

Internet Streaming of TV Programming

How to do it at home and in other
places

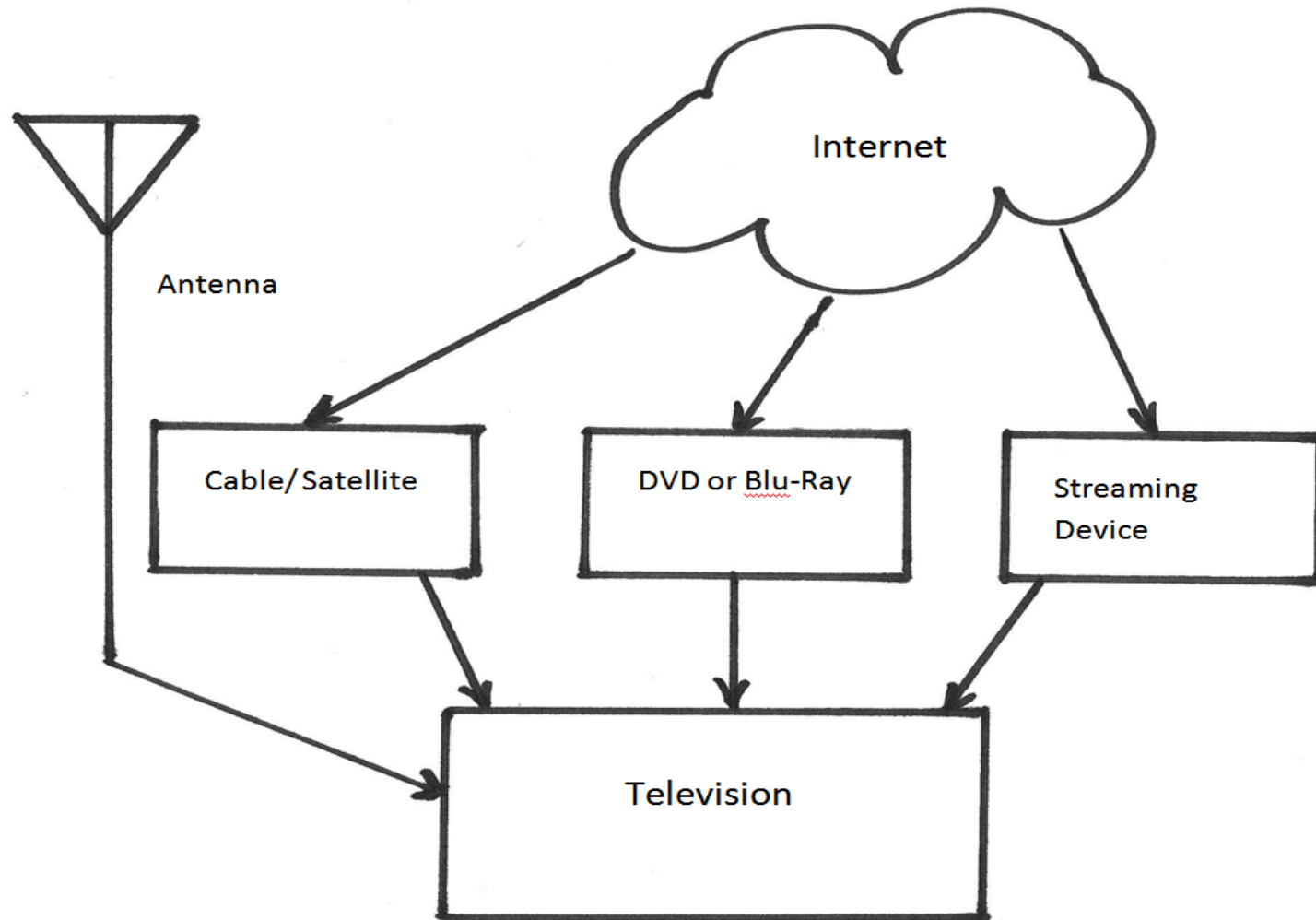
Streaming: what, when, where, how

- What is streaming?
- What can be streamed?
- What equipment is needed?
- How do I travel with it?
- How can I connect to and use my cable/satellite system when away from home?

Where can you get TV programming?

- Over-the-air via antenna
- Cable or satellite service
- DVD or Blu-Ray player
- Gaming system
- Computer/tablet/phone
- External storage device or NAS
- **Streamed from Internet via special device or “smart” TV**

Sources for TV Programming



Streaming – Where and What

- At home
- Elsewhere -- hotel, RV, vacation home, ...

Internet service is required, of course, but no cable or satellite service is needed

What can be streamed?

Paid services: Netflix, Amazon, Hulu, Acorn, ...

Free services: Youtube, etc.

Internet sites: major TV networks and many others

Is Internet Service Fast Enough?

Your Internet service must be fast enough for what you want to stream

Speed is usually measured in Mbps (megabits per second)

For SD TV about 1.5 Mbps is needed

For HD TV about 2.5 Mbps

For 4K TV about 15 Mbps

A device is required to receive the data stream and convert it for display on TV

- Smart TV
- Cable box (e.g. Tivo)
- DVD/Blu-Ray player \$ 60 and up
- Computer w/HDMI connector
- Special streaming devices:
 - Apple TV – 4 \$130
 - Google Chromecast 2 \$ 35
 - Amazon Fire TV Stick \$ 40
 - Roku streaming stick \$ 49
 - Roku – latest version \$100 - 120

Devices support only a limited set of sources

- Companies must write software (apps) for every streaming source for every device
- Not all devices can stream all sources
- Roku is probably the most comprehensive
- See links at end for reviews of major streaming devices

Connecting device to Internet

- If the device supports it, Ethernet cable is best for speed and reliability
- Some devices have built-in wifi which works if connection is good and can provide enough speed
- Ethernet-over-power-line adapters give good speed but are not cheap (about \$100 for a pair) ... but much less expensive than running cable
- Inexpensive travel routers can provide wifi for devices that do not have it built in (about \$20)

Or Use Cable to Carry Internet

- Coaxial cable used for cable or satellite service can be shared by Internet service
- Think of the cable in your home as a private set of radio stations in the range 500-1500 MHz
- MoCA (Multimedia over Coax Alliance) devices can be used with cable TV systems (\$64 each)
- DECA (DirecTV Ethernet-to-Coax Adapter) is similar and can be used with DirecTV (\$8 each)
- Dish Network uses an Internet connection to its devices but I can't find any equivalent adapter

Internet Connection in Hotels

Even if you can connect a streaming device to a TV in a hotel, getting that device on the Internet can be challenging.

Usually there is some kind of sign-on page which appears when you connect or first use your browser that requires accepting terms and conditions and/or requires something like your room number and name. Most streaming devices can't handle this (but Roku is an exception).

The easiest way is to use a travel router to connect to the hotel Internet and, in turn, provide a new wifi access point which you can then use to connect your streaming device and other devices you might have with you. (See links at end for a device that can do this for less than \$20.) You will need a computer, tablet or smart phone to configure the connection to the travel router (or to a Roku).

Connecting to TV in a hotel

It's not always easy to physically connect your device to a hotel TV. Usually you need to plug into an HDMI port on the back of the set. Most TVs have these now. It's usually dark behind the sets so carry a flashlight.

Once connected, you will have to switch the set to the proper HDMI input in order to view your streamed programming. This is not always easy since hotels often provide a special remote that does not have the ability to change the inputs. Most of the time you will find a few buttons on the top, back, side or lower edge of the set that can be used to get the menu on the screen. There are also buttons for menu, up and down volume and up and down channel. Once the menu is displayed, these will move up/down or left/right to make it possible to select a different input. This takes a bit of trial and error but is usually not too hard to figure out.

Another option is to carry an inexpensive universal remote with you. Setting one of these up can be tedious but works as a last resort – about \$10 at Wal-Mart.

Connecting with a Travel Router

Normally you want to connect your router in bridge mode which creates a private wireless access point you then use to connect all your devices. Details vary by specific routers but generally you use a smart phone, tablet or computer to set one up. Part of the process usually involves dealing with a logon screen that is the first thing you see after connection. If not automatically launched, open your browser and you should get the screen. If that fails, you can try typing in the IP address of the router you have connected to into the browser. You must guess the last part of the address but it's usually 1 or 254. For example, if you have an address of 123.456.1.77, try using 123.456.1.1 or 123.456.1.254. If all of this fails, you're out of luck.

The same process applies to connecting directly with a Roku device.

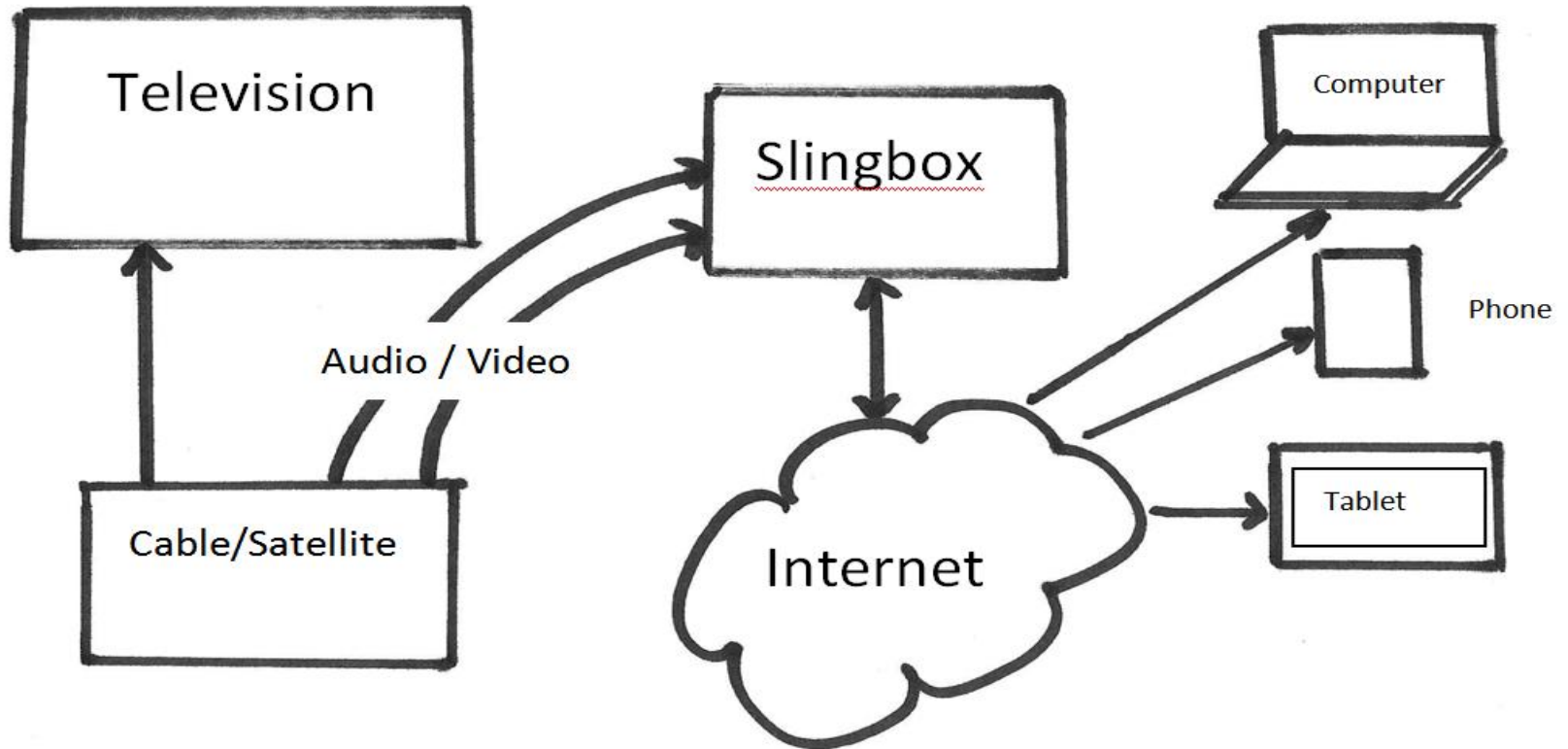
Slingbox – taking it all with you

You pay a good bit of money to have cable or satellite service at home. Wouldn't it be nice to take it all with you to a vacation home, RV or hotel? Or be able to watch your home system on a phone or tablet while waiting somewhere. Slingbox makes this possible. With it you can change channels, pause, resume, etc. exactly as you would at home.

Slingbox connection

- Slingbox requires a cable or satellite set-top box; it can't be used with an antenna-only system
- Connection and setup is not complicated
- Internet service is required at home and the location where you are viewing
- A smart phone, tablet or computer is needed at the remote location to control the system
- Your cable/satellite set-top box, the Slingbox and Internet equipment must be left powered on at home but there is no need for the TV to be left on
- A streaming device is required at the viewing end if you want to get the remote picture onto a local TV set
- Cost varies depending on version -- \$180-230

Slingbox Connection



Using Slingbox

- Only one device can watch Slingbox at a time
- Data is streamed from your Slingbox through Slingbox servers to the place you are watching
- You can watch on a computer, a phone, a tablet, or ...
- ... on a TV attached to a supported streaming device (Roku, Apple TV 4, Chromecast, Fire TV)
- You must first connect via a phone or tablet and then use the app on phone or tablet to switch the video to the TV; control is still via the phone or tablet but the picture is on the TV

Reviews of Streaming Devices

The following links are to some reviews of streaming devices. They are helpful in comparing products but note that Roku has released new versions of almost all their products as of October 7. Also, Amazon will release a new improved version of it's Fire TV Stick on October 20 and Google has just announced new versions of Chromecast which will be in stores "soon".

Review of the latest versions of products just out but not much detail --

<https://www.yahoo.com/tech/streaming-stick-swordfight-chromecast-vs-152830896.html>

Reviews of current products --

<http://thewirecutter.com/reviews/best-media-streamers/>

<http://www.tomsguide.com/us/best-streaming-players,review-2140.html>

<http://www.digitaltrends.com/home-theater/best-tv-streaming-devices/>

<http://www.cnet.com/topics/media-streamers/best-media-streamers/>

<http://www.usatoday.com/story/tech/2015/11/24/best-internet-tv-streaming-devices-20-200/76000454/>

Links to New Products

Roku product line all replaced as of October 7 - <https://www.roku.com/index#>

New Amazon Fire TV Stick available October 20 - https://www.amazon.com/All-New-Stick-Remote-Streaming-Player/dp/B00ZV9RDKK/ref=sr_1_1?ie=UTF8&qid=1475754429&sr=8-1&keywords=fire+tv+stick

New Google Chromecast Ultra available “soon” at stores - <https://www.google.com/chromecast/tv/>

Links to Products Mentioned

The following are links to various products mentioned or shown in demonstrations.
Most of these are to Amazon but there may be lower prices elsewhere.

HDMI short extension cable -

https://www.amazon.com/dp/B004C4XR00/ref=wl_it_dp_o_pC_nS_ttl?encoding=UTF8&colid=1P5AZOBKT4GRH&coliid=IX6LS6PYK1IIZ

HDMI coupler -

https://www.amazon.com/dp/B001EPVOQY/ref=wl_it_dp_o_pC_nS_ttl?encoding=UTF8&colid=1P5AZOBKT4GRH&coliid=I2E4OSV9ENIMEP&th=1

Roku Streaming Stick -

https://www.amazon.com/dp/B01DA0YCNC/ref=wl_it_dp_o_pC_nS_ttl?encoding=UTF8&colid=1P5AZOBKT4GRH&coliid=I1CR6NDZC0W8CT&th=1

Links continued

Multiple USB charger -

https://www.amazon.com/dp/B016OAHQYM/ref=wl_it_dp_o_pC_nS_ttl?encoding=UTF8&colid=1P5AZOBKT4GRH&coliid=I1MFWF9Q3SKDC7&psc=1

Flashlight -

https://www.amazon.com/dp/B015WV5HD6/ref=wl_it_dp_o_pC_nS_ttl?encoding=UTF8&colid=1P5AZOBKT4GRH&coliid=I2BXE9HSL014LM

Slingbox 500 -

https://www.amazon.com/dp/B00U1S7Q30/ref=wl_it_dp_o_pd_nS_ttl?encoding=UTF8&colid=1P5AZOBKT4GRH&coliid=I3H9APIQ1BRADH&psc=1

Ethernet powerline adapters -

https://www.amazon.com/dp/B00HRO2CH6/ref=wl_it_dp_o_pd_nS_ttl?encoding=UTF8&colid=1P5AZOBKT4GRH&coliid=I1VHLNO8JW9W30

Links continued

Short extension cords -

https://www.amazon.com/dp/B014K0TCEA/ref=wl_it_dp_o_pC_nS_ttl?encoding=UTF8&colid=1P5AZOBKT4GRH&coliid=I2XREHZHEJ42PG

Travel router -

https://www.amazon.com/dp/B00HZWOQZ6/ref=wl_it_dp_o_pC_nS_ttl?encoding=UTF8&colid=1P5AZOBKT4GRH&coliid=IINCMK0W72JO

Amazon Fire TV Stick (new) -

https://www.amazon.com/dp/B00ZV9RDKK/ref=wl_it_dp_o_pC_nS_ttl?encoding=UTF8&colid=1P5AZOBKT4GRH&coliid=I2C9S6GDTJKKA9

MoCA adapter -

https://www.amazon.com/dp/B019VSW2RA/ref=wl_it_dp_o_pC_nS_ttl?encoding=UTF8&colid=1P5AZOBKT4GRH&coliid=I9BS1FNRPN8LJ

Links continued

DECA adapters - https://www.amazon.com/PACK-Broadband-Ethernet-Generation-Supplies/dp/B01AYMGPIO/ref=sr_1_1?ie=UTF8&qid=1475495500&sr=8-1&keywords=deca%2Badapter&th=1

4-way extension cord splitter -

https://www.amazon.com/gp/product/B000083KIH/ref=s9_wsim_gw_g23_i2_r?ie=UTF8&fpl=fresh&pf_rd_m=ATVPDKIKX0DER&pf_rd_s=&pf_rd_r=16C70K6FF2Z6FMD6YXS7&pf_rd_t=36701&pf_rd_p=6aad23bd-3035-4a40-b691-0eefb1a18396&pf_rd_i=desktop

Links continued

Electronics travel case -

https://www.amazon.com/gp/product/B002VPE1QG/ref=oh_aui_detailpage_o07s02?ie=UTF8&psc=1

Ethernet switch (5 port) -

https://www.amazon.com/gp/product/B00KFD0SNG/ref=oh_aui_detailpage_o04s00?ie=UTF8&th=1

Bi-directional HDMI switch - <https://www.amazon.com/Fosmon-HD8024-Bi-Directional-Switcher->

[Passthrough/dp/B00LFX1UDM/ref=sr_1_15?s=electronics&ie=UTF8&qid=1475753325&sr=1-15&keywords=hdmi+switch](https://www.amazon.com/Fosmon-HD8024-Bi-Directional-Switcher-Passthrough/dp/B00LFX1UDM/ref=sr_1_15?s=electronics&ie=UTF8&qid=1475753325&sr=1-15&keywords=hdmi+switch)