

Why **YOU** shouldn't overclock.



Overclocking is easy.

Overclocking is easy.

Overclocking reliably, is hard.

Overclocking is easy.

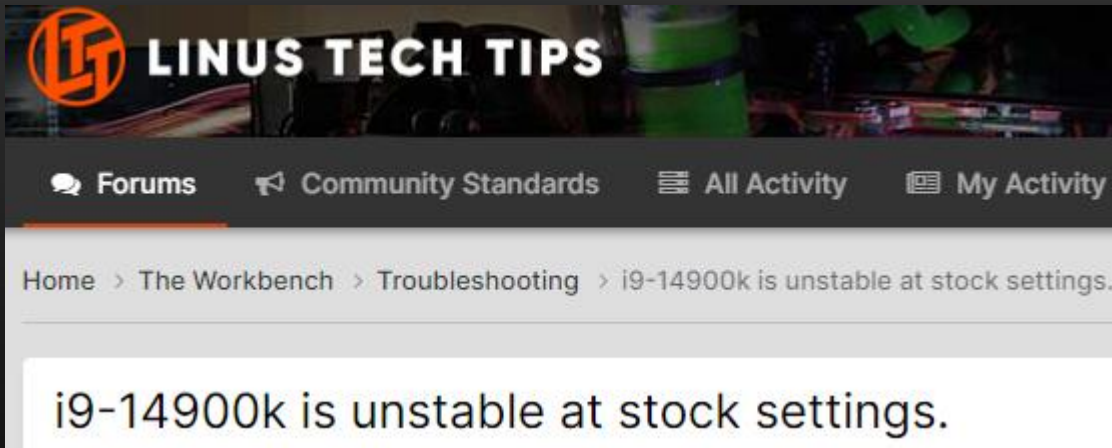
Overclocking reliably, is hard.

Overclocking reliably, at scale, is harder.

Tester Reveals Only 5 out of 10 Core i9-13900K & 2 out of 10 Core i9-14900K CPUs Stable In Auto Profile, Intel & Board Partners Yet To Determine Cause of Stability Issues

Hassan Mujtaba · May 2, 2024 08:30 AM EDT · Copy Shortlink

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i9-14900k is unstable at stock settings.

Home > CPUs

In Light of Stability Concerns, Intel Issues Request to Motherboards Vendors to Actually Follow Stock Power Settings

by [Gavin Bonshor](#) & [Ryan Smith](#) on April 29, 2024 9:30 PM EST

INTEL / TECH / PC GAMING

Intel investigating games crashing on 13th and 14th Gen Core i9 processors



CHALLENGE 1 - Component Choices

How do you overcome the component problem?

- Choose the right components

Did you know...

- Off-the-shelf motherboards will not support overclocking, IPMI, and enterprise tool sets like firmware management via Linux in one package



Blackcore Standard

- Most off-the-shelf OC RAM, will target high bandwidth, not low latency



Blackcore Standard

- Not all CPUs OC the same, identical SKUs will have different OC capabilities. **You need a consistent, scalable OC strategy**



Blackcore Standard

Details we consider

CPU

- Not all CPUs have OC
- Not all CPUs can OC to the same level

RAM

- OC capable
- RDIMM vs UDIMM?
- Will you target bandwidth or latency?

MBD

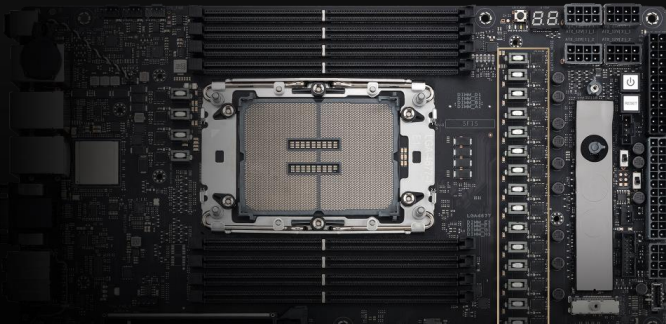
- Socket compatibility
- OC Capable
- Requirements like IPMI

PSU

- Correct wattage
- Correct connectors

CHASSIS

- Fit these components with good airflow
- Expansion / PCIe considerations






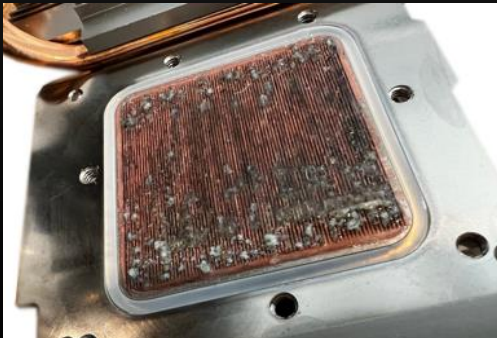
CHALLENGE 2 - Effective Liquid Cooling

How do you overcome the cooling problem?

- Create a reliable, long-lasting, high-performance liquid cooling system

You need to achieve...

- High thermal transfer  Blackcore Standard
- No corrosion  Blackcore Standard
- High flow rate, large surface area  Blackcore Standard
- low conductivity + safe liquid  Blackcore Standard



Details we consider

Water Block

- Socket compatibility
- Material: Copper vs. Nickel Plated

Radiator & Fans

- Physical dimensions
- Fin density + thickness
- Airflow / CFM / Pressure Drop

Tubing & Fittings

- Soft vs Hard
- Porous

Pump

- Pressure
- Speed
- Lifetime

Galvanic Corrosion





- Did you know you can't mix Aluminium & Copper?

CHALLENGE 3 - Overclocking

How do you overcome the overclock problem?

- Trial & error, education, and experience

You need to understand...

- 100s of OC settings  Blackcore Standard
- Impact on performance and stability  Blackcore Standard
- Impact on component lifespan  Blackcore Standard
- How to effectively test for stability  Blackcore Standard



Details we consider

CPU

- What is a safe clock speed?
- What is vcore, svid, vccio, vccsa?

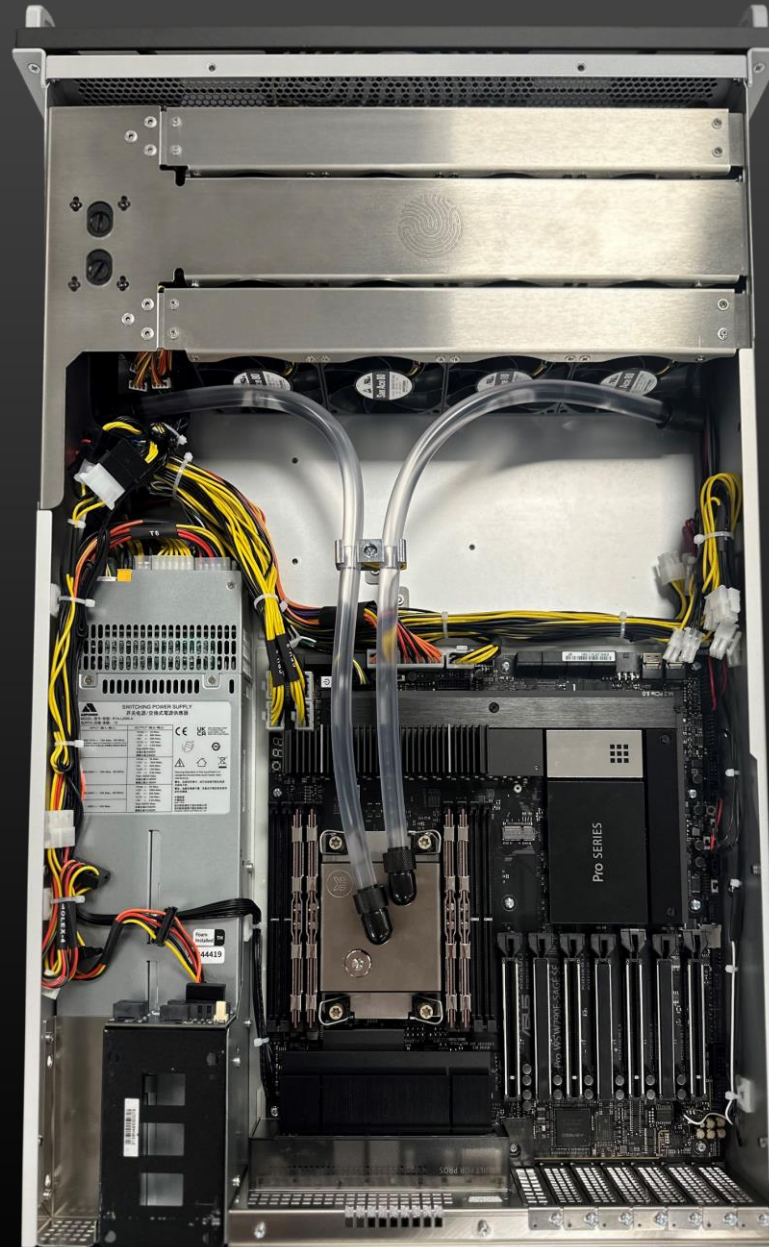
RAM

- Should you focus on frequency or timings?
- What is tCAS, tRAW, tREFI etc?

TESTING

- How do you test?
- What constitutes as stable?
- Are my system stats safe?

At Blackcore, we create fast, reliable unrivaled servers, that deliver the ultimate competitive edge to our clients within the electronic trading industry.



The Blackcore Range

3100-RL+

5.9GHz

Clock Speed

8

Cores

36MB

Cache

DDR5

RAM

16x Gen5

PCIe Lanes

G3 SPR-M

4.8GHz

Clock Speed

24

Cores

45MB

Cache

DDR5

RAM

64x Gen5

PCIe Lanes

G3 SPR-X

4.2GHz

Clock Speed

56

Cores

105MB

Cache

DDR5

RAM

112x Gen5

PCIe Lanes



Why Overclock?

All-Core Frequency

		intel. STOCK	blackcore technologies OVERCLOCK
	CORES		
3100-RL+	8	5.5GHz	→ 5.9GHz
G3 SPR-M	24	3.3GHz	→ 4.8GHz
G3 SPR-X	56	2.9GHz	→ 4.2GHz

The Benefits of Blackcore Overclock

NOT STAC BENCHMARKS

"STOCK" is Intel's default specification with no adjustments. This includes HT on and E-cores enabled where applicable.
 Core, Cache, and RAM are all run at the manufacturer's defaults. SPR uses 128GB RAM, 3100-RL+ uses 64GB RAM. All other aspects of SUT are identical.
 OS: Rocky 8.8, Kernel: 4.18.0-477 - minimal OS tuning.
 Intel MLC v3.10 | Prime95 v30.7b9_x64 | pcie_lat:
<https://github.com/andre-richter/pcie-lat>

3100-RL+

intel.

blackcore
technologies 

G3 SPR-M

intel.

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technologies 

G3 SPR-X

intel.

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	14900KS STOCK	14900KS OC	w7-2495X STOCK	w7-2495X OC	w9-3495X STOCK	w9-3495X OC
m1c -r --latency_matrix (ns) [Lower is better]	89.3	61.6	102.0	71.8	113.3	84.5
L2->L2 HIT (ns) [Lower is better]	32-24	31.2	65.2	45.9	85.7	72.9
PCIe Latency - slot1 (ns) [Lower is better]	423	415	441	411	544	451
All-core Clock-speed (SSE, GHz) [Higher is better]	P-Core = 5.5 E-Core = 4.2	P-Core = 5.9 E-Core = 4.3	3.3	4.8	2.9	4.2
Peak IPC (prime95, SSE) [Higher is better]	P-Core = 3.7 E-Core = 2.4	P-Core = 4.9 E-Core = 2.4	4.2	5.8	4.2	5.0

Up to
34%
Reduction RAM
Latency

Up to
30%
Reduction
Cache Latency

Up to
45%
Increase
Clock Speed

Up to
38%
Increase
IPC

Up to
17%
Reduction
PCIe Latency

The Blackcore Edge

QUALITY & RELIABILITY

Blackcore only utilizes the highest quality components and performs extensive QA on every system.

R & D

The constant development of new products to enhance performance and wider feature sets.

SUPPORT & WARRANTY

Unrivaled support and 2 Year Box Swap warranty with every system for peace of mind.



ENTERPRISE-GRADE

Comes with all the toolsets for enterprise-grade reliability and monitoring.

CUSTOMIZATION

Products may be extended or tweaked for client needs, enabling unique client advantages.

EXPERIENCE

Partnered with trading firms and with over 20 years of expertise in the hardware space, Blackcore understands the needs of trading.





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