



Zenoh

Zenoh: Data-Centric Communication for the Cloud-to-Things Continuum

Tutorial session @ 9th ACM ICN 2022



Agenda

- 1. Opening
- 2. Zenoh: The Genesis
- 3. Zenoh: A Crash Course in Building Cloud-to-Microcontroller Applications
- 4. Zenoh and Zenoh-Flow Hands-on
- 5. Zenoh High Performance Networking with Rust
- 6.Q&A





Unifies data in motion, data at rest and computations from embedded microcontrollers up to data centres

Provides a **location-transparent API** for high performance **pub/sub** and **distributed queries** across **heterogeneous** systems

Facilitates **geo-distributed storage** and **integration with third party technology** in a plug-and-play fashion



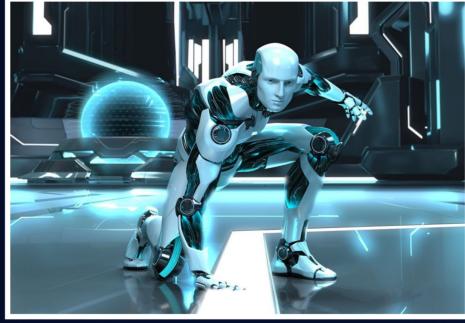
Application Domains in Real Life













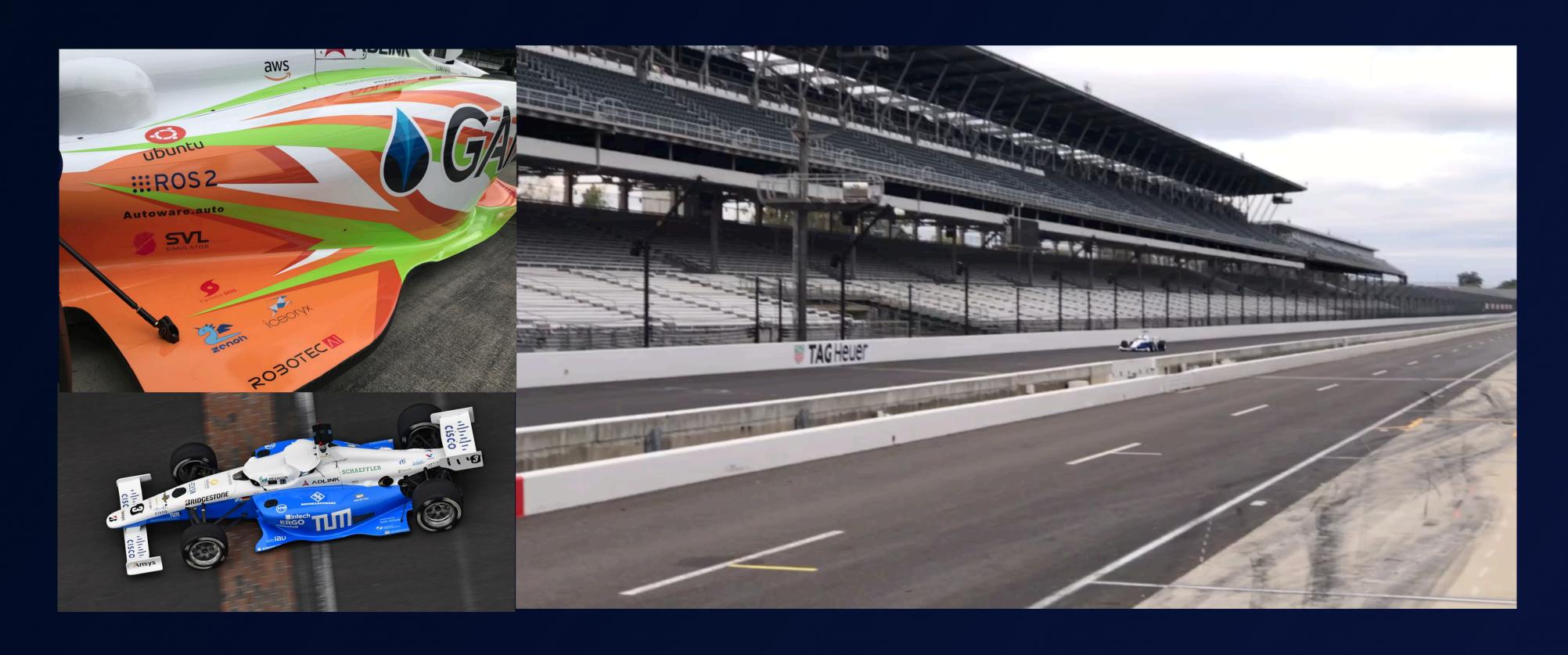






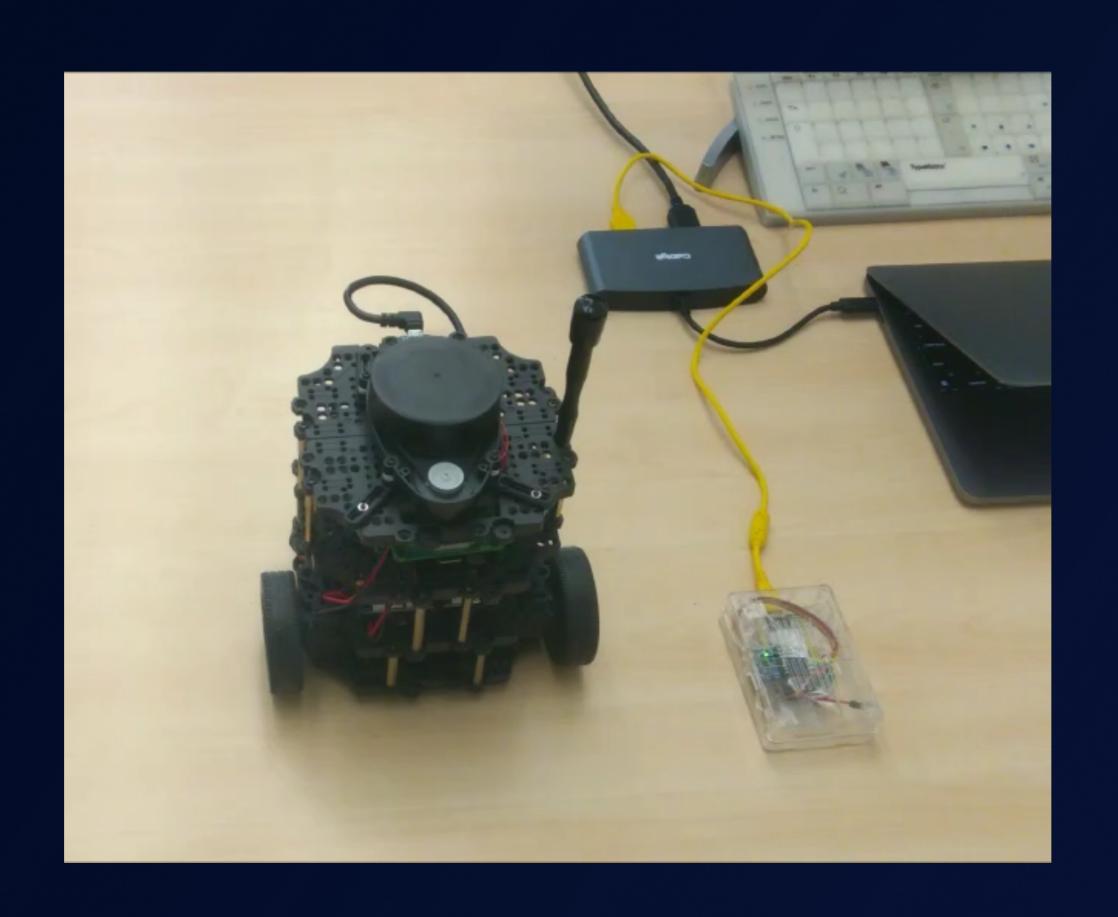


Indie Autonomous Challenge



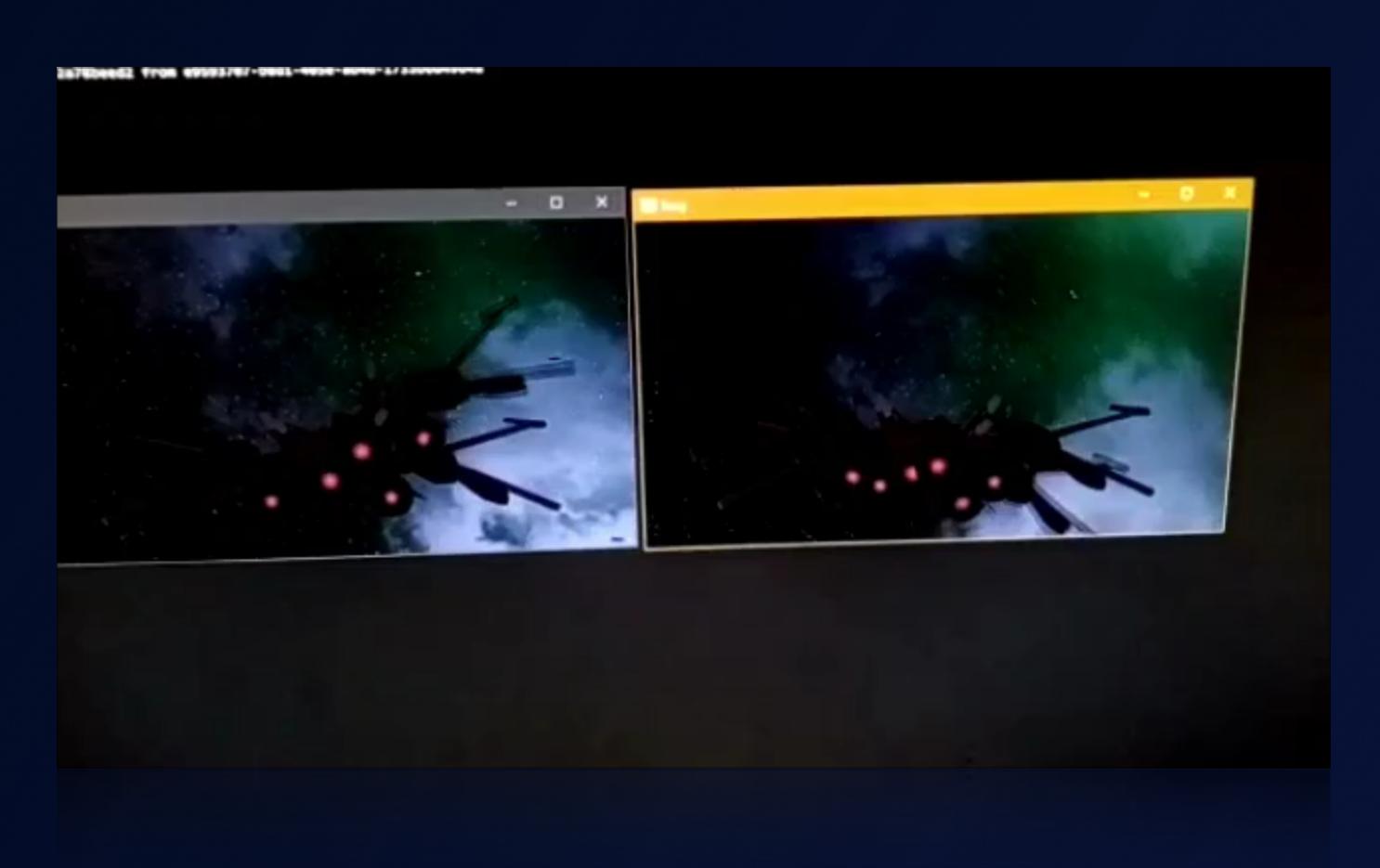


Robotic Systems with ROS/ROS2





Online Gaming





The Core Team



Angelo Corsaro



Luca Cominardi



Julien Loudet



Olivier Hecart



Julien Enoch



William Liang



Gabriele Baldoni Carlos Guimaraes

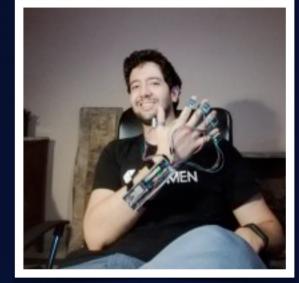




Sreeja Nair



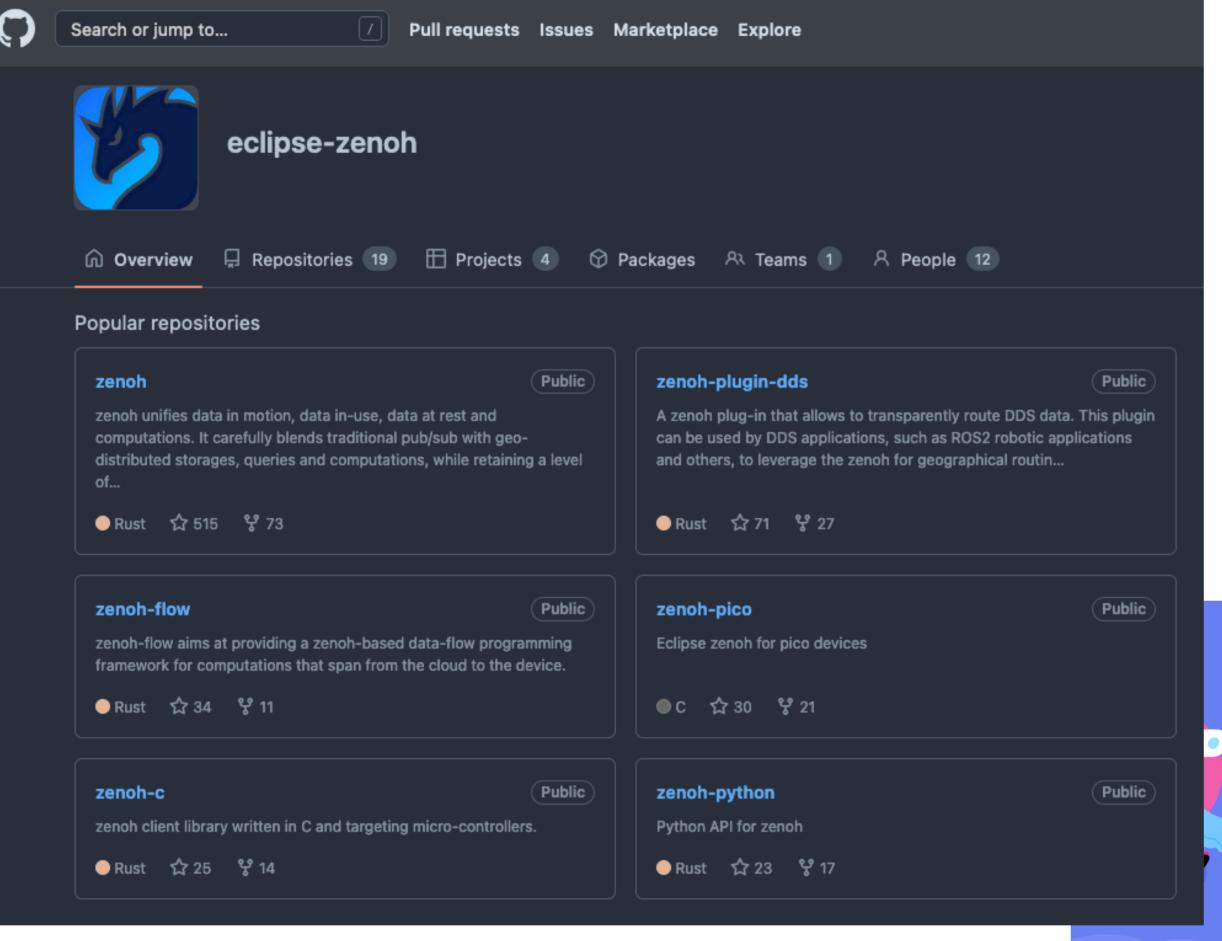
Pierre Avital



Darius Maitia



Zenoh Community



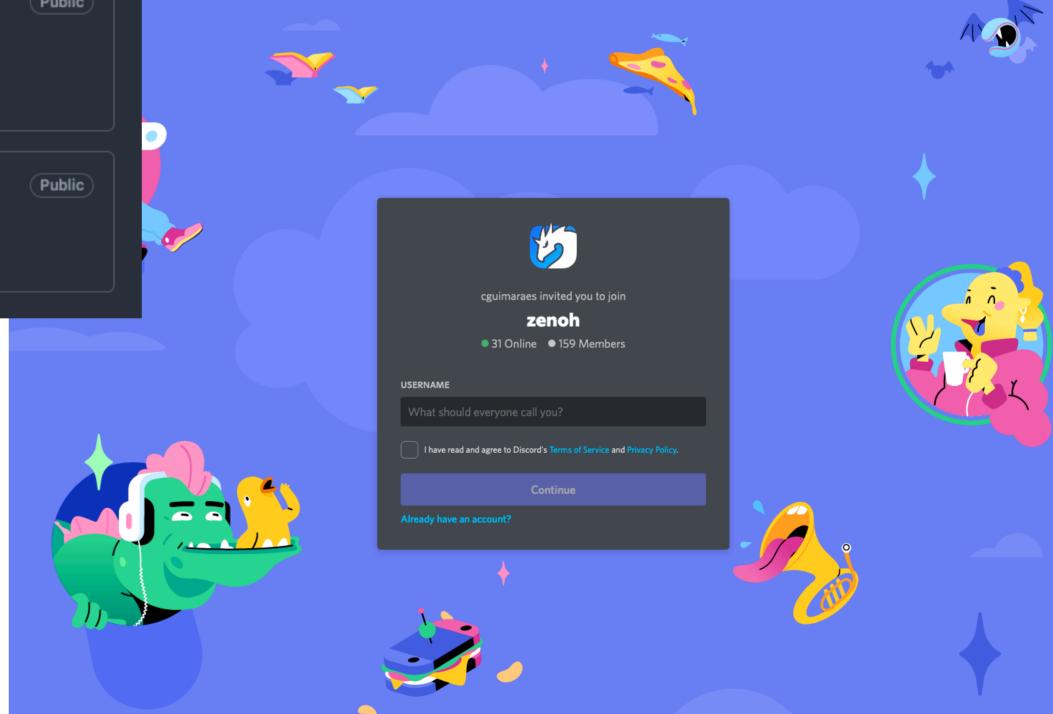
Eclipse Zenoh is fully open-source

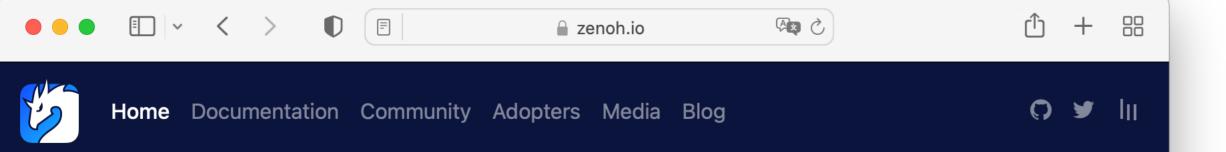
https://github.com/eclipse-zenoh



...with an open community in Discord

https://discord.gg/vSDSpqnbkm







Zenoh

Zero Overhead Pub/sub, Store/Query and Compute.

zenoh /zeno/ unifies data in motion, data at rest and computations. It elegantly blends traditional pub/sub with geo distributed storage, queries and computations, while retaining a level of time and space efficiency that is well beyond any of the mainstream stacks.



Get started

Don't forget to visit Zenoh's website...

https://zenoh.io/

DragonBotOne Egg
Hatching with Zenoh and
Zenoh-Pico

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valuation

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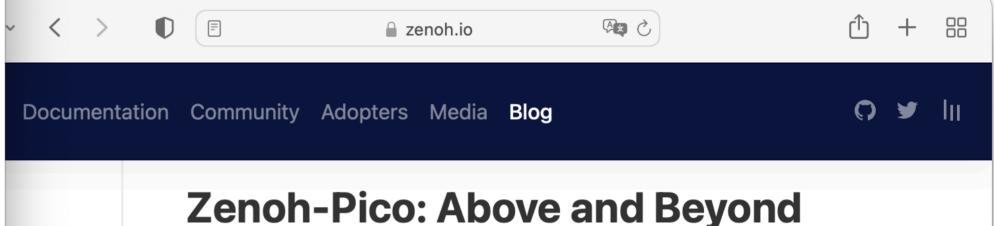
and

ROS 2 and microcontrollers integration via Zenoh-pico

Zenoh goes embedded with zenoh-pico

Indy Autonomous
Challenge (IAC):
Experiences from the

...and the blog



09 June 2022 -- Paris.

In a previous blog post, we introduced Zenoh-Pico, an implementation of Zenoh for microcontrollers and embedded devices, along with a preliminary performance results and its integration on off-the-shelf robots (by bridging both legacy ROS2+DDS and Zenoh systems or by making it a full-fledged Zenoh system).

In this post, we will dive deeper on Zenoh-Pico, show, how Zenoh-Pico is capable of:

- exchanging close to 2.5M msg/s for small payloads, and over 25 Gbps for larger messages,
- achieving end-to-end latency (i.e., one way delay) as small as 45 μsec and
 15 μsec for unicast and multicast transports, respectively,
- minimizing the overhead in the wire down to 5 bytes per data transmission,
- fitting all its capabilities in less than 50KB footprint, which can be quickly reduced to ~15KB in tailored compilation setups, and
- provides simple to use and yet powerful APIs.