Complete Dynamic Multi-cloud Application Management

Project no. 644925

Innovation Action

Co-funded by the Horizon 2020 Framework Programme of the European Union

Call identifier: H2020-ICT-2014-1

Topic: ICT-07-2014 – Advanced Cloud Infrastructures and Services

Start date of project: January 1st, 2015 (36 months duration)

Deliverable D2.6

Dissemination and Communication Activity Report 2016

Due date: 31/12/2016

Submission date: 30/12/2016

Deliverable leader: TUB

Editors list: Y. Demchenko (UvA)

Dissemination Level

☒	PU:	Public
☐	PP:	Restricted to other programme participants (including the Commission Services)
☐	RE:	Restricted to a group specified by the consortium (including the Commission Services)
☐	CO:	Confidential, only for members of the consortium (including the Commission Services)

List of Contributors

Participant	Short Name	Contributor
Interoute S.P.A.	IRT	Matteo Biancani, Domenico Gallico
SixSq SARL	SIXSQ	Louise Merifield, Charles Loomis
QSC AG	QSC	
Technische Universität Berlin	TUB	Mathias Slawik, Begüm Ilke Zilci
Fundacio Privada I2CAT, Internet I Innovacio Digital A Catalunya	I2CAT	José Ignacio Aznar Baranda, Eduard Escalona
Universiteit van Amsterdam	UvA	Yuri Demchenko, Miroslav Zivkovic
CNRS Laboratoire de l'Accelerateur Lineaire	LAL	Oleg Lodygensky
CNRS Institut Français de Bioinformatique	IFB	Christophe Blanchet, Bryan Brancotte, Jean-François Gibrat

Change history

Version	Date	Partners	Description/Comments
0.1	24/11/2016	UvA	Initial version and placeholders for data collection
0.2	16/12/2016	UvA	First full version for internal review with full information
0.3	20/12/2016	UvA	Integrated internal reviews
FF	20/12/2016	UvA	Final version

Executive Summary

Effective dissemination and communication activity is an important factor of achieving higher impact of the innovative and practical results of the project by addressing main target groups in research and industry. General focus of WP2 activities in the second year was providing information on the first project results and collecting feedback from different user communities as well as following new trends in the project related areas.

This report presents the results of dissemination and communication activity during the second year of the project. The project followed the initial plan and its update for the second year outlined in deliverables D2.2 and D2.3. This document reports on the regular dissemination and communication activities that are strongly built on the successful results in the first year. The following are the main components and results described in this report:

- Working with the initially identified target communities and identification of new potential users of the project results.
- Consistent use of the project branding elements in all public, online and communication materials.
- Consistent use of different communication channels to the target audiences such as website, social media, newsletters
- Conference publications, exhibitions, events organisation
- Standardization activities

The report provides information about improvements made to website to better focus on target user groups: IT managers, cloud based applications developers, service integrators, and applications users.

Presented results demonstrate that the project successfully fulfilled planned KPI in 2016 following similar successful results in the first year.

Table of Contents

1. Introduction

The CYCLONE project has well defined target communities that are demonstrate strong interest and are already using the project products for automated cloud services deployment and management that would allow both applications developers and services operators to effectively use cloud based resources by simplifying development, deployment and test of services and applications. The developed tools are extending their functionalities to integrating services from multiple providers and providing user friendly web-based interface for non IT savvy users.

Effective dissemination and communication activity is an important factor of achieving higher impact of the innovative and practical results of the project by addressing main target groups in research and industry. General focus of WP2 activities in the second year was providing information on the first project results and collecting feedback from different user communities as well as following new trends in the project related areas.

Presented results demonstrate that the project successfully fulfilled planned KPI in 2016 following similar successful results in 2015. This includes number of publications, participated events, statistics on website visitors and social network activities.

This is the second dissemination and communication report and for easy navigation the documents follows the same sections structure as the original Dissemination and Communication Plan (deliverable D2.2) and previous early report in deliverable D2.3.

2. General Strategy Development and Implementation

This section provides information about the project activities related to the general dissemination and communication strategy that was initially defined in deliverable D2.2 and updated in deliverable D2.3.

2.1. Dissemination and communication strategy in the second project year

In the second year the CYCLONE project followed the initial Dissemination and Communication Plan (DCP) and extended it with the activities identified in the DCP update after the first year, in particular, the targeting two new potential user groups:

- programmable network community that starting extensively using Software Defined Network (*SDN*) and Network Function Virtualization (*NFV*) technologies for building overlay network and require massive Virtual Machines (*VM)* based network elements deployment on cloud

- Intercloud and multi-cloud infrastructures provisioning and management that is demanded by the emerging Big Data and Internet of Thing (IoT) applications.

The DCP realisation effectively involved the partners networks what allowed maintaining continuous connection with target communities during and after the project ends.

2.2. Branding, co-branding and exploitation

The project benefitted from the well-defined branding strategy that was developed at the beginning of the project and provided consistency of all dissemination and communication activities done in the first and second project years, including website, social media icons, presentation and dissemination materials templates. Refer to deliverable D2.1 for the branding strategy outline.

2.2.1. Dissemination materials and branding

The CYCLONE branding strategy has been developed from the very beginning of the project and was methodically implemented in all dissemination materials and activities during the first project year, however at the initial stage they were primarily focused on rising the community and stakeholders awareness about the project and its future products. The target for the second period will shift to promoting the project products and services, user support and outreach.

The second period will require updating existing dissemination materials and developing new ones to present results and products or services readiness status:

- Different leaflets and flyers focusing on CYCLONE products will be produced for major events in which the project will participate.

- CYCLONE Newsletters: 2 new newsletters summarising the project's ongoing activities and developments will be produced in Year 3.

- CYCLONE posters will be produced for all conferences and events that allow posters. Based on past experience, posters are planned at least for EGI Conference 2017 and TNC17.

All above mentioned materials will use the main components of the CYCLONE brand such as logo, templates, and styles as well as specifically crafted messages to address different target communities.

All produced materials will be available via the project website and announced on social media.

2.3.Key Performance Indicators

The project fulfilled the key performance indicators in the second year as summarised in Table 2.1 below (similar like it was achieved in the first year).

Table 2.1. KPI statistics for the first 18 month (midterm review period)

KPI-8.1: Number of unique visitors to the CYCLONE online presence per week (Target: 50) Web site visitor's statistic shows that CYCLONE website has in average 57 visitors per week during data collection period with variation from 25 to 100 visitors per week (refer to Appendix B for sample website statistics).
KPI-8.2: Number of CYCLONE software downloads per week (Target: 20) – not measured.
KPI-8.3: Number of news items on social media platforms per week (Target: 5) The project uses two major channels for publishing regular news about the project: news items on the project website (average 1 news bi-weekly), LinkedIn forum messages and Twitter. Twitter (account @h2020_cyclone) is the main news publishing channel, at the moment of reporting there is 366 tweets and 118 followers what averages to more than 5 tweets per week. There are in total published 50 news articles on the project website covering project development updates, events, publications and presentations.
KPI-8.4: Number of scientific publications per year on CYCLONE topics (Target: 10) This dissemination channel has long term impact as published papers are effectively cited many years after publishing. The project has strong research team what allows producing sufficient number of scientific publications. Current results include • 10 publications in year 2015, and • 11 publications in year 2016 All publications are on the main research topics related to CYCLONE developments and practical use. All papers and publications are archived in one of recognized by academic community open access self-archiving service such as Arxiv,org, Researchgate.net, OpenAIRE or Zenodo.

More detailed analysis of the corresponding KPI for website, social media is provided in sections 4.1 and 4.2, publications and conferences are detailed in sections 4.3 and 4.4.

3. Target Communities and Technology Focus

The following audiences were focus of dissemination activities for the main project products during the first year [D2.2]: Application Service Providers and Managed Service Providers. The fact that the project proposes tools and platforms for development of cloud based applications makes CYCLONE results potentially interesting to other audiences and developers who create and operate applications on cloud infrastructures. The most prominent communities here are European Grid Initiative (EGI) and the pan-European data network for the research and education community, GEANT.

In particular, the project identified two new target application domains for CYCLONE tools:

- Networking community (vendors and operators) that widely adopts Software Defined Networking (SDN) and Network Function Virtualization (NFV) which are becoming predominantly software and VM-based and use cloud deployment automation tools.

- Intercloud and multi-cloud infrastructures provisioning and management that is demanded by the emerging Big Data and Internet of Thing (IoT) applications. In addition to the general cloud based services provisioning, the deployment and bootstrapping of these complex infrastructures and applications requires incorporating additional Intercloud control and management functionalities.

The DCP activity is focused on the target communities identified in the initial DCP plan (D2.2, 2015) and updated after the first project year (D2.3, 2015) that include general developer and provider communities and related to the specific application domains:

- Application Service Providers and Managed Service Providers

- Networking community (vendors and operators) that widely adopts Software Defined Networks (SDN) and Network Functions Virtualisation (NFV).

- Big Data and Internet of Thing (IoT) that require Intercloud and multi-cloud infrastructures provisioning and management.

- Bioinformatics community and potentially energy community.

While developing applications and tools for these communities, the project will identify and address their problems and challenges by providing targeted information, tutorials, targeted design templates and tools. The project will refer to the successful results in already supported domains (bioinformatics and energy) when targeting other communities.

As an example of already planned action, the project will produce a Whitepaper on the security and compliance for bioinformatics applications, other whitepapers will be considered.

The above-mentioned application domains are currently being actively developed and targeting them in the future DCP activities will potentially increase the project results exploitation. When working with target communities and searching for new applications domains, the project will refer to successful cooperation and achieved results in already defined and explored domains.

4. Leveraging the CYCLONE network and increasing the project awareness

The main goal of the current stage of the project development is to provide information about the project results and activities to the identified communities and stakeholders. The following are the main milestones in realising this approach:

- Operation and monitoring of the CYCLONE website, regularly update information about the project results and activities.

- Active use of the CYCLONE social media accounts to deliver the project news and the updates on activities and new developments, using it also to collect feedback from the communities.

- Use partner networks and channels for coordinated dissemination, to access wide professional, national and international contacts, conferences, exhibitions, and the social media.

- Actively using presentations and posters at a number of conferences targeting different stakeholder groups from research, industry and developer communities.

- Further cooperating with other H2020 cloud projects (part of EC Unit E2 Software Services and Cloud) as well as other projects, namely GEANT4 and ELIXIR.

- We organised workshops, special sessions and demos at the EU ICT events, TNC and EGI conferences that provide access to target communities and stakeholders.

4.1. Project website operation and improvement

The project website http://www.cyclone-project.eu/ is operational from the very beginning of the project. It plays important role in increasing awareness about the CYCLONE activities and providing information about the project results and activities by publishing regular news items. It links to CYCLONE-related social media pages at Twitter and LinkedIn. The website contains also links to the project repositories at GitHub and a separate use-cases site.

We made two main changes to the website. First, we created a content strategy, identifying the main target groups and their requirements regarding the website. Second, we made a mayor website redesign, reflecting this content strategy. The website was redesigned and restructured considerably, reflecting the identified personas and goals as described in the table below.

4.1.1. New website content strategy

New website design (implemented and operational since November 2016) reflects concept of targeted messages and vocabulary:

- Present results instead of the project description
- Call to action appealing to visitors needs

- Content structured to address project target groups

- Conversational style instead of generic addressing

- "Bite-snack-meal" approach for effective visitors' browsing

The website content strategy consists of defined *purposes of the website* and identified *personas*, described below in details. The purposes can be expressed in a following way:

1. We want DevOps to benefit from using our software when creating and managing applications

2. We want potential use case end-users to get their ASPs to participate in CYCLONE use cases

3. We want researchers from related fields to collaborate in research and projects

4. We want ASP CTOs to innovate their IT architecture using CYCLONE approaches

The personas are described in the Table below. Figure 4-1 illustrates the proposed web design that implements hierarchical visual design, structured information presentation, and targeted messages for different user groups represented by personas.

Name	*R*icky the *R*esearcher	*D*oreen the *D*evOp	*M*anny the *M*anager	*E*lena the *E*nd-user
Occupation	Researcher at a University	DevOp, handling mainly an important business application used by Elena and others	Manager of Doreen, Head of IT department	End-user of Doreen's application
Main Task	• Researching about IT-related topics • Coming up with innovative solutions • Implementing prototypes • Writing Papers and grant applications	• Implementing new functionality • Maintaining and automating IT infrastructure • Trying things out for fun and profit	• Coordinating with other managers and own staff • Making high-level strategic decisions • Realize business value	• Uses Doreen's application for business functionality
Pain points	When papers and grant applications are rejected because of missing innovation.	When things distract her from coding, e.g., manual maintenance tasks or when development and maintenance becomes a burden and not a joy.	Having too many people nag him about IT problems. When profits decrease and layoffs loom.	When there are problems with the application (unavailability, missing functionality, slow speed, etc.)
Time for content, if related	A lot	Medium	Very little	Medium
Looking for	State of the art, research collaborations	Readily usable software, Trials	Strategic partnerships, Success stories, Innovative IT architectures	Stories of similar users who overcame challenges with similar applications

| Name	*R*icky the *R*esearcher	*D*oreen the *D*evOp	*M*anny the *M*anager	*E*lena the *E*nd-user
What do we want them to do?	Collaborate on Research, use CYCLONE for research prototypes	Apply CYCLONE in SME setting to raise maintainability and allow new functionality	Collaborating on external use cases, getting Doreen to use CYCLONE	Talk to their IT department, asking them to implement CYCLONE use cases for increased user satisfaction
Additional Channels	Blog, Stack Overflow, Research Gate, Academia, Scientific conferences	Blog, GitHub, Stack Overflow, OpenStack Community, Developer Conferences	IT trade fairs (e.g., CeBit, MWC), management journals, industry specific fairs	Popular IT portals (Heise), user forums, industry-specific fairs
Media	Posts, scientific papers, tutorials, source code	Posts, tutorial, step-by-step guides, recipes, source code	Short posts, whitepapers focused on business value, use case descriptions	Use case descriptions,
Communication Style	Formal, precise, featuring diagrams, formalizations, code, and screenshots	Open, direct, to-the-point, featuring code, screenshots	Business language, like an elevator pitch, to-the-point, featuring trend charts, diagrams, SmartArts	Not too formal, not too complex
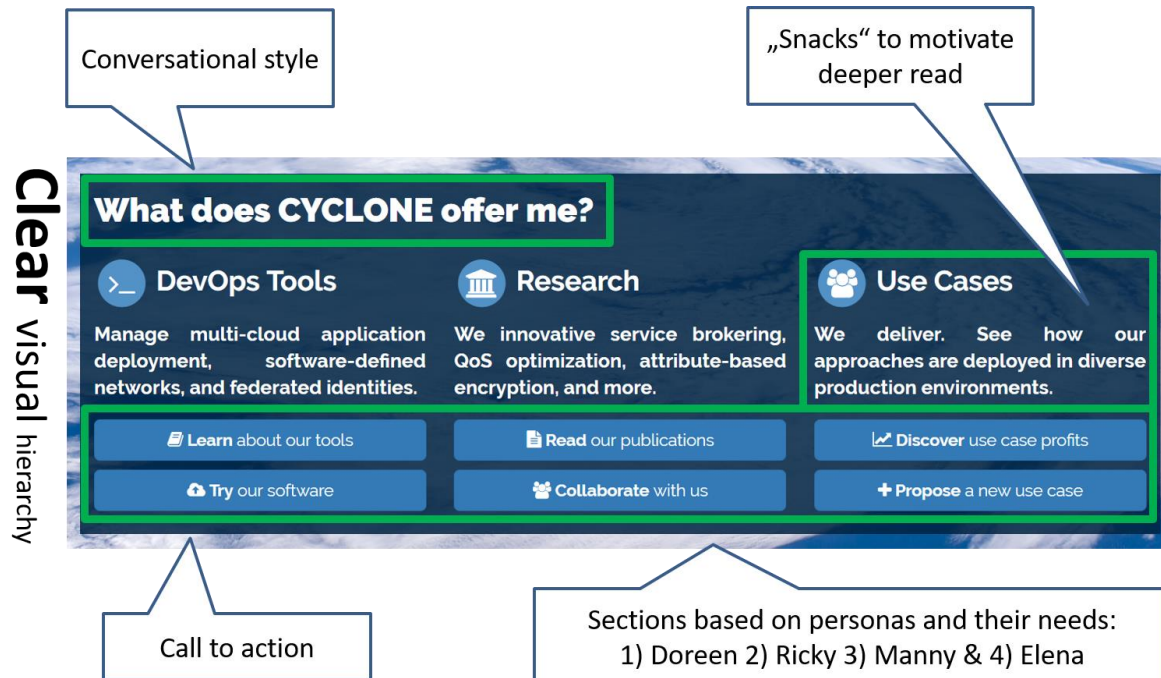
Figure 4-1: Example and illustrated website design.

4.2.Social Media

A social media presence and active interaction with followers' network is an important channel to disseminate information about the project goals, developments and events. Using social networks allows the project to reach a larger group of people nearly instantly while support constant awareness about CYCLONE among created groups of followers and subscribers. The maintenance of the social media accounts serves the branding purposes as well since the CYCLONE logo is used which ensures the consistency with the rest of the project's communications.

The project is maintaining two social media accounts LinkedIn and Twitter that provide the most effective channels to reach professional communities of the target user groups:

- **@H2020_CYCLONE Twitter account**
  Twitter offers the most dynamic way of communicating project news and cross-posting relevant news items. Twitter account is actively used to publish regular project news and additional coverage of events where the project is involved. The CYCLONE Twitter account is linked with partners' individual accounts and in some cases organizational accounts, which extends the audience reached by tweets.

- **H2020 CYCLONE LinkedIn group**
  LinkedIn provides a benefit of accessing the professional community via creation of the interest groups. Up to date the LinkedIn group was not much active but appearance of the practical project results and products will make the LinkedIn groups more effective in the final project year.

The following results have been achieved in using social media for the project results and activities dissemination.

The H2020 CYCLONE LinkedIn group has 18 members, mostly from project partner and partners' professional contacts. It is primarily used for posting topics that may generate long lasting interest from professional community, such as newsletters, papers, tutorials. Current CYCLONE Twitter hashtag has 157 followers and accumulated 461 tweets (as of 15 Dec 2016) what demonstrate significant increase from 51 followers in 2015.

Figure 4-2. CYCLONE Twitter homepage (461 tweets, 157 followers as of 15 Dec 2016).

An example of the CYCLONE Twitter activity over period of three months is shown in Figure 4-3 that illustrates periodical increase of re-tweets, followers engagement and impressions. Figure 4-4 graphically represents the breakdown of the H2020 CYCLONE follower audience. It is primarily consists of technical and technology oriented companies and individuals. There is also significant share of news media what presumably provides better opportunities for the project results dissemination.
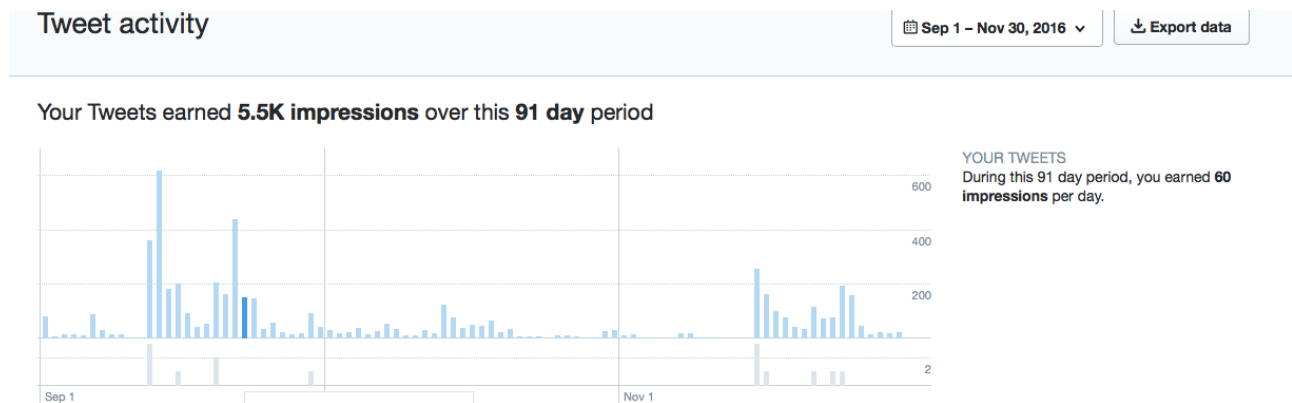

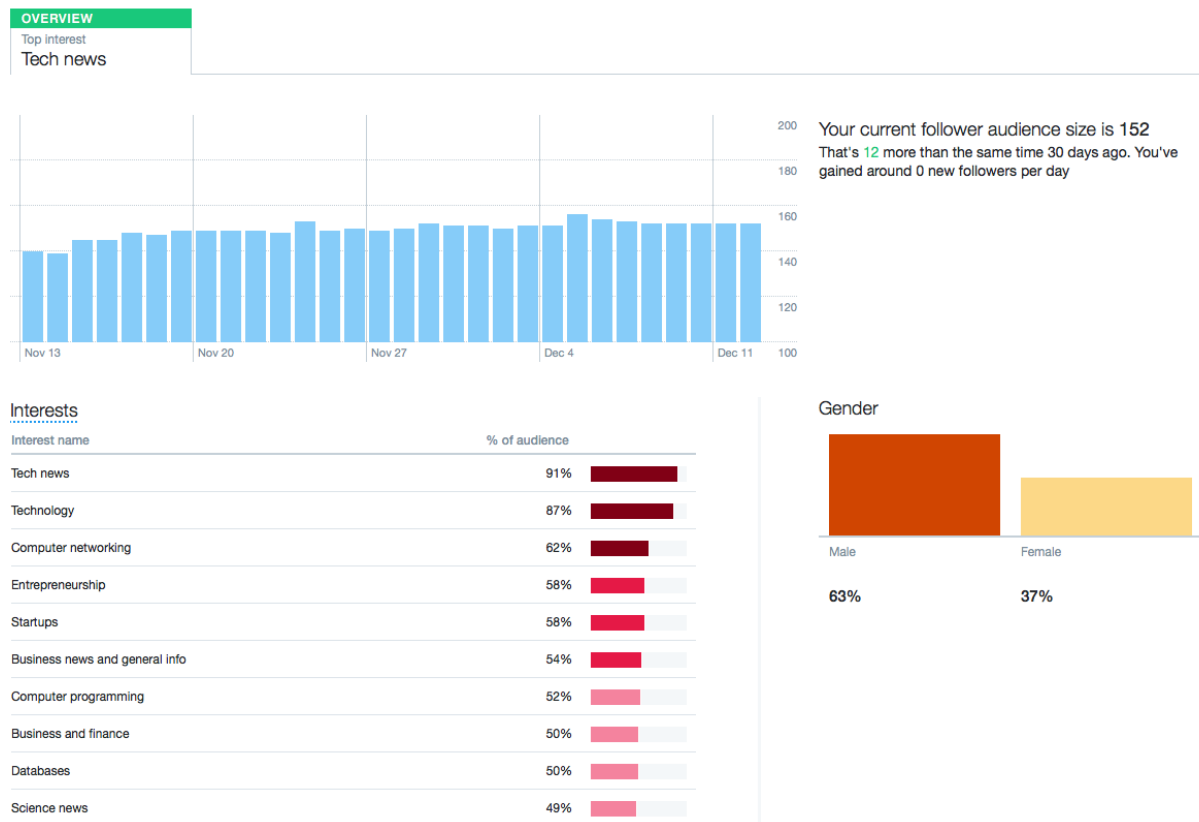**Figure 4-3. Tweets and followers engagement.**

Figure 4-4. Breakdown of follower audience on interest group categories.

4.3.**Publications**

Ten papers and three posters were published during the second year of the CYCLONE project, comparing to 8 papers in the first year. This demonstrates positive extension of the project dissemination activity. It is important to notice that paper [2] from the list is a joint paper with the GEANT4 project that have been developing the cloud aware Cloud Services Delivery Infrastructure (CSDI) over GEANT network. Cooperation with the GEANT4 project is targeting promoting SlipStream as tool for automatic deployment of the CSDI SDN components.

Refereed conference papers, conference posters, position papers

[1] Yuri Demchenko, Miroslav Zivkovic, Cees de Laat, José Ignacio Aznar Baranda, Christophe Blanchet, Mohamed Bedri, Jean-François Gibrat, Oleg Lodygensky, Mathias Slawik, Ilke Zilci, Rob Branchat, Charles Loomis, CYCLONE: A Platform for Data Intensive Scientific Applications in Heterogeneous Multi-cloud/Multi-provider Environment, Fifth IEEE International Workshop on Cloud Computing Interclouds, Multiclouds, Federations, and Interoperability (Intercloud 2016), In Proc. IEEE International Conference on Cloud Engineering (IC2E), April 4 - 8, 2016, Berlin, Germany

[2] Yuri Demchenko, Paola Grosso, Cees de Laat, Sonja Filiposka, Migiel de Vos, ZeroTouch Provisioning (ZTP) Model and Infrastructure Components for Multi-provider Cloud Services Provisioning, Fifth IEEE International Workshop on Cloud Computing Interclouds, Multiclouds, Federations, and Interoperability (Intercloud 2016), In Proc. IEEE International Conference on Cloud Engineering (IC2E), April 4 - 8, 2016, Berlin, Germany

[3] Demchenko, Yuri, Fatih Turkmen, Christophe Blanchet, Charles Loomis, Cees de Laat, Cloud Based Big Data Infrastructure: Architectural Components and Automated Provisioning, The 3rd International Symposium on Big Data Principles, Architectures and Applications (BDAA 2016), as part of The International Conference on High Performance Computing and Simulation (HPCS 2016), 18-22 July 2016, Innsbruck, Austria.

[4] José Aznar, Eduard Escalona, Isart Canyameres, Oscar Moya, Albert Vines, CNSMO: A Network Services Manager/Orchestrator Tool for Cloud Federated Environments, Proc. Med-Hoc-Net 2016 : Annual Mediterranean Ad Hoc Networking Workshop, Barcelona, Submitted to IEEE Xplore and other Abstracting and Indexing (A&I) databases

[5] Mathias Slawik, Begüm İlke Zilci, Fabian Knaack, Axel Küpper, Economics of Grids, Clouds, Systems, and Services, Chapter in book "The Open Service Compendium", Springer International Publishing, 2016.

[6] Mathias, Slawik, Begum Ilke Zilci, Axel Kupper,Yuri Demchenko, Fatih Turkmen, Christophe Blanchet, and Jean-Francois Gibrat, An economical security architecture for multi-cloud application deployments in federated environments, GECON2016 Conference, 20-22 Sept 2016, Athens, Greece.

[7] D. Gallico, M. Biancani, C.Blanchet, M. Bedri, J.-F.Gibrat, J.I.A.Baranda, D.Hacker, M.Kourkouli, CYCLONE: a Multi-Cloud Federation Platform For Complex Bioinformatics And Energy Applications, CloudNet 2016 Conference, 3-5 Oct 2016, Pisa, Italy.

[8] Mathias Slawik, Begum ̇Ilke Zilci, Axel Kupper, Establishing User-relevant Cloud Service Repositories, Future Generation Computer System (FGCS), Submitted paper, 2016

[9] Fatih Turkmen, Yuri Demchenko, On the Use of SMT Solving for XACML Policy Evaluation, IEEE CloudCom2016 Conference, 12-15 Dec 2016, Luxembourg, Submitted paper

[10] Miroslav Zivkovic, Charles Loomis, Yuri Demchenko, Runtime application performance management for multi-cloud CYCLONE environment, IEEE CloudCom2016 Conference, 12-15 Dec 2016, Submitted paper

Posters:

[11] Poster. Fatih Turkmen, Yuri Demchenko, Miroslav Zirkovic, Cees de Laat, Eduard Escalona, Jose Aznar, Mathias Slawik, Ilke Zilci, Christophe Blanchet, Oleg Lodygensky, Cal Loomis, Doris Hacker, CYCLONE: A Platform for Scientific Applications Deployment, TNC16, 13-16 June 2016, Prague, Czechia.

[12] Poster. Fatih Turkmen, Yuri Demchenko, Miroslav Zirkovic, Cees de Laat, Eduard Escalona, Jose Aznar, Mathias Slawik, Ilke Zilci, Christophe Blanchet, Oleg Lodygensky, Cal Loomis, Doris Hacker, Cloud Federation and Multi-cloud Application Deployment for Bioinformatics Research, Cloudscape VIII, 7-8 March 2016, Brussels

4.4. Conferences and workshops

In this section we give an overview of conferences, workshops EU research community and industry events attended and/or organized by the CYCLONE project members. This overview is given in Table 4-1. We provide more information on the Intercloud 2015 and NetCloud2015 workshops and ICT2015 networking session on Cloud SWOT in respective subsections.

Table 4-1 Conferences and events in 2016 where CYCLONE project members participated/contributed.

Date (Month/Year)	Event, place	Partner contribution	Target community
8-9 - March 2016	Cloudscape VIII Brussels, Belgium 8-9 March 2016, Brussels	CYCLONE Poster, demo, presentation. Dissemination materials distribution	EU cloud research community and industry, FP7/H2020 projects
12-13 April 2016	Cloud Expo Europe 2016 London, UK	Attendance, market research. Dissemination materials distribution, talking to target user groups.	European cloud industry
4-8 April 2016	IEEE Workshop on Cloud Computing, Interclouds, Multiclouds, Federations, and Interoperability, in conjunction with the IEEE International Conference on Cloud Engineering (IC2E) Berlin, Germany	Workshop organisation, paper presentation, panel organisation.	Cloud services and infrastructure researchers and developers, researchers from big companies.
20-21 April 2016	Net futures 2016	Demonstration of CYCLONE cloud networking use cases. Participation in the inter-cloud challenges and issues cluster meeting.	EU cloud research community and industry, FP7/H2020 projects
June 2016	CLOUD 2016 – 9th IEEE International Conference on Cloud Computing (CLOUD 2016)	Paper on Cloud Service Matchmaking and Brokering.	International academic and industrial researchers and practitioners.
13-16 June 2016	TNC16 – TERENA Networking	Posters, demo	Key European

	Conference 2016 Prague, Czechia		networking community event, 400-700 attendees
20 June 2016	Med-Hoc-Net 2016 : Annual Mediterranean Ad Hoc Networking Workshop, Barcelona	Paper	50+ attendees
18-22 July 2016	International Conference on High Performance Computing and Simulation (HPCS 2016), Innsbruck, Austria.	Paper	100 attendees, academia, research, industry
20-22 Sept 2016	GECON2016 Conference, Athens, Greece	Paper	50+ attendees
3-5 Oct 2016	CloudNet 2016 Conference, Pisa, Italy.	Paper, presentation	100+ attendees
3 October 2016	Brokering and Pitching Event	Pitching of CYCLONE results. Workshop.	25+ attendees
18-20 October 2016	CloudForward Conference	Demonstration of bioinformatics UC2. Participation in the inter-cloud challenges and issues cluster meeting.	Cloud community research: and industry. 200-300 attendees
8-10 Nov 2016	France Grille workshop, Bordeaux, France	Workshop	60+ attendees from Distributed and Cloud Computing
15 Nov 2016	Bioinformatics use cases hackathon for developers (IFB)	Workshop, training	10+ developers, bioinformatics
16-17 Nov 2016	Big Data Innovation Conference 2016, Frankfurt	Workshop on Cloud Security and Compliance	50+ attendees from industry
23-24 Nov 2016	French Workshop for High Computing and Cloud Computing, Paris, France	Workshop	60+ attendees from HPC and Clouds
12 December 2016	SPD Workshop Collocated with CloudCom2016 Luxembourg	Paper	Cloud community research: and industry. 200-300 attendees
12-15 December 2016	NetCloud2016 Workshop Collocated with CloudCom2016 Luxembourg	Workshop organisation, papers submission	Cloud and networking community: research and industry 20-30 attendees

4.4.1. InterCloud 2016 workshop

The 5th IEEE Workshop on Cloud Computing, Interclouds, Multiclouds, Federations and Interoperability (Intercloud2016) was held in conjunction with the IEEE International Conference on Cloud Engineering (IC2E) on 4-8 April 2016 in Berlin, Germany (http://www.intercloudtestbed.org/intercloud2016.html). The workshop is organized in cooperation with GEANT project. This workshop provided an effective dissemination and awareness raising event targeted for diverse community of the general cloud and Intercloud services development among research and industry. The project partners presented 3 papers [5, 6] on the major project developments and background research and developments by partner universities focused on Intercloud and multi-cloud infrastructures that combines cloud technologies and inter-cloud networking infrastructure.

4.4.2. **NetCloud2016 workshop and other publications at CLoudCom2016**

The 6th NetCloud2016 Workshop, in conjunction with the IEEE International Conference on Cloud Computing (CloudCom2016) that was held on December 12-15, 2016 in Luxembourg. The organization of the workshop was sponsored by two EU projects, namely CYCLONE and GEANT4. The workshop included two sessions with paper presentations and panel discussion on cloud automation tools.

CYCLONE presented two papers related to the WP6 developments [14] and the research paper on the complex policy assessment tools related to WP4 [13].

In a summary, the NetCloud2016 workshop organization and contribution to another workshop provided a strong project presence at one of the top conferences on Cloud Computing technologies.

4.4.3. **Coordination and cooperation with the cluster projects**

The Clusters of European Projects on Cloud is an initiative aimed at creating a joint collaboration between projects funded by the European Community in order to let them interact and find synergies among them. There have been defined four clusters based on specific topics and specific goals but all of them are focused on cooperation among members on technical aspects, on market trends analysis and on dissemination and exploitation activities.

CYCLONE is taking part of the Inter-cloud Challenges, Expectations and Issues cluster. In this cluster, CYCLONE main research problems, challenges and technical solution have been explained and included in a research roadmap report that the EC may consider as input for the preparation of future work plans. Additionally, this cluster represents a smart opportunity to share the results of the projects and discuss on the technical approaches. CYCLONE is mainly in contact with BEACON project in terms of cloud networking for cloud-federated environments.

4.4.4. **Brokering and Pitching Event**

The Brokerage and Pitching event is a service provided by the EC for certain H2020 projects in order to train and identify how to pitch the exploitable results of the projects. It was a one-day workshop hosted by the EC in Brussels, in which representatives of the projects had the chance to attend to a workshop on "How to pitch the results" to later carry out the pitching for the outcomes of the project in front of a number of European experts and business angels. The result was a great experience to learn more on how to exploit and sell potential CYCLONE outcomes and we received the feedback from the experts and the coach that was assigned to the project.

4.4.5. **ELIXIR All-Hands Meeting**

CNRS IFB presented a brief overview of the CYCLONE project with a more focus part on the use cases UC1 and UC2. We presented the context of these use cases, namely the treatment of the deluge of genomics data produced by next gene sequencers. Technologies developed by CYCLONE to benefit to the use cases were detailed (deployment of complex applications, federation proxy, etc.) and there was a special interest about the CYCLONE PAM module and the ability to open a secured shell based on the eduGAIN Identity.

4.4.6. **French Distributed Computing Days - SUCCES 2016**

CNRS-LAL presented a general poster introducing the Cyclone project while CNRS IFB presented the use case UC2. A focus was done on the construction of the application using the inheritance functionality available in slipstream. This allows us to base the application on the CNSMO VPN cluster, and then propose a turnkey SGE cluster using this VPN. WE were also able to install bioinformatics tools easily with the conda framework. The cluster recipe is public and ready to be used. In the use case UC2, we inherit the cluster, add to the master node the software Insyght with its database, and the scripts that allow to populate and

enrich the database of new data. The audience was interested to the technologies used in this use case, especially to the secured shell access based on the EduGain Identity. The audience was also interested in the elastic aspect of the cluster, with the ability to add and remove computation nodes on-the-fly, and the multi-cloud aspect.

4.4.7. CYCLONE Use case Hackathon

CNRS IFB organized a hackathon for CYCLONE use cases. The main idea was to bring together the use case developers and the Cyclone component ones during two days in the same location. The goals were to outcome with applications fully integrated with the Cyclone components, and with validated recipes of deployment for use cases. The goal was also to have a clearer understanding between developers from use case applications and Cyclone components.

Five CYCLONE use case developers attended the hackathon (UC2, UC3, UC11, UC12, UC13), all from bioinformatics domain, with tools developers for a total of 12 attendees. Several CYCLONE tools were presented by the CYCLONE partners: Slipstream cloud broker, IFB bioinformatics cloud portal, Federation proxy and CNSMO. A GitHub repository was created to manage the presentations and the use cases integration (https://github.com/cyclone-project/usecases-hackathon-2016). And the infrastructure used during the hackathon was based on the Nuvla/Slipstream CYCLONE instance, the IFB bioinformatics cloud portal and three clouds sites (CNRS LAL testbed, CNRS IFB Pilot, Exoscale) relying on two different cloud frameworks (Openstack and Cloudstack).

During the hackathon, the participants worked on building and configuring complex applications to deploy in multi-cloud federated environments. It has been also offered the possibility to deploy the applications together with some pre-defined network services that are included in the application deployment by means of the OpenNaaS CNSMO, the Slipstream/Nuvla or the Federation proxy components.

The status of the developments is detailed in the hackathon code repository (file demos.md). Most use cases (UC2, UC3, UC12, UC13) are now ready for deployment with Nuvla on the CYCLONE testbed sites. Several use cases were also integrated with the Federation Proxy and CNSMO components. The hackathon was useful for collecting real life user experience and feedback. The developments continued after the hackathon days and will be extended during CYCLONE Year3.

4.5. Standardization activity

Standardization activities can be seen as a way to promote project results and secure products adoption on a longer time period. Standardization bodies typically involve industry experts and representatives from the provider community, developers, and the major industry vendors. The adopted standards have strong impact on the technology roadmaps for all involved parties. Table 4.2 summarizes the main contributions to standardization bodies by project partners. One of the important achievements for CYCLONE project was contribution to the IETF Draft [4]. This draft defines the Intercloud Architecture Framework (ICAF) including Intercloud Federation Framework (ICFF).

Table 4-2 Contribution to standardisation activity in 2016

SDO	Committee, Working group, topic	Partner involved	What kind of contribution	Impact/ community
NIST	Cloud Computing Architecture WG	UvA	Cloud architecture, cloud services management, cloud	Whole cloud industry, other IT sectors

	Big Data WG		infrastructure for data centric services	
IETF	Different groups focused on SDN, Cloud aware networks	UvA		Wide, whole Internet, communication, computing industry
IEEE	IEEE P2302 Intercloud Standards Working Group	UvA	Multi-cloud, Intercloud services federation Intercloud Testbed Initiative	Industry and wide developers community
DMTF	Cloud CIMI	SixSq	Implementation and feedback on cloud services description format for management purposes	Industry and wide developers community
TMF	Follow multiple standards development, use in research and education Affiliate University membership.	UvA	Cloud/multi-cloud services deployment, management and operation. Zero Touch services provisioning model	Telecom industry, emerging cloud IaaS providers
CSA	Follow Best Practices documents, contribute, use in research and cloud education (UvA)	SixSq, TUB, UvA	Cloud security, Big Data security, federated security services	Whole cloud industry, research community

5. Conclusions

This report provides an overview of the major dissemination and exploitation activities in the second year of the CYCLONE project. The project CYCLONE is an Innovation Action within the scope of H2020 EU framework. Therefore, the effective dissemination is an importance factor to increase the project results impact and wider adoption after the project ends.

The dissemination and exploitation activities are based on the general dissemination strategy described in Dissemination and Communication Plan (DCP) and its update after the first year, it also followed the branding strategy described in respective CYCLONE deliverable. During the second project year the produced a number of information and dissemination materials, first of all Newsletters, posters and flyers, that were used actively during all event where the partners took part.

The project website http://www.cyclone-project.eu has been re-designed and updated to implement targeted messaging for different user communities using persona concept. We actively used Twitter (@H2020_CYCLONE) social account to reach the audience. In total, we have published ten papers and posters meeting KPI target for 2016. The project partners organized three workshops and one use cases hackathon that are described in the document. In summary, coordinated and committed activity of all partners realised extensive dissemination and communication activity in the second project year.

6. References

1. CYCLONE Deliverable D2.1 Branding Strategy

2. CYCLONE Deliverable D2.2 Dissemination and Communication Plan

3. CYCLONE Deliverable D2.3 Dissemination and Communication Plan (Update 1)

4. CYCLONE Deliverable D2.4 Dissemination and Communication Activity report 2015

5. Yuri Demchenko, Miroslav Zivkovic, Cees de Laat, José Ignacio Aznar Baranda, Christophe Blanchet, Mohamed Bedri, Jean-François Gibrat, Oleg Lodygensky, Mathias Slawik, Ilke Zilci, Rob Branchat, Charles Loomis, CYCLONE: A Platform for Data Intensive Scientific Applications in Heterogeneous Multi-cloud/Multi-provider Environment, Fifth IEEE International Workshop on Cloud Computing Interclouds, Multiclouds, Federations, and Interoperability (Intercloud 2016), In Proc. IEEE International Conference on Cloud Engineering (IC2E), April 4 - 8, 2016, Berlin, Germany

6. Yuri Demchenko, Paola Grosso, Cees de Laat, Sonja Filiposka, Migiel de Vos, ZeroTouch Provisioning (ZTP) Model and Infrastructure Components for Multi-provider Cloud Services Provisioning, Fifth IEEE International Workshop on Cloud Computing Interclouds, Multiclouds, Federations, and Interoperability (Intercloud 2016), In Proc. IEEE International Conference on Cloud Engineering (IC2E), April 4 - 8, 2016, Berlin, Germany

7. Demchenko, Yuri, Fatih Turkmen, Christophe Blanchet, Charles Loomis, Cees de Laat, Cloud Based Big Data Infrastructure: Architectural Components and Automated Provisioning, The 3rd International Symposium on Big Data Principles, Architectures and Applications (BDAA 2016), as part of The International Conference on High Performance Computing and Simulation (HPCS 2016), 18-22 July 2016, Innsbruck, Austria.

8. José Aznar, Eduard Escalona, Isart Canyameres, Oscar Moya, Albert Vines, CNSMO: A Network Services Manager/Orchestrator Tool for Cloud Federated Environments, Proc. Med-Hoc-Net 2016 : Annual Mediterranean Ad Hoc Networking Workshop, Barcelona, Submitted to IEEE Xplore and other Abstracting and Indexing (A&I) databases

9. Mathias Slawik, Begüm İlke Zilci, Fabian Knaack, Axel Küpper, Economics of Grids, Clouds, Systems, and Services, Chapter in book "The Open Service Compendium", Springer International Publishing, 2016.

10. Mathias, Slawik, Begum Ilke Zilci, Axel Kupper,Yuri Demchenko, Fatih Turkmen, Christophe Blanchet, and Jean-Francois Gibrat, An economical security architecture for multi-cloud application deployments in federated environments, GECON2016 Conference, 20-22 Sept 2016, Athens, Greece.

11. D. Gallico, M. Biancani, C.Blanchet, M. Bedri, J.-F.Gibrat, J.I.A.Baranda, D.Hacker, M.Kourkouli, CYCLONE: a Multi-Cloud Federation Platform For Complex Bioinformatics And Energy Applications, CloudNet 2016 Conference, 3-5 Oct 2016, Pisa, Italy.

12. Mathias Slawik, Begum˙ Ilke Zilci, Axel Kupper, Establishing User-relevant Cloud Service Repositories, Future Generation Computer System (FGCS), Submitted paper, 2016

13. Fatih Turkmen, Yuri Demchenko, On the Use of SMT Solving for XACML Policy Evaluation, IEEE CloudCom2016 Conference, 12-15 Dec 2016, Luxembourg.

14. Miroslav Zivkovic, Charles Loomis, Yuri Demchenko, Runtime application performance management for multi-cloud CYCLONE environment, IEEE CloudCom2016 Conference, 12-15 Dec 2016.

15. Poster. Fatih Turkmen, Yuri Demchenko, Miroslav Zirkovic, Cees de Laat, Eduard Escalona, Jose Aznar, Mathias Slawik, Ilke Zilci, Christophe Blanchet, Oleg Lodygensky, Cal Loomis, Doris Hacker, CYCLONE: A Platform for Scientific Applications Deployment, TNC16, 13-16 June 2016, Prague, Czechia.

16. Poster. Fatih Turkmen, Yuri Demchenko, Miroslav Zirkovic, Cees de Laat, Eduard Escalona, Jose Aznar, Mathias Slawik, Ilke Zilci, Christophe Blanchet, Oleg Lodygensky, Cal Loomis, Doris Hacker, Cloud Federation and Multi-cloud Application Deployment for Bioinformatics Research, Cloudscape VIII, 7-8 March 2016, Brussels

17. CYCLONE Usecases Hackathon (November 2016), IFB, France. https://github.com/cyclone-project/usecases-hackathon-2016

7. Abbreviations and Definitions

7.1. Definitions

No specific definitions are introduced in this document.

7.2. Abbreviations

CSA	Cloud Security Alliance
DC	Data Centre
DMTF	Distributed Management Task Force
DOA	
E2E	End-to-End
EGI	European Grid Initiative
IaaS	Infrastructure-as-a-Service
ICAF	Intercloud Architecture Framework
ICFF	Intercloud Federation Framework
IPR	Intellectual Property Rights
IT	Information Technology
IEEE	Institute of Electrical and Electronic Engineers
IETF	Internet Engineering Task Force
NaaS	Network-as-a-Service
NFV	Network Function Virtualization
NIST	National Institute of Standards and Technology
OGF	Open Grid Forum
PaaS	Platform-as-a-Service
PoP	Point of Presence
RDA	Research Data Alliance
SaaS	Software-as-a-Service
SDN	Software Defined Networking
SDO	Standard Development Organisations
SP	Service Provider
TCTP	Trusted Cloud Transfer Protocol
TM Forum	Tele Management Forum
TNC	TERENA Networking Conference

Appendix A. Summary of dissemination activities in 2016

The Table below summarises the dissemination and communication activity linked to the project (in a format of the midterm review)

Number of Dissemination and Communication activities linked to the project for each of the following categories		
Organisation of a Conference	0	
Organisation of a Workshop	3	Intercloud2015, Intercloud2016, NetCloud2015
Press release	2	2 Newsletters issues
Non-scientific and non-peer-reviewed publication (popularised publication)	0	
Exhibition	1	Cloud Expo Europe 2015 London, UK, 11-12 March
Flyer	5	Distributed at poster sessions at Intercloud2015, EGI2015, TNC15, TNC16, Cloudscape VIII
Training	6	4 internal trainings on SlipStream (2015, 2016), OpenNaaS (2015), TRESOR (2015), public tutorial at NetCloud2015 and Intercloud2016
Social Media	2	H2020 CYCLONE LinkedIn group Twitter (account @H2020_CYCLONE (366 tweets and 118 followers)
Website	1	50 news items
Communication Campaign (e.g. Radio, TV)	0	
Participation to a Conference	16	14 publications
Participation to a Workshop	4	Intercloud2015, Intercloud2016, NetCloud2015, DEXA Workshop KDCloudApps 2015
Participation to an Event other than a Conference or a Workshop	1	
Video/Film	0	
Brokerage Event	0	
Pitch Event	0	
Trade Fair	0	
Participation in activities organized jointly with other H2020 projects	4	Cloud SWOT session at ICT2015 is organised jointly with the SWITCH project All 3 workshops are organised jointly with the GEANT project
Other	4	Posters at EGI2015, TNC15, TNC16, Cloudscape VIII (2016)
Estimated number of persons reached, in the context of all dissemination and communication activities, in each of the following categories		

Scientific Community (Higher Education, Research)	1100	All conferences, workshops, training activities
Industry	300	Primarily exhibition but also some per cent of industry attendees to other events
Civil Society	0	
General Public	100	Those interested in new technologies development
Policy Makers	30	
Media	10	Media accredited to major conferences and EC events
Investors	0	
Customers	50	Potential product users
Other	0	

Appendix B. CYCLONE website visitors sample data

Sample visitor data for period from November 2015 to July 2016

| Period	Unique visitors
02.11.2015 - 08.11.2015	57
09.11.2015 - 15.11.2015	63
16.11.2015 - 22.11.2015	59
23.11.2015 - 29.11.2015	80
30.11.2015 - 06.12.2015	71
07.12.2015 - 13.12.2015	63
14.12.2015 - 20.12.2015	60
21.12.2015 - 27.12.2015	49
28.12.2015 - 03.01.2016	45
04.01.2016 - 10.01.2016	48
11.01.2016 - 17.01.2016	66
18.01.2016 - 24.01.2016	51
25.01.2016 - 31.01.2016	59
01.02.2016 - 07.02.2016	64
08.02.2016 - 14.02.2016	96
15.02.2016 - 21.02.2016	59
22.02.2016 - 28.02.2016	42
29.02.2016 - 06.03.2016	66
07.03.2016 - 13.03.2016	86
14.03.2016 - 20.03.2016	79
21.03.2016 - 27.03.2016	58
28.03.2016 - 03.04.2016	83
04.04.2016 - 10.04.2016	104
11.04.2016 - 17.04.2016	57
18.04.2016 - 24.04.2016	52
25.04.2016 - 01.05.2016	51
02.05.2016 - 08.05.2016	49
09.05.2016 - 15.05.2016	34
16.05.2016 - 22.05.2016	43
23.05.2016 - 29.05.2016	62
30.05.2016 - 05.06.2016	54
06.06.2016 - 12.06.2016	59
13.06.2016 - 19.06.2016	36
20.06.2016 - 26.06.2016	54
27.06.2016 - 03.07.2016	26
04.07.2016 - 10.07.2016	36
11.07.2016 - 17.07.2016	50
18.07.2016 - 24.07.2016	57
25.07.2016 - 31.07.2016	55
TOTAL	**2283**

Average per week	57
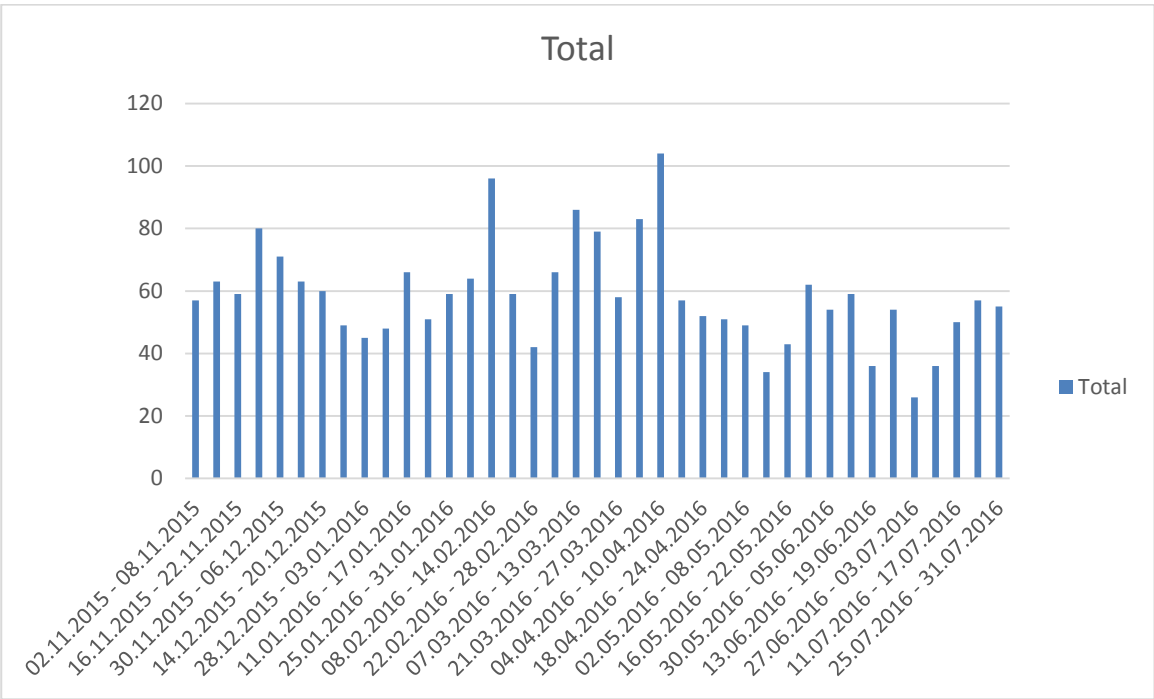
Figure A.7-1: Number of CYCLONE website visitors per week in period Nov 2015 – July 2016

<END OF DOCUMENT>