MultiSpeak® Specification – Background and Recent Developments

Introduction to MultiSpeak®

- Developed by NRECA in collaboration with key industry vendors
- Currently covers applications of interest to distribution utilities and to the distribution portion of vertically integrated utilities, moving towards support for transmission.
- Standard is mature, scope is continuing to grow
- In use at over 500 utilities in at least 11 countries
- More information and specification available at www.MultiSpeak.org

MultiSpeak Background

- MultiSpeak Initiative is a group of about 60 vendors that provide products and services to distribution utilities.
- Recently membership was opened to utilities interested in supporting the effort.
- Currently about 30 utilities are members of MultiSpeak, including Consumers Energy and DTE.
- Members have access to latest drafts of specification and can affect the direction of the spec.

MultiSpeak Vendor Members (6/2010)

- Aclara (DCSI TWACS)
- Advanced Control Systems
- AutoDesk
- C3-Ilex
- Carina Technology, Inc.
- Capricorn Systems
- Central Service Association
- CIM-ple Solutions
- Clevest Solutions
- Cooper Power (Cannon Technologies)
- Cooperative Response Center
- Cornice Engineering
- Daffron
- Elster Integrated Solutions
- EnerNex
- Enspiria Solutions
- EPRI
- ESRI
- Exceleron Software
- GeoNav Group
- GridPoint
- Int3s
- KRB Applied Sciences
- Landis + Gyr
- Meltran, Inc.
- Milsoft
- Mueller Systems, Inc.
- N-Dimension Solutions
- Nexant, Inc.
- NISC
- NRTC
- Olameter, Inc.
- Open Secure Energy Control Systems
- Open Systems International
- Oracle Utilities
- Ovace A Mamnoon
- Papros, Inc.
- Partner Software
- Powel
- Power Delivery Associates
- Power System Engineering (PSE)
- Professional Computer Systems
- Progress Software
- QEI
- RMA Engineering
- SageQuest
- SEDC
- Sensus
- Siemens
- SmartGridCIS
- SpatialNet
- STAR Energy Services
- Survalent Technologies
- Tantalus
- Telvent/Miner & Miner
- Telogis
- Trimble/UAI
- UISOL
- Wireless Matrix
- Xtensible Solutions

MultiSpeak Specification

- Semantic framework documented in XML schema.
- Rich set of service definitions, documented in web services (WSDL).
- Web service payloads formatted in XML.
- Easy to extend for semi-custom implementations.
- Currently most implementations are in Version 3.0.
- Version 4.0 issued in February 2009
- Version 4.1 issued June 2010
- Well defined, third-party compliance and/or interoperability testing program since 2001 – applies to all interfaces.

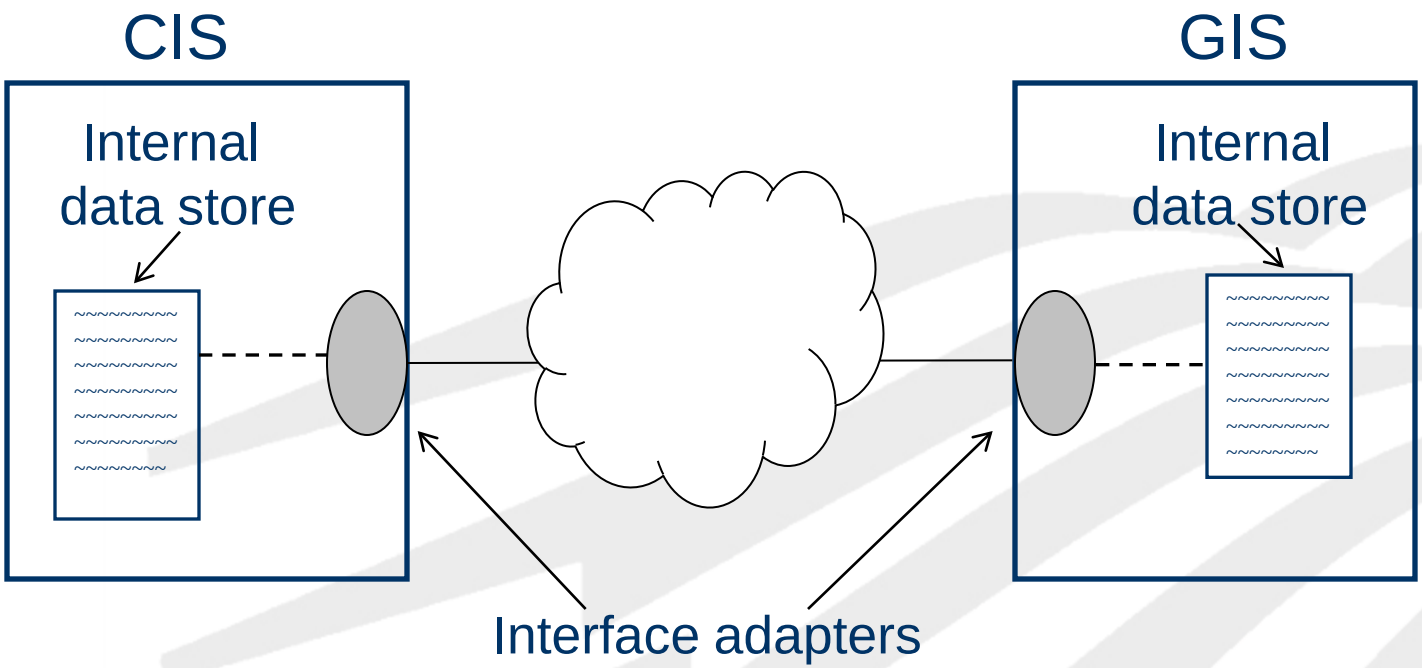
MultiSpeak Approach

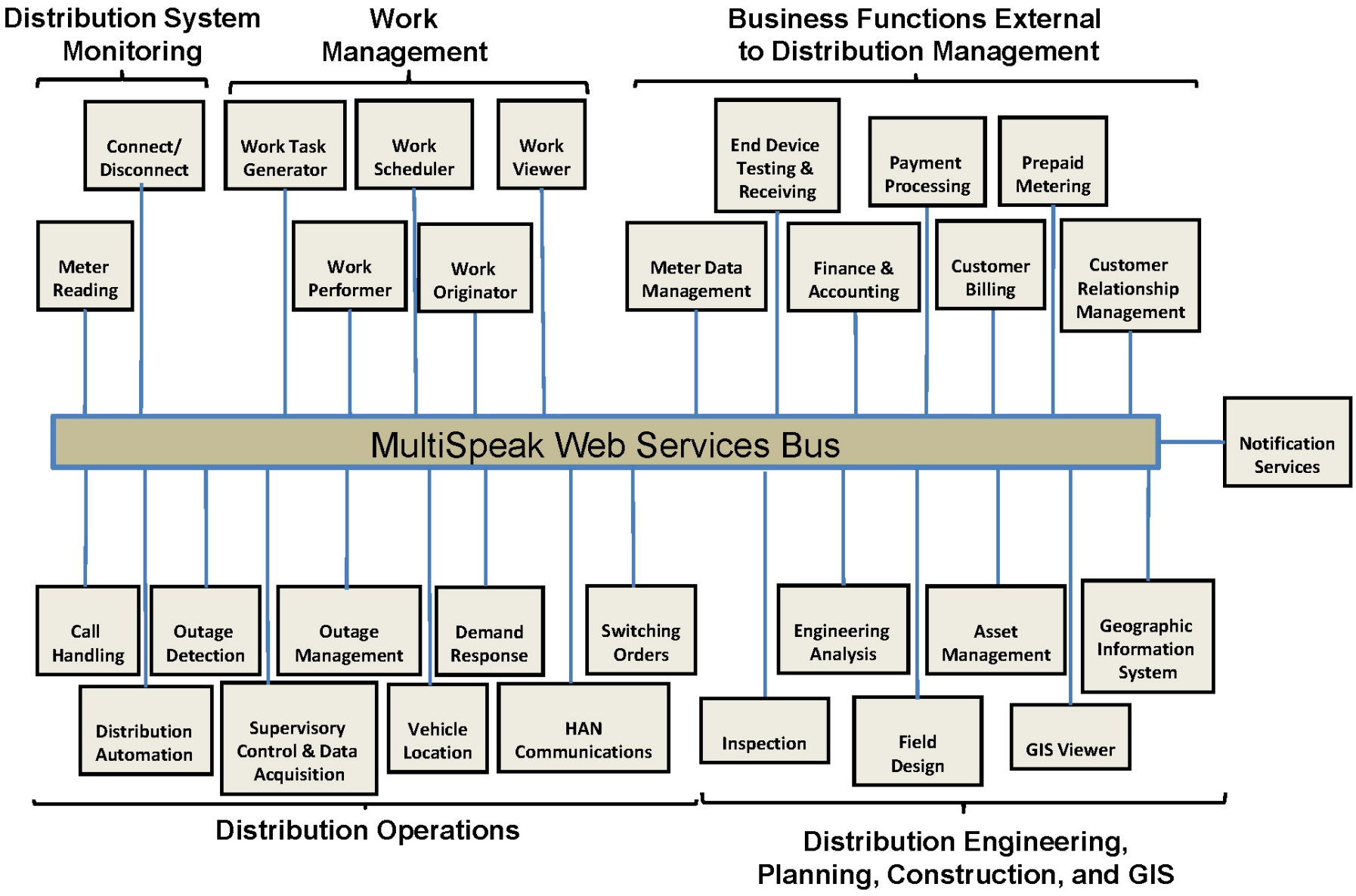
- Data objects are formalized in a highly extensible XML Schema
  - New objects can be added
  - Existing objects can be extended
- Messaging components defined in messaging schema (V2.2) or in Web Services (V3.x and V4.x)
- All transports support request/response and pub/sub
- Graphical constructs sent as XML in standard Geography Markup Language primitives, not proprietary graphics formats
  - GML is a standard issued by the OpenGIS Consortium, Inc.

Market Needs Drove MultiSpeak Design Choices

- Co-ops often have few or no IT staff, hence relied on vendor-supplied integration.
- Co-ops often have no messaging infrastructure or ESB – hence protocol needed to address lack of message persistence and guaranteed delivery.
- Originally P2P interfaces with simple transport layer security were adequate. Late in V3 services were recast for bus implementation.

MultiSpeak Approach




Distribution System Monitoring
Work Management
Business Functions External to Distribution Management
Connect/ Disconnect
Work Task Generator
Work Scheduler
Work Viewer
End Device Testing & Receiving
Payment Processing
Prepaid Metering
Meter Reading
Work Performer
Work Originator
Meter Data Management
Finance & Accounting
Customer Billing
Customer Relationship Management
MultiSpeak Web Services Bus
Notification Services
Call Handling
Outage Detection
Outage Management
Demand Response
Switching Orders
Engineering Analysis
Asset Management
Geographic Information System
Distribution Automation
Supervisory Control & Data Acquisition
Vehicle Location
HAN Communications
Inspection
Field Design
GIS Viewer
Distribution Operations
Distribution Engineering, Planning, Construction, and GIS

Completed Interoperability Tests (as of 1/2010)

- Survalent SCADA v. 1.08.0626
- Elster EnergyAxis MAS v. 6.0.2 – Milsoft DisSPatch & Web Server v. 7.2
- Aclara (TWACS) AMR (OD) with C3-ilex SCADA (acting as OA).
- Aclara (TWACS) AMR (MR) with NISC iVue (CB).
- Aclara (TWACS) AMR (OD) with NISC iVue (OA).
- Hunt Command Center v.2.2.2 (MR) – Milsoft Windmil & Web Server v. 7.1 (EA)
- Hunt Command Center v.2.2.2 (OD) – Milsoft Windmil & Web Server v. 7.1 (OA)
- Advanced Control Systems PRISM Web Service Gateway v. 1.0
- Cannon Yukon v. 3.1.17 (MR) – Milsoft DisSPatch & Web Server v. 7.1 (EA)
- Cannon Yukon v. 3.1.17 (OD) – Milsoft DisSPatch & Web Server v. 7.1 (OA)
- DCSI Optimum v. 0.1 – Milsoft WindMil, DisSPatch & Web Server v. 7.1
- Hunt Command Center v. 2.2.2 (MR) – NISC iVUE v. 1.8 (CB)
- Survalent Windows SCADA v. 3.0 (SCADA) – Milsoft WindMil, DisSPatch & Web Server v. 7.1 (OA)
- Survalent Windows SCADA v. 3.0 – Milsoft WindMil, DisSPatch & Web Server v. 7.1 (EA)
- QEI TDMS Plus SCADA System v. 7.0.0 (SCADA) - Milsoft WindMil, DisSPatch & Web Server v. 7.2 (OA)
- QEI TDMS Plus SCADA System v. 7.0.0 (SCADA)- Milsoft WindMil, DisSPatch & Web Server v. 7.2 (EA)
- Aclara (TWACS) AMR (OD) with Milsoft WindMil, DisSPatch & Web Server v. 7.2 (OA)
- Aclara (TWACS) AMR (MR) with Milsoft WindMil, DisSPatch & Web Server v. 7.2 (EA)
- Aclara (TWACS) AMR (MR) with Milsoft WindMil (CB)
- Exceleron PAMS v. 1.0 (CB) – Hunt Command Center v. 3.0 (CD)
- Exceleron PAMS v. 1.0 (CB) – Hunt Command Center v. 3.0 (MR)
- Exceleron PAMS v. 1.0 (CB) – Cannon Yukon v. 3.2 (CD)
- Exceleron PAMS v. 1.0 (CB) – Cannon Yukon v. 3.2 (MR)
- Exceleron PAMS v. 1.0 (CB) – DCSI TWACS OPTIMUM V. 1.5 (CD)
- Exceleron PAMS v. 1.0 (CB) – DCSI TWACS OPTIMUM V. 1.5 (MR)
- Cannon Yukon v. 3.2 (MR)– NISC iVUE v. 1.8 (CB)
- Cannon Yukon v. 3.2 (OD) – NISC OMS v. 1.7 (OA)
- DCSI TWACS OPTIMUM v. 1.5 – NISC OMS v. 1.7 & iVUE v. 1.8
- Clevest Mobile Field Force – Milsoft DisSPatch OMS, V3.0
- Clevest Mobile Field Force – Milsoft DisSPatch OMS, V4.0
- Tantalus TUNet AMI – Milsoft DisSPatch OMS – V3.0
- Tantalus TUNet AMI – NISC iVUE OMS – V3.0

31 Version 3.0 Interoperability Interfaces Tested; 1 Version 4.0 Tested

Changes in Version 4

- Internationalization
  - International telephone and address fields
  - Unit/value pairs with wide selection of units
  - Supports all ISO 4217 currency codes
- Adds work management and AVL
- Enhanced support for water and gas metering
- Adds support for engineering model catalogs
- Adds CIM CPSM-compatible transmission power system model exchange, will add in CIM CDPSM as unbalanced profile is completed
- In development - Enhanced support for AMI-focused smart grid, including IHD, demand response, Zigbee® Smart Energy Profile and the work of UtilityAMI/UtilityHAN.

Plans for MultiSpeak/IEC CIM Harmonization

- Separate standards continue to be a stumbling block for utility implementations.
- Implementations in process trying to bridge the standards and look for best of both worlds.
- MultiSpeak V4.x and future releases will move towards IEC CIM where appropriate.
- IEC and MultiSpeak will develop international standards leading to harmonized profiles.

Harmonizing Data Models

- Approach to include CIM CPSM/CDPSM into MultiSpeak data model:
  - Add optional CIM IdentifiedObject (naming) fields to base MultiSpeak objects
  - Where similar objects exist in MultiSpeak, create superset object to include CIM-specific fields as option
  - Where objects do not exist, use CIM object extended to have MultiSpeak naming fields
  - Maintain extended CIM objects in separate schema and namespace for maintainability

To Learn More

- Join the Initiative!
- Download the V3.0 specification or Utility User's Guide from web site
- Browse the web services on the web site or download version for local hosting
- Watch the web site for developments and subscribe to the MultiSpeak mailing list (www.MultiSpeak.org)

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