FG Resource Report

Release 0.4

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June 19, 2013

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CHAPTER

ONE

SUMMARY REPORT (ALL)

- Period: October 01 – December 31, 2012
- 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)

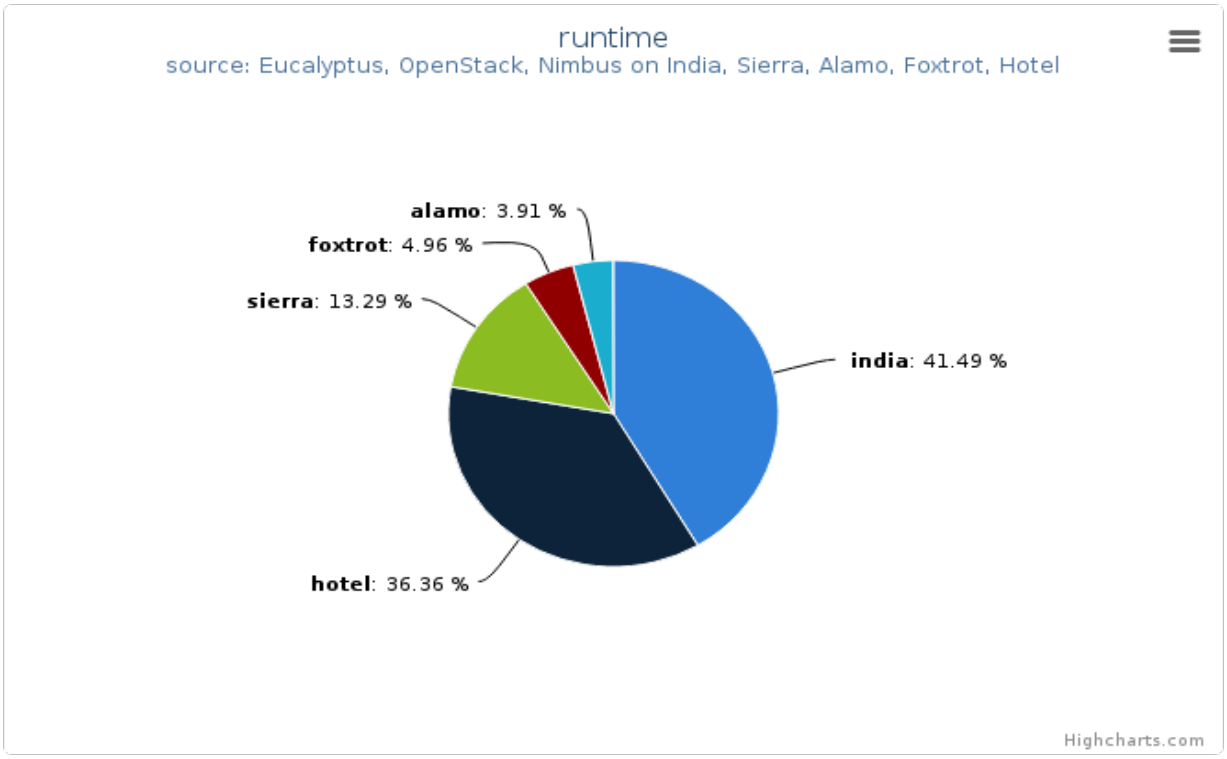

Figure 1. Wall time (hours) by Clusters
This chart represents overall usage of wall time (hours).

- Period: October 01 – December 31, 2012
- **Cloud:**
  - india: Eucalyptus, Openstack
  - sierra: Eucalyptus, Nimbus
  - hotel: Nimbus
  - alamo: Nimbus
  - foxtrot: Nimbus

Table 1.1: Wall time (hours) by Clusters

Total	Value
india	124391.0
hotel	109012.0
sierra	39857.0
foxtrot	14859.0
alamo	11719.0

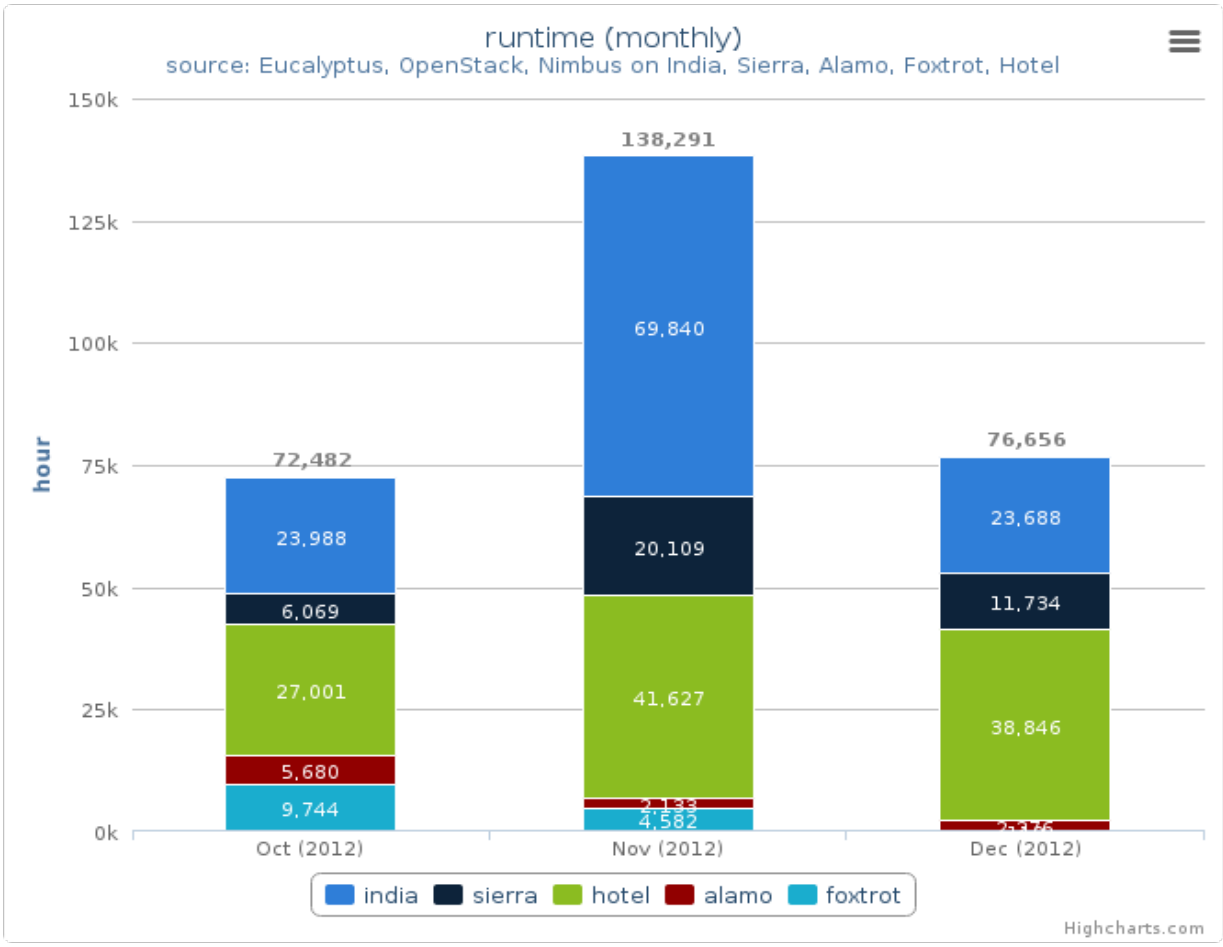

Figure 2. Wall time (hours) by Clusters (monthly)
This stacked column chart represents average monthly usage of wall time (hours).

- Period: October 01 – December 31, 2012
- **Cloud:**
  - india: Eucalyptus, Openstack
  - sierra: Eucalyptus, Nimbus
  - hotel: Nimbus
  - alamo: Nimbus
  - foxtrot: Nimbus

1.2 VM Count by Clusters (Total, monthly)

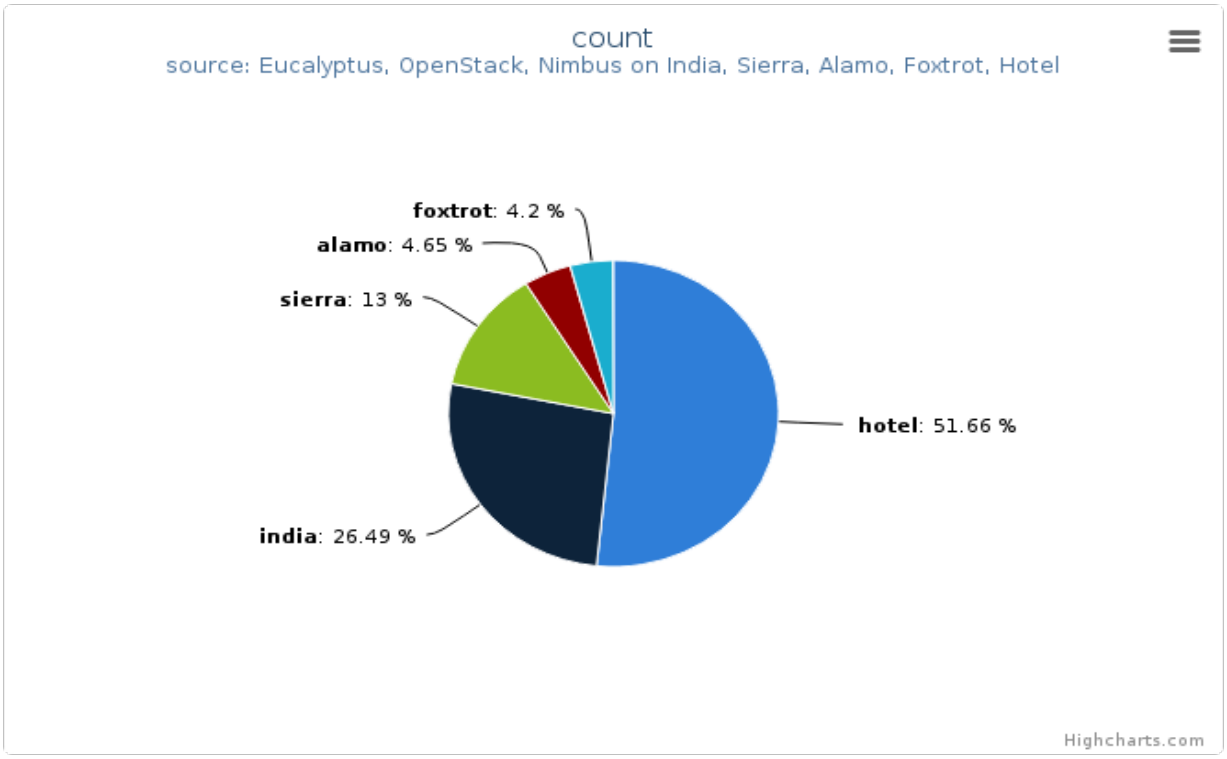

Figure 3. VMs count by Clusters
This chart represents overall VM instances count during the period.

- Period: October 01 – December 31, 2012
- **Cloud:**
  - india: Eucalyptus, Openstack
  - sierra: Eucalyptus, Nimbus
  - hotel: Nimbus
  - alamo: Nimbus
  - foxtrot: Nimbus

Table 1.2: VM instance count by Clusters

Total	Value
hotel	8792
india	4508
sierra	2212
alamo	792
foxtrot	714

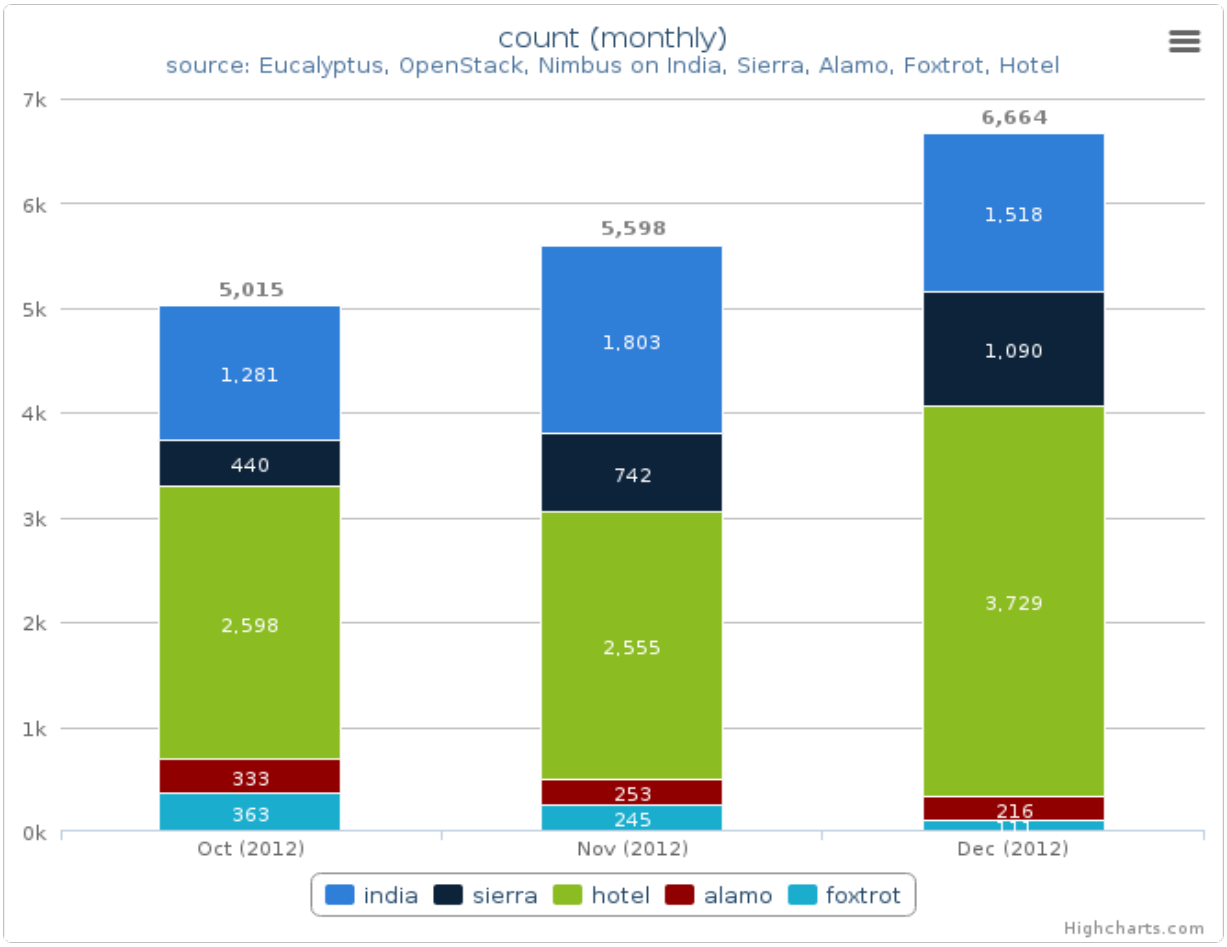

Figure 4. VMs count by Clusters (monthly)
This stacked column chart represents average VM instances count per month.

- Period: October 01 – December 31, 2012
- **Cloud:**
  - india: Eucalyptus, Openstack
  - sierra: Eucalyptus, Nimbus
  - hotel: Nimbus
  - alamo: Nimbus
  - foxtrot: Nimbus

1.3 Users Count by Clusters (Total, monthly)

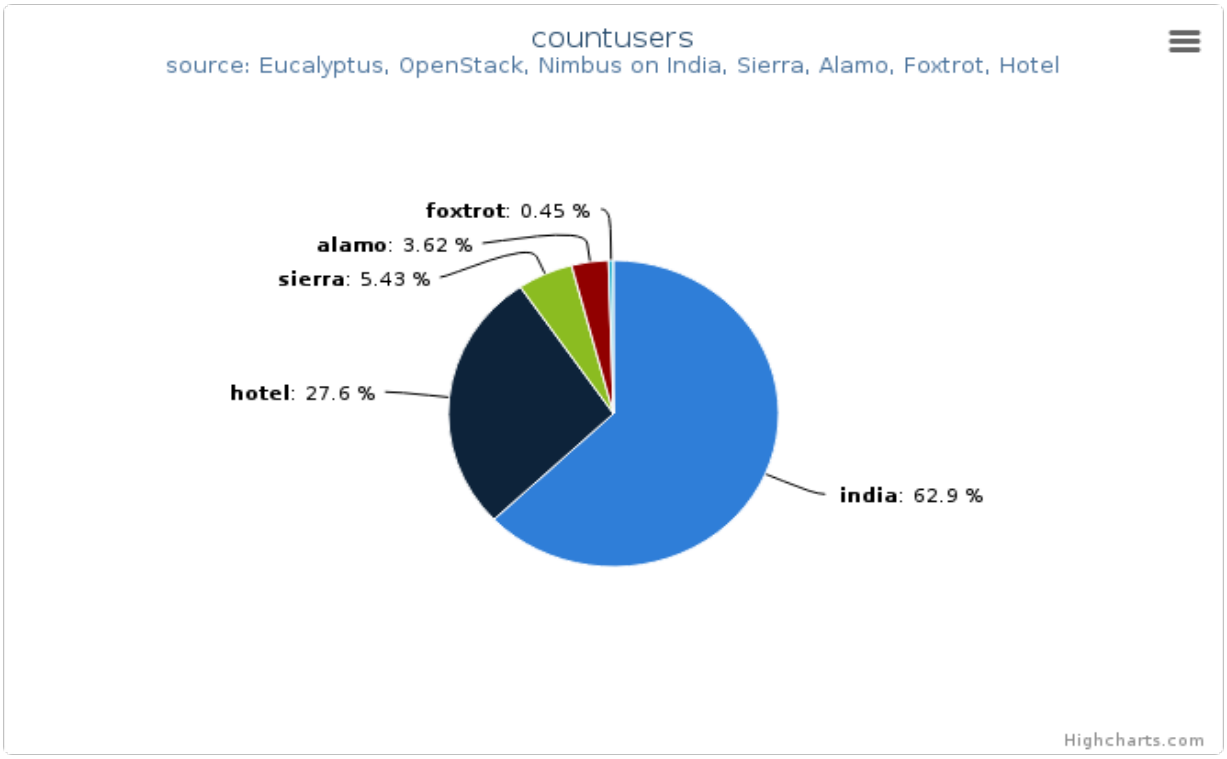

Figure 5. Users count by Clusters
This chart represents total number of active users.

- Period: October 01 – December 31, 2012
- **Cloud:**
  - india: Eucalyptus, Openstack
  - sierra: Eucalyptus, Nimbus
  - hotel: Nimbus
  - alamo: Nimbus
  - foxtrot: Nimbus

Table 1.3: User count by Clusters

Total	Value
india	139
hotel	61
sierra	12
alamo	8
foxtrot	1

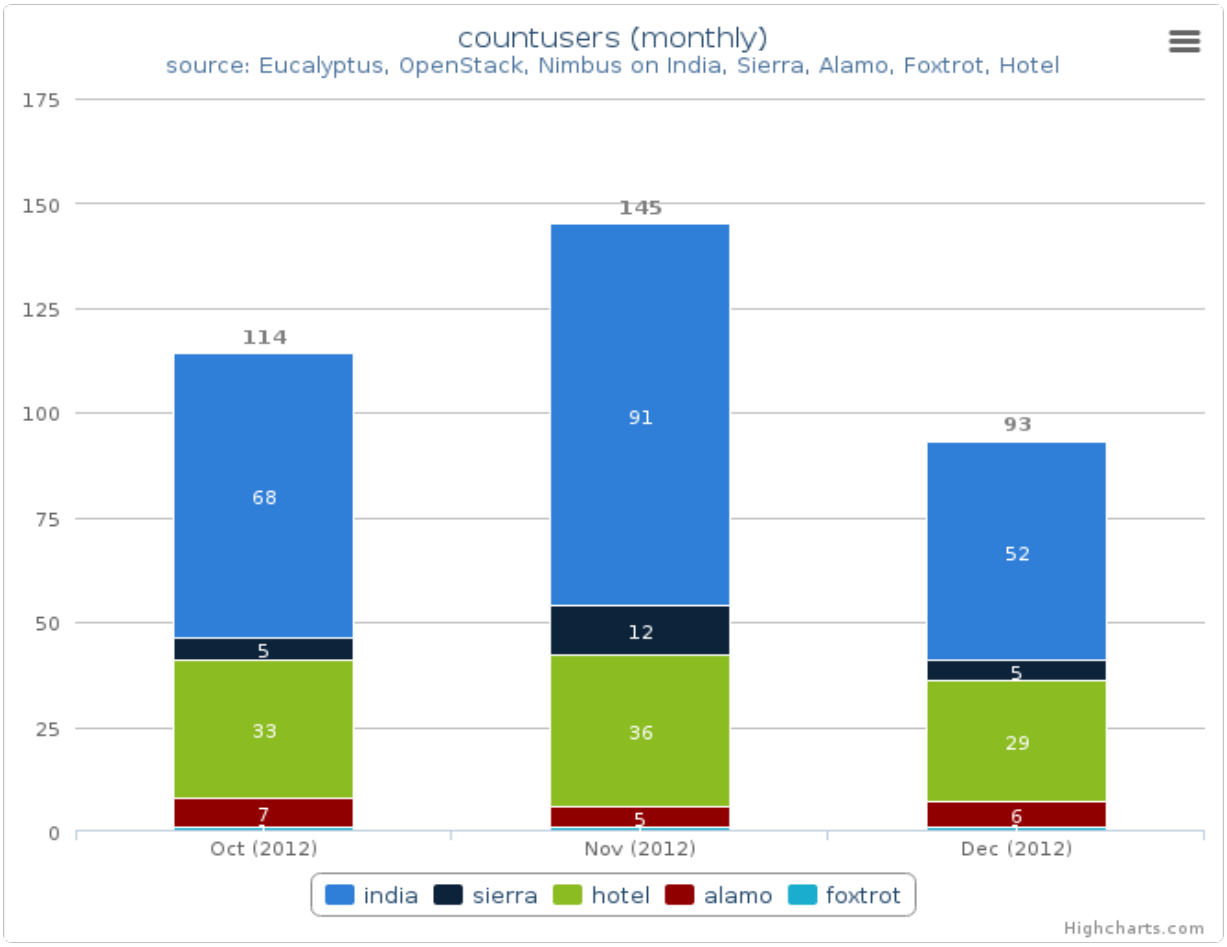

Figure 6. Users count by Clusters (Monthly)
This stacked column chart represents average count of active users per month.

- Period: October 01 – December 31, 2012
- **Cloud:**
  - india: Eucalyptus, Openstack
  - sierra: Eucalyptus, Nimbus
  - hotel: Nimbus
  - alamo: Nimbus
  - foxtrot: Nimbus

CHAPTER

TWO

USAGE REPORT SIERRA

- Period: October 01 – December 31, 2012
- 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)

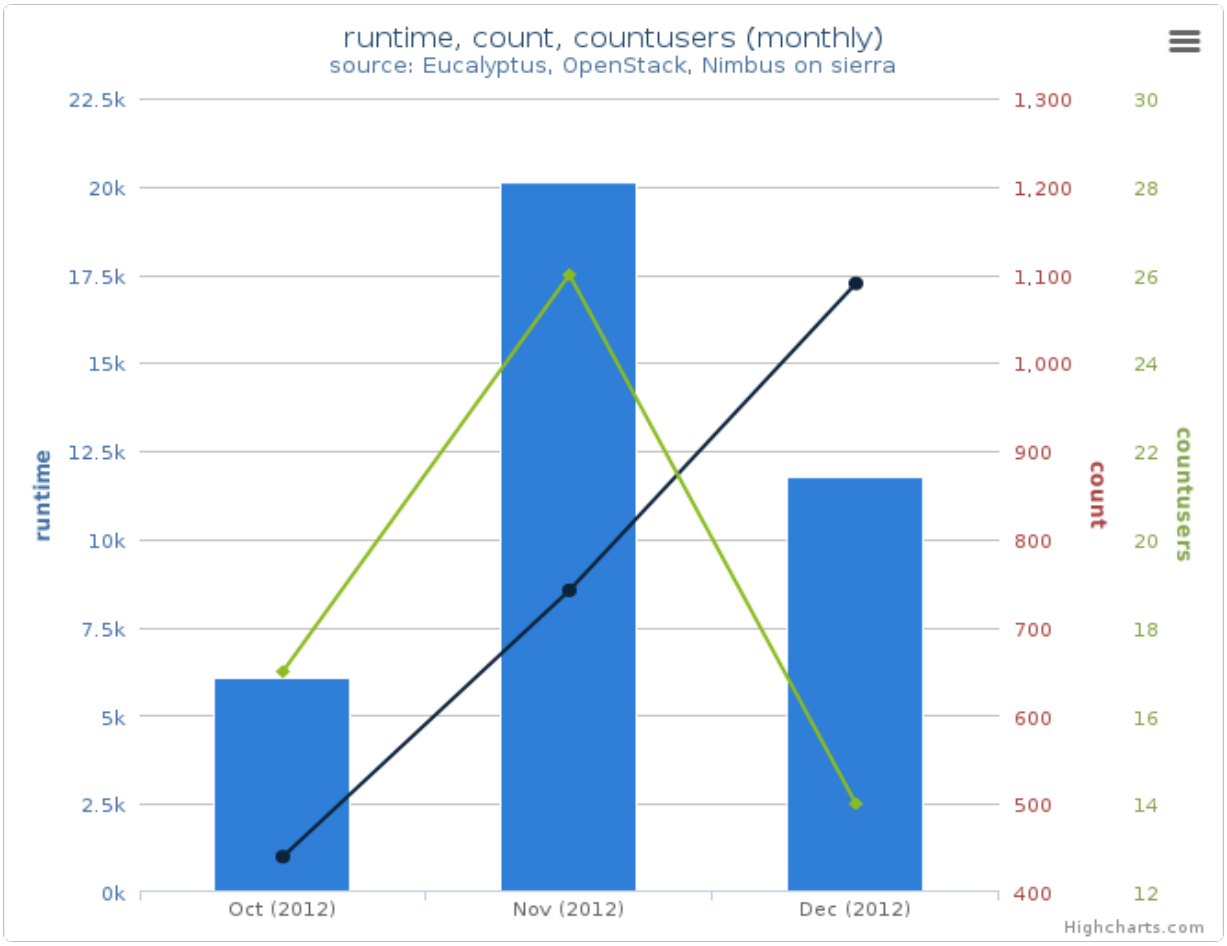

Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: October 01 – December 31, 2012
- 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)

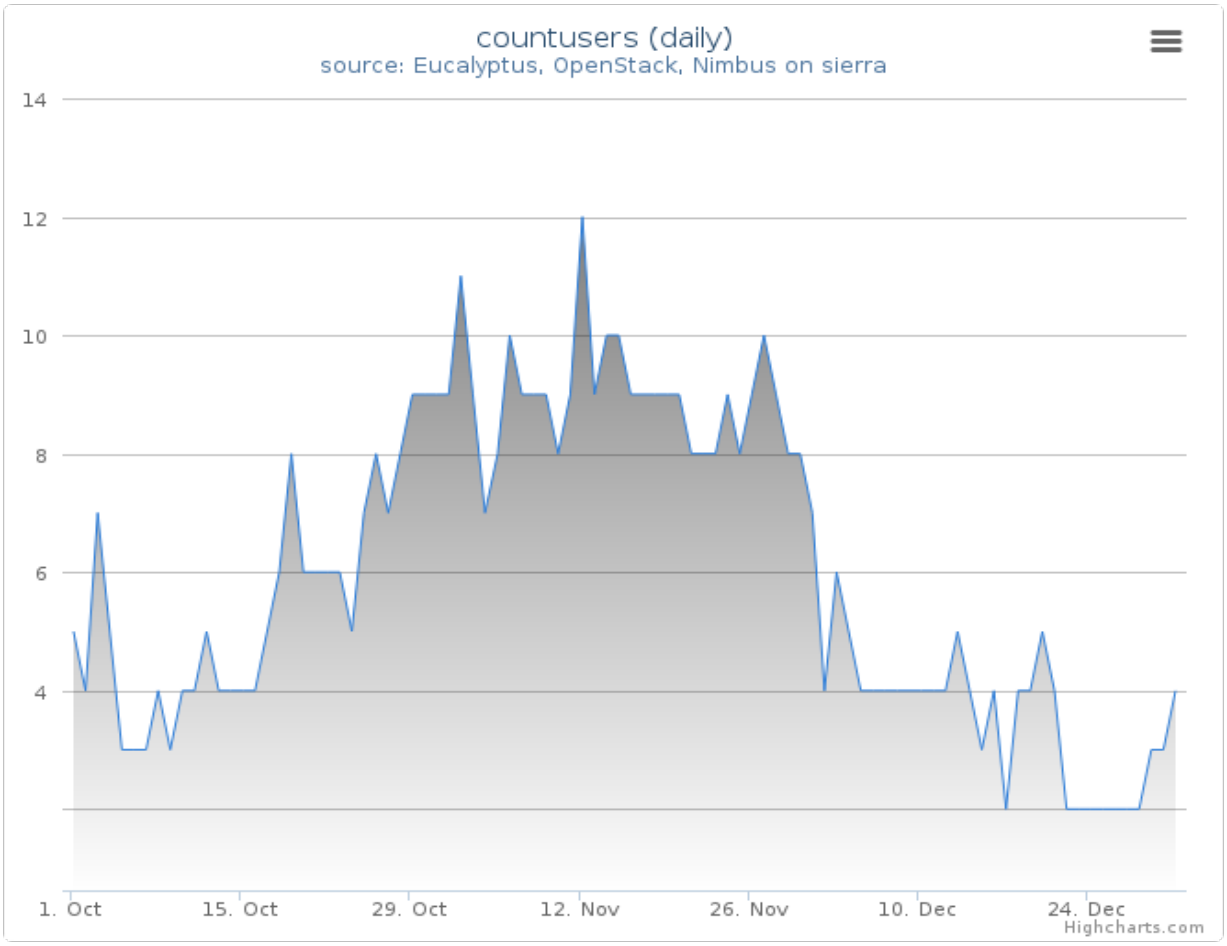

Figure 2: Users count

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

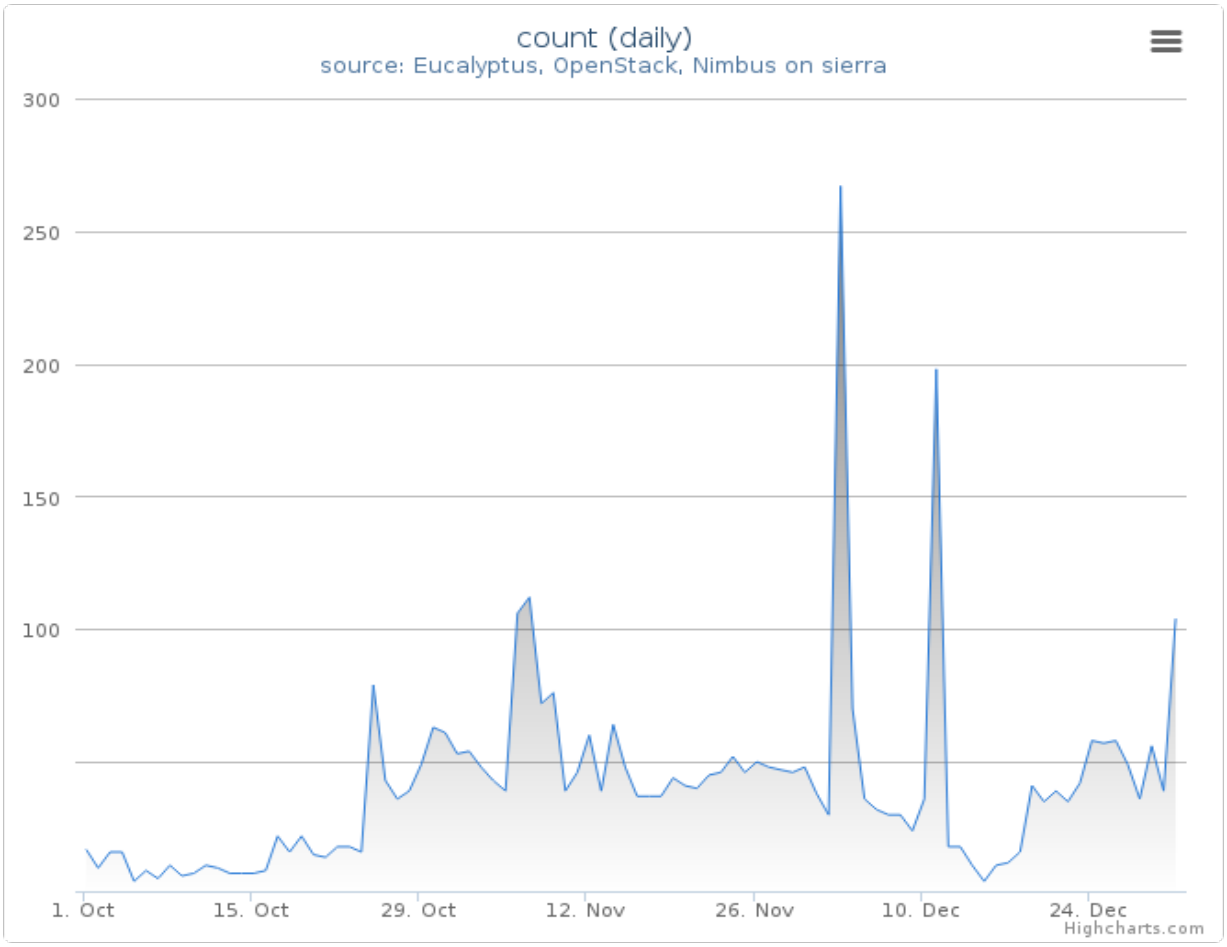

Figure 3: VMs count

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

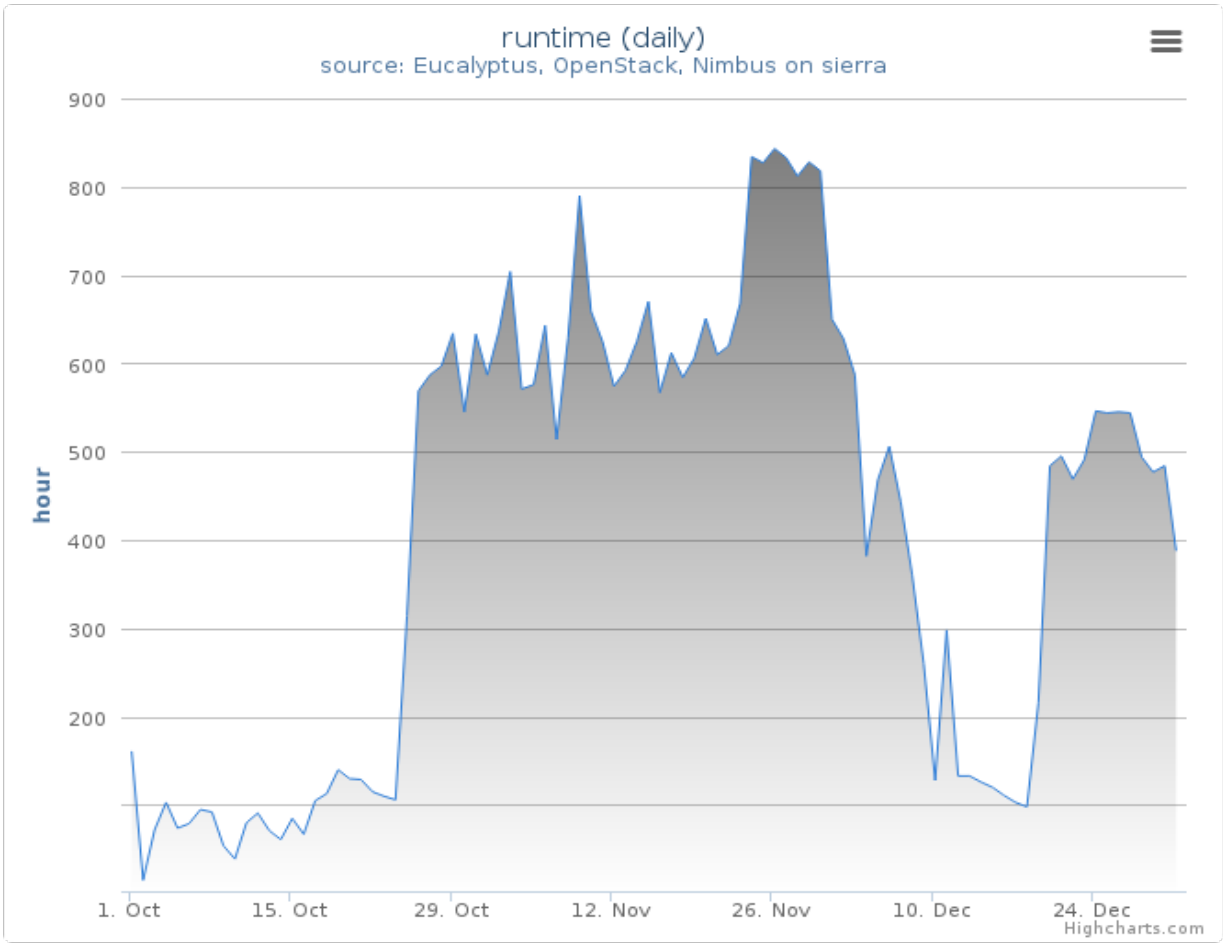

Figure 4: Wall time (hours)

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

2.2 Distribution

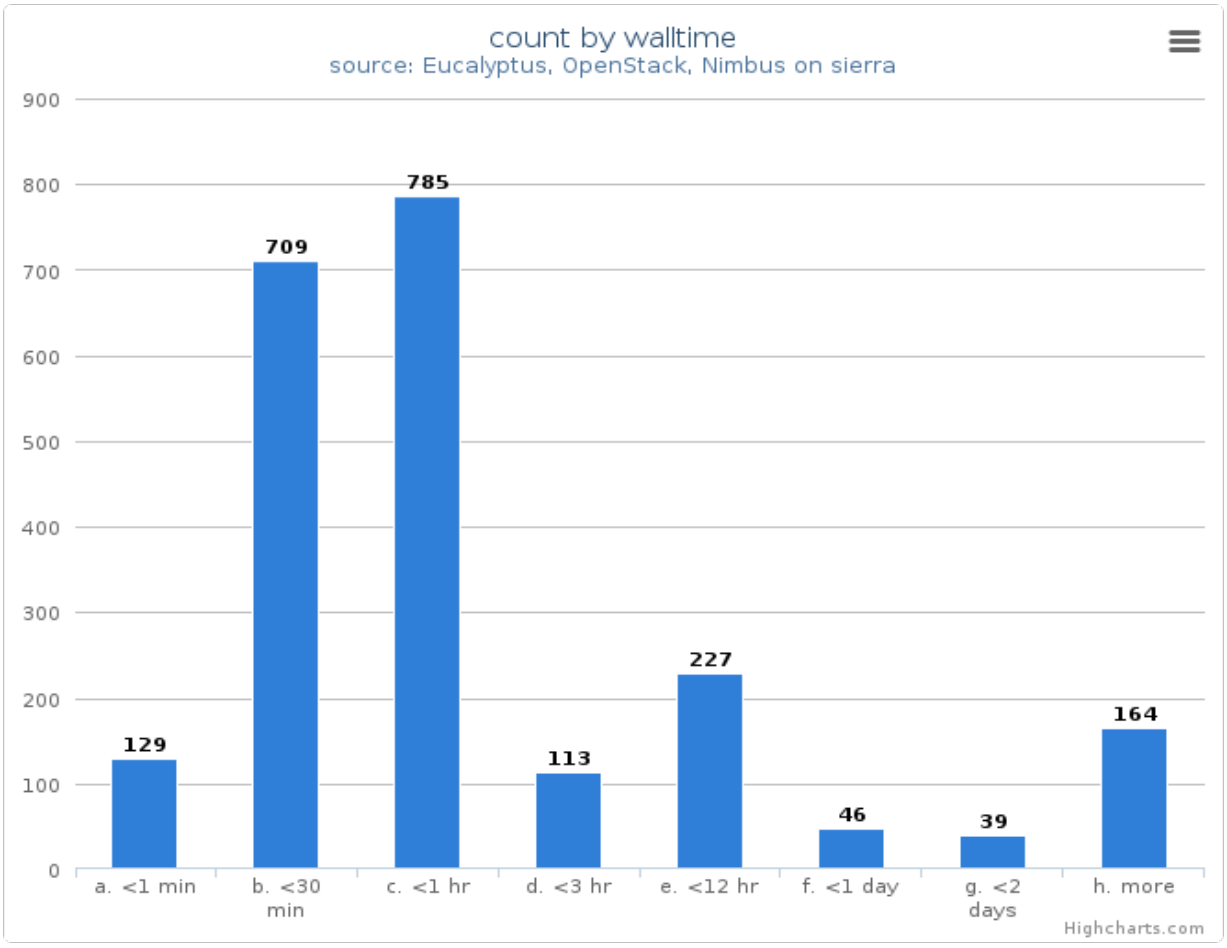

Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

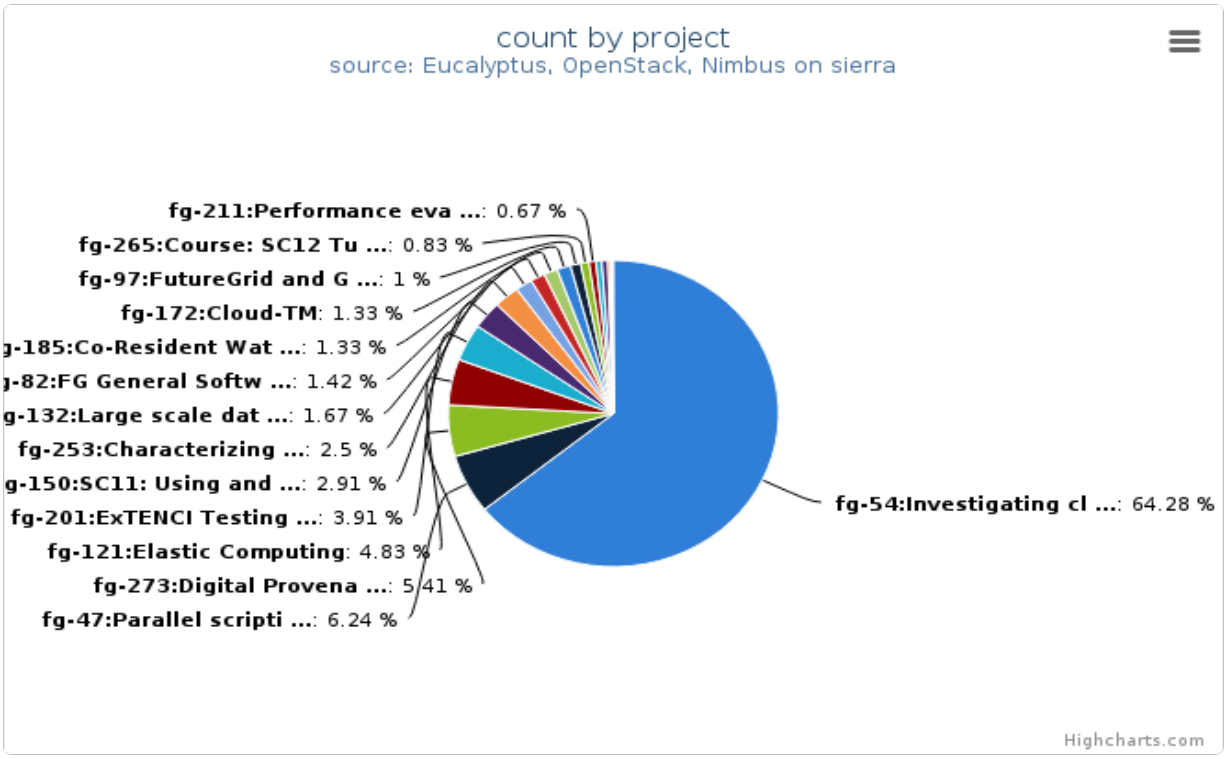

Figure 6: VMs count by project

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

- Period: October 01 – December 31, 2012
- 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	772
fg-47:Parallel scripting using cloud resources	75
fg-273:Digital Provenance Research	65
fg-121:Elastic Computing	58
fg-201:ExTENCI Testing, Validation, and Performance	47
fg-150:SC11: Using and Building Infrastructure Clouds for Science	35
fg-253:Characterizing Performance of Infrastructure Clouds	30
fg-132:Large scale data analytics	20
fg-82:FG General Software Development	17
fg-185:Co-Resident Watermarking	16
fg-172:Cloud-TM	16
fg-97:FutureGrid and Grid'5000 Collaboration	12
fg-265:Course: SC12 Tutorial	10
fg-211:Performance evaluation of cloud storage placement	8
fg-170:European Middleware Initiative (EMI)	7
fg-266:Secure medical files sharing	7
fg-224:Nimbus Auto Scale	3
fg-42:SAGA	1
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	1
fg-291:Distributed Computing course	1

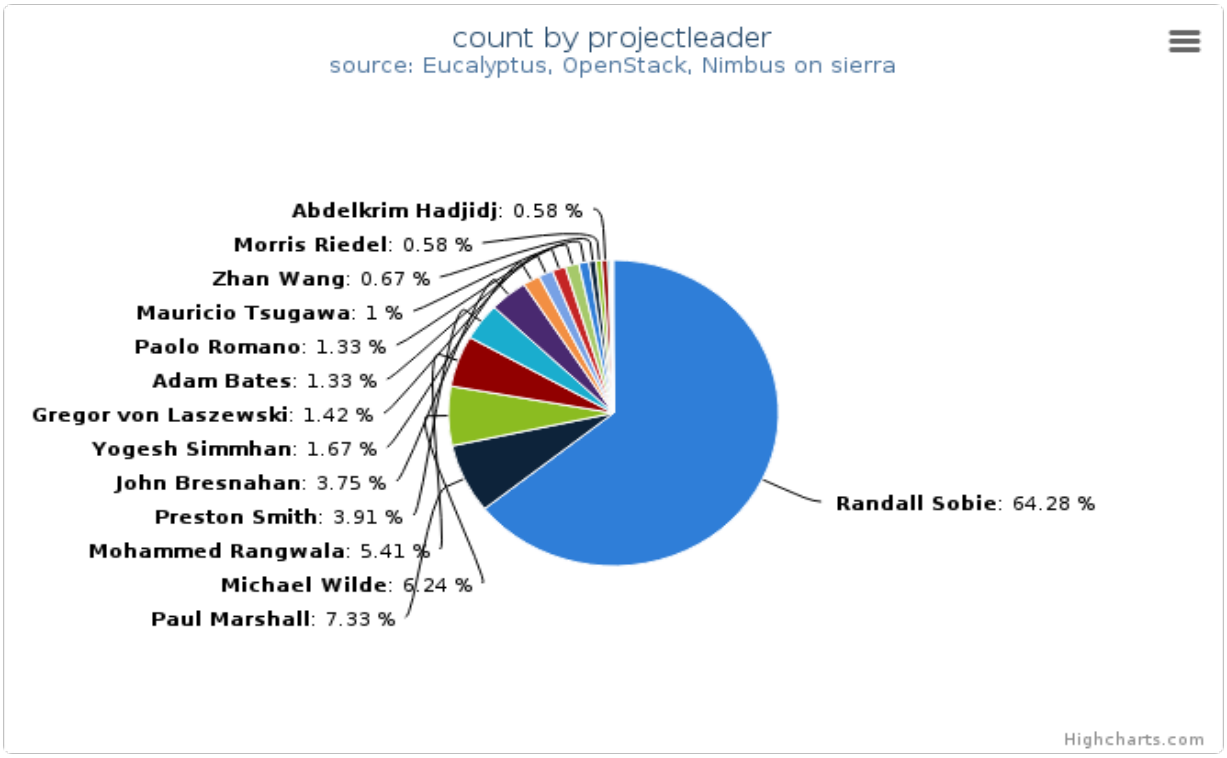

Figure 7: VMs count by project leader

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

Table 2.2: VMs count by project leader

Projectleader	Value
Randall Sobie	772
Paul Marshall	88
Michael Wilde	75
Mohammed Rangwala	65
Preston Smith	47
John Bresnahan	45
Yogesh Simmhan	20
Gregor von Laszewski	17
Adam Bates	16
Paolo Romano	16
Mauricio Tsugawa	12
Zhan Wang	8
Morris Riedel	7
Abdelkrim Hadjidj	7
Pierre Riteau	3
David Fergusson	1
Shantenu Jha	1
Renato Figueiredo	1

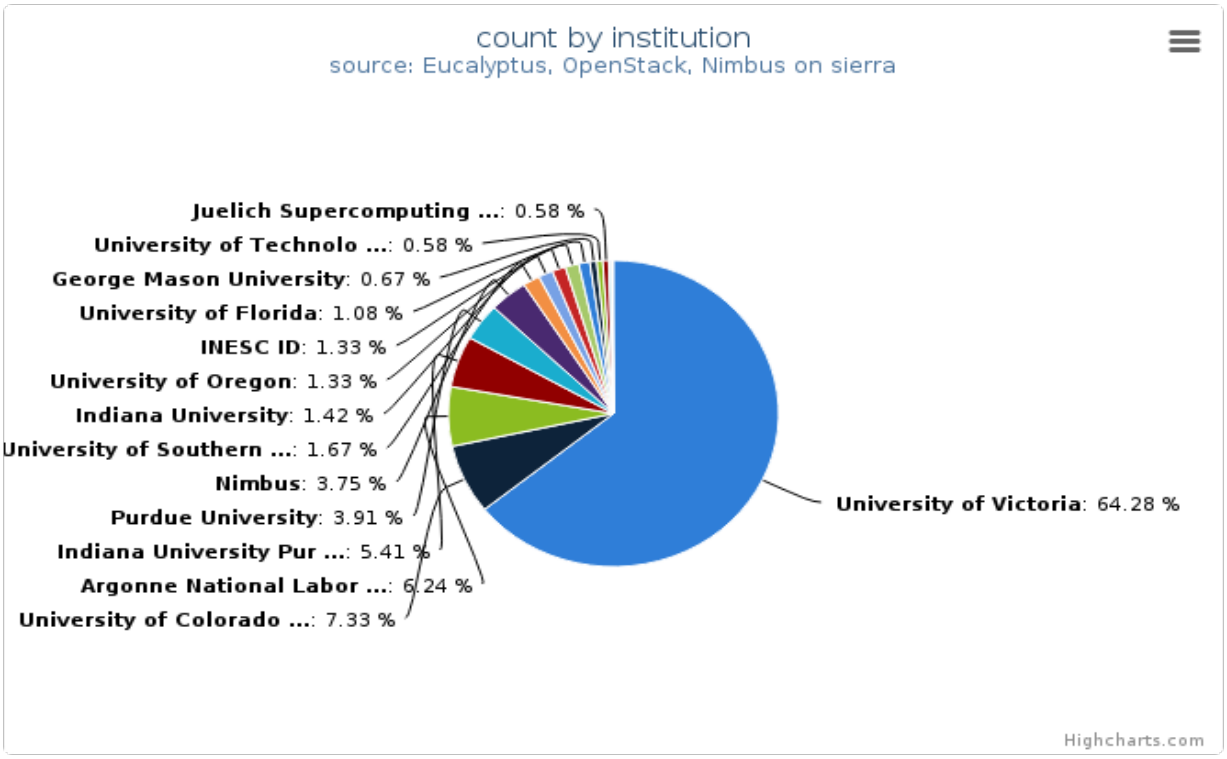

Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

Table 2.3: VMs count by institution

Institution	Value
University of Victoria	772
University of Colorado at Boulder	88
Argonne National Laboratory	75
Indiana University Purdue University Indianapolis	65
Purdue University	47
Nimbus	45
University of Southern California	20
Indiana University	17
University of Oregon	16
INESC ID	16
University of Florida	13
George Mason University	8
University of Technology of Compiegne	7
Juelich Supercomputing Centre	7
University of Chicago	3
BioIT	1
Louisiana State University	1

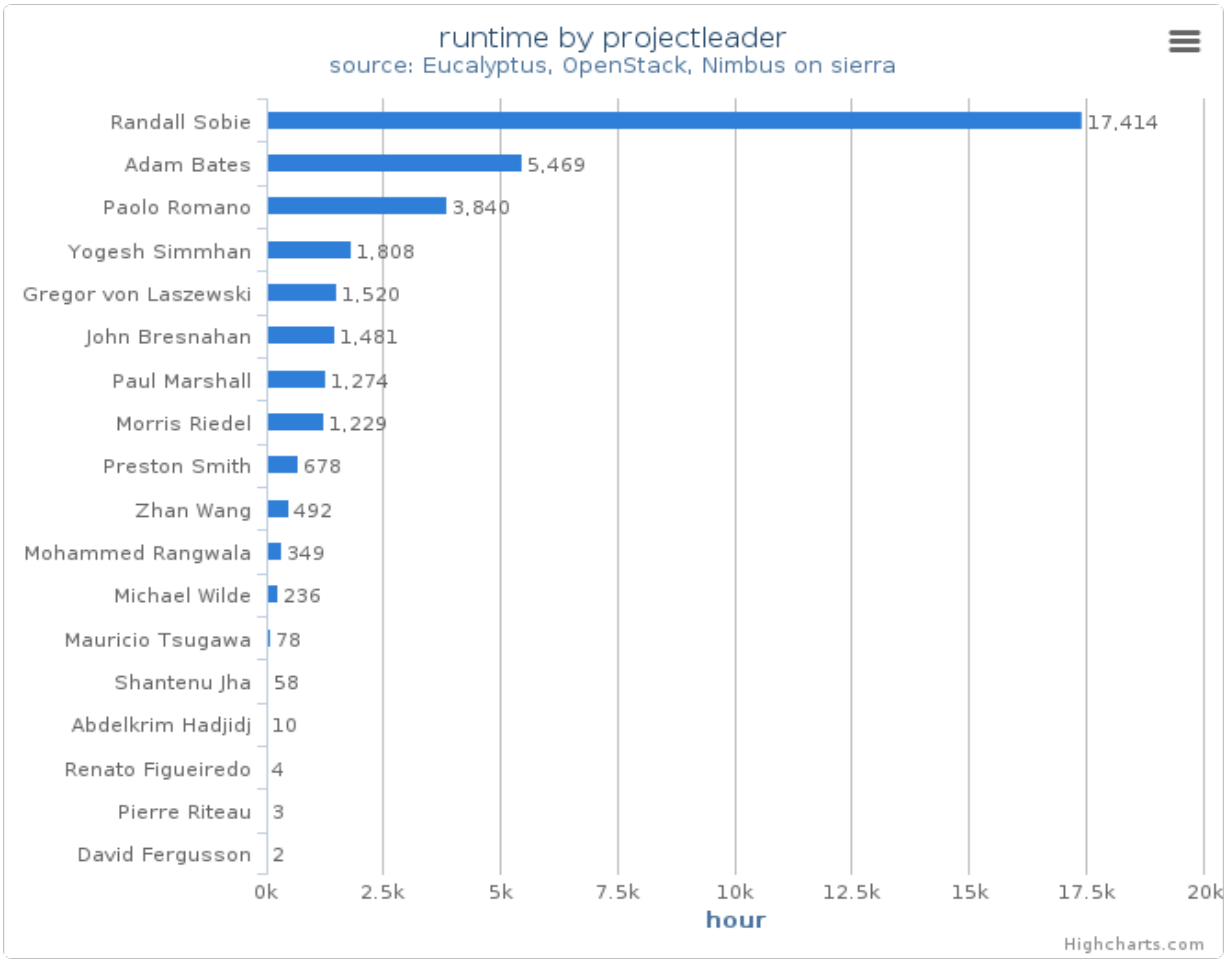

Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: October 01 – December 31, 2012
- 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.

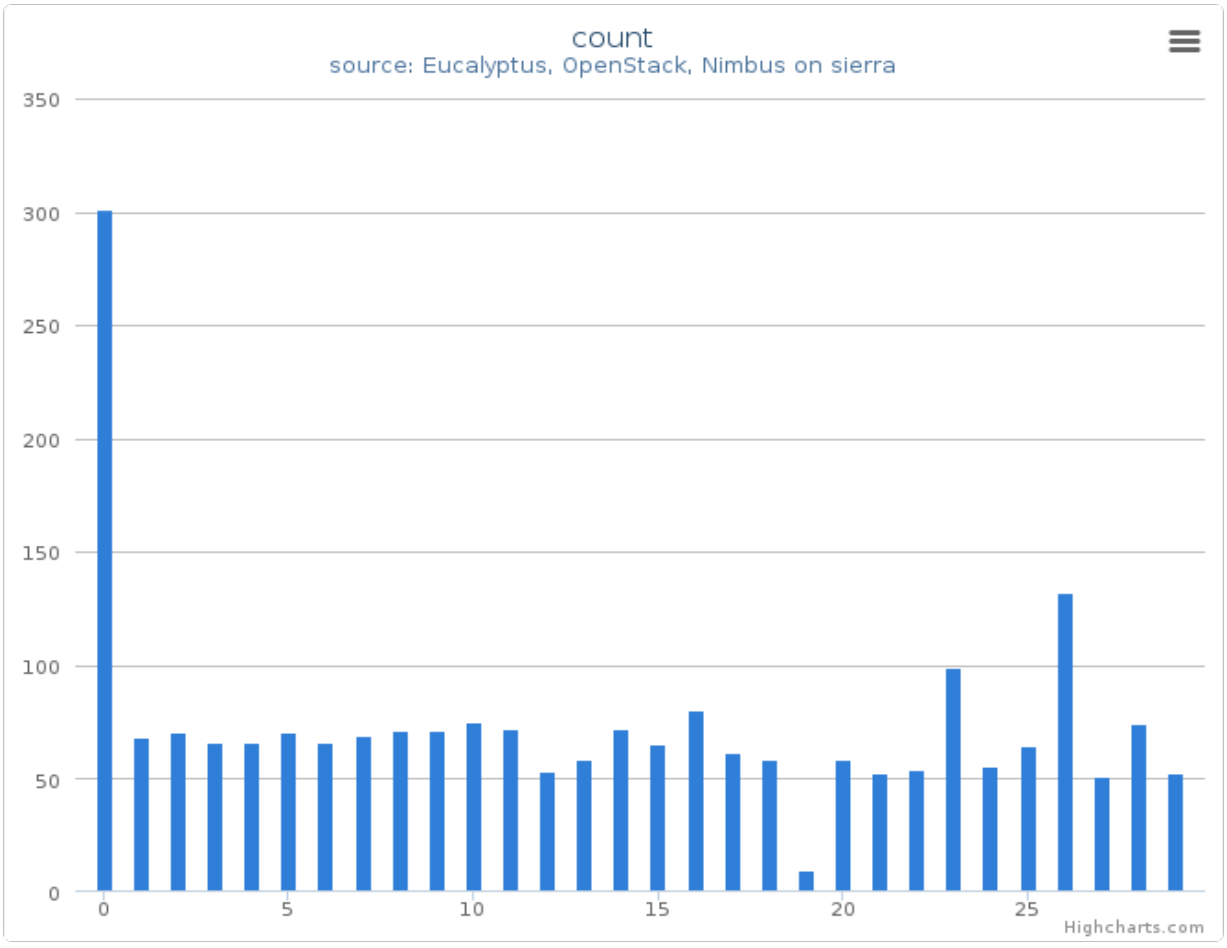

Figure 10: VMs count by systems (compute nodes) in Cluster (sierra)
This column chart represents VMs count among systems.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

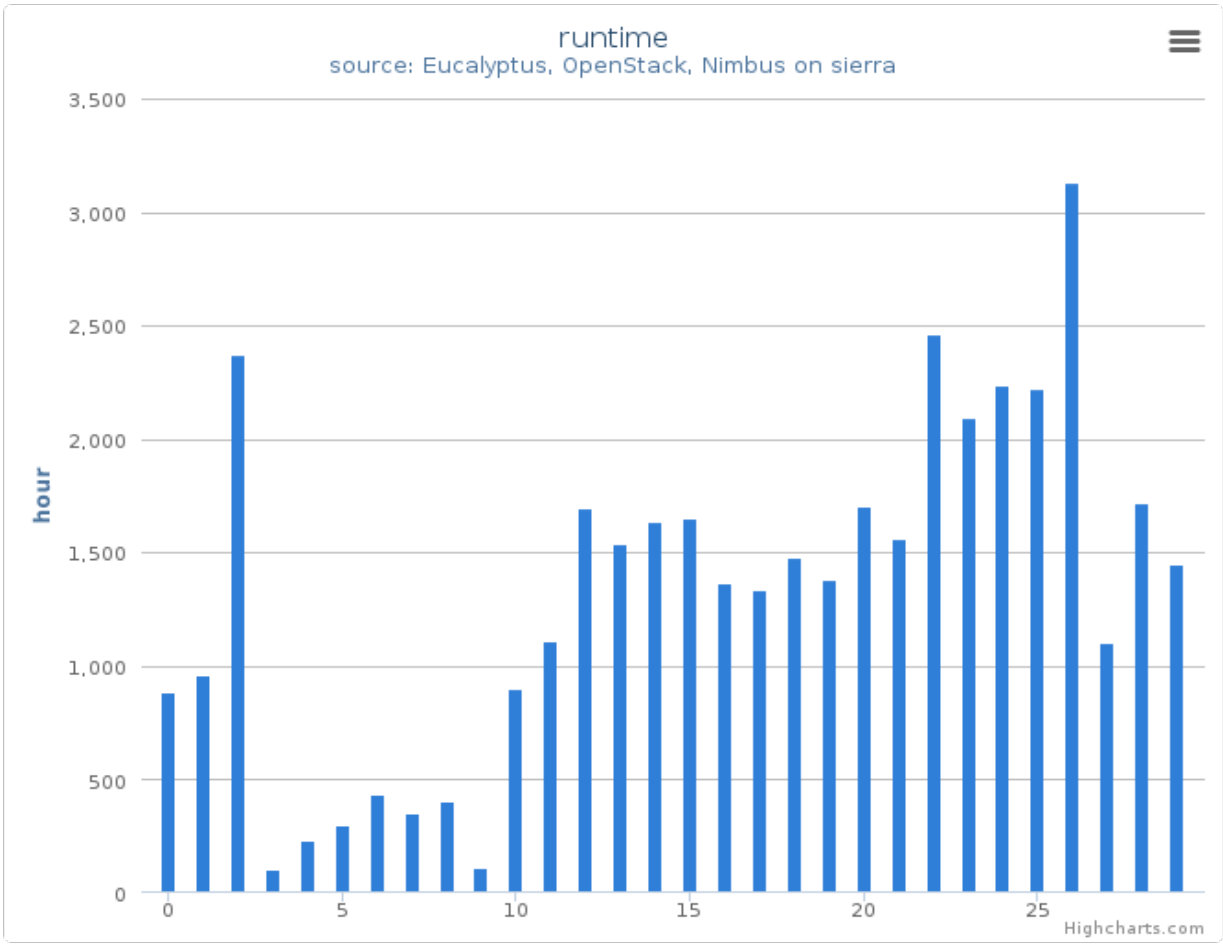

Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (sierra)
This column chart represents wall time among systems.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus, eucalyptus
- Hostname: sierra

CHAPTER

THREE

USAGE REPORT INDIA

- Period: October 01 – December 31, 2012
- 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)

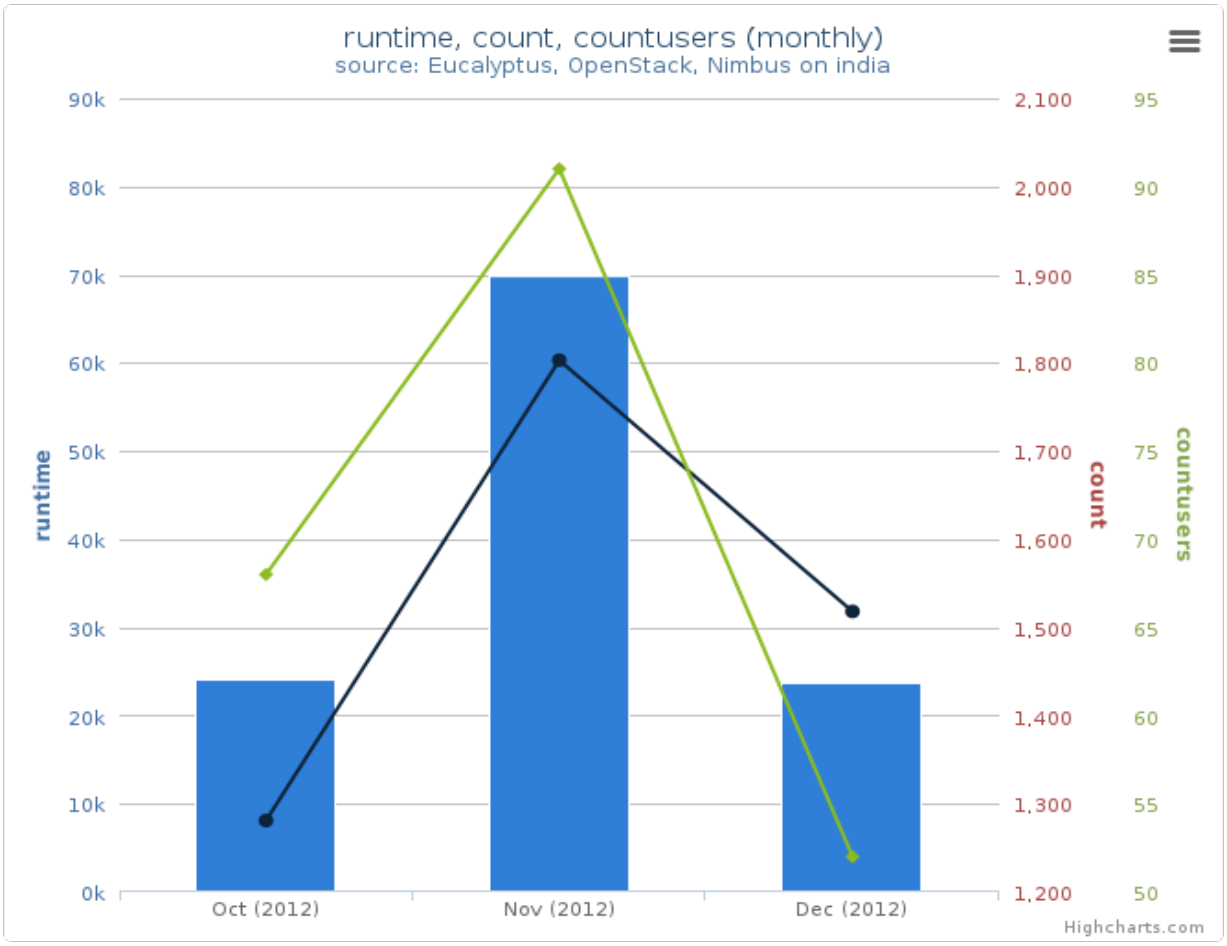

Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: October 01 – December 31, 2012
- 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)

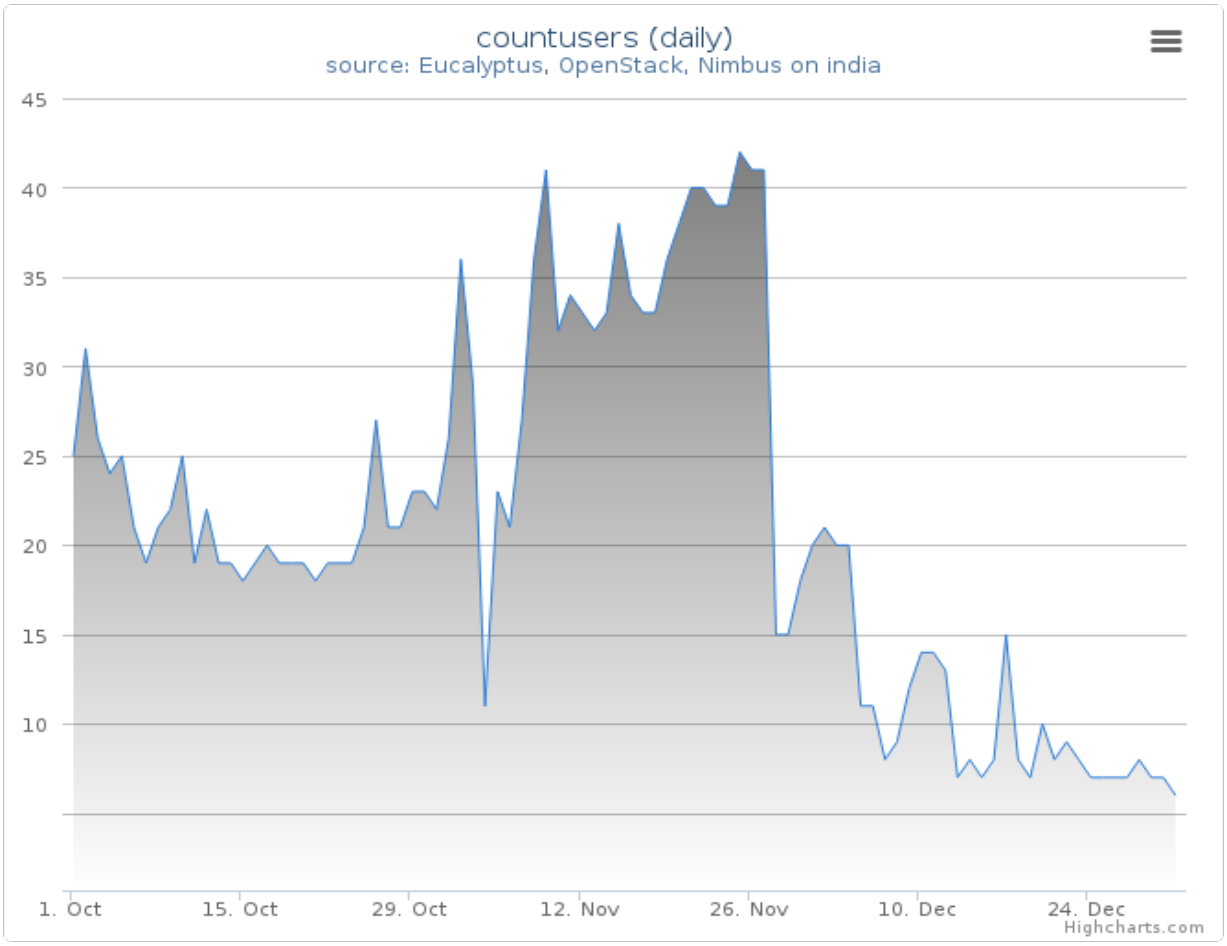

Figure 2: Users count

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

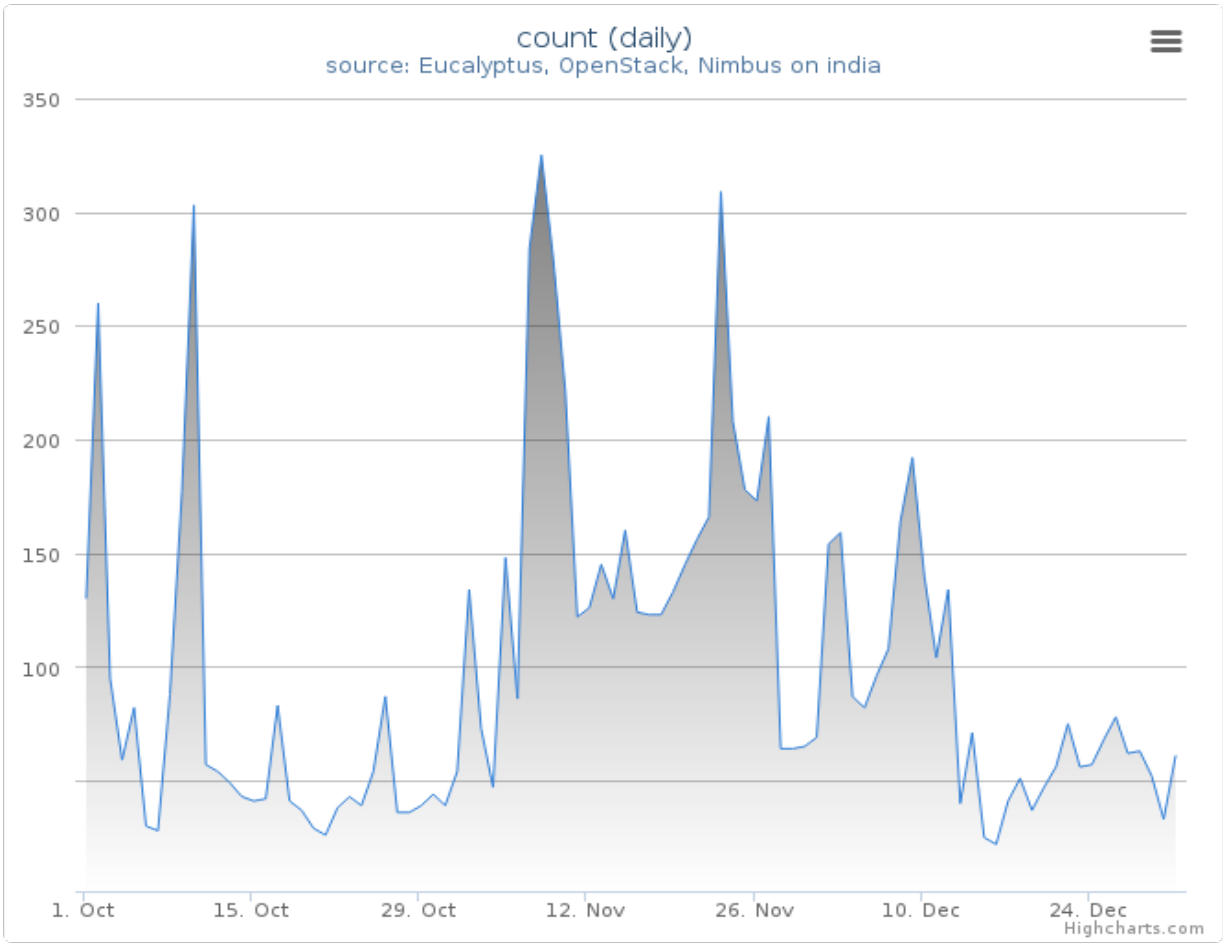

Figure 3: VMs count

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

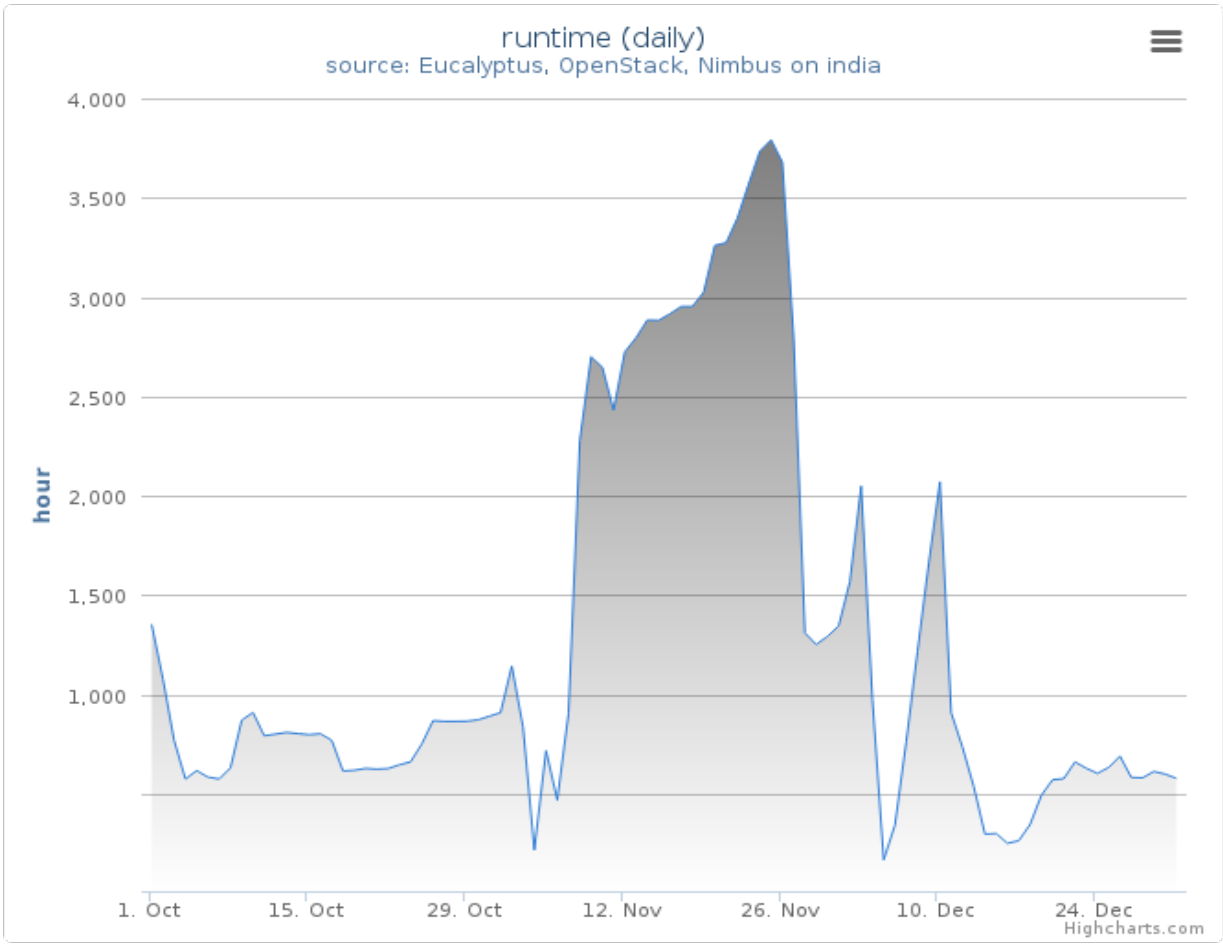

Figure 4: Wall time (hours)

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

3.2 Distribution

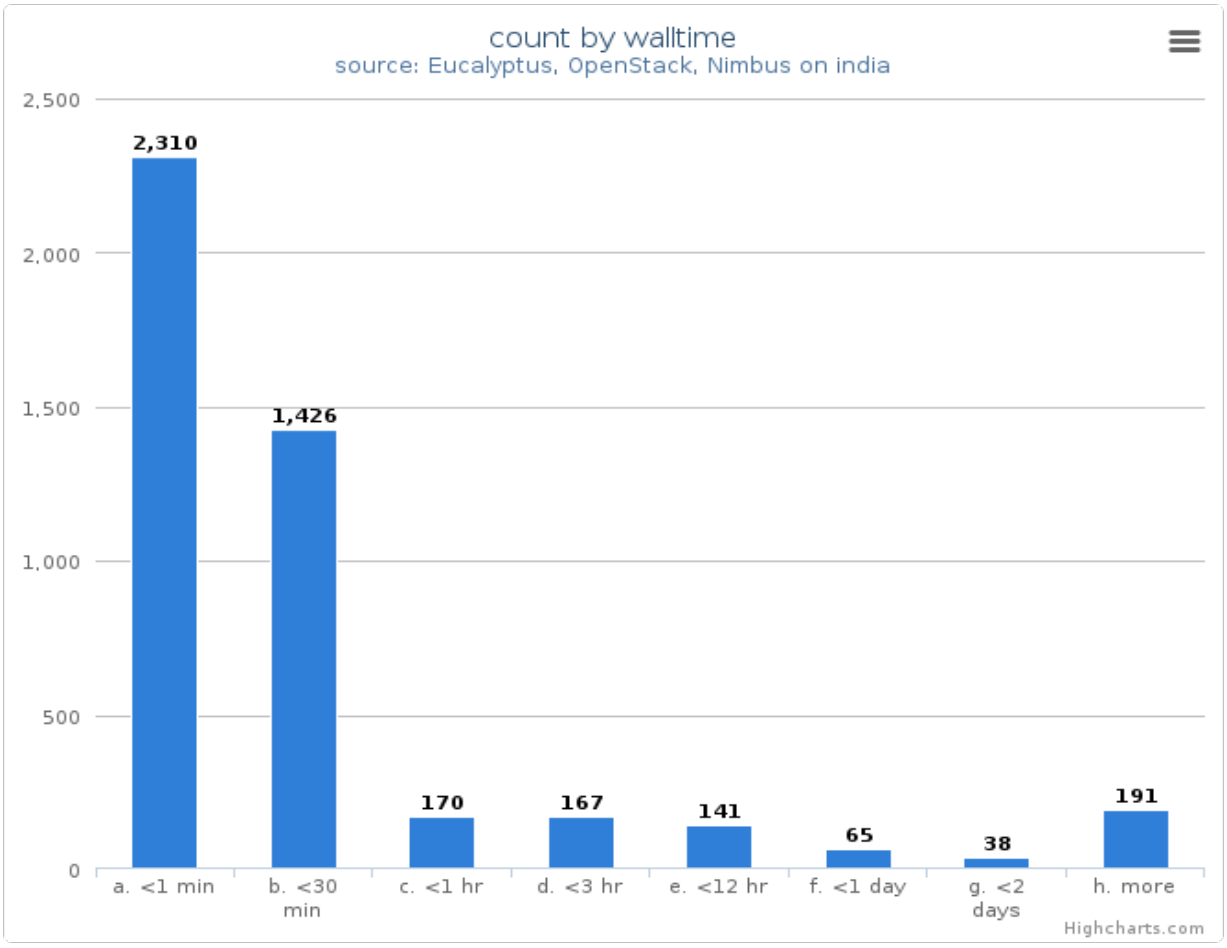

Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

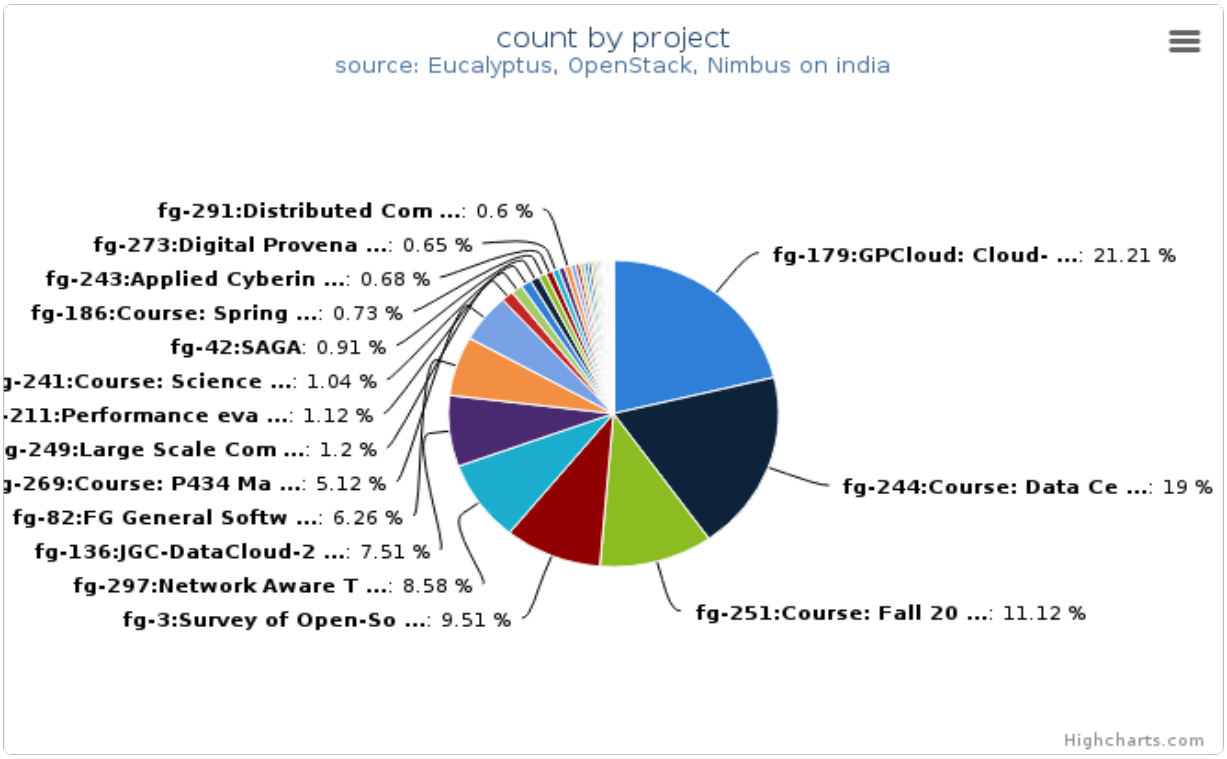

Figure 6: VMs count by project

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

Table 3.1: VMs count by project

Project	Value
fg-179:GPCloud: Cloud-based Automatic Repair of Real-World Software Bugs	816
fg-244:Course: Data Center Scale Computing	731
fg-251:Course: Fall 2012 B534 Distributed Systems Graduate Course	428
fg-3:Survey of Open-Source Cloud Infrastructure using FutureGrid Testbed	366
fg-297:Network Aware Task Scheduling in Hadoop	330
fg-136:JGC-DataCloud-2012 paper experiments	289
fg-82:FG General Software Development	241
fg-269:Course: P434 MapReduce Class Project	197
fg-249:Large Scale Computing Infrastructure 2012 Master class	46
fg-211:Performance evaluation of cloud storage placement	43
fg-241:Course: Science Cloud Summer School 2012	40

Continued on next page

Table 3.1 – continued from previous page

Project	Value
fg-42:SAGA	35
fg-186:Course: Spring 2012 B534 Distributed systems Graduate Course	28
fg-243:Applied Cyberinfrastructure concepts	26
fg-273:Digital Provenance Research	25
fg-266:Secure medical files sharing	23
fg-291:Distributed Computing course	23
fg-47:Parallel scripting using cloud resources	19
fg-4:Word Sense Disambiguation for Web 2.0 Data	16
fg-213:Course: Cloud Computing class - second edition	16
fg-224:Nimbus Auto Scale	15
fg-132:Large scale data analytics	12
fg-256:QuakeSim Evaluation of FutureGrid for Cloud Computing	12
fg-201:ExTENCI Testing, Validation, and Performance	8
fg-60:Wide area distributed file system for MapReduce applications on FutureGrid platform	8
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	8
fg-97:FutureGrid and Grid‘5000 Collaboration	7
fg-20:Development of an information service for FutureGrid	5
fg-239:Community Comparison of Cloud frameworks	4
fg-289:Benchmarking the cloud	4
fg-279:Course: Mastering OpenStack	4
fg-90:Unicore and Genesis Experimentation	4
fg-200:MapReduce Based Ray Tracing Class Project	3
fg-189:Pegasus development and improvement platform	3
fg-174:RAIN: FutureGrid Dynamic provisioning Framework	2
fg-121:Elastic Computing	2
fg-8:Running workflows in the cloud with Pegasus	2
fg-167:FutureGrid User Support	2
fg-168:Next Generation Sequencing in the Cloud	1
fg-238:HPC meets Clouds	1
fg-176:Cloud Interoperability Testbed	1
fg-48:Cloud Technologies for Bioinformatics Applications	1
fg-257:Particle Physics Data analysis cluster for ATLAS LHC experiment	1

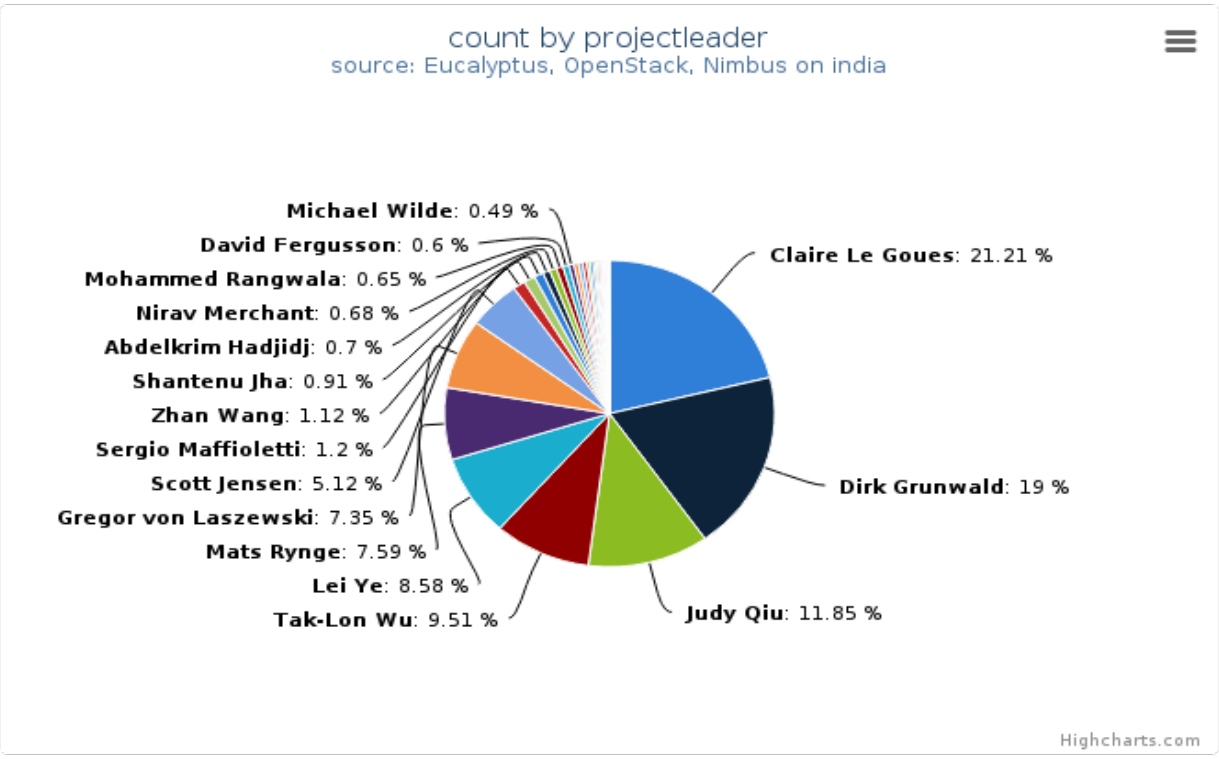

Figure 7: VMs count by project leader

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

Table 3.2: VMs count by project leader

Projectleader	Value
Claire Le Goues	816
Dirk Grunwald	731
Judy Qiu	456
Tak-Lon Wu	366
Lei Ye	330
Mats Rynge	292
Gregor von Laszewski	283
Scott Jensen	197
Sergio Maffioletti	46
Zhan Wang	43
Shantenu Jha	35

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Table 3.2 – continued from previous page

Projectleader	Value
Abdelkrim Hadjidj	27
Nirav Merchant	26
Mohammed Rangwala	25
David Fergusson	23
Michael Wilde	19
Jonathan Klinginsmith	17
Massimo Canonico	16
Pierre Riteau	15
Yogesh Simmhan	12
Andrea Donnellan	12
Renato Figueiredo	8
Lizhe Wang	8
Preston Smith	8
Mauricio Tsugawa	7
Hyungro Lee	5
Yong Zhao	4
Ashish Jain	4
Shava Smallen	4
Jingya Wang	3
Paul Marshall	2
Gary Miksik	2
Gideon Juve	2
Thilina Gunarathne	1
Alan Sill	1
Doug Benjamin	1
Li Chunyan	1

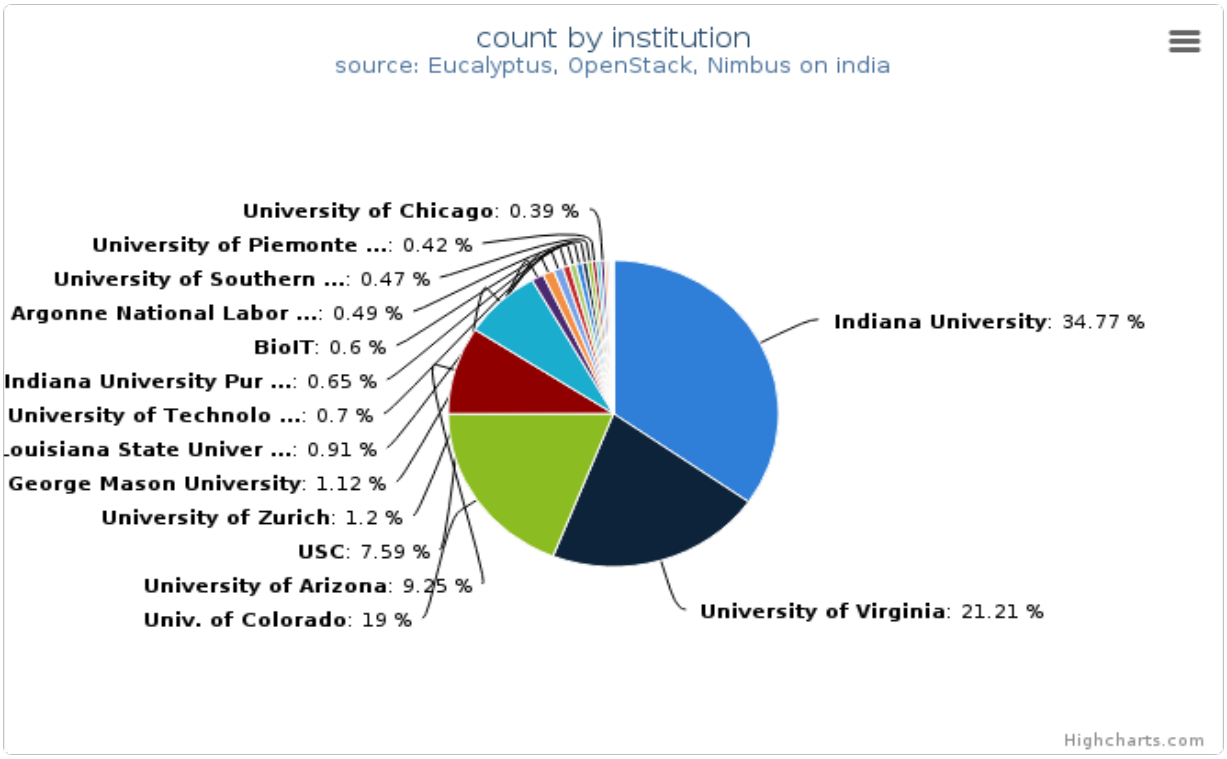

Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

Table 3.3: VMs count by institution

Institution	Value
Indiana University	1338
University of Virginia	816
Univ. of Colorado	731
University of Arizona	356
USC	292
University of Zurich	46
George Mason University	43
Louisiana State University	35
University of Technology of Compiegne	27
Indiana University Purdue University Indianapolis	25
BioIT	23
Argonne National Laboratory	19
University of Southern California	18
University of Piemonte Orientale	16
University of Florida	15
University of Chicago	15
Jet Propulsion Laboratory	12
Purdue University	8
University of Electronic Science and Technology	4
UC San Diego	4
University of Colorado at Boulder	2
YunNan University	1
Duke University	1
Texas Tech University	1

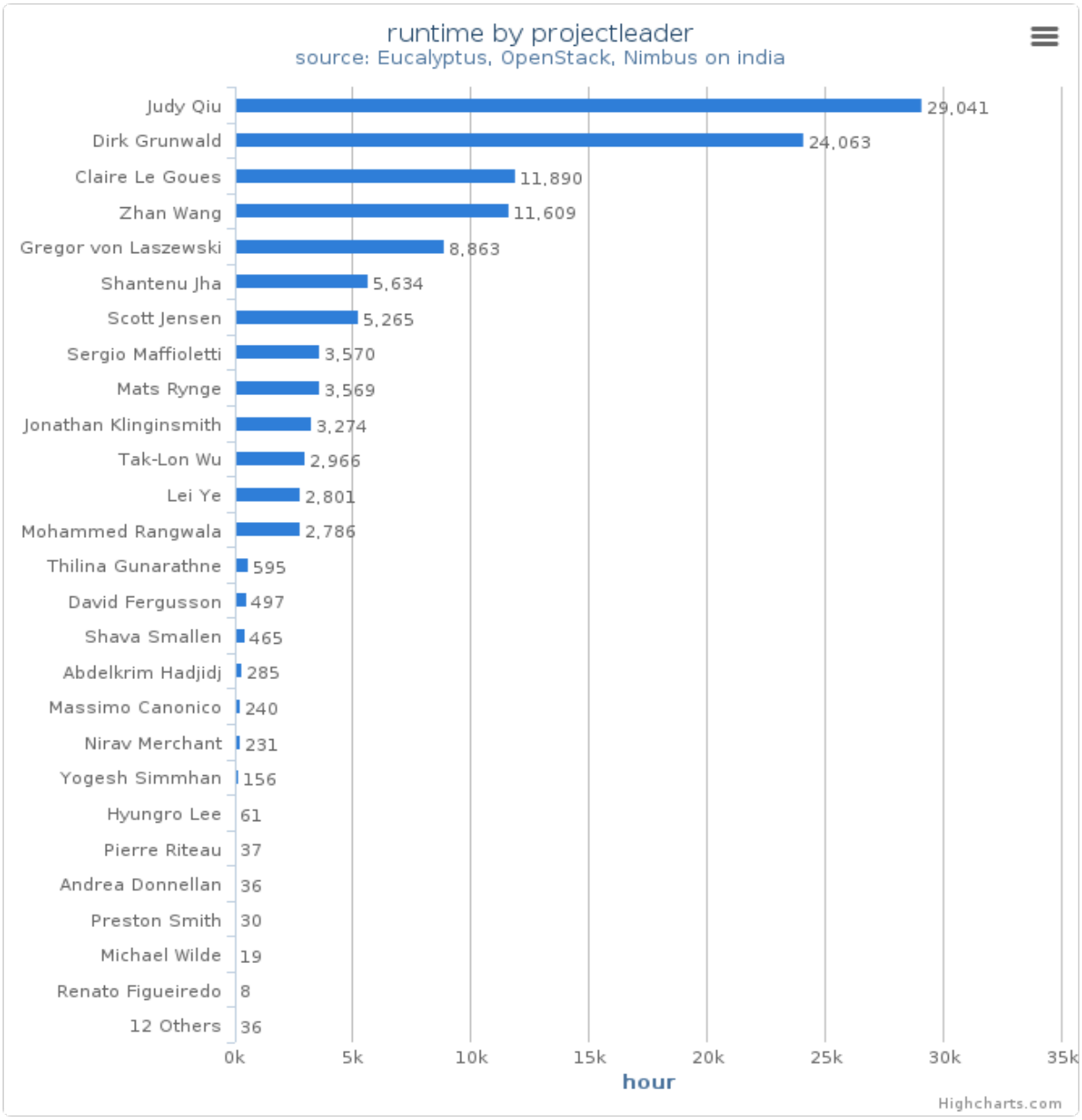

Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: October 01 – December 31, 2012
- 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.

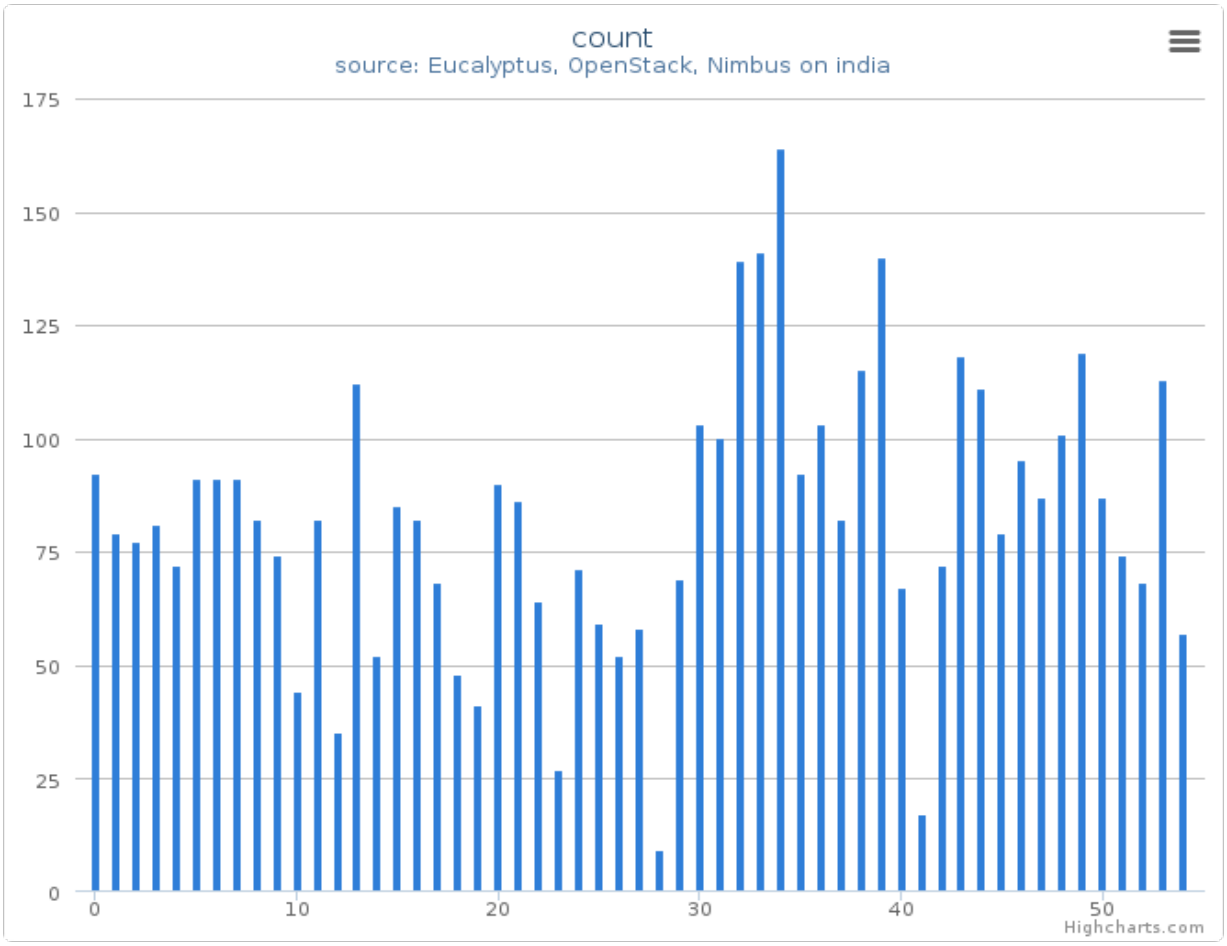

Figure 10: VMs count by systems (compute nodes) in Cluster (india)
This column chart represents VMs count among systems.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

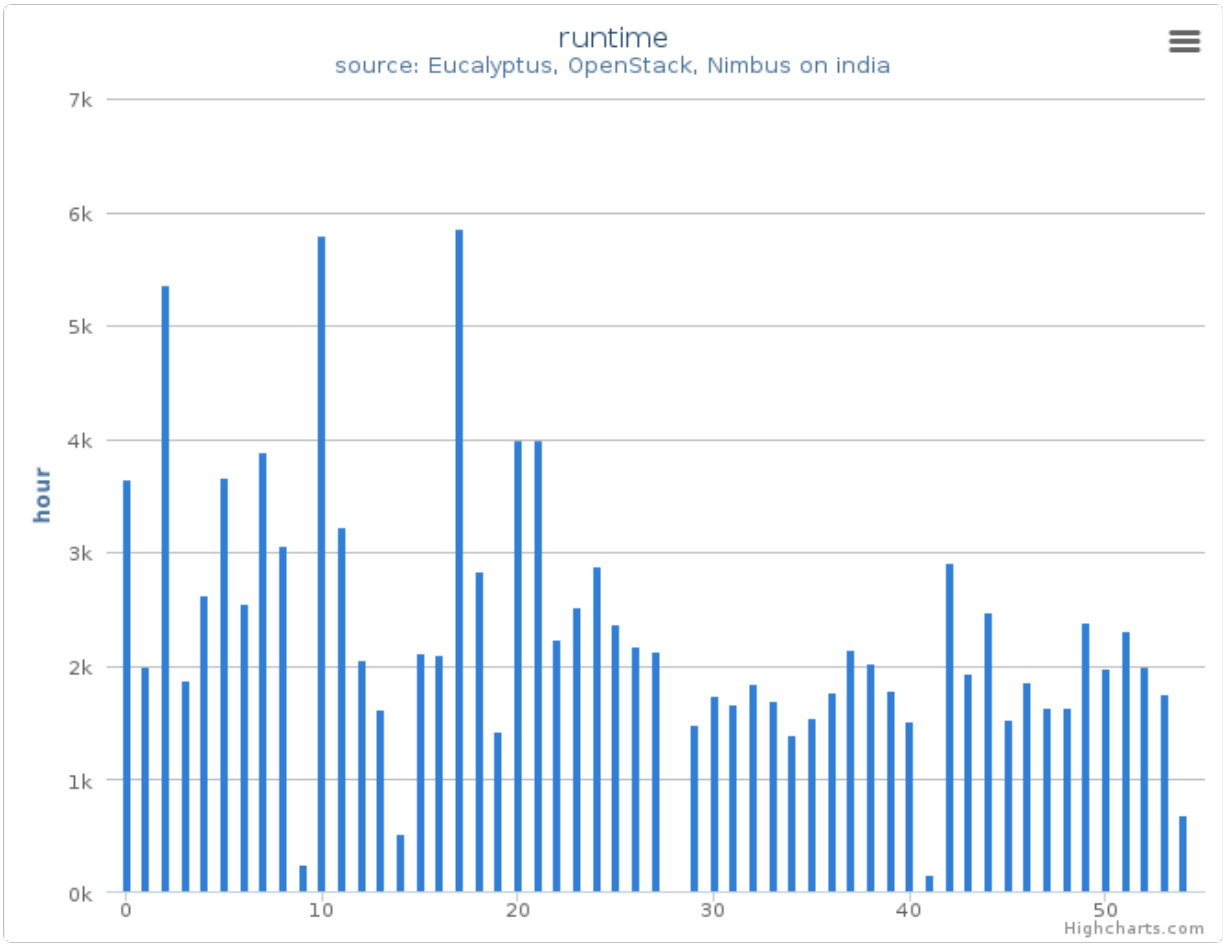

Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (india)
This column chart represents wall time among systems.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): openstack, eucalyptus
- Hostname: india

CHAPTER

FOUR

USAGE REPORT HOTEL

- Period: October 01 – December 31, 2012
- 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)

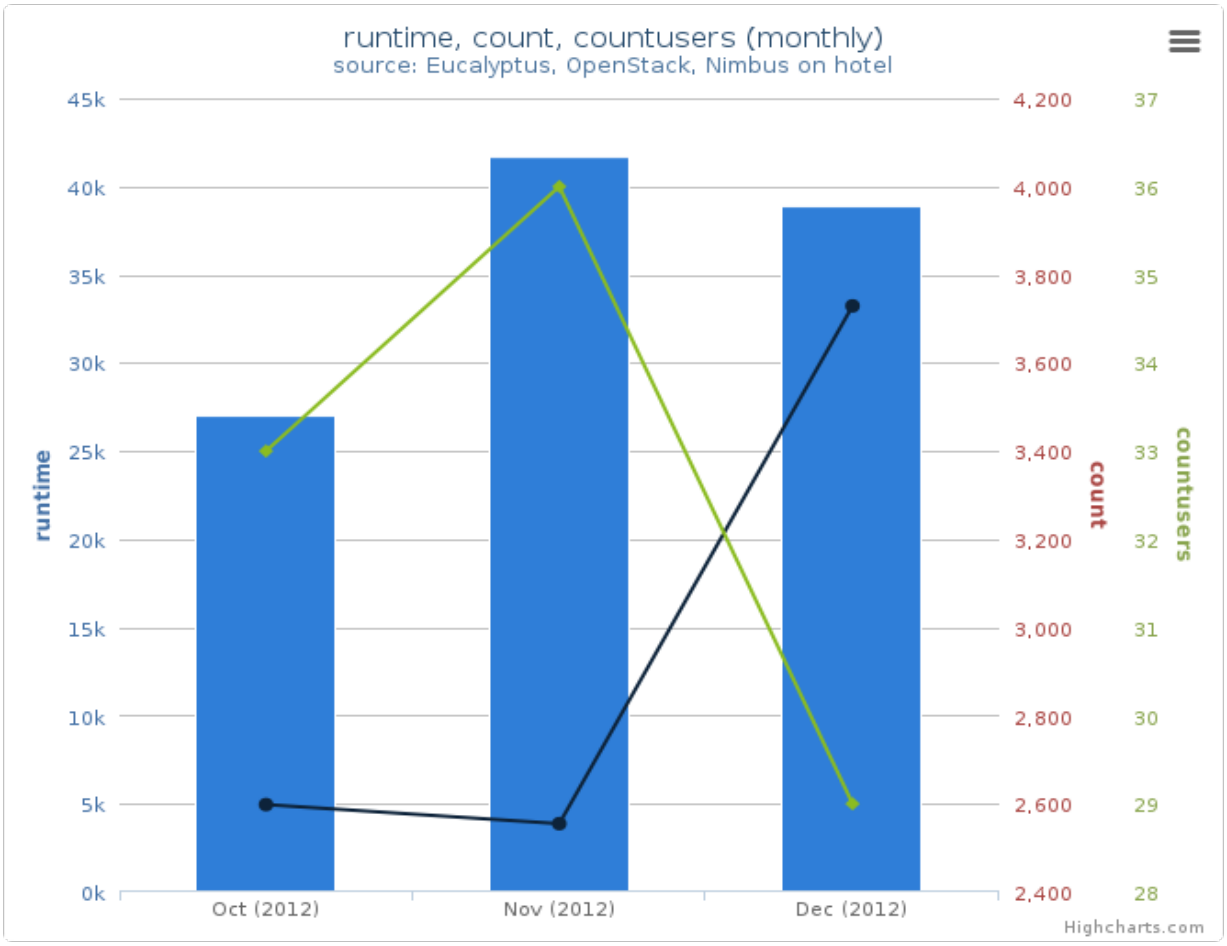

Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: October 01 – December 31, 2012
- 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)

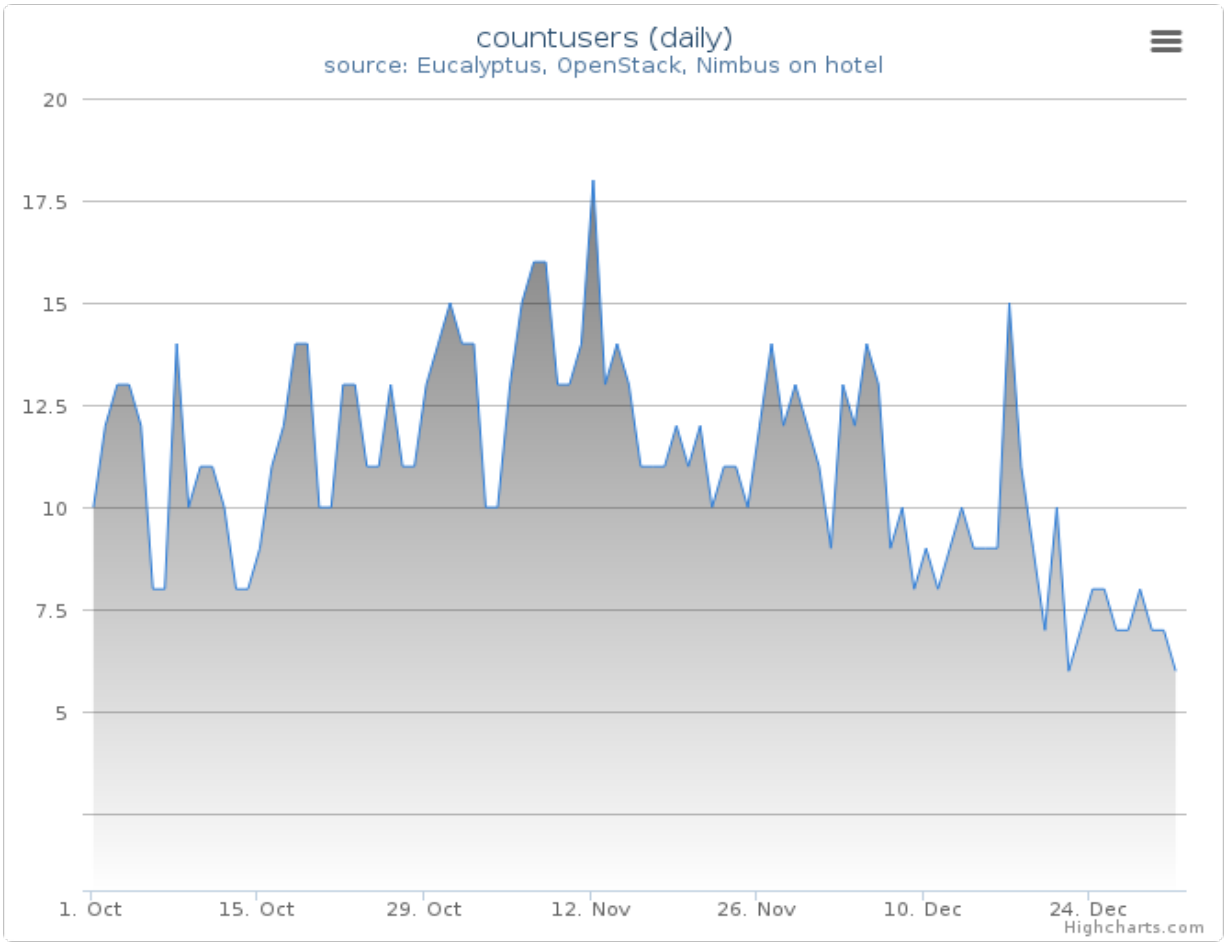

Figure 2: Users count

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: hotel

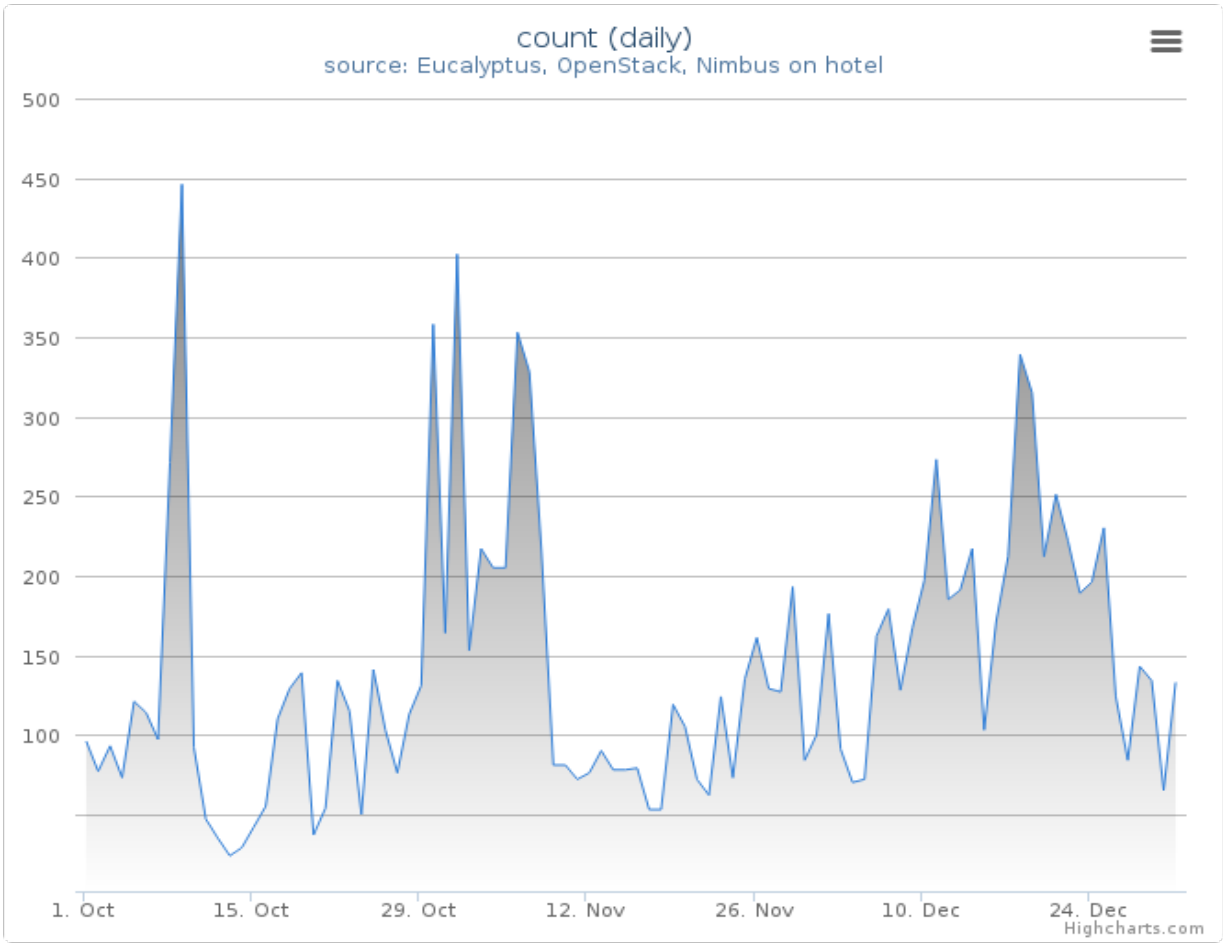

Figure 3: VMs count

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: hotel

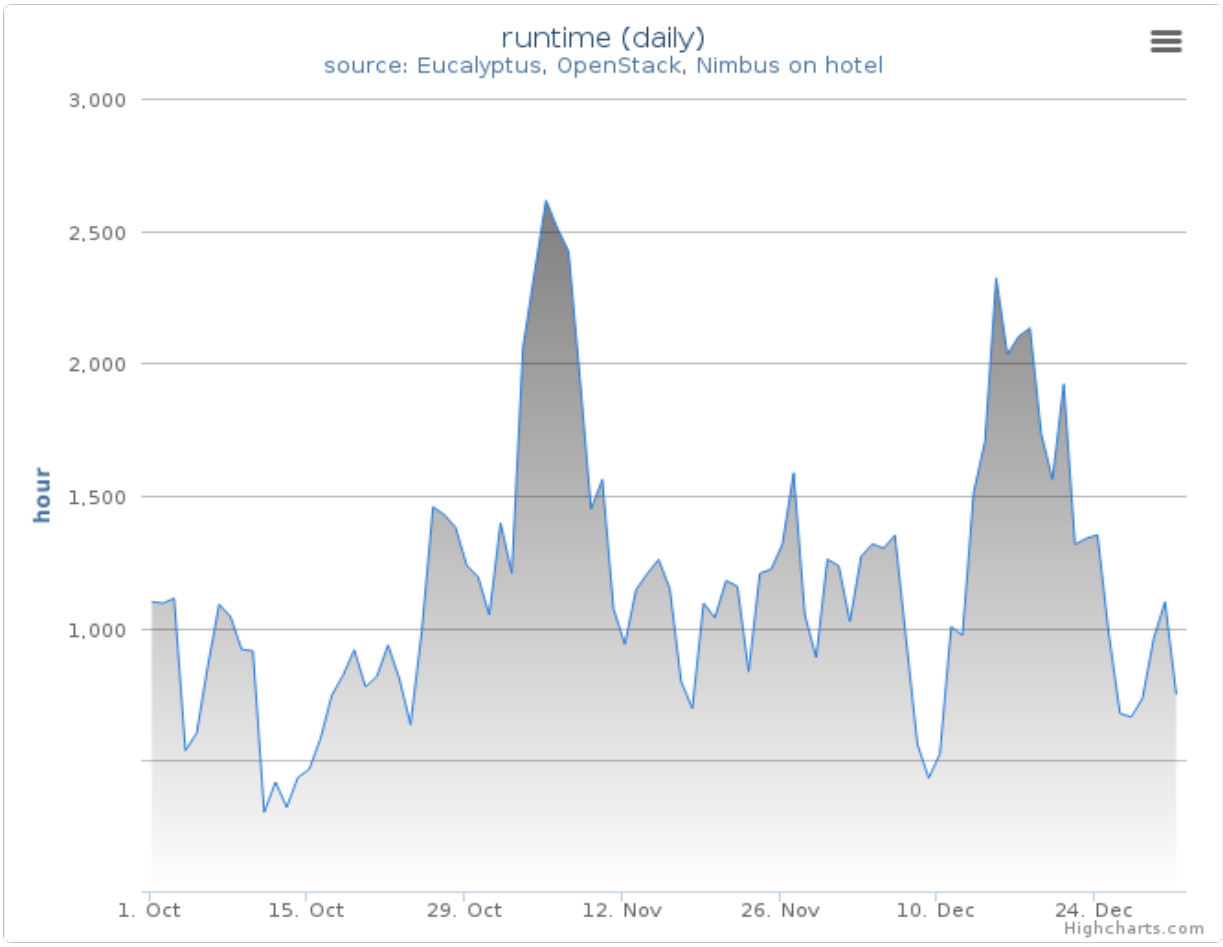

Figure 4: Wall time (hours)

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: hotel

4.2 Distribution

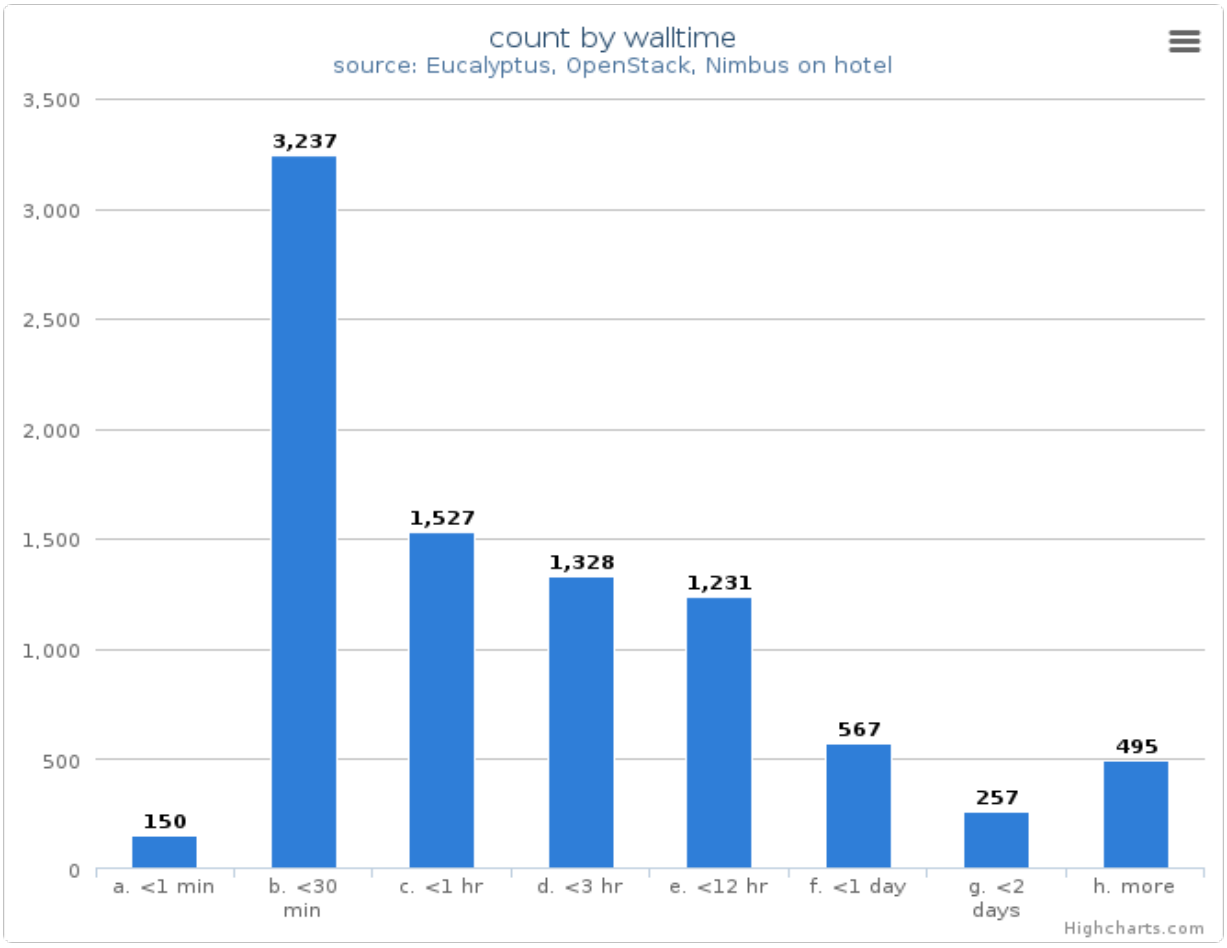

Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: hotel

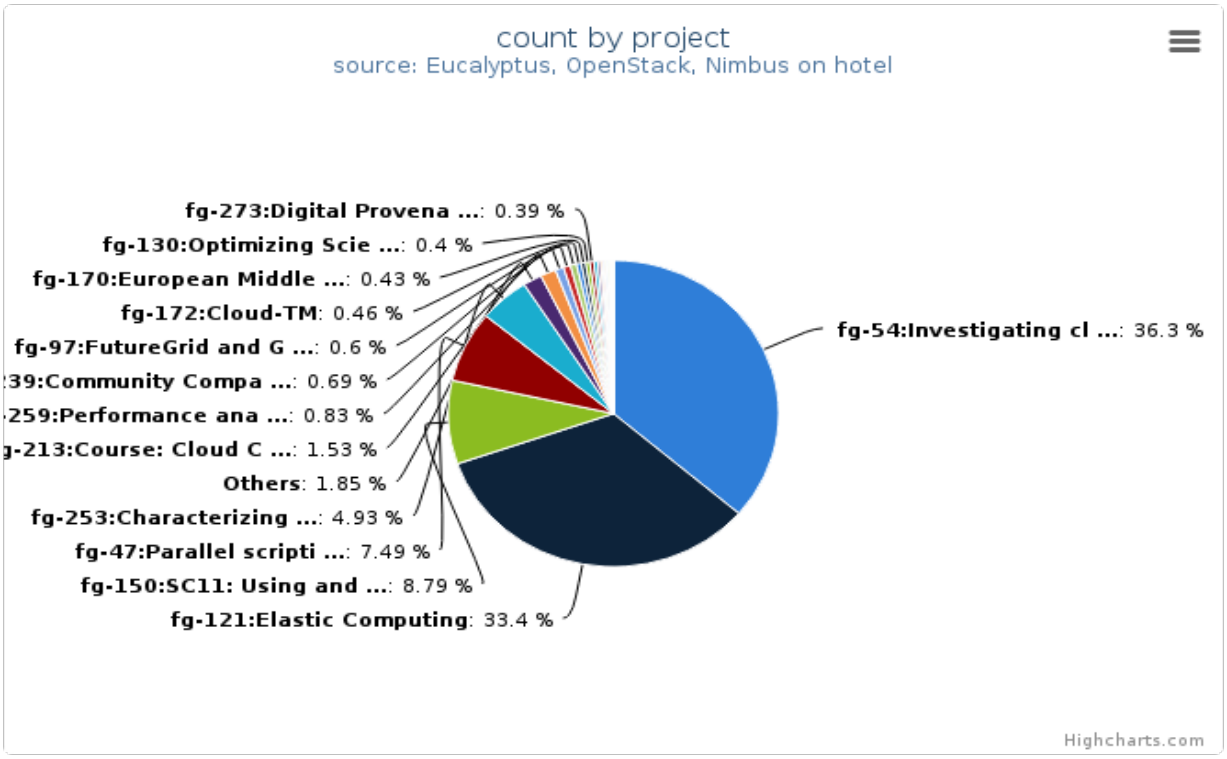

Figure 6: VMs count by project

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: hotel

Table 4.1: VMs count by project

Project	Value
fg-54:Investigating cloud computing as a solution for analyzing particle physics data	3009
fg-121:Elastic Computing	2769
fg-150:SC11: Using and Building Infrastructure Clouds for Science	729
fg-47:Parallel scripting using cloud resources	621
fg-253:Characterizing Performance of Infrastructure Clouds	409
Others	153
fg-213:Course: Cloud Computing class - second edition	127
fg-259:Performance analysis of a parallel CFD solver in cloud computing clusters	69
fg-239:Community Comparison of Cloud frameworks	57
fg-97:FutureGrid and Grid‘5000 Collaboration	50
fg-172:Cloud-TM	38

Continued on next page

Table 4.1 – continued from previous page

Project	Value
fg-170:European Middleware Initiative (EMI)	36
fg-130:Optimizing Scientific Workflows on Clouds	33
fg-273:Digital Provenance Research	32
fg-201:ExTENCI Testing, Validation, and Performance	31
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	24
fg-241:Course: Science Cloud Summer School 2012	16
fg-265:Course: SC12 Tutorial	12
fg-291:Distributed Computing course	11
fg-189:Pegasus development and improvement platform	10
fg-10:TeraGrid XD TIS(Technology Insertion Service) Technology Evaluation Laboratory	10
fg-82:FG General Software Development	9
fg-221:Course: High Performance Computing Class	8
fg-136:JGC-DataCloud-2012 paper experiments	5
fg-165:The VIEW Project	5
fg-20:Development of an information service for FutureGrid	3
fg-224:Nimbus Auto Scale	3
fg-266:Secure medical files sharing	3
fg-125:The VIEW Project	3
fg-243:Applied Cyberinfrastructure concepts	2
fg-161:XSEDE: GenesisII-Unicore6 interop testing	1
fg-15:Grid Appliance	1
fg-175:GridProphet, A workflow execution time prediction system for the Grid	1

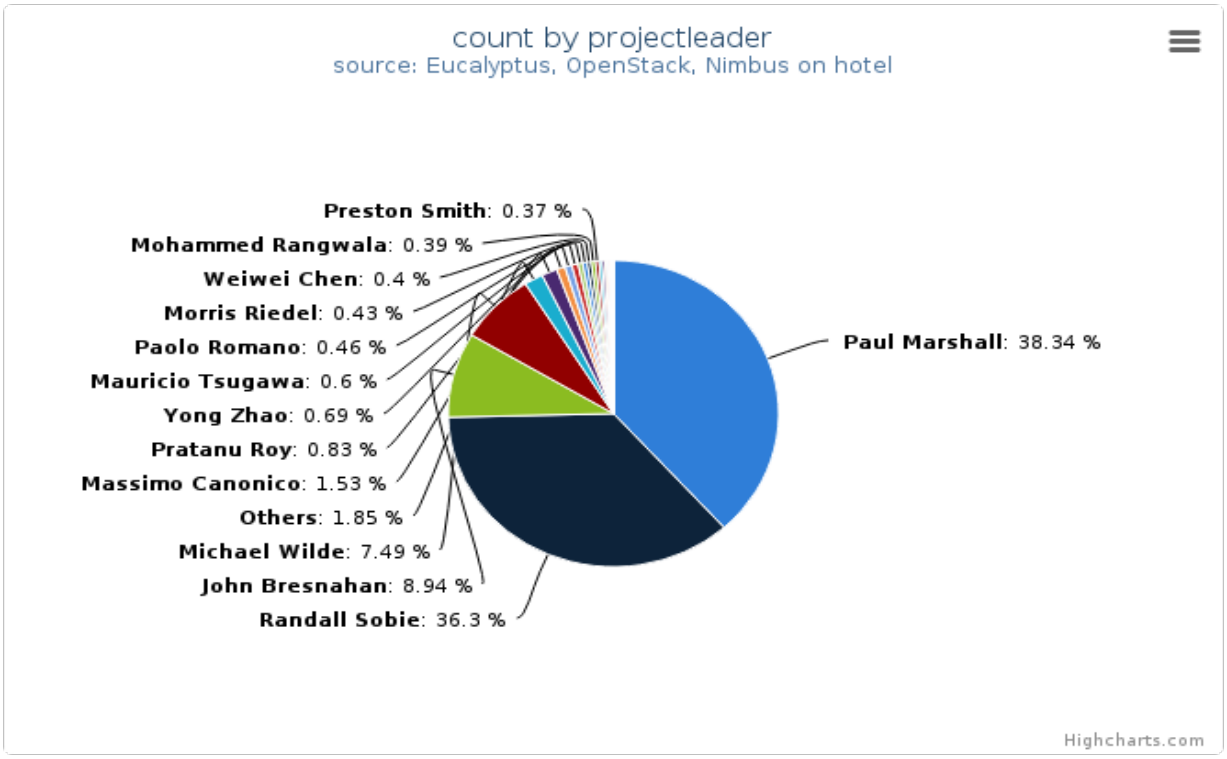

Figure 7: VMs count by project leader
This chart also illustrates the proportion of launched VM instances by project Leader. The same data in tabular form follows.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: hotel

Table 4.2: VMs count by project leader

Projectleader	Value
Paul Marshall	3178
Randall Sobie	3009
John Bresnahan	741
Michael Wilde	621
Others	153
Massimo Canonico	127
Pratanu Roy	69
Yong Zhao	57
Mauricio Tsugawa	50
Paolo Romano	38
Morris Riedel	36
Weiwei Chen	33
Mohammed Rangwala	32
Preston Smith	31
Gregor von Laszewski	25
Renato Figueiredo	24
Mats Rynge	15
David Fergusson	11
John Lockman	10
Shiyong Lu	8
Wilson Rivera	8
Pierre Riteau	3
Hyungro Lee	3
Abdelkrim Hadjidj	3
Nirav Merchant	2
Thomas Fahringer	1
Panoat Chuchaisri	1
Andrew Grimshaw	1

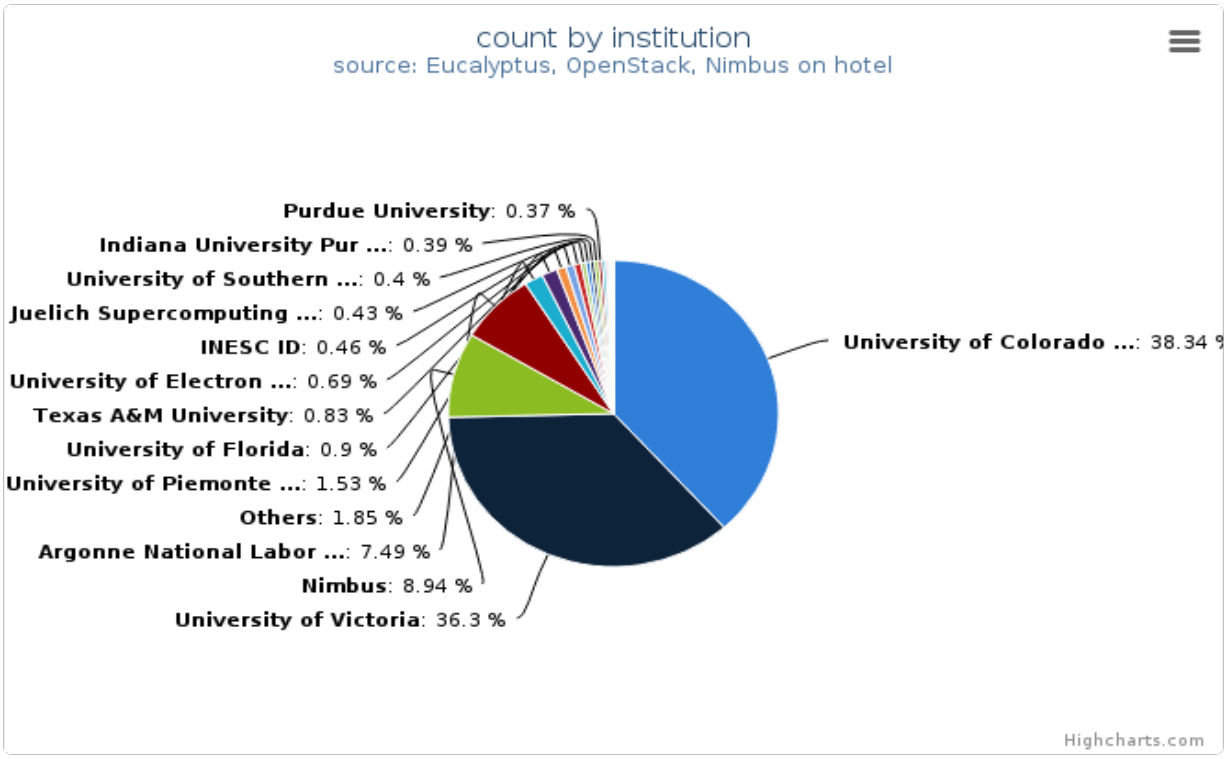

Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: hotel

Table 4.3: VMs count by institution

Institution	Value
University of Colorado at Boulder	3178
University of Victoria	3009
Nimbus	741
Argonne National Laboratory	621
Others	153
University of Piemonte Orientale	127
University of Florida	75
Texas A&M University	69
University of Electronic Science and Technology	57
INESC ID	38
Juelich Supercomputing Centre	36
University of Southern California	33
Indiana University Purdue University Indianapolis	32
Purdue University	31
Indiana University	28
USC	15
BioIT	11
University of Texas at Austin	10
Wayne State University	8
University of Puerto Rico	8
University of Technology of Compiegne	3
University of Chicago	3
University of Arizona	2
University of Innsbruck	1
University of Virginia	1

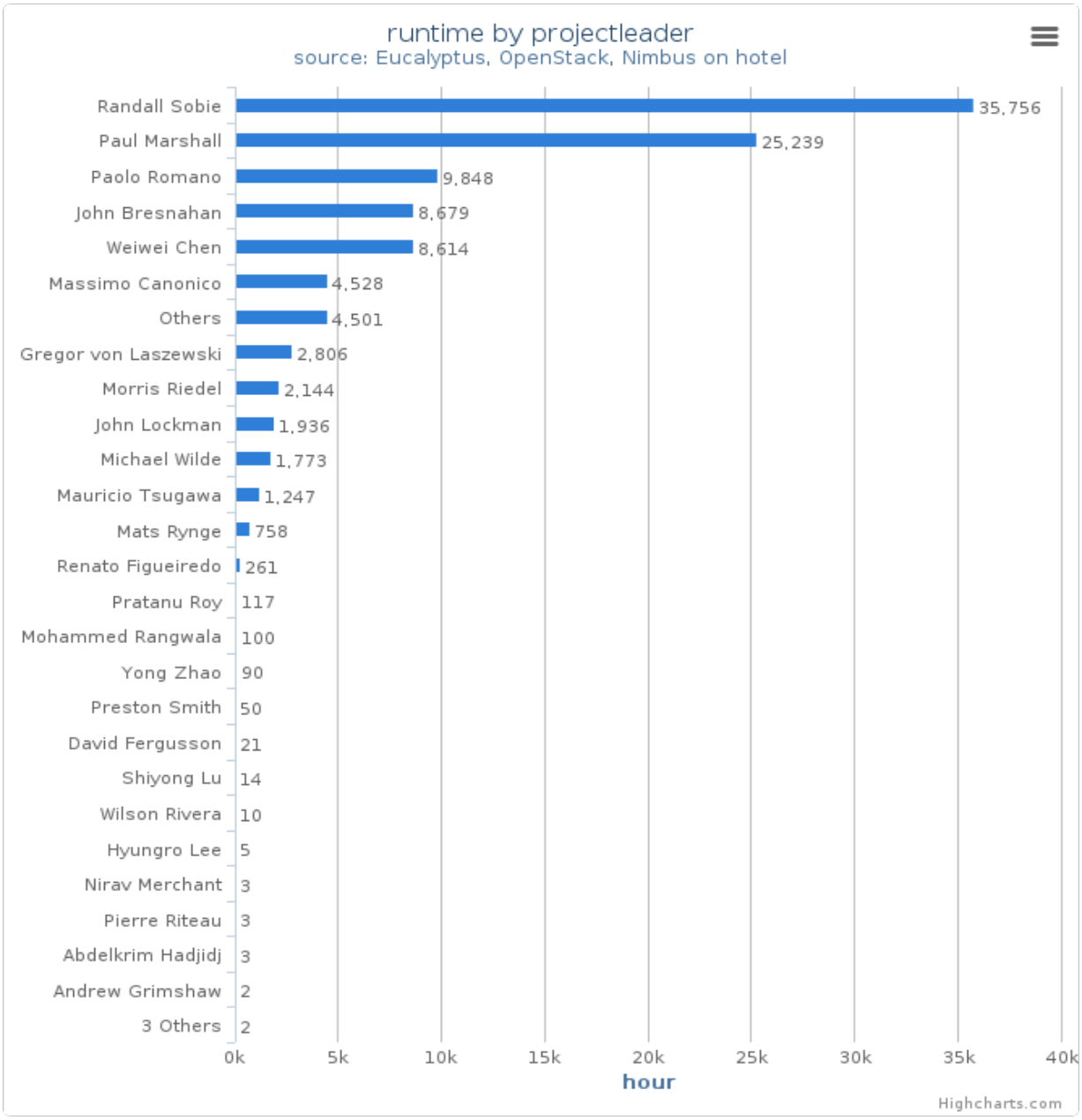

Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: October 01 – December 31, 2012
- 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.

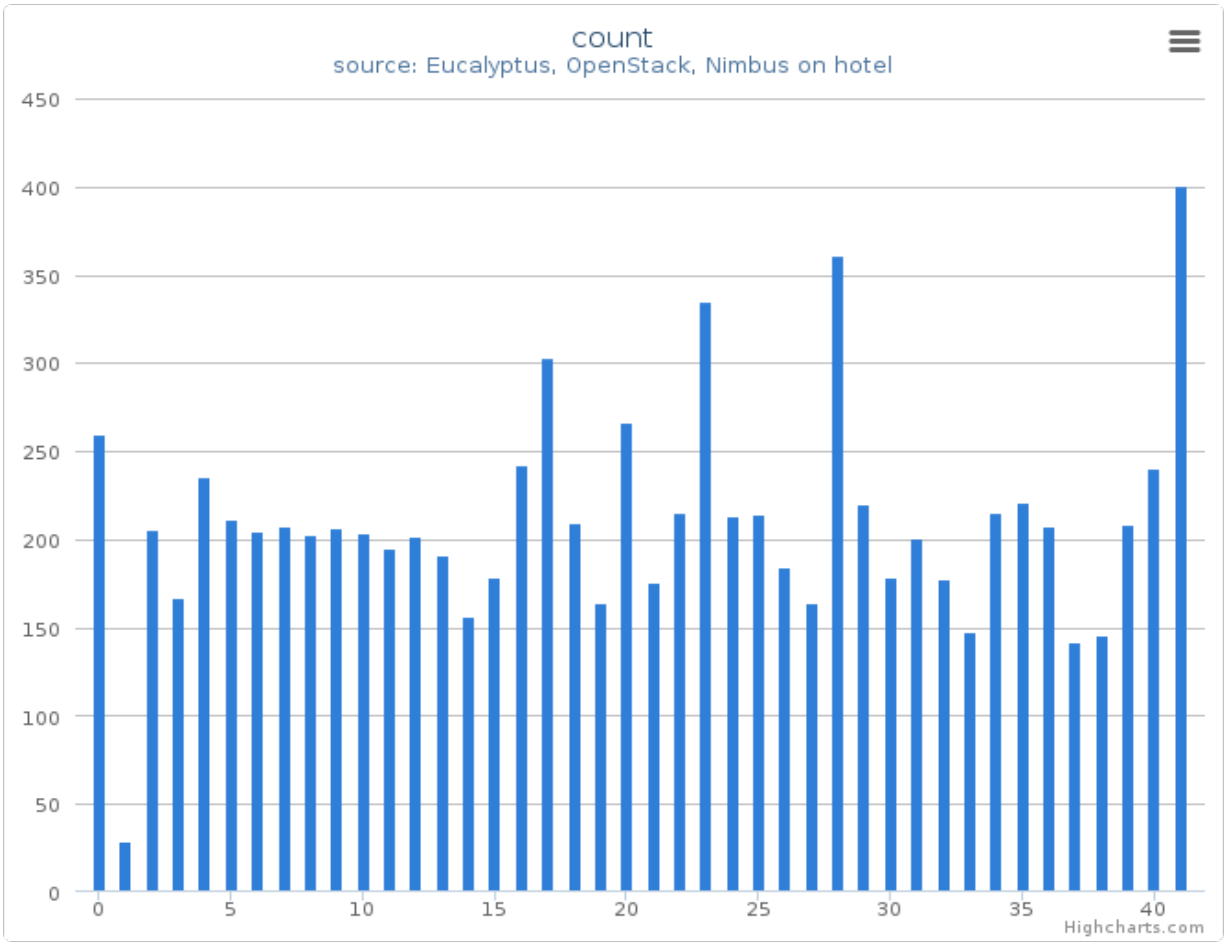

Figure 10: VMs count by systems (compute nodes) in Cluster (hotel)
This column chart represents VMs count among systems.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: hotel

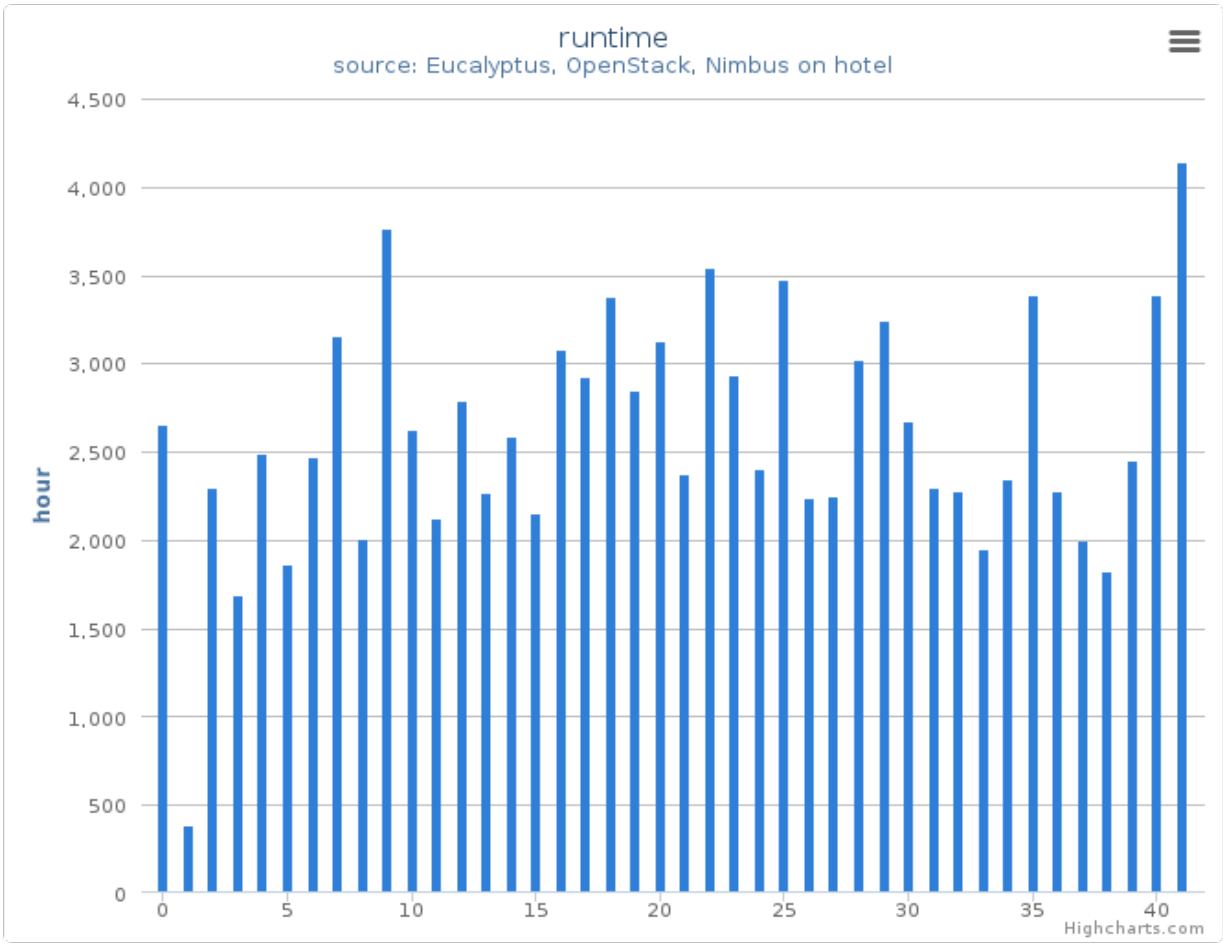

Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (hotel)
This column chart represents wall time among systems.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: hotel

CHAPTER

FIVE

USAGE REPORT ALAMO

- Period: October 01 – December 31, 2012
- 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)

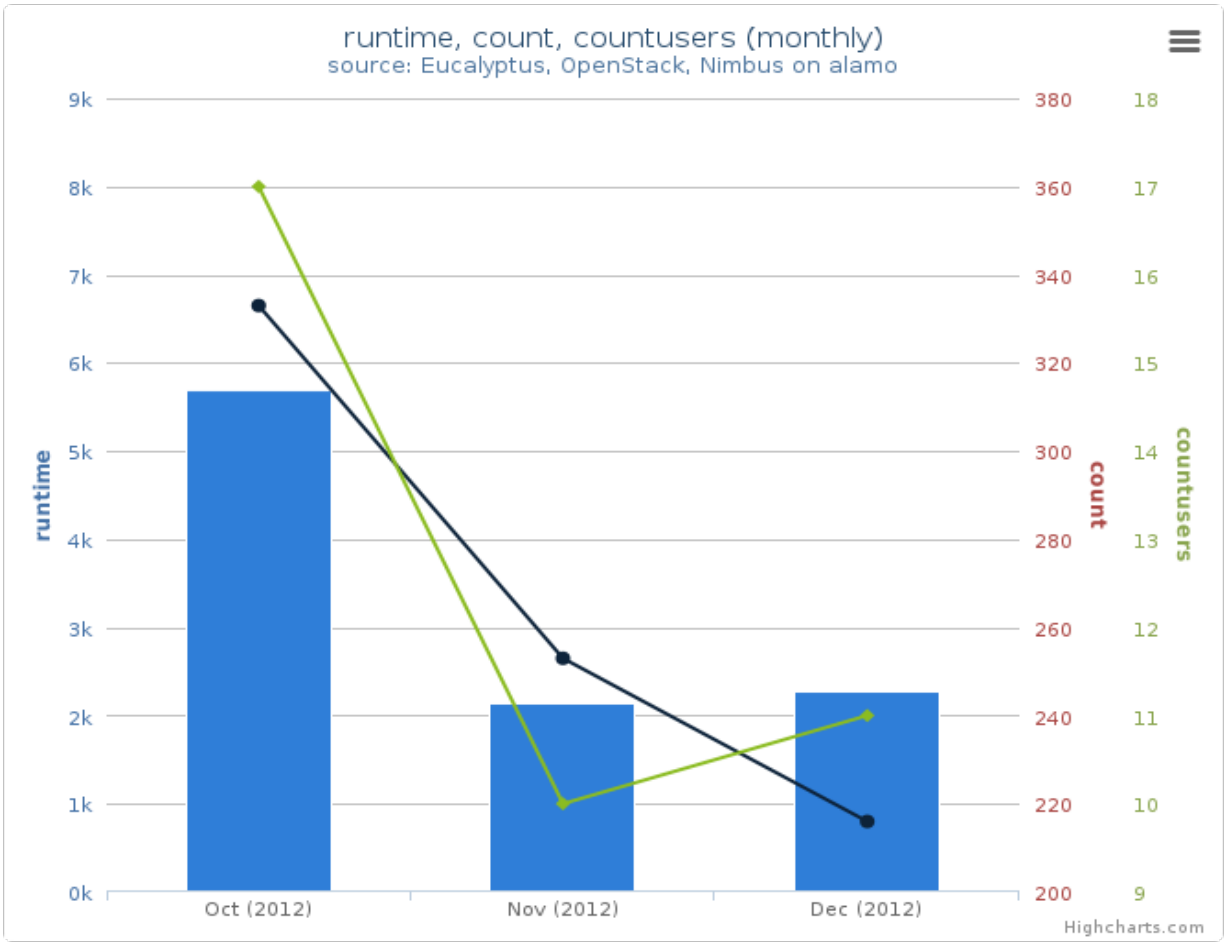

Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: October 01 – December 31, 2012
- 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)

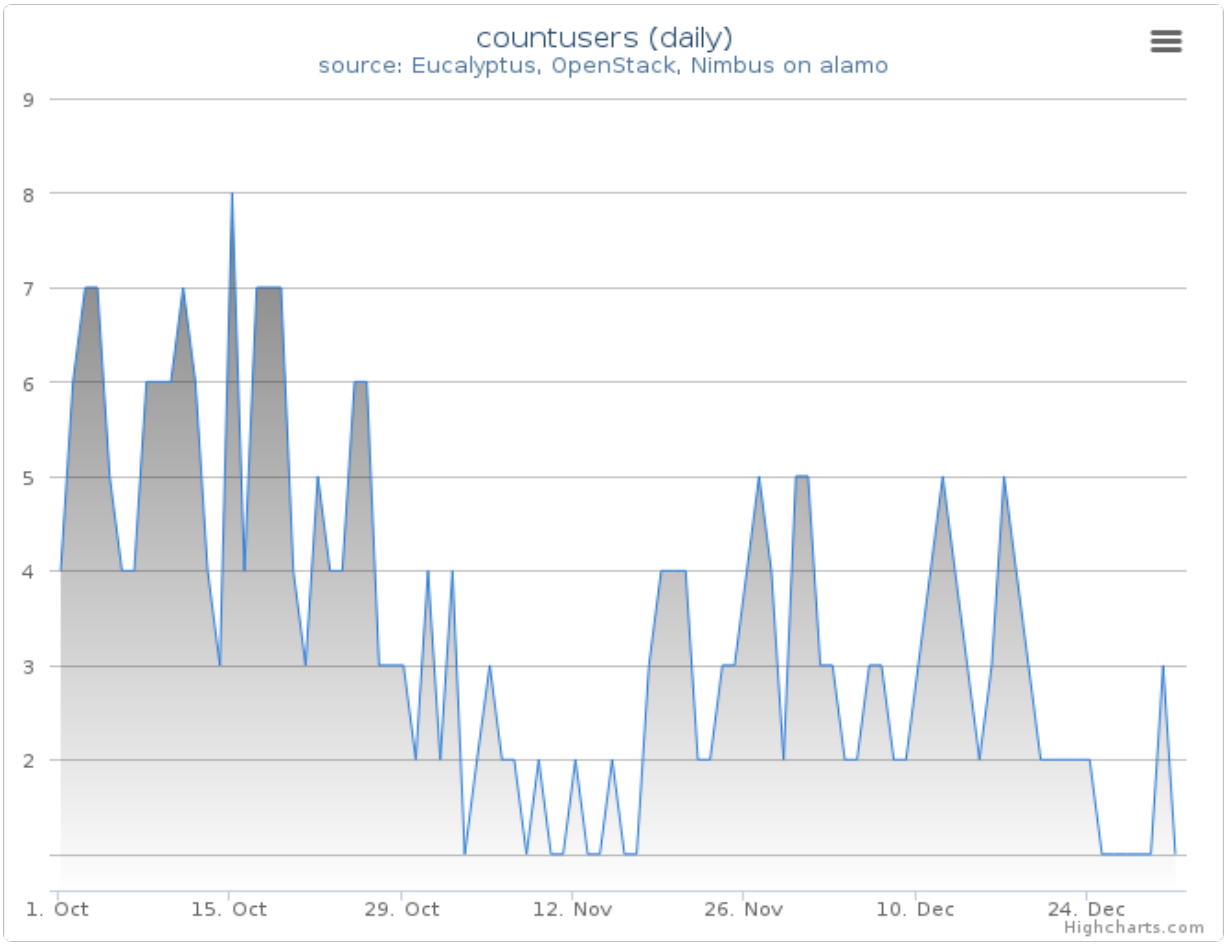

Figure 2: Users count

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: alamo

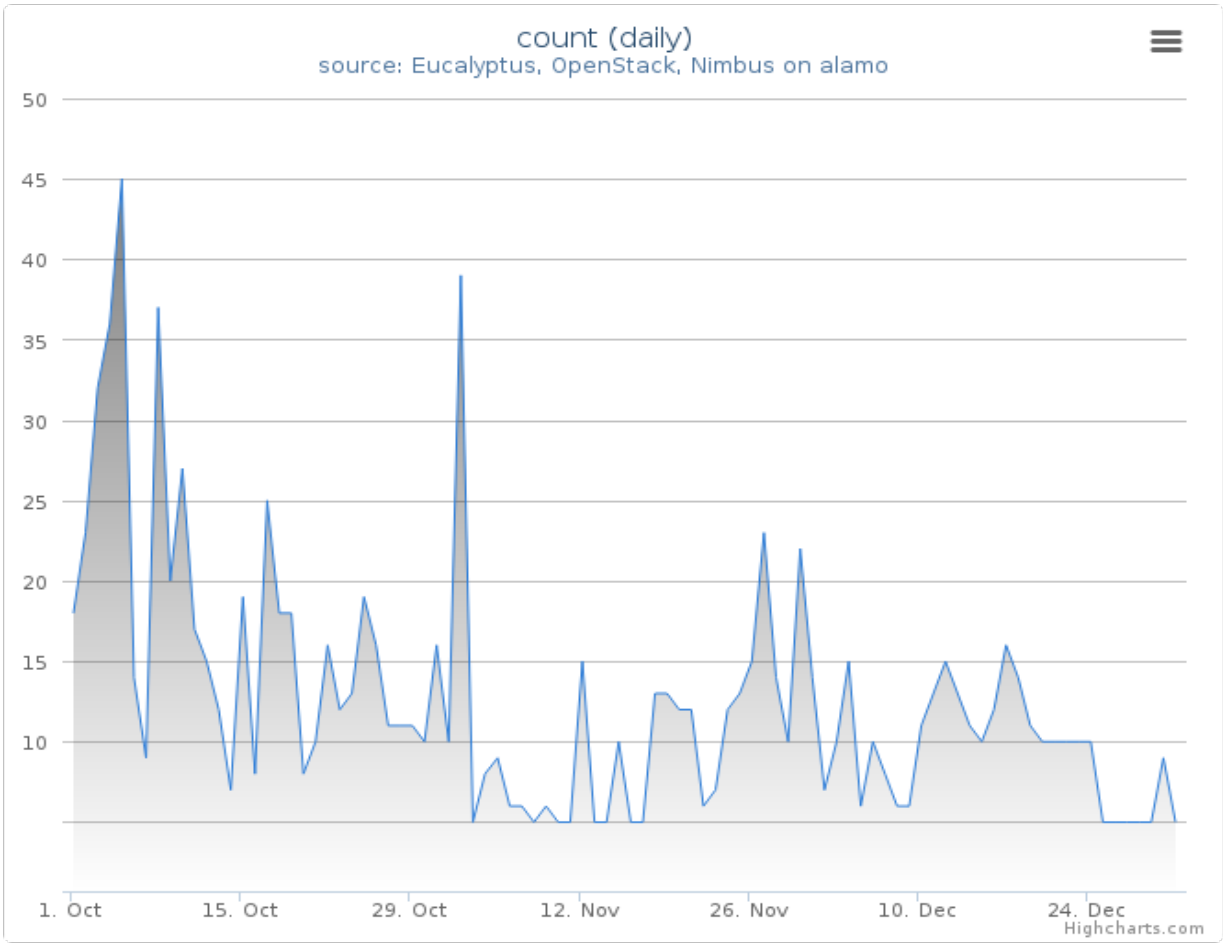

Figure 3: VMs count

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: alamo

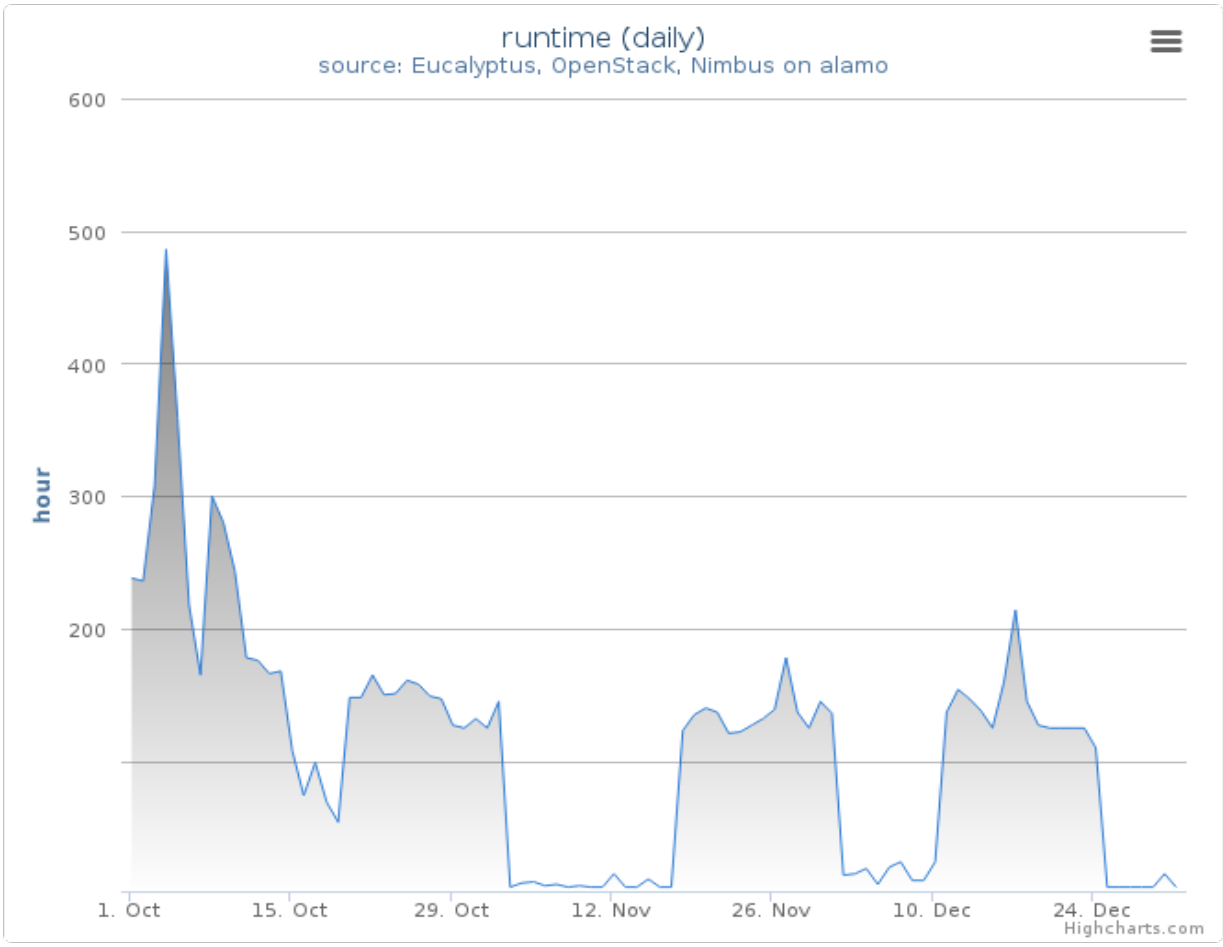

Figure 4: Wall time (hours)
This time series chart represents daily wall time (hours) for cloud services and shows historical changes during the period.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: alamo

5.2 Distribution

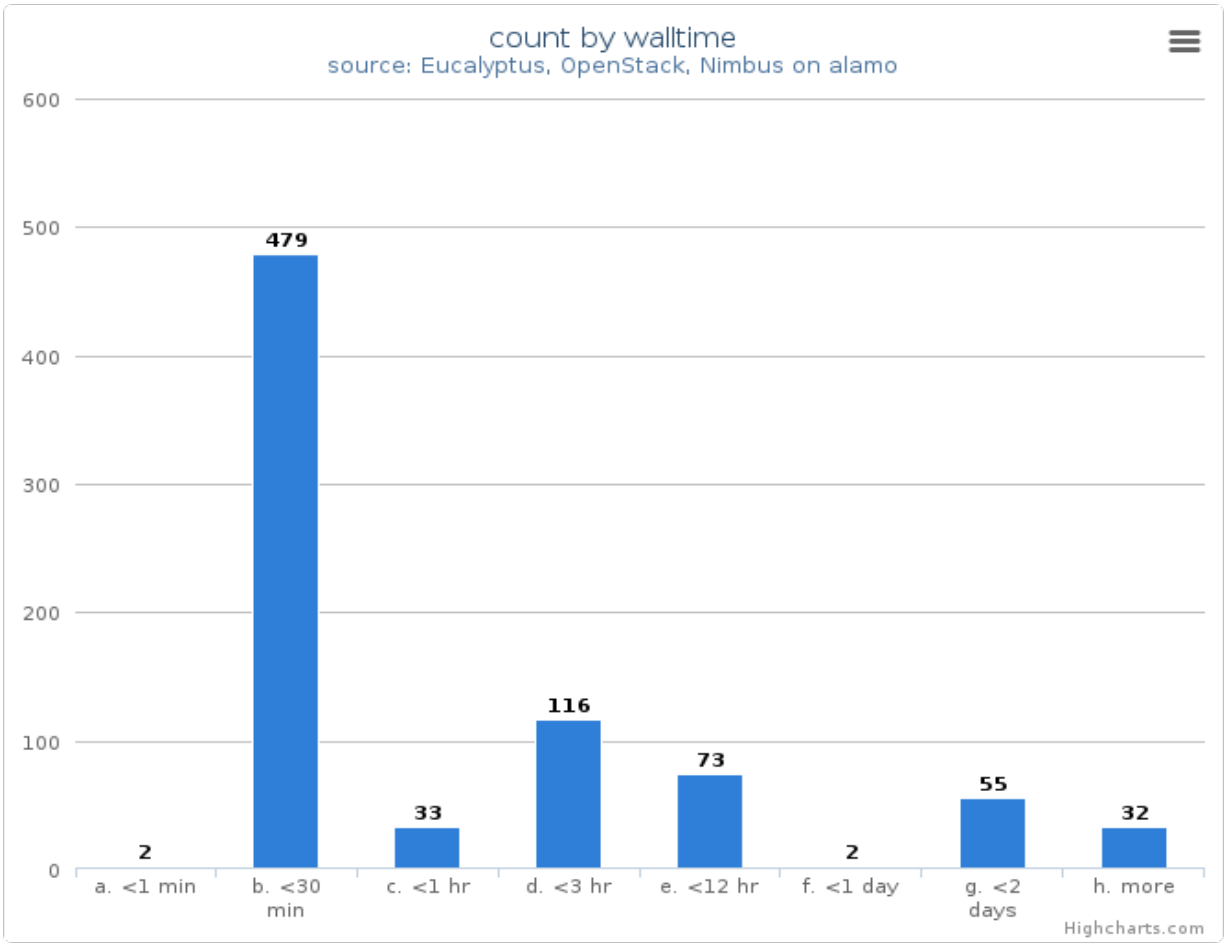

Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: alamo

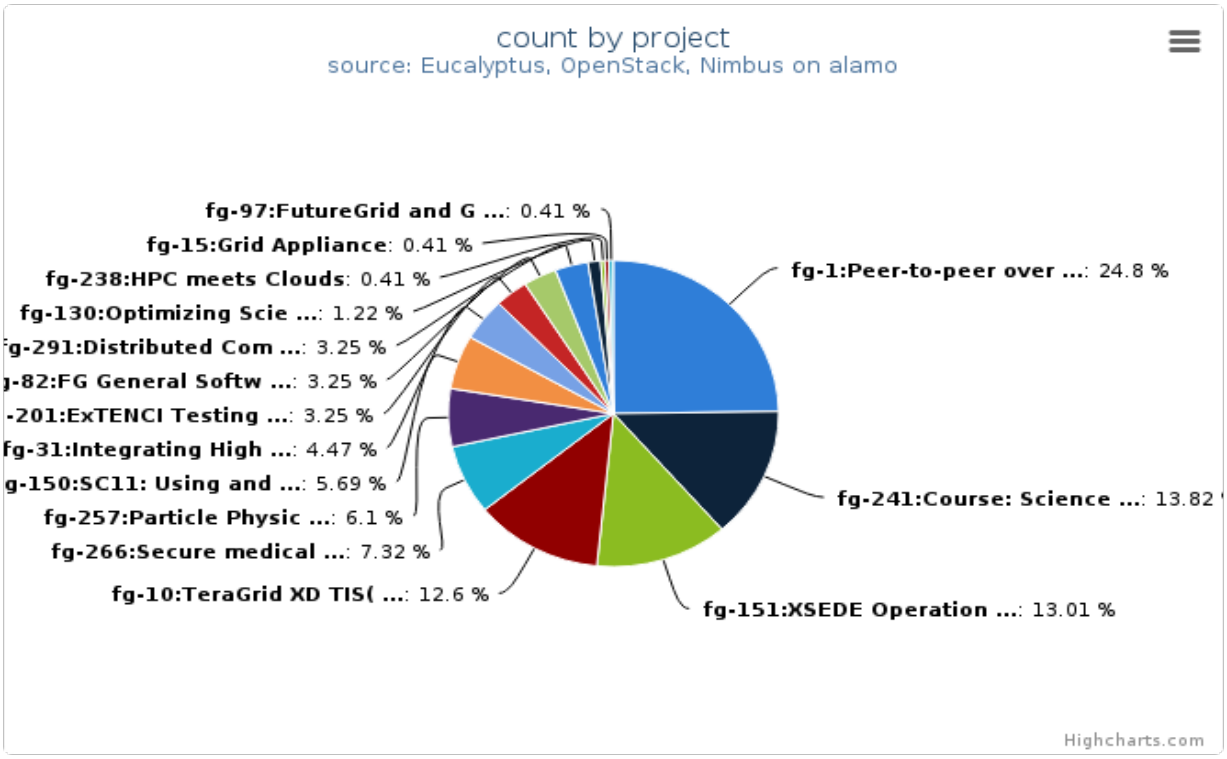

Figure 6: VMs count by project
This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: alamo

Table 5.1: VMs count by project

Project	Value
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	61
fg-241:Course: Science Cloud Summer School 2012	34
fg-151:XSEDE Operations Group	32
fg-10:TeraGrid XD TIS(Technology Insertion Service) Technology Evaluation Laboratory	31
fg-266:Secure medical files sharing	18
fg-257:Particle Physics Data analysis cluster for ATLAS LHC experiment	15
fg-150:SC11: Using and Building Infrastructure Clouds for Science	14
fg-31:Integrating High Performance Computing in Research and Education for Simulation, Visualization and RealTime Prediction	11
fg-201:ExTENCI Testing, Validation, and Performance	8
fg-82:FG General Software Development	8
fg-291:Distributed Computing course	8
fg-130:Optimizing Scientific Workflows on Clouds	3
fg-238:HPC meets Clouds	1
fg-15:Grid Appliance	1
fg-97:FutureGrid and Grid'5000 Collaboration	1

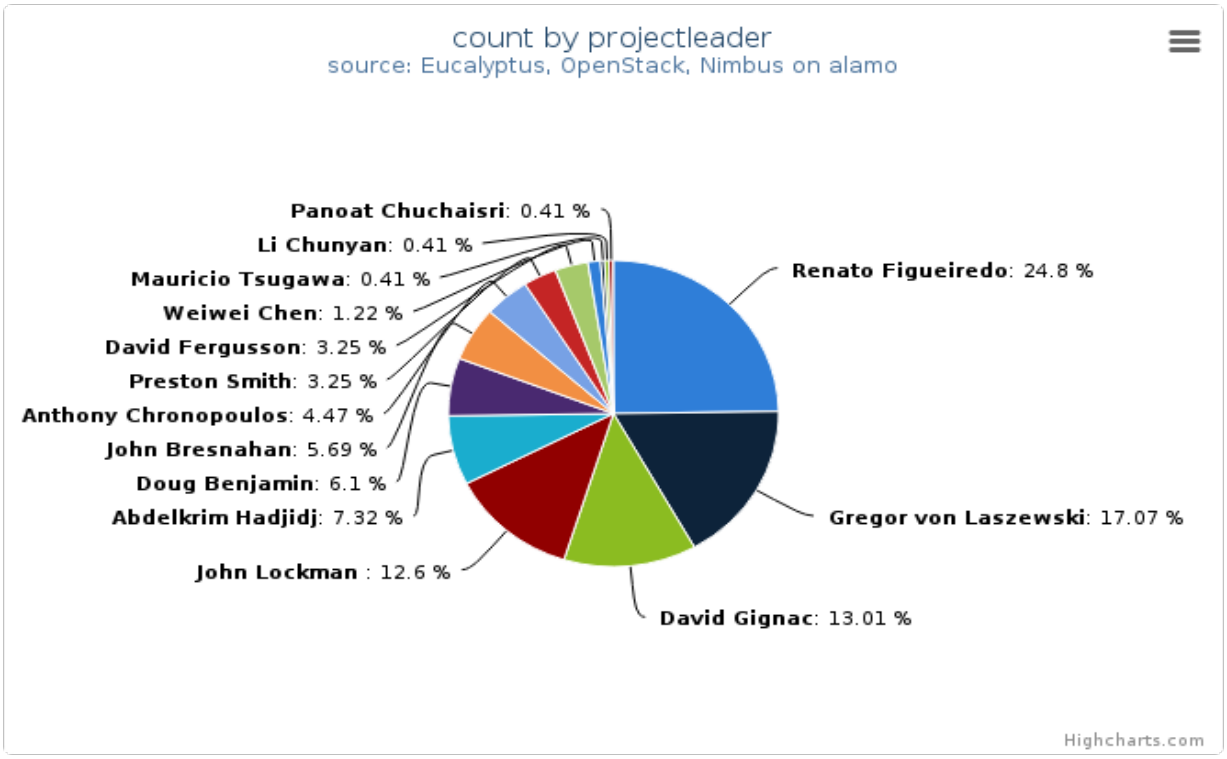

Figure 7: VMs count by project leader

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

- Period: October 01 – December 31, 2012

- Cloud(IaaS): nimbus
- Hostname: alamo

Table 5.2: VMs count by project leader

Projectleader	Value
Renato Figueiredo	61
Gregor von Laszewski	42
David Gignac	32
John Lockman	31
Abdelkrim Hadjidj	18
Doug Benjamin	15
John Bresnahan	14
Anthony Chronopoulos	11
Preston Smith	8
David Fergusson	8
Weiwei Chen	3
Mauricio Tsugawa	1
Li Chunyan	1
Panoat Chuchaisri	1

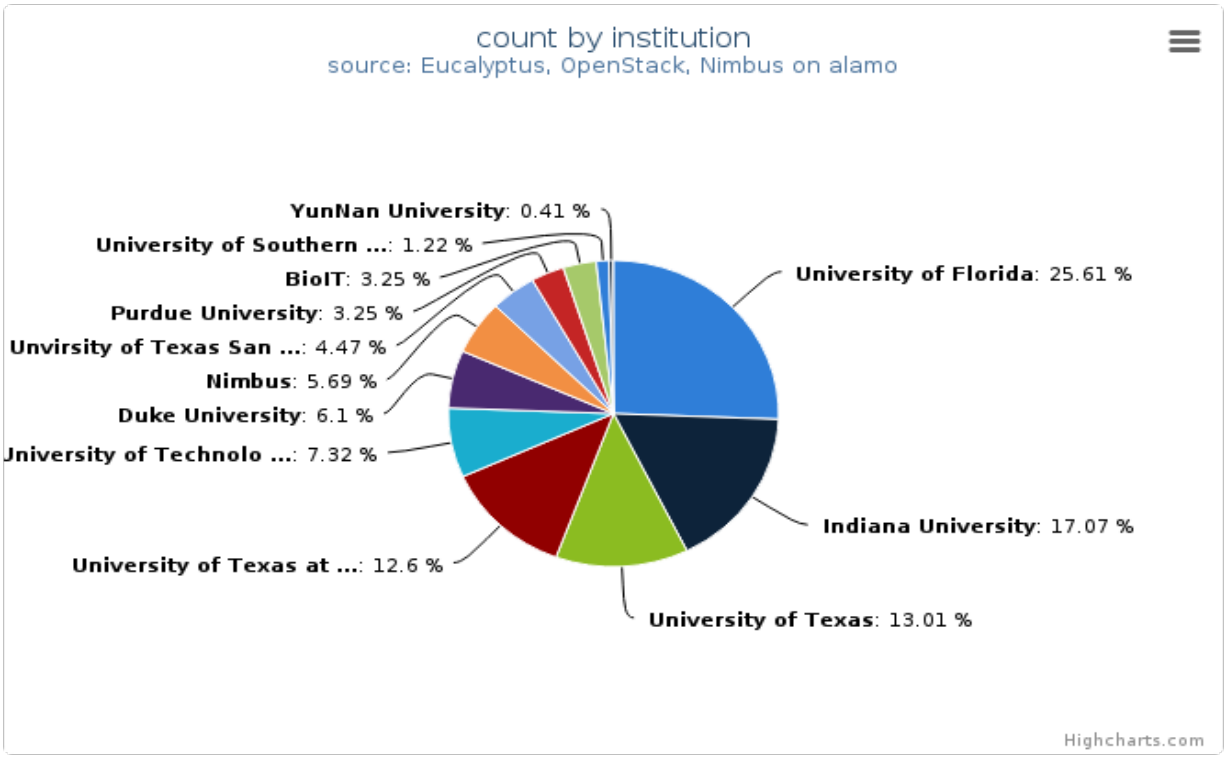

Figure 8: VMs count by institution

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: alamo

Table 5.3: VMs count by institution

Institution	Value
University of Florida	63
Indiana University	42
University of Texas	32
University of Texas at Austin	31
University of Technology of Compiegne	18
Duke University	15
Nimbus	14
Unvirsity of Texas San Antonio	11
Purdue University	8
BioIT	8
University of Southern California	3
YunNan University	1

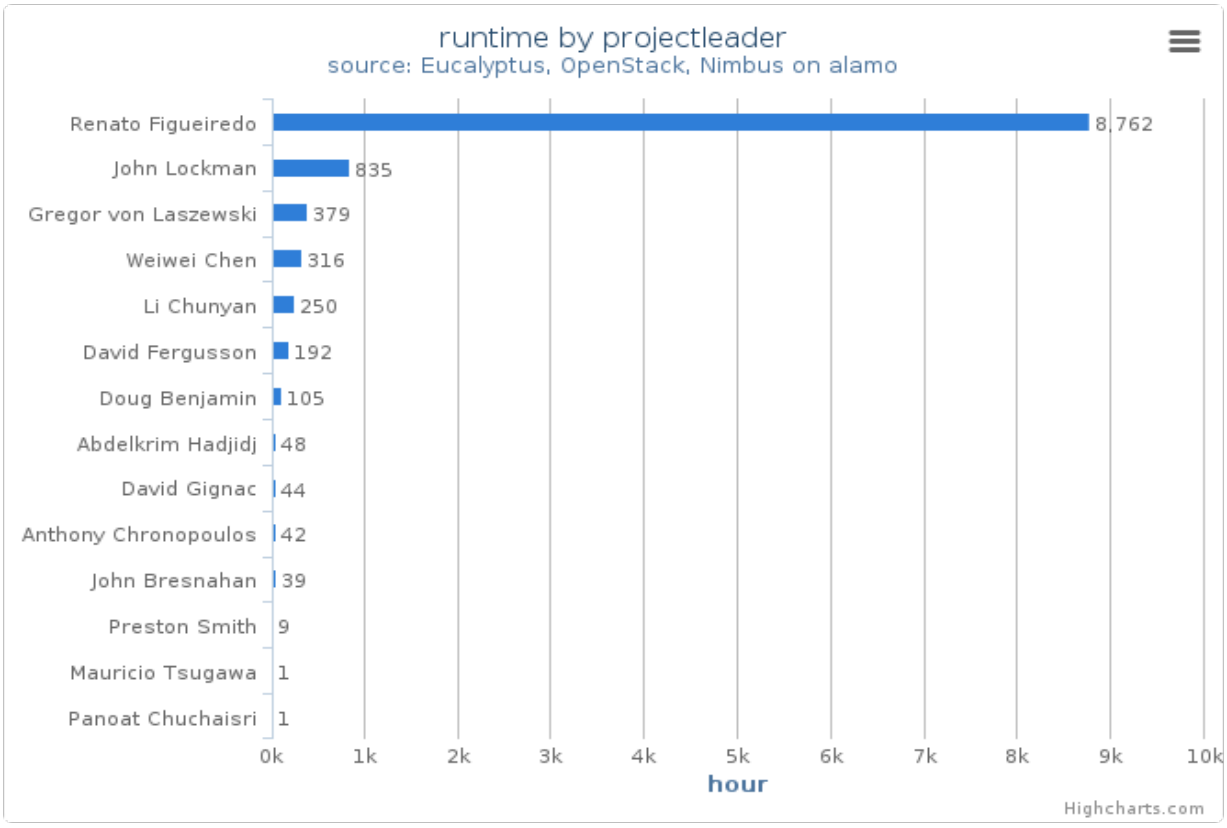

Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: October 01 – December 31, 2012

- 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.

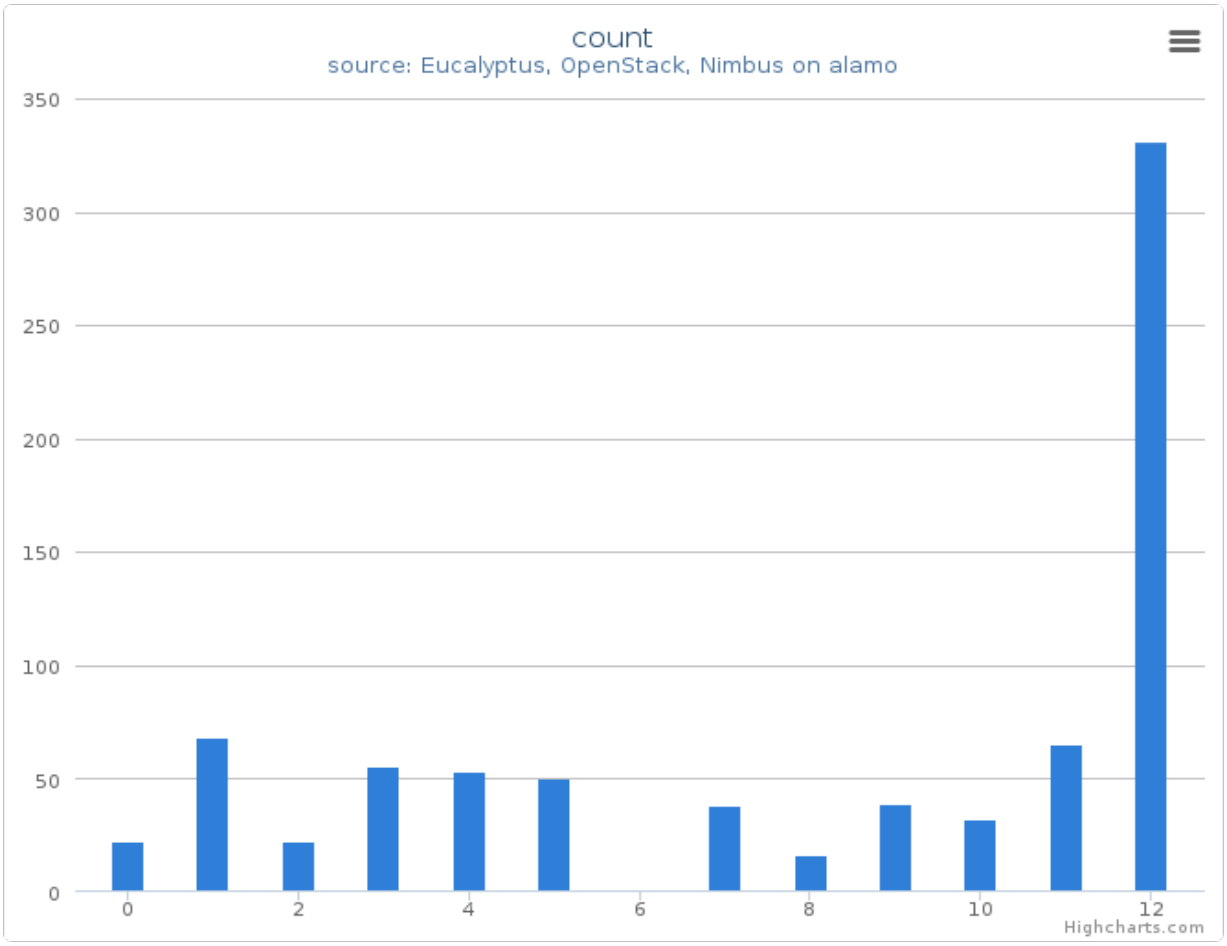

Figure 10: VMs count by systems (compute nodes) in Cluster (alamo)
This column chart represents VMs count among systems.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: alamo

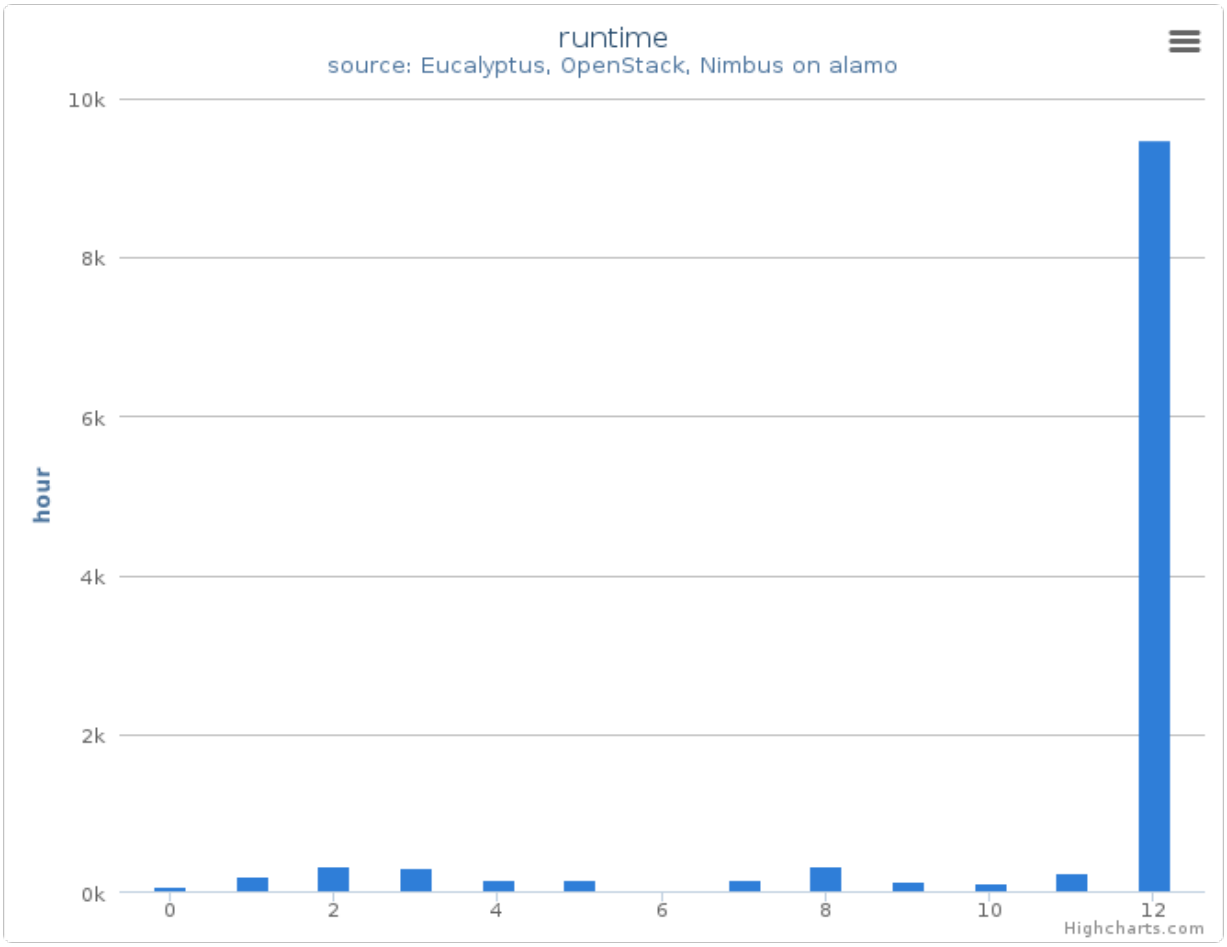

Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (alamo)
This column chart represents wall time among systems.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: alamo

CHAPTER

SIX

USAGE REPORT FOXTROT

- Period: October 01 – December 31, 2012
- 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)

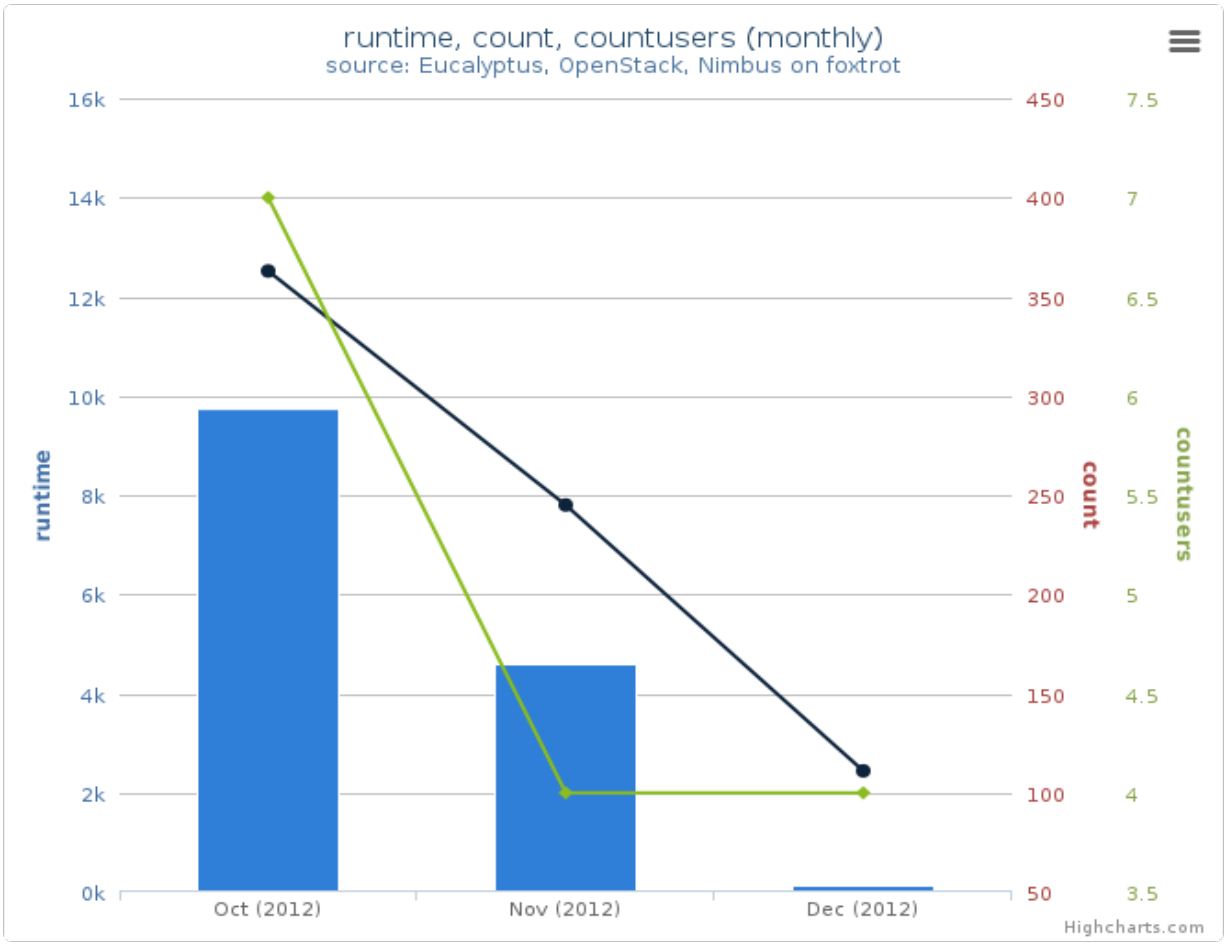

Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: October 01 – December 31, 2012
- 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)

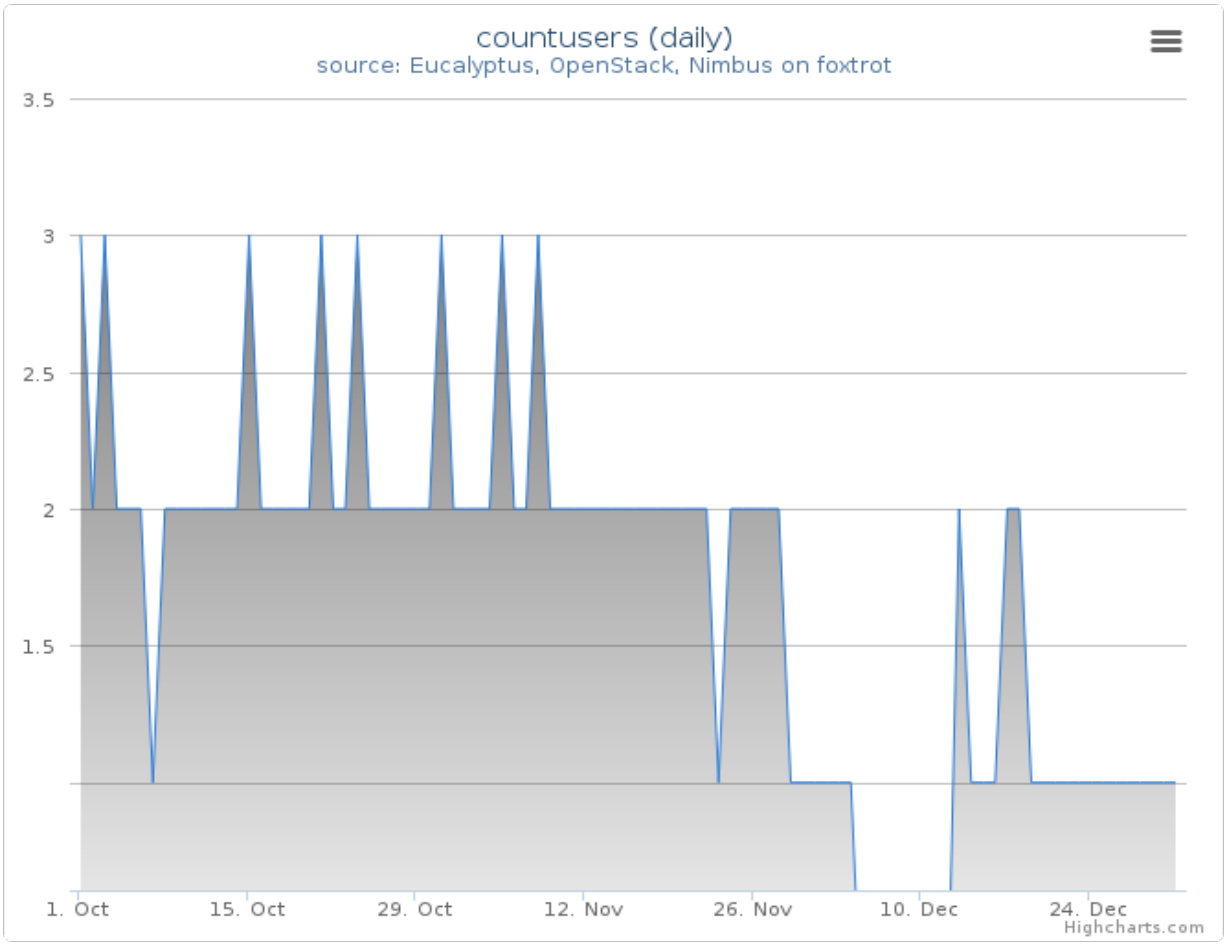

Figure 2: Users count

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: foxtrot

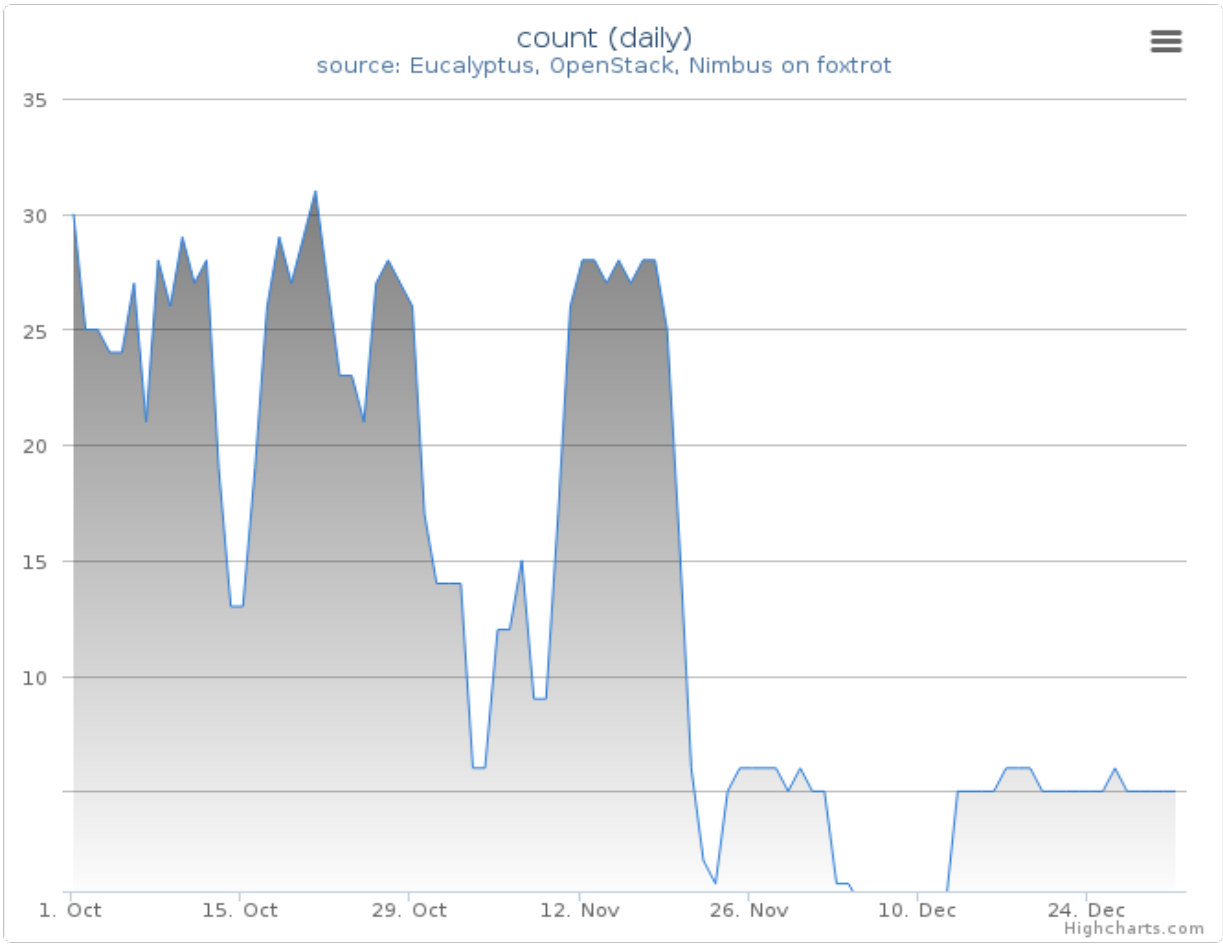

Figure 3: VMs count

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: foxtrot

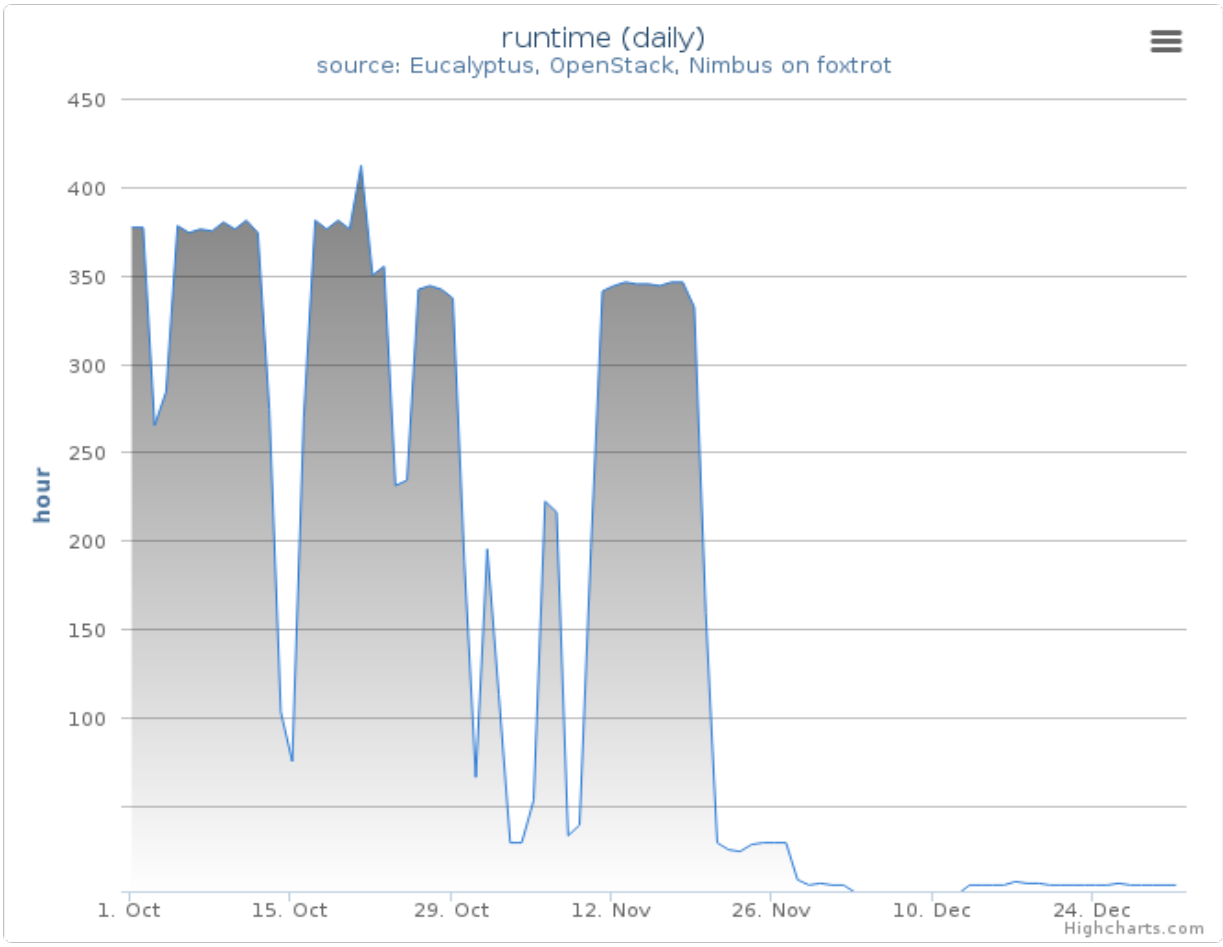

Figure 4: Wall time (hours)

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: foxtrot

6.2 Distribution

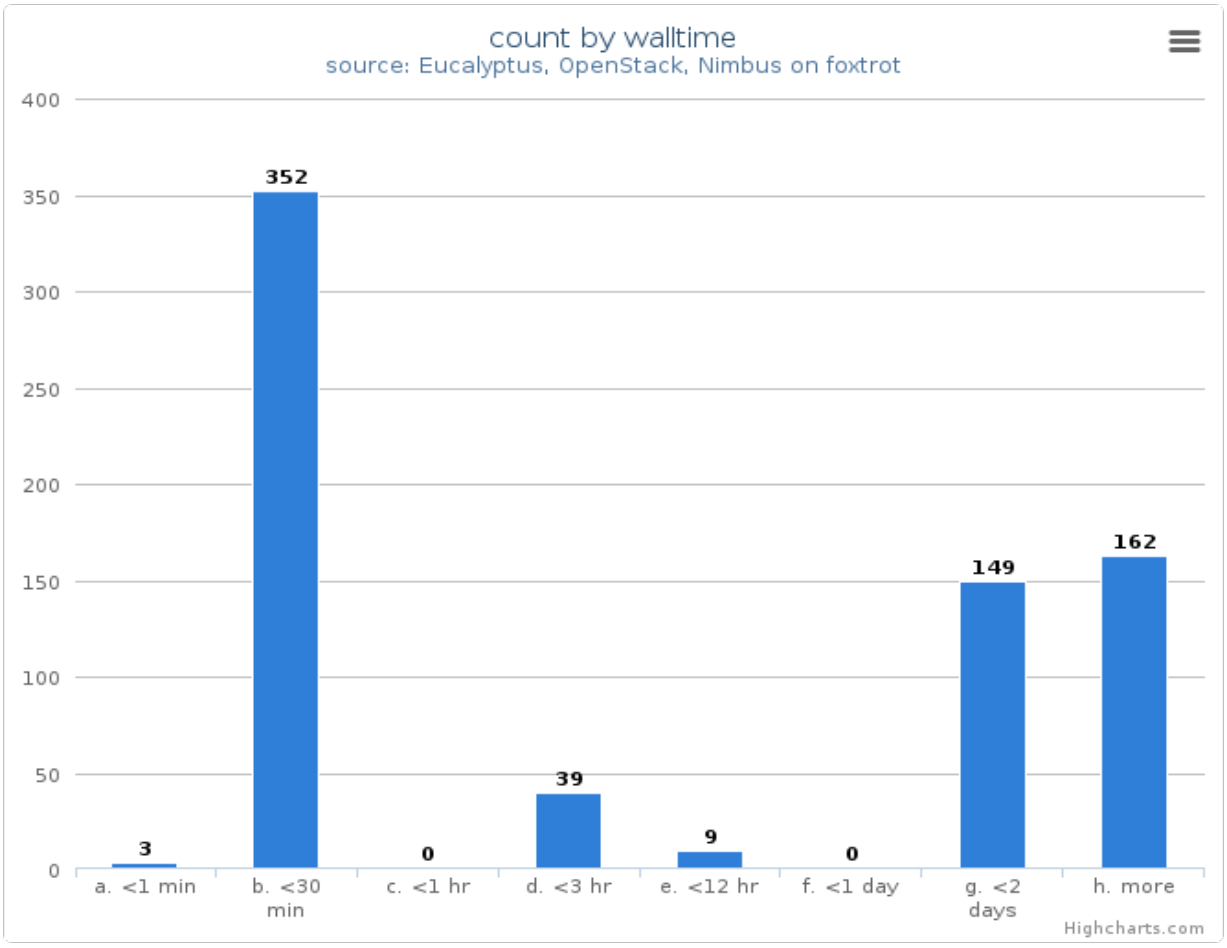

Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: foxtrot

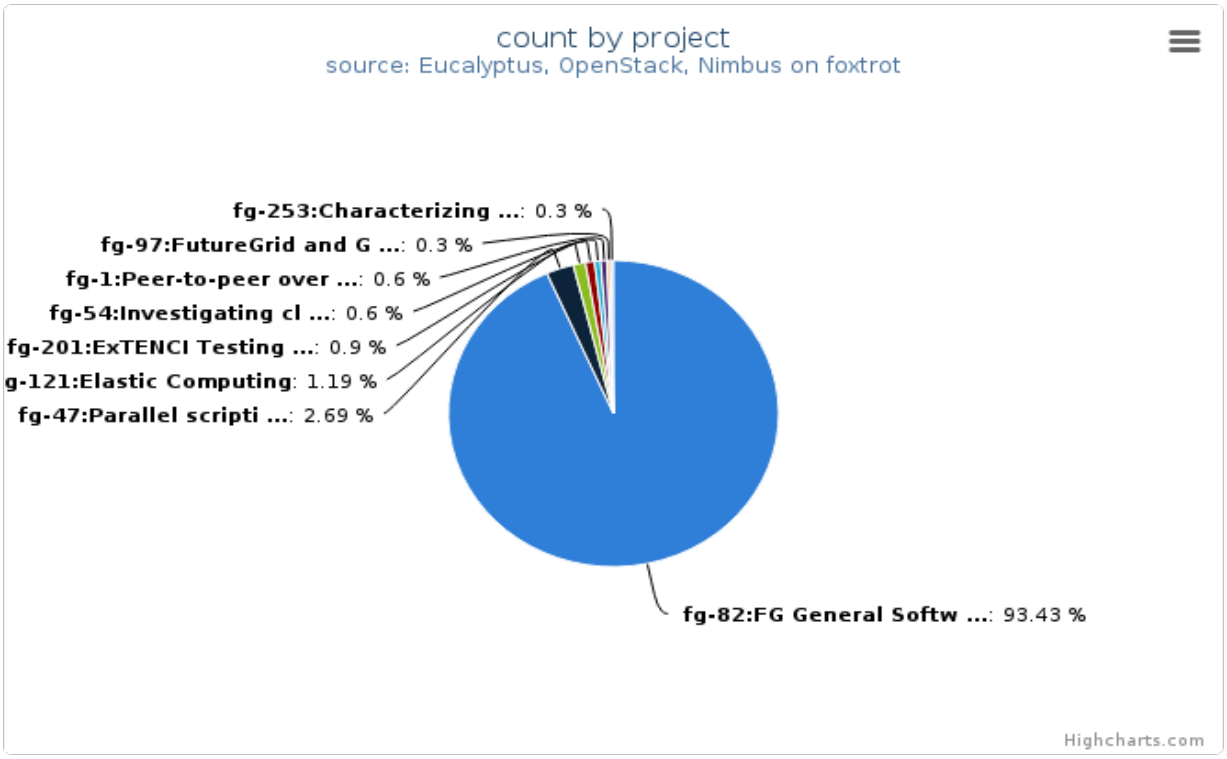

Figure 6: VMs count by project
This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: foxtrot

Table 6.1: VMs count by project

Project	Value
fg-82:FG General Software Development	313
fg-47:Parallel scripting using cloud resources	9
fg-121:Elastic Computing	4
fg-201:ExTENCI Testing, Validation, and Performance	3
fg-54:Investigating cloud computing as a solution for analyzing particle physics data	2
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	2
fg-97:FutureGrid and Grid‘5000 Collaboration	1
fg-253:Characterizing Performance of Infrastructure Clouds	1

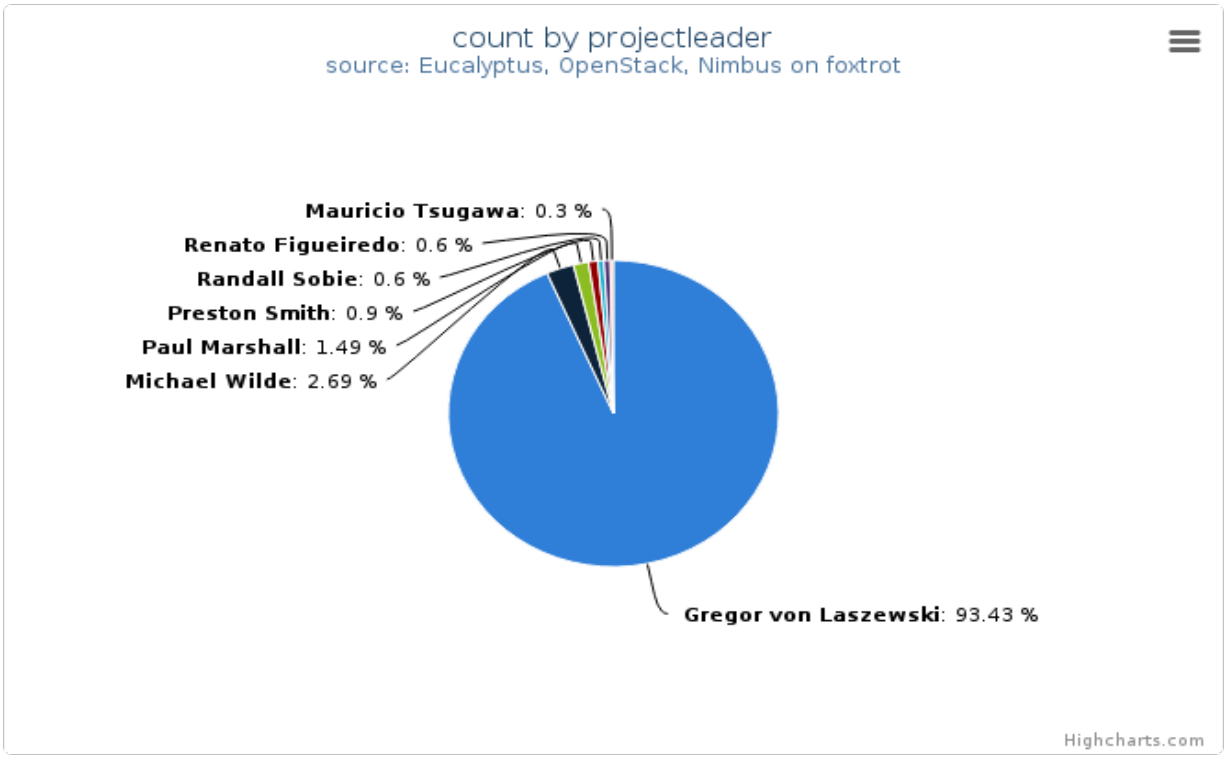

Figure 7: VMs count by project leader

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

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: foxtrot

Table 6.2: VMs count by project leader

Projectleader	Value
Gregor von Laszewski	313
Michael Wilde	9
Paul Marshall	5
Preston Smith	3
Randall Sobie	2
Renato Figueiredo	2
Mauricio Tsugawa	1

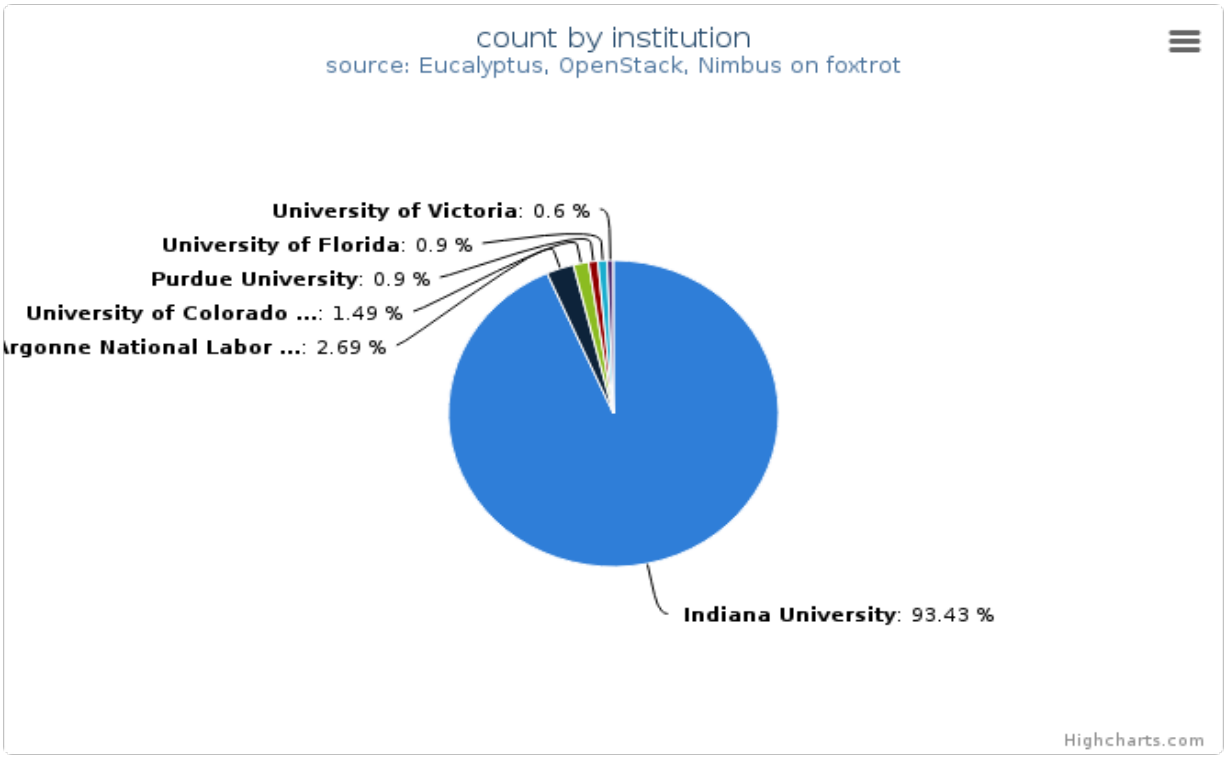

Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: foxtrot

Table 6.3: VMs count by institution

Institution	Value
Indiana University	313
Argonne National Laboratory	9
University of Colorado at Boulder	5
Purdue University	3
University of Florida	3
University of Victoria	2

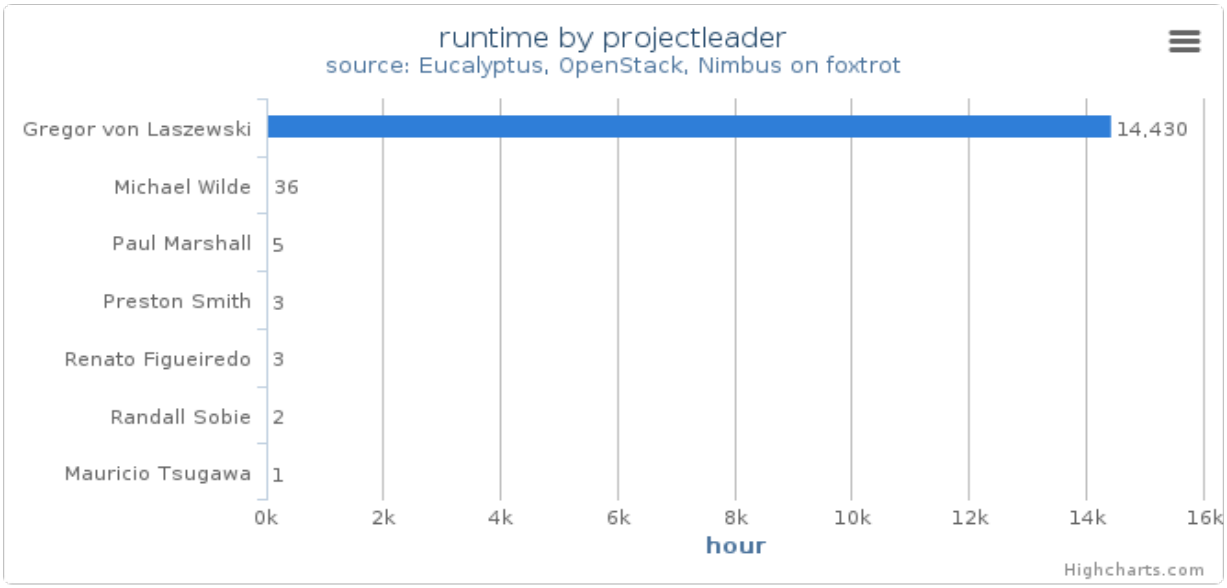

Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: October 01 – December 31, 2012
- 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.

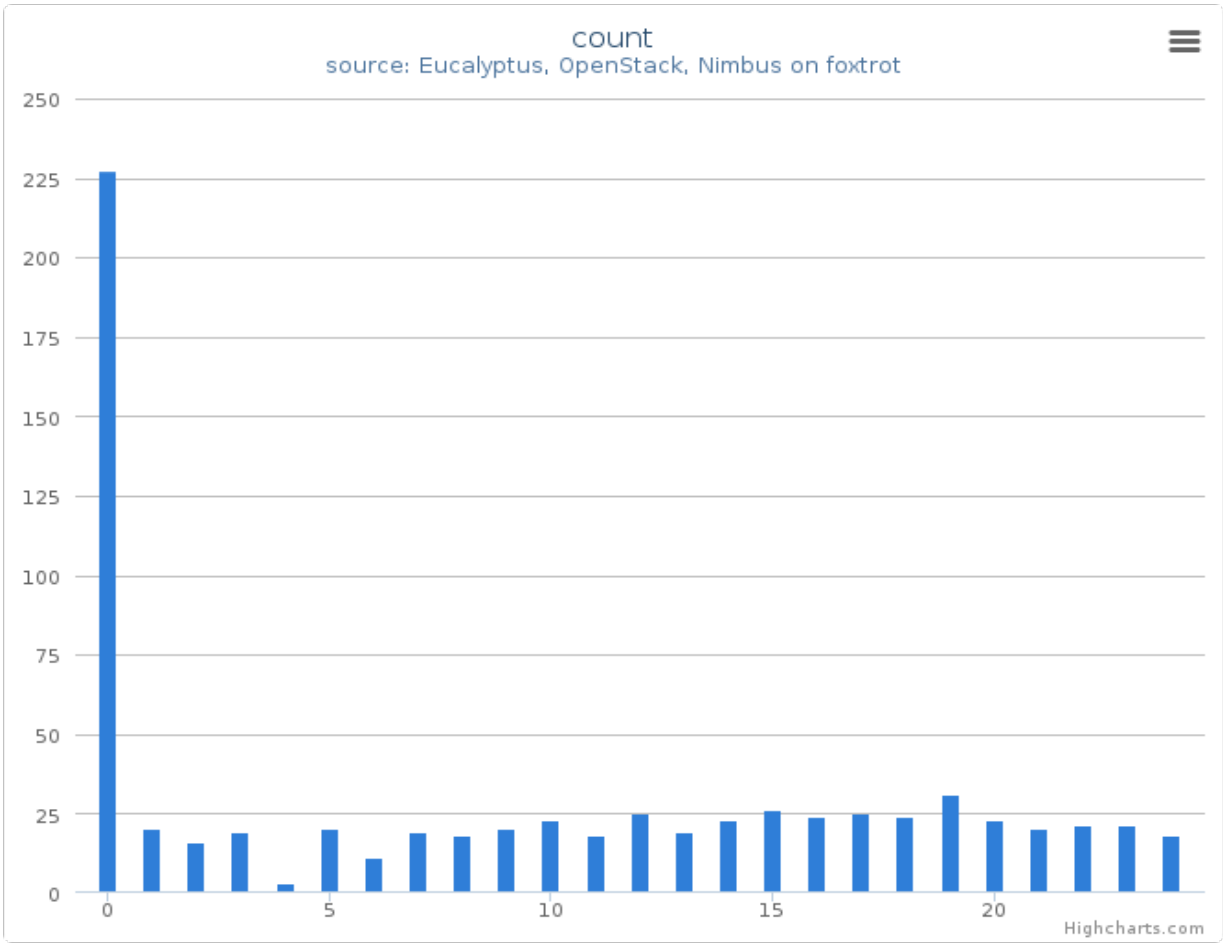

Figure 10: VMs count by systems (compute nodes) in Cluster (foxtrot)
This column chart represents VMs count among systems.

- Period: October 01 – December 31, 2012
- Cloud(IaaS): nimbus
- Hostname: foxtrot

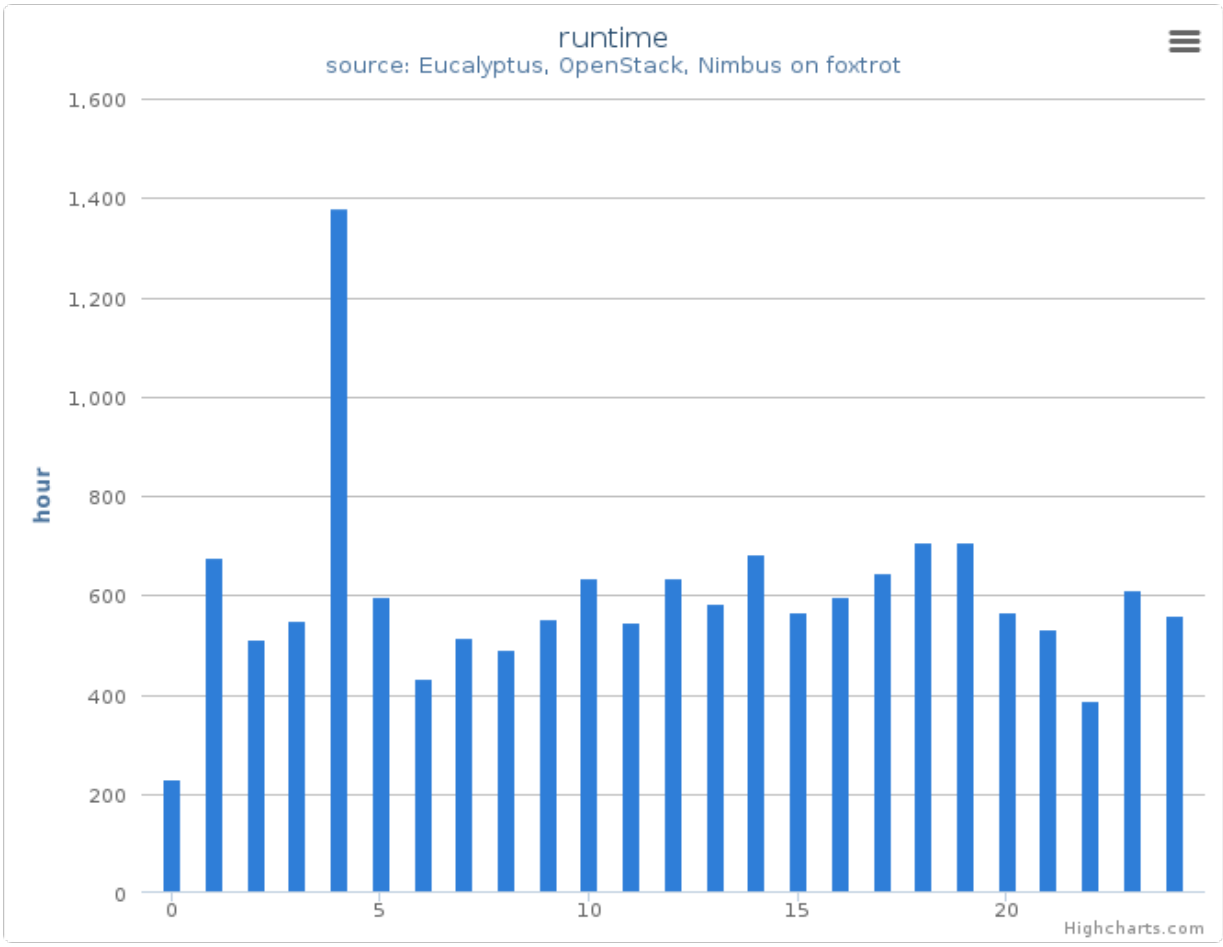

Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (foxtrot)
This column chart represents wall time among systems.

- Period: October 01 – December 31, 2012
- 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.