

Cross-Platform Switching

Direct Inter-CP Communications

Back-End Process Use Cases

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Summary of changes

Version	Section	Description
1.0	n/a	Initial draft for Ofcom review.
2.0		Update to incorporate Ofcom feedback and additional internal changes.
3.0		Update of the process diagrams.

References

Ref.	Title	Version	Author/Company
[1]	Cross-Platform Switching Gaining Provider Led Front-End Process Use Cases	2.0	Cartesian
[2]	Cross-Platform Switching Enhanced Cease & Re-provide Front-End Process Use Cases	1.0	Cartesian
[3]	TM Forum TAM Documentation	R15.5.0	TM Forum

Glossary of Terms

Term or Abbreviation	Description
Account/service record	This term is used to describe the set of account and service level data that allow an LP to identify an individual instance of a service on a customer account. For example, account reference, post code, service type and one or more service identifiers. The customer would be expected to know or have access to this information. They would need to use it to identify the service for the purpose of switching that service from the LP to the GP.
AO	Access Operator – usually the operator providing the connection to the customer's premises, although note that BT Wholesale could also be considered an access operator in some contexts.
BAU	Business As Usual
BSS	Business Support Systems
CLI	Calling Line Identifier
CP	Communications Provider
C&R	Cease & Re-Provide
CRD	Customer Required Date
CSR	Customer Services Representative
DCC	Direct Inter-CP Communications. A potential new communications channel between CPs for coordinating switching activity.
ETC	Early Termination Charges
GP	Gaining Provider – the CP to whom the customer is switching
GPL	Gaining Provider Led – describes a switching process in which the Customer interacts with the Gaining Provider and does not need to directly contact the Losing Provider
GNP	Geographic Number Portability
IS	Implications of Switching – the (potential) consequences of moving an end user's service(s) from one provider to another
IVR	Interactive Voice Response - technology that allows a computer to interact with humans through the use of voice and keypad inputs
LoS	Loss of Service
LP	Losing Provider – the CP away from whom the customer is switching
NoT	Notice of Transfer
OSS	Operations Support Systems
PONR	Point of No Return
Switching Reference	A unique reference to identify the customers' switch order request. Generated by the GP in the context of this document.

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1 Introduction

Within Ofcom's wider programme of work on consumer switching, Ofcom engaged Cartesian to conduct a feasibility study on different options to reform the existing switching processes for voice, broadband and Pay TV services delivered across different platforms. The objective of Cartesian's work was to identify, define and cost a set of alternative process options that sought to address consumer harms that had been identified as part of recent consumer research and through other evidence.

Two alternative switching options have been chosen for assessment:

1. Enhanced Cease & Re-Provide (EC&R) Cross-Platform switching model
2. Gaining Provider led (GPL) Cross-Platform switching model

In both cases, an inter-CP communication channel is proposed for implementation. Again, two alternative options have been chosen for assessment:

3. Openreach EMP System Extension
4. Direct Inter-CP Communication Channel

For each of the chosen options, Cartesian has developed use case documents. This documentation is intended to provide Communication Providers (CPs) with sufficient information to conduct their own assessment of the potential costs and implications of adopting these models.

In the documentation, a distinction is made between '*front-end*' and '*back-end*' activities. The '*front-end*' is the initial interaction between the Customer and CP(s) to validate the switching request and obtain the Customer consent. The '*back-end*' covers both the internal CP and CP-to-CP technical activities.

This document concerns the '*back-end*' activities of option 4, "*Direct Inter-CP Communication Channel*" (DCC). This document should be read in combination with the documentation addressing alternative front-end implementations – see References [1] and [2].

1.1 Aim and Document Scope

The focus of the project was on the technical and operational aspects of consumer switching of communications services between communication providers (CPs) that use different delivery platforms, i.e. cross-platform switches. This included a consideration of both the processes

(operational activities) that the CPs undertake and the systems (software applications) that support the CPs' business operations.

Ofcom had recently (late 2015) carried out quantitative and qualitative research across a full range of switching scenarios of triple play switching to better understand the nature and scale of harms experienced by consumers. Ofcom shared with Cartesian the findings and Cartesian was then asked to develop potential alternatives to the current switching processes that would help to address the issues identified. In particular, measures that could help to address loss of service; double paying; difficulties contacting the losing provider (LP)/cancelling existing services and lack of awareness of implications of switching (IS). Cartesian also considered how to mitigate potential unintended consequences of the measures and assessed the impact to industry should these be adopted.

The following switching cases were within the scope of the project^a:

- Switching of fixed voice, broadband and/or pay TV services between Virgin Media and another CP
- Switching of satellite pay TV from Sky to another CP (switched either by itself or alongside voice and/or broadband).

The following items were outside the scope of the project:

- Switches that only involve services delivered on the Openreach network, i.e. where there is no cross-platform switch occurring
- Over-the-top TV services, e.g. NOW TV, Netflix (services offered over broadband that are agnostic to which CP is supplying the broadband connection)
- Mobile voice and broadband services
- Switching during a home move
- The commercial and legal implications of the potential alternative options

1.2 Assumptions

1. When switching more than one service, all of the services have the same switch date
2. When switching more than one service, if the GP encounters a problem with the delivery of one of the services, then the switch date will be postponed for all of the services.

^a The original scope of the project was broadened to include the switching of standalone pay TV services.

3. The asset validation phase of the process defined in this document is treated in a real time manner. The GP's sales conversation is complete at this stage so the customer would not be waiting on-line or have to be contacted a second time.
4. The customer perception of the quality of service is outside of the remit of this document. The processes in this document cover the activation and cease of active, live services and the provision of such equipment as is necessary to access the service in good working order. CPs may wish to implement additional, post-switch activities to assure that customers are satisfied with their new services.
5. A unique reference is automatically generated by the GP, in the context of this document, to identify the customer's switch order request – Switch Reference ID. A means by which to identify the GP would need to be included in the reference.



2 Overview of Process

The processes described in this document refer to the technical back-end activities between the GP and the LP to execute the switch of services in a coordinated manner across the different delivery platforms. In this document, the coordination of those switching activities between CPs is achieved via a new communication channel, the DCC.

It is envisioned that the DCC would be used by all large CPs that offer consumer telephone, broadband and Pay TV services, e.g. BT, Sky, TalkTalk and Virgin Media (VM), and other CPs operating on the Openreach access network.

Coordination of switching activities would enable CPs to provide a more seamless switching experience for consumers. However from a technical perspective, switches between platforms remain discrete cease and re-provide activities in the background.

As the switch is achieved through discrete cease and re-provide activities, there is no reason why multiple instances of an alternative switching process could not be run in parallel to achieve a switch from more than one LP to one GP.

It should be noted that switches for services delivered wholly over the Openreach network (e.g., between BT and TalkTalk) are covered by the existing GPL NoT+ process.

A short summary of the DCC back-end approach is detailed below:

- The back-end process implements a new DCC system as the electronic channel between CPs for cross-platform switching
- The back-end process can be used with either the GPL or the EC&R front-end. See References [1] and [2]
- For those cases where the activation/cease of the TV service is communicated over the new DCC (as a standalone switch or as part of a bundle but the TV service is delivered separately from the voice and broadband services – e.g. customer leaving Sky to BT), the Switching Reference allows the CPs to align the two orders from the two channels/systems in their internal systems, i.e., the voice/broadband switch order (the Openreach platform) and the TV service activation/cease order (new DCC). No change to the EMP system is required
- The primary means of identifying the customer (with the Losing Provider (LP)) is through the Account Reference and / or the Calling Line Identity CLI during the Asset/Account Validation step

Although the asset validation happens during the front-end of the process, it is described here due to the dependency on the inter-CP communication channel in place.

The GP must identify the customer to the LP during the Asset/Account Validation step, i.e. the interaction between the two CPs to identify the assets used to provide the consumer's service. The LP Account Reference and/or the CLI of the line to be switched can be used. The CP name, and customer's postcode are also requested from the customer by the GP. The postcode is sent with the LP Account Reference / CLI as a means to prevent erroneous transfers due to miskeying of account references / CLI.

The following diagrams show the end-to-end switching process for the two alternative front-end switching options. Note that the back-end high-level activities remain the same independently of the front-end approach. The front-end elements of these processes are defined in References [1] and [2].



Figure 1: High-level Overview of the Gaining Provider Led (GPL) Cross-Platform Switching End-to-End Process using the extended Openreach EMP System

High-level Overview of Cross-Platform Switching End-to-End GP-led Process

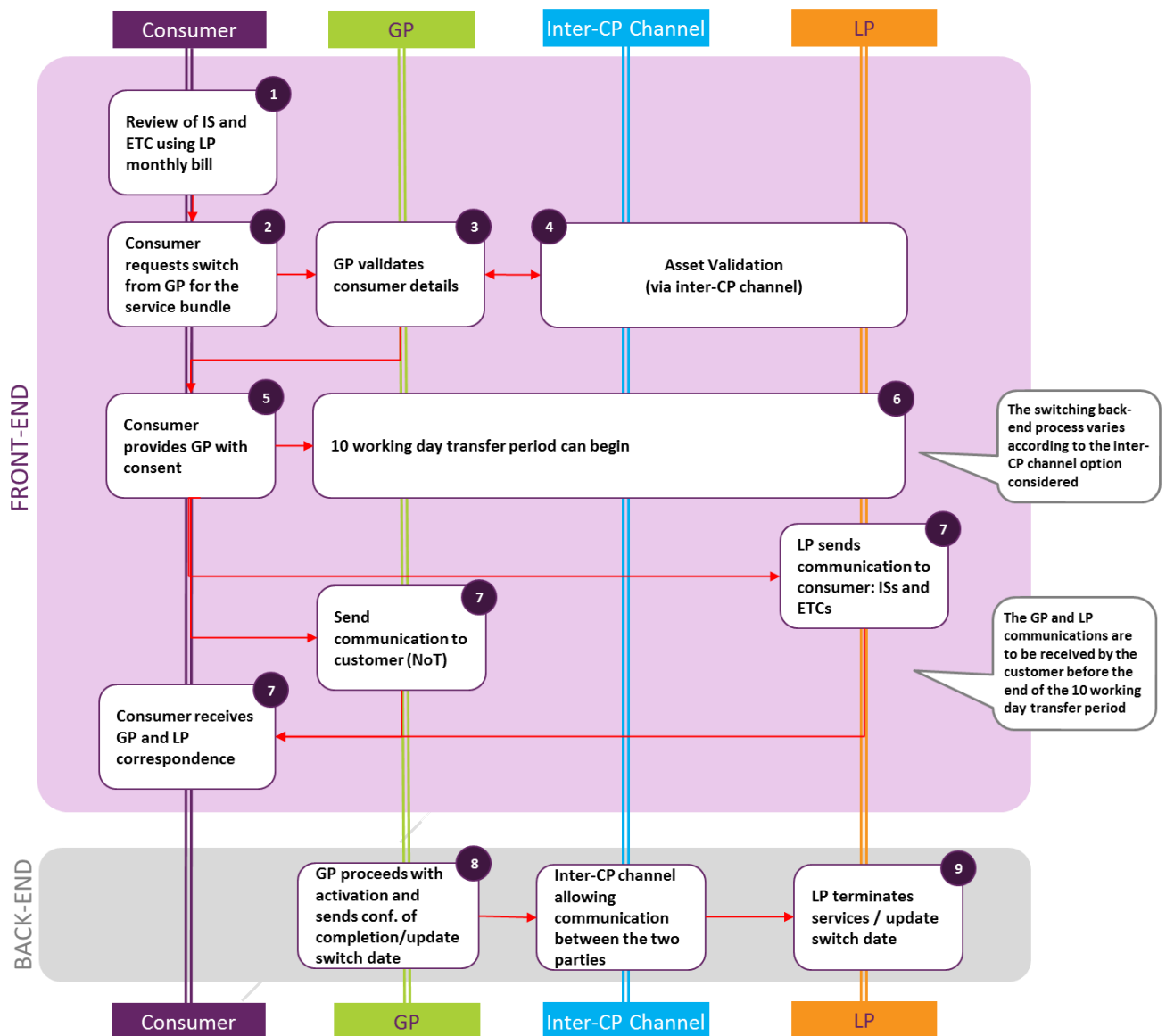


Figure 2: High-level Overview of the Enhanced C&R (EC&R) Cross-Platform Switching End-to-End Process using the extended Openreach EMP System

High-level Overview of Cross-platform Switching End-to-end eC&R Process

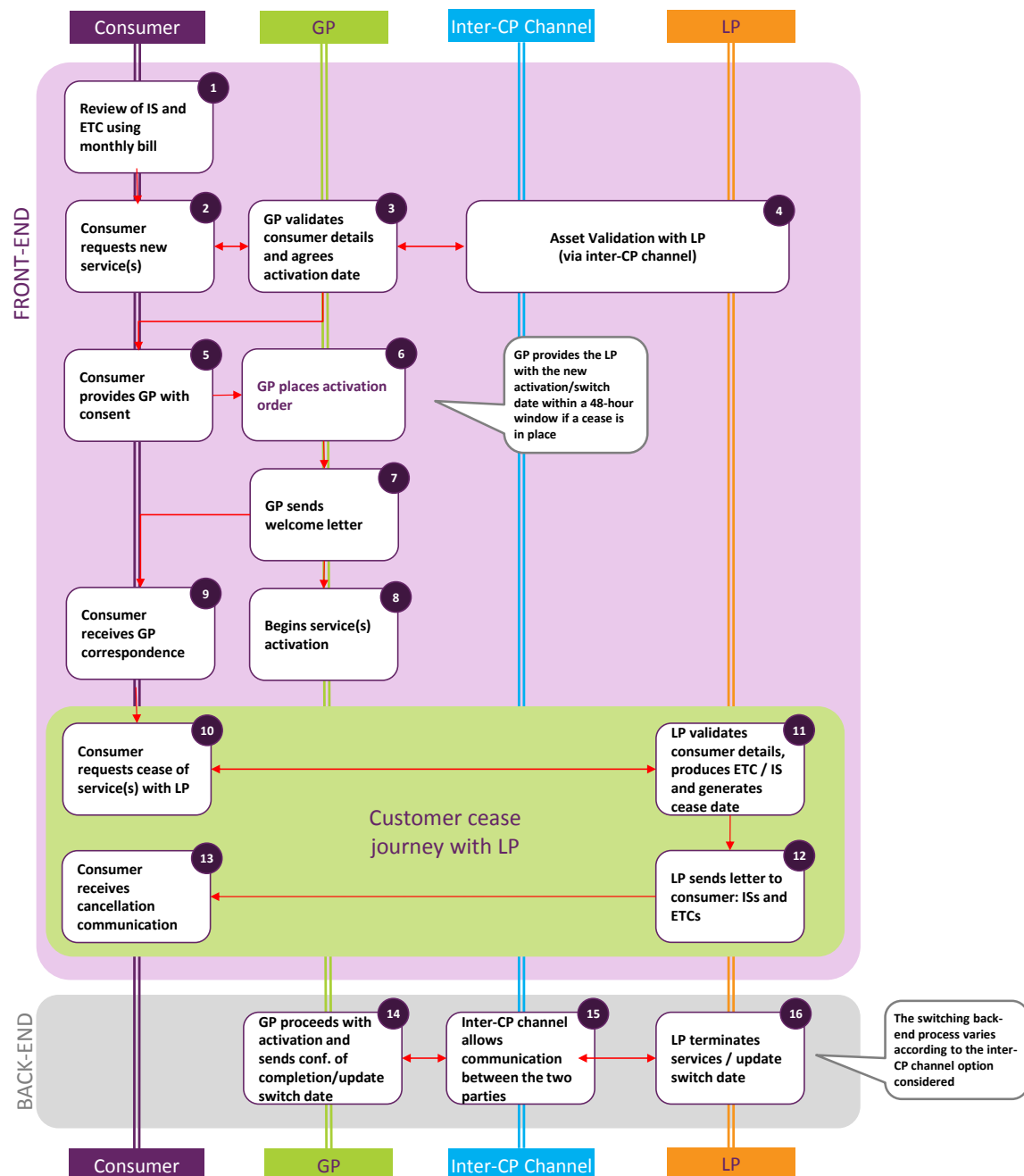


Table 1 High-level steps in the back end cross-platform switching process

Area	Step (GPL EC&R)	Description
Back-end	4 8	<p>GP requests asset validation with the LP</p> <p>Asset validation.</p> <p>The GP uses information provided by the customer to validate the customer account and active services with the LP. The GP must explain the process to the customer and asks them for consent (because customer data is involved).</p> <p>Customer Information for Validation:</p> <p>The GP can use the customer's LP account number and/or CLI as the primary means of identifying the customer to the LP. To avoid erroneous transfers (disconnections), the primary identifying information should be sent to the LP with the customer's surname, address or postcode.</p> <p>As part of asset validation, the LP also returns the earliest possible cease date for the customer. The GP may subsequently request the LP to postpone this, for example if the GP's anticipated provisioning activities are expected to take longer than the LP's earliest cease date.</p>
Front end processes		
Back-end	6 null	<p>GP places switch order with the LP.</p> <p>The GP communicates to the LP which services are to be switched (ceased) and the day on which the switch will occur.</p> <p>Services are all switched on the same day</p> <p>CPs will need to account for interdependencies between services when scheduling activation and cessation activities. For example:</p> <ul style="list-style-type: none"> • IPTV and Cable TV services are dependent on the availability of a working broadband line and a set-top box. • Number Porting will trigger the cease of a telephone line and any services that are dependent on the line (i.e. broadband for lines supplied by Openreach) <p>For switches from Openreach to VM, the number port completion can also be used as a trigger for the VM to activate its TV and broadband services.</p>
Back-end	8 14	<p>GP sends confirmation of completed switch to LP.</p> <p>This avoids unexpected service loss should problems arise with the GP service delivery on the switch date.</p> <p>Confirmation Message to cease services</p> <p>The GP sends a final message to confirm that the new services are up and running to the LP before the LP ceases its services (i.e. a reactive approach). The planned switch date is communicated to the LP in advance but the actual cease order/event is left in standby. The LP must stop billing upon receipt of this confirmation message.</p>

Area	Step (GPL EC&R)	Description
		Proactively rescheduling the switch date If delays occur during the GP service activation then the GP is able to update the switch date, as long as this is before the point of no return (PONR). The switch date may also be postponed by the GP in response to a customer request. The switch date refers to all components of the services being switched.
Back-end	9 16	LP terminates services / updates switch date

3 Overview of Impacted Areas

3.1 Overview of Use Cases

The following table summarises the use cases described in more detail later in this document. All use cases are focused on the switching process and how the scenario affects the elements of that process.

Table 2 Overview of Use Cases

Ref	Scenario	Sect.	Figure	Description
BE-DCC-UC01	Customer Switch Request - Back End via DCC	4.1	4.1.1	Process to be followed during a cross-platform switch request
BE-DCC-UC02	Change date - back end via DCC	4.2	4.2.1	Process to be followed when requesting a change of switching date.
BE-DCC-UC03	Cancel – back end via DCC	4.3	4.3.1	Process to be followed when CP cancels switch for technical reasons, or triggered from front end use cases when customer cancels switch.

3.2 Interfaces

The following table summarises the interfaces referenced in the use cases in this document. Exact details of these will vary from one CP to another. The intention here is to cover at a generic level the types of interfaces that will be required and that will be impacted by the proposed switching process.

Table 3 : Overview of Interfaces

Interface	Description
CP order entry	This covers the front end interfaces used to input customer and order data, such as the applications used by the CSRs and any customer self-service front ends.
CP <- -> CP electronic interface	This covers the interactions between CPs via new, direct Inter-CP comms to manage requests and how their acknowledgements and their responses in relation to existing (and potential new) back-end switching processes will be orchestrated.
CP customer information management	This covers the back end interfaces used to query, retrieve and present customer information data to other internal CP systems.

3.3 Applications

Each operator will have a unique suite of applications in their OSS/BSS architecture. To provide a common language, this document uses the “Level 1” application names and descriptions in the TM Forum’s Application Framework (a.k.a. TAM). This industry standard framework can be mapped by CPs to their own specific application architecture.

The descriptions below are replicated from the TM Forum's TAM Map document and are included for ease of reference. Please reference the TM Forum TAM documentation, reference [3], for more detail on TAM.

Table 4: Overview of Applications

Application	Description
Channel Sales Management	The Channel Sales Management application provides the necessary functionality to sell to a number of specific sales channels.
Knowledge Management	Knowledge Management (KM) comprises a range of practices used in an organisation to identify, create, represent, distribute and enable adoption of insights and experiences. Such insights and experiences comprise knowledge, either embodied in individuals or embedded in organizational processes or practice.
Customer Information Management	Customer Information Management ensures the delivery of a consistent, accurate and complete customer view to operational and analytical touch-points across the service provider enterprise, thus enabling the optimization of key business processes and the leverage of new revenue opportunities. Customer information is typically scattered across mixed environment with fragmented, isolated customer data which needs to be consolidated, directly or using data federation. A Customer Information Management application, using context sensitive business logic, synchronizes customer information across all of service provider systems and reconciles customer data inconsistencies. Customer Information Management traditionally lies within the boundaries of Master Data Management (MDM), however, it is not mandatory.
Customer Self-Management	Customer self-empowered applications provide an internet technology driven interface to the customer to undertake a variety of business functions directly for themselves. These applications interact to provide fully automated service or assisted service over various customers touch points. Although customer self-management applications primarily trigger functionality defined in the rest of the CRM, Service Management and Resource Management applications, they should also contain functionality specific to customer self-empowerment.
Customer Contact Management, Retention and Loyalty	Customer contact management, retention and loyalty applications are a varied group of functions that are generally sold as part of a Customer Relationship Management (CRM) suite of applications. These applications allow an operator create, update and view the customer's information (names, addresses, phone numbers, organizational hierarchy), record and view all customer interactions across different communication channels and department, so that whoever is speaking to a customer can see the history of issues that have concerned that customer, be they order issues, billing enquiries or service problems. More sophisticated systems allow capabilities to highlight customers as risk of switching to an alternative carrier (churn indicator) and provide comparisons with other operator's service packages to allow customer care agents to try to persuade a customer that their current operator can provide the best value for money. These indicators can be provided via integration to business intelligence platforms.
CSR Toolbox	The CSR toolbox addresses the need for rich interactions with the customer, comprising of applications from the Fulfilment, Assurance and Billing domains. The CSR toolbox provides additional functionality in a common look and feel across the applications – and is not simply a convoluted assembly of applications and processes across silo systems.

Application	Description
Customer Order Management	Customer Order Management applications manage the end to end lifecycle of a customer request for products. This includes order establishment (step guiding, data collection and validation), order publication as well as order orchestration and overall lifecycle management. A customer request may also pertain to already purchased product(s). Thus the Customer Order Management application handles order requests to suspend, resume, change ownership, amend, add, change and discontinue existing ordered products. Customer Order Management application should support repackaging of the purchased offers into alternate product offering (may require sales/contract negotiation). Customer Order Management applications typically serve all the customer touch points / channels, including call centre, retail, self-service, dealers, affiliates, etc. The order may be initiated by any channel and visible to the other channels if needed.
Customer Problem Management	<p>The purpose of Customer Problem Management is to manage problems reported by customers, resolving these problems to the customer's satisfaction, and providing meaningful status on the issue as needed to the customer.</p> <p>Customer problems can include:</p> <ul style="list-style-type: none"> • General questions on products purchased and being used by the customer • Problems with products already purchased and being used by the customer either due to lack of education or service/network problems. • Problems with a material purchase from the service provider, even if they do not have an account with the said service provider. • General inquiries, complaints, and commendations.
Service Order Management	<p>Service Order Management applications manage the end to end lifecycle of a service request. This includes validating service availability as well as the service order request. Other functionality includes service order issuance, service and or product order decomposition, and service order tracking along with orchestrating the activation and the test and turn up processes. Notifications will be issued to the Customer Order Management during the service order orchestration process (especially upon completion). Such notification can trigger other steps in the Customer Order Management (e.g. service order completion concludes these steps with Customer Order Management).</p> <p>In addition, Service Order Management also provides service design and assignment functionality.</p>
Service Inventory Management	<p>Service Inventory Management represents the applications which contain and maintain information about the instances of services in a telecom organization.</p> <p>A Service Inventory application may store and manage customer or resource facing service instances, and their attributes. The Service Inventory may also store and manage service relationships.</p>
Service Problem Management	Service Problem Management applications are responsible for receiving service affecting customer problems as well as network troubles/faults, relating the various problems, and resolving them in an efficient manner.

Application	Description
Partner Management	<p>Most of the service providers now bring in a lot of products from partners to add to their service portfolio, so that customers can choose from a wide array to their preference and benefit. The service providers can also form channel partners through which they can offer their products to other markets where they don't have any direct access. As the market is getting polarized to service providers and customer owners, partnerships are going to be the key. Virtual world is opening up with increasing operations of players like MVNOs, extending services or products from other parties to their customers leveraging their brand power and customer access. Hence horizontal and vertical value chain integration is going to be a vital part of the consolidation and convergence strategy of any service provider. In the online content and commerce world, the length of value chain could go on to include content providers, brokers, intermediaries, network operators, payment processing entities, banks and so on. Revenue from the end customer needs to be shared among these value chain entities based on pre-defined agreements. Sometimes the revenue settlement process has to be done in real-time so that final transaction can be validated and output delivered to the end customer.</p>
Transactional Document Production	<p>Transactional Document Production applications can be used in the telecommunications activities that require bills, invoices, letters and statements to be created for subscribers. It can be deployed by any organization that provides these services.</p> <p>Transactional Document Production applications can process numeric, text and image content into print-ready and web-ready streams that can be reproduced using a predefined template on a variety of media. For instance, telecommunications companies can process data from a billing system into standard industry print streams to produce paper bills.</p>
Bill Calculation	<p>The purpose of this application is to calculate a convergent bill for next-generation voice, data, content, and commerce services - Including prepaid and post-paid services in a single convergent bill.</p>

Application	Description
Application Integration Infrastructure ^b	<p>The enterprise integration framework described in this document seeks to provide an effective, generic and flexible approach to such integration where changes can be made by operations people rather than software engineers.</p> <p>It is critical to the success of any 'lean operator' program that integration between processes, data and applications can be achieved progressively, accommodating both legacy applications as well as new systems sourced from commercial suppliers or built in-house. Some approaches to integration are really only applicable to 'clean-build situations and for most operators with legacy systems, it is most unlikely that they can deploy anything other than step-by-step progressive integration approach. This progressive approach assumes that an increasing number of steps in a lean operator's processes will be automated via applications, either by replacement of current manual process steps, replacement of existing applications with one's offering greater functionality or upgrades to existing systems. Thus the task of providing end-to-end, flexible process automation is essentially one of providing integration between "islands" of automation.</p> <p>There are 3 primary building blocks to achieving a generic and flexible approach to integration such process and application "islands". These are:</p> <ul style="list-style-type: none"> • A common communications infrastructure between each application. Several leading middleware products are now well established to provide a common communications vehicle. The most common of these is currently enterprise application integration (EAI) bus technology that supports numerous interface types to cater for a variety of legacy operating systems, databases, data formats, standards etc. EAI is concerned foremost with application-to-application exchange of data, not user activity or interaction. Other common communications vehicles such as web based approaches can also be used. • A business process management (BPM) environment. BPM is an emerging class of technologies that work hand-in-hand with EAI technology to provide a range of facilities to manage process and information flows between applications. The real value of BPM is the ability to define and execute business processes independent of applications and infrastructure. While EAI and integration capabilities offer an important resource to BPM environments, EAI software alone typically lacks the ability to address the user-facing side of business processes. • Contract-defined interfaces between applications. In Frameworx parlance, these are defined as contract interfaces. Frameworx Contracts define the interfaces to Services made available by the OSS application. The data and metadata in Contract specifications use information defined in the Shared Information and Data model (SID).

^b This is a domain rather than a level 1 application

4 Use Cases

This section considers the uses cases resulting from the mechanisms implemented to enable the bi-directional communication between the GP and LP. It allows 1) the GP to inform the LP of the switch date (or activation date if EC&R front-end) and 2) keeps the activities of the two CPs synchronised in the event of delays or other issues. It is assumed that the switch date is communicated to the customer following the front-end activities – see References [1] and [2] – and to the LP following the back-end activities.

4.1 *BE-DCC-UC01: Customer Switch Request - Back End via DCC*

This use case consists of the interaction between the GP and the LP(s) following the customer request (and consent) to switch their services. The customer request triggers the provisioning of new services with the GP and the ceasing of existing services with the LP (if GPL front-end). The medium for CP-to-CP (inter-CP) communication is via a new DCC channel, and no customer involvement is required.

It is worth noting that in the Enhanced C&R switching model, the customer request is a service activation rather than a switch. The cease is placed before, and independently of this request, with the LP. Some additional options below only apply if the switching model is the Enhanced C&R. These are properly identified where applicable.

The following aspects must be considered by the CPs as part of the back-end switching process:

- In the GPL switching model, the switch date is set by the GP – see Reference [1]. This is important for ensuring that a ‘loss of service’ issue does not later arise and for giving both GP and LP enough time to conduct activities essential to the switch
- In the Enhanced C&R switching model, the GP aligns its activation date to the LP cease date communicated by the customer to mitigate risk of ‘loss of service’ or double payment – see Reference [2]
- Scheduling the switch (activation if EC&R) takes place during, or shortly after, the interaction with the customer and is defined by taking into account the GP’s own availability in terms of resources and infrastructure capacity, the customer’s preferences and the cease date for the LP services (if EC&R)
- It is assumed that all services would be switched on the same date. Providing greater flexibility would add cost and complexity to any future solution
- The GP generates a Switching Reference prior to sending the first switching request. This switching reference uniquely identifies the switch itself, and is communicated in

subsequent message exchanges, e.g. completion of switch, change date of switch or cancel switch

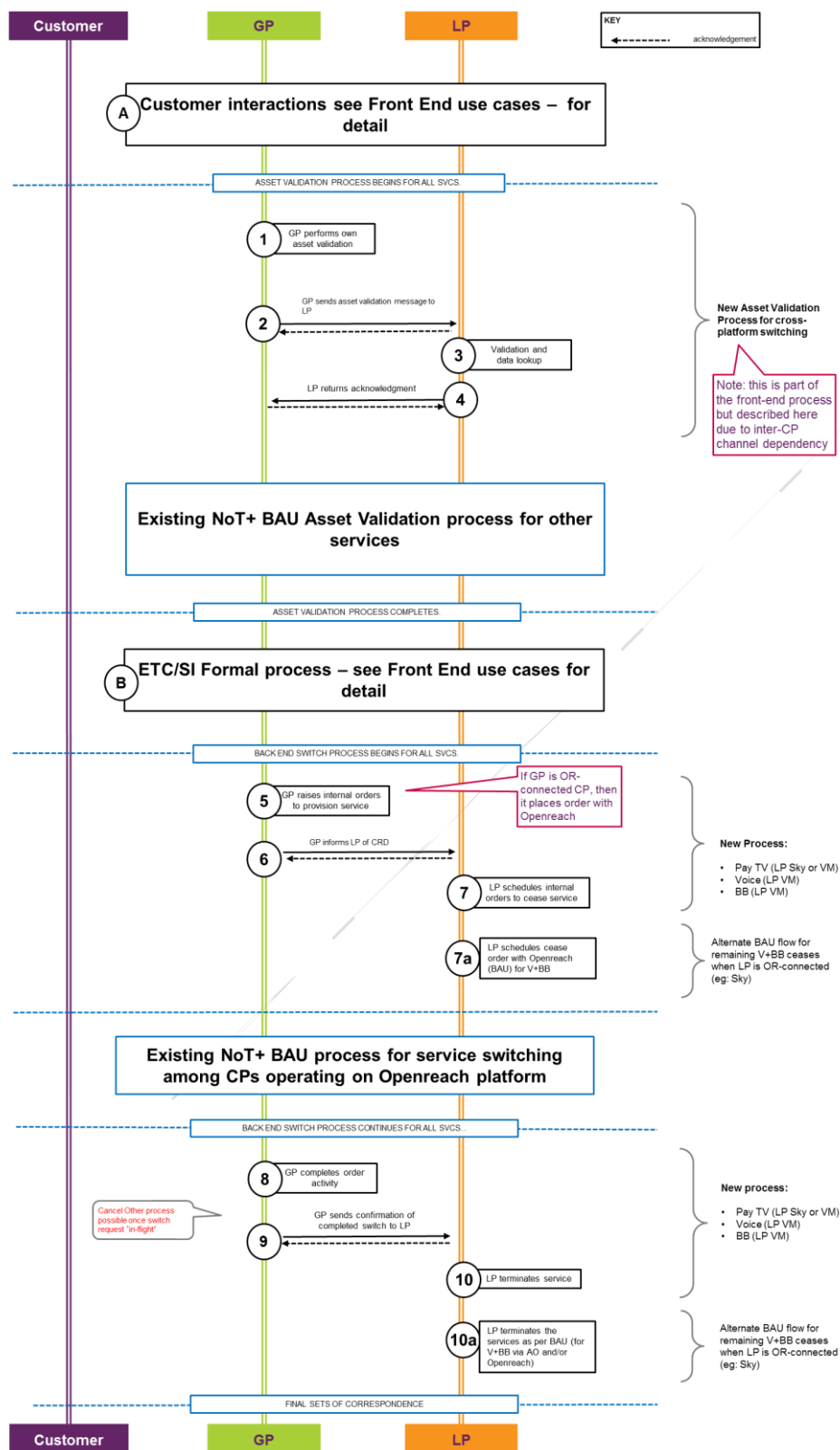
4.1.1 Process

The following diagram walks through the process for this use case.



Figure 3: Use case BE-DCC-UC01: Customer Switch Request - Back End via DCC

BE-DCC-UC01: Customer Switch Request - Back End via DCC



4.1.2 Use Case Steps

Table 5: Use Case Steps BE-DCC-UC01: Customer Switch Request - Back End via DCC

No	Description
A	The use case is triggered by the front end interactions between the customer and the GP. The process steps and use cases are described in detail in the corresponding front-end process specification document – see References [1] and [2].
1	GP performs asset validation on their own estate to validate service can be provided to customer.
2	<p>GP sends asset query to LP, passing some or all of the information provided by the customer in the front end process:</p> <ul style="list-style-type: none"> • LP customer account reference • LP customer name • LP customer address information • Service Type(s) (fixed voice, broadband, TV) <p>Asset validation will be with Openreach or direct with the LP, depending on which CP the customer is switching from. If the LP and relevant service is on the Openreach network, then the GP performs the asset validation using the Openreach dialogue services (part of the EMP system), as per the existing BAU process. A new interface would need to be provided by CPs that deliver services over platforms other than Openreach (e.g. VM and Sky) for other CPs to validate LP customer assets. Note that in both cases, the account number will be used to aid address matching and asset validation.</p> <p>NB: mechanism for this varies between the options</p>
3	The LP looks up data related to the service using the account/service information supplied by the GP.
4	LP acknowledges customer detail correct to GP, and returns earliest possible cease date. (For EC&R this will be the scheduled cease date if one has already been set.)
B	Subsequent customer and GP interactions involving the ETC and SI are carried out at the front end. The process steps and use cases are described in detail in the corresponding front-end process specification document – see References [1] and [2].
5	<p>GP raises internal orders to provision service – these could include BAU Openreach/AO interactions for an Openreach/AO connected GP.</p> <p>When GNP Geographic Number Portability (GNP) is indicated, the timing of the GP's own provision orders, the cease requests to the LP and any GNP messages must be synchronised with the activation dates for broadband and TV to avoid GNP triggering loss of those services too early.</p> <p>Where the TV service can be delivered independently of the other services, the TV activation date is the same as that for the other services.</p>

No	Description
6	<p>The GP sends the switching request to the LP containing:</p> <ul style="list-style-type: none"> • LP customer account reference • Services to be switched • Customer name • Customer address information • Customer Required Date (CRD) • Switching reference <p>The GP generates the Switching Reference for use in subsequent message exchanges.</p>
7	LP schedules cease(s) via internal order systems. (Under EC&R The LP may already have an open cease order – see reference [2])
7a	LP schedules cease(s) with Openreach/AO for other services (V+BB) - BAU
8	GP completes provisioning activity
9	GP sends confirmation of completed switch to LP
10	The Service is terminated by the LP once confirmation has been received from the GP that the GP has established service.
10a	Other services (fixed voice and broadband) are terminated by LP via BAU interactions with AO/Openreach.

4.1.3 Deviations from Happy Path

Table 6: Deviations From Happy Path BE-DCC – UC-01

Step	Deviation	Alternative Process
1	GP asset validation fails – cannot offer service	None – terminate flow
2	Customer does not have LP account details	None – terminate flow
4	LP has no record of customer	LP returns error message to GP
7	CRD date incompatible with notice periods	LP returns error message to GP
8-9	Cancel process possible once switch request “in-flight”, prior to PONR	Use Case BE-DCC-UC03 applies

4.1.4 Application Impacts

The mapping of impacts to applications is illustrative, based on a generic application framework (see reference [2]).

Table 7 Application Impacts BE-DCC-UC01: Customer Switch Request - Back End via DCC

Step	Impacted Applications															Party	Description	
	Channel Sales Mgt.	Knowledge Mgt.	Customer Info. Mgt.	Customer Self-Mgt.	Cust. Retention & loyalty	CSR Toolbox	Customer Order Mgt.	Customer Problem Mgt.	Service Order Mgt.	Service Inventory Mgt.	Service Problem Mgt.	Partner Mgt.	Transactional Doc. Prod.	Bill Calculation	App. Integ. Infrastructure			
2			✓			✓	✓		✓			✓				✓	GP, LP	GP can send details to LP, for new service interactions (BB, TV with VM, TV with Sky). GP needs to support new message type with data: <ul style="list-style-type: none">• Customer name• LP Customer account reference• Service Type(s)• Customer address information
3			✓									✓				✓	LP	LP can validate request utilising their account number
4			✓			✓	✓		✓			✓				✓	LP to GP	LP sends details back to GP: <ul style="list-style-type: none">• Customer name• LP Customer account reference• Live Service Type(s)• Customer address information• Earliest possible cease date

Step	Impacted Applications															Party	Description
	Channel Sales Mgt.	Knowledge Mgt.	Customer Info. Mgt.	Customer Self-Mgt.	Cust. Retention & loyalty	CSR Toolbox	Customer Order Mgt.	Customer Problem Mgt.	Service Order Mgt.	Service Inventory Mgt.	Service Problem Mgt.	Partner Mgt.	Transactional Doc. Prod.	Bill Calculation	App. Integ. Infrastructure		
6			✓			✓	✓		✓			✓			✓	GP, LP	GP to LP comms, new message type, containing: <ul style="list-style-type: none">• LP Customer account reference• Services to be switched• Customer name• Customer address information• CRD• Switching reference
7			✓			✓	✓		✓						✓	LP	LP receives request and schedules internal orders for service cessation.
9			✓			✓	✓		✓			✓			✓	GP	GP completion of BAU order provisioning activity triggers messaging to LP.
9			✓			✓	✓		✓			✓			✓	GP, LP	GP can send message to LP to confirm switch is complete: <ul style="list-style-type: none">• LP Customer account reference• Service type(s)• Switching reference
10			✓			✓	✓		✓			✓			✓	LP	LP only completes cessation activities upon receipt of confirmation of completed switch from LP.

4.1.5 Interface Impacts

Table 8: Interface Impacts BE-DCC-UC01: Customer Switch Request - Back End via DCC

Step	Impacted Interfaces			Parties	Data Description
	CP order entry	CP <- -> CP electronic interface	CP customer information management		
2		✓		GP, LP	Allow transmission of customer validation information from GP to LP.
3			✓	LP	Allow querying and retrieval of customer account information.
4		✓		LP, GP	Allow transmission of customer validation information from LP to GP.
6		✓		GP, LP	Allow transmission of switching information from GP to LP.
7	✓			LP	Allow creation of cessation orders in response to LP switching messages.
9		✓		GP, LP	Allow transmission switch completion from GP to LP.
10	✓			LP	Allow completion of cessation orders in response to LP switch completion messages.

4.2 BE-DCC-UC02: Change Date Back End via DCC

This use case covers the scenario whereby a CP modifies the switch date, due to a technical issue being encountered, for example delays in new infrastructure deployment or at customer request. The request would be made by the GP.

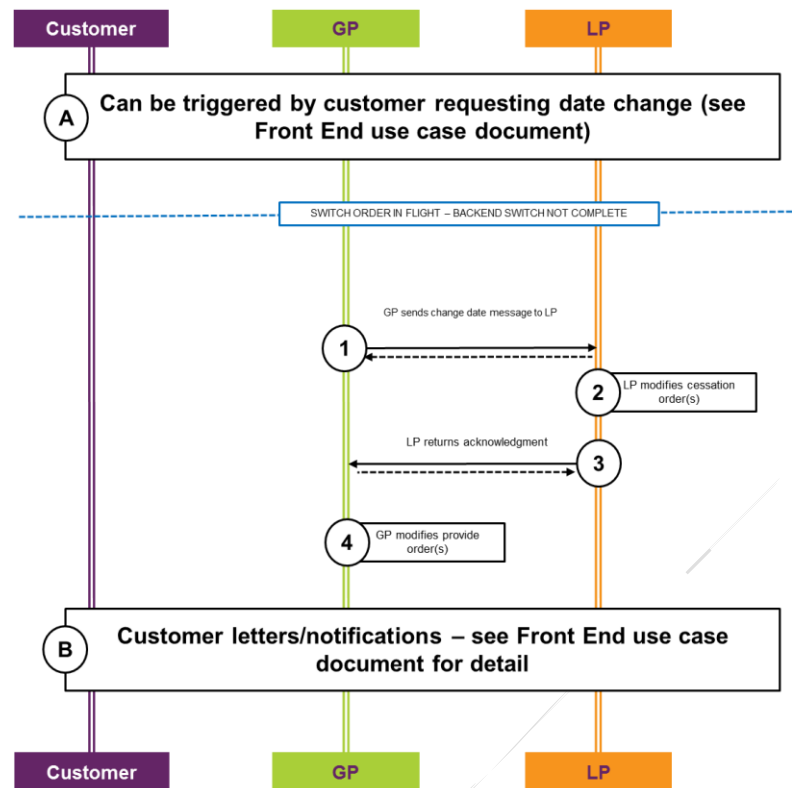
Note that there is no provision for LP-initiated change of switch date. The reason for this is that any delays incurred by the LP to cease their services do not necessitate postponing the switch date.

4.2.1 Process

The following diagram walks through the process for this use case.

Figure 4: Use case BE-DCC-UC02 - Change Date - Back End via DCC

BE-DCC-UC02: Change Date - Back End via DCC



4.2.2 Use Case Steps

Table 9 Use Case Steps: Use case BE-DCC-UC02 Change Date - Back End via DCC

No	Description
A	The change date use case can be triggered by the customer or the GP. In the case of the customer, the process steps and use cases are described in detail in the corresponding front-end process specification document – see References [1] and [2].
1	<p>GP sends modify message to the LP, passing some or all of the information provided by the customer in the front end process:</p> <ul style="list-style-type: none"> Switching reference New switch date <p>The cease dates for all services remain synchronised, even if the change of date is due to the delay in provision of a single service.</p> <p>If GNP was indicated in the original switch request, the timing of the GP's own provision orders, the cease requests to the LP and any GNP messages must be synchronised to avoid unintentional loss of service.</p>

No	Description
2	The LP modifies the cessation of service orders.
3	LP acknowledges to GP.
4	GP modifies internal orders to provision service – these could include BAU Openreach/AO interactions for an Openreach/AO connected GP.
B	Customer, GP and LP interactions for confirmation letters etc. are described in detail in the corresponding front-end process specification document – see References [1] and [2].

4.2.3 Deviations from Happy Path

Table 10 Deviations from Happy Path BE-DCC-UC02 – Change Date Back End via DCC

Step	Deviation	Alternative Process
2	LP has no record of customer	LP returns error message to GP
2	Modified switch date incompatible with notice periods	LP returns error message to GP

4.2.4 Application Impacts

The mapping of impacts to applications is illustrative, based on a generic application framework (see reference [2]).

Table 11 : Application Impacts BE-DCC-UC02 – Change Date –Back End via DCC

Step	Impacted Applications															Party	Description
	Channel Sales Mgt.	Knowledge Mgt.	Customer Info. Mgt.	Customer Self-Mgt.	Cust. Retention & loyalty	CSR Toolbox	Customer Order Mgt.	Customer Problem Mgt.	Service Order Mgt.	Service Inventory Mgt.	Service Problem Mgt.	Partner Mgt.	Transactional Doc. Prod.	Bill Calculation	App. Integ. Infrastructure		
1			✓			✓	✓		✓			✓			✓	GP, LP	GP can send details to LP, for modified date service interactions. GP and LP need to support new modify message type with data: <ul style="list-style-type: none">Switching ReferenceNew switch date
2			✓			✓	✓		✓			✓			✓	LP	LP can modify cease orders as a result of receiving a message from GP.

Step	Impacted Applications															Party	Description
	Channel Sales Mgt.	Knowledge Mgt.	Customer Info. Mgt.	Customer Self-Mgt.	Cust. Retention & loyalty	CSR Toolbox	Customer Order Mgt.	Customer Problem Mgt.	Service Order Mgt.	Service Inventory Mgt.	Service Problem Mgt.	Partner Mgt.	Transactional Doc. Prod.	Bill Calculation	App. Integ. Infrastructure		
3			✓									✓			✓	LP, GP	LP can send acknowledgement to GP: <ul style="list-style-type: none">• Customer name• LP Customer account reference• Switching reference
4			✓			✓	✓		✓			✓			✓	GP	GP can modify provide orders as a result of receiving a message from LP.

4.2.5 Interface Impacts

Table 12: Interface Impacts BE-DCC-UC02 – Change Date Back End via DCC

Step	Impacted Interfaces			Parties	Data Description
	CP order entry	CP <- -> CP electronic interface	CP customer information management		
1		✓		GP, LP	Allow transmission change of switch date information from GP to LP.
2	✓			LP	Allow modification of orders as a result of GP message flow.
3		✓		LP, GP	Allow transmission of change of switch date confirmation from LP to GP.

Step	Impacted Interfaces			Parties	Data Description
	CP order entry	CP <- -> CP electronic interface	CP customer information management		
4	✓			GP	Allow modification of provide orders in response to LP switching messages.

4.3 BE-DCC-UC03: Cancel – Back End via DCC

This use case covers the following two scenarios:

- 1) The customer cancels the switch.
- 2) The GP cancels a switch. This would occur if the GP discovered that it was unable to fulfil the customer's order.

In either scenario, the request would be triggered by the GP from the perspective of the back end flow.

Note that there is no provision for LP-initiated cancellation of cross-platform switches. The reason for this is that the activation of GP services in a cross-platform switch does not necessitate the cessation of the LP services. The LP would require a mechanism to cancel in-flight cease orders in its front-end processes. It is assumed that the existing mechanism for LP-initiated cancel will continue to apply for switches of services on the Openreach network.

4.3.1 Process

The following diagram walks through the process for this use case.

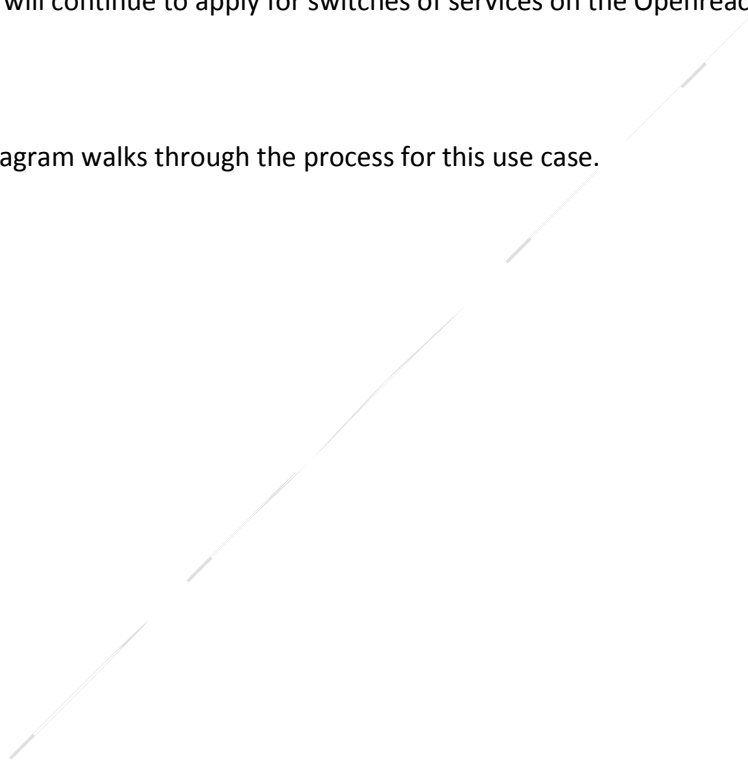
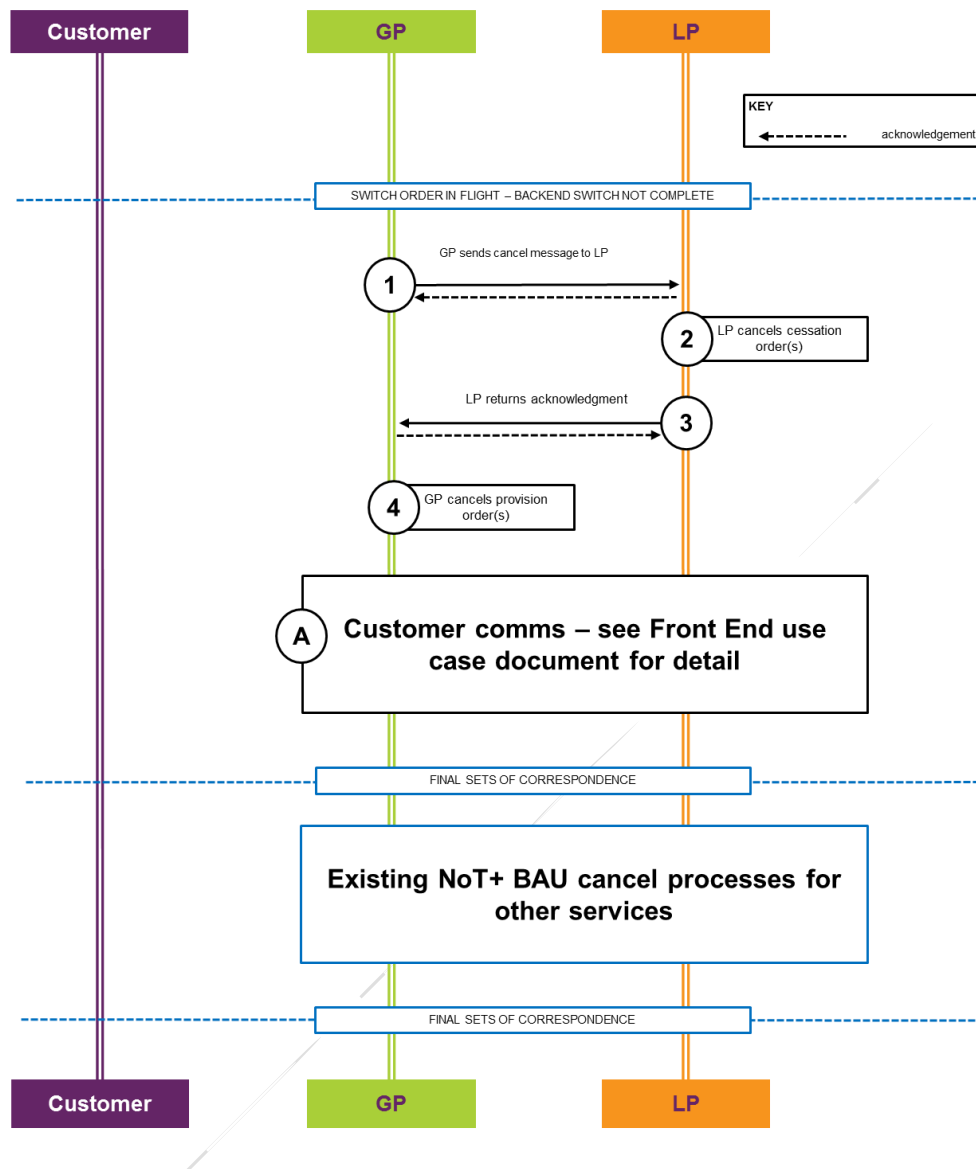


Figure 5: Use case BE-DCC-UC03 – Cancel - Back End via DCC

BE-DCC-UC03: Cancel - Back End via DCC



4.3.2 Use Case Steps

Table 13 Use Case Steps BE-DCC-UC03 – Cancel - Back End via DCC

No	Description
A	The cancellation use case can be triggered by the customer or the GP. In the case of the customer, the process steps and use cases are described in detail in the corresponding front-end process specification document – see References [1] and [2].
1	GP sends cancel message LP, passing some or all of the information provided by the customer in the front end process: <ul style="list-style-type: none"> Switching reference Cancel instruction A point of no return agreement is needed between CPs. A standard approach would be beneficial.
2	The LP cancels the cease orders.
3	LP acknowledges to GP.
4	GP cancels internal orders to provision service – these could include BAU Openreach/AO interactions for an Openreach/AO connected GP.
A	Customer, GP and LP interactions for confirmation letters etc. are described in detail in the corresponding front-end process specification document – see References [1] and [2].

4.3.3 Deviations from Happy Path

Table 14 Deviations from Happy Path BE-DCC-UC03 – Cancel - Back End via DCC

Step	Deviation	Alternative Process
2	LP cannot find account/service record	Error message returned to GP
2	LP finds account/service record, but status is “Closed”	Error message returned to GP
2	GP finds account/service record, but not enough time remains – unable to invoke cancel	Error message returned to GP

4.3.4 Application Impacts

The mapping of impacts to applications is illustrative, based on a generic application framework

Table 15 Application Impacts BE-DCC-UC03 – Cancel - Back End via DCC

Step	Impacted Applications															Party	Description
	Channel Sales Mgt.	Knowledge Mgt.	Customer Info. Mgt.	Customer Self-Mgt.	Cust. Retention & loyalty	CSR Toolbox	Customer Order Mgt.	Customer Problem Mgt.	Service Order Mgt.	Service Inventory Mgt.	Service Problem Mgt.	Partner Mgt.	Transactional Doc. Prod.	Bill Calculation	App. Integ. Infrastructure		
1			✓			✓	✓		✓			✓			✓	GP, LP	GP can send details to LP, for cancel service interactions. GP and LP need to support new cancel message type with data: <ul style="list-style-type: none">Switching ReferenceCancel instruction
3			✓			✓	✓		✓			✓			✓	LP	LP can cancel cease orders as a result of receiving a message from GP.
3			✓									✓			✓	LP, GP	LP can send acknowledgement to GP: <ul style="list-style-type: none">Customer nameLP Customer account referenceSwitching Reference
4			✓			✓	✓		✓			✓			✓	GP	GP can cancel provide orders as a result of receiving a message from LP.

4.3.5 Interface Impacts

Table 16 Interface Impacts BE-DCC-UC03 – Cancel - Back End via DCC

Step	Impacted Interfaces			Parties	Data Description
	CP order entry	CP <- -> CP electronic interface	CP customer information management		
1		✓		GP, LP	Allow transmission of cancel information from GP to LP.
2	✓			LP	Allow cancellation of orders as a result of GP message flow.
3		✓		LP, GP	Allow transmission of cancel confirmation from LP to GP.
4	✓			GP	Allow cancellation of provide orders in response to LP switching messages.

4.4 Common Elements across all Use Cases

4.4.1 Common Interface Impacts

It is assumed that each party communicating with another party via electronic means will be able to do the following:

1. Store details of any message sent to it, including details of the party that sent the message
2. Validate that the party sending it a message is allowed to do so
3. Provide and store the appropriate level of acknowledgement to the message, whether that be:
 - a. an acknowledgement
 - b. an acceptance code and message
 - c. a rejection code and message
 - d. data

- e. a combination of the above
- 4. Store details of any message it sends, including details of the party to which it sent the message
- 5. Store details of responses to any message it sends, including details of the party to have sent the response

4.4.2 Common Application Impacts

The common interface impacts described in section 4.4.1 above will impact each operator's Application Integration Infrastructure functionality (see section 3.3 and The TM Forum's documentation for more information on how TAM defines this).



5 Non-Functional Areas

Non-functional areas need to be given consideration, including but not limited to the following:

- Amount of data storage required at CP level
 - Persistent data (*additional fields x number of non-closed services*)
 - Switch-related data (*additional fields x number of switched services*)
 - Messaging per switch (*variable message size x process touch-points x number of switches*)
 - Messaging for BAU (*variable message size x number of non-closed services x average number of non-switch, account/service record impacting transactions per service*)
- Performance requirements and SLAs for synchronous transactions
- Performance requirements and SLAs for asynchronous transactions
- Performance requirements and SLAs around asset validation process (synchronous – response time across multiple CPs; asynchronous – *steps in chain x time period* such that *total time <= n minutes/hours*)