

Capacity planning is a solution to maintaining business service quality and avoiding the consequences of downtime and brownouts.

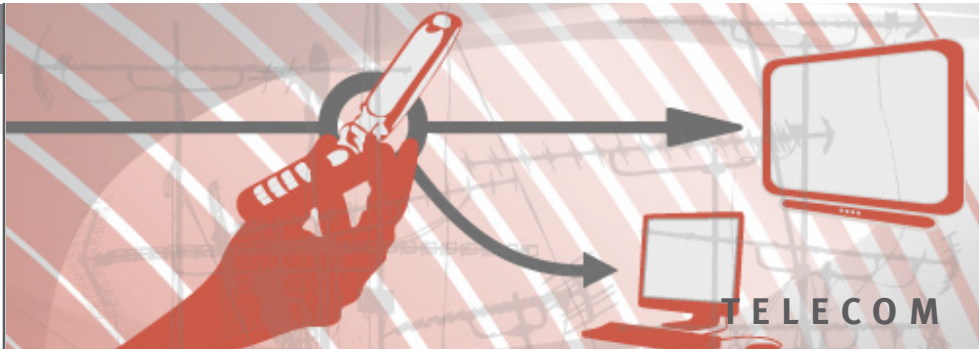
— “*The Capacity Planning Software Market,*”
Forrester

I modeled one of the servers and saw a very significant bottleneck. We were able to get that corrected the day before the conversion, and one director commented that TeamQuest paid for itself in that one instance.

— *Telecom Programmer*

TeamQuest software saved us \$4 million in one year by helping us better utilize existing infrastructure and avoiding unnecessary purchases.

— *Fortune 500 Telecom capacity manager*



itso

**Ensure Service Quality for
New Generation Communications Services**

Communications service providers are continually challenged with delivering services that add value and meet consumer expectations. New generation services such as VoIP, IPTV and Mobile TV are based on complex technologies which depend on an ecosystem of content providers, broadband delivery networks, data center server technologies, operations support system (OSS) and consumer devices for business, home and mobile use.

While all of these ecosystem elements are mission critical to ensure end-to-end service quality, it all starts by ensuring service availability in the data center and/or the headend. Many new generation services, such as IPTV and Mobile TV, are based on media content delivery. This programming content is likely housed in the data center. It is important to have world class IP networks architected with broadband throughput, prioritized Quality of Service (QoS), security, and fail-safe reliability.

TeamQuest understands it is equally important to optimize the operations of the data center to ensure service availability of service delivery systems and OSS platforms.

These new generation service delivery platforms are designed with server-based technologies such as Service Oriented Architecture (SOA) and IP Multimedia Subsystem (IMS). Service providers must optimize these server infrastructures in the data center to support the demands of rapid subscriber adoption and extreme transaction processing. This means being able to measure server utilization in detail to make the best possible use of every processor cycle.

SOA and IMS are multi-tiered software architectures and are most-likely highly distributed across banks of servers and geographic boundaries with clustered, high-availability server implementations. The purpose is to produce flexible, scalable, and rapid service creation architectures.

Service providers must continually focus on meeting service level thresholds for data center systems. These thresholds may be formal or implied service level agreements (SLAs). The ability to anticipate and isolate problems within the IT infrastructure is mission critical to ensure full compliance.

Manage Performance

In order to exceed service level thresholds, service providers must effectively manage performance. In fact, performance management is key to providing customers with compelling quality of experience (QoE).

World-wide Telecom Customers

Belgacom
Bell Canada
Bell Mobility
CenturyTel
China Telecom-Guangzhou
Deutsche Telekom (T-Systems)
Ericsson AB
GrameenPhone
GuangDong Mobile
Hainan Mobile
KTF
Orange France
Polska Telefonia
SingTel
SK Telecom
Sprint Nextel
StarHub
Syniverse Technologies
Telefonica España
Time Warner Cable
T-Mobile (T-Systems)
Uraltel
Virgin Mobile USA
Verisign
Verizon Wireless
Vodafone Group
Vodafone Omnitel

Service providers face two main analysis activities around performance management — reactive and proactive.

Reactive analysis occurs after an adverse event and includes activities such as:

- Correlating performance data to locate the IT component that is the root cause
- Drilling down from an anomalous point on a performance graph to determine who or what is responsible
- Visually comparing current performance with past performance in an effort to understand the cause of an event

Proactive analysis prevents disruptive events, ensures a smooth-running data center, and eliminates time spent fighting performance fires. Some of the activities include:

- Identifying trends and cycles in system performance and projecting future performance levels as compared to service levels specified in the service definition
- Analyzing trends to determine how best to ensure that service levels will be met in the future
- Predictive performance modeling based on queuing theory analysis

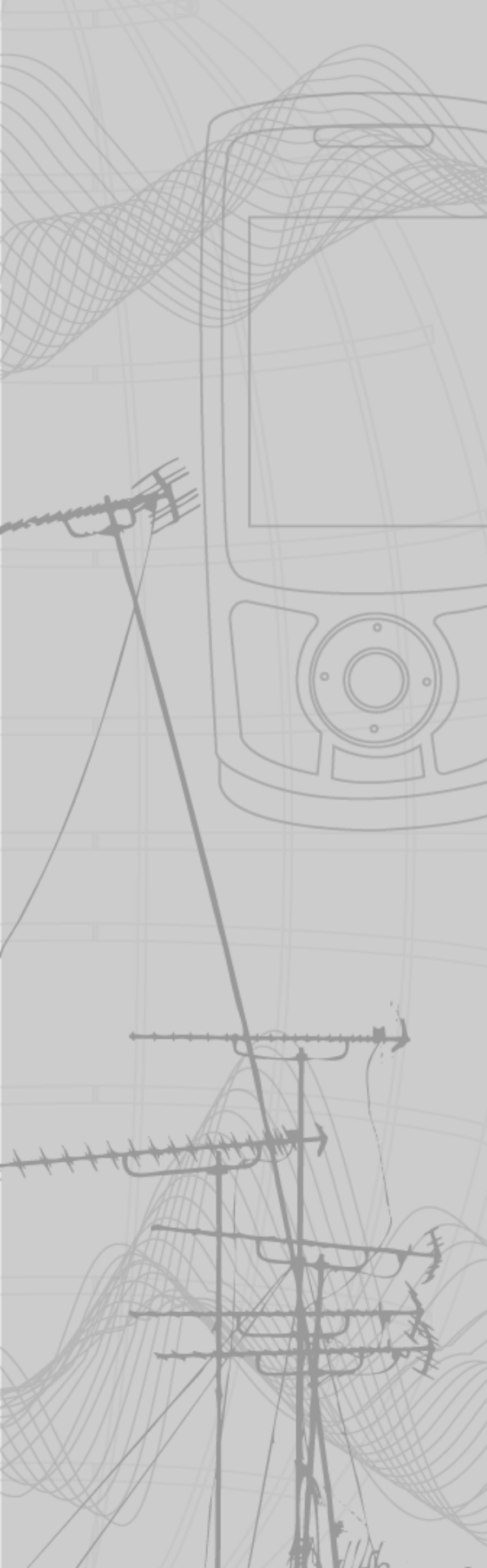
Proactive analysis starts in the application development environment. Developers should consider capacity management early in the development process due to the plug-and-play nature of IMS and SOA. Because of the inherent interoperability of the service components, more exhaustive application testing is required to ensure application performance. TeamQuest's ability to accurately model multi-tiered services gives developers the ability to predict system-wide service performance and possible infrastructure bottlenecks early in the design process.

Larger, more comprehensive pre-production testing environments would normally be required to test all services sharing common IT resources because of increased interoperability. TeamQuest's analytical modeling solutions help minimize the costs of the lab testing infrastructure by predicting application performance based on results produced in smaller, controlled testing environment.

Manage Growth

Rapidly implemented plug-and-play service applications are of little use if the infrastructure cannot react to subscriber growth just as quickly.

New generation services become complex, multi-tiered applications as they are implemented and layered into the data center environment. Of course, the service provider's objective is to sell more services and build a rapidly growing customer base.



By realizing that objective, the operator is faced with another challenge... properly sizing the operating infrastructure in the face of demand acceleration. Carriers have to worry about both the network capacity and data center capacity to support the service mix and demand growth. That's where TeamQuest comes in.

TeamQuest Performance Software delivers mission critical value across the spectrum of the new generation architecture. TeamQuest software provides the data and analysis tools that operators need to deliver the service quality necessary to attract and retain rapid subscriber adoption.

The data and analysis tools provided by TeamQuest software enable the operator to realize that new generation environments will deliver the service quality necessary to attract and retain rapid subscriber adoption.

Support Consistent Service Delivery

Multi-tiered application modeling can be challenging. The output of one tier of servers or applications becomes the input to the next tier or application, creating inter-dependencies that must be accounted for in the modeling process. Any changes in service usage or system configuration of one tier will have an impact on additional tiers in the system.

The key benefit to modeling multi-tiered systems is the ability to pinpoint at what tier or subsystem in the architecture future contention will occur based on changing workloads and/or system configurations. Modeling can also isolate the functional components of the infrastructure that will become the bottleneck, such as CPU utilization, Disk I/O usage, controller, disk space, TCP/IP, etc. With this ability to see the future, the service provider knows for sure that service availability and subscriber QoE are maximized.

In data center production operations, it is easier to predict application performance because of the modular nature of SOA and IMS. While you have fewer components to manage, service delivery risks are greater due to component sharing. If one service component fails to perform as required, the impact is magnified. In many cases, service components from existing 'application inventory' will be used to build the production service. Capacity management personnel can then use existing performance data and TeamQuest Model to accurately predict the impacts of accelerating subscriber usage across the entire data center infrastructure.

Because of the highly integrated and shared environment, the management reporting scope needs to expand significantly. Capacity planners need to look across service components and consider enterprise-level IT resources for their performance analysis and capacity reporting needs. Again, the ability to model multi-tiered applications becomes mission critical for the service provider to deliver consistently compelling QoE to the subscriber.

Why TeamQuest

TeamQuest Performance Software is a way to align service performance with business expectations. Our users maintain business service quality and avoid the consequences of downtime and brownouts.

New generation technologies like SOA and IMS require more capacity management involvement earlier in the service implementation process when designing and scaling the IT infrastructure to support various and multiplying service types.

TeamQuest specializes in helping carriers and operators plan ahead and build on IT infrastructure that ensures service availability during rapid subscriber adoption.

TeamQuest provides IT Service Optimization solutions to help communications service providers stay ahead of the wave of demand and ensure optimal service availability for new generation communications infrastructures. TeamQuest provides the data and analysis tools to realize complete confidence that these new generation environments will deliver the service quality necessary to attract and retain rapid subscriber adoption.

Communications service providers must accurately predict IT service performance and determine optimal configurations to assure availability and minimize cost while meeting demand. TeamQuest can help.

