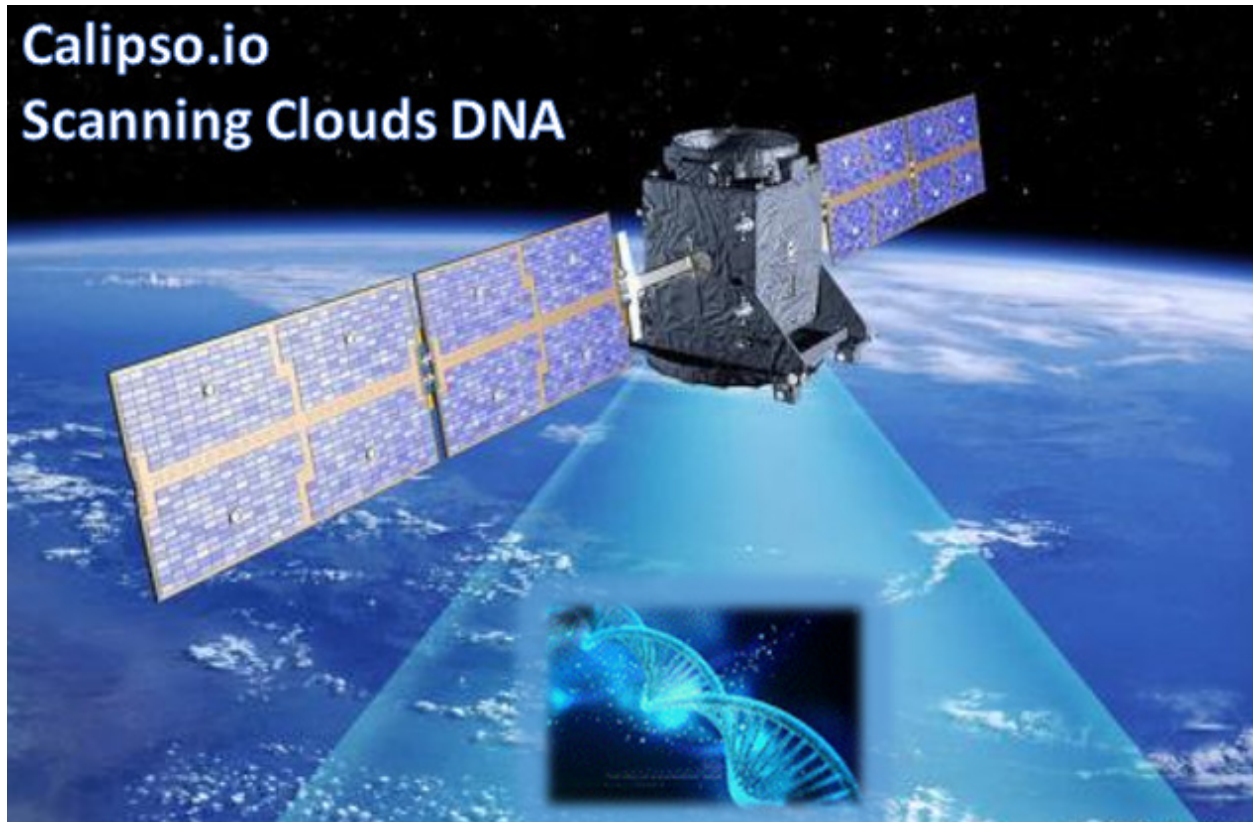# Calipso.io
Product Description

Virtual and Physical networking low level details and inter-connections, dependencies in OpenStack, Docker or Kubernetes environments are currently invisible/abstracted by design, so data is not exposed through any API or UI.

During virtual networking failures, troubleshooting takes longer times due to manual discovery and analysis.

Maintenance work needs to happen in the data center, virtual and physical networking (controlled or not) are impacted.

Most of the times the impact of any of the above scenarios is catastrophic.

Customer needs during maintenance:

Visualize the networking topology, easily pinpointing the location needed for maintenance and show the impact of maintenance work needed in that location.

Administrator can plan ahead easily and report up his command chain the detailed impact – Calipso wants to substantially lower the admin time needed for that reporting.

Customer need during troubleshooting:

Visualize and pinpointing the exact location of the failure in the networking chain, using a suspected 'focal point' (like a VM that cannot communicate).

Monitor the networking location and alerting till the problem is resolved.

Fixing the problem is the last step, Calipso should cover pinpointing the root cause.

Calipso for multiple distribution/plugins:

Our innovation actually focused here, building a proven unified model to deal with that.

Supporting in initial release: VPP, OVS, LXB with all type drivers possible, onto 5 different OS distributions, totaling to more than 18 variances

New classes per object, link and topology can be programmed (see development docs).

Project "Calipso" tries to illuminate complex virtual networking with real time operational state visibility for large and highly distributed Virtual Infrastructure Management (VIM).

We believe that Stability is driven by accurate Visibility.

Calipso provides visible insights using smart discovery and virtual topological representation in graphs, with monitoring per object in the graph inventory to reduce error vectors and troubleshooting, maintenance cycles for VIM operators and administrators.

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1 About

1.1 Project Description

Calipso interfaces with the virtual infrastructure (like OpenStack) through API, DB and CLI adapters, discovers the specific distribution/plugins in-use, their versions and based on that collects detailed data regarding running objects in the underlying workers on the different hosts. Calipso analyzes the inventory for inter-relationships and keeps them in a common and highly adaptive data model.
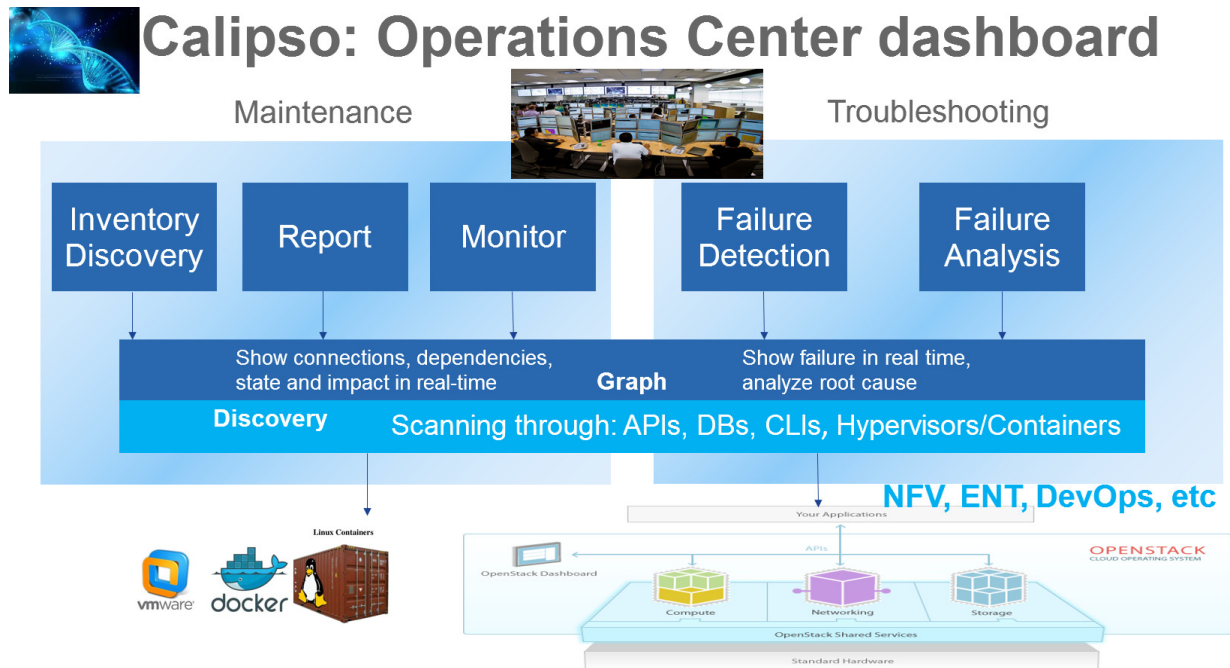
Calipso also represents the topologies in real-time (automatic updates per changes in VIM), monitors the related objects and analyzes some data for impact and root-cause analysis.

This is done with the objective to lower and potentially eliminate complexity and lack of visibility from the VIM layers as well as to offer a common and coherent representation of all physical and virtual network components used under the VIM.

Calipso is to work with different OpenStack flavors, plugins and installers.

Calipso is to save network admins discovery and troubleshooting cycles of networking aspects. Calipso helps estimate the impact of any micro failure in the infrastructure to allow appropriate resolutions.

Calipso focuses on scenarios, which requires VIM/OpenStack maintenance and troubleshooting enhancements using operations dashboards i.e. connectivity, topology and related stats – as well as their correlation.

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2 Main modules

2.1 High level module descriptions

Calipso modules included with initial release:

- Scanning: detailed inventory discovery and inter-connection analysis, smart/logical and automated learning from the VIM, based on specific environment version/type etc.

- Listening: Attach to VIM message BUS and update changes in real time.

- Visualization: represent the result of the discovery in browsable graph topology and tree.

- Monitoring: Health and status for all discovered objects and inter-connections: use the discovered data to configure monitoring agents and gather monitoring results.

- Analysis: some traffic analysis, impact and root-cause analysis for troubleshooting.

- API: allow integration with Calipso application's inventory and monitoring results.

- Database: Mongo based

- LDAP: pre-built integration for smooth attachment to corporate directories.

For Monitoring we are planning to utilize the work done by 'Sensu' and 'Barometer'.

The project also develops required enhancements to individual components in OpenStack like Neutron, Telemetry API and the different OpenStack monitoring agents in order to provide a baseline for "Operations APIs".

2.2 High level functionality

Scanning:

Calipso uses API, Database and Command-Line adapters for interfacing with the Cloud infrastructure to logically discover every networking component and it's relationships with others, building a smart topology and inventory.

Automated setup:

Calipso uses Sensu framework for Monitoring. It automatically deploys and configures the necessary configuration files on all hosts, writes customized checks and handlers to setup monitoring per inventory object.

Modeled analysis:

Calipso uses a unique logical model to help facilitate the topology discovery, analysis of inter-connections and dependencies. Impact Analysis is embedded, other types of analysis is possible through a plugin framework.

Visualization:

Using its unique dependency model calipso visualize topological inventory and monitoring results, in a highly customizable and modeled UI framework

Monitoring:

After collecting the data, from processes and workers provisioned by the cloud management systems, calipso dynamically checks for health and availability, as a baseline for SLA monitoring.

Reporting:

Calipso allows networking administrators to operate, plan for maintenance or troubleshooting and provides an easy to use hierarchical representation of all the virtual networking components.

3 Customer Requirements

We believe that currently there is lack of visibility that leads to limited stability.

The lack of operational tooling coupled with the reality of deployment tools really needs to get solved to decrease the complexity as well as assist not only deploying but also supporting OpenStack...

Calispo integrates well with installers like Apex to also start enhancing day 2 operations.

3.1   Releases and Distributions

Calipso is distributed for enterprises - 'S' release, through calipso.io, and for service providers - 'P' release, through OPNFV.