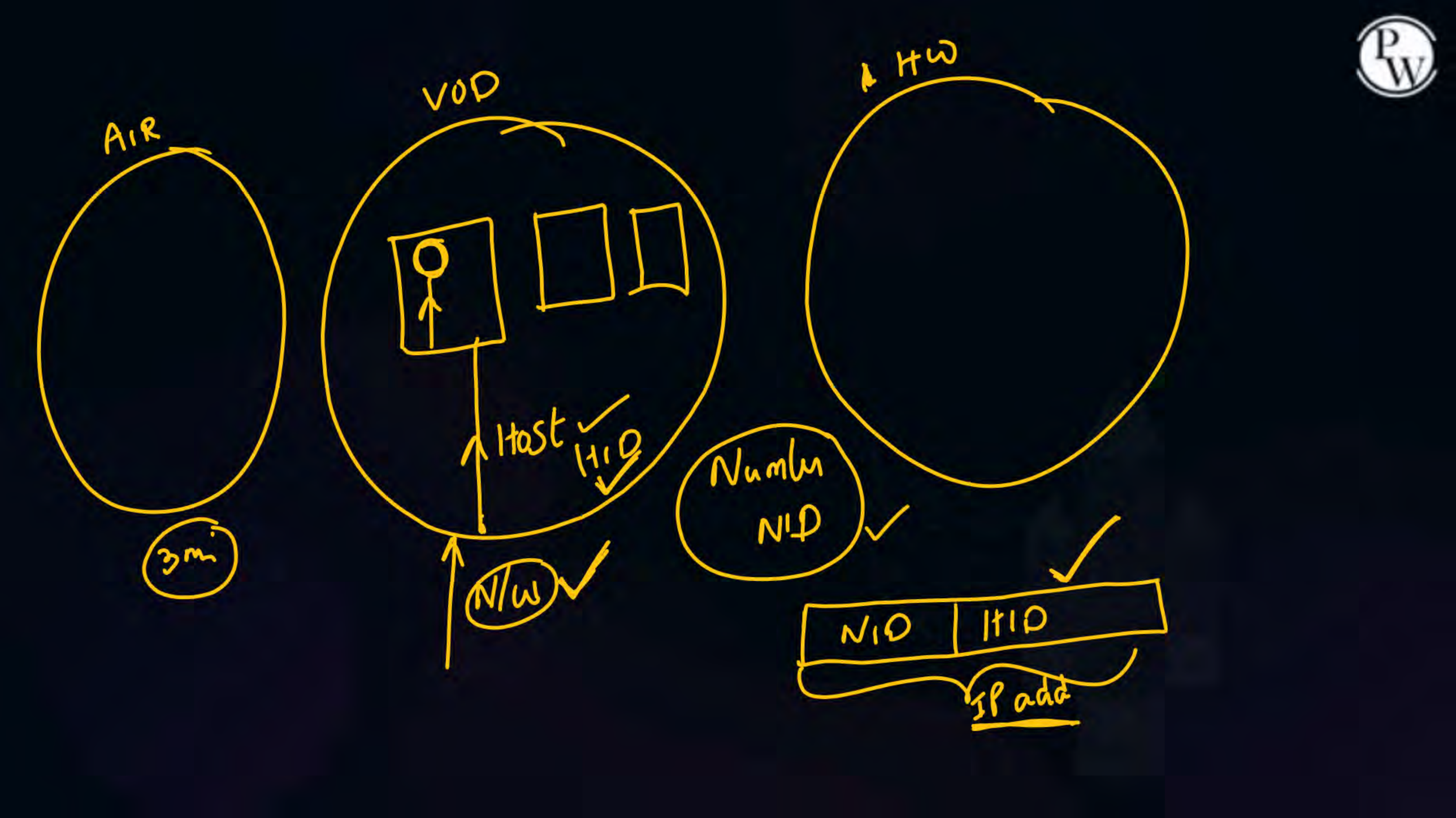
How do a process reaches the other process in internet?




DNS
www.g.c
DNS
ISP
A
1.2.3.4
DNS
DN | IP | Cab
g.c | 1.2.3.4 | 1h 2h 3h | 1min
DNS overhead
IP
NID | HID
amazon
Port
HID
NID

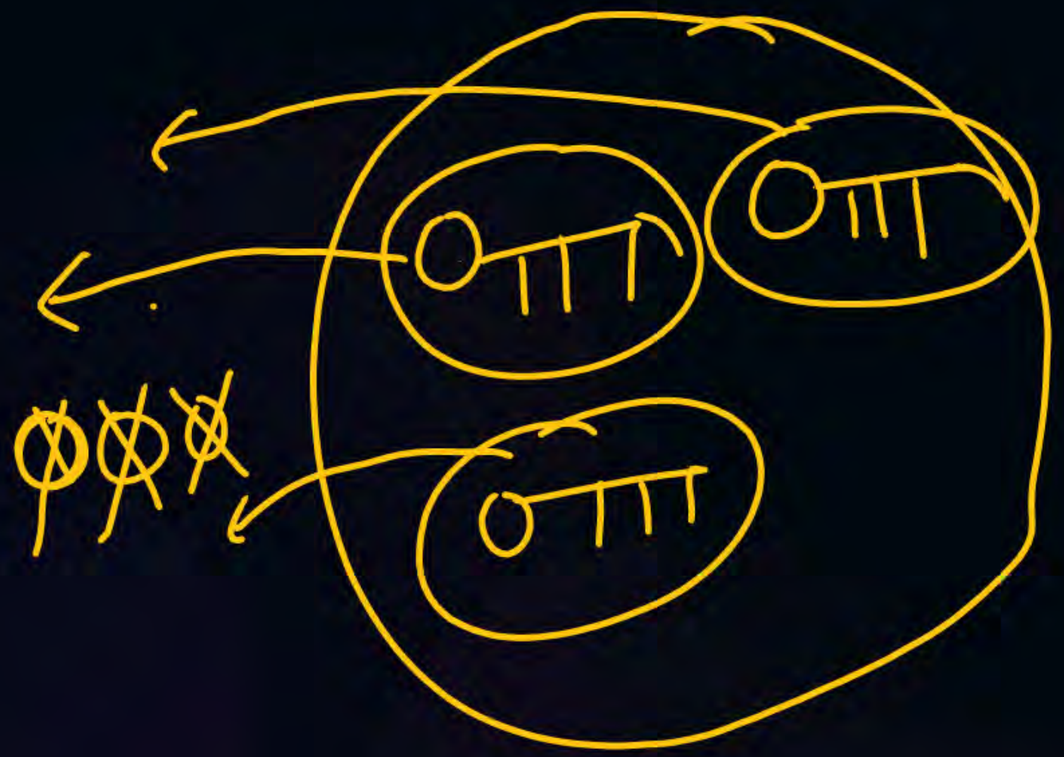
IP add is not permanent




AIR
VOD
HW
Host
HID
Numb
NID
3m
N/W
NID
HID
IP add

Number System :-

Base 1 → unary number → Abacus



Base - 10 :- (10 Symbols) → 0, 1, 2, 3, 4, 5, 6, 7 8, 9

Num of figes

Base 10:

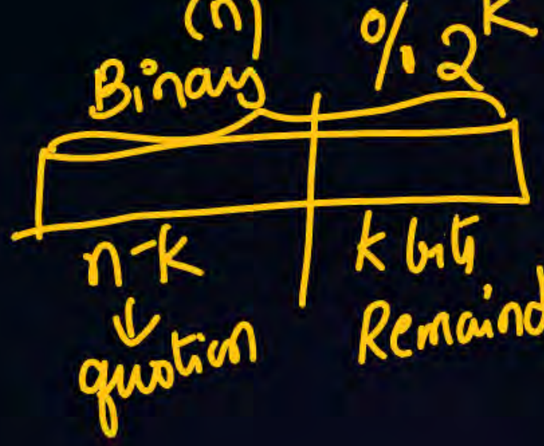
1 2 3 | 4 /10

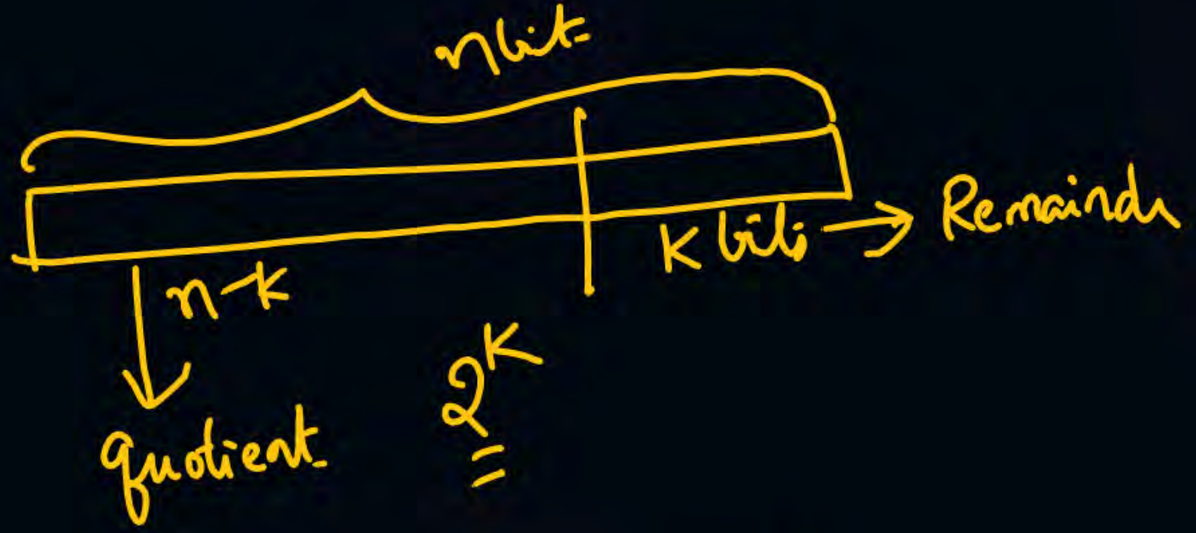
1 2 | 3 4 /100 10^2

1 | 2 3 4 /1000 10^3

Binary (0,1) 11/4 = 3, R=2

	%2^1	%2^2	%2^3	%2^4
11	1011	10 | 1 (Q | R)	10 | 11 (Q | R→3)	1 | 011 (1 | 3)	0 | 1011 (Q | R) 11
		Q ↓ 2		




n bit
k bits → Remainder
n-k
quotient
$= 2^k$


Base 10
n digit
n-k
coefficient
k 10^k
Remainder

Base 3 (0, 1, 2)

Base n:

OS :- Page — 2^K

6-pack — ?

8-pack

2^3

$2^1 - 2$

$2^2 - 4$

$2^3 - 8$

$2^4 - 16$

$2^5 - 32$

$2^6 - 64$

$2^7 - 128$

$2^8 - 256$

$2^9 - 512$

$2^{10} - 1024$

Prof Rawat Bakkam

2^{10} – Kilo – 1024

2^{20} – (M)ega

2^{30} – (G)iga

2^{40} – (T)era

(M)(G)(T)

mGIT

2^{20} 2^{30} 2^{40}

THANK - YOU