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TinyOS

TinyOs was started as a collaboration between the University of California, Berkley and Intel Research and Crossbow Technology. It was initially released in 2000 with supplement releases continuing to through 2010. TinyOS is a free and open source operating system with a platform that targets wireless sensor networks or WSNs. This operating system is an embedded operating system written in nesC, which is a dialect of C programming language and uses sets of cooperating tasks and processes. NesC is mainly used for memory limitations of sensor networks. It also uses Java and shell script front-ends.

TinyOS is assembled with both software and hardware components connected with interfaces. TinyOS has interfaces for numerous common abstractions including; packet communication, routing, sensing, actuation and storage. TinyOS uses non-blocking which means is a form of input/output (I/O) that permits other processing to continue before the transmission has finished. It also uses a single stack, which is a data structure that stores information about the active subroutines of a computer program. This means that any I/O operations that last to long will have a callback. Callbacks are pieces of code that pass arguments to other code which lets lower-level software call a function that is defined in a higher-level layer. To better optimize this process the compiler features can link the callbacks statically. Since TinyOs is non-blocking it makes the programmers write complex programs to connect all the small event handlers. To be able to handle larger computations TinyOS uses something similar to Deferred Procedure Call, this takes higher priority tasks and does them leaving less important tasks for later. The OS can post tasks that do not need to be run immediately, so it will be saved to run at a later time. The tasks are done in the order they are received also known as the first in first out method. The TinyOS code is complied into binary using a custom built GNU toolchain which is a blanket term for a collection of programming tools produced by the GNU Project. These tools form a toolchain (suite of tools used in a serial manner) used for developing applications and operating systems.

Sources: http://en.wikipedia.org/wiki/Tinyos
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