

Internet-accessible Cats

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Executive Summary

Today's Talk

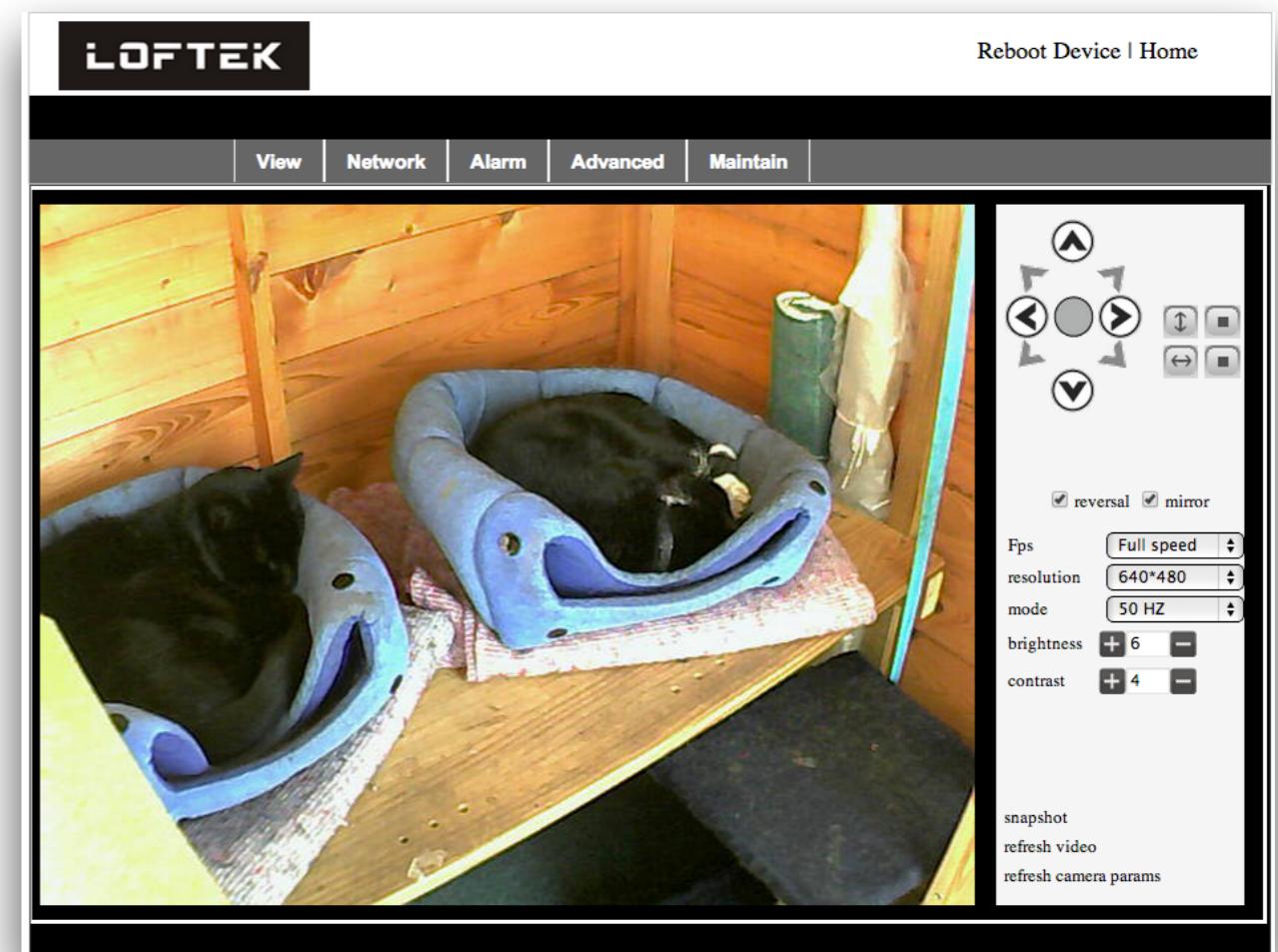
- The Cat Palace
- Choosing a Webcam
- Security
- Video
- Web Stuff
- A bit of Linux & KVM

The Cat Palace



Choosing a Webcam

- Original versus Cloned
 - Axis, Foscam (popular), Loftek (clone)
- Embedded Web Sever
- Pan/Tilt Controls
- Features
 - IR Cut, Wifi
 - Invert & Mirror

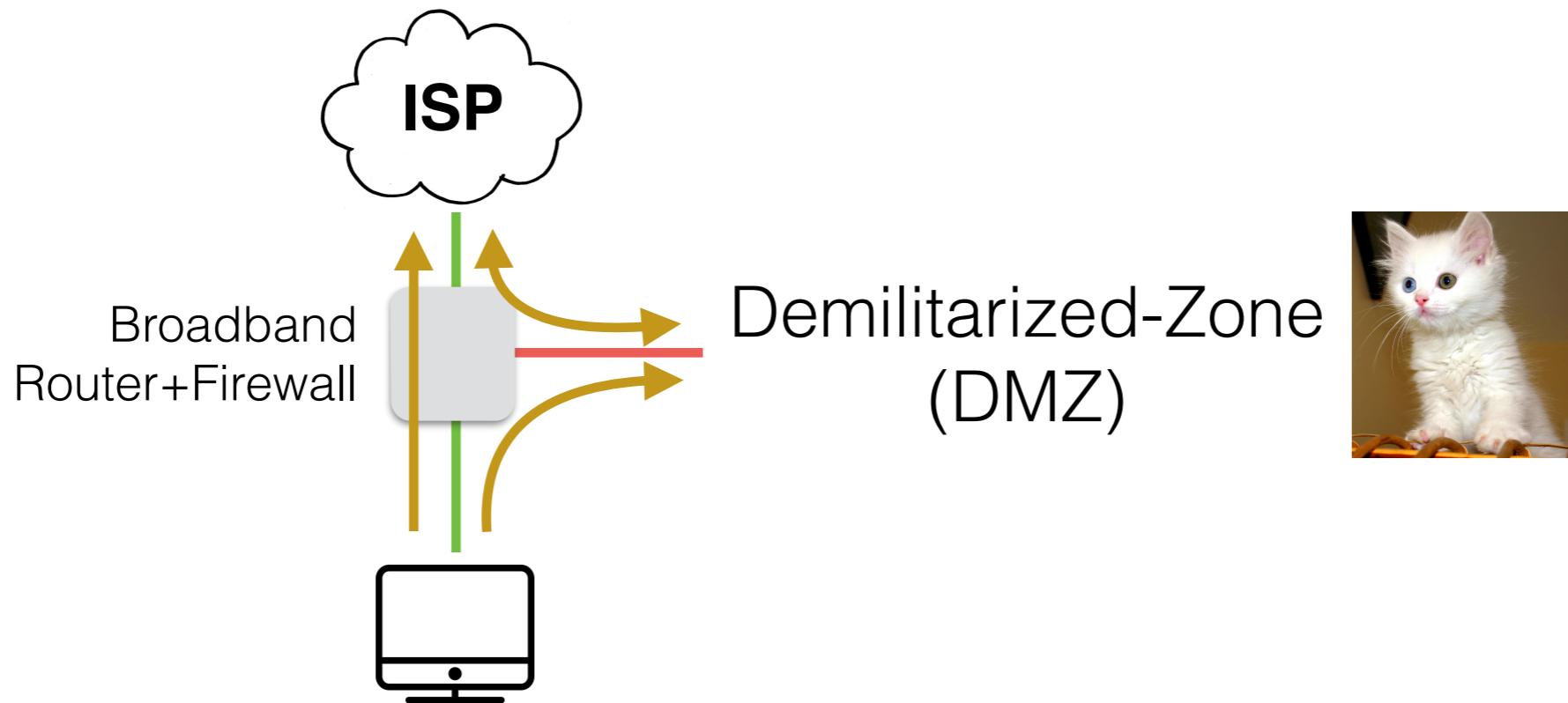


Web Hosting at Home

- Security, Security, Security
- Foscam auto-registers with “dyndns” service
- No idea of code quality → avoid putting webcam on the Internet
- Most homes - Tortoise Model of Security

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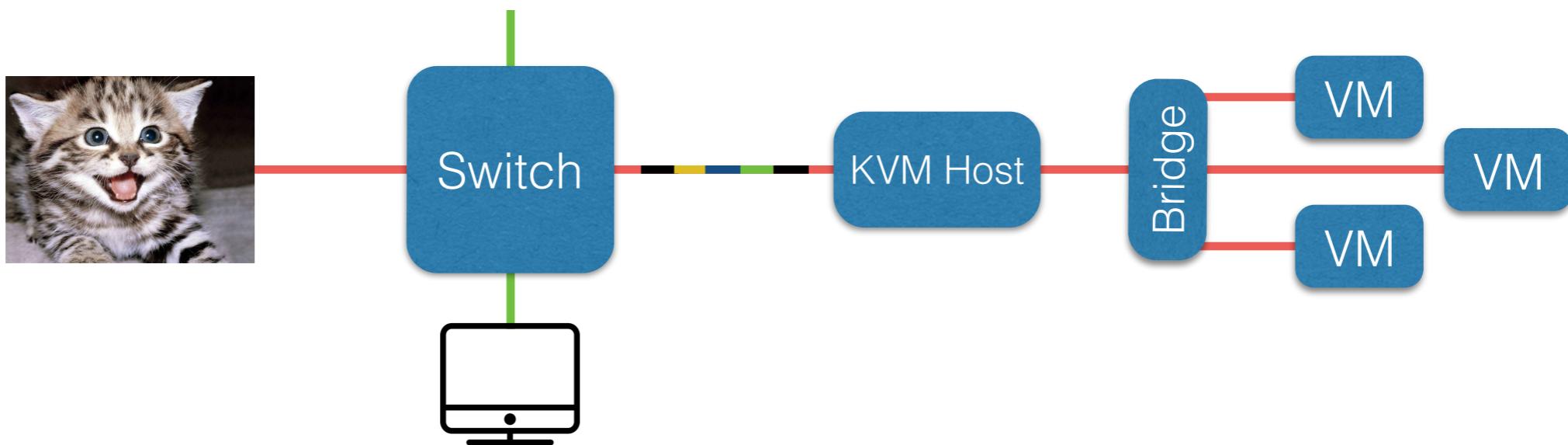


Home Networking

- DMZ Problem: only one switch & AP in the house
- Solution: Netgear GS108E + VLAN tagging
- DMZ Problem: only one Linux server
- Solution: KVM virtual machines + VLAN tagging

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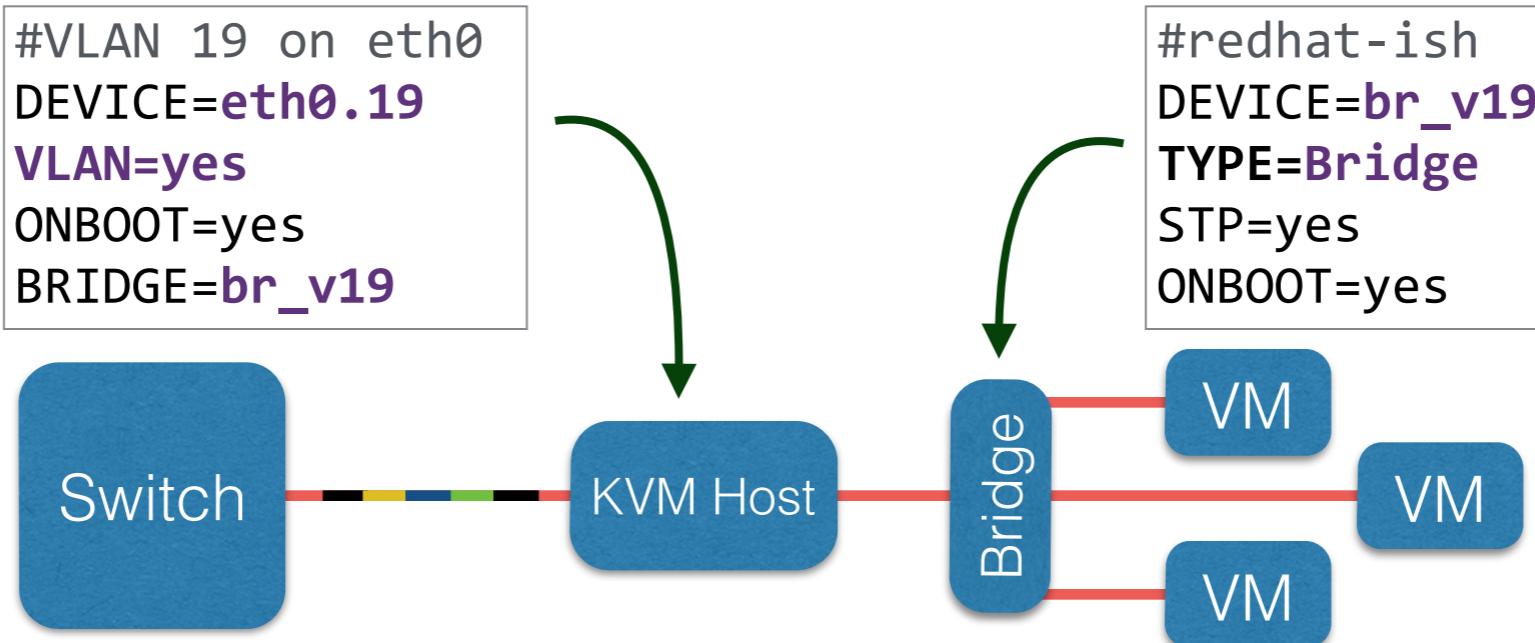


802.1q VLANs in Linux + KVM

Connection to
the outside world

```
#VLAN 19 on eth0
DEVICE=eth0.19
VLAN=yes
ONBOOT=yes
BRIDGE=br_v19
```

```
#redhat-ish
DEVICE=br_v19
TYPE=Bridge
STP=yes
ONBOOT=yes
```



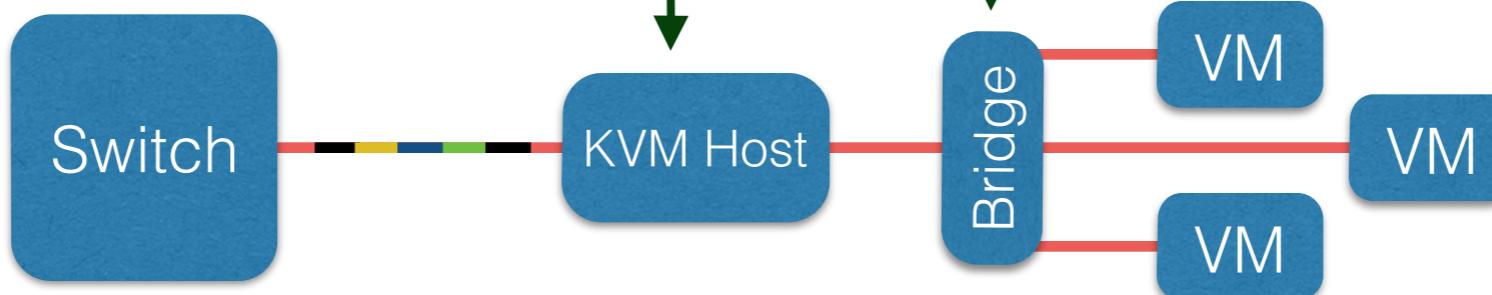
Used by VMs

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Used by VMs

```
# ifup br_v19 && ifup eth0.19 && brctl show
bridge name bridge id                                STP enabled      interfaces
br0          8000.00145ed87f4a                          yes            eth0
virbr0       8000.000000000000                          yes
br_v19       8000.00145ed87f4a                          yes            eth0.19
```

```
# kvm instance config
<interface type='bridge'>
    <mac address='54:52:00:5b:1a:cd' />
    <source bridge='br_v19' />
    <target dev='vnet0' />
</interface>
```

VLC

- Swiss Army Chainsaw of video processing
- Transcode MJPEG stream from Camera
 - HTTP Live Streaming for Apple & Microsoft
 - Ogg Theora for others
- Timestamp images (cats don't move much)
- Upstart script

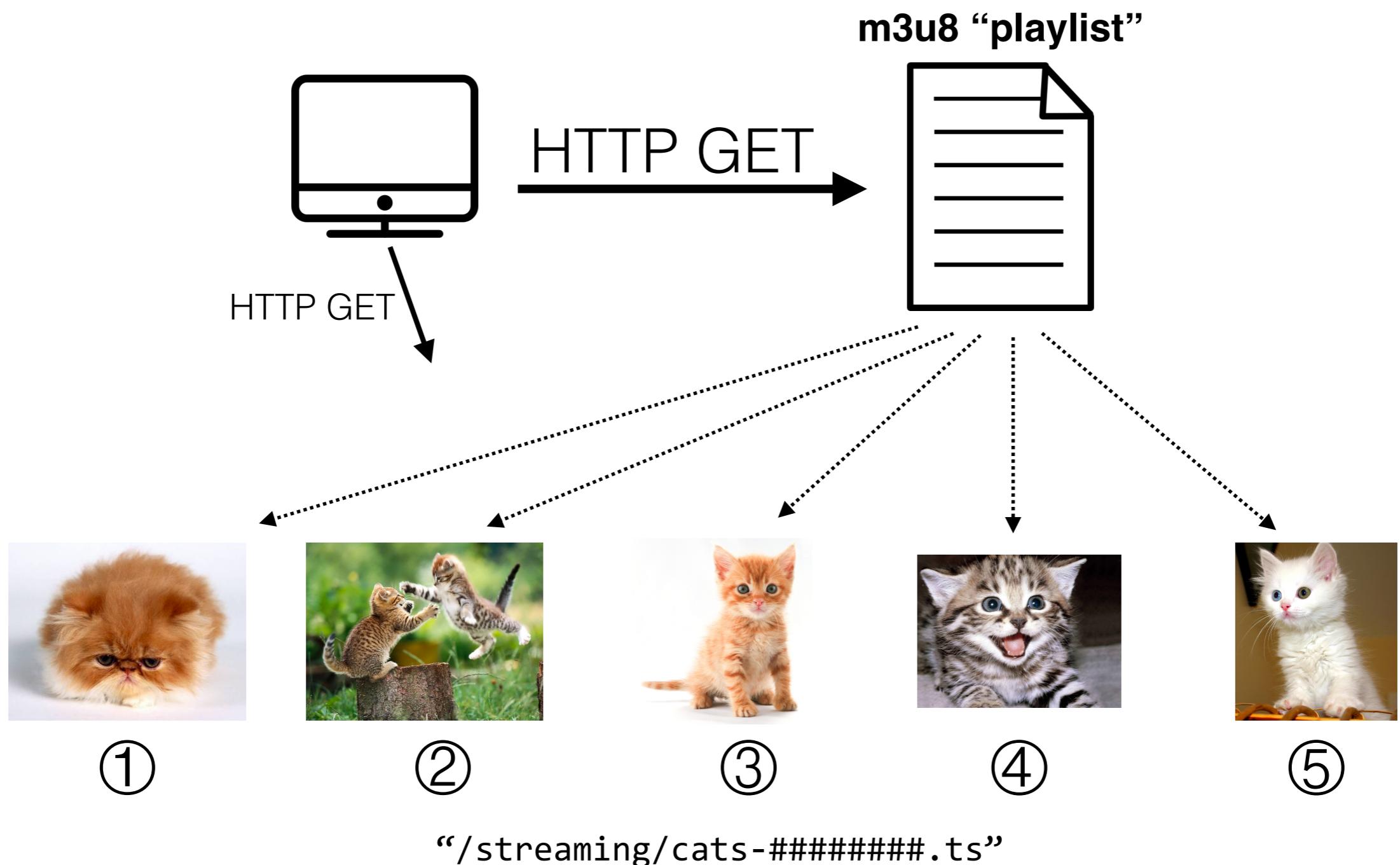
VLC Invocation

```
/usr/bin/cvlc -I dummy http://guest:guest@172.16.30.10:8888/videostream.cgi?rate=0  
--sout='#duplicate{  
  
dst="transcode{  
    width=320,height=240,fps=25,vcodec=h264,vb=256,acodec=none,  
    venc=x264{profile=baseline,level=30,keyint=30,ref=1},  
    sfilter=marq{marquee="\[%Y-%m-%d %H:%M:%S]\",position=8,size=18}  
}:std{access=livehttp{  
    seglen=10,delsegs=true,numsegs=5,  
    index=/var/www/streaming/cats.m3u8,  
    index-url=/streaming/cats-#####.ts},  
    mux=ts{use-key-frames},  
    dst=/var/www/streaming/cats-#####.ts},  
  
dst="transcode{  
    width=640,height=480,fps=25,vcodec=theo,vb=512,acodec=none,  
    sfilter=marq{marquee="\[%Y-%m-%d %H:%M:%S]\",position=8,size=18}  
}:http{mux=ogg,dst=127.0.0.1:8081/catcam.ogg}"  
}'
```

Video Formats

- (Apple) HTTP Live Streaming
 - Variable bitrate lossy video, H.264 (MPEG4 pt10)
 - Chunked TS container
- Ogg + Theora
 - Variable bitrate lossy video, a bit like MPEG4 pt2
 - Ogg container

HTTP Live Streaming



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The WWW Bit

- Ogg Theora output via VLC's *built-in web server*
- HTTP Live Streaming is files on disk
- Need to make both available in one WWW page
 - Apache - Reverse Proxy + File Server
 - HTML5 Video Tag

HTML5 "video" tag

Try Live Streaming first

Fall-back to Ogg/Theora

```
<video id="video" autoplay="autoplay">
    <source src="/streaming/cats.m3u8">
    <source src="/stream/catcam.ogg" type="video/ogg; codecs=theora">
    Your browser doesn't appear to support the
        HTML5 <code>&lt;video&gt;</code> element.
</video>
```

```
# apache config highlights
ProxyReceiveBufferSize 16384
ProxyPassReverse /stream/catcam.ogg http://localhost:8081/catcam.ogg

# ... remainder is left as exercise for the reader ;)
```

A well-deserved Cup of Tea



Bond will return in....



Q & A

All cat picture credits: Flying Spaghetti Monster