<https://github.com/Kosuke9311/Data-communication-CS320/wiki/Assignment%233>

# Network Congestion



## Definition:

Network congestion refers to a situation in which the network is congested caused by the accessing request that exceeds expectations, and the congestion sometimes makes it impossible to communicate or talk.  
The network is designed to be able to deal with a certain amount of increase of network access and connection, which is made the assumption based on the usual amount of connection. However, a temporary rush of communication requests from a large number of users can cause congestion, network capacity is greatly exceeded.

## Examples:

### Telecommunication

Network congestion could be caused by a lot of communication requests for big events, such as, taking tickets to the famous singer’s concerts, confirming the safety of the area of disaster, and holidays.  
9 years before, there was the Great East Japan Earthquake, many people were killed by the earthquake and tsunami. Nothing is more than any disaster which I have watched, and a large number of people tried to access the network to confirm if their family and friends were safe. In order to prevent large communication failures, network carriers conducted communication regulations.

### Internet:

Network congestion could suddenly happen to a particular website or server, and many people make requests to connect the server because of the popular topic of conversation and so on. Those who want to get information on the server tried to make a lot of access, then it makes the connecting speed slow down, and then their reloading makes the situation worse.

### Security attack

A Denial of Service (DoS) attack is an attack that sends a large amount of traffic to the website or web server being attacked to bring down the service. The goal is to overload the system by using the communication protocol data communication to prompt processing, causing a vulnerability. However, the attack is characterized by a single IP address, and once the attacker is identified, it is possible to block access to the system. However, DDoS attacks allow attackers to vary their attack methods and the number of attack sites.  
In a Distributed Denial of Service (DDoS) attack, an attacker uses an unspecified number of computers as a stepping stone (bot) to carry out DoS attacks in a distributed fashion. It is difficult to identify the IPs that are to be blocked, and security measures are struggling at present.

## How to Protect Network Congestion

#### Ping

You can easily make sure whether the network is congested or not using Ping. It has the ability to show not only packet loss but also an actual delay in your network. The good tool with Ping is MTR, it can help you to find out the area of the network where is congested.

#### LAN Performance Test

It allows the user to discover the parts where is congested in the network. A tool such as iPerf tries to find out the problem statistically, and tell the details of troubles to the user based on the measurements of packet loss, delay, bandwidth, jitter, and so on. In addition, it can show the devices which have some trouble.

#### Choke Packet

When you use the choke packet, you can prevent network congestion from making worse. When maintenance of the network, choke packets are often utilized. You can send choke packets to the computer accessing your computer, and it works to make that computer slow down. In this way, the computer and router on your side can afford to come up with the congestion.

#### To Find The Risk of Congestion as Soon as Possible

if you can discover the probability of network congestion before it occurs, you will be able to make provisions against congestion. In this way, Explicit Congestion Notification should be helpful. This is for notifying you whether or not there is a risk of congestion within your network.

#### Router Setting

Changing the setting of the router will help you to prevent network congestion. You make the priority of traffic over a network. To make changes easily, you should go over the setting of Voice over IP (VoIP), which gets priority over your network. By prioritizing traffic, you can get rid of bandwidth-hog.

## References

* Network Congestion – 5 Causes & How to Alleviate Issues with your Network being Congested! <https://www.pcwdld.com/network-congestion>
* 10 Ways to Reduce Network Congestion <https://datapath.io/resources/blog/10-ways-to-reduce-network-congestion/>