# KServer

## The client-server solution for ngKLAST users

**KServer is a J2EE software application allowing ngKLAST users to run KLAST jobs on a dedicated computational infrastructure. This can be a single server computer up to a cluster.**

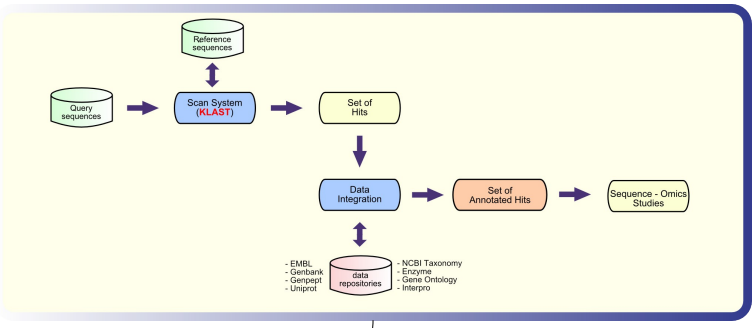
### KServer software architecture

KServer contains three components: KDMS, KlastRunner and KServer itself.

• KDMS is the Korilog Databank Manager System. It is a software application run on the server side to install sequence databanks to be used during KLAST jobs.

• KlastRunner is the software component running KLAST jobs; i.e. KLAST jobs are executed within separate processes, outside the KServer.

• KServer is a set of servlets managing the data exchange between the server and the ngKLAST clients.




KlastRunner performs:

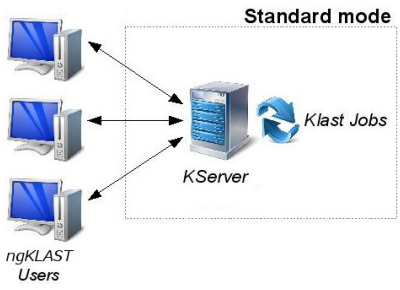
• KLAST jobs on distributed infrastructures

• data filtering using user-defined constraints

• sequence data integration (i.e. feature tables, biological classifications, etc.) within KLAST results, i.e. producing fully annotated KLAST results.

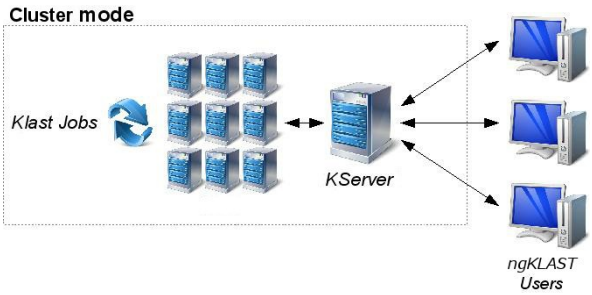
### KServer installation

KServer is usually installed on a computer running Java (1.6+) and Tomcat (6.x). KServer is available with two modes:




**Standard mode**: KServer runs jobs on a single computer. In that mode, KLAST jobs are executed on the computer running Tomcat/KServer.

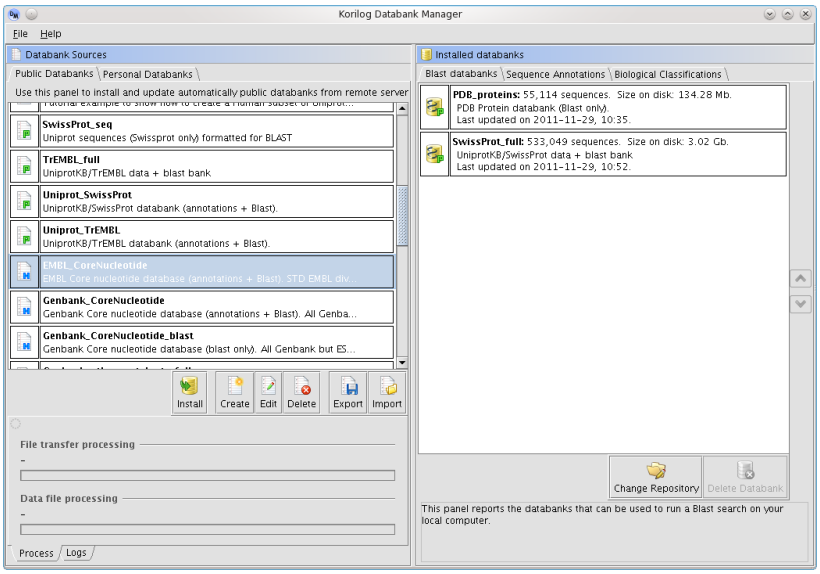
Using standard mode requires a computer with some computational power: at least 12 cores and 32 Gb RAM.




**Cluster mode**: KServer runs jobs on a cluster using a scheduling system; this mode is compatible with SGE (6.x), OGE (2011.11) and PBS (10.3+). In that mode, Tomcat/KServer is installed on a computer allowed to submit jobs on the cluster.

Using cluster mode usually requires a "standard" computer to install Tomcat/KServer; 4 cores and 4 Gb RAM is a fine setup. Indeed, as jobs are executed on the cluster nodes, the computer hosting KServer does not require high-performance computational capabilities.

*Screenshot of KDMS, the Korilog Databank Manager System (GUI version)*




KDMS prepares public and personal sequence data sets to use with KServer. Regarding public databanks, KDMS automatically handles:

- sequence files downloading from remote sites (via FTP),
- file decompression (gzip files),
- file un-archiving (tar files),
- file conversion from native formats to Fasta,
- data indexing of Genbank, Genpept, Embl and Uniprot files allowing their efficient querying by way of sequence identifiers,
- data indexing of biological classifications allowing their efficient querying by way of classification identifiers.

KDMS can be used on the Unix command-line or with a graphical user interface (see screenshot).

Using command-line script enables the use of 'cron' to schedule databank installations over time.

## KServer clients: ngKLAST vs. ngKLAST-LE

For ngKLAST clients, two solutions are available. Either they are full-featured ngKLAST softwares enabling both local-based KLAST jobs (using the computational power of the computer running ngKLAST) and KServer remote KLAST jobs. Or they are ngKLAST-LE (Light Edition) clients which do not provide the local KLAST facility, nor a local Databank Manager. ngKLAST comes with its standard licensing model, which consists of Single User Licenses (one license per user).

## KServer licensing model

The KServer licensing model mainly relies on the number of KLAST jobs that can be executed simultaneously (i.e. concurrent tokens). Each KLAST job (i.e. token) uses a fixed number of cores to achieve the computation; that number usually ranges from 4 to 16. For example, if KServer uses a license enabling 4 tokens/12 cores, then KServer can submit up to 4 jobs simultaneously, each of them using 12 cores. Additional jobs are automatically queued by the KServer, awaiting execution. As the licensing system is integrated within KServer, there is no need for any additional licensing systems. Usually it is recommended to use a number of tokens matching the number of ngKLAST users (i.e. ngKLAST clients).

### System Requirements

KServer has been tested with the following operating systems: Redhat Linux Fedora Core 14+, MacOS X (10.6+).
KServer requires an Oracle Java virtual machine, version 1.6 or higher; an Apache Tomcat server, version 6.x.

The computer hosting KServer/Tomcat can be an Intel/AMD platform (dual & quadri cores) with 4Gb of RAM.

For cluster configuration, KServer can be configured to use SGE, OGE or PBS Pro. KServer has been tested with SGE 6.0, 6.1 and 6.2, OGE 2011.11 and PBS Pro 10.4.

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