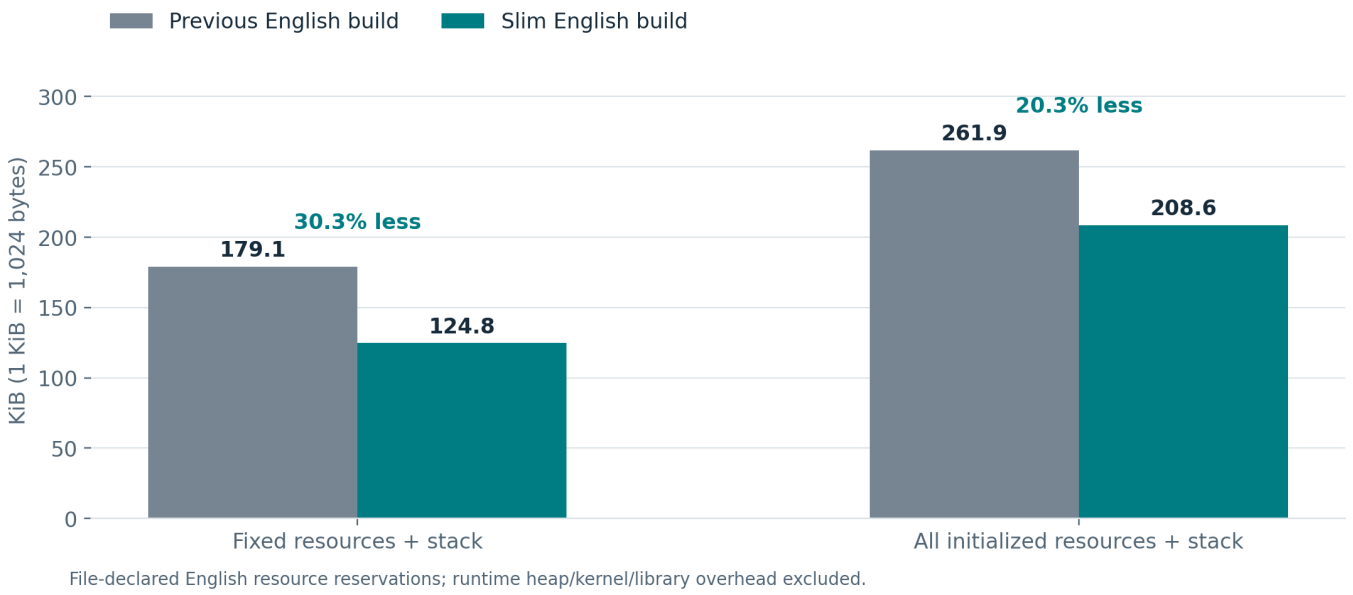
FOOTPRINT

A smaller native build

The slim English build reserves 55,616 fewer bytes in fixed resources plus its unchanged stack. The tested chess results match the previous build across the stated regression corpus.

54.3 KiB
less fixed resource + stack reservation

30.3%
reduction



File-declared English resource reservations; runtime heap/kernel/library overhead excluded.

File-declared, paragraph-rounded resource sizes. These are not measured total runtime RAM. Both totals exclude kernel handles, heap metadata, object relocation slack and UI/library allocations.

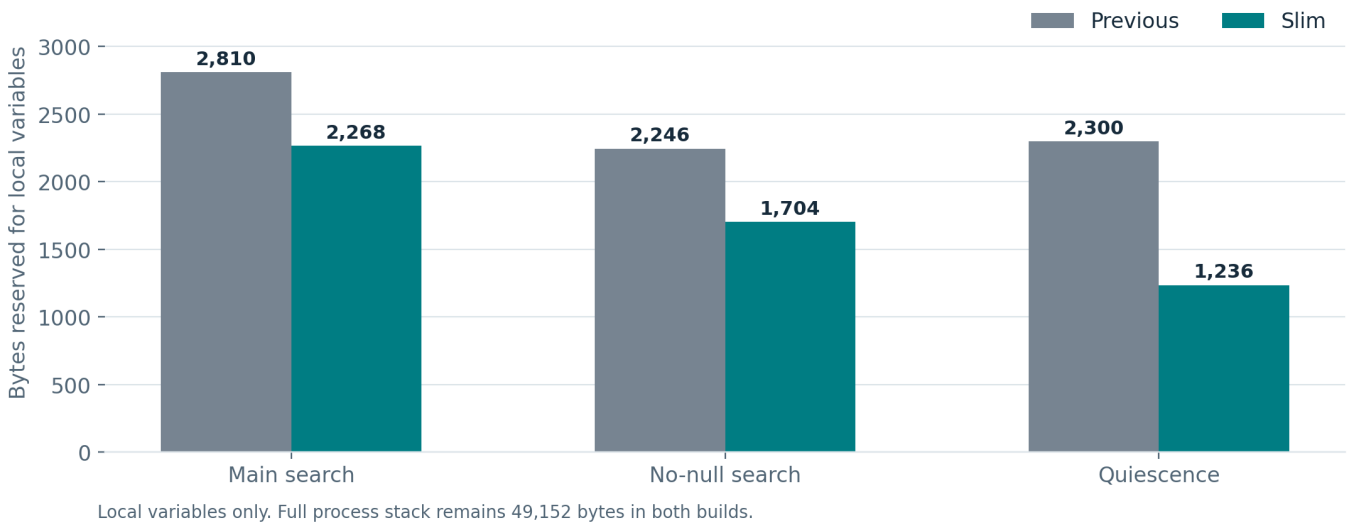
English reservation	Previous bytes	Slim bytes	Saved bytes
Fixed resources + stack	183,392	127,776	55,616
All resources + stack	268,160	213,632	54,528
File on disk	224,622	169,232	55,390

The German slim build is 16 bytes larger because of its localized shell. Its engine, arena, artwork, cache capacities and reserved stack match the English build.

ENGINEERING

Storage changed; the engine stays intact

Narrow storage is used only where the complete legal value range fits. Full 32-bit arithmetic and 64-bit hash keys remain. Search input aliases the current game safely; history and search caches retain their capacities.



Native Watcom local-variable reservations per recursive function. These values exclude saved registers, return addresses, arguments and helper calls.

Preserved setting	Value
Transposition / pawn / material entries	1,027 / 512 / 256 (16 bytes each)
Position history / hash keys	256 entries / 64 bits
Requested search depth / hard search height	1-4 / 16 entries
Reserved process stack	49,152 bytes (unchanged)

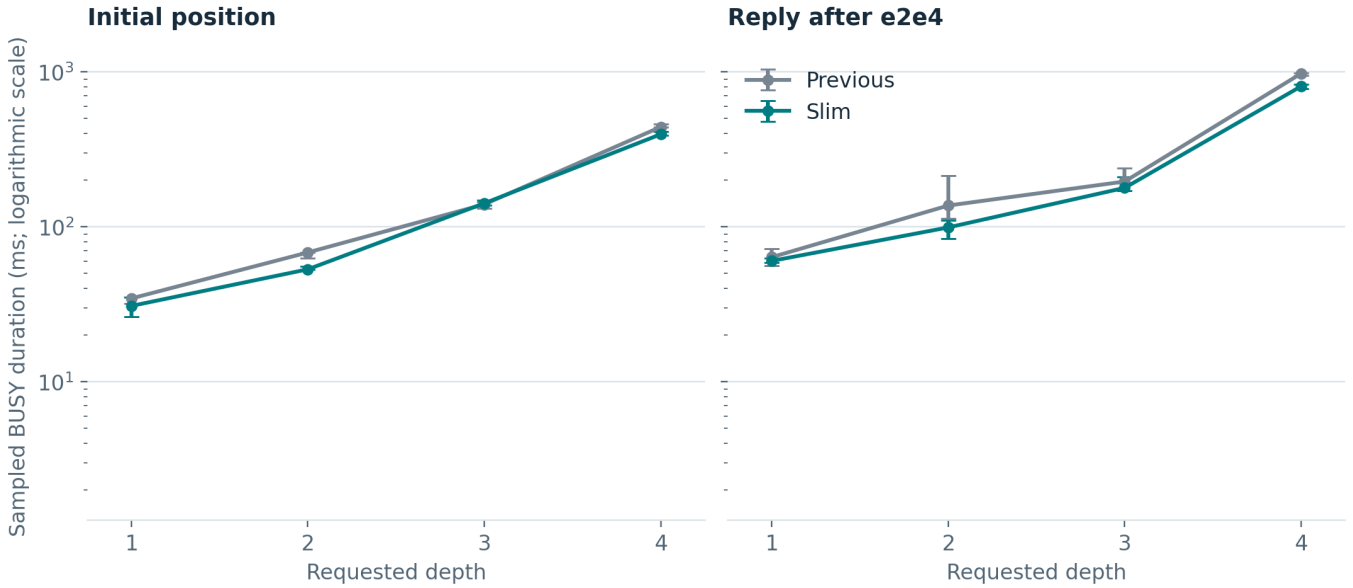
The arena holds 34,260 bytes of deterministic initialization allocations. Its limit is 34,336 bytes: paragraph alignment plus 64 bytes of explicit headroom (76 unused bytes in total). A native 80-ply run and repeated resets added no allocations; both arena-tail and stack-gap canaries remained intact.

Smaller stack frames do not justify shrinking the full stack. The search-recursion component alone has a conservative 38,316-byte bound under the default settings; helpers, application entry and GEOS scheduling need additional room. The full 48 KiB reservation is retained.

OBSERVED PERFORMANCE

Native search BUSY intervals

Three native UI searches per depth and position, on both English builds. Points show median sampled BUSY duration; whiskers show the observed minimum and maximum. All 48 runs are retained in the raw data.



Position / depth	Previous median (min-max), ms	Slim median (min-max), ms
Initial, depth 1	34.5 (32.0-35.0)	30.9 (26.3-35.1)
Initial, depth 2	68.4 (62.6-68.6)	53.2 (53.0-55.7)
Initial, depth 3	139.8 (131.2-144.0)	141.9 (137.9-149.2)
Initial, depth 4	441.5 (439.5-461.3)	395.9 (387.9-410.7)
After e2e4, depth 1	63.8 (56.2-72.2)	60.3 (59.0-63.0)
After e2e4, depth 2	137.3 (113.5-214.5)	99.2 (83.6-110.0)
After e2e4, depth 3	196.1 (191.5-239.1)	178.5 (171.3-210.0)
After e2e4, depth 4	976.5 (949.9-984.0)	807.6 (781.5-831.5)

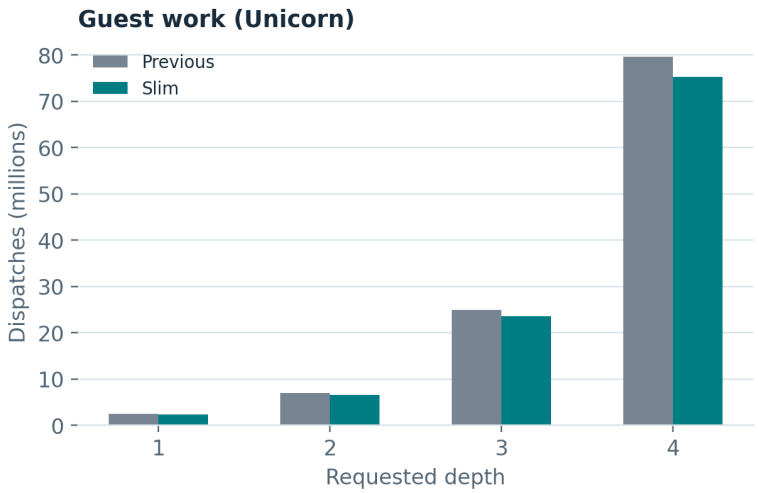
DOSBox Staging 0.83, normal core, 80,000 cycles; VGA 640 x 480; 16 MiB and 1,500 handles. A read-only host sampler observes the native BUSY flag at nominal 2 ms intervals. BUSY starts before thinking repaint and clears before the final board redraw. It includes initial repainting, scheduling/yields and paging, but excludes input delays and full final repaint. Nominal sampling is not an error bound; observed gaps reached 49.216 ms. Short-search values are sensitive to sampling and host load. These are emulator-host times, not physical-PC performance or a universal speed guarantee.

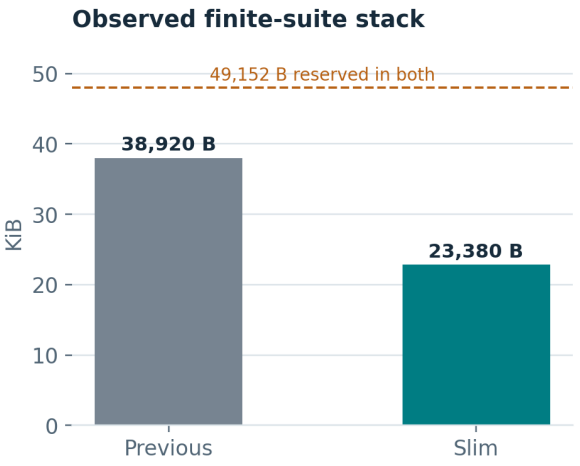
VALIDATION

Matching results on tested positions

The comparison uses host semantic checks and execution of the final 16-bit geode code. These cover different boundaries; neither proves correctness for every possible chess position.

Evidence	Scope / result
Host paired regression	113 positions; 452 searches; 3,385 identical result records; 19,081,983 repeated checks. ASan and UBSan comparison passes.
Representation and move ordering	9,989 table values match exhaustively; 12,303 sorter cases match exact output order.
Actual 16-bit engine	65 identical logical records; 32 searches over 8 FENs, plus special moves, terminal states, repetition and 16 self-play plies. Moves, scores, nodes and restored state match.
Native resource behavior	Relocated/swapped code lock thunks and moved artwork exercised; no leaked locks in the stated finite suite.
Ensemble 1.2 UI	48 UI-driven searches in matched configurations; initial board capture matches pixel for pixel between English builds. English/German 4 MiB UI and lifecycle smoke checks pass. 2 MiB: five apps, code/artwork swap/reload and Undo pass.





Totals sum the same eight FEN searches at each depth. Units are Unicorn 16-bit guest instruction dispatches, including REP iterations/final tests as reported by Unicorn, not ISA-retired instructions or CPU cycles. Production engine/runtime/thunks and synthetic RETF kernel stubs are counted. Real GEOS kernel work, paging and graphics are excluded; identical host hooks insert no guest instructions.

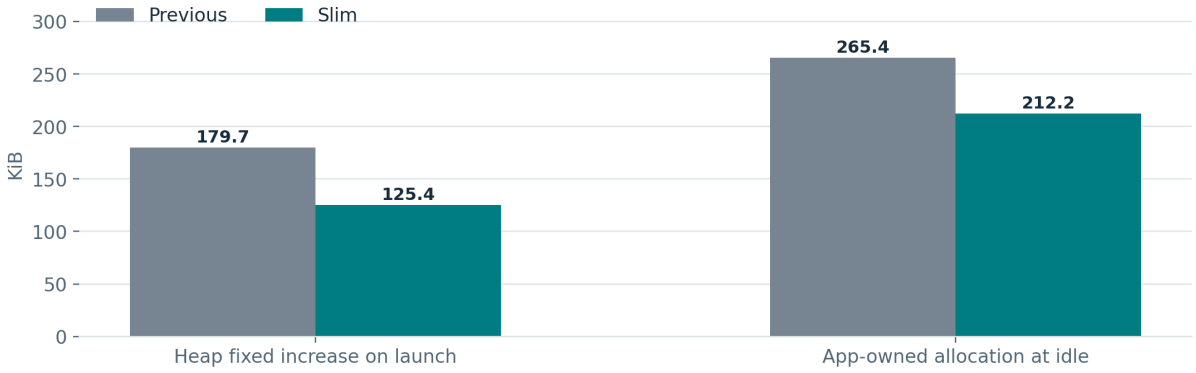
The 32 paired searches total 114,177,759 dispatches before and 107,883,512 after (5.51% fewer). The observed whole-suite stack peaks are finite-corpus measurements, not complete-process bounds.

Interpreting the native counters

After searches, the global Perf Memory meter read 837.3 KiB (previous) and 845.7 KiB (slim). It counts allocated memory including swapped blocks, not physical resident RAM. The guests share a configuration, but background allocations and cache states differ. Application-owned allocation and heap-fixed launch increments are reported separately; no whole-system Memory reduction is claimed.

SCOPE AND IDENTITY

Native memory and release identity



Native system counters

Native observation (16 MiB guest)	Previous English	Slim English
Heap fixed before launch	120,736 B	120,736 B
Heap fixed with Chess idle	304,720 B	249,120 B
Heap fixed increase on launch	183,984 B	128,384 B

Matched 16 MiB native guests. These are Perf heap fixed-byte counters; the displayed absolute Fixed total additionally includes a constant kernel-size contribution. Other system allocations/cache state are included. This is separate from file-declared reservations and does not establish minimum RAM.

Release identity (SHA-256)

Previous English (6.3.0.4)

796ba70122e22276bbeac16ef55fa9be
d87d525419072446df3afff6137d5c62

Slim English (6.3.0.6)

58a4cc7c8a293913ce8069d6888cd179
3aec8a05f2341a0b7276e20d27084941

Slim German (6.3.0.7)

eb65acf09895f2684a10899ba104d416
6217942e0d47a5144a1cfb0bf96719c4

What remains bounded

Tests use the supplied English Ensemble 1.2 runtime under emulation. German application UI smoke and lifecycle checks passed on that English system. No German system runtime was supplied. Physical hardware and other 1.x releases remain untested. Search remains synchronous and bounded to depths 1-4. The finite suite is not an exhaustive all-position proof or unrestricted desktop GNU Chess strength claim.

Rebuild and raw data

The package contains the source and native rebuild route, a matching SHA-bound engine intermediate/link map for quick NASM rebuilding, and exact-binary rebuild checks. COMPARISON/data retains the per-case native timing CSV/JSON, native CPU records, host result records and source reports used here. COMPARISON/figures contains the PNG and editable SVG exports. The self-contained HTML report embeds the charts and lets you inspect timing data offline.