

The Architecture

Darkstar is built as a set of separate services available in the address space of the server side of a game or virtual world. Each service is defined by a small programming interface. Although not the original intention, the basic services provided by Project Darkstar are much like those of a classic operating system, allowing the server side of the game or virtual world to access persistent storage, schedule and run tasks, and perform communication with the client side of the game or virtual world.

Structuring the system as an interconnected set of services is an obvious way to begin the process of divide and conquer that is basic to the design of any large computer system. Each service can be characterized by an interface that protects those using the service from changes in the underlying implementation, and allows those implementations to be undertaken independently. Changes in the implementation of one service ought not affect the implementation of another, even if that other service makes use of the implementation being changed (assuming the interface and the semantics of the interface don't change).

We had other reasons to adopt the service decomposition approach. From the very beginning, Project Darkstar was envisioned as an open source project, with the hope that we could leverage the work of the core team by allowing other members of the community to build additional services that could enrich the functionality of the core. Running an open source community is complicated under any circumstance, and we believed that having the greatest level of isolation between the services that make up the infrastructure would allow a higher level of isolation between different service implementation levels. Additionally, it was not clear that there was a single set of services that would be just right for all MMOs and virtual worlds. By structuring the infrastructure as a set of independent services, different sets of those services could be used in different circumstances dictated by the needs of the particular project using the infrastructure. The services included in any particular Darkstar stack can be set by a configuration file.

The Macro Structure

Figure 3-1 shows the basic structure of a game or virtual world based on the Project Darkstar infrastructure. There will be some number of servers that form the backend of the game or virtual world. Each of these servers runs a copy of the selected set of services (labeled the Darkstar stack) and a copy of the game logic. Clients will connect to one of these servers to interact with the abstract representation of the world held by the server.