Appendix C: Hardware Architectures

Return to Reference Architecture (RA) or Return to Appendices or 4.2.1.1 Hardware Platform

Gezelter[1] defined Hardware architecture as follows:

> *"Computer architecture" refers to the underlying physical and logical structures of the computer system. In the case of a computer system, this includes instruction set, numeric sizes and representations, and how the system connects to external devices (interrupts or polling).*
>
> *While in the theoretical sense, most architectures are functionally equivalent, it does not mean that some architectural choices make some applications and algorithms easier or more efficient to implement. An architecture without support for floating point can be extended in software to perform the needed functions, but it will generally be slower than a hardware implementation. In the interfacing device area, interrupts make it more efficient to overlap device operation with computing. Such operations can be done without interrupts, but it is far more complex.*
>
> *In summary, computer architecture defines the underlying structure of the computing system. It governs how the various elements interact.*

The following Hardware Architectures need to be considered when designing distributed systems. It is not important that every distributed system supports all these kinds of architectures, but that the inclusion and elimination of some of the architectures is an overt act. The goal during the functional requirements specification process is to establish the subset of Hardware Architectures supported. This does not mean that the set is static and, thus, cannot be changed. It does mean; however, that changes require careful consideration and planning.

1)
Gzelter, Robert; The Graduate Center, CUNY, Quora, 2018, Accesssed 8 December 2020, https://www.quora.com/What-is-the-importance-of-computer-architecture-in-a-computer-system