



Application Report

Mass and Serial Analysis with Open Source Software

One hundred billion cows in a shoe box, or genetic fingerprints in a database, that is the business of GAG Bioscience in Bremen. Their mass analysis operates with a production host computer by KAT, based on Linux and web technology.

The line can process more than a thousand samples a day when it runs for almost 24 hours each day.

For each sample, at least one result is saved, though for **scientific purposes** and comparisons – "this is the meat of which cow?" – the samples are analyzed **multiple times**.

The staff members are experienced lab technicians who occasionally need to adapt the process to changing demands.

Instead of superimposing a strict process sequence, the software **monitors** the process and collects the data.

Only in the case of errors, like a sample mix-up, does it issue an **alert**. This allows the company to start new business fields **very quickly**.

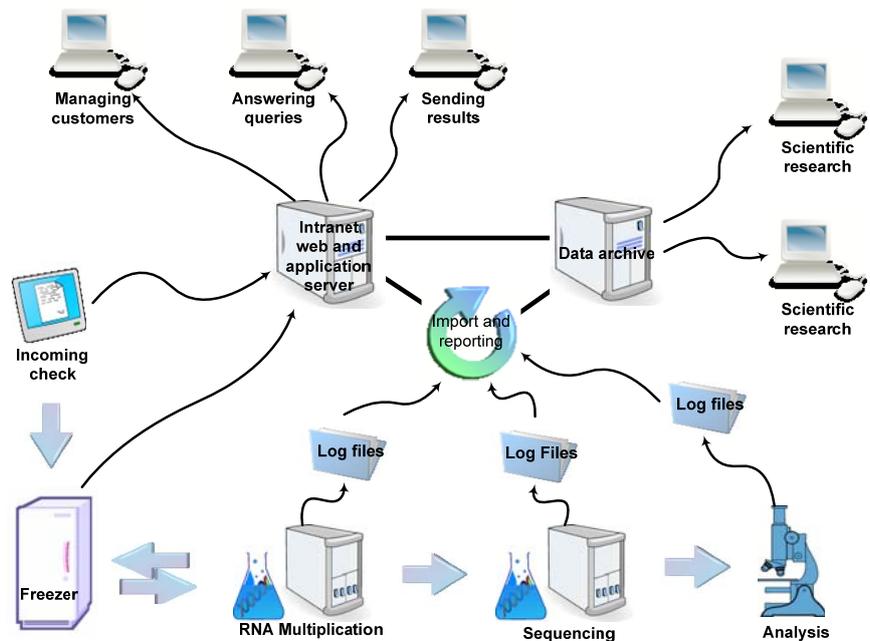
The workstations are **web-based**. **Software installation** and client computer management are not necessary.

The **lab machines** do not offer accessible interfaces for their results, therefore the control technology analyzes their **log files**.

This loose coupling also works for exotic equipment or instruments that are not always available, in this case **automatic pipettes** and **mass spectrometers**.

For the software, GAG and KAT rely on **open source systems** like **Linux**, **Apache** and **PHP**, and also on **Oracle** as a commercial **high-end database**.

Most of the programming was done in PHP. This language allows for very **fast program development** and **flexible changes**. Web-based workplaces and the background processing can use the same software functions.



The data center, consisting of computers, **RAID system** and backup, is held in a 19" rack. One main controller is responsible for the **database** alone. The analysis computer processes the received log files and performs other cyclical tasks like backups and reports. Another computer builds the **web server**.

If necessary, each computer can be used as backup for every other, so that no IT failure should stop the sample processing.