BU – LRAIC fixed

Input data definitions and questionnaire manual

27-th July 2012

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Introduction

The purpose of this questionnaire is to collect information, which is necessary for BU-LRAIC modeling. Costs of services would be calculated on the ground of a provided data.

The terminology used in this document is defined in legal acts of The Republic of Lithuania and is the same as Reference paper for creating bottom up long run average incremental costs model (BU-LRAIC).

Please provide requested data as accurate as possible. If You think, that there is a need to explain, comment or add additional remarks to data provided, please provide them in empty cells next to particular data or in a separate document.

As you will notice there is no timeline introduced in sheets "Service Statistics" and „Network Statistics". Therefore the fixed values are foreseen to be used through the entire modeling period. However, if according to your judgment some data has high possibility to change dramatically and operator can provide forecast for 2012-2020 period mentioned, please leave comments next to the input cells.

If there are any questions or uncertainty regarding the questionnaire, please contact Giedrius Pūras ((8 5) 210 5668; giedrius.puras@rrt.lt) or Audrius Šniepis ((8 5) 210 5668; audrius.sniepis@rrt.lt) for more detailed explanation. Any technical questions about filling-in the questionnaire can be consulted directly with representative of Ernst & Young Baltic, UAB – Algirdas Zabarauskas, (8 5) 219 9830; algirdas.zabarauskas@lt.ey.com.

Thank You for Your contribution.

A1 Access nodes

This page contains data of the Access Nodes in the fixed line network, which should include all Access Nodes operating in the network of Operator. Access Node is defined as a location including at least one of the following types of the equipment:

- RSU – Remote Subscriber Unit;
- MSAN – Multi Services Access Node;
- DSLAM - Digital Subscriber Line Access Multiplexer;
- LE – Local Exchange which includes subscriber cards;
- PE – Primary Exchange which includes subscriber cards;
- OLT – Optical Line Termination;
- Access Ethernet Switch.

Each Access Node should be specified by:

- Access Node name (column B) – unique name of the Access Node used in the inventory system or network management system;
- Access Node Address (column C-E) - the address should have format: City, Street, Number;
- Access Node geographical coordinates GPS (EOVX, EOVY) (column F-G) – geographical coordinates of the Access Node presented in the WGS 84 (GPS) coordinates system;
- Parent Local Node (column H) - unique name of the Local Node used in the inventory system or network management system, to which Access Node is directly connected. Local Node is defined as a location including at least one of the following type of the equipment:
  - LE – Local Exchange;
  - PE – Primary Exchange;
  - Edge Ethernet Switch.
- Parent Transit Node (column I) - unique name of the Transit Node used in the inventory system or network management system, which aggregates traffic from the Local Node presented in column H. Transit Node is defined as a location including at least one of the following type of the equipment:
  - SE – Secondary Exchange;
  - TE – Tandem Exchange;
  - Core IP Router.
- Volume of services (columns K-Q) provided for each Access Node – volume of active services provided on each Access Node (using the latest available data) for the following services:

- Voice services (columns K-L), which includes:
  - Voice services provided over pair of cooper cables (POTS);
  - Voice services provided over fiber cable (GPON / P2P).
- ISDN-BRA services (column M);
- ISDN-PRA services (column N);
- Internet access services provided over pair of cooper cables using xDSL technology (column O);
- Internet access services provided over fiber cable using GPON technologies (column P);
- Internet access services provided over fiber cable using P2P technologies (column Q).

- Services presence (columns S-U) provided for each Access Node – information if each group of services presented below have been provided by particular Access Node. This parameter can take only "0" or "1" value, where "1" means than Access Node is a Points of Presence for particular group of services and "0" means than Access Node is not a Points of Presence for particular group of services. Please provide this information for the following group of services:
  - TDM leased lines- up to 2Mbit/s (column S): 64 Kbit/s, nx64 Kbit/s and 2 Mbit/s leased lines;
  - TDM leased lines - high speed (column T): STM-0, STM-1, STM-4 and STM-16 leased lines;
  - ATM/Ethernet data transmission (column U): IP corporate and IP Access.

A2 Service Volumes

This page contains quantities of each services, presented at aggregated (network wide) level, for the period from 2010 to 2022. Services volume for the year 2010-2011 should present total annual values, from the Operators databases. Services volume for the years 2012-2022 should present annual values forecasted by the Operators.

The first part of this page contains services' quantities (lines 8-42). Subscribers' quantities are presented for the following group of services:

- Voice services (lines 10-13) – year-end volume of active voice and ISDN services, in particular:
  - Year-end voice services – year-end volume of voice services over POTS, GPON or P2P technologies;
  - Year-end ISDN - BRA services - year-end volume of the ISDN – BRA services;
  - Year-end ISDN - PRA services - year-end volume of the ISDN – PRA services.
- Internet access services (lines 14-17) – year-end volume of Internet access services provided over pair of cooper cables (xDSL) or over fiber cable (GPON / P2P), in particular:
  - Year-end Internet access services - residential subscribers - year-end volume of Internet access services provided to residential subscribers;

- Year-end Internet access services - business subscribers - year-end volume of Internet access services provided to business subscribers;
- Year-end Internet access services - wholesale subscribers - year-end volume of Internet access services provided to wholesale subscribers.

- IPTV services (lines 18-19) – year-end volume of television services provided over pair of cooper cables (xDSL) or over fiber cable (GPON / P2P);
- TDM leased lines (lines 20-23) – year-end volume of connected TDM leased lines, in particular:
  - Year-end analog leased lines - 64 Kbit/s – year-end volume of connected 64 Kbit/s leased lines;
  - Year-end digital leased lines - nx64 Kbit/s – year-end volume of connected nx64 Kbit/s leased lines;
  - Year-end digital leased lines - 2 Mbit/s – year-end volume of connected 2 Mbit/s leased lines.
- TDM leased lines - high speed (lines 24-29) year-end volume of connected TDM leased lines, in particular:
  - Year-end leased lines – E3 - year-end volume of connected E3 leased lines;
  - Year-end leased lines - STM-0 - year-end volume of connected STM-0 leased lines;
  - Year-end leased lines - STM-1 - year-end volume of connected STM-1 leased lines;
  - Year-end leased lines - STM-4 - year-end volume of connected STM-4 leased lines;
  - Year-end leased lines - STM-16 - year-end volume of connected STM-16 leased lines.
- ATM/Ethernet data transmission - IP corporate (lines 30-35) – year-end volume of point-to-point data transmission services provided over ATM/Ethernet technology to corporate and business clients and other telecommunication operators (for example a dedicated line for connection for one business office with another in other location) , in particular:
  - 2Mbit/s – year-end volume of end-to-end data transmission services provided over ATM/Ethernet technology with throughput lower than 2Mbit/s;
  - up to 10Mbit/s – year-end volume of end-to-end data transmission services provided over ATM/Ethernet technology with throughputs from 2Mbit/s to 10Mbit/s.;
  - up to 100Mbit/s – year-end volume of end-to-end data transmission services provided over ATM/Ethernet technology with throughputs from 10Mbit/s to 100Mbit/s;
  - up to 1Gbit/s – year-end volume of end-to-end data transmission services provided over ATM/Ethernet technology with throughputs from 100Mbit/s to 1Gbit/s;
  - up to 10Gbit/s – year-end volume of end-to-end data transmission services provided over ATM/Ethernet technology with throughputs higher than 1Gbit/s.
- ATM/Ethernet data transmission - IP Access (lines 36-41) - year-end volume of services providing access to Internet over ATM/Ethernet technology to corporate and business clients and other telecommunication

operators (for example sophisticated access to internet over Ethernet technology and directly connected to edge Ethernet switch, but not for peering purposes), in particular:

- 2Mbit/s - year-end volume of services providing access to Internet over ATM/Ethernet technology with throughput lower than 2Mbit/s;
- up to 10Mbit/s - year-end volume of services providing access to Internet over ATM/Ethernet technology with throughput from 2Mbit/s to 10Mbit/s
- up to 100Mbit/s - year-end volume of services providing access to Internet over ATM/Ethernet technology with throughput from 10Mbit/s to 100Mbit/s;
- up to 1Gbit/s – year-end volume of end-to-end data transmission services provided over ATM/Ethernet technology with throughputs from 100Mbit/s to 1Gbit/s;
- up to 10Gbit/s – year-end volume of end-to-end data transmission services provided over ATM/Ethernet technology with throughputs higher than 1Gbit/s.

- Other - packet data services (lines 42-43) - year-end volume of other data transmission services, not included in the previous categories.

The second part of this page contains amount of traffic generated by listed above services, during each year, in particular:

- Voice calls traffic (lines 45-61) – yearly volume of the realized minutes for the retail and interconnection calls, excluding call set-up time and unsuccessfully calls, presented for the following services:
  - Local calls – on-net calls (in the network of incumbent operator) - yearly volume of minutes for calls on own Operator network, realized in a single numbering zone;
  - National calls – on-net calls (in the network of incumbent operator) - yearly volume of minutes for calls on own Operator network, realized in a several numbering zones;
  - International calls (except calls to short telephone numbers) – yearly volume of minutes realized for calls to VoIP, PSTN and mobile networks in foreign countries;
  - Calls to short telephone numbers - yearly volume of minutes realized for calls to VoIP, PSTN, mobile networks to short telephone numbers despite the call is charged or not;
  - Interconnection calls – outgoing on local level - yearly volume of minutes for outgoing calls from the Operator network at the POI located in the same numbering zone as calling subscriber;
  - Interconnection calls – outgoing on national level - yearly volume of minutes for outgoing calls from the Operator network at the POI located in the different numbering zone as calling subscriber;
  - Interconnection calls – incoming on local level - yearly volume of minutes for incoming calls to the Operator network at the POI located in the same numbering zone as subscriber receiving call;

- Interconnection calls – incoming on national level - yearly volume of minutes for incoming calls to the Operator network at the POI located in the different numbering zone as subscriber receiving call;
- Interconnection calls – transit 1 - yearly volume of minutes transited through single Transit switch (inclusive);
- Interconnection calls – transit 2 - yearly volume of minutes transited from (to) Local switch (excluding that switch), located as near as possible to calling customer (called customer), where interconnection is already provided or can be provided, to (from) Transit switch (inclusive), where interconnection can be provided;
- Interconnection calls – transit 3 - yearly volume of minutes transited from Transit switch (excluding that switch), where interconnection is provided or can be provided, to Transit switch (inclusive), where interconnection is provided or can be provided;
- Interconnection calls – transit 4 - yearly volume of international call minutes transited through single International Transit switch (inclusive), when international call is originated in network in Lithuania;
- Interconnection calls – transit 5 - yearly volume of international call minutes transited from Transit switch (excluding that switch) to International Transit switch (inclusive), when international call is originated in networks in Lithuania;
- Interconnection calls – transit 6 - yearly volume of transit minutes originated abroad and terminated in Lithuania;
- Other connections - yearly volume of minutes for services not listed above.

- Data traffic (lines 63-77) – yearly volume of two way data traffic (uplink and downlink) in Gbytes measured in the second layer (ATM / Ethernet), presented for the following services:
  - Internet access services – residential - yearly volume of data traffic in Gbytes measured at the first aggregation point (MSAN, DSLAM, OLT, ATM or Ethernet equipment) generated by residential subscribers connected over pair of cooper cables (xDSL) or over fiber cable (GPON / P2P);
  - Internet access services – business - yearly volume of data traffic in Gbytes measured at the first aggregation point (MSAN, DSLAM, OLT, ATM or Ethernet equipment) generated by business subscribers connected over pair of cooper cables (xDSL) or over fiber cable (GPON / P2P);
  - Internet access services - wholesale - yearly volume of data traffic in Gbytes measured at the first aggregation point (MSAN, DSLAM, OLT, ATM or Ethernet equipment) generated by wholesale subscribers connected over pair of cooper cables (xDSL) or over fiber cable (GPON / P2P);
  - IPTV services - yearly volume of data traffic in Gbytes measured at the firs Access Node (MSAN, DSLAM, OLT or Ethernet equipment) generated by IPTV subscribers connected over pair of cooper cables (xDSL) or over fiber cable (GPON / P2P). This volume should not be included in the above categories;

- ATM/Ethernet data transmission – IP corporate - yearly volume of data traffic in Gbytes measured at the first aggregation point (ATM/Ethernet equipment) generated by data transmission services realized over ATM/Ethernet technology;
- ATM/Ethernet data transmission - IP access - yearly volume of data traffic in Gbytes measured at the first aggregation point (ATM/Ethernet equipment) generated by Internet access services realized over ATM/Ethernet technology;
- Other data transmission services - yearly volume of data traffic in Gbytes measured at the first aggregation point (ATM/Ethernet equipment) generated by services not listed above – excluding leased lines;
- POI - yearly volume of data traffic of beat stream access services in Gbytes measured at the data Points of Interconnection with other operators;
- Peering - yearly volume of data traffic in Gbytes measured at the peering points with national and international Internet providers.

In case operator has no technical possibility to provide data traffic at the first aggregation point, please provide the data for higher aggregation point and leave comment regarding which aggregation point was the data taken from.

A3 Service Statistics

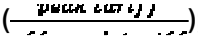
This page contains statistical and technical parameters regarding particular services and information regarding POI in the Operator network. Please provide statistics with the latest data available. The following modeling parts are specified in this table:

- Priority factors (lines 7-20) should reflect that specific quality parameters required by particular services, which have impact on utilization of network resources. This value should be from 100-500%, where 100% means lowest priority and 500% represent services with highest quality parameters;
- Busy Hour to Average Hour traffic ratio for voice and data services (lines 22-29) – presents ratio between traffic in Busy Hour and traffic in average hour (using the latest available data) and should be calculated in the following steps:
  - Calculation of BH / AVG for each month is done by taking average of any three busiest hour (not necessarily in a row) traffic during the month divided by the average hour traffic during the month

$$Busy\ hour\ ratio = \frac{(first\ busiest\ hour\ of\ the\ month\ traffic + second + third)/3}{\ }$$

  - Calculation of BH / AVG for the year - average of the BH / AVG calculated for the each month.
- VoIP assumptions (lines 31-38) – this section presents technical assumptions regarding VoIP technology, in particular:
  - Voice codec used – questionnaire includes predefined list of VoIP codec, Operator should choose codec which he uses, which is supported by its network equipment or which he is planning to use;

- Payload of each network layer protocols: RTP / UDP / IP / Ethernet – presents theoretical size of each protocol header.

- Voice services parameters (lines 40-51) – this section presents:
  - Unsuccessful call attempts as percentage of successful calls;
  - Call set-up duration for successful calls - average length of time required to set-up successful call between users. It is period of time between call initiation (calling party dial a number) and call set-up (called party answers the call);
  - Call set-up duration for unsuccessful calls - average length of time between call initiation (calling party dial a number) and call break (calling party breaks connection, due to called party did not answer the call);
  - Call duration - average call duration in minutes, excluding call set-up duration;
  - Equivalent voice channels – POTS – number of voice channels which can be provided thought POTS line;
  - Equivalent voice channels ISDN-BRA – number of voice channels which can be provided thought ISDN-BRA line;
  - Equivalent voice channels ISDN-PRA - number of voice channels which can be provided thought ISDN-PRA line.
- Data - Points of interconnection (POI) (lines 53-58) – presents ratio of the data traffic from Internet access wholesale services outgoing at POI at each networks level, to the total traffic from Internet access wholesale services outgoing at POI;
- Parameters POI interfaces (lines 60-66) – presents capacities of POI interfaces, defined in number o E1 lines. This parameter should present nominal number of E1 lines which can be provided thought listed interfaces;
- Voice - Points of interconnection (POI) (lines 68-76) – presents number of POI interfaces located at Transit Nodes;
- Equivalent number of 64 Kbit/s lines (line 81) – present volume of 64bkps leased lines which could be provided thought nx64 kbps leased lines. It should be calculated as a total throughput of nx64 kbps leased lines divided by throughput of one 64bkps leased line;
- High speed leased lines average throughputs (lines 83-90) – present the average throughputs in Mbit/s of the interfaces listed;
- IPTV services (lines 92-96) – present maximal number of TV channels offered to subscriber, average throughput of IPTV stream and average STB activity length per day;
- Voice - tariff differentiation statistics (lines 98-102) – this section presents:
  - Peak to off-peak tariff differentiation ratio - ratio of peak tariff for retail calls to off-peak tariff for retail calls ();
  - Peak traffic proportion – ratio of voice traffic in peak period to total daily traffic;

- Off-peak proportion – ratio of voice traffic in off-peak period to total daily traffic;

- Voice interconnection statistics (lines 104-107) – present the proportions of interconnection traffic occurring with the old PSTN networks and with the NGN networks (SIP/H.323);

A4 Headroom Allowance

This page presents list of network elements and their capacity parameters. Design utilization factor at planning stage (column F). Design utilization factor at planning stage should take into account operational and technical reserve. It represents (vendor designated) maximal level of equipments utilization, which ensures that the equipment will not be overloaded by any transient spikes of traffic in the network. It reflects reserve for temporary equipment performance decrease or environmental conditions which not allows to utilize equipment with its nominal capacity (redundancy). The basic formula to estimate the design utilization factor at planning stage is:

$$Utilization\ factor = \frac{Redundancy}{Vendor\ recommended\ utilization\ rate}$$

Where redundancy and utilization rates are expressed in percentages. For further understanding, 90% utilization factor would initially mean that one out of ten network elements is reserved for redundancy/transient spikes.

This parameter should be calculated based on:

- Total network average;
- Average calculated on the representative sample;
- Best estimate – equipment technical documentation or engineering rules.

- Planning horizon (column G). Planning horizon presents the time required to make all the necessary preparations to bring new equipment online. This period can be defined from weeks to years (values of periods are predefined).

A5 Network Statistics

In the first section please provide:

- Capacity of 2Mbit/s line in Erlangs (line 14) – capacity of E1 link presented in Erlangs.

The remaining page consists of the two basic sections:

- Active network elements specification and statistics
- Ducts and fiber cables specification and statistics

Second section specifies building elements (chassis and cards) and capacities of the network elements. Capacities of building elements should correspond to the prices provided in page A6 Economic data.

The following building blocks can be defined for each network element:

- Chassis / shelves – chassis / shelves which capacities are based on the number of card slots that it contains. Different types chassis represent different capacities;

- Switching / processing card - cards switching / processing traffic in the network equipment. Capacities of subscriber cards are based on maximal processing / switching capacities of those cards defined in amount of traffic which they can handle;
- Subscriber cards - cards containing different numbers of ports and support different technologies and data rates which are used to directly connect subscribers. Capacities of subscriber cards are based on the number of ports that there contains;
- Trunking cards - cards containing different numbers of ports and support different technologies and data rates which are used to connect network elements. Capacities of trunking cards are based on the number of ports that there contains;
- Optical modules – optical modules which can be used in particular trunking cards.

Presented parameters should be prepared based on technical documentation or dimensioning rules provided to the Operators by the vendors of network equipment.

- MSAN specification (lines 12-33) – this paragraph includes data regarding MSAN equipment used in the network.
  - Chassis – present types of MSANS's used in the network, and their capacities defined in:
    - Maximal number of subscriber cards, which can be installed in particular chassis type;
    - Maximal number of trunking cards, which can be installed in particular chassis type;
    - Maximal voice processing capacity in BHCA of particular chassis type;
    - Maximal switching capacity in Gbit/s of particular chassis type;
  - Subscriber cards – presents the capacities (defined in number of ports) for the following types of subscriber cards which can be used at MSAN:
    - Type 1 – ADSL – card providing subscriber ports in ADSL technology;
    - Type 2 –SHDSL – card providing subscriber ports in SHDSL technology;
    - Type 3 –POTS – card providing subscriber ports in POTS technology;
    - Type 4 –ISDN-BRA – card providing subscriber ports in ISDN-BRA technology;
  - Trunking card – presents the types and capacities (defined in number of Ethernet ports) of trucking cards used at MSAN;
  - Optical module – present types of optical modules which can be used in particular trunking card;
- OLT specification (lines 35-51) – this paragraph includes data regarding OLT equipment used in the network.
  - Chassis – present types of OLT's used in the network, and their capacities defined in:

- Maximal number of subscriber cards, which can be installed in particular chassis type;
- Maximal number of trunking cards, which can be installed in particular chassis type.

- Subscriber cards – presents the capacities (defined in number of ports) for the following types of subscriber cards which can be used at OLT:
  - Type 1 – GPOON – card providing subscriber ports in GPON technology;
  - Split ratio – amount of subscribers which can be served from one GPON port which is spitted in the lower parts of the network.
- Trunking card – presents the types and capacities (defined in number of Ethernet ports) of trucking cards used at OLT;
- Optical module – present types of optical modules which can be used in particular trunking card;

- Access Ethernet Switch (lines 53-74) - this paragraph includes data regarding Access Ethernet Switch equipment used in the network in Access Nodes location to aggregate traffic from subscribers connected with P2P technology.
  - Chassis – present types of Access Ethernet Switches used in the network, and their capacities defined in number of card slots for trunking and switching cards that it contains. Different types chassis represent different capacities;
  - Subscriber cards – presents the capacities (defined in number of ports) for the following types of subscriber cards which can be used at Access Ethernet Switch:
    - Type 1 –P2P – card providing subscriber ports in Gigabit Ethernet technology;
    - Type 2 –P2P – card providing subscriber ports in Gigabit Ethernet technology;
  - Trunking card – presents the types and capacities (defined in number of GE ports) of trucking cards used at Access Ethernet Switches;
  - Optical modules – present types of optical modules which can be used in particular trunking cards.
- Ethernet rings statistics (lines 76-82) – this paragraph includes statistics regarding Ethernet connections used in the backhaul and distribution network in particular:
  - Ring throughput – Ethernet link throughput which should be defined as 1GE or 10GE;
  - Operational allowance - presents maximal level of Ethernet link utilization, it should take into account operational and technical reserve.
- Edge Ethernet Switch (lines 84-117) - this paragraph includes data regarding Edge Ethernet Switch equipment used in the network to aggregate traffic from Access Nodes.

- Chassis – present types of Edge Ethernet Switches used in the network, and their capacities defined in number of card slots for trunking and switching cards that it contains. Different types chassis represent different capacities;
- Switching cards- presents the types of switching cards which can be used at Edge Ethernet Switches and their capacities defined in Gbit/s;
- Trunking card – presents the types and capacities (defined in number of 1GE and 10 GE ports) of trucking cards used at Edge Ethernet Switches;
- Optical modules – present types of optical modules which can be used in particular trunking cards.

- Core Ethernet Switch (lines 119-152) - this paragraph includes data regarding Core Ethernet Switch equipment used in the network to aggregate traffic from Core Ethernet Switches.
  - Chassis – present types of Core Ethernet Switches used in the network, and their capacities defined in number of card slots for trunking and switching cards that it contains. Different types chassis represent different capacities;
  - Switching cards- presents the types of switching cards which can be used at Core Ethernet Switches and their capacities defined in Gbit/s;
  - Trunking card – presents the types and capacities (defined in number of 1GE and 10 GE ports) of trucking cards used at Core Ethernet Switches;
  - Optical modules – present types of optical modules which can be used in particular trunking cards.
- IP routers Transit Node (lines 154-174) - this paragraph includes data regarding IP routers equipment used in the network at the Transit Nodes.
  - Chassis – present types of IP routers used in the network, and their capacities defined in number of card slots for trunking and switching cards that it contains. Different types chassis represent different capacities;
  - Switching cards- presents the types of switching cards which can be used at IP routers and their capacities defined in Gbit/s;
  - Trunking card – presents the types and capacities (defined in number of 10 GE ports) of trucking cards used at IP routers;
  - Optical modules – present types of optical modules which can be used in trunking cards.
- MGW (lines 176-197) this paragraph includes data regarding Media Gateway's equipment used in the network at the POI.
  - Chassis – present types of MGW used in the network, and their capacities defined in number of card slots for trunking and switching capacity in Gbit/s. Different types chassis represent different capacities;

- Trunking card GE– presents the types and capacities (defined in number of 1GE) of trucking cards used to connect MGW to IP router;
- Trunking card E1/STM– presents the types and capacities (defined in number of E1, STM-1, STM-4 ports) of trunking cards used to provide interconnection ports in TDM technology to other operators;
- Optical modules – present types of optical modules which can be used in particular trunking cards.

- N-SBG (lines 199-207) this paragraph includes data regarding Network Session Border Gateway's equipment used in the network at the POI.
  - Main unit – presents type of N-SBG used in the network, and its capacity defined in number of slots for expansion units;
  - Expansion unit – N-SBG – presents expansion unit of Network Session Border Gateway and its capacity (defined in number of BHCA).
- MGC (lines 209-217) this paragraph includes data regarding Media Gateway Controller's equipment used in the network at the POI.
  - Main unit – presents type of MGC used in the network, and its capacity defined in number of slots for expansion units;
  - Expansion unit – MGC – presents expansion unit of Media Gateway Controller and its capacity (defined in number of BHCA).
- IMS (lines 219-236) this paragraph includes data regarding IMS equipment. The IMS system includes the following parts:
  - IMS core service frame – present types of service cards used in the IMS core and their capacity. It can include the following service cards:
    - Service card - Type 2- MGCF - presents service card implementing MGCF function which capacities is defined in BHE;
    - Service card - Type 3- Telephony AS - presents service card implementing telephony AS function which capacities is defined in volume of subscribers;
    - Service card - Type 4 - CSCF & MRCF - presents service card implementing both - CSCF and MRCF, functions which capacities are defined in BHCA and volume of subscribers;
    - Service card - Type 5 - BGCF - presents service card implementing BGCF function which capacities is defined in BHE.
  - HSS service frame – present types of HSS service cards used in the network and their capacity. It can include the following service cards:
    - Service card - Type 1 – Control card – presents service card implementing control function which capacity is defined in volume of subscribers;

- Service card - Type 2 – Database card – presents service card implementing database function which capacity is defined in volume of subscribers.

- IC billing system (lines 238-246). Billing system is serving the wholesale traffic, responsible for pre-rating and rating of the traffic. It consists of:
  - Main unit– present types of wholesale billing system primary units used in the network, and their capacities defined in maximal number of expansion units;
  - Expansion unit- presents the types of expansion units which can be used to expand the processing capacity of the main unit, their capacities are defined in BHE.
- Number of network elements currently present in the Operators network (lines 238-246). This section includes actual number of network equipment used in the core network of the Operators. The number of network elements is defined in volume of chassis for the particular network elements:
  - Edge ATM/Ethernet switches;
  - Core ATM/Ethernet switches.
  - Volume of core IP routers.

Second section of this page includes ducts and fiber cables specification and statistics.

- Length of fiber cables used in each geotype in kilometers for AN-TN and TN-TN layers (lines 255-261) – statistics presenting fiber cable length between Access Nodes and Transit nodes as well as between Transit nodes for each geotype;
- Average number of installed fibers in cable for each network level (lines 263-266), in particular:
  - AN - TN – fiber cables type used between Access Nodes and Transit Nodes;
  - TN - TN – fiber cables type used between Transit Nodes.
- Proportion of ducts used in each geotype in percentages (lines 193-220) – statistics presenting duct types proportion for each geotype. This proportion of each type of duct should include ducts for the total network (access and core);
- Ground reconstruction, passages and ducts statistics for urban, suburban and rural geotype (lines 288-334):
  - Density factors – parameter presenting density of manholes and joints in the network:
    - Manholes density - factor presenting average number of manholes per kilometer of ducts;
    - Joints density - factor presenting average number of joints per kilometer of fiber cables.
  - Ground reconstruction statistics – statistics presenting how the ducts have been build up:
    - Passages under obstacles – ratio of length of ducts build by making passages under obstacles to the total ducts length.

- Ground reconstruction – ratio of length of ducts which required ground reconstruction to the total ducts length.

- Ground reconstruction types – statistics presenting what types of ground reconstruction are made:
  - Grass reconstruction – ratio of length of ducts which required grass reconstruction to the total ducts length which require ground reconstruction;
  - Sidewalk reconstruction – ratio of length of ducts which required sidewalk reconstruction – to the total ducts length which require ground reconstruction;
  - Asphalt pavement reconstruction – ratio of length of ducts which required asphalt pavement reconstruction – to the total ducts length which requires ground reconstruction;
  - Concrete pavement reconstruction – ratio of length of ducts which required concrete pavement reconstruction – to the total ducts length which requires ground reconstruction;
  - No reconstruction – ratio of length of ducts which have not been required reconstructed – to the total ducts length which require ground reconstruction;
- Passages under obstacles – statistics presenting what types of passages under obstacles are made:
  - Passage under road (up to 15m) – ratio of length of ducts which have been built as a passage under road narrower than 15 meters to the total ducts length which have been built as a passage under obstacles;
  - Passage under road (above 15m) – ratio of length of ducts which have been built as a passage under road wider than 15 meters to the total ducts length which have been built as a passage under obstacles;
  - Passage under railway tracks – ratio of length of ducts which have been built as a passage under railway tracks to the total ducts length which have been built as a passage under obstacles;
  - Passage under rivers and channel – ratio of length of ducts which have been built as a passage under railway tracks to the total ducts length which have been built as a passage under obstacles;
  - Passage under other obstacles – ratio of length of ducts which have been built as a passage under other than listed above obstacles to the total ducts length which have been built as a passage under obstacles.

- Average volumes of ground reconstruction (lines 336-349) present average trench width for each type of ground reconstruction, and average passages under obstacles length for the each type of ground reconstruction;

- Additional works statistics (lines 351-355) present number of parcel per kilometer of ducts.

A6 Economic data

This input parameter page presents the economic data regarding network equipment.

- Current network equipment price, LT (column D) – pricing data of network equipment which original currency in the contract is presented in LT. Pricing data should:
    - Be provided for the currently available assets based on latest contracts with the vendors including available/received discounts;
    - Correspond to the equipment specified on the previous page;
    - Include installation, materials, planning and documentation costs where is applicable;
    - Present average price weighted with the number of existing elements in the network, if the category represents broader set of elements;
    - Chassis and shelf prices should include all supporting equipment (control cards, power supply, cooling, patch panel etc.).
- Current network equipment price, EUR (column E) – pricing data of network equipment which original currency in the contract is presented in EUR. Same criteria apply to the pricing data as above;
- Useful lifetime (column F) – useful lifetime of each asset based on the existing accounting policy;
- Price index (column G) - contains year to year price change ratios for network elements. Please provide the latest available year to year price trend, which should be calculated based on prices form contracts with equipment vendors or offers for equipment purchase.

A7 CAPEX

This page includes gross book values, net book values and historical yearly depreciation for the defined groups of assets. The values for each group should be provided based on Fixed Assets Register and should reconcile to the last audited not-consolidated financial statement for year-ended 31 December 2011. The following groups of assets have been defined:

- Network – assets presenting network equipment:
    - Access Nodes (RSU, DSLAM, MSAN);
    - Transmission network (SDH, DWDM, ATM, Ethernet);
    - Switching network (Exchanges);
    - IP network (IP routers);
    - Fiber cables:
        - In the Access network;
        - In the Core network.

- Synchronization network;
- Power supply (power plants, batteries, aggregates);
- Other network equipment, not listed above.

- IT systems - assets presenting financial, inventory, CRM IT systems:
  - tangible assets;
  - non-tangible assets.
- Network management system – general - assets presenting NMS system which cannot be assigned to particular network elements groups defined in next point;
- Network management system - assets presenting NMS system which can be assigned to particular network elements group, in particular:
  - Access Nodes (RSU, DSLAM, MSAN, OLT, Access Ethernet Switches);
  - Transmission network (SDH, DWDM, ATM, Ethernet);
  - Switching network (Exchanges, Ethernet Switches);
  - IP network (IP routers);
  - Other network elements group, not listed above.
- Land and Building:
  - Ducts;
  - Buildings - Network sites;
  - Buildings – Offices.
- Support – assets including motor vehicles, fixtures, fittings and office equipment including PCs;
- Non-tangible assets;
- Other assets, not listed above.

This page includes also percentage split of IT systems by functions.

A8 OPEX

This page includes gross expenditures for the defined groups of costs. The provided expenditures should comprise the sum of the following captions in Profit and Loss accounts:

- Material-type expenditures;
- Payments to personnel;
- Other expenditures, not listed above.

They also should reconcile to the audited not-consolidated financial statement for year-ended 31 December 2011. Groups of the expenditures listed above should include all of the expenditures listed in the financial statement. In order to bring the expenditures into more detail, the following groups of operational costs have been defined:

- Network operation, maintenance and planning expenses, for the following groups of network equipment:
    - Access Nodes (RSU, DSLAM, MSAN, OLT, Access Ethernet Switches);
    - Transmission network (SDH, DWDM, ATM, Ethernet);
    - Switching network (Exchanges, Ethernet Switches);
    - IP network (IP routers);
    - Fiber cables and ducts;
    - Synchronization network;
    - Power supply (power plants, batteries, aggregates);
    - Other network equipment not listed above.
- IT systems operation and maintenance expenses;
- Sales, Marketing and Customer Care expenses (incl. dealer commissions);
- Finance and Administration costs;
- Telecommunication concession and fees toward national authorities;
- Other telecommunication fees toward other operators;
- Wholesale and regulatory cost (only headcounts costs);
- Network site rental costs;
- Office rental cost;
- Energy costs;
- Postal and billing costs;
- Interconnection costs – cost of interconnected traffic;
- Peering costs – cost of traffic provided through peering points;
- Fees and taxes, which do not fit into categories listed above;
- Other expenditures – expenditures not listed above.

A9 Network Structure

This page contains data of the Local Nodes and Transit Nodes in the fixed line network. This page should include information regarding all Local Nodes (nodes including Local Exchanges or Edge Ethernet Switches) and Transit Nodes (nodes including Transit Exchanges or Core IP Routers) operating in the network of Operator.

Each Local Nodes should be specified by:

- Local Node name – unique name of the Local Node used in the inventory system or network management system;
- Local Node Location - the address should have format: City, Street, Number;
- Local Node geographical coordinates GPS (EOVX, EOVY) – geographical coordinates of the Local Node presented in the WGS 84 (GPS) coordinates system;
- Numbering Zone number (NZ) - number of Numbering Zone in which Local Node is located;
- Transit Zone number (TZ) - number of Transit Zone in which Local Node is located.

Each Transit Node should be specified by:

- Transit Zone number (TZ) - number of Transit Zone in which Transit Node is located;
- Transit Node name – unique name of the Transit Node used in the inventory system or network management system;
- Transit Node Location - the address should have format: City, Street, Number;
- Transit Node geographical coordinates GPS (EOVX, EOVY) – geographical coordinates of the Transit Node presented in the WGS 84 (GPS) coordinates system.

A10 Fiber cables sections

This page contains list of all sections of fiber cables used in Operators core network, therefore it should not include fiber cable sections used to provide subscriber access in GPON / P2P technology. This data will be used to calculate length of fiber cables in urban and rural area. In particular each fiber cable section is specified by:

- Fiber cable section ID – unique name of the fiber cable section used in the inventory system or network management system;
- Point A ID – unique name of the starting point of fiber cable section, used in the inventory system or network management system;
- Point B ID – unique name of the ending point of fiber cable section, used in the inventory system or network management system;

- Geotype – the geotype in which the part of the cable is located in (Rural or Urban);
- Section optical length – optical length of fiber cable section presented in kilometers.