LAST EDITED BY
Administrator
Last Wednesday at 12:48 AM

考试重点和超纲内容

Representing and Manipulating Information

- 2.1 Information Storage
  - **Convertion between decimal, binary and hex values**
  - **Byte ordering (Big endian and little endian)**
  - **Bit-level operations (&, |, ~, ^)**
  - Logical operations (||, &&, !)
  - **Shift operations** (logical shift, arithmetic shift), arithmetic right shifts for signed data
- 2.2 Integer Representations
  - Unsigned encoding and signed encoding (two's complement)
    - **Maximum value, minimum value**
  - Conversion between signed and unsigned
    - Explict convertion, **implict convertion**
  - **Expanding and Truncating numbers**
    - From long to int
    - From int to long
- 2.3 Integer Arithmetic
  - Unsigned/Signed addition (**Overflow, underflow**)
  - **Two's complement negation**
  - Unsigned/Signed multiplication (Overflow)
  - Dividing: out of scope
- 2.4: Out of Scope

Machine-Level Representation of Programs

- 3.1: Out of Scope
- 3.2 Program Encodings
- 3.3 Data Formats
- 3.4 Accessing Information
  - **Registers, Operand forms**
  - Data Movement Instructions
  - Pushing and Popping Stack Data
- 3.5 Arithmetic and Logical Operations
  - **Load Effective Address** (`lea`)
  - Others
- 3.6 Control
  - Condition Codes
  - Accessing the Condition Codes
    - `cmp`, `set`
  - Conditional Control
  - **Conditional Move**
  - **Loop**
  - **Switch statements**
- 3.7 **Procedures**
  - The Run-Time Stack
  - Control Transfer
    - `call`: **Push return address to the stack**
    - `ret`: **Pop return address from the stack**
  - Data Transfer (**argument, return value**)
  - Local Storage on the Stack
    - **Stack frame**
  - Local Storage in Registers
    - **Caller saved, callee saved**
  - **Recursive Procedures**
- 3.8 **Array Allocation and Access**
  - memory allocation
  - Access
- 3.9 Heterogeneous Data Structures
  - **Structures**
  - Unions: Out of scope
  - **Data Alignment**
- 3.10 Combining Control and Data in Machine-Level Programs
  - Buffer overflow
    - Code injection attack
    - Return-oriented programming
  - Protection
- 3.11 Floating-Point Code: Out of scope

The Memory Hierarchy

- 6.1 Storage Technologies
  - **DRAM, SRAM**
  - Disk Storage, Solid State Disks, Storage Technology Trends: Out of scope
- 6.2 **Locality**
  - **Temporal locality, spatial locality**
- 6.3 **The Memory Hierarchy**
- 6.4 **Cache Memories**
  - **Cache organization**
  - **The process of cache read**
    - Cache miss
    - Cache hit

- **Cache Associativity**
- Cache write
  - Write hit
    - write through, write back
  - Write miss
    - write allocate, write non-allocate
- 6.5 **Writing Cache-Friendly Code**
- 6.6 Putting It Together: The Impact of Caches on Program Performance
- The Memory Mountain: Out-of-scope
- Rearranging Loops to Increase Spatial Locality

Comments

No comments yet.