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Data Processing for EAST Remote Participation

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The international collaboration becomes popular in the research field of Tokamak. The traditional on-site collaboration model, which has to spend much money and time on international travel, is no longer suitable to the more frequent international collaboration of Tokamak research. The Experimental Advanced Superconducting Tokamak (EAST), which was constructed by the Institute of Plasma Physics Chinese Academy of sciences (CASIPP), face the same problem. The main objective of Remote Participation System(RPS) for EAST is to provide an integration platform the allow collaborators to access data, monitor system status, control the EAST facility remotely and it will be a low cost and high performance alternative to traditional international collaboration model. This paper presents the description of design and implement of EAST Remote Participation System, a new NoSQL based archiving engine, message system, raw data compression and optimization for long distance transfer. The design of RPS focused on the following major technical issues including engineer and raw Data processing, long distance data transmission, remote data access security and convenience. The Rich internet application was selected to develop front-end. Java Spring was chosen to perform back-end services, authorization and authentication[fig.1]. To improve the efficiency of engineering data access, a new archiving engine was developed. The new archiving engine uses pvmanager to collect EPICS (Experimental Physics and Industrial Control System) PV values through Channel Access and pushed them to a NoSQL database(Redis) and a JMS based logging & Message server[fig2,3]. A hardware data compression card was select to compression raw data[fig.4] and an open-source wan optimization application was rebuilt to optimize long distance data transfer.

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