System Capacity Test Approach Document (SCTAD)

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1 Introduction and context

1.1 The SEC Variation Test Approach Document for SMETS1 Services (SMETS1 SVTAD) provides for the development of the System Capacity Testing Approach Document. The SMETS1 Testing Objective is set out in Clause 5.1 of the SMETS1 SVTAD. As set out in Clause 5.2(d) of the SMETS1 SVTAD, System Capacity Testing is a Test Phase that demonstrates that the operational performance of the Modified DCC Total System is not adversely affected by the introduction of SMETS1 Services, and that the SMETS1 Services will operate at the requisite performance levels.

1.2 This document is the System Capacity Testing Approach Document (SCTAD). In accordance with Clause 3.4 of the SMETS1 SVTAD, each person that participates in (or is required to participate in) System Capacity Testing is required to comply with this SCTAD. DCC is required to participate System Capacity Testing.

1.3 DCC has taken a risk-based approach to defining the scope of System Capacity Testing. This approach had been developed in line with our technical assessment as well as an economic assessment balanced against the risks. Where DCC's technical assessment indicates that there is a low-risk that end-to-end performance related issues will arise within components of the Modified DCC Total System, they have been excluded. However, where the risk is high, in the core components of the Data Service Provider (DSP) (often referred to as 'the motorway'), which will process larger volumes of SMETS1 and SMETS2+ traffic, these components are included within the scope. Where the risk is lower, e.g. the interface between the SMETS2 CSPs and DSP – which will be unaffected by SMETS1 traffic, these are not included in the scope. It should also be noted that the DSP motorway has been fully tested at Release 2.0 for volume and performance with no degradation observed.

Purpose of the SCTAD

1.4 The purpose of this SCTAD is to set out:

- supplementary rights and obligations with respect to the System Capacity Testing;
- details of the high-level approach to System Capacity Testing;
- the Entry Criteria that need to be met before the SMETS1 System Capacity Test Phase can begin for each of IOC, MOC and FOC;
- the Exit Criteria to be satisfied to exit the SMETS1 System Capacity Test Phase for IOC, MOC and FOC;
- the roles and responsibilities of DCC and DCC Service Providers; and
- the role of the SEC Panel's Testing Advisory Group ("TAG") and the SEC Panel with respect to System Capacity Testing.

1.5 This document may only be modified pursuant to Clause 4 of the SMETS1 SVTAD.

2 Definitions and Interpretations

2.1 Capitalised terms used in this document are set out in Section A of the Amended SMETS1 SEC (as defined in the SMETS1 SVTAD) or in Schedules or Appendices of the Amended SMETS1 SEC.

2.2 Where there are conflicts between the SMETS1 SVTAD and this Test Approach Document, the SMETS1 SVTAD shall take precedence.

2.3 Where obligations are expressed in respect of DCC Service Providers in this document, these shall be construed as obligations on the DCC. Where text is included in this document which does not explicitly place obligations on a Party, the SEC Panel or a Testing Participant, these shall be construed as obligations on the DCC.

3 High Level Approach

3.1 Included within the scope of System Capacity Testing will be testing of the operational performance of the subset of components of the Modified DCC Total System set out in Clause 3.5 below to ensure that the Modified DCC Total Modified System is able to support predicted levels of:

- The Migration of SMETS1 Installations;
- The installation and Commissioning (I&C) of SMETS2+ Smart Metering Systems; and
- SMETS1 and SMETS2+ daily traffic on the Modified DCC Total System

3.2 Each of the subset of components of the Modified DCC Total System included within the scope of System Capacity Testing will be tested to the requisite performance levels for the purpose of System Capacity Testing, which shall be derived by the DCC using the volume model in Appendix A.

3.3 System Capacity Testing shall be undertaken for IOC, MOC and FOC to confirm that the expected quantities of Smart Metering Systems can be both enrolled and operated. If the testing undertaken for:

3.3.1 In the case of MOC, IOC; or

3.3.2 in the case of FOC, IOC and MOC,

has been tested to levels that meet the requisite performance levels for MOC or FOC (as the case may be), and there has been no change that might affect the previous test results to any of the components of the Modified DCC Total System within the scope of System Capacity Testing, then the DCC shall be entitled to rely on evidence from earlier testing, in assessing System Capacity Testing completion.

Scope of System Capacity Testing activities

3.4 The scope of System Capacity Testing activities is set out in sub Clauses (a) to (c) below. An illustration of the components that are within the scope of System Capacity Testing is provided for guidance in Figure 1. Each of the components will be tested in isolation using test drivers/simulators to generate traffic requests into the component and simulators to support the interface and responses from adjacent components.

(a) Data Services Provider (DSP). The DSP is the common element to both SMETS2+ and SMETS1. To provide confidence and assurance, the System Capacity Testing of DSP shall test the core subsystems involved in service request processing and SMETS1 migration. These systems will be verified using SMETS2+ and SMETS1 traffic at the requisite performance levels and will be considered against the effect it

has on Target Response Times within acceptable CPU usage targets. DCC will utilise a Service User emulator which will inject Service Request Variant (SRVs) directly into the DSP system as if they had been received via the DUIS3 gateway.

System Capacity Testing will utilise a pre-production test environment which replicates a proportion of the predicted DSP production environment at the end of the Smart Metering roll-out, with simulated User, Dual Control Organisation (DCO), Communication Service Provider and SMETS1 Service Provider (S1SP) components. This shall be tested at the requisite performance levels derived from the volume model in Appendix A.

Some elements of the DSP are out of scope of System Capacity Testing. These are:

- Specific testing of the DUIS1 and 2 gateways is not required. DCC have conducted a design review which indicates that DUIS1 and DUIS2 should not perform any differently to DUIS3;
- the SMETS2+ interface between DSP and SMETS2 CSPs – which is already in use at scale for message transfer and will not be impacted by SMETS1 Services;
- the SMETS1 Migration Interface – the Commissioning Party will use files as they would be received from the SMETS1 Migration Interface, as opposed to passing them across the interface; and
- the audit report for the DSP which feeds into DCC's business and management information processes – which has been subjected to scaling enhancements as part of DCC's provision of its technical operations centre.

(b) Commissioning Party (CP). The System Capacity Testing of the Commissioning Party shall test the capacity of the CP to support the predicted levels of Migration of SMETS1 Installations per day (derived in accordance with the volume model set out in Appendix A).

The CP will use a production-like environment for System Capacity Testing with hardware security modules (provided in limited numbers due to their cost). The Commissioning Party will use simulated DSP, S1SP and a Secure File Transfer Protocol (SFTP) server for System Capacity Testing to simulate and process Commissioning Requests/ acknowledgement, Migration Common File and S1SP Commissioning File, audit file (which contain the timestamps for the start and completion of installations) and Commissioning Outcome File respectively.

(c) Dual Control Organisation (DCO), SMETS1 Service Provider (S1SP): The System Capacity Testing of the DCO and the S1SP shall test SMETS1 traffic at the requisite performance levels while maintaining Target Response Time, and threshold targets set for CPU memory usage that are agreed with DCC.

DCO shall use a production like environment with hardware security modules (provided in limited numbers due to their cost), with simulated DSP and S1SP for System Capacity Testing. The DCO System Capacity Testing will include request manager, command manager tiers and DCO core services.

The S1SP shall utilise simulated User, DSP, SMETS1 Devices, DCO and S1CSP to facilitate the System Capacity Testing.

3.5 The System Capacity Tests used by the DCC shall include, but not be limited to, the following:

- Stress testing – Up to, and beyond the point at which SRV processing starts to degrade processing times beyond requisite performance levels, i.e. at which point any forms of throttling may need to be induced into the infrastructure. Execution using this method will also provide an insight into the scalability of the solution;
- Load testing - Load testing is a type of non-functional testing. A load test is type of system testing which is conducted to understand the behaviour of the application under a specific expected load. Load testing is performed to determine a system's behaviour under both normal and at peak conditions; and
- Soak testing - Extended duration of System Capacity Testing, effectively a day in the life of DCC operations simulating traffic across the Modified DCC Total System alongside forecasted peak migration of SMETS1 Installations in a day plus forecasted peak SMETS2+ Smart Metering System installation and Commissioning.

3.6 As part of System Capacity Testing, the scalability of the Commissioning Party, the Dual Control Organisation and the SMETS1 Service Provider shall be proven by each DCC Service Provider as below:

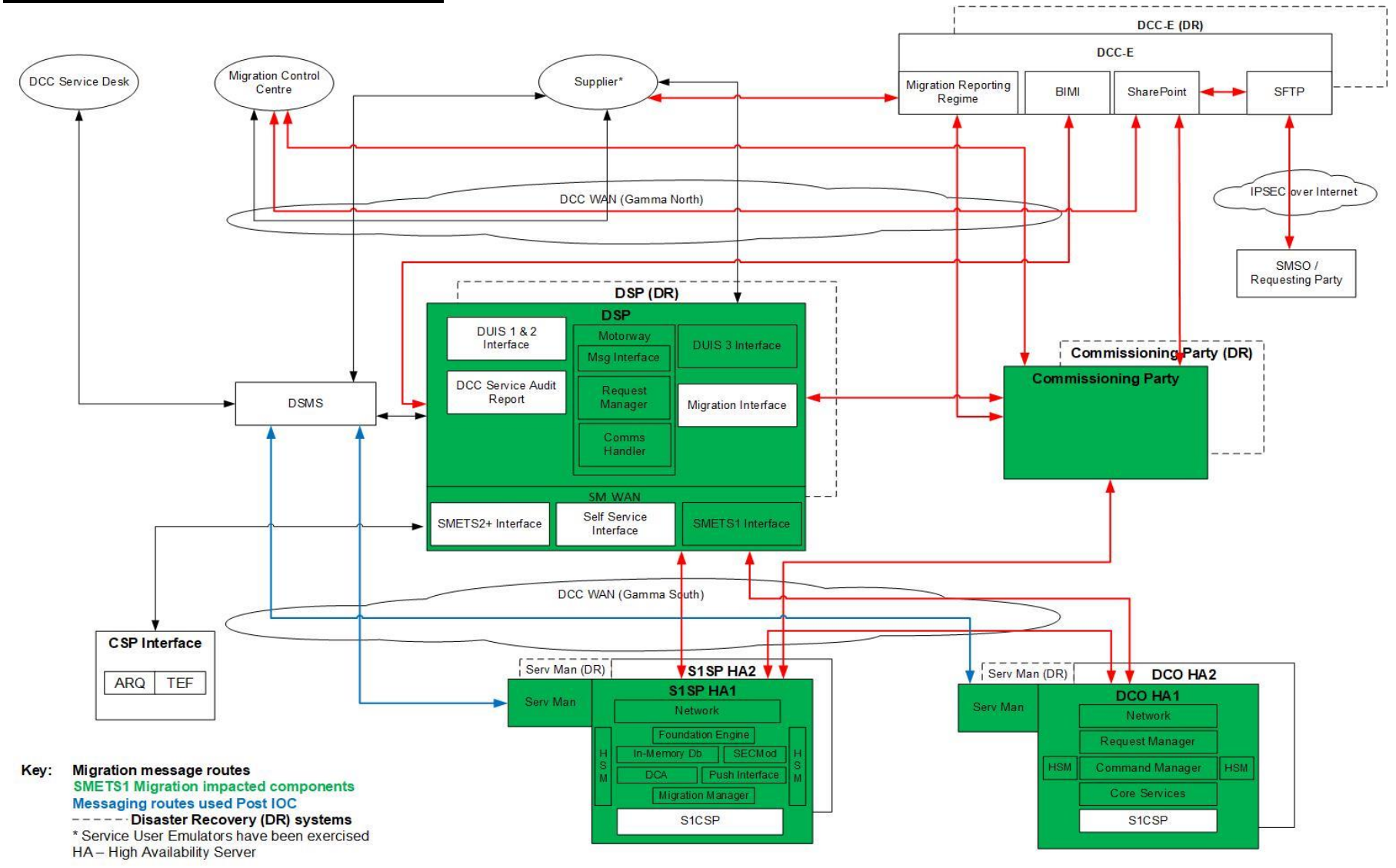
- each DCC Service Provider shall demonstrate that it has in place a dynamically scaling solution and show that it has the ability to scale both up and down dependent on processing loads subject to design;
- each DCC Service Provider shall confirm that it will carry out optimisation/tuning of Service Request processing where necessary

DCC shall assure the above activities undertaken by DCC Service Providers against requisite performance level. The DSP's ability to scale in readiness to handle increasing data traffic has already been proven as part of DCC's business-as-usual activities in readiness for the increasing number of SMETS2+ meters and is therefore not subjected to this scalability test. DSP components are able to be added to its systems to provide linear scalability to manage increased volumes of data.

3.7 Testing of current SMETS1 CSPs will not be undertaken as part of System Capacity Testing. DCC shall obtain assurance from the SMETS1 CSP that it can manage expected capacity increases associated with SMETS1 Services.

3.8 Testing of DCC's Service Management System and Self-Service Interface will not be undertaken as part of System Capacity Testing. The Self-Service Interface is being tested as part of the SSI improvement project which DCC is undertaking with oversight from the SEC Panel Operations Group Sub-Committee and includes scaling the portal to support future demands. DCC's Service Management System has been tested as part of DCC's earlier operational readiness activity which has considered the increase in service management activity associated with SMETS1 Services.

Figure 1: System Capacity Testing scope



4 Entry & Exit Criteria

4.1 The following criterion needs to be met prior to DCC commencing each System Capacity Test Phase:

- The generic entry criteria specified in Clause 12.5 of the SMETS1 SVTAD.

4.2 The following criteria are required to exit each System Capacity Test Phase:

- System Capacity Testing has been undertaken in accordance with the requirements set out in this SCTAD;
- All evidence within scope of System Capacity Testing has been delivered by each DCC Service Provider and approved by DCC, including the Test Traceability Matrix, which will be specific to DCC Service Provider's non-functional requirements;
- All planned tests detailed within DCC Service Provider test specifications agreed by DCC have been executed (unless the removal of a test is approved by the Test Assurance Board at any point during System Capacity Testing);
- The number of System Capacity Testing Issues outstanding does not exceed the threshold level, per relevant DCC Service Provider, defined in Table 13.2 of the SMETS1 SVTAD.

4.3 Completion of System Capacity Testing for each of IOC, MOC and FOC shall be subject to a Test Assurance Board gate review.

5 System Capacity Testing Audit and Independent Assurance

5.1 The DCC shall appoint an independent System Capacity Testing Auditor through the existing DCC audit and assurance framework agreement available on the DCC website.

5.2 Tender responses shall be assessed against criteria which shall inter alia include:

- independence from the DCC and the DCC Service Providers;
- proposed audit approach;
- relevant experience; and
- cost.

5.3 Subject to clause 6.3.7, for each System Capacity Test Phase, the Auditor shall produce a System Capacity Testing Audit Report that shall include:

- confirmation that DCC testing and assurance has been conducted in accordance with this SCTAD;
- confirmation that each of the test exit criteria have been met;
- confirmation that all open Testing Issues have been captured and are either closed or, where still open, Work Off Plans are in place; and

6 SMETS1 System Capacity Testing Completion

6.1 For each of IOC, MOC and FOC the process for completion of System Capacity Testing set out in this Section 6 shall apply.

6.2 The DCC shall review each DCC Service Provider's evidence to assure that each DCC Service Provider has successfully completed its component of System Capacity Testing.

6.3 The DCC shall prepare a System Capacity Testing Completion Report which will include:

6.3.1 details of the System Capacity Testing undertaken;

6.3.2 any risks identified as a consequence of the testing and/or as a consequence of certain parts of the DCC Total System being out of scope of testing;

6.3.3 DCC assurance statement that confirms that the SMETS1 CSP can manage expected capacity increases associated with SMETS1 Services;

6.3.4 how the volume model in Appendix A has been applied, including the input data used;

6.3.5 the results of the testing undertaken;

6.3.6 the results of any extrapolations applied to determine if the criteria for the Test Phase exit has been met; and

6.3.7 the relevant System Capacity Testing Audit Report prepared as set out in Clause 5.3 of this SCTAD, except in the case of the System Capacity Testing Completion Report for IOC, where such audit report is not a pre-requisite for System Capacity Testing Completion, therefore does not need to form part of the System Capacity Testing Completion Report, but shall be published as soon as reasonably practicable after publication of the System Capacity Testing Completion Report.

These reports will be issued to the Test Assurance Board for review and approval.

6.4 System Capacity Testing for each of IOC, MOC, and FOC shall only complete when the Test Assurance Board determines that the System Capacity Testing exit criteria have been met.

6.5 When System Capacity Testing is complete, the DCC shall:

- notify the Secretary of State, the Authority, the Panel, TAG and SEC Parties that System Capacity Testing has been completed;
- provide the Authority, the Panel, TAG and the Secretary of State with copies of the System Capacity Testing Completion Report.

6.6 On direction from the Panel, the DCC shall provide the Parties with copies of the System Capacity Testing Completion Report, having first redacted any sections specified by the Panel.

6.7 In the case of the System Capacity Test Audit Report for IOC, the notification and circulation requirements of clauses 6.5 and 6.6 shall also apply to the separate provision of that report.

7 Roles and Responsibilities

7.1 DCC shall:

- provide details of the volume model profiles to the DCC Service Providers;
- assure test planning, preparation and execution activities undertaken by DCC Service Providers against the Test Traceability Matrix;
- review and approve the relevant Test Documents, and issue of Test Completion Certificate if required;
- participate in quality gate reviews; and
- define and implement a process to assure the achievement of System Capacity Testing exit criteria produce the System Capacity Test Completion Report for IOC, MOC and FOC.

7.2 The DCC Service Providers subject to this SCTAD (with the exception of the System Integrator) shall be responsible for:

- producing the test stage plans, test specifications, Test Traceability Matrices, progress reports and test completion reports;
- design and creation of test scenarios, test scripts, test data and test environments;
- preparing test execution and environment usage schedules;
- diagnosing Testing Issues;
- contributing to the master configuration management plan;
- contributing to the master Release schedule;
- contributing to the environment plan;
- establish, maintain and control their own test environments, in terms of software / hardware configuration and access control;
    - for tests within their agreed test boundary, under the direction of the Systems Integrator:
        i. execute and monitor test scripts;
        ii. capture evidence;
        iii. report progress;
- identifying & monitoring the infrastructure performance measurement to diagnose performance and identify potential issues; and
- resolve Test Issues for their solution elements and undertaking System Capacity Testing of any fixes required, where appropriate.

7.3 The System Integrator will be responsible for:

- overall planning and control of DCC environments;
- maintaining risk, assumption, issue and dependency logs;

- supporting other DCC Service Providers in their assigned test preparation and execution activities;
- supporting DCC in managing Test Issue resolution, and supporting DCC Service Provider in the resolution process;
- operating the master configuration management plan of DCC's Production environment plan;
- operating the master Release schedule into DCC Production environment; and
- operating DCC's production environment plan.

8 Appendix A - Volume Model for defining System Capacity Testing performance levels

8.1 Introduction

Appendix A of this System Capacity Testing Approach Document describes the model used to define the requisite performance levels for System Capacity Testing for IOC, MOC and FOC.

There are 4 stages in the process followed for using this model:

- stage 1 extracts the forecasted cumulative volumes of meters that are to be installed or migrated for each Operating Capability
- stage 2 calculates the scaling factors from start and end of each Operating Capability for device volumes and applies them to the aggregated SRV volumes for the relevant Operating Capability.
- stage 3 calculates the scaling factors for alerts and events for each Operating Capability
- stage 4 allocates the resulting requisite performance level requirements for test on individual components within the scope of System Capacity Testing for each Operating Capability.

Figure A1 below illustrates the expected cumulative number of enrolled devices into DCC for each Operating Capability.

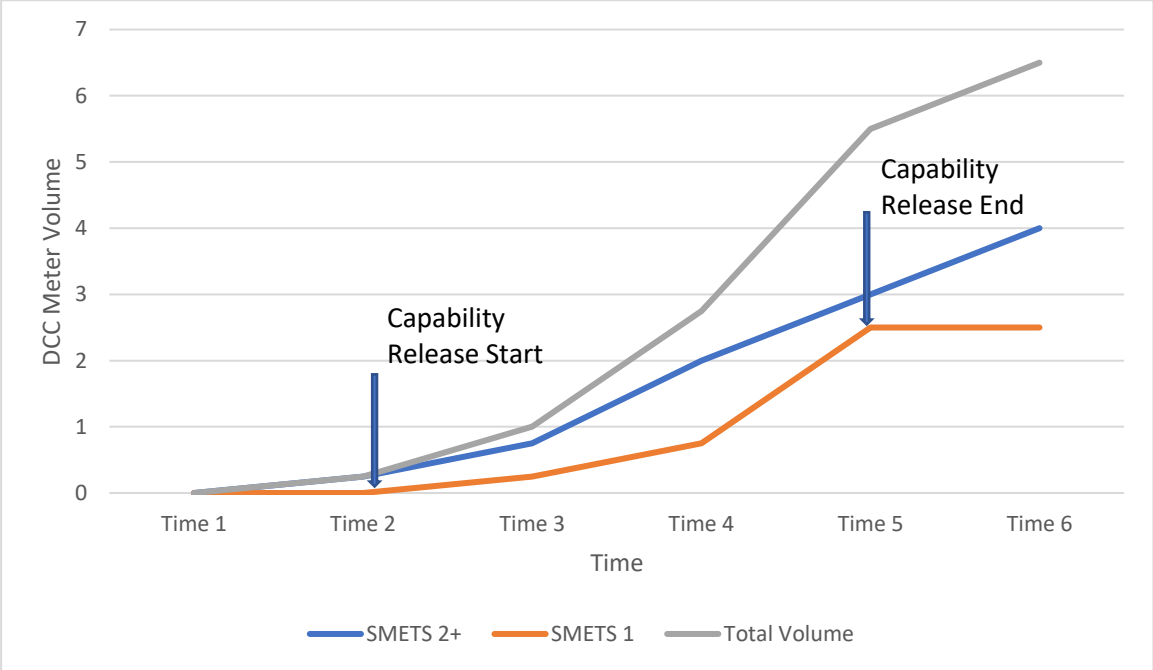


Figure A1: SMETS1 Migration Model (N.B. illustrative only)

The “Capability Release Start” and “Capability Release End” points in figure A1 mark the assumed start & end of SMETS1 migration for an Operating Capability. The total volume of

devices to be migrated for any capability release will be derived from in field SMETS1 Devices.

The maximum volume is determined on the day before the “Capability Release End” date where the maximum rate of migrations is occurring at the same time as the maximum number of existing deployments. This is the point at which there are the most deployed meters and the highest rate of migrations and is selected for the test volumes.

Each of the stages described in section 7.1 above are described in more detail in the following 4 sections.

8.2 **Stage 1 – Extract Forecast Deployment and Installation Volumes**

The current values for cumulative SMETS2+ and SMETS1 meter deployment volumes, SMETS 2+ installations, and SMETS1 migrations will be taken from the forecasts supplied to DCC by all users. Although the forecasts are not split by SMETS1 and SMETS2+, they will be manually split by DCC based on the forecasted deployment volumes. The values used will be those from the month from which the Operating Capability commences, through to the final month where SMETS1 migrations can take place for that Operating Capability.

The Capability Transaction Forecasts provide a rolling monthly forecast of the number of Capability Transactions expected to be required in the next three calendar months (the “forecast transactions”) and anticipated in the subsequent three calendar months (the “anticipated transactions”) for SMETS1 and SMETS2+. An additional 18 months of forecast Service Request volumes and capability transactions are provided as guidance for the long-term development of the service. Each SRV from the DCC User Gateway Catalogue maps onto one or more Capability Transaction. The Capability Transaction Forecasts are derived from Quarterly Service User Forecast provided by individual Service Users.

8.3 **Stage 2 - SRV Forecast aggregation, Installation and Migration Scaling**

Aggregation

The model then uses the observed current usage of DCC systems for each day to allocate the SRV forecasts derived in Stage 1 above to different times of day. SRVs are grouped so that an appropriate scheduling of SRVs can be applied.

Each day is split into 3 timeslots with a range of different activities. The timeslots are:

- midnight to 7 AM;
- 7 AM to 7 PM; and
- 7 PM to midnight;

These timeslots are based on those currently being used by DCC Operational team to manage the different activities that are being observed and predicted by Users.

SRVs are grouped into SRV ‘Types’ to simplify the model. Table A1 below sets out how the SRV Types are allocated to different times of day used in the Volume Model. Table A2 shows how the SRVs are grouped into each SRV Type.

SRV Type/Time of Day	Midnight to 7am	7am to 7pm	7pm to Midnight
SMETS1 and SMETS2+ Meter Reads	X		
SMETS2+ I&C (Credit & Pre-Payment) (all User activity)		X	
SMETS 1 Installations Migration (Credit & Pre-Payment) (all User activity)		X	X
SMETS 1 and SMETS 2 BAU (all User activity)	X	X	X

Table A1 - SRV Groups and Times

SRV Type	SRVs Included
SMETS 1 and SMETS 2 Meter Reads	4.6.1 & 4.8.1 & 4.14 (PrePay)
SMETS 2+ I&C (Credit)	12.2, 8.11, 6.4.1, 6.20.1, 6.8,3.4, 8.7.1, 8.7.2, 8.1.1, 1.1.1, 6.21, 6.15.1 and SMETS 2+ install SRVs
SMETS2+ I&C (Pre-Payment)	12.2, 8.11, 6.4.1 6.20.1, 6.8, 3,4,8.7.1, 8.7.2, 1.6, 1.5, 1.1.1, ,1.6, 1.5, 2.1, 2.2, 6.21, 6.15.1 and SMETS 2+ install SRVs
SMETS1 Migration (Credit)	12.2, 8.11, 6.8, 8.7.1, 8.7.2, 8.1,1, 1.1.1, 6.21, 6.15.1 and SMETS 1 install SRVs
SMEST1 Migration (Pre-Pay)	12.2, 8.11, 6.8, 8.7.1, 8.7.2, 1.6, 1.5, 1.1.1, 2.1 2.2, 1.6,1.5,6.15.1 and SMETS 1 install SRVs
SMETS1 and SMETS2+ other daily traffic	All other SRVs for any User

Table A2 - SRVs in each SRV Type

Nearly all installations of SMETS2+ Devices are currently taking place in credit mode and this has been highlighted in Table 1 and 2. The number of SRVs used for a credit and a pre-payment installation for as shown in Table A2 more SRVs. The effect of this has been taken into consideration for the volume model by extracting the appropriate SRV forecasts.

DCC uses the combination of the Commissioned Devices and the split of SRV types (and SRVs included in each type) across different time slots to calculate the different volume of SRVs by SRV type and time of day.

These results are used to populate total number of SRVs over each time slot in the following table:

SRV Type/Time of Day	Midnight to 7am	7am to 7pm	7pm to Midnight
SMETS1 and SMETS2+ Meter Reads			
SMETS2+ Installations (Credit)			
SMETS2+ Installations (Pre-Payment)			
SMETS1 Migration (Credit)			
SMETS1 Migration (Pre-Payment)			
SMETS 1 and SMETS 2 BAU			

Table A3 – Current SRV Aggregation results

SRV Installation and Migration Scaling

With SRVs aggregated, the next step in the model is to split out the installation and migration volumes from other SRV activities, to provide more granular data against which System Capacity Testing is undertaken.

To do this, SMETS2+ I&C and SMETS1 installation migrations quantities are populated into table A4 below.

	Current enrolled meter volume	Current Peak S1 Installation Migration and S2+ I&C Volume per day	Predicted S1 Installation Migration and S2+ I&C Volume	Predicted S1 Installation Migration and S2+ I&C Volume per day
SMETS1				
SMETS2+				

Table A4 - Current and Predicted Volumes

The results of the previous forecast analysis are then combined into a final forecasted volume of SRVs within the timeslots

SRV Type/Time of Day	Midnight to 7am	7am to 7pm	7pm to Midnight
SMETS1 and SMETS2+ Meter Reads			
SMETS2+ I&C (Credit)			
SMETS2+ I&C (Pre-payment)			
SMETS1 Installation Migration (Credit)			
SMETS1 Installation Migration (Pre-payment)			
SMETS1 and SMETS 2 BAU			

Table A5 - Scaled SRV Volume

DCC will use the values in table A5 that have been calculated using the processes described above, as the predicted average volumes of SRVs over the measurement period and standardised as a total volume of SRVs per second. The test volumes are subjected to a range of modelling assumptions, which are listed below, which enable DCC to develop individual test profiles for each component under test:

Scaling assumptions and inputs

- the impact of pre-payment meters within the model assumes:
    - an additional volume of SRVs as described above for SMETS2+ I&C;
    - a higher additional volume for SMETS1 Installation migration caused by the requirement to migrate in Credit mode;
    - no impact on meter reading volumes; and
    - an additional volume of 1 transaction per pre-payment meter per day (added to the BAU volume to account for a top up based on the percentage of prepay meters within a particular “Capability Release”)

- the volumes of overnight reads and in-day activities will vary depending on current enrolled numbers of SMETS1 and SMETS2+ meters;
- SMETS1 SRV utilisation for migration will be the same as for installation of SMETS2+ meters except for Pre-payment when a greater volume will be included for SMETS 1 meters;
- except for pre-pay migration, SMETS1 devices will create the same level of southbound traffic (SRVs) as current SMETS2+ device; and
- the current traffic on current production SMETS2+ will be scaled to include the expected volume of SMETS1 Devices installed i.e. DCC users will operate SMETS1 Devices in the same way as for SMETS2+ Devices.

8.4 **Stage 3 - Alerts and Events**

DCC is using a simpler model for the alerts and events scaling based on the fact that both SMETS1 and SMETS2+ Devices behave similarly. There are large quantities of alerts created by Devices that are not linked to an actual event occurring. These are far higher than for any other activities on the meter and so it is these that will be scaled based on current volume and predicted volumes.

Since the volume of these alerts have been observed in the production system to be a steady state volume, the working assumption will be that the alerts will be spread evenly across the time of day. Once all of the assumptions have been introduced below, the alert volume will be assumed to be 1 alert per metering device per day.

The following assumptions will be made:

- for SMETS2+ Devices, any required change that suppresses any unnecessary alerts and events from being processed by the DSP will be assumed to have been implemented;
- for SMETS1 Devices, there is a similar suppression system being introduced to avoid unnecessary alerts from affecting the performance of the S1SP.
- the suppression of unnecessary alerts will not affect the performance of S1SP as it would be carried out externally to the S1SP process and system.

8.5 **Stage 4 – Allocation of volume per Service Provider**

Once all of the calculations above have been made, then the SRV volumes for each of the Service Provider systems will be calculated based on their involvement with the different SRVs and alarm types.

For example, as the DSP is involved in all transactions and so will be allocated a SRV volume per day against which to test which includes SMETS1 and SMETS2+ calculated volumes. The S1SP and DCO are only involved in SMETS1 transactions and only receives an SRV volume per day against which to test which includes SMETS1 calculated volumes.

Figure A2 below illustrates the different paths for messaging.

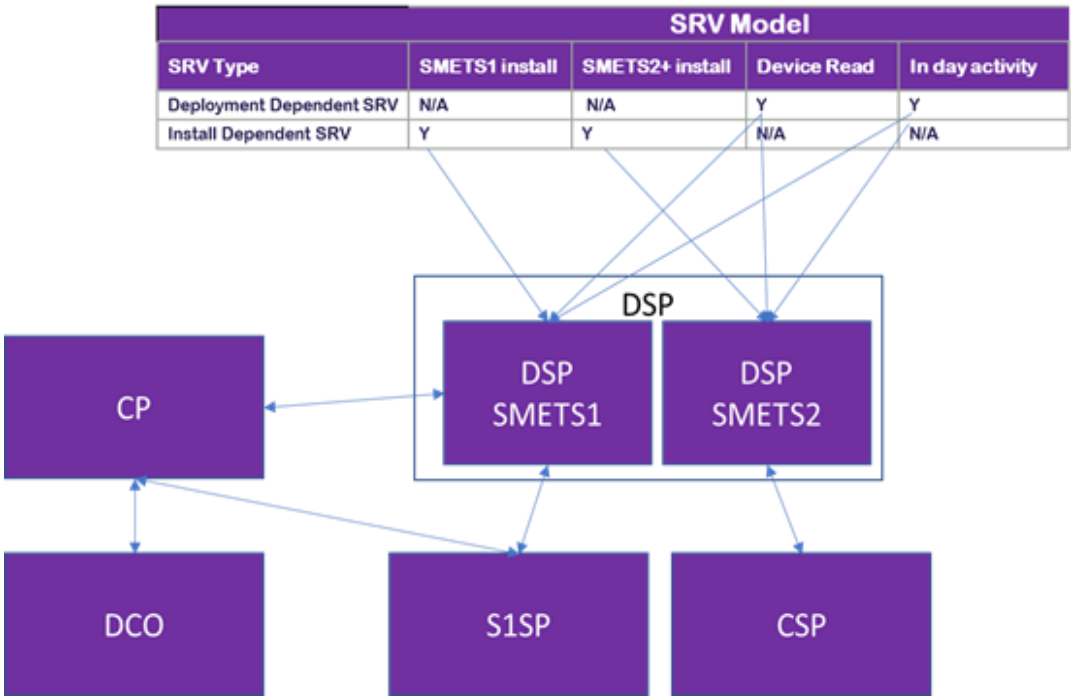


Figure A2 – Messaging paths

Table A6 below shows how the scaled SRV volumes are assigned to the different components of the DCC System which fall within the scope of System Capacity Testing.

SRV Type/Time of Day	Midnight to 7am	7am to 7pm	7pm to Midnight
DSP			
S1SP			
DCO			
CP			

Table A6 – Scaled SRV Volume per SP per day

The peak SRV per-second for SMETS2+ and SMEST1 in the production environment is expected to occur at the same time within the timeslot. In particular, the requested execution time for DSP Future Dated SRVs (e.g. SR4.6.1 Daily Read Log and/or SR4.8.1 HH Profile Read requests) are expected to be the same for SMETS1 following adoption. The DSP will then schedule the actual execution of these SRVs across the available timeslot to avoid very large traffic spikes occurring at the original requested execution time. To factor the peak traffic in the SRV volume calculation, DCC will use live monitoring on SMETS2+ traffic to calculate the ratio between current SMETS2+ peak SRV per sec and average SRV per sec. The said ratio will be used to calculate the peak SRV per sec for SMETS1 traffic by scaling up the vales of Table A6.

The SMETS1 volumes are derived from migration modelling activity which has different volumes for IOC, MOC and FOC based on different number of Suppliers for each cohort.

DCC will calculate the SRV per-second for each IOC, MOC and FOC based on these different volumes for each of the three S1SP.

Table A7 shows the peak SRVs per-second which will form the basis of the performance volumes referred to in the main body of the SCTAD. The peak SRV per-second will be scaled down to each Service Provider's test environment and then used as the required testing volume.

SRV/second	Midnight to 7am	7am to 7pm	7pm to Midnight
DSP			
S1SP			
DCO			
CP			

Table A7 – Scaled SRV volume per second