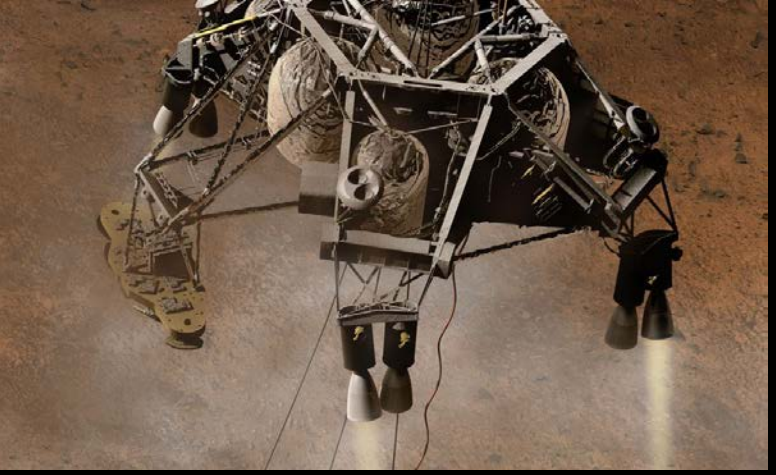
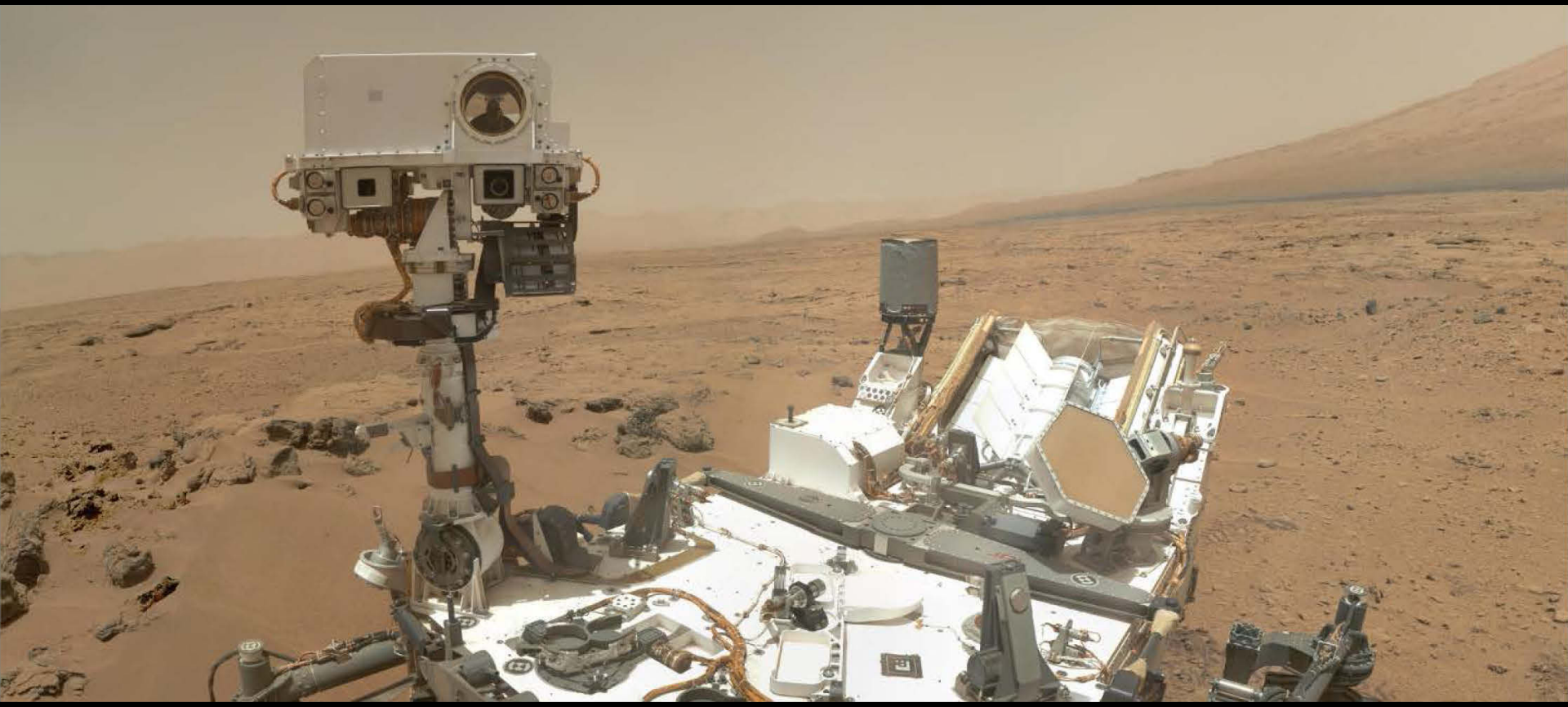
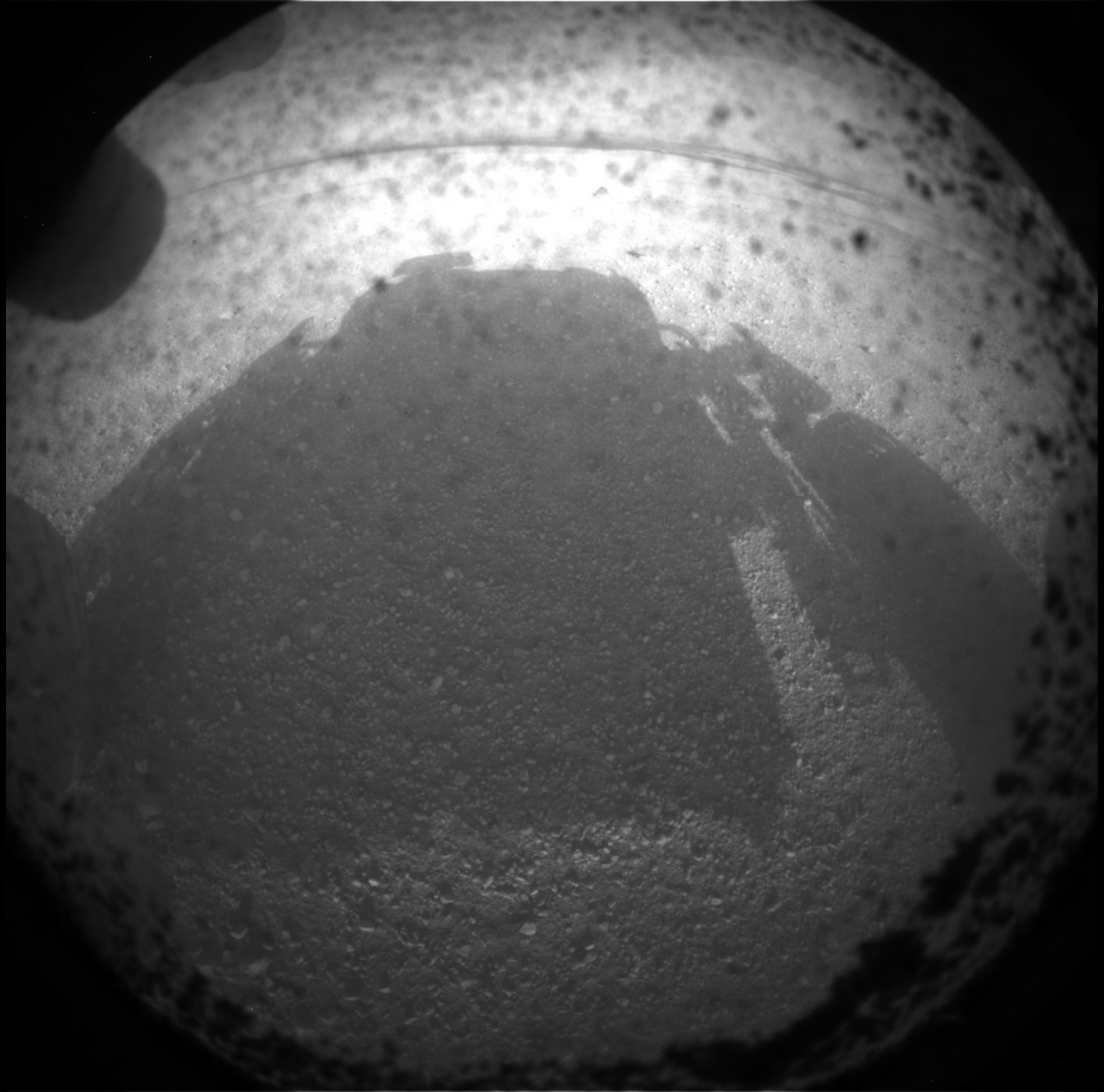


Mission Critical Cloud Computing in a Week

Jet Propulsion Lab
Caltech
Amazon Web Services

Brett George
Khawaja Shams
David Knight
Jamie Kinney





ELBs on Steroids

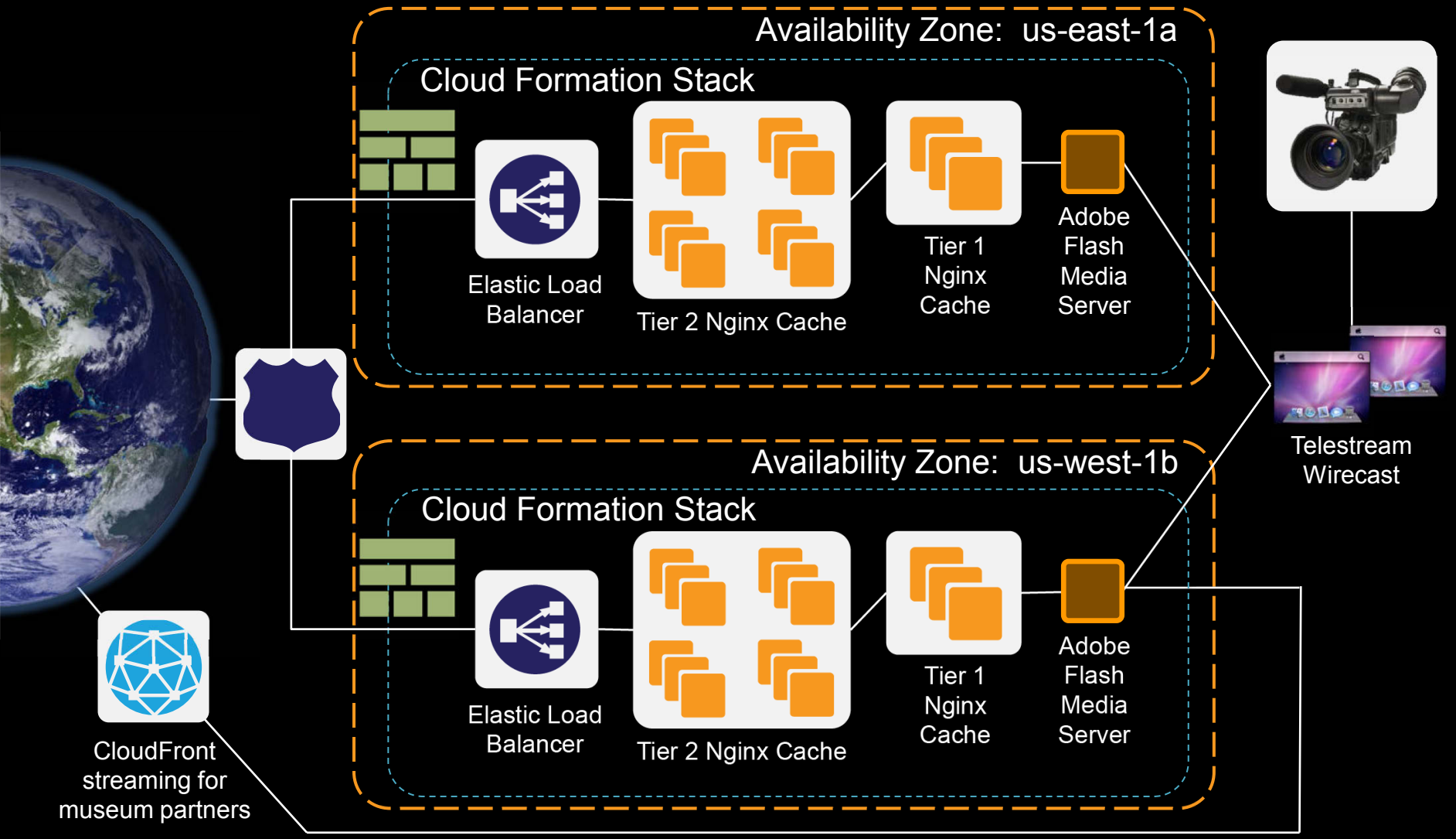
Route53

CloudFormation

Regions and AZs

ARCHITECTURE

Live Streaming Architecture



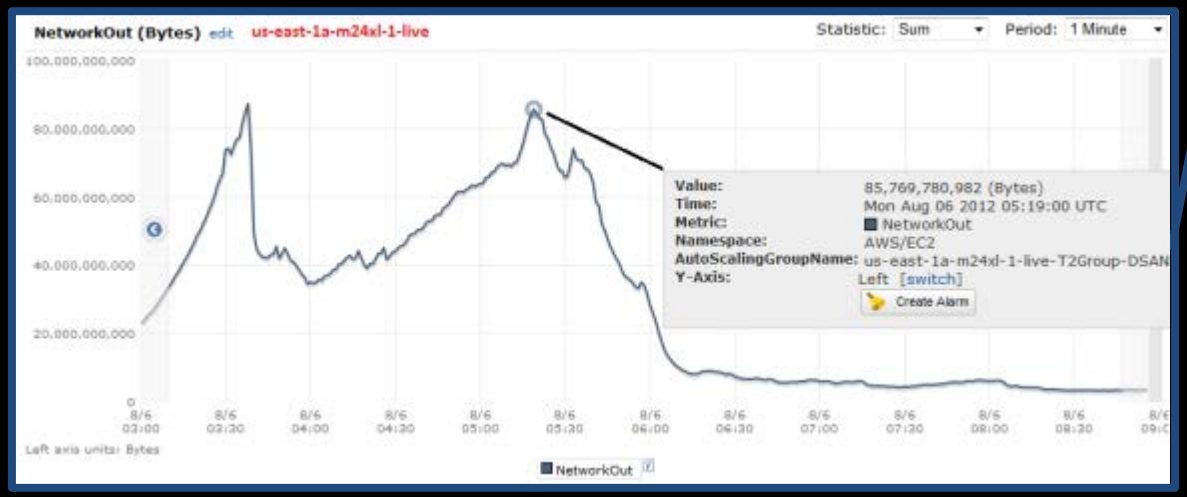
CloudWatch Monitoring

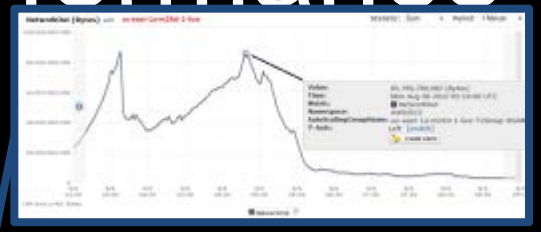
- Overview of ELB group performance
- Web Console provides basic visualization support
  - individual EC2 instances
  - auto-scale groups
  - ELBs
- Alarms

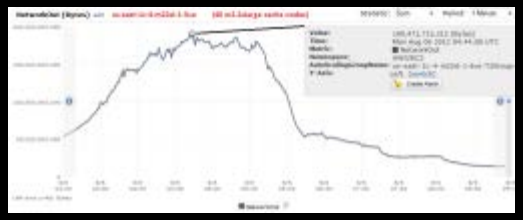
BATTLE TESTING

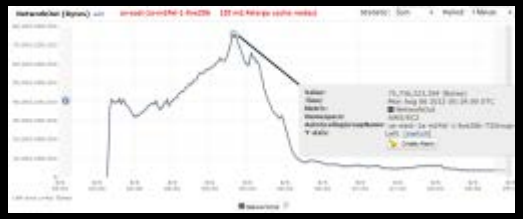
Benchmarking

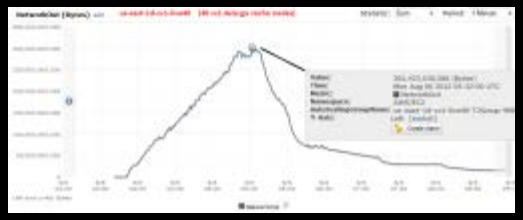
US-East Cache Node Performance

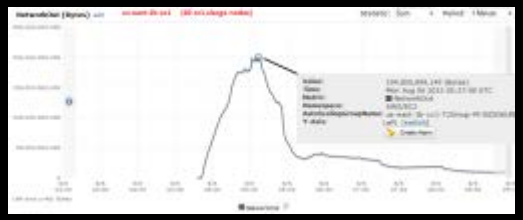






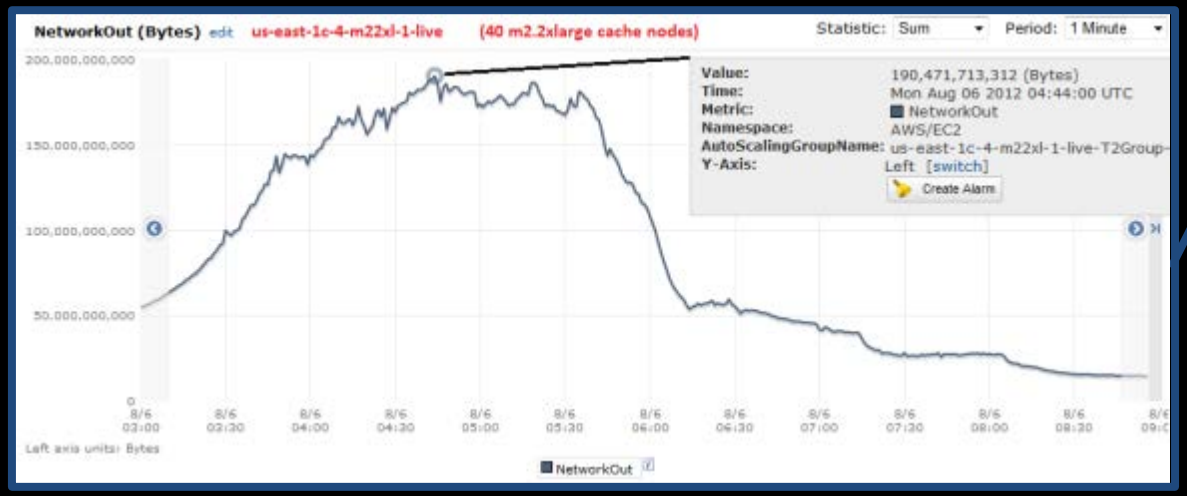


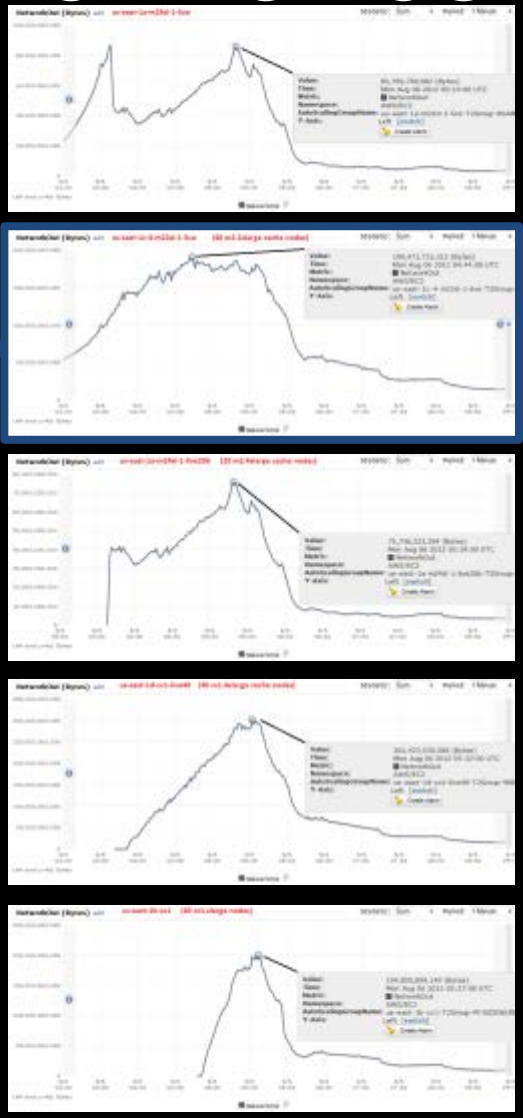




11.4 Gbps

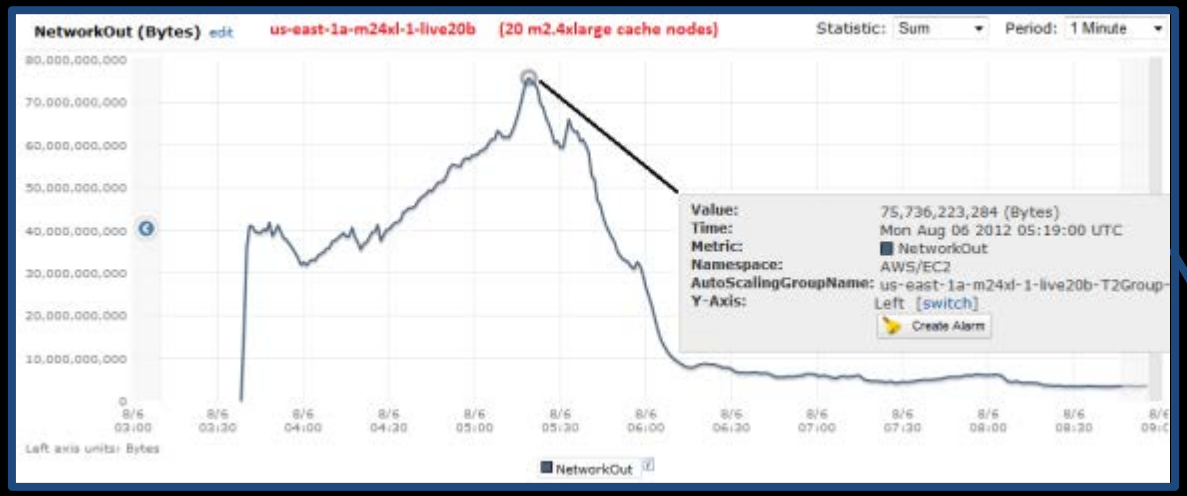
US-East Cache Node Performance

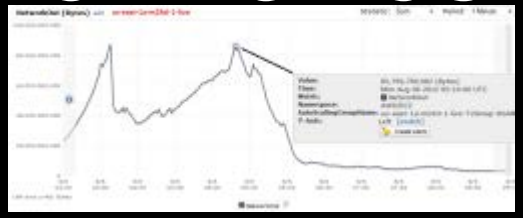


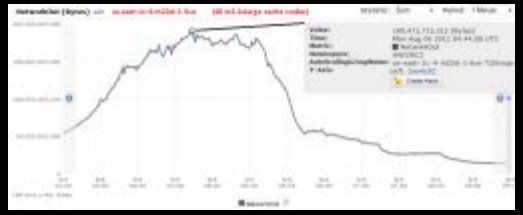


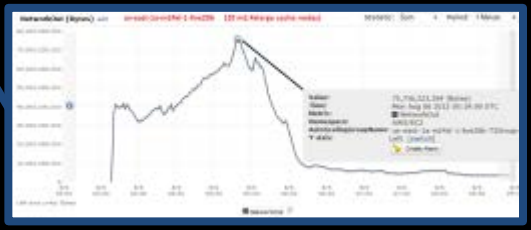
25.3 Gbps

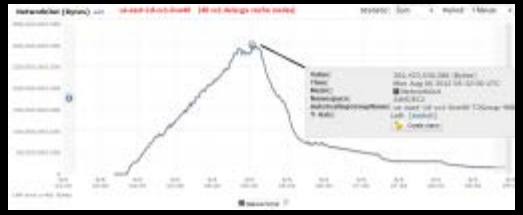
US-East Cache Node Performance

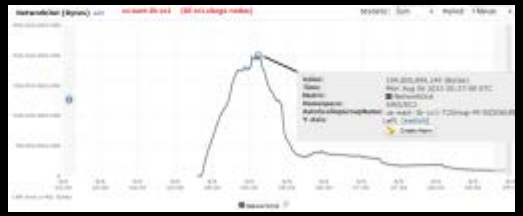






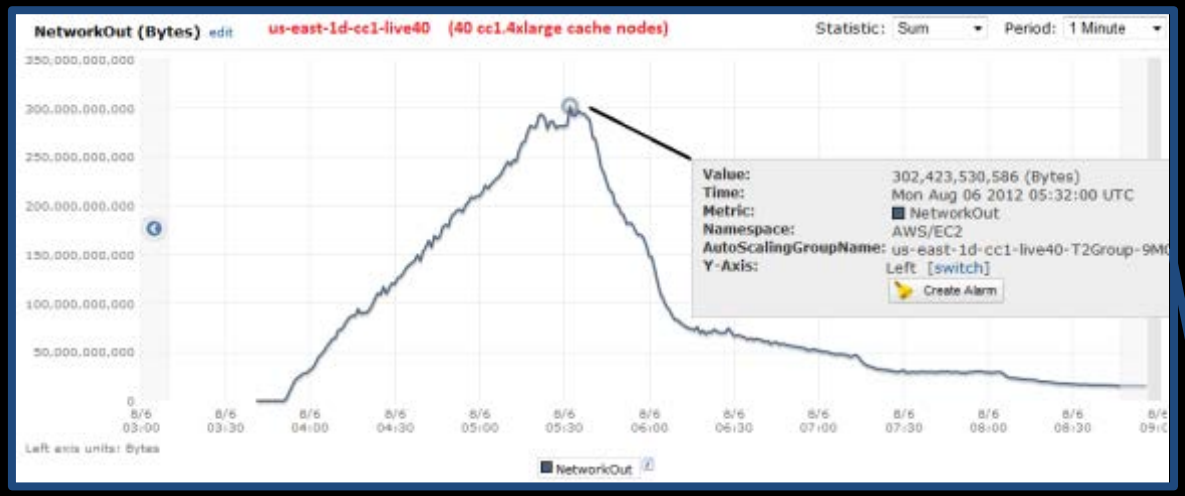


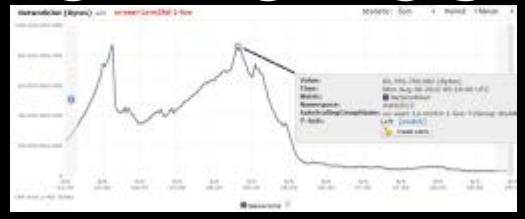


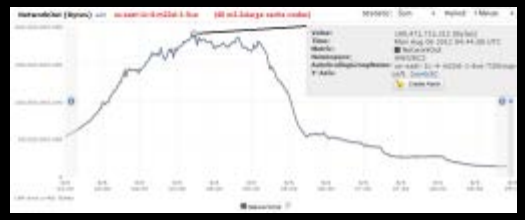


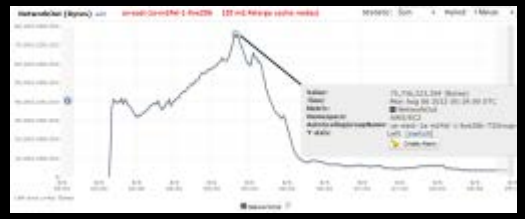
10.1 Gbps

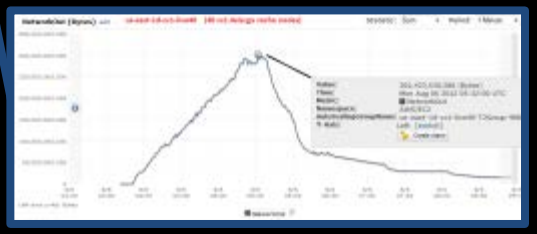
US-East Cache Node Performance

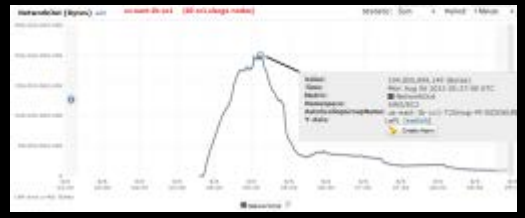






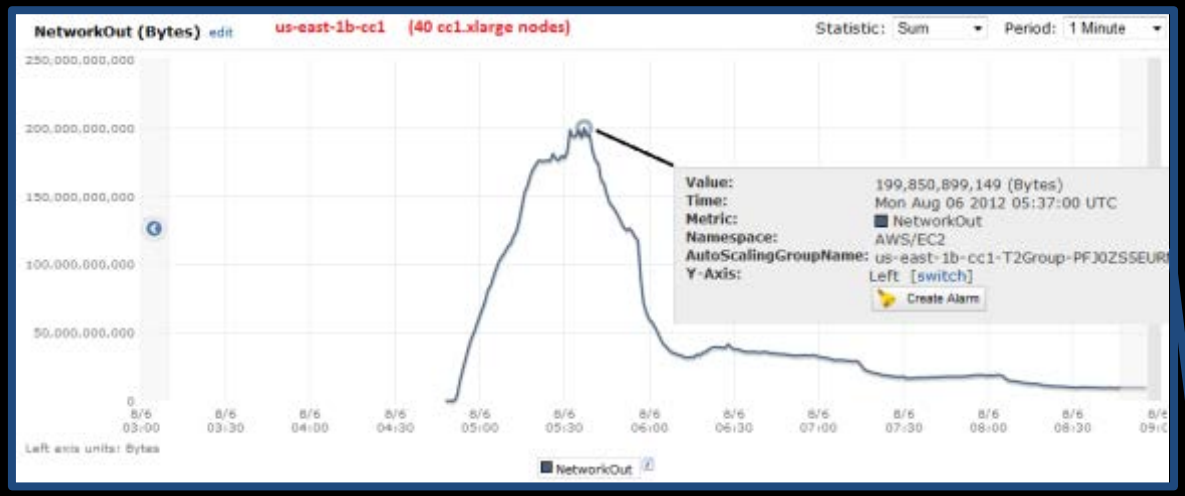


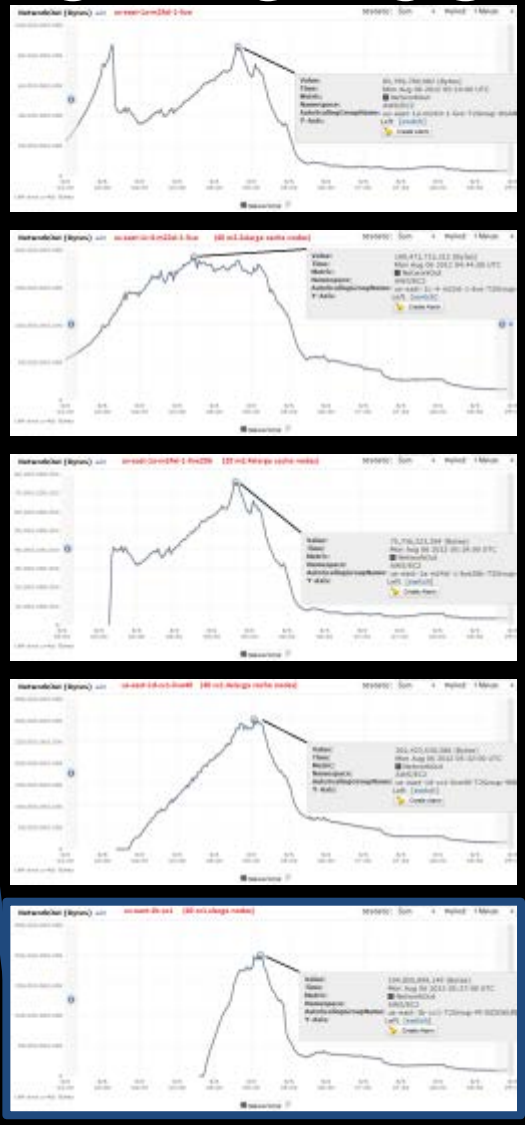




40.3 Gbps

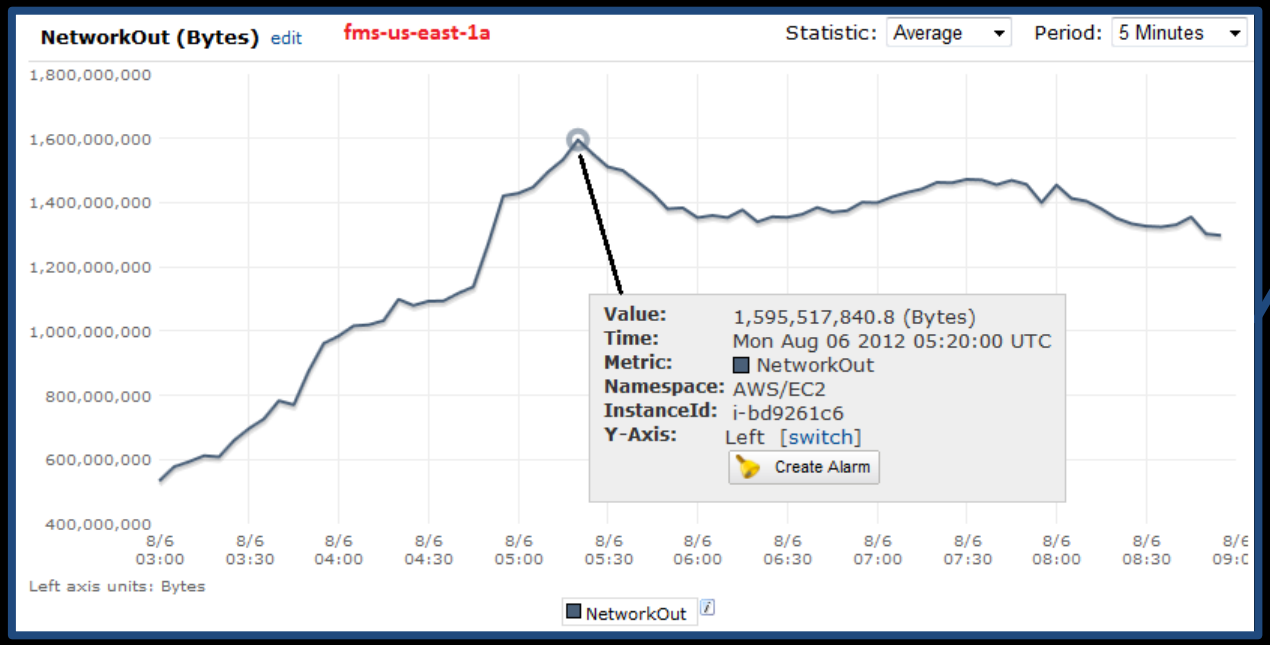
US-East Cache Node Performance

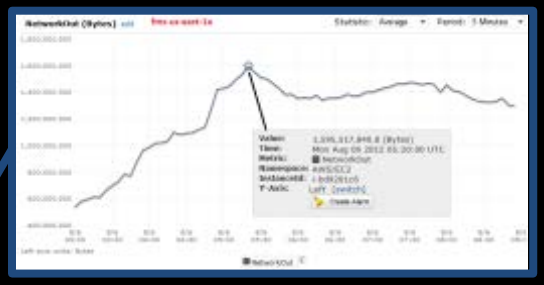


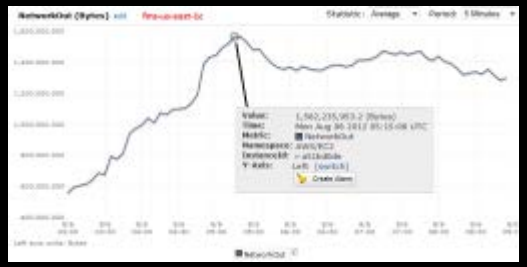


26.6 Gbps

Impact on US-East FMS Origin Servers

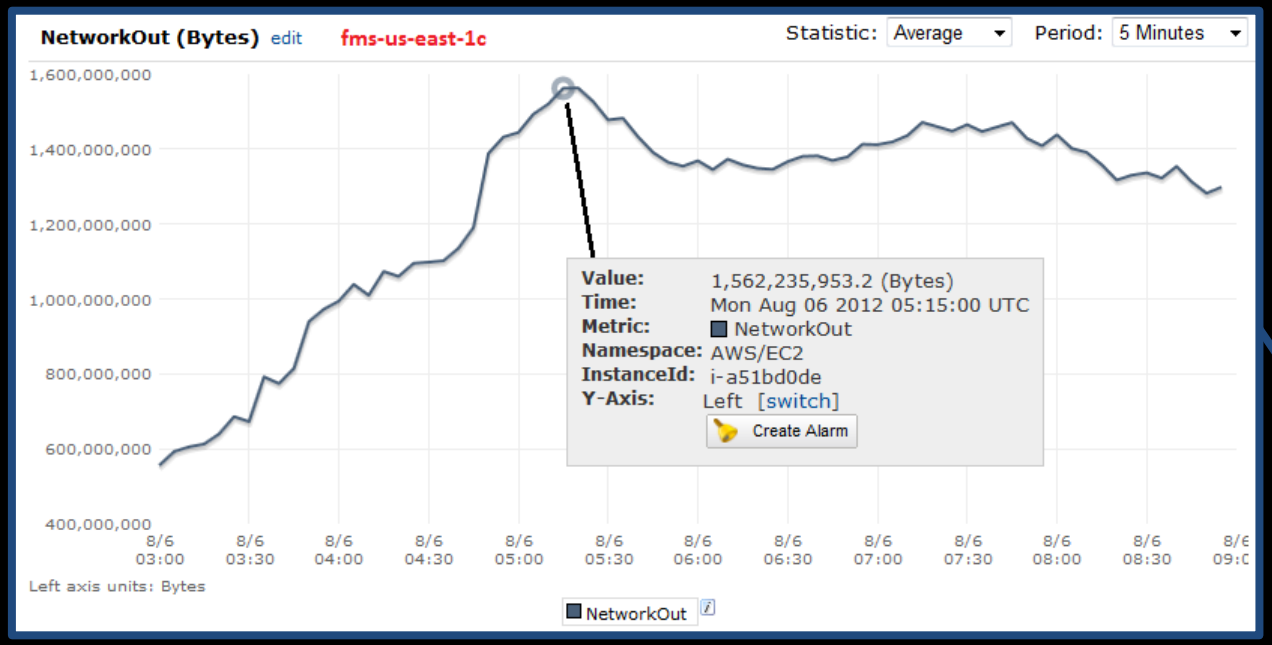


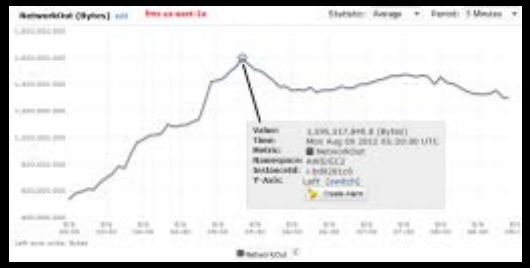


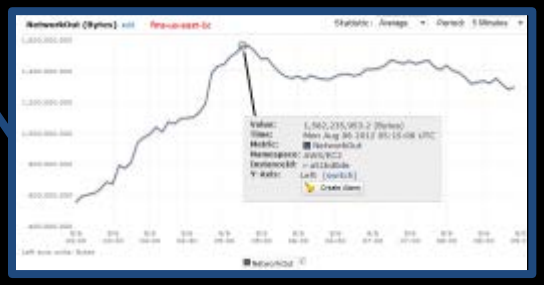


Only ~42Mbps

Impact on US-East FMS Origin Servers

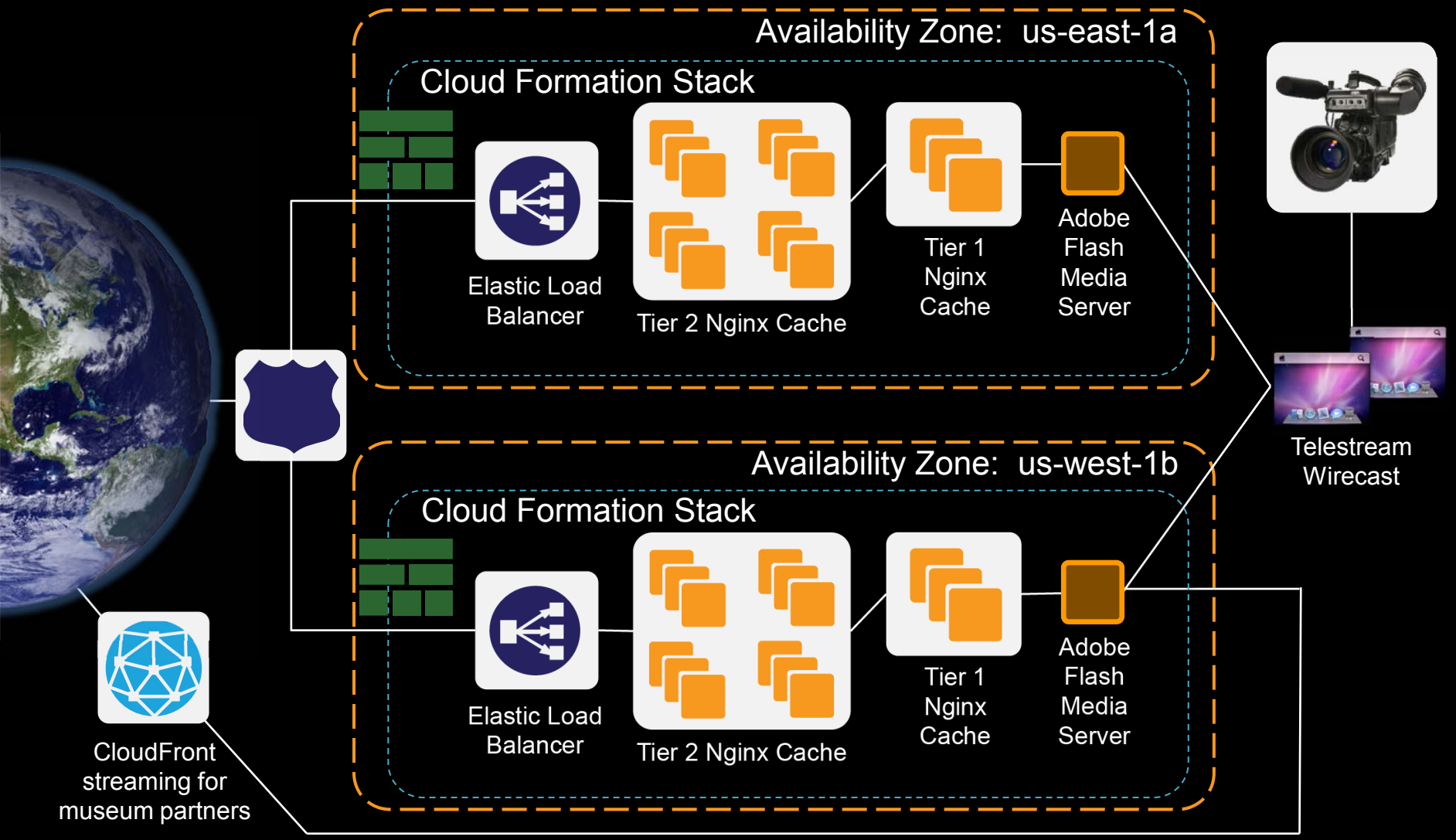






Only ~42Mbps

Live Streaming Architecture



Fun with CloudFront Behaviors

CloudFront: Distribution Settings

Back to Distributions | Help

General | Origins | **Behaviors** | Invalidations

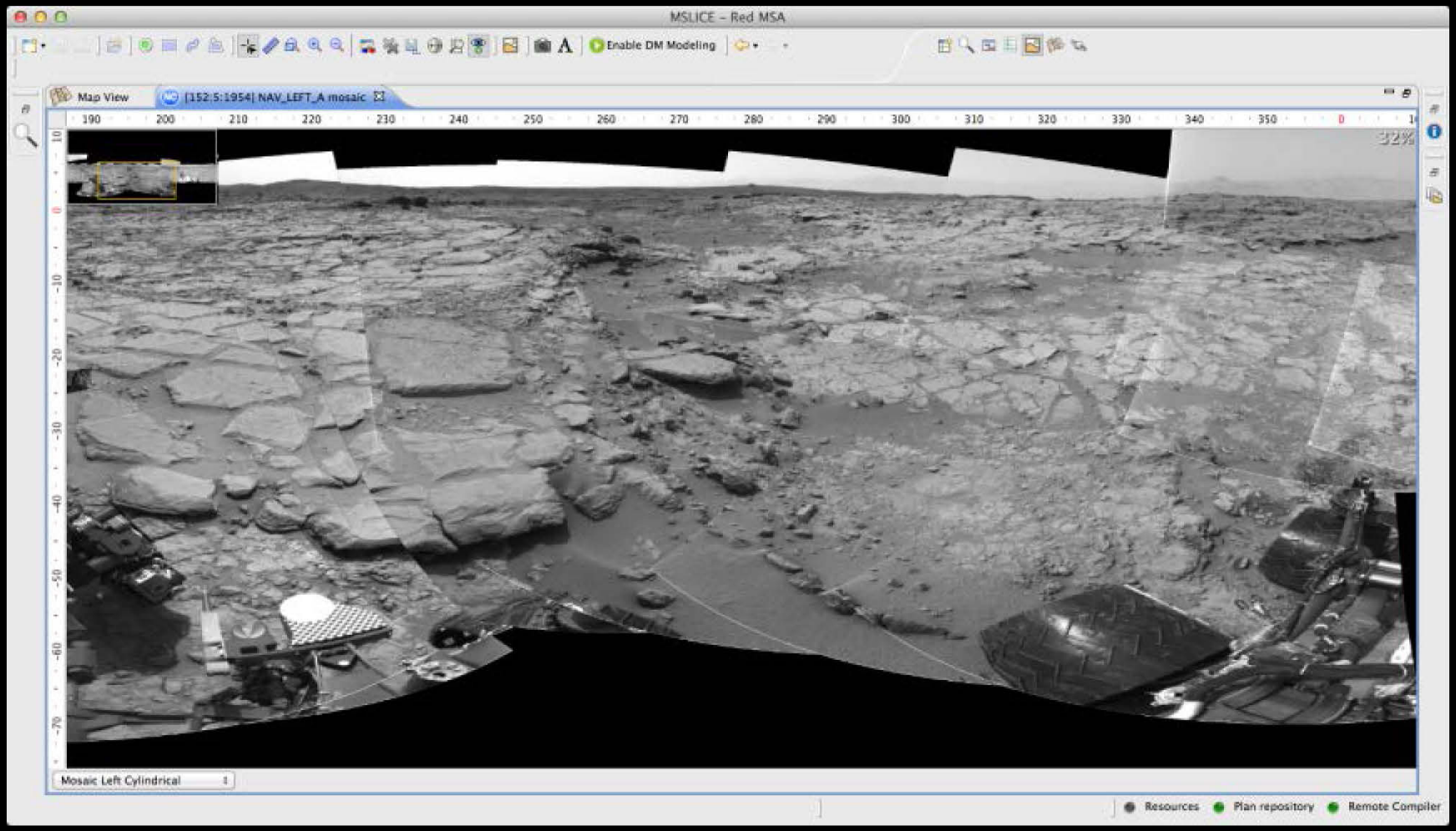
CloudFront compares a request for an object with the path patterns in your cache behaviors based on the order of the cache behaviors in your distribution. Arrange cache behaviors in the order in which you want CloudFront to evaluate them.

Create Behavior | Edit | Delete | **Change Precedence:** Move Up | Move Down | Save

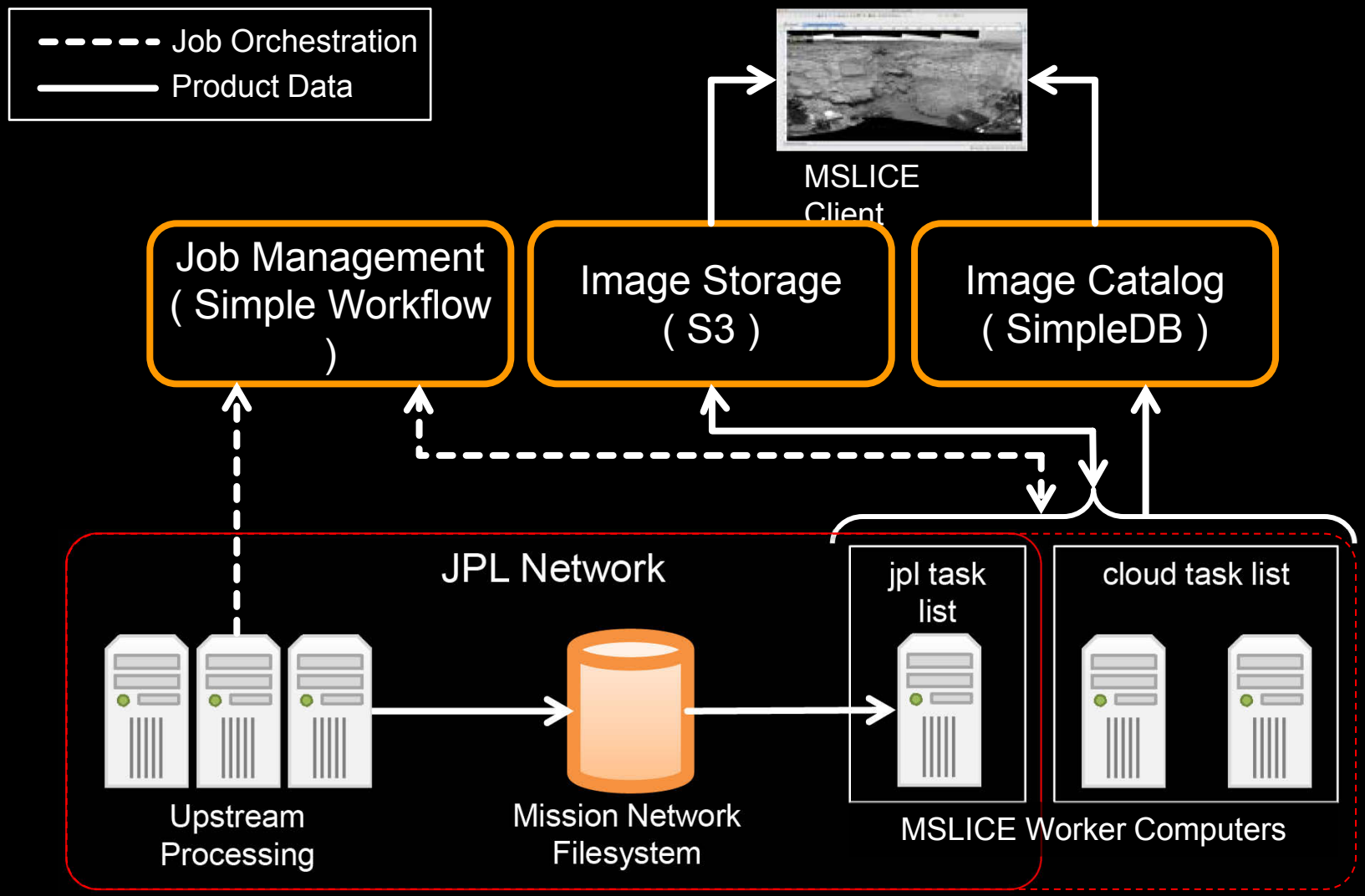
	Precedence	Path Pattern	Origin	Viewer Protocol Policy	Forwarded Query Strings	Trusted Signers
☐	1	/msl-raw-images/*	S3-msl-raws	HTTP and HTTPS	No	-
☐	2	/explore/*	S3-Website-exploremars	HTTP and HTTPS	No	-
☐	3	/multimedia/videos/movies/*	Custom-mars-jpl-nasa-gov.s3-website-us-west-1.amazonaws.com	HTTP and HTTPS	No	-
☐	4	/	Custom-mars-jpl-nasa-gov.s3-website-us-west-1.amazonaws.com	HTTP and HTTPS	No	-
☐	5	/msl/	Custom-mars-jpl-nasa-gov.s3-website-us-west-1.amazonaws.com	HTTP and HTTPS	No	-
☐	6	/msl/participate/	Custom-mars-jpl-nasa-gov.s3-website-us-west-1.amazonaws.com	HTTP and HTTPS	No	-
☐	7	/rss/json/videos.cfm	Custom-mars-jpl-nasa-gov.s3-website-us-west-1.amazonaws.com	HTTP and HTTPS	No	-
☐	8	/rss/json/images.cfm	Custom-mars-jpl-nasa-gov.s3-website-us-west-1.amazonaws.com	HTTP and HTTPS	No	-
☐	9	Default (*)	ELB-Prod-[redacted]-mars-ELB-[redacted]	HTTP and HTTPS	Yes	-

USING AWS FOR MISSION OPS

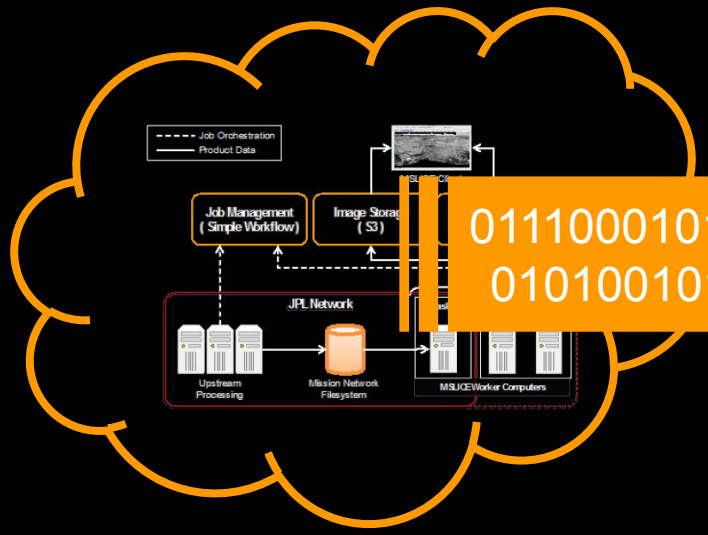
MSL InterfaCE



Data Ingestion Architecture



Final Destination



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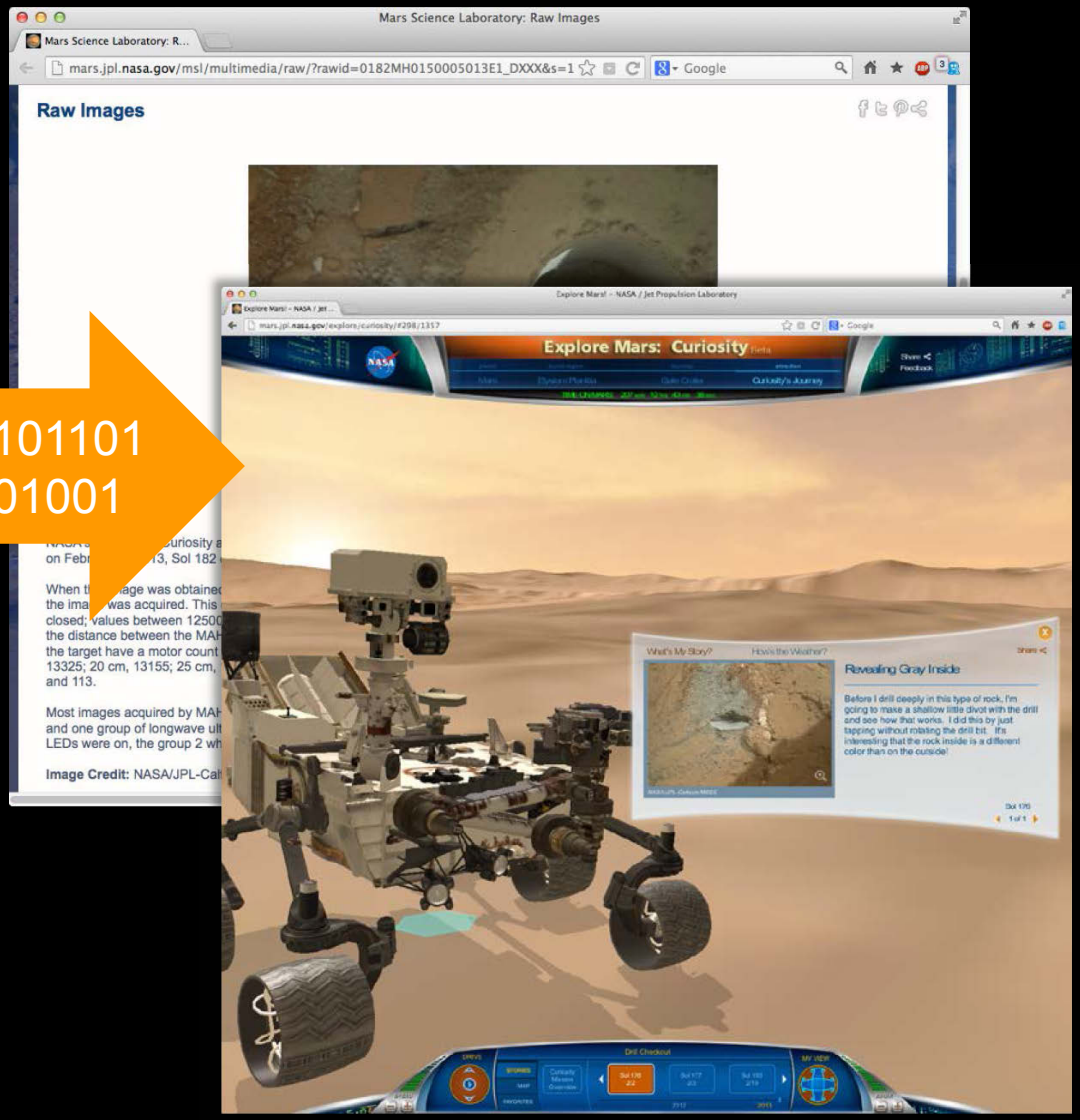

Enabling Space with the Cloud

Cost-effective, Scalable, Nimble

(use what you need, change things when you want to)

Durable Services for Mission Criticality

(lots of datacenters, lots of regions)

Simple APIs for Rapid Development

(make cool stuff quickly)