

# **Network Services**



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# IP Access is not enough

⌘ An ISP service also requires:

☑ mail & mailing lists

☑ DNS

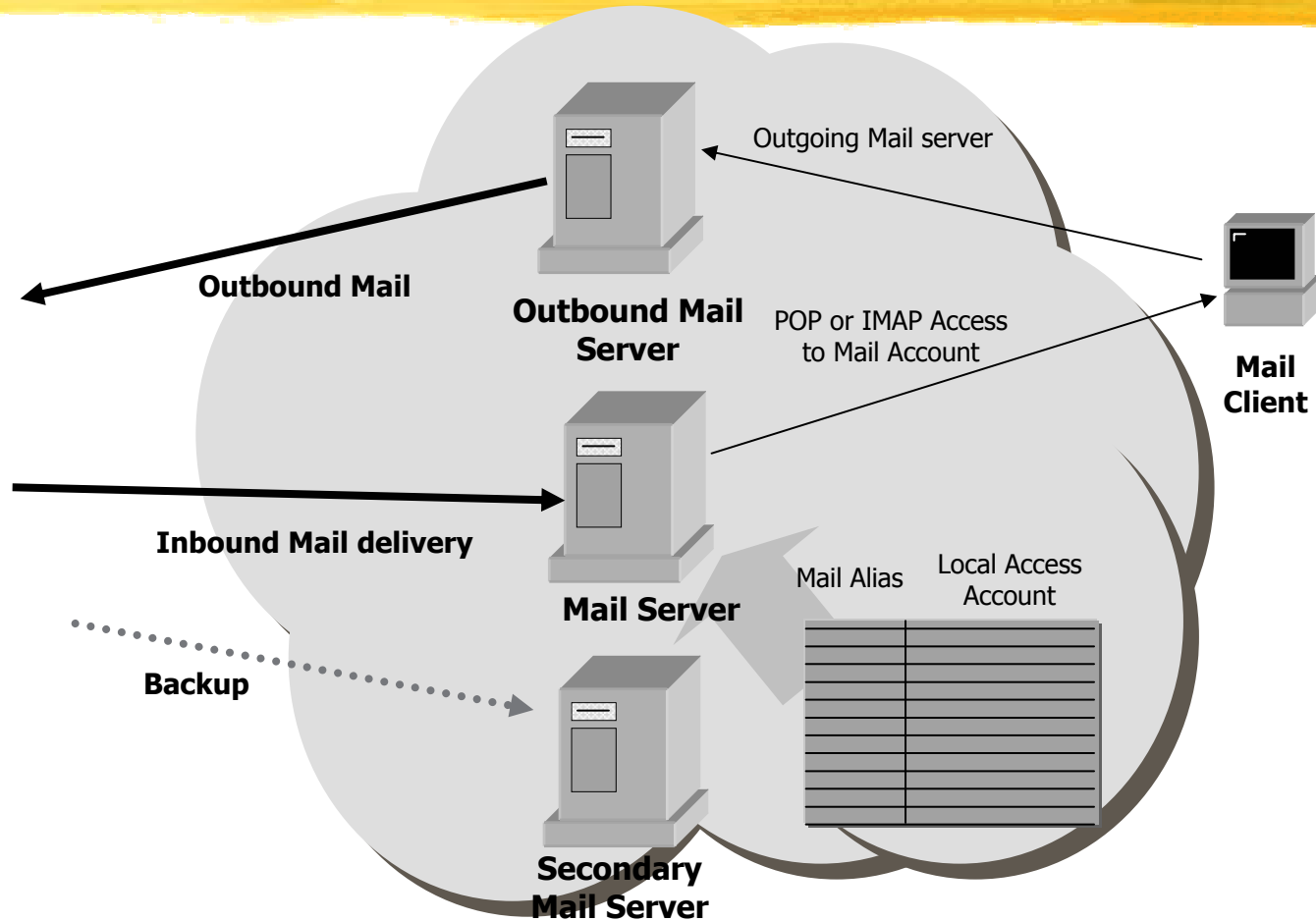
☑ web

☑ usenet

☑ ftp

☑ ...

# Mail Services



# Mail Services



## ⌘ Customer mailboxes

- ☑ SMTP server
- ☑ POP / IMAP access server
- ☑ account management
- ☑ alias management

# Mail Services



- ⌘ SMTP relay for outbound mail
- ⌘ Secondary MX for customers
- ⌘ Mail List management for customers

# DNS Services



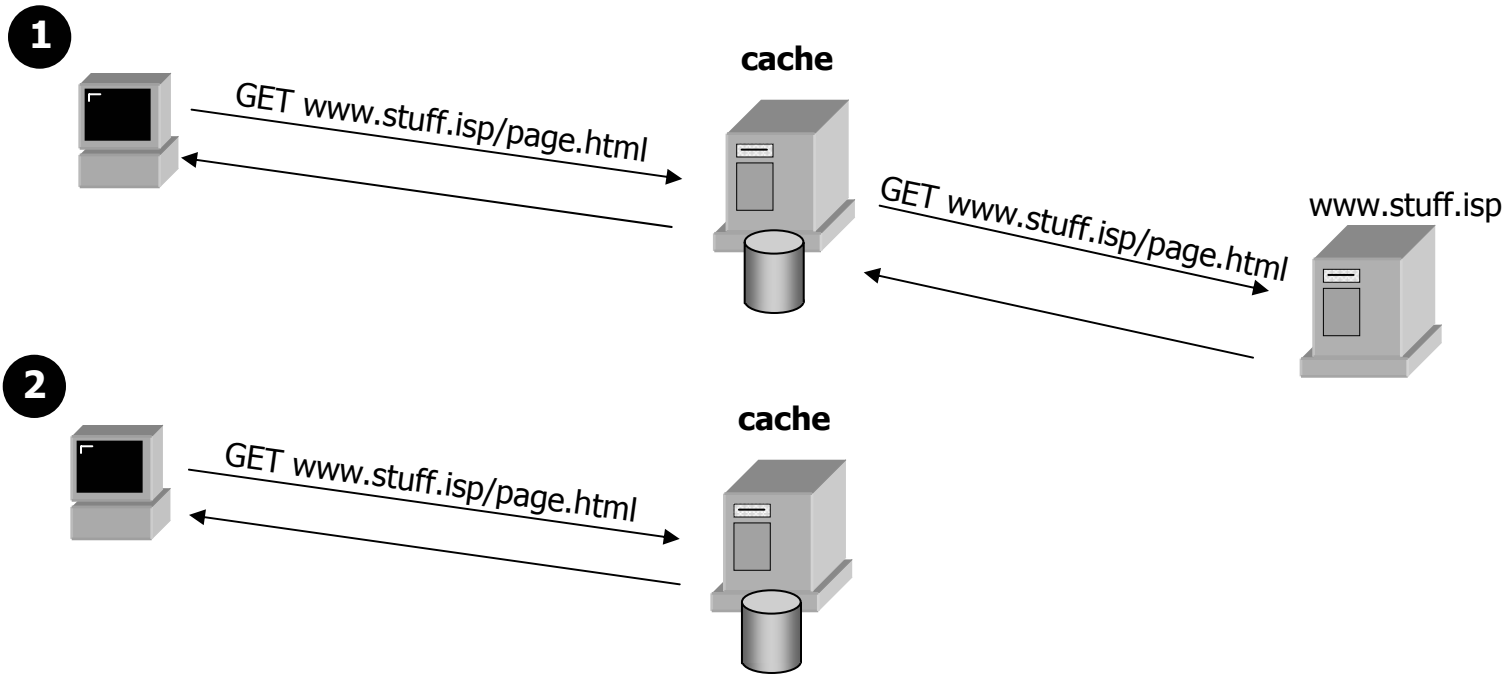
- ⌘ Hosting Primary Domain Service
- ⌘ Secondary DNS Server
- ⌘ DNS Forwarder

# Web Caching



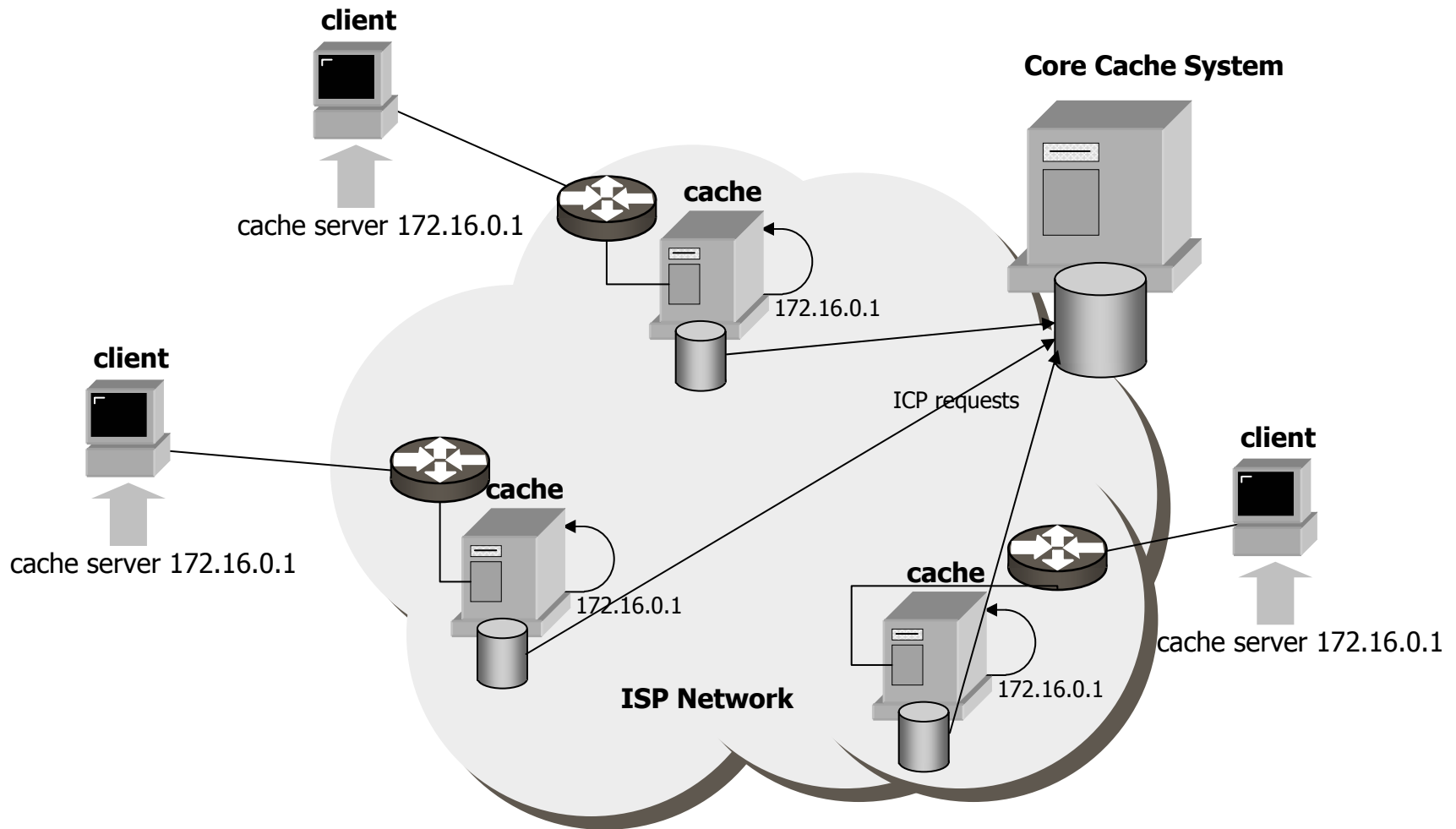
- ⌘ improved fetch performance
- ⌘ ISP cost reduction
- ⌘ virtual web servers (virtual domains)
- ⌘ proxy servers
- ⌘ accepting advertisements on the web page

# Caching

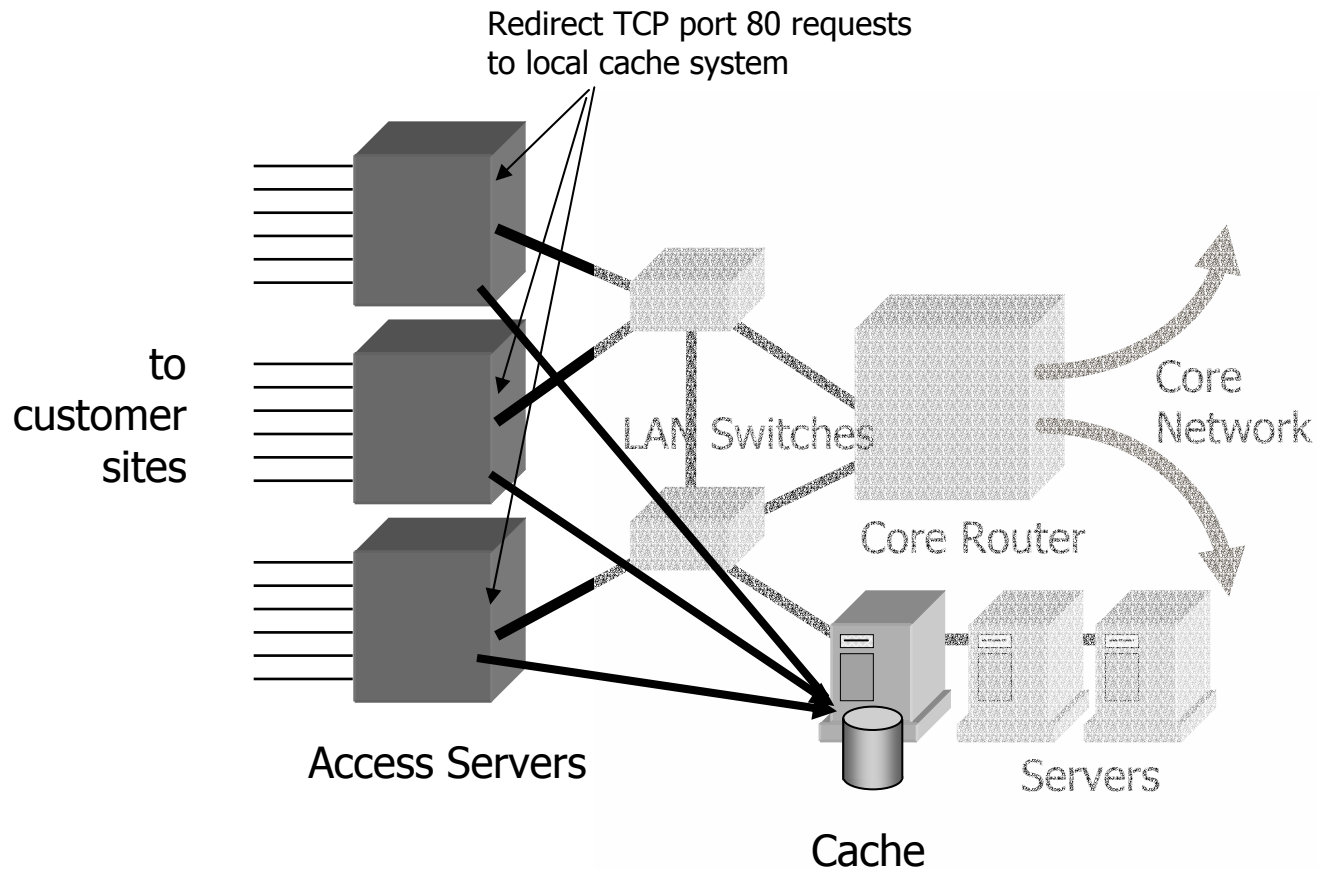




# Large Scale Caching

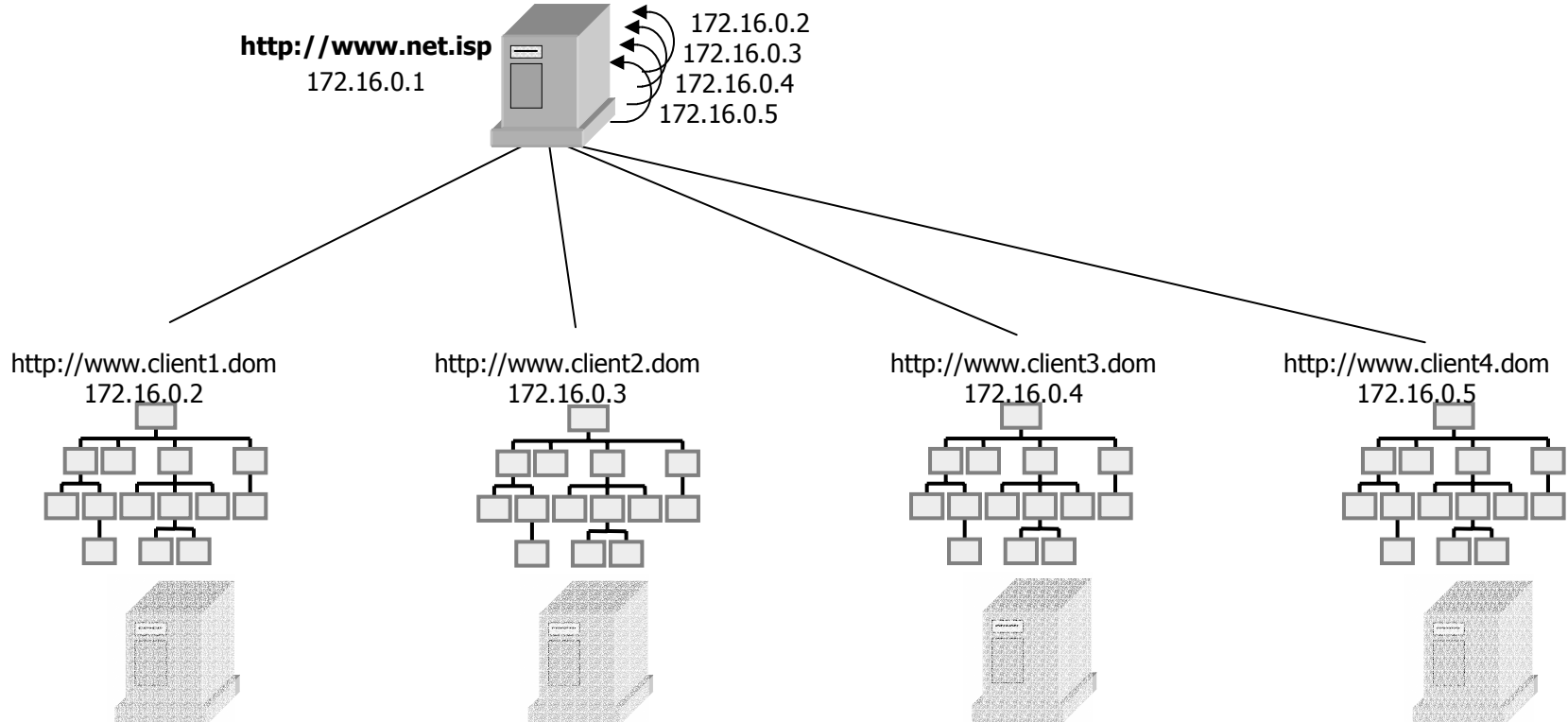


# POP Cache Architecture



# Web Hosting

## Virtual web hosts



# USENET servers



⌘ can be a valuable service

⌘ can be expensive!

- ⊞ too much traffic getting-in

- ⊞ too much hard disk capacity

- ⊞ maintenance cost a lot!

# Games and Entertainment

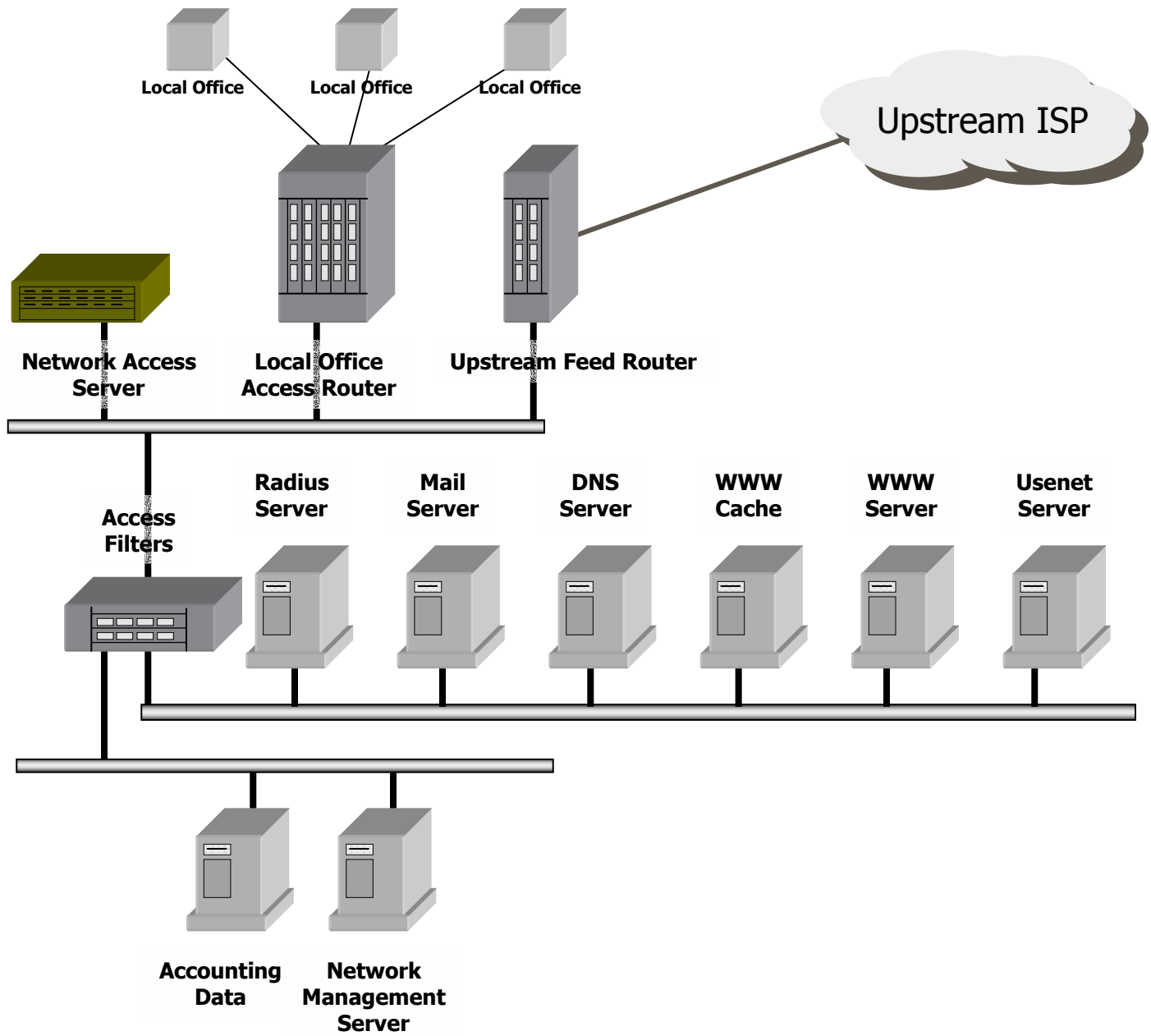


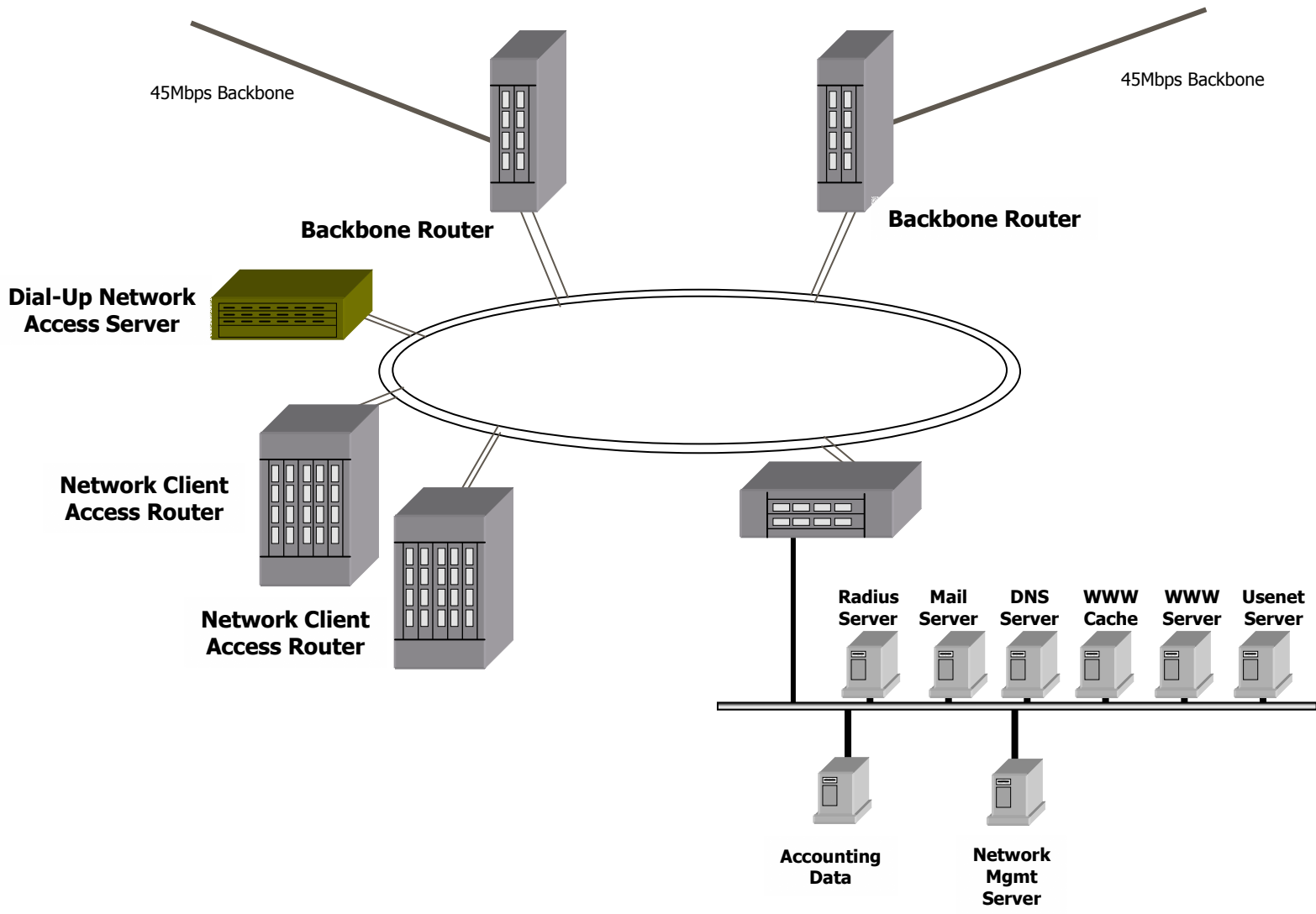
⌘ The Internet is not intended to be serious and there's a perfectly good market for games and entertainment

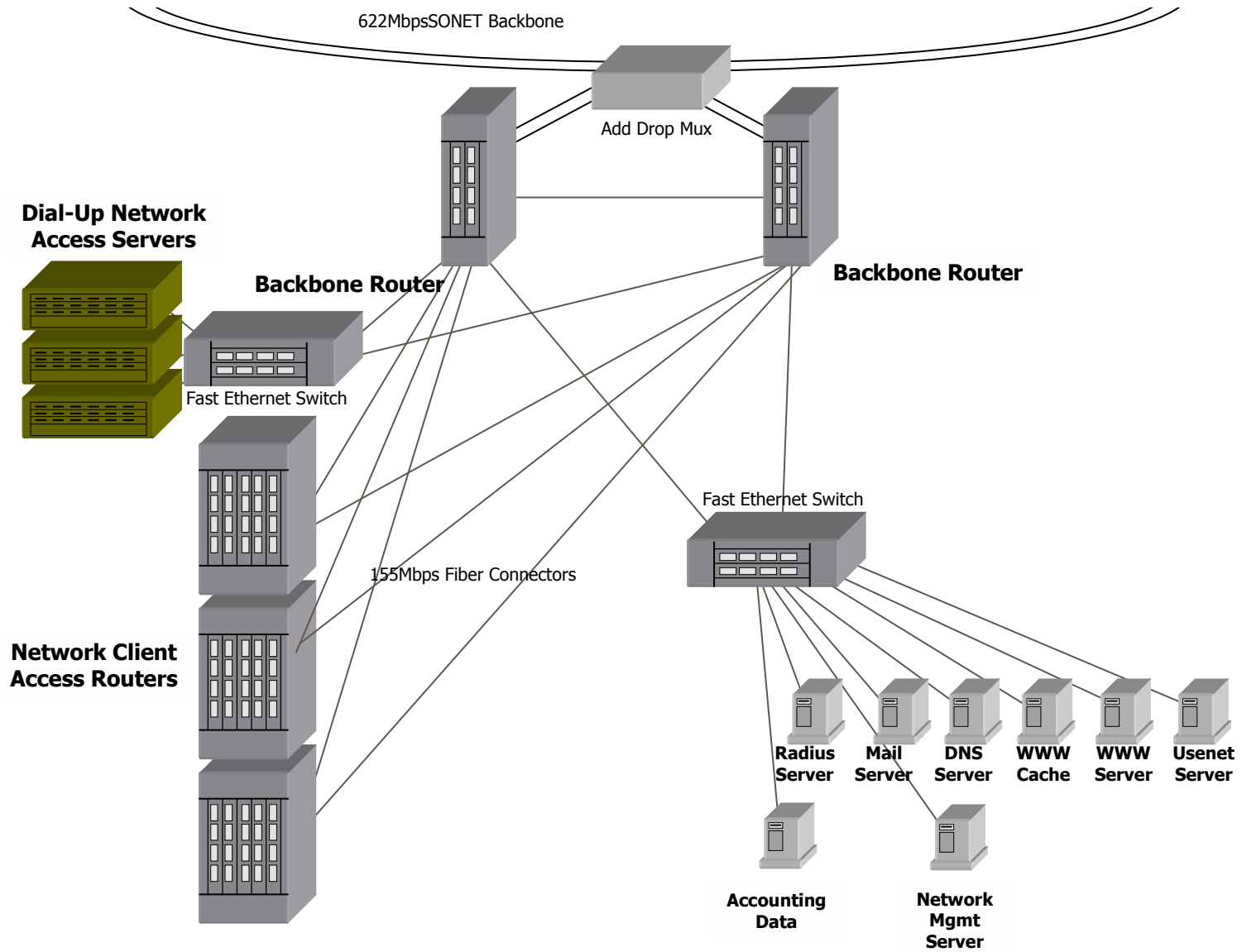
- ☑ Game servers

- ☑ Streaming audio/video servers

- ☑ ...

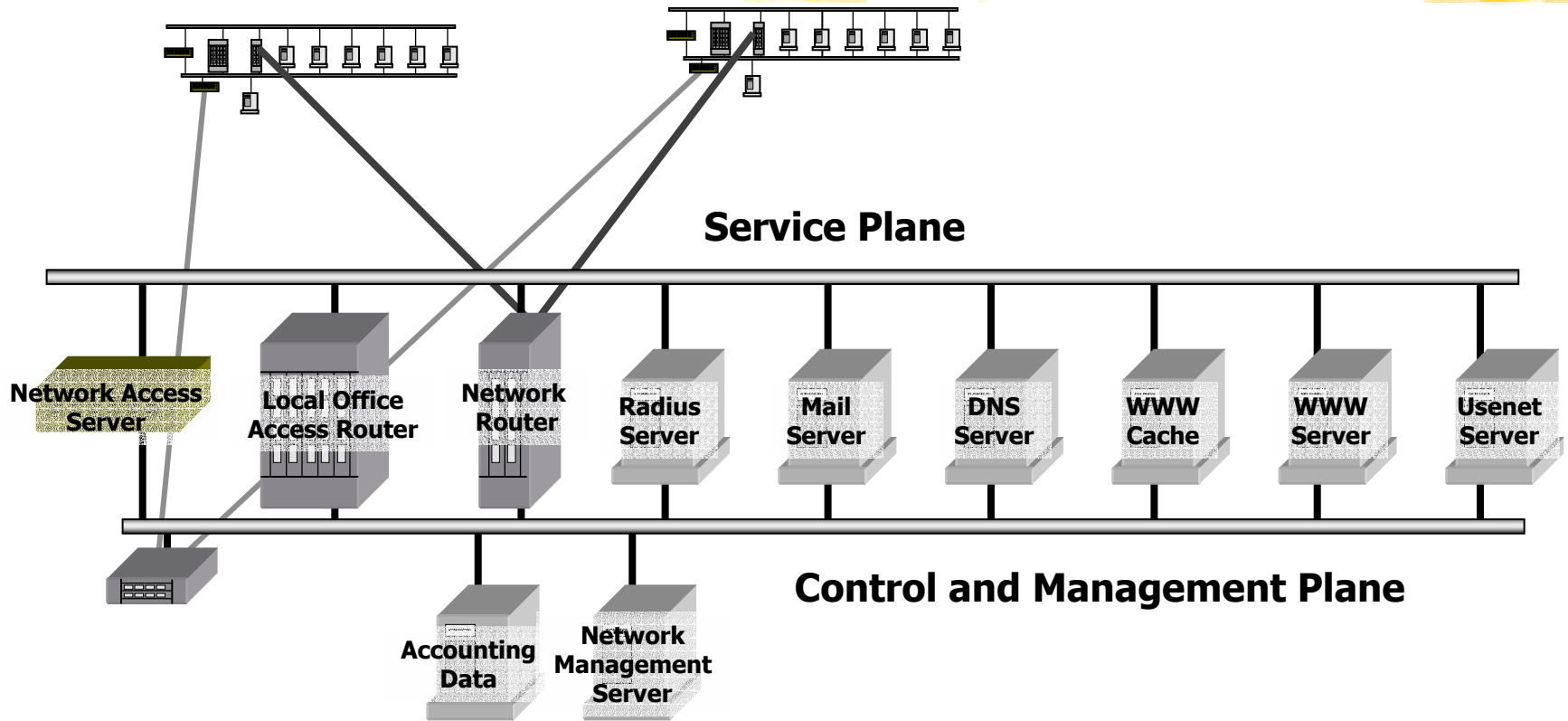




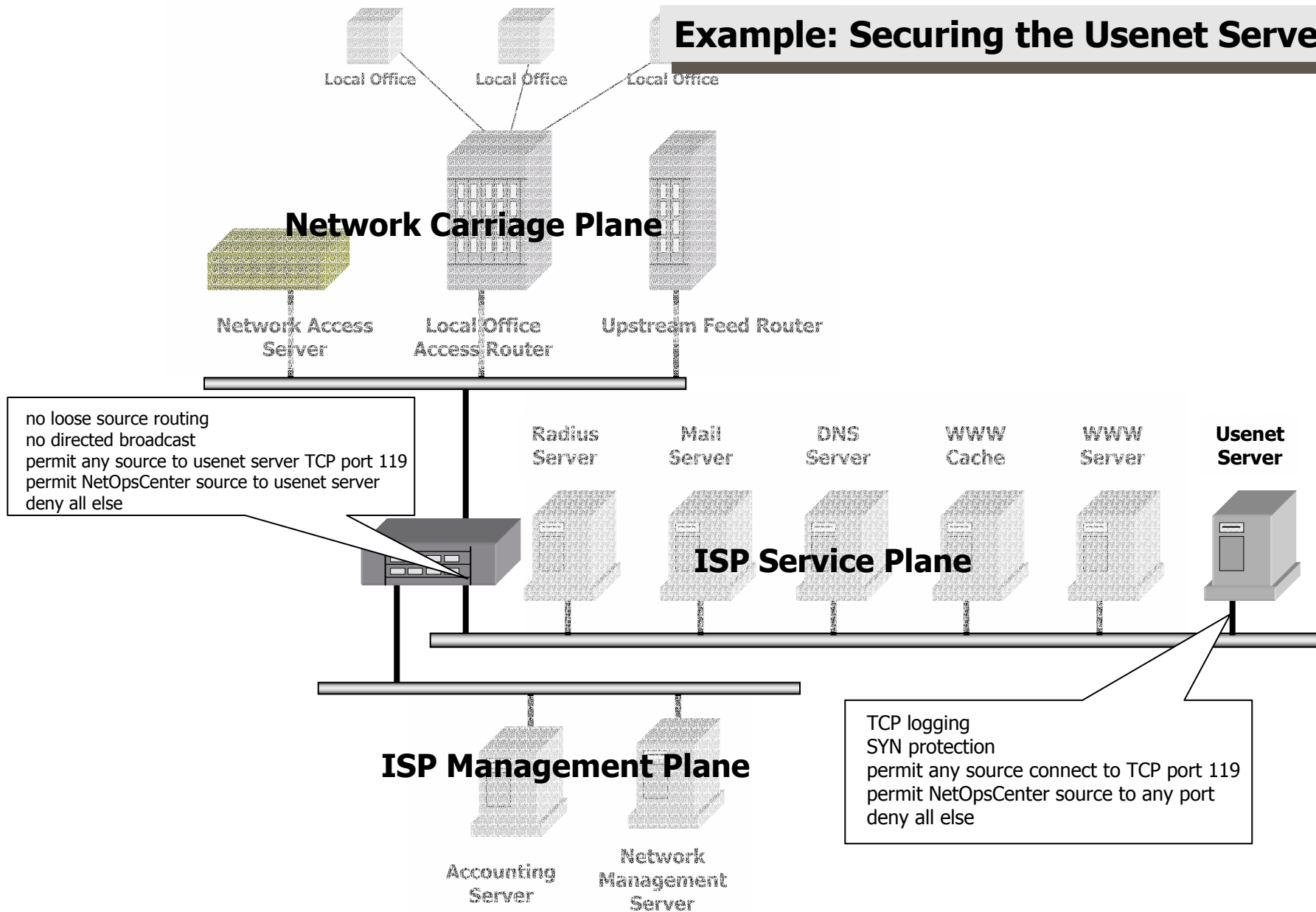




# Adding Security to the Design



# Example: Securing the Usenet Server



# Service Issues



- ⌘ Do ISP services attract a different tariff?
- ⌘ How are service ports accounted?