



C Salon

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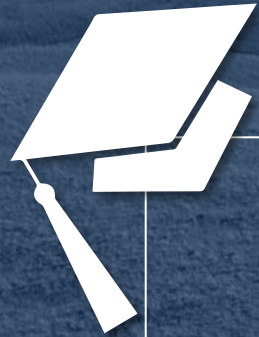
C Grammar

C Internal

C & OS

C & Compiler

Summary



C

Grammar

Data type, operator, and expression

Control structure

Function

Memory

Data type

Int, float, double, unsigned.

Operator

+ - * / %

&, ++, --,

etc.

Expression

End with semicolon

Control structure

if, else

while, do while, for

switch

goto

The essence of control structure

[Resource release](#).

```
grep goto ./ -rn -l | xargs -i grep "free(" -rn -l {} |  
grep mm
```

Optimize

Expression optimize

Shift

Constant fold

Formula

Storage

Branch optimize

Change order

Use switch

Loop optimize

Calculate once

Note: So called 'structured programming standard'.

Function

Machine instruction

Function name

A pointer to a address of code section

Stack frame

Stack top to return address, fade away after procedure over.

Procedure

- 1.Load parameters to stack.
- 2.Load value of register.
- 3.Load return address.
- 4.Jump.

Optimize

Calculate once

Storage(loop variable, memory or register?)

Memory

Variable

Global, data section(Initialize value)

Local, stack

auto

register

extern, extension of global variable to EOF(action scope, but not lifecycle).

Volatile, cannot be a global variable.

Static

In data section.

Restriction to file action scope or compound sentence.

For global variable:

No change for lifecycle, action scope shrinking.

For local variable:

No change for action scope, lifecycle extend.

Variable argument

Implement of a variable argument function.

Implement of printf

Lack of argument circumstance

Integer argument

String argument

Pointer

Pointer to pointer.

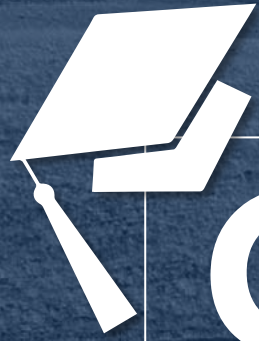
`void *`

Const

Provide cautions.

Infos deliver to compiler.

Prevent unexpected write.



C Internal

Precompile.

Comment

filter

Include file

Extend macro

Compile

Link

Symbol resolve

Relate memory position with symbol, modify
the symbol

Object file

Relocatable object file

Executable object file

Shared object file

Relocation

Relocate section, combine sections to large one

Relocate symbol cite, modify symbol address.

Structure

`struct`

Memory alignment

$$v = (n + a - 1) \& \sim(a - 1)$$

`nav nav`

9 1 9 7 1 7

9 2 10 7 2 8

9 4 12 7 4 8

inline

Extend in compile time

Type check

Complex sentence

Judge by compiler

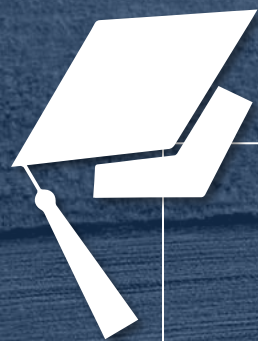
restrict

Static library

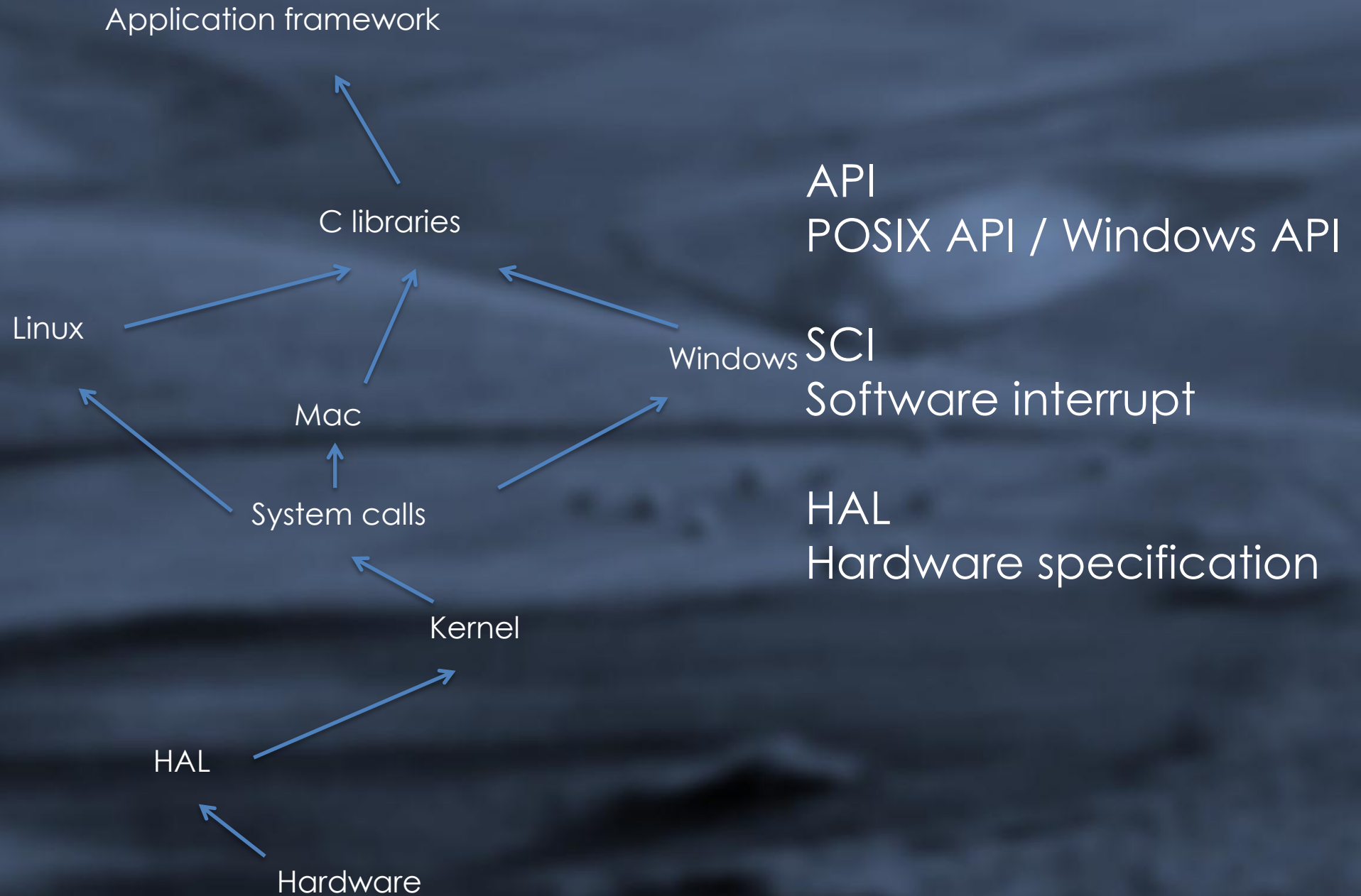
A collection of object code
Compiled into relocatable file

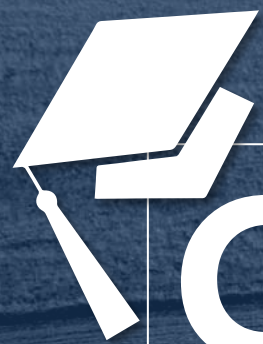
Dynamic library

Load before program invoke.
One copy in memory.



C & OS





C & Compiler

Frontend

Clang

Integrate

GCC

Backend

LLVM

MISC

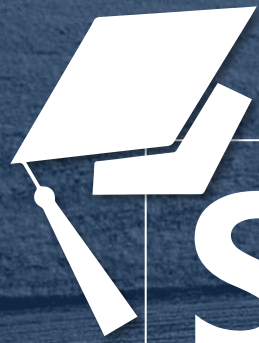
SCC, LCC, TCC, MCC

Precompile

Compile

Link

Load



Summary

Turing-complete

Powerful

Freedom

Simple

Flexible

An aerial photograph of a rural landscape, heavily tinted with a dark blue color. The terrain consists of rolling hills and fields, with visible patterns of agricultural work. In the lower-middle section, a cluster of approximately 15-20 cylindrical hay bales is scattered across a field. The overall mood is serene and quiet.

Thanks all

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