

# A Grid of Grids using Condor-G

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The Condor-G meta-scheduling system has been used to create a single Grid of GT2 resources from LCG and GridX1, and ARC resources from NorduGrid. Condor-G provides the submission interfaces to GT2 and ARC gatekeepers, enabling transparent submission via the scheduler. Resource status from the native information systems is converted to the Condor ClassAd format and used for matchmaking to job Requirements and Rank by the Condor Negotiator. The use of custom external functions by the Negotiator during matchmaking, provides versatility to develop job placement strategies. For example, a function exist to use a matrix of CE-to-SE bandwidths, together with data location information, to make 'network closeness' available to both Requirements and Rank expressions. Other examples where such flexibility can be applied are in implementing a feedback loop to dynamically prefer successful or fast resources, and block matching to blackholes. The Condor-G Grid of LCG resources has produced 180,000 jobs during recent ATLAS productions, which matches the number produced by the LCG Workload Management System in the same period. GridX1 resources were used for ATLAS production in this way starting Autumn 2005. Simple jobs have been matched and ran on the full Grid federation, including NorduGrid resources, and work is underway to make use of advanced ARC features allowing Condor-G submission of ATLAS production on all resource flavours.

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