### 计网week1-tutorial 9月5日 10:35 H1 Pro录音

说话人1 00:00  
It wants to the company, is it? The 2000 I could find the market can come on. So we just continue. Basically, we run the market. What's happening is called the updating. Basically, the money is probably a typical is after a lecture. And we give you a set of questions. We briefly talk about the several slides related to this tutorial. Once finishing this. I knew you guys about 10 to 15 minutes of working your own solution.

Then I give you this questions, solution, everybody, you already done. One of the tomorrow questions already, right? You need to work here before you come here to. I kind of sorry, sometimes you bring your question. It may be efficient. Otherwise, you just sit here, and then I tell you the solution, then you go home, you forgot. Okay. All right. And this is not cool. We prepare this kind of a lot of time to talk about the internet is right technology, but very important concept. Internet is through share the resource about the packets which is gamma. That means you got the package is right giving the application message. You chop into many evil size, the package, the package forward following the store and forward. That means every limit, each time, you only one single package, only thing the package already, some assessment receive the procedure, the next term, formal related.

So also, we talk about how to calculate the transmission delay, basically the package side, giving the package. You can put a different aside in the middle. We were talking about that the competition rate already, and then you got capital how we found this. For this type of calculation. Basically, the question is, you always memorize the different unit. You should be followed in the same unit in regulation. Otherwise, you get the area. Another concept we talk about the package. In terms of delay, you have to have actually 40 from the sources is right. Why is the relation this package? In the rotor delay, the other package transition to next communicate today? In terms of the model, the robot is why is a very easy understand in coming the package? Raise a lot of outgoing capital rate, so you can buffer, so you need wedding in the buffer, in the next available, upgrading the transmission.

Then we have so called in the local processing the age. And this package you have market or outgoing means we all committees should relate. So you need to change that. I guess the whole table release also take time, so you turn to wrote on two time today. Why? Once a persistent delay, once a truly delay, then now you are watching your schedule, okay? The precision transmission, the transmission of k one transition delay, this determined by this impact, aside small. And in practice, given the fire, you can see given the practical size, ok not outside airport, then also depends on what's the capacity. But in great, where hard can we be available? Take it, where so can be great, where is low? So this is related. The package and transition.

Now, there is a propagation rate is because from this group of this program, how long as I said, in better part of it? If you have 100 kilometers, if you use the optimal level, that's the workshop you can ignore. But if you content of the continent that is a problem, let's say, from australia, to this, even to the west coast of los angeles, that's also reality is 12,000 kilometers.

In that case, the propagation debate is cannot ignore ok so this is nothing to do with your private transmission rate, rather physical distance. And this is a particular kind of single. The physical medium speak, make the decision. Okay, for example, do you use the market speed? Maybe faster? All right? Also we talk about the store and the forwards again I capital that dog. Then I guess the traditional talk about circuits, which circuits, which basically you talk about resources loosely, nobody can occupy until you finish, you release. Let's have two different ways to do that. Why is so called fdn fda frequency, the specifically by the why is why and how different the bad sometimes you really heard about that.

So i'm trying to different kind of pharmacy. This is pharmacy. For public broadcasting is pregnancy for probably use this pregnancy probability probably use that pregnancy for aircraft is so in the different countries, some is international about the 70s, different than, for example, broad broadcasting currency in states. You'll have to the so called primary.

The second one primary means, for example, from 11 to 12 and I come from possible. This is always, for me, if you will find, example, 6:00 am to 11 in this period, though, actually the problem is not use. The second, are you I you wanna use you be come you be then give someone who is this charge for every day you can or every month you can change. This is pregnancy one. The same about the complication that means give a certain comes from is fixed.

For example, every 100 seven for all washington, you partition accordingly different views on this, give your fraction sharing. This is that's specifically that period for you. This one. So this is already mentioned already. So what's the advantage? The circuit, which is because you occupy results, not sharing someone. So you doing service that virtually no interruption, we also guarantee. But you tend to share one. This target is not possible. This target may be, in particular over, is very suggest that you need to be all part. So that's not really guarantee. So this, but some of the complications, for example, very high power, urgent like a fire patient, a critical situation, people all you use this one, but most likely you guys we are all wrong. That is not really important. You can use another one.

We already talk about how to do this calculations. This is some people demonstrate in the practice, 55. And that a lot of people use, that is the only a billion people use, but actually not everybody at the same time, same point to use. So the fraction the practice is not. That is 10 %, even less than 1 %, or 0 . 1 %. Because here is they have as our supply and also in the world power. And others is that sometime in the summer, lost. I have somewhere in the south africa is very simple system, the totally different.

That's typically why that was the invasion. It is because everybody at the same time we use in this infrastructure chance very small. We didn't talk about because of today. And probably you want this on just briefly imagine that so called the throughput. We put a lot of time to talk about throughput. Basically, they say that this is a single case from the source destinations, right? You have different links, as I say, different limits of different transmission rate. Some maybe is out of it very fast. You use. One is one, maybe slow. So this can be very intuitive information. This is like a top line, okay? This apartment is dynamic, very small. It's a compliment very large. You're supposed to like a water or a bucket of water. Okay, we run into that. So because the public is here, this is very fast. So the in terms of this bucket of water or holidays, how it takes actually determined by this. Alternatively, this is the customer side of this server side.

If the server side, this time get a central very high, but you in your own, the rate is low, this is the bottom line. Sometimes we call the bottling. That's the measure I to me in practice from sort of the best information you have, any needs. Usually you have different capacity anyways. So you always choose the one is the minimum one that's called m to m throughput ok in this case, in the throughput is rs in this case, throughput is rc all right?

Now we started working loudly. We have four questions, right? Four questions. I'm not sure you already work out at home already did not. Now is the 47 ill give you 10 minutes. 57, I start from the solution. You're working, your own partner up to 4 minutes for questions. If you already found it very quickly. All right. Ok you can start now. Thanks. Does everybody have finished? Look at the very first question, very easy, right? The first question is, assuming the take it, aside, is six sixteen thousand, it is, right. The transmission rate is 1,000 meters per second. So 1,000 maybe it is 26, 33. Then you got 16 × to 10 to - 6. That's how many seconds in a single package ask through easy, right?

The second question asked you, what's the maximum number of patches for a second? You can be transmitted? Because each the the target, take it that amount of time, 1 second ddy five, 16 × 10 to - 6. You got it? One of the 16 compared to the six, right? So that's actually what? 6,000, since 2005 100, the happiness for a second is for this kind of problem, easy. But as I said, you need careful about the unit. What's the different unit in solutions?

And then we take a the second question. Basically I asked you, okay? You have swimming is right. 123, you give your label already each of these. One, how long? And you need to calculate the force. Why is the transmission delay? Why is the propagation delay? Look at where approach the limit one. You have. You calculate the air, the transmission delay, l one, r one, transmission delay. You can say it there is 12,050, right? 10 to 3 and 12,050. But the transition is 1,000, the big quiz. So 1,010, 2 ~ 3. This is 10, 2 ~ 6. You got in the end, how? 0012 milliseconds. Okay? Then use calculated propagation delay. This one can maybe use different by citizen. Oki use d one distance, oks one is translations. Propagation speed. You have 2 kilometers. You calculate 2 kilometers, two km so this one is, when are they talking to? That is 3 times attention.

35, 10, 228. Be careful. This is two different units. This kilometers, this this is me a papers. So meters, then you put the most unit together. Can I ask for the 0 . 006 6 to 7 million seconds? We are already, this is 1 million seconds. The first one you already calculated, then you calculate the second link. I think you can do a similar way. So I just show you the result transmission the same single package, because the transition, the uk transitions be the same. No, this is ten. The trans. The transmission with this becomes less. That's why it took a 102 milliseconds. So a transmission, then you're talking. The second one is this is sensible, and that always the dss you only. Therefore, the l one, r one, t one, s one, l two, t two, except for the second one, you get this. But the third one, you can say the transmission today, signal like is identical, is second link.

But the purportation today is 4th that the third is a daily comes, right? The second one is transmission delay is long, propagation delay also long. This is a typical situation. Can anyone tell me the rich situation as it look like this? While the middle of one so long? So you can see imagine in the two cities far away, right? So this is in this city get away, that's the program get away the these are two cities. You relate the message from these two cities. In the middle, you can see transformation. Delay is a kind of long despite the the great that you can see 1,000 kilometers maybe come in for countries in the united aircraft from the Qingdao to.

So why close it doesn't take it on nature 3 hours? That's 1,000 kilometers. She had only walked aside from Philippine to China. That's about some of them. They don't have any sense. The second question. Now, we look at the third one. So the one basically is, suppose the user share ten. This is about the water layer, as I just mentioned. And through both that is people are ruling past each evening, have a that transition capacity or battery capacity from all of these, they choose the minimum one as end to end throughput ok so in this case, you have ten. Maybe they all said the topic you are known the has ten. You get the following issue of policy issues, five other issues on the 20 %. This is, if you can say the first one, we use circles, which is right, 20. If you serve it, because of the total is ten big business, which is occupied five, so you must have two users.

Now we have four users with this. One, what fragment carbon could be you require. So if you have four users, because 12 users ago overflow no, three part of each of the months in the past weeks. So you have 10 minutes. In this case, you only calculate your only four customers, three and three usual using the same time or four usual users. The same time. So you can enjoy this, the possible formula to do that or simplify just three user, because each user you have a seven, three user using that means that everybody uses 0 . 2 of probability.

So three guys, the guys do not use 0 . 8 is right. So because you have four customers. So each person become above. This is 2 . 8 times its people. So that's why you come to fall here. That is, if the fall, that means that everybody just they required to everyone in government. That's probability you can say very small in here is less than 3 %, right? Become . 0256 less than 3 %. You get a I think, is kind of protection. Before everyone involved, that's where we are small. That's you can say you just for this too. So you're almost a double compared to the example. In the circle of speech is that one, the 4th one, therefore, the probability is not empty in the queue, because similarly to two users, in that case, no carry requirement.

So on these three and four use of the the last one is about this one. You can see the middle shadow area. Some of the area you can imagine. This is not good. You said here you use data center, for example, on the noise service in the Qingdao ok so from here with this rule, one room in a more you use the old cable to collect, so it doesn't usually is a large capacity, 300 millimeters per second.

That means that everybody use this one. So you have from any source up going link is 20 megabits. The receiver 60 meters in the base. But for the middle of 300, we can visit that's supposed you for the anybody who are here. So this should be divided by four. That means you've got 75, right? Every any twenty, 75, 60, the minimum one is here is 20. Right? Ok so that's everywhere. This report is 20. All right? That the second question ask you, what link is the bottle link for each session? What was it we get? Sometimes you can say you put this icon in the server side. Ok this terminal means the client side. It may be the server side, is this one.

Now we look at the sea, assuming the sender means silver, clear, ascending and the maximum rates. That means is 20 s is the center. What are in the utilization of the center in the literary and applying?

First of all, you got to know what's called utilization utializa yeah. So utilization always less than one. That means you are total. Actually, we can define. This is the total capacity, so this is an actual utilization. You use it. Ok so as we already know, the bottom line is 20, is right, 20 minutes. So usually it passed at least 20. So in terms of the where we beginning in here, each of these images is for 89, right? Because you only 20, but the road in the model that they also pointed. So you got one. Then we have the middle of one is how we can get in the middle. So you can say the middle one is total is 300, 50, right? 300. But actually, in addition, because from each of these thoughts, you got 20 is right. Each of from here, twenty, twenty actually is how much you use. Maybe it's like, what was the things? 4, 15 is correct.

You can go home to. So what it means, then you look at the customers are also the regional direction rate, but you didn't listen, I read is 20, so I called then the entire group passed onto the Top 20 database. Beta can run, but in this side, the capacity is 60 is right. So you've got 1/3. That means 30, 3 %.

This 140, this is our faculty ok this is another video for the team. That means we got all of you. You might have 15. We have 13 and 7 and 7. There are 60 k that means the middle are roughly 76. Something is easy to write. So this way, 2061. That's my presentation and error. It makes. This is two and four upon 16. So the six, how about this figure? 26. This is calculation error. So thats for today to program. So the next time you come here and I suggest you before you need to change, rather, you do any questions you need to go through. So the easy one we can scale, but for otherwise, you may be trying to regard it by yourself. First. If you couldn't figure out, then come here, how to solve problem, then much more efficient learning. All right. Thank you.