



Open Source IoT (OS-IoT)

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AT&T

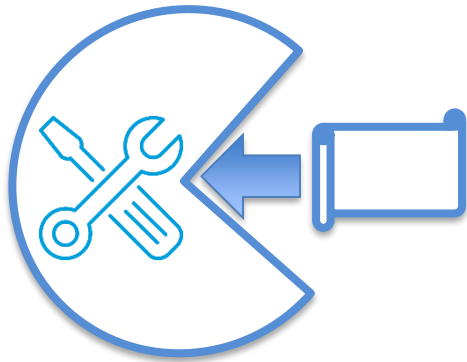
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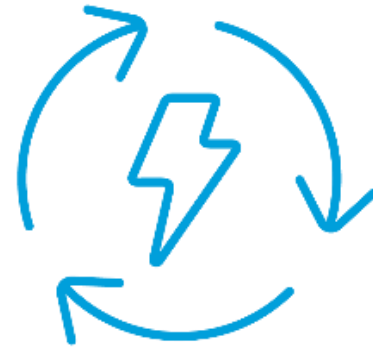
Open Source and Industry Trends

Pivot Towards Open Source

Consumption



Contribution



Culture



Open Source Adoption

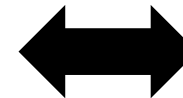
Open Source Community



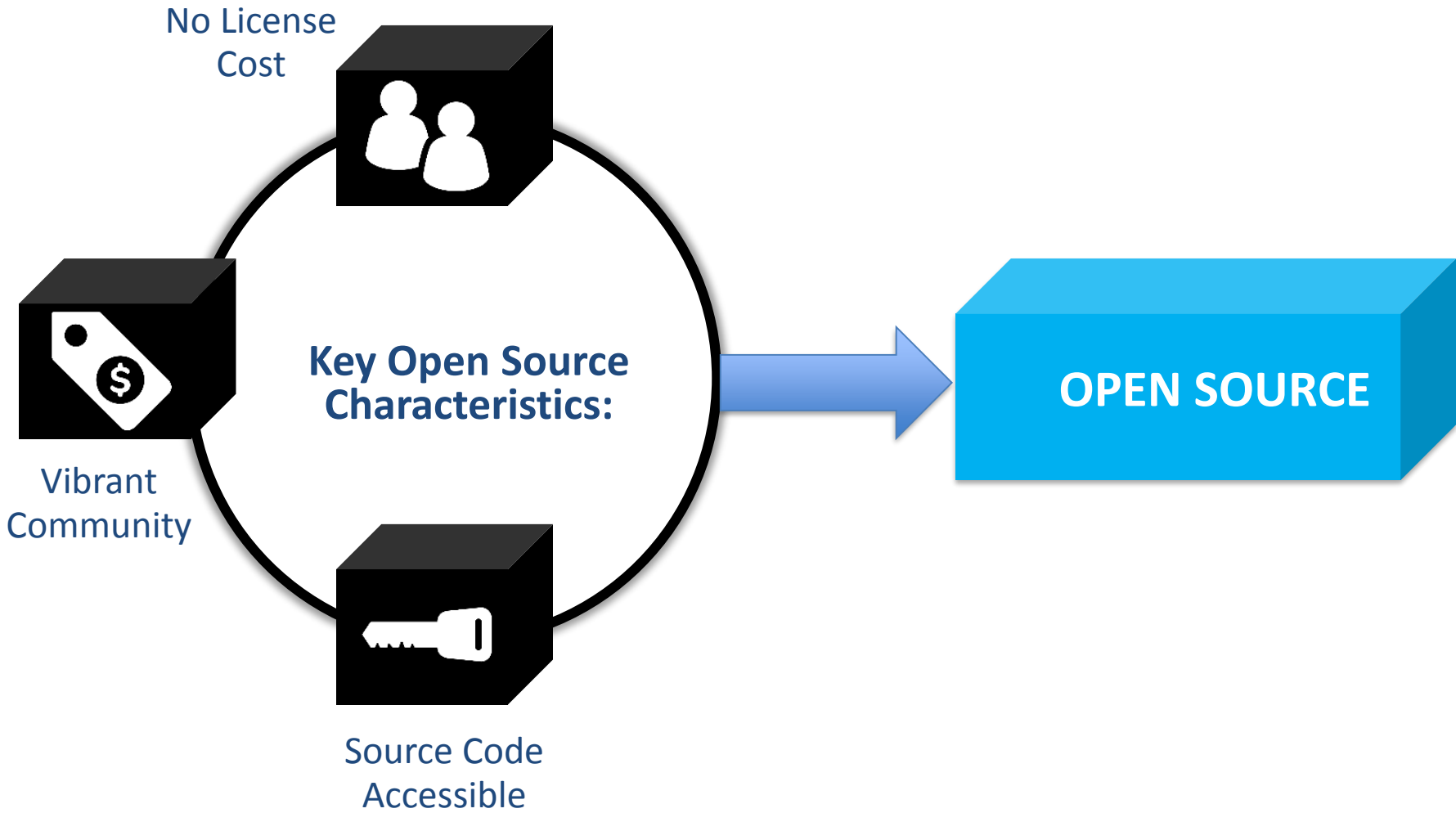
Community Teams



Internal Teams



Key Open Source Characteristics





OS-IoT – ATIS Project on Open Source IoT

ATIS Advances oneM2M Adoption

- oneM2M is promoting the adoption of its standard and working to educate and equip developers to use it:
 - Training materials and developer guides
 - “Developers Corner” on oneM2M web site
- Testing framework, profiling and interoperability events to help deliver openness in the market
- Emerging ecosystem of implementations and tools
 - Open-source and proprietary



ATIS OS-IoT Project: Background

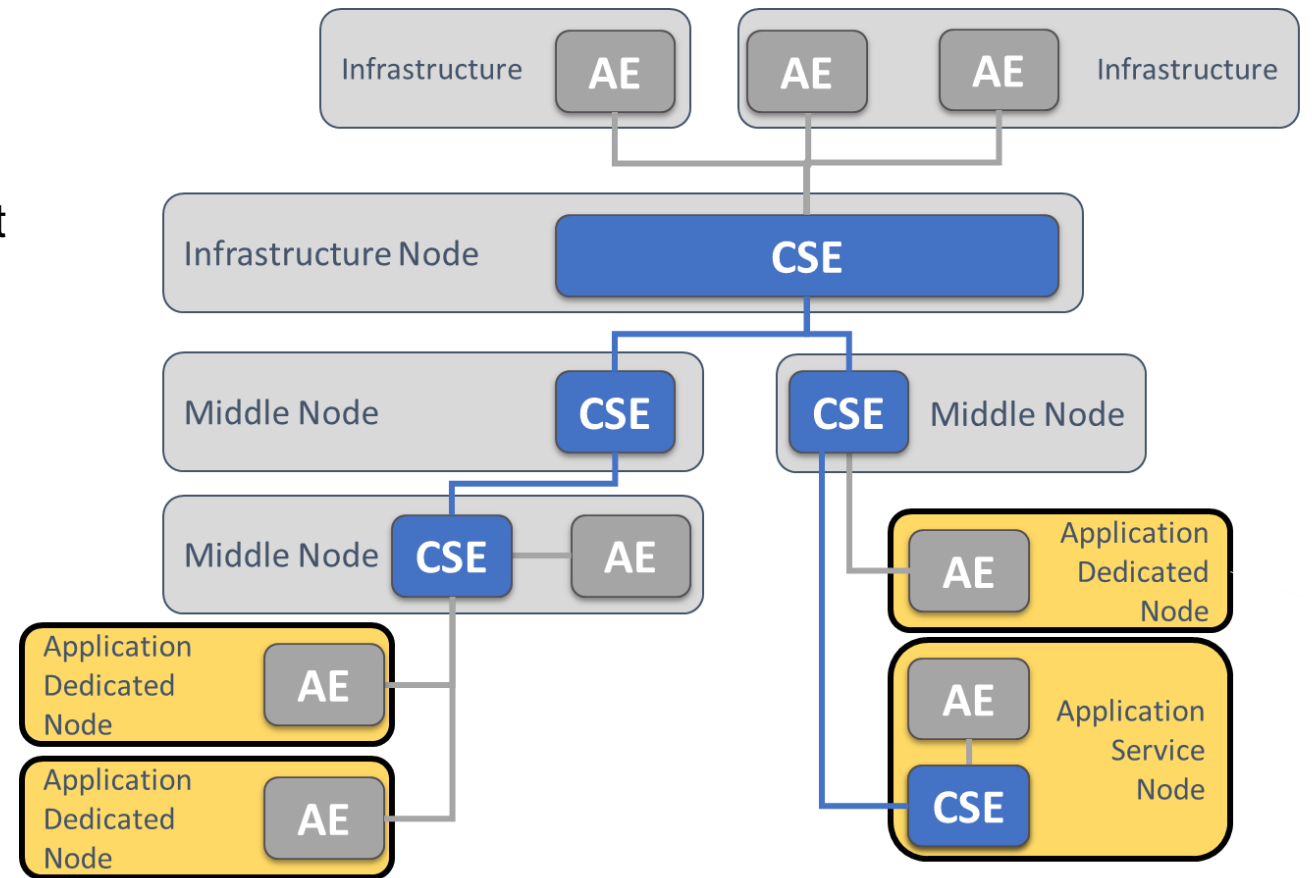
- ATIS member and industry survey highlighted a support need for simple clients:
 - Simple clients are required for many IoT applications (e.g., smart metering, smart city/transport, wearables)
- A portable, simple, open source oneM2M client framework would drive industry adoption and help improve the quality and security of IoT devices
- OS-IoT's goal is to create a simple oneM2M Open Source client which can broaden and enrich the range of open oneM2M clients available

OS-IoT Client: Key Goals

- Simple “on-ramp” for developers to quickly develop common types of IoT clients based on oneM2M specifications
- Open source with commercial/industry-friendly licensing terms
- Highly portable across platforms
- Reference target is open-hardware and open-software embedded platform

OS-IoT Client: System Aspects

- Basis will be stable oneM2M Release 2 (with clarifications adopted from Release 3 where needed):
 - Will draw on the oneM2M Release 3 client profile work
- Support oneM2M client Application Service Node (ASN) or Application Dedicated Node (ADN):
 - Target basic sensor (thermometer) and actuator (door lock) applications
- oneM2M security support intended as part of early deliverables
- Initial release will assume IP network connectivity

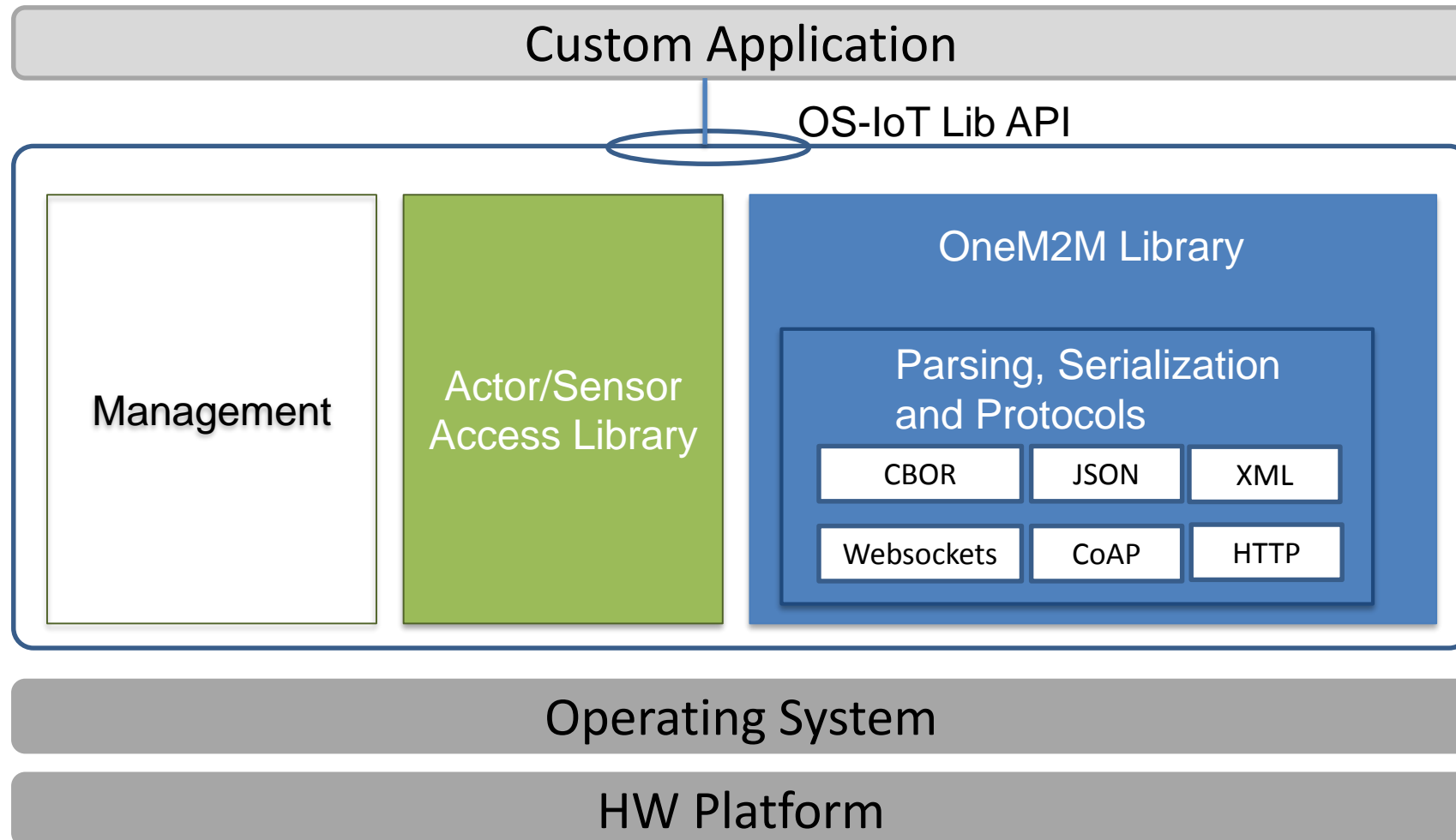


OS-IoT Participation

- Open to both ATIS members and non-members
- Leaders and active contributors:
 - AT&T, Qualcomm, Huawei, InterDigital, and Linaro
- Other participants:
 - ARM, CenturyLink, Cisco, KETI, Nokia, and Sierra Wireless

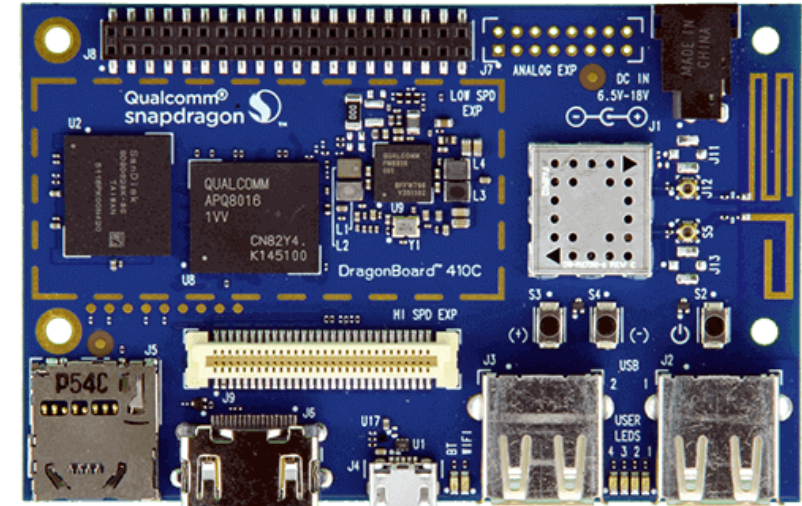
Contributors provide a wide-range of expertise on oneM2M standards, client chipsets and open-client ecosystems

Overview of OS-IoT Client Architecture



OS-IoT Platform

- Initial target hardware representative of embedded platforms:
 - '96boards' DragonBoard 410c (ARM Cortex A53 CPU)
- Open hardware specification with common form factor and software load available from multiple vendors
- Initial target OS: Debian Linux
 - Packaged by Linaro for the 96Boards open platform
 - OS dependencies will be abstracted to allow portability to other OSs/RTOSs/No OS environments
- Development language C++
 - Portable and broadens the range of languages which have open oneM2M clients



IPR

- Legal framework established for code licensing and contribution process:
 - Project deliverables are licensed under 3 clause BSD license
 - BSD version 2.0
 - Highly flexible and industry friendly
 - No “copy-left” requirements
 - Developers Certificate of Origin confirmation for contributed code to confirm compliance
 - ATIS FRAND patent policy applies:
 - Balances interests of patent holders and patent users

First Deliverables

- First working prototype has been shared with OS-IoT participants:
 - Supports XML over HTTP
 - Tested against Eclipse OM2M CSE and InterDigital Cloud CSE
 - Portable between PC/x64 environment and DragonBoard/ARM
 - Supports create/get/delete for AE, Container and contentInstance
 - Prototype tests some of the concepts and helps direct future work
- Planning phase:
 - Support for JSON over HTTP
 - Simplified API for application developers
 - Code availability for others to review, test and contribute

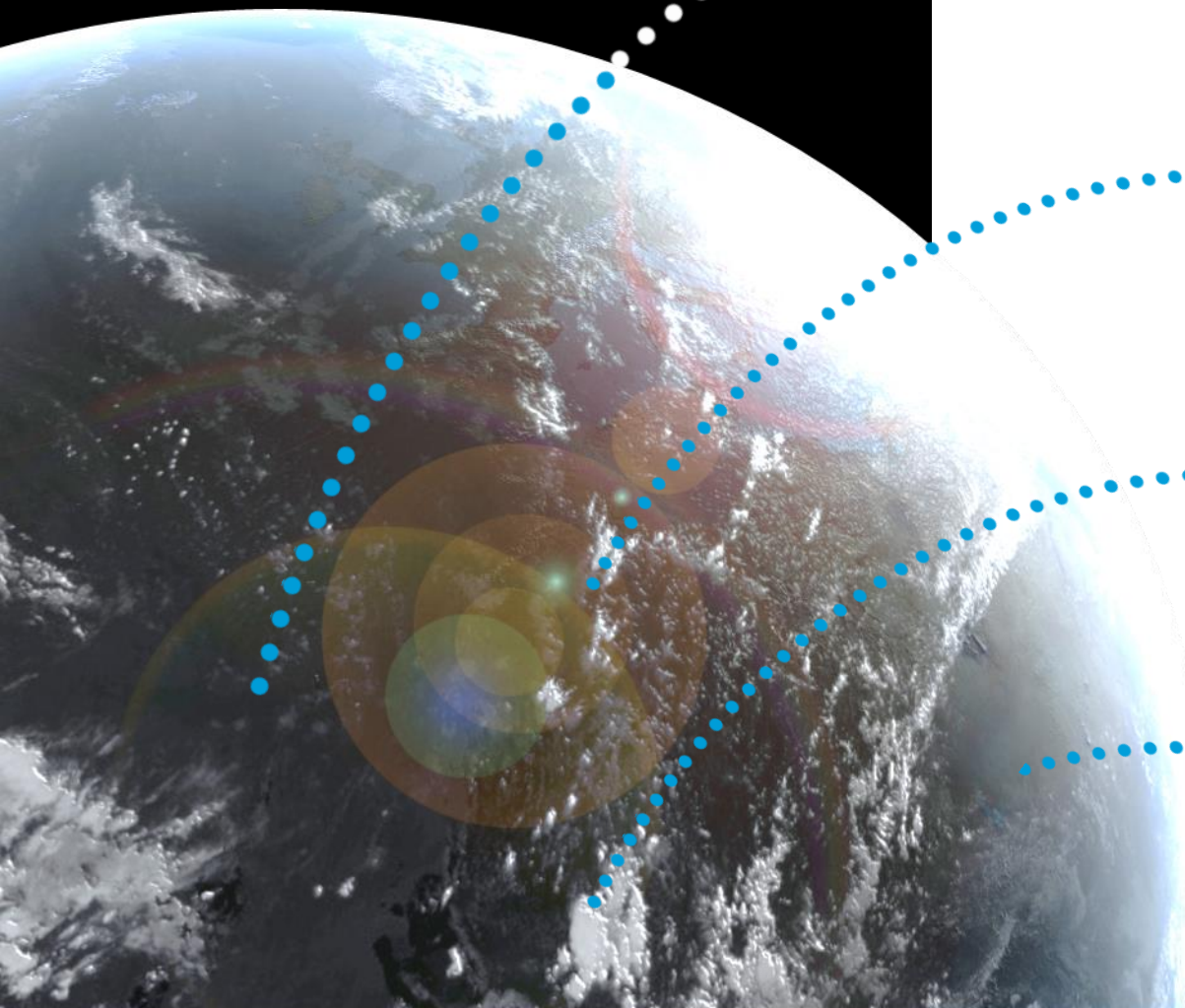
How Can You Contribute?

- Provide testing input:
 - Ensures the client offers maximum value
 - Involvement in testing against different CSEs or against test tools would be valuable
 - Comments on the API and alignment of capabilities to developer needs are welcome
- Contribute to the code:
 - Many aspects of the prototypes should be enhanced to make a ready-to-release version
 - Participation, particularly coders with experience in C/C++ embedded development, is encouraged
 - In addition to the oneM2M library, interfacing to actors and sensors will be added

For More Information

- To join the activity or to be notified when prototypes are released, please contact:
 - Iain Sharp (isharp@atis.org), ATIS Technical Lead, or
 - Yvonne Reigle (yreigle@atis.org), ATIS Director – Strategic Initiatives

Open Source Software



Vibrant Community



Source Code Accessible



Speed & Agility



Open Innovation