



Telekom Austria TA AG

ENUM – Next Generation Interconnection



April 2008
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Agenda

- Telekom Austria Group Overview
- Mobile Services provided by TA WS CCMS for the TA Group
- GSMA ENUM Pilot Mobilkom Austria – Telekom Austria
- Applications and Benefits
- Integration Possibilities
- Roadmap
- NRS Intergration
- Technical Integration
- Tier 2 Service - Any Call Enablement
- Tier 1 Service - National & International Call
- Tier 0 Service - International Call Enablement
- Other Scenarios
- Next Steps

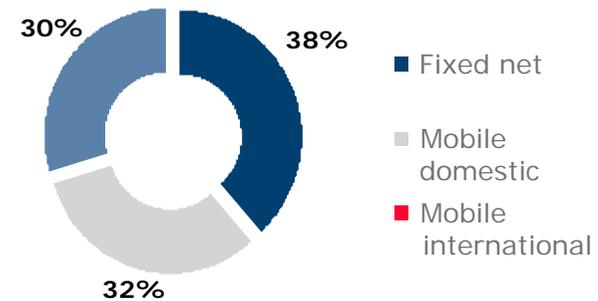
Telekom Austria Group

-is a Strong Player in Eastern- & South-Eastern Europe



International Expansion

- 1998: Croatia
- 2000: Liechtenstein & Czech Rep.
- 2001: Slovenia
- 2005: Bulgaria
- 2006: Serbia
- 2007: Macedonia & Belarus

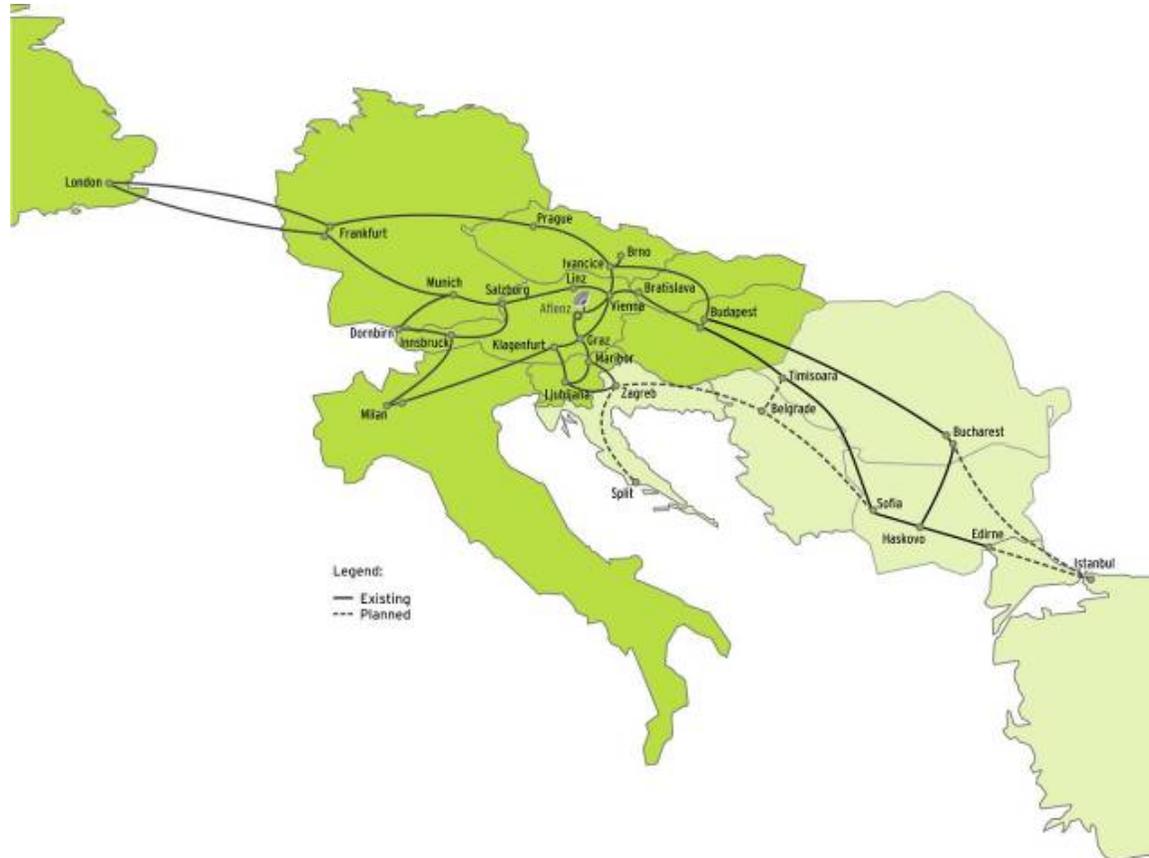


<http://wholesale.telekom.at>

Highlights

- Established player in the CEE region due to high-quality service and cross-cultural understanding
- „Follow your customer“ – Telekom Austria Wholesale paves the way for worldwide connections
- Future-oriented infrastructure is the basis for success:
 - Country-wide and largest network in Austria
 - Telekom Austria’s JetStream backbone connecting the CEE region
 - Teleport Aflenz
- Wide range of services and solutions:
 - Voice telephony
 - Scalable data networking
 - Customer-specific corporate networks
 - Global satellite

Telekom Austria Jet Stream



Legend:
 — Existing
 - - - Planned

PoPs

-  Vienna PoP Telekom
 Salzburg PoP Telekom
 Linz PoP Telekom
 Vienna POP InterXion
-  Prague PoP Sitel
 Brno PoP Selfservis
 Ivancice PoP Selfservis
-  Frankfurt PoP ancotel gmbh
 Frankfurt PoP InterXion FRA 4
 Munich PoP Global Crossing
-  Budapest PoP Pantel
 Budapest PoP Dataplex
-  Bratislava PoP Sitel
-  Milan PoP Malpaga
 Milan PoP KPNQwest Italia
-  Maribor PoP Amis
 Ljubljana PoP Voljatel
-  London PoP TMI
-  Zagreb PoP VIPnet
 Zagreb PoP AMIS
-  Bucharest PoP Datek
 Bucharest PoP NX-Data
 Timisoara PoP Orange
-  Sofia PoP Mobilitel EAD
 Sofia PoP Neterra
 Haskovo PoP Mobilitel EAD

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Mobile Services by Telekom Austria

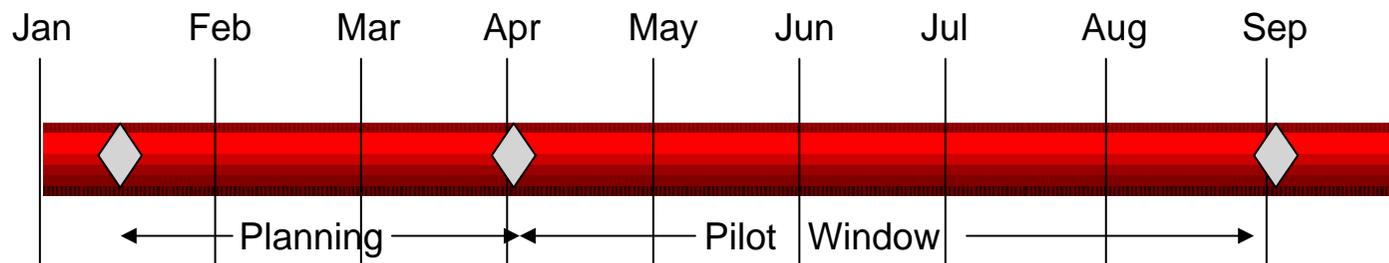
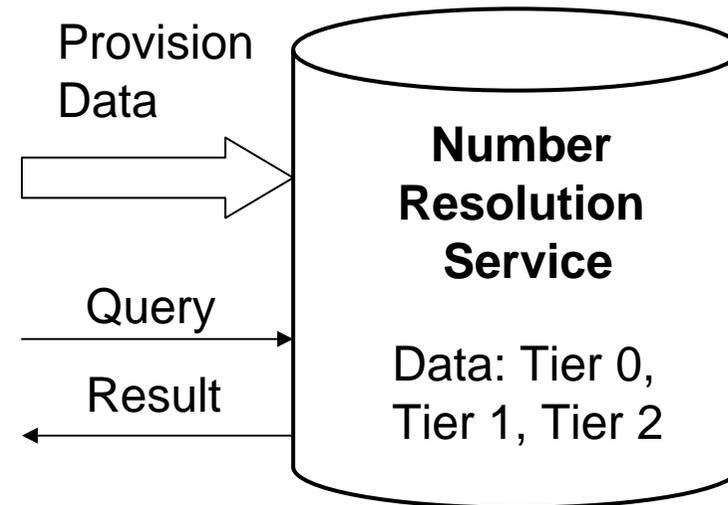
- Signaling for Roaming via SS7 data links or via IP (SigTran)
- Roaming WebView
- ANSI Converting
- IPX Services
 - GRX Transport
 - SMS Hubbing
 - MMS Hubbing

GSMA ENUM Pilot Mobilkom Austria – Telekom Austria

- GSMA ENUM Directory Project
 - *EMC Approved April 2007
 - *Pilot April - September 2008
- February 2008 – Participation of Mobilkom Austria and Telekom Austria
- Project centralized and driven by GSMA – IR.67

GSMA ENUM Pilot Mobilkom Austria – Telekom Austria

- Single Root Carrier ENUM
- Managed Service
- Carrier Grade
- Access through GRX/IPX
- Tier 0 Global Root Service
- Tier 1 Delegation Service
- Tier 2 No. Mapping Service



GSMA ENUM Pilot Mobilkom Austria – Telekom Austria

Services in scope for

— **IMS SIP-based Voice**

Eyebeam SIP-Client registered to mag-IMS-Core, and inviting a foreign e.164-b-party number, as well as vice-versa.

— **IMS SIP-based Video**

Eyebeam SIP-Client registered to mag-IMS-Core, and inviting a foreign e.164-b-party number, as well as vice-versa.

— **IMS SIP-based InstantMessage**

Eyebeam SIP-Client registered to mag-IMS-Core, and sending a "MESSAGE" to foreign e.164-b-party number, as well as vice-versa.

GSMA ENUM Pilot Mobilkom Austria – Telekom Austria

— Peer2Peer-Presence (optional)

Eyebeam SIP-Client registered to mag-IMS-Core, and exchanging Peer2Peer-Presence Info with a foreign e.164-b-party number Eyebeam SIP-client, as well as vice-versa.

— Clearinghouse functionalities

<To be defined and clarified>

Applications and Benefits

Applications

Voice, Text, email, MMS, IM, Videocalling, Videoshare, etc
Content delivery, mobile payments, location services, etc
IP Interconnect between operators
Carrier selection

Customers Benefit

All services integrated behind phone numbers

Operator benefits

Phone number asset relevant in an all-IP world
Enable migration to all-IP NGNs
Long term simplification of routing technology and management

GSMA Objectives

Provide an industry ENUM resource
Trigger adoption and fulfilment of benefits
Facilitate a trusted ENUM community
Ensure global scalability and interoperability - IPX

Integration Possibilities

-TA-GRX-connectivity (minimal deployment)

Provide only IP-connectivity to reach other participants of the GSMA ENUM Trial

Provisioning of mobilkom austria group destinations will be done manually on GSMA-ENUM-DNS

-TA-GRX-connectivity plus TA-ENUM-DNS

Provide IP-connectivity to reach other participants of the GSMA ENUM Trial

Zone « .3.4.e164enum.net » delegated to TelekomAustria

Mag IMS-Core will use TA-ENUM-DNS, responsible for b-party resolvment

Provisioning of mobilkom austria group destination will be done manually on TA-ENUM-DNS

Integration Possibilities

— **TA-GRX plus TA-ENUM-DNS plus TA-IPX-Proxy**

Provide IP-connectivity to reach other participants of the GSMA ENUM Trial

Zone « .3.4.e164enum.net » delegated to TelekomAustria

Mag IMS-Core will use TA-ENUM-DNS, responsible for b-party resolution

Mag IMS-Core will use TA-IPX-Proxy for SIP-routing “only” (ie. No Break-out to CircuitSwitched-Domain) as specified in GSMA

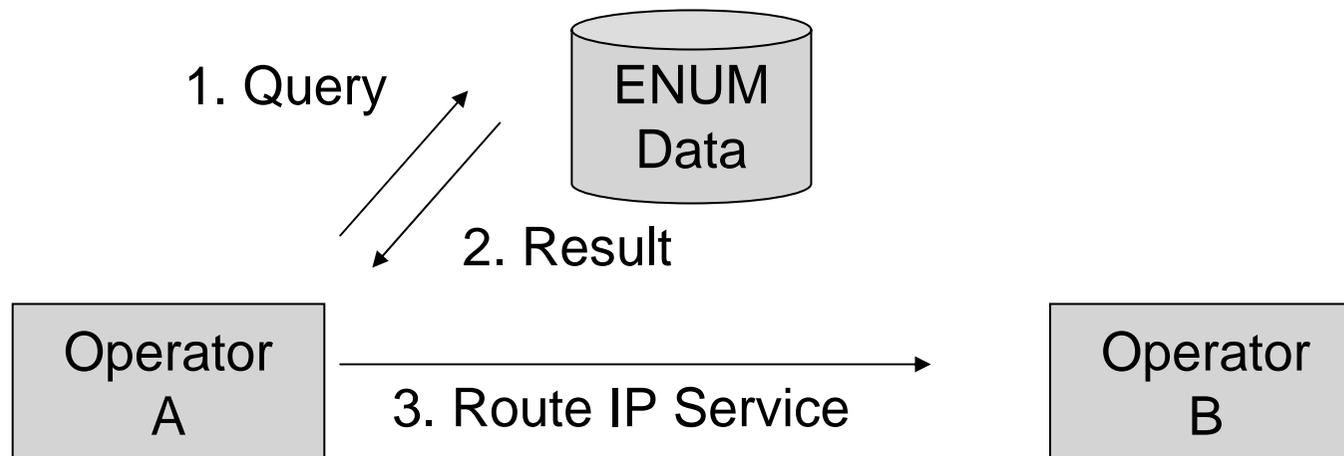
Provisioning of mobilkom austria group destination will be done manually on TA-ENUM-DNS

Roadmap

- Pilot: 2Q08
 - AMS-IX EUnetworks
 - AMX-IX Telecity
- Commercial deployment: 4Q08
 - Add Ashburn (Virginia, USA)
- Ramp-up: 1Q09
 - Add Singapore
- Additional locations based on demand

NRS Intergration

- Connectivity: Network connection to POP (AMS-IX)
- Routing: BGP routing to ENUM DNS servers
- Services: issue DNS queries, use responses
- Traffic Exchange: To use responses also need network connection/routing to services



Technical Integration

- Query Service
 - Physical connection to AMS-IX interworking VLAN
 - BGP Routing to AMS-IX locations
 - ENUM DNS queries
- Provisioning Service
 - VPN connection for XMLI API
 - HTTPS (login) connection for GUI

Technical Integration

- Publish data for access by others

- Data owned by operator,
- Used by queries to reach subscribers

Production: Can use locally hosted instance

- Provides in-network latency
- Provides real-time policy/rule changes

Caching

- Determined by provisioner
- TTL reflects dynamic nature of DNS data

Security

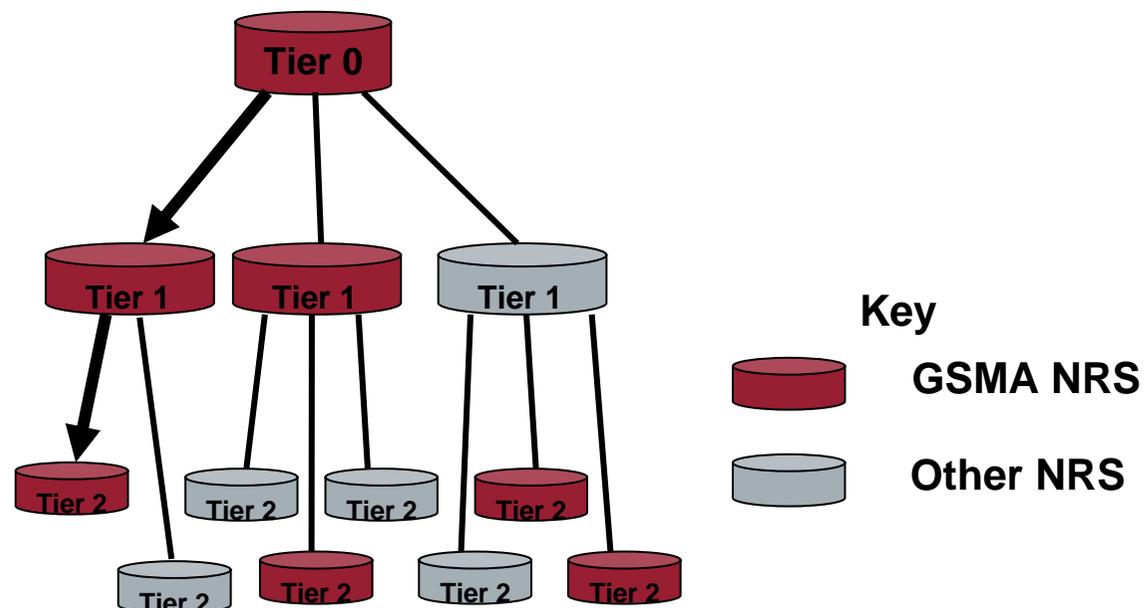
- Data only available via private network (same as GRX interworking)
- Provisioning secured via VPN/SSL

Tier 2 Service - Any Call Enablement

-Use the GSMA Tier 0/1/2 service to provide the ENUM data (NAPTR Results) for your telephone numbers

Benefits: Operator(s) does not have to implement their own Tier 2

Benefits: Data can be reached by all other operators globally with only one query

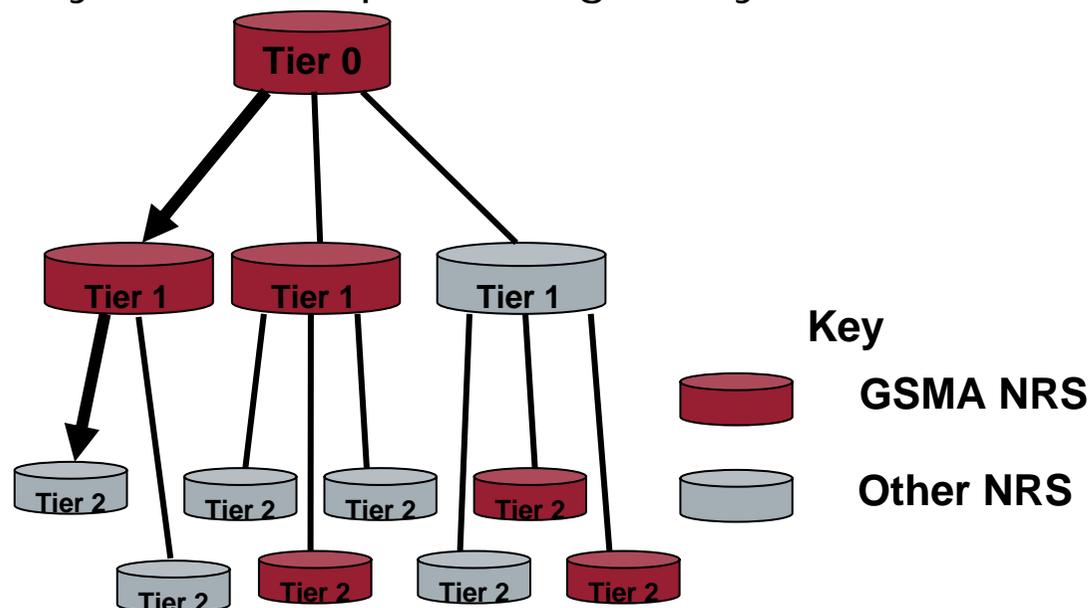


Tier 1 Service - National & International Call

- Use the GSMA Tier 0/1 service to provide a pointer to your Tier 2 ENUM database

Benefits: Operator(s) do not have to implement a Tier 1

Benefits: Operators who have implemented their own tier 2 can be reached by all other operators globally

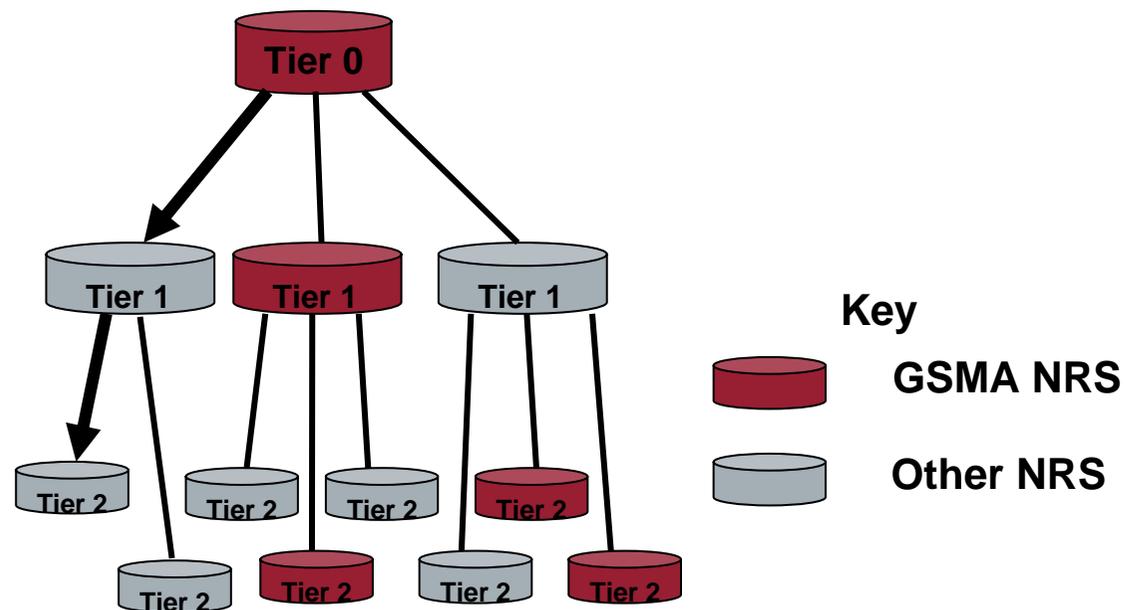


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Tier 0 Service - International Call Enablement

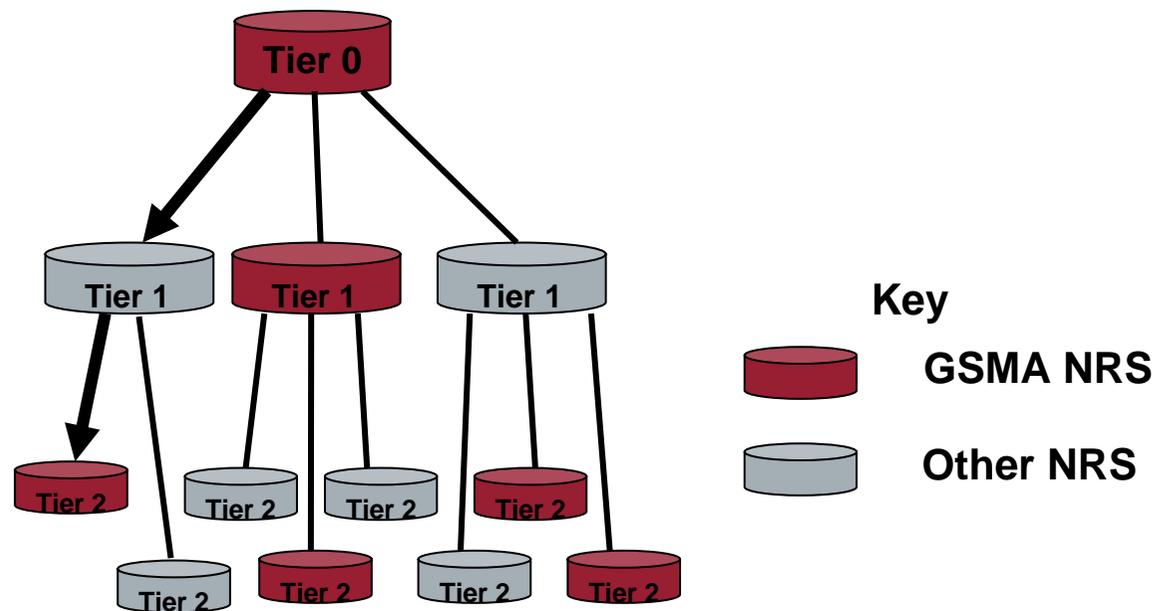
-Use the GSMA Tier 0 service to provide a pointer to the agreed Tier 1 ENUM database for a country code

Benefit: Operator(s) who have implemented their own Tier 1 can be reached by all other operators globally



Other Scenarios

- Use the GSMA Tier 0 and 2 services with an existing Tier 1
- Benefit: Operator(s) can work around established Tier 1



Next Steps

- Complete Pilot & produce results
- Develop & initiate communications plan
- Achieve production readiness of the system
- Launch Production Service
- Connection Programme

Thank you.