

TSA Connect

Learn, shape, network and collaborate.

Digital Transformation – The Shift from Analogue to Digital

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2019 Quality Standards Development

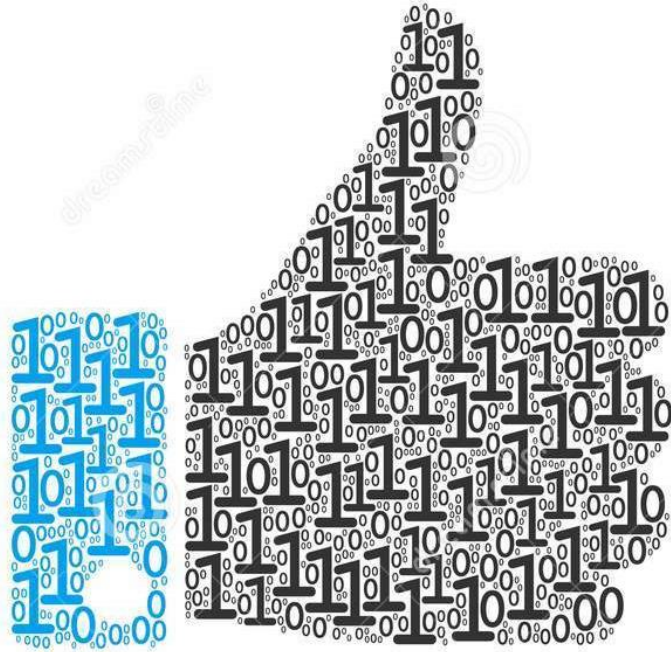


Focus of the TSA in the digital shift



- Creating events and sharing information as to how members can make best use of TECS in the delivery of their services
- Publishing guides to relevant technical standards to support stakeholders
- Developing and agreeing test specifications for TEC industry stakeholders to adhere to
- Publishing testing results to ensure openness and transparency
- Supporting individual members to a greater or lesser extent on their transition testing to All-IP

Benefits of Digital



Digital alarm alerts much quicker to send

Devices are online – connected continuously

Published protocols eg SCAIP

Data rich services

Internet Protocol signalling

Barriers to take up of fixed digital alarms



Long established analogue industry

Digital not yet required by procurement

Capital cost of wholesale device replacement

Alarm Receiving Centre capability

SIM cost

Digital Readiness Guide

TEC Services Association

Digital readiness guidance

Guidance for providers of TEC services on future provision of technology enabled care equipment on digital broadband networks



Highlights:

How analogue & digital alarms work

Considerations for Alarm Receiving Centres

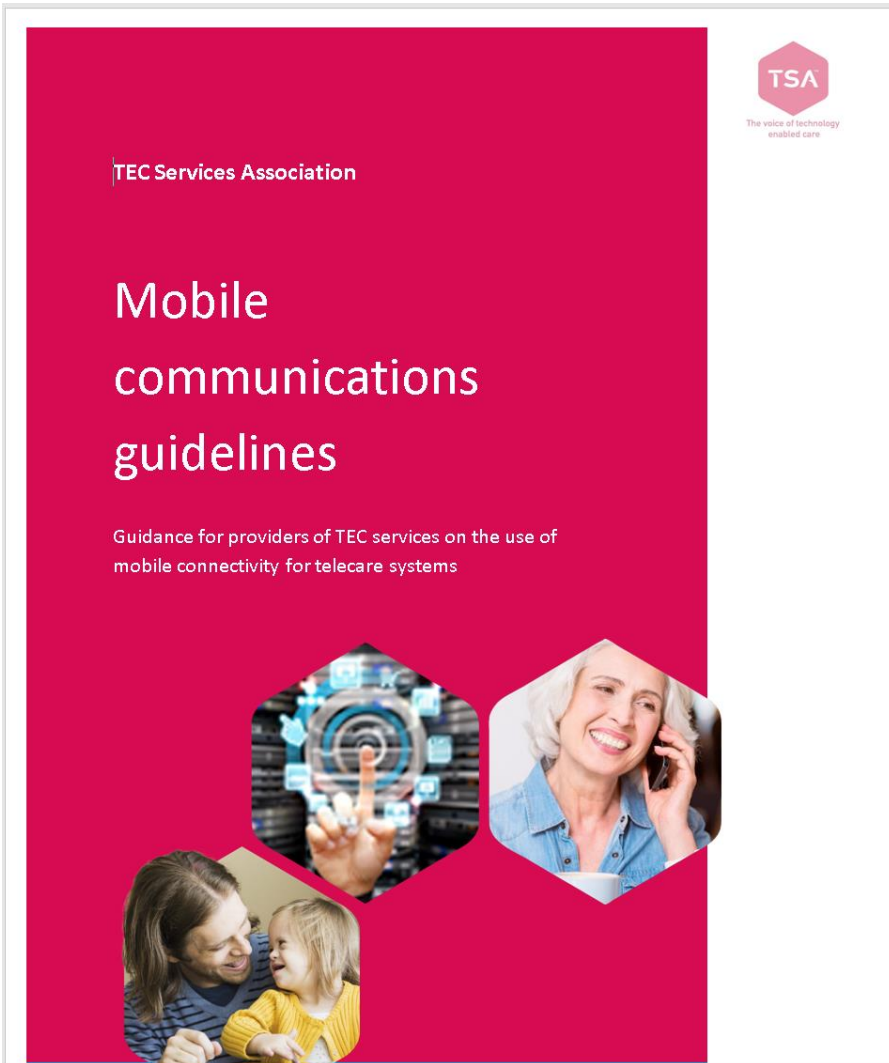
Failover and redundancy

Installing digital alarms in the home

Glossary of terms



Mobile Readiness Guide



Highlights:

Global Roaming SIMs

USB Dongle guidance

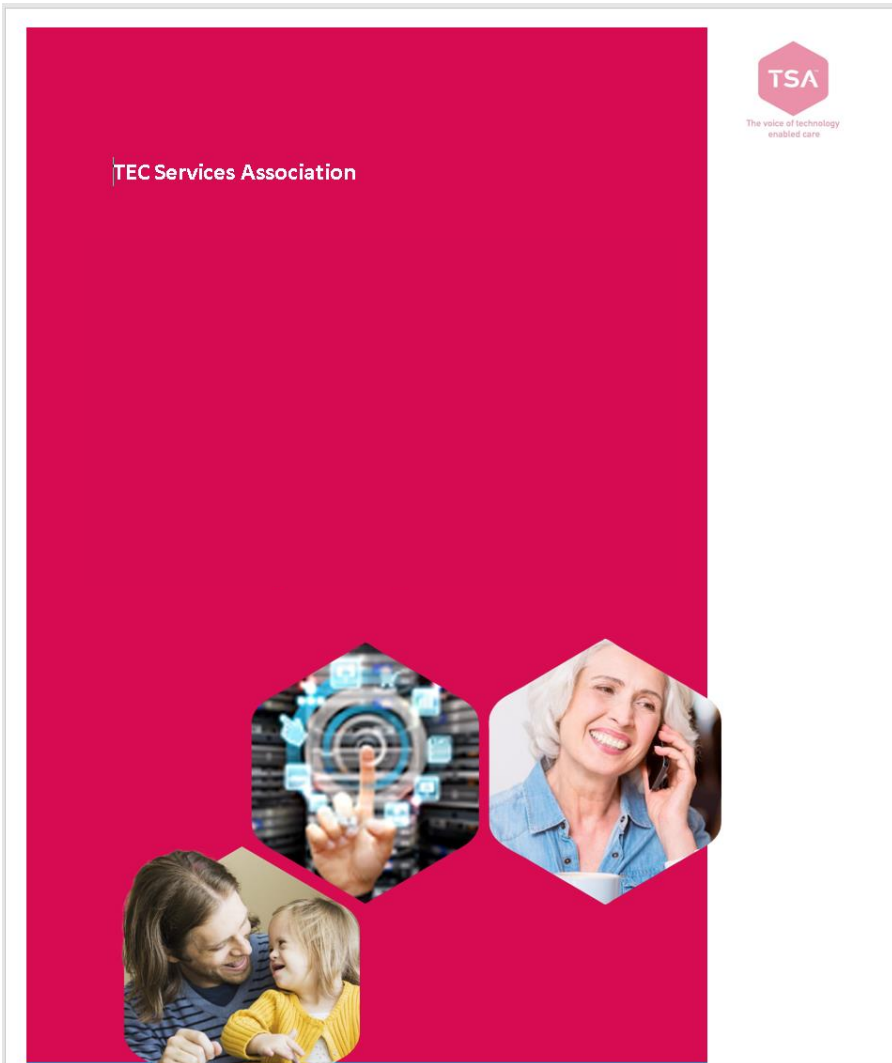
3G Sunset

PAYG SIMs

Data reservoir pricing



Cyber Security Guide



Highlights:

Organisational Awareness

Systems & Processes

Business Continuity

Network Security

Data Protection



Communications Providers



Managing special services during the all IP transformation

TSA Wales

Sodhi Dhillon – BT Consumer



When?

- May 2018: Openreach started WLR closure consultation.
- July 2018: new test facility opened at BT's R&D site.
- November 2018: BT Consumer launched the SmartHub 2 which is compatible with Digital Voice

December 2025: All BT customers are using digital telephone services.



- 2019 – BT Consumer launches its digital voice products for residential customers

- September – Openreach plans to stop opening new PSTN / ISDN lines, so no new sales from this time.

Testing Special Services Equipment in the Digital Services Lab

- Early July 2018, BT launched a test facility in Adastral Park, BT's R&D headquarters near Ipswich, for special services suppliers to come and test their equipment in BT's new all IP digital world.
- We've created an environment as close as possible to customers' premises. The lab includes:
 - All types of BT Consumer and Business lines and routers
 - Possibility to simulate different line performance levels and real world usage
- We encourage everyone to reach out to their provider and ask for test results.



Addressing the key issues of all IP

Reconnecting special services equipment

- We'll never advise our customers on how to reinstall or plug back their special services equipment after they move to Digital Voice.
- Instead we'll always tell them to contact their special services supplier for a resolution.

Rapid restoration process

- On a case by case basis, customers may be reverted to PSTN in case of incompatibility of their special services equipment (only possible until PSTN is switched off)

Battery Back Up

- In the all IP world, telephone line power no longer exists.
- We'll have a battery back up available to power the router for at least 1 hour in case of outage (free of charge for vulnerable customers)

Voice Re-Injection kit

- If using the ATA isn't suitable, customers may be offered an engineer visit to connect their wired extension to the ATA.
- It requires changing the master socket for the NTE5C model (launched in 2016)

For questions or lab bookings, get in touch with us

btdigitalvoice@bt.com

www.btplc.com/DigitalServicesLab



IP Voice

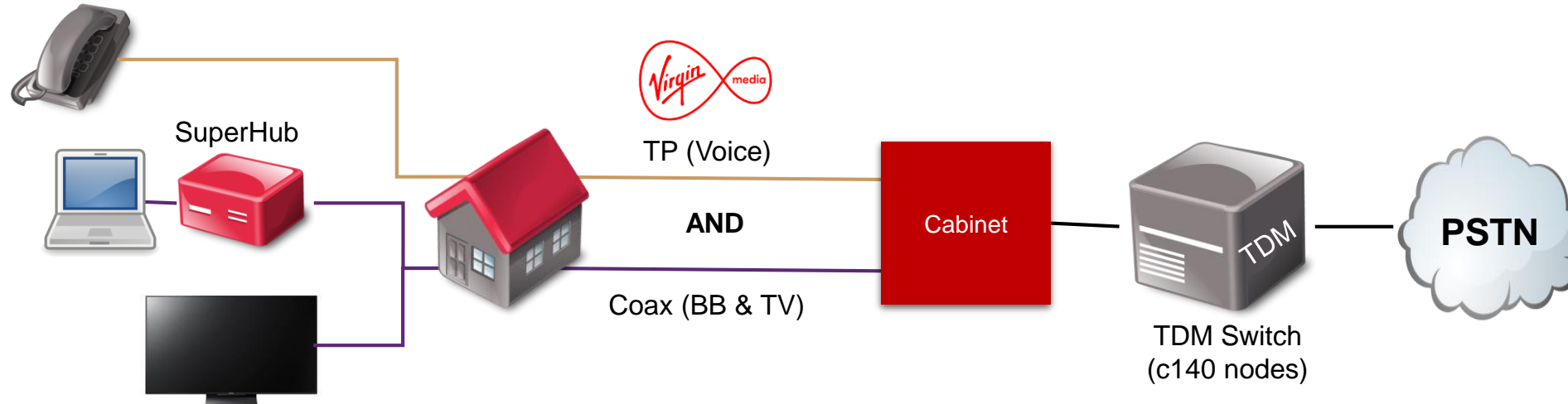
The Migration to Voice over IP

Safe Harbour Statement

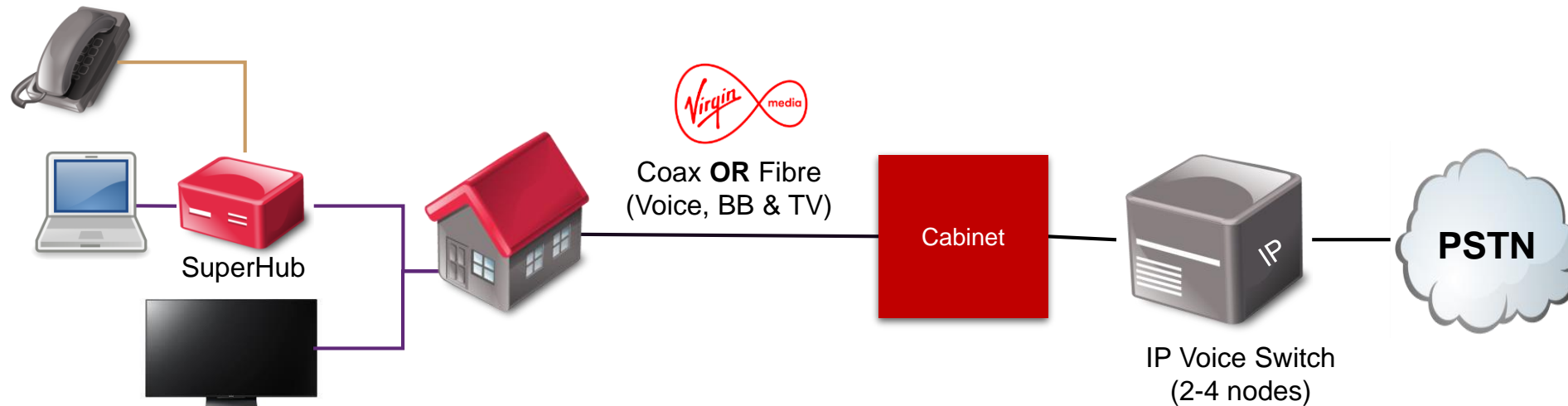
This document contains forward looking statements and any such statements be they explicit or implicit implies no commitment on the part of Virgin Media / Liberty Global.

Virgin Media Voice Technology

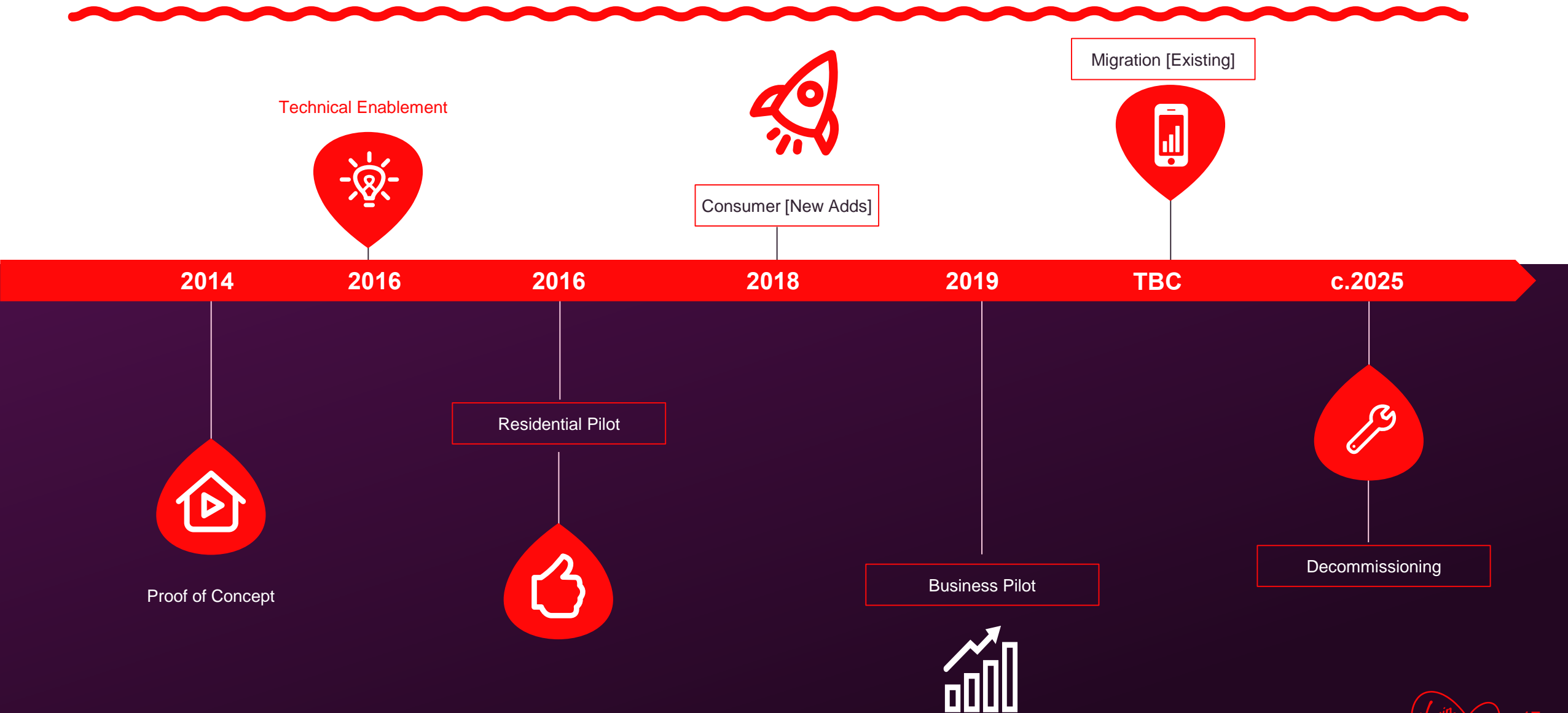
Existing (PSTN):



IP Voice :

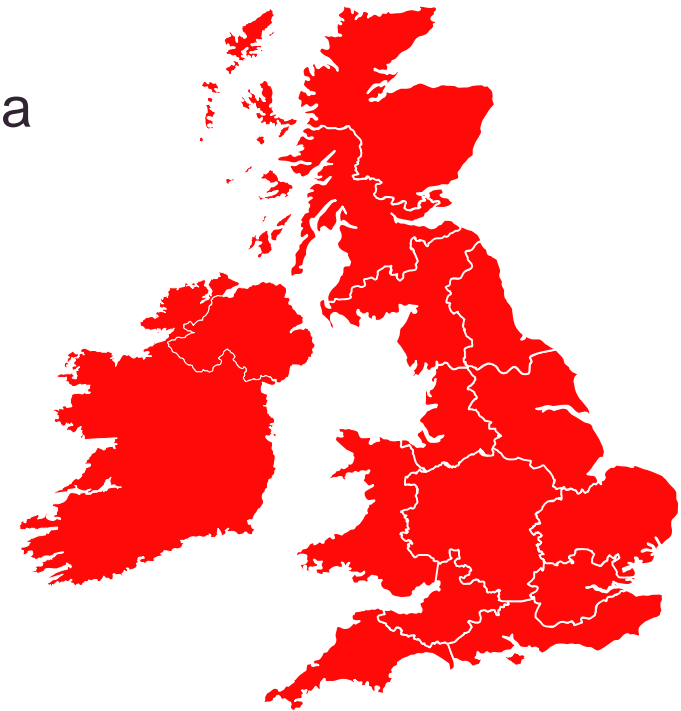


IP Voice – Current Timeline



Migration Planning

- Virgin Media are planning to migrate customers from legacy telephony to IP Voice services by 2025.
- This migration will occur in different ways :
 - Provision of IP Voice service to new customers joining Virgin Media
 - Migration of individual customers in-life who contact VM
 - Migration of customers when a “switch” or area is migrated
- The first two methods could happen anywhere within Virgin Media’s network area
- The final method will be geographically based
- We will trial switch migration before undertaking this activity



What challenges are we facing?

- **Power Outages:** VM is providing an Emergency Back Up Line (EBUL) solution that uses an in-built SIM card so customers can access 999 / 112
- **Signaling Protocol:** Devices that comply to relevant standards (e.g. BS8521 and those adherent to ITU-T recommendations) should be unaffected. However, we are in dialogue with the alarm industry and stakeholders to support their understanding of the impacts of the IP switch
- **Customer Education:** We are making sure our sales channels are clear and informative, encouraging customers to check with their device provider, updating our T&Cs and user guides, working to identify vulnerable customers so we can ensure they are properly managed during migration
- **Changing Customer Needs:** We are providing the battery powered back up solution (EBUL) and we are working with Ofcom, other CPs, and alarm / telehealth industry stakeholders





Thank you!

Time for your questions
or email

IPvoice@virginmedia.co.uk

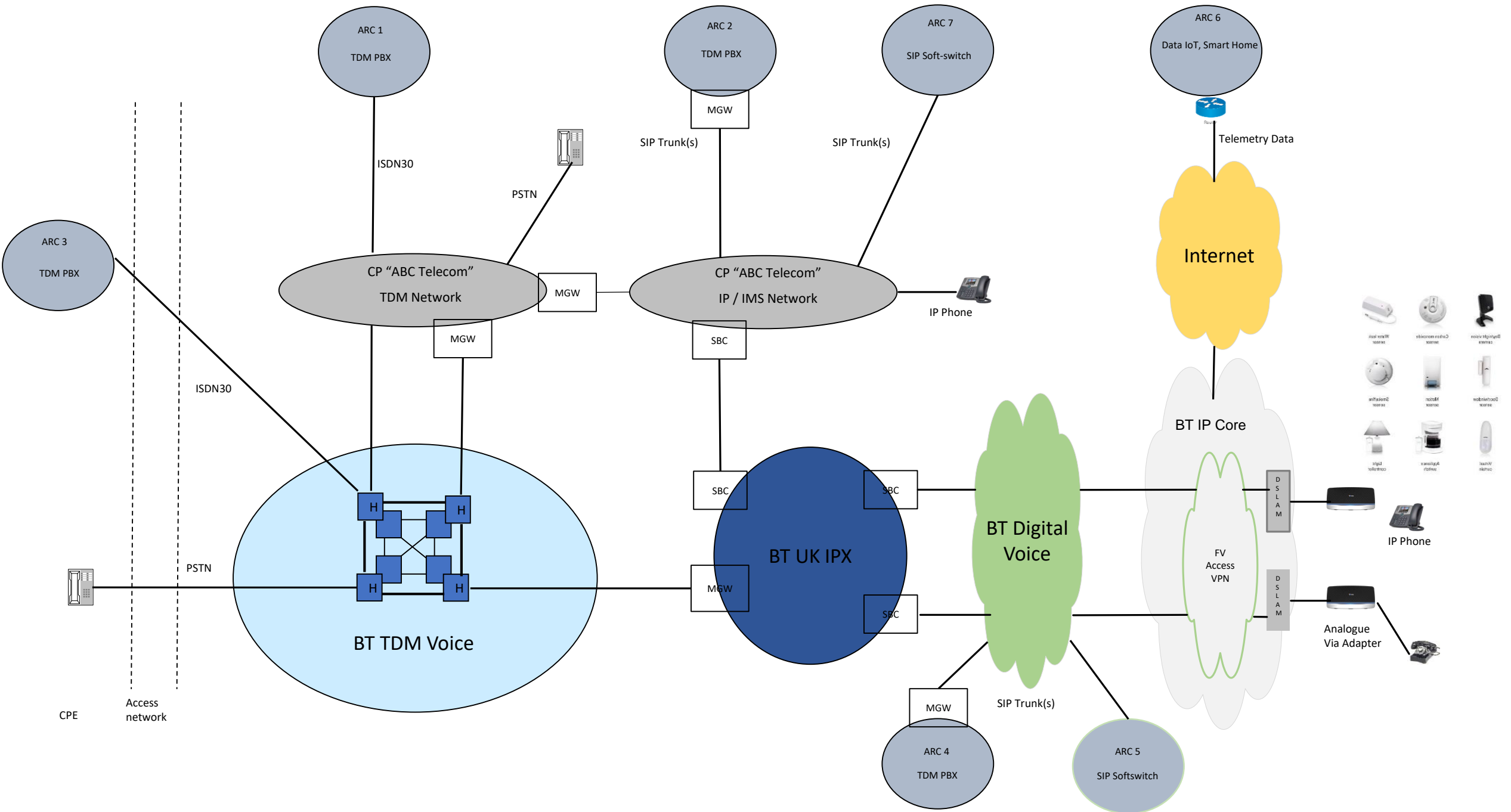
ALL-IP Testing

Summary of Potential Impact of ALL-IP Networks

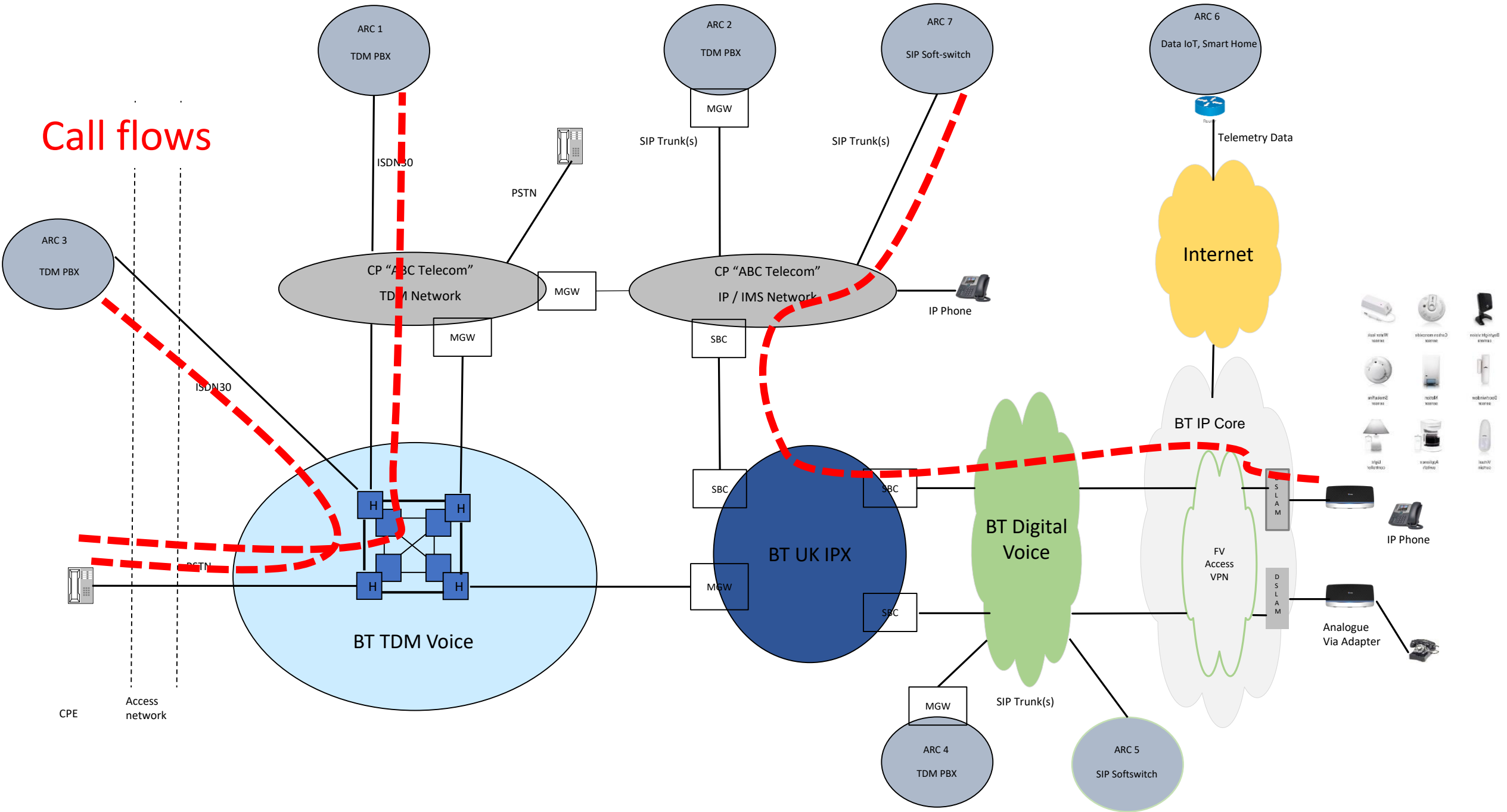
Characteristics of ALL-IP that potentially affect the operation of alarms include:

- No 'line powering'
- No primary communication path in the event of local power failure
- Data discontinuities, which may occur due to:
 - dynamic jitter buffering
 - packet loss
 - interconnections between communications sub-networks
 - DTMF tone detection/re-generation
- End to end delays and synchronisation issues





Call flows



Test Specification

Appendix B – Network Combination Tests

Network Combination Tests	
Organisation	Date
<input type="text"/>	<input type="text"/>
Test Identification	Test Location
<input type="text"/>	<input type="text"/>
Company Representative	Independent Reviewer in Attendance
<input type="text"/>	<input type="text"/>

System Under Test	
Alarm Receiving Centre (type/version)	Telecare Consumer Premises Equipment (manufacturer, model, unique ID)
<input type="text"/>	<input type="text"/>
ARC Network Connection (provider/type/configuration)	TCPE Network Connection (provider/type/configuration)
<input type="text"/>	<input type="text"/>
Signalling protocol (type/version)	Call Flow no.
<input type="text"/>	<input type="text"/>
Connecting equipment (e.g. ATA type/version)	Any special test equipment used (type/version)
<input type="text"/>	<input type="text"/>

Test Results		PASS/PARTIAL FAIL / FAIL		
End-to-end delay (msecs)	Packet loss ratio	Test Results Test 1	Test 2	Test 3
300	0	<input type="text"/>	<input type="text"/>	<input type="text"/>
550	0	<input type="text"/>	<input type="text"/>	<input type="text"/>
1100	0	<input type="text"/>	<input type="text"/>	<input type="text"/>
300	1 x 10 ⁻⁶	<input type="text"/>	<input type="text"/>	<input type="text"/>
550	1 x 10 ⁻⁶	<input type="text"/>	<input type="text"/>	<input type="text"/>
1100	1 x 10 ⁻⁶	<input type="text"/>	<input type="text"/>	<input type="text"/>
300	1 x 10 ⁻⁵	<input type="text"/>	<input type="text"/>	<input type="text"/>
550	1 x 10 ⁻⁵	<input type="text"/>	<input type="text"/>	<input type="text"/>
1100	1 x 10 ⁻⁵	<input type="text"/>	<input type="text"/>	<input type="text"/>
Breaking point:	<input type="text"/>			
Comments: <input type="text"/>				

Appendix C – Responses to Fault Modes

Response to Selected Fault Modes	
Organisation	Date
<input type="text"/>	<input type="text"/>
Test Identification	Test Location
<input type="text"/>	<input type="text"/>
Company Representative	Independent Reviewer in Attendance
<input type="text"/>	<input type="text"/>

System Under Test	
Alarm Receiving Centre (type/version)	Telecare Consumer Premises Equipment (manufacturer, model, unique ID)
<input type="text"/>	<input type="text"/>
Signalling protocol (type/version)	Communication Network (type & configuration)
<input type="text"/>	<input type="text"/>
Connecting equipment (e.g. ATA type/version)	Any special test equipment used (type/version)
<input type="text"/>	<input type="text"/>

Test Results	Alarm can be raised to an ARC?	Consumer alerted by TCPE?	Care service provider alerted?
Disconnect TCPE from ATA device	Yes / No	PASS / FAIL	Yes / No
Disconnect ATA from home gateway/router (if possible)	Yes / No	PASS / FAIL	Yes / No
Disconnect home gateway/router from wide-area network	Yes / No	PASS / FAIL	Yes / No
Mains power disconnected from home gateway/router (for 60mins)	PASS / FAIL	Yes / No	Yes / No
Mains power disconnected from home gateway/router (for 24hrs)	PASS / FAIL	Yes / No	Yes / No
Mains power disconnected from TCPE (for 60mins)	PASS / FAIL	PASS / FAIL	PASS / FAIL
Mains power disconnected from TCPE (for 24hrs)	PASS / FAIL	PASS / FAIL	PASS / FAIL
Disconnect primary ARC	PASS / FAIL	Yes / No	PASS / FAIL
Comments: <input type="text"/>			



Test Specification – Packet Delay & Loss

<u>Test Results</u>		PASS/PARTIAL FAIL /FAIL			
End-to-end delay (msecs)	Packet loss ratio	Test Results	Test 1	Test 2	Test 3
300	0				
550	0				
1100	0				
300	1×10^{-6}				
550	1×10^{-6}				
1100	1×10^{-6}				
300	1×10^{-5}				
550	1×10^{-5}				
1100	1×10^{-5}				
Breaking point:					
Comments:					



Test Specification – Fault Response

Test Results		
Circle test outcome	Alarm can be raised to an ARC?	Consumer alerted by TCPE?
Disconnect TCPE from ATA device	Yes / No	PASS / FAIL
Disconnect ATA from home gateway/router (if possible)	Yes / No	PASS / FAIL
Disconnect home gateway/router from wide-area network	Yes / No	PASS / FAIL
Mains power disconnected from home gateway/router (for 60mins)	PASS / FAIL	Yes / No
Mains power disconnected from home gateway/router (for 24hrs)	PASS / FAIL	Yes / No
Mains power disconnected from TCPE (for 60mins)	PASS / FAIL	PASS / FAIL
Mains power disconnected from TCPE (for 24hrs)	PASS / FAIL	PASS / FAIL
Disconnect primary ARC	PASS / FAIL	Yes / No
Comments:		

ALL-IP Test Guidelines: Categories of Testing

- **Baseline Tests:** end to end testing over a single communications network provider, employing selected combinations of alarm and ARC equipment and protocol types across a TDM network.
- **Network Combinations:** different combinations of paired communications providers, varying network performance characteristics, only selected combinations of alarm, ARC equipment and protocol types.
- **Alarm System Configurations:** multiple combinations of alarm and ARC equipment types, employing nominal network performance characteristics.
- **Fault identification:** communications are disconnected and the ability of the alarm system to identify faults and recover is tested.
- **Power Testing:** loss of local power is simulated, alarm system response is tested.



Test Scenarios for different 'Call Flows'

Call Flow no.	TCPE Connection	ARC Connection	Description and Variant Configuration
001	BT/TDM	BT/TDM	Baseline network test
002	BT/IP	BT/TDM	IP-TDM transcoding
003	BT/IP	BT/IP	SIP (IP) end to end
004	BT/IP	BT/IP	Media gateway transcodes to TDM at ARC
005	BT/TDM	Virgin/TDM	TDM interconnect
006	BT/TDM	Virgin/IP	TDM-IP transcoding, and SIP server at ARC
007	BT/TDM	Virgin/IP	TDM-IP transcode & transcode to TDM at ARC
008	BT/IP	Virgin/TDM	Via UK IPX or TDM interconnect
009	BT/IP	Virgin/IP	SIP (IP) end to end
010	BT/IP	Virgin/IP	Media gateway transcodes to TDM at ARC
011	BT/TDM	TalkTalk/TDM	TDM interconnect
012	BT/TDM	TalkTalk /IP	TDM-IP transcoding, and SIP server at ARC
013	BT/TDM	TalkTalk /IP	TDM-IP transcode & transcode to TDM at ARC
014	BT/IP	TalkTalk /TDM	Via UK IPX or TDM interconnect
015	BT/IP	TalkTalk /IP	SIP (IP) end to end
016	BT/IP	TalkTalk /IP	Media gateway transcodes to TDM at ARC
Etc	Repeated for each major Communications Provider combination		

Single comms provider

multiple providers



Alarm Receiving Centres (ARCs)

- ARCs monitor vulnerable clients using hubs and peripherals via predominately landline technology
- There are over 200 ARC s in the UK
- ARCs deal with a total of 1.7 million clients
- Alarms are typically raised for falls, smoke alarms, door exit contacts etc...
- ARC receives a landline call from the property triggered by the emergency
- Landline call contains the audible DTMF tones which identify the type of incident to the contact centre as well as the voice connection to speak to the client
- The ARC operator will then deal with the emergency as appropriate

ARC Incident – March 2019

- ARC operators began to receive emergency calls which carried DTMF tone but no voice connection
- Operators were unable to dial back as the alarm equipment was constantly re-dialing the ARC number
- This issue multiple clients
- These failed emergency calls were classified as no response and the individual impact was as follows:

Failed Smoke Alarm Alerts

- There were two smoke alarm alerts raised for this cohort of clients
- On both occasions the operator was unable to provide any guidance to the client as to how to exit the property as per normal procedures
- Fire Services was called to both incidents – both incidents were identified as not requiring fire services

Door Exit Alert

- One door exit alert was triggered during this period
- The door exit trigger was in place for a client with dementia who was known for wandering
- The operator was unable to provide reassurance to the client and to assist them with returning to the property
- Quick thinking on the operators part led them to notify a neighbour who was able to help the client return to their property

Fall Alarm

- Fall alarm emergency received with no voice connection possible
- Lady had fallen and was in extreme pain with a broken hip but was only able to trigger the fall alarm
- She did not receive any reassurance that her emergency call had got through to the ARC and she did not know if anyone was coming to help her
- An ambulance did eventually arrive but her confidence in the system has been lost



Analysis

- The communication provider was utilising lower cost routing where possible
- The dialled number was not on a protected dialled number list
- Multiple hops on the core network degraded the standard of the call to the point at which the emergency calls were not being transmitted across the network correctly
- The dialled number has now been added to the protected list but how can this be prevented in the future for all 200+ ARC with multiple dialled numbers?

Summary

- Learn from events and network with other organisations with similar challenges to yourselves
- Provide relevant information to ALLIP@tsa-voice.org.uk
 - CPE Equipment / Dialed Numbers
 - ARC Hardware / Software / Network / Number / Type
- Consider an alternative to like for like replacement
 - Richer datasets
 - Predictive Analysis
 - A more digitally aware aging population
- Seek engagement from the highest levels in your organisations
- Use TSA guidance and support

