



How MultiSpeak® Supports Interoperability of Diverse Grid Automation Systems

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MultiSpeak Initiative

- Background on MultiSpeak® and CIM
- How MultiSpeak supports interoperation of power system applications
- **Why** MultiSpeak and CIM should be harmonized
- **How** harmonization can occur

Standards for Integration of Distribution Applications

MultiSpeak

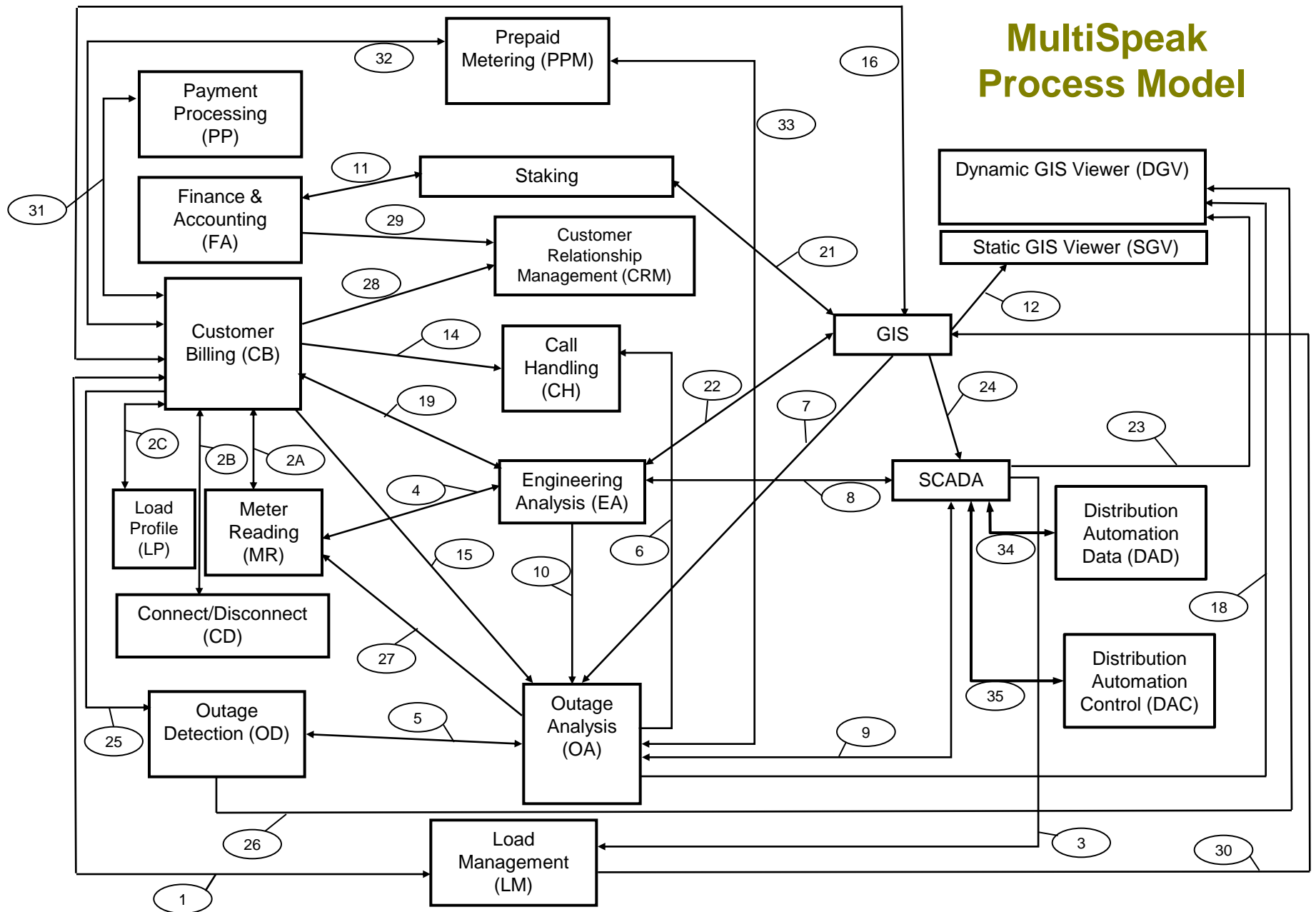
- Developed by NRECA in collaboration with key industry vendors
- Covers applications of interest to distribution utilities
- Currently doesn't include power scheduling or generation
- Standard is mature, but scope is continuing to grow
- In use at hundreds of utilities
- Mature interoperability testing program, applies to all interfaces
- Implemented using XML; web services and batch transport profiles defined
- More information and specification available at www.MultiSpeak.org

Standards for Integration of Distribution Applications

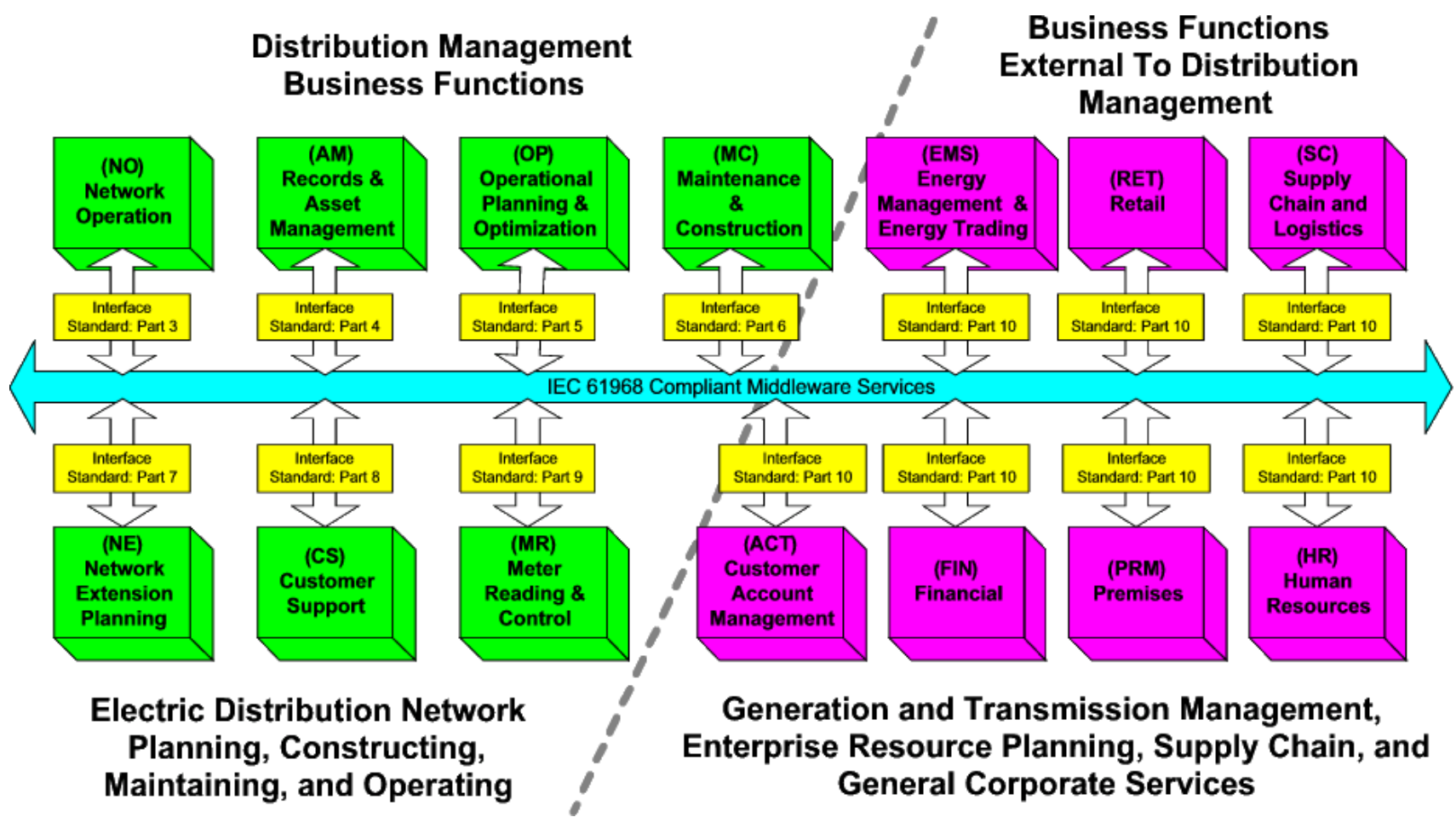
CIM with Distribution Extensions

- Grew out of EPRI UCA research; currently maintained by IEC Technical Committee 57
- Scope is larger than MultiSpeak, but is less mature
- Implementations based on CIM data model in place at dozens of utilities
- Implementation is messaging-based and transport agnostic, currently no transport profiles defined
- Interoperability testing is in place for two limited profiles (transmission and distribution power system model exchange)
- Core CIM in IEC 61970; distribution extensions in IEC 61968

MultiSpeak Process Model

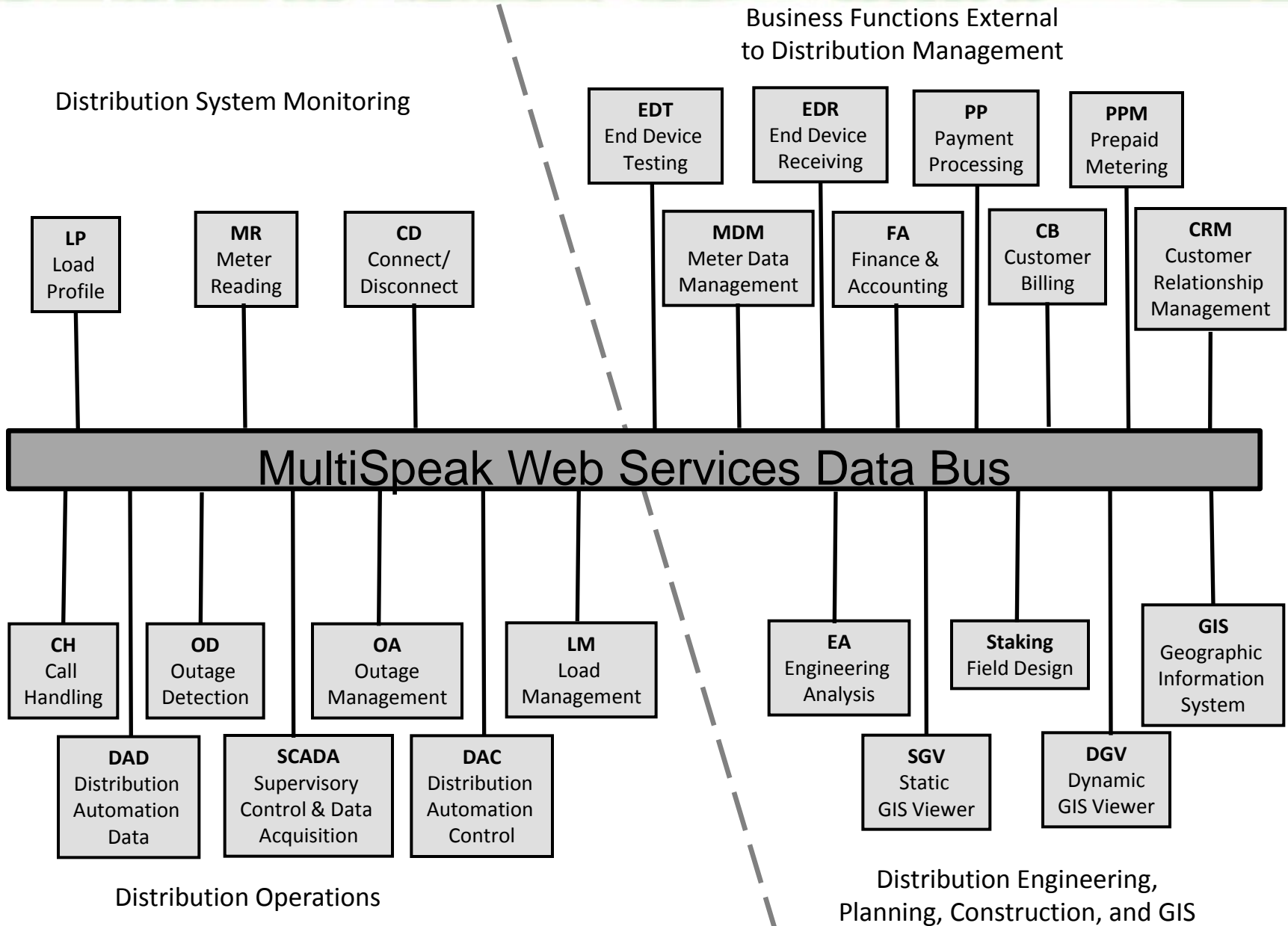


IEC 61968 Reference Architecture

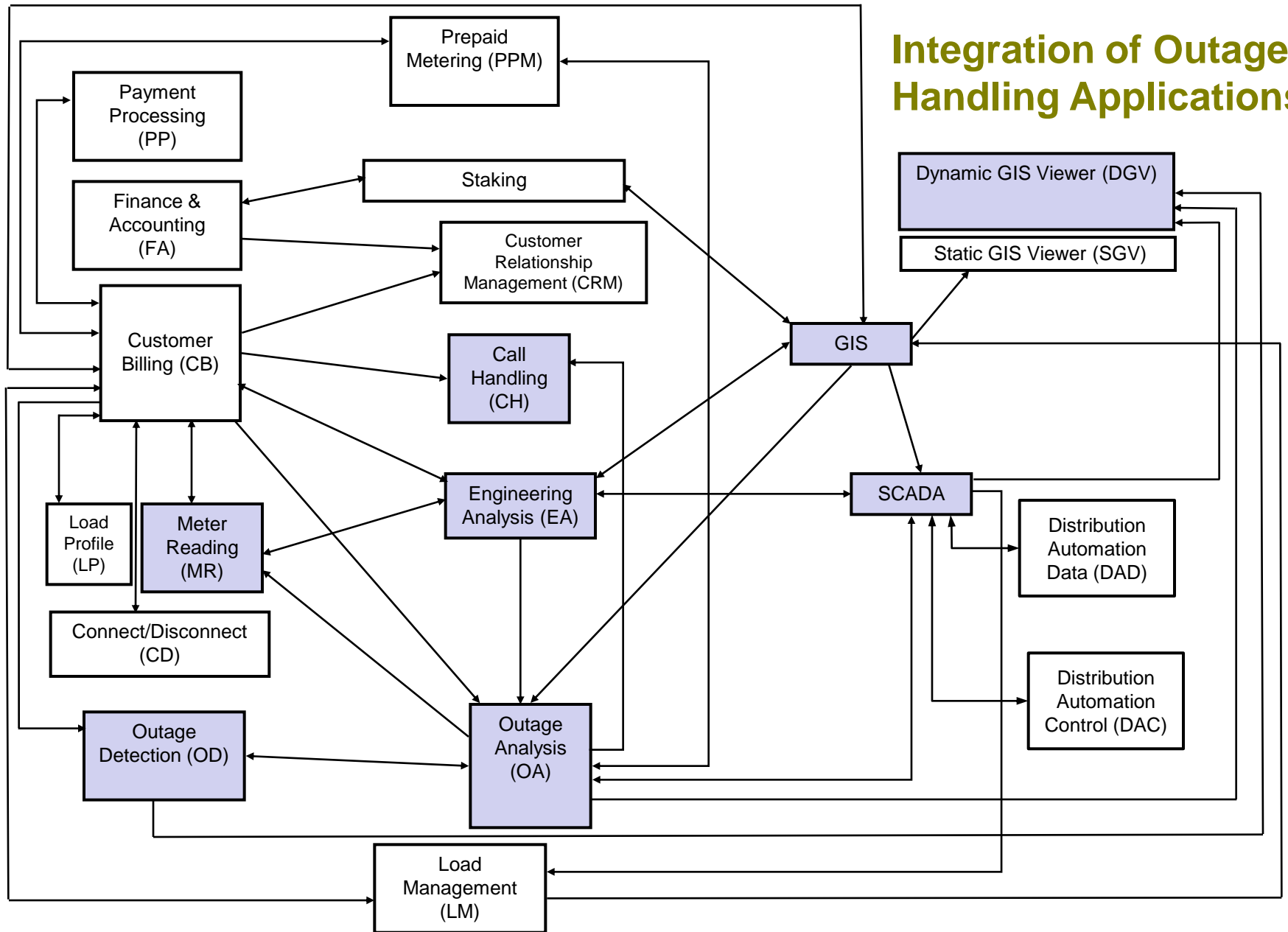




MultiSpeak Data Bus Architecture



Integration of Outage Handling Applications



- **Outages detected by AMI system transmitted to outage management system (OMS)**
 - Both pub/sub and request/response supported
 - Both “pinging” (for polled systems) or published (for unsolicited detection systems) methodologies supported
- **SCADA device status transmitted to OMS**
 - Both pub/sub and request/response supported
- **Loads/voltages/blinks/permanent outages transmitted from AMI system to engineering analysis or OMS**
 - Information useful for engineering studies, planned maintenance, troubleshooting

- **Outage calls sent from IVR to OMS**
 - Enhances troubleshooting capability
- **Outage information from OMS transmitted to IVR**
 - Improves customer service
- **System connectivity (power system model) transmitted from OMS or engineering analysis to monitoring applications (e.g. AMI, SCADA)**

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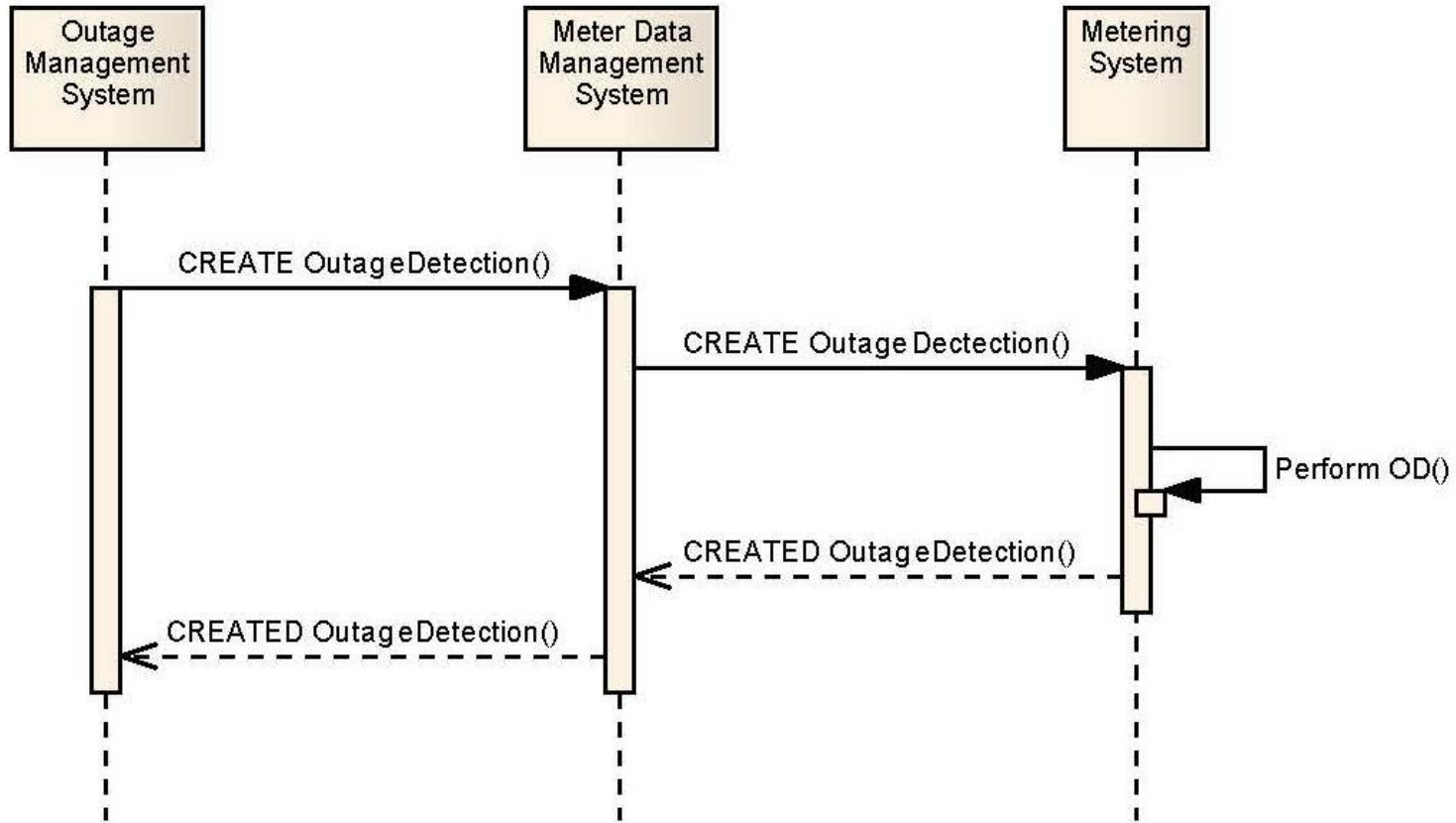
All of this is already in operation at utilities

- ***Under Development:*** Combination of load data from AMI and current feeder loading from SCADA sent to engineering analysis permits *real-time* distribution contingency analyses
- ***Next Step:*** Initiate feedback action based on the contingency analysis automatically
- ***Under Development:*** Mutual exchange of data and control actions between SCADA and any other distribution automation system

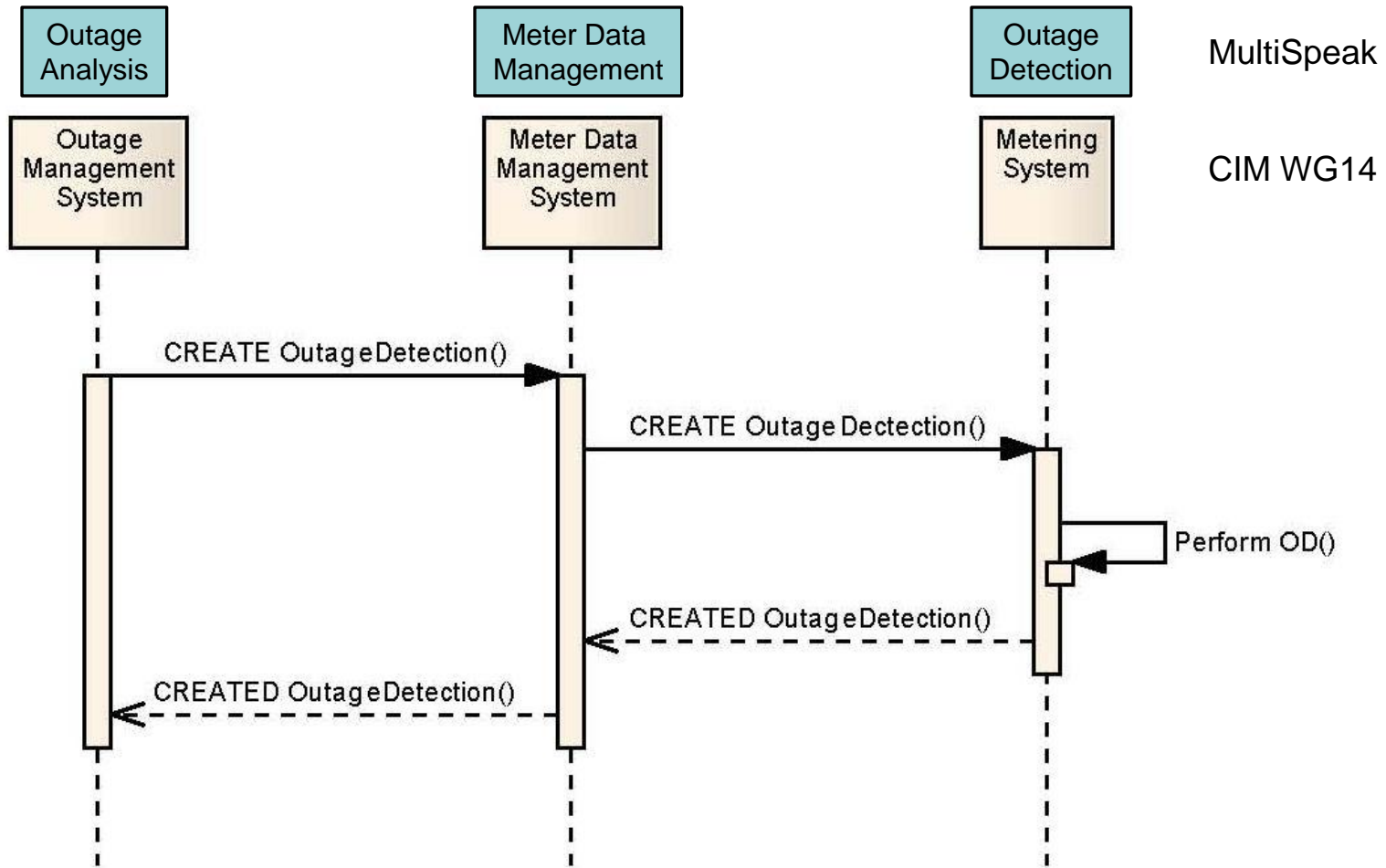
- Both standards have value for specific markets and likely will persist in market
- Both standards will undoubtedly be simultaneously implemented in some utilities
- Inter-company messaging will likely be required among companies using different standards

1. Map MultiSpeak web service methods to WG14 (CIM) use case steps.
2. Compare WG14 and MultiSpeak data payloads for each use case step.
3. Create style sheet data payload transformation.
4. Create adapter layer to handle data transformation and messaging conversion.

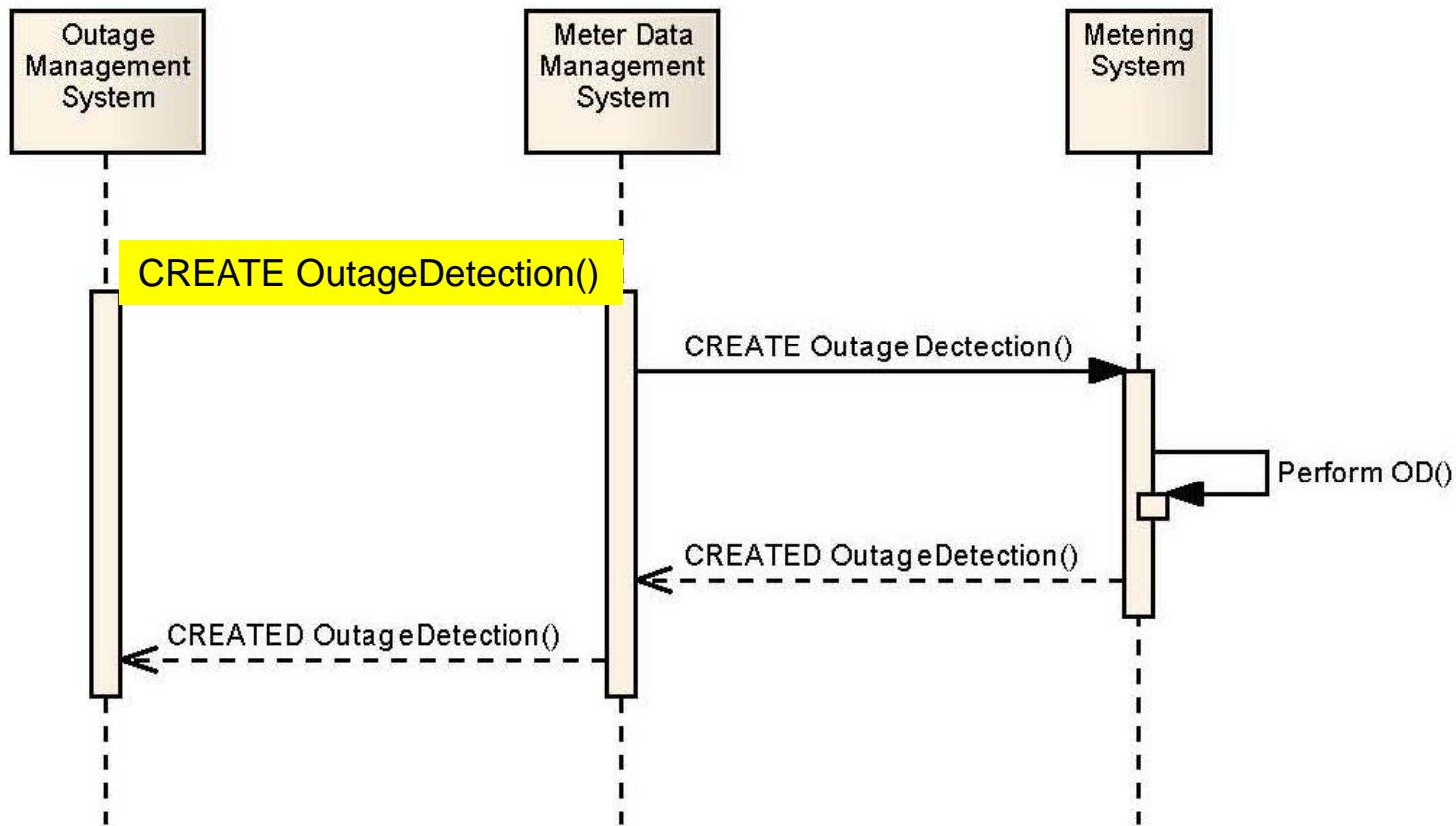
WG14 Outage Detection Use Case



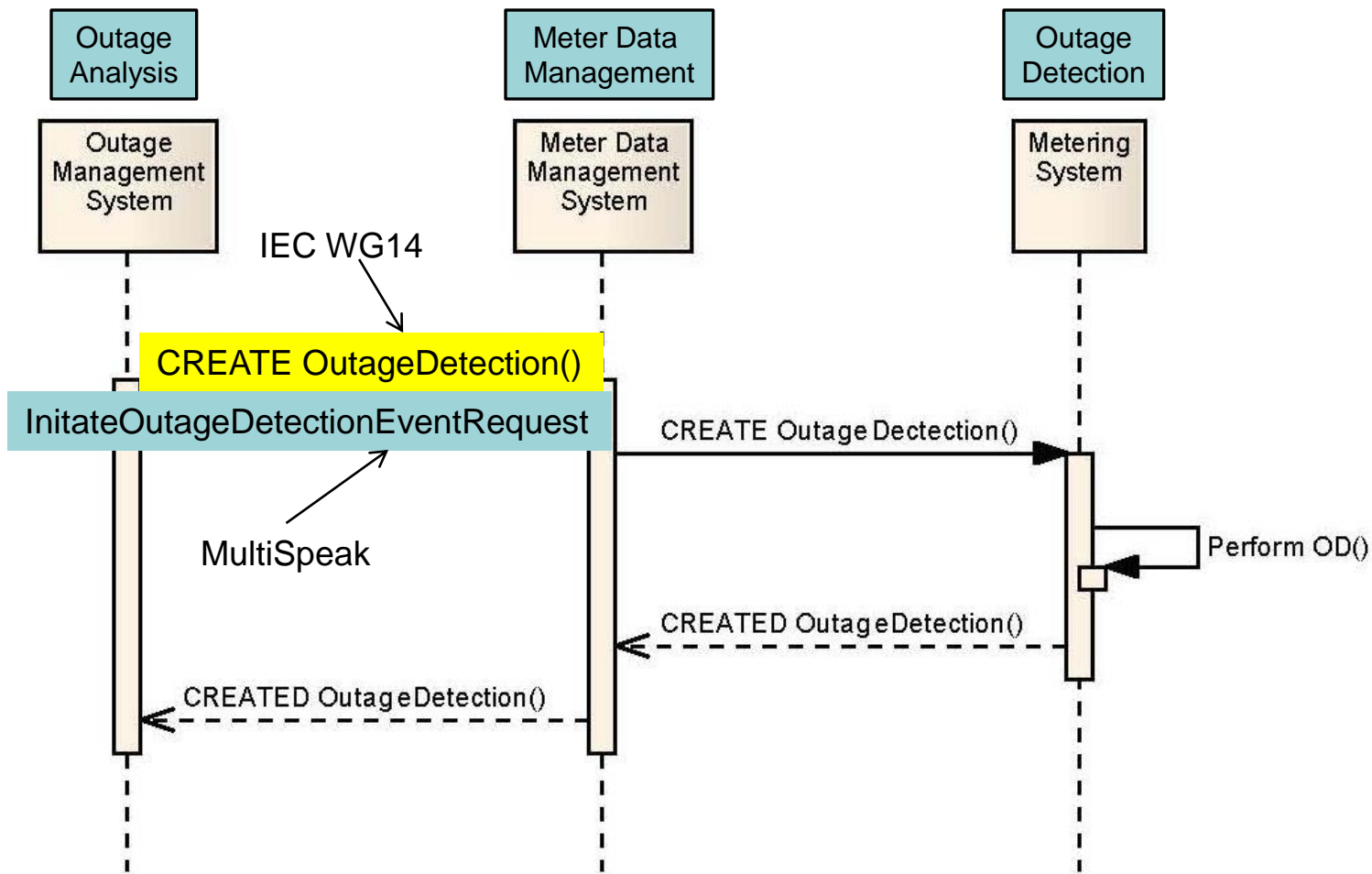
Actors - Outage Detection Use Case



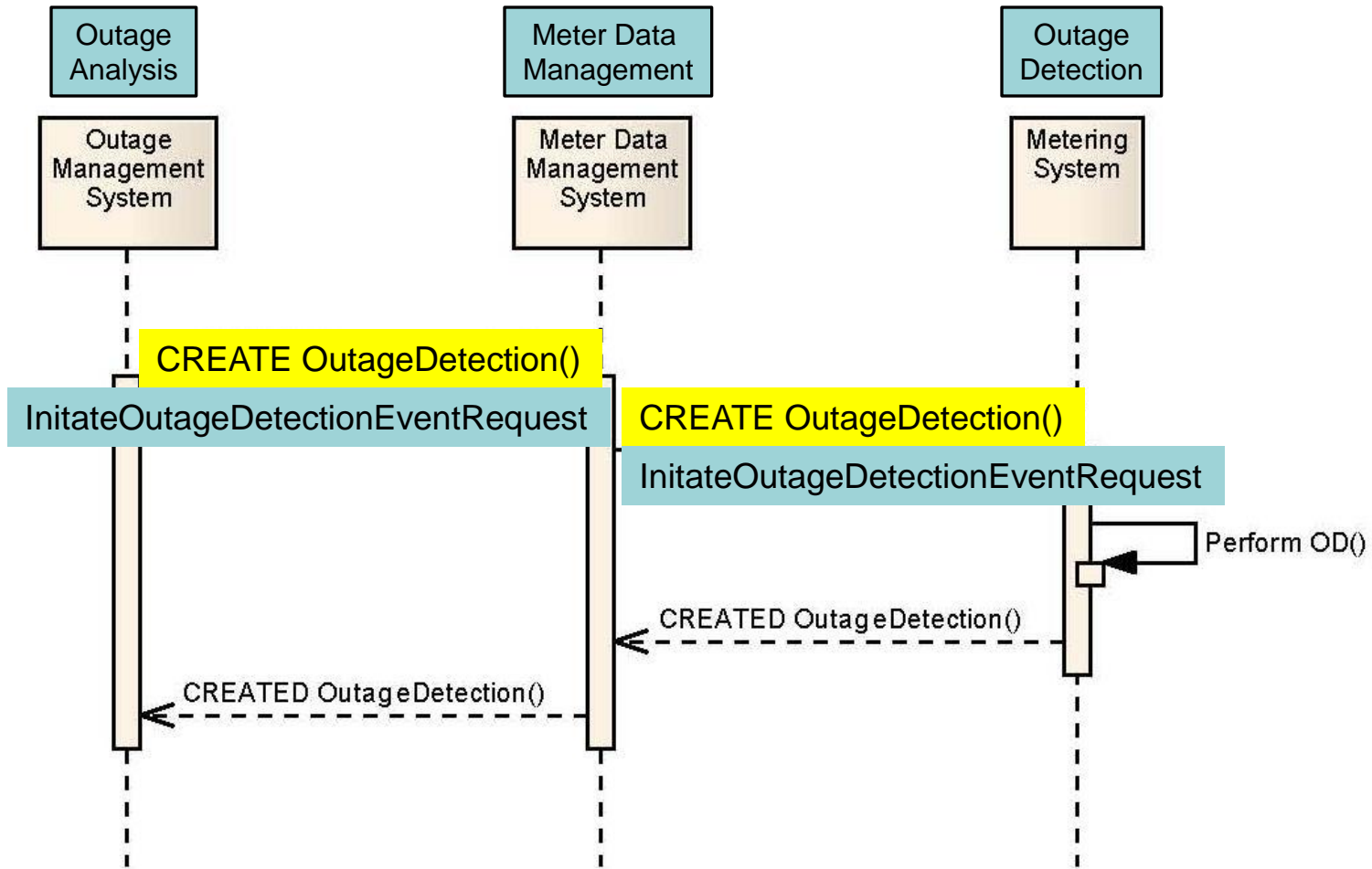
Monitoring Request Issued by OMS



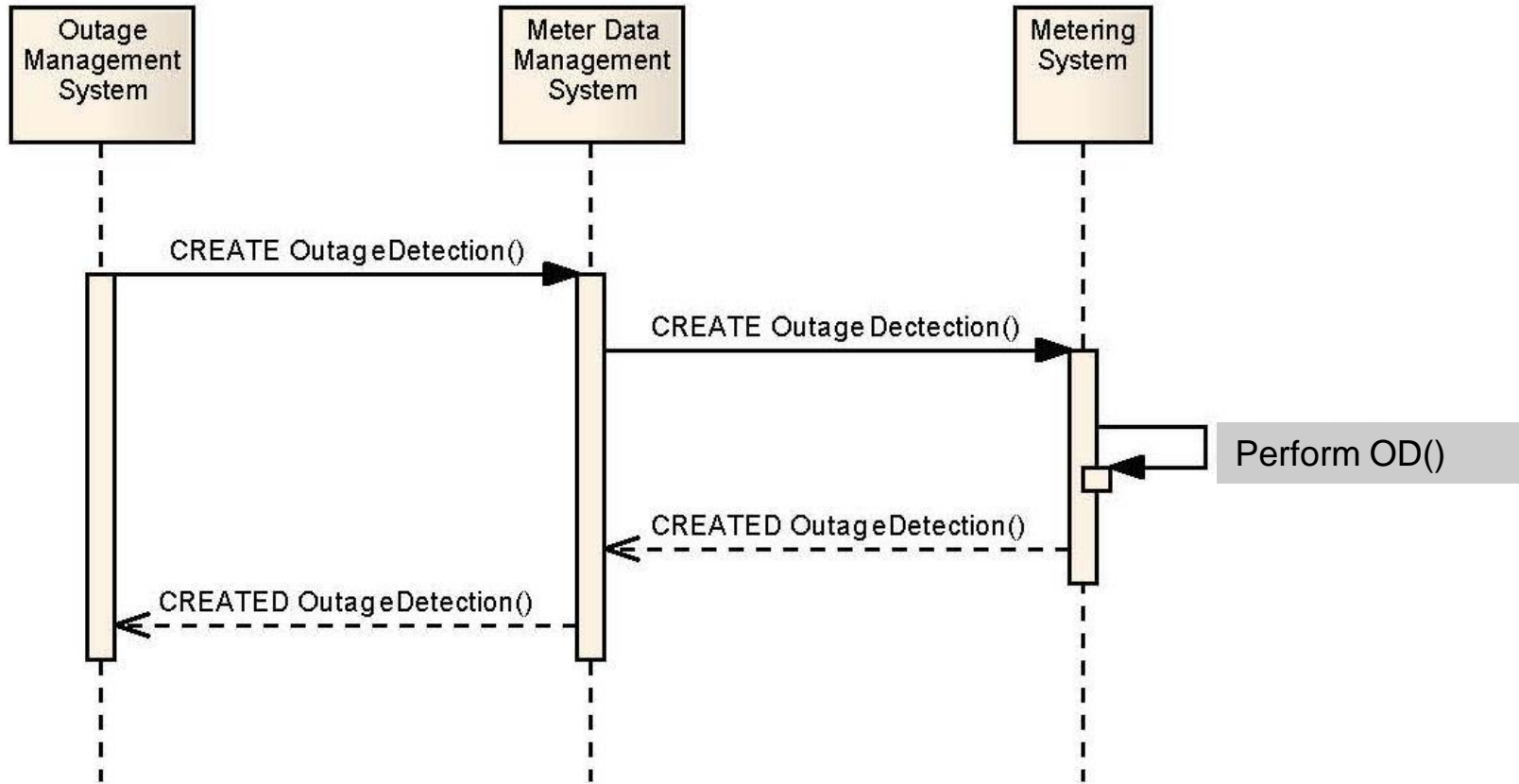
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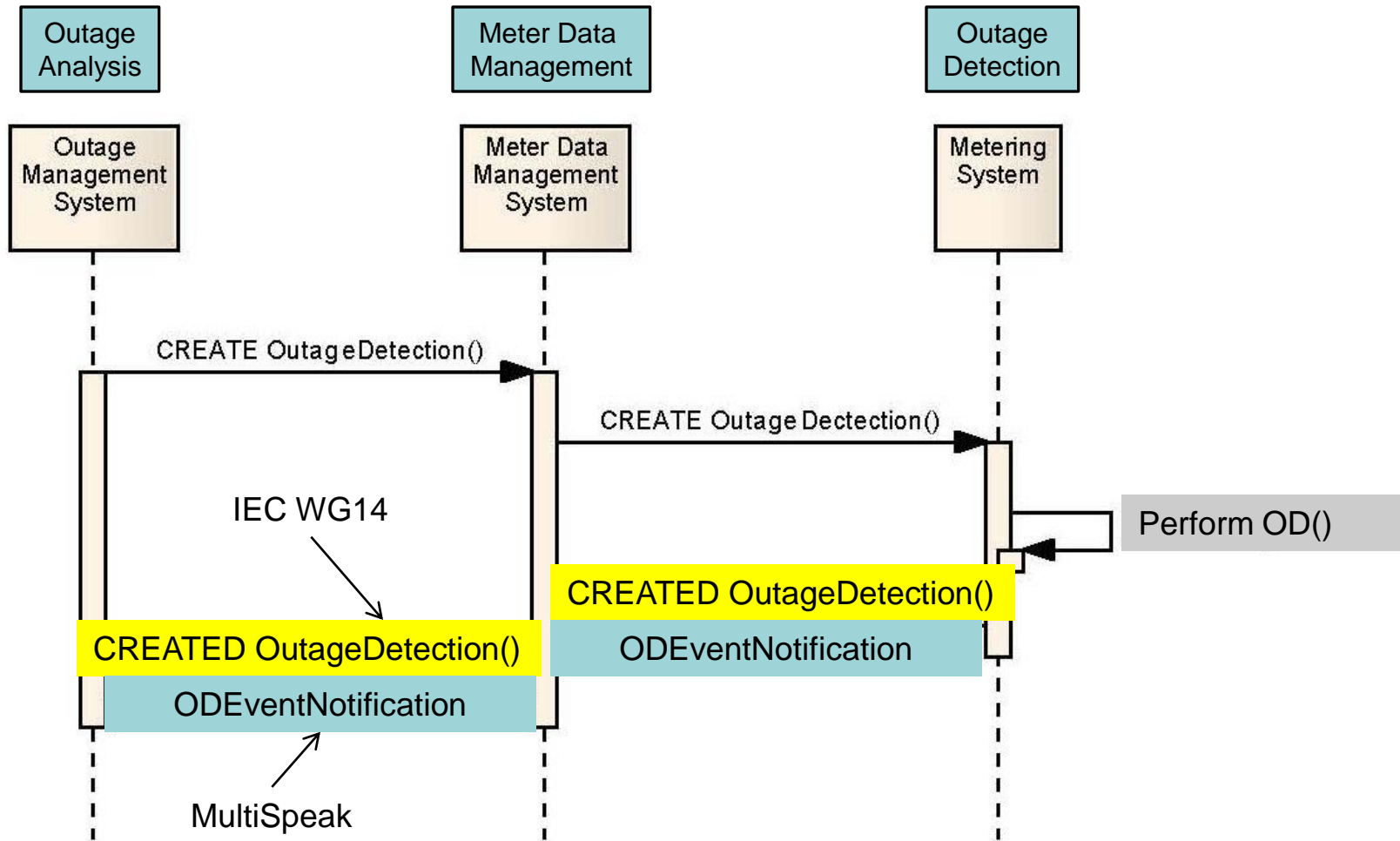
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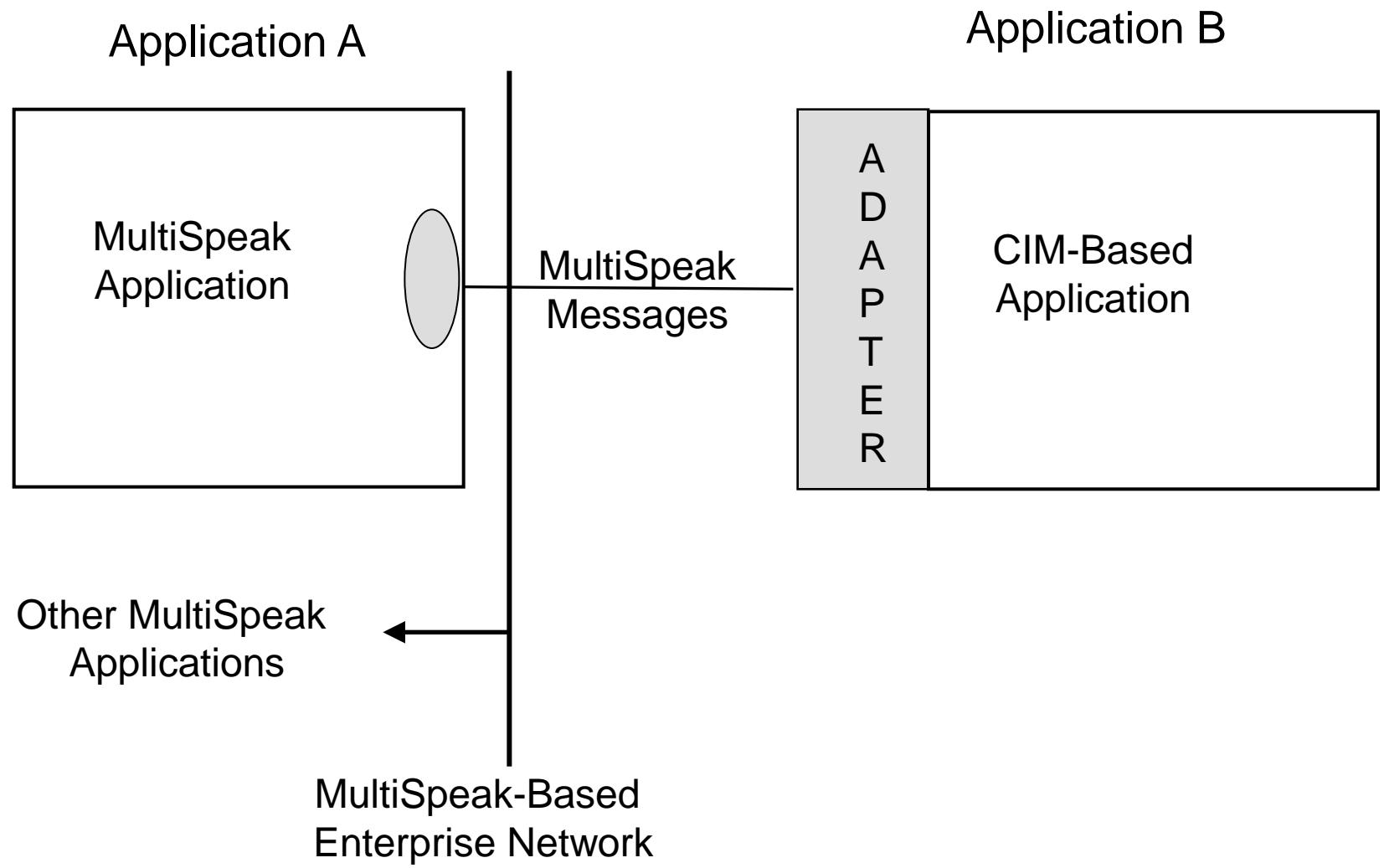
AMI Detects Outage



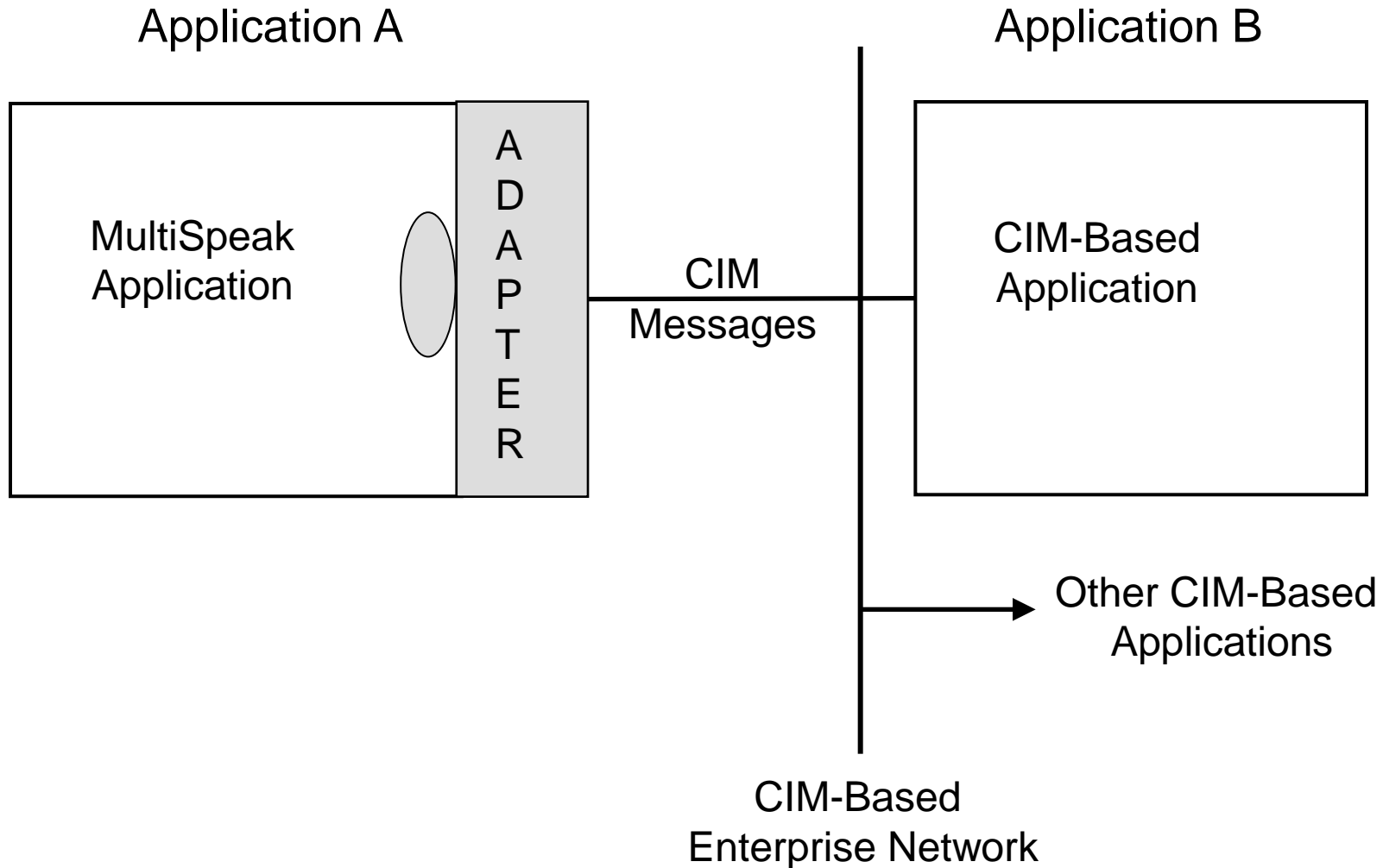
AMI Publishes Detected Outage



CIM Applications in a MultiSpeak Enterprise



MultiSpeak Application in a CIM Enterprise



For More Information

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