

#### Argo Monitoring and Messaging Updates & RoadMap

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#### **Outline** what is new in 2021 and what to expect in 2022

- Argo Monitoring
- Introduction
- Latest Developments
- RoadMap
- Argo Messaging
- Introduction
- Latest Developments
- RoadMap





# Argo Monitoring Provided By GRNET, SRCE & CNRS



EGI-ACE receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 101017567.

### **Argo Monitoring - Introduction**

#### **ARGO** Monitoring service

- provides a flexible and scalable framework for monitoring status, availability and reliability of a wide range of services provided by infrastructures with medium to high complexity.
- generates reports using customer defined profiles (e.g. for SLA management, operations, etc.). During the report generation, ARGO takes into account custom factors such as the importance of a specific service endpoint and scheduled or unscheduled downtimes.



### Monitoring What's New in 2021

- Service Trends
  - Flapping
  - Critical, Warning, Unknown
- Documentation
- UI Updates
- Compute Engine & Web-API Updates
- POEM Updates
- Monitoring Engine Updates



## **Service Trends - Flapping**





**Flapping** occurs when a service or host changes state too frequently,

**Flapping** can be indicative of configuration problems, troublesome services, or real network problems. This causes a lot of alarms and notifications.

ARGO Monitoring service analyzes the status timelines in different levels, detects the flapping patterns and creates a report .



#### **Service Trends - Flapping**

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## Service Trends - CRITICAL, WARNING, UNKNOWN





State changes can occur due to network problems between monitoring host and monitored item.

ARGO Monitoring Service applies calculations on the recorded status timeline and counts the appearance and duration of CRITICAL, WARNING, UNKNOWN state. The duration of the status is calculated by aggregating the interval duration of each status appearance in the timeline.



#### Service Trends - CRITICAL, WARNING, UNKNOWN

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#### **Documentation** *Core part of the monitoring service*

- We Continuously update our Documentation
- Last year we focused on the documentation of our WEB-UI
- This year we are focusing on the Documentation the processes to start monitoring a new service type and the computations that are happening in the backend.

**Argo Monitoring** Documentation Introduction InformationFeeds  $\sim$ Topology Downtimes Monitoring V Monitoring guide for Service Providers Guidelines for monitoring probes Profiles  $\sim$ Profiles **Operations Profile** Aggregation Profile **Threshold Profile** reports V Status Timelines & A/R Results Status Timelines A/R results Status Trends - Flapping Status Trends - Critical, Warning, Unknown



#### **Interoperability Guidelines**





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### **UI Updates**

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# **Analytics Engine and Web-API Updates**



Analytics Engine Updates

- All Analytic engine jobs now talk directly to argo-web-api to configure themselves and receive all additional information needed such as reports, profiles, topologies, downtimes etc... instead of hunting pushed config files in HDFS
  - Implementation of central **ApiResourceManager** component to gather all needed info from **argo-web-api**
  - On the fly translation of argo-web-api resources to avro format on demand.
- Handle Endpoint extra information such as url in endpoint a/r results
- Implementation of new jobs that calculate trends and insights (flapping, status patterns etc...)

#### Web-API Updates

- Support management of historic snapshots for all information items stored in argo-web-api
- Display status and flapping trends over a range of results such as
  - metrics
  - endpoints
  - services
  - o groups
- Allow to aggregate trend results over a range of time and with various levels of granularity (month, daily)
- Add notification information to topology items
- Introduce topology tags/values method



### **POEM Updates**

- Easier handling of ARGO Reports configurations
  - Previously via clumsy configuration files with dozen of options in argo-connectors component
    - hidden internally
- Reports streamlined via pleasant UI forms
  - Configuration stored on ARGO WEB-API
- Reports jointly represents all configuration needed for compute engine to generate A/R results
  - Apply Metric and Aggregation profiles
  - Topology cherry-picking by the tags and filters defined in source (GOCDB)
  - Thresholds for A/R results
- [WIP] Public Reports pages





## **Monitoring Engine Updates**

- Automatic deployment & configuration
- Automatic probe deployment (by connecting to POEM-api)
- ARGO internal probes improvements
  - OIDC refresh token management
  - AMS publisher
- ARGO internal monitoring improvements
  - multi-tenant POEM & connector metrics
- [WIP] WebAPI as the only source of truth
- Probe development support
  - HTCondor-CE certificate, ARC-CE IGTF checks, EGI Check-in



#### **Next Steps** What to expect in 202



- [VIP] Customisable A/R thresholds for the several SLAs
- [WIP] Documentation
- [WIP] Harmonise metric names
- Breaking the chains of RPM
- New View for raw data from the monitoring engines.
- Alerts to endpoints owners
- Status and incident communication tool
- [WIP] New metrics / probes







### Argo Messaging Service Provided By GRNET, SRCE



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# **ARGO Messaging Service**

A Publish/Subscribe Service which implements the Google PubSub protocol

#### A scalable HTTP Messaging Service With:

- an HTTP API for client access
- Transparent scalability & high availability
- Access controls implemented at the API layer
- Multi-tenant support
- Instrumentation at the API layer

Messaging as a Service for everyone ! AMS





# AMS: Fundamentals





**Project** a basis of organizing and isolating groups of users & resources

#### Resource Types



#### Торіс

A named resource to which messages are sent by publishers.



#### Subscription

A named resource representing the stream of messages from a single, specific topic



#### Message

The combination of data and attributes



#### **Schemas**

A mechanism that support schema validation



Metrics activity of the resources

#### Users & Roles



A list of service-wide roles. Can be extended. (action is a permission)



Publisher Client that publishes messages to a topic.



Subscriber Client that consumes msgs from a topic.





### **AMS: Push Severs**



**Push Server** 



The push server(s) are an optional set of worker-machines that are needed when the AMS wants to support push enabled subscriptions.

- Set of workers that handle push enabled subscriptions
- They perform the push functionality of a subscription (consume->deliver->ack)
- Provide a gRPC interface in order to communicate with their api
- Provide subscription runtime status

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**Zookeeper Cluster:** *is a centralized service for maintaining configuration information, naming, providing distributed synchronization.* 

**Kafka Cluster:** is a distributed publish-subscribe messaging system that is designed to be fast, scalable, and durable.

**MetaData store Cluster:** *a distributed metadata store based on mongodB* 



### **AMS Components**



- Argo-ams-library: A simple library to interact with the ARGO Messaging Service.
- Argo-AuthN: Argo-authn is a new Authentication Service. This service provides the ability to different services to use alternative authentication mechanisms without having to store additional user info or implement new functionalities. The AUTH service holds various information about a service's users, hosts, API urls, etc, and leverages them to provide its functionality.
- AMS Metrics: Metrics about the service and the usage.



### **AMS: Main Features**

lates

- **Replay messages:** that have been acknowledged by seeking to a timestamp.
- Schema Support: on demand mechanism that enables a) the definition of the expected payload schema, b) the definition of the expected set of attributes and values and c) the validation
- Republisher script that consumes and publishes messages for specific SITES
- Extend api calls with more functionality, adding new api endpoints
- Improved **metrics** to help us understand the activity of our resources (publishing-rate, consumption-rate)

Ease of use

Always **Follow** the Google PUB/SUB features

- Main functionalities of AMS
- python3 ready

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- RPM packages for all supported Python
  - versions
    - o py26, py27, p34, py36
- Improve the monitoring/logging
- Internal optimizations
- Consistency fixes in responses



#### AMS: Who Uses it



**ARGO**: Sends the messages from the monitoring engine to the other components.

**Accounting**: Use of AMS as a transport layer for collecting accounting data from the Sites.

**Operations Portal**: Reads the alarms from predefined topics, store them in a database and displays them in the operations portal. **FedCloud** : Use of AMS as a transport layer of the cloud information system. It make use of the ams-authN. **AppDB** consumer of the cloud information system.



# **AMS: Next Steps**

#### What to expect in 2022

- Update the documentation
- AMS library
- deploy a second instance of the message service
- AMS Metrics





#### **AMS: Documentation**



Github: <u>https://github.com/ARGOeu/argo-messaging/</u> API documentation: <u>http://argoeu-devel.github.io/messaging/v1/</u> API Swagger: <u>https://api-doc.argo.grnet.gr/argo-messaging/</u> Compatibility with the Google PubSub API specification Operated as production service since September 2016



#### :: till our next face to face meeting







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