

## Chapter 1 : 21 Strategies to Solve Congestion – David Levinson, Transportist

*Congestion control refers to the techniques used to control or prevent congestion. Congestion control techniques can be broadly classified into two categories: Open Loop Congestion Control. Open loop congestion control policies are applied to prevent congestion before it happens. The congestion control is handled either by the source or the destination.*

It is characterized by a buildup of mucus in the trachea and the respiratory tract that leaves your chest feeling heavy. If not treated timely, it can cause an infection in your respiratory tract. The most common cause of chest congestion is the common cold. Allergens, bacteria and fungi can also cause chest congestion and infection. Some other causes include asthma, bronchitis, the flu, pneumonia and tuberculosis. Symptoms of chest congestion can make you very uncomfortable and tired due to the short supply of oxygen. Common symptoms include a tightened chest, irritation in the throat, mild chest pain, cough, shortness of breath, dizziness and difficulty breathing. Both over-the-counter and prescribed medicines can help treat chest congestion. You can also use some simple, natural home remedies to get rid of chest congestion.

Advertisements Here are the top 10 home remedies for chest congestion.

**Salt Water Gargling** with salt water several times a day is an effective treatment for chest congestion. While the salt helps remove mucus from the respiratory tract, the hot water reduces irritation in the throat.

Advertisements Add 1 teaspoon of salt to a glass of warm water. Mix well until the salt is dissolved thoroughly. Gargle with it 2 or 3 times daily until your congestion clears. Fill a bowl with very hot water. Add a few drops of eucalyptus or peppermint essential oil. Place your face over the bowl and a towel over your head. Inhale the steam for as long as you can and breathe deeply. You can also take a hot shower and breathe in the steam vapors for 5 minutes. Follow either of these remedies 2 or 3 times daily until the congestion goes away.

**Apple Cider Vinegar** Apple cider vinegar is another effective remedy against chest congestion. It helps thin the mucus in the chest, thus relieving congestion and helping you breathe better. Apple cider vinegar also boosts your immunity, which greatly helps prevent chest congestion in the first place. Mix in 1 teaspoon of raw honey. Drink this solution 2 or 3 times a day for a week.

**Turmeric** Turmeric has an active compound called curcumin that helps expectorate the mucus and give you quick relief from chest congestion. Also, its anti-inflammatory property helps deal with cough, pain and other symptoms of chest congestion. Mix a pinch of turmeric powder in a glass of warm water. Gargle with it a few times daily. Mix in 2 teaspoons of honey and a pinch of black pepper. Drink it hot 2 or 3 times daily. Alternatively, thoroughly mix 2 tablespoons each of turmeric powder and apple cider vinegar. Take it 2 times daily. Follow these treatments until the symptoms of chest congestion go away. Turmeric is not recommended for people who have gallstones, hyperacidity or stomach ulcers.

**Ginger** Ginger can also help with chest congestion due to its anti-inflammatory and immune-boosting properties. The polyphenols present in ginger help inhibit the secretion of mucus. Plus, ginger fights infection to get rid of the underlying cause of chest congestion. Add 1 tablespoon of freshly chopped raw ginger pieces to a cup of hot water. Cover and allow it to steep for 5 minutes. Strain, then add a little honey. Alternatively, grind together 1 teaspoon each of dry ginger, black pepper and cloves to form a powder. Divide it into 3 doses and take it 3 times a day with honey or milk. You can even chew small ginger pieces or ginger candies throughout the day to get rid of congestion. Follow these remedies for a few days or until your chest congestion is treated completely.

**Onion** Onion is a good remedy for chest congestion. Plus, it prevents further buildup of mucus in the chest. Its antimicrobial properties also help prevent infection.

Advertisements Extract the juice of 1 onion. Add equal amounts of lemon juice, honey and water. Heat this mixture until it is lukewarm. Drink this solution 3 or 4 times a day. You can also eat raw, baked or cooked onions to help mucus flow easily. Follow these remedies daily until the chest congestion is gone.

**Lemon** Lemon can also help treat chest congestion naturally. The citric acid in lemon reduces the thickness of the mucus, so that it can be expelled from the body easily. Add 1 tablespoon of lemon juice to a glass of hot water along with a little honey. Another option is to add 1 tablespoon of grated lemon zest to a cup of hot water. Strain and drink the warm solution. You can even gargle with it. Follow this treatment 2 or 3 times daily.

**Honey** Honey is another well-known home remedy for chest congestion as it helps reduce the thickness of mucus. This promotes easy removal of mucus from the

respiratory tract. Also, being high in antiviral and antibacterial properties, honey helps fight infection. Eat 1 teaspoon of raw honey alone, or mix it with warm water and drink it. This will alleviate congestion for several hours. Swallow this paste 3 or 4 times daily until you get complete relief from the congestion. Do not give honey to children under age 1 as it can lead to botulism. Garlic is another very effective home remedy for reducing chest congestion. Its antimicrobial and anti-inflammatory properties help fight respiratory infections that cause congestion. Plus, it has nutrients like vitamins A, C and B as well as copper, iron, calcium and selenium that help keep you healthy. Strain and drink it 2 times daily until the congestion clears. Another option is to add 2 crushed garlic cloves and juice from 3 lemons to a cup of very hot water. Drink it while it is still warm to get instant relief. Do this 2 times a day for a few days. Eating fresh garlic cloves can also help relieve congestion. Licorice acts as an expectorant and thus can help relieve some symptoms of chest congestion. It will also help soothe your irritated throat. Cover and allow it to steep for 5 to 10 minutes, then strain. Add a little honey and drink this tea 2 or 3 times a day. Drink it 2 times a day. Follow either of these remedies until your symptoms begin to resolve. Licorice remedies are not suitable for people who have high blood pressure. Additional Tips Drinking chicken soup may help ease chest congestion as it reduces inflammation in the lungs. Drink 1 to 2 cups of strong black coffee regularly. You can also drink green tea or any other herbal tea on a regular basis. Use a humidifier at night. This will help open your nasal passages so that you can breathe much easier. Eat more vitamin-rich fresh fruits and vegetables as well as spicy foods. Stay away from foods that can aggravate congestion, such as dairy products, fried foods, refined foods, frozen foods and rice. Stay hydrated by drinking plenty of fluids. Stay away from carbonated drinks, though. Avoid drinking alcohol and quit smoking to get relief from chest congestion. Keep your room and surroundings clear of dust and bacteria that cause a buildup of mucus. Get sufficient sleep to keep your body strong to fight the congestion. If your chest congestion is due to the flu and you are experiencing fever, chills, body aches and malaise, it is best to consult a doctor for proper diagnosis and treatment.

## Chapter 2 : Congestion Control Mechanisms (Linktionary term)

*Reduce Traffic Congestion Traffic congestion is no fun for anyone, but it's deadly for public transport. When buses and trams are stuck in traffic jams they fall behind schedule and, because this means that more people will be waiting at the next stops, they fall even further behind schedule leading to bunching and compounding delays.*

Depending on your needs, you can make your own steam room or humidifier at home. You can also pick up a humidifier at your local drug store. Cool mist humidifiers are an option, as well. You may find it beneficial to use the humidifier at night and keep it near your bed. Be sure to keep your bedroom door and window closed to keep the vapor from escaping. There are a couple of ways to DIY your own humidifier: Allow your shower to become a sauna Let the water run until it begins to steam up the bathroom. To maximize your steam, step into the shower and close the curtain or door. Use a bowl and a towel For a more targeted steam, place a large bowl in your sink and fill it with hot water. Place a hand towel over your head to help trap the steam around your face. If at any point the heat becomes overwhelming or makes you uncomfortable, remove yourself from the steam. Drinking a glass of cold water can help you cool down and rehydrate. Natural remedies are often beneficial in cases of mild or infrequent congestion. Give these natural options a shot: Take honey Researchers in one study found evidence to suggest that buckwheat honey may be more effective than traditional medication at relieving cough. The researchers enrolled children between the ages of 2 and 18 to participate. They received buckwheat honey, a honey-flavored cough suppressant known as dextromethorphan, or nothing at all. Results revealed that parents found buckwheat honey to provide the most symptom relief for their kids. You can purchase buckwheat honey at most health food stores and specialty food shops. Simply take a spoonful every few hours like you would any cough medicine. Use essential oils Certain essential oils may help loosen mucus in the chest. Peppermint oil and eucalyptus oil are also used as natural decongestants. You can make use of essential oil in one of two ways: If you want to diffuse the oil into the air, you can pick up a diffuser from your local drug store. You can also add a couple of drops of the oil to a hot bath or bowl of hot water so the scent is released into the air. For a more targeted approach, fill a bowl with hot water and a few drops of the essential oil. Lean over the bowl and cover your head with a hand towel to help trap the steam. Breathe in the steam for 5 to 10 minutes. To do this, mix your essential oil with a carrier oil, like jojoba or coconut oil. The carrier oil helps dilute the essential oil and reduces your risk of irritation. A good rule of thumb is 12 drops of carrier oil for every 1 or 2 drops of essential oil. Then, apply the diluted oil to the inside of your forearm. Repeat as needed throughout the day. Never apply an essential oil to inflamed, irritated, or injured skin. You should also keep all essential oils away from your eyes. Take a decongestant Decongestants are available in liquid, tablet, or nasal spray form at your local drug store. Common OTC options include: A decongestant can speed up your heart rate and make it harder to fall asleep. You may find it better to take during the daytime. In one study , researchers studied children who received either vapor rub treatment, petrolatum ointment, or no medication. Vapor rub scored the highest in providing relief from cough and congestion. You can purchase vapor rubs at any drug store. Common OTC chest rubs that contain camphor and menthol include:

### Chapter 3 : 24 Best Home Remedies for Chest Congestion You should Try (Edited )

*Nasal congestion can be more than merely annoying; it can be downright Nasal congestion occurs when a cold or allergies cause the nasal cavity to swell and mucus to build, making it tougher to breathe.*

Whatever the cause – a sinus infection, allergies, a cold, or the flu – dealing with congestion can leave you feeling tired and dreary. Stringer, MD , professor and chairman of otolaryngology and communication sciences at the University of Mississippi Medical Center in Jackson. This causes swelling in your nasal passages, which makes it difficult to breathe. If you use decongestants for more than three to five days, you may cause rebound swelling in your nasal passages, which can lead to a vicious cycle: Rebound swelling causes you to take more of the drug, but increased dosage causes it to lose its effectiveness, which then leads to even more use. And you may already have other powerful ingredients on hand, like salt or garlic, in your pantry – both of which researchers believe may have an effect on congestion and colds. Read on to find out more about how to breathe easier with these non-drug approaches. Thinkstock Add Moisture to the Air With a Humidifier or Vaporizer Battling a cold or the flu can leave you feeling dried out and dehydrated , so many people turn to humidifiers or vaporizers to relieve congested sinuses. Humidifiers help break up congestion by adding moisture to the air, which helps to thin the mucus in your nose. Also be sure to keep your humidifier clean to prevent the growth of bacteria and mold. Follow the cleaning instructions that come with the humidifier, or simply wipe it down every day with a 10 percent bleach solution nine parts water to one part bleach. Used for centuries by yoga and Ayurvedic practitioners in India, nasal irrigation is a gentle and effective way to clear the nasal passages of mucus and allergens. To use this natural remedy, fill the neti pot with a saline solution made of warm water and salt, then insert the spout into one nostril while you tilt your head to the other side, allowing the solution to flow up into your nasal passage and then out the other nostril. When making the saline solution, pharmaceutical grade salt is recommended. Researchers at the University of Michigan in Ann Arbor , who studied adults with chronic nasal and sinus problems, found that people treated with nasal irrigation had greater improvement of symptoms over two months than those treated with saline sprays. In addition, researchers in China found that nasal irrigation with saline reduced the need for steroid sprays in children with allergies. Neti pots are safe to use on a daily basis. Researchers who split up a group of people with cold and flu symptoms , giving half of them a room-temperature drink and the other half a hot drink, found that there was no measurable improvement in nasal stuffiness in either group. But interestingly, the group that drank the hot drink reported greater relief from symptoms. Researchers also speculated that in addition to the placebo effect, the taste of the hot drink also contributed to the favorable response. These have been used traditionally in many cultures, and are safe, but have limited research evidence backing their use specifically for nasal congestion. A few herbal treatments, especially menthol and eucalyptus oil, can also help ease a stuffy nose. Menthol, a derivative of peppermint oil , can be found in inhaled balms and rubs for congestion. For a soothing way to possibly improve chest congestion, try a eucalyptus oil steam: Take a steaming bowl of water and add a few drops of eucalyptus oil. Breathe in the steam for about 10 minutes. Thinkstock Apply Hot or Cold Packs to Congested Sinuses Another common natural treatment for congestion is applying hot or cold packs across the bridge of your nose. For a ready-made cold pack, take a bag of frozen peas or other frozen vegetables out of your freezer, wrap it in a towel, and lay it across your face. For a hot pack, wring out a wet washcloth and heat it in the microwave for approximately one minute. You can also breathe in some garlic steam: This can create a vicious cycle because you need lots of rest to get over a cold or the flu, but the difficulty you have breathing at night can make it hard to sleep. The solution is to help your body stay as congestion-free as possible while you sleep. For starters, put an extra pillow or two under your head, as this will help drain your sinuses. Make sure your bedroom climate is humid, and run a humidifier while you sleep to further thin the mucus in your nose. For another natural remedy, try nasal breathing strips, which lift the sides of the nose to help open nasal passages. If you experience other symptoms, such as a high fever, one-sided nose bleeds, wheezing or shortness of breath, or persistent facial or tooth pain, see a doctor right away.

### Chapter 4 : TCP congestion control - Wikipedia

*Congestion Control refers to techniques and mechanisms that can either prevent congestion, before it happens, or remove congestion, after it has happened. Congestion control mechanisms are divided into two categories, one category prevents the congestion from happening and the other category removes congestion after it has taken place.*

Throat pain Home Remedies for Chest Congestion Chest congestion is a very common symptom noticed in most of people, including toddlers, young children, and adults. We always refer a doctor, if we are suffering with chest congestion. Very few people take out time to utilize some home remedies for treatment of chest congestion. We never know that some ingredients, present in the kitchen, can work so effectively for health problems, like chest congestion. Take a look at some easy and natural home remedies for chest congestion.

**Salt Water Gargle** One of the mostly used home remedies for chest congestion is salt water gargle. Gargling with saline water helps in removing mucus from respiratory tube. Put one glass of water to boil. Add tablespoons of salt in it. Stir it well and add a pinch of turmeric powder to it. Take a swig of warm water and gargle for minutes. Repeat the process, four or five times a day to experience a soothing effect.

**Onion and Honey** Onion has anti-inflammatory properties. It is an effective remedy for curing chest congestion, when used with honey. Place a slice of onion in a bowl and cover it with honey. Let it stay for overnight. The next day, remove onion from it and consume this onion soaked honey, 4 times a day. Take one teaspoon of honey at a time. You can also have raw, baked, or cooked onions to help mucus flow easily.

**Bay Leaf** Bay leaf is a very beneficial herb, which is a natural remedy for several health problems, including chest congestion. For curing chest congestion, one can have tea prepared from bay leaves. For this, you are required to take fresh bay leaves and put them into a cup of boiling water. Let it soak for some time. You can also use bay leaves as a hot compress. Put some bay leaves in hot water. Boil it for some time. Now, dip a clean cloth in the strained water and place it on the chest to get relief from chest congestion.

**Lemons** To get rid of mucus-forming bacteria in the respiratory system, lemons are the best remedy. You are advised to add some grated lemon rind or a lemon wedge in a cup of hot water. Let it steep for five minutes. Drink the water after straining it. You can also this solution for gargling.

**Ginger** Ginger is very soothing for throat as well as a natural remedy for chest congestion relief. Add one small piece of ginger in hot water. Add two or three black pepper in the water and strain it in a glass. Stir it well adding one tablespoon of honey to it. Drink it twice or thrice a day to relieve congestion as well as cough from chest. Another way to use ginger is to add one teaspoon of ginger in a glass of hot water. Put a pinch of ground cloves and cinnamon in it. After filtering, drink it. You can also consume raw ginger.

**Thyme** To get relief in chest congestion, thyme is an effective natural remedy. This natural herb makes lungs so strong to fight against the mucus-causing bacteria. Thyme acts as a protecting shield against bacteria. Soak it for five minutes and add a little honey to make it sweet. Drink this herbal tea. You can also use diluted thyme oil for chest congestion. Mix olive oil or corn oil with thyme oil in 1: Rub it gently on the chest to relieve discomfort.

**Hot Tea with Lemon and Honey** One of the simplest home remedies for chest congestion is hot tea with lemon and honey. To get relief in sore throat, prepare tea and add a little honey and lemon juice in it. Drink it to get a calming relief in the throat and chest.

**Boiled Vinegar** Vinegar is one of the essential remedies for various ailments. It is also beneficial against chest congestion. Boil some vinegar and use it for inhaling its vapours.

**Black Coffee** Black coffee is also an effective remedy against chest congestion. When you suffer with shortness of breath and cough, consume two or three cups of black coffee. Caffeine present in coffee acts like a medication against shortness of breath and clears mucus.

**Apple Cider Vinegar** Apple cider vinegar is an effective remedy against chest congestion. Vinegar helps in killing bacteria, which causes mucus in the chest and throat. It relieves congestion and helps in breathing better than before. It is awful in taste but is effective. Swig down a shot of apple cider vinegar. For best results, follow this method after every eight hours. Note- If you over drink it; your stomach will get upset.

## Chapter 5 : Network congestion - Wikipedia

*Agile-SD is a Linux-based Congestion Control Algorithm (CCA) which is designed for the real Linux kernel. It is a receiver-side algorithm employs a loss-based approach using a novel mechanism, called Agility Factor (AF).*

David Levinson So your city has traffic congestion. Welcome to the club. Congestion not only wastes time, it increases pollution and crashes. While this undoubtedly annoys you as a traveler, it could be worse; your city might not have congestion because no one wants to be there. Still, it would be great to have a thriving city without congestion. People could reach more destinations in less travel time, and thus have more time to spend doing the things they wanted. If you figure it out, let us know. Congestion, due in part to weather, on I This is probably because policy-makers want to sound like they are doing something without promising anything. There are a number of proffered solutions out there. This article outlines 21 ways that congestion could be solved. Some of these are dumb, many are good, one is great. This is what we do with most things if we can. If our house is too small, we make it bigger. If the internet is too slow, we add capacity. In roads, this usually means adding lanes to existing roads. The first problem with this solution is that it is expensive. Further, if you expand capacity, demand will respond. New induced developments will be built, and much of the capacity will quickly be used up by new travelers. There will still likely be a small amount of travel time saved for existing travelers, and the new travelers do gain benefits otherwise why would they make the trip , so it is not necessarily a bad thing, but it may not solve your congestion problem. The End of Traffic and the Future of Access Connectivity “ Often the problem is not width of the road, but where it goes. So reducing the circuitry indirectness of the network through selected connections can reduce congestion and total traffic by taking traffic off of longer routes. Even when there is nominal connectivity, it might not be very good. A bridge can replace much slower and lower capacity ferries, eliminating a bottleneck. But as with capacity expansions above, it can be very expensive. In a mature network, all the cheap and useful roads have been built already. The induced demand outcome also applies. Closure “ Perhaps counter-intuitively, if we shut down key links on the network, we could also reduce congestion. Just as there is induced demand when capacity is added, there is reduced demand when it is taken away. Controls “ The next most obvious solution is to use the infrastructure we have better. When we have a stop-sign controlled intersection, and there are long queues, we add traffic lights, which manage traffic better because there is less time lost in starting and stopping. Coordinating traffic lights on a city street grid can make sure more vehicles hit green lights. The use of controls on freeways includes devices like ramp meters , the traffic lights at freeway on-ramps, that manage the input flow to keep the freeway flowing more freely than it otherwise would. Traffic engineers have suites of controls that try to squeeze in a few more cars on the same set of pavement by reducing the size of gaps between vehicles. These can help, and may be worthwhile. And these gains are potentially absorbed by both general traffic growth where that occurs, and induced demand in a mature system. Crashes “ It is sometimes estimated that half of all delay is due to non-recurring congestion, most notably crashes. First, we want people not to crash. Crashes can be reduced by better designed roads. Crashes can also be reduced with better-trained drivers. Making licensure more difficult so the drivers are better is one strategy. Making driving more expensive so fewer people and especially fewer marginal drivers are driving is also significant. More importantly, crashes can be reduced by better-designed drivers. Over the longer term, we need to replace the human with the machine. Second, we want crashes to be cleared quickly. Quick emergency response helps save injured travelers. Construction “ Maintaining roads is important, without proper maintenance they would eventually cease to be. The alternative, trying to do construction one lane at a time will take much longer. So for a 4 lane road, closing one lane at a time for 6 months each will take 2 years, but closing all 4 lanes, and requiring travelers to detour might take less than six months as it is more efficient. Doing all work at night or weekends is another strategy. The cost of the delays vs. Competing modes “ Just as widening a road is in theory a solution to a congestion problem, building a competing mode is also a theoretical solution. By building a rapid transit line or running an express bus, or even building sidewalks and bike lanes, other people may switch off the road, leaving the roads faster for the rest of us. The traditional induced demand

argument follows. As with railroads, the gauge of roads has been largely determined, with freeway lanes being 12 feet wide, and cars, buses, and trucks are narrower so that they fit. Lanes on surface streets vary a bit more, but tend to be similarly sized in newer developments. Most cars carry one person most of the time, but are sized for at least 4, 2 in parallel, and 2 rows. If cars were half as wide, we could fit twice as many in the same space. This is what we do with motorcycles and bicycles. Pedestrians can even fit more. Now the carriage is brought along whether it is needed or not, wasting space and delaying others. Redefining the gauge of road lanes, so that lanes at least are split for narrower cars could double capacity. Storage

On surface streets, we waste pavement storing parked cars. A lane or turn-lane or half-lane or bike-lane or bus-lane can often be added in the space devoted to unmoving metal, increasing throughput. Adjacent property owners are often under the mistaken impression they or their customers have a right to park for free! When there is no congestion, this is not a problem. Where there is congestion, this artificial right is costly to society.

Information

People are terribly inefficient routers, choosing routes that are not only not the shortest for society which is to be expected but not the shortest for themselves either. Autonomy

While humans can barely safely drive with a two-second following distance between vehicles, autonomous vehicles with advanced sensors, in an environment where most or all the cars are autonomous, are expected to follow at less than one-second. That doubles capacity right there. How well this work on city streets, as opposed to freeways, remains to be seen, but up to a four-fold increase in freeway vehicle capacity just from autonomous vehicles is well-within the realm of possibility, and while it will induce demand, should buy significant congestion reduction gains. Even non-freeways will benefit as more travelers switch to the less congested freeways. The first set of strategies are basically supply side. But congestion is caused by a mismatch of supply and demand. While at some level, people coordinate location of origin and destination they are usually in the same metropolitan area, they could certainly do so better. From a public policy perspective, moving more jobs out to where people live, and more people to where the jobs are, increasing the local balance between jobs and housing can reduce travel. In practice this is difficult, as there is no mechanism to require people to take local jobs or firms to employ local residents. The best municipalities can do is ensure the zoning permits developers to build appropriate developments. Still, ensuring the opportunities are there is one thing and at best you can ensure developers are permitted to develop these opportunities, ensuring people partake of those opportunities is another. The cost of this also needs to be considered. There are reasons many firms like to locate near other firms rather than workers, which has to do with economies of agglomeration and the efficiencies that can be had from close inter-firm coordination. Telecommuting

At the extreme of mutually co-locating home with respect to work is working at home. This involves no commuting travel outside the home, though may induce some additional non-work travel outside the peak. This has been growing slowly over the past decades, and is amenable for many, but by no means most, jobs. Like location, this is largely an individual decision. Better broadband would help, and encouraging employers to allow or require employees to work from home would not reduce this trend, but it is hard to see outside of money or regulation in some form what persuades firms to behave differently with regards to incentives for where employees work. Still, the more people that tele-commute tele-shop, etc. We could stagger work hours, so not everyone arrived at work at the same time. Some large firms already do this, but it could be expanded. The downside is that the whole point of everyone going to work at the same time is that they be there together or at the same time as customers and vendors so that can collaborate. The point of going to work is only in part the ability to use expensive machinery in isolation. It is also about the gains from cooperation of people being at the same place at the same time. Sequencing

We do not begin and end all trips at home, we chain our trips together to reduce the total amount of travel. We go from work to the store to another store to home. This not only saves us time, it reduces congestion. Do this more systematically, with a little more planning, and you can reduce more congestion. Shipping

Just as chaining trips may be efficient for you, chaining trips may be good for your goods. Sharing

Carpooling has been around since the dawn of cars, and sharing the back of a horse, camel, or llama before that. It is easiest when there are two people going from the same place to the same place like members of the same family going from home to work at the same time.

### Chapter 6 : What is Congestion Control? Describe the Congestion Control Algorithm commonly used

*Network Congestion Management: Considerations and Techniques 2 Introduction to Access Network Congestion*  
Network congestion is defined as the situation in which an increase in data transmissions results in a.

Stuffy nose relief A stuffy nose can be annoying. You sound funny when you talk. And just when you want to blow your nose to finally breathe again, nothing comes out. Many people think a stuffy nose is the result of too much mucus in the nasal passages. However, a clogged nose is actually caused by inflamed blood vessels in the sinuses. These irritated vessels are usually triggered by a cold , the flu , allergies , or a sinus infection. Regardless of the reason for your stuffed-up nose, there are easy ways to relieve it. Here are eight things you can do now to feel and breathe better. We pick these items based on the quality of the products, and list the pros and cons of each to help you determine which will work best for you. We partner with some of the companies that sell these products, which means Healthline may receive a portion of the revenues when you buy something using the links below. Use a humidifier A humidifier provides a quick, easy way to reduce sinus pain and relieve a stuffy nose. The machine converts water to moisture that slowly fills the air, increasing the humidity in a room. Breathing in this moist air can soothe irritated tissues and swollen blood vessels in your nose and sinuses. Humidifiers also thin the mucus in your sinuses. This can help empty the fluids in your nose and return your breathing to normal. Put a humidifier in your room to ease the inflammation causing your congestion. Take a shower Have you ever had a stuffy nose and found that you could breathe so much better after a hot shower? The steam from a shower helps to thin out the mucus in your nose and reduce inflammation. Taking a hot shower can help your breathing return to normal, at least for a little while. You can get the same effect by breathing in steam from hot water in a sink. Turn on the hot water in your bathroom sink. Once the temperature is right, place a towel over your head and put your head over the sink. Allow the steam to build, and take in deep breaths. Be careful not to burn your face on the hot water or steam. Stay hydrated Keep the fluids flowing when your nose is stuffed up. They help thin the mucus in your nasal passages, pushing the fluids out of your nose and decreasing the pressure in your sinuses. Less pressure means less inflammation and irritation. If your stuffy nose is accompanied by a sore throat , warm tea and soup will help ease the discomfort in your throat, too. Use a saline spray Take hydration one step further with saline, a saltwater solution. Using a nasal saline spray can increase the moisture in your nostrils. The spray helps thin the mucus in your nasal passages. This decreases the inflammation of your blood vessels and helps empty fluids from your nose. Numerous saline sprays are available over the counter. Some saline sprays also include decongestant medication. Talk to your doctor before you begin using saline sprays with decongestants. They may actually make your congestion worse if used for more than three days. They can also cause side effects when used along with other medications. A neti pot is a container designed to flush mucus and fluids out of your nasal passages. Stand with your head over a sink. Place the spout of the neti pot in one nostril. Tilt the neti pot until water enters your nasal passage. Once the water flows into your nostril, it will come out through your other nostril and empty into the sink. Do this for about one minute, and then switch sides. Use a warm compress A warm compress may help unclog a stuffy nose by opening the nasal passages from the outside. To make a warm compress, first soak a towel in warm water. Squeeze the water out of the towel, then fold it and place it over your nose and forehead. The warmth can provide comfort from any pain and help relieve the inflammation in the nostrils. Repeat this as often as necessary. Try decongestants A decongestant medication can help reduce swelling and ease pain associated with irritated nasal passages. They come in two forms: Common decongestant nasal sprays include oxymetazoline Afrin and phenylephrine Sinex. Common decongestant pills include pseudoephedrine Sudafed, Sudogest.



## Chapter 7 : TCP (Transmission Control Protocol) Congestion Control | Noction

*There are certain times of the day when there is always going to be a lot of traffic. While this can't be avoided with the number of people working 8- or 9-to-5 shifts, there are ways your own driving habits can help minimize the magnitude of congestion in your area.*

The "Tahoe" algorithm first appeared in 4. Improvements were made in 4. If three duplicate ACKs are received i. Fast recovery Reno only [ edit ] In this state, TCP retransmits the missing packet that was signaled by three duplicate ACKs, and waits for an acknowledgment of the entire transmit window before returning to congestion avoidance. If there is no acknowledgment, TCP Reno experiences a timeout and enters the slow start state. University of Arizona researchers Larry Peterson and Lawrence Brakmo introduced TCP Vegas, named after the largest Nevada city, in which timeouts were set and round-trip delays were measured for every packet in the transmit buffer. In addition, TCP Vegas uses additive increases in the congestion window. During fast recovery, for every duplicate ACK that is returned to TCP New Reno, a new unsent packet from the end of the congestion window is sent, to keep the transmit window full. For every ACK that makes partial progress in the sequence space, the sender assumes that the ACK points to a new hole, and the next packet beyond the ACKed sequence number is sent. Because New Reno can send new packets at the end of the congestion window during fast recovery, high throughput is maintained during the hole-filling process, even when there are multiple holes, of multiple packets each. When TCP enters fast recovery it records the highest outstanding unacknowledged packet sequence number. When this sequence number is acknowledged, TCP returns to the congestion avoidance state. A problem occurs with New Reno when there are no packet losses but instead, packets are reordered by more than 3 packet sequence numbers. When this happens, New Reno mistakenly enters fast recovery, but when the reordered packet is delivered, ACK sequence-number progress occurs and from there until the end of fast recovery, every bit of sequence-number progress produces a duplicate and needless retransmission that is immediately ACKed. TCP Hybla[ edit ] TCP Hybla [15] aims to eliminate penalization of TCP connections that incorporate a high-latency terrestrial or satellite radio link, due to their longer round-trip times. It stems from an analytical evaluation of the congestion window dynamics, which suggests the necessary modifications to remove the performance dependence on RTT. BIC is used by default in Linux kernels 2. It is a receiver-side algorithm employs a loss-based approach using a novel mechanism, called Agility Factor AF. It has been proposed by Mohamed A. The bandwidth is estimated by properly low-pass filtering the rate of returning acknowledgment packets. The rationale of this strategy is simple: It has been widely deployed in Windows versions since Microsoft Windows Vista and Windows Server and has been ported to older Microsoft Windows versions as well as Linux. The algorithm ensures that the window size after recovery is as close as possible to the slow start threshold. But finally BBR is not the best in all the cases, and we have to deal with 13 different algorithms. While most congestion control algorithms are loss-based, in that they rely on packet loss as a signal to lower rates of transmission, BBR is model-based. The algorithm uses the maximum bandwidth and round-trip time at which the network delivered the most recent flight of outbound data packets to build an explicit model of the network. Each cumulative or selective acknowledgment of packet delivery produces a rate sample which records the amount of data delivered over the time interval between the transmission of a data packet and the acknowledgment of that packet. He calls it "not scalable" and says it "has the ability to slaughter concurrent loss-based flows". If used with one flow, they confirmed the claimed features, but also found "some severe inherent issues such as increased queuing delays, unfairness, and massive packet loss". Other TCP congestion avoidance algorithms[ edit ].

### Chapter 8 : 20 Home Remedies for Chest Congestion Relief - Home Remedies

*Congestion is, in principle, a mostly solvable problem, even if no fast-growing city has fully solved it. This article outlines 21 ways that congestion could be solved. Some of these are dumb, many are good, one is great.*

Search Linktionary powered by FreeFind Note: Many topics at this site are reduced versions of the text in "The Encyclopedia of Networking and Telecommunications. This topic is presented in its entirety as a sample topic. Congestion is a problem that occurs on shared networks when multiple users contend for access to the same resources bandwidth, buffers, and queues. Think about freeway congestion. Many vehicles enter the freeway without regard for impending or existing congestion. As more vehicles enter the freeway, congestion gets worse. Eventually, the on-ramps may back up, preventing vehicles from getting on at all. In packet-switched networks, packets move in and out of the buffers and queues of switching devices as they traverse the network. In fact, a packet-switched network is often referred to as a "network of queues. Buffers help routers absorb bursts until they can catch up. If traffic is excessive, buffers fill up and new incoming packets are dropped. Increasing the size of the buffers is not a solution, because excessive buffer size can lead to excessive delay. Congestion typically occurs where multiple links feed into a single link, such as where internal LANs are connected to WAN links. Congestion also occurs at routers in core networks where nodes are subjected to more traffic than they are designed to handle. There are no virtual circuits with guaranteed bandwidth. Packets are injected by any host at any time, and those packets are variable in size, which make predicting traffic patterns and providing guaranteed service impossible. While connectionless networks have advantages, quality of service is not one of them. Shared LANs such as Ethernet have their own congestion control mechanisms in the form of access controls that prevent multiple nodes from transmitting at the same time. End-system flow control This is not a congestion control scheme, but a way to prevent the sender from overrunning the buffers of the receiver. See " Flow-Control Mechanisms. The mechanism is similar to end-to-end flow controls, but the intention is to reduce congestion in the network, not the receiver. Network-based congestion avoidance In this scheme, a router detects that congestion may occur and attempts to slow down senders before queues become full. Resource allocation This technique involves scheduling the use of physical circuits or other resources, perhaps for a specific time period. A virtual circuit, built across a series a switches with a guaranteed bandwidth is a form of resource allocation. This technique is difficult, but can eliminate network congestion by blocking traffic that is in excess of the network capacity. A list of related topics may be found on the related entries page. Caching is probably the ultimate congestion control scheme. By moving content closer to users, a majority of traffic is obtained locally rather than being obtained from distant servers along routed paths that may experience congestion. Caching has become a serious business on the Internet, as discussed under " Content Distribution. Buffers on network devices are managed with various queuing techniques. Properly managed queues can minimize dropped packets and network congestion, as well as improve network performance. The most basic technique is FIFO first-in, first-out , where packets are processed in the order in which they arrive in the queue. Going beyond this, a priority queuing scheme uses multiple queues with different priority levels so that the most important packets are sent first. An important queuing technique is to assign flows to their own queues. This differentiates flows so that priorities can be assigned. Just as important, each flow is responsible for making sure that it does not overflow its own queue. Separating queues in this way ensures that each queue only contains packets from a single source. See " Queuing " for more information. Congestion Control in Frame Relay While this topic is primarily about congestion problems in connectionless packet-switched networks, it is useful to examine the way congestion is handled in a connection-oriented network. Frame relay provides a good example. Frame relay subscribers negotiate a CIR committed information rate with the service provider. The CIR is the guaranteed level of service, but providers usually allow subscribers to burst over this level if network capacity is available. However, frames in excess of the CIR are marked as discard eligible. If a switch on the network becomes congested, it will drop discard eligible frames. This ensures that the service providers can meet their negotiated CIR levels for subscribers. Dropping frames is never a good idea, so two congestion avoidance

mechanisms are available: BECN backward explicit congestion notification When a switch starts to experience congestion i. FECN forward explicit congestion notification When a switch starts congesting, it can send a frame in the forward direction to receiving nodes with the FECN bit set. This informs the forward nodes that they should inform the sender to slow down. Note that sender or receiver do not need to respond to BECN or FECN, but eventually, network switches will drop frames as congestion continues to increase. Individual connections used flow controls between sender and receiver to prevent the sender from overwhelming the receiver. However, the early Internet consisted of a large number of relatively slow links, so congestion was not the problem it is today. In the late s, Van Jacobson developed the congestion control mechanisms that make TCP respond to congestion in the network. The basic "signal" is a dropped packet, which causes the host to stop or slow down. Normally, when a host receives a packet or set of packets , it sends an ACK acknowledgement to the sender. A window mechanism allows the host to send multiple packets with a single ACK as discussed under " Flow-Control Mechanisms. In either case, the sender slows down or stops. If you graphed the flow, you would see a sawtooth pattern where the number of packets increases additive increase until congestion occurs and then drops off when packets start to drop multiplicative decrease. The window size is typically halved when a congestion signal occurs. What the host is doing is finding the optimal transmission rate by constantly testing the network with a higher rate. Sometimes, the higher rate is allowed, but if the network is busy, packets start to drop and the host scales back. This scheme sees the network as a "black box" that drops packets when it is congested. Therefore, congestion controls are run by the end systems that see dropped packets as the only indication of network congestion. A sender that is transferring a large file will push for a higher rate until eventually it grabs all the bandwidth. Other hosts may have trouble getting packets through. Often, the host that has grabbed the bandwidth is transmitting the least important traffic. The effect is especially disruptive to real-time traffic such as voice. Even if a link has sufficient bandwidth to handle its load, ill-behaved hosts can saturate the link although briefly enough to disrupt voice traffic in a way that is perceptible to users. Of course, the network can take an active role in managing congestion. That is where "active queue management" and congestion avoidance come into play, as discussed later. The group divided congestion handling into the following: Congestion recovery Restore the operating state of the network when demand exceeds capacity. Congestion avoidance Anticipate congestion and avoid it so that congestion never occurs. RFC states that the Internet would cease to operate without congestion recovery, but has operated a long time without congestion avoidance. Today, congestion avoidance is an important tool for improving the performance and QoS of the Internet. RFC Recommendations on Queue Management and Congestion Avoidance in the Internet, April states that router-based mechanisms for controlling congestion can be divided into "queue management" algorithms and "scheduling" algorithms. Refer to this RFC for useful information about congestion controls, congestion avoidance schemes, and queue scheduling techniques. An important goal is to minimize the number of dropped packets. If a host is transmitting at a high rate and the network go into congestion, a large number of packets will be lost. Congestion avoidance attempts to prevent this without putting limits on network throughput. RFC points out that it is better to accept the fact that there will be bursts that overflow queues rather than try to maintain queues in a non-full state. That would essentially translate to favoring low end-to-end delay over high throughput. The RFC also notes the following: The point of buffering in the network is to absorb data bursts and to transmit them during the hopefully ensuing bursts of silence. This is essential to permit the transmission of bursty data. It should be clear why we would like to have normally-small queues in routers: The counter-intuitive result is that maintaining normally-small queues can result in higher throughput as well as lower end-to-end delay. In short, queue limits should not reflect the steady state queues we want maintained in the network; instead, they should reflect the size of bursts we need to absorb. Keep in mind that bursts can disrupts multiple hosts. If a single hosts fills a queue being used by multiple hosts, all of the hosts will need to back off. This results in a period in which the network is underutilized because hosts are sending packets at a lower rate. But eventually, they start building back up with a need to retransmit dropped packets. What happens then is that all the hosts that previously backed off try to resend at about the same time, causing another congestion state. This is called the "global synchronization" problem. Keep in mind is that TCP

handles congestion control. UDP is typically used for real-time audio and video streams because there is no need to recover lost packets. So long as TCP operates only in the end-stations its operation cannot be substantially improved. Users are severely impacted by the slow start-up rate and high delay variance inherent with TCP.

## Chapter 9 : How to Get Rid of Sinus Congestion: 13 Steps (with Pictures)

*Nasal congestion and sinus pressure have many causes: colds, the flu, and allergies to name a few. Whatever your triggers are, the symptoms can get to you. Whatever your triggers are, the symptoms.*

A major weakness is that it assigns the same price to all flows, while sliding window flow control causes burstiness that causes different flows to observe different loss or delay at a given link. Classification of congestion control algorithms[ edit ] Among the ways to classify congestion control algorithms are: By type and amount of feedback received from the network: Loss; delay; single-bit or multi-bit explicit signals By incremental deployability: Only sender needs modification; sender and receiver need modification; only router needs modification; sender, receiver and routers need modification. Max-min fairness; proportionally fair; controlled delay Mitigation[ edit ] A few mechanisms have been invented to prevent network congestion or to deal with a network collapse: Provided all endpoints do this, the congestion lifts and the network resumes normal behavior. The most common router congestion avoidance mechanisms are fair queuing and other scheduling algorithms , and random early detection , or RED, where packets are randomly dropped, proactively triggering the endpoints to slow transmission before congestion collapse occurs. Fair queuing is most useful in routers at chokepoints with a small number of connections passing through them. Larger routers must rely on RED. Some end-to-end protocols behave better under congested conditions. TCP is perhaps the best behaved. UDP does not control congestion. Protocols built atop UDP must handle congestion independently. Protocols that transmit at a fixed rate, independent of congestion, can be problematic. Real-time streaming protocols, including many Voice over IP protocols, have this property. Thus, special measures, such as quality-of-service routing, must be taken to keep packets from being dropped. In general, congestion in pure datagram networks must be kept at the periphery of the network, where the above mechanisms can handle it. Congestion in the Internet backbone is problematic. Cheap fiber-optic lines have reduced costs in the Internet backbone allowing it to be provisioned with enough bandwidth to keep congestion at the periphery. Various network congestion avoidance processes, support different trade-offs. All flows that experience port queue buffer tail-drop begin a TCP retrain at the same moment – this is called TCP global synchronization. Active queue management[ edit ] Active queue management AQM is the reorder or drop of network packets inside a transmit buffer that is associated with a network interface controller NIC. This task is performed by the network scheduler. RED indirectly signals to sender and receiver by deleting some packets, e. The average queue buffer lengths are computed over 1 second intervals. A policy could then divide the bandwidth among all flows by some criteria. With this method, a protocol bit is used to signal explicit congestion. The sender should respond by decreasing its transmission bandwidth, e. Dynamic buffer limiting[ edit ] Cisco Systems Engine IV and V has the capability to classify flows as aggressive bad or adaptive good. It ensures that no flows fill the port queues. TCP window scale option Congestion avoidance can be achieved efficiently by reducing traffic. When an application requests a large file, graphic or web page, it usually advertises a "window" of between 32K and 64K. This results in the server sending a full window of data assuming the file is larger than the window. When many applications simultaneously request downloads, this data creates a congestion point at an upstream provider by flooding the queue. By using a device to reduce the window advertisement, the remote servers send less data, thus reducing the congestion. This technique can reduce network congestion by a factor of Effective congestion notifications can be propagated to transport layer protocols, such as TCP and UDP, for the appropriate adjustments. This is true in nearly all cases; errors during transmission are rare. However, this causes WiFi , 3G or other networks with a radio layer to have poor throughput in some cases since wireless networks are susceptible to data loss due to interference. The TCP connections running over a radio based physical layer see the data loss and tend to erroneously believe that congestion is occurring. Short-lived connections[ edit ] The slow-start protocol performs badly for short connections. Older web browsers created many short-lived connections and opened and closed the connection for each file. This kept most connections in the slow start mode, which slowed response times. To avoid this problem, modern browsers either open multiple connections simultaneously or reuse one connection for all

files requested from a particular server. Initial performance can be poor, and many connections never get out of the slow-start regime, significantly increasing latency. Admission control[ edit ] Admission control requires devices to receive permission before establishing new network connections. If the new connection risks creating congestion, permission can be denied.