

OOI Cyber-Infrastructure

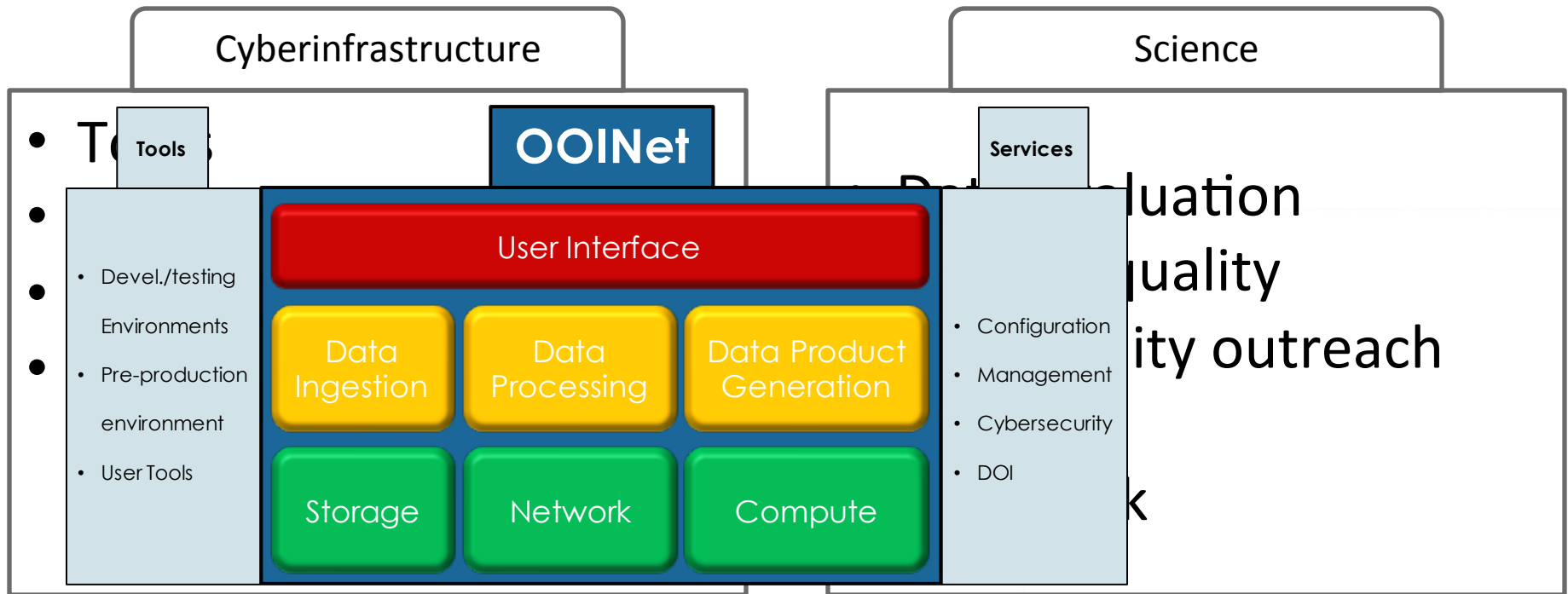
Manish Parashar

oceanobservatories.org

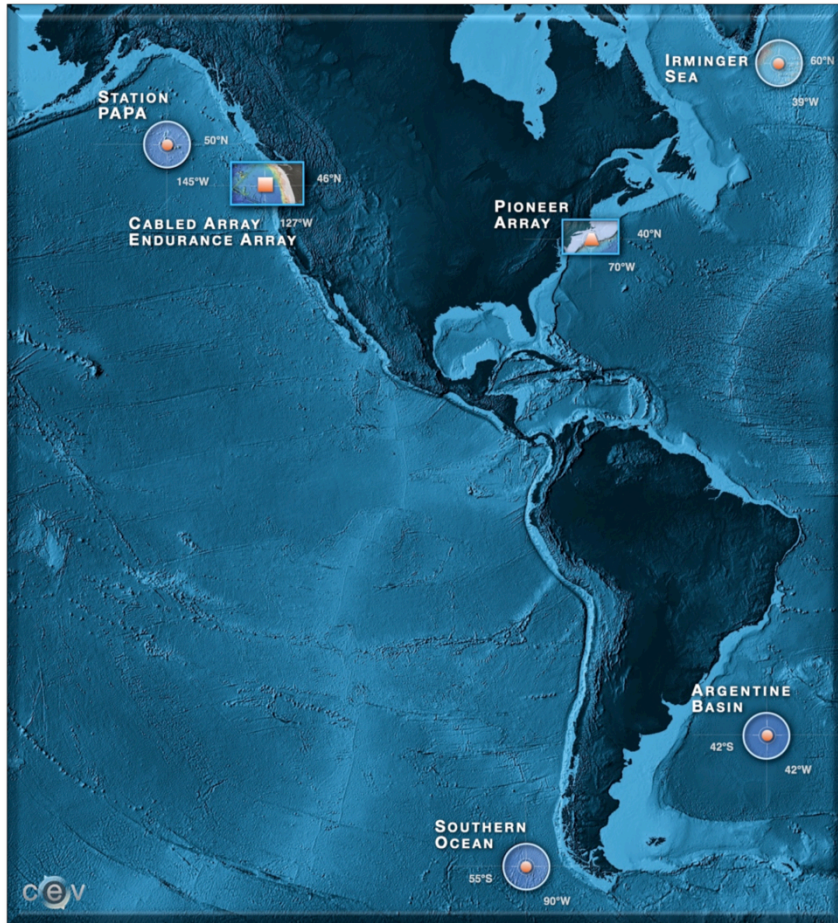


What is OOI CI?

System Overview



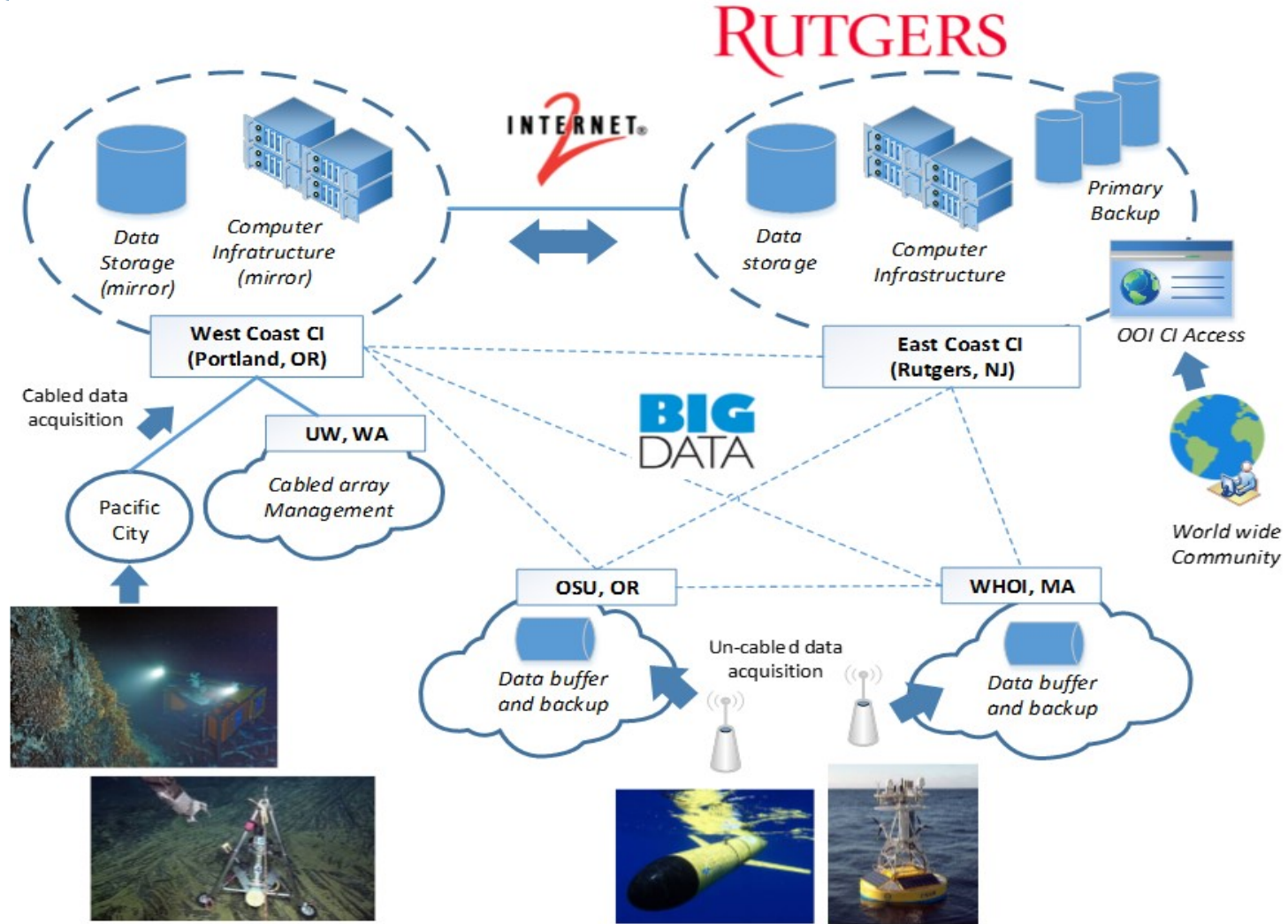
Overview of the CI



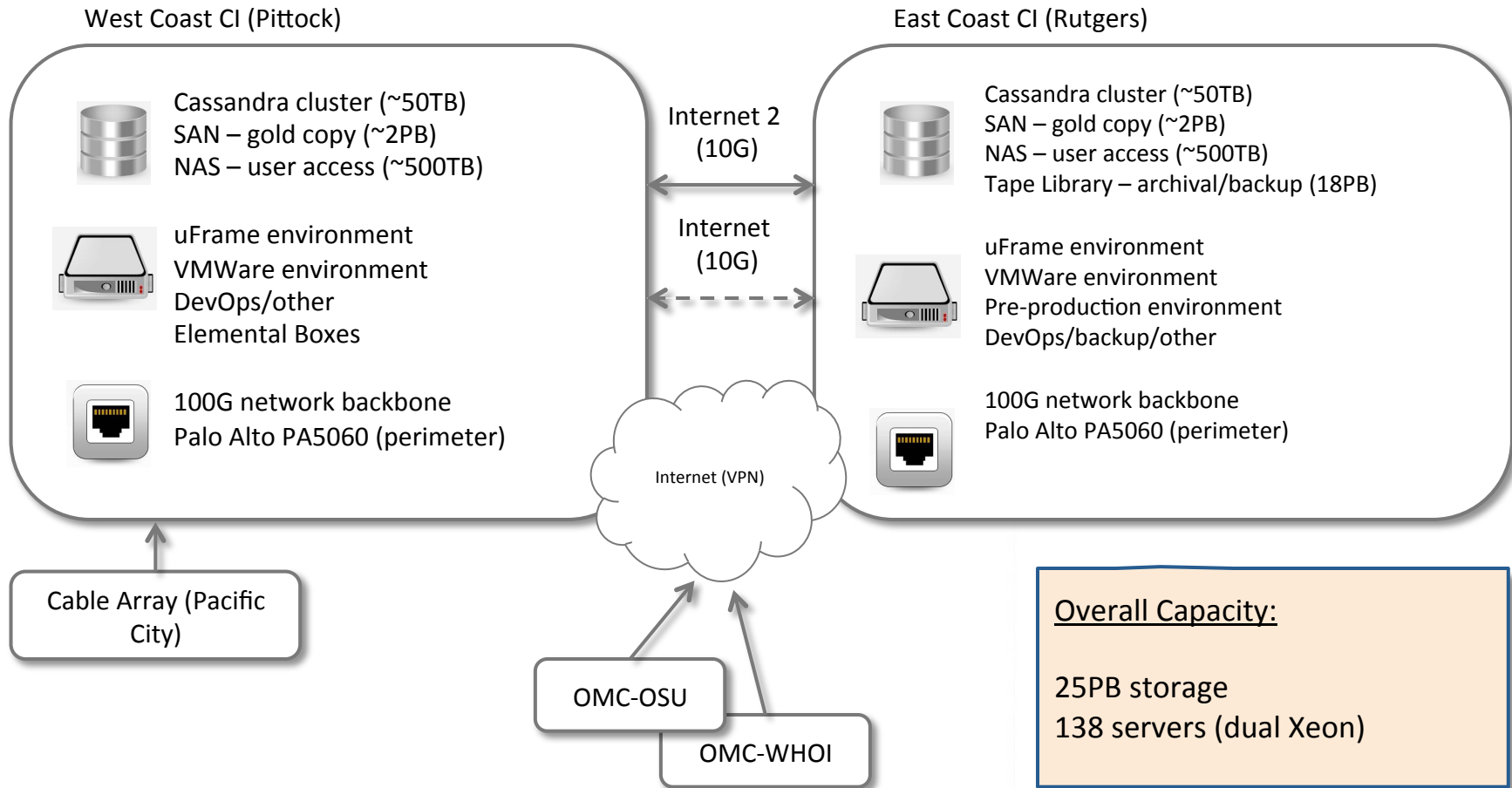
- Enterprise-level system and network architecture
- CI best practices
- Information lifecycle management
- 24/7 delivery of data & services
- Integrated software stack
- Configuration management
- Comprehensive monitoring and analytics
- Mirroring and fail-over
- Integrated cyber-security



OOI CI Overall Architecture



CI Systems – Summary



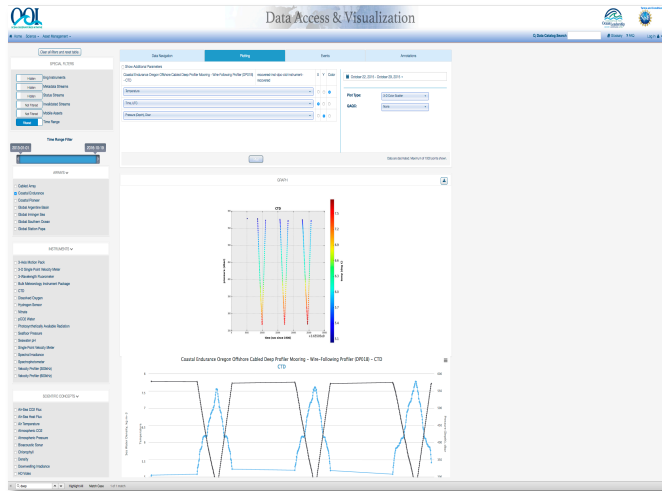
Estimated Data (Acquisition) Rates

	Data Rate		
Data Types	Peak Rate (Mb/s)	Nominal Storage/ Year(TB)	Max Storage/ Year (TB)
Cabled Drivers	0.15	0.558	0.60
Un-cabled Drivers	0.44	69.615	70.01
Video/Images	1,945.52	32.809	7,669.25
Antelope	58.42	230.27	230.27
Overall	2,004.54	333.26	7,970.15

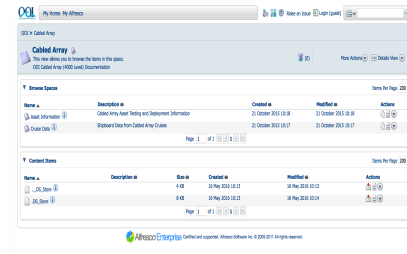


Integrated Software Stack

OOI Data Portal + M2M



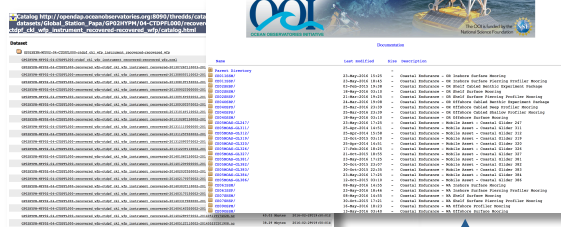
oceanobservatories.org



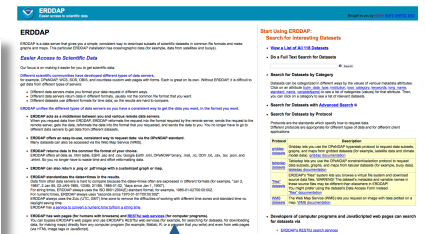
Alfresco
(cruise and
doc CM)

THREDDS

Raw data



ERDDAP



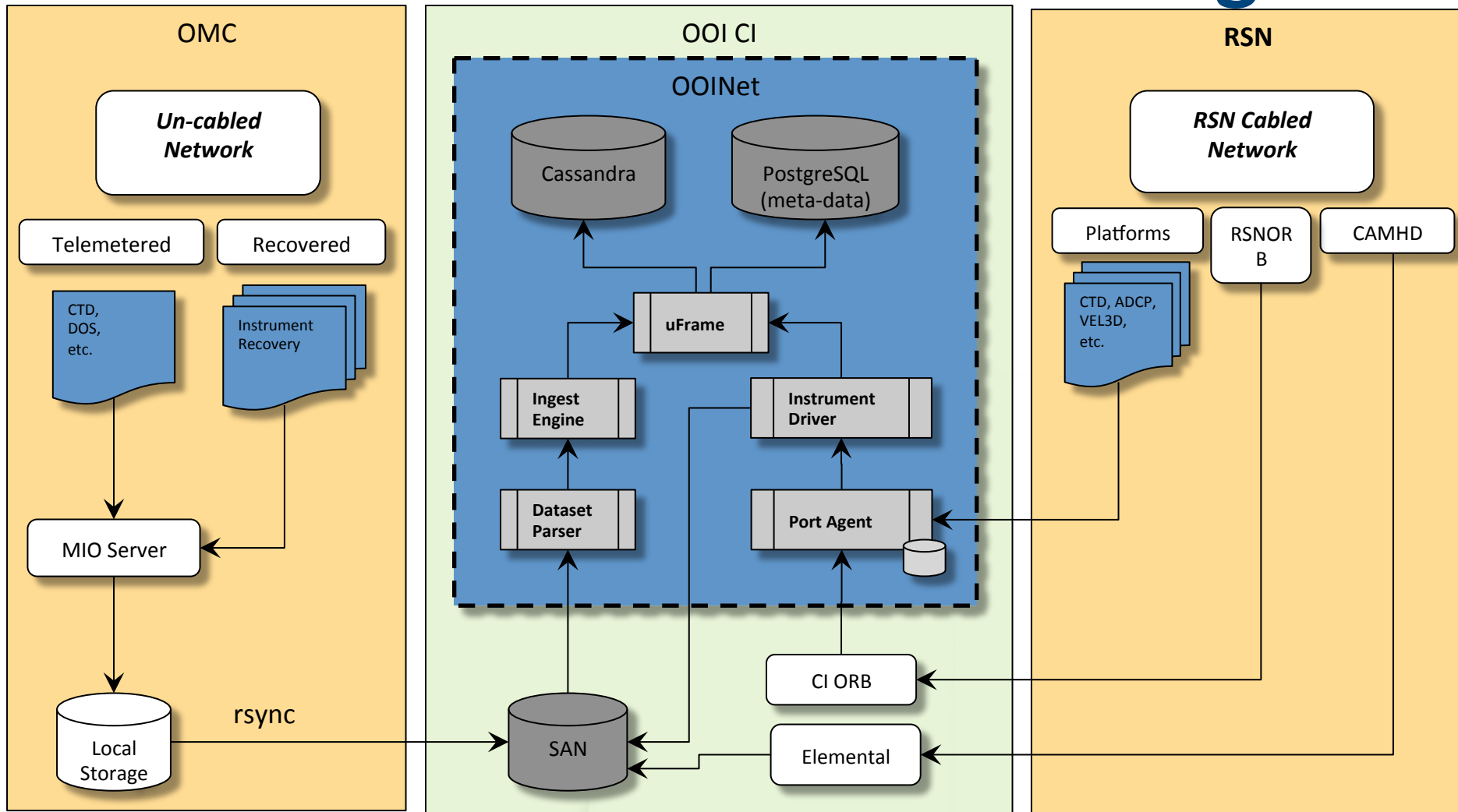
uFrame Service-Oriented Infrastructure

OOINet

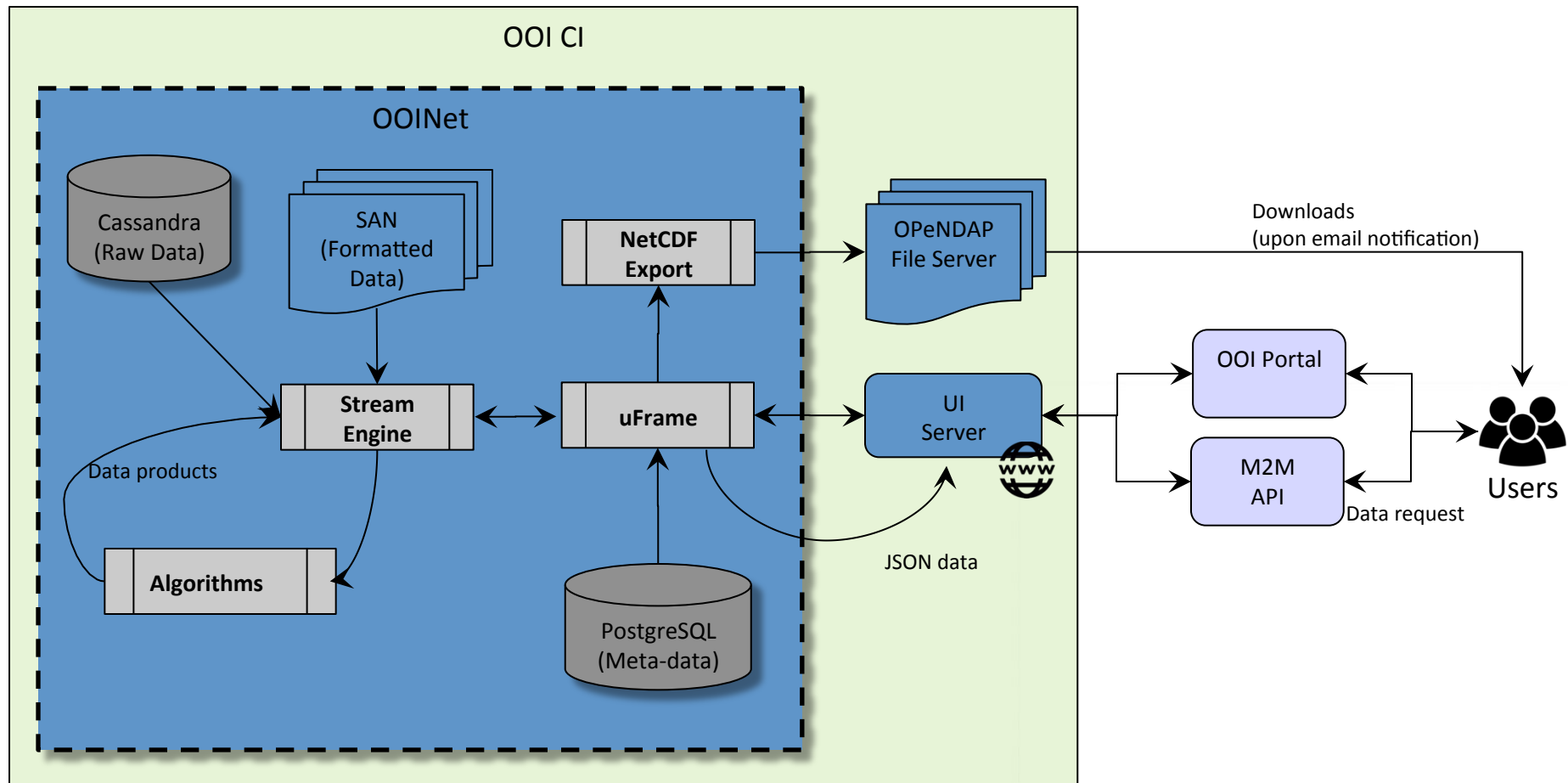
OOI Data



uFrame-based OOINet - Data Ingest



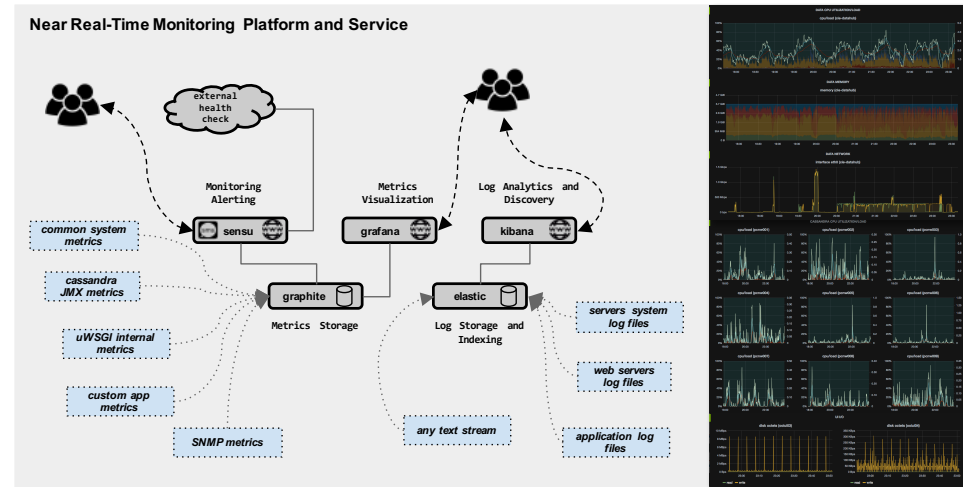
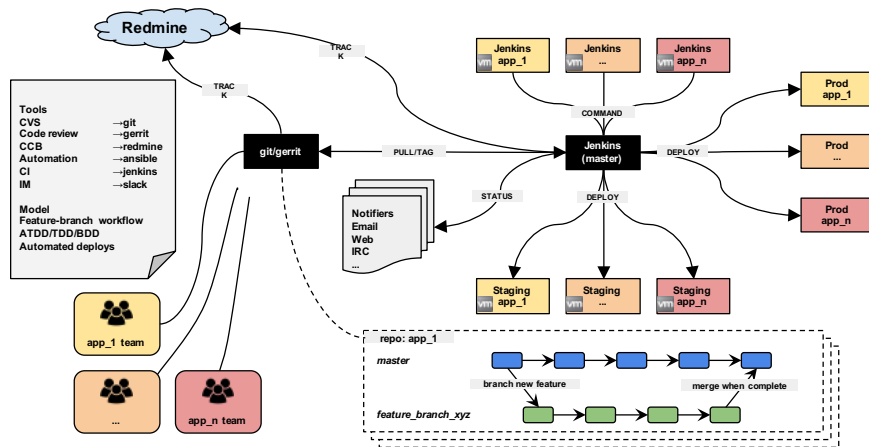
uFrame-based OOI Net – Plotting and download



On-demand data product generation

Other CI Integrated Services

- Configuration management
 - Code review
 - Continuous integration system
 - Change control
 - Automation
- Comprehensive monitoring
 - Metrics visualization
 - Log analytics and discovery
 - Health check
 - Alerting system



Leverage industry best practices

Cyber-security Overview

- Implementation
 - Redundant perimeter firewall appliances in all sites
 - VPN IPSec tunnels across all sites
 - Two-factor authentication
 - Federated Identity Management
- 778 attacks mitigated in Q1, 2017
- Cyber-security Program
 - Engagement with NSF Center for Trustworthy Scientific Cyberinfrastructure (CTSC)
 - Maintains policies and procedures (12+ documents)
 - Cyber-security scans/audits
 - Leverage Rutgers' policies and protocols
 - Training activities

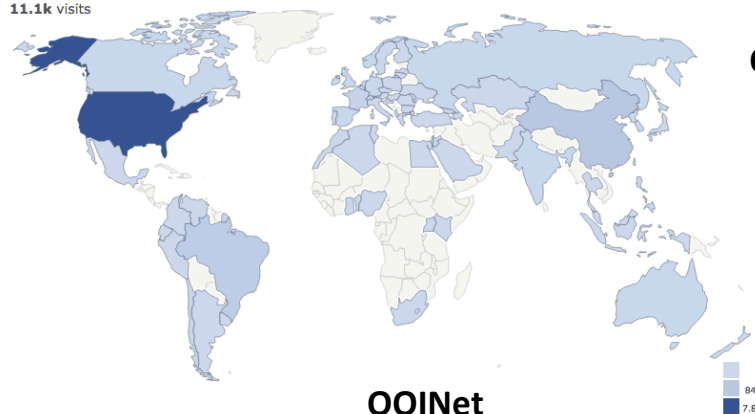


Data Download Statistics

(2nd half 2016)

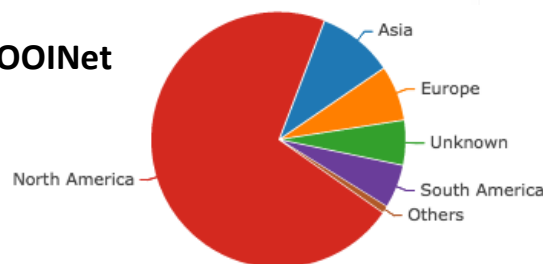
	OOINet (UI Portal)	THREDDS Server	Raw Data Server
Visits	13,919	2,534	10,409
Distinct countries	86	36	50
Direct entries	10,568 (76%)	2,243 (89%)	9,188 (88%)
Search engines	123 (1%)	50 (2%)	10 (<1%)
From websites	3,228 (26%)	241 (10%)	1,211 (12%)
Distinct websites	95 (337 distinct URLs)	11 (66 distinct URLs)	16 (82 distinct URLs)
Data transferred	48.51 GB	168.58 GB	35.14TB

11.1k visits

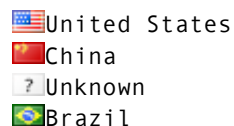


OOINet

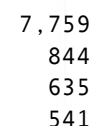
OOINet



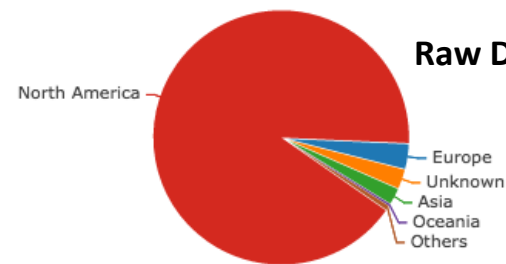
Country



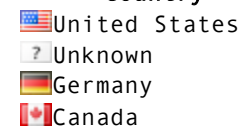
Visits



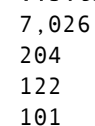
Raw Data



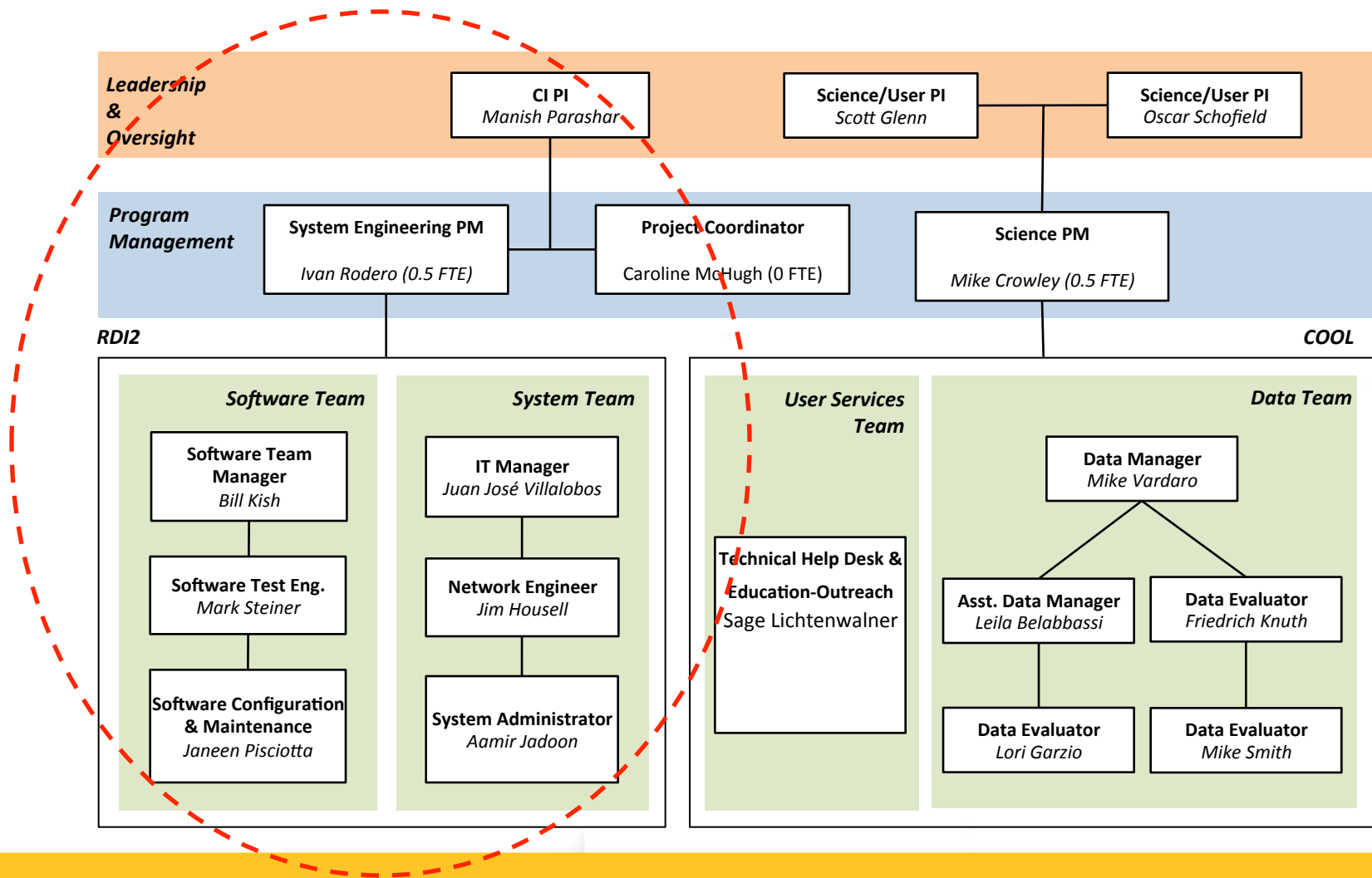
Country



Visits



OOI CI Teams



Thank You!



facebook.com/rutgersRDI2



[@RDI2_rutgers](https://twitter.com/RDI2_rutgers)



rdi2.rutgers.edu

