SOLUTIONS FOR CLOUD/HPC AND BIG DATA FRAMEWORKS INTEROPERABILITY

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THE PROBLEM WE ADDRESS

- EO high volume, delivery rate, variety, complexity
- Heterogenous big data frameworks
- Cloud platforms limitations in Europe
CS HYBRID CLOUD OFFER
IAAS – CS VIP SOLUTION

- Transparent multi cloud infrastructure management
  - Computing nodes
  - Block storage
  - Brokering

- Overlay multi cloud networks
  - Portable topologies
  - DNS, multicast

- Software deployment
  - Hypervisor independent
  - Guest OS independent
  - Full web desktop environment

- Multi-cloud unified monitoring
  - Metrics
  - Alerting
  - Charting
  - Reporting
CS VIP: KEY TECHNOLOGIES

- CS VIP Broker
- libcloud
- Paramiko
- CS VIP Network
- weave.net
- PROJECT CALICO
- Contiv
- CS VIP Deploy
- docker
- Appliance
- Apache Guacamole
- CS VIP Scope
- Grafana
- Prometheus
- telegraf
CS VIP “INFRASTRUCTURE AS CODE” EXAMPLE

1. `>> vip network create net_test --cidr “192.168.0.0/16”`
2. `>> vip server create --os=“ubuntu 16.04” --cpu=4 --ram=10 --disk=200 --public=true --networks=net_test srv1`
3. `>> vip server create --os=“ubuntu 16.04” --cpu=4 --ram=10 --disk=200 --public=false --networks=net_test --gw srv1 srv2`
4. `>> vip server create --os=“ubuntu 16.04” --cpu=4 --ram=10 --disk=200 --public=false --networks=net_test --gw srv1 srv3`
5. `>> vip user add --user=auser --password=password1234 -g docker srv1`
6. `>> vip firewall --rule “allow in 443/ctp” srv1`
7. `>> vip nas create --size 5000 nas1`
8. `>> vip nas attach --hosts=“srv1, srv2, srv3” --mount “/data” nas1`
9. `>> vip ssh -c ‘touch /data/hello && echo “Hello World”’ srv1`
10. `>> vip download srv2 /data/hello hello.txt`

1. To create a private network
2. To create a server with a routable IP address and an interface on the private network,
3. To create a server with same interface on the private network
4. To create a servers with same interface on the private network
5. To create an "auser" user with password "password1234"
6. To open incoming port 443 for TCP protocol on public server
7. To create a 5TB SAN
8. To attach the 3 servers to the NAS
9. To create a file in the shared directory of srv1
10. To download this file from srv2
SCREW: FEATURES

Multi-framework distributed platform

- Fair resource distribution between services and processing
- Combined usage of HPC and Big Data frameworks
- Transparent management of high availability and scalability
- Monitoring services
SCREW: KEY TECHNOLOGIES

- MESOS
- docker
- MARATHON
- MPICH: High-Performance Portable MPI
- DRMAA: Distributed Resource Management Application APIs — www.drmaa.org
- SCREW
- HPC
- Resource Allocation
- Micro Service
- No/New SQL
- Big Data
- cassandra
- Postgres-XL
- apache Ignite
- apache Spark
- hadoop
SCREW “INFRASTRUCTURE AS CODE” EXAMPLE

```
screw cluster create --nbnodes=15 --cpu=16 --ram=64 --disk=1000 --topology=HA test_cluster
{
  "cluster":{
    "name":"test-cluster",
    "password":"82wZzNq2"
  }
}
screw cluster update test_cluster --nodes=20 --disksize=5000
```

- To create a cluster of 15 nodes with 1TB
- To upgrade the cluster to 5TB
FULLY OPERATIONAL & NEXT STEPS

➔ Copernicus Research & User Support (RUS)
   ➔ http://rus-copernicus.eu

➔ Toward a new service: SafeScale
   ➔ IaaS and PaaS
   ➔ fully secured