

Mapping Various Sources to a Centralized Data Warehouse



Trinity Technology Group (TrinityTG) was brought in to assist California Correctional Health Care Services (CCHCS) (referred to as "Health Care Services" or HCS) with its Business Intelligence efforts and lay the architecture for a consolidated Data Warehouse for HCS.

Our initial analysis determined that mapping the various data sources to a single centralized Data Warehouse would be the most challenging aspect of the project. Through this mapping effort we had to address a series of issues related to data quality, the type of data being collected and amount of data being collected.

Other challenges that had to be solved through our innovative solution included the fact that many of the CCHCS data sources had their own set of unique health code sets which required TrinityTG to develop a master code set to be used as part of the Data Warehouse design.

In addition, the system requirements necessitated that the solution had to extract, transform, and load data for these various sources in near real time.

Key Benefits to the Client:

- **CCHCS Reporting Infrastructure** – Trinity Technology worked with both Cerner and CCHCS Information Technology (IT) staff to build an Oracle Standby that would extract data in real time from the Millennium system and import the data into a CCHCS SQL Server utilizing Oracle Golden Gate software. This infrastructure had to be both scalable as well as provide data from the source to the target in real time.

Background

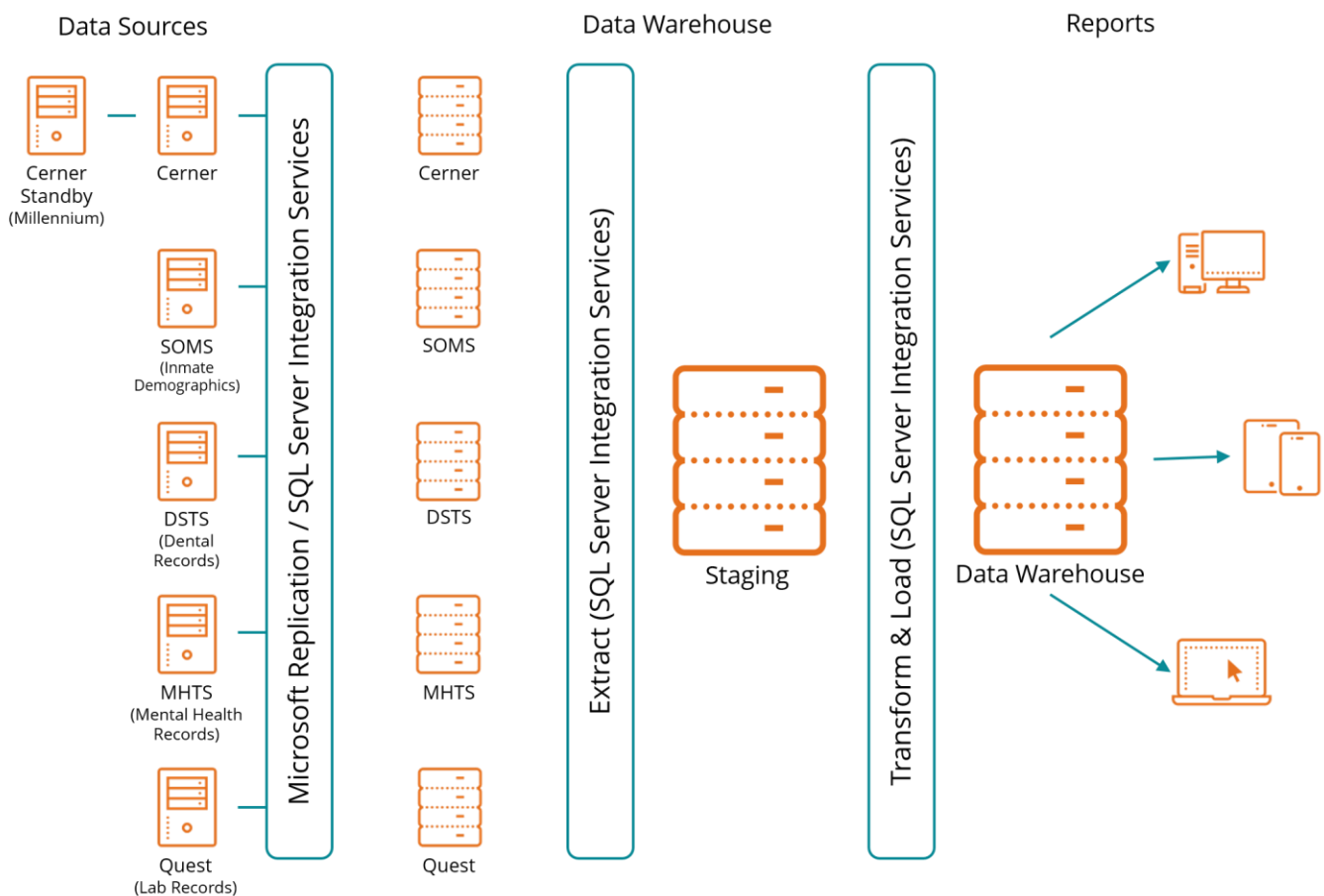
CCHCS currently maintains a data repository of more than one million patients generating daily reports of consolidated data from over a dozen external data sources. These sources provide data which is needed to be used for standard, scheduled, and ad hoc reports. HCS then needs to analyze this information to explore patterns and trends related to inmate demographics, diagnoses, lab results, prescriptions, as well as both physical and mental health.

In late 2014, HCS executives approved a project for creating a new Millennium data extract to support ongoing HCS performance reporting, analysis, monitoring, business intelligence and continual improvement. The new Electronic Health Records System (EHRS) will replace some of the existing systems that feed the current data repository – these "to-be-sunsetted" systems will be retired after EHRS has been fully implemented statewide, expected late 2017.



- **Mapped Cerner Millennium EHR System** – We mapped the needed data elements between the Cerner Oracle EHR System and the CCHCS external data sources. We also integrated Cerner EHR data with the data from many different CCHCS production systems.
- **New Preproduction and Production Environment** – We built out two environments for Production usage and Preproduction/Development usage, designing and implementing all of the external Extract, Transfer and Load (ETL) processes from the various sources and migrating all ad-hoc reports used by various reporting departments.
- **Designed and Implemented a Centralized Data Warehouse** – TrinityTG mapped all of the external data sources including Cerner Millennium system and many CCHCS legacy data sources into a single centralized database repository focusing on elements that will be utilized to meet HCS reporting needs while performing the ETL process(s) in real time and retaining historical data.

Figure 1. EHR | CCHCS Data Warehouse Diagram



Trinity Technology Group

Trinity Technology Group has been building working IT solutions that solve real business problems for nearly 20 years in Sacramento. Our team of talented professionals – from business analysts to seasoned developers, quality assurance analysts to project managers – work hand-in-hand with you to create formal plans for each critical process and to deliver the solution your department needs.