



AMI1.2 Release for SGM3000 Meters

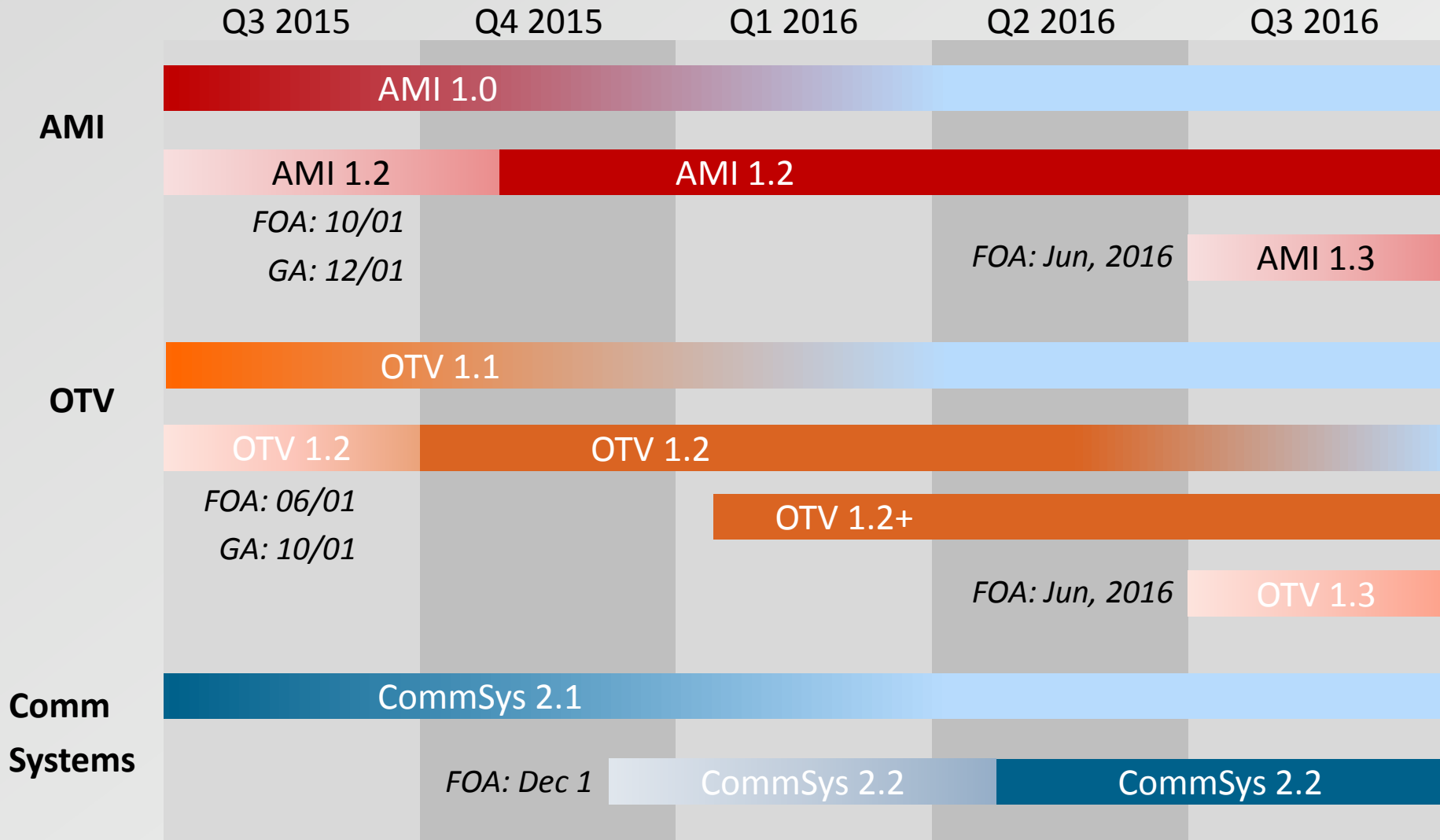
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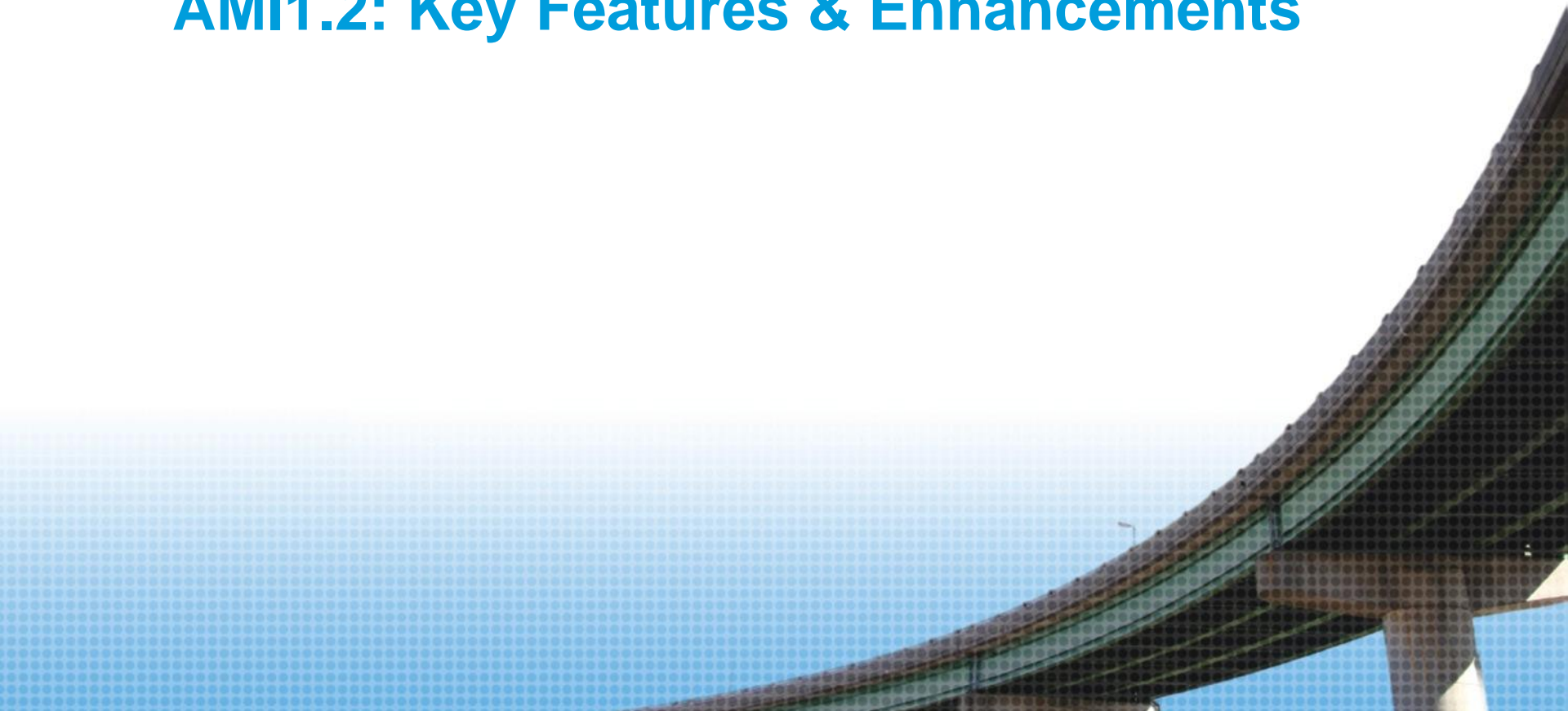
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ORW Product Roadmap



AMI1.2: Key Features & Enhancements



Momentary and Sustained Outage Detection

Sustained Power Outage

- Total loss of power lasting more than two to five minutes (configurable)
- Email alerts are sent by OTV upon detection of sustained outage
- Reduced power restoration notification latency (as soon as node rejoins)
- Exact power restoration time reported in a new event message

Momentary Power Outage

- Loss of power for a short duration (less than two to five minutes)
- “Reclosers” on power lines revive power when interference gets cleared
- Momentary outages are logged, which are reported every 15 minutes
- No mass email alerts sent out

AMI1.2 can differentiate momentary outages from sustained outages

Enhanced Meter Reading Choices

- Introduction of **secondary reporting schedule for register/billing data**
 - Scheduled read of only summations (bulk data) from total tier
 - Supports more frequent read schedule
 - Lower latency than reporting entire billing data
 - Readings are not stored and hence have to be reported immediately
- On-demand read of **limited set of UOMs**
 - Summations of all bulk data or only kWh bulk data
 - Lowest latency in reporting of billing reads
- Scheduled read of **all four load profile sets**
- Scheduled read of **all load profile (interval data) channels** in load profile sets
- On-demand read of interval data

Complete and faster reporting of register and interval data

Power Quality Events and Readings

- Support for **power quality reporting** in SGM3000 meters
- Addition of on-demand and scheduled **power quality readings**
 - Line side diagnostics: line-to-neutral voltage, current
 - Instantaneous demand: active, reactive, apparent, etc.
- Reporting of **logged power quality events** – momentary outages

Enhanced power quality readings and event reporting

Expanded Meter Controls

Demand Reset

- **Back office triggered** demand reset aligned on billing cycle
 - Pre-scheduled or instantaneous execution
 - Only one reset command can be scheduled in advance
- Exact time and schedule for execution is configurable

Meter Program Update (Over-the-Air)

- **Over-the-air update of meter programs** – multicast to meter groups

TOU and Season Change

- Easy, flexible and meaningful **back office triggered TOU support**
- Meter triggered season change is unnecessary

Expanded Meter Controls

Remote Connect/Disconnect (RC-DC)

- OTA RC-DC of main and auxiliary relays in SGM meters
- Periodic monitoring and reporting of relay state changes
- Enables Arm-to-Connect feature of SGM meters

Others

- Back office triggered remote “disable override” (IEC-CIM commands)
- DST support for SGM3000 meters

Under-the-Hood Enhancements

uStream: Robust Transport Control Protocol

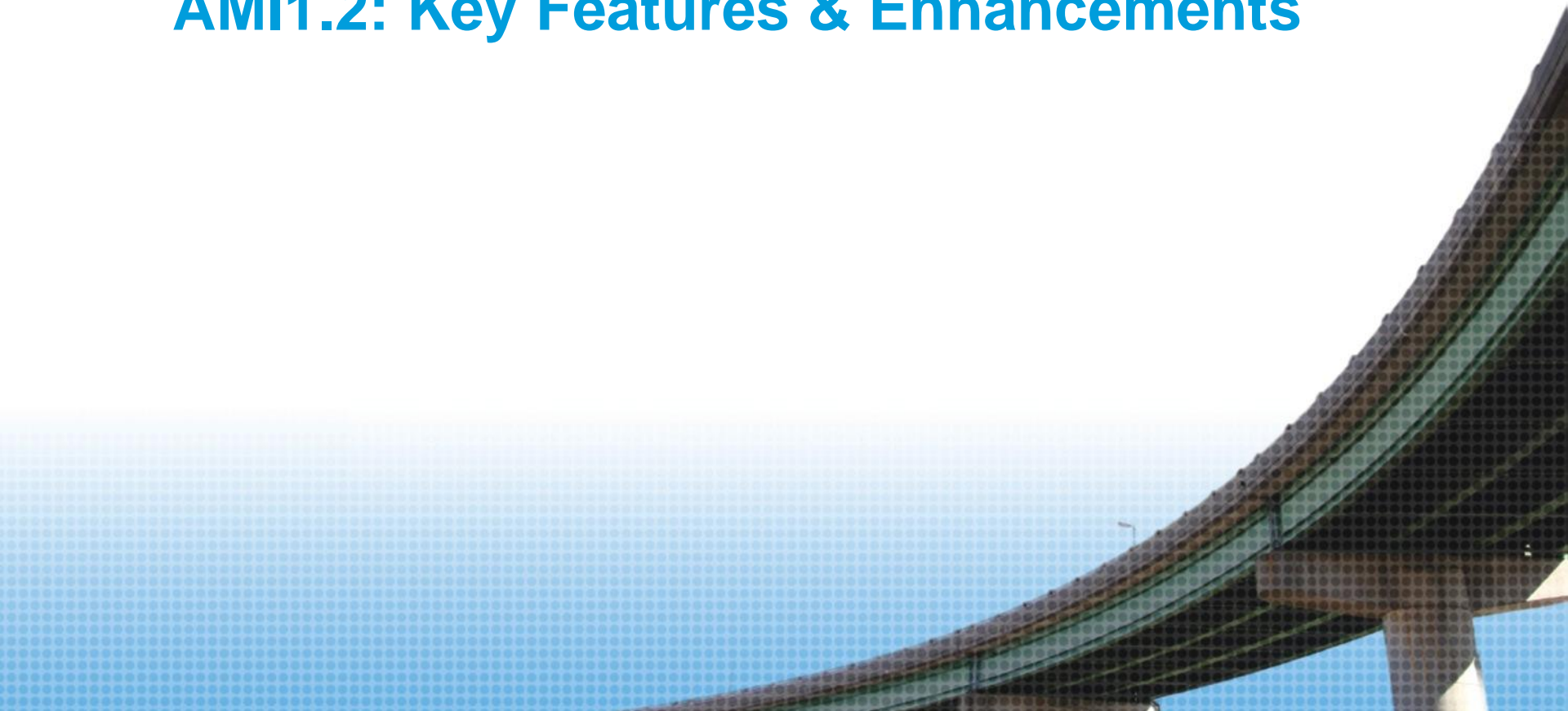
- End-to-end message reliability and flow control
- Large file transfer capability
- QoS: Prioritization for on-demand reads, billing data, etc.

Improved System Capacity

- Reporting of bulk and interval data is randomized over the reporting period
 - Adds flexibility in supporting various meter configurations
 - Enhanced transmission reliability (fewer retransmissions)
- uStream boosts system capacity and performance

uStream adds more robustness and resilience to AMI system

AMI1.2: Key Features & Enhancements



Richer Set of Meter Controls

Demand Reset

- Back office triggered demand reset aligned on billing cycle
- Exact time and schedule for execution is configurable

Remote Connect/Disconnect (RC-DC)

- OTA RC-DC of main and auxiliary relays in SGM meters
- Periodic monitoring and reporting of relay state changes
- Enables Arm-to-Connect feature of SGM meters

OTA Program Update

- Remote over-the-air update of meter programs – multicast to meter groups

TOU and Season Change

- Easy, flexible and meaningful back office triggered TOU support
- Meter triggered season change is unnecessary

Feature Releases Summary



Register and Interval Data Reads

	Features	AMI1.0	AMI1.2	AMI 1.3
		SGM	SGM	SGM
Register and Interval Data	Register/Billing data read			
	– scheduled read of all data from all tiers (bulk, demand and coincident)	✓	✓	✓
	– scheduled read of summations from total tier (enables frequent read schedule)	✓	✓	✓
	– on demand read of all data	✓	✓	✓
	– on demand read of limited set of UOMs (reduces latency)		✓	✓
	– back filling of persistently stored data	✓ ¹	✓ ²	✓ ³
	Interval data read			
	– scheduled read of load profile set of the meter	✓	✓	✓
	– scheduled read of all load profile channels		✓	✓
	– on demand read of load profile data		✓	✓
	– back filling of persistently stored data		✓ ⁴	✓

¹Only one billing data read

²Most recent two billing reads

³More billing reads with ST26 tables

⁴Upto 16 interval reads (default 4 reads)

Instantaneous Power Quality Reads

	Features	AMI1.0	AMI1.2	AMI1.3
		SGM	SGM	SGM
Instantaneous Power Quality Reads	Power quality metrics read: scheduled & on-demand			
	– RMS and average voltage: line-to-neutral		✓	✓
	– RMS and average voltage: line-to-line			
	– current: RMS		✓	✓
	– Momentary power factor		✓	✓
	– avg. power factor, voltage angle, current angle			
	– total harmonic distortion (VTHD, ITHD, TDD)			
	– distortion: volt-amp, power factor			
	– temperature			
	– frequency			
	– power: active		✓	✓
	– power: reactive and apparent		✓	✓
	Configuration of meter read schedules	P	✓	✓

P – Supported through program update

Quality over Intervals

	Features	AMI1.0	AMI1.2	AMI1.3
		SGM	SGM	SGM
Quality over Intervals	Quality interval reads			
	– power: active (kW), reactive (kVAr), phasor apparent (kVA)	✓	✓	✓
	– power: apparent (kVA)			
	– RMS voltage, average voltage	✓	✓	✓
	– current: RMS, power factor (coincident only)	✓	✓	✓
	– voltage squared, current squared			
	– total harmonic distortion (VTHD, ITHD, TDD)		✓	✓
	– distortion (kVA), distortion power factor			
	– Vx – Vy (V)		✓	✓
	– quality			
	– frequency		✓	✓
	– pulses	X	X	X

Notifications & Reporting

	Features	AMI1.0	AMI1.2	AMI1.3
		SGM	SGM	SGM
Notifications & Reporting	Momentary detection and logging		✓	✓
	LastGasp: outage reporting	✓	✓	✓
	Power quality events			
	– Sag/swell log reporting		✓	✓
	– Voltage imbalance, over/under frequency log reporting		✓	✓
	– under and over-voltage alerts at poll time			✓
	– Voltage imbalance and distortion alerts at poll time			✓
	Relay state changes notification – main & auxiliary	✓	✓	✓
	Load control event notification – prepayment (paid at meter), load shedding etc.		✓	✓
	Configurable monitoring periods for event notifications	✓	✓	✓

End Device Controls

	Features	AMI1.0	AMI1.2	AMI1.3
		SGM	SGM	SGM
End Device Controls	Demand reset: daily reset & calendar scheduled		✓	✓
	OTA remote connect/disconnect of relays			
	– Main relay	✓	✓	✓
	– Auxiliary relay		✓	✓
	– Arm-to-Connect		✓	✓
	OTA enabling/disabling of load control points		✓	✓
	TOU and season change triggered by enterprise SW		✓	✓
	Daylight savings time support: LP & TOU modes	✓ ¹	✓ ²	✓
	Daylight savings time support: Demand only mode		✓	✓
	Daylight savings time support: Energy only mode			
	OTA meter program (configuration) update		✓	✓
	OTA meter firmware update			✓

¹ Not supported in southern hemisphere and non-recurring DST

² Not supported for non-recurring DST & more than 2 DST changes per year



Thank You!

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