

# Hardware

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# Dell PowerEdge R640

# R640 (1U) - Specs

I purchased this server from PC Server & Parts via Ebay.com, a reputed and certified seller of refurbished enterprise gear and hardware. Dell PowerEdge servers are extremely configurable, which can make it difficult to select the "right" server to purchase. Some factors I considered when purchasing were:

- Power Consumption
- Processors
- Noise level
- RAM & Storage capacity
- iDRAC license

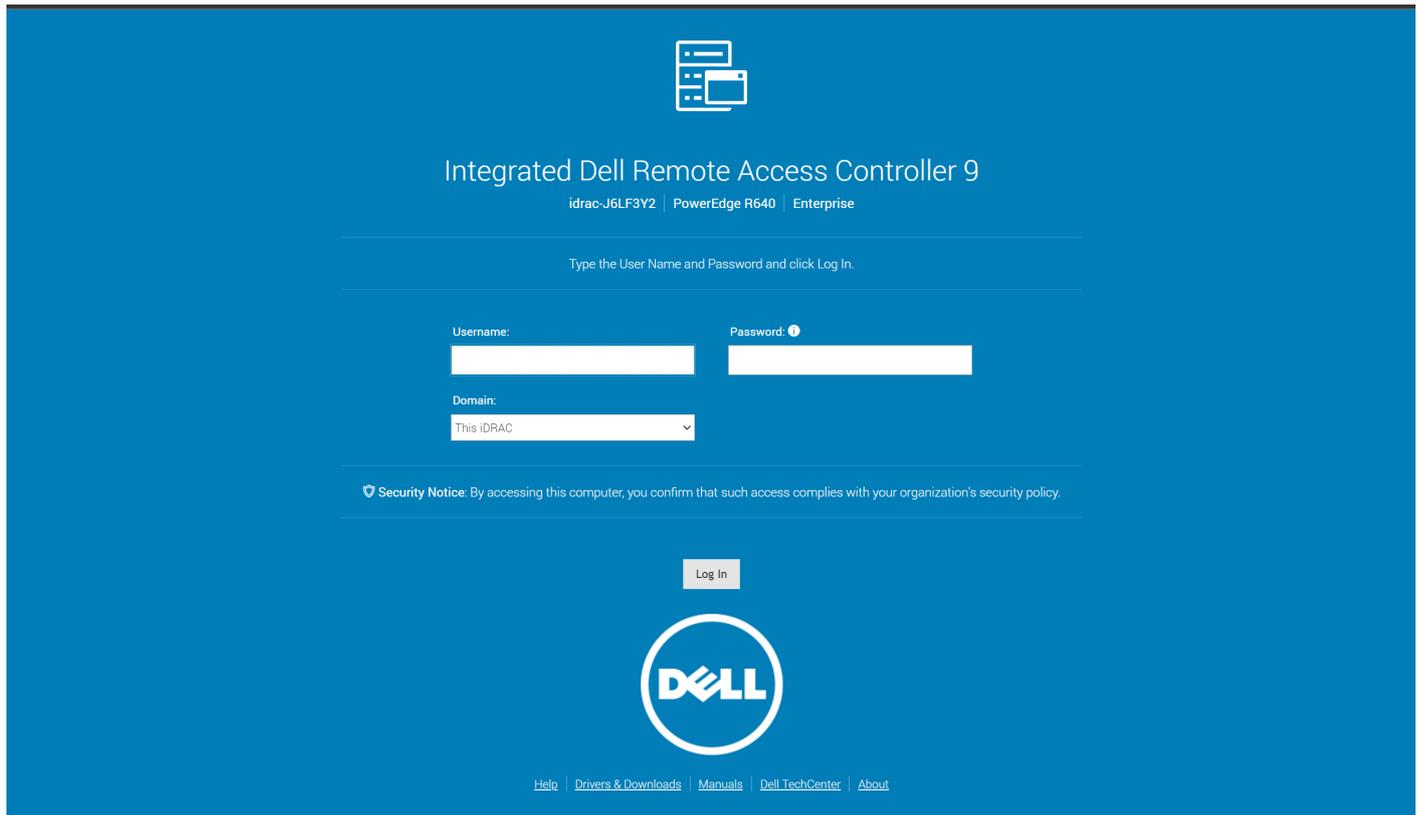
I was able to get lucky and find a server for a decent price point that comes with a 1 year warranty. The specs are as follows (yes, most would consider it overkill, but to me, the more the better...)

<b>Form Factor</b>	1U
<b>Processors</b>	2x Intel Xeon Gold 6148 @ 2.40GHz
<b>Cores</b>	40 Cores (20 each)
<b>Memory (RAM)</b>	DDR4 - 128 GB
<b>Storage</b>	8x 2.5 Drive Bay Capacity (I currently have 4x 1TB SATA SSDs)
<b>Power Supply</b>	Redundant PSU (2 PSUs - 750W)
<b>RAID Controller</b>	Dell H730P
<b>Network Interface</b>	Intel I350 - 4x 1GbE RJ45 ports
<b>iDRAC</b>	Enterprise License

These are some of the important specs of my R640 that I paid closest attention to. The chassis & motherboard also allow for future scalability, so I hopefully shouldn't have to worry about another server for 5-6 years.

# iDRAC9 Enterprise

iDRAC9 is Dell's version of remotely accessing and controlling the server. This was probably one of the most important parts of my homelab, as it lets me configure, power on and off, and control the server from anywhere in the house or via my VPN connection



The dashboard below will showcase all the options for configuration. There is also a virtual console which allows you to even access system BIOS and the Lifecycle Controller.

# Dashboard

[Graceful Shutdown](#) [LED Off](#) [More Actions](#)

[Refresh](#)

## Health Information

**SYSTEM IS HEALTHY**

**System Health**

✔ **Healthy** [Details](#)



**Storage Health**

✔ **Healthy** [Details](#)



## System Information

Power State	On
Model	PowerEdge R640
Host Name	
Operating System	
Operating System Version	
Service Tag	J6LF3Y2
BIOS Version	2.20.1
iDRAC Firmware Version	6.10.80.00
IP Address	192.168.1.200
iDRAC MAC Address	f4:02:70:a2:5e:1e
License	<span style="color: green;">✔</span> Enterprise <a href="#">Edit</a>

## Task Summary

[View All Jobs](#)

**Pending Jobs : 0**

No Pending Jobs

**In-Progress Jobs : 0**

No In-Progress Jobs

**Completed Jobs : 9**

0 with Errors  
1 Failed

## Recent Logs

[view all](#)

Severity	Description	Date and Time
<span style="color: green;">✔</span>	The chassis is closed while the power is off.	Tue Mar 12 2024 16:04:12
<span style="color: red;">✘</span>	The chassis is open while the power is off.	Tue Mar 12 2024 16:04:07
<span style="color: green;">✔</span>	The chassis is closed while the power is off.	Fri Mar 08 2024 09:32:43
<span style="color: red;">✘</span>	The chassis is open while the power is off.	Fri Mar 08 2024 09:32:38
<span style="color: green;">✔</span>	Log cleared.	Tue Mar 05 2024 08:02:54

## Virtual Console

[Settings](#)



Dell PowerEdge R640

# OEM Docs

- [Getting Started.pdf](#)
- [BIOS and UEFI Reference Guide.pdf](#)
- [Dell Systems Management Overview Guide.pdf](#)

# Dell OptiPlex 7050 SFF

Dell OptiPlex 7050 SFF

# Specs

I purchased this Dell OptiPlex 7050 via Ebay for around \$60.00. It is a small form factor (SFF) desktop, with additional PCIe expansion slots, which made it a suitable alternative to other dedicated hardware these days for firewall appliances. The desktop specs were as follows:

- Processor - Intel Core i5-7600T 3.50GHz
- 8 Gb DDR4 Ram
- 500 Gb SSD
- Intel HD Graphics 630

The small form factor version of this desktop came with:

- 2x VGA ports
- Optical Drive
- 1x USB-C port
- 4x USB 2.0 ports
- 2x DisplayPort
- 1x HDMI port
- 1x RJ45 ethernet port

**The most important reason for selecting the SFF version was its capacity for PCIe expansion. Firewall appliances require 2 RJ45 ports, and these expansion slots allowed me to purchase a Network Interface Card (NIC) and install it on the motherboard. You can find more information about the NIC I purchased on the next page!**

# PCIe Expansion

As stated on the previous page, the SFF OptiPlex had the capacity to add an additional NIC to the motherboard. I purchased an Intel I350-T4 NIC, which is a quad port gigabit NIC. I purchased the card for around \$40.00 off of Ebay, but it had a full server height bracket. Adapter brackets are available via Amazon for \$7.00. Below you'll find the NIC after I attached the half-height bracket.

## Intel I350-T4 Network Interface Card



\*\* There are many people selling fake versions of this card. Check out this link below to learn how to tell the difference between an OEM NIC and a fake!

- [Spot Counterfeit Gigabit NICs](#)

# NETGEAR GS108E Gigabit Switch

# Set Up & Config



GS108Ev3 - 8-Port Gigabit Ethernet Smart Managed Plus Switch

System	VLAN	QoS	Help
Management	Maintenance	Monitoring	Multicast

- Switch Information
- Port Status
- Loop Detection
- Switch Management Modes

## Switch Information

Product Name	GS108Ev3
Switch Name	<input type="text" value="homelab"/>
Serial Number	3UHF3158A1354
MAC Address	E0:46:EE:20:E5:93
Bootloader Version	V2.06.03
Firmware Version	V2.06.17EN
DHCP Mode	<input type="text" value="Enable"/> <input type="checkbox"/> Refresh
IP Address	<input type="text" value="192.168.2.10"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>
Gateway Address	<input type="text" value="192.168.2.1"/>

# Power Supply & Rack

# Uninterruptible Power Supply (UPS)

Home labbing can get expensive, and its incredibly important to protect your gear. To prevent any electrical damage that could occur from power failures, I purchased a [CyberPower CP1500 System](#). This model is a PFC Sine Wave system, which is important as it will produce a cleaner output of electricity should anything interrupt the current power supply. This system should be properly supply my lab with power in the event of failure and allow for proper and graceful shutdowns, which will mitigate data loss and hardware failures.



\*\*These are much heavier than they look!

# Surge Protectors & Grounding

In addition to the UPS, I also purchased a 1U 10 outlet surge protector and have mounted it to my rack. The surge protector is grounded and will protect any other devices from power failure damage, like my Eero AP and NETGEAR switch



# Eero Pro 6

# Ventoy Drive

WD Hard Drive for ISOs