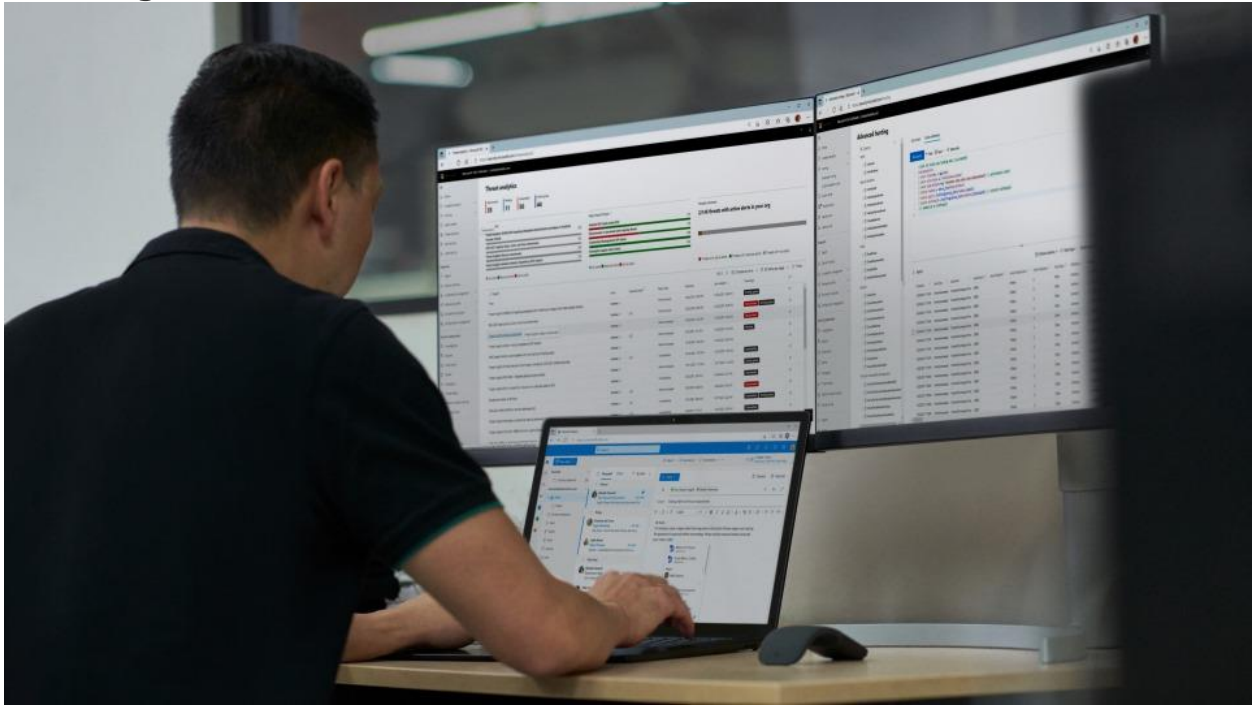


#StartupsOnAzure – Azure helps R2 Wireless bring IoT wireless threat analysis to smart cities



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Critical infrastructure under threat

The demand for multi-layered protection for smart cities and critical infrastructure has increased with the growing threats. On one hand, smart cities and critical infrastructure are routinely targeted by attackers and persons who willfully trespass, posing significant risks for assets that are essential to societal functions.

Even minor damage caused by malicious behavior, not to mention terrorism, may have negative consequences for security, the well-being of its citizens and their quality of life. On the other hand, they rely on secure wireless communications to maintain uptime. With countless potential threats that can cause platform-to-device communication latency or

hacks, it's imperative to have the means to monitor and manage each wireless device on a limitless scale.

Data access challenges for IoT wireless threat detection

It's become clear that IoT sensor-driven smart cities and infrastructure can dramatically improve lives. But they also bring major data security, interference, and latency challenges. The billions of sensors over wireless networks, communicate with the cloud and the edge present countless signal interference and hacking opportunities. The latter is known as a new radio frequency, or RF cyber landscape, created by various malicious IoTs.

More of these IoT platform-based smart cities and critical infrastructure providers are turning to Israel-based R2 Wireless for the proactive endpoint monitoring and threat analysis they require. [R2 Wireless's Open Radio Analysis](#), a proprietary AI-driven radio signal processing cloud platform, relies on its own growing sensor networks. These networks monitor for wireless signals that could interfere with or hack into wireless data transmissions between the IoT sensors of smart city platforms or infrastructure run by R2 clients.

The challenge is the massive data ingress and management required for analysis, including:

- Large-scale worldwide deployment requiring high data-rate ingress from a growing number of sensor endpoints at the same time with minimal latency
- The need for a ceaseless and high-reliability cloud-based platform to store and route data to expanding databases and application/workload nodes, with low latency and minimal end-user surveillance data downtime
- The ability to aggregate, store, route, and manage vast amounts of endpoint sensor data in real time

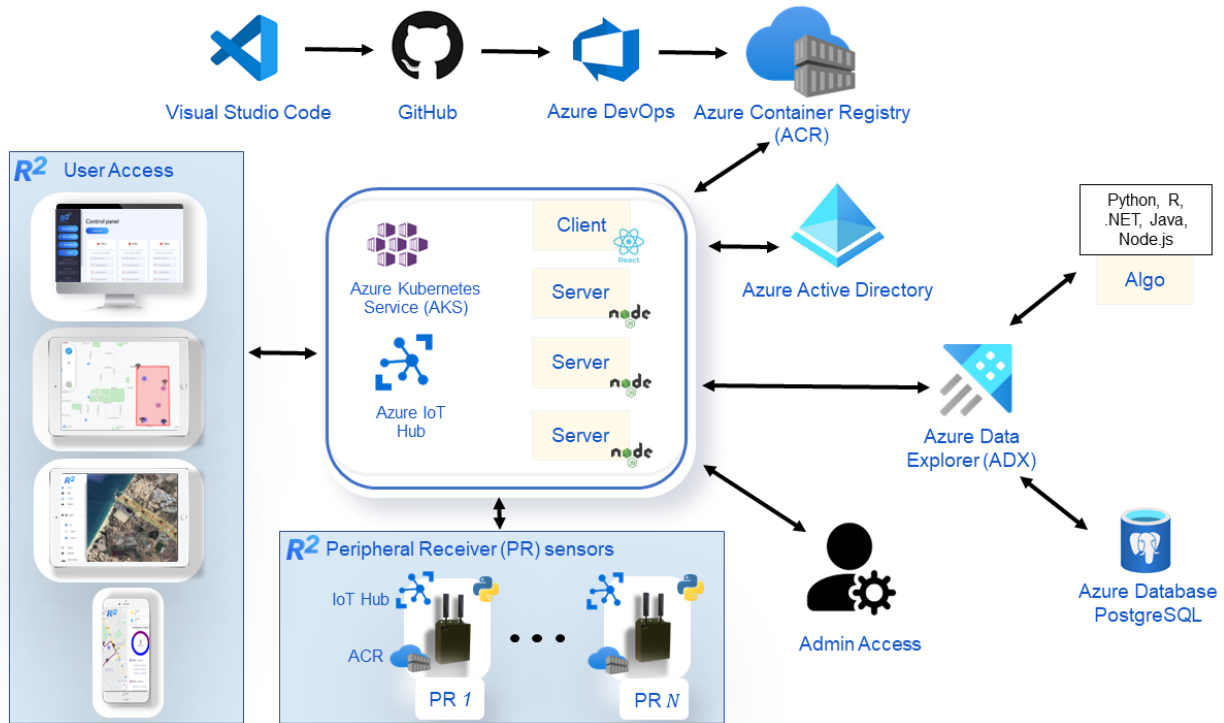
R2 Wireless needed to aggregate and store data in a scalable cloud environment for ingestion by their AI-driven Open Radio Analysis platform. This would deliver real-time, non-intrusive wireless interference threat analysis, supporting worldwide client IoT platform remediation.

What is R2 Wireless's Open Radio Analysis?

Israel-based R2 Wireless is the developer of what they have labeled the "Iron Dome for wireless threats." R2's solution is a proprietary, AI-based signal processing algorithm and analysis platform. The platform, known as Open Radio Analysis, detects, identifies, and localizes wireless threats (e.g., drones, cellular, Wi-Fi, and more) in real time. This fulfills a critical need for smart cities and infrastructure around the world where uptime is crucial.

Their customers' IoT platforms may have thousands or even millions of sensors transmitting wireless data to the edge or the cloud. To accommodate this broad need, Open Radio

Analysis passively receives the radio waves and extracts information about the wireless devices without infringing on user privacy. It then provides situational awareness and actionable insights on threats that come from these wireless devices or the people who carry them.



How R2 Wireless works with Azure to improve threat analysis in smart cities

[Azure Kubernetes Service](#) (AKS) brings much more than fast development and deployment of cloud-native apps. It also enables management and governance of on-premises, edge, and multicloud Kubernetes clusters. These are critical functions for any organization requiring globally scalable cloud application and workload architectures.

[Azure Database for PostgreSQL](#), the world's most advanced relational database service in the Microsoft cloud, was created based on the [PostgreSQL open source](#), which lets users set up, configure, and run managed database instances with scalability, backups, and high availability.

Cloud-hosted [Azure IoT Hub](#) provides two-way communication between IoT applications and virtually unlimited managed endpoint devices. IoT platforms across smart cities and critical infrastructure can range from thousands to millions of endpoint devices. Azure IoT Hub provides critical per-device authentication, built-in device management, scalable provisioning, updating, and security from the cloud to beyond the edge.

[Azure Data Explorer](#) (ADX) is a fast, fully managed data analytics service for real-time analysis on large volumes of data streaming from applications, websites, IoT devices, and more.

R2 Wireless relies on a growing, large-scale network of sensors around the world to monitor client IoT wireless network interference and potential hacking via a large-scale sensor deployment. R2 wirelessly sends monitoring data from countless endpoint sensors to cloud databases for analysis by their Open Radio Analysis platform.

This requires a cloud architecture capable of supporting high data-rate ingress from a vast and growing list of global endpoints with:

- Low latency
- High reliability
- Minimal end-user downtime
- The ability to aggregate, manage, and offline vast amount of data in real time

AKS delivers scalability and real-time support to R2 Wireless

Azure Kubernetes Service gives R2 Wireless the needed scalability and real-time support for countless Open Radio Analysis IoT endpoint sensor devices, while providing adjustability and high performance. Azure MySQL DB and Redis in-cache memory ensure that the platform maintains real-time ingress and egress end-point data access aligned with memory, CPUs, and I/O for infinitely variable use cases. Azure IoT Hub is a major service that helps R2's C2 monitor and control multiple endpoints sensors with high reliability.

"Azure services give us the scalability, availability, and remote control we need by providing us with a vast amount of infrastructure capabilities to support our solution development process. This saves us a great deal of time and resources while giving us the ability to scale the application and database environments in ways that impact R2's Open Radio Analysis platform performance and availability," said Dr. Yiftach Richter, founder and CEO of R2 Wireless.

ADX allows R2 to ingest data with low-latency and high-throughput using its connectors for various uses cases like [Azure Data Factory](#), [Azure Event Hubs](#), and so on.

These solutions collectively enable scalable, low-latency data ingress and storage from large numbers of Open Radio Analysis sensors, which they can deploy worldwide. The devices

communicate by cellular network using the Azure IoT Hub service via the C2 from remote areas to enable wireless threat monitoring and surveillance of IoT platform topologies.

Azure has the perfect tools for IoT analysis

Azure AKS, Azure Database for PostgreSQL, Azure IoT Hub and Azure Data Explorer are the perfect tools for startups working on IoT analysis for smart cities and critical infrastructure. With these tools, you gain the needed scalability, availability, and remote control of all surveillance endpoints and their data ingress from beyond the edge to your cloud architecture/database storage.

You can also enable real-time data access to support real-time monitoring with high performance across any kind of use case. Additionally, you can monitor and control multiple end unit sensors with high reliability. If needed, adding Azure services such as such as Event Hubs, [Azure Stream Analytics](#), and [Azure Cosmos DB](#) will support high data rates.

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