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NP Technical Overview

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Agenda

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- Routing Options
- Routing Number Specification
- Routing Testing
- Central Clearinghouse Functional & Operational Requirements
- Porting Process & Interworking with Central Clearinghouse
- Porting System/ Process Requirements
- Implementation of Porting systems into Operator Business Systems/ processes
- Porting Testing
- End-2-End Resting & Launch Readiness Preparations
- Equivalence of Service Delivery Across Operators – review of service delivery mechanisms, ie LLU, fibre to home, Wholesale Line Rental, wireless services etc
- Future-proofing the NP Service

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NP – Technically Challenging?

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Expensive – Typically costs **multi-million $** to implement

Complex- Involves every part of the operators business

Significant Risks – Fundamental change to Network, Business, Regulatory and Retail systems and processes

Cannot be rushed– Major programme requiring discipline, planning & collaboration

Brand Scrutiny – Reinforces brand if implemented well.... But damages credibility, standing & confidence if implemented poorly

ONE SHOT TO GET NP RIGHT - LIFE WILL NEVER BE THE SAME AFTERWARDS!

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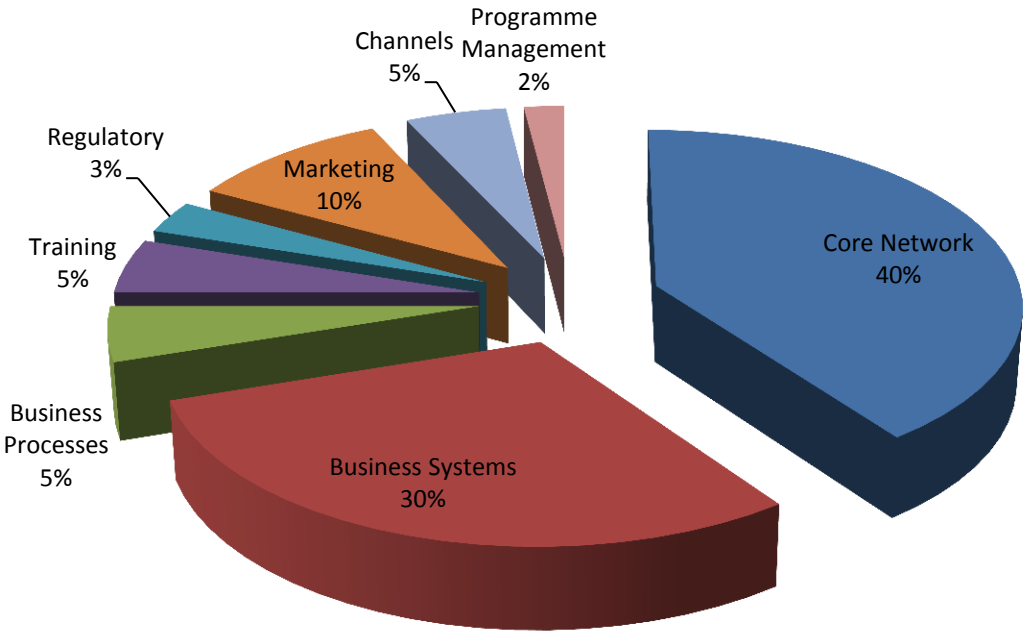
Indicative NP Implementation Costs



- Routing solution - $300k to $5 million
- Billing system upgrade - $50k to $2 million
- Interconnect system upgrade - $50k to $250k
- Provisioning system automation - $50k to $300k
- Programme Management – upto 6 man months
- Business Process Development – upto 30 man months
- Regulatory support – upto 5 man months
- Routing & Porting Testing – upto 10 man months
- NP Training – 1-8 hours per employee

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Fixed & Mobile NP – Operator Implementation Considerations

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- **Forcing operators to implement & operator separate fixed & mobile NP support systems/ functions?**
  - Core network routing
  - Provisioning systems
  - Mediation/ rating & billing systems
- **Central NP Clearinghouse** – most NP platforms capable of processing fixed & mobile number portability transactions.
  - Changes required to Porting Process Flow, Timers, Validation Requirements, Porting Windows, Reject reasons etc
  - Expansion of central number management database to include fixed number range allocations
  - Additional automated consumer authorisation/ validation mechanism, ie IVR/ PIN etc
  - Development of automated interfaces/ manual GUI porting facilities
- **Routing Approach**
  - Different routing approaches for fixed and mobile NP?
  - Indirect Routing - more appropriate for fixed NP
  - All Call Query Direct Routing – Appropriate for both Mobile & Fixed Number Porting
    - All Call Query Routing and CDR/ Billing System Changes applied to across all core network & business systems

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Fixed Number Portability – Implementation Considerations

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- **Robust and established Wholesale Access Product Frameworks & Inter-operator provisioning processes**
  - **LLU** – requires **significant investment by all parties** in access infrastructure
  - **WLR** – requires regulated commercial and operational frameworks
  - **FWP** – Quick and change to implement and uses existing mobile provisioning approach
  - Inter-Operator provisioning processes, resources and facilities to manage complex transfer of fixed number services – potential out of hours porting for business users
- **Business Rules** – Similar between Fixed & Mobile
- **Consumer Code** – Similar between Fixed & Mobile
- **Regulatory Requirements** – Similar between Fixed & Mobile
  - porting charges, transit charges, porting SLAs -
- **Operational Requirements** – Similar between Fixed & Mobile
  - Inter-operator provisioning interworking processes, changes to bundled package management/ billing, Off/ On Net differential billing, separation of DSL & Voice services

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Mobile NP Process

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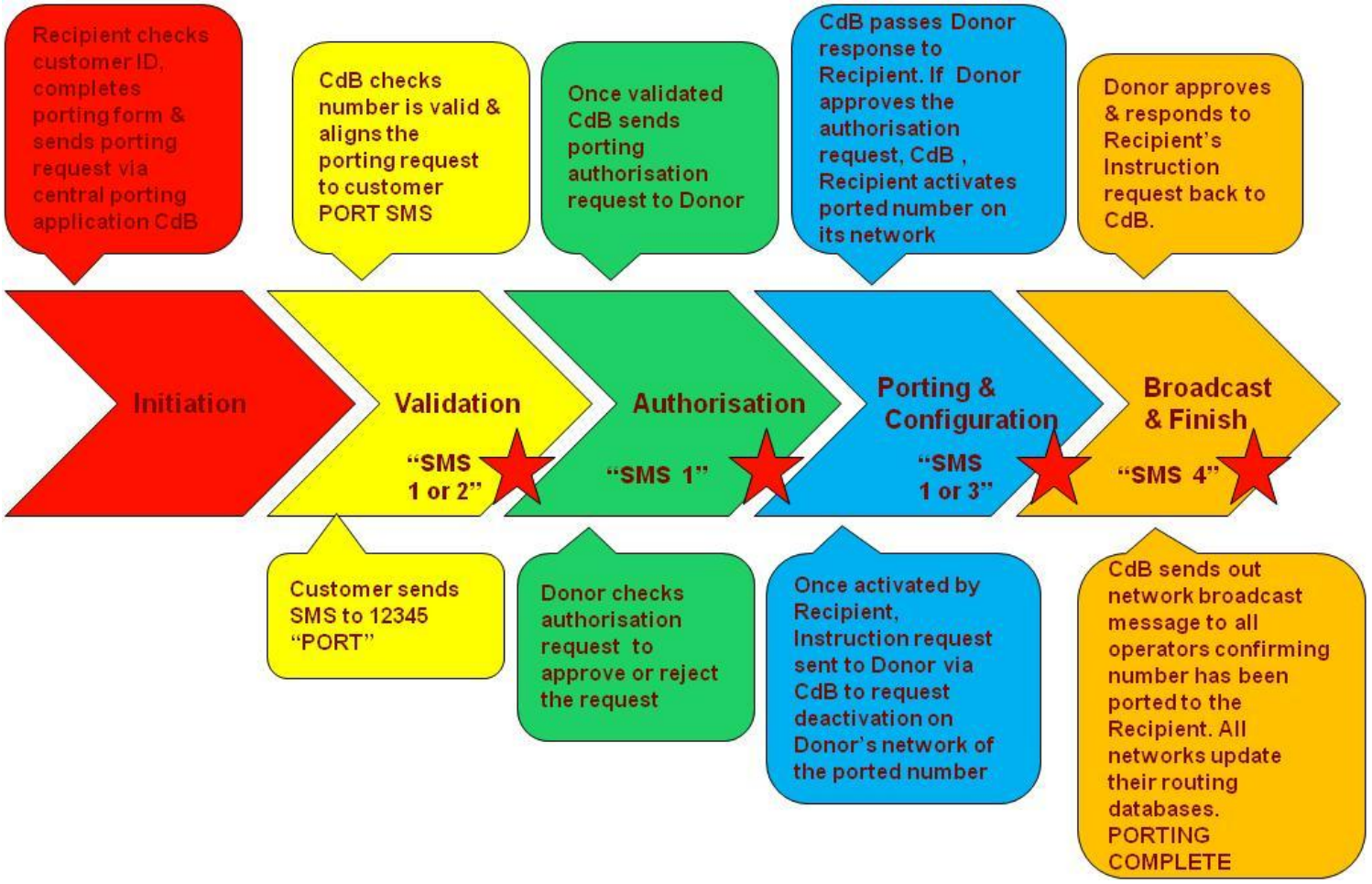

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Fixed NP Process

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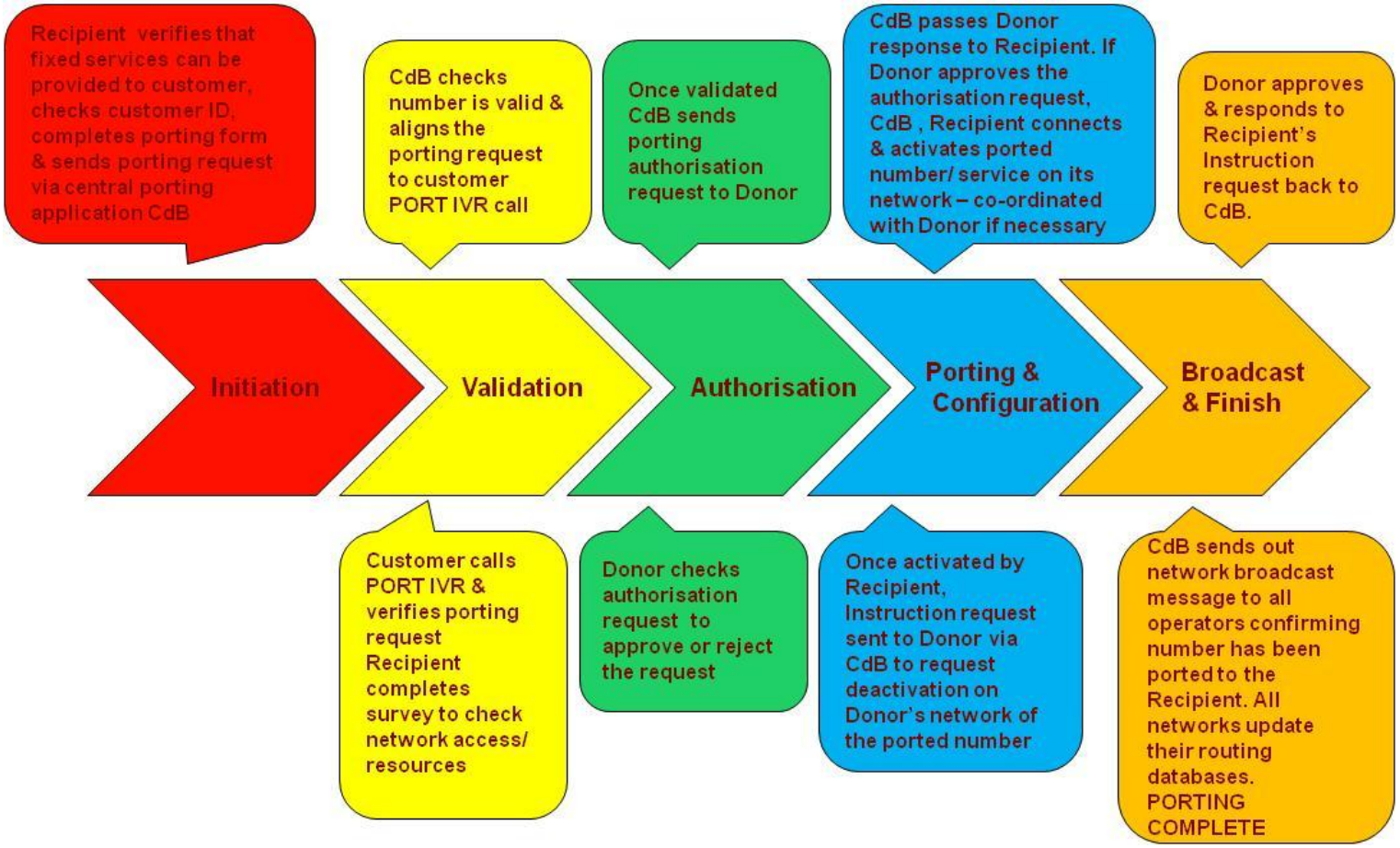

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Cross Stakeholder NP Journey

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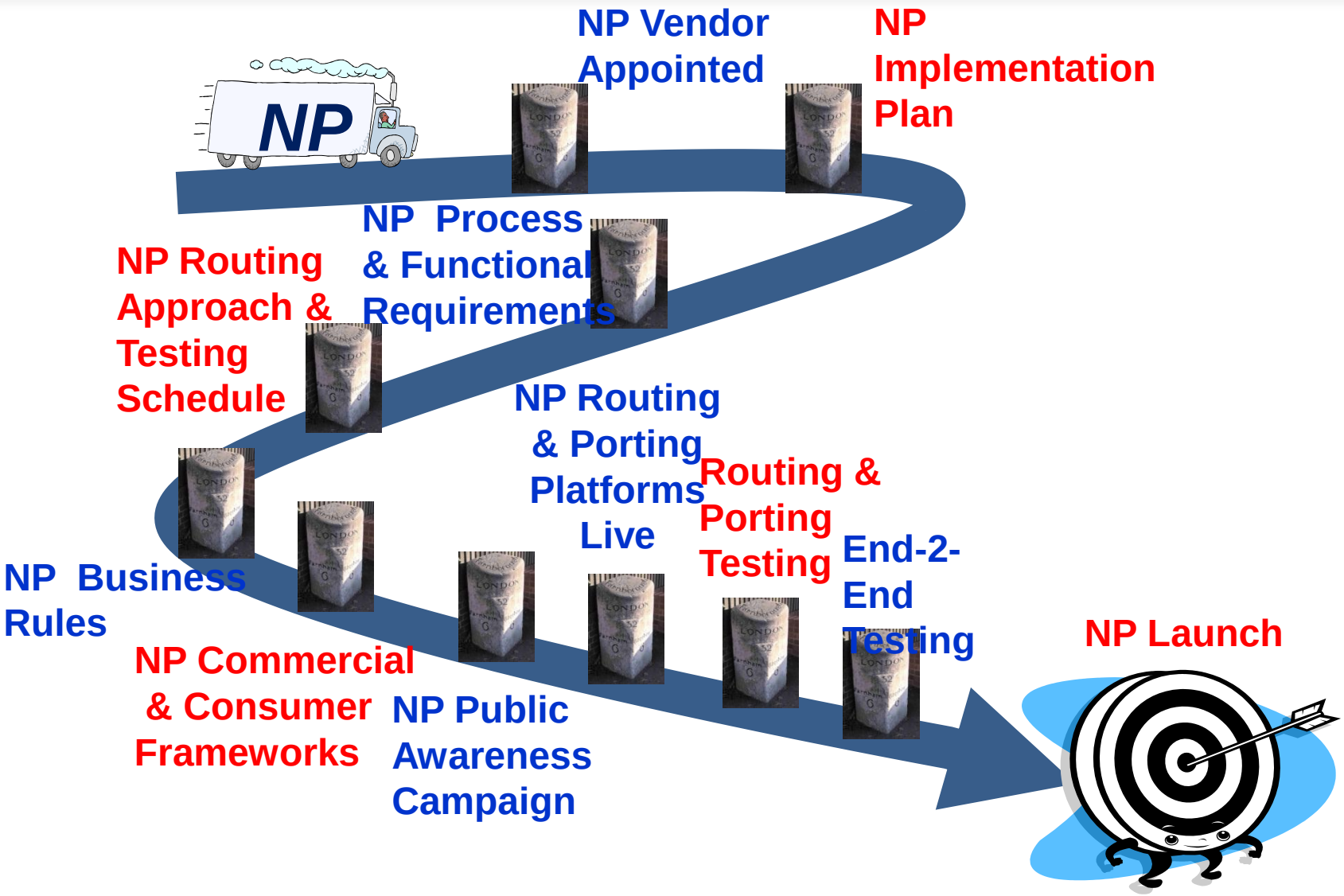

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NP Technology Workstream Schedule

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			Development					Implementation				Testing			Launch	
Workstream	Activity	Functions Involved	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
Technology	Development Inter-operator end-2-end test schedule	Regulatory/ Commercial														
Technology	Assessment of impact of Number Portability on business system and processes	Regulatory/ Commercial/ Call Centre/ Provisioning/ Retail/ IT Development & Operations/ Procurement														
Technology	Development & implementation of changes to key business systems	Regulatory/ Commercial/ Call Centre/ Provisioning/ Retail/ IT Development & Operations/ Procurement/ Finance														
Technology	Definition and assignment of Inter-Operator Network Routing Approach and Codes	Regulatory/ Networks														
Technology	Inter-operator technical routing discussions, including development of testing schedule and specification	Regulatory/ Networks														
Technology	Network routing impact assessment, solution definition and procurement	Regulatory/ Networks/ IT Development/ Procurement/ Finance														
Technology	Implementation by each operator of the agreed routing approach solution & infrastructure	Networks/ IT Development/ Procurement/ Interconnect/ Roaming														
Technology	Inter operator testing – dependent on readiness of each operator	Regulatory/ Networks/ IT Development/ Procurement/ Commercial/ Call Centre/ Retail/ Finance														

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Routing options

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Technical LNP vs Administrative LNP?

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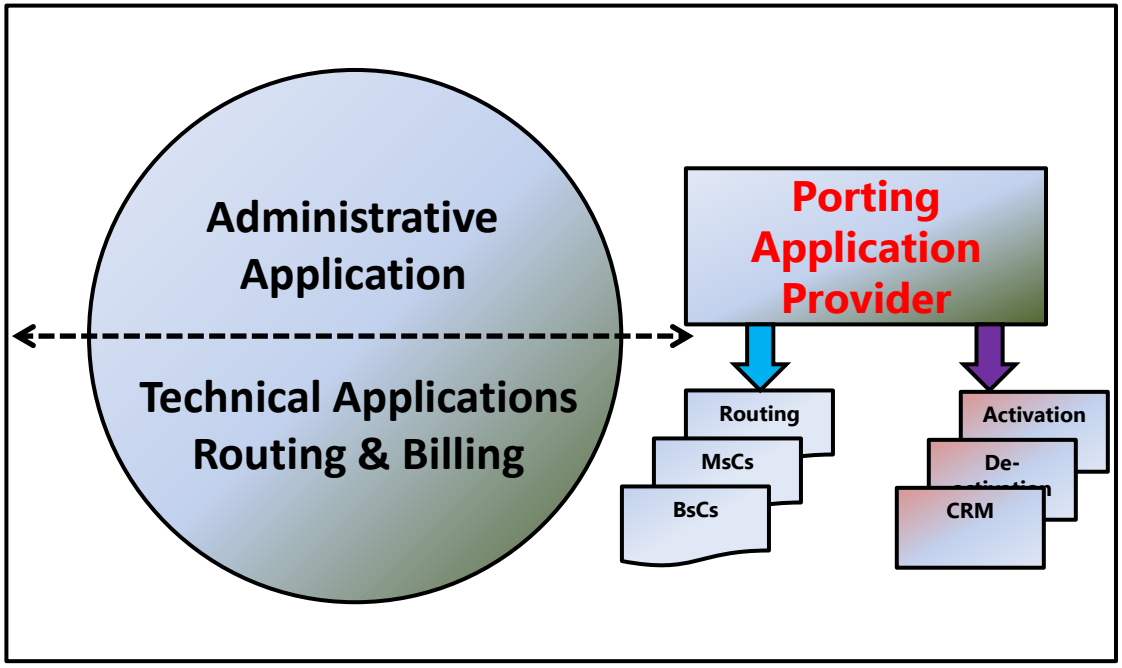
Porting Applications typically ONLY manage :

- Processing of porting orders
- Management of ported numbers
- Does NOT provide routing function



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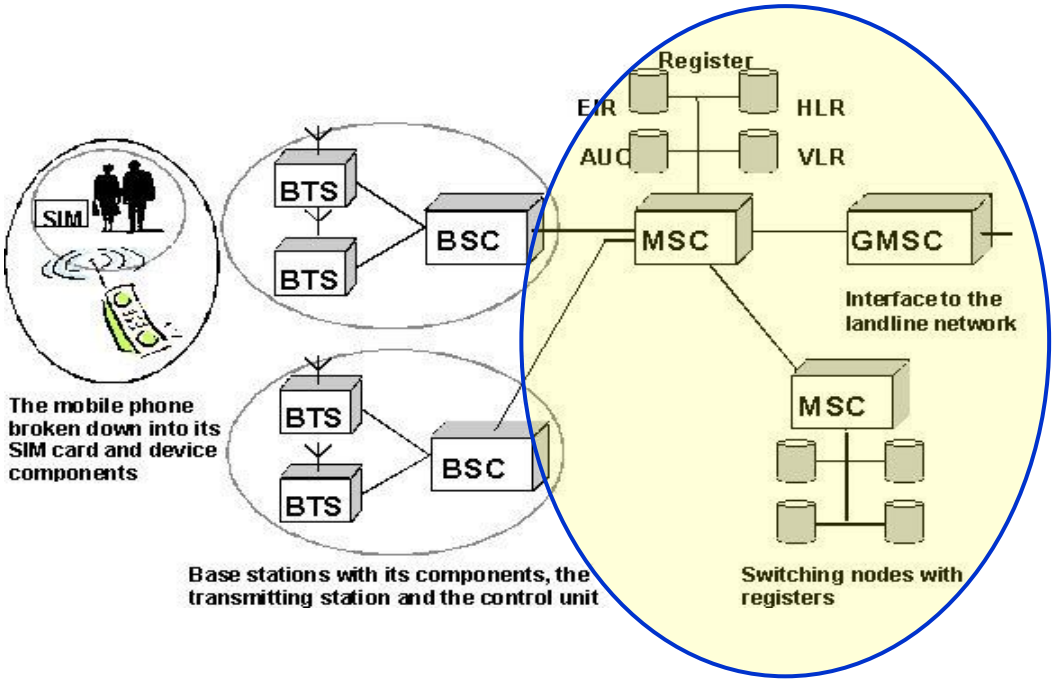
NP Core Network - Routing Impact

- NP Routing perfomed at core level only
- No Impact at access or radio network level
- Routing changes impact
- Voice – fixed & mobile
- SMS/MMS



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Which Routing Approach?

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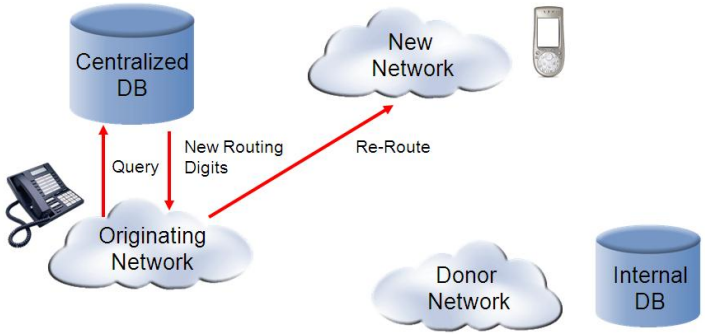
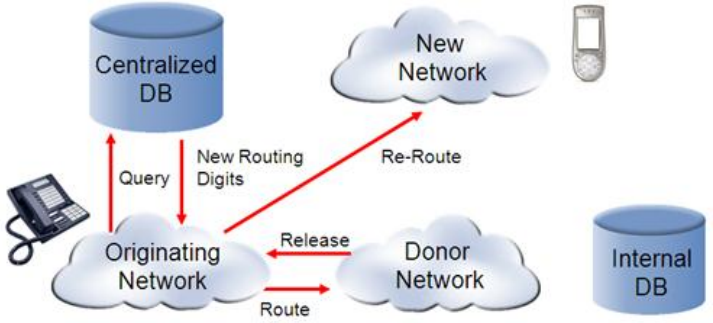
- Operational/ Efficiency?
- Complexity?
- Cost/ Investment?
- Impact on the Subscriber?

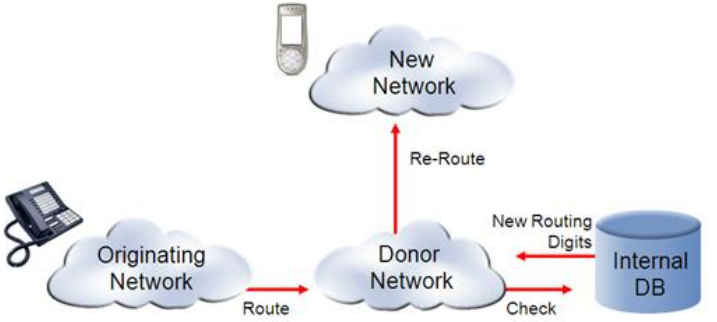
DIRECT ALL CALL QUERY



QUERY ON RELEASE



INDIRECT ONWARD ROUTING



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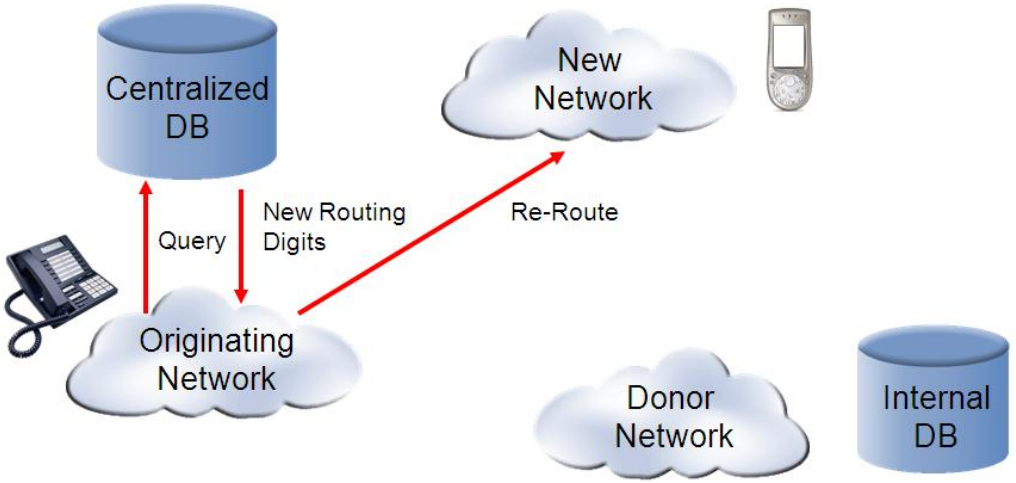
Routing Options – Direct Routing - All Call Query

- **All Call Query (ACQ)**: Every call is queried during call set up to determine if it is ported or not and if so, what operator/switch to route the call to
  - Pros
    - Network efficient at high volumes
    - All calls handled equally
    - Ported/non-ported numbers treated equally
    - No reliance on donor
  - Cons
    - Requires central database
    - Requires a local query DB – additional routing infrastructure required by Every operator – can be expensive



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Routing Options.. Indirect Routing – Onward Routing

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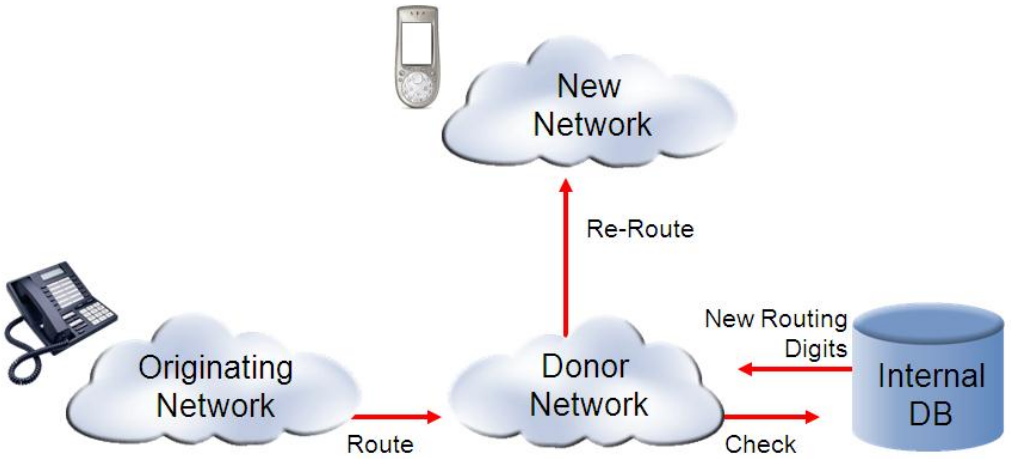
- **Onward Routing (OR):** Calls default routed according to number (prefix ownership). If a number has ported out donor/assignee operator does NP query to determine current provider and forwards call to that network
  - Pros
    - Can begin without extensive modifications to switches and networks
    - No new network elements to manage
    - No need for a central database
  - Cons
    - Dependent on donor network for call set up
    - Latency and prioritization
    - Network inefficiency – ties up 2 trunks per call
    - Donor network going out of business strands numbers and callers
    - Assignee operator has work to do even if number ports from 1st recipient to 2nd recipient
    - Text messages generally dropped when number ports



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Routing Options.. Indirect Routing – Query on Release

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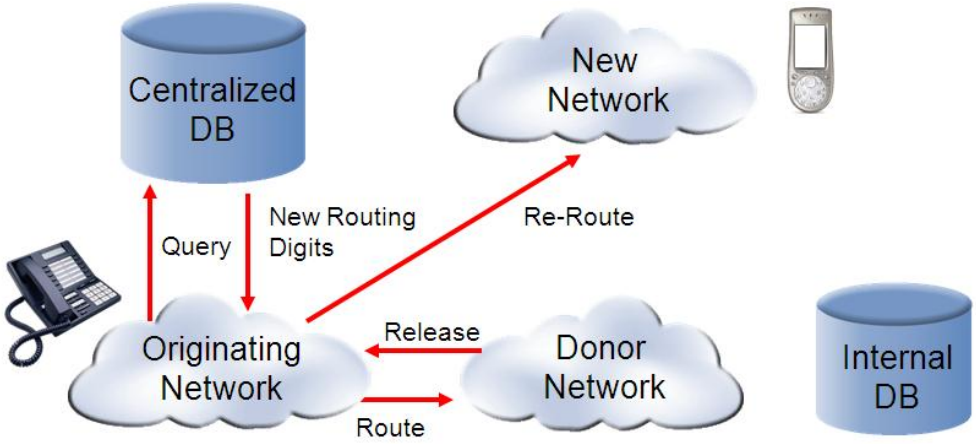
- **Query on Release (QOR):** Calls default routed according to number (prefix ownership) if number has ported out donor/assignee operator returns message in call set up then a NP query is done by originating network
  - Pros
    - Only ported numbers are queried,
    - Less overall latency
    - But calls to ported numbers have more latency than calls to non-ported numbers
  - Cons
    - Dependent on donor network for call set up
    - Requires central database -– additional routing infrastructure required by EVERY operator– can be expensive
    - Requires a local query DB – additional routing infrastructure required by EVERY operator – can be expensive



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Sharing the Cost of Routing?

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- Centralised Routing
  - Single routing solution/ infrastructure shared across all operators
    - Saves/ minimises industry routing investment/ costs
    - Potential single point of failure impacting all networks – potentially impacting all nationwide traffic
    - Ownership and management of the central routing platform?
    - Interfacing/ interworking with different operator networks and vendors?
- Clearinghouse/ Third Party Routing
  - ACQ routing/ traffic transit provided by third party
    - Reduces operator routing investments/ costs
    - Potential single point of failure impacting served networks
    - Potential regulatory issues – imbalance of routing investment, routing charges etc
    - Technical & interworking issues

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Triggered vs Triggerless Routing

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- Mobile Number Portability – 2 approaches
  - Signalling relay function (SRF) - a triggerless solution
    - The triggerless method intercepts the GSM/IS41 call delivery messages that are already flowing in the network, so that the switches need not be equipped with IN capabilities.
  - Intelligent network (IN) triggering - a triggered solution.
    - The triggered approach requires the switch to be equipped with IN triggering capabilities. The triggered solution can be used in either fixed or mobile environments.
- Fixed Number Portability – 2 Approaches
  - North America Markets
    - A triggered solution is commonly used in North America to support fixed number
  - Non North American Markets (ITU)
    - An ISUP-based triggerless solution is used to support fixed number portability.
- ITU-T Q. series specifies the functional requirements for supporting number portability, applicable to mobile and fixed networks.

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Different Triggered & Triggerless Routing Approaches

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- **SRF-based Mobile Number Portability (MNP):**
  - Triggerless solution applicable to GSM operators to support fixed-line NP and mobile NP.
- **• ANSI-41 Mobile Number Portability:**
  - Triggerless solution applicable to CDMA and TDMA operators to support fixed-line NP and mobile NP.
- **• INAP-based Number Portability:**
  - Triggered solution applicable to GSM and ITU based fixed-line operators to support fixed-line NP and mobile NP.
- **• ANSI-41 Number Portability (AINPQ):**
  - Triggered solution applicable to TDMA and CDMA operators to support fixed-line NP and mobile NP.
- **• Triggerless ISUP-based Number Portability (TINP):**
  - Triggerless solution applicable to wireline operators to support fixed-line NP and mobile NP.
- **• IS-41 to GSM Migration:**
  - Triggerless solution supports portability when an operator migrates its TDMA/CDMA-based network to a GSM based network and vice versa.
- **• Local Number Portability (LNP):**
  - Triggered solution applicable to North American (excluding Mexico) fixed-line and mobile (GSM, TDMA and CDMA) operators to support fixed-line and mobile NP.

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Routing Number Specification

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Routing Number Allocation/ Format

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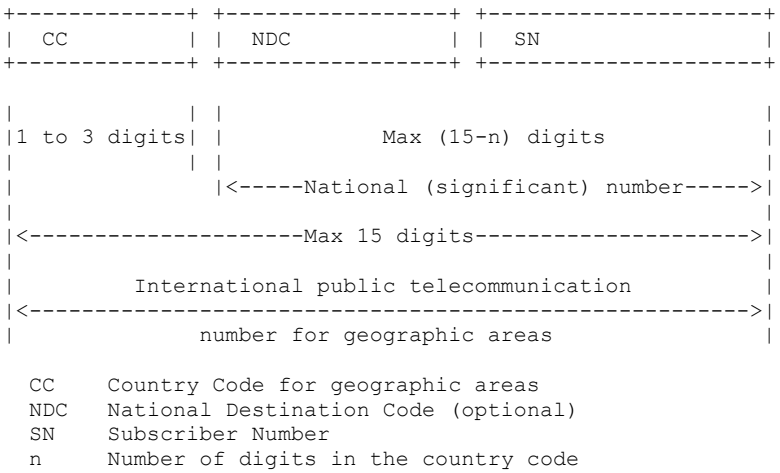
- **ITU-T Recommendation E.164 (1997),** The international public telecommunication numbering plan
- **routing number**: A number that is derived and used by the network to route the call towards a ported number
- Routing Number – Allocated by regulator – unique number for each operator
- For Bahamas – ITU E-164
  - N = 4 digits 1 242
  - 15-n = 11
  - RN < 4 digits
  - Hexidecimal format recommended to minimise ambiguity
  - Needs to be aligned to existing numbering plan and future needs



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Routing Number Implementation

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- All configurations which rely on number range will need to be changed
  - Routing Number
  - IMSI
  - Service Number
- Core Switch – Fixed & Mobile
- Voicemail
- SMSC
- VAS platforms
- Mediation
- Rating
- Billing/ IN

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Routing testing

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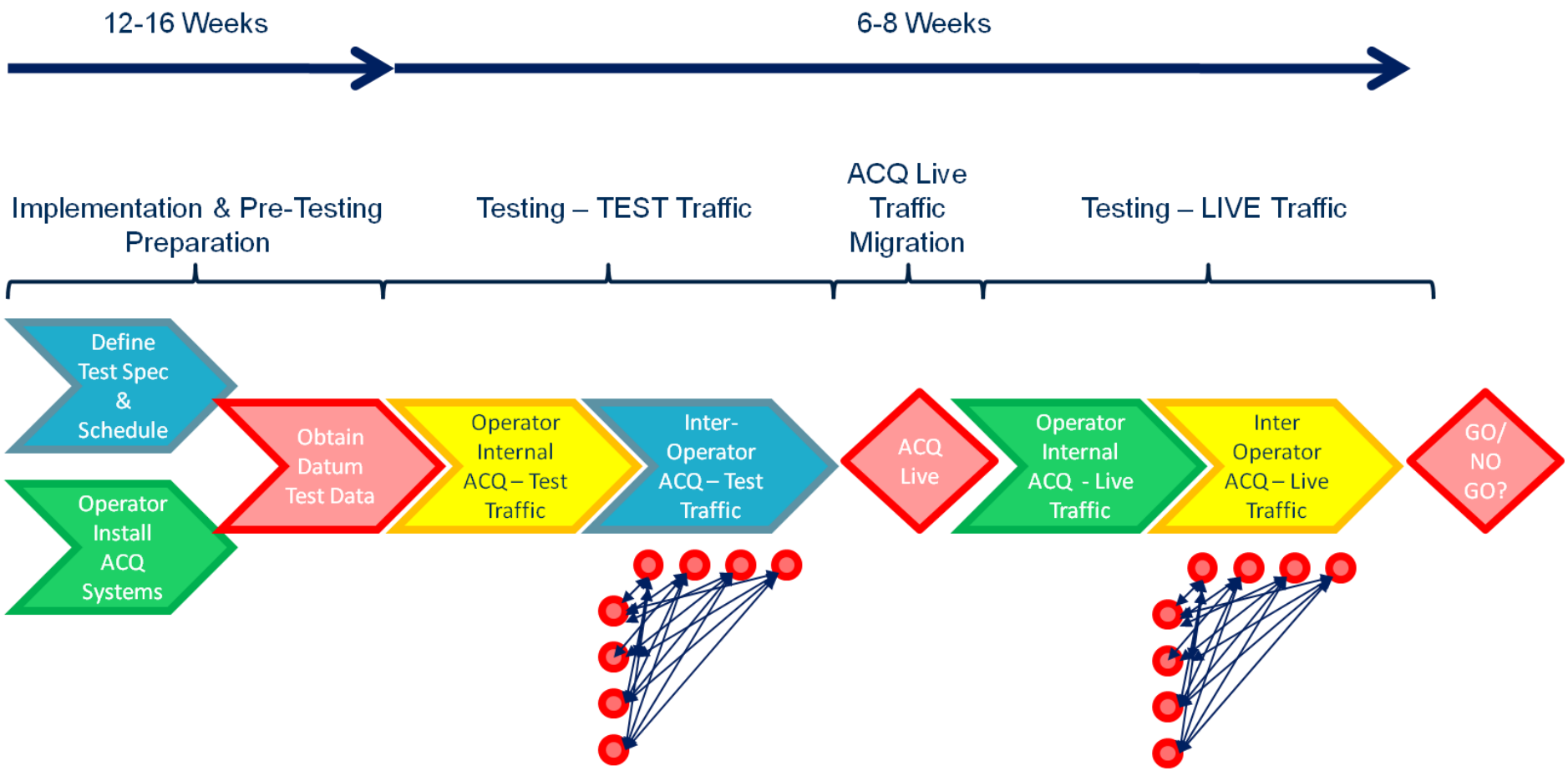
NP Routing Testing Approach



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Key Objectives of Routing Testing

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- Comprehensive Test Plan & Schedule
- Defined Testing Approach & Specification
  - Core Voice/ SMS scenarios
  - Local Fixed & Mobile Traffic
  - Roaming & International Traffic
  - VAS Products/ Services
- Agreed Test Numbers & SIM exchange
- Collection of Datum pre-NP Test & CDR data
- Comprehensive Internal Testing – Test & Live Traffic Scenarios
- Staged Inter-operator Testing – Test & Live Traffic Scenarios
- Revenue Assurance Validation
- Cross Party Sign-Off – ACQ Live Migration Go/ No Go
  - Big Bang vs Phased Approach?
  - Well planned & strong stakeholder coordination, co-operation & communication
  - Roll back contingency planning

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Sample Routing Testing Template

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			A-NUMBER		B-NUMBER				
A-PARTY	B-PARTY	DATE-TIME	MSISDN	IMSI	MSISDN	IMSI	CDR FORMAT/RN VERIFICATION	EXPECTED RESULTS	OBSERVATION
MobilePrepaidNon-Ported	Non-Ported-HOME								
MobilePrepaidNon-Ported	Ported-Out-HOME								
MobilePrepaidNon-Ported	Non-Ported-OLO								
MobilePrepaidNon-Ported	Ported-In-OLO								
MobilePrepaidNon-Ported	Ported-In-Prepaid-Roaming								
MobilePrepaidNon-Ported	Ported-In-Postpaid-Roaming								
MobilePrepaidNon-Ported	Non-Ported-Prepaid-Roaming-HOME								
MobilePrepaidNon-Ported	Non-Ported-Postpaid-Roaming-HOME								
MobilePrepaidNon-Ported	Fixed-Line-HOME								
MobilePrepaidNon-Ported	International								
MobilePrepaidPorted-In	Non-Ported-HOME								
MobilePrepaidPorted-In	Ported-Out-HOME								
MobilePrepaidPorted-In	Non-Ported-OLO								
MobilePrepaidPorted-In	Ported-In-OLO								
MobilePrepaidPorted-In	Ported-In-Prepaid-Roaming								
MobilePrepaidPorted-In	Ported-In-Postpaid-Roaming								
MobilePrepaidPorted-In	Non-Ported-Prepaid-Roaming-HOME								
MobilePrepaidPorted-In	Non-Ported-Postpaid-Roaming-HOME								
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FixedPrepaidHOME	Fixed-Line-HOME								
FixedPrepaidHOME	International								
FixedPostpaidHOME	Non-Ported-HOME								
FixedPostpaidHOME	Ported-Out-HOME								
FixedPostpaidHOME	Non-Ported-OLO								
FixedPostpaidHOME	Ported-In-OLO								
FixedPostpaidHOME	Ported-In-Prepaid-Roaming								
FixedPostpaidHOME	Ported-In-Postpaid-Roaming								
FixedPostpaidHOME	Non-Ported-Prepaid-Roaming-HOME								
FixedPostpaidHOME	Non-Ported-Postpaid-Roaming-HOME								
FixedPostpaidHOME	Fixed-Line-HOME								
FixedPostpaidHOME	International								

Routing - 600 tests per phase - 4 phases

Revenue Assurance – 2000 tests

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Example VAS/ Ancillary Testing

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- Call Ring Back Tones
- Money Transfer/ Mobile Banking
- Call Forwarding
- SMS Service Notifications
- USSD Services
- USSD Notifications
- Recharge Functions
- Friends & Family – CUG
- Voicemail
- Blackberry Services
- Loyalty Management Systems – Bonus/ Reward
- Premium Rate SMS/ VAS services
- Service & Short Code Access
- Negative balance/ Credit overdraw
- Home Zone/ Cell Zone services
- Fixed Wireless Products & Services
- International Roaming – CAMEL
- Corporate Hybrid Services
- SMS Blacklist/ Whitelist Management/ Screening

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Central NP Clearinghouse Functional & Operational Requirements

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Central NP Clearinghouse Functional & Operational Requirements

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- Management of Central Number Database
- Routing broadcast update to operator local routing databases – Real-time update
- Management of inter-operator NP porting process
  - Initial validation – customer/ system
  - Onward Porting Restrictions
  - Progress communication with customers
- Management of porting history
- Safeguarding of Porting & Routing data
- Return to Block Operator Number Management Process
- Local Routing Database Synchronisation
- NP performance management and reporting
- Helpdesk support to stakeholders

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Porting Process & Interworking with Central Clearinghouse

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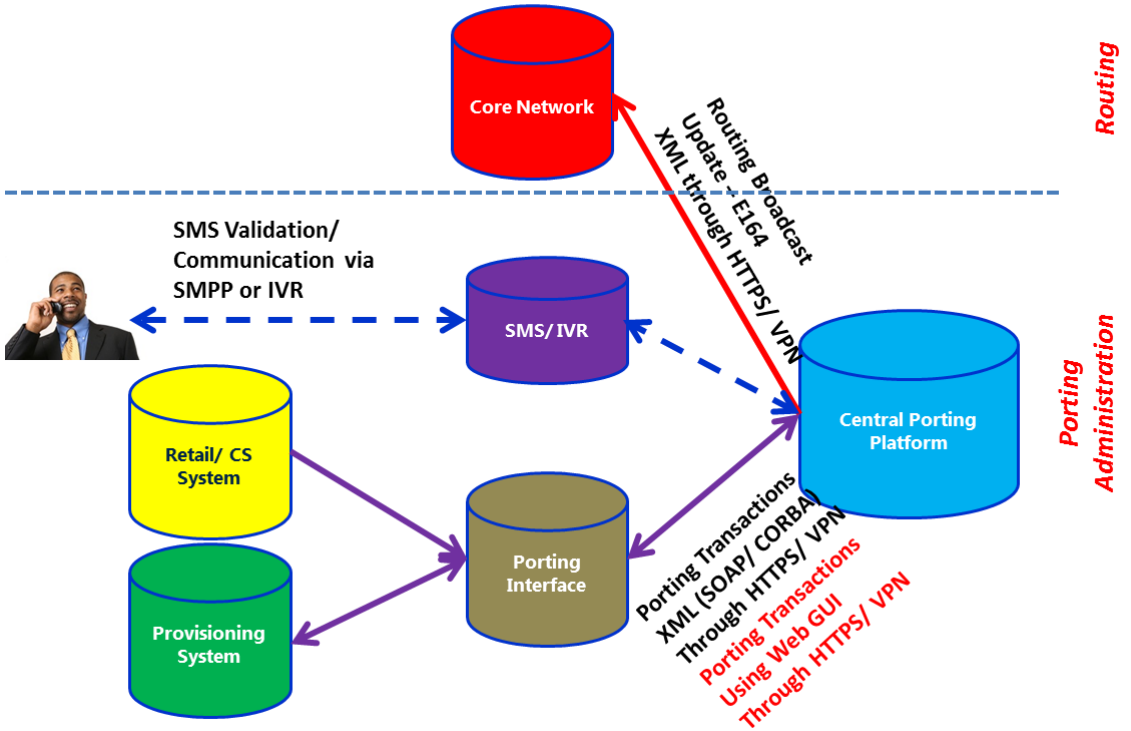
Operator Connectivity to the Central Porting Platform

- Receive Routing Updates & Automatically Process within Local Routing Database – Real Time
- Transmit customer validation & communication SMS (Mobile)
- Connect to IVR validation platform & process customer email updates (Fixed)
- Transmit, Receive & Process Porting Messages
  - Manually – via GUI
  - Automatically – via XML etc
  - Port IN
    - Port Requests
    - Port Activation
  - Port OUT
    - Port Approval
    - Port Deactivation



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NP – Fixed vs Mobile ?

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- **Service availability between Operators - Key Pre-requisites**
  - Direct Interconnection – Fixed to Fixed & Fixed to Mobile
  - Network Access – Fixed – LLU etc – need for pre-order audit etc
- **Operational delivery**
  - Mobile – transfer/ provisioning completed at core network level – simple & quick
  - Fixed – transfer can be complex, involving audit, exchange jumpering, Wholesale Access Product Framework (LLU/ WLR etc) customer premises line provisioning & engineer co-ordination
- **Porting Timescales**
  - Mobile – less than 2 working hours
  - Fixed – typically 2 to 5 working days (aligned to existing provisioning timeframes)
- **Porting Windows**
  - Mobile – aligned to retail opening hours
  - Fixed – extended since business customers require out of hours porting to minimise disruption to business activities

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Fixed vs Mobile – Porting Process Differences

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Porting Stage	Mobile Number Portability	Fixed Number Portability
Initiation	Confirm customer ownership of number Check customer ID	Confirm customer ownership of number Check customer ID **Confirm services can be provided & by what means?**
Validation	CdB checks validity of porting request Customer sends PORT sms CdB aligns & validates Port sms to port request	CdB checks validity of porting request **Customer calls PORT IVR** CdB aligns & validates Port IVR to port request **Donor may complete survey to confirm network availability & resources**
Authorisation	Donor validates porting request against agreed checks	Donor validates porting request against agreed checks
Porting & Configuration	Recipient activates number/ services Activation confirmed via CdB	**Recipient arranges engineer/ exchange provision of services** Activation confirmed via CdB **Recipient co-ordinate engineer/ exchange activity with Donor if necessary – separate to CdB**
Broadcast & Finish	Donor deactivates/ disconnects services CdB sends E164 broadcast to all operators to update local copies of routing CdB Port Closed	Donor deactivates/ disconnects services CdB sends E164 broadcast to all operators to update local copies of routing CdB Port Closed

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Fixed & Mobile NP – Operator Implementation Considerations

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- Forcing operators to implement & operator separate fixed & mobile NP support systems/ functions?
  - Core network routing
  - Provisioning systems
  - Mediation/ rating & billing systems
- Central NP Clearinghouse – most NP platforms capable of processing fixed & mobile number portability transactions.
  - Changes required to Porting Process Flow, Timers, Validation Requirements, Porting Windows, Reject reasons etc
  - Expansion of central number management database to include fixed number range allocations
  - Additional automated consumer authorisation/ validation mechanism, ie IVR/ PIN etc
  - Development of automated interfaces/ manual GUI porting facilities
- Routing Approach
  - Different routing approaches for fixed and mobile NP?
  - Indirect Routing - more appropriate for fixed NP
  - All Call Query Direct Routing – Appropriate for both Mobile & Fixed Number Porting
    - All Call Query Routing and CDR/ Billing System Changes applied to across all core network & business systems

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Fixed Number Portability – Implementation Considerations

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- **Robust and established Wholesale Access Product Frameworks & Inter-operator provisioning processes**
  - **LLU** – requires **significant investment by all parties** in access infrastructure
  - **WLR** – requires regulated commercial and operational frameworks
  - **FWP** – Quick and change to implement and uses existing mobile provisioning approach
  - Inter-Operator provisioning processes, resources and facilities to manage complex transfer of fixed number services – potential out of hours porting for business users
- **Business Rules** – Similar between Fixed & Mobile
- **Consumer Code** – Similar between Fixed & Mobile
- **Regulatory Requirements** – Similar between Fixed & Mobile
  - porting charges, transit charges, porting SLAs -
- **Operational Requirements** – Similar between Fixed & Mobile
  - Inter-operator provisioning interworking processes, changes to bundled package management/ billing, Off/ On Net differential billing, separation of DSL & Voice services

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Porting System Requirements

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Operator Porting System/ Process Requirements

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- Single/ Multiple/ Block Port Transactions
  - Port In
  - Port Out
- Real Time Approval of Porting Requests
  - Checking Billing/ Customer Services/ Provisioning/ Core Network systems
- Multi-channel Retail Access
- On Demand Pre Pay SIM provisioning
- Accurate & Real-Time Verification of Service Availability - Fixed
- Real Time Service Activation/ Deactivation
- Co-ordination of Field Engineers/ Truck Rolls with OLOs
- Separation of Voice & ADSL Services
- Return to Block Operator/ Number Range Holder – Quarantining Ported Numbers
- Separation of Customer Accounts
- Real-time generation of Final Bills

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Implementation of porting systems into Operator business systems/ processes

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Business Systems Impacted by NP

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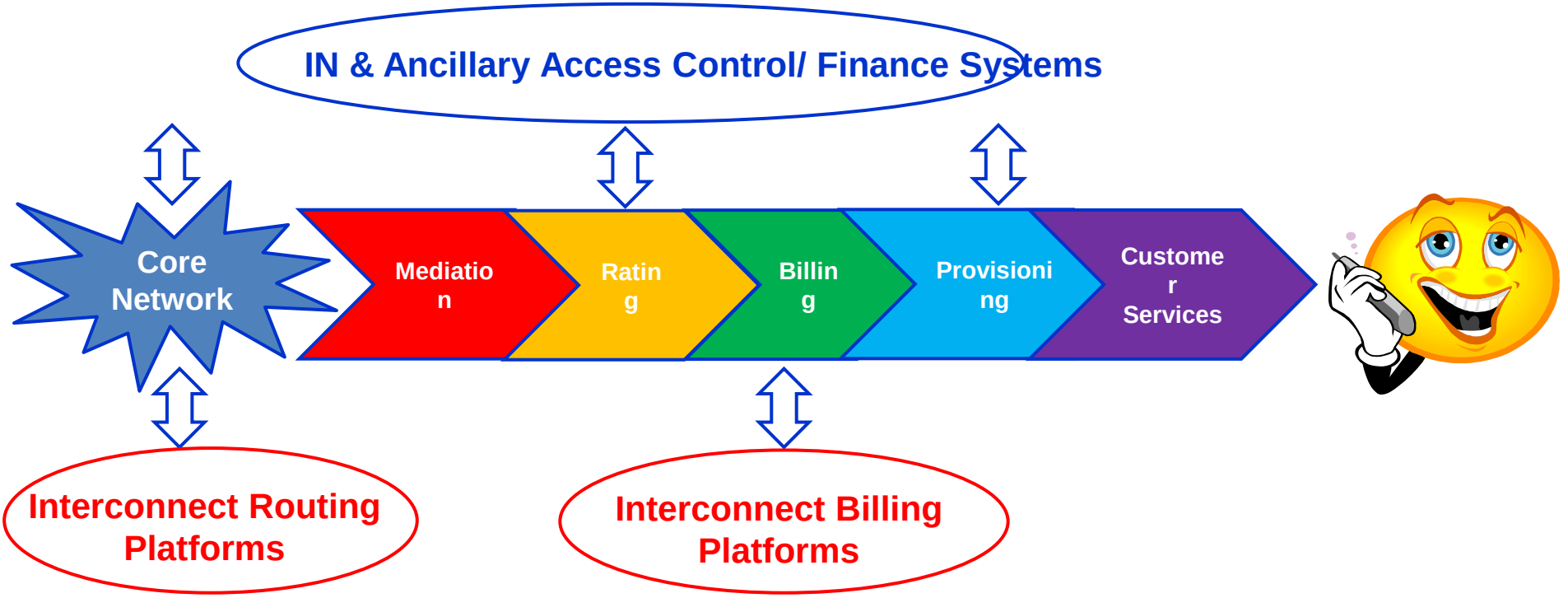

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NP– Impact on Business Systems

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System Type	Impact	Change Required	Nature of Change
Customer Relationship Management	High	Very Likely	Validate Port-Out requests. Segregate Ported Out services/ customers
Retail Billing	High	Very Likely	On/ Off Net billing can no longer be processed by number range. Presentation of differential on/ off net billing
Mediation	Critical	Mandatory	Ability to collect & process pre-fixed CDRs
Rating	Critical	Mandatory	Ability to rate CDRs for On/ Off Net traffic
Interconnect Billing	Critical	Mandatory	On/ Off Net processing and billing of On/ Off Net Interconnect traffic
Network Routing	Critical	Mandatory	CdB look-up and prefixing/ routing of traffic to ported numbers. Integration to receive porting updates from porting application. On/ Off Net call differentiation. Changes to HLR/ Roaming configurations
Pre Pay Mobile	High	Very Likely	Provisioning of ported numbers with non block number ranges. Pre Pay usage & Roaming management for Ported IN & Out numbers
Post Pay Mobile	High	Very Likely	Provisioning of ported numbers with non block number ranges. Pre Pay usage & Roaming management for Ported IN & Out numbers
Service Activation/ Provision – Fixed/ Mobile	Critical	Mandatory	Interaction/ coordination with the central Porting Application & other operators. Verification of service provision to ported users

NP Core Network Considerations

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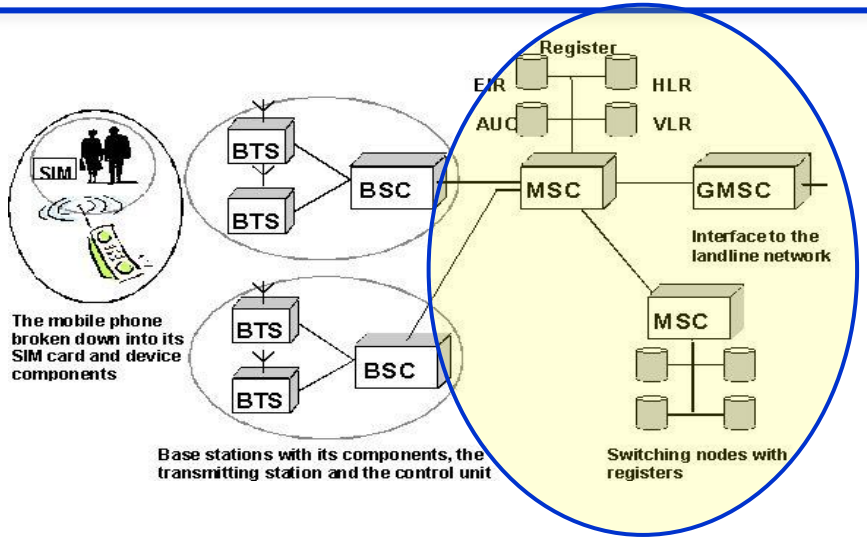

Simple or Complex Core Network architecture

Single or Multiple Core Network Vendors?

Integrated Core Network Platforms? HLR/ IN etc

NP requires either onward routing or local look-up database/ addition of a Routing Number – Options include :-

- STP (Signal Transfer Point) – upgrade or additional
- Central Services Database Platform
- Activation of NP functionality on existing MSC/ HLR

Routing update Interfacing/ Interworking with central porting clearinghouse/ database

- Existing Core Network Vendor
- In-House Development
- Central porting vendor
- Third Party

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NP Core Network Impact Assessment

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ALL number range network settings/ configurations WILL change

Most routing issues caused by inadequate impact assessment of MNP on call flows. Vendors assume operators are experts & vice versa

Risk analysis & planning critical to ensure smooth migration to pre-fixed traffic routing across the networks – staged approach

- Call Flow, Services & Scenario Analysis

Development & agreement of detailed test plans covering all possible scenarios, including In & Out roaming

- Internally
- Inter-Operator

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NP Core Network Impact Assessment

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- Routing prefixing – format and configuration
- Routing number requirements for individual network elements
- Differential processing of pre-pay/ post pay and SMS traffic
- Collection & presentation of differentiated Off Net/ On Net CDRs
- ACQ processing of SMS traffic - enum
- Compatibility issues between different operators' networks
- On Net/ Off Net Notification approach?
- Prevention of Call Loop Back during the port activation phase
- "On Demand" provisioning of SIMs/ Services
- Separation of ADSL from Voice Services
- Out of Hours porting of corporate/ enterprise fixed services

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On Net/ Off Net Differentiation

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- **Why?**
  - **Customers no longer able to tell whether a call is On Net or Off Net by the number pre-fix**
  - **Protect customers & regulators from "Bill Shock" complaints**
- **Reality – Unnecessary & Dangerous**
  - **Customers only call limited numbers & soon identify a ported number – very few Bill Shock complaints**
  - **Tones/ message etc cause irritation & confusion to customers**
  - **Can cause major disruption & damage to core networks**
  - **Involves significant engineering activity & cross stakeholder co-ordination**
- **Differential ring tone – conflicts with VAS CRBT**
- **Off Net Tone – Causes customer irritation and confusion**
- **Off Net Message – Causes customer irritation**
- **SMS/ Web Look Up – Better Option – Less Intrusive – Can be Provided by Central Clearinghouse provider**
- **Recommendation – Avoid or make optional**

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Business Systems Impacted by NP

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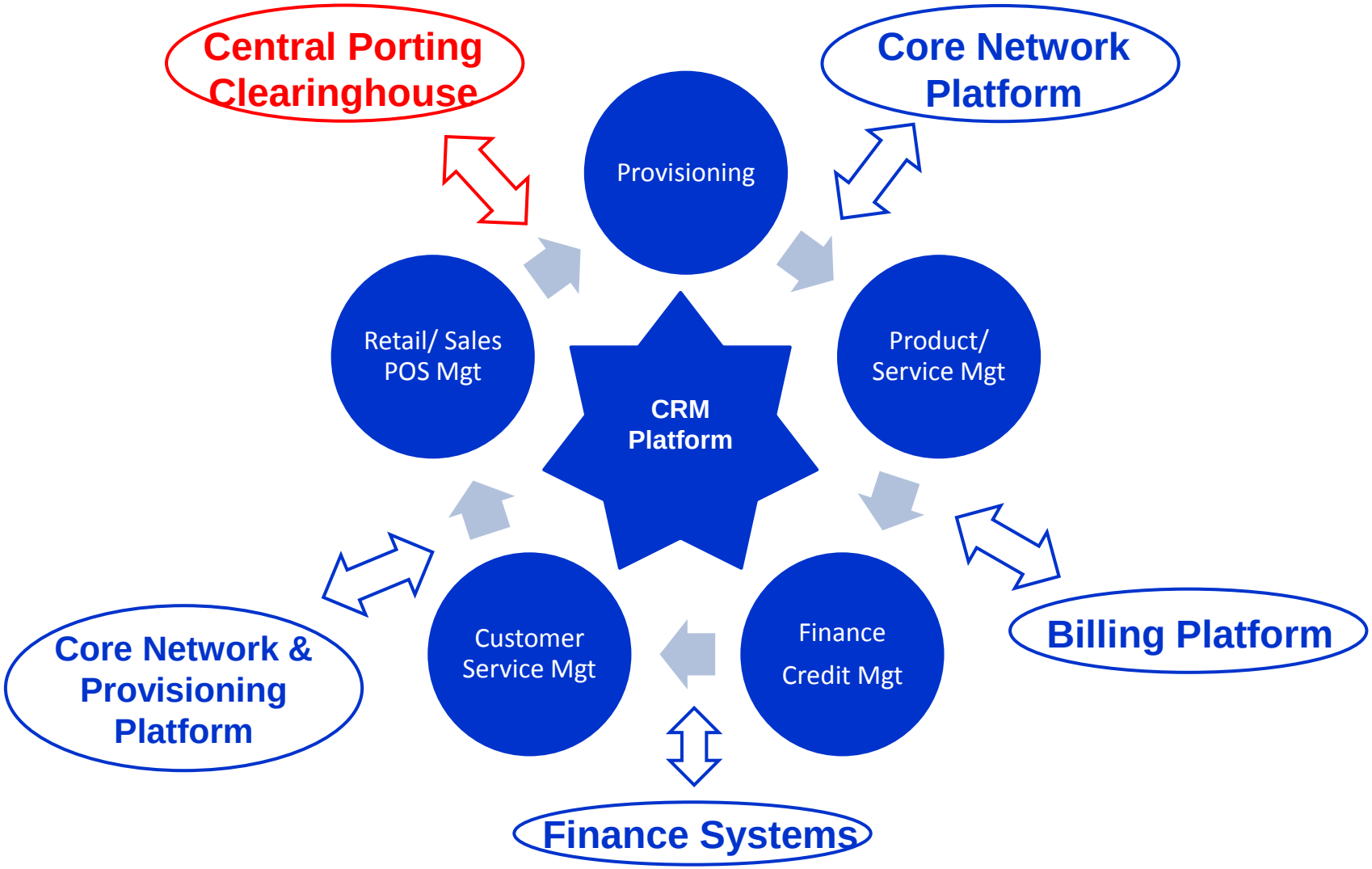

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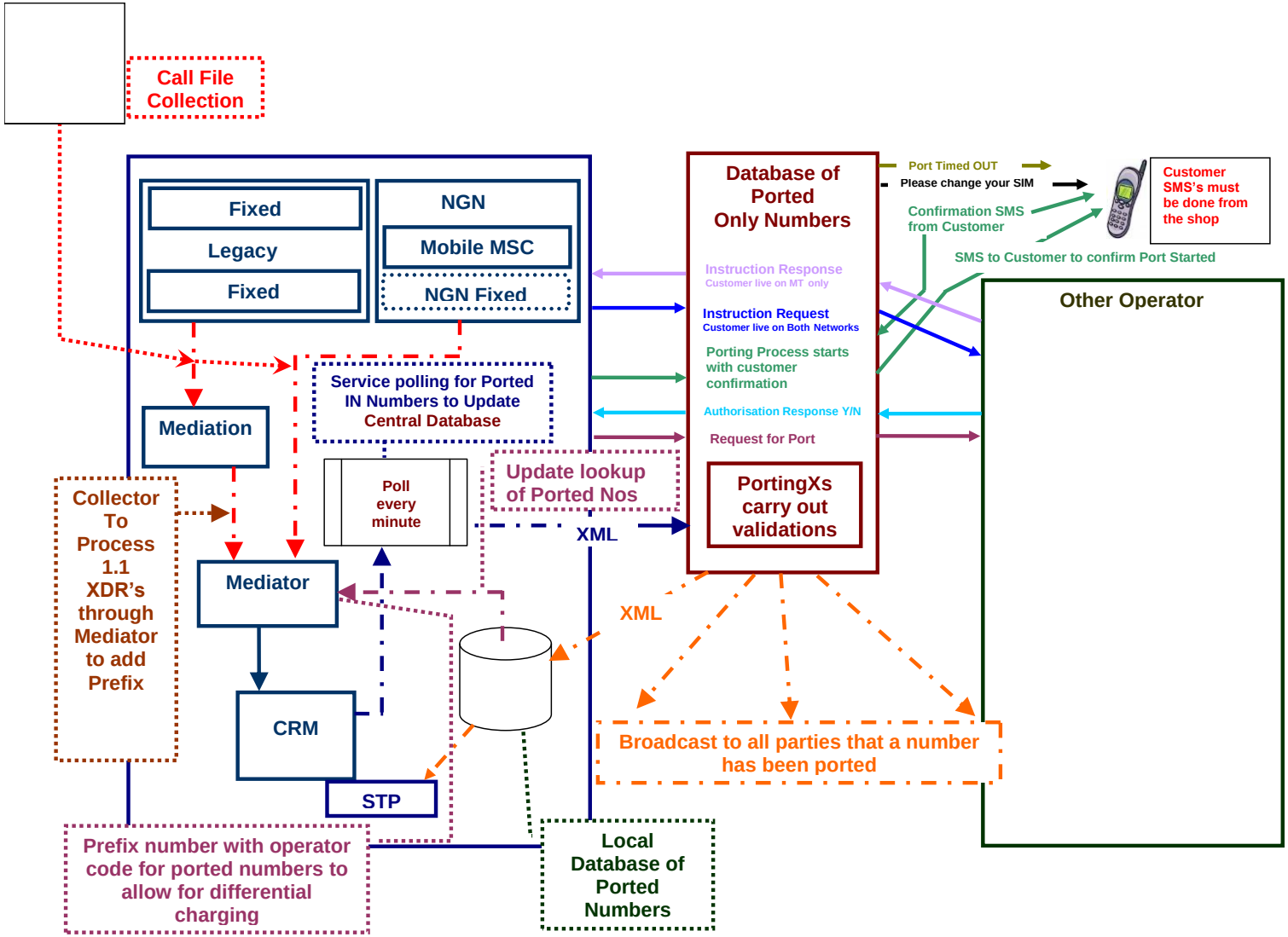
Example NP Systems Architecture



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Routing is just part of the story?

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- Critical to be able to rate & bill calls/ SMS correctly & in real-time
- Collection & presentation of differentiated Off Net/ On Net CDRs
- Differential processing of pre-pay/ post pay and SMS CDRs
- Correct rating against CUG/ Friends & Family services
- Accurate processing of Pre-Pay decrement, bonus and top-up services for ported numbers
- Processing of Roaming CDRs for ported numbers
- Interconnect CDR processing & billing
- Treatment of debt – credit management
- Separation of multiple/ bundled services to support porting – Voice/ ADSL/ Mobile
- Prevention of accidental Winback – Multiple services

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NP Process Impact Assessment

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- **Process efficiency ? – meeting regulatory NP timeframes**
- **Capacity issues? – scalable to meet peak demands**
- **Security – Safeguarding subscriber integrity and meeting data protection requirements**
- **Flexibility – Supporting Fixed & Mobile, Pre-Pay & Post Pay, Retail & Business?**
- **Availability – Geographically – bringing porting to the consumer – multiple channels? Time – complying with regulatory requirements**
- **Reliability & Stability – Providing a consistent and quality porting experience**
- **Impact on existing operations – Retail/ Channel footfall, provisioning capacity etc**
- **Level of Automation - CAPEX investment vs OPEX resourcing, system capabilities etc**

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Porting testing

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Key Objectives of Porting Testing

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- Verify central porting application conforms with specified NP process requirements
- Test Port-In and Port-Out Functionality , Stability & Usability– GUI & API
- Test ALL porting scenarios
- Test porting fault finding & fixing
- Testing completed with allocated & managed test accounts using exchanged SIMs
- Driven by comprehensive inter-operator test specification and schedule
- Carefully managed through phased and co-ordinated approach

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NP Porting Testing Approach

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Implementation & Pre-Testing Preparation 12- 16 weeks

NP Porting Systems Acceptance Testing 3-4 weeks

Operator NP System Testing 2-3 weeks

Inter-Operator NP System Testing 3-4 Weeks

Define Test Spec & Schedule & SIM exchange

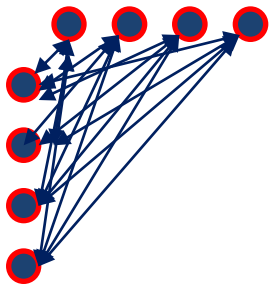
Parties Install NP Systems

Acceptance Testing of NP Platform

Operator Internal Porting Application Testing

Inter-Operator Porting Testing

GO/ NO GO ?



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Porting Testing – Considerations

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Provisioning

- Systems
- Processes
- Variations in Delivery Mechanisms – Fixed

Field Operations – Fixed

- Service Availability – Efficiency & Accuracy of Survey Activities
- Coordinating Field Resources

Validation mechanisms are Appropriate, Reliable & Consistent

- Data Transfer/ Checking – Accurate & Reasonable
- SMS/ IVR – Consistent, Stable & Reliable

Stability of Inter-operator Links & Interfaces

- Stress Testing – Porting Volumes
- Consistent Response Times
- "Fool Proof" Resistance
- Monitoring & Fault Fixing Performance

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End-2-End testing & launch readiness preparations

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NP Testing Approach

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Comprehensive & Exhaustive Testing is Critical

Ensure that NP implementation does NOT impact

- Customer Services Provisioning & Migration
- Core Network Routing
- Service/ VAS Product Delivery
- Revenue & Financial Integrity
- Retail Systems & Processes

Takes a minimum of 6-8 weeks

Parallel Internal and Inter-Operator Routing & Provisioning Testing Programmes

Final Integrated End-2-End & Readiness Testing Phase

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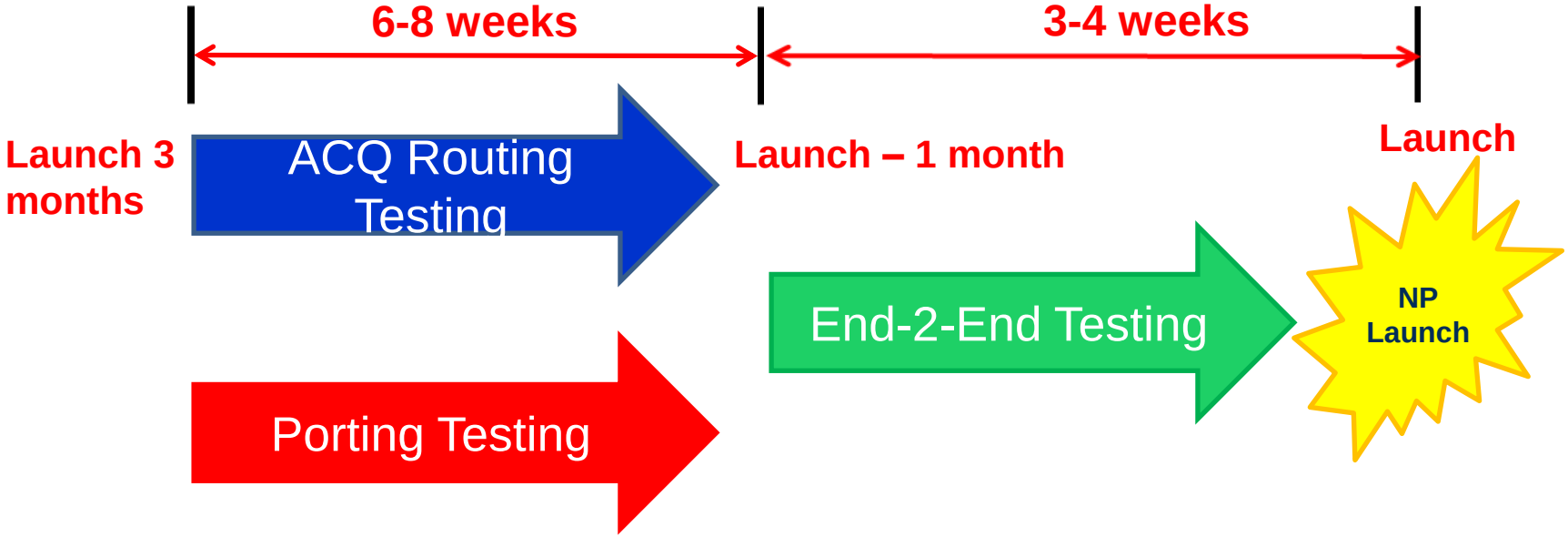
Staged NP Testing Programme



Carefully structured and managed test schedule

Test & verify ACQ and Porting separately

End-2-End testing checks all elements

End-2-End testing can include verification of retail systems, processes & training ahead of launch

Depends on readiness of all parties and close collaboration between operators

Minimum test period – 6 to 10 weeks – depending on readiness

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Effective Testing Progress Tracking & Collaboration are Key

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- Agreed testing objectives & approach
- Clearly defined & realistic testing milestones
- Nominated testing owner within each stakeholder
- Comprehensive defined testing management framework
- Regular & structured progress reviews
- Positive commitment & collaboration between the Stakeholders
- Openness & honesty between all parties

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NP End-2-End Testing

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Final key stage – typically last 3-4 weeks

Verifies all constituent elements & processes are working correctly

- ACQ routing
- Porting systems/ process
- Retail training
- Revenue Assurance
- Porting fault finding – inter stakeholder

Involves multiple functions across ALL operators & stakeholders

Mystery shopping between operators can be useful to identify operational issues & verify uniform & positive porting experience

- Identify porting process anomalies defect & assess training issues & verify uniform porting experience across operators

Final stage before the KEY All Party Launch Go/ No Go decision milestone – signed off at CEO level

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NP Testing – Food For Thought?

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Who Should Drive Testing?

- Operators or Regulator?
  - Regulator – Driver, Participant or Observer?

Launch on target or when ready?

Critical tool for tracking and verifying readiness and compliance

Testing is not just a Technical Process – Testing should challenge every aspect of NP

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Future evolution of NP services and functions

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Future-proofing the NP service

- Any service which involves a numeric unique identifier and can be offered by different competitors can be ported
- Telecoms
  - VoIP
  - DNS
  - Enum
  - Non-conversational services based on MSISDN – BBM/IM
  - Least cost routing of International calls
  - IP-IP – IP interconnect
- Non –Telecoms
  - Bank Accounts
  - Credit Cards
  - Utility Services
  - Health Insurance etc

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Thank you

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