



STS ASSOCIATION

The STS Prepayment Standard TID rollover in 2024 managing the change

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Vanderbijlpark

Overview

- STS enhancements
- TID roll over
- Timelines and processes





STS ASSOCIATION

**THE ONLY GLOBALLY PROVEN
OPEN STANDARD FOR PREPAYMENT
SYSTEMS**

Simple ▶ Trusted ▶ Secure

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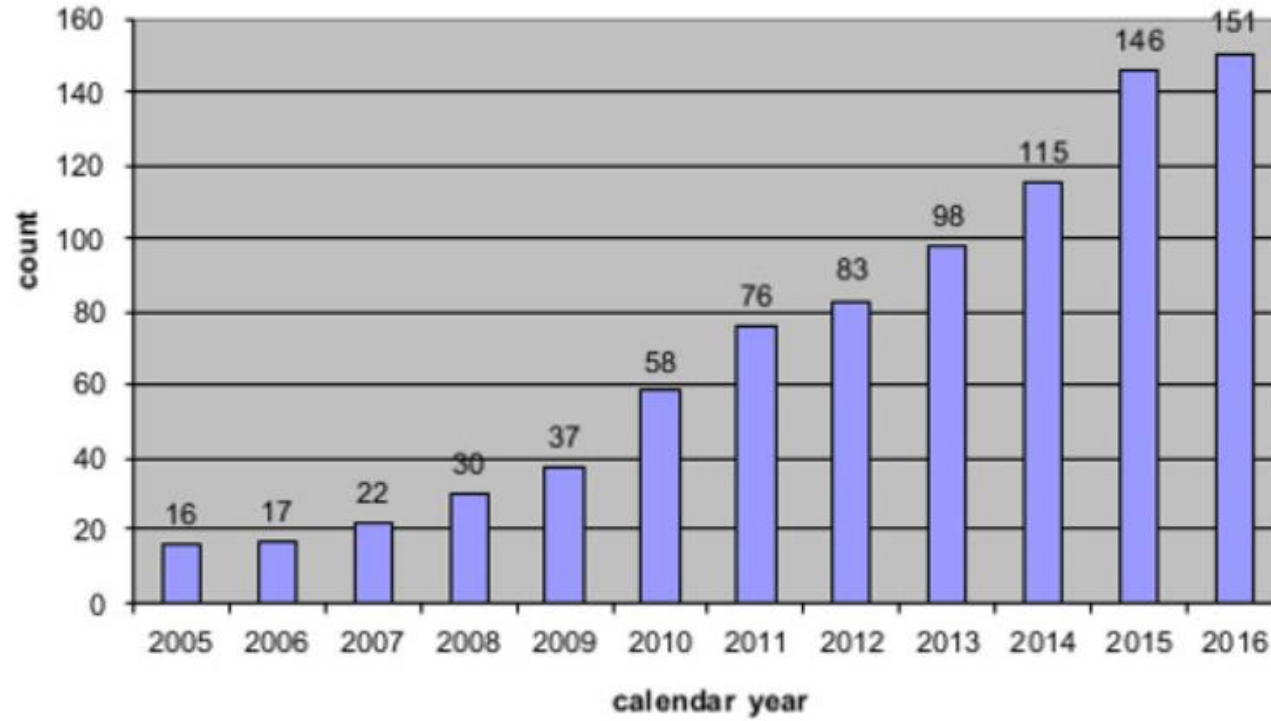


Open standard published by the IEC, 62055-41/51/52



STS ASSOCIATION

ACTIVE MEMBERSHIP up to 16/05/2016

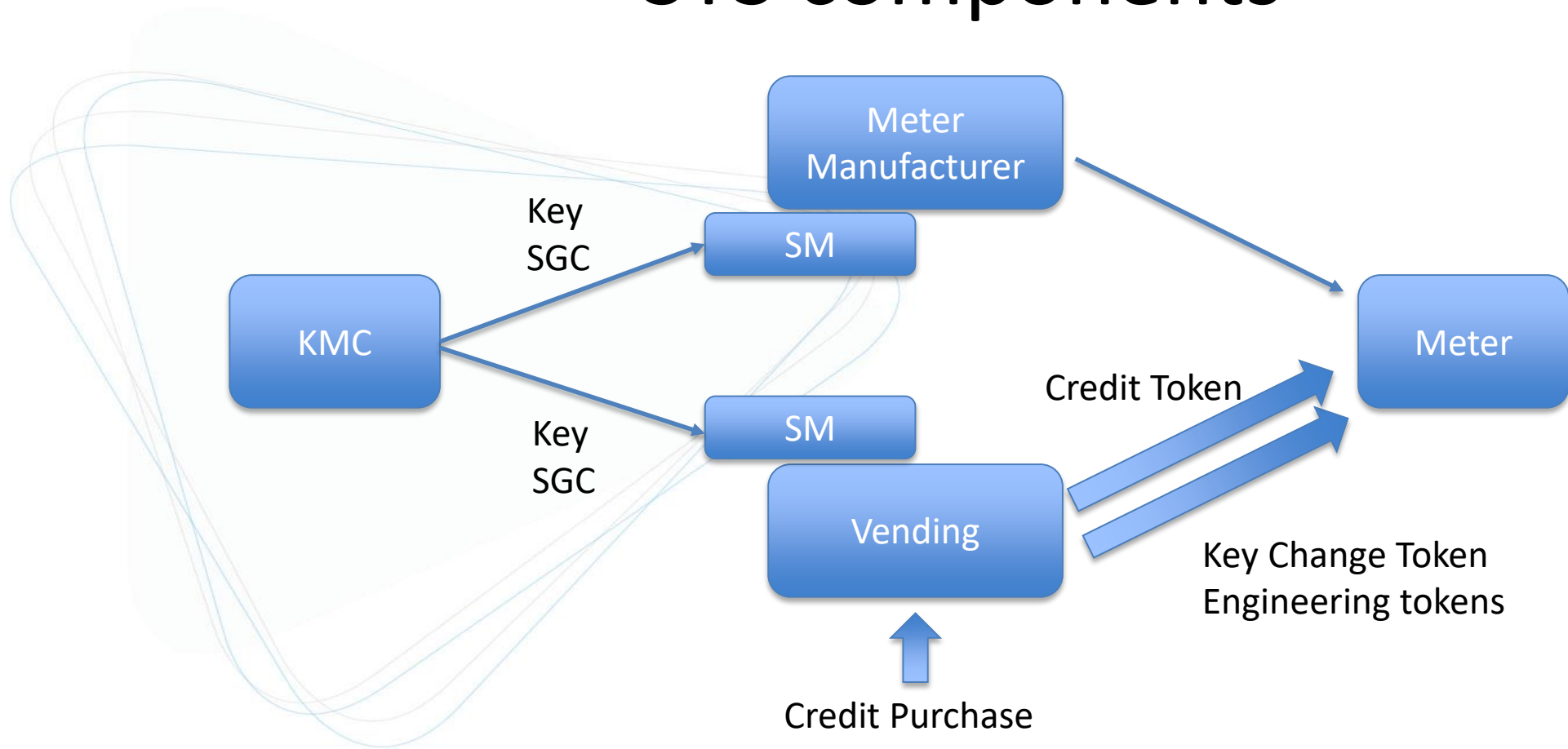


> 151 manufacturing members
and growing

Used in 84 countries



STS components



STS SECURITY ENHANCEMENTS

- Meter key increased from 64 bit to 128 bit
- Vending key increased from 112 bit to 192 bit
- HSM does not need to visit the KMC
- Remote initialization and key load
- Programmable vending limits: amount per service type
- Vending key expiry by time
- Remote authenticated vending key reactivation



STS FUNCTIONAL ENHANCEMENTS

- water + gas meters
- currency vending
- complex tariffs
- complex account, credits and charges
- complex load control
- 4 digit manufacturer code, 13 digit meter number



STS/DLMS/COSEM INTEGRATION

- To enable STS technology to be used with Smart Metering systems it has been interfaced with DLMS:
- DLMS/COSEM is a Client/Server protocol for smart meters
- STS 101-2 is vending system interface to DLMS Client
- STS token over DLMS/COSEM to remote online Server (meter)
- Uses a COSEM Token Gateway as online channel A
- Standard STS keypad as off-line channel B
- Some additional DLMS/COSEM features:
- Additional security on top of STS security
- Calendar / clock / special days
- Scheduled / on demand meter readings
- Alarm / event push notifications
- Import / export energy registers
- Multiple clients per server with unique authentication



What is a TID (Token ID)

- The Token Identifier is a 24 bit field, contained in STS compliant tokens, that identifies the date and time of the token generation. It is used to determine if a token has already been used in a payment meter. The TID represents the minutes elapsed since the 1st January 1993. The incrementing of the 24 bit field means that at some point in time, the TID value will roll over to a zero value. TID window = 31 years: 1993 to 2024
- All STS prepayment meters will be affected by TID roll over on the 24/11/2024. Any tokens generated after this date and utilizing the 24bit TID will be rejected by the meters as being old tokens as the TID value embedded in the token will have to reset back to 0.
- In order to overcome this problem all meters will require key change tokens with the roll over bit set. In addition to this, the base date of 01/01/1993 will be required to be changed to a later date. (2014, 2035) This process will force the meters to reset the TID stack to 0. To avoid previously played tokens from being accepted by the meter due to the TID stack reset, the key change process must introduce into the meter, a new decoder key.



New Feature set of STS600 secure module

- Key Expiry and Refresh
- Unit and Currency Limits on a vending Key
- New Algorithm for meters (Misty-1)
- TID Rollover
- Currency Tokens (also in recent legacy systems)



Benefits of a TID rollover

- Significantly stronger algorithms for vending key creation and protection
- Key expiration - the new system will allow for a vending key to be expired after a certain time (chosen by the SGC owner). This ensures that even if a vending key has been compromised, the key will expire after a certain time. This will significantly reduce the risks associated if a vending system or security module is stolen.
- The longevity of the STS system is guaranteed.
- All meters that have been using tokens purchased from un-authorized vendors will no longer be able to purchase from those vendors.



TID rollover actions: Secure Module supplier

- Upgrade SM to cater for rollover bit and multiple base dates
- Test SM - initialization, key-loading, and new firmware functionality to STS600-4-2 specification
- Certify SM to CTS spec for STS600-4-2
- Field test SM - code at KMC and test tokens with live keys
- Deploy SM to the field once KMC deployed and vending systems updated - note: if the updated SM can be firmware updated in the field, then these may be deployed before the KMC and vending systems upgrades have been completed. If not, then the SM supplier must only supply the new SM after establishing that the vending system on the site (SGC) has been upgraded.



TID rollover actions: KMC supplier

- Upgrade KMC to cater for multiple base dates as per STS600-4-2
- Migrate all data from current KMC to new KMC
- Test SM initialization and key-loading to new KLF specification
- User acceptance testing of KMC
- Field test KMC
- Get STSA approval for KMC
- Deploy the new KMC



TID rollover actions: KMC centre

- New KMC training
- Field test - code TSM250 SM's. Generate key with rollover bit set, test on live meter
- Generation of a list of all SGC's and security modules for communications strategy
- Code all new SM's supporting rollover bit (STS6) from manufacturers and utilities
- Update their processes for the new SM and KMC since these will differ from the current system



TID rollover actions: Meter manufacturers

- Update manufacturing secure modules
- Check rollover bit functionality in meters
- Change production processes to cater for multiple base dates
- Manufacture meters with new base dates



TID rollover actions: Vending system manufacturers

- Update software to cater for new KLF specification
- Update software to handle multiple base dates
- Certify software to CTS test specs
- Upgrade customer vending software in the field
- Get contact details of all sub-vendors that use their vending systems



TID rollover actions: Utilities

- Upgrade all SM's to STS6 functionality
- Select SGC's to do key-changes
- Decide on key-change process (manual or automatic)
- Inform all users and regions of the program
- Generate a program for KCT's - whether by SGC or smaller groups of meters
- Start the program on a pilot site
- Roll out to all SGC's
- Ensure that the entire program is completed at least one year before the TID rollover date of 2024



5 Overall project implementation timeline

Year	2016				2017				2018			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
SM Manufacturers												
SM update to STS6	■											
SM field test		■										
SM certification	■											
SM Deployment			■	■	■	■	■	■				
KMC manufacturers												
KMC update	■	■										
KMC data migration		■										
KMC UAT (+ field trial)			■	■								
KMC training	■	■										
KMC approval (STSA)				■								
KMC Deployment					■							
Meter manufacturers												
Update production processes			■	■	■	■	■	■				
Start meter manufacture to new base dates									■	■	■	■



Year	2016				2017				2018			
Quarter	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Vending Software Manufacturers												
Upgrade all SM's to STS6												
Upgrade vending software												
Software accreditation to CTS												
Update customer software in the field												
Utilities												
Update all field SM's												
Communications program rollout												
Select SGC's												
Run pilot												
Generate program												
Rollout to all areas												
Sub-vendors												
Contact all sub-vendors												
Upgrade SM to STS6 with new base dates												
Perform key-changes												

Conclusion

- The STS specification has been enhanced significantly
- STS is smart meter ready to ensure that current and future systems will be compatible
- TID roll over process should be planned well ahead of the 2024 cut-off date
- Updating of Secure Modules, KMC and vending systems should be completed to support new processes
- Investment in STS systems protected by new functionality



Reference Documents

- TID roll over CoP: STS 402-1 Edition 1.1 –2015
- TID Rollover Checklist and Timeline
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