

INTERNET ROUTING ARCHITECTURE

A stylized blue map of the world is centered on the slide, with glowing nodes and connecting lines representing network connections. The background is dark blue with a pattern of binary code (0s and 1s) and faint, glowing lines that suggest a global network or data flow.

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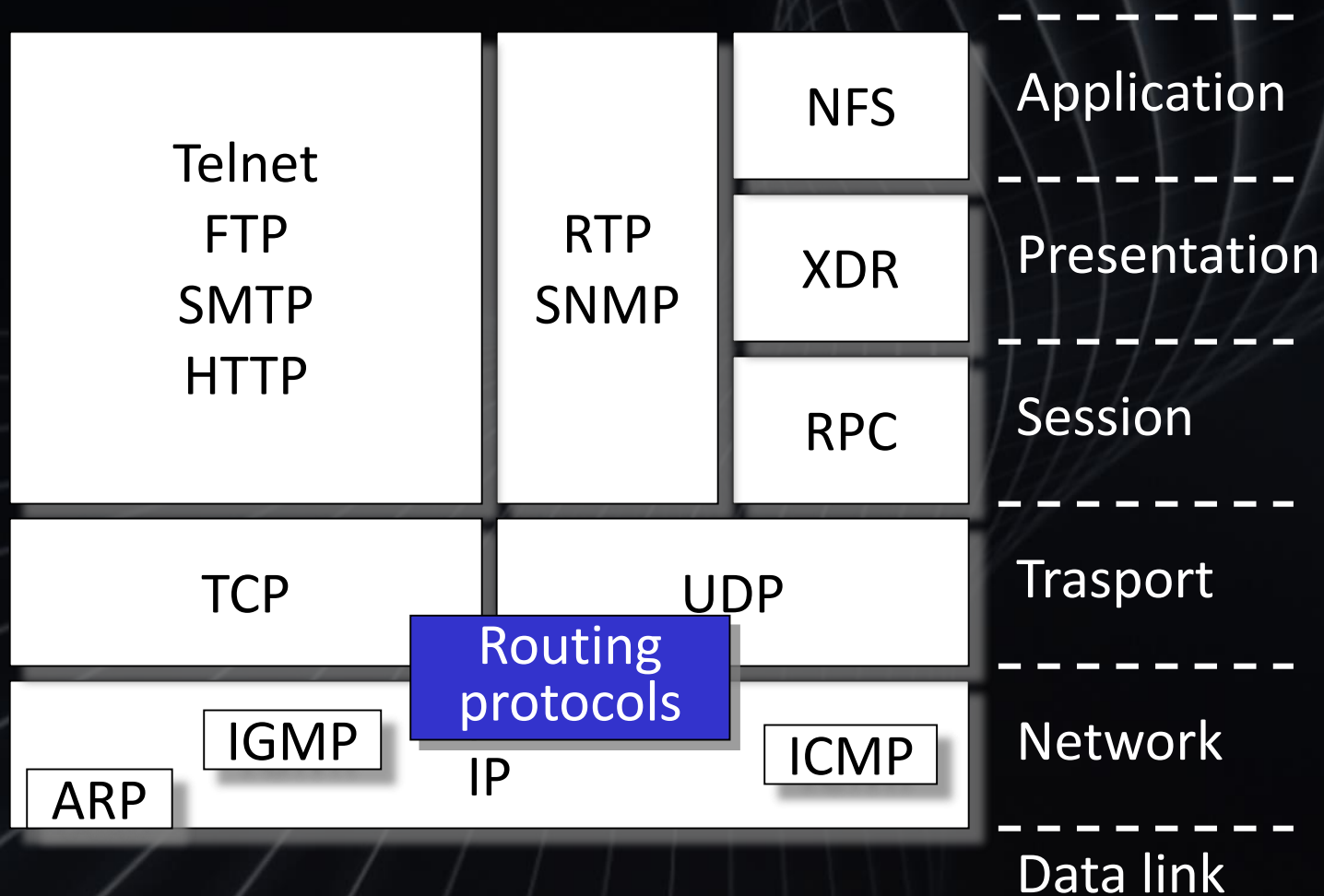
路由协议和路由域

ROUTING PROTOCOL AND ROUTING DOMAIN

Some basic definitions



In the Protocol Architecture



Routing Protocol

Protocol for routers to exchange information on the network to determine the best route to each destination

→ Based on routing algorithm

- Define metric(s) 定义度量标准
- Their encoding in packets
- Specific timing 具体的时间
- Configurable parameters

可配置的变量

Routing Domain

部署相同路由协议，的路由器集合

- A set of routers deploying the same routing protocol
- It is a connected portion of the network

他是网络连接的一部分

Redistribution

重新分发

→ A router may belong to multiple routing domains

一个路由器可以属于多个路由域

→ It uses multiple routing protocols

→ It can redistribute information learned with a protocol through another one

协议之间是相互联系

再分配策略

Redistribution Policies

- Defined by administrator
- Advertisement filters
- Metric conversion
- Information source priority

公制换算

信息源的优先级

AUTONOMOUS SYSTEM

自治系统



What

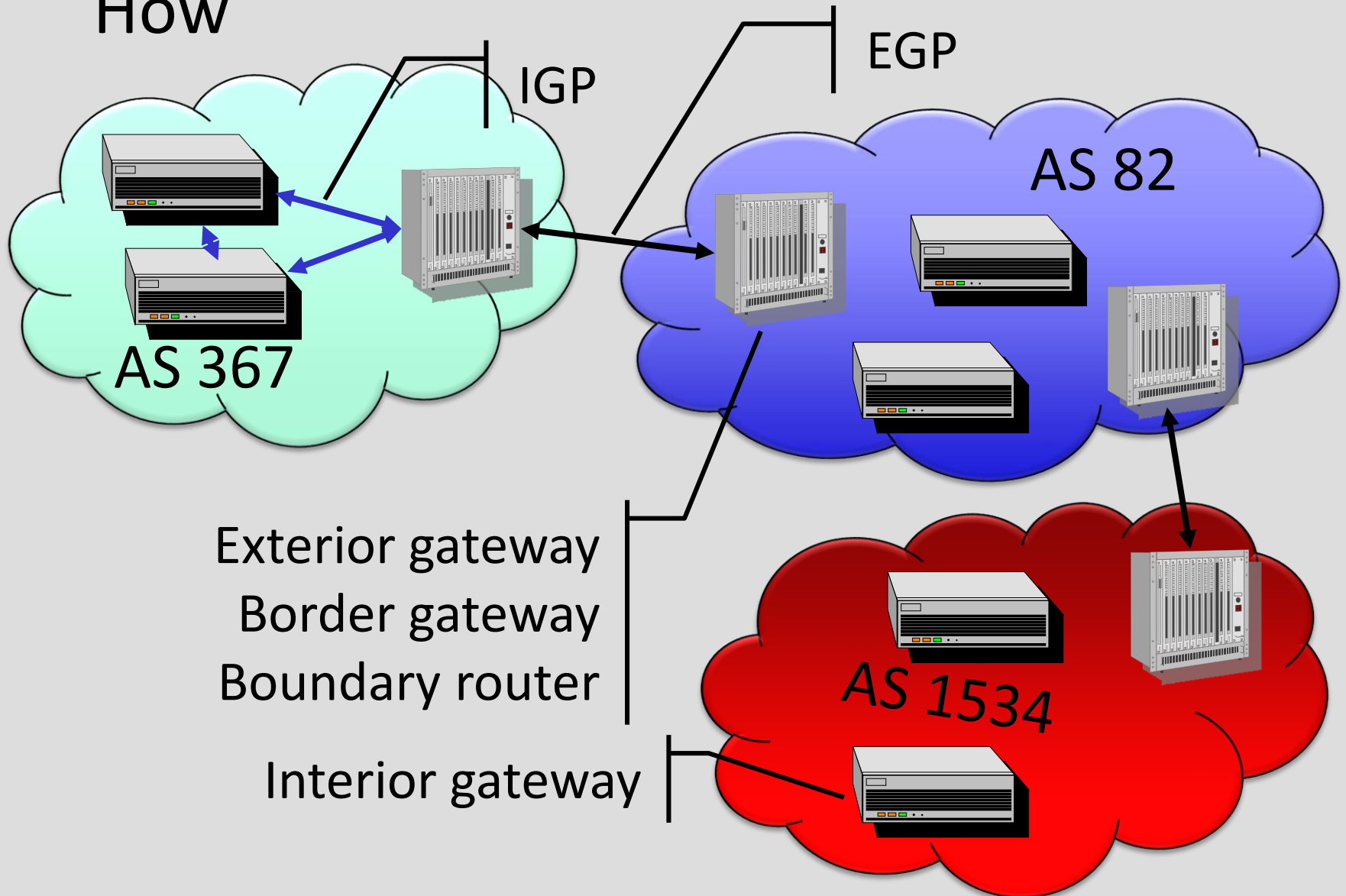
- A set of subnets grouped based on 一系列子网的集合
 - Topology 拓扑结构
 - Organizational criteria 组织标准
- E.g. the subnets of a large internet service provider 大的ISP的子网

Why

- Addressing and routing tightly coordinated
 - Possibly multiple internal routing domains
- Controlled AS interfacing
 - Data
 - Routing information

- Administration 管理
 - Autonomous internal routing choices 自主内部路由选择
 - Negotiated external routing choices 协商的外部路由选择
- Scalability 可扩展性
 - Not all information propagated everywhere
并不是所有的信息都会被传播到世界各地

How



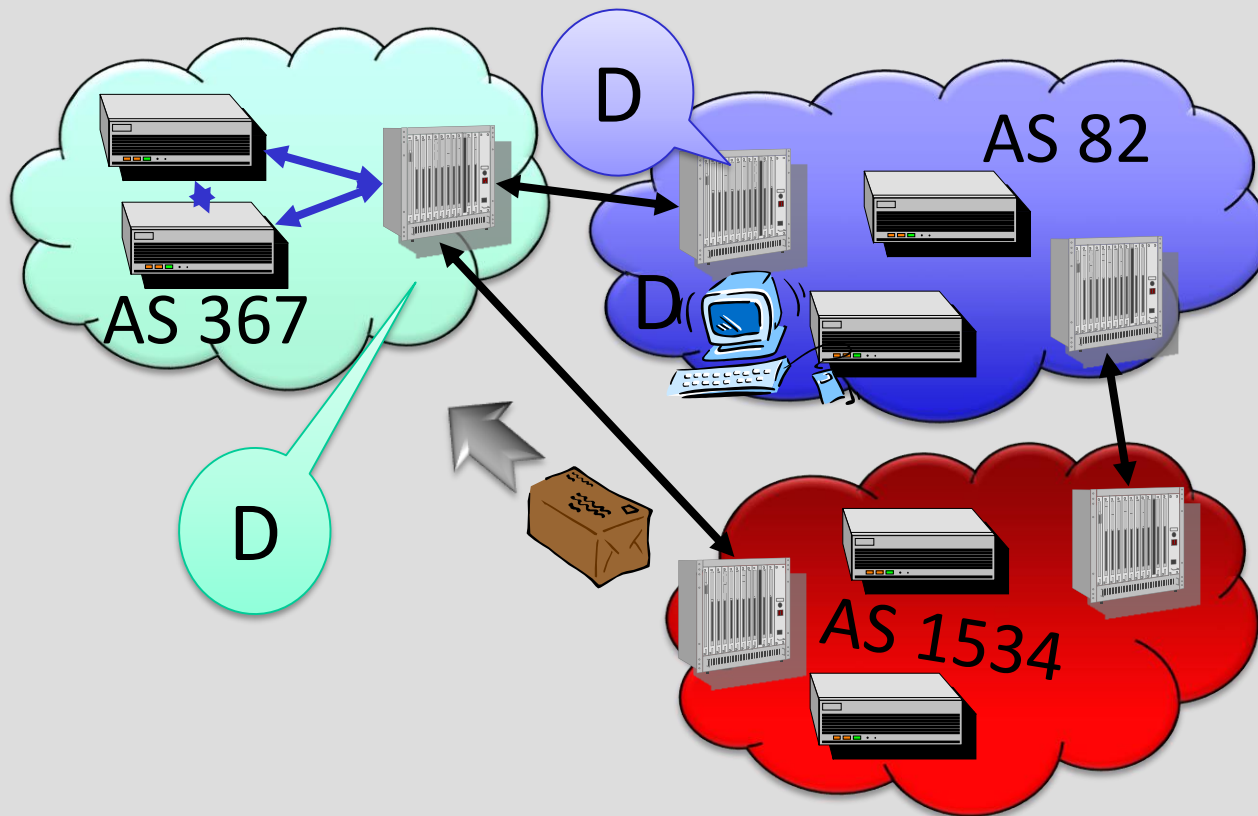
Identification

- Two byte number
- Assigned by IANA (Internet Assigned Numbers Authority)
- Private number range
 - 64512-65534
 - Controlled routing information exchange

Administration Aspects

Announcements determine
data flows

公告决定数据流



Exterior Routing

- Not necessarily shorter path
不需要选择较短的路径
- Choice based on policies
基于策略的选择
- Reflect agreements among ASs
反应自治系统之间的契约

Scalability

扩展性

→ Destinations can be aggregated

→ 195.1.2.0/24 and
195.1.3.0/24 can be
announced as 195.1.2.0/23

→ Hierarchical routing

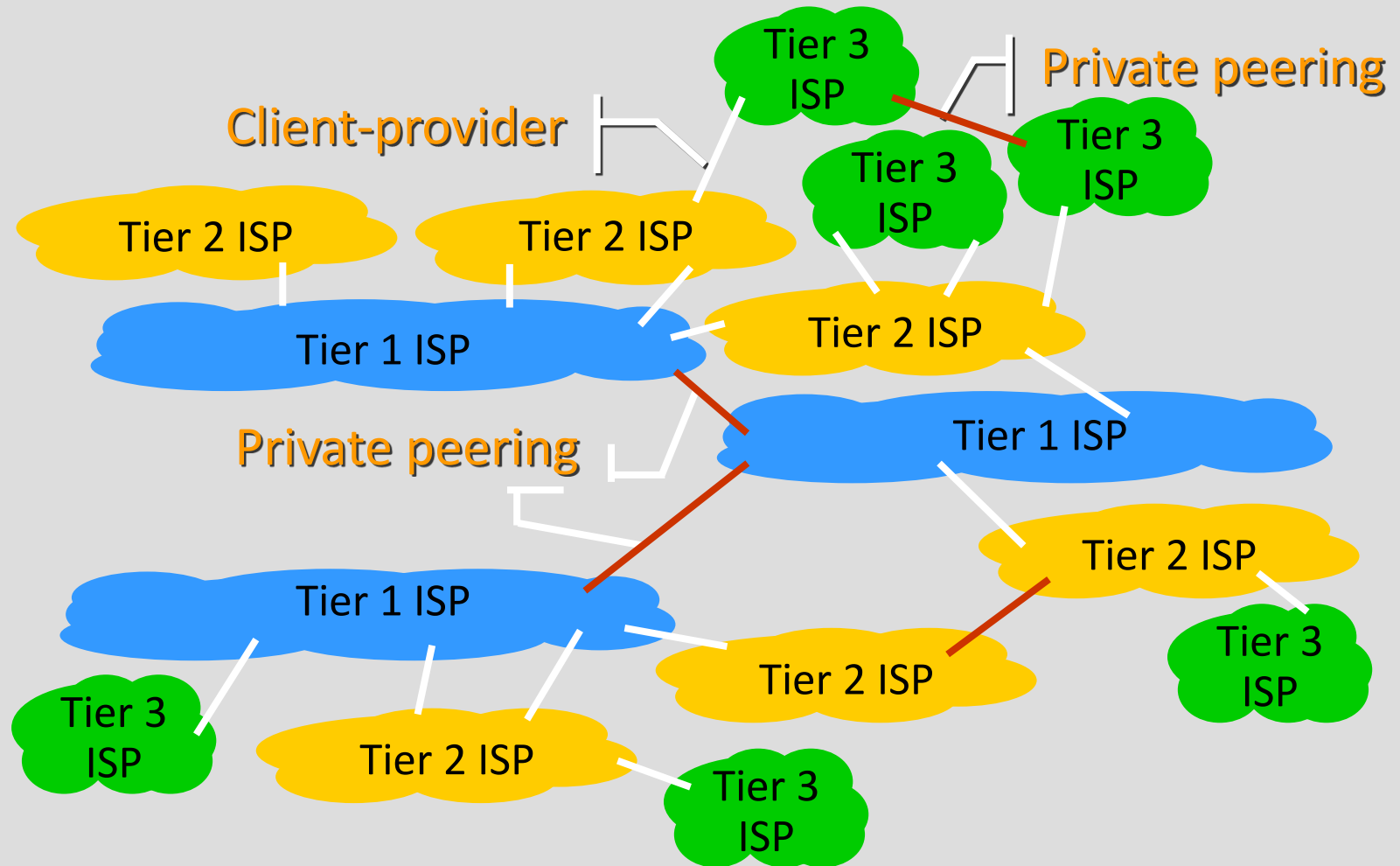
等级路由

INTERNET ROUTING ARCHITECTURE

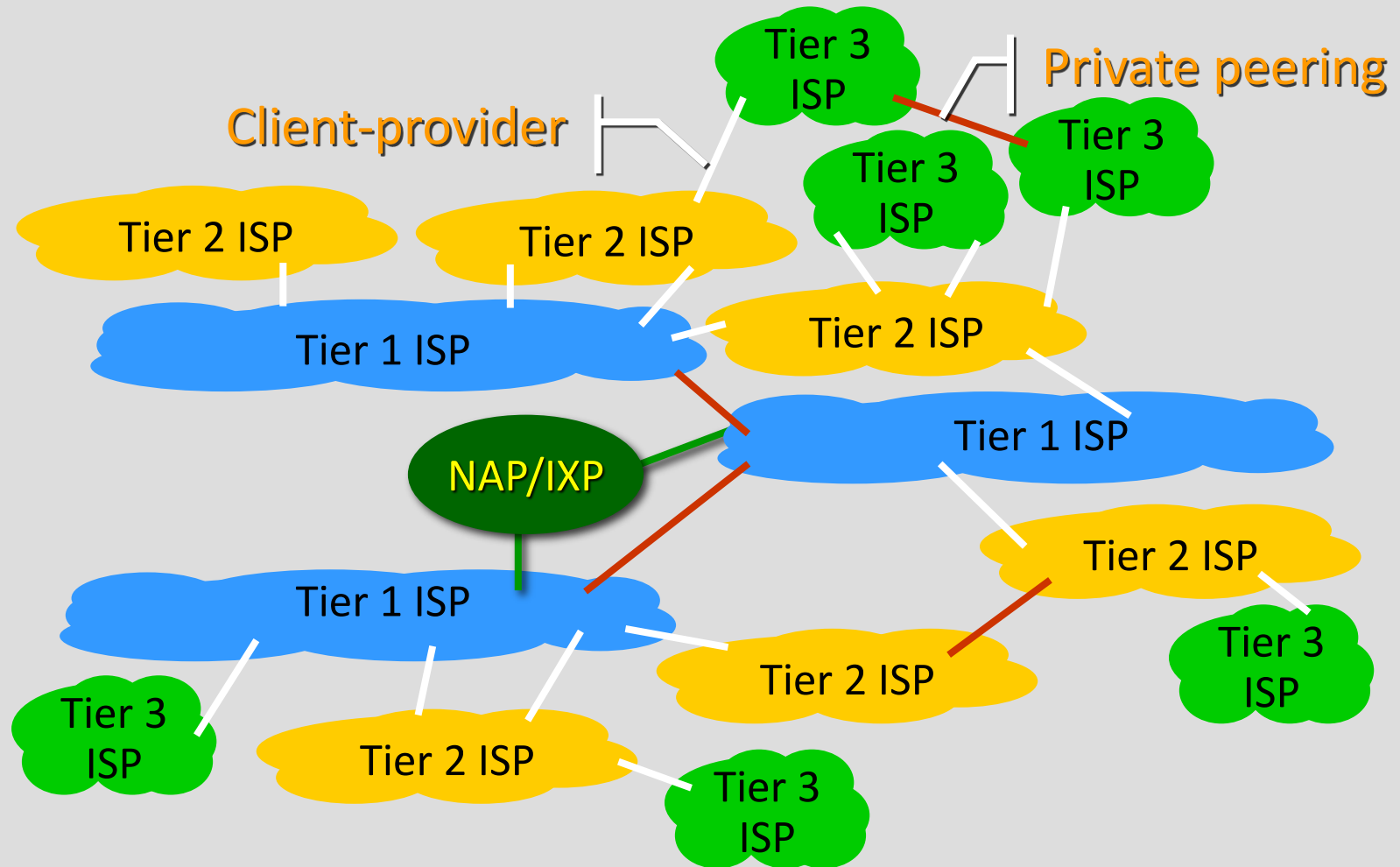
内部路由结构



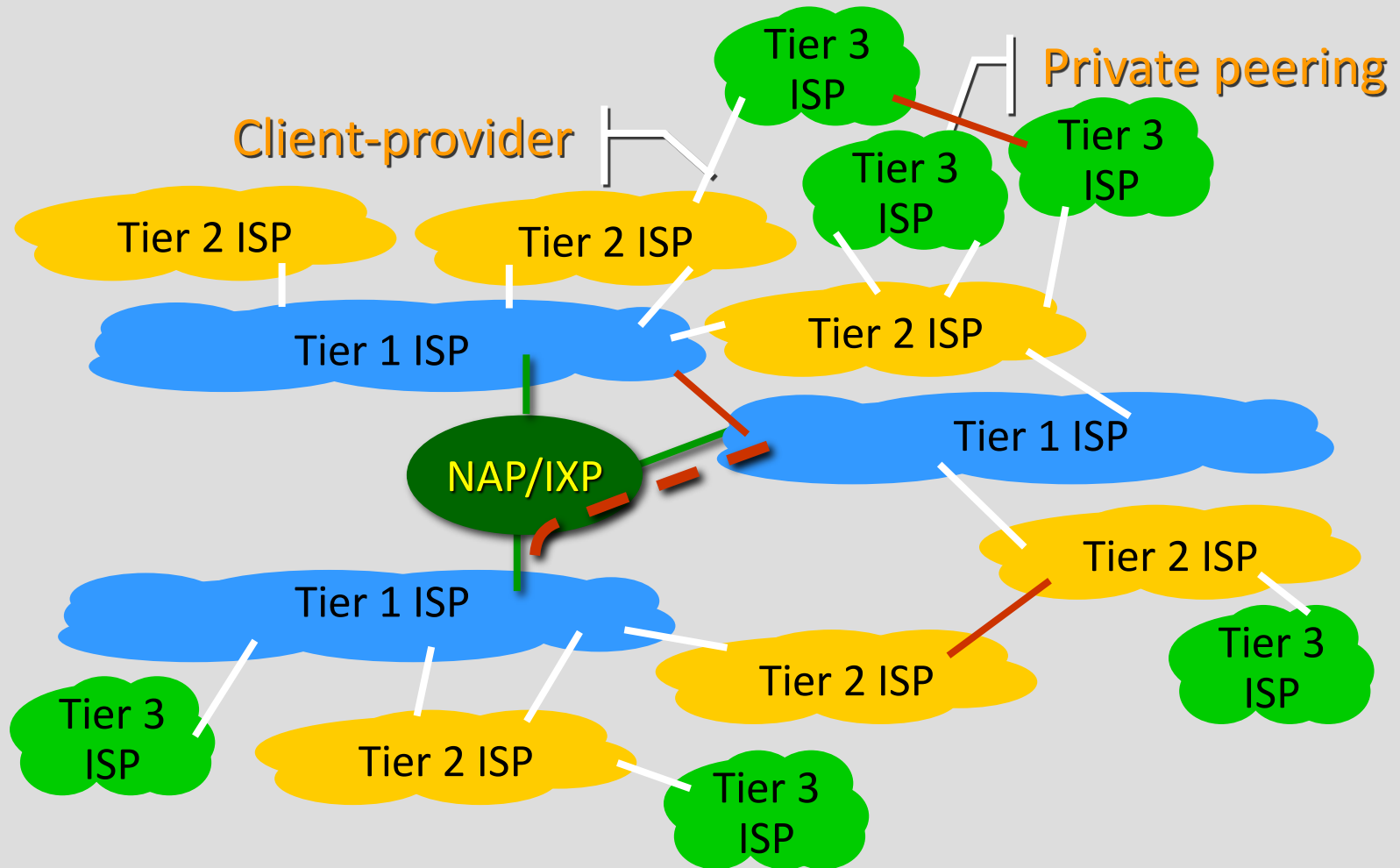
Internet Routing Architecture



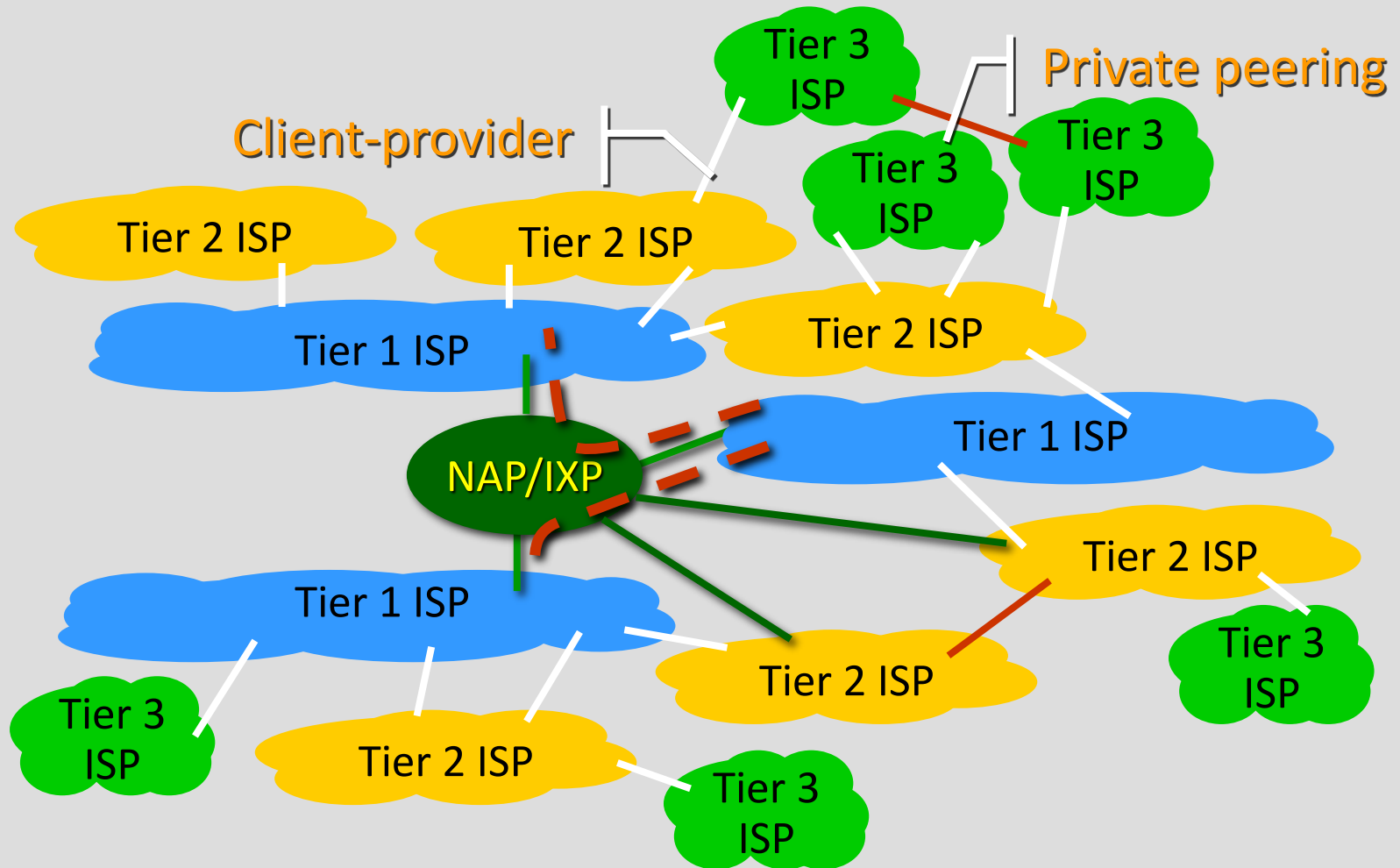
Internet Routing Architecture



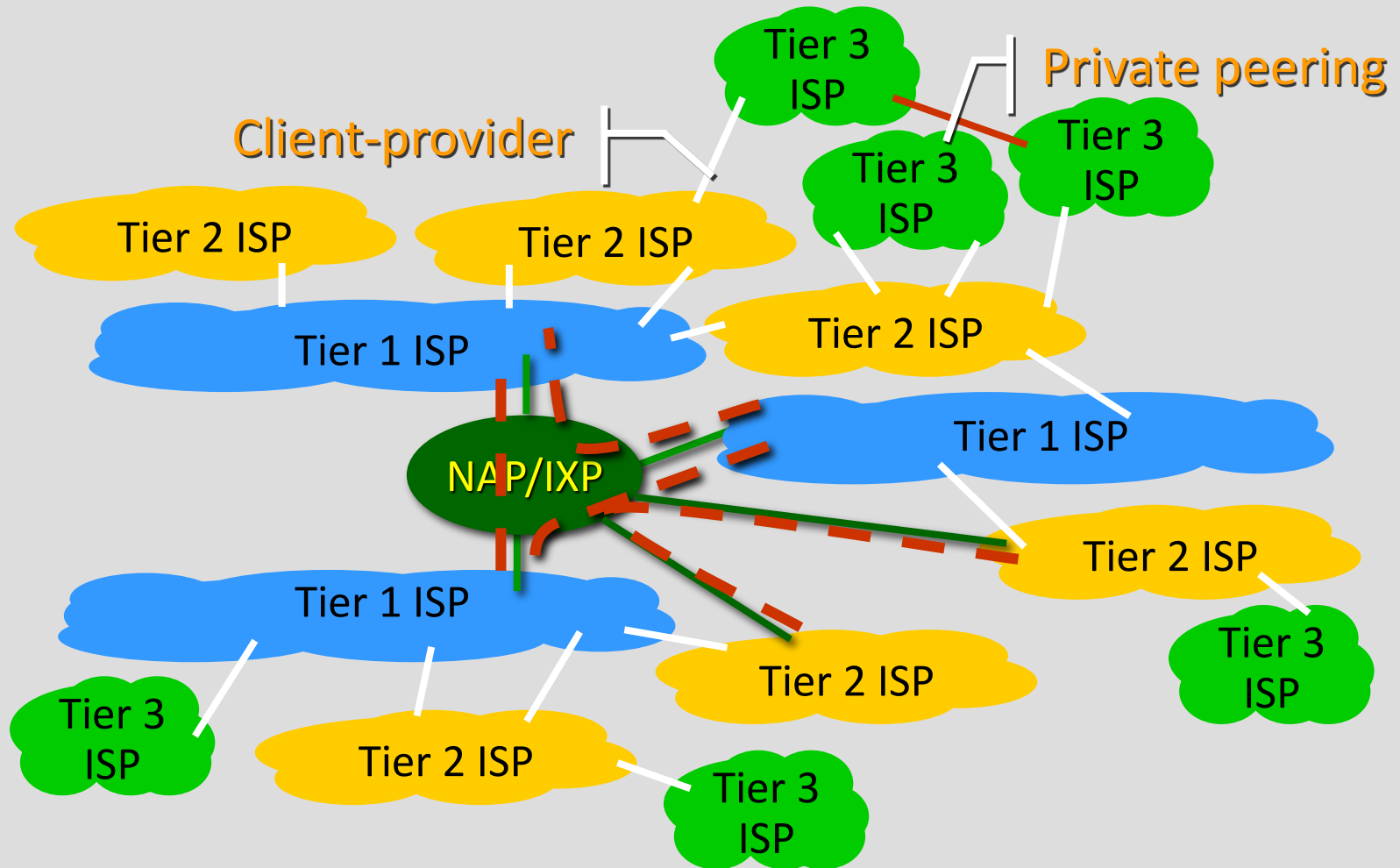
Internet Routing Architecture



Internet Routing Architecture



Internet Routing Architecture



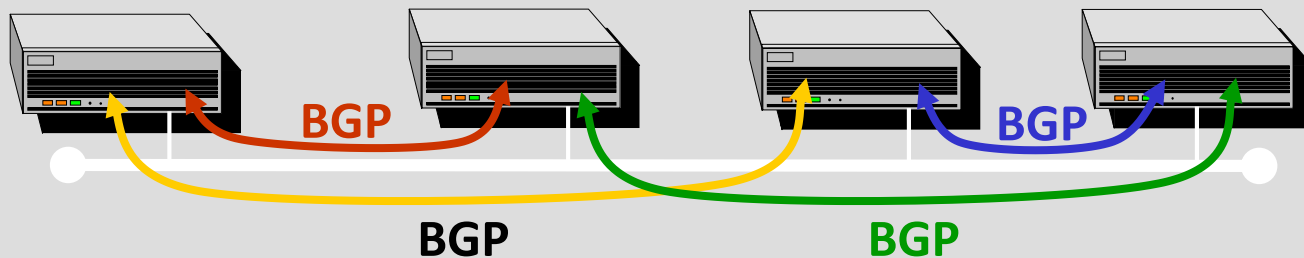
中立的访问点

Neutral Access Point (NAP) Internet eXchange Point (IXP)

网络交换点

- A LAN to which routers of different AS's (ISPs) connect
- Pairs of routers exchange routing information
- Possibly using BGP

两两交换信息



Physical Topology

