National Institute of Information and Communications Technology

# Towards Programmable Storage Service Infrastructure

Eiji Kawai

NICT

# Background

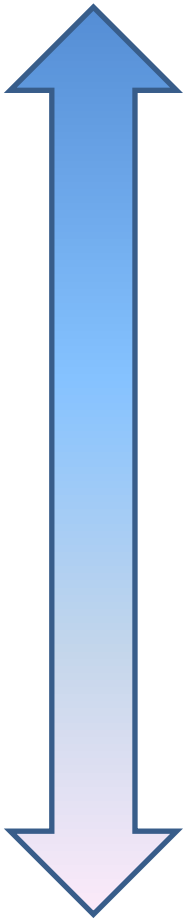
- Many storage/FS technologies have been developed with specific aims
  - Space efficiency, Scalability, Manageability, Security, etc
- Current trend to high scalability brings new services with large-scale data processing
  - E.g., what can we do with GFS?
- Issue: How can we use those new technologies for our services?
  - They are often not optimal for a specific service
  - A much effort is required to organize and configure them

# Goal

- Storage infrastructure with
  - high performance for a variety of workloads,
  - flexible performance-control mechanisms,
  - and low management cost

# Layered Structure of Storage Technologies

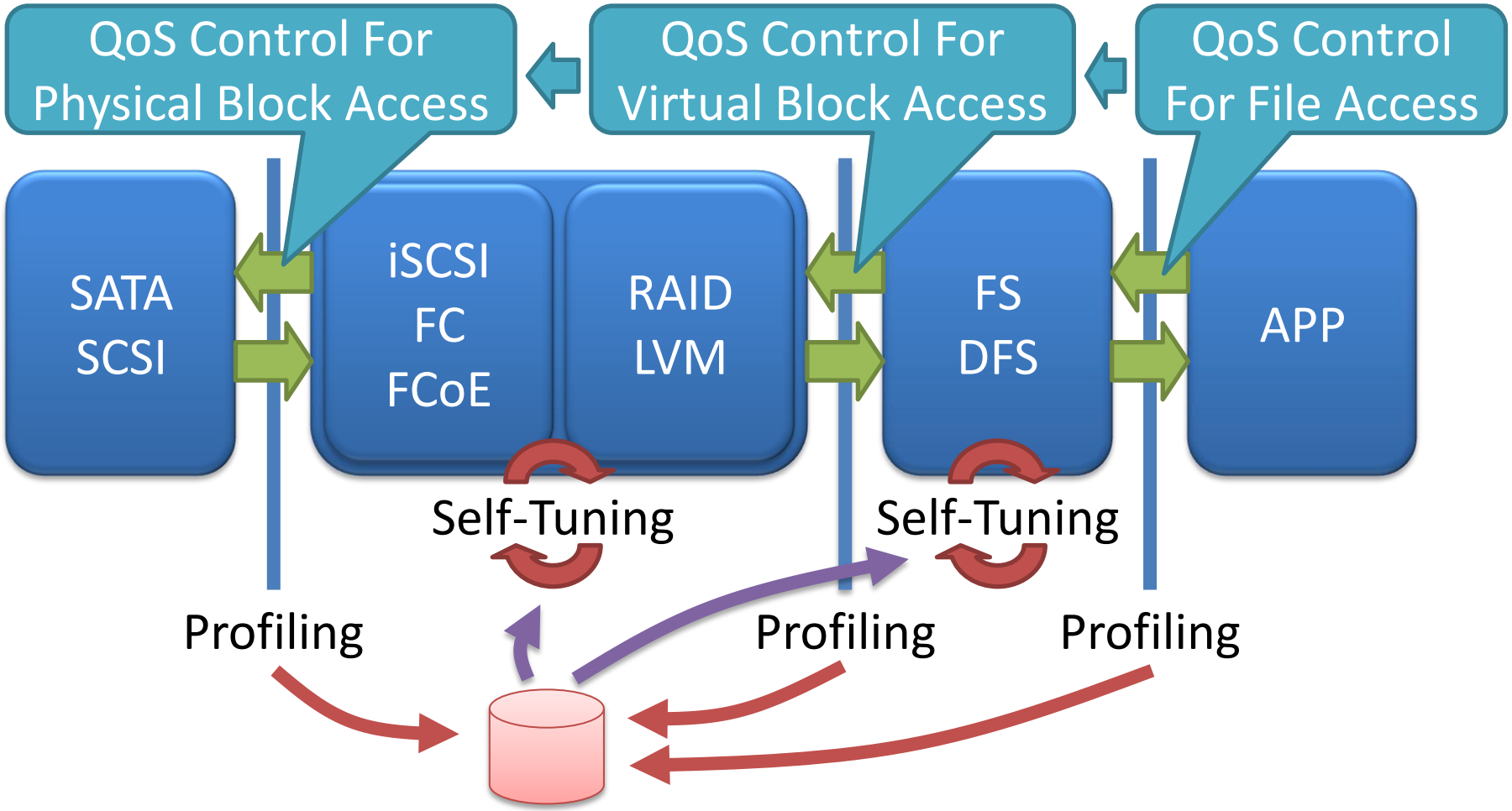
Operating System



Storage Device

- Virtualization
  - File systems (VFS), Distributed file systems
- Aggregation
  - RAID, LVM
- Networking
  - FC, iSCSI, FCoE
- Bus architecture
  - ATA, SCSI, USB

# Self-Tuning Storage Framework



# Connecting SAN and NwGN

- NwGN will provide flexible control framework on networking
- Opportunity for more efficient QoS control for storage infrastructure

# We just started the project

- Joint work with other projects started
  - Kidawara-san, Zetsu-san, Murakami-san, …
- Comments, questions, collaborations are welcome

Thank you