Demonstrator proposal for BDEC2 Poznan

Information Technology Center, The University of Tokyo

1. What innovative capabilities/functionalities will the proposed candidate platform demonstrate (e.g. transcontinuum workflow, edge computing, data logistics, distributed reduction engine, etc.)?
    *   Provide the platform which enables real-time data acquisition, data logistics, and realtime data analysis with on-demand configuration, expansion, and integration as well as computational science and engineering (CSE)
    *   Important to create synergy between computational sciences and cyberphysical applications on such platforms
2. What applications/communities would/could be addressed?
    *   Traditional computational science applications
    *   Various kinds of applications with large-scale data processing and realtime (streaming) data analytics: Disaster prevention, Medical, Smartcity, Agriculture and fishery, and so on.
3. What is the "platform vision," i.e. what kind of shared cyberinfrastructure (CI) for science would the further research/design/development of this platform lead to?
    *   Provide infrastructure as the fusion of BDEC (Big-Data and Extreme-Computing) supercomputer system for large-scale simulation, data-analysis, and machine learning with external part to acquire data via the Internet, and Data-Platform system that enables responsive applications with higher security by isolation and encryption for each project than the external part of BDEC system in early 2021
    *   Create extra values by circulating data provided by other users via the Data-Platform
    *   Access to various edge and IoT devices through secure mobile network with VPN by SINET academic network
4. How available/ready/complete is the set of software components to be used to build the demonstrator?
    *   Mainly Integration of existing software, such as resource management, job scheduling, container, and so on.
    *   In collaboration among vendors, potential platform users, and ourselves
5. As far as one can tell at this early date, to what extent can this be done with existing and/or otherwise available hardware/software/human resources?
    *   Hardware for such a platform will not differ from existing hardware. Some kind of extensions for security could be required.
    *   Regarding software, there is no suitable products especially for resource orchestrator, so we need huge amount of developments. Common data exchange format and APIs are also needed.
    *   Coordinator for data curation is crucial for data utilization and circulation.
6. What is the potential international footprint of the demonstrator?

- No actual collaborations yet, but the large-scale data analysis with global observation network is suitable for this demonstrator.
- Astrophysics, such as blackhole detection
- Global climate prediction with data assimilation, such as typhoons and hurricanes
- …