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Systems and Networking

INTRODUCTION

The Systems and Networking team manages EMBL-EBI's IT infrastructure. This includes compute and database servers, storage, desktop systems and networking, as well as managing our campus connection. An important task is supporting EMBL-EBI users in their daily activities. The team works closely with all project groups in maintaining and planning their specific infrastructures. The IT environment consists of more than 3,600 CPU cores (Figure 1) and 500 terabytes of disk storage.

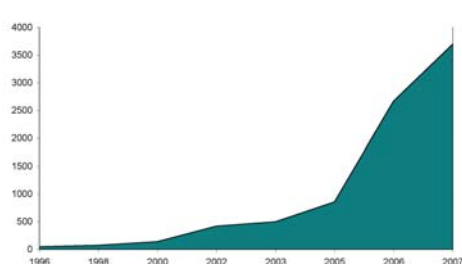


Figure 1. Number of CPU cores.

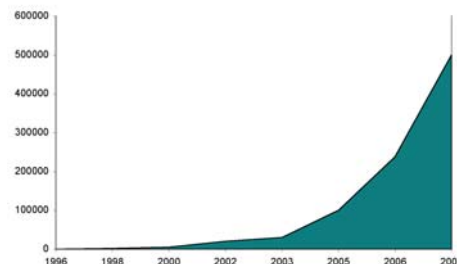


Figure 2. Storage growth in from 1996 to the present.

EXPANSION OF THE IT INFRASTRUCTURE TO THE NEW EMBL-EBI EAST WING

Our team has had an important role in planning the IT infrastructure for EMBL-EBI's new East Wing. The desktop team in particular has been instrumental in the implementation of the new IT training room's presentation and computer facilities. The machine set-up is fully automated and allows each tutor to quickly and easily configure the machines to run the required operating system and applications. In collaboration with the Outreach and Training team, we have organised training sessions and provided documentation for the tutors. The Systems desktop team was the first team to move to the new building where they were able to provide support and facilitate the relocation of other teams.

STORAGE

Total storage has doubled again this year (Figure 2). We have spent a substantial amount of time investigating storage systems and backup solutions that should provide reliable and scalable implementations. We feel that this is critical as we will soon be managing petabytes of storage. We have obtained a new backup system and are beginning to utilise storage replication on our centralised network. We are also evaluating storage clusters.

NEW MACHINES

We have continued adding servers to our PC farms. This has enabled our user community to utilise them to maximum capacity (Figure 3).

NETWORKING

Our primary internet connection is via Cambridge and we have an active backup link to London. This year we have installed two new site routers, thus eliminating a single point of failure in the campus internet connection.

DATABASE SERVER INFRASTRUCTURE

We have installed more than twenty new database servers and a new storage area network. This has enabled the database teams to migrate their Oracle instances from the old Tru64 based servers. The new set-up is also designed to accommodate database replication, enabling the EBI database teams to replicate their total instances to redundant systems. We have also started configuring a centralised scalable MySQL server farm that can be used by all the EBI teams.

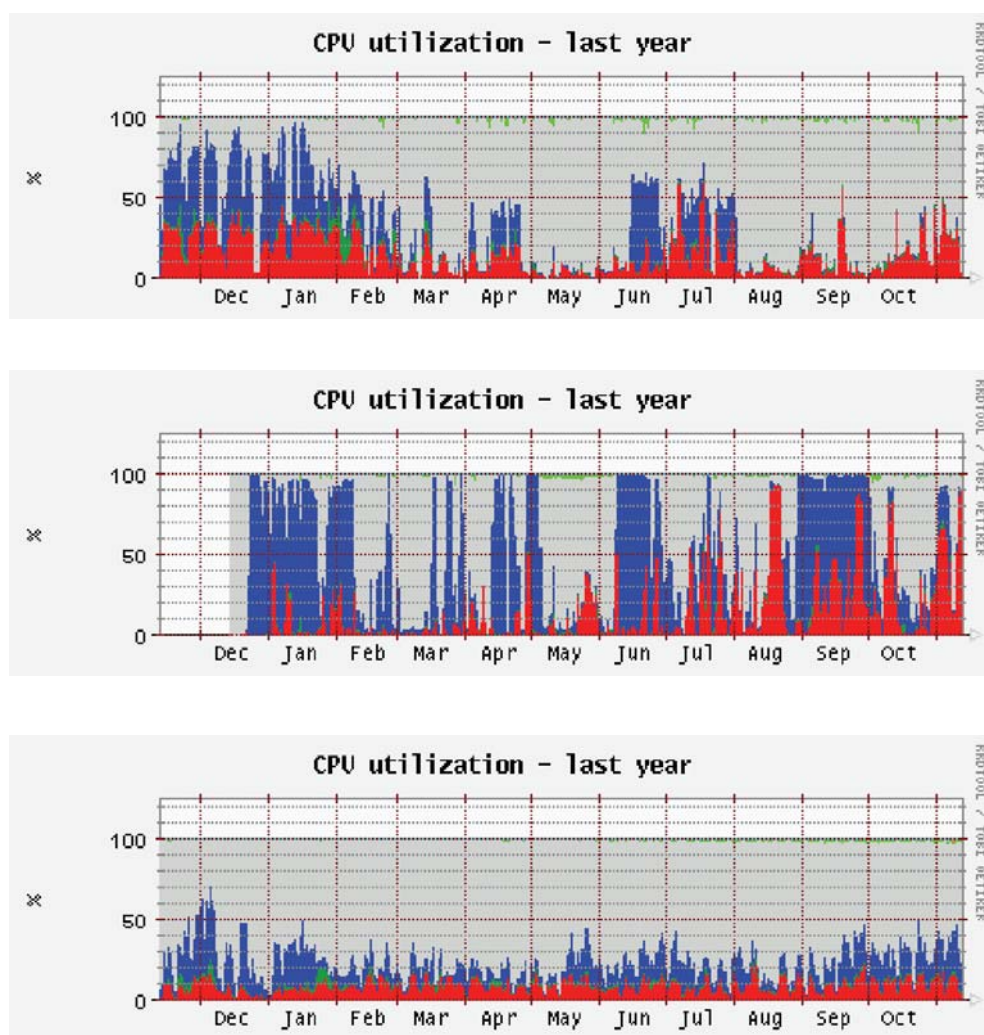


Figure 3a. Production Farm Use; 3b. Research Farm Use; 3c. External Services Farm Use. Red, top priority; blue, lower-priority jobs; green, systems jobs.

MISCELLANEOUS PROJECTS

In addition to the above projects, we have made several other developments. Examples of these include a new machine monitoring and alerting system, Sun/Solaris installation and management system and software that allows system administrators to manage user/group accounts and security settings etc.

SUMMARY

Overall, 2007 has been a successful year for the Systems and Networking team. The new EBI extension and training facilities have been successfully incorporated into the existing infrastructure. Due to the recent expansion, there has been a large quantity of equipment to install and maintain as well as an increasing number of people to support. We are trying very hard to deploy the best solutions and we continue to put a lot of emphasis on automation. We believe that these efforts will maintain the effectiveness of a relatively small team.