

Contrail Facts, Objectives, and Current Results

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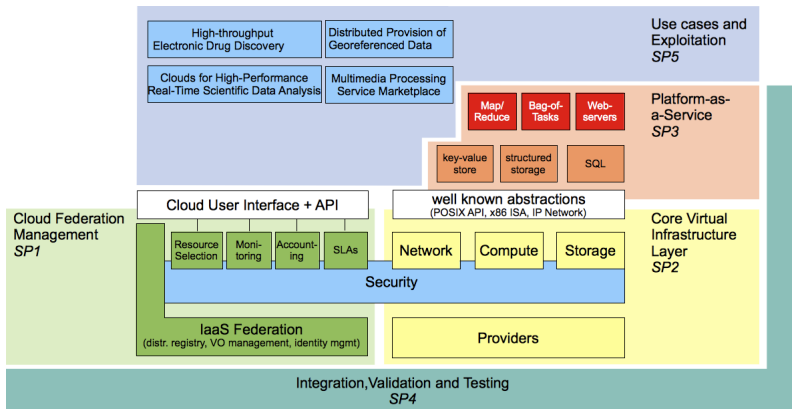
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What is Contrail

- Collaborative project partly funded by European Commission under FP7 directive (Contract No: FP7-ICT-257438)
- Duration 3 years (Oct 2010 - Sept 2013)
- Budget: €11.3 M
- Integrated Cloud Federation Software Suite
- Individual software suites to manage IaaS clouds, PaaS, SLAs Federation services

In a nutshell ...



Project Goal

The goal of Contrail is to provide an integrated open-source solution to manage virtualization from IaaS layer to the PaaS layer.

Contrail provides tools for managing federation of multiple IaaS clouds, through federated identity management it aims to provide a secure yet usable platform for end users, while supporting SLAs and quality of protection for satisfying stringent business requirements for using the cloud.

Major Contrail Components

The major components offered by the Contrail consortium are:

- ConPaas (www.conpaas.eu)
- Contrail Federation Modules
- Virtual Execution Platform (<http://vep.gforge.inria.fr/>)
- Contrail GAFS - Cloud Filesystem (www.xtreemfs.org)
- Cloud Security Tools
- Virtual Infrastructure Network

Each of these can be used independently to solve your business needs, packaged together they provide the full Contrail federated cloud management suite.

What are the major Obstacles?

Trust and Dependability

- increase confidence in clouds
- provide guarantees to customers
 - Quality of Service (QoS)
 - Quality of Protection (QoP)

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How to achieve these?

- By providing Service Level Agreements (SLAs)
 - through security enforcements - QoP
 - by providing performance guarantees
- Effective monitoring
- Proper auditing facilities

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Interoperability

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How to achieve this?

- Standards, standards and finally standards!
 - Open Virtualization Format (OVF) for application description
 - Standard interface APIs for application developers (OCCL, CIMI)
- Ability to snapshot and migrate an application
- Federated identity management (single sign-on)

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How to achieve this?

- Platform as a Service (PaaS)
 - hides underlying platform (IaaS) complexities
 - automated scripts to perform most common tasks
 - map-reduce, bag-of-tasks, web-services, etc.
- Intuitive user interfaces at service entry points

Can Contrail provide a usable platform?

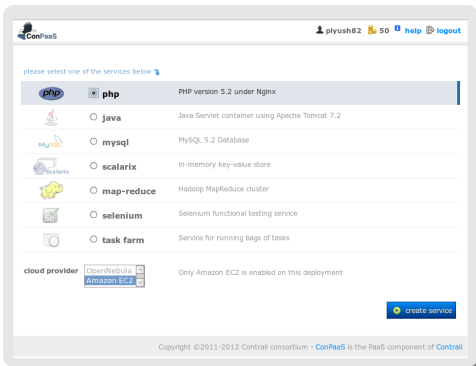
We like to think so!

Rest of the slides

A top-down view of Contrail components: each component can be utilized independently of other.

You be the judge!

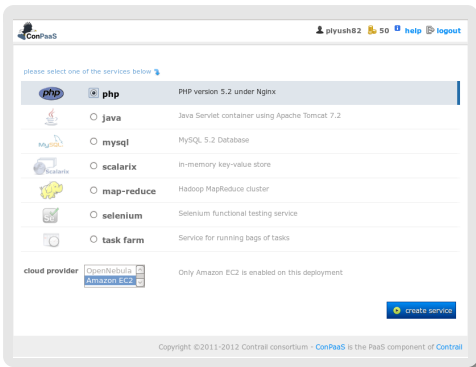
ConPaas - A Contrail PaaS solution



ConPaas 1.0.0 release is out

- secure framework for hosting applications in the cloud
- supports deployment over Amazon EC2 and OpenNebula
- GIT-based code uploads for PHP and Java services
- new services are being added - TaskFarming and Selenium

ConPaaS - A Contrail PaaS solution



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- secure framework for hosting applications in the cloud
- supports deployment over Amazon EC2 and OpenNebula
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Want to try ConPaaS? Visit: <http://www.conpass.eu/>

The Contrail Federation layer - ConFederation

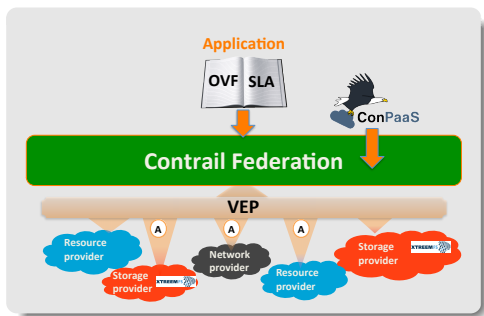
The Contrail federation provides all tools necessary to make a federation of clouds possible.

Main subcomponents

- Federation web-portal
- Federation identity-provider
- Federation CA service
- SLA manager
- Federation Policy Decision Service (PDP/PEP)

What can Contrail federation do for you?

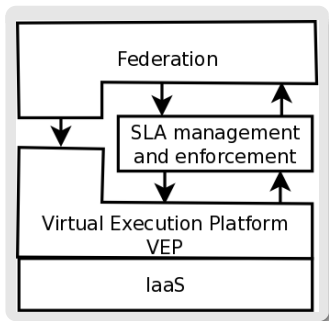
- deploy your application over multiple cloud providers (if needed)
- initiate setup of inter-cloud secure networking for your application
- allows you to negotiate SLA terms
- allows you to monitor your deployed applications and manage them



Virtual Execution Platform

VEP interfaces Contrail federation to the participating provider's IaaS infrastructure. It provisions hardware resources for running applications on behalf of Contrail end users.

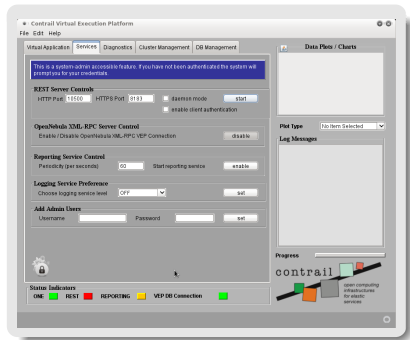
- VEP supports deployment of OVF applications
- a REST interface to 3rd party application developers
- upcoming reference CIMI implementation (VEP v2.0)
- provides API to manage full application lifecycle
- support for application monitoring



Virtual Execution Platform

VEP software has been released. Version 1.1 is available on OW2 SVN repository. Binary packages will be made available very soon.

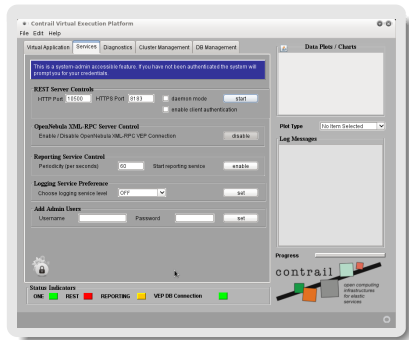
- allows a complete control on level of federation participation to the provider
- full featured interface for common administrative tasks
- includes a lot of security features, interface access security, multi-tier access/authorization control, REST API over SSL, etc.



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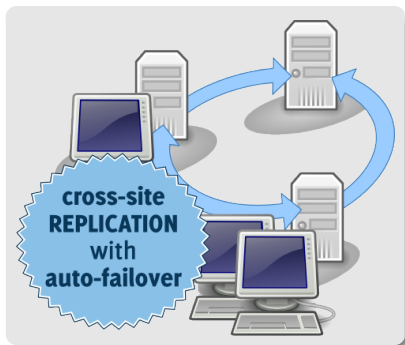
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Try VEP now: <http://vep.gforge.inria.fr/>

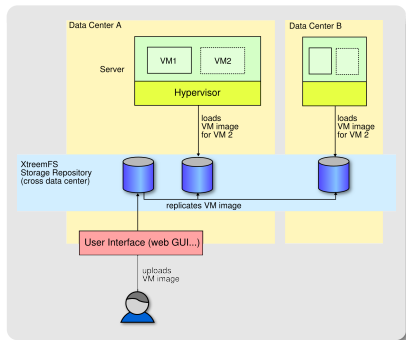
Global Autonomous File System

- Develop a storage system for the **cloud infrastructure** and **user data**
 - **Storage for the cloud infrastructure**
 - for virtual machine images
 - for system and monitoring information
 - **Storage as a Service**
 - for user data
 - accessible from within the cloud and over the Internet



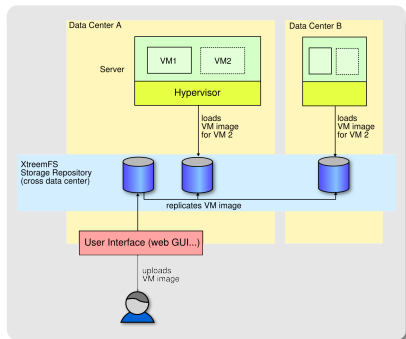
GAFS: New Upcoming Features

- ability to start hundreds of VMs simultaneously
- intelligent overload protection, system remains responsive even under extreme load.
- intelligent data-deduplication to save on storage



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Try GAFS/xTreemFS now: <http://xtreemfs.org/>

Contrail Cloud Security Tools

The Contrail security team aims to provide a framework for federated identity management. It provides tools for credential conversion and attribute management including access control and usage control.

The main solutions from this effort are -

- Contrail Federated Identity Provider
- Credentials Conversion tools
- Delegation Mechanisms over oAuth 2
- Contrail CA Service (Certificate generation service)
- Policy Enforcement/Policy Decision tools (PEP/PDP)

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These tools will be packaged and made available as part of Contrail v1.2 release.

Virtual Infrastructure Network

VIN aims to provide a seamless virtual network service to virtual applications spread across multiple providers.

- uses and extends StrongSwan to manage secure tunnel setup
- works both inside the VMs (for non Contrail providers) and outside the VMs for providers that have Contrail stack installed.
- can connect application VMs deployed on multiple providers

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VIN is integrated with VEP and will be made available as part of Contrail 1.2 packaging.

Does Contrail address the cloud adoption challenges?

Trust and Dependability

- Contrail has support for comprehensive SLA terms including location, colocation, and other hardware characteristics.
- Comprehensive security mechanisms to provide isolation
- Effective monitoring stack to help monitor SLAs and extensive logging to support auditing if needed.

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Interoperability

- Support for open cloud standards including DMTF's OVF and CIMI REST Interface
- Storage component (GAFS) provides POSIX compliant interface

Does Contrail address the cloud adoption challenges?

Usability

- ConPaaS automates almost all the steps in deployment of several common cloud use case scenarios
- VEP has a very intuitive, feature-rich yet simple web-based user/admin interfaces.

So does Contrail modules aid in minimizing some of the hurdles in cloud adoption?

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So does Contrail modules aid in minimizing some of the hurdles in cloud adoption?

→ *We sure would like to think so! But you are the ultimate judge.*

Need more info? Questions?

VEP: <http://vep.gforge.inria.fr/>

VIN and other packages: <http://contrail.ow2.org/>

GAFS/xTreemFS: <http://xtreemfs.org/>

Contrail: <http://contrail-project.eu/>



Contact the speaker

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