

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

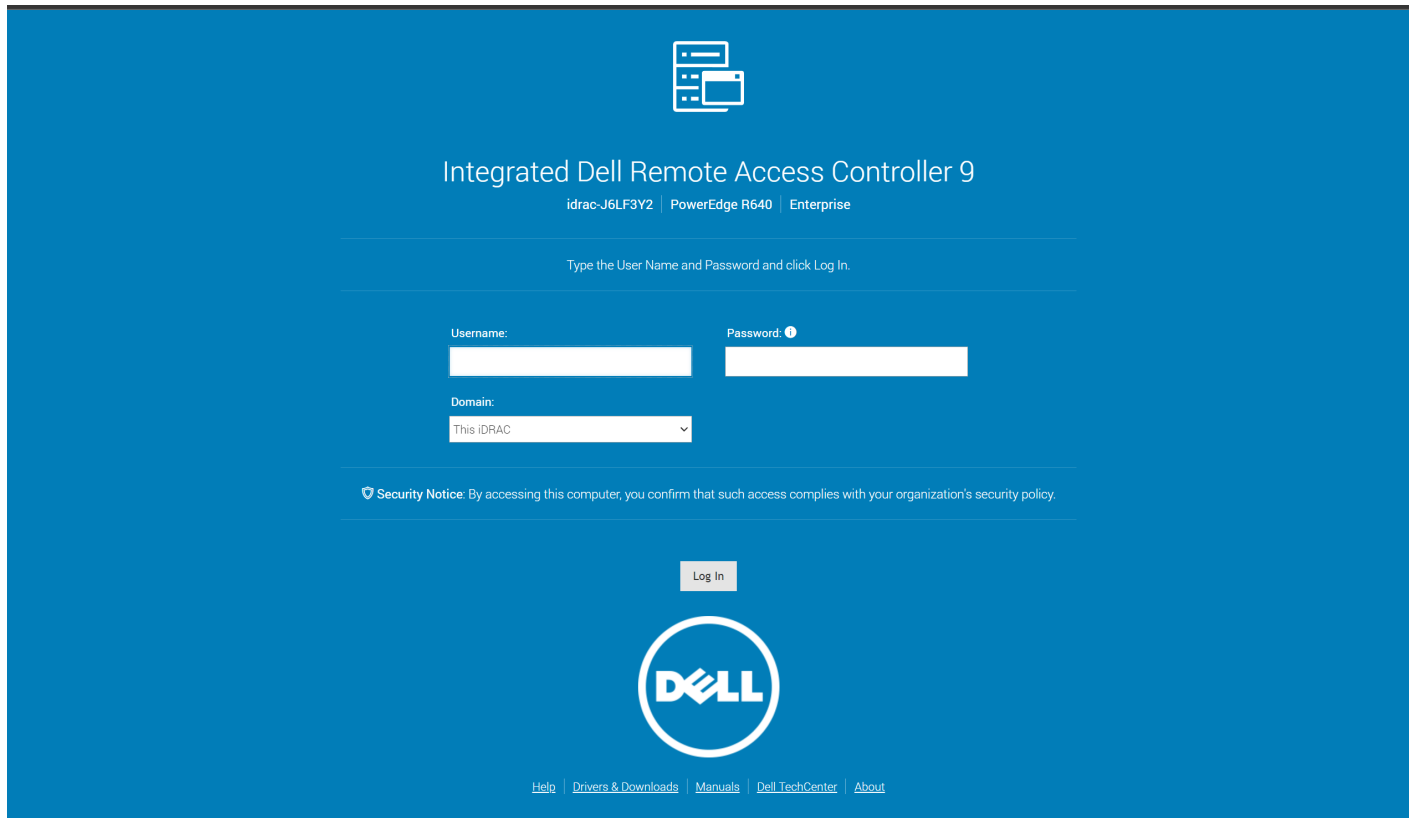
I was able to get lucky and find a server for a decent price point that comes with a 1 year warranty. The specs are as follows (yes, most would consider it overkill, but to me, the more the better...)

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



Integrated Dell Remote Access Controller 9

idrac-J6LF3Y2 | PowerEdge R640 | Enterprise

Type the User Name and Password and click Log In.

Username:

Password:

Domain:

Security Notice: By accessing this computer, you confirm that such access complies with your organization's security policy.

Log In

DELL

[Help](#) | [Drivers & Downloads](#) | [Manuals](#) | [Dell TechCenter](#) | [About](#)

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.

iDRAC9 | Enterprise

Search

Dashboard

System

Storage

Configuration

Maintenance

iDRAC Settings

Enable Group Manager

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

Enterprise

Edit

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
✔	The chassis is closed while the power is off.	Tue Mar 12 2024 16:04:12
✖	The chassis is open while the power is off.	Tue Mar 12 2024 16:04:07
✔	The chassis is closed while the power is off.	Fri Mar 08 2024 09:32:43
✖	The chassis is open while the power is off.	Fri Mar 08 2024 09:32:38
✔	Log cleared.	Tue Mar 05 2024 08:02:54

Virtual Console

Settings

OEM Docs

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

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:

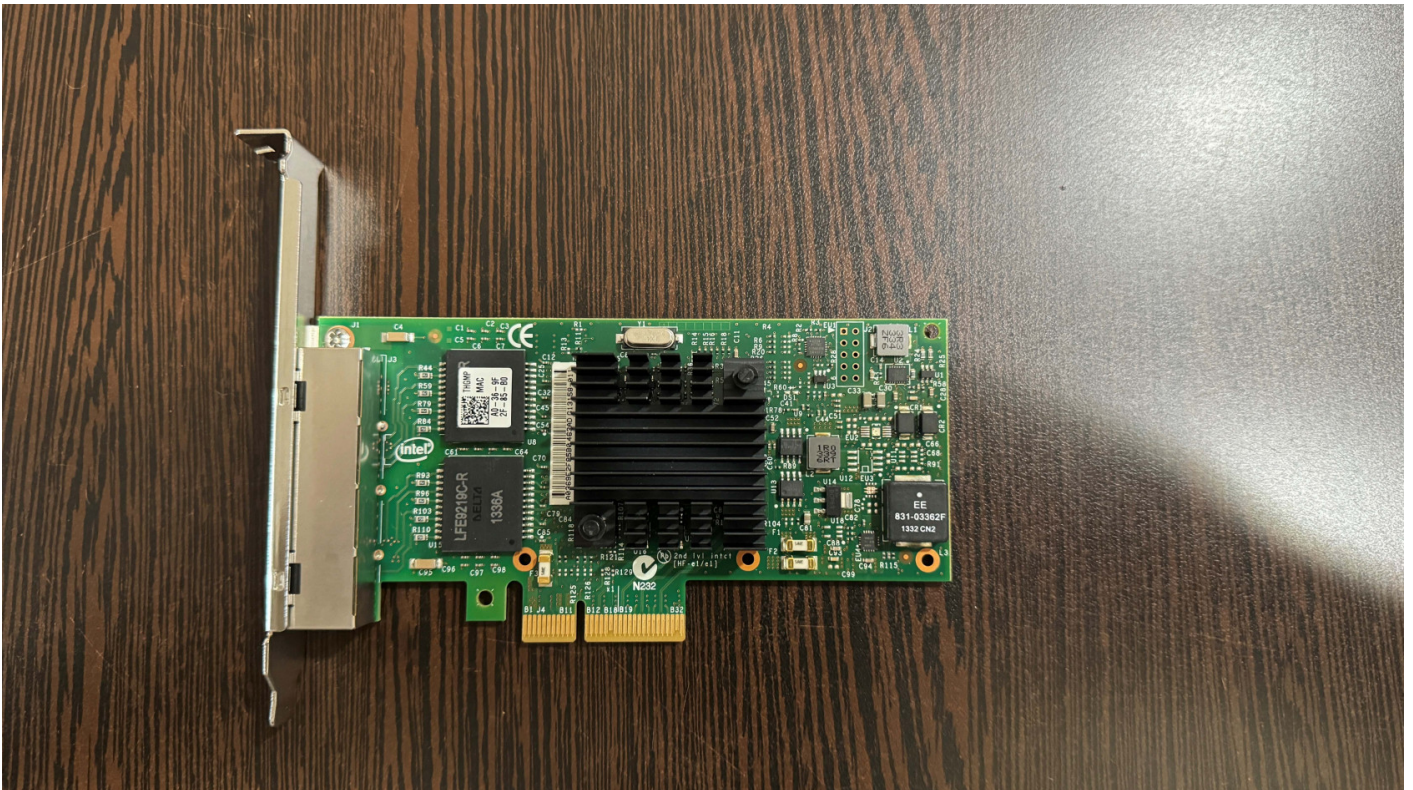
- 2x VGA ports
- Optical Drive
- 1x USB-C port
- 4x USB 2.0 ports
- 2x DisplayPort
- 1x HDMI port
- 1x RJ45 ethernet port

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

homelab

Serial Number

3UHF3158A1354

MAC Address

E0:46:EE:20:E5:93

Bootloader Version

V2.06.03

Firmware Version

V2.06.17EN

DHCP Mode

Enable

☐ Refresh

IP Address

192.168.2.10

Subnet Mask

255.255.255.0

Gateway Address

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