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1. PURPOSE. The purpose of the Enterprise Information Technology Service Management (ITSM) Capacity Management Process Guide is to establish a documented and clear foundation for process implementation and execution across the Marine Corps Enterprise Network (MCEN). Process implementation and execution at lower levels (e.g., Regional, Local and Programs of Record) must align and adhere to directives and schema documented within this guide. The use of this guide enables USMC Information Technology (IT) activities through promoting standardization of work instructions and operating procedures across a continuum of document specificity.

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3. AUTHORITY. The information promulgated in this publication is based upon policy and guidance contained in reference (a).

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b. Waivers. Waivers to the provisions of this publication will be authorized by the Director, Command, Control, Communications and Computers.

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Capacity Management
Process Guide

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1.0 INTRODUCTION

1.1 Purpose

The purpose of this process guide is to establish a documented and clear foundation for process implementation and execution across the Marine Corps Enterprise Network (MCEN). Process implementation and execution at lower levels (e.g., Regional, Local, and Programs of Record) must align and adhere to directives and schema documented within this guide. The use of this guide enables USMC IT activities through promoting standardization of work instructions and operating procedures across a continuum of document specificity as represented in Figure 1-1.

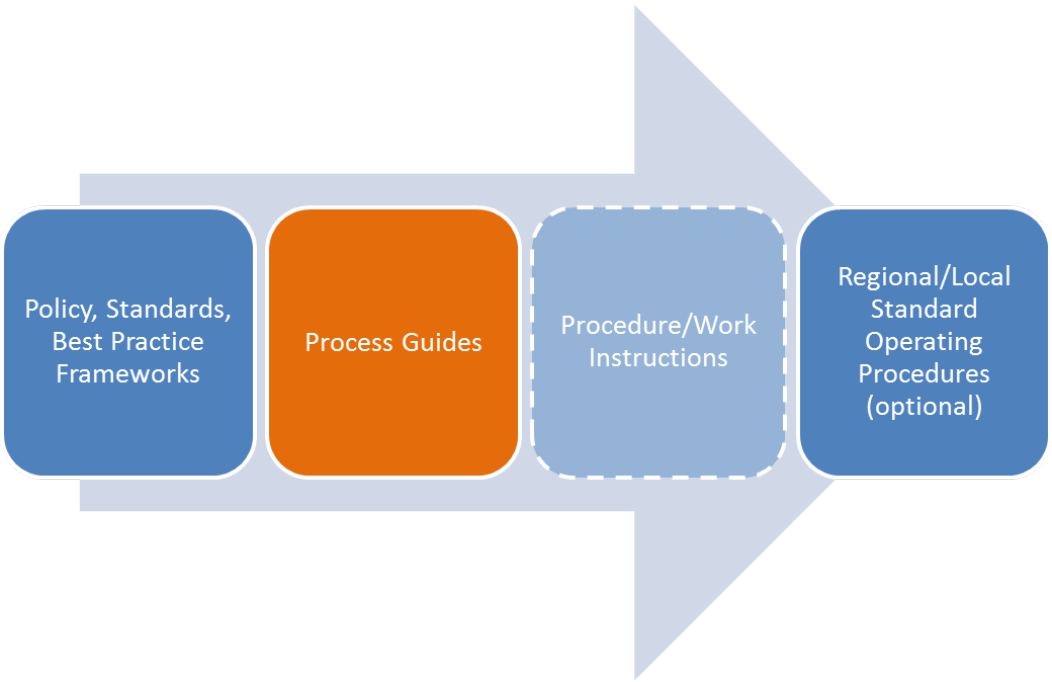

Figure 1-1. Process Document Continuum

1.2 Scope

The scope of this document covers all services provided in support of the MCEN for both the Secret Internet Protocol Router Network (SIPRNET), and the Non-Secure Internet Protocol Router Network (NIPRNET). Information remains relevant for the global operations and defense of the Marine Corps Enterprise Network (MCEN) as managed by Marine Corps Network Operations and Security Center (MCNOSC) including all Regional Network Operations and Security Centers (RNOSC) and Marine Air Ground Task Force Information Technology Support Center (MITSC) assets and supported Marine Expeditionary Forces (MEF), Supporting Establishments (SE) organizations, and Marine Corps Installation (MCI) commands.

Table 1-1 depicts the various layers of document design. Each layer has discrete entities, each with their own specific authority when it comes to promulgating documentation. This enterprise process operates at Level B, sub processes such as procedures and work instructions are not included within the scope of this document.

Table 1-1. Document Design Layers

	ENTITIES	DOCUMENTS GENERATED
LEVEL A	Federal Govt DoD DoN CMC/HQMC	Statutes/Laws DoD Issuances DoN Policies Marine Corps Orders/IRMS
LEVEL B	HQMC C4 MCNOSC MCSC	MCOs IRMs (Process Guides) Directives MARADMINS
LEVEL C	RNOSC MITSC	Regional Procedures Work Instructions
LEVEL D	MCBs POSTS STATIONS	Locally Generated SOP's

1.3 Process and Document Control

This document will be reviewed semi-annually for accuracy by the Process Owner with designated team members. Questions pertaining to the conduct of the process should be directed to the Process Owner. Suggested Changes to the process should be directed to USMC C4 CP in accordance with MCO 5271.1 Information Resource Management (IRM) Standards and Guidelines Program.

2.0 PROCESS OVERVIEW

2.1 Purpose, Goals, and Objectives

The purpose of the Capacity Management process is to ensure that the capacity of IT services and the IT infrastructure is able to deliver the agreed capacity and performance related service level targets in a cost effective and timely manner. Capacity Management considers the appropriate resources required to deliver IT Services, and plans for short, medium and long term USMC mission and business requirements. Capacity Management provides a point of focus and management for all capacity and performance related issues, relating to services and resources.

The primary goal of Capacity Management is to ensure that cost justifiable IT capacity in all areas of IT exists and matches the current and future agreed needs of the USMC, in a timely manner.

The objectives of Capacity Management include:

- Produce and maintain a Capacity Plan that reflects current and future needs of the mission and business of the United States Marine Corps
- Provide advice and guidance to other ITSM areas of the USMC on all capacity and performance related issues.
- Ensure service performance meets or exceeds agreed performance targets by managing performance and capacity of services and resources.
- Assist with diagnosis and resolution of performance and capacity related incidents and problems.
- Assess the impact of all changes on the Capacity Plan, and the performance and capacity of all services and resources.
- Ensure proactive measures to improve performance of services are implemented when cost-justifiable to do so.

2.2 Relationships with Other Processes

Many of the E-ITSM processes are interrelated. While any one of the E-ITSM processes can operate in the presence of an immature process, the efficiency and effectiveness of each is greatly enhanced by the maturity and integration of all E-ITSM processes. Figure 2-1 depicts key relationships and dependencies that exist between the Capacity Management process and current E-ITSM processes. These processes underpin the USMC near-term objectives. Note, this figure is not all-encompassing and the relationships shown can be direct or indirect.

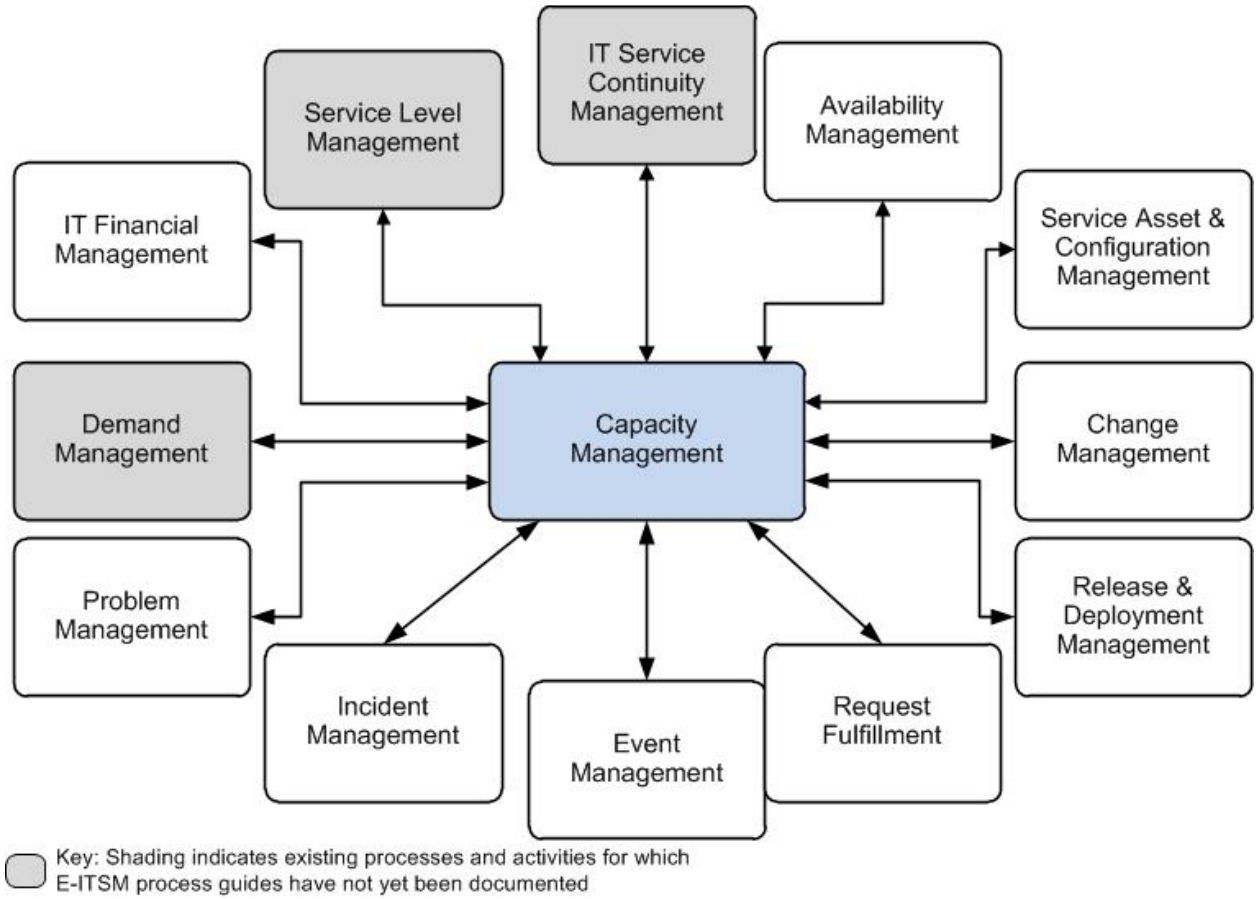

Figure 2-1. Capacity Management Relationships with Other Processes

The following list describes key inputs/outputs regarding the relationships between the Capacity Management process and the other E-ITSM processes as illustrated in Figure 2-1.

IT Financial Management

- Financial Plan: Financial Management provides IT budget with cost estimates and spending plan used for acquisition of infrastructure to Capacity Management. It contains the time phased cost estimates and spending plan for all expenditures, including the schedule and expected costs of IT asset acquisitions and operating costs.
- Capacity Plan: Capacity Management provides the Capacity Plan to Financial Management, identifying predicted workload, users, and capacity.
- Acquisition and Implementation Plan: Capacity Management provides to Financial Management for acceptance and approval. This plan includes justification for expenditures.

Demand Management (when implemented)

- Patterns of Business Activity: Demand Management provides to Capacity Management.
- Capacity Plan: Capacity Management provides capacity predictions and plans to Demand Management

- Utilization Report: Capacity Management provides a utilization report showing how capacity is used over time.

Service Level Management (when implemented)

- Performance / Utilization / Throughput Reports: Capacity Management provides to Service Level Management showing performance against targets
- Service level Agreement (SLA) Development Support: Capacity Management provides information to Service Level Management in support of the development of SLAs, including, but not limited to service design recommendations and cost/value data
- SLAs: Service Level Management provides to Capacity Management for use in baseline reports and assessing compliance.
- Service level Requirements (SLRs): Service Level Management provides to Capacity Management for use in baseline reports and assessing compliance.
- Capacity Plan: Capacity Management provides capacity predictions and plans to Service Level Management

IT Service Continuity Management (when implemented)

- Service Continuity strategy: IT Service Continuity Management provides the continuity strategy to Capacity Management to support development of the Capacity Plan.
- Service Continuity Design: IT Service Continuity Management provides the continuity design to Capacity Management
- RFC Capacity Evaluations: Capacity Management provides IT Service Continuity Management with anticipated capacity impacts of RFCs to allow the impact on IT Service Continuity Management plans to be assessed
- Capacity model: Capacity Management provides a capacity model to IT Service Continuity Management to reduce risk and to provide minimum agreed service levels. This plan specifies the minimum capacity needed to continue or recover services in the event of a disaster.

Availability Management

- Service Availability Plan: Availability Management provides Capacity Management availability, maintainability, and serviceability guidance, including availability techniques deployed, in order to plan accurately for future capacity and meet documented Service Level Agreements for IT infrastructure components.
- Performance data: Capacity Management provides Availability Management with performance data, including information on performance degradation.
- Capacity Plan: Capacity Management provides Availability Management the Capacity Plan, showing how capacity plans support availability requirements.

Change Management

- Proposed Request for Change (RFC): Change Management provides RFCs to Capacity Management for assessment

- Updated Request for Change (RFC): Change Management provides RFC updates to Capacity Management. This would include status changes such as RFC implementation or backout, and updates to anticipated impacts.
- Change Schedule: Change Management provides the change schedule to Capacity Management. This schedule provides anticipated RFC implementation dates.
- RFC Assessments: Capacity Management provides Change Management assessments of impacts that might affect capacity or the ability to achieve expected service levels.
- RFC's: Capacity Management provides Capacity RFCs to Change Management.

Configuration Management Database

- Configuration Data: The CMDB provides Configuration Data (including capacity data) for Configuration Items to Capacity Management. This data may be used to support growth estimates based on the CMDB.
- Capacity Data: Capacity Management may need to provide CI capacity if the CMDB does not contain the data. The data may be stored in the Capacity Management System, and available through a link.
- Capacity Management Information System: The CMS maintained by SACM provides a Capacity Management Information System (CMIS), which is a virtual repository of all Capacity Management data and usually stored in multiple physical locations in the CMS.

Release and Deployment Management

- Release Plan: Release and Deployment Management provides to Capacity Management, prior to rollout, for analysis of capacity needs and capabilities and adequacy of capacity.
- Testing Performance Metrics: Release and Deployment Management provides to Capacity Management performance metrics recorded during testing.
- Release Capacity Assessment: Capacity Management provides Release and Deployment Management an assessment of the capacity requirements of a planned release.
- Systems Engineering Technical Review (SETR) participation: Capacity Management provides representation on SETR review boards

Request Fulfillment

- Available Capacity: Capacity Management provides Request Fulfillment the amount of capacity, by type, that is available for use.
- Capacity Guidelines: Capacity Management provides Request Fulfillment guidelines pertaining to additional use of capacity – what capacity requests can be granted under what circumstances, and the approval required to do so

Event Management

- Capacity thresholds: Capacity Management provides Event Management with recommendations and guidance related to capacity thresholds, based upon the Capacity Management understanding of trends, service levels, and patterns of business activity. This guidance includes alert and alarm levels, and recommended response actions.
- Event: Event Management provides Capacity Management with information regarding events that indicate capacity alerts of threshold breaches. (The events reported will be

dependent upon the ability of the tools to identify the conditions that we would want to observe.)

Incident Management

- Incident: Incident Management provides incident information to Capacity Management for analysis. This may include Known Error information.
- Incident Diagnosis and Recovery Options: Capacity Management provides diagnosis assistance and recovery options to assist in the Incident investigation. Capacity Management may do a Performance Analysis to assist in the diagnosis of performance incidents.
- Capacity Reports: Capacity Management provides capacity data to Incident Management to support investigation of incidents.

Problem Management

- Problem: Problem Management provides problem information to Capacity Management for analysis. This may include Known Error information.
- Capacity Status and Recommendations: Capacity Management analyses problems, and returns capacity status and recommendations for resolving the problem. This may include a Performance Analysis.
- Capacity Reports: Capacity Management provides capacity data to Problem Management to support proactive and reactive investigation of problems.

2.3 High-Level Process Model

Capacity Management is the process of planning, sizing, and controlling IT capacity to satisfy user demand at a reasonable cost within the required service performance levels. Capacity is analyzed to assess the ability to match computing demands to IT infrastructure capacity, for both existing and forecasted future needs, taking into account future demands for new services due to changes in stakeholder requirements. The CpM process consists of three sub-processes that represent the cornerstone of managing IT capacity:

- Mission/Business Capacity Management (BCM)
- Service Capacity Management (SCM)
- Resource Capacity Management (RCM)[1]

The flow in Figure 2-2 depicts these sub-processes. See Section 4.0 for complete descriptions of the sub-processes and their activities.

[1] ITIL v3 refers to this sub-process as Component Capacity Management. USMC Enterprise Capacity Management has chosen to name this sub-process Resource Capacity Management, to allow the management of capacity of resources that are not considered to be IT components.

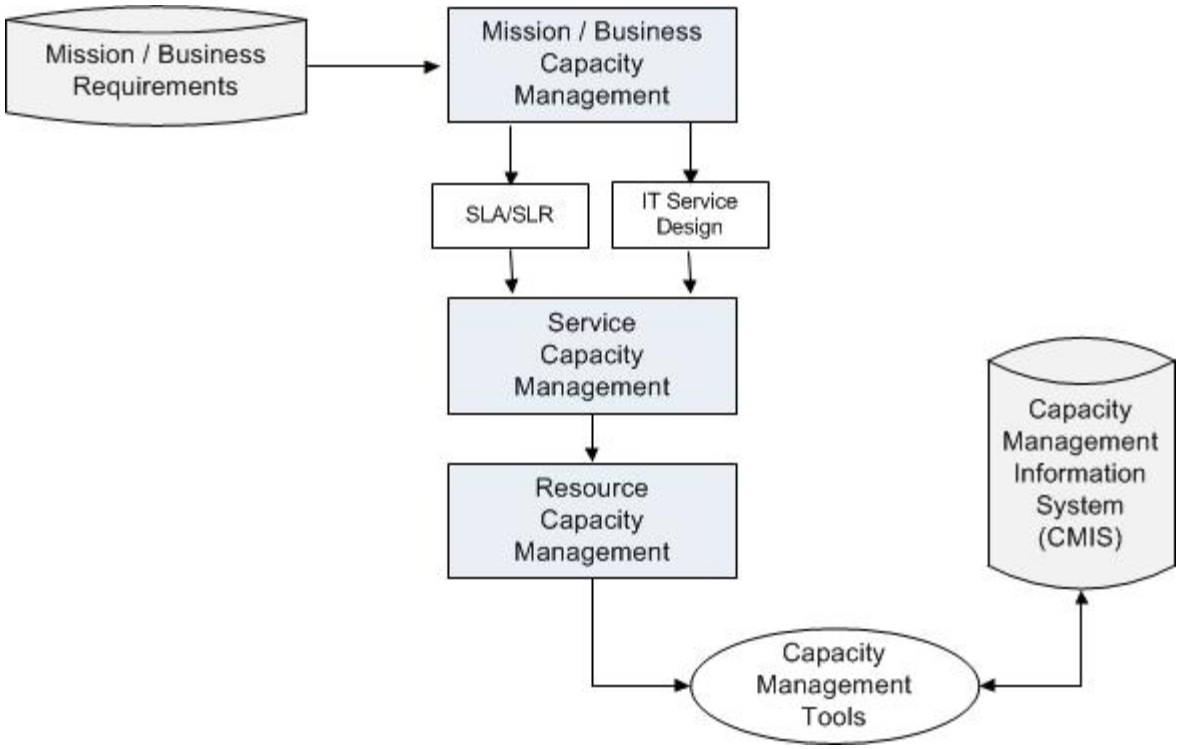

Figure 2-2. High-level CpM Workflow

Table 2-1 contains descriptions of each sub-process of the Capacity Management process. Detailed descriptions are in Section 4.0 of this guide.

Table 2-1. CM Process Activity Descriptions

Number	Process Activity	Description
1.0	Mission/Business Capacity Management	Responsible for making sure that the impacts of current and future requirements for IT services upon IT resources are considered, planned and implemented in a timely fashion. Elements to be considered include, but are not limited to: Number and types of MCNOSC customers; number of users and workstations and number of concurrent users; number and types of transactions; customer, users and other stakeholders' vision and mission and business requirements and expectations.
2.0	Service Capacity Management	Responsible for managing live, operational IT services used by customers and users. The performance of IT services is monitored and measured, and the data analyzed and reported. Actions are taken so that the performance of these services meets mission and business requirements. Inputs to this sub process include: Service Level Requirements, Service Catalog, SLAs, Operating Level Agreements, and Memorandum of Understanding (MOUs)
3.0	Resource Capacity Management	Responsible for managing the individual resources and components of the IT infrastructure. Performance and utilization are monitored and measured, and the data analyzed and reported. Actions are taken so that mission and business requirements are met. Resources include, but are not limited to: Hardware, Network Components, Peripherals, and Critical Human Resources.

2.3.1 Process Description

The three Capacity Management sub-processes are performed through a series of activities as shown in Figure 2-3. Capacity Management provides both short- and long-term forward looking views of capacity requirements and usage. At this stage of the implementation of Capacity Management, the primary emphasis must be on the iterative activities, in support of Performance Management to establish capacity baselines and metrics.

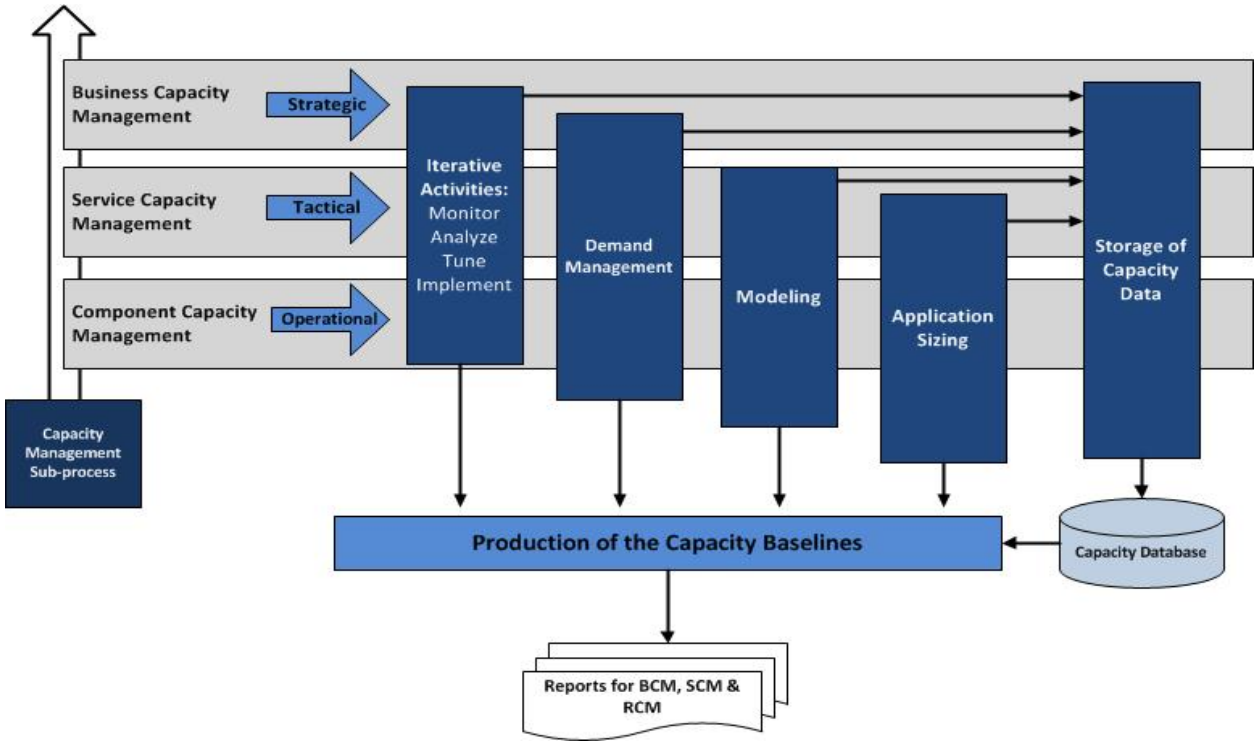

Figure 2-3. Marine Corps Enterprise Capacity Management Activities

Capacity Management also plays an influential role in Service Design. This role involves two main areas: exploitation of new technology, and designing for resilience. It is imperative that Capacity Management understand the capabilities of new technologies, and the opportunities that these technologies afford. These new technologies encompass hardware, software, techniques and technology, all of which must be assessed to determine if the benefits they could provide are cost justified. Capacity Management should work with Availability Management to assess how susceptible the current IT configuration is to failure, or overload of individual components, and make recommendations for cost-effective and cost-justified improvements. Resilience is most effectively addressed during service and system design.

2.4 Key Concepts

The following describe key concepts that are utilized in this CpM Management Process Guide:

2.4.1 Commander's Critical Information Requirements

Commander's Critical Information Requirements (CCIR) is the commander's "need to know immediately" information and response requirements. From MCWP 3-40.2 Information Management, "CCIR are tools for the commander to reduce information gaps generated by uncertainties that he may have concerning his own force, the threat, and/or the environment. They define the information required by the commander to better understand the battle-space, identify risks, and to make sound, timely decisions in order to retain the initiative. CCIR focus the staff on the type and form of quality information required by the commander, thereby reducing information needs to manageable amounts." In the context of Capacity Management, CCIRs would include, but not be limited to, capacity failures, which are a basis for hierarchical escalations.

All commands are required to produce command specific CCIR guidance with detailed ITSM requirements and are required to adhere to the current CCIR guidance of their superior commands. Common CCIR categories are Enterprise Service Management, Network Defense, Content Management, and MCEN, but others may be applicable based upon the commander's requirements.

2.4.2 Configuration Item

A Configuration Item (CI) is a component or service asset that needs to be managed in order to deliver an IT service. Information about each CI is recorded in a configuration record within the Configuration Management System and is maintained throughout its lifecycle by SACM. CIs are under the control of Change Management. CIs may vary widely in complexity, size, and type, ranging from an entire service or system including all hardware, software, documentation, and support staff to a single software module or a minor hardware component. CIs may be grouped and managed together.

2.4.3 Configuration Management Database

The Configuration Management Database (CMDB) is a database used to manage configuration records throughout their lifecycle. The Configuration Management Database records the attributes of each Configuration Item, and its relationships with other Configuration Items. A Configuration Management Database may also contain other information linked to Configuration Items, for example Incident, Problem or Change Records.

2.4.4 Incident

An Incident is an unplanned interruption to an IT Service or reduction in the Quality of an IT Service. Any event which could affect an IT Service in the future is also an Incident.

2.4.5 Problem

A Problem is the unknown cause (undiagnosed root cause) of one or more incidents. Each Problem Record documents the lifecycle of a single problem.

2.4.6 Service Level Agreement

A Service-Level Agreement (SLA) is an agreement between an IT service provider and a customer. The SLA describes the IT service, documents service level targets, and specifies the responsibilities of the IT service provider and the customer. A single SLA may cover multiple IT services or multiple customers.

2.5 Capacity Management Activities

2.5.1 Performance Management

Performance Management encompasses the day-to-day activities within Capacity Management that measure levels of performance, with the objective of ensuring services are provided efficiently and effectively, while continuing to meet Service Level Agreements. These activities are shown in Figure 2-4, and described in the sub-sections that follow.

Performance Management addresses the total effectiveness of computer systems (software, servers, storage, and network), including throughput, application response time, and availability. Performance Management activity has the following objectives:

- Ensure that key applications and business workloads achieve service objectives for throughput, transaction volumes, availability, and response times for end users.
- Monitor service performance compared with agreed-upon objectives for IT infrastructure and services.
- Report on infrastructure health and status.
- Predict potential slowdowns, bottlenecks, or outages.
- Provide diagnostics for root cause analysis.
- Avoid performance crises, eliminate the turmoil, and overload on IT staff resulting from serious performance problems.
- Communicate service status.

Performance Management relies on consistent, reliable monitoring to provide the basis for analysis of performance, utilization and trends in the IT environment. This monitoring data is the basis for establishing total capacity and capacity utilization baselines. Monitoring data also provides the foundation for much of the monitoring required to evaluate the efficiency and effectiveness of the Capacity Management process.

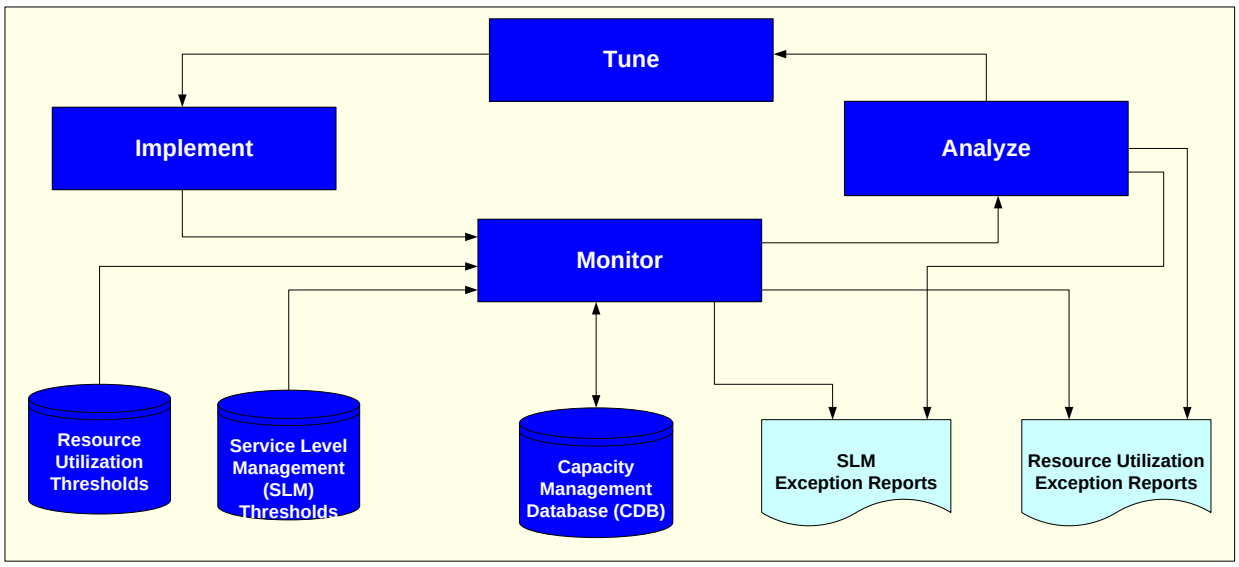

Figure 2-4. Detailed Iterative Performance Management Activities

2.5.1.1 Monitor

The Monitor activity performs repeated observation of a process, IT service, or configuration item to detect events and record current status. The Monitor activity must collect all the data required by Capacity Management, for each specific service or component. Monitored data must address both capacity and performance. To monitor the "end to end" customer experience, it must incorporate all components in the services. Ideally, data is gathered at a both the total resource utilization level, and at a more detailed level to allow analysis of the load that each service places on each component.

The data pertaining to business volumes required by Mission/Business Capacity Management may have to be derived from the data available to Resource Capacity Management and Service Capacity Management.

Some objectives of monitoring include:

- Optimize the use of hardware, software and network resources
- Achieve agreed upon service levels
- Measure business volumes, service capacity levels, and resource usage levels against expectations established and documented by MBCM, SCM, and RCM and their respective baselines
- Identify and notify in real-time when thresholds are exceeded.

Automated monitoring of the IT infrastructure components is in place for a portion of the USMC environment. Expansion of the infrastructure components monitored is planned. Measurement against thresholds will be performed on an ongoing basis. Data from this monitoring will enable decision makers to make informed decisions regarding how well the system and its components are performing, and their current capacity levels against pre-established measures.

2.5.1.2 Analyze

The data collected from the Monitor activity is analyzed to determine and forecast future utilization needs. An analysis of current systems and components may initiate efficiency improvements or the acquisition of additional IT components. Analysis can include looking at data to identify time related patterns. Trend Analysis is used as part of modeling and management reporting to predict future behavior. This enables proactive acquisition activities to validate that sufficient capacity is in place to support growth.

The objectives of analysis are to:

- Identify trends from which normal utilization and service levels can be established
- Define exception conditions in the utilization of individual system components and service thresholds
- Predict future resource usage
- Monitor actual business growth against predicted growth
- Validate capacity models using operational data
- Detect underlying causes of problems and fix them proactively to reduce total cost of ownership (TCO)

Analysis of the operating characteristics of applications and the corresponding infrastructure components, under different workload scenarios and periods of time, is important to properly understand the behavior of the resources. Analysis can identify such issues as:

- Contention for data, file, memory, processor
- Inappropriate distribution of workload and/or data across system resources
- Inappropriate database locking strategy
- Inefficiencies in the application design
- Unexpected increase in transaction rates
- Inefficient use of memory and/or storage

2.5.1.3 Tune

The Analyze activity may identify areas of the configuration that could be tuned to better utilize a service, system, or component resource, or improve service performance. The Tune activity is responsible for identifying and making configuration changes to resources so they are efficiently utilized. Tuning resources provides improved performance for the service with the anticipated workload.

Tuning techniques include:

- Balancing workloads
- Balancing disk traffic
- Balancing Matcher loads
- Implementing or updating a locking strategy, specifying when and at what level locks are necessary
- Efficient use of memory or disk space

2.5.1.4 Implement

The Implement activity is responsible for developing recommendations for changes to or new operational component capabilities into the production IT infrastructure environment. All changes to the infrastructure require a Request for Change be submitted to the Change Management process.

2.5.2 Update Baseline

When Change Management notifies Capacity Management that a change has been implemented, capacity impacts must be reflected in the baseline. This can be based on a variety of changes – infrastructure updates, service changes, modifications to strategies and plans may all affect some aspect of the capacity baseline.

2.5.3 Capacity Planning

Capacity Planning encompasses the forward looking activities within Capacity Management. This may be triggered by updated mission or business strategies and plans, change requests, or special "what-if" requests to support longer term strategy and planning activities. The Capacity Planning activities are executed within each sub-process of Capacity Management, with each sub-process having a different focus. This is described more fully in section 4.0. Descriptions of the activities of Capacity Planning are below.

2.5.4 Demand Management

Demand Management within Capacity Management is a tactical activity responsible for optimizing the use of capacity by shifting workload to less utilized locations, processing times, or environments / servers. Tactical Demand Management needs to understand which services use the resources, as well as the extent and schedule of the usage.

2.5.5 Solution Sizing

Solution Sizing is the activity responsible for understanding the resource requirements needed to support a new or changed strategy, service, or application. Solution Sizing helps to provision IT Services to meet agreed to service levels within capacity constraints and performance expectations. Performance Testing can be used as an input to provide guidance for sizing applications.

2.5.6 Engineer Solution Options

Once the capacity requirements for a proposed change are understood, options for meeting those requirements are engineered. This will include a gap analysis to compare the anticipated capacity need to the anticipated available capacity in the relevant time frame, and a preliminary cost/benefit analysis to evaluate carious options.

2.5.7 Model Solutions

Modeling is the activity to predict future behavior of an IT service, configuration item or business process. Types of models include Baseline Models, Trend Analysis, Analytical Models, and Simulation Models.

- Baseline Models are the first stage in building a solid foundation for predictive models. The intent of the baseline model is to capture the key characteristics of a service or

application and to accurately reflect existing throughput and performance timings. Once validated, this model provides the core foundation to perform "what if" analysis and scenarios.

- Trend Analysis uses data captured during the execution of an IT service or configuration item. Trending is typically performed against service performance information and / or resource utilization. Trend Analysis models are helpful in seeing the rate of change or predicting future observations based upon items such as the slope of the curve.
- Analytical Models represent and predict the behavior of an IT service or configuration item by using mathematical approaches / models. Component utilization such as CPU, memory, queue depth, or response time can be projected for differing workloads.
- Simulation Models are created by using the actual configuration items, with distinct events such as transaction arrival rates, arrival rates by transaction type, and/or record size parameters. Artificial workloads or transactions are then input into the model to simulate and forecast sizing characteristics. Models also simulate the processing behavior of the architecture and "what if" scenarios can be performed.

2.5.8 Capacity Plan

A Capacity Plan is used to manage resources required to deliver IT services to meet the mission or business demand. It contains a forward-looking view of capacity needs, and identifies additional resources required, by location to meet those needs. The plan will also include the total additional resources, when they are required, and the anticipated cost of those resources.

2.5.9 Capacity Database

Capacity management data is stored in the Capacity Database. This may be a single Capacity Database, but it is typically a logical database consisting of several storage locations of data related to Capacity Management. The Capacity Database holds different types of data related to business, service, and resource, including utilization rate data. Some examples are below.

Business data in the Capacity Database can include, but not be limited to such items as:

- Anticipated workload volumes by transaction type, by stakeholder, and by customer type
- Business / Program Plan

Service data in the Capacity Database can include, but not be limited to such items as:

- Actual response time for each transaction type
- Throughput rate by transaction type
- Service Level thresholds for the SLAs

Resource data in the Capacity Database can include, but not be limited to, such items as:

- IT infrastructure component response time
- IT infrastructure component throughput

2.6 Quality Control

2.6.1 Metrics, Measurements and Continual Process Improvement

Continual Process Improvement depends on accurate and timely process measurements and relies upon obtaining, analyzing, and using information that is practical and meaningful to the process. Measurements of process efficiency and effectiveness enable the USMC to track performance and improve overall end user satisfaction. Process metrics are used as measures of how well the process is working, whether or not the process is continuing to improve, or where improvements should be made.

Effective operation and management of the process requires the use of metrics and measurements. Reports need to be defined, executed, and distributed to enable the managing of process-related issues and initiatives. Daily management occurs in Service Operations, at the process manager level. Long-term trending analysis and management of significant process activities occurs in Service Design, under the responsibilities of the process owner.

The essential components of any measurement system are Critical Success Factors (CSFs) and Key Performance Indicators (KPIs).

2.6.2 Critical Success Factors with Key Performance Indicators

CSFs and KPIs establish the baseline and mechanism for tracking performance. CSFs are those factors that must be done well within the process; KPIs ensure each CSF is met.

- **Critical Success Factor (CSF)** – A Critical Success Factor is a metric that represents key operational performance requirements and indicates whether a process or operation is performing successfully from a customer or business perspective.
- **Key Performance Indicator (KPI)** – A KPI is used to measure the achievement of each Critical Success Factor. Many metrics may be measured, but only the most important of these are defined as KPIs and used to actively manage and report on the process, IT service, or activity. A KPI should lead to action and be a driver for improvement.
- **Metric** – A metric is a measure for quantitatively or qualitatively assessing, controlling or selecting a person, process, event, or institution along with the procedures to carry out measurements for interpretation. Metrics may be used to help manage an IT process, service, or activity.

Table 2-2 describes CSFs and KPIs that can be used to judge the efficiency and effectiveness of the Capacity Management process. Results of the analysis provide input to improvement programs (i.e., continual service improvement). At the current level of process development and maturity, the critical objectives of CpM are to publish the Capacity Plan when needed for the budget cycle, and avoidance of failures due to capacity issues. These are the preliminary activities required to establish KPIs 3, 11 and 13, in the table. The USMC must also establish the baseline of total capacity and capacity utilization, as they are key to developing the CSFs and KPIs.

Information on capacity metrics is included in Section 5.0.

Table 2-2. Capacity Management Critical Success Factors and Key Performance Indicators

CSF #	Critical Success Factors	KPI #	Key Performance Indicators	Benefits
1	Accurate mission and business forecasts	1	Production of workload forecasts on time	Timely, accurate forecasts allow capacity plans which dovetail with the budget and acquisition schedule, with adequate acquisition intervals, allowing purchase of correct capacity, not over- or under-purchasing.
		2	Percentage accuracy of forecasts of mission and business trends	
		3	Timely incorporation of mission and business plans into the published capacity plan(s)	
		4	Reduction in the number of variances from the mission and business plans and capacity plans	
2	Knowledge of current and future technologies	5	Increased ability to monitor performance and throughput of all services and components	New technology enables increased automation of monitoring, allowing more proactive capacity management, providing the ability to prevent incidents using increased ability to identify capacity usage.
		6	Timely justification and implementation of new technology in line with mission and business requirements (time, cost and functionality)	
		7	Reduction in the use of old technology, causing breached SLA's due to problems with support or performance	
3	Ability to demonstrate cost effectiveness	8	Reduction in last-minute buying to address urgent performance issues	The ability to demonstrate cost effectiveness increases the ability to justify acquisition of capacity when needed, resulting in more efficient use of financial resources.
		9	Reduction in the over-capacity of IT	
		10	Accurate forecasts of planned expenditure	
		11	Reduction in the mission or business disruption caused by a lack of adequate IT capacity	
		12	Relative reduction in the cost of production in the capacity plan	
4	Ability to plan and implement the appropriate IT capacity to match mission and business need	13	Percentage reduction in the number of incidents due to poor performance	The ability to implement appropriate capacity provides better service at lower cost.
		14	All new services implemented match SLRs	
		15	Increased percentage of recommendations made by capacity management are acted on	
		16	Reduction in the number of SLA breaches due to either poor service performance or poor component performance	

3.0 ROLES AND RESPONSIBILITIES

Each process has roles and responsibilities associated with design, development, execution and management of the process. A role within a process is defined as a set of responsibilities. There will be instances where roles are combined and a person will be responsible for multiple roles.

This is based on factors such as the area or responsibility, size of user base, and/or size of the process support team which will dictate exactly which roles require a dedicated person(s) and the total number of persons performing each role.

While the goal is to have a single CpM Process Owner at the enterprise level, the USMC will initially use a shared process ownership framework. There will be a Process Owner for Marine Corps System Command (MCSC), as well as a Process Owner for the operational sector inclusive of all other USMC organization at the enterprise, regional, and local levels. The CpM process owners will serve as the authoritative process point of contact for any higher headquarters (DoN or DoD) or adjacent organization engagement or coordination.

The Process Manager provides direct support to the process owner by daily operational management of the Capacity Management process. The Process Manager reports deviations in the processes and recommend corrective action to the respective process owner.

3.1 Roles

The following abstract drawing (Figure 3-1) depicts Capacity Management process roles for the USMC, followed by a description of these roles. Table 3-1 describes the roles and responsibilities in more detail.

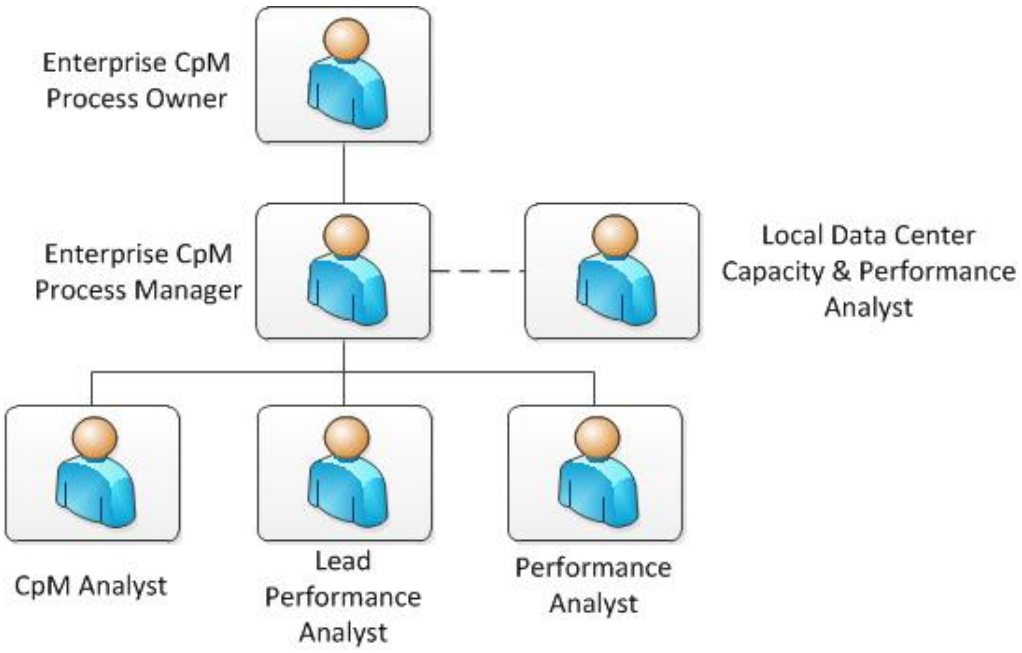

Figure 3-1. Capacity Management Roles

Table 3-1. CpM Roles and Responsibilities

Description	Overall Responsibility
Enterprise Capacity Management Process Owner	
The Enterprise Process Owner owns the process and the supporting documentation for the process. At this time, the USMC Enterprise Capacity Management process owner role is shared by MCSC and MCNOSC.	The Process Owner shall act on behalf of the Commanding Officer to establish and ensure adherence to and enterprise CpM process. Duties include[2]: • Review and understand all references pertaining to the appointment • In coordination with the Marine Corps System Command (MCSC) CpM Process Owner, document and publicize the CpM process • Ensure updates to the CpM Process Guide, once established and approved, are performed according to the Change Management Process • Define the Key Performance Indicators (KPIs) to evaluate the effectiveness and efficiency of the CpM Process • Review KPIs and take action required following the analysis • Assist with and be ultimately responsible for the CpM Process design • Ensure the effectiveness and efficiency of the CpM Process and working practices through continuous improvement • Review any proposed enhancements to the CpM Process • Develop and provide input to the CpM Process Improvement Plan • Address any issues with the execution of the process • Ensure all relevant staff have the required training and are aware of their role in the CpM Process • Ensure that the CpM Process, roles, responsibilities and documentation are regularly reviewed and audited • Interface with the appropriate organizations to ensure the process receives the necessary staff resources • Ensure all stakeholders are sufficiently involved in the CpM Process • Ensure tight linkage between CpM Processes and other related Marine Corps Information Technology Service Management Processes • Ensure organizational adherence to the CpM Process Additional responsibilities include: • Ensure that capacity acquisitions support the USMC strategic vision for IT Infrastructure • Provide the strategic direction for the CpM tool/system • Ensures CpM processes and tools integrate with other ITSM processes and that requirements for the tools are defined • Responsible for the requirement and guidelines of the CpM tool usage • Perform service financial modeling and budget analysis • Benchmark the process performance • Participate in other ITSM process initiatives and process reviews
Enterprise Capacity Management Process Manager	
The CpM Process Manager ensures effective coordination of the activities necessary to execute the capacity management process.	• Awareness of USMC and DoD directives • Support Change Review processes and review boards • Manages interfaces with external processes • Maintain capacity baselines • Develop and manage capacity plans

[2] The Process Owner responsibilities shown are from the MCNOSC letter "Appointment as Process Owner for the Enterprise Information Technology Service Management Capacity Management Process", 27 February 2013.

Description	Overall Responsibility
	• Publish capacity related reports • Interfaces with system engineering and system architecture • Identifies opportunities to improve the process • Conduct SETR reviews for CpM development
Local Data Center Capacity & Performance Analyst	

The Local Data Center Capacity & Performance Analyst provides support to the Enterprise Process Manager in assuring capacity requirements are defined, documented and met. In addition, they develop, produce and publish capacity reports.	• Provides Capacity support to Programs and Projects to make sure business and service requirements are met
	• Optimize system resource utilization
	• Adheres to standards
	• Updates Capacity baselines
	• Supports metrics
	• Supports threshold development
	• Contributes to the development of Capacity Plans
	• Evaluates RFC's
	• Produces statistics and reports from the CpM tools
	• Designs, develops and produces new reports as well as modifying existing reports
	• Participates in data gathering and trend analysis
	• Reacts to Events, Incidents and Problems
	  • Issues resolution
	  • Supports root cause analysis
	• Assists with the assessment of infrastructure (servers, storage, etc.)
	  • Determine how well an infrastructure CI is able to do what it is supposed to do
	  • Identify poorly performing infrastructure CIs and recommend remediation actions (identify bottlenecks impacting performance, and attempt to identify the "limiting factor" and relieve it)
	  • This recommendation would eventually end up as an RFC; how it gets there would depend on who owns the CI, and what the issue is
	  • If the cause of poor performance cannot be determined, work with Problem Management to engage a wider team
	• Supports threshold development
	• Contributes to the development of Capacity Plans
	• Evaluates RFC's

Capacity Management Analyst	
The CpM Analyst assists the Process Manager in assuring capacity requirements are defined, documented and met. In addition, they develop, produce and publish capacity reports.	• Provides Capacity support to Programs and Projects to make sure business and service requirements are met • Optimize system resource utilization • Adheres to standards • Supports incorporation of Capacity Management into development & testing • Identifies areas for capacity-related improvement during development • Supports SETR reviews • Updates Capacity baselines • Supports metrics • Supports threshold development • Contributes to the development of Capacity Plans • Evaluates RFC's • Produces statistics and reports from the CpM tools • Designs, develops and produces new reports as well as modifying existing reports

Description	Overall Responsibility
	• Establishes and maintains automatic reporting capabilities • Establishes and maintains the CpM Reporting architecture and user reporting portal • Produces monthly reports for Service Level Management and service analysis • Participates in data gathering and trend analysis
Lead Performance Analyst	

The Lead Performance Analyst has overall responsibility for Performance Management.	• Directs activities of Performance Analysts
	• Reacts to Events, Incidents and Problems
	  • Issues resolution
	  • Supports root cause analysis
	• Systematically assesses infrastructure (servers, storage, etc.)
	  • Determine how well an infrastructure CI is able to do what it is supposed to do
	  • Identify poorly performing infrastructure CIs and recommend remediation actions (identify bottlenecks impacting performance, and attempt to identify the “limiting factor” and relieve it)
	  • This recommendation would eventually end up as an RFC; how it gets there would depend on who owns the CI, and what the issue is
	  • If the cause of poor performance cannot be determined, work with Problem Management to engage a wider team
	• Supports threshold development
	• Contributes to the development of Capacity Plans
	• Evaluates RFC’s

Performance Analyst	

The Performance Analyst is a senior technical expert with experience in performance management, responsible for the day to day operational responsibilities of CpM.	• Reacts to Events, Incidents and Problems
	  • Issues resolution
	  • Supports root cause analysis
	• Systematically assesses infrastructure (servers, storage, etc.)
	  • Determine how well an infrastructure CI is able to do what it is supposed to do
	  • Identify poorly performing infrastructure CIs and recommend remediation actions (identify bottlenecks impacting performance, and attempt to identify the “limiting factor” and relieve it)
	  • This recommendation would eventually end up as an RFC; how it gets there would depend on who owns the CI, and what the issue is
	  • If the cause of poor performance cannot be determined, work with Problem Management to engage a wider team
	• Supports threshold development
	• Contributes to the development of Capacity Plans
	• Evaluates RFC’s

3.2 Responsibilities

Processes may span departmental boundaries; therefore, procedures and work instructions within the process need to be mapped to roles within the process. These roles are then mapped to job functions, IT staff and departments. The process owner is accountable for ensuring process interaction by implementing systems that allow smooth process flow.

The Responsible, Accountable, Support, Consulted, Informed, (RASCI) model is a method for assigning the type or degree of responsibility that roles (or individuals) have for specific tasks.

Responsible – Completes the process or activity; responsible for action/implementation. The degree of responsibility is determined by the individual with the 'A'.

Accountable – Approves or disapproves the process or activity. Individual who is ultimately answerable for the task or a decision regarding the task.

Support – Supports the process or activity.

Consulted – Gives needed input about the process or activity. Prior to final decision or action, these subject matter experts or stakeholders are consulted.

Informed – Needs to be informed after a decision or action is taken. May be required to take action as a result of the outcome. This is a one-way communication.

Both proactive and reactive activities are necessary to manage IT capacity successfully. Proactive activities include:

- Estimating future requirements, using trends and thresholds for planning upgrades and enhancement
- Modeling predicted changes in services, including anticipate service retirements, and identifying service and component changes needed in both infrastructure and applications
- Ensuring upgrades and improvements are budgeted, planned, and implemented to prevent breach of SLAs and service targets or performance issues
- Producing and maintaining a Capacity Plan which reflects trends, predicted changes, future requirements, and the plans for meeting them
- Tuning the performance of services and components
- Participating in Continual Service Improvement efforts for both services and the Capacity Management process

Reactive Capacity Management activities include:

- Responding to all events where capacity thresholds are breached and initiating corrective action
- Addressing performance issues
- Monitoring, measuring, reporting and reviewing performance of both services and resources

Table 3-2 establishes responsibilities for high-level process activities by role.

Table 3-2. Responsibilities for Capacity Management

CpM Process Activities	Enterprise CpM Process Owner	Enterprise CpM Process Manager	CpM Analyst	Lead Performance Analyst	Performance Analyst	Local Data Center Analyst
Estimating future requirements	I	AR	S			S
Modeling predicted changes in services	I	AR	S			S
Ensuring upgrades and improvements meet requirements	I	AR				
Producing and maintaining a Capacity Plan	I	AR				
Tuning the performance of services and components	I	AR		S	S	S
Participating in Continual Service Improvement	I	AR				
Responding to all capacity related events	I	AR	S	S	S	S
Addressing performance issues	I	AR		S	S	S
Monitoring, measuring, reporting and reviewing performance	I	AR		S	S	S
Maintain Capacity Management Process	AR	S				

4.0 SUB-PROCESSES

The USMC Enterprise CpM process consists of three sub-processes, each performing similar activities, as shown in section 2.3.1. These activities feed the development of and updates to the Mission/Business Capacity, Service Capacity and Resource Capacity Baselines.

4.1 Mission/Business Capacity Management

Mission/Business Capacity Management is the sub-process focused on ensuring that future business requirements for IT services are properly documented, planned and implemented in a timely manner. This also entails predicting future business needs based on both the anticipated business needs and analysis of current performance data. Inputs to planning are future requirements from Service Strategy and Service Portfolio, current Service Level Agreements (SLAs), Operational Level Agreements (OLAs), patterns of business activity, service plans, forecasts of growth in existing services, and resource utilization data. The inputs are employed to trend, forecast or model the future requirements.

Workload elements considered include, but are not limited to: number and types of customers; number of users and workstations and number of concurrent users; number and types of transactions; customer, users and other stakeholders' vision and business requirements and expectations. The activities associated with business capacity management are monitoring and analyzing current performance data, modeling, solution sizing and creating the capacity baselines. Historical data describing how current resources are being used is input to forecasting future requirements.

The output of mission / business capacity planning is the capacity plan that is reviewed and published annually, but is consulted and reviewed as needed.

4.2 Service Capacity Management

Service Capacity Management is the sub-process responsible for managing the performance of operational IT services managed by MCNOSC. IT services are monitored and measured against the targets within service level agreements and requirements. Service Capacity Management is also responsible for understanding the performance and capacity of IT Services. This includes the resources used by each Service and the pattern of usage over time. Actions are taken to make sure that the performance of these services meets the business requirements.

Service Capacity Management seeks to correlate business activity and service usage so that the impact of business activity changes can be predicted in terms of service performance (e.g. transaction response times) over time.

4.3 Resource Capacity Management

Resource Capacity Management is responsible for identifying and understanding the performance, capacity, and utilization of individual resources or components used to support IT services, including infrastructure, environment, data, and applications. Resource Capacity Management ensures optimum use of hardware and software to achieve and maintain the agreed service levels.

Due to hardware and software components having finite capacity, Resource Capacity Management monitors individual components, continuously collects resource utilization data, and performs analysis, forecasts, and reports on performance capacity and utilization. Services may need to be balanced across existing resources to make the most effective use of current resources.

In addition, the Capacity Management plan will provide the required level of information to the Facilities Management function to determine that sufficient resources (e.g. floor space, power, HVAC) is available to support the implementation of the capacity plan.

In order for Resource Capacity Management to be successful, it needs to be proactive and predictive. However, there are instances when Resource Capacity Management needs to be reactive to specific and immediate problems. In order to predict or forecast issues, changes in the use of services and hardware or software upgrades need to be estimated, budgeted, and planned. Data is collected, stored, recorded and analyzed for use in the capacity baselines.

The Resource Capacity Baseline, sub-process, and requirements are acted upon and driven by the Business and Service Capacity Management requirements.

4.4 Sub-Process Activity Perspectives

The ongoing, iterative Performance Management activities are performed on infrastructure, systems and applications supporting the Marine Corps Enterprise Network. The activities that comprise the iterative capacity activities maintain the stability and enhance the capacity and performance of a deployed solution.

While the same activities are performed for each sub-process, the key difference is in the data that is monitored and collected, and the lens through which the data is viewed. For example, Mission/Business Capacity Management looks at transaction throughput rates in terms of business volumes. Service Capacity Management focuses on transaction throughput rates and response times, while Resource Capacity Management is interested in IO rates, and the utilization level of individual infrastructure components. Activity descriptions are provided in Section 2.5, and the different activity perspectives are shown by sub-process in Table 4-1, and by activity in Appendix C.

Table 4-1. Activity Perspectives associated with the three capacity sub-processes

Activity	Mission/Business Capacity Management (BCM)	Service Capacity Management (SCM)	Resource Capacity Management (RCM)
Monitoring	Actual Volumes • By type • By customer • By location Measured against threshold	Response Time Throughput rate By transaction Measure against SLA	Hardware metrics Database metrics Application metrics Network metrics

Activity	Mission/Business Capacity Management (BCM)	Service Capacity Management (SCM)	Resource Capacity Management (RCM)
Analyzing	Trending Forecasting Actual Volumes • By type • By customer • By location Gap versus business workload expectations	Metrics against SLAs Gap versus service workload expectations	Hardware utilization Database utilization Application utilization Network utilization Gap versus resources workload expectations
Tuning	N/A	Services	Infrastructure components • Network • Server • Database
Implementing	Application and business processes	Services	Infrastructure components • Network • Server • Database Application components
Modeling	Process Flows Volumes	Transaction / service throughput Validate against service level requirements	Network Architecture Application Architecture
Demand Management	Volumes • By transaction type • By customer • By location • By time of day	Service Levels • By transaction type • By time of day	Hardware utilization Database utilization Application utilization Network utilization
Application Sizing	Current and future workload	Service Level Requirements Service Level Agreements	Infrastructure components needed to support The current / future workload The negotiated service levels
Storage of Capacity Data	Business (Program) Plan including: • Vision, goals, objectives, strategies, and plans Business changes that affect the underlying IT services and systems (policy changes, stakeholder addition…)	Aggregate data indicating the performance of a service Compare to service level targets using specified metrics Service Plan	Infrastructure component performance Availability, response time, and throughput of IT infrastructure components • Hardware • Network • Database IT Plan

5.0 CAPACITY METRICS

The goal of the Capacity Management process is to enable the timely delivery of cost justifiable IT capacity that is matched to the current and future identified needs of the business. Metrics, measures, methods and tools are used to measure how the environment is performing against baselines and expected future requirements.

It is essential to establish metrics and measure against baselines so that the behavior, performance and resource utilization of the applications, environment and network are understood and tracked against expectations. Specific performance metrics will be associated with each infrastructure category in the technical architecture. These metrics will generally relate to either the application or infrastructure perspective. As part of the process to create the three baselines, additional metrics may be identified covering business, service and resource areas. Additionally, thresholds will be established to trigger alarms or other notifications.

Metrics to be implemented will be determined, in large part, based on the ability of the Capacity Management tools in use.

5.1 Infrastructure Measurements

Measurement data will be captured by a number of different sources within the IT environment. These include Server, Storage, and Network measurements for infrastructure components. Application specific measurements can also obtained directly from the application logs and through automated tools.

The tools and applications provide data and a means to monitor measure and manage infrastructure, application and database capacity and performance. This data serves as input for trending analyses, evaluation against baselines and established service level commitments. The information also aides in root cause analysis and recommendations related to near and long term capacity and performance recommendations.

Specific infrastructure component measurements and metrics, by technology Utilization, CPU usage type, are shown in Table 5-1. System management tools monitor and record server measurements; the metrics shown are typically the ones scrutinized. SAN storage management tools generate a large number of internal SAN metrics, providing the storage measurements. Network measurements are collected by network management tools.

Table 5-1. Sample Infrastructure Metrics by Technology Type

Technology Type	Metrics
CPU	• Total CPU by System and User • CPU Queue Length, CPU Load, CPU Wait Time • CPU usage by process, by System and User
Memory	• Total memory utilized • Memory assigned as Swap space, total Swap space used • Paging rate to memory, paging rate to disk

Technology Type	Metrics
Disk I/O	• Total number of disk I/Os by device • Number of reads and writes by device • Disk queue length, disk wait time, disk service time
Network I/O	• Total bytes sent and received • Total packets sent and received • Percent network busy • Network latency
Storage	• Total Storage Installed • Total Storage Allocated by System and Application • Total Storage Used by System and Application • Cache-Hit Ratio • Total I/Os by device • Total reads and writes by device • Average block size
Network	• Total bytes sent and received • Total packets sent and received • Percent network busy • Network latency • Server measurements are obtained through monitoring performed by system management tools. The metrics shown above are typically the ones scrutinized. • Storage measurements are obtained from the SAN storage management console, which generates a large number of internal SAN metrics. • Network measurements are collected by MCNOSC owned tools.

5.2 Services/Application Measurements

Services and Applications are measured in terms of the transactions they process, and each is processed by a subset of the Marine Corps architecture. Measurements / metrics will vary by service or application, and by the tools available to provide monitoring. General metrics include response times (average, min, max, mode, etc.) and failure rate by period, application, and failure type.

Service or Application Workload: Workload is a measure of usage patterns. Workload is used in conjunction with other metrics to understand the impact of capacity utilization on performance. Workload data is typically collected from server log files. Often this data is analyzed in response to specific ad hoc requests or to resolve specific problems.

Key workload metrics include:

- Number of transactions processed by period (hourly, daily, monthly)
- Type of transactions processed (examples)
- Transaction arrival rates (by transaction type)
- Database size and growth
- Query database to identify peak periods (hour, day) and/or loads

- Percentage of successful transactions by period and type

Service or Application Response Time: Response time is the mean cycle time for a given transaction type for a particular period. Unlike availability, response time will vary according to the type of transaction. Typically, cycle time definition is the time it takes for a user to submit data, have it processed, and get a result.

Response Time metrics include:

- Overall transaction response times by period, transaction type (examples)
- Mean response time by period, transaction type
- Maximum response time by period, transaction type.

Appendix A – ACRONYMS

The official list of E-ITSM acronyms can be found on the Enterprise Information Technology Service Management site (https://eis.usmc.mil/sites/irm/ITSM/default.aspx). The link to the document is referenced below:

https://eis.usmc.mil/sites/irm/ITSM/Documents/Forms/AllItems.aspx?RootFolder=%2Fsites%2Firm%2FITSM%2FDocuments%2FE%2DITSM%20Acronym%20List&FolderCTID=0x01200019187 60B7D35A5478C0474985E3ACBCD&View={9CD820B3-EF85-4D2C-BD0C-A255AEE9E40D}

Appendix B – GLOSSARY

Term	Definition
Asset Management	Asset Management is the process responsible for tracking and reporting the financial value and ownership of assets throughout their life cycle.
Back-out Plan	A Back-out Plan is developed in the Release planning phase. This plan provides a recovery plan to return to the original configuration or process if the release fails to achieve the planned outcome.
Backup	Backup is copying data to protect against loss of integrity or availability of the original data.
Change Schedule	A Change Schedule is a document that lists all approved changes and their planned implementation dates.
Configuration Control	Configuration Control is a sub-process of Configuration Management. Configuration Control is a set of processes and approval stages required to change a CI attribute. Configuration Control encompasses the oversight to ensure that a CI is changed through the Change Management process.
Configuration Identification	A sub-process of Configuration Management, Configuration Identification is the selection, identification, and labeling of the configuration structures and CIs including their respective technical owner and the relationships between them. CIs become the manageable unit that is planned for release into a configuration controlled environment. The CIs consist of hardware, software, services, and documentation.
Configuration Item	A Configuration Item (CI) is any component that needs to be managed in order to deliver an IT Service. Information about each CI is recorded in a Configuration Record within the Configuration Management System (CMS) and is maintained throughout its life cycle by Configuration Management. CIs are under the control of Change Management. CIs typically include IT services, hardware, software, buildings, people and formal documentation such as process documentation and SLAs.
CI Type	CI Type is a category used to Classify CIs. The CI Type identifies the required attributes and relationships for a configuration record. Common CI Types include: server, document, user, etc.
Configuration Management Database	A Configuration Management Database (CMDB) is a database used to store configuration records throughout their life cycle. The Configuration Management System (CMS) maintains one or more CMDBs and each CMDB stores attributes of CIs and relationships with other CIs.
Configuration Management Plan	Document defining how configuration management will be implemented (including policies and procedures) for a particular acquisition or program. (Source: MIL HDBK-61A)
Configuration Management System	A Configuration Management System (CMS) is a set of tools and databases used to manage an IT service provider's configuration data. The CMS also includes information about incidents, problems, known errors, changes, and releases and may contain data about employees, suppliers, locations, units, customers and users. The CMS includes tools for collecting, storing, managing, updating and presenting data about all CIs and their relationships. The CMS is maintained by Configuration Management and is used by all IT Service Management processes.
Deployment	Deployment is the activity responsible for movement of new or changed hardware, software, documentation, process, etc. to the live environment. Deployment is part of the Release and Deployment Management Process.
Deployment Readiness Test	A Deployment Readiness Test is conducted to ensure that the deployment processes, procedures, and systems can deploy, install, commission, and decommission the release package and resultant new or changed service in the production/deployment environment.
Deployment Verification Test	A Deployment Verification Test is conducted to ensure the service capability has been correctly deployed for each target deployment group or environment.
Early Life Support	Early Life Support (ELS) involves Technical Management or IT Operations providing support for a new or changed IT service for a period of time after it is released. During ELS, the IT service provider may review the KPIs, service levels, and monitoring thresholds and provide additional resources for incident management and problem management (when implemented).

Term	Definition
EM System	The EM System (EMS) is composed of tools which monitor CIs and provide event notifications. It is a combination of software and hardware which provides a means of delivering a message to a set of recipients. The EMS often requires real-time interaction, escalation, and scheduling.
Environment	Environment is a subset of the IT infrastructure used for a particular purpose (e.g., live environment, test environment or build environment). It is possible for multiple environments to share a CI (e.g., test and live environments may use different partitions on a single mainframe computer). In the term physical environment, environment can be defined as the accommodation, air conditioning, power system, etc. Environment can be used as a generic term defined as the external conditions that influence or affect something.
Error	An Error is a design flaw or malfunction that causes a failure of one or more CI or IT services. A mistake made by a person or a faulty process that affects a CI or IT service is also an error.
Escalation	Escalation is an activity that obtains additional resources when needed to meet service-level targets or customer expectations.
Event	An Event is a piece of data that provides information about one or more system resources. Most events are benign. Some events show a change of state which has significance for the management of a CI or IT service. The term 'event' is also used to define an alert or notification created by any IT service, CI, or monitoring tool. Events typically require IT operations personnel to take actions and often lead to incidents being logged.
Event Correlation	Event correlation involves associating multiple related events. Often, multiple events are generated as a result of the same infrastructure fault. Events need correlation to prevent duplication of effort in resolving the original fault.
Exit and Entry Criteria (Pass/Fail)	These are criteria (defined well in advance and accepted by the stakeholders) defined at authorized points in the Release and Deployment Process to set expectations of acceptable/unacceptable results.
Fault	Fault is the deviation from *normal* operation of a CI or a series of CIs. A fault is a design flaw or malfunction that causes a failure of one or more CIs or IT services. Fault is also referred to as an error.
Governance	Governance is the process of ensuring policies and strategy are actually implemented and that required processes are correctly followed. Governance includes defining roles and responsibilities, measuring, and reporting and taking actions to resolve any issues identified.
Incident	An Incident is an unplanned interruption, degradation or reduction in IT Service quality.
Key Performance Indicator	A Key Performance Indicator (KPI) is a metric used to help manage a process, IT service, or activity. Many metrics may be measured, but only the most important of these are defined as KPIs and used to actively manage and report on the process, IT service, or activity. KPIs are selected to ensure that efficiency, effectiveness, and cost-effectiveness are all managed.
Known Error	A Known Error is a problem that has a documented root cause and a work-around. Known errors are created and managed throughout their life cycle by Problem Management. Known errors may also be identified by SIE or suppliers.
Known Error Database (KEDB)	A database containing all Known Error Records. This database is created by Problem Management and used by Incident and Problem Management.
Major Problem	A Major Problem is any problem where the severity or impact was such that the Enterprise Problem Process Manager decides to review the entire series of activities.
Monitoring	Monitoring is the process of repeated observation of a CI, IT service, or process to detect events and to ensure that the current status is known.
Notification	Notification is a communication that provides information.
Problem	A problem is defined as a cause of one or more incidents. The cause is not usually known at the time a problem record is created, and the Problem Management process is responsible for further investigation. The problem record in Service Manager documents the entire life cycle of a single problem.

Term	Definition
Process	A Process is a structured set of activities designed to accomplish a specific objective. A process takes one or more defined inputs and turns them into defined outputs. A process may include any of the roles, responsibilities, tools, and management controls required to reliably deliver the outputs. A process may define policies, standards, guidelines, activities, and work instructions, if needed.
Quality Assurance	Quality Assurance (QA) is the process responsible for ensuring the quality of a product and also ensuring it will provide its intended value.
Role	A Role refers to a set of connected behaviors or actions that are performed by a person, team, or group in a specific context.
Severity	Severity refers to the level or degree of intensity.
Root Cause Analysis	An Activity that identifies the Root Cause of an Incident or Problem. RCA typically concentrates on IT Infrastructure failures.
Service Design Package	A Service Design Package (SDP) is composed of document(s) defining all aspects of an IT service and its requirements through each stage of its life cycle. An SDP is produced for each new IT service, major change, or IT service retirement.
Service Improvement Plan	A Service Improvement Plan (SIP) is a formal plan to implement improvements to a process or IT service.
Service Knowledge Management System	A Service Knowledge Management System (SKMS) is a set of tools and databases used to manage knowledge and information. The SKMS includes the Configuration Management System (CMS) as well as other tools and databases. The SKMS stores, manages, updates, and presents all information that an IT service provider needs to manage the full life cycle of IT services.
Service Level Agreement	A Service-Level Agreement (SLA) is an agreement between an IT service provider and a customer. The SLA describes the IT service; documents service-level targets; and specifies the responsibilities of the IT service provider and the customer. A single SLA may cover multiple IT services or multiple customers.
Service Validation and Testing	Service Validation and Testing is the process responsible for validation and testing of a new or changed IT service. Service Validation and Testing ensures an IT service matches the design specification and will meet the needs of the business. Service Validation and Testing during release conducts testing in the pre-production System Integration Environment (SIE) and during deployment in the pilot production environment.
Single Point of Contact	A Single Point of Contact (SPOC) is an agreement used to assign a single, consistent way to communicate within an organization or unit. For example, the Service Desk will be the SPOC for a service provider.
Snapshot	A Snapshot is the baseline as captured by a discovery tool. A snapshot can also be called a benchmark.
Test	A Test is an activity that verifies that a CI, IT service, or process meets its specification or agreed requirements.
Test Environment	A Test Environment is a controlled environment used to test CIs, builds, IT services, and processes.
Throttling	Some events do not need to be acted on until they have occurred a number of times within a given time period. This is called Throttling. Once a repeated event has reached its limit for repetition, forward that event to be acted upon.
User Acceptance Testing	User Acceptance Testing is a testing activity conducted by the user intended to verify a CI, IT service, or process meets a specification. It is also used to validate whether agreed requirements have been met.
Work-around	Work-arounds for problems are documented in known error records and are intended to reduce or eliminate the impact of an incident or problem for which a full resolution is not yet available. Work-arounds for incidents that do not have associated problem records are documented in the incident record.
Work Instruction	The Work Instruction is a document containing detailed instructions that specify exactly what steps are followed to carry out an activity. A work instruction contains much more detail than a procedure and is only created if very detailed instructions are needed.

Appendix C – CAPACITY MANAGEMENT ACTIVITIES

Table C-6-1. Program Level Process Activities Descriptions

Program Level Process Activities Descriptions							
ID	**Sub-Process**	**Input**	**Input Source**	**Activity Steps**	**Output**	**Output Recipient**	**Supporting Organization**
Update Baseline							
A.1	BCM	• Business Capacity Baseline (N-1) • Output from G.1	• Business Capacity Database	Publish new baseline based on changes in Business plans	• Updated Business Capacity Baseline (N+1).	• Business Capacity Database	Capacity Management
A.2	SCM	• Service Capacity Baseline (N-1); • Output from G.2	• Service Capacity Database	Publish new baseline based on changes in Service delivery plans	• Updated Service Capacity Baseline (N+1).	• Service Capacity Database	Capacity Management
A.3	RCM	• Resource Capacity Baseline (N-1); • Output from G.3	• Resource Capacity Database	Publish new baseline based on changes in Resource deployment plans	• Updated Resource Capacity Baseline (N+1).	• Resource Capacity Database	Capacity Management
Program Level – Analysis							
B.1.1	BCM	• Business Capacity Baseline; • Options and Recommendations from Project Level Capacity Management	• Business Capacity Database; • Project Level Capacity Management	Review Options and Recommendations from project level capacity management plan; Examine measurements for changes in customer demand for transaction processing; Compare actual transaction volumes to expected activity level.	• Business Capacity Management Reports; • Options and alternatives to meet changing customer demand from project level plans; • Reset exception level if transaction level has changed.	Program Level Engineering, Cost / Benefit Analysis, Root Cause Analysis, Tuning, Application Sizing, and Upgrade activities	Capacity Management with the support of: MCNOSC

Program Level Process Activities Descriptions							
ID	**Sub-Process**	**Input**	**Input Source**	**Activity Steps**	**Output**	**Output Recipient**	**Supporting Organization**
B.1.2	SCM	• Service Capacity Baseline; • Options and Recommendations from Project Level Capacity Management	• Service Capacity Database; • Project Level Capacity Management	Review Options and Recommendations from project level capacity management plan; Examine measurements for failure to meet expected service levels for transaction processing; Compare actual SLR and SLA measurements to expected levels;	• Service Capacity Management Reports; • Options and alternatives to meet desired service levels from project level plans; • Reset exception level if service level has changed.	Program Level Engineering, Cost / Benefit Analysis, Root Cause Analysis, Tuning, Application Sizing, and Upgrade activities	Capacity Management with the support of: MCNOSC
B.1.3	RCM	• Resource Capacity Baseline; • Options and Recommendations from Project Level Capacity Management	• Resource Capacity Database; • Project Level Capacity Management	Review Options and Recommendations from project level capacity management plan; Examine measurements to determine if the current level of utilization is approaching the saturation level for any server, storage, or network resource. Examine measurements to determine if actual utilization is tracking against projected utilization.	• Resource Capacity Management Reports; • Options and alternatives to meet changing workload demand from project level plans; • Reset exception level if utilization level of any server, storage, or network has changed.	Program Level Engineering, Cost / Benefit Analysis, Root Cause Analysis, Tuning, Application Sizing, and Upgrade activities	Capacity Management with the support of: MCNOSC
Program Level – Engineering							
B.2.1	BCM			No activity required.			
B.2.2	SCM			No activity required.			
B.2.3	RCM	• Resource Capacity Database; • Configuration Items; • Output from B.1.3	• Resource Capacity Database; • Configuration Management Database	Determine if IT infrastructure alternatives needed to meet expected demand are compatible with existing	• Set of recommendations / alternatives of infrastructure changes to meet changing	Financial Management Process	Capacity Management; Project Level Capacity Management

Program Level Process Activities Descriptions							
ID	**Sub-Process**	**Input**	**Input Source**	**Activity Steps**	**Output**	**Output Recipient**	**Supporting Organization**
				infrastructure.	workload demand compatible with existing infrastructure.		
Program Level – Cost Benefit Analysis							
B.3.1	BCM			No activity required.			
B.3.2	SCM			No activity required.			
B.3.3	RCM	• Resource Capacity Database; • Configuration Items; • Budgets; • Output from B.1.3	• Resource Capacity Database; • Configuration Management Database; • Financial Management Process;	Rank IT infrastructure alternatives using cost / benefit analysis.	• Set of recommendations / alternatives of infrastructure changes to meet changing workload demand ordered by cost / benefit. Analysis of impact to budget.	Financial Management Process	Capacity Management
Program Level – Root Cause Analysis							
B.4.1	BCM	• Business Capacity Database; • Business Requirements / Drivers; • Incidents; Problems	• Business Capacity Database; • Incident Reports and • Problem Reports from MCNOSC	For Incident or Problem reports, determine cause of issue and alternatives for corrective action.	• Set of recommendations / alternatives to meet changes in demand of customer transaction processing.	Change Management Process	Capacity Management with the support of: MCNOSC
B.4.2	SCM	• Service Capacity Database; Service Agreement Information • Incidents; Problems	• Service Capacity Database; • SLAs, SLRs from Business Policy and Planning; • Incident Reports and • Problem Reports from MCNOSC	For Incident or Problem reports, determine cause of failure to meet expected service levels and alternatives for corrective action.	• Set of recommendations / alternatives to continue to meet expected service levels.	Change Management Process	Capacity Management with the support of: MCNOSC
B.4.3	RCM	• Resource Capacity Database; • Operational Schedules;	• Resource Capacity Database; • Configuration Management	For Incident or Problem reports, determine cause of level of utilization approaching the saturation level for any	• Set of recommendations / alternatives to avoid reaching saturation level for ant server,	Change Management Process	Capacity Management with the support of: MCNOSC

Program Level Process Activities Descriptions							
ID	**Sub-Process**	**Input**	**Input Source**	**Activity Steps**	**Output**	**Output Recipient**	**Supporting Organization**
		Configuration Items; Incidents; Problems	Database; • Operational Schedules; • Incident Reports and • Problem Reports from MCNOSC	server, storage, or network resource.	storage, or network resource.		
Program Level – Tuning							
C.2.1	BCM	• Business Capacity Database; • Business Requirements / Drivers; • Options and Recommendations from Project Level Capacity Management	• Business Capacity Database; • Business Policy and Planning; • Project Level Capacity Management	Review customer transaction forecasts to determine if additional capacity requirements can be met by rescheduling lower priority workloads.	• Publish report of changes needed to workload scheduling to accommodate additional workload without acquiring additional infrastructure resources.	Change Management Process	Capacity Management with the support of: MCNOSC
C.2.2	SCM	• Service Capacity Database; • Service Agreement Information; • Options and Recommendations from Project Level Capacity Management	• Service Capacity Database; • SLAs, SLRs from Business Policy and Planning; • Project Level Capacity Management	Review future projections of SLRs and SLAs under changing transaction demands. Determine if rescheduling lower priority workload can avoid service level breaches.	• Publish report of changes needed to workload scheduling to maintain expected service levels without acquiring additional infrastructure resources.	Change Management Process	Capacity Management; Project Level Capacity Management MCNOSC
C.2.3	RCM	• Resource Capacity Database; • Operational Schedules; • Configuration Items; • Options and Recommendations from Project Level Capacity	• Resource Capacity Database; • Configuration Management Database; • Operational Schedules from MCNOSC; • Project Level	Review future projections of IT infrastructure resource utilization to determine if rescheduling lower priority workload can avoid saturating hardware resources.	• Publish report of changes needed to workload scheduling to avoid reaching saturation level of existing IT infrastructure resources.	Change Management Process	Capacity Management with the support of: MCNOSC

Program Level Process Activities Descriptions							
ID	**Sub-Process**	**Input**	**Input Source**	**Activity Steps**	**Output**	**Output Recipient**	**Supporting Organization**
		Management	Capacity Management				
Program Level – Application Sizing							
C.3.1	BCM	• Business Capacity Database; • Business Requirements / Drivers; • Options and Recommendations from Project Level Capacity Management	• Business Capacity Database; • Business Policy and Planning; • Project Level Capacity Management	Review customer estimates of changes in transaction volumes resulting from new or enhanced application.	• Publish report of expected changes in customer transaction volumes caused by new or enhanced application.	Financial Management Process	Capacity Management with the support of: MCNOSC
C.3.2	SCM	• Service Capacity Database; • Service Agreement Information; • Options and Recommendations from Project Level Capacity Management	• Service Capacity Database; • SLAs, SLRs from Business Policy and Planning; • Project Level Capacity Management	Review predictions of service level changes caused by new or enhanced application.	• Publish report of expected changes in service levels caused by new or enhanced application.	Financial Management Process	Capacity Management with the support of: MCNOSC
C.3.3	RCM	• Resource Capacity Database; • Operational Schedules; Configuration Items; • Options and Recommendations from Project Capacity Plan	• Resource Capacity Database; • Configuration Management Database; • Operational Schedules; • Options and Recommendations	Review predictions of future IT infrastructure resource utilization caused by new or enhanced application. Determine additional resources needed to meet application demand.	• Publish report of expected changes in IT infrastructure resource utilization levels as a result of new or enhanced application. • Recommend additional equipment needed to meet application demand. • Program Level Decision & Availability Options	Financial Management Process	Capacity Management with the support of: MCNOSC

Program Level Process Activities Descriptions							
ID	**Sub-Process**	**Input**	**Input Source**	**Activity Steps**	**Output**	**Output Recipient**	**Supporting Organization**
					• Publish Program Level Acquisition and Implementation Plan.		
Program Level – Upgrade							
C.4.1	BCM			No activity required.			
C.4.2	SCM	• Service Capacity Database; • Service Agreement Information	• Service Capacity Database; • SLAs, SLRs from Business Policy and Planning	Determine impact of infrastructure upgrade or technology change on SLAs and SLRs.	• Publish report of expected change to service levels as a result of infrastructure upgrade or technology change.	Financial Management Process	Capacity Management with the support of: MCNOSC
C.4.3	RCM	• Resource Capacity Database; • Operational Schedules; Configuration Items	• Resource Capacity Database; • Configuration Management Database; • Operational Schedules from MCNOSC	Determine impact to IT infrastructure resource utilization levels as a result of upgrade or technology change.	• Publish report of expected changes to IT infrastructure resource utilization levels as a result of upgrade or technology change. • Publish a list of equipment needed to accomplish upgrade or technology change. • Publish Program Level Decision & Availability Options. • Publish Program Level Acquisition and Implementation Plan.	Financial Management Process	Capacity Management with the support of: MCNOSC

Table C-6-2. Performance Management Activity Descriptions

Performance Management Activity Descriptions							
ID	**Sub-Process**	**Input**	**Input Source**	**Activity Steps**	**Output**	**Output Recipient**	**Supporting Organization**
Monitor							
D.1	BCM	• Business Requirements / Drivers; • Threshold and Alarm Information	• Business Capacity Database; • information provided by strategy and planning organizations	Review, Validate, Verify and Recommend actual customer measurements for transaction processing.	• Updated Business Capacity Database; • Incident or Problem Report if Threshold Level is breached.	• Analyze Activity • Capacity Management Database	Capacity Management with the support of: Business Policy and Planning
D.2	SCM	• Service Agreement Information; • Threshold and Alarm Information	• Service Capacity Database; • SLAs, SLRs from Business Policy and Planning; • Transaction Logs and Transactions Monitors	Review, Validate, Verify and Recommend measurements of service levels delivered by transaction processing.	• Updated Service Capacity Database; • Incident or Problem Report if Threshold Level is breached.	• Analyze Activity	Capacity Management with the support of: Business Policy and Planning MCNOSC
D.3	RCM	• Data Collected from: Server monitor tools, Storage monitor tools, Network monitor tools	• Resource Capacity Database; • Server monitor tools, Storage monitor tools, Network monitor tools from MCNOSC	Review, Validate, Verify and Recommend measurements of IT infrastructure resources consumed by transaction processing.	• Updated Resource Capacity Database; • Incident or Problem Report if Threshold Level is breached.	• Analyze Activity	Capacity Management with the support of: MCNOSC
Analyze							
E.1	BCM	• Business Capacity Database; • Business Requirements / Drivers; • Incidents; Problems; • Change Management Requests;	• Business Capacity Database; • Business Policy and Planning; • Incident Reports and Problem Reports from MCNOSC; • Change Management	Examine measurements for changes in customer demand for transaction processing; Compare actual transaction volumes to expected activity level.	• Incident or Problem Report if Threshold Level is breached. • Reset exception level if transaction level has changed. • Change analysis and approval for Change Management Requests.	• Tune Activity	Capacity Management with the support of: Business Policy and Planning

Performance Management Activity Descriptions							
ID	**Sub-Process**	**Input**	**Input Source**	**Activity Steps**	**Output**	**Output Recipient**	**Supporting Organization**
		• Output from D.1;	Process;		• Threshold recommendations	• Event Management	
E.2	SCM	• Service Capacity Database; • Service Agreement Information; • Incidents; Problems; • Change Management Requests; • Output from D.2	• Service Capacity Database; • SLAs, SLRs from Business Policy and Planning; • Incident Reports and Problem Reports from MCNOSC; • Change Management Process;	Examine measurements for failure to meet expected service levels for transaction processing; Compare actual SLR and SLA measurements to expected levels	• Incident or Problem Report if Threshold Level is breached. • Reset exception level if service level has changed. • Change analysis and approval for Change Management Requests.	• Perform Tuning Activity	Capacity Management with the support of: Business Policy and Planning
E.3	RCM	• Resource Capacity Database; • Operational Schedules; Configuration Items; Incidents; Problems; • Change Management Requests; • Output from D.3	• Resource Capacity Database; • Configuration Management Database; • Operational Schedules, Incident Reports, Problem Reports from MCNOSC; • Change Management Process	Examine measurements to determine if the current level of utilization is approaching the saturation level for any server, storage, or network resource. Examine measurements to determine if actual utilization is tracking against projected utilization.	• Incident or Problem Report if Threshold Level is breached. • Reset exception level if utilization level of any server, storage, or network has changed. • Change analysis and approval for Change Management Requests.	• Perform Tuning Activity	Capacity Management with the support of: MCNOSC Engineering
Perform Tuning							
F.1	BCM	• Business Capacity Database; • Business Requirements / Drivers; • Incidents and Problems;	• Business Capacity Database; • Incident Reports and • Problem Reports from MCNOSC; • Business Policy and	If actual transaction demand exceeds predicted demand, determine if workload volume has changed or if an anomaly exists.	• Prepare updated Business Capacity Baseline (N+1) if workload increase; • No action if anomaly.	• Update Business Capacity Baseline Activity	Capacity Management with the support of: MCNOSC Business Policy and Planning

Performance Management Activity Descriptions							
ID	**Sub-Process**	**Input**	**Input Source**	**Activity Steps**	**Output**	**Output Recipient**	**Supporting Organization**
		• Output from E.1	Planning				Engineering
F.2	SCM	• Service Capacity Database; • Service Agreement Information • Incidents and Problems; • Output from E.2	• Service Capacity Database; • SLAs, SLRs from Business Policy and Planning; • Incident Reports and • Problem Reports from MCNOSC	If expected SLRs or SLAs are not being met, determine if transaction prioritization requires adjustment or if an adjustment must be made to the current SLRs or SLAs.	• Prepare updated Service Capacity Baseline (N+1) if SLRs or SLAs are adjusted; • Recommend prioritization changes sent to Implementation activity.	• Update Service Capacity Baseline Activity • Change Management Process	Capacity Management with the support of: MCNOSC Business Policy and Planning Engineering
F.3	RCM	• Resource Capacity Database; • Operational Schedules; Configuration Items; Incidents and Problems; • Output from E.3	• Resource Capacity Database; • Configuration Management Database; • Operational Schedules, • Incident Reports, • Problem Reports from MCNOSC	If the utilization of any IT infrastructure server, storage or network resource is approaching saturation, determine if a change to a hardware or software parameter, or a change to the storage configuration, or a change to the network configuration will solve the issue. If actual utilization is not tracking to predicted utilization, determine if a change to hardware or software parameter, or a change to the storage configuration, or a change to the network configuration will solve the issue.	• Prepare updated Resource Capacity Baseline (N+1) if actual utilization has changed; • Recommend changes to hardware or software parameter, storage configuration, or network configuration to Implementation activity.	• Update Resource Capacity Baseline Activity • Change Management Process	Capacity Management with the support of: MCNOSC Engineering
Perform Implementation							
G.1	BCM	• Business Capacity Database; • Business	• Business Capacity Database; • Updated Business	When increase in transaction volume is determined to be a result of a change in	• Deliver updated Business Capacity Baseline (N+1) to Update Baseline	• Update Business Capacity Baseline	Capacity Management with the support

Performance Management Activity Descriptions							
ID	**Sub-Process**	**Input**	**Input Source**	**Activity Steps**	**Output**	**Output Recipient**	**Supporting Organization**
		Requirements / Drivers; • Updated Business Capacity Baseline (N+1); • Output from F.1	Capacity Baseline (N+1) from Tuning activity; • Business Policy and Planning	Business Requirements / Drivers, the baseline will be adjusted.	activity.	Activity	of: Business Policy and Planning
G.2	SCM	• Service Capacity Database; • Service Agreement Information; • Output from F.2	• Service Capacity Database; • Service Agreement Information from Business Policy and Planning; • Updated Service Capacity Baseline (N+1) from tuning activity.	When changes to SLAs or SLRs or workload prioritization are needed, determine if the baseline will be adjusted. Determine prioritization changes needed.	• Deliver updated Service Capacity Baseline (N+1) to Update Baseline activity. • Recommended prioritization changes sent to Change Management process.	• Update Service Capacity Baseline Activity • Change Management Process	Capacity Management with the support of: Business Policy and Planning MCNOSC
G.3	RCM	• Resource Capacity Database; • Operational Schedules; Configuration Items; • Output from F.3	• Resource Capacity Database; • Configuration Management Database; • Operational Schedules from MCNOSC	When changes to hardware or software parameters, storage configuration, or network configuration are needed, determine if the baseline will be adjusted. Determine hardware or software parameter changes, storage configuration, or network configuration needed.	• Deliver updated Resource Capacity Baseline (N+1) to Update Baseline activity. • Recommended changes to hardware or software parameter, storage configuration, or network configuration to Change Management process.	• Update Resource Capacity Baseline Activity • Change Management Process	Capacity Management with the support of: MCNOSC Engineering

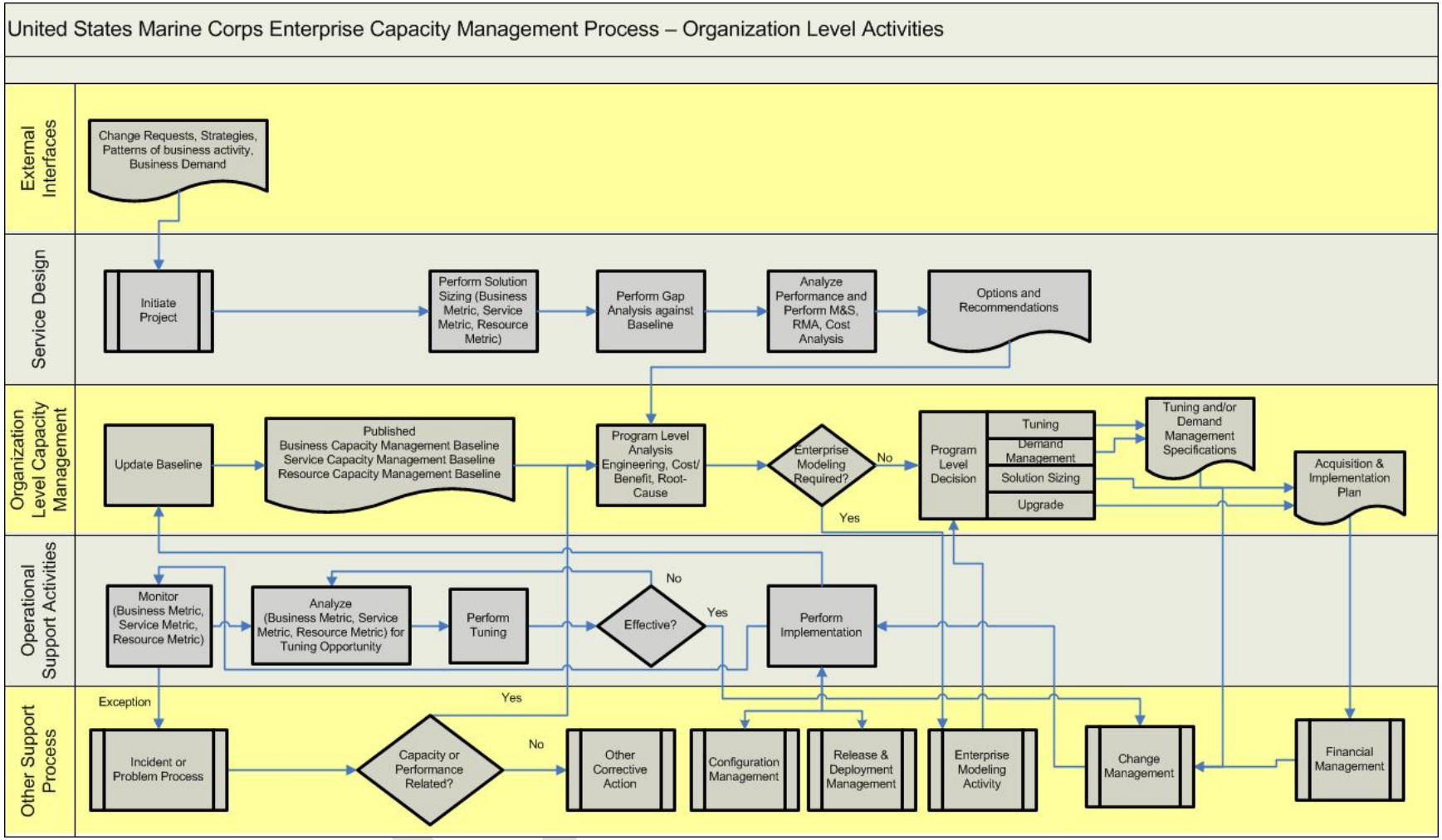

Figure C-1. USMC Enterprise Capacity Management