



EOSDIS

NASA'S EARTH OBSERVING SYSTEM
DATA AND INFORMATION SYSTEM

NGAP: A (Brief) Update

PaaS, IaaS, Onboarding, and the Future

Brett McLaughlin & Andrew Pawloski

NASA EED2/ESDIS

Summer ESIP, 2016



This work was supported by NASA/GSFC under
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SESIP-0716-BM

Agenda

- What is NGAP?
- NGAP as a PaaS
- NGAP as an IaaS
- What's Next?
- Questions and Answers

NGAP: A (Brief) Update

WHAT IS NGAP?

“NASA Takes Off to Cloud Computing”

** http://www.onthenetoffice.com/blog/2012/02/nasa_cloud/*



What is NGAP?

NGAP is the **NASA General Application Platform**. It provides a cloud-based Platform-as-a-Service (PaaS) and Infrastructure-as-a-Service (IaaS) for ESDIS applications.

NIST Definition of Cloud Computing*

- On-demand self service
- Broad network access
- Resource pooling
- Rapid elasticity
- Measured service

* <http://faculty.winthrop.edu/domanm/csci411/Handouts/NIST.pdf>

NGAP: A (Brief) Update

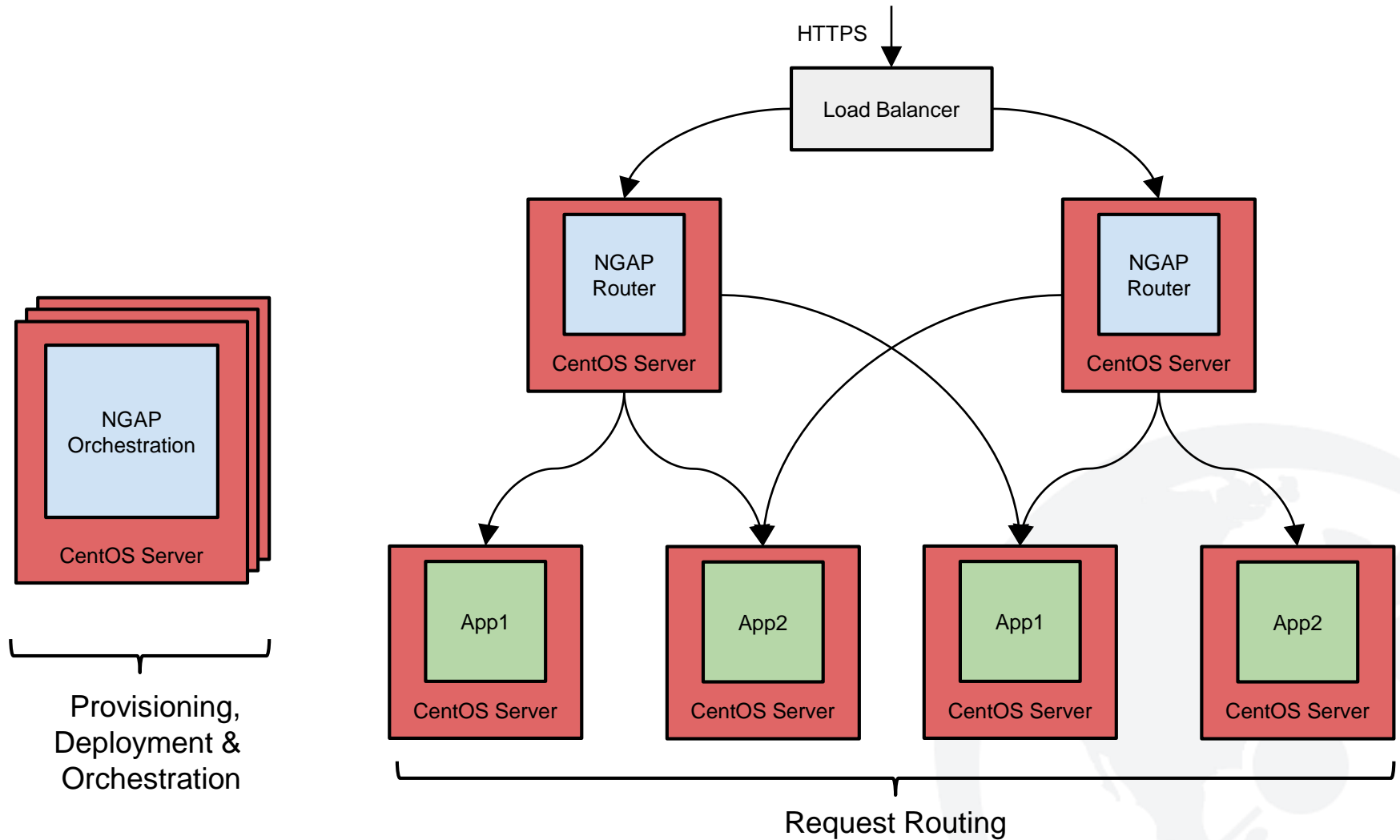
NGAP AS A PAAS



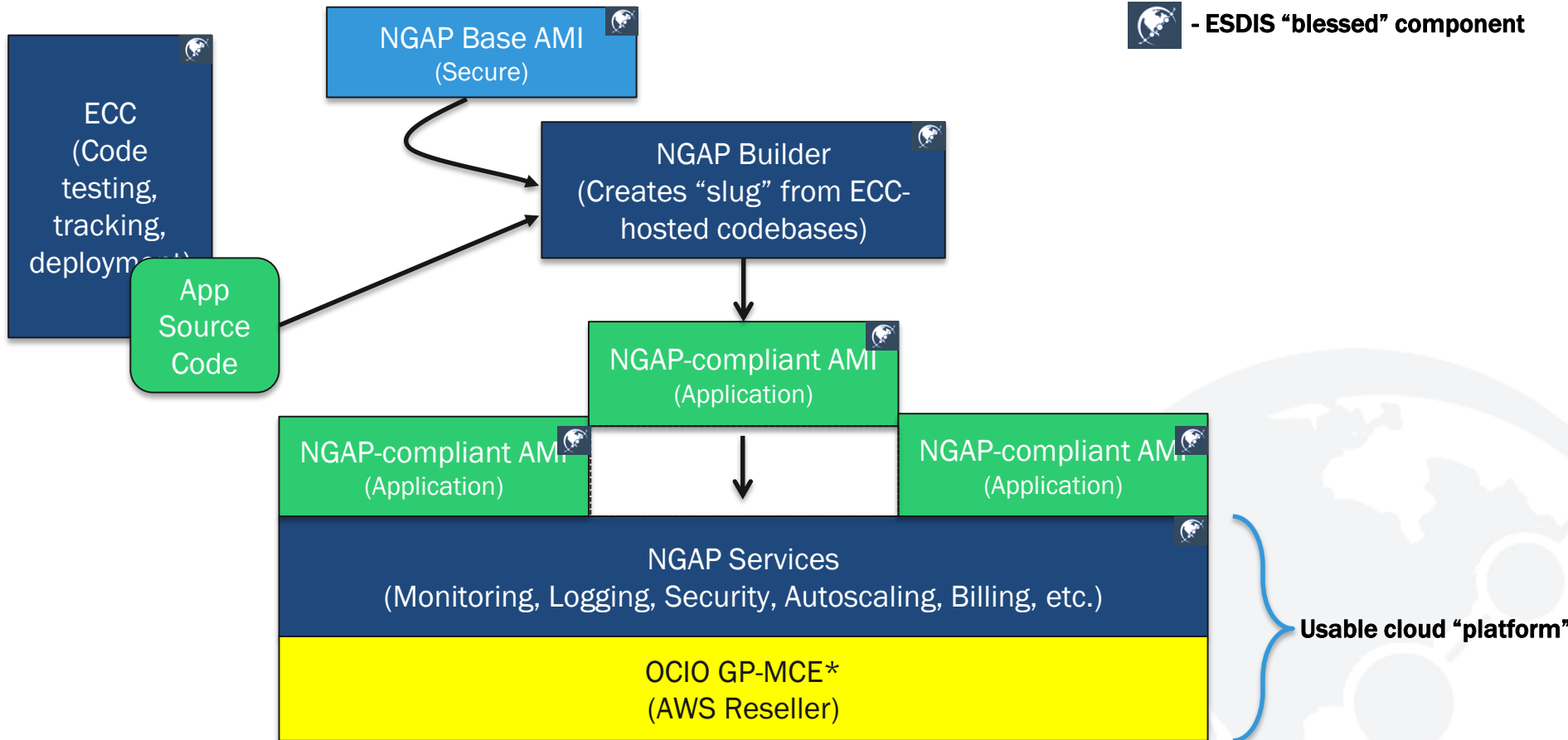
PaaS

Platform-as-a-Service

It starts with infrastructure...



...and adds services and “slugs”



Highlights of PaaS

- Simplified AWS-focused architecture
- Focused on web application hosting
 - 12-factor applications
 - Web front-end plus database back-end
- Demonstrated Earthdata Search running in NGAP prototype with fault tolerance, high availability, and scaling

NASA (National Aeronautics and Space Administration)

EARTHDATA | Data Discovery | DAACs | Community | Science Disciplines

EARTHDATA β | Feedback | Earthdata Login

Discover Earth Science Data

[Take a Tour](#)

Search NASA Earth Science data by keyword and filter by **time** or **space**.

Temporal Spatial

[Browse All Data](#) | See featured datasets or use categories to narrow your results.

v 0.35.1 | NASA Official: Andrew Mitchell | FOIA | NASA Privacy Policy | USA.gov

Earthdata Access: A Section 508 accessible alternative

Guides

Design & User Interface Toolkit

Earthdata User Interface Library (EUI)

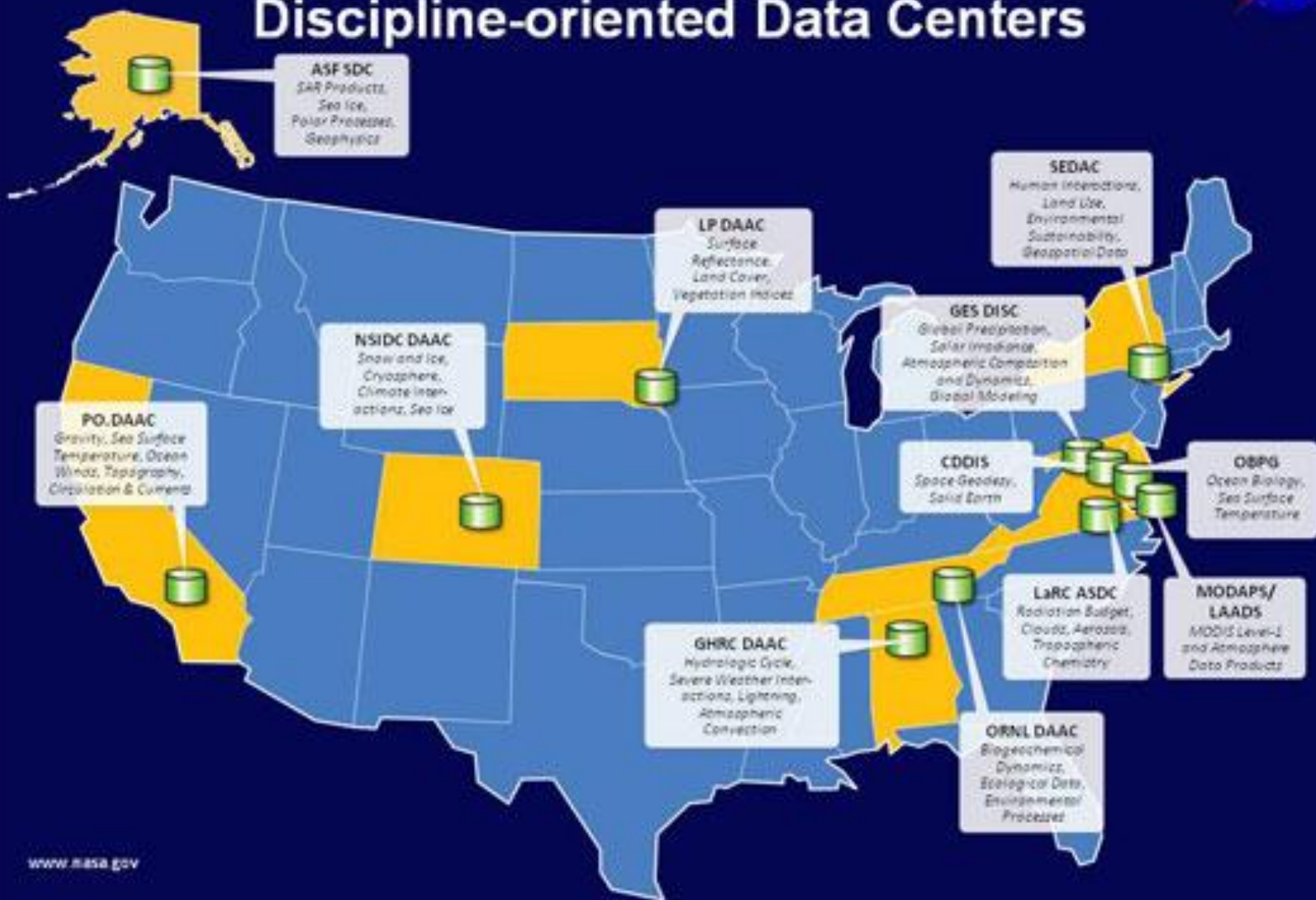
The EUI is a small design framework for building earth science-specific website and web applications.

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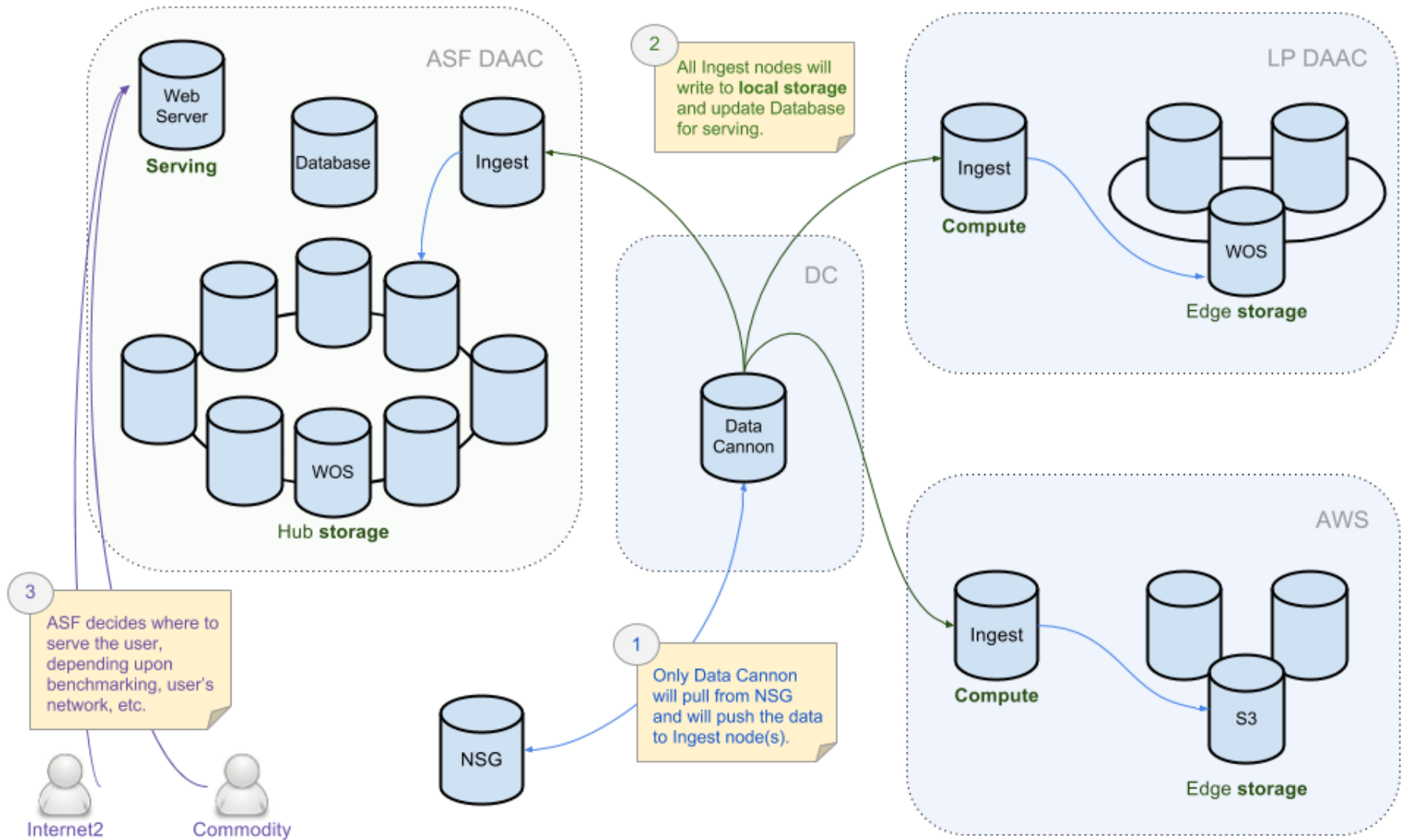
NGAP AS AN IAAS



Discipline-oriented Data Centers



AWS and WOS: Benchmarking at the Edges

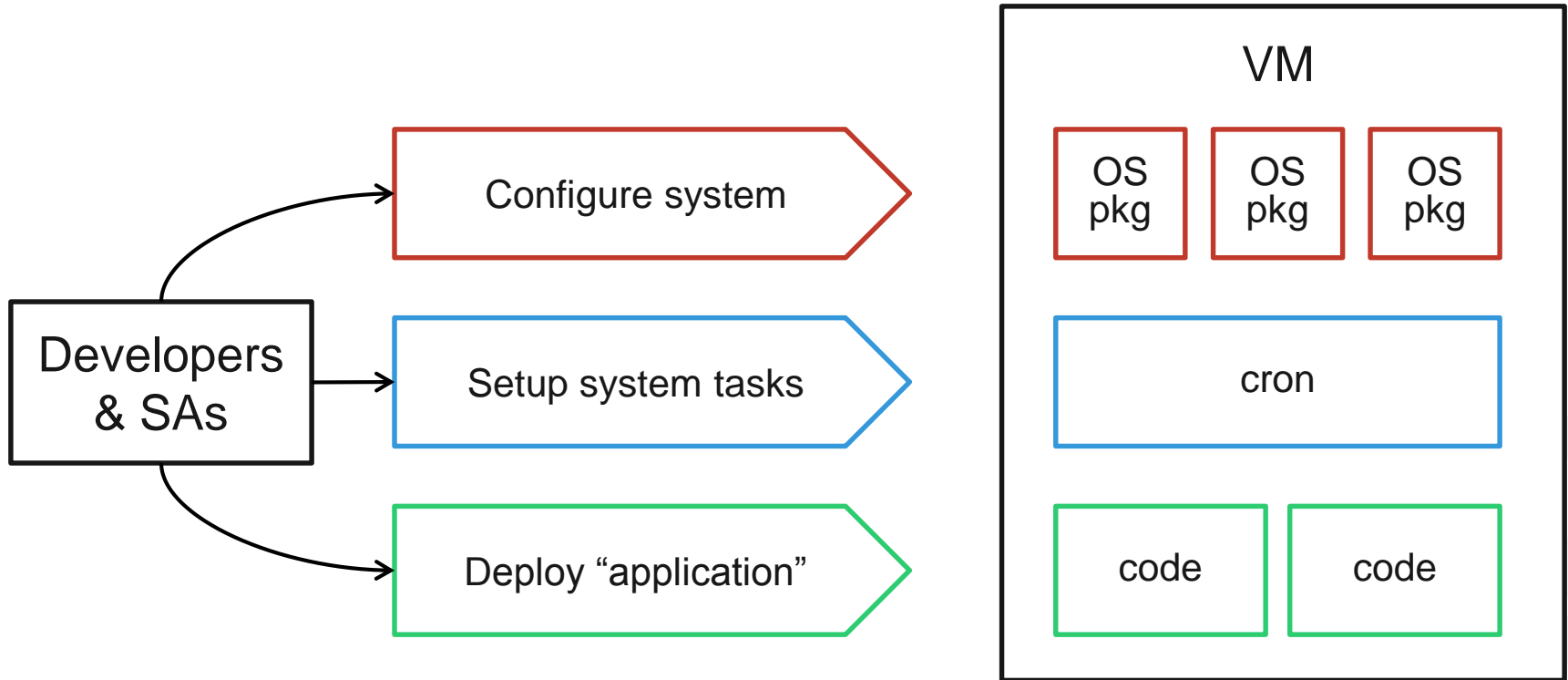


*DC refers to a Datacenter in lower 48 that is not yet defined.

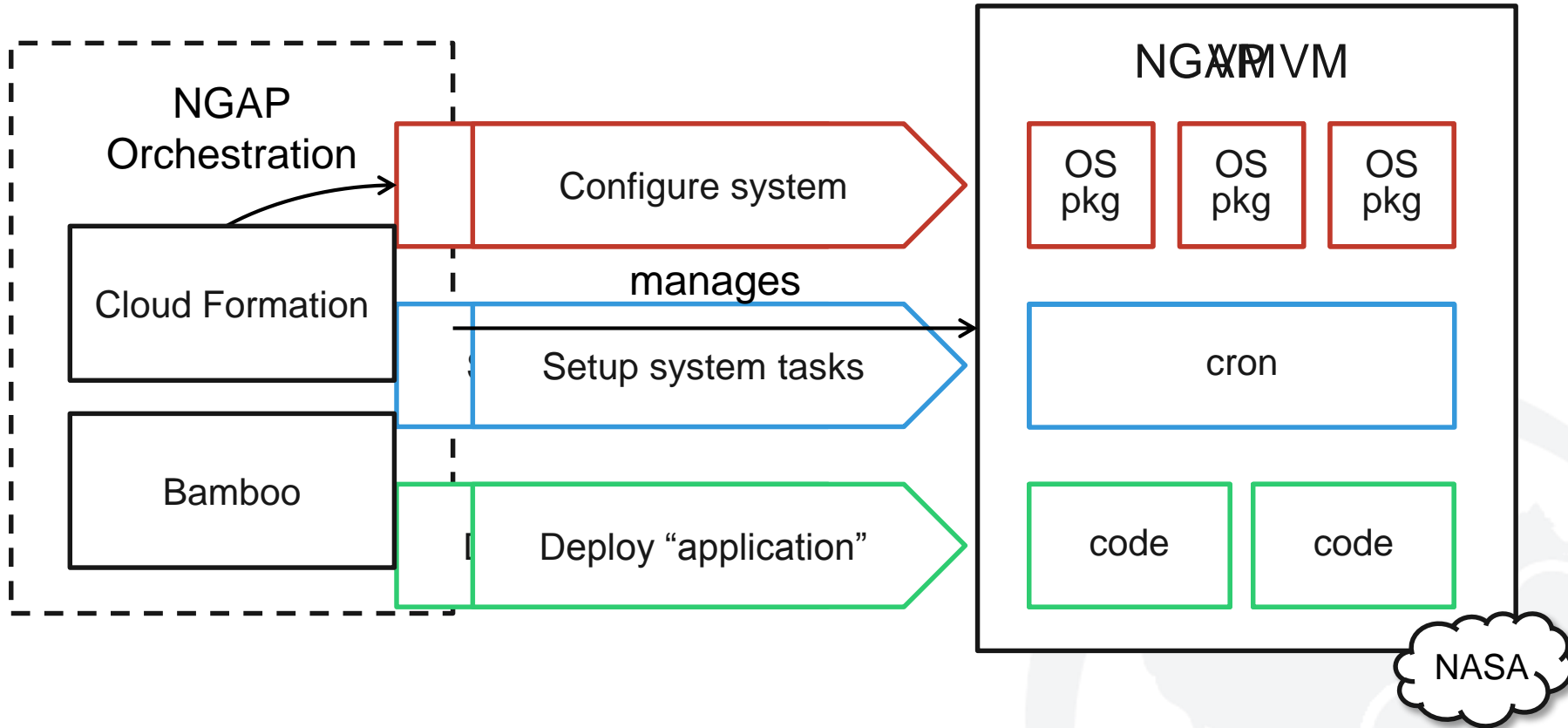


Forklifting: Not ideal, but sometimes necessary

ASF Pre-NGAP



ASF Today



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WHAT'S NEXT?

Identified Profiles

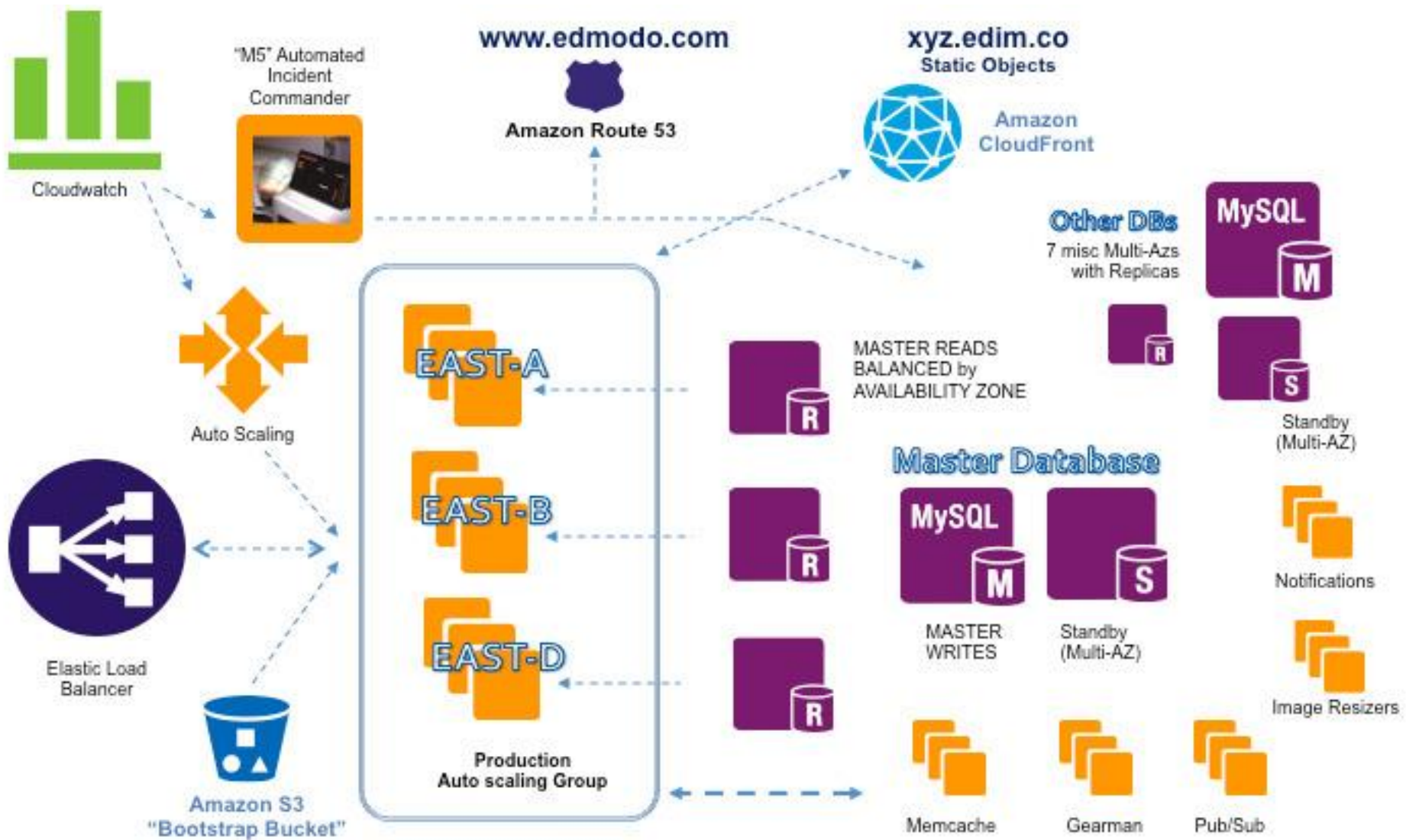
Application Profile	Required features
Baseline web application	SQL Database, background jobs, popular language
Persistent local storage	Fault-tolerant storage that survives instance reboots
Microservices	Private communication, complex deployment profiles
Reverse proxy control	Control of traffic at the router level
COTS Installation / Licensing	Static instances to allow licenses. Limitations in scaling.
Short lived compute jobs	Fast CPU and network, ephemeral storage, broad use
Legacy software	Obscure language and hardware support

For additional details, see <https://wiki.earthdata.nasa.gov/display/NGAP/Target+Application+Profiles>

Identified Applications

Application	Model, Profile, and Notable Features
ASF Web Objects Storage	IaaS, script-based, VMs, S3, and edge storage
Earthdata Search Client	PaaS, web application, Ruby on Rails, RDS, Node.js, AWS database migration service
CMR	Hybrid, Clojure API, ElasticSearch cluster, RDS (Oracle), AWS database migration service
Earthdata Developer Portal	PaaS, web application
Earthdata Website/CMS	PaaS, web application, Clojure/Ruby on Rails

For additional details, see <https://wiki.earthdata.nasa.gov/display/NGAP/Target+Application+Profiles>



* <https://aws.amazon.com/solutions/case-studies/edmodo/>

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QUESTIONS AND ANSWERS

What can I do to prepare?

- Development Best Practices
 - Thoughtful application testing
 - Don't do it twice; automate
- Deployment Best Practices
 - Configuration Management
 - (More) Automation
- Follow 12-Factor Principles
 - <http://12factor.net>



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