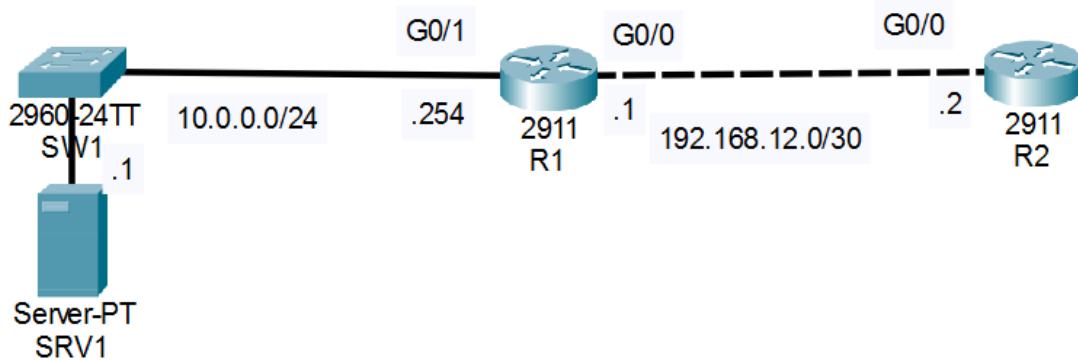Network Topology:

Instructions and actions:

1. Use TFTP on R1 to retrieve the following file from SRV1:
   c2900-universalk9-mz.SPA.155-3.M4a.bin

```
R1#copy tftp: flash:
Address or name of remote host []? 10.0.0.1
Source filename []? c2900-universalk9-mz.SPA.155-3.M4a.bin
Destination filename [c2900-universalk9-mz.SPA.155-3.M4a.bin]?

Accessing tftp://10.0.0.1/c2900-universalk9-mz.SPA.155-3.M4a.bin....
Loading c2900-universalk9-mz.SPA.155-3.M4a.bin from 10.0.0.1:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
[OK - 33591768 bytes]

33591768 bytes copied in 4.176 secs (844587 bytes/sec)
R1#sh flash

System flash directory:
File  Length   Name/status
  3   33591768 c2900-universalk9-mz.SPA.151-4.M4.bin
  4   33591768 c2900-universalk9-mz.SPA.155-3.M4a.bin
  2   28282    sigdef-category.xml
  1   227537   sigdef-default.xml
[67439355 bytes used, 188304645 available, 255744000 total]
249856K bytes of processor board System flash (Read/Write)
```

2. Upgrade R1's OS and then delete the old file from flash.

```
R1#show flash

System flash directory:
File  Length   Name/status
  3    33591768 c2900-universalk9-mz.SPA.151-4.M4.bin
  4    33591768 c2900-universalk9-mz.SPA.155-3.M4a.bin
  2    28282    sigdef-category.xml
  1    227537   sigdef-default.xml
[67439355 bytes used, 188304645 available, 255744000 total]
249856K bytes of processor board System flash (Read/Write)


R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#boot system flash c2900-universalk9-mz.SPA.155-3.M4a.bin
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#write memory
Building configuration...
[OK]
R1#reload
Proceed with reload? [confirm]
System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2010 by cisco Systems, Inc.
Total memory size = 512 MB - On-board = 512 MB, DIMM0 = 0 MB
CISCO2911/K9 platform with 524288 Kbytes of main memory
Main memory is configured to 72/-1(On-board/DIMM0) bit mode with ECC
disabled

Readonly ROMMON initialized

program load complete, entry point: 0x80803000, size: 0x1b340
program load complete, entry point: 0x80803000, size: 0x1b340

IOS Image Load Test
_____
Digitally Signed Release Software
program load complete, entry point: 0x81000000, size: 0x3bcd3d8
Self decompressing the image :
####################################################################
[OK]
Smart Init is enabled
smart init is sizing iomem
                TYPE        MEMORY_REQ
    Onboard devices &
        buffer pools      0x022F6000

R1#delete flash:
Delete filename []?c2900-universalk9-mz.SPA.151-4.M4.bin
Delete flash:/c2900-universalk9-mz.SPA.151-4.M4.bin? [confirm]

R1#sh flash

System flash directory:
File  Length   Name/status
  4    33591768 c2900-universalk9-mz.SPA.155-3.M4a.bin
  2    28282    sigdef-category.xml
  1    227537   sigdef-default.xml
[33847587 bytes used, 221896413 available, 255744000 total]
249856K bytes of processor board System flash (Read/Write)


R1#
```

3. Use FTP on R2 to retrieve the following file from SRV1:
   c2900-universalk9-mz.SPA.155-3.M4a.bin
   (FTP username: jeremy, password: ccna)

Configuring route on R2 –

```
R2(config)#ip route 10.0.0.0 255.255.255.0 192.168.12.1
R2(config)#do sh ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

      10.0.0.0/24 is subnetted, 1 subnets
S        10.0.0.0/24 [1/0] via 192.168.12.1
      192.168.12.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.12.0/30 is directly connected, GigabitEthernet0/0
L        192.168.12.2/32 is directly connected, GigabitEthernet0/0

R2(config)#
```

Now, using username and password:

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ip ftp username jeremy
R2(config)#ip ftp password ccna
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#copy ftp flash
Address or name of remote host []? 10.0.0.1
Source filename []? c2900-universalk9-mz.SPA.155-3.M4a.bin
Destination filename [c2900-universalk9-mz.SPA.155-3.M4a.bin]?

Accessing ftp://10.0.0.1/c2900-universalk9-mz.SPA.155-3.M4a.bin...
%Error opening ftp:///c2900-universalk9-mz.SPA.155-3.M4a.bin (Timed out)
.


R2#


R2#copy ftp flash
```

And then the commands are just like TFPT.

*There was an error in retrieving the file as I forgot to configure the default gateway on SRV1.