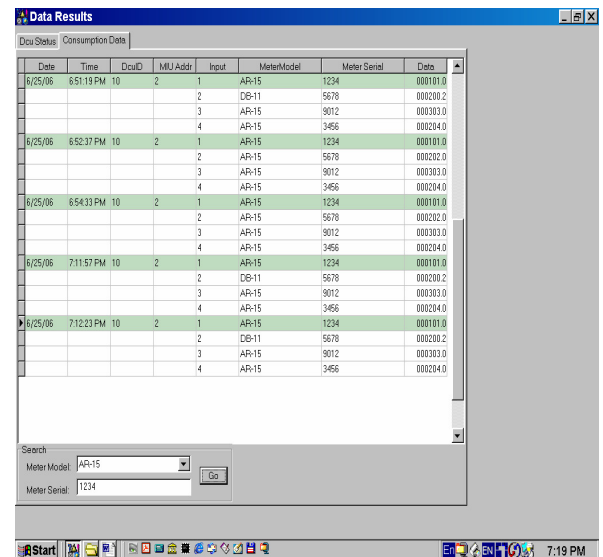
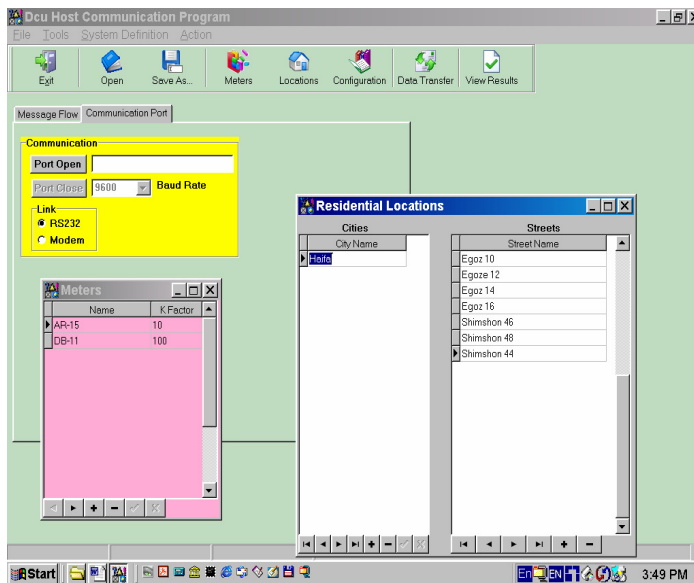


Scroll™

An MDM (Metering Data Management) platform





Overview

Meter Data Management (MDM) has been traditionally defined as a repository for meter data collected from diverse meter collection systems as well as providing Validation, Estimation and Editing functions, and providing integration with Customer Information Systems (CIS). It is the primary source for meter analysis and load profiling. However, leading MDM system providers now broaden the definition to be a data repository for operation data which surpasses early generation MDMs by integrating all collection endpoint data such as SCADA, Outage Management System Data, and GIS Mapping Data.

The MDM platform serves as the integration point for current and future data collection technologies such as AMI. MDM is well-suited to utilities that have already implemented AMI and find themselves with “data overload” and need a strategic methodology to efficiently manage and utilize the vast amounts of data they are collecting from multiple data streams from multiple systems such as: drive-by, fixed wireless, mesh, PLC, etc. into a single data platform. However, utilities that have not yet implemented AMI will also find that it makes sense to have MDM in place before moving forward with these projects.

MDM systems have the potential to immediately meet utility’s short-term system integration and data management needs in a way that will enable a fully-integrated solution that will meet utility’s future business needs and national Smart Grid imperatives.

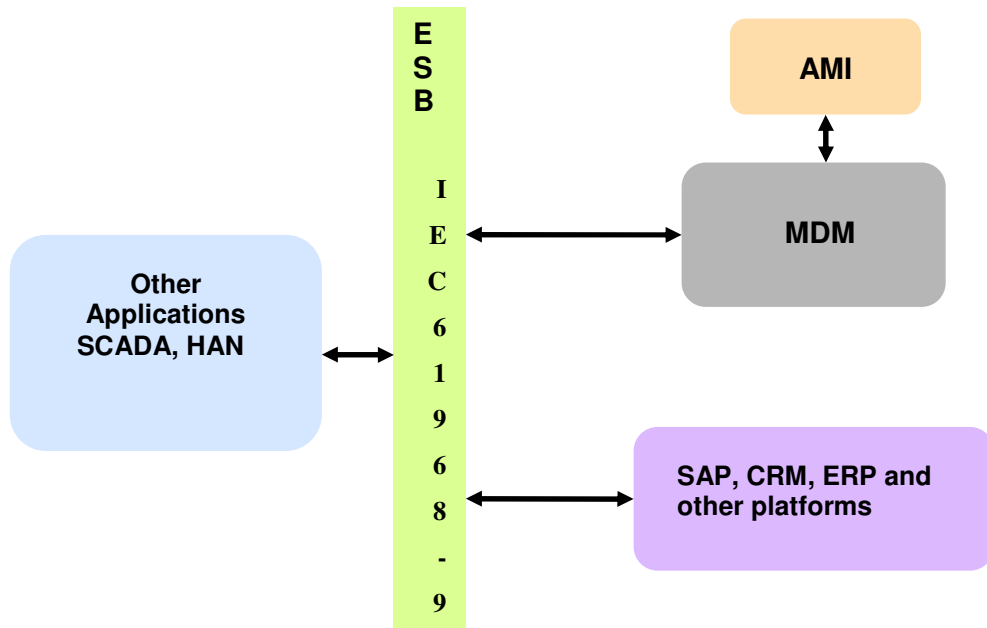
Utilities should implement their MDM system in phases. Once MDM is deployed, system integration can be phased in. System management dashboards, the MDM utility portal and the MDM customer portal can be extended later once the core system has been deployed. Utilities can set the pace of their phased implementation based on the level of customer sophistication.

Benefits of the MDM Solution

- Reduce cost/time to gather meter data from multiple collection systems
- Provide higher quality data from operating a single enterprise-wide data repository
- Improve reliability, security and consistency of meter data for billing and analytics
- Reduce number of errors associated with increased data collection and intervals
- Interface to numerous analytical software applications
- Improved operational efficiency by way of secure data that’s audited and easily accessible to the enterprise
- Insulate the utility’s business systems from the details of metering/meter reading in a multi-technology environment
- The Scroll™ uses modern development tools as **ASP .NET** framework for Web environment and **M.C SQL Server 2000** as for data base structure.

ESB (Enterprise Service Bus) data stream

Nortex is implementing the **MDM** system as a modular open architecture using a standardized ESB to interface with any SAP platform.



Automatic Meter Infrastructure

An AMI application where for electricity, water, and gas with interfacing to different vendor meters with various protocols.

ESB- Enterprise Service Bus

A virtual Bus implementing the IEC-61968-9 standard with files in XML format to be used as a Web portal for data traffic exchange of meter readings and control.

MDM- Meter Data Management (MDM) - Scroll™ software runtime.

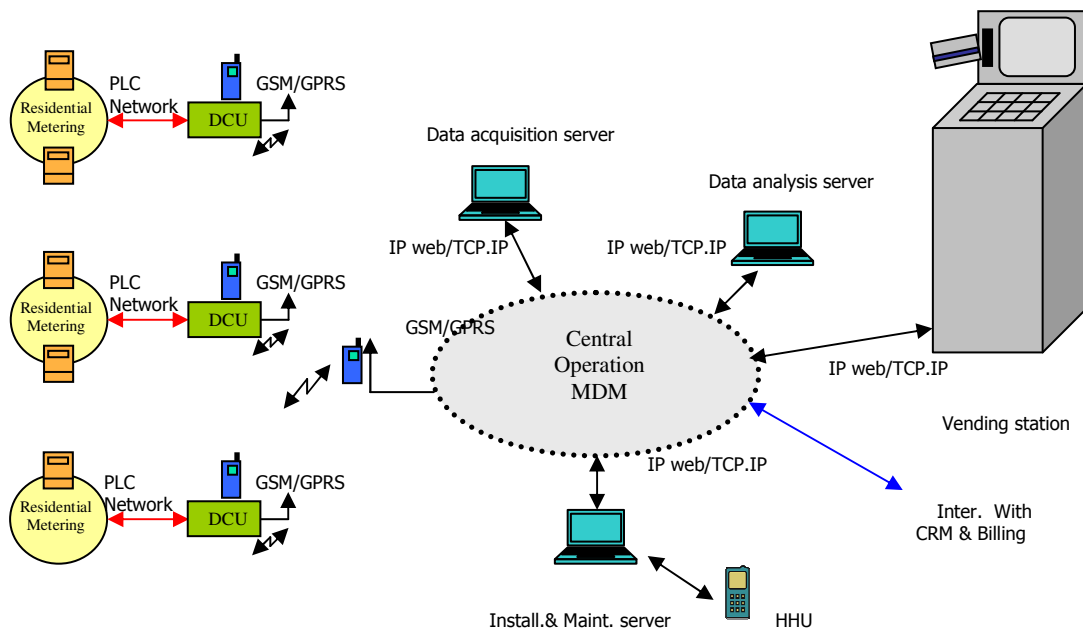
SAP platform

Implements any CRM, ERP and Billing platform

The MDM platform

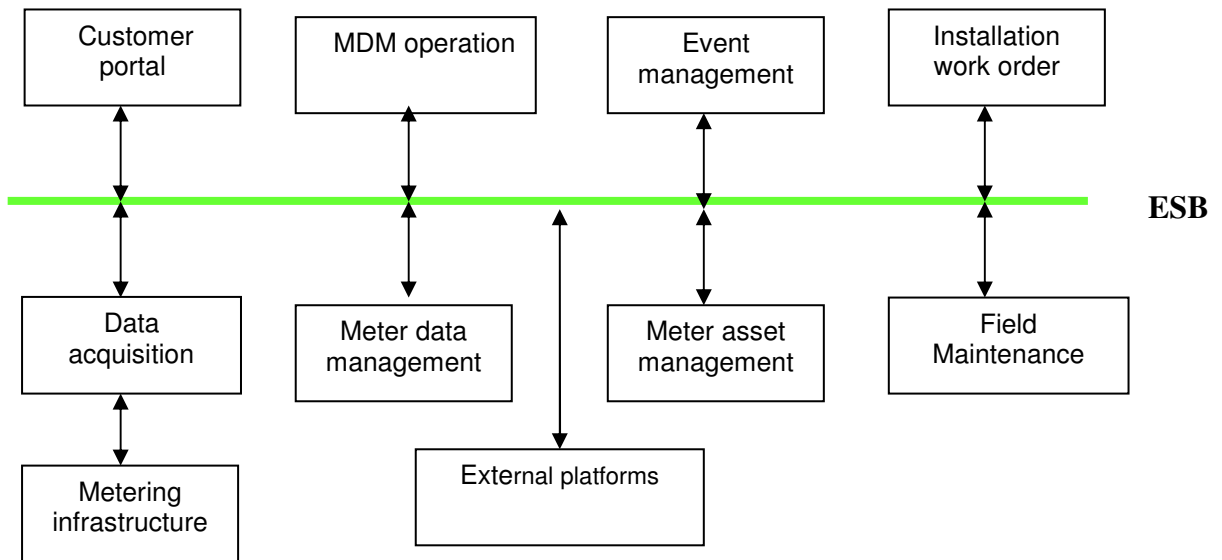
A typical MDM structure for Smart Metering is where the ESB aims to facilitate interaction between systems and therefore reduces the need for the systems to be able to interact directly with each other.

A single data repository is crucial to the functionality and integration between the applications interacting through the ESB.



The MDM architecture

Functionalities



Metering Infrastructure

Measures, collects, transmit and temporarily stores end-user consumption.

Data acquisition

Data collection with XML export files often outsourced to data management, maintenance and other servers, and to external platforms as billing, ERP and other.

Meter data management

Central meter data base which accessed by other systems. Interface between meter values and corporate applications to effectively manage meter data.

Used for creating analyzed data files of irregular data, load profile, loss detection, peak demands and other expandable options.

Meter asset management

Single storage point for meter configuration (meter S.N, input slot for end nodes), network configuration and parameters (K factor, TOU, load profile etc.).

Field maintenance

Manages work orders as local maintenance and reading operation which cannot be handled remotely for field crew by two way access with the Tiny™ runtime maintenance tool. Could be external if the service is provided by a supplier



Installation work order

Manages upload for installation work order and download with hardware network configuration after installation activities by two way access with the Tiny™ runtime installation tool.

Handles the logistics, scheduling and reporting related to work orders.

Event management

Stores and handles events like alarms, power outages, missing meter values, quality of energy distributed.

MDM operation

Executing auto cyclic communication access according to file list, interactive configuration, TOU and parameters uploads, selected online readings and interactive prepayment transaction mode.

Customer portal

Often web based portal for customer service to log on for data receiving of real time readings, last bill, load profile tariff schedule and prices.

External platforms

Interfacing by the ESB bus for getting sorts of data and operating any real time operation as; online billing, control, data validate with consumer and other operations.

AMR Technology Limited -- Data Results

Date	Time	DcuID	MUAddress	Input	MeterModel	Meter Serial	Date
8/27/06	11:35:27 AM	100	2	1	BK G4	2496597	000235.6
8/27/06	11:35:27 AM	100		2	BK G4	2341711	001600.9
8/27/06	11:35:27 AM	100		3	BK G4	2428661	001146.7
8/27/06	11:35:27 AM	100		4	BK G4	2498497	000477.7
8/27/06	11:35:27 AM	100		5	BK G4	2282922	000732.8
8/27/06	11:35:27 AM	100		8	BK G4	2283149	000578.3
8/27/06	11:35:27 AM	100	3	1	BK G4	2362719	002254.0
8/27/06	11:35:27 AM	100		2	BK G4	2222815	003601.5
8/27/06	11:35:27 AM	100		4	BK G4	2221933	003138.6
8/27/06	11:35:27 AM	100		7	BK G4	2283330	001893.5
8/27/06	11:35:27 AM	100		8	BK G4	2494776	001886.4
8/27/06	11:35:27 AM	100		9	BK G4	2220618	001924.6
8/27/06	11:35:27 AM	100		10	BK G4	2630814	000040.7
8/27/06	11:35:27 AM	100		11	BK G4	2221868	002241.1
8/27/06	11:35:27 AM	100		12	BK G4	2221862	001557.5
8/27/06	11:35:28 AM	100	5	1	BK G4	2221947	001563.8
8/27/06	11:35:28 AM	100		2	BK G4	2219522	000777.3
8/27/06	11:35:28 AM	100		3	BK G4	2219784	002346.3
8/27/06	11:35:28 AM	100		4	BK G4	2220462	002043.1
8/27/06	11:35:28 AM	100		5	BK G4	2220620	001722.8
8/27/06	11:35:28 AM	100		6	BK G4	2219947	000957.6
8/27/06	11:35:28 AM	100		7	BK G4	2222836	002170.0
8/27/06	11:35:28 AM	100		8	BK G4	2220429	001749.3
8/27/06	11:35:28 AM	100		10	BK G4	2341647	000778.0

AMR Technology Limited -- Dcu Host Communication Program V1.0

Configuration

Channel	Meter Model	Meter Serial
1	BK G4	2498887
2	BK G4	2341711
3	BK G4	2428661
4	BK G4	2498497
5	BK G4	2282922
8	BK G4	2283149

Current Dcu: ID: [redacted], Tel Num: [redacted], City: [redacted], Street: [redacted]

Current MU: Net Address: [redacted], Type: [redacted]

Meters: BK G4 100, NYGA 100

Residential Locations: City Name: Bondomo, Hato, Matsuya; Street Name: Ego: 10, Ego: 12, Ego: 14, Ego: 16, Shenshon 46, Shenshon 48, Shenshon 44, Levent