INTEROPERABILITY DLMS OVER PRIME

Fundamentally, the grid is optimised to move electricity generated as a whole and it has benefited from many innovations and improvements over the last decade to achieve an efficient distribution network. An AMI system, as the key building block for a larger smart grid infrastructure, requires a high level of interoperability among devices which are operating within the grid. This interoperability aims to ensure interchangeability and sustainability of smart metering solutions among multiple suppliers under one communication infrastructure with one common set of functions. PRIME Alliance has invested a great deal of time and effort to endorse one common interoperable data model assembled above the current PRIME communication layer supporting security through data encryption and authentication, load management, and data supervision among smart meters, sensors and grid management devices. This unified data model protocol will lead to new services hosted by smart meter, smart grid and smart home applications and it will allow the constructions of future infrastructure upgrades over the current groundwork.

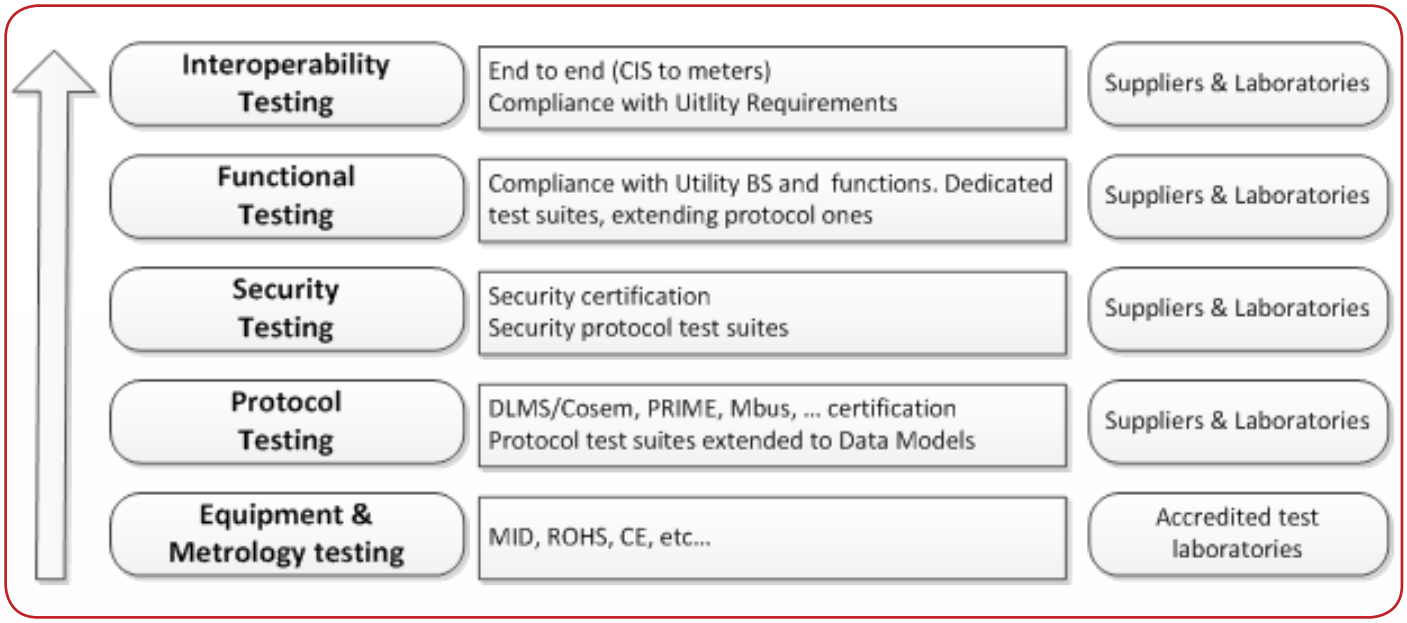

Figure 1:????????????????

Building the bridge from communication to application over the DLMS protocol using a collection of predefined COSEM objects and attributes, the PRIME Alliance advocates these common sets of functions to all its current and futures members to achieve a single end-to-end interoperable solution in Europe and world-wide. Over the past year, with participation of major utilities, meter manufacturers and laboratories, a COSEM task force within the PRIME Alliance has been formed to draft such a companion specification. Thanks to the diversity of participating actors, the companion standards will take into account all the current specified functions as well as the future needs of utilities. Aiming to secure and to maintain an interoperable data model and defining a seamless data flow for new applications, the PRIME Alliance publicly promotes an interoperable technical specification, known as the PRIME COSEM MODEL (PCM) based on open standards.

The new COSEM profile defines the remote management interface using PRIME technology as the main communication link and 2G/3G/4G as a secondary technology for isolated areas. The multi-utility interface, along with the local customer port interface using Wireless Mbus protocol, enables new services for utilities and end consumers. The proposed objects and attributes are in accordance with the latest DLMS Blue Book release 12. Load management is also a key feature within the COSEM profile which will allow utilities to optimise power consumption by shedding electricity to appliances that are using the most energy. This attribute will restore a balance between production and consumption within the smart grid network. In order to withstand the cybersecurity challenges and ensure consumer data protection, the COSEM profile defines layered security levels in compliance with the latest security suites defined within DLMS green book release 8, known as security suite 0, 1 or 2. The COSEM profile offers multiple sets of objects which include different extensions and the proposed PCM will allow one interoperable model to meet both mandatory and optional features among the COSEM profile.

Interoperability requires sharing standards and specifications bound with a validation process. Tests laboratories and test tools will be proposed by the COSEM task force, which allow the supplier to use the same tool sets to validate interoperability and conformance in simulated networks with hundreds of devices. Data captured from these tests assures that all solutions comply in detail with the specification; can communicate to each other and can achieve the required level of performance. COSEM profile certification will be carried out by one of two (2) accredited test laboratories, DNV GL and Tecnalia which have been facilitating the introduction of COSEM profile compliant and interoperable products in the market.

The interoperability proposed by the COSEM task force is warranted by a dedicated independent layered validation process involving different test suites which validate the main function and the optional extensions such as equipment and metrology testing, protocol (DLMS/COSEM, PLC, Mbus), security (Different security suites), functional and end-to-end interoperability.

The COSEM profile together with the PRIME communication profile interoperability will enhance the robustness of the PRIME solution by leading an integrated end-to-end solution enabling new services for metering sub-systems as well as for grid operations. By promoting full interoperability, PRIME Alliance meets the challenges brought in by the smart grid and smart metering globally. MI