

Department of Veterans Affairs (VA)

Veterans Relationship Management (VRM) Clinical Video TeleConferencing (CVT)

System Design Document



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1. Introduction

The objective of the Telehealth Scheduling System (TSS) project is to enhance efficiency and optimize resource utilization in the clinical telehealth programs of the VA by providing a single, consolidated platform within which users can manage the availability and booking of a variety of resources for remote patient servicing, as defined by inter-facility Telehealth Service Agreements (TSA) and Master Telehealth Service Agreements (MTSA).

The Clinical Video TeleConferencing TSS project, as part of the New Models of Care (NMOC) functional area, will deploy a scheduling solution that has the ability to schedule a patient and provider as a pair on the VistA system, where the provider is located, and where the patient is located. This would also include the ability to document all Clinical Video TeleConferencing (CVT) activities -- including event closures on both sides. As a result, Telehealth units will experience a considerable time and expense savings.

This scheduling solution will utilize an existing Microsoft Commercial Off The Shelf (COTS) product called Customer Relationship Management (CRM). This tool has already been in production use by the Veterans Relationship Management (VRM) group for Veterans Benefit Administration (VBA). The CVT Scheduling program will be a minor application hosted on the existing CRM infrastructure, which is currently housed at [REDACTED]. It will be a web-based Graphical User Interface (GUI) tool, which will later have an interface with VistA utilizing either MDWS or the Java version of MDWS for scheduling of sessions/appointments.

1.1. Purpose of this document

The purpose of this document is to describe, in sufficient detail, how the proposed system is to be constructed. The System Design Document (SDD) translates the Requirement Specifications into a document from which the developers can create the actual system. It identifies the top-level system architecture, and identifies hardware, software, communication, and interface components.

1.2. Identification

The SDD applies to the CVT system and software. Microsoft (MS) is the software supplier for the following applications utilized in CVT:

- MS Dynamics CRM 2011 (v5.0)
 - MS CRM Sales Standard/Professional
 - MS CRM Customer Service Standard/Professional
 - MS CRM Suite Standard/Professional
 - MS Dynamics CRM Software Development Kit (SDK)
 - MS Dynamics CRM Customer Care Accelerator [optional]
- MS Internet Explorer (v9)
- MS Windows 7
- MS Office Suite 2010
- MS Structured Query Language (SQL) Server 2008 R2
- MS Windows Server

The standards that apply to this design document, at a minimum, include:

- VA Handbook 6102 Internet/Intranet Web-site requirements
- VA Handbook 6500.3 Certification & Accreditation

1.3. Scope

This document covers the overall high-level descriptions through the project perspectives, functions, characteristics, constraints, assumptions, and dependencies as outlined in Section 3. The specific requirements are detailed by the external interface requirements, classes, performance requirements, design constraints, software system attributes, and other requirements. The CVT solution will have the following functionalities:

- Scope Inclusions:

CVT Increment 3 Includes
Site and Facility management – Enables users to manage participating VA facilities and their constituent Sites.
Equipment and Resource Management – Enables users to manage equipment, technicians, and other necessary items for patient servicing individually and in pre-determined groupings.
Resource and location booking – Enables Users to book groupings of Resources, Locations, Sites, and Facilities on a single record, scheduling and reserving as appropriate.
Resource Calendar – Enables Users to manage resources from a calendar view, allowing for immediate and simplified data access.
Role-based interfaces – Provides Leads, Coordinators, Schedulers, Technicians and Presenters access to appropriate information based on sensitivity level and/or role.
Deploy CVT Scheduling System (TSS 1.0) to one VISN in production. Initiate Vista Integration development.

- Scope Exclusion:

CVT Increment 3 Excludes
Deploy Vista integrated tool nationwide – This functionality is planned for the Increment 4 release but is not part of this Increment.
Other external system integrations
Contact Information Synchronization
CRM Reports & Dashboard Reporting
SharePoint Integration

At a more detailed level than above, the following activities and capabilities are in scope for the CVT Solution:

- Enter in summary TSA information including:
 - Resources required for the Patient clinic
 - Resources required for the Physician clinic
- Create Service Sites
- Enter in work hours for all resources

- Note: Work hours are daily schedules sometimes referred to as free/busy time.
- Create a Service activity (TSA) in CRM:
 - The user will be able to select a Service Site for a patient and identify a list of times when all of the required resources for both the patient and physician will be available. Once a time is selected, a Service Activity (appointment) is created for the Veteran and the related Resources will be blocked off from other appointments within CVT for that time period.
 - A TCT would then have to manually schedule the same resources in VistA.
- Service Activity Management
- Service Scheduling
- VA CVT Resource Management
- VA CVT TSA Management

The following activities are out of scope for the CRM/UD Solution:

- Automated booking of appointments in constituent VistA systems (Users will need to process these manually for Increment 1)
- Identity Access Management (IAM) process
- Master Veteran Demographics Information synchronization with VistA
- Provider preferences and contact information not in AD Active Directory
- Synchronization over time of Provider AD info
- The TSA creation and lifecycle process
- External System Integration (i.e. – Tandberg Management Suite (TMS))
- SharePoint Integration
- Reports or inline BI
- Dashboards

Future system goals include:

- Dashboards & Reports
- Scheduling integration with VistA
- Demographic Data synchronization with VistA
- Workflow / Process-managed TSA creation and maintenance

1.4. Relationship to Other Plans

The SDD supports the requirements defined within the CVT Requirements Specification Document (RSD). It also relates to the following documents:

- VRM Configuration Management Plan (CMP)
- VRM Quality Assurance (QA) Plan

- CRM/UD Integrated Project Team (IPT) Charter
- CRM/UD Project Charter
- CRM/UD Master Test Plan
- VRM Risk Log
- VRM Acquisition Strategy
- VRM Communications Plan
- VRM Risk Management Plan
- VA PMAS Guide v3.0
- MS Dynamics CRM 2011 (v5.0) Installation and User Guides
- CRM/UD User Guide

1.5. Methodology, Tools, and Techniques

For requirements, the CRM/UD project will utilize the International Business Machines (IBM) Rational Requirements Composer (RRC), Rational Team Concert (RTC), Rational Quality Manager (RQM), and the VRM change control process plan. The CRM/UD IPT is the current governing body. The CRM/UD project team is using Program Management Accountability System (PMAS) processes and the latest ProPath templates for all artifacts, including design documents.

1.6. Policies, Directives, and Procedures

The following standards and regulations apply to the design of this system:

- C.5 VAAR 852.219-10 VA NOTICE OF TOTAL SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS SET-ASIDE (DEC 2009)
- Federal Information Security Management Act (FISMA) of 2002
- Federal Information Processing Standard (FIPS) Pub 201, Personal Identity Verification for Federal Employees and Contractors, February 25, 2005
- VA Directive 6102, Internet/Intranet Services
- VA Handbook 6102, Internet/Intranet Services
- Electronic and Information Technology Accessibility Standards (36 CFR 1194)
- Office of Management and Budget (OMB) Circular A-130
- Sections 504 and 508 of the Rehabilitation Act (29 U.S.C. § 794d), as amended by the Workforce Investment Act of 1998 (P.L. 105-220), August 7, 1998
- VA Directive 6500, Information Security Program
- VA Handbook 6500.5, Incorporating Security and Privacy into the System Development Life Cycle
- Office of Enterprise Development (OED) ProPath Process Methodology
[http://\[REDACTED\]](http://[REDACTED])
- PMAS portal [http://\[REDACTED\]](http://[REDACTED])
- Technical Reference Model (TRM)
- National Institute Standards and Technology (NIST) Special Publications

- VA Information Technology (IT) Program Management (VA Handbook 6062), no date
- VA Facility Directory [http://\[REDACTED\]](http://[REDACTED])
- VA Enterprise Architecture (EA) - The P/PMS Contractor shall ensure that all projects adhere to the one VA EA [http://\[REDACTED\]](http://[REDACTED])
- The Program Managers' Guide to the Integrated Baseline Review Process (Office of the Undersecretary of Defense), April 2003 [G]
- FISMA [http://\[REDACTED\]](http://[REDACTED])

Any regulations related to security may impose access restrictions or other protection related limitations on the system.

1.7. Constraints

The TSS solution uses MS Dynamics CRM and will eventually utilize the security functionality of Identity Access Management (IAM) when integration with VistA is ready for development and release.

The following constraints are applied to the TSS system:

- The initial design and development will be done on a CRM Online instance and laptops. At some point the application will be moved to the AIDE environment at [REDACTED]. This may be delayed while we await the development team getting access to [REDACTED].
- Microsoft cannot control the availability of the [REDACTED] resources.
- VistA will continue to be the operational system of record for clinic appointments. TSS will only be aware of the appointments which exist in its system. Therefore it is possible that CVT resource availability may differ from the actual VistA resource availability.

1.8. Design Trade-offs

The design chosen for the TSS system comes from a COTS product and is not connected to any external systems at this time. Therefore, no significant design tradeoffs have been encountered in the process of developing this solution.

1.9. User Characteristics

Below are the various roles in use for the CVT solution, along with general descriptions and supplemental security roles used to provide adequate permission structuring.:

Role	Primary Job Functions	Additive Roles
VISN Lead	<ul style="list-style-type: none">• Manages Facilities, Sites, Resource Groups, Resources, Resource Calendars• General Application Administration, Updates Metadata Libraries	<ul style="list-style-type: none">• CVT User• CVT Application Administrator
Facility Telehealth Coordinator	<ul style="list-style-type: none">• Manages Facilities, Sites, Resource Groups, Resources, Resource Calendars• Manages Master TSAs and TSAs	<ul style="list-style-type: none">• CVT User• Facility Telehealth Coordinator
Telehealth Clinical Technician	<ul style="list-style-type: none">• Manages Facilities, Sites, Resource Groups, Resources, Resource Calendars• Schedules Service Activities (appointments)• Creates and Edits Patients	<ul style="list-style-type: none">• CVT User• Telehealth Clinical Technician• CVT Scheduler
CVT Scheduler	<ul style="list-style-type: none">• Schedules Service Activities• Creates and Edits Patients	<ul style="list-style-type: none">• CVT User• CVT Scheduler
Telehealth Provider/Clinician	<ul style="list-style-type: none">• Provides telehealth clinical services	<ul style="list-style-type: none">• CVT User
Telepresenter	<ul style="list-style-type: none">• Clinical presenter of patient	<ul style="list-style-type: none">• CVT User
CVT User	<ul style="list-style-type: none">• A User of the CVT Application• Owns calendar	<ul style="list-style-type: none">• CVT User• (base role)

1.9.1. User Problem Statement

Clinical Video Telehealth (CVT) scheduling is a complex undertaking for several reasons. Among them: Typically, each facility (medical center / healthcare system) has a separate VistA database:

- Two VistA clinics, one for the patient side encounter and one for the provider side encounter must be scheduled.
- While schedulers usually have access to a VistA system, it is a problematic undertaking to obtain access to additional remote VistA systems.

Unlike traditional, face to face encounters, CVT encounters entail the use of (and subsequent need for) a variety of other resources. Further, these resources must be available synchronously:

- Teleprovider time for the clinical encounter
- Room for the Teleprovider
- Necessary equipment at the provider site
- Secure telecommunications connection between the provider site and patient sites
- Room for clinical activity at the patient site
- Necessary equipment at the patient site
- Telepresenter time for the clinical encounter
- Patient

Scheduler role definitions and responsibilities are highly variable across VHA. The scheduling of resources beyond those traditionally scheduled in Vista (provider and patient) fall outside the training and responsibility of clinical scheduling staff.

Historically, these scheduling complexities have been addressed through variably effective “work-arounds”, including commercially available scheduling software, Microsoft Outlook calendars and SharePoint, and locally developed scheduling solutions. While some of these solutions have met the need to schedule the additional resources, none of the existing processes have successfully interfaced with VistA. Additionally, these solutions have been resource intensive.

1.9.2. User Objectives

The Telehealth Scheduling System (TSS) is designed to address these issues, and offers the end-user a comprehensive solution for the scheduling of CVT events. Primary features include:

1. The process and organization is driven by Telehealth Service Agreements: TSAs and TSA data;
2. Ability to schedule multiple sites, including patient and provider sites, simultaneously;
3. Ability to inventory and schedule resources, such as rooms, equipment and Telepresenter staff;
4. TSS user log-on is the same as the VA network user log-on because TSS is interfaced with Active Directory;
5. Multi-Level access for users based on User ID and Password;
6. Robust reporting capabilities.

In the interest of time and efficiency, TSS will be rolled-out across VHA with basic functionality (not including VistA Integration). Basic functionality will allow users to inventory, track, and schedule all rooms, technologies, and clinical staff involved in the telehealth process (telehealth clinicians, telepresenters, etc.). The system will further allow for the simultaneous scheduling of these resources at multiple sites. The primary feature of the fully functional version of the system will include the ability to schedule into multiple instances of VistA, at the affected telehealth sites. Future capabilities will include:

1. VistA scheduling integration.
2. TSA development and maintenance workflow/process.
3. TMS VTC booking/call initiation.
4. Video Anywhere scheduling for CVT-into-the-Home applications.
5. CareTone IP Management System, CIMS (electronic digital stethoscope, out of band).
6. Ability for synchronous data exchange with TMS / Remedy for equipment information.
7. Sophisticated notification features.

2. Background

2.1. Overview of the System

TSS is a web-based application aimed at improving customer service, scheduler efficiency, and resource utilization levels by effectively providing schedulers with dependable resource availability data which can be used to rapidly create and maintain appointments for individual or group services. TSS is designed to be intuitive and simple to the scheduler while providing fast and easy access to scheduling abilities. This enables schedulers to rapidly respond to service requests, avoid over-bookings, and optimize the use of VA resources wherever they may be found, all while keeping safely and easily within the guidelines of the TSAs formed between individual VA facilities.

Properly configured, the TSS solution will enable schedulers to quickly select a TSA and patient, then view all schedulable times, with the system itself accounting for the individual availability schedules of rooms, technologies, users, and more. Moreover, Users will be able to monitor resource availability at broad or narrow degrees in an intuitive calendar view, immediately familiar to because of its similarity to the ubiquitous Outlook calendar.

2.2. Overview of the Business Process

The TSS Project will support and enhance the operations of CVT within the VA by providing an accelerated, streamlined operational process for the scheduling of Group and Individual services for Veterans. By enabling the efficient scheduling of these resources, veterans at remote sites will be able to leverage the technologies and expertise of VA sites and facilities they would otherwise not have access to. This will dramatically improve the capability of the VA to deliver an enhanced quality of care and service. Moreover, by implementing a standardized solution across all VISNs, Veterans and their caregivers will be able to leverage the advantages of CVT across all VISNs, eliminating the regional barriers to service that now exist because of inconsistent practices and scheduling procedures.

The TSS Project will rely on Agile Project Management Methodology, more specifically Scrum Methodology, to enable incremental design and development while keeping the entire process open and transparent to the various stakeholders in the VA. This methodology is critical for establishing and maintaining a high level of stakeholder engagement and input for prioritization as development progresses.

The initial Pilot release of TSS will be limited in functionality to exclude any integration with outside systems or data sources. Subsequent to feedback and second iteration planning, integrations with the various VistA systems will be planned and implemented in order to both provide a data source for limited patient information and to provide a direct feed of scheduling data back into the VistA systems.

This incremental deployment planning is the surest way to provide rapid functional delivery for user feedback and system adaptation while minimizing time expenditure on waterfall-style advance planning which would need to be cyclically repeated in a feedback-integrating scenario.

The two major business processes that will be handled by this iteration are the input and management of facility, site, and resource data, and the scheduling process itself.



Veterans Affairs CVT Project:
Business Process Model

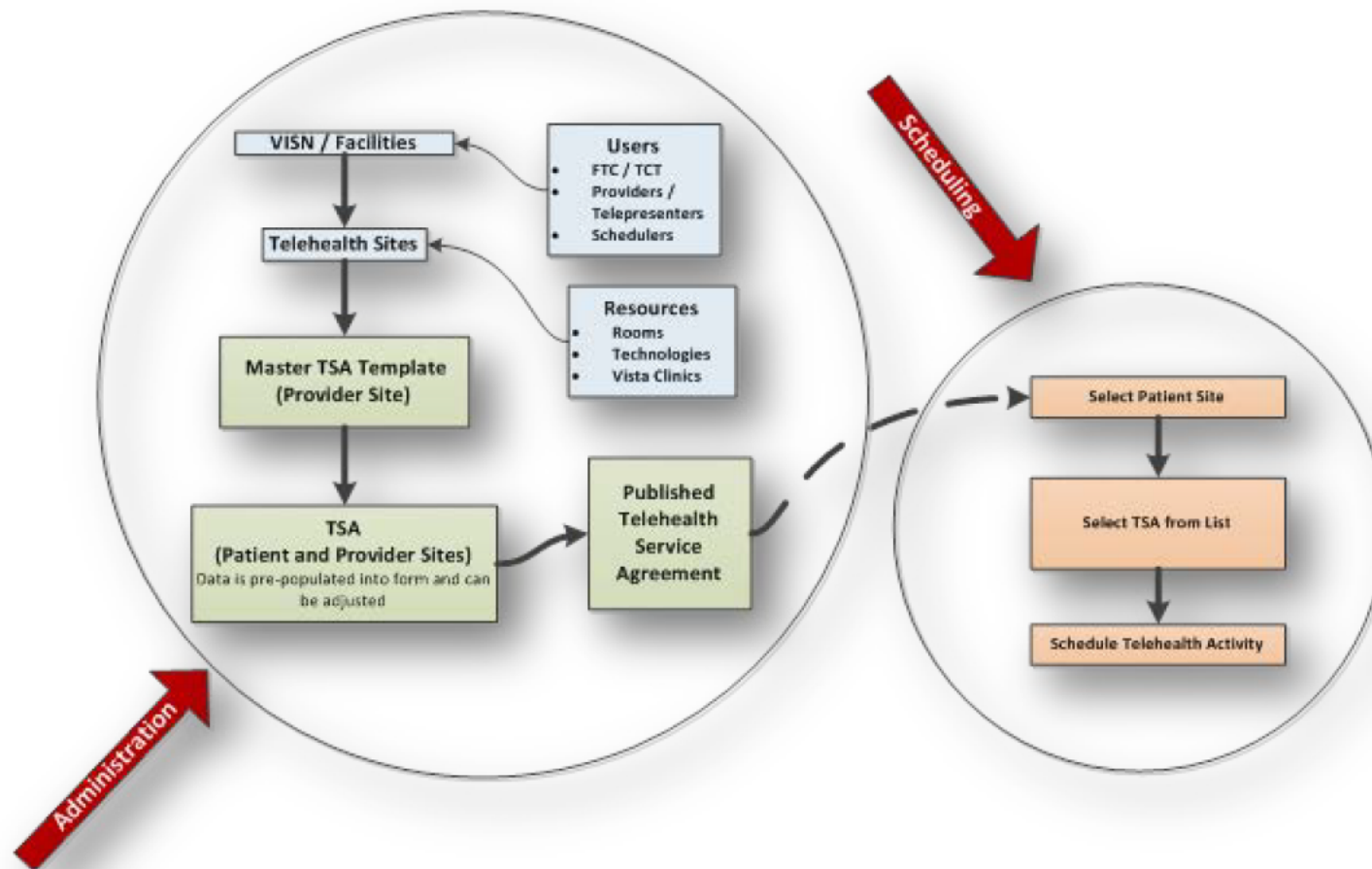


Figure 1 - Business Processes Diagram

Business Process ID	Business Process Name	Type	Owner	Description
1	Administration	Existing	VISN Leads, FTCs, TCTs	Administration and Configuration of the underlying data sets including Facilities, Sites, Resources, Users, MTSAAs, and TSAs
2	Scheduling	Existing	CVT Schedulers	Rapid Scheduling of appointments, enabled by careful administrative configuration.

2.3. Business Benefits

The desired solution provides benefits in enhancing scheduling efficiency and resource utilization by:

- Providing a rapid, single-form scheduling interface for CVT Schedulers.
- Automated availability tracking and accounting
- Time zone tracking and conversion
- A consolidated Calendar view for managing resource utilization.

Specific goals and objectives for this release of the CVT solution functionality include:

- Allow for the scheduling of diverse resource types and components.
- Automate the selection of available time slots.
- Enable schedulers to rapidly create appointments for Individual or Group services.
- Provide a consistent scheduling interface for all VISNs
- Providing role-based interfaces and security for various end users.

2.4. Assumptions and Constraints

The CVT initiative is the implementation of CRM to manage and expose data to CVT Schedulers in furtherance of broader Telehealth objectives. This approach is consistent with the VA-wide intention to move to the web services architecture based on SOA best practices.

2.4.1. Design Assumptions

The following assumptions influenced the design of this system.

- CVT Schedulers have a significant need for efficiency increase, so much so that preference must be given to this business operation's efficiency over the efficiency of configuration and data management.
- MS Dynamics CRM application server is going to reside in a secure cloud.
- The CRM/UD application will reside in the [REDACTED] environment.

Data Integration:

- No external systems will be integrated with the system for this release.
- MS Dynamics CRM will be implemented with VISNs, Facilities, and Sites pre-inserted. It is expected that Leads will need to reconfigure, rename, or add to this initial list to more accurately reflect their setup.
- Contacts will only be used to store basic information and will not contain detailed patient information
- VistA integration is planned as part of a subsequent release of the system.

Email Integration:

- MS Outlook is the email client.

2.4.2. Design Constraints

The following conditions or constraints will limit the range of design choices that are available:

Data Integration:

- Mandate to use existing VBMS Web Services.
- Use of existing Web Services that are functioning as wrappers around legacy Tuxedo services. Most of the business logic is coded in the Tuxedo services.
- Absence of Web Services critical to key CRM/UD functionality.
- Need for Web Services to be developed by teams external to VRM.

CRM Functionality:

- Mandate to not store Veteran data in CRM/UD.
- Accessing data as read-only using Web Services constrains CRM/UD from using native forms, therefore custom J-Script forms must be used to display data rapidly.

2.5. Overview of the Significant Requirements

The material in this section is not to replace either the existing functional and technical requirements documents, nor serve as the basis for the Requirements Traceability Matrix (RTM). It should only inform non-project personnel reading this document as to the basis for the design.

For more details on requirements, see the CVT RSD.

2.5.1. Overview of Significant Functional Requirements

The following is an overview of the major functional requirements for the system. The goal is not to include the full set of requirements in this document or to replace the functional requirements documents, but to identify the major functions to be performed and the few major requirements that drive the design that is described in the sections below.

These requirements are from the Business Requirements Document (BRD), which currently exists as Addendum 1.0 to the RSD.

ID	Specific Requirement/Synopsis	Requirement
NEEDCVT1	Ability to schedule a patient and provider as a pair on both the VistA system where the health care provider is located and the VistA system where the Veteran is located. This pair should be handled within and across VistA systems as synchronized event.	
NEEDCVT2	Ability to document all CVT activities including CVT event closure on both healthcare provider and veteran's local VistA systems.	Assumptions: 1. A CVT Scheduler (health care provider or care coordinator) has all necessary information for both the health care provider and Veteran locations at the time of scheduling. This data would include Provider's name, location, and time zone, Veteran's name/SSN, location, and time zone, Date/time of appointment; VISTA clinics to be used for the appointment (determined by the purpose of the visit or specialty of the provider, etc.) and window of time within which the consult (if via teleconsultation) needs to take place. 2. All clinical activity will be created/documented in the VistA system of Veteran's Medical Home (PACT initiative term – VistA system where the patient receives their primary care).

ID	Specific Requirement/Synopsis	Requirement
NEEDCVT3	A CVT scheduling system would reduce clerical error and improve workload capture, in addition to improving efficiency for provider and scheduler. There is a need for a single listing of daily scheduled CVT patients across facilities and VISNs. Health care providers currently do not have a clear view of CVT scheduled patients.	
OWNRCVT1	The system shall have the capacity to identify the Veteran.	
OWNRCVT2	The system shall have the capability to select locations of patient and healthcare provider.	
BDETCVT1	The system shall have the ability to capture Patient Location (including patient home).	<ul style="list-style-type: none"> • VistA clinics • Non-VA sites (e.g. DoD, IHS, Veteran's home)
BDETCVT2	The system shall have the ability to capture Provider Location including:	<ul style="list-style-type: none"> • Providers designated as privileged at the chosen Veteran location • VistA clinics • Non-VA sites (e.g. DoD, IHS, Contractor site)
OWNRCVT3	The system shall have the ability to generate an automatic Consult to register a Veteran at a provider location. The need will be determined by search for Veteran at a provider site.	
BDETCVT3	The system shall prompt to return to schedule event, allowing time for registration to occur.	
OWNRCVT4	The system shall provide an interface to schedule the following resources:	<ul style="list-style-type: none"> • CVT Rooms • CVT Equipment • Telepresenter
OWNRCVT5	The system shall have the ability to handle the creation, cancellation, or updates to a CVT appointment pair (patient and provider) as a single event (to prevent creation of orphans) within VistA and any interfacing system.	

ID	Specific Requirement/Synopsis	Requirement
OWNRCVT6	The system shall provide the ability to allow changes to a CVT appointment pair (patient and provider) to occur individually as needed to prevent creation of orphans or to correct errors.	
OWNRCVT7	The system shall allow visualization of VistA clinics in order to review and/or confirm correct Decision Support System (DSS) coding by request.	
OWNRCVT8	The system shall allow for appointments/events at non-VistA sites for Veterans that includes:	<ul style="list-style-type: none"> • Veteran home • Non-VA sites e.g. DoD, IHS, Veterans' home
OWNRCVT9	The system shall allow for appointments/events at non-VistA sites for Providers that includes:	<ul style="list-style-type: none"> • VA Contracted Providers at non-VA Sites • Non-VA sites e.g. DoD
OWNRCVT10	The system shall have the capability to process check-in, no-show, reschedule, cancellation, and walk-in.	
OWNRCVT11	The system shall have the capability to query and view of appointments by:	<ul style="list-style-type: none"> • Health care provider • Veteran • Pre-determined views (control by access, pre-built reports for quality management, e.g. where are telepresenters, room schedules, basic management reports)
OWNRCVT12	The system shall have the capability to set permissions to access lookup tables and scheduling processes determined in advance.	
OWNRCVT13	The system shall allow a health care provider to choose events to document/close:	<ul style="list-style-type: none"> • From Veteran identification information from a list (created by "action required" status on events for this provider.) • Allow for visualization by date, locations, or other selections.

ID	Specific Requirement/Synopsis	Requirement
OWNRCVT14	After an event is selected, the system shall provide a means to display all open consults on (at all locations) for Veteran, so provider can indicate which to close at the time if necessary (or proceed if not necessary). <i>Existing CPRS functionality shall be accessible to the CVT scheduling system.</i>	
OWNRCVT15	The system shall allow selection of a Veteran's Medical Home by healthcare provider from a list of locations where Veteran is registered. Documentation, such as a clinical progress note, would be captured to this system (for example, a Veteran that receives primary care in one facility, but also receives care from a primary care Provider while at another VA site while on vacation or "snowbird".)	
BDETCVT4	System shall provide a lookup capability and/or display the Veteran's Medical Home for primary care.	
OWNRCVT16	The system shall allow a provider to select from a list of standardized CVT note titles and enter clinical progress note content, service connection, and other question information, chooses/enters diagnosis(es) and chooses/enters clinical procedure code(s) (<i>System would allow healthcare provider to access their progress note templates</i>):	
BDETCVT5	The system shall build clinical progress note in Veteran's Medical Home VistA system.	
BDETCVT6	The system shall automatically create a clinical encounter on Veteran's Medical Home VistA system with a Q3014 procedure code.	
BDETCVT7	The system shall build clinical encounter on Provider's VistA system with GT (Procedure Code) modifier.	

ID	Specific Requirement/Synopsis	Requirement
BDETCVT8	The system shall build “pointer” note on Provider’s VistA system indicating that there is clinical content on Veteran’s VistA system.	
BDETCVT9	The system shall apply an electronic signature to both notes.	
BDETCVT10	The system shall allow for administrative closure of consults.	
OWNRCVT17	The system shall have the ability to convert the date/time of the appointment across time zones so the correct date and time of the appointment is displayed on all media at the respective provider and patient sites, but will then assign the appropriate date/time on the provider and patient VISTA encounters for VERA workload matching purposes.	
OWNRCVT18	The system shall provide a capability for patient self-scheduling.	

2.5.2. Functional Workload and Functional Performance Requirements

The following table includes significant Functional Workload and Functional Performance Requirements.

ID	Requirement
	Data volume for the CRM/UD system should start with 800 users in the first year, adding approximately that number each year thereafter. In the end, the system should be able to handle about 3000 concurrent users on average per year.
	Maintain 99.99% availability

A summary of the project’s compliance with Enterprise Infrastructure Engineering, IT Infrastructure Standards, and details of the Technical Analysis Review process can be found in the System Security Plan (SSP).

2.5.3. Operational Requirements

ID	Specific Requirement/Synopsis	Requirement
----	-------------------------------	-------------

ID	Specific Requirement/Synopsis	Requirement
NONFCVT1	Interface with other systems:	<ul style="list-style-type: none"> • Clinical Enterprise Video teleconferencing Network (CEVN) scheduling system to check availability of telecommunications connectivity • Data sources with rooms and designated purposes e.g. calendar/tracking system(s)/MS Outlook <ul style="list-style-type: none"> ○ Identification of the equipment in the room <ul style="list-style-type: none"> ▪ Video ▪ Peripheral equipment ▪ Status of mobile equipment e.g. wheeled carts • Staff – VistA data on staff (contract staff would also have to be in VistA)
NONFCVT2	Urgent appointment request facility	
NONFCVT3	A Memorandum of Understanding (MOU) and Service Level Agreement (SLA) between VHA and OI&T should specify service level requirements for a national CVT scheduling system.	
NONFCVT4	An Operations and Maintenance Plan (O&M Plan) should specify operational support, system robustness, and help desk for a national CVT scheduling system.	
NONFCVT5	A Continuity of operations plan (COOP) and disaster recovery plan should identify risks, mitigations, and contingencies for the national CVT scheduling system	

2.5.4. Overview of the Technical Requirements

The CVT technical requirements are included in Sections 2.5.1 and 2.5.3.

2.5.5. Overview of the Security or Privacy Requirements

The security requirements of CVT bifurcate access into VISN-restricted access and parental scheduling access. Business Units have been created for each VISN in order to silo the management of each VISN's Facilities, Sites, and Resources to within that VISN, while providing visibility of that data across the entire system for scheduling purposes.

ID	Requirement
N/A	No additional explicit Security or privacy requirements were outlined in the Business Requirements Document.

The CRM/UD system will require a new C&A. It is in compliance with the VA C&A process and compliance with the C&A process is documented in the PMP. Details about the CRM/UD C&A process can be found in the SSP.

2.5.6. System Criticality and High Availability Requirements

The CVT system is at "medium" mission criticality and will have 99.99% availability. Details of the availability requirements, approach to provide the required level of availability and disaster recovery, and the summary of the compliance with Enterprise Infrastructure Engineering can be found in the SSP.

2.5.7. Special Device Requirements

There are no special devices required for the CVT solution.

2.6. Legacy System Retirement

Legacy systems in place are specific to each individual VISN and include Outlook Calendars and SharePoint Calendars. Many of these systems are not free-standing and will not be retired at the time of CVT Go-Live, but will simply fall out of use for this purpose. Others which are dedicated to this specific purpose will be entirely retired. The table below contains a list in progress of such applications which will have their workload significantly reduced.

Legacy System or Legacy System Component	Retired or Workload Reduced	If Workload Reduced - How Much
Resource Outlook Calendar	Reduced	Specific to VISN
SharePoint Calendars	Reduced	Specific to VISN
COTS Scheduling Software	Retired	Specific to VISN
Locally developed scheduling solution(s)	Retired	Specific to VISN

3. Conceptual Design

3.1. Conceptual Application Design

MS Dynamics CRM 2011 contains native service scheduling capabilities perfectly suited to the needs of the CVT Scheduling process; allowing for the specified location tracking at facility and site levels, as well as the integration of diverse resource types from User to Room to Technology without any significant customization. The specific data points which must be tracked and the dichotomy between Patient Site and Provider Site determination, however, mandate the creation of a sort of 'super-structure' for the end-user interface which allows for the custom fields and divergent work processes of Individual and Group service activities.

In practice, this requires the duplication of certain system entities such as Facility and Site as ‘custom’ entities which then leverage plugins to create their corresponding system components. Figure 2 below illustrates this systemic bifurcation:

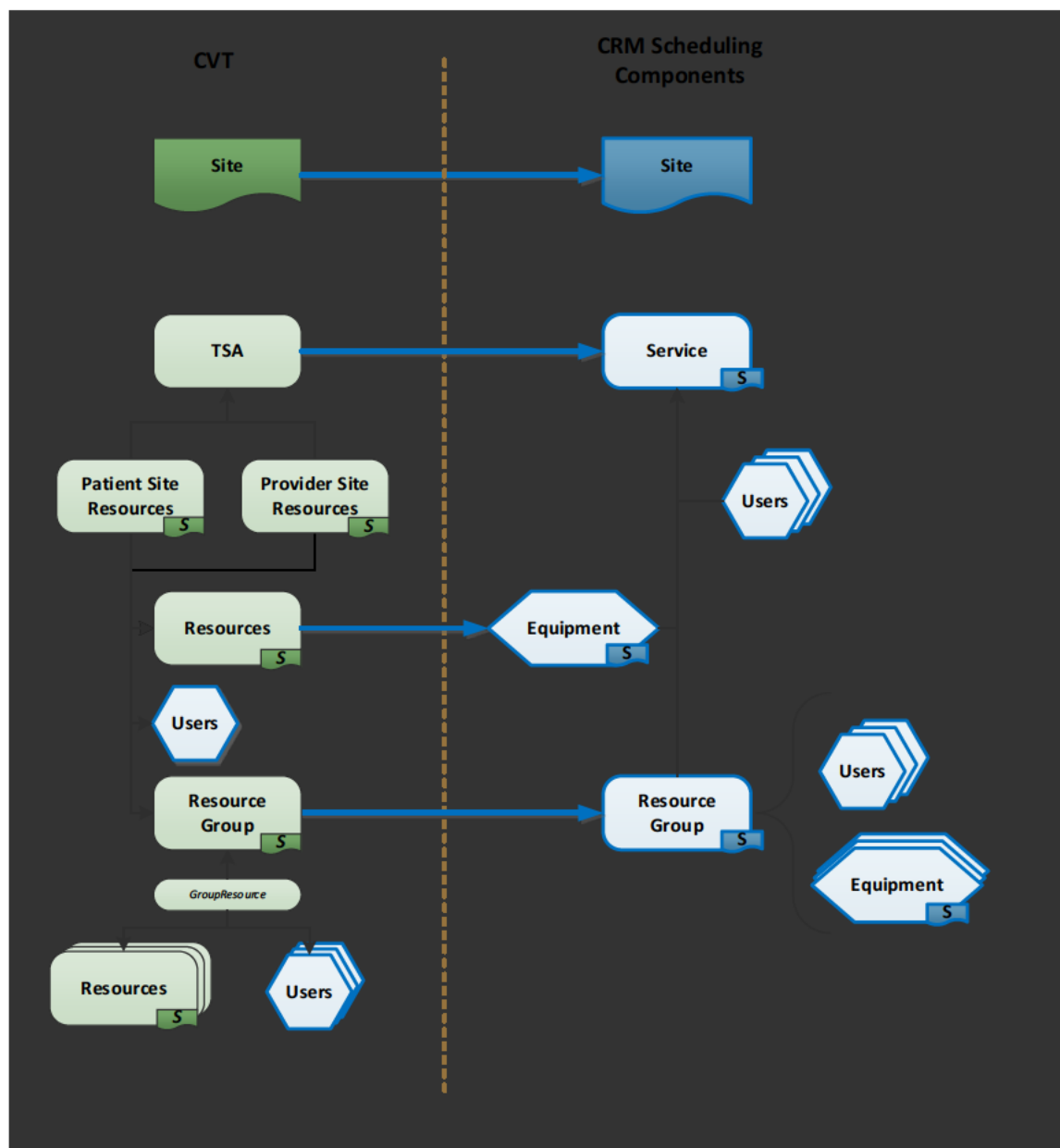


Figure 2 – CVT Conceptual Diagram

By effectively wrapping the existing CRM Scheduling functionality in a CVT-specific layer the system is able to provide an effectively tailored environment for users, structured according to familiar conventions and systems while minimizing the degree of necessary custom coding by leveraging existing structure and capabilities.

The present design of the system excludes external system integrations, but future releases are planned to include integrations with the VistA systems of constituent VISNs through web services.

3.1.1. Application Context

The CVT solution is independent of other external systems, aside from the authentication requirements of Active Directory and the email connectivity provided by Microsoft Exchange Server. Future connection is planned with individual VISN VistA systems, but is not included in this release.

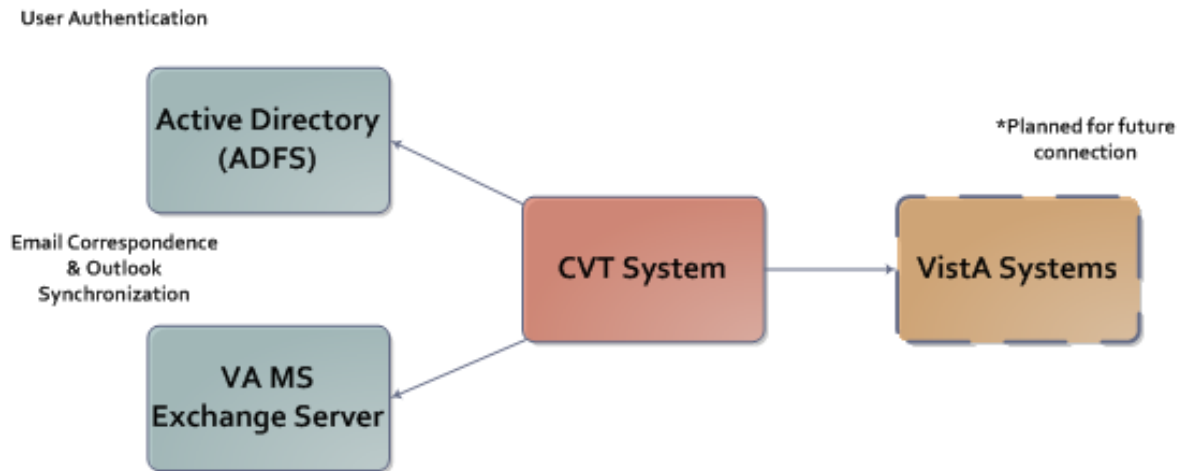


Figure 3 - CRM/UD Context Diagram

CRM/UD Context Description:

ID	Name	Description	Interface Name	Interface System
N/A	CVT	CRM application serving as the resource scheduling platform.	All interfaces listed below	All systems listed below
N/A	VistA/VHA	VHA appointments data used by Schedulers.	Pathways	CVT
N/A	VA MS Exchange Server	To be used for CRM correspondence.	N/A	CVT
N/A	Active Directory Federated Services (ADFS)	To be used for user authentication.	N/A	CVT

Interfaces External to Office of Information and Technology (OIT):

ID	Interface Name	Related Object	Input Messages	Output Messages	External Party
N/A	N/A	N/A	N/A	N/A	N/A

Interfaces Internal to OIT:

ID	Interface Name	Related Object	Input Messages	Output Messages	Other CBP Party
N/A	Pathways	VistA/VHA	ICN	Appointments data	N/A

Externally Shared Data Stores:

ID	Name	Data Stored	Owner	Access
N/A	CRM SQL Server Database	Contact History	VBA	CRUD Access; Contact History

3.1.2. High Level Application Design

The High Level Application Design is intended to identify the major components of the application and the relationships of the major application components to each other and to the surrounding applications.

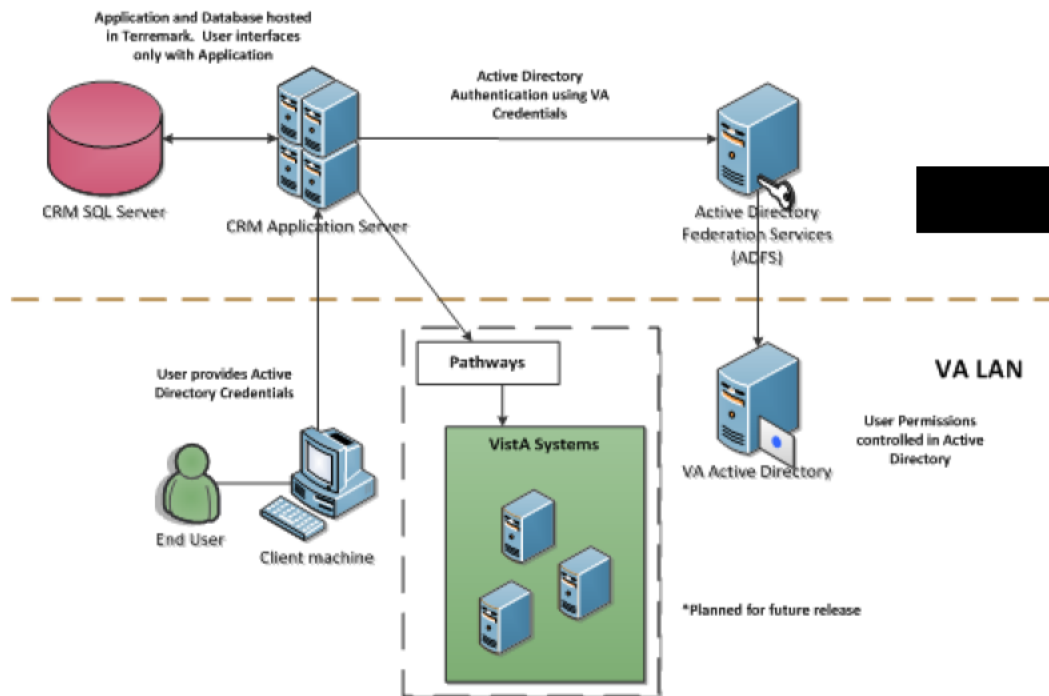


Figure 4 - High Level Application Design

3.1.3. Application Locations

Application	Location	Type
CRM		Application and Data Store

3.1.4. Application Users

Application	Location	User
CRM	Constituent Facilities	TCT
CRM	Constituent Facilities	FTC
CRM	TBD	CVT Scheduler
CRM	TBD	CVT Application Administrator

3.2. Conceptual Data Design

3.2.1. Project Conceptual Data Model

A project Conceptual Data Model (CDM) is a high-level representation of the data entities and their relationships. It is a first step to developing the more detailed Logical Data Model (LDM), which will be provided during the Logical Data Design (LDD).

The CRM data model will consist of stored data in the out-of-the-box CRM tables as well as custom entities created for masking the underlying CRM base entities to enable a greater degree of manipulability. Where those custom entities are used to mask base ones, indirect 'lateral' relationships will exist between the entity Users interact with and the system one created by Plugins which is actually used by CRM to manage scheduling requirements.

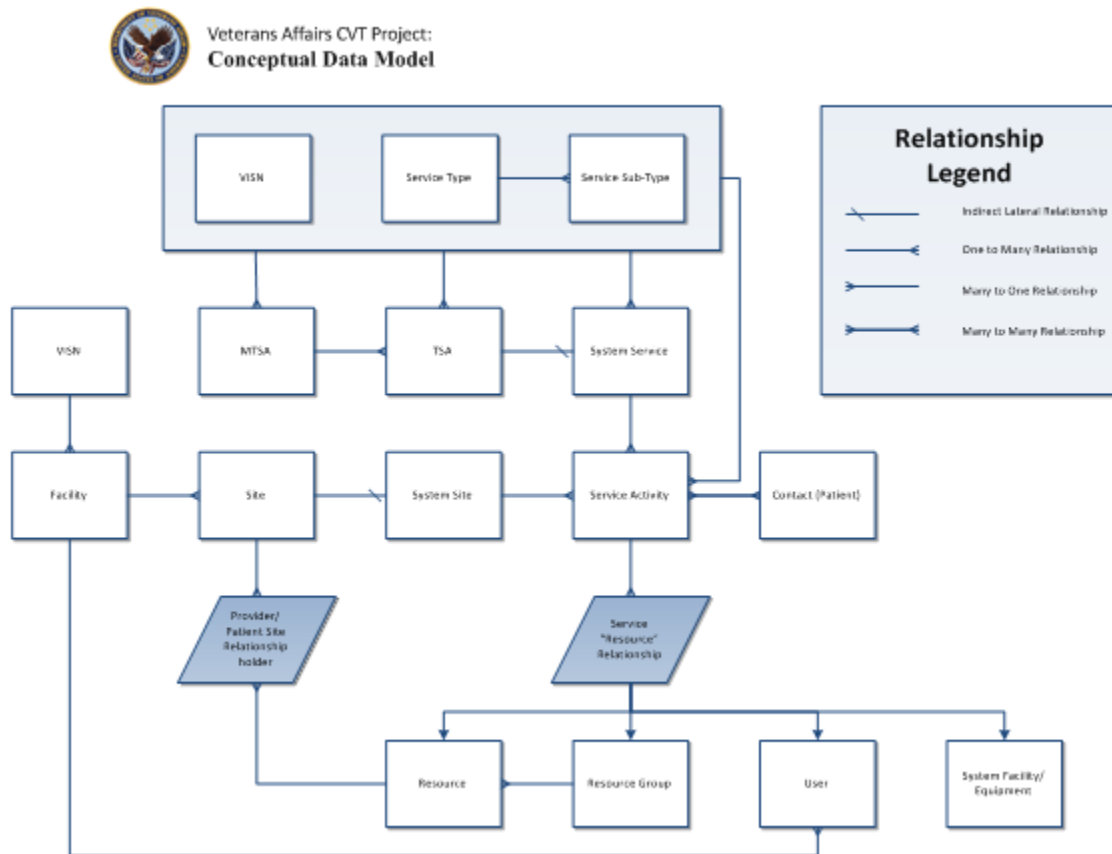


Figure 5 - CRM/UD Project Conceptual Data Model

3.2.2. Database Information

The table below identifies all databases that will be created, replaced, interfaced with, or whose structure will be modified as part of this effort.

Database Name	Description	Type	Steward
CRM DB	SQL Server database that will house Resource information and scheduling data.	Create	[REDACTED]
VISTA	Integration planned for future release.	Interface via Web Services	VHA

3.3. Conceptual Infrastructure Design

The Conceptual Infrastructure Design is a very high-level overview of the infrastructure that will be used to support the application. Primary emphasis is on the environments that will be required and the locations at which they will be installed. The Infrastructure Design will become more detailed at later stages as more information is collected regarding the system and as the infrastructure and capacity requirements are better known.

Also, the Conceptual Infrastructure Design will describe any unique technology that the system will attach to or which is part of the system.

3.3.1. System Criticality and High Availability

The approach that will be taken to provide the required level of availability and disaster recovery is described in the CVT SSP.

3.3.2. Special Technology

At this time, no special technology is used as part of this system.

3.3.3. Technology Locations

This section describes the various technology components that will be used.

Technology Component	Location	Usage
Initial Development and Test Environment	CRM Online Cloud	Initial Development Environment established to allow maximum accessibility to developers and client resources.
Replacement Development and Test Environment	[REDACTED]	Development Environment established to continue development in a stabilized on-premise environment more closely reflecting the planned production configuration
Client Duplicate Environment	VA Offices.	For local client access to the environment during testing and acceptance procedures.
Production Environment	[REDACTED]	Professionally hosted, production-ready deployment environment.

Workstations	At all participating VA Facilities nationwide	Production end user stations
Special Hardware	N/A	
Interface Processors	N/A	
Legacy Mainframe	N/A	
Legacy Application Server	N/A	Systems of record
Legacy Databases	N/A	

3.3.4. Conceptual Infrastructure Diagram

3.3.4.1 Location of Environments and External Interfaces

No external systems or environments are connected to the solution at present.

3.3.4.2 Conceptual Production String Diagram

Below is an illustration that shows the configuration of a single production string to the extent that it is known.

This single production string illustrates the start of a scheduling process from the receipt of a request by whatever method to the determination of whether the request is for individual or group service. The User then creates the service record as appropriate to the nature of the request and clicks, “Schedule” to view all available time slots. Upon selecting one, an automated system process reserves the resources and decrements capacity, while the User must then manually schedule the same resources in VistA systems as necessary.



Veterans Affairs CVT Project:
Conceptual Data Model

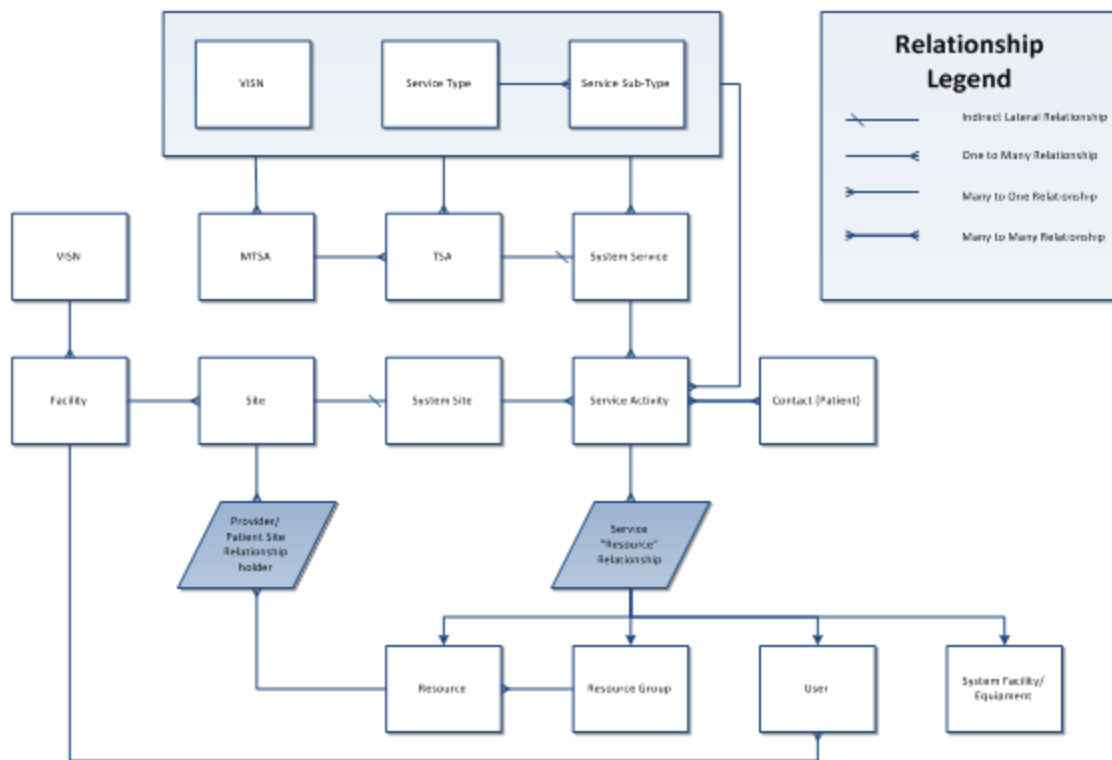


Figure 6 - Conceptual Production String Diagram

4. System Architecture

The system architecture for the CRM/UD solution is below.

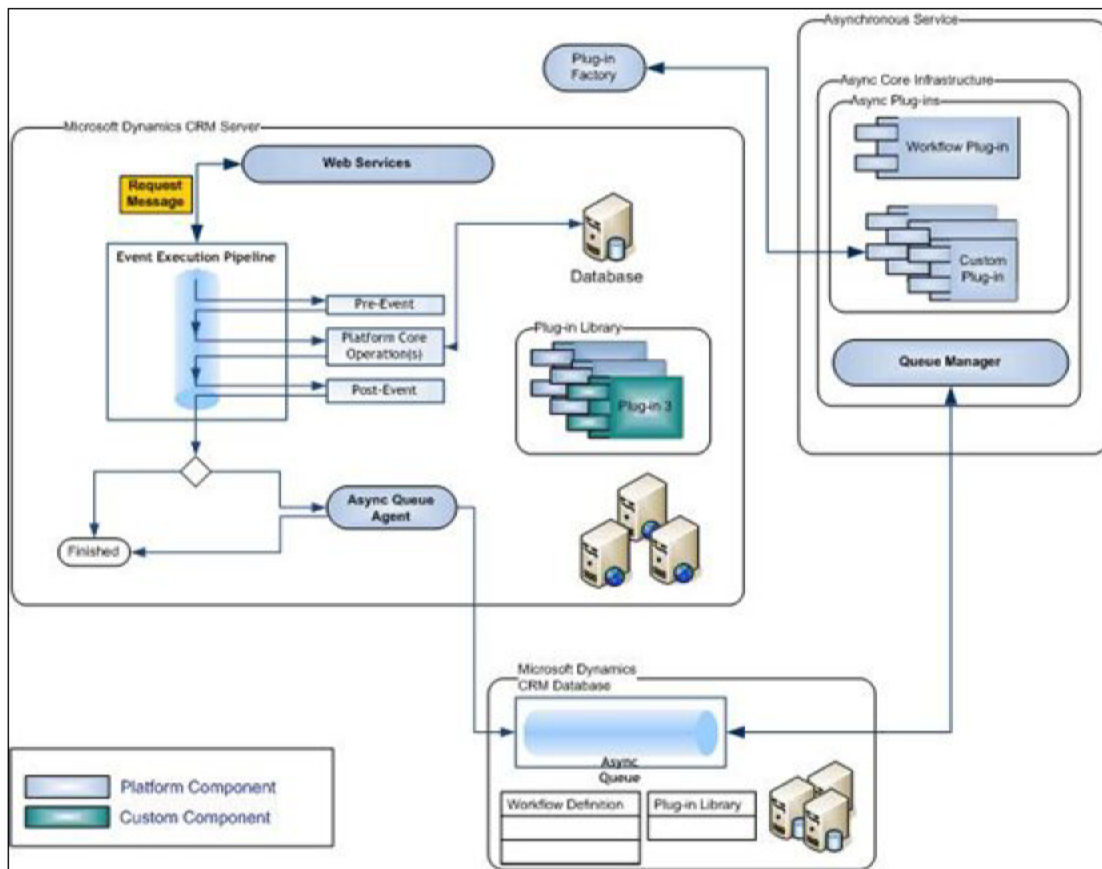


Figure 7 - System Architecture 1

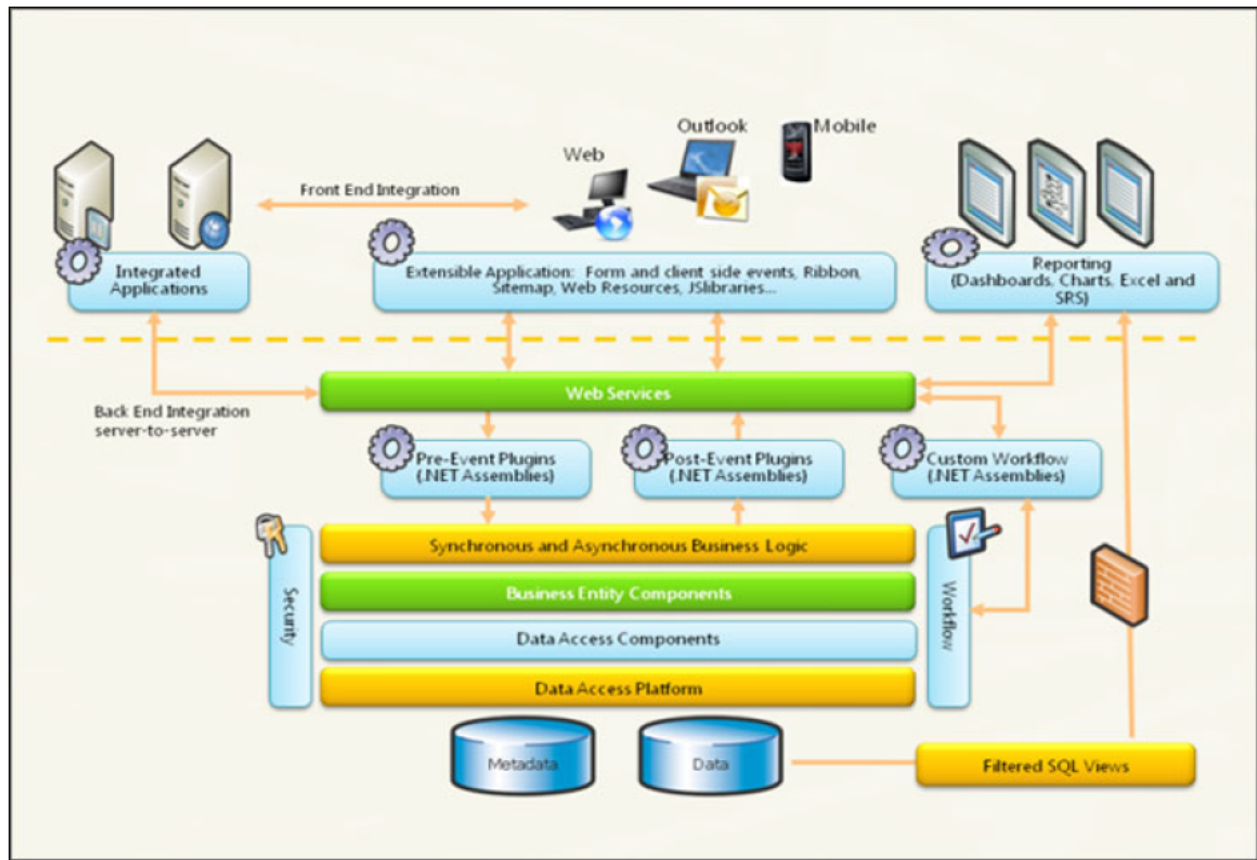


Figure 8 - System Architecture 2

4.1. Hardware Architecture

The CRM/UD solution will have three Environments [REDACTED]. These environments will utilize switches, servers, and databases to support the solution.

Additional detail on the hardware architecture can be found in Section 6.1, Hardware Detailed Design.

4.2. Software Architecture

Refer to section 3.1

The Software Architecture will encompass several modules to include Veteran Contact, claims, appeals, payments, and activities such as service requests and contact history.

The MS Dynamics CRM SDK ([http://\[REDACTED\]](http://[REDACTED])) contains information pertaining to routines tables, events, methods, classes, etc. MS CRM Dynamics is a COTS application that has packaged and supported software classes and other relevant source code.

The physical location of all software systems including CRM software and web applications, database platforms, compilers, utilities, operating systems, and communication software will be VA HINES and Austin facilities and [REDACTED] hosting environment.

The physical location for CVT through March 2014 will be within [REDACTED]. Additional detail is in Section 6.2 CRM SDD.

4.3. Communications Architecture

Modes of Communication:

- Telephone - Scheduling requests and confirmations are often transmitted by telephone call.
- Fax - Scheduling requests may be received by Fax.
- E-mail - Email is the most typical means of scheduling request and confirmation. CVT will include an email interface to enable emails with attachments to be sent to requestors.

At present, none of these communication methods are automated by TSS, although email communication may be tracked within the system. Future release plans include the creation of TSA development communication and workflow tracking and management, but this functionality is not included in the current release.

5. Data Design

The data design of the CVT system exists entirely within the COTS structural paradigm. All data being used by TSS is stored within the CRM SQL Server, also hosted by [REDACTED] and controlled from within the application UI. At present no system data is being sureced from or provided to external systems or applications. An effective graphical representation of the Entities being leveraged for TSS use is found in Figure 5, above.

6. Detailed Design

This section describes the proposed design in detail. Updates will be made as necessary.

6.1. Hardware Detailed Design

The CRM hardware architecture as a part of the VRM program is spread across three different hardware infrastructure enclaves:

- Verizon Infrastructure - CRM G-Plus adaptor for CTI. Decision pending on where the adaptor will be installed. The choices are either Verizon environment or [REDACTED] cloud.
- [REDACTED] Cloud Facility - Hardware for CRM application server, database server, ADFS server, and CTI Genesys Server.
- VA facilities - All the web services including BGS services, new developed VIERS services hosted within the VADIR environment reside on the VA servers. Additionally the new desktops supporting the CRM/UD implementation will be within the VA boundary at the NCC locations starting with St. Louis.

A high-level representation of hardware segmentation is as follows:

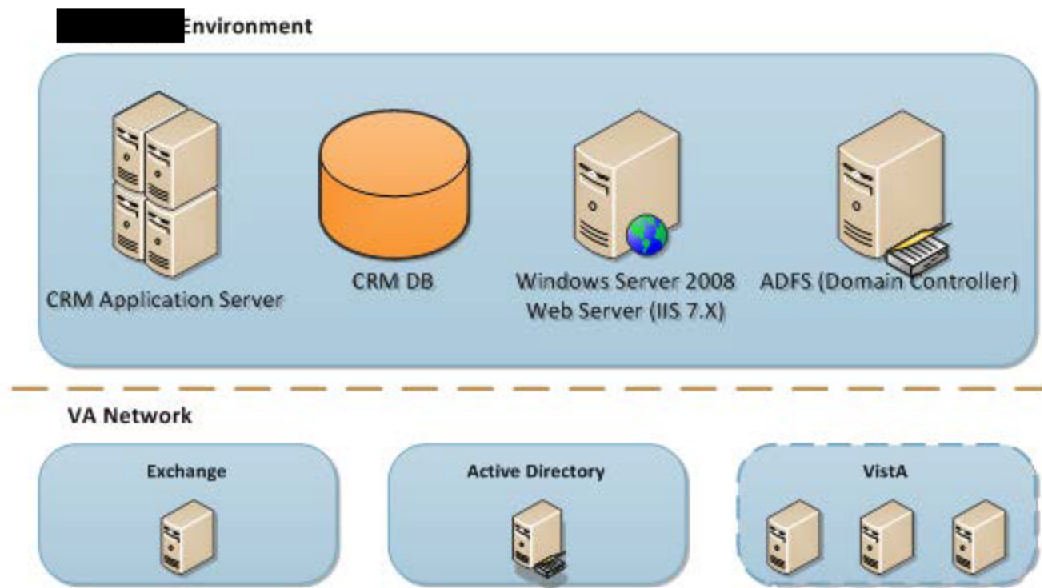
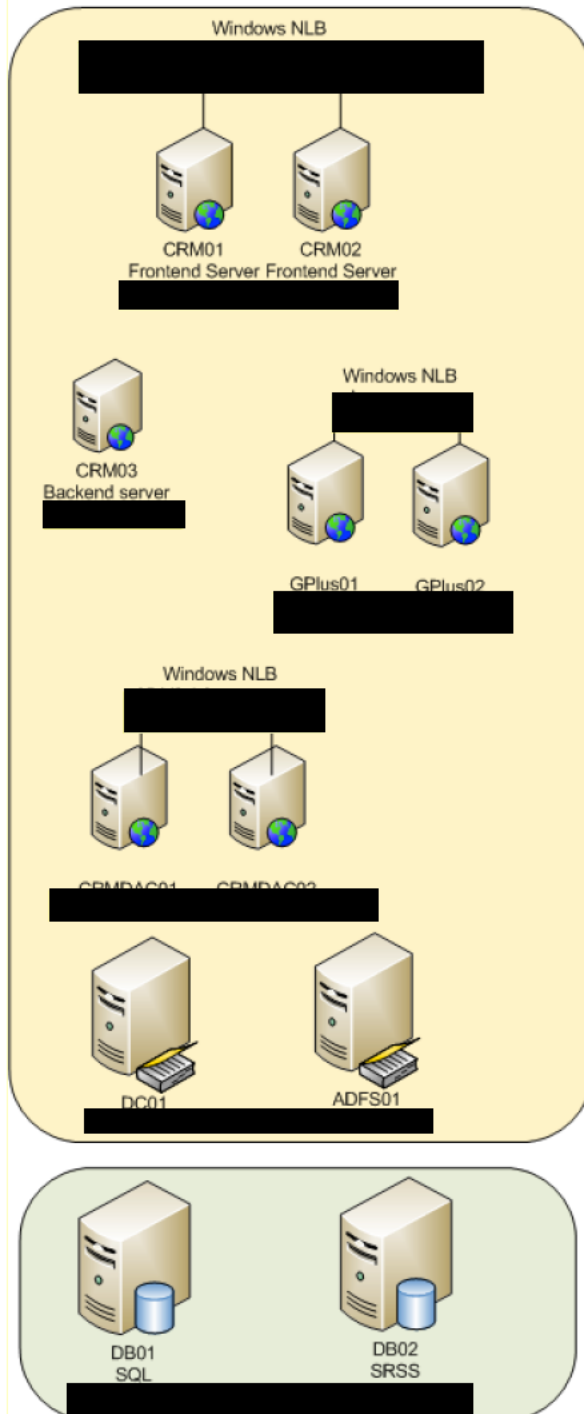


Figure 9 - Hardware Detailed Design



Web Application Server - Internalcrm.xrm.va.gov
 Organization Web Service - Internalcrm.xrm.va.gov
 Discovery Web Service - Internalcrm.xrm.va.gov
 Deployment Web Service - Deploymentwebsvc.xrm.va.gov

CRM01, 02, 03 : gplus01 and 02; CRMDAC01 and 02

Windows 2008 R2
 CRM 2011 Rollup 3
 8 GB Ram
 2 x 2.10GHZ AMD 6172
 C = 40gb
 E = 20 GB

DC01, ADFS01

Windows 2008 R2
 2 GB Ram
 2 x 2.10GHZ AMD 6172
 C = 40gb

DB01

Windows 2008 R2
 SQL 2008 R2
 16 GB Ram
 2 x 2.10GHZ AMD 6172
 C = 40gb
 E = 20gb
 F = 30gb
 G = 15gb
 H = 90gb

DB02

Windows 2008 R2
 SQL 2008 R2
 8 GB Ram
 2 x 2.10GHZ AMD 6172
 C = 40gb
 E = 20gb

Figure 10 - Hardware Configuration and Infrastructure

The above diagram represents the CVT hardware configuration for the CVT Pilot release.

Eventually, this section will also include the following information (as applicable):

- Cable type(s) and length(s)
- Connector specifications
- Details of hardware items, such as monitors, printers, servers, Input/Output (I/O) devices, and the relationship to each other.
- Hard drive/floppy drive/CD-ROM requirements
- Memory and/or storage space requirements
- Monitor resolution
- Power input requirements for each component
- Processor requirements
- Signal impedances and logic states

6.2. Software Detailed Design

This section addresses the major functional areas/modules of the system. Details will be added incrementally.

6.2.1. Navigation

The TSS screen is divided into navigation area (left), the Office Ribbon (top) and a Desk top area (main). At the bottom left of the navigation area are three headings: Workplace, Telehealth Administration, and Settings. Clicking any of the three will take you to the corresponding location. Following, is a brief description of each:

Workplace

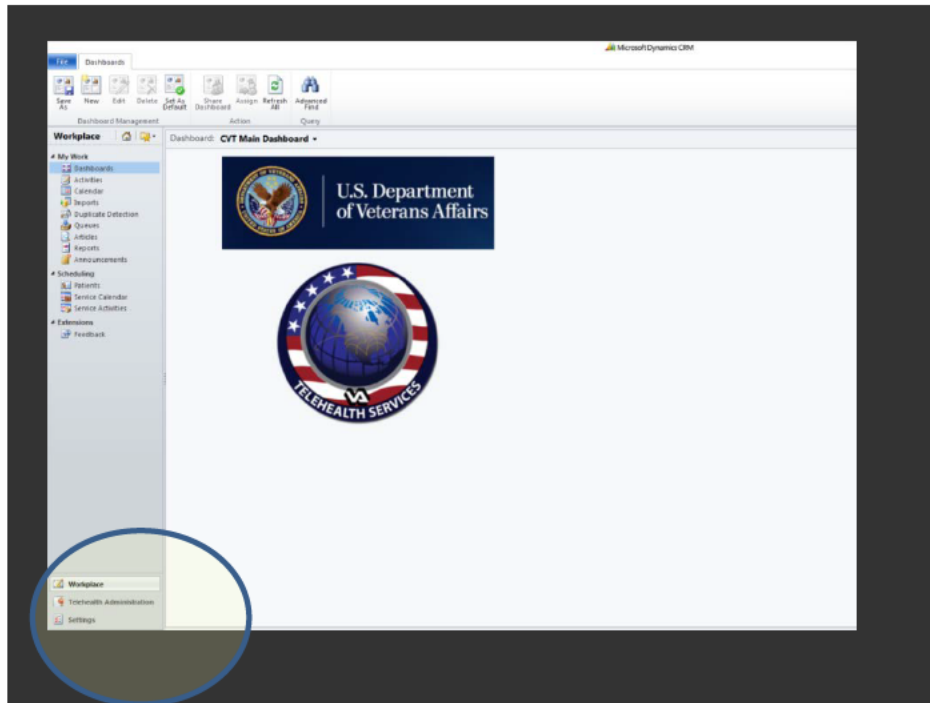
Workplace is where scheduling and reporting activities take place.

Telehealth Administration

Administration includes capabilities to add and maintain TSAs, resources, facilities, and sites.

Settings

The Settings section contains a variety of administrative functions such as users and security role management.



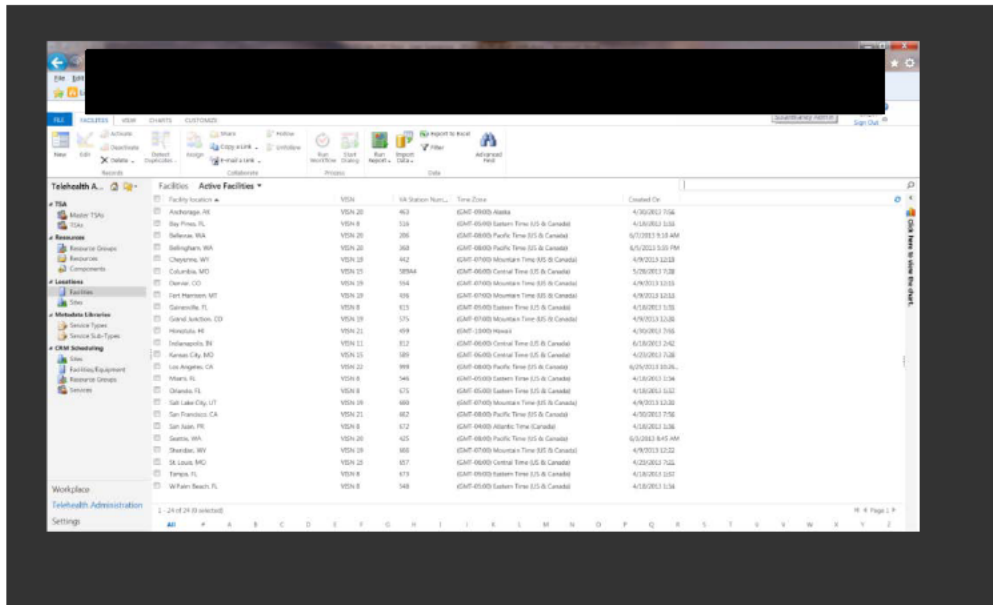
6.2.2. Administration – Managing Facility and Site Data

At a primary level, almost all data is managed under the set of VISNs. These will be pre-inserted into the system at the time of Go-Live, as will an initial set of Facilities and Sites. Unlike VISNs, Facility and Site data is expected to require editing and management by Users to more accurately reflect the reality of VA organizational structure. Maintaining the structure carefully will be essential for the ability of Schedulers to quickly and effectively locate resources and schedule services. The below processes outline how that data will be managed by TCTs, FTCs, and CVT Application Administrators. Schedulers will have read-only access to this data and will not be able to add or edit Facilities and Sites.

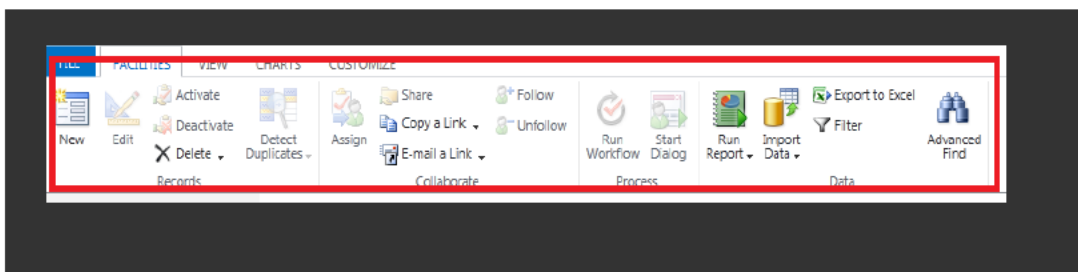
Add a CVT Facility

A Facility is a “parent” to its sites. Facilities are also often referred to as a main stations or medical centers.

- Click Telehealth Administration (lower left)
- Click Facilities in the left navigation area
- Verify the Facility you would like to add is not already in the list



- Click the New button (FACILITIES tab, in the ribbon)



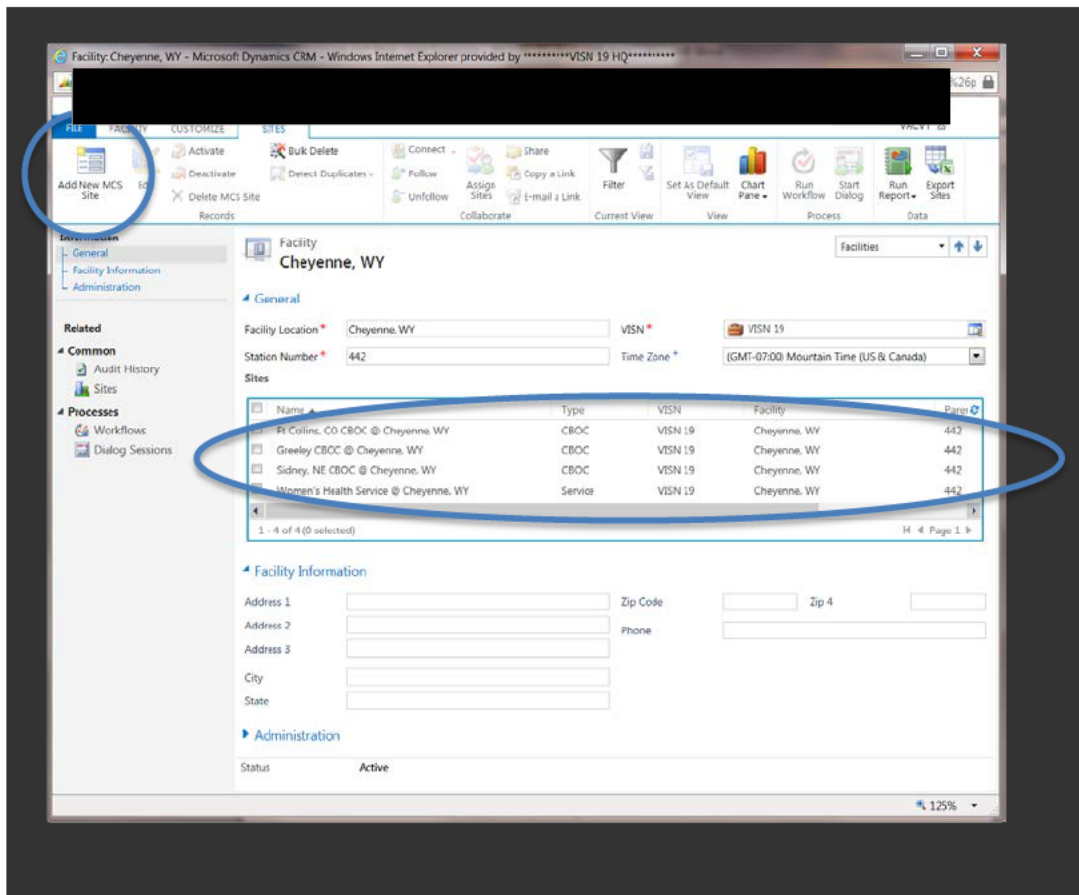
- Enter a unique Facility Location
 - Format: City, ST
 - For ST: please use the two letter "Post Office" designation for your state
- Enter the VA Station Number (Division Code) for the Facility
 - Example: Denver, CO is 554
- Enter a VISN number
 - Easiest: Click on Lookup Box on right and check the correct VISN
 - If typing, use the following format: VISN xx
- Select the Time Zone for the Facility from the drop-down list
- At this time, ignore the Sites Information in the middle of the form (Sites will be added later).
- The Sites that "belong" to the Facility will appear in the box in the center of the page.
 - If this is a new Facility, no sites will appear
- Place the cursor in the Address 1 box and enter the Facility Information for Address, Zip Code, and Phone

- Click Save (to stay on screen) or Save and Close (to leave screen) (upper left in the ribbon)
- Facility must be Saved before Sites can be added

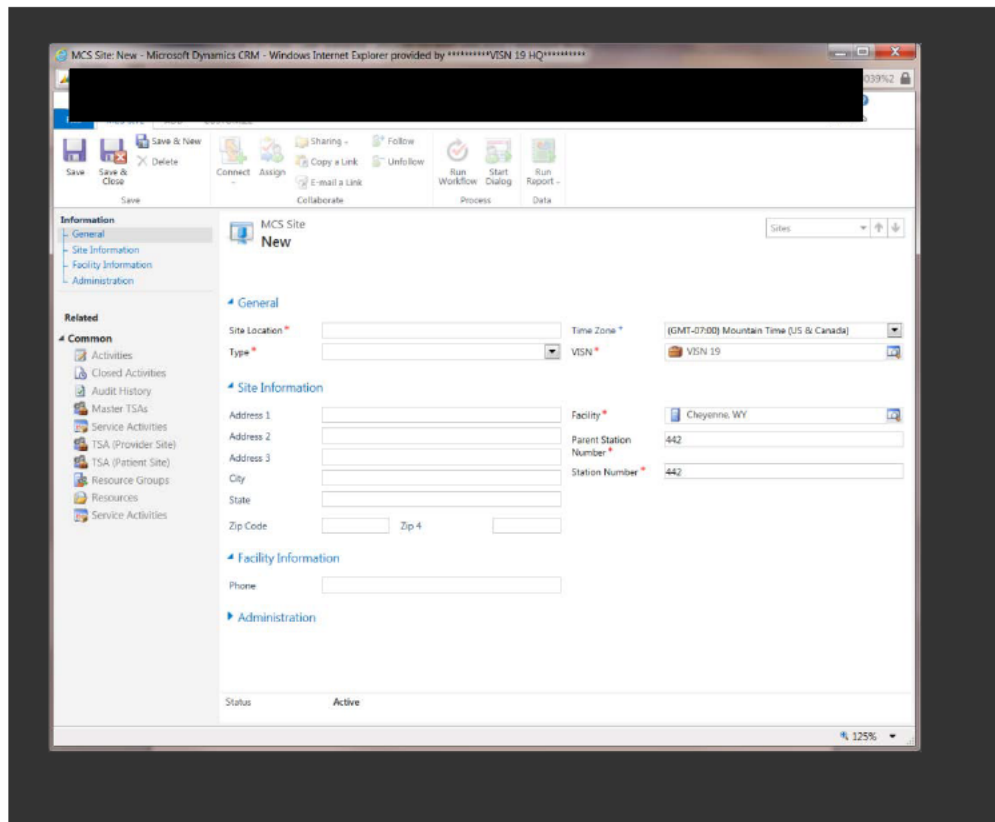
Add a CVT Site

*To ease this process, please add Sites from the related Facilities Form – This will pre-populate a maximum number of fields on the forms

- The “parent” Facility must be present in the TSS system
- A Site is either
 - a satellite clinic (CBOC, PCTOC, Outreach Clinic, etc.) or
 - a clinical service within a Facility
- Click Telehealth Administration (lower left)
- Click Facilities in the left navigation area
- Check the Facility that is “parent” to the site
- Click the Edit button (FACILITIES tab, in the ribbon)
 - All of the sites tied to this Facility will appear in the Sites box(see picture below)
 - Make sure the site is not already in the list
- If Site is not present in sites box, click the Sites box so the blue outline appears



- Click Add New MCS Site button (in the ribbon)



- Enter a Site Location
 - Format: City, ST or Service/Specialty Name
 - Example: Alamosa, CO or Mental Health
- The full Site Location will be constructed based on the
 - <Site Location> field + <Site Type> field
 - Example: Fort Collins, CO CBOC
 - Example: Mental Health Service
 - Duplicates are not allowed
- Select a Type for the site from the drop-down box. Choices include
 - CBOC = Community-Based Outpatient Clinic
 - CLC = Community Living Center
 - DR RTP = Domiciliary/Residential Rehab Treatment Program
 - HBOC = Hospital-Based Outpatient Clinic
 - IOC = Independent Outpatient Clinic
 - MOC = Mobile Outpatient Clinic
 - MVC = Mobile Vet Center
 - OC = Outreach Clinic
 - PCTOC = Primary Care Telehealth Outreach Clinic
 - RRTP = Residential Rehab Treatment Program
 - Service = Clinical Service
 - VAMC = Veterans Affairs Medical Center
 - Vet Center
- Time Zone will be prepopulated (if adding Site via the Facility form)
 - The Time Zone will default to the Time Zone of the parent facility
 - If the Site Time Zone differs from the parent facility,

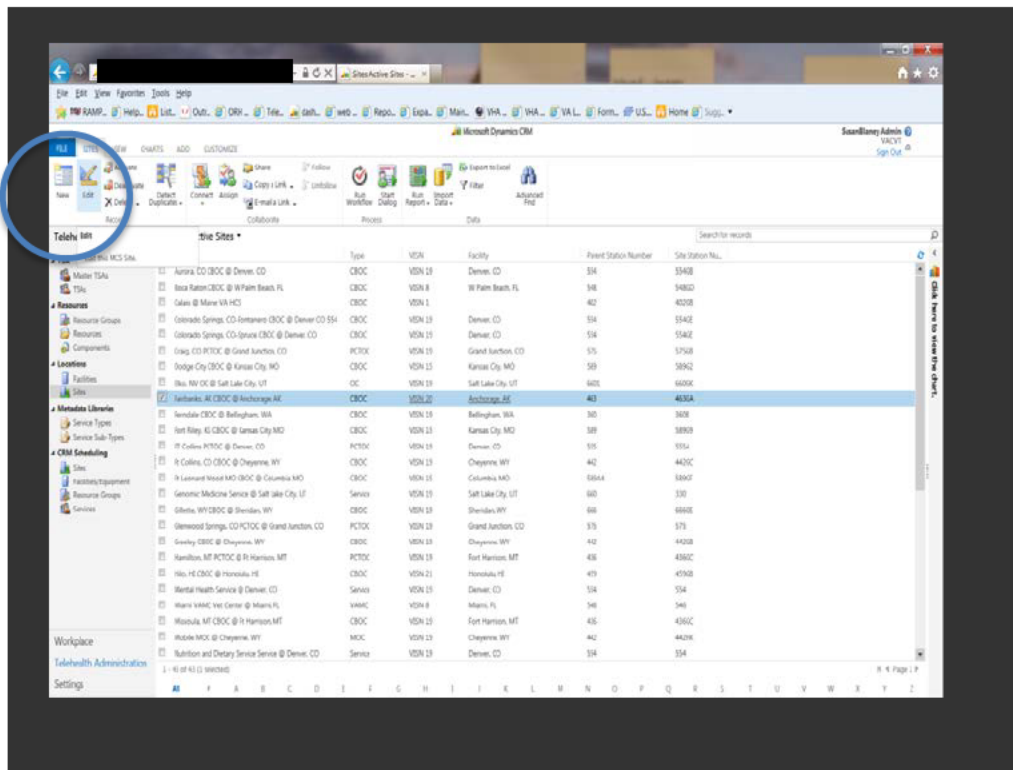
- choose the correct Time Zone from the drop-down box
- VISN will be prepopulated (if adding Site via the Facility form)
- Enter the Site Information: Address, City, State, Zip Code, and Phone
- Facility will be prepopulated (if adding Site via the Facility form)
- Parent Station Number will be prepopulated (if adding Site via the Facility form)
- Site Station Number
 - This is the VAST number/Division Code for the Site
 - It will be prepopulated with the Parent Station Number
 - Note: It must be changed if the Site Station Number varies from the Parent Station Number
 - Example:
 - Parent station number for Cheyenne, WY VAMC is 442
 - Station number for Fort Collins CBOC is 442GC
 - It will be the same as the Parent Station Number if it is a Clinical Service within a Facility
 - Example:
 - Parent station number for Denver, CO VAMC is 554
 - Station number for Mental Health Service @ Denver, CO VAMC is 554
 - Click Save (to save and stay on screen) or Save & Close (to save and leave screen)
 - Note: If you are creating multiple Sites, click Save and New to close the current window and automatically open a new record window

6.2.3. Administration – Resources and Resource Groups

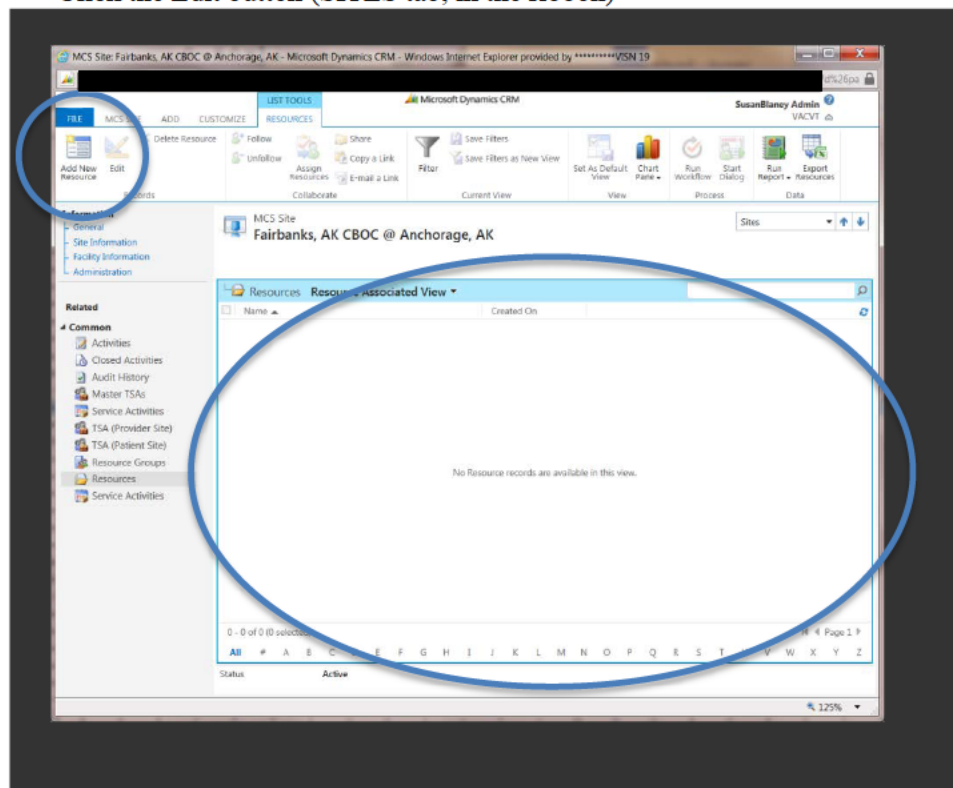
Administration of Resources and Resource Groups will be performed by Users local to the Sites where the Resources are kept. That includes FTCs and TCTs, but not Schedulers. CVT Schedulers will not have the ability to add or edit Resources and Resource Groups.

*To ease this process, add and edit resources via the Sites Form – This will pre-populate a maximum number of fields on the forms

- Click Telehealth Administration (lower left)
- Click Sites in the left navigation area
- Check the Site where the Resource is to be added



- Click the Edit button (SITES tab, in the ribbon)



- From the Site Form| Click Resources in the left navigation area
- Click 'Add New Resource' in the ribbon.

Add New Resource

- Enter a descriptive label for the Resource using the Resource Label field
 - Example: 807 or Primary Care for Room
 - Example: Videoconferencing Unit or Imaging Camera for Technology
 - Example: DEN CVT WOUND PRO for a VistA Clinic
- Select a Type for the Resource (using drop-down box)
 - Room: A room at the Site that may be scheduled for a Telehealth visit
 - Technology: The technology located at the Site
 - VistA clinic: A VistA clinic that is used to schedule Telehealth visits at the Site
 - You must have the VistA clinic built in VistA before entering the name you were given by the VistA Clinic Builder
 - This is for reference only at this time, but the CVT Scheduling System will interface with VistA at some point in the future
- Select a Site for the Resource.
 - Note: This will be prepopulated if adding the Resource from the Site form.
- The full Resource Name will be constructed based on the <User input> + <Site> fields. Duplicates are not allowed.

The screenshot shows the Microsoft Dynamics CRM interface for adding a new resource. The form is titled "Resource: 305 @ Mental Health Service @ Denver, CO". The left sidebar contains a navigation pane with "Information" (General, Room Information, Notes, Administration) and "Related" (Common, Activities, Closed Activities, Audit History, Patient Site Resources, Provider Site Resources, Components, Group Resources). The main form area has three sections: "General", "Room Information", and "Notes". The "General" section includes "Resource Label" (305), "Type" (Room), and "Site" (Mental Health Service @ Denver, CO). The "Room Information" section includes "Service" (MH), "Campus", "Designation" (Telehealth Only), "Building", and "Phone". The "Notes" section has a text area for "Enter a note". The status is "Active".

- If you Add a Room Resource
 - Type in the Service the room is assigned to (or who most often uses it, like Patient Education or Mental Health, etc.)
 - Campus: If the Site is divided into different campuses, enter the Campus where the Room is located

- Example: Colorado Springs, CO CBOC has two campuses, Fontenero Campus and Spruce Campus
- Designation: is the room used for Telehealth Only or is it Shared Telehealth/Face to Face Visits? Building is used if the Building has a name or designation, like the Anschutz Building
- Enter Phone number of the phone in the Room
- Click Save (to save and stay on screen) or Save & Close (to save and leave screen)
- Note: If you are creating more than one Resource, click Save and New button to close the current window and automatically open a new record window

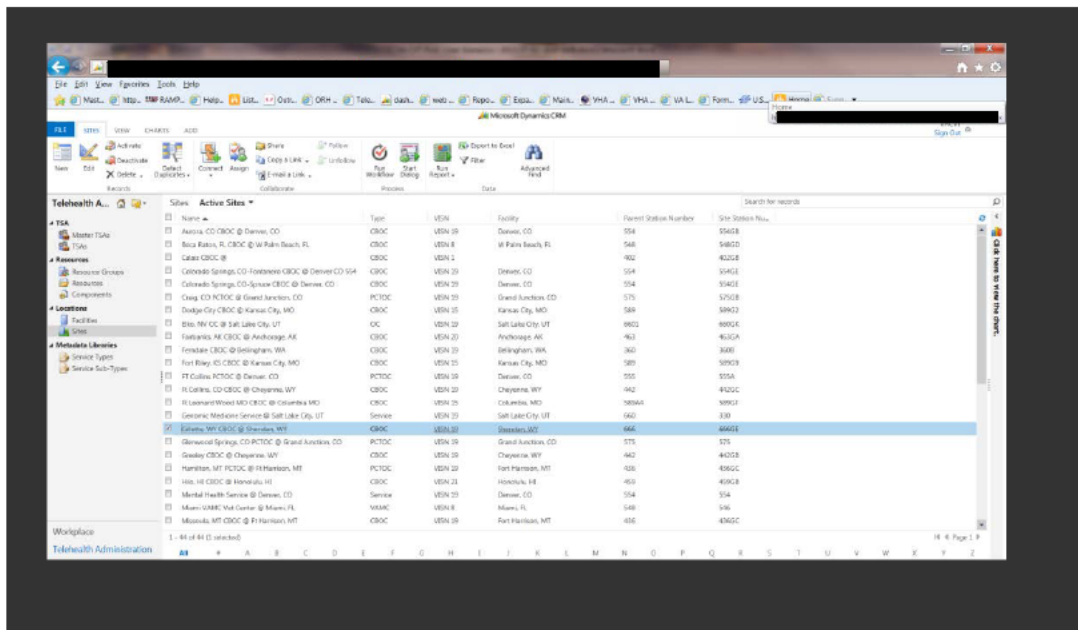
The screenshot shows the 'Resource' form in Microsoft Dynamics CRM. The title bar indicates the browser is 'Windows Internet Explorer provided by *****'. The form is for a resource named 'VTC unit @ Mental Health Service @ Denver, CO'. The left sidebar shows the 'Information' tab selected, with sub-tabs for General, Technology Information, Notes, and Administration. The 'Related' section on the left lists various entities like Activities, Closed Activities, Audit History, Patient Site Resources, Provider Site Resources, Components, and Group Resources. The main form area is divided into sections: 'General' with fields for Resource Label, Site, and Type; 'Technology Information' with fields for System Index, POC, System Type, CMT Capability, VSN, Room, Primary User, and Provider / Reader; and 'Notes' with a text area. The Status is set to 'Active'.

- If you Add a Technology Resource
 - System Index is a unique number that ties all components of a system together
 - (Put in here how to concoct a system index unique to the system but used across several technology components)
 - Some systems have only one component, like a codec
 - A cart will have several components and all will carry the same System Index number
 - POC is the person who has primary responsibility for the technology
 - Tip: You can't free type this name, click on the LookUp box on the right and search for the person as you would in Outlook and check his/her name when found
 - System Type is chosen from the drop-down box
 - Image Capture/Reader System
 - Patient Cart

- VTC Desktop System
 - VTC Room Based System
- CVT Capability is chosen based on capability of the technology
 - Telemedicine is a technology that has patient care peripherals (e.g. primary care carts)
 - Interview is generally a VTC system, used just for interviews/talking visits
- Enter a VISN number
 - Easiest: Click on Lookup Box on right and check the chosen VISN
 - Typing Format: VISN xx
- Room is the room name, number or designation for the room in which the technology resides
 - This item is not cross-referenced to the Room Resources, so errors can occur if care is not taken, example below: Room Resource for a teleprovider for a PTSD group is 305, but is listed as 503 on the Technology Resource
- Primary User is the person who uses the technology most often
 - Presenter / Imager
 - Provider / Reader
- Location is the setting in which the technology is used
 - Clinic-Based
 - Home-Based
 - Transportable
- Click Save (to save and stay on screen) or Save & Close (to save and leave screen)
- Note: If you are creating more than one Resource, click Save and New button to close the current window and automatically open a new record window
- If you chose to Add a Vista Clinic Resource
 - Resource Label: Type in the name of the Vista Clinic (as it was named and built in VistA)
 - (e.g., DEN CVT WOUND PRO)
 - Site: Will be pre-populated
 - Click Save (to save and stay on screen) or Save & Close (to save and leave screen)
 - Note: If you are creating more than one Resource, click Save and New button to close the current window and automatically open a new record window

Add a Resource Group

Resource Groups allow for the checking of availability of more than one resource (room, telepresenter, or technology, for example) to be inspected when a service activity/visit is scheduled within the MTSA/TSA specifications. It is recommended that all Resources be entered into the CVT Scheduling System prior to building Resource Groups, to simplify the process. Pre-grouping resources in this way can accelerate scheduling on the Patient Site end in cases where a single service requires several resources and recurs frequently.

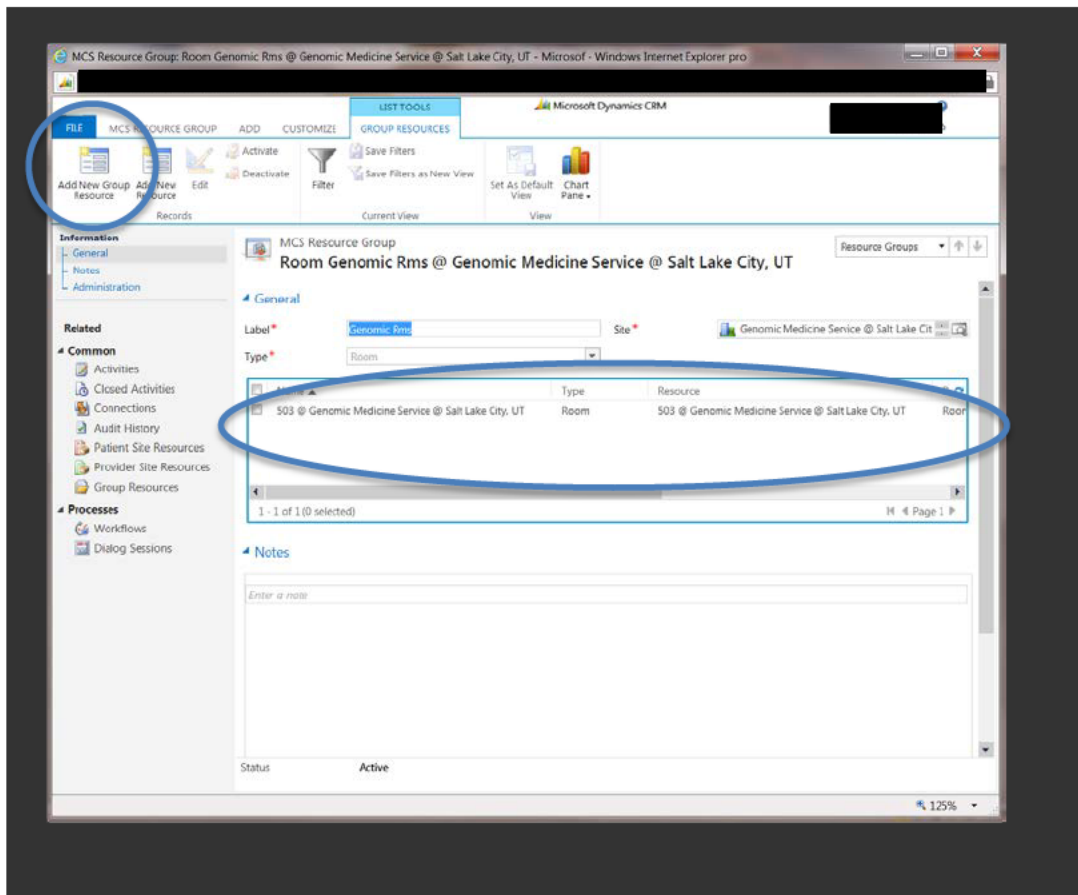


- From the Active Sites list, check the site to which you want to add a resource group
- Click the Edit button (FACILITIES tab, in the ribbon) or double-click the Name of the Resource Group
- From the Sites Form click the Resource Groups section located on left side
- Click Add New MCS Resource Group button in the upper left ribbon
- Enter a descriptive, but general word as the Label
 - The full Group Name will be constructed based on the <Label field + <Site> field @ Facility field. Duplicates are not allowed.
 - Examples: Rooms, PC Carts, TCTs
 - The name will generated: TCTs Gillette, WY @ Sheridan VAMC, for example
- Select a Type for the Resource Group from the drop-down box
 - Choices are Room , Technology, Telepresenter, Provider
- Select a Site for the Resource Group
 - Note: This will be prepopulated with the Site, if creating the Resource Group from the Site form
- Click Save
 - Note: If you are creating more than one Resource Group, click Save and New button to close the current window and automatically open a new record window

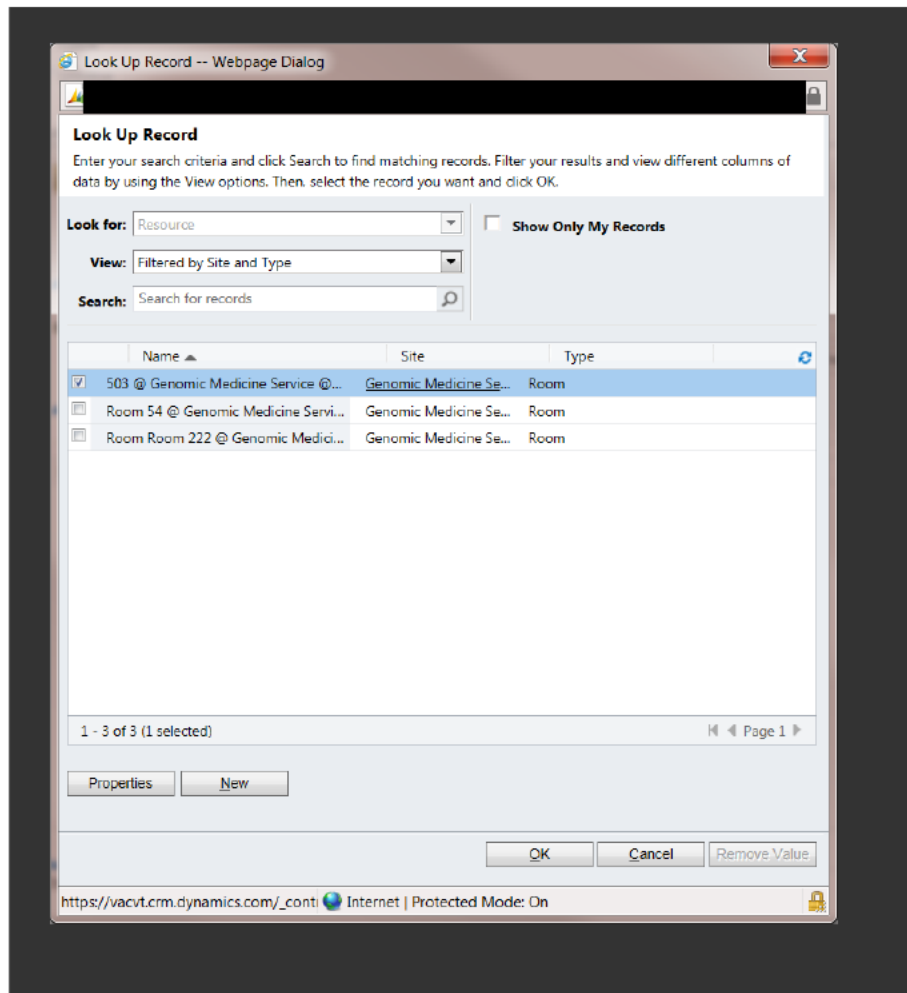
Add a New Resource to a Resource Group

Once a “parent” Resource Group is created and saved, then individual Resources may be added to the group, to populate the group. If building a Room Resource Group, individual Room Resources are added to the group. That group can then be associated with a Master TSA or a TSA and the scheduling program will investigate all Rooms in the group for next available opening, rather than just an individual room.

- Highlight Sites (under Locations) on the left navigation area)



- Click on the box at the center of the page, so the blue outlines appears
- Click on the Add a New Group Resource button in the ribbon
- Resource is a required entry. Use the Look Up Box to bring up the list of Resources for the Site and check the one that you want to add to the Resource Group



- Check the Resource to be added to the Resource Group
- Click the “OK” box
- The Look Up Record box will disappear
- Click Save (to save and stay on screen) or Save & Close (to save and leave screen)

Add a Service

The Service refers to the clinical service being provided via CVT technologies.

- Click Telehealth Administration (lower left)
- Click Service Types in the left navigation area
- Inspect the list of Service Types to assure the one you are going to add is not already there
- New button (in the ribbon)
- The Service Type form appears
 - Enter the Service Type
 - Owner defaults to the person entering the data. If you wish to change to the Service Chief, Clinical Champion or a lead Administrative person, click on the LookUp Box on the right and check the chosen name and click the OK button.

Add a Service Sub-Type

A service sub-type helps refine the service being provided via CVT technologies.

For example, Mental Health is a service that has several sub-types: Psychiatry, PTSD Treatment, etc.

Another example is Patient Education, which could have Smoking Cessation, MOVE, Diabetes Education and several other sub-types.

- Click Telehealth Administration (lower left)
- Click Service Sub-Types in the left navigation area
- Inspect the list of Service Sub-Types to assure the one you are going to add is not already there
- New button (in the ribbon)
- The Service Sub-Type form appears
 - Enter the Name for the Service Sub-Type
- Owner defaults to the person entering the data. If you wish to change to the Service Chief, Clinical Champion or an Administrative person, click on the LookUp Box on the right and check the chosen name and click the OK button. Service Type: Use the Look Up Box to bring up the list of available Services and check the one that relates to the Service Sub-Type you are adding, check the chosen Service and click the OK button.

6.3. Communications Detailed Design

This section is currently under development and will provide details about the communication requirements to build and/or procure the communications components for the system. It will include the following information in the detailed designs (as appropriate):

- Details of servers and clients to be included on each area network.
- Specifications for bus timing requirements and bus control.
- Format(s) for data being exchanged between components.
- Diagrams showing connectivity between components, data flow (if applicable), and distances between components.
- Local Area Network (LAN) topology.

7. External Interface Design

There are at present no external systems connected to the CVT system. As part of a future release, integration with VISN VistA systems is planned, but documentation on the nature of this connection is not available at this time.

8. Human-Machine Interface

8.1. Interface Design Rules

The conventions and standards used for designing the user interface is based on CRM out-of-the-box, structured similarly to the efficiency-optimizing practices of the Office 2010 interface. Where requested, forms and fields have been arranged within the interface to minimize the visible content to Users, focusing entirely on the immediately relevant content.

8.1.1. Requirements

A number of requirements specify what a CVT user would like to have displayed and how it should be displayed. Examples of those types of requirements would be:

- Technology Resources display different fields from Room resources
- VISN, Patient Site Resource ID, and other administrative data points which are not relevant to end users are relegated to the minimized, “Administration” tab.
- “Provide one-click access to...”

The requirements help to identify what must be incorporated into the design of the interface. However, outside of requirements, there are other factors that are considered when incorporating the requirement into the design.

8.1.2. Ease of Use

The VA’s employees need an application that would help them provide good service to the Veterans and that means the application needs to be intuitive and easy to use. CRM out-of-the-box is designed with this in mind. In addition, CRM out-of-the-box uses the same type of navigation system and similar look as Outlook, which is already used by all employees on a daily basis.

8.1.3. Consistency

Tools and utilities available to users are largely consistent across the entire system, making navigation a much simpler process. Users come to intuitively understand when the operation they are looking for is contained within the Ribbon, and when it is actually contained within a subgrid. Consistency across the environment reinforces the effects of repetition, making the learning process faster and easier for end users.

8.1.4. Feedback

It is important for a user’s experience and input to the application be acknowledged by some kind of feedback so that user’s feel confident the application is or will respond to their request. For instance, when a user searches for a record, there is displayed on the screen the web service(s) that is being invoked, and it acts almost like a countdown.

8.1.5. Aesthetics

Aesthetics is certainly a factor in design. From a development standpoint, this is more about uniformity of font size and color, or the conscious decisions made on the graphics used for icons and such throughout the application.

8.2. Inputs

Input media used by the user would be the keyboard and mouse.

8.3. Outputs

The users input will result in the following type of application output: reports, data display screens, and query results.

8.4. Navigation Hierarchy

The Navigation Hierarchy is depicted in the graphic below. Not all Users will see the entirety of this navigation hierarchy; the specific navigation available to any User role is dependant upon the individual's access priviledges.

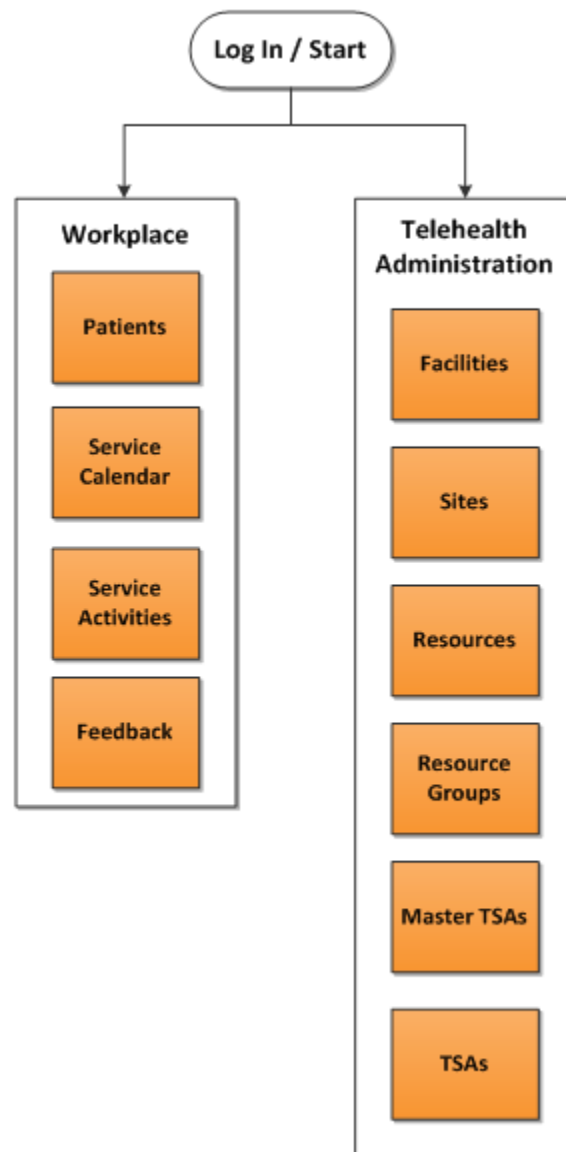


Figure 11 - Navigation Hierarchy

9. System Integrity Controls

The System Security Plan describes controls in more detail. However, the controls being applied to the CRM/UD system include at a minimum:

- Physical Security
 - CRM/UD is a Web based application therefore, no install required.

- **Configuration Management**
 - Teams and roles are defined in CRM/UD granting access to the appropriate users.
- **Certification, Accreditation, and Security assessments**
 - The CRM/UD team is in the process of completing the C&A package and Sensitive Case Advisory (SCA) requirements.
- **Identification and authentication**
 - CRM/UD will use federated active directory authentication method.
- **Access controls**
 - CRM/UD will use standard VBA access controls to provide application level access to users.
- **Audits**
 - CRM/UD will utilize native CRM auditing capabilities for the current release and will adhere to standard VA auditing requirements. The CRM/UD team is currently discussing future auditing functionality to be provided by IAM.
- **Training**
 - Training will be provided to end users prior to the first release of CRM/UD.
- **Systems and Communications Protection controls**
 - CRM/UD will use standard VA ports and protocols for communication purposes.

10. Appendix A

10.1. Requirements Traceability Matrix

The RTM is an addendum to the CVT RSD.

10.2. Packaging and Installation

There are no special considerations for software packaging and installation.

10.3. Design Metrics

The design activity will maintain compliance with IT Infrastructure Standards and compliance with Enterprise Infrastructure Engineering (EIE) standards. It will also be in compliance with C&A and other security standards.

10.4. Acronyms

Acronym	Acronym Meaning
A&A	Aid & Attendance
ADFS	Active Directory Federated Services
Ajax	Asynchronous JavaScript and XML
API	Application Programmer Interface
ASOIT	Assistant Secretary Office of Information & Technology
BDN	Benefits Delivery Network
BEP	Business Enterprise Platform
BGS	Benefits Gateway Services
BIRLS	Beneficiary Identification and Records Locator Subsystem
BPE	Business Partner Extranet
BVA	Board of Veterans' Appeals
C&A	Certification and Accreditation
C&P	Compensation and Pension
CADD	Change of Address
CAPRI	Compensation and Pension Records Interchange
CCT	Care Coordination Telehealth
CEVN	Clinical Enterprise Video Teleconferencing Network
CHAMPVA	Civilian Health and Medical Program of the Department of Veterans Affairs
CMP	Configuration Management Plan
COLA	Cost of Living Adjustment
COOP	Continuity of Operations Plan
CORP	Corporate
COTS	Commercial Off-The-Shelf
CPAC	Consolidated Patient Accounts Centers
CPRS	Computerized Patient Record System
CRM	Customer Relationship Management
CRM/UD	Customer Relationship Management/Unified Desktop
CSS	Common Security Services
CSS	Cascading Style Sheets
CSV	Comma Separated Values
CTI	Computer Telephony Integration
CVT	Clinical Video Telehealth
DAC	Data Access Component
DB	Database
DD	Direct Deposit
DEERS	Defense Enrollment and Eligibility Reporting System

DFN	Data File Numbers
DHTML	Dynamic Hyper Text Markup Language
DIC	Dependency and Indemnity Compensation
DMC	Debt Management Center
DOM	Document Object Model
DSS	Decision Support System
EA	Enterprise Architecture
ECC	Education Call Center
EFT	Electronic Funds Transfer
EIE	Enterprise Infrastructure Engineering
EOD	Enter On Duty
ESE	Enterprise Systems Engineering
ESM	Enterprise Systems Management
EVR	Eligibility Verification Report
FAS	Finance and Accounting Services
FID	Fiduciary
FIPS	Federal Information Processing Standard
FISMA	Federal Information Security Management Act
FNOD	First Notice of Death
FTC	Facility Telehealth Coordinator
GB	Gigabyte
GUI	Graphical User Interface
HAC	Health Administration Center
HDS	Health Data Systems
HEC	Health Eligibility Center
HIS	Integrated Hospital System
HRC	Health Resource Center
HTML	Hypertext Markup Language
I/O	Input/Output
IAM	Identity Access Management
IBM	International Business Machines
ICN	Integration Control Number
IIS	Internet Information Services
IPT	Integrated Project Team
IRIS	Inquiry Routing and Information System
IT	Information Technology
IVM	Income Verification Match
IVR	Interactive Voice Response

JSON	JavaScript Object Notation
KM	Knowledge Management
LAN	Local Area Network
LDD	Logical Data Design
LDM	Logical Data Model
MAP-D	Modern Award Processing Development
MOD	Month of Death
MOU	Memorandum of Understanding
MS	Microsoft
MVC	Model-View-Control
MVI	Master Veteran Index
N/A	Not Applicable
NCA	National Cemetery Administration
NCC	National Call Center
NIST	National Institute of Standards and Technology
NMOC	New Models of Healthcare
NOD	Notice of Disagreement
NOK	Next of Kin
O&M	Operations and Maintenance
OED	Office of Enterprise Development
OEF	Operation Enduring Freedom
OHI	Office of Health Information
OI&T	Office of Information and Technology
OIF	Operation Iraqi Freedom
OIT	Office of Information and Technology
OMB	Office of Management and Budget
PACT	Patient Aligned Care Team
PCR	Public Contact Representative
PCT	Public Contact Team
PCTC	Public Contact Team Coach
PDF	Portable Document Format
PGF	Parent Guardianship File
PIF	Pending Issue File
PII	Personally Identifiable Information
PMAS	Program Management Accountability System
PMC	Presidential Memorial Certificate
PMP	Project Management Plan
POA	Power of Attorney

POW	Prisoner of War
PTSD	Post-Traumatic Stress Disorder
QA	Quality Assurance
RAM	Random Access Memory
RIA	Rich Internet Applications
RO	Regional Office
RQM	Rational Quality Manager
RRC	Rational Requirements Composer
RSD	Requirements Specification Document
RTC	Rational Team Concert
RTM	Requirements Traceability Matrix
SCA	Sensitive Case Advisory
SCOM	Systems Center Operations Manager
SDD	System Design Document
SDK	Software Development Kit
SOA	Service Oriented Architecture
SOAP	Simple Object Access Protocol
SOC	Statement of Case
SOJ	Station of Jurisdiction
SQL	Structured Query Language
SSA	Social Security Administration
SSIS	SQL Server Integration Services
SSN	Social Security Number
SSOC	Supplemental Statement of Case
SSP	System Security Plan
SVG	Scalable Vector Graphics
TAR	Technical Analysis Review
TAS	Technical Analysis Summary
TBD	To Be Determined
TCT	Telehealth Clinical Technician
TLS	Transport Layer Security
TRM	Technical Reference Model
TS	(VHA) Telehealth Services
TSA	Telehealth Service Agreement
TSPR	Technical Services Project Repository
TSS	Telehealth Scheduling System
UD	Unified Desktop
UI	User Interface

URL	Uniform Resource Locator
VA	Department of Veterans Affairs
VACOLS	Veterans Appeals Control and Location System
VADIR	VA/Department of Defense Information Repository
VAI	Veterans Assistance Inquiry
VAM	Voice Access Modernization
VAMC	Veterans Affairs Medical Center
VBA	Veterans Benefits Administration
VBMS	Veterans Benefits Management System
VCC	Virtual Call Center
VERA	Veterans Equitable Resource Allocation
VETSNET	Veterans Service Network
VHA	Veterans Health Administration
VHA	Veterans Health Administration
VIERS	Veteran Identity and Eligibility Reporting System
VIP	Veterans Information Portal
VISN	Veteran Integrated Service Network
VistA	Veterans Health Information Systems and Technology Architecture
VM	Virtual Machine
VML	Vector Markup Language
VRM	Veterans Relationship Management
VSO	Veterans Service Organizations
VVA	Virtual VA
WF	Workflow Foundation
WFM	Work Force Management
WS	Web Service
WSDL	Web Services Description Language
XML	Extensible Markup Language
YUI	Yahoo! User Interface

10.5. Glossary of Terms

Term	Meaning
Agile Methodology	A project management approach used typically for software development to help teams respond to the volatility of building software by implementing incremental, iterative work modulations.
Public Contact Representative (PCR)	Person at National Call Center (NCC) that answers calls and interfaces with caller to perform requested activities

Term	Meaning
PMAS	Project Management Accountability System (PMAS) is a performance-based project management discipline mandated by the Assistant Secretary Office of Information & Technology (ASOIT) for all product delivery projects.
ProPath	ProPath is designed to enhance and encourage standard, repeatable processes across an organization. ProPath document templates feed into PMAS.
CRM/UD Solution	The software/hardware application CRM/UD shall implement upon project completion. The CRM/UD Solution is a tangible deliverable.
Rational Requirements Composer (RRC)	A software application that manages requirements and requirements related documents.

10.6. Required Technical Documents

Upon completion, the following documents will be uploaded to the CRM/UD Technical Services Project Repository (TSPR) to support proper approval:

- Product Architecture Document
- Disaster Recovery Plan
- Interface Data Mapping
- Security Assurance Strategy

For additional information regarding how to obtain proper approval for this project, refer to the following documents:

- IT Infrastructure Standards
- Technical Analysis Review (TAR) - Technical Analysis Summary (TAS) process
- Enterprise Architecture Web page
- One-VA TRM
- Requirements Traceability Matrix
- System Design Document
- Requirements Specification Document
- Acceptance Criteria Plan

Attachment A - Approval Signatures

This section is used to document the approval of the System Design Document during the Formal Review. The review should be ideally conducted face to face where signatures can be obtained 'live' during the review however the following forms of approval are acceptable:

1. Physical signatures obtained face to face or via fax
2. Digital signatures tied cryptographically to the signer
3. /es/ in the signature block provided that a separate digitally signed e-mail indicating the signer's approval is provided and kept with the document

The Chair of the governing Integrated Project Team (IPT), Business Sponsor, IT Program Manager, Project Manager, and the members of the Technical and Enterprise Architectural Review Team are required to sign. . Until the Engineering and Architecture Review Board is stood up, both the Engineering IPT member(s) and the Architecture IPT member(s) must approve/sign the SDD. Please annotate signature blocks accordingly.


a

Signed:	Date:
 <i>OIT Project Manager</i>	

Signed:	Date:
 <i>VRM PMO Business Sponsor</i>	

Signed:	Date:
 <i>OIT Program Manager</i>	

Signed:	Date:
 <i>Enterprise Architecture</i>	

Signed:	Date:
 <i>Service Delivery and Engineering</i>	