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**Using Data Standards to Cope with Continual
Regulatory Pressures and the Current Smart Meter Initiative**

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Data Standards and the Smart Meter Initiative

Ontario's LDCs continually face the same central issue: Regulations are constantly changing, and there is a large degree of uncertainty as to what will transpire in the future. Consider the current Ontario smart meter initiative as one such example. This imposes at least two problems at the outset on LDCs:

1. LDCs face unknown risks, increased costs, and aggressive implementation timelines
2. LDCs need to invest in more flexible infrastructures that accommodate changes

Information technology (IT) system changes are an integral part of such initiatives, so how can LDCs deal with such IT problems? The answer is to include data standards as a requirement to do business.

LDCs currently use a variety of standards (technical, procurement, process, etc.) in order to run their day-to-day operations and do business. Why not apply the same theory of using standards to your IT infrastructure so that LDCs can have a collaborative and defined approach to implement equipment, services and processes to comply with new and evolving regulations?

Let us define what data standards entail:

What functionality must be specified?	Content: The structure and format of data passed between systems.
	Storage: The minimum requirements for the amount of data to be stored and the corresponding retention periods.
	Connectivity & Delivery: The delivery methods required to transport data between systems, including how systems locate and connect to each other.
What characteristics of the functionality must be specified?	Security: The storage and delivery must be secure, and systems and parties must be authenticated before data passes.
	Certification Capabilities: The minimum requirements to demonstrate regulatory compliance.
	Audit Capabilities: The ability to audit the delivery and content of data, and non-repudiation of parties, especially when using independent third parties.
	Reliability: The minimum requirements to ensure availability of systems and methods of service interruption recovery.



Consider the situation facing an LDC that adopts data standards versus one that does not:

As an LDC, what do you gain by using data standards?	What happens without data standards?
<p>Standards bring more service providers to the table, continually competing for your dollars today and into the future:</p> <ul style="list-style-type: none"> • Gives you the advantage to select vendors that bring you the most value (no vendor lock in) • Competition amongst vendors forces them to lower their fees • Reduces the risks and costs of switching vendors or service providers 	<p>Proprietary implementations leave you locked into your current vendors:</p> <ul style="list-style-type: none"> • Vendors must charge significant fees if they have to implement systems specific to you, since the lack of standards prevents them from recovering their costs over a larger client base • The difficulty of migrating provides no incentive for your current vendors to reduce their costs • Migrating systems is very costly and time consuming
<p>Standards help you come together as a group and determine a common implementation strategy, lowering your risk, costs, and lengthy timelines.</p>	<p>Since your systems and IT needs are so distinct, it is difficult to use standards-based implementation methods, and you must expend the effort to derive your own.</p>
<p>Standards establish a clear set of testing and certification guidelines, which lowers your risk and implementation timelines, and therefore costs as well. Additionally, standards permit you to select testing tools and services from a variety of vendors.</p>	<p>You are forced to derive unique testing methods for your particular set of proprietary systems, and therefore have little ability to leverage other LDCs' efforts. You are similarly forced to construct your own testing tools, and cannot take advantage of standards-based testing tools.</p>
<p>The more deeply you embed standards in your IT systems (i.e. by specifying standard methods to <i>connect</i> and <i>deliver</i> data between systems), the easier it becomes to enhance, replace, or insert new systems that <i>process</i> data, providing a larger degree of flexibility.</p>	<p>Systems that are tightly coupled using proprietary methods are very difficult to rework or update. You are forced to "shoe horn" new requirements into systems that were never intended to accomplish the new functionality – and you have no ability to work around these systems.</p>

Other jurisdictions that did not mandate strong data standards have suffered the consequences of these decisions. Alberta now recognizes a shortcoming in its meter data delivery standards which has resulted in excessive support costs to deal with transmission errors. Texas now acknowledges its lack of consistent standards between methods of dealing with consumption data and billing & settlement data has resulted in high costs to resolve billing and settlement discrepancies. *Let's not repeat these mistakes in Ontario.*

Do strong data standards exist in Ontario? They certainly do, in the form of the OEB EBT standards. Originally designed to handle the LDC-to-retailer relationship, they are perfectly suited to handle the data standards for broader initiatives.



Let us examine how the EBT standards meet the definition of data standards:

Content	Transactions are defined using implementation guides, and validated against published XML schemas.
Storage	The on-line and off-line storage requirements of participants and their service providers are documented in OEB protocols.
Connectivity & Delivery	The permitted connectivity and delivery methods between participants and their service providers are fully specified in OEB transport protocol documentation.
Security	Secure connectivity, authentication, and data encryption standards are fully documented in OEB protocols.
Certification Capabilities	Certification strategies and specific testing methodologies and checklists have been developed for market opening and for major EBT standards upgrades.
Audit Capabilities	Delivery protocols require that confirmations be passed to each party. Non-repudiation is provided since each transmission is tagged with keys uniquely identifying each party. In the event of disputes, independent third-party confirmation of data delivery is performed by each EBT service provider.
Reliability	The OEB protocols mandate the confirmation of each transmission. In the event of a major system failure at a participant site, EBT service providers are mandated to provide the ability to recover lost transmissions using the existing protocols.

Have the EBT Standards been proven to reliably meet the data standards of Ontario, and are they capable of scaling to the data standards required for the smart meter initiative?

Yes, they have proven to be reliable and are capable of handling the tremendous quantities of data for SMI (See *Appendix B* below).

In fact, under SMI, such data standards become even more critical, given that much more data will be handled than ever before. LDCs cannot afford to lose meter reads and interval data or expend significant resources building infrastructures and processes to guarantee data will be properly passed from the meter all the way through to the consumer (i.e. to VEE processes, billing and settlement functions, customer service departments, and consumer presentment).

Data standards that specify how an LDC transmits and processes the substantially increased volumes of data are fundamental to the success of an LDC's smart meter initiative, and implementing data standards at an LDC provides flexibility for the future.

The EBT Standards and the EBT network service is a suitable vehicle for an LDC to use in its SMI plans:

- You can leverage your existing investment, lowering your risk, costs, and implementation timelines since this is a well-known mechanism you are already comfortable with.
- The data structures for delivering consumption and interval data are almost already complete, and can readily extend to meet expanded SMI processing.
- AMR, Billing, Settlement, and Consumer Presentment vendors and service providers that certify to the Standards can provide their offerings to you in a highly competitive manner.



- Since you are already connected to the EBT network, you can connect to any new service provider that joins the network.
- Defining system interfaces in a standards-based manner allows you to add functionality without completely replacing your older systems (e.g. CIS). New services that perform SMI-specific processing can be inserted or wrapped around existing systems. These services can be enhanced or further decoupled as rate structures, DSM, and other regulatory initiatives are rolled out.

Consider how data standards, and the EBT standards in particular, can benefit your SMI plans.

Appendix A

1.1.1 Ontario's Smart Meter Initiative – What are the IT Issues?

The Ministry's plan to roll out smart meters creates a number of IT issues for LDCs, but at the same time, opens the possibility for LDCs to leverage existing technology to forge new business relationships.

The issues that arise are:

- **Variety of AMR Vendors:**

An LDC does not want to sole-source its meters from one AMR vendor. Due to different technical requirements, let alone advances in technology, this would not be in the best interests of the LDC. Therefore, the LDC must plan for the assumption that it will use meters and AMR systems from a variety of vendors as the years go on. But how can the LDC handle the burden of coding interfaces and testing each AMR vendor?

The existing Ontario network addresses this issue by providing an interface that can deal with the AMR vendor's native data format and translate it to a suitable industry standard. This approach permits any vendor, once it certifies its systems to be network compliant, to send meter readings and interval data to the LDC. The network alleviates the LDC's burden to custom code connections to each AMR vendor's interface, as well as providing the LDC with the ability to use multiple vendors and switch vendors over time without affecting the core interface or data.

- **Moving and Storing Volumes of AMR Data:**

The volumes of smart meters sending interval data will overwhelm an LDC's existing meter data repositories, both in terms of moving the volumes of data between many systems (VEE, billing, settlement, consumer presentment, etc.) and storing the data. How can the LDC offload, jointly develop or outsource these burdens to an external party?

The existing Ontario network answers this issue of reliably moving the data by using the existing and proven network service as a reliable, secure and auditable transport mechanism that can handle the large volumes of data involved. Using the existing network infrastructure serves to dramatically reduce the risk that is inherent in any alternative solution. The current infrastructure has already demonstrated the capacity to transmit and process data in the volumes anticipated.

The existing Ontario network addresses the problem of storing the volumes of data by forwarding the raw AMR data to a meter data processing service provider. This service handles the burden of storing the data for the LDC, while still providing access to subsets or summaries of the data as required at no charge.

Such an external service could be provided either by a commercial vendor or by a collaborative effort of a group of LDCs.



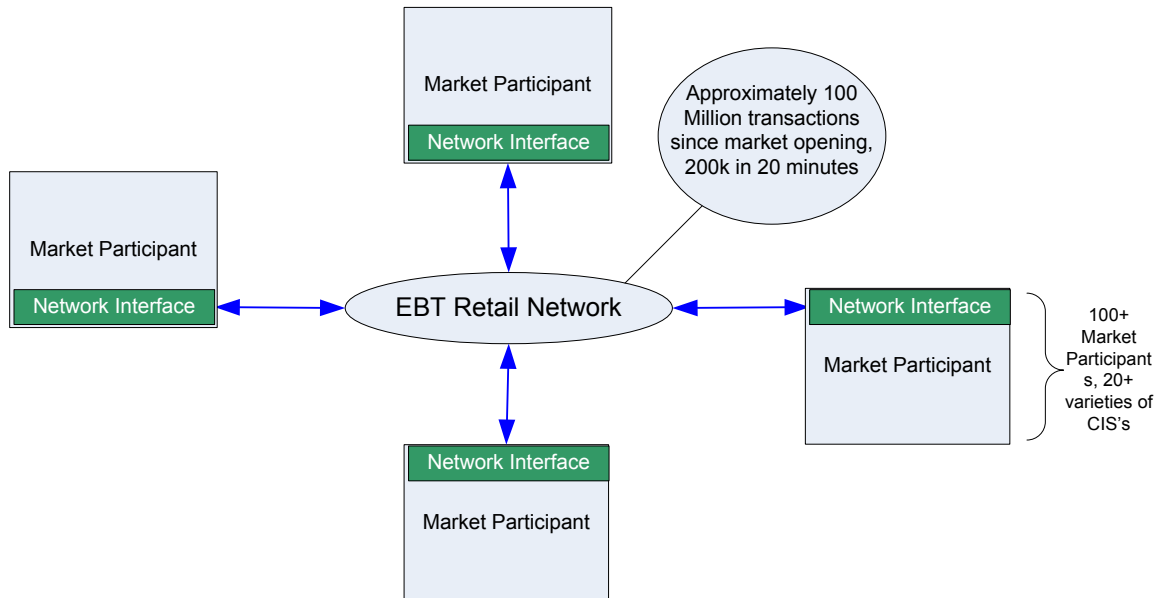
- **Billing Calculation Concerns:**

Many low-volume customers may not require interval meter data for billing purposes, yet the meters may store and therefore provide interval data. How can the LDC avoid having to calculate a non-interval (or TOU) form of the interval data for billing purposes?

The existing Ontario network can address this concern by using a meter data processing vendor. The service can convert multiple interval reads into a single non-interval read (or TOU read), and pass the simplified read back to the LDC for billing purposes. This provides the CIS with only the data it requires – and more importantly, the same data it is currently designed to handle.

Appendix B

1.1.2 Ontario's existing network – What is it?



1.1.3 Ontario's EBT Infrastructure is a Proven Network Service

Ontario's existing EBT infrastructure or network is a proven, reliable and robust network capable of rapidly processing millions of transactions.

The existing network is trusted to ensure that large volumes of data are consistently formatted and transported securely, that parties are authenticated, and that the delivery of data is monitored and acknowledged. It currently handles interval and non-interval meter data for over 973,000 meters. Projecting the network infrastructure's highest production load to date, our benchmarks indicate an effective 24-hour load ability of over 14 million transactions per day without straining network capacities. Far larger transaction volumes are achievable with modest enhancements to the existing infrastructure.

The following benefits are realized by using the current network to deal with the issues of reliably handling large volumes of data:

- Costs are minimized
 - Leverage an existing infrastructure investment
 - Reduce integration costs by transporting data from multiple sources to the CIS in a manner that LDCs currently recognize
- Time to market and risks are reduced
 - Existing network infrastructure is in place, has been thoroughly tested, and can minimize development and implementation requirements
 - Existing network stores all data (2 years online, 5 offline), and also allows for all historical information to be retrieved automatically 24x7

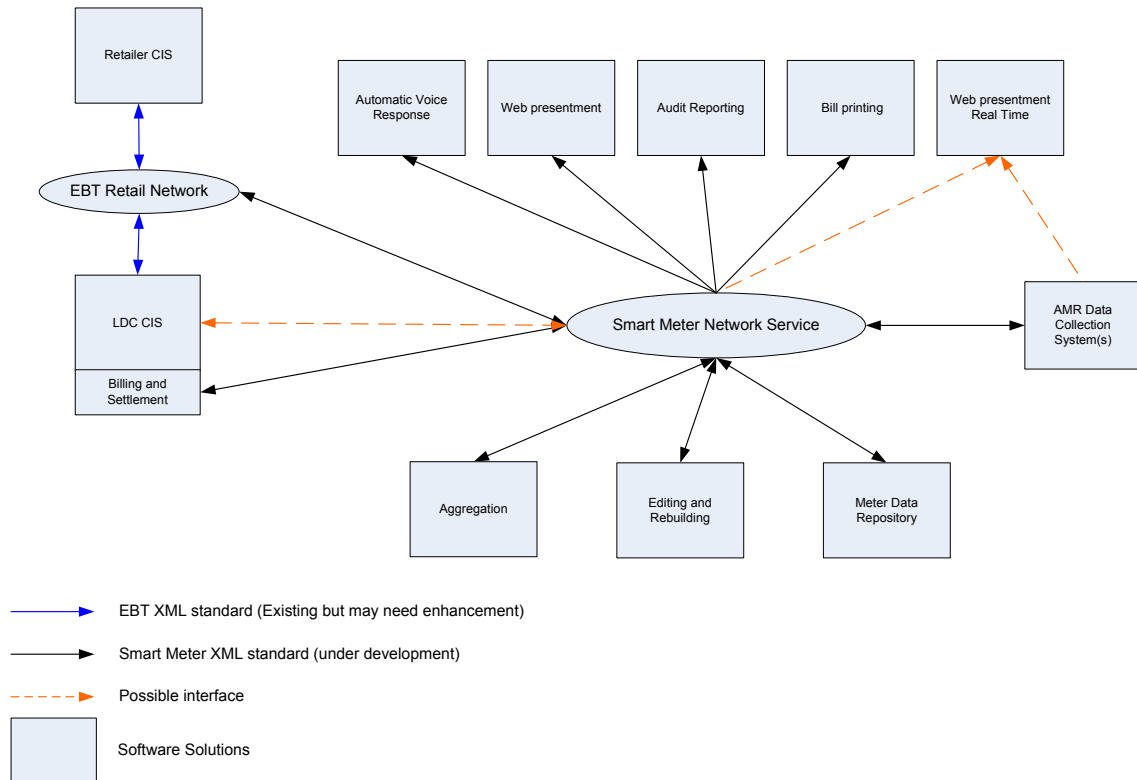


- Choice of vendors and opportunities for collaboration exist
 - By placing business functions on the network, LDCs can choose to selectively collaborate or outsource key functions

- Large amounts of data can be transported
 - Network infrastructure is robust and reliable, hosted in a tier 1 data centre, with redundant Internet connectivity and multiple levels of backup power capabilities

Appendix C

1.1.4 Expanding Ontario's Existing Network for the Smart Meter Initiative



1.1.5 The benefits of Ontario's existing network

- Connect once and you are connected to many.
- LDCs define a requirement for vendors to connect to the network – this then provides the LDCs with a standard interface and data transport protocol for all vendors and service providers.
- LDCs can optimize this standard and outsource and integrate business requirements that are strategic and cost-effective.