Digital Entertainment SUPERCUSTO

WHAT YOU NEED TO KNOW TO STREAM AUDIO AND VIDEO AROUND THE HOUSE
Audio and video content is all around us. And these days much of it comes not from TV cables, satellite dishes, and radio antennas, but from our digital devices around the house, streaming over the Internet and local networks. In short, it's a brave new world for fans of digital entertainment.

And that's why we created the *Digital Entertainment Superguide*, a primer with everything you need to know to get started. This book walks you through how to set up your home network and choose the right hardware—set-top boxes, smart TVs, media center computers, streaming speakers, remote controls, and more—for your needs.

Like to watch TV shows and movies but not sure where to find what? We've got you covered with a guide to streaming video sources for your TV or mobile devices (even if you haven't cut the cord entirely and still subscribe to a cable or satellite package).

We don't leave music lovers out either, as we help you choose the best streaming audio service. Do you want Mog, Rdio, Rhapsody, Slacker, or Spotify? How much does each service cost? Which sounds best? Which supports the most devices and has the best mobile apps? We answer all those questions and more in the pages that follow.

Finally, if you're wondering how to move audio and video around the house—stream music wirelessly from an iPhone to an AirPlay speaker in the living room or send video from a computer to your beautiful wall-mounted HDTV—you've come to the right place. We'll even show you how to use your smartphone or tablet to control it all. So read on, and let the fun begin!

—Jonathan Seff
San Francisco, April 2013
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Set Up Your Home

Thanks to nearly unlimited options through the Internet, a home entertainment system can fill your abode with enough movies, music, and games to keep you enthralled every minute of your life. But before you can lose yourself in digital nirvana, you need the gear to play it all. Choosing the right equipment makes the difference between fun and frustration.
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How Do You Get Started?

Whether you plan to play games, watch streaming video, or listen to digital audio, you’ll need a fast Internet connection and a robust network to make all your entertainment dreams a reality.

For streams and downloads coming to you via the Internet—Netflix, Hulu Plus, or Amazon Instant Video, for example—you’ll need broadband speeds from your cable, DSL, fiber optic, or even 4G mobile providers. High-definition video files are large (about 2.3GB per hour), and slow speeds result in buffering delays and choppy playback. If your Internet connection can’t keep up with the demands of online gaming, for instance, the delays will likely put your game to a grisly end.

So how much speed do you need? The more, the better, especially if you expect to have multiple streams going at once—say, a streaming movie in the living room and an online game in the bedroom. Netflix recommends at least 1.5 mbps to use its streaming service, and 5 mbps for HD quality (see the table below for Netflix’s complete bandwidth information). If for some reason you can’t get the consistent speed needed for HD video, most services will detect the best quality they can deliver for uninterrupted playback—though this can result in disappointing picture quality.

### How Much Speed Do You Need for Netflix?

<table>
<thead>
<tr>
<th>Netflix Service</th>
<th>Recommended Speed (MBPS)</th>
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<tbody>
<tr>
<td>Basic service</td>
<td>1.5 (0.5 required)</td>
</tr>
<tr>
<td>DVD quality</td>
<td>3.0</td>
</tr>
<tr>
<td>HD quality</td>
<td>5.0</td>
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<tr>
<td>Super HD quality</td>
<td>7.0</td>
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<tr>
<td>3D quality</td>
<td>12.0</td>
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Internet speed is only part of the quality equation, though. Your router sends the information from the Internet to the video-streaming device, game console, or smart TV. Your router can also create a local-area network (LAN) that you can use to deliver video and audio content from connected computers and hard drives.
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Wired or Wi-Fi?

For the most dependable speed and quality, use wired network connections to your router through ethernet cables. Wired connections reduce interference that can sap the speed and consistency necessary to ensure smooth and sharp video.

But wired connections can be cumbersome, so you may prefer a wireless option unless you don’t mind tripping over cables that stretch from your router to your devices or you’re up for doing some remodeling to run the wires through the walls. Wireless networks offer a compromise many people are willing to make: They have no wires to limit where you can put equipment, but you’re more likely to encounter interference that interrupts playback. Even if you choose a wired network, you'll want a wireless alternative too, since some devices are Wi-Fi only and don’t come with an ethernet port.

EXPAND YOUR MIND If you decide to go wireless, you might need to extend your network with something like Apple’s AirPort Express to cover your whole house.

For wireless networks, choose a router that supports the 802.11n standard to get the strongest signal strength and greatest reach. If you have a particularly large home or an obstacle that interferes with Wi-Fi signals—a concrete wall, say—you may need to extend your network. For example, pairing a $99 AirPort Express router with a $179 AirPort Extreme can help improve signal strength in more remote areas of your home.

What Do You Need?

With so many entertainment options available at a moment’s notice, the question isn’t just what you want to watch, listen to, or play—it’s which device (or devices) will deliver digital entertainment in the ways that suit you best.

Many devices do more than one thing. A set-top box focuses on video and audio, but can also handle some gaming. A game console can stream video, too. The right device for you comes down to what you expect to do most often—and how much you can afford to spend.
Set-Top Box

The days of physical media are numbered; it’s only a matter of time before your DVD or Blu-ray disc player finds a spot next to your CD player in a cold, dark closet. The future of video and audio is via the Internet.

A set-top box acts as a hub for your digital content—it brings content in from the outside world over your Internet connection or over your network and pushes it out to your beautiful HDTV.

While many cable and satellite TV companies offer set-top boxes for television signals, most of them are limited in what they can do beyond that. To make the most of your digital entertainment options, you’ll want to invest in a dedicated set-top box that’s focused on content outside traditional TV—in other words, content delivered through the Internet.

The primary role of these boxes is to stream video. They use apps, like those on your smartphone, to stream content over the Internet from sources such as Netflix, Hulu, and Amazon Instant Video. Some set-top boxes also offer games and audio content. More robust models include storage for video and audio downloads. On the far end of the category you’ll find digital video recorders (DVRs) for recording traditional TV that also include apps for streaming content from the Internet.

**TYPES:** Most set-top box companies have been in the game for a while; challengers crop up from time to time, but these are the tried-and-true choices.

**THIRD TIME’S THE CHARM** The Roku 3 offers access to more than 750 channels of streaming goodness.
ROKU: The popular line of video-streaming devices from Roku features more than 750 channels you can add to your account for content. Beyond the ubiquitous Netflix, Amazon, Pandora, and Hulu Plus channels, you'll find content for almost any taste (some free and some requiring subscriptions): sports, news, music, documentaries, and more. At the top end, the $100 Roku 3 includes a motion controller for games, a microSD slot for additional storage, a USB port for local content, and more. At the low end, the $50 Roku LT is a basic option with channels only.

APPLE TV: The $99 Apple TV set-top box offers fewer content choices than other video-streaming devices, but if you have a rich collection of TV shows, movies, and music purchased from the iTunes Store, this is the only way to access it. Apple's box can play content directly from iTunes on a Mac or Windows PC on your network (whether you've purchased that content from Apple, ripped it from your own CDs, or bought it from Amazon), or stream Internet purchases directly from Apple. The device also works with AirPlay, Apple's technology for wirelessly streaming content from your computer or iOS device to your HDTV. And it offers access to Netflix, Hulu Plus, several sports subscriptions, YouTube, Flickr, and a few other content sources.
THE HYBRID TiVo is part DVR, part set-top box, but it only makes sense if you're a cable subscriber.

TiVo: The TiVo device is a DVR for your cable channels first and foremost, but newer versions also include apps for streaming Netflix, Hulu Plus, and many other Internet sources. TiVo Premiere, starting at $150, can also access music and pictures from your computer over your local network. You wouldn't buy one just to use for media streaming, but as a combo DVR and set-top box, TiVo is a pretty strong competitor these days. (Keep in mind that you'll need to pay a monthly or one-time subscription fee to get the most from the DVR features.)

IN THE GOOGLEPLEX The Vizio Co-Star is an inexpensive way to get the Google TV interface into your home.
GOOGLE TV: A newer entry into set-top boxes, Google TV hasn't delivered on the hype that first surrounded it (mostly generated by the company itself), but newer versions are showing promise. While it’s not a DVR, you can use it with your cable or satellite TV to combine Web and TV on the same screen. It has more video apps than the Apple TV, though fewer than Roku. Models like Vizio’s $100 Co-Star offer abundant features, including a USB port for external storage and support for 3D. Sony also uses Google TV’s software in its $170 Sony Internet Player.

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<tr>
<th>IF YOU WANT...</th>
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<tr>
<td>Best combination of content options, including streaming video, audio, and games</td>
<td>Roku 3</td>
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<tr>
<td>Close integration with iTunes Store and Apple products such as Macs, iPhones, and iPads</td>
<td>Apple TV</td>
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<tr>
<td>Integrated DVR along with some streaming and on-demand choices</td>
<td>TiVo</td>
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Game Consoles

Get ready for a real game changer—next-generation game consoles are coming. The new consoles should be even more Internet connected and will further blur the lines between gaming systems and set-top boxes.

Today’s game consoles tap into online communities so you can play with people from around the world. Increasingly, you don’t need a DVD to play, either: You can download the games or even stream them. With motion sensors, you can use your body to control the on-screen action.

Most game consoles can act as media centers, too. You can stream Netflix or listen to Pandora, watch movies on disc or in streaming form, and listen to your MP3 files. The new generation extends the experience—Nintendo’s TVii, which comes with the new Wii U system, turns its touchscreen controller into a second screen that shows enhanced content for programs you’re watching and also lets you control a TiVo DVR.

TYPES: Sony, Microsoft, and Nintendo dominate the game console market, but a new open-source challenger is stirring the pot.
SONY PLAYSTATION: The PlayStation 4 is coming for the 2013 holiday season, bringing with it more cloud gaming and other connected features. In the meantime, users have widely lauded Sony’s PlayStation 3 (starting at $270) as the best console for most gamers, thanks to the excellent gaming experience and extensive game collection it offers. It’s also the only console that includes a Blu-ray player, making it a great home theater centerpiece. You can add the $40 Move Motion Controller accessory for motion detection, and the PlayStation Network lets you access an online store and stream Netflix and other entertainment options.
AN OLDIE BUT A GOODIE The Xbox 360 has been around since 2005, but it still keeps many a gamer happy.

MICROSOFT XBOX 360: Microsoft’s Xbox consoles, which start at $200 (or $99 with a two-year subscription to Xbox Gold Live at $15 a month), offer an outstanding online community through Xbox Live. The subscription-based service lets you play with other gamers online and also offers access to streaming content from Netflix and other services. Kinect, Xbox’s $100 motion sensor, which uses cameras and microphones to detect your movements, sets the standard for motion control in gaming. The system also offers the best games for taking advantage of motion control. But the Xbox is starting to look dated compared to the competition—it was released way back in 2005. Expect a new version in late 2013 to go along with Sony’s PlayStation 4.
WII FOR U AND ME Nintendo's Wii and Wii U let you play games and stream content.

NINTENDO WII AND WII U: Nintendo’s Wii brought motion control to the mainstream, but many gamers decried its poor performance. Nintendo launched Wii U in late 2012, which brought more-robust specs and another interaction innovation: Its touchscreen controller not only controls the game but also acts as a second screen. Only a few games take advantage of the controller now, so time will tell if it holds up against the next-generation devices from Sony and Microsoft. Both the $130 Wii and the Wii U (starting at $300) support Netflix, Hulu Plus, Amazon Instant Video, and YouTube streaming.
GAMING CUBED The unusual Ouya is an open-source, fully funded Kickstart project.

OUYA: This open-source console appeals to a different gamer—one who usually plays on a smartphone or tablet. (Ouya is a successful Kickstarter project that has so far shipped only to its initial backers; preorders should be available in early June). The $99 Ouya runs Android and is designed to hook up to a TV. All the games will be free to try. It also functions as a media center, with an option to install open-source media center software XBMC, as well as Internet radio apps from TuneIn and others.

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<th>IF YOU WANT...</th>
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<tr>
<td>An all-around high-quality gaming experience</td>
<td>Sony PlayStation</td>
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<tr>
<td>The best motion-control experience</td>
<td>Xbox 360</td>
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<tr>
<td>A step up from a tablet</td>
<td>Ouya</td>
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Smart TVs

The latest smart TVs promise to make it easier to access all the entertainment the Internet offers.

Smart TVs integrate many of the functions of video-streaming devices; you use apps to stream video from services like Netflix and Hulu Plus directly through the TV. Some sets, like the LG Smart TV with Google TV, literally have the same software as the set-top box inside. Others offer their own interface for apps and content on your local network. Many smart TVs also include games like Angry Birds and Cut the Rope—nothing to satisfy a serious gamer, but enough for casual players.

The latest generation is smart enough to recognize gestures and voice commands so you don't have to rely strictly on the remote. In certain LG models, you can move the remote around like a wand, while Samsung models use a built-in camera to register your movements, in the style of the Xbox Kinect. With voice commands, you can tell the TV to search for shows or change the channel.

To help stave off obsolescence, many models promise to upgrade the unit's software to keep up with new apps and features. This should assuage any fears that your smart TV will soon be dumb.

If you're in the market for a new smart HDTV, keep in mind that the latest display technologies, OLED and Ultra HD, will soon be available for $10,000 or so. In a few more years, those technologies will likely become more affordable.

**TYPES:** Many manufacturers offer HDTVs that connect to the Internet, but only a few offer more advanced interactive features. These models have the best track records in the field.
LOOKING GOOD LG Smart TVs offer a host of Internet-enabled options.

LG SMART TVs: LG’s Smart TV lineup starts at $700 for the entry-level 42-inch model and goes up to a $3500 65-inch set. The units come with LG’s Magic Remote Control, a motion-detecting device that helps you navigate more easily. Some units come with Google TV built in, offering access to its Android apps and additional Web content. LG also recently acquired webOS from Hewlett-Packard and intends to use it in its future smart TV software.
DON'T JUST WATCH Samsung Smart TVs let you browse the Web, watch online videos, and even video-chat using Skype.

SAMSUNG SMART TVs: Starting at $740 for a 32-inch model, Samsung Smart TVs use voice control and a built-in camera for gestures, so you don't need a remote to navigate. The camera also enables it to use face recognition to create a profile for each family member. In addition to the regular suite of apps (Netflix, Hulu Plus, and so on), Samsung offers Skype for video chat.
PICTURE PERFECT *Panasonic sets itself apart with some of the best picture quality in the industry.*

**Panasonic Smart Viera:** Panasonic offers some smart TV features in models as small as 32 inches, but it reserves more-advanced features like voice control for its higher-end units. Many come with a remote that includes a touchpad to aid navigation. We favor the picture quality on the Panasonic Smart Viera HDTVs over that of other HDTVs—a key consideration when you’re talking about TVs, smart or not.

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<th>IF YOU WANT...</th>
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<tr>
<td>Lots of apps, games, and Internet integration</td>
<td>LG Smart TV with Google TV</td>
</tr>
<tr>
<td>Gesture and voice control</td>
<td>Samsung Smart TV</td>
</tr>
<tr>
<td>Great picture quality with access to apps and some interactivity</td>
<td>Panasonic Viera</td>
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Media Center PCs

If you want all your home entertainment options—Blu-ray player, video streaming, digital music, games, and DVR—in one device, a media center PC is your best choice. While you can get many of these options through a game console or a smart TV, a media center PC offers each in its full glory—with no compromises.

The trade-off: You’ll need to work a bit harder to make it happen. It’s difficult to find a complete media center PC you can buy off the shelf; in most cases, you have to piece together the hardware and software yourself.

You start with the computer itself. You want a small, quiet machine, so that it blends in with your living room environs. It should have an HDMI output to connect to your HDTV, and a digital audio output if you intend to connect speakers.

What computing and graphics power you need depends on what you expect to do. Most basic computers can handle video streaming and disc playback, but for intense gaming you’ll need a more robust processor like an Intel Core i7. If you want to use the PC as a DVR, make sure you add a TV tuner accessory to accept a signal from an antenna or your cable or satellite box.

Once you have your hardware, you’ll also want software that makes it easy to access your entertainment options. XBMC, an open-source application available for most operating systems, unites Internet sources with your local files for an integrated experience. Plex, a free option, offers similar features and includes a service for watching content when you’re away from home. (For more on digital entertainment software, see Chapter 4, “Connect Your Devices.”)

TYPES: In many instances, building a media center PC piece by piece—separately purchasing the case, processor, drives, and so forth—gives you the best combination of price and features. But if you prefer a prepackaged approach, you can install XBMC or Plex software on one of the following computers.

MINI ME  Apple’s Mac mini has built-in HDMI output and can access any site on the Web.

APPLE MAC MINI: Apple’s minute machine looks great and is quiet—two important considerations for a device that sits in your living room. Starting at $599, the Mac mini needs some add-ons to make it a full-featured media center PC, such as an optical drive and a TV tuner like Elgato’s $150 EyeTV Hybrid or SiliconDust’s $100 HDHomeRun.
Find Streaming Video Sources

The choices for streaming video are almost endless these days, which is good news for people who want to watch their way.

Forget channel surfing or waiting for Netflix DVDs to arrive in the mail: If you have decent broadband (see “How Do You Get Started?” in Chapter 1, “Set Up Your Home”), scores of streaming media services are eager to supply you with all manner of multimedia on demand.
Choose a Streaming Audio Service

SUBSCRIPTION ADDICTION Subscription music services let you listen to millions of track, on demand, for a modest monthly fee.

You're no doubt aware that you can purchase music directly over the Internet—from Apple's iTunes Store, Amazon MP3, Google Play, and a host of other sites. These are perfectly fine options if you want to own your music. But for those who like to listen to—but not necessary collect—a vast library of music, there's an alternative: music subscription services (not to be confused with the likes of Pandora, which is purely station based and doesn't allow you to choose the specific songs you want to listen to).
Connect Your Devices

JUMP AROUND You can send and control media from device to device with the right combination of hardware—and a little know-how.

It’s the conundrum of digital media: Local movies, music, and photos live on your computer or mobile device, but you want to enjoy them on the big TV in the living room. The solution is sharing technologies for digital media.
Thanks for Reading!

We hope that our Digital Entertainment Superguide has helped you set up your home network, choose the right hardware and software, and pick a streaming music subscription service and video streaming options that fit the way you listen and watch. For even more, check out TechHive.com and the rest of our Superguide program.