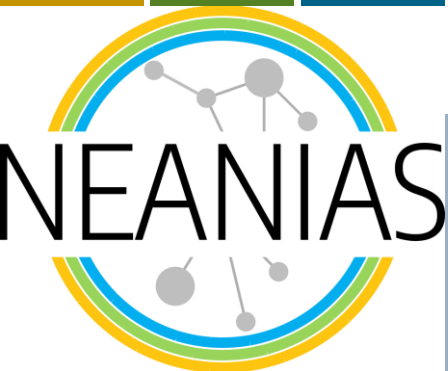


NEANIAS Accounting Service

Accounting Information Aggregator

Giorgos Papanikos (CITE) - gpapanikos@cite.gr



Novel EDSC Services for Emerging
Atmosphere, Underwater & Space
Challenges

NEANIAS receives funding from
European Union under Horizon
2020 Research and Innovation
Programme under grant
agreement No. 863448



The need

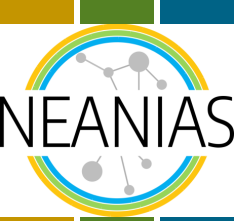
- › Ubiquitous challenge
 - Discover how a service is being used on the field
 - Single point of reference for KPI collection
 - Design & Validate billing schemes
 - Help define and evolve the service roadmap
- › Prefer not to disrupt operation
 - Ideally, not even the codebase
- › As a Service

Service
Provider

- How much CPU time has one user occupied the system
- How many invocations per day by a particular user
- How much short-term storage is used by a user

Service
User

- What interactions I had with a specific service
- Where did I spend my Quota



NEANIAS Accounting Service

- › NEANIAS Accounting service
 - Centrally register accounting information
 - Gradually accumulate through service usage
 - Configuration and log-processing based integration
 - Authorized access and separation of data
 - Distributed and scalable across all layers
 - › Data storage
 - › Processing
 - › Visualization
 - Offered as a Service

Usage

- › Information sink
- › Aggregate
- › Visualize / Report
- › Drive BI
- › Non- disruptive
- › As a Service

Technical

- › Reusable
- › Portable
- › Scalable
- › Cloud-native

Data Model

- › Per Service Provider – diverse accounting needs & targets
- › Data Model – Generic enough to be usable / Specific enough to be valuable

Field	Mandatory	Description
Timestamp	Yes	The timestamp of the event
Start/End Time	No	Start / End timestamps for the event
Service Id	Yes	Global unique identifier for the producing service
Resource	Yes	The resource the action accounts for
Action	Yes	The action performed on the resource
User (delegate) Id	Yes	The on whose behalf / delegate to perform the action
Measure	No	The measure being accounted e.g. time(ms), information(mb), throughput (mb/sec), unit
Value	No	The measure value / weight
Type	No	Operation towards measure calculation e.g. additive (+), subtractive (-), rebasing (0)
Comment	No	Textual comments to accompany the accounting entry

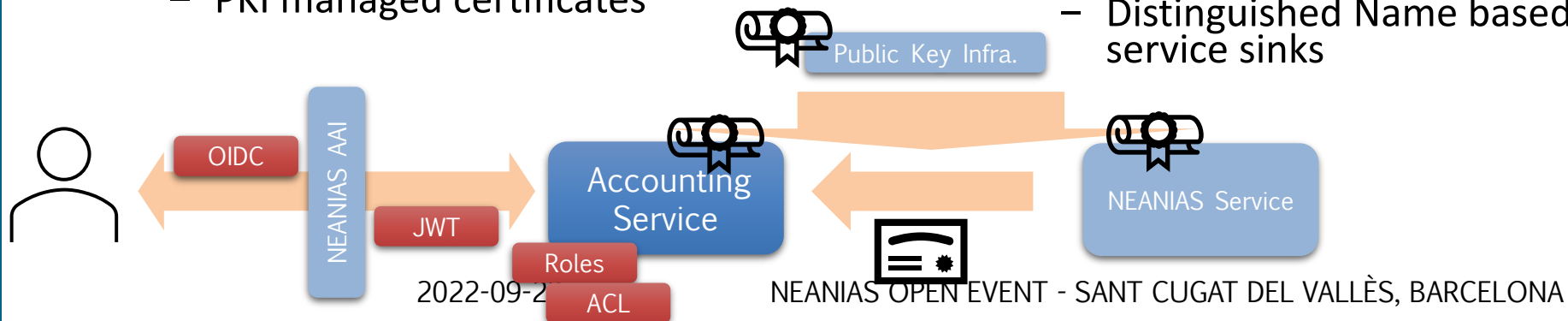
Securing the Access

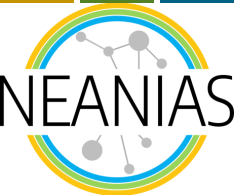
AUTHENTICATION

- › End-user
 - OpenID Connect
 - NEANIAS AAI – Authorization Code grant flow
- › Service to Service API integrations
 - OpenID Connect
 - NEANIAS AAI – Client Credentials grant flow
- › Data Aggregation
 - Using client certificates
 - PKI managed certificates

AUTHORIZATION

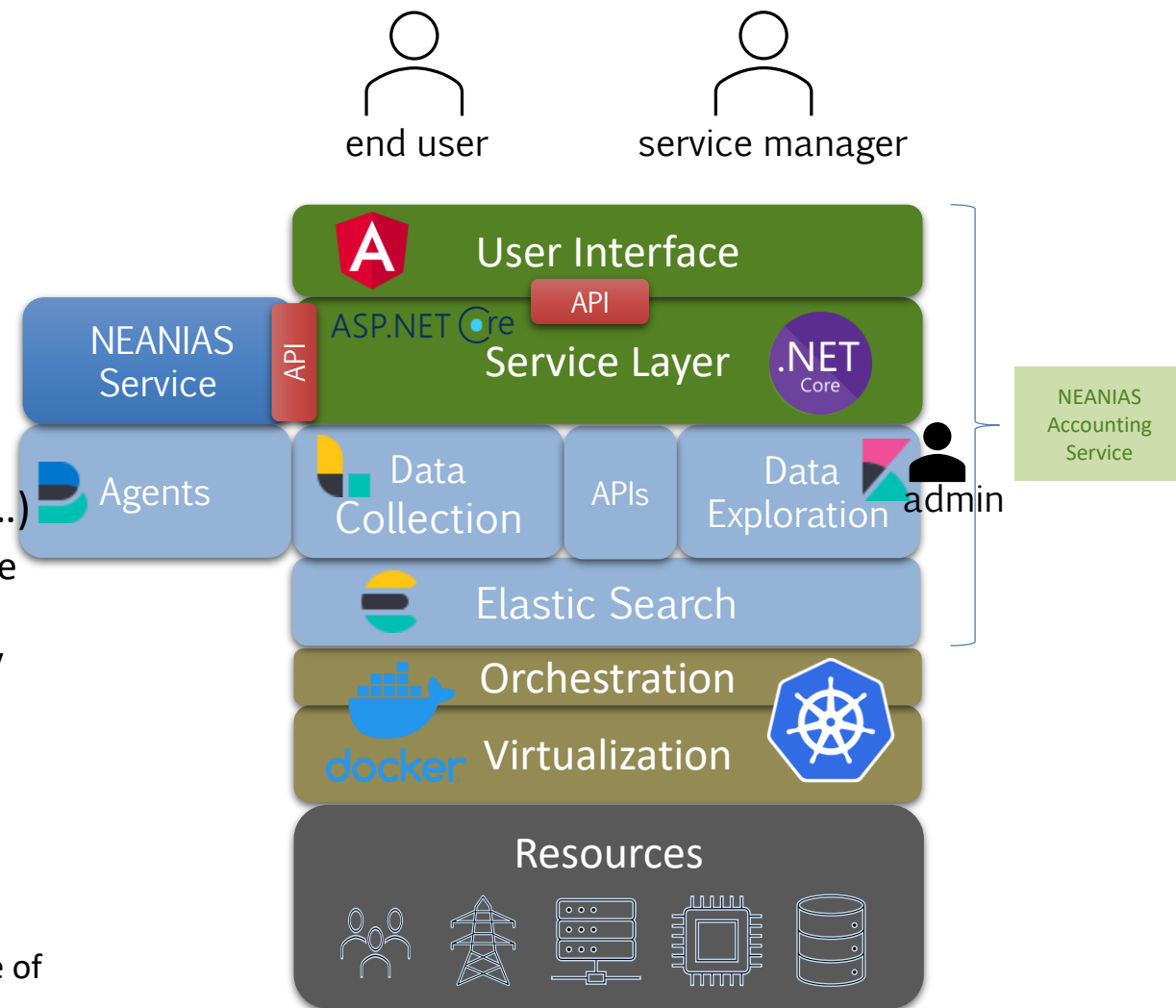
- › End-user
 - NEANIAS AAI – RBAC
 - Service internal – resource specific ACL
 - Personal accounting content available for all authenticated users
- › Service to service
 - Role & ACL based
 - Uniform approach
- › Data Aggregation
 - Client certification based
 - Distinguished Name based mapping to service sinks

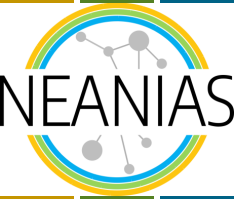




Technology Overview

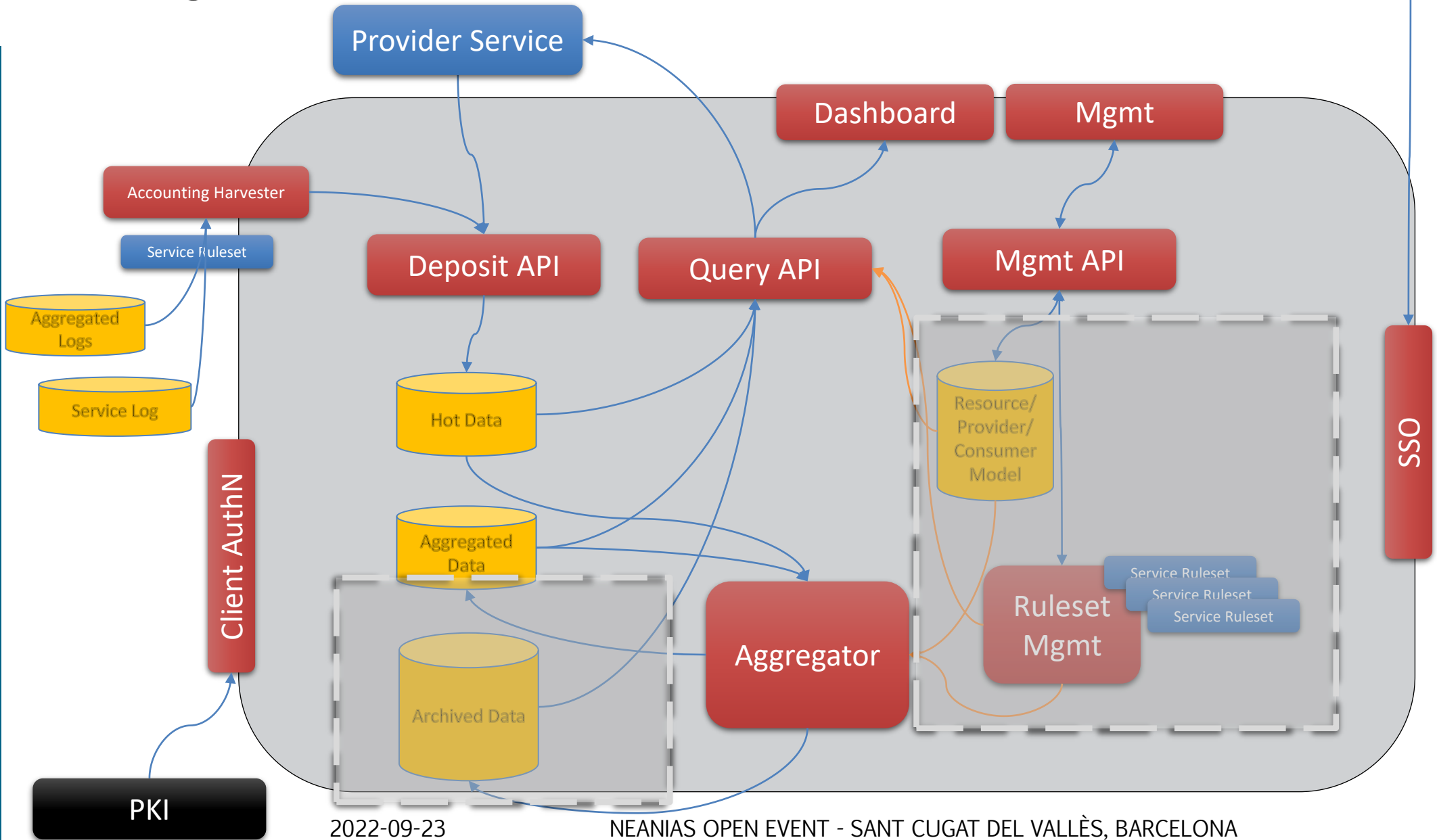
- › Backed by a high performant NoSQL data store
 - Aggregate and track accounting information
 - Investigating moving to OpenSearch
- › Distributed – Collection, Pre-processing & transformations, Storage, Processing
- › Scaling – Vertical & Horizontal
- › Data Folding & Accumulating indicators (coming...)
 - Information gradually eligible to be folded to create aggregations
 - Ensure long-term performance and maintainability
- › Fan-out – Trusted services spreading accounting info
 - e.g. AAI on behalf of targeted services
- › Supporting policy enforcement (coming...)
 - Run-time decision making, throttling or altering the scope of user requests





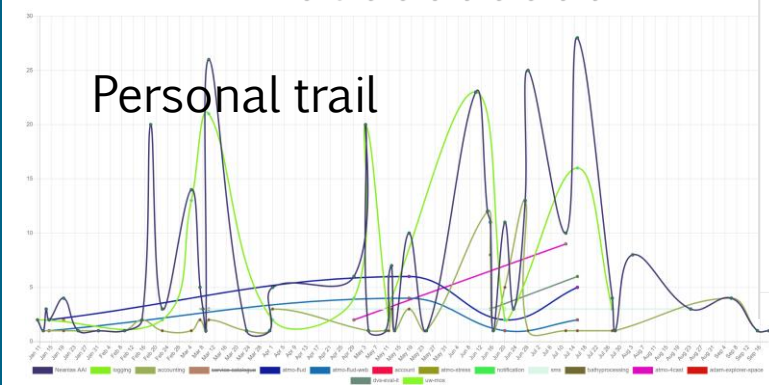
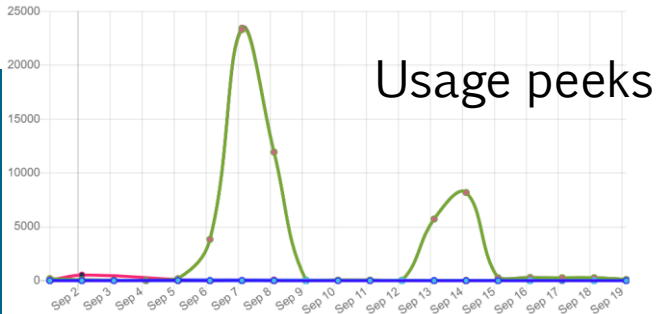
Integration and data flow

AAI





Visualization & Data exploration



AuthZ Registered Services

Name	Code	Created	Actions
account	account	10/11/21, 12:59 PM	⚙️ 🔗
accounting	accounting	7/22/21, 12:34 PM	⚙️ 🔗
adam-explorer	adam-explorer	4/19/21, 3:32 PM	⚙️ 🔗
adam-explorer-atmosphere	adam-explorer-atmosphere	4/19/21, 3:32 PM	⚙️ 🔗
adam-explorer-space	adam-explorer-space	4/19/21, 3:33 PM	⚙️ 🔗
adam-neanias-orchestrator	adam-neanias-orchestrator	4/19/21, 3:33 PM	⚙️ 🔗
adn-app	adn-app	5/11/22, 11:10 AM	⚙️ 🔗
atmo4-cast	atmo4-cast	7/12/22, 2:00 PM	⚙️ 🔗
atmo-4cast	atmo-4cast	4/7/21, 8:24 AM	⚙️ 🔗
atmo-4cast-integration	atmo-4cast-integration	7/11/22, 1:19 PM	⚙️ 🔗

- Visualize & report on aggregated info
- Dedicated reporting utilities Web UI
 - Graphs, Data browsing, exports, reports

Filters

Group By *
 Service Calculations * Measure * Date Interval

Filtering & Data exploration

Date Range

Resources Actions Users

Excluded Resources Excluded Actions Excluded Users

Timestamp	Service Name	Sum
7/15/22, 12:00 AM	Neanias AAI	28
3/10/22, 12:00 AM	Neanias AAI	26
6/28/22, 12:00 AM	Neanias AAI	25
6/28/22, 12:00 AM	service-catalogue	24
6/10/22, 12:00 AM	Neanias AAI	23
6/10/22, 12:00 AM	logging	23
3/10/22, 12:00 AM	logging	21
5/3/22, 12:00 AM	Neanias AAI	21
5/3/22, 12:00 AM	logging	21
2/18/22, 12:00 AM	Neanias AAI	20

Accounting Entries

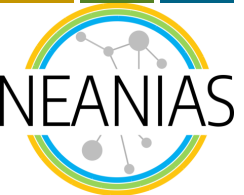
Name	Code	Service	Parent	Created
DataObject_Persist	DataObject_Persist	dvs-eval-it		2/22/22, 12:19 PM
Deleted	Deleted	uw-mos		2/23/21, 3:41 PM
DISPLAY_RESULTS	DISPLAY_RESULTS	bathyprocessing		5/24/22, 9:47 AM
FEDERATED_IDENTITY_LINK	FEDERATED_IDENTITY_LINK	bathyprocessing		8/30/22, 7:40 AM
FEDERATED_IDENTITY_LINK	FEDERATED_IDENTITY_LINK	Neanias AAI		8/30/22, 7:40 AM
FEDERATED_IDENTITY_LINK	FEDERATED_IDENTITY_LINK	c42-vis-gateway		8/30/22, 7:42 AM
file size	file size	atmo-flud-web		3/18/21, 10:44 AM
file upload	file upload	atmo-flud-web		4/13/21, 9:09 AM
file upload	file upload	c42-vis-gateway		4/13/21, 9:09 AM
file upload	file upload	atmo-flud-web		3/29/21, 8:19 AM

Accountable Actions

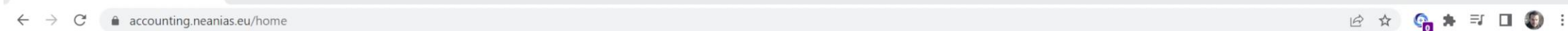
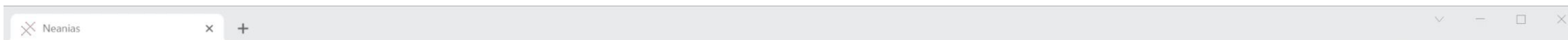
2022-09-23



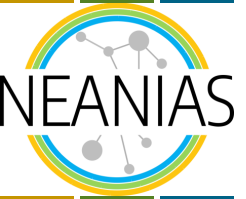
118 Total



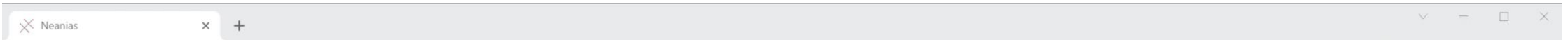
Browsing Accounting Data



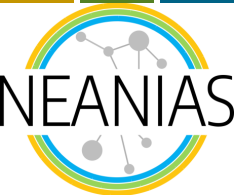
Welcome to Neanias Accounting



End-User Usage



Welcome to Neanias Accounting



Accounting Actions

accounting.neanias.eu/services?lookup=%7B%22page%3A%7B%22offset%3A0%2Csize%3A10%7D%2C%22isActive%3A%5B1%5D%2C%22order%3A%7B%22items%3A%5B%22name%3D%7D%7D%7D&lv=1

Services | Resources | Actions | Users | My Accounting | Admin | Privacy Statement | Terms of Use

Georgios Papanikos

Services

Filter Profile [dropdown] [add] [trash]

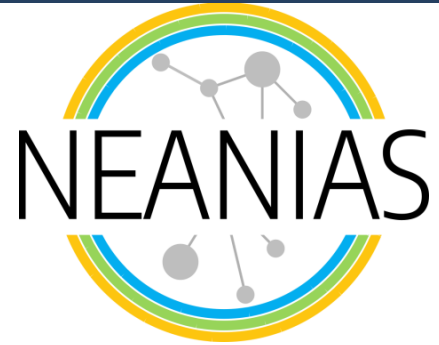
SEARCH FILTERS 1 [dropdown] search... Show Deleted [toggle]

Name ^	Code ^	Description ^	Parent ^	Created ^	Actions
account	account			10/11/21, 12:59 PM	[gear] [wavy]
accounting	accounting			7/22/21, 12:34 PM	[gear] [wavy]
adam-explorer	adam-explorer			4/19/21, 3:32 PM	[gear] [wavy]
adam-explorer-atmosphere	adam-explorer-atmosphere			4/19/21, 3:32 PM	[gear] [wavy]
adam-explorer-space	adam-explorer-space			4/19/21, 3:33 PM	[gear] [wavy]
adam-neanias-orchestrator	adam-neanias-orchestrator			4/19/21, 3:33 PM	[gear] [wavy]
adn-app	adn-app			5/11/22, 11:10 AM	[gear] [wavy]
atmod-cast	atmod-cast			7/12/22, 2:00 PM	[gear] [wavy]

[+]

Wrap-up

- › Accounting service:
 - Tracks usage of resources of a system, in a direct or indirect manner
 - Supports resource management and administration to oversee the operation of a system and potentially apply or tune policies
 - Non-disruptive integrations
- › Key tool to:
 - Discover how a service is being used on the field
 - Single point of reference for KPI collection
 - Apply quotas / throttle usage
 - Design & Validate billing schemes
 - Design & evolve the offered service
- › Offered as a Service in the cloud



Novel EOOSC Services for
Emerging Atmosphere,
Underwater & Space
Challenges



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Thank you!

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https://twitter.com/Neanias_eu

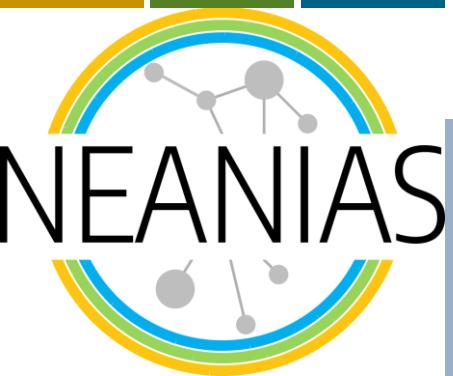
<https://www.facebook.com/neanias.eu/>

<https://www.linkedin.com/groups/13786081/>

2022-09-23

NEANIAS OPEN EVENT - SANT CUGAT DEL VALLÈS, BARCELONA

Supplementary Slides



2022-09-23

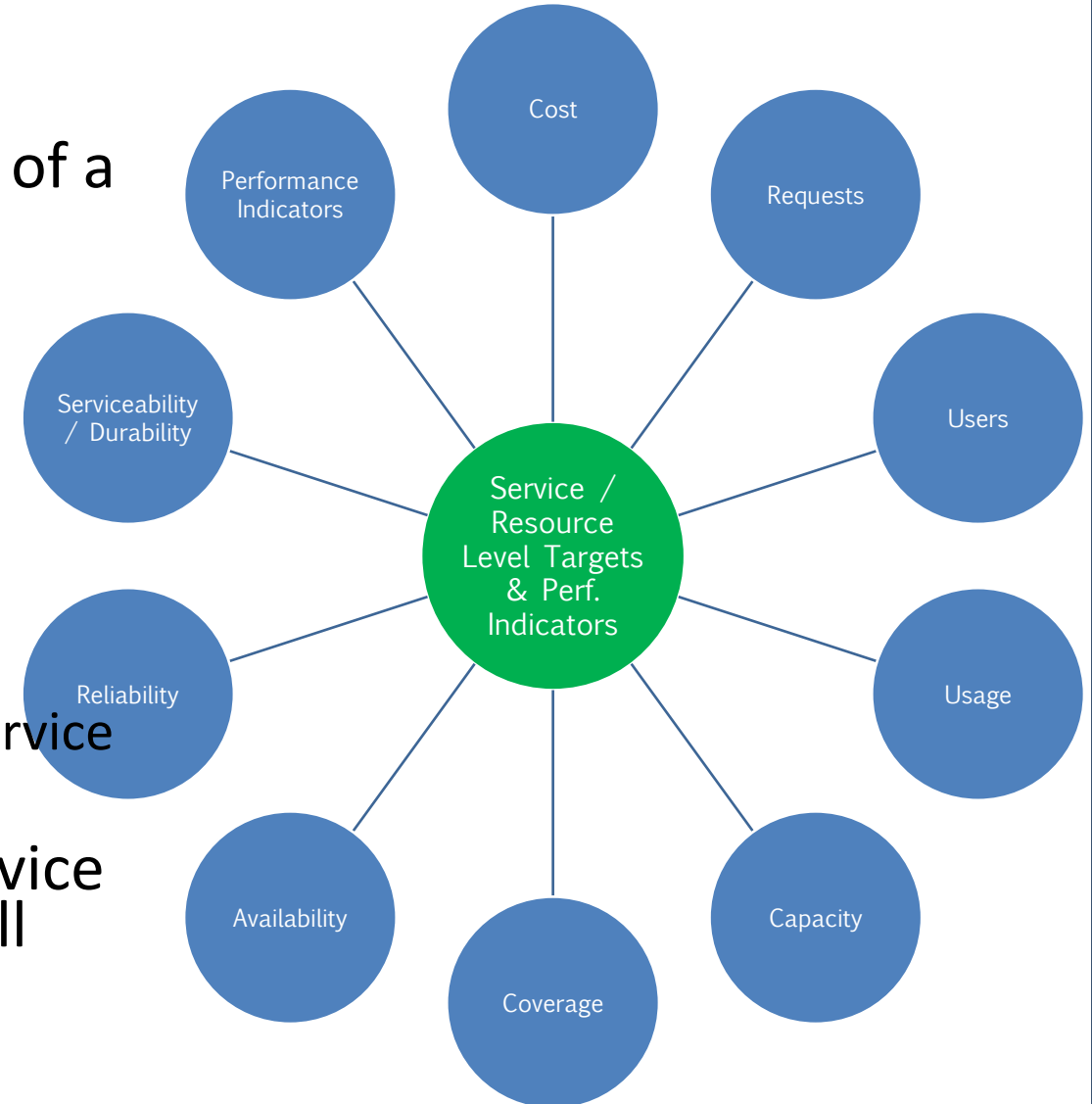
NEANIAS OPEN EVENT - SANT CUGAT DEL VALLÈS, BARCELONA

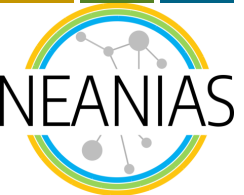
Setting the stage – The challenge

- › NEANIAS ecosystem characteristics
 - Diverse, distributed and loosely connected set of services
 - Wide range of technologies, topology and supporting infrastructures
- › Needed to be able to easily and centrally track and account for
 - Usage, resource allocation, response times, jobs submitted, ...
 - Service & individual user level
- › Example use cases:
 - A service provider wants to identify how much CPU time a particular user activity has occupied in the system
 - A service provider wants to know how many invocations per day were performed by a particular user
 - A service provider wants to know how much short-term storage is used by a user of a particular service
 - A service user wants to know the interactions he had with a specific service

EOSC on my mind

- › Need to quantify access and usage of a service
 - Emerging suggestions within EOSC environment
 - Necessity for Service Providers
- › Identify aspects of accountable information
 - Service / Resource Level Targets and Performance Indicators Set
 - Gathered or assisted calculation by Service Providers
- › If EOSC releases an Accounting Service API and data model, the service will comply with its specification and interoperate with it.





Technology Overview

- > Backed by a high performant NoSQL data store
 - Aggregate and track accounting information
 - Investigating moving to OpenSearch
- > Distributed
 - Collection, Pre-processing & transformations, Storage, Processing
- > Scaling
 - Vertical & Horizontal
- > Data Folding & Accumulating indicators (coming...)
 - Varying granularity and time frames
 - Accumulation policies and granularity of information
 - Information gradually eligible to be folded to create aggregations
 - Ensure long-term performance and maintainability
 - Cost on granularity of historical data
- > Dead Letter Queue
 - Keep malformed accounting records for future reference, without aggregating
- > Fan-out
 - Trusted services spreading accounting info
 - e.g. AAI on behalf of targeted services
- > Supporting policy enforcement (coming...)
 - Run-time decision making, throttling or altering the scope of user requests
 - Considering endpoints supporting run time decision making logic, rule templates, threshold setting logic ...

