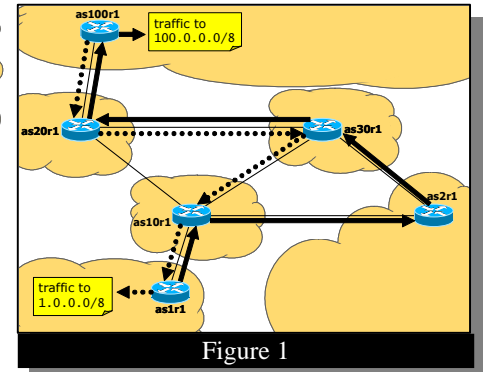
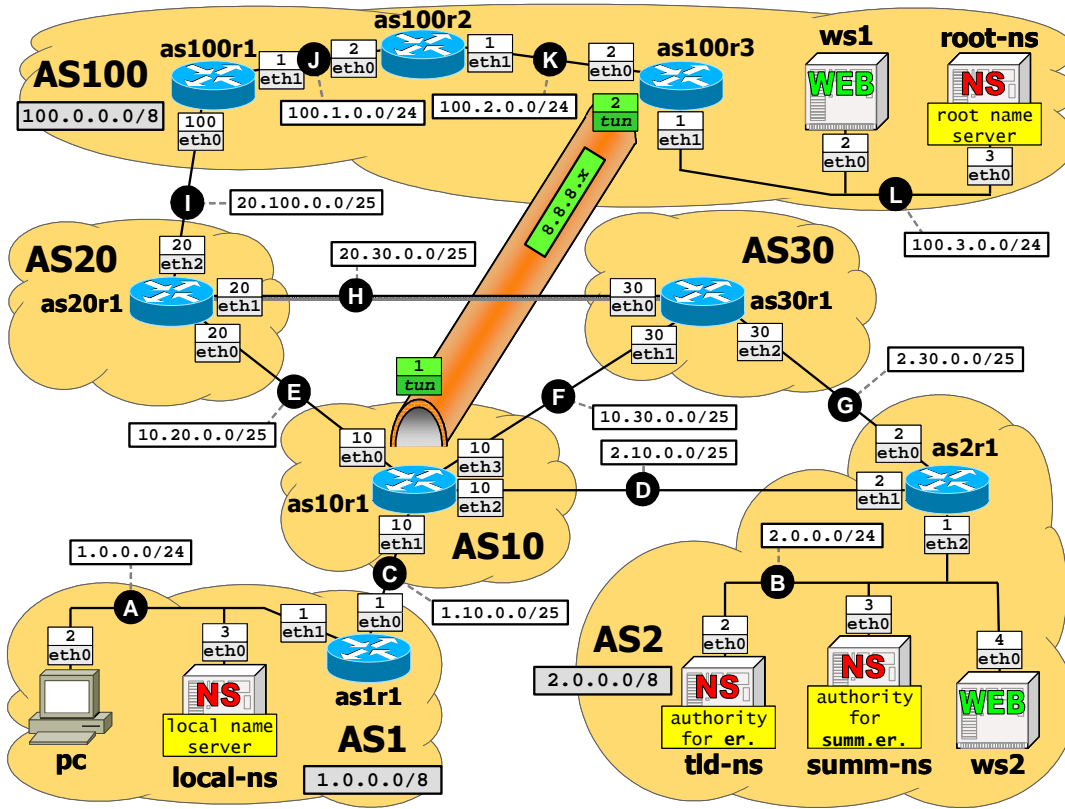




Available time: 150 minutes.



**TUNNEL SETUP COMMANDS**

- ip tunnel add *tunnelName* mode ipip remote *remIP* local *locIP* ttl 20
- ip link set *tunnelName* up
- ip addr add *locTunnelIP* peer *remTunnelIP* dev *tunnelName*

**Warning:** do not use an interface on the 100.3.0.0/24 subnet, which is reached through the tunnel, as a tunnel endpoint (*remIP*, *locIP*).

Using Netkit, implement the network illustrated in the figure above and described below (you can use the following items as a convenient checklist).

- Every host has a statically configured default route.
- Routing between different ASes is implemented by using BGP.
  - No router announces the default route (0.0.0.0/0) or applies filters.
  - Peering LANs are announced in BGP. AS1, AS2, and AS100 also announce their own local subnets (in gray).
  - as2r1, as10r1, as20r1, and as30r1 apply preferences to direct traffic between AS1 and AS100 as indicated in Figure 1.
- Internal routing within AS100 is implemented by using OSPF. All router interfaces belong to area 0.0.0.0 (backbone).
- ws1 and ws2 are web servers that host a default web page.
- local-ns is the local name server for AS1; root-ns is the root name server; tld-ns is the authoritative name server for er; summ-ns is the authoritative name server for summ.er. The only name that should be resolved is go.summ.er, which is mapped to the IP addresses of both web servers, implementing a load balancing policy.
- An IPv4-in-IPv4 tunnel is established between as10r1 and as100r3.
  - The tunnel is used as a “shortcut” for network traffic towards 100.3.0.0/24.
  - Routing towards the tunnel is implemented by static routes.

**Goals:**

- Every router, as well as the pc, must be able to reach any IP addresses on the network.
- Traffic from AS1 to AS100 and from AS100 to AS1 must preferably go along the paths in Figure 1.
- pc should be able to access the web page served by go.summ.er using the links browser.
- pc should be able to reach hosts on the 100.3.0.0/24 by using the tunnel.