

# Jitrino OPT

## List of IR transformations used in Jitrino.OPT compiler:

Use [this](#) link for details on type system used in Jitrino.OPT compiler

### IR construction:

- [translator](#) - Translates Java bytecode to [High Level Intermediate Representation \(HIR\)](#)
- [hir2lir](#) - Translates HIR to Low Level Intermediate Representation (LIR)

### High-Level (HIR) optimizations

- [optimizer](#) - An alias for all HIR transformations
- [abce](#) - Array bounds check elimination
- [dce](#) - Dead code elimination
- [dessa](#) - SSA deconstruction
- [devirt\\_intf](#) - Guarded devirtualization of interface calls
- [devirt\\_virtual](#) - Guarded devirtualization of virtual calls
- [edge\\_annotate](#) - IR annotation with edge profile
- [edge\\_instrument](#) - IR instrumentation in order to collect edge profile
- [escape](#) - Escape analysis bases optimizations
- [gcm](#) - Global code motion
- [gvn](#) - Global value numbering
- [hlo\\_api\\_magic](#) - Replaces known Java API method calls with predefined algorithms written with HIR
- [hvn](#) - Hash value numbering (CSE)
- [inline](#) - Inlines hot methods calls
- [inline\\_helpers](#) - Replaces HIR instruction with a Java method call and inlines this call
- [lazyexc](#) - Eliminates redundant creation of exception objects
- [lower](#) - Partial inlining for type checks
- [memopt](#) - Redundant memory loads and stores elimination
- [osr](#) - Operator strength reduction
- [peel](#) - Loop peeling
- [purge](#) - Purge empty nodes
- [simplify](#) - Type/copy propogation and constant folding
- [ssa](#) - SSA construction
- [statprof](#) - Annotates HIR with edge profile using static heuristics
- [throwopt](#) - Replaces Throw instruction with the jump to the exception handler
- [uce](#) - Unreachable code elimination
- [unguard](#) - Removal of untaken type guards
- [unroll](#) - Loop unrolling

### Low-level (LIR) optimizations

- [codegen](#) - An alias for all LIR transformations
- [api\\_magic](#) - Replaces known Java API method calls with predefined algorithms written with LIR
- [bbp](#) - Back branch polling for loops
- [break](#) - Inserts 'int3' into the prologue of the generated method
- [btr](#) - Branch optimizations
- [cafl](#) - Complex address form loader
- [cg\\_dce](#) - Removes dead code
- [cg\\_fastArrayFill](#) - Finds and replaces particular internal helper with a loop providing fast array filling with a constant
- [constraints](#) - Performs resolution of operand constraints and assigns calculated constraints to operands
- [copy](#) - translates [CopyPseudoinsts](#) to corresponding copying sequences
- [early\\_prop](#) - A simple algorithm of constant and copy propagation
- [emitter](#) - Emits binary code from LIR
- [gcmmap](#) - Builds a map with information for all Object and Managed pointers operands locations on suspension points
- [gcpoints](#) - Inserts pseudo-use instructions for some Object operands to extend their live-ranges.
- [i586](#) - Replaces SSE2 instructions with SSE or FPU ones if SSE2 is not supported by the current platform
- [i8l](#) - Splits 64-bit integer operands into two 32-bit ones
- [info](#) - Registers various method information in VM memory associated with the method
- [iprof](#) - Instruments a method with various profile collection counters
- [itrace](#) - Instruments method entry/exit and unwind points with calls to logger
- [layout](#) - Prepares code layout
- [light\\_jni](#) - Allows to call some predefined JNI methods directly avoiding JNI stub
- [native](#) - Transforms 3-address LIR form into 2-address form
- [peephole](#) - Performs various architecture specific per-inst optimizations
- [rce](#) - Removes redundant comparisons. The analysis is based on EFLAGS affect
- [regalloc](#) - Global register allocator
- [si\\_insts](#) - Saves information about call instructions for stack unwinding
- [spillgen](#) - Local (basic-block level) register allocation and spill generator
- [stack](#) - Layouts stack and assigns locations for operands on stack

### Auxiliary runtime and configuration services:

- [opt\\_init](#) - Initializes global optimizer flags
- [lock\\_method](#) - Locks method data in VM
- [unlock\\_method](#) - Unlocks method data in VM