



IoT Smart Buildings Challenge

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Evaluation Criteria

The submitted proposals will be evaluated according to the following criteria:

Business

How well does the proposal support the outlined use cases, provide value-add for the partners and deliver innovation?

Technology

How well does the proposal describe how it will ensure scalability and realistic rollout in an enterprise environment? Proof of concepts will be given bonus consideration.

Community Contribution

How well have the contributors supported the challenge events reflected in the timeline?

Submission deadline: August 30, 2019

A cluster of three faded, light gray gear icons located in the bottom right corner of the slide.



Challenge Submission

Please use the following slides to make your submission to the challenge

Use this PowerPoint template to submit your proposed concept for the challenge.

Fill out each slide from the following, using the appendix for additional material.

Optional:

- Video
 - To access the short introductory video, please use this URL:
https://drive.google.com/file/d/14ZY4H9ztQNxoV_8hszXgNcAAsSx-Ec6L/view?usp=sharing
- Code / PoC (proof of concept) Results
 - This is mentioned at the end of this presentation.





About Your Company OR Challenge Team

Please submit on this slide:

- Company name(s): **Cloud Studio** (CLOUD GROUP S.A.)
- Submitter name(s) and e-mail addresses: Diego De Marco (ddemarco@cloud.studio)
- Web site: <https://www.cloud.studio>
- Diego de Marco, CEO is representing this submission
- We're a small company, 6 people in all, all involved in the design and development of the product described in this submission.



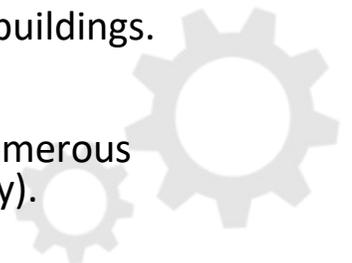


Use Case: Smart Automated Building with GEAR.STUDIO

Our **GEAR.STUDIO** platform focuses on large-scale infrastructure monitoring and energy optimization, with a special interest on power monitoring and demand response:



- It enables the collection of power metering data from multiple commercially-available power meters, both single-phase and multi-phase.
- Offers compatibility with hundreds of sensors and actuators both from ourselves and third parties, through a variety of technologies.
- Makes it possible to define rules used to control HVAC and lighting devices in order to reach predefined goals, based on schedules, occupancy, ambient variables, weather conditions, power usage, etc.
- Provides key performance indicators via highly customizable dashboards and history reports.
- 100% designed as a multi-tenant platform. Each tenant may have multiple facilities / buildings.
- Business model: platform as a Service (PaaS).
- We've also created many complementary hardware devices that we've installed in numerous projects in our country, both sensors and actuators (100% owned Intellectual Property).





Contributions to the Smart Buildings Challenge

We're members of the CABASE (Argentinean Internet Consortium, www.cabase.org.ar), and contributed papers, experiences, and participated in numerous events organized by them over the past years, mostly as lecturers on commercial and residential smart-building technology.

We've also collaborated with the University of La Plata (a member of CABASE as well), and shared design specifications with local companies such as Smartmation (www.smartmation.com) to produce an Argentinean Smart Lighting standard.





Solution Design: Business Perspective

In late 2017, we identified that many ISPs, datacenter brokers, and building maintenance companies, having a rather-commoditized portfolio of services, wanted to provide building management to their numerous existing customers had large and/or numerous facilities.

In response to that, we created **GEAR.STUDIO**, a multi-tenant platform, enabling them to offer centralized management of buildings a service. From their perspective, this opens a whole new business line, with which they can also consolidate the fidelity of their existing customers.

From the perspective of tenants (i.e. customers of the companies mentioned above), the added value is very straightforward: they gain centralized monitoring and control of all facilities they use, optimize energy use, and monitor business-critical variables within a single tool, accessible both in web and mobile versions.

For us, this means being a fundamental link in the chain, capturing a relevant part of the revenue stream, and being able to improve the scope and usefulness of our platform, based on the data collected from real facilities.





Solution Design: GTM Perspective

Based on our experience here, the key business tiers in real-life implementations, are:

Cloud Studio. We provide the **GEAR.STUDIO** platform to operators and charge them a recurring per-facility fee. In most cases, we also sell them our hardware: DIN-rail and in-wall actuators, 5-in-1 sensors, and most notably, our Gear Blocks edge controller.

Operators. These are our direct customers, i.e. those who rent our platform, buy hardware, (from us and/or third parties), install them in the tenant's facilities, and manage the infrastructure. When required by the tenants, they also provide maintenance services, although this is relatively unusual.

Tenants. These are the operator's customers. They use the facilities and rely on the operators to manage them (and as mentioned above, sometimes also to maintain them). They receive alerts from the operators when anything goes wrong, including business-critical variables, and use operator-provided dashboards as needed.





Solution Design: GTM Perspective - variations

In some cases, there may be variations to the roles mentioned in the previous slide.

In many cases, **the operator role is split** so that maintenance is done by a third party. The operator then uses the platform, and detects infrastructure problems, but the actual maintenance tasks are carried out by a separate company, or in many instances, by the tenant itself.

In other instances, the tenant itself may also be the operator, effectively **Operators**. These are our direct customers, i.e. those who rent our platform, buy hardware, (from us and/or third parties), install them in the tenant's facilities, and manage the infrastructure. When required by the tenants, they also provide maintenance services, although this is relatively unusual.

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Solution Design: Differentiation

Our solution is different from others in the market in different ways:

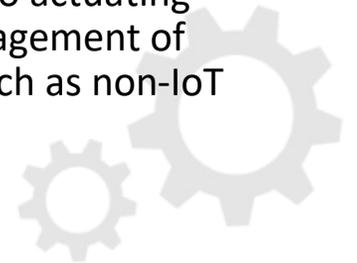
It's **multi-tenant** out of the box. Most solutions out there (mostly BMSs) are not.

We're **not hardware-bound**. We love using our own hardware, but we've gone to great lengths to make sure we can use anybody else's hardware, if it is based on a reasonably open standard.

Our platform is **licensed as a service**. Most BMSs out there are sold with a one-time license, and do not offer an active upgrade/evergreen path.

We own **100% of the intellectual property** of our platform, which means we can extend and improve it as needed with great efficiency.

We cover the **whole range of applications**, from monitoring, metering, and sensing, to actuating and executing carefully-designed energy-saving plans. We will also soon include management of non-IoT assets, so that our dashboards can include information about other things such as non-IoT equipment, and even furniture.





Solution Design: Architecture

Please refer to the attached PPT presentation that contains more details about the platform.





Solution Design: Technology

Please refer to the attached PPT presentation that contains more details about the platform.

In addition to this, our platform is based on the following base technologies:

- Database infrastructure / caching: Microsoft SQL Server and MemCached.
- Back-end: ASP.Net with C#, using secure web services.
- Web front-end: Angular 7, HTML5, CSS3
- Mobile apps: Ionic 4.7.1





Solution Design: Scale

The **Gear** platform was designed with multi-tenancy in mind. This implies dealing with thousands of devices. To accomplish this:

- We implemented our own algorithms to normalize data in special ways (which we call “**statistical normalization**”) to improve database performance.
- We applied **caching** as much as needed, using MemCached.
- We made sure our design can **scale horizontally**, with load balancing.
- We **tested our platform in real-life projects** with more than 65,000 actual devices, bridging the platform to an actual installation that currently controls a significant portion of the public lighting of the City of Buenos Aires.
- This is all built on top of the founder’s **previous experience in mission critical** transportation systems, which allowed him to sell one of his previous companies to Kapsch TrafficCom AG, the largest ITS supplier in the world, in 2006.

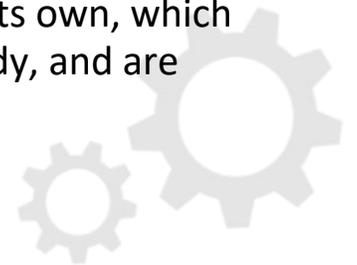




Potential Issues/Challenges

The main challenges we found, and/or expect to find in the future:

- Compatibility with an ever-growing number of technologies and standards. We've participated in the creation of certain standards (mostly for public lighting in Argentina) and understand the complexity of dealing with multiple manufacturers, technologies, hardware limitations, etc. We've dealt with this by abstracting hardware as much as possible and creating specific APIs.
- We expect that business models for the commercialization of platforms like ours to change soon. Only a fraction of the players capable to offer these services are currently doing it. As more players enter the game, new business models will appear, and we will need to make sure our platform is adequate for all of them.
- At the company level, launching our business in other countries is a challenge on its own, which goes far beyond the technological aspects of the platform. We believe we are ready, and are looking forward to that.





Tentative Timeline

- We currently have two PoCs running in Buenos Aires, one of them still in the installation phase (new building).
 - **PoC 1:** Burger King in downtown Buenos Aires. Includes power metering, motion/temperature/light level sensing in different areas, lighting control, HVAC control, monitoring of large freezers and large refrigerators.
 - **PoC 2:** Telecom/Personal retail offices in downtown Buenos Aires. Includes power metering, motion/temperature/light level sensing in different areas, lighting control, HVAC control, monitoring of water tanks, and flooding sensors.
- We are ready to run PoCs in other locations whenever needed. As a matter of fact, we expect to be running several other PoCs here in Argentina before the end of the year.
- In its current state, the platform is perfectly usable in real-life projects, not just PoCs.

We can offer “guided tours” over the internet for PoC 1, if needed.



Join Us Now!

- Submit your application before August 30, 2019
- Fill in the Submission PPT Template and email it to:

Kathy Walsh
walsh@iiconsortium.org

or

Evan Birkhead
evan@trusted-iot.org

