Georgia Tech College of Computing

UNIVERSITY OF MICHIGAN

pundit.gatech.edu

Pythia Network Diagnosis Infrastructure (PuNDIT)

PIs: Shawn McKee (smckee@umich.edu) and Constantine Dovrolis (dovrolis@cc.gatech.edu)
Members: Jorge Batista and Danny Lee

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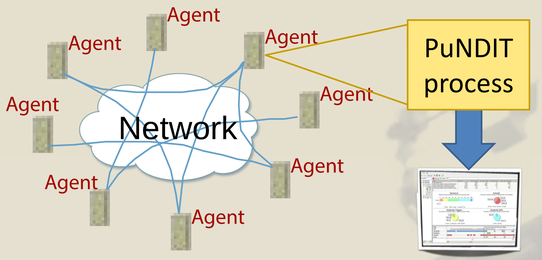
Problem Statement

- Monitoring of the network infrastructure is key to efficient distributed collaborations
- Currently, intermittent network problems are manually identified
  - operator dashboards
  - user trouble tickets
- PuNDIT aims to automate the detection and localization of network problems

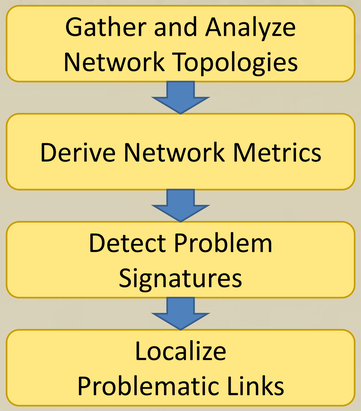
Objectives

- Key idea: Convert complex network metrics into easily understood diagnoses in an automated way
- Integrate with the de-facto standard perfSONAR network measurement infrastructure

- Work with paris-traceroute developers to create accurate localization in perfSONAR
- PuNDIT aims to:
  - Identify short-term events
  - Produce results in near real time
  - Scale to large number of agents
  - Visualize useful summaries



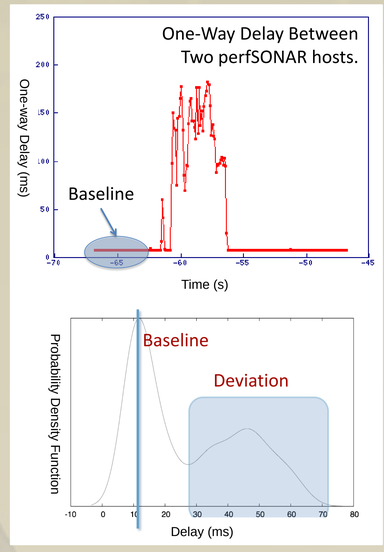
How PuNDIT Works



- Uses a lightweight process on each perfSONAR agent for detection
- Uses a central server for problem event repository and for localization algorithm

Detection

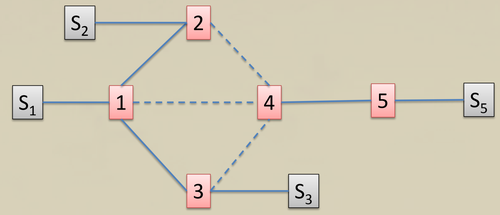
- Find significant deviations from the baseline for loss, latency and reordering



Localization

- Uses Range (latency) and Boolean Tomography (loss, reordering)

Example of Range Tomography:

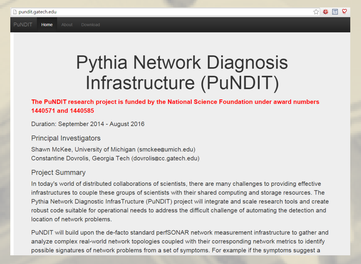


- Measured lossy links:
  - 15% loss between (1,5)
  - 5% between (2,5)
  - 7% between (3,5)
- Plausible solution:
  - Link (4,5) has loss rate [5%-7%]
  - Link (1,4) has loss rate [8%-10%]

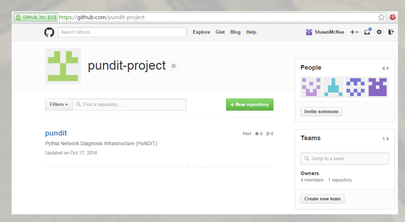
Current Progress

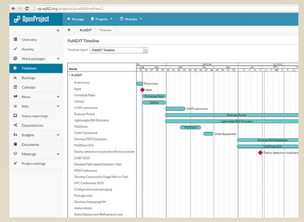
- New project that started in September 2014
- Set up the PuNDIT testbed with perfSONAR nodes at seven sites spanning the country
  - Allows us to test our prototype versions in realistic conditions
- PuNDIT testbed participants:

- To document and describe our project, we have setup a PuNDIT website at: http://pundit.gatech.edu/



- PuNDIT code and documentation is hosted on GitHub: https://github.com/pundit-project





- Development is underway, managed using OpenProject
- PuNDIT prototyping infrastructure using VMware:
  - Two test VMs running perfSONAR 3.4 for agent development
- Prototype central PuNDIT server instantiated as a VM
  - Gathers PuNDIT agent data from our deployments
  - Used to estimate the required hardware profile needed for a future PuNDIT production server