



Bookmarks



Bookmark

► Pre-course  
Materials

▼ Topic 1: Course  
Overview

1.1 Course  
Overview

1.2 Internet  
Hierarchy

Week 1 Quiz due Jan  
25, 2016 at 15:30 UTC

1.3 Packet  
Switching

Week 1 Quiz due Jan  
25, 2016 at 15:30 UTC

1.4 Layering

Week 1 Quiz due Jan  
25, 2016 at 15:30 UTC

► Topic 2: The  
Link Layer

► MATLAB  
download and  
tutorials

Topic 1: Course Overview > 1.3 Packet Switching > 1.3 Quiz

## 1.3 QUIZ QUESTION 1 (1/1 point)

Which of the following is/are true?

☐ In circuit switching, links are shared using a technique called statistical multiplexing.

☒ In packet switching, when a host wants to send a large amount of data to another host, it breaks the data into smaller chunks. ✓

☒ In circuit switching, link resources must be reserved in advance before two hosts can communicate. ✓

☐ In packet switching, since user activity is assumed to be random, there is always a non-zero probability that the link will be overloaded, no matter what the number of users.



Note: Make sure you select all of the correct options—there may be more than one!

### EXPLANATION

In circuit switching, links are shared by making a fixed reservation of resources. In packet switching, if the number of users is zero, then there is no possibility that the link will be overloaded.

## 1.3 QUIZ QUESTION 2 (1/1 point)

Consider a packet switching network where 20 users are attempting to access the same link, which can support 9 Megabits per second. Suppose that when active, each user requires 750 kilobits per second, but that

users are active only 15% of the time. At any time, what is the numerical probability that the link is overloaded to two significant digits (e.g. 1.3e-2)?

✓ Answer: 5.2951e-07

$5.3 \times 10^{-7}$

#### EXPLANATION

Since 9 Megabits/750 kilobits = 12, so if more than 12 users attempt to access the same link at the same time, the link will be overloaded.

Using Matlab code to calculate

```
n = 20;
```

```
p = 0.15;
```

```
x=13:20;
```

```
y=nchoosek(n,x).*p.^x.*(1-p).^(n-x);
```

```
sum(y) = 5.2951e-07
```

© All Rights Reserved



© edX Inc. All rights reserved except where noted. EdX, Open edX and the edX and Open EdX logos are registered trademarks or trademarks of edX Inc.

POWERED BY  
OPENedX



