A We Got Served Step by Step Guide

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Building a Windows Home Theatre PC

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About the Author

Terry Walsh is the Owner and Editor of We Got Served (http://www.wegotserved.com), which he established in 2007 to share his own experiences with emerging Home Server platforms.

Since then, the site has grown to cover a wide range of digital home, consumer electronics, and small business product categories but retains at its core the mission to help users make the most of technology.

Terry graduated from the University of Durham in 1995 with a Bachelor of Arts in English Language and Literature and currently works in the telecommunications industry, writing about technology in his spare time. Prior to starting WGS, Terry cut his teeth online in 1993 building and operating a number of successful alternative music websites and communities for UK artists.

Born and raised in Liverpool, England and now living in Silverstone with his wife and two sons, Terry has been awarded Microsoft's Most Valuable Professional Award each year since 2008 for his work on We Got Served.

Prior to writing *Building a Windows Home Theatre PC*, Terry has authored a number of Mac and Windows home server guides, including *Windows Home Server 2011 Step by Step*, *Using OS X Lion Server at Home*, *Using OS X Mountain Lion Server at Home*, *Using OS X Mavericks Server at Home*,*25 Essential Windows Home Server Projects* and *Building a Windows 8 Home Server.* He has also edited a number of titles, including *Using Windows Home Server*, *25 Essential Windows Home Server Projects Volume 2* and *15 Essential Windows 8 Projects.*

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About We Got Served

We Got Served (http://www.wegotserved.com) is a popular technology news and community site which was founded in February 2007. It is written, edited and moderated by a dedicated and knowledgeable team of technology enthusiasts across the world who are focused on bringing you the latest news, reviews, tutorials and support for the products you're using today and tomorrow.

We created We Got Served as a place to learn about new technology, help readers make the most of the products and services they use, and most importantly to create a community where readers can learn, discuss and share their experiences and knowledge with others in need of support. However you use the site, I hope you enjoy it.

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Building a Windows Home Theatre PC

A We Got Served "Step by Step" Guide

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Building a Windows Home Theatre PC

Introduction

In today's modern world, with seemingly every device shipping with an Ethernet socket or Wi-Fi connectivity – including fridges and washing machines – you may well question the need for a Home Theatre PC (HTPC) in the connected home.

If you have a modern TV, a connected Blu-ray player or a games console such as the Xbox 360 or Xbox One then those devices include powerful media capabilities, including the ability to stream music, video and photos from local computers and Network Attached Storage devices or cloud-based services such as Netflix and BBC iPlayer.

However, as fixed consumer electronics devices, you have limited opportunities to customise and tailor those offerings to your needs, your family's needs and the needs of your home. Depending on your choice, you get these services, miss out on those services and are reliant on a benevolent manufacturer to continue adding new apps and maintaining existing apps.

Of course, as the manufacturer, if you're going to invest in R&D then you're more likely to include those new services on the latest and greatest models rather than service those customers who have already handed over their hard-earned cash. But for those seeking an easy, convenient media solution, it's hard to beat a modern Connected TV & Blu-ray player.

But building, configuring and managing a Home Theatre PC isn't as tricky as it once was – especially once you've made the choice of hardware and software platforms. There are a plethora of options available to users on both sides, and they no longer have to break the bank – small footprint, powerful and silent hardware running slick, easy to manage media center software is not a dream. It's available for you today. Right now.

It's a far cry from the past. Wind the clock back ten years and I was running a very early beta version of Microsoft's Windows XP Media Center on a custom-built *beast* of a PC. Fans so large they drowned out dialogue, TV tuners with drivers that were flakier than Grandma's pastry, separate MPEG decoders to play DVDs – once you'd found a sufficiently powerful graphics card and processor combination to muster an (blurry) image on your TV – these were the days before high definition

signals and HDMI connections.

A Silverstone 2007-era HTPC case. It has "heft".

Thankfully, all a distant memory. As we'll see during the course of our time together, today's modern HTPCs are strong, silent and small – fitting neatly into your AV cabinet alongside your other components. HD-capable, Dolby-decoding, silent-running and highly-customisable to your needs.

Intel's latest NUC (Next Unit of Computing) offers greater power in a tiny footprint

In this guide, we'll walk through the building, installation and configuration of a modern HTPC, step by step. In writing this guide, I'm assuming the you, the reader, have some interest in building a HTPC for your own connected home – perhaps you've already conducted some research and are looking for an easy to follow installation guide. You may have already purchased some components, or you're right at the beginning of your own HTPC project. Whatever your needs, we'll step carefully

through your options and the build itself, showing you what to buy and how it all fits together.

Of course, as I mentioned earlier, there is a plethora of options available for building an HTPC and clearly we can't cover it all. For expediency's sake, I've pulled together a strong "mid-range" solution for the build, which is very easy to put together – whether you choose to follow my selection in detail, or simply use the guide as stimulus for your own selection, my goal is to help you see how simple it can be to build and install a HTPC today in 2014 and give you the confidence to try it out for yourself.

With that said, let's get going.

Chapter 1

Consider the Environment

Chapter 1: Consider the Evironment

Of course, whilst we're all concerned about the future of the planet, the call to action above is less focused on what's happening outside your home and much more interested in what's going on inside.

We're going to start our HTPC project with a simple rule. Before you consider what hardware you're going to select for your Home Theatre PC, make sure you spend some time thinking about where it's going to be positioned in your home, what devices need to work with it and most importantly what you want to do with it.

I know it's fun to dive into cases and specs, but the answers to the questions above will help you narrow down your choice of hardware from the thousands of combinations available. Importantly, you will also be clear as to whether you can slot your HTPC straight into your existing AV cabinet and hook it up, or whether you're going to need a little device and/or network surgery to integrate the solution into your connected home.

Let's talk through those questions. I'll illustrate your considerations by discussing how I'm going to integrate the HTPC in my own home.

What Do You Want to Do With a HTPC and Why?

Let's start with a fundamental question. Sure, you may like the idea of a Home Theatre PC but the clearer you are up front with what you want to get out of such a solution, the easier your hardware selection will be. And, most likely, the cheaper it'll be as you'll get your configuration right first time – for today and for the future!

Today's HTPC offers huge flexibility for media consumption but, depending on your local circumstances and home configuration, you may not want to take advantage of every feature on offer.

I'm going to assume you've already worked out the potential of streaming video – whether that's

your own video (ripped DVDs, Blu-rays and home video captured on smartphones and cameras) or video streamed from online entertainment services. But what about Live TV? Do you want to use your HTPC as a digital video recorder, with the ability to capture and playback TV programmes? How will you schedule recordings and capture those TV programmes? What do you need to do to ensure you can take advantage of high definition video streaming and surround sound playback?

What about audio streaming? Do you have a music library you'd like to play via your home cinema system? Will your HTPC replace your old hi-fi and if so, what software are you going to use to manage playback? Are you locked into iTunes or another music ecosystem and if so, will that work okay on an HTPC?

Photos too offer great opportunities for the HTPC – do you want to be able to playback slideshows from specific photo folders on the network? Or perhaps push individual photos from your smartphone/tablet?

All of this is possible, and more but each decision impacts your list of HTPC requirements – specifically with regard to your hardware and software selection. Before you get started, grab a pen (or I don't know, **Evernote** for you digital gurus out there) and simply list out:

- The Must Haves (what features your HTPC simply must deliver)
- The Nice to Haves
- The Must Nots (flipping the Must Have question around, is there anything that your HTPC must not do?)

Remember, your choices may not just impact *you*. View the questions above in the shoes of everyone using the HTPC – for the kids, how easy must it be to use and as a parent, what do you need in terms of parental controls? What about when grandma and the babysitter comes around and needs to switch on the TV?

Of course, it's not just about features. The now-famous **SAF** (*Spousal Acceptance Factor*) is going to be a critical issue to think through – will you have any requirements on how your HTPC needs to look, in terms of size and finishes? What about connectivity? Are you free to run cables everywhere, or will you need to investigate cable management options – or Wi-Fi solutions.

Planning your HTPC must start with a consideration of needs – what you're doing today, what you want to change, and importantly a view of what you may need tomorrow and beyond. Make that list now and we'll move on to other considerations.

Positioning Your HTPC

I'm sure you already have an idea where you are going to place your HTPC – that is, what room you wish to view the output from the HTPC. Whether it's the big screen in the lounge for family viewing, a Bedroom TV for you or the kids, or elsewhere in the home, this is the first question that needs to be addressed.

Of course, you don't necessarily need to place the HTPC in the same room as the screen on which its output will be displayed. There are advanced AV distribution solutions out there that can push HDMI video and audio right around the home – but they're a little out of scope for this book.

I'm working on the basis that you, like me, will want to position your HTPC in the same room as the TV it will be connected to – most likely housed in some kind of AV cabinet with a number of other devices. In my case, we'll be connecting the HTPC to the big screen in the lounge (a Samsung 46" ES8000, LED TV if you're interested).

Here's my TV and AV cabinet in the lounge – this is where we'll be installing the HTPC.

Once you have an idea of positioning, that will provide your first set of HTPC requirements - most notably on case size. You will need to ensure that the HTPC is small enough to fit into the cabinet or on a

shelf amongst your other AV devices without creating too much mess. After all, once you have your project finished, you don't want to be distracted from the TV by the chaos of an unruly AV cabinet, do you?

The good news is that you'll find a host of HTPC cases on the market today of all shapes and sizes – standard AV cases which resemble a Blu-ray player or AV receiver, cubes, mini-towers and so on. Grab your tape measure and figure out what kind of case size would work best in the cabinet or on the shelf on which you're going to place the computer.

It's important too to think about ventilation – whilst the heat output of HTPCs has reduced dramatically (and I mean dramatically) over the last few years – particularly this year with Intel's 4th generation "Haswell" processors – it's still wise to ensure that there's space around your HTPC for any heat generated to escape. If your AV cabinet has a closing door, then bear in mind that you may need some additional ventilation options from the rear of the cabinet, or base. As mentioned, heat is far less of an issue today than it ever used to be, but if you're placing the HTPC in a hot room, then give it the best chance of doing a great job for you.

From tablets to desktop's, Intel's fourth generation Core processor family delivers fabulous performance with a very lower power and thermal footprint.

Here at home, I'm fortunate enough to have an AV cabinet tucked underneath the TV which (just about) has space to fit a small footprint HTPC. – especially as we'll be able to replace a large-ish Samsung Blu-ray player with smaller hardware. We may need to move some kit around to get the neatest fit, but there should be plenty of ventilation available to keep everything cool.

My AV cabinet with a typical array of devices – satellite box, AV receiver, Blu-ray player, games console, audio streamer. I have my eye on the bottom left slot for my HTPC, currently occupied by a Samsung Blu-ray player.

Finally, the positioning of your HTPC will also provide some clues for you on cabling – not necessarily what cables you need (we'll get there soon), but rather on cable length. You'll need power, data and AV cables to stretch between your HTPC and the various additional components that make up your audio-video ecosystem at home. As long as your components aren't miles away from each other, you should have no worries with connectivity but start thinking now about how you want to manage all of those additional cables without leaving an unsightly mess.

For my project, as the HTPC will be positioned in the AV cabinet which already has power and data connections, cabling should be straightforward – we'll still need some cable ties to keep everything tidy though!

Your Device Ecosystem

It would be a rare thing indeed if your HTPC was going to be the only device sitting in your TV cabinet. As you can see in the picture above, my AV cabinet is packed with other devices, and I – like you – need to consider which ones need to integrate with my HTPC.

There are a few categories of device you should consider up front when planning your HTPC:

TV & AV Receivers

Of course, the HTPC will need to be able to send images and audio to the TV, and a direct connection (best via a HDMI cable) would suffice. But, as I use an AV receiver as the hub for all of my lounge audio and video, I'll need to connect the HTPC to that device (again, via HDMI) which is already connected to the TV.

As I'm connecting to an AV receiver, which supports all manner of surround sound standards and pushes audio to my speakers and subwoofer, we'll need to ensure our HTPC can output those same surround sound audio standards (generally DTS and Dolby Digital) for our movies. Of course, we mustn't forget high definition (1080p) video output (4K video support would also be a great option for those looking for future-proofing) to ensure our movies look and sound their best.

If you're using an AV receiver like me (my Yamaha RXV-675 is highly recommended, by the way) then you'll need to ensure that you have a free HDMI input available for use by the HTPC. If you're going direct to the TV and/or a soundbar, the same rule applies – if you're struggling for spare ports, then HDMI switchers are available on the market that will let you use multiple devices on a single HDMI port.

AV Receivers such as this Yamaha RVX-675 aren't pretty but they deliver fabulous sound and make switching between AV devices far easier.

TV Tuners

One of the big decisions you'll need to make regarding your HTPC is whether you wish to route all of your viewing through the computer – that is, viewing Live TV from over the air (OTA), cable or satellite sources as well as streaming music, video and photos from PCs and NAS devices located elsewhere on your network.

The purist will, of course, be seeking a "one-box" solution and if you're happy to manage a little complexity and (still, in 2014) some technical glitches, that's eminently possible with the right hardware and software. Or, you may just want a box to play ripped and downloaded music and video, plus the usual cloud entertainment services.

Either option is fine for a HTPC, but depending on your needs (see below) your hardware requirements will differ. If you want Live TV on the HTPC, you'll need to look at Cable/Satellite/Over the Air (OTA) TV Tuner devices (integrated PCI cards are available that will fit into a (larger) HTPC case or take advantage of USB and network tuners for a neater solution).