

NFR Category	Reference	Requirement Description	System or Service to which requirement applies	MoSCoW Rating ^[1]	Derivation of requirement and notes
Time Behaviour (Response Time)	PERF01	<p>A Supplier shall acknowledge receipt of an enquiry message from CSS as follows:</p> <ul style="list-style-type: none"> - at average hourly volume, mean response time of 3s or less - at average hourly volume, 90th percentile response time of 6s or less - at peak hourly volume, mean response time of 5s or less - at peak hourly volume, 90th percentile response time of 8s or less 	Supplier	M	<p>Switching Programme proposal</p> <p>Note that this applies to a request for objection to loss of consumer. An "enquiry" message is defined in <i>Interface Patterns</i> in D-4.1.5 E2E Solution Architecture.</p> <p>NOTE that average and peak volumes are defined in requirement PERF14</p>
Time Behaviour (Response Time)	PERF02	For the network, latency shall be 200ms or less.	Switching Network	S	<p>The Switching Network connects CSS to the other Central Data Services (except Smart Metering) and Market Participants who send and receive messages from CSS (not those which only receive notifications).</p> <p>Switching Programme proposal</p> <p>Note that this is a SHOULD because it is expected to be met. Should it not be met due to considerations described in D-4.2.1 CSS Detailed Design, then the impact will be assessed at that time.</p>
Time Behaviour (Response Time)	PERF03	<p>CSS shall process a switch request or a request for initial registration (from the point of receipt by CSS to the point where CSS sends out the response of either "Validated" or "Rejected") as follows:</p> <ul style="list-style-type: none"> - at average hourly volume, mean response time of 3s or less - at average hourly volume, 90th percentile response time of 6s or less - at peak hourly volume, mean response time of 5s or less - at peak hourly volume, 90th percentile response time of 8s or less 	CSS	S	<p>Switching Programme proposal</p> <p>Note that this is a SHOULD because it is expected to be met, but further work is needed on the intra-day transaction profile before this can be confirmed. Of particular concern is the receipt of a large number of messages from Suppliers shortly before the Gate Closure. It is expected this requirement will be confirmed in D-4.2.1 CSS Detailed Design, where the requirement will be refined and made MUST.</p>
Time Behaviour (Response Time)	PERF04	<p>CSS shall acknowledge receipt of update messages (from receipt of the message to sending the response) as follows:</p> <ul style="list-style-type: none"> - at average hourly volume, mean response time of 2s or less - at average hourly volume, 90th percentile response time of 4s or less - at peak hourly volume, mean response time of 3s or less - at peak hourly volume, 90th percentile response time of 6s or less 	CSS	M	Switching Programme proposal
Time Behaviour (Response Time)	PERF05	<p>CSS shall process the securing of switches and send synchronisation messages of secured switches at Gate Closure to Smart Metering (from the time of Gate Closure to the point at which CSS sends the last message) as follows:</p> <ul style="list-style-type: none"> - at average daily volume, mean time of 20 minutes or less - at average daily volume, 90th percentile time of 25 minutes or less - at peak daily volume, mean time of 35 minutes - at peak daily volume, 90th percentile time of 40 minutes 	CSS	M	<p>Switching Programme proposal</p> <p>Note that this equates to the following number of transactions per second (tps), which is comparable with throughput rates in financial applications:</p> <ul style="list-style-type: none"> - average daily volume, mean tps = 42 - average daily volume, 90th percentile tps = 34 - peak daily volume, mean tps = 40 - peak daily volume, 90th percentile tps = 35 <p>Note that this is consistent with the requirement placed on CSS (PERF05).</p>

Time Behaviour (Response Time)	PERF06	Smart Metering shall respond to synchronisation by CSS of secured switches at Gate Closure (from the point at which Smart Metering receives the first message to the point at which it sends the acknowledgement of receipt for the last message) as follows: - at average daily volume, mean response time of 20 minutes or less - at average daily volume, 90th percentile response time of 25 minutes or less - at peak daily volume, mean response time of 35 minutes - at peak daily volume, 90th percentile response time of 40 minutes	Smart Metering	M	Switching Programme proposal Note that this is consistent with the requirement placed on CSS (PERF05).
Time Behaviour (Response Time)	PERF07	Smart Metering shall process a synchronisation message from CSS other than at Gate Closure (from receipt of the message in Smart Metering to the sending out of a response from Smart Metering) as follows: - at average hourly volume, mean response time of 6s or less - at average hourly volume, 90th percentile response time of 10s or less - at peak hourly volume, mean response time of 10s or less - at peak hourly volume, 90th percentile response time of 15s or less	Smart Metering	M	Switching Programme proposal
Time Behaviour (Response Time)	PERF08	The time taken for a file containing 10,000 switch requests/initial registration requests to be sent out by CSS to UK Link (from the point at which CSS sends the first record in cord in the file) shall be as follows: - at average hourly volume, 15 minutes or less - at peak hourly volume, 20 minutes or less	CSS	M	Switching Programme proposal Note that this equates to the following number of transactions per second (tps), which is relatively low when compared with throughput rates in financial applications: - average volume tps = 11 - peak volume tps = 9
Time Behaviour (Response Time)	PERF09	The time taken for a file containing 10,000 switch requests/initial registration requests to be acknowledged by UK Link (from the point at which UK Link commences receiving to UK Link sending an acknowledgement of the successful transfer) shall be as follows: - 20 minutes or less	UK Link	M	Switching Programme proposal Note that separate figures have not been given for average and peak volumes because the volume of transactions being processed by CSS has no bearing on the "busy-ness" of the UK Link system. See the comment on PERF08 regarding the tps.
Time Behaviour (Response Time)	PERF10	The time taken for a file containing 2,000 switch requests/initial registration requests to be sent out by CSS to the Meter Point Registration System (MPRS), from the point at which CSS commences sending to the point at which the send is complete, shall be as follows: - at average hourly volume, 5 minutes or less - at peak hourly volume, 10 minutes or less	CSS	M	Switching Programme proposal Note that this equates to the following number of transactions per second (tps), which is relatively low when compared with throughput rates in financial applications: - average volume tps = 7 - peak volume tps = 4
Time Behaviour (Response Time)	PERF11	The time taken for a file containing 2,000 switch requests/initial registration requests to be acknowledged by MPRS (from the point at which MPRS commences receiving to MPRS sending an acknowledgement of the successful transfer) shall be as follows: - 10 minutes or less	MPRS	M	Switching Programme proposal Note that separate figures have not been given for average and peak volumes because the volume of transactions being processed by CSS has no bearing on the "busy-ness" of the MPRS system. The maximum file size given here is less than for UK Link because CSS will be communicating updates to more than one MPRS instance. See the comment on PERF10 regarding the tps.

Time Behaviour (Response Time)	PERF12	The Data Enquiry Service (DES) shall respond to an enquiry from a Supplier or TPI (from the point at which DES receives the message to the point at which DES sends the response) as follows: <ul style="list-style-type: none"> - at average hourly volume, mean response time of 3s or less - at average hourly volume, 90th percentile response time of 6s or less - at peak hourly volume, mean response time of 5s or less - at peak hourly volume, 90th percentile response time of 8s or less 	DES	M	Switching Programme proposal NOTE that average and peak volumes are defined in requirement PERF17.
Time Behaviour (Response Time)	PERF13	The Electricity Central Online Enquiry Service (ECOES) shall respond to an enquiry from a Supplier or TPI (from the point at which ECOES receives the message to the point at which ECOES sends the response) as follows: <ul style="list-style-type: none"> - at average hourly volume, mean response time of 3s or less - at average hourly volume, 90th percentile response time of 6s or less - at peak hourly volume, mean response time of 5s or less - at peak hourly volume, 90th percentile response time of 8s or less 	ECOES	M	Switching Programme proposal NOTE that average and peak volumes are defined in requirement PERF17.
Time Behaviour (Throughput Rates)	PERF14	The system shall be capable of processing the following volumes of switch requests: <ul style="list-style-type: none"> - average daily volume of 33,200 - peak daily volume of 67,400 - average hourly volume of 2,800 - peak hourly volume of 27,000 - annual volume of 12,131,400 	CSS, Smart Metering, ECOES, DES, MPRS, UK Link, Switching Network	M	Based on actual monthly data for the last 5 years, as published by Ofgem; see <i>Volume Calculation, Assumptions</i> sheet. Numbers have been rounded to the nearest 100. Note that the average volumes used have been extrapolated to give those anticipated for 2020, when Switching will be in live operation. The peak volumes are based on the peak month experienced so far, which was March 2017. This figure has been used "as is" without extrapolation.
Time Behaviour (Throughput Rates)	PERF15	The system shall be capable of processing the following volumes of initial registrations: <ul style="list-style-type: none"> - annual volume of 270,000 	CSS, Smart Metering, ECOES, DES, MPRS, UK Link	M	Switching Programme proposal Current UK new build in 2017 is approximately 100,000 units pa, each of which is assumed to have both a gas and an electricity supply and is assumed to increase by 10% pa until 2020.
Time Behaviour (Throughput Rates)	PERF16	The system shall be capable of processing 250,000 switch requests in addition to the normal day's volume in exceptional conditions, spread across 2 days and with 2 days' notice. This relates to a Supplier of Last Resort event (SoLR) and gives a: <ul style="list-style-type: none"> - "peak of peaks" daily volume of 158,200 	CSS, Smart Metering, ECOES, DES, MPRS, UK Link	M	Based on PERF14 and Switching Programme proposal.
Time Behaviour (Throughput Rates)	PERF17	The system shall be capable of processing the following average volume of address updates from the Premises Address service: <ul style="list-style-type: none"> - 1M updates to existing addresses every 6 weeks 	CSS	M	Switching Programme proposal, based on the volumes quoted by an established UK address service.

Time Behaviour (Throughput Rates)	PERF18	The system shall be capable of processing enquiries at volumes of 1.5 times those for switch requests, for: - average daily volume - peak daily volume - average hourly volume - peak hourly volume - annual volume	DES, ECOES	M	Switching Programme proposal It has been assumed that there will be 3 enquiries made for each switch request and that these enquiries will be distributed as 50% on DES and 50% on ECOES. The volumes for switch requests are given in PERF14.	
Time Behaviour (Throughput Rates)	PERF19	The system shall be capable of processing the following volumes of changes to MEM, DC or DA: - the same volumes as for number of switch requests	CSS	M	Switching Programme proposal See PERF14.	
Time Behaviour (Throughput Rates)	PERF20	The system shall be capable of processing the following volumes of changes to MAP: - the same volumes as for the number of initial registrations	CSS	M	Switching Programme proposal See PERF15. Note that a peak may be experienced if a MAP sells its portfolio. The likely profile associated with this will be defined in the D-4.2 CSS Design.	
Resource Utilisation	PERF21	Resource utilisation must be such that all the other non-functional requirements placed on the system are met.	CSS	M	Switching Programme proposal	
Capacity	PERF22	The system shall be capable of storing information related to a combined total of Metering Points and Supply Meter Points of 54.9M.	CSS, ECOES, DES, MPRS, UK Link	M	Switching Programme proposal Note that this is the projected 2020 figure, based on 53.7M Metering Points/Supply Meter Points in 2015, with an annual growth of 200,000 in 2016 (100,000 new builds, each with 2 meter points) and annual growth increasing by 10% per year thereafter.	
Capacity	PERF23	Capacity shall be such that all the other non-functional requirements placed on the system are met.	CSS	M	Switching Programme proposal	
Capacity	PERF24	The system shall be capable of expansion to support a 350,000 increase in number of Metering Points/Supply Meter Points in the first year of operation, with the annual growth increasing by 10% per year thereafter.	CSS, Smart Metering, ECOES, DES, MPRS, UK Link	M	Switching Programme proposal	
Capacity	PERF25	The system shall be capable of holding 24 months'-worth of transactions online.	CSS	M	Switching Programme proposal This is to allow consistency with settlement processes where changes can be made up to 23-24 months after the event.	
Capacity	PERF26	The system shall be capable of holding 7 years'-worth of transactions in an archive, from which information can be recovered within 3 working days.	CSS	M	Switching Programme proposal This is consistent with data retention policies for financial applications.	
o m p a t i b i l i t	Co-existence	COMP01	CSS shall run on infrastructure (hardware and software) which is logically separated from other applications.	CSS	M	Switching Programme proposal
	Interoperability	COMP02	The exchange of information between CSS and Market Participants' systems and between CSS and Central Data Services other than Smart Metering shall be based upon open standards.	CSS, ECOES, DES, MPRS, UK Link, Supplier	M	Switching Programme proposal
	Interoperability	COMP03	The exchange of information between CSS and Smart Metering shall be based upon the applicable Smart Metering interface standards.	CSS, Smart Metering	M	Switching Programme proposal

R e l i a b i l i t y	Maturity	REL01	The potential risks and benefits of using suggested innovative technology in CSS will be assessed by the appropriate governance during the CSS procurement and subsequently via the change management process.	CSS	M	Switching Programme proposal
	Availability	REL02	The system shall have 99.75% availability outside scheduled maintenance periods.	CSS, Switching Network	M	Switching Programme proposal (Ofgem Design Assumptions)
	Availability	REL03	The system shall have 99.75% availability outside scheduled maintenance periods.	ECOES, DES	S	Switching Programme proposal (Ofgem Design Assumptions) Note that this is a SHOULD because it is expected to be met. The availability of the enquiry services is extremely important, but not essential for a switch to take place.
	Recoverability	REL04	In the event of an unplanned outage, the system shall be able to resume operation within 1 hour. In addition, there shall be a business continuity process which allows the continued operation of the system in case of overall failure. This may be partially manual but must operable at the anticipated volumes.	CSS, Switching Network	M	Switching Programme proposal
	Recoverability	REL05	In the event of an unplanned outage, the system shall be able to resume operation within 1 hour.	ECOES, DES	S	Switching Programme proposal Note that this is a SHOULD because it is expected to be met. The availability of the enquiry services is extremely important, but not essential for a switch to take place.
	Recoverability	REL06	In the event of corruption of business-critical data, CSS shall be capable of restoring uncorrupted data from back-up to a suitable point to resume processing without loss or duplication of any inbound or outbound message.	CSS	M	Switching Programme proposal
	Recoverability	REL07	In the event of insolvency of the organisation maintaining CSS, the source code shall be recoverable from escrow.	CSS	M	Switching Programme proposal
	Fault Tolerance	REL08	The system shall be able to detect loss and duplication of messages transferred from/to it and shall have facilities for rectification.	CSS, ECOES, DES, MPRS, UK Link, Supplier	M	Switching Programme proposal