Week 2 Quiz

15/22 points earned (68%)

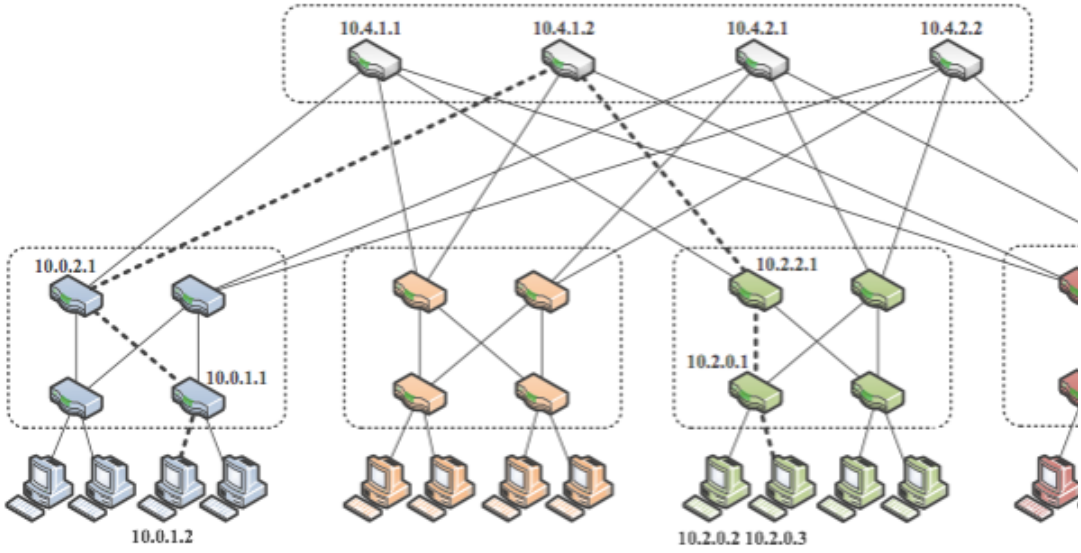
You haven't passed yet. You need at least 70% to pass. Review the material and try again! You have 3 attempts every 8 hours.

Review Related Lesson

0 / 1
points

1.

The fat-tree network below has a total of 32 switch-switch links. (Verify that this is true.) H
these links will be used by a tree spanning all the switches? Remember: we're excluding s
links in both counts and are counting cables, not directed edges.



ACM SIGCOMM,

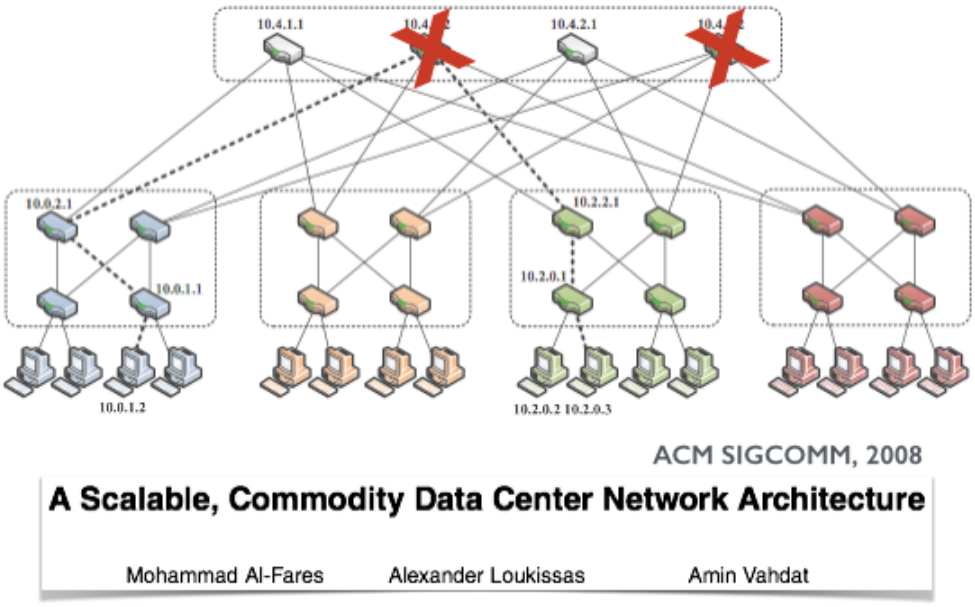
A Scalable, Commodity Data Center Network Architec

Mohammad Al-Fares Alexander Loukissas Amin Vahdat

1 / 1
points

2.

Assuming that there's no other traffic in the network, how much aggregate bandwidth is available from the left-most pod (the left-most four servers) to any other pod in the fat-tree below with the switches marked with **X** having failed? Count only bandwidth in the direction from the left-most pod to the other; assume links are all unit capacity and that we have perfect multipath routing.



1 / 1
points

3.

How does TRILL enable the use of all the links in the network?

1 / 1
points

4.

In BGP, the path announcements nodes make to neighbors contain:

1 / 1
points

5.
How does ECMP avoid packet reordering?

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0 / 1
points

6.
Between a specific pair of servers, how many ECMP paths can be set up for the fat-tree topology (as in this paper: A Scalable, Commodity Data Center Network Architecture) built with switches with 10 ports each, i.e., k = 10? Ignore any switch hardware constraints on ECMP; we're only looking for the number of equal-cost shortest paths.

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0 / 1
points

7.
How does CONGA do forwarding on multiple paths?

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1 / 1
points

8.
What are flowlets?

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1 / 1
points

9.
How do containers (for example, with Docker) typically differ from virtual machines?

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0 / 1
points

10.

At 100Gbps, with all packets being 100 Bytes in size (including the preamble, etc.), how much time can we afford to spend on processing each packet to be able to process packets at line-rate, sequentially?

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1 / 1
points

11.

How does SR-IOV help with the difficulty of packet processing at line rates?

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1 / 1
points

12.

What are some drawbacks of SR-IOV's approach?

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1 / 1
points

13.

Which of these design decisions enables Open vSwitch to provide fast-enough performance for common workloads while allowing general purpose packet forwarding logic?

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1 / 1
points

14.

Assuming that TCP is in the additive increase phase and the congestion window is *X* bytes, what will the congestion window be after the sender detects a single packet loss?

✔ 1 / 1 points

15.

What problems does TCP's reaction to loss pose?

✔ 1 / 1 points

16.

Assume that data travels over fiber at a speed of $2c/3$, where c is the speed of light in a vacuum. What is the (one-way) propagation delay across 300 meters of fiber running across a data center floor? (This might seem annoying, but the point of such questions is to make sure you have a better sense of these timescales.)

✘ 0 / 1 points

17.

Assuming a line rate of 10Gbps, what time elapses between a packet arriving in a buffer with five packets already queued (each packet being 9000 bytes in size), and reaching the head of the queue (i.e., just before its bytes start to get sent across the wire)?

✔ 1 / 1 points

18.

In data centers, queuing delay caused by just a few packets can exceed the propagation delay. What problem(s) does this pose?

✘ 0 / 1 points

19.

Suppose that to address TCP incast, we reduce the TCP connection timeout value. Which of the following is true?

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1 / 1
points

20.

How does DCTCP try to provide both low latency (i.e., keeping buffer occupancies small) and high throughput?

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0 / 1
points

21.

If the congestion window at a sender is *X* bytes and it receives congestion markings based on which fraction of marked packets is updated to 0.4 (i.e., the α calculated per equation (1) in the DCTCP paper – Data Center TCP (DCTCP) is 0.4), what is the congestion window adjusted to?

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1 / 1
points

22.

What considerations govern the setting of DCTCP's congestion marking threshold, *K*?
