Creating a Prototype Web Application for Spacecraft Real-Time Data Visualization on Mobile Devices

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Mobile devices (smart phones, tablets) have become commonplace among almost all sectors of the workforce, especially in the technical and scientific communities. These devices provide individuals the ability to be constantly connected to any area of interest they may have, whenever and wherever they are located. The Huntsville Operations Support Center (HOSC) is attempting to take advantage of this constant connectivity to extend the data visualization component of the Payload Operations and Integration Center (POIC) to a person's mobile device. POIC users currently have a rather unique capability to create custom user interfaces in order to view International Space Station (ISS) payload health and status telemetry. These displays are used at various console positions within the POIC. The Software Engineering team has created a Mobile Display capability that will allow authenticated users to view the same displays created for the console positions on the mobile device of their choice. Utilizing modern technologies including ASP.net, JavaScript, and HTML5, we have created a web application that renders the user's displays in any modern desktop or mobile web browser, regardless of the operating system on the device. Additionally, the application is device aware which enables it to render its configuration and selection menus with themes that correspond to the particular device. The Mobile Display application uses a communication mechanism known as signalR to push updates to the web client. This communication mechanism automatically detects the best communication protocol between the client and server and also manages disconnections and reconnections of the client to the server. One benefit of this application is that the user can monitor important telemetry even while away from their console position. If expanded to the scientific community, this application would allow a scientist to view a snapshot of the state of their particular experiment at any time or place. Because the web application renders the displays that can currently be created with the POIC ground system, the user can tailor their displays for a particular device using tools that they are already trained to use.

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