Routing & Addressing: Basic Principles for Alternative Services

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international ip interconnection

i3 forum

i3 Objective and Progress Updates

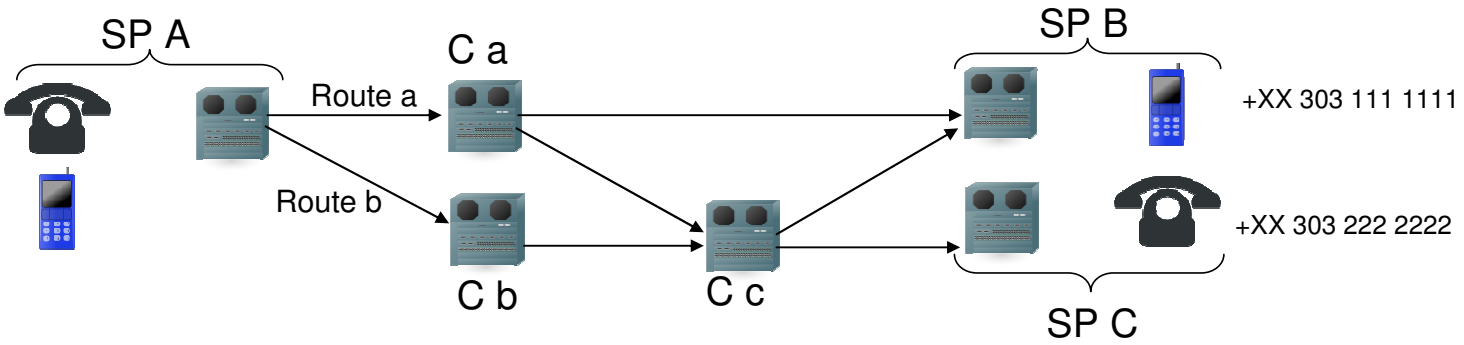
- **Objectives**
  - ✓ Support alternative services to explore new revenue opportunities
  - ✓ Allow carriers to exchange addressing and service attribute information
  - ✓ Optimize carrier routing & addressing schemes
  - ✓ Evolve from country-to-country routing to network-to-network routing
  - ✓ Assist effective bilateral/multilateral traffic exchange
- **Progress Updates**
  - ✓ i3 carrier routing and addressing discussion started in late 2008
  - ✓ Documents published in May 2010
    - ✓ i3 Forum WS "Services" – Routing and Addressing Services for International Interconnections over IP (V 1) May 2010
    - ✓ i3 Forum WS "Technical" – White Paper Techniques for Carriers' Advanced Routing and Addressing Schemes (Rel 1.0) May 2010
    - ✓ http://www.i3forum.org/library

Alternative Service Opportunities

- **Alternative Services**
  - ✓ Onnet routing opportunity with
    - ✓ Terminating service provider network
    - ✓ Exclusive carrier network representing the underlying service providers
  - ✓ Value-added services
    - ✓ E.g. leveraging presence information to pre-determine terminating party status
  - ✓ Call filtering based on end user and underlying carrier capabilities
  - ✓ CLI validation verifying the sending network's ownership of the number
  - ✓ Wideband calls via capable carriers to supportable end devices
- **Required Routing Information**
  - ✓ Terminating network serving dialed E.164 number
    - ✓ Number portability corrected data or service provider ID
    - ✓ Solutions available in some countries but vary by country and technology
  - ✓ Terminating device capabilities
    - ✓ Phone types: fixed, mobile, VoIP, TDM, wideband, and narrowband
    - ✓ Supported services: SMS, PSTN, FAX/IFAX etc.

Carrier Routing Decision

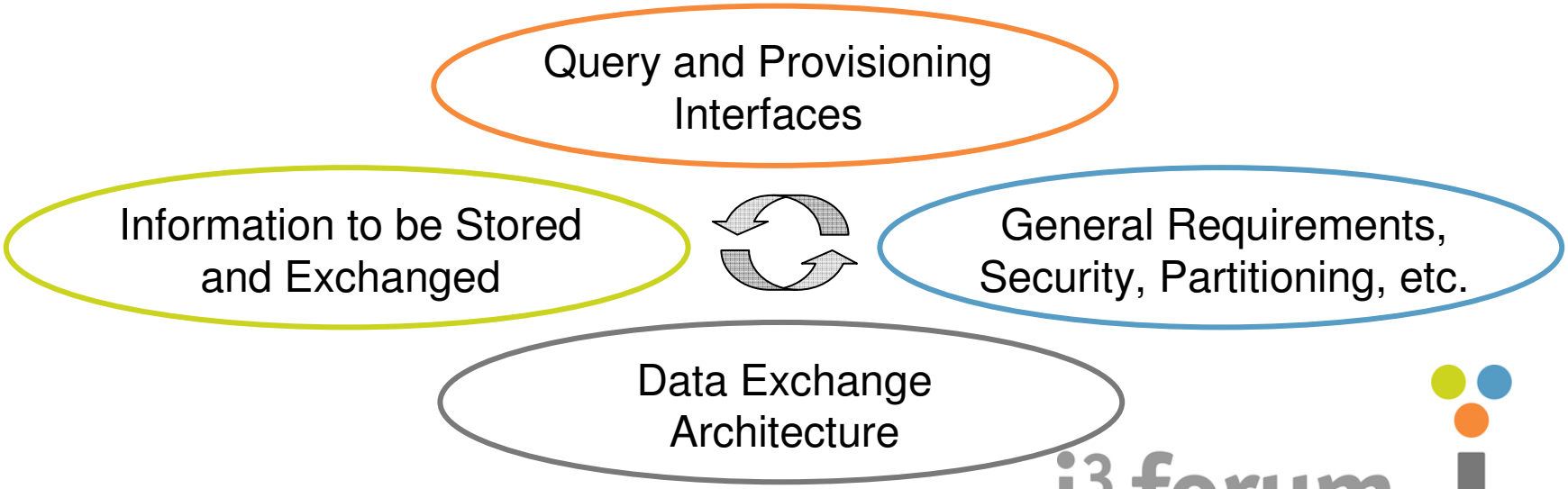
- **Routing Decision Variables**
  - ✓ Business commitment, e.g. traffic volume commitment
  - ✓ Business cost optimization, e.g. Least Cost Routing
  - ✓ Capacity availability
  - ✓ Quality parameters
  - ✓ Service requested
  - ✓ Quality requested
  - ✓ Technology awareness, e.g. end-to-end IP, special codec support
- **Routing Decisions Managed by Carriers**
  - ✓ To identify optimal route rather than the most direct route



Advanced Routing and Addressing Schemes

- **Service Requirements**
  - ✓ Standard interface for data exchange with international operators
  - ✓ Standard information presentation format and query interfaces
  - ✓ Common language for data interpretation
  - ✓ Flexible commercial models to upload, query, and exchange data while considering local regulatory rules
    - ✓ Privacy and confidentiality of consumer information

Areas Covered



Query and Provisioning Interfaces

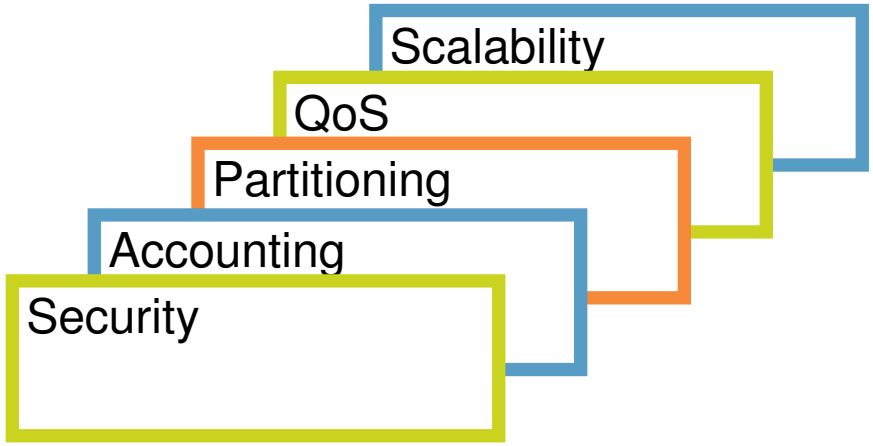
- **Query Interfaces**
  - ✓ Four alternatives studied
    - ✓ ENUM
    - ✓ SIP Redirect
    - ✓ SS7 MAP/TCAP
    - ✓ DIAMETER
  - ✓ ENUM is recommended
    - ✓ IETF RFC 3761 & 4769
    - ✓ Tel URI or SIP URI
    - ✓ Number portability corrected info
    - ✓ Service info
  - ✓ SIP Re-direct is recommended
    - ✓ When ENUM is not supported
    - ✓ Service Provider ID based routing complexity
    - ✓ Lack of multiple service types

- **Provisioning Interfaces**
  - ✓ Data upload to registry
  - ✓ Data download from registry
  - ✓ Other reference interfaces
    - ✓ Existing carrier federation
    - ✓ Other consortium registry
    - ✓ Selected national NPDB
    - ✓ Selected regional NPDB
  - ✓ Some available standards
    - ✓ IETF
    - ✓ CableLabs
    - ✓ Vendor defined interfaces

Information to be Stored and Exchanged

- **International Service Provider Identity (SPID)**
  - ✓ Int'l SPID as input to carrier routing decision
    - ✓ Routing decisions remain within carrier domain
    - ✓ Carriers map SP to a carrier or a group of carriers for routing
  - ✓ Universally consistent SPID scheme requirement
    - ✓ Some recommendations available but no industry-wide acceptance
    - ✓ Single code per service provider is preferred
    - ✓ ITU Study Group 2 Effort and ITU Recommendations M.1400
    - ✓ IANA Enterprise Numbers (IETF RFC 2578)
    - ✓ i3 continues monitoring the industry development on SPID schemes
- **Other Data Objects**
  - ✓ Public Identity – E.164 number or number ranges
  - ✓ End User Service Objects
  - ✓ Data Source Identity for shared database
  - ✓ Virtual User Identity – Network-free VoIP provider, or an enterprise, not necessarily the Service Provider of record

General Requirements



- **Data Partitioning Requirements**
  - ✓ Vertical partitioning
    - ✓ A party is permitted to query only a set of numbers or addresses
    - ✓ A party is permitted to query and replicate a set of numbers or addresses
  - ✓ Horizontal partitioning
    - ✓ A party is permitted to query or replicate a subset of the service attributes
- **Security, Accounting, QoS and Scalability Requirements**
  - ✓ Refer to the white paper

Summary

- **Carrier Community Requirements**
  - ✓ Evolving the traditional E.164 country code and number block based routing
  - ✓ Optimizing traffic routing leveraging number portability corrected data
  - ✓ Creating alternative service opportunities using service based routing
  - ✓ Standardizing the approach is critical for the carrier community
- **Unified Effort from the Industry**
  - ✓ Development of a universal standard for service provider ID
  - ✓ Definition of required service and capability information
  - ✓ Integration of SP ID, number portability, and service attributes into a form suitable for use by carriers' routing optimization systems
  - ✓ Suitable architecture for carriers to exchange routing and addressing information