

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



آزمایشگاه شبکه های کامپیوتری

جلسه ۱

معرفی درس

Course Introduction

کاظم فولادی قلعه
دانشکده مهندسی، پردیس فارابی
دانشگاه تهران

<http://courses.fouladi.ir/compnetlab>

آزمایشگاه شبکه های کامپیوتری

Computer Networks Lab.

۱ واحد - عملی

هم نیاز: شبکه های کامپیوتری

سه شنبه، ۱۷:۳۰ تا ۱۹:۰۰ (و ۱۲:۳۰ تا ۱۴:۰۰)

وبسایت درس

<http://courses.fouladi.ir/compnetlab>

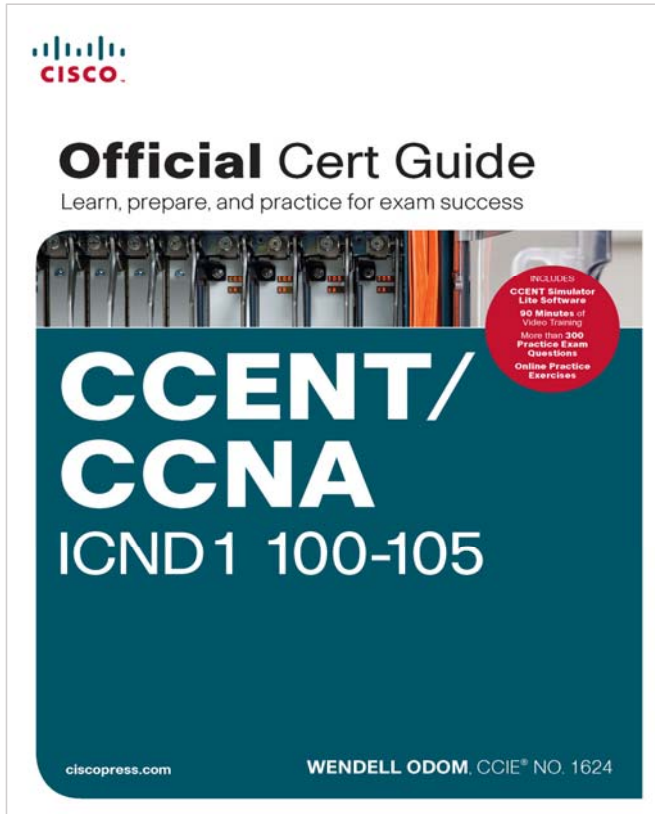
ارزیابی

۱۰ نمره	تکلیفها و گزارش کار
۵ نمره	کارهای کلاسی
۵ نمره	آزمون پایان ترم

معرفی درس

منابع

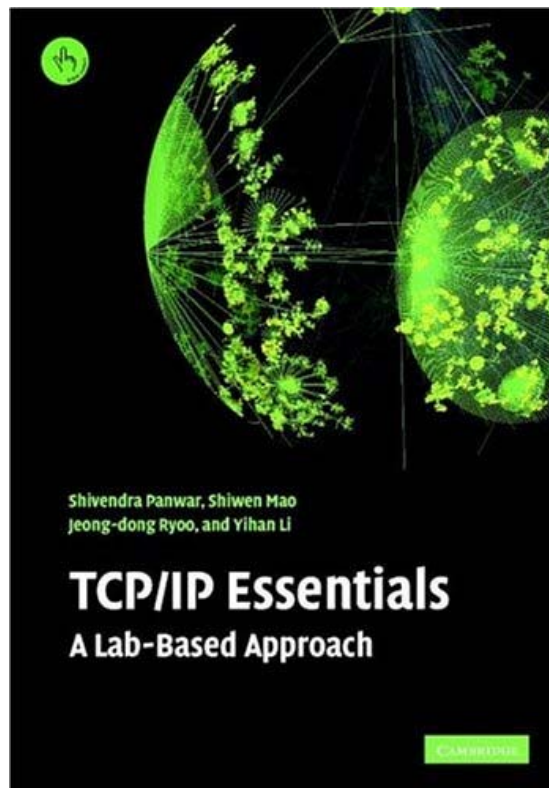
کتاب درس



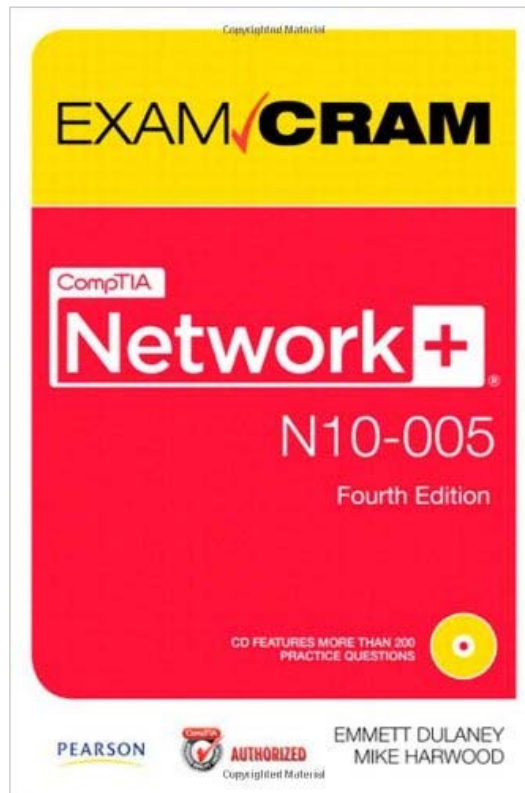
W. Odom,
CCENT/CCNA ICND1 100-105 Official Cert Guide,
Cisco Press, 2016.

<http://www.ciscopress.com/store/ccent-ccna-icnd1-100-105-official-cert-guide-9781587205804>

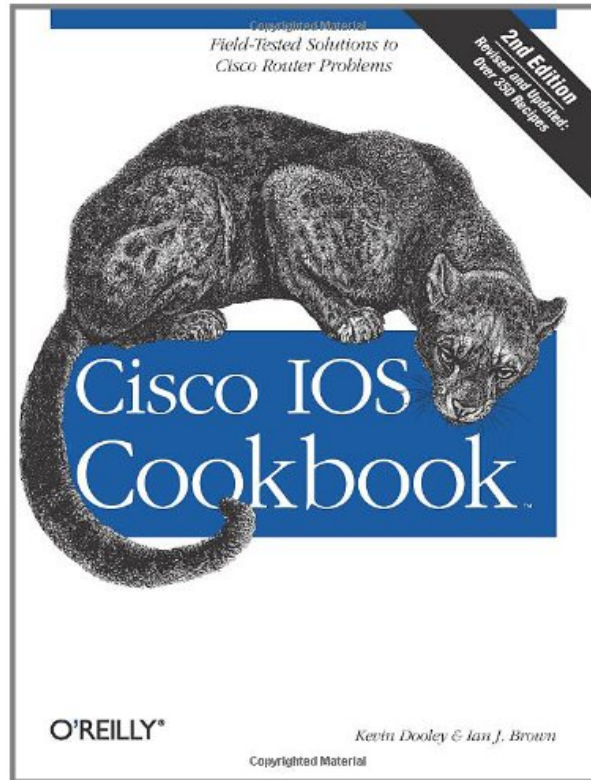
کتاب کمکی



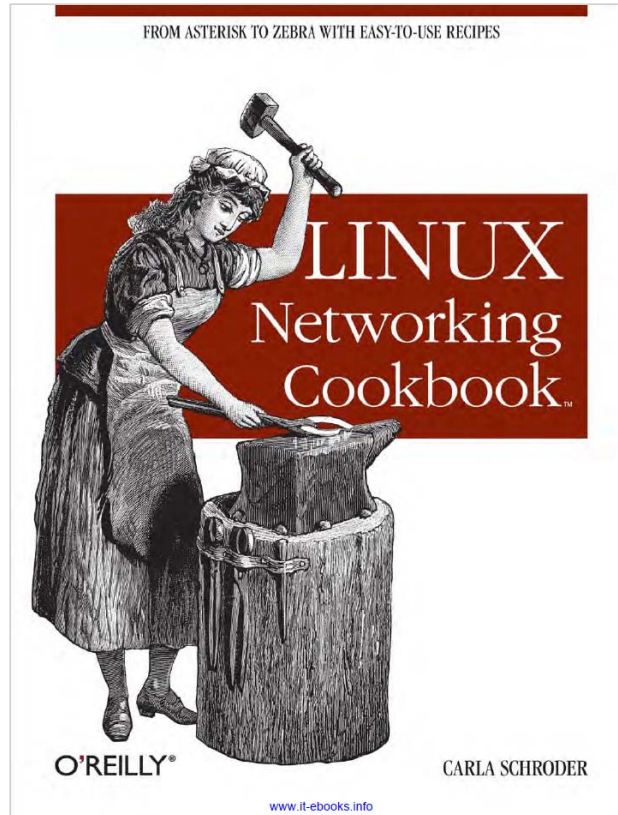
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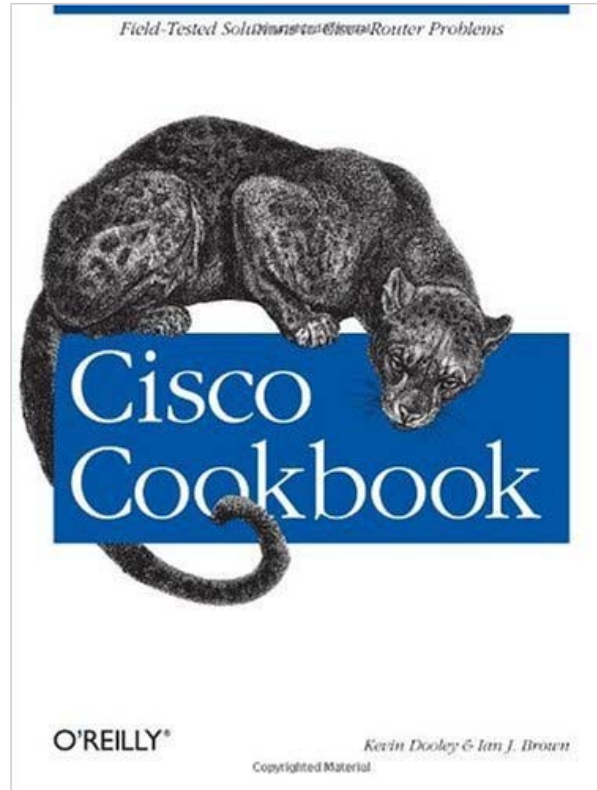
کتاب مرجع



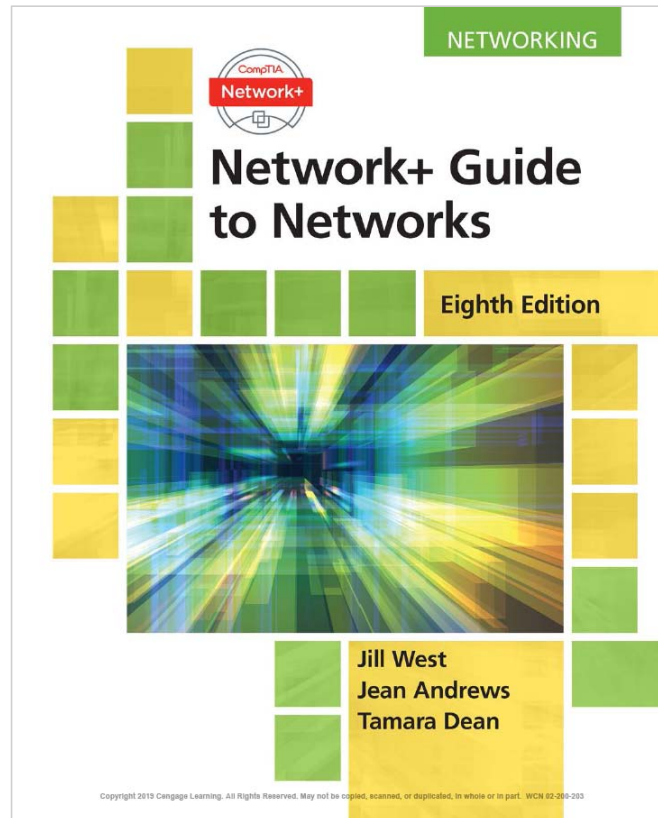
کتاب مرجع



کتاب مرجع



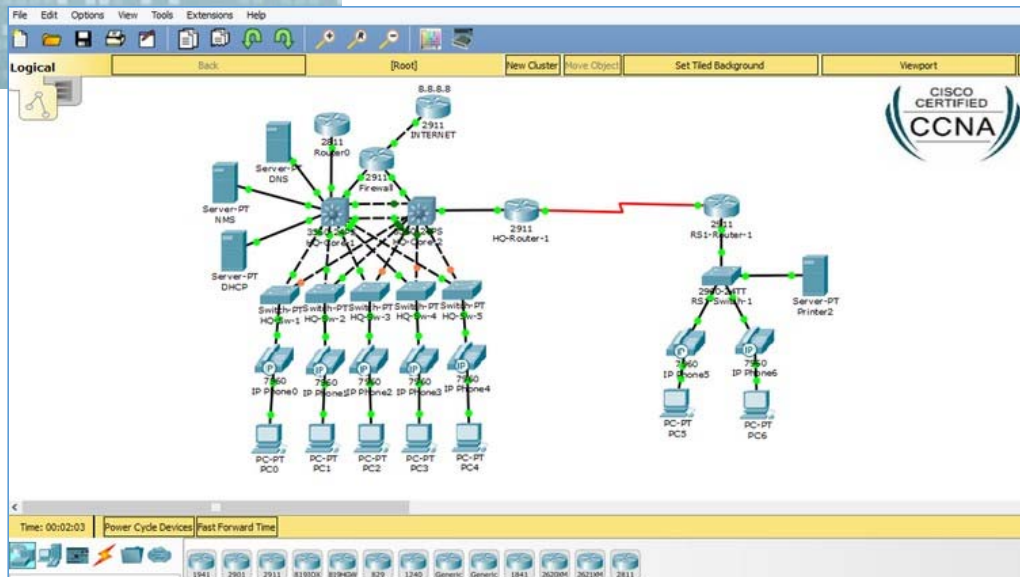
کتاب مرجع



معرفی درس

ابزارها

Cisco Packet Tracer



Cisco Packet Tracer Mobile



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The screenshot displays the Cisco Packet Tracer Mobile interface. At the top, there is a navigation bar with icons for search, more options, simulation, and playback. The main area shows a network diagram with a central router (Central) and a remote router (Remote) connected via a serial link (192.168.0.8/30). A Frame Relay cloud connects the central router to two branch routers (Branch-2 and Branch-1). Branch-2 is connected to a laptop (10.3.0.0/24) and a server (10.2.0.0/24). Branch-1 is connected to a laptop (10.2.0.0/24) and a server (10.2.0.0/24). A Corporate Network is connected to the Remote router (10.4.0.0/24) and contains a laptop. The diagram is labeled as OSPF Area 0. Below the diagram is a table showing the results of a packet capture.

Fire	Last Status	Source	Destination	Type	Delete
Fire	--	Laptop	209.165.200.2	TCP	X
Fire	In Progress	PC	Laptop	ICMP	X



untitled.gns3* — GNS3

File Edit View Control Device Annotate Tools Help

The diagram shows a network topology with the following components and connections:

- Linux-host-1** (bottom left) connected to **Quagga-1** (bottom left) via interface **e0**.
- Linux-host-2** (bottom right) connected to **Quagga-2** (bottom right) via interface **e0**.
- Quagga-1** (bottom left) connected to **Quagga-3** (center) via interface **e5**.
- Quagga-2** (bottom right) connected to **Quagga-3** (center) via interface **e6**.
- Quagga-3** (center) connected to **SW1** (top center) via interface **e0**.
- SW1** (top center) connected to **Linux-host-3** (top left) via interface **2**.
- SW1** (top center) connected to **Linux-host-4** (top right) via interface **3**.

A context menu is open over the connection between **Quagga-2** and **Quagga-3**, showing options: **Start capture** and **Delete**.

Topology Summary

- ▶ Linux-host-2
- ▶ Linux-host-3
- ▼ Quagga-2
 - e0 <-> e0 Linux-host-2
 - e6 <-> e6 Quagga-3
 - e7 <-> e7 Quagga-1
- ▼ Quagga-3
 - e0 <-> 1 SW1
 - e5 <-> e5 Quagga-1
 - e6 <-> e6 Quagga-2
- ▶ Linux-host-1
- ▼ Quagga-1
 - e0 <-> e0 Linux-host-1
 - e5 <-> e5 Quagga-3
 - e7 <-> e7 Quagga-2
- ▶ SW1
- ▶ Linux-host-4

Console Topology Summary



tv-netflix-problems-2011-07-06.pcap

File Edit View Go Capture Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl> Expression ...

No.	Time	Source	Destination	Protocol	Length	Info
343	65.142415	192.168.0.21	174.129.249.228	TCP	66	40555 → 80 [ACK] Seq=1 Ack=1 Win=5888 Len=0 TSval=491519346 TSecr=551811827
344	65.142715	192.168.0.21	174.129.249.228	HTTP	253	GET /clients/netflix/flash/application.swf?flash_version=flash_lite_2.1&v=1.5&n...
345	65.230738	174.129.249.228	192.168.0.21	TCP	66	80 → 40555 [ACK] Seq=1 Ack=188 Win=6864 Len=0 TSval=551811850 TSecr=491519347
346	65.240742	174.129.249.228	192.168.0.21	HTTP	828	HTTP/1.1 302 Moved Temporarily
347	65.241592	192.168.0.21	174.129.249.228	TCP	66	40555 → 80 [ACK] Seq=188 Ack=763 Win=7424 Len=0 TSval=491519446 TSecr=551811852
348	65.242532	192.168.0.21	192.168.0.1	DNS	77	Standard query 0x2188 A cdn-0.nflximg.com
349	65.276870	192.168.0.1	192.168.0.21	DNS	489	Standard query response 0x2188 A cdn-0.nflximg.com CNAME images.netflix.com.edge...
350	65.277992	192.168.0.21	63.80.242.48	TCP	74	37063 → 80 [SYN] Seq=0 Win=5840 Len=0 MSS=1460 SACK_PERM=1 TSval=491519482 TSecr=...
351	65.297757	63.80.242.48	192.168.0.21	TCP	74	80 → 37063 [SYN, ACK] Seq=0 Ack=1 Win=5792 Len=0 MSS=1460 SACK_PERM=1 TSval=329534130
352	65.298396	192.168.0.21	63.80.242.48	TCP	66	37063 → 80 [ACK] Seq=1 Ack=1 Win=5808 Len=0 TSval=491519502 TSecr=3295534130
353	65.298687	192.168.0.21	63.80.242.48	HTTP	153	GET /us/nrd/clients/flash/814540.htm HTTP/1.1
354	65.318730	63.80.242.48	192.168.0.21	TCP	66	80 → 37063 [ACK] Seq=1 Act=88 Win=5792 Len=0 TSval=3295534151 TSecr=491519503
355	65.321733	63.80.242.48	192.168.0.21	TCP	1514	[TCP segment of a reassembled PDU]

< Frame 349: 489 bytes on wire (3912 bits), 489 bytes captured (3912 bits)
> Ethernet II, Src: Globaisc_00:3b:0a (f0:ad:4e:00:3b:0a), Dst: Vizio_14:0a:e1 (00:19:9d:14:0a:e1)
> Internet Protocol Version 4, Src: 192.168.0.1, Dst: 192.168.0.21
> User Datagram Protocol, Src Port: 53 (53), Dst Port: 34036 (34036)
▼ Domain Name System (response)
 [Request In: 348]
 [Time: 0.034338000 seconds]
 Transaction ID: 0x2188
 > Flags: 0x8180 Standard query response, No error
 Questions: 1
 Answer RRs: 4
 Authority RRs: 9
 Additional RRs: 9
 ▼ Queries
 > cdn-0.nflximg.com: type A, class IN
 > Answers
 > Authoritative nameservers

```
0020 00 15 00 35 84 f4 01 c7 83 3f 21 88 81 80 00 01 ...5.... .!.....
0030 00 04 00 09 00 09 05 63 64 6e 2d 30 07 6e 66 6c .....c dn-0.nfl
0040 7e 69 6d 67 03 63 6f 6d 00 00 01 00 01 c0 0c 00 xing.com .....
0050 05 00 01 00 00 05 29 00 22 06 69 6d 61 67 65 73 .....) " images
0060 07 6e 65 74 66 6c 69 70 03 6f 6d 69 65 64 67 .netflix.com.edg
0070 65 73 75 69 74 65 03 6e 65 74 00 c0 2f 00 05 00 esuite.n et./...
```

Identification of transaction (dns.id), 2 bytes Packets: 10299 · Displayed: 10299 (100.0%) · Load time: 0:10.182 Profile: Default