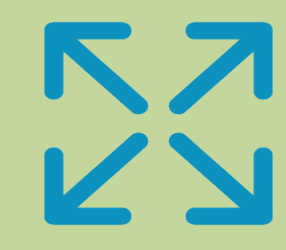


BENEFITS

SCALABILITY



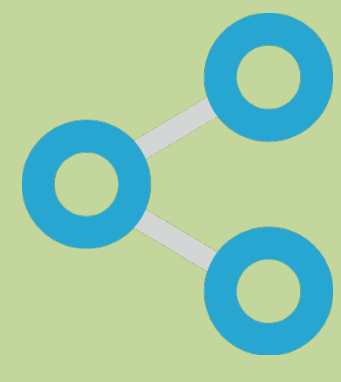
Computing resources can be added and removed either at the click of a button, on a schedule, or automatically based on load. A software-driven infrastructure enables easy environment replication for development or testing.

RELIABILITY



AWS experienced only 2.41 total hours of downtime in 2014 (99.9974% uptime), which is the best of all cloud providers.

SHAREABILITY



Institution independence enables shared ownership of computing resources and program-dictated access management.

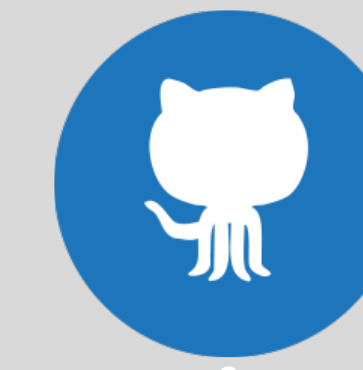
EFFICIENCY



Usage-based cost eliminates:

- expensive overprovisioning to accommodate peak usage,
- hardware maintenance costs, and
- purchase delays.

SERVICE ARCHITECTURE



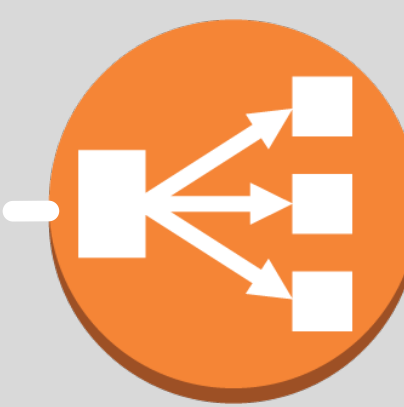
CODE

All code related to ARM.gov is managed using both cloud-hosted as well as ARM-hosted Git repositories that enable cross-institution collaboration. Vagrant is used to simulate the website in a local development environment for easy testing before deployment.



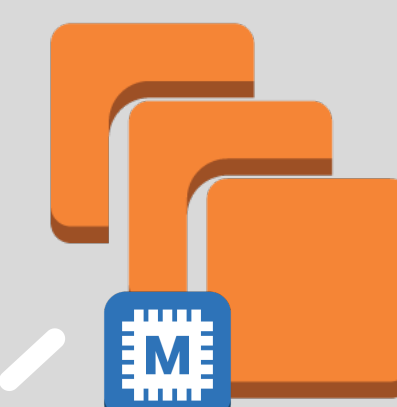
OPSWORKS

AWS OpsWorks is a service for configuring and running automated deployments using Chef (Ruby). The ARM.gov web servers and CMS server are managed 100% via code. With the click of a few buttons the development team was able to clone the production environment for testing. The testing services remain turned off while not being used in order to keep costs low.



LOAD BALANCER

The AWS-provided load balancer responds to every request to ARM.gov and is responsible for intelligently distributing the load among the available web servers.



WEB SERVERS

The servers that handle each request from the load balancer can be automatically scaled by time of day or by load to 1) keep costs low and 2) make sure performance remains constant.



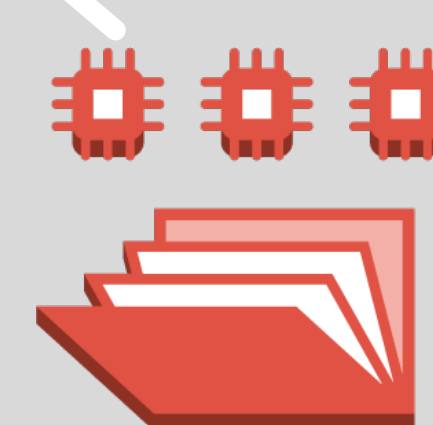
CMS SERVER

The Content Management System (CMS) behind the website is a WordPress instance where ARM Communications staff log in to control what you see on ARM.gov. It is backed by an AWS-provided MySQL server that is automatically updated and backed up.



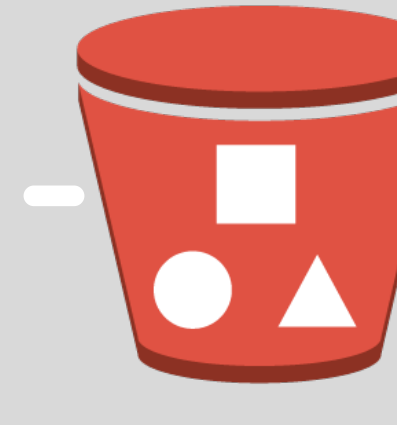
ELASTICSEARCH

AWS provides a hosted, distributed Elasticsearch service that is being leveraged for all content served on the website. Its indexes are synchronized with the AWS-hosted CMS in addition to ARM's internal, BNL-hosted databases.



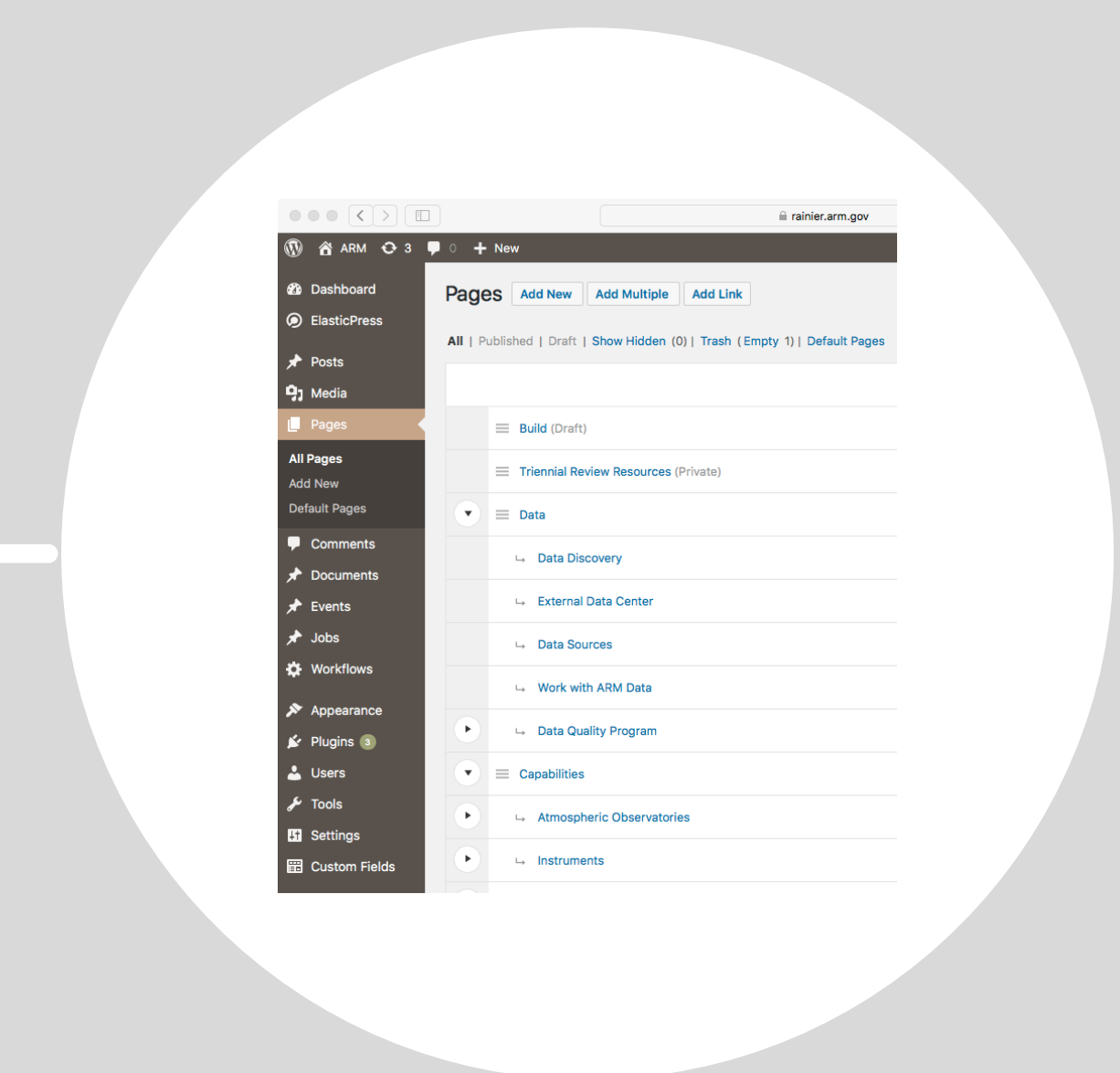
EFS

The AWS Elastic File Store enables a shared directory structure for all website media. It is mounted during deployment for read access on all web servers and read/write on the CMS server.



S3

The Simple Storage Service (S3) provides fast, redundant file storage. It is currently used for backing up website media from the EFS but in the future it will take the place of EFS as the sole media repository to lower cost even further.



RISK MITIGATION

SECURITY



We have a security plan in place that identifies the risks and mitigations for existing ARM services in the AWS cloud e.g., SSH access limited to white-list IP ranges, and services like MySQL and Elasticsearch are only accessible within ARM's private AWS network.

BILLING



We spend time getting familiar with the relatively complex cost structure. We use detailed billing to identify potentially unneeded expenses.

MANAGEMENT



We deliberately:

- scale down as well as up,
- turn things off when not used, and
- actively monitor resources.