Project GHOST

The CDC's Global Hepatitis Outbreak & Surveillance Technology

Lovissa Winyoto
Jeongsoo Kim
Raghav Kaul
Ernest Lai
Sarthak Mohapatra

Outline

- What is Hepatitis C?
- Overview of GHOST
- Summary of Feasibility Report
- Summary of Statement of Work
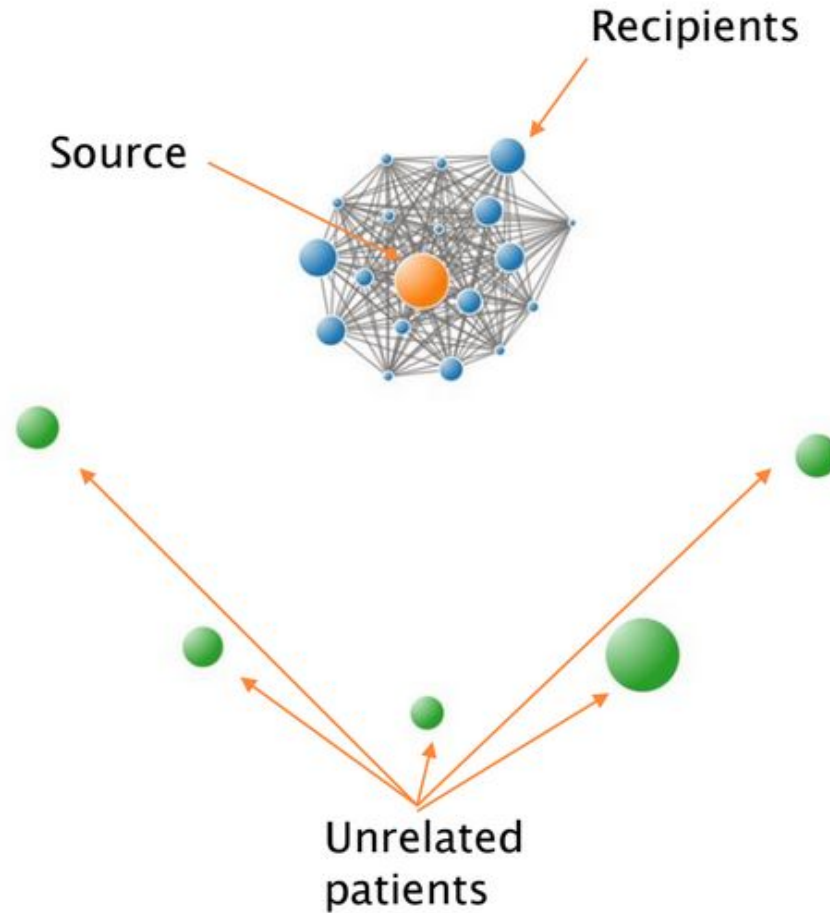- Prototype Demo
- Summary
- Reflection

Motivation

3 FACTS ABOUT HEPATITIS C

1 Hepatitis C is a **LEADING CAUSE OF LIVER CANCER.**

2 Millions of Americans have hepatitis C, but **MOST DON'T KNOW IT.**

3 **TREATMENTS CAN ELIMINATE** the hepatitis C virus.
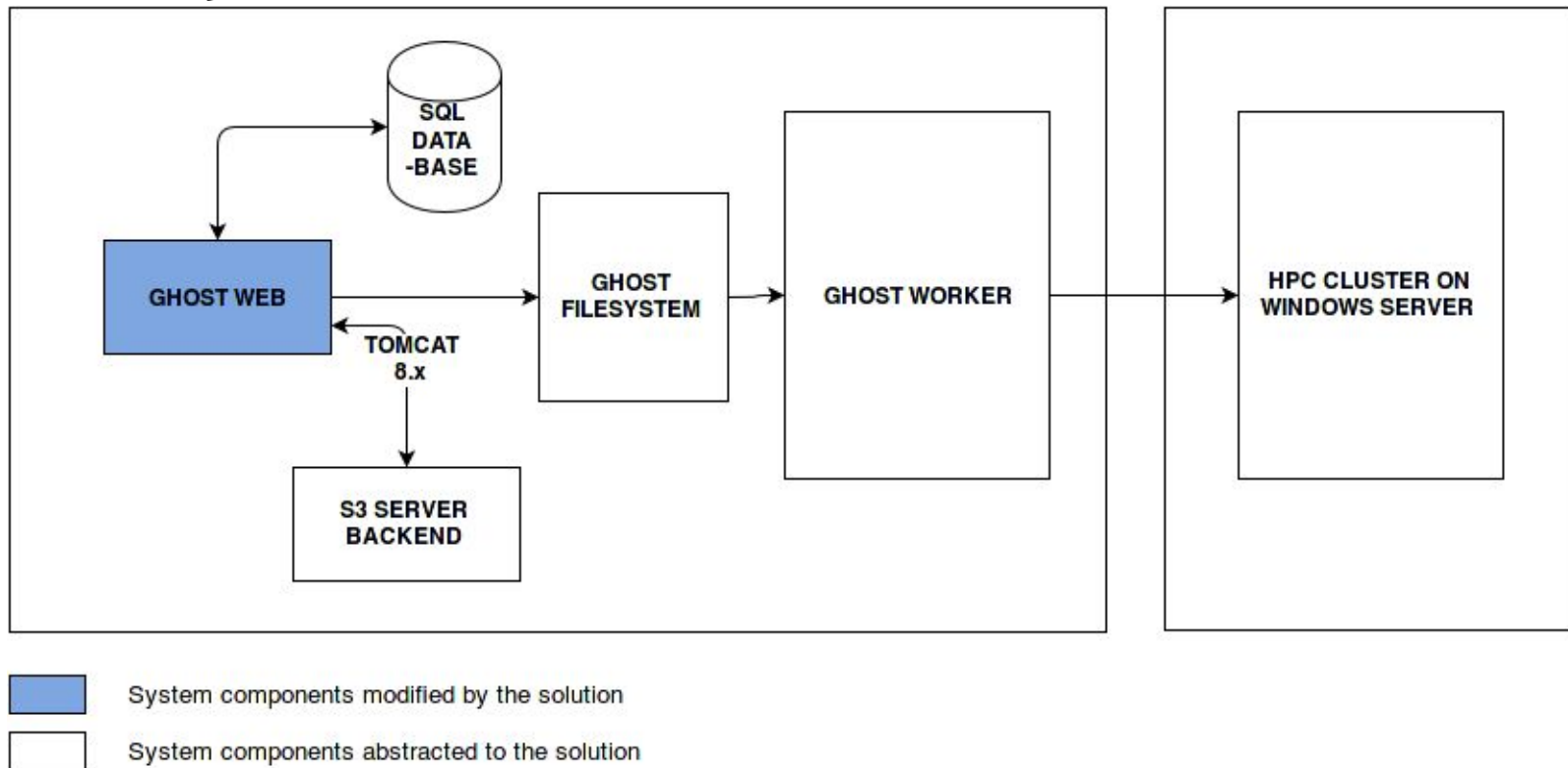
CDC

Motivation

Recipients

Source

Unrelated patients

Current system (overview)

Standard experimental guidelines

Standard analytical procedure

Not linked

Transmission cluster

Source?

Standard and meaningful output

Global Hepatitis Outbreak Surveillance Technology

team casper

CDC CENTERS FOR DISEASE CONTROL AND PREVENTION

Current system (architecture)

team casper

SQL DATA-BASE

GHOST WEB

TOMCAT 8.x

S3 SERVER BACKEND

GHOST FILESYSTEM

GHOST WORKER

HPC CLUSTER ON WINDOWS SERVER

System components modified by the solution

System components abstracted to the solution

Feasibility Report (Alternatives, criteria)

Alternatives

- D3 (JavaScript) vs Flare (Flash)

Criteria

- Rendering speed
- Budget
- Maintainability

Feasibility Report (Results)

	D3.js (existing system)	Flare/Prefuse (new system)
Rendering speed	60 fps (n<10) to 10 fps (n>1000)	Fully controllable at runtime
Loading Speed	Loads up to 3 times faster than Flare	Loads slowly (have to load a plugin)
Works with JSON?	Yes	Yes
Free & Open Source?	Yes	Yes
Development Support	StackOverflow comments: ~16k for D3, ~1k for NVD3 (a D3 add-on), ~962k for Javascript	StackOverflow comments: ~30 for Flare & Prefuse, ~47k for Actionscript

team casper

Statement of Work: Solution (Node Visualization)

Data Visualization

- Threshold bar
- Selection schema
- Toggle mode
- Download
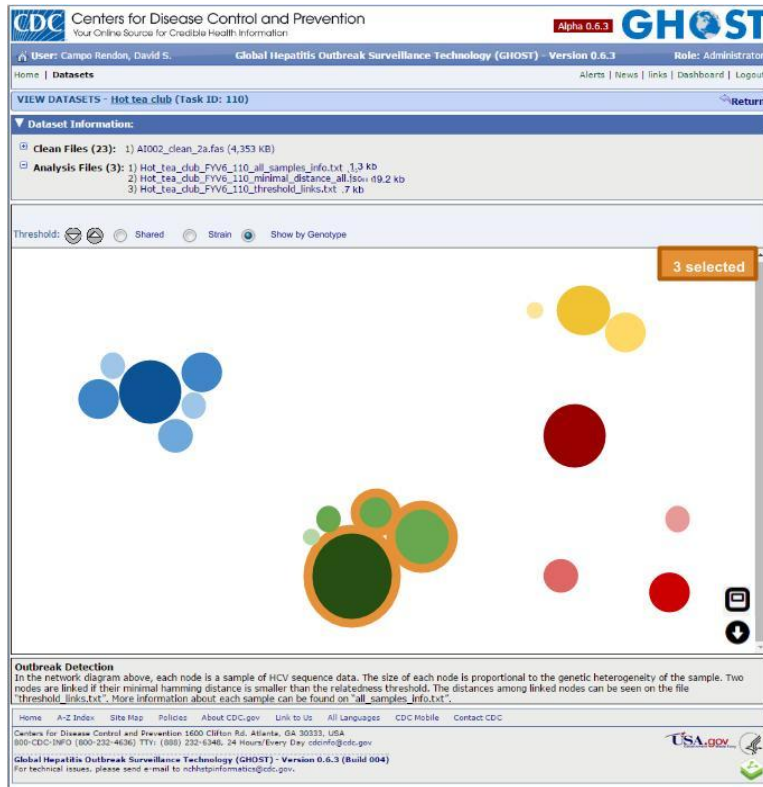
Node Visualization
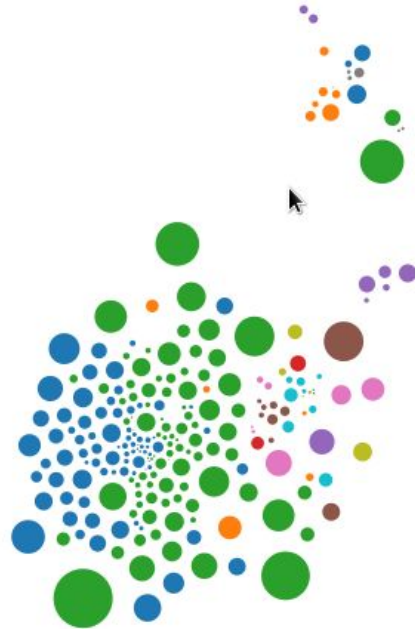
Statement of Work: Solution (Landing page)

Work: Solution (Dashboard)
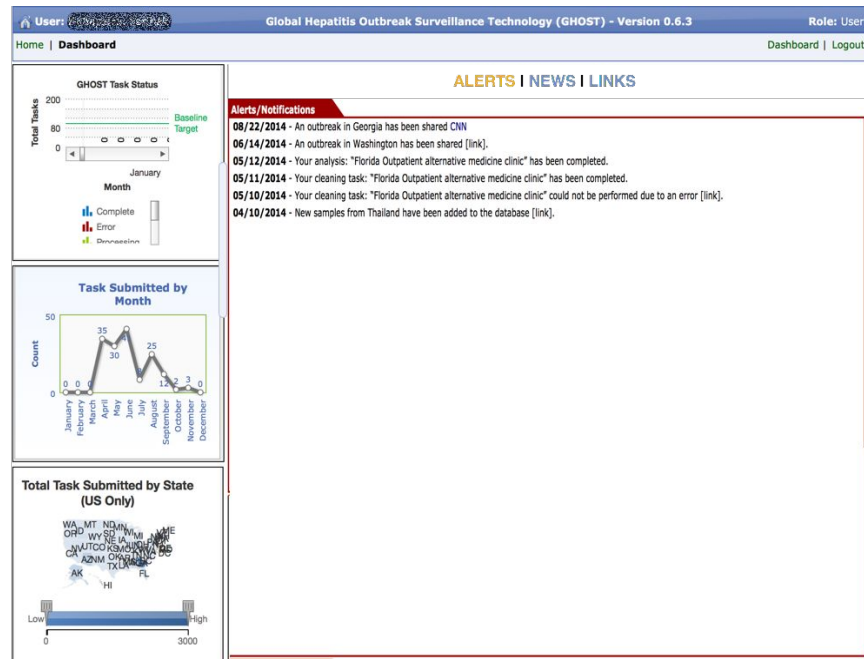
Statement of Work: Schedule

Releases

- Node-link visualization
- Landing page
- Dashboard
- Testing and documentation

Summary

- GHOST is a system provided by the CDC for detections of Hepatitis C outbreaks

- D3.js is the selected framework for its' rendering speed and ease of maintainability

- Landing page, visualizations, and dashboard components will be modified

Reflection

Learned
- Formal documentation
- Client communication

Improvement
For next semester

Reflection

Learned
Improvement
- Earlier Prototyping
- Aligned Expectations
For next semester

Reflection

Learned
Improvement
For next semester

- Scheduling resolutions
- Client communication

Questions?