

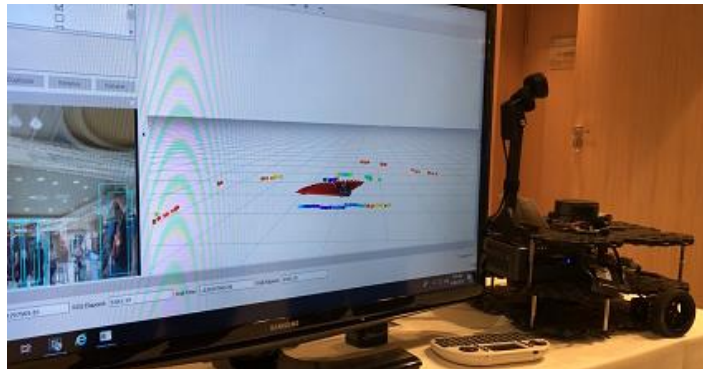
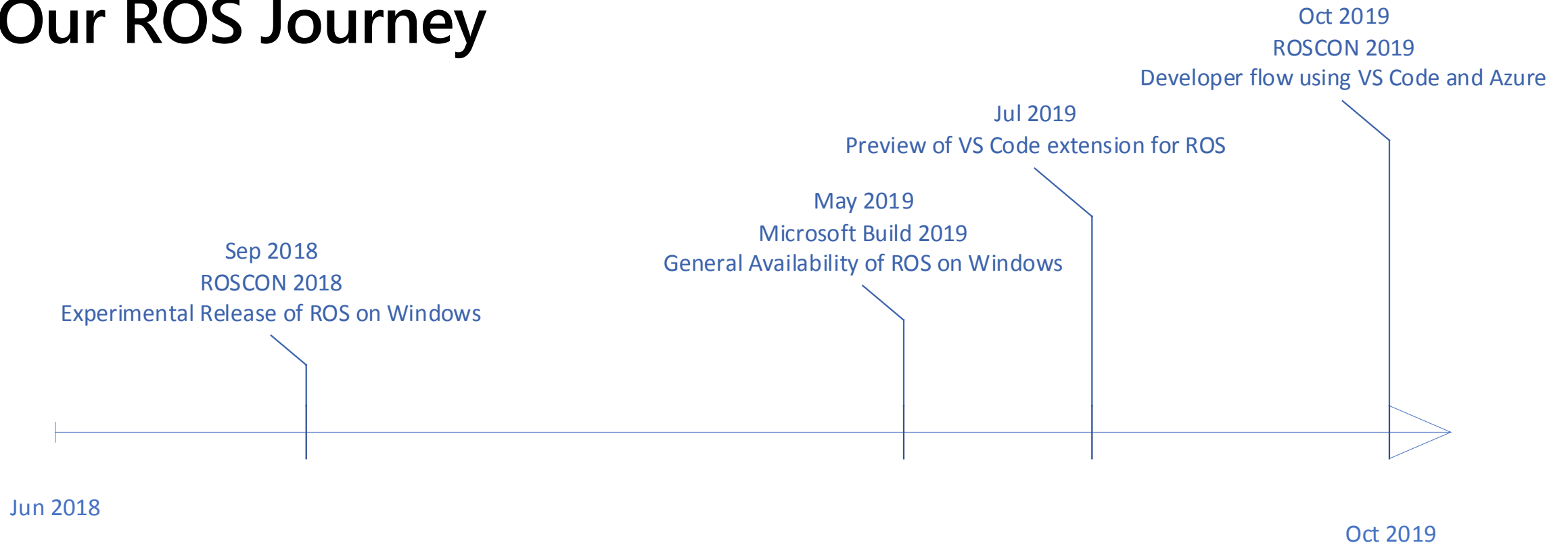


Develop ROS™ applications with Visual Studio Code and Azure

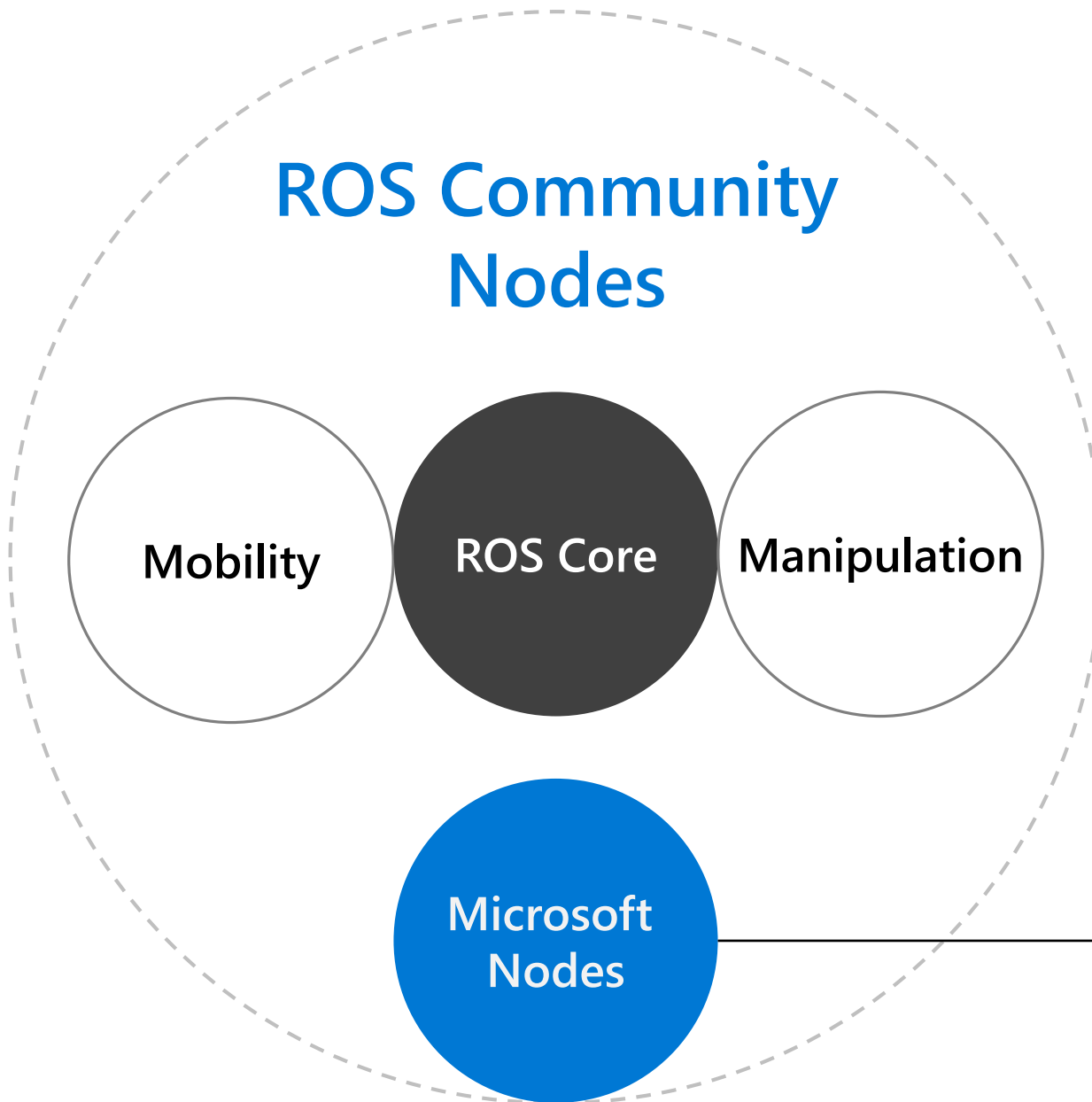
Gunter Logemann, Senior Software Engineer

Our ROS for Windows Journey

Our ROS Journey



ROS Enablement



[Azure IoT Hub Connector ROS node](#)
[Azure Kinect ROS Driver](#)
[Windows ML Tracker ROS node](#)

Azure IOT_Hub connector

[Azure IoT Hub Connector ROS node](#)

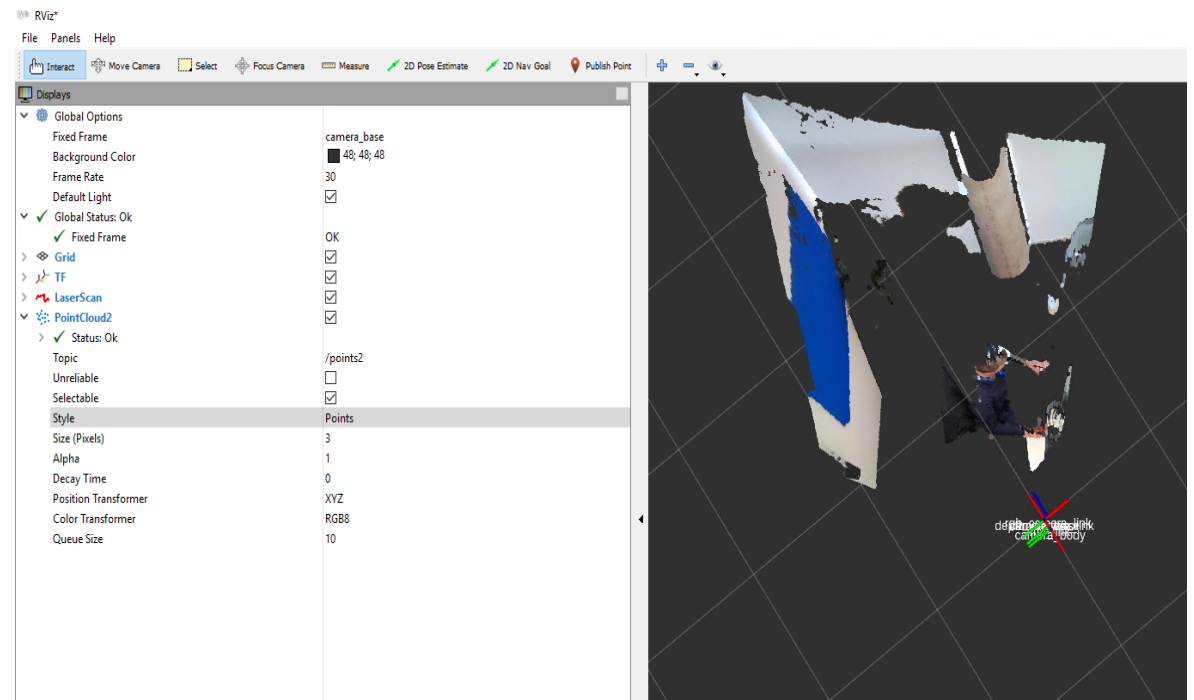
These samples demonstrate how to use the various features of Microsoft Azure IoT Hub service to relay telemetry messages or dynamic reconfiguration commands in ROS nodes.

- [IOT Hub connector sample in C++](#)
- [IOT Hub connector sample in Python](#)
- [Dynamic reconfiguration sample](#)

Azure Kinect ROS Node

[Azure Kinect ROS Driver](#)

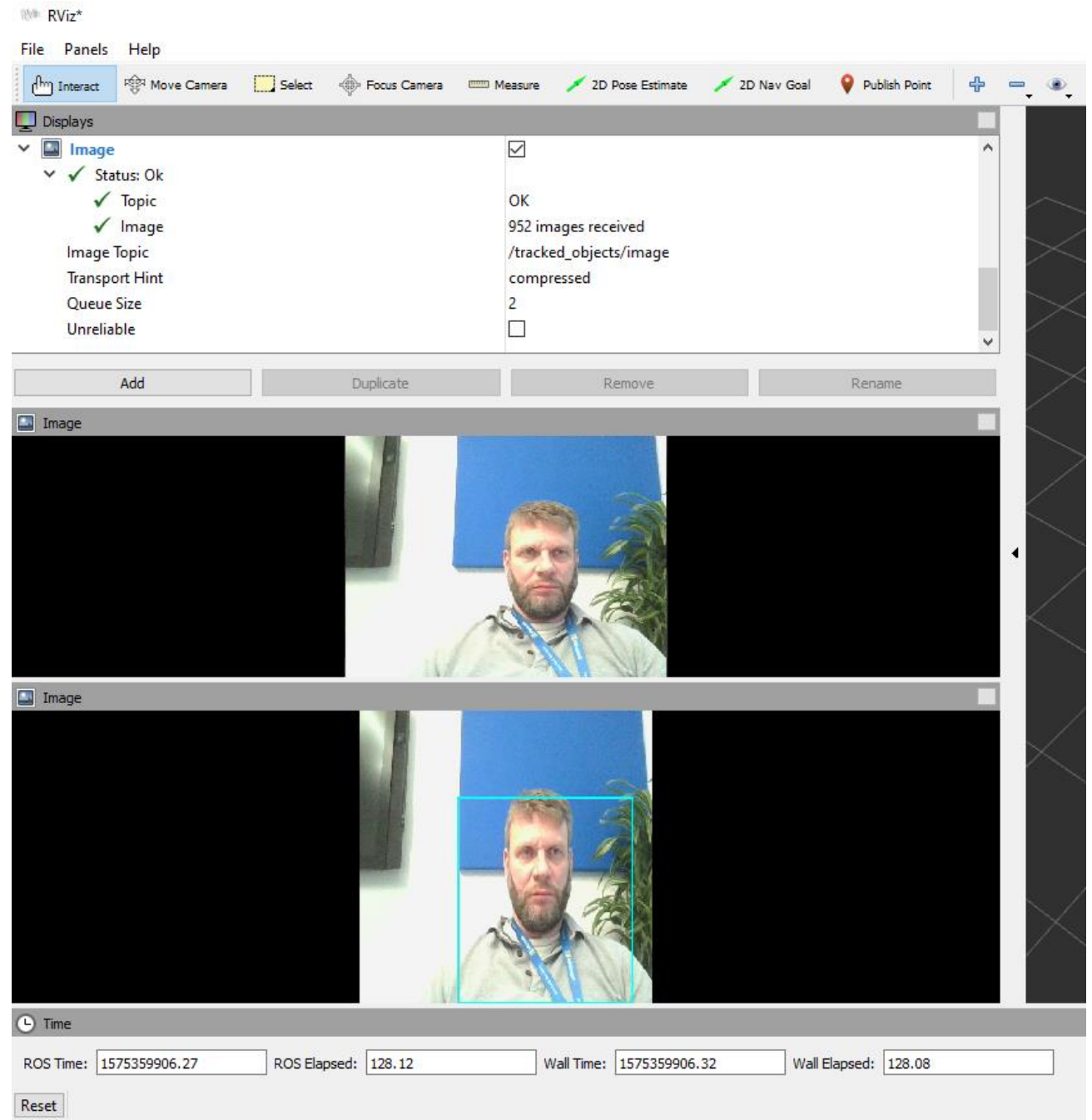
- A PointCloud2, optionally colored using the color camera
- Raw color, depth and infrared Images, including CameraInfo messages containing calibration information
- Rectified depth Images
- Rectified color Images
- The IMU sensor stream
- A TF2 model



Windows ML Node

[Windows ML Tracker ROS node](#)

- ROS node which uses Windows Machine Learning (WinML) to track people (or other objects) in camera frames.
Uses camera frames from the OpenCV based cv_camera node at /cv_camera/image_raw
- Outputs an image with the ID boxes for tracked objects overlayed on the source frame at /tracked_objects/image





279 ROS
packages
enabled on
Windows



~1,800
downloads of
ROS Melodic
monthly



From **6**
Continents
across the
world



Over **14,000**
installs of ROS
extension since
July

Visual Studio Code extension for ROS

Visual Studio Code



Free, cross-platform, open source
Fast and lightweight
Rich extension ecosystem

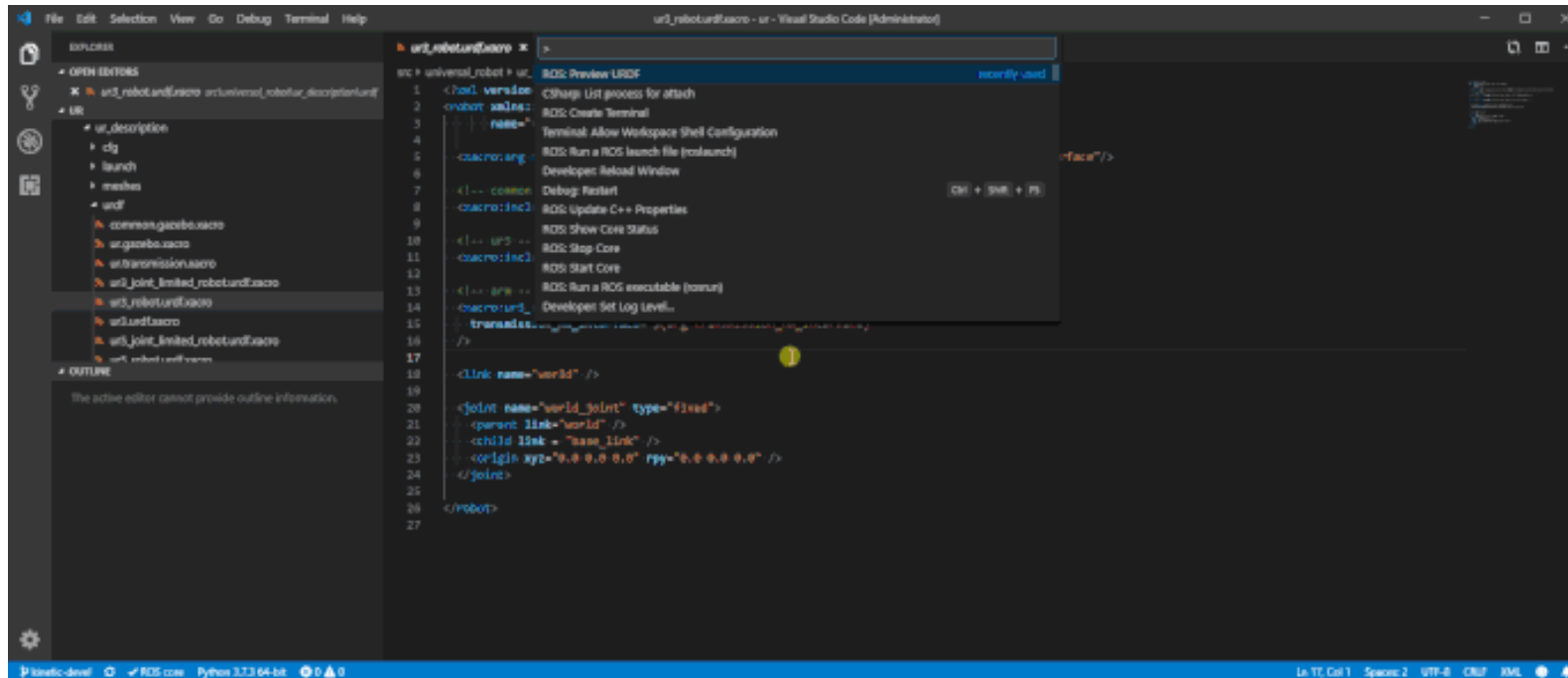
"In the Stack Overflow 2019 Developer Survey, Visual Studio Code was ranked the most popular developer environment tool, with 50.7% of 87,317 respondents claiming to use it." - Wikipedia

ROS Extension

- Automatic ROS workspace activation.
- Allows starting, stopping and viewing the ROS system status.
- Automatically discover build tasks.
- 3D preview URDF and XACRO files.
- Debug ROS nodes (C++ or Python) by attaching to the process or from the ROS launch.
- And more

URDF Preview

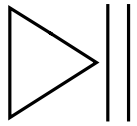
A tool built on top of [Robot Web Tools](#)
Visualize URDF\XACRO files in seconds



ROS2 Support



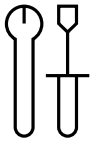
Workspace Discovery



ROS2 Daemon Start\Stop



ROS2 Status Monitor

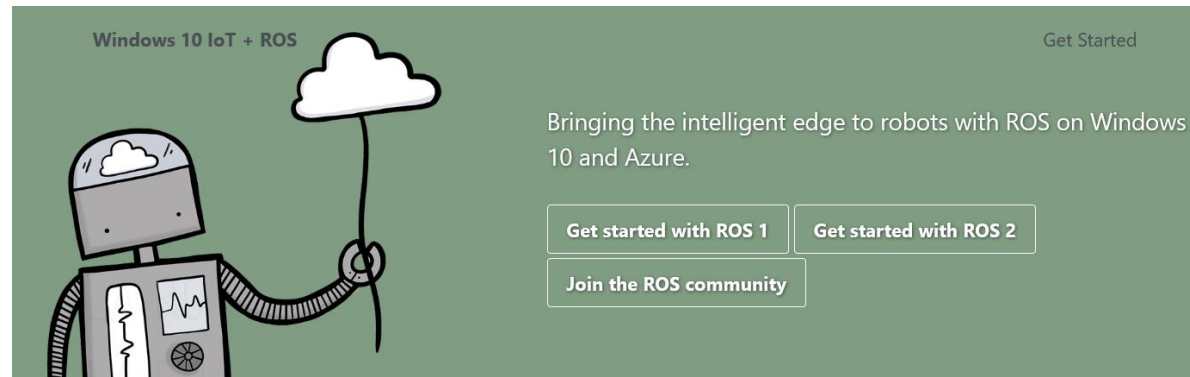


Colcon Build Tool Integration

Getting Started

Pre-requisites

Install ROS/ROS2 (Melodic and Dashing) on Windows
(<http://aka.ms/ros>)



Install C\C++ Toolchain (depending on your platform)

GNU GCC on Linux\MacOS


Visual C++ Workload on Windows

Install Visual Studio Code & ROS Extension

ROS on Azure with Windows VM

Look for “ROS” on aka.ms/azure/quickstart


(<https://azure.microsoft.com/en-us/resources/templates/ros-vm-windows/>)

 Microsoft Azure

Overview Solutions Products ▾ Documentation Pricing Training Marketplace ▾ Partners ▾

[Templates](#) / ROS on Azure with Windows VM

ROS on Azure with Windows VM

 by [Sean Yen](#)
Last updated: 9/13/2019

[Deploy to Azure >](#) [Browse on GitHub >](#)

This template creates a Windows VM and installs the ROS into it using the CustomScript extension.

ROS on Azure with Windows VM


Let's walk through the template


[Home](#) > ROS on Azure with Windows VM


ROS on Azure with Windows VM


Azure quickstart template

TEMPLATE

 ros-vm-windows
8 resources

 Edit template

 Edit paramet...

 Learn more

BASICS

* Subscription

Visual Studio Enterprise

* Resource group

Select a resource group

Create new

* Location

(US) West US 2

SETTINGS

Location ⓘ

[resourceGroup().location]

* Project Name ⓘ

Virtual Machine Size ⓘ

Standard_NV6

* Admin Username ⓘ

* Admin Password ⓘ

What's next?

Add debug support for ROS2 Launch system

Plus ROS and ROS2 coexistence environment

More improvement for cross-platform development

More visualization tooling

End-to-end DevOps workflow

Call to Action

Try it out aka.ms/ros/vscode

Give us feedback on github.com/ms-iot/vscode-ros

Learn more about ROS on Windows IoT and Azure aka.ms/ros

Demo: A simple ROS application

