

GIS ... the window to T-Com Croatia's telecommunications network data.

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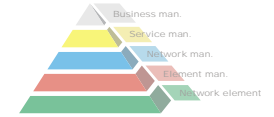
T . . . Com . . .

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Kupska 1
Zagreb, HR - 10000

Mihaela Sokić, ms.ee.
Mihaela.sokic@t.ht.hr
Head of OSS reporting

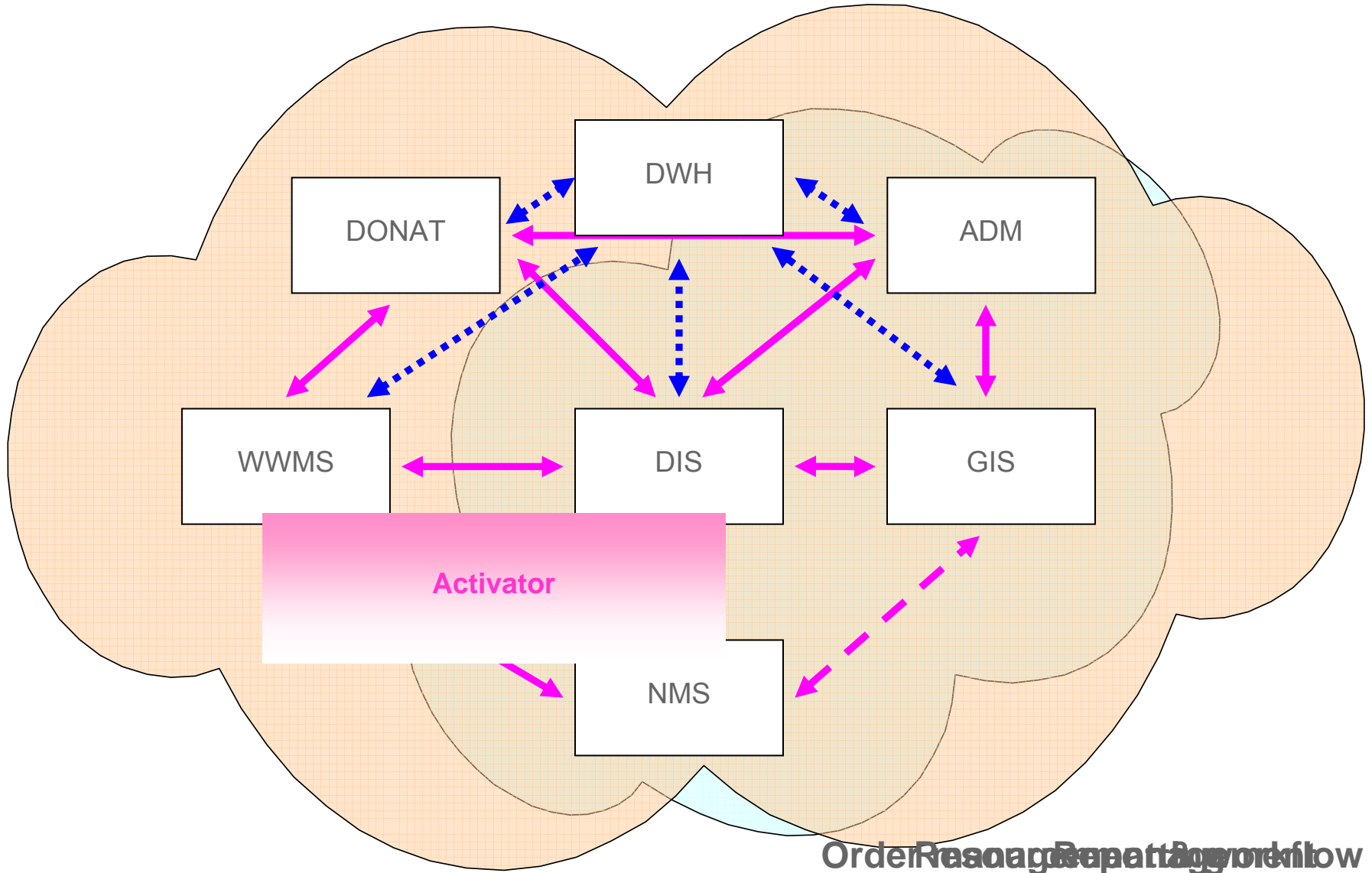
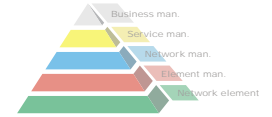
Zvonimir Unković, bs.ee.
Zvonimir.unkovic@t.ht.hr
Head of GIS department

Agenda

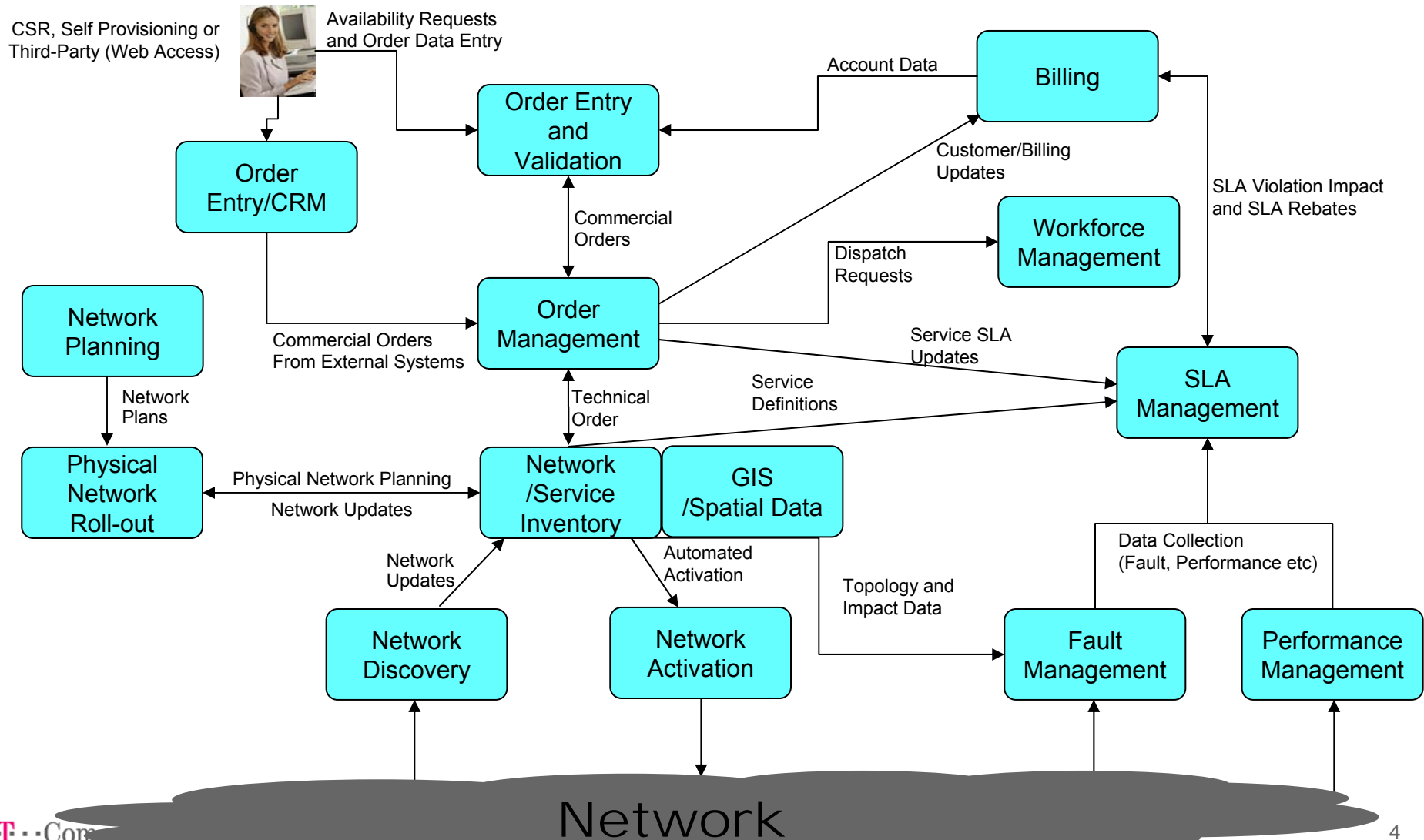
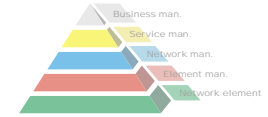


- OSS environment
- Processes
- Functionalities
- Inventory
- Users
- Actualities & Plans

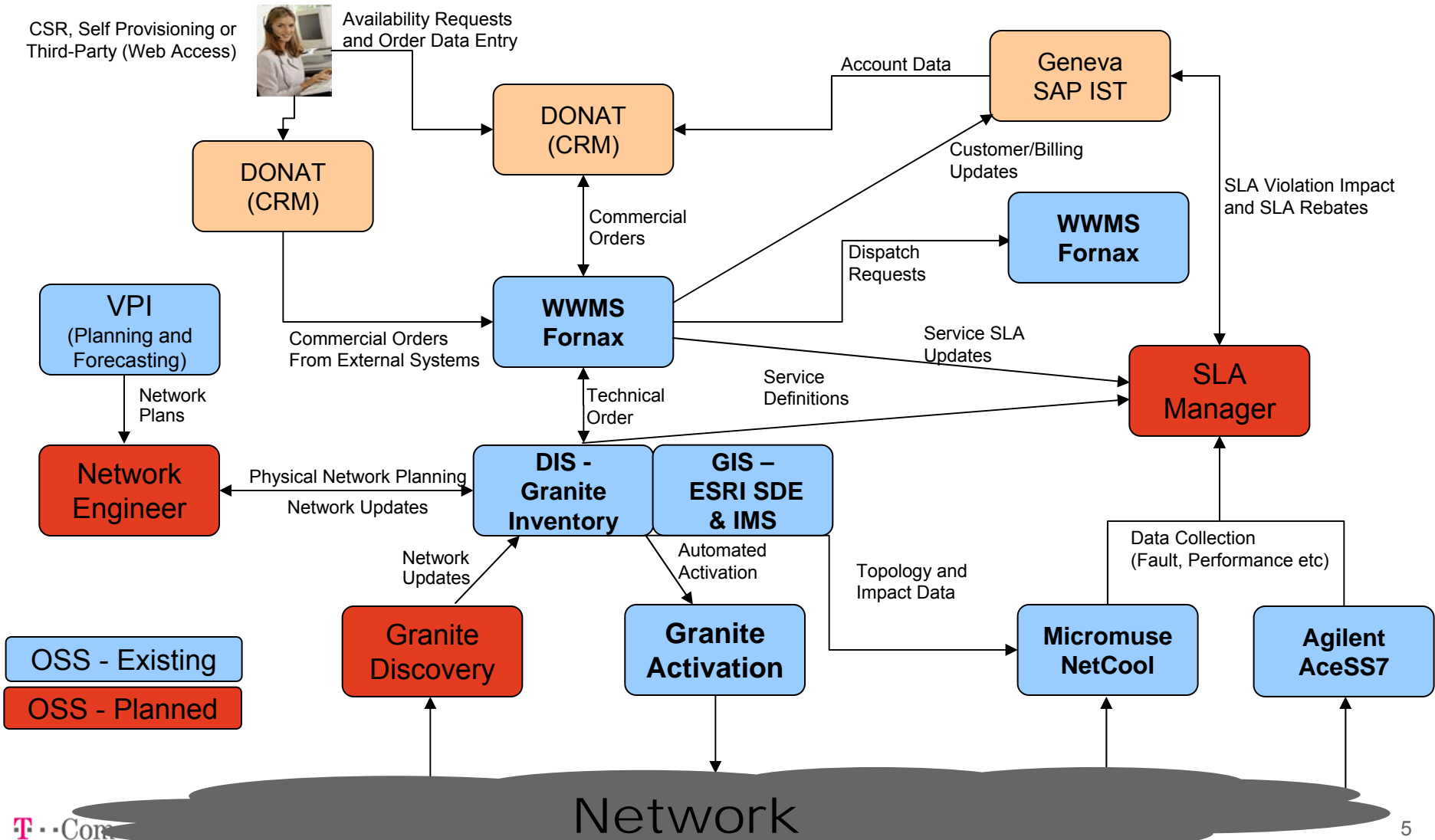
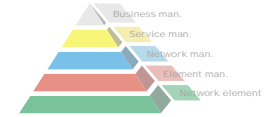
OSS environment



Overall BSS/OSS Architecture

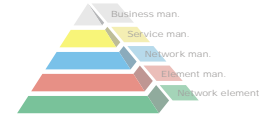


T-COM OSS Solution Architecture



Processes

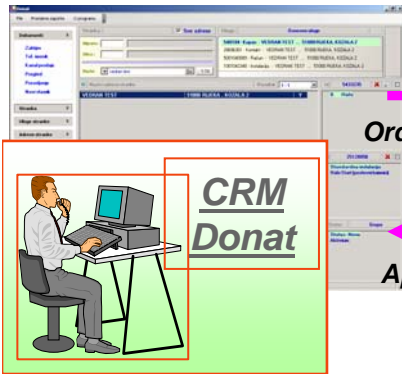
E2E automated PSTN provisioning – Feasibility check



Order creation in Sales (manual)

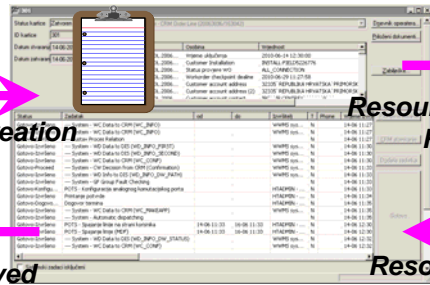
Order creation in WWMS (automatic via interface)

Resource allocation request (automatic via interface)



Order creation

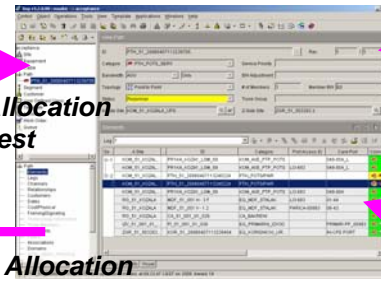
Approved



WWMS
Working order

Resource Allocation Request

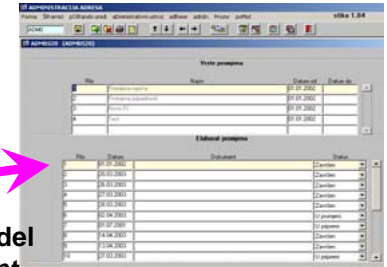
Resource Allocation Response



DIS
Resource Allocation Request Processing

Address model management

Last mile allocation Field group assignments



ADM



GIS

Resource Allocation
- Address admin
- Last mile allocation
- Line interface allocation
- Field group assignment

WWMS

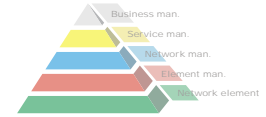
Resource Management

Sales

CTO - OSS

Processes

E2E automated provisioning – PSTN Fulfilment & future



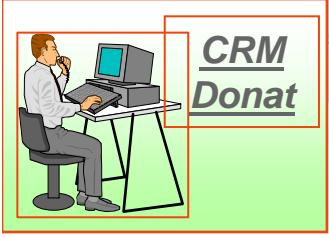
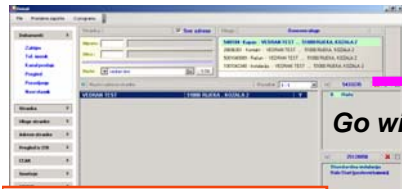
Realisation (Fulfillment)

- Resource list and field assignments from DIS & GIS
- Port configuration via NMS (RTTMS)
- Automated task dispatching based on GIS data
- Field group activities

Resource management

Confirmation (contracting)

WWMS



Go with realisation

Connected!

Resource Detailed List Request

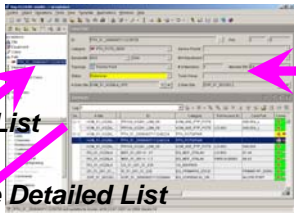
Resource Detailed List Response

Port configuration Request

Port configuration Response

Activation Request

Activation Response

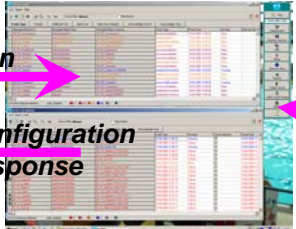


Field group assignments

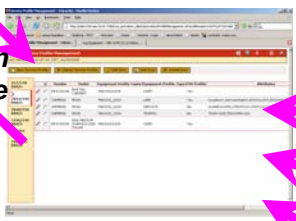
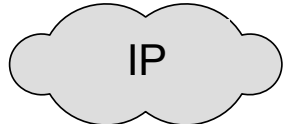
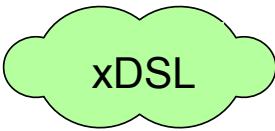


GIS

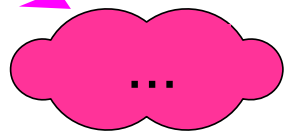
Provisioning on voice NE



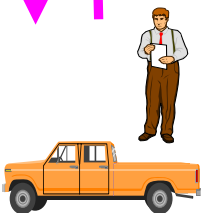
NMS



Activator



Field activities

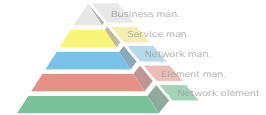


Sales

CTO - OSS

Processes

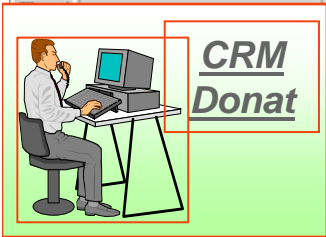
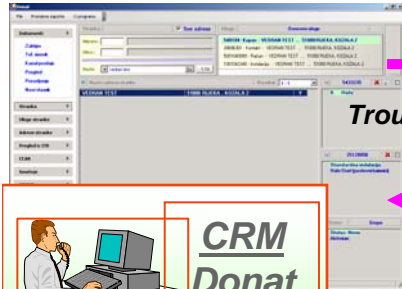
Fault Repair for PSTN Services



Fault Repair

- Resource list and field assignments from DIS & GIS
- Ticket correlation
- Automated task dispatching based on GIS data
- Field group activities
- Remote automated diagnosis

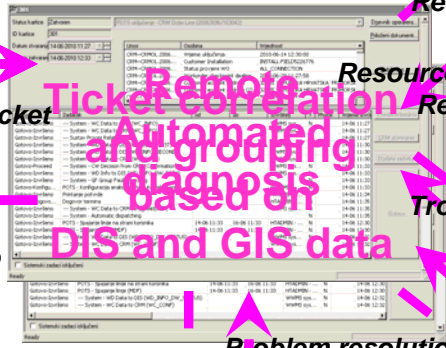
Customer complaint



Trouble ticket

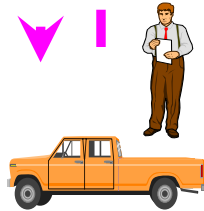
Info

WWMS

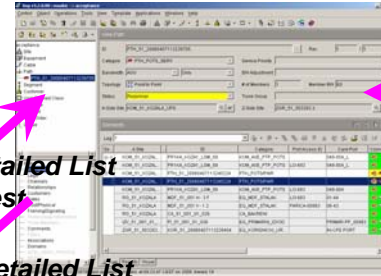


Problem resolution

Field activities



Resource management

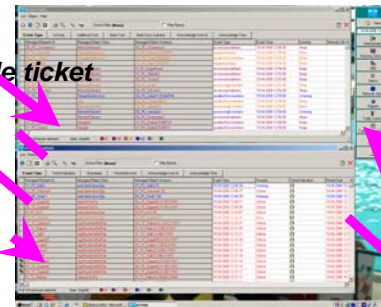


Resource Detailed List Request

Resource Detailed List Response

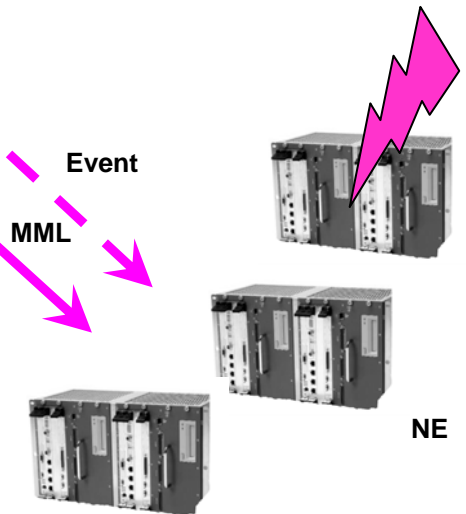
Field group assignments

DIS



Trouble ticket

NMS



Event

MML

NE



GIS

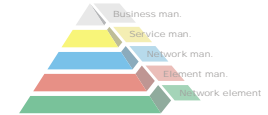
CTO - OSS

Sales

OSSC

Functionalities

EMG control down - PSTN Node Outage Impact

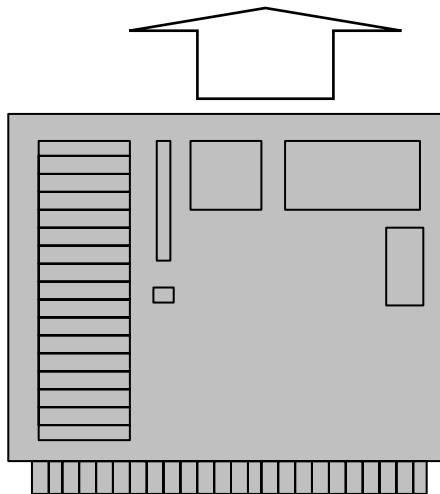


http://snms201tr.nms.ht.hr:8080/Template/ael.html?Entity_Name-OS_LiveEvents - Microsoft Internet Explorer

http://snms201tr.nms.ht.hr:8080/EMG/

Serial	Node	Count	LastOccurrence	Summary
100621986	Z0_PC_Centar4	8	5/7/08 8:00:00 AM	EMG CONTROL DOWN (TEST1)
98957441	ST_PC_Plovec1	224	3/15/06 1:08:00 AM	EMG EM MANUALLY BLOCKED (BILAD)
100716083	OS_PC_Plovec1	2	5/9/06 1:34:00 PM	EMG EM MANUALLY BLOCKED (PLET1)
98952261	Z0_PC_Tmsko2	223	3/15/06 1:34:00 AM	EMG EM MANUALLY BLOCKED (SST1)
88031813	Z0_PC_Medvescak2	162	3/28/06 8:53:00 AM	EMG EM MANUALLY BLOCKED (S88R)
100569671	Z0_PC_Centar4	10	5/7/08 8:00:00 AM	EMG EM MANUALLY BLOCKED (TEST1)
100697361	ST_PC_Sibenik1	3	5/9/08 9:27:00 AM	EMG FAULT (PERK1)
100710139	RI_PC_Zamet1	3	5/9/08 11:16:00 PM	EMG FAULT (STAR1)
100717322		1	5/9/06 1:53:41 PM	EMG FAULT TEST ALARM
99498989	ST_PC_Zadar1	72	4/22/06 12:42:00 AM	EMG STR MANUALLY BLOCKED (BILB1)
99585657	Z0_PC_Centar4	69	5/7/08 8:00:00 AM	EMG STR MANUALLY BLOCKED (TEST1)

1 rows selected



*** ALARM 735 A2/APZ PSS11HR
 EMG FAULT
 EMG UNIT STATE
 PERK1 STR-A ABLOCK

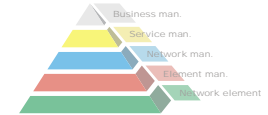
TK Sibenik: Preglednički odnosi - Microsoft Internet Explorer

http://trgast1.ht.hr/webot/SEPRET_CODE/view.htm

005	002.L	SELO	L13	Logical	L13-30337	PTH 22 000010230337 - Akšvan - PTH_POTS_SERV SEDLAR ZORAYKO POK. FRANJE, Glavni # broj:022/772001 SIBENIK, 22005 SITNO DONJE PSS11_PERK1_LSM_01-L13-30337;
005	003	POTS	L13	Wire Wrap	L13-30338	PTH 22 0001030038 - Akšvan - PTH_POTS/PAIR RADNIĆI SIME IVANOVIĆ, Glavni # broj:022/772002 PERKOVIĆ SELO, 22005 PERKOVIĆ PSS11_PERK1_LSM_01-L13-30338;
005	003.L	SELO	L13	Logical	L13-30338	PTH 22 000010230338 - Akšvan - PTH_POTS_SERV RADNIĆI SIME IVANOVIĆ, Glavni # broj:022/772002 PERKOVIĆ SELO, 22005 PERKOVIĆ PSS11_PERK1_LSM_01-L13-30338;

Functionalities

Copper Access Network Proactive Fault Repair Indirect monitoring of access network using NMS system



Line interfaces are scanned in 4h, 5h and 6h each morning

Measurements are propagated to DIS

Measurement data are enriched with inventory data (DIS)

Enriched data are correlated

Events are sent to NetCool for suspicious elements of access network

For each event – access network element trouble ticket in WWMS is created and monitored

Problem investigation

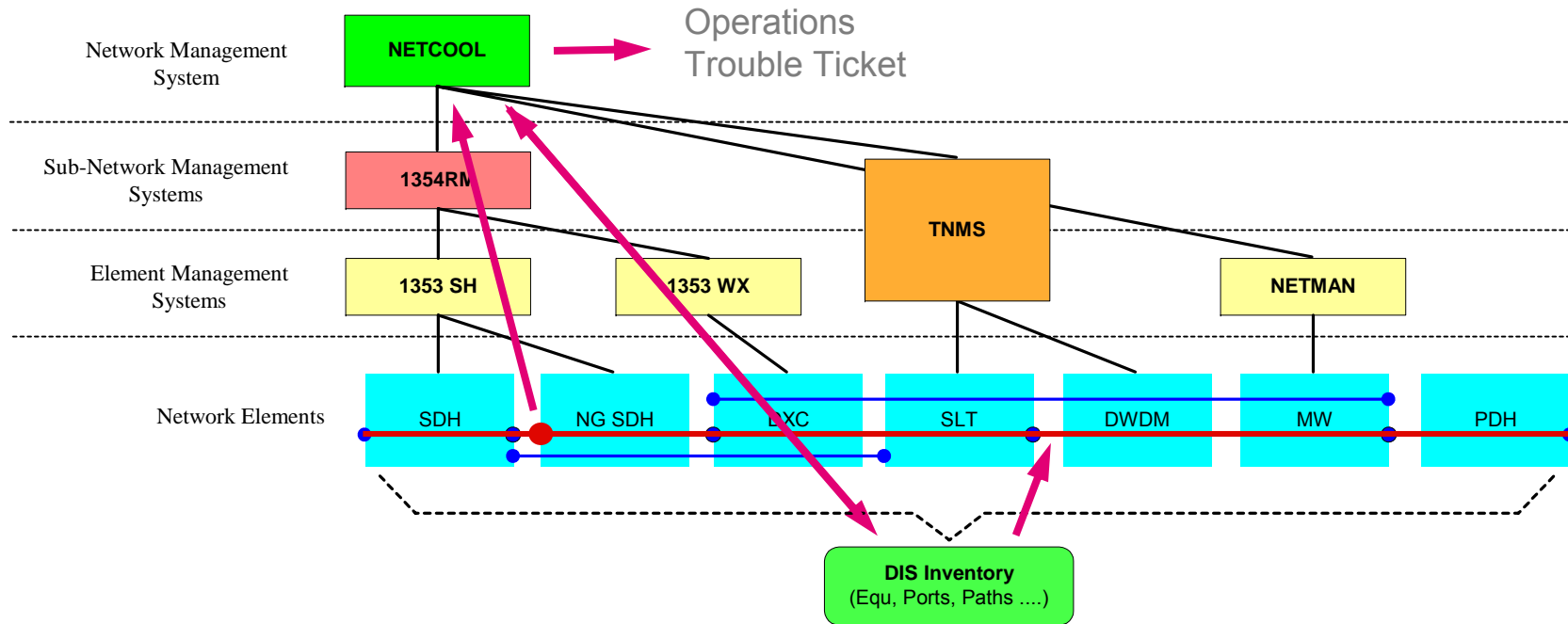
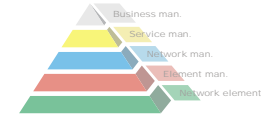
Field group dispatching according to inventory data from DIS & GIS

Problem resolution

Serial	Node	Count	Last Occurrence	Summary
10057486	ZO_PC_Centek4	8	5/7/06 8:50:05 AM	EMO CONTROL DOWN (TEST)
99057441	ST_PC_Pozpar1	224	3/15/06 1:58:00 AM	EMO EM MANUALLY BLOCKED (BLAD)
100716083	OS_PC_Pozpar1	3	5/9/06 1:34:05 PM	EMO EM MANUALLY BLOCKED (PLETT)
98602261	ZO_PC_Thies42	223	3/15/06 1:34:00 AM	EMO EM MANUALLY BLOCKED (BS1)
98018193	ZO_PC_Melchior42	182	3/26/06 5:53:00 AM	EMO EM MANUALLY BLOCKED (OSBR)
100559875	ZO_PC_Centek4	83	5/7/06 6:55:00 AM	EMO EM MANUALLY BLOCKED (TEST)
100887383	ST_PC_Sibenak1	3	5/9/06 9:37:00 AM	(EMO) FAULT (OPEN)
101121179	PC_PC_Zamet1	1	5/9/06 12:21:00 PM	(EMO) FAULT (OPEN)
100571722	ST_PC_Zadart	1	5/9/06 1:53:41 PM	EMO FAULT TEST ALARM
99499995	ST_PC_Zadart	72	4/23/06 12:42:00 AM	EMO STR MANUALLY BLOCKED (BLAD)
99568657	ZO_PC_Centek4	59	5/7/06 6:55:00 AM	EMO STR MANUALLY BLOCKED (TEST)

Functionalities

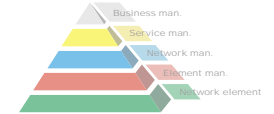
Transmission Network Event Management



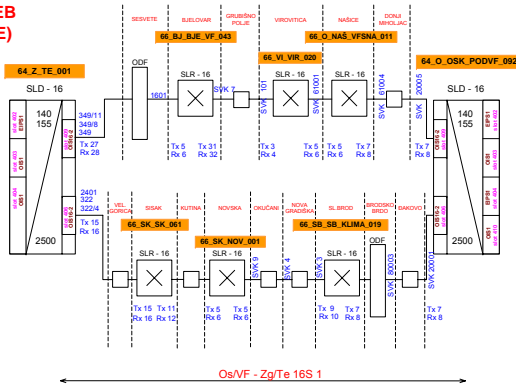
- Transmission Equipment & Paths – PDH, SDH, MW, HDSL, DWDM
- DIS Inventory – Xng (cross technology inventory of sites, equipment, ports, paths ...)
- EMS: Management of equipment on NE level (Alcatel 13xx - SDH, Siemens TNMS SDH&DWDM..)
- SNMS: Management of SDH network on regional level (Alcatel 1354RM, Siemens TNMS)
- NMS: Alarm collection, Alarm enrichment, Corelation (Micromuse Netcool)
- Port Alarm -> EMS Alarm -> Netcool Impact -> DIS Inventory ->Path/Service Affected

Functionalities

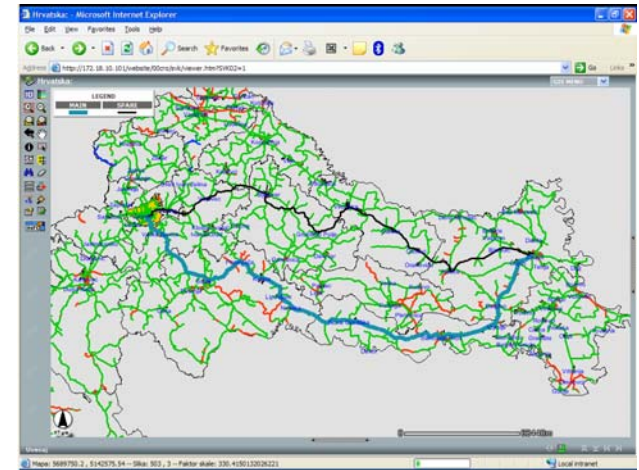
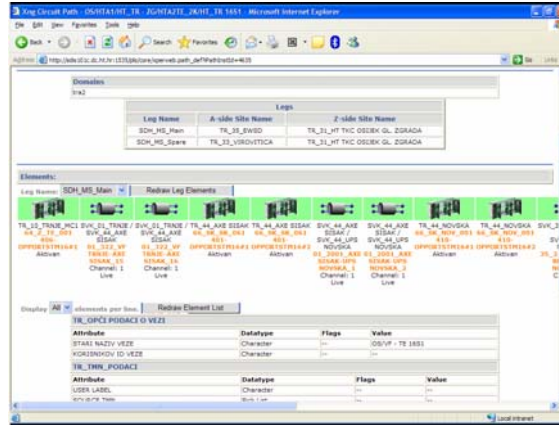
DIS and GIS for visualisation in transmission



ZAGREB (TRNJE)

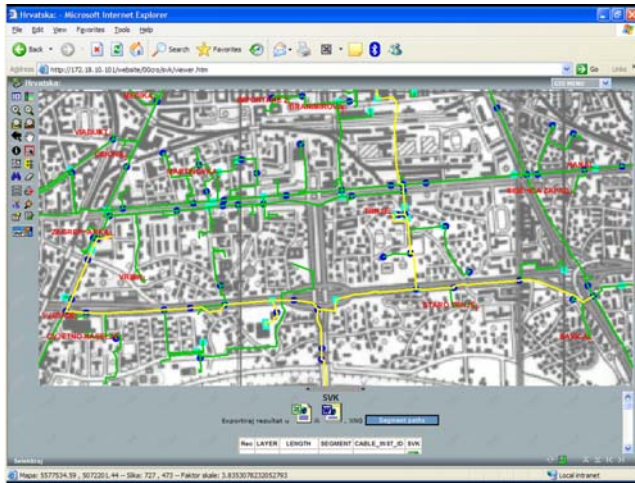


OSIJEK

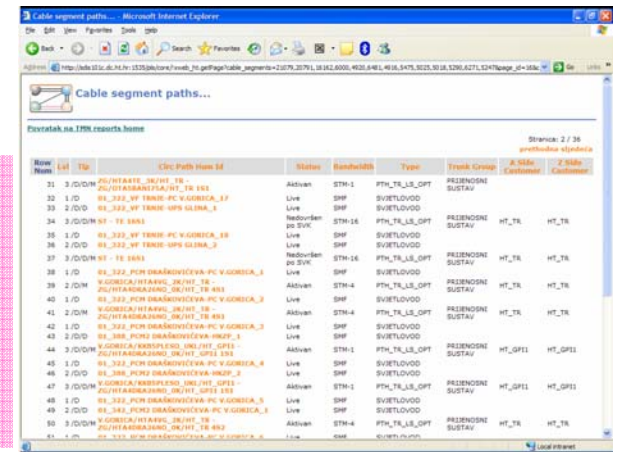


DIS
Transmission Paths
Transmission FO Line Systems
Equipment ports
FO strands
FO cable segments

GIS
FO cable segments



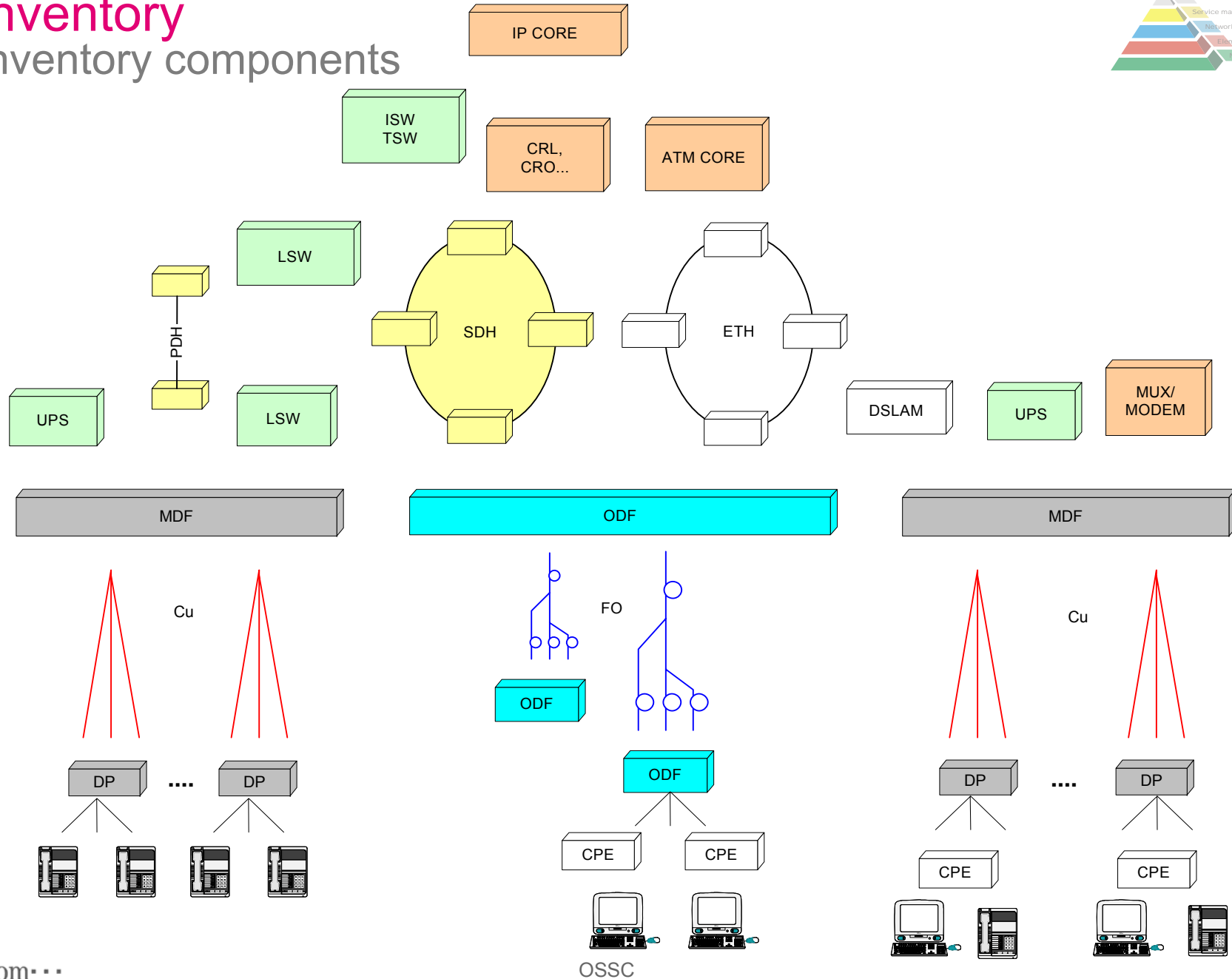
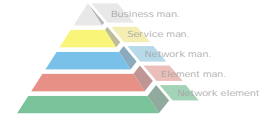
DIS
FO cable segments
FO strands
Transmission FO Line Systems
Transmission Paths



GIS
FO cable duct
FO segments

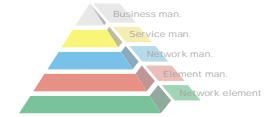
Inventory

Inventory components



Functionalities

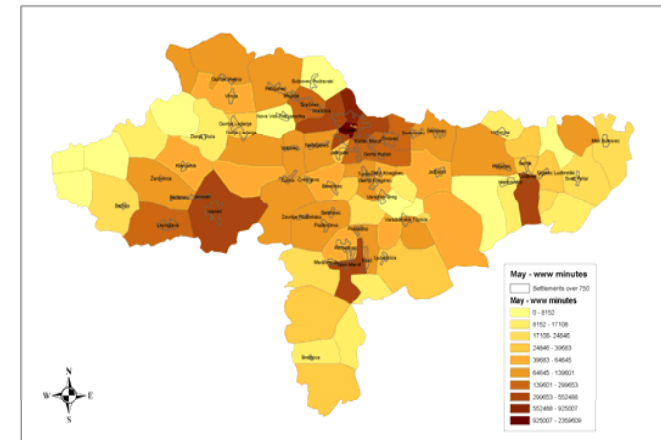
Sales activities support



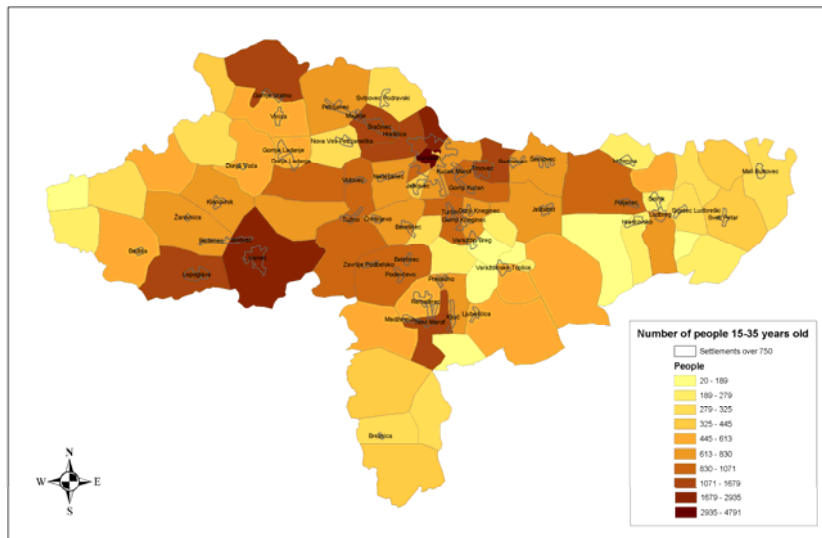
OSS GIS support:

- Analysis of billing data (aggregating switches billing data according to network nodes)
- Distribution of waiting list over network nodes
- Demographic analysis
- ADSL campaign planing –optimal positions for new broadband nodes

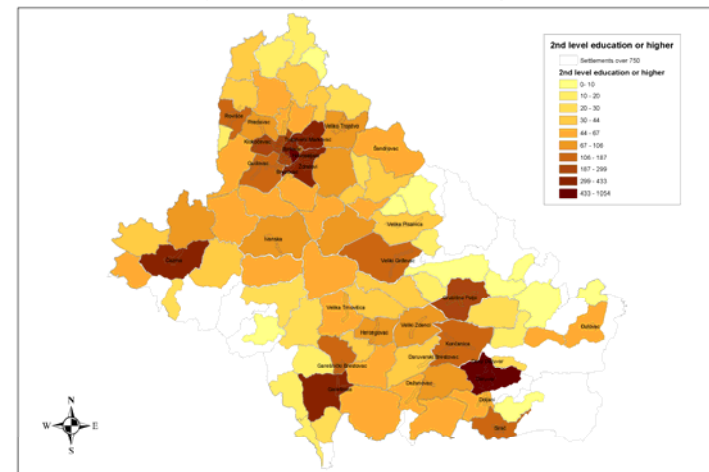
Varaždin county (2003 May - www minutes)



Varaždin county (people 15-35 years old)

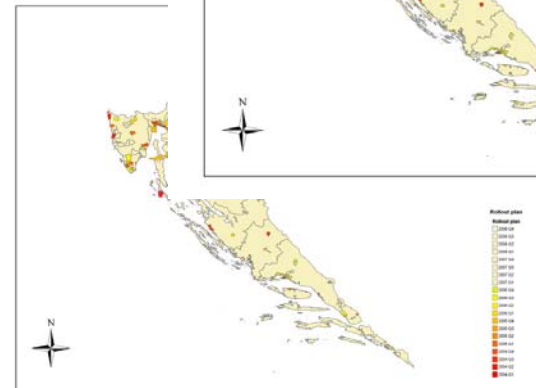
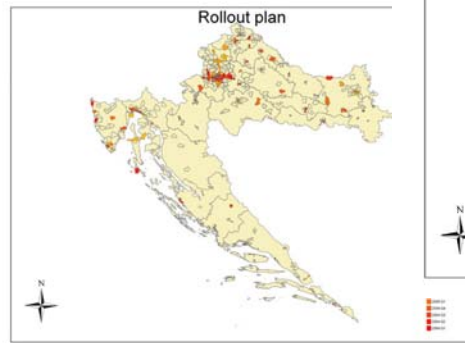
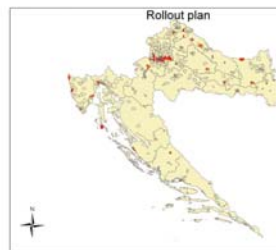
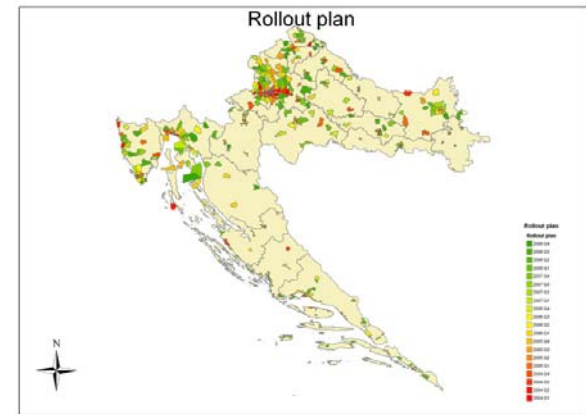
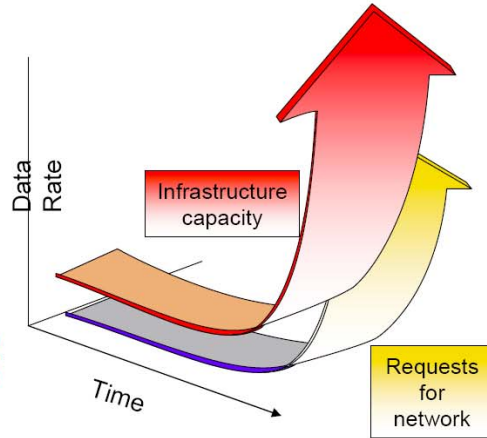
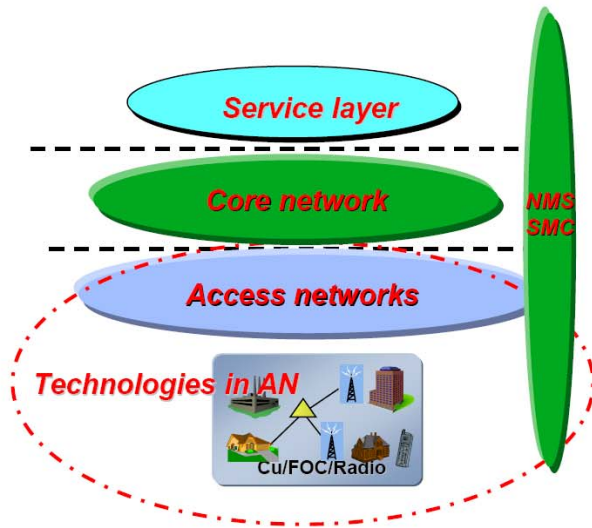
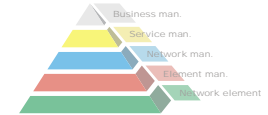


Bjelovar county (2nd level education or higher)

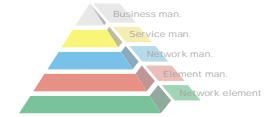


Functionalities

Sales activities support – services rollout plan



Reporting



Periodical

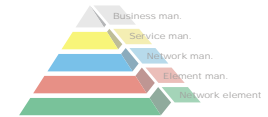
- Network availability (KPI)
- Network utilization
- CDQI
- Annual reporting for Regulatory Agency

On demand

- Benchmarking
- Cost Calculation
- GEO marketing
- Various operational reports

Reporting

CDQI – Compound Data Quality Index

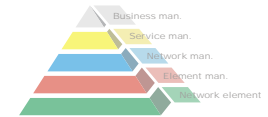


- Success of automated processes depends on data quality
- CDQI – Measurement of data quality from different sources

	Inactive index	New index	target				POINTS	SIGNIF.	CALCULATION				
			2	3	1	0			EAST	WEST	NORTH	SOUTH	
			95%	97%	90%	80%	HIGH						
	x		50%	60%	45%	40%	LOW	1	1	2	1		
			95%	97%	90%	80%	HIGH	3	0	3	3		
			95%	100%	93%	90%	MEDIUM	3	2	3	2		
			95%	100%	90%	85%	HIGH	3	3	3	2		
	x		95%	100%	93%	90%	HIGH						
			90%	95%	80%	70%	LOW	3	3	3	3		
			95%	100%	90%	85%	HIGH	2	2	2	2		
			90%	95%	85%	80%	MEDIUM	0	0	0	0		
			95%	100%	93%	90%	HIGH	0	0	0	0		
			95%	98%	90%	85%	HIGH	3	3	3	3		
			100%	100%	98%	95%	HIGH	3	3	3	3		
			100%	100%	98%	95%	HIGH	1	0	1	3		
			90%	95%	85%	80%	MEDIUM	0	0	0	0		
			100%	100%	98%	95%	HIGH	1	0	1	0		
			95%	98%	90%	85%	MEDIUM	3	3	3	3		
			90%	95%	80%	70%	LOW	2	2	2	2		
			90%	95%	80%	70%	LOW	2	2	2	2		
			100%	100%	98%	95%	HIGH	3	3	3	3		
			100%	100%	98%	95%	MEDIUM	3	3	3	2		
			90%	95%	80%	70%	HIGH	3	3	3	3		
			100%	100%	98%	95%	HIGH	3	2	3	3		
								42	38	43	40		
								CDQI	70,00%	58,33%	71,67%	66,67%	

Reporting

Capacity management

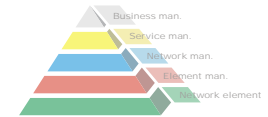


Current status

- ADSL capacity management
- ISDN capacity management

Plans

- Prequalification of Access Network
- Enhanced automated provisioning
 - Based on current utilization on objects
 - Based on measurement data
- Enhanced capacity reporting
 - Based on absolute and relative values and trends
 - Based on marketing and planning inputs



OSS Users

Sales Departments (Customer and Intercarrier) - Fulfillment

- Feasibility Check
- Resource Reservations
- Billing

Professional Services and IP Business Solutions Department BCSMC – Fulfillment, Assurance

- Resource Reservation
- Provisioning, Fault Repair, Inventory
- Net Monitor Service

Regional Network Operations (OMC, SMC, ANDD, Field) - Operations

- Provisioning, Fault Repair, Inventory

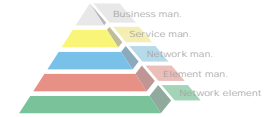
Network Production Department – NOC Operations

- Inventory, Provisioning, Fault Repair
- Fraud analyses
- Reporting

Network Strategy and Design Department

- Strategic technical planning
- Regions – Operative Technical Planning

OSS Users (2)



Product Development and Marketing

- Marketing planning
- Designing marketing campaigns

Controlling Production and Services Department

- Cost calculation

Quality Assurance and Support Department

- DT group banchmarking
- Cost calculation

Network Services Department

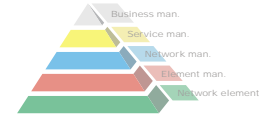
- Field group assignments

Technical Research and Product Development Department

- Fault Repair Support
- Testing

Actualities & Plans

Work in progress



- **Activator**
 - ATP finished

- **ADSL equipment from WWMS in DIS**

- **IPTV quality management system**

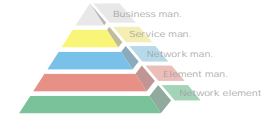
- **DATA processes**
 - Specification and development of enhanced ADSL fault repair and provisioning processes
 - Specification and development of DATA fault repair and provisioning processes

- **NetPhone**
 - Implementation in OSS environment

- **Transmission - Optical network connectivity**

Actualities & Plans

Near term plans



■ Processes

- DATA provisioning and FR in E2E environment
- Triple-play services

■ Inventory

- Cable and duct inventory
- DATA-Transmission links
- Triple-play services

■ Inventory and SAP integration

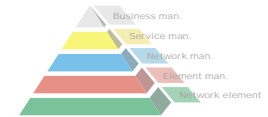
- Consolidation of models for CTO equipment
- Redesign and support for equipment lifecycle inside OSS systems
- Process automatization

■ Support for new technologies, concepts and services

- Capacity management concept
- Planning tools integration in OSS environment
- Element Managers for WiMAX, Telindus, xDSL, MSAN

Actualities & Plans

Intermediate to long term plans



- **E2E automated provisioning
All Services & All Platforms**

Automated activation processes for next-generation technologies, e.g. optical, xDSL, Ethernet, IP, ...

Reducing provisioning time

- **Capacity management based on
Plan-Build-Run OSS architecture**

Configurable triggers based both on capacity and traffic parameters inside the OSS systems for operations, planning and procurement divisions and systems which will trigger the necessary processes before the customer request comes in dead-end

Just in time Resource Delivery

Efficient Capacity Utilization

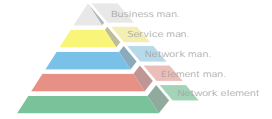
- **Transmission and optical network optimization, visualization and forecasting**

Active network optimization for delivering Just-In-Time network capacity, anticipation and implementation of necessary network changes just ahead of the demanding curve.

Support For SLA

Increasing Employee satisfaction

Q & A



Thank you