A visualization tool for geographic information of NTP servers

Project Update

Jonatan Schroeder

University of British Columbia

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Outline

Domain Description

- NTP - Network Time Protocol
- Self-organized network
- Frequent exchange of messages

NTP Survey

- NTP survey in 2005
- Data query, collection and analysis
- http://www.ntpsurvey.arauc.br
- 1,290,819 unique addresses found
- 147,251 complete responses

Available data

- For each server:
    - IP address
    - System information
    - *Stratum* and source of time information
    - Delay, dispersion, jitter
    - Clock stability
- For each association:
    - Source and destination addresses
    - *Stratum*
   - Delay, dispersion, jitter, offset

Tasks

- Overall visualization of the geographic topology
- Deficient NTP servers identification
- Geographic topology and deficient NTP servers identification in a specific geographic region
- Geographic topology and deficient NTP servers identification in a specific IP range
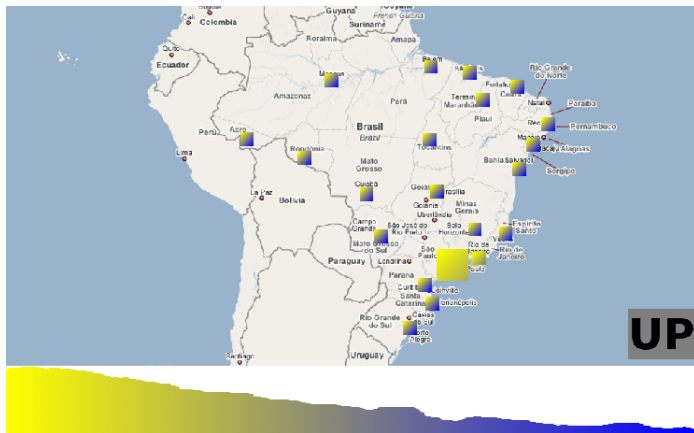
Main Window

- Map of the region in focus
- Rectangle for each subregion
    - Colour: variable in focus (delay, dispersion, etc.)
    - Size: number of servers
- Bottom: Histogram
    - Colour and X-axis: variable in focus
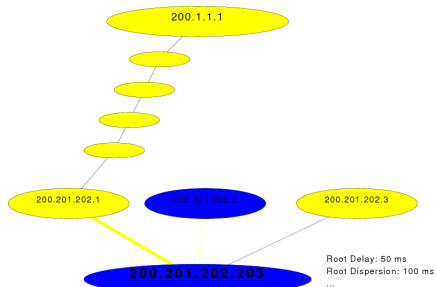   - Y-axis: number of servers

Main Window
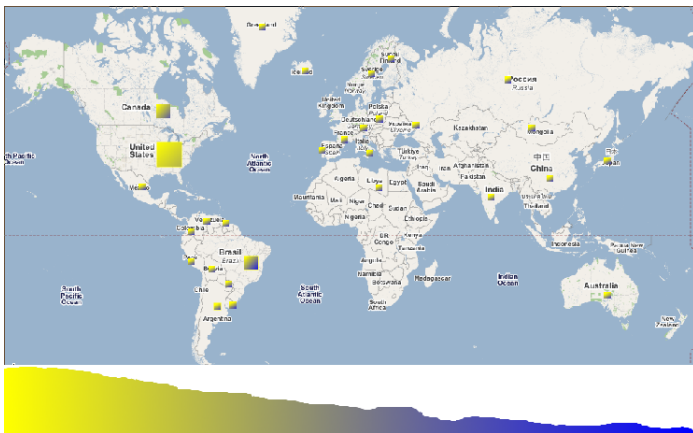
Main Window

Detailed View of a Server

- Sources of time information
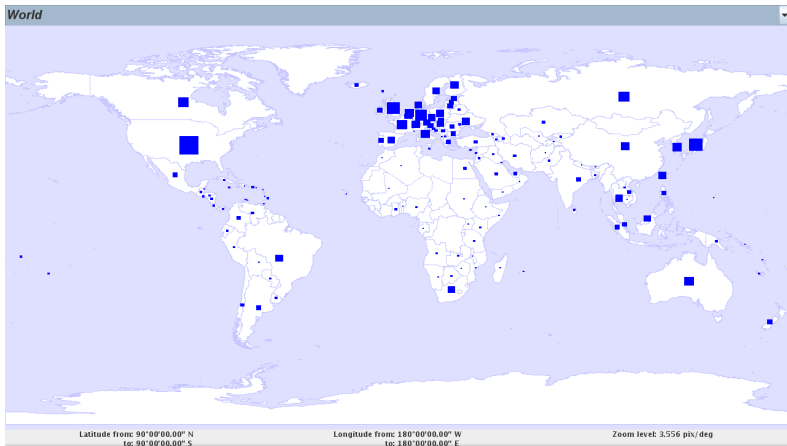- Focus on used source

Implementation Approach

- Java2D, Swing
- Maps using GIS boundary information
- Location using GeoLiteCity

What is done

- Geographic visualization
- Zoom and pan with animation
- Organization of NTP servers data
- Datafile with NTP servers data and location information

Main Window - in progress

Next steps

- Color-coding of regions
- Grouping data per continent (at least for Europe)
- Labeling
- Histogram
- Improvement in linking and representation of servers per region
- Detailed view of a server
- Range selection
- Some processing time issues

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