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Interoperable Open-Source-Based Architecture
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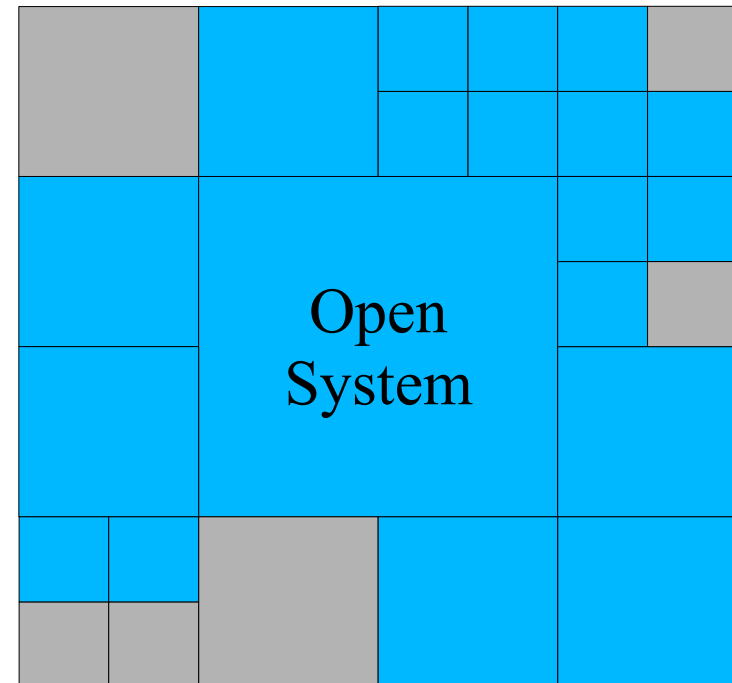
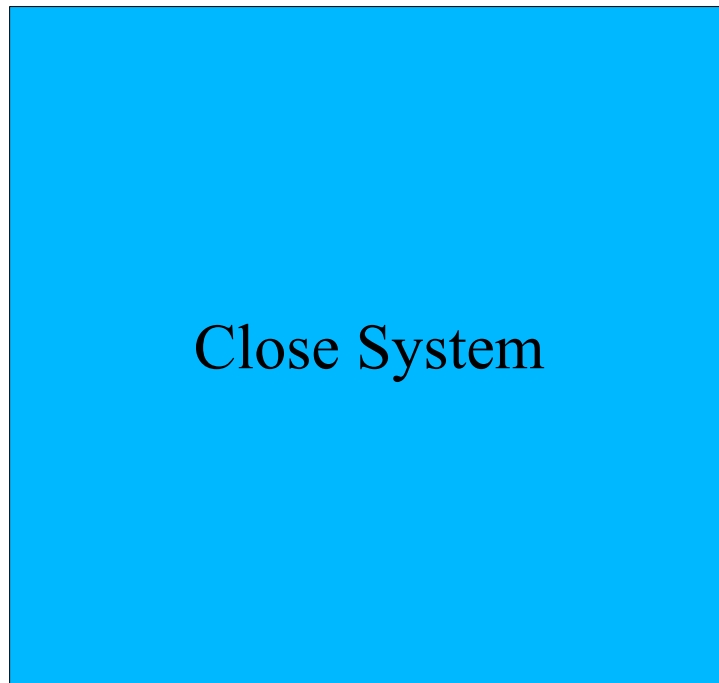
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What we'll learn now...

- What are Open and close systems
- Interoperability principles
- Needs for Technical Standards
- Certification Processes
- Rôle of FLOSS in Interoperability

•Open -vs- Close Systems



From an architecture stand-point, an open system is a system where boundaries are not fixed in a deterministic manner, but as a matter of design considerations.

Interoperability

A generic definition from Wikipedia

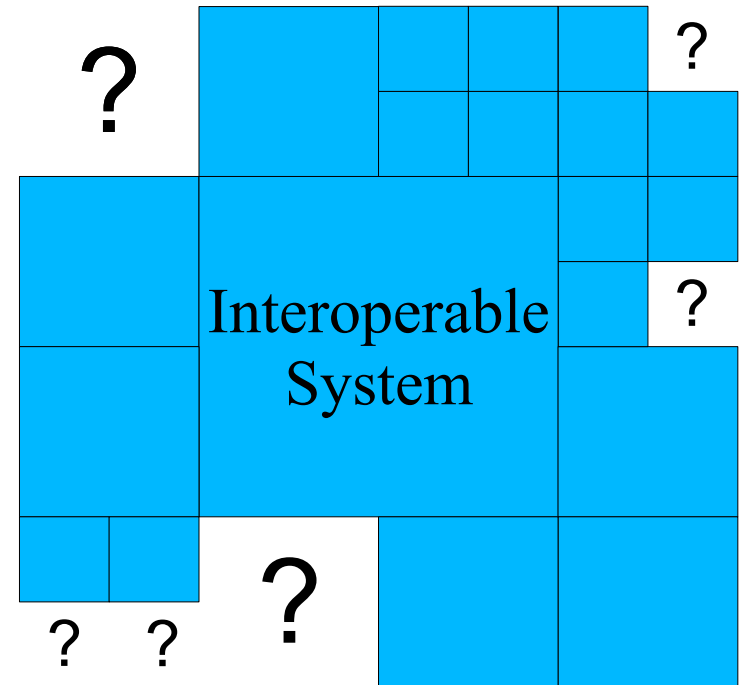
“Interoperability is a property referring to the ability of **diverse systems and organizations to work together** (inter-operate). The term is often used in a technical systems **engineering sense**, or alternatively in a **broad sense**, taking into account social, political, and organizational factors that impact system to system performance.”

Software-specific definition from ISO/IEC 2382-01

"The capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units"

Interoperable Systems

- Interoperable systems are open systems where specifications of interactions between subsystems is available to third-party designers
- “*Frameworks of technical specifications*” often include APIs, SPIs, Protocols, Formats, Grammars...



What is a Technical Standard?

- A framework of **specifications**
 - approved by a recognized organization
 - « **de jure** » if the SO (standards organization) has official recognized authority
 - or generally accepted and widely used throughout the industry
 - aka « **de facto** »
- Standards **≠** software (no code implied)
 - file formats, communication protocols, application programming interfaces, ...

So, why are Standards Important?

- Solve problems once, not every time
- Facilitate assembly of components from different vendors
- Inform customer of product features before acquisition
- Open a market to a large number of customers
- Ensure stability over time

Open Standards

What is the Issue at Hand?

- Open Technology \neq Open Business
- \Rightarrow One may have enter into business contract to run, distribute or sell interoperable software.
- Common Business Rationales
 - Free Razor, expensive Blades
 - Force users to upgrade to maintain data access
 - Force partners to align with business strategy
 - Organise scarcity of interoperable systems

Open Standard Definition #1

- **Bruce Perens' Definition**

- Availability
- Maximize end-user choice
- No royalty
- No discrimination
- No certification of subsets
- Extensions protected against predatory practices (embrace and extend)

Open Standard Definition #2

☰ **The EU IDABC Definition**

- Adopted and maintained by:
 - ◆ a non-profit organisation (S.O)
 - ◆ with a decision making process open to all interested parties
- Published specification document available at nominal or no charge
- Patents irrevocably made available on a royalty free basis
- **No constraints on the re-use of the standard**

Compliance with Standards : The Certification Process

3 Distincts Organisations

- Standard O. \neq **Certification O.** \neq Testing O.

The Certification Mark

- C.M rights usually owned by Certification Organisation.

Certification Agreement

- Between the (software) vendor and the Certification O. rules use of Certification Mark
- Use of the mark is subject to approval (**test of compliance**)

From Open to Proprietary

The EEE Tactics

- **Embrace**
 - Dominant vendor implements an open standard
 - Vendor markets fully compliant products
- **Extend**
 - Vendor adds proprietary enhancements to the standard
 - Product gradually drifts away from the open standard
- **Extinguish**
 - Enhancements become a *de facto* standard

FLOSS and Open Standards

- Existence of FLOSS implementations may prevent from EEE
- FLOSS projects are well suited to develop compatible-software that can interoperable with close systems is legal (In many countries) through reverse engineering
 - Some restrictions for DMCA/EUCD: if it is deemed that the process can assist in the circumvention of measures implemented to protect against illegal copying or use*
- FLOSS and Open Standards share the same vision of availability, openness and large participation

Architecture of a News Portal

- 1. Read carefully the requirement document (on the wiki)
- 2. Search for norms and standards that may be relevant to the system.
- 3. Search for open-source platforms and components that could apply to the design.
- 4. In the provided slide template, make a list of standards and components
- 5. In the provided slide template, choose the most appropriate architecture diagram template and fill the diagram with open-source components you have selected
- 6. Fill the slide with design rationale and your choice motivation
- 7. Fill the conclusion slide with the strengths and weaknesses of your design.

Recap

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- “Open systems” designs are modern architecture principles that rely on standards for interoperability
- Open standards and companion FLOSS projects are essential to the development of fair ecosystems
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About:

"FOSS Bridge EU-Vietnam - Joint Business through Free and Open Source Software" is an ASIA-Invest programme implemented by InWEnt - Capacity Building International of Germany, Institut National de Recherche en Informatique et en Automatique (INRIA) of France and the Institute of Information Technology of Vietnam (IOIT) with financial support by the European Commission and the German Federal Ministry of Economic Development and Cooperation (BMZ).

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