CSGE602055 Operating Systems
CSF2600505 Sistem Operasi
Week 02: Protection, Security, Privacy, & C-language

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http://rms46.vlsm.org/2/207.html
Always check for the latest revision!

REV120 22-FEB-2018

Operating Systems 2018-1 (Room 3114 Tue/Thu)
Class: A (10:00-12:00) | B (13:00-15:00) | C (16:00-18:00)

Week	Schedule	Topic	OSC9
Week 00	06 Feb - 12 Feb 2018	Intro & Review1	Ch. 1, 16
Week 01	13 Feb - 19 Feb 2018	Review2 & Scripting	Ch. 1, 2
Week 02	20 Feb - 26 Feb 2018	Protection, Security, Privacy, & C-language	Ch. 14, 15
Week 03	27 Feb - 05 Mar 2018	I/O, BIOS, Loader, & Systemd	Ch. 13
Week 04	06 Mar - 12 Mar 2018	Addressing, Shared Lib, & Pointer	Ch. 8
Week 05	13 Mar - 19 Mar 2018	Virtual Memory	Ch. 9
Reserved	20 Mar - 24 Mar 2018		
Mid-Term	26 Mar - 03 Apr 2018	(UTS)	
Week 06	05 Apr - 11 Apr 2018	Concurency: Processes & Threads	Ch. 3, 4
Week 07	12 Apr - 18 Apr 2018	Synchronization	Ch. 5, 7
Week 08	19 Apr - 25 Apr 2018	Scheduling	Ch. 6
Week 09	26 Apr - 05 May 2018	File System & Persistent Storage	Ch. 10, 11, 12
Week 10	14 May - 19 May 2018	I/O Programming & Network Sockets Programming	
Reserved	22 May - 22 May 2018		
Final	23 May - 26 May 2018	(UAS)	
Deadline	07 Jun 2018 16:00	Extra assignment **deadline**	

- Operating Systems Check List
  - Trace this document from `http://rms46.vlsm.org/2/207.html`
  - Have a decent OS Book and map it to **OSC9**.
  - Create **public** project "os181" on your `github.com` account.
    - Write in "`README.md`" file:
      Special for Week 00: "**ZCZC Sistem Operasi 2018 Awal (1)**".
      Add line on Week01: "**ZCZC W01 ...**".
      On Week02: "**ZCZC W02 ...**".
      On WeekXX: "**ZCZC WXX ...**".
  - Encode your **QRC** with image size of approximately 250x250 pixels:
    "OS181 CLASS ID GITHUB-ACCOUNT SSO-ACCOUNT SIAK-Full-Name"
    Special for Week 00: Mail your **embedded** QRC to: `os181@vlsm.org` with Subject: [W00] CLASS ID SIAK-NAME.
  - Write your Memo (with QRC) **every week**.
  - Using your **SSO** account, login to `badak.cs.ui.ac.id` via `kawung.cs.ui.ac.id`.
    - Check folder `badak:///extra/Week00/`
    - Week00: Copy the folder to your home directory:
      `cp -r /extra/Week00/W00-demos/ W00-demos/`
    - For WeekXX: Copy the folder to your home directory:
      `cp -r /extra/WeekXX/WXX-demos/ WXX-demos/` (XX=01, 02,... 10).
  - **How to improve this document?**

Agenda

Week 02: Protection, Security, Privacy, & C-language

- Reference: (OSC9-ch14 OSC9-ch15 demo-w02)
- Goals of Protection
- Domain and Access Matrix
- ACL: Access Control List
- The Security Problem
- Threats: Trojan Horse, Trap Door, Overflow, Viruses, Worms, Port Scanning, DOS (Denial of Service).
- Cryptography: (Symmetric and Asymmetric) Encryption,
- User Authentication: Password, Biometrics.
- Implementing Security Defenses: Policy, Assesment, Prevention, Detection, Protection, Auditing.
- Privacy.

How to Protect?

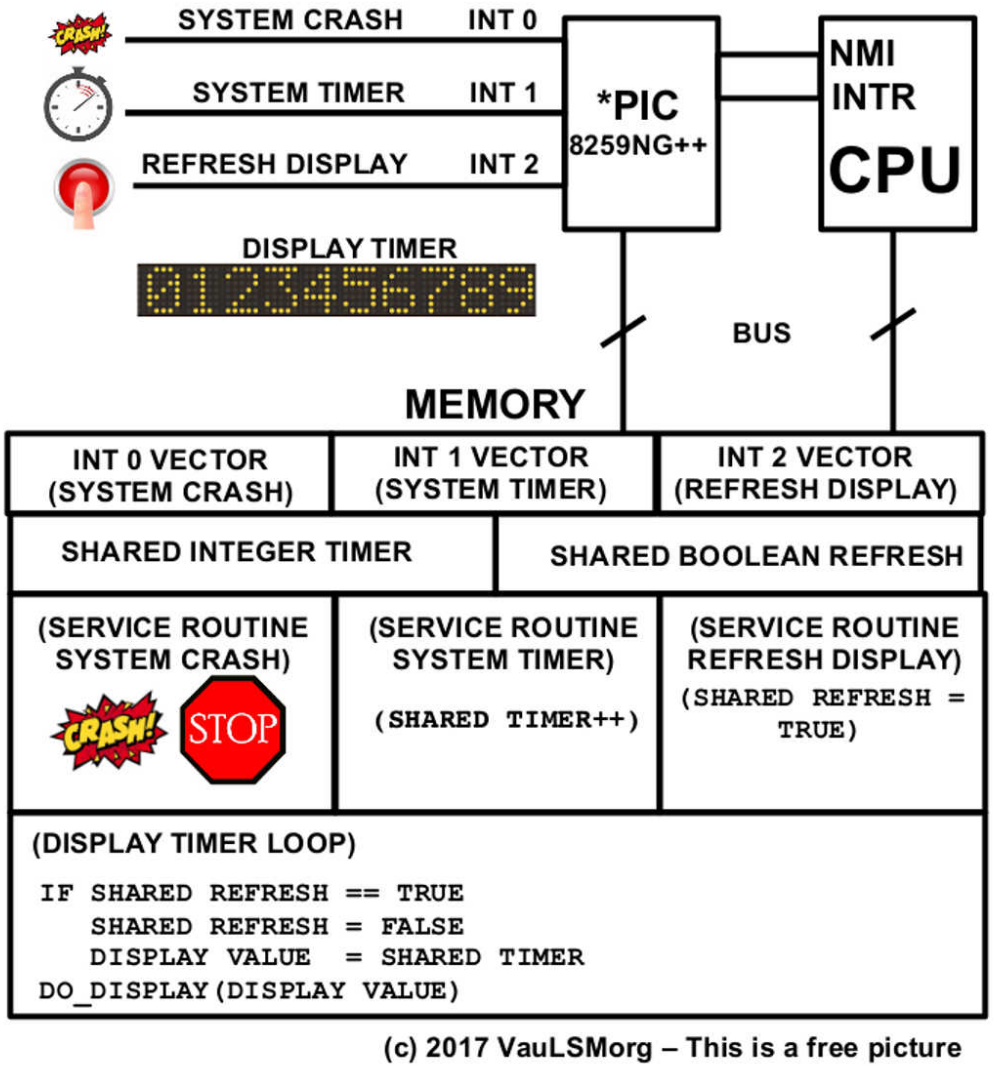

Figure: How to protect and secure this design?

Goals and Principles of Protection

- Principle of Least Privilege
- Domain Structure and Access Matrix
- Domain = set of Access-rights (eg. **user-id**).
- Access-right = <object-name, rights-set> (eg. object: file).

	File1	File2	File3	Printer
User1	Read		Read	
User2				Print
User3		Read	Execute	Print
User4	R/W		R/W	Print

- Access-right Plus Domain (Users) as Objects

	F1	F2	F3	Printer	U1	U2	U3	U4
U1	R		R			SW		
U2				Print			SW	SW
U3		R	EXEC	Print				
U4	R/W		R/W	Print	SW			

Copy Rights

- Start

	File1	File2	File3
User1	Exec		Write*
User2	Exec	Read*	Exec
User3	Exec		

- User3: Read access to File2 (by User2)

	File1	File2	File3
User1	Exec		Write*
User2	Exec	Read*	Exec
User3	Exec	**Read**	

- Owner Rights

	File1	File2	File3
User1	O & E		W
User2		O & R* & W*	O & R* & W
User3		W	W

The Security Problem

- Security Violation Categories
- Security Measure Levels
- Encryption
- Linux Security
- gnupg & sha1sum

Privacy (Wikipedia)

- Privacy can mean different things in different contexts; different people, cultures, and nations have different expectations about how much privacy a person is entitled to or what constitutes an invasion of privacy.
- Considering all discussions as one of these concepts
  - Right to be let alone (such as one's own home).
  - Limited access (no information collection).
  - Control over information (in the era of big data).
  - States of privacy: solitude, intimacy, anonymity, and reserve.
  - Secrecy: does not apply for any already publicly disclosed.
  - Personhood and autonomy.
  - Self-identity and personal growth.

C Language

- Reference: (Any C Language Tutorial)

Week 02: Problems

- Tugas Minggu 02 (Week 02) ada dua:
  - Memo Week02: to be checked at break of the first lecture of WEEK 01.
  - Try Demo Week02 and write in "README.md" (os181), something like: "ZCZC W02 Demo: done!".

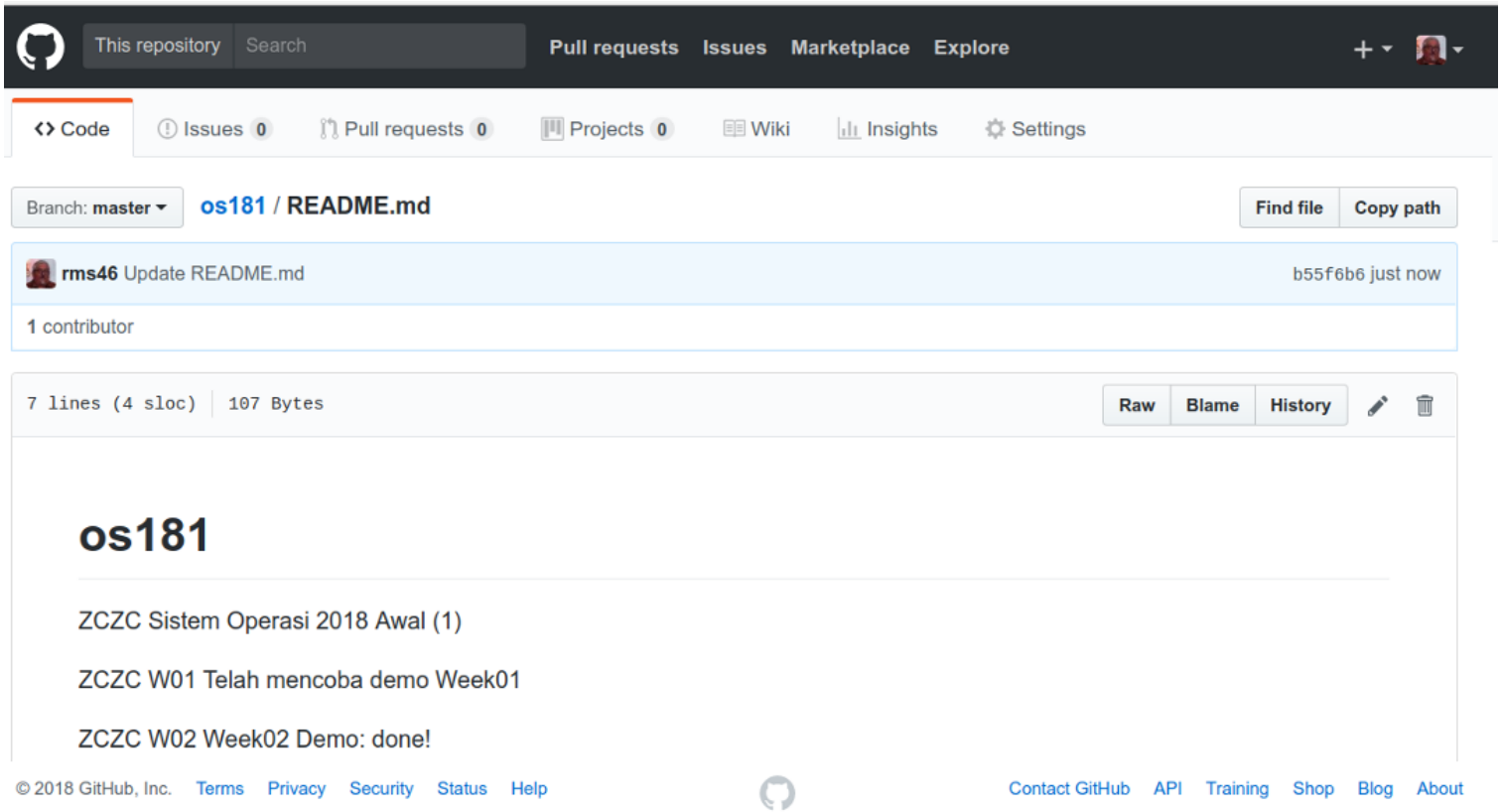

Figure: README.md: ZCZC W02 Demo: done!

Week 02: Summary

- Reference: (OSC9-ch14 OSC9-ch15 demo-w02)
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- Implementing Security Defenses: Policy, Assesment, Prevention, Detection, Protection, Auditing.
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Week 02: Check List

- [ ] **How to improve this document?**

The End

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