????????

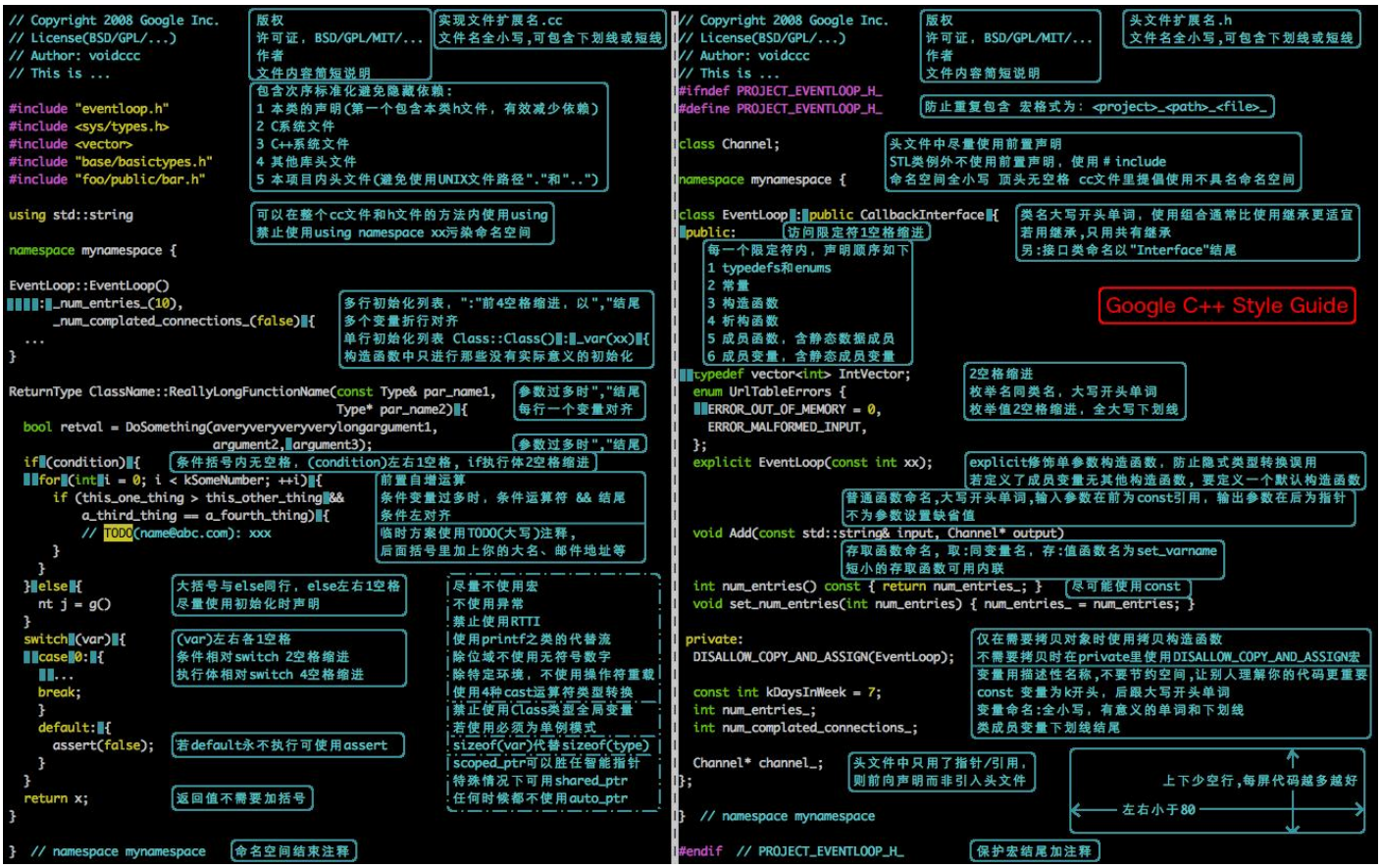
vscode ????

```
{
// Place your snippets for cpp here. Each snippet is defined under a snippet name and has a prefix, body and
// description. The prefix is what is used to trigger the snippet and the body will be expanded and inserted. Possible variables are:
// $1, $2 for tab stops, $0 for the final cursor position, and ${1:label}, ${2:another} for placeholders. Placeholders with the
// same ids are connected.
// Example:
"copyright info":{
        "prefix": "//file",
        "body": [
            "//-------------------------------------------------------------------------------
",
            "//! Copyright(C) 2020-2022, netflt.com",
            "//! All rights reserved.",
            "// ",
            "// name: $TM_FILENAME",
            "// author: Danny.Zhu"
            "// date: $CURRENT_YEAR-$CURRENT_MONTH-$CURRENT_DATE $CURRENT_HOUR:$CURRENT_MINUTE:$CURRENT_SECOND",
            "//-------------------------------------------------------------------------------"
        ],
        "description": "add copyright information"
    },
    "simple comment":{
        "prefix": "//",
        "body": [
            "//<! ${1}"
        ],
        "description": "add simple comment"
```

```
    },
    "block comment":{
        "prefix": "///",
        "body": [
            "/***",
            "//<! ${1}",
            "***/"
        ],
        "description": "add block comments"
    },
□"TODO": {
□□"prefix": "//td",
□□"body": [
□□□"//<! TODO (Danny.Zhu): $1"
□□],
□□"description": "Log output to console"
□}

}
```

clang-format ??



.clang-format

```
---
Language:        Cpp
# BasedOnStyle:  Chromium
SortIncludes:    true
AccessModifierOffset: -4
DerivePointerAlignment: false
PointerAlignment: Left
ConstructorInitializerIndentWidth: 4
AlignEscapedNewlines: Left
AlignAfterOpenBracket: Align
AlignConsecutiveMacros: Consecutive
AlignConsecutiveAssignments: None
AlignConsecutiveBitFields: Consecutive
AlignConsecutiveDeclarations: false
AlignOperands:   Align
AlignTrailingComments: true
AllowShortBlocksOnASingleLine: Never
AllowShortFunctionsOnASingleLine: Empty
AllowAllArgumentsOnNextLine: true
```

```
AllowAllConstructorInitializersOnNextLine: false
AllowAllParametersOfDeclarationOnNextLine: false
AllowShortEnumsOnASingleLine: false
AllowShortLambdasOnASingleLine: Empty
AllowShortIfStatementsOnASingleLine: Never
AllowShortCaseLabelsOnASingleLine: false
AllowShortLoopsOnASingleLine: false
AlwaysBreakTemplateDeclarations: true
BinPackArguments: false
AlwaysBreakBeforeMultilineStrings: false
BreakBeforeBinaryOperators: NonAssignment
BreakBeforeTernaryOperators: true
BreakConstructorInitializersBeforeComma: false
BinPackParameters: false
ColumnLimit:     96
ConstructorInitializerAllOnOneLineOrOnePerLine: false
DerivePointerBinding: false
ExperimentalAutoDetectBinPacking: false
IndentCaseLabels: false
MaxEmptyLinesToKeep: 1
NamespaceIndentation: None
ObjCSpaceBeforeProtocolList: true
PenaltyBreakBeforeFirstCallParameter: 1
PenaltyBreakComment: 300
PenaltyBreakString: 1000
PenaltyBreakFirstLessLess: 120
PenaltyExcessCharacter: 1000000
PenaltyReturnTypeOnItsOwnLine: 1000
AlwaysBreakAfterDefinitionReturnType: None
AlwaysBreakAfterReturnType: None
PointerBindsToType: true
Cpp11BracedListStyle: false
Standard:        Auto
IndentWidth:     4
TabWidth:        4
UseTab:          Never
BreakBeforeBraces: Custom
AttributeMacros:
  - __capability
```

```
BraceWrapping:
  AfterCaseLabel:  false
  AfterClass:      true
  AfterControlStatement: false
  AfterEnum:       false
  AfterFunction:   true
  AfterNamespace:  true
  AfterObjCDeclaration: true
  AfterStruct:     false
  AfterUnion:      false
  AfterExternBlock: true
  BeforeCatch:     true
  BeforeElse:      true
  BeforeLambdaBody: false
  BeforeWhile:     false
  IndentBraces:    false
  SplitEmptyFunction: false
  SplitEmptyRecord: false
  SplitEmptyNamespace: false
SpacesInParentheses: false
SpacesInAngles:  false
BreakBeforeConceptDeclarations: true
BreakBeforeInheritanceComma: false
BreakInheritanceList: BeforeComma
BreakConstructorInitializers: BeforeComma
BreakAfterJavaFieldAnnotations: false
BreakStringLiterals: true
CommentPragmas:  '^ IWYU pragma:'
CompactNamespaces: false
ContinuationIndentWidth: 4
DeriveLineEnding: true
DisableFormat:   false
EmptyLineBeforeAccessModifier: LogicalBlock
FixNamespaceComments: true
ForEachMacros:
  - foreach
  - Q_FOREACH
  - BOOST_FOREACH
StatementAttributeLikeMacros:
```

```
  - Q_EMIT
IncludeBlocks:   Regroup
IncludeCategories:
  - Regex:           '^<ext/.*\.h>'
    Priority:        2
    SortPriority:    0
    CaseSensitive:   false
  - Regex:           '^<.*\.h>'
    Priority:        1
    SortPriority:    0
    CaseSensitive:   false
  - Regex:           '^<.*'
    Priority:        2
    SortPriority:    0
    CaseSensitive:   false
  - Regex:           '.*'
    Priority:        3
    SortPriority:    0
    CaseSensitive:   false
IncludeIsMainRegex: '([-_](test|unittest))?$'
IncludeIsMainSourceRegex: ''
IndentCaseBlocks: false
IndentGotoLabels: true
IndentPPDirectives: BeforeHash
IndentExternBlock: AfterExternBlock
IndentRequires:  false
IndentWrappedFunctionNames: true
InsertTrailingCommas: None
JavaScriptQuotes: Leave
JavaScriptWrapImports: true
KeepEmptyLinesAtTheStartOfBlocks: true
MacroBlockBegin: ''
MacroBlockEnd:   ''
ObjCBinPackProtocolList: Auto
ObjCBlockIndentWidth: 2
ObjCBreakBeforeNestedBlockParam: true
ObjCSpaceAfterProperty: false
PenaltyBreakAssignment: 2
PenaltyBreakTemplateDeclaration: 10
```

```
PenaltyIndentedWhitespace: 0
RawStringFormats:
  - Language:        Cpp
    Delimiters:
      - cc
      - CC
      - cpp
      - Cpp
      - CPP
      - 'c++'
      - 'C++'
    CanonicalDelimiter: ''
    BasedOnStyle:    google
  - Language:        TextProto
    Delimiters:
      - pb
      - PB
      - proto
      - PROTO
    EnclosingFunctions:
      - EqualsProto
      - EquivToProto
      - PARSE_PARTIAL_TEXT_PROTO
      - PARSE_TEST_PROTO
      - PARSE_TEXT_PROTO
      - ParseTextOrDie
      - ParseTextProtoOrDie
      - ParseTestProto
      - ParsePartialTestProto
    CanonicalDelimiter: ''
    BasedOnStyle:    google
ReflowComments:  true
SortJavaStaticImport: Before
SortUsingDeclarations: true
SpaceAfterCStyleCast: false
SpaceAfterLogicalNot: false
SpaceAfterTemplateKeyword: true
SpaceBeforeAssignmentOperators: true
SpaceBeforeCaseColon: false
```

```
SpaceBeforeCpp11BracedList: true
SpaceBeforeCtorInitializerColon: true
SpaceBeforeInheritanceColon: true
SpaceBeforeParens: ControlStatements
SpaceAroundPointerQualifiers: Default
SpaceBeforeRangeBasedForLoopColon: true
SpaceInEmptyBlock: false
SpaceInEmptyParentheses: false
SpacesBeforeTrailingComments: 1
SpacesInConditionalStatement: false
SpacesInContainerLiterals: false
SpacesInCStyleCastParentheses: false
SpacesInSquareBrackets: false
SpaceBeforeSquareBrackets: false
BitFieldColonSpacing: Both
StatementMacros:
  - Q_UNUSED
  - QT_REQUIRE_VERSION
UseCRLF:         false
WhitespaceSensitiveMacros:
  - STRINGIZE
  - PP_STRINGIZE
  - BOOST_PP_STRINGIZE
  - NS_SWIFT_NAME
  - CF_SWIFT_NAME
...
```

clang-tidy ??

.clang-tidy

```
---
# Configure clang-tidy for this project.

# Here is an explanation for why some of the checks are disabled:
#
#  -google-readability-namespace-comments: the *_CLIENT_NS is a macro, and
#      clang-tidy fails to match it against the initial value.
#
#  -modernize-use-trailing-return-type: clang-tidy recommends using
#      `auto Foo() -> std::string { return ...; }`, we think the code is less
#      readable in this form.
#
#  -modernize-return-braced-init-list: We think removing typenames and using
#      only braced-init can hurt readability.
#
#  -modernize-avoid-c-arrays: We only use C arrays when they seem to be the
#      right tool for the job, such as `char foo[] = "hello"`. In these cases,
#      avoiding C arrays often makes the code less readable, and std::array is
#      not a drop-in replacement because it doesn't deduce the size.
#
#  -performance-move-const-arg: This warning requires the developer to
#      know/care more about the implementation details of types/functions than
#      should be necessary. For example, `A a; F(std::move(a));` will trigger a
#      warning IFF `A` is a trivial type (and therefore the move is
#      meaningless). It would also warn if `F` accepts by `const&`, which is
#      another detail that the caller need not care about.
#
#  -readability-redundant-declaration: A friend declaration inside a class
#      counts as a declaration, so if we also declare that friend outside the
#      class in order to document it as part of the public API, that will
#      trigger a redundant declaration warning from this check.
#
#  -readability-function-cognitive-complexity: too many false positives with
#      clang-tidy-12. We need to disable this check in macros, and that setting
#      only appears in clang-tidy-13.
#
#  -bugprone-narrowing-conversions: too many false positives around
#      `std::size_t`  vs. `*::difference_type`.
#
#  -bugprone-easily-swappable-parameters: too many false positives.
```

```
#
#  -bugprone-implicit-widening-of-multiplication-result: too many false positives.
#     Almost any expression of the form `2 * variable` or `long x = a_int * b_int;`
#     generates an error.
#
#  -bugprone-unchecked-optional-access: too many false positives in tests.
#     Despite what the documentation says, this warning appears after
#     `ASSERT_TRUE(variable)` or `ASSERT_TRUE(variable.has_value())`.
#
Checks: >
  -*,
  abseil-*,
  bugprone-*,
  google-*,
  misc-*,
  modernize-*,
  performance-*,
  portability-*,
  readability-*,
  -google-readability-braces-around-statements,
  -google-readability-namespace-comments,
  -google-runtime-references,
  -misc-non-private-member-variables-in-classes,
  -misc-const-correctness,
  -misc-use-anonymous-namespace,
  -modernize-return-braced-init-list,
  -modernize-use-trailing-return-type,
  -modernize-use-nodiscard,
  -modernize-avoid-c-arrays,
  -performance-move-const-arg,
  -readability-braces-around-statements,
  -readability-identifier-length,
  -readability-magic-numbers,
  -readability-named-parameter,
  -readability-redundant-declaration,
  -readability-function-cognitive-complexity,
  -readability-convert-member-functions-to-static,
  -readability-qualified-auto,
  -readability-implicit-bool-conversion,
  -bugprone-narrowing-conversions,
  -bugprone-easily-swappable-parameters,
```

```
  -bugprone-implicit-widening-of-multiplication-result,
  -bugprone-unchecked-optional-access,
  -bugprone-branch-clone

# Turn all the warnings from the checks above into errors.
WarningsAsErrors: "*"

CheckOptions:
  - { key: readability-identifier-naming.ClassCase,              value: CamelCase  }
  - { key: readability-identifier-naming.StructCase,             value: CamelCase  }
  - { key: readability-identifier-naming.TemplateParameterCase,  value: CamelCase  }
  - { key: readability-identifier-naming.FunctionCase,           value: camel_back  }
  - { key: readability-identifier-naming.PrivateMemberPrefix,    value: _          }
  - { key: readability-identifier-naming.ProtectedMemberPrefix,  value: _          }
  - { key: readability-identifier-naming.EnumConstantCase,         value: CamelCase }
  - { key: readability-identifier-naming.EnumConstantPrefix,       value: k         }
  - { key: readability-identifier-naming.ConstexprVariableCase,    value: CamelCase }
  - { key: readability-identifier-naming.ConstexprVariablePrefix,  value: k         }
  - { key: readability-identifier-naming.GlobalConstantCase,       value: CamelCase }
  - { key: readability-identifier-naming.GlobalConstantPrefix,     value: k         }
  - { key: readability-identifier-naming.MemberConstantCase,       value: CamelCase }
  - { key: readability-identifier-naming.MemberConstantPrefix,     value: k         }
  - { key: readability-identifier-naming.StaticConstantCase,       value: CamelCase }
  - { key: readability-identifier-naming.StaticConstantPrefix,     value: k         }
  - { key: readability-implicit-bool-conversion.AllowIntegerConditions,  value: 1   }
  - { key: readability-implicit-bool-conversion.AllowPointerConditions,  value: 1   }
  - { key: readability-function-cognitive-complexity.IgnoreMacros,  value: 1   }
```

Revision #3
Created 9 August 2024 13:41:20 by Danny
Updated 18 August 2024 12:42:49 by Danny