The HPX runtime system is a critical component of the DOE XPP (eXascale PProgramming Environment and System Software) project and other projects worldwide. We are exploring a set of innovations in execution models, programming models and methods, runtime and operating system software, adaptive scheduling and resource management algorithms, and instrumentation techniques to achieve unprecedented efficiency, scalability, and programmability in the context of billion-way parallelism. A number of applications have been implemented to drive system development and quantitative evaluation of the HPX system implementation details and operational efficiencies and scalabilities.