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| Artifact ID:  DJ-003 | Artifact Title:  Server Software Decision Justification | |  |
| Revision:  1.0 | Revision Date:  6 NOV 2019 | |
| Prepared by:  Joe Hansen | | Checked by:  Jesse Krage |
| Purpose:  The purpose of this artifact is to justify our decision to host the server using NGINX and not Apache. | | |

# Revision History

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| Revision: | Revised by: | Checked by: | Date: |
| 1.0 | Joe Hansen | Jesse Krage | 6 NOV 2019 |

# References

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| N/A | N/A | N/A |

# Justification

As part of our system’s design, we intend to host a web page user interface on a server to allow the user to control the positioning system. This is desirable so that the UI can be accessed by any device that is connected to the same network. We decided that this constitutes a ***major decision*** because while it is important to the system architecture design, the overall design will be even if this decision is not perfect.

We quickly realized that there were several viable software options for the server. Among the viable options that would run on the Raspberry Pi are:  
  
Apache  
Lighttpd  
NGINX  
  
Our criteria for this decision is dictated by:

-Lightweight process that boots quickly

-Easily communicates with controller language (C++)

-Has ample documentation to help troubleshoot and optimize

Our preliminary research showed that Lighttpd and NGINX were considerably faster than Apache. While Apache is the most commonly used server software, one study reports that it is up to 2.5 times slower than either Lighttpd or NGINX. Apache becomes advantageous in high-traffic server applications where it needs to handle multiple simultaneous requests. This is not a requirement for our design and would sacrifice speed, making Apache a suboptimal for our server software.

Our research also showed that NGINX is much more widely used than Lighttpd, and as such, has more available documentation and online help. The speed and functionality of the two is comparable, but NGINX clearly fulfills the design requirement criteria more than Lighttpd.

NGINX supports the usage of a package called FastCGI, which makes for seamless communication with our controller language.

We ultimately decided to use NGINX.