

Well done! This is a well-structured architectural synthesis report!

We think you did a great job selecting architectural patterns and tactics that align with the system's needs. You've made strong choices especially with the Microkernel and Actor Model, which align well with the system's key quality attributes: performance, availability, usability, modifiability, and safety. All of it makes sense given the dynamic nature of betting odds and the need for scalability.

For the Microkernel, while it effectively decouples bookmakers and makes the system more modular, it could introduce performance overhead due to added abstraction, as you also mentioned. We believe one possible improvement would be to offload frequently accessed data, like odds updates, to a caching layer (like Redis) to reduce query times. Alternatively, using a hybrid approach where only critical functions go through the microkernel while performance-sensitive ones communicate directly could improve efficiency.

Regarding the Actor Model, while it helps with concurrency and fault isolation, too much inter-actor messaging could introduce delays. You might want to consider batch processing bet transactions instead of handling them individually to reduce communication overhead. Another possible improvement would be introducing a priority queue, which we see you already considered, so high-value or time-sensitive bets are processed first.

Your 3+1 structure is well thought out. The module view is clear, showing how each part of the system interacts. The component & connector view helps visualize the flow of data, and the deployment diagram does a good job of showing how everything is distributed across different servers. This makes it easy to understand how the system will actually run in a real-world environment.

If anything, for future development, you could consider adding details about technologies used, potential cloud providers if you plan to scale, as well as some accompanying text for additional context. This could be useful as things tend to get more complex during the prototype phase.

Finally, your architecture backlog is well thought out and clearly identifies important decisions and issues.

Hope this helps! Keep up the good work!

Kind regards,

Group Beta