# FG Resource Report

***Release 0.4***

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January 03, 2014

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Date Created: Fri, 03 Jan 2014

CHAPTER

ONE

# SUMMARY REPORT (ALL)

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

## 1.1 Wall Hours by Clusters (Total, monthly)

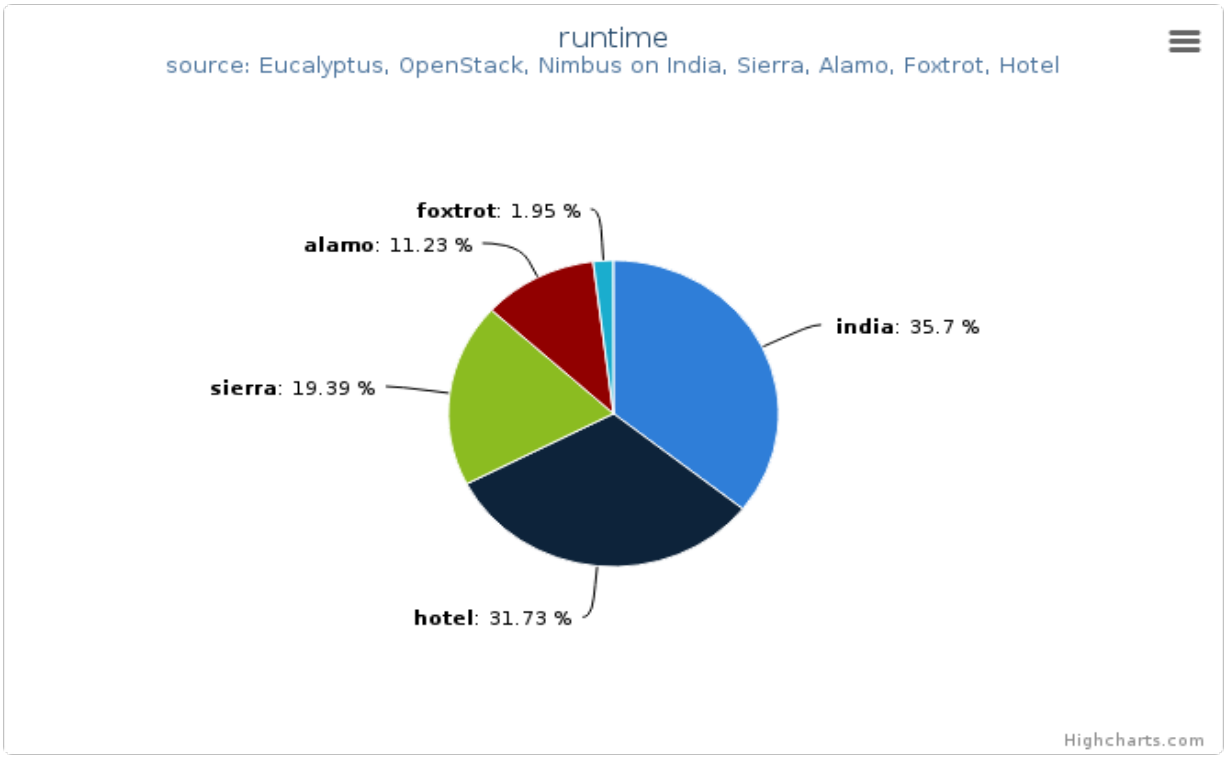


Figure 1. Wall time (hours) by Clusters
This chart represents overall usage of wall time (hours).

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

Table 1.1: Wall time (hours) by Clusters

| Total | Value |
|---|---|
| india | 256720.0 |
| hotel | 228158.0 |
| sierra | 139398.0 |
| alamo | 80740.0 |
| foxtrot | 14054.0 |

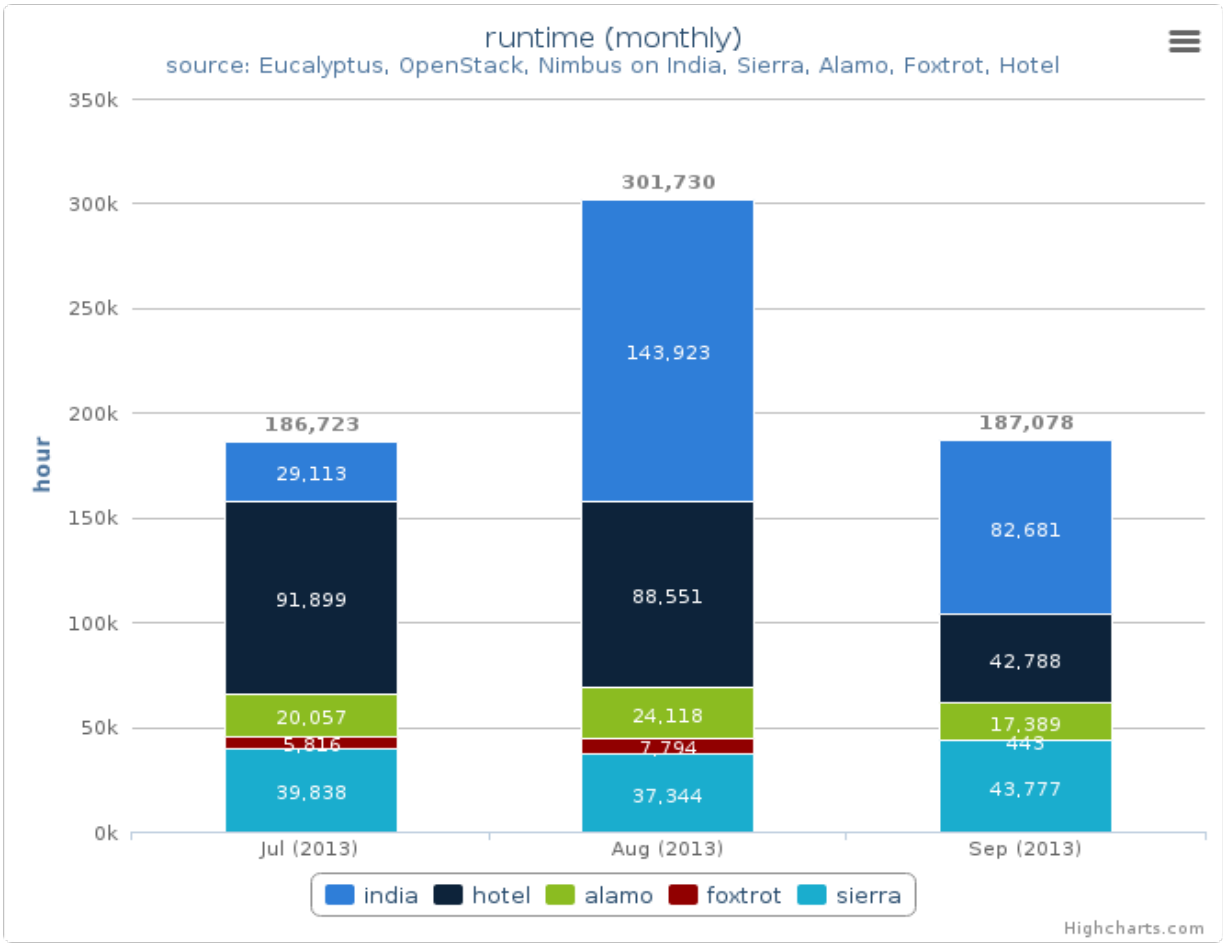


Figure 2. Wall time (hours) by Clusters (monthly)
This stacked column chart represents average monthly usage of wall time (hours).

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

## 1.2 VM Count by Clusters (Total, monthly)

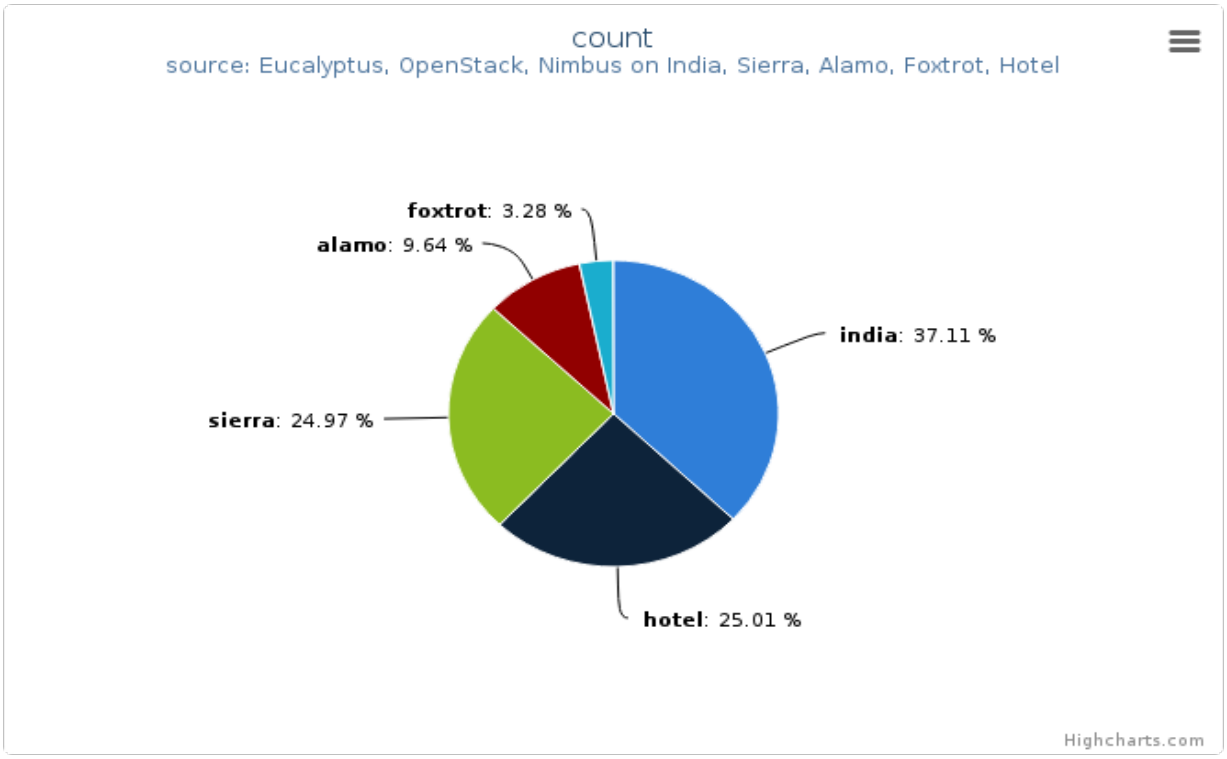


Figure 3. VMs count by Clusters
This chart represents overall VM instances count during the period.

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

Table 1.2: VM instance count by Clusters

| Total | Value |
|---|---|
| india | 7262 |
| hotel | 4894 |
| sierra | 4886 |
| alamo | 1887 |
| foxtrot | 642 |

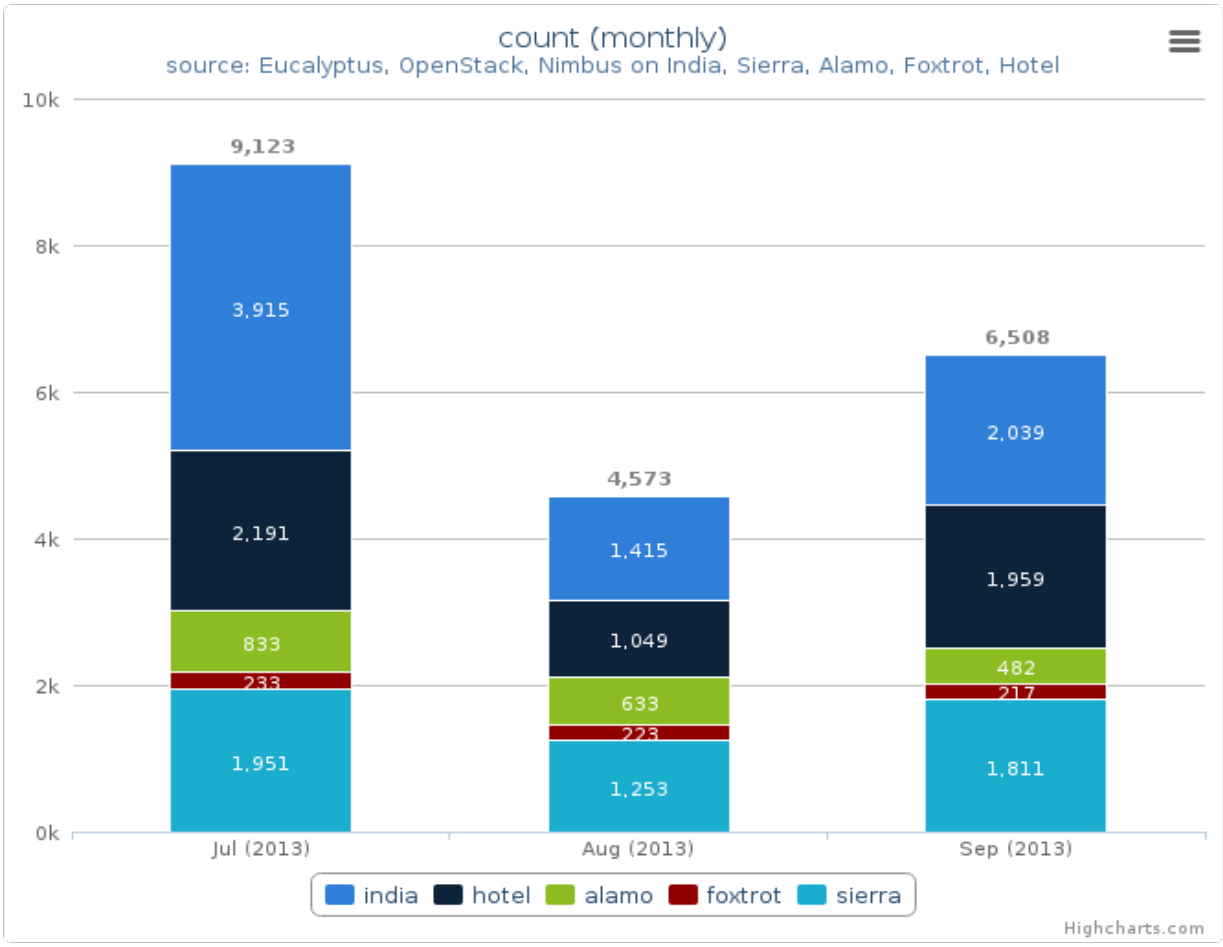


Figure 4. VMs count by Clusters (monthly)
This stacked column chart represents average VM instances count per month.

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

## 1.3 Users Count by Clusters (Total, monthly)

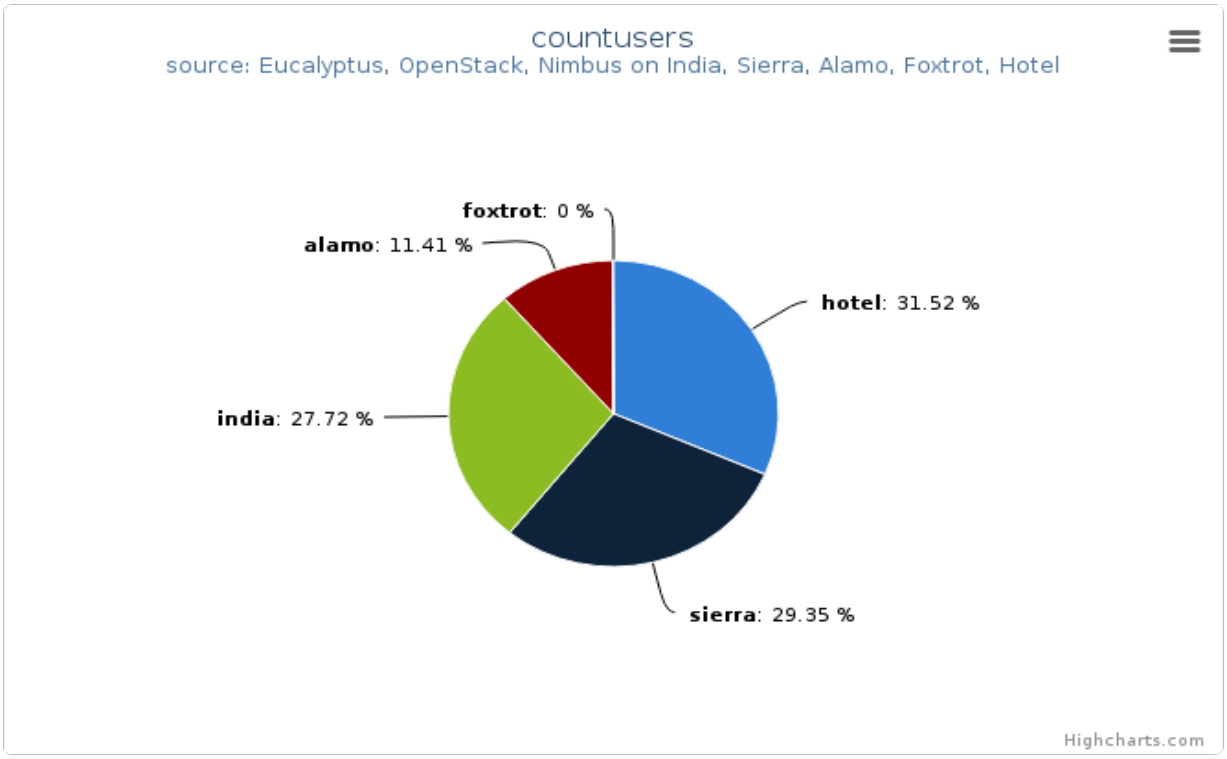


Figure 5. Unique User count by Clusters
This chart represents total number of unique active users.

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

Table 1.3: Unique User count by Clusters

| Total | Value |
|---|---|
| hotel | 58 |
| sierra | 54 |
| india | 51 |
| alamo | 21 |
| foxtrot | 0 |

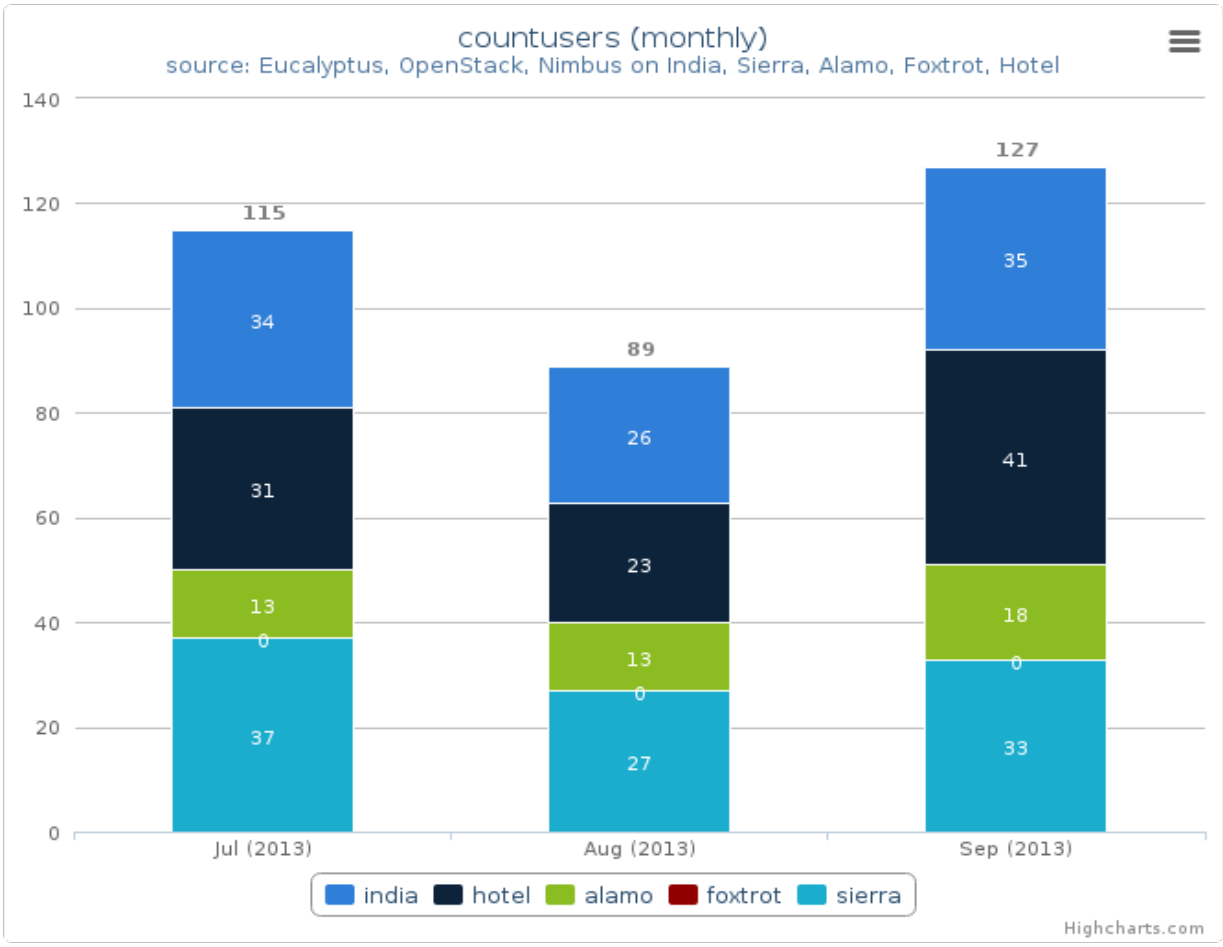


Figure 6. Users count by Clusters (Monthly)
This stacked column chart represents average count of active users per month.

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

CHAPTER

TWO

# USAGE REPORT INDIA

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

## 2.1 Histogram

### 2.1.1 Summary (Monthly)

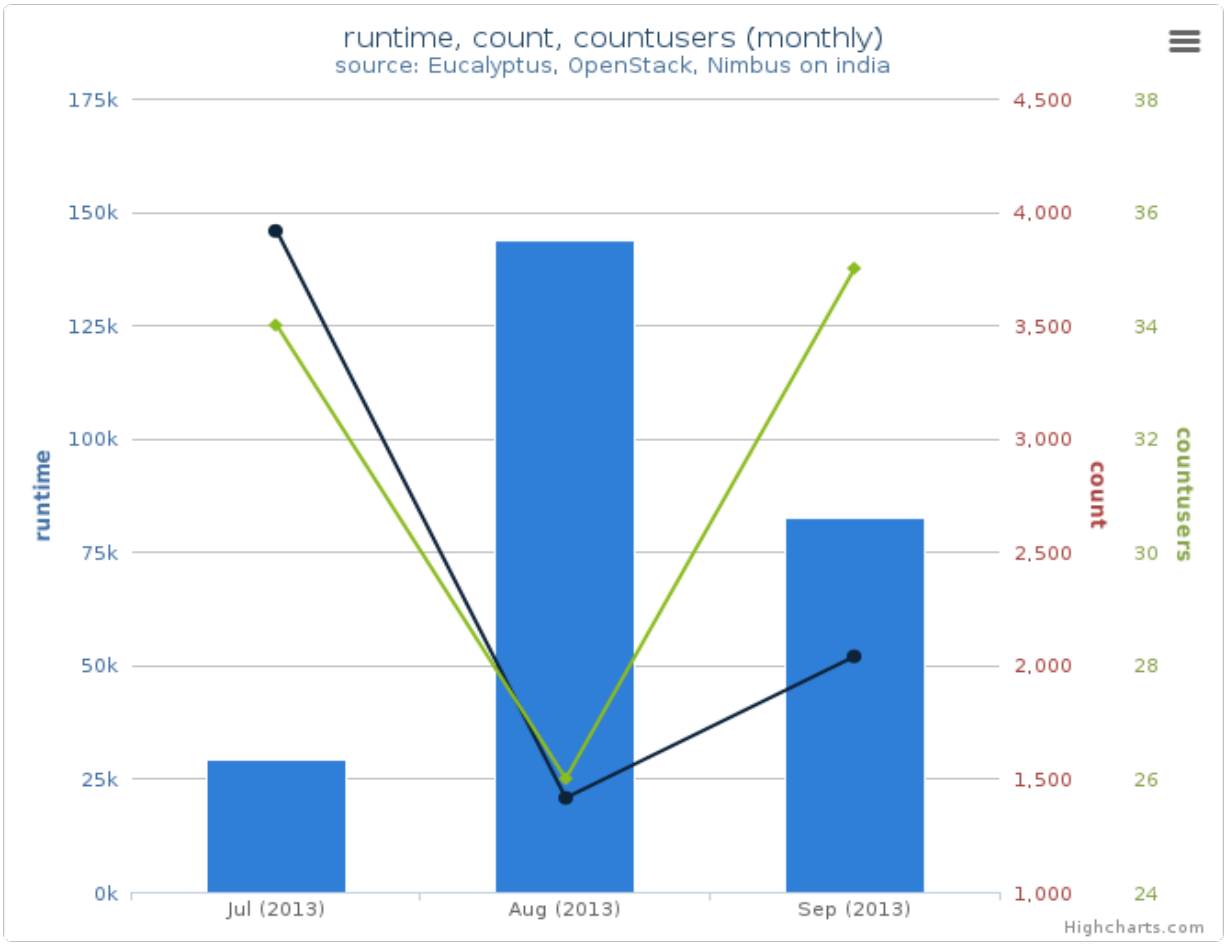


Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

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

### 2.1.2 Summary (Daily)

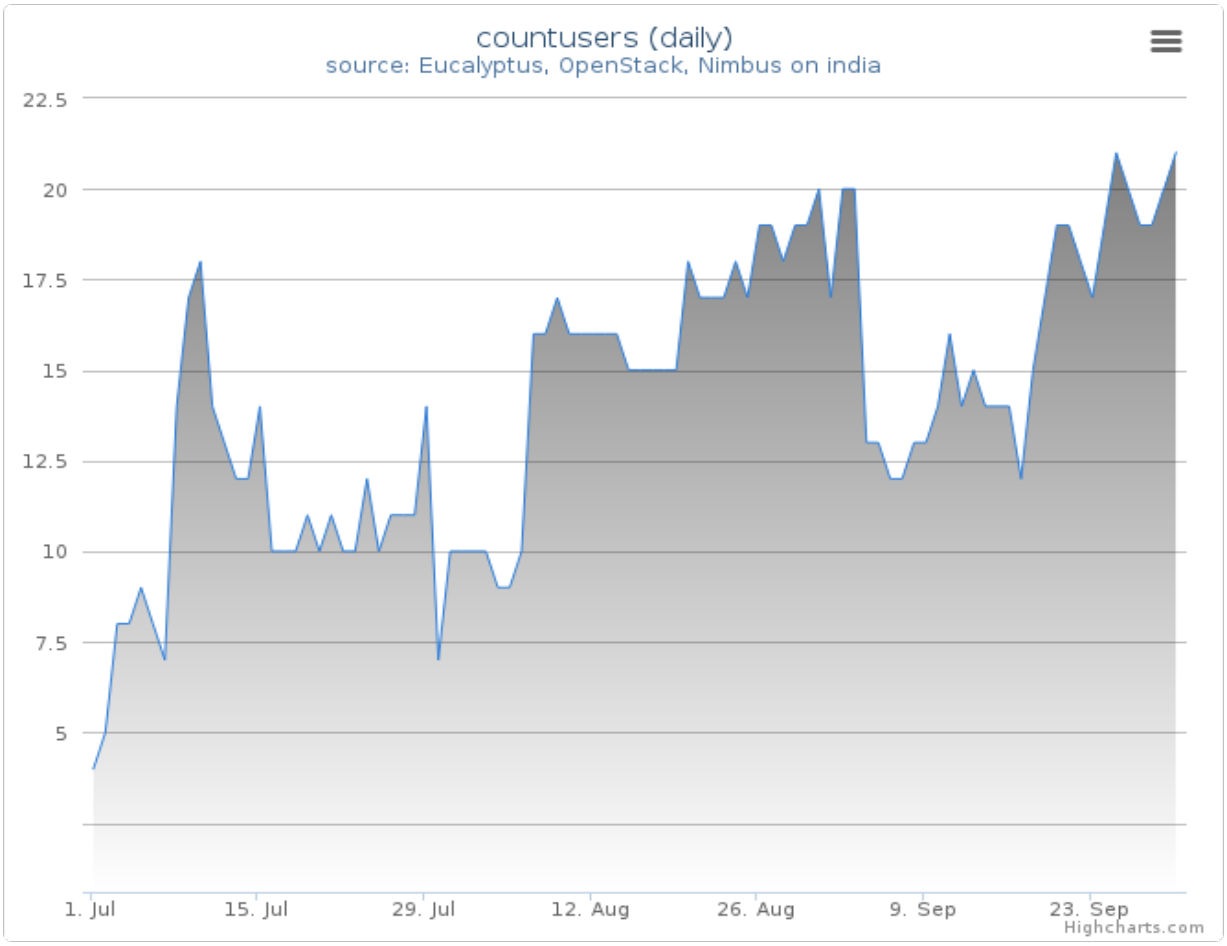


Figure 2: Users count

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

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

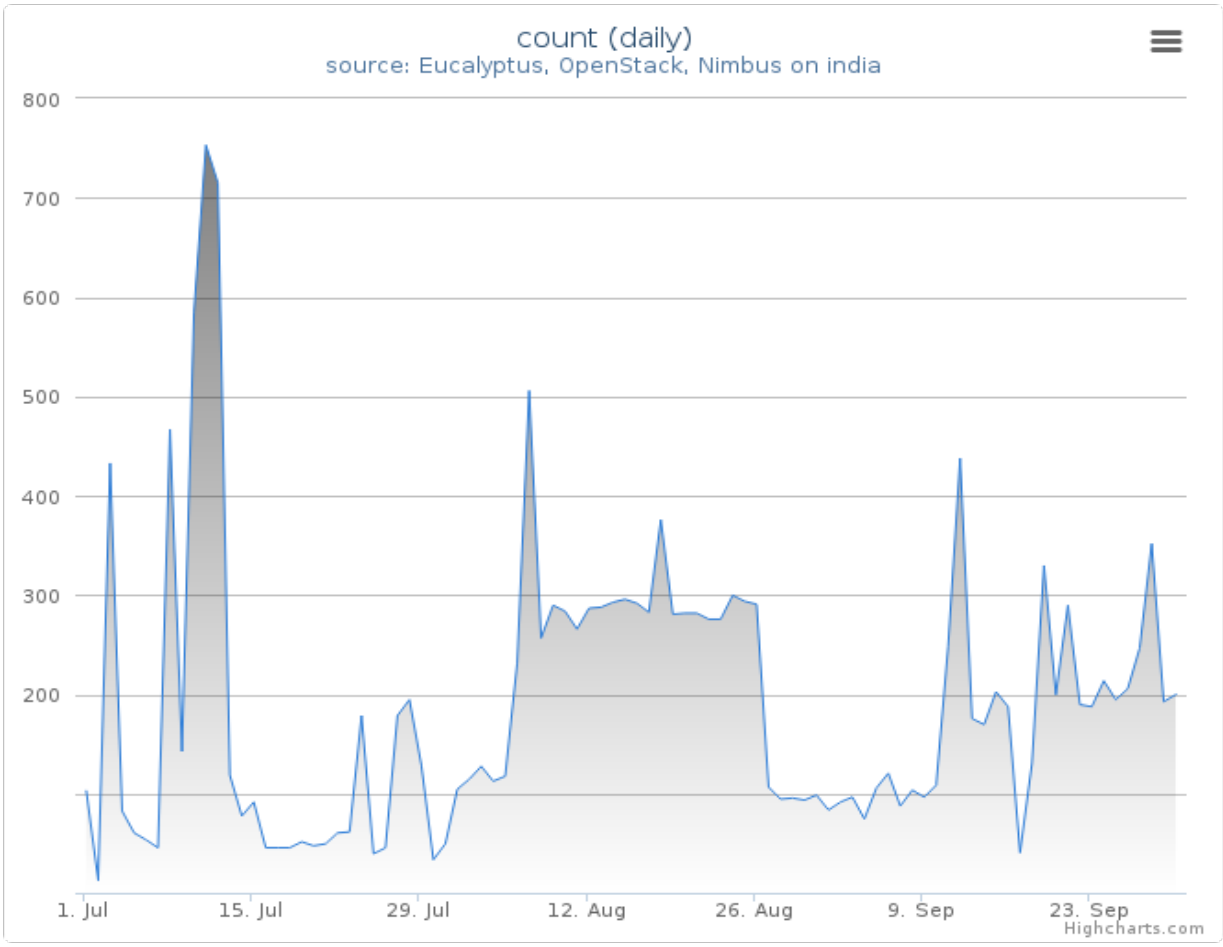


Figure 3: VMs count

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

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

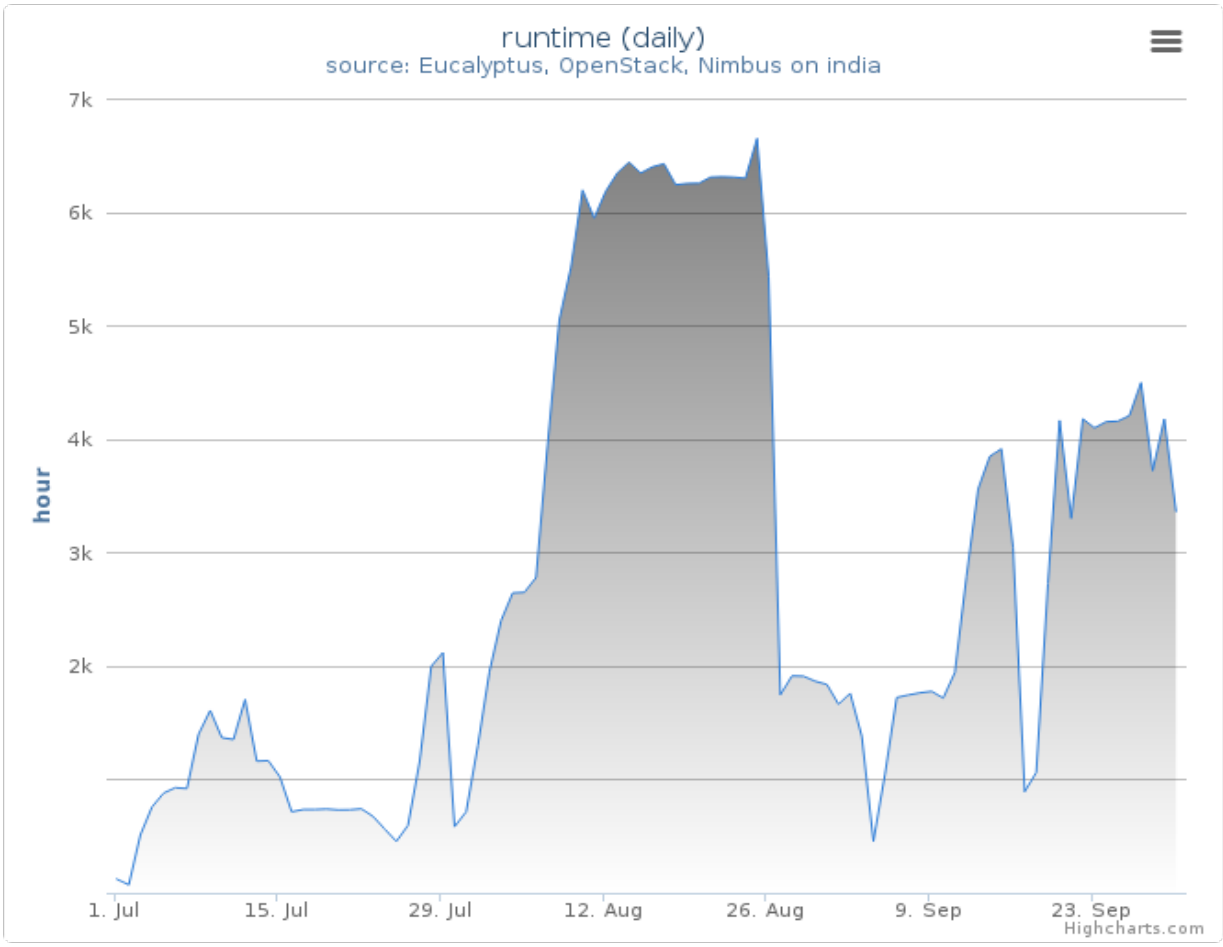


Figure 4: Wall time (hours)

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

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

## 2.2 Distribution

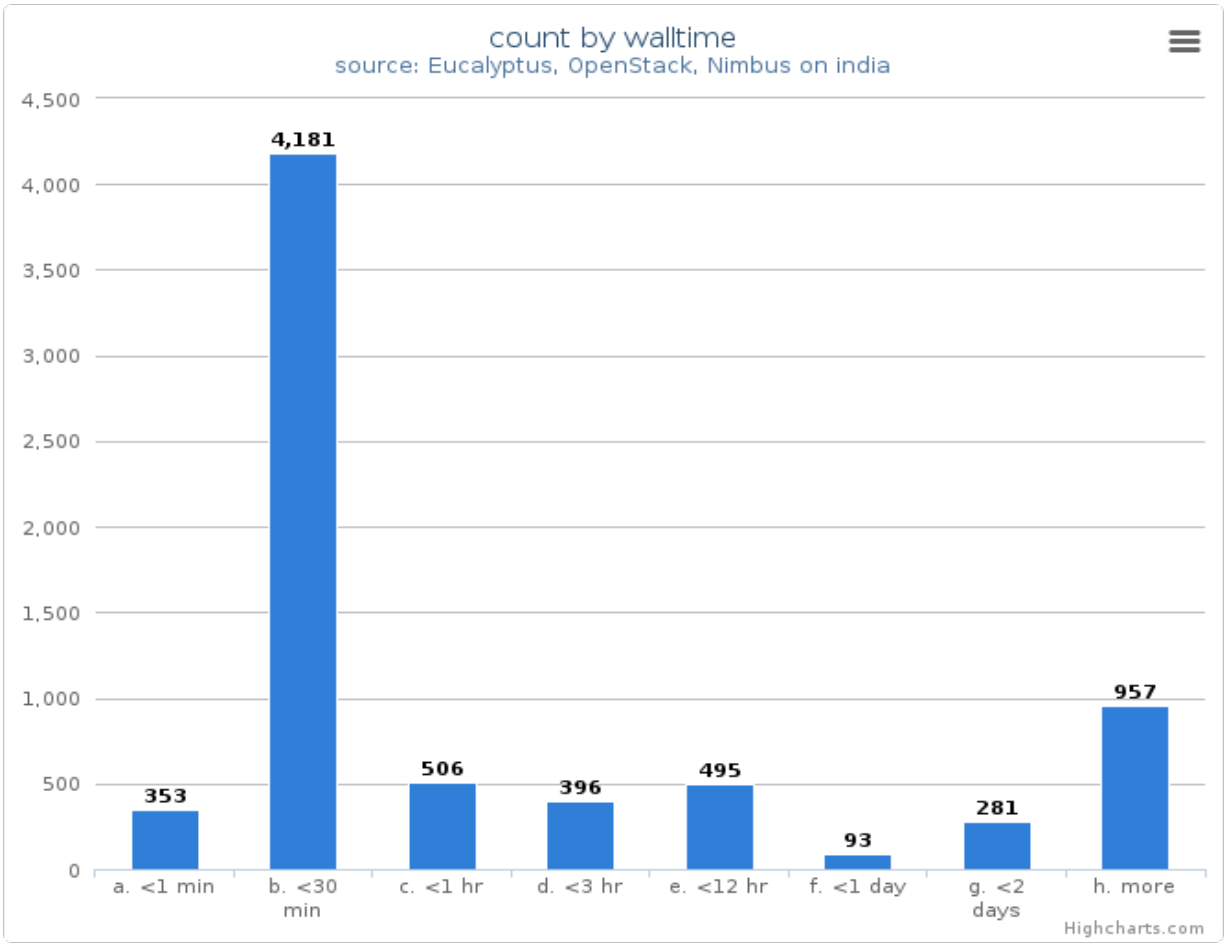


Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

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

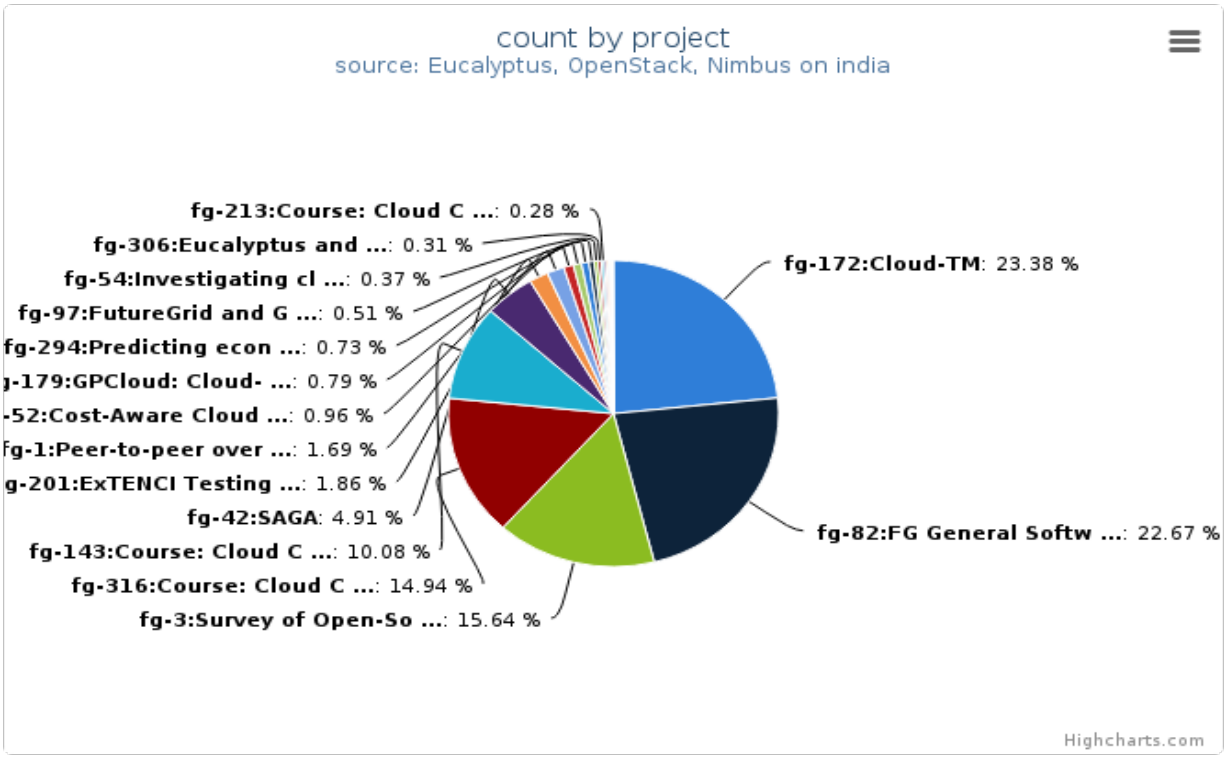


Figure 6: VMs count by project
This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

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

Table 2.1: VMs count by project

| Project | Value |
|---|---|
| fg-172:Cloud-TM | 828 |
| fg-82:FG General Software Development | 803 |
| fg-3:Survey of Open-Source Cloud Infrastructure using FutureGrid Testbed | 554 |
| fg-316:Course: Cloud Computing Class - third edition | 529 |
| fg-143:Course: Cloud Computing for Data Intensive Science Class | 357 |
| fg-42:SAGA | 174 |
| fg-201:ExTENCI Testing, Validation, and Performance | 66 |
| fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters | 60 |
| fg-52:Cost-Aware Cloud Computing | 34 |
| fg-179:GPCloud: Cloud-based Automatic Repair of Real-World Software Bugs | 28 |
| fg-294:Predicting economic activities using social media | 26 |
| fg-97:FutureGrid and Grid'5000 Collaboration | 18 |
| fg-54:Investigating cloud computing as a solution for analyzing particle physics data | 13 |
| fg-306:Eucalyptus and Openstack | 11 |
| fg-213:Course: Cloud Computing class - second edition | 10 |
| Others | 8 |
| fg-253:Characterizing Performance of Infrastructure Clouds | 8 |
| fg-136:JGC-DataCloud-2012 paper experiments | 6 |
| fg-20:Development of an information service for FutureGrid | 3 |
| fg-60:Wide area distributed file system for MapReduce applications on FutureGrid platform | 2 |
| fg-241:Course: Science Cloud Summer School 2012 | 2 |
| fg-249:Large Scale Computing Infrastructure 2012 Master class | 1 |
| fg-132:Large scale data analytics | 1 |

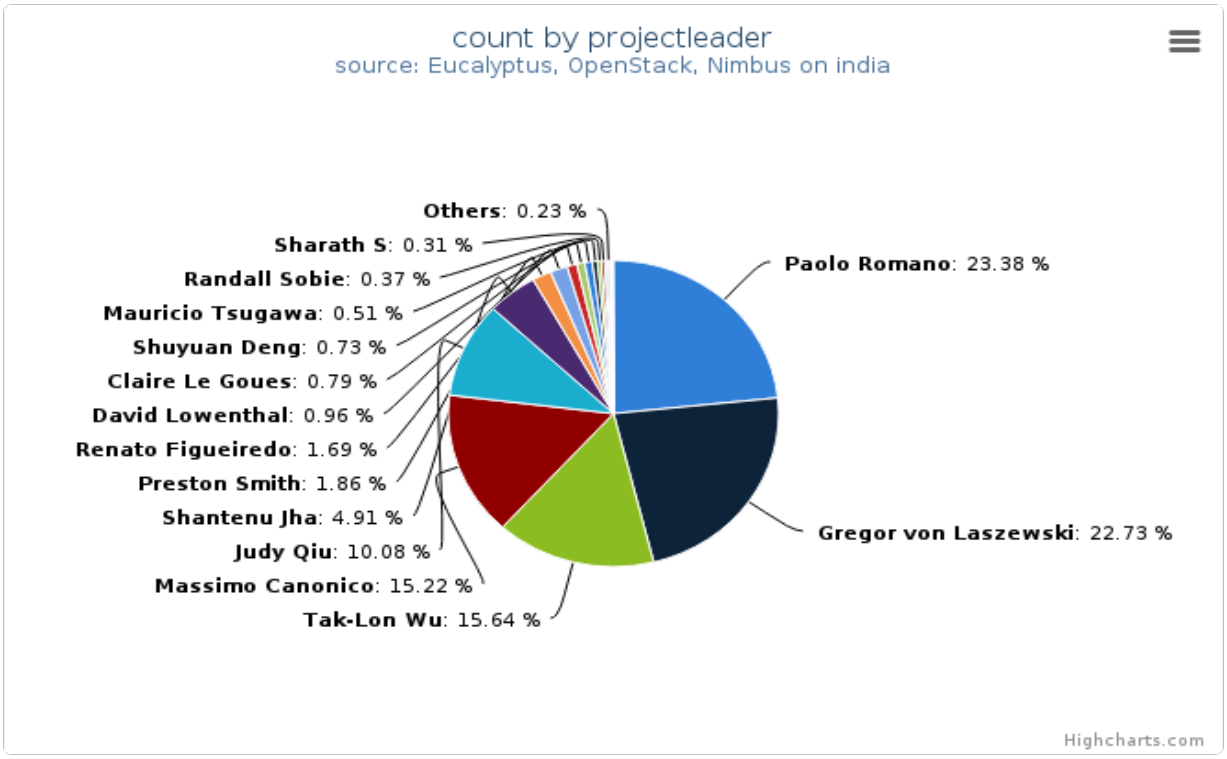

Figure 7: VMs count by project leader
This chart also illustrates the proportion of launched VM instances by project Leader. The same data in tabular form follows.

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

Table 2.2: VMs count by project leader

| Projectleader | Value |
|---|---|
| Paolo Romano | 828 |
| Gregor von Laszewski | 805 |
| Tak-Lon Wu | 554 |
| Massimo Canonico | 539 |
| Judy Qiu | 357 |
| Shantenu Jha | 174 |
| Preston Smith | 66 |
| Renato Figueiredo | 60 |
| David Lowenthal | 34 |
| Claire Le Goues | 28 |
| Shuyuan Deng | 26 |
| Mauricio Tsugawa | 18 |
| Randall Sobie | 13 |
| Sharath S | 11 |
| Paul Marshall | 8 |
| Others | 8 |
| Mats Rynge | 6 |
| Hyungro Lee | 3 |
| Lizhe Wang | 2 |
| Yogesh Simmhan | 1 |
| Sergio Maffioletti | 1 |

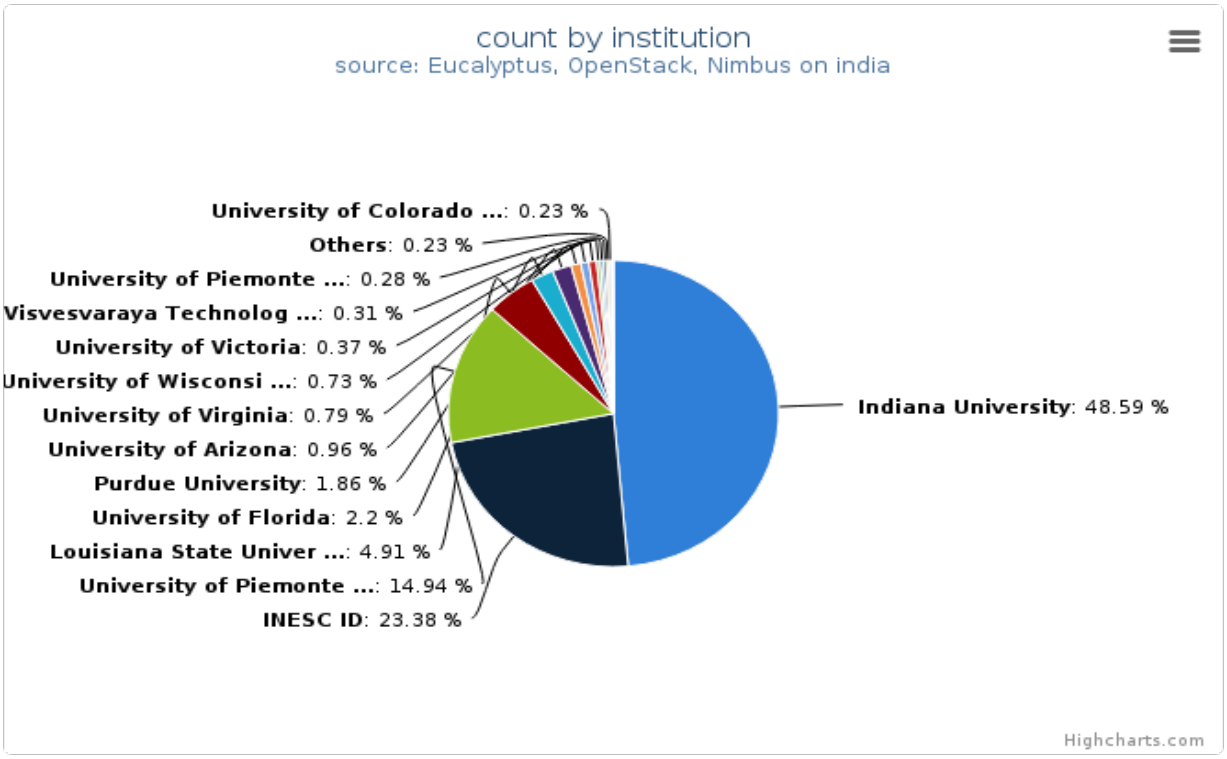


Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

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

Table 2.3: VMs count by institution

| Institution | Value |
|---|---|
| Indiana University | 1721 |
| INESC ID | 828 |
| University of Piemonte Orientale, Computer Science Department | 529 |
| Louisiana State University | 174 |
| University of Florida | 78 |
| Purdue University | 66 |
| University of Arizona | 34 |
| University of Virginia | 28 |
| University of Wisconsin -Milwaukee | 26 |
| University of Victoria | 13 |
| Visvesvaraya Technological University, Computer science organiza | 11 |
| University of Piemonte Orientale | 10 |
| Others | 8 |
| University of Colorado at Boulder | 8 |
| USC | 6 |
| University of Southern California | 1 |
| University of Zurich | 1 |

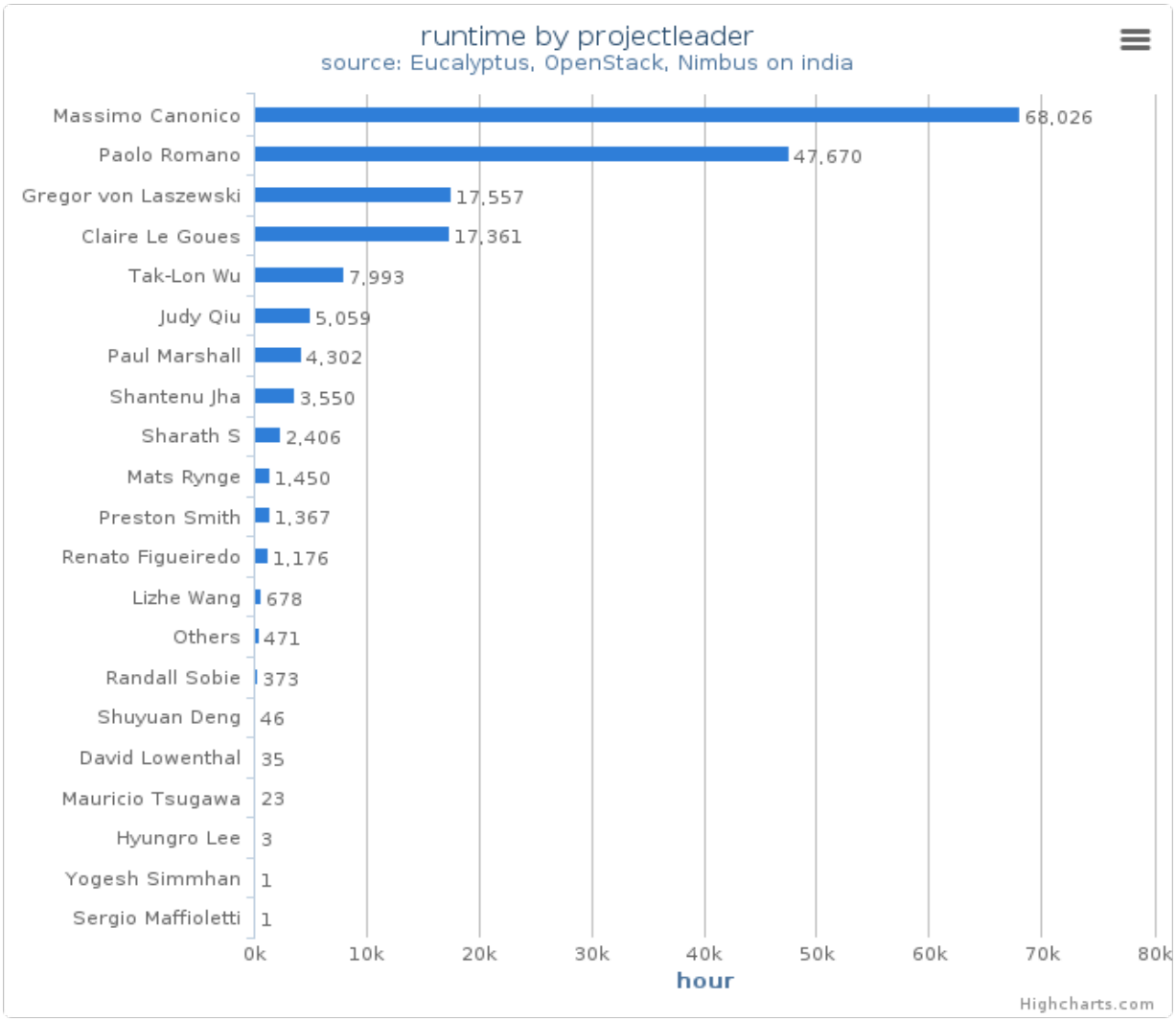


Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

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

## 2.3 System information

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

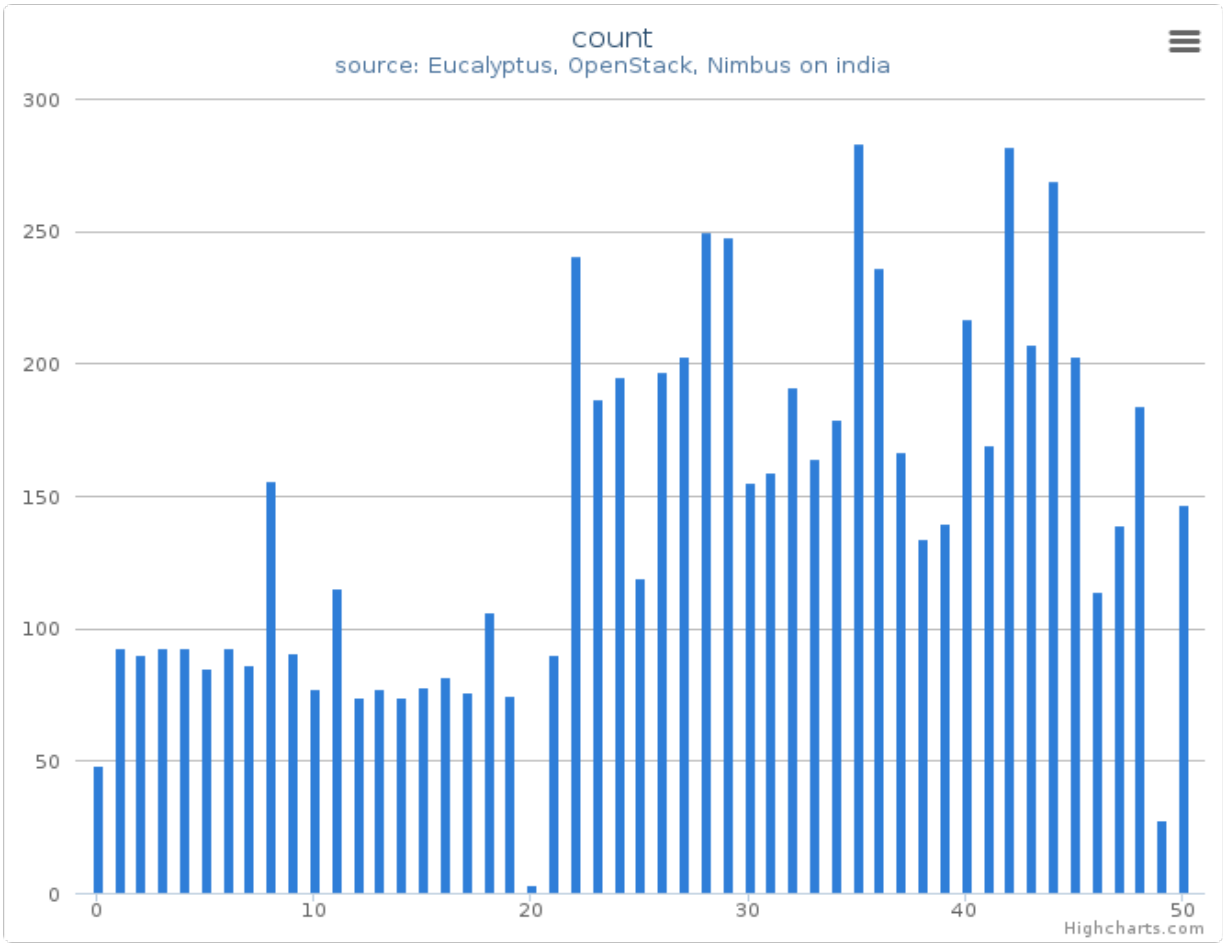


Figure 10: VMs count by systems (compute nodes) in Cluster (india)
This column chart represents VMs count among systems.

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

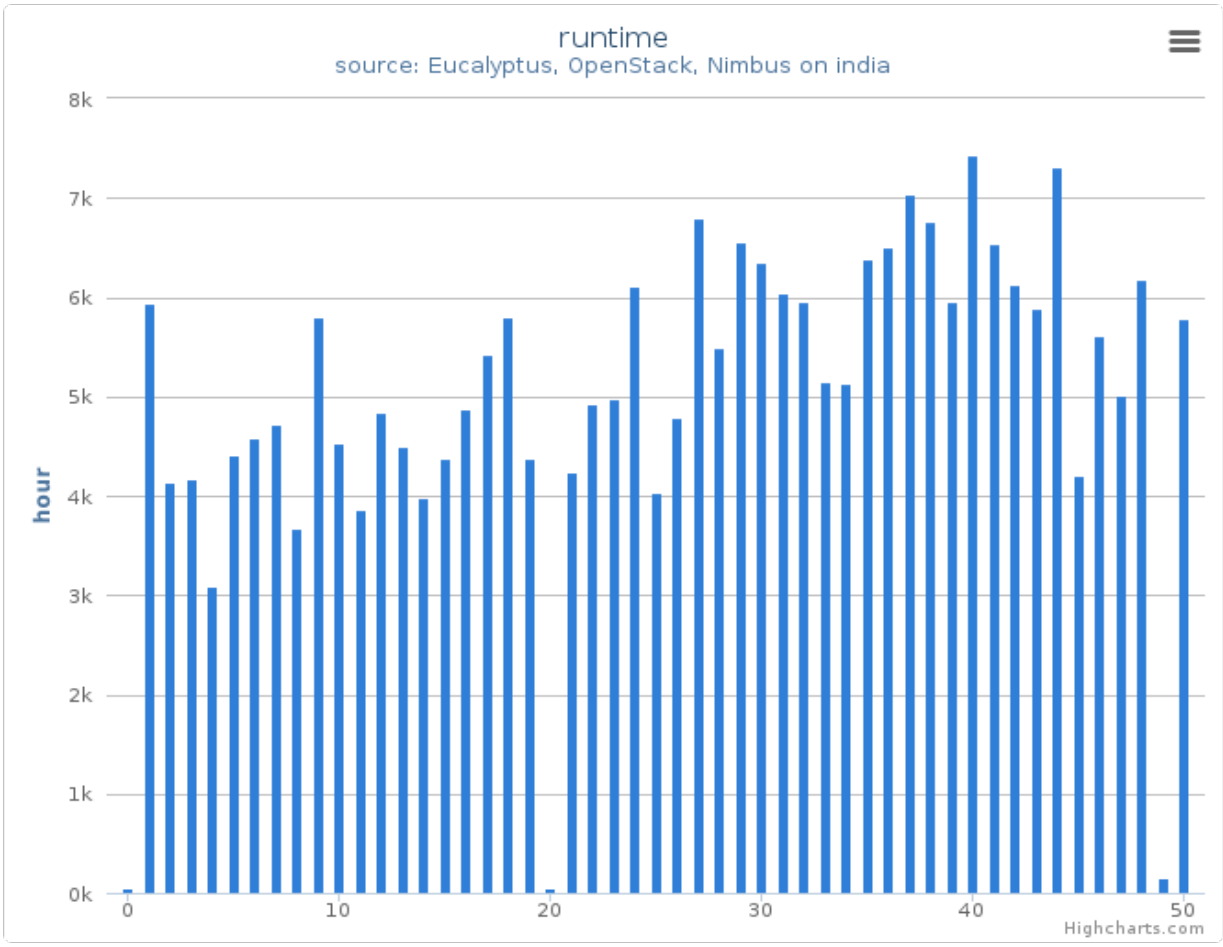


Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (india)
This column chart represents wall time among systems.

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

CHAPTER

THREE

# USAGE REPORT SIERRA

- Period: July 01 – September 30, 2013
- Hostname: sierra.futuregrid.org
- Services: nimbus, 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)

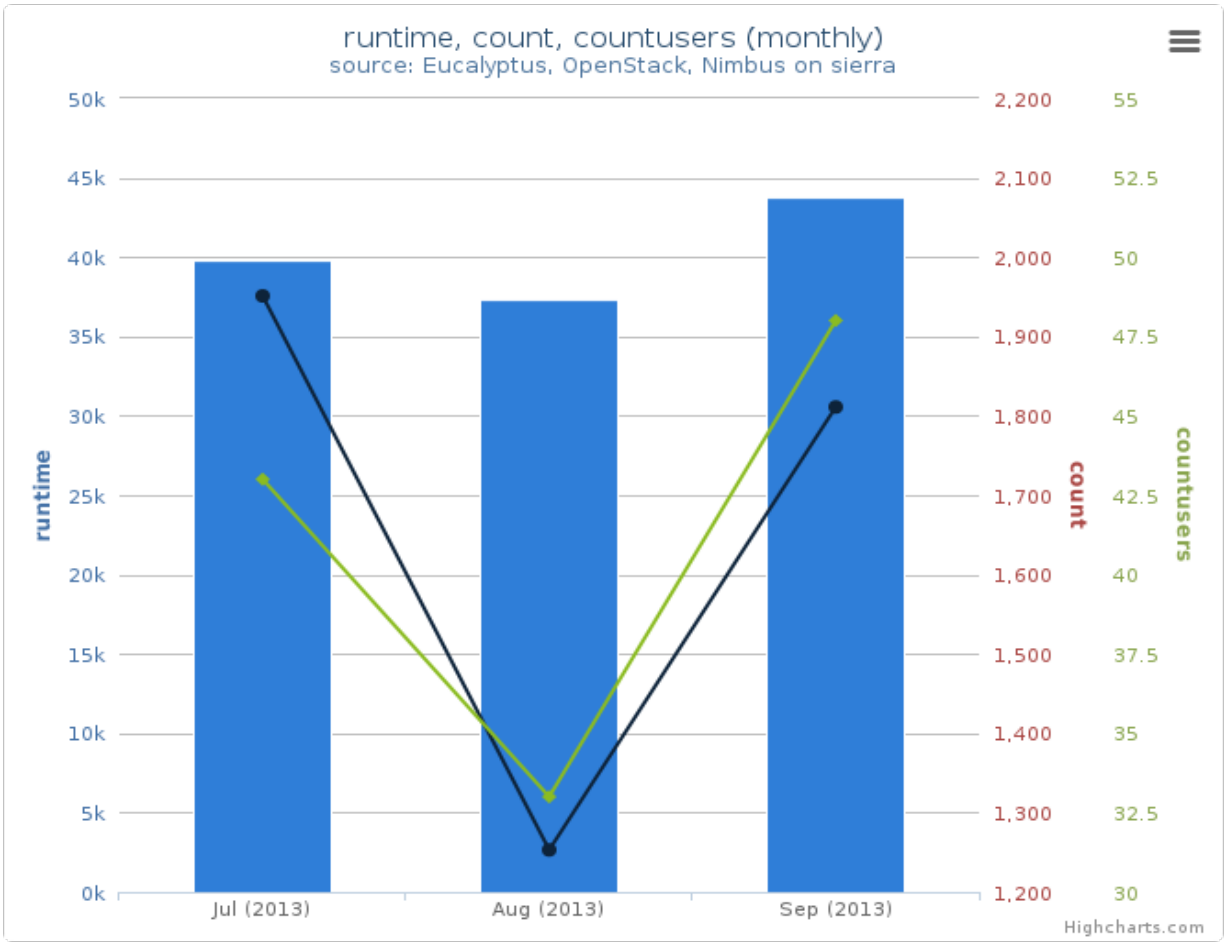


Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack, 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

### 3.1.2 Summary (Daily)

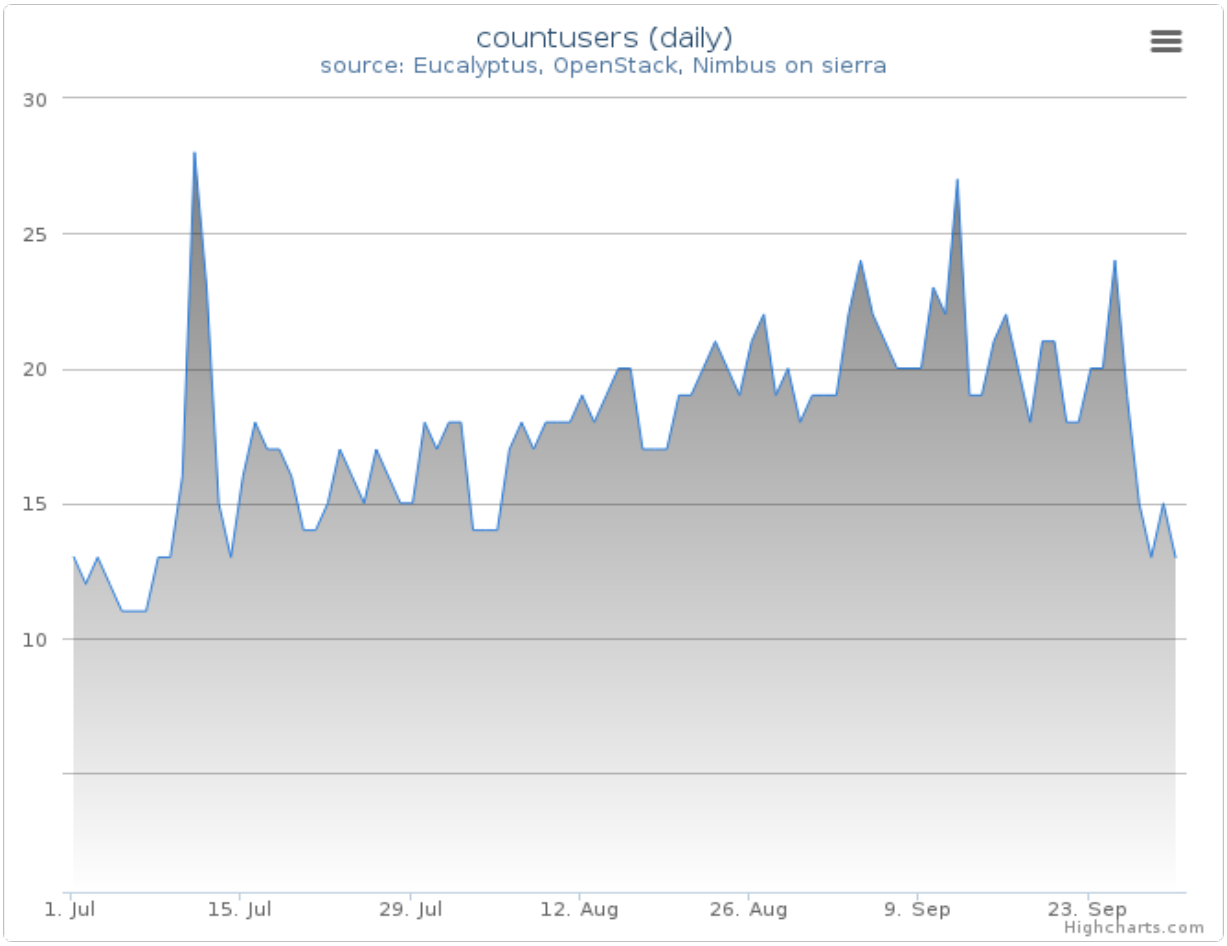


Figure 2: Users count

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack, eucalyptus
- Hostname: sierra

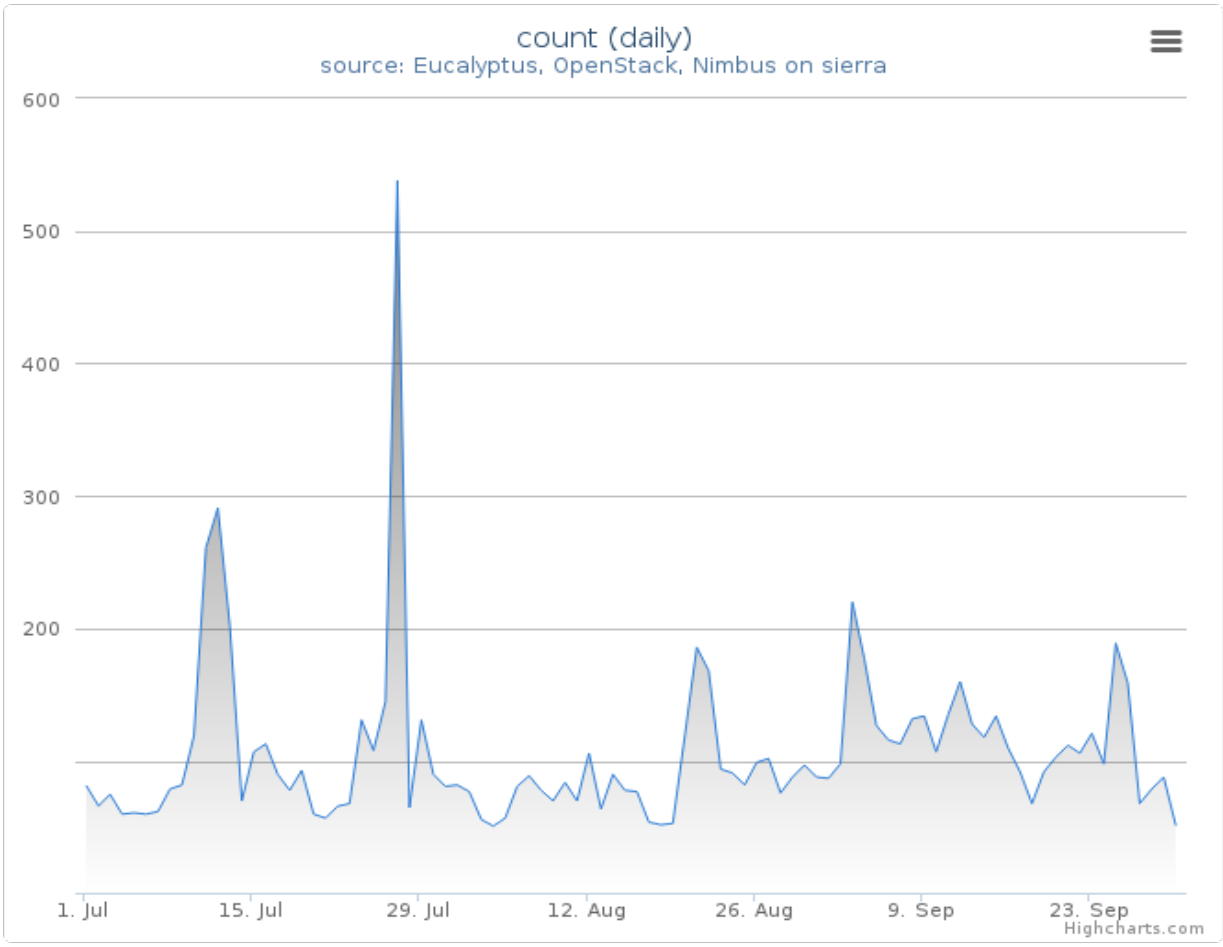


Figure 3: VMs count

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 – September 30, 2013
- Cloud(IaaS): nimbus, openstack, eucalyptus
- Hostname: sierra

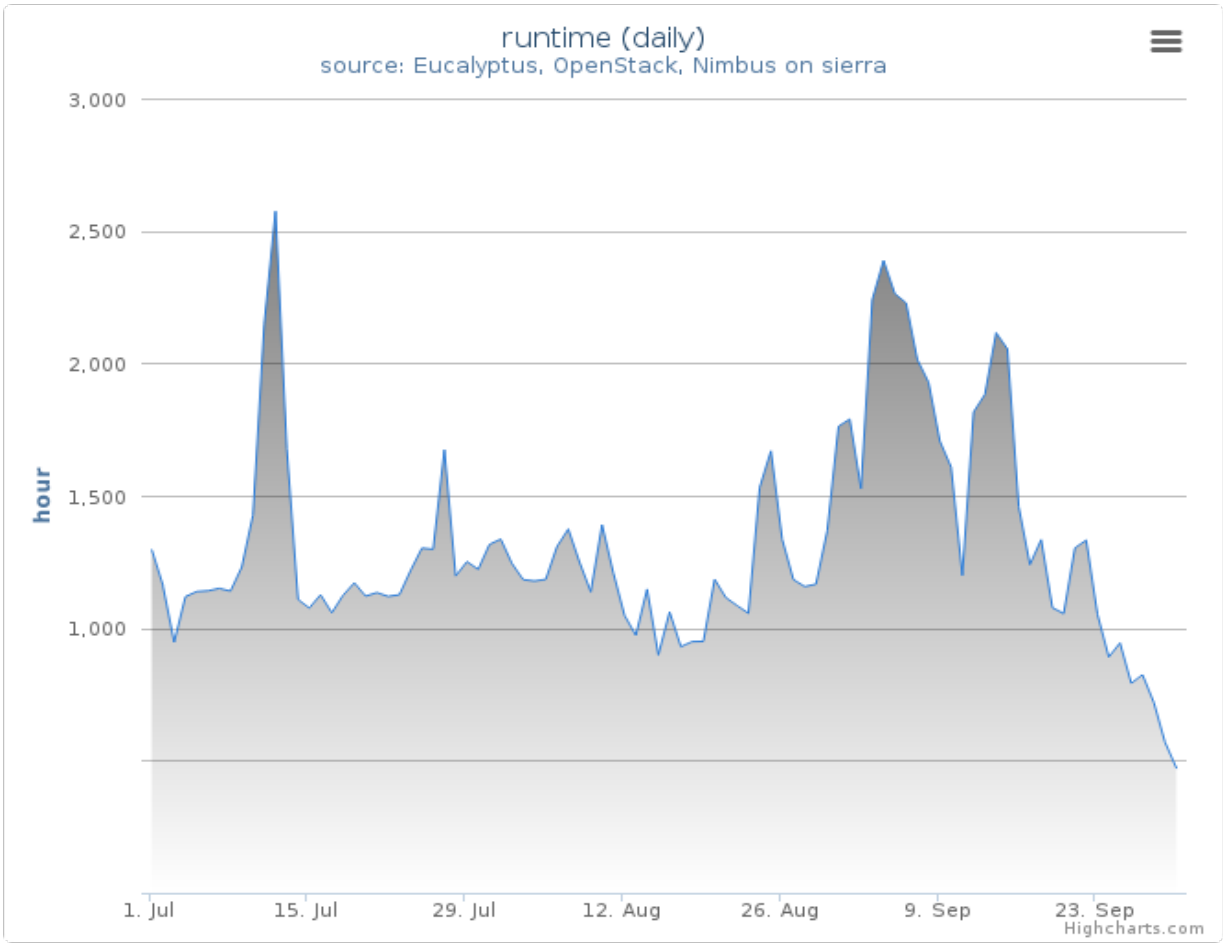


Figure 4: Wall time (hours)

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack, eucalyptus
- Hostname: sierra

## 3.2 Distribution

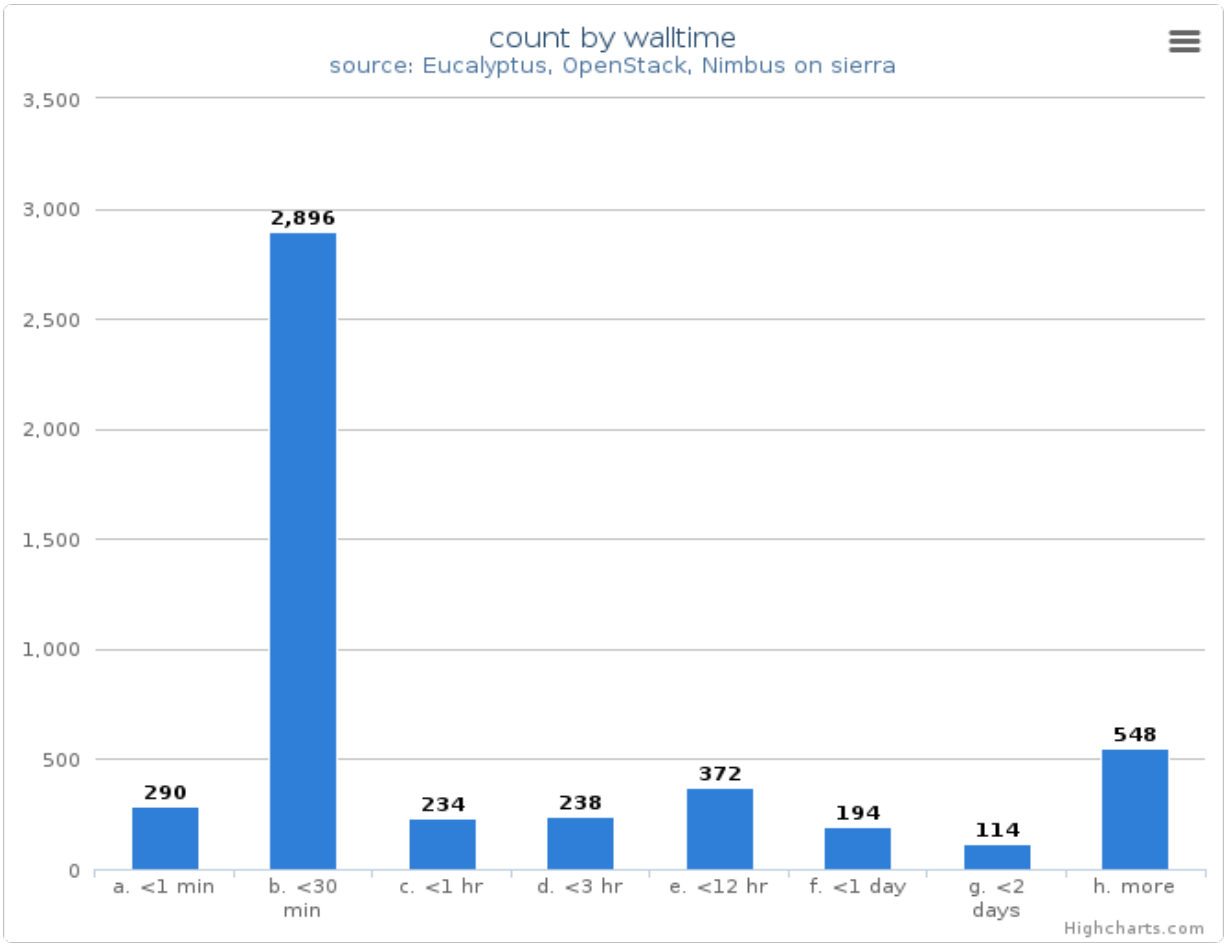


Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack, eucalyptus
- Hostname: sierra

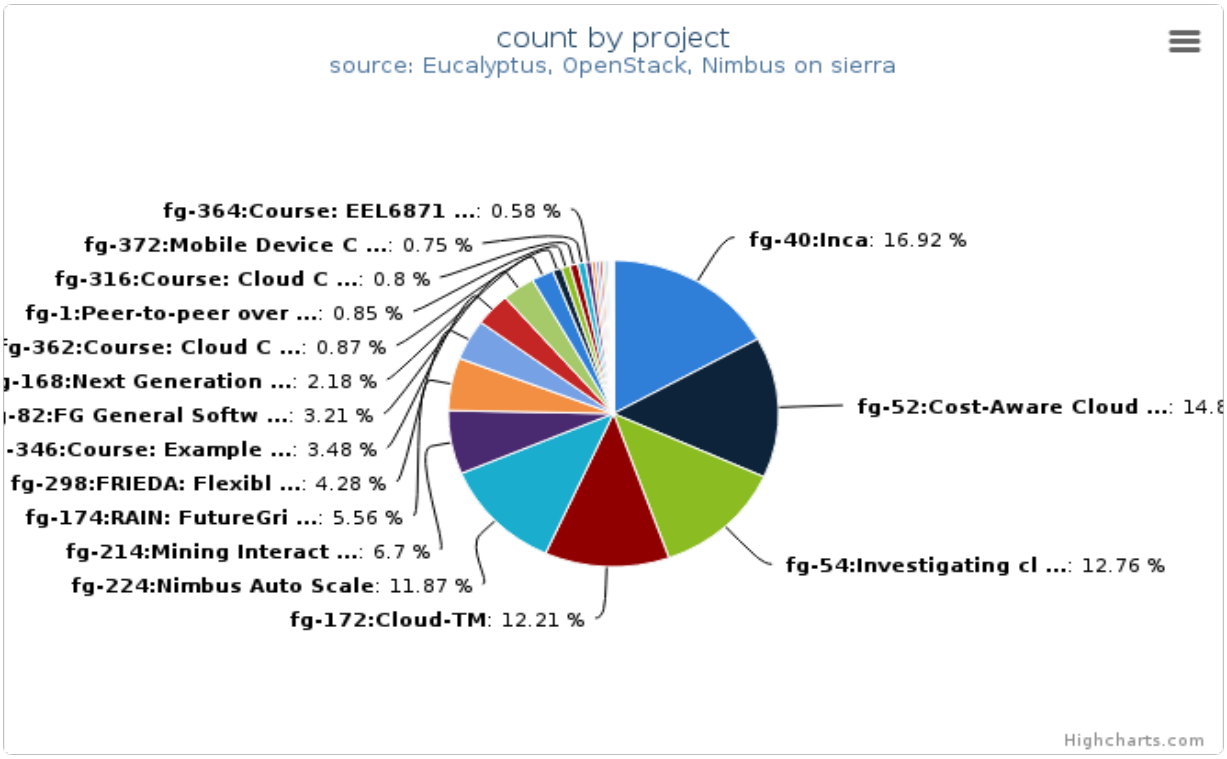


Figure 6: VMs count by project

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack, eucalyptus
- Hostname: sierra

Table 3.1: VMs count by project

| Project | Value |
|---|---|
| fg-40:Inca | 700 |
| fg-52:Cost-Aware Cloud Computing | 615 |
| fg-54:Investigating cloud computing as a solution for analyzing particle physics data | 528 |
| fg-172:Cloud-TM | 505 |
| fg-224:Nimbus Auto Scale | 491 |
| fg-214:Mining Interactions between Network Community Structure and Information Diffusion | 277 |
| fg-174:RAIN: FutureGrid Dynamic provisioning Framework | 230 |
| fg-298:FRIEDA: Flexible Robust Intelligent Elastic Data Management | 177 |
| fg-346:Course: Example Course On Advanced Cloud Computing | 144 |
| fg-82:FG General Software Development | 133 |
| fg-168:Next Generation Sequencing in the Cloud | 90 |

Continued on next page

**Table 3.1 – continued from previous page**

| Project | Value |
|---|---|
| fg-362:Course: Cloud Computing and Storage (UF) | 36 |
| fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters | 35 |
| fg-316:Course: Cloud Computing Class - third edition | 33 |
| fg-372:Mobile Device Computation Offloading over SocialVPNs | 31 |
| fg-364:Course: EEL6871 Autonomic Computing | 24 |
| fg-315:Biome representational in silico karyotyping | 17 |
| fg-97:FutureGrid and Grid'5000 Collaboration | 15 |
| fg-264:Course: 1st Workshop on bioKepler Tools and Its Applications | 13 |
| fg-367:Optimize rapid deployment and updating of VM images at the remote compute cluster | 12 |
| fg-132:Large scale data analytics | 10 |
| fg-175:GridProphet, A workflow execution time prediction system for the Grid | 5 |
| fg-374:Course: Cloud and Distributed Computing | 4 |
| fg-356:IPython pipelines for training life sciences researchers on NGS data analysis | 3 |
| fg-251:Course: Fall 2012 B534 Distributed Systems Graduate Course | 3 |
| fg-244:Course: Data Center Scale Computing | 2 |
| fg-314:User-friendly tools to play with cloud platforms | 1 |
| fg-180:STAMPEDE | 1 |
| fg-355:Course: Data Center Scale Computing Class | 1 |
| fg-69:Investigate provenance collection for MapReduce | 1 |

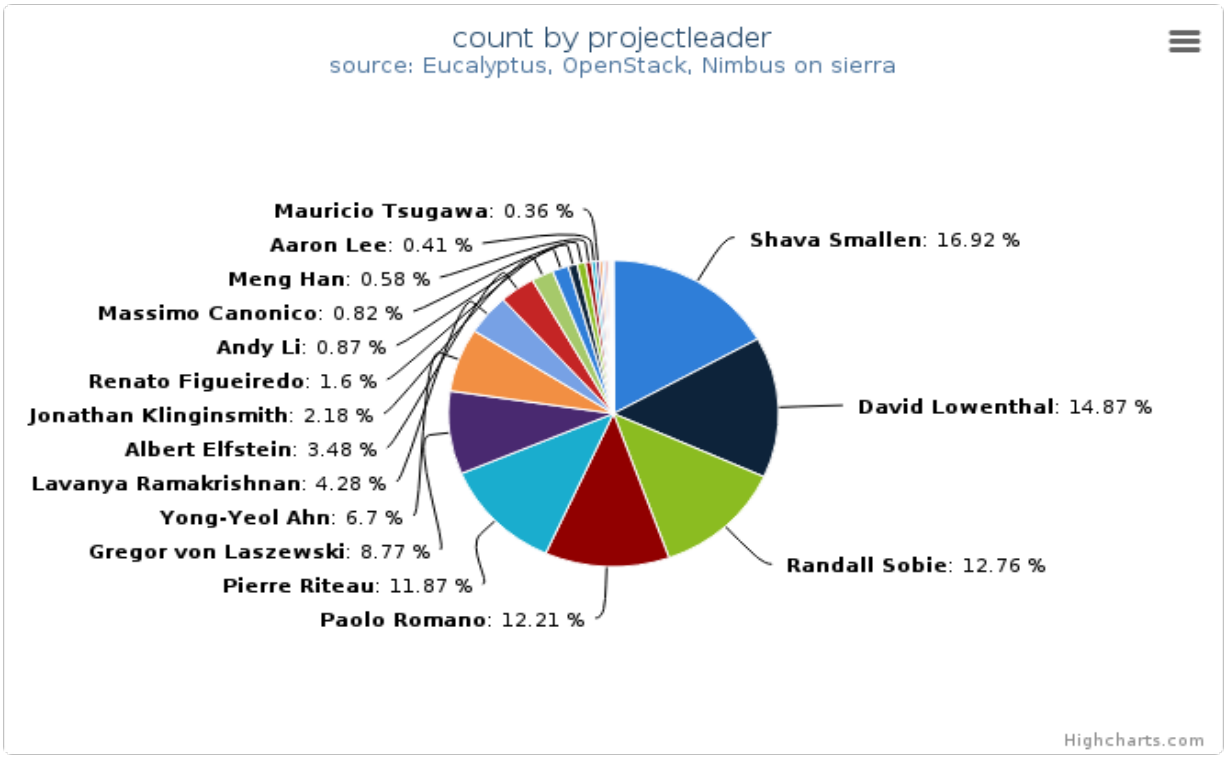


Figure 7: VMs count by project leader

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

follows.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack, eucalyptus
- Hostname: sierra

Table 3.2: VMs count by project leader

| Projectleader | Value |
|---|---|
| Shava Smallen | 700 |
| David Lowenthal | 615 |
| Randall Sobie | 528 |
| Paolo Romano | 505 |
| Pierre Riteau | 491 |
| Gregor von Laszewski | 363 |
| Yong-Yeol Ahn | 277 |
| Lavanya Ramakrishnan | 177 |
| Albert Elfstein | 144 |
| Jonathan Klinginsmith | 90 |
| Renato Figueiredo | 66 |
| Andy Li | 36 |
| Massimo Canonico | 34 |
| Meng Han | 24 |
| Aaron Lee | 17 |
| Mauricio Tsugawa | 15 |
| Ilkay Altintas | 13 |
| Jan Balewski | 12 |
| Yogesh Simmhan | 10 |
| Thomas Fahringer | 5 |
| Philip Rhodes | 4 |
| Todd Blevins | 3 |
| Dirk Grunwald | 3 |
| Judy Qiu | 3 |
| Jiaan Zeng | 1 |
| Dan Gunter | 1 |

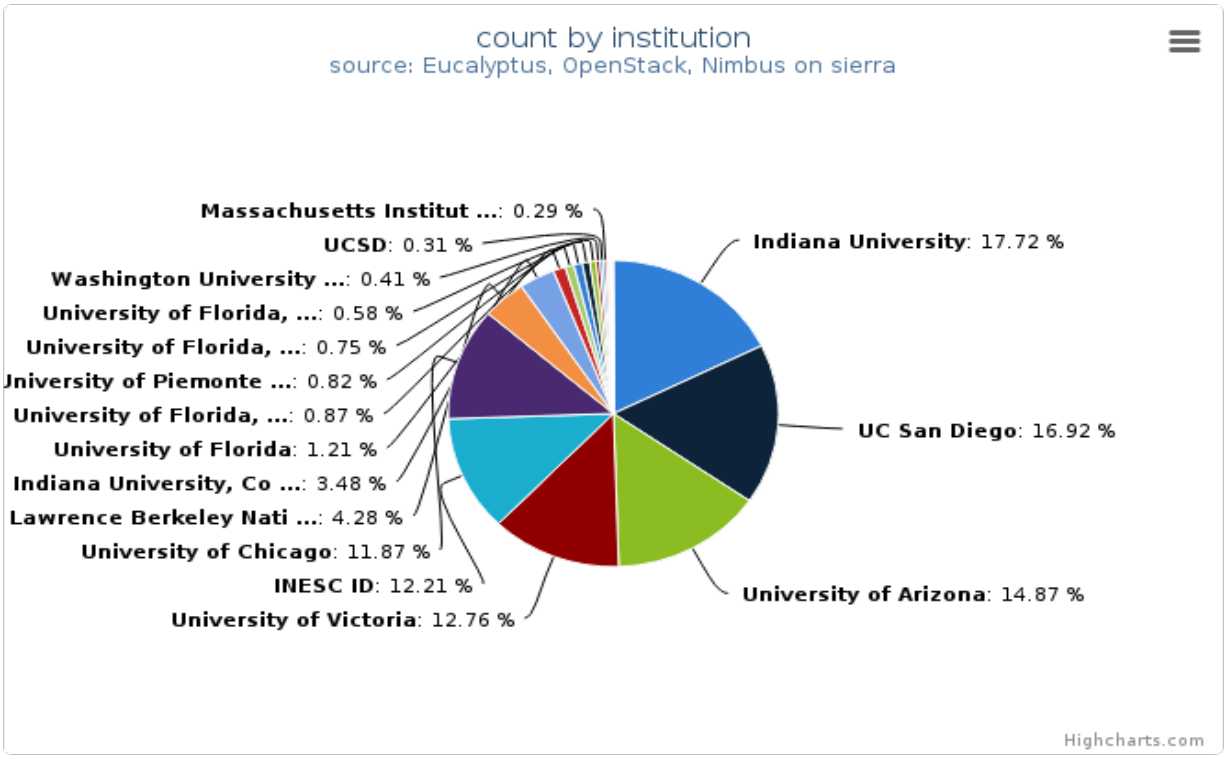


Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack, eucalyptus
- Hostname: sierra

Table 3.3: VMs count by institution

| Institution | Value |
|---|---|
| Indiana University | 733 |
| UC San Diego | 700 |
| University of Arizona | 615 |
| University of Victoria | 528 |
| INESC ID | 505 |
| University of Chicago | 491 |
| Lawrence Berkeley National Lab | 177 |
| Indiana University, Computer Science Department | 144 |
| University of Florida | 50 |
| University of Florida, Department of Electrical and Computer Eng | 36 |
| University of Piemonte Orientale, Computer Science Department | 34 |
| University of Florida, Electrical and Computer Engineering | 31 |
| University of Florida, ACIS | 24 |
| Washington University at St Louis, School of Medicine, Departmen | 17 |
| UCSD | 13 |
| Massachusetts Institute of Technology, Laboratory for Nuclear Sc | 12 |
| University of Southern California | 10 |
| University of Innsbruck | 5 |
| University of Mississippi, Department of Computer Science | 4 |
| Indiana University, Depts of Biology and Molecular and Cellular | 3 |
| Univ. of Colorado | 2 |
| Computer Science | 1 |
| Univ. of Colorado, Boulder, Computer Science | 1 |
| LBNL | 1 |

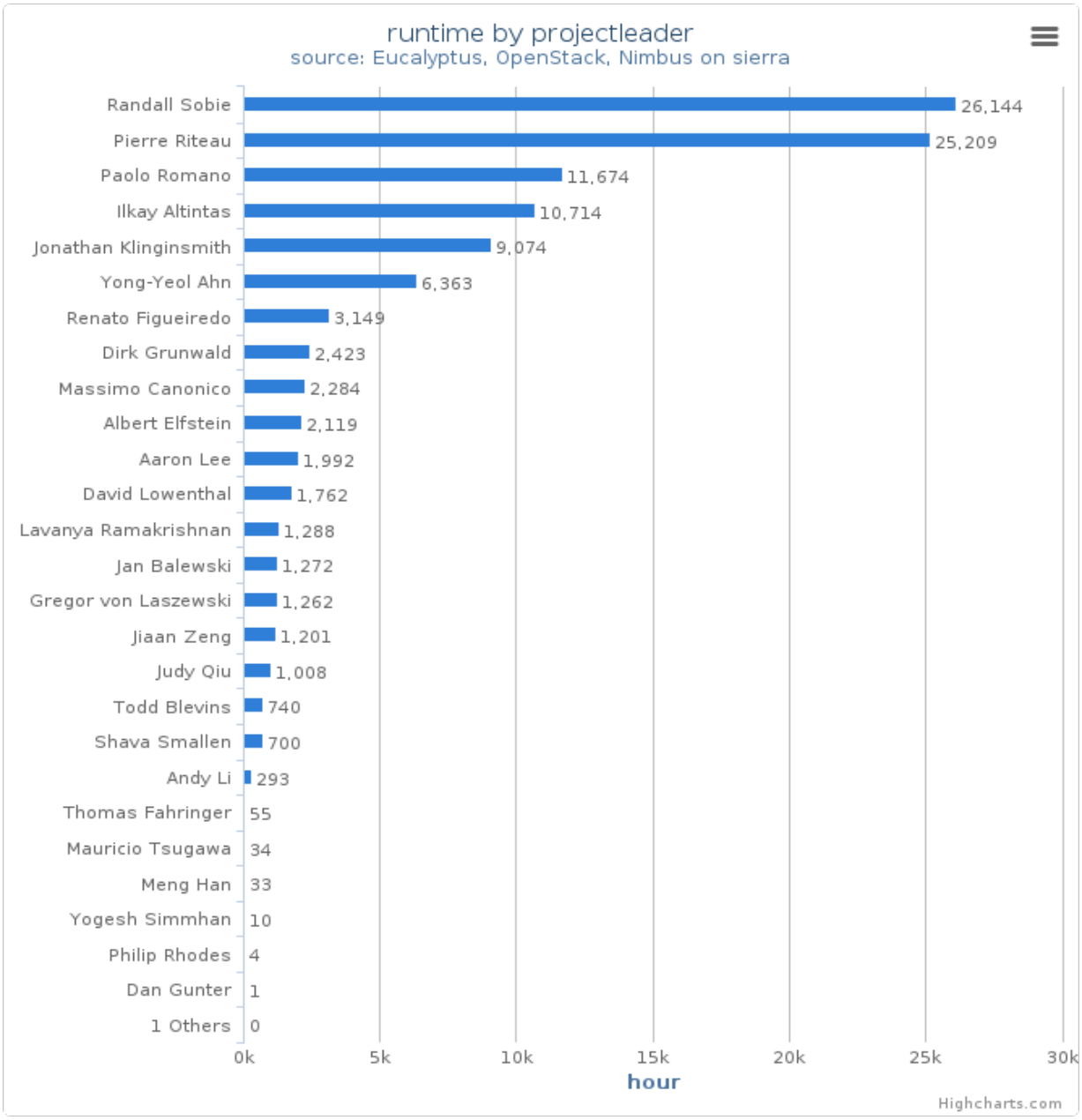


Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack, eucalyptus
- Hostname: sierra

## 3.3 System information

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

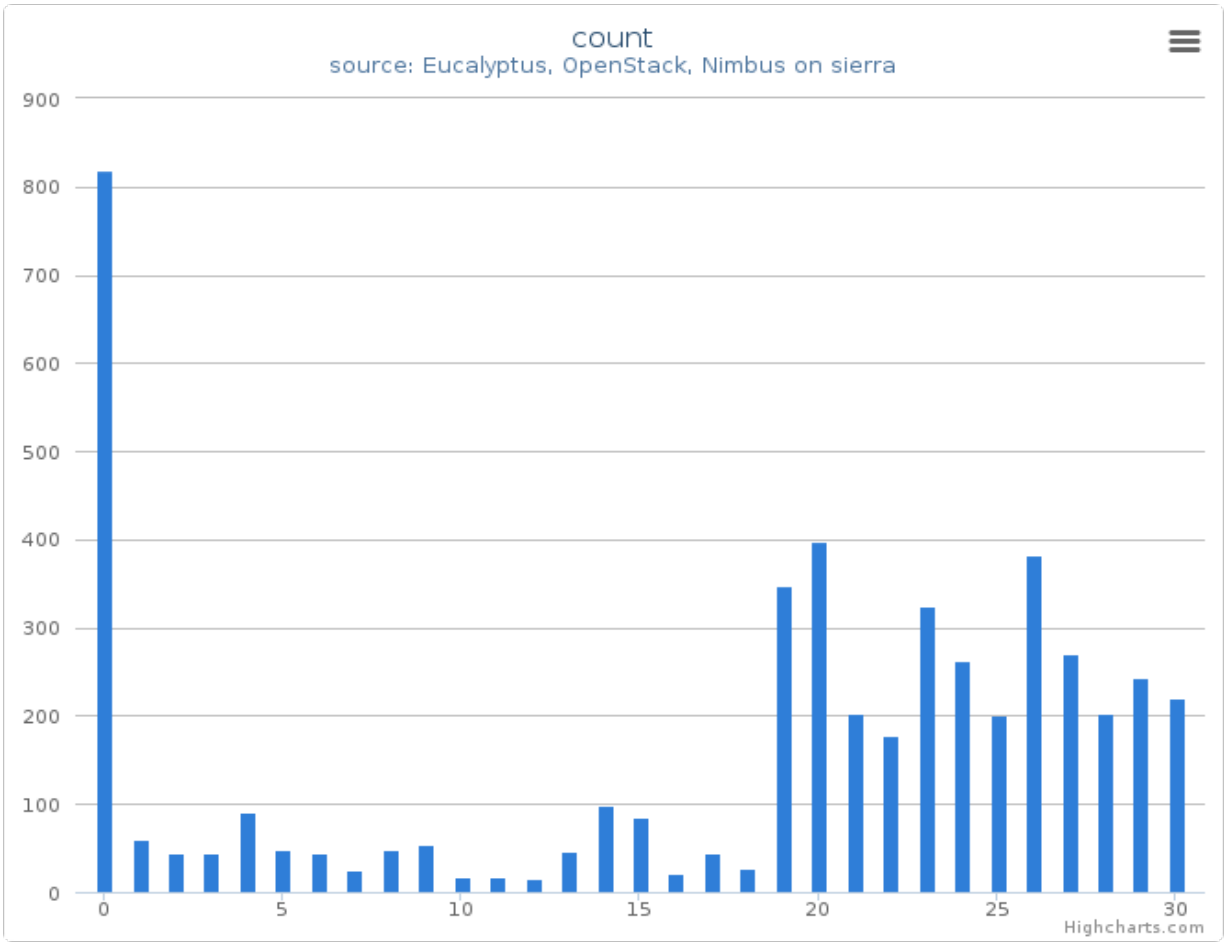


Figure 10: VMs count by systems (compute nodes) in Cluster (sierra)
This column chart represents VMs count among systems.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack, eucalyptus
- Hostname: sierra

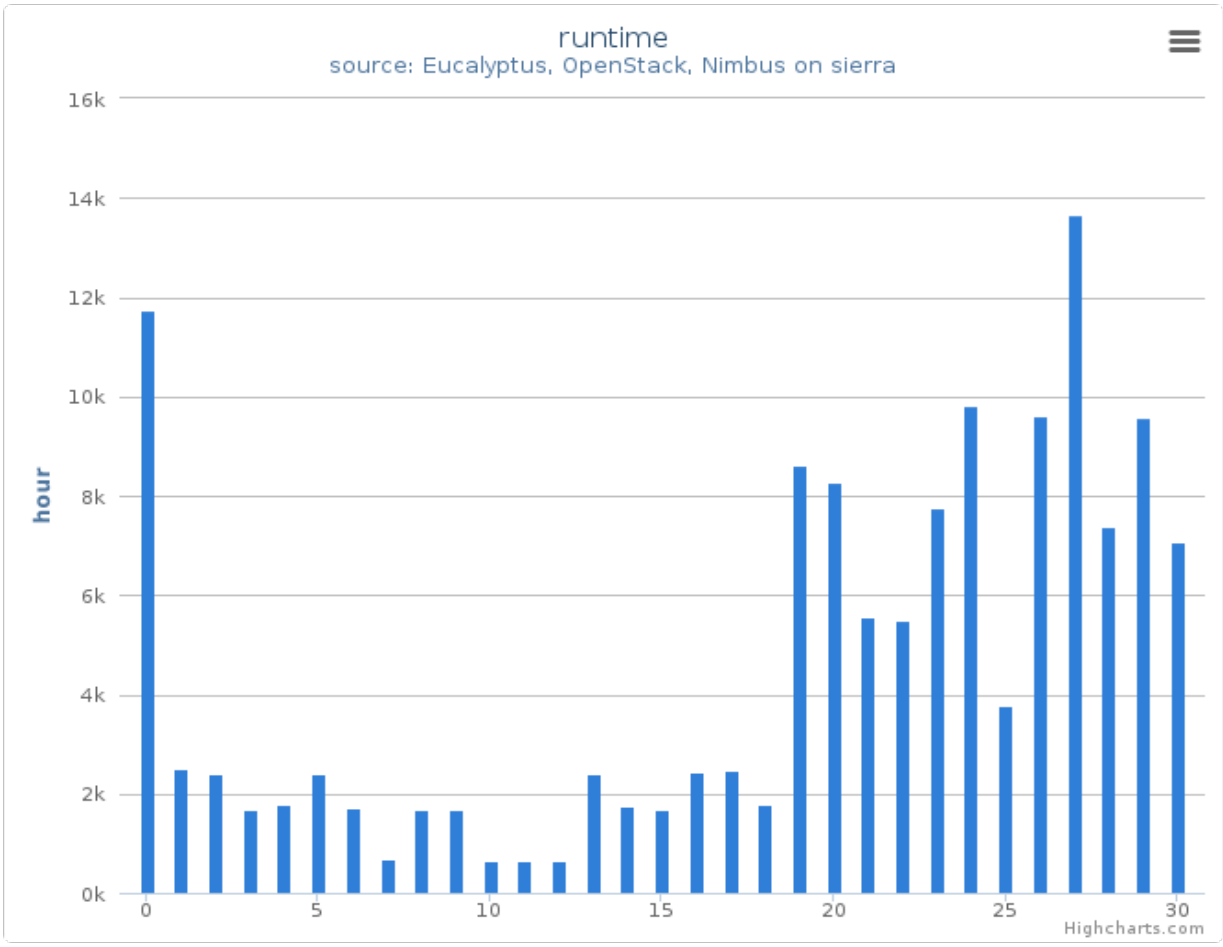


Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (sierra)
This column chart represents wall time among systems.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack, eucalyptus
- Hostname: sierra

CHAPTER

FOUR

# USAGE REPORT ALAMO

- Period: July 01 – September 30, 2013
- Hostname: alamo.futuregrid.org
- Services: nimbus, openstack
- 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)

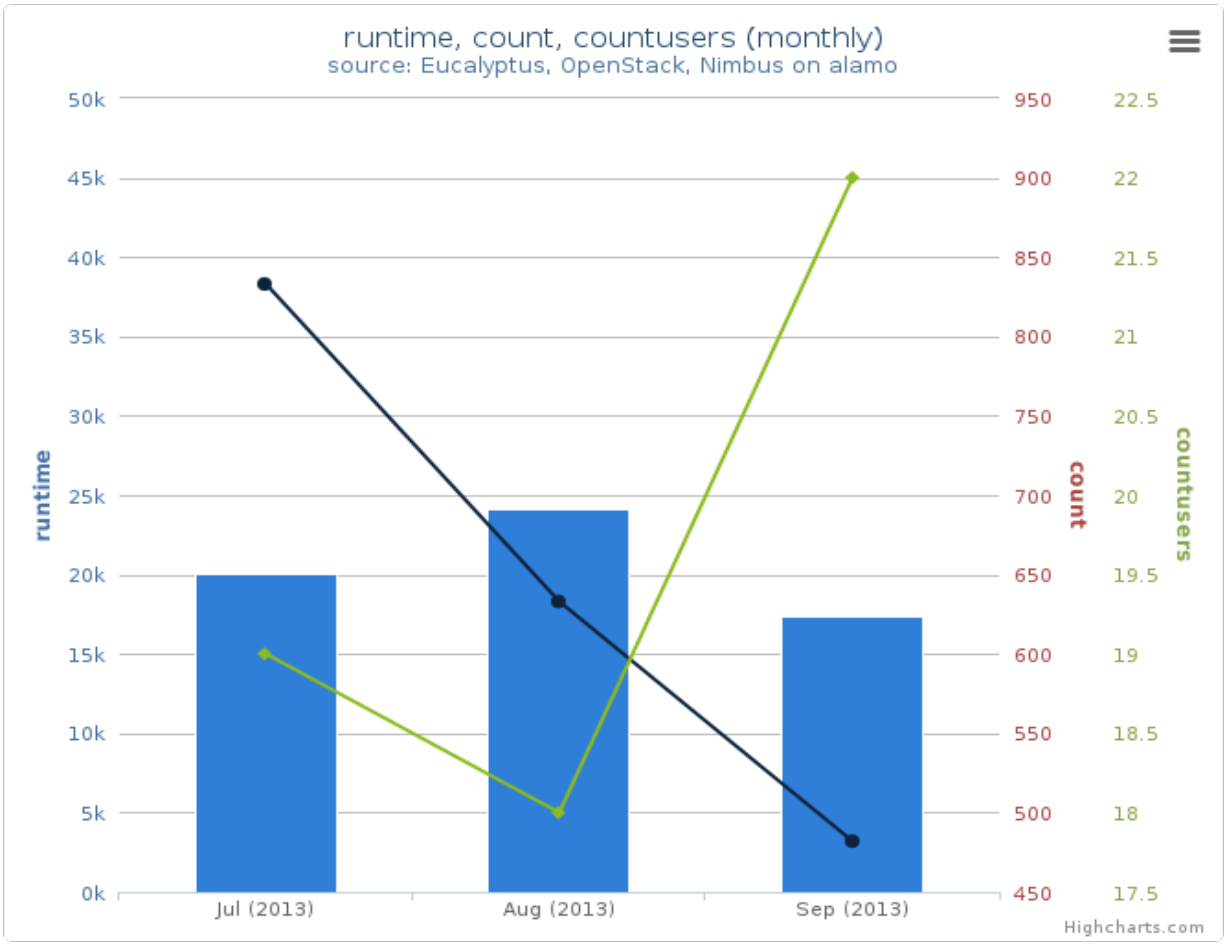


Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack
- 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

### 4.1.2 Summary (Daily)

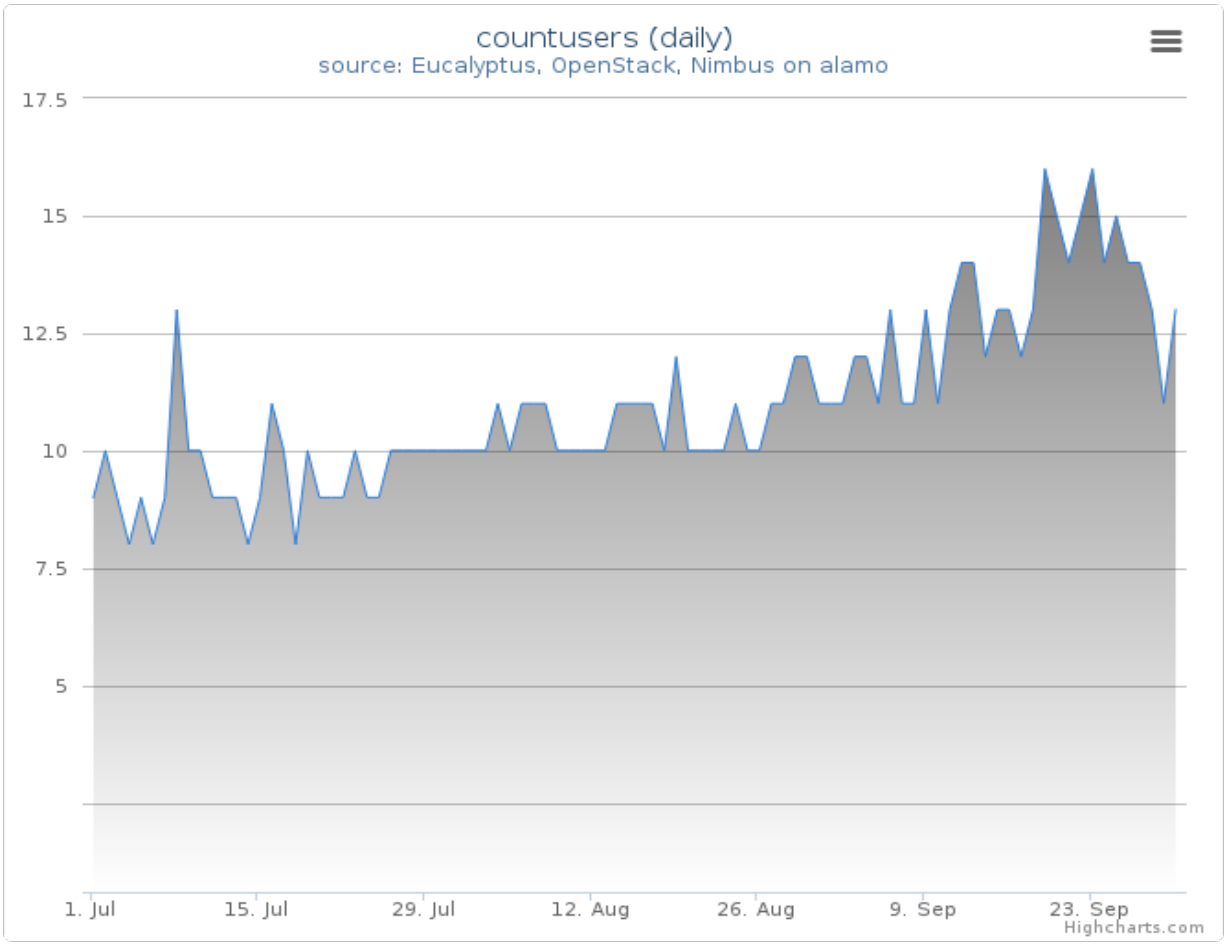


Figure 2: Users count

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack
- Hostname: alamo

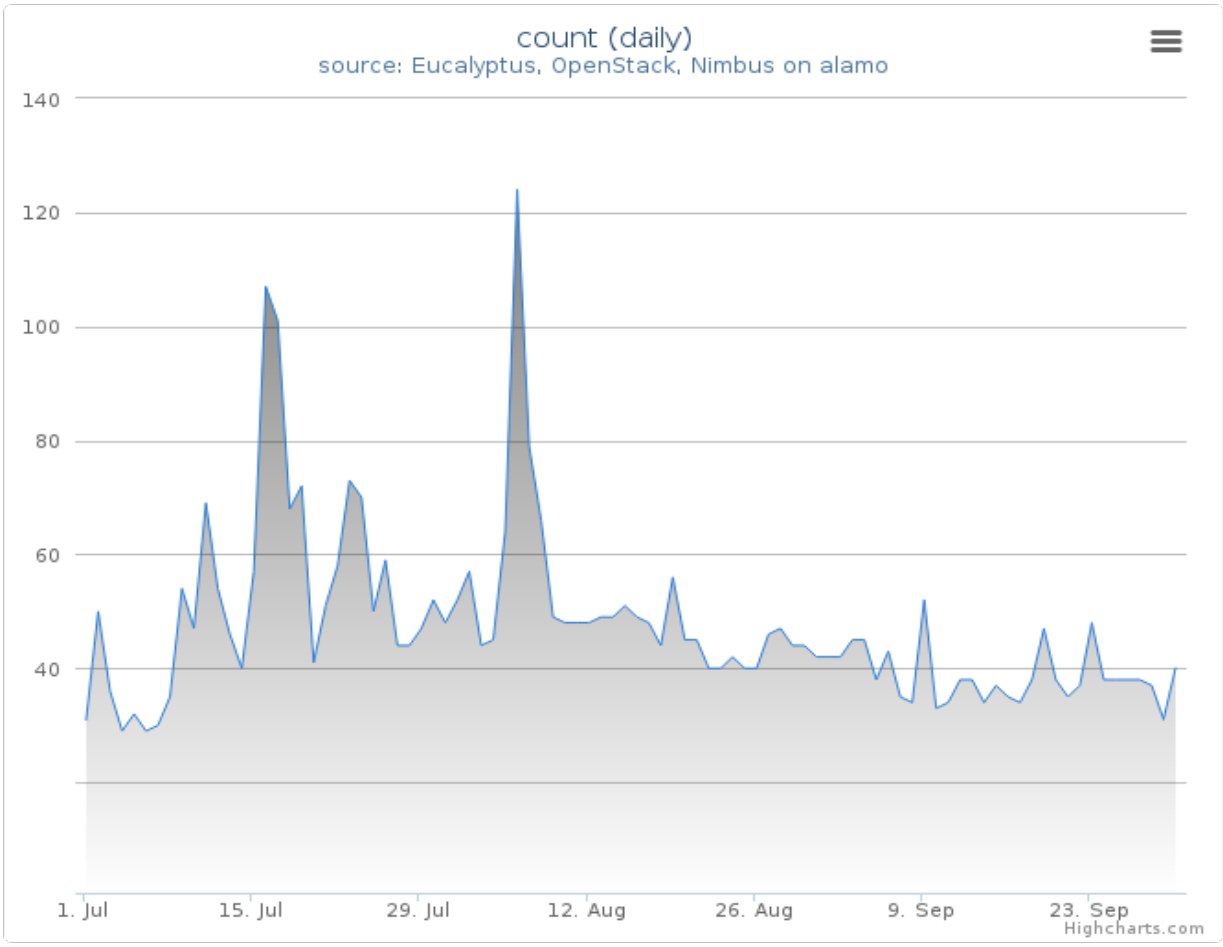


Figure 3: VMs count

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 – September 30, 2013
- Cloud(IaaS): nimbus, openstack
- Hostname: alamo

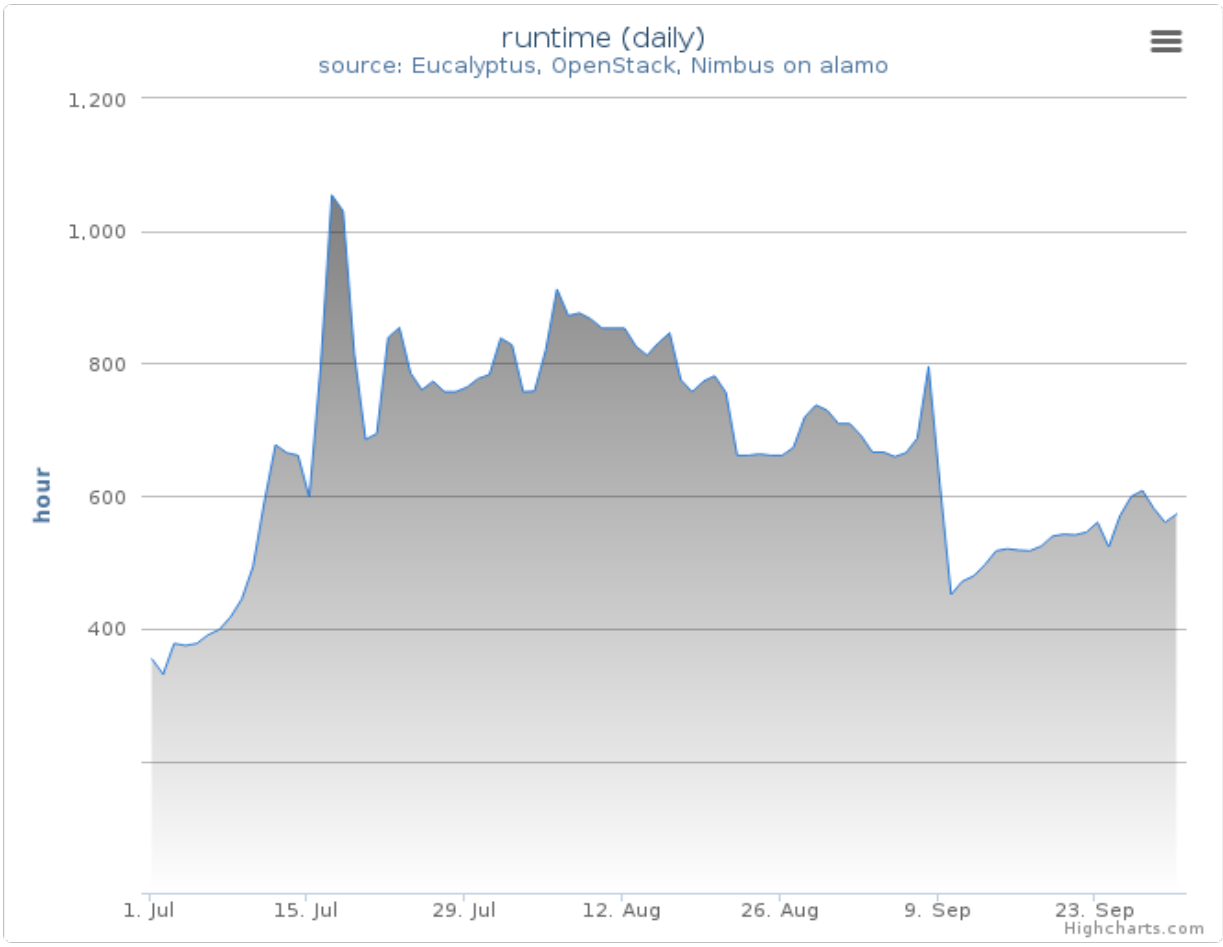


Figure 4: Wall time (hours)

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack
- Hostname: alamo

## 4.2 Distribution

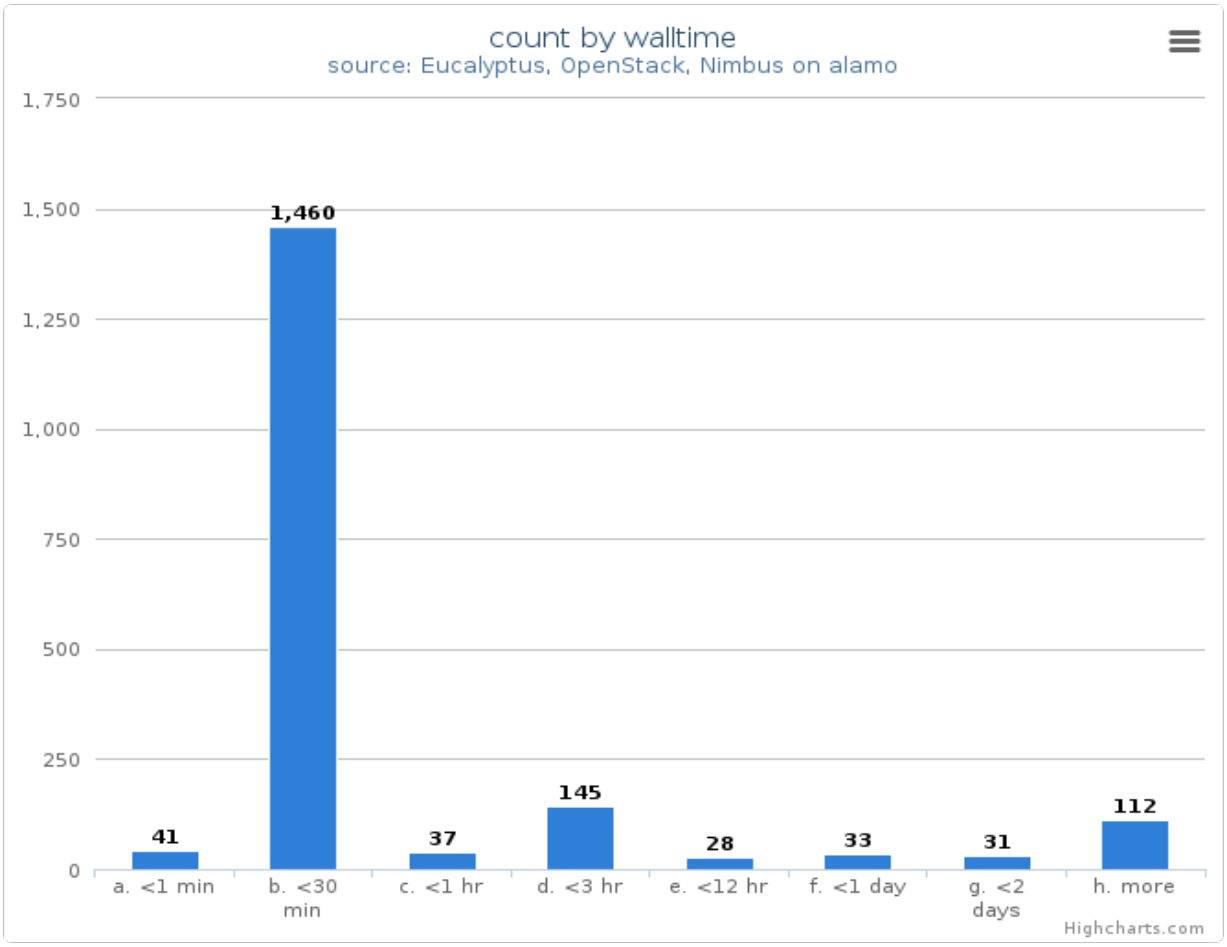


Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack
- Hostname: alamo

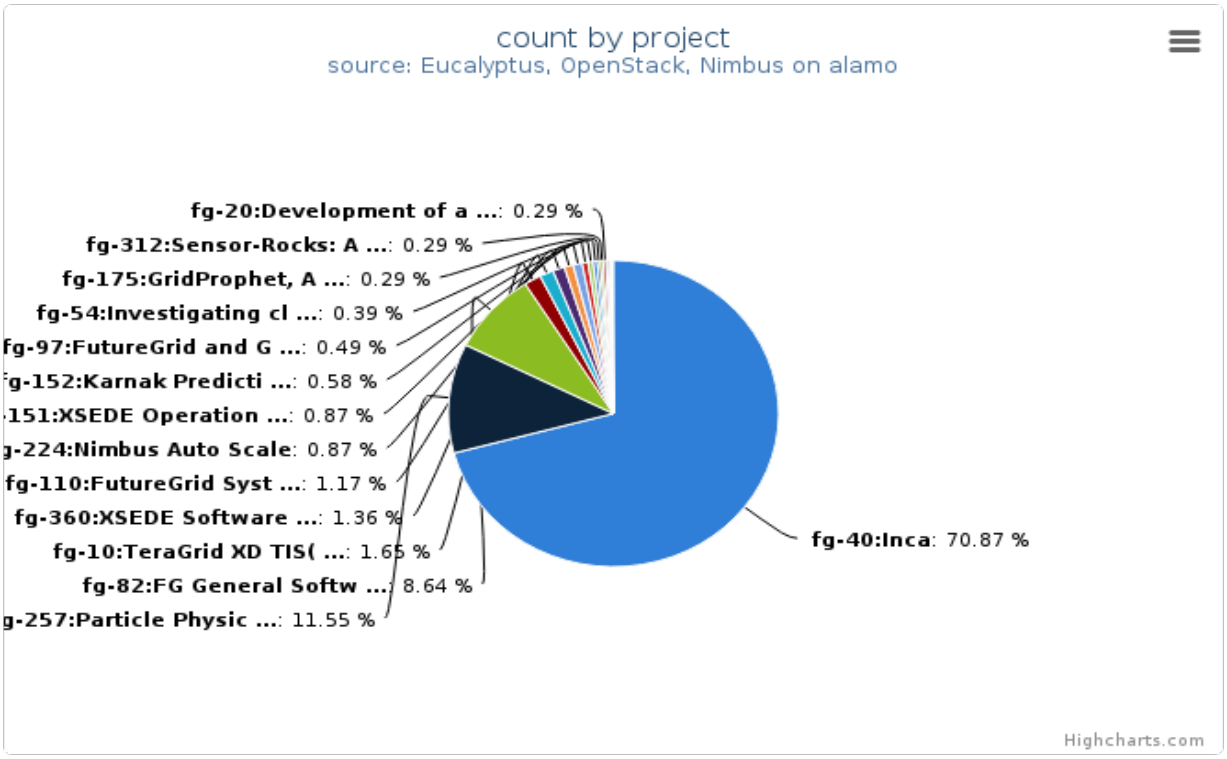


Figure 6: VMs count by project
This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack
- Hostname: alamo

Table 4.1: VMs count by project

| Project | Value |
|---|---|
| fg-40:Inca | 730 |
| fg-257:Particle Physics Data analysis cluster for ATLAS LHC experiment | 119 |
| fg-82:FG General Software Development | 89 |
| fg-10:TeraGrid XD TIS(Technology Insertion Service) Technology Evaluation Laboratory | 17 |
| fg-360:XSEDE Software Development and Integration Testing | 14 |
| fg-110:FutureGrid Systems Development | 12 |
| fg-224:Nimbus Auto Scale | 9 |
| fg-151:XSEDE Operations Group | 9 |
| fg-152:Karnak Prediction Service | 6 |
| fg-97:FutureGrid and Grid'5000 Collaboration | 5 |
| fg-54:Investigating cloud computing as a solution for analyzing particle physics data | 4 |
| fg-175:GridProphet, A workflow execution time prediction system for the Grid | 3 |
| fg-312:Sensor-Rocks: A novel integrated framework to improve software Operations and Management (O&M) and power management in environmental observing systems | 3 |
| fg-20:Development of an information service for FutureGrid | 3 |
| fg-367:Optimize rapid deployment and updating of VM images at the remote compute cluster | 2 |
| fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters | 2 |
| fg-172:Cloud-TM | 1 |
| fg-90:Unicore and Genesis Experimentation | 1 |
| fg-136:JGC-DataCloud-2012 paper experiments | 1 |

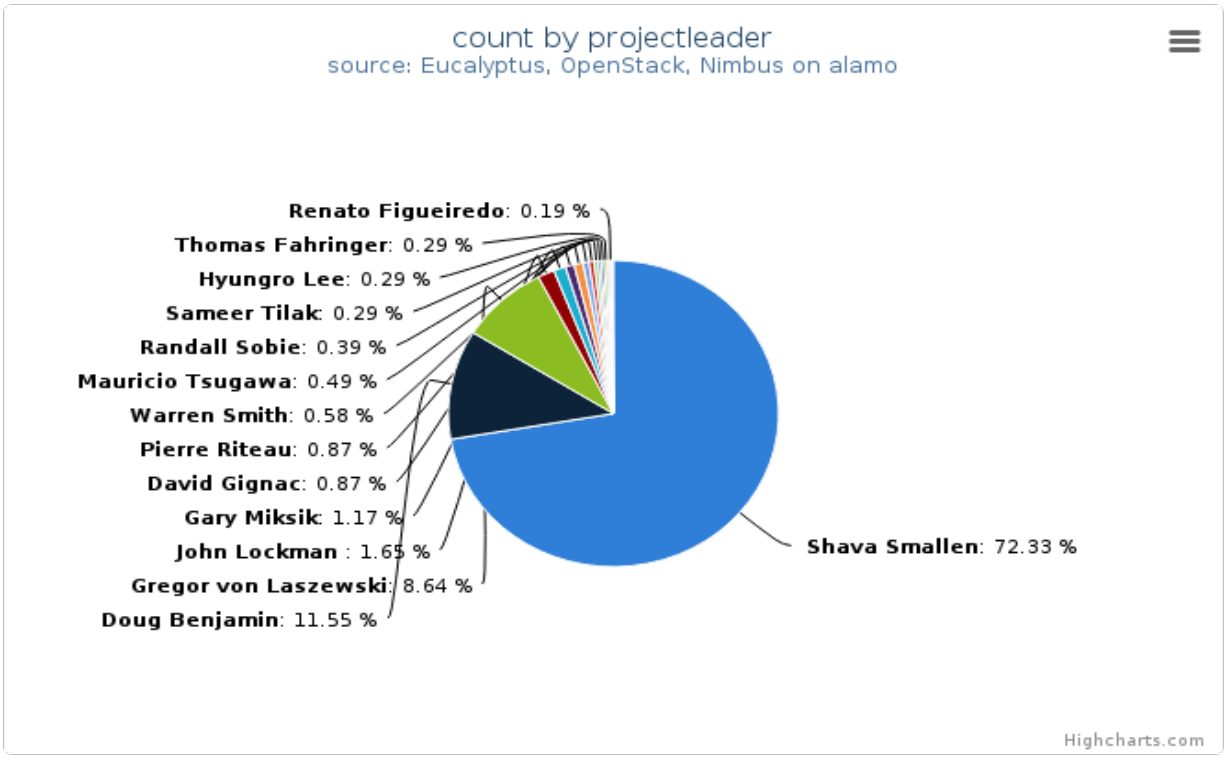


Figure 7: VMs count by project leader

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack
- Hostname: alamo

Table 4.2: VMs count by project leader

| Projectleader | Value |
|---|---|
| Shava Smallen | 745 |
| Doug Benjamin | 119 |
| Gregor von Laszewski | 89 |
| John Lockman | 17 |
| Gary Miksik | 12 |
| David Gignac | 9 |
| Pierre Riteau | 9 |
| Warren Smith | 6 |
| Mauricio Tsugawa | 5 |
| Randall Sobie | 4 |
| Sameer Tilak | 3 |
| Hyungro Lee | 3 |
| Thomas Fahringer | 3 |
| Jan Balewski | 2 |
| Renato Figueiredo | 2 |
| Mats Rynge | 1 |
| Paolo Romano | 1 |

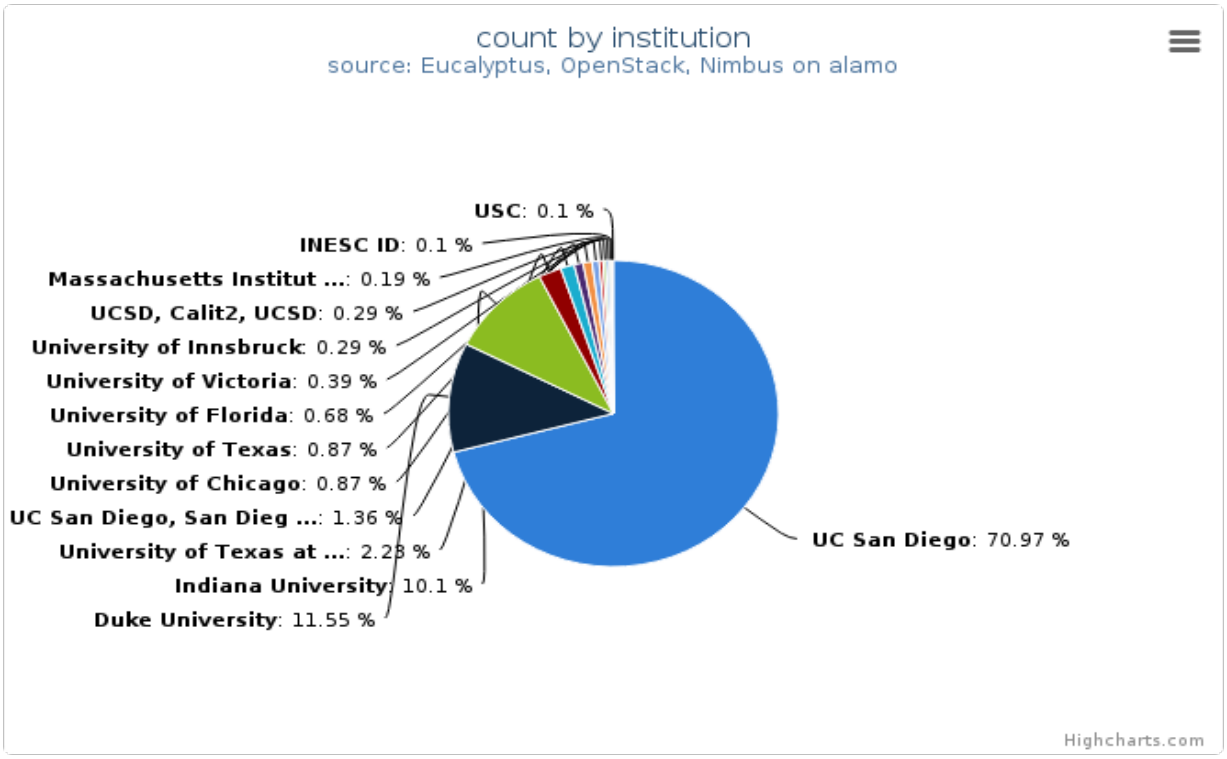


Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack
- Hostname: alamo

Table 4.3: VMs count by institution

| Institution | Value |
|---|---|
| UC San Diego | 731 |
| Duke University | 119 |
| Indiana University | 104 |
| University of Texas at Austin | 23 |
| UC San Diego, San Diego Supercomputer Center | 14 |
| University of Chicago | 9 |
| University of Texas | 9 |
| University of Florida | 7 |
| University of Victoria | 4 |
| University of Innsbruck | 3 |
| UCSD, Calit2, UCSD | 3 |
| Massachusetts Institute of Technology, Laboratory for Nuclear Sc | 2 |
| INESC ID | 1 |
| USC | 1 |

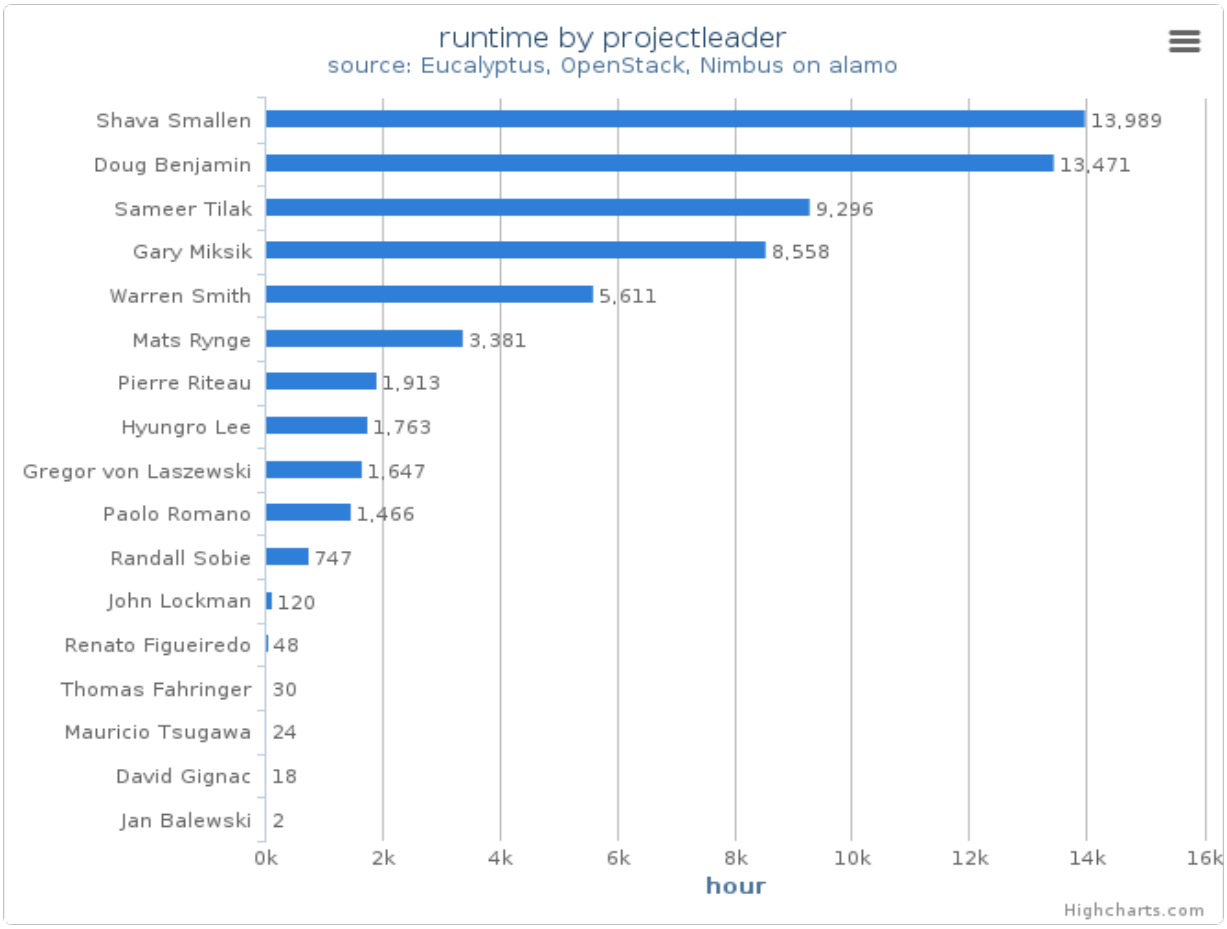


Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: July 01 – September 30, 2013

- Cloud(IaaS): nimbus, openstack
- Hostname: alamo

## 4.3 System information

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

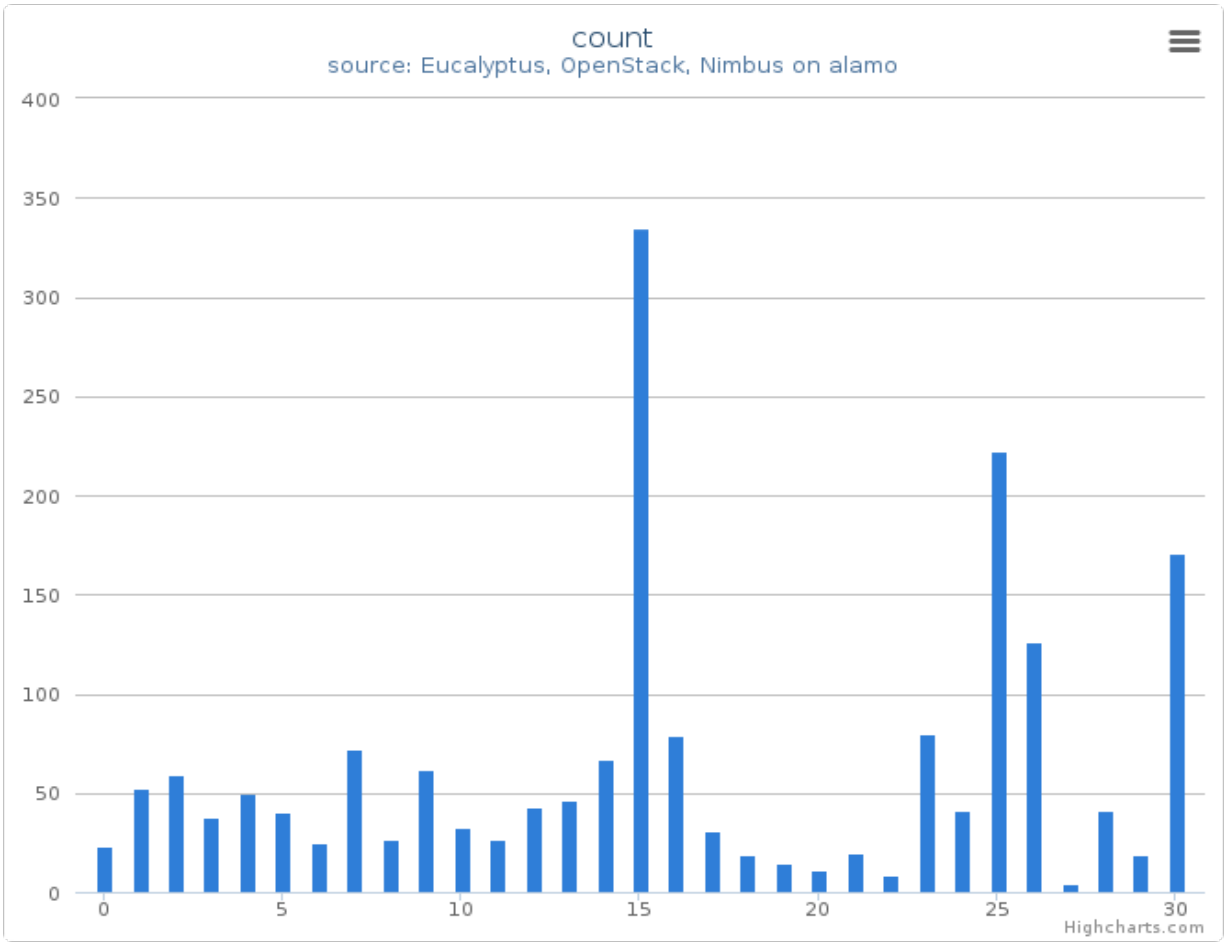


Figure 10: VMs count by systems (compute nodes) in Cluster (alamo)
This column chart represents VMs count among systems.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack
- Hostname: alamo

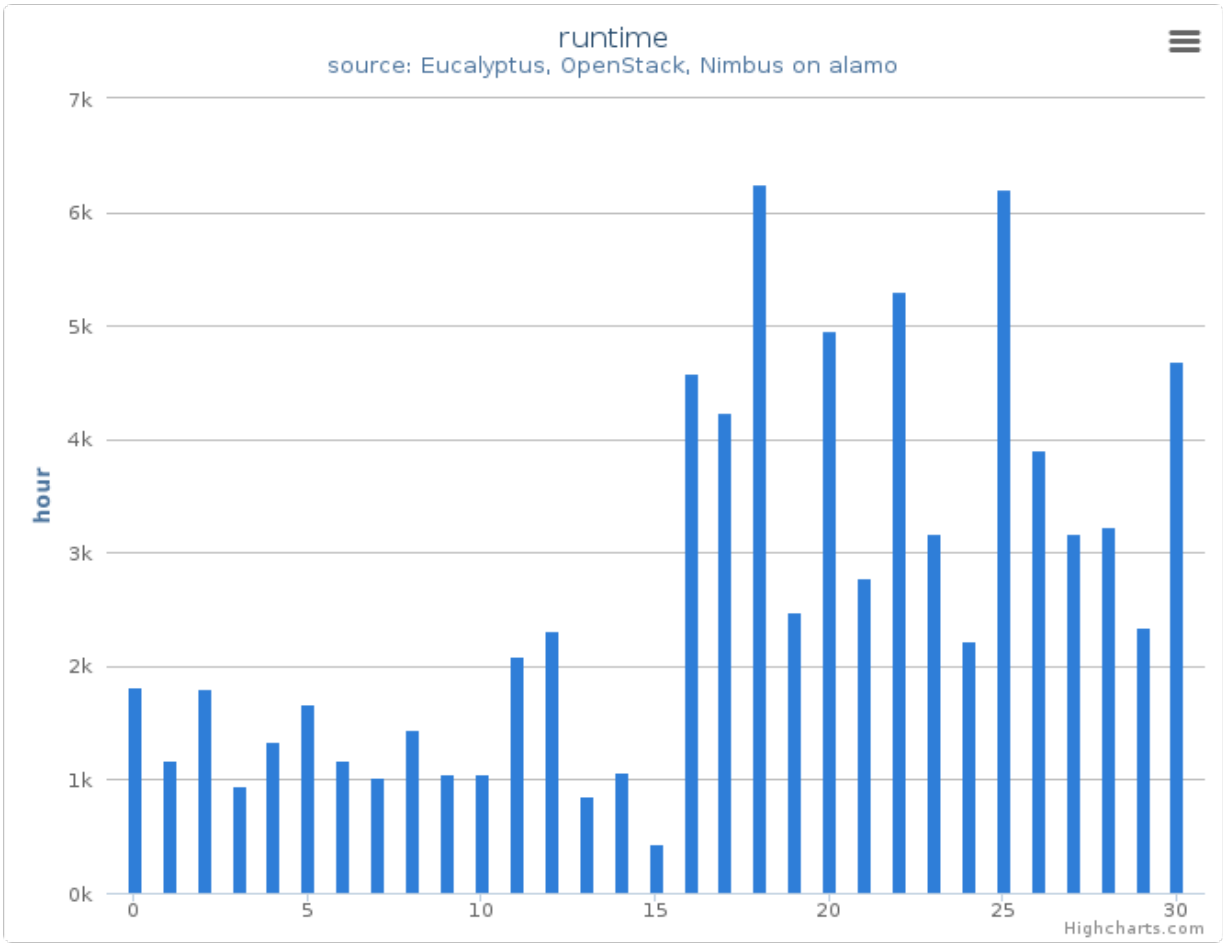


Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (alamo)
This column chart represents wall time among systems.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus, openstack
- Hostname: alamo

CHAPTER

FIVE

# USAGE REPORT FOXTROT

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

## 5.1 Histogram

### 5.1.1 Summary (Monthly)

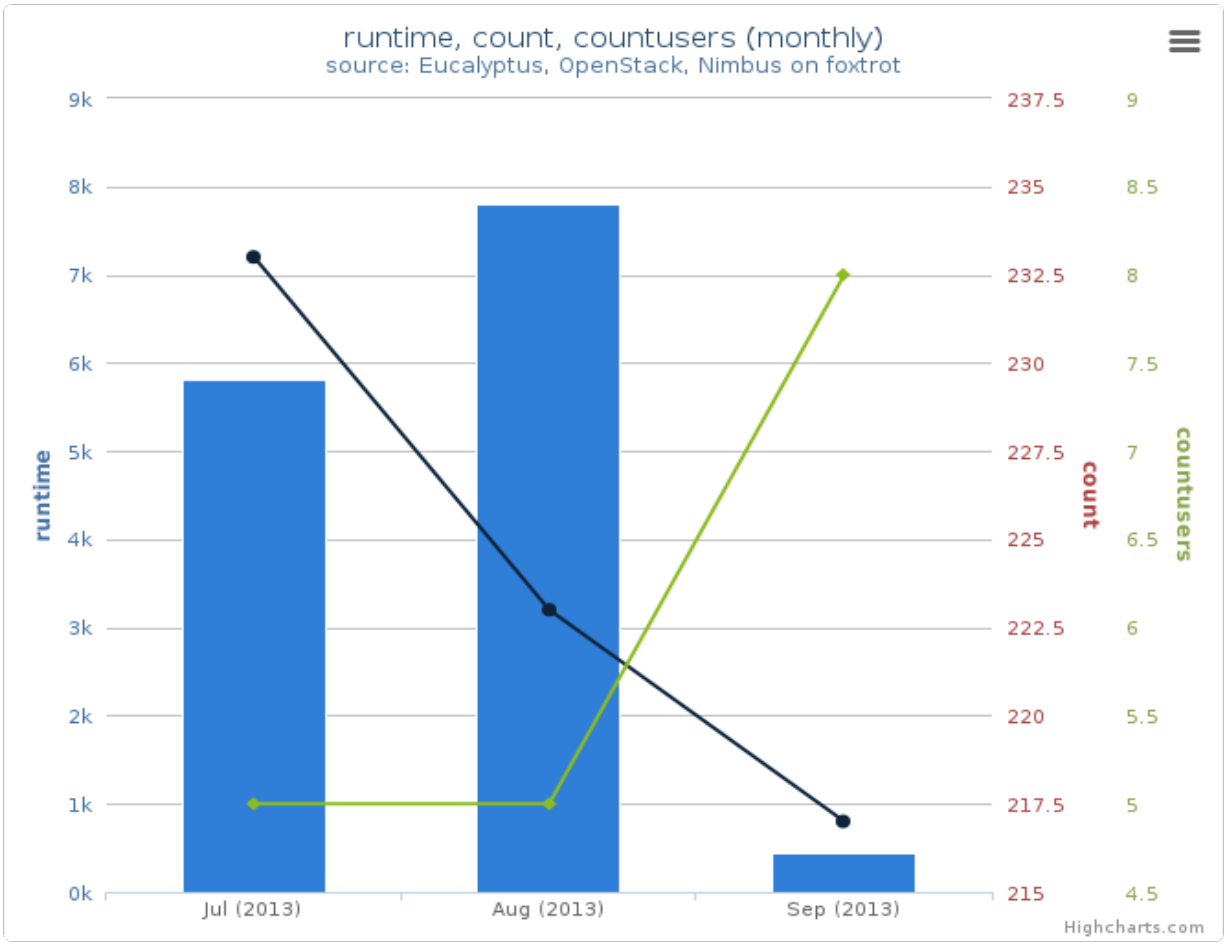


Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

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

### 5.1.2 Summary (Daily)

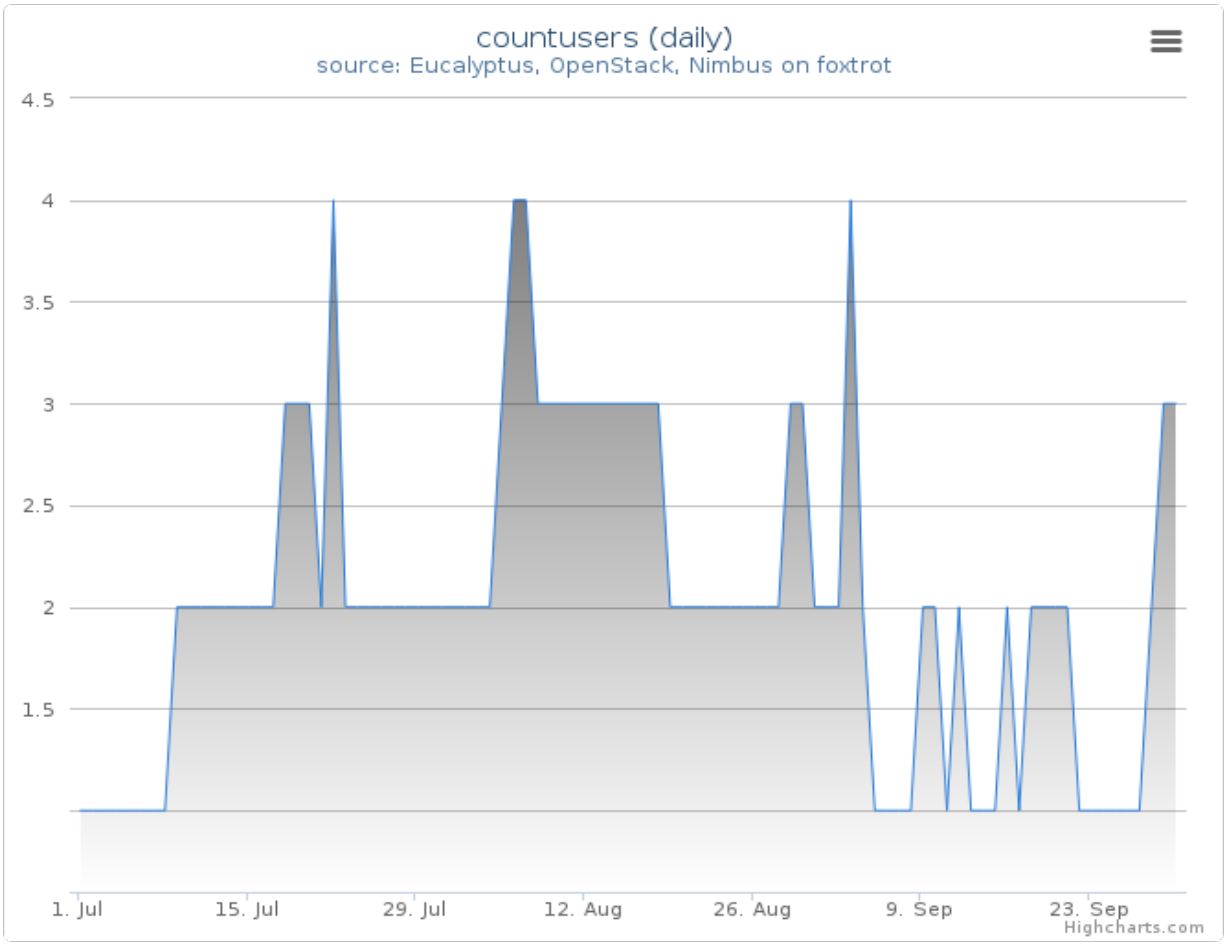


Figure 2: Users count

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

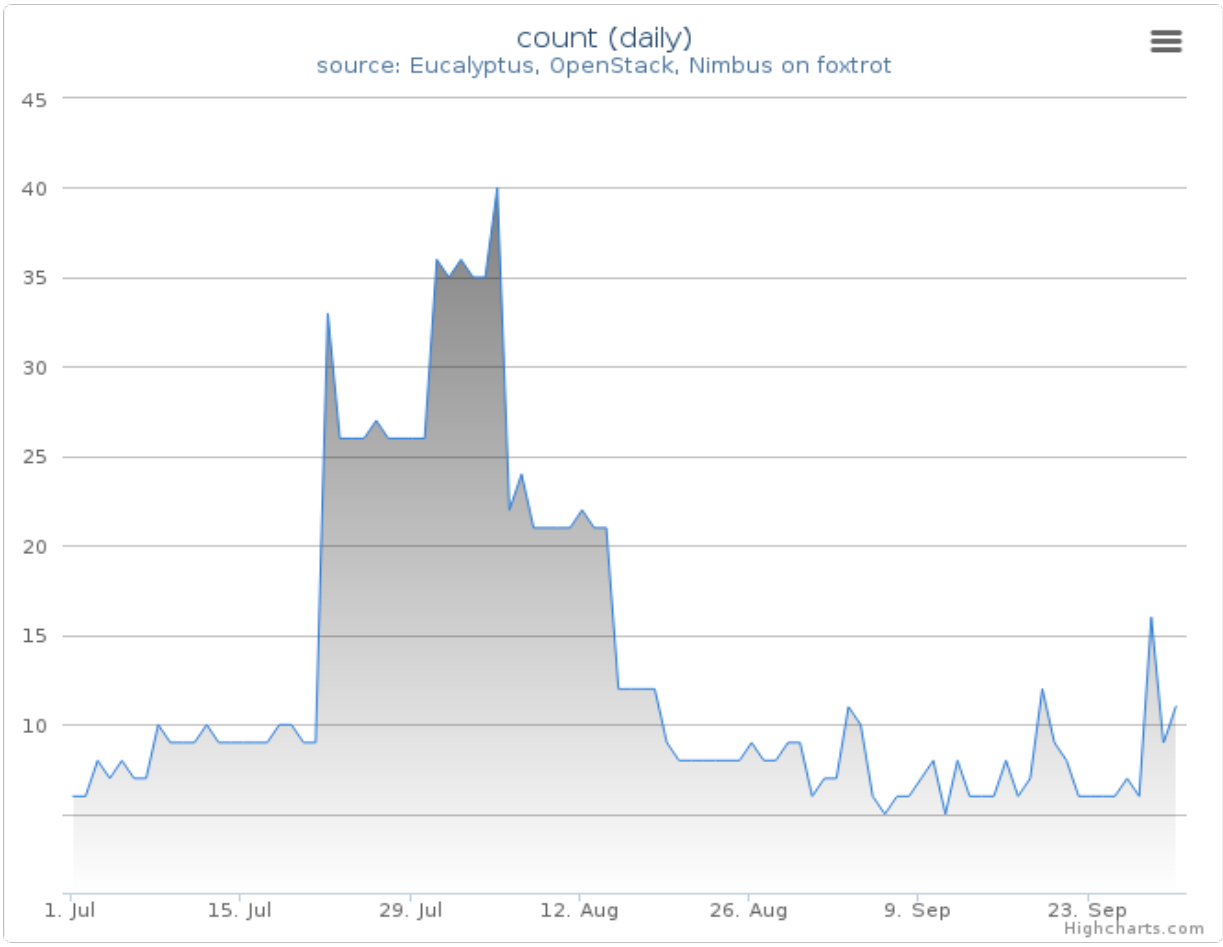


Figure 3: VMs count

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

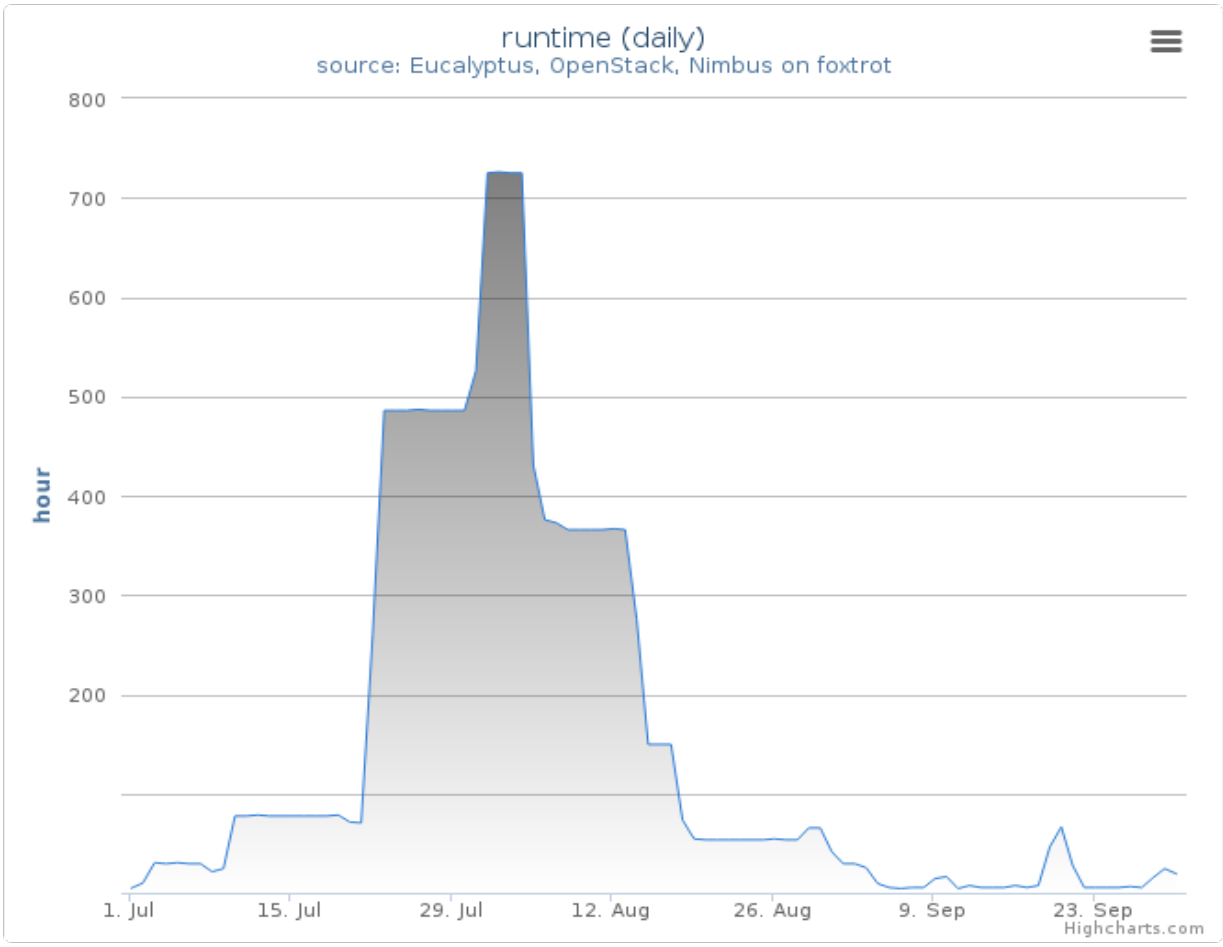


Figure 4: Wall time (hours)

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

## 5.2 Distribution

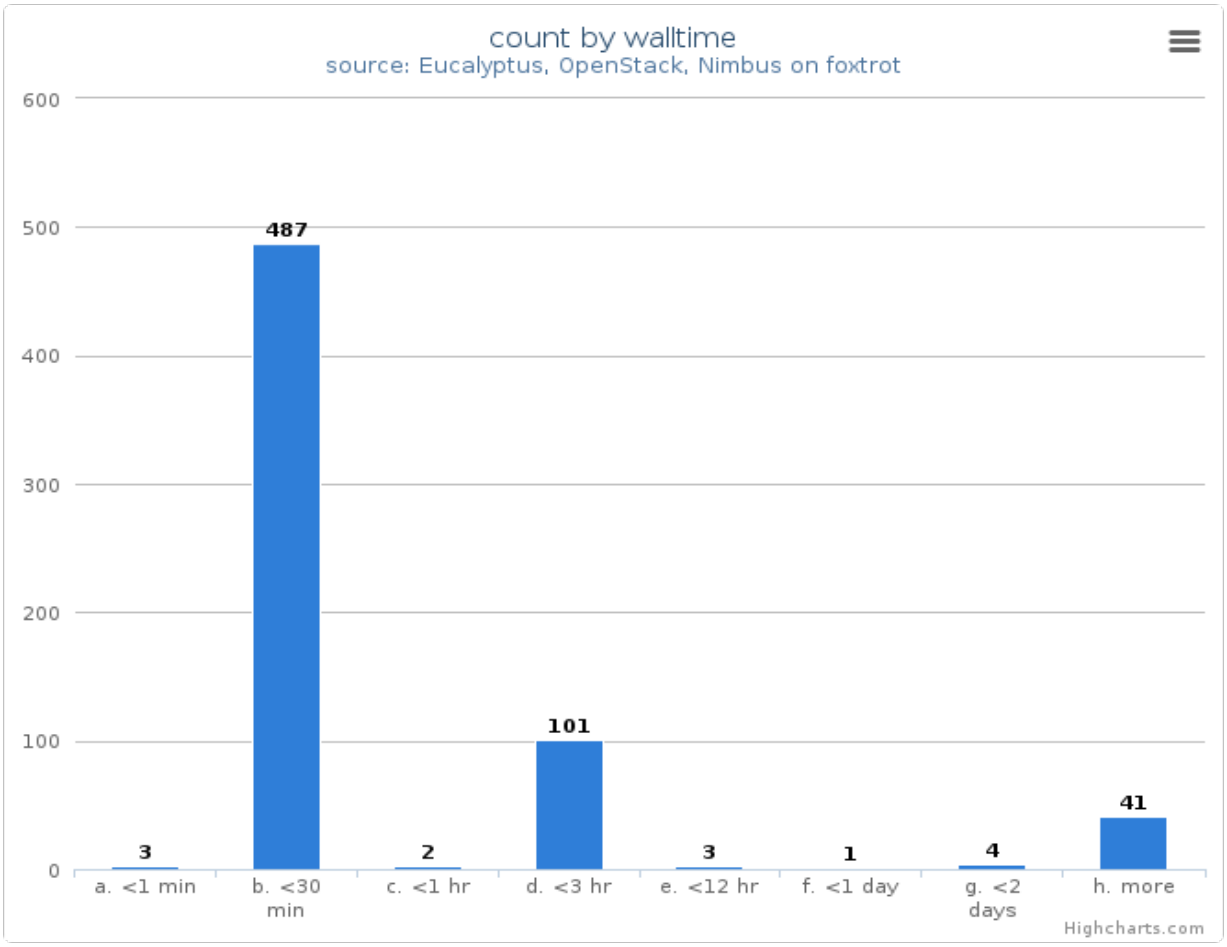


Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

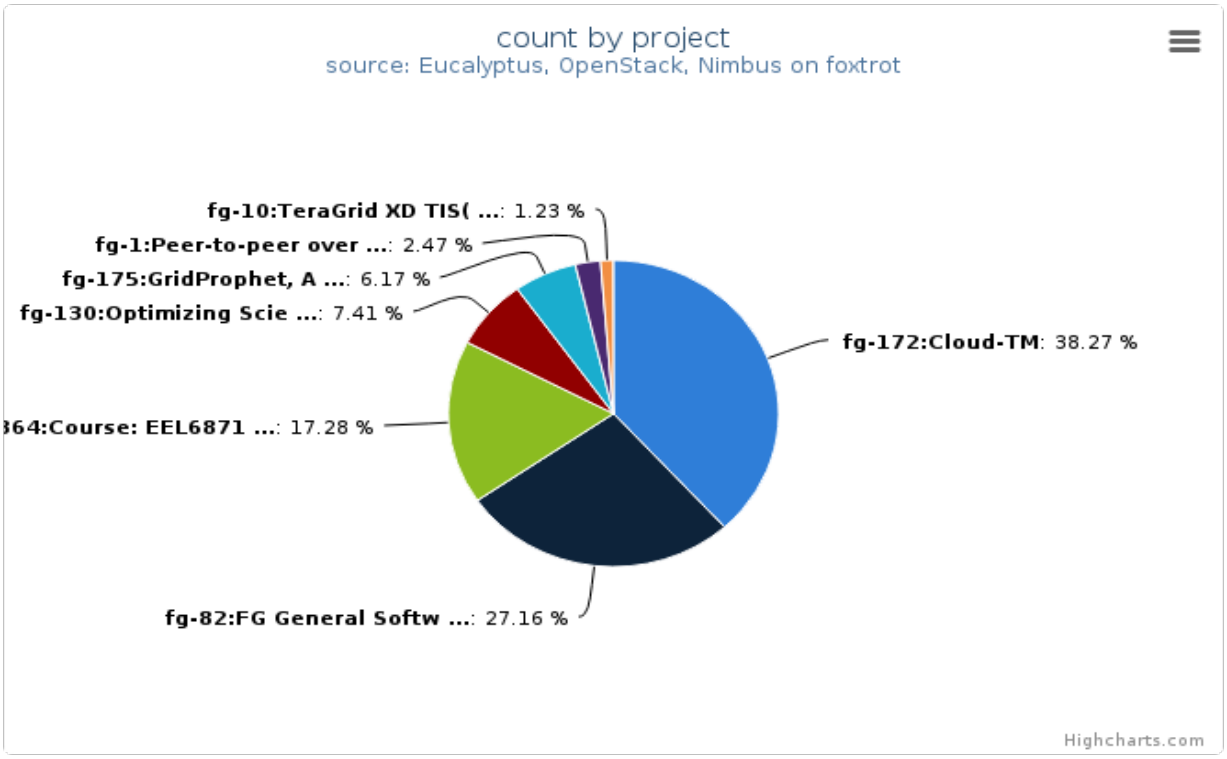


Figure 6: VMs count by project
This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

Table 5.1: VMs count by project

| Project | Value |
|---|---|
| fg-172:Cloud-TM | 31 |
| fg-82:FG General Software Development | 22 |
| fg-364:Course: EEL6871 Autonomic Computing | 14 |
| fg-130:Optimizing Scientific Workflows on Clouds | 6 |
| fg-175:GridProphet, A workflow execution time prediction system for the Grid | 5 |
| fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters | 2 |
| fg-10:TeraGrid XD TIS(Technology Insertion Service) Technology Evaluation Laboratory | 1 |

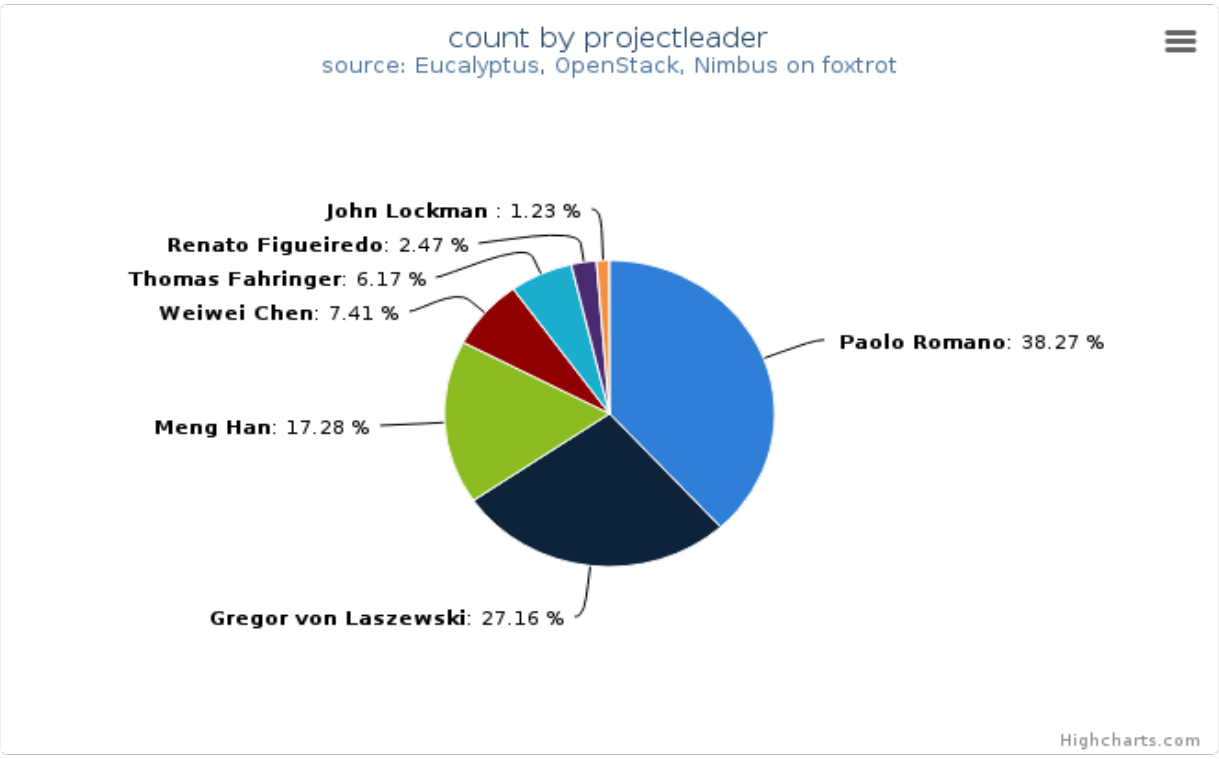


Figure 7: VMs count by project leader

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

Table 5.2: VMs count by project leader

| Projectleader | Value |
|---|---|
| Paolo Romano | 31 |
| Gregor von Laszewski | 22 |
| Meng Han | 14 |
| Weiwei Chen | 6 |
| Thomas Fahringer | 5 |
| Renato Figueiredo | 2 |
| John Lockman | 1 |

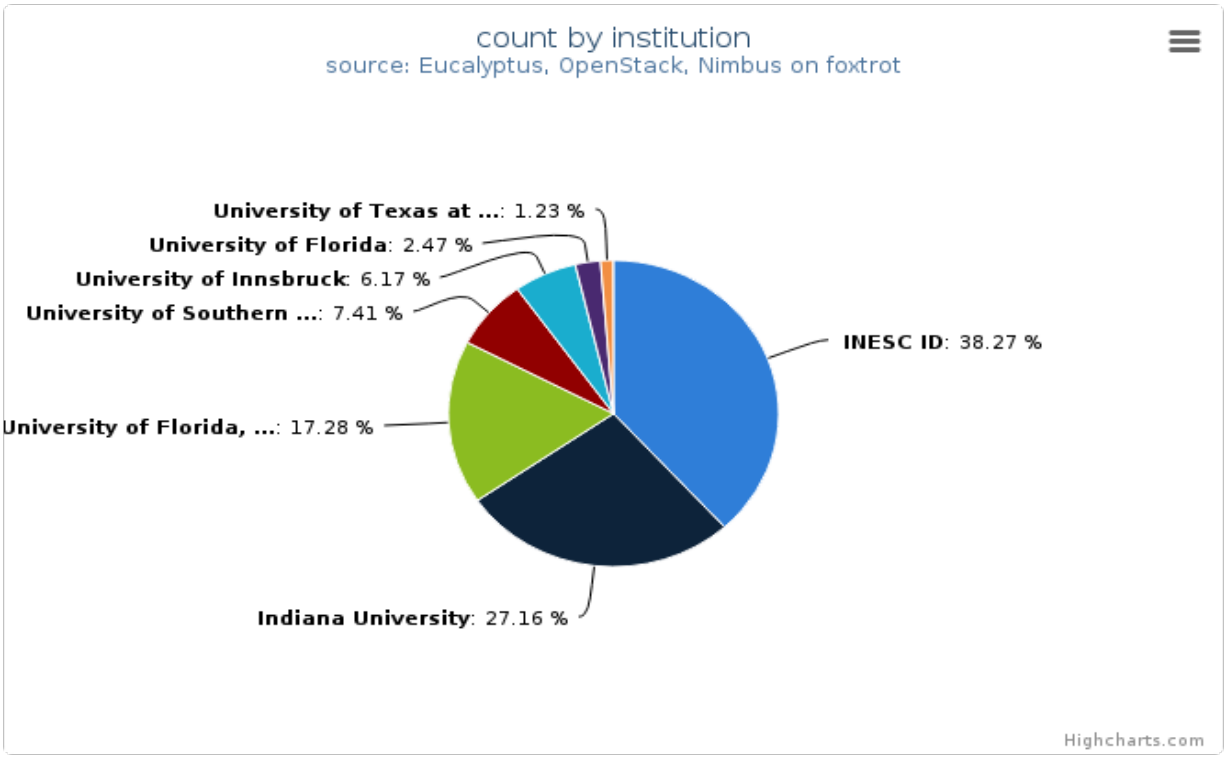


Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

Table 5.3: VMs count by institution

| Institution | Value |
|---|---|
| INESC ID | 31 |
| Indiana University | 22 |
| University of Florida, ACIS | 14 |
| University of Southern California | 6 |
| University of Innsbruck | 5 |
| University of Florida | 2 |
| University of Texas at Austin | 1 |

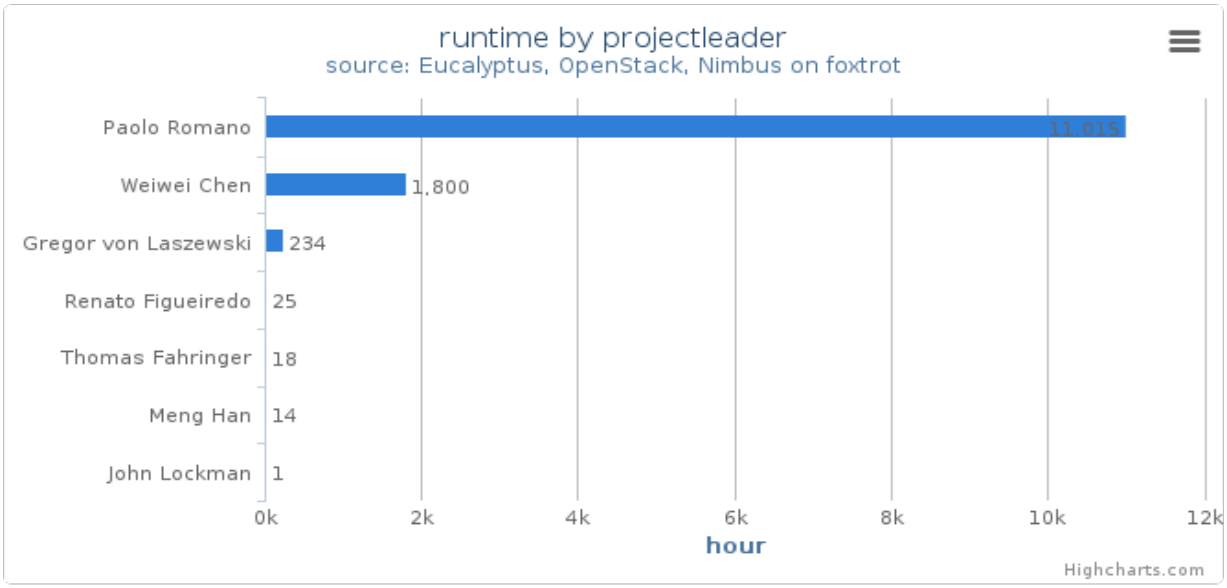


Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

## 5.3 System information

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

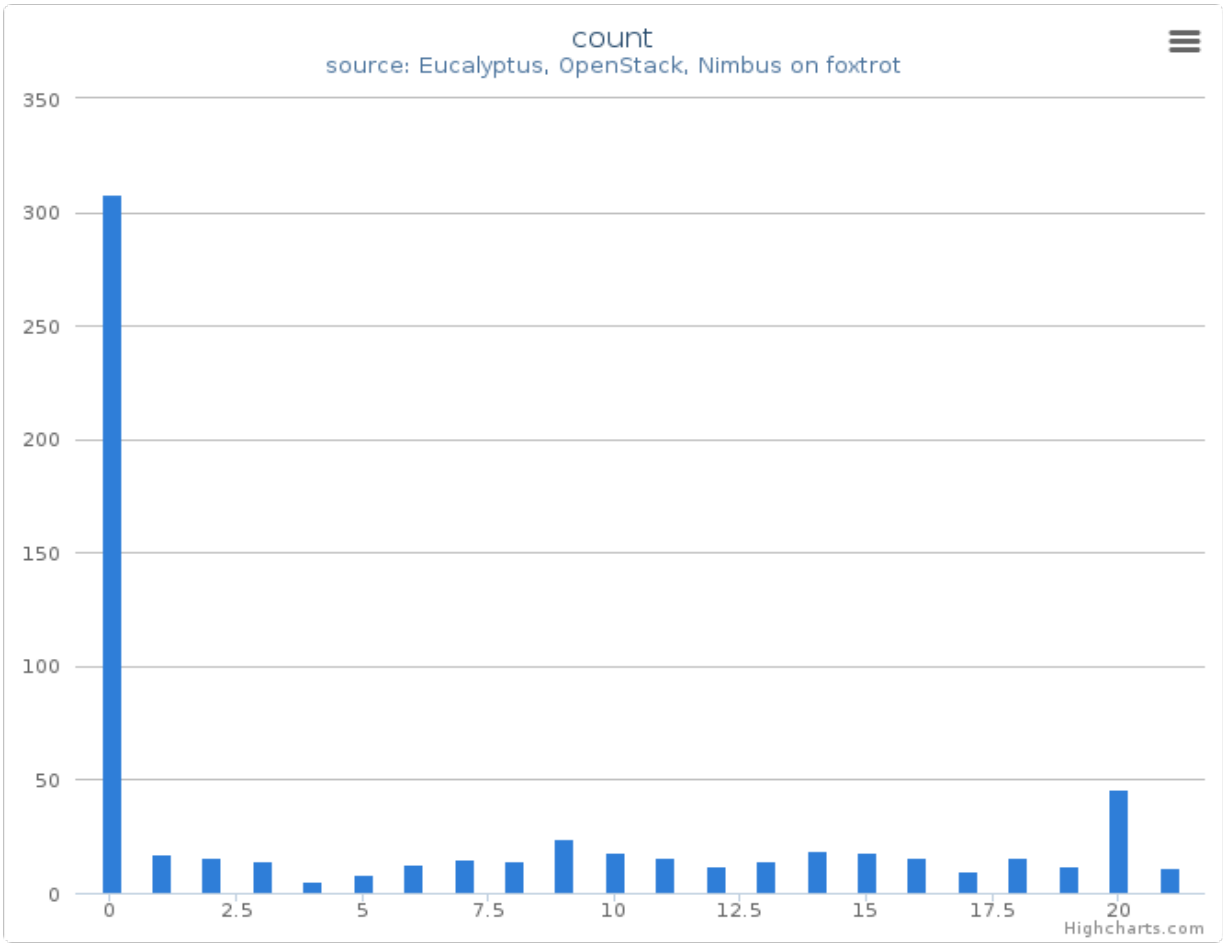


Figure 10: VMs count by systems (compute nodes) in Cluster (foxtrot)
This column chart represents VMs count among systems.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

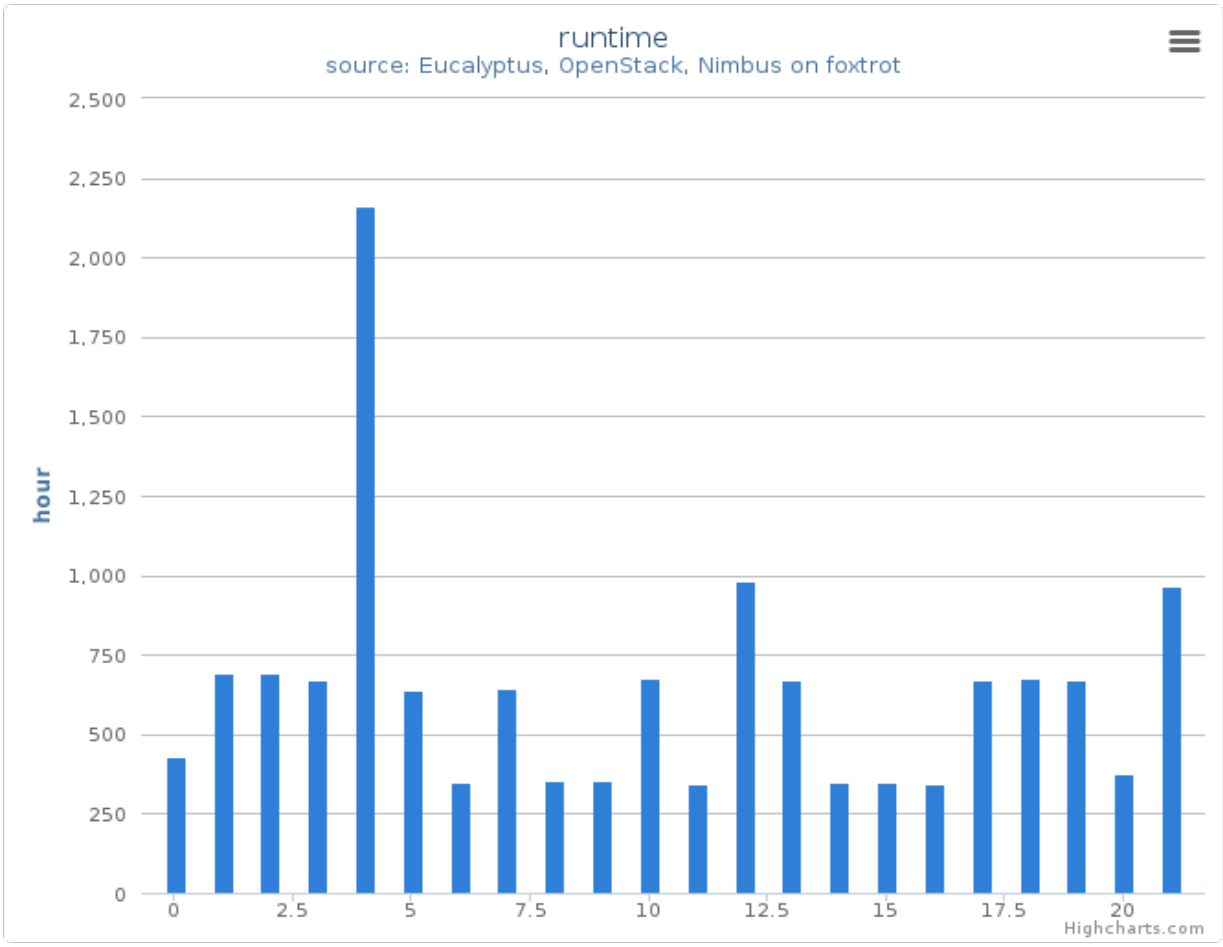


Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (foxtrot)
This column chart represents wall time among systems.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: foxtrot

CHAPTER

SIX

# USAGE REPORT HOTEL

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

## 6.1 Histogram

### 6.1.1 Summary (Monthly)

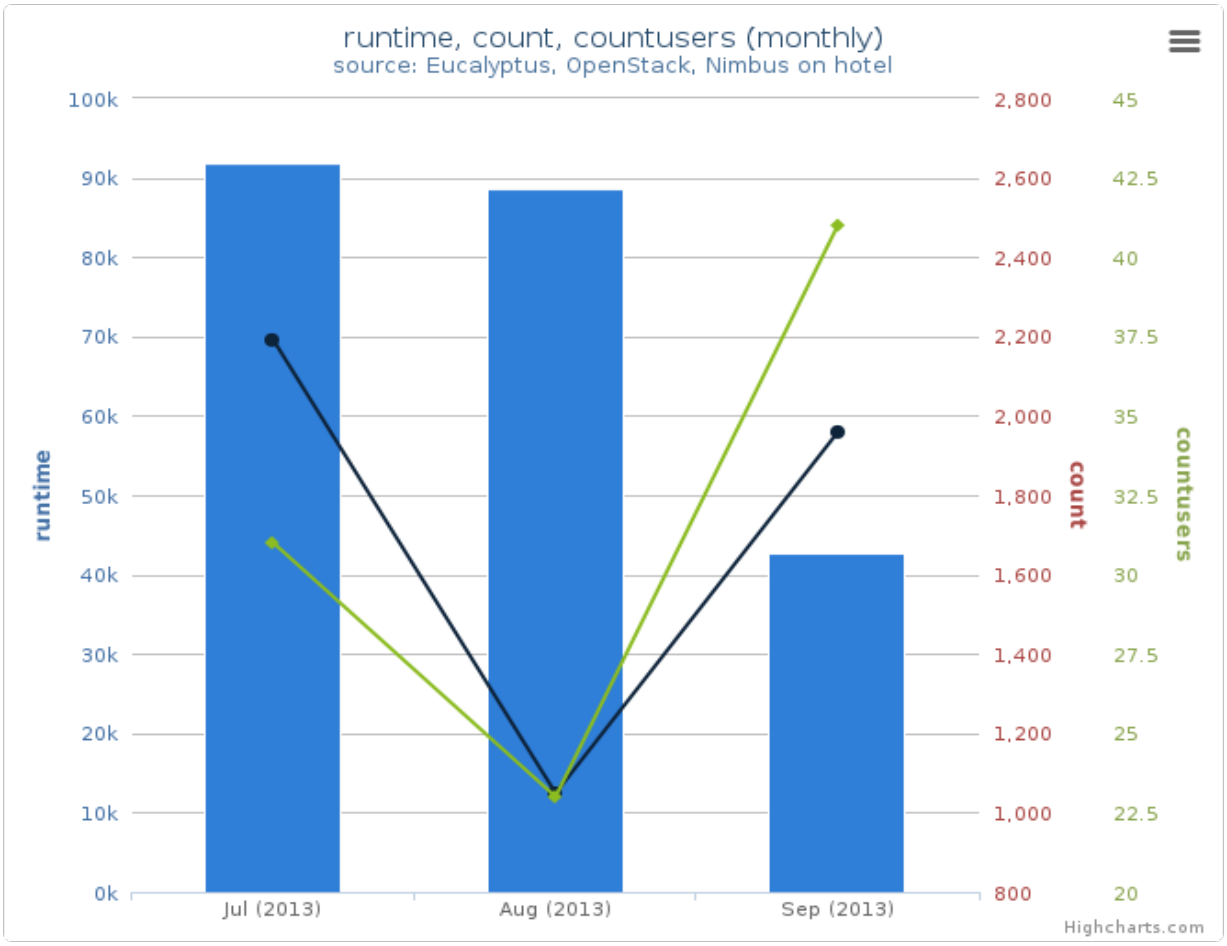


Figure 1: Average monthly usage data (wall time (hour), launched VMs, users)
This mixed chart represents average monthly usage as to wall time (hour), the number of VM instances and active users.

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

### 6.1.2 Summary (Daily)

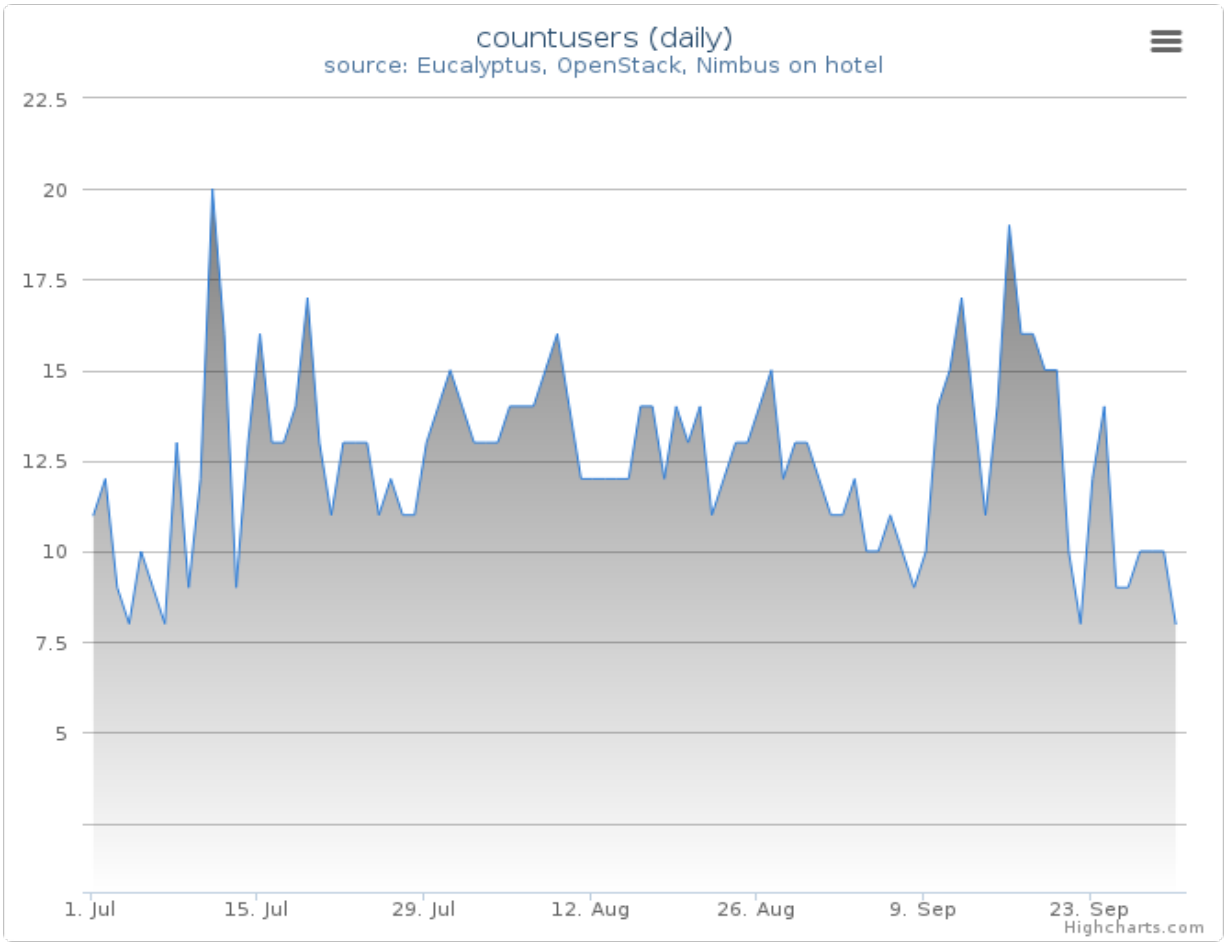


Figure 2: Users count

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

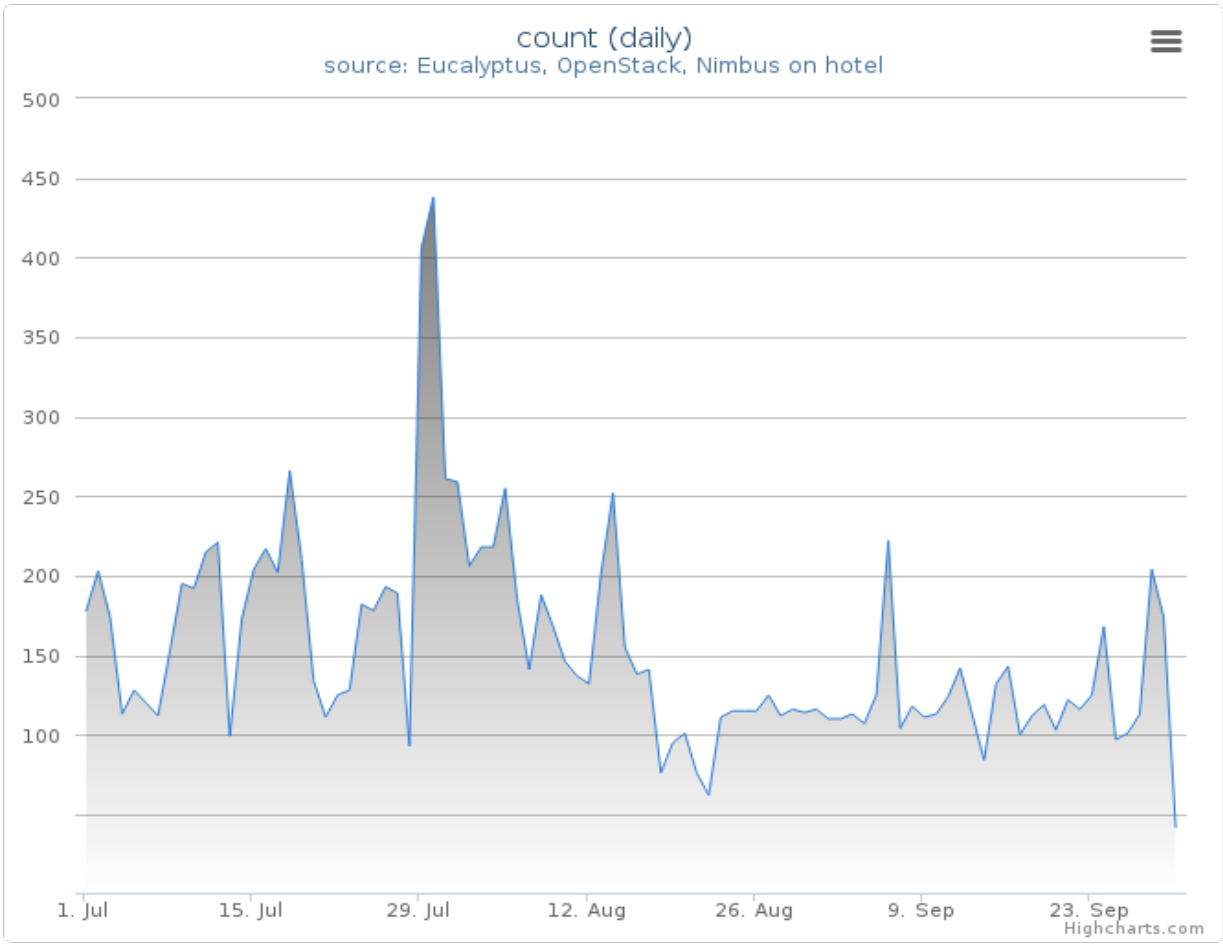


Figure 3: VMs count

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

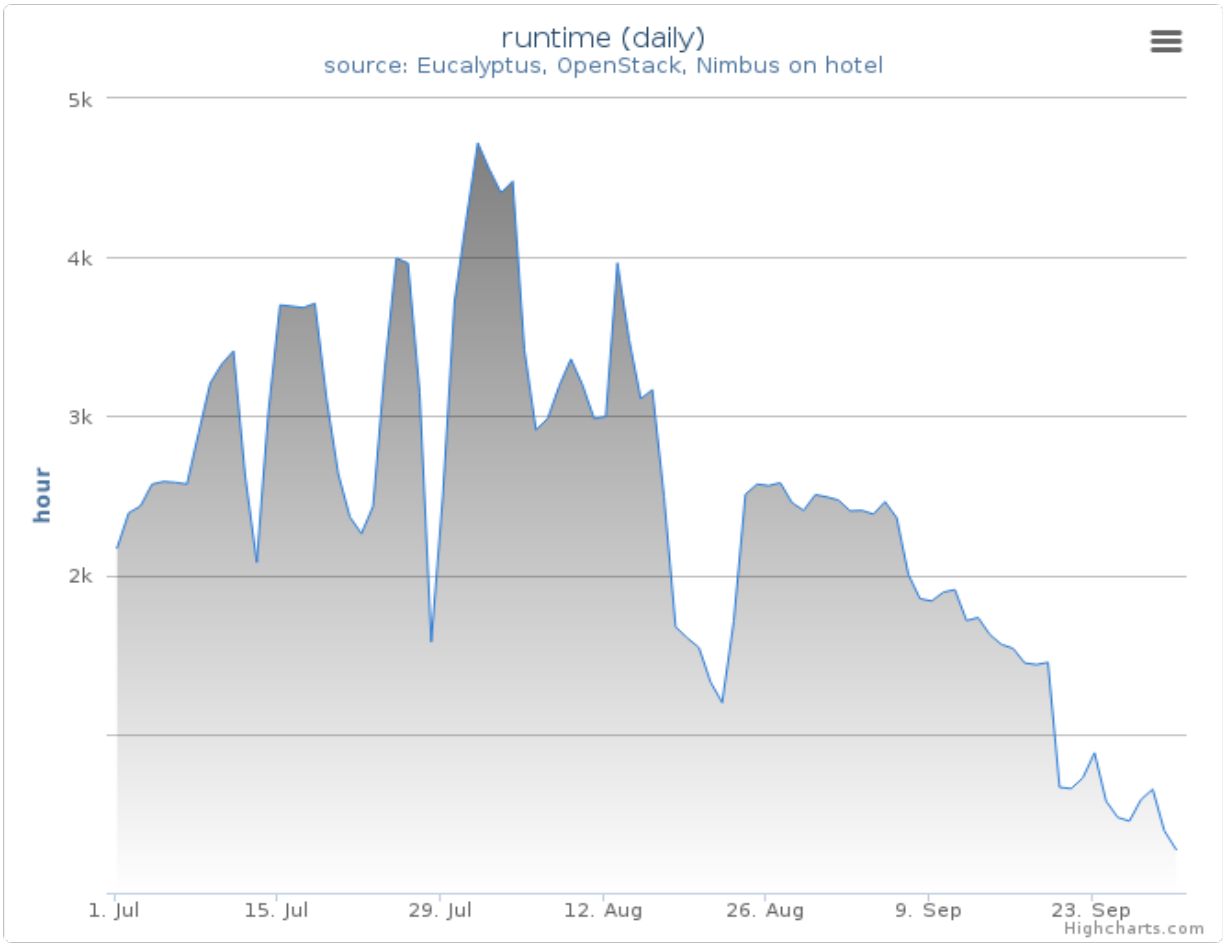


Figure 4: Wall time (hours)

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

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

## 6.2 Distribution

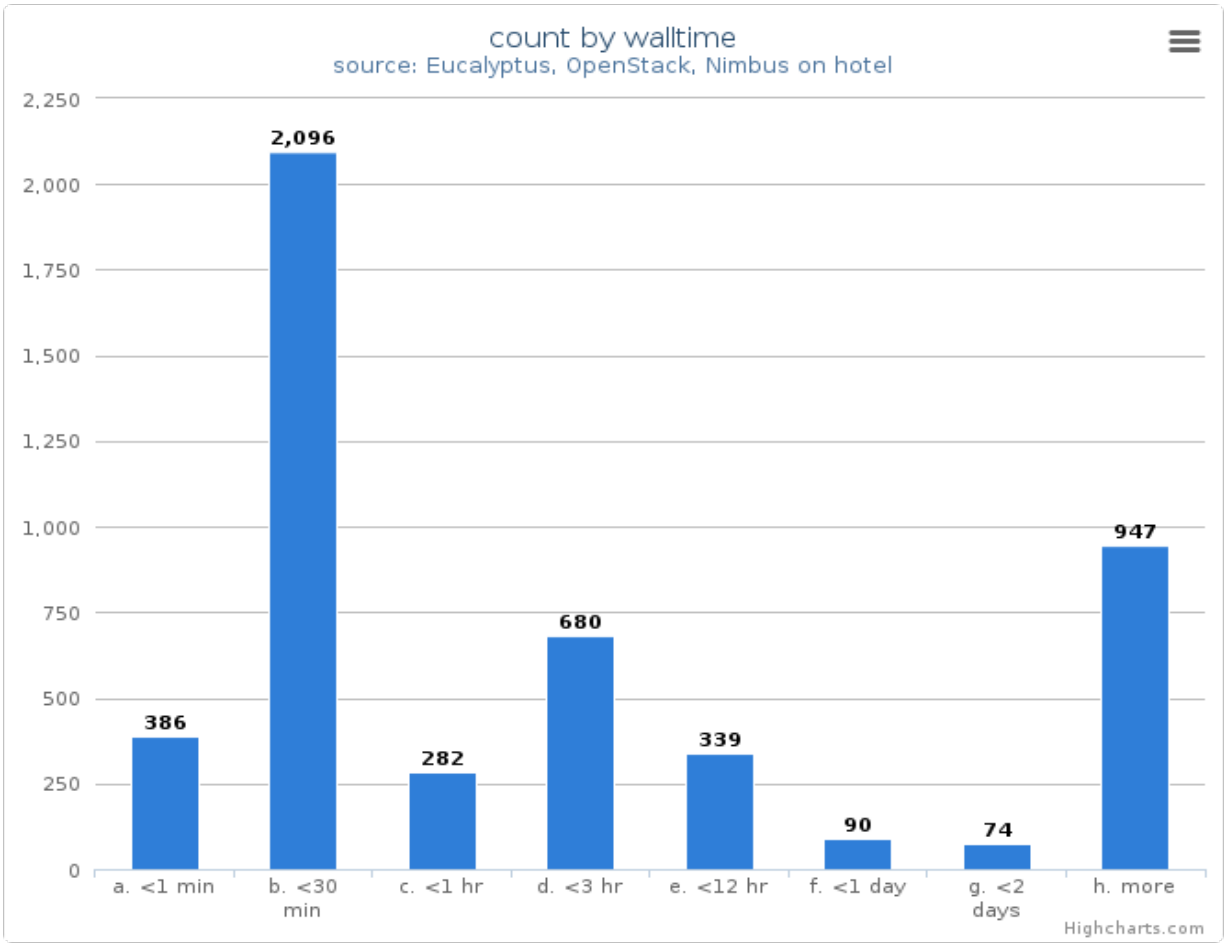


Figure 5: VM count by wall time
This chart illustrates usage patterns of VM instances in terms of running wall time.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

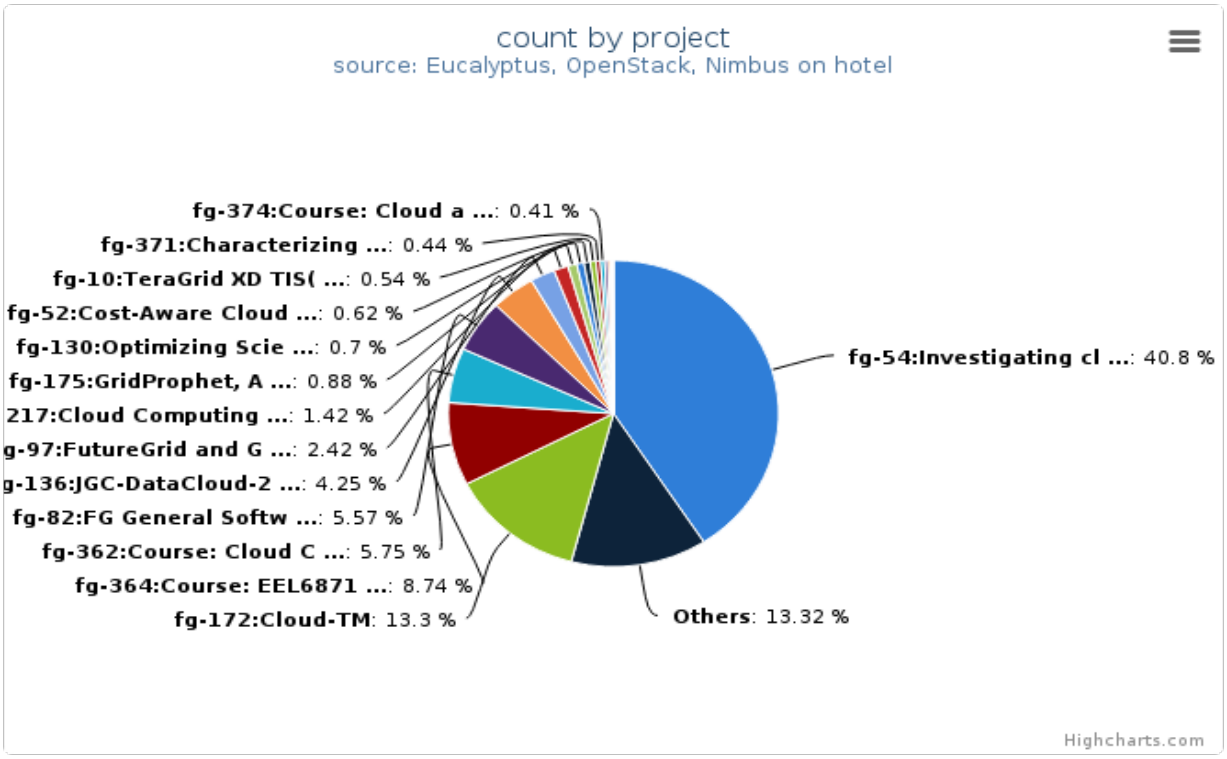


Figure 6: VMs count by project
This chart illustrates the proportion of launched VM instances by project groups. The same data in tabular form follows.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

Table 6.1: VMs count by project

| Project | Value |
|---|---|
| fg-54:Investigating cloud computing as a solution for analyzing particle physics data | 1583 |
| Others | 517 |
| fg-172:Cloud-TM | 516 |
| fg-364:Course: EEL6871 Autonomic Computing | 339 |
| fg-362:Course: Cloud Computing and Storage (UF) | 223 |
| fg-82:FG General Software Development | 216 |
| fg-136:JGC-DataCloud-2012 paper experiments | 165 |
| fg-97:FutureGrid and Grid'5000 Collaboration | 94 |
| fg-217:Cloud Computing In Education | 55 |
| fg-175:GridProphet, A workflow execution time prediction system for the Grid | 34 |
| fg-130:Optimizing Scientific Workflows on Clouds | 27 |
| fg-52:Cost-Aware Cloud Computing | 24 |
| fg-10:TeraGrid XD TIS(Technology Insertion Service) Technology Evaluation Laboratory | 21 |
| fg-371:Characterizing Infrastructure Cloud Performance for Scientific Computing | 17 |
| fg-374:Course: Cloud and Distributed Computing | 16 |
| fg-213:Course: Cloud Computing class - second edition | 13 |
| fg-367:Optimize rapid deployment and updating of VM images at the remote compute cluster | 10 |
| fg-201:ExTENCI Testing, Validation, and Performance | 3 |
| fg-150:SC11: Using and Building Infrastructure Clouds for Science | 3 |
| fg-1:Peer-to-peer overlay networks and applications in virtual networks and virtual clusters | 2 |
| fg-60:Wide area distributed file system for MapReduce applications on FutureGrid platform | 1 |
| fg-355:Course: Data Center Scale Computing Class | 1 |

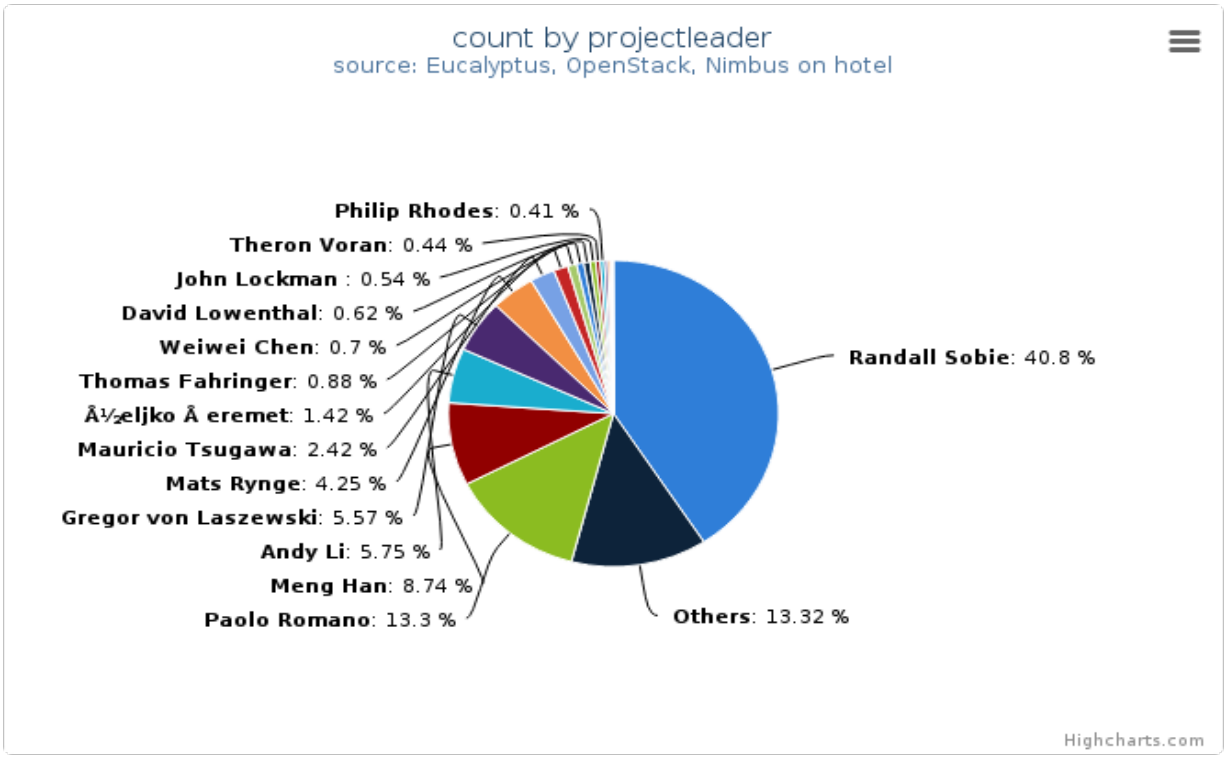

Figure 7: VMs count by project leader
This chart also illustrates the proportion of launched VM instances by project Leader. The same data in tabular form follows.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

Table 6.2: VMs count by project leader

| Projectleader | Value |
|---|---|
| Randall Sobie | 1583 |
| Others | 517 |
| Paolo Romano | 516 |
| Meng Han | 339 |
| Andy Li | 223 |
| Gregor von Laszewski | 216 |
| Mats Rynge | 165 |
| Mauricio Tsugawa | 94 |
| Željko Šeremet | 55 |
| Thomas Fahringer | 34 |
| Weiwei Chen | 27 |
| David Lowenthal | 24 |
| John Lockman | 21 |
| Theron Voran | 17 |
| Philip Rhodes | 16 |
| Massimo Canonico | 13 |
| Jan Balewski | 10 |
| John Bresnahan | 3 |
| Preston Smith | 3 |
| Renato Figueiredo | 2 |
| Dirk Grunwald | 1 |
| Lizhe Wang | 1 |

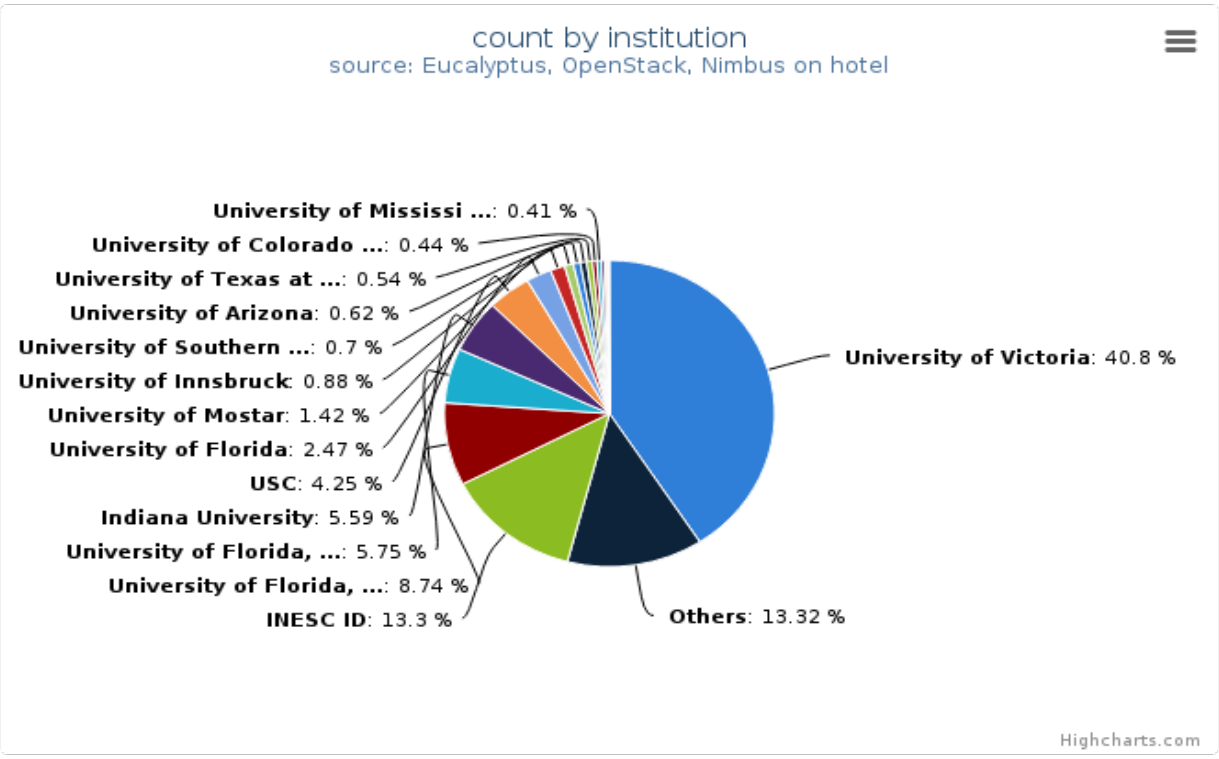


Figure 8: VMs count by institution
This chart illustrates the proportion of launched VM instances by Institution. The same data in tabular form follows.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

Table 6.3: VMs count by institution

| Institution | Value |
|---|---|
| University of Victoria | 1583 |
| Others | 517 |
| INESC ID | 516 |
| University of Florida, ACIS | 339 |
| University of Florida, Department of Electrical and Computer Eng | 223 |
| Indiana University | 217 |
| USC | 165 |
| University of Florida | 96 |
| University of Mostar | 55 |
| University of Innsbruck | 34 |
| University of Southern California | 27 |
| University of Arizona | 24 |
| University of Texas at Austin | 21 |
| University of Colorado at Boulder, Computer Science Department | 17 |
| University of Mississippi, Department of Computer Science | 16 |
| University of Piemonte Orientale | 13 |
| Massachusetts Institute of Technology, Laboratory for Nuclear Sc | 10 |
| Purdue University | 3 |
| Nimbus | 3 |
| Univ. of Colorado, Boulder, Computer Science | 1 |

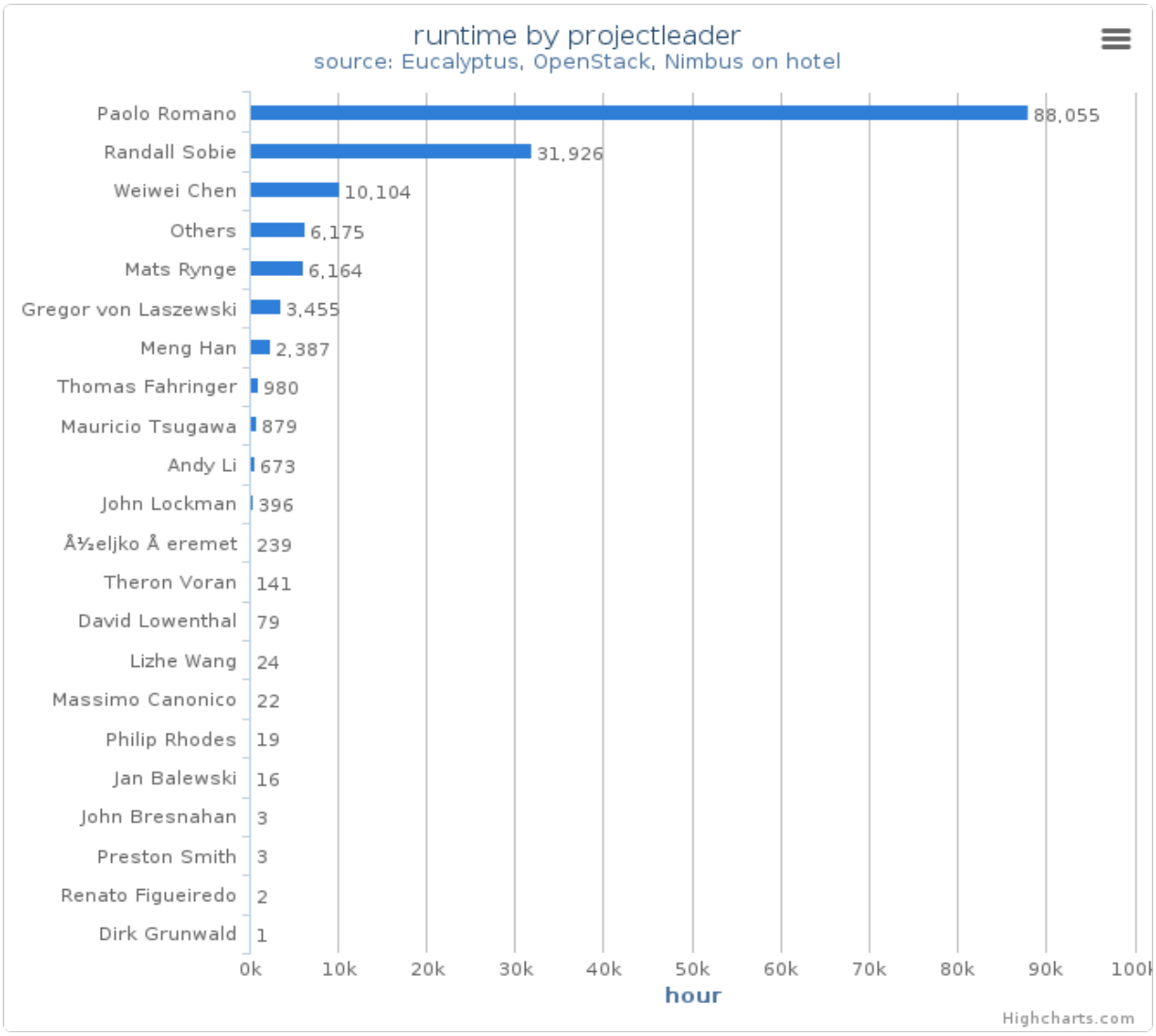


Figure 9: Wall time (hours) by project leader
This chart illustrates proportionate total run times by project leader.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

## 6.3 System information

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

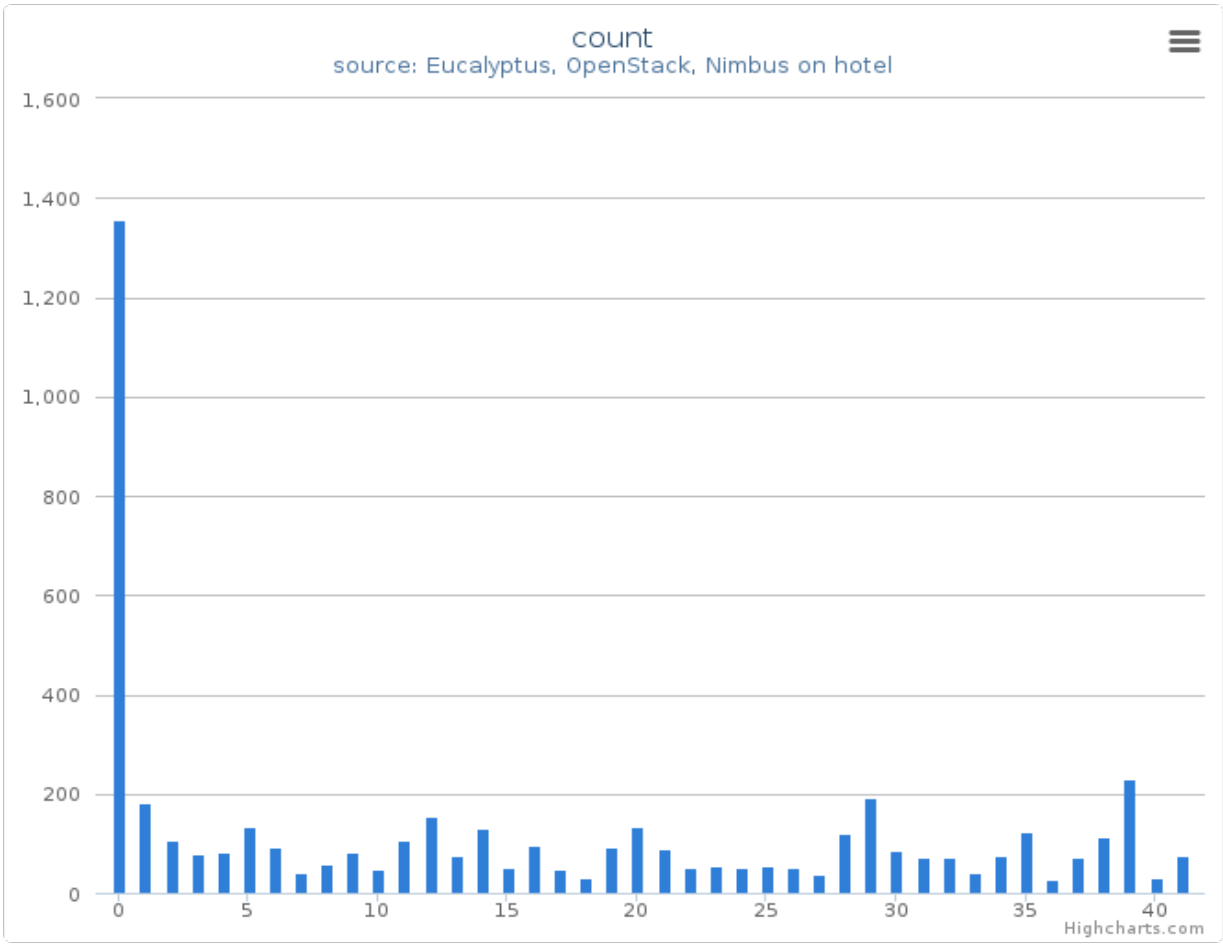


Figure 10: VMs count by systems (compute nodes) in Cluster (hotel)
This column chart represents VMs count among systems.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

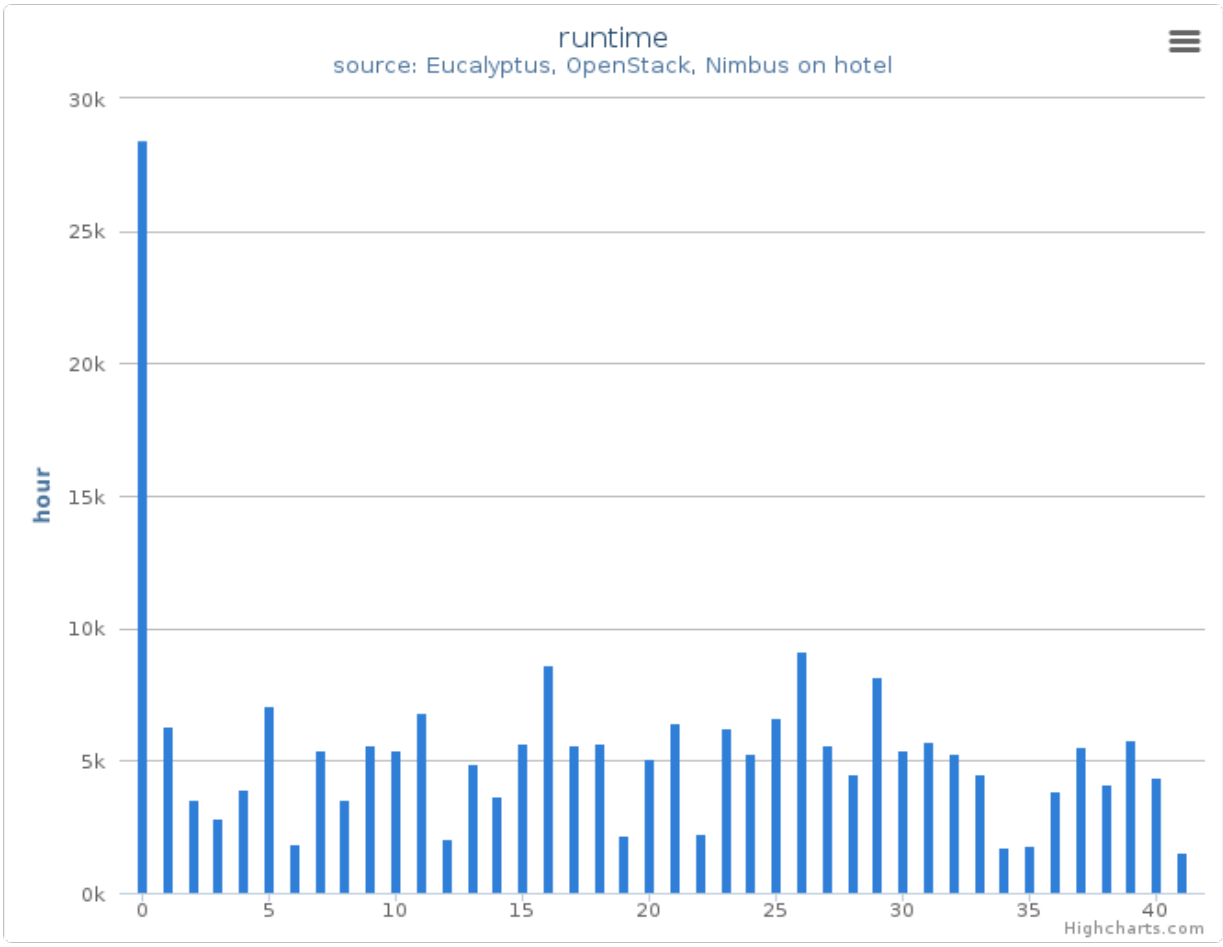


Figure 11: Wall time (hours) by systems (compute nodes) in Cluster (hotel)
This column chart represents wall time among systems.

- Period: July 01 – September 30, 2013
- Cloud(IaaS): nimbus
- Hostname: hotel

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.