

COMPETITIVENESS AND INNOVATION FRAMEWORK PROGRAMME

CIP-ICT-PSP-2013-7



SERVICE DISTRIBUTION NETWORK AND TOOLS FOR INTEROPERABLE PROGRAMMABLE AND UNIFIED PUBLIC CLOUD SERVICES

Deliverable D5.1b

Cloud-Enablement of Distributed Services

Workpackage	WP5 – Pilot Sites Preparation
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Abstract:	Based on the outcomes of task T5.2, this deliverable will be the accompanying report of the prototype implementation and deployment of the public cloud services that will result from the cloud-enablement of the existing on-line services of the STRATEGIC pilot sites.

Document Revision History

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Table of Contents

1	INTRODUCTION & SCOPE OF THE DELIVERABLE	8
1.1	SCOPE AND PURPOSE OF THE DOCUMENT.....	8
1.2	TARGET AUDIENCES	8
1.3	STRUCTURE OF THE DOCUMENT.....	8
2	CLOUD-ENABLEMENT OF DISTRIBUTED SERVICES	10
2.1	GROUNDWORK ON DISTRIBUTED SERVICES	10
2.2	Cloud-ENABLEMENT	10
2.3	DISTRIBUTED SERVICES.....	12
3	STRATEGIC IAAS: INSTALLATION AND DEPLOYMENT	15
3.1	AVAILABLE IAAS SINCE Y1	15
3.1.1	BT Cloud IaaS based on CloudStack	15
3.1.2	SILO IaaS based on OpenStack together with MaaS deployment... 16	
3.1.3	NICPB Cloud IaaS	17
3.2	PLANNING MOSG IAAS CONFIGURATION AND DEPLOYMENT	17
3.2.1	Environment	17
3.2.2	Plan	18
3.2.3	Onboarding of IaaS on STRATEGIC Service Store.....	18
3.2.4	Commencement of Pilot operations	20
3.3	PLANNING GENOA IAAS CONFIGURATION AND DEPLOYMENT	20
3.3.1	Environment	20
3.3.2	Plan	21
3.3.3	Onboarding of IaaS on STRATEGIC Service Store.....	21
3.3.4	Commencement of Pilot operations	22
4	CONCLUSIONS AND NEXT STEPS	23
	REFERENCES	24

List of Figures

FIGURE 1: AVAILABLE OPENSTACK FLAVOURS IN SILO IAAS	13
FIGURE 2: ADDING CLOUD INFRASTRUCTURE THOUGH GRAPHICAL INTERFACE	19
FIGURE 3: CREATING CLOUD PROFILE THOUGH GRAPHICAL INTERFACE	19
FIGURE 4: CREATING CLOUD PROFILE THOUGH GRAPHICAL INTERFACE	19
FIGURE 5: CREATING CLOUD PROFILE THOUGH GRAPHICAL INTERFACE	20
FIGURE 6: CREATING CLOUD PROFILE THOUGH GRAPHICAL INTERFACE	22

List of Tables

TABLE 1: DEFINITIONS, ACRONYMS AND ABBREVIATIONS	6
TABLE 2: NEEDED VIRTUAL RESOURCES PER EACH SCENARIO	14
TABLE 3: INDICATIVE R320 SERVER BASE SPECIFICATIONS	18
TABLE 4: INDICATIVE R520 SERVER BASE SPECIFICATIONS	18

Definitions, Acronyms and Abbreviations

Acronym	Title
CSP	Cloud Service Provider
IaaS	Infrastructure as a Service
ICT	Information and Communications Technology
ISV	Independent Software Vendor
IT	Information Technology
MaaS	Metal as a Service
MSP	Managed Service Provider
PaaS	Platform as a Service
SSP	Service Store Provider
WP	Work Package

Table 1: Definitions, Acronyms and Abbreviations

Executive Summary

The main goal of the STRATEGIC project is to enable, pilot and evaluate a radical shift in the way public cloud services (and existing on-line services) can be migrated, replicated and reused across different regions, as well as in the way they can be used in the composition of novel services.

Overall, the cloud enablement of existing on-line services, along with their subsequent replication, localization and extension (towards developing new services) are key factors for the wider adoption of public cloud services by European organizations (including the public sector) and European citizens. Despite the emergence of tools, techniques and standards that support the above processes, there are still very limited experiences associated with the above processes in a real context, while relevant European policies are not fully in place. Furthermore, security and privacy management mechanisms (along with related policies) are not yet fully integrated into public cloud services.

In WP5 the focus is on the preparation of the pilot sites in order to participate in the pilot process of the project. To accomplish the previously stated goal, we should ensure that the framework and associated cloud computing infrastructures will be available to the public bodies.

Task 5.2 "STRATEGIC framework/platform installation, deployment" deals with the installation and deployment of the cloud infrastructures that comprise the STRATEGIC framework. This deployment may take place across all pilot sites (including the public bodies and their technology partners), in order to enable the latter operation and evaluation of the solutions of the STRATEGIC framework.

This deliverable "*D5.1 Cloud Enablement of Distributed Services*" will reflect the outcomes of Task 5.2 which deal with the installation and deployment of the cloud infrastructures. The document report is delivered in two iterations (D.5.1.a, D.5.1b).

First iteration provides guidelines to public bodies and their technology partners to on-board the cloud infrastructures that comprise the STRATEGIC framework on their sites.

D.5.1b the second iteration of the deliverable describes the infrastructures that will be used by pilot partners during the third year of the project as well as the planning and the steps to on-board STRATEGIC. This document is extending the previous submitted deliverable covering the different environments used in STRATEGIC as target clouds. In addition, the document provides a description of the virtual resources templates (flavours) used by each of the use cases.

1 Introduction & Scope of the deliverable

The main goal of the STRATEGIC project is to facilitate organisations and notably public bodies to leverage the benefits of public cloud services, through boosting three complementary adoption directions: (a) the porting of existing on-line services to the Cloud, (b) the adaptation and localisation of existing services, which have been successfully deployed by other organisations and (c) the composition of new public cloud services on the basis of available legacy services.

1.1 Scope and purpose of the document

The installation and deployment of the cloud infrastructures that comprise the STRATEGIC framework is a key aspect to enable the use of computational resources on the pilot sites. The deployment may take place across all pilot sites (including the public bodies and their technology partners) in order to enable the latter operation and evaluation of the solutions of the STRATEGIC framework.

D5.1a Cloud-Enablement of Distributed Services: This deliverable is the prototype and an accompanying report associated with the implementation and deployment of the public cloud services that will result from the cloud-enablement of the existing on-line services of the STRATEGIC pilot sites. The deliverable will be delivered in two iterations and will reflect the outcome of task T5.2 “STRATEGIC framework/platform installation, deployment”.

The document describes the systems deployed and configured for the cloud-enablement of the pilot sites.

D5.1b Cloud-Enablement of Distributed Services: This deliverable is an extension of the previous described deliverable. The second iteration of the document includes the environments that will be used to install and configure the IaaS that are going to be used by some pilot partners in Y3.

1.2 Target audiences

The main target audience are Public bodies and their technology partners to enable the installation and deployment of the cloud computing infrastructures on their sites. In addition, the document could be interesting for Independent Software Vendors (ISVs) and Managed Service Providers (MSP) of the STRATEGIC public cloud services.

1.3 Structure of the document

The document has the following three main sections:

- Section 1, introduces the content of the document, the intended audience and its structure.
- Section 2, covers the technology enablers as well the distributed cloud resources that will be operated by the pilots during the execution of the use cases.

- Section 3, covers the process to follow by pilot partners that want to on-board their IaaS into STRATEGIC, the underlying infrastructures will be installed and configured to be used by some of the pilot partners during the third year of the project

2 Cloud-Enablement of Distributed Services

In the scope of STRATEGIC, cloud infrastructure are offered by technical partners with the paradigm of IaaS cloud delivery model. In IaaS, the provider manages the data centre facilities, hardware and virtualization, but everything above the hypervisor layer — the OS, middleware and application — was managed by the pilot partners. The consumer does not manage or control the underlying cloud infrastructure, but has control over operating systems, storage, deployed applications, and possible networking components (e.g., firewalls, load balancers) via self-service fashion in a highly-automated way. The second iteration of this deliverable after the analysis of the required cloud distributed services provides tips for pilots who want to build their own IaaS providers in order to execute the cloud services on their own premises.

2.1 Groundwork on Distributed Services

The work carried out during the life time of the STRATEGIC project enabled technical and pilot partners to learn how to create cloud based workloads as well as instantiate and operate distributed services on top of the cloud.

In an early stage of the project public cloud providers have been used to assess the viability of the pilot applications in the cloud (IaaS), during this period, both technical a pilot partners have been analysing the requirements related to each pilot application, trying to detect in advance issues that may arise after moving the applications from a traditional IT environment to a cloud based environment (IaaS).

After the aforementioned first approximation for the IT applications to become cloud based services deployed on public providers, the same process have been used through the STRATEGIC Service Store on private providers, taking into account the lessons learned for public providers. The private provider environments, offered by the technical partners (see section 3.1), have been built in order to support technical developments and pilot operations during the life-time of the project, in the third year is planned the installation of IaaS on some public bodies premises.

Similar infrastructure environment like the one offered by technical partners, is going to be built on the premises of two of the three pilot partners (MoSG, GENOA) while the pilot uses cases defined for CAMDEN pilot are deployed on the BT Cloud. The knowledge gained by pilot partners during the first half of the project assures a smooth operation of pilot applications in the cloud during the second half. For instance, various components and systems have been integrated within WP4 to enable the deployment of distributed cloud services in an orchestrated and secure way through the STRATEGIC framework.

2.2 Cloud-Enablement

Most of the technology enablers used within the STRATEGIC framework have been briefly introduced in the previous iteration of this deliverable; D.5.1a Cloud Enablement of Distributed Services [9] and covered further within the documents previously submitted in the scope of WP3 and WP4 (D.3.1 [1], D.3.2 [2], D.3.3 [3], D.4.1 [5], D.4.2 [6], D.4.3 [7], D.4.4 [8]).

The STRATEGIC Service Store is the entry point for all workload configurations and service deployments of STRATEGIC. The Service Store provides orchestration capabilities to the workloads defined within their application marketplace; in addition STRATEGIC allows associating each service with horizontal security mechanisms (i.e.: data protection, data encryption). At the same time, when a pilot application service is instantiated, monitoring agents are deployed together with the virtual resource instances in order to keep track of the availability and performance information of the service during the whole service lifecycle. Another key enabler for our deployments are the infrastructure providers that after being registered within the Service Store become target working nodes for pilot deployments. As it was mentioned before in previous STRATEGIC documentation, our approach is not limited to one provider. Several providers can be registered under our STRATEGIC multi-tenant environment allowing multi-cloud deployments over various types of IaaS providers.

The components and systems that enable the operations in the cloud are listed below:

- Service Store

The Service Store allows to inject control points into the application stack, during the service creation phase, before the final deployment of the resources on top of an Infrastructure Provider. The application as well as the control points can be defined and configured using the STRATEGIC metadata model together with the applications already available in the application catalogue or registering new applications that can be included in the metadata as part of the definition of the cloud workload.

- Monitoring system

The monitoring system being used as part of the STRATEGIC is able to collect performance and availability information over various Cloud Service Providers (CSPs) built on top of different infrastructure providers. The backbone of the monitoring system has been configured to automatically retrieve information from the computational resources after the deployment of the aforementioned resources in private or public cloud infrastructure.

- Security mechanisms

STRATEGIC provides among other mechanisms application and host protection in addition to data encryption of data drives as a service which can be consumed as horizontal services. Cross-border attributes exchange as well as cross-border authentication engine for pilots which is applied at application level through STORK/SEMIRAMIS components.

- IaaS Provider Environment

Several IaaS environments have been provided to support deployment from technical and pilot partners (see section 3.1). The environments provide different types of virtualized computing resources each of which might be managed by different cloud computing software (i.e: OpenStack, CloudStack). After being registered in the Services Store, the resources managed by the cloud computing software become target working nodes for our deployments from the marketplace.

- IaaS as a Service (MaaS)

In order to deal with the administration complexity of physical infrastructural elements a Metal-as-a-Service layer has been added. MaaS is responsible for the “Dynamic provisioning and Scaling” at the physical world through a simple web interface or API. Through MaaS we can add, commission, update, deploy and recycle physical servers at will.

The actors involved in provisioning a horizontal service through the Service Store as depicted in previous iteration of this deliverable are:

- **CSP:** An infrastructure provider and service host, which acts as the Cloud Infrastructure (IaaS) or Platform (PaaS) provider. We refer to this entity as the CSP (Cloud Service Provider).

- **SSP:** A (cloud) service store provider that offers the ability to assemble vertical application stacks from software components offered by ISVs and deploy, configure and manage the application stacks on different CSPs.

- **ISV:** Independent Software Vendors whose role is to provide applications or software elements (e.g. operating systems, web servers, data-bases, web applications, etc.) which will be published in catalogues by the SSP and will be assembled by application owners in order to be hosted by the CSPs that the application owner selects.

- **MSPs:** (self-) managed service providers who are offering hosted or cloud-based services that allow the governance of features (e.g. network performance, encryption, security, federation, data protection, system and application protection, etc.) that are integrated into the SSP.

- Finally, we refer to the entity that exploits or consumes compound services as the application owner/service store client.

2.3 Distributed Services

On Cloud environments where automation of deployment is the goal, usually specific hardware templates are used. These templates are created by the IaaS administrator in a way that allows the proper utilization of the underlying infrastructure. For example, different templates should exist in order to make possible the deployment of services with different needs, on VCPU count, RAM availability and storage as well. In the same time those templates should be aligned with the existing hardware in order not to create templates that divide resources in a way that all resources are not utilized.

After consulting the needs of the pilot partners that have been described in deliverable D2.2 [4], and based on the infrastructure described in section 3.1.2, the SILO technical team has created five virtual resources templates on SILO IaaS. On OpenStack IaaS, these templates are called flavors¹ and the specific flavors created namely are: Tiny, Small, Medium, Large and xLarge. The details on VCPU number, RAM and base disk size are depicted in Figure 1 **Error! Reference source not found..**

¹ <http://docs.openstack.org/openstack-ops/content/flavors.html>

Flavors

<input type="checkbox"/>	Flavor Name	VCPUs	RAM	Root Disk
<input type="checkbox"/>	m1.tiny	1	512MB	1GB
<input type="checkbox"/>	m1.small	1	2048MB	20GB
<input type="checkbox"/>	m1.medium	2	4096MB	40GB
<input type="checkbox"/>	m1.large	4	8192MB	80GB
<input type="checkbox"/>	m1.xlarge	8	16384MB	160GB

Displaying 5 items

Figure 1: Available OpenStack flavours in SILO IaaS

Pilots that use OpenStack IaaS on their scenarios will try to replicate those flavors or adapt them to their specific infrastructure on their private IaaS.

Scenario	Scenario name	Needed Virtual Resources
Camden-1	Open data initiative for publishing data on the cloud	<ul style="list-style-type: none"> • 4x VM (2-core CPU, 4 GB RAM, Windows Server 2008 R2) • 100 GB disk storage
Camden-2	Open systems for hosting a publicly available application	<ul style="list-style-type: none"> • 3x VM (2-core CPU, 4 GB RAM, Windows Server 2008R2) • 100 GB disk storage
Camden-3	Digital identity and authentication	<ul style="list-style-type: none"> • 1x VM (2 VCPU, 4 GB RAM, CentOS) • 32 GB disk storage
Genoa-1	Cloud-enabled service for business activities	1x VM (m1.medium 4GB RAM 2 VCPU 40.0GB Disk)- possible upgrade to large
Genoa-2	Cross-border authentication for business activities	<ul style="list-style-type: none"> • 1x VM (m1.medium 4GB RAM 2 VCPU 40.0GB Disk) • 1x VM of Stork (m1.small 2GB RAM 1 VCPU 20.0GB Disk)
Genoa-3	Cross-border issuance of resident certificate	<ul style="list-style-type: none"> • 1x VM (m1.small 2GB RAM 1 VCPU 20.0GB Disk) • 1x VM of Semiramis (m1.small 2GB RAM 1 VCPU 20.0GB Disk)
Genoa-4	Open data initiative	<ul style="list-style-type: none"> • 1x VM (m1.medium 4GB RAM 2 VCPU 40.0GB Disk)

Scenario	Scenario name	Needed Virtual Resources
Stari Grad-1	Cloud-enabled certificate issuance service	<ul style="list-style-type: none"> 1x VM (m1.medium 4GB RAM 2 VCPU 40.0GB Disk)
Stari Grad-2	Cross-border issuance of resident certificate	<ul style="list-style-type: none"> 1x VM (m1.small 2GB RAM 1 VCPU 20.0GB Disk) 1x VM of Semiramis (m1.small 2GB RAM 1 VCPU 20.0GB Disk)
Stari Grad-3	Cloud-enabled email service	<ul style="list-style-type: none"> 1x VM (m1.small 2GB RAM 1 VCPU 20.0GB Disk)
Stari Grad-4	Open data initiative	<ul style="list-style-type: none"> 1x VM (m1.medium 4GB RAM 2 VCPU 40.0GB Disk)

Table 2: Needed virtual resources per each scenario

Due to the usage of cloud environment and the automation process provided by STRATEGIC Service Store, if services need more virtual resources or if resources are underutilized, changing the used virtual hardware template for each scenario is possible.

3 STRATEGIC IaaS: Installation and Deployment

In order to facilitate the early commencement of pilot operations two IaaS providers have been deployed on British Telecom and Singular Logic premises based on CloudStack and OpenStack respectively. During first and second year of the project, these IaaS providers have been used by technical and pilot partners to deploy the cloud based services through the STRATEGIC Service Store.

However, during third year of the project two of the pilot partners (GENOA and MOSG) want to build their own IaaS provider in order to execute the cloud services on their own premises.

Since some of MoSG use cases will handle private data, one of the main reasons to move to IaaS in Serbia is better protection of data privacy. These use cases are Stari-Grad-1, Stari-Grad-2 and potentially Stari-Grad-3. We will consider if the chosen IaaS will be built in MoSG itself or it will be some other already established IaaS in Serbia. A first intention is to build an IaaS of the same architecture as in SiLO on the new purchased hardware that will be installed in the MoSG services. Other reasons to build this in Serbia are easier administration, etc.

GENOA already has a local platform based on a different technology (VSphere) on which most of the applications are deployed. There are different reasons for GENOA to have a local IaaS based on STRATEGIC are: the use of an open-source solution and acquisition of the skills to manage it, the possibility to compare the solution to the existing one realistically, the possibility to exploit the security mechanisms provided etc.

Towards a smooth installation and deployment of IaaS providers on the pilot sites the MaaS component has been provided (see **Error! Reference source not found.**), the aforementioned component is capable to orchestrate the installation and configuration of the Openstack software modules to easily build a ready to use IaaS provider in the pilot premises. As it was documented in D.5.1a the OpenStack that is going to be instantiated through MaaS component will configure three types of nodes to allow the deployment of services. The first node type includes the Openstack core as well as the GUI, the second type includes additional services implementing network, storage and orchestration capabilities, and finally the third node type is in charge of the provisioning of instances into the environment. After the proper registration of the pilot IaaS in the Service Store pilot partners will be enabled to deploy cloud services from the STRATEGIC marketplace.

3.1 Available IaaS since Y1

3.1.1 BT Cloud IaaS based on CloudStack

As part of the target cloud clouds that are available to the Pilots, BT has provisioned a multi-server cloud based on the managed by Citrix CloudPlatform connecting two separate islands based on Xen and VMWare hypervisors. Their configurations are as follows:

There are 3x Huawei blades that support the Xen zone, specs as follows:

- 131 GB RAM
- 24x CPU – Intel® Xeon® CPU E5-2667 0 @ 2.90GHz

There are 2x HP blades that support the VMware Zone, specs as follows:

- 1x ProLiant BL 465c G7 (24x CPU – AMD Opteron™ Processor 6172 @ 2.099 GHz, 131 Gb RAM)
- 1x ProLiant BL 460c G6 (8x CPU - Intel® Xeon® CPU E5530 @2.40GHz, 65 Gb RAM)

The aforementioned IaaS will be registered in the Service Store to support the deployment of services by technical and pilot partners.

The Service Store described in section **Error! Reference source not found.** within this document and is running on:

- 8GB RAM, 4vCPU's - AMD Opteron 2.3MHz (using 20%), 2 x HDD (250GB / 500GB), OS - Ubuntu 12.04.4 LTS

3.1.2 SILO IaaS based on OpenStack together with MaaS deployment

SingularLogic provides an IaaS setup that can be used by pilot partners, for all the duration of the project and pilot partners can use it based on their needs and even in parallel in case they create their own private cloud. Until now applications from Genoa and Municipality of Stari Grad have been deployed and are successfully used for evaluation and piloting. The cloud deployment created is composed by 3 physical machines, each of them being multicore rack server. As also described in deliverable D5.1 [9], the 3 physical machines are namely exp3201.maas, exp3202.maas and exp5201.maas.

In more details, the first server (exp3201.maas) is a Dell R320 server that includes core OpenStack services that are required for the graphical interface, like database, message bus and key server. The second server (exp3202.maas) is also a Dell R320 server that includes the rest of the OpenStack services that are implementing network, storage and orchestration capabilities. Finally the last server (exp5201.maas) is a Dell R520 server that is used with the sole purpose of providing compute instances in the OpenStack environment.

Detailed setup of the offered IaaS has been provided in deliverable D5.1a [9]. In this deliverable more information about the underlying hardware, of the 2 Dell R320 Servers and 1 Dell R520 Server is provided.

Each Dell R320 has 1 Intel Xeon 2430 CPU with 6cores with 16GB each and 1,5 TB of HDD Storage. As CPU support hyper threading technology², so total VCPU count is doubled³ to 12 for the each server.

Dell R520 has 2 CPUs Intel Xeon 2470 with 10 cores each, 48 GBs of RAM and 146GB of SSD storage. As CPU support hyper threading technology⁴, so total VCPU count is doubled to 40 for the specific server.

² <http://www.intel.com/content/www/us/en/architecture-and-technology/hyper-threading/hyper-threading-technology.html>

³ http://docs.openstack.org/openstack-ops/content/compute_nodes.html

3.1.3 NICPB Cloud IaaS

NICPB has two IaaS clouds – one based on OpenNode and the other one on OpenStack. During the first year they were used for internal development and packaging only, i.e. pilot applications were not allowed access for hosting production environment, as the hosting needs were satisfied with BT and SiLO clouds.

There is a plan to increase amount of pilot scenarios by a certain factor, in this case NICPB OpenStack-based cloud is planned to be integrated with a STRATEGIC Service Store following instructions in D4.2a. This would provide pilots with a wider choice of options for hosting of the non-critical services.

3.2 Planning MOSG IaaS configuration and deployment

3.2.1 Environment

Municipality of Stari Grad (MoSG) will create a private cloud that will host the pilot services and possibly other services of the municipality. As a public administration body, municipality needs to perform a public procurement process to purchase necessary hardware and software to build our own IaaS. Technical team of MoSG objective is to create a cloud infrastructure that will be long lasting and after discussions with SILO, it has been decided to base MoSG IaaS on the specifications of IaaS provided by SiLO. Suggested hardware specifications are inline with SILO infrastructure described in section 3.1.2, with the addition of a high available physical server that can be used for MaaS Server installation.

So suggested is the usage of 3 Dell R320 Servers and 1 Dell R520 Server:

The allocation of software per server includes;

1. Dell R320: Canonical MaaS Server
2. Dell R320: OpenStack Core Services (UI, database, key server, VM images, etc)
3. Dell R320: OpenStack Networking Services
4. Dell R520: OpenStack Compute

The (indicative) specification of each R320 can be aligned with the specifications of SILO IaaS and can be:

Base Server	Dell PowerEdge R320 Server, compatible with Intel Xeon 24XXv2 processors
CPU	1x Intel Xeon E5-2430v2 2.50 GHz, 6 cores
RAM	16GB of RAM, 1600MHz

⁴ <http://www.intel.com/content/www/us/en/architecture-and-technology/hyper-threading/hyper-threading-technology.html>

Storage	3x500GB HDD for storage
Network	Dual port 1Gibabyte Ethernet adapter

Table 3: Indicative R320 server base specifications

The (indicative) specification of the Dell R520 server can be aligned with the specifications of SILO IaaS and can be:

Base Server	Dell PowerEdge R520 Server, compatible with Intel Xeon 24XXv2 processors
CPU	2x Intel Xeon E5-2470v2 2.40 GHz, 10 cores
RAM	64GB of RAM, 1600MHz
Storage	2x146GB SDD for storage
Network	Dual port 1Gibabyte Ethernet adapter

Table 4: Indicative R520 server base specifications

The mentioned specific setup is powerful enough to host many VMs; however the above setup is indicative and can be downsized or upsized according to MOSG preferences. In general 4 servers or at least 3 physical servers and one VM that can be used for MaaS Server are the minimum requirement. 1 server should have at least 2 network cards (the networking node) and 1 server (the compute node) should have enough disk space and CPUs in order to be able to span the needed number of VMs in MoSG cloud.

3.2.2 Plan

MoSG will start the public procurement procedure with the above specifications and what we will purchase actually will depend on the procedure and available budget.

In case that procurement doesn't succeed MoSG is considering the usage of other already established IaaS in Serbia for the piloting during 3rd year of the project.

MoSG plan for IaaS activities:

- June-July 2015: Education of IaaS configuration and activities with SILO, during Belgrade meeting and with remote sessions
- July-October 2015: Hardware procurement and purchasing
- October-November 2015: IaaS installation with help of SILO technical team
- November-December 2015: On-boarding and testing of IaaS on STRATEGIC Service Store
- December 2015: IaaS ready to host all MoSG applications

3.2.3 On-boarding of IaaS on STRATEGIC Service Store

In order to use an IaaS based infrastructure by STRATEGIC Service Store, the IaaS must become available to STRATEGIC Service Store. First, the installation of

IaaS will be based on D5.1a [9] process and will be concluded with the help of the technical team of SILO.

As the selected OpenStack is supported from Service Store the process described in D4.2a [6] will be followed.

This process includes network configuration by MoSG administrators in order to allow connections between the IaaS and STRATEGIC Service Store. Also for the on-boarding of an IaaS on STRATEGIC Service Store, the STRATEGIC administrator will be contacted in order to enable the connection and approve MoSG IaaS. In order to add a new Cloud Infrastructure administrator will use the form displayed in Figure 2.

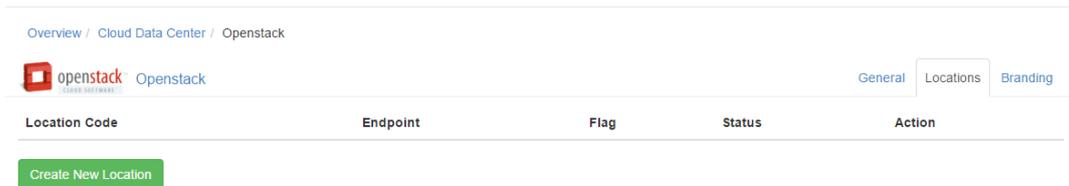


Figure 2: Adding Cloud Infrastructure through graphical interface

More details can be provided, with the form presented in figures Figure 3 and Figure 4.

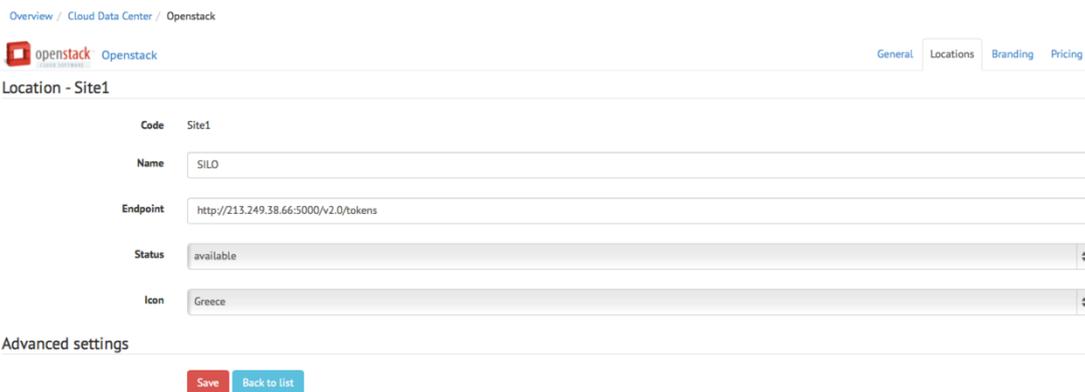


Figure 3: Creating Cloud Profile through graphical interface

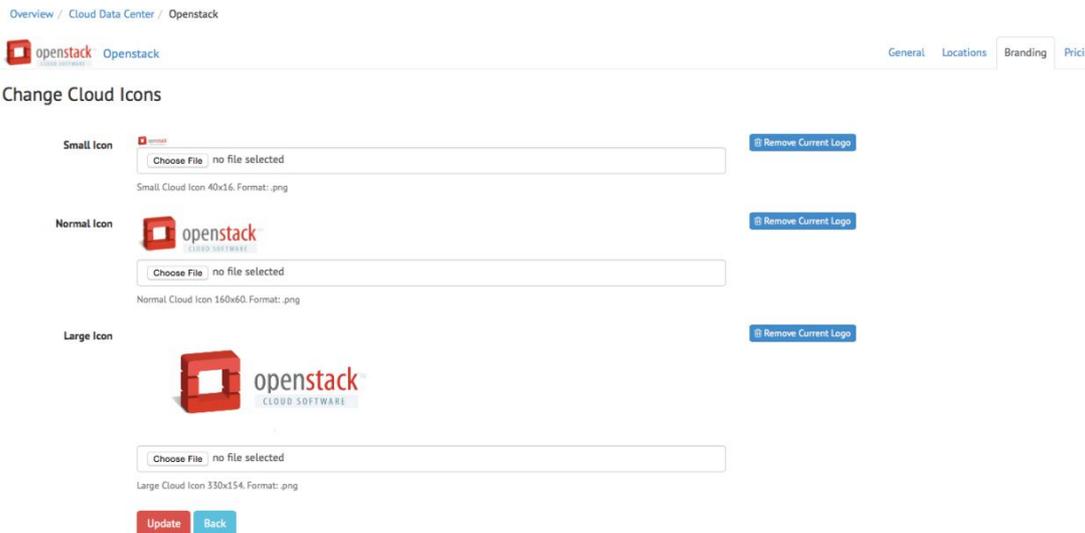


Figure 4: Creating Cloud Profile through graphical interface

After the IaaS will become already available in STRATEGIC Service Store, the MoSG administrator will have to create a specific Cloud Profile. Cloud Profiles represent the information stored for each user and for each specific IaaS in order to achieve IaaS level management through STRATEGIC. If the IaaS has been on boarded to STRATEGIC Service Store, the keys have to be provided and the cloud target becomes immediately available.

Location Settings Add Location -

Site1 <http://213.249.38.66:5000/v2.0/tokens> Remove

Tenant
Tenant Name

Username
User Name

API Key
API Key or Password

Pending Back Verify settings

Figure 5: Creating Cloud Profile through graphical interface

3.2.4 Commencement of Pilot operations

Applications and services will be deployed from STRATEGIC Service Store will be deployed to MoSG IaaS, as soon as it will be on-boarded. However, pilot operations in the MoSG IaaS will officially start with the start of 3rd year of the project, on Month 24, as planned in deliverable D5.4 [11]. As pilot operations are reported on the two iterations of deliverable D6.1, the usage of existing IaaS will be documented in deliverable D6.1a that will be published in M24, while MoSG IaaS usage will be documented in deliverable D6.1b that will be published in M36. Also, the commencement of MoSG IaaS by pilot operations of the project will be documented in the final reporting of pilot operations, deliverable D6.2.

3.3 Planning GENOA IaaS Configuration and deployment

3.3.1 Environment

Technical team of Genova will create a cloud infrastructure that will be used during the pilot operations of the project. After discussions with SILO, it has been decided to create an OpenStack based IaaS, that follows the setup described in deliverable D5.1 [9] and follows the Ubuntu Cloud approach⁵.

Genova IaaS will have the following setup, comprised of 4 servers:

1. Canonical MaaS Server
2. OpenStack Core Services (UI, database, key server, VM images, etc)
3. OpenStack Networking Server
4. OpenStack Compute Server

⁵ <http://www.ubuntu.com/cloud/tools>

The first three servers will have at least the type A specifications while the fourth server will have at least the type B specifications. Server 4 at least 2 net cards.

Type A Specifications

- Processor: 2 GHz, 4 core, 10M cache, DDR3
- Memory: 4G
- Performance BIOS settings
- RAID: HW
- HD: 2 x 500G SATA
- Dual power supply
- Network adapter
- DVD
- No Operating system

Type B Specifications

- Dual-Processor: 2 GHz, 6 core, 15M cache, DDR3
- Memory: 8G
- Performance BIOS settings
- RAID: HW
- HD: 2 X 1T SAS
- Dual power supply
- Network adapter
- DVD
- No Operating system

3.3.2 Plan

Genova plan for IaaS activities:

- July 2015: education of IaaS configuration and activities with SILO
- July-October 2015: HW purchasing
- October-December 2015: IaaS installation and first application running
- 2016: other application running

3.3.3 On-boarding of IaaS on STRATEGIC Service Store

For Genova, like in MoSG, in order to use an IaaS based infrastructure by STRATEGIC Service Store, the IaaS must become available to STRATEGIC Service Store. First, the installation of IaaS will be based on D5.1a [9] process and will be concluded with the help of the technical team of SILO.

As the selected cloud-computing software platform of OpenStack is supported from Service Store the process described in D4.2a [6] will be followed.

This process includes network configuration by Genova administrators in order to allow connections between the IaaS and STRATEGIC Service Store. Also for the on-boarding of an IaaS on STRATEGIC Service Store, the STRATEGIC administrator will be contacted in order to enable the connection and approve Genova IaaS. Procedure will be the same as presented above in section 3.2.3 for Strari Grad.

After the IaaS will become already available in STRATEGIC Service Store, Genova administrator will have to create a specific Cloud Profile by providing the needed keys and the cloud target becomes immediately available.



Location Settings [Add Location](#)

Site1 <http://213.249.38.66:5000/v2.0/tokens> [Remove](#)

Tenant
Tenant Name

Username
User Name

API Key
API Key or Password

[Pending](#) [Back](#) [Verify settings](#)

Figure 6: Creating Cloud Profile through graphical interface

3.3.4 Commencement of Pilot operations

Applications and services from the STRATEGIC Service Store will be deployed to Genoa IaaS, as soon as Genoa's IaaS will be on-boarded. However, pilot operations in the Genoa IaaS will officially start with the start of 3rd year of the project, on Month 24, as planned in deliverable D5.4 [11]. As pilot operations are reported on the two iterations of deliverable D6.1, the usage of existing IaaS will be documented in deliverable D6.1a that will be published in M24, while Genoa IaaS usage will be documented in deliverable D6.1b that will be published in M36. Also, the commencement of Genoa IaaS by pilot operations of the project will be documented in the final reporting of pilot operations, deliverable D6.2.

4 Conclusions and Next Steps

This deliverable D.5.1 provides in two iterations a detailed description of the installation and deployment process of the cloud infrastructures that comprise the STRATEGIC framework. The document has been given for the benefit of pilot partners and public bodies, to enable the installation and deployment of the cloud computing infrastructures on their sites.

In the second iteration of the document the installation and deployment process have been described to enable the pilot partners to build their own IaaS provider on their sites interacting with STRATEGIC framework with their own private IaaS deployed on their premises.

The work carried out in the scope of T5.2 “STRATEGIC framework/platform installation, deployment” will ensure a smooth adoption of the pilot applications when are moved to the cloud. The required steps to build an IaaS environment in the pilot premises has been agreed and scheduled.

In addition, the effort needed during the IaaS deployment and installation process in the pilot sites has been reduced thanks to the MaaS component, capable to automatically deal with the installation and configuration of the cloud software components.

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