

تقرير عن ورشة عمل

نفذت وحدة المعامل و المختبرات بكلية العلوم و الآداب بالقريات ورشة عمل بعنوان :

بروتوكولات الإنترنت العامة والخاصة

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المكان: معمل F056 قسم الحاسب

الموضوع: تدريب الطلاب على معرفة عناوين بروتوكولات الإنترنت العامة والخاصة

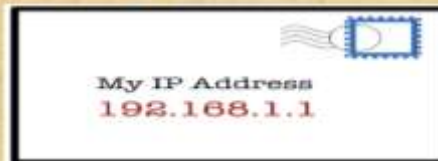
الفئة المستهدفة: الطلاب

الاهداف:

1. ان يتعرف الطالب على بروتوكولات الإنترنت
2. ان يتعرف الطالب على عناوين بروتوكولات الإنترنت العامة
3. ان يتعرف الطالب على عناوين بروتوكولات الإنترنت الخاصة
4. ان يستطيع الطالب التفرقة بين عناوين بروتوكولات الإنترنت العامة والخاصة
5. ان يستطيع الطالب تحليل النتائج الظاهرة على الشاشة.

IP Addresses

- An IP address is a unique address that is required of all computers that communicate on a network
 - IPv4 was standardized in 1983
 - IPv6 was standardized as a draft in 1998 and became an official IETF standard in 2017
- IPv4 addresses consist of 32 bits separated as 4 numbers of 8 bits each
 - 128.128.253.146
- IPv6 addresses consist of 128 bits separated as 8 sets of 4 hexadecimal values
 - fe29:392a:3396:829e:55b1:40d3:3495:109a
 - NOTE that if all four hexadecimal values are 0, the term will be omitted
 - fe29:392a:2284::0001:6661 (4th, 7th, and 8th terms are 0001)



IPv4 Classes

Class	Network	Host	Range of host addresses
A	0		1.0.0.0 to 127.255.255.255
B	10		128.0.0.0 to 191.255.255.255
C	110		192.0.0.0 to 223.255.255.255
D	1110		224.0.0.0 to 239.255.255.255
E	1111		240.0.0.0 to 255.255.255.255

- Network numbers are managed by ICANN
- The Internet Assigned Numbers Authority (IANA) was founded by USC/ISI in 1978 by Jon Postel and transferred to ICANN in 1998
 - ICANN was founded primarily to take over control of IANA



Internet Assigned Numbers Authority

IPv6 Address Space



- How many IPv4 addresses are there?
 - 32 bits = 2^{32} addresses = $2^8 \cdot 2^{24}$ addresses = 4,294,967,296 addresses
- How many IPv6 addresses are there?
 - 128 bits = 2^{128} addresses = $2^8 \cdot 2^{120}$ addresses = $256 \cdot 2^{120}$ addresses = 340,282,366,920,938,463,463,374,607,431,768,211,456 addresses

$2^{10} = 1024 \approx 10^3 =$ thousand
 $2^{20} = 1,048,576 \approx 10^6 =$ million
 $2^{30} \approx 10^9 =$ billion
 $2^{40} \approx 10^{12} =$ trillion
 $2^{50} \approx 10^{15} =$ quadrillion
 $2^{60} \approx 10^{18} =$ quintillion

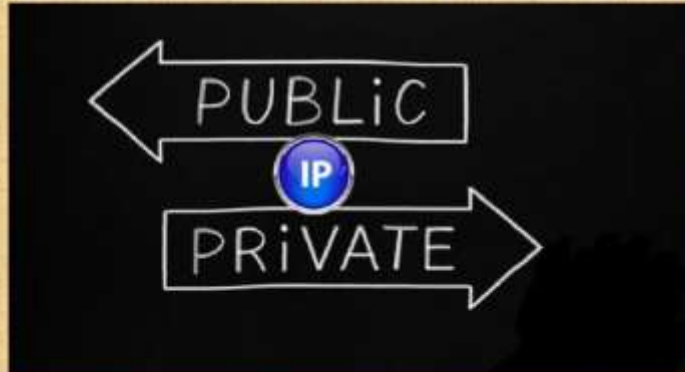
$2^{20} \approx 10^{21} =$ sextillion
 $2^{30} \approx 10^{24} =$ septillion
 $2^{40} \approx 10^{27} =$ octillion
 $2^{50} \approx 10^{30} =$ nonillion
 $2^{60} \approx 10^{33} =$ decillion
 $2^{70} \approx 10^{36} =$ undecillion

Public IP address

- **Public IP address** of a system is the IP address which is used to communicate outside the network. Public IP address is basically assigned by the ISP (Internet Service Provider).



Difference between Private and Public IP address:



Private vs Public IP Addresses

- ☒ Whatever connects directly into Internet must have public (globally unique) IP address
- ☒ There is a shortage of public IPv4 address
- ☒ So Private IP addresses can be used within a private network
- ☒ Three address ranges are reserved for private usage
 - ☒ 10.0.0.0/8
 - ☒ 172.16.0.0/16 to 172.31.0.0/16
 - ☒ 192.168.0.0/24 to 192.168.255.0/24
- ☒ A private IP is mapped to a Public IP, when the machine has to access the Internet

Difference between Private and Public IP address:

PRIVATE IP ADDRESS	PUBLIC IP ADDRESS
Scope is local.	Scope is global.
It is used to communicate within the network.	It is used to communicate outside the network.
Private IP addresses of the systems connected in a network differ in a uniform manner.	Public IP may differ in uniform or non-uniform manner.
It works only in LAN.	It is used to get internet service.
It is used to load network operating system.	It is controlled by ISP.
It is available in free of cost.	It is not free of cost.
Private IP can be known by entering "ipconfig" on command prompt.	Public IP can be known by searching "what is my ip" on google.
Range: 10.0.0.0 – 10.255.255.255, 172.16.0.0 – 172.31.255.255, 192.168.0.0 – 192.168.255.255	Range: Besides private IP addresses, rest are public.
Example: 192.168.1.10	Example: 17.5.7.8



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التوقيع : 