Make Optimizing Business Services Less Art, More Science with BMC TrueSight Capacity Management

Reduce costs while provisioning the right level of resources

Table of Contents

Executive Summary

To support the dynamic business needs of the digital economy, IT must provision resources quickly while optimizing utilization and costs. When translating business needs into IT metrics, however, it can be difficult to accurately predict what resources will be needed to meet changing demands. IT often ends up erring on one side or the other:

- **Under-provisioning**, leading to service degradation or disruption that can impact revenue and customer retention

- **Overprovisioning**, which wastes capital and operational budget that could be shifted to other needs

Capacity management provides an accurate way to:

1. Map business needs to IT metrics

2. Identify potential bottlenecks, and

3. Provision the right level of resources for each project at the right time.

By making capacity management tools such as **BMC TrueSight Capacity Optimization** a core element of their infrastructure and operations strategy, **IT groups can reduce waste and costs while optimizing service for the business.** This paper illustrates the effectiveness of capacity management in a Microsoft® Skype for Business™ implementation at BMC Software.

Capacity management provides an accurate way to:

Map business needs to IT metrics	Identify potential bottlenecks	Provision the right level of resources for each project at the right time

THE ESSENTIAL ROLE OF CAPACITY MANAGEMENT IN THE DIGITAL ECONOMY

The digital economy places a premium on IT speed, agility, and innovation. Yet it is still essential to capitalize on every opportunity to reduce costs and ensure every IT dollar drives maximum business value.

Capacity planning helps IT meet the dynamic requirements of the business while controlling and reducing costs by:

- Making sure the right resources are allocated to each application at the right time so they are deployed on schedule

- Adjusting IT resources proactively to address growth, periodic and cyclic changes in demand, ensuring that services are consistently delivered at a speed that meets customer expectations

- Optimizing hardware investments while reducing software and service costs

In fact, **capacity management provides the key to turning your IT infrastructure into a competitive advantage.** Gartner emphasizes its strategic importance: "Carrying excess capacity can be a significant financial burden for a business, but performance slowdowns or outages caused by insufficient capacity can cost even more through reputational damage and direct revenue loss. I&O leaders need a holistic IT service and IT infrastructure view of capacity management."[1]

But achieving a holistic view and understanding of capacity is made more difficult by data center transformation and new delivery models—especially when the methods being used are grossly outdated and ineffective. These methods include time-consuming, error-prone manual approaches such as spreadsheets, which typically contain data that lags by a month or more. Siloed views into various elements of infrastructure make it difficult to identify opportunities to improve efficiency. Manual analysis inevitably falls short of addressing the needs of today's business and IT needs.

The resulting inaccuracy has real consequences for IT and the business. Lacking a full understanding of changing workloads, trends, and potential bottlenecks, IT must base project requirements on rough estimates. When these estimates are too optimistic, **under-provisioning leaves the business vulnerable to service degradation or disruption**, which impairs business productivity, frustrates customers, slows business agility and performance, and harms competitiveness. **A more conservative approach often leads to overprovisioning** that wastes precious budget and resources, increases administrative overhead, and diverts funds from innovation.

USE CASE: HOW CAPACITY MANAGEMENT HELPED BMC SAVE $1.5M

BMC recently undertook an initiative to transform our communications infrastructure through the implementation of Skype for Business. The project scope was ambitious—we aimed to:

- Remove all desk phones in every office worldwide

- Provide a single platform for phone, video conferencing, desktop sharing, and web sharing

- Enable a unified and streamlined communications experience for 6,000 globally distributed employees

- Reduce business and IT operational costs

The project began with a proof-of-concept (PoC) implementation for IT users. While the success of the PoC validated the premise of the project, we still needed to understand the IT infrastructure resources required to scale to all 6,000 BMC employees, including sales, customer support, and internal business operations.

To scope the project, we needed to analyze extensive data, including:

- What are the loads incurred by different types of usage—voice, online presentations, video conferences, desktop sharing, and so on?

- How are the loads placed on various points of infrastructure by different types of user activity?

- What are the usage patterns and peak periods for the different usage types throughout the week?

- Which days would the platform see maximum utilization, and how much capacity would be needed to support this?

- Which days and times would offer the best windows to take systems down for maintenance?

1 Gartner. Key Research to Implement an IT Infrastructure Capacity and Performance Management Planning Process. November 18, 2015.

To collect, analyze, and model this data, we used TrueSight Capacity Optimization and followed our capacity management process.

1. To begin with, we discovered and mapped the service model for Skype in our configuration management database (CMDB). This model includes network, storage, and systems for a full picture of the business service.

2. We then collected the necessary business data, including numbers of users, active users, active conferences, and web hits from a .csv import or from IT data analytics.

3. Having grouped and merged this business and technical data, we then performed capacity modeling and forecasting.

This **exercise reveals patterns of usage that help IT make adjustments based on real-world loads.** For example, an IT team might find that some groups make extensive use of Microsoft® PowerPoint®, while others rely heavily on Microsoft® Windows® sharing, placing different demands on different servers. This cycle of data gathering, analysis, and adjustment helps ensure that each service is provided with adequate capacity to perform as needed.

In the case of our Skype for Business implementation, IT needed to know the correlation between the business metric, number of users, and the IT metric, the number of active conferences, and the impact of this correlation on call quality and network and storage latency (Figure 1).

Systems ↓	Business Drivers →		hou-lorem-01.ipsum.bmc.com
			Events by Set
			ACTIVE CONFERENCES
hou-lorem-01	CPU Run Queue Length	GLOBAL	23% (Low)
	CPU Utilization %	GLOBAL	1% (Low)
	Disk IO Rate	GLOBAL	33% (Medium)
	Disk Utilization %	GLOBAL	-0% (Low)
	Free Memory	GLOBAL	-42% (Medium)
	Memory Swap Out Byte Rate	GLOBAL	NA
	Memory Utilization %	GLOBAL	42% (Medium)
	Network Interface Bit Rate	GLOBAL	29% (Low)

Figure 1: Finding the correlation between active conferences and call quality and latency
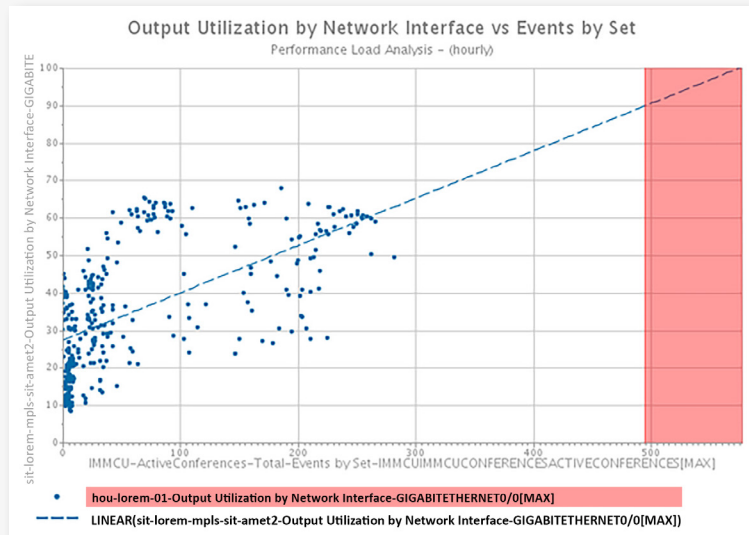
Using TrueSight Capacity Optimization and following our capacity management process, we determined that the highest correlation between active conferences and system metrics—i.e., the bottleneck that would impact quality of service the most—is MPLS link utilization (Figure 2). This was an important discovery. Well-informed WAN link planning is crucial since we cannot upgrade links without giving at least 90 days' notice to our telecommunications vendors.

Systems ↓	Business Drivers →		IMMCU-ActiveConferences-Total
			Events by Set
			ACTIVE CONFERENCES
sit-lorem-mpls-sit-amet2	Input Utilization by Network Interface	GIGABITETHERNET0/0	22% (Low)
	Output Utilization by Network Interface	GIGABITETHERNET0/0	61% (Medium)

Figure 2: CPU, memory, queue length, network, and disk metrics were studied. The only significant correlation found was between Network Output Utilization and Active Conferences.

Pursuing this lead, we aligned our weakest WAN link against the number of active conferences to see how we were trending and where we would hit saturation. We determined that we could handle 494 active conferences on the weakest WAN link (Figure 3). Beyond this point, we would reach saturation, incurring significantly higher vendor fees and worse, preventing users from holding conference calls with business partners, customers, and coworkers. Based on this finding, we requested an increase in bandwidth to ensure that the WAN link would not saturate, eliminating potential costs and service degradation or outages.

Figure 3: Identifying the saturation point for our weakest MPLS link.

Measurable results

Our use of TrueSight Capacity Optimization, along with a capacity management process for our Skype for Business implementation, resulted in **significant value for the business and our users**.

- We displaced voice and IP calls, conferencing minutes, and desktop sharing that averaged a rental rate of $6 million per year.
- The conversion of more than 200 voice conference users alone yielded **$25,000 in savings per month, $300,000 per year, and $1.5 million projected over five years**.
- IT converted and upgraded our one of BMC's largest sites, to Microsoft® Lync® and Enterprise Voice in a matter of just six weeks—notwithstanding India's strict telecom regulations.
- We brought true unified communications to BMC and its employees by offering a single, feature-rich platform for phone, voice and video conferencing, desktop sharing, web sharing, and chat.

The conversion of more than 200 voice conference users alone yielded $25,000 in savings per month, $300,000 per year, and $1.5 million projected over five years.

CAPACITY BY THE NUMBERS

The Skype for Business project illustrates the important role of capacity management at BMC and to our customers. Simply put, the business gives IT a business metric, and IT maps this to an IT metric to see where the bottleneck will be—based not just on the raw number of users, but their actual activity and the resulting resource consumption. We plan, then implement, then gather data on the resulting utilization, perform analysis, and further refine our IT infrastructure and capacity needs based on actual usage patterns and workloads.

Other groups at BMC are working with our capacity manager to support their own infrastructure planning to reduce costs while optimizing performance and availability. In one case, we determined which applications require high-performance Tier 1 storage with low latency, and which can be supported with less-costly storage. In another, we investigated a server that was dropping network packets. Using TrueSight Capacity Optimization as an aid for troubleshooting, we discovered that the issue was related to server performance, not capacity. We were able to quickly diagnose the problem and address it through the relevant vendor.

The extent of capacity management at BMC is considerable, encompassing 323 technical services in our CMDB. We import these technical services into TrueSight Capacity Optimization and merge them with system, storage, network, and business data to identify bottlenecks and what-if conditions. To date, we have explored 15 critical services in deep detail and are using out-of-the-box, on-demand reports to analyze the remaining services—all with one dedicated capacity planner using TrueSight Capacity Optimization.

In this manner, we can optimize IT infrastructure resources throughout our environment.

- **Networking** – We currently perform capacity management on 950 network switches and 90 WAN links using information about peak patterns in different countries to help keep cost in check.

- **Storage** – Understanding which groups use various storage resources and which storage resources faces a higher risk of overprovisioning is important for business continuity. High-end storage for business-critical applications (as well as the virtualization backend) is expensive due to performance requirements, making it important to keep a close eye on our forecast and usage using our prediction models.

- **Virtualization** – More than 27,000 virtual machines (VMs) are currently managed using TrueSight Capacity Optimization, which helps keep the environment from getting out of control by enforcing good housekeeping on idle VMs, overprovisioned or underutilized resources, and excess snapshots, and by forecasting saturation dates. In addition to reporting on all of these resources, the system provides information on the current trend in requests, which is currently 567 VMs per month. We also look at cost and risk based on under and overprovisioning memory, CPU, and storage.

- **Systems** – Our BMC Performance Assurance gateway server gives us a deep dive into process-level information. We use this data to help identify bottlenecks in software development or in a system housing a critical application. This is extremely helpful to our application team for both capacity planning and performance troubleshooting.

BMC TRUESIGHT: ADDRESSING MODERN CAPACITY

BMC TrueSight Capacity Optimization improves agility and accelerates digital business by streamlining capacity management. A flexible and scalable integration layer makes it possible to integrate virtually any source of performance, capacity, and configuration data, so that IT can holistically manage all types of infrastructure systems, across any technology domain   even when distributed across multiple data centers. Sophisticated analytics provide visibility into spare capacity, automatically predict potential saturations, and support what-if scenarios. Automatic integration with system-to-service mapping in a CMDB or a simple spreadsheet provides a service perspective. Integrated business KPIs such as transaction volume and number of concurrent users are correlated to resource utilization, so IT can easily perform what-if scenarios that answer questions about resource requirements to support a given level of user growth in a given time period.

TrueSight Capacity Optimization provides flexible and scalable integration

TrueSight Capacity Optimization makes it possible to integrate virtually any sources of

Performance   Capacity   Configuration data
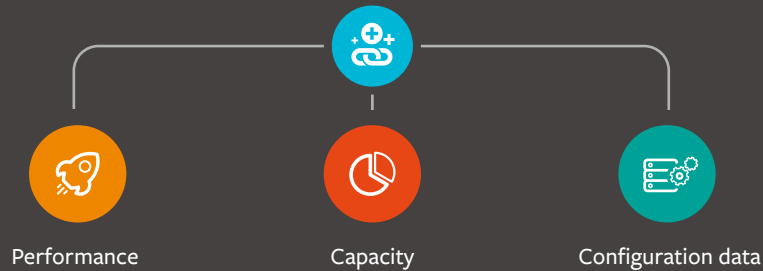
CONCLUSION

As shown by our implementation of Skype for Business, capacity management plays a valuable role in helping IT organizations support dynamic business needs and leverage innovation quickly and effectively, while controlling costs. Instead of relying on rough estimates and accepting the costs—both financial and operational—that result from over- and under-provisioning, **IT can identify the right level of IT infrastructure resources at the right time to ensure the desired level of service for every business entity.**

FOR MORE INFORMATION

To learn more about using BMC TrueSight Capacity Optimization to deliver the benefits of capacity management in your organization, please visit **bmc.com/capacity**

477310