For problems that involve the solution of linear systems of equations, the solvers operate using generic linear solver modules (of type SUNLinearSolver), through a set of operations defined by the particular implementation. These work in coordination with the generic and modules to provide a set of compatible data structures and solvers for the solution of linear systems using direct or iterative methods. Moreover, users can provide their own specific implementation to each solver, particularly in cases where they provide their own and/or modules, and the customized linear solver leverages these additional data structures to create highly efficient and/or scalable solvers for their particular problem. Additionally, provides native implementations of eight modules, as well as four modules that interface between and external linear solver libraries.

The various solvers have been designed to specifically leverage the use of either direct linear solvers or scaled, preconditioned, iterative linear solvers, through their "Dls" and "Spils" interfaces, respectively. Additionally, solvers can make use of custom linear solvers, whether these be problem-specific or come from external solver libraries.

The generic SUNLinearSolver type has been modeled after the object-oriented style of the generic N_Vector type. Specifically, a generic SUNLinearSolver is a pointer to a structure that has an implementation-dependent content field containing the description and actual data of the linear solver, and an ops field pointing to a structure with generic linear solver operations. The type SUNLinearSolver is defined as verbatim typedef struct $_generic_SUNLinearSolver * SUNLinearSolver$;

struct $_generic_SUNLinearSolver void * content; struct_generic_SUNLinearSolver_Ops * ops$;;