Example 1: **Colocation Provider**

- 30 Staff
- Routing
  - Dual stack!
  - Possible IGP combinations are:
    - OSPFv2 for IPv4, IS-IS for IPv6
    - OSPFv2 for IPv4, OSPFv3 for IPv6
    - IS-IS for IPv4, OSPFv3 for IPv6
    - IS-IS for both IPv4 and IPv6 (their solution)
Colocation Provider

- Check list
  - Set access list on network equipment
  - Set up monitoring (SNMP)
  - Have working DNS
- Subnetting tools
  - sipcalc, IPv6calc, apps
- Every customer gets a /48 assignment
  - And a /64 for the connection

Points of attention:

- Stateless auto configuration can assign an IP
- “unexpectedly” (SLAAC is on by default)
- Does your firewall support IPv6?
- Make sure your hardware can do IPv6 the way
- you want it!
- Be careful with the statement “IPv6 Ready”
ISP xDSL

- 200 staff
- 2 /32 prefixes (due to merger)
  - Not enough
  - Make a plan before requesting your allocation
- /48 per POP
- /56 per router
- /64 per customer vlan

ISP xDSL

- Servers
  - No SLAAC
  - Port numbers for services (i.e. POP3 at ::110)
  - Default gateway manually set to 2001:db8::1/64
ISP xDSL

- Network links (point-to-point)
  - /64 per link
  - ::1, ::2
  - No SLAAC
  - Easy to remember!
- You don’t want your router link at
- 2001:db8:ef9d:7631:edff:fe55:4532:ae60/64

Colocation 2

- 1/32 PA Allocation
- 5 x Cisco 7206 NPE-G2
  - 2 border routers
  - 3 access layer routers
- 4 x IPv6 Transit Providers
  - No peering, small network
- Technologies used: IS-IS, BGP
Colocation 2

- Servers are connected via the switch to the access layer router (colocation router)
- Servers have a static route to the colocation router
- Router-to-router connections: /127
- Server-to-router connections: /64
Colocation 2

Colo-C to Border-A Connection

```
show run interface ge0/0/3.443
!
interface ge0/0/3.443
  description "Core: link to Colo-C"
  encapsulation dot1Q 443
  ip address 94.142.247.225 255.255.255.252
  ipv6 address 2a02:898:0:305::a/127
end
```

```
show run interface ge0/0/1.0
!
interface ge0/0/1.0
  ip address 94.142.226.225 255.255.255.252
  ipv6 address 2a02:898:0:301::b/127
end
```
Colocation 2

- IS-IS is used as IGP

```
show run | sec router isis
router isis
net 49.0001.0000.0000.000b.00
redistribute connected
redistribute static ip
passive-interface loopback0
```

Colocation 2

- IS-IS Export filter
- The server /64 subnet and router-to-router links are redistributed
- A /48 is routed to the customer server, these are Redistributed
- A blackhole route for the whole /32 is set on the router to avoid ping-pong
- A /48 is routed towards each customer
Colocation 2

```
show ipv6 static
IPV6 Static routes Table - default
Codes: * - installed in RIB, u/m - Unicast/Multicast only
U - Per-user Static route
N - ND Static route
M - MIP Static route
P - DHCP-4D Static route
R - RHI Static route
2a02:898:52::/48 via 2a02:898::52:1 distance 1
```

Colocation 2

- Full iBGP Mesh
Colocation 2

- iBGP configuration

```
show run interface loopback 0
!
interface Loopback0
  ip address 94.142.247.1 255.255.255.255
  ipv6 address 2a02:898:0:300::1/128
end
```

Colocation 2

- iBGP configuration

```
sh run sec router bgp
router bgp 8283
...
neighbor 2a02:898:0::1:2 remote-as 65530
neighbor 2a02:898:0::1:2 update-source Loopback0
neighbor 2a02:898:0::2:2 remote-as 65530
neighbor 2a02:898:0::2:2 update-source Loopback0
neighbor 2a02:898:0::3:2 remote-as 65530
neighbor 2a02:898:0::3:2 update-source Loopback0
address-family ipv6
  neighbor 2a02:898:0::1:2 activate
  neighbor 2a02:898:0::2:2 activate
  neighbor 2a02:898:0::3:2 activate
```
BGP Sessions Overview

Colocation 2

- eBGP example part 1

```
sh run | sec router bgp
router bgp 8283

neighbor 2001:67c:21B4:106::11 remote-as 8954
neighbor 2001:888:1:8000::1 remote-as 3265
neighbor 2001:828:1:3::2:2 remote-as 21155
```

- eBGP example part 2

```
show ipv6 prefix-list
ipv6 prefix-list TRANSIT-OUT-IPv6: 1 entries
  seq 5 permit 2a02:898::/32
```