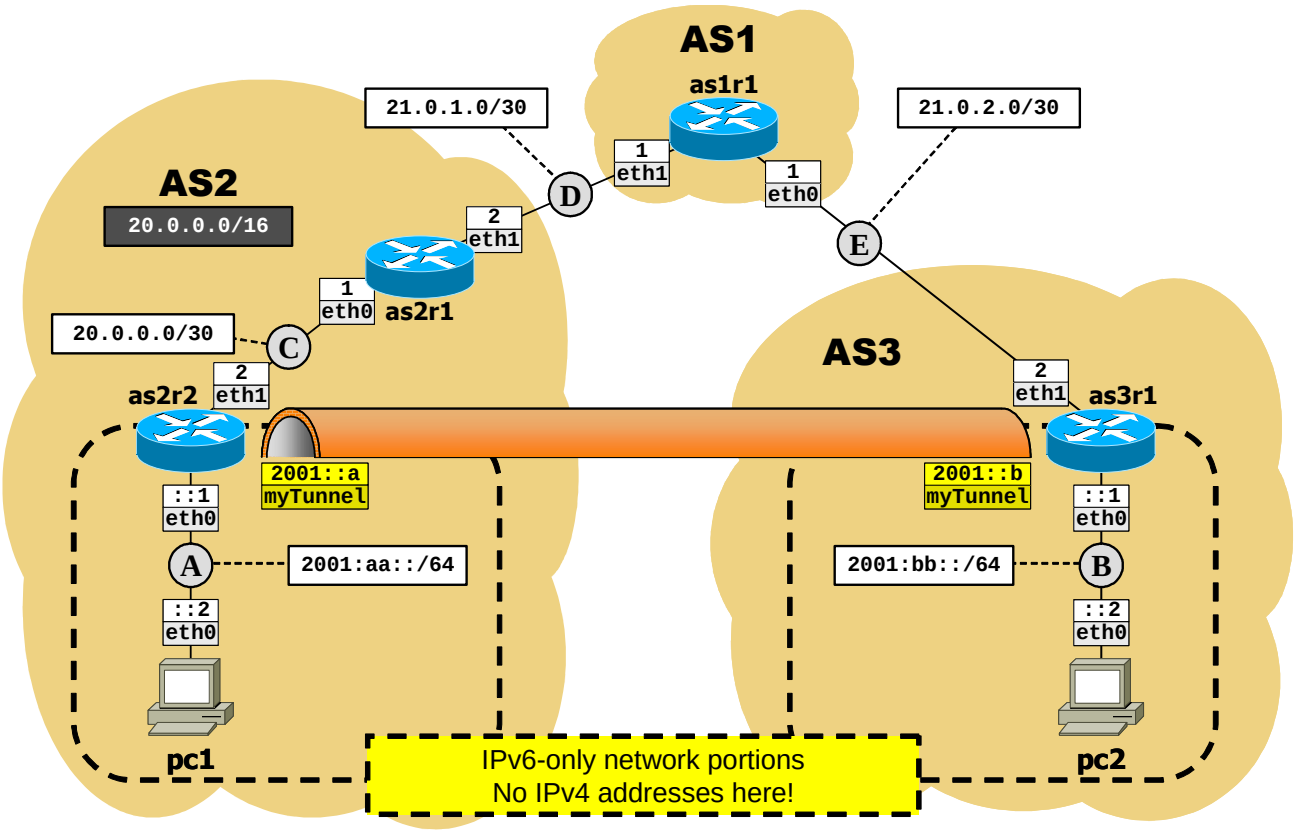
ICN – Examination date: 23-01-2013 – Round 1 – "Letter A"

Avilable time: 100 minutes.

Using Netkit, implement the network depicted in the figure below. In doing so, comply with the specifications and achieve the goal indicated below the figure.



Specifications:

- Internal IPv4 routing within **AS2** must be implemented using RIP.
- **AS2** announces the network prefix indicated in the dark grey box.
- **When required, a node must be enabled to act as an IPv6 router by using the command specified in the box alongside.**
- No router announces IPv6 subnets in RIP or BGP.
- No router announces the default route **0/0**.
- No router implements customer-provider routing policies.
- No router implements filters that drop BGP announcements.

USEFUL COMMANDS (arguments in square brackets are optional):

- Assign the IPv6 address ***ipv6addr/mask*** to interface ***if***:
```
ifconfig if up
ifconfig if add ipv6addr/mask
```
- Enable a network node to act as an IPv6 router:
```
echo 1 >/proc/sys/net/ipv6/conf/all/forwarding
```
- Add a static route towards ***ipv6addr*[*/mask*]**:
```
route -A inet6 add ipv6addr[/mask] [gw nexthop] [dev interface]
```
- Setup of an IPv6-in-IPv4 tunnel called ***tunnelName*** between ***ipv4LocalAddr*** and ***ipv4RemoteAddr*** (note: this setup must be applied to both tunnel endpoints):
```
ip tunnel add tunnelName mode sit remote ipv4RemoteAddr local
      ipv4LocalAddr ttl 10
ifconfig tunnelName up
ifconfig tunnelName add ipv6LocalAddr
route -A inet6 add ipv6RemoteAddr dev tunnelName
```

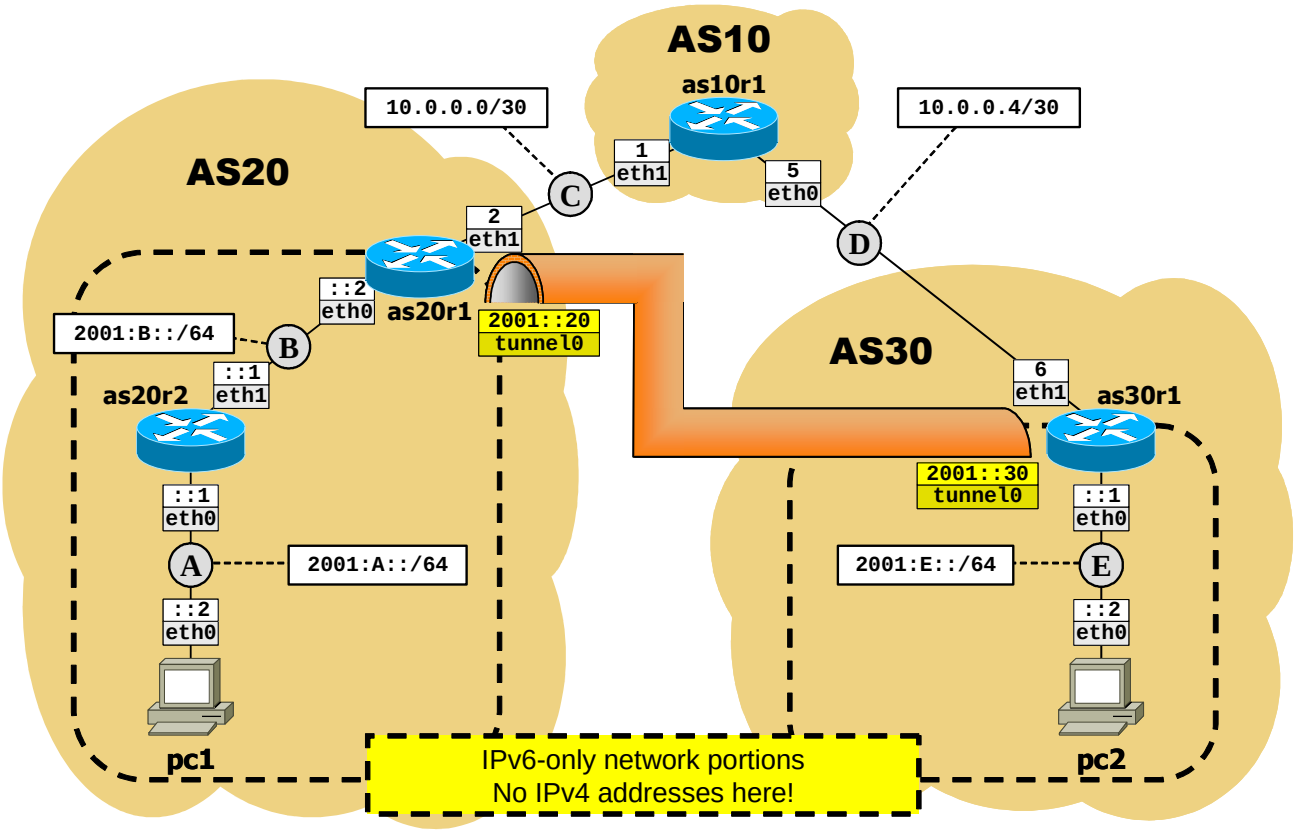
Goal:

It must be possibile to ping **pc2** from **pc1** (and vice versa) in IPv6 using command **ping6**.

ICN – Examination date: 23-01-2013 – Round 1 – "Pipes"

Avilable time: 100 minutes.

Using Netkit, implement the network depicted in the figure below. In doing so, comply with the specifications and achieve the goal indicated below the figure.



Specifications:

- Internal IPv6 routing within **`AS20`** must be implemented using static routes.
- **When required, a node must be enabled to act as an IPv6 router by using the command specified in the box alongside.**
- No router announces IPv6 subnets in RIP or BGP.
- No router announces the default route **`0/0`**.
- No router implements customer-provider routing policies.
- No router implements filters that drop BGP announcements.

USEFUL COMMANDS (arguments in square brackets are optional):

- Assign the IPv6 address ***`ipv6addr/mask`*** to interface ***`if`***:
  `ifconfig` ***`if`*** **`up`**
  `ifconfig` ***`if`*** **`add`** ***`ipv6addr/mask`***
- Enable a network node to act as an IPv6 router:
  `echo 1 >/proc/sys/net/ipv6/conf/all/forwarding`
- Add a static route towards ***`ipv6addr`***`[`***`/mask`***`]`:
  `route -A inet6 add` ***`ipv6addr`***`[`***`/mask`***`]` **`[gw`** ***`nexthop`***`] [dev`** ***`interface`***`]`**
- Setup of an IPv6-in-IPv4 tunnel called ***`tunnelName`*** between ***`ipv4LocalAddr`*** and ***`ipv4RemoteAddr`*** (note: this setup must be applied to both tunnel endpoints):
  `ip tunnel add` ***`tunnelName`*** **`mode sit remote`** ***`ipv4RemoteAddr`*** **`local`** ***`ipv4LocalAddr`*** **`ttl 10`**
  `ifconfig` ***`tunnelName`*** **`up`**
  `ifconfig` ***`tunnelName`*** **`add`** ***`ipv6LocalAddr`***
  `route -A inet6 add` ***`ipv6RemoteAddr`*** **`dev`** ***`tunnelName`***

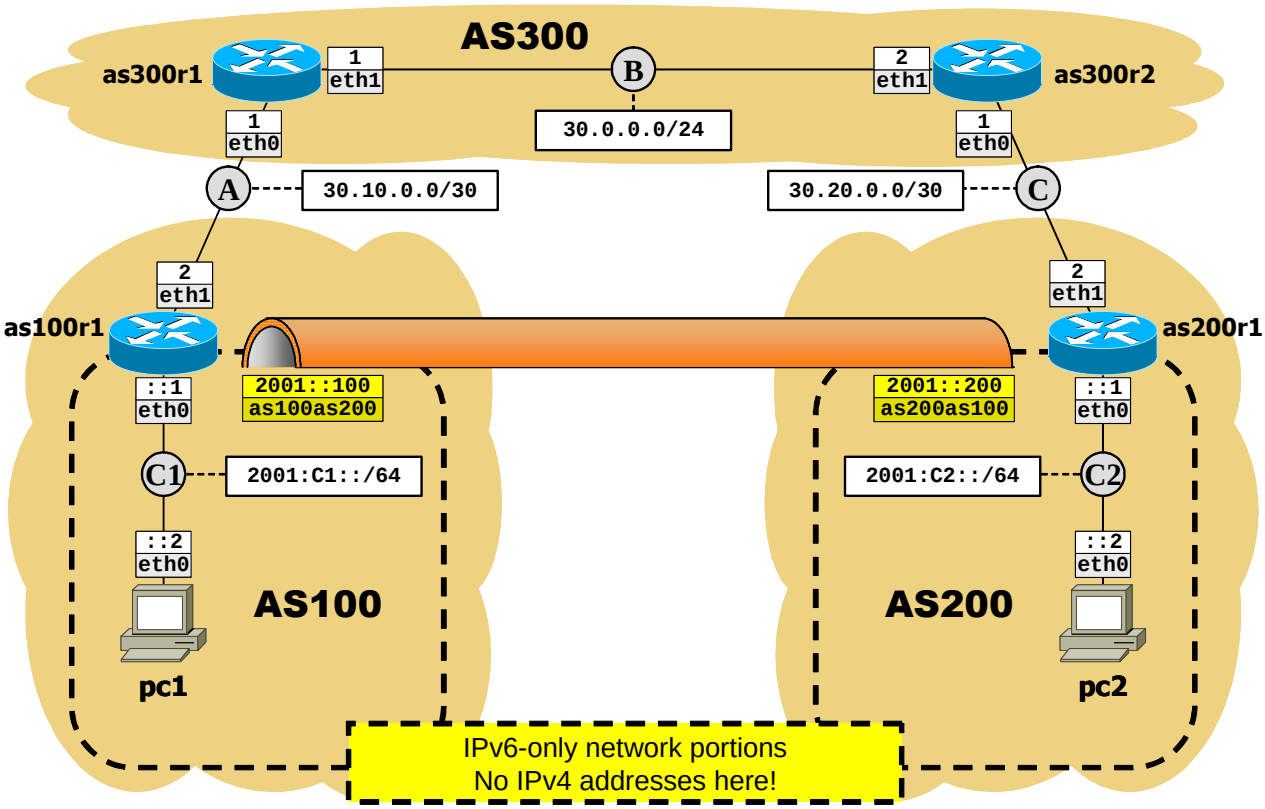
Goal:

It must be possibile to ping **`pc2`** from **`pc1`** (and vice versa) in IPv6 using command **`ping6`**.

ICN – Examination date: 23-01-2013 – Round 2 – "Dolmen"

Avilable time: 100 minutes.

Using Netkit, implement the network depicted in the figure below. In doing so, comply with the specifications and achieve the goal indicated below the figure.



Specifications:

- Internal IPv4 routing within **`AS300`** must be implemented using RIP.
- **`AS300`** routers must not use **`redistribute bgp`**.
- **When required, a node must be enabled to act as an IPv6 router by using the command specified in the box alongside.**
- No router announces IPv6 subnets in RIP or BGP.
- No router announces the default route **`0/0`**.
- No router implements customer-provider routing policies.
- No router implements filters that drop BGP announcements.

USEFUL COMMANDS (arguments in square brackets are optional):

- Assign the IPv6 address ***`ipv6addr/mask`*** to interface ***`if`***:
  `ifconfig` ***`if`*** **`up`**
  `ifconfig` ***`if`*** **`add`** ***`ipv6addr/mask`***
- Enable a network node to act as an IPv6 router:
  `echo 1 >/proc/sys/net/ipv6/conf/all/forwarding`
- Add a static route towards ***`ipv6addr`***`[/mask]`:
  `route -A inet6 add` ***`ipv6addr`***`[/mask]` **`[gw`** ***`nexthop`***`]` **`[dev`** ***`interface`***`]`**
- Setup of an IPv6-in-IPv4 tunnel called ***`tunnelName`*** between ***`ipv4LocalAddr`*** and ***`ipv4RemoteAddr`*** (note: this setup must be applied to both tunnel endpoints):
  `ip tunnel add` ***`tunnelName`*** **`mode sit remote`** ***`ipv4RemoteAddr`*** **`local`** ***`ipv4LocalAddr`*** **`ttl 10`**
  `ifconfig` ***`tunnelName`*** **`up`**
  `ifconfig` ***`tunnelName`*** **`add`** ***`ipv6LocalAddr`***
  `route -A inet6 add` ***`ipv6RemoteAddr`*** **`dev`** ***`tunnelName`***

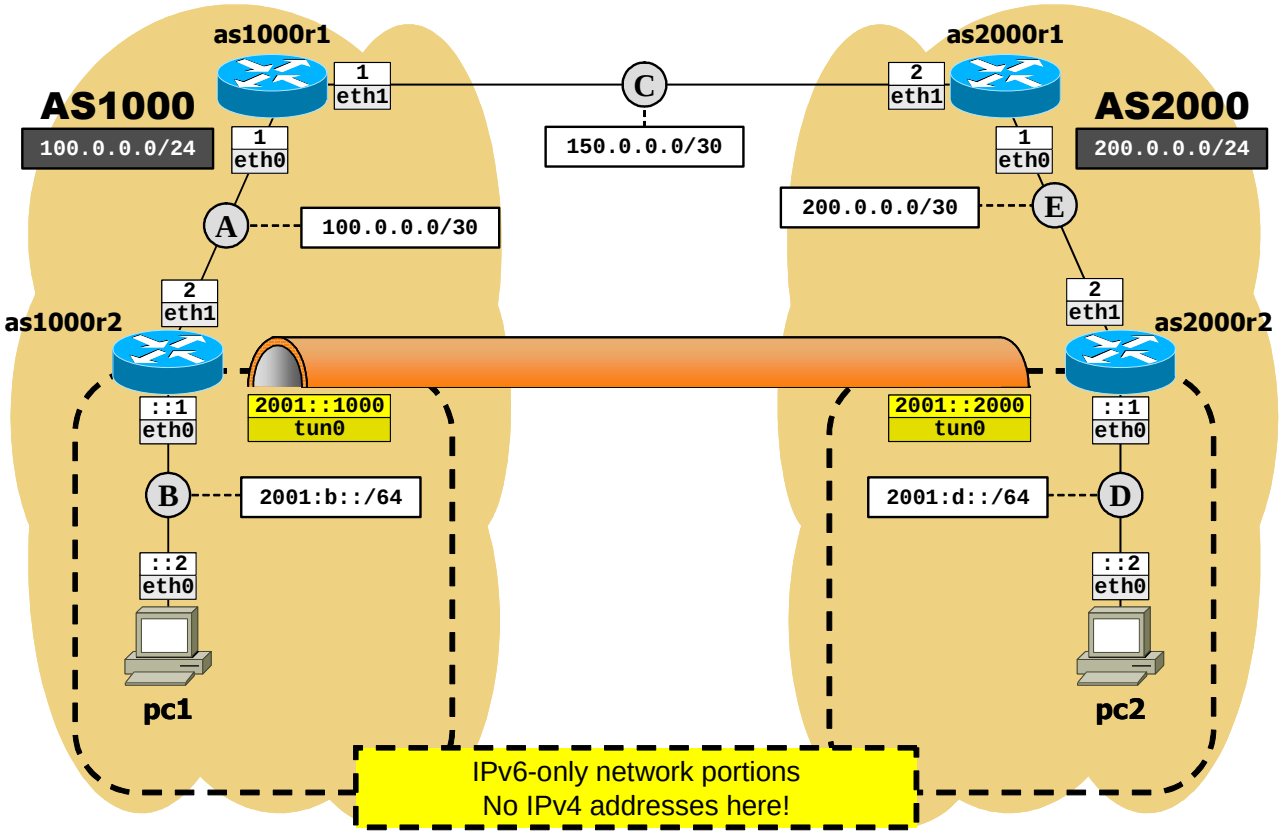
Goal:

It must be possibile to ping **`pc2`** from **`pc1`** (and vice versa) in IPv6 using command **`ping6`**.

ICN – Examination date: 23-01-2013 – Round 2 – "Yeti"

Avilable time: 100 minutes.

Using Netkit, implement the network depicted in the figure below. In doing so, comply with the specifications and achieve the goal indicated below the figure.



Specifications:

- Internal IPv4 routing within **`AS1000`** and **`AS2000`** must be implemented using RIP.
- **`AS1000`** and **`AS2000`** announce the network prefix in the dark grey box.
- **When required, a node must be enabled to act as an IPv6 router by using the command specified in the box alongside.**
- No router announces IPv6 subnets in RIP or BGP.
- No router announces the default route **`0/0`**.
- No router implements customer-provider routing policies.
- No router implements filters that drop BGP announcements.

USEFUL COMMANDS (arguments in square brackets are optional):

- Assign the IPv6 address ***`ipv6addr/mask`*** to interface ***`if`***:
```
ifconfig if up
ifconfig if add ipv6addr/mask
```
- Enable a network node to act as an IPv6 router:
```
echo 1 >/proc/sys/net/ipv6/conf/all/forwarding
```
- Add a static route towards ***`ipv6addr`***`[/mask]`:
```
route -A inet6 add ipv6addr[/mask] [gw nexthop] [dev interface]
```
- Setup of an IPv6-in-IPv4 tunnel called ***`tunnelName`*** between ***`ipv4LocalAddr`*** and ***`ipv4RemoteAddr`*** (note: this setup must be applied to both tunnel endpoints):
```
ip tunnel add tunnelName mode sit remote ipv4RemoteAddr local
      ipv4LocalAddr ttl 10
ifconfig tunnelName up
ifconfig tunnelName add ipv6LocalAddr
route -A inet6 add ipv6RemoteAddr dev tunnelName
```

Goal:

It must be possibile to ping **`pc2`** from **`pc1`** (and vice versa) in IPv6 using command **`ping6`**.