

Connected Home Best Practices

Choosing the Right Digital Media Player

There is no single digital media player that is good at everything. Each connected device has its own strengths and weaknesses. Some are much better than others, so make sure to do your homework before purchasing one. This document should help to steer you in the right direction.

1. Try to purchase products that have been DLNA-certified, because they undergo a higher level of testing than other connected devices. You can search for DLNA-certified products [here](#).
2. Not all DLNA-certified devices can be externally controlled using your PC or mobile device. Try to buy products that can accept media that you push or beam from a PC or mobile device, or pull from a media server. You can find a list of devices that meet this requirement [here](#).
3. Try to purchase devices that have both wired and wireless connections. This gives you the flexibility to switch from wireless to wired if you have problems. Make sure your device can support advanced encryption like WPA or WPA2 because it's more secure.
4. Keep current with firmware updates. These updates can fix problems you are experiencing.
5. Before purchasing a game console over a dedicated digital media player, you should be aware of their limitations:
 - You cannot beam media to the Sony PS3 or Nintendo Wii from your PC or mobile device.
 - Xbox 360 can accept pushed media, but only when it's in Media Center Extender mode and you have a Windows 7, Vista or XP Media Center Edition PC running on your network.
 - Game consoles do not support as many formats as other digital media players.
 - Xbox 360 does not display all of the items in the Twonky navigation tree. As a result, you won't see things like By Folder, Artist Index, Artist Album, Genre Index, Genre/Artist or Internet feeds like SHOUTcast, YouTube, Flickr, Picasa Web or PhotoBucket.
6. What to look for in a digital photo player:
 - Ideally, you should have a digital media player that supports photos and video everywhere you have a television. If your TV doesn't do this, try to find a digital media player that has an HDMI output.
 - Make sure your digital media player can automatically scale your photos so they appear full-screen. Not all DLNA-certified TVs or digital media players do this.

- The best photo players have nice transitions in-between photos and let you play music in the background if desired (e.g. Sony PS3, Xbox 360). Xbox 360 has a nice zoom transition effect on photos.
 - At this time, there are no digital media players that can display a continuous slideshow of photos pushed from a PC or mobile device. In most cases, a black or blue screen appears in-between each photo. For this reason, you'll want to pull your photos from a media server and start all slideshows using the remote that came with your digital media player.
 - If you purchase a networked digital photo frame, try to find one that has both wired and wireless support. This will allow you to place it anywhere in your home and easily move it from room to room. Make sure your networked digital photo frame works with media servers like TwonkyServer.
7. What to look for in a digital video player:
- Don't assume that all digital media players can stream true 1080 high definition video. Some cannot do this without stuttering problems (e.g. Apple TV).
 - Do not assume your connected TV can play all media formats. Most DLNA-certified TVs can only play MPEG-2, AVCHD and a few others. Many connected TVs and digital media players can't play 3GP, QuickTime, DivX, MKV and YouTube videos. Devices that play most of these formats include Samsung TVs, Xbox 360 (in Media Center Extender mode), WD TV Live and WD TV Live Hub.
8. What to look for in a digital music player:
- Ideally, you should have a digital media player that supports music everywhere you have a stereo.
 - Don't assume that all digital media players can accept music playlists that are beamed from PCs or mobile devices. Some only allow one song to be sent at a time.
 - Don't assume all connected devices can have their volume changed externally. Most stereo receivers disable this feature (e.g. Denon, Onkyo, etc).
 - Look for audio digital media players that can be grouped -- so you can have the same music playing in different rooms of your home. Examples of players that can do this: Linksys Wireless music players, Linn multi-room music systems, Philips Streamium networked media players, Sonos ZonePlayers, etc.
 - If you subscribe to a music service like Rhapsody, make sure your digital music players work directly with your service, so you don't have to use Rhapsody's PC software. Examples of devices that include Rhapsody support include: Denon AVR receivers, Linksys wireless music players, Philips Streamium NP Series networked media players, Sonos ZonePlayers, etc.

Network-related Tips

1. Wired networking tips:
- Connect your media players to your network using a wired connection whenever you have a choice. Wired networks are easier to setup and capable of much higher

throughput. This means they are less likely to have stuttering problems when streaming high-definition video. They also don't "drop" and have range problems like wireless connections sometimes do.

- Use Cat 5e or Cat 6 network patch cords and cabling if possible. They cost about the same as regular Cat 5 cable and may enable faster data transfer over a Gigabit Ethernet network.
- Do not connect any of your PCs or connected devices to the "Internet" or "Uplink" ports on your router or switch.

2. Wireless-related networking tips:

- If you have problems with wireless devices on your network, consider power-line networking alternatives like HomePlug. It can be more reliable than wireless, but has its own issues with split-phase wiring. If you're using HomePlug, avoid using an AC power strip and plug the unit directly into the wall, since the power strip's surge protection circuit can interfere with the device.
- If you must use wireless, make sure your wireless access point is password-protected and you're using the most advanced security your devices will support (e.g. WPA-PSK or WPA2).

3. Router-related networking tips:

- Having devices connected to both wired and wireless networks at the same time can cause problems. If you can't see your media server or some media players on your network, this could be the cause.
- Allow your router or switch to use DHCP; it makes setup easier. Don't use fancy network setups with multiple subnets and hubs. Doing so can introduce latencies that cause problems with DLNA.
- If you want to be able to stream multiple high-def videos at once, make sure there are no 10Mbps routers or switches on your LAN. Use 1000Mbps Gigabit Ethernet switches instead. They are now surprisingly affordable.
- If you want to access your media remotely, consider buying a router that supports UPnP configuration.
- Some routers and switches work better than others for media streaming. Problems with media playback stopping or stuttering sometimes go away when a new router or switch is used.

Media Server & Storage Suggestions

1. If possible, you should store your media on a low-power, always-on device like a network-attached storage device (NAS) with an embedded media server (e.g. Buffalo, QNAP, Thecus, WD, etc.).
2. Avoid using media servers like Windows Media Player 11, iTunes or Rhapsody. Make sure your media server is a DLNA 1.5-certified reference server like TwonkyServer. It is faster, more reliable and supports more formats and devices than other media servers.

3. If you're using a Mac or PC as a media server, make sure your virus scanner is not a CPU hog. This can cause problems like skipping during playback of high-definition video.
4. Avoid running a software firewall like ZoneAlarm, unless you understand how to configure it so it won't cause problems.
5. Avoid storing media on a network share. It's better to share content from a hard drive in the same device where the media server resides. Network shares increase the traffic on your network and can be unreliable when they are not always online.
6. Be careful which folder you select as your watched folder. Do *not* select a folder the operating system constantly updates, like a Temp folder, bit-torrent download folder, or the Windows System folder. A watched folder with lots of changes can slow down your media server.

Media-related Tips

1. Perform regular backups of all of your media or make sure it's copied to another hard drive.
2. Avoid buying copy-protected media when the same content exists in a legal, unprotected form. Unprotected media is superior, because any device can play it and you'll never have to worry about losing your licenses.
3. As you create your digital media library, try to use the formats that are supported by all DLNA-certified devices. This includes JPEG photos, LPCM audio and MPEG-2 video. MP3 audio, WMV video and MPEG4 video are not guaranteed to work, but are supported by most DLNA-certified devices as well.
4. When ripping your CDs, choose high-bit rate MP3 or LPCM (WAV) over AAC and FLAC, because not every device can play AAC or FLAC files. If you must use lossless audio, consider LPCM, because almost every device supports it.
5. It is essential that all of your music files have accurate ID3 tags, because your media server uses these tags to create its navigation trees. If any of your music files are missing artist, genre or album tags, those artists/genres/albums won't appear in the navigation tree. You can still access this media from the song list, but it's more time consuming.

Tip: Software is available, like "Tag & Rename," which can use your music file names to add ID3 tags for you.

6. Avoid entering or editing metadata using media management software like iTunes or Windows Media Player. Some of these programs only add the metadata and album art to their local database and not the file itself. It's much better to enter metadata directly into an ID3 or EXIF tag, so it can be imported by software on any Mac or PC.
7. Although it is not essential, it's a good idea to create separate folders for each artist in your music library. Each artist folder should have separate folders for each album. Each album folder should contain a JPEG file for the album cover. Normally this file is called "folder.jpg". Your media server will use this file to display album art. You can also embed album art in each music file in the ID3 tag.

8. It's a good idea to create separate folders for each year in your My Photos folder. Inside each year folder, you should have subfolders for different photo albums (e.g. Hawaii Trip). Your media server will use these folders to make it easier to locate your photos.
9. It's also a good idea to use software like Windows Live Photo Gallery to add tags to your photos. Although it's time consuming, you should try to rename your individual photos from their camera issued names (e.g. DSC04945).
10. Pre-rotate your pictures before you copy them to your shared folder. The easiest way to do this is to view them by thumbnails and right-click on the photos that need to be rotated.

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