Warcbase: Building a Scalable Web Archiving Platform on HBase and Hadoop

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When does an event become "history"?

Source: Wikipedia (Opposition to United States involvement in the Vietnam War)

When does an event become “history”?

~20-30 years later

The history of the 1960s were written in the 1980s!

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> “This scandal was brought to you by the digital revolution. That meant we could access all the information we wanted, when we wanted it, anytime, anywhere, and when the story broke in January 1998, it broke online. It was the first time the traditional news was usurped by the Internet for a major news story, a click that reverberated around the world…
>
> … it was before social media, but people could still comment online, email stories, and, of course, email cruel jokes. News sources plastered photos of me all over to sell newspapers, banner ads online, and to keep people tuned to the TV.”

Monica Lewinsky – The Price of Shame
TED Talk, March 2015

So, where are those web pages now?

When does an event become “history”?

~20-30 years later

Historians are getting ready to write about the 90s…

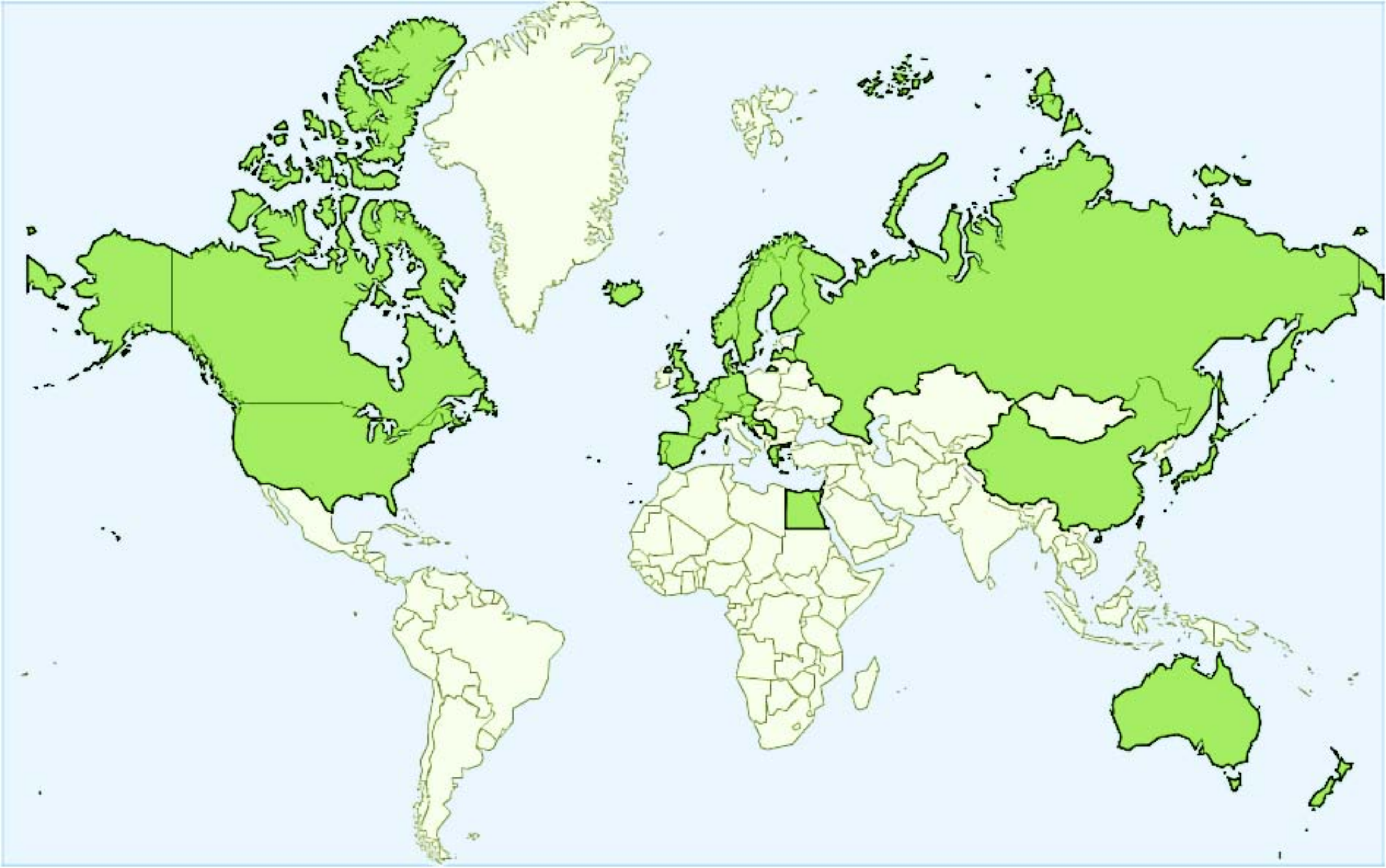
Right about now!

Can you write a history of the 1990s without the web?

So, where are those web pages now?

ARCHIVE
INTERNET ARCHIVE
INTER
SUPERMICR
SUPERMICR

And beyond…



70+ web archiving efforts worldwide!

Can you write a history of the 1990s without the web?

So, where are those web pages now?
Great, let’s get to work…

Users can’t do much with current web archives

Hard to develop tools for non-existent needs

Source: http://www.flickr.com/photos/cheryne/8417457803/

We need *deep* collaborations between:

Users (e.g., archivists, journalists, historians, digital humanists, etc.)

Tool builders (me and my colleagues)

Goal: tools to support exploration and discovery in web archives

Beyond browsing…
Beyond searching…

Source: http://waterloocyclingclub.ca/wp-content/uploads/2013/05/Help-Wanted-Sign.jpg

What would a web archiving platform built on modern big data infrastructure look like?

Source: Google

Petabox by Internet Archive;
NAS, SAN, etc. by others

OpenWayback:
monolithic Tomcat application

- Scalable storage of archived data
- Efficient random access
- Scalable processing and analytics
- Scalable storage and access of derived data

Some work by the Internet Archive,
Common Crawl, and others…

Ad hoc storage in
flat text WAT files

Desiderata

HDFS Scalable storage of archived data

Efficient random access HBase

Scalable processing and analytics Hadoop

Scalable storage and access of derived data HBase

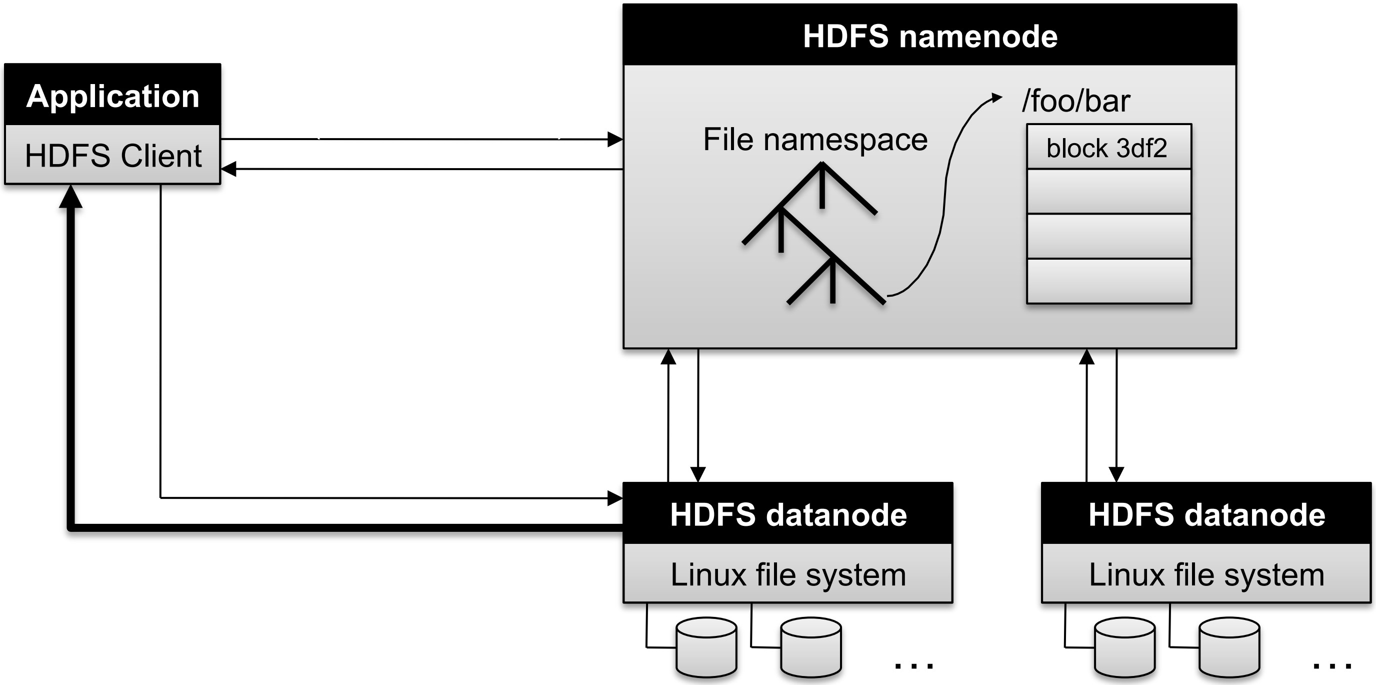
Existing tools aren't adequate!

hadoop HDFS

Open source implementation of the Google File System

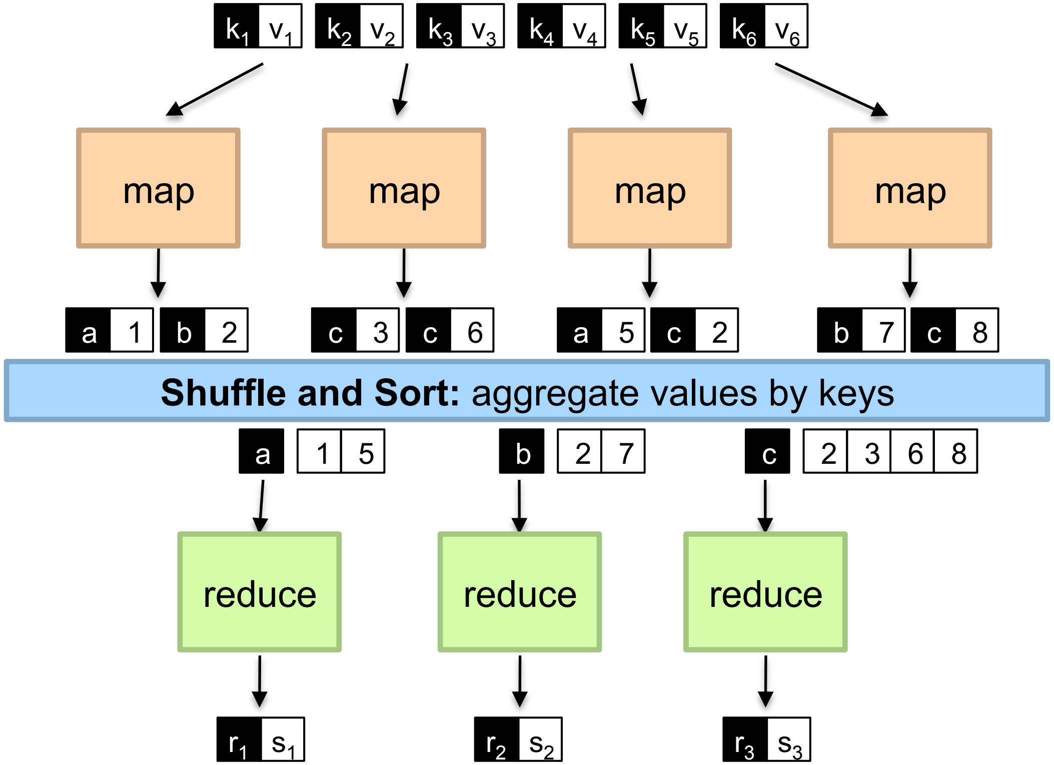
Stores data blocks across commodity servers

Scales to 100s of PBs of data



Open source implementation of Google's framework

Suitable for batch processing on HDFS data



APACHE HBASE

~ Google’s Bigtable

A collection of tables, each of which represents a sparse, distributed, persistent multidimensional sorted map

Source: Bonaldo Big Table by Alain Gilles

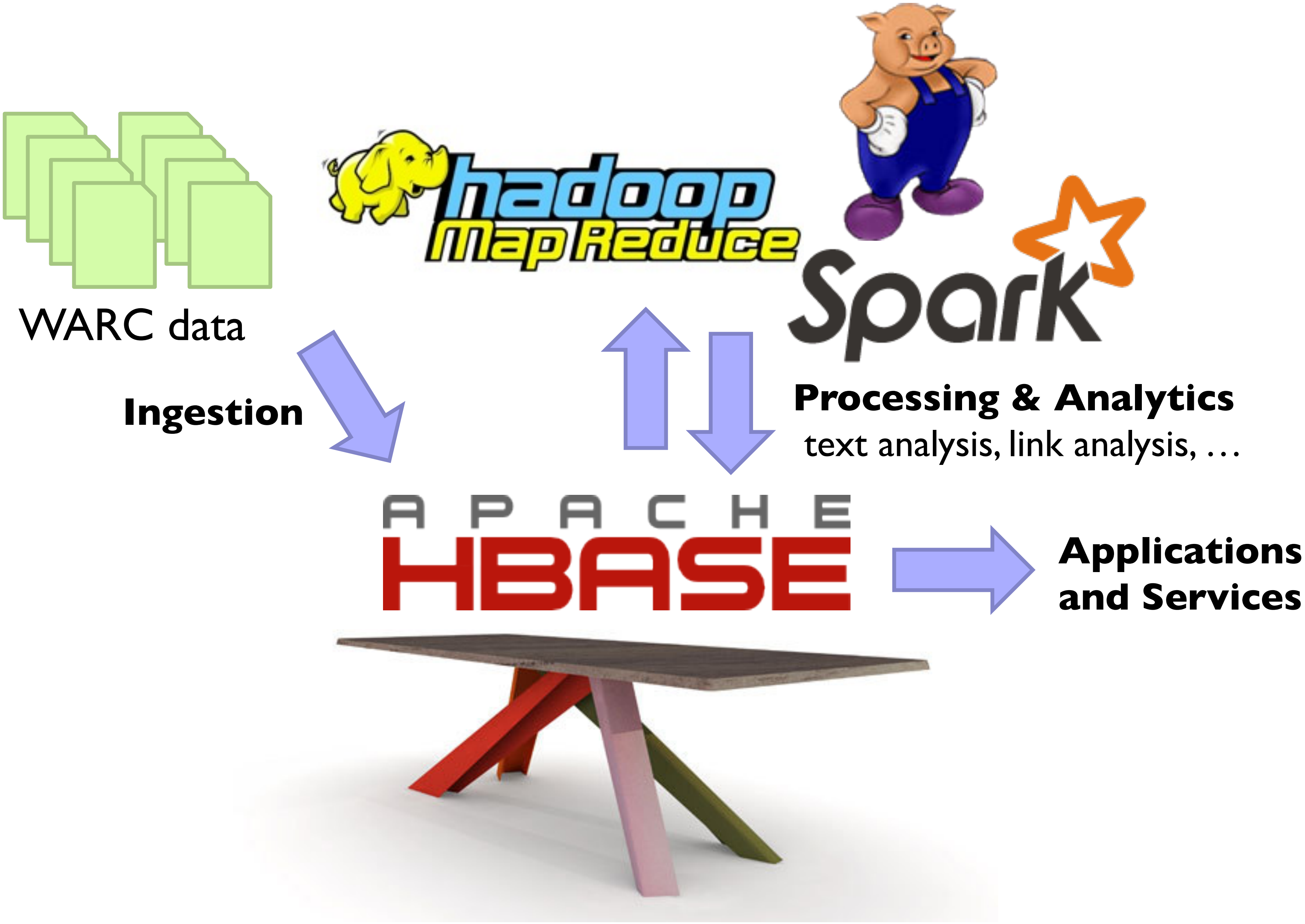
Warcbase

An open-source platform for managing web archives built on hadoop and APACHE HBASE

`http://warcbase.org/`

Source: Wikipedia (Archive)

The Andrew W. Mellon Foundation



WARC data

Ingestion

Processing & Analytics

text analysis, link analysis, …

Applications and Services

Warcbase: here.

Warcbase: here.

Warcbase in a ~~box~~ cylinder

Warcbase: here.
Portable Warcbase

What's the big deal?

Historians probably can't afford Hadoop clusters…

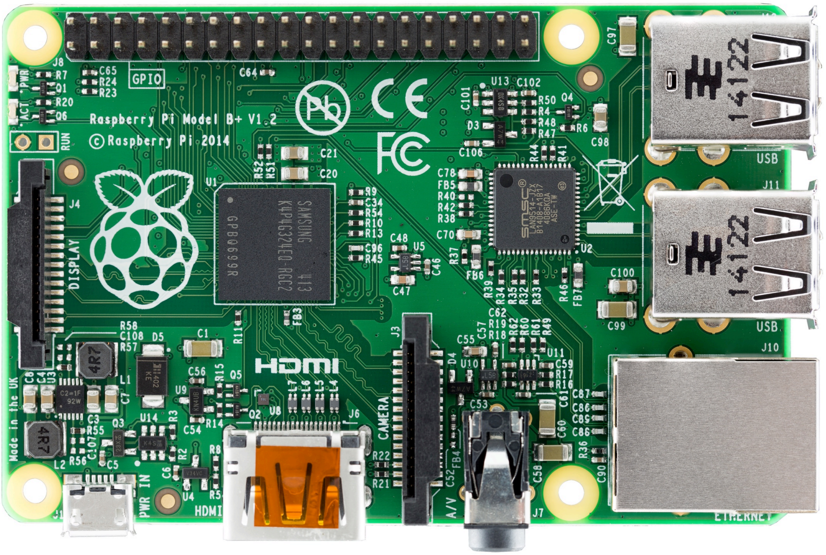
But they can probably afford a Mac Pro or Macbook

How will this change historical scholarship?

Visual graph analysis on longitudinal data, select subsets for further textual analysis

Drill down to examine individual pages

… all on your desktop/laptop!



Warcbase: here.
The price of three cocktails

What's the big deal?

Store every page you've ever visited in your pocket!

Throw in search, lightweight analytics, …

What will you do with the web in your pocket?

How will this change how you interact with the web?

So what can you do with Warcbase?