



Interconnecting Our Digital World

Response to RTR/Austrian Regulator's

**“Routingnummern-Konzept für die  
Rufnummernportierung”**

**Konsultationsdokument**

**RTR-GmbH**

Wien, 02.07.2013

## **Version History**

| <b>Issue Number</b> | <b>Date</b> | <b>Reason For Issue</b> |
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## **1 EXECUTIVE SUMMARY**

XConnect is the leader in NGN Communications Routing and Federation services. We are in the unique position of having deployed multiple federations worldwide for over seven years for IP voice, HD Voice and Video, both directly and in partnership.

The core to all of these services is a combination of the patented XConnect complex numbering database systems & Registry, which provides multi-billion telephone number (and other identifiers), secure management with advanced centralised portability corrected routing and policy control combined with our multimedia, multiprotocol scalable hub.

Our extensive on-net, extra-net (other federations) and off-net routing are carrier class, due to our wide number of federation, global and national all-IP operator interconnects combined with our ENUM Registry & databases of live global telephone and portability number data.

Our award winning services, to over 200 major Telecom Service Providers worldwide has given us strong insights into the technology and features necessary to make the carrier grade routing & interworking services a success, and we welcome the opportunity to bring this accumulated knowledge to bear in Austria.

## 2 AUSTRIAN NUMBER PORTABILITY

### 2.1 XConnect's understanding of current approach & limitations

The mobile numbering routing concept in Austria has been implemented in such manner that only 10 mobile network codes (maximum 9 addressable mobile networks) are allocated by the regulator for number portability process. At the time of allocation, 10 was considered sufficient by the operators for Portability implementation, whereas today there are 46 mobile operators in operation in Austria, rendering the current approach unfair as operators not fortunate enough to be one of the original 10 are forced to use telephone numbers "owned" by one of the 10. This introduces a significant disadvantage to new entrants creating a significant entry barrier vis-à-vis existing operators.

Another related issue has to do with the desire by some operators to introduce direct bill and routing for numbers subject to target network tariffing. However Direct "Reverse" Charge is not possible due to the lack of Originating Network identification (due to the same "10 network code" issue).

### 2.2 National Regulation Authority Suggested Approach

The document issued by the RTR reflects a range of options proposed by different stakeholders in the Austrian market defining potential new routing code structures (presented in Appendix B) and associated routing rules defined below that all operators would have to comply with.

- The Originating network would have to use for traffic transfer routing numbers starting with 'ab', 'cd' and 'e' (as defined in appendix B).
- The Terminating network would release traffic with non-valid 'ab', 'cd' or 'e' identifiers.
- The Originating network would have to ensure that the transferred routing number, initiated with 'ab', 'cd' and 'e' including all possible transit (exception is Number range holder transit) would be transferred unchanged to the Terminating Network.
- Once the Number range holder would determine that the call corresponded to a ported number, then the Number range holder would have to direct the call to the Network where the called number would have been ported to. For this the Number range holder would insert the relevant Operator-code and the e-Identifier.
- Calls transferred to an Operator without the established Calling Number Structure or calls with an e-Identifier 4 or 5 (Look-up follows) and these Number not in his own Network, would have to be released (to avoid routing loops)

## 2.3 XConnect Enabling Services

XConnect is well positioned to **support the Austrian Regulator and Operators in their thoughts & concept evolution towards this new model** by leveraging its significant global expertise in complex numbering management and highly configurable routing engine to discuss & define a roadmap towards the routing functionality outlined above.

XConnect also has the **technological, operational & business expertise to provide to the Austrian market a solution or service that would fulfil the requirements and address the challenges** defined in the RTR document, while at the same time support the RTR in the definition of a future-proof path.

But to be able to provide such, XConnect would like to propose to hold a meeting with the RTR and other key stakeholders in Wien in order to understand in depth beforehand more of the specifics of the current structure and processes implemented in the Austrian MNP market.

## 2.4 Technical Overview

XConnect Hubs are built in a layered approach enabling scaling of the various components in an independent manner. As displayed in the figure below, 5 distinct layers are defined, with communication between these layers taking place via open (where possible) interfaces and protocols for seamless operation.

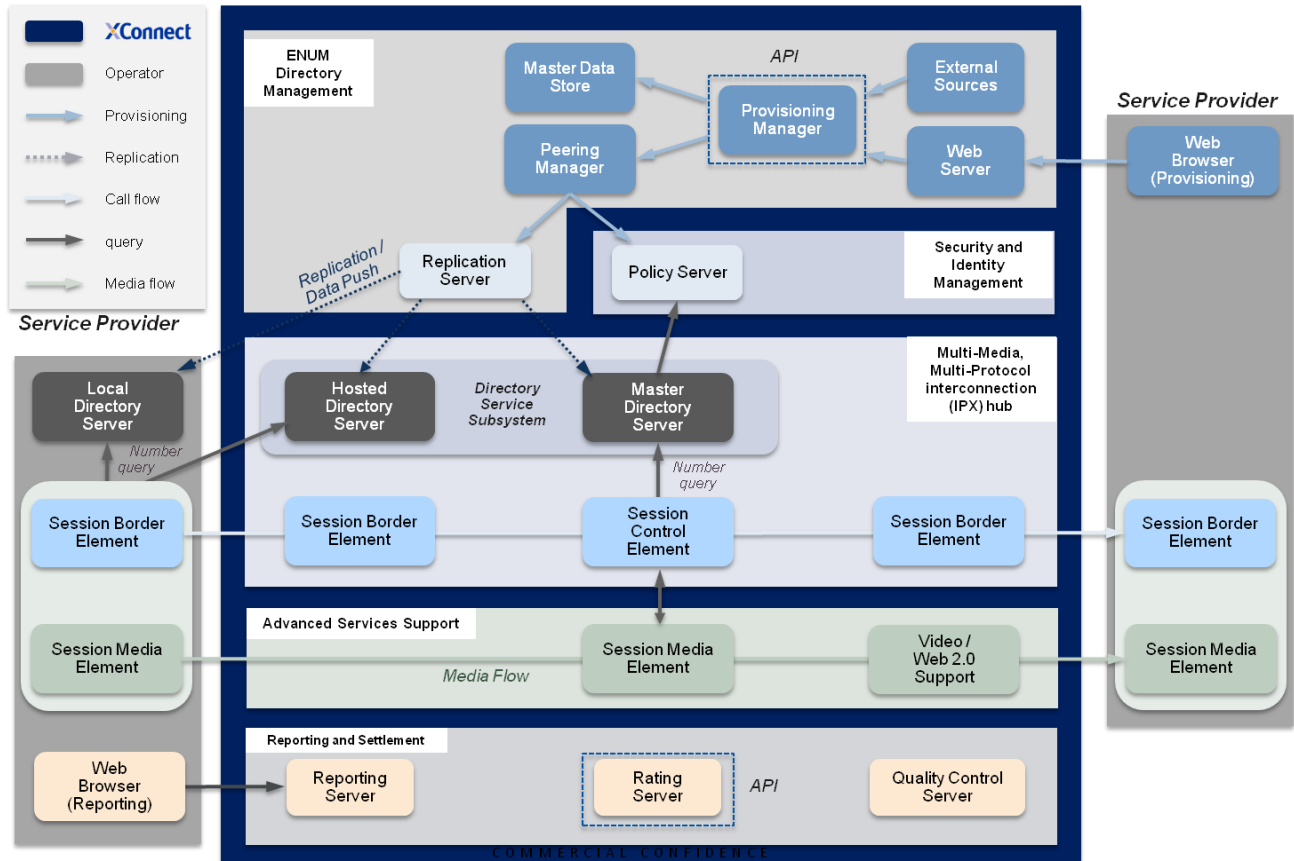


Figure 2-1 – XConnect’s Routing & Interconnection Architecture.

## 2.4.1 Registry Architecture

Looking at the Overall architecture diagram, and starting from the top, one can see the “ENUM Registry Management” layer, responsible for accepting numbering, routing and policy information from relevant sources, and publishing the combined policy corrected information to directory servers to be used for real time querying by the signalling elements. At its core, provisioning associates phone numbers with IP routable addresses. Policy is a layer that sits on top of the provisioned data and is the special sauce that allows the provisioning party to control all aspects of their peering relationship (yes/no, service, capacity, etc.) on a peer-by-peer and service-by-service basis. The policy is controlled via a peering GUI (or API) provided by XConnect.

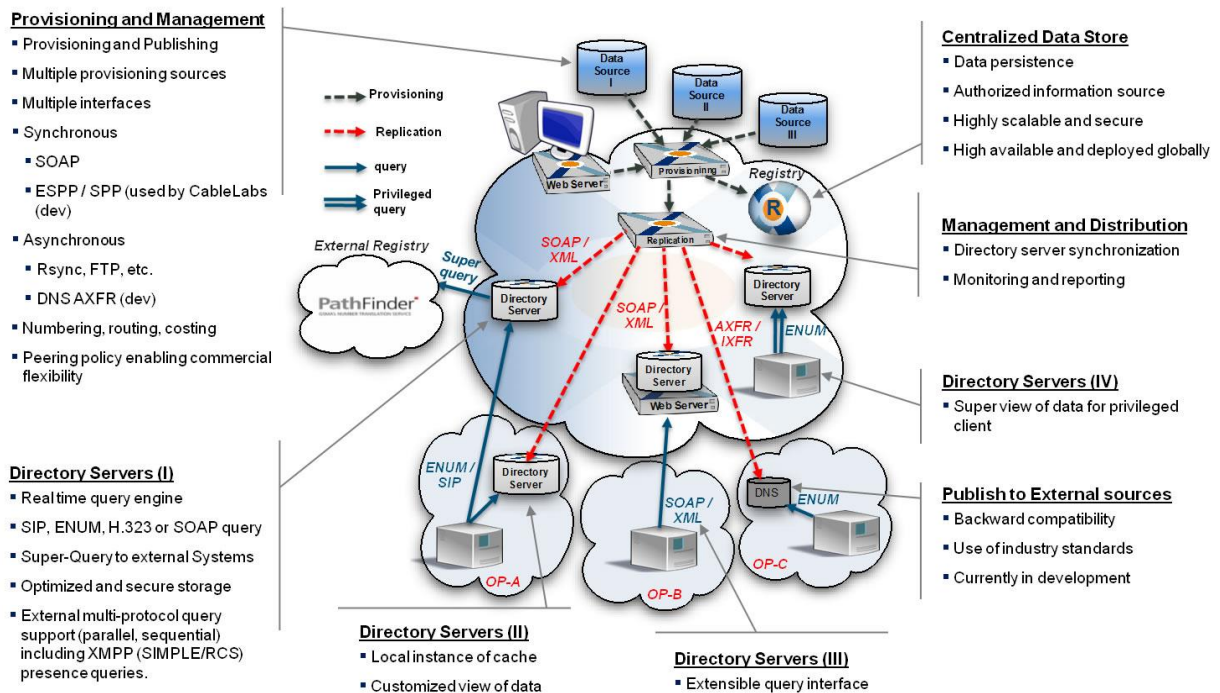


Figure 2-2 – Advanced and Distributed Registry Architecture

## 2.4.2 Directory Server – LDS

As mentioned above, the “ENUM Directory Management” layer pushes data into caching servers known as Directory Servers and sitting at the logical “Directory Service Subsystem” layer. The Directory servers come in 3 flavours: Local (LDS), Hosted (HDS) and Master. The local Directory Server (LDS) as its name implies is local to a Service Provider and contains a unique policy corrected view of data that is appropriate for the particular Service Provider. The Directory Servers are accessed by the signalling elements on a call-by-call basis (All Call Query - ACQ) using protocols such as SIP, ENUM and SOAP.

### 2.4.3 Signalling Layer

The “Multimedia Interconnection Hub” layer consists of flanking Session Border Elements responsible for security/NAT/FW/etc, type of issues and a centralized session controller tasked with typical signalling chores such as routing (via query to Directory Servers), Media Control (via media plane), Call Detail Recording, etc, and more advanced and patented processing such as security, identity management and SPAM control. The Hub becomes the trust anchor for the Signalling.

### 2.4.4 Other Services’ Layers

As part of more complex Federation type services which incorporate numbering DBs and number based routing XC also offers Media, Network, Security, Financial & Clearing House Layers.

### 2.4.5 Online Reporting Tools for Federation Members

All Telco members can have access to advanced online reports of their routing and federation data, include real-time live monitoring.

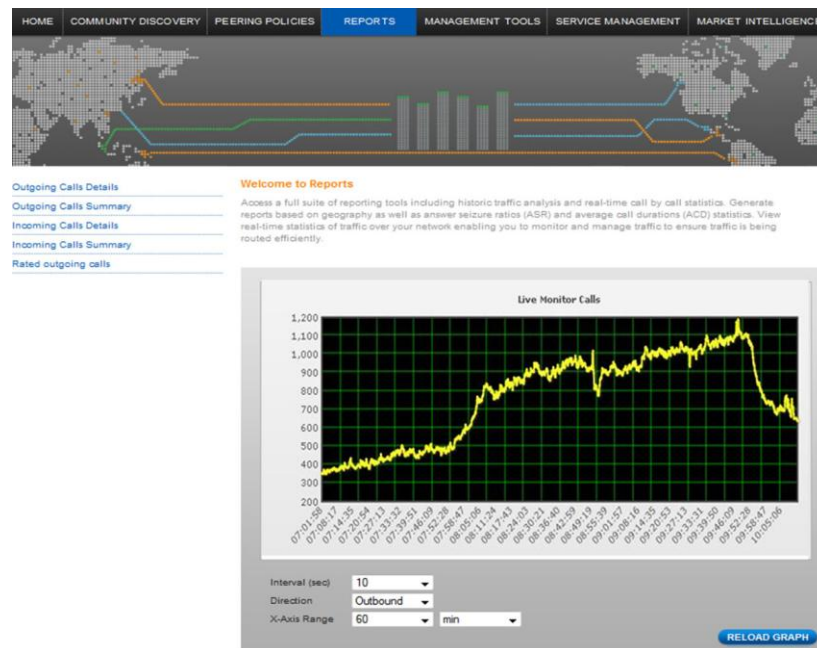


Figure 2-3 – Call Monitoring GUI

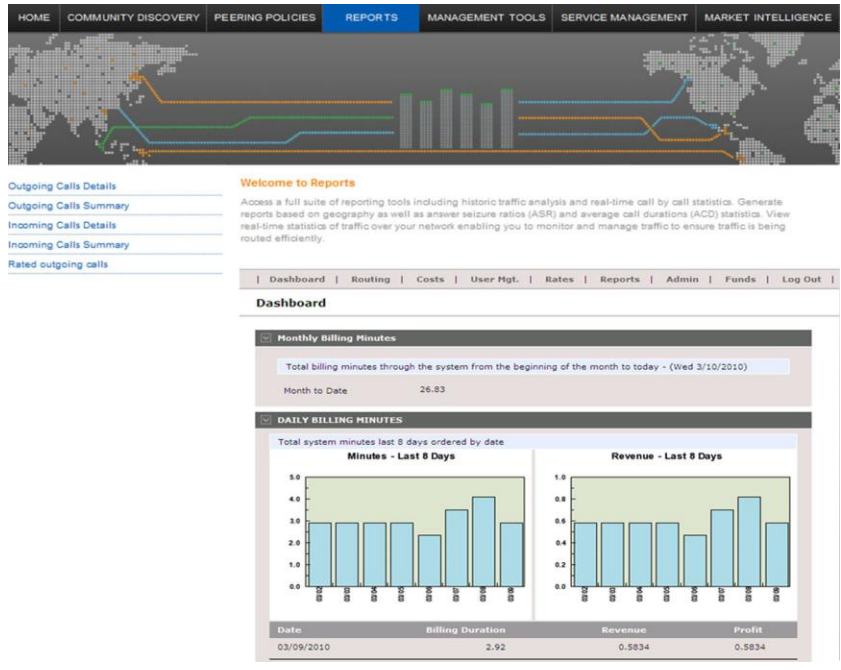


Figure 2-4 – Traffic Reporting GUI

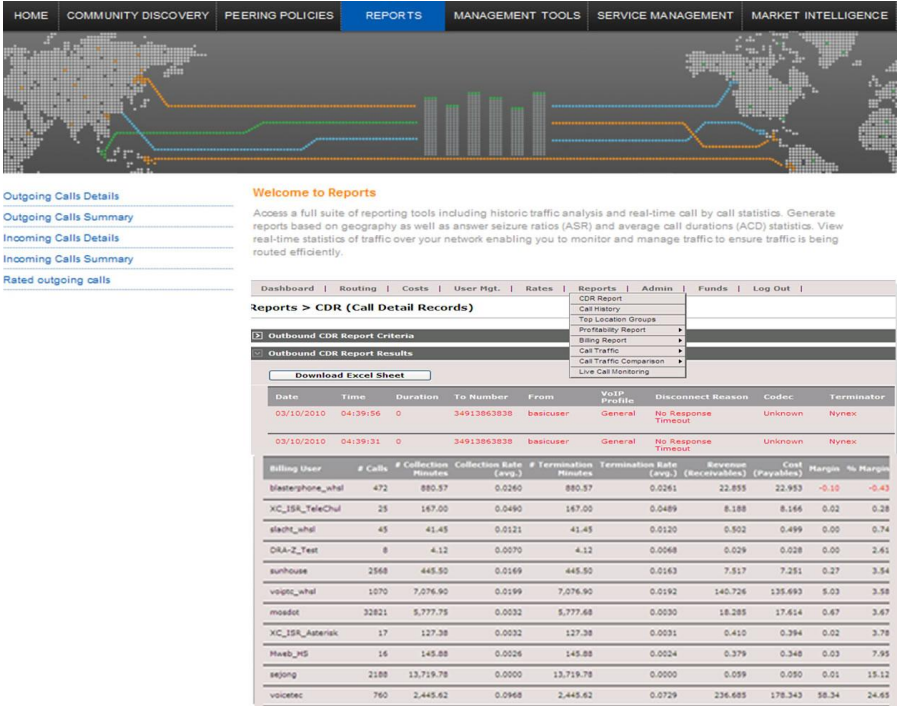


Figure 2-5 – CDR GUI

## **APPENDIX A – COMPANY OVERVIEW**

XConnect's entire company focus is on the development and utilization of advanced ENUM-enabled Directory and Routing Database services together with complementary NGN / VoIP Interworking Services for Service Providers and Network Operators.

In recognition of the significant R&D invested, we have a number of Patents Pending (US, EU and Asia) regarding the technology required to support carrier-grade implementations of ENUM-enabled Directory servers, optimization techniques for massively scalable number databases and synchronization for highly-distributed environments.

XConnect have the largest world wide deployment of live ENUM Registries in relation to Routing and Interconnection between Fixed, Mobile and Web2.0 operators, deployed as part of the XC Global Alliance and National Federation services. These services serve over 100 Operators globally (with national Federations in Korea, South Africa, USA, and Norway) with Carrier ENUM and SIP interconnection for VoIP and increasingly multi-media.

Increasingly XC are involved with next generation services, and have launched HD voice Federation within the US, and are exploring Video and UC peering with several leading industry solution providers.

XConnect are a recognized partner and fully integrated with the GSMA Pathfinder Carrier ENUM registry, and we believe that co-operation and Federation of Registries is a key part of what we do.

XConnect are active participants and co-authors of numerous Internet Engineering Task Force (IETF) standards for the relevant working groups including Carrier ENUM (ENUM), SIP Peering (SPEERMINT), and Registry Provisioning (DRINKS). Furthermore, Richard Shockey is a senior member of the XConnect Advisory Board. He is chair of the influential ENUM Working Group, co-chair of DRINKS, and chairman of the world's largest independent SIP industry organization – SIP Forum.

XConnect have certified relationships validating technical interoperability with most of the leading vendors providing NGN and VoIP systems including soft switches, session border controllers and routing databases. The full list is available at <http://www.xconnect.net/xc-ready/>.

XConnect, established in 2005, is a venture backed company with multi-billion Tier 1 VCs including Crescent Point (Asia) & Young Associated (EU). As the global leader in enum registry services and network peering, XConnect is trusted by IP-based service providers in 70 countries to offer a suite of Interconnect 2.0 services, including carrier ENUM-registry and next-generation multimedia interconnection hub solutions. London-based XConnect offers the most comprehensive and reliable solutions to help service providers deliver rich multimedia IP communications across networks while reducing costs and improving service quality. XConnect operates the largest worldwide ENUM-based IP-peering federation, the Global Alliance, and the world's first national VoIP/NGN interconnection federations, in the Norway, Korea, Germany and South Africa

Our board of directors include world-leading Telecom entrepreneurs and Tier 1 senior management including Paul Reynolds (CEO, Telecom New Zealand, ex CEO, BT Wholesale), and Yuval Shahar (founder & CEO at Vocaltec, P-Cube)), Ohad Finkelstein (ex CEO, Interoute Communications), Torsten Kreindel (Board Member, Swisscom, ex Board Member, Deutsch Telekom).

XConnect senior management include CEO Eli Katz (also Founder & Chairman at the UK IP Telephony Association – ITSPA), SVP Sales and Marketing John Wilkinson (SVP Interoute; VP Energis) and CTO, David Schwartz – inventor of multiple ENUM based patents and Chief Architect at DeltaThree.

## Company Details.

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## APPENDIX B – ROUTING NUMBER STRUCTURE

| Meaning     | Mobile Network Code | Operator-Code | Origination-Operator-Code | Service-Code | National Number |
|-------------|---------------------|---------------|---------------------------|--------------|-----------------|
| Length      | 2                   | 2             | 2                         | 1            | max. 13         |
| Designation | 85                  | ab            | cd                        | e            | < NSN >         |

### Alternate Version

| Mobile Network Code | Operator-code | Service-code | Origination-Operator-Code | National Number |
|---------------------|---------------|--------------|---------------------------|-----------------|
| 85                  | ab            | e            | cd                        | < NSN >         |

**Operator-code:** The operator-code „ab“ contains the addressed Network (Routing-Terminating-Network). The Operator-code „ab“ could take any DE-Identifier, which currently are determined 86 and 87 for the used Routing numbers (see also: <https://www.rtr.at/de/tk/InfoCDEKennungen>).

**Origin-Operator-code:** The Originating Operator-code „cd“ contains the Originating Network. The starting point is that every Terminating Network can also act as an Originating Network, in which case the same Operator code allocation must be used.

**Service-code:** The Service-code „e“ contains additional information. In case of a call to a ported number, this is the information if the Call number a Ported-look-up success or if an announcement should be provided.

| Service-code | Meaning  |                 |
|--------------|--|-----------------|
| 0 till 3     | meaning in accordance with § 95 KEM-V 2009 Abs 9 |                 |
| 4            | Look-up success                                  | No Announcement |
| 5            | Look-up success                                  | Announcement    |
| 6            | Look-up not yet success                          | No Announcement |
| 7            | Look-up not yet success                          | Announcement    |
| 8, 9         | Reserved   |                 |

**National call number:** This field contains the Terminating called number in the national format without the national Prefix (f.e. 664 1234567) with a maximum length of 13 digits.