

Docker container in DWD's Seamless INtegrated FOrcastiNg sYstem (SINFONY)

At Deutscher Wetterdienst (DWD) the SINFONY project has been set up to develop a seamless ensemble prediction system for convective-scale forecasting with forecast ranges of up to 12 hours. It combines Nowcasting (NWC) techniques with numerical weather prediction (NWP) in a seamless way for a number of applications. Historically the operational NWC and NWP forecasts are generated on separate IT-Infrastructures, which in turn increases the number of potential error sources. To reduce data transfer between both infrastructures and to reduce the complexity of SINFONY those NWC components, which solely rely on NWP pre-products, are ported to the NWP infrastructure using software container.

With this aim in view a container image containing all relevant NWC components is created in a CICD oriented procedure. The respective containers are integrated into DWD's development and operational code bases and executed on DWD's HPC using apptainer. The integration into DWD's development code base is completed already and currently used for further development of the data assimilation procedure.

A major innovation of SINFONY is the rapid update cycle (RUC), an hourly refreshing NWP procedure with a maximum lead time of 12 hours. Currently RUC is in a preoperational stage and the subsequent generation of SINFONY products combining NWP and NWC forecasts is still executed on the NWC infrastructure. The RUC will be implemented to the operational forecasting system at the end of 2024 and together with that our aim is to implement the containers to the RUC for applications that rely on NWP data. At this step the container implementations have to meet even harder requirements in terms of performance, update reliability and support, since it will then be part of Germany's national critical infrastructure.

Topic

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