

**Chapter 1 : Capacity Planning and Performance Modeling**

*In addition, an educational version of QSolver/1, a PC based capacity planning software package is provided. Book Reviews: "When even the most educated guesswork doesn't cut it anymore, Capacity Planning and Performance Modeling is the book to turn to.*

For his tenth birthday, Gunther received a copy of the now famous book entitled The Golden Book of Chemistry Experiments from an older cousin. Inspired by the book, he started working on various experiments, making use of various chemicals that could be found around in his house. After he spilled some potassium permanganate solution on his bedroom carpet his mother confined him to an alcove in the garage which he turned into a small laboratory , replete with industrial chemicals and second-hand laboratory glassware. Gunther was interested in finding out how things like detergents and oils were composed by cracking them in his fractionating column. He took particular interest in mixing paints for his art classes, as well as his chemistry classes in Balwyn High School. This ultimately led to an intense interest in synthesizing Azo dyes. At around age 14, Gunther attempted to predict the color of azo dyes based on the chromophore - auxochrome combination. Apart from drawing up empirical tables, this effort was largely unsuccessful due to his lack of knowledge of quantum theory. Gunther was asked to analyze the thermal stability test data from the Voyager RTGs. He discovered that the stability of the silicon - germanium Si-Ge thermoelectric alloy was controlled by a soliton -based precipitation mechanism. Ultimately, he was recruited onto the Dragon multiprocessor workstation project where he also developed the PARCBench multiprocessor benchmark. This was his first fore into computer performance analysis. He also performed simulations for the design of the Reliant RM parallel database server. Consulting practice[ edit ] Gunther founded Performance Dynamics Company as a sole proprietorship, registered in California in , to provide consulting and educational services for the management of high performance computer systems with an emphasis on performance analysis and enterprise-wide capacity planning. He went on to release and develop his own open-source performance modeling software called "PDQ Pretty Damn Quick " around That software also accompanied his first textbook on performance analysis entitled The Practical Performance Analyst. Several other books have followed since then. Current research interests[ edit ] Quantum information systems[ edit ] In , Gunther has embarked on joint research into quantum information systems based on photonics. In its simplest rendition, this theory can be considered as providing the quantum corrections to the Abbe - Rayleigh diffraction theory of imaging and the Fourier theory of optical information processing. In , he developed a tool called Barry, which employs barycentric coordinates to visualize sampled CPU usage data on large-scale multiprocessor systems. A barycentric 3-simplex] a tetrahedron , that can be swivelled on the computer screen using a mouse , has been found useful for visualizing packet network performance data. In , he co-founded the PerfViz google group.

## Chapter 2 : What is Capacity Management in ITIL?

*Capacity Planning and Performance Modeling: From Mainframes to Client-Server Systems [Daniel A. Menasce, Virgilio A.F. Almeida, Lawrence W. Dowdy] on calendrierdelascience.com \*FREE\* shipping on qualifying offers. This example-driven exploration of capacity planning of computer systems is designed for both practising professionals and those with little.*

As we have noted on a variety of occasions, it usually takes technology to manage technology. This is particularly true in the area of evaluating the capacity of information technologies to meet the demands placed upon them. The case for this module looks at some aspects of this problem. First, read this background on capacity planning: TeamQuest How to do capacity planning, Retrieved Nov. Performance Capacity Planning Explained. Retrieved December 4, , from [http://www.teamquest.com/whitepapers/capacity\\_planning.html](http://www.teamquest.com/whitepapers/capacity_planning.html). Your paper should be between three and five pages. Take a definite stand on the issues, and develop your supporting argument carefully. Using material from the background information and any other sources you can find to support specific points in your argument is highly recommended; try to avoid making assertions for which you can find no support other than your own opinion. You will be particularly assessed on: Your draw on a range of sources, and to establish your understanding of the historical context of the question. You use examples, citations especially to the required readings , and elaboration to support assertions. You provide evidence that you have read the required background materials. Your answers are clear and show your good understanding of the topic. You see what the module is all about and to structure your paper accordingly. The scope covered in your paper is directly related to the questions of the assignment and the learning objectives of the module. The paper incorporates YOUR reactions, examples, and applications of the material to business that illustrate your reflective judgment and good understanding of the concepts. It is important to read the "required readings" posted in the background material plus others you find relevant. Your informed commentary and analysis is vital -- simply repeating what your sources say does not constitute an adequate paper. Your paper is well written and the references, where needed, are properly cited and listed refer to the university guidelines [http://www.teamquest.com/whitepapers/capacity\\_planning.html](http://www.teamquest.com/whitepapers/capacity_planning.html). The company should be ready with service level requirements irrespective of the service received from cloud computing. One of the most important reasons why a firm requires computer capacity evaluation is that it needs to plan for future. For example, the company is evaluating an acquisition, it needs to evaluate if the computing capacity is adequate. Similarly, a company may be undertaking a project that requires strong IT support the company needs to evaluate its capacity. From the perspective of the company, it needs to assess if its computer systems are scalable to a sufficient degree. Building scalable software architectures is important for a company that is striving to provide reliable IT support to its business. The compatibility of the existing and Solution Summary Capacity evaluation and cloud computing are discussed step-by-step in this solution. The response also has the sources used.

**Chapter 3 : Capacity Planning and Performance Modeling HW Research Paper**

*Capacity Planning and Performance Modeling. As we have noted on a variety of occasions, it usually takes technology to manage technology. This is particularly true in the area of evaluating the capacity of information technologies to meet the demands placed upon them.*

As we have noted on a variety of occasions, it usually takes technology to manage technology. This is particularly true in the area of evaluating the capacity of information technologies to meet the demands placed upon them. The case for this module looks at some aspects of this problem. First, read this background on capacity planning: TeamQuest How to do capacity planning, Retrieved Nov. Performance Capacity Planning Explained. Retrieved December 4, , from <http://> Your paper should be between three and five pages. Take a definite stand on the issues, and develop your supporting argument carefully. Using material from the background information and any other sources you can find to support specific points in your argument is highly recommended; try to avoid making assertions for which you can find no support other than your own opinion. You will be particularly assessed on: Your draw on a range of sources, and to establish your understanding of the historical context of the question. You use examples, citations especially to the required readings , and elaboration to support assertions. You provide evidence that you have read the required background materials. Your answers are clear and show your good understanding of the topic. You see what the module is all about and to structure your paper accordingly. The scope covered in your paper is directly related to the questions of the assignment and the learning objectives of the module. The paper incorporates YOUR reactions, examples, and applications of the material to business that illustrate your reflective judgment and good understanding of the concepts. It is important to read the "required readings" posted in the background material plus others you find relevant. Your informed commentary and analysis is vital -- simply repeating what your sources say does not constitute an adequate paper. Perhaps the greatest challenge facing capacity planning and management is the explosive use of cloud computing in many networks today. The goal of capacity planning is to provide satisfactory service levels to users in a cost effective manner TeamQuest, The challenges presented by cloud-based systems question the effective capacity evaluation an organization must make when determining how to address their capacity management needs. Capacity planning is challenging for many organizations, as there are a multitude of options available. In the past, the tough decisions were essentially in reference to server capacity. There was no major issue in having too much capacity. The cloud-based systems are steadily changing the game however, when it comes to evaluating needed capacity. Previously, to measure storage system performance capability was to measure its throughput, which measures the average number of megabytes, typically by a single computer Franklin, Server administrators have not changed their methods per se, but the use of cloud-based systems may yield the need to evaluate capacity planning and management in a different method. There are many tools available to administrators to determine which system is more beneficial to the organization. The challenge begins though with the cloud-based systems of capacity planning and management. Under a cloud-based system of capacity planning and management, the user does not have to rely on its internal servers to meet the demand or organizational needs. Instead, the "cloud" allows data to be stored on a shared server network, thus reducing the need for an internal set of servers for the Solution Summary The expert examines capacity planning and performance modeling.

**Chapter 4 : Capacity Planning and Performance Modeling (Module 3 Case)**

*To avoid or rectify performance issues before they become serious, monitor server performance throughout the lifetime of the site, and make this part of your capacity plan for the SMS site. Modeling formulas can help you develop site capacity plans.*

Join For Free Senu is an open source monitoring event pipeline. This article is the first part in a series of blogs where we will talk about capacity planning for IT systems. In this part, we will start with an overview of capacity planning, why we need capacity planning, the capacity planning process, and common pitfalls in capacity planning. What would the average response time, throughput, and CPU utilization be for a particular workload? Which components of the system affect performance the most? Are they potential bottlenecks? CPU utilization, memory utilization, and transaction response time are of interest here. When capacity numbers do not meet the expectations, there are two options: Optimize application architecture and code. Of course, infrastructure architecture needs to support this. What Is Capacity Planning? Capacity Planning is an important part of IT Management. A capacity plan is important input to the IT budget process - it helps in allocating the appropriate budget to meet the capacity requirements Without a capacity plan, organizations are either grossly under-prepared or over-prepared. Capacity planning is the process of determining the production capacity needed by an organization to meet changing demands for its products. A discrepancy between the capacity of an organization and the demands of its customers results in inefficiency, either in under-utilized resources or unfulfilled customers. The goal of capacity planning is to minimize this discrepancy. Capacity can be increased through introducing new techniques, equipment, and materials, increasing the number of workers or machines, increasing the number of shifts, or acquiring additional production facilities. Approaches to Capacity Planning Various techniques and approaches are used by practitioners to do capacity planning. Make an Educated Guess Rely on intuition, expert opinions, past experience, ad hoc procedures and general rules of thumb. Quick, easy and cheap. Very inaccurate and risky Approach 2: Generate Load and Measure Performance Use load-testing tools that generate artificial workloads and measure performance. Provides accurate and realistic data. Could help to identify bottlenecks and fine-tune system prior to production. Extremely expensive and time-consuming. Assumes that the system is available for testing. Build a Performance Model of the System Build and analyze performance models which capture the performance and scalability characteristics of the system. Often much cheaper and quicker than load-testing. Accuracy depends on how representative models are. Capacity Planning Process Determine service level requirements From a capacity planning perspective, a computer system processes workloads and delivers service to users. During the first step in the capacity planning process, these workloads must be defined and a definition of satisfactory service must be created. A workload is a logical classification of work performed on a computer system. If you consider all the work performed on your systems as pie, a workload can be thought of as some piece of that pie. Workloads can be classified by a wide variety of criteria. Who is doing the work particular user or department. What type of work is being done order entry, financial reporting. How the work is being done online inquiries, batch database backups. Determine the unit of work What "transaction" really means. Can vary from an OLTP application to a batch system. If you want to base your service level requirements on present actual service levels, then you may want to analyze your current capacity before setting your service levels. Note that these steps are generally done for an existing system during load testing phase. First, compare the measurements of any items referenced in service level agreements with their objectives. This provides the basic indication of whether the system has adequate capacity. This analysis identifies highly used resources that may prove problematic now or in the future. Look at the resource utilization for each workload. Ascertain which workloads are the major users of each resource. This helps narrow your attention to only the workloads that are making the greatest demands on system resources. Determine where each workload is spending its time by analyzing the components of response time, allowing you to determine which system resources are responsible for the greatest portion of the response time for each workload. Plan for the future Determine future processing requirements Systems may be satisfying service levels now, but will they be able to do that

while at the same time meeting future organizational needs? Future processing requirements can come from a variety of sources. Input from management may include: Expected growth in the business, Requirements for implementing new applications. Planned acquisitions, IT budget limitations. Problems in the Capacity Planning Process No standard technology. Each vendor has their own benchmarks. Distributed environments make modeling even more complex. Monitoring overheads are ignored. Learn moreâ€”download the whitepaper. Read More From DZone.

**Chapter 5 : Capacity Planning and Performance Modeling:**

*Capacity planning is one of the processes applied by organizations in determining the resources that are required to curb performance impact as well as availability impact on the company's business-critical applications.*

And a - indicates a negative score. Which Capacity Planning Tool is the Best? Go deeper into each factor to determine which ones matter most to you. Time It Takes to Use This is fairly self-explanatory but nevertheless important. Simulation modeling takes time- and is resource-intensive. So, it should be used strategically in the capacity planning process. The other four types—trending, additive resource allocation, analytic modeling without automation, and automated analytic modeling—are quicker to use. So, if the time it takes to use matters most to your organization, steer clear of performance monitoring and simulation modeling. Trending tools give imprecise forecasts as systems do not perform linearly. Capacity planners typically use trending tools only for conservative estimates to avoid bottlenecks and downtime based on KPI thresholds. But that results in overprovisioning and overspending—which leads to a bloated, inefficient IT budget. Additive resource allocation tools tend to lack in accuracy as well. The other three types—simulation modeling, analytic modeling without automation, and automated analytic modeling provide accurate results. So, any of these three would make a smart choice if capacity planning accuracy matters to you. This is especially true when it comes to manual data entry. Automated capacity planning minimizes the risk. Tools that excel in automated capacity planning automatically run the numbers. That way, IT professionals can focus on the work they do best—analyzing complex sets of data and converting data into actionable insights. Simulation modeling tools tend to be pretty manual. And so do most analytic modeling tools. Scalability As IT infrastructure gets larger and more complicated, scalability is of the utmost importance. A scalable tool needs to be able to monitor and make predictions about thousands of servers at once. Simulation modeling and analytic modeling tools without automation can only handle tens of servers at a time. Performance monitoring, trending, additive resource allocation, and automated analytic modeling tools will be much more effective for large organizations. Answers Even if you get an accurate prediction of future workload demands, it can be difficult to know how to prepare for them. Performance monitoring and trending tools only give you raw data. Additive resource allocation tools might help you identify servers that are underutilized as candidates for consolidation. But these tools use imprecise methods. Tools like simulation modeling, analytic modeling without automation, and automated analytic modeling will give you real, easy-to-understand answers. These tools are the best way to solve potential problems in the near and distant future. Simplified Comprehensive Reporting Easy yet thorough capacity reporting is a must if you need to communicate to business leaders. Unfortunately, five out of six types of capacity tools fail to provide this. Only automated analytic modeling gives you the holistic view of your entire infrastructure that: Makes accurate predictions Finds when a risk will occur Identifies the resource constraint Communicates IT metrics in business terms If this factor matters most, you ought to choose an automated analytic modeling tool. Choose the Right Capacity Planning Tool Automated analytic modeling tools are the only solutions that excel in all six criteria. Vityl Capacity Management falls directly into the automated analytic modeling category for capacity planning. With automated solutions for capacity planning, you can: Get fast, accurate results across thousands of servers Automatically identify when there will be risk and what will cause it Use queuing network theory to automate capacity planning Focus capacity planning efforts on critical business functions Present IT results to business leaders in terms they can understand Interested in Automated Capacity Planning Made Easy? Vityl Capacity Management may be what you need.

## Chapter 6 : Introduction to Modeling for Sizing and Capacity Planning | Microsoft Docs

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Strategies[ edit ] The broad classes of capacity planning are lead strategy, lag strategy, match strategy, and adjustment strategy. Lead strategy is adding capacity in anticipation of an increase in demand. It is also a strategy aimed at reducing stockout costs. A large capacity does not necessarily imply high inventory levels, but it can imply higher cycle stock costs. Excess capacity can also be rented to other companies. Advantage of lead strategy: First, it ensures that the organization has adequate capacity to meet all demand, even during periods of high growth. This is especially important when the availability of a product or service is crucial, as in the case of emergency care or hot new product. For many new products, being late to market can mean the difference between success and failure. Another advantage of a lead capacity strategy is that it can be used to preempt competitors who might be planning to expand their own capacity. Being the first in an area to open a large grocery or home improvement store gives a retailer a define edge. Finally many businesses find that overbuilding in anticipation of increased usage is cheaper and less disruptive than constantly making small increases in capacity. Of course, a lead capacity strategy can be very risky, particularly if demand is unpredictable or technology is evolving rapidly. Lag strategy refers to adding capacity only after the organization is running at full capacity or beyond due to increase in demand North Carolina State University, This is a more conservative strategy and opposite of a lead capacity strategy. It decreases the risk of waste, but it may result in the loss of possible customers either by stockout or low service levels. Three clear advantages of this strategy are a reduced risk of overbuilding, greater productivity due to higher utilization levels, and the ability to put off large investments as long as possible. Organization that follow this strategy often provide mature, cost-sensitive products or services. Match strategy is adding capacity in small amounts in response to changing demand in the market. This is a more moderate strategy. Capacity[ edit ] In the context of systems engineering , capacity planning [4] is used during system design and system performance monitoring. It extends over time horizon long enough to obtain resources. Capacity decisions affect the production lead time, customer responsiveness, operating cost and company ability to compete. Inadequate capacity planning can lead to the loss of the customer and business. The question of when capacity should be increased and by how much are the critical decisions. Failure to make these decisions correctly can be especially damaging to the overall performance when time delays are present in the system. In this example 4. By repeating this process for all the parts that run through a given machine, it is possible to determine the total capacity required to run production. Capacity available[ edit ] When considering new work for a piece of equipment or machinery, knowing how much capacity is available to run the work will eventually become part of the overall process. Typically, an annual forecast is used to determine how many hours per year are required. To calculate the total capacity available, the volume is adjusted according to the period being considered. The available capacity is difference between the required capacity and planned operating capacity.

## Chapter 7 : Get a Capacity Planning Checklist

*Capacity management by the organizations is very crucial. It is because it plays very vital role towards the fulfillment of the demands made by the customers. Failure to manage the capacity of the organization may result in either the dissatisfaction of the customers' wants or the underutilization of the available resources by the organization.*

## Chapter 8 : Capacity planning - Wikipedia

*You can better manage performance and costs of your existing IT resources with ASG-TMON Performance Analyzer. ASG-TMON Performance Analyzer (PA) solutions provide powerful and comprehensive automated analysis, reporting, modeling and manage, and optimize your IT infrastructure.*

Chapter 9 : Capacity Planning and Performance Modeling Essay - 1

*Suggested Model Workload Performance Model Mash-up Represent load/stress on the environment and components within while profiling the reaction in order to measure & analyze the current and predicted performance and capacity of the system.*