

The next generation of public-safety facilities to manage high-rise buildings

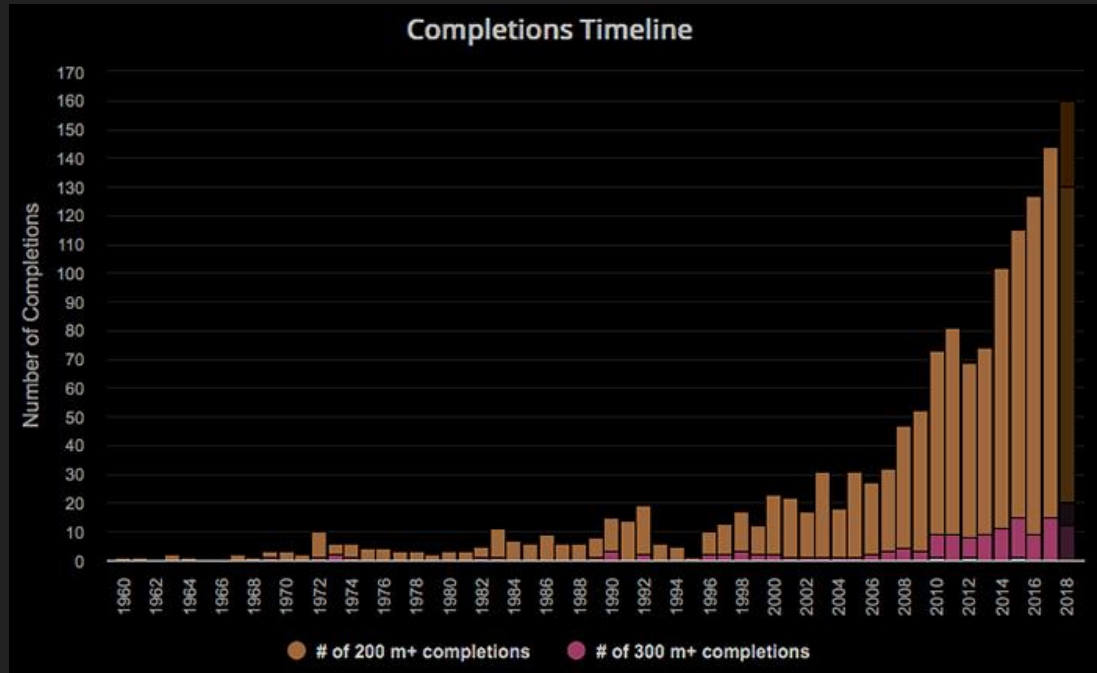
Victor Semenov

WHO AM I?

- Chief Technology Officer at TowerIQ.
- I've been developing public-safety solutions for the last 3 years, primarily for the US market. I spent 2 years as a technical lead and last year as a CTO.
- I started my career as an embedded engineer from the lowest level of programming.

Modern urban trends

- Global skyscraper construction is up 802% since 2000.



Modern urban trends

- A skyscraper is a building taller than 150m or approximately over 40 floors.
- A high-rise building is construction that is taller than 35 meters or approximately 12 floors.
- The number of high-rise buildings is growing around the world, and drastically. Some examples are:

City\Year	2011	2018
New York	5,924	6,436
Kiev	1,531	2,066
Moscow	3,273	12,346
Shanghai	990	25,000+ (approx.)

What systems are we talking about?

- Two-way radio communication enhancement systems
- Fire alarm
- Mass notification
- Fire suppression
 - Sprinkler system
 - Stairwell pressurisation
- Standpipe
- Automatic transfer switch
- Emergency lighting

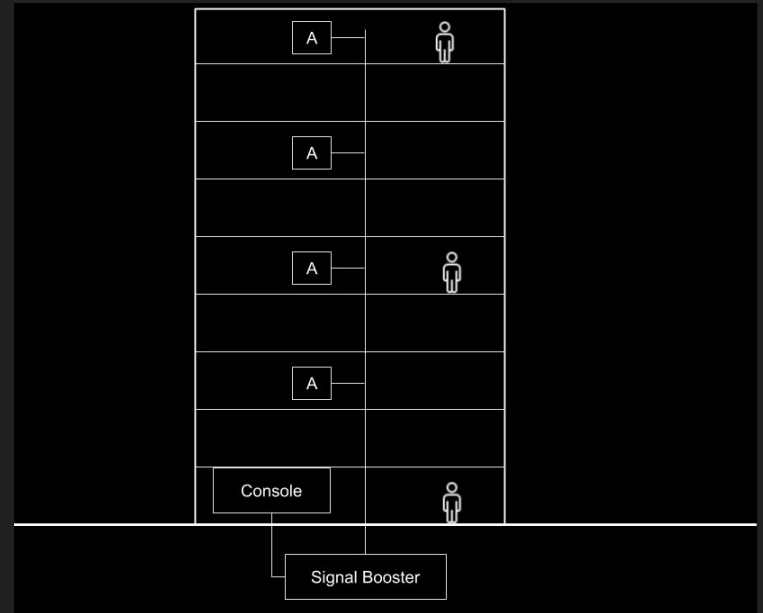
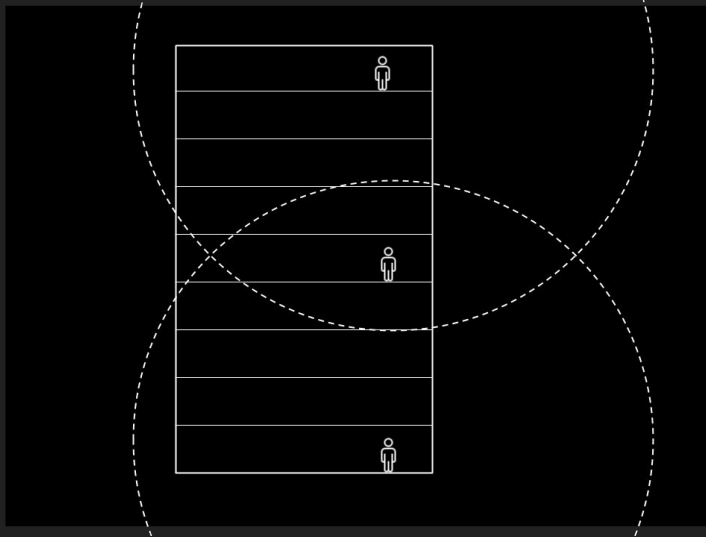
Developers' main concerns

- Do you think the hardest puzzle for engineers is to build higher?
- The main and the hardest barrier in high-rise building construction is safety concerns: infrastructure and facilities.
- The higher a building is:
 - the harder it is to evacuate
 - the harder it is to supply with water for firefighting
 - the harder it is to coordinate first responders communications inside the building

Do we really need this?

- Two-way radio communication enhancement system

“As important as water” - Michael Yohannan, FDNY Bureau Fire Prevention



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- Two-way radio communication enhancement system

“As important as water” - Michael Yohannan, FDNY Bureau Fire Prevention



Do we really need this?

- Fire alarm

Most incidents avoided human losses due to successful and timely evacuations, thanks to fire alarms and mass notification systems.

“Under the testing conditions, a 520 Hz square wave sound woke up 92% of hard-of-hearing participants, making it the most effective.” - NFPA study

Do we really need this?

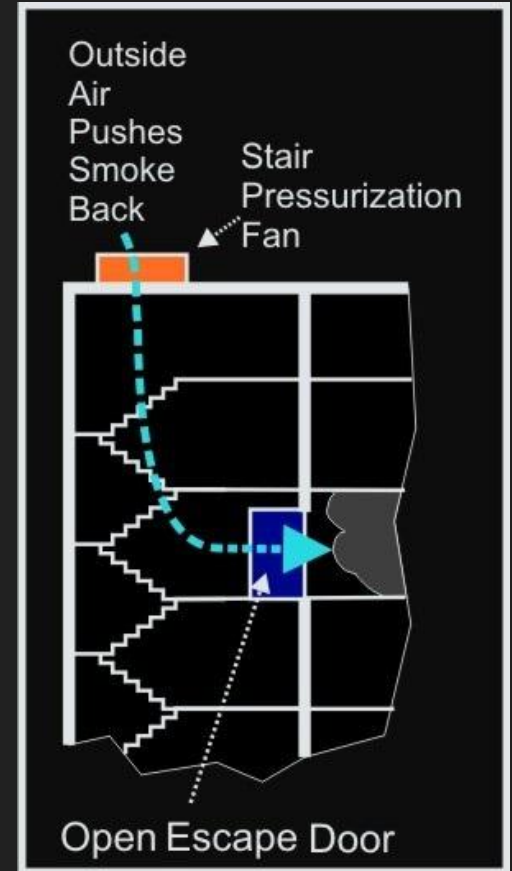
- Fire suppression - Sprinklers

Fact: **“90% of all fires are controlled with six or fewer heads. A study conducted during 80 years of automatic sprinkler use found that 82% of the fires that have occurred were controlled by two or fewer sprinkler heads.”** - TUFTS University

Do we really need this?

- Fire suppression - Stairwell pressurisation

Properly working systems can maintain a smoke-free stairwell (escape route) for at least 2 hours. This allows most tenants to leave the building.



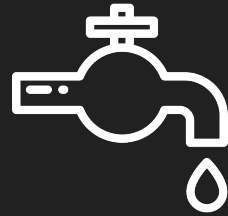
Problems

- Most of the time reliable infrastructure stays unused
- Public-safety facilities are installed at property owners' expense
- Maintenance is privately funded as well
- Owners choose cheapest possible solutions
- Old technologies are widely used (limited or absent use of wireless technologies and cloud services)

Our focus



Infrastructure and
monitoring



Water facilities



Air/smoke facilities

Current solutions - Communication & Monitoring

- **Tactical Series**

- Communication is extremely important. Currently most of the high-rise buildings in the US are equipped with two-way radio communication systems.
- It provides complete supervision and control over communication system.
- It monitors and analyses thousands of system performance indicators and reports it to the fire command centre.



Coming soon - data conveyance & edge processing

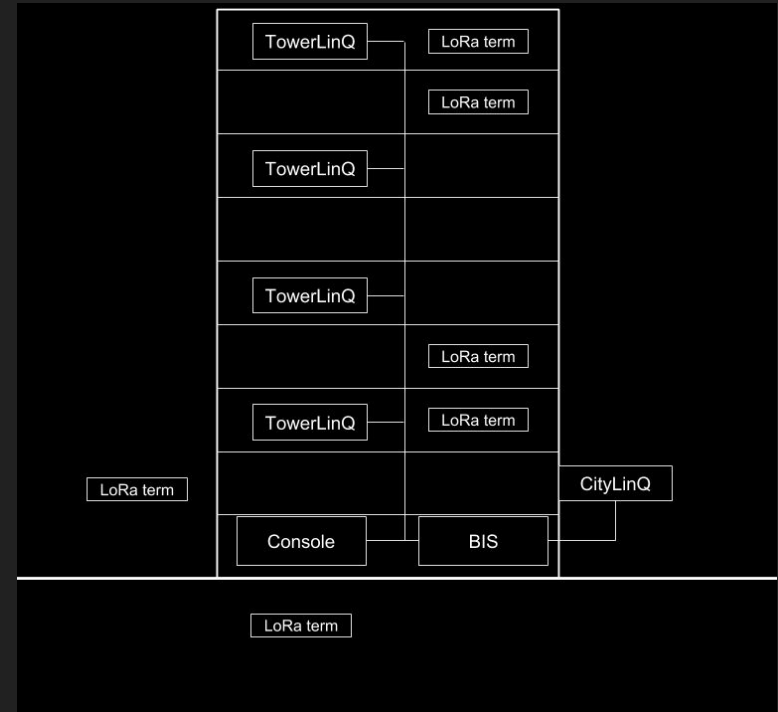
● TowerLinQ

- Current system integrity is poor: usually building's fire alarms trigger local fire departments and the department follows up.
- TowerIQ makes fire grade infrastructure available for commercial use with TowerlinQ and TIQ.cloud service.
- Similar to how mobile carriers provide coverage for mobile communications, TowerlinQ provides 100% in-building coverage for IoT devices of all kinds:
 - Access control nodes
 - Fan/lighting control
 - Environmental sensors
 - Any third party device

Coming soon - data conveyance & edge processing

● TowerLinQ & CitiLinQ

- The Building Information Server makes each building act as a small data centre. It can process collected data at the facility.
- CitiLinQ provides mesh topology communication to other buildings and outdoor terminal devices.
- In case of an incident, all commercial services are sacrificed to give way to first responders' communications.



The Big Idea - Inter-system integration

- TIQ.cloud

- We dream of safe, connected cities and believe that most of the required facilities will be made better by others.
- We provide API for third parties (government, integrators, hobbyists), so they can deploy any outdoor and indoor system or even a single device.
- We provide robust and reliable infrastructure, with no additional charge for property owners.
- We increase reliability by implementing mesh networking.

Thank you! Questions?

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TOWERIQ
SIGNAL WHERE IT MATTERS

We did that →

- 8 km of cabling
- 250 antennas

