

Helix Nebula – The Science Cloud

Title: D5.4 Final Flagship Deployment Report

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0.1 Initial Revision



Executive Summary

During May and September 2014 the Flagship Application Deployment activity was undertaken as part of the Helix Nebula initiative and was coordinated as part of the FP7 project activity.

During the deployments, the Flagship applications of CERN, ESA and EMBL were deployed on to the two Blue Box platforms created for the purposes of the initiative, one was open source solution (SlipStream) and the other a commercial solution (EnStratus).

All three flagship deployments are considered successful by the flagship application providers themselves, however a number of issues were identified during the deployments. These can be summarised as:

- Large delays in blue box provisioning and cloud integration/configuration; the overall schedule slipped largely requiring significant effort
- Level of blue box-cloud integration required far too much human intervention and direct interaction with cloud providers instead of programmatic access to their services
- Deployment via the Blue Box was not stable using EC2 bridge; maturity is missing
- Elasticity could not be experienced since significant amount of manual configuration was required
- It is difficult to pay bills using the current set-up of blue box & supplier
- Availability of sufficient cloud assets was not always granted

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1 Introduction

This document contains an analysis and evaluation of the flagship application deployment activities that were performed as part of the Helix Nebula FP7 Project between May and September 2013

The contents of the document can be outlined as follows:

- Section 2: A description of the platforms used during the Pilot Phase, and an outline of the approach taken during the activity
- Section 3: A description of the individual findings during the Pilot deployments by CERN, ESA and EMBL
- Section 4: A summary of the findings and lessons learnt during the deployment activity
- Section 5: A selection of the various minutes produced in order to track the coordination of the various deployment activities.

2 Deployment Approach

For the Pilot Phase deployments, a two solution approach was taken in respect to the 'Blue Box' platforms that were used, one commercial (EnStratius) and one open source product. The diagram below and the table contained in Section 2.1 details the cloud providers that were available integrated with the two Blue Boxes. Not all cloud providers were supported by either of the Blue Boxes.

All Flagship Provider organisations deployed using either one or both of the Blue Boxes and a map showing which provider deployed using which Blue Box(es) is provide in Section 2.2

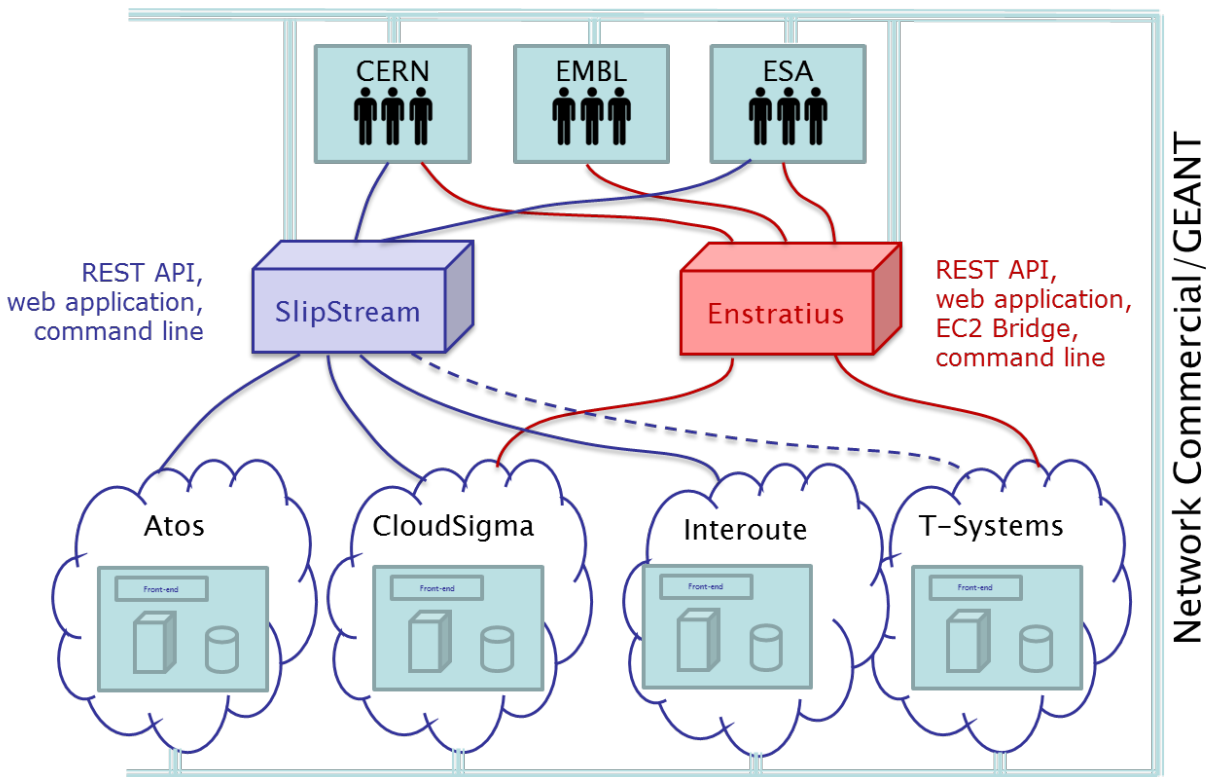


Figure 1: Diagram showing cloud provider/blue box integration

2.1 Supported Cloud Providers per Blue Box

The following table details which Clouds were integrated with which of the Blue Boxes. The decision to integrate a Cloud with a particular Blue Box was a decision that was made by the Cloud Service Provider themselves and also taking in to account the technical and commercial feasibility of the integration in the timescales available for the deployment phase.

	Atos	CloudSigma	EGI*	Interoute	T-Systems
Enstratus	N	Y	N	N	Y
SlipStream	Y	Y	Y	Y	N

Figure 2: Table summarising Cloud Provider/Blue Box integration

2.2 Deployment Map

The decision on which Blue Box to use for deployment was a decision that sat with the Flagship Application Provider themselves. The following table below details which deployments were performed by which Flagship Provider during the Pilot Phase. Not Applicable (N/A) is used to denote where the deployment would not have been possible due to a particular cloud not being integrated with a particular Blue Box.

		Atos	CloudSigma	EGI	Interoute	T-Systems
CERN	Enstratius	N/A	N	N/A	N/A	Y
	SlipStream	Y	N	O	Y	N/A
EMBL	Enstratius	N/A	Y	N/A	N/A	Y
	SlipStream	N/A	N/A	N/A	N/A	N/A
ESA	Enstratius	N/A	Y	N/A	N/A	Y
	SlipStream	Y	Y	O	Y	N/A

Figure 3: Table identifying which organisations deployed with which Blue Box(es)

2.3 Volume of Coordination Calls

The deployment activity was supported and coordinated by a number of calls between various suppliers and user organisations between May and September. The graph below details the number of weekly calls that were being held throughout that period.

The core call was a weekly deployment coordination call lead by CGI from which minutes were produced detailing the various statuses of the flagship deployment activities and any outstanding actions. However, it was necessary in some cases to supplement these calls with a number of other calls in order to help progress some blocking issues encountered during the deployment phase. These calls included:

- Weekly deployment status calls (May until September)
- Weekly coordination calls with EnStratius (May until June)
- Daily EnStratius/EMBL coordination calls (June until August)
- Weekly Supply-Side status/coordination calls (every week)

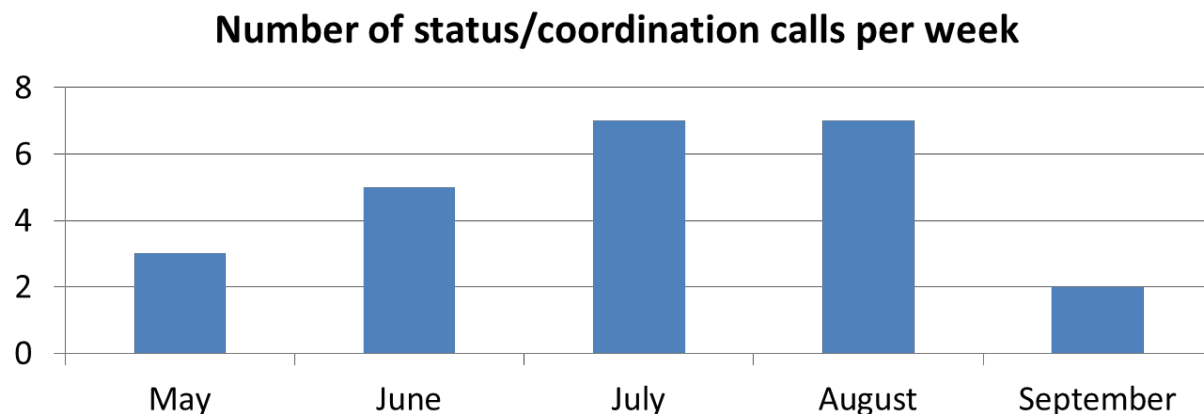


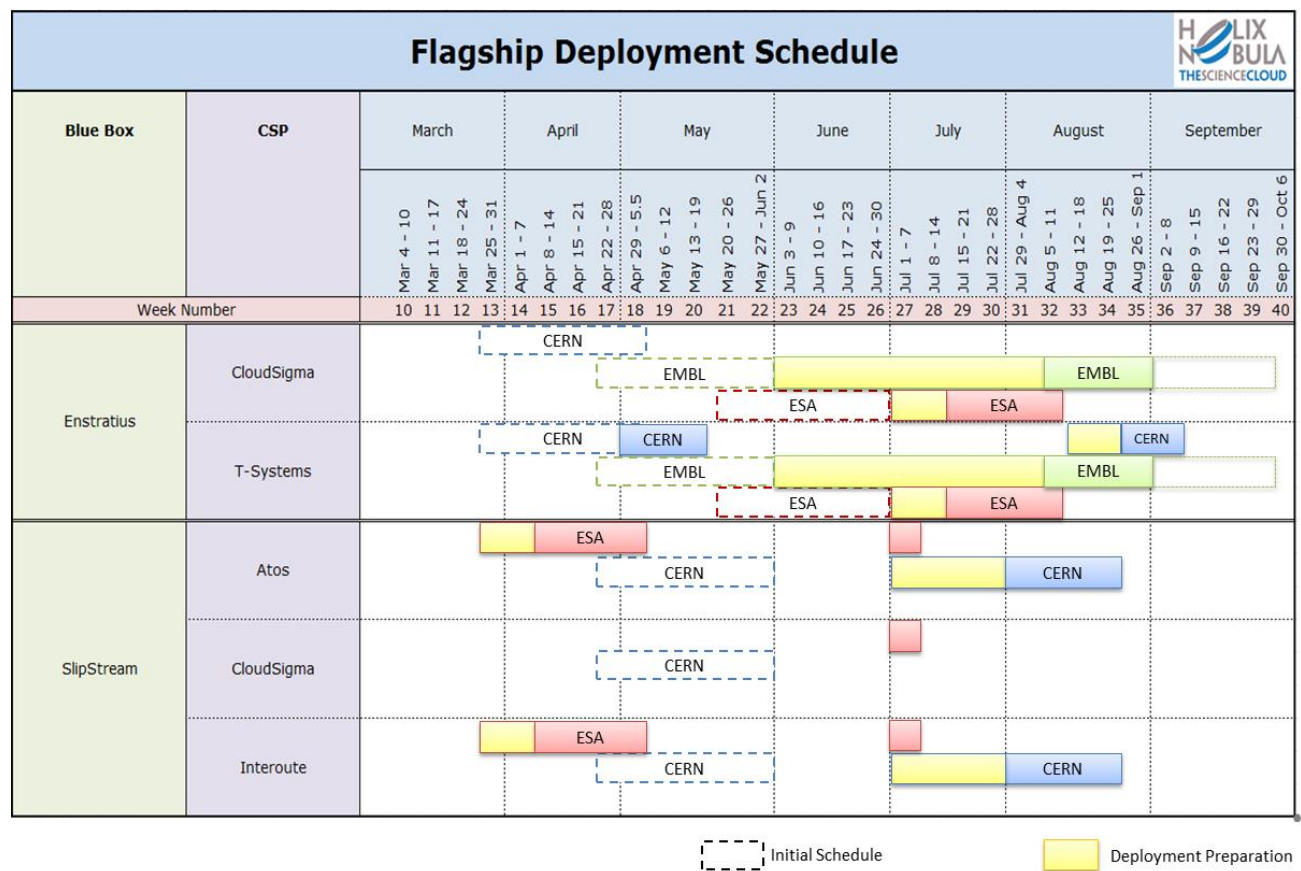
Figure 4: Coordination Call Volumes

The minutes that were produced from the weekly coordination call are contained in Section 7 of this document.

2.4 Schedule

It was originally envisaged that the flagship deployments would take three months from mid-April until mid-July however delays were experienced due to technical integration issues and due to the rollout of the Blue Box platforms themselves. A summary of some of the technical challenges encountered are detailed in Section 4 of this document.

The table below shows the original deployment plan put in place before the start of the Pilot deployment phase against the actual deployment schedule achieved.



3 Deployment Findings

The following section details the findings and outcomes of the flagship application deployments during the Pilot phase by CERN, ESA and EMBL.

3.1 CERN

3.1.1 Introduction

CERN began Pilot deployment activities in May 2013 and had a focus of testing the Blue Boxes that had put in place for the Pilot phase and as described in Section 2.1. In addition, there was a wish to test multi-provider billing, the APIs made available as part of the platform, the lifecycle for deployment of machines and unified. As opposed to the Proof of Concept phase, a focus on testing at scale as not as important but more a focus on validating and comparing the functionality of the two Blue Box platforms and integrated the Blue Box APIs with the Grid Managers used by CERN.

3.1.2 Schedule

CERN encountered significant delays to the originally planned schedule. The following table outlines the planned schedule against the actual final schedule of deployments.

Platform	Month	Preparing	Running
EnStratius (Planned)	May 2013	1 Week	1 Week
EnStratius (Actual)	May 2013	2 Week	1 Week
SlipStream (Planned)	August 2013	1 week	1 week
SlipStream (Actual)	July 2013	Several Weeks	2 Weeks

During deployment with both SlipStream and EnStratius it is clear that the time taken to configure for deploying the CERN flagship took longer than originally anticipated and a summary of some of the issues encountered during this activity can be summarised as:

- The Blue Box tools will still under configuration and deployment themselves at this point which the flagship deployment activity should start
- Not all of the providers connectors for the Blue Boxes were finalised in time for the deployment
- Network configuration took a while

- It was necessary in some cases to re-configure parts of the deployment.
- It is not possible to update the pre-baked images which CERN have which meant that images had to be converted or configured separately for each Blue Box
- The deployments were impacted by holidays taking during August.

3.1.3 Results

As previously described, performance of the platform was not during this activity a focus for CERN however the testing was performed using a standard benchmark focusing on testing the interfaces and functionality available via the two platforms using a representative workload. The findings of the CERN deployment can be summarised as follows:

- Performance was on the whole found to be OK with performance comparable with the CERN bare-metal. It was not possible to saturate the network however the deployment was done using clusters of 10-20 VMs and so one could consider that the scale was not high enough to achieve this.
- Reliability: the majority of issues were identified during the configuration of the deployment itself however once this was achieved a level of reliability was experienced.
- Given the tight timescale of the deployment activity there was not sufficient time to test Configuration Management or performing Software Updates to the deployed clusters.
- Elasticity was not testing at all during this activity and all testing was performed using clusters of a small number of machines.
-

The following table summarises the deployments that were achieved:

Metric	enStratus	Slip Stream	CERN-P1
Core count	~80	~40	~13,500
Jobs submitted	11,090	5,474	1,301
Failure rate	0,71%	0,13%	0,38%
Wallclock time	43 min (± 8.9)	20 min (± 9.6)	29 min (± 6.4)

Figure 5: Summary of CERN deployment scale and performance

3.1.4 Issues Found

There were a number of issues identified by CERN during the deployment activities performed.

Deploying the CERN flagship via the Blue Boxes was found to require a large amount of manual preparation work. In some cases, static network allocation was required for the deployed platform. In addition, acquiring the relevant information in order to integrate with the various providers supported by the platform was not straightforward

Regarding APIs, the Blue Boxes themselves do not use “standard” APIs and in both cases are proprietary to the Blue Box platform themselves. Going forward CERN may consider using the EC2 Bridge as a more “standard” API but considered that this could be an additional level of abstraction which could introduce other issues in the future.

The scale of the deployment cannot be considered large enough to stress the Blue Box and in the future large scale and elasticity should be tested. However during this deployment it was found that static configuration for almost everything which raises concerns of how this might be handled for varying workloads.

It was not possible to make use of the Billing features during this activity.

3.1.5 Recommendations

CERN would make the following recommendations coming out of the Pilot Phase:

- A common interface should be defined whether an open standard or a third party product. This could be for example a subset of EC2 however thought would need to be given as to which subset of the EC2 API should be implemented.
- One option would be to consider the issue of API wrappers to simplify interoperability. Internally, CERN has performed some testing of the DeltaCloud tool.
- A suite should be created for validating the Blue Box platforms
- A method needs to be put in place to crosscheck Billing
-

3.1.6 EGI Federated Cloud Test Deployment

During the Pilot Phase it was not possible to test using the EGI Fed-Cloud however CERN would still be keen to perform the testing once the platform is available with a view to performing a deployment across both public and commercial providers.

3.2 EMBL

3.2.1 Introduction

The EMBL deployment made use of the EnStratus Blue Box and making use of both Cloud Providers integrated to the platform, CloudSigma 2.0 and T-Systems. In addition, EMBL made use of the EC2 Bridge platform that had been created for the purposes of allowing integration with StarCluster which is used by EMBL for managing clusters.

The EC2 Bridge was developed by The Server Labs specifically for the purpose of this activity and implemented a subset of 24 calls of the EC2 API in order to support the required EnStratus integration.

The focus of the EMBL deploy activity was to assess the feasibility of the using the Blue Box platform and to perform a limited amount of scalability and performance testing through end-to-end testing of EMBL's genome assembly & annotation pipeline.

3.2.2 Schedule

As with the other deployments significant delays were experienced by EMBL during the Pilot phase which heavily impacted the original plan of the activity taking 8 weeks to instead taking 4 months. At a high level, this slip can be attributed to issues related to the readiness of the platform and some cloud provider specific issues encountered during the deployment.

The following diagram provides a summary of the planned schedule against the actual schedule with some of the issues encountered during the deployment.

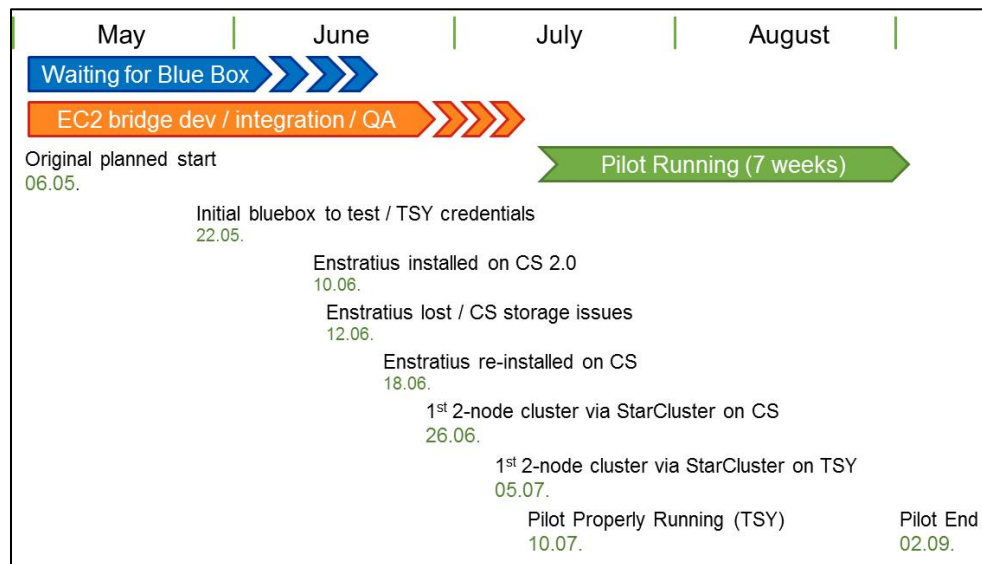


Figure 6: EMBL Deployment Schedule

3.2.3 Deployment

In general, the deployment is considered by EMBL a success and the table below summarises the feasibility & scale and the deployments performed by EMBL during this activity.

		CS	TSY
EC2 Bridge		Dynamically launched cloud based HPC clusters using a set of EC2 calls initiated by StarCluster	
	6x cluster	Success	Success
	34x cluster	Success	Insufficient resources
Annotation		Success	Success
Assembly	Small genome	Success	Success
	Large genome	Not performed Storage stability issues	Success

Figure 7: EMBL Deployment feasibility & scale

3.2.4 Results

Performance of the platform was found to be ok and was considered comparable to the in-house test results performed by EMBL. Compute specifically was found to be comparable

and storage performance was sufficient for the needs of the EMBL Flagship deployment. In addition, the network bandwidth is considered sufficient for the data transfer from EMBL to the cloud to run the application.

Although the deployment is considered on the whole a success by EMBL they do however consider that that success was achieved at high cost. The deployment activity was subject to huge delays to the deployment of the functional blue box platform and the EC2 bridge solution. This delayed EMBL's pilot and ability to test and in addition negatively impacted participant's stamina and blue box acceptance.

EMBL consider that they were essentially involved in full-time Quality Assurance for supply-side blue box and EC2 bridge teams which for them is not considered appropriate.

The EC2 Bridge was initially in alpha state & incompatible with StarCluster and throughout the deployment still unstable and functionally unpredictable. This was further compounded with severe cloud storage problems experienced during the whole pilot that resulted in the loss of the entire Blue Box platform and resulted in it becoming impractical to run large assembly tests on one of the Cloud Providers platforms.

3.2.5 Further Limitations & Difficulties

It was found that the API / programmatic access to end point functions limited and it should be explored to increase what is provided here in the future. It was also found that at a communication and operations level that too much direct communication with the cloud provider or application provider themselves rather than using the blue box when chasing of resources or tracking errors.

Other issues encountered included:

- Hard coded configuration inside the EC2 bridge & blue box
- Although billing functionality is provided in EnStratus the pricing information had been information missing in EnStratus
- Lack of a storage API at T-Systems
- Image discovery issues with EnStratus
- Reusing cluster names not possible when redeploying clusters

- Post image launch configuration issues with vSphere on T-Systems
- Disk images not deleted after VM termination (CS feature)

3.2.6 Appropriateness of Blue Box Solutions

The deployment of the EnStratius and EC2 Bridge solutions for the purpose of this activity should be considered pre-production and a number of issues were encountered during the deployments. In addition, the lack of support by all suppliers is not acceptable for support production of EMBL's genome analysis pipeline on a federated cloud.

Given the delays to the deployment activities it was not possible to test the federation aspects of the platform.

3.2.7 Service, Support & Coordination

EMBL consider the situation related to Server Level Agreements and Terms and Conditions to be confused during the Pilot Phase and often EMBL found themselves having to integrate directly with EnStratius in order to try and iron out and address the issues that were encountered during the deployment activity.

It was felt that on the whole a good job was performed by Logica for the coordination of the pilot with efficient weekly calls and individual communication. In addition to this a daily EMBL pilot calls during several weeks with T-Systems, EnStratius, TSY, CloudSigma, Logica and EMBL teams to improve communication and mitigate issues.

3.2.8 Recommendations

The following recommendations have been identified by EMBL for addressing the future development of the platform:

- Ensure that programmatic access is available for all aspects of the Blue Box platform
- Ensure a minimum API is supported by all suppliers, which for the EMBL flagship, would be preferably EC2 based
- Ensure that there is sufficient stability of the platform and the connected clouds before starting deployment activities.
- The suppliers providing the service need to align & provide a coordinated set of services to reduce the amount of effort that needs to be spent by the flagship provider organisation

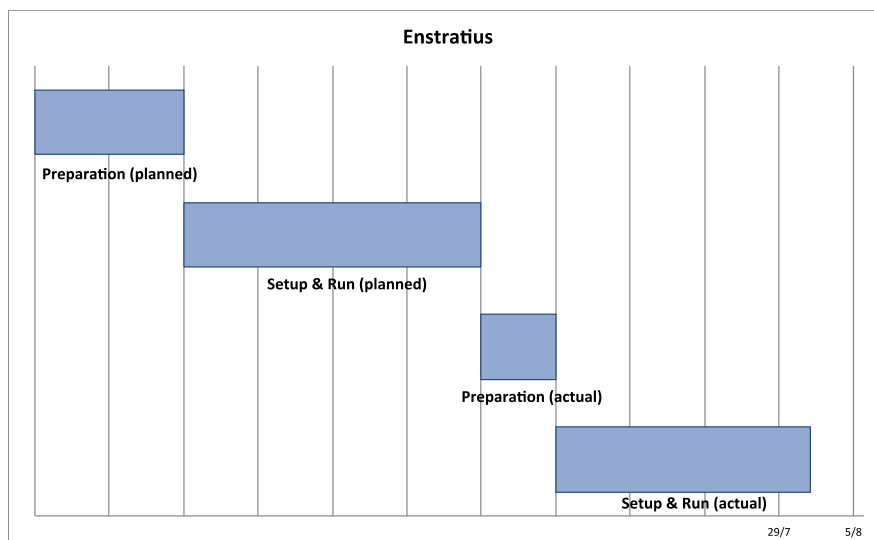
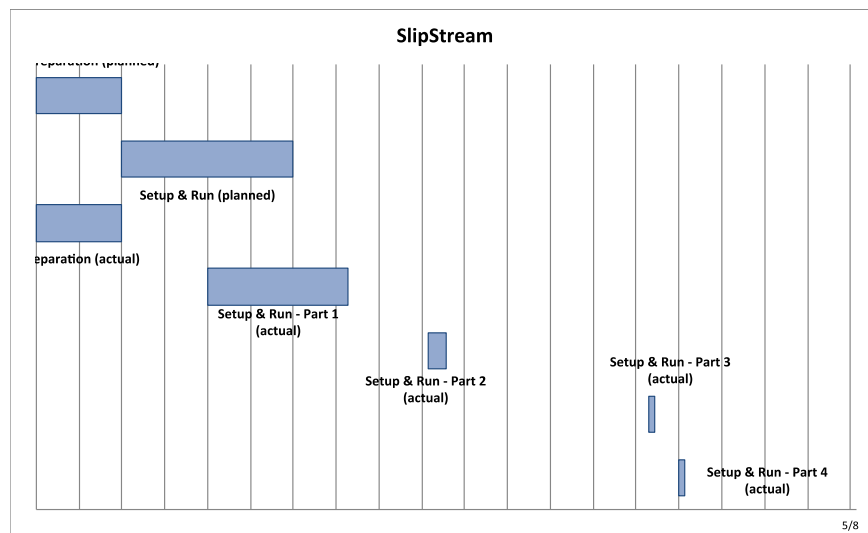
3.3 ESA

3.3.1 Introduction

The ESA flagship was performed using both the EnStratius and SlipStream platforms.

3.3.2 Schedule

As with the other Flagship deployments issues were encountered with the timescales for the ESA flagship deployment.



3.3.3 Results

The following results were found by ESA during the deployment of the ESA flagship on the Helix Nebula platforms:

- **Time to First Instance:** The usage of the Blue boxes is of help in this direction and ESA found specifically that Slipstream's image creation feature allows for reproducible customization of base images, decreasing the time to first instance.
- **Scaling:** Mechanisms for scaling (dynamic provisioning) are supported by EnStratius however resources for scaling were not always available due to limitations in the infrastructure made available for the pilot by the providers.
- **Performance:** Evaluation of the computing power of machines was not the goal of this set of experiments. From the performance side, network bandwidth has been analysed to evaluate the sustainability of inter-cloud deployments. Relevant problems in inter-cloud bandwidth, in the order of 100mb/s, not enough for our typical processing needs.
- **Contextualization:** Both Blue Boxes provide interesting contextualization options;
 - Slipstream's coordinated deployment very useful to establish order of execution during the deployment of a multi-VM appliance;
 - EnStratius Services provide a fine-grained system to keep track of what services are installed on the VMs.
- **User Management:** EnStratius provides a complete solution to manage accounts inside an organization, with role-based permissions.
- **Cost:** EnStratius provides reports on the costs incurred by the deployments.
- **Support:** Level of support was generally highly satisfactory. For SlipStream, e-mail interaction with SixSq team and for EnStratius initially e-mail interaction with T-Systems and thereafter Logica provided a ticketing system shortly after the beginning of tests.

3.3.4 Issues Found

The following issues were identified by ESA during the Flagship application deployment activity:

- A number of features existing at the provider level is still missing in the Blue Boxes;
- Several implementation glitches at Blue Box level;
- Inter-cloud bandwidth must be improved;

- Going forward, a focus on data management is needed

3.3.5 Platform Strengths and Weaknesses

The following table summarises the Strengths and Weakness of the two Blue Box platforms from an ESA perspective:

	Strengths	Weaknesses
SlipStream	<ul style="list-style-type: none"> • Image Creation Workflow • Coordinated deployments make ordering of distributed operations easy • Support 	<ul style="list-style-type: none"> • Lack of cost reporting • Basic user management
Enstratius	<ul style="list-style-type: none"> • Dynamic Scaling • Provides cost estimation • Support 	<ul style="list-style-type: none"> • Long VM Startup Time • Difficult to debug failed deployments

Figure 8: SlipStream & EnStratius Strengths & Weaknesses

4 Overall Deployment Evaluation Summary

This section details an overall evaluation and summary of the findings of the flagship deployment activities as presented in Section 3 of this document. Additionally presented is an outline of what should be considered going forward from the Demand-Side perspective.

4.1 Overall Summary

All 3 flagships concluded successfully the pilot phase, however:

- Large delays in blue box provisioning and cloud integration/configuration; the overall schedule slipped largely requiring significant effort
- Level of blue box-cloud integration required far too much human intervention and direct interaction with cloud providers instead of programmatic access to their services
- Deployment via the Blue Box was not stable using EC2 bridge; maturity is missing
- Elasticity could not be experienced since significant amount of manual configuration was required
- It is difficult to pay bills using the current set-up of blue box & supplier
- Availability of sufficient cloud assets was not always granted

4.2 Lessons Learnt

In summary, the lessons learn from the Blue Box deployments are as follows:

- The transition from the Proof of Concept (1 to 1 direct deployment) to a federated system using the blue box was not straight forward. In the future we should be more realistic about efforts required for the next step, i.e. when we are going in production
- Before going into production, the system needs to become more stable and automatic configurable system needs be provided.
- Procurement process needs to be analysed in more details allowing cash flows within Helix Nebula. Currently it is difficult to pay.
- Major focus has been given from all sides to the Blue Box, which is a tool (essential) but alone does not cover the four main goals of the Helix Nebula initiative.

4.3 Next Steps

The following recommendations have been identified by the demand-side for going forward with the platform:

- Agree on a standard interface, not on name of a blue box (functionality)
- Agree on standard terms and conditions with a clear service definition (in production mode SLAs are needed)
- Integrate EGI and hybrid clouds
- Identify a procurement scheme allowing demand side to go into operations
- Implement high capacity interconnectivity between cloud providers and data providers.
- The blue boxes are a tool enabling functionalities. Functionality requirements are slightly different from demand side partners requiring different solutions at current stage and choice of platform would allow users to pick which tool would be best for them.
- The procurement should ensure that Helix Nebula is not a cartel and this can be achieved by providing service differentiation and price flexibility
- Ensure a comprehensive Service Catalogue is introduced and clear Terms and Conditions and SLAs for use of the platform are communicated.

5 Deployment Call Coordination Minutes

5.1 Overview

Following is a selection of the minutes that were produced as part of the coordination activities during the Pilot Phase deployment activities.

5.2 7th May 2013

Pilot Deployment Status Meeting Minutes

Tue 7th May 2013

In Attendance:

Name	Organisation	Email	Initials
Ramon Medrano Llamas	CERN	ramon.medrano@cern.ch	RML
Bob Jones	CERN	Robert.Jones@cern.ch	RJ
Wolfgang Lengert	ESA	Wolfgang.Lengert@esa.int	WL
Salvatore Pinto	ESA	Salvatore.Pinto@esa.int	SP
Jordi Farres	ESA	jordi.Farres@esa.int	JF
Antonio Cuomo	ESA	Antonio.Cuomo@esa.int	AC
Rupert Lueck	EMBL	lueck@embl.de	RL
Jonathon Blake	EMBL	blake@embl.de	JB
Michael Wahlers	EMBL	wahlers@embl.de	MW
Stephen Keenan	EMBL-EBI	keenan@ebi.ac.uk	SK
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Konstantin Skarbuskas	SixSq	konstan@sixsq.com	KS
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Jonathan Graham	Interoute	Jonathan.Graham@interoute.com	JG
Mick Symonds	Atos	Michael.Symonds@atos.net	MS
Klaus-Peter	Atos		KP
Sjaak Theelen	Atos	sjaak.theelen@atos.net	SJ
Phil Evans	Logica (CGI)	phil.evans@cgi.com	PE
Paul Klobuszewski	Logica (CGI)	paul.klobuszewski@cgi.com	PK

Minutes:

CERN:

- Have successfully deployed to the T-Systems cloud through EnStratius and would like to continue performing some scaling tests.
- Question whether it is possible to create snapshots using EnStratius. PE to investigate and will get back to RML [Action #1]
- CERN will begin preparation from deployment to SlipStream. Ideally would like to deploy to all three Cloud Service Providers through SlipStream but first need to plan their intentions. RJ/RML to plan [Action #2]
- Atos happy to accommodate CERN once CERN's plans have been established.

ESA:

- Successfully deployed to Interoute and Atos through SlipStream and have been running their tests successfully.
- Issues experienced using CloudSigma, it was not possible to clone disks. MH will case the issue up immediately and get back to ESA [Action #3].
- A small-scale deployment using CloudSigma through SlipStream scheduled week beginning 20th May for one week once issues above have been rectified.

EMBL:

- An initial small-scale test deployment should have started this week using EnStratius however the deployments are running late and the EC2 Bridge is not yet available.
- Rupert reiterated the importance of the EC2 Bridge and requested that the timeline for availability of the bridge should be made clear.
- GA to coordinate with Paul Parsons with a view to making the bridge available to EMBL by the end of this week (6th -10th May) [Action #4] in any case, the timeline should be communicated to EMBL as a matter of urgency [Action #5].
- EMBL are available Thurs (Stephen) and Fri (Jonathon).
- EMBL will begin loading images etc. to the cloud end of the week with a view to some initial test deployments starting next week.
- Jonathon requested that the Cloud Service Providers ensure resources are available to support the deployment to ensure a successful kick-off.
- Initial deployments will be to the magnetic-disk cloud and will be migrated to SSD after a week.

General:

- Phil Evans raised awareness of the Success Criteria forms that need to be completed as part of the Pilot deployments. Please ensure that they are being completed as accurately and complete as possible. Work will begin shortly on the Initial Evaluation activity. [Action #6]
- Jurry reported he could not find the Success Criteria forms on Alfresco. Phil Evans to re-distribute [Action #7].
- Future calls will be on Tuesdays at the earlier time of 1pm CET [Action #8]

Actions:

1. PE/SP to investigate the possibility to perform snapshots using EnStratius and will get back to RML
2. CERN to plan SlipStream deployments. Cloud Service Provider scheduling will be provided to PE who will update the schedule.
3. MH to chase up cloning issues and report back to ESA
4. GA to coordinate with Paul Parsons (PP) with a view to making the EC2 Bridge available the end of the week.
5. GA/PP to communicate timeline for bridge access to EMBL
6. Success Criteria forms should be completed by each flagship organisation/actively involved providers. Draft copies can be sent to PE for review.
7. PE to re-distribute success criteria forms.

8. PE to set up reoccurring call.

5.3 14th May 2013

Pilot Deployment Status Meeting Minutes

Tue 14th May 2013

In Attendance:

Name	Organisation	Email	Initials
Ramon Medrano Llamas	CERN	ramon.medrano@cern.ch	RML
Wolfgang Lengert	ESA	Wolfgang.Lengert@esa.int	WL
Antonio Cuomo	ESA	Antonio.Cuomo@esa.int	AC
Jonathon Blake	EMBL	blake@embl.de	JB
Paul Parsons	The Server Labs	pparsons@theserverlabs.com	PP
Marc-Elia Bégin	SixSq	meb@sixsq.com	MEB
Jurry de la Mar	T-Systems	jurry.delaMar@t-systems.com	JdlM
Mick Symonds	Atos	Michael.Symonds@atos.net	MS
Klaus-Peter Nebert	Atos		KP
Johan Louter	Atos		JL
Phil Evans	Logica (CGI)	phil.evans@cgi.com	PE
Paul Klobuszewski	Logica (CGI)	paul.klobuszewski@cgi.com	PK

Minutes:

CERN:

- Shared the deployment status and a new schedule proposal on Monday.
- Phil Evans pointed out that, although we will do our best to accommodate the request from CERN we must be careful not to overload CloudSigma. Presented updated draft schedule for all deployments [Action #1]. Ramon to further discuss the scheduling internally at CERN [Action #2]
- CERN would be able to shift the deployment on SlipStream if necessary but definitely want to test the Blue Boxes with multiple providers at the same time.
- Have successfully deployed 20 VMs so far to the T-Systems cloud through EnStratus and will deploy another 20 VMs this week.

ESA:

- Completed deployments to Interoute and Atos through SlipStream.
- Waiting for the deployment to CloudSigma through SlipStream next week [Action #3].

EMBL:

- The deployment has not started yet and is going to be delayed by a week due to the outstanding issues with the EC2 Bridge.
- EMBL has not yet received credentials from CloudSigma as a fix to EnStratus for CloudSigma is still required. Michael Higgins has communicated the issues to EnStratus' management and we are awaiting their answer.

- Paul Parsons stated that there are a few configuration changes required to EnStratius for the EC2 bridge. Paul has reached out to EnStratius for assistance with the change.
- Jonathon made it clear that EMBL must be kept up to speed on the status of the above outstanding issues as they are currently dead in the water. Jurry suggested that a daily flash-email would be a useful way to keep everyone updated. PE to implement [Action #5].

General:

- A call with Enstratius has been scheduled for 5pm today to resolve the remaining issues [Action #4].

Actions:

1. PK to distribute the update schedule with appropriate reminders.
2. CERN to further discuss scheduling internally.
3. ESA scheduled to being 1 week deployed as of Monday 20th of May, PE to coordinate with Michael Higgins for an update on the status of the CloudSigma API v2.0 integration.
4. PP and MH to communicate the status and the timeline when the remaining issues will be fixed.
5. PE to send out the “daily flash” emails.

5.4 21st May 2013

Pilot Deployment Status Meeting Minutes

Tue 21st May 2013

In Attendance:

Name	Organisation	Email	Initials
Ramon Medrano Llamas	CERN	ramon.medrano@cern.ch	RML
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Jordi Farres	ESA	Jordi.Farres@esa.int	JF
Jonathon Blake	EMBL	blake@embl.de	JB
Paul Parsons	The Server Labs	pparsons@theserverlabs.com	PP
Marc-Elian Bégin	SixSq	meb@sixsq.com	MEB
Jurry de la Mar	T-Systems	jurry.delaMar@t-systems.com	JdlM
Michael Higgins	CloudSigma	micheal.higgins@cloudsigma.com	MH
Mick Symonds	Atos	Michael.Symonds@atos.net	MS
Joseph	Atos		J
Johan Louter	Atos	johan.Louter@atos.net	JL
Paul Klobuszenski	Logica (CGI)	paul.klobuszenski@cgi.com	PK

Minutes:

CERN:

- T-Systems deployment has been finished last Friday.
- CERN identified no malfunctions and found nothing suspicious in the captured metrics so far.
- Would like to transfer images from T-Systems to CloudSigma if possible. Transfer of deployment scripts will most likely not be possible due to their uniqueness.

ESA:

- Waiting for the deployment to CloudSigma through SlipStream [Action #2].
- Would like to transfer deployment scripts between Blue Boxes.
- Will use VMware based vCloud on T-Systems.

EMBL:

- Are concerned since the deployment has not started yet and is going to be delayed by another week due to the outstanding issues with the EC2 Bridge and CloudSigma integration.
- EMBL has not yet received credentials from both providers [Action #3].
- Paul Parsons has reached out to EMBL for assistance with the EC2 Bridge and StarCluster integration – a StarCluster enabled image is needed either on T-Systems or CloudSigma cloud for further analysis [Action #4].
- EMBL expressed concerns about the delay since the staff need to be reassigned and cannot stay on stand-by.

General:

- A call with Enstratus has been scheduled for 5pm today to resolve the remaining issues [Action #5].

Actions:

6. PK to distribute the updated schedule.
7. MEB to update ESA on CloudSigma's connector integration and give a green light to start the deployment.
8. JdlM to chase up T-System's team.
9. JB to provide PP with a StarCluster enabled image.
10. PK to send out the "daily flash" email.

5.5 28th May 2013

Pilot Deployment Status Meeting Minutes

Tue 28th May 2013

In Attendance:

Name	Organisation	Email	Initials
Ramon Medrano Llamas	CERN	ramon.medrano@cern.ch	RML
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Klaus-Peter	Atos		KP
Johan Louter	Atos	johan.Louter@atos.net	JL
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Paul Klobuszewski	Logica (CGI)	paul.klobuszewski@cgi.com	PK

Minutes:

CERN:

- Need credentials for SlipStream [Action #1].
- Will begin deploying one or two machines for functional testing on SlipStream this week.
- Intend to deploy 20-25 VMs per flagship, in total up to 50 VMs with 200 cores and 80 GB root core disk.

ESA:

- Have problems with the API. Meb has investigated the issues and this has now been addressed. ESA can re-start deploying to CloudSigma with SlipStream.
- Shilpa received ESA's VM image, it is now being prepared and will be ready for kick off [Action #2]

EMBL:

- Shilpa prepared the VM image for EMBL at T-Systems, EMBL can start creating instances now.
- The EC2 Bridge has been deployed but there are a few issues remaining.
- Paul Parsons does not have access to EMBL's StarCluster enabled image for analysis yet, has created an instance using the EC2 Bridge but this was not reported in the EnStratus console. PP conducted

his analysis using account set up by Shilpa for testing, access to EMBL's account is needed [Action #3].

- Jurry requested a concrete deadline for the EC2 Bridge. It was agreed that the Bridge will be functional by the end of this week.

General:

- A call with EnStratius will be scheduled to resolve the remaining issues [Action #4].
- A daily call will be set up for the next three days, until all issues are resolved [Action #5]

Actions:

11. MEB to provide CERN with credentials for SlipStream.
12. SP to prepare the VM image for ESA's deployment to T-Systems with EnStratius.
13. SP to provide PP with access to EMBL's account on EnStratius.
14. PK to send out "daily flash" email.
15. PE to set up the daily call.

5.6 4th June 2013

Pilot Deployment Status Meeting Minutes

Tue 4th June 2013

In Attendance:

Name	Organisation	Email	Initials
Ramon Medrano Llamas	CERN	ramon.medrano@cern.ch	RML
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Jurry de la Mar	T-Systems	jurry.delaMar@t-systems.com	JdlM
Kaspar Duetting	T-Systems	Kaspar.Duetting@t-systems.com	KD
Joseph	Atos		J
Johan Louter	Atos	johan.Louter@atos.net	JL
Phil Evans	Logica (CGI)	phil.evans@cgi.com	PE
Paul Klobuszewski	Logica (CGI)	paul.klobuszewski@cgi.com	PK

Minutes:

CERN:

- Cannot deploy to Cloud Sigma on Enstratius because of the missing API 2.0 integration. The API is ready for deployment but requires a reinstallation of some modules of the management server. The maintenance window will be agreed on in the next few days. Immediate upgrade was not possible due to on-going EC2 Bridge integration.
- Will deploy to SlipStream as soon as the resources are imported. [Action #1]

ESA:

- Have successfully deployed to CloudSigma via SlipStream. All objectives have been completed successfully but have found out that interconnectivity in a multi-cloud deployment becomes very slow. Currently the connectivity is not using GEANT but public Internet. [Action #2] The tests could not be completed because of switching from ESA's own to Atos managed service infrastructure, which will now be the final location for the rest of the deployment phase.
- Would like one more day to perform one more multi-cloud deployment.
- Started using Enstratius and will deploy to T-Systems cloud for 3-4 weeks.

EMBL:

- EMBL is increasingly concerned about the delays.
- Were able to test some EC2 Bridge functionality but there are issues with user groups and the control of instances. EMBL is not able to use the Bridge properly at the moment. [Action #3]

General:

- A call with Enstratius is scheduled for today to resolve the remaining issues [Action #4].

Call with Enstratius:

- CloudSigma 2.0: The mentioned maintenance window is needed for an upgrade. The new version will be deployed on a single node. Accounts will have to be set up again and the DNS entry might need an update as well.
- EC2 Bridge: issues were investigated but could not be resolved. A second call with Enstratius has been scheduled for Wed 5th June.

Actions:

16. MEB to provide CERN with information about the status and a “green light” for the deployment.
17. JB to discuss with John Chevers and ESA to understand what will help with the bottlenecks.
18. PK to include the update in the minutes.

5.7 11th June 2013

Pilot Deployment Status Meeting Minutes

Tue 11th June 2013

In Attendance:

Name	Organisation	Email	Initials
Ramon Medrano Llamas	CERN	ramon.medrano@cern.ch	RML
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Klaus-Peter	Atos		KP
Johan Louter	Atos	johan.louter@atos.net	JL
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Paul Klobuszewski	Logica (CGI)	paul.klobuszewski@cgi.com	PK

Minutes:

CERN:

- Accounts are being configured for each CSP. Meb is currently waiting for credentials from Interoute and the setup will be finished today or tomorrow.
- Ramon has scheduled a separate call with Interoute to resolve remaining issues.
- Setup on SlipStream will start either today or tomorrow.
- Deployment on Enstratus is delayed.

ESA:

- Cross-CSP testing has not been completed yet.
- Will deploy to Enstratus as soon as SlipStream deployment is finished.
- Do not need many VMs or resources. [Action #1]
- Staff on holiday in August, deployments should be finished by the end of the month.

EMBL:

- Did not make any progress yet due to unresolved issues with Enstratus.
- A significant effort was needed to resolve previous issues.
- CloudSigma 2.0 has been deployed to separate environment, tests will be completed tomorrow. The migration to the new version will be completed without any downtime.
- The new environment is needed by EMBL to start preparations for the deployment

General:

- A call with Enstratius is scheduled for today to resolve the remaining issues.

Enstratius calls 11/06 and 12/06:

- Enstratius is looking for a way to reproduce the issues.
- On Tuesday night a disk failure occurred, the deployment will be moved to CloudSigma 2.0.
- The management node has been reported dead, it is currently being investigated what data can be recovered. Pricing data might be lost.
- Issues will be resolved during Wednesday US time.

Actions:

19. SP to verify that T-Systems have the needed resources.

5.8 25th June 2013

Pilot Deployment Status Meeting Minutes

Tue 25th June 2013

In Attendance:

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Mick Symonds	Atos	Michael.Symonds@atos.net	MS
Johan Louter	Atos	Johan.Louter@atos.net	JL
Phil Evans	Logica (CGI)	phil.evans@cgi.com	PE
Paul Klobuszenski	Logica (CGI)	paul.klobuszenski@cgi.com	PK

Minutes:

CERN:

- Finished deploying images to SlipStream and will start lightweight testing today. [Action #1]
- Will deploy to CloudSigma and Interoute (only a few machines initially).
- Will check if moving the Enstratus deployments to August is possible. [Action #2]

ESA:

- Multi-provider testing on SlipStream was not possible so far, another attempt will be made today.
- Intend to deploy to all three cloud providers for one day only. Atos is currently not available via SlipStream due to connectivity issues. [Action #3]
- Have received working credentials for Enstratus. [Action #4]

EMBL:

- Had no connectivity on Enstratus until this morning. The issues are being solved today.
- PP tested the EC2 Bridge; instances on CloudSigma are being started properly. Images on T-Systems cloud are not being started via API. Issues with security groups have been resolved but need verification. [Action #5]

- Are happy to start deploying to CloudSigma first, instead of T-Systems.
- EMBL pointed out that their deployment on Enstratus should be prioritized if there is a resource bottleneck.

General:

- Interoute try to connect to GÉANT in London. There is currently no information available on what might be required for the connection.
- Interoute will try to connect to SURFnet in Amsterdam like Atos. Atos experienced significant administrative and contractual problems. WL pointed out that the issues must be sorted out before the General Assemble in August.

Call with Enstratus:

- IP-assigning issue has been resolved, however it is currently not possible to SSH to the VMs. The logs indicate that the operating system could not be loaded.
- StarCluster terminates with an error message that the network does not exist. This has been traced back during the call to be an issue with DNS names.
- SunGridEngine has not been installed on the cluster yet. [Action #6]

Actions:

20. MEB to answer CERN's questions about the VM images.
21. RML to inform PE if the proposed deployment schedule for Enstratus is acceptable.
22. MS to check when the issues will be resolved.
23. XX to update AC on the status of networking issues on Enstratus.
24. PP to investigate the SSH issues today.
25. XX to install SunGridEngine.

5.9 2nd July 2013

Pilot Deployment Status Meeting Minutes

Tue 2nd July 2013

In Attendance:

Name	Organisation	Email	Initials
Ramon Medrano Llamas	CERN	ramon.medrano@cern.ch	RML
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Minutes:

CERN:

- Working on resolving the remaining issues. Ramon will make a request to upload new images today.
- CloudSigma on Enstratius is throwing exceptions while booting, VMs on Atos are not accessible. Interoute is using a data centre in London which has restrictions on IP addresses because there are issues in the data centre located in Geneva. Issues in the Geneva DC will be resolved by tomorrow.
- CERN would like to access the EC2 Bridge on both Enstratius and SlipStream if possible.
- Issues with images on T-Systems will be resolved by Shilpa and Meb.

ESA:

- Reported issues with deployments on Atos.
- Both Interoute and Atos have not been connected to GEANT yet, both experiencing same issues, the connection might take another month or two.
- Wolfgang would like Interoute to be connected before the General Assembly for presentation purposes.
- Deployment on Enstratius has not been started yet, there are remaining issues with config management.
- Shilpa reported that she is not able to see images in the automation part of Enstratius, another two issues should be resolved by tomorrow.

EMBL:

- Issues with CloudSigma will now be discussed directly between CS and EMBL.
- Are trying to setup T-Systems environment, some changes have been made which need verification now.
- Remaining issues will be discussed in the daily call with Enstratius.
- EMBL reported that they still do not have a working environment.

General:

- Holiday season is starting:
 - EMBL will not be available first two weeks of August.
 - CERN will not be available 13-21.07.
 - ESA will not be available the whole August.

Actions:

26. JdLM to clarify the license extension with EnStratius.

5.10 9th July 2013

Pilot Deployment Status Meeting Minutes

Tue 9th July 2013

In Attendance:

Name	Organisation	Email	Initials
Ramon Medrano Llamas	CERN	ramon.medrano@cern.ch	RML
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Paul Parsons	The Server Labs	pparsons@theserverlabs.com	PP
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Jurry de la Mar	T-Systems	jurry.delaMar@t-systems.com	JdLM
Shilpa Padgaonkar	T-Systems	Shilpa.Padgaonkar@t-systems.com	SP
Jonathan Graham	Interoute	Jonathan.Graham@interoute.com	JG
Mick Symonds	Atos	Michael.Symonds@atos.net	MS
Johan Louter	Atos	johan.Louter@atos.net	JL
Phil Evans	Logica (CGI)	phil.evans@cgi.com	PE
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Minutes:

CERN:

- Configuring SlipStream but are still not able to deploy a cluster. Current issues are
 - Images have not been transferred from T-Systems and upload of CERN's images was not possible as well. [Action #1, #2]
 - Issues on Interoute with public IPs and a bug in the connector (has already been fixed by MEB). Interoute will switch to the data center in Geneva.
 - Authentication on SlipStream not working properly although configured.
- Would like to test the EC2 Bridge on both SlipStream and Enstratius (need only to boot, check status and kill the machines). SlipStream implementation is still a prototype, the implementation on Enstratius will be made available. [Action #3]

ESA:

- Completed bandwidth tests on SlipStream. SlipStream deployment has been finished completely.
- Intend to deploy until the 26th of July on Enstratius and test inter-cloud deployment.
- At the moment, GEANT have only agreed to allow connectivity between demand-side to supply-side and not supply-side to supply-side therefore it might not be possible to perform testing across multiple clouds.

- Jurry proposed to try three potential scenarios of data and processing deployments. Antonio proposed local processing on each cloud, or the data being hosted at ESA with the processing being performed on the CSPs infrastructure.

EMBL:

- Can start a small cluster from the Bridge. Starting a large cluster is not yet possible but is being worked on currently. PP noted that if a large number of instances is started, they are put in the Enstratus queue, StarCluster however thinks that these instances are already running.
- Intend to proceed with the deployments as fast as possible.
- Would like to be prioritized regarding the resources on both cloud providers during the deployment.

General:

- MEB reported that the vCloud connector on SlipStream has been nearly finished.

Actions:

27. MEB to update CERN on the status of the fix today.
28. RML to check if CentOS images can be used.
29. RML to provide PP with information on the source of the connections to the bridge.
30. JB to confirm official start date of the deployment to JdIM.

5.11 16th July 2013

Pilot Deployment Status Meeting Minutes

Tue 16th July 2013

In Attendance:

Name	Organisation	Email	Initials
Wolfgang Lengert	ESA	Wolfgang.Lengert@esa.int	WL
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Paul Klobuszenski	Logica (CGI)	paul.klobuszenski@cgi.com	PK

Minutes:

CERN:

- Not attended.

ESA:

- Reported two open issues on T-Systems and minor ones on CloudSigma with Enstratus. Issues on T-Systems will be discussed later today during the call with Enstratus.
- Will run normal tests similar to CERN/EMBL but need to ensure performing a cross-cloud test.
- ESA does not want to place the data on their own infrastructure but in other locations and access it via GEANT.
- Benino suggested using CloudSigma since CS is connected to GEANT and the resulting costs will be minimal. [Action #1]
- ESA's staff will be on vacation in August – testing must be finished until then.

EMBL:

- Nearly finished deployment preparation on CloudSigma and clusters are working. In order to use T-Systems one remaining issue has to be resolved.

General:

- MEB reported that the vCloud connector on SlipStream has been nearly finished.

Actions:

31. Benino to prepare a proposal and contact Jonathon.

5.12 23rd July 2013

Pilot Deployment Status Meeting Minutes

Tue 23rd July 2013

In Attendance:

Name	Organisation	Email	Initials
Antonio Cuomo	ESA	Antonio.Cuomo@esa.int	AC
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Minutes:

CERN:

- Not attended.

ESA:

- Tests are progressing well, trying to leverage all features on Enstratus.
- Dynamic provisioning has not been tested so far.
- All reported issues are resolved.

EMBL:

- Performing tests on CloudSigma.
- Can run for at least 3 weeks.
- Waiting for the resolution of naming issues on T-Systems as it is currently blocking progress.

General:

- Jurry reported that the GEANT connection is not working so far. The deadline was Monday and no reasons for the delay were provided.

5.13 30th July 2013

Pilot Deployment Status Meeting Minutes

Tue 30th July 2013

In Attendance:

Name	Organisation	Email	Initials
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Kaspar Duetting	T-Systems	Kaspar.Duetting@t-systems.com	KD
Jonathan Graham	Interoute	Jonathan.Graham@interoute.com	JG
Paul Klobuszewski	Logica (CGI)	paul.klobuszewski@cgi.com	PK

Minutes:

CERN:

- Not attended.

ESA:

- Finishing the deployment on Enstratus, deployment will be completed tomorrow.
- Are in contact with Shilpa regarding last tests.
- Automated and coordinated deployments are the last remaining issue, will be resolved by Shilpa after the call.
- Inter-cloud connections are in the review at the moment but ESA is facing same issues as during the previous deployment on SlipStream.

EMBL:

- A one-day test on CloudSigma was completed without issues.
- Prepare to deploy on T-Systems.
- Are making good progress.

5.14 6th August 2013

Pilot Deployment Status Meeting Minutes

Tue 6th August 2013

In Attendance:

Name	Organisation	Email	Initials
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Minutes:

CERN:

- Not attended.

ESA:

- Completed all deployments and managed to test all required features, both via the UI and the API.

EMBL:

- Not attended.

5.15 13th August 2013

Pilot Deployment Status Meeting Minutes

Tue 13th August 2013

In Attendance:

Name	Organisation	Email	Initials
Ramon Medrano Llamas	CERN	ramon.medrano@cern.ch	RML
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Michael Higgins	CloudSigma	Michael.higgins@cloudsigma.com	MH
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Mick Symonds	Atos	Michael.Symonds@atos.net	MS
Johan Louter	Atos	Johan.Louter@atos.net	JL
Phil Evans	Logica (CGI)	phil.evans@cgi.com	PE
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Minutes:

CERN:

- Tests on T-Systems cloud via EnStratus were successful.
- Would like to have access and some more time assigned on CloudSigma.
- Will need 1-2 VMs to perform compatibility tests of the EC2 Bridge against the internal tools.
- Are currently working mostly on SlipStream but are experiencing issues with Atos and Interoute (configuration and exceptions). [Action #1]
- Will start booting resources on CloudSigma and, as soon as other suppliers are stable, start real tests with about 20 VMs via SlipStream. A test-run will be conducted next week.

ESA:

- Completed all tests.
- Working on connections of new data providers via GEANT but the majority of the team are currently on holiday.
- Will place the production on the supplier side and pull the data via GEANT as a proof of concept.
- CGI to update schedule with ESA plans [Action #4]

EMBL:

- Annotation runs have been successful on CloudSigma and T-Systems.
- The main deployments have been finished but will continue testing through September. Currently looking at comparisons of performance on the two clouds and updating the EMBL HTML5 Dashboard for the deployments.
- Assembly phase was not run at CloudSigma. [Action #2]

General:

- CloudSigma requested a summary of what has been run on what providers. CGI will provide a summary of this as far as possible plus the updated deployment schedule. [Action #3,#4]

- SixSq are currently underway with working on v2 of SlipStream which includes new metering functionality and a new UI. It was proposed to present the new version at the General Assembly.

Actions:

32. RML and MEB to schedule a call to resolve the issues and prepare the deployment.
33. Jonathon & MH to schedule a meeting externally.
34. PE to distribute a deployment summary.
35. PK to update and distribute the schedule plan.