Internet of Things - UDP Connections through Tunnels

Overview
The current ThingWorx platform is able to handle the tunneling of different applications using the Transmission Control Protocol. This tunneling however does not currently support transmission of data that relies on the User Datagram Protocol (UDP). In order to support the inclusion of UDP-based tunneling communication in the ThingWorx platform changes must be made to the code-base that handles the establishment of these connections on either side of the platform. In addition, these changes to the system must be tested to ensure that the communication properly transmits through the tunnel correctly.

Objectives
The objective of the project is to add functionality to the ThingWorx Edge Device Software Development Kit to support the handling of UDP-based tunnels. An additional goal was to use the tunneling functionality to stream data from an embedded device to demonstrate the viability of this functionality.

Approach
- Discussed project needs with ThingWorx to ensure adequate completion of tasks about how you gathered the customer needs and/or requirements
- Visited the ThingWorx office to better understand project specifications and the ThingWorx platform
- Devise solution in ThingWorx codebase to provide desired functionality
- Implement code in ThingWorx development kit to implement desired functionality
- Research appropriate tools and open source libraries to test code implementation
- Test implemented code using decided upon UDP-based service
- Research devices that could be used to test functionality of the UDP tunnel additions
- Implement demonstration of tunnel functionality using single-board computer connected to appropriate sensors
- Presented and discussed project results with ThingWorx

Outcomes
The results of this project pave the way for future development of the ThingWorx Internet of Things platform:
- Added UDP tunneling capability to the Edge Agent code
- Tested and verified usability of UDP tunneling using a Constrained Application Protocol server and client
- Demonstrated capability of UDP tunneling using sample Edge Device data stream