



Enterprise Connectivity to Service Providers

Implement BGP in the Service Provider Network

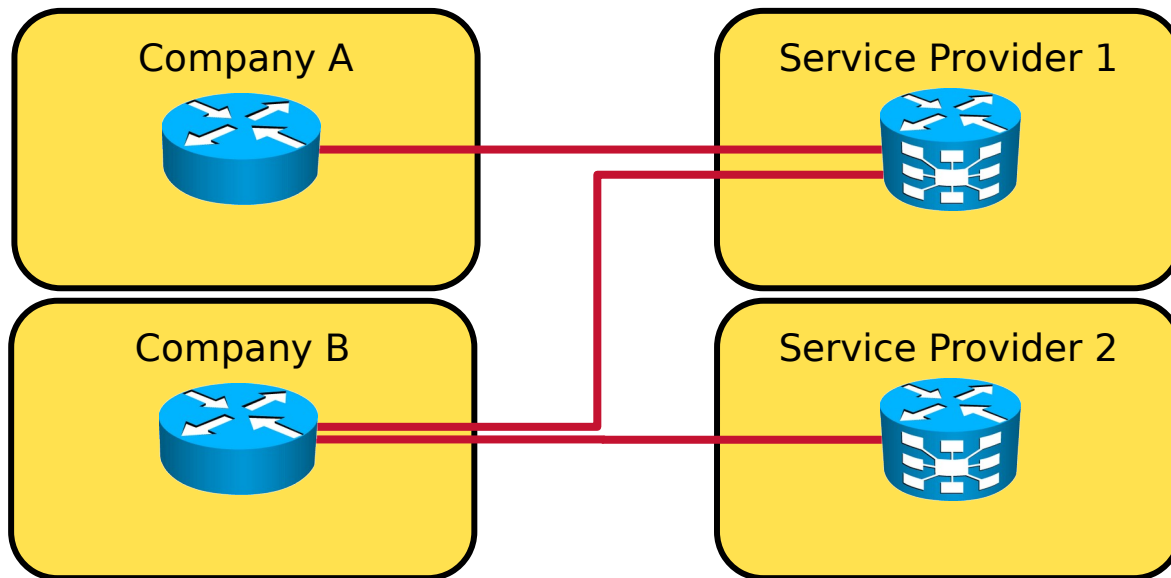


Objectives

- Describe connectivity requirements when connecting an enterprise network to a service provider
- Describe routing method selection when connecting an enterprise to a service provider
- Describe different connection options between enterprises and service providers
- Describe single-homed enterprises
- Describe dual-homed enterprises
- Describe multihomed enterprises
- Describe dual-multihomed enterprises

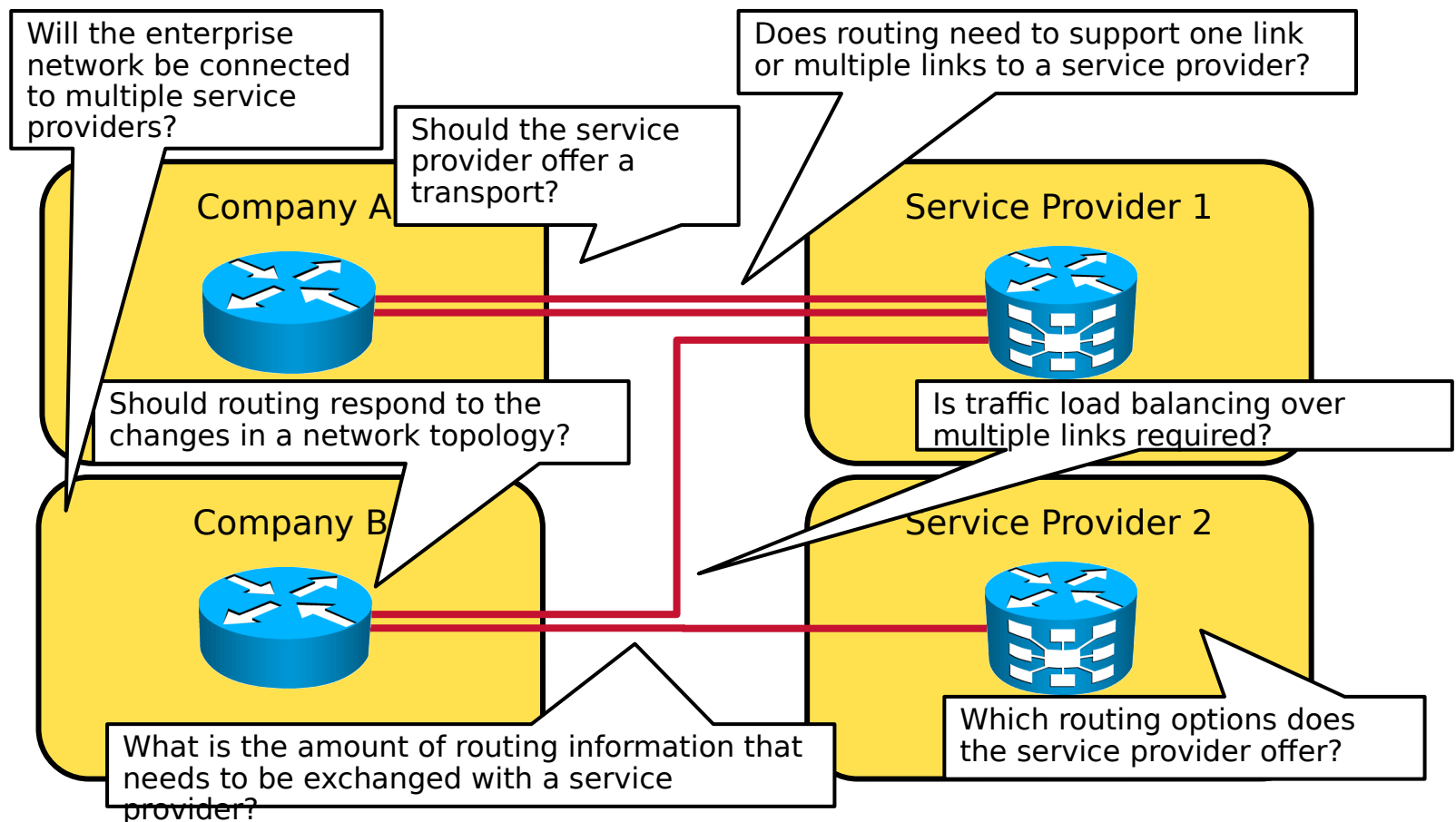
Enterprise Connectivity Requirements

- Public IP address space (subpool or whole /24 subnet)
- Link type and bandwidth availability
- Routing options
- Connection redundancy
- Independency in regard to a service provider:
 - Public IP address space
 - AS number



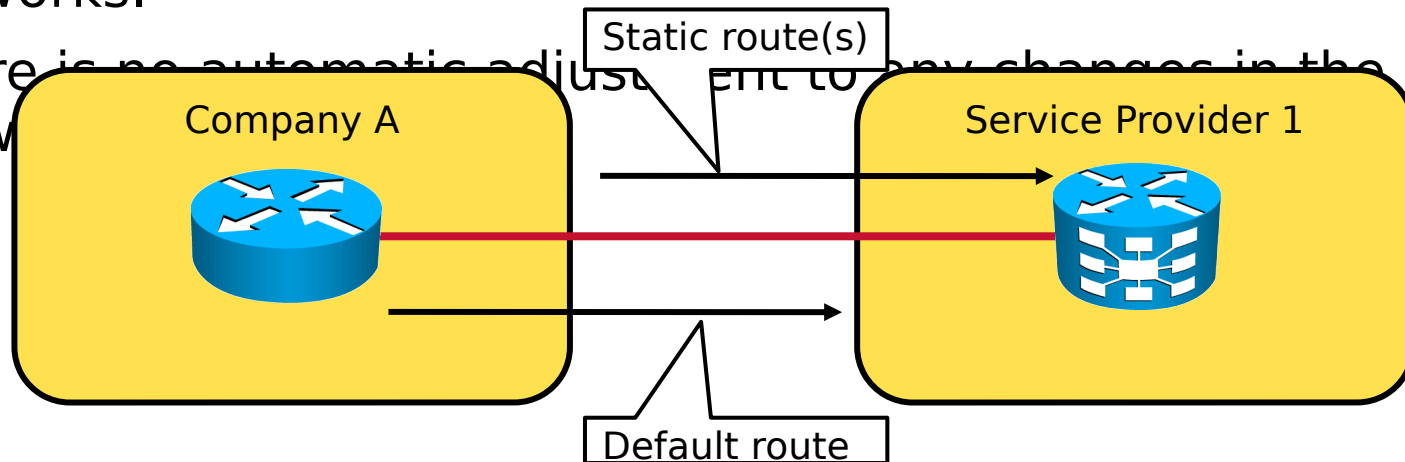
Routing Method Selection

- Static routes and BGP are typically selected for Internet connectivity.



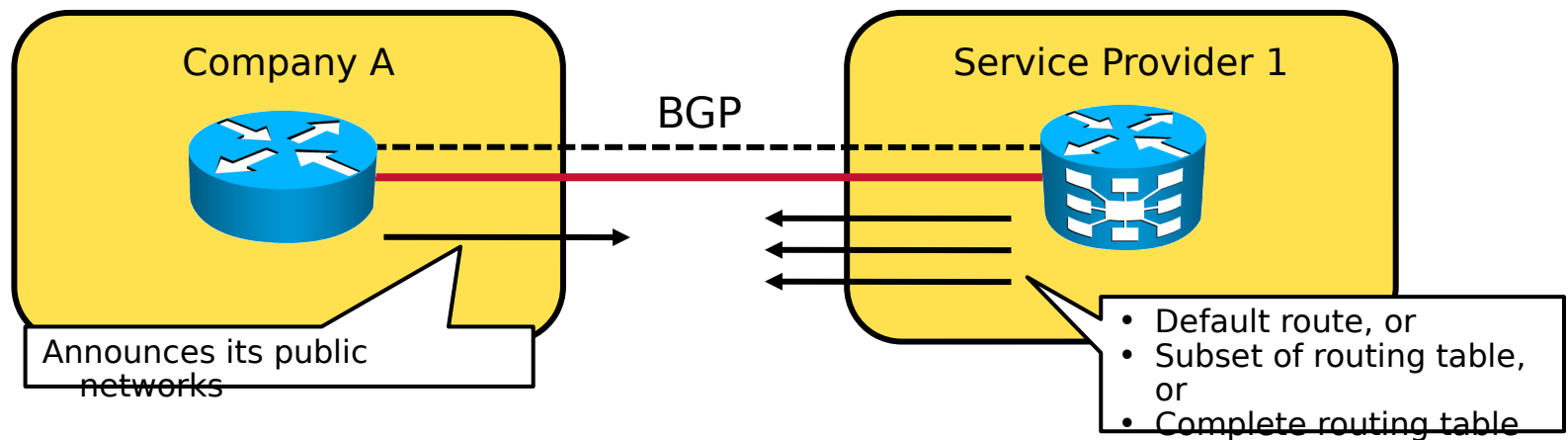
Routing Method Selection - Static Routes

- Customer is connected through a single connection to a service provider.
- The customer uses the default route toward the service provider.
- The service provider uses static route(s) for customer public networks.
- There is no automatic adjustment to any changes in the network.

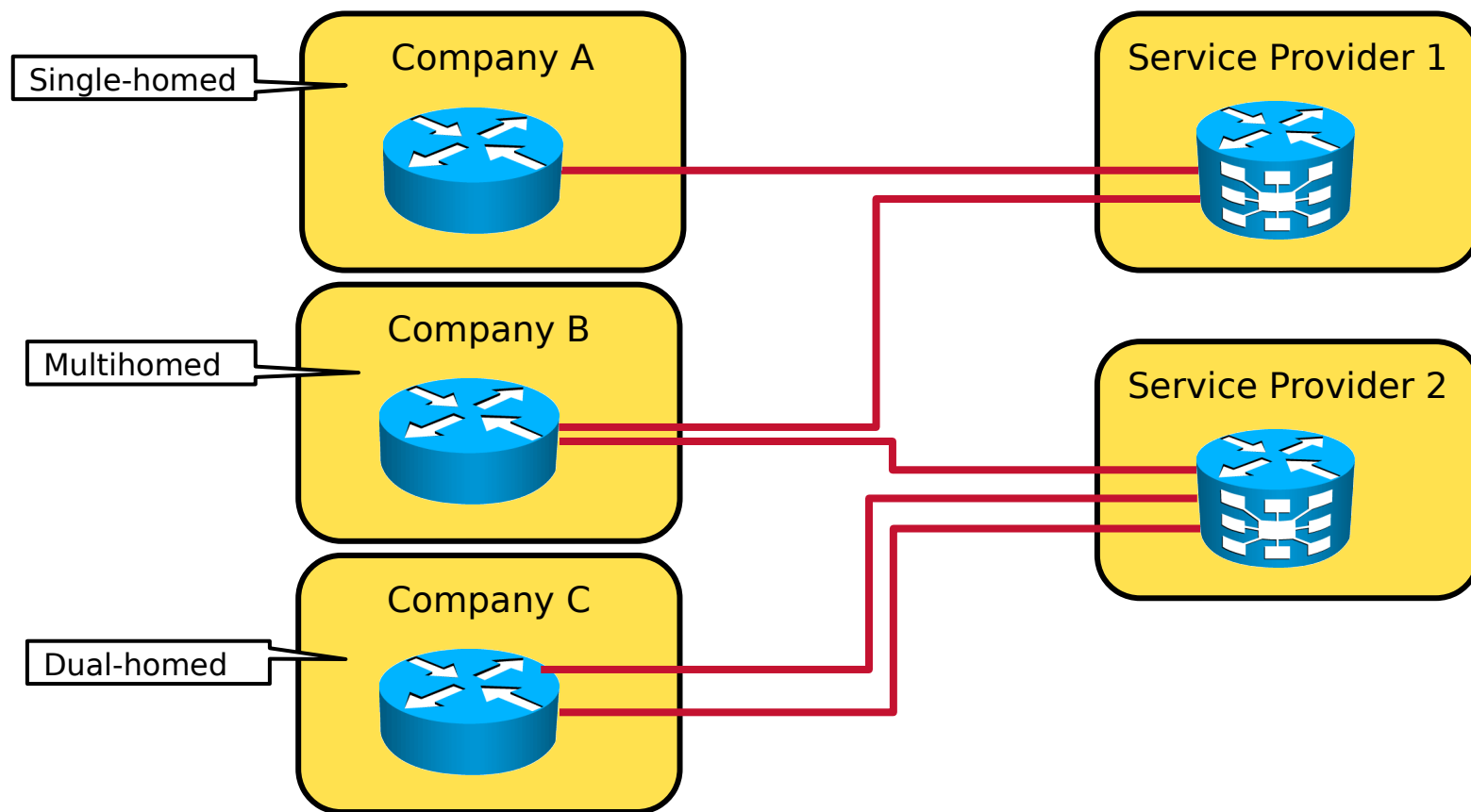


Routing Method Selection - BGP

- Typically used for inter-AS routing



Connection Options



Single-Homed Enterprises

Link failure results in broken connectivity.

Option 1: Routing with static routes

- A default route from an enterprise network is used.
- A static route(s) from a service provider is used for customer networks.

Option 2: Routing with BGP

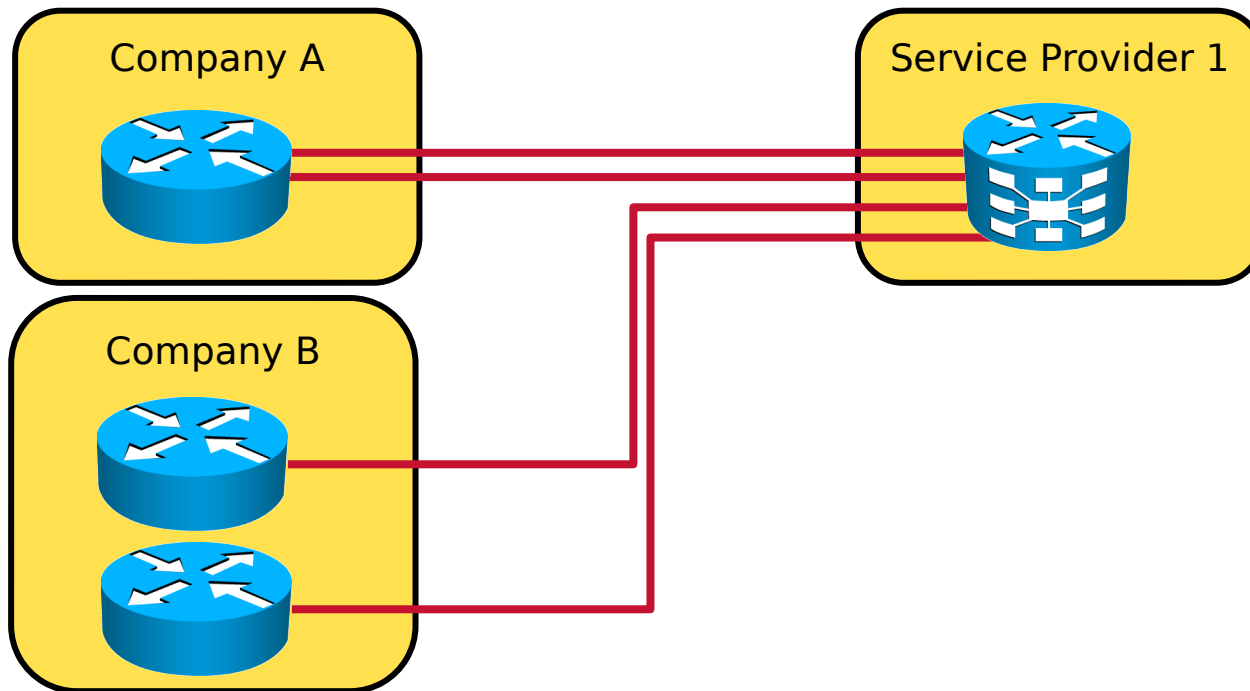
- The customer announces its public network or networks.
- The service provider announces the default route to the customer.



Dual-Homed Enterprises

Characteristics:

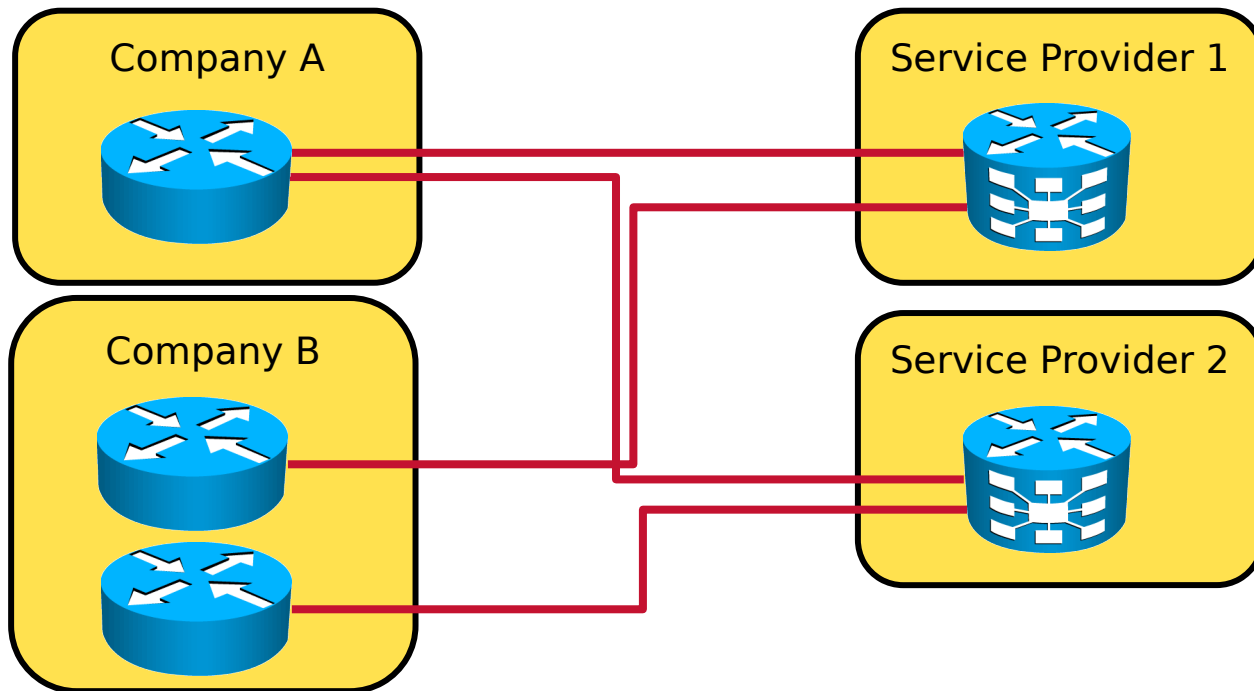
- Connected with two links to the same service provider
- Can use a single router or two edge routers
- Can use static routes or BGP



Multihomed Enterprises

Characteristics:

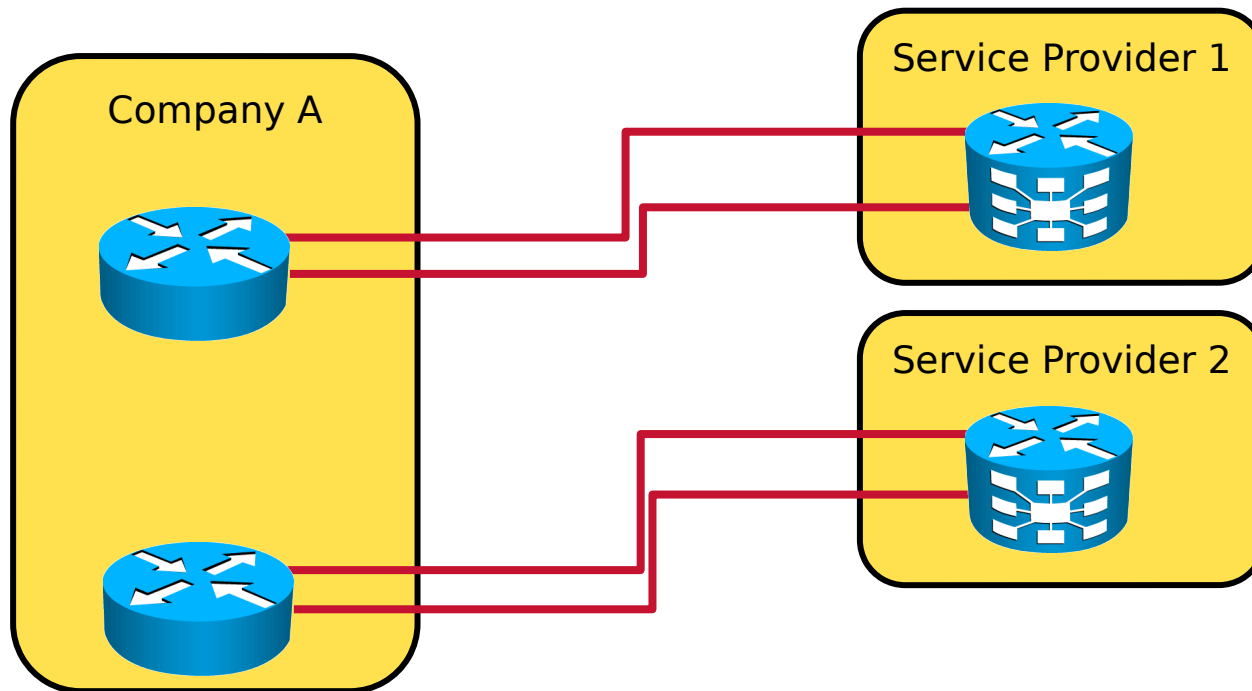
- Connected to two or more different ISPs
- Can use a single router or multiple edge routers
- Dynamic routing achieved with BGP



Dual-Multihomed Enterprises

Characteristics:

- Connected to two or more different service providers with two links per service provider
- Typically uses multiple edge routers (one per service provider)
- Dynamic routing achieved with BGP



Summary

- The way in which the customer connects to a service provider depends on the redundancy requirements.
- You can use static routing or BGP to provide routing between an enterprise and a service provider.
- You can achieve redundancy between an enterprise and a service provider by using redundant links and/or redundant equipment.
- Single-homed service provider connectivity is used in cases when a loss in Internet connectivity is not vital or highly problematic to a customer.
- Dual-homed customer is connected to single service provider using two links.
- Multihomed customer is connected to two service providers.
- Dual-multihomed customer is connected to two service providers using two links.

