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Worm and Peer To Peer Distribution of ATLAS Trigger & DAQ Software to Computer Clusters

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ATLAS Trigger & DAQ software, with six Gbytes per release, will be installed in about two thousand machines in the final system. Already during the development phase, it is tested and debugged in various Linux clusters of different sizes and network topologies. For the distribution of the software across the network there are, at least, two possible aproaches: fixed routing points, and adaptive distribution. The first one has been implemented with the SSH worm Nile. It is a utility to launch connections in a mixture of parallel and cascaded modes, in order to synchronize software repositories incrementally or to execute commands. A system administrator configures, in a single file, the routes for the propagation. Therefore it achieves scalable delivery, as well as being efficiently adapted to the network. The installation of Nile is trivial, since it is able to replicate itself to other computers memory, being implemented as a worm. Moreover, the utilization of routing and status monitoring protocols together with an adaptive runtime algorithm to compensate for broken paths, make it very reliable. The other aproach, adaptive distribution, is implemented with peer to peer protocols, or P2P. In these solutions, a node interested in a file acts as both client and server for small pieces of the file. The strength of the P2P comes from the adaptive algorithm that is run in every peer. Its goal is to maximize the peer's own throughput, and the the overall throughput of the network. Hence the network resources are used efficiently, with no configuration effort. The selected tool in this case is BitTorrent. This paper describes tests performed in CERN clusters of 50 to 600 nodes, with both technologies and compares the benefits of each.

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