Why Collocate Overseas?

- Hard to re-terminate transoceanic circuit in case of "issues" with upstream ISP
- No Quality of Service
- No Control over infrastructure
- No Monitoring of link performance

Collocation Overseas

- Many AP region ISPs collocate equipment in the US
  - install their own router(s) and other hardware (servers, caches,…)
  - establish peering relationships with US NSPs and domestic ISPs
  - buy facilities management services
    - usually hardware maintenance, installation management

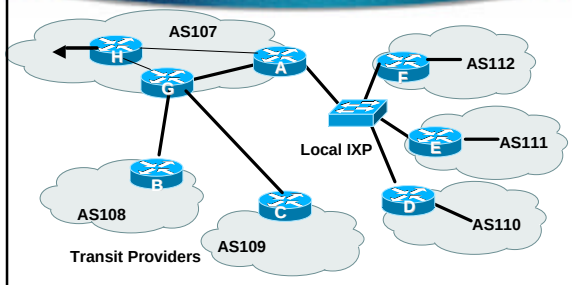
Collocation Overseas

- Many AP region ISPs collocate equipment in the US
  - US domestic circuits are "cheap"
  - Easy to change your upstream
  - Easy to have multiple upstreams
  - Easy to implement QoS related features, service differentiation, etc...

Collocation

- Common Scenario:
  - AS107 has collocate space in the US
  - AS108 and AS109 are transit providers for AS107
  - AS107 is also present at the local exchange point for regional peers

Collocation



Collocation

- **AS107**
  - **Router A is dedicated to peering at local IXP**
  - **Router G is dedicated to links with the transit providers**
  - **Router H is dedicated to the transoceanic link**

Collocation
Router A Configuration

```
interface loopback 0
 description Border Router Loopback
 ip address 221.0.0.1 255.255.255.255
!
interface fastethernet 0/0
 description Exchange Point LAN
 ip address 220.5.10.2 255.255.255.224
 ip verify unicast reverse-path
 no ip directed-broadcast
 no ip proxy-arp
 no ip redirects
!
..next slide
```


Collocation
Router A Configuration

```
interface fastethernet 1/0
 description Crossover 100Mbps Connection to Router G
 ip address 221.0.10.2 255.255.255.252
 no ip directed-broadcast
 no ip proxy-arp
 no ip redirects
!
interface fastethernet 2/0
 description Crossover 100Mbps Connection to Router H
 ip address 221.0.10.6 255.255.255.252
 no ip directed-broadcast
 no ip proxy-arp
 no ip redirects
..next slide
```


Collocation
Router A Configuration

```
router bgp 107
 neighbor ixp-peers peer-group
 neighbor ixp-peers soft-reconfiguration in
 neighbor ixp-peers prefix-list myprefixes out
 neighbor 221.0.0.2 remote-as 107
 neighbor 221.0.0.2 description Router G - Upstream Peers
 neighbor 221.0.0.2 update-source loopback 0
 neighbor 221.0.0.3 remote-as 107
 neighbor 221.0.0.3 description Router H - transpacific router
 neighbor 221.0.0.3 update-source loopback 0
 neighbor 221.0.0.4 remote-as 107
 neighbor 221.0.0.4 description Router at HQ
 neighbor 221.0.0.4 update-source loopback 0
..next slide
```


Collocation
Router A Configuration

```
 neighbor 220.5.10.4 remote-as 110
 neighbor 222.5.10.4 peer-group ixp-peers
 neighbor 222.5.10.4 prefix-list peer110 in
 neighbor 220.5.10.5 remote-as 111
 neighbor 222.5.10.5 peer-group ixp-peers
 neighbor 222.5.10.5 prefix-list peer111 in
 neighbor 220.5.10.3 remote-as 112
 neighbor 222.5.10.3 peer-group ixp-peers
 neighbor 222.5.10.3 prefix-list peer112 in
!
ip prefix-list myprefixes permit 221.10.0.0/19
ip prefix-list peer110 permit 222.12.0.0/19
ip prefix-list peer111 permit 222.18.128.0/19
ip prefix-list peer112 permit 222.1.32.0/19
```

Collocation
Router A Configuration

- Router A does NOT originate AS107's prefix block
  - if router is disconnected from AS107 either locally or across the ocean, announcement could cause blackhole
- Prefix-list filtering is the minimum required
  - usually include AS path filtering too

Collocation
Router G Configuration

```
interface loopback 0
 description Peering Router Loopback
 ip address 221.0.0.2 255.255.255.255
!
interface fastethernet 0/0
 description Crossover 100Mbps Connection to Router A
 ip address 221.0.10.1 255.255.255.252
 no ip directed-broadcast
 no ip proxy-arp
 no ip redirects
!
..next slide
```


Collocation
Router G Configuration

```
interface hssi 1/0
 description T3 link to BigISP
 ip address 222.0.0.2 255.255.255.252
 no ip directed-broadcast
 no ip proxy-arp
 no ip redirects
!
interface hssi 2/0
 description T3 link to MegaISP
 ip address 218.6.0.2 255.255.255.252
 no ip directed-broadcast
 no ip proxy-arp
 no ip redirects
..next slide
```


Collocation
Router G Configuration

```
router bgp 107
 neighbor 221.0.0.1 remote-as 107
 neighbor 221.0.0.1 description Router A - US Local IXP
 neigbhor 221.0.0.1 update-source loopback 0
 neighbor 221.0.0.1 prefix-list myprefixes out
 neighbor 221.0.0.3 remote-as 107
 neighbor 221.0.0.3 description Router H - transpacific router
 neighbor 221.0.0.3 update-source loopback 0
 neighbor 221.0.0.4 remote-as 107
 neighbor 221.0.0.4 description Router at HQ
 neighbor 221.0.0.4 update-source loopback 0
..next slide
```


Collocation
Router G Configuration

```
 neighbor 222.0.0.1 remote-as 108
 neighbor 222.0.0.1 prefix-list myprefixes out
 neighbor 222.0.0.1 prefix-list rfc1918-dsua in
 neighbor 218.6.0.1 remote-as 109
 neighbor 218.6.0.1 prefix-list myprefixes out
 neighbor 218.6.0.1 prefix-list rfc1918-dsua in
!
ip prefix-list myprefixes permit 221.10.0.0/19
```


Collocation
Router G Configuration

- Router G accepts full BGP prefixes from both AS108 and AS109
- Router G announces AS107 prefix to upstreams
- Simple Example - policy may also be required for loadsharing etc

Collocation
Router H Configuration

```
interface loopback 0
 description Peering Router Loopback
 ip address 221.0.0.3 255.255.255.255
!
interface fastethernet 0/0
 description Crossover 100Mbps Connection to Router A
 ip address 221.0.10.5 255.255.255.252
 no ip directed-broadcast
 no ip proxy-arp
 no ip redirects
!
..next slide
```


Collocation
Router H Configuration

```
interface hssi 1/0
 description T3 link back to home
 ip address 221.1.0.1 255.255.255.252
 rate-limit output access-group 195 ..etc
 no ip directed-broadcast
 no ip proxy-arp
 no ip redirects
!
..next slide
```


Collocation
Router H Configuration

```
router bgp 107
 neighbor 221.0.0.1 remote-as 107
 neighbor 221.0.0.1 description Router A - US Local IXP
 neighbor 221.0.0.1 update-source loopback 0
 neighbor 221.0.0.2 remote-as 107
 neighbor 221.0.0.2 description Router G - peering router
 neighbor 221.0.0.2 update-source loopback 0
 neighbor 221.0.0.4 remote-as 107
 neighbor 221.0.0.4 description Router at HQ
 neighbor 221.0.0.4 update-source loopback 0
!
```


Collocation
Router H Configuration

- Router H is dedicated to transoceanic link
  - part of ISP core iBGP mesh
- More complex configuration likely
  - CAR, RED, etc
- More complex links likely
  - e.g satellite uplink for low revenue latency insensitive traffic

Collocation

- Richer interconnectivity possible
- Better redundancy possible
- Overall advantage - control!

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