PREDICTING COMPUTER NEEDS FOR BANKING
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Introduction

Bank of America's World Banking Division (WBD) is preparing a Capacity Planning Methodology. WBD has over 100 computer systems in over 50 locations world-wide. Many of these computer installations are experiencing severe growing pains. Electronic data processing in banking has recently shown exponential growth. The business applications' projected rate of growth may soon exceed the capacity of many of these installations. Our Capacity Planning Methodology will allow us to provide timely and accurate planning tools for the EOP managers. We hope to provide an easy-to-use methodology for all WBD computer installations.

Providing over 100 individual Capacity Planning Analyses from a centralized source would be a quite timely and an expensive task. WBD elected to sample ten installations to help verify our Capacity Planning Methodology. Four groups of IBM systems are included in this methodology: System/3, System/34, 4331, and 4341. (Because of time constraints, the 4341 systems were later omitted.) The Capacity Planning Methodology is intended to be a planning tool for use with any of these systems.

Assumptions

Our Capacity Planning Methodology is based on several fundamental assumptions. These assumptions are necessary to focus the scope of our work and to provide some means of making the methodology a general tool for the bank.

1. Bank of America's business applications are fairly standardized (e.g., savings applications in Hong Kong are very much like savings applications in London).

2. The same application (e.g., Time Deposits and Loans) run on the same type of system (e.g., System/34) will use roughly the same resources per natural forecasting unit (e.g., 2 CPU minutes per hour per account).

3. Samples of selected sites, within a computer systems group, can be generalized to the entire group. Sites must run a core group of applications as standard business practices.

4. A common methodology can be created to satisfy the capacity planning needs of all WBD computer installations.

Procedures

Our first step in our Capacity Planning Methodology is to collect systems data from our sample sites. We send a User Data Request to each location to help them collect the information we need. The returned User Data Requests came in many forms and with many interpretations. We found an immediate need to better communicate our needs to those who are providing the system information to the Capacity Planners. We suspect that the next iteration of the methodology will provide better inputs since the EOP managers will be more familiar with the Capacity Planning process.

Our efforts to summarize and standardize the User Data Requests pointed out several shortcomings. We are able to proceed with our analyses using information about CPU and printer utilization. Since most Bank of America business applications are batch applications, we are able to make fairly accurate utilization predictions with data about CPU and printer. Very little information about growth of existing applications or new applications seems to be available. Growth Data is important to the Capacity Planners and needs further consideration.

A good capacity planning effort must begin by examining current performance. We ask, can we make the current equipment last longer by improvements or changes to current operations? We may find excessive capacity at some locations while others show that they are near capacity. The WBD Capacity Planning Methodology provides several worksheets to help the planners evaluate current system performance.

We need to forecast our system requirements for several years. We choose ten forecasting periods of 6-months each. We expect that each iteration of our methodology, every six months, will yield better results. That is, as the EDP managers in the field learn how to use this tool, better inputs will be provided to the Capacity Planners. The capacity planning forecasts are based on the EDP manager's estimates of growth of existing applications and on estimates of new applications.

We also will provide an early warning system for the managers. This system is in the form of tables which will provide rough estimates of needed capacity based on current or future application volumes. A manager can monitor the required capacity using this early warning system. If they determine that they may exceed their current capacity in the future, they may wish to perform a full iteration of the methodology. This would be especially useful when unexpected growth or new applications are brought into a system.
Finally, we will provide a recommended upgrade path for this class of IBM systems. When re-scheduling operations will no longer help reduce the needed resources, the managers should have specific guidelines to meet their computing needs.

Findings

Our preliminary results have shown us several avenues for improvements in current operations. For example, we learned that at one site, they had four times the computer power they needed for an average day, but they were close to exceeding operational capacity during their peak measurement interval (PMI). (The PMI is the hour during the day which has the heaviest utilization.) We can suggest that they re-evaluate their scheduling and move one or more applications out of the PMI. This would allow them to get more mileage out of their current system.

In all cases, our current forecasts show that all sampled WBS systems will run out of capacity within 30 months. This is valuable planning information for the EDP managers. Whether they need to upgrade the current system; buy or lease new equipment; or put the lid on their expansion is now their concern. We have provided them with a time-table of their growth, now they must decide how to deal with their growing computer needs.