FG Resource Report

Release 0.4

Hyungro Lee **Gregor von Laszewski**
Fugang Wang **Geoffrey C. Fox**

July 15, 2013

CONTENTS

Date Created: Mon, 15 Jul 2013

CHAPTER

ONE

SUMMARY REPORT (ALL)

- Period: January 01 – June 30, 2013
- Cloud(india.futuregrid.org): eucalyptus, openstack
- Cloud(sierra.futuregrid.org): eucalyptus, nimbus
- Cloud(hotel.futuregrid.org): nimbus
- Cloud(alamo.futuregrid.org): nimbus
- Cloud(foxtrot.futuregrid.org): nimbus
- Metrics: VMs count, Users count, Wall hours, Distribution by Wall Hours, Project, Project Leader, and Institution, and Systems

1.1 Wall Hours by Clusters (Total, monthly)

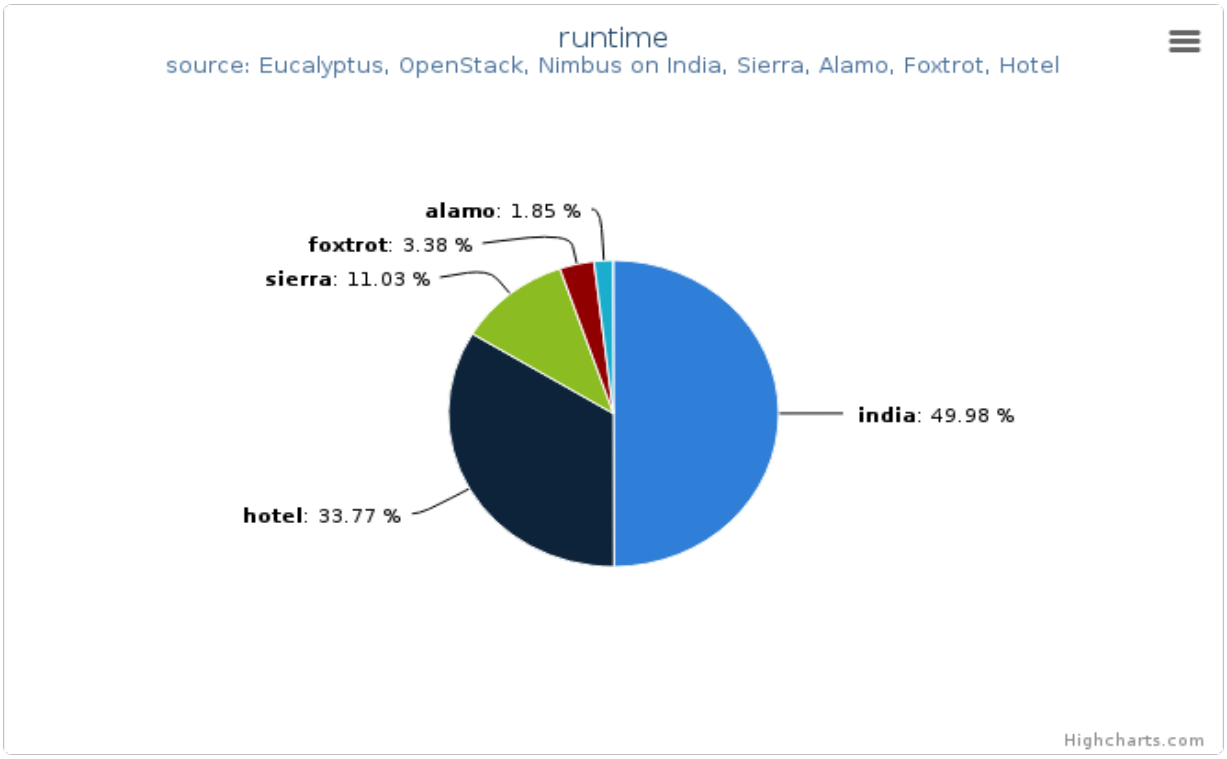

Figure 1. Wall time (hours) by Clusters
This chart represents overall usage of wall time (hours).

- Period: January 01 – June 30, 2013
- **Cloud:**
  - india: Eucalyptus, Openstack
  - sierra: Eucalyptus, Nimbus
  - hotel: Nimbus
  - alamo: Nimbus
  - foxtrot: Nimbus

Table 1.1: Wall time (hours) by Clusters

Total	Value
india	291522.0
hotel	196984.0
sierra	64323.0
foxtrot	19703.0
alamo	10790.0

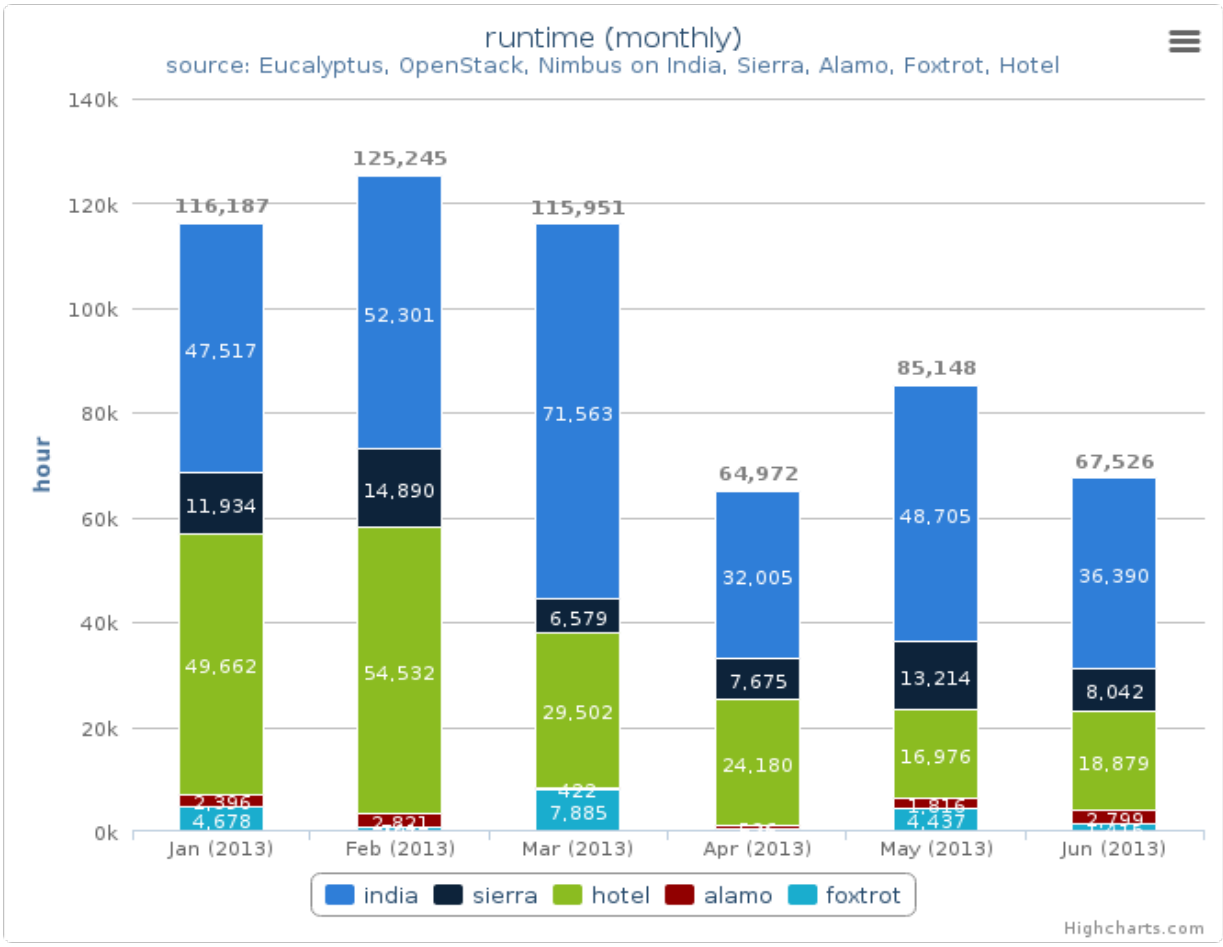

Figure 2. Wall time (hours) by Clusters (monthly)
This stacked column chart represents average monthly usage of wall time (hours).

- Period: January 01 – June 30, 2013
- **Cloud:**
  - india: Eucalyptus, Openstack
  - sierra: Eucalyptus, Nimbus
  - hotel: Nimbus
  - alamo: Nimbus
  - foxtrot: Nimbus

1.2 VM Count by Clusters (Total, monthly)

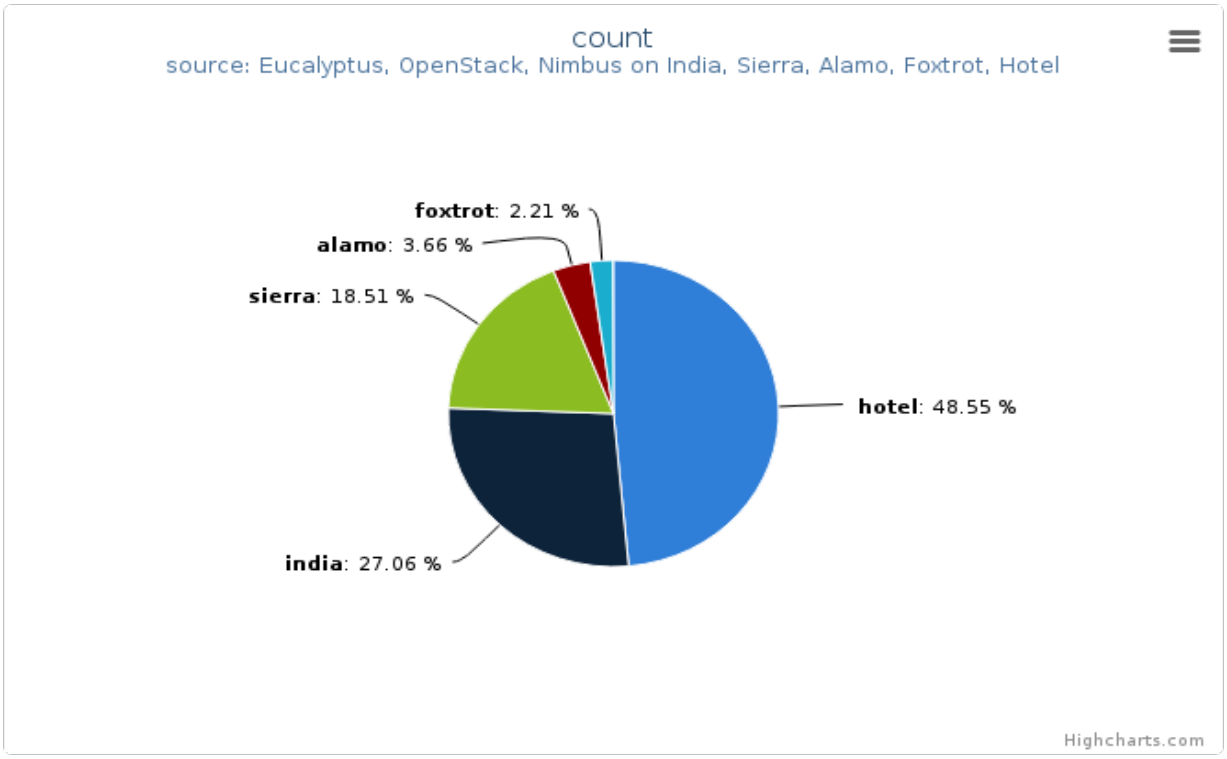

Figure 3. VMs count by Clusters
This chart represents overall VM instances count during the period.

- Period: January 01 – June 30, 2013
- **Cloud:**
  - india: Eucalyptus, Openstack
  - sierra: Eucalyptus, Nimbus
  - hotel: Nimbus
  - alamo: Nimbus
  - foxtrot: Nimbus

Table 1.2: VM instance count by Clusters

Total	Value
hotel	21152
india	11790
sierra	8065
alamo	1595
foxtrot	965

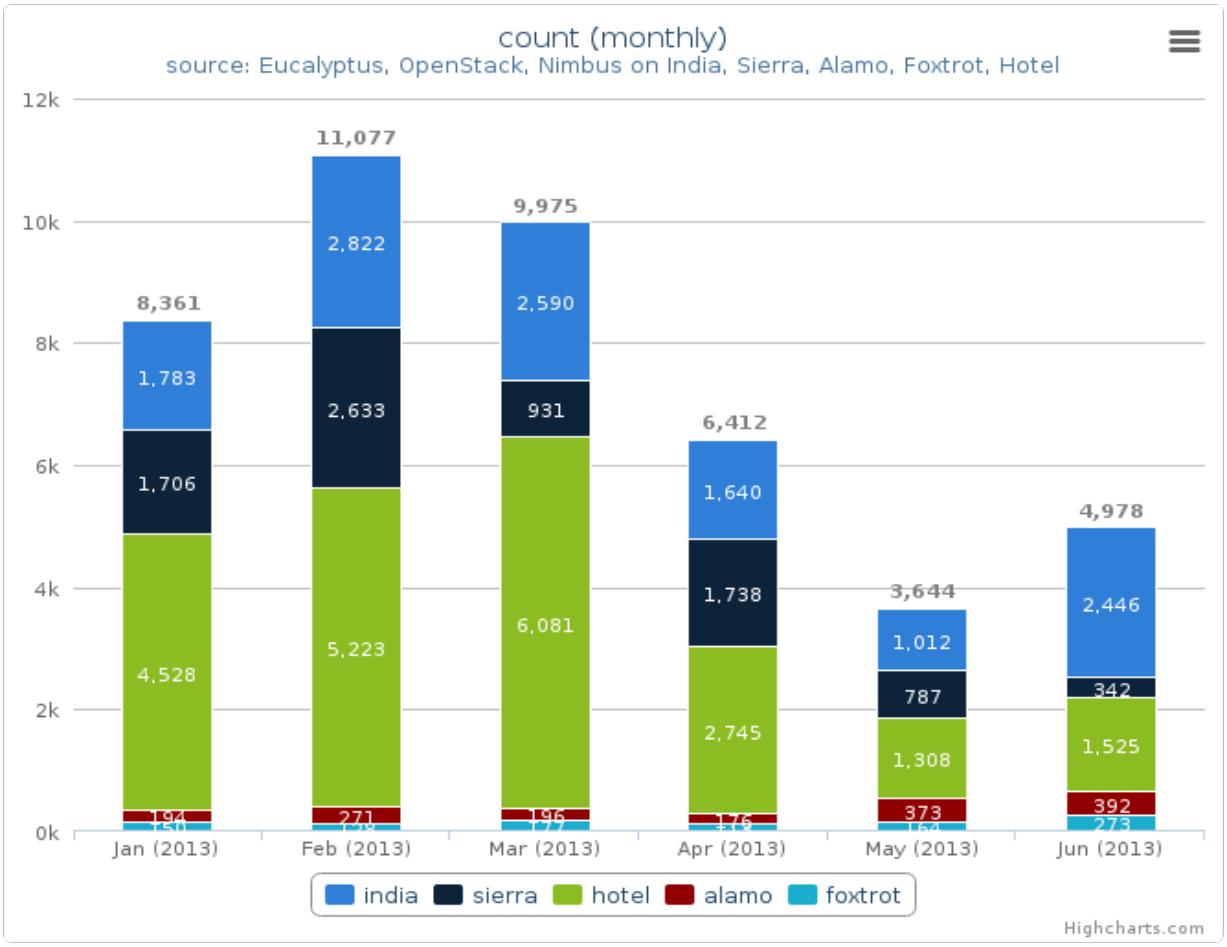

Figure 4. VMs count by Clusters (monthly)
This stacked column chart represents average VM instances count per month.

- Period: January 01 – June 30, 2013
- **Cloud:**
  - india: Eucalyptus, Openstack
  - sierra: Eucalyptus, Nimbus
  - hotel: Nimbus
  - alamo: Nimbus
  - foxtrot: Nimbus

1.3 Users Count by Clusters (Total, monthly)

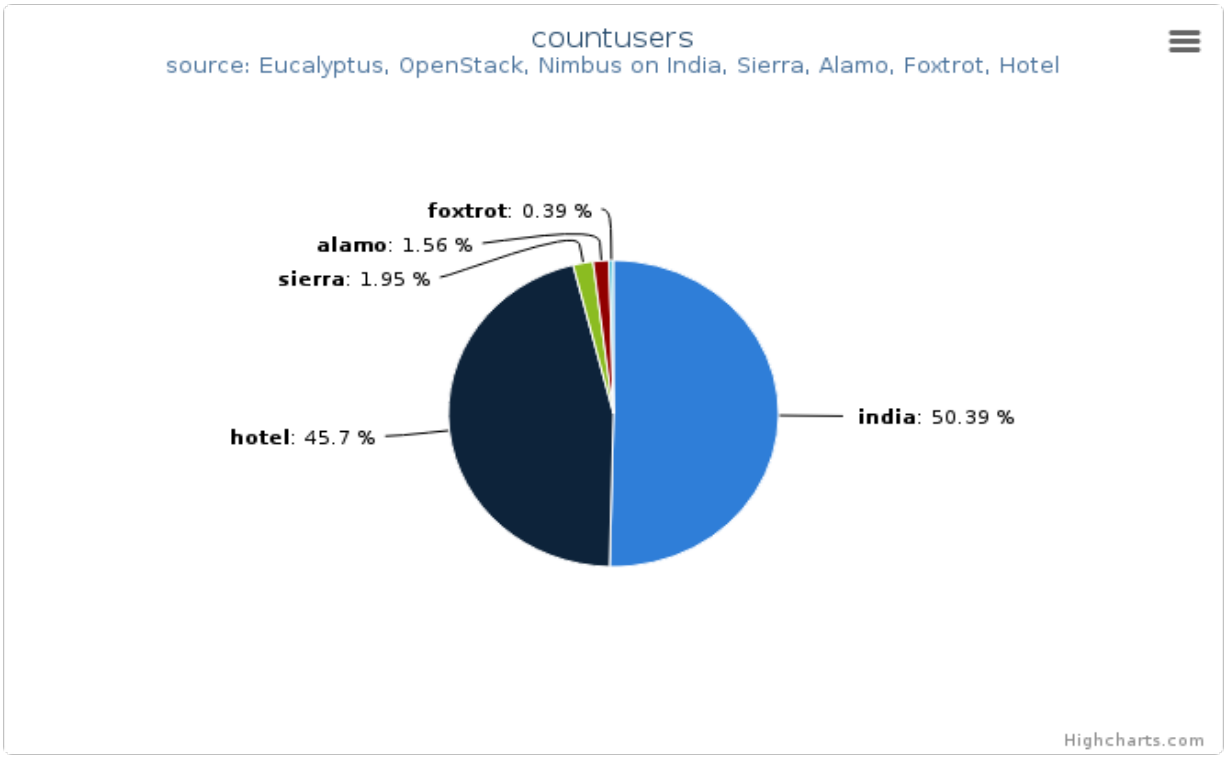

Figure 5. Users count by Clusters
This chart represents total number of active users.

- Period: January 01 – June 30, 2013
- **Cloud:**
  - india: Eucalyptus, Openstack
  - sierra: Eucalyptus, Nimbus
  - hotel: Nimbus
  - alamo: Nimbus
  - foxtrot: Nimbus

Table 1.3: User count by Clusters

Total	Value
india	129
hotel	117
sierra	5
alamo	4
foxtrot	1

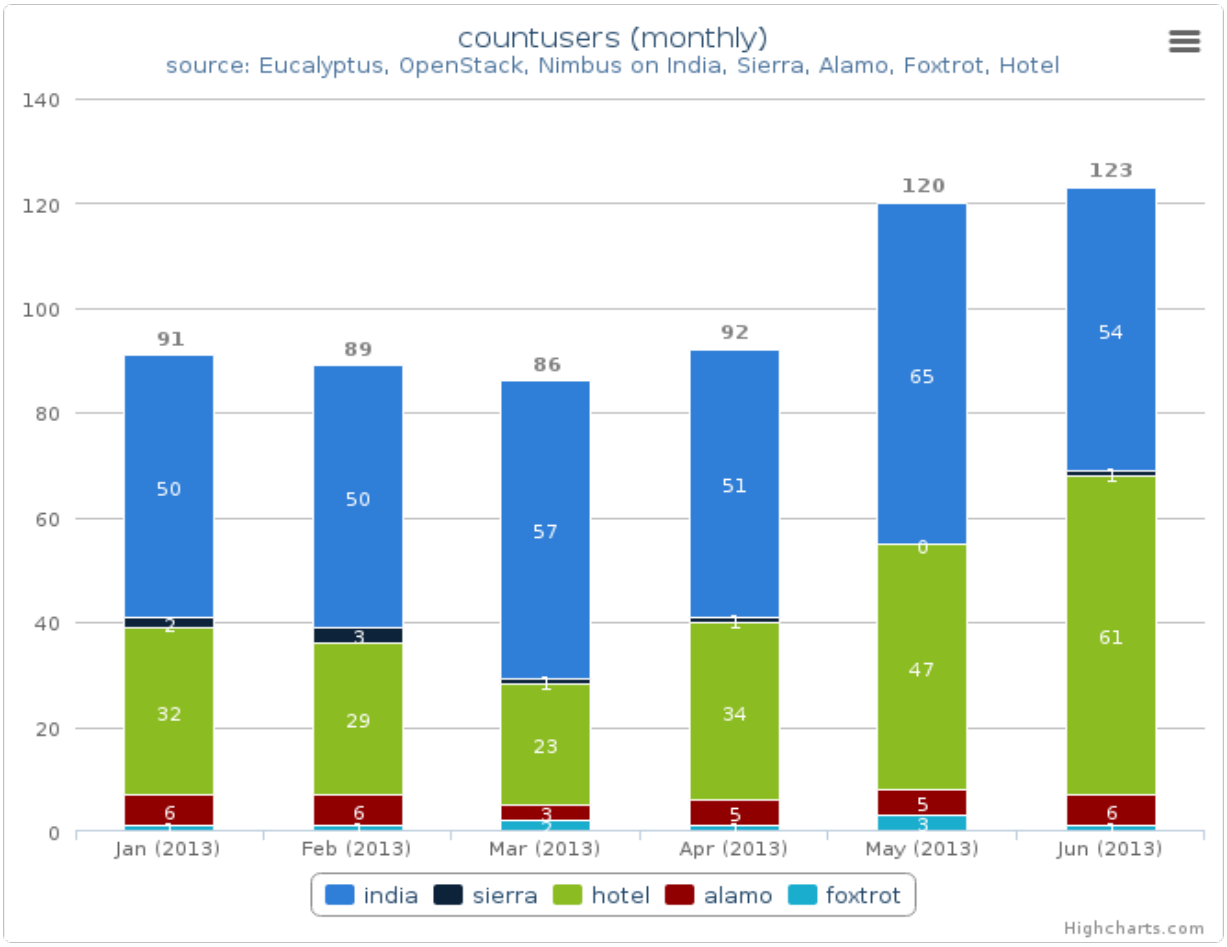

Figure 6. Users count by Clusters (Monthly)
This stacked column chart represents average count of active users per month.

- Period: January 01 – June 30, 2013
- **Cloud:**
  - india: Eucalyptus, Openstack
  - sierra: Eucalyptus, Nimbus
  - hotel: Nimbus
  - alamo: Nimbus
  - foxtrot: Nimbus

CHAPTER

TWO

USAGE REPORT SIERRA

- Period: January 01 – June 30, 2013
- Hostname: sierra.futuregrid.org
- Services: nimbus, eucalyptus
- Metrics: VMs count, Users count, Wall time (hours), Distribution by wall time, project, project leader, and institution, and systems

2.1 Histogram

2.1.1 Summary (Monthly)

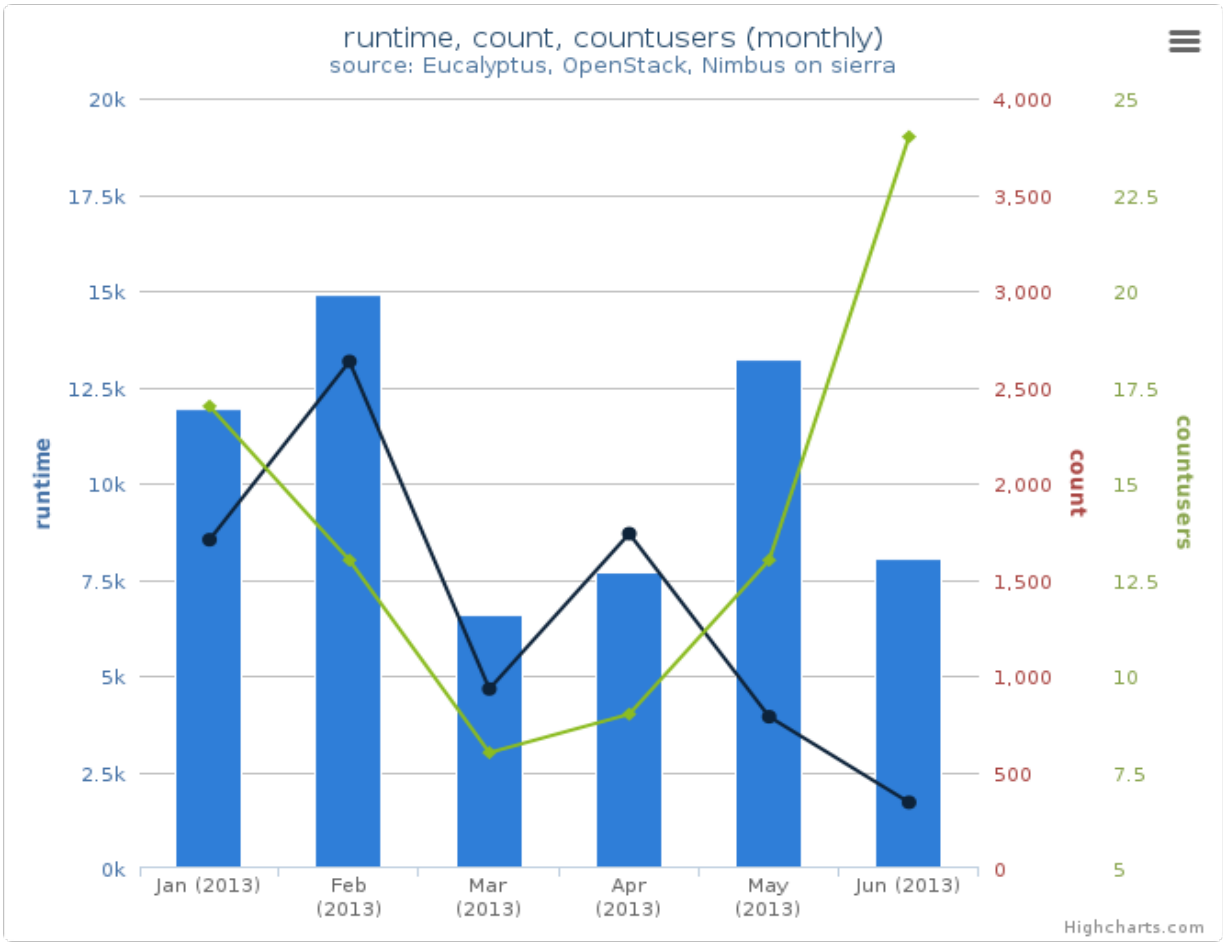

Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra
- **Metric:**
  - Runtime (Wall time hours): Sum of time elapsed from launch to termination of VM instances
  - Count (VM count): The number of launched VM instances
  - User count (Active): The number of users who launched VMs

2.1.2 Summary (Daily)

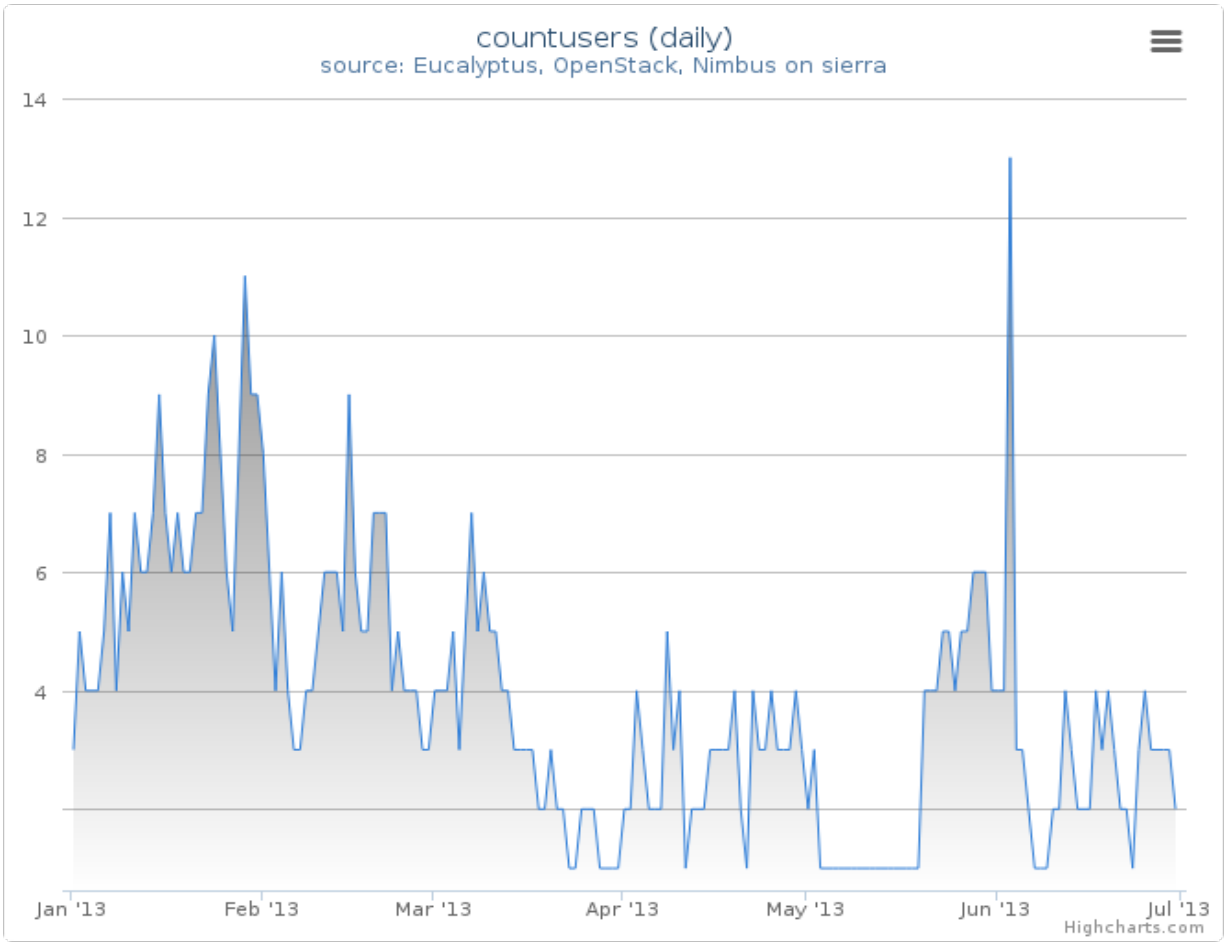

Figure 2: Users count

This time series chart represents daily active user count for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

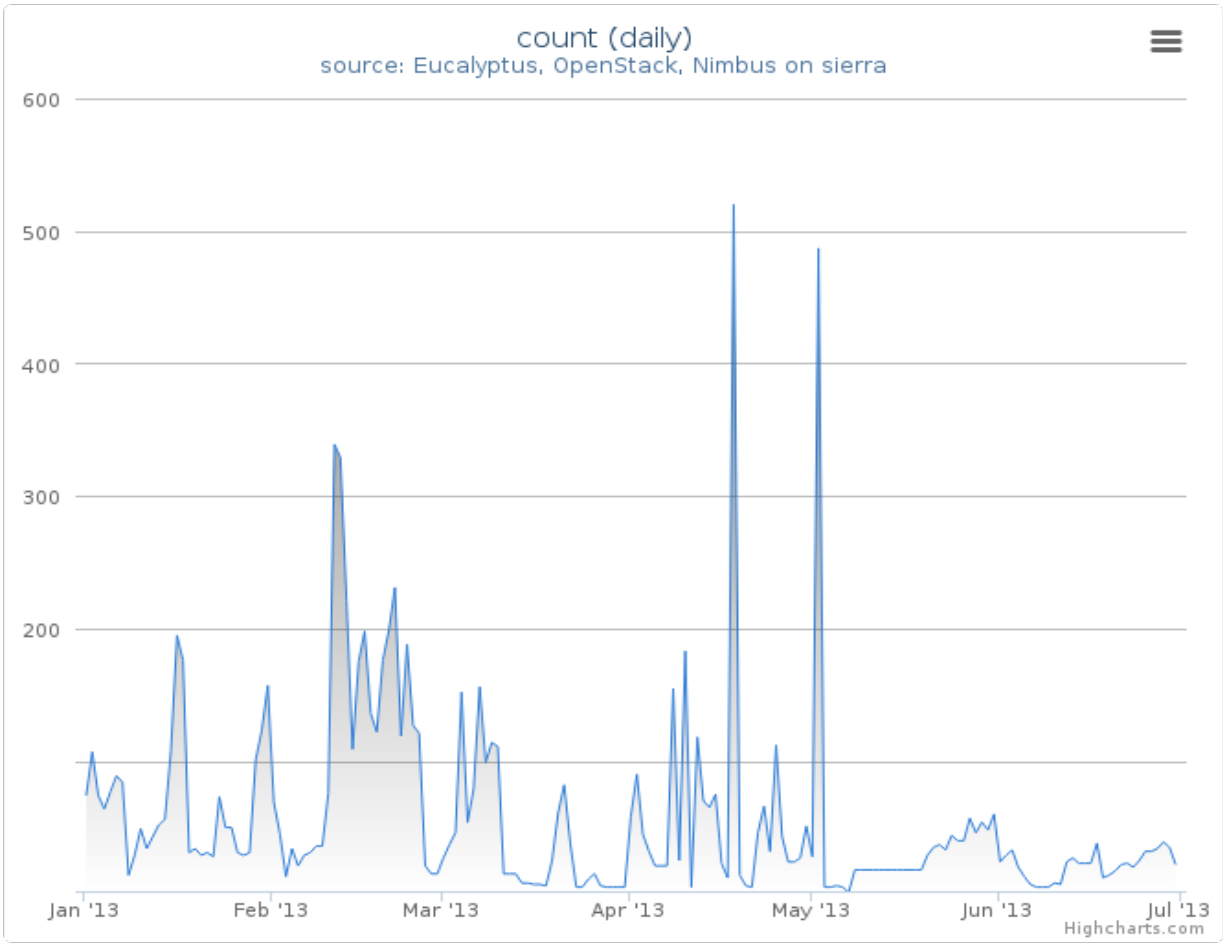

Figure 3: VMs count

This time series chart represents the number of daily launched VM instances for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

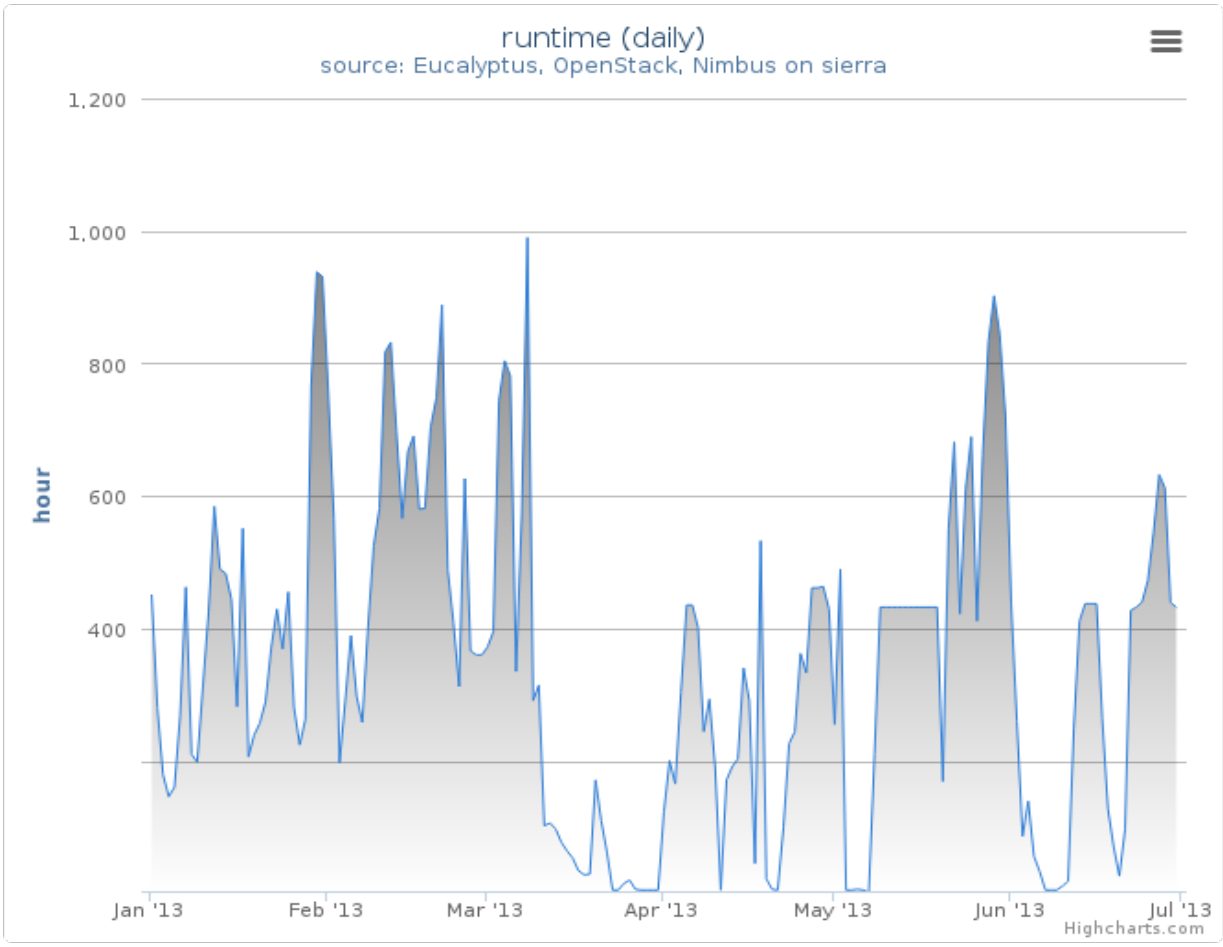

Figure 4: Wall time (hours)

This time series chart represents daily wall time (hours) for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

2.2 Distribution

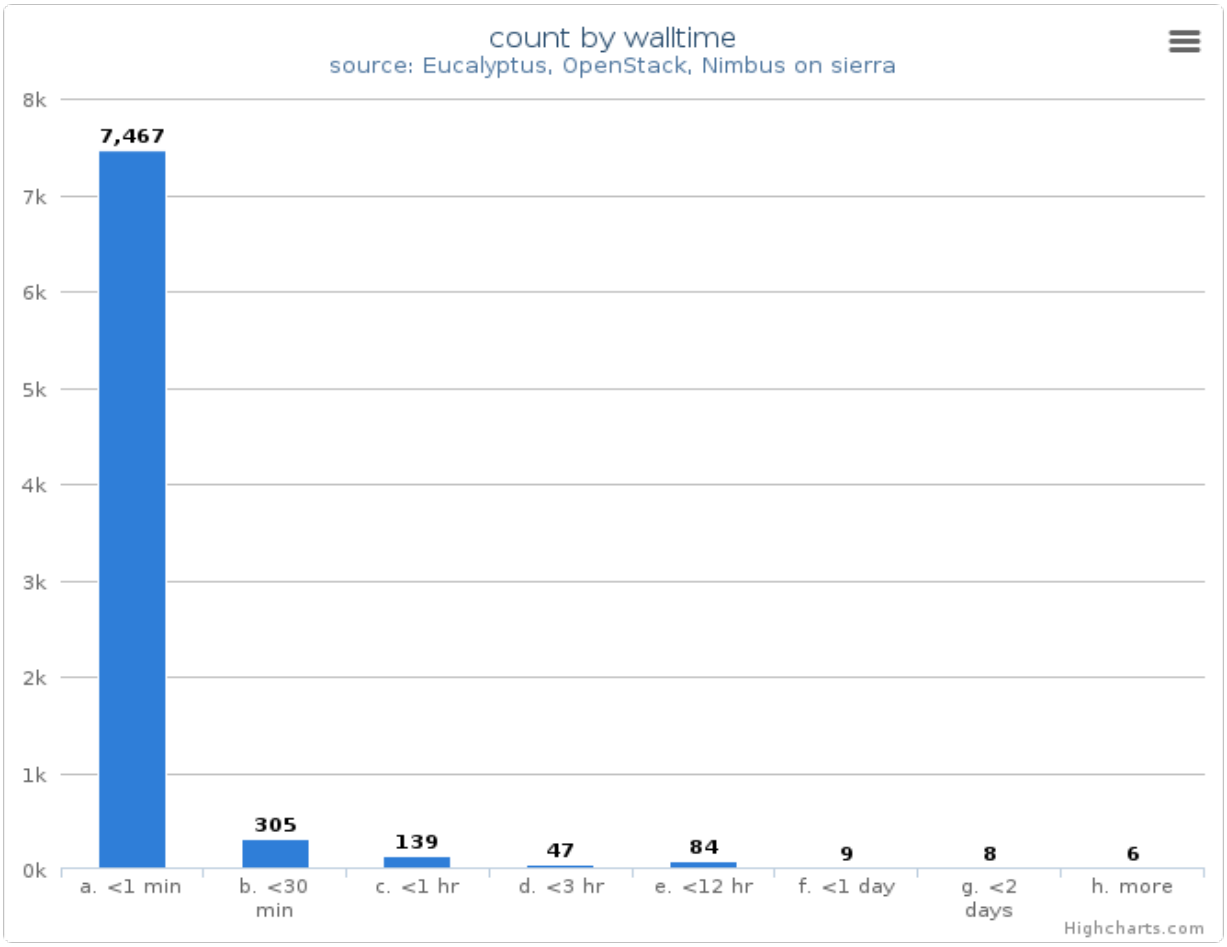

Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

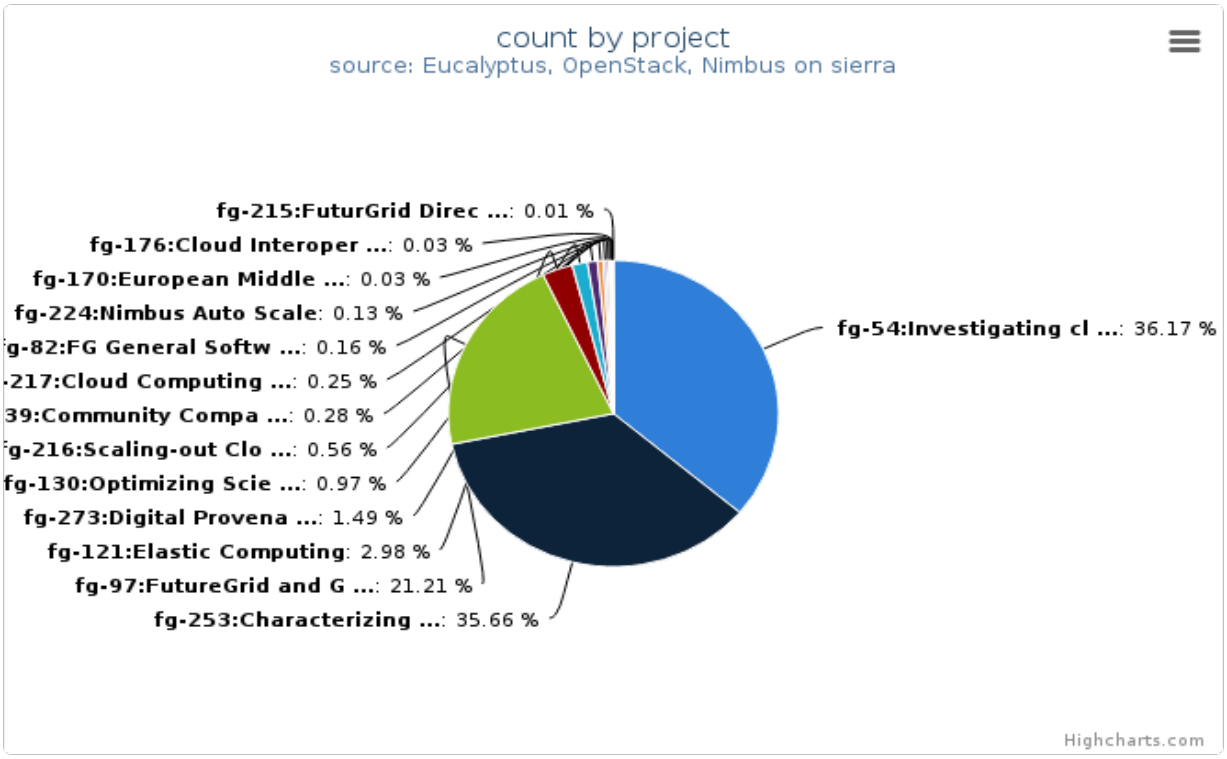

Figure 6: VMs count by project
This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

Table 2.1: VMs count by project

Project	Value
fg-54:Investigating cloud computing as a solution for analyzing particle physics data	2454
fg-253:Characterizing Performance of Infrastructure Clouds	2419
fg-97:FutureGrid and Grid'5000 Collaboration	1439
fg-121:Elastic Computing	202
fg-273:Digital Provenance Research	101
fg-130:Optimizing Scientific Workflows on Clouds	66
fg-216:Scaling-out CloudBLAST: Deploying Elastic MapReduce across Geographically Distributed Virtulized Resources for BLAST	38
fg-239:Community Comparison of Cloud frameworks	19
fg-217:Cloud Computing In Education	17
fg-82:FG General Software Development	11
fg-224:Nimbus Auto Scale	9
fg-170:European Middleware Initiative (EMI)	2
fg-176:Cloud Interoperability Testbed	2
fg-241:Course: Science Cloud Summer School 2012	1
fg-150:SC11: Using and Building Infrastructure Clouds for Science	1
Others	1
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	1
fg-215:FuturGrid Directory Entry	1

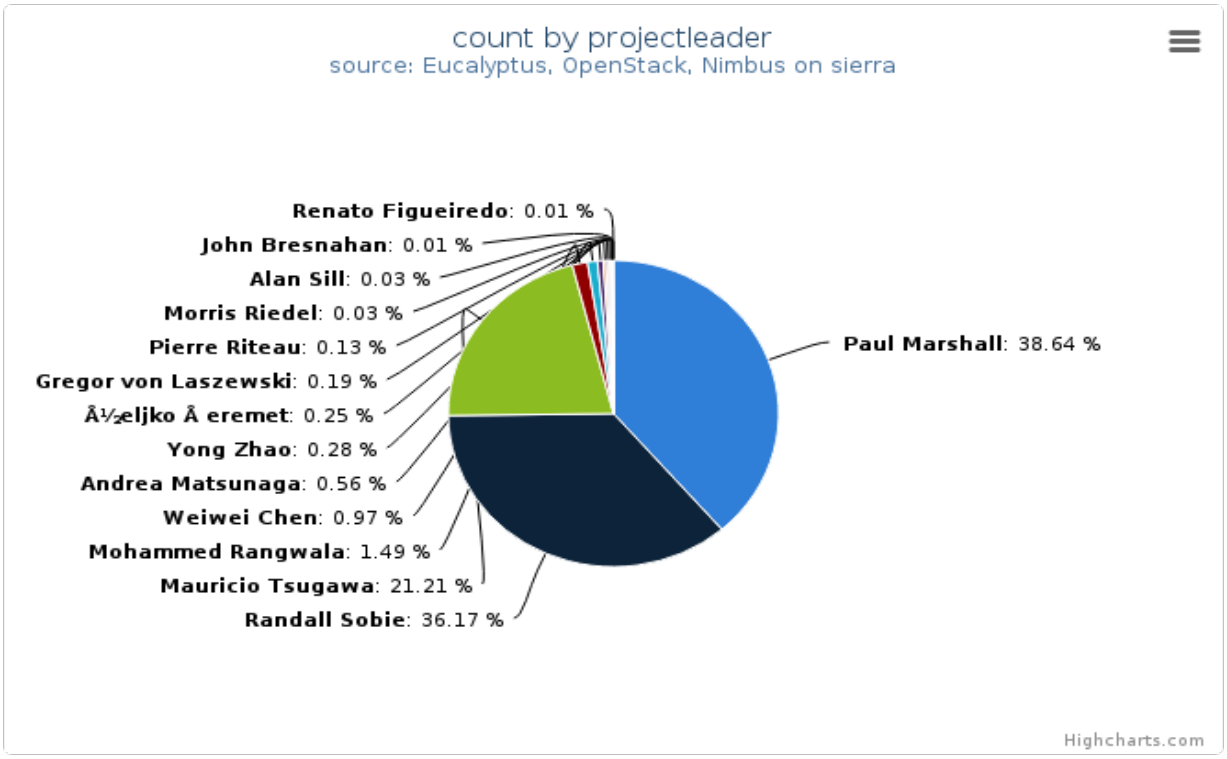

Figure 7: VMs count by project leader

This chart also illustrates the proportion of launched VM instances by project Leader. The same data in tabular form

follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

Table 2.2: VMs count by project leader

Projectleader	Value
Paul Marshall	2621
Randall Sobie	2454
Mauricio Tsugawa	1439
Mohammed Rangwala	101
Weiwei Chen	66
Andrea Matsunaga	38
Yong Zhao	19
Željko Šeremet	17
Gregor von Laszewski	13
Pierre Riteau	9
Morris Riedel	2
Alan Sill	2
Others	1
John Bresnahan	1
Renato Figueiredo	1

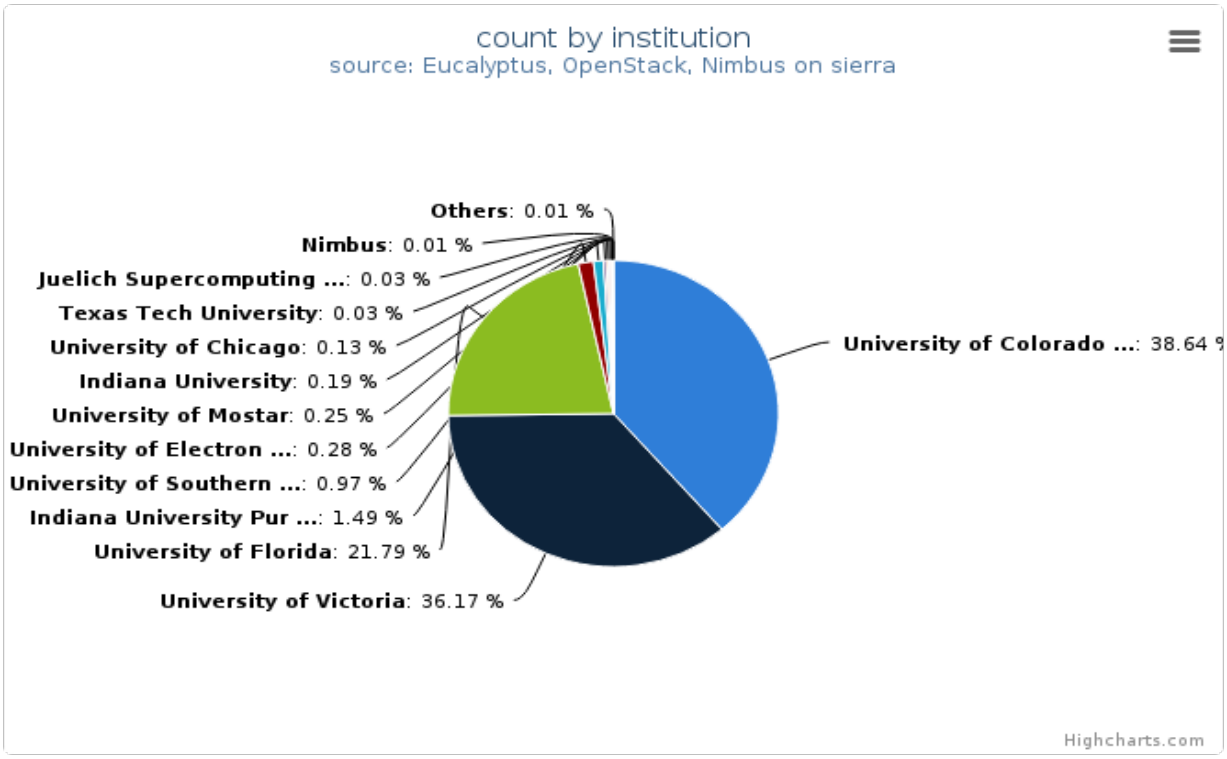

Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

Table 2.3: VMs count by institution

Institution	Value
University of Colorado at Boulder	2621
University of Victoria	2454
University of Florida	1478
Indiana University Purdue University Indianapolis	101
University of Southern California	66
University of Electronic Science and Technology	19
University of Mostar	17
Indiana University	13
University of Chicago	9
Texas Tech University	2
Juelich Supercomputing Centre	2
Nimbus	1
Others	1

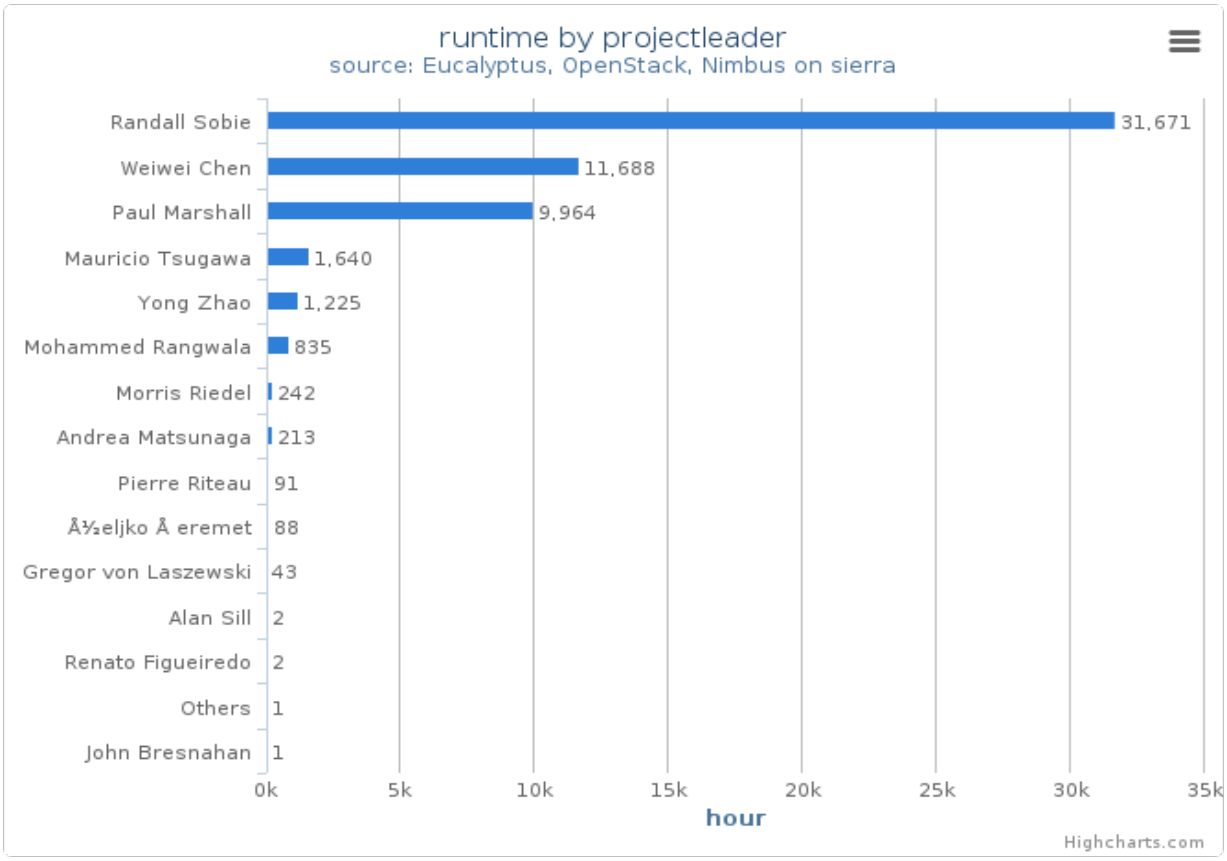

Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

2.3 System information

System information shows utilization distribution as to VMs count and wall time. Each cluster represents a compute node.

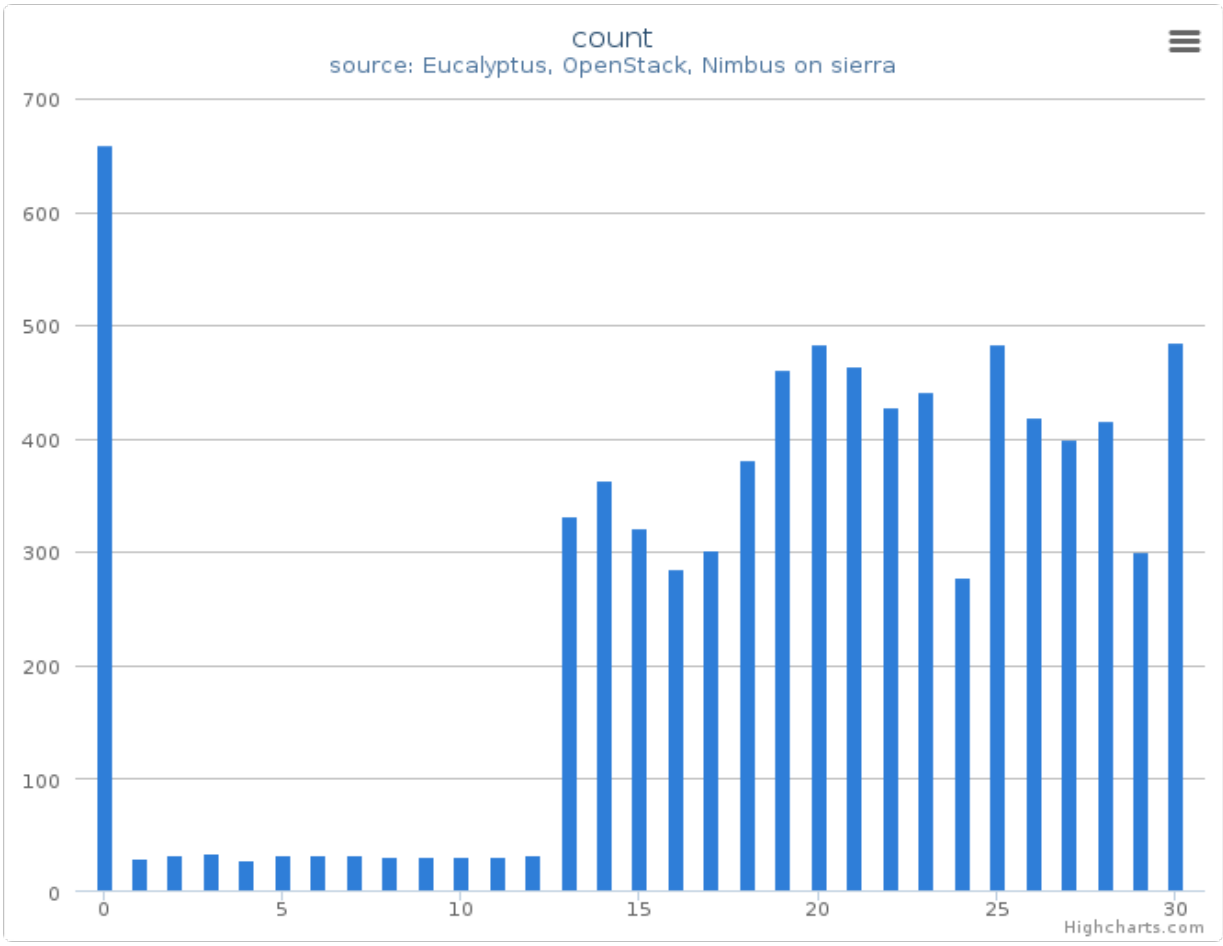

Figure 10: VMs count by systems (compute nodes) in Cluster (sierra)
This column chart represents VMs count among systems.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

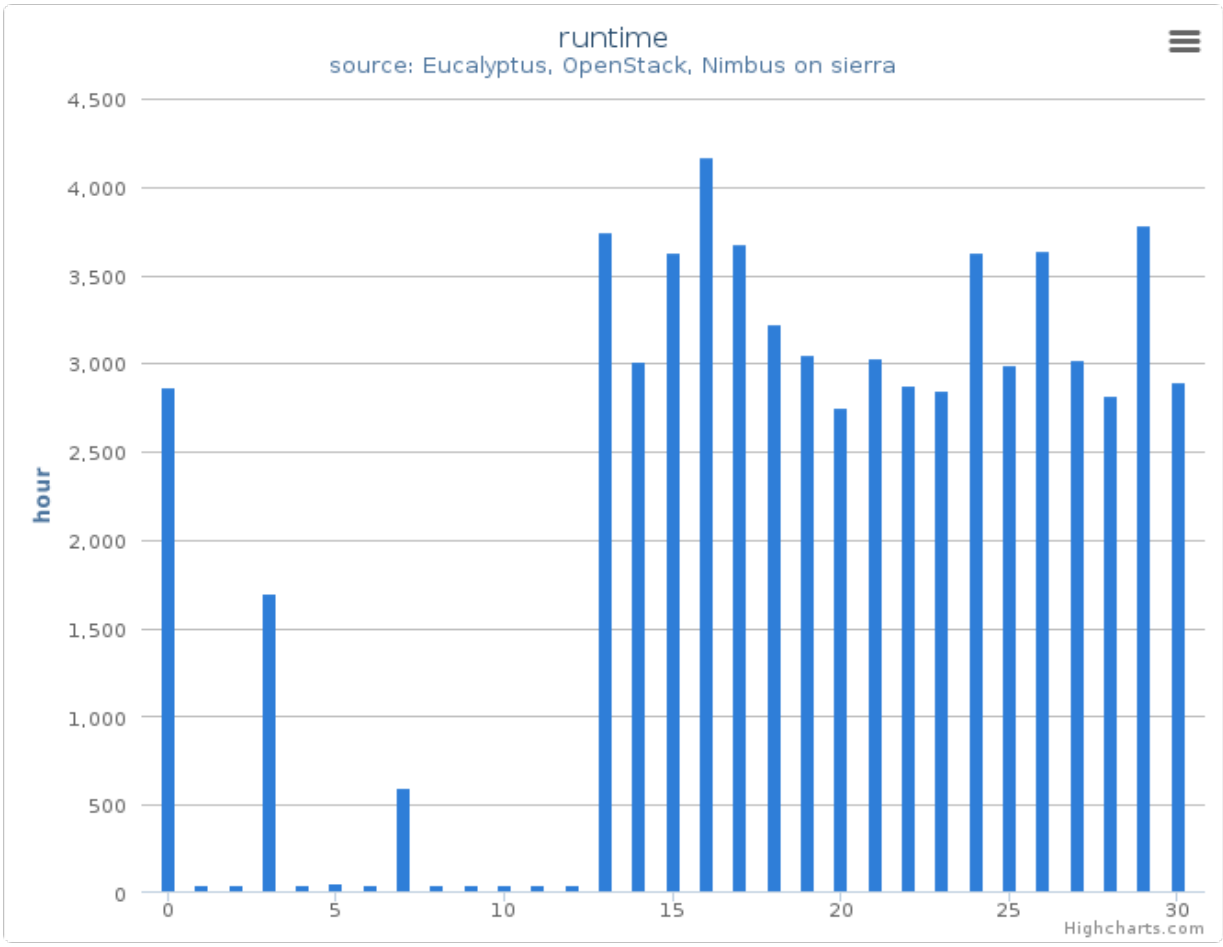

Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (sierra)
This column chart represents wall time among systems.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

CHAPTER

THREE

USAGE REPORT INDIA

- Period: January 01 – June 30, 2013
- Hostname: india.futuregrid.org
- Services: openstack, eucalyptus
- Metrics: VMs count, Users count, Wall time (hours), Distribution by wall time, project, project leader, and institution, and systems

3.1 Histogram

3.1.1 Summary (Monthly)

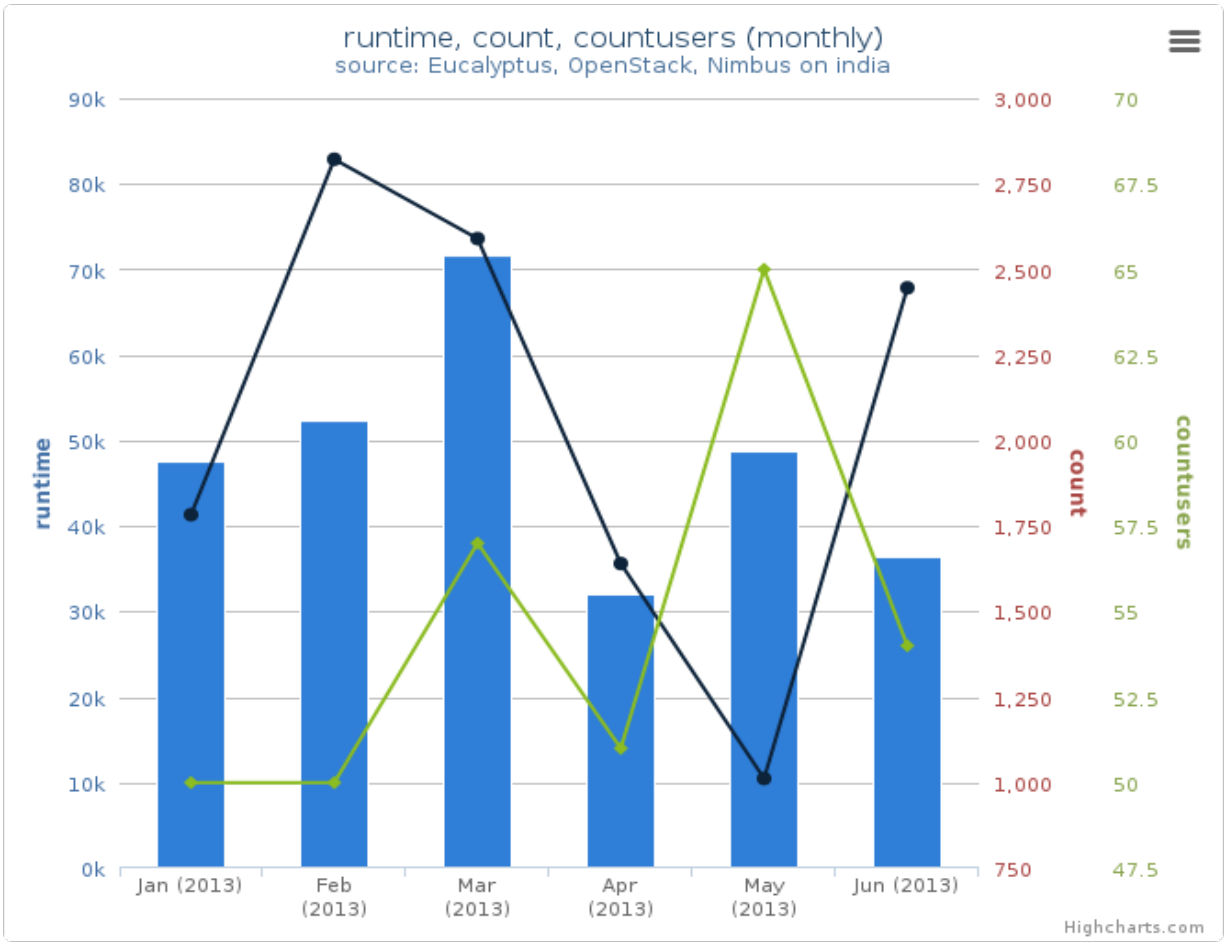

Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india
- **Metric:**
  - Runtime (Wall time hours): Sum of time elapsed from launch to termination of VM instances
  - Count (VM count): The number of launched VM instances
  - User count (Active): The number of users who launched VMs

3.1.2 Summary (Daily)

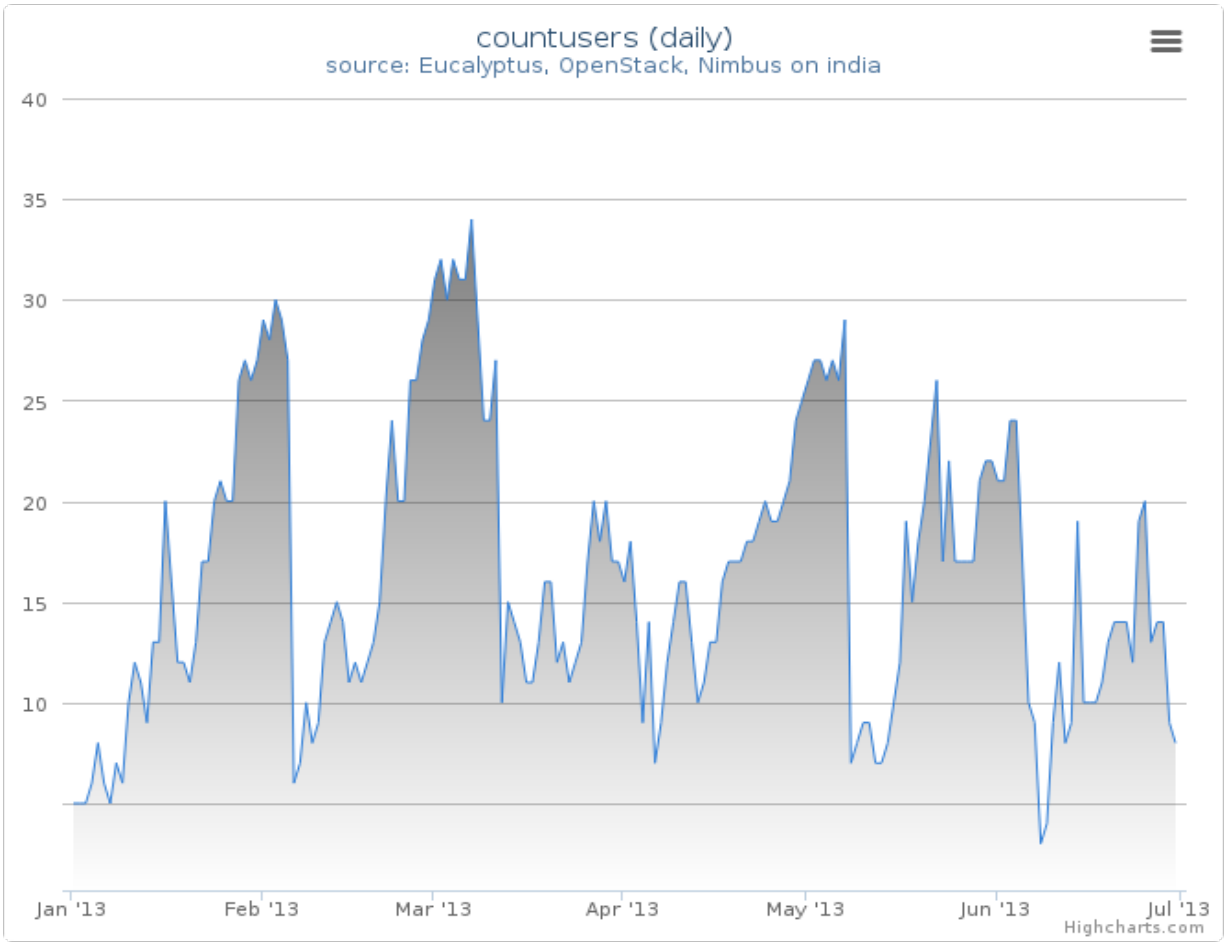

Figure 2: Users count

This time series chart represents daily active user count for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

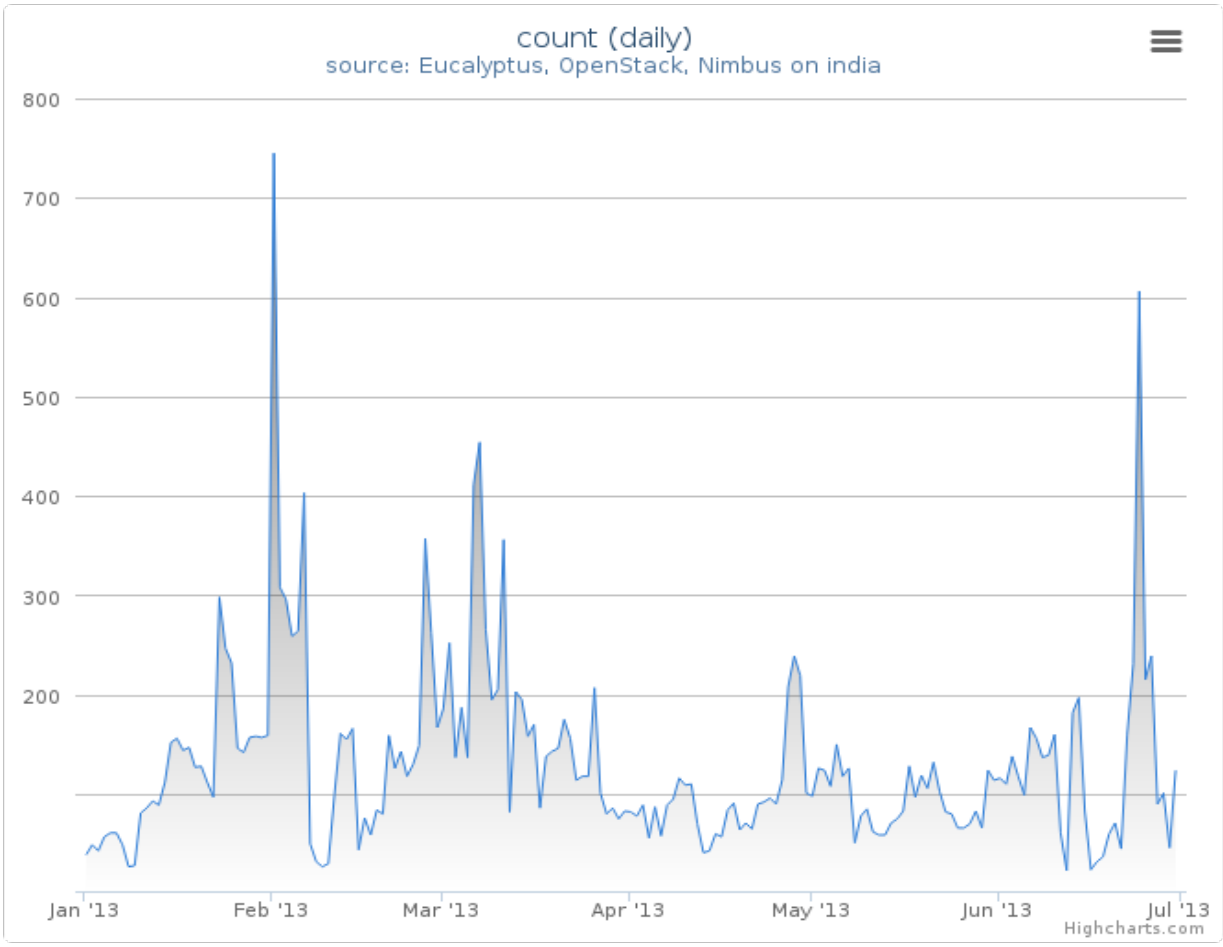

Figure 3: VMs count

This time series chart represents the number of daily launched VM instances for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

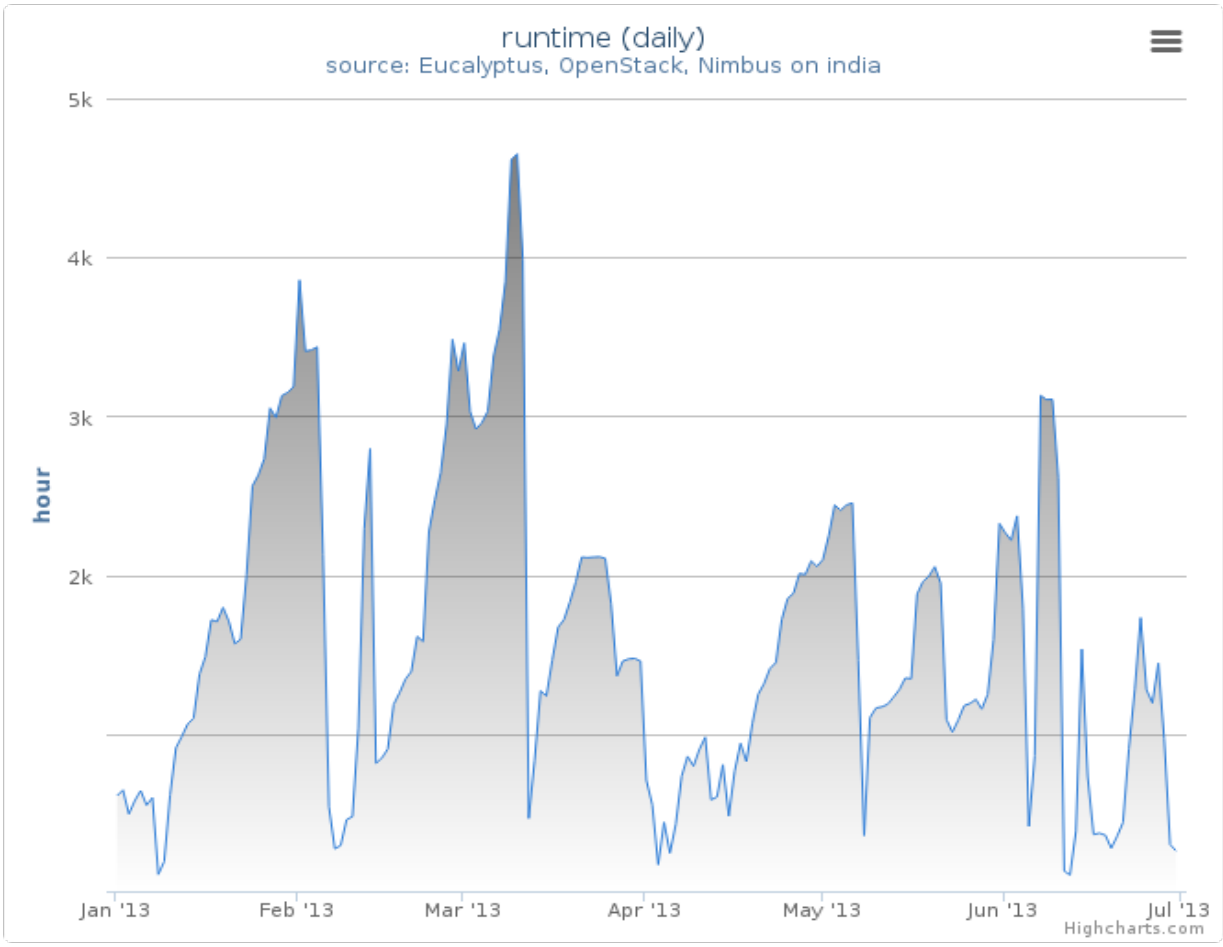

Figure 4: Wall time (hours)

This time series chart represents daily wall time (hours) for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

3.2 Distribution

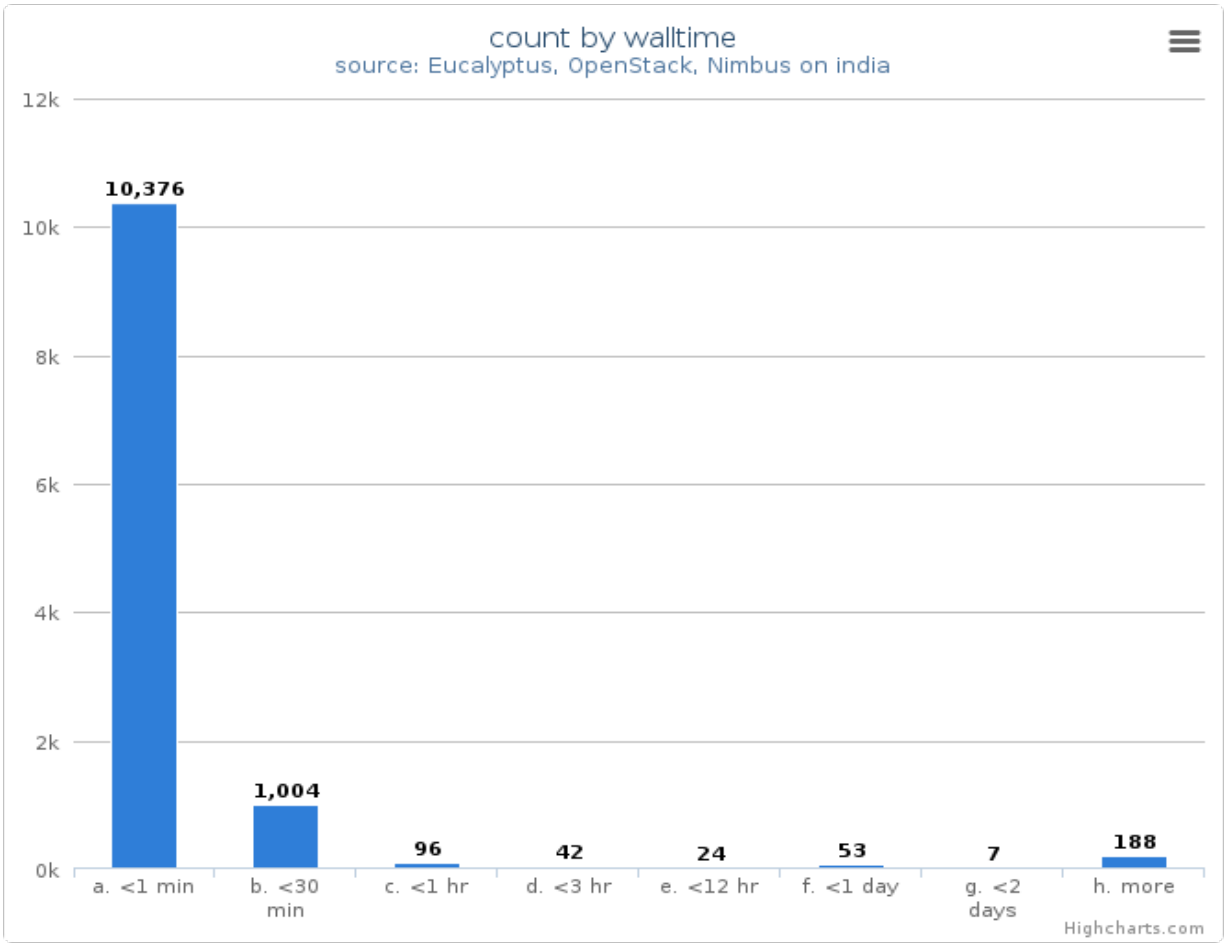

Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

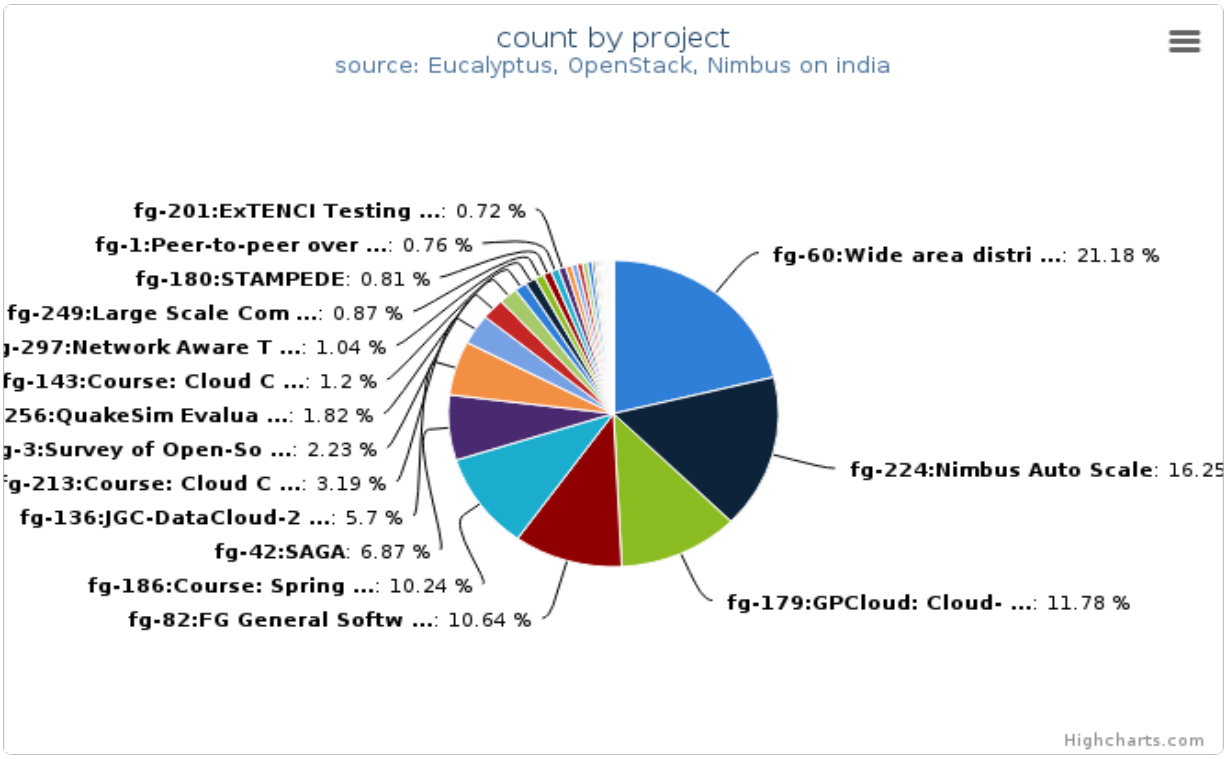

Figure 6: VMs count by project
This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

Table 3.1: VMs count by project

Project	Value
fg-60:Wide area distributed file system for MapReduce applications on FutureGrid platform	1359
fg-224:Nimbus Auto Scale	1043
fg-179:GPCloud: Cloud-based Automatic Repair of Real-World Software Bugs	756
fg-82:FG General Software Development	683
fg-186:Course: Spring 2012 B534 Distributed systems Graduate Course	657
fg-42:SAGA	441
fg-136:JGC-DataCloud-2012 paper experiments	366
fg-213:Course: Cloud Computing class - second edition	205
fg-3:Survey of Open-Source Cloud Infrastructure using FutureGrid Testbed	143
fg-256:QuakeSim Evaluation of FutureGrid for Cloud Computing	117
fg-143:Course: Cloud Computing for Data Intensive Science Class	77

Continued on next page

Table 3.1 – continued from previous page

Project	Value
fg-297:Network Aware Task Scheduling in Hadoop	67
fg-249:Large Scale Computing Infrastructure 2012 Master class	56
fg-180:STAMPEDE	52
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	49
fg-201:ExTENCI Testing, Validation, and Performance	46
fg-244:Course: Data Center Scale Computing	39
fg-97:FutureGrid and Grid'5000 Collaboration	35
fg-4:Word Sense Disambiguation for Web 2.0 Data	33
fg-130:Optimizing Scientific Workflows on Clouds	31
fg-176:Cloud Interoperability Testbed	30
fg-131:HBase Application and Investigation	17
fg-134:Distributed Mapreduce	14
fg-251:Course: Fall 2012 B534 Distributed Systems Graduate Course	12
fg-257:Particle Physics Data analysis cluster for ATLAS LHC experiment	11
fg-253:Characterizing Performance of Infrastructure Clouds	10
fg-9:Distributed Execution of Kepler Scientific Workflow on Future Grid	8
fg-294:Predicting economic activities using social media	8
fg-301:Course: Advanced Networking class University of Colorado	7
fg-168:Next Generation Sequencing in the Cloud	7
Others	7
fg-233:CINET - A Cyber-Infrastructure for Network Science	7
fg-20:Development of an information service for FutureGrid	5
fg-189:Pegasus development and improvement platform	5
fg-243:Applied Cyberinfrastructure concepts	3
fg-239:Community Comparison of Cloud frameworks	2
fg-69:Investigate provenance collection for MapReduce	2
fg-23:Hardware Performance Monitoring in the Clouds	2
fg-299:Pluggable Event Architecture for Cloud Environments	1
fg-263:Hello MapReduce	1
fg-293:Future Testbeds	1
fg-273:Digital Provenance Research	1
fg-122:Course: Cloud computing class	1

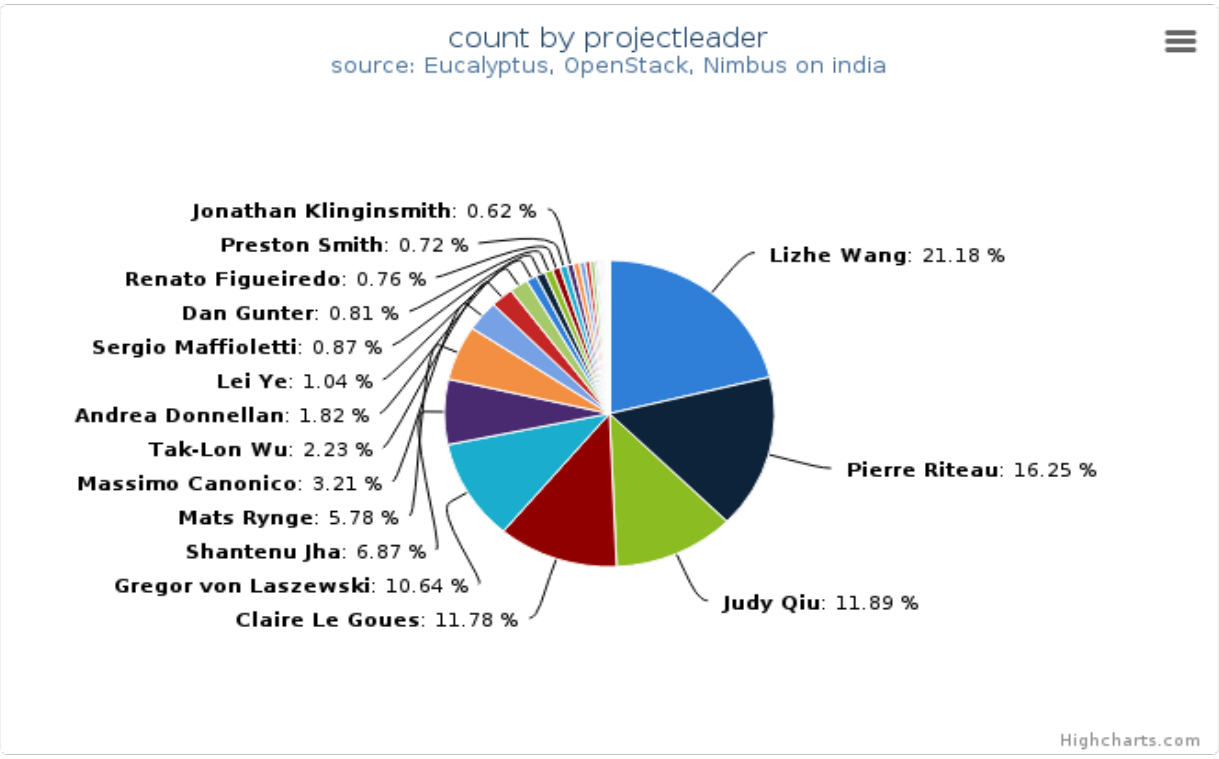

Figure 7: VMs count by project leader

This chart also illustrates the proportion of launched VM instances by project Leader. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

Table 3.2: VMs count by project leader

Projectleader	Value
Lizhe Wang	1359
Pierre Riteau	1043
Judy Qiu	763
Claire Le Goues	756
Gregor von Laszewski	683
Shantenu Jha	441
Mats Rynge	371
Massimo Canonico	206
Tak-Lon Wu	143
Andrea Donnellan	117
Lei Ye	67

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Table 3.2 – continued from previous page

Projectleader	Value
Sergio Maffioletti	56
Dan Gunter	52
Renato Figueiredo	49
Preston Smith	46
Jonathan Klinginsmith	40
Dirk Grunwald	39
Mauricio Tsugawa	35
Weiwei Chen	31
Alan Sill	30
Chenyu Wang	14
Doug Benjamin	11
Paul Marshall	10
Ilkay Altintas	8
Shuyuan Deng	8
Keith Bisset	7
Others	7
Eric Keller	7
Hyungro Lee	5
Nirav Merchant	3
Yong Zhao	2
Jiaan Zeng	2
Shirley Moore	2
Robert Ricci	1
Mohammed Rangwala	1
Dong Wang	1
Jeffrey Cox	1

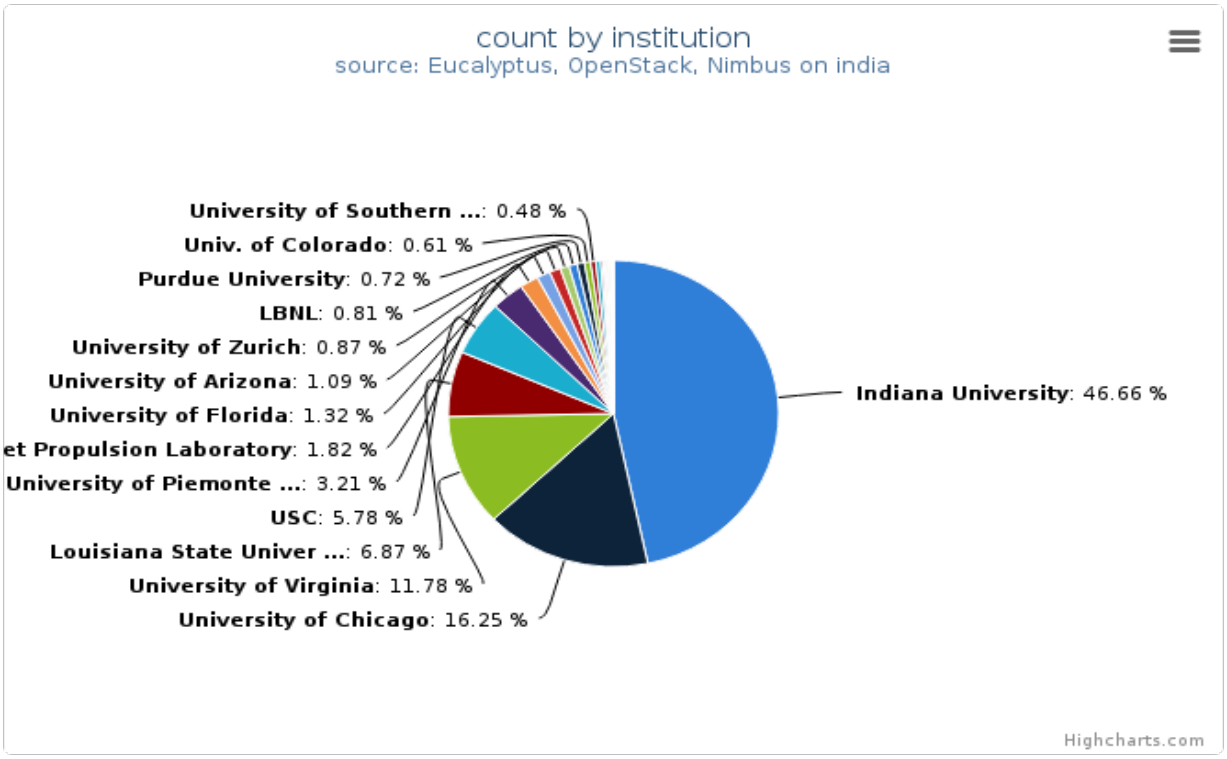

Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

Table 3.3: VMs count by institution

Institution	Value
Indiana University	2994
University of Chicago	1043
University of Virginia	756
Louisiana State University	441
USC	371
University of Piemonte Orientale	206
Jet Propulsion Laboratory	117
University of Florida	85
University of Arizona	70
University of Zurich	56
LBNL	52
Purdue University	46
Univ. of Colorado	39
University of Southern California	31
Texas Tech University	30
University of Minnesota	14
Duke University	11
University of Colorado at Boulder	10
UCSD	8
University of Wisconsin -Milwaukee	8
University of Colorado	7
Others	7
Virginia Tech	7
Computer Science	2
University of Electronic Science and Technology	2
University of Tennessee	2
Indiana University Purdue University Indianapolis	1
University of Utah	1

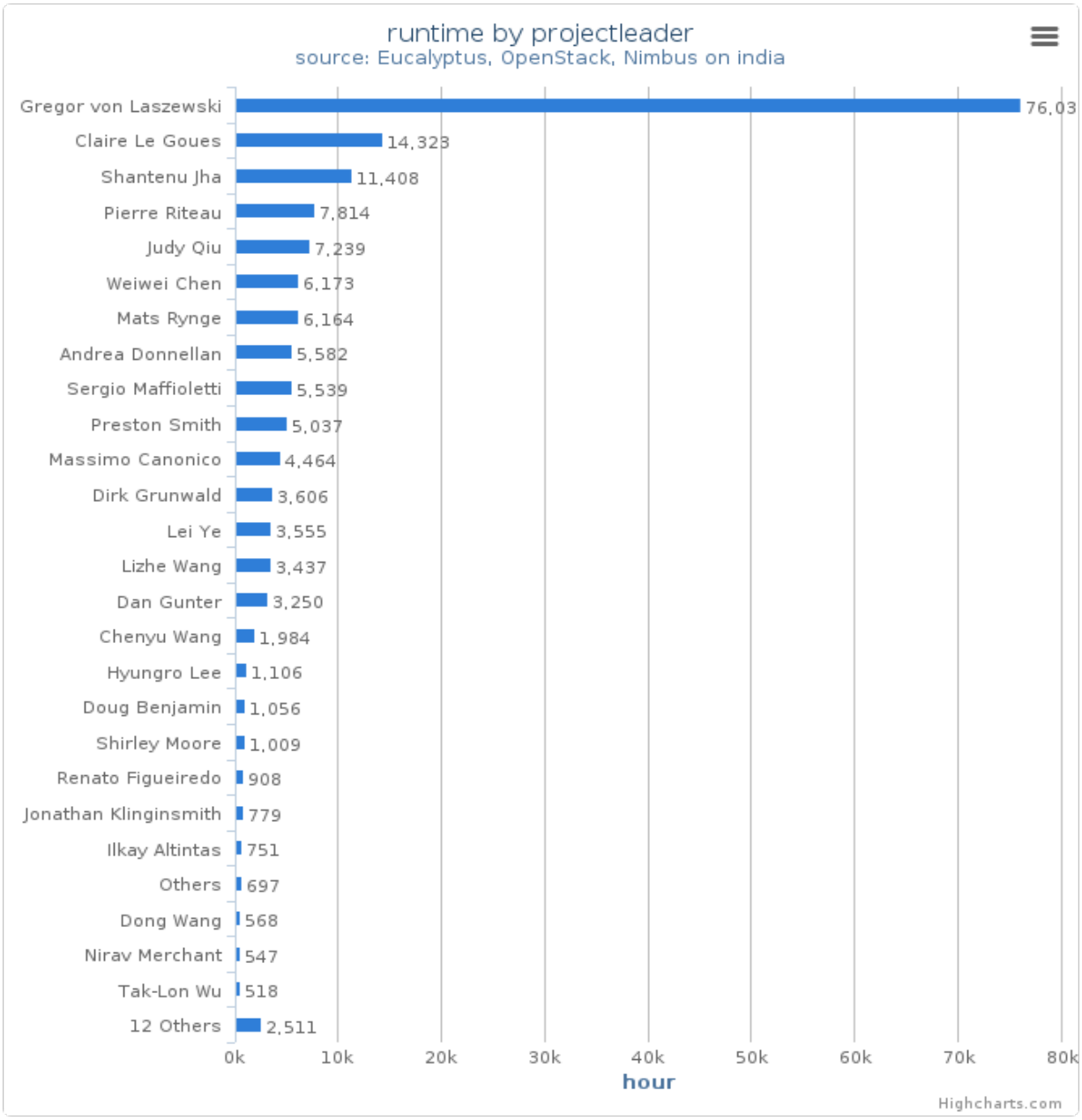

Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

3.3 System information

System information shows utilization distribution as to VMs count and wall time. Each cluster represents a compute node.

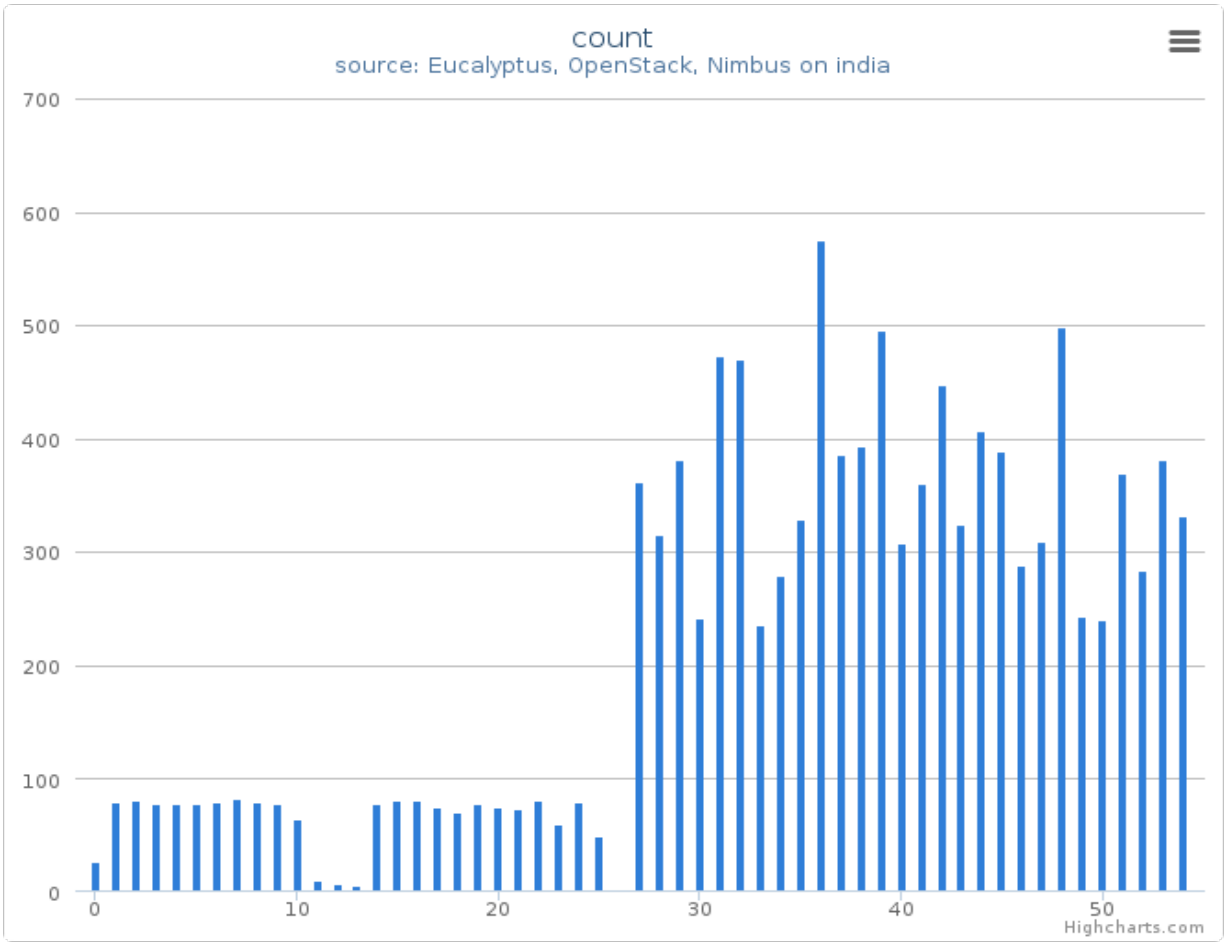

Figure 10: VMs count by systems (compute nodes) in Cluster (india)
This column chart represents VMs count among systems.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

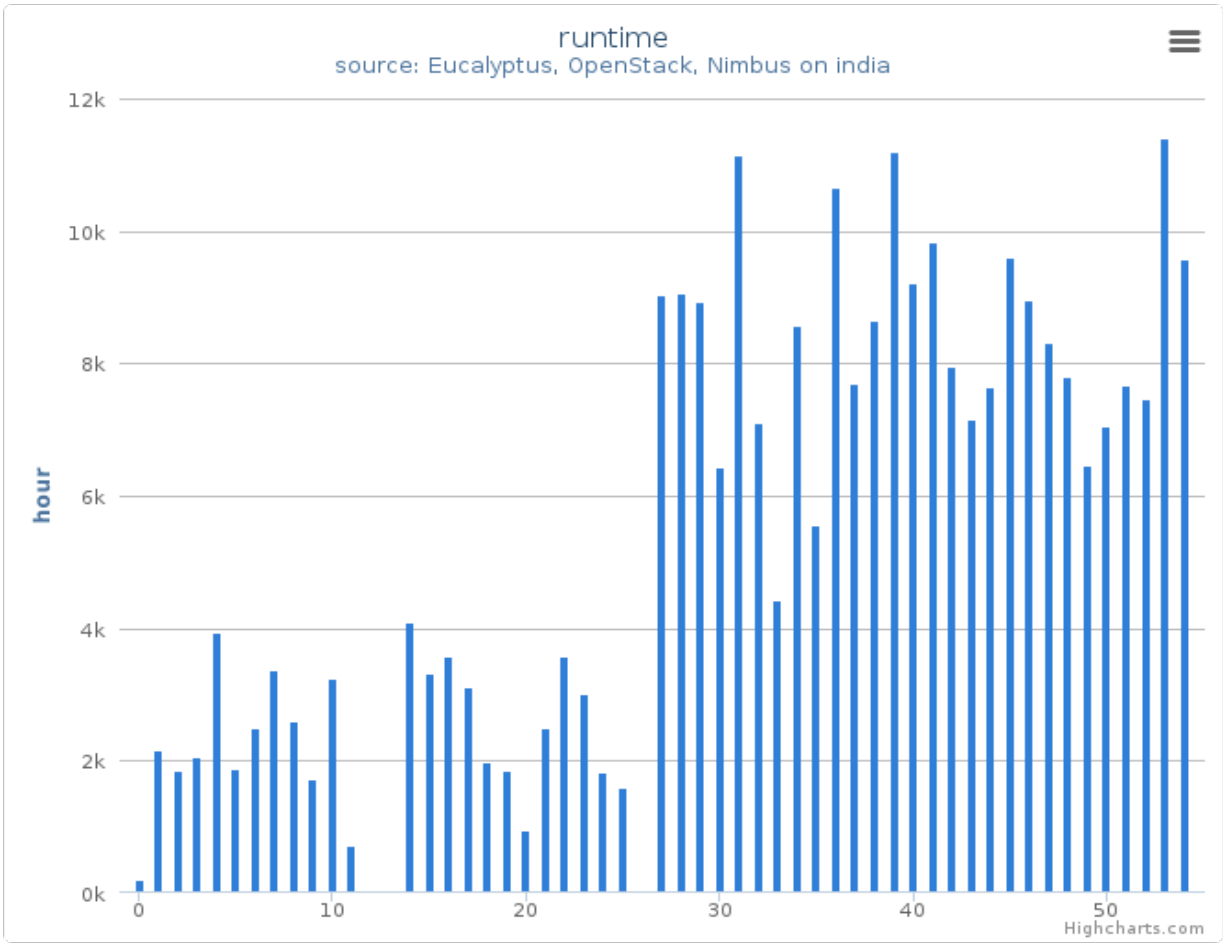

Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (india)
This column chart represents wall time among systems.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

CHAPTER

FOUR

USAGE REPORT HOTEL

- Period: January 01 – June 30, 2013
- Hostname: hotel.futuregrid.org
- Services: nimbus
- Metrics: VMs count, Users count, Wall time (hours), Distribution by wall time, project, project leader, and institution, and systems

4.1 Histogram

4.1.1 Summary (Monthly)

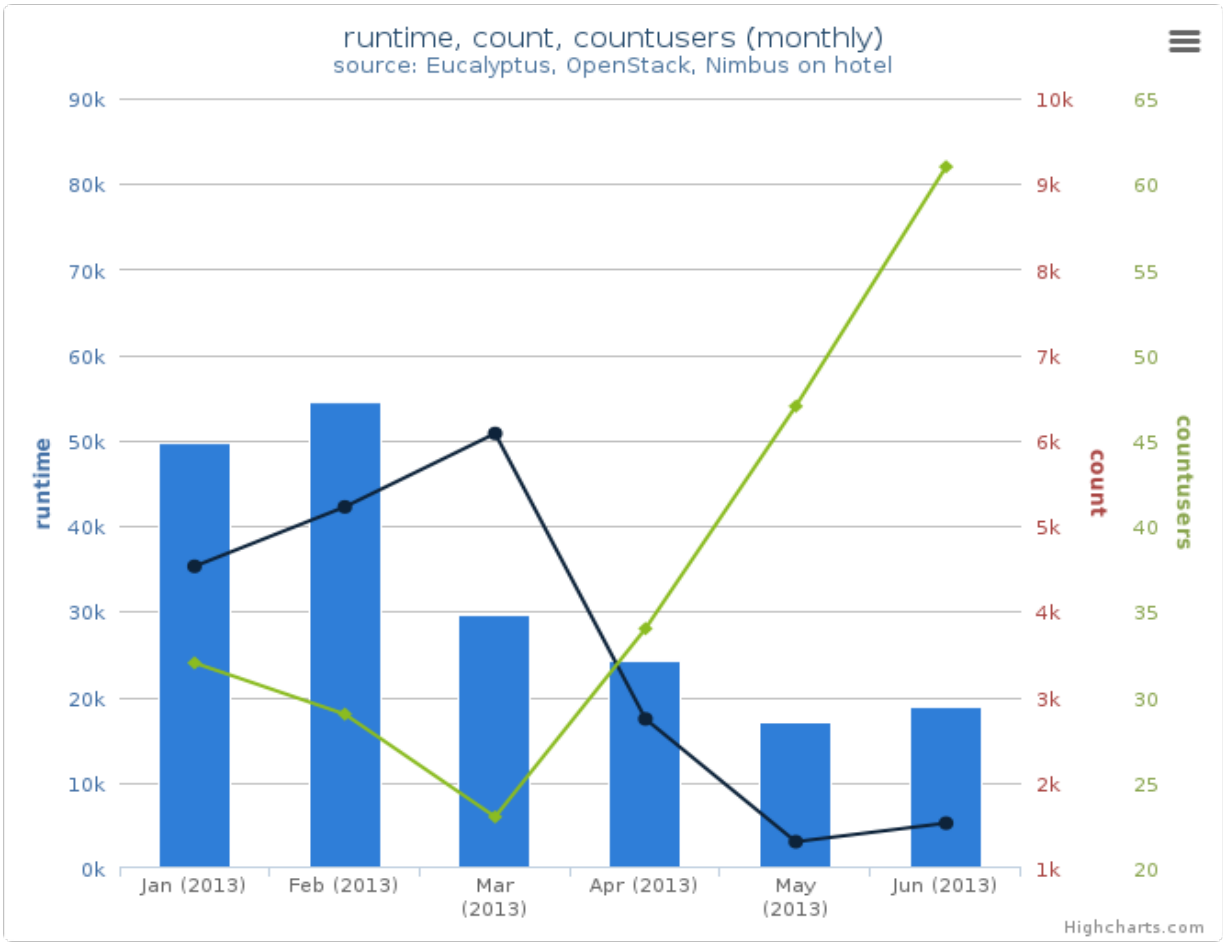

Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel
- **Metric:**
  - Runtime (Wall time hours): Sum of time elapsed from launch to termination of VM instances
  - Count (VM count): The number of launched VM instances
  - User count (Active): The number of users who launched VMs

4.1.2 Summary (Daily)

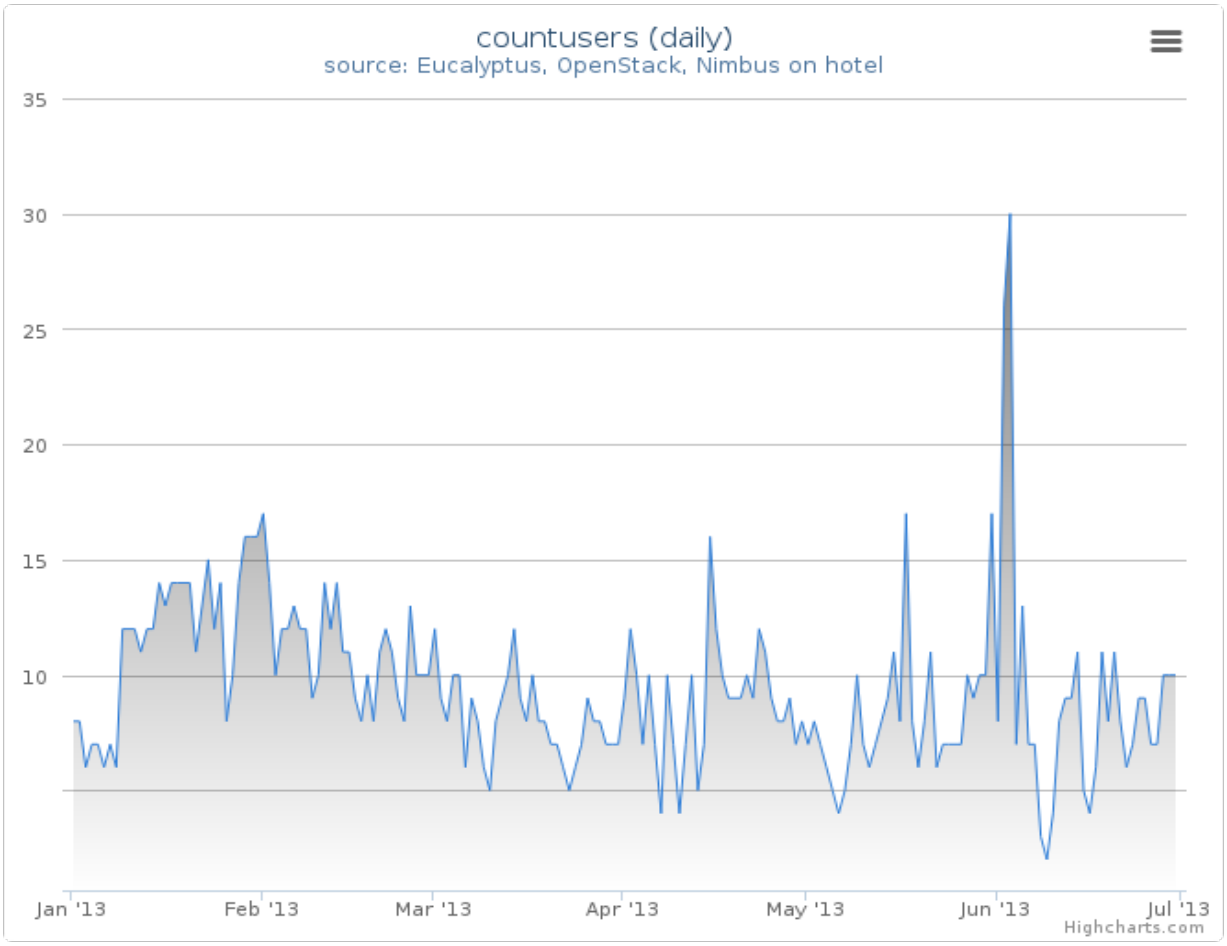

Figure 2: Users count

This time series chart represents daily active user count for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

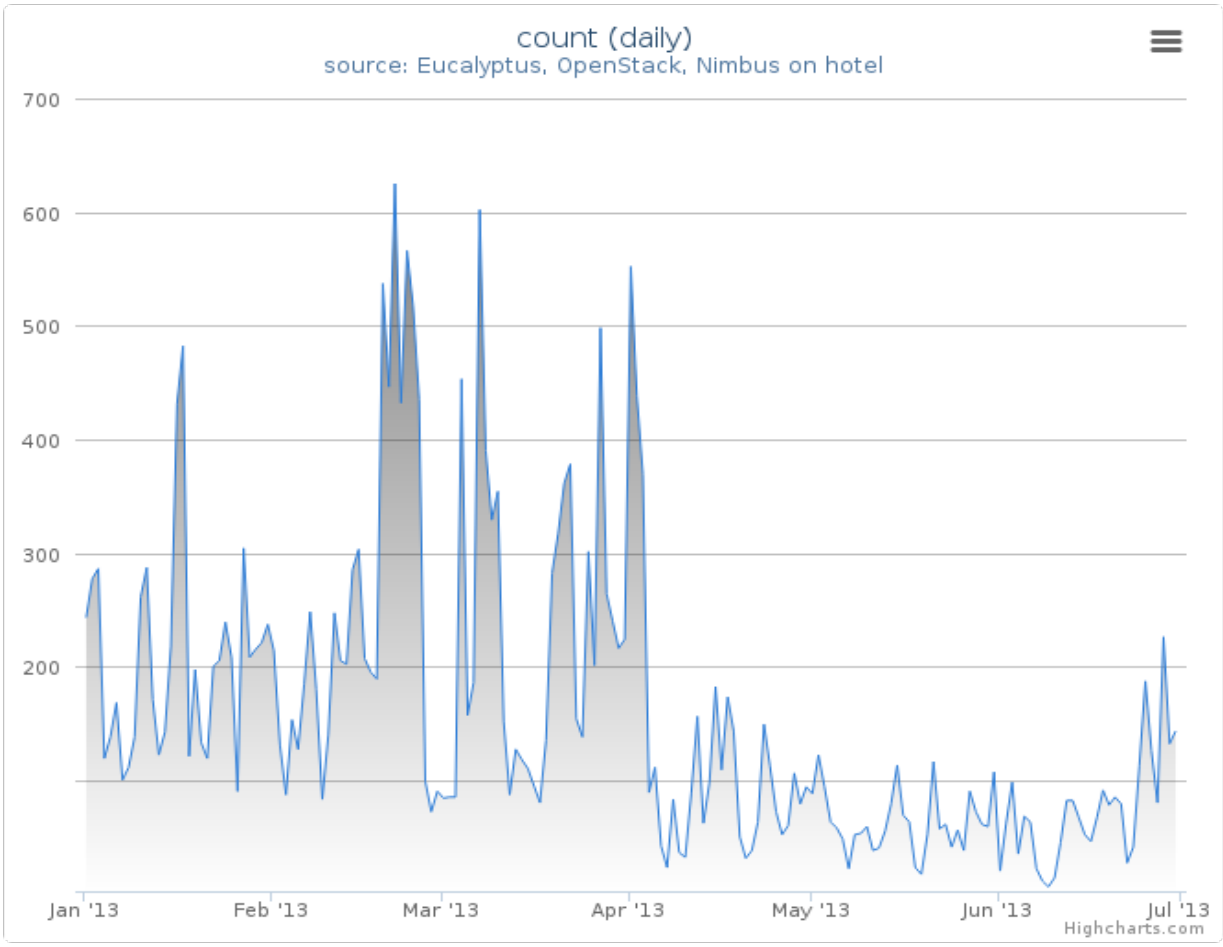

Figure 3: VMs count

This time series chart represents the number of daily launched VM instances for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

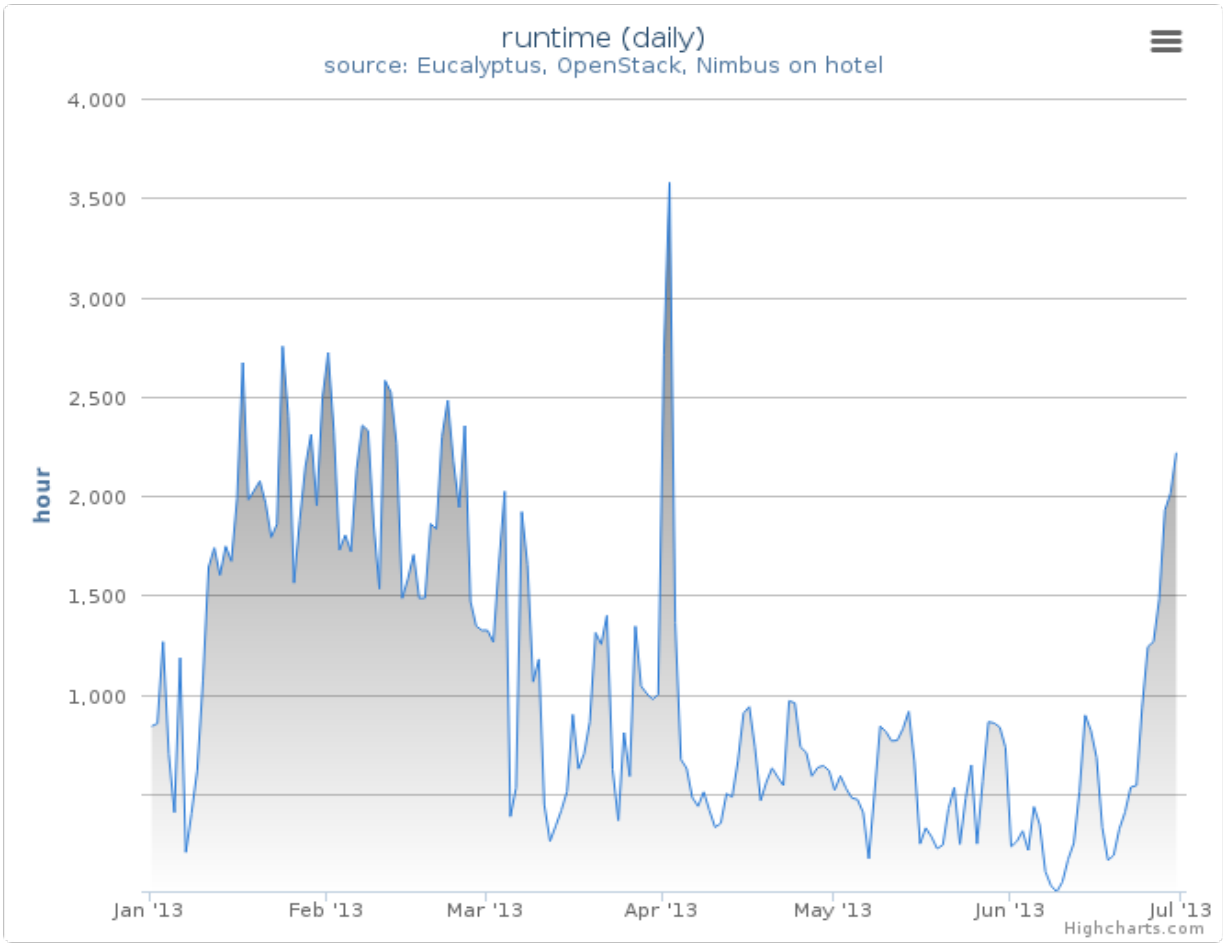

Figure 4: Wall time (hours)
This time series chart represents daily wall time (hours) for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

4.2 Distribution

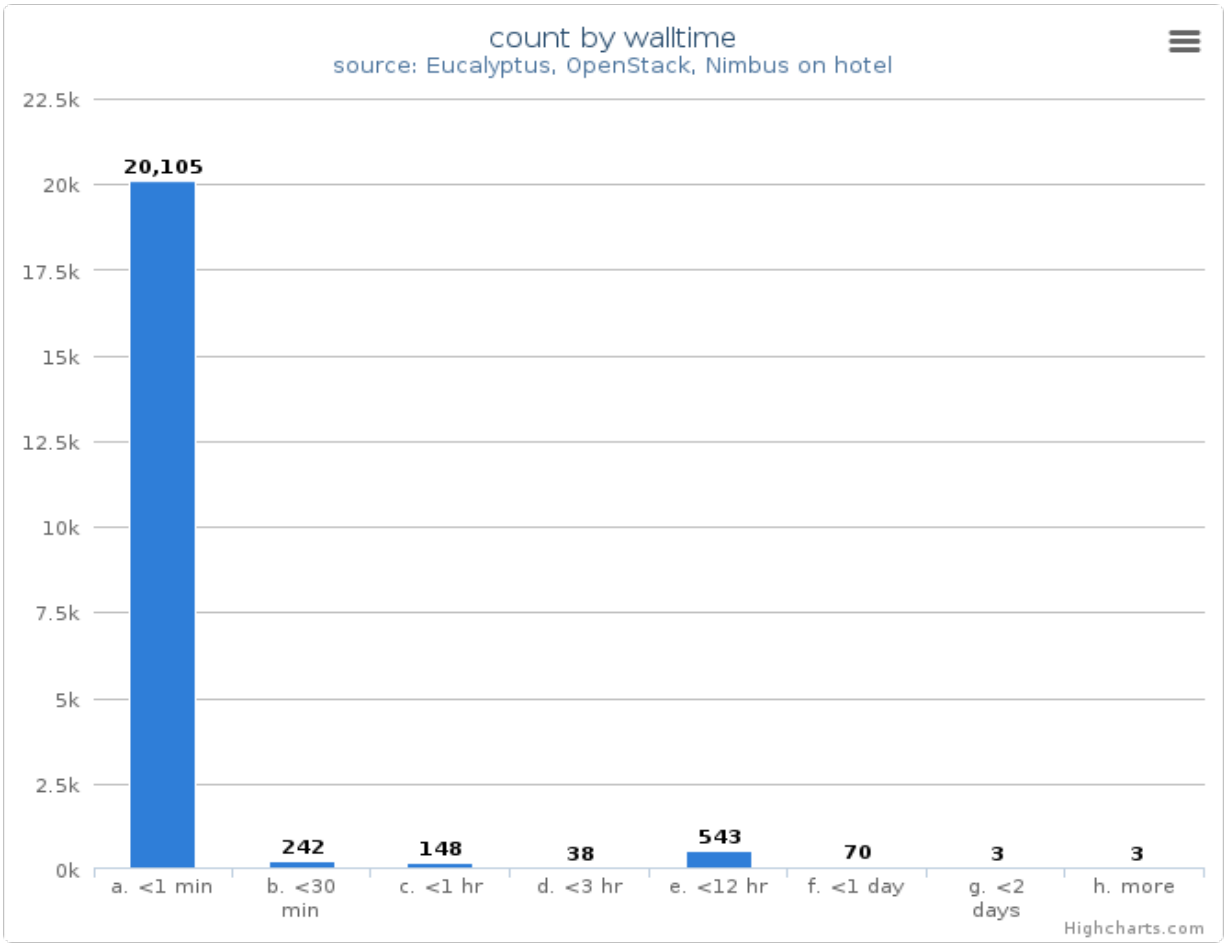

Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

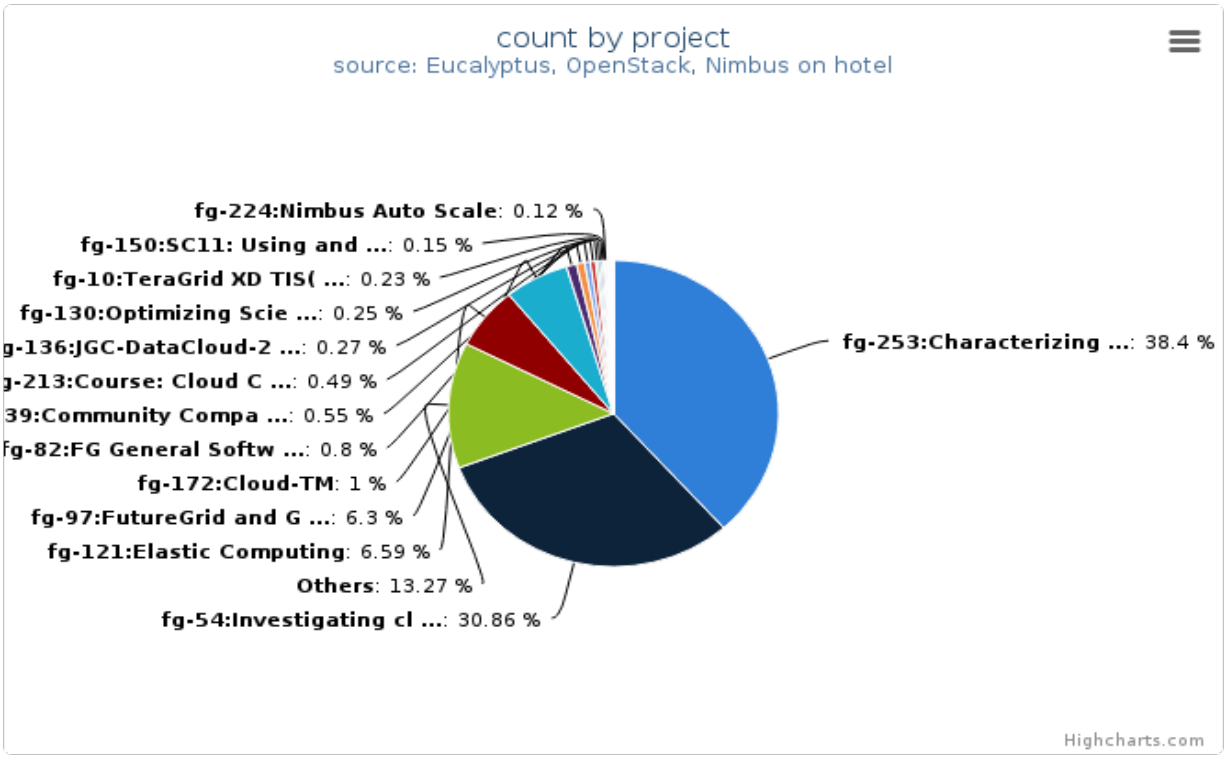

Figure 6: VMs count by project

This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

Table 4.1: VMs count by project

Project
fg-253:Characterizing Performance of Infrastructure Clouds
fg-54:Investigating cloud computing as a solution for analyzing particle physics data
Others
fg-121:Elastic Computing
fg-97:FutureGrid and Grid‘5000 Collaboration
fg-172:Cloud-TM
fg-82:FG General Software Development
fg-239:Community Comparison of Cloud frameworks
fg-213:Course: Cloud Computing class - second edition
fg-136:JGC-DataCloud-2012 paper experiments
fg-130:Optimizing Scientific Workflows on Clouds
Continued on

Table 4.1 – continued from previous page

Project
fg-10:TeraGrid XD TIS(Technology Insertion Service) Technology Evaluation Laboratory
fg-150:SC11: Using and Building Infrastructure Clouds for Science
fg-224:Nimbus Auto Scale
fg-217:Cloud Computing In Education
fg-273:Digital Provenance Research
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters
fg-247:Course: Cloud Computing and Storage Class
fg-165:The VIEW Project
fg-47:Parallel scripting using cloud resources
fg-257:Particle Physics Data analysis cluster for ATLAS LHC experiment
fg-241:Course: Science Cloud Summer School 2012
fg-216:Scaling-out CloudBLAST: Deploying Elastic MapReduce across Geographically Distributed Virtulized Resources for BLAST
fg-125:The VIEW Project
fg-225:Budget-constrained workflow scheduler
fg-294:Predicting economic activities using social media
fg-215:FuturGrid Directory Entry
fg-201:ExTENCI Testing, Validation, and Performance
fg-266:Secure medical files sharing
fg-139:Course: Cloud Computing and Storage Class

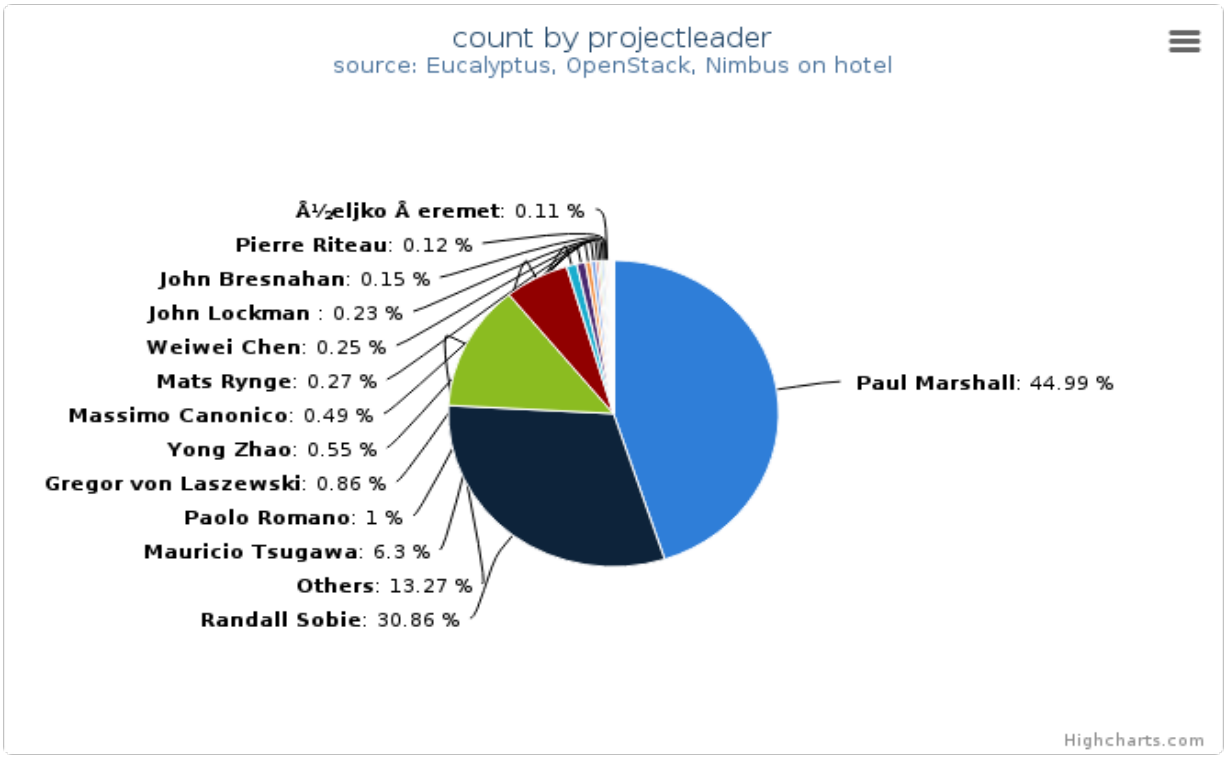

Figure 7: VMs count by project leader

This chart also illustrates the proportion of launched VM instances by project Leader. The same data in tabular form

follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

Table 4.2: VMs count by project leader

Projectleader	Value
Paul Marshall	8532
Randall Sobie	5852
Others	2517
Mauricio Tsugawa	1194
Paolo Romano	190
Gregor von Laszewski	163
Yong Zhao	105
Massimo Canonico	93
Mats Rynge	51
Weiwei Chen	48
John Lockman	43
John Bresnahan	29
Pierre Riteau	22
Željko Šeremet	21
Shiyong Lu	20
Andy Li	16
Mohammed Rangwala	16
Renato Figueiredo	15
Michael Wilde	10
Doug Benjamin	10
Andrea Matsunaga	7
Adrian Muresan	4
Shuyuan Deng	3
Abdelkrim Hadjidj	1
Preston Smith	1

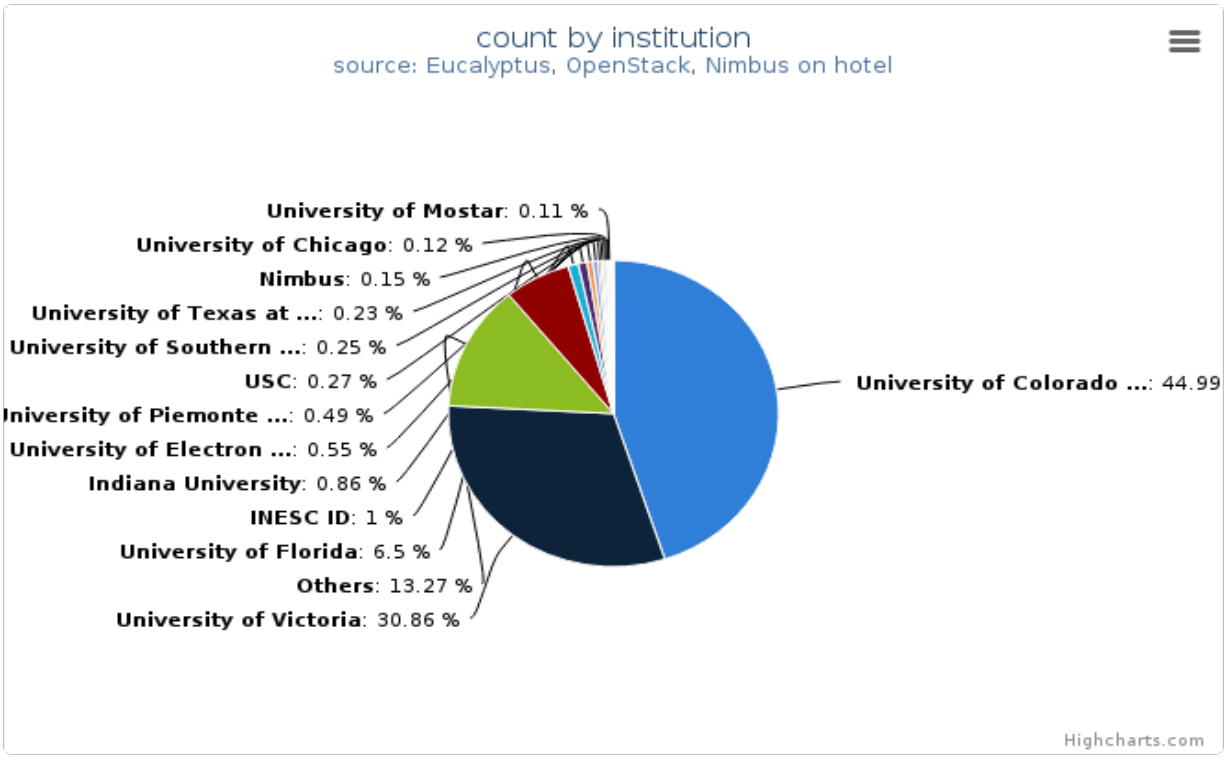

Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

Table 4.3: VMs count by institution

Institution	Value
University of Colorado at Boulder	8532
University of Victoria	5852
Others	2517
University of Florida	1232
INESC ID	190
Indiana University	163
University of Electronic Science and Technology	105
University of Piemonte Orientale	93
USC	51
University of Southern California	48
University of Texas at Austin	43
Nimbus	29
University of Chicago	22
University of Mostar	21
Wayne State University	20
Indiana University Purdue University Indianapolis	16
Argonne National Laboratory	10
Duke University	10
ENS Lyon	4
University of Wisconsin -Milwaukee	3
Purdue University	1
University of Technology of Compiegne	1

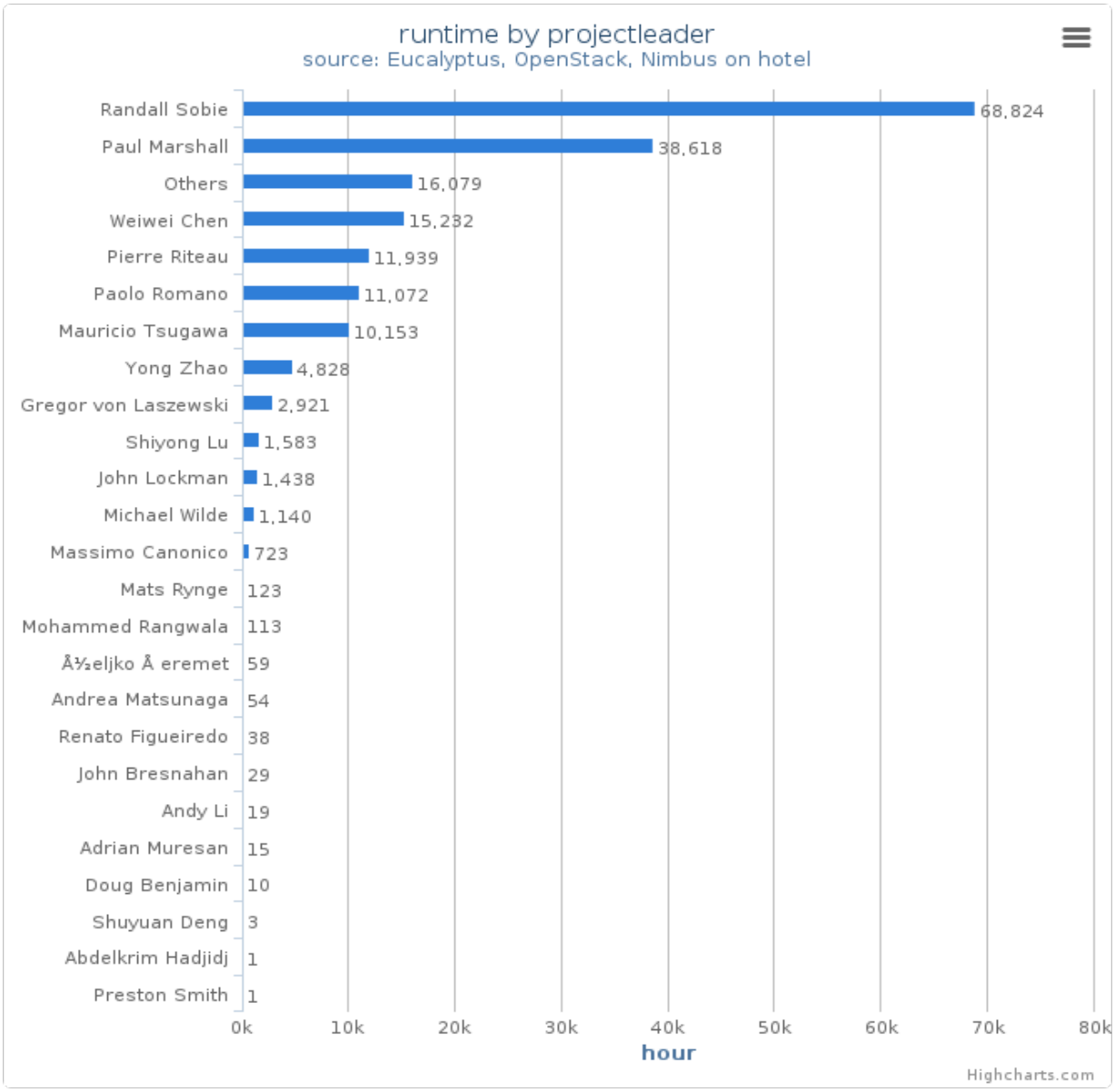

Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

4.3 System information

System information shows utilization distribution as to VMs count and wall time. Each cluster represents a compute node.

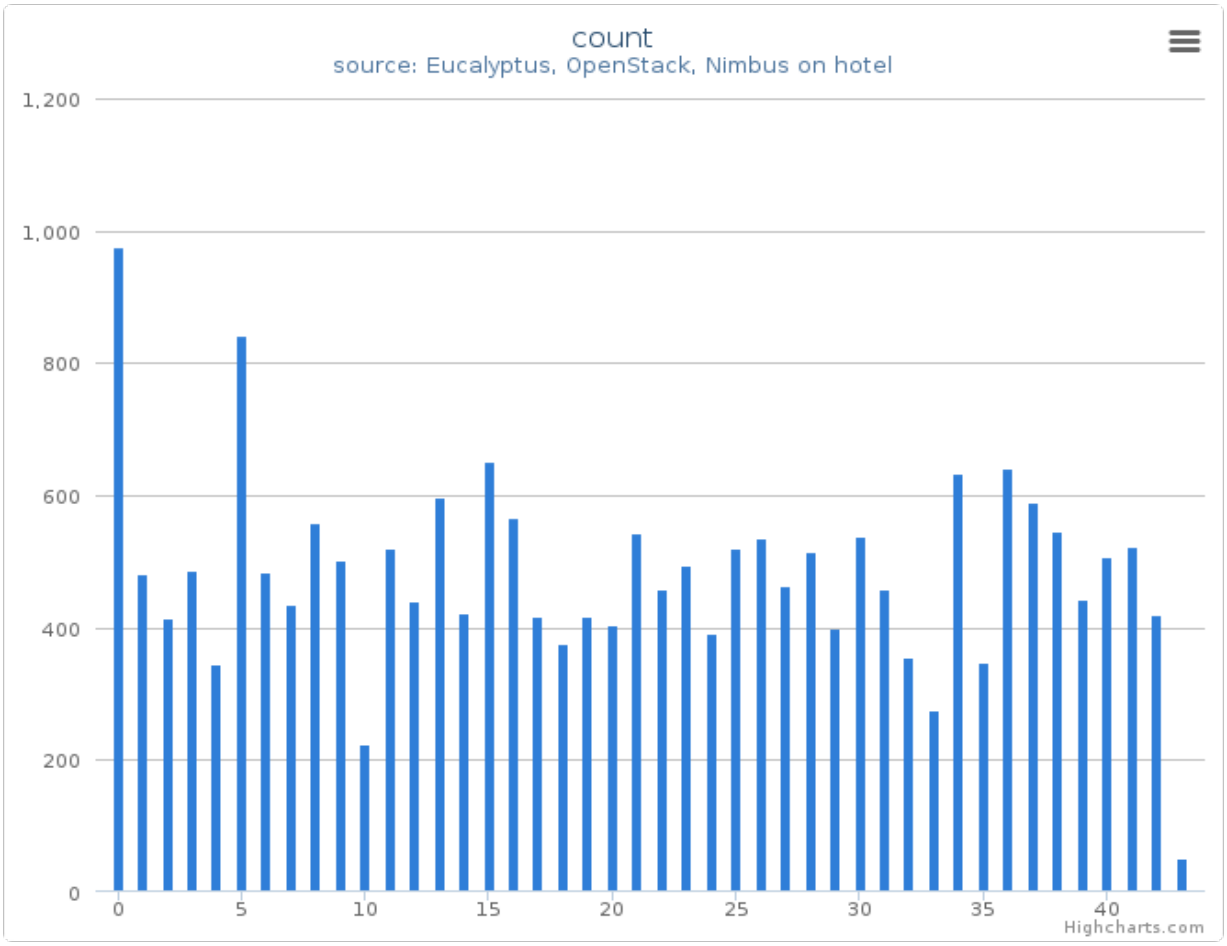

Figure 10: VMs count by systems (compute nodes) in Cluster (hotel)
This column chart represents VMs count among systems.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

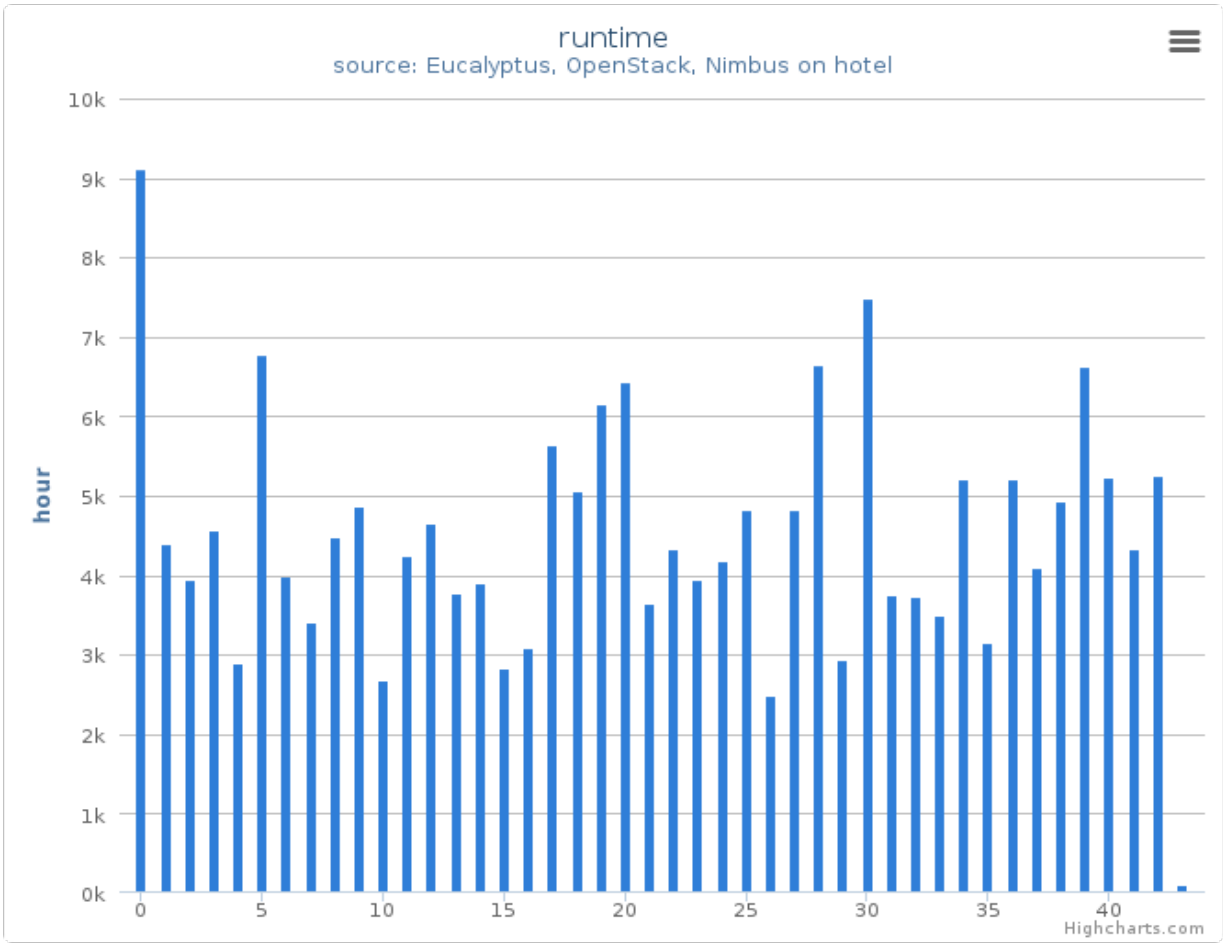

Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (hotel)
This column chart represents wall time among systems.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

CHAPTER

FIVE

USAGE REPORT ALAMO

- Period: January 01 – June 30, 2013
- Hostname: alamo.futuregrid.org
- Services: nimbus
- Metrics: VMs count, Users count, Wall time (hours), Distribution by wall time, project, project leader, and institution, and systems

5.1 Histogram

5.1.1 Summary (Monthly)

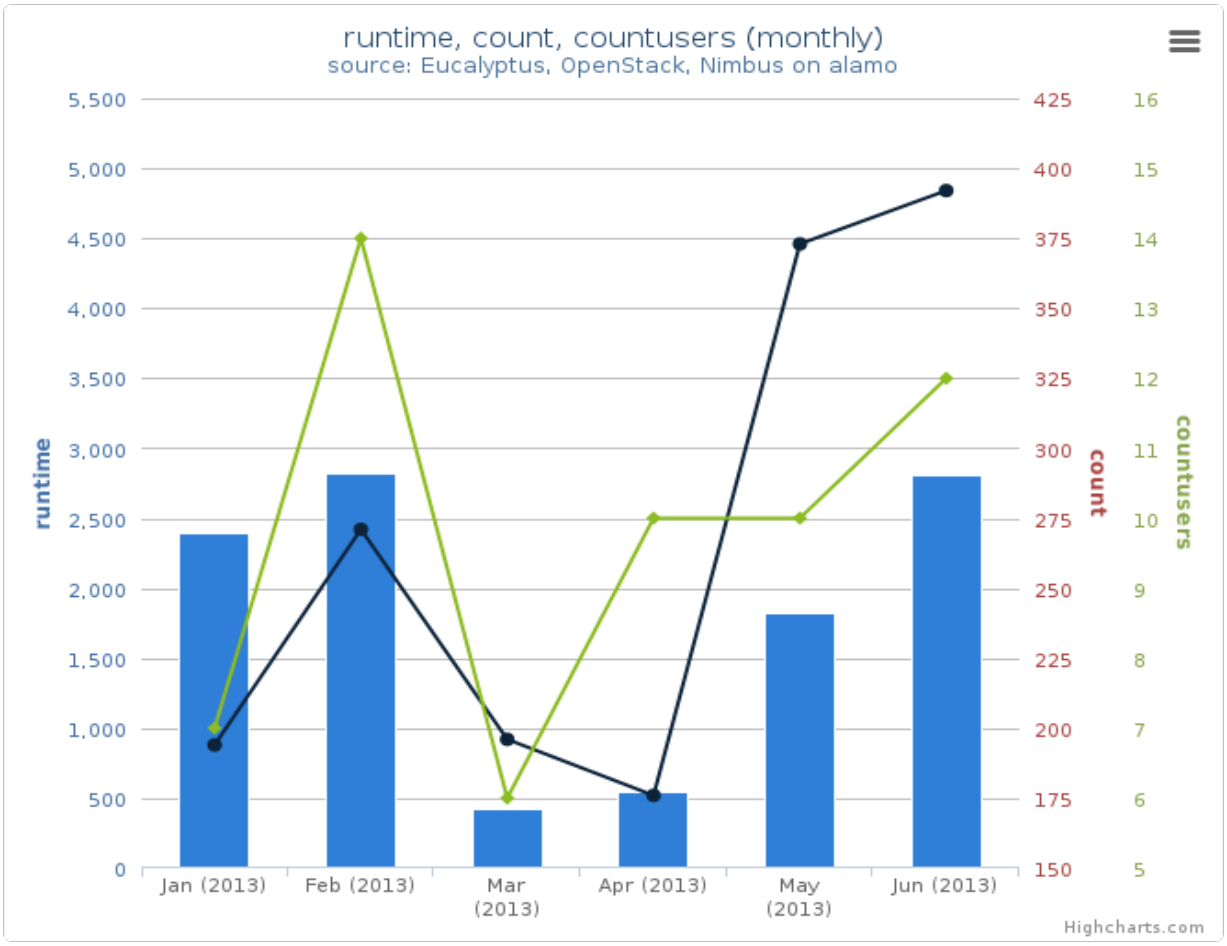

Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: alamo
- **Metric:**
  - Runtime (Wall time hours): Sum of time elapsed from launch to termination of VM instances
  - Count (VM count): The number of launched VM instances
  - User count (Active): The number of users who launched VMs

5.1.2 Summary (Daily)

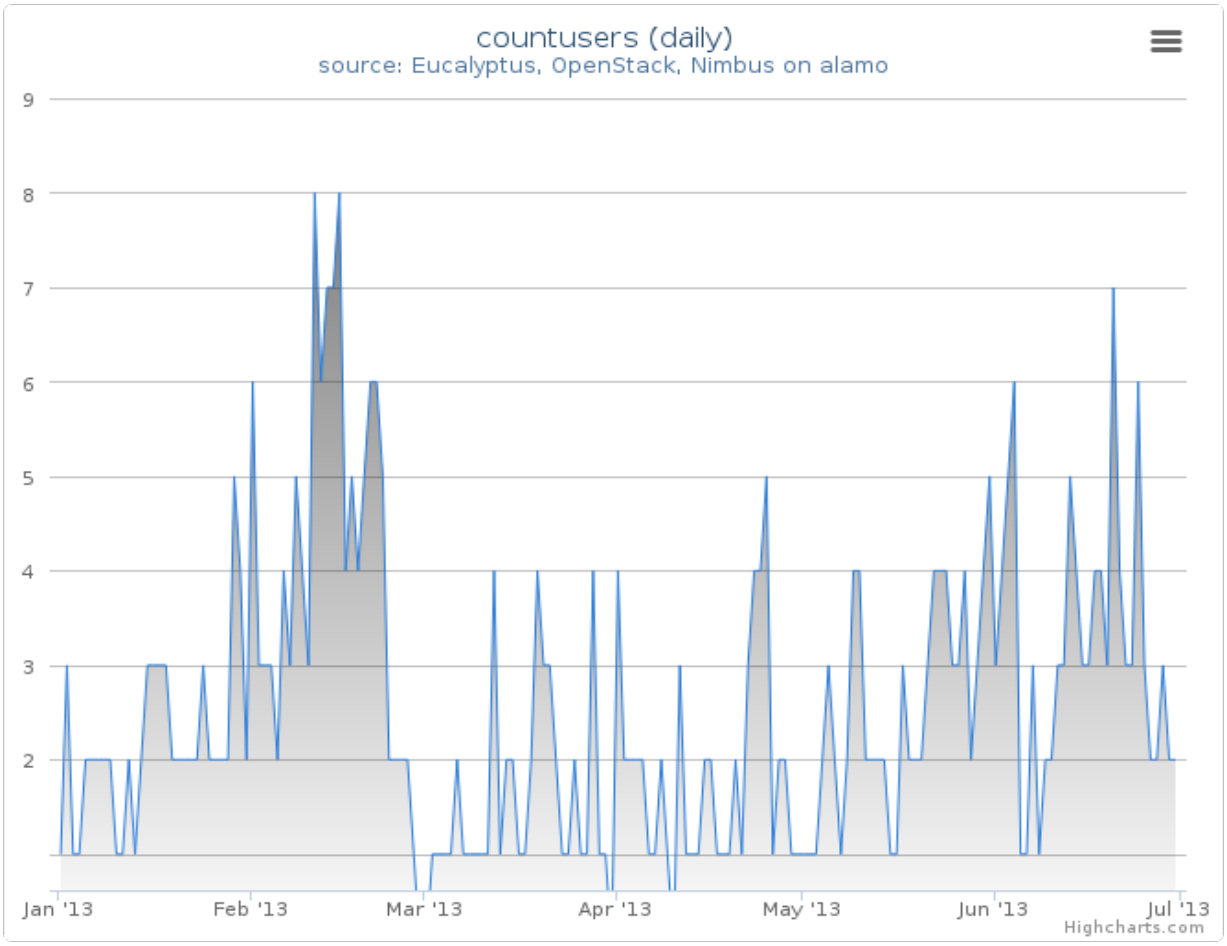

Figure 2: Users count

This time series chart represents daily active user count for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: alamo

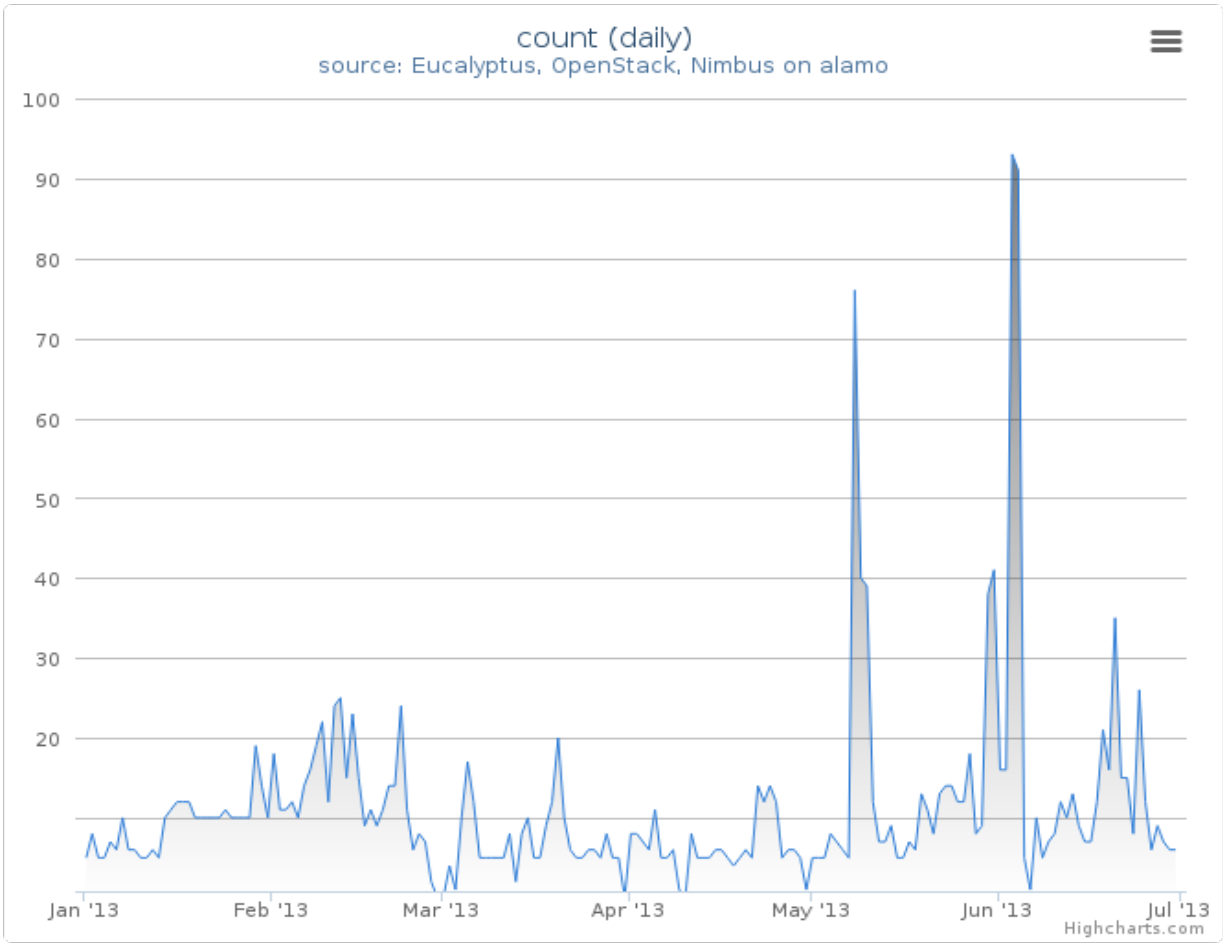

Figure 3: VMs count

This time series chart represents the number of daily launched VM instances for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: alamo

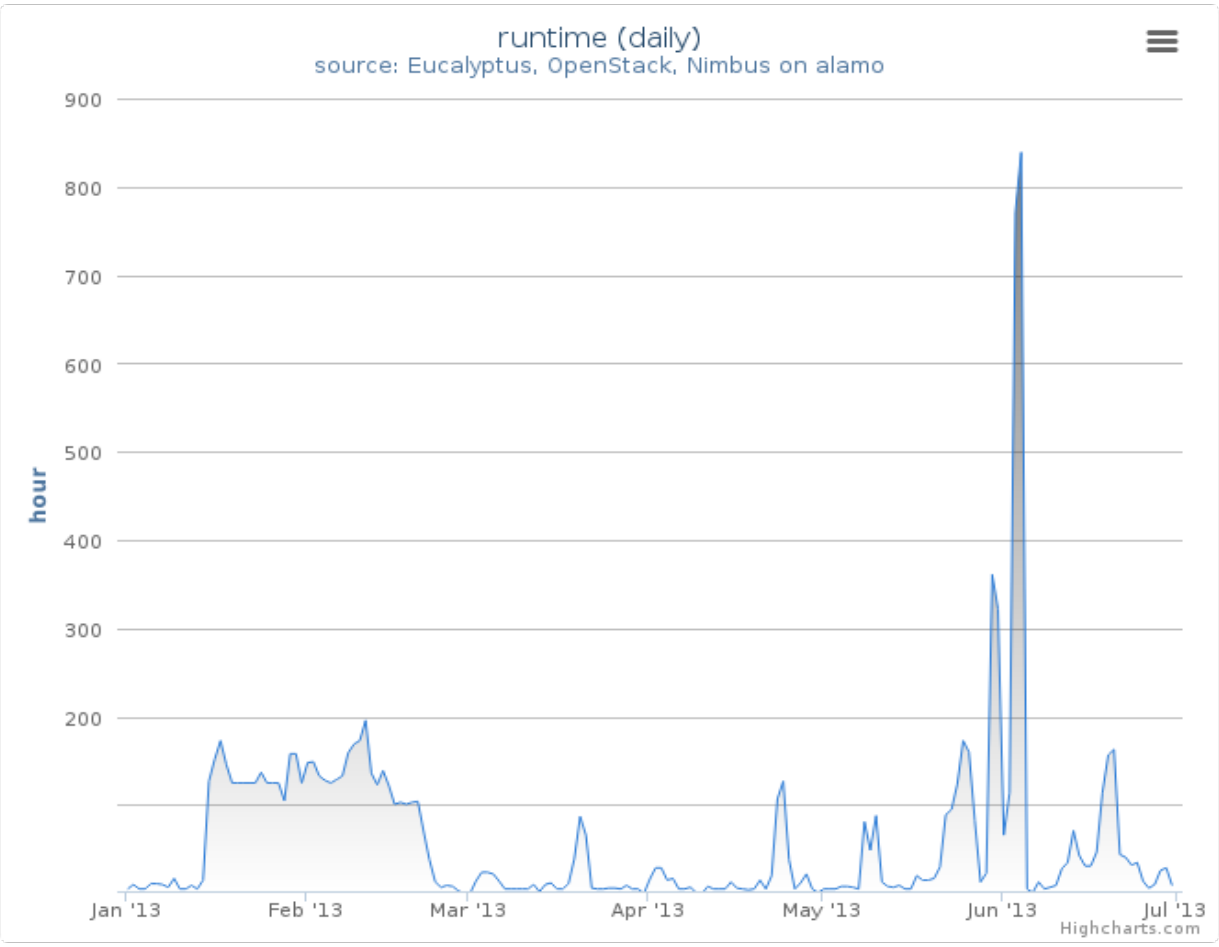

Figure 4: Wall time (hours)
This time series chart represents daily wall time (hours) for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: alamo

5.2 Distribution

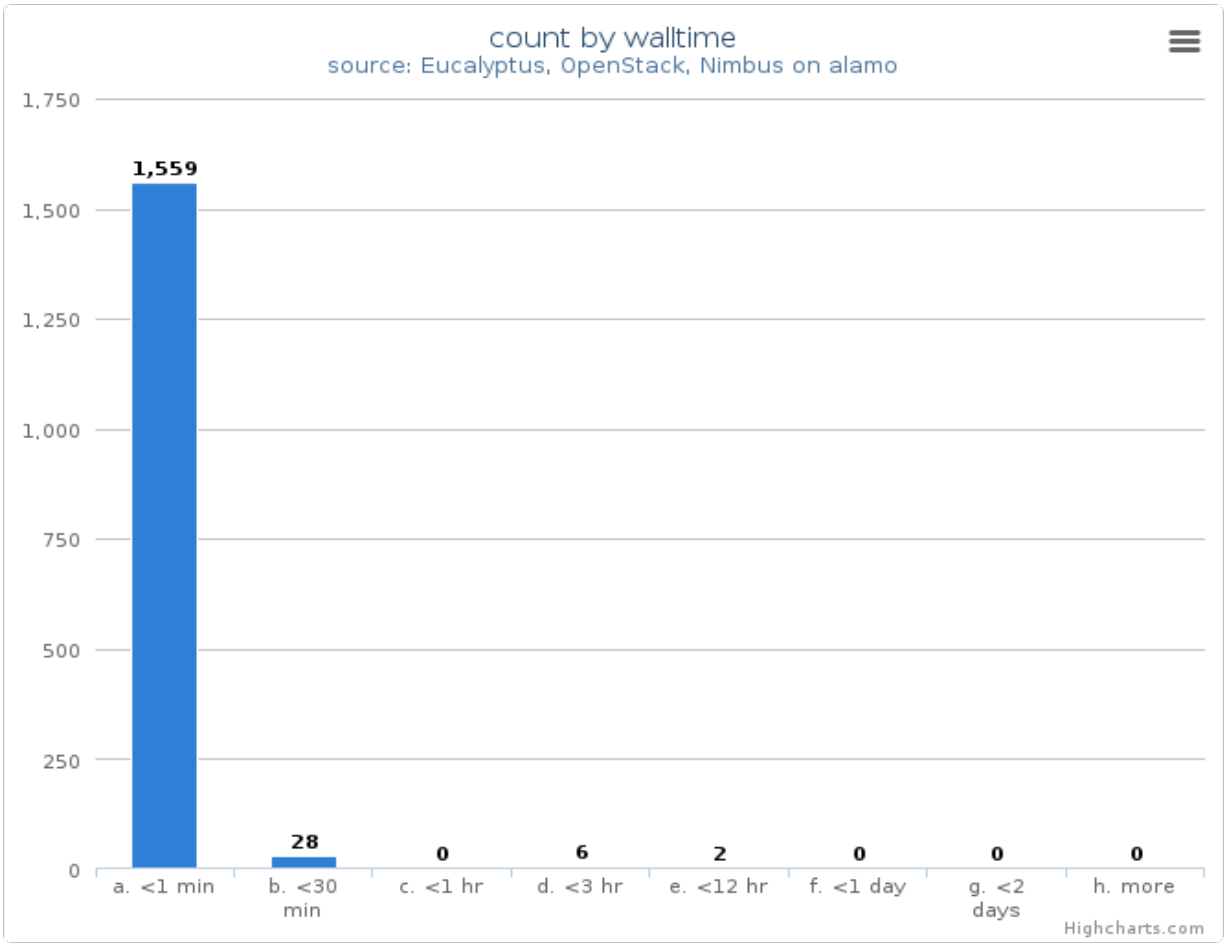

Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: alamo

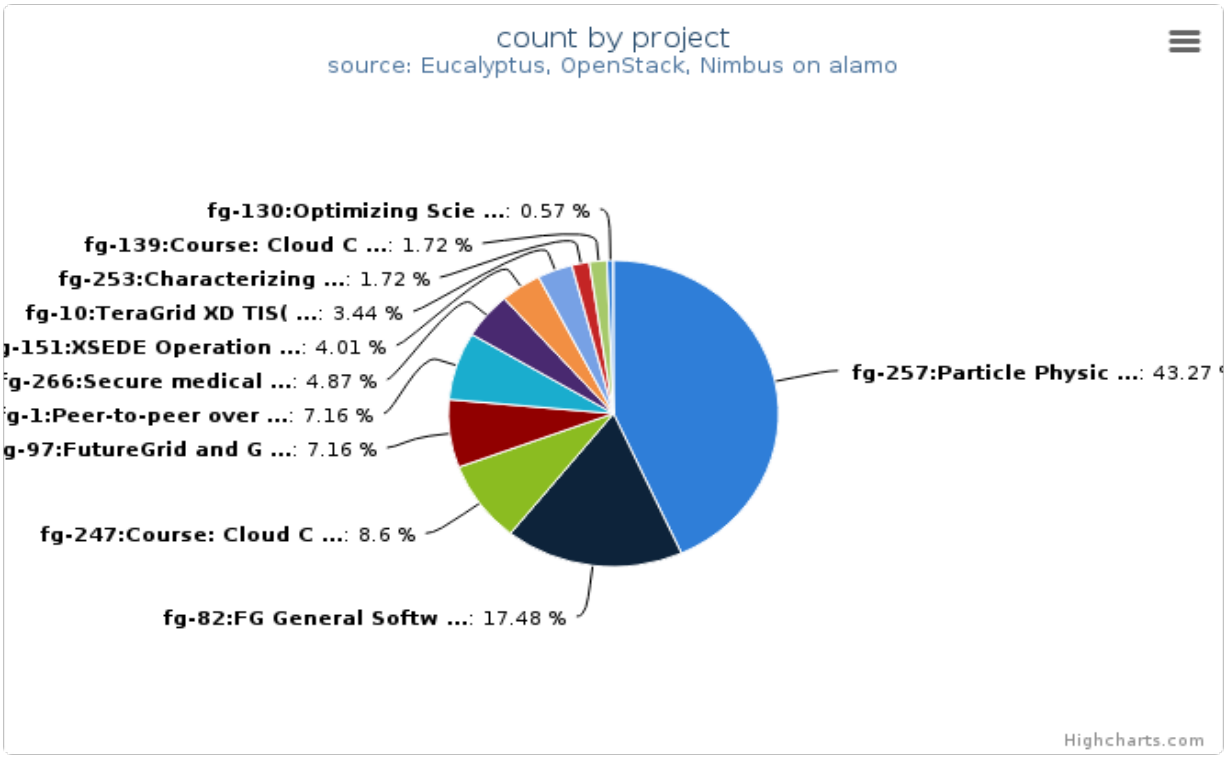

Figure 6: VMs count by project
This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: alamo

Table 5.1: VMs count by project

Project	Value
fg-257:Particle Physics Data analysis cluster for ATLAS LHC experiment	151
fg-82:FG General Software Development	61
fg-247:Course: Cloud Computing and Storage Class	30
fg-97:FutureGrid and Grid‘5000 Collaboration	25
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	25
fg-266:Secure medical files sharing	17
fg-151:XSEDE Operations Group	14
fg-10:TeraGrid XD TIS(Technology Insertion Service) Technology Evaluation Laboratory	12
fg-253:Characterizing Performance of Infrastructure Clouds	6
fg-139:Course: Cloud Computing and Storage Class	6
fg-130:Optimizing Scientific Workflows on Clouds	2

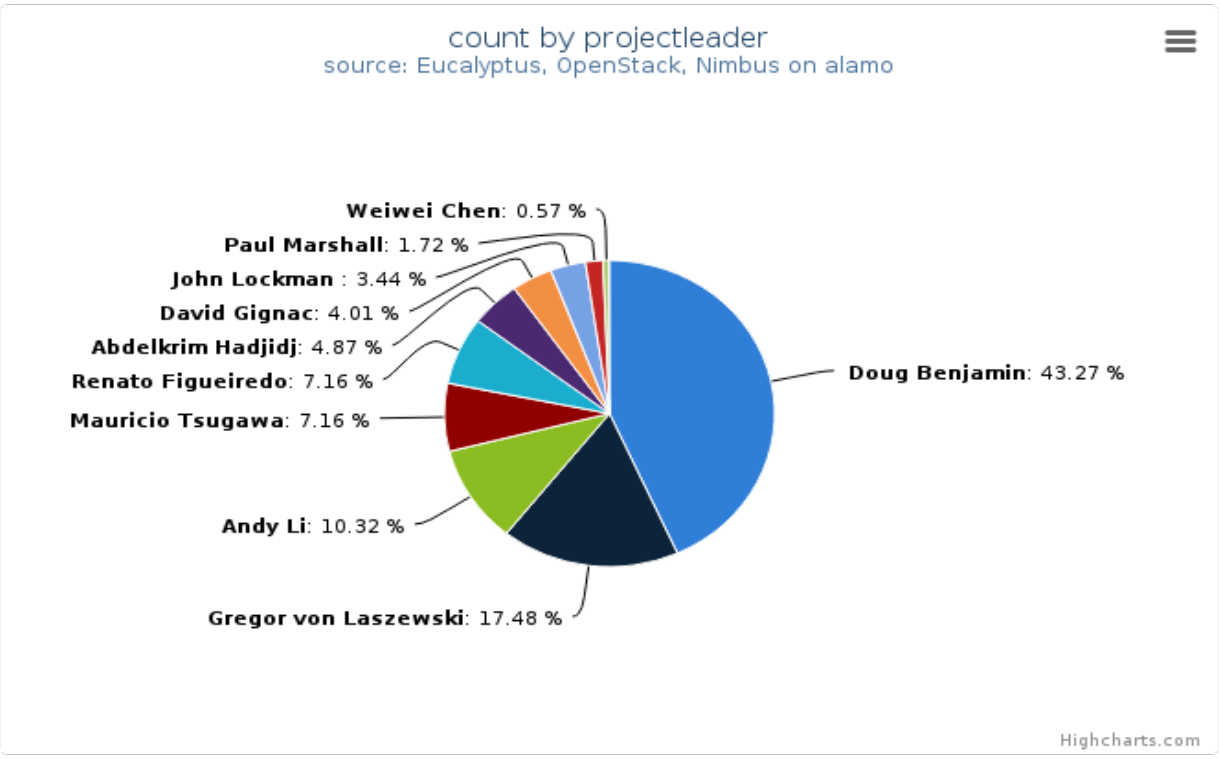

Figure 7: VMs count by project leader

This chart also illustrates the proportion of launched VM instances by project Leader. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: alamo

Table 5.2: VMs count by project leader

Projectleader	Value
Doug Benjamin	151
Gregor von Laszewski	61
Andy Li	36
Mauricio Tsugawa	25
Renato Figueiredo	25
Abdelkrim Hadjidj	17
David Gignac	14
John Lockman	12
Paul Marshall	6
Weiwei Chen	2

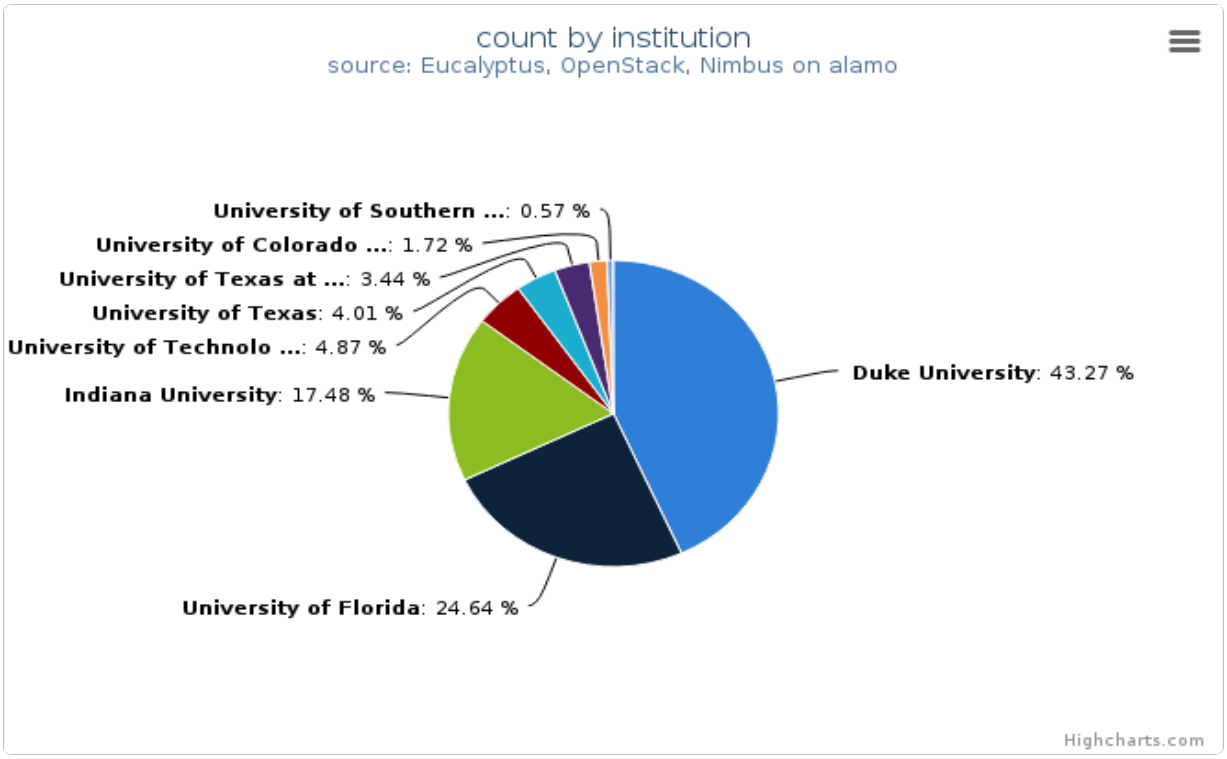

Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: alamo

Table 5.3: VMs count by institution

Institution	Value
Duke University	151
University of Florida	86
Indiana University	61
University of Technology of Compiegne	17
University of Texas	14
University of Texas at Austin	12
University of Colorado at Boulder	6
University of Southern California	2

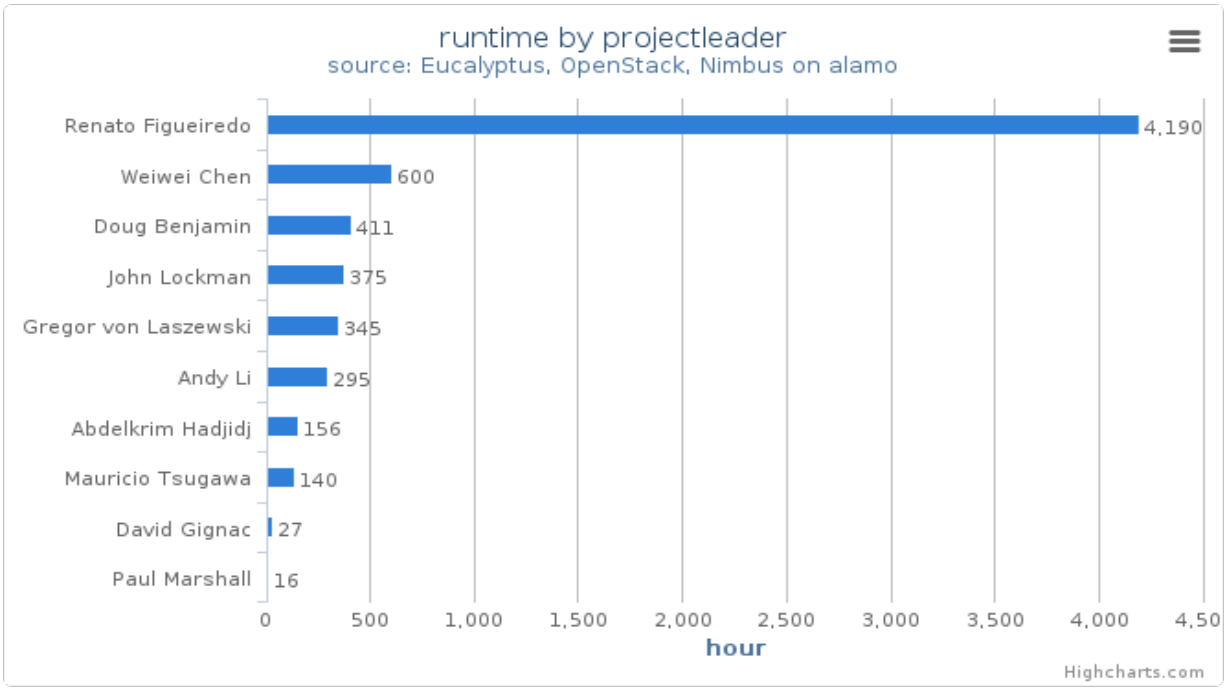

Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: alamo

5.3 System information

System information shows utilization distribution as to VMs count and wall time. Each cluster represents a compute node.

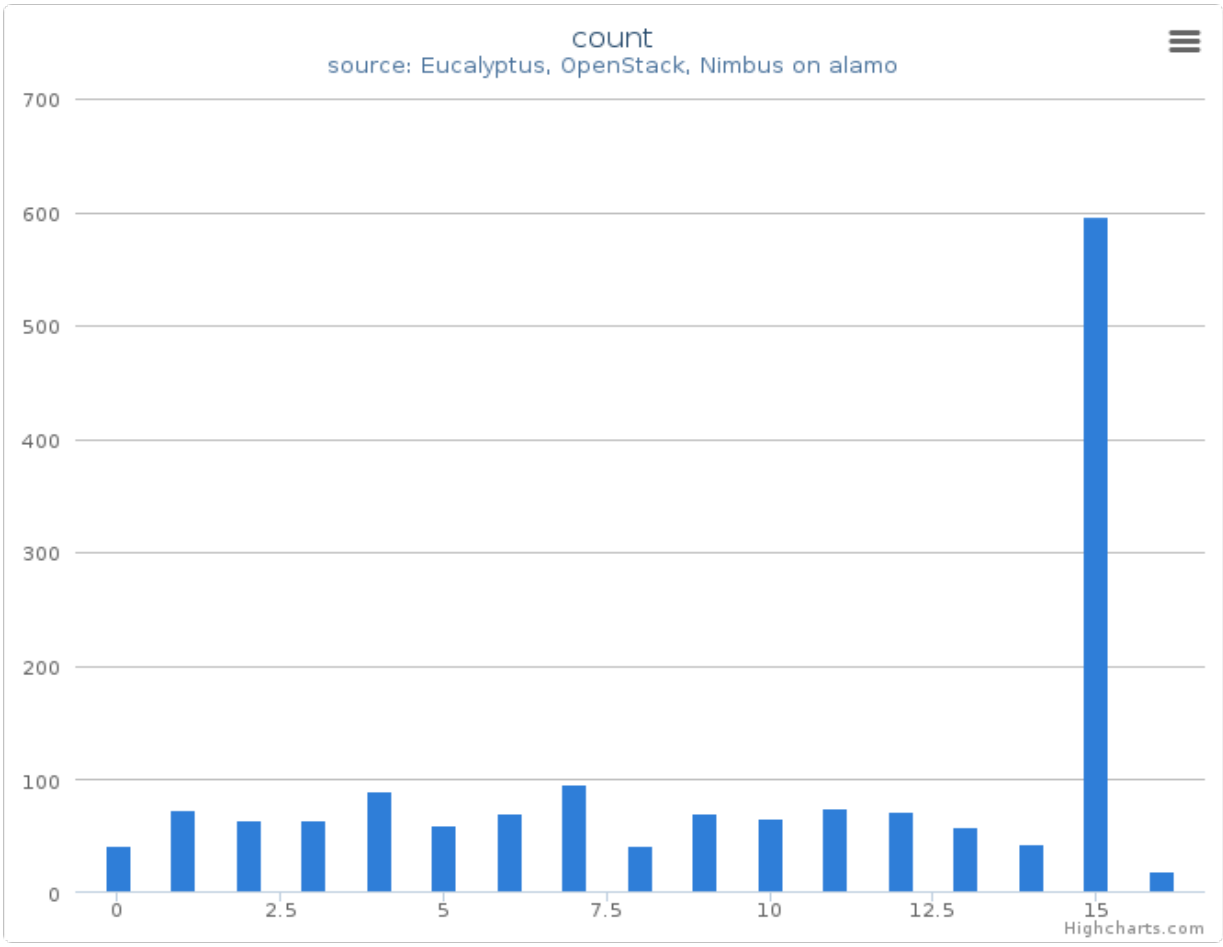

Figure 10: VMs count by systems (compute nodes) in Cluster (alamo)
This column chart represents VMs count among systems.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: alamo

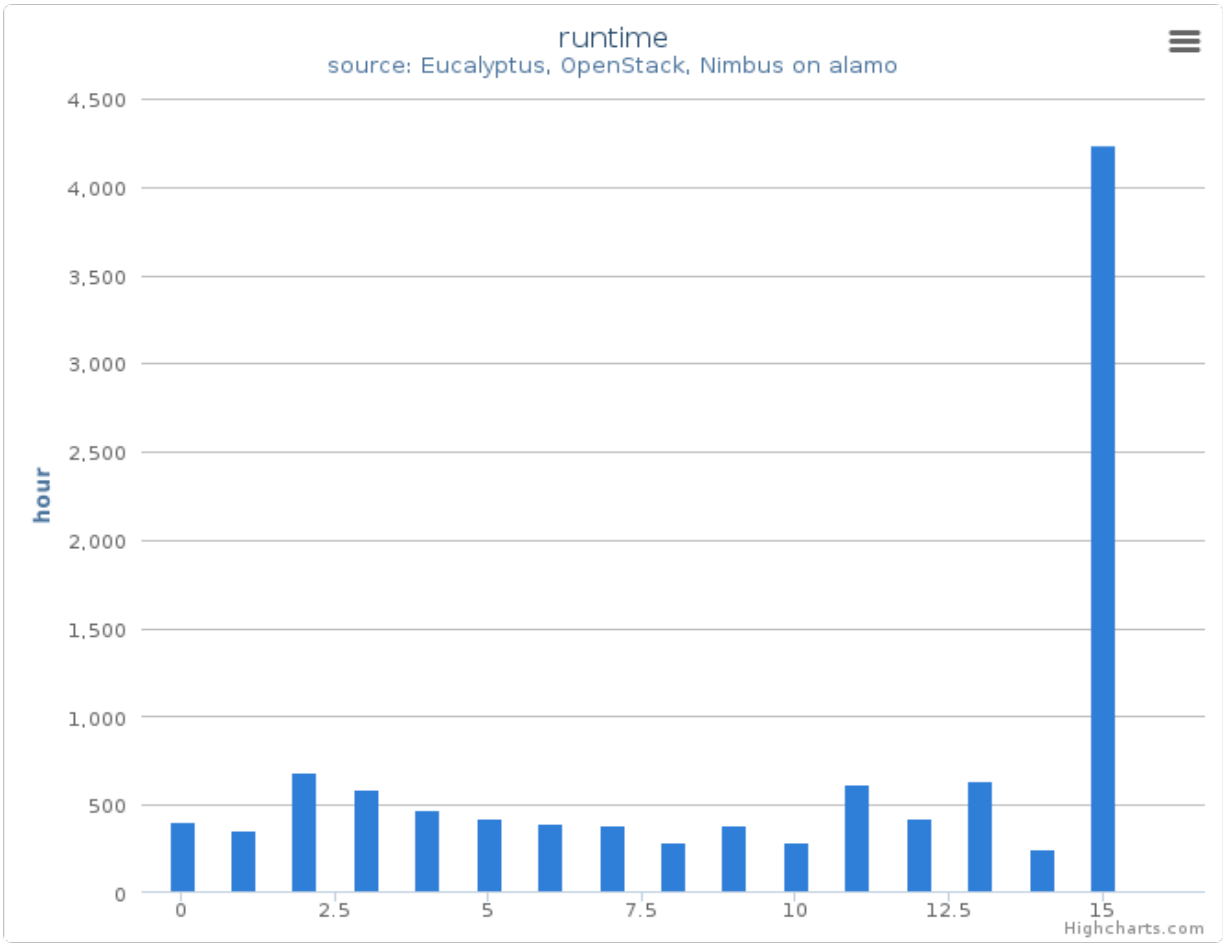

Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (alamo)
This column chart represents wall time among systems.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: alamo

CHAPTER

SIX

USAGE REPORT FOXTROT

- Period: January 01 – June 30, 2013
- Hostname: foxtrot.futuregrid.org
- Services: nimbus
- Metrics: VMs count, Users count, Wall time (hours), Distribution by wall time, project, project leader, and institution, and systems

6.1 Histogram

6.1.1 Summary (Monthly)

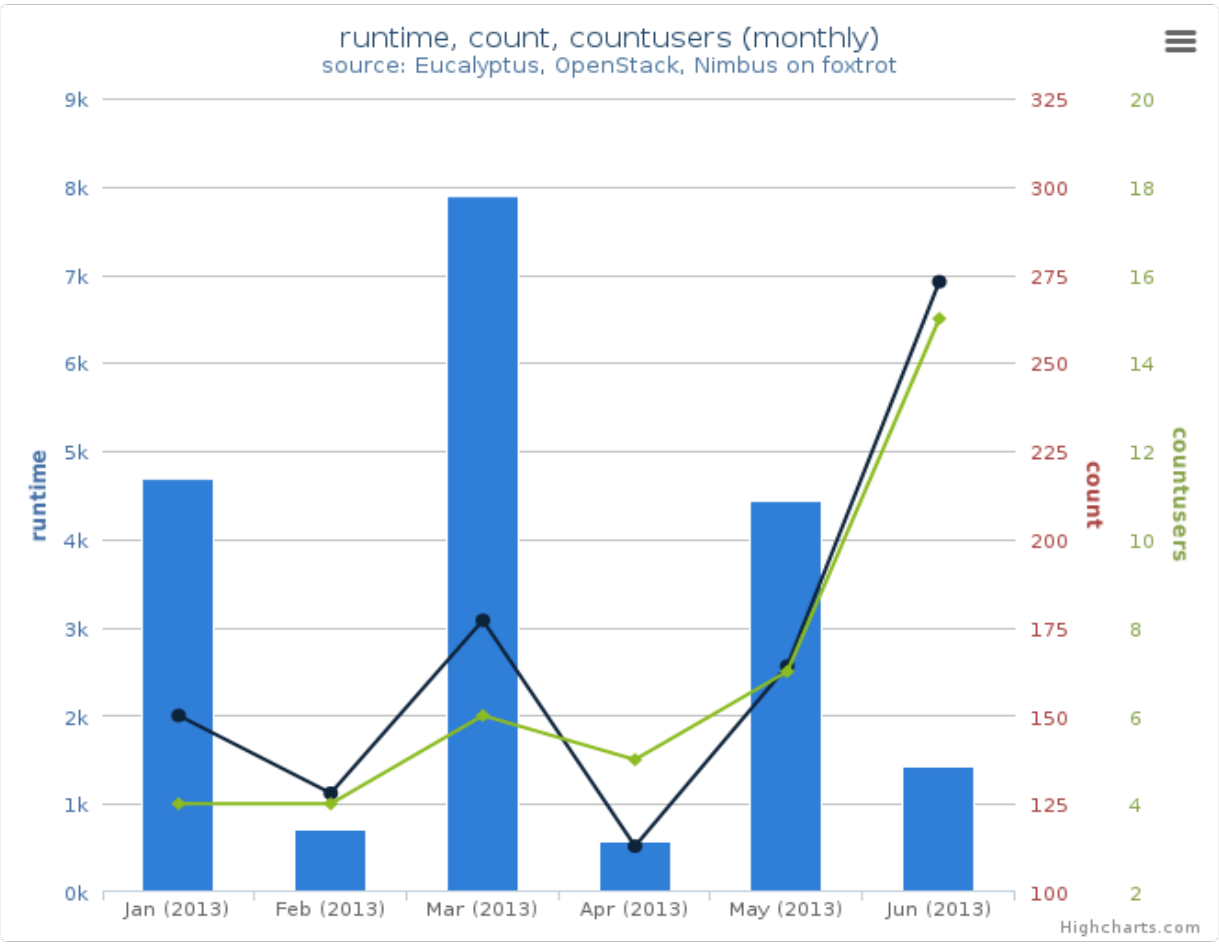

Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot
- **Metric:**
  - Runtime (Wall time hours): Sum of time elapsed from launch to termination of VM instances
  - Count (VM count): The number of launched VM instances
  - User count (Active): The number of users who launched VMs

6.1.2 Summary (Daily)

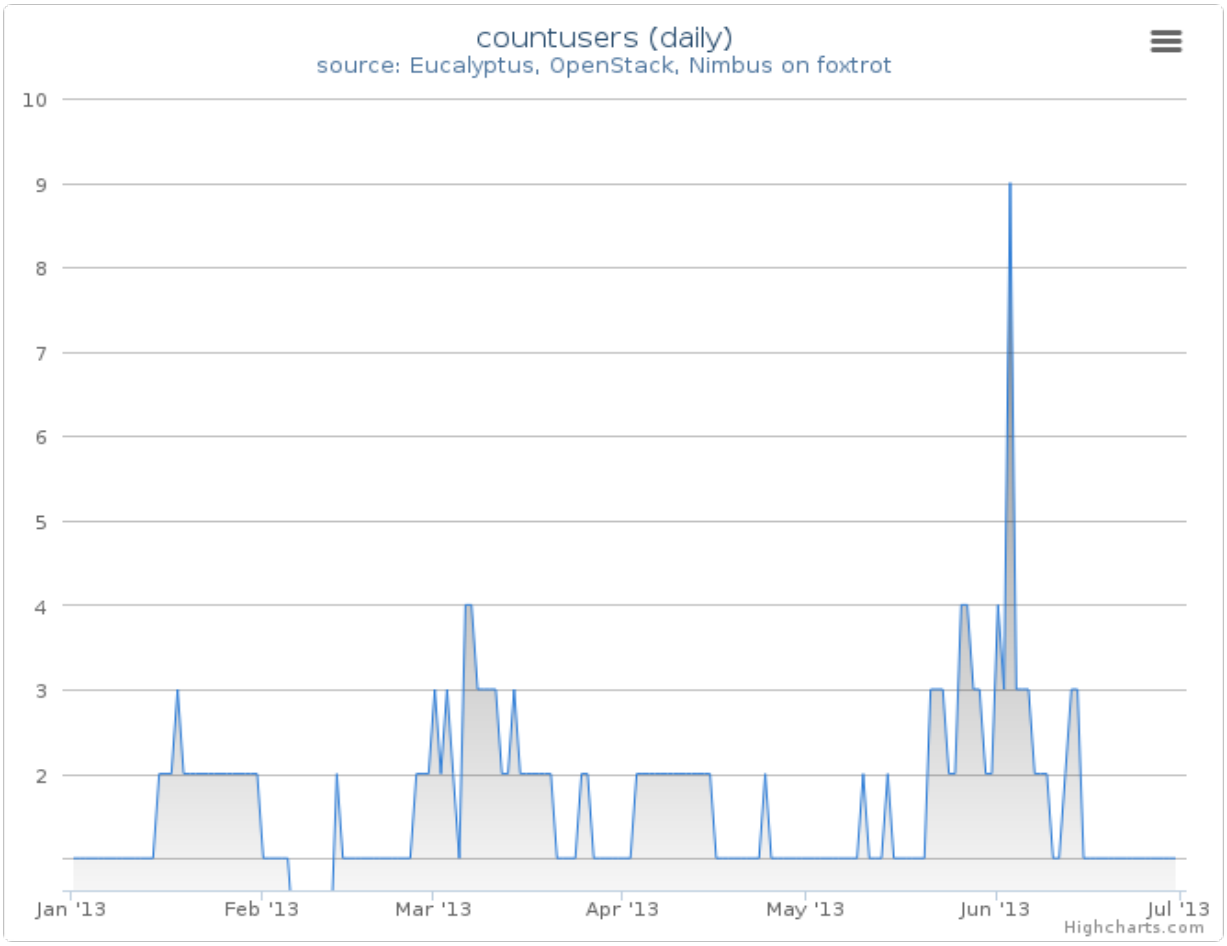

Figure 2: Users count

This time series chart represents daily active user count for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

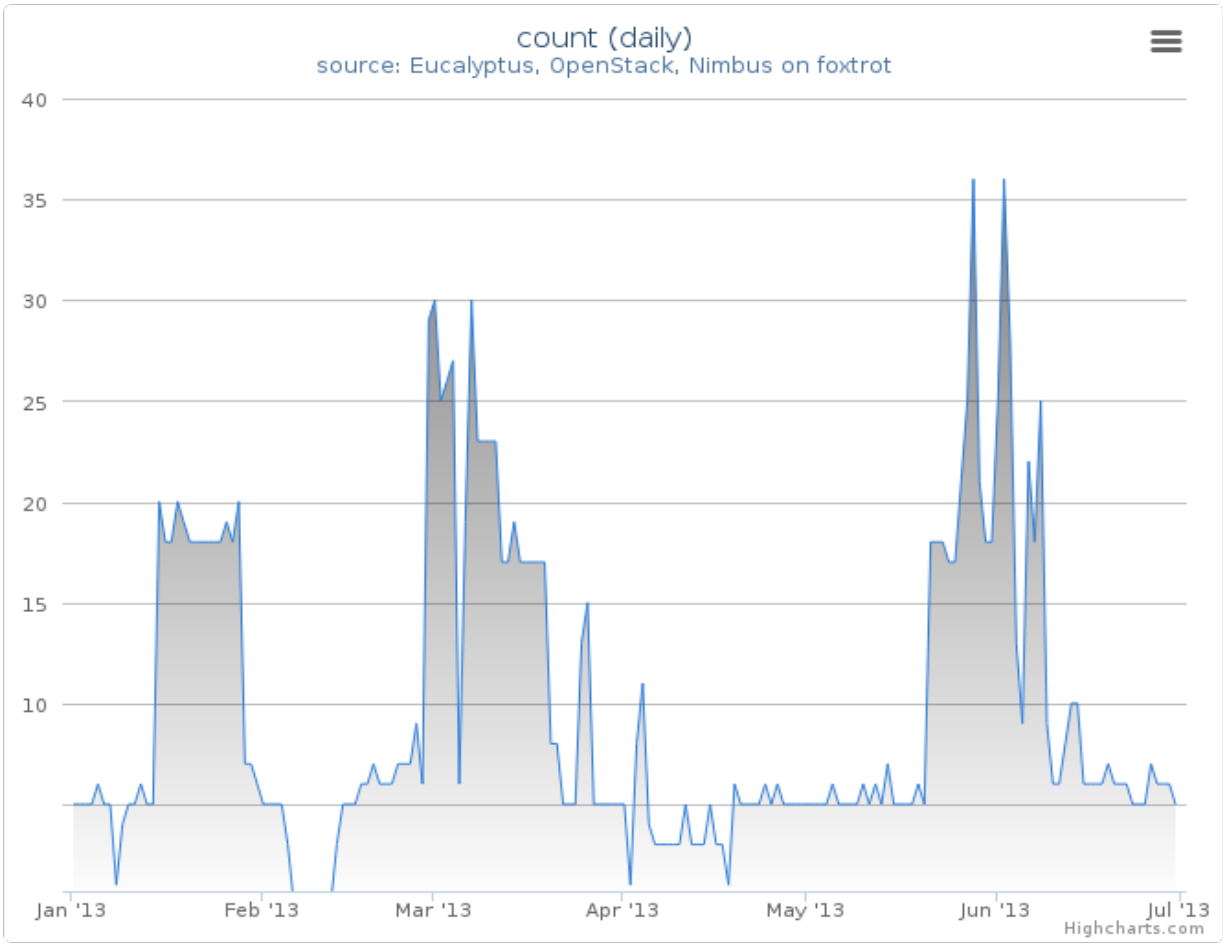

Figure 3: VMs count

This time series chart represents the number of daily launched VM instances for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

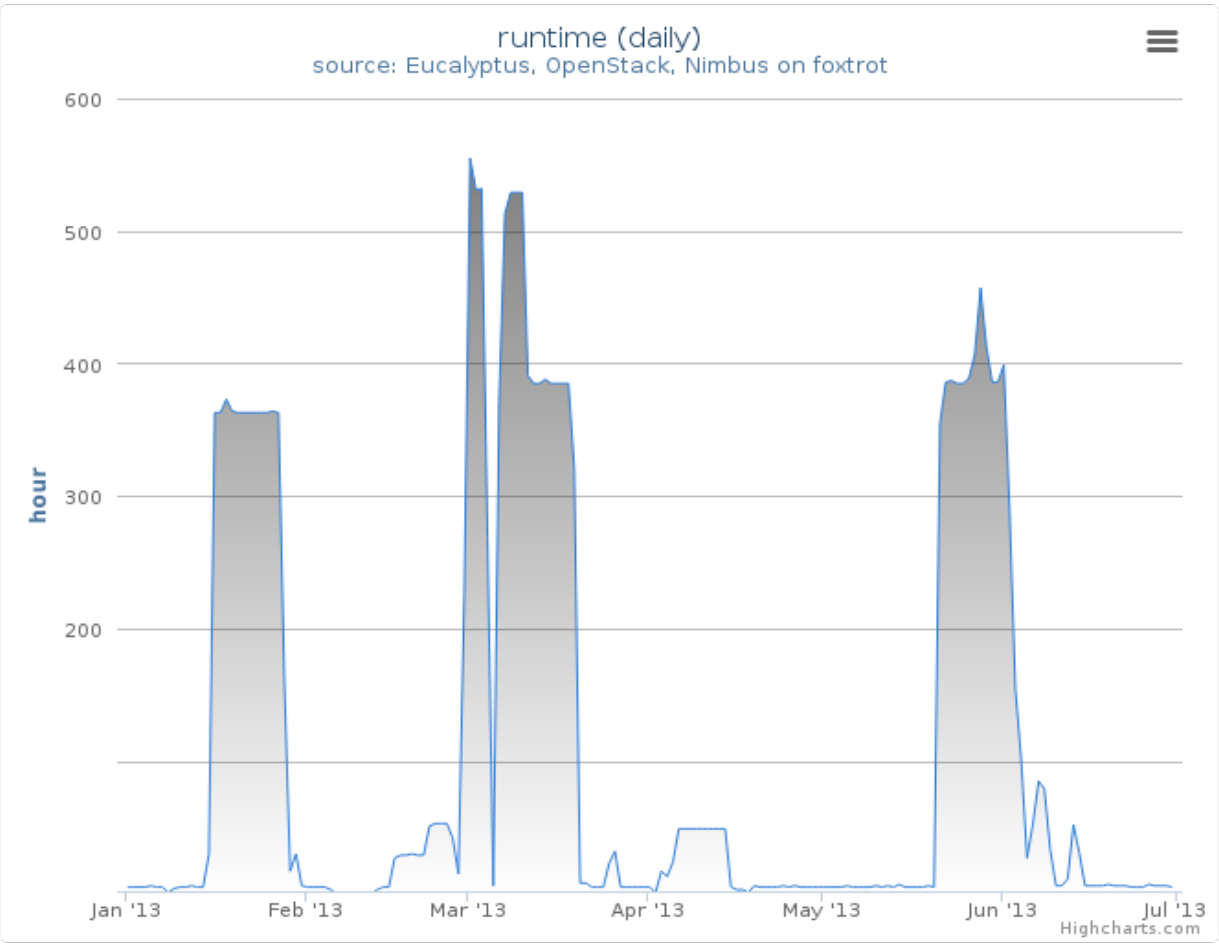

Figure 4: Wall time (hours)
This time series chart represents daily wall time (hours) for cloud services and shows historical changes during the period.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

6.2 Distribution

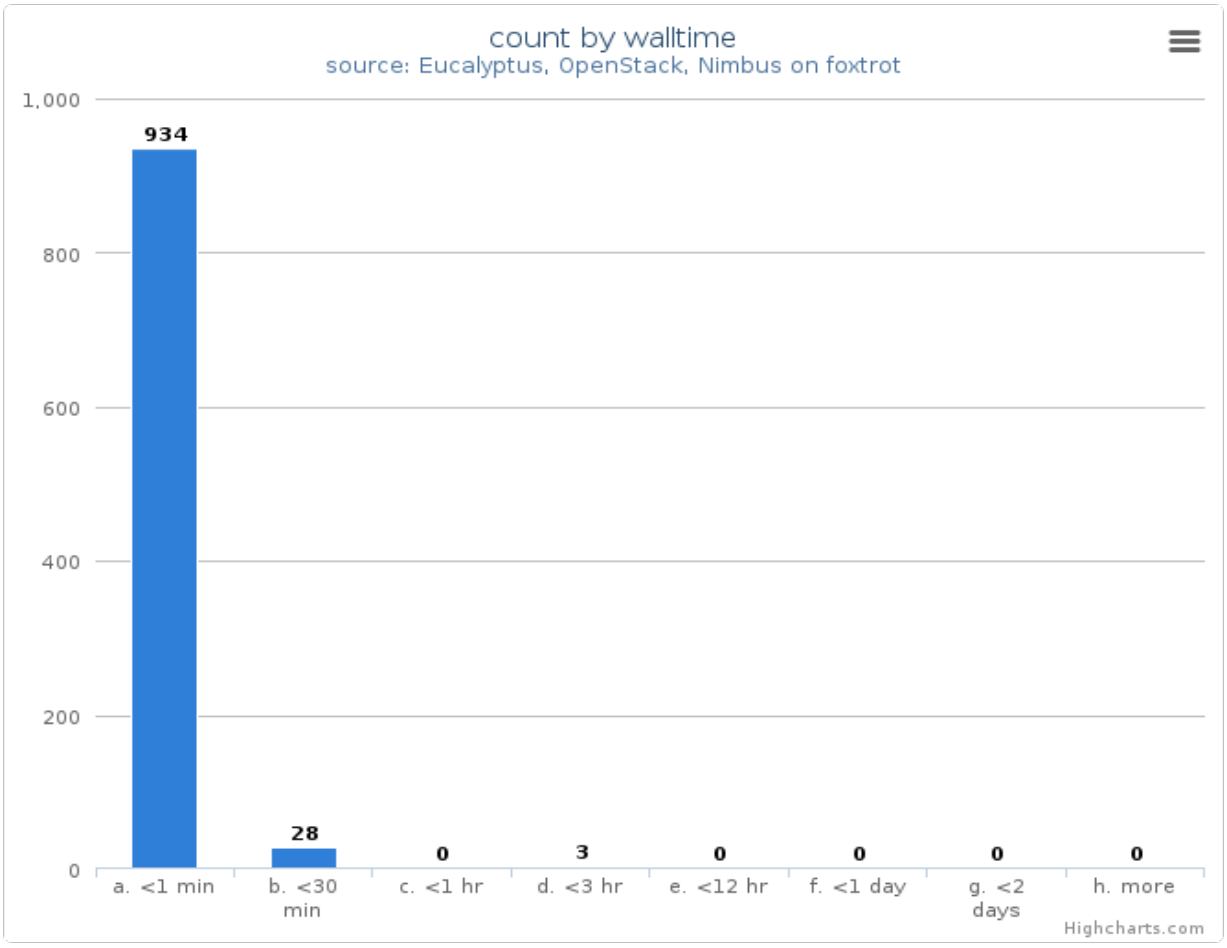

Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

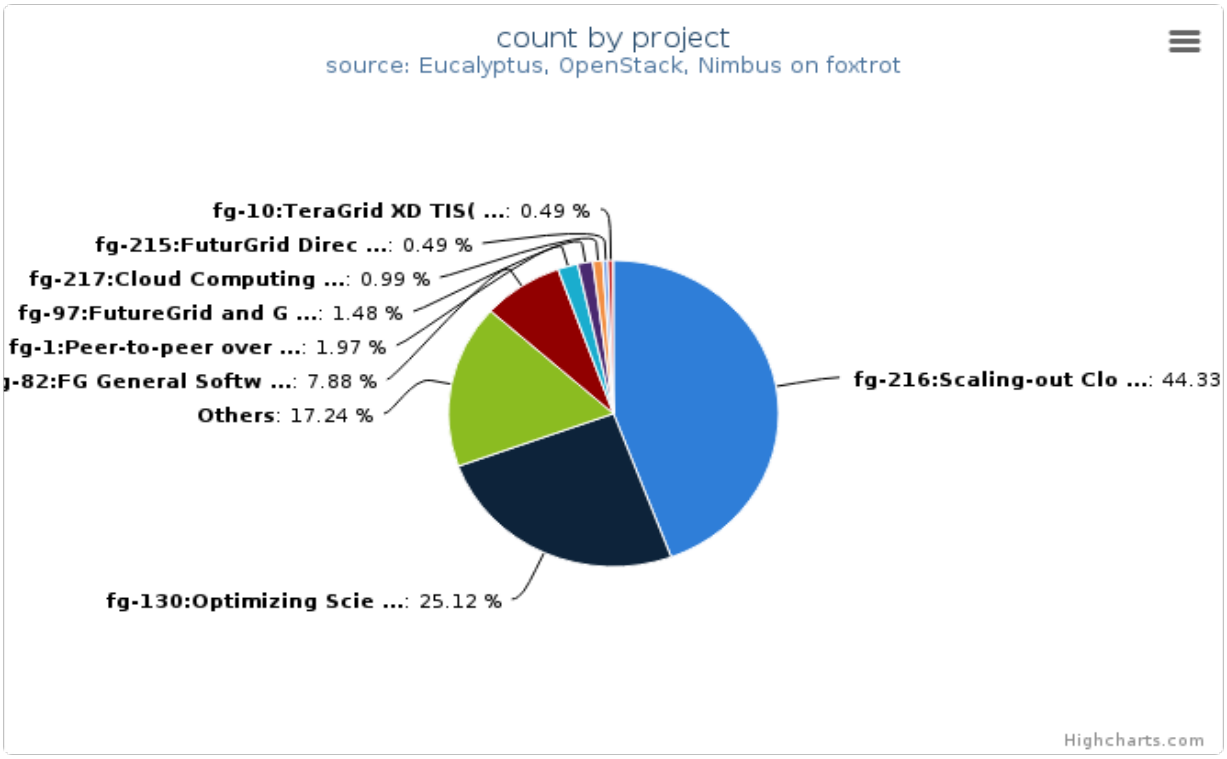

Figure 6: VMs count by project

This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

Table 6.1: VMs count by project

Project	Value
fg-216:Scaling-out CloudBLAST: Deploying Elastic MapReduce across Geographically Distributed Virtulized Resources for BLAST	90
fg-130:Optimizing Scientific Workflows on Clouds	51
Others	35
fg-82:FG General Software Development	16
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	4
fg-97:FutureGrid and Grid‘5000 Collaboration	3
fg-217:Cloud Computing In Education	2
fg-215:FuturGrid Directory Entry	1
fg-10:TeraGrid XD TIS(Technology Insertion Service) Technology Evaluation Laboratory	1

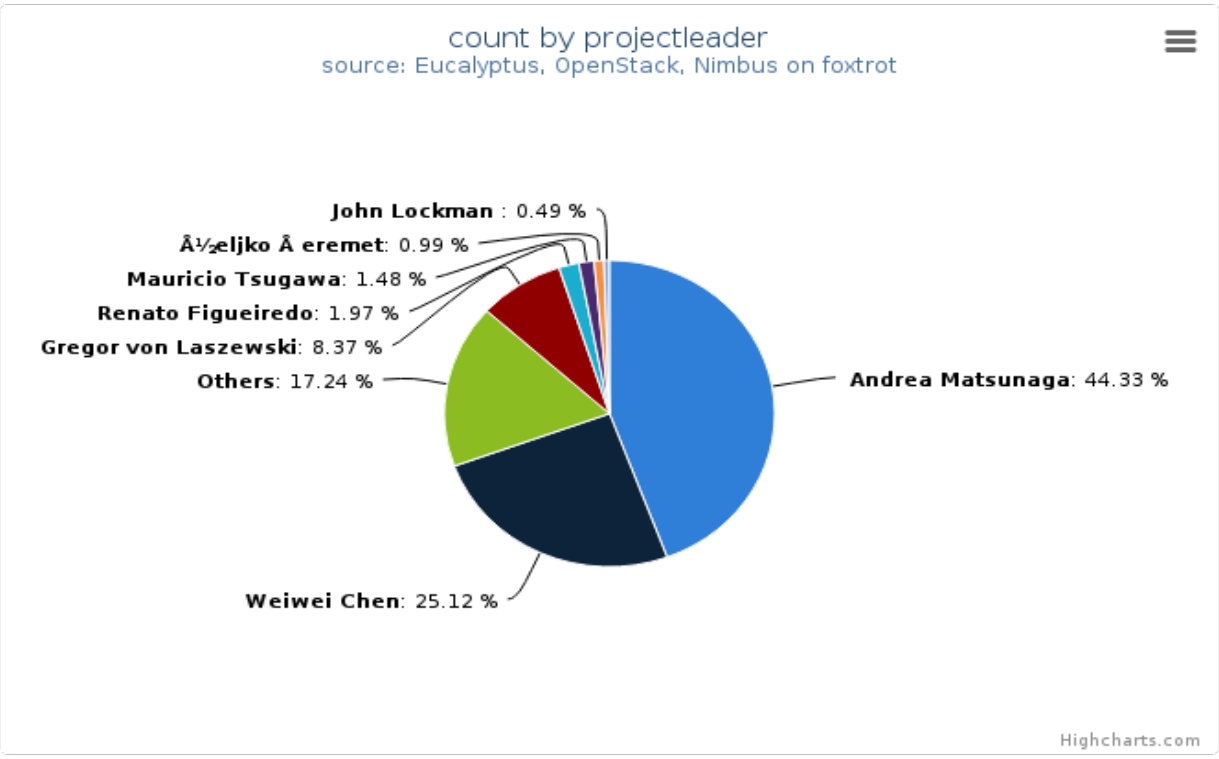

Figure 7: VMs count by project leader

This chart also illustrates the proportion of launched VM instances by project Leader. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

Table 6.2: VMs count by project leader

Projectleader	Value
Andrea Matsunaga	90
Weiwei Chen	51
Others	35
Gregor von Laszewski	17
Renato Figueiredo	4
Mauricio Tsugawa	3
Željko Šeremet	2
John Lockman	1

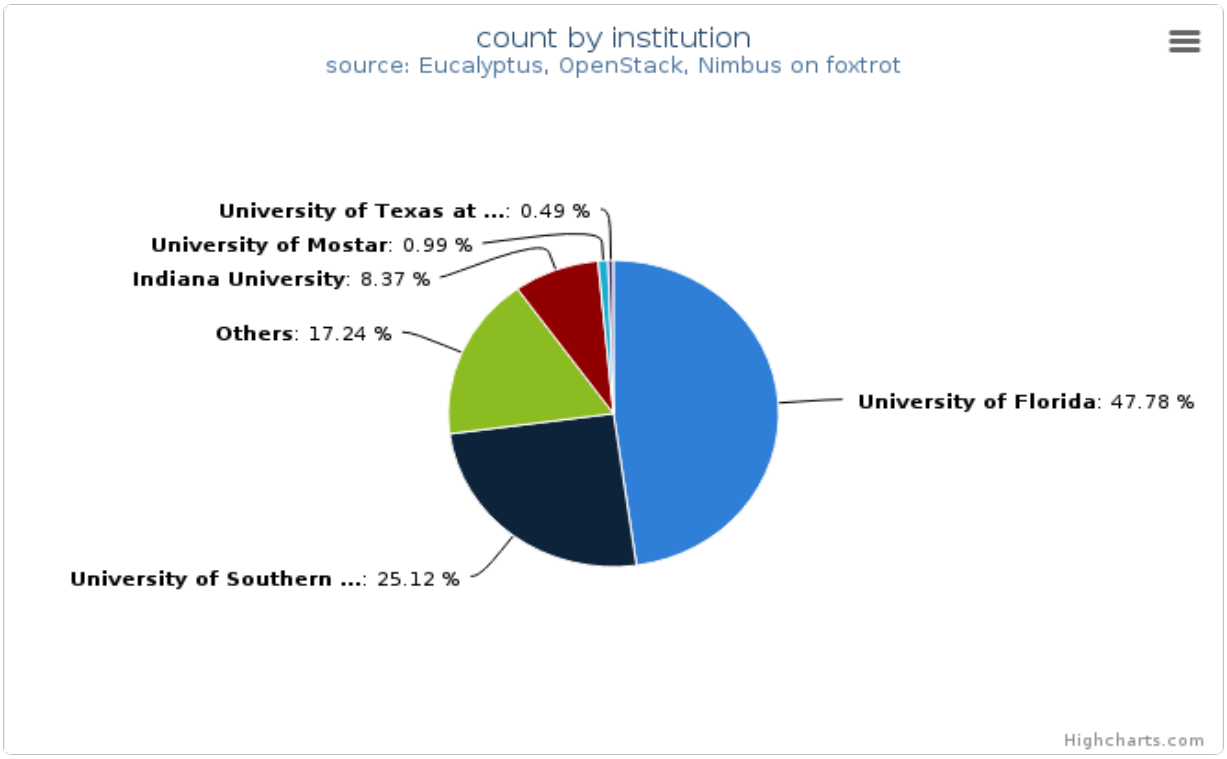

Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

Table 6.3: VMs count by institution

Institution	Value
University of Florida	97
University of Southern California	51
Others	35
Indiana University	17
University of Mostar	2
University of Texas at Austin	1

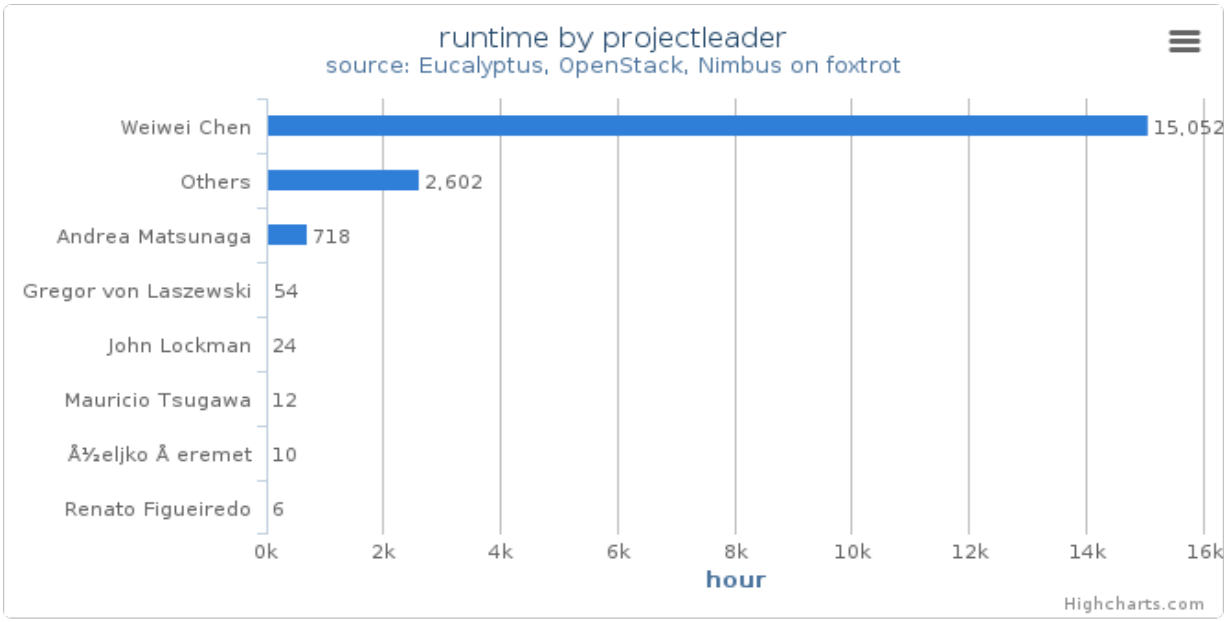

Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

6.3 System information

System information shows utilization distribution as to VMs count and wall time. Each cluster represents a compute node.

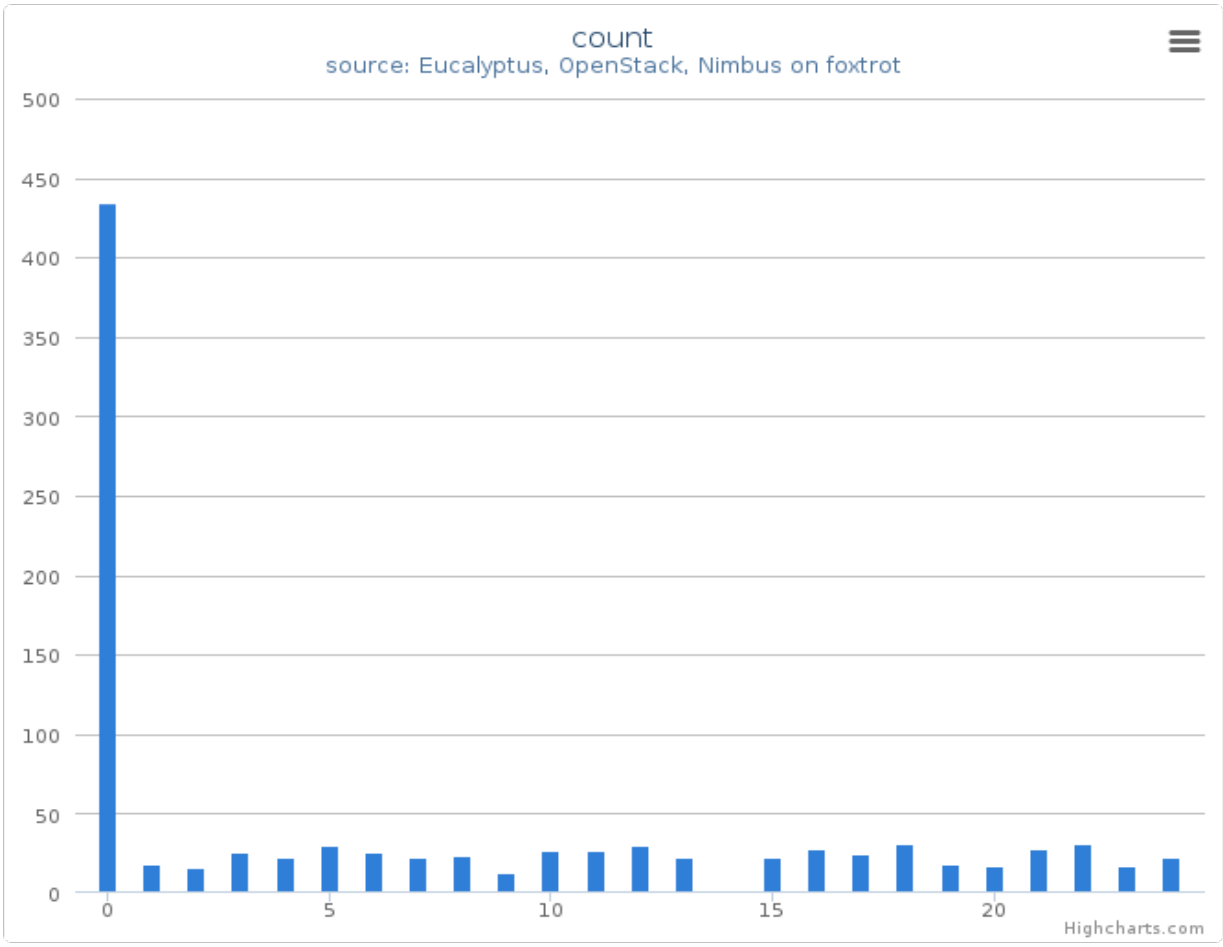

Figure 10: VMs count by systems (compute nodes) in Cluster (foxtrot)
This column chart represents VMs count among systems.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

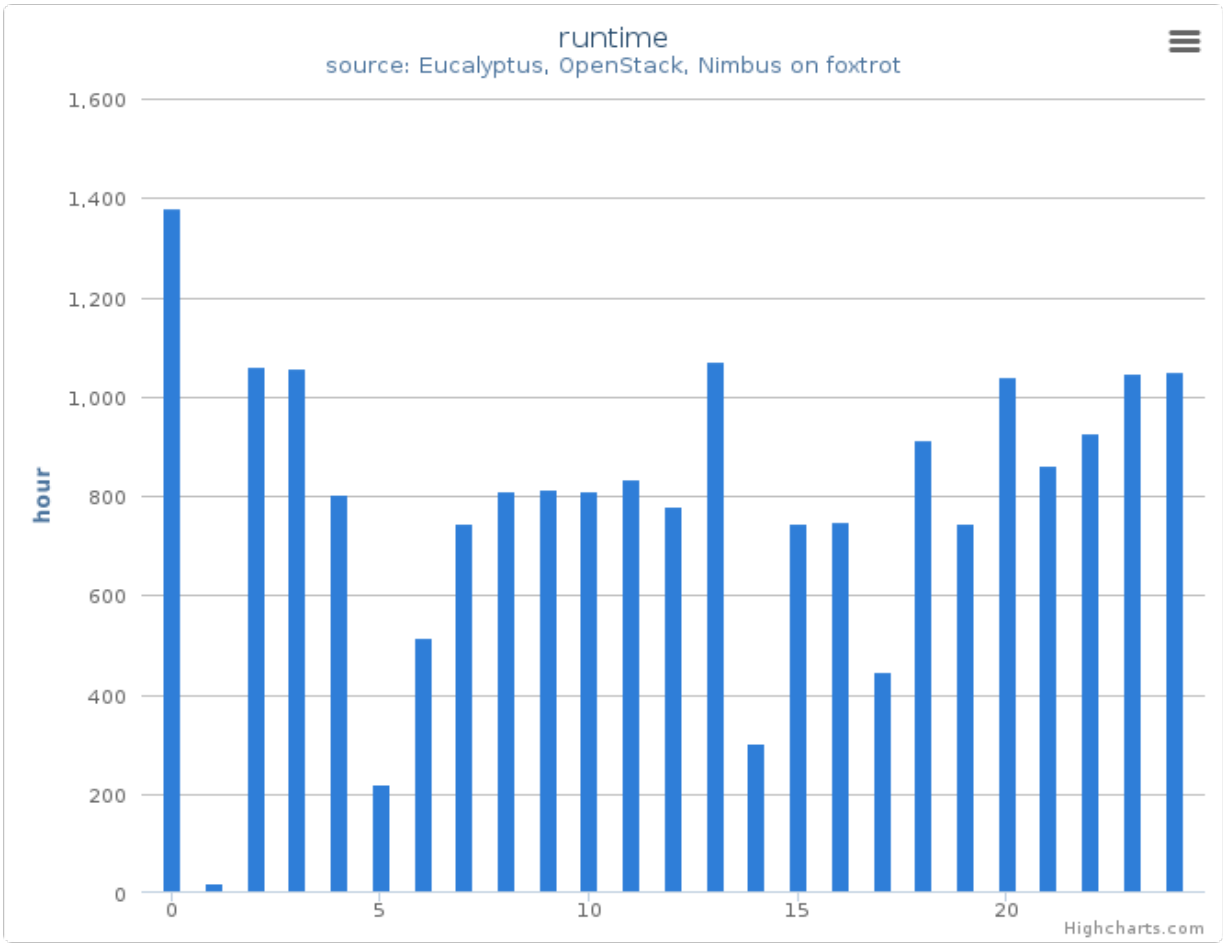

Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (foxtrot)
This column chart represents wall time among systems.

- Period: January 01 – June 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

CHAPTER

SEVEN

USER TABLE (CLOUD)

This table provides wall time usage of cloud users with the project id (first appearance). - Cloud:

- india.futuregrid.org: openstack, eucalyptus
- sierra.futuregrid.org: nimbus, (openstack expected soon)
- hotel.futuregrid.org: nimbus
- alamo.futuregrid.org: nimbus, (openstack expected soon)
- foxtrot.futuregrid.org: nimbus

CHAPTER

EIGHT

USER TABLE (HPC)

This table provides detailed information on users, including average job size, average wait time, and average run time. - HPC: alamo, bravo, hotel, india xray, sierra - Data obtained from ubmod.futuregrid.org **** Missing user name is represented as a hidden userid under asterisks.