2020 CAP Implementation Workshop Jan.ibbotson@k-int.com

Agenda

- All about the open source alert-hub software
 - \circ purpose, process and function
- How is alert-hub developing in 2020
- Improvements since the 2019 workshop
 - Cloud support, Scaling and Resilience
 - Feed provider toolkit, dashboard
 - General
- Future Roadmap
 - Overall direction
 - MQQT
 - Immediate Priorities

Alert-Hub Software Introduction

Ethos and Principles (Why)

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- There are system-wide (cross-cutting) challenges arising from the need to publish/provide Critical Alert information, and the need to deliver/obtain that information.
- The process of communicating alerts from information providers to information consumers over all devices in a trusted manner is a fundamental social good, and we can help with the system-wide challenges.
- Support and be part of the wide CAP ecosystem
- Open and Accountable, technical state of the art

What is alert-hub?



• A resilient, open source, internet scale toolkit for the CAP community existing to support

- Publishers Assisting in the secure authoring, validation, monitoring and onward publishing of alerts; reducing the load on publisher systems by aggregating consumption.
- Consumers By providing intermediary services such as spatial and non-spatial filtering, recombination into regional or subject based feeds, validation and verification.
- The community By providing an open-source reference implementation of an alerting service platform for future innovation, registries of feeds and sources. Working with information channels to present the CAP ecosystem as a coherent whole

Purpose of the Alert-Hub open source stack (what does it do?)

- Support the CAP community
 - Producers
 - Validation & Verification, Trust, Security, Alerting & monitoring
 - Provide a unified face of all alert feeds
 - Consumers
 - Aggregation, sorting, validation, Trust, Security
 - Consolidation into locale based aggregate feeds
 - Support for novel devices and protocols
 - Intermediaries & Specialist organisations
 - Aggregation and Filtering tools

Organisational Information (Who)



Structure

- Open Source
- Not for Profit
- People
 - Eliot Christian eliot.j.christian@gmail.com
 - US; Product Owner, Subject Matter Expert, leadership
 - Ian Ibbotson ian.ibbotson@k-int.com
 - UK; Technical architecture, development and support lead
 - Future Teams

Provenance (When)

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- Toolkit arose due to some of the challenges we spoke about previously functional and non-functional challenges
- First commit 19 Nov 2016
- Service established on AWS
- Continuous development, regular updates and enhancements
- Alert-hub continues to attract requests for support and extension projects and support through grants and in-kind contribution of the community

https://github.com/SemwebServices/PubSubHubBubFacade/

https://github.com/SemwebServices/CAPCollator/

Functional Makeup (How)

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- Alert-hub is currently composed of several major components in a Service Oriented Architecture
 - System-facing / Edge
 - The Feed Collector (feed-facade)
 - The CAP Aggregator
 - Source and Target Feeds
 - Supporting / Internal
 - ElasticSearch (Text Search)
 - RabbitMQ (Messaging, Guaranteed Deliver)
 - PostgreSQL (System of Record)

What did we get really right?

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- Internet scale cloud storage as an intermediary destination for filtered feeds
- Shared service for validation and verification and feed health publisher feedback
- Elasticsearch for combined spatial and text matching, pre-filtering/pre-coordination
- Platform for demonstrating the viability of the CAP ecosystem to device manufacturers and content provider networks.

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Alert-Hub High Level Direction

High Level Direction

- Toolkit with Reference Implementations
 - Toolkit Supporting anyone wanting to run their own virtual-private alert-hub for whatever reasons arise
 - Cloud based service highly resilient alert aggregation and re-publishing in secure long-term data channels.

Alert-Hub Software Yearly Update

Work streams

Devops and Deployment

- Support for Azure From AWS AMI images to docker-swarm, dockerhub and on to kubernetes
- Scaling
- Deployment tested on AWS, Azure, Docker-Swarm, VPC and bare-metal kubernetes
- CI / CD with pipelines through to docker image repository
- Zero-downtime upgrades

Work streams

Horizontal Scaleout, Performance, Efficiency

- Improvements to feed fetcher horizontal scaling, thread-pool and promise based.
- Reflecting ability to dynamically scale with workload (Including Kubernetes actuator endpoints)
- Improvements in HTTP protocol handling, with progressive enhancement (HTTP HEAD)

Work streams

Ongoing Maintenance

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- Problems of modern systems development -- rolling dependency upgrades
- Continually maintain performance, security and integrity
 - Upgrade to SpringBoot2, JDK11, ES7, etc
 - Improvements to support zero-downtime upgrade
 - Site Certificates / letsencrypt
- Started Feed provider Feedback

Alert-Hub Software Future Roadmap

Future Roadmap

Secure Goals

- XML Signature Verification, and optionally re-signing
- Authentication and Authorization improvements (Keycloak)
- Conformance Testing (Profile Tags)
- "Sandbox" environments regression testing feeder systems

Future Roadmap - Aspirations

Functional Aspirations

- Digital Signature Validation
- Provider Live Messaging / alerting
 - Provider Registration
 - SMS, Slack, Gtalk/MQQT, Email
- Public MQQT Live push alerts over web-sockets
- Public WebHooks (Sub match, Feed issues)
- Demonstrator kiosk / template application or widget
- Develop the alerting service platform with other capabilities

Future Roadmap - Aspirations

Architectural Aims and Aspirations

• Back-office

- \circ SOA to Microservices
- Authentication and Authorization Keycloak to enable
 - Consolidation & Open up to external authentication services
 - Authorized access to webhooks and other feedback services
 - Secure MQQT
- Front-End
 - Microsites
 - o SPA



Summary

- Development & Adoptions continues, continuous improvement
- AlertHub helps address real issues for publishers and consumers Seeking partners to
 - Run AlertHub nodes
 - Collaborate on testing MQQT, Webhook and other notification mechanisms
 - Support new use cases and requirements open or closed
 - Improve sustainability
 - Give feedback, suggestions "If only it....."

Comments / Questions



Thankyou