

# Projects 1.a & 1.b - Improve Archie performance by updating hardware and database

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Project 1 consists of four sub-projects in total: 1.a Update server hardware, 1.b Update database server software, 1.c Update application server software, and 1.d Review and update Archie programming framework.

## 1.a Update server hardware

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### 1.a.1 Background

The typical life span for server hardware is between three and five years. Archie has been running on two servers since 2004 and these are becoming outdated. The system sometimes becomes slow or unresponsive - especially around the peak load periods before submission deadlines. Even if we move to a 'publish when ready' model for individual Cochrane reviews, we expect that these surges of activity will continue when the four full issues per year are being compiled. In the current configuration, one server hosts the Archie application itself, while the other hosts the database.

### 1.a.2 Proposal and discussion

The Archie servers need to be replaced with state of the art hardware. This will improve the general response time, and will reduce the risk of out-of-memory errors bringing Archie to a halt during critical periods. It is difficult to predict the performance gain because this depends on the choice of hardware, but a speed improvement factor of 1.5 to 2.5 is realistic (2 would mean a doubling in the speed).

This project will begin with a period of monitoring of the current hardware configuration. This will locate the bottlenecks (e.g. processing power or memory) and will support a well-informed choice of the hardware that will deliver the best value for money. This will include the key decision as to whether Archie should run on one or two separate servers. The final steps would be to prepare and install the new server(s).

### 1.a.3 Summary of recommendations

The outdated Archie servers should be replaced by state of the art hardware, to substantially improve performance. This hardware should be chosen following an assessment of needs, which will allow the decision to be made on the basis of the best value for money.

### 1.a.4 Resource implications

We expect that the new hardware will cost around 10,000 Euro in total. Approximately 2 FTE weeks for the system administrator and 2 FTE weeks for the developer time will be needed to investigate and implement the upgrade.

### 1.a.5 Impact statement

All users of Archie will benefit from improved performance. A faster and more reliable system will increase productivity and satisfaction with Archie. Reduced down time around the submission deadline will indirectly help to improve the end product by ensuring that each build of The Cochrane Library includes the maximum amount of new and updated material. Furthermore, the upgrade will substantially reduce the risk of a major hardware failure.

Failing to update the hardware will gradually reduce Archie's performance as the number of users and the amount of data increases. This may lead to serious stability problems. If one of the servers should fail altogether, it may take weeks to replace, during which time Archie will have to run on one of the spare servers (e.g. the test server) with limited capacity and performance.

## 1.b Update database server software

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### 1.b.1 Background

All data in Archie (including the reviews) are stored in a Microsoft SQL Server database. We currently use a year 2000 version of this software in Archie. There have been two major updates since then, in 2005 and 2008. Microsoft ended mainstream support for the 2000 version in April 2008, meaning that no more bug fixes or security updates will be released.

### 1.b.2 Proposal and discussion

The database used by Archie should be upgraded to Microsoft SQL Server 2008. This version has mainstream support available until at least 2014, includes new features and is better equipped to exploit modern hardware to improve performance. One particular improvement, which will allow us to put in place the replacement for the parent database (see Project 4), is XML indexing. This dramatically decreases the time it takes to search inside structured documents, such as Cochrane reviews. Another feature is improved backup functionality. This might permit the automation of this time-consuming procedure, which is currently done manually by the system administrator.

### 1.b.3 Summary of recommendations

Archie's database should be brought up to date by replacing Microsoft SQL Server 2000 with the 2008 version.

### 1.b.4 Resource implications

The cost of the software license is ? (pending quote). Approximately 2 FTE weeks of the system administrator and 2 FTE weeks of developer time are needed to investigate and implement the update.

### 1.b.5 Impact statement

All users of Archie will benefit from the improved performance. Improved backup functionality will reduce the cost of running Archie. Keeping the database up to date is a safeguard against future problems that could arise with incompatible software or hardware.

Failure to update the database will mean that the project to replace the parent database (Project 4) cannot be carried out in the presently conceived form, and will require more resources. Updating software is part of the lifecycle of any system, it needs to be done periodically and delays increase the risk that the system will stop working.