SWITCHengines for bioinformatics
A novel and effective solution to bioinformatics training

Our Training
sciCORE is the scientific computing center of the University of Basel. We provide scientists with HPC infrastructure and technical support. In partnership with the SIB Swiss Institute of Bioinformatics, we are tasked with training the next generation of life scientists, clinicians, and bioinformaticians in the Swiss and international scientific community. Our courses cover various bioinformatics and data science-related fields in a primarily face-to-face format with an emphasis on practical learning. We strive to provide our course participants with knowledge and tools which can be immediately applied to their research programs. In the era of “big data” (e.g., genomics and image processing), this requires novel solutions to cost-effective provisioning of the resources and infrastructure necessary to prepare our course participants for rapidly evolving real-world applications.

Our Challenges
Existing cyberinfrastructure solutions for bioinformatics training suffer from significant limitations. The re-purposing of existing HPC resources, for example in a university setting, pulls resources from active research and creates substantial configuration overhead and potential security issues in accommodating participants from outside of the institution. Provisioning VMs for each participant to run on their own computer involves the distribution of large VM images, frustrating configuration overhead, and the use of “down-sampled” or simulated datasets which can be performed on the limited resources of a typical laptop. Running software in VMs on cloud-based infrastructure can address memory and CPU limitations, however the VM images must still be deployed for each user’s instance, software configuration can be laborious, the VMs suffer from performance and interoperability issues, and VMs are not typically used in real-world applications. We require a cloud-based solution which can be easily updated, rapidly deployed and disassembled, and provides an interoperable working environment which accurately reflects real-world bioinformatics workflows.

Our Solution
We developed a novel and effective solution to bioinformatics training in collaboration with SWITCHengines, which provides the ideal infrastructure for our requirements due to its full “end-to-end” capability... Feedback from participants was highly positive, and we are continuing to adapt and improve this training solution for additional courses.”

– Geoffrey Fucile

Geoffrey Fucile and Pablo Escobar López from sciCORE Center for Scientific Computing in Basel

Further information:
swit.ch/engines

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Stories from the Swiss research communities – Education and Training