



**UNIVERSITY OF UTAH**

**STUDENT COMPUTING LABS**

# QT Broadcaster

Overview of Live Streaming

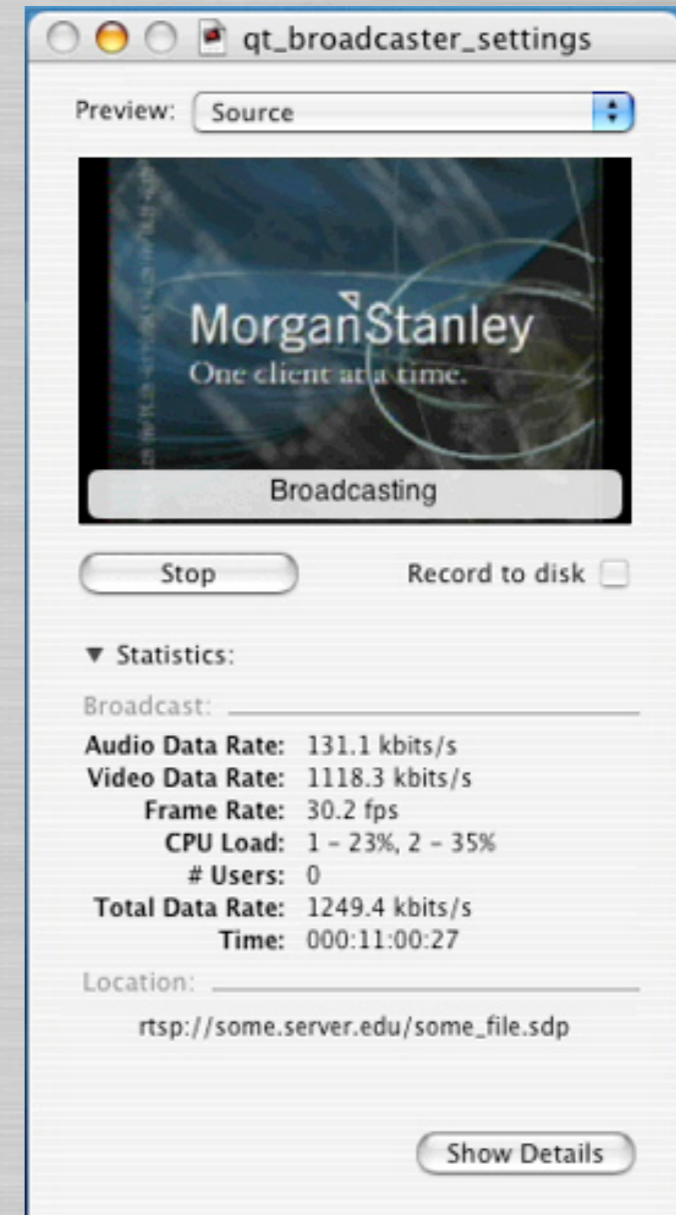
by Richard Glaser



# What is it?

## ● Live Encoding Software

- Free
- Mac-only
- Available from Apple
- Supports QuickTime compatible formats



# Why use it?

- Free
- Easy-to-Use Interface
- MPEG-4 Support
  - Future H.264 (Advanced Video Coding) or MPEG-4 Part 10 support
- Codec Flexibility
  - Supports QuickTime Codecs
- Instant Video-on-Demand
- Supports Unicast & Multicast
- AppleScript Support



# Requirements

- Mac OS X (recommend 10.2 or later)
- QuickTime 6 or later
- Mac w/PowerPC G4 & 256 MB RAM
- Video and/or Audio Source
  - DV Camcorder
  - DV Converter Box (i.e. Canopus ADVC-110)
  - Analog-to-Digital Card (i.e. miroMOTION DC30)
  - Analog or USB Microphone



# Terms

## ● Unicast

- A unicast is a point to point communication between two computers on a network.



QT Broadcaster



Client



# Terms - Unicast

## ● Unicast

- Streaming server allows multiple unicasts

- Con

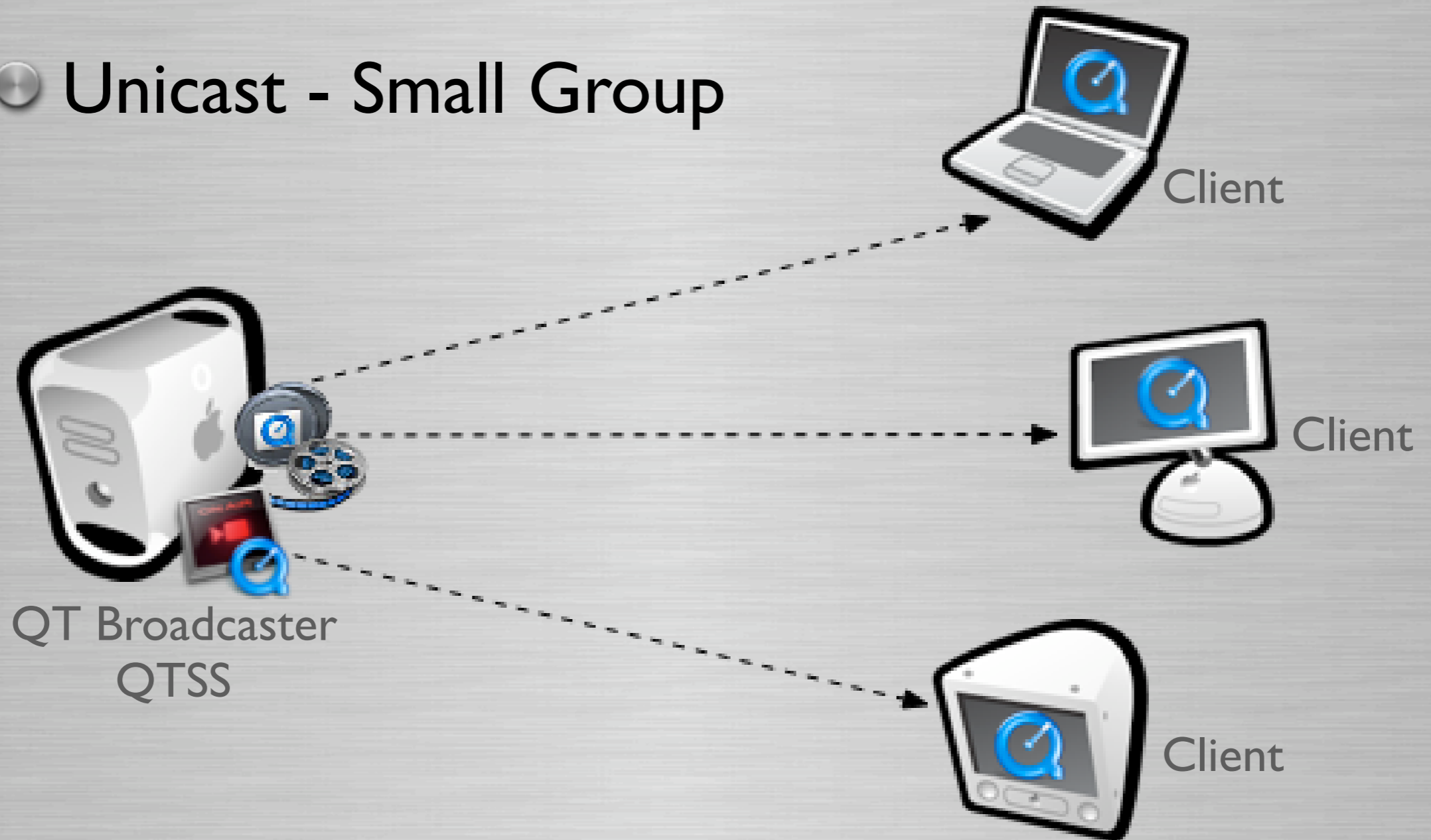
Can result in heavy server/network traffic

- Pro

No special transport required on network  
Clients can randomly access stream

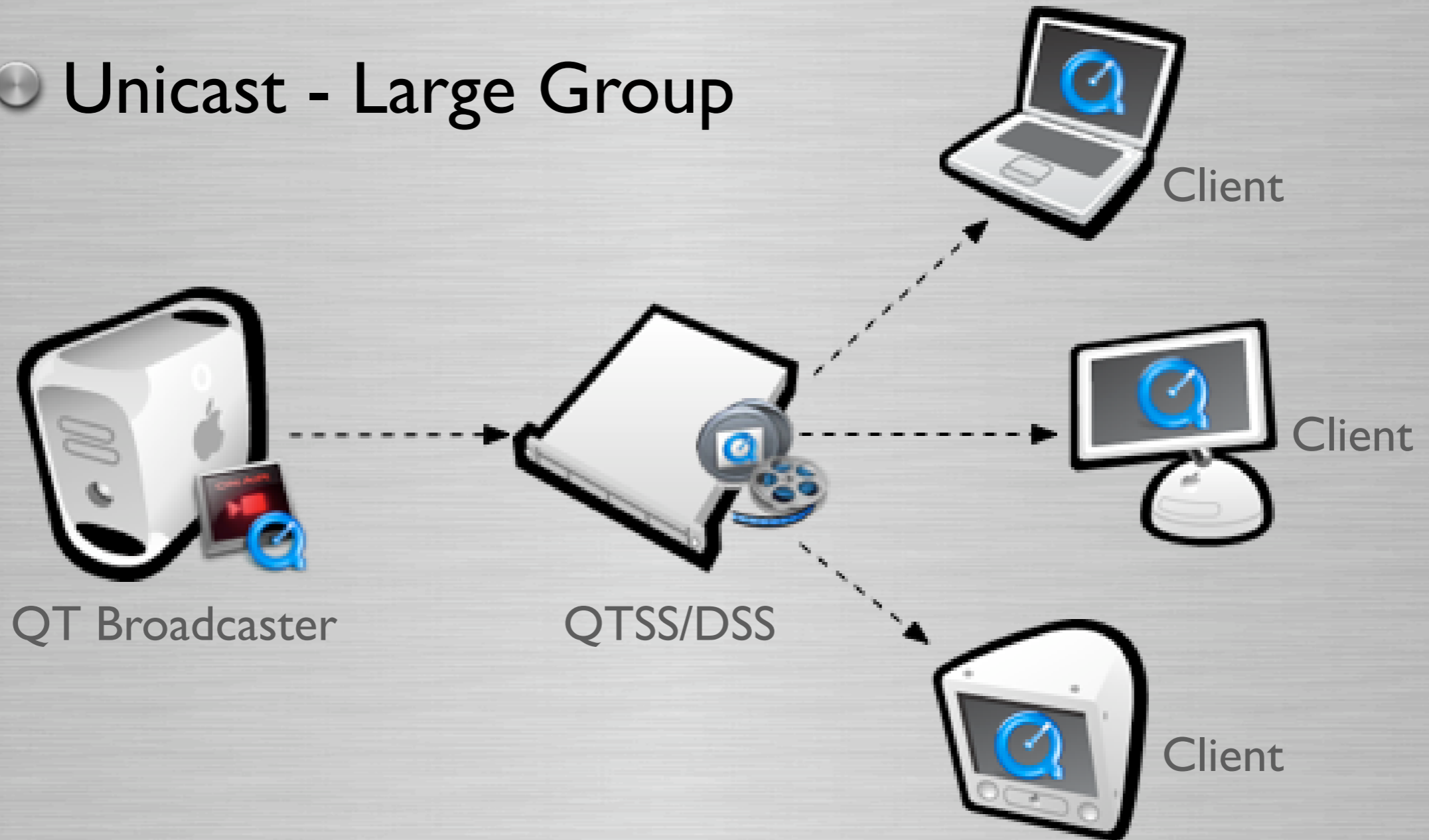
# Terms - Unicast

- Unicast - Small Group



# Terms - Unicast

- Unicast - Large Group





# Terms - Multicast

## ● Multicast

- Point to multipoint communication
- Similar to broadcast radio or TV
- Con
  - Clients CAN NOT randomly access stream
  - Requires special network transport (i.e. Internet 2)
- Pro

More efficient utilization of network/server



# Terms - SDP

- Session Description Protocol (SDP)
  - A simple text file
  - Standard for describing a network media stream
  - Clients access SDP files from streaming server
    - View & Listen to live webcasts



# Terms - SDP

## Example

v=0

o=richard 3319790716 3319790716 IN IP4 fe80::20a:95ff:fec3:713a

s=Example Manual Unicast

c=IN IP4 169.1.1.1

t=0 0

a=x-qt-text-nam:Example Manual Unicast

a=x-qt-text-cpy:University of Utah, Marriott Library

a=x-qt-text-aut:Student Computing Labs

m=audio 5432 RTP/AVP 96

a=rtpmap:96 mpeg4-generic/44100/2

a=fmtp:96 profile-level-id=1;mode=AAC-hbr;sizelength=13;indexlength=3;indexdeltalength=3;config=1210

m=video 5434 RTP/AVP 97

a=rtpmap:97 MP4V-ES

a=cliprect:0,0,240,320

a=fmtp:97 profile-level-id=1;config=000001B0F3000001B50EE040C0CF0000010000000120008440FA285020F0A31F



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# Terms - RTSP

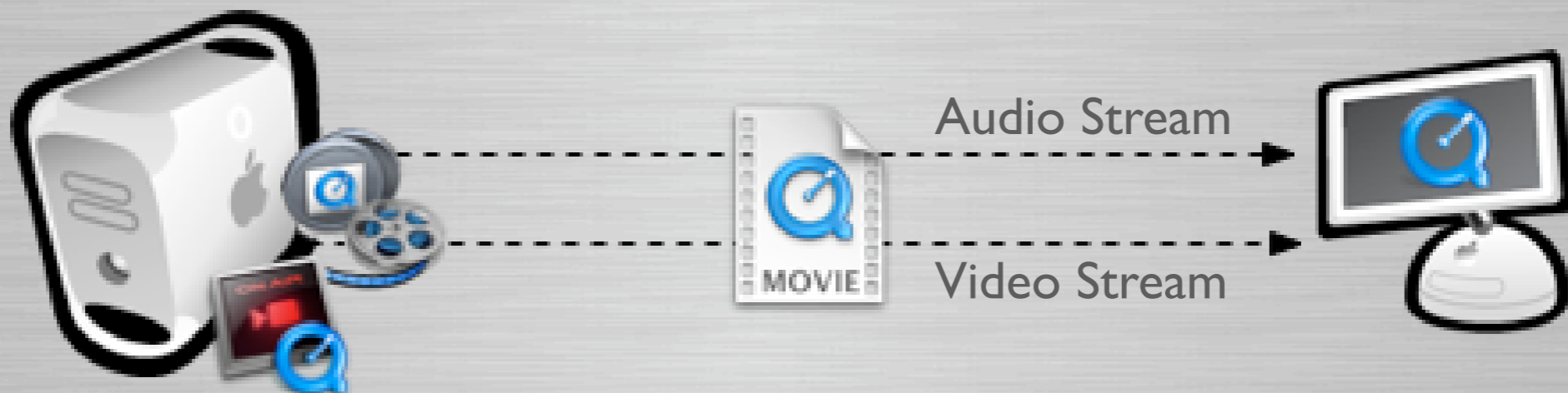
- Real Time Streaming Protocol
  - A standard for setting up streaming session
  - A stream is requested over RTSP



# Terms - RTP

## ● Real Time Protocol

- A standard for transferring streaming media data
- A stream is sent over RTP



# Terms - Reflectors

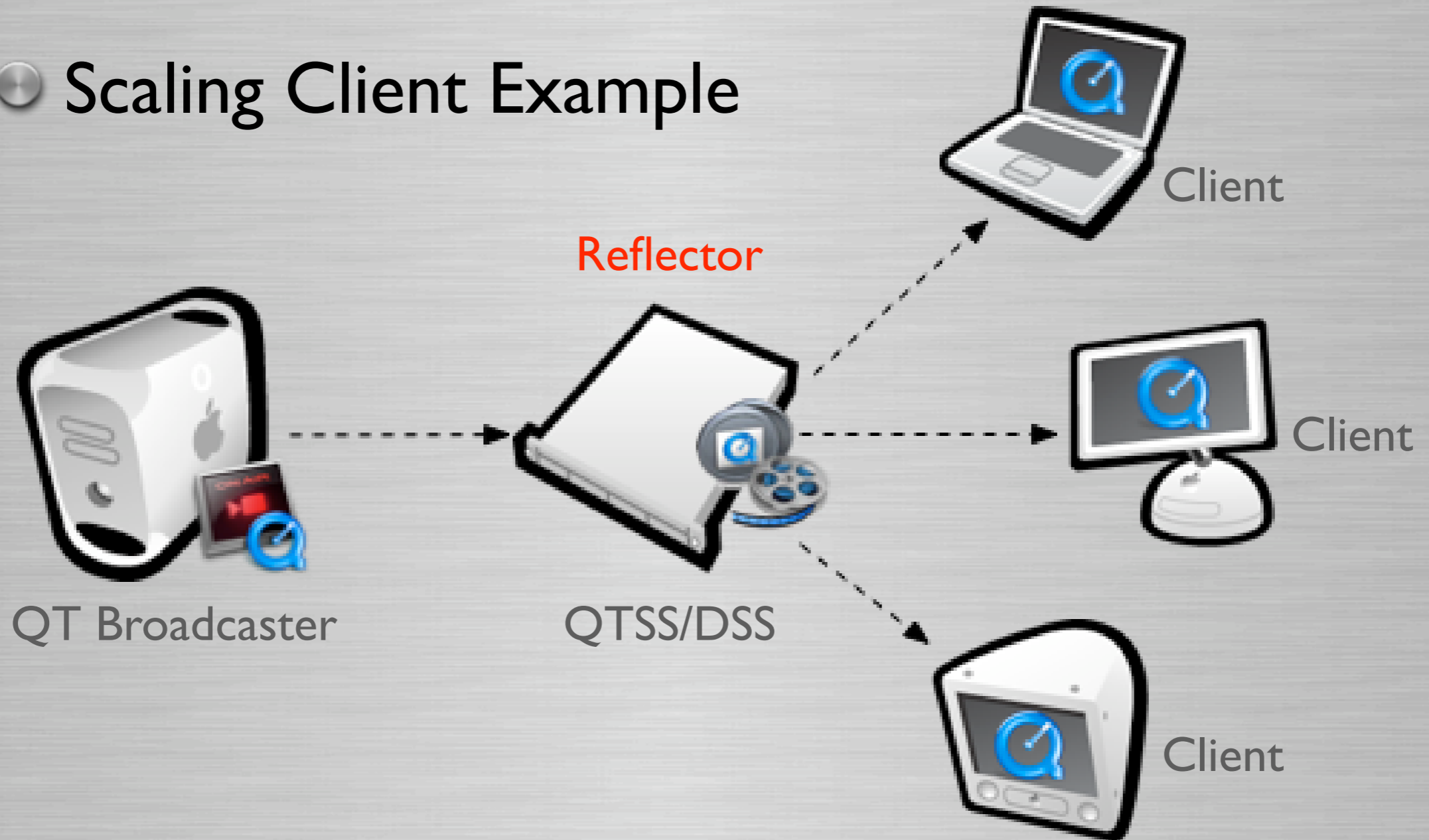
## ● Reflectors

- Allows scaling number of clients
- Allows translation of multicast to unicast



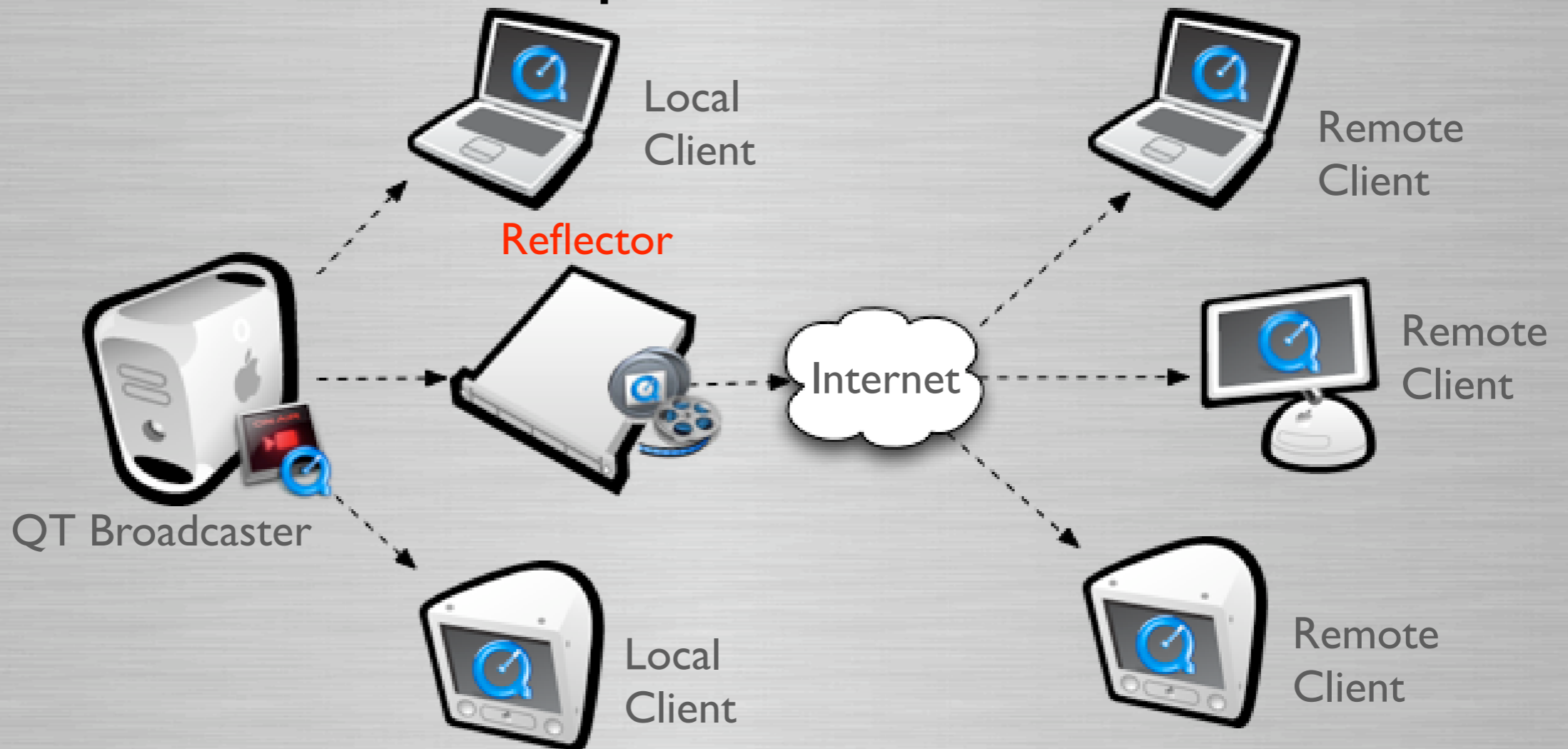
# Terms - Reflectors

- Scaling Client Example



# Terms - Reflectors

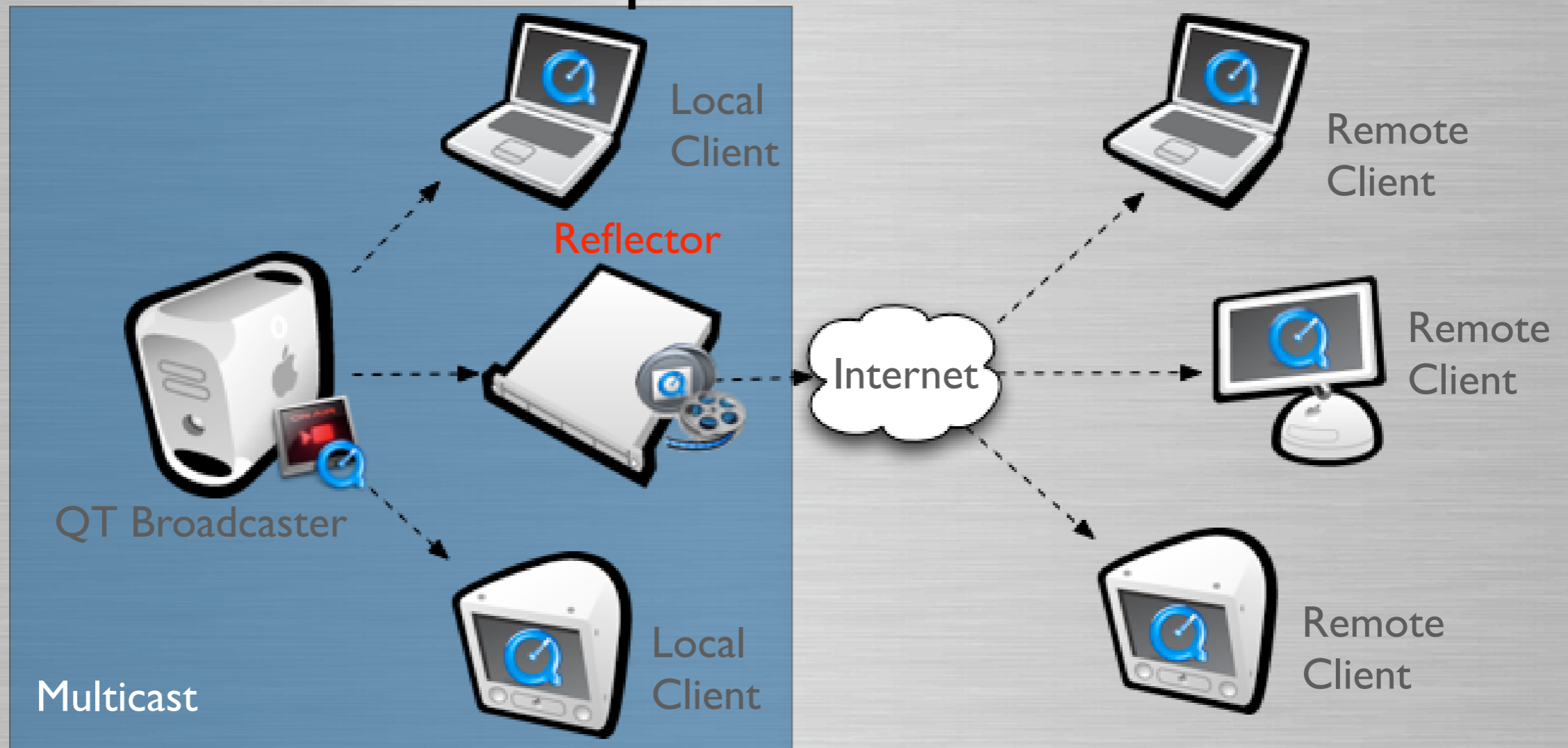
## Translation Example





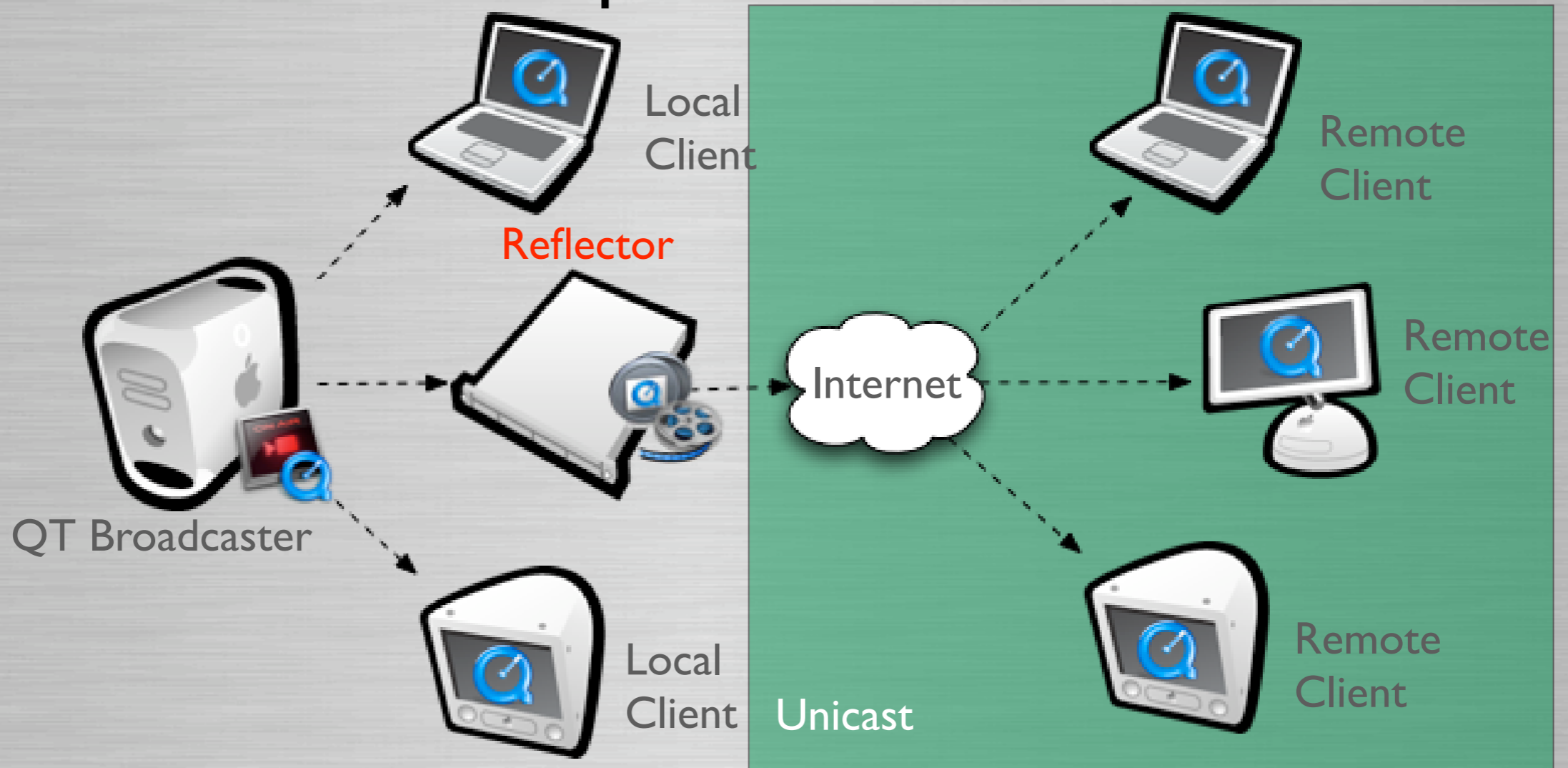
# Terms - Reflectors

## Translation Example



# Terms - Reflectors

## Translation Example



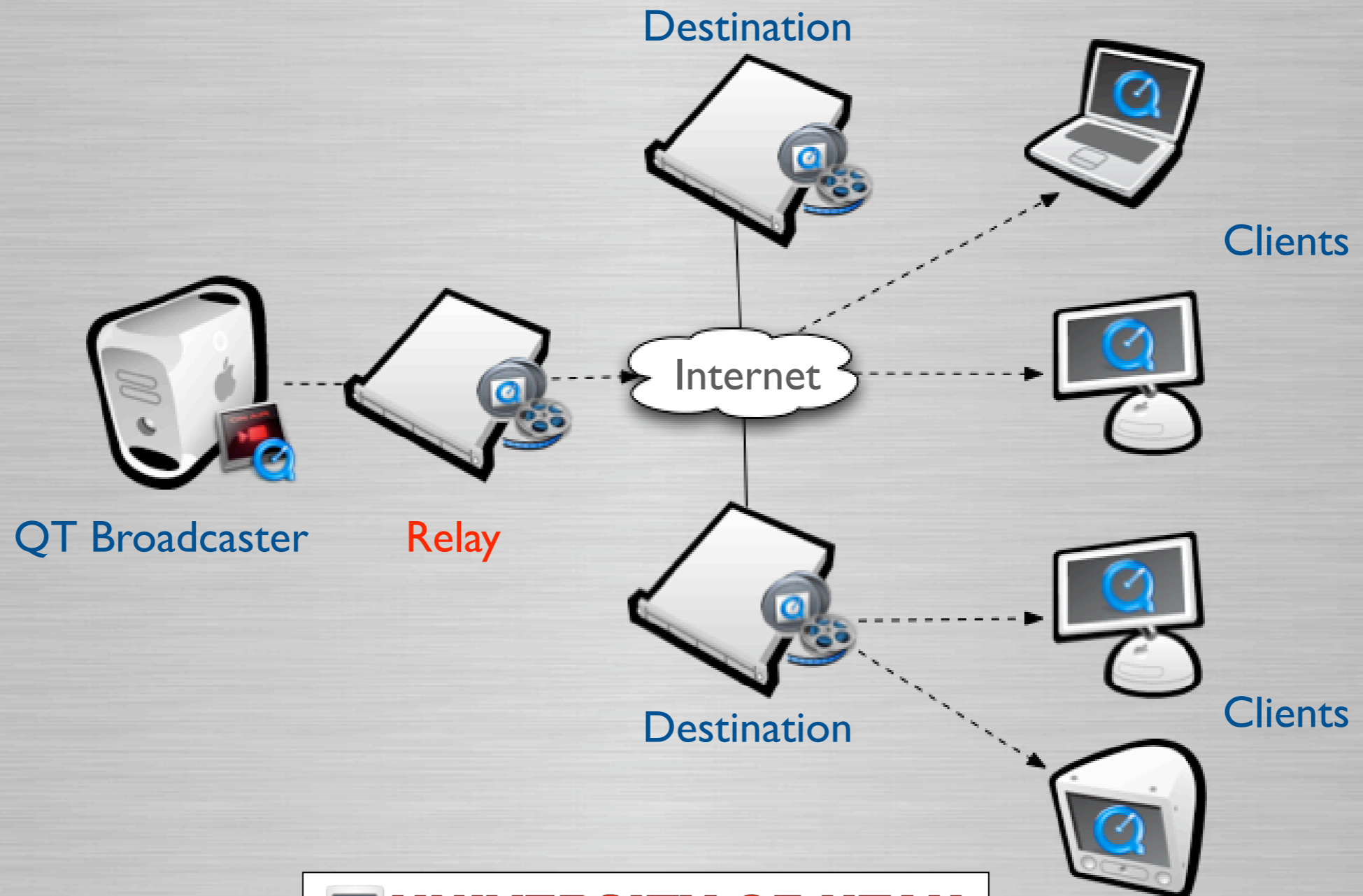
# Terms - Relays

## ● Relays

- Receives an incoming stream
- Forwards it to one or more streaming servers
- Can reduce Internet bandwidth overall usage
- Useful for stream with numerous viewers in different locations



# Terms - Relays



# Network Configurations

- QT Broadcaster supports three configs:
  - Automatic Unicast
  - Manual Unicast
  - Multicast

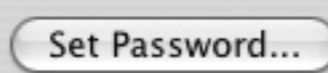


# Automatic Unicast Setup

- Allow incoming broadcasts on QTSS
  - Launch Server Admin
    - Select QuickTime Streaming, Settings & Access tab
    - Select “Accept incoming broadcasts”

Accept incoming broadcasts

- Optionally, you can require a username/password.

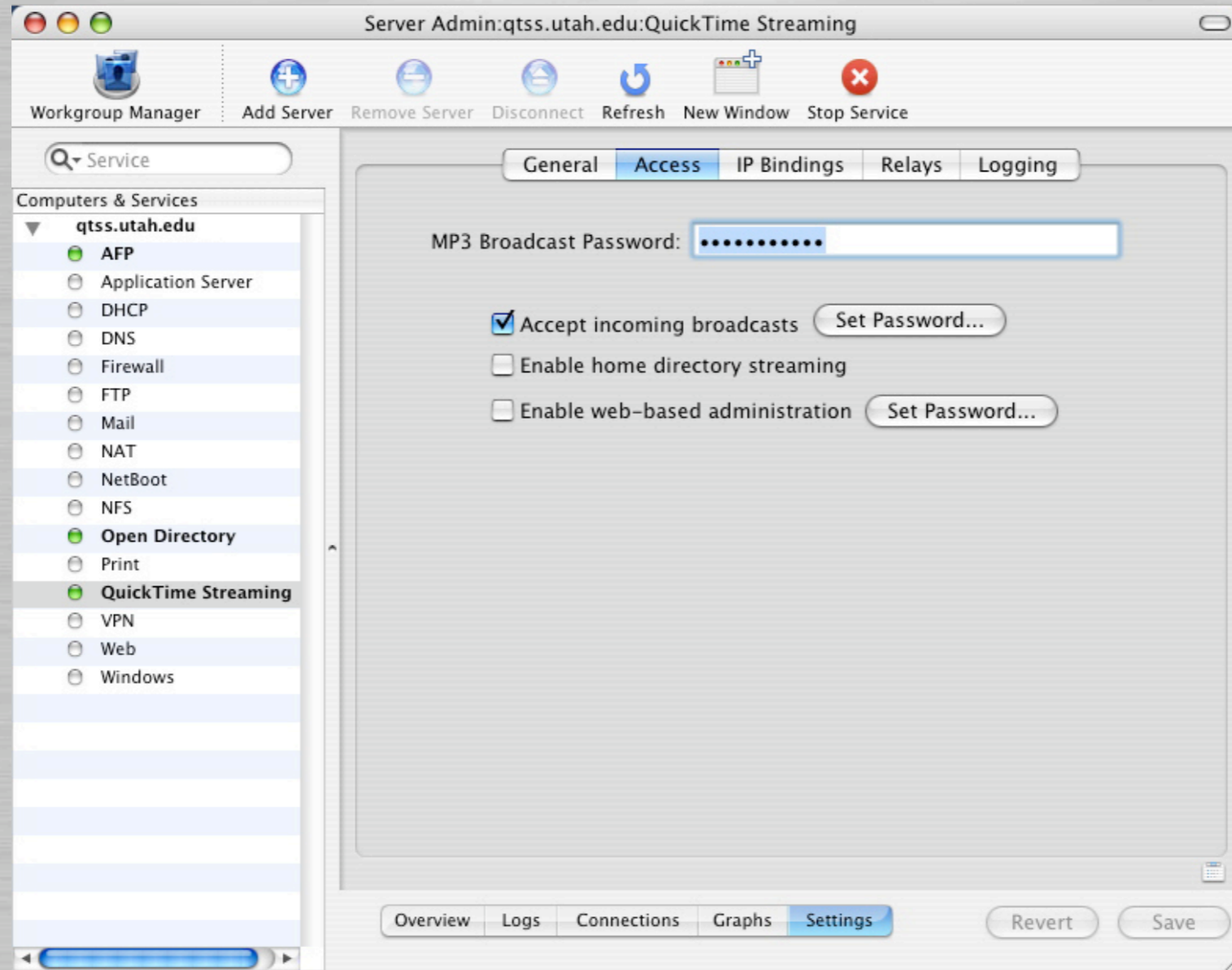
 

Username:

Password:

Retype Password:

# Server Admin



# QuickTime Broadcaster

## Select Network tab

- From “Transmission” pop-up list
  - Select “Automatic Unicast (Announce)”
  - Enter Hostname (domain or IP)
  - Enter broadcast filename
  - Enter username & password

Audio Video **Network**

✓ Automatic Unicast (Announce)  
Manual Unicast  
Multicast

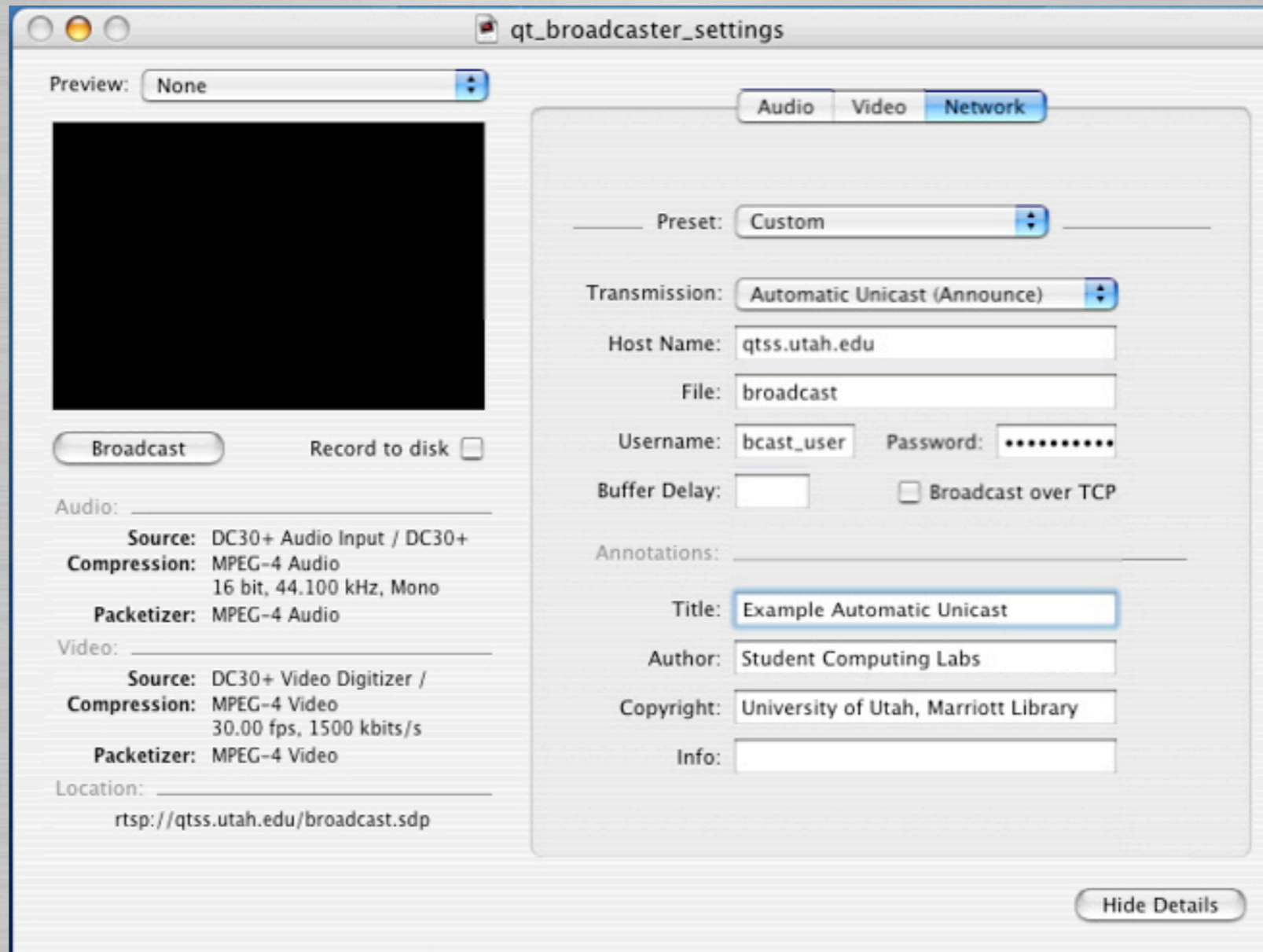
Host Name: qtss.utah.edu

File: broadcast

Username: bcast\_user Password: .....



# QuickTime Broadcaster



# Automatic Unicast Example

## ● Example

- Streaming Server address is [qtss.utah.edu](http://qtss.utah.edu)

- Username is [bcast\\_user](#)

- The sdp file will be created on server

[broadcast.sdp](#)

- Clients will use address

<rtsp://qtss.utah.edu/broadcast.sdp>

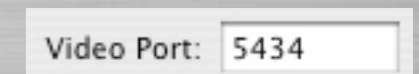
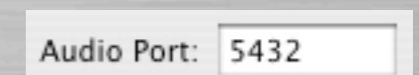
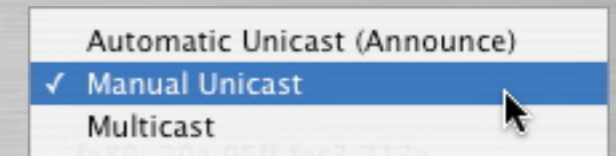
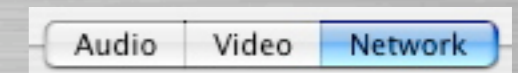
# Automatic Unicast Tips

- QT Broadcaster & QTSS on Same Box
  - Use loopback address ([127.0.0.1](#))
  - Leave Username and Password Blank
- Sub-Directories
  - Use [/path/to/file](#) in QuickTime Broadcaster
    - To have sdp file created in a subdirectory
- qtss user
  - Needs full read-write privileges to sdp location

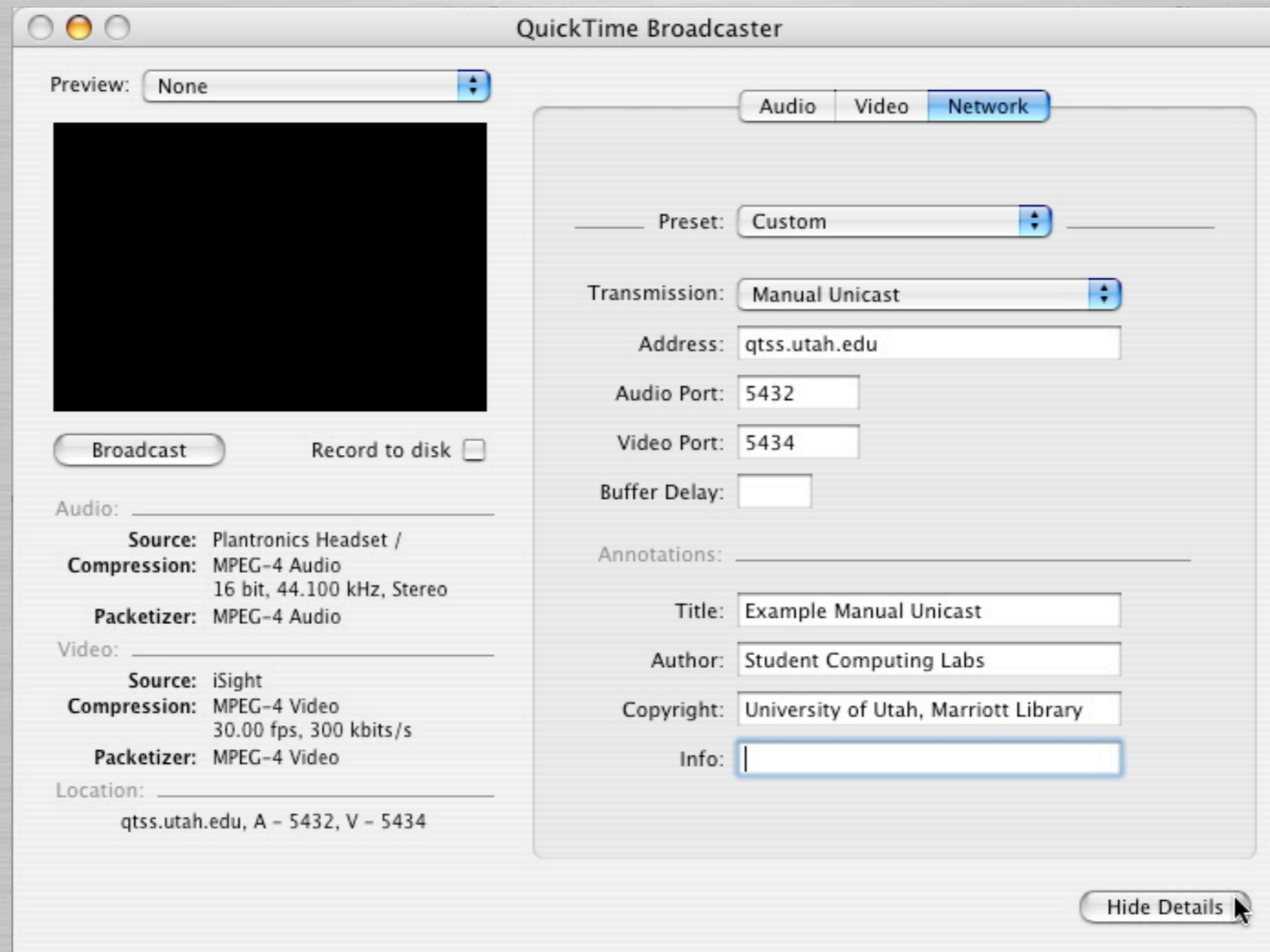


# Manual Unicast Setup

- Select Network tab
  - From “Transmission” pop-up list
    - Select “Manual Unicast”
    - Enter Address (IP)
    - Enter Audio Port
    - Enter Video Port



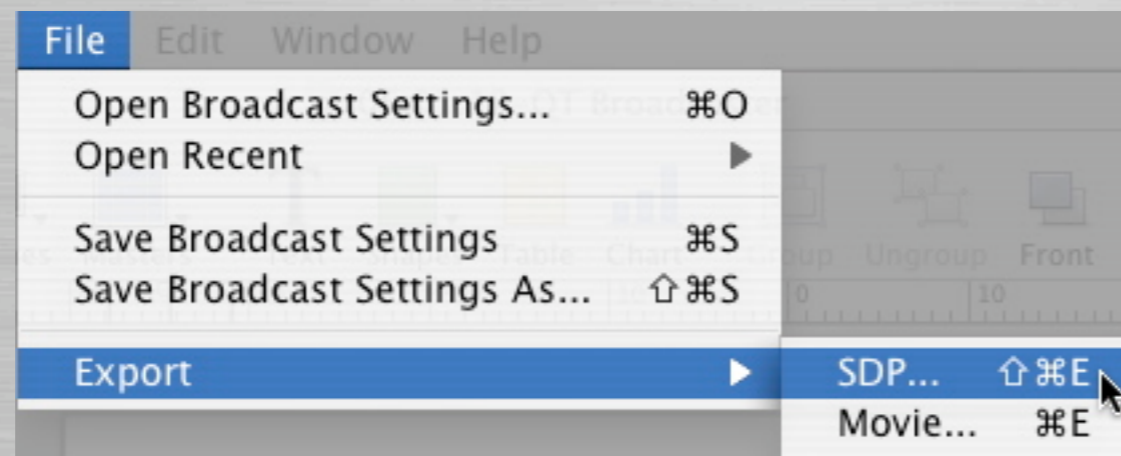
# Manual Unicast Setup



# Manual Unicast Setup

## Export sdp file

- File Menu, Export, SDP..



- Copy sdp file to QTSS/DSS Movie directory

# Tips & Tricks

- Use AppleScript to start broadcast

```
tell application "QuickTime Broadcaster"  
  delay 5  
  if (exists document 1) then  
    start document 1  
    return "broadcast"  
  end if  
end tell
```



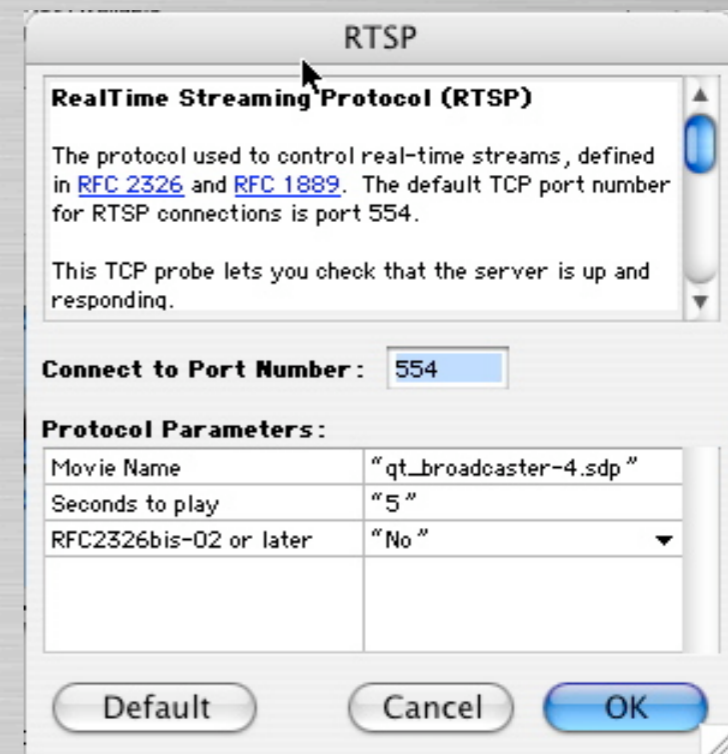
# Tips & Tricks

## Monitor Stream

- Use network monitoring
  - Intermapper or Nagios
  - Network outages or server issues

## Watchdog

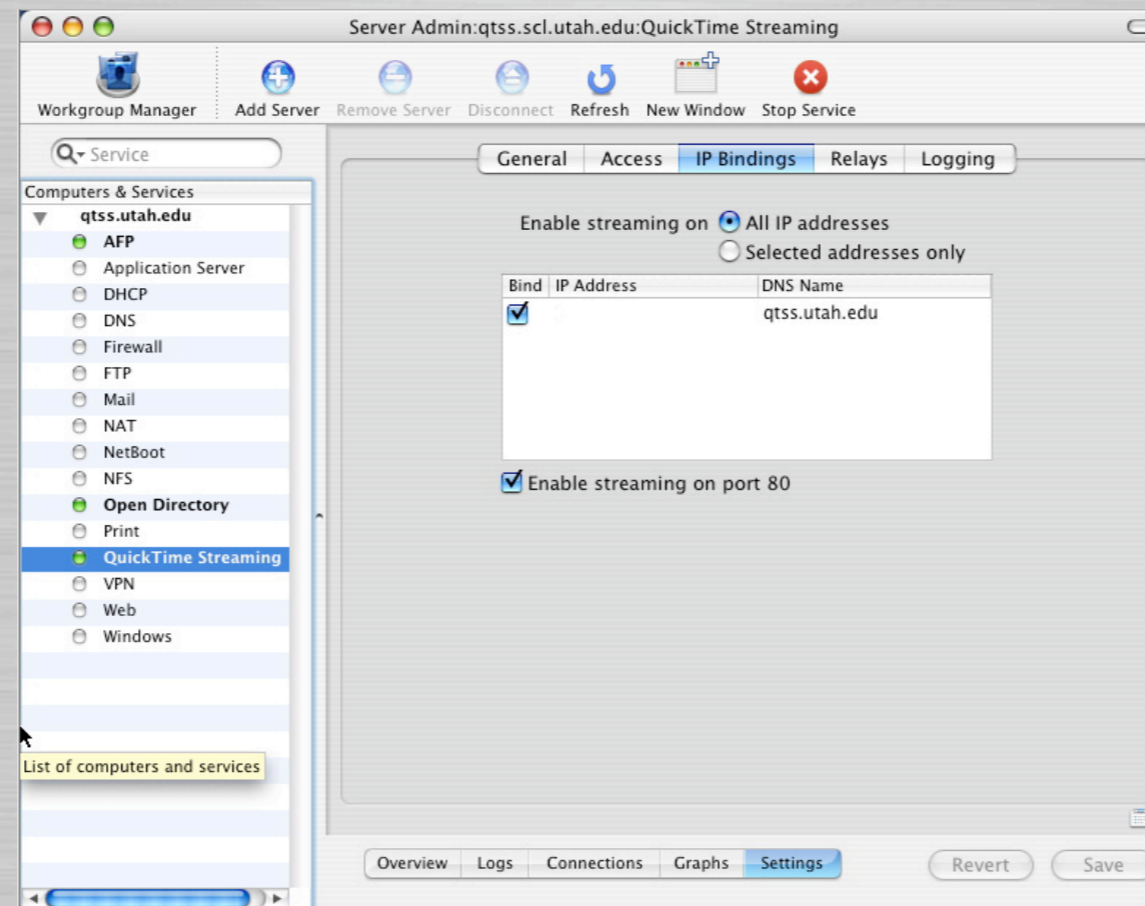
- Use script to monitor QT Broadcaster
- Quit/restart it if issues arise





# Tips & Tricks

- Client Firewall & NAT Issues
  - Enable streaming on port 80





# Questions & Answers

Any questions or answers?

