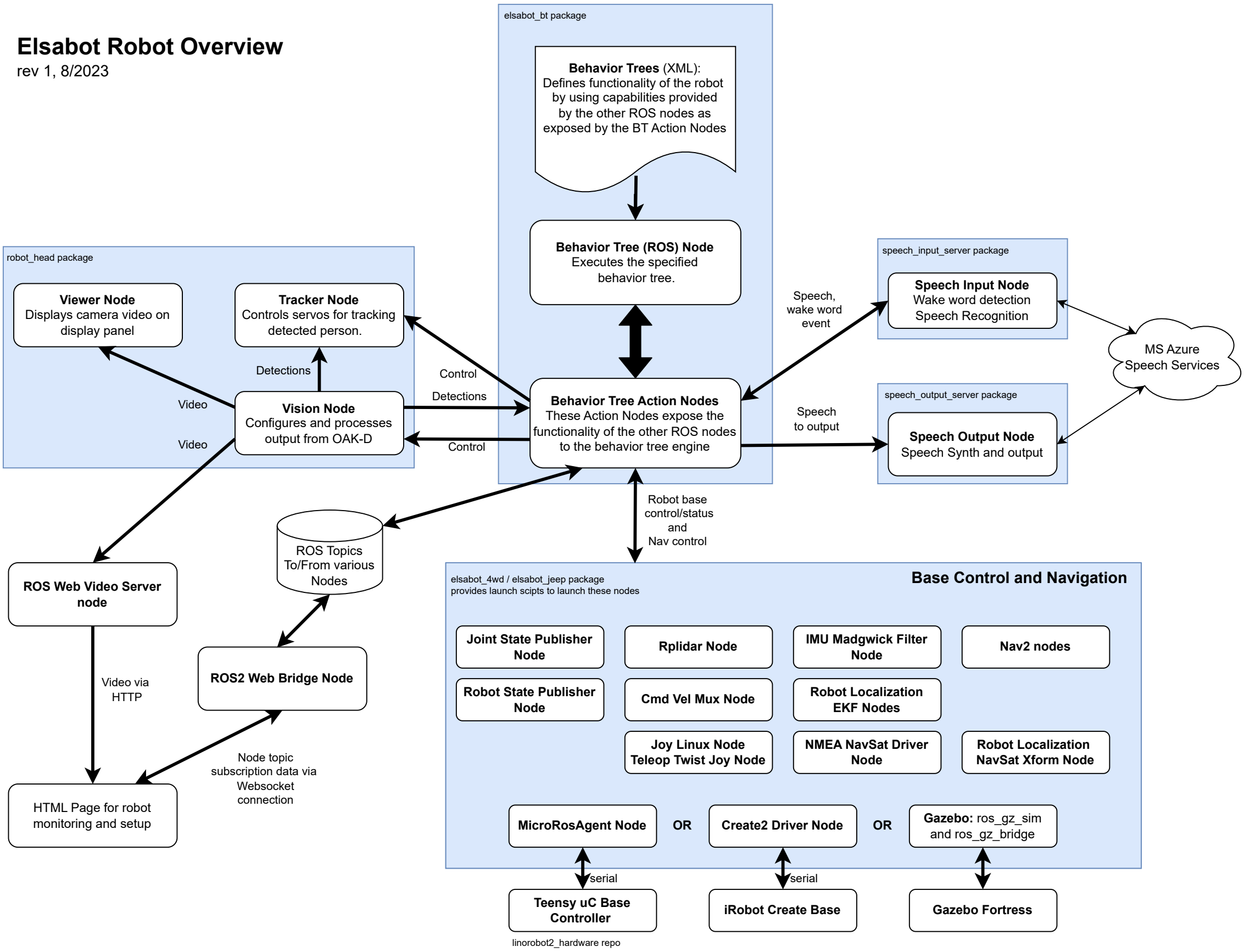
# Elsabot Robot Overview

rev 1, 8/2023




## Nodes

robot_head package

vision - configures and processes output from the OAK-D including video capture and NN object tracking/detection output.
tracker - receives detection results from the vision node and controls servos for tracking a person in view by changing the camera (robot head) orientation.
face - controls the smile and antenna LEDs.
viewer - displays video from the camera on the Elsabot display panel.

elsabot_bt package

bt node - uses the BehaviorTree.CPP framework to execute custom behavior trees and actions that implement the ElsaBot functionality. These trees use custom behavior tree action nodes developed for this project which expose functionality provided by other ROS nodes.

elsabot_4wd / elsabot_jeep packages

Linorobot2 derived packages that includes launch scripts and configurations for bringing-up the various nodes required to manage the core functionality of the robot including sensors, teleop input, and navigation.

speech_output_server package

speech_output - node that uses the Microsoft Cognitive Speech Services to convert text to speech and then output using the USB speaker.

speech_input_server package

speech_input - node that reads audio samples from the microphone and uses Microsoft Cognitive Speech Services to perform speech detection and wake word detection.

ROS web video server package

Node for streaming camera topics over HTTP for display on a web browser.

ROS2 web bridge

Node for bridging topics to web apps.

Teensy uC base controller (for elsabot bases)

Controller/firmware that implements the motor controller, IMU driver, ultrasonics sensor driver, and battery monitor driver.

Create2 driver

create_robot - bring-up scripts for Elsabot when using the iRobot Create base  (this support is currently stale as of 8/2023)

Gazebo

Launch scripts for running Elsabot using Gazebo simulation

## Launching

elsabot_4wd / elsabot_jeep - handles the base-level nodes
elsabot_bt - handles the high-level nodes including speech related and robot head