

Optimize IT Services with a Capacity Management Information System (CMIS)

A good Capacity Management Information System (CMIS), combined with proven Capacity Management processes, can help you simplify IT Service Optimization; keeping your systems and applications running efficiently and reliably. Done right, a CMIS can help reduce the time spent fixing performance problems, freeing up time for more fruitful work such as initiatives that improve service and increase business productivity.

This paper will explain what a CMIS is and how it provides a valuable foundation for performance and capacity management tools.



About the Author

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What is a CMIS?

A Capacity Management Information System or CMIS is a collection of IT infrastructure usage, capacity and performance information that has been gathered in a consistent manner and stored in one or more databases. It is the single book of record for all usage, capacity, and performance data, complete with associated business, application and service statistics. Any IT staffer needing access to capacity management data can potentially use a CMIS.

IT service management processes frequently accessing CMIS data are:

- Capacity planning
- Performance management
- Service level management
- Help/Service desk
- Incident management
- Problem management
- Configuration management

The CMIS concept is new with ITIL Version 3. In earlier ITIL versions, the Capacity Management Database (CDB) was the central data store but ITIL proponents realized that it fell short of what was needed to take Capacity Management to the next level. The CDB was a collection of data, but there were no standards regarding collection and archival nor integration between the different technologies. Different collection periods resulted in different capacity or performance numbers being communicated by different departments. Longer collection and reporting time frames smoothed the peaks, so the conflicting information confused management and made the accuracy of departmental statistics suspect. By devising the CMIS, all data is synchronized from a collection period perspective. It is scrubbed to ensure it is consistent and accurate. Analysis and reporting is consistent so management sees similar statistics, fostering confidence in the reports.

Version 3 Capacity Management processes have new steps to ensure the accuracy and integrity of the data. While updating the processes, ITIL Version 3 also expands the breadth and scope of information stored, which now includes such additional items as business forecasts and metrics.

Example CMIS Contents

Business performance data

- Business transaction metrics
- Application transaction counts
- Invoices generated

IT service performance data

- Transaction response times
- Transaction rates
- Workload volumes

Financial data

- Infrastructure upgrade costs
- Power & cooling costs
- IT budget information

Component utilization data

- Server performance metrics
- Network performance
- Data storage measurements
- Memory usage

The technological value of a CMIS

Probably the most important aspect of a CMIS is that it is the single book of record for all capacity and performance related information for IT infrastructure components. Instead of disparate platform-specific tools keeping inconsistent data in isolated silos, every environment being measured and analyzed has all of its metrics stored in one place. You always know where to find the performance data you need.

All data points in a CMIS are synchronized to the same time frames. Automatic processes ensure data integrity and accuracy. Because of the care given to the data, everyone reporting on a certain period of time should arrive at the same answer every time. Predictable results foster confidence in the work.

A CMIS provides a hub or integration point where a single set of analysis and reporting tools can be used by everyone involved with the capacity management process. This creates the possibility for tools that are technology agnostic—the same tools can be used independent of the type of infrastructure being analyzed or reported upon. For example, performance data regarding Windows, Unix, and Linux can all be coexistent and analyzed together using one set of tools accessing one CMIS. This means that performance analysts and capacity planners need learn just one set of analysis and reporting tools for use across the enterprise.

The business value of a CMIS

More precise, comprehensive IT infrastructure usage and performance information will lead to fewer mistakes, lower costs and better informed business decisions. Capacity plans based on accurate and reliable data will result in fewer surprises and less firefighting later. Because it provides better accuracy and consistency of data, a CMIS is useful for spotting operational inefficiencies and discerning the right corrective action when needed. This all leads to better use of expensive assets and saves precious time.

CMIS Business Value

- Increased accuracy for better business decisions
- Business-aligned capacity management
- Accurate chargeback and cost allocation
- Increased performance and availability
- Reduced personnel and training requirements
- Improved IT efficiency!

A good CMIS is able to analyze IT resource usage in business terms, facilitating an analysis that takes into account the resources consumed by IT or business services. Doing so helps IT and business management understand costs and business impact associated with a particular IT or business service. This can facilitate capacity planning that better optimizes IT for business results. The information can also help leaders understand where future bottlenecks in their business processes will occur, giving them precious time to make corrections before the business is impacted.

Charging business units for their actual usage of computing resources is just another way to ensure IT services are wisely used. With usage data broken down by IT or business service, business unit, or other business-relevant terms of your choice, CMIS data can feed your chargeback application. Since the data has been validated and screened, the business units can be assured that the allocation is accurate and equitable.

A CMIS can reduce down time, minimize bottlenecks, and increase availability. When failures occur, a CMIS can enable all involved support teams to look at the same accurate data with the same tools. Since the data can be analyzed in business-relevant terms, the support teams can more quickly understand impacts to the various parts of the business. This permits them to better determine priorities and solutions to minimize impact to the business while more quickly restoring mission-critical IT services. Important business services are more quickly restored, improving service availability.

Technology agnostic analysis and reporting tools deliver a common look-and-feel across technologies. Having a single tool reduces training costs, permits management to leverage fewer Capacity Management technicians across many different technologies. A highly functional CMIS facilitates analysis among and between support groups, speeds capacity planning tasks and permits rapid development of reports. Since reports of similar metrics have the same format independent of infrastructure components, leaders no longer have to struggle with how the information is presented so can focus all their attention what the content means to them.

What should I look for in a CMIS?

It is critical to pick out the best CMIS for maximizing the efficiency and performance of IT services. Some of the most important characteristics to look for when shopping for a CMIS are:

- Openness** The goal is for your CMIS to become the central hub for all performance-related data. To fulfill that goal, a good CMIS needs to make it easy to get information in and out. You want comprehensive performance data regarding your infrastructure going in, and efficient access to that data for analysis and reporting purposes.
- Data collectors use the CMIS to store information.
 - Performance and other systems management tools use it to access data and share analysis results.

It should be possible to effectively instrument all of your critical applications, including custom applications. You want to be able to implement custom analysis and reports. The CMIS should facilitate information sharing with Configuration Management Databases (CMDBs), chargeback applications and other tools. A CMIS should be able to alert event consoles and Service Desk tools when adverse events are detected.

- Business-relevant views** A CMIS should let tools analyze and report on enterprise IT infrastructure from a component view, an IT service-based view, or a business process view. These views allow you to relate operational and planning results at many different levels. Business process and IT service views can help facilitate business-aligned analysis and reporting. Component views are useful for problem solving and technology-specific detailed planning.
- Real-time data** Historical data is important, but don't forget that you also need real-time views as well. Your ability to detect and respond to performance bottlenecks will be hampered if your CMIS is unable to collect and deliver performance data in real-time.
- Heterogeneous coverage** Most data centers use multiple technology platforms to deliver services. One of the big advantages of a CMIS is being able to manage the performance and capacity of all those platforms from a single repository. So be sure that your CMIS can handle data from the key platforms in use within your data centers.
- Automation** There are many mundane tasks need to be accomplished to configure a CMIS, manage the data, and keep CMIS software current. Many of these tasks are excellent candidates for automation. Good CMIS offerings have built-in automation to handle most of the repetitive tasks and provide interfaces where you can automate other related tasks that are specific to your organization's needs.
- Scalability** It is important for a CMIS to have the ability to scale up or down to meet the growth needs of your organization. If you have thousands of systems in your datacenter, check to be certain that the CMIS you are considering has been successfully deployed on that scale. If your CMIS can't scale, you could end up in a situation where you can only analyze and report on portions of your enterprise and not be able to get a true enterprise-wide view.
- Efficiency** A tool is of limited use if it uses more computing resources than the problems you are analyzing. The best CMIS tools minimize their use of computing resources, networking bandwidth, and require less data storage to perform their work. When comparing CMIS options, be sure to compare computing, networking, and data storage needs as these can be hidden costs you may not anticipate.

- Security** Without robust security within a CMIS, data integrity cannot be guaranteed. Security prevents unauthorized changes or deletion of historical data. It also permits you to restrict access to proprietary data stored in the CMIS, such as business plans, where need-to-know access is mandatory to preserve competitive advantage.
- Support** Your CMIS is a key element in your IT service optimization toolkit, so you will want to be certain that there is a capable support team available to assist you with implementation and ongoing maintenance of your CMIS.

Tips for implementing your CMIS

Once a CMIS is selected, implementation follows. As with any new technology or procedure, you start with little prior knowledge or experience to guide you through an initial implementation. After working together with many enterprise IT professionals and seeing how they have implemented and maintained their CMIS, we have collated a collection of tips and best practices to help you on your way.

Before you start collecting, decide what data to keep and for how long.

The amount of data coming from infrastructure components can be huge if you collect everything. Collect only what you think you need. Only keep very detailed data for the minimum amount of time needed to investigate problems. Remember, if you selected a highly flexible CMIS, it will be easy to add statistics later.

Synchronize data capture.

As you review data capture across the infrastructure components, synchronize your capture periods to the same collection interval. Doing so will permit you to more easily track end-to-end usage across the various application and system tiers within your infrastructure.

Set up maintenance processes.

The work is not over once a CMIS is installed and operational. It still needs to be maintained. Automation will reduce the work but even automation needs to be monitored to ensure it is operating as designed. Maintenance processes should be put in place soon after the CMIS is put into production. The processes should identify roles and responsibilities for the support staff and day-to-day tasks such as upgrade and break-fix schedules, license management procedures, backup and recovery plans, and data import/export schedules.

Automate, automate, automate.

The more work you can set up to run automatically, the more time your people have to do important analysis and reporting work. Data maintenance and regularly scheduled reports are probably the easiest pieces of work to automate. The earlier you automate work processes, the easier it is to accomplish. Once a sub-optimal process has been in place and operating for several years, interdependencies can develop with entrenched processes making it extremely difficult to make improvements.

Establish security rules and processes.

Security rules and procedures can be important to maintaining data integrity and confidentiality for the CMIS. Since a wide range of proprietary data including business data is stored in the CMIS, access should be restricted. In addition, the integrity of the data contained in the CMIS can only be ensured by preventing unauthorized changes. Therefore you need to understand security needs and develop the rules, policies and procedures needed to protect data and access before the CMIS is widely available to your IT community.

Start small and then expand.

Don't try to attack the entire infrastructure at once. In almost all cases, the amount of work will be insurmountable. Pick out one or two significant infrastructure components to start; maybe a few servers supporting one or two mission-critical applications or services. Once the data is being gathered, reported upon, and you have confidence in the results, build on your successes and add more infrastructure components to the CMIS.

Configure the CMIS for business-relevant analysis.

By configuring your CMIS to track how much of each infrastructure component is being consumed by each service, you can track usage during the life of a transaction. Armed with end-to-end views of performance, support personnel can quickly locate the cause of bottlenecks and outages, permitting improved service quality and reliability. Reporting can be customized to focus on specific transactions and services. This allows you to tailor information to a specific business unit or department; giving each of them concise information that only applies to them. You can also use this information for chargeback applications to equitably allocate the cost of computing to the departments using the services.

The ability to configure your CMIS to analyze the utilizations resulting from each business service will allow you to develop reports that are more meaningful to business leaders and help you express results in business terms instead of technology terms. Because the information is organized by business process, costs can be broken out along those same lines, permitting you to reveal the actual IT costs of specific business transactions. Business leaders will better understand IT costs, and conversations about increasing capacities and capabilities will be transformed from ones of expense to those of investment.

Implement analysis and reporting tools.

Having data stored in a database is of little use if you don't convert it to usable information and communicate the results. Early in your CMIS implementation process you should configure your chosen analysis and reporting tools and publish needed reports. As examples, you might configure reports showing actual service results against Service Level Agreements or the capacity positions of all infrastructure components supporting a particular business process.

Share information across the enterprise.

The intrinsic value of a CMIS is that it is single source of information that can be used by anyone in the enterprise. Using tools that all get their data from one CMIS ensures that the same results will be obtained no matter who runs a report against the same data with the same parameters. Therefore once your CMIS is stable, its use should be promoted across the IT community and training provided.

Overview of TeamQuest offerings

Although ITIL first defined the concept of a CMIS in 2007, we at TeamQuest identified the need for such a capability much earlier. As a result, although we weren't yet calling it a CMIS, TeamQuest customers have been enjoying the benefits of a wide range of CMIS functions since 1993. The TeamQuest CMIS is built into products in TeamQuest Performance Software, a tightly integrated suite of tools for IT service optimization.

TeamQuest Performance Software

TeamQuest Alert	Problem detection & alarming
TeamQuest IT Service Analyzer	Problem analysis
TeamQuest IT Service Reporter	Management reporting
TeamQuest Model	Capacity planning

A software component in the suite called TeamQuest Manager is responsible for managing the data in the TeamQuest CMIS. TeamQuest Manager is not sold as a separate product. It is provided together with various products in the TeamQuest Performance Software suite.

The TeamQuest Manager-implemented CMIS uses a distributed approach, allowing you to store detailed data close to the source for shorter retention periods while summarizing data centrally. It provides seamless access to data, regardless of where it is stored, meaning that you have all the detail you need for troubleshooting, without placing undue burdens on your network infrastructure. Performance data is synchronized to identical time frames and collection durations. Additionally, there are capabilities for tracking resource utilization by business or IT service and for collecting business data to allow for more business-relevant reporting. The same CMIS and the same analysis and reporting tools can be used across diverse platforms.

The TeamQuest suite, together with the TeamQuest CMIS, allows you to standardize on one tool set and integrate data from various technology silos, providing a single point of reference for information regarding every platform type. A single suite analyzing consistent data and implementing standardized capacity management processes creates a strategic advantage, potentially helping you to replace wasteful chaos with optimized order.

Key attributes of the TeamQuest CMIS

Openness

TeamQuest provides a wide array of methods for getting data in and out of our CMIS. As one method for getting crucial data in, we provide efficient, detailed, and accurate data collectors for many popular platforms including:

- AIX & PowerVM, HP-UX, VMware, Linux, Solaris
- Web servers
- DB2, SQL Server, Sybase ASE, Oracle
- Microsoft Exchange Server
- EMC Symmetrix

Several of these collectors allow remote “agentless” collection. Most of these collection capabilities are provided with TeamQuest products at no additional charge. You also get the ability to collect network data including response time measurements.

Additional data can be easily collected into the TeamQuest CMIS using what is called a user agent. You can easily develop agents that meet your individual needs. TeamQuest customers use them for a wide range of reasons, especially for incorporation application and business statistics. Common uses of user agents include gathering business metrics, transaction counts, power consumption data, and custom application measurements.

The TeamQuest CMIS Getting Data In & Out

- Collect from many popular platforms
- Create additional collectors for almost anything
- Use powerful reporting & analysis tools
- Exchange relationship data with xml
- Write custom reports on an Oracle Enterprise Database
- Send TeamQuest alarms to your event console

To facilitate business-relevant analysis and reporting, the TeamQuest CMIS allows you to describe relationships between components and IT or business services. These relationships (called “IT Resources” within TeamQuest Software) can be brought in from third party discovery tools or from a Configuration Management Database (CMDB) via an xml interface. It’s also possible to export relationships via xml to third party tools, such as a CMDB.

Another method that the TeamQuest CMIS has for getting information out to other tools is via SNMP traps. This is a common mechanism used for notifying third party event consoles when a tool notices a problem or an impending problem. The TeamQuest suite also includes TeamQuest Alert, a tool for natively displaying event notifications from the CMIS.

Besides getting information from the CMIS about exceptional events, you also need to be able to extract information for planning, problem solving, and reporting. The TeamQuest Performance Software suite augments our CMIS with powerful real-time and historical analysis and reporting functions (TeamQuest IT Service Analyzer and Reporter) as well as a fast and accurate capacity planning tool (TeamQuest Model). Of course you also get the obligatory text export functions for moving data out of the CMIS and into third party or custom tools, but you also have the ability to configure our CMIS to store key data in what we call an Oracle Enterprise Database. When Oracle is used in this way to store selected, summarized, and aggregated data, it opens your CMIS for access by a vast array of third party or custom reporting tools.

Business-relevant views

Using “IT Resource” definitions in a TeamQuest CMIS you can conduct a combined performance analysis and reporting of multiple, related IT components. By merging performance data from component utilizations that correspond to a particular IT service, performance can be examined and optimized in business terms.

IT Resources can be used to analyze performance across whatever technology silos that may exist in your data centers. It is possible to drill down from ailing IT or business services to the actual hardware or software components involved in providing a particular service, regardless of where the performance data for those components may reside. In this way, IT Resources provide for an enterprise-wide drill down capability, crossing technology silos or even data centers.

Another capability for business or IT service analysis is accomplished with a TeamQuest CMIS using “workload definitions.” The TeamQuest CMIS uses workload definitions to determine what portion of a system is being utilized by each business or IT service. This makes it possible to analyze and report on how much of a shared server’s resources are utilized by a particular business unit, for example.

Workload definitions used in combination with IT Resources make it possible to subdivide and/or combine performance data to allow true enterprise-class IT service analysis and reporting.

Real-time and historical data

Of course the TeamQuest CMIS provides historical performance data that is crucial for analysis and planning. That’s a given. But it also provides real-time information. The TeamQuest CMIS even allows for the business-relevant views described in the previous section... in real time.

Heterogeneous coverage

In order for a CMIS to fulfill its purpose as the single book of record for all performance data in the data center, it needs multi-vendor coverage. The TeamQuest CMIS not only facilitates storage and analysis of data from heterogeneous platforms, it comes with data collectors for a wide variety of operating systems, middleware, and databases. What isn’t covered by the built-in collectors, can potentially be handled with a little work and a TeamQuest user agent.

Automation

The TeamQuest CMIS keeps track of the relationships between components and IT or business services using “IT Resources.” In dynamic environments these relationships are created, deleted, or altered automatically as changes to the underlying infrastructure occur. This makes it possible, for example, to analyze all of the virtual machines that were running on a particular physical server at any given time, because each of the virtual machines were related to their physical server in the CMIS using an IT Resource.

IT Resources provide another type of automation as well. They are used by the TeamQuest CMIS during an enterprise drill down to get from higher level data that you might find in a management dashboard report to the underlying details. The real power of this sort of drill down is that it occurs without regard to the location of the data being accessed. The summarized information for the management dashboard is likely stored in a central data store while the underlying details are kept closer to the source, distributed throughout the datacenter. Keeping the details close to the source for shorter durations greatly decreases the impact on your network that would otherwise be required to centralize detailed data.

Administration of the distributed TeamQuest CMIS is accomplished largely through the use of policies. Many configuration aspects for the various nodes that comprise the TeamQuest CMIS can be developed as policies in a centralized place and then automatically propagated out to servers on a schedule that meets your needs. In addition, fixes and upgrades to the CMIS software can be applied through another built-in facility. All updates and configuration changes are applied in accordance with your processes and schedules.

Scalability

TeamQuest exists for the purpose of helping with IT service optimization of hundreds or thousands of servers, so the TeamQuest CMIS was designed for scalability. That's why the CMIS uses a distributed storage model. The distributed model allows for very comprehensive data to be kept for shorter durations without negatively impacting your network infrastructure.

The policy-based administration functions described in the previous section also contribute to the practicality of using a TeamQuest CMIS in larger data centers.

Efficiency

The TeamQuest CMIS allows people to keep fine-grained details close to the source and only centralize selected, summarized and aggregated data. Your performance data can be distributed to minimize impact on your infrastructure, but the CMIS still gets you right to the details you need automatically, without regard to where they are stored. We get you to those details without forcing the centralization of large amounts of data.

TeamQuest data collectors provide comprehensive data with a negligible impact on the infrastructure being measured. In some cases, agentless data collection is an available option.

Security

Access to data in the TeamQuest CMIS is only allowed after proper login credentials have been provided by the application making a request. Communication between some TeamQuest software components can be encrypted using SSL.

Support

TeamQuest is known for providing very personalized support. Because TeamQuest specializes in IT service optimization, the company has the expertise needed to help you through whatever capacity or performance challenges you may face.

At TeamQuest you know that your maintenance dollars are being invested in software improvements. Each year TeamQuest typically provides two or three software updates with new fixes and new features.

Implementation time

Compared to less specialized tools, TeamQuest is much faster and simpler to implement in your data center. Depending on the circumstances, an initial setup for a hundred servers can be accomplished in as little as a couple weeks.

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