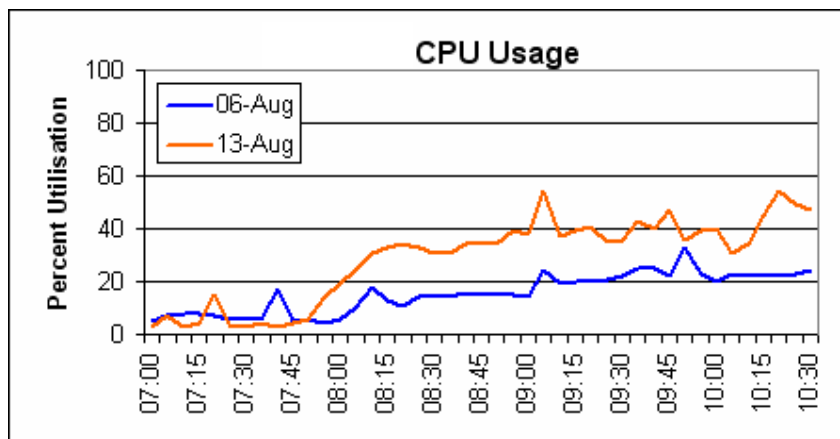


Preliminary Assessment of Oracle Forms*6.0 upgrade

Background. A call-centre/sales operation used an Oracle*Forms application for it's agents. They had a business need to upgrade from Forms 4.5 to Forms 6.0, to increase the functionality of the application. They ran a thick client-server architecture, with database and application servers in the datacentre and PCs in the call centre. Testing had shown that the new application would use more resources on the application server (but not necessarily on the database server, that's a different piece of work) and this report is an analysis of the first stage of a ramp-up to predict the effect of migrating all the users to Forms*6.0

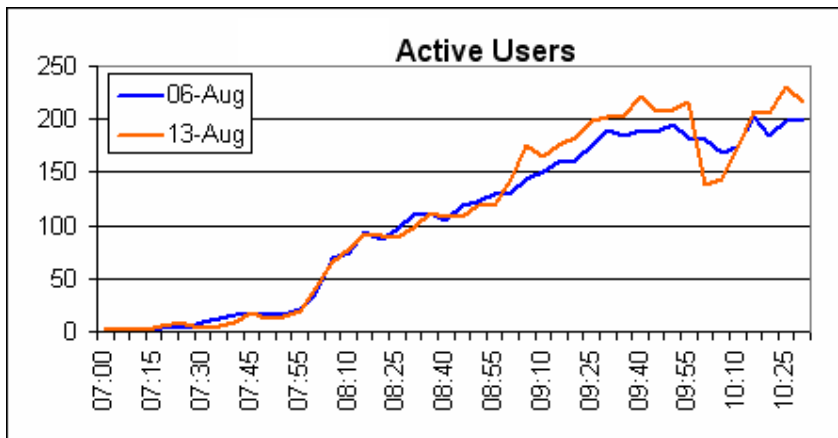
Note: The data presented here is entirely dependent on the functions performed by the Forms application and cannot therefore be used to infer the performance or requirements of any other application in a different environment

This work analyses the first day after the Forms*6.0 rollout (August 13). In preparation for this, 340 application users had their profiles set to use Forms 6i. I compared the performance of the application server this morning with it's performance last Wednesday. The CPU usage for the two periods is shown below.



The headline from this is that CPU usage on the 13th with some Forms 6 users is roughly twice what it was the previous week, when there were none.

The chart below shows that on both days there were similar numbers of users actively using the application, therefore a comparison of CPU resource usage is valid.



User Breakdown

Of the 340 users who could potentially use the application with Forms 6, only a fraction actually did use it during the period I monitored. The data shows that from the total of 366 application sessions, just less than 40% were Forms 6 users, the remainder were using Forms 4.5.

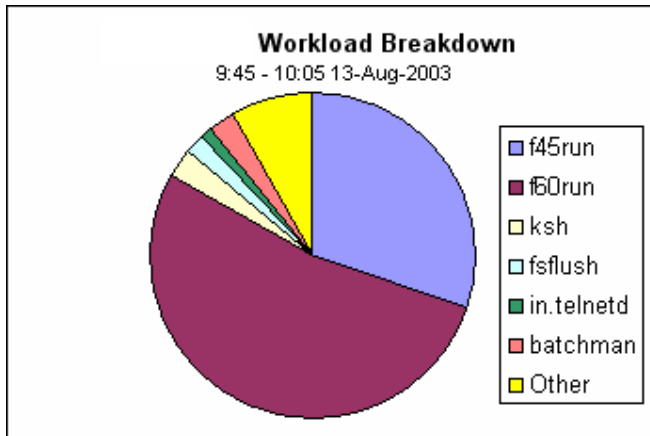
Be aware that these 366 sessions were not all actively using the application all the time. The graph above of *active* users shows that of the 366 sessions that were logged in, only 200 or so were actively using the application. I have assumed that the proportion of active users is the same for Forms 6 users, as it is for Forms 4.5 users. This implies there were about 80 Forms 6 users active.

There is a “blip” in user numbers in the 13 August data from 10:00 to 10:15. This shows that roughly 120 users were disconnected (of which 70 were active, see the Active Users chart). Since this was a network failure and not a result of Forms 6 problems, the blip has been ignored in the calculations that follow, which are based on the period just before the blip occurred.

Workload

This section deals with the amount of system resources (specifically CPU) that the different types of users consumed.

The chart below shows the relative amount of CPU used by all the processes of the types shown.



The traditional Forms 4.5 users made up 62% of the total Forms processes and used 30% of the application server's CPU. The Forms 6 users were the other 38%, but accounted for 53% of the used CPU.

From this we can say that the 220 Forms 4.5 users consumed 0.14% of the CPU each, whereas the 146 Forms 6 users required 0.36% each.

Memory Requirements

The amount of memory allocated to each Forms process depends to some extent on the type and number of screens that it's user has opened. During the working day, the amount of memory each process requests increases as users do more work. This means that at the beginning of the day only a certain proportion of the platform's memory is in use, but as time progresses this proportion increases.

Because of this memory increase that Oracle Forms processes exhibit, it is necessary to wait until a Forms process has been running for some hours to get a true measurement of its memory requirements.

Since there were both Oracle Forms 4.5 and 6 running in parallel, I was able to compare the amount of memory used by each type of process. To keep things simple I assumed that when all the Forms processes were taken together, a Forms 6 user would, on average, have done as much work by a given time as a Forms 4.5 user. The memory allocated to a process does not depend on whether that process is active all the time. Therefore these memory requirements are for each logged in user, not just for "active" users.

Measurements of the *private* segment of all of the running processes shows that on average, a Forms 6 process requires 8.3MB of memory compared with 3.09MB for a Forms 4.5 user.

Since all the support processes are the same, whether a user is running Forms 4.5 or 6, the only difference between the overall memory requirements is an additional 5.21MB per user.

(**Caveat:** this conclusion only holds until the version of Solaris is changed)

Predictions

From the workload analysis we can forecast the effect on the CPU of having all application users running Forms 6.

Apart from servicing interactive users, there are some other restrictions on CPU availability on the application server:

- Background system and housekeeping tasks (the 17% that aren't f45run or f60run in the workload chart)
- A "good housekeeping" limit of 85% of the server's capacity

Taking into account these two restrictions, there is 68% of the processor's capacity available for application users. We can therefore say that in CPU terms, the machine is capable of supporting 190 active Forms 6 users. We know from past work that only 60% of application users are active during the peak morning times. Therefore the 190 active users corresponds to 315 Forms 6 users actually logged in to the application.

In practice on a day to day basis there are around 360 application users logged on at this time. My prediction from past years patterns is that the seasonal nature of the business means that during the coming winter, the business will require around 420 logged on application users.

To support just the Forms 6 activity will put the CPU requirements of the application server (note: not the database server, this is the subject of a separate study) at 91% of it's capacity. In addition there is the 17% background workload – part of which is necessary to support these users and therefore cannot be removed. This 108% of the capacity of the current platform should be run on a machine of sufficient size that it does not exceed 85% of it's capabilities. To do this will require a platform with 125% of the processing power of the current machine.

Further, the 4GB of memory installed on the application server is sufficient for the user population that it has now. But, when all the users are upgraded to Forms 6 and when the winter peak season requires more users this quantity of memory will be insufficient and could introduce more delays for application users.

Using the value measured above, with the expected 420 users, needing 5.21MB more memory each, will require $420 * 5.21 = 2188\text{MB}$ of additional memory. This quantity is not a "round" number in memory terms. The nearest memory size to this that can be configured is 6GB, therefore an extra 2GB will be needed.

Recommendations

The current 4 processor domain will need an increased processing power of 25% to support the expected number of users in the run up to Christmas. This could be satisfied either by adding one more processor, or by moving the application to a 4 processor domain on a platform with 25% faster processors.

In addition, the domain (however it is implemented) will require an extra 2GB of memory, bringing its total requirements to 6GB.

There is no need to increase either the network or disk provisions for this application.