Program 6:

Write a program for congestion control using leaky bucket algorithm.

Procedure:

? Initialize a counter to n at the tick of the clock.

? If n is greater than packet size, then send the packet and decrement the counter by the packet size.

? Repeat step 2 until n becomes smaller than the packet size.

? Reset the counter and go back to step 1.

Source Code:

#include<stdio.h>

#include<stdlib.h>

int main()

{

int i,j,qs,ns,t,count,size,a,choice,p[10],cap,rate,delay,flag=1,t1,t2;

printf("enter the queue size:");

scanf("%d",&size);

count=size;

printf("enter leaky bucket capacity:");

scanf("%d",&cap);

qs=cap;

printf("enter the size of the packets in the queue:");

for(i=0;i<size;i++)

{

scanf("%d",&a);

if(a>cap)

{

i--;

printf("packets cannot be entered");

}

else

p[i]=a;

}

printf("enter the output rate:");

scanf("%d",&rate);

delay=cap/rate;

printf("delay=%d\n",delay);

while(flag)

{

qs=cap;

while(qs>=p[0]&&count>0)

{

printf("\npacket of size %d is put into the bucket\n",p[0]);

qs=qs-p[0];

printf("\navailable space %d\n",qs);

count--;

for(i=0;i<count;i++)

p[i]=p[i+1];

}

t=delay;

long int t1=(long)time(NULL);

long int t2=(long)time(NULL);

while((t2-t1)<delay)

{

t2=(long)time(NULL);

if((delay-t)==(t2-t1))

{

printf("\ntransmitting packets in the leaky bucket:%d seconds\n",t);

t--;

}

}

printf("\npackets in the queue:\n");

for(i=0;i<count;i++)

printf("%d\t",p[i]);

printf("\ndo u want to enter more packets in the queue? (1 or 0)\n");

scanf("%d",&choice);

while(choice&&count<size)

{

printf("enter the no of packets (<=%d)\n",size-count);

scanf("%d",&ns);

if(ns>(size-count))

printf("\nexceeding queue size\n");

else

{

printf("\nenter the size of the packets to put in the queue:\n");

for(i=0;i<ns;i++)

{

scanf("%d",&a);

if(a>cap)

printf("packets cannot be entered");

else

p[count++]=a;

}

}

printf("\ndo u want to enter more? (0 or 1)\n");

scanf("%d",&choice);

if(choice!=0)

if(count>=size)

printf("queue is full");

}

if(count==0)

flag=0;

}

}

Sample Input/Output:

enter the queue size:5

enter leaky bucket capacity:6

enter the size of the packets in the queue:3 4 1 2 3

enter the output rate:2

delay=3

packet of size 3 is put into the bucket

available space 3

transmitting packets in the leaky bucket:3 seconds

transmitting packets in the leaky bucket:2 seconds

transmitting packets in the leaky bucket:1 seconds

transmitting packets in the leaky bucket:0 seconds

packets in the queue:

4 1 2 3

do u want to enter more packets in the queue? (1 or 0)

0

packet of size 4 is put into the bucket

available space 2

packet of size 1 is put into the bucket

available space 1

transmitting packets in the leaky bucket:3 seconds

transmitting packets in the leaky bucket:2 seconds

transmitting packets in the leaky bucket:1 seconds

transmitting packets in the leaky bucket:0 seconds

packets in the queue:

2 3

do u want to enter more packets in the queue? (1 or 0)

0

packet of size 2 is put into the bucket

available space 4

packet of size 3 is put into the bucket

available space 1

transmitting packets in the leaky bucket:3 seconds

transmitting packets in the leaky bucket:2 seconds

transmitting packets in the leaky bucket:1 seconds

transmitting packets in the leaky bucket:0 seconds

packets in the queue:

do u want to enter more packets in the queue? (1 or 0)

0