CONNECTING YOUR COMPUTER TO A TV: HDMI, "wireless HDMI", "WiDi", "EZCast", and "Chromecast"

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SUMMARY

By using HDMI, "wireless HDMI", "WiDi", "Chromecast", "EZCast", or or a "ScreenBeam Kit", you can connect your computer to a television (or to a monitor that has an HDMI jack)
TOPICS

• Wired connections for connecting a computer to a TV or a monitor
• Terminology for wireless connections between a computer and a TV or a monitor
TOPICS (continued)

• Time Line of Wireless Computer-to-TV Technology

• Comparison of Wireless Computer-to-TV Technologies:
TOPICS (continued)

• "Wireless HDMI"
• "WiDi"
• "EZCast 5G"
• "Chromecast"
• Actiontec's "ScreenBeam" Transmitter and Receiver Kit"
WIRED CONNECTIONS FOR CONNECTING A COMPUTER TO A TV OR A MONITOR

• Three types of connections from a computer to a monitor or TV:
  VGA
  DVI
  HDMI
"VGA" stands for "Video Graphics Array"

A "VGA" port is sometimes called a "PC" port in a TV
No is sound transmitted to the TV or monitor.
WIRED CONNECTIONS FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

- "DVI" stands for "Digital Visual Interface"
WIRED CONNECTIONS FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

• A DVI cable will transmit the video screen from the computer to the TV or monitor

• A DVI cable will not transmit the sound from the computer to the TV or monitor
No sound transmitted to the TV or monitor.
WIRED CONNECTIONS FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

• "HDMI" stands for "High Definition Multimedia Interface"
• A HDMI cable carries both the video signal and the sound from the computer to the TV or monitor
Sound is transmitted to the TV or monitor.
A conversion between HDMI and DVI is easy:
You use a conversion cable or a conversion adapter.
Both are passive devices.
No active electronics is needed to make the conversion:
No sound is transmitted to the TV or monitor.
No sound is transmitted to the TV or monitor.
• If you have a DVI port at one end and a HDMI port at the other end, you will not transmit the sound.
WIRED CONNECTIONS FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

- VGA, DVI, and HDMI cables have maximum usable length of between 15 and 22 feet.
TERMINOLOGY FOR WIRELESS CONNECTIONS BETWEEN A COMPUTER AND A TV OR A MONITOR

- "Streaming stick"
- "Dongle"
- "SSID"
"streaming stick" = A device that you plug into the HDMI port of a television set or a flatscreen monitor
TERMINOLOGY FOR WIRELESS CONNECTIONS BETWEEN A COMPUTER AND A TV OR A MONITOR (continued)

• According to http://en.wikipedia.org/wiki/Dongle: "A dongle is a small piece of hardware that attaches to a computer, TV, or other electronic device in order to enable additional functions.."
"SSID" stands for "Service Set Identifier": A "SSID" is broadcast by a "Wireless Access Point" which is usually part of a "wireless router"
TIMELINE OF WIRELESS COMPUTER-TO-TV TECHNOLOGIES

- **2007:** "wireless HDMI"
- **2010-01:** "WiDi"
  = "Intel Wireless Display"
- **2013-01:** Actiontec
  "ScreenBeam Kit"
- **2013-07:** "Chromecast"
- **2013-11:** "EZCast"
- **2015-06:** "EZCast 5G"
COMPARISON OF THE WIRELESS COMPUTER-TO-TV TECHNOLOGIES

- Price comparison?
- Main feature comparison?
- Usable for the only monitor or the main monitor of a computer?
- Technical complexity index?
PRICE COMPARISON OF THE WIRELESS COMPUTER-TO-TV TECHNOLOGIES

• 2007: "wireless HDMI" (~$250)
• 2010-01: "WiDi"
  = "Intel Wireless Display" (~$200)
• 2013-01: Actiontec "ScreenBeam Kit" (~$80)
• 2013-07: "Chromecast" (~$40)
• 2015-06: "EZCast 5G" (~$40+, no USB Power Supply)
COMPARISON OF THE WIRELESS COMPUTER-TO-TV TECHNOLOGIES (continued)

• Main feature comparison:
• 2007: "wireless HDMI"  
  (simplest to install and use)
• 2010-01: "WiDi"  
  (best penetration through walls)
• 2013-01: Actiontec "ScreenBeam Kit"
• 2013-07: "Chromecast"  
  (easy to use in a home environment, complex to use in public Wi-Fi environment, need to bring along your own wireless router)
• 2015-06: "EZCast 5G"  
  (easier to use in a public Wi-Fi environment)
• Usable for the only monitor or the main monitor of your computer?
• 2007: "wireless HDMI" (can be used as the only monitor of your computer)
• 2010-01: "WiDi" (cannot be used as the only monitor of your computer)
• 2013-01: Actiontec "ScreenBeam Kit" (cannot be used as the only monitor of your computer)
• 2013-07: "Chromecast" (cannot be used as the only monitor of your computer)
• 2015-06: "EZCast 5G" (cannot be used as the only monitor of your computer)
• Effect on existing wireless Wi-Fi network bandwidth for your computer?
• 2007: "wireless HDMI" (no effect on wireless network bandwidth)

• 2010-01: "WiDi" (reduces wireless network bandwidth since it uses the existing "Intel" wireless Wi-Fi adapter of your computer)
2013-01: Actiontec "ScreenBeam Kit" (minimum effect on wireless network bandwidth since a USB Wi-Fi transmitter dedicated to communicating with the TV or (second) monitor is provided for your computer)
2013-07: "Chromecast" (reduces wireless network bandwidth since it uses the existing wireless Wi-Fi adapter of your computer. The existing wireless Wi-Fi adapter of your computer has to also be the same network adapter that connects your computer to the Internet or "Chromecast" software will refuse to install into your computer.)
• 2015-06: "EZCast 5G" (reduces wireless network bandwidth since it uses the existing wireless Wi-Fi adapter of your computer.)
WIRELESS HDMI

• At the computer end, you install a "HDMI transmitter"

• At the TV or monitor end, you install a "HDMI receiver" that is compatible with the "HDMI transmitter" that you installed at the computer end.
The TV is a second monitor for the computer. Sound is transmitted to the TV.
"Wireless HDMI" is the only wireless "computer-to-tv" technology that automatically works when you turn on your computer. All other wireless "computer-to-tv" technologies require that you do something after you turn on your computer.
WIRELESS HDMI (continued)

- For detailed information about "wireless HDMI", see http://aztcs.org/meeting_notes/wihardsig/wireless/wireless_HDMI.pdf
FOUR Wi-Fi-BASED TECHNOLOGIES FOR CONNECTING A COMPUTER TO A TV OR A MONITOR

• "WiDi"
• "EZCast"
• "Chromecast"
• "ScreenBeam Kit"
At the computer end, transmit video and sound is transmitted by a Wi-Fi wireless networking adapter.

At the TV or monitor end, you have 3 types of receiver devices that you can install:
Computer

Wi-Fi wireless networking adapter

Wireless Wi-Fi radio signals

TV or Monitor

"WiDi" / "Miracast" receiver
or
"EZCast"
or
"Chromecast"
or
"ScreenBeam Kit"
FOUR Wi-Fi-BASED TECHNOLOGIES FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

- At the TV or monitor end, all three of these types of receivers have an integral wireless router inside of them. The integral wireless router provides a real wireless access point with a real SSID for the Wi-Fi wireless networking adapter at the computer end to communicate with.
FOUR Wi-Fi-BASED TECHNOLOGIES FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

• At the computer end, your computer needs to have a wireless Wi-Fi network adapter:
FOUR Wi-Fi-BASED TECHNOLOGIES FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

Three types of Wi-Fi adapters:

- Integral Wi-Fi adapter (on the motherboard or as a daughterboard attached to the motherboard)
- PCI or PCIe or "mini PCIe" Wi-Fi adapter
- USB Wi-Fi adapter
Computer

Wi-Fi wireless networking adapter

Wireless Wi-Fi radio signals to the TV or the monitor
FOUR Wi-Fi-BASED TECHNOLOGIES FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

• At the TV or monitor end, the wireless receiver can be connected to the TV or monitor with a short HDMI cable:
Audio is transmitted from the PC to the TV or Monitor.

Wireless Wi-Fi radio signals from the computer are transmitted through a "WiDi" / "Miracast" receiver or "EZCast 5G" or "Chromecast". The signals are then connected to the TV or Monitor via an HDMI cable.
FOUR Wi-Fi-BASED TECHNOLOGIES FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

- At the TV or monitor end, if your TV or monitor only has a DVI jack, the wireless receiver can be connected to the TV or monitor with a short HDMI-to-DVI adapter or a HDMI-to-DVI cable. However the adapter causes sound to be lost:
Wireless Wi-Fi radio signals from the computer

"WiDi" / "Miracast" receiver or "EZCast 5G" or "Chromecast"

HDMI Jack

HDMI-to-DVI adapter or HDMI-to-DVI cable

TV or Monitor

DVI jack

No audio is transmitted from the PC to the TV or Monitor
FOUR Wi-Fi-BASED TECHNOLOGIES FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

- "WiDi" stands for "Intel Wireless Display"

- You can use "WiDi" to wirelessly connect a "Windows.." computer directly to a TV set or to a (second) monitor. This wirelessly-connected monitor or TV becomes an additional monitor for your computer.
FOUR Wi-Fi-BASED TECHNOLOGIES FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

• You can use "EZCast 5G" to wirelessly stream either the entire monitor screen or specific Web pages or specific online media players or specific local media files from a "Windows.." computer or a Mac to a TV or to a (second) monitor.
FOUR WI-FI-BASED TECHNOLOGIES FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

• You can use "Chromecast" to wirelessly stream either the entire monitor screen or specific Web pages or specific online media players or specific local media files from a "Windows.." computer or a Mac to a TV or to a (second) monitor.
FOUR Wi-Fi-BASED TECHNOLOGIES FOR CONNECTING A COMPUTER TO A TV OR A MONITOR (continued)

• Warning:
All of these wireless technologies have too much latency and unpredictability for serious gaming.
(You must use wired HDMI or DVI cables for serious gaming.)
"WiDi" DETAILS

• For our detailed information and advice on "WiDi", please see
  
  http://aztcs.org/meeting_notes/winhardsig/wireless/WiDi.pdf
"EZCAST 5G" DETAILS

- For our detailed information and advice on "EZCast 5G", please see http://aztcs.org/meeting_notes/winhardtswils(WZCast).pdf
"CHROMECAST" DETAILS

• For our detailed information and advice on "Chromecast" please see http://aztcs.org/meeting_notes/winhardsig/wireless/Chromecast.pdf
ACTIONTEC "SCREENBEAM" KIT

• For our detailed information and advice on the Actiontec "ScreenBeam Kit", please see http://aztcs.org/meeting_notes/winhardsig/wireless/Actiontec_ScreenBeam.pdf