

RIA-653549

INDGO -DataCloud PaaS Core Summary

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Reasons: Core

Advanced users might be used to access the underlying computing infrastructure (i.e. clusters). We should not try to prevent the user from directly accessing the provisioned infrastructure.

PaaS Core Session: Ideas to Foster Discussion (I)

Producing a single, integrated, coherent platform that addresses all the requirements by the user communities using new interfaces for users can: Be unfeasible due to time constraints Difficult the adoption of the platform.

similar results (i.e. different workflow engines).

- Different user communities might use different software to achieve We should not try to impose a single-software approach from the PaaS



PaaS Core should: Enable users to describe/choose services that are already being used by user communities (e.g. Taverna, Galaxy, etc.) Enable users to describe/choose the infrastructure(s) on which this service will be deployed and the computing requirements (cores, RAM, etc). hybrid Clouds. already available for those services. User-driven elasticity vs Automated elasticity infrastructure).

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PaaS Core Session: Ideas to Foster Discussion (II)

Automatically deploy these services (and provision the infrastructure) on on-premises Clouds, public Clouds, across

Provide the scientific user with an endpoint to connect to the service (or provisioned infrastructure) and rely on the GUIs or CLIs Users are typically reluctant to change their usage patterns. Introduce elasticity support for the deployed services Manage the lifecycle of the provisioned service (and



Usage example: Requirements The PaaS Core: credentials). cluster)

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PaaS Core Session: Ideas to Foster Discussion (III)

perform some molecular dynamics computation.

with the GROMACS software

2. Deploys and configures the service (virtual cluster front-end) 3. Provides the user with an endpoint to the service (the IP of the

A user wants a virtual cluster (service) to be deployed across an on-premises Cloud and a public Cloud (infrastructure) to

Up to 10 2-VCPUs x86 with at least 8 GB of RAM based on Ubuntu 14.04

1. Provisions the required infrastructure (according the user's



deploy those services

And provide:

Automated deployment of those services to those infrastructures Lifecycle and elasticity management of (the infrastructure) allocated for) those services.

This will:

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PaaS Core Session: Ideas to Foster Discussion (IV)

Therefore, PaaS Core should focus: On the definition of e-science services that address the requirements of user communities. On the definition of computational infrastructures on which to

different infrastructures.

Enable to iteratively introduce support for different services and



PaaS Projects and Components Identify existing open-source components that could match the interests of INDIGO. Collaborative open document to survey and identify past and current research projects Focus on tools and license. https://docs.google.com/document/d/15fKNgQbvwx_uVTyy7p wtQ08eGzpobV56vU1pQkT8q30/edit?usp=sharing

Your input is really much appreciated to start identifying the components that exist and might fit the INDIGO PaaS architecture.

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Survey of Tools and Components



Mesosphere offers a layer of software that organizes your machines, VMs, and cloud instances and lets applications draw from a single pool of intelligently- and dynamically-allocated resources, increasing efficiency and reducing operational complexity



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Mesosphere

Key Concept: Data Center Operating System

Applications

Init System

Kernel







Mesos Two-Level Scheduling





Long Running Services Aurora, Marathon, Singularity, SSSP Big Data Processing Cray Chapel, Dpark, Exelixi, Hadoop, Hama, MPI, Spark, Storm Batch Scheduling Chronos, Jenkins, JobServer, Torque

Data Storage

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(John Mesos Frameworks

Cassandra, ElasticSearch, Hypertable







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Cluster configuration - example

Batch

Recurring Jobs (ETL, backups)

Batch REST API "Chronos" (cron)

Example Federated Architecture

– public information – **Federated PaaS**

Duetting et al. / WP5 Proposal

Docker containers enable cloning of images suitable for federated PaaS

24/04/2015

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	WP 5.1 Elasticity	WP 5.1 Service Orchestration	WP 5.1 ESB	WP 5.3 High Level Deployme		
OS	TBD	TBD	TBD	TBD		
<section-header></section-header>	To be extended (openshift/clou dify/wso2)	Already present form PRISMA - To be developed/inte grated	To be integrated (wso2?)	Workflow already present– To developed/ grated		
APIs	To be developed	To be developed	To be developed	To be developed		
Docker Scripts				To be developed		
HNX Scripts				To be developed		
Gnubila	To be integrated in Architecture	To be integrated in Architecture	To be integrated in Architecture			

WP 5.1 and

Analysis

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o be /inte	Monitoring abstraction from PRISMA project to be extended and integrated
	To be integrated

Question about the license of the software we want to include We should decide soon the license in order to be sure that we are thinking to include do not impose any limitation No proprietary or closed source software should be part of the architecture

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PaaS core discussion

• Question about the software we going to write: the less software we write the more our system will be easy to maintain and the more it will be sustainable We know this ... and we will always keep this in mind when we design the architecture

If a user community has already their own platform to analyze data, could this be included in our architecture? Yes, in principle it could be. It should be decided case by case to see if it is technically feasible.

Discussion about the needs to have actions on the items of the Monitoring and Information System Yes, we need this traversal Task Force among WP4-5-6

requirement

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PaaS core discussion

Obviously the discussion is still in the very early stage and we need to evolve it taking care of the users-

