# Neuroscience Gateway (NSG)

http://www.nsgportal.org

NSG facilitates access and use of High Performance Computing resources freely and openly for the neuroscience community via web-based and programmatic (RESTful API) access. Various computational neuroscience tools, libraries, pipelines and data processing software are made available on HPC resources.

NSG - Portal and Programmatic Access

NSG Portal: Simple and easy to use web interface
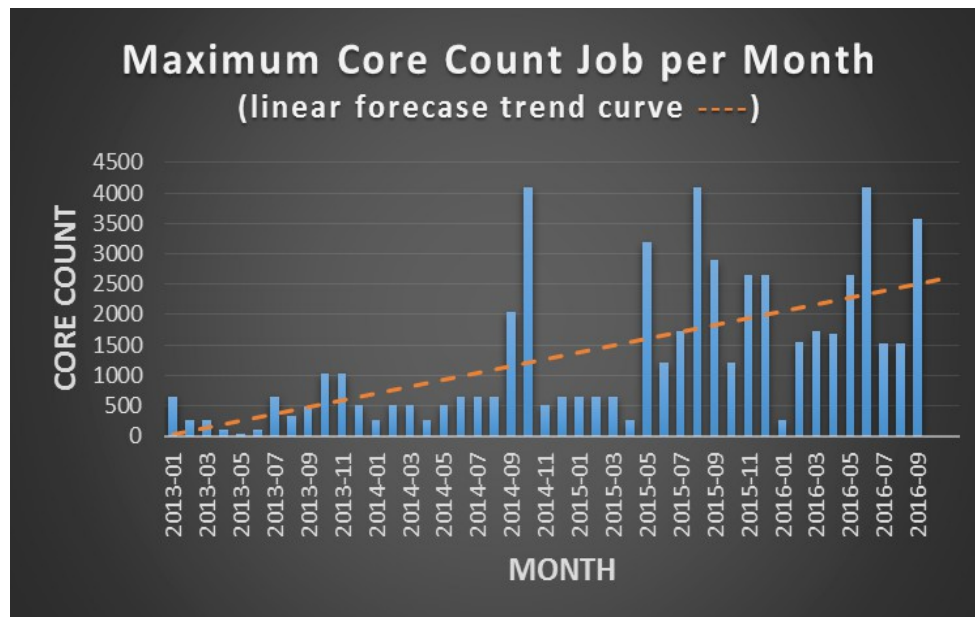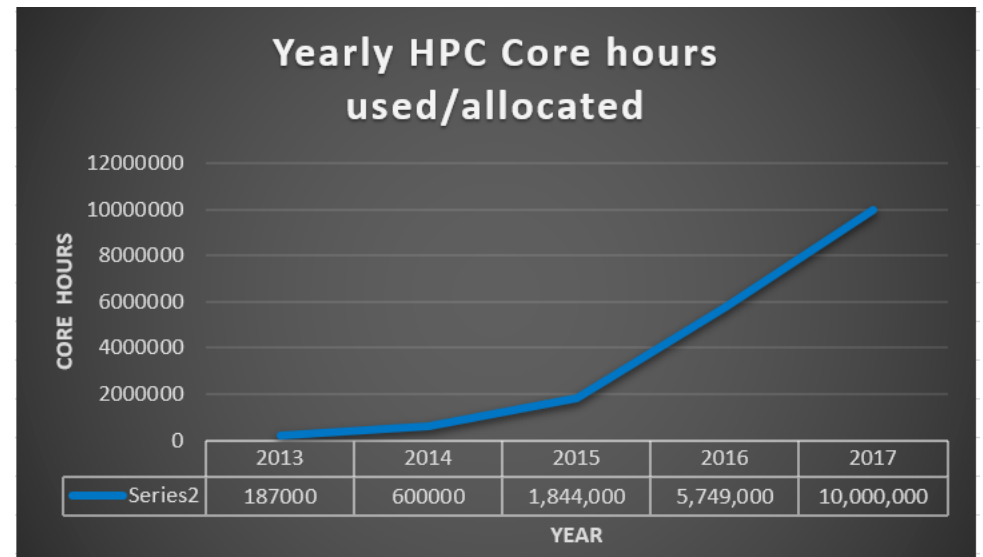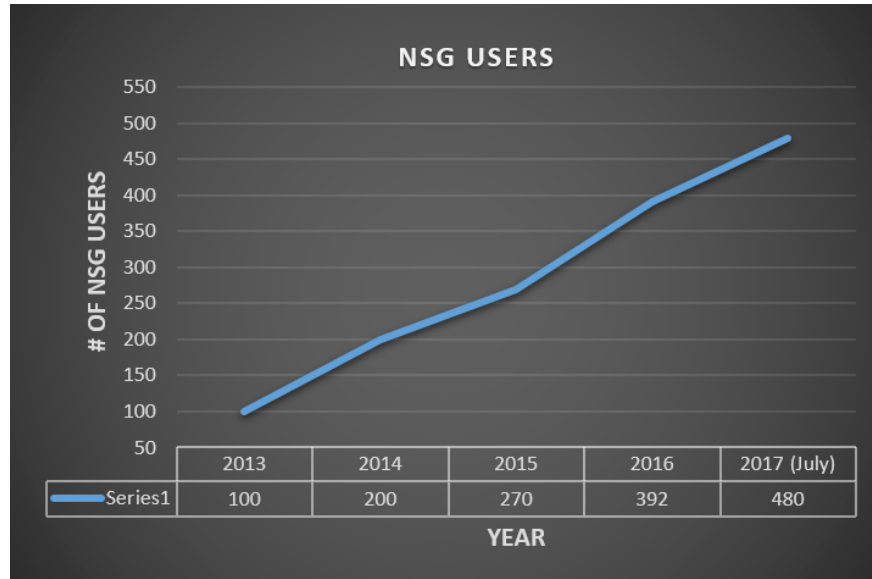NSG–R: Programmatic access through RESTful services
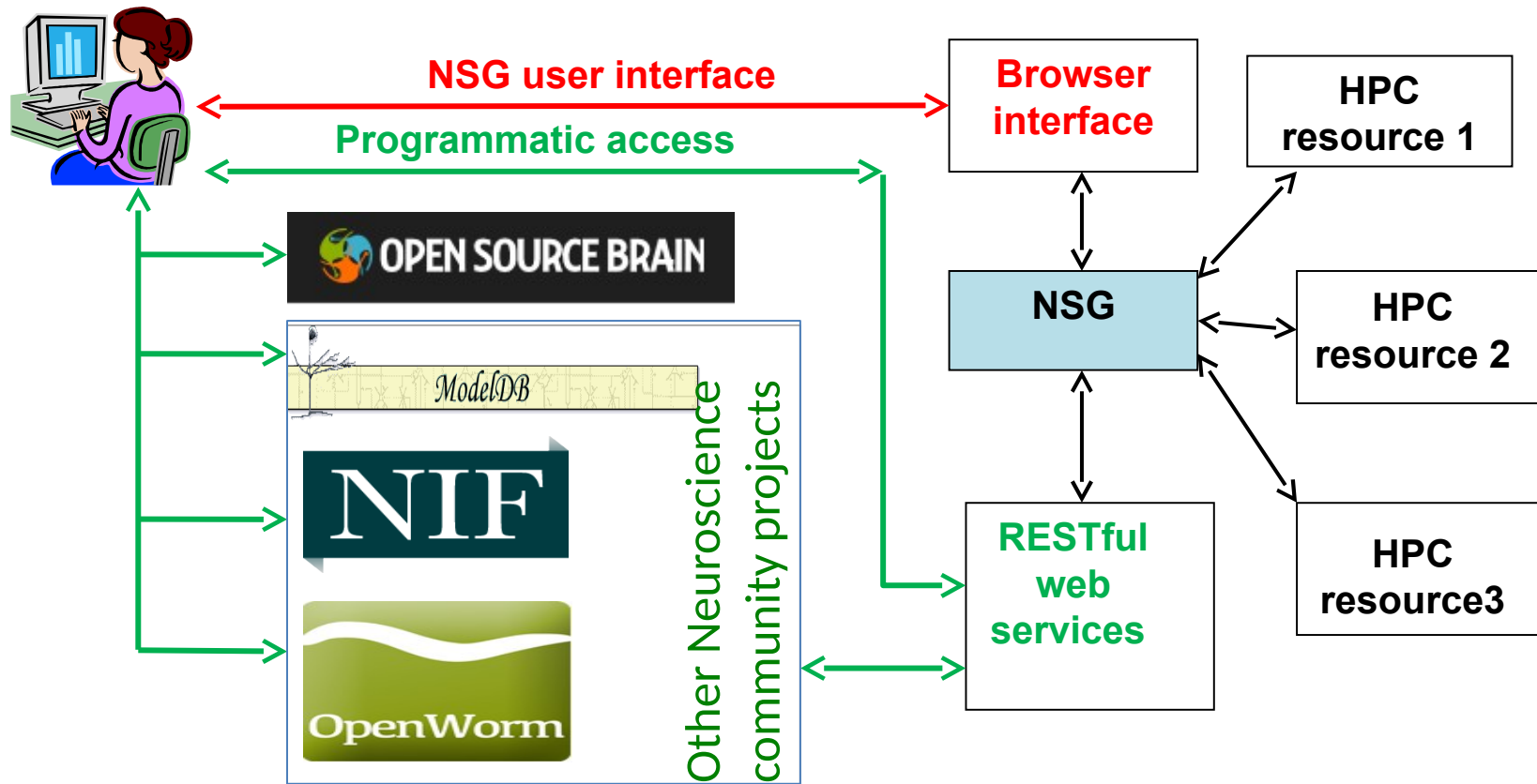
Currently available tools/software/pipelines

New tools are added continuously based on request from users, researchers, and developers

Current (July, 2017) tools, libraries, software, pipelines	
BluePyOpt, Michele Migliore et al, National Research Council, Italy	PyMoose
BRIAN	NEST
CARLsim, Jeffrey Krichmar, UC Irvine	NEURON
The Virtual Brain Personalized Medicine Pipeline, Petre Ritter, Humboldt University	Parameter Search Dieter Jaeger, Emory University
FreeSurfer	PyNN
Large Scale Neural Simulator Antonio Ulloa, Neural Bytes	Python
Matlab	R
TensorFlow	Octave
GENESIS	

NSG usage growing – since 2013

NSG USERS

	2013	2014	2015	2016	2017 (July)
Series1	100	200	270	392	480

Yearly HPC Core hours used/allocated

	2013	2014	2015	2016	2017
Series2	187000	600000	1,844,000	5,749,000	10,000,000

Maximum Core Count Job per Month
(linear forecase trend curve ----)

Monthly Average job size

Amazon Web Services

http://aws.amazon.com

Amazon Web Services (AWS) is a cloud computing platform by Amazon which provides on demand or 24/7 access to virtual computing resources such as computing (CPU & GPU), storage, databases, etc.

Amazon Web Services

Widely used cloud computing platform

Can be used for:

- Web hosting

- Databasing

- Compute intense tasks

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Example: OSB is hosted on AWS (live and development servers)

Find a service by name or feature (for example, EC2, S3 or VM, storage).

Group   A-Z

Compute
EC2
EC2 Container Service
Lightsail ⧉
Elastic Beanstalk
Lambda
Batch

Storage
S3
EFS
Glacier
Storage Gateway

Database
RDS
DynamoDB
ElastiCache
Redshift

Networking & Content Delivery
VPC
CloudFront
Direct Connect
Route 53

Migration
Application Discovery Service
DMS
Server Migration
Snowball

Developer Tools
CodeStar
CodeCommit
CodeBuild
CodeDeploy
CodePipeline
X-Ray

Management Tools
CloudWatch
CloudFormation
CloudTrail
Config
OpsWorks
Service Catalog
Trusted Advisor
Managed Services

Security, Identity & Compliance
IAM
Inspector
Certificate Manager
Directory Service
WAF & Shield
Artifact

Analytics
Athena
EMR
CloudSearch
Elasticsearch Service
Kinesis
Data Pipeline
QuickSight ⧉

Artificial Intelligence
Lex
Polly
Rekognition
Machine Learning

Internet Of Things
AWS IoT
AWS Greengrass

Contact Center
Amazon Connect

Game Development
Amazon GameLift

Mobile Services
Mobile Hub
Cognito
Device Farm
Mobile Analytics
Pinpoint

Application Services
Step Functions
SWF
API Gateway
Elastic Transcoder

Messaging
Simple Queue Service
Simple Notification Service
SES

Business Productivity
WorkDocs
WorkMail
Amazon Chime ⧉

Desktop & App Streaming
WorkSpaces
AppStream 2.0

EC2 Dashboard
Events
Tags
Reports
Limits

INSTANCES

Instances
Spot Requests
Reserved Instances
Scheduled Instances
Dedicated Hosts

IMAGES

AMIs
Bundle Tasks

ELASTIC BLOCK STORE

Volumes
Snapshots

NETWORK & SECURITY

Security Groups
Elastic IPs
Placement Groups
Key Pairs
Network Interfaces

LOAD BALANCING

Load Balancers
Target Groups

AUTO SCALING

Launch Configurations
Auto Scaling Groups

Launch Instance   **Connect**   **Actions** ∨

🔄 ⚙ ❓

🔍 Filter by tags and attributes or search by keyword   ❓ |< < 1 to 2 of 2 > >|

	Name	▲	Instance ID	▾	Instance Type	▾	Availability Zone	▾	Instance State	Status Checks	▾	Alarm Status	Public DNS (IPv4)
☑	OSB		i-51602		m3.large		us-east-1d		🟢 running	✅ 2/2 checks ...		None 🔔	ec2-184-72-223-204.compute-1.am
☐	OSB development		i-ab12		m3.medium		us-east-1b		🟢 running	✅ 2/2 checks ...		None 🔔	

Instance: i-5160 (OSB)   **Elastic IP: 184.72.223.204**

▬ ▬ ▭

Description   Status Checks   **Monitoring**   Tags

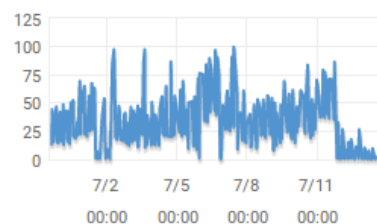▸ **CloudWatch alarms:** ✅ **No alarms configured**   **Create Alarm**

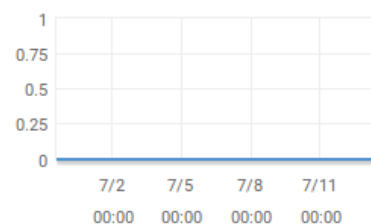**CloudWatch metrics:** Basic monitoring. **Enable Detailed Monitoring**   Showing data for: **Last 2 Weeks** ∨ 🔄

Below are your CloudWatch metrics for the selected resources (a maximum of 10). Click on a graph to see an expanded view. All times shown are in UTC. › View all CloudWatch metrics

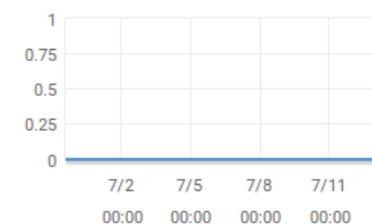**CPU Utilization** (Percent)
```
125
100
 75
 50
 25
  0
    7/2    7/5    7/8    7/11
   00:00  00:00  00:00  00:00
```

Disk Reads (Bytes)
```
1
0.75
0.5
0.25
0
    7/2    7/5    7/8    7/11
   00:00  00:00  00:00  00:00
```

Disk Read Operations (Operations)
```
1
0.75
0.5
0.25
0
    7/2    7/5    7/8    7/11
   00:00  00:00  00:00  00:00
```

Binder

http://mybinder.org
(maybe http://beta.mybinder.org)

Turn a GitHub repo into a collection of interactive notebooks.
Open those notebooks in an executable environment, making your code
immediately reproducible by anyone, anywhere.
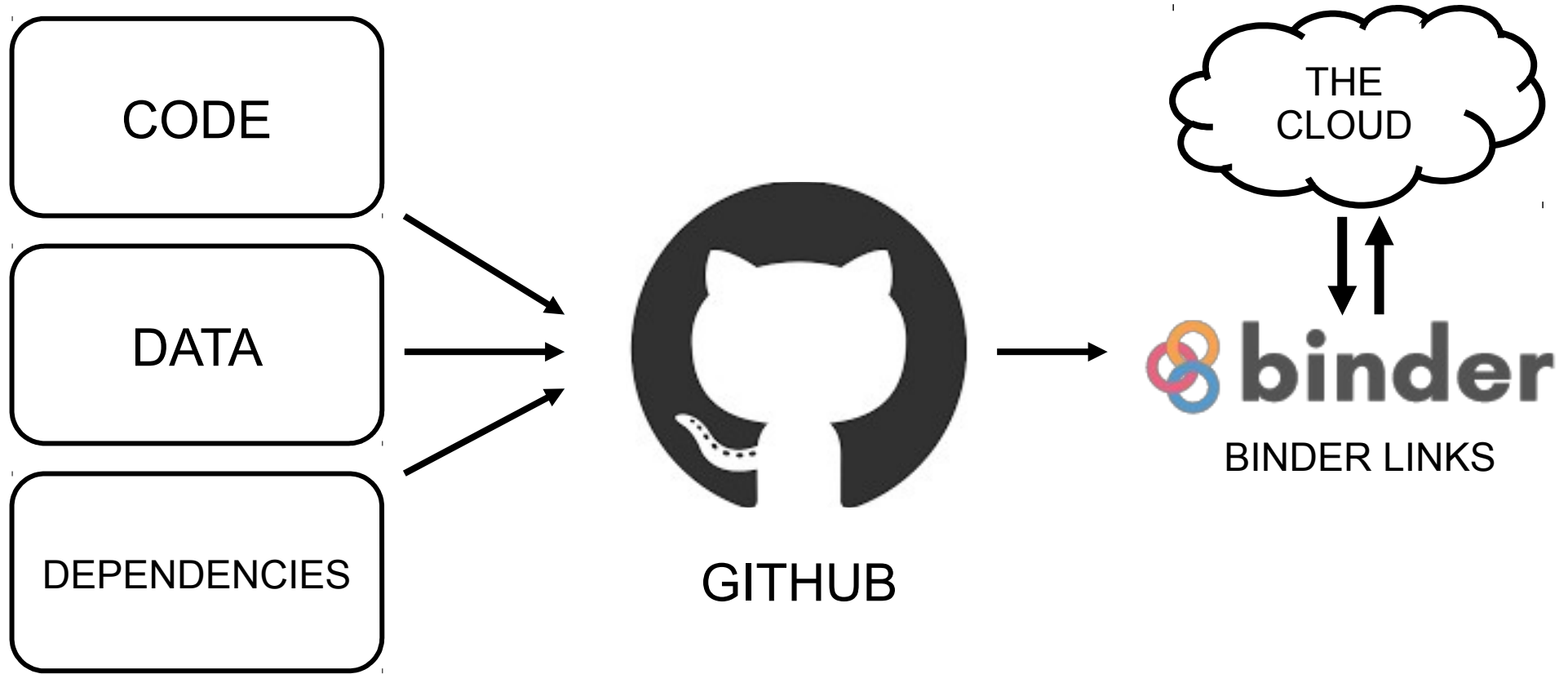
- Reproduce figures
- Share code with collaborators
- Highlight an analysis
- Show off your codebase

Running live, in the cloud, for free

- Current work
  - Rebuilt Binder from the ground up.
  - More stable + faster.
  - Support for Python and Julia
  - Support interactive widgets and javascript
  -

- (near) future work
  - Adding support for R
  - Support multiple languages simultaneously
  - Make it easier to deploy your own Binder server
  - Support new user interfaces (RStudio, JupyterLab)

Useful links

Use mybinder

beta.mybinder.org

Deploy your own Binder

binderhub.jupyter.org

Get in touch

gitter.im/binder-project/binder

Get involved

github.com/jupyterhub/binderhub