

# Options to the StreamIt 'strc' Compiler Script

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This is for the January 29, 2007 release of the StreamIt compiler and runtime system, version 2.1.1.

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## Basic Usage

`strc Foo.str`

Reads `Foo.str`, produces `Foo.java` as an intermediate file, compiles this down to a number of C++ files, and then compiles and links this to produce a binary, `a.out`.

## Options

**--help** Displays a summary of common options.

**--more-help** Displays a summary of advanced options (which are not described below).

**--cluster**  $\langle n \rangle$  Compile for a cluster or multicore with  $\langle n \rangle$  nodes.

**--library** Produce a Java file compatible with the StreamIt Java library, and compile and run it.

**--simpleC** Generate a simple C file that inlines the entire application into a single function. This is sometimes more readable than the default uniprocessor output, but the backend is not fully-featured.

**--raw**  $\langle n \rangle$ , **-r**  $\langle n \rangle$  Compile for an  $\langle n \rangle$ -by- $\langle n \rangle$  Raw processor.

**--rstream**, **-R** Generate a C-like file to be compiled by the RStream compiler from Reservoir Labs.

**--output**  $\langle filename \rangle$ , **-o**  $\langle filename \rangle$  Places the resulting binary in  $\langle filename \rangle$ .

**--verbose** Show intermediate commands as they are executed.

## Options available for all backends

- O0** Do not optimize (default).
- O1** Perform basic optimizations that should improve performance in most cases. Adds `--unroll 16 --destroyfieldarray --partition --wbs`.
- O2** Perform extended optimizations that should improve performance in most cases, but may also cause the compiler to become unstable. Adds `--unroll 256 --destroyfieldarray --partition --wbs --macros`.
- iterations  $\langle n \rangle$ , -i $\langle n \rangle$**  Run the program for  $\langle n \rangle$  steady-state iterations. Defaults to infinity. For the uniprocessor, cluster, and simpleC backends, the number of iterations can also be passed at the command line of the final executable (`a.out -i 100`).
- linearreplacement** Domain-specific optimization: combine adjacent “linear” filters in the program into a single matrix multiplication operation wherever possible. Corresponds to the “linear” option in the PLDI’03 paper.
- statespace** In combination with `--linearreplacement`, performs combination and optimization of linear statespace filters as described in the CASES’05 paper.
- unroll  $\langle n \rangle$ , -u $\langle n \rangle$**  Specify loop unrolling limit. The default value is 0.

## Options specific to Uniprocessor and Cluster backends

- cacheopt** Performs cache optimizations as described in the LCTES’05 paper.
- l1d  $\langle n \rangle$**  Sets the L1 data cache size (in KB) for cache optimizations. The default is 8 KB.
- l1i  $\langle n \rangle$**  Sets the L1 instruction cache size (in KB) for cache optimizations. The default is 8 KB.
- l2  $\langle n \rangle$**  Sets the L2 cache size (in KB) for cache optimizations (we assume a unified L2 cache). The default is 256 KB.
- linearpartition, -L** Domain-specific optimization: perform linear replacement and frequency replacement selectively, based on an estimate of where it is most beneficial. Corresponds to the “autosel” option in the PLDI’03 paper. (Relies on FFTW installation.)

## Options specific to Raw backend

- asciifileio** Specifies that FileReader’s and FileWriter’s should use ASCII format rather than binary. Also works under the `--simpleC` backend.

- numbers**  $\langle n \rangle$ , **-N** $\langle n \rangle$  Instrument code to gather performance statistics on simulated code over  $\langle n \rangle$  steady-state cycles. The results are placed in **results.out** in the current directory.
- ssoutputs**  $\langle n \rangle$  For applications containing a dynamic I/O rate, this option indicates how many outputs should count as a steady-state when gathering numbers (with **--numbers**).
- rawcol**  $\langle m \rangle$ , **-c** $\langle m \rangle$  Specify number of columns in Raw processor; **-raw** specifies number of rows.
- wbs** When laying out communication instructions, use the work-based simulator to estimate exactly when items will be produced and consumed. This improves the scheduling of routing instructions.