
FG Resource Report

Release 0.4

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June 18, 2013

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Date Created: Tue, 18 Jun 2013

SUMMARY REPORT (ALL)

- Period: July 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)

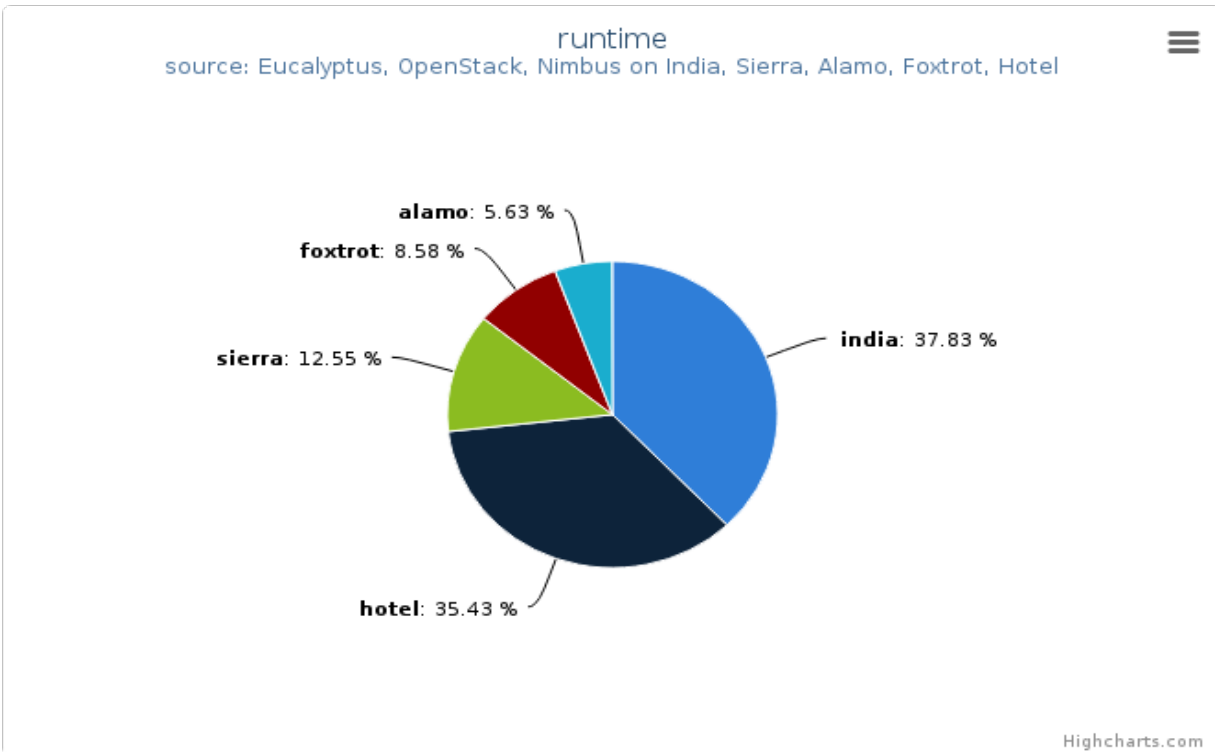


Figure 1. Wall time (hours) by Clusters
This chart represents overall usage of wall time (hours).

- Period: July 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	260056.0
hotel	243557.0
sierra	86268.0
foxtrot	58958.0
alamo	38680.0

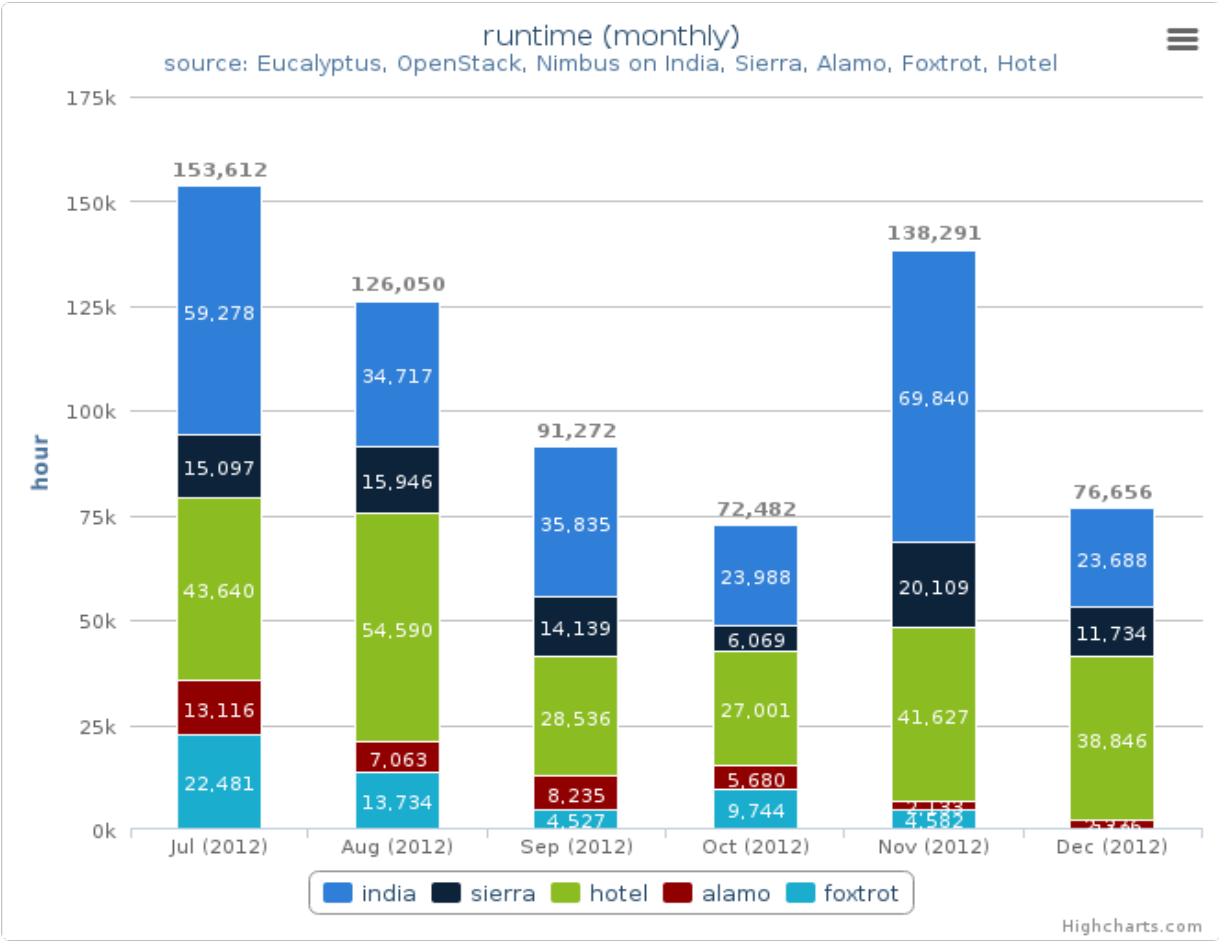


Figure 2. Wall time (hours) by Clusters (monthly)
This stacked column chart represents average monthly usage of wall time (hours).

- Period: July 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)

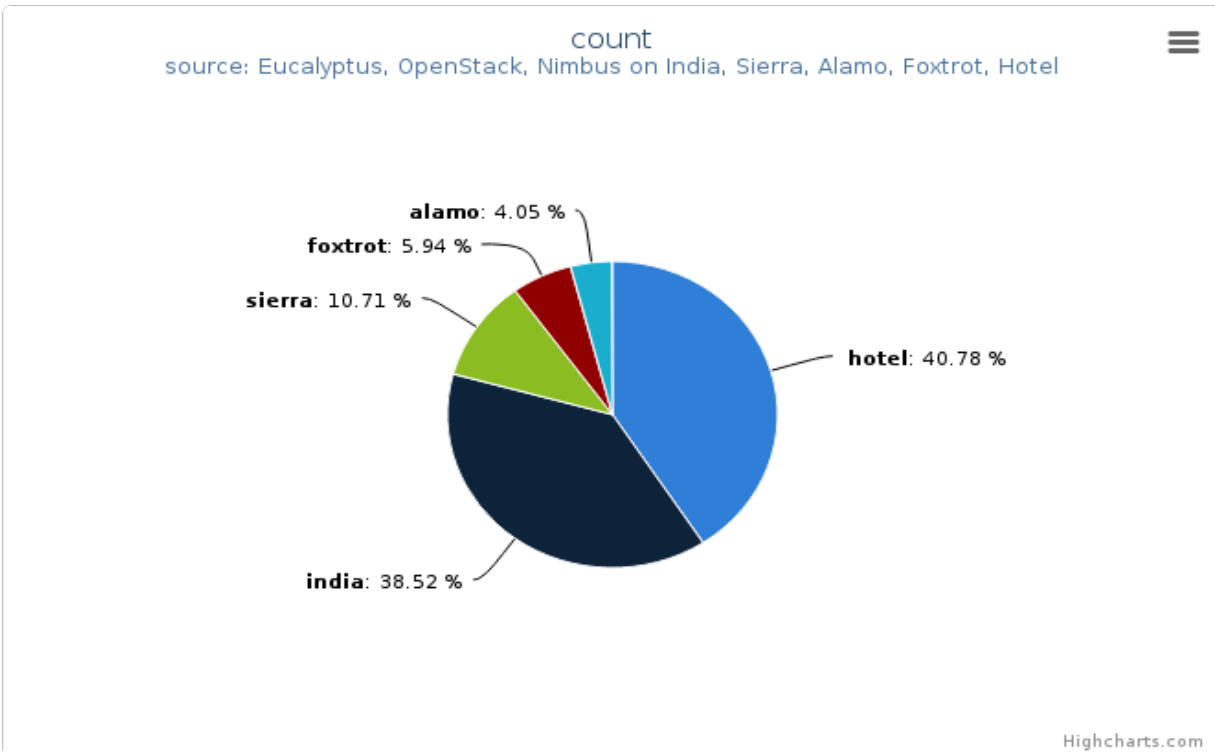


Figure 3. VMs count by Clusters

This chart represents overall VM instances count during the period.

- Period: July 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	16211
india	15313
sierra	4257
foxtrot	2361
alamo	1611

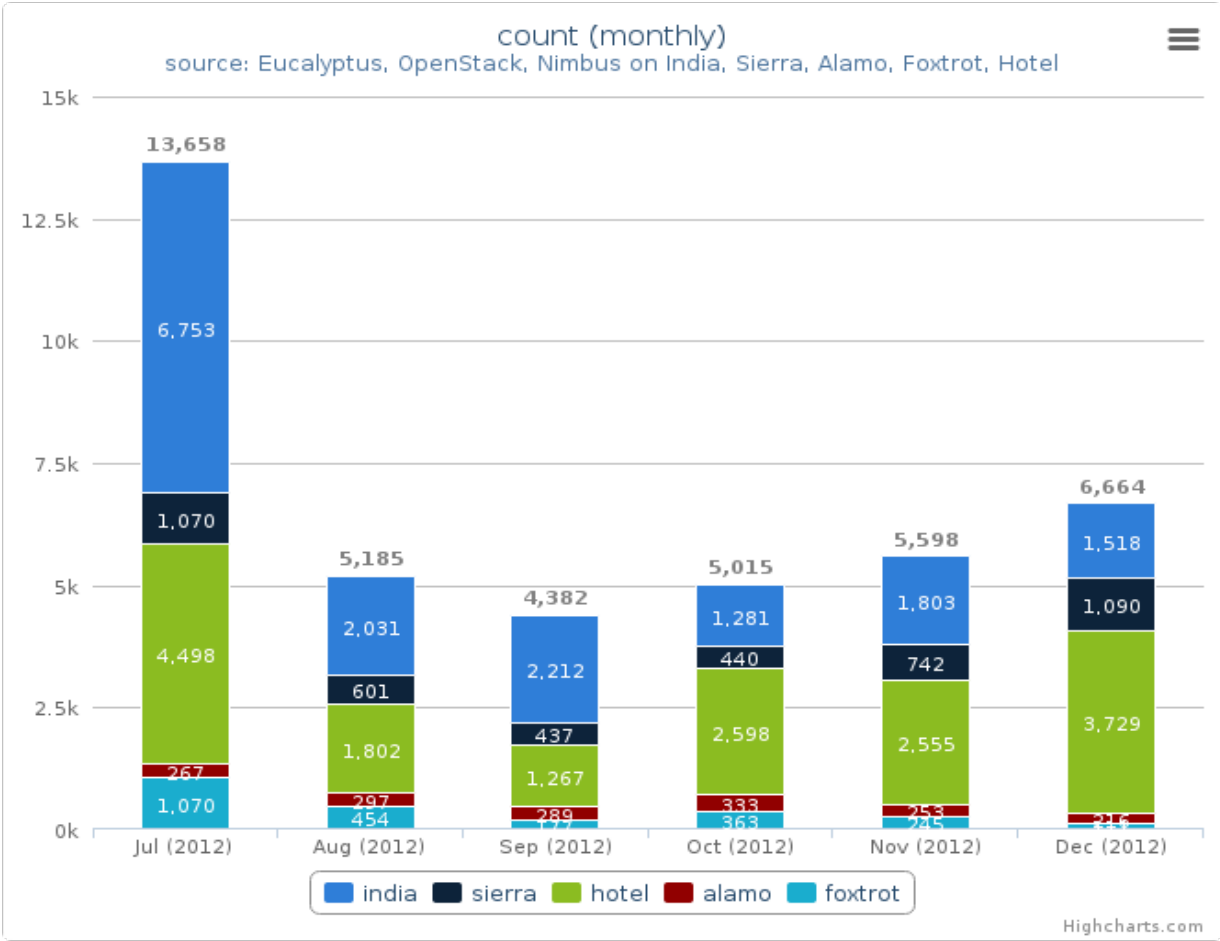


Figure 4. VMs count by Clusters (monthly)
This stacked column chart represents average VM instances count per month.

- Period: July 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)

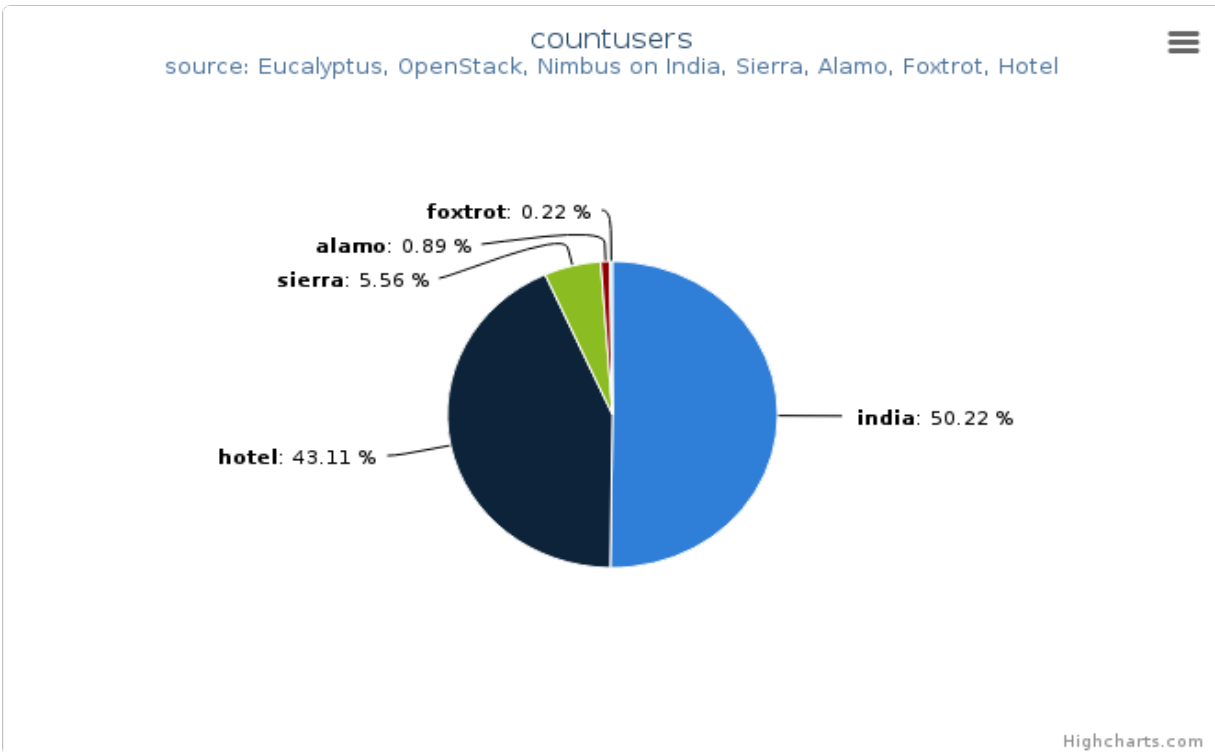


Figure 5. Users count by Clusters
 This chart represents total number of active users.

- Period: July 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	226
hotel	194
sierra	25
alamo	4
foxtrot	1

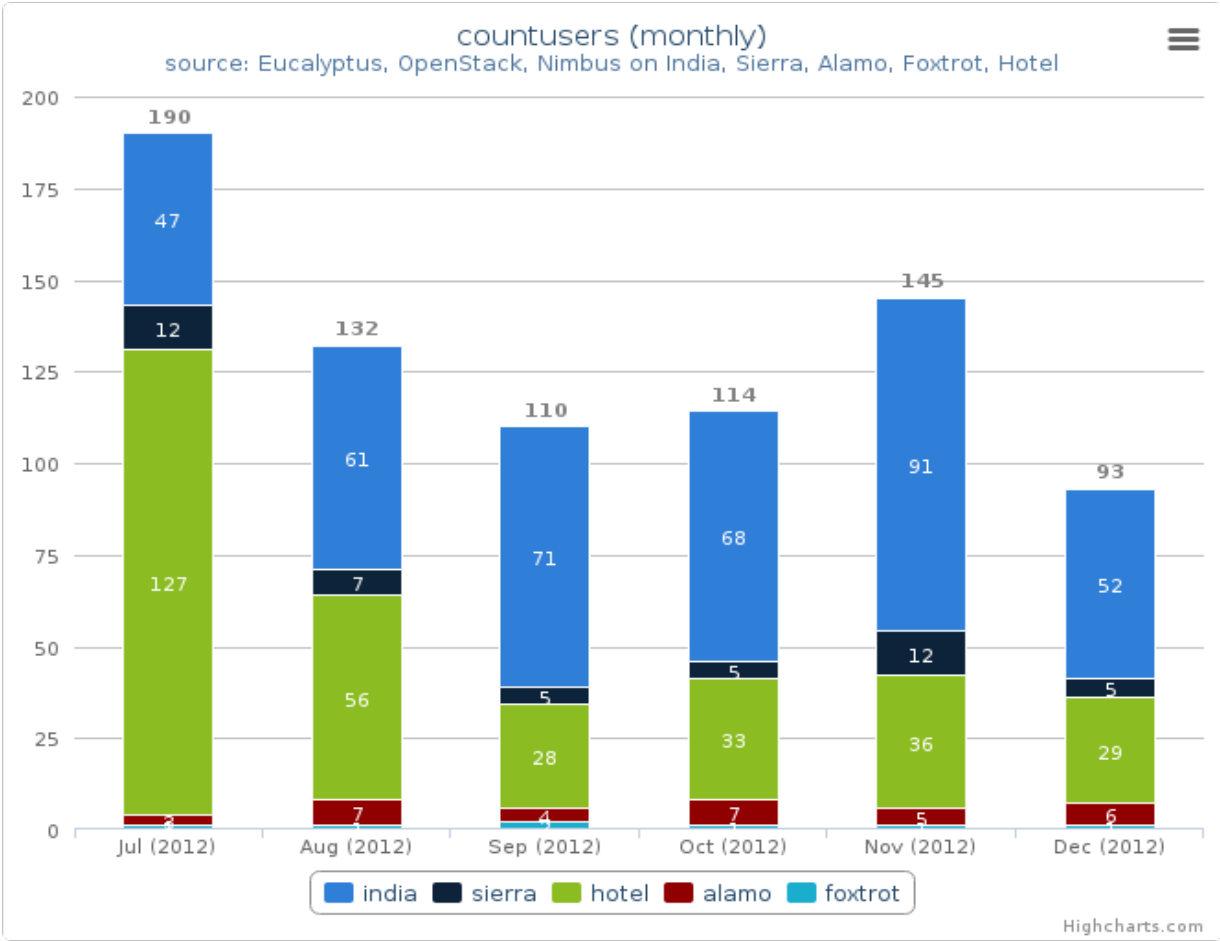


Figure 6. Users count by Clusters (Monthly)
This stacked column chart represents average count of active users per month.

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

USAGE REPORT SIERRA

- Period: July 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)

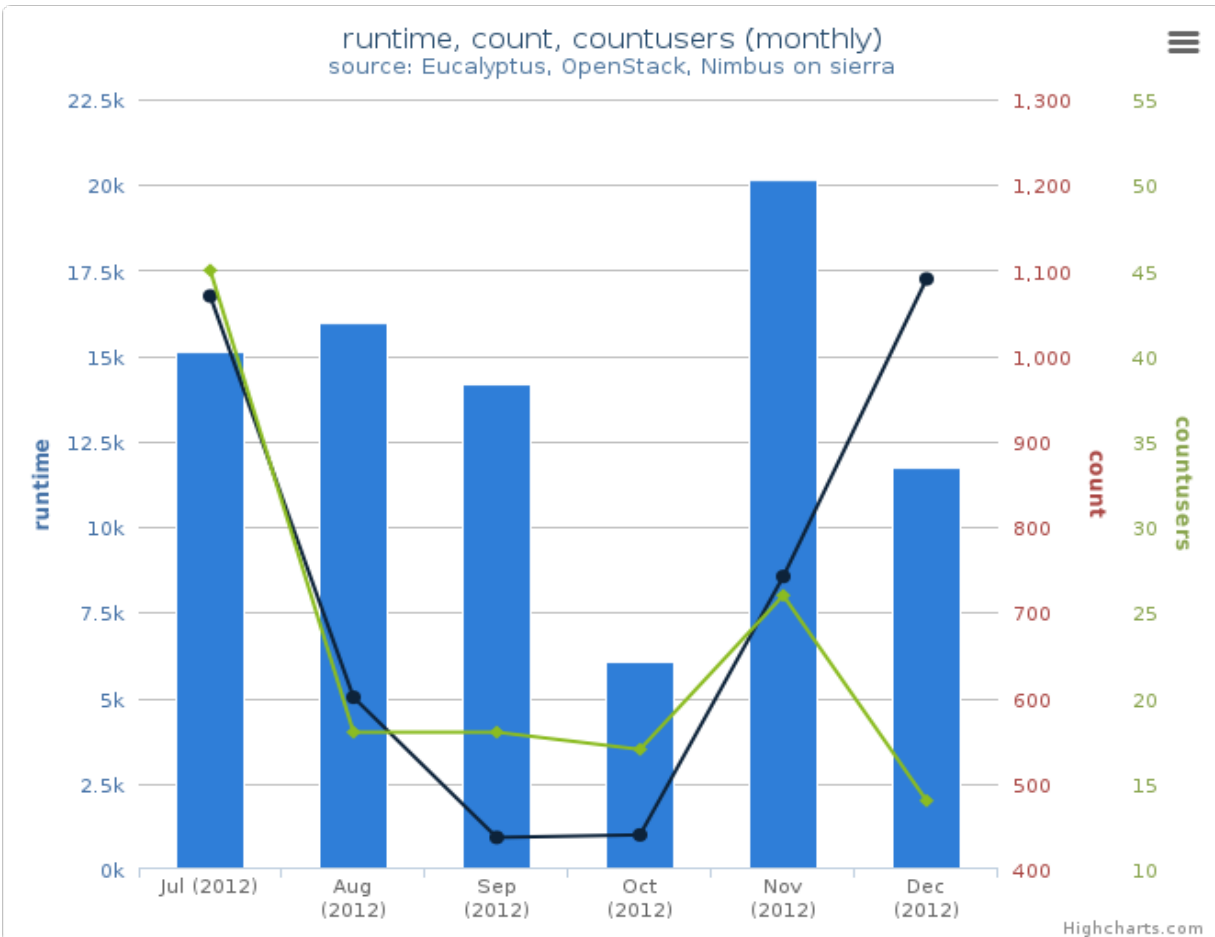


Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)

This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: July 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)

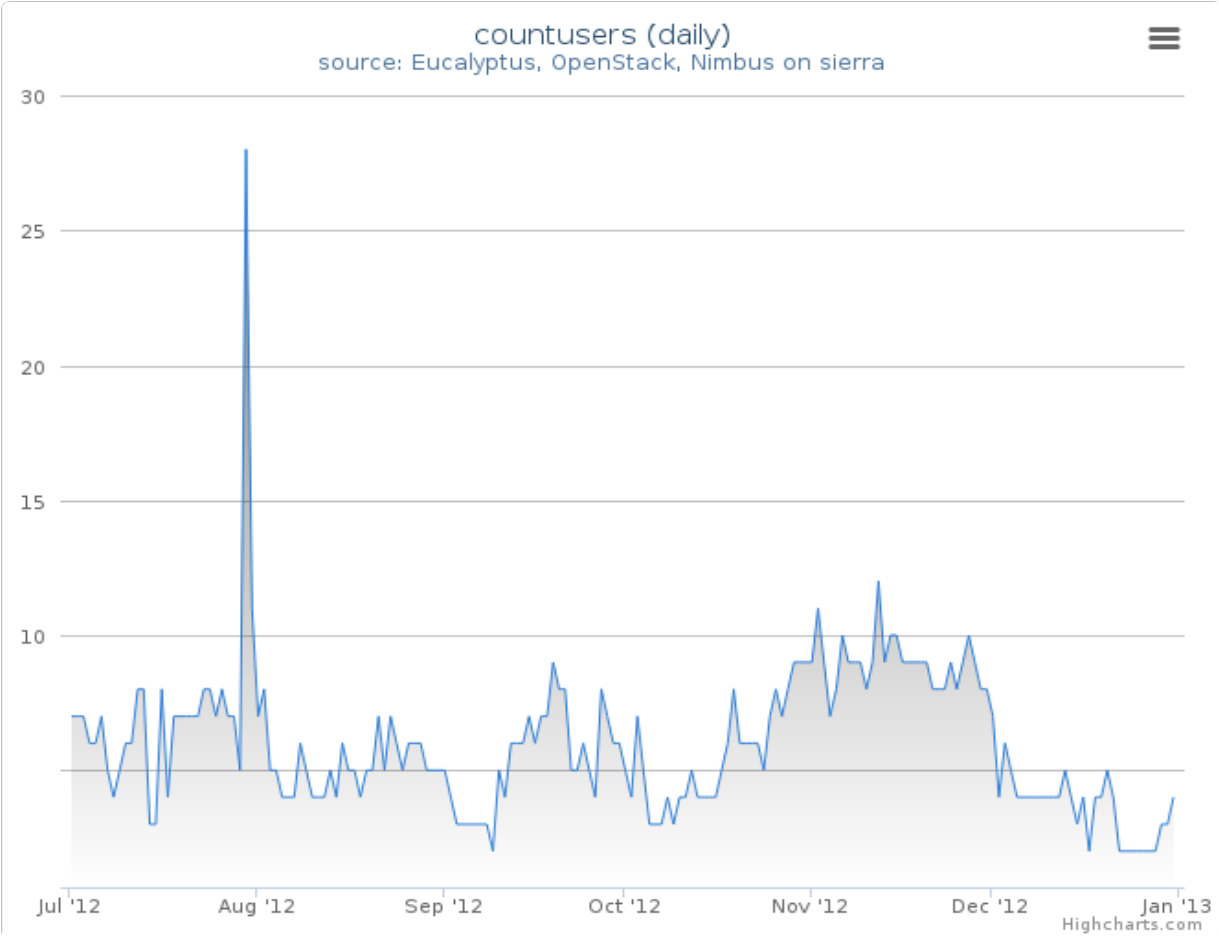


Figure 2: Users count
This time series chart represents daily active user count for cloud services and shows historical changes during the period.

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

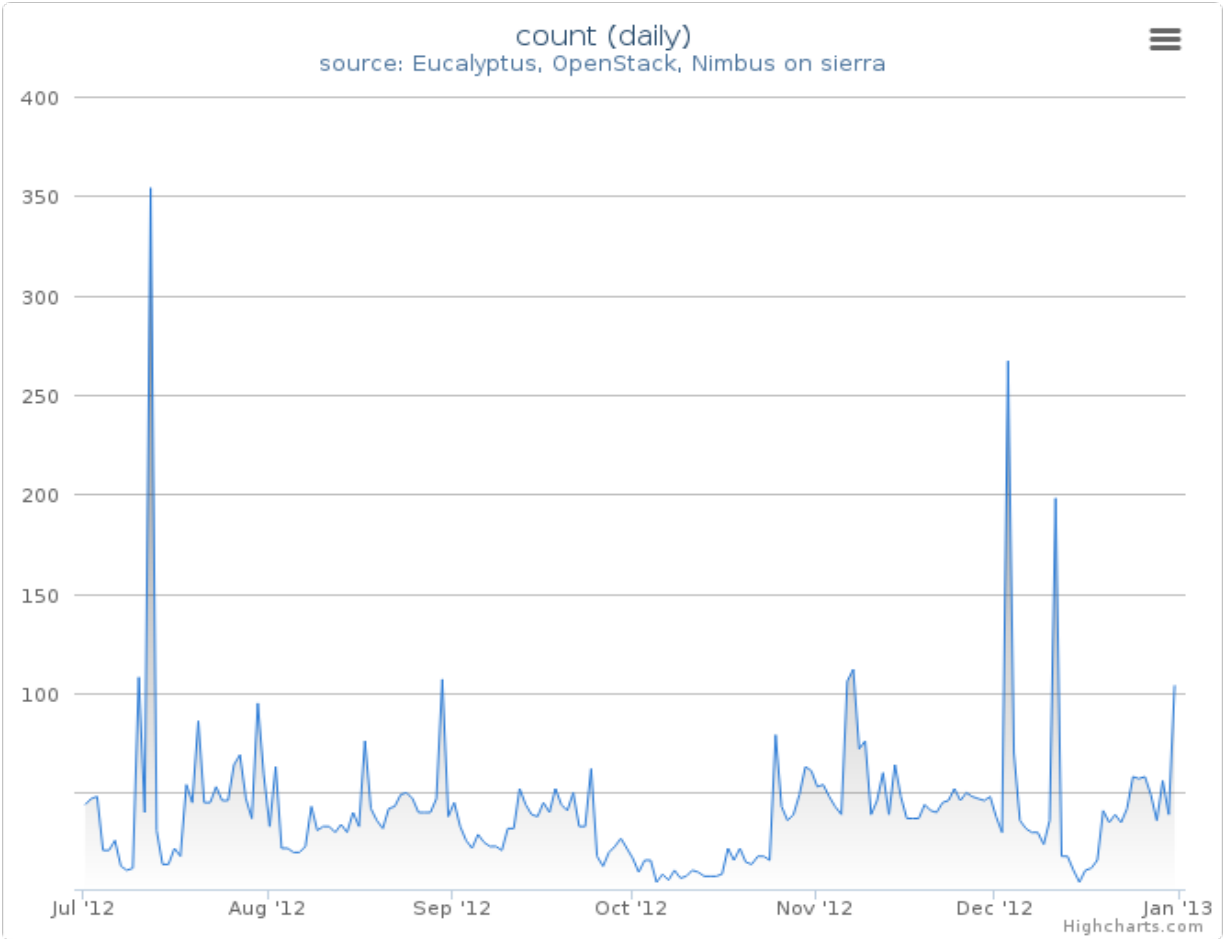


Figure 3: VMs count

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

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

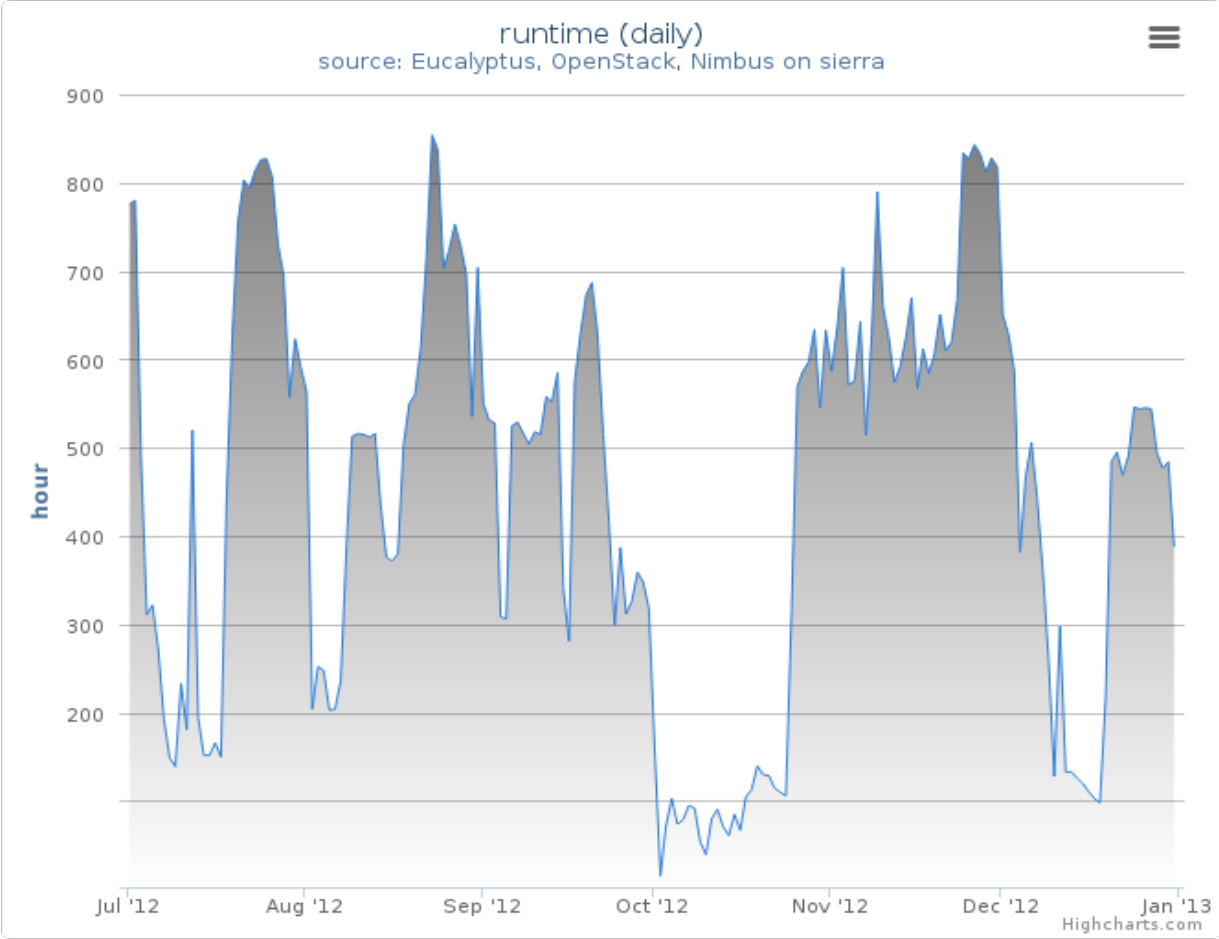


Figure 4: Wall time (hours)
This time series chart represents daily wall time (hours) for cloud services and shows historical changes during the period.

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

2.2 Distribution

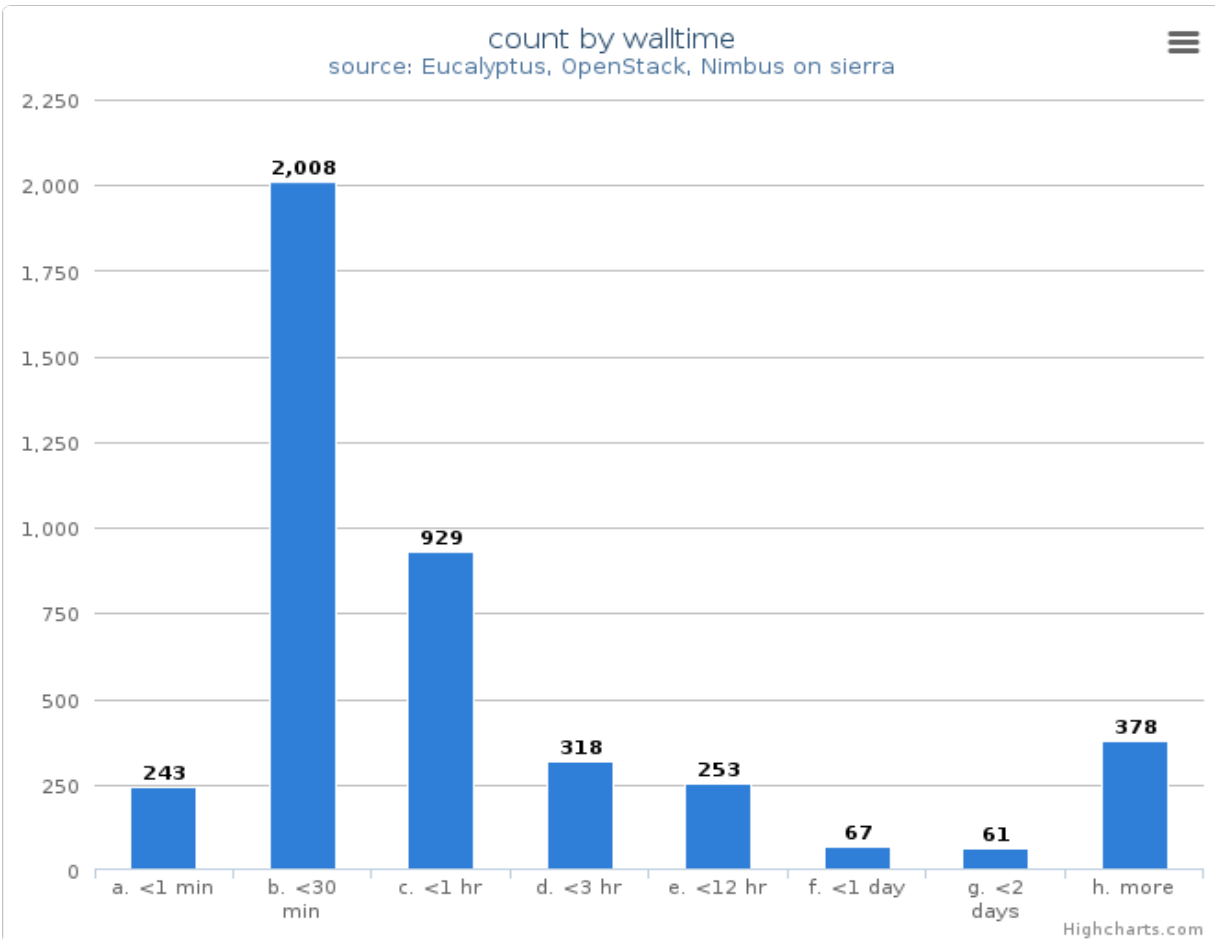


Figure 5: VM count by wall time

This chart illustrates usage patterns of VM instances in terms of running wall time.

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

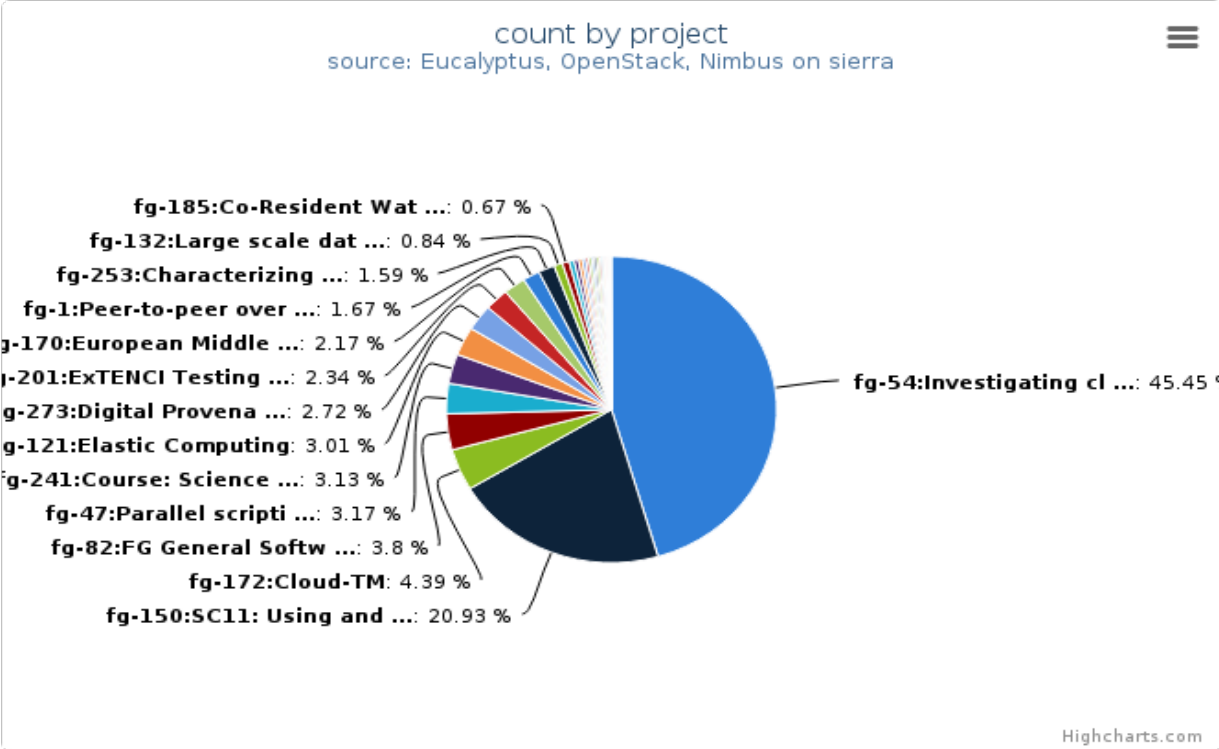


Figure 6: VMs count by project
This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

- Period: July 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	1088
fg-150:SC11: Using and Building Infrastructure Clouds for Science	501
fg-172:Cloud-TM	105
fg-82:FG General Software Development	91
fg-47:Parallel scripting using cloud resources	76
fg-241:Course: Science Cloud Summer School 2012	75
fg-121:Elastic Computing	72
fg-273:Digital Provenance Research	65
fg-201:ExTENCI Testing, Validation, and Performance	56
fg-170:European Middleware Initiative (EMI)	52
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	40

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Table 2.1 – continued from previous page

Project	Value
fg-253:Characterizing Performance of Infrastructure Clouds	38
fg-132:Large scale data analytics	20
fg-185:Co-Resident Watermarking	16
fg-97:FutureGrid and Grid'5000 Collaboration	12
fg-265:Course: SC12 Tutorial	10
fg-52:Cost-Aware Cloud Computing	9
fg-211:Performance evaluation of cloud storage placement	8
fg-42:SAGA	7
fg-266:Secure medical files sharing	7
fg-9:Distributed Execution of Kepler Scientific Workflow on Future Grid	6
fg-69:Investigate provenance collection for MapReduce	6
fg-225:Budget-constrained workflow scheduler	6
fg-130:Optimizing Scientific Workflows on Clouds	5
fg-229:Course: XSEDE 2012 Tutorial	4
fg-224:Nimbus Auto Scale	3
fg-112:University of California (UC) Grid and Cloud Project	3
fg-200:MapReduce Based Ray Tracing Class Project	3
fg-78:Exploring VMs for Open Science Grid Services	2
fg-186:Course: Spring 2012 B534 Distributed systems Graduate Course	2
fg-40:Inca	1
fg-20:Development of an information service for FutureGrid	1
fg-176:Cloud Interoperability Testbed	1
fg-244:Course: Data Center Scale Computing	1
fg-238:HPC meets Clouds	1
fg-291:Distributed Computing course	1

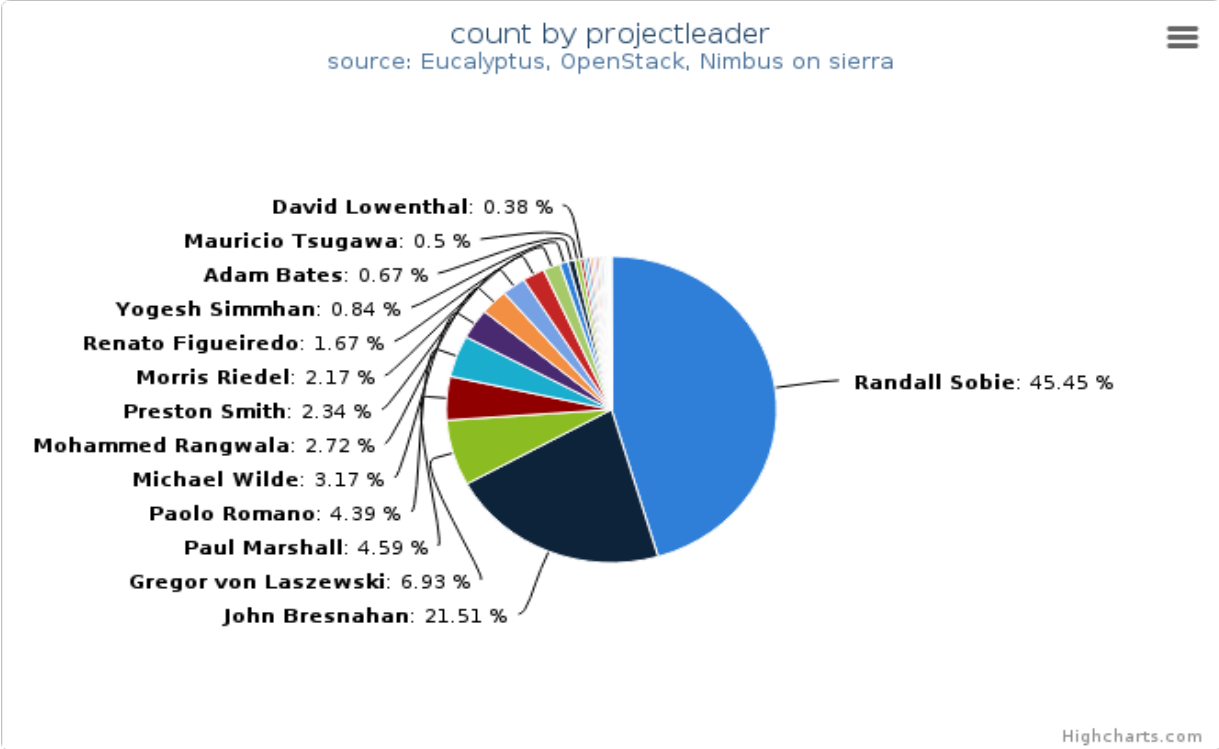


Figure 7: VMs count by project leader
This chart also illustrates the proportion of launched VM instances by project Leader. The same data in tabular form follows.

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

Table 2.2: VMs count by project leader

Projectleader	Value
Randall Sobie	1088
John Bresnahan	515
Gregor von Laszewski	166
Paul Marshall	110
Paolo Romano	105
Michael Wilde	76
Mohammed Rangwala	65
Preston Smith	56
Morris Riedel	52
Renato Figueiredo	40
Yogesh Simmhan	20

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Table 2.2 – continued from previous page

Projectleader	Value
Adam Bates	16
Mauricio Tsugawa	12
David Lowenthal	9
Zhan Wang	8
Shantenu Jha	7
Abdelkrim Hadjidj	7
Adrian Muresan	6
Ilkay Altintas	6
Jiaan Zeng	6
Weiwei Chen	5
Prakashan Korambath	3
Pierre Riteau	3
Jingya Wang	3
	2
Judy Qiu	2
Hyungro Lee	1
Dirk Grunwald	1
Alan Sill	1
David Fergusson	1
Li Chunyan	1
Shava Smallen	1

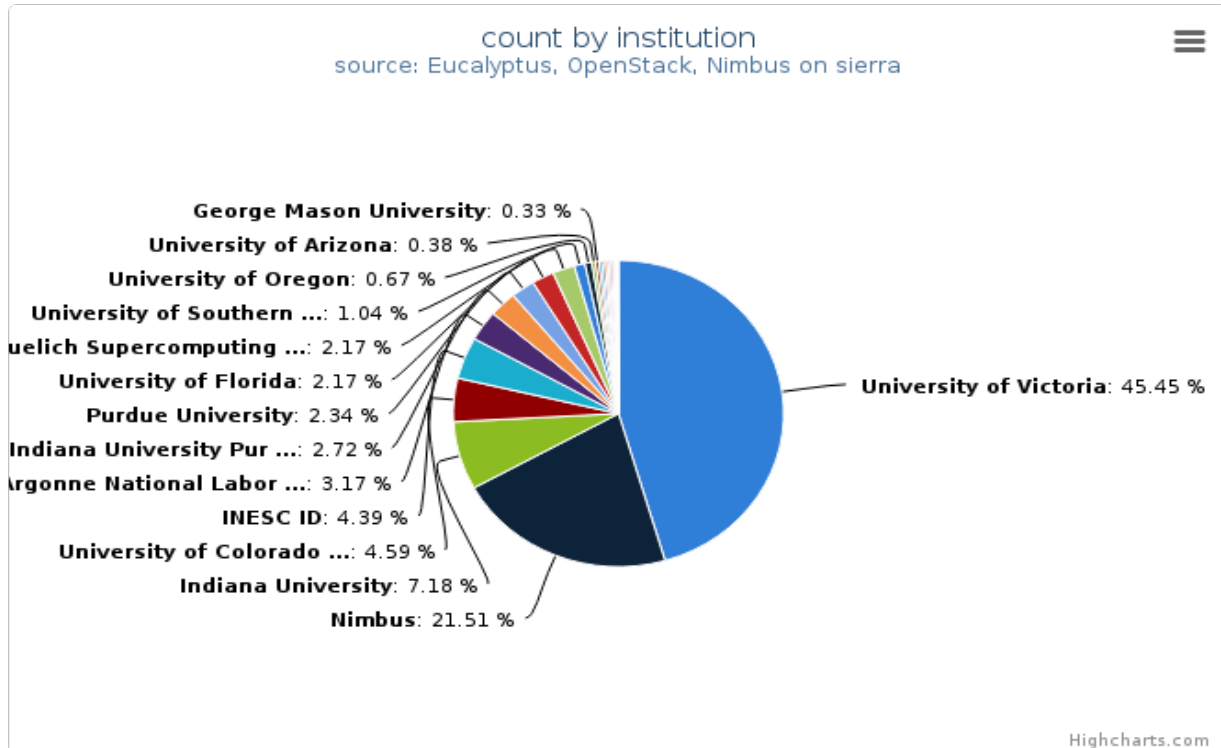


Figure 8: VMs count by institution

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

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

Table 2.3: VMs count by institution

Institution	Value
University of Victoria	1088
Nimbus	515
Indiana University	172
University of Colorado at Boulder	110
INESC ID	105
Argonne National Laboratory	76
Indiana University Purdue University Indianapolis	65
Purdue University	56
University of Florida	52
Juelich Supercomputing Centre	52
University of Southern California	25
University of Oregon	16
University of Arizona	9
George Mason University	8
Louisiana State University	7
University of Technology of Compiegne	7
Computer Science	6
ENS Lyon	6
UCSD	6
University of Chicago	3
UCLA	3
	2
YunNan University	1
BioIT	1
Univ. of Colorado	1
UC San Diego	1
Texas Tech University	1

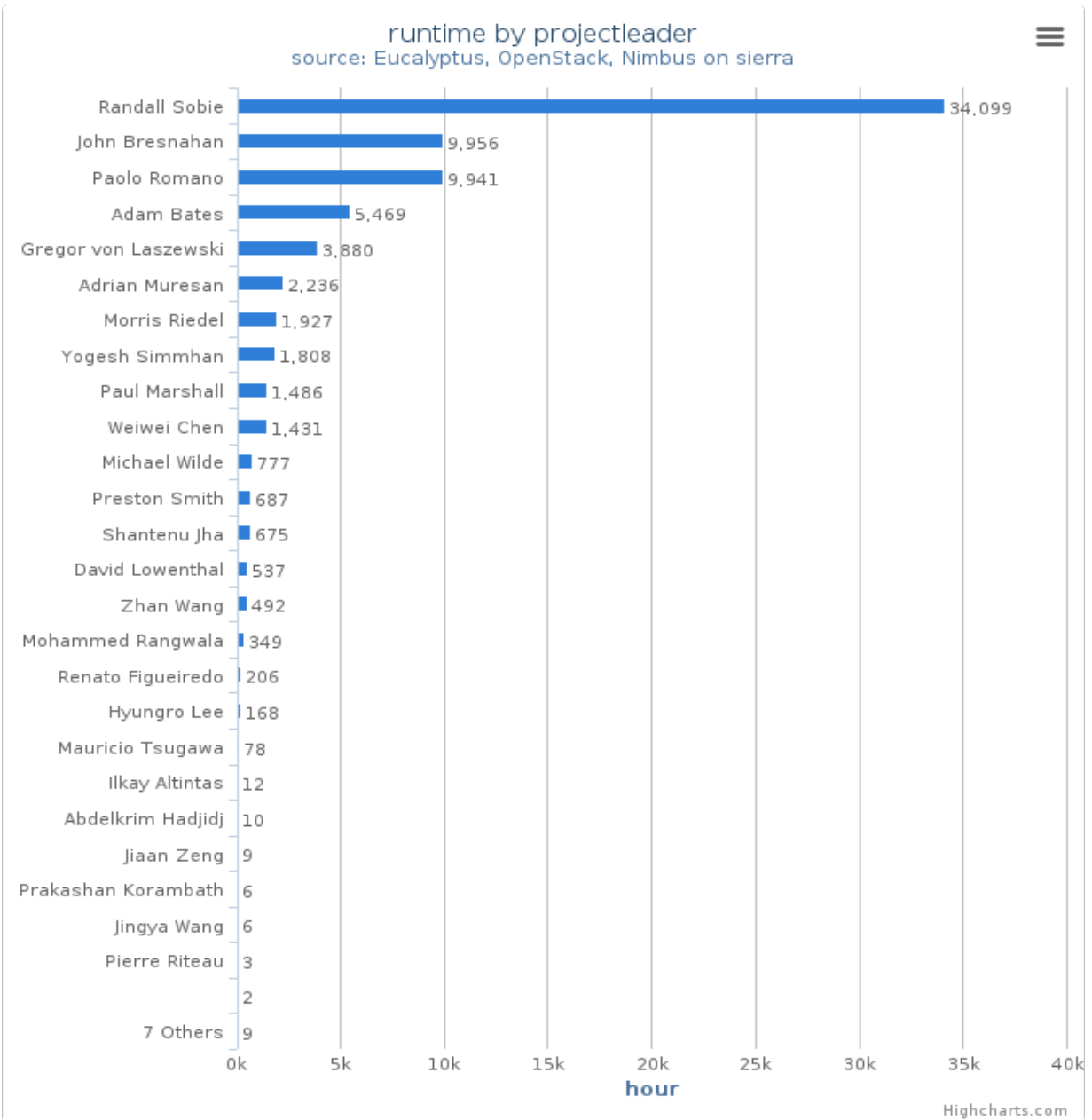


Figure 9: Wall time (hours) by project leader
 This chart illustrates proportionate total run times by project leader.

- Period: July 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.

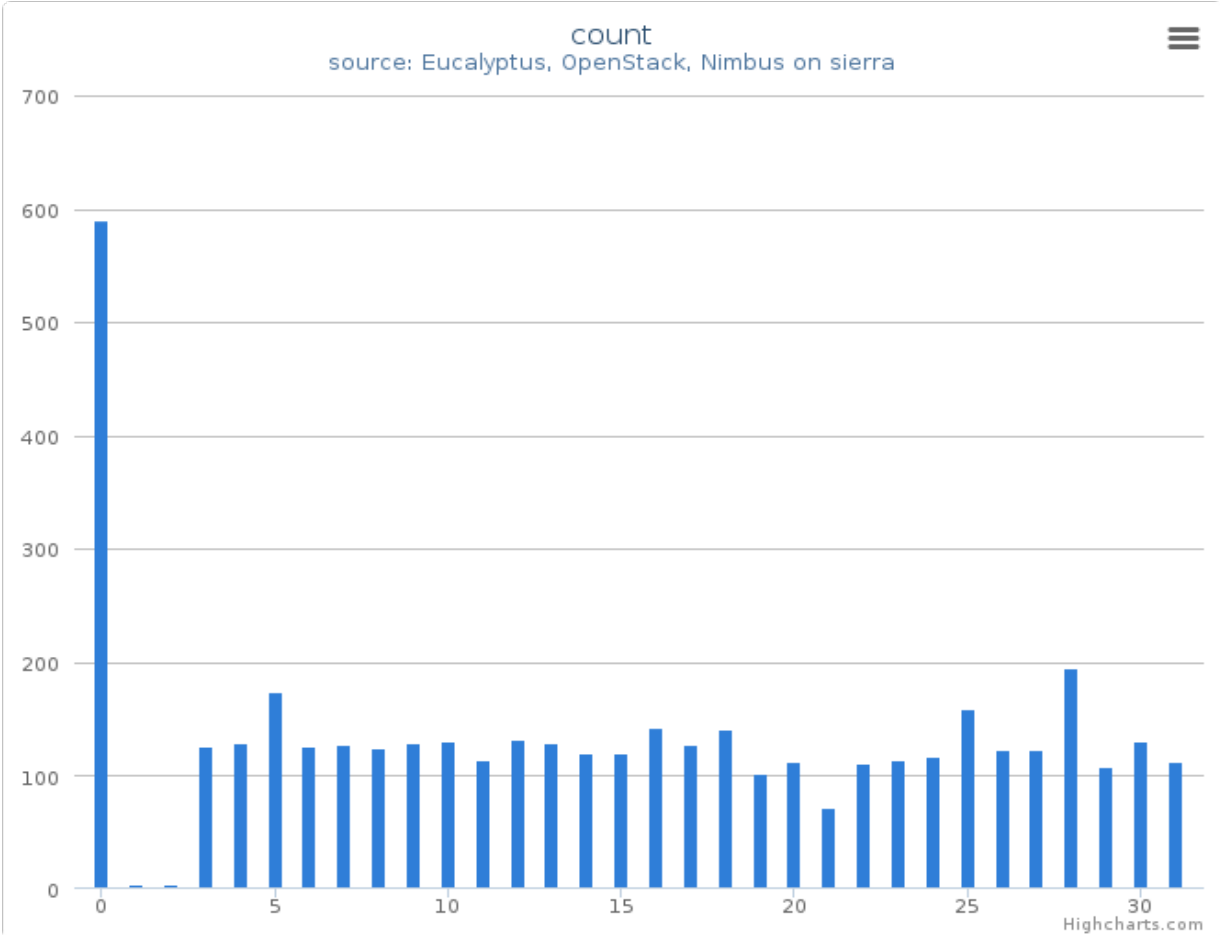


Figure 10: VMs count by systems (compute nodes) in Cluster (sierra)
This column chart represents VMs count among systems.

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

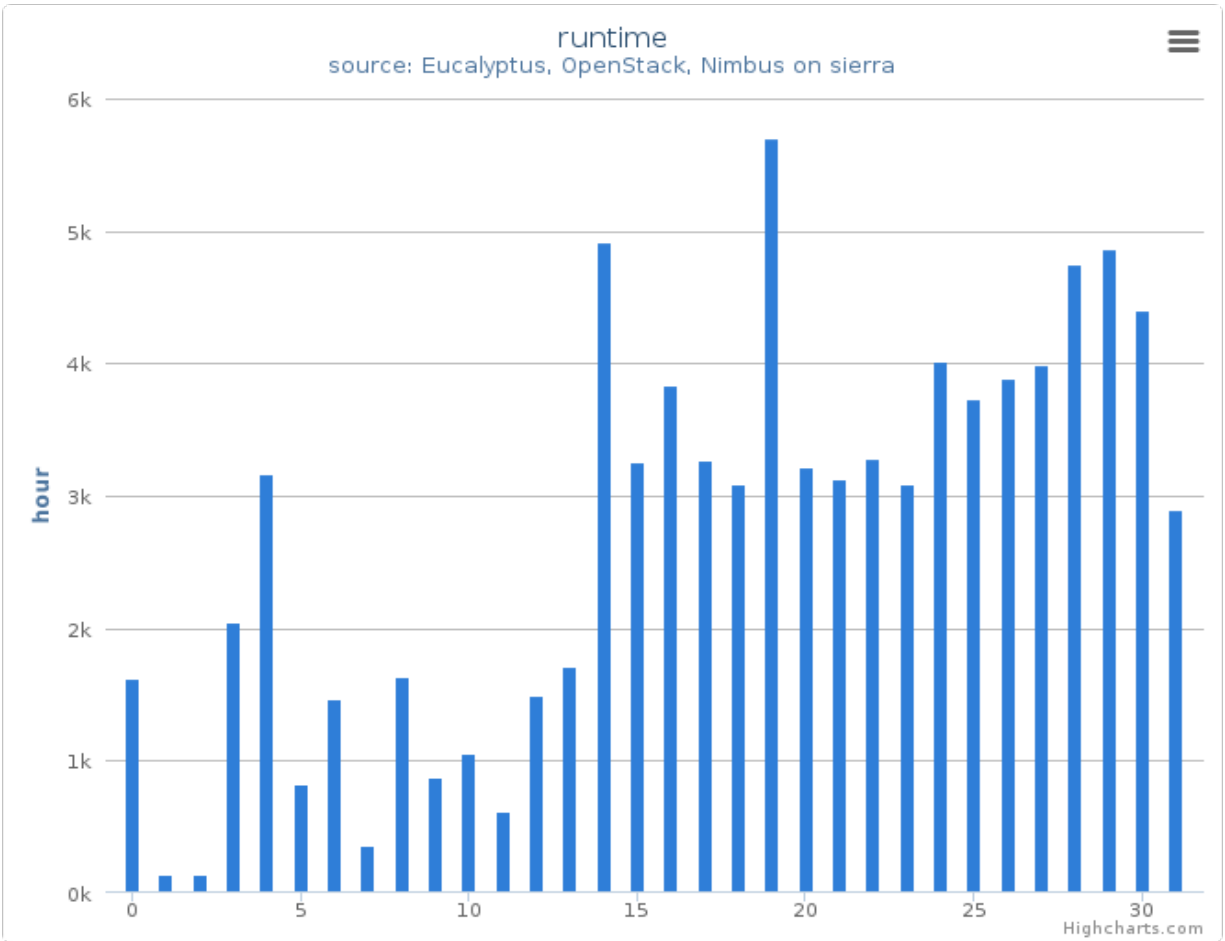


Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (sierra)
This column chart represents wall time among systems.

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

USAGE REPORT INDIA

- Period: July 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)

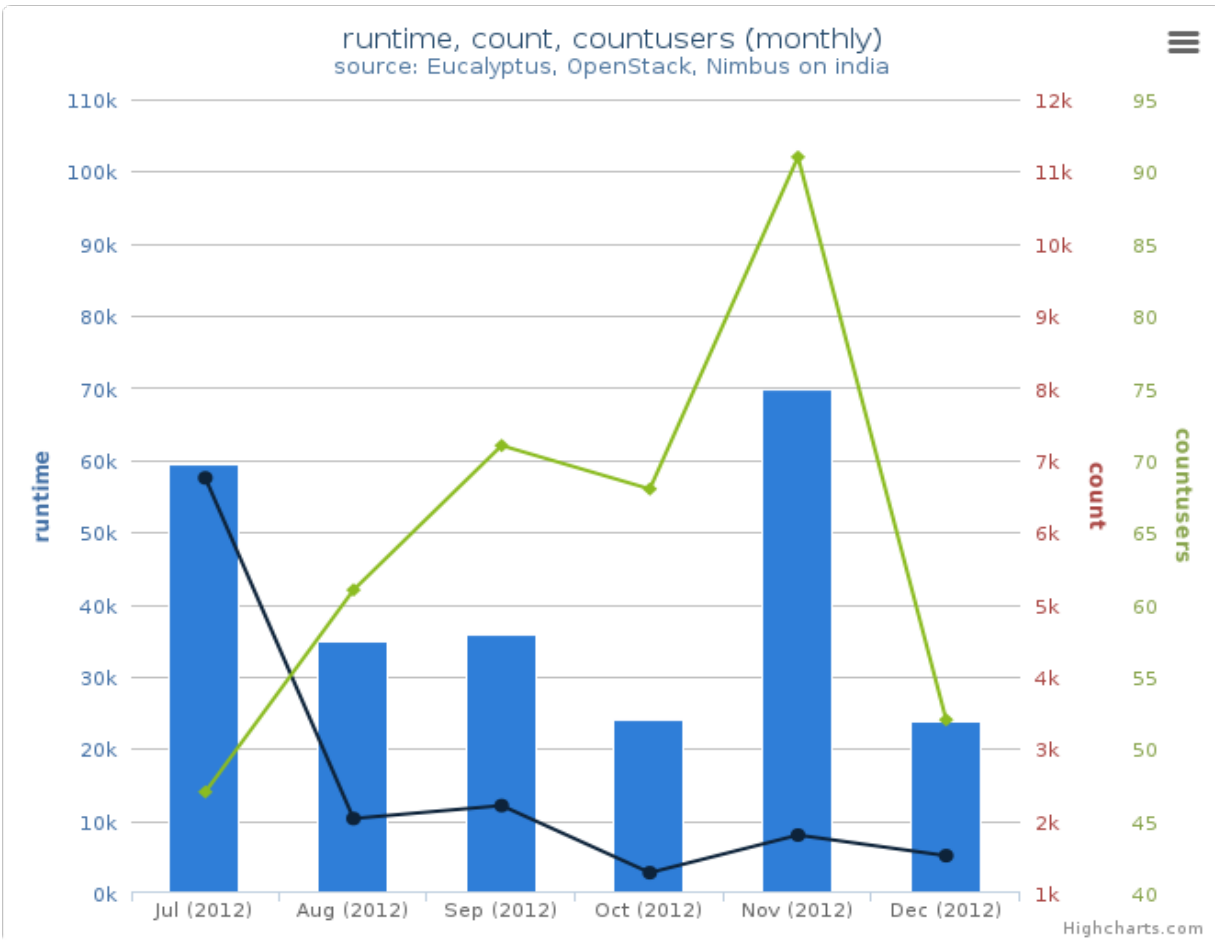


Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
 This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: July 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)

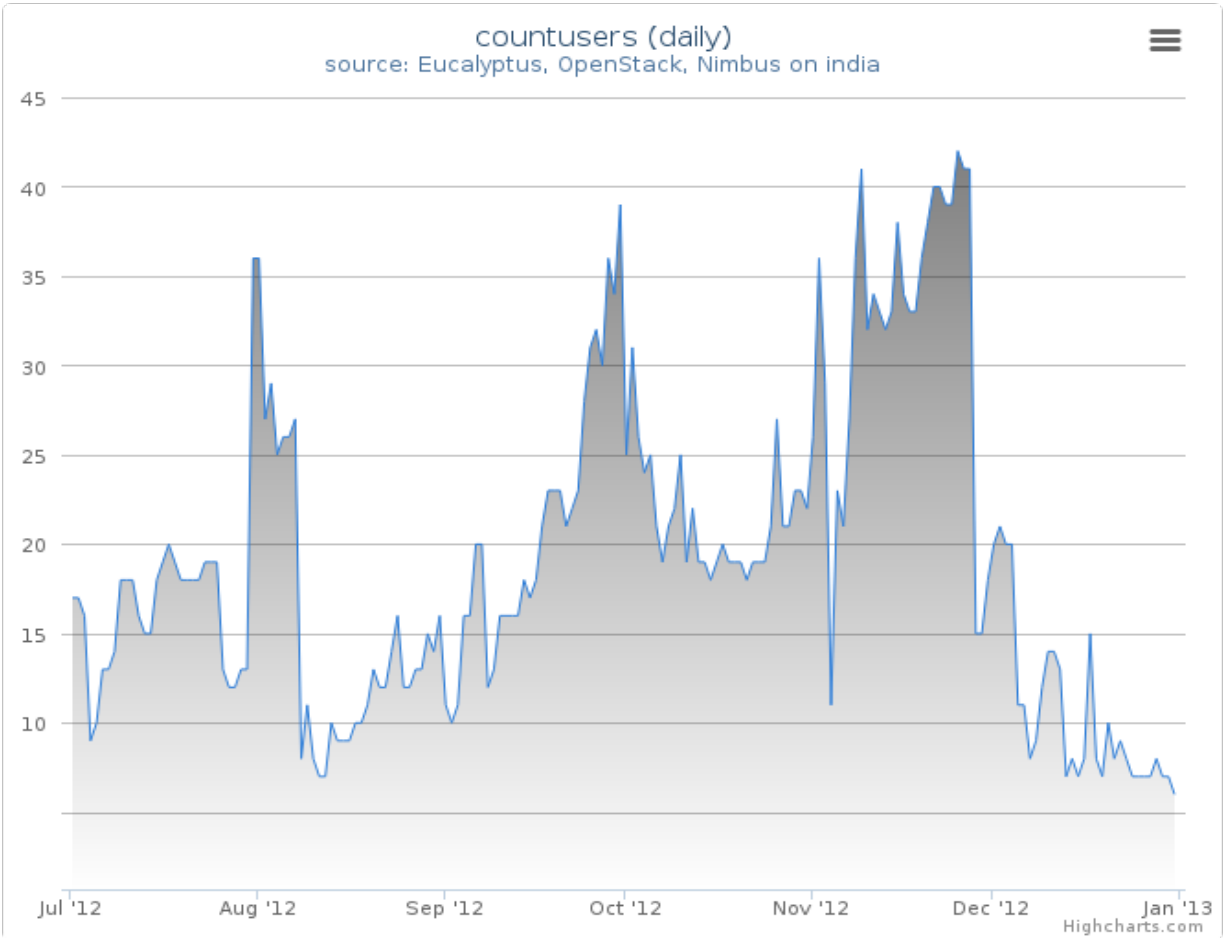


Figure 2: Users count

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

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

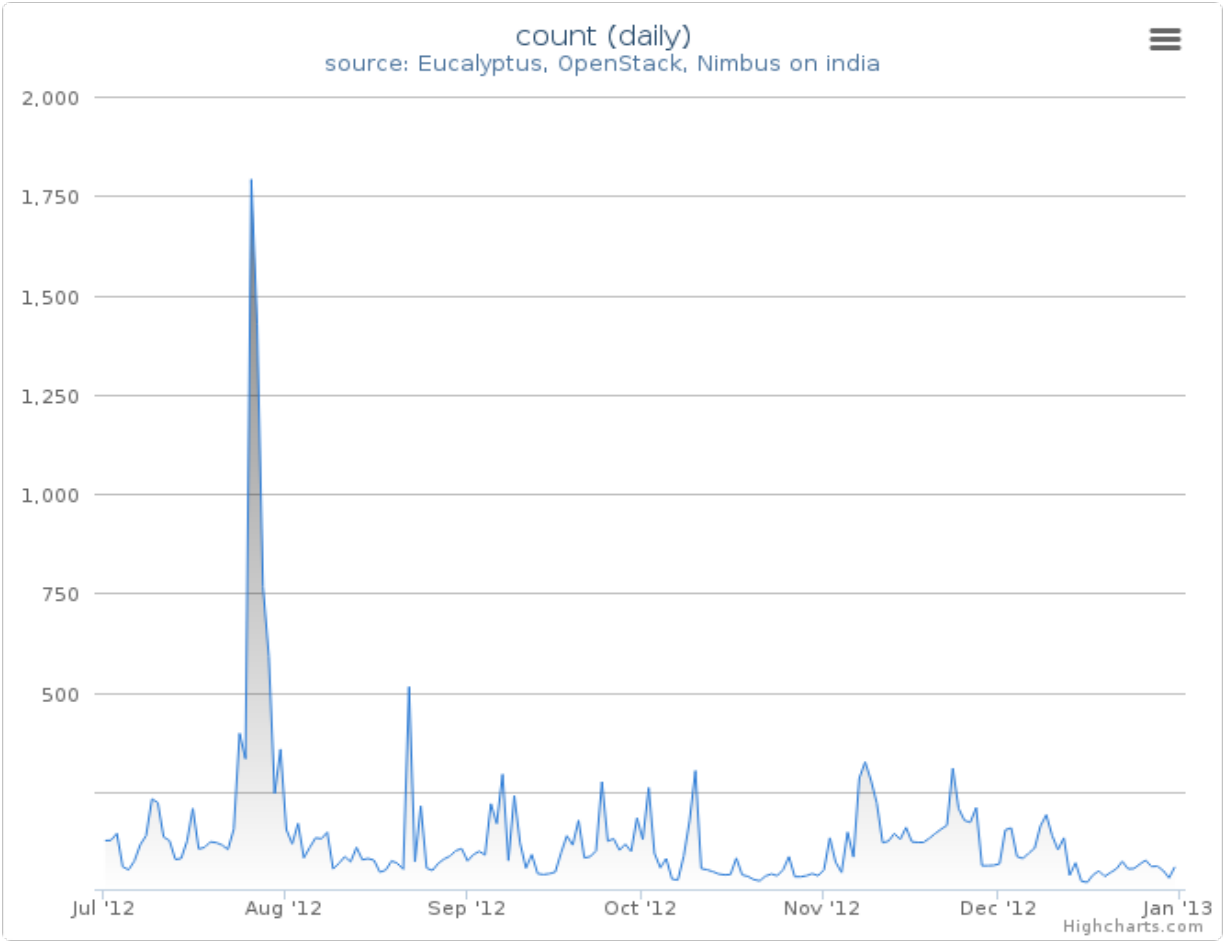


Figure 3: VMs count

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

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

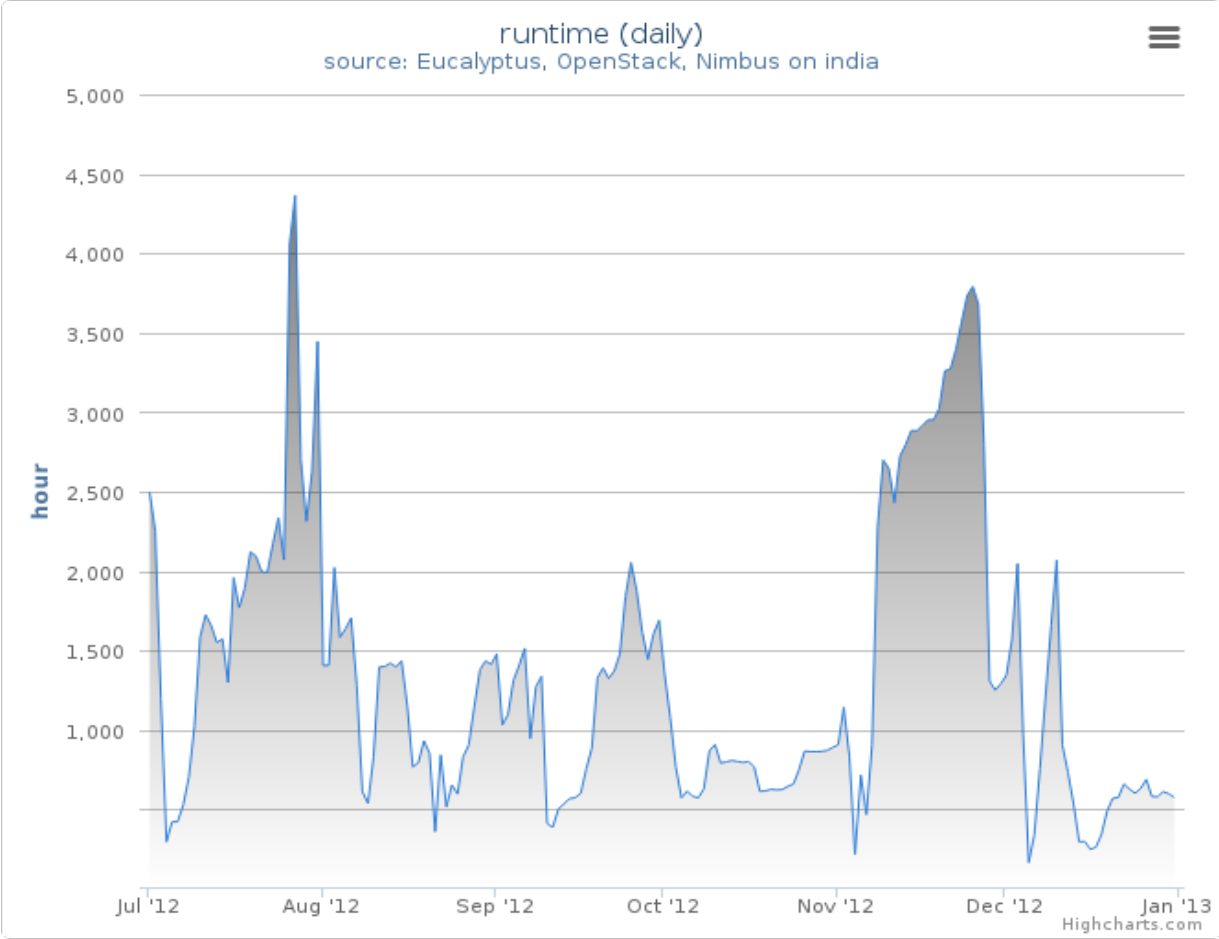


Figure 4: Wall time (hours)
This time series chart represents daily wall time (hours) for cloud services and shows historical changes during the period.

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

3.2 Distribution

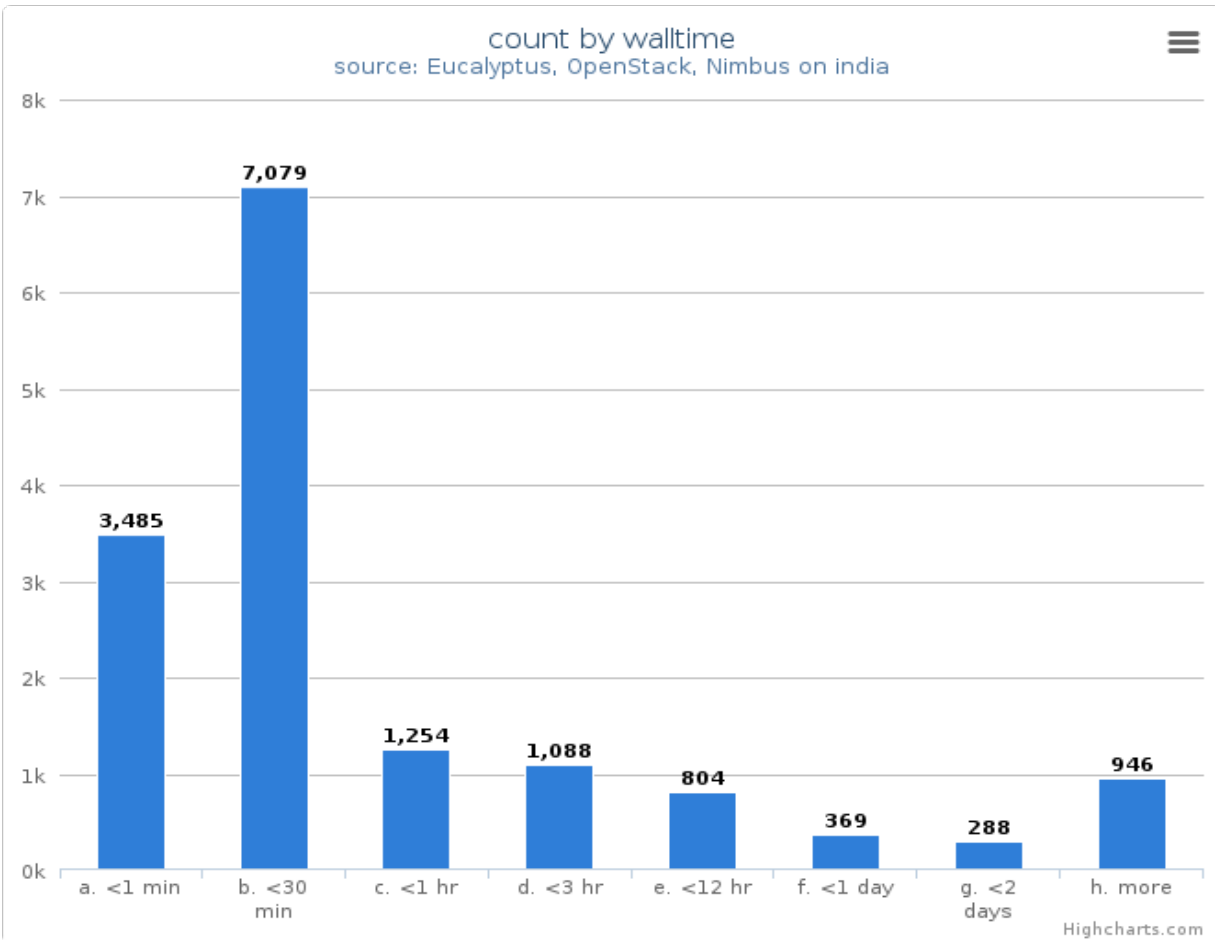


Figure 5: VM count by wall time

This chart illustrates usage patterns of VM instances in terms of running wall time.

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

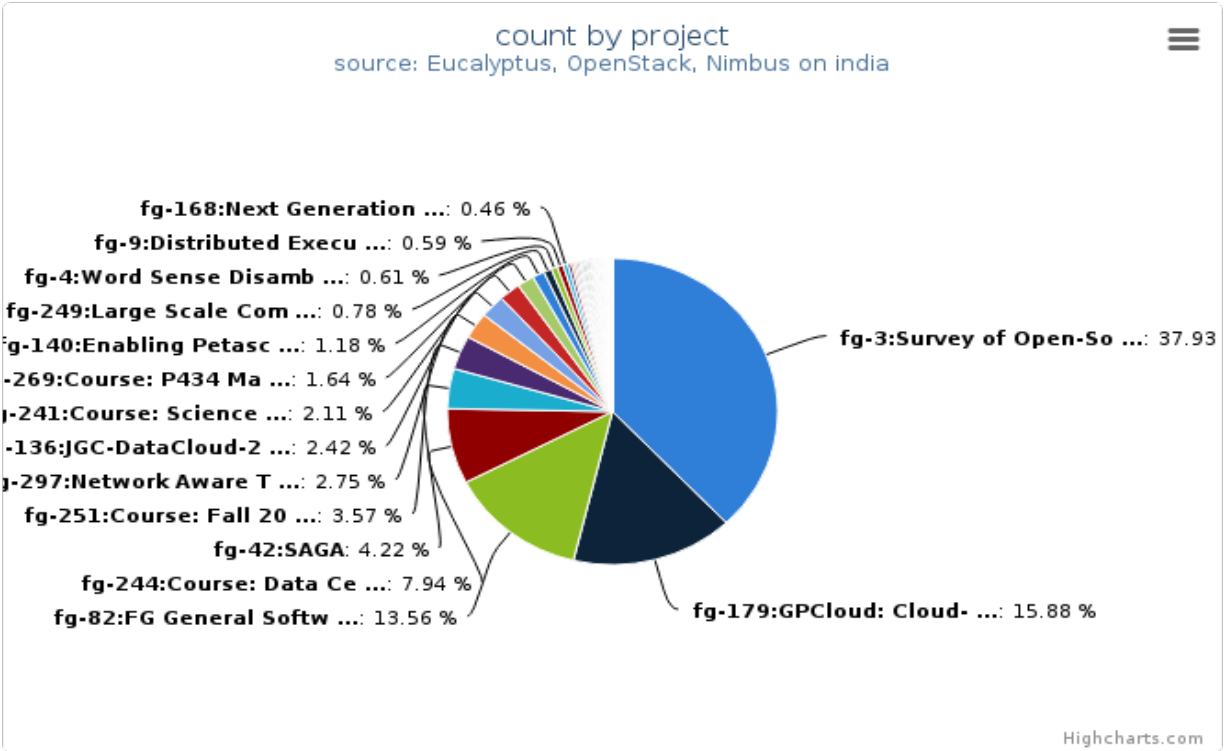


Figure 6: VMs count by project

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

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

Table 3.1: VMs count by project

Project	Value
fg-3:Survey of Open-Source Cloud Infrastructure using FutureGrid Testbed	4549
fg-179:GPCloud: Cloud-based Automatic Repair of Real-World Software Bugs	1905
fg-82:FG General Software Development	1626
fg-244:Course: Data Center Scale Computing	952
fg-42:SAGA	506
fg-251:Course: Fall 2012 B534 Distributed Systems Graduate Course	428
fg-297:Network Aware Task Scheduling in Hadoop	330
fg-136:JGC-DataCloud-2012 paper experiments	290
fg-241:Course: Science Cloud Summer School 2012	253
fg-269:Course: P434 MapReduce Class Project	197
fg-140:Enabling Petascale Ensemble-based Data Assimilation for Numerical Analysis and Prediction of High-Impact Weather	142

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Table 3.1 – continued from previous page

Project	Value
fg-249:Large Scale Computing Infrastructure 2012 Master class	94
fg-4:Word Sense Disambiguation for Web 2.0 Data	73
fg-9:Distributed Execution of Kepler Scientific Workflow on Future Grid	71
fg-168:Next Generation Sequencing in the Cloud	55
fg-211:Performance evaluation of cloud storage placement	43
fg-186:Course: Spring 2012 B534 Distributed systems Graduate Course	34
fg-213:Course: Cloud Computing class - second edition	31
fg-257:Particle Physics Data analysis cluster for ATLAS LHC experiment	27
fg-243:Applied Cyberinfrastructure concepts	26
fg-189:Pegasus development and improvement platform	26
fg-273:Digital Provenance Research	25
fg-266:Secure medical files sharing	23
fg-291:Distributed Computing course	23
fg-69:Investigate provenance collection for MapReduce	20
fg-47:Parallel scripting using cloud resources	19
fg-60:Wide area distributed file system for MapReduce applications on FutureGrid platform	18
fg-200:MapReduce Based Ray Tracing Class Project	16
fg-233:CINET - A Cyber-Infrastructure for Network Science	16
fg-224:Nimbus Auto Scale	15
fg-20:Development of an information service for FutureGrid	12
fg-132:Large scale data analytics	12
fg-256:QuakeSim Evaluation of FutureGrid for Cloud Computing	12
fg-99:Cloud-Based Support for Distributed Multiscale Applications	11
fg-176:Cloud Interoperability Testbed	10
fg-148:Developing Virtual Clusters for Science Gateways and HPC Education	10
fg-238:HPC meets Clouds	9
fg-201:EXTENCI Testing, Validation, and Performance	8
fg-138:Data mining samples based on Twister	8
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	8
fg-8:Running workflows in the cloud with Pegasus	8
fg-97:FutureGrid and Grid'5000 Collaboration	7
fg-170:European Middleware Initiative (EMI)	6
fg-110:FutureGrid Systems Development	5
fg-239:Community Comparison of Cloud frameworks	4
fg-90:Unicore and Genesis Experimentation	4
fg-289:Benchmarking the cloud	4
fg-52:Cost-Aware Cloud Computing	4
fg-279:Course: Mastering OpenStack	4
fg-174:RAIN: FutureGrid Dynamic provisioning Framework	3
fg-121:Elastic Computing	3
fg-23:Hardware Performance Monitoring in the Clouds	3
fg-167:FutureGrid User Support	2
fg-112:University of California (UC) Grid and Cloud Project	1
fg-48:Cloud Technologies for Bioinformatics Applications	1
fg-94:SpeQulos: A Framework for QoS in Unreliable Distributed Computing Infrastructures using Cloud Resources.	1
fg-78:Exploring VMs for Open Science Grid Services	1

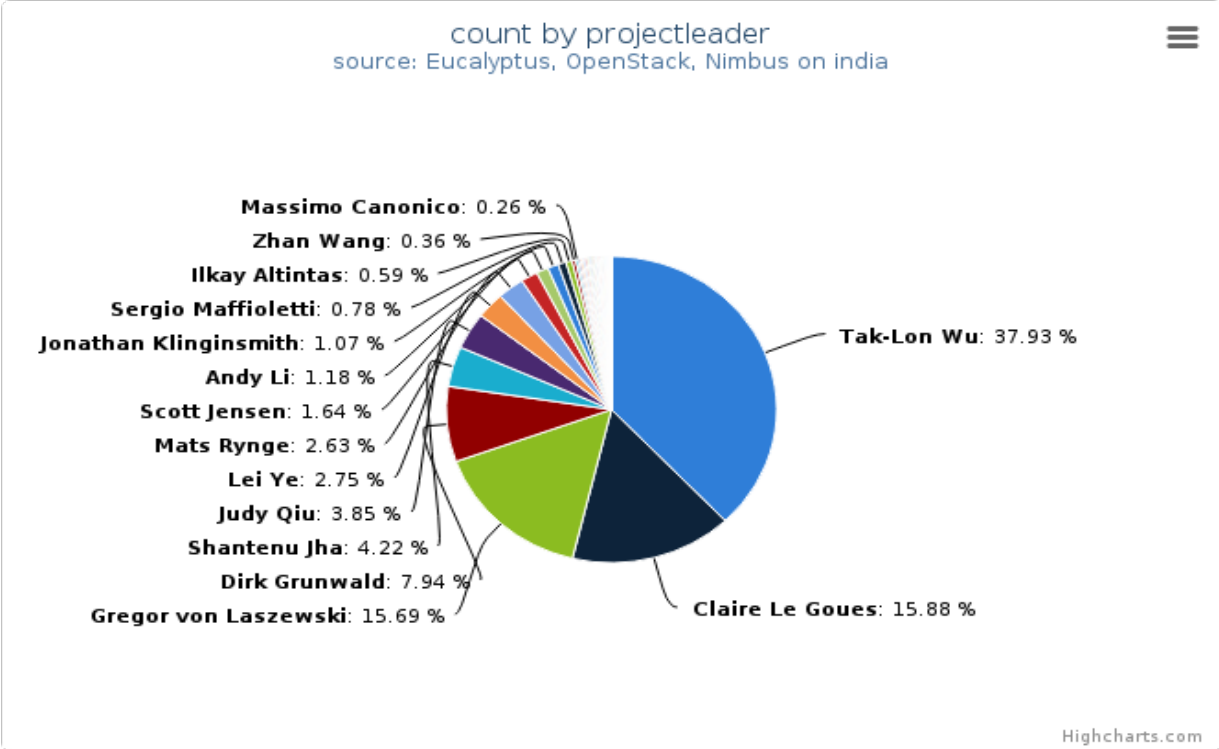


Figure 7: VMs count by project leader
This chart also illustrates the proportion of launched VM instances by project Leader. The same data in tabular form follows.

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

Table 3.2: VMs count by project leader

Projectleader	Value
Tak-Lon Wu	4549
Claire Le Goues	1905
Gregor von Laszewski	1882
Dirk Grunwald	952
Shantenu Jha	506
Judy Qiu	462
Lei Ye	330
Mats Rynge	316
Scott Jensen	197
Andy Li	142
Jonathan Klinginsmith	128

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Table 3.2 – continued from previous page

Projectleader	Value
Sergio Maffioletti	94
Ilkay Altintas	71
Zhan Wang	43
Massimo Canonico	31
Abdelkrim Hadjidj	27
Doug Benjamin	27
Nirav Merchant	26
Mohammed Rangwala	25
David Fergusson	23
Jiaan Zeng	20
Michael Wilde	19
Lizhe Wang	18
Keith Bisset	16
Jingya Wang	16
Pierre Riteau	15
Yogesh Simmhan	12
Hyungro Lee	12
Andrea Donnellan	12
Katarzyna Rycerz	11
Alan Sill	10
Thomas Hacker	10
Li Chunyan	9
Renato Figueiredo	8
Zhanquan Sun	8
Gideon Juve	8
Preston Smith	8
Gary Miksik	7
Mauricio Tsugawa	7
Morris Riedel	6
Yong Zhao	4
David Lowenthal	4
Ashish Jain	4
Shava Smallen	4
Paul Marshall	3
Shirley Moore	3
	1
Prakashan Korambath	1
Simon Delamare	1
Thilina Gunarathne	1

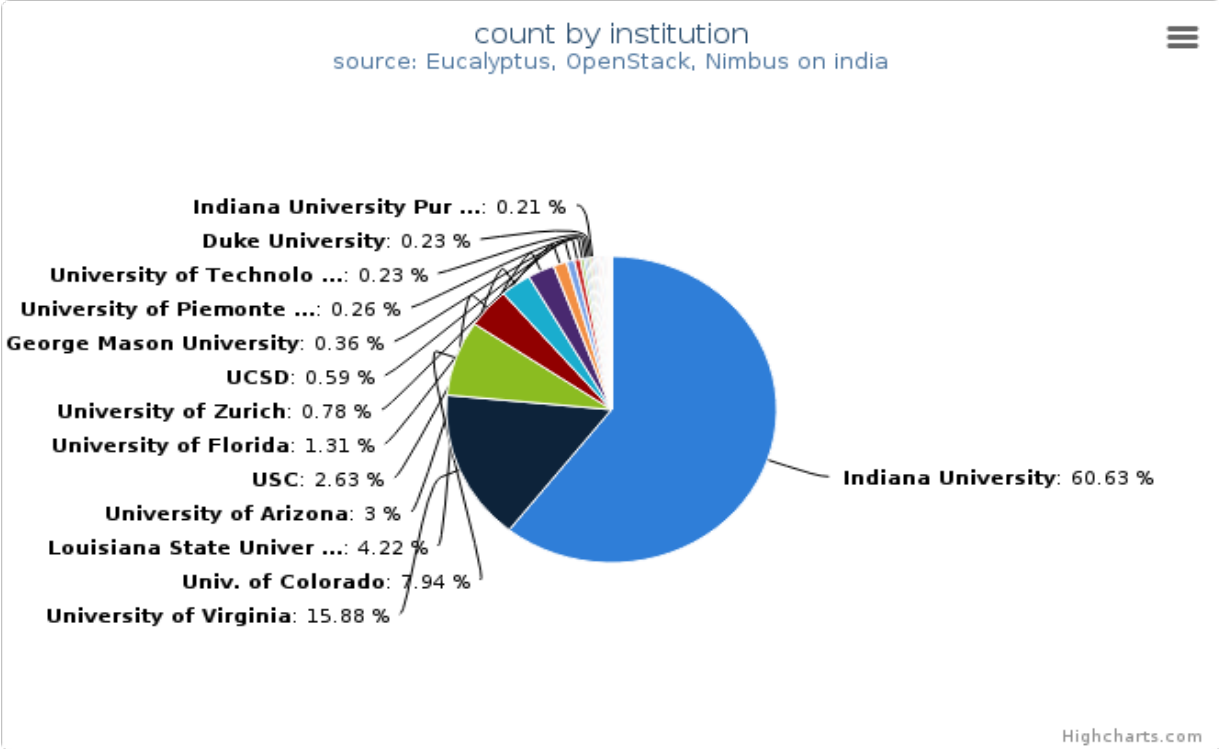


Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

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

Table 3.3: VMs count by institution

Institution	Value
Indiana University	7272
University of Virginia	1905
Univ. of Colorado	952
Louisiana State University	506
University of Arizona	360
USC	316
University of Florida	157
University of Zurich	94
UCSD	71
George Mason University	43
University of Piemonte Orientale	31
University of Technology of Compiegne	27

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Table 3.3 – continued from previous page

Institution	Value
Duke University	27
Indiana University Purdue University Indianapolis	25
University of Southern California	24
BioIT	23
Computer Science	20
Argonne National Laboratory	19
Purdue University	18
Virginia Tech	16
University of Chicago	15
Jet Propulsion Laboratory	12
AGH	11
Texas Tech University	10
YunNan University	9
Indiana University Bloomington	8
Juelich Supercomputing Centre	6
University of Electronic Science and Technology	4
UC San Diego	4
University of Colorado at Boulder	3
University of Tennessee	3
	1
INRIA - France	1
UCLA	1

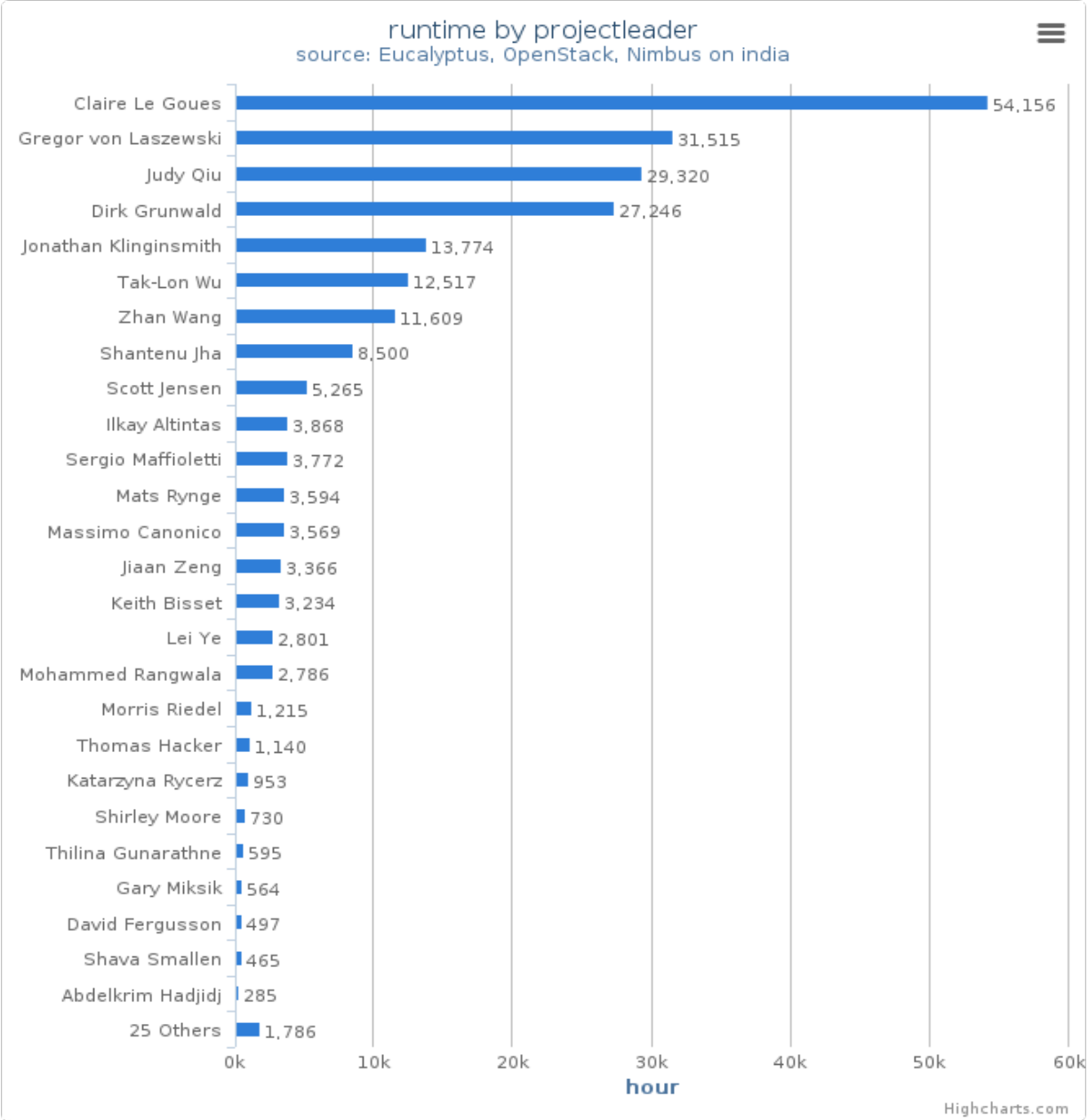


Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: July 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.

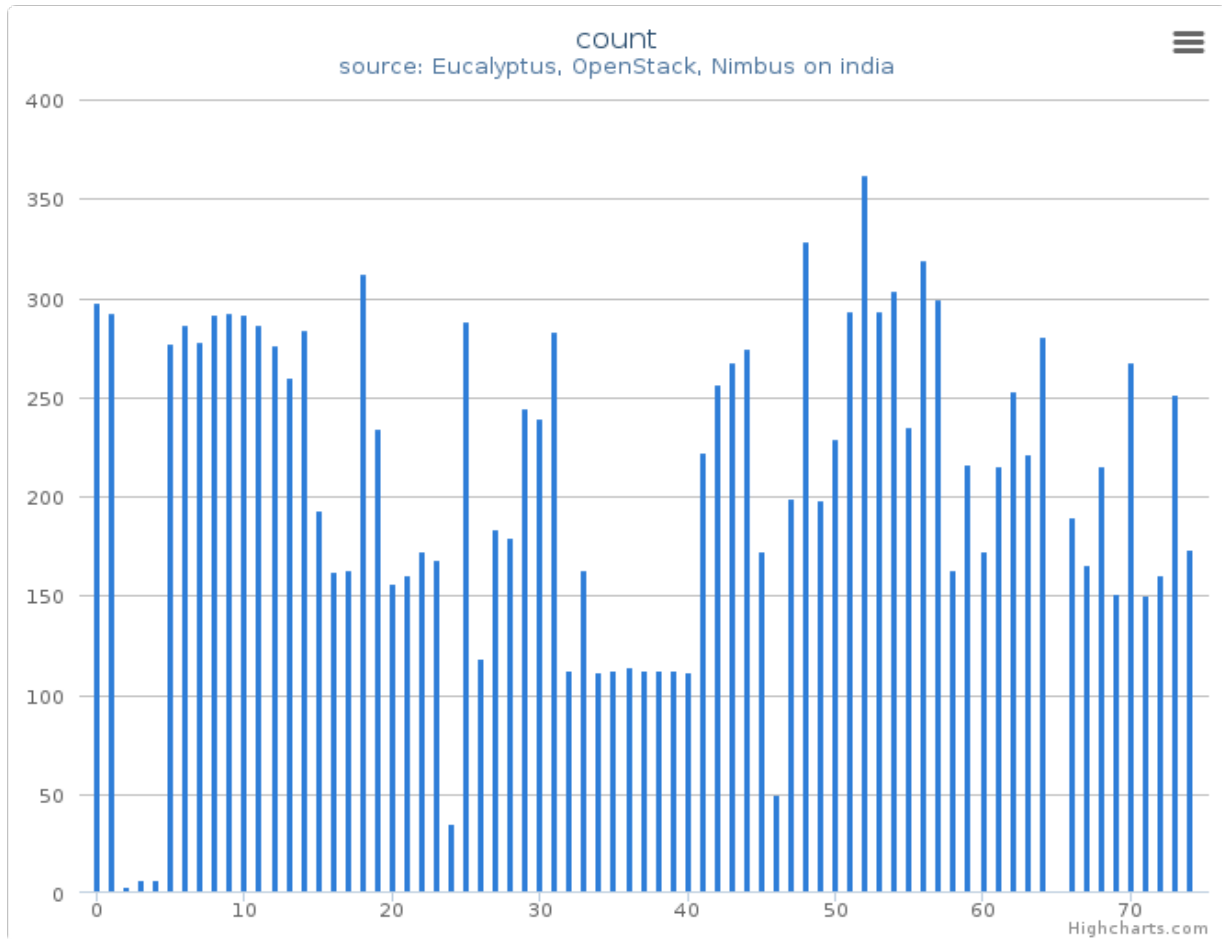


Figure 10: VMs count by systems (compute nodes) in Cluster (india)

This column chart represents VMs count among systems.

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

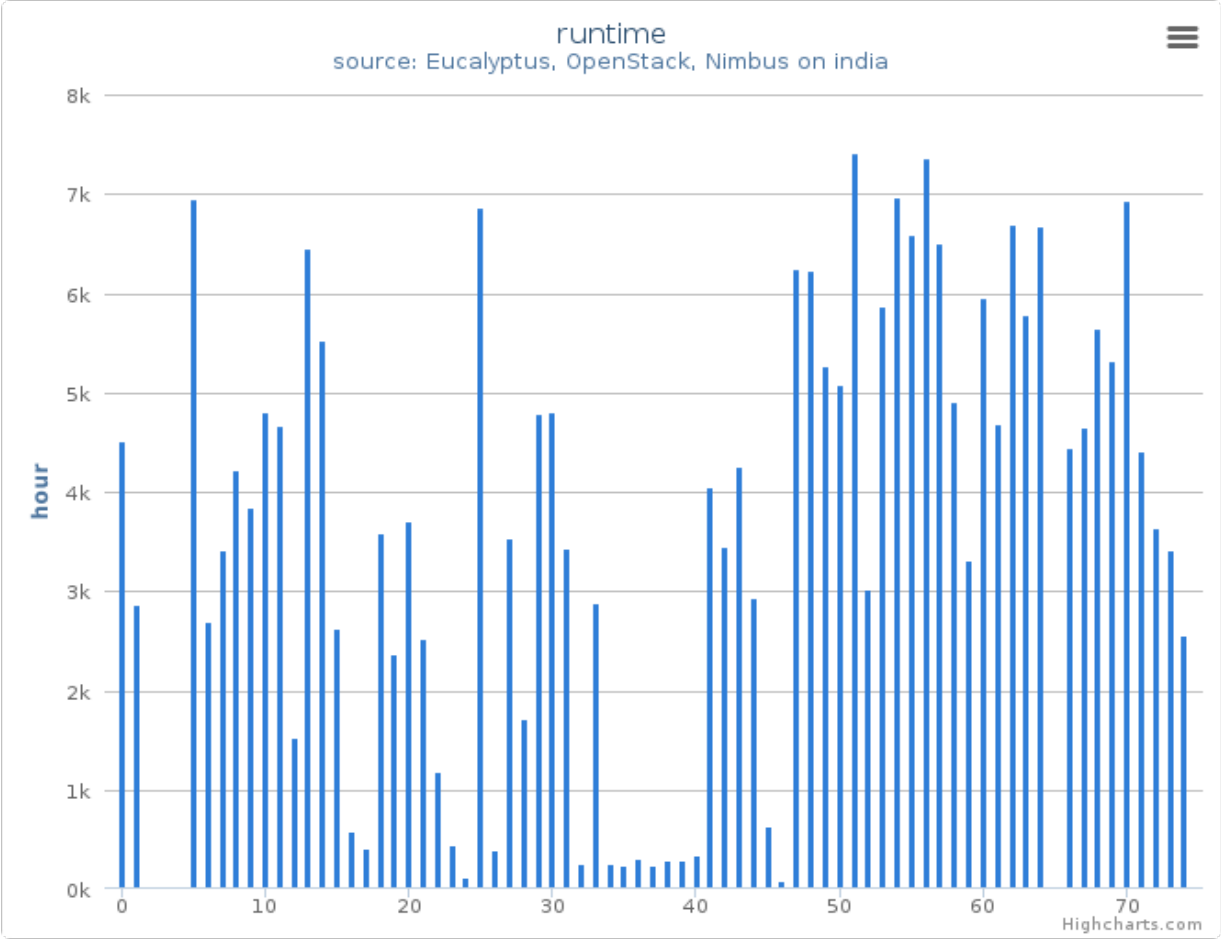


Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (india)
This column chart represents wall time among systems.

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

USAGE REPORT HOTEL

- Period: July 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)

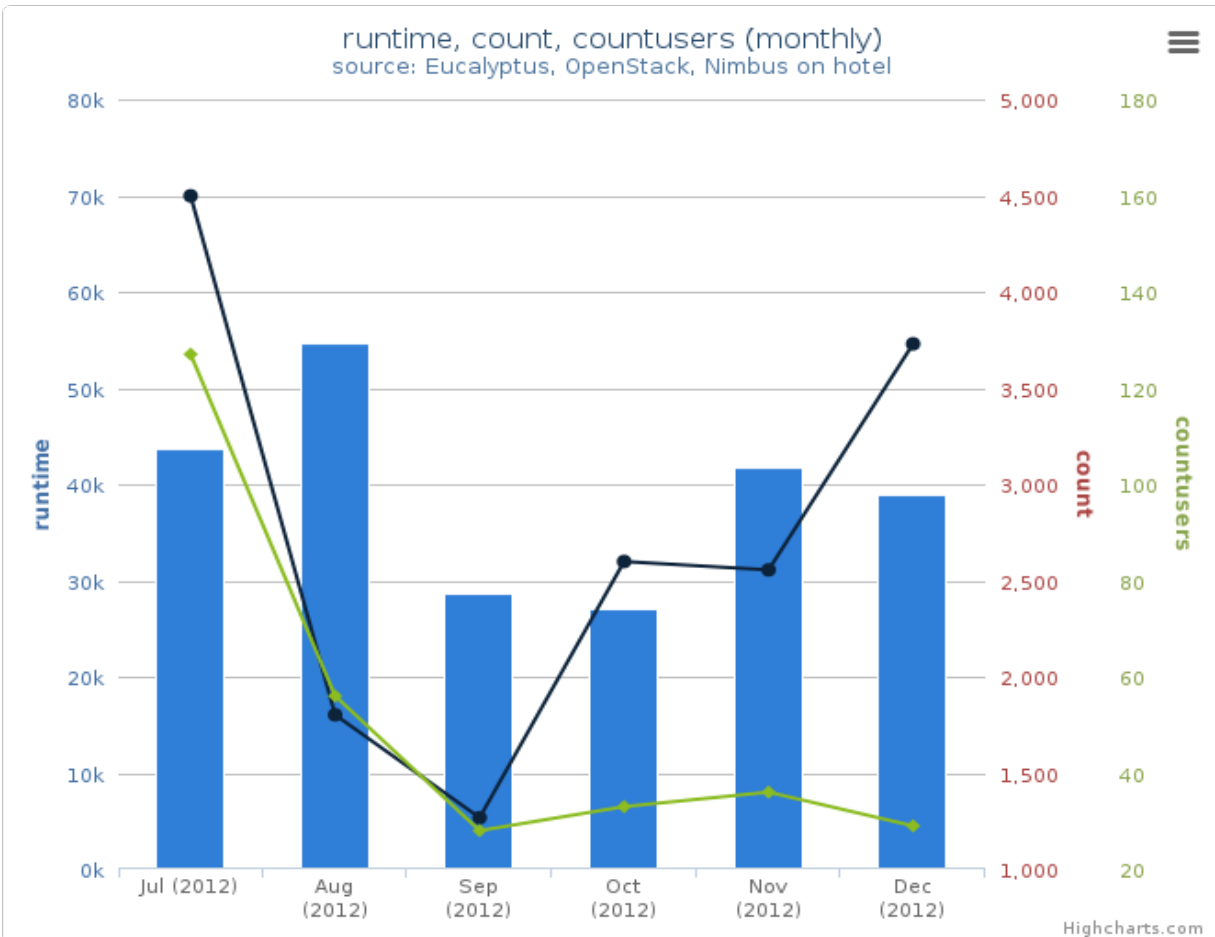


Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)

This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: July 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)

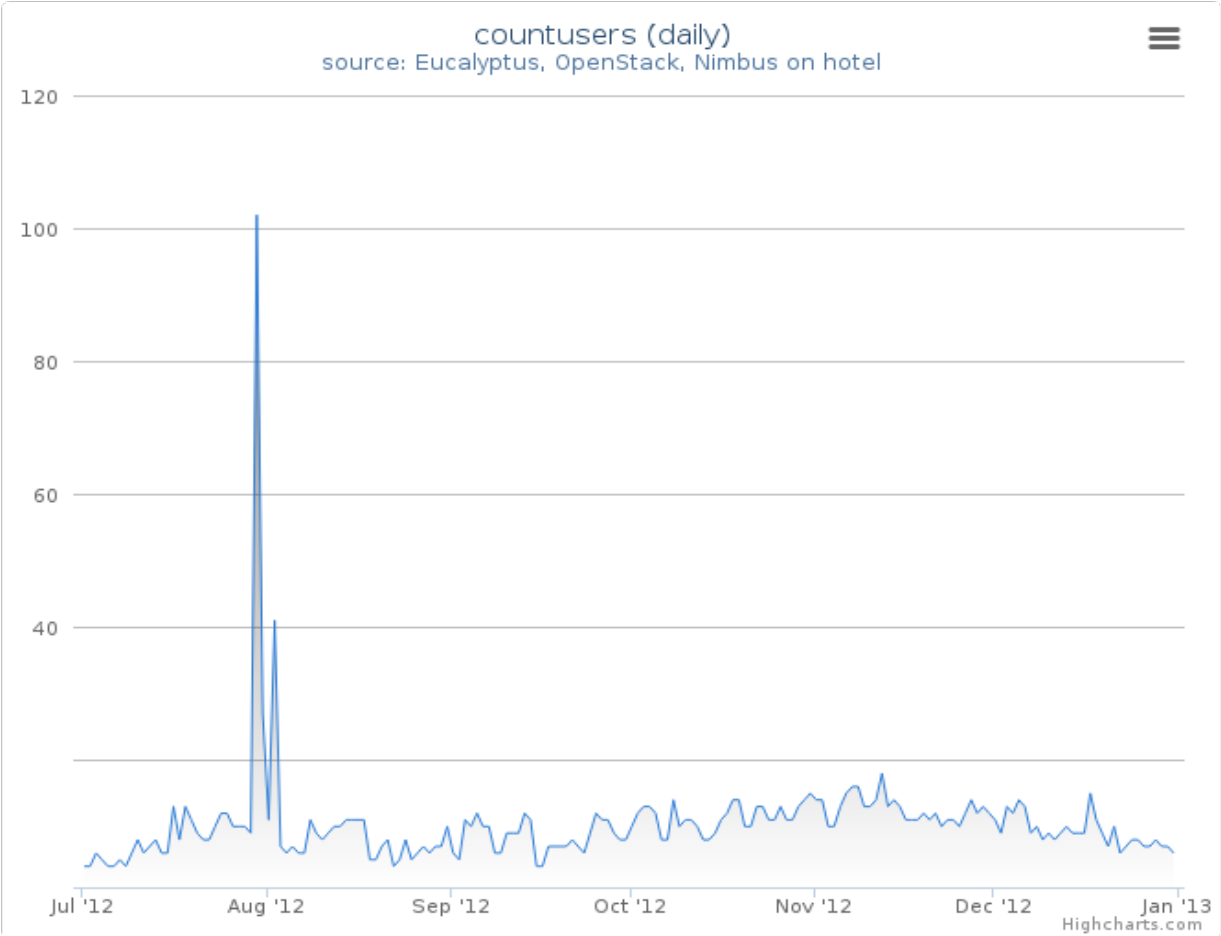


Figure 2: Users count
This time series chart represents daily active user count for cloud services and shows historical changes during the period.

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

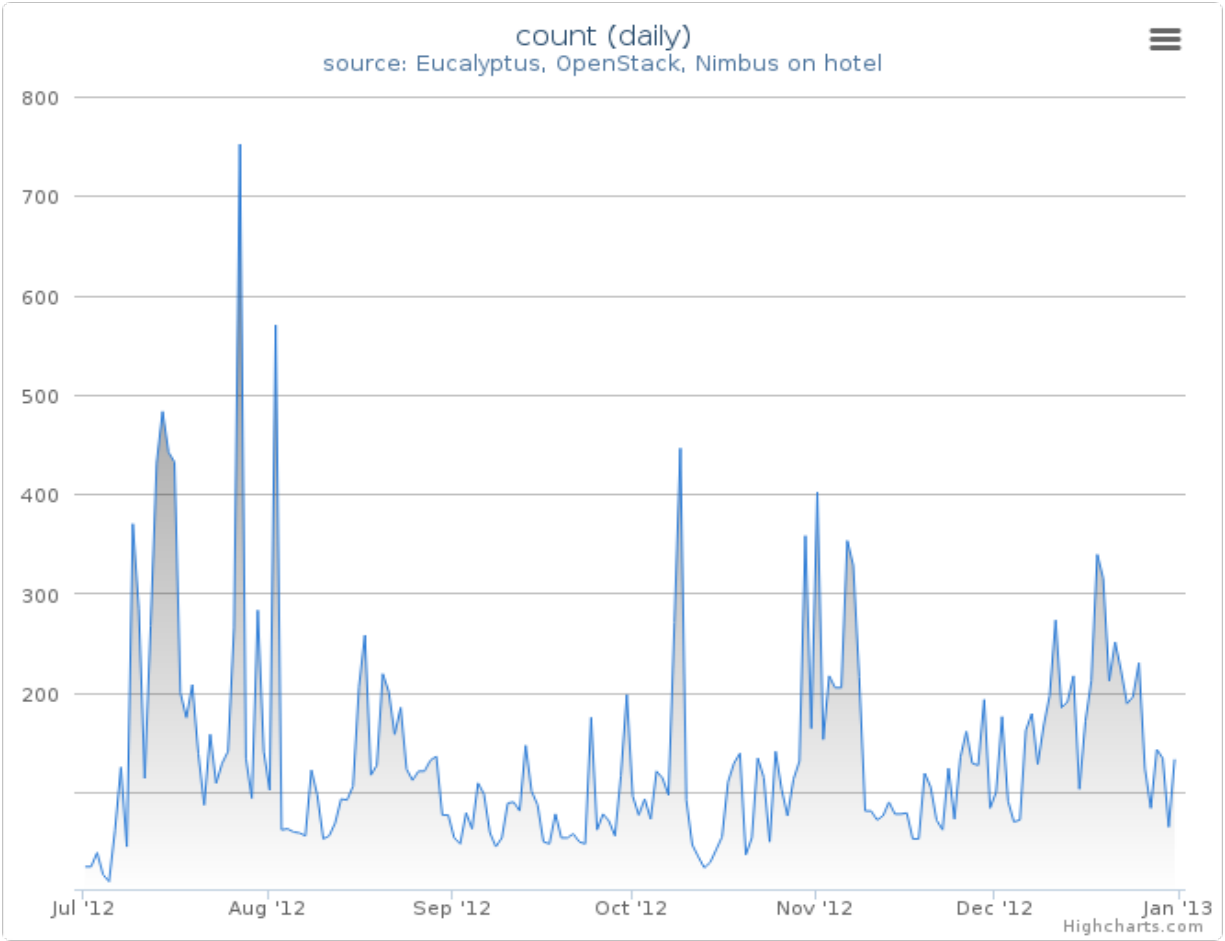


Figure 3: VMs count

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

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

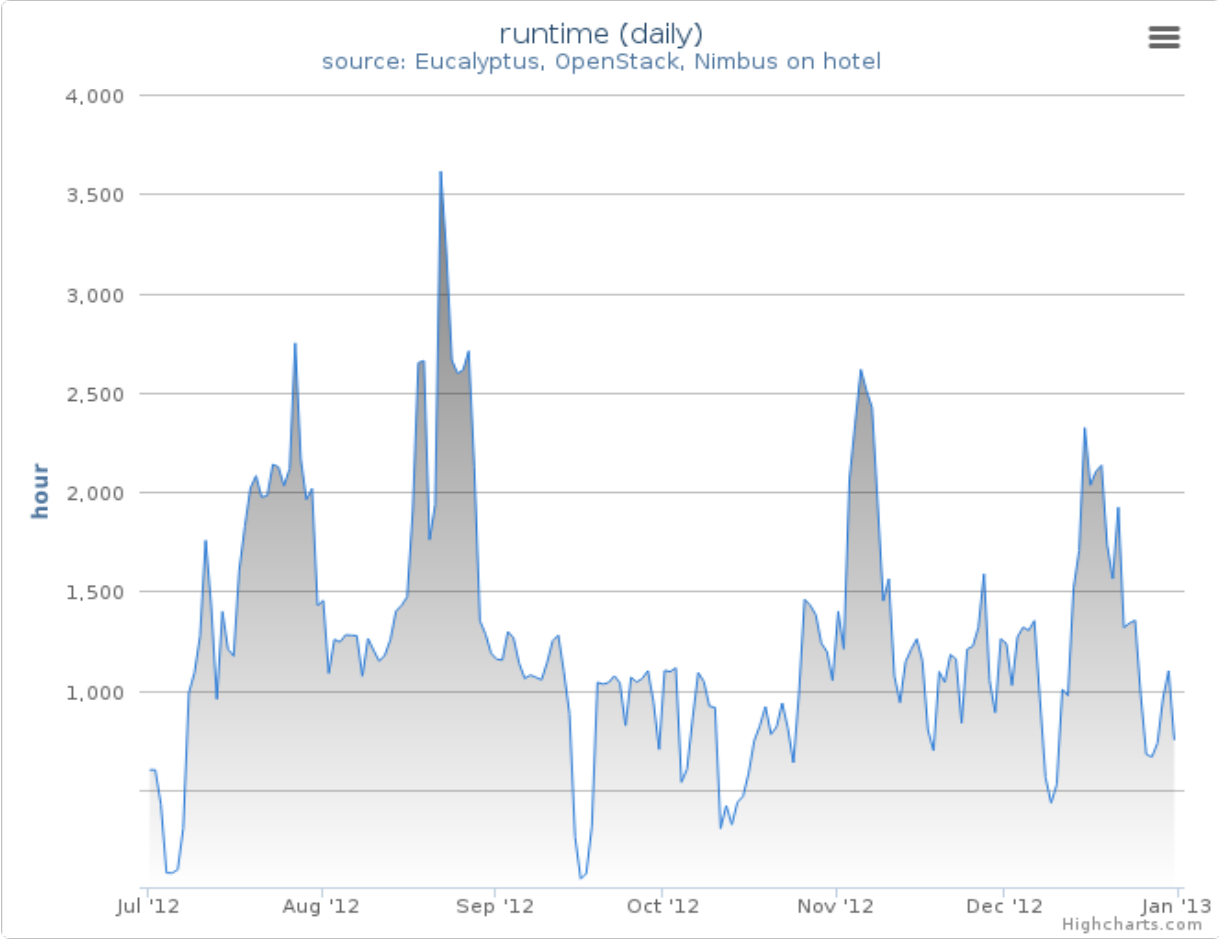


Figure 4: Wall time (hours)
This time series chart represents daily wall time (hours) for cloud services and shows historical changes during the period.

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

4.2 Distribution

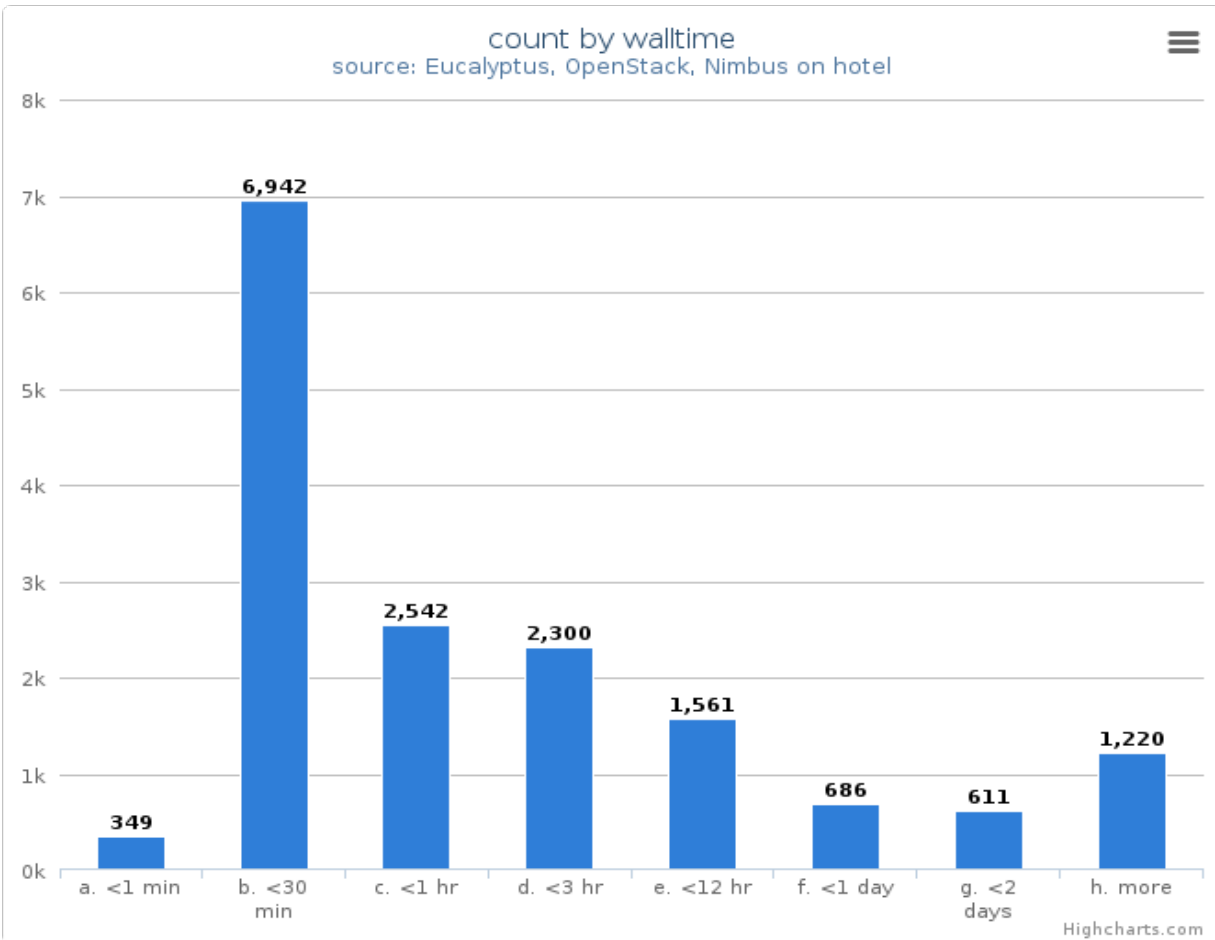


Figure 5: VM count by wall time

This chart illustrates usage patterns of VM instances in terms of running wall time.

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

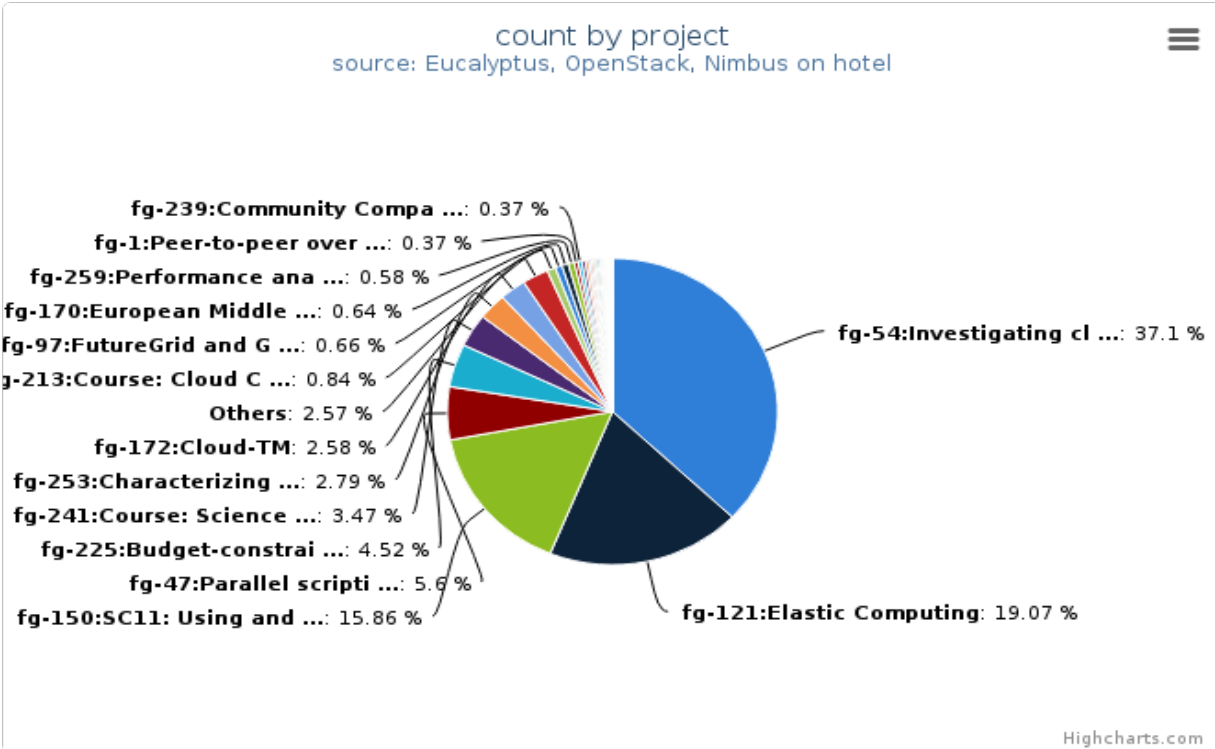


Figure 6: VMs count by project

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

- Period: July 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	5708
fg-121:Elastic Computing	2934
fg-150:SC11: Using and Building Infrastructure Clouds for Science	2441
fg-47:Parallel scripting using cloud resources	861
fg-225:Budget-constrained workflow scheduler	696
fg-241:Course: Science Cloud Summer School 2012	534
fg-253:Characterizing Performance of Infrastructure Clouds	429
fg-172:Cloud-TM	397
Others	395
fg-213:Course: Cloud Computing class - second edition	130
fg-97:FutureGrid and Grid'5000 Collaboration	101

Continued on next page

Table 4.1 – continued from previous page

Project	Value
fg-170:European Middleware Initiative (EMI)	99
fg-259:Performance analysis of a parallel CFD solver in cloud computing clusters	90
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	57
fg-239:Community Comparison of Cloud frameworks	57
fg-201:ExTENCI Testing, Validation, and Performance	53
fg-130:Optimizing Scientific Workflows on Clouds	50
fg-10:TeraGrid XD TIS(Technology Insertion Service) Technology Evaluation Laboratory	36
fg-159:Evaluation of MPI Collectives for HPC Applications on Distributed Virtualized Environments	34
fg-191:Course: UCF EEL6938 Data-intensive computing and Cloud Class	34
fg-273:Digital Provenance Research	32
fg-82:FG General Software Development	29
fg-186:Course: Spring 2012 B534 Distributed systems Graduate Course	26
fg-257:Particle Physics Data analysis cluster for ATLAS LHC experiment	17
fg-112:University of California (UC) Grid and Cloud Project	13
fg-265:Course: SC12 Tutorial	12
fg-291:Distributed Computing course	11
fg-189:Pegasus development and improvement platform	10
fg-60:Wide area distributed file system for MapReduce applications on FutureGrid platform	10
fg-78:Exploring VMs for Open Science Grid Services	10
fg-52:Cost-Aware Cloud Computing	9
fg-238:HPC meets Clouds	9
fg-221:Course: High Performance Computing Class	8
fg-229:Course: XSEDE 2012 Tutorial	7
fg-214:Mining Interactions between Network Community Structure and Information Diffusion	6
fg-146:SLASH2 Testing in a Wide Area Environment	6
fg-136:JGC-DataCloud-2012 paper experiments	5
fg-165:The VIEW Project	5
fg-20:Development of an information service for FutureGrid	4
fg-224:Nimbus Auto Scale	3
fg-266:Secure medical files sharing	3
fg-125:The VIEW Project	3
fg-143:Course: Cloud Computing for Data Intensive Science Class	3
fg-243:Applied Cyberinfrastructure concepts	2
fg-234:CCTools Scalability Testing	2
fg-175:GridProphet, A workflow execution time prediction system for the Grid	1
fg-161:XSEDE: GenesisII-Unicore6 interop testing	1
fg-15:Grid Appliance	1
fg-69:Investigate provenance collection for MapReduce	1
fg-247:Course: Cloud Computing and Storage Class	1
fg-200:MapReduce Based Ray Tracing Class Project	1

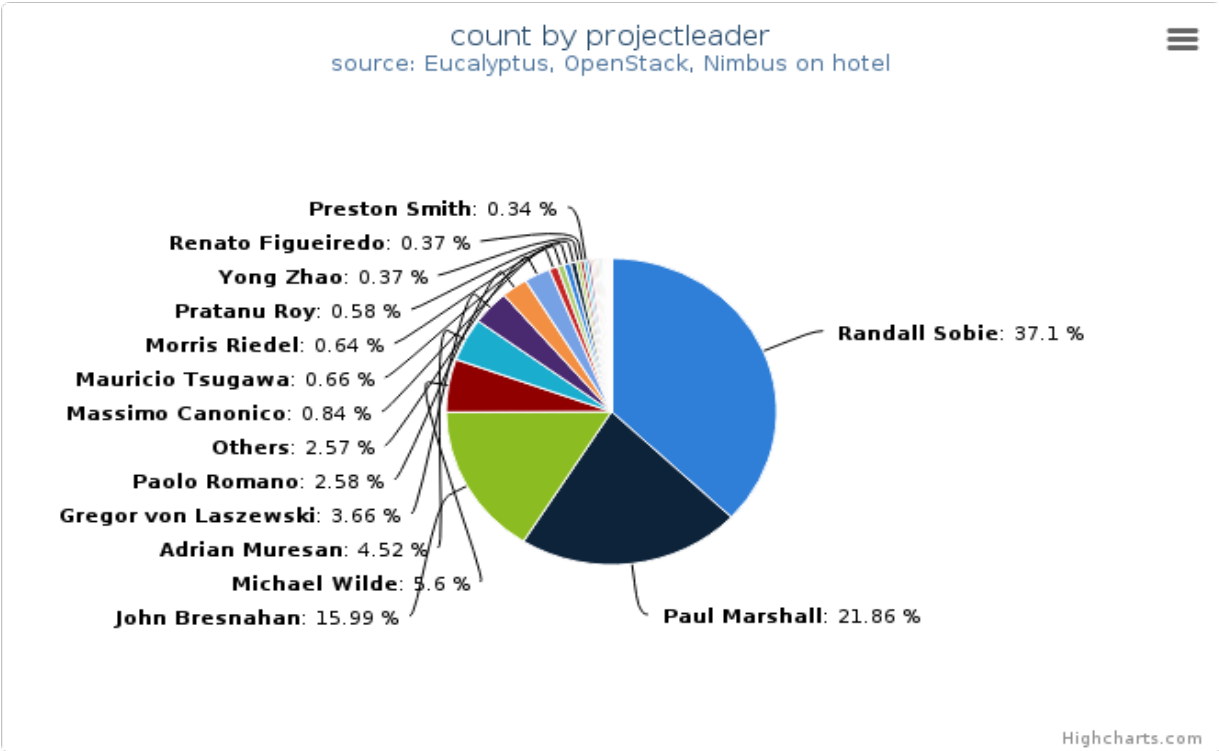


Figure 7: VMs count by project leader
This chart also illustrates the proportion of launched VM instances by project Leader. The same data in tabular form follows.

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

Table 4.2: VMs count by project leader

Projectleader	Value
Randall Sobie	5708
Paul Marshall	3363
John Bresnahan	2460
Michael Wilde	861
Adrian Muresan	696
Gregor von Laszewski	563
Paolo Romano	397
Others	395
Massimo Canonico	130
Mauricio Tsugawa	101
Morris Riedel	99

Continued on next page

Table 4.2 – continued from previous page

Projectleader	Value
Pratanu Roy	90
Yong Zhao	57
Renato Figueiredo	57
Preston Smith	53
Weiwei Chen	50
John Lockman	36
Ivan Rodero	34
Prof. Jun Wang	34
Mohammed Rangwala	32
Judy Qiu	29
Doug Benjamin	17
Mats Rynge	15
Prakashan Korambath	13
David Fergusson	11
	10
Lizhe Wang	10
David Lowenthal	9
Li Chunyan	9
Shiyong Lu	8
Wilson Rivera	8
Yong-Yeol Ahn	6
J Ray Scott	6
Hyungro Lee	4
Pierre Riteau	3
Abdelkrim Hadjidj	3
Nirav Merchant	2
Douglas Thain	2
Panoat Chuchaisri	1
Thomas Fahringer	1
Andy Li	1
Jiaan Zeng	1
Andrew Grimshaw	1
Jingya Wang	1

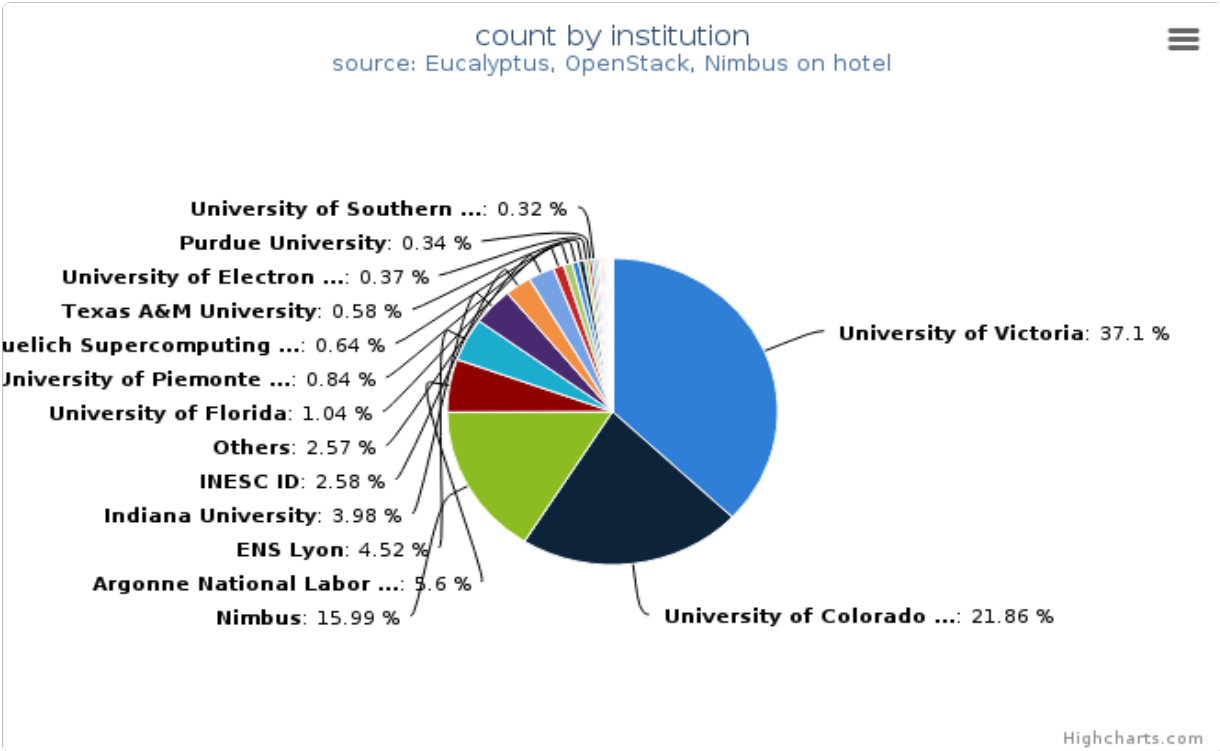


Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

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

Table 4.3: VMs count by institution

Institution	Value
University of Victoria	5708
University of Colorado at Boulder	3363
Nimbus	2460
Argonne National Laboratory	861
ENS Lyon	696
Indiana University	613
INESC ID	397
Others	395
University of Florida	160
University of Piemonte Orientale	130
Juelich Supercomputing Centre	99
Texas A&M University	90

Continued on next page

Table 4.3 – continued from previous page

Institution	Value
University of Electronic Science and Technology	57
Purdue University	53
University of Southern California	50
University of Texas at Austin	36
Rutgers University	34
University of Central Florida	34
Indiana University Purdue University Indianapolis	32
Duke University	17
USC	15
UCLA	13
BioIT	11
University of Arizona	11
	10
YunNan University	9
Wayne State University	8
University of Puerto Rico	8
Carnegie Mellon University	6
University of Technology of Compiegne	3
University of Chicago	3
University of Notre Dame	2
Computer Science	1
University of Innsbruck	1
University of Virginia	1

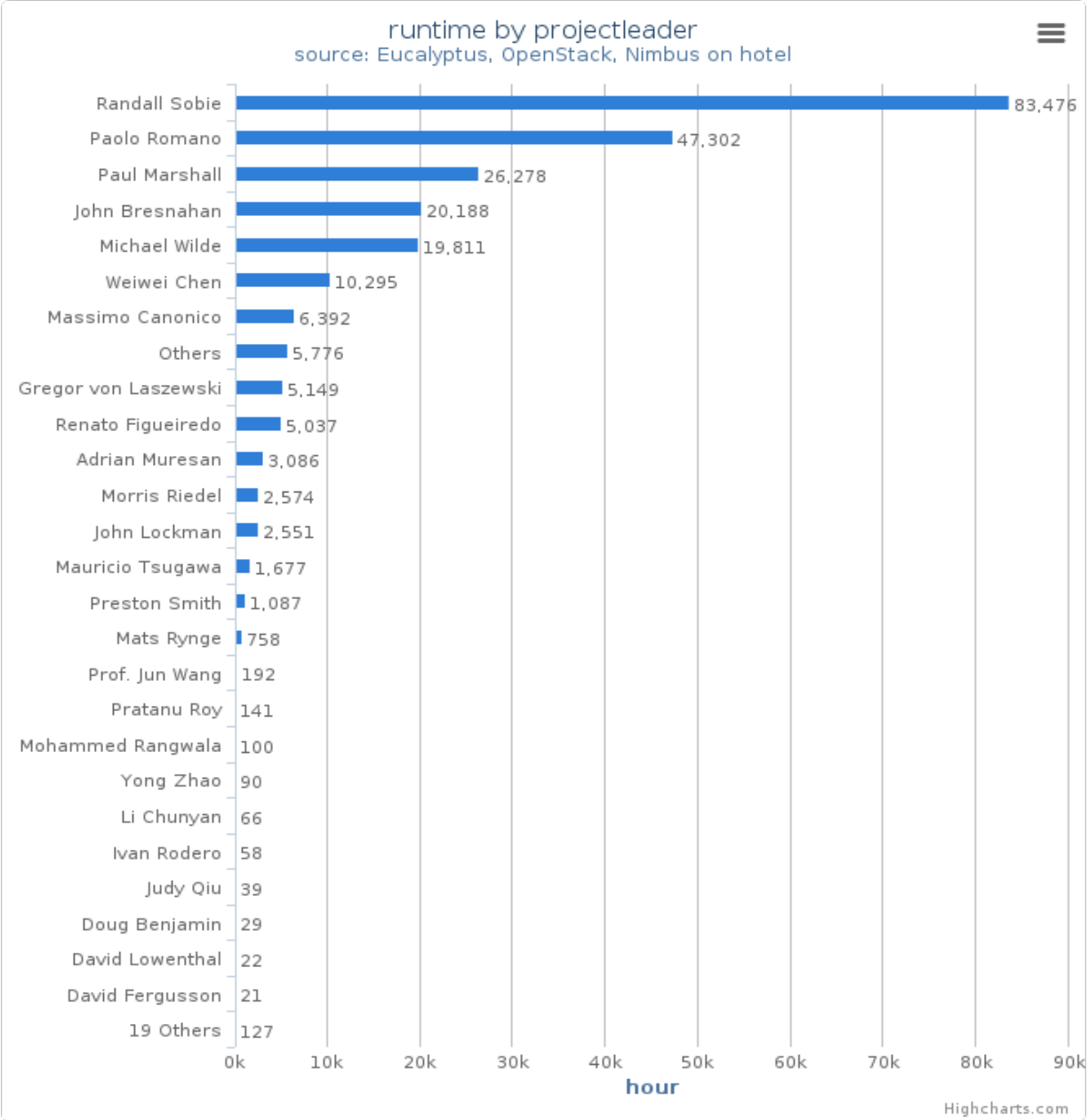


Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: July 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.

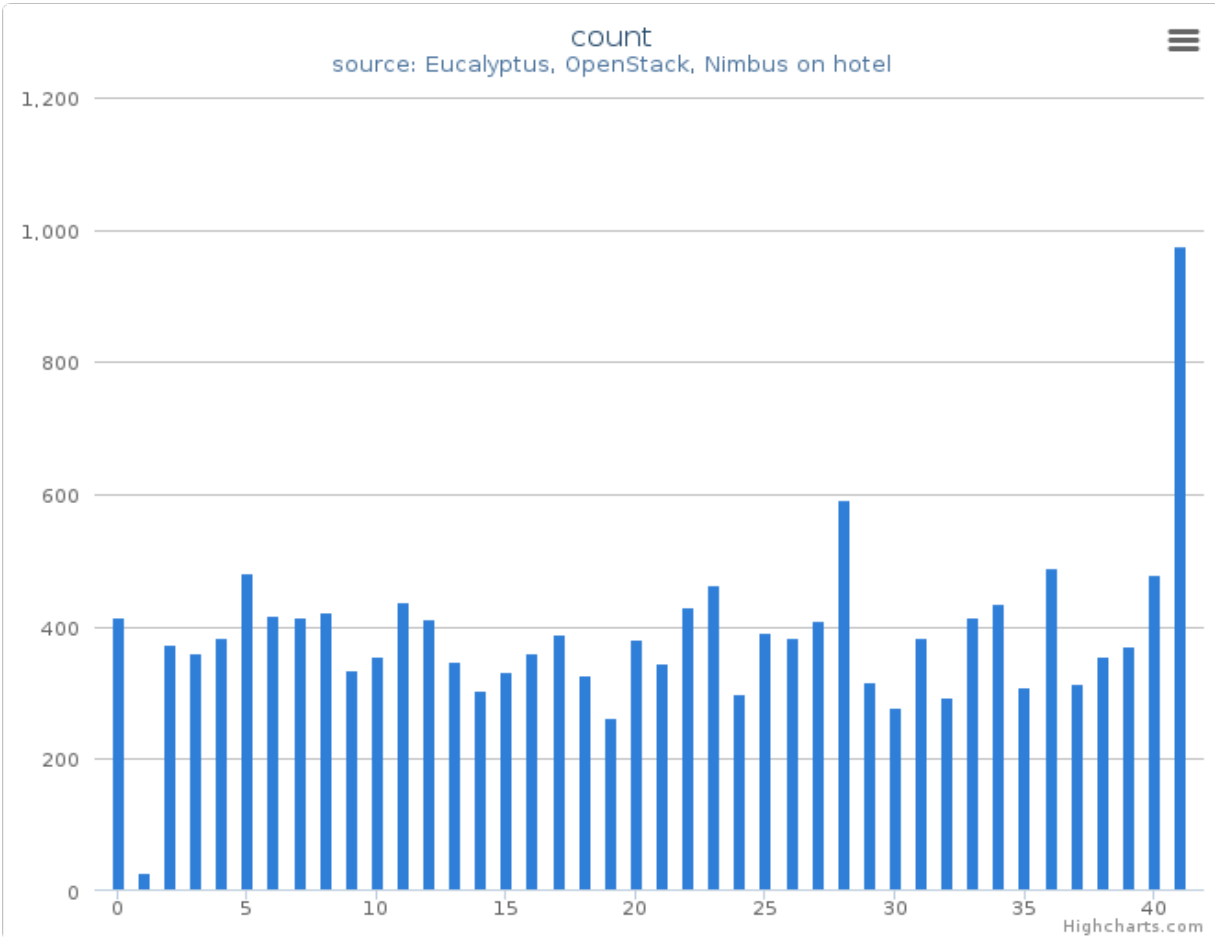


Figure 10: VMs count by systems (compute nodes) in Cluster (hotel)

This column chart represents VMs count among systems.

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

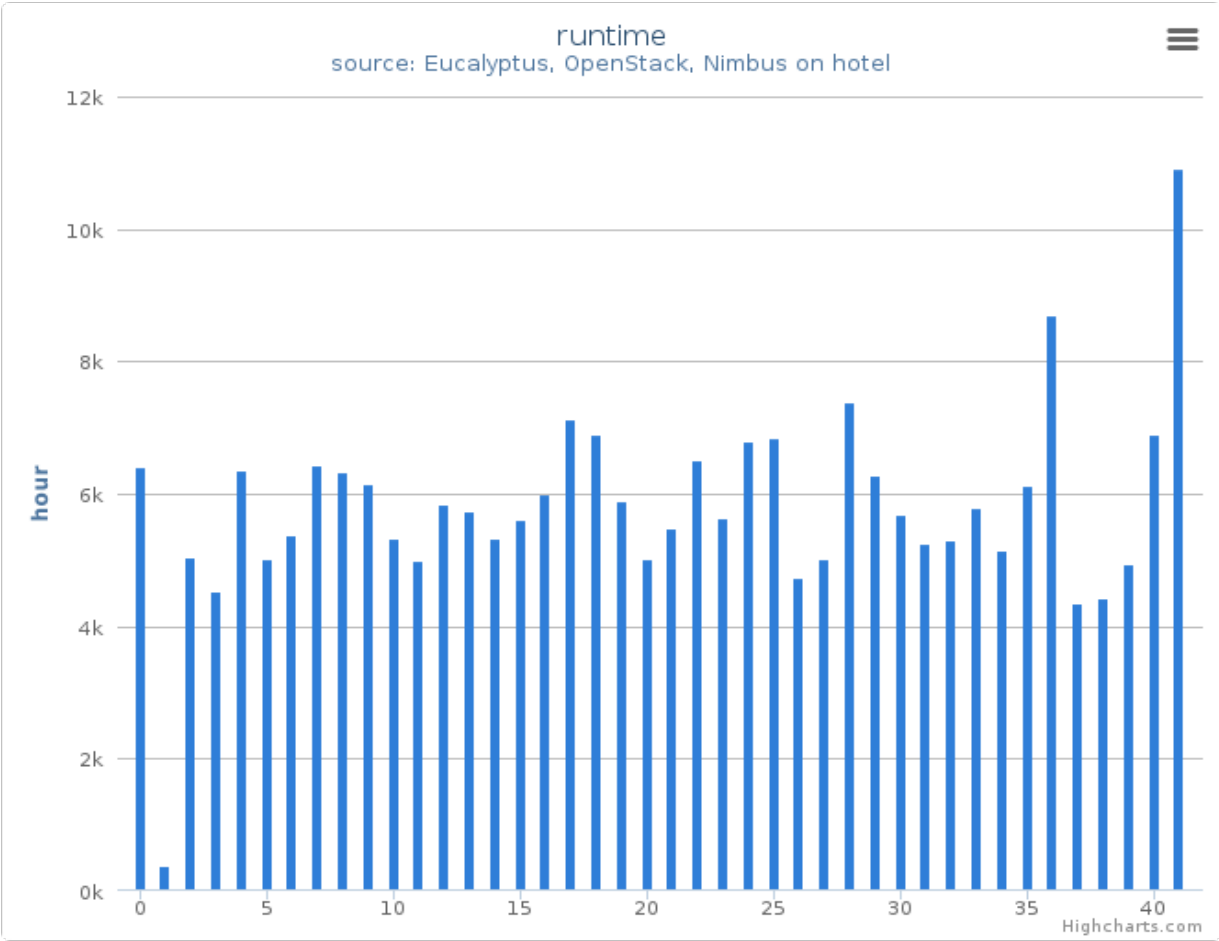


Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (hotel)
This column chart represents wall time among systems.

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

USAGE REPORT ALAMO

- Period: July 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)

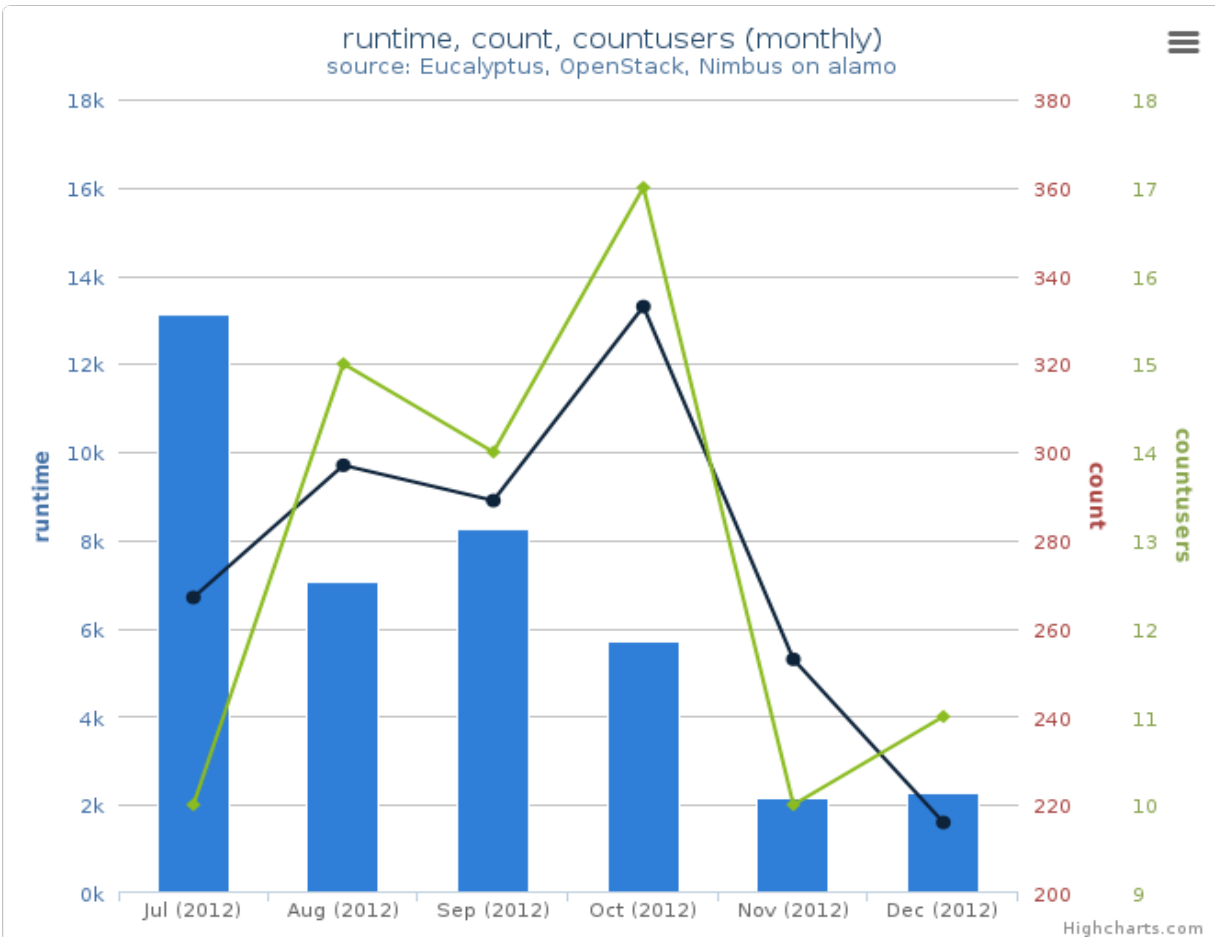


Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)

This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: July 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)

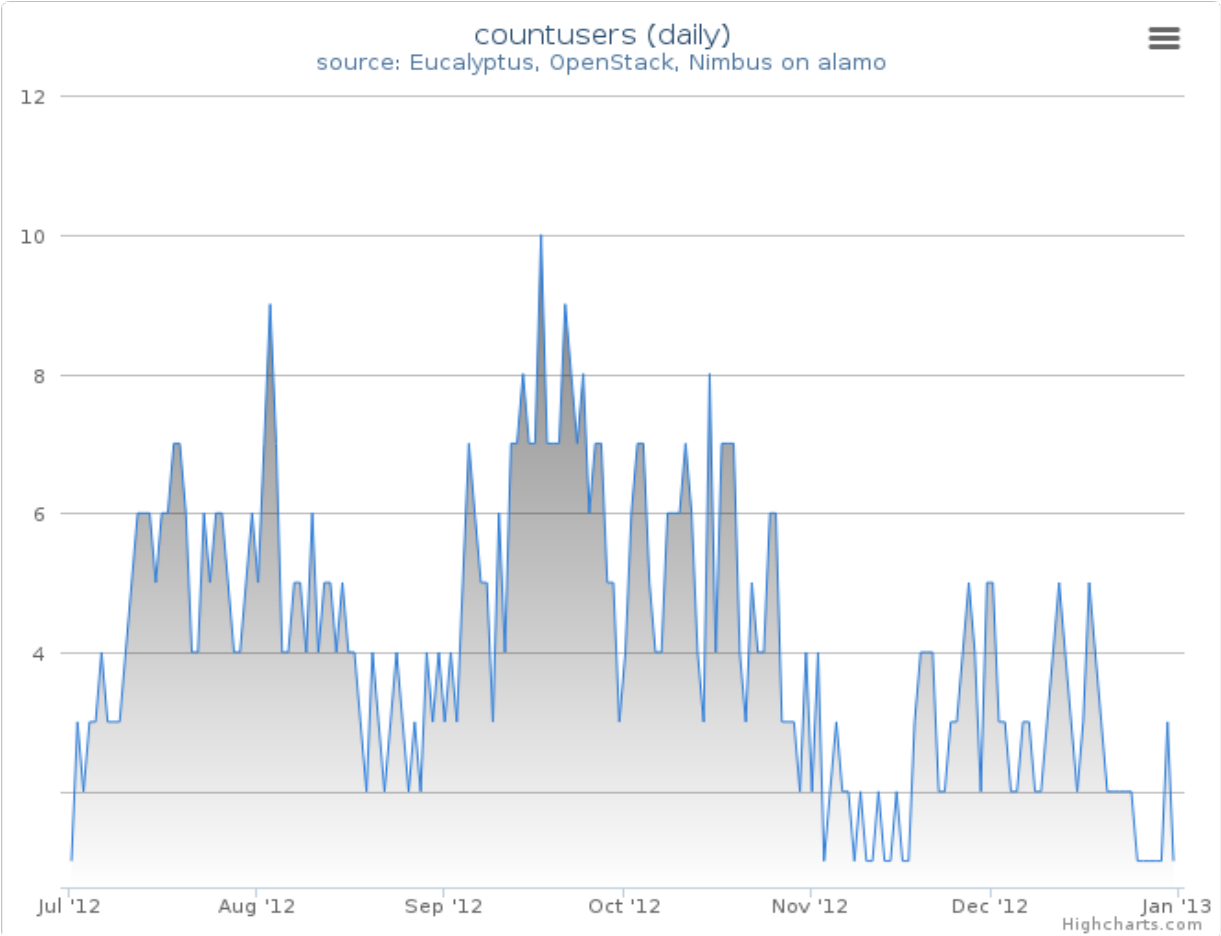


Figure 2: Users count
This time series chart represents daily active user count for cloud services and shows historical changes during the period.

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

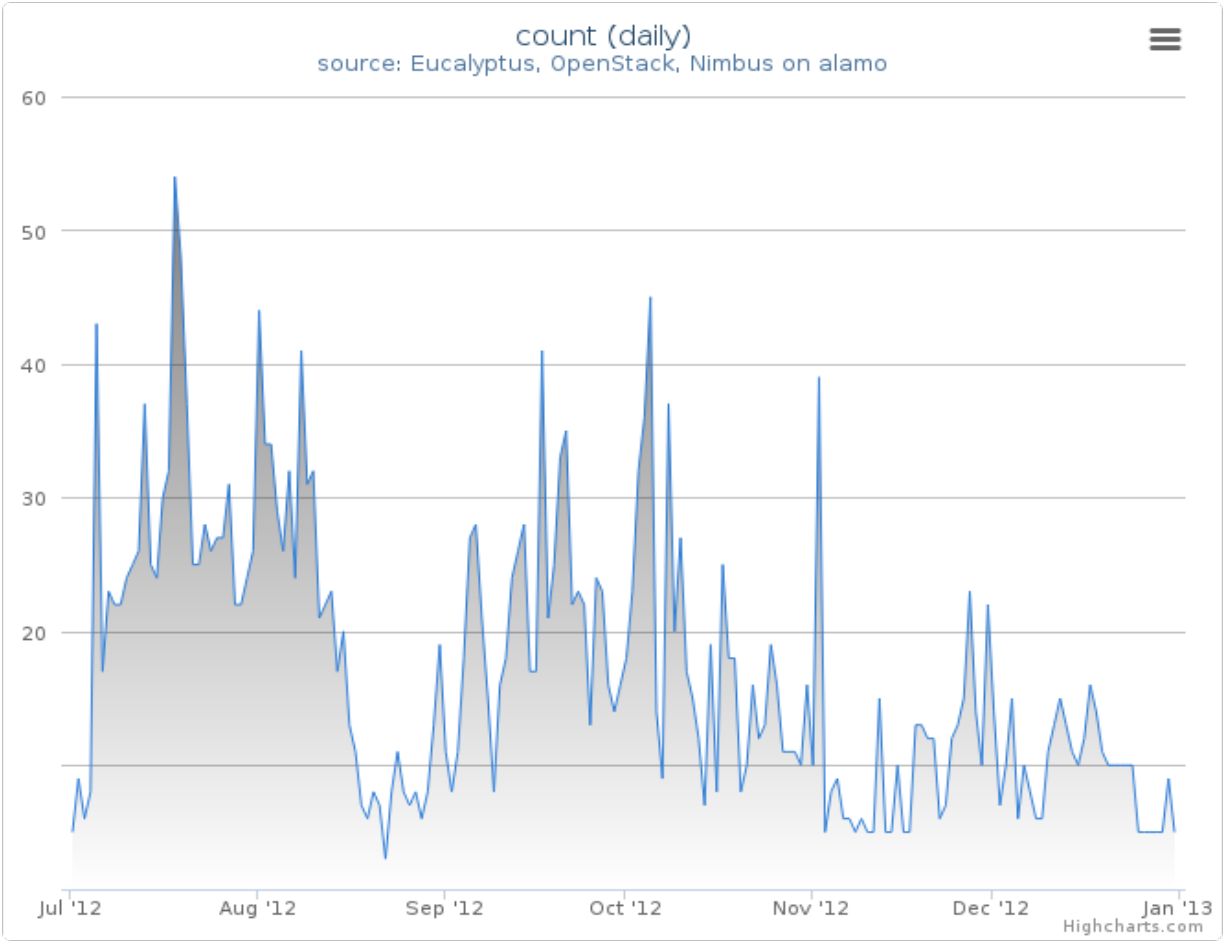


Figure 3: VMs count

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

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

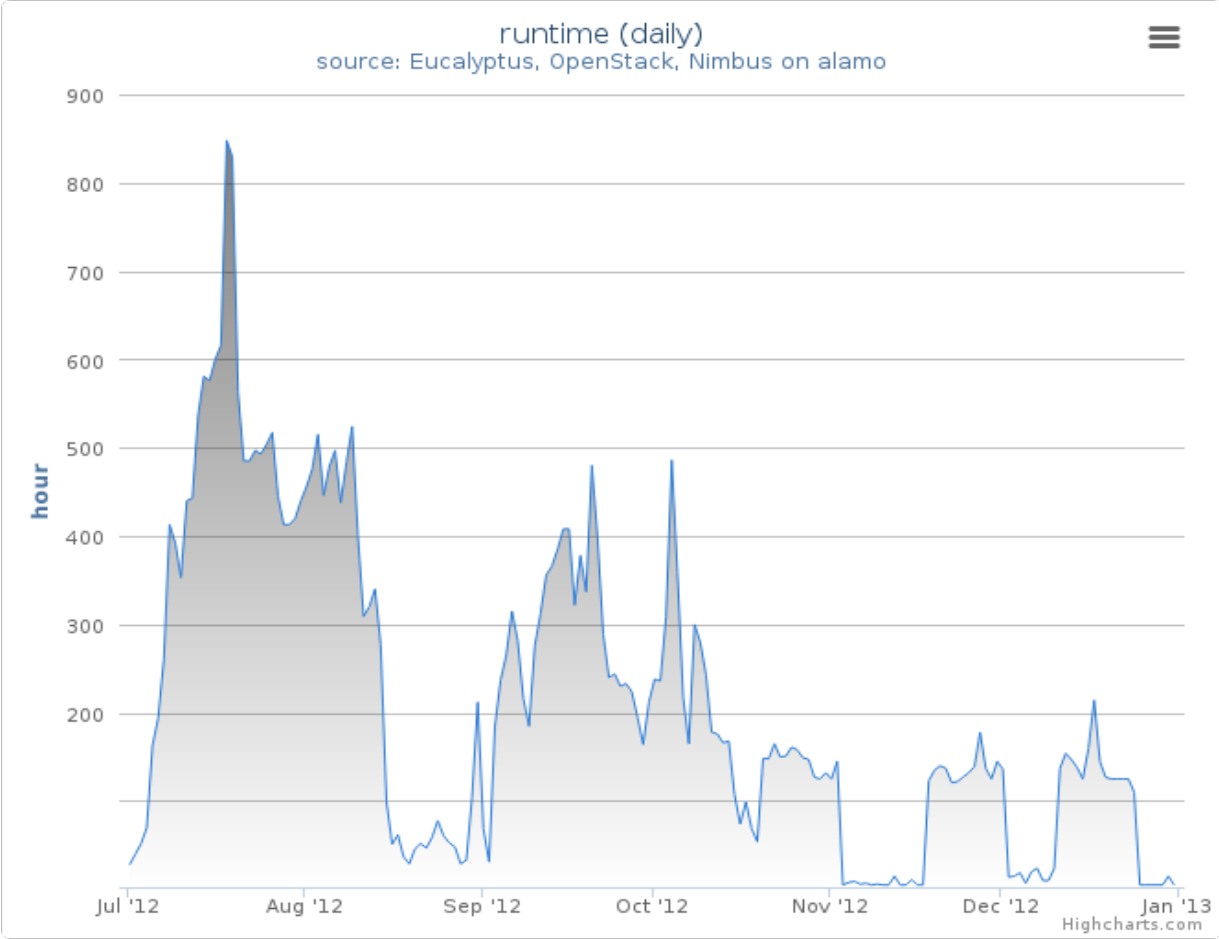


Figure 4: Wall time (hours)
This time series chart represents daily wall time (hours) for cloud services and shows historical changes during the period.

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

5.2 Distribution

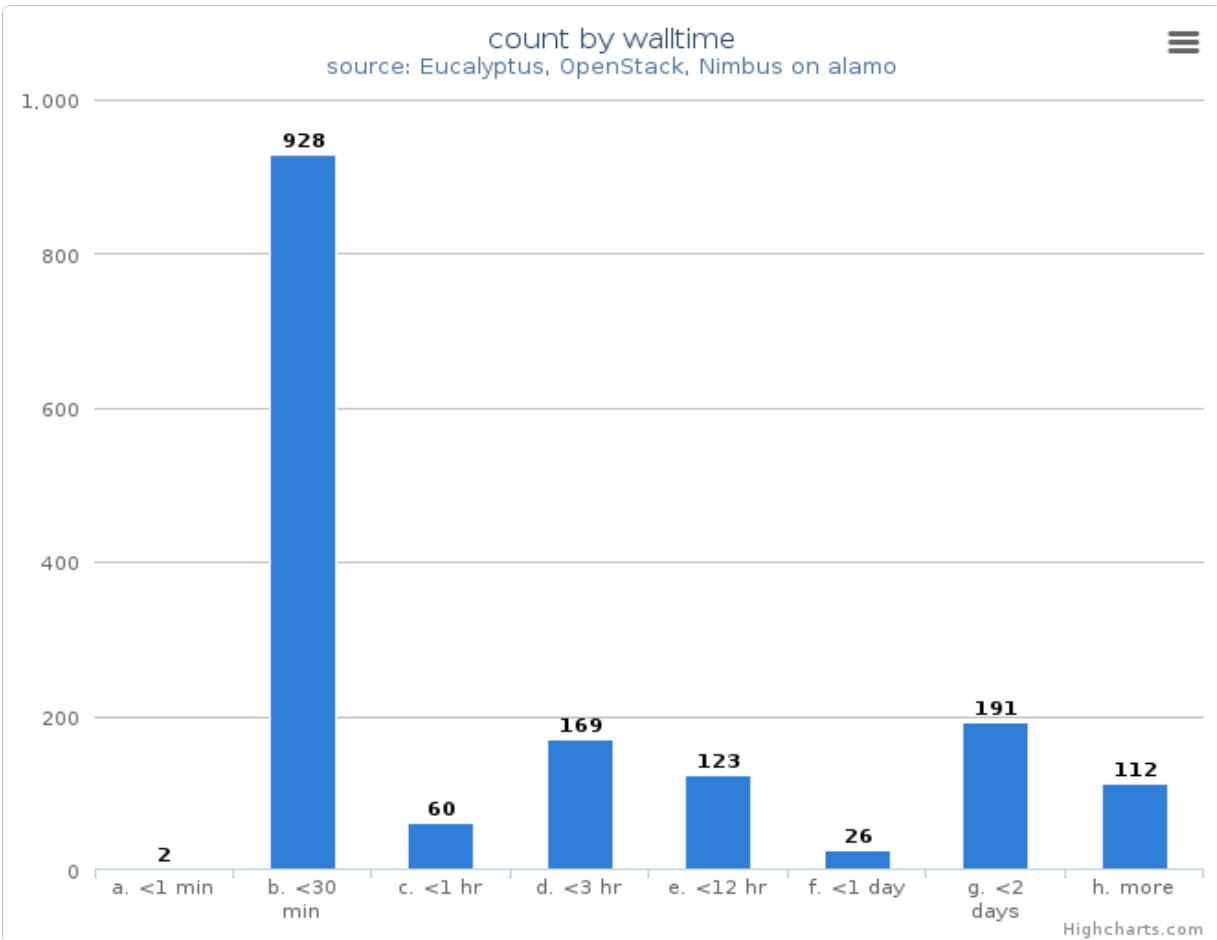


Figure 5: VM count by wall time

This chart illustrates usage patterns of VM instances in terms of running wall time.

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

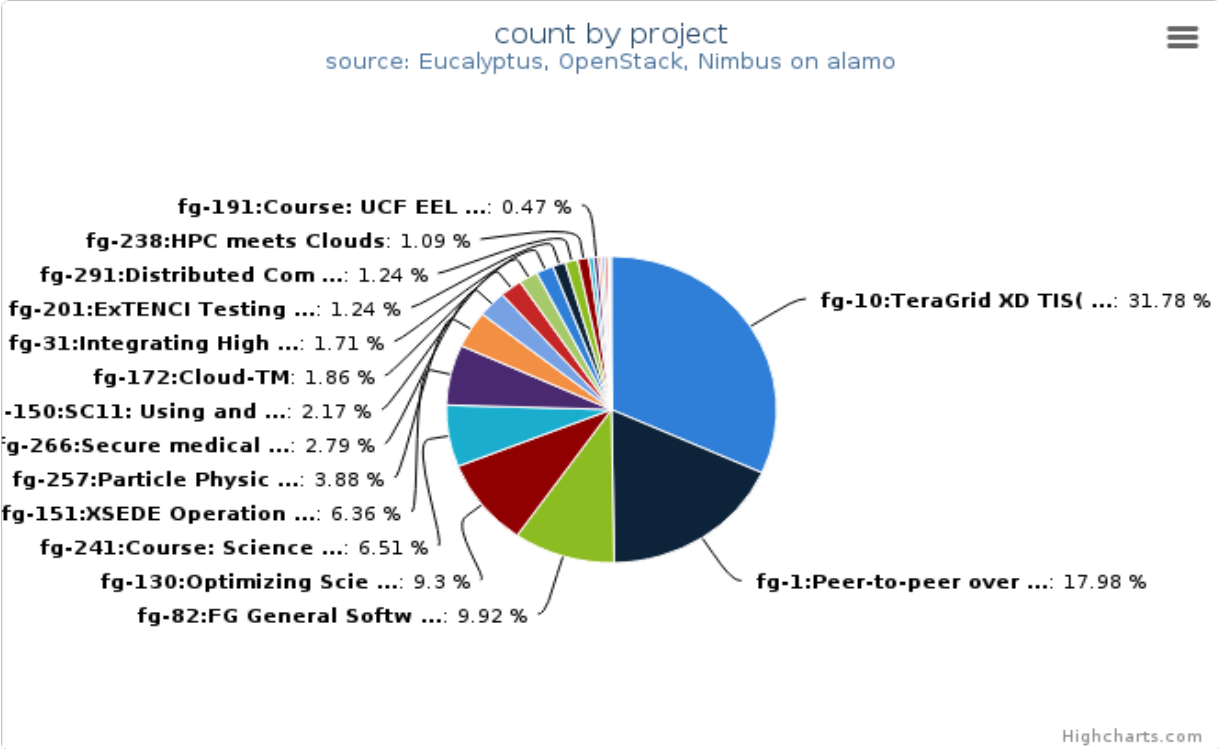


Figure 6: VMs count by project
This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

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

Table 5.1: VMs count by project

Project	Value
fg-10:TeraGrid XD TIS(Technology Insertion Service) Technology Evaluation Laboratory	205
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	116
fg-82:FG General Software Development	64
fg-130:Optimizing Scientific Workflows on Clouds	60
fg-241:Course: Science Cloud Summer School 2012	42
fg-151:XSEDE Operations Group	41
fg-257:Particle Physics Data analysis cluster for ATLAS LHC experiment	25
fg-266:Secure medical files sharing	18
fg-150:SC11: Using and Building Infrastructure Clouds for Science	14
fg-172:Cloud-TM	12
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-291:Distributed Computing course	8
fg-238:HPC meets Clouds	7
fg-170:European Middleware Initiative (EMI)	3
fg-191:Course: UCF EEL6938 Data-intensive computing and Cloud Class	3
fg-112:University of California (UC) Grid and Cloud Project	2
fg-253:Characterizing Performance of Infrastructure Clouds	2
fg-176:Cloud Interoperability Testbed	2
fg-15:Grid Appliance	1
fg-97:FutureGrid and Grid'5000 Collaboration	1

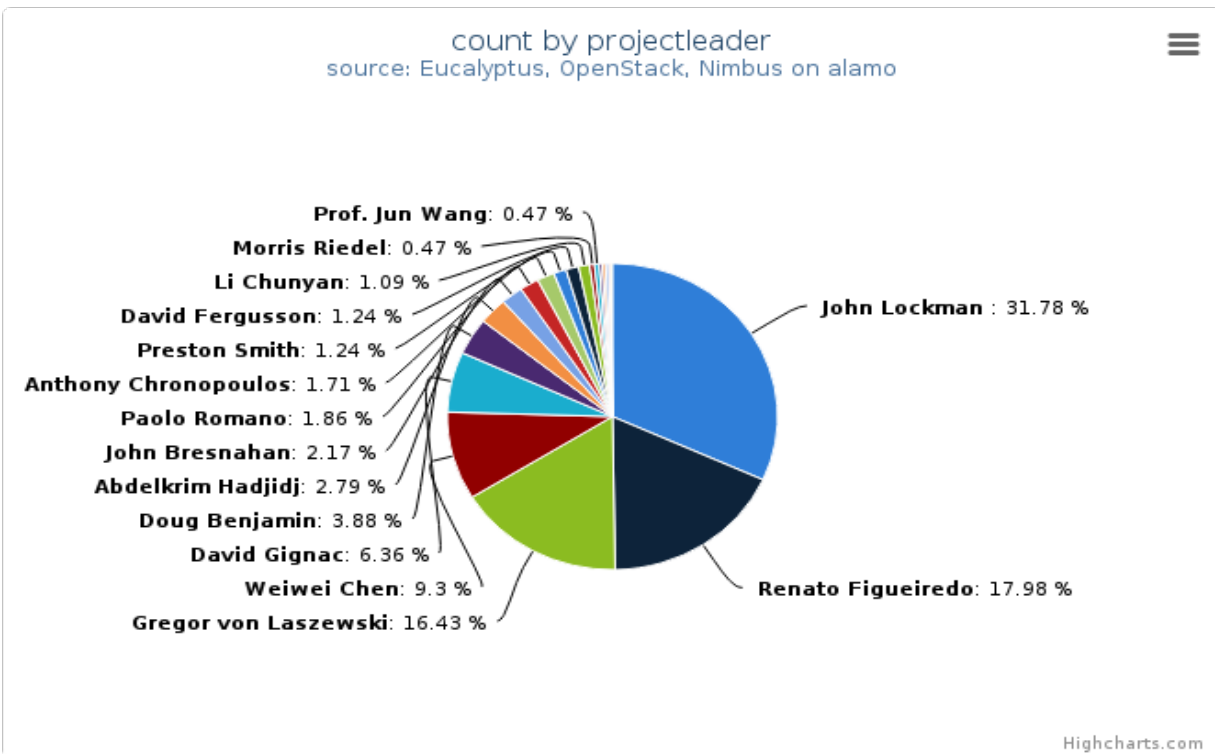


Figure 7: VMs count by project leader

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

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

Table 5.2: VMs count by project leader

Projectleader	Value
John Lockman	205
Renato Figueiredo	116
Gregor von Laszewski	106
Weiwei Chen	60
David Gignac	41
Doug Benjamin	25
Abdelkrim Hadjidj	18
John Bresnahan	14
Paolo Romano	12
Anthony Chronopoulos	11
Preston Smith	8
David Fergusson	8
Li Chunyan	7
Morris Riedel	3
Prof. Jun Wang	3
Prakashan Korambath	2
Alan Sill	2
Paul Marshall	2
Mauricio Tsugawa	1
Panoat Chuchaisri	1

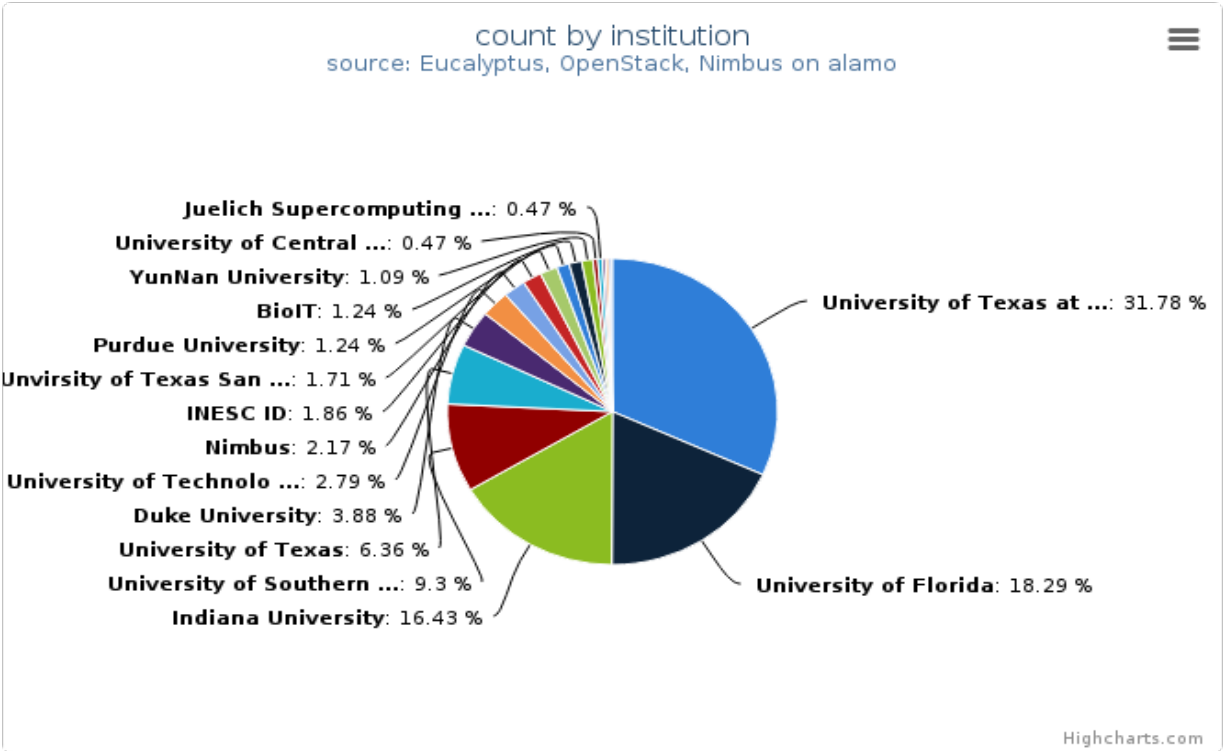


Figure 8: VMs count by institution

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

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

Table 5.3: VMs count by institution

Institution	Value
University of Texas at Austin	205
University of Florida	118
Indiana University	106
University of Southern California	60
University of Texas	41
Duke University	25
University of Technology of Compiegne	18
Nimbus	14
INESC ID	12
Unvirity of Texas San Antonio	11
Purdue University	8
BioIT	8
YunNan University	7
University of Central Florida	3
Juelich Supercomputing Centre	3
University of Colorado at Boulder	2
UCLA	2
Texas Tech University	2

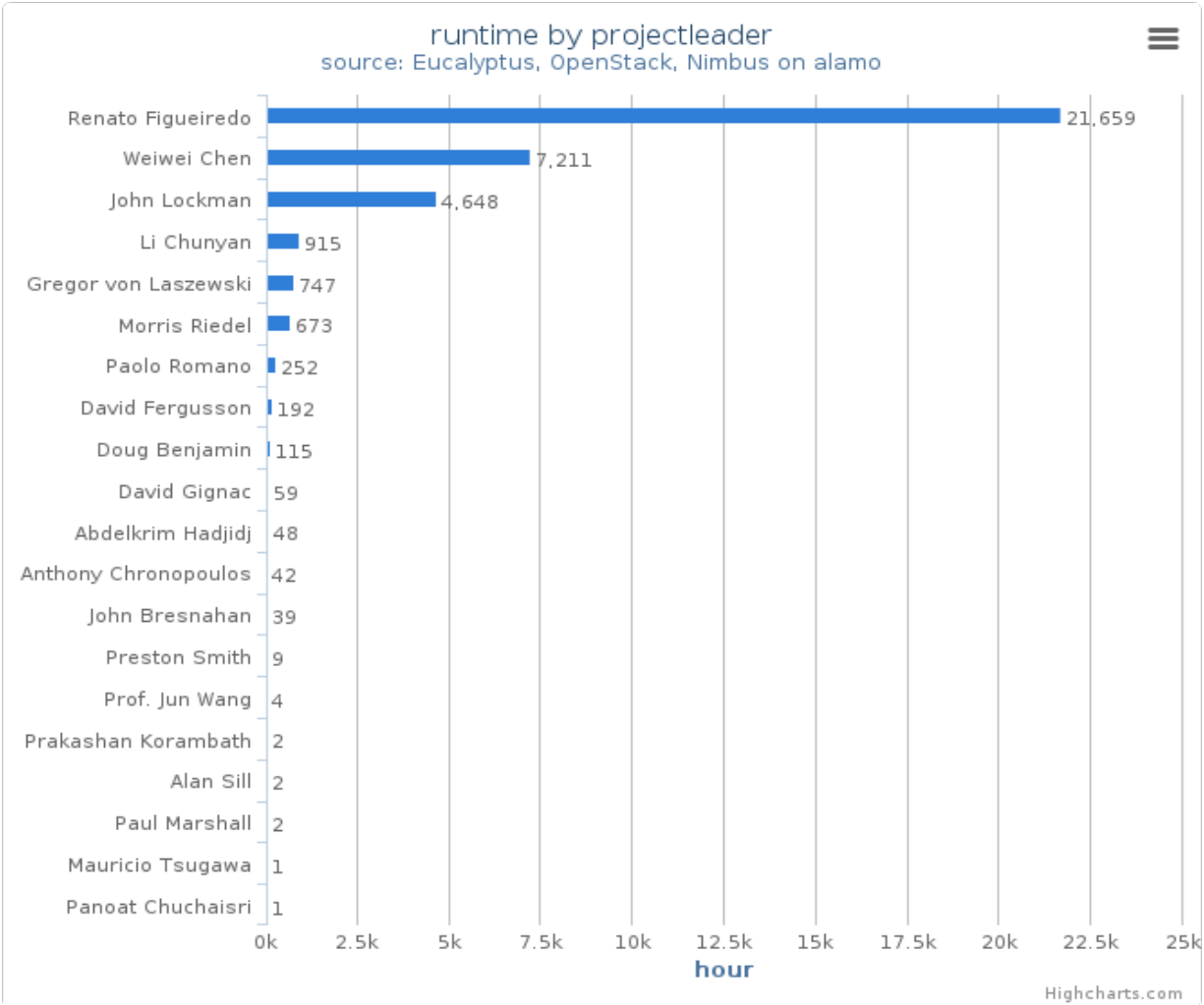


Figure 9: Wall time (hours) by project leader
 This chart illustrates proportionate total run times by project leader.

- Period: July 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.

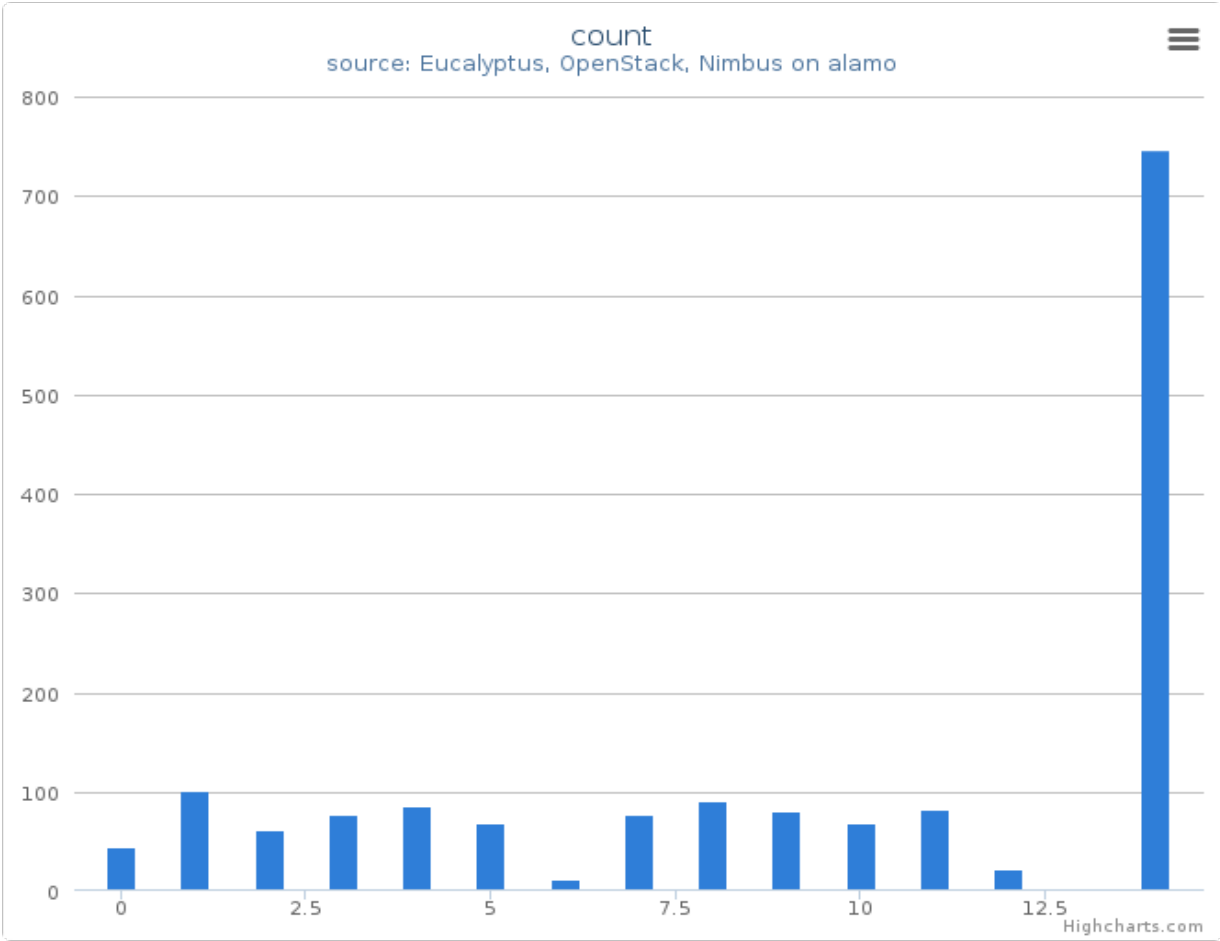


Figure 10: VMs count by systems (compute nodes) in Cluster (alamo)
This column chart represents VMs count among systems.

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

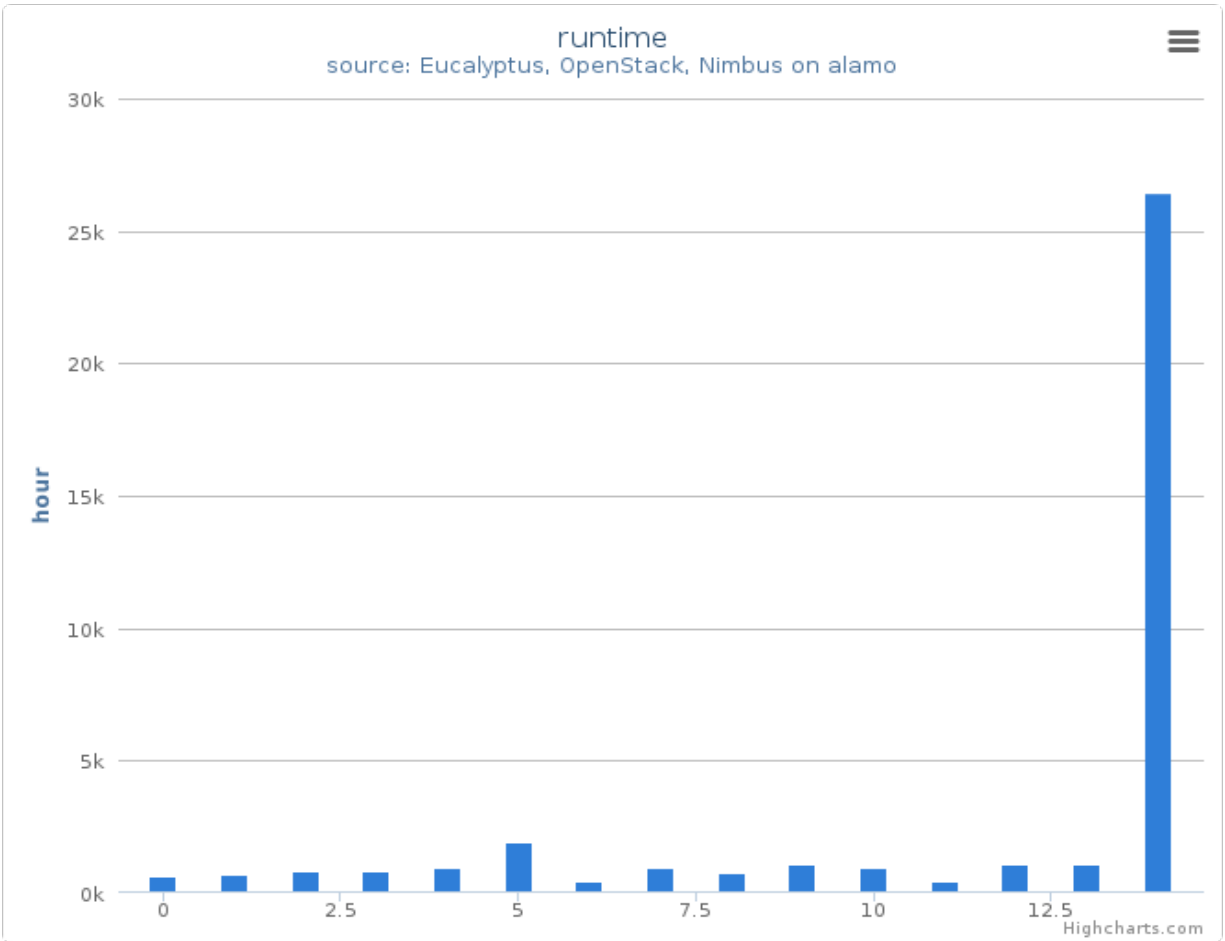


Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (alamo)
This column chart represents wall time among systems.

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

USAGE REPORT FOXTROT

- Period: July 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)

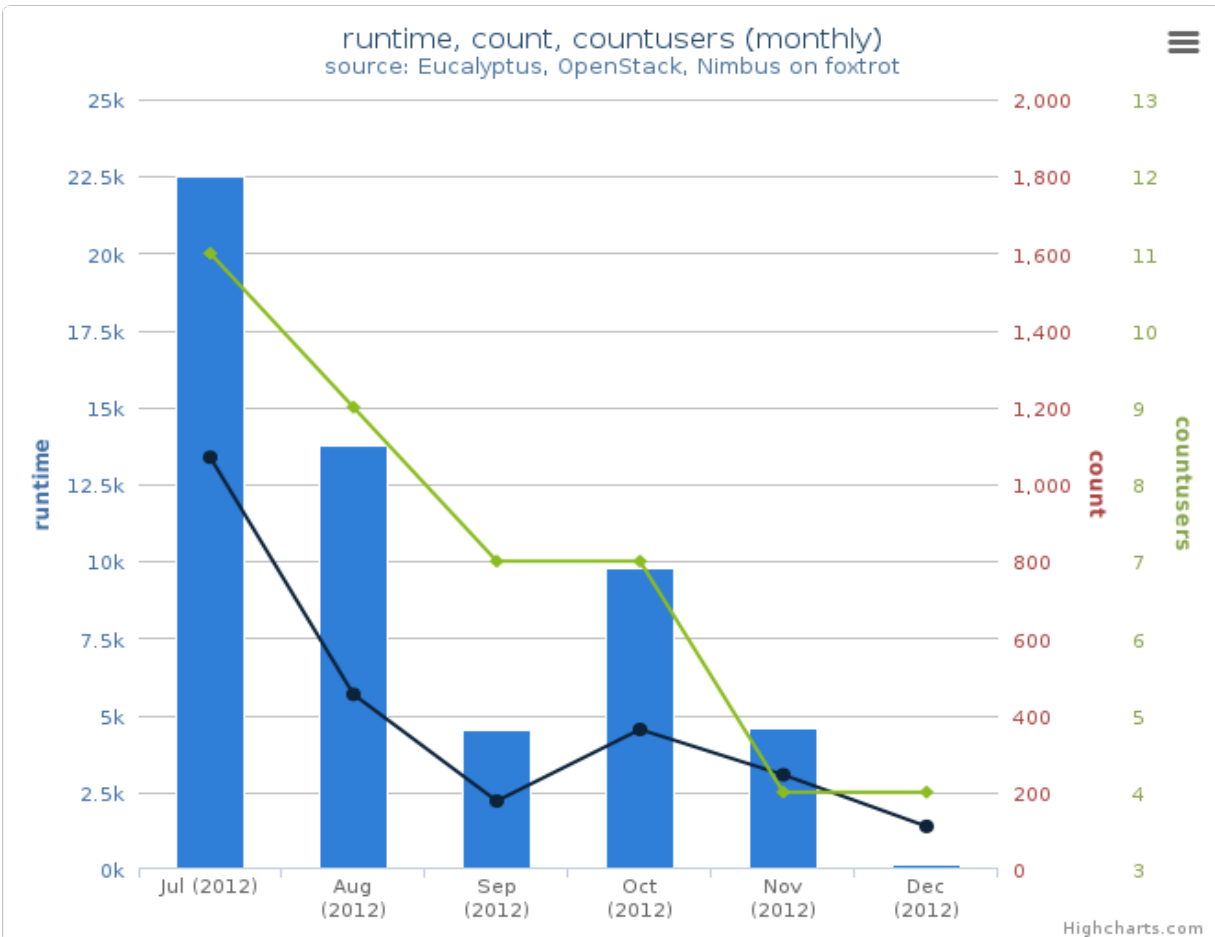


Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)

This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: July 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)

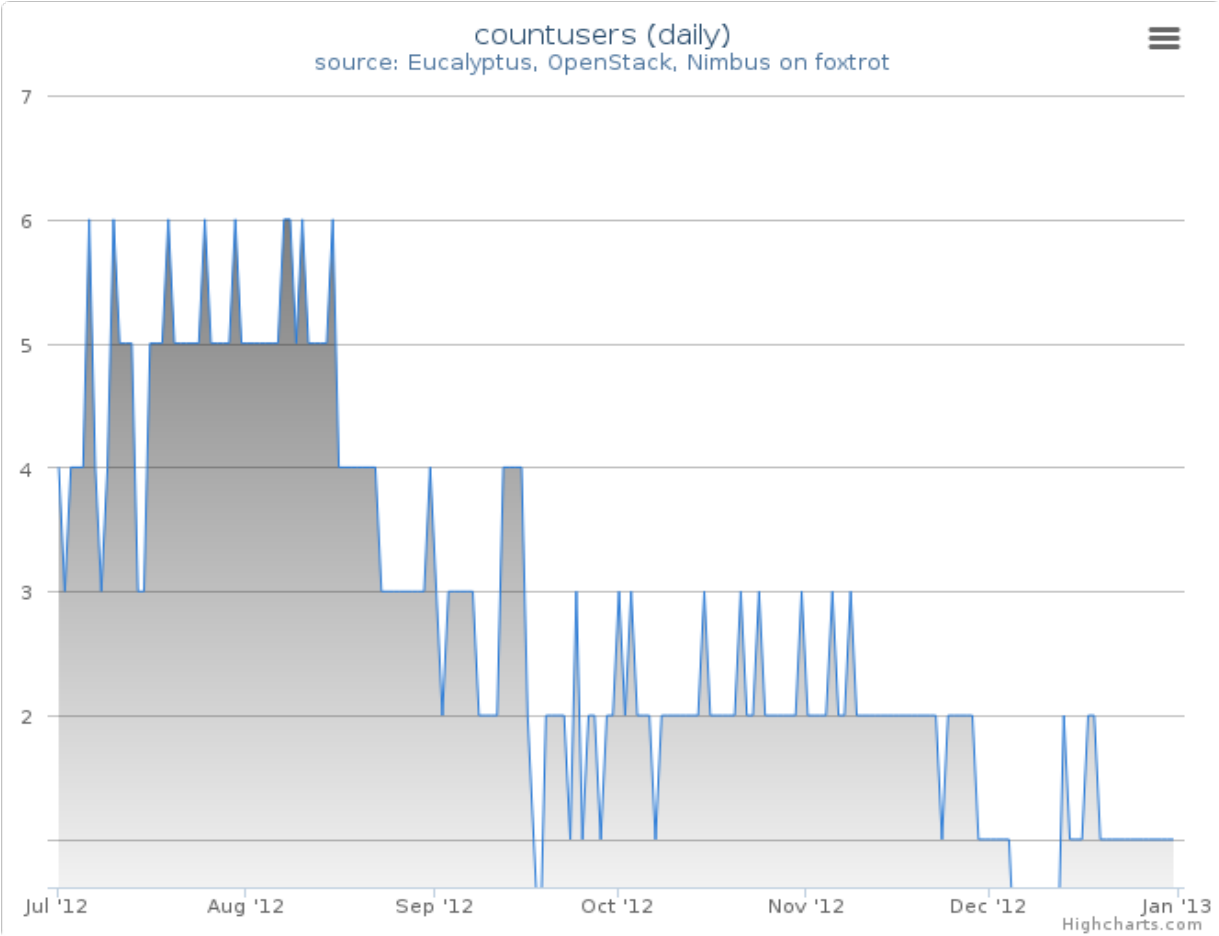


Figure 2: Users count
This time series chart represents daily active user count for cloud services and shows historical changes during the period.

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

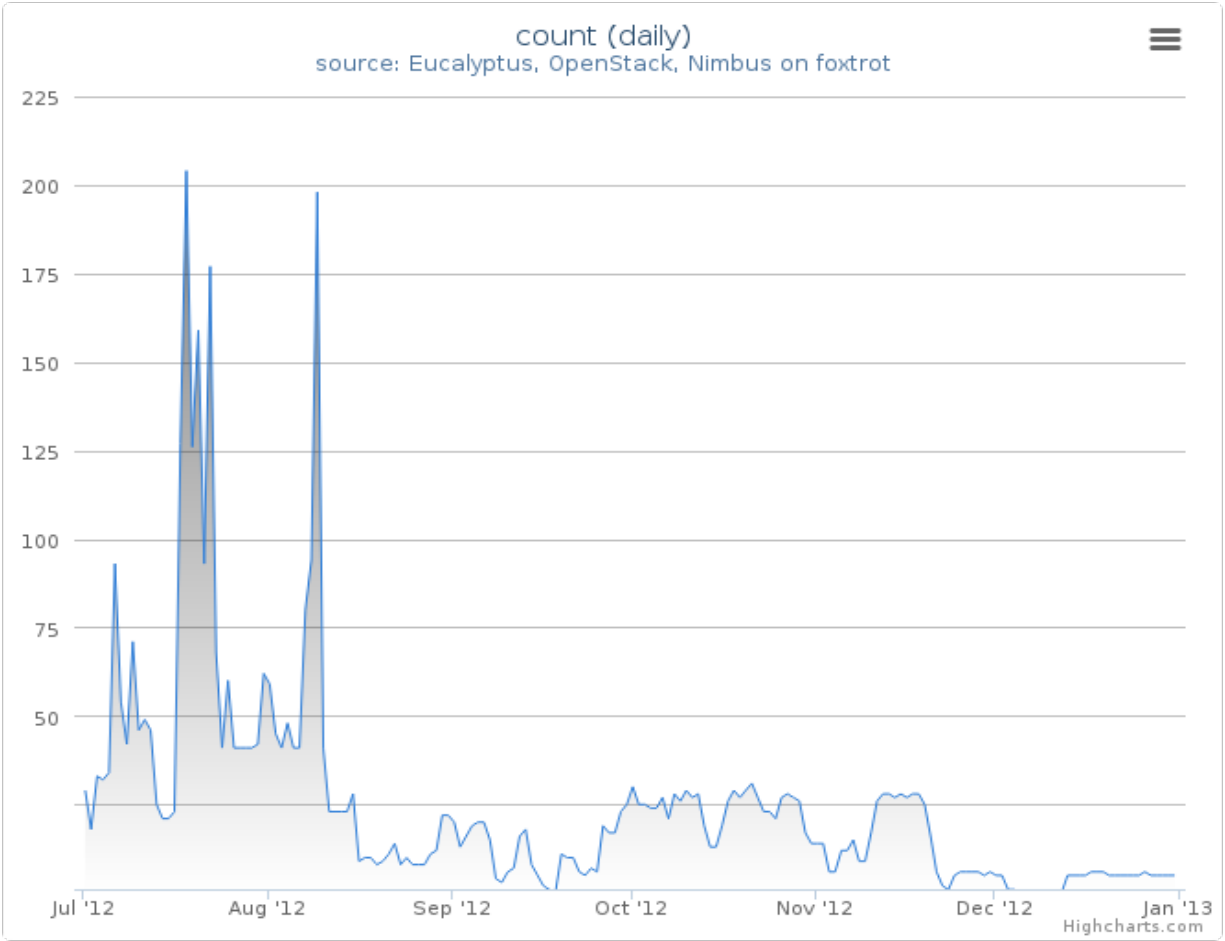


Figure 3: VMs count

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

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

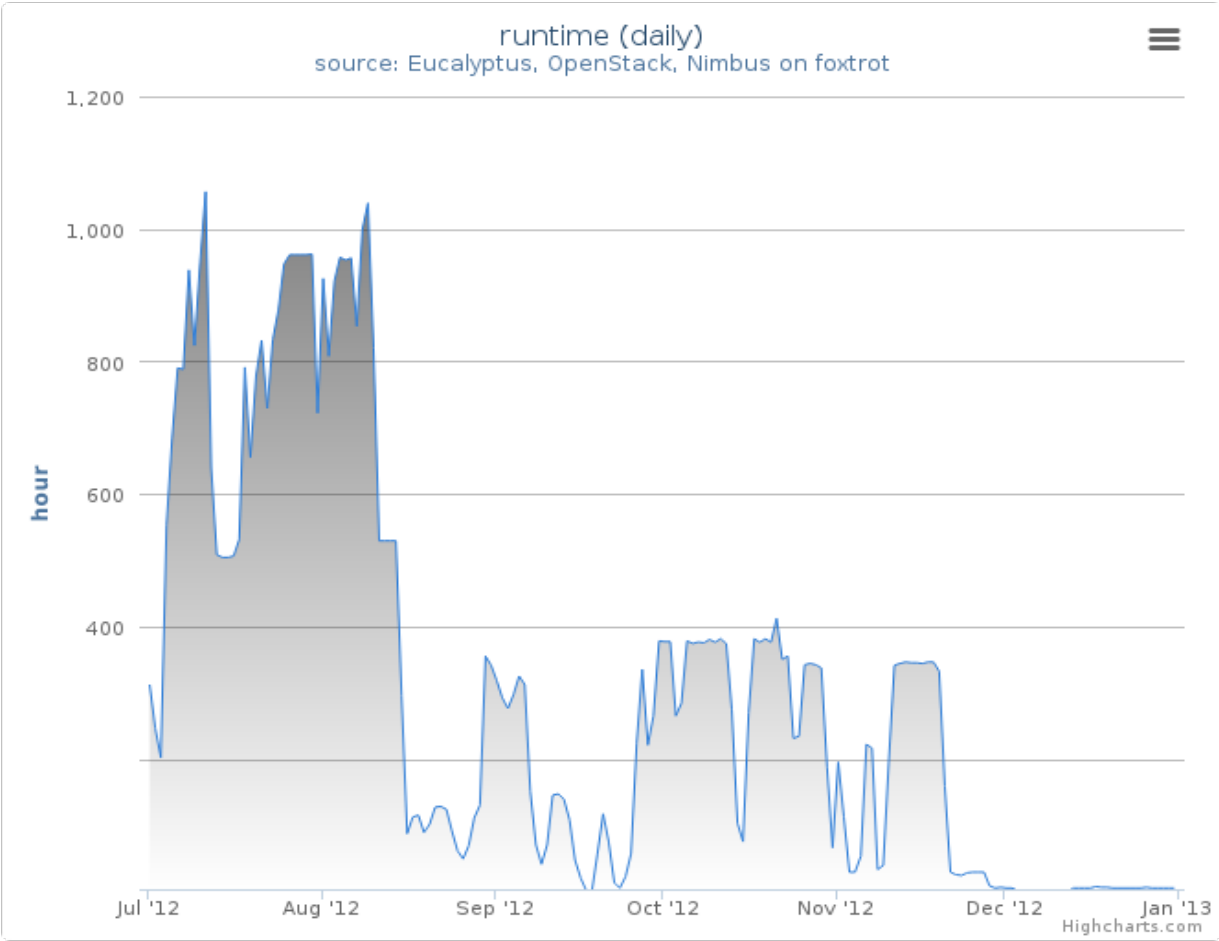


Figure 4: Wall time (hours)
This time series chart represents daily wall time (hours) for cloud services and shows historical changes during the period.

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

6.2 Distribution

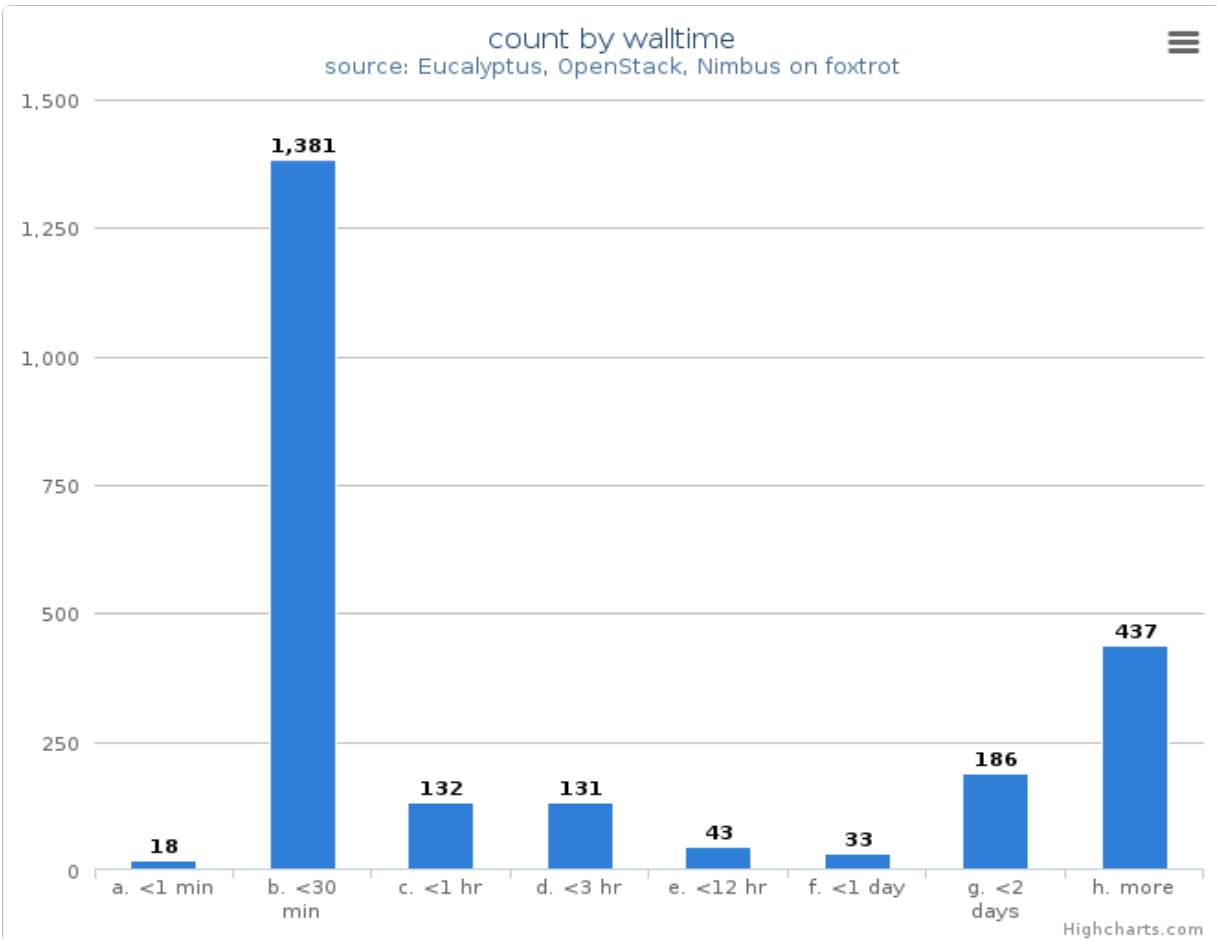


Figure 5: VM count by wall time

This chart illustrates usage patterns of VM instances in terms of running wall time.

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

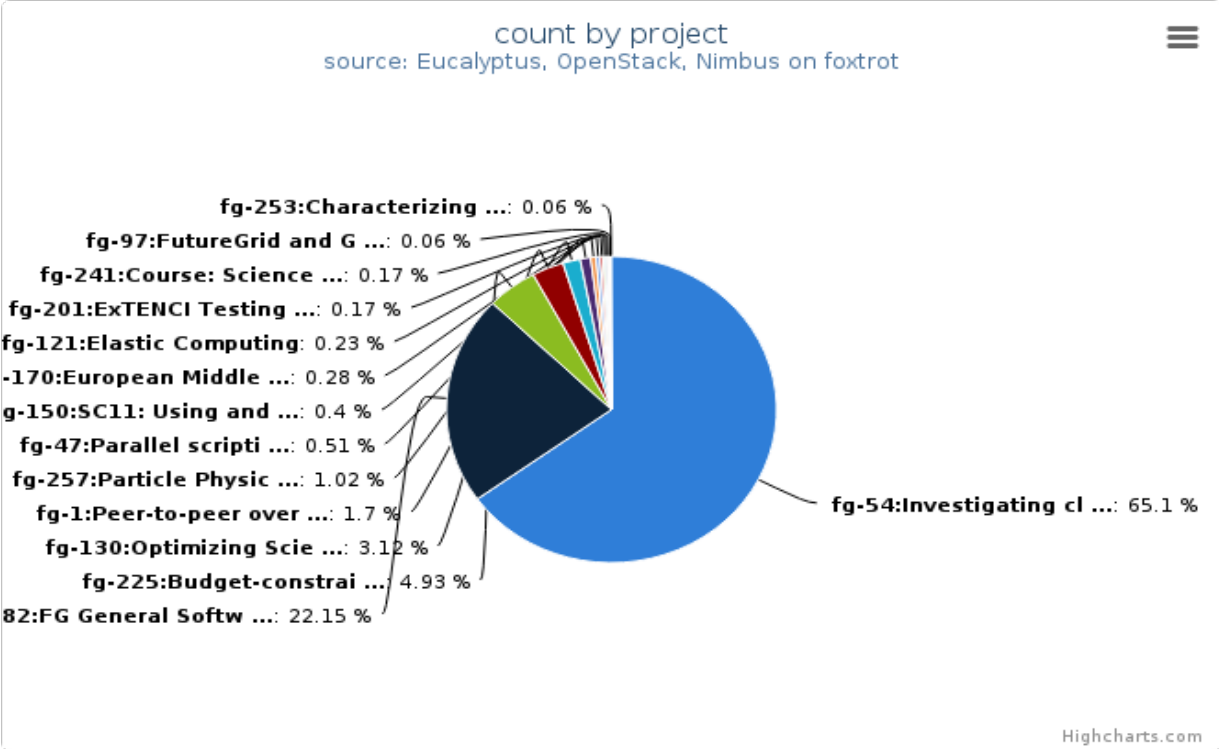


Figure 6: VMs count by project
This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

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

Table 6.1: VMs count by project

Project	Value
fg-54:Investigating cloud computing as a solution for analyzing particle physics data	1149
fg-82:FG General Software Development	391
fg-225:Budget-constrained workflow scheduler	87
fg-130:Optimizing Scientific Workflows on Clouds	55
fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters	30
fg-257:Particle Physics Data analysis cluster for ATLAS LHC experiment	18
fg-47:Parallel scripting using cloud resources	9
fg-150:SC11: Using and Building Infrastructure Clouds for Science	7
fg-170:European Middleware Initiative (EMI)	5
fg-121:Elastic Computing	4
fg-201:ExTENCI Testing, Validation, and Performance	3
fg-241:Course: Science Cloud Summer School 2012	3
fg-52:Cost-Aware Cloud Computing	1
fg-191:Course: UCF EEL6938 Data-intensive computing and Cloud Class	1
fg-97:FutureGrid and Grid'5000 Collaboration	1
fg-253:Characterizing Performance of Infrastructure Clouds	1

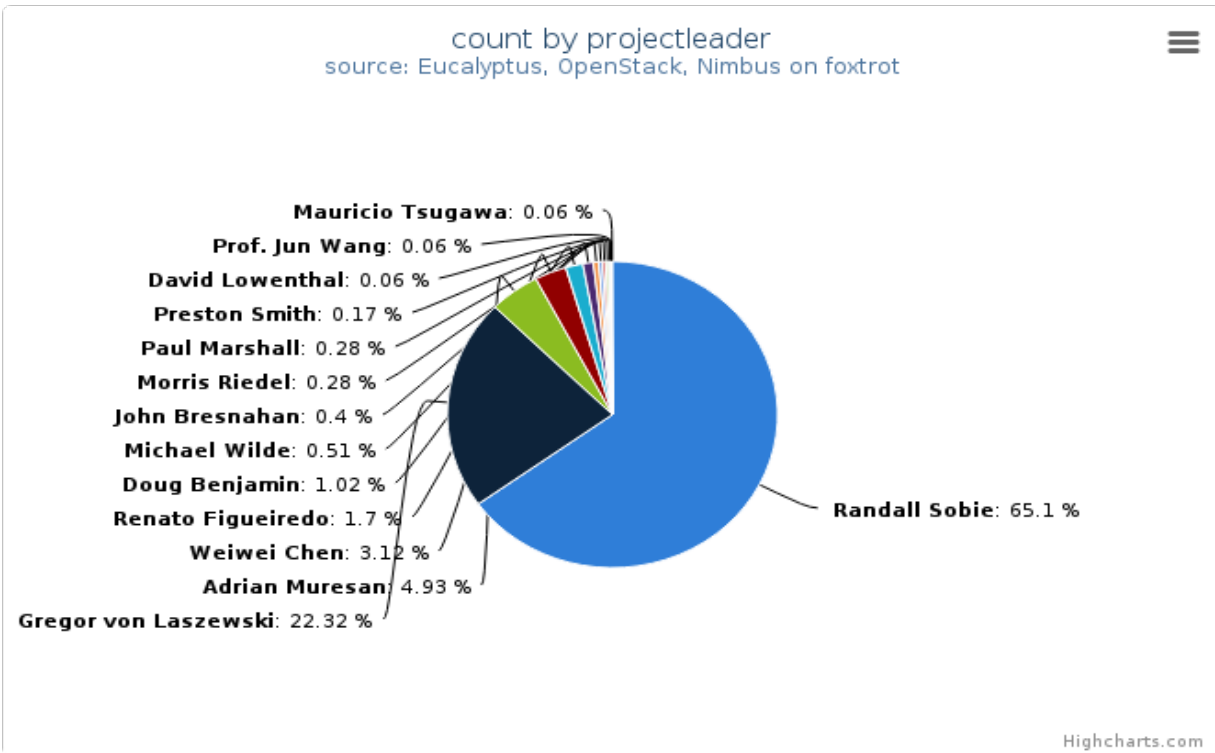


Figure 7: VMs count by project leader

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

- Period: July 01 – December 31, 2012

- Cloud(IaaS): nimbus
- Hostname: foxtrot

Table 6.2: VMs count by project leader

Projectleader	Value
Randall Sobie	1149
Gregor von Laszewski	394
Adrian Muresan	87
Weiwei Chen	55
Renato Figueiredo	30
Doug Benjamin	18
Michael Wilde	9
John Bresnahan	7
Morris Riedel	5
Paul Marshall	5
Preston Smith	3
David Lowenthal	1
Prof. Jun Wang	1
Mauricio Tsugawa	1

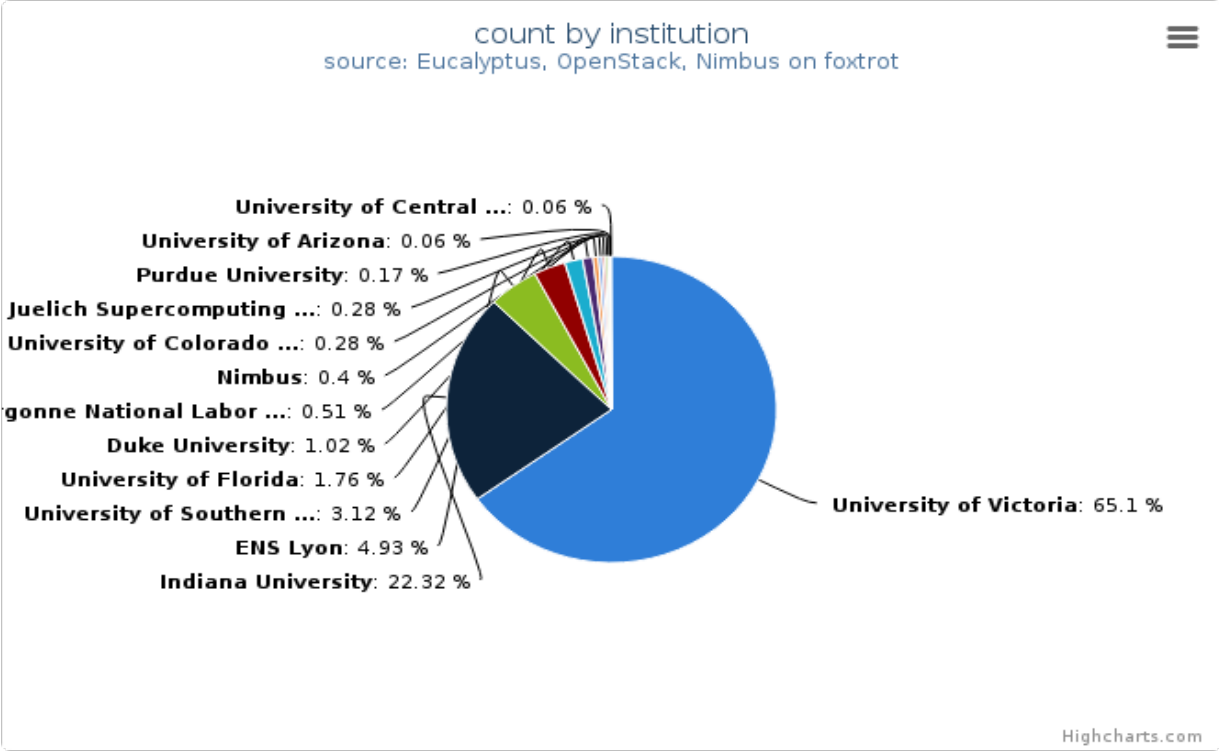


Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

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

Table 6.3: VMs count by institution

Institution	Value
University of Victoria	1149
Indiana University	394
ENS Lyon	87
University of Southern California	55
University of Florida	31
Duke University	18
Argonne National Laboratory	9
Nimbus	7
University of Colorado at Boulder	5
Juelich Supercomputing Centre	5
Purdue University	3
University of Arizona	1
University of Central Florida	1

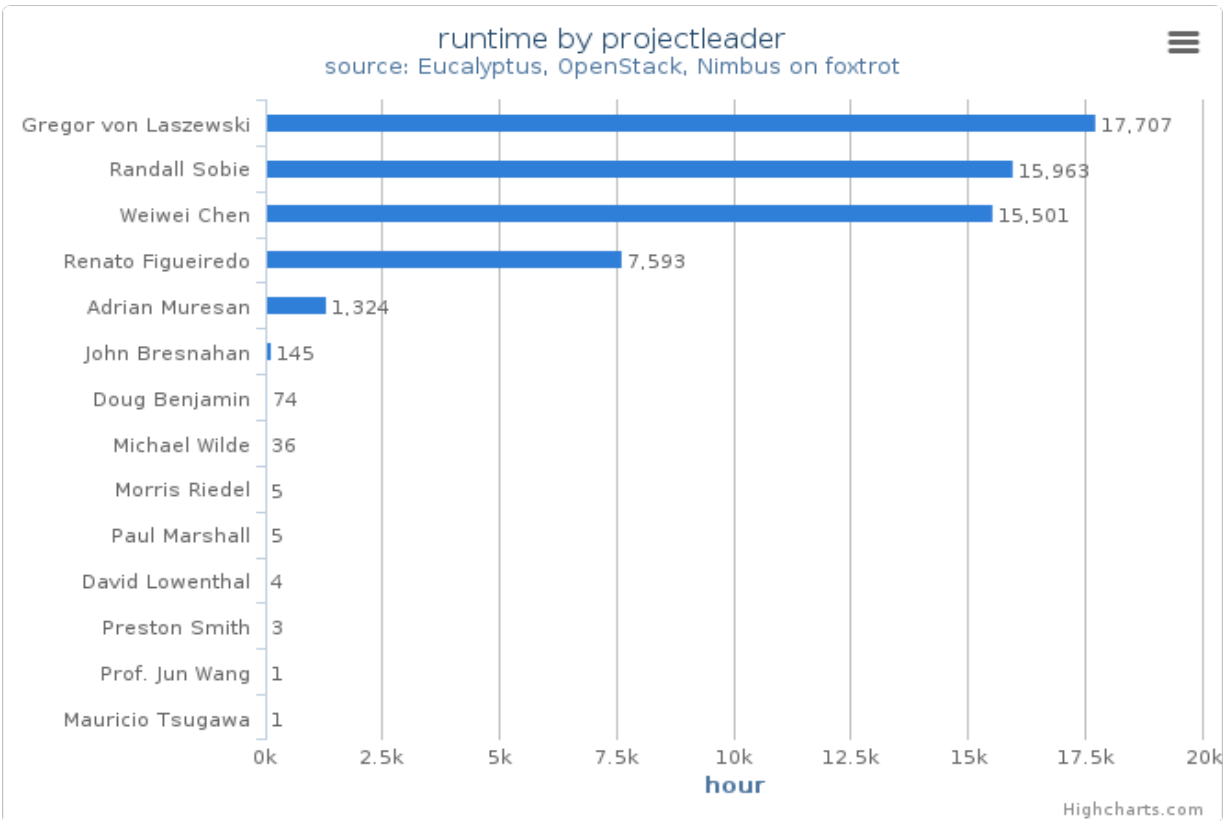


Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: July 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.

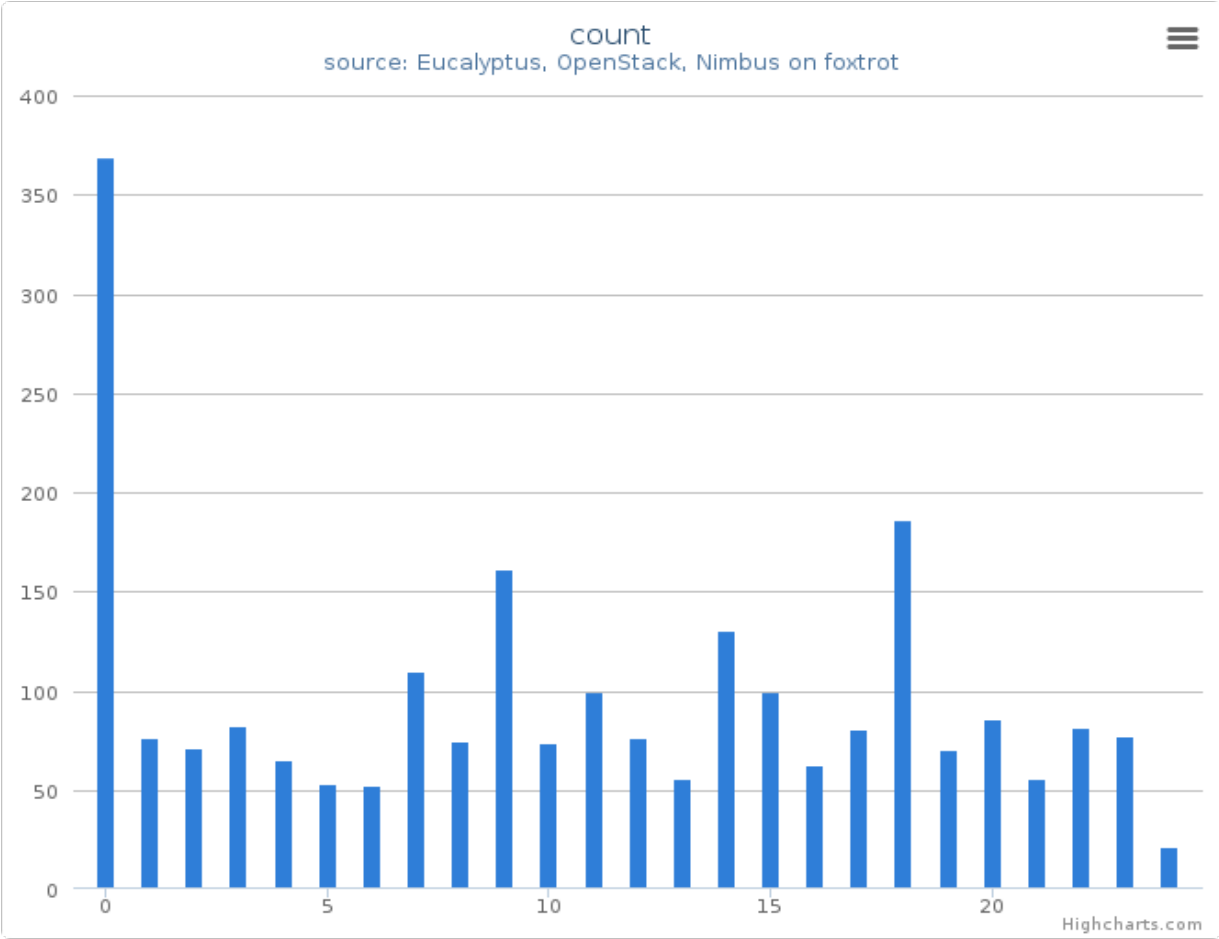


Figure 10: VMs count by systems (compute nodes) in Cluster (foxtrot)
This column chart represents VMs count among systems.

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

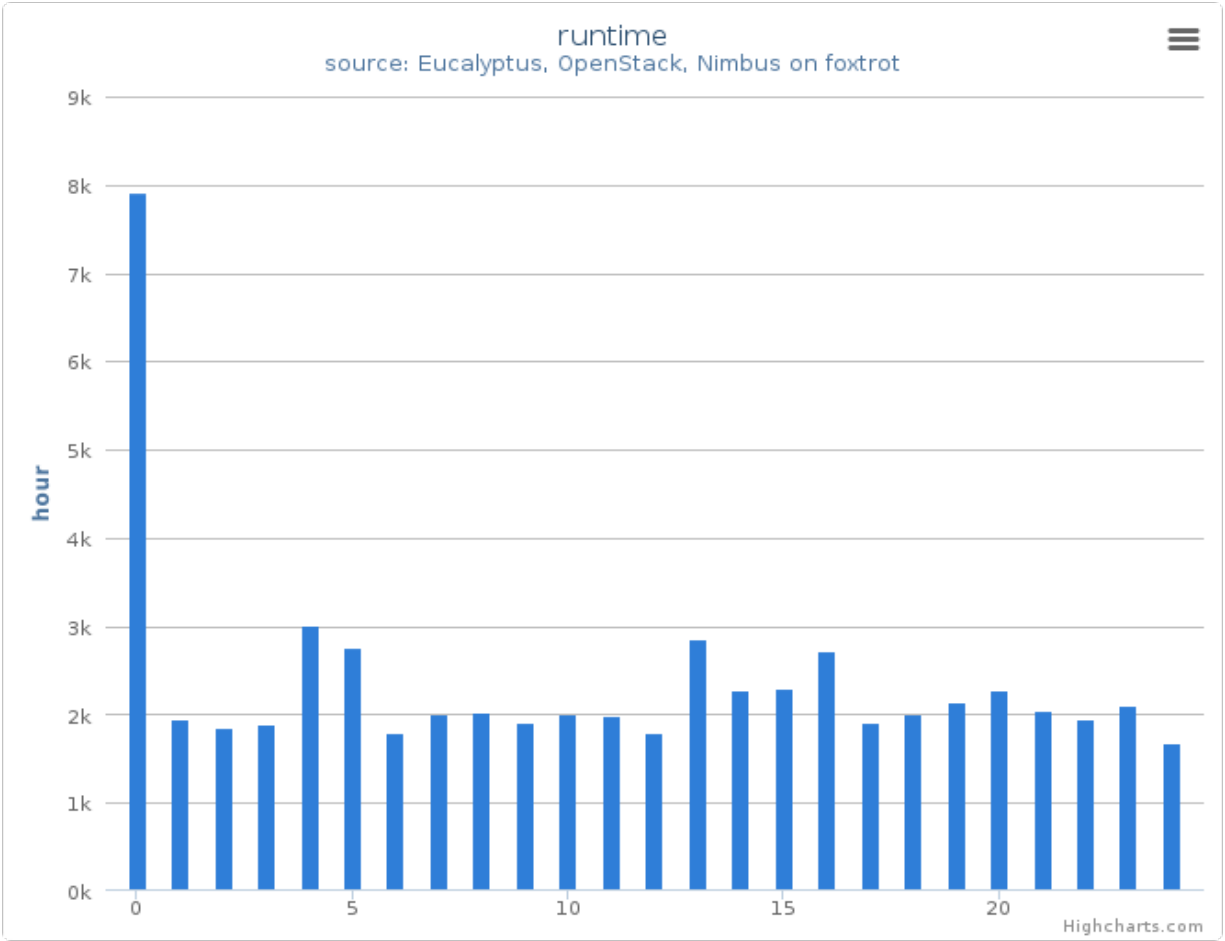


Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (foxtrot)
This column chart represents wall time among systems.

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

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

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.