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AIRAVATA

Tutorial Big Picture:
How all the Tutorial Modules fit together

XSEDE16, July 18th 2016

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- Viknes Balasubramanee, PernixData

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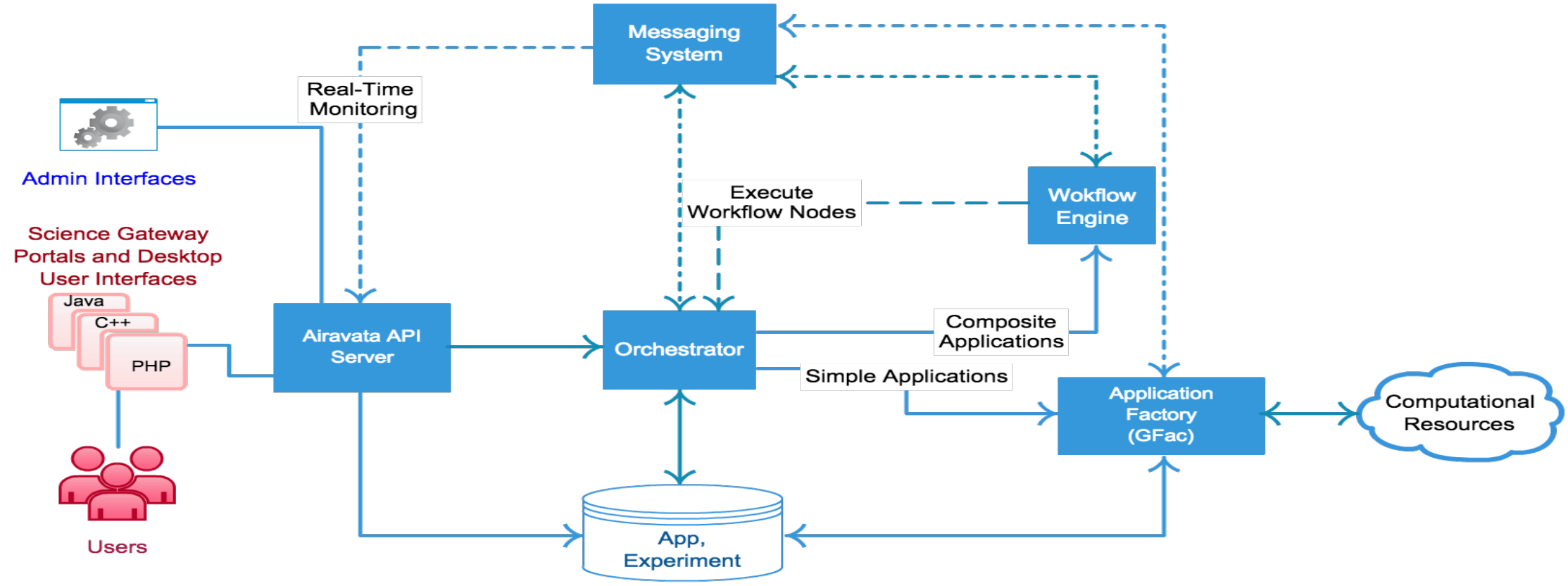
Airavata Overview

- Airavata is a general purpose distributed task management system build on micro-service and component based architecture principles.
- Airavata provides capabilities to compose, manage, execute and monitor large scale applications on distributed computing resources.
- Airavata supports executions on local clusters, national grids, academic and commercial clouds.
- Airavata is multi-tenanted -- one service runs many gateways.

Airavata: Keep it simple, yet flexible



- External clients interact with Airavata API (based on Apache Thrift).
- Internally, components interact with each other through Component Programming Interfaces (thrift based CPIs).

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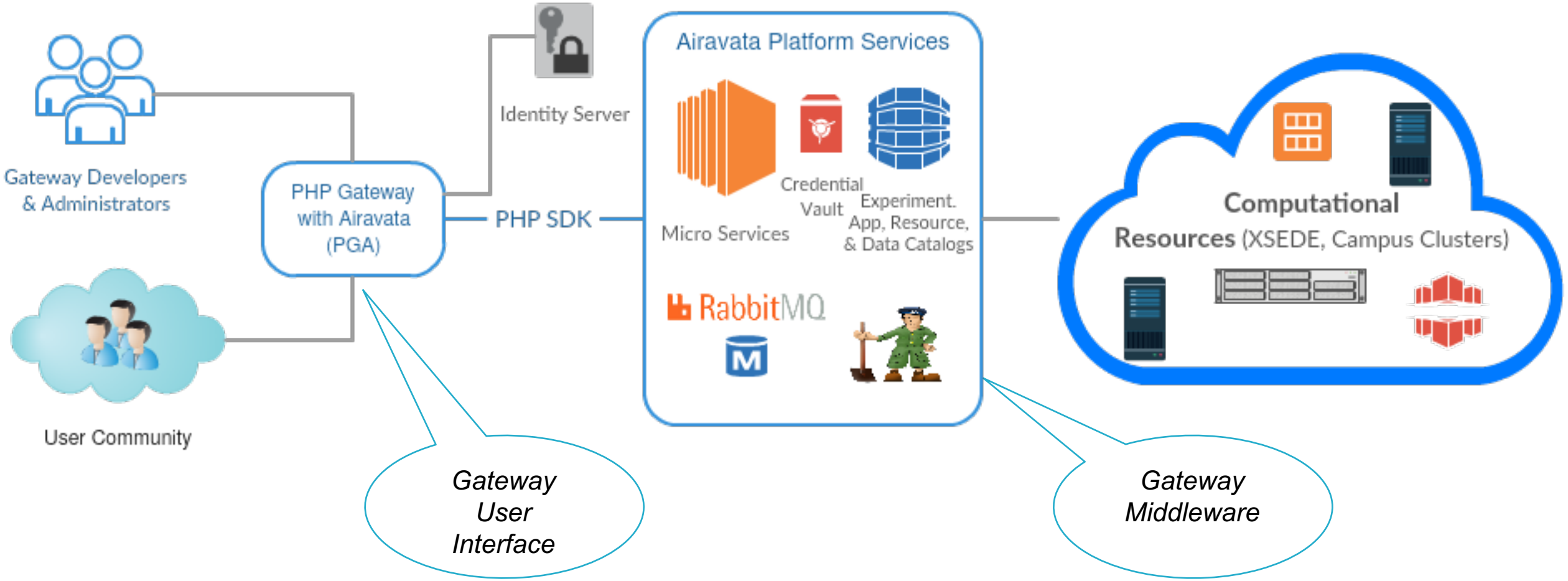
Gateway Anatomy mapped to Airavata



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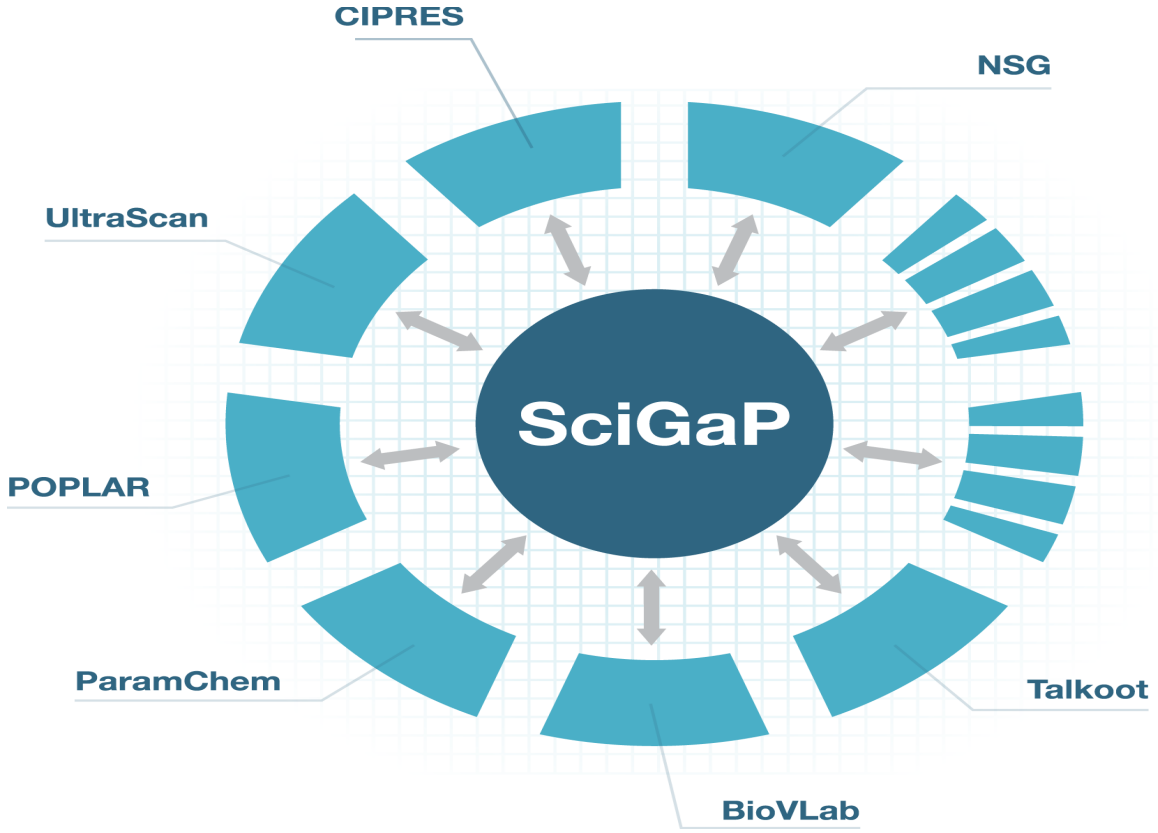
SciGaP Key Mission

Scale number of gateways without having to scale FTE's needed to support them.



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INDIANA UNIVERSITY

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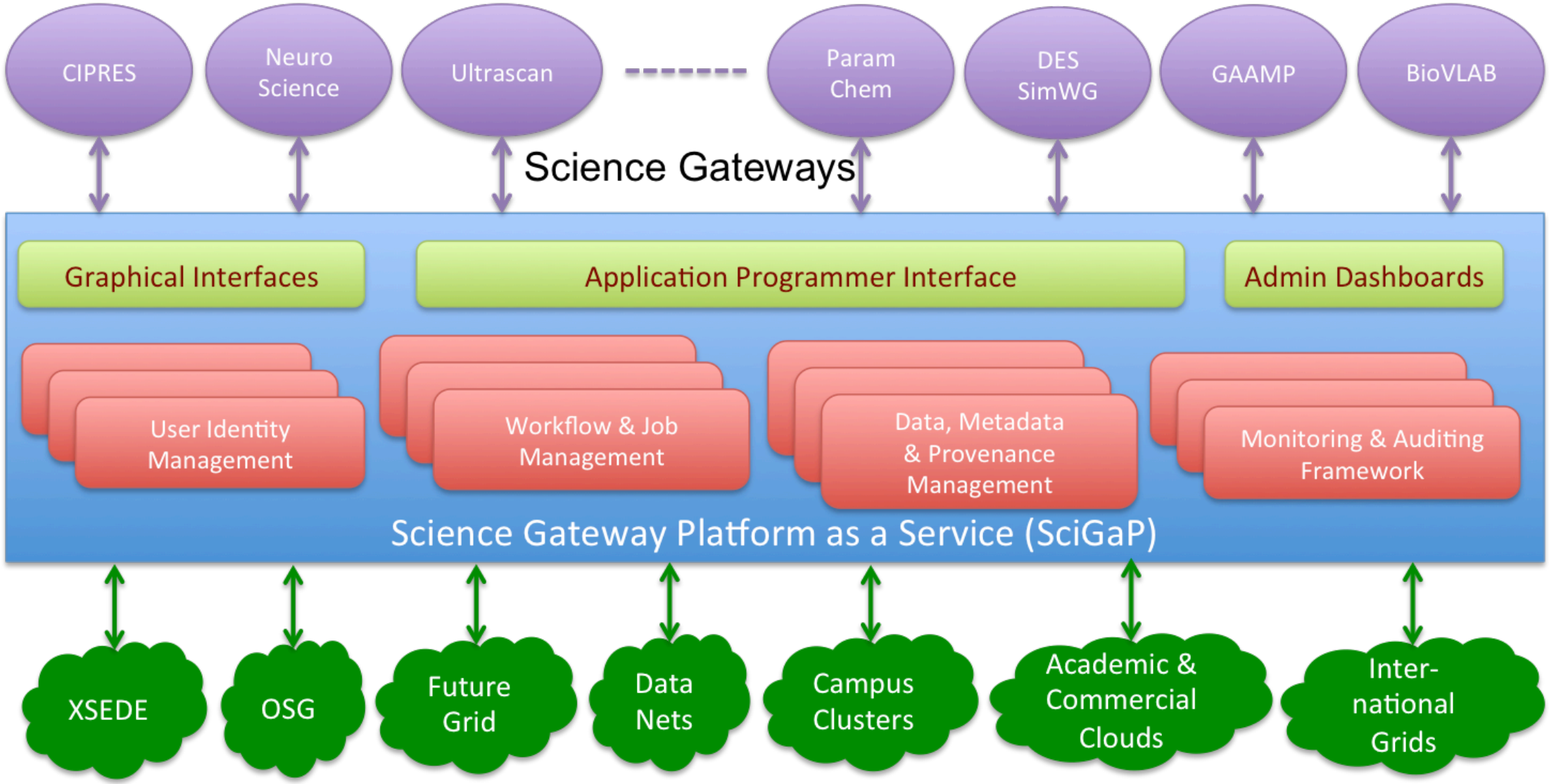
SEAGrid Science Gateway	CIPRES Science Gateway	Ultrascan Science Gateway
IU Cyberinfrastructure Gateway	Neuroscience Gateway	

Diverse and Complementing TEAM

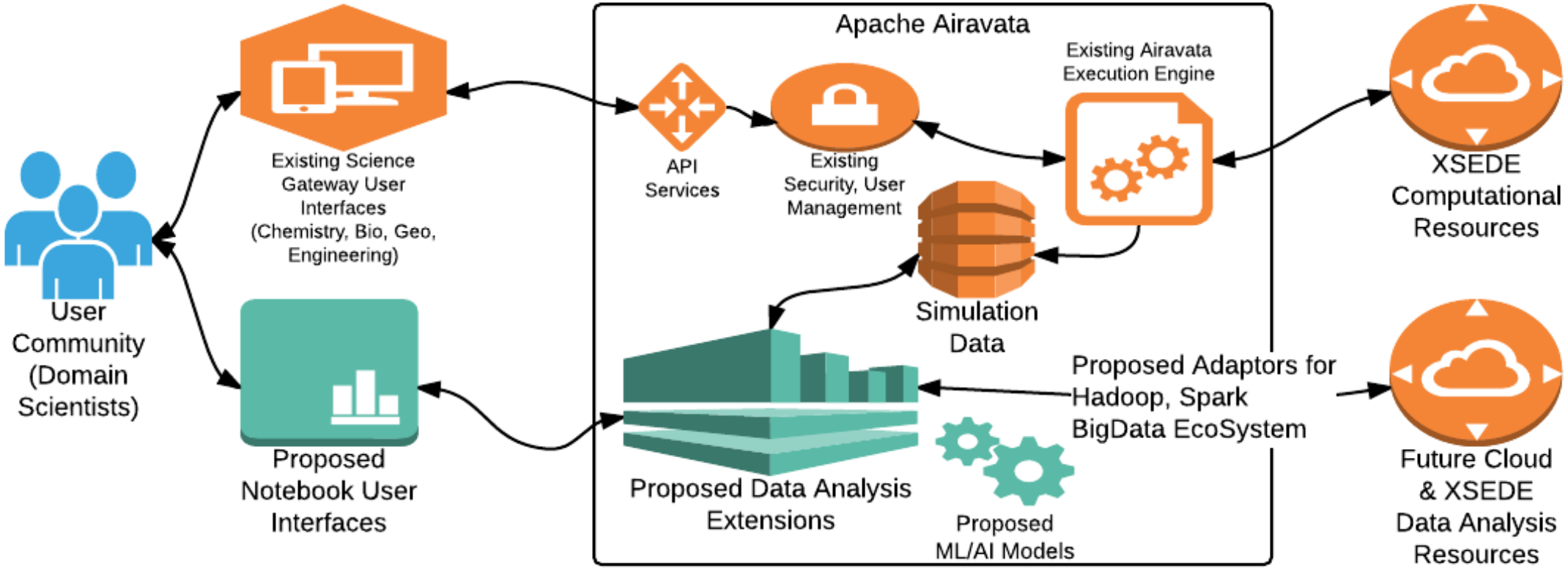
SciGaP

Improve sustainability by converging on a single set of hosted infrastructure services



SciGaP

Managing Computations → Data Analysis



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Use Notebooks to interact?

jupyter ⟷ APACHE AIRAVATA

jupyter airavata-notebook Last Checkpoint: a day ago (autosaved)

File Edit View Insert Cell Kernel Help

Code CellToolbar

In [32]:
```
import ConfigParser
import pandas as pd
import datetime
from datetime import datetime
import calendar
import matplotlib.pyplot as plt
%matplotlib inline
conf = ConfigParser.RawConfigParser()
conf.read('cli.properties')
hostName = conf.get('AiravataServer', 'host')
port = conf.get('AiravataServer', 'port')
```

In [33]:
```
from airavata_cli import AiravataCLI
airavata_cli = AiravataCLI(hostName, int(port))
print(airavata_cli.printVersion())
```

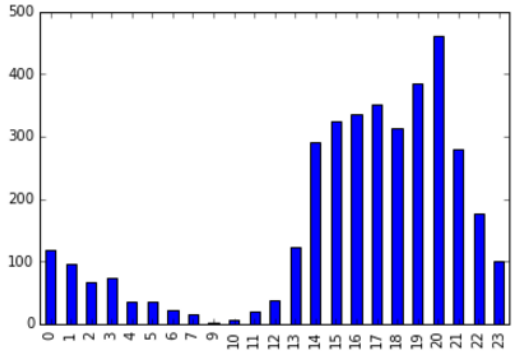
```
0.16.0
0.16.0

Welcome to Airavata CLI v0.0.1 - Wirtten in python


None
```

Experiments Created by the hour of the day

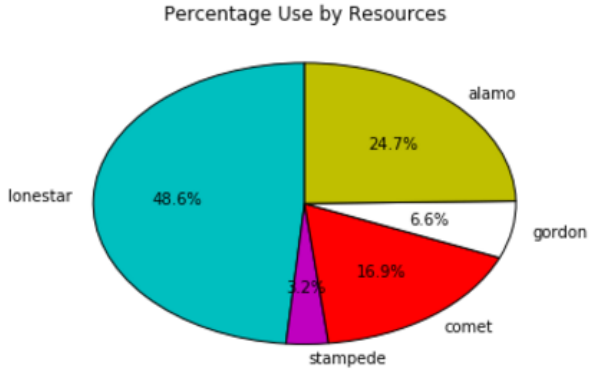
In [21]:
```
df['hour_of_day'] = df['Creation Time'].apply(lambda time: datetime.utcfromtimestamp(time/1000).hour)
```

In [29]:
```
df['hour_of_day'].value_counts().sort_index().plot('bar')
```

Out[29]: <matplotlib.axes._subplots.AxesSubplot at 0xa192198>



In [39]:
```
slices= [ls5_cn,stampede_cn,comet_cn,gordon_cn,alamo_cn]
cols = ['c','m','r','w','y']
Hosts= ["lonestar","stampede","comet","gordon" , "alamo"]
plt.pie(slices,
        labels= Hosts,
        colors=cols,
        startangle=90,
        shadow= False,
        autopct='%1.1f%%')

plt.title('Percentage Use by Resources')
plt.show()
```



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Tutorial Modules

1. Module 1 - Introductions & Warmup
2. Module 2 - Test-Drive Airavata
3. Module 3 - Under the Hood Technical Details
4. Module 4 - Build your own Gateway
5. Module 5 - Interactive Web Notebooks + Airavata
6. Module 6 - Data Organization, Sharing, Discovery
7. Module 7 - Conclude & Getting support

Detailed Agenda - https://s.apache.org/xsede16-gateway-tutorials

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Community Hangout

Mailing lists:

- architecture@airavata.apache.org
- dev@airavata.apache.org
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Additional Slides

For discussion based on Q& A

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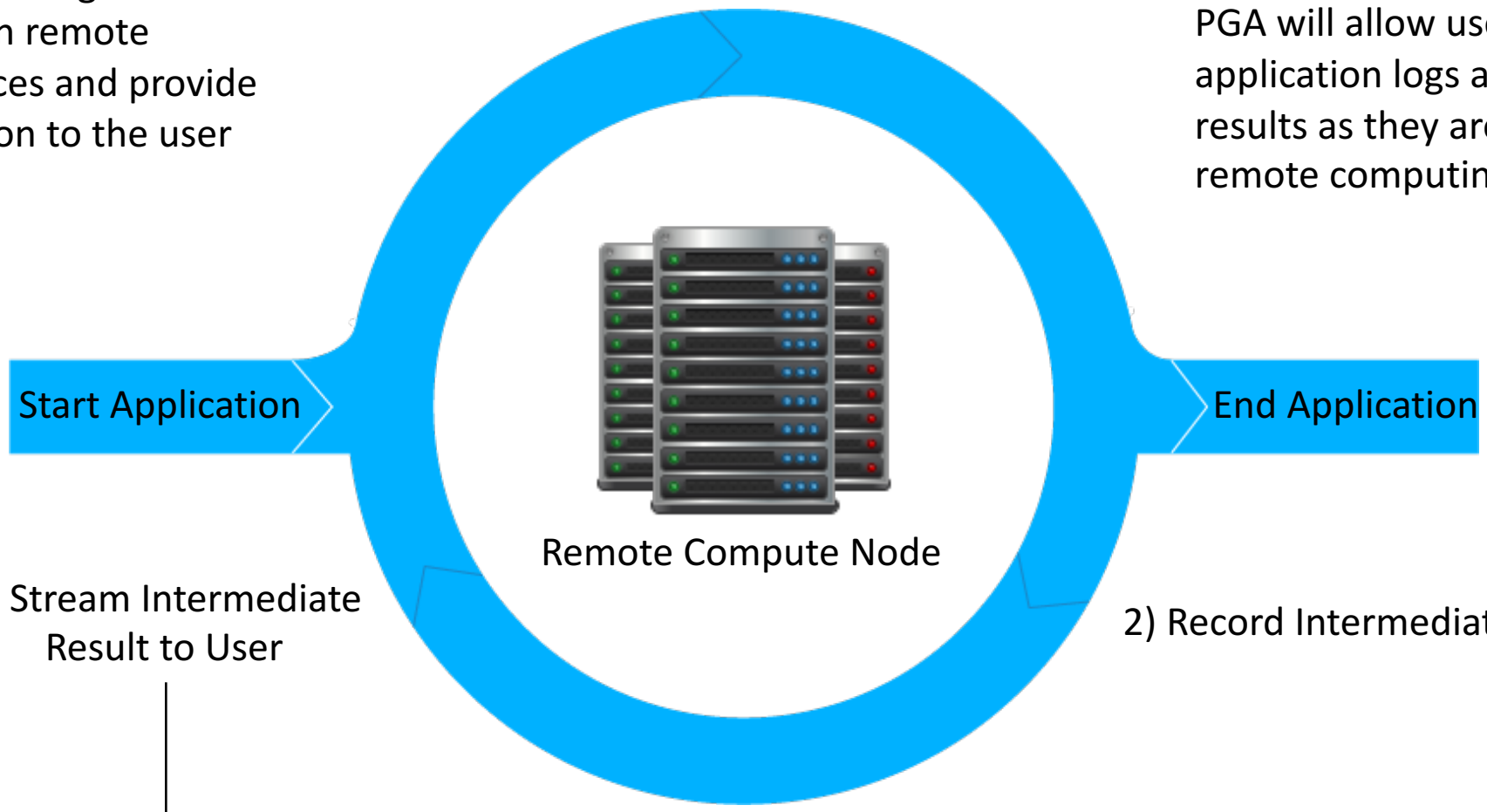
GSoC Project: Inspect executions through layers

Traditional long-running applications run on remote computing resources and provide minimal information to the user during execution.



Using WebSockets and AMQP, the PGA will allow users to view application logs and intermediate results as they are generated on remote computing resources.

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