



ITU Regional Seminar

Belgrade, Serbia and Montenegro, 20-24 June 2005

Session 6.2

Features, Inputs/outputs for most frequent tools: application of **Excel** **PLANITU**

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Application of **Excel**

- entering and storing of network data
(coordinates, traffic, equipment costs)
- sorting of network data
- calculating of basic formulas (demand forecasting) and simple methods (exchange locations)
- presenting of tables and charts

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Excel

Example for the location problem from Session 4.2
“Switching/Routing planning”:

0	0	81	326	81	0	0	0	<i>R1</i>
0	0	122	407	163	0	0	0	<i>R2</i>
0	0	81	366	204	0	0	0	<i>R3</i>
156	40	323	284	122	0	0	0	<i>R4</i>
391	236	323	323	326	41	43	43	<i>R5</i>
234	235	194	150	132	190	222	188	<i>R6</i>
38	208	326	310	240	283	317	317	<i>R7</i>

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Excel

Example for the location problem from Session 4.2
“Switching/Routing planning”:

$$R1 = 81 + 326 + 81 = 488$$

$$S1 = R1 = 488$$

$$R2 = 122 + 407 + 163 = 692$$

$$S2 = S1 + R2 = 1180$$

$$R3 = 81 + 366 + 204 = 651$$

$$S3 = S2 + R3 = 1183$$

$$R4 = 156 + 40 + 323 + 284 + 122 = 925$$

$$S4 = S3 + R4 = 2756$$

$$R5 = 391 + 236 + 323 + 323 + 326 + 41 + 43 + 43 = 1726$$

$$S5 = S4 + R5 = 4482$$

$$R6 = 234 + 235 + 194 + 150 + 132 + 190 + 222 + 188 = 1545$$

$$S6 = S5 + R6 = 6027$$

$$R7 = 38 + 208 + 326 + 310 + 240 + 283 + 317 + 317 = 2611$$

$$S7 = S6 + R7 = 8638$$

$$S_{TOT} = S7$$

$$S_Y = S_{TOT} / 2 = 8638 / 2 = 4319$$

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Excel

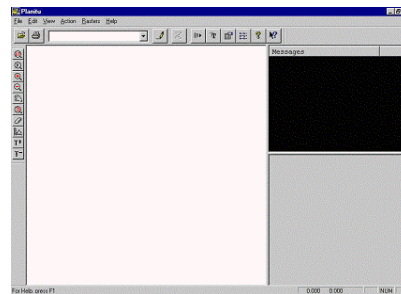
Result for the location problem from Session 4.2
 “Switching/Routing planning”:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	0	0	81	326	81	0	0	0	488	488					
2	0	0	122	407	163	0	0	0	692	1180					
3	0	0	81	386	204	0	0	0	651	1831					
4	156	40	323	284	122	0	0	0	925	2756					
5	981	236	323	323	306	41	43	43	1726	4482					
6	234	236	194	190	130	190	222	188	1545	5027					
7	36	290	326	310	240	383	317	317	2038	3866					
8	819	1538	2808	5154	6422	6836	7518	8066		4033	4033				
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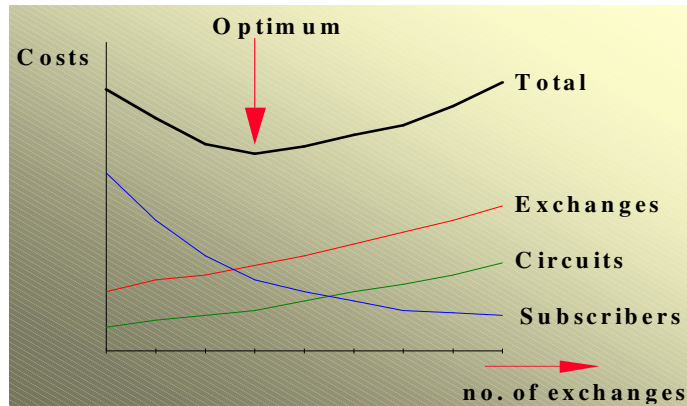
PLANITU

PLANITU is a tool for optimisation and dimensioning of telecom networks, based on an integrated interactive approach for finding minimum cost solutions for:

- *location and boundaries of exchanges*
- *selection of switching and transmission equipment*
- *circuit quantities, traffic routing, switching hierarchy*
- *choice of transmission paths.*

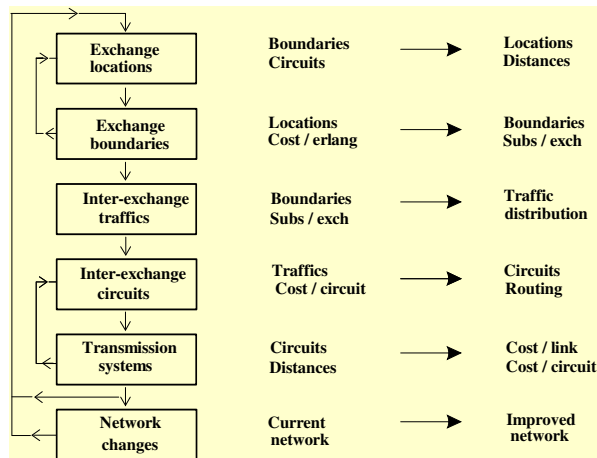


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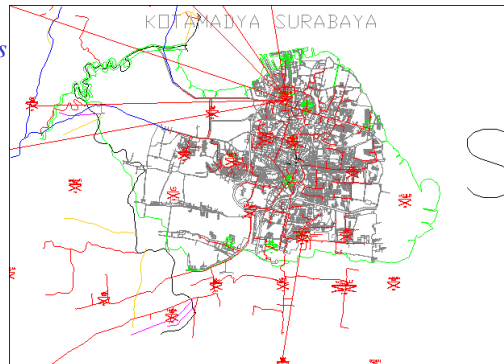


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Local Networks

- Exchange locations
- Exchange boundaries
- RSU locations & boundaries
- Inter-exchange network
- Exchange hierarchy
- Transmission systems

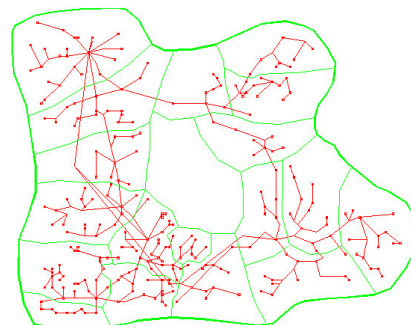


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Rural Networks

- Exchange locations & boundaries
- Exchange hierarchy
- Inter-exchange network
- Transmission systems

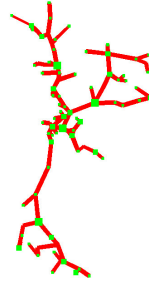


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National & International Networks

- *Traffic routing*
- *Exchange hierarchy*
- *Inter-exchange network*
- *Transmission systems*



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New Features in Planitu 3.0

Access network optimization

1. Dial-up Internet subscriber planning
2. Broadband access planning
3. Planning of cabinet areas

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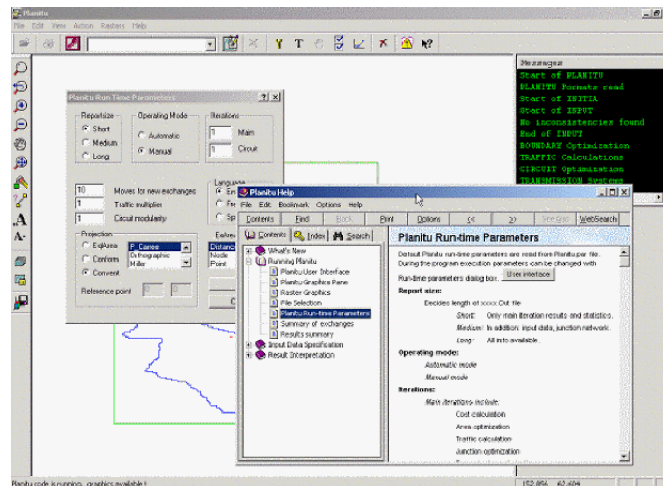
New Features in Planitu 3.0

Backbone network optimization

1. Dual homing (load sharing)
2. Design of nonhierarchical circuit-switched networks
3. Optimization of the fixed part of mobile (GSM) networks
4. Optimization of Ring/ Mesh SDH/ SONET transport networks
5. Design of ATM, IP MPLS, WDM networks using equivalent bandwidth paradigm.

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New Features in Planitu 3.0



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New Features in Planitu 3.0

Updated data handling and Planitu user interface

1. Contemporary "flat" look and feel with redesigned toolbars.
2. Integrated running cost chart for immediate inspection.
3. Export Planitu graphics into industry standard CAD formats
4. Results saving into Access database for post processing
5. New Planitu help containing complete Planitu manual
6. Set of demo networks for the new Planitu functionality
7. New click and go installation procedure on one CD

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New Features in Planitu 3.0

Planitu 3.0 Manual



Planitu 3.0 Network planning system manual
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APPLICATION:

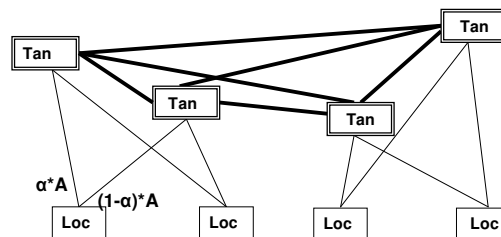
- ✓ PSTN circuit-switched (TDM) networks
- ❑ Data (packet) networks – very limited
- ❑ Evolution to NGN - limited
- ✓ Training tool for network planning

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CASE STUDY - Dual homing (load sharing) :

In the hierarchical routing one option is to overflow/transit traffic through two different tandems (Tan), i.e. to implement dual homing for the source of the traffic (Loc).

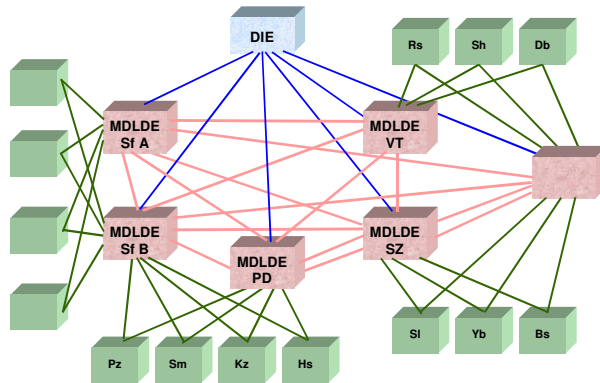
General rule is to divide traffic in equal portions, i.e. 50% to 50%. More universal approach will be to use coefficient α , $0 < \alpha < 1$.



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CASE STUDY - Dual homing (load sharing) :

*Optimisation
of the
Bulgarian
National LD
Circuit
Switched
Network*



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CASE STUDY - Dual homing (load sharing)

The optimisation of the national LD network results in:

- **transition from semi-meshed towards dual-homing network structure**
- **more robust and reliable traffic handling and routing**
- **simplifying the network management**
- **readiness for smooth transition towards Class 4 NGN solutions, deploying MGW in the location of the existing 6 MDLDEs**

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