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## Dynamic integration of distributed, Cloud-based HPC and HTC resources using JSON Web Tokens and the INDIGO IAM Service

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In the last couple of years, we have been actively developing the Dynamic On-Demand Analysis Service (DODAS) as an enabling technology to deploy container-based clusters over any Cloud infrastructure with almost zero effort. The DODAS engine is driven by high-level templates written in the TOSCA language, that allows to abstract the complexity of many configuration details. DODAS is particularly suitable for harvesting opportunistic computing resources; this is why several scientific communities already integrated their computing use cases into DODAS-instantiated clusters automating the instantiation, management and federation of HTCondor batch system.

The increasing demand, availability and utilization of HPC by and for multidisciplinary user community, often mandates the possibility to transparently integrate, manage and mix HTC and HPC resources.

In this paper, we discuss our experience extending and using DODAS to connect HPC and HTC resources in the context of a distributed Italian regional infrastructure involving multiple sites and communities. In this use case, DODAS automatically generates HTCondor-based clusters on-demand, dynamically and transparently federating sites that may also include HPC resources managed by SLURM; DODAS allows user workloads to make opportunistic and automated use of both HPC and HTC resources, thus effectively maximizing and optimizing resource utilization.

We also report on our experience of using and federating HTCondor batch systems exploiting the JSON Web Token capabilities introduced in recent HTCondor versions, replacing the traditional X509 certificates in the whole chain of workload authorization. In this respect we also report on how we integrated HTCondor using OAuth with the INDIGO IAM service.

### Consider for promotion

Yes

**Authors:** CECCANTI, Andrea (Universita e INFN, Bologna (IT)); SPIGA, Daniele (Universita e INFN, Perugia (IT)); SALOMONI, Davide (Universita e INFN, Bologna (IT)); Dr ALFIERI, Roberto (Universita' di Parma & INFN); DAL PRA, Stefano (Universita e INFN, Bologna (IT))

**Presenter:** DAL PRA, Stefano (Universita e INFN, Bologna (IT))

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