



# Module 3 | Memory & Storage Challenge



## WELCOME, FUTURE PC EXPERTS!

Today, you'll compete in a series of challenges focused on computer memory and storage using PC Building Simulator. Test your knowledge, speed, and problem-solving skills in this exciting competition!

### What You'll Need

- A computer with PC Building Simulator installed
- Document for recording your results & to submit to D2L
- Your problem-solving skills and creativity!

### Competition Rules

- Complete each challenge in order
- Record your results for each challenge
- Work individually unless otherwise instructed
- Have fun and learn from each task!

## CHALLENGE 1: SPEED BUILD - MEMORY MASTER

### Your Mission

Build a PC with the fastest possible memory configuration within the given constraints.

### Steps

1. Open PC Building Simulator in Free Build mode
2. Build a PC with these requirements:
  - a. Budget: \$1200 max
  - b. Must use at least 16GB of RAM
  - c. Aim for the highest possible memory speed and lowest latency
3. Take a screenshot of your completed build
4. Record the total cost, RAM capacity, speed, and latency

## CHALLENGE 2: STORAGE SHOWDOWN

### Your Mission

Create a PC with the optimal balance of storage speed and capacity.

### Steps

1. Start a new build in Free Build mode
2. Build a PC with these requirements:
  - a. Budget: \$1500 max
  - b. Must include at least one SSD and one HDD
  - c. Aim for the best combination of speed (SSD) and capacity (HDD)
3. Take a screenshot of your completed build
4. Record the total cost, SSD specs (type, capacity, speed), and HDD specs (capacity, RPM)

## CHALLENGE 3: UPGRADE EXPERTISE

### Your Mission

Upgrade an outdated system to improve its memory and storage performance.

### Outdated PC Specifications:

- CPU: Intel Core i3-4130 (2 cores, 3.4 GHz)
- Motherboard: ASRock H81M-HDS (LGA 1150 socket)
- RAM: 1x 4GB DDR3-1600
- Storage: 500GB 5400 RPM HDD
- GPU: Integrated Intel HD Graphics 4400
- PSU: 300W Generic Power Supply
- Case: Generic ATX Mid Tower

### Steps

1. You have a virtual budget of \$400 for upgrades
2. Focus on upgrading the RAM and storage
3. Take screenshots before and after your upgrades
4. Record what you changed and why, along with the performance improvements

## CHALLENGE 4: TROUBLESHOOTING TRIUMPH

### Your Mission

Diagnose and fix memory and storage issues in problematic systems.

### Steps

1. Review "Troubleshooting Scenarios" below
2. You'll face three systems with memory or storage problems
3. For each system:
  - a. Identify the issue
  - b. Explain your diagnosis
  - c. Describe and implement your solution
4. Record your process and solutions for each scenario

### Scenario 1: "The Sluggish Startup"

#### System Specs:

- CPU: AMD Ryzen 5 3600
- Motherboard: MSI B450 TOMAHAWK MAX
- RAM: 2x 8GB DDR4-3200
- Storage: 1TB 7200 RPM HDD
- GPU: NVIDIA GeForce GTX 1660 Super

**Reported Issue:** The PC takes an unusually long time to boot and load applications.

**Hidden Problem:** The PC is relying solely on an HDD for storage, causing slow boot and load times.

## Scenario 2: "The Memory Muddle"

### System Specs:

- CPU: Intel Core i7-9700K
- Motherboard: ASUS PRIME Z390-A
- RAM: 1x 16GB DDR4-2666
- Storage: 512GB NVMe SSD
- GPU: AMD Radeon RX 5700

**Reported Issue:** The system is underperforming in memory-intensive tasks and games.

**Hidden Problem:** The RAM is running in single-channel mode and at a lower frequency than the CPU supports.

## Scenario 3: "The Disappearing Drive"

### System Specs:

- CPU: AMD Ryzen 7 3700X
- Motherboard: Gigabyte X570 AORUS ELITE
- RAM: 2x 16GB DDR4-3600
- Storage: 1TB NVMe SSD + 2TB 7200 RPM HDD
- GPU: NVIDIA GeForce RTX 2070 Super

**Reported Issue:** The 2TB HDD is not showing up in File Explorer, but it appears in BIOS.

### Hidden Problems:

1. The HDD is not initialized in Disk Management.
2. The SATA power cable is loose.

## FINAL CHALLENGE: FUTURE-PROOF BUILD

### Your Mission

Design a PC that's ready for future memory and storage technologies.

### Steps

1. Start a new build in Free Build mode
2. Create a high-end PC with these requirements:
  - a. Budget: \$2500 max
  - b. Must include cutting-edge memory and storage solutions
  - c. Consider compatibility with potential future upgrades
3. Take a screenshot of your completed build
4. Write a brief explanation of why your build is "future-proof" in terms of memory and storage

## **HOMEWORK: MEMORY AND STORAGE RESEARCH**

After today's hands-on challenges, dive deeper into memory and storage technology:

1. Create a timeline of major developments in RAM and storage technology over the last 20 years.
2. Research and explain one recent breakthrough in either memory or storage technology.
3. Predict a future trend in PC memory or storage. How might it impact PC building and performance?

Include at least three reliable sources in your research.

### **What to Submit (IN ONE DOCUMENT PLEASE)**

1. Screenshots and results from each challenge
2. Your reflection on the competition experience
3. Your Memory and Storage Research homework

**Good luck, and may the best builder win!**