Option X - Broadband & Voice switching proposal

Response to Ofcom

EXECUTIVE SUMMARY

In August 2019, Ofcom invited industry to collaborate on developing a process for cross-platform switching of fixed telecommunication services, in preparation for implementing European requirements. From the outset of these discussions, one, credible, code-based candidate solution ("**Option X**") has been the foundation of those discussions. This document seeks to provide further details of Option X, as set out in the OTA's December report to Ofcom. Although timeframes to develop this proposal further have been short, nevertheless we are confident that our solution is robust, reasonable and both protects and empowers consumers.

Broadly, Ofcom's recent Gaining Provider Led ("**GPL**") mobile auto-switch reforms have been taken as a blueprint for how Option X has been designed and can be implemented. Mobile switching reforms were implemented by industry, delivered on time and have been well-received by consumers and, as a proven model in operation today, is the natural starting point for addressing cross-platform fixed switching. Sky and Virgin Media advocate the transposition of these enhancements into fixed telecommunications switching.

The challenge set by Ofcom to industry has been to find a way for current (and future) distinct networks to interact and manage the transition of a customer between providers, potentially across networks and between separate supply chains , led by the Gaining Provider ("**GP**"). After first ensuring the customer can engage in this process without friction and are well-informed, we view the key considerations are how to achieve this interaction robustly without misidentifying customers, assets, intentions or implications. In our view, Option X is designed, bottom-up, to confront this challenge and the key features of our proposal are:

- **Strong customer authentication** – via Communication Providers' ("**CPs**") existing validation processes.
- **Strong asset/service validation** – ensure the correct service is switched and assets are reused where applicable.
- **Ease of engagement** – the process is currently used in mobile switching and offers many contact channels.
- **Quicker switching** – enabled through real confidence in authentication, intent and awareness.
- **Efficient design** – limiting the number of entities required to connect to the Hub.

As well as delivering all "must have" capabilities required of these reforms, we have also sought to ensure this process can support Number Porting order exchange / activation. We are confident that this is the case and that Option X can also be used to manage the transfer of 999 address and DQ record ownership between Communication Providers ("**CPs**").

As requested by Ofcom we provided an estimate on the types of cost likely to be incurred by different Industry players and a view the timescales we expect to be involved in implementing the change across Industry.

We anticipate an implementation timescale of approximately 18 months from publication of Ofcom's Statement for a 'big bang' approach across industry. However, in the section "Implementation timeline and considerations" we describe another potential deployment model that may expedite delivery of a code-based switching process across larger providers (and potentially alt nets).

SCOPE AND ASSUMPTIONS

Caveats/Disclaimer

This document sets out further details of the proposed approach to Option X, including the customer journey, process flows, system impacts and initial estimates of costs. These proposals, estimates and implementation timeframes have been produced in the context of the short timeframes available and are indicative and subject to change.

Factors such as the structure and design of the code, the specific data payload for the code as well as the optimal integrations to the hub will all be established in the detail design stage. Until all scenarios are tested no one approach can be considered as final at this stage.

Scope of switching proposal

- Residential customers who are switching Broadband and / or voice supplier (but not moving home).
- All Broadband services delivered over all UK fixed access networks.
- All (PATS compliant) voice services delivered over all UK fixed access networks.
- All fixed telephone numbers (if portability has been technically established between CPs).
- Customers who have single or dual supply for broadband and voice (over the same access line).

Key assumptions

- No entity other than Network Access Providers and Wholesalers (who wish to support intra-wholesale switching) need be directly connected to the Hub. We are not precluding additional entities connecting to the Hub if there is shown to be value in doing so.
- All parties in the supply chain will make facilities available for Codes to be generated against existing Voice and Broadband services on a 24/7 basis.
- The minimum switching timescale can be reduced to “next working day” due to better protection.
- Number Porting lead times are reduced in line with the minimum switching lead time.
- Cancel Other is not required within the process due to stronger consumer protection. Cancel Own will therefore be the only route to cancel the order (i.e. via the GP)
- No CP has an obligation to allow another CP to provide a primary outbound call service over their access line. CPs may “reject” a request for customers to generate a switching code for just one of the services (where both are being provided).
- It will be possible for the 999 database to be automatically updated through a feed from the Hub (of all completed number ports).
- The process will not support customers moving from one supplier for Broadband and Talk to two (split) suppliers for Broadband and Talk.
- There is no need for a separate Emergency Restoration process (since the process allows customers to switch as quickly as possible, by default).

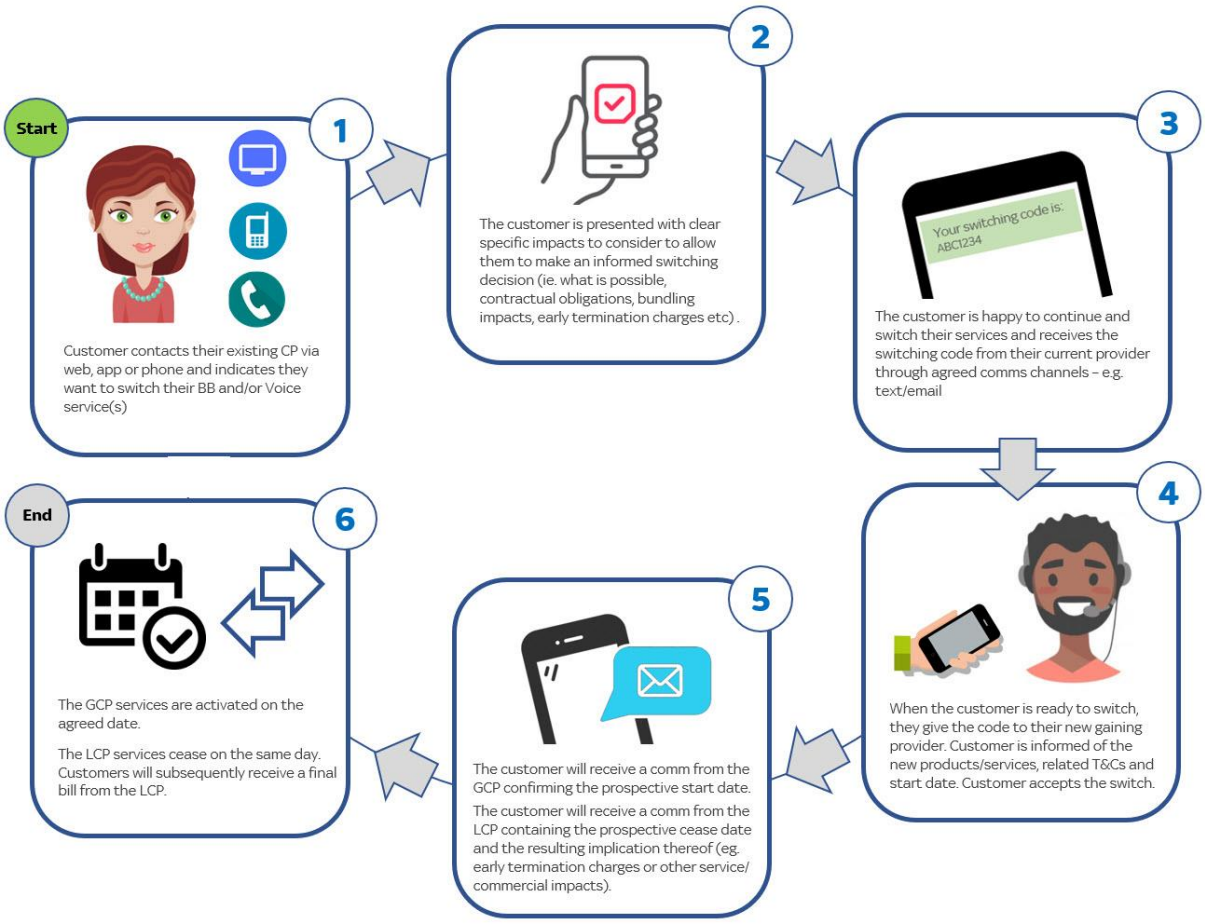
CUSTOMER EXPERIENCE

We believe that a Code-based switching process delivers an attractive, reliable and flexible experience for customers. The process ensures authenticated customers are given timely, relevant and correct information. Additionally, the process ensures the correct services are switched and the chosen new service is delivered in the shortest possible time.

The below diagram shows the customer steps throughout the proposed switching process.

Note: Virgin Media has developed an interactive wireframe example of an online code generation request journey with an LCP. We will share this with Ofcom in due course.

Customer steps during the BB & Talk switching process



OPTION X – PROCESS OVERVIEW

The Option X process can be broken into 4 main sections:[1]

1 - Losing Communications Provider - Code generation process

- The customer is required to get a switching code from their current provider for the services that they no longer require.
- The LCP must offer a number of communication channels to allow a customer to request a Code (including online, contact centre, App). It must be quick and simple for a customer to initiate a request for Code generation – once this process has been initiated then retention activity will not be allowed (as per the mobile process). The customer will receive ETC and Switching Information details, on demand and in 'real-time', from their current provider, at the same time as receiving their switch code. A CP can guide the customer as to which services can / cannot be switched on their own (to avoid order rejections and subsequent cancellations).
- As part of the 'contact centre' option CPs must offer customers the opportunity to receive their switching Code via an IVR platform. When connecting to the IVR the customer would need to provide relevant authentication information (to ensure the request is valid) and the Code would be provided to the customer via the IVR and, subsequently, in durable format (letter/email/SMS). This would allow all customers, including voice-only customers, to receive their Code without speaking to a CP agent.
- The Code should be returned to the customer within 60 seconds (with a design target for 10 seconds) of being requested by the customer. The Code should be returned through the channel it was requested and provided in durable format in a method chosen by the customer (e.g. text / email).
- Losing Providers may allow a customer to provide their own "passphrase" instead of having a Code provided to them. The "passphrase" would need to be associated with the customer's postcode (and stored against the Code on the Hub).
- If the customer is switching / ceasing services from two suppliers, they will need to request two separate codes / passphrases (and provide both to their chosen supplier).

2 - Gaining Communications Provider – sales process

- We expect a GCP to ask a prospective customer, early in the sales process, whether they are switching services and if so, whether they have a Switching Code. The GCP would then 'validate' the Code provided by the customer (through their supply chain / hub).
- Through validation of the Code, a GCP is informed whether there is the opportunity to re-use an existing live service (e.g. the customer is switching between providers on the same access network). The Gaining Provider sales process would continue, as BAU, with a requirement to capture the Code and provide within their provisioning order. We expect the minimum switching lead-time can be reduced (to better match the shortest delivery time of the service being requested).
- Once a confirmed provision date has been scheduled for the delivery of the new service, the Hub is informed that the associated Code now has a status of "in use".
- The GCP sends their welcome communications to the customer containing details of the services being provided and the start date.

3 - Losing Provider – notification process

- When the Hub has been informed that a Code has been updated to a status of "in use", the Losing CP is informed.

[1] See Annex C for further detail on the customer journey and the high-level end-to-end process.

- The LCP is required to send a notification to the customer confirming the cease date of the services and the implications for the customer (e.g. ETCs, service impacts).

4a - Day of Provision – customer switching within the same Network Access Provider

- On the day of Provision, the Network Access Provider switches the existing service(s) to the GCP[2]. The Hub is informed that the new services have been provided.
- The GCP is notified that their services have been provided by the Network Access Provider
- The LCP is notified that their services have been ceased by the Network Access Provider. The LCP undertakes any additional required cease activity (e.g. final bill generation, number port activation).
- The GCP will notify the customer that their new service(s) have been provided.
- The LCP may notify the customer that their existing services have been ceased.

4b - Day of Provision – customer switching to a different Network Access Provider

- On the day of installation, the Gaining Access Provider delivers their new service. The Hub is informed that the new services have been provided.
- The Hub informs the Losing Access Provider / LCP that they should cease their services.
- The Gaining Access Provider notifies the GCP that their services have been provisioned.
- The Losing Access Provider actions the cease of the existing services.
- The Losing Access Provider notifies the LCP that their services have ceased. The LCP undertakes any additional required cease activity (e.g. ceases billing, final bill generation and number port activation).
- The GCP will notify the customer that their new service(s) have been provided.
- The LCP may notify the customer that their existing services have been ceased.

[2] For intra-network switches, existing service is ceased immediately before new service is provided.

OPTION X – KEY BENEFITS

Option X has been designed to meet the requirements of the EECC. Industry discussions of these requirements have been structured within the "base capabilities" of a credible GPL solution, as set out by the OTA.

In addition to meeting these base capabilities, Option X has the potential to deliver a number of further benefits to cross-platform switching and to other existing industry processes such as 999 and DQ.

Each of these categories of benefits is set out below further:

Base capability benefits

Benefit	Details
Strong customer authentication	• Option X enables the LP to confirm that the request for a Code, and details about existing services, is provided only to the customer by using existing data protection processes/mechanisms. • The ability to 'slam' is effectively ruled out by this process. • The Code is provided securely to the customer via the channel requested.
Unambiguous customer intentions	• The customer is able to confirm their intentions to the LP directly and 'up-front' in the process, so that once the GP triggers the switch/cease actions, the LP and the customer are in no doubt about the resulting impacts and this clarity is not delayed until the end of the process. • Cross-platform propositions are (and will become more) diverse and choices about remaining services may be complex, Option X provides a mechanism for the customer and LP to avoid ambiguity about these impacts. • There is no need for the GP to attempt to interpret the prospective customers' current circumstances and then relay proposed changes back to the LP, removing the risk of erroneous instructions being sent to the LP. • There is an opportunity for the customer to confirm their preferred course of action for existing/remaining services.
Strong asset/service validation	• In all switching scenarios, the customer explicitly confirms the intended services to switch by mechanisms already familiar to the customer/LP e.g. logging into the relevant customer account – ensuring the wrong CP, service or assets are not erroneously switched or ceased. • The GP would be mandated to require a customer to provide Code if switching – reducing the risk to the Access Provider of new line

	provides being requested where a switch was the appropriate order type.
Ease of engagement/customer awareness	• Acquiring a code to switch is a familiar process (i.e. mobile switching as well as historically MAC process)[3] for consumers and will use BAU contact channels the customer would expect. • The authenticated customer will have a number of non-real-time contact channels to acquire the Code enabling customers to gain a Code without speaking to an agent if preferred. • For each contact channel, the customer will receive their code quickly – maximum 60 second return timeframe to be mandated, with a design objective of 10 seconds. • Regardless of the communication channel used, the customer will receive the Code and implications of switching in a durable format. • The customer is informed of the implications of switching before engaging with the market, enabling better informed decision making. • Customer is prompted to read switching information as it is delivered alongside Code – rather than information being delivered after a decision has been made.
Reliable process	• Under inter-network switching scenarios the GCP's service will be live before triggering the LCP cease and so there is no need for a bespoke emergency restoration process. • For intra-network switching, stronger asset / service validation makes the switching process more reliable and will reduce the need for emergency restorations as these are often required due to the GCP targeting the wrong service to switch.

[3] Codes are also widely used in other consumer authentication interactions such as collecting pre-paid tickets for rail or cinema.

Broader benefits of Option X

Benefit	Details
Designed to support customers with vulnerable circumstances	• Under this process a customer can confidently engage with the market for a 30-day period and, where necessary, seek support of friends, family, carers or confidantes in evaluating their course of action ahead of placing an order with a new provider.
Efficient design	• The solution is designed to optimise interactions to the Hub via Network Access Providers and Wholesalers (where required). This reduces those parties that need secure read/write access to the Hub as well as making governance of the arrangement with the 3rd party supplier simpler. • The solution is designed to leverage existing BAU interaction channels between Network Access Providers, Wholesalers and Retailers. • The solution is flexible – it will work for small players that do not use XML / Automated processes (i.e. they could use an enhanced portal provided by their wholesale / reseller provider).
Quicker switching	• The customer can switch as soon as the GP can practically provision the service due to confidence that the customer has been authenticated, their intention has been clearly communicated and they are aware of the implications.
Vehicle to improve other industry processes	• Option X is suitable to incorporate the existing porting process and has the potential to also embed 999 and Directory Enquiry activities to also improve these processes. We envisage these changes can be made without adding any further cost or design complexity to the Hub.
Futureproof	• Potential to align with mobile switching – combating any perceived barriers to switching due to confusion, enabling Ofcom/industry consumer education campaigned to be more effective. • Maintains the potential that fixed and mobile switching could be harmonised, or perhaps even unified, in the longer term.

OPTION X – KEY IMPACTS OF THE PROPOSAL

#	Impact/cost area	Considerations
1	Retail website development App development	New process for / winning and losing customers. Confirm impacts of switching New Help content My account updates ('Switch tracking' process) T&Cs changes
2	CRM platform costs	Switching code generation Confirm impacts of switching Code checking process (tracking code used/generated) Include Code in switching order Supplier interface changes Number porting and 999 process changes New business rules - reduced lead times. Security and Data Protection considerations
3	Other platform costs (non-CRM)	Billing / finance impacts
4	Order Management	Provisioning / cease process API changes. New code generation / validation API New notification types Info on implications of switching Internal migration process (for wholesalers / resellers). Security and Data Protection
5	Testing/Trialling	Internal testing/trialling required Trialling with external parties (Openreach, other providers).
6	Transaction comms	Customer comm to include switching code. Updates to new sales and cease comms.
7	Telephony / IVR / Natural Language	Telephony, routing, Natural language changes & IVR updates.
8	Operational costs	Impact on existing financial / regulatory reports. Tracking of all customers switching and joining via switch code.
9	Reporting	Impact on existing financial / regulatory reports. Tracking of all customers switching and joining via switch code.
10	Hub integration	Development and integration with Hub.

In addition to the key impacts identified above, we have identified more than 50 individual switching use cases. For brevity we have not included this multitude of scenarios within this document and instead we are happy to review these in subsequent design discussions.

OPTION X – COST ESTIMATES

Entity type	Entity examples	Implementation costs
Large retailer (>1m base)	BT, TT, VM, Sky	£4-7m
Openreach	-	£2.5-5m
Wholesalers	BTW, DWS	£1.5-3m
Medium FTTP (<2m coverage)	CF, Hyperoptic, Gigaclear	£1-1.5m
Medium retailer (<1m base)	Vodafone, Post Office	£0.75-1.25m
Small FTTP (<50k coverage)	Regional FTTP providers	£100-200k
Smaller retailer (<1,000 base)	Local/niche providers	£75-125k

General cost assumptions

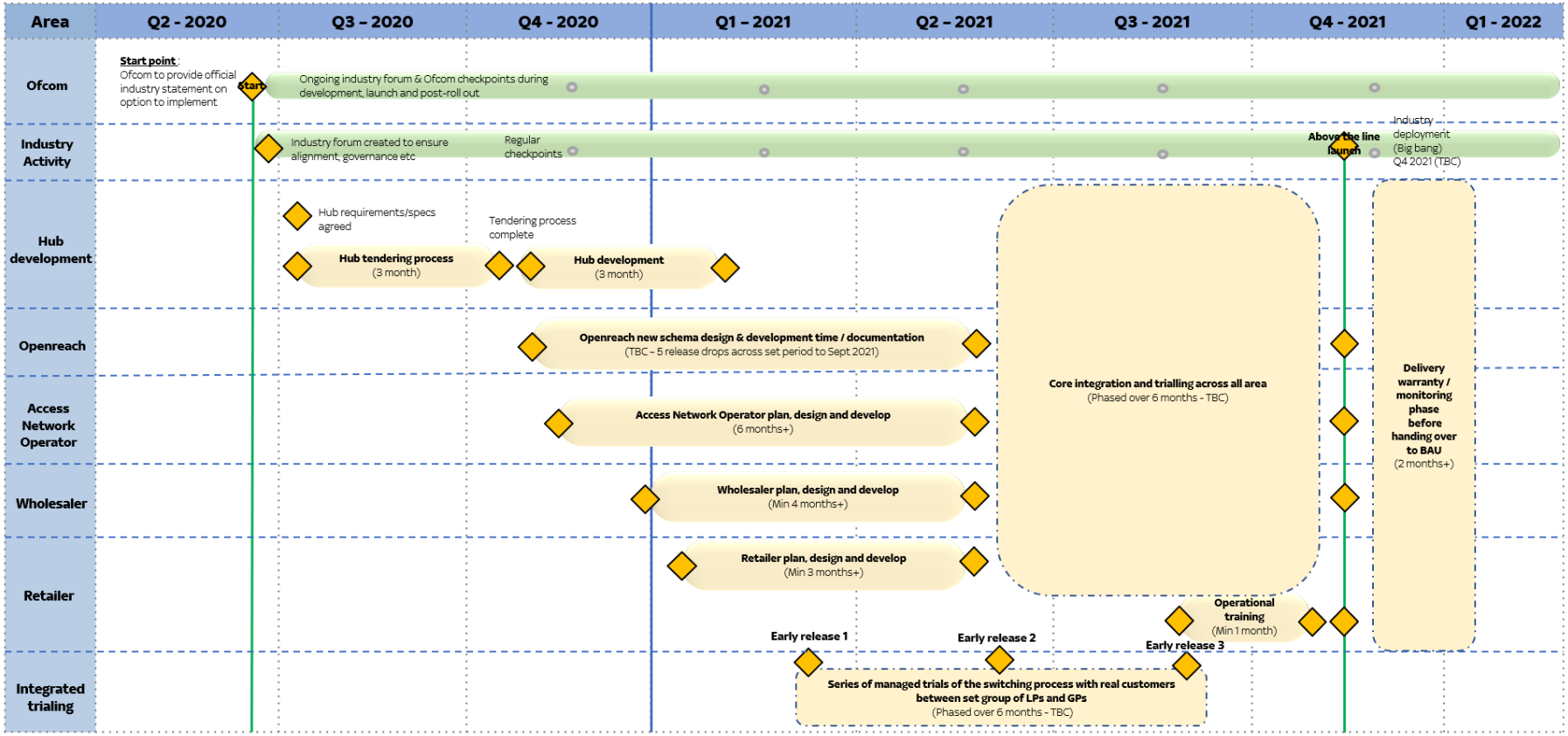
- Cost estimates provided are for the full implementation across industry, including a period for testing/trialling across CPs and the solution will support the volume of actors and transactions as indicated by the OTA (email, 05/02/20).
- CPs that provide services via the Openreach network are assumed to interact with the hub via Openreach (or their Wholesaler's) interfaces.
- Project management costs have not been included.
- Opex costs other than training have not been included (for example, additional support opex to implement future hub changes). Equally, opportunities for opex savings for all entities have not been sized.
- Sky/Virgin Media's cost estimates have not been adjusted to apply a contingency factor.
- Cost estimates for Virgin Media also reflect its role as an Access Provider. Cost estimates for TalkTalk and CityFibre also reflect their roles as a Wholesaler.
- BT (inc. EE and Plusnet) and TalkTalk's costs will fall within the range of Sky/Virgin Media's cost estimates.
- Medium/smaller retailer costs have been based on a proportion of the larger retailer cost estimates.
- Openreach cost estimates as indicated based on Option X-Openreach meeting (26/02/20).
- Medium/small FTTP costs have been based on a proportion of Openreach cost estimate.
- VoIP – at this stage, it is not clear whether and how VoIP providers would interface with the Option X process. As a result, we have not sought to quantify estimates of costs for these providers at this point.
- Hub – cost estimates to be provided via the OTA.

OPTION X – IMPLEMENTATION TIMELINE AND CONSIDERATIONS

EECC Switching- High-Level Implementation Timeline

Draft

Notes:
- Each quarter shown below represents a calendar quarter (ie. Q2 covers April, May, June)



Dependencies:
- All dates are estimations only.
- A statement from Ofcom on which option to implement will be required before developments can commence.

Rollout and potential for earlier partial implementation

It is clearly attractive to implement Code-based switching through a "Big Bang" approach such that the new process is implemented unilaterally for all consumer switches requested from a single date. However, we understand that Openreach has indicated the changes required to its systems and interfaces to support Code-based switching are such that implementation across industry before end of 2021 is not guaranteed. We understand that these timescales are estimates from Openreach, but are keen to investigate potential opportunities that could be delivered in absence of Openreach's platform being fully integrated (if not available within a reasonable timescale).

It is a given that the larger providers (e.g. BT and its consumer brands, Virgin Media, Sky and TalkTalk) will need to have a direct connection to the Hub outside of an Openreach-managed environment (e.g. to support migration of customers between different retail brands provided on their network). That being the case, we believe it may be possible to have earlier delivery of some benefits of the switching Code process for customers moving between the four providers (as well as any other alt nets that are in a position to support this proposal). We envisage a scenario where switching Codes are generated for customers switching from either Virgin Media to Sky / BT / TalkTalk or from Sky / BT / TalkTalk to Virgin Media. This could allow for delivery of many of the benefits of Code-based switching for the high volume inter network switching scenario. The Code-based switching process would then be comprehensively brought in for intra-network switches on the Openreach network when it is able to implement this functionality.

We anticipate that the only mandatory development steps for this interim process is the deployment of the hub and delivery of the related hub workflows by the four large CPs. For clarity there will be no impact to the Openreach provisioning process, instead the Hub transactions would be managed directly by the three large Openreach providers alongside existing BAU practice. Option X supporters would welcome the opportunity to further test the feasibility of this proposal in the event Option X is selected as the preferred strategic implementation for cross-platform switching.

ANNEX A – CODE DETAILS

Switch Codes, what are they?

The purpose of switch codes is to manage the handshake between two parties at the point of engagement such that when presented with a code, the GCP can use the code in order to establish communication with the LCP, and also to be able to determine any specific technical information to assist with the order they are taking.

The code(s) also provides the guaranteed identification of the customer with the LCP and their authorisation to switch. This facilitates quicker switching as there are no artificial delays incurred through additional verification or the need for a cooling off period.

Switch code – an automatically generated, unique, code used to represent the switching transaction as agreed between the customer and the LCP. This code will be kept simple in construction (e.g. three letters and four numbers).

In addition, rather than giving the customer the code, the customer can choose a pass phrase to replace the need for a code. This should be short, preferably three words and crucially only needs to be unique within their post code, not nationally. Behind this passphrase there would still be a switch code that the GCP would use to start the switching process; however, the customer never needs see it. The passphrase is not a password and does not need the same protections.

The code itself is non-descriptive. It does not tell you anything about the provider, the customer or their services. It is simply a facilitator for the agreed switching transaction.

Codes like the switch code proposed are ubiquitous in modern society, we already have a mobile switching process that uses a code, but an example of a non-communications industry processes is rail ticketing system which are 100% code based again utilising an 8 letter/number code to obtain tickets from machines at stations.

When a transaction needs to be verified and pre-authorised 100% reliably between two independent parties or processes, codes are always used, and for good reason, the customers are left in no doubt what is happening and that on presentation of the code they will get exactly what they expected.

Switch code payload

The switch code itself only identifies the relationship between a GCP and LCP. When a switch code is generated, the LCP will publish a data payload alongside the code generation request that contains information about the customers' existing service that the GCP needs to know.

The payload will be an open format, self-describing with an agreed schema for key elements. For example, the address and phone number elements need to be agreed by all providers, but the Openreach network data elements are only needed by Openreach themselves and so they can define their own schema for that part of the payload.

This flexible approach to the switching data structure will make it extremely easy to expand in future as the industry changes, new services are added and new network operating models are adopted.

One such structure that has universal support is JSON as it is an open format, self-describing and easy to extend without requiring additional development.

Here is an example of a switch payload:

```
{"message": {
    "owningCP": "SKY",
    "UPRN": "123456789",
    "PostCode": "XX1 11XX",
    "Address": "1 Acacia Avenue",
    "issueDate": "20200301",
    "providers": [
        “provider”: “openreach”;
        "services": [
            {"id": "XYZ123456789"},
            {"id": "ABC123456798"}
        ]
    ],
    "numberports": [
        {"number": "0111222222", “cupid”: “12345”},
        {"number": "0111333333", “cupid”: “12345”}
    ]
}}
```

The switching database that tracks the codes themselves can be more structured, for example the following are likely to be the core elements that are tracked at the code database level.

	Property	Example
	Switching Access Code	SKY12345
	UPRN	123456789
	OwningCP	SKY
	IssueDate	20200305
	expiryDate	20200404
	codeAvailable	false
	dateClaimed	20200315
	claimedCP	VMG
	newServiceActivated	False
	oldServiceCeased	False
	scheduledInstallationDate	20200314
	gainingProviderCUPID	65432
	Pass Phrase	BLUE DOG BANANA

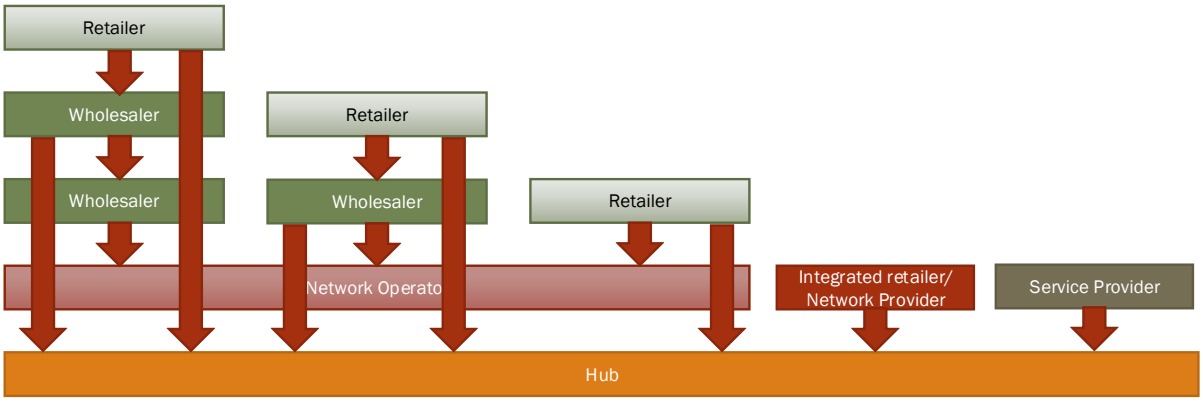
Some key points about the rules around code use.

- An unclaimed code can only be revoked by the original creator.
- Codes can’t be claimed once expired.
- A code once claimed has no expiry.
- A cancelled switch releases the code for re-use.

The aim will be to keep the content and the processes simple, easy to manage and control and to keep the functionality in the hub as simple as possible.

ANNEX B – SOLUTION ARCHITECTURE

We first need to consider who could be integrated to the hub and their role in the process of delivering switching services. The following diagram shows possible models and inter-relationships with different actors.



Virgin Media would be an example of an Integrated retailer/Network Access Provider who would directly integrate with the hub.

Sky or BT would be an example of a retailer who delivers service using a Network Access Provider (Openreach). Sky could either integrate to the hub directly, or if Openreach provided a hub integrated service they could do so on Sky's behalf.

TalkTalk is an example of a company that acts as a wholesaler to retailers such as the Post Office. In this stack, any party could provide the hub integration and provide that capability on behalf of the business function above. For example, TalkTalk could integrate to the hub on behalf of the Post Office.

Considerations need to be made if an entity is providing hub integration services on behalf of others. They will need to update or expose new workflows/services to allow those above them in the stack to process the new required switching transactions.

The stack is designed to be able to be extended out to include additional service providers. For example, connecting a service provider that can automate the 999, number port and even Directory Enquiry switching process which could be triggered when both the GCP and LCP have confirmed the switch is complete.

Micro Service Hub

Looking at the hub itself, this should take the form of a cloud hosted application server, following a micro services architecture to maintain a lightweight and fast response to all transactions with full security as the database will need to contain telephone numbers and address information so is subject to GDPR regulations.

Interactions with the hub are expected to be very simple. A few will have specific code related activities and rules around their use.

- An unclaimed code can only be revoked by the original creator.
- A code can only be read if it is unclaimed, or by the provider that has claimed it.
- A claimed code cannot be revoked until released by the provider that claimed it.
- A code can only be updated to change the install date by the provide that claimed it.
- The new service provision status can only be updated by the provider that claimed it.
- The old service cease status can only be updated by the original creator.

All of the above services would be deployed on the hub as explicit actions. As a result of an action to the hub, it may trigger a message to be sent to another provider. For example, when a code is claimed, a notification will be sent to the LCP with the details of the planned cease date. When a code is released, the LCP will be notified that the switch has been cancelled etc.

Notification Framework

Unlike the services listed above, notifications will not be real time, but be messages queued for collection by providers.

The aim is not to require providers to deploy listening services for the hub to talk to, instead to use a polling service to retrieve messages. This means that any provider can have downtime on their network or their services and not be affected by activities that still need to update the hub itself.

The notification system will employ a completely open messaging format. The only fixed identifier on any message will be the provider that the message is intended for.

This will allow JSON to again be used to create expandable self-describing messages and for the hub to be used not only for the immediate switching processes, but any other aspects of inter provider communications.

Here is an example of a notification to a LCP that a code has been claimed:

```
{"switchNotice": {
 “action”: “claim”,
 "switchCode": "ABC12345",
 "gainingProvider": "SKY",
 "switchDate": "20200315"
 }
}
```

And another if the gaining provider has activated service:

```
{"switchNotice": {
 “action”: “activated”,
 "switchCode": "ABC12345",
 "gainingProvider": "SKY",
 "switchDate": "20200315"
 }
}
```

As you can see there is very little information that needs to be provided to the LCP for any activity to trigger their appropriate business processes.

As previously mentioned, a 3rd party could be plugged into the hub and notified when both providers have completed the switch. This could provide number port management, 999 changes and possibly directory enquiry updates on behalf of both parties. This would need to be looked at in conjunction with every parties GC obligations to establish if this is viable.

A message could look as follows:

```
{
"numberSwitch": {
   “switchCode”: “ABC12345”
   “numbers”: [
      “number”: “0111222222”,
      "sourceCUPID": "12345",
      "destinationCUPID": "65432",
      "DirectoryListing": {
         "required", “yes”,
         "name": "A.J. Hartley"
      }
   ], [
      “number”: “0111333333”,
      "sourceCUPID": "12345",
      "destinationCUPID": "65432",
```

```
    "DirectoryListing": {
      "required", “no”
    }
  ]
}
```

Please note: These are only samples to provide an indication of potential content and behaviour.

Hub Design and Function

Looking at the hub architecture itself, this would be a very simple application server with a secondary message queue store. All interactions with the hub would be through secure, authenticated micro services.

The following lists the services the hub is likely to expose:

Key Services	Supporting Services	Messaging Service
Store or Generate Key	Get Operator Directory	Send Message
Read Key		Get Next Message
Revoke Key		Acknowledge Message
Claim Key		
Release Key		
New Service Provided		
Old Service Cancelled		

They have been divided into three here by function only. The code services are for explicit actions to create or use an existing code. Supporting services are any functions that are implemented to support use of the hub, for example there could be a directory service to list all known providers and their full names, contact details for support etc.

The messaging service is where the queue will be accessed to either send an unsolicited message to another provider or to read messages sent to you. Some messages will require acknowledgement, and a specific service will be provided for that purpose.

The most likely deployment mechanism would use cloud-based services such as Amazon Web Services (AWS) or Azure with a database back end. These are extremely scalable, and can provide the infrastructure and support within a hosted environment without the need for any specific Vendor hardware deployments.

High-Level Implementation Requirements

Looking further to the business integration points that would need to be built, the following provides a high-level view of the expected architectural components needed.

	Business Area	Function	Implementation	Complexity
	Code Acquisition	Web Channel	Self-care access to select services to switch, determine switching impacts, present the code and publish to the hub.	Medium/High
		CRM (Phone) support	Agent/CRM access to follow code issue process on behalf of the customer. To select services to switch, determine switching impacts, present the code and publish to the hub.	Medium/High

	Post code issue support	Web Channel	To display the status of codes, to cancel if they want to change what the code does etc.	Low/Medium
		CRM (Phone) support	Agent access to display the status of codes, to cancel if the customer wants to change what the code does etc.	Low/Medium
	Order Entry Code Capture	Web Channel	Web tools to provide the ability to enter and validate code(s), then to claim code once order confirmed.	Medium
		CRM (Phone) support	Web tools to provide the ability to enter and validate code(s), then to claim code once order confirmed.	Medium
	Order Cancel Capability	CRM (Phone) support	To add to existing BAU order cancellation processes to notify to the hub to cease a code (or codes) if present on the order.	Low/Medium
	Order Completion	Back Office/OM Systems	A completed order containing a switch code triggers a notification to the hub that the switch is complete	Low/Medium
	Hub Listening Service	Poll hub for available messages	Performs polling of the hub at regular intervals for available messages. Action to perform depends on message.	Medium/High
		Code Claimed	Potentially raise a pending cease order, generate Sorry to See you go notices.	Medium/High
		Code Released	Cancel any pending cease order.	Low/Medium
		Switch Rescheduled	Update pending cease order, potentially re-issue STSYG notice	Low/Medium
		Switch Complete	Action cease order. Notify hub once cease is complete	Medium
	Reporting	Compliance Reporting	Provide statistics etc. for OFCOM. Requires capturing usage data for switching from all above processes	Medium/High

Switching Scenarios

There are many use cases that have been identified through the analysis of the switching process, and a list of those considered are documented. These broadly fall in to one of six main categories as follows:

1. Switching a voice product from one provider to another
2. Switching a broadband-only product from one provider to another
3. Switching broadband and voice from one provider to another provider
4. Switching products from multiple providers to one provider
5. Switching multiple products from one provider to multiple providers (1:2 - Note: This is out of scope)
6. Switching broadband and voice services from two providers to two different providers (2:2 - Note: This is out of scope but a customer can migrate the two separate services sequentially.)

Co-Existence with Existing Processes

Switching will only be one type of order any provider will have to deal with through their systems and with their partners and access providers. Therefore, any changes to support the switching process must be able to co-exist with the existing processes with the minimal of impact. The main example is that there will be switch requests yet to be completed (using the previous switching process) that will need to co-exist with new switching requests generated through the new switching process.

Another example of this will be the number porting processes. At the point a provider turns on switching there will be orders still in process using existing porting mechanisms, business processes doing something different to switching etc. and these cannot be impacted by the new process.

However, that also provides an opportunity to provide the mechanisms for next generation processes such as porting using the switching hub as a conduit to overhaul the porting processes over time to the inter provider messaging described above. The same is true for 999 and DQ processes.

ANNEX C – PROCESS/CUSTOMER FLOWS

Please see:

- “Project EECC - Intra and Inter network switching flows_FINAL.pdf” and
- “Project EECC - Customer Journeys_FINAL.pdf” enclosed alongside this submission.

ANNEX D – CUSTOMER COMMUNICATION DURING THE BB & VOICE SWITCHING PROCESS

Stage	Contact channels customers can use	Communications sent to the customer at each stage	Other communications provided
	Online App Contact Centre	• n/a	• n/a
	Online App Contact Centre	• Pertinent information (implications of switching) is shown on screen or explained to the customer.	• n/a
	Online App Contact Centre	Losing Communications Provider: • Customer receives a copy of their switching code, indicating they wish to leave their provider & any relevant end-of-contract/costs via agreed comms routes (ie. email & text with accessibility options – whitemail, braille, large font etc). Email Text / Mobile services Accessibility versions	Losing Communications Provider: • Customer provided access to a 'Check my switch status' area via online and app to allow customer to (1) re-access their switching code, (2) resulting implications of the request switch, (3) present the specific switch timings (prospective cease date and cease date) when available.
	Online App Contact Centre	• Pertinent information for the new service that they are ordering is shown on screen or explained to the customer.	Gaining Communications Provider: • GCP provides access to their Online 'Check my switch status' area (as above).
	Online App Contact Centre	Gaining Communications Provider: • Customer receives relevant welcome comm from the GCP including the prospective start date and any next steps required. Losing Communications Provider: • Customer receives a comm from the LCP containing the prospective cease date and resulting implications thereof. Email Accessibility versions	Losing and Gaining Communications Provider : • Online 'Check my switch status' area – is updated with prospective cease date.
	Online App Contact Centre	Gaining Communications Provider: • Customer receives BAU comms indicating service is now live. Losing Communications Provider: • Customer subsequently receives the final bill from the LCP. Email Text / Mobile services Accessibility versions	Losing Communications Provider • Online 'Check my switch status' area – is updated to the status of 'completed'. Gaining Communications Provider: • Online 'Check my switch status' area – is updated to the status of 'completed'.

ANNEX E – DEFINITIONS/ ACRONYMS

Term	Meaning	Description
GCP	Gaining Communications Provider	The prospective organisation that will hold the retail relationship with the customer at the end of the switching process.
LCP	Losing Communications Provider	The incumbent organisation that holds the retail relationship with the customer at the beginning of the switching process.
GAP	Gaining Access Provider	The organisation that provides the network used by the GCP to deliver services to the customer at the end of the switching process.
LAP	Losing Access Provider	The organisation that provides the network used by the LCP to deliver services to the customer at the beginning of the switching process.
OTA	Office of the Telecoms Adjudicator	-
GPL	Gaining Provider Led	A process enabling the gaining provider to manage the switching process: coordinating the termination of the old service(s), the start of the new services and contacting the losing provider to terminate the old contracts.
ETC	Early Termination Charges	-
BAU	Business as Usual	-
SAP	Shared Access Provider	The organisation that provides the network used by both the LCP and GCP to deliver services to the customer at the end of the switching process (i.e. and intra-network switch).
AP	Access Provider	The organisation that provides the network used by a CP, which is agnostic to gaining/losing status.
CP	Communications Provider	A organisation that holds the retail relationship with the customer, which is agnostic to gaining/losing status.
Customer	-	The account holder or other, duly authorised, end-user.
EECC	European Electronic Communications Code	European legislation mandating changes to the fixed telecommunication switching process.
MAC	Migration Authorisation Code	Legacy switching code used by Openreach and CPs on its network
Wholesaler	-	An organisation that provides business services to CPs to support their provision of retail services to customers and may also support these CPs' interactions with APs.