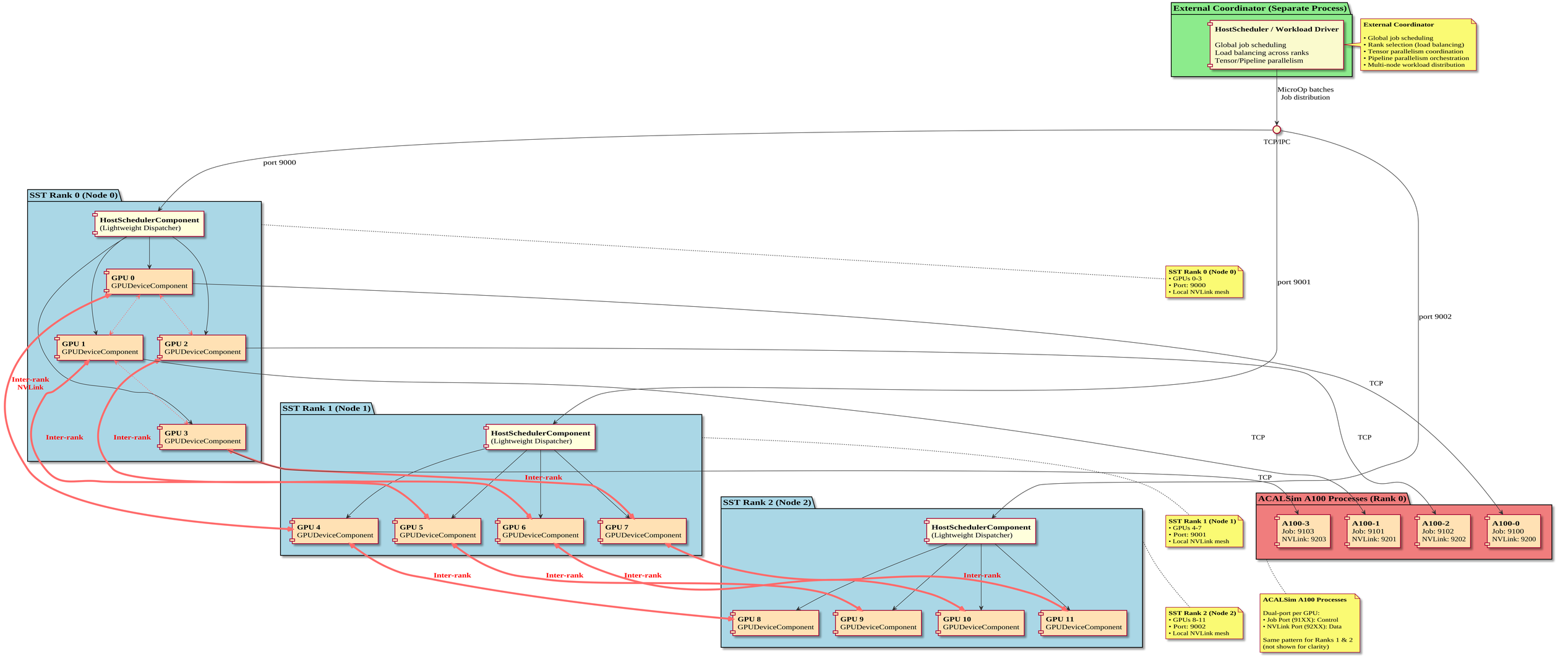Multi-Rank Scalable Simulation Architecture