Dynamic Data Structures for Non-Volatile RAM

Master Project 2016, EPIC

01 Feb 2016

Status Quo

- High-Performance Applications profit from fast DRAM

- But DRAM is expensive and limited in capacity
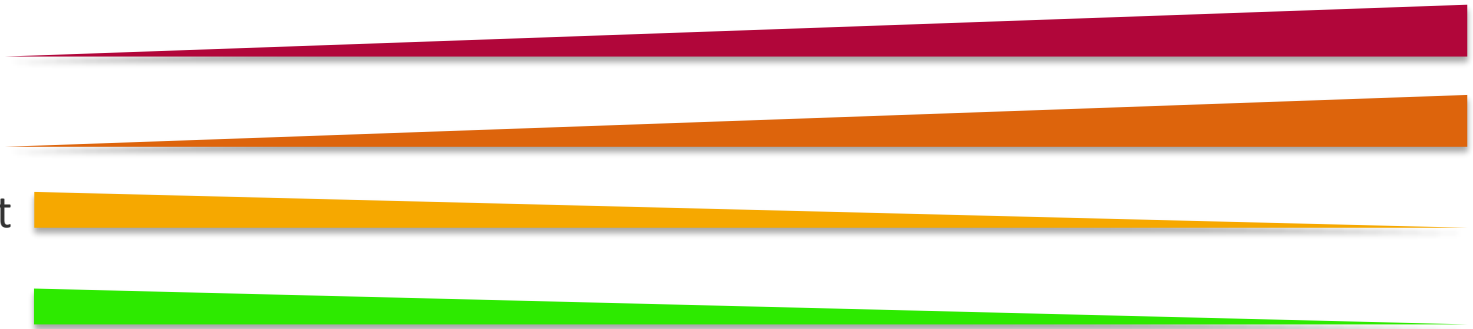
- Today, people buy bigger systems to use more DRAM

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Traditional Storage Hierarchy

DRAM

SSD

HDD

Latency

Capacity

Throughput

Price

What is NVRAM?

- New technology, announced for 2016/17 (e.g., 3D XPoint)
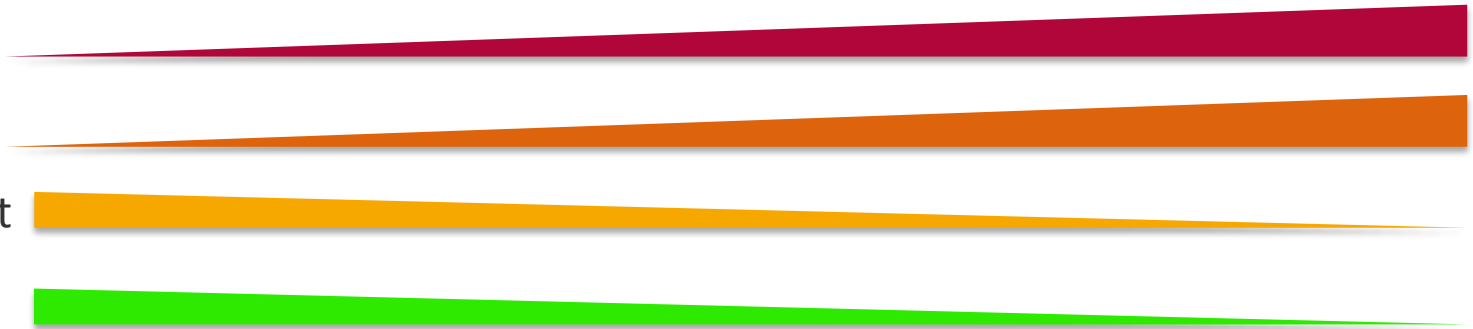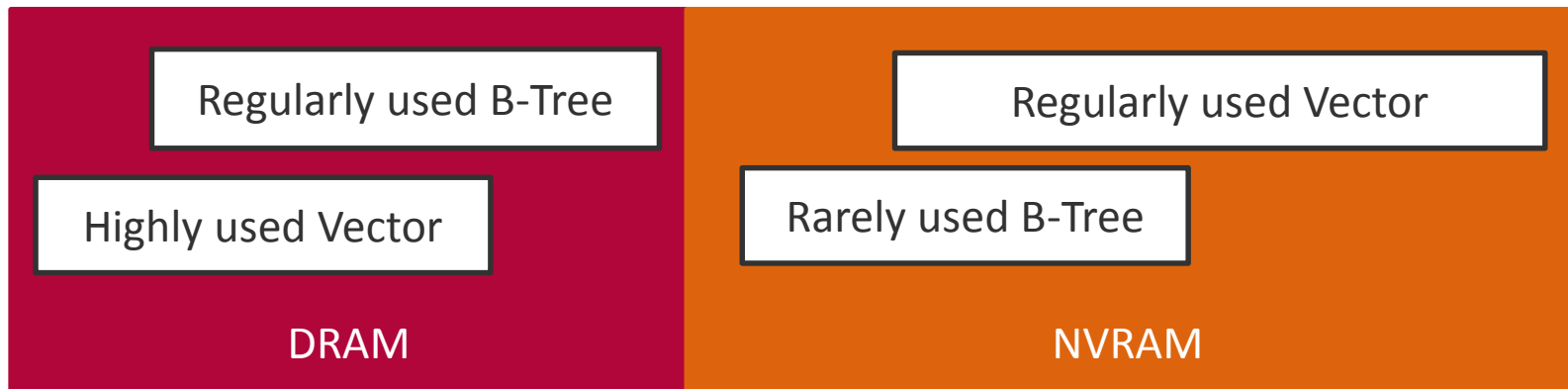
| DRAM | NVRAM | SSD | HDD |

Latency

Capacity

Throughput

Price

Research Question

- In a system with fast, but limited DRAM and large NVRAM, how might we profile accesses and place data based on their access characteristics to optimize for performance?

DRAM	NVRAM
Regularly used B-Tree	Regularly used Vector
Highly used Vector	Rarely used B-Tree

Project Outline

- Develop a general-purpose C++ library that transparently manages different data structures

- For now, simulate NVRAM with a hardware emulator

- Technologies: C++ with templates

- Optional: Database Knowledge

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Contact

- For more details see **http://tinyurl.com/epicmp**

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- Informational Meeting: Thursday, 11.02.2016, 15:15
                        Villa Conference Room (V-2.16)