



# Stratodesk Raspberry Pi Thin Clients

Stratodesk Whitepaper

In recent years, the Raspberry Pi has garnered attention for its ability to solve many use cases.



The question was inevitably raised – is the Raspberry Pi a viable platform for high performing Thin Clients? Significant obstacles, however, existed between the popular and cost effective motherboard and its entrance into the enterprise market. It was said that the Raspberry Pi is not powerful enough for the enterprise – that no management solution with enterprise features exists for the Pi, especially not one able to incorporate various x86 and Raspberry Pi devices in the same environment. The list goes on – all suggesting that the Raspberry Pi is far too limited to be a viable alternative to x86 Thin Clients.

Over the past few years, the Raspberry Pi Thin Client has evolved into a viable, enterprise grade endpoint alternative or complement to traditional Thin Clients. Thanks in part to advances made by Stratodesk's team, today enterprises have a real, mature solution that allows them to scale their VDI network by thousands of devices at a fraction of the cost of investing in an entirely new network of traditional Thin Clients.

**The Raspberry Pi Thin Client** is already productized by several leading hardware brands including **ViewSonic** and **NComputing**, and it is even available with exclusive Citrix features, like **Citrix Casting**, on the Citrix Ready workspace hub. One of the advantages of purchasing a fully assembled Raspberry Pi Thin Client is that you get all of the features you require to connect to your enterprise VDI and to start being productive right out of the box including 2 HD displays, Skype for Business, H.264 decoder, connections to major environments and more.

Lastly, with the advent of the Raspberry Pi 4, the Raspberry Pi Thin Client is a more viable alternative than ever to traditional x86 Thin Clients.

This article seeks to explore the many challenges facing the notion of Raspberry Pi based Thin Clients, how Stratodesk solves these challenges, how Raspberry Pi Thin Clients compare with x86 Thin Clients, and how Stratodesk software allows you to leverage both to unlock the full effect of your VDI, DaaS and IoT endpoint network.

# Challenges Facing Raspberry Pi Thin Clients

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## Raspberry Pis Are Not Enterprise Grade

In the past Raspberry Pi devices, though handy for many novel use cases, are simply not powerful enough, versatile enough, or complete with the very basic necessities that enterprises need in order to be viable in production environments. In order to be an enterprise grade endpoint, a Thin Client must be light enough to not pose a security risk. But they still must be fast enough to provide a PC equivalent user experience. They must also be able to support dual view. The Raspberry Pi has not met these needs in the past.

## Raspberry Pis Cannot Be Managed Effectively

No VDI endpoint management software exists for Raspberry Pis. System administrators face significant obstacles in managing and maintaining their endpoints – they don't have the skills, the time or the resources needed to do this for a mixed environment of not only x86 but also Raspberry Pi based devices. Not to mention their peripherals and monitoring their performance.

## A Thin Client OS

Lastly, Thin Clients need an OS powerful enough to connect to major VDIs, but also low footprint enough to run on a Thin Client, and fight against third party applications and security threats. Preferably, the Thin Client OS must be able to connect to a central management solution, and be ready directly out of the box and installed with next to zero IT involvement.



# How Stratodesk Software Solves Major Challenges Facing Raspberry Pi Thin Clients

## Stratodesk Delivers an Enterprise Grade Thin Client

Stratodesk software proves the use case for the Raspberry Pi Thin Client by delivering an enterprise grade Raspberry Pi based Thin Client capable of Skype for Business, H.264, and even dual view. With Stratodesk software, the Raspberry Pi is both powerful enough for enterprise grade use cases while delivering a PC equivalent user experience at the same time. Lastly, because Stratodesk NoTouch OS is Linux based, it is secure against common security threats that target endpoints, making it ideal for the enterprise.

With the new Raspberry Pi 4 motherboard, enterprises have access to a lightning fast Raspberry Pi device that is also natively capable of multi-monitoring/dualview. But even before this new and advanced device was announced, Stratodesk also enabled enterprises to leverage dual view with the versatile Pi 0 based device called the Secondary Display Adapter, available from ViewSonic and NComputing.

## Stratodesk software can manage both x86 and Raspberry Pis together

Truly cutting edge: Stratodesk software is the only solution on the market able to manage both x86 and Raspberry Pi devices together harmoniously in the same environment. This means that enterprises have unparalleled agility in managing a next generation network comprised of as many Pis and traditional Thin Clients as they want or need.

All of NoTouch Center's most advanced capabilities work fluidly with Raspberry Pis including: inheritance of settings, real time tactical overview, asset tracking and beyond.

## Stratodesk Raspberry Pi Thin Client OS – Ready Out of the Box

Last but certainly not least, Stratodesk software comes preinstalled on the Raspberry Pi, and is easily deployed onto Raspberry Pi devices, entirely ready out of the box. With one simple firewall rule, end users can be connected to the corporate network securely without any heavy lifting done by IT staff. Working from home and managing IT assets across multiple sites has never been easier.

# Summary of Benefits: Stratodesk Raspberry Pi Thin Clients

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**We've shown how Stratodesk software does the impossible by enabling Raspberry Pi Thin Clients to perform at enterprise production level. But what exactly are the benefits of using Raspberry Pi Thin Clients in conjunction with Stratodesk software? These benefits include:**

- **Cost Reduction**
- **PC Equivalent Performance**
- **Heightened Security**
- **Enabling Remote Work**

## **The Raspberry Pi Thin Client Slashes Prices**

From 1000 to 100 dollars PC to Raspberry Pi Thin Client, it's easy to see why enterprises and IT leaders are excited by the next generation endpoint device. By providing the same performance level as PCs, the Raspberry Pi Thin Client effectively overhauls the industry standard, disrupting and innovating in the wake of now comparably overpriced and outdated machines. A fully functioning Raspberry Pi Thin Client can be purchased from hardware manufacturers with Stratodesk software already installed and shipped ready directly out of the box for just a little over \$100.

## **Fully Secure**

The Raspberry Pi is itself a very secure hardware device. That coupled with Stratodesk software makes the Pi impervious to common security threats and exploits that are likely to target endpoints. The zero attack surface OS is trusted by thousands of customers and leading companies to protect and stand up to even the most hardened security standards.

## **Better Management**

As mentioned above, when customers buy Raspberry Pi Thin Clients with Stratodesk software, they are buying a ready out of the box solution for their end users. Remote workers can connect from virtually anywhere without any help from their IT department. This saves additional time and money by eliminating countless IT hour excess and headache.

Superior management is also an advantage here. Stratodesk software enables complete control over both x86 Thin Clients and Raspberry Pis.

# How the Raspberry Pi 4 Revolutionizes the Pi Platform

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With next generation capabilities including native dual screen, 4k support, USB 3.0, enriched CPU and GPU, and up to 4 GB RAM, the Raspberry Pi 4 further establishes the Citrix Ready workspace hub as a viable alternative to x86 Thin Clients.

The long anticipated release of the Raspberry Pi 4 also has a significant impact on the Raspberry Pi Thin Client. In fact, it isn't an overstatement to say that the release of the Pi 4 marks a turning point in the evolution of the Raspberry Pi Thin Client. No longer will users need to bother with additional hardware in order to enable dual view on the Raspberry Pi. The low cost endpoint is now a more viable alternative to traditional x86 Thin Clients than ever, thanks to the Raspberry Pi 4's incredible speed and enhanced native capabilities.

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## Raspberry Pi 4 Specifics

The Raspberry Pi 4 marks a landmark achievement and advancement in technology. It has made the great jump to an impressive new 4 GB of fast memory while also adding support for 4k displays. Additionally, it supports gigabit ethernet, boasts an increase in processor speed to 1.5HG, and includes a USB 3.0.

The base Raspberry Pi 4 Model B is still available for \$35 with 1GB LPDDR4 memory, but for the first time on a Raspberry Pi, users can pay a little extra in order to unlock additional memory options. 2GB of memory is available for \$45 while a board with 4GB memory is available for \$55.

Lastly, and also for the first time ever, the Raspberry Pi 4 brings native dual screen monitoring to the Raspberry Pi platform. If the rest of these updates have not already caused the traditional x86 Thin Client market to feel the shockwave of the Raspberry Pi, this latest installment in its history of technological breakthroughs will surely cause the entire industry to tremble.

No longer will it be necessary to use additional hardware to enable something so common for enterprise use cases as multi monitoring. Raspberry Pi Thin Clients like the Citrix Ready workspace hub will simply have dual view capabilities ready directly out of the box.

## What the Raspberry Pi 4 Means for the Thin Client Market

Today, organizations are successfully deploying the Raspberry Pi Thin Clients in production environments and reaping its many rewards. These include significantly reduced endpoint procurement costs and streamlined endpoint management that reduces the average PC endpoint/refresh time from 4 business weeks to just 4 days.

Though the Raspberry Pi Thin Client is already considered a serious competitor to traditional x86 Thin Clients, the new Raspberry Pi 4 will certainly impact its future. Quite simply, the Raspberry Pi 4 will solidify the Raspberry Pi Thin Client's reputation as a fully enterprise ready alternative to traditional x86 Thin Clients.

# Raspberry Pi vs x86 Thin Clients – a Comparison

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**“It is estimated that organizations spend upwards of 1,000 hours a week on detecting and containing insecure endpoints. In order to effectively scale their VDI, organizations must educate themselves on the many options, challenges, and benefits they are likely to face before diving into virtualization.”**

– “The Cost of Insecure Endpoints,” a study commissioned by Absolute and conducted by the Ponemon Institute.

Saving on costs is important when it comes to making the shift to VDI. For this reason, many companies choose Thin Clients as their preferred way to get the most return on investment – delivering cutting edge hardware that performs as well as Desktop PCs at a reduced price.

However, in a world of increasing hardware prices and in scenarios where sometimes as many as thousands of devices must be added at a time, small differences in the price of individual Thin Clients can make a huge difference to an overall investment.

## **Traditional x86 vs Raspberry Pi Thin Clients – Both Are Viable**

Over the past few years, the Raspberry Pi Thin Client has evolved into a viable, enterprise grade endpoint alternative or complement to traditional Thin Clients. Today enterprises have a real, mature solution to allow them to potentially scale their VDI network by thousands of devices at a fraction of the cost of investing in an entire, new network of traditional Thin Clients.

**The Raspberry Pi Thin Client** is already productized by several leading hardware brands including **ViewSonic** and **NComputing**, and it is even available with exclusive Citrix features, like **Citrix Casting**, on the Citrix Ready workspace hub.

One of the advantages of purchasing a fully assembled Raspberry Pi Thin Client is that you get all of the features you require to connect to your enterprise VDI and to start being productive right out of the box including 2 HD displays, Skype for Business, H.264 decoder, connections to major environments and more.



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## What if I Want to Customize and Build My Own Raspberry Pi Thin Client?

There are situations where customers want to create their own, enterprise grade Raspberry Pi endpoints from scratch. The reason for this varies case-by-case, ranging from branding purposes to solving specific and unique challenges (for example IoT or some healthcare use cases). For companies who want to create their own Raspberry Pi Thin Client, Stratodesk can power such devices similarly to how it would x86 Thin Clients. Simply deploy NoTouch onto your device and benefit from enterprise grade NoTouch features. Additionally, Raspberry Pis powered by NoTouch work seamlessly with Node-RED and Azure IoT to solve innovative, enterprise IoT challenges.

## When Should You Consider Traditional Thin Clients?

Traditional Thin Clients are the proven standard for end user computing. In situations where more powerful hardware is necessary, it might be the right choice for you to invest in a traditional Thin Client. The impact of purchasing pricier devices might also be felt less if you are only purchasing a few Thin Clients, as opposed to purchasing thousands.

In scenarios where the use case requires extraordinary amounts of processing power, NoTouch is able to run on the most cutting edge and powerful x86 Thin Client device out there. These outlying circumstances might be, for example, running specific, specialized software, or to power more than two HD displays. In such scenarios, NoTouch on x86 Thin Clients will certainly suffice. If you already have existing devices to use, NoTouch is capable of repurposing x86 Thin Clients, laptops and PCs and managing them in the same environment as Raspberry Pi Thin Clients.

# Stratodesk NoTouch Raspberry Pi Thin Clients

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**Stratodesk NoTouch software** is the perfect solution for the common problem of scaling endpoints. NoTouch can run on any x86 device, and is able to incorporate both x86 and Raspberry based devices into your VDI environment – fluidly managing them as one collective whole.

A combination of Stratodesk software with low cost Raspberry Pi hardware is what makes this enterprise grade endpoint a possibility, and available at a fraction of the cost of a traditional Thin Clients. This means that with NoTouch, you have access to unlimited saving potential and flexibility options to scale your VDI.

Whether you are going for affordability or powerful hardware, or a little bit of both, NoTouch unlocks the full benefit of secure, flexible virtual desktop and end user computing without compromises.

# In Summation

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As this paper has shown, the Raspberry Pi Thin Client is a truly progressive endpoint capable of solving both advanced and everyday IoT use cases. Stratodesk software and new innovations to the Raspberry Pi platform have further solidified the Raspberry Pi Thin Client as a fully viable option for production environments.

For scenarios where traditional Thin Clients are preferred, Stratodesk also runs on the most powerful, cutting edge x86 Thin Clients, and can manage both in the same environment.

Raspberry Pi Thin Clients like the Citrix Ready workspace hub can be delivered directly to end users, booted and connected to the corporate network with next to no IT involvement. The Citrix Ready workspace hub, powered by NoTouch OS, is available from NComputing and ViewSonic for Citrix customers and comes with advanced, next generation features exclusive to the workspace hub, including Citrix Casting.

Ultimately, the Raspberry Pi Thin Client unlocks significant benefits for enterprises and indeed businesses and organizations of all sizes across multiple industries by providing a low cost and high powered alternative to any device on the market.

# About Stratodesk

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Stratodesk is the world's leading endpoint OS and management solution. It is used by government and healthcare organizations, banks, SMBs and large enterprises to eliminate cost and scalability obstacles facing their complex network of devices. By delivering the only management software for mixed environments of x86, ARM and Raspberry Pi devices, Stratodesk is reinventing endpoint computing for enterprise IoT and VDI. Our cutting edge, linux-based solution, NoTouch, is hardware-agnostic and runs on the Raspberry Pi.

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