FLOSS 4.0 conference
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Open Source and ATM

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Air Traffic Management systems

• Past
  • Sector based control
  • Operational coordination
  • Independent systems
    → System fragmentation

• Future
  • Single European Sky
  • Business trajectories management
  • Harmonisation, interoperability, defragmentation
    → System integration

• SESAR (Single European Sky ATM Research): strategic moment of defining tomorrow’s ATM
Scope of the study

• The study focuses on surveillance products but the output could be valid for other applications in ATM
  • Niche market
  • Technicality, Quality, Safety

• Eurocontrol Surveillance products (ARTAS, SDDS and SASS-C) highlights
  • Central management
    • Development of baseline upgrades
    • Maintenance & Support
  • Guidance from User Communities
  • Activities outsourced to industry
  • Most IPR’s reside at EUROCONTROL

• SPOSS: Surveillance Products & Open Source Software
SPS products investigated by the study

**Surveillance Chain**: Chain of complementary equipments processing surveillance information from detection up to the controller display.
Relevance of Open Source approach

- OSS as a vector of harmonisation
- Parallel between "commoditisation" and Surveillance Products
  - Surveillance techniques maturity
  - Standardised performance
  - No real competitive advantage
- Positive drivers for OSS Surveillance Products
  - Create wider budget basis
  - Foster Innovation
  - Contribution to opening the market
  - Creating a new eco system for the industry
  - Potentially reach/ support non ECAC ANSP’s
Ecosystem & potential Dual model

Governance body

Ecosystem Control & Management

Visitors

SASS-C

SDDS

ARTAS

Sources, dev documentation Binaries, Unit testing

Proposed contribution

Identification, Download

Agreed contribution

Contributor agreement

Accredited Contributors

Requirements

Forger (LGPL)

Controlled Public access

Safety - ESARR6

(Dev & end user Documentation

Requirements, Product Testing)

Improvements

Corrections

Baseline

SASS-C

SDDS

ARTAS

Baselines

(LGPL + EULA)

Non Public access
Critical analysis – Safety & Security

- Safety
  - Any contribution must be assessed within ESARR6 context (Eurocontrol SAfety Regulatory Requirements)
  - Safety procedures integrated into Governance Model and Inspection Committee

- Security
  - Better prevention against introduction of malicious code using an open source model
  - Source code examination by both the attackers and defenders
Critical analysis – technical benefits

• Fostering innovation
  • By opening the application code & algorithms to a wider community (Universities, research organisations, industry)
  • Building a platform to support incremental innovation
  • By Harmonising methodologies and computations techniques

• Fostering Standardisation
  • To create industry standard “commodity software”
  • Through the shared development of interfaces with solutions from existing suppliers (compatible API’s)
  • To optimise software development/maintenance costs
Economic aspects

- Maximum cost when complete cost of development and maintenance is supported by one party
  - Current situation for Surveillance Products

- Limited initial investment to implement the software forges, for staff training, for documentation...
  - Already existing User community and governance

- Impact on industry should be globally positive and competition more dynamic
  - Proprietary and open source business model can co-exist (non-contamination)
  - Potential interest at ICAO level in cost effective ATM solutions to improve safety in developing countries.

- Universities and Research institutions could more easily contribute to the development of innovation
Conclusions

- OSS is
  - Applicable and relevant in the ATM domain
  - Supported in principle by most of interviewed stakeholders

However
- Change of culture
  - Extensive communication is needed
  - Find right examples (not IT mass market)

- Leading Industry needs to be convinced
  - Proven and quantified Benefits
  - Protection of competitive interests

- Pioneers are needed…
Thank you for your attention

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