Assignment 115: What is the difference between a zombie process and an orphan process?

A zombie process and an orphan process are two distinct types of processes in the context of operating systems.

A zombie process is a terminated process that has completed its execution but still exists in the system. It is in a "zombie" state, waiting to be removed by the parent process. The parent process must collect the exit status of the child process by calling the wait() system call. If the parent process exits before collecting the status of the child process, the child process becomes a zombie. Zombie processes consume system resources and can lead to issues in resource management.

An orphan process, on the other hand, is a process that has been adopted by the init process (PID 1) after its original parent process has terminated. This happens when the parent process terminates without having a chance to wait for its child processes. The init process, acting as a parent to all processes in Unix-like systems, takes over the responsibility of taking care of the orphaned child processes.

In summary, the main difference between a zombie process and an orphan process is that a zombie process is a terminated process waiting to be removed, while an orphan process is a process that has lost its parent and is adopted by the init process.