2016 SUMMER INTERNSHIP @Google
Rafael Lourenço
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NetLab Friday Group Meeting
(all info in this presentation is publicly available)
• Some products are handled by the same organizational structure (aka team)
• Each team might have its own developers, managers, commercial people, etc...
Google Platforms

- Most teams within the Platforms group exist to serve other product teams in Google, e.g.:
  - Infrastructure software: Borg, MapReduce, GFS, FlumeJava, BigTable, etc...
  - Infrastructure hardware: Servers, Racks, Cooling systems, Chips (TCUs), etc...
  - Networking hardware and software
  - Operations
Google Platforms and other Teams

Ex: Google Search Autocomplete

To implement Autocomplete functionality, Google Search Team needs low latency

Google Platforms deploys new Datacenters: design ("manufacture") servers, network configuration, operation, etc.

Delegates construction of new Datacenters
The Datacenter as a Computer

Eventually to B4 and B2
SDN @Google

• SDN implementation started several years ago: already a well established technology
• B4 and Jupiter: fully SDN
• Each domain has its control plane, each control plane has several pieces of specialized software
My Internship Project

Developed a tool to perform a time-continuous assessment of Google's Software Defined Networks. This tool checked how different network properties evolved in a timeline. This computational-intensive task was distributed across several machines using Flume, a Google library that creates highly efficient parallel data-processing pipelines.
Next Challenges

• General:
  ➢ Run the networks as hot as possible
  ➢ Make latency as small as possible

• Specific – Colorless, Directionless, Contention-less ROADM:
  ➢ How to coordinate L2 and L3 restoration? (Should repair be made on L3 or L2?)
  ➢ What is the availability improvement of CDC? Capacity utilization improvement? How much cheaper?
  ➢ Demand forecast unpredictable: what is a good buffer strategy for capacity allocation?