

MICHIGAN STATE

UNIVERSITY

Beta Presentation

Kubernetes Cluster Inspection Tool

The Capstone Experience

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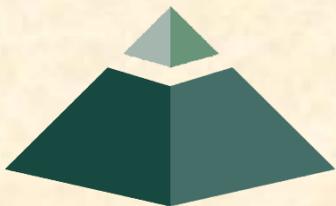
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Spring 2019



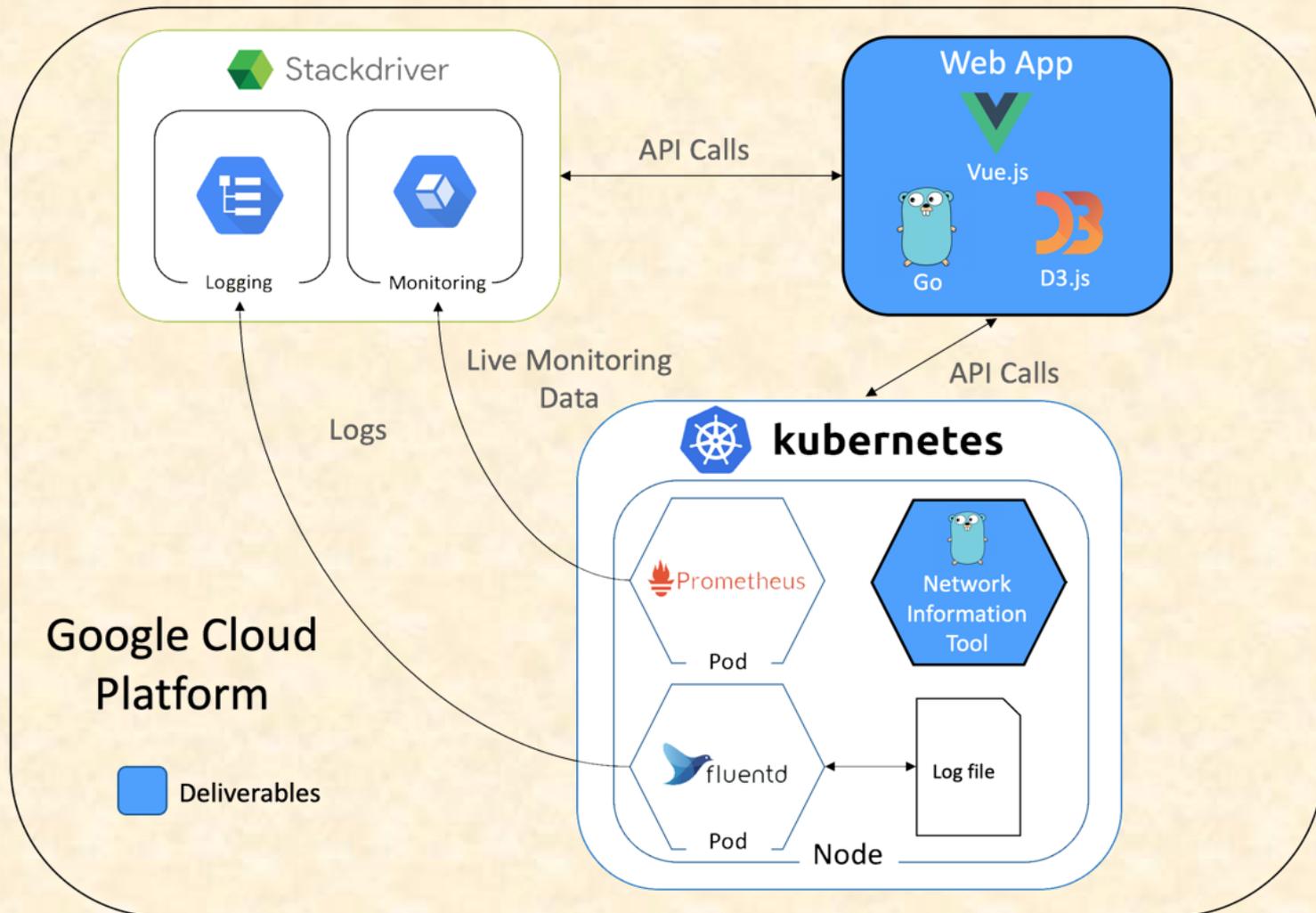
From Students...
...to Professionals

Project Overview

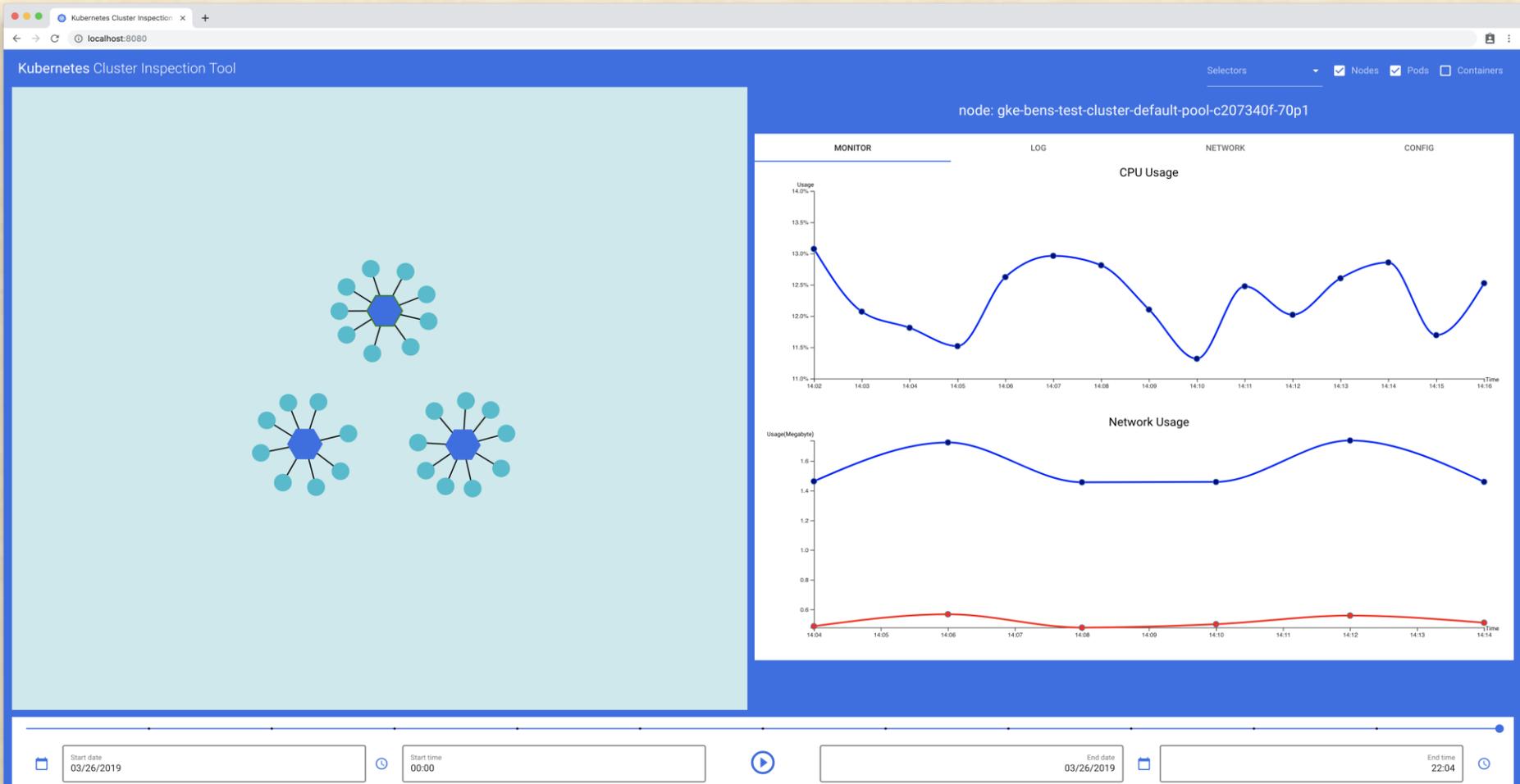
- Provide Robust Inspection Tool of Kubernetes Cluster
 - Both Current and Historical State
- Gather All Cluster Data into a Single Interactive View
 - Provide Health, Performance, and Resource Changes
 - Ingest with Native, Kubernetes Stackdiver Agent
 - Trace Lifecycle of Nodes, Pods, and Containers
- Implement Easily on Any GCP Kubernetes Cluster



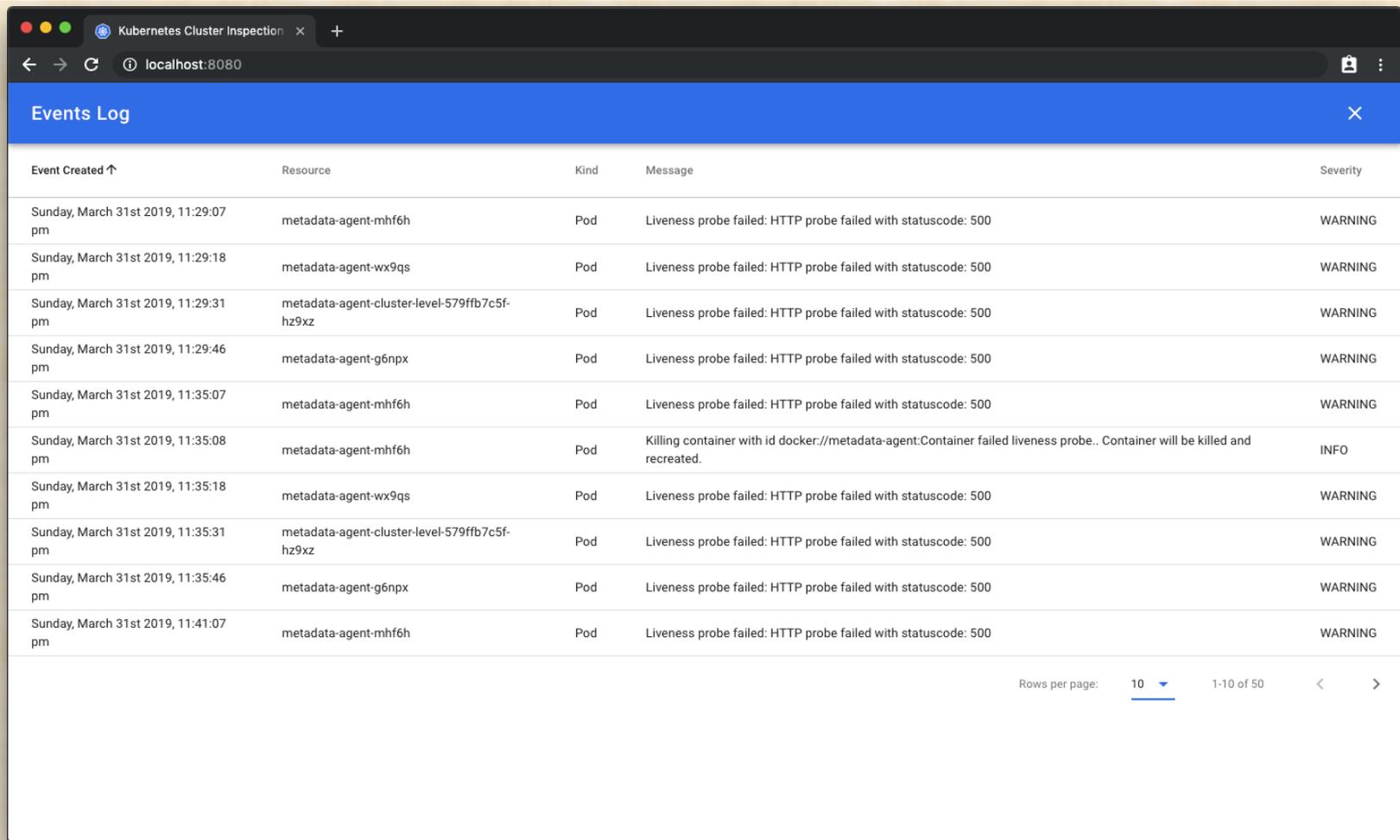
System Architecture



Stackdriver Monitoring Metrics for a Selected Node



Cluster Events from Stackdriver Logging



The screenshot shows a web browser window titled "Kubernetes Cluster Inspection" with a URL of "localhost:8080". The main content is an "Events Log" table with the following data:

Event Created ↑	Resource	Kind	Message	Severity
Sunday, March 31st 2019, 11:29:07 pm	metadata-agent-mhf6h	Pod	Liveness probe failed: HTTP probe failed with statuscode: 500	WARNING
Sunday, March 31st 2019, 11:29:18 pm	metadata-agent-wx9qs	Pod	Liveness probe failed: HTTP probe failed with statuscode: 500	WARNING
Sunday, March 31st 2019, 11:29:31 pm	metadata-agent-cluster-level-579ffb7c5f-hz9xz	Pod	Liveness probe failed: HTTP probe failed with statuscode: 500	WARNING
Sunday, March 31st 2019, 11:29:46 pm	metadata-agent-g6npx	Pod	Liveness probe failed: HTTP probe failed with statuscode: 500	WARNING
Sunday, March 31st 2019, 11:35:07 pm	metadata-agent-mhf6h	Pod	Liveness probe failed: HTTP probe failed with statuscode: 500	WARNING
Sunday, March 31st 2019, 11:35:08 pm	metadata-agent-mhf6h	Pod	Killing container with id docker://metadata-agent.Container failed liveness probe.. Container will be killed and recreated.	INFO
Sunday, March 31st 2019, 11:35:18 pm	metadata-agent-wx9qs	Pod	Liveness probe failed: HTTP probe failed with statuscode: 500	WARNING
Sunday, March 31st 2019, 11:35:31 pm	metadata-agent-cluster-level-579ffb7c5f-hz9xz	Pod	Liveness probe failed: HTTP probe failed with statuscode: 500	WARNING
Sunday, March 31st 2019, 11:35:46 pm	metadata-agent-g6npx	Pod	Liveness probe failed: HTTP probe failed with statuscode: 500	WARNING
Sunday, March 31st 2019, 11:41:07 pm	metadata-agent-mhf6h	Pod	Liveness probe failed: HTTP probe failed with statuscode: 500	WARNING

At the bottom right of the table, there is a pagination control showing "Rows per page: 10" (with a dropdown arrow) and "1-10 of 50" (with left and right navigation arrows).

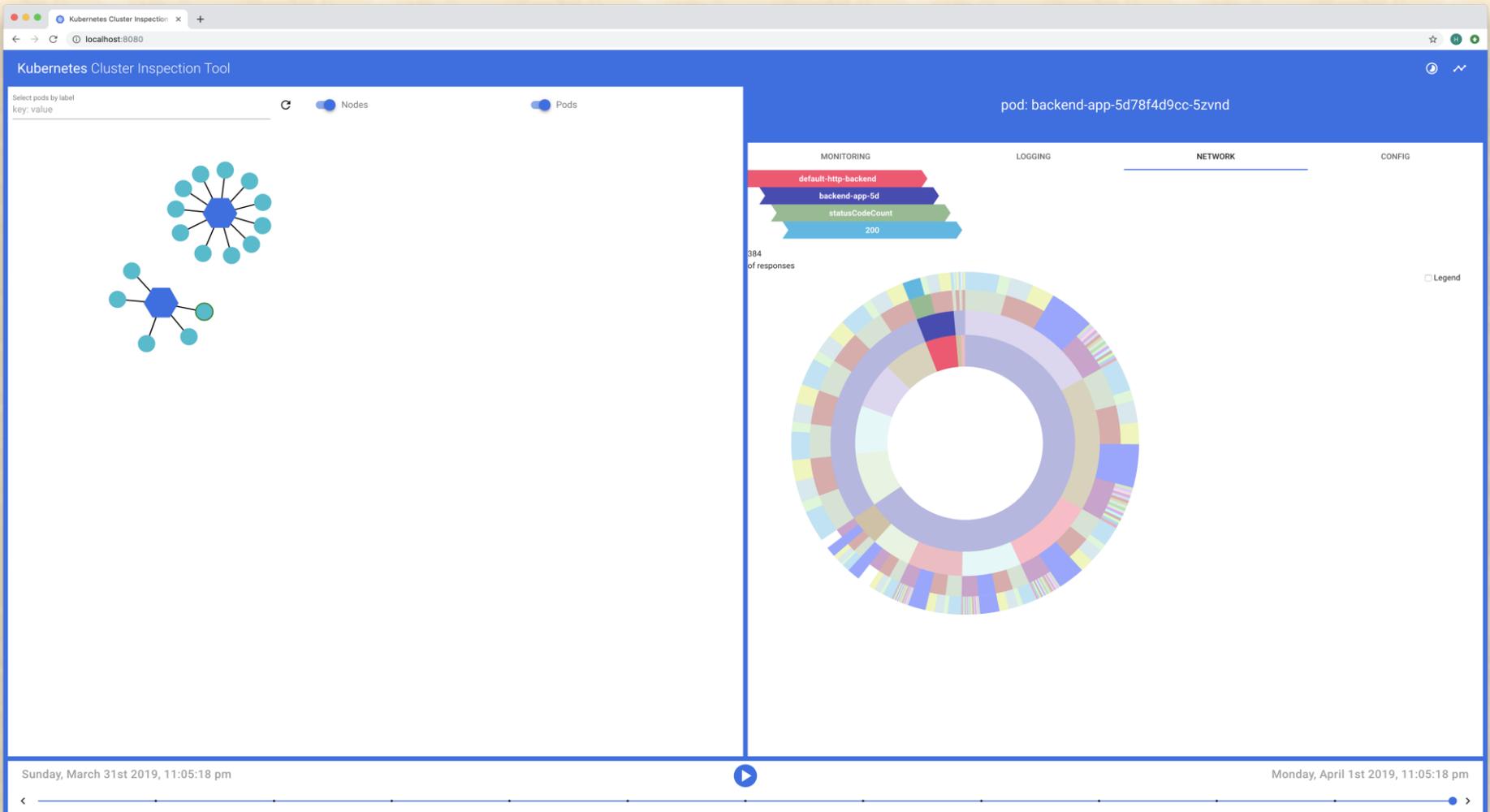


Severity Insights from Stackdriver Logging

The screenshot displays the 'Kubernetes Cluster Inspection Tool' interface. On the left, there is a cluster diagram with two nodes and their associated pods. The right-hand panel is titled 'pod: heapster-v1.6.0-beta.1-79f5c6649-nr85q' and features four tabs: 'MONITORING', 'LOG', 'NETWORK', and 'CONFIG'. The 'LOG' tab is active, showing a progress bar with 'INFO' and 'Healthy' segments, and a donut chart indicating that 'Healthy' logs constitute 3.45% of the total. A legend on the left of the donut chart lists severity levels: CRITICAL (red), ERROR (orange), WARNING (light orange), INFO (light blue), DEBUG (blue), Healthy (green), Unhealthy (red), and FrequentDockerRestart (purple). At the bottom, there are input fields for 'Start date' (20/19/), 'Start time' (00:00), 'End date' (20/19/), and 'End time' (23:02), along with a play button icon.



Network Traffic Between Pods



What's left to do?

- Google Cloud Platform Deployment of the Network Information Tool
- Specific Keyframes for Important Events in Playback
- Flexibility for Playback Timeframes
 - Timezones
- IAM Roles Instead of Tokens
- Polishing the Front End



Questions?

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