# Cloudify and OpenStack Heat

General

Cloudify is an application orchestration platform that provides a complete solution for automating and managing application deployment and DevOps processes on top of a multi-cloud environment.

OpenStack Heat is OpenStack's orchestration project that provides a scripting, templating and orchestration engine to automate the configuration and setup of an OpenStack environment. It also allows the addition of application stacks as part of the provisioning process.

While there is some degree of overlap between Cloudify and OpenStack Heat, the two are mostly complementary.

Mapping Cloudify and Heat in the Cloud Stack

The following diagram maps the Amazon cloud stack (marked in yellow boxes) and its OpenStack equivalent (marked in blue boxes). In this stack, Cloudify serves as the equivalent of Amazon OpsWorks and as in the case of Amazon it is mostly complementary with OpenStack Heat that serves as the equivalent of Amazon CloudFormation.
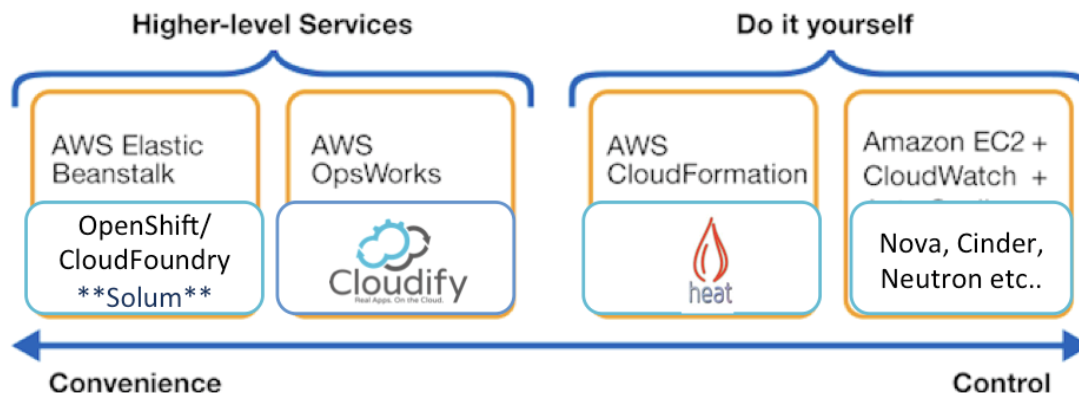
Cloudify and Heat Integration

The next versions of Cloudify will include an integration with Heat for infrastructure orchestration (e.g. network, compute, security setup). In the first phase, Cloudify will simply execute Heat templates instead of calling the Nova, Cinder or Neutron API directly as it does today as part of its current OpenStack cloud driver.

Support for OpenStack

OpenStack Heat is a core service with OpenStack and is, therefore, included as part of the OpenStack distribution. Meanwhile, Cloudify is an external, open source project that works natively with OpenStack, but not exclusively.

Cloudify's Native OpenStack Approach

The open nature of OpenStack allows Cloudify to provide deeper integration with the underlying stack, despite being external to OpenStack. This is done through tight integration with OpenStack's core services, such as Nova, Neutron, Cinder, Cilometer, Keystone, etc. Cloudify follows similar design and architecture principles to those of other OpenStack projects. It is also based on Python and includes a similar stack, such as RabbitMQ, as part of the underlying implementation.

Multi-Cloud Support

OpenStack Heat is designed to work exclusively with OpenStack.
Cloudify was designed to support multi-cloud infrastructure and allow interoperability between those infrastructures.

The supported cloud infrastructure includes support for private clouds such as VMware, CloudStack as well as public clouds such as Amazon, Azure and IBM SoftLayer.

It also includes support for traditional a datacenter environment through a specialized driver that allows mapping a group of IP addresses into a Cloudify cloud.

The cloud abstraction includes abstraction for Compute, Network and Storage API.

Project (Heat) vs Platform (Cloudify) - Cloudify's added value beyond Heat

OpenStack Heat is one of the projects within the OpenStack environment. As such, building a complete deployment solution with Heat will require integration of many other projects within and outside of an OpenStack environment.

Cloudify provides a pre-integrated solution for automating and managing the application's deployment and post deployment processes. As such, it comes with a rich set of services, starting with application topology and modeling to complete monitoring analytics and deployment.

The following diagram illustrates the overall set of services that Cloudify provides in which OpenStack Heat overlaps to limited degree with only one of the Cloudify components (intelligent Orchestration).
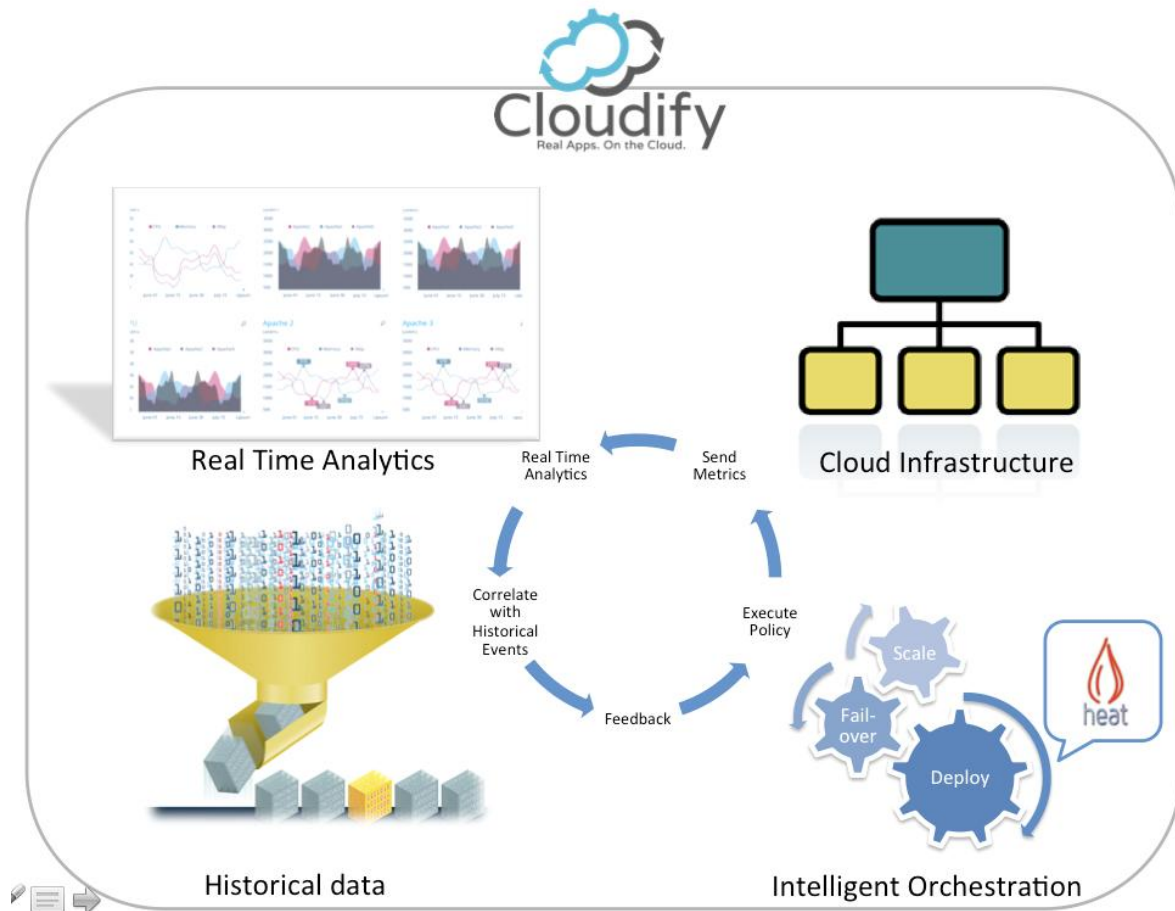

Cloudify Logging and Monitoring Services

A big part of the Cloudify platform includes built-in logging and monitoring services to allow for tracking and monitoring of application deployment.
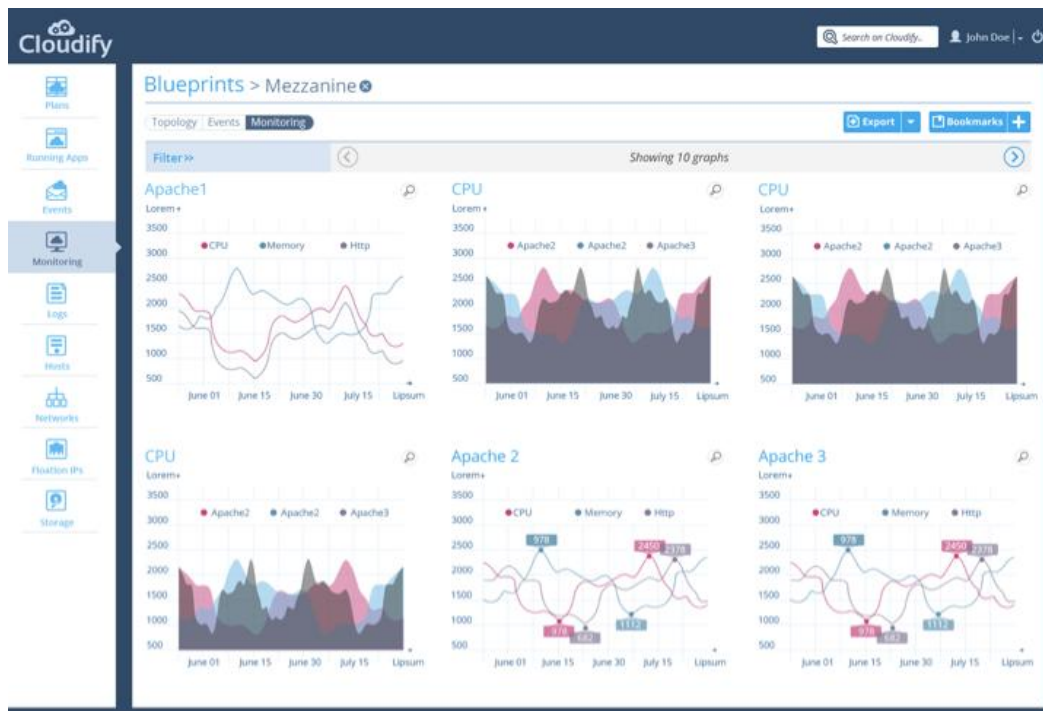
Such services include:
- Log Aggregation
- Historical analysis of event and logs
- Real-Time monitoring analytics
- Application deployment monitoring
- Easy to use Application Topology editor and execution

The following diagrams illustrate Cloudify's built-in blueprint editor and monitoring. The blueprint editor allows users to create and change topologies through graphical and text interfaces.
It also provides a single point of access to execute a blueprint and monitor the status of the deployment directly from the blueprint.
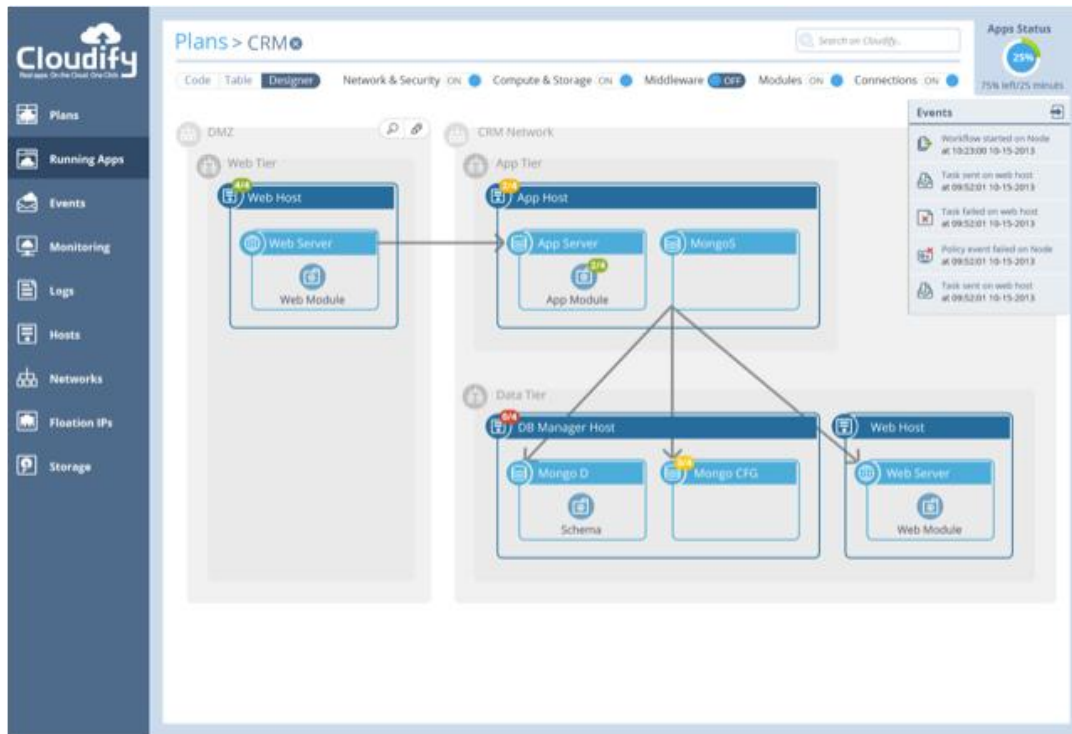
Cloudify provides enhanced monitoring that allows for monitoring of application-specific KPI as well as system monitoring. It also provides easy integration of external monitoring sources into a single view.

Other Added Value Services

In addition to monitoring and logging, Cloudify includes other sets of services, including:

- Advanced Workflow
- Integrated Application Catalog Service
- Native support for TOSCA
- Built-in policies for DevOps processes, self-healing, auto-scaling
- Built-in services for data replication, session HA and Elastic caching

These services will expand over time and will continually increase the set of added value services that Cloudify adds on top of OpenStack Heat.