

# Introduction to the Jasmine OpenSSD Platform

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- OpenSSD Platform
- Development Environment

# Schedule

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<b>Date</b>	<b>Title</b>
3/10 (Mon)	Intro. to the Jasmine OpenSSD Platform
3/17 (Mon)	Dummy FTL
3/24 (Mon)	Tutorial FTL
3/31 (Mon)	Greedy FTL
4/7 (Mon)	Reliability Issues
4/14 (Mon)	Project #1 Log Block Scheme
4/28 (Mon)	Project #1 Q&A, Kernel-Based FTL
5/12 (Mon)	Project #2 Suggestions
5/26 (Mon)	Project #2 Progress Report
6/? (Mon)	Project #2 Presentation

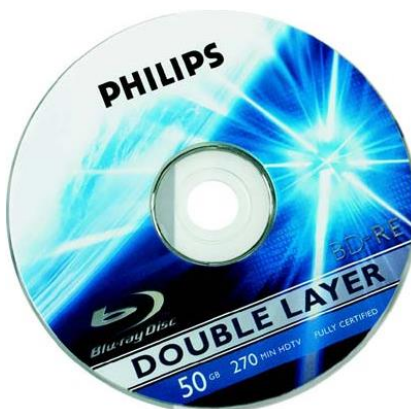
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# Project Overview

- **Project #1. Log Block FTL**
  - “A Space-efficient Flash Translation Layer for CompactFlash Systems,” 2002
  - Implement on OpenSSD Platform
  
- **Project #2. Term Project**
  - Implement other FTLs
  - Performance, Reliability

# Jasmine OpenSSD Platform

# Storage Device



# HDD vs SSD



# HDD vs SSD

## ▪ HDD

- Slow Read/Write speed
- Different Sequential/Random I/O speed
- In-Place update

## ▪ SSD

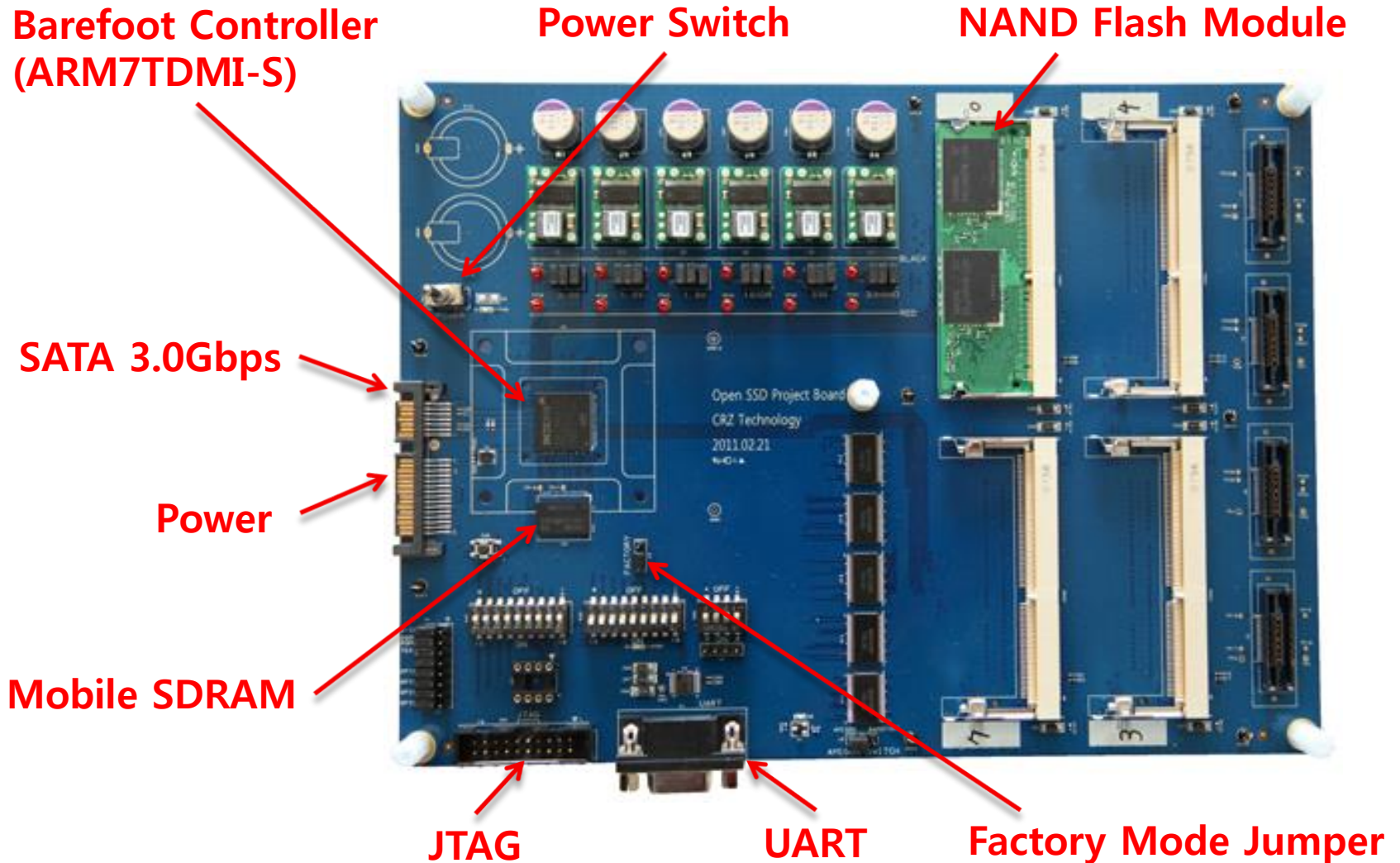
- Fast Read/Write speed
- Similar Sequential/Random I/O speed
- In-Place update is impossible.
  - Page unit write/ Block unit erase.
- Wearing.



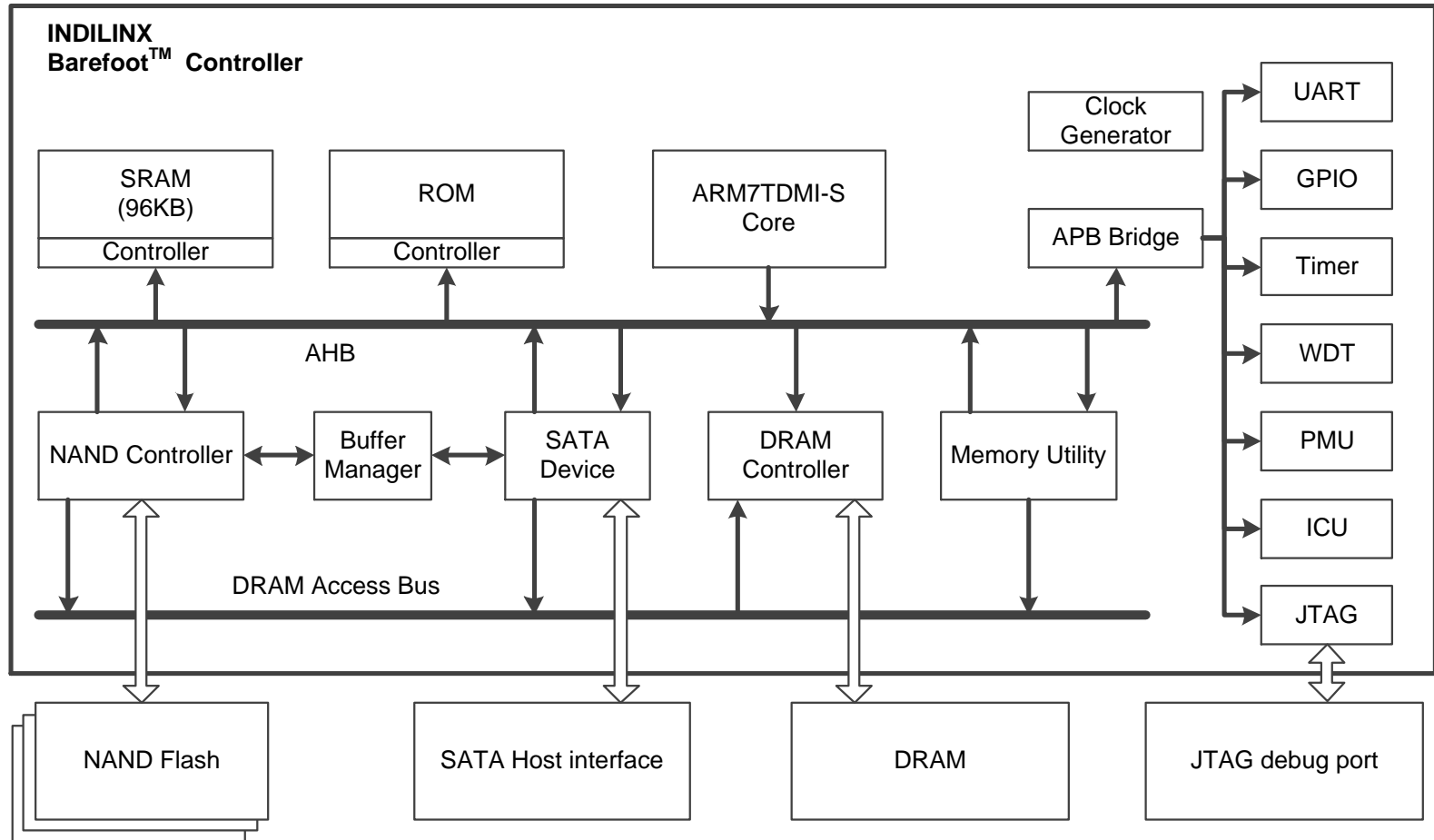
# The OpenSSD Project

- It is an initiative to promote **research and education** on the recent SSD technology
- Providing OpenSSD platforms on which open source SSD firmware can be developed

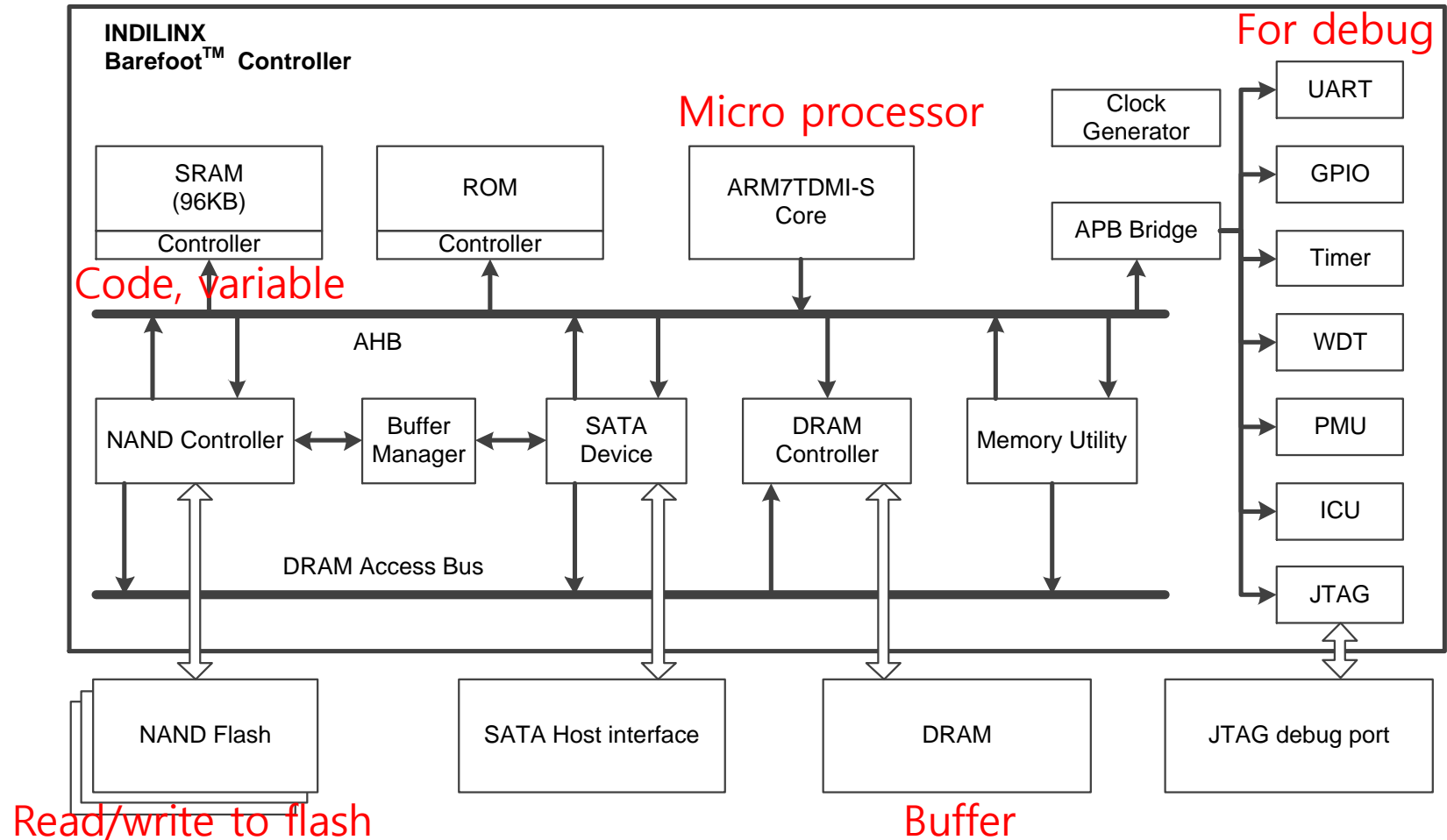
# Indilinx Jasmine Platform



# Hardware Architecture



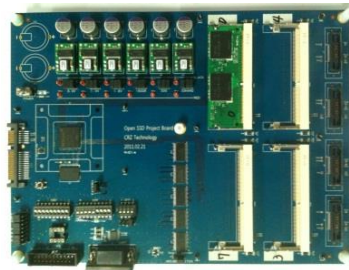
# Hardware Architecture



# Development Environment

# Development Environment

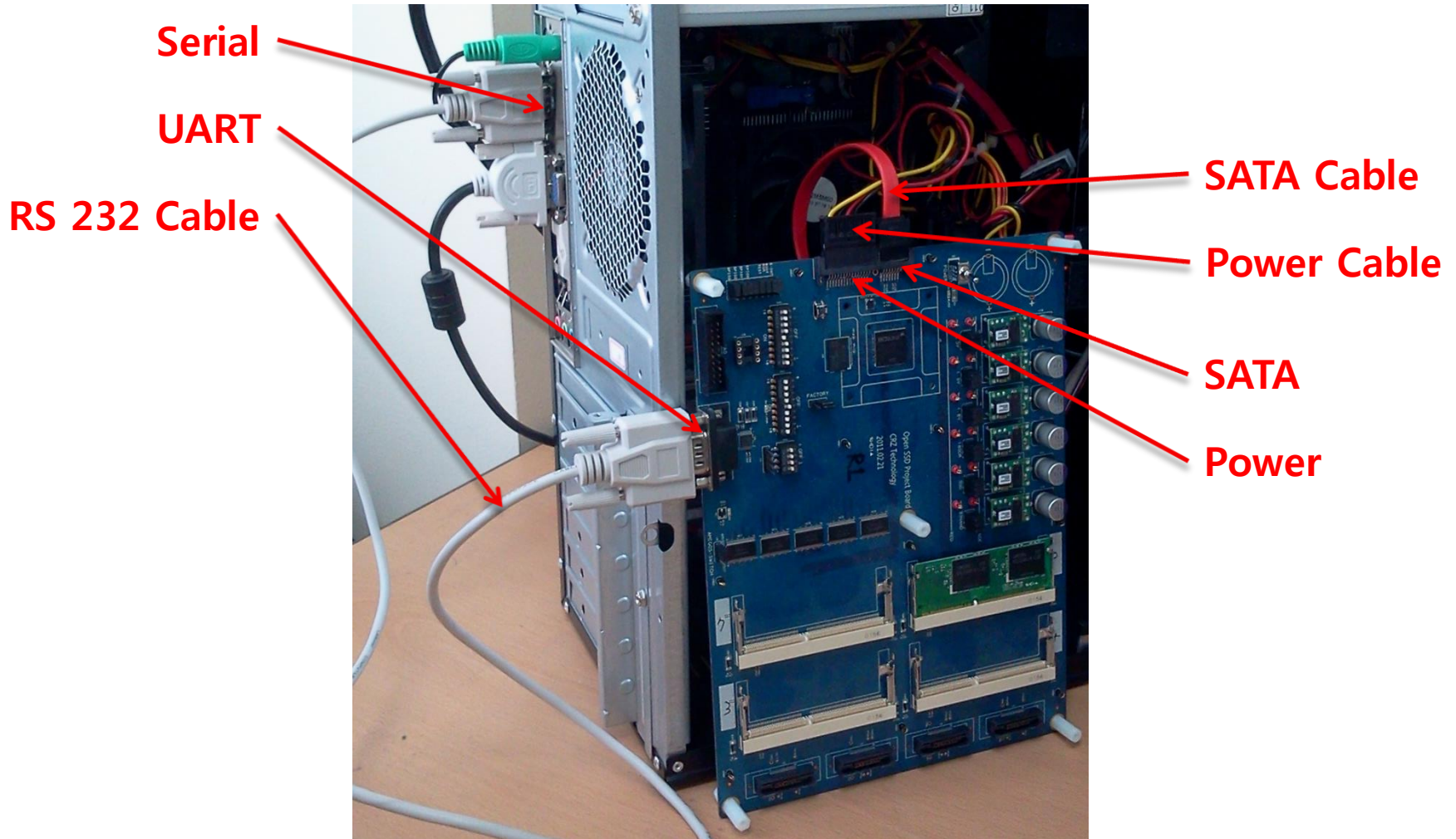
- Hardware Requirement



- Software Requirement

- Code Sourcery G++ Lite Edition for ARM EABI
- MS Visual Studio 2010
- MS Visual Studio Express Free Edition 2010
- Jasmine OpenSSD Firmware

# Hardware Setup





# Hardware Setup



**SATA to USB gender**



# Software Setup

- Code Sourcery G++ Lite Edition for ARM EABI
  - To build firmware binary (firmware.bin)
- MS Visual Studio 2010 & MS Visual Studio Express Free Edition 2010
  - To build the firmware installer (install.exe)
- Hyper Terminal
  - To debug firmware with serial communication
  - BAUD\_115200/8/N/1/X

# Firmware & Installer

- Download Jasmine Firmware
  - <http://www.openssd-project.org>
  - 1.1.0 Version
- Build firmware
  - > cd ./build\_gnu
  - > build.bat
- Build the firmware installer
  - Compile installer folder with Visual C++
  - Or, you can download from <http://csl.skku.edu/uploads/ICE3028S12/InstallerXP.zip>

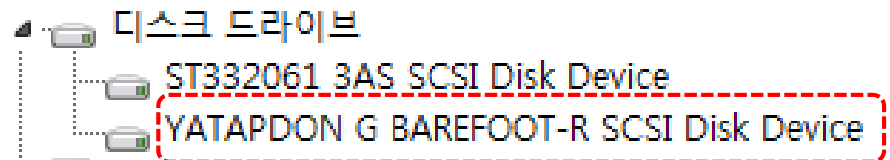
# Install Firmware

- Power-up Jasmine board as '*Factory Mode*'



Factory Mode

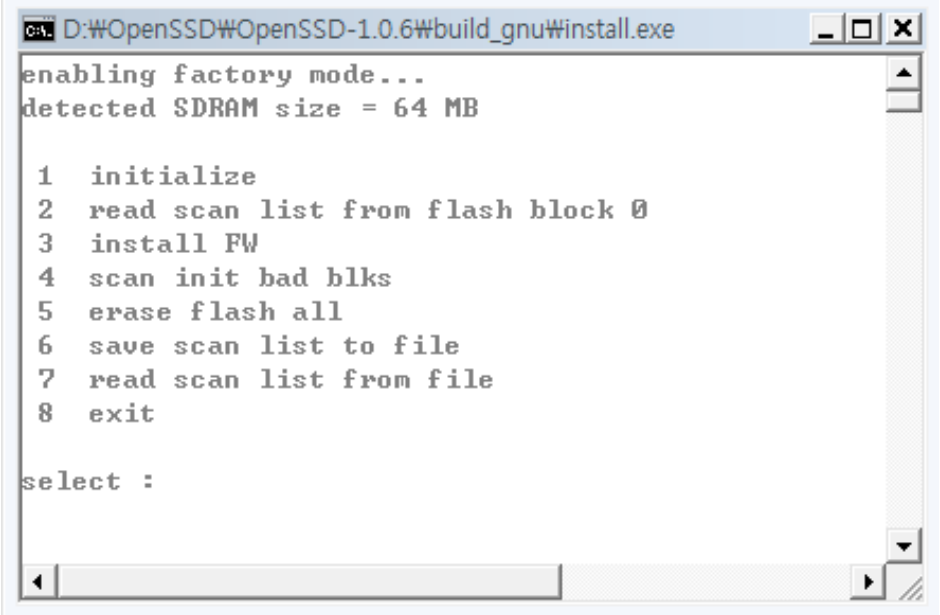
## Device Manager



- Run installer
  - > `cd ./build_gnu`
  - > `install.exe`

# Install Firmware

- Install for the first time
  - 1 -> 2 -> 6 -> 3
- Re-install
  - 1 -> 2 -> 3



```
D:\#OpenSSD#OpenSSD-1.0.6#build_gnu#install.exe
enabling factory mode...
detected SDRAM size = 64 MB

1 initialize
2 read scan list from flash block 0
3 install FW
4 scan init bad blks
5 erase flash all
6 save scan list to file
7 read scan list from file
8 exit

select :
```

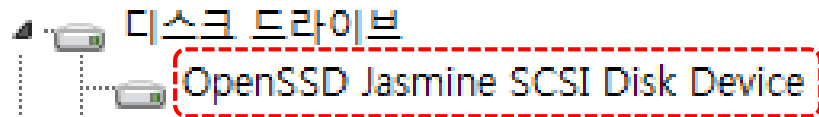
# Run Firmware

- **Power-down** Jasmine board
- **Power-up** Jasmine board as '*Normal Mode*'



Normal Mode  
(Default)

## Device Manager



- Now, Jasmine is ready to process SATA command

# Technical Resource

- Download resources from OpenSSD Wiki
  - <http://www.openssd-project.org>
  - Technical Reference Manual
  - FTL Developer's Guide
  - Jasmine Firmware

# Contact TA

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Any Questions?