[BIOINFO 2024]

Efficient Cloud-Based Deployment of BioData Analysis Tools in K-BDS

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The K-BDS(Korea Bio Data Station) is a national bioinformatics data platform designed for the collection and integrated utilization of biological data. The K-BDS platform offers fair access to researchers without requiring data transfer, supporting the sharing of large-scale bioinformatics infrastructure to facilitate efficient data-driven research. Specifically, the K-BDS platform has established a service system for the outcomes of R&D projects to enhance bio-data usability and support integrated analysis. It integrates the software tools developed from 15 bio-data analysis technology development projects conducted across various fields such as drug discovery, genomics, transcriptomics, epigenomics, microbiome, medical imaging, cancer genomics, and multi-omics into the cloud platform. These project outcomes vary in the preferred execution environments and computing resource requirements by field-specific researchers. To support the diversity of bio-data analysis tools, K-BDS has containerized these tools on a cloud-based platform, offering a wide range of functionalities to researchers. Furthermore, K-BDS applies a multi-layered security system, composed of a platform-wide firewall and security groups specific to each analysis tool, ensuring secure data protection. The platform also supports development groups for maintaining and updating analysis tools, enabling continuous improvements and updates for them. K-BDS is poised to become a vital tool in bioinformatics research, offering flexible and secure solutions that can adapt to the evolving needs of the scientific community.