

15-440/640: Distributed Systems

Spring 2015

People

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Course Resources

Web Page: <http://www.cs.cmu.edu/~15-440>

AFS area: </afs/andrew/course/15/440/> (often abbreviated as “~440”)

Class notes: in AFS at [~440/classnotes](#)

- note README with usage guidelines
- these are for your personal use only, not for distribution

Use Piazza for ALL class-related communications

- <https://piazza.com/cmu/spring2015/15440/home>

All students in the course are expected to adhere to policies on web page, currently

- CMU Policy on Academic Integrity
- Collaboration guidelines
- Piazza policy
- [no video or audio recordings](#)
- other policies that may be added as the course proceeds
- if in doubt, ask one of the instructors

What Is This Course About?

1980-2005



Coda File System



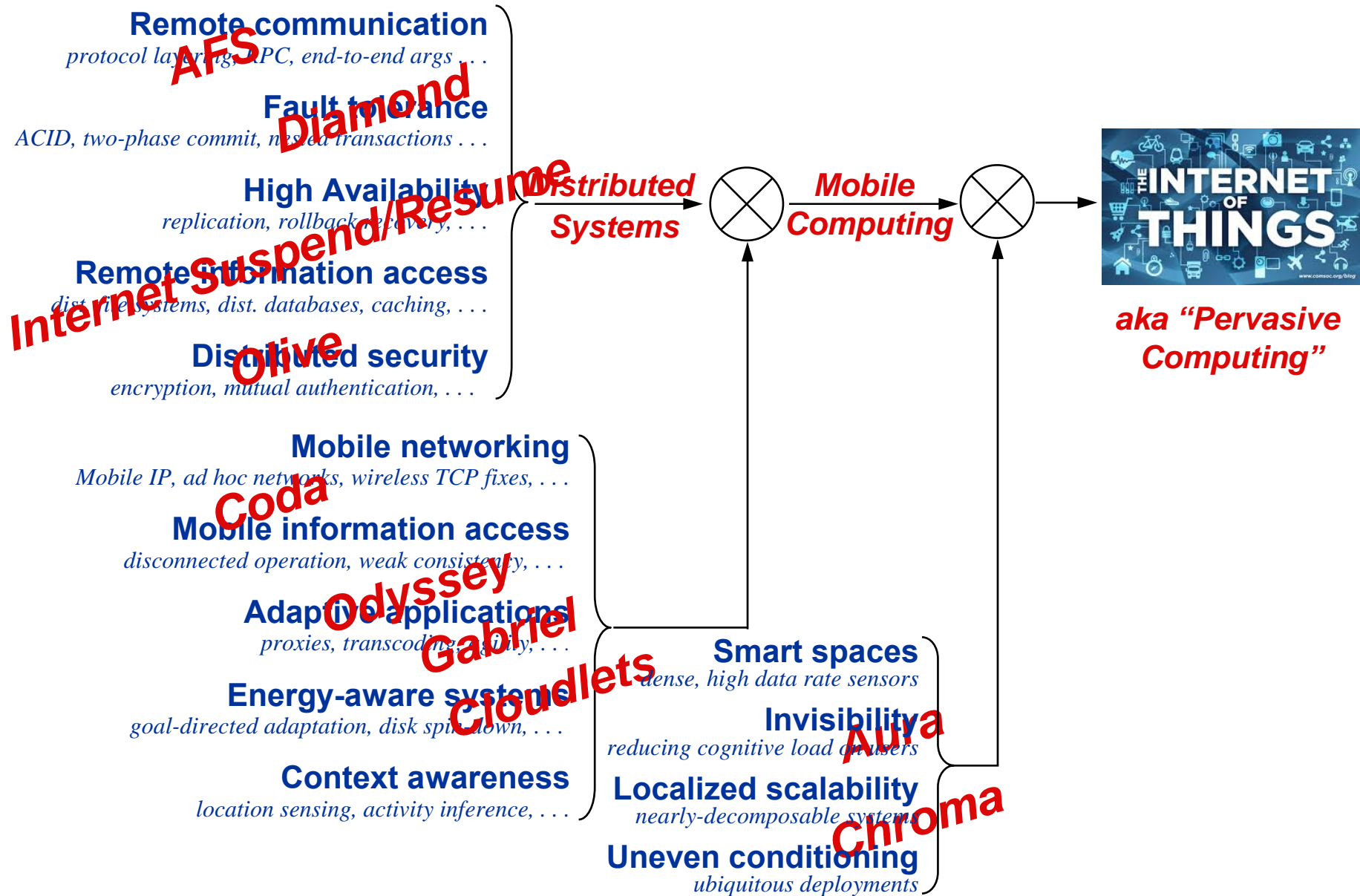
Today



2025



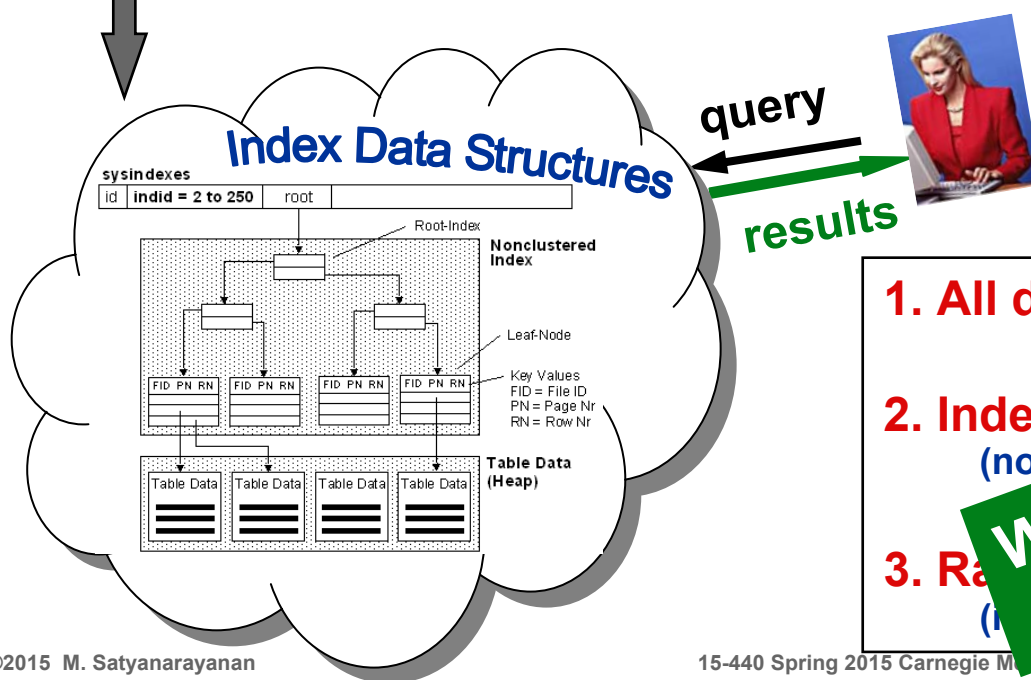
Evolution of Knowledge in Distributed Systems



Search Engines Today



**Data
Intensive
Computing
in Large
Data Centers**



1. All data fetched to data center
 2. Indexing fully processed
 3. Raw data processed after indexing
- Works great for text data on Internet**
- (no human bodies all search knowledge)

Fails for Deep Non-Text Search

Queries and result relevance are highly **context-sensitive**

- e.g. experts and non-experts “see” different things in same image
- e.g. time and events force re-interpretation of old data

Indexing \equiv **context-free** pre-computation

Example 1:



What an expert sees in this picture:

*“So far, the endangered Bakersfield cactus, *Opuntia basilaris* var. *treleasei*, has not been attacked by the cactus moth, which is working its way from Florida across the South. If the moth reaches California, this rare cactus will be vulnerable to predation by its larvae, as are all prickly pear species. Photo by Teresa Prendusi.”*

(Source: <http://www.fs.fed.us/wildflowers/rareplants/whyare/index.shtml>)

Example 2

New Jersey family's picture catches theft in the making

By **Jamie Guzzardo**, CNN
August 25, 2010 9:49 a.m. EDT

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The picture shows a man allegedly taking John Myers' bag as his family gets photographed. Police later arrested a suspect.

STORY HIGHLIGHTS

- A New Jersey man snapped a photo of his family during a trip to Wisconsin
- The photo also caught the image of someone allegedly making off with the man's bag
- Among other valuables, the man's wallet and car keys were in the bag
- Wisconsin Capitol Police quickly apprehended a suspect and returned the bag

Read more on the story on CNN affiliate [WISC-TV](#) in Madison, Wisconsin.

(CNN) -- In today's technology-laden society, hearing of crimes solved or cold cases cracked with state-of-the-art tech tools has become commonplace. But for one New Jersey family all it took to catch an alleged thief was a camera and a little luck.

John Myers and his family from Bloomfield, New Jersey, were visiting Madison, Wisconsin, to attend a friend's wedding Saturday at the state Capitol.

According to Myers, the family went outside after the ceremony to take pictures. He decided it would be a good idea to take a family

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Example 3

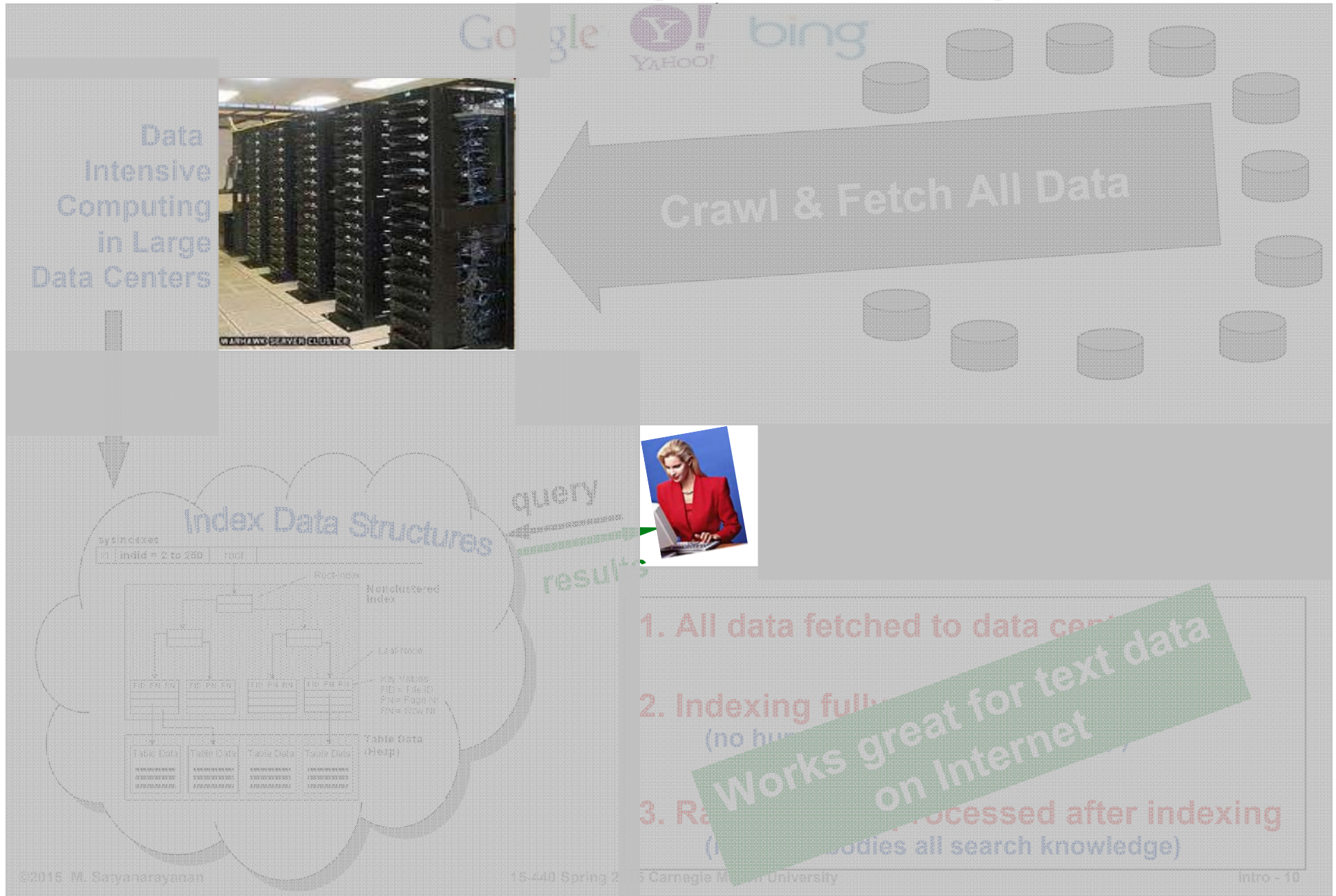


“Tuesday, September 11, 2001, dawned temperate and nearly cloudless in the eastern United States. Millions of men and women readied themselves for work. ...

... Among the travelers were Mohamed Atta and Abdulaziz Alomari, who arrived at the airport in Portland, Maine.”

(Source: The 9/11 Commission Report, Chapter 1)

Search Engines Today



Olive Demo?