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Seismic-Hydroacoustic-Infrasound (SHI) in the Sky: benefits and pitfalls of NDC-in-a-box in the Cloud

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Capacity building efforts for National Data Centers (NDCs) commonly involve the provisioning and shipment of physical hardware systems and the training, installation, maintenance and distribution of the "National Data Centre (NDC)-in-a-Box" (NIAB) software suite. These fundamental functions (access to hardware and software) are the foundations of cloud computing. We investigate whether utilizing cloud infrastructure is feasible and beneficial to users of the IMS data and IDC software. We test using basic cloud computing and storage technologies to increase access and capacity for NDCs/users, to decrease cost and logistical burden, increase processing capabilities, and improve overall infrastructure reliability without losing the current level of local flexibility. We investigate the use of VirtualBox virtual machines (VMs), Docker containers, and Amazon Machine Images (AMIs) on elastic compute cloud (EC2) virtual hardware in the Amazon Web Services commercial cloud. Thus far we have found that AMIs offer the best balance of high configurability and low resource usage. Internal and external evaluations of AMIs containing NIAB Seismic, Hydroacoustic, and Infrasound (SHI) software and virtualized desktop environments on EC2 instances note good desktop responsiveness and adequate computing and storage capacity.

Promotional text

The study shows how the use of the NIAB software on cloud platforms could expand NDC capabilities and their use of IMS data by performing the analysis and data pulls utilizing cloud resources, reducing local bandwidth and infrastructure issues.

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