

first draft prepared for
OSBC-UK, London, 27th June 2006
Open Source Business Conference

OSS in ATM: the Need for a Meta-Community

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Abstract. A project has been launched at EUROCONTROL to research an Open Source Software (OSS) policy for the Air Traffic Management (ATM). Since there is almost nothing done on such a subject, the policy should propose initiatives. Some basic predictive hypotheses were first defined and then discussed through various networking actions. The present paper elaborates about the need of a Meta-Community in order to trigger appropriate initiatives that would provide a valid ecosystem for OSS communities working on ATM software. It gives an abstract description of some present OSS realities, but it also suggests the basis of a normative approach for the introduction of OSS in ATM. In this paper, ATM is considered as a particular case of the Secondary Software Sector (SSS²).

1. Introduction

EUROCONTROL is the European Organisation for the safety of Air Navigation. Its primary objective is the design and development of a safe and seamless pan-

¹ This presentation made for R&D purposes is not related to an existing official EUROCONTROL policy. Any opinions expressed in this presentation are those of the author, and do not necessarily reflect the views of EUROCONTROL.

² The expression Secondary Software Sector (SSS) has been introduced by the European Commission by opposition to the Primary Software Sector. It has been widely spread by the CALIBRE project and targeted by the CALIBRATION forum [2]. The SSS is the sector where software is not sold as a separate product, but it is used either as an embedded part of a product or as an enabler for a product or a service.

European Air Traffic Management (ATM³) system in Europe. Founded in 1960 as a civil/military intergovernmental organisation, it is now a world leader, pioneering advances in ATM technology, operational procedures and system interoperability.

ATM includes a wide range of activities from real time control (ATC) to planning and optimising, taking into account demand and capacity constraints. The ATM operations are based on a threefold infrastructure: Communication, Navigation, and Surveillance (CNS).

The ATM industry is divided between ATM infrastructure providers who install the hardware and software components (for example, Lockheed Martin, Thales,...), and ATM service providers who provide the ATM operations in real-time (for example, DFS, NATS,...)⁴.

Many ATM projects are implemented partially or totally through software developments. Proprietary software is the usual practice in the ATM industry. Most software produced by the EUROCONTROL Agency is outsourced. In theory, such products remain the property of the Member States, but in practice, the proprietary paradigm introduces some difficulties in the free usage and distribution of these products. Presently, OSS principles and licenses are not included in the official Intellectual Property Right (IPR) policy of EUROCONTROL.

The present paper is part of a research project exploring the possible introduction of OSS in ATM. The present description includes four parts: a project (OSIFE), a network (CALIBRE), an event (roundtable), and a discussion about the possible roles of an OSS meta-community for the ATM.

2. The OSIFE project

By the middle of 2004, we started a project to get a better understanding of the potential impact of the OSS movement on ATM. The OSIFE acronym was coined: “Open Source Implications For EUROCONTROL”. After reviewing the basic literature concerning Open Source and Free Software, the scope, the objective and the method of the project became more clear.

In terms of scope, the investigation is limited to the impact of OSS on the core business of EUROCONTROL, i.e. ATM. In terms of objective, we want to understand when and how OSS could impact the business in ATM. In terms of method, we chose to describe our initial insights as a set of predictive hypotheses. To

³ Air Traffic Management is a rather catch-all term not limited to managerial issues: “Air Traffic Matters” would probably be a more appropriate translation of the ATM acronym. It includes three sub-domains: Air Traffic Control (ATC), Air Traffic Flow Management (ATFM), and Air Space Management (ASM).

⁴ ATM service providers are called “Air Navigation Service Providers” or ANSPs.

launch the debate, four broad hypotheses about the potential of OSS for ATM were introduced. They can be summarized as follows: the OSS paradigm will

1. facilitate the harmonization of ATM,
2. maintain or improve the quality of ATM software,
3. affect the ATM industry in a positive way,
4. help EUROCONTROL to better meet its public service obligation.

3. The CALIBRE network

After a first public presentation of these hypotheses [1], it became clear that, although there is no specific literature about OSS in ATM, the ATM community was interested in OSS. Since further investigations were needed, networking was initiated to gather facts and arguments about the initial hypotheses. During 2005, networking proceeded twofold: within the ATM world and within the OSS world.

To explore the ATM world, we made numerous contacts inside EUROCONTROL. It appeared that many experts involved in the improvement of ATM systems are unaware or unclear about the OSS paradigm. For example, OSS is often wrongly considered as equal to freeware. However, we also had the pleasant surprise of discovering a few projects and experiences where the OSS concepts were used or considered helpful.

To explore the OSS world, the CALIBRE consortium [2] quickly appeared as the appropriate network. It is supported by the European Sixth Framework Programme. As part of its commitments to promote the OSS paradigm in Europe, CALIBRE facilitates an industry forum called CALIBRATION, which provides contacts with representatives of other industries.

The CALIBRE conference at Limerick in September 2005 [3] was a first opportunity to present the 4 initial hypotheses of OSIFE to the OSS community and to collect feedback. The second opportunity was a CALIBRE workshop at Krakow [4], about quality, safety and security in OSS initiatives.

4. The OSS-in-ATM roundtable

Assuming that the stimulating spirit of the CALIBRE network could help to increase the OSS awareness among ATM circles, we dreamed about a meeting between both worlds: the OSS world and the ATM world. A roundtable on the subject: "Potential of OSS in ATM" [5] was co-organised by EUROCONTROL and CALIBRE in December 2005. It drew a participation of 28 persons from the CALIBRE expert circle, the EUROCONTROL staff, and the ATM industry. Several outcomes were expected from such a confrontation: (i) increased awareness of the OSS paradigm in the ATM circles; (ii) better appreciation of the relevance of early open source experiences in the ATM domain; and (iii) modification or confirmation of the validity of the hypotheses.

5. The need for a meta-community

While trying to define a policy about the introduction of OSS in ATM, the issue is not only why such an introduction could be useful, but also how to proceed in order to make it successful.

This paper discussed a new basic hypothesis about the way OSS could be implemented in ATM: the first step could be starting up a meta-community, i.e, a community that shares ideas about OSS communities and that could trigger and support OSS community working on ATM software projects.

Actually, Linux was created as bottom-up spontaneous and voluntary initiatives. After a few years, it appears that the community of developers was not sufficient to guarantee the success of Linux. At that stage a meta-community was created for the promotion of Linux in the software business. This community includes many people who are not Linux developers. It is a meta-community because its aim is to support, describe or specify the primary Linux community of developers, a little bit like a meta-language is used to describe or specify one or several languages. If we consider that people like Eric S. Raymond is part of the Linux meta-community, then it is clear that such a meta-community has promoted more than just the one OSS community of Linux.

The community and the meta-community share two fundamental characteristics: 1) they are not profit-oriented and 2) their members are scattered throughout various business organizations (most of them being profit-oriented).

In ATM, a bottom-up approach does not seem possible. For example, the www.openATC.org initiative appears to be a failure [6]. The reason of the failure seems to be threefold. First, the knowledge domain is rather specialized, and such a specialisation creates a barrier to entry for volunteers. Second, there is no sufficient critical mass of software developers in ATM. Third, the spontaneous generation of an OSS community is likely to appear when the developer have easy access to all the environment where the software will be used. The real ATM infrastructure is rather heavy and, for security reasons, it will never be easily accessible. Therefore, in ATM, a bottom-up approach based on spontaneous commitment is not likely to happen.

However, our major hypothesis is that a top-down approach can be used to replace the existing closed source approach by an open source approach for the benefit of all the users of ATM.

Given the vast literature on OSS successful initiatives, it might be that a top-down approach could be started in which the launch of a meta-community would be the first step guiding the creation of primary OSS communities.

6. Roles of a meta-community

There are several reasons why a meta-community could be necessary or helpful to start or to guide OSS in ATM. Here are some of the roles that could be assigned to such a meta-community.

6.1. To start OSS communities

In the case of Linux, the meta-community appeared years after the primary community. However, such a scenario was not repeated for other projects, like OpenOffice.org or Mozilla-Firefox, where the creation of the primary OSS community came after the decision to open an existing closed software (Netscape) was made by a particular OSS meta-community. In such a case, the meta-community has created or instantiated the primary OSS community.

ATM is obviously a domain where lots of software exists. It is used to support either operations or research. The critical point is threefold: take the decision to open some piece(s) of software, to develop a community and to maintain a sustainable ecosystem. This triggers a new list of things to be considered and decided by a meta-community.

6.2. To develop a commonly accepted OSS rationale

In ATM, there is a lot of scepticism about the OSS paradigm, simply because it is new, and because it does not fit with the usual practices. Because ATM is a safety critical domain, trial and error is limited to research, it cannot affect real operations. Therefore, the need for anticipation and top-down approach is essential to start with. In that respect, a meta-community is necessary before any real community can get sufficient trust.

The meta-community must elaborate and approve a set of rationale for introducing OSS in ATM. This implies that some hypotheses about the overall benefits of OSS for ATM are widely and strongly approved by the meta-community. For example, the four predictive hypotheses mentioned in section 2 could be used as common background consensus or even as broad objectives for a meta-community, in order to prepare and to guide further initiatives.

To elaborate on a strategic viewpoint, we have proposed that the rationale for decision making about OSS in ATM could be derived from a kind of SWOT analysis [8], considering the two following basic rules:

RULE 1

IF P= strength (OSS)

AND P= weakness (ATM)

THEN P= opportunity (OSSinATM)

Example: P could be “interoperability”.

RULE 2

IF Q= strength (ATM)

AND Q= weakness (OSS)

THEN Q= threat (OSSinATM)

Example: Q could be “security of access”

If such rules were described with the necessary detailed constraints, if possible combined through mathematical reasoning, they could be used to build a knowledge base or an expert system of OSS in ATM with possible transfer of knowledge to and from other domains, considering that “OSS in ATM” as a particular case of “OSS in SSS”, i.e. a industrial sector where the software is not the product, but it is either a component or an enabler of the product. In case of a mathematical approach, a clear documentation should be provided so that the meta-community could fully understand and evaluate the rationale for using OSS.

6.3. To keep security secret

It has often been pointed out that the OSS has similarities with scientific research. Actually, there are three kind of scientific research: public, private and also secret research done by militaries for example. It is not surprising that the same threefold approach could be found in software, the secret software being related to security.

Safety and security are different issues. The great majority of ATM software applications are about safety and efficiency, without particular security functions. The only important rule to be enforced about these ATM software applications which do not implement security procedures, is that they must be executed in a very protected and isolated environment where interference and unauthorized access are made impossible. Such protections already exist for any IT infrastructure used for operational ATM. Since the operational ATM systems are based on binary executable files, the openness of the source code files does not affect the existing security protections.

Thinking about the 9/11 case or other terrorist attack in aviation, two important issues must be pointed out when considering the possible evolution of ATM to OSS practices. First of all, such terrorist attacks were successful despite the general use of closed and proprietary software in ATM.

Considering that training could increase security risk, the high precision and the realism of closed source flight simulators largely available could be considered as an advantage for potential terrorists. For such easily available simulators, the security issue is dependent of level of operational and functional details. The availability of the source code for such simulators does not change the security risk induced through skill training.

The second important issue is that ATM is a field where security is an intrinsic essential component. The existence of security procedures must remain secret, or at least the details about the security procedures and the software supporting these

procedures must remain absolutely secret, to guarantee the effectiveness of these procedures.

The difference between proprietary and closed, hidden or secret software must be emphasized here. Indeed, the rule that some security software must remain secret (hidden or closed), does not mean that such software must be proprietary. Indeed, any software involved in a security process must be accessible for the scrutiny of the security authorities who must guarantee that the security practices and the knowledge about the security tools are kept secret.

Eventually, in terms of security, the role of the meta-community is to guarantee that the ATM software which are candidate for being opened do not contain any security features, in such a way that they could be opened without negative consequences to the security of aviation, but with potential benefits for the air traffic safety.

6.4. To decide which software to open up

The OSS paradigm is introducing a set of software tools and systems which are shared by various stakeholder organizations. All organizations have different goals. The evolution of these tools and systems are made by the communities of developers, but guided by meta-communities of stakeholders' representatives.

For the ATM, it is very likely that an OSS effort will require a well-defined consensus between the majority of the ATM players. In positive terms, every player must see his advantage in joining an OSS project. In negative terms, every player must also be convinced that the OSS project will not give a competitive advantage to another player.

For office tools, the open source solutions have obviously been introduced to reduce a monopoly. However, this situation is particular to the field where a monopoly exists, OSS being used against the monopoly. However, the presence of a monopoly is not the primary motivation of the OSS paradigm. In general, the OSS approach is introduced when sharing software is in an advantage for many players involved.

To guarantee that the OSS is not introduced to provide a competitive advantage for one company and stimulate the participation of many players, there should be some kind of facilitator to kick up the OSS initiative in the meta-community. The presence of such a facilitator is probably necessary to dilute the scepticism and to build trust between the players who have interest in sharing software. In ATM, it might be that a facilitator role could be fulfilled by the EUROCONTROL Agency, because it is not part of the competition. In that sense, the existence of an Agency could be an opportunity to unleash the potential of OSS in ATM.

By contrast, in other industrial domains where normal competition exists, if there is no facilitator, the competitive climate could disturb the OSS process: it might not

be easy to invite a competitor to join a common effort. Donate the code to a foundation is a solution: in such a case, the foundation could act as facilitator of the meta-community.

In ATM (and probably in other industrial domains as well), a “what if” exercise could be used as a method of selecting the piece(s) of software to be opened. Indeed, it is necessary for the meta-community to figure out what could happen if suddenly, the software source were available. It is essential to anticipate the impacts for the present owner of the source code (if any) and for the other partners, in order to avoid problems that could jeopardize not only one application, but also the trust in the OSS meta-community and the possibility to extend the OSS paradigm to other applications.

The “what if” exercise could be useful in choosing OSS pilot-projects or prototypes.

6.5. To choose license and forge

The meta-community can also be the place where licenses and forges will be chosen for all the OSS projects and communities.

In ATM, it might be that existing licences and forges could be used for research tools. For operational tools, specific licences and forges could be created to limit the openness of the code depending of security issues. For security reasons, it might be necessary to use special licences and restricted access forges to establish restricted source software between open and closed source software. Such restriction, if they are not too difficult to define and implement, could also create a buffer that will facilitate the migration from CSS to OSS.

6.6. To guarantee the quality testing

Using CSS, the quality of an ATM application is usually guaranteed by the company who develops the software. Using OSS, such a usual guarantee does not exist. As M. Michmayr pointed out in a recent CALIBRE conferences [9], it is not the kind of thing that volunteers do spontaneously.

Therefore, it must be the role of the meta-community to choose the method for establishing or choosing the required criteria and level of quality, and to assign the quality testing to one or several experts.

In particular for life-critical applications, the quality cannot be obtained through an incremental process, as it has typically been the case for office products, even in the proprietary world, where new patches are produced on a regular basis.

6.7. To trigger the domain evolution

Nolens volens, the OSS paradigm is a vehicle for another set of values than the only profit value which are the predominant value of the business world. It does not mean that the profit-oriented values must disappear. Not at all. It just means that these values must interact with other set of values.

Spontaneous OSS community have been developed without any or much consideration for the potential financial benefit. The dynamism of these communities, the enthusiasm and the dedication of many actors is the demonstration that the OSS fulfils the need for other values which are not dependent on profit.

It also appears that big profit-oriented organization, like IBM, have understood that OSS communities must be recognized and supported even if the members of these communities cannot be controlled or fired like their employees.

Generally speaking, evolution is probably the main value driving the OSS communities: the OSS communities contribute to the positive evolution of software tools for the sake of quality and innovation without consideration for profit-oriented constraints or strategies. In particular, the OSS communities are independent from profit-oriented marketing constraints.

When profit-oriented organization deal with evolution, they generally want to keep the benefit of the evolution for themselves. When they participate in an OSS community, it is no longer the case.

Consequently, a meta-community must not be guided by profit constraints, but by the evolution of the domain for which the software is useful. In particular, such a meta-community is becoming very useful when it appears that the profit-oriented mechanisms are becoming counter-productive for the evolution.

In ATM, the harmonization objective has been tackled in Europe during the last 15 years through numerous projects⁵ and initiatives all inspired by explicit or implicit profit criteria, emphasized by the privatisation of the ATM sector started in the mid-nineties. The general impression of many experts seems to be that the harmonization objectives have not been achieved sufficiently. This also explains why the first hypothesis of OSIFE was about harmonization. One of the reasons for such a failure could be the closed source software paradigm derived from profit-oriented and competitive business strategies of the ATM players.

It is assumed that the ATM industry could profit from the harmonized evolution of the ATM more than from the appropriation of ATM software.

⁵ Started in the beginning of the nineties, a major project was called EATCHIP, an acronym for "EUROCONTROL ATC **Harmonization** and Integration Project".

A meta-community in ATM could be a meeting point for actors who will benefit from the ATM evolution by contributing to this evolution (ATM software industry) or by providing a better level of service deriving from the evolution (ATM service industry), rather than trying to capture the evolution and sell it as a proprietary product.

6.8. To promote OSS products (OSS marketing and training)

Nowadays, all important OSS projects have been supported by a marketing community. It is the role of the meta-community to organize the marketing, in order to support the primary community, define priorities of development and promote the software products.

The meta-community could also decide to instantiate a marketing community, as it has been the case for Firefox. Such a marketing community allows the users to express and share their spontaneous enthusiasm for a product that they like. Both OSS development and marketing communities have one essential characteristic in common: creativity.

Training must also be organized either for potential developers or for potential users.

In many cases, the OSS community is able to deal with the marketing and training needs. For example for OpenOffice, there is a large community of volunteers who facilitate the dissemination of the product. There is no real need for a meta-community.

In ATM, because each OSS project could be rather small, a meta-community could be necessary to gather and streamline the training and marketing needs for several OSS communities of developers.

7. Roles of the profit-oriented businesses

The OSS introduces a set of values and practices that are not derived from the top-down profit optimisation for one organization. However, for each organization involved there are several ways to make money with OSS.

It is not at all the role of an OSS (meta-)community to define or influence the business the organizations involved. Each organization needs to elaborate a clear business model for using OSS providing them with a clear view about how their implication in the community will help their mission and generate revenues and profits, if that is their major goal.

The businesses which participate in a meta-community will try influence the (meta-)community to address their own need. If conflicting needs appear, the meta-community will have to deal with it and define the best possible compromise.

8. Roles of the universities

The OSS phenomena addresses a very wide scope of issues, from technical to ethical and through (not exhaustive list) legal, social, managerial, economical, and even philosophical issues. Creating meta-communities imply interactions with the academic world that research on this phenomena. The role of the universities is essential in that regard.

8.1. To research the OSS phenomena

Considering a spontaneous creation of an OSS community like Linux, it is the role of the academic world to analyse such a wild phenomena in order to understand the conditions in which it can survive and also how it can be reproduced in other environment. Looking to a field of wild flowers, poppies for example, admiring it is one thing, but succeeding to have the same kind of poppies in the garden of an organization, is a very big challenge that necessitates lots of knowledge, lots of research, and lots of trials and errors to determine and control all the important parameters of the ecosystem of that flower⁶.

Considering the number of people looking to the OSS communities (not only researchers), B. Fitzgerald, the CALIBRE project leader [2], used to mention the joke about the Navaho family typically composed of husband, wife, children, grandparents, uncle and aunt, and an anthropologist⁷. Similarly, there are lots of people interested in the ecosystem of the OSS communities, and researchers are producing knowledge about this ecosystem. Such a production of idea is a kind of meta-production on top of the production of software, which remains the primary productive issue. It is the role of meta-communities to filter what could be interested in that meta-production to enhance their software communities, considering the specific constraints of the domain where they are working, i.e. considering ATM in the scope of the present article.

The role of the academic world is also to research about business models and to provide insights on this issue not so much for meta-communities, but also directly to the business managers who might not want to share their insights with competitors.

⁶ Such a metaphor could also use penguin instead of the poppy, except that not many people would like to have a penguin in their house or in their garden.

⁷ It seems that Indian intellectuals have criticized anthropologists about their excessive presence.

8.2. To disseminate the information

It is likely that the financing of academic research on open source will be a strong condition for the success of new open source initiatives. Indeed, the OSS movement does not concern each company in particular: it crosses the border of each company and creates links between competitors. By nature, OSS is a question of communities. Each OSS community covers the interest of many companies which have to decide to be involved or not. Therefore, especially at this early stage and probably for a long period, it is the role of the academic world to organize the research process, the networking between researchers (including researchers of private research laboratories) and the dissemination of information. In negative words, if projects are started without the commitment of the academic world, there is a strong risk that the companies will not be able to gather the sufficient level of knowledge to benefit from the potential of OSS.

8.3. To participate in meta-communities

Actually, the OSS paradigm appears to be a wonderful opportunity to increase the intensity of the relationship between the academic world and the business world. Not only at the level of software communities, where academic can participate as developers of software applications or as providers of new software projects, but also at the level of meta-communities where the academic world can provide interesting analysis and insights. While doing that, they can give the impetus to OSS initiatives and guide their evolution.

8.4. To create inter-meta-communities

Finally, the role of the academic world is also to organize inter-meta-communities where delegates from the meta-communities can meet together and with representatives of the academic world.

At this stage, the reader of this article might think that inter-meta-community is just a too abstract jargon to be useful. Well, the nice thing about this story, it that an inter-meta-community already exists. Started in 2004, the CALIBRE-CALIBRATION project [2] launched under the auspice of the EU, succeeded to create such an inter-meta-community which has given the impetus not only to academic research in the field of OSS, but also to initiatives in some industrial fields of the Secondary Software Sector. The present article is much indebted to that inter-meta-community.

9. Conclusions

The Linux community and many other communities have been created as a bottom-up movement: the community came first and the meta-community came afterwards. In ATM, the bottom-up process seems to have failed. The hypothesis presented in this paper, it that the process should be inversed: a meta-community should start first in order to trigger the creation of OSS communities focused on particular software tools. The roundtable about the potential of OSS in ATM [5] could be considered as a first event for an OSS-in-ATM meta-community.

Considering ATM as a particular case of the Secondary Software Sector (SSS), it can be assumed that meta-communities principles could be extrapolated for the benefits of the evolution and the welfare of other SSS.

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OSS in Air Traffic Management: The Need for a Meta-Community

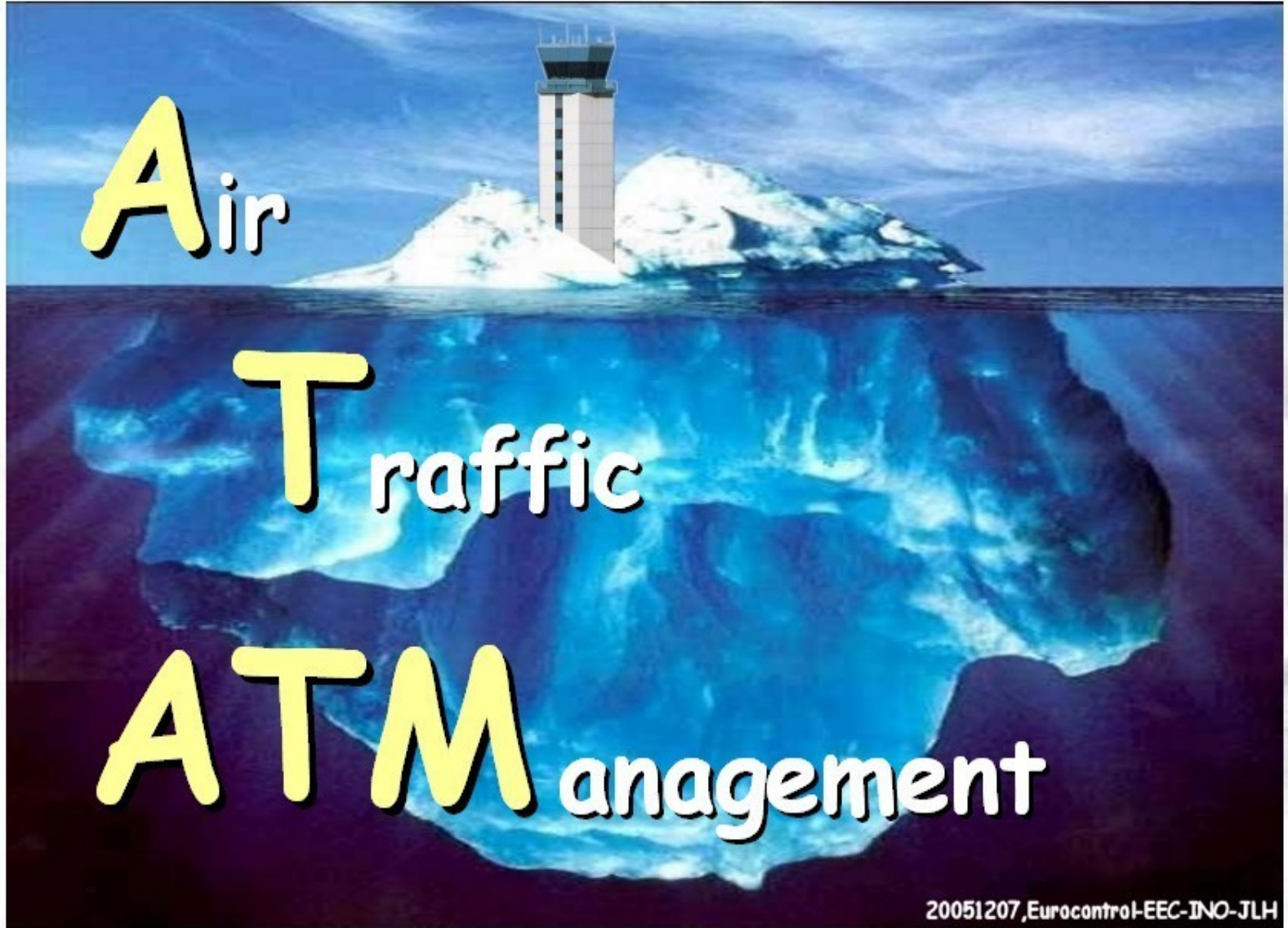
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OSS in ATM > Meta-Community

OUTLINE

- Intro: ATM and EUROCONTROL
- OSIFE project: 4 hypotheses
- www.OSS-in-ATM.info roundtable
- Need for a meta-community
- Roles of a meta-community
- Roles of companies and universities
- Conclusions



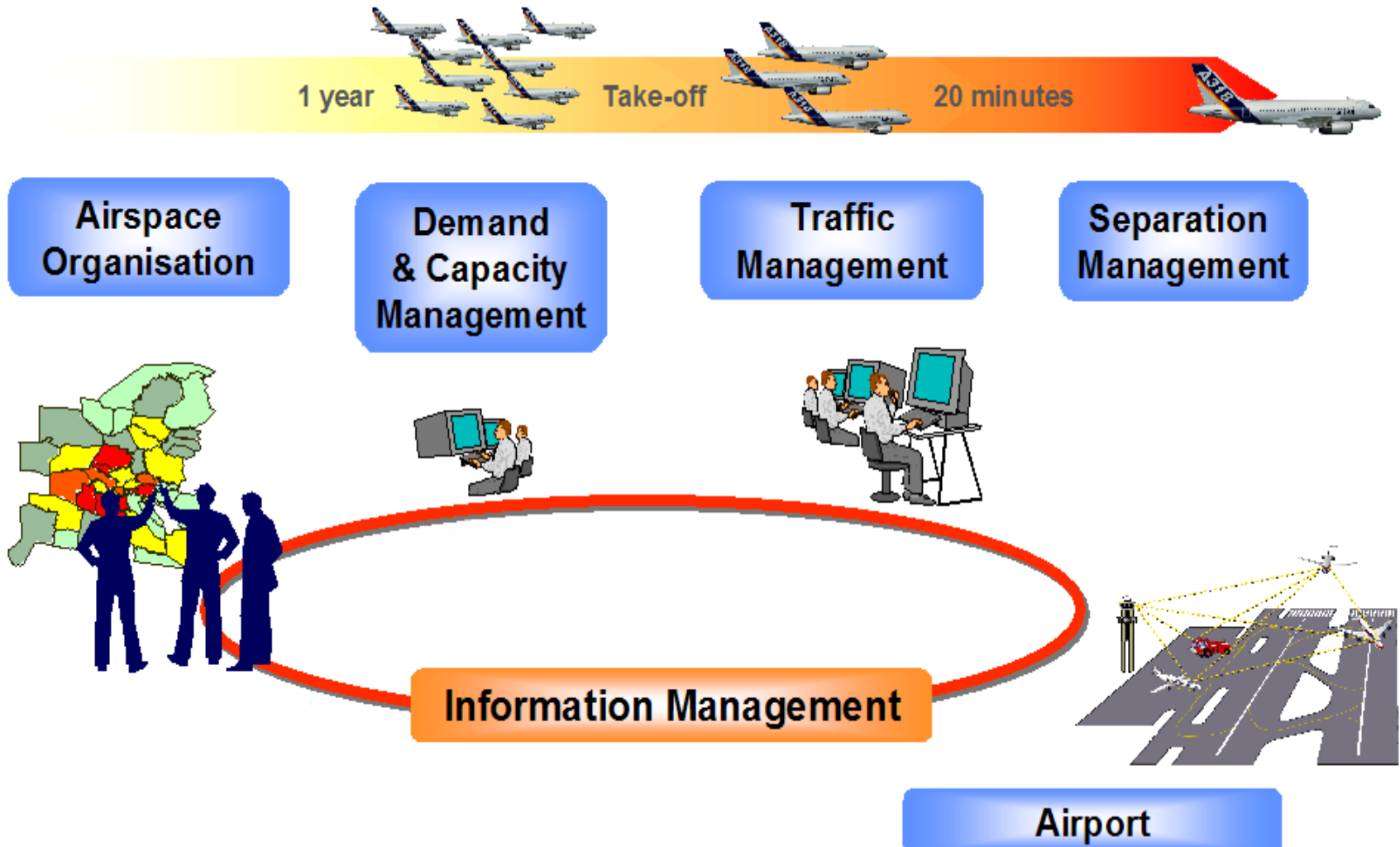
OSS in ATM > Meta-Community

From ATC to ATM

- ATC is one part of the ATM industry
- **ATM = ATC + ATFM + ASM**
 - ATC = Air Traffic Control
 - ATFM = Air Traffic Flow Management
 - ASM = Air Space Management
- From real time
to planning and optimizing

OSS in ATM > Meta-Community

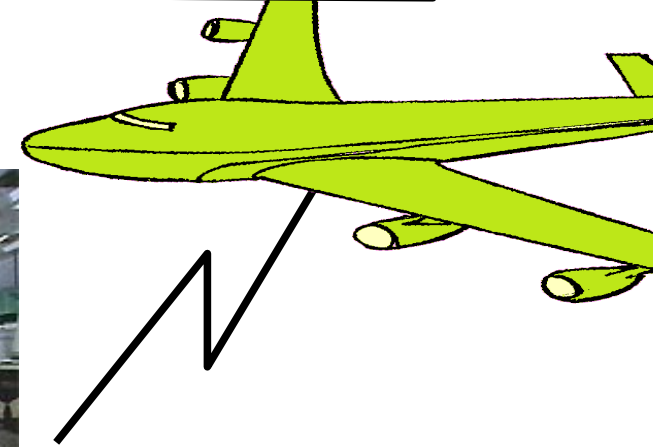
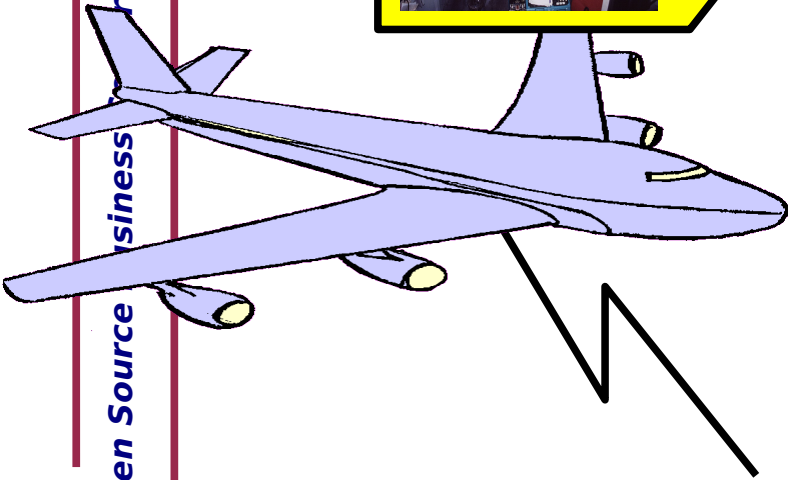
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OSS in ATM > Meta-Community

Ground:ATC vs. Avionics:TCAS

TCAS



OSS in ATM > Meta-Community

ATM is based on CNS

(operations are based on infrastructure)

- **Communication:** voice + data links
- **Navigation:** beacons, ILS, GPS... Galileo
- **Surveillance:** active + passive

ATM industry

- Infrastructure providers:
hardware + software
Ex: Lockheed Martin, Thales, ...
- Service providers:
(real-time) operations
= ANSPs
Ex: DFS, NATS, ...

OSS in ATM > Meta-Community

EUROCONTROL



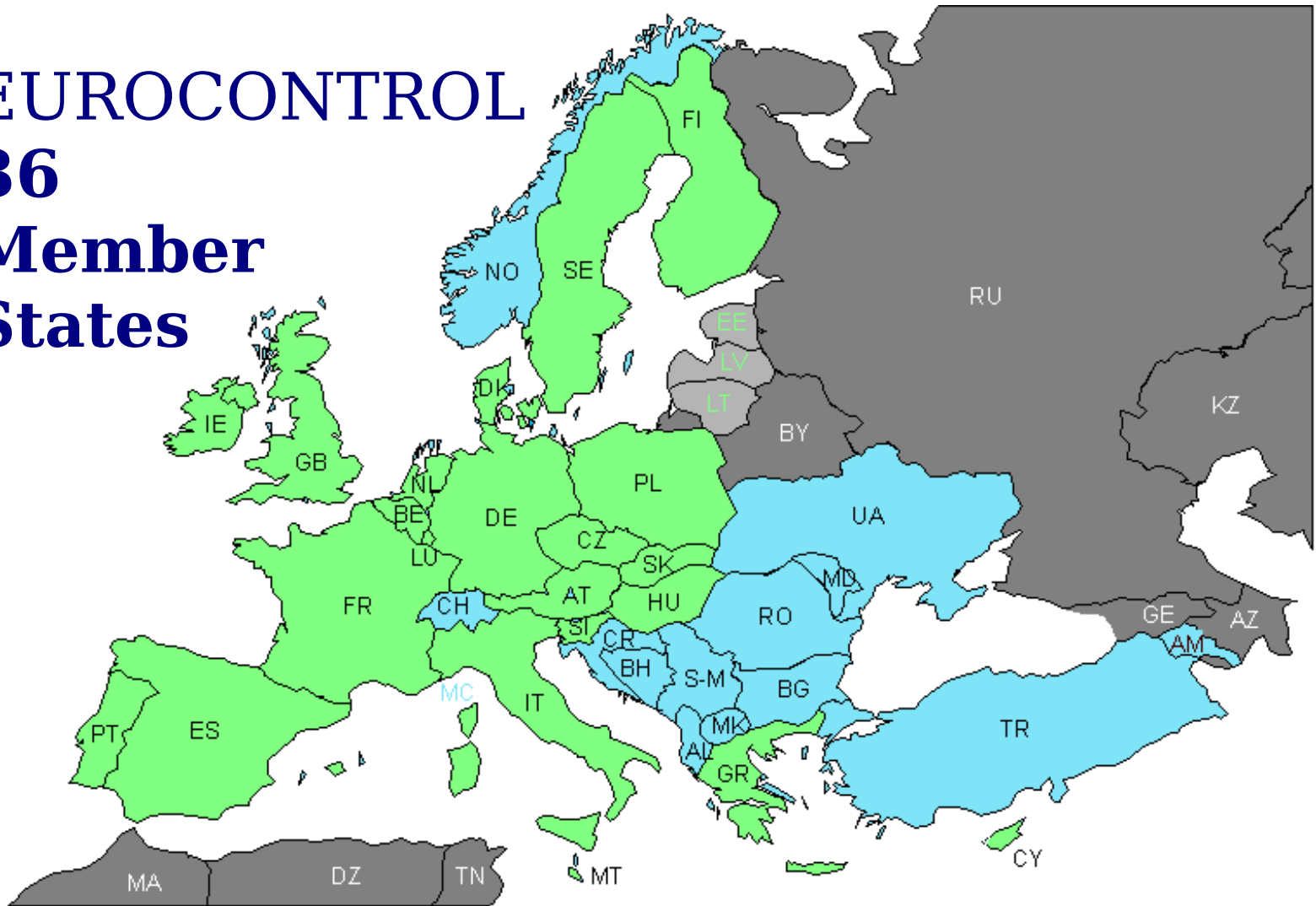
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- 36 Member States
- Institutional cooperation
- Partnership with ATM industries

OSS in ATM > Meta-Community

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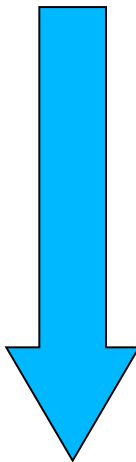
EUROCONTROL
36
Member
States



OSS in ATM > Meta-Community

EUROCONTROL: conventions

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Step	Reason	Goal	Result	Member States
1960	Jet flights	<u>ATC</u> Air traffic Control	Maastricht UAC	6  36 today
1981	Delays	<u>ATFM</u> Air Traffic Flow Management	CFMU Central Flow Management Unit	
1997	Rise in traffic	<u>ASM</u> Air Space Management	RVSM Reduced Vertical Separation Minimum	

OSS in ATM > Meta-Community

Main goals:

- **Safety**
- Capacity
- Efficiency
- Security
- Environment

EUROCONTROL

Main activities:

- Pan European programmes
- **R&D**
- Training
- ATC for 4+8 States
- CFMU
- Route charges
(5.6€ billion in 2003)

OSS in ATM > Meta-Community

2 critical events for ATM

- 11th Sept 2001
- **SECURITY**



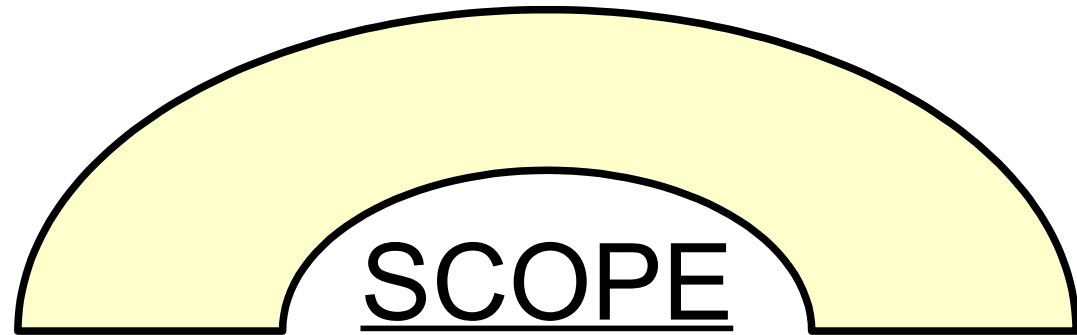
- 1st July 2002
- **SAFETY**



OSS in ATM > Meta-Community

R&D project: **OSIFE**

- ◆ **O**pen
- ◆ **S**ource
- ◆ **I**mplications
- ◆ **F**or
- ◆ **E**urocontrol



Not for office administration

Not for ATM systems infrastructure

For ATM software itself

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OSIFE 1) method

1) Define first hypotheses.

2) Collect facts and arguments from experts.

3) Formalize (**if possible**).

4) Refine hypotheses.

Iterate → 2).

6) Conclude.

**Opportunity
to increase
awareness**

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OSIFE 2) basic hypotheses

- **ATM harmonization** will be facilitated.
- **ATM quality** will be improved.
- **ATM business model** will be adapted.
- **ATM public service** obligations will be met better.

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OSIFE 3) collection of facts and arguments

- A) through literature
- B) through networking
- C) through prototyping



Limits of OSS literature:

- much literature
- but nothing about ATM

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OSIFE 4) collection of facts and arguments



- A) through literature
- B) through networking
- C) through prototyping



ambassador
of ATM in OSS

1) Visit OSS world

ambassador
of OSS in ATM

2) Re-visit ATM world

ATM delegates
meeting
OSS delegates

3) Cross-fertilize the 2 worlds:
roundtable > www.oss-in-atm.info

OSS in ATM > Meta-Community

Need of a meta-com 1/2

- Linux:
1991 Linus Torvalds
> OSS community
1998 Eric S. Raymond
> OSS meta-community
- ATM:
1999 www.openATC.org > failure
2006 www.oss-in-atm.info > success

OSS in ATM > Meta-Community

Need of a meta-com 2/2

ATM: no bottom-up OSS possible because

- Specialized field
- No access to infrastructure
- No critical mass of developers

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Roles of a meta-com

- To start OSS communities
- To develop a common rationale
- To keep security secret
- To decide which s/w to open up
- To choose licence and forge
- To guarantee quality testing
- To trigger domain evolution
- To promote OSS products

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OSIFE 5) formalism 1/2

SWOT analysis.

- **S**trengths
 - **W**eaknesses
- OSS

translation

- **O**pportunities
 - **T**hreats
- ATM

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OSIFE 5) formalism 2/2

SWOT analysis > basic OSS rules

- IF P= strength (OSS)
- AND P= weakness (ATM)
- THEN P= opportunity (OSSinATM)

- IF Q= strength (ATM)
- AND Q= weakness (OSS)
- THEN Q= threat (OSSinATM)

Example
P=
interoperability

Example
Q=
security
(access)

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Roles of profit-oriented business

- Participate to the Meta-Community
- Develop its own business model to deal with OSS

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Roles of universities

- To research all the spectrum of the OSS phenomena, including business models
- To disseminate the research info. and organize OSS curricula
- To participate in specific meta-communities
- To create inter-meta-communities
Ex: CALIBRE-CALIBRATION

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Conclusions 1/2

LINUX
bottom-up

beyond LINUX
top-down

- For Linux-like cases, the meta-community appears years after the OSS community.
- For OSS-in-ATM (beyond Linux case), the meta-community should come first in order to instantiate OSS communities.
- Starting event: www.oss-in-atm.info

***Thank you CALIBRE+CALIBRATION
for a strong and bright impetus!***

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Conclusions 2/2

linux-like



**Thank
YOU
for your
attention
!**

OpenOffice presentation available in ODP, PPT, PDF

OpenOffice text available in ODT, DOC, PDF

www.oss-in-atm.info > follow-up