

New prospective of DNS- technology: 3d Generation of MNP & IMEI Systems Under Convergence Conditions

Yurii Kargapolov
Ukrainian Network Information Center

3 Systems of the 3.0 Generation (3G Systems)

- ✓ **Mobile Number Portability System**
- ✓ **IMEI Codes System**
- ✓ **ENUM Registry System**

“Inter Service Provider IP communications are starting to evolve to support services other than GPRS Roaming. Many, if not all, of these services rely upon DNS. Therefore, it is of utmost importance for the interworking and stability of such services that Service Providers have all the necessary information to hand to ease configuration of their DNS servers upon which such services rely.”

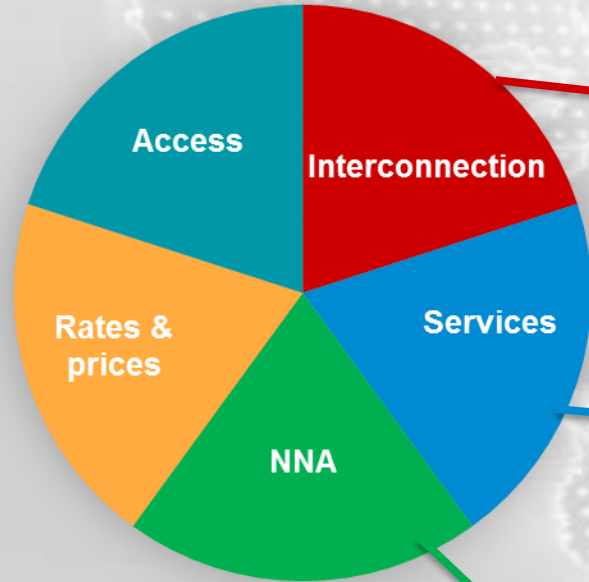
GSM Association. Official Document IR.67. 01 February 2016

DNS and ENUM Guidelines for Service Providers and GRX and IPX Providers Version 12.0

Why 3.0 Generation?

- ✓ Only base function on number portability and fight with the counterfeiting, smuggling, and fraud. } **1st G**
- ✓ In addition enhanced functions including handling of complex transactions (npdi, number portability dynamic correction) within mobile and fixed networks, transfer the data on roaming and geolocation, support of non-geographical and nomadic numbers. } **2nd G**
- ✓ Formation a unified and integrated data and decision policy environment with the prognostics algorithms, support for all subscriber IDs types at any time and in any place including personal numbers within really unlimited personalized set of subscriber services. } **3.0 G**
- ✓ Formation the basis for converged environment where any user at any time, anywhere, using any own ID(s), and own device(s) can receive from any selected operator the necessary "here and now" service.

Five aspects of the convergence



- Interaction in the NGN environment (IMS/LTE)
- Number Portability Dynamic Correction during a transition from SS7-networks in to IP-network and vice versa
- Roaming support
- Number Portability Dip Indicator (npdi) – addressing universal indicator in the CDB PN, which allows not to refer to it again in the processing of operators' transactions
- Open standards and data formats XML and/or CSV

- The possibilities of Service Provider Network
- The ability to support an unlimited number of service subscriber functions: tel, H.323, SIP, SMS, MMS, XMPP, Email, UNIMSG, iCall, etc., without compromising their quantity, quality and reliability of service after subscriber's porting
- Support transferring geolocation data

- Support of all types of the subscriber identification at any time and in any place by means of any technology
- Support of non-geographical and nomadic numbers
- Support of personal numbers
- Support of transition of the DNS → ENUM → ENUM Data Hosting → ENUM Personal

What possibilities of ENUM technologies?

5

General possibilities	Organizational and administrative possibilities	Technical possibilities
Clustering, modularity and flexibility of adaptation	ENUM-domain root .e164.apra - base allowing to form a unified national policy for regulating the market and technological development	Support for cloud computing
Full localization for "Principal languages" and any one another in the Customer country	Roaming support of ported subscribers, personal numbers, geolocation, VoIP, emergency services	Independent workstations for all participants of the system
Unified array of data, the ability to cross-exchange, and the possibility of integration of systems MNP/LNP, IMEI и ENUM	Unified data set and cross-data exchange between the NRA, the State Administration of communication, Customs, Police, Tax Service give possibility not only the quantity and quality of reporting of imports of electronic tools and ported numbers as well as tasks of the national security, fight with thefts, fraud and fishing cases etc.	Monitoring and logging of all processes
Storing and logging the history of all operations and processes to ported numbers and IMEI. Storing and logging the history of the use of a mobile device in accordance with the specified parameters and probabilistic prediction of their behavior	Support for third parties, including financial, content, and SMS-aggregators	High reliability, annual availability (uptime) and CDB PN and IMEI CDB, not less than 100%

3 G Systems can solve the issues for converged networks

- ✓ 3G Systems can meet **the challenges under conditions of total convergence**: technology convergence, convergence of e-services, and fixed-mobile convergence.
- ✓ For Regulators and Administrations 3G Systems offer a universal instrumental platform and transfer from policies "**forbidden or blocked data and lost money for the budget**" to policies "**make clear policy, put money in the budget and create an effective, clear and understandable control under new challenges**" even if these challenges are the OTT services like WhatsApp, Facebook, Skype, Viber, Telegram, WeChat etc.
- ✓ For Telcos 3G Systems offer the platform which will **save telecom infrastructure from big changes and new investments**.

What are unique features of 3G Systems?

7

- ✓ Basis of 3G Systems solution is the **original DNS/ENUM technology** that is integrated with possibilities and options of the SS7 in full accordance with docs ITU, GSMA, 3GPP, ETSI, IETF etc.
- ✓ All 3G Systems use the **family of harmonized centralized databases and maintenance tools** under rules and policies of the Regulator or Administration.
- ✓ All 3G Systems **can learn, understand and remember** the cases of roaming, transferring from SS7 to IP networks and vice versa, fraud, shift of codes, stolen devices, changes of Telcos or subscribers' numbers, new type of services etc.
- ✓ All 3G Systems have the **prognostic behavior mechanisms** regarding cases using of Subscriber and device IDs

Capabilities of 3G System are virtually limitless

- ✓ All 3G Systems have **the common unified core**. If the Customer already has rolled out any System **it is not necessary again make new investments** in the core during unfolding the next System. Adding the following system **is much cheaper than buying individual systems** from other vendors.
- ✓ All 3G Systems **can expand*** and do not require stopping of **any system workflow or serious hardware upgrade**.
- ✓ All 3G Systems can be implemented **like united complex as well as at once or separately step by step**.
- ✓ **Order of implementation does not matter**. Any 3G System can be implemented as first stage or at next stages. In any case, Customer will immediately creates the instrumental basis and data base for implementation of the next System in the required time.

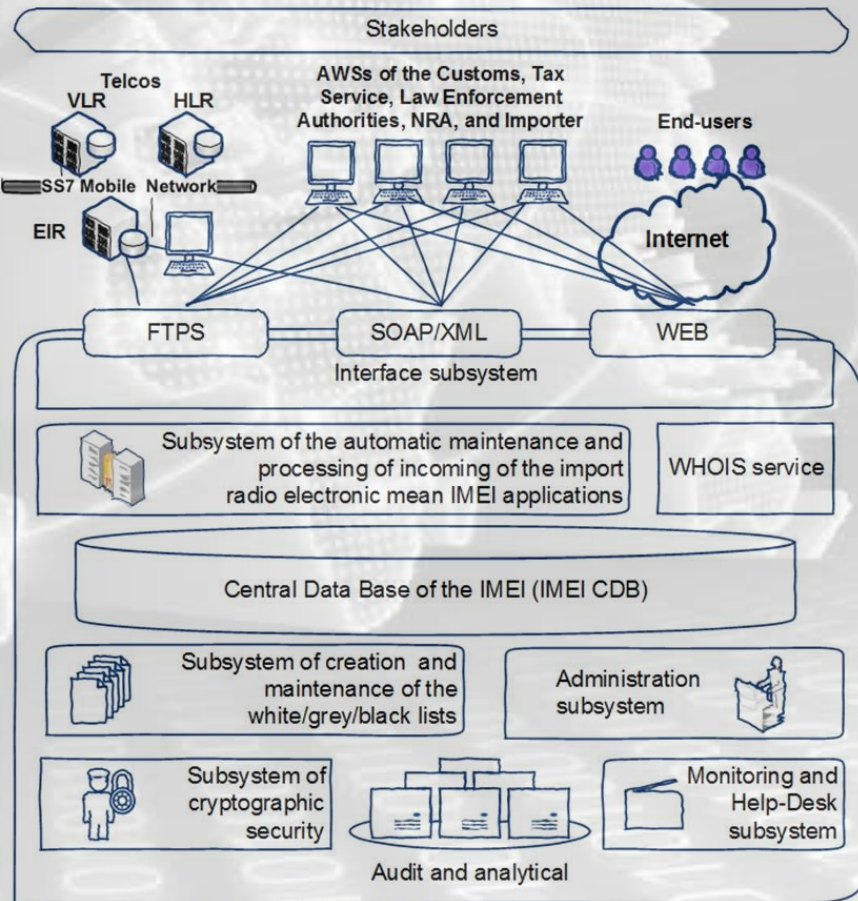
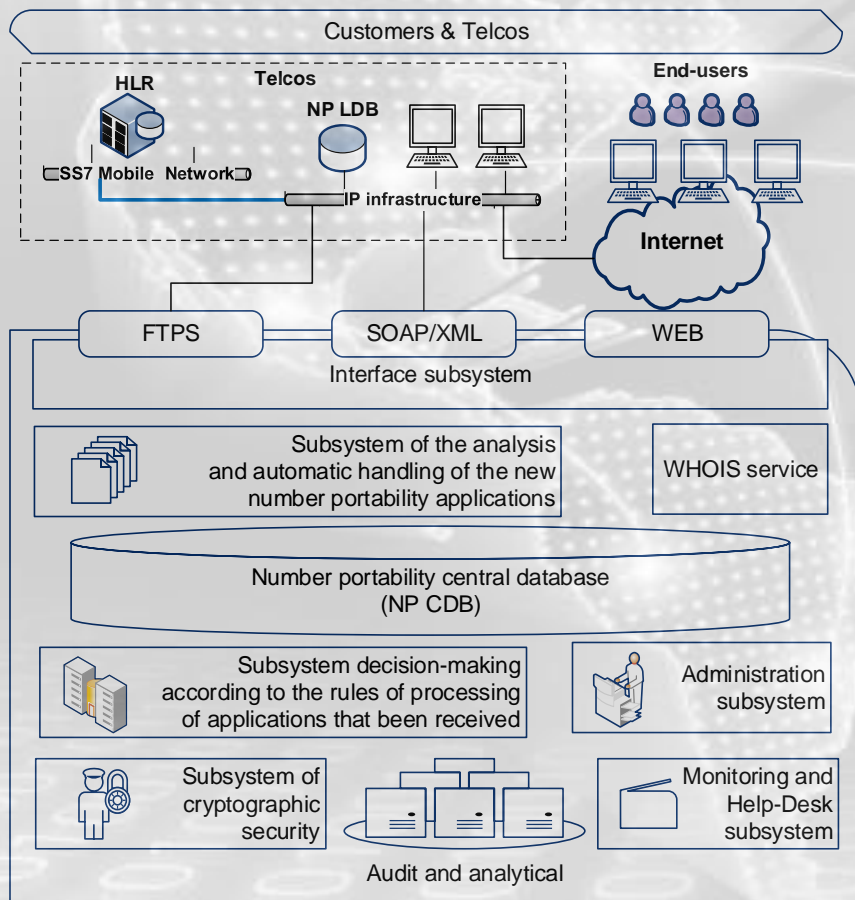
* - as well as the quantity of DB records about users/numbers and functionality of the System

Advantages of 3G Systems decision

- ✓ **Cost of any 3G System is cheaper than market cost ones.**
- ✓ **Expanding of any 3G System can be done without significant investments.**
- ✓ **All 3G Systems support full converged SS7/IP telco-environment, geolocation, VoIP, dynamic routing correction, number portability dynamic correction, deep processing of triplets IMEI/IMSI/MSISDN and not only these ones.**
- ✓ **All 3G Systems can easily adjust to any safety requirements including the most stringent.**
- ✓ **All 3G Systems can be rolled out in cloud services with clusterization and full localization for any languages.**
- ✓ **Any 3G System completely scalable and can be improved as well as global and even partial updates without stop the workflows.**

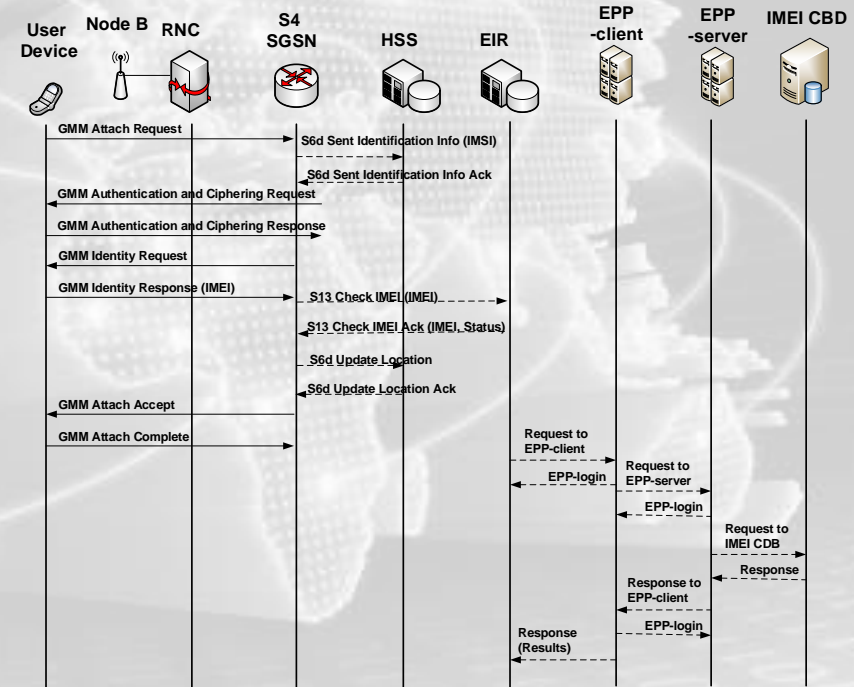
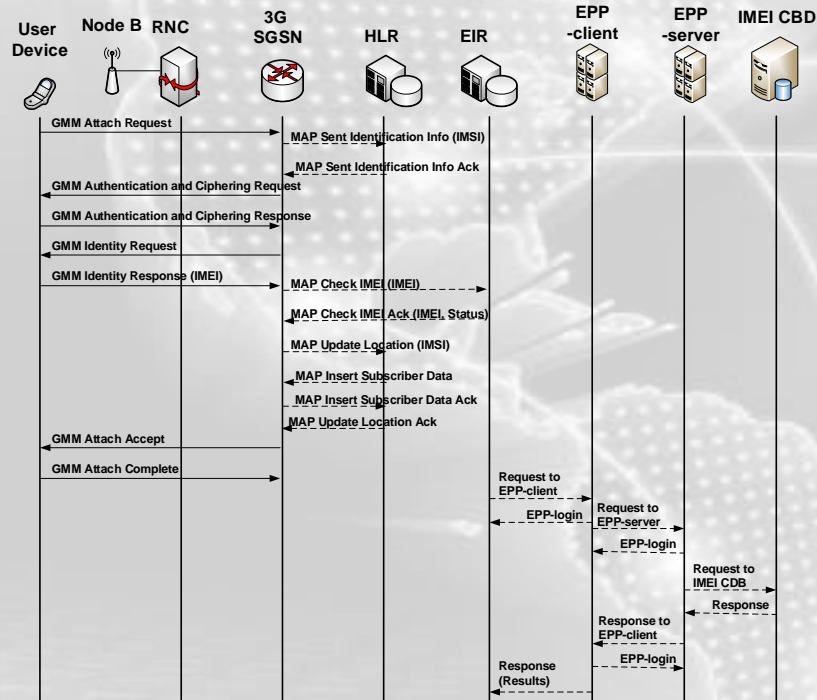
Functional structure of Systems

10



Working datagrams. #1

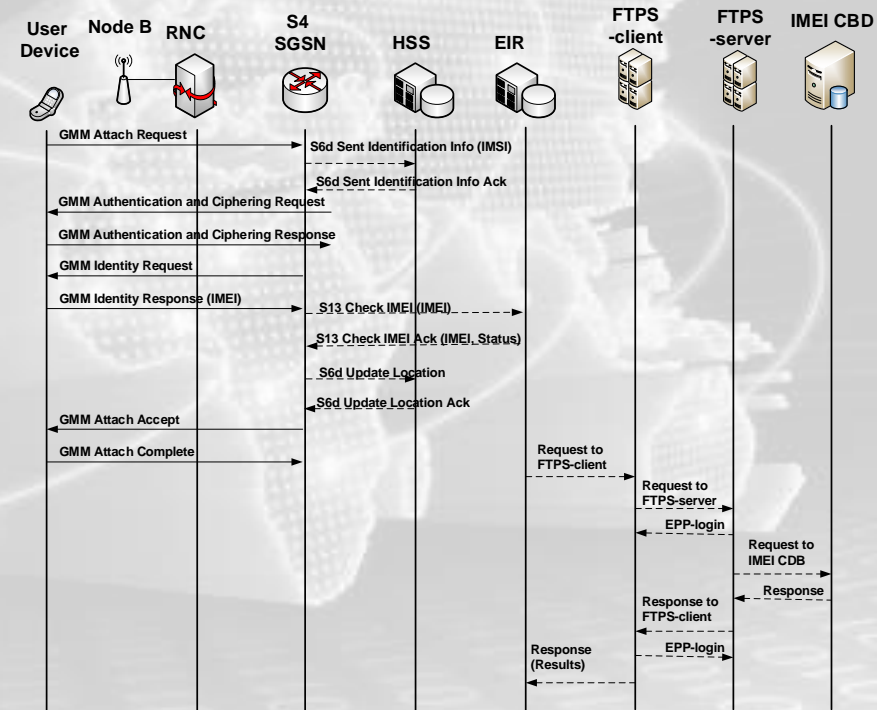
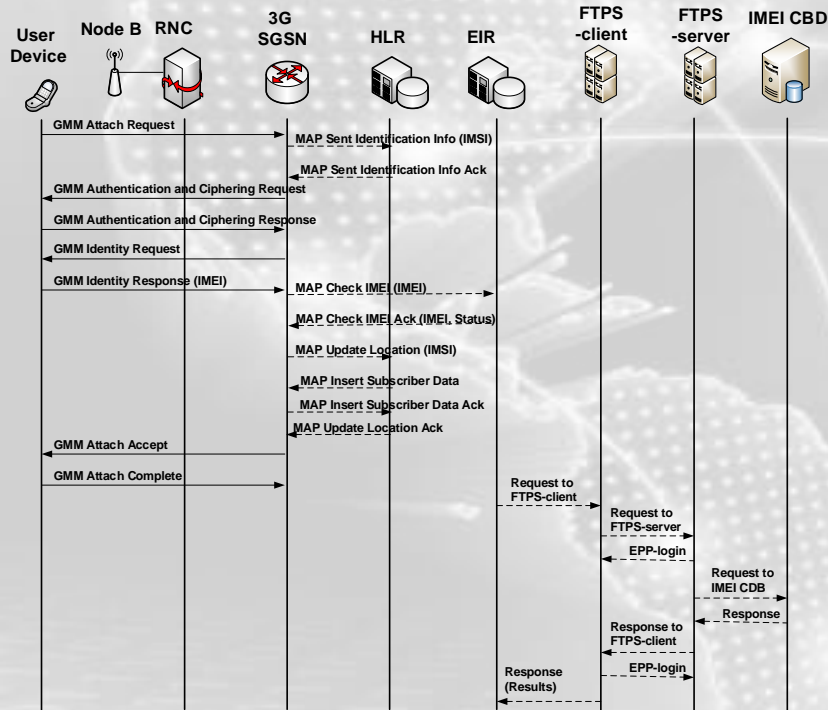
11



- ➡ Operator GSM/UMTS/LTE generates a single request to IMEI CDB using *EPP-protocol* in *on-line/real-time* mode. Not excluded the formation of a group request to IMEI CDB and
- ➡ receives response from IMEI CDB with the complete data set for next actions

Working datagrams. #2

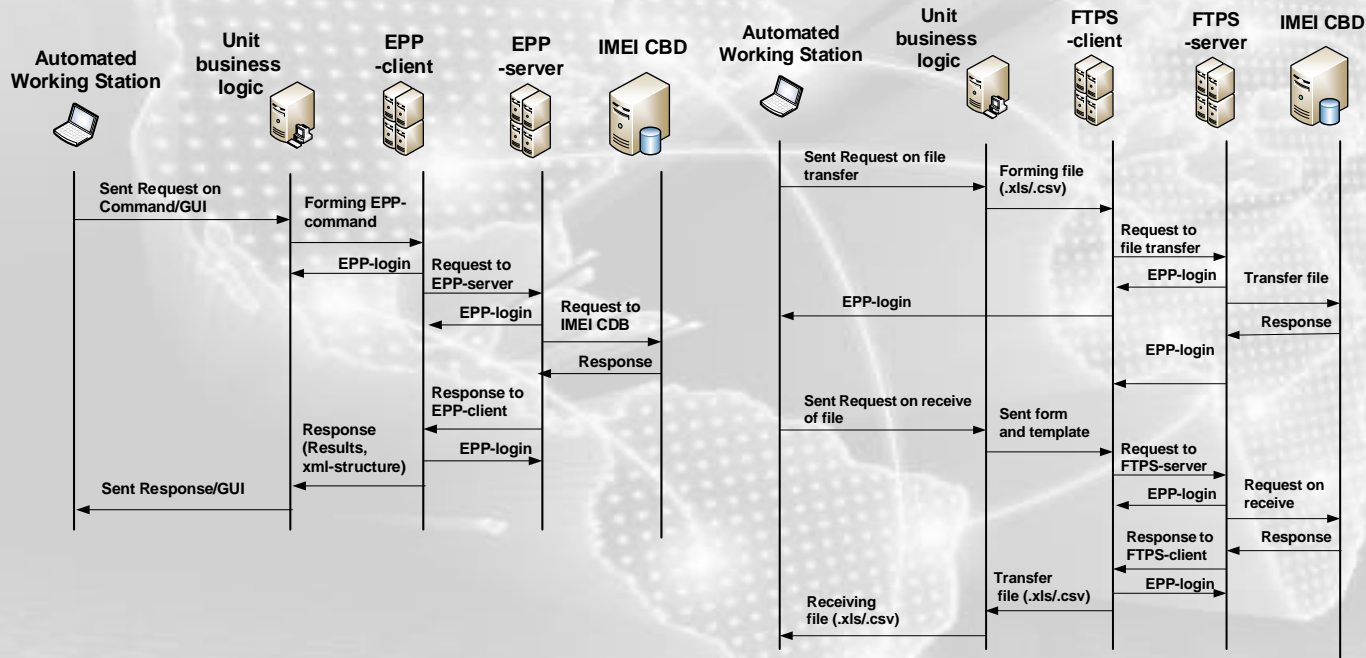
12



- ➡ Operator GSM/UMTS/LTE generates a request that comprises a group of data to IMEI CDB using *FTPS-protocol* either in *on-line* or in *off-line* modes and
- ➡ receives response from IMEI CDB with the complete data set for next actions

Working datagrams. #3

13



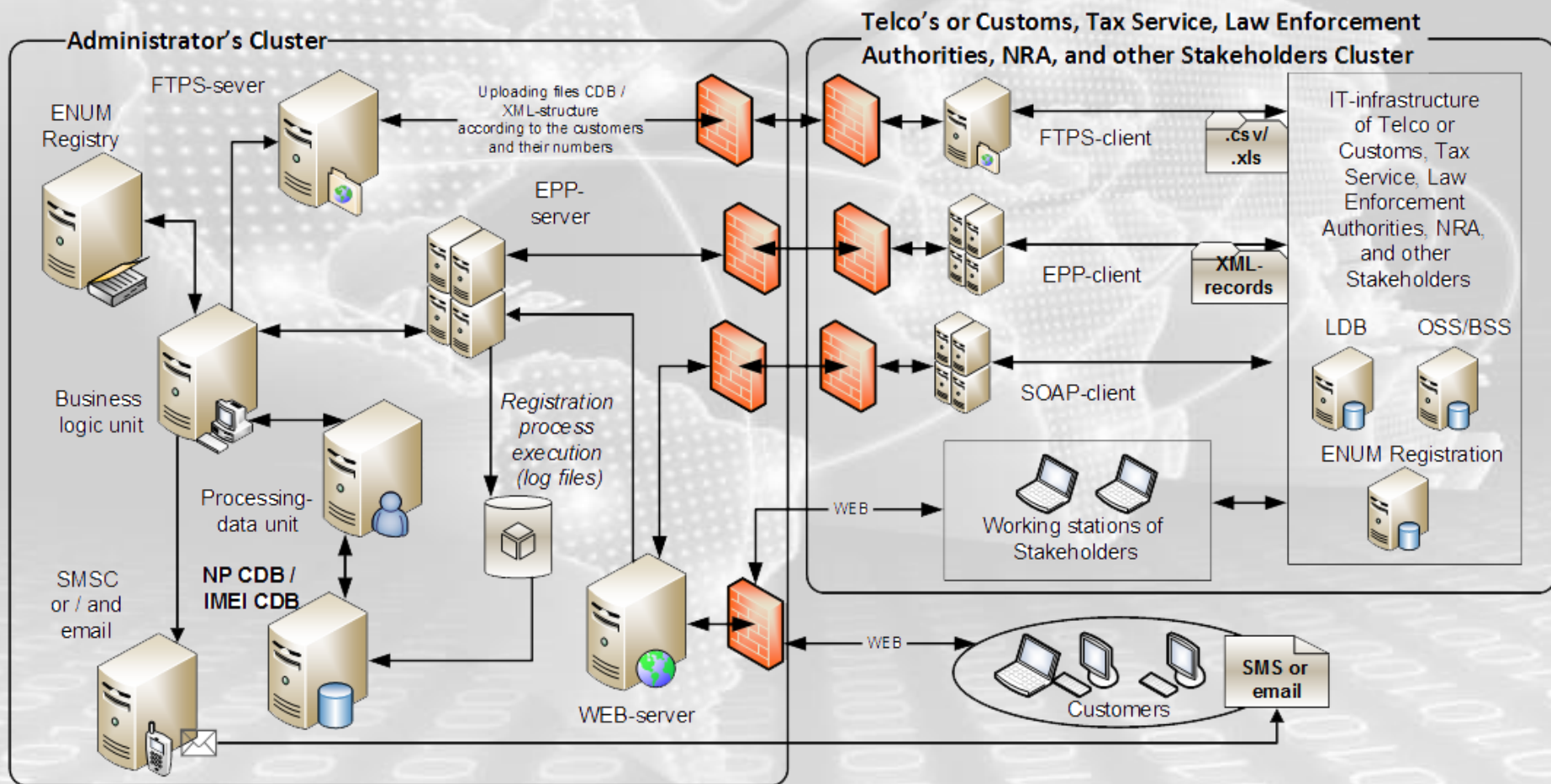
For example:

- Customs Officer has prepared the relevant information for inclusion in the reference book of importers; or Law Enforcement Officials prepared the information to adjust the "gray" list.
- Law Enforcement Officials seek relevant information regarding certain devices from reference book on radio electronic means; or Law Enforcement Officials want to obtain the actual "black list".

- ➡ Stakeholder from AWS generates a request to IMEI CBD using *EPP- or FTPS-protocol* either in *on-line/real-time* or in *off-line* modes and
- ➡ receives response from IMEI CBD with the complete data set for next actions

Common Structure of 3G Systems

14





Thank you!

Question?

Yurii Kargapolov
UANIC

<mailto:yvk@uanic.net>
skype:yvk777