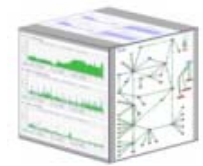


# GARR Integrated Networking Suite

GARR\_WS7 17/11/2006

[giovanni.cesaroni@garr.it](mailto:giovanni.cesaroni@garr.it)

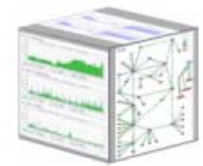


## Cosa e' GINS?

**GINS e' una suite software il cui scopo e' l'integrazione di**

- **servizi di monitoring**
- **servizi di acquisizione statistiche**
- **trouble ticket system**
- **fault and performance reports**

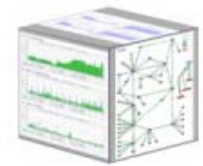
**La base dell'integrazione e' stata la creazione di un singolo database da cui tutti i tool possano generare i loro file di configurazione.**



# Necessita' dell'integrazione

**Cosa ha portato alla creazione di GINS:**

- **Interoperabilita' dei tool** per
  - Migliorare lo strumento di diagnostica dei disservizi
  - Facilitare l'accesso ai dati
- **Amministrazione dei tool**
  - automatizzazione del management
  - eliminazione delle multiple basi dati
- **Integrazione di nuovi servizi** (Multicas, IPv6, IPpremium, E2E)



# Servizi Integrati

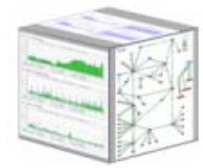
- servizi di monitoring
- servizi di acquisizione statistiche
- trouble ticket system
- fault and performance reports

## Monitoring Services

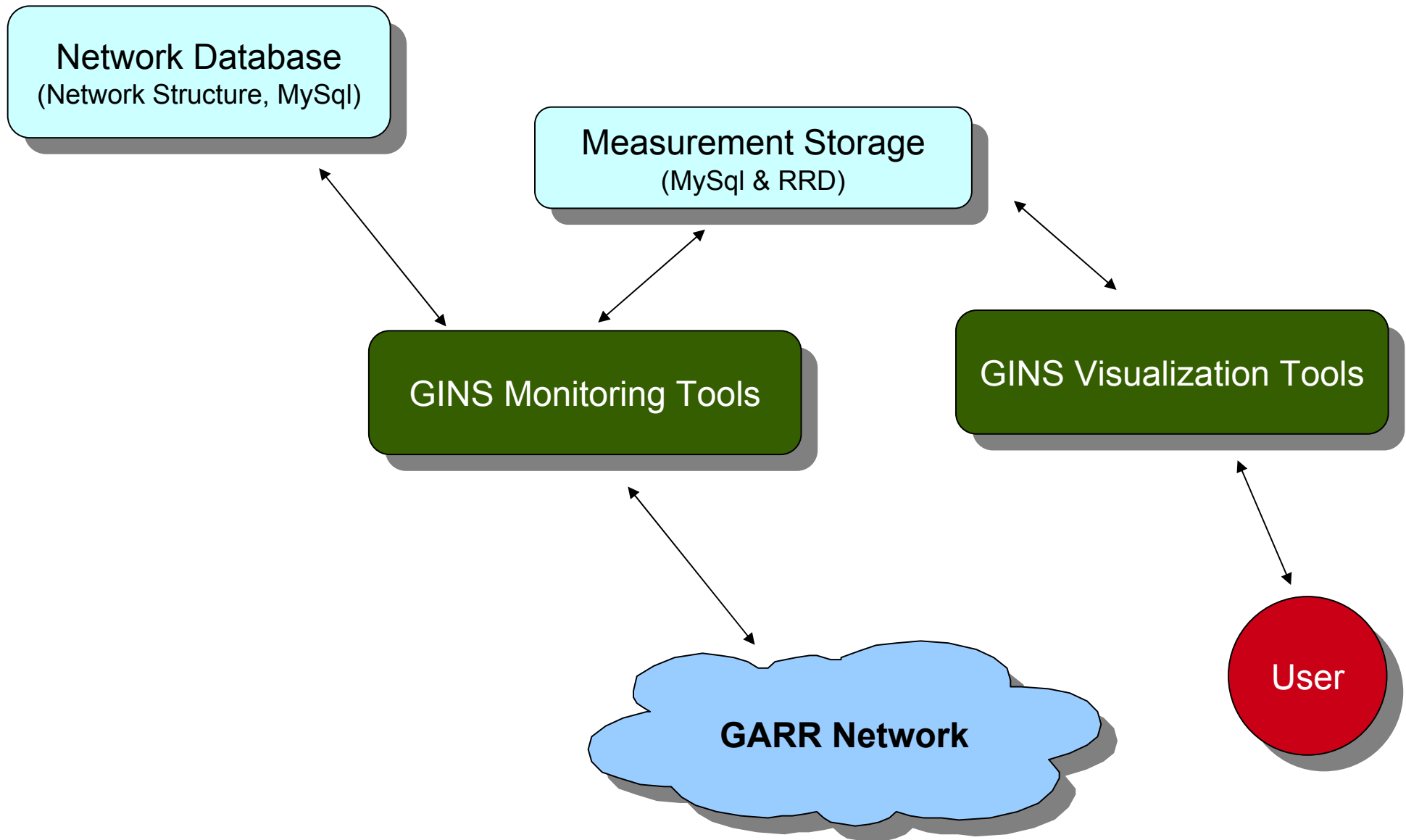
- IP circuits status
- IPv6 circuits status
- Status of Multicast Beacons
- SDH/Sonet alarms acquisition
- Lambda services
- MPLS
- E2E

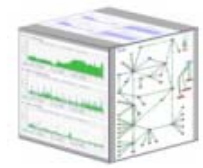
## Statistics Services

- IP traffic
- IPv6 traffic
- Interface errors
- Routers CPU
- Premium IP traffic
- SDH/Sonet errors
- Backbone weathermap
- Uncompressed Statistics

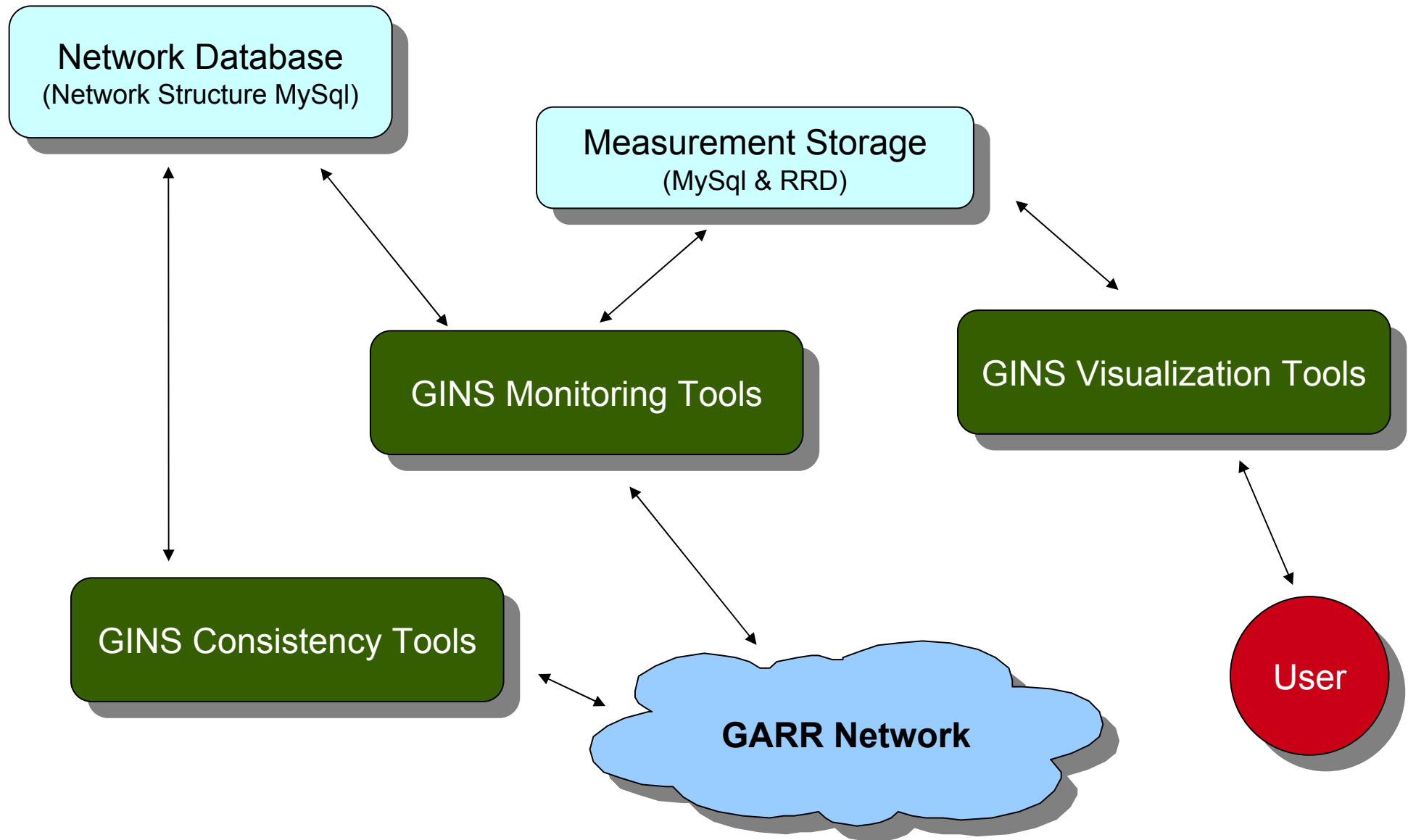


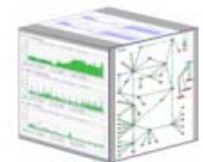
# GINS Architecture





# GINS Architecture



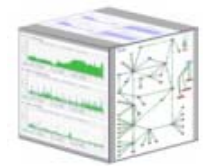


## The face of GINS

Home Page:

<https://www.noc.garr.it/GINS>

La visualizzazione dei contenuti dipende dall'utenza e così anche il menu' e le service home pages.



## The face of GINS

**GINS MONITOR - Firefox**

File Edit View History Bookmarks Tools Help

https://www.noc.garr.it/GINS/home\_moni

**GARR Integrated Networking Suite**

Author: Giovanni Cesaroni

**GINS: MONITOR HOME PAGE**

- MONITOR
- TTS
- STATISTICS
- REPORTS
- SCHOOLS
- SEARCH
- SET LAYOUT
- CONTROL CENTER

User: cesaroni  
Group: noc  
[Logout](#)

- IP MONITOR**  
Visualizzazione degli allarmi relativi allo stato IP dei circuiti logici.
- IP MONITOR HISTORY**  
Accesso ai dati storici degli allarmi IP dei circuiti logici.
- IPv6 MONITOR**  
Visualizzazione degli allarmi relativi allo stato IPv6 dei circuiti logici.
- MULTICAST**  
Acquisizione e visualizzazione dello stato dei Multicast Beacons.
- SONET ALARMS**  
Visualizzazione degli errori SONET dei circuiti fisici.
- SMOKE PING**  
Strumento di misurazione della latenza dei circuiti logici.
- LAMBDA SERVICE**  
Acquisizione e visualizzazione dello stato delle applicazioni Lambda.
- E2E SERVICE**  
Sistema di monitoring dello stato dei circuiti E2E, relativi al progetto LHC-OPN.
- MPLS L2 Circuits and LSP Monitor**  
Visualizzazione dello stato degli L2 Circuits e degli LSP MPLS.

Done www.noc.garr.it

**GINS STATISTICS - Firefox**

File Edit View History Bookmarks Tools Help

https://www.noc.garr.it/GINS/home\_stati

**GARR Integrated Networking Suite**

Author: Giovanni Cesaroni

**GINS: STATISTICS HOME PAGE**

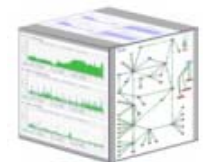
- MONITOR
- TTS
- STATISTICS
- REPORTS
- SCHOOLS
- SEARCH
- SET LAYOUT
- CONTROL CENTER

User: cesaroni  
Group: noc  
[Logout](#)

- ROUTER TRAFFIC STATISTICS**  
Visualizzazione delle statistiche di traffico dei circuiti logici ordinate per router.
- USERS TRAFFIC STATISTICS**  
Visualizzazione delle statistiche di traffico dei circuiti logici ordinate per utenza.
- AGGREGATES TRAFFIC STATISTICS**  
Visualizzazione delle statistiche di traffico degli aggregati.
- ROUTER CPU STATISTICS**  
Visualizzazione delle statistiche di carico e temperatura delle cpu dei router.
- BACKBONE TRAFFIC WEATHERMAP**  
Visualizzazione della weathermap di traffico del backbone.
- SONET ERROR STATISTICS**  
Visualizzazione delle statistiche degli errori SONET dei circuiti fisici.
- IPv6 TRAFFIC STATISTICS**  
Visualizzazione delle statistiche di traffico IPv6.
- PIP TRAFFIC STATISTICS**  
Visualizzazione delle statistiche di traffico Premium IP.

Done www.noc.garr.it





# L'integrazione in pratica: Layer3 Monitor UI

## Link Monitor Alarms: Interface Down

Circuit	Router	Interface	Status	Down At	IN	OUT	HIST	TT	Last Action	Black List
INFN - Pavia -- PoP Milano-Colombo	rt.mi3.garr.net	at-2/0/0.108	operational	14-11-2006 10:50	0	0				
UNI-Pavia -- PoP Milano-Colombo	rt.mi3.garr.net	at-2/0/0.109	operational	14-11-2006 10:50	0	0				
CSA-Enna (EN) -- PoP Roma-Tizii	rc.rm2.garr.net	ATM4/0/0.354	operational	10-11-2006 10:00	0	0				
HSH-Genova (GE) Istituto Giannina Gaslini -- PoP Roma-Tizii	rc.rm2.garr.net	ATM4/0/0.389	operational	19-10-2006 08:51	0	0				
IRCCS CSS - San Giovanni Rotondo (FG) -- PoP Roma-Tizii	rc.rm2.garr.net	ATM4/0/0.398	operational	25-10-2006 14:45	0	0				

## Link Monitor Alarms: No Ping Response

Circuit	Router	Interface	Status	Down At	IN	OUT	HIST	TT	Last Action	Black List
PoP-MI2 -- PoP-MI1 backup	rt.mi1.garr.net	PO4/2	operational	25-10-2006 14:45	4	15				
e2e-MILANO-KARLSRUHE-viaMANNO	rt1.mi1.garr.net	ge-5/1/0.0	operational	13-11-2006 15:30	0	3				

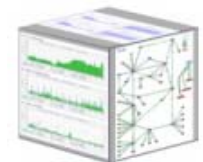
Punta alla scheda informativa del circuito:

- informazioni logiche e fisiche
- storia dei ticket
- statistiche di traffico ed degli errori

Punta allo storico degli allarmi

Indica se esiste un ticket aperto e punta al form di apertura/update ticket

Riporta l'ultima azione fatta nella gestione del ticket



## L'integrazione in pratica: Circuit Info

### Logical Info:

Name	APAT - Roma -- PoP Roma-Tizii
Status	operational
Router	rt.rm2.garr.net
IP Address	193.206.131.153
Virtual Interface	fe-5/3/4.0
BW Configured	
BW Raw	100000
Site Contact	Luigi Gasbarro
Phone	+39 06 50072110
Mobile	

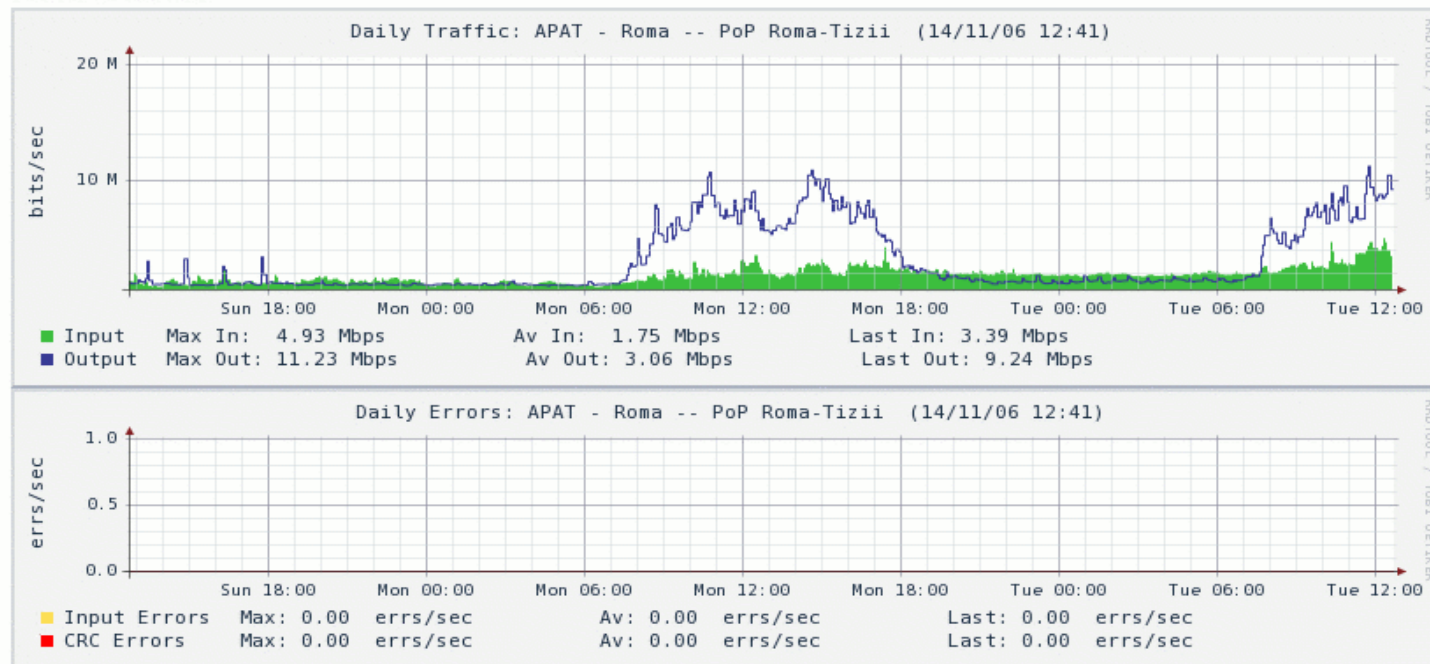
### Physical Info:

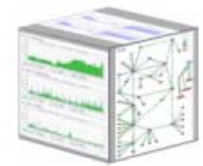
Name	APAT - Roma -- PoP Roma-Tizii
ID	ROM/ROM/LE-070269
BW Physical	
Provider	COLT
NOC	
NOC Phone	
Port A	
Port B	rt.rm2 (5/3/4) Fast Ethernet Copper

### Tickets Info:

ID	PROBLEM	DOWN AT	UP AT	TTF (h)	FIX	ACTIONS	INFO
3940	Line Fault	30-07-2006 18:00	30-07-2006 18:20	0.33		pellegrini -29/08/2006 18:10 chiuso guasto pellegrini 31/07/2006 09:45 aperto guasto	<span style="color:red">●</span>

### Traffic Statistics:







# Trouble Ticket System: News

- In produzione prossimamente
- Introdotte specifiche mailing list per progetto
- nuovo motore di ricerca

**Ticket Info:**

Ticket Number:  External Ticket Number:  Competence:

Operator:  Fix:

From:   To:  

---

**Site Info:**

Site Key:  Site Name:  Region:

---

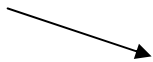
**Physical Circuit Info:**

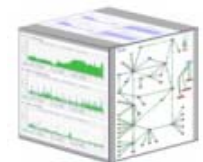
Circuit Name:  Carrier:  Circuit ID (TD):

---

**Logicia Circuit Info:**

Circuit Name:  Circuit Type (CDN,DSL,..):

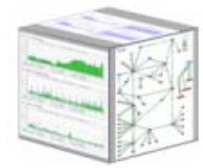




# Fault & Performance Reports

Report mensile

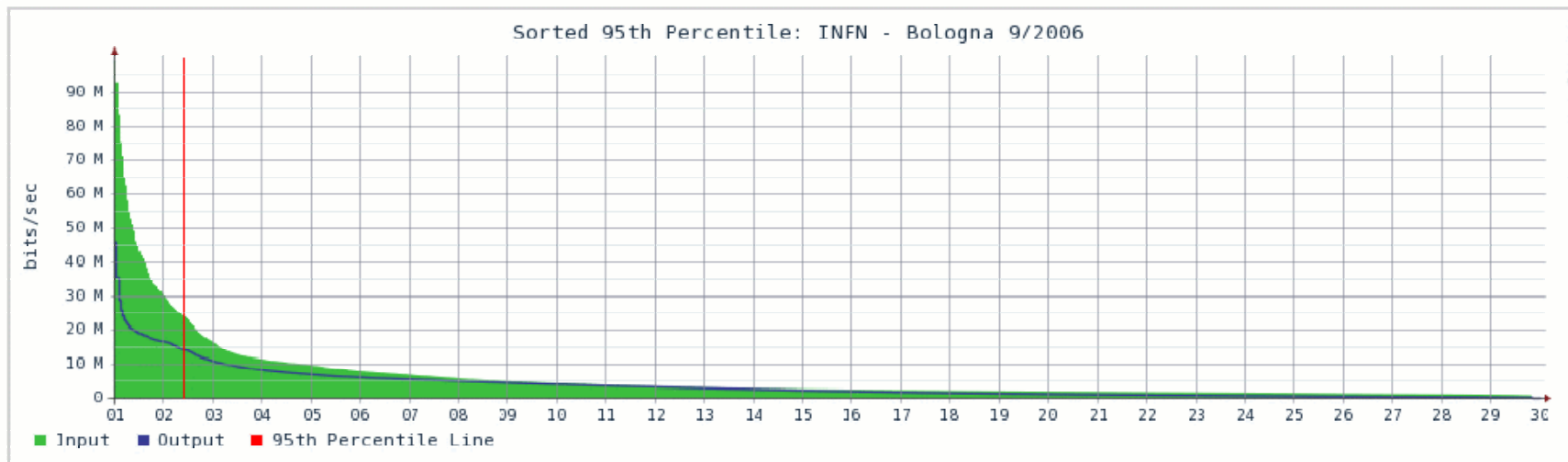
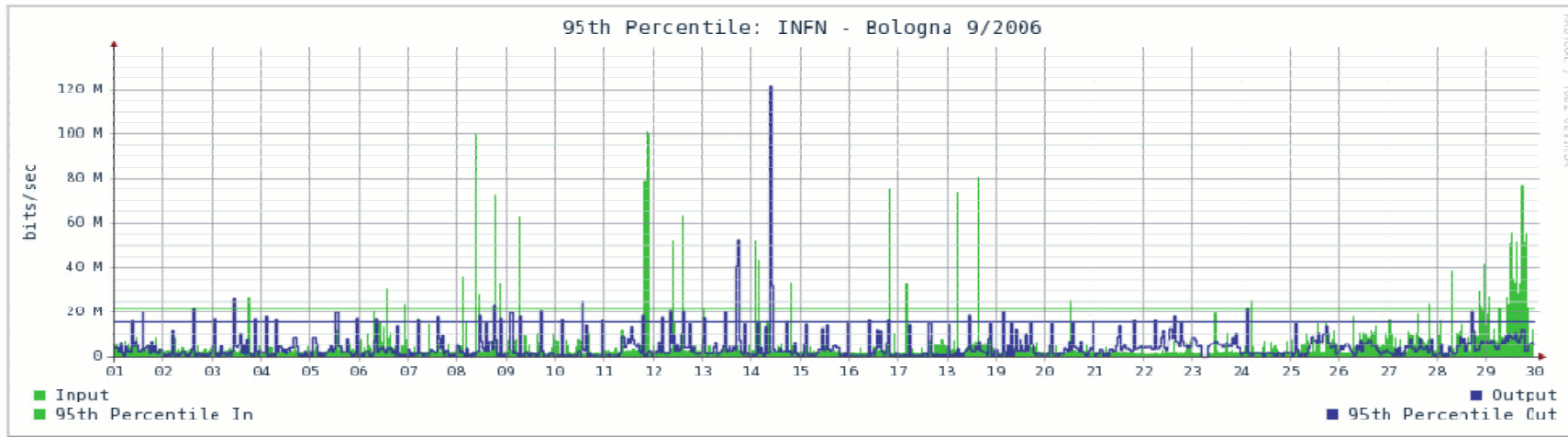
Statistiche non compresse

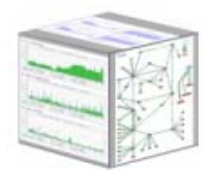


# Historical Uncompressed Traffic Statistics

## Uncompressed Traffic Statistics for 9/2006:

Name	Average In (Mbps)	Average Out (Mbps)	Max In (Mbps)	Max Out (Mbps)	Volume In (Tb)	Volume Out (Tb)	95th percentile In (Mbps)	95th percentile Out (Mbps)	95th percentile (Mbps)
INFN - Bologna	5.78	3.88	107.65	190.63	14.49	9.72	23.96	14.32	23.96

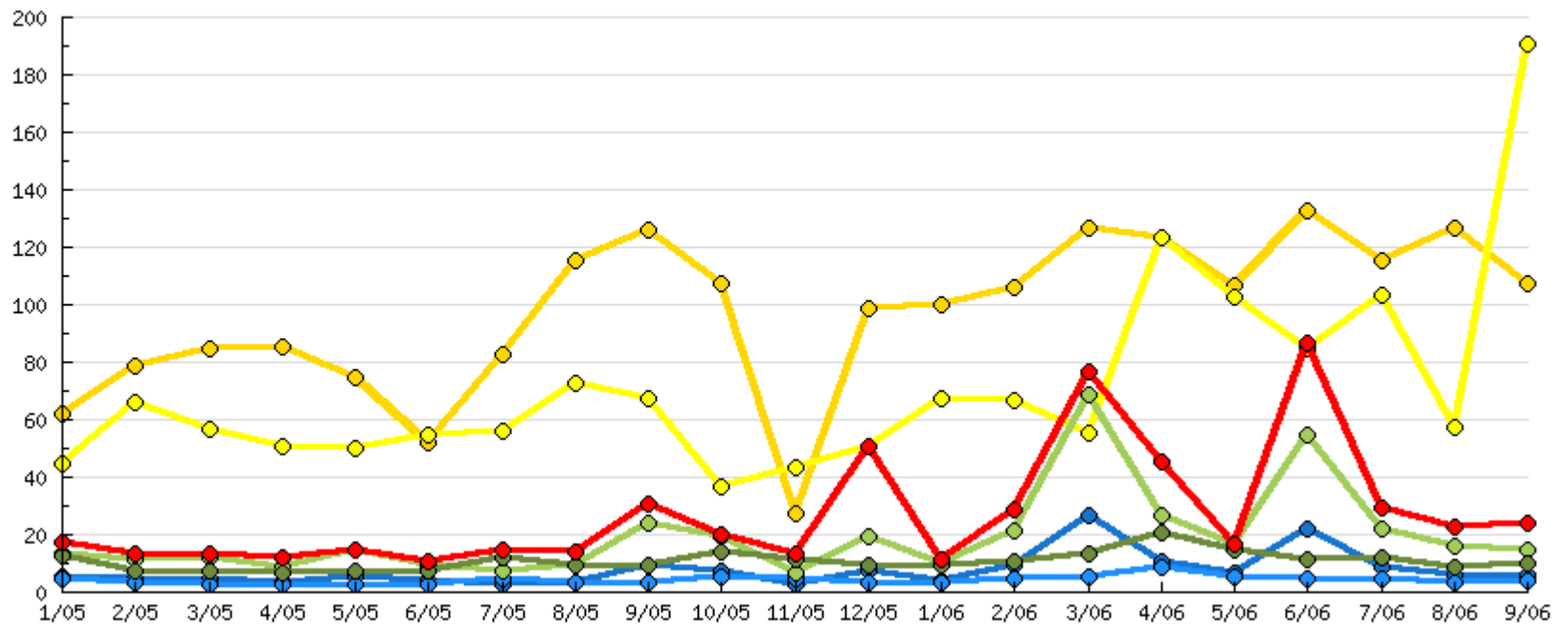


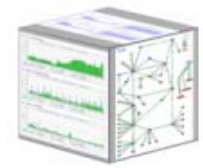


# Historical Uncompressed Traffic Statistics

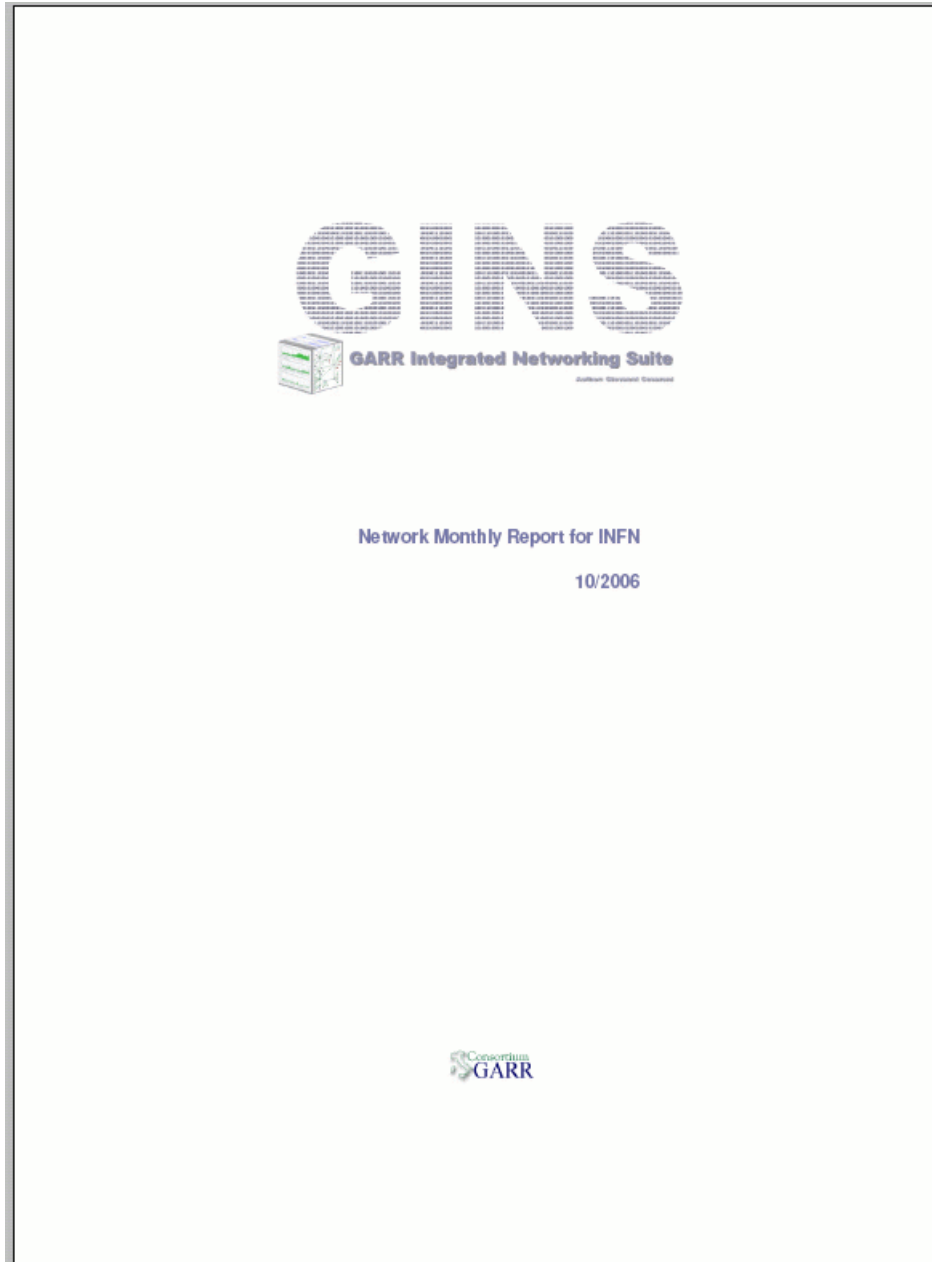
PERFORMANCE TRAFFIC HISTORY

- Average IN (Mbps)
- Average OUT (Mbps)
- Peak IN (Mbps)
- Peak OUT (Mbps)
- Volume IN (Tb)
- Volume OUT (Tb)
- Percentile (Mbps)



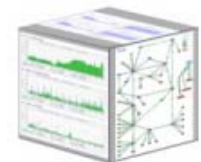


# Monthly PDF Reports



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## Monthly PDF Reports

### 1 Introduzione

Il presente report e' fornito dal Consortium GARR a tutti gli enti costituenti la rete, e' disponibile in formato PDF e generato su base mensile.

Il report e' suddiviso in due sezioni: *FAULT REPORT* e *PERFORMANCE REPORT*.

#### **FAULT REPORT:**

Fornisce i dati relativi alla disponibilita' dei cicuiti ed il dettaglio dei trouble ticket.

Nel paragrafo *Circuit Availability* i valori di disponibilita' dei circuiti sono ricavati a partire dai trouble ticket emessi dal *NOC* (Network Operation Center). Ai fini del calcolo della disponibilita' mensile sono considerati i soli disservizi dovuti a fault su circuiti e/o apparati, sono quindi esclusi i disservizi dovuti a manutenzione di competenza utente.

Nel paragrafo *Trouble Tickets Details* sono riportati i dettagli di tutti i trouble ticket emessi per ogni circuito, includendo anche quelli relativi a manutenzione di competenza utente.

#### **PERFORMANCE REPORT:**

Fornisce i valori e le statistiche di utilizzo della banda passante dell'aggregato dei circuiti di ogni sede.

E' costituito da due sezioni: *Traffic Statistics Summary*, *Traffic Statistics Details*.

##### *Traffic Statistics Summary:*

Riportata la lista di tutte le sedi collegate ed i relativi valori di traffico: medie, massimi, volumi e novantacinquesimo percentile.

##### *Traffic Statistics Details:*

Include una scheda per ogni sede in cui vengono mostrate rispettivamente: la tabella con i valori del traffico relativo alla sede, il grafico del traffico ed il grafico del novatacinquesimo percentile.

Il primo grafico, in stile *MRTG*, rappresenta il traffico in ingresso ed uscita (verde, blue) in bit per secondo. Ogni punto corrisponde ad un intervallo di 5 minuti. Il secondo grafico deriva da un'elaborazione degli stessi dati utilizzati per generare il primo, che vengono ordinati in modo decrescente al fine di evidenziare l'intervallo di valori che corrisponde al 5% dei picchi di traffico piu' alti.

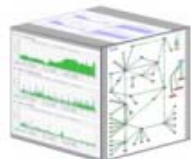
I dati da cui vengono ricavati i suddetti valori, nonche' i valori riportati nei grafici, non sono soggetti a compressione e vengono generati a partire dalle statistiche di traffico acquisite dal tool *GINS* (GARR Integrated Networking Suite) e conservati in strutture ad hoc (RRD).

### 2 Fault Report

#### 2.1 Circuit Availability

Circuit Name	ID Number	Status	Date Production	Date Terminaed	Number of Tickets	Total Troubles Duration (hours)	Availability (%)	Active Time (hours)
NFN - Milano - Bicocca L. PoP Milano-Columbo	CCH011	operational	20/06/2005		1	1.00	99.9613	721





## Monthly PDF Reports

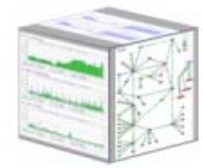
### 2.2 Trouble Tickets Details

Circuit Name	ID Number	Status	Date Production	Date Terminated	Ticket Number	Problem Type	Problem Start	Problem End	Trouble Duration (hours)	Problem Fix
INFN - Milano - Bicocca -- PoP Milano-Colombo	COH011	operational	20/06/2005	-	4286	Scheduled Maintenance	16/10/2006 23:30	17/10/2006 00:30	1.00	manutenzione completata
INFN - Milano - Bicocca -- PoP Milano-Colombo	COH011	operational	20/06/2005	-	4337	Line Fault	28/10/2006 07:45	30/10/2006 11:35	52.83	L'istituto ha dimenticato di segnalare una manutenzione programmata
INFN - Pisa - Fibonacci -- PoP Pisa-S.Maria		operational	27/04/2005	-	4233	Degraded Service	05/10/2006 07:50	31/10/2006 00:00	317.17	-

### 3 Performance Report

#### 3.1 Traffic Statistic Summary

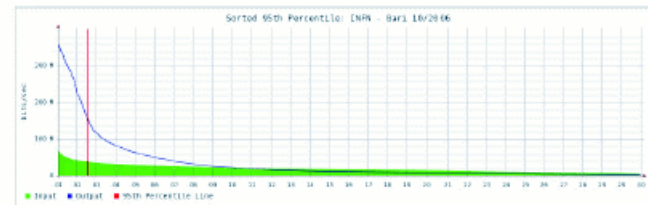
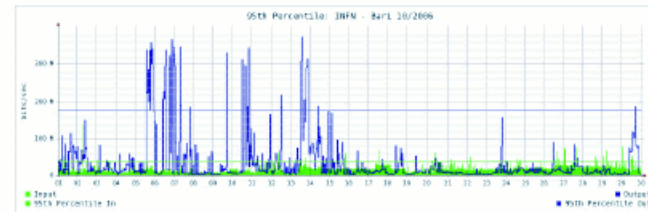
Name	Average In (Mbps)	Average Out (Mbps)	Max In (Mbps)	Max Out (Mbps)	Volume In (Tb)	Volume Out (Tb)	95th percentile In (Mbps)	95th percentile Out (Mbps)	95th percentile (Mbps)
INFN - Bari	18.08	33.98	179.75	415.48	46.95	88.21	37.37	163.09	163.09
INFN - Bologna	7.24	6.36	73.91	278.83	18.79	16.52	22.06	21.83	22.06
INFN - Cagliari	5.79	2.32	30.90	30.82	15.02	5.02	17.94	7.25	17.94
INFN - Catania-Citadella	1.17	2.16	28.68	61.79	3.04	5.61	3.42	7.88	7.88
INFN - Catania-GRID	17.91	6.91	222.15	81.16	46.50	17.93	63.71	19.72	63.71
INFN - CNAF - Bologna	223.37	101.84	1355.22	644.97	579.91	264.41	638.27	247.46	638.27
INFN - CNAF-LCG Bologna	1638.61	2290.09	10343.49	11847.03	4254.17	5945.50	9936.00	10463.41	10463.41
INFN - Cosenza	3.74	1.37	7.39	8.82	1.92	3.56	3.20	3.82	3.82
INFN - Ferrara	3.96	5.06	23.80	49.50	9.73	13.13	7.61	20.42	20.42
INFN - Firenze-Sesto	2.83	3.62	65.07	97.32	7.35	9.40	11.29	16.79	16.79
INFN - Genova	3.34	3.06	23.54	25.47	9.67	7.95	7.19	8.46	8.46
INFN - GGI Arcetri (FI)	0.07	0.17	1.97	2.00	0.17	0.45	0.59	0.91	0.91
INFN - L'Aquila	1.24	1.43	11.05	13.00	3.22	3.72	2.23	3.82	3.82
INFN - Lecce	1.90	1.81	100.21	100.90	4.92	4.69	5.52	6.69	6.69
INFN - LNF - Frascati	53.11	15.90	347.51	169.30	137.88	41.28	96.82	35.27	96.82
INFN - LNGS - Assergi (AQ)	10.82	5.07	32.72	72.14	38.09	15.77	33.46	15.92	33.46
INFN - LNL - Legnaro (PD)	18.88	39.79	118.28	711.04	49.02	103.31	63.16	161.40	161.40
INFN - LNS - Catania	1.86	1.83	20.34	31.39	4.82	4.75	4.65	5.87	5.87
INFN - Messina	0.10	0.27	1.61	1.84	0.27	0.71	0.16	0.67	0.67
INFN - Milano	17.57	9.28	75.37	190.06	45.63	21.44	29.96	28.98	29.96
INFN - Milano - Bicocca	4.07	2.07	30.07	29.08	10.98	5.38	14.80	9.54	14.80
INFN - Napoli	32.24	10.97	237.99	190.21	93.69	28.47	95.38	34.59	95.38
INFN - Padova	13.16	11.56	298.44	112.18	34.17	30.01	37.09	27.81	37.09
INFN - Parma	3.07	1.88	12.53	16.10	7.98	4.82	6.95	6.18	6.95
INFN - Pavia	3.19	2.01	39.13	29.43	9.29	5.22	6.71	6.90	6.71
INFN - Perugia	2.13	1.95	11.05	12.08	5.54	5.06	6.69	6.59	6.59
INFN - Pisa - Fibonacci	6.58	30.80	175.59	667.57	17.09	209.77	15.66	310.19	310.19
INFN - Presidenza - Roma	0.04	0.06	1.78	2.00	0.11	0.17	0.18	0.32	0.32
INFN - Roma1	30.63	53.71	191.21	646.25	78.53	139.43	70.22	248.98	248.98
INFN - Roma2	6.82	6.08	58.52	63.75	17.72	15.78	19.64	21.97	21.97
INFN - Roma3	3.08	1.49	72.19	72.77	7.98	3.88	15.66	7.05	15.66



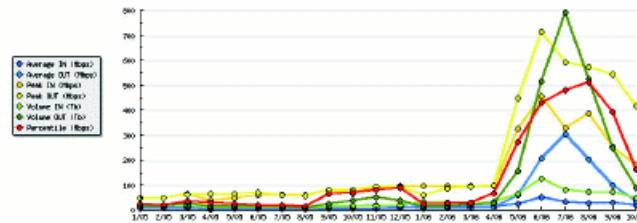
# Monthly PDF Reports

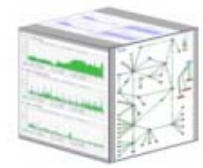
## 3.2.1 INFN - Bari

Name	Average In (Mbps)	Average Out (Mbps)	Max In (Mbps)	Max Out (Mbps)	Volume In (Tb)	Volume Out (Tb)	95th percentile In (Mbps)	95th percentile Out (Mbps)	95th percentile (Mbps)
INFN - Bari	18.08	33.98	179.75	115.48	48.95	88.21	37.37	183.09	183.09



PERFORMANCE TRAFFIC HISTORY





# GINs & the European Projects

Some EP activities involved in the development of monitoring services

- LHC-OPN

Monitoring the status of an e2e path between T0-T1 connections through cross border fibers (CBF)

Activities: GN2:JRA1, GN2:JRA4

- MUPBED:

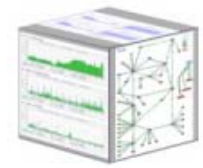
Monitoring the status of interdomain MPLS L2 circuits and LSP

Activity: MUPBED:WP3

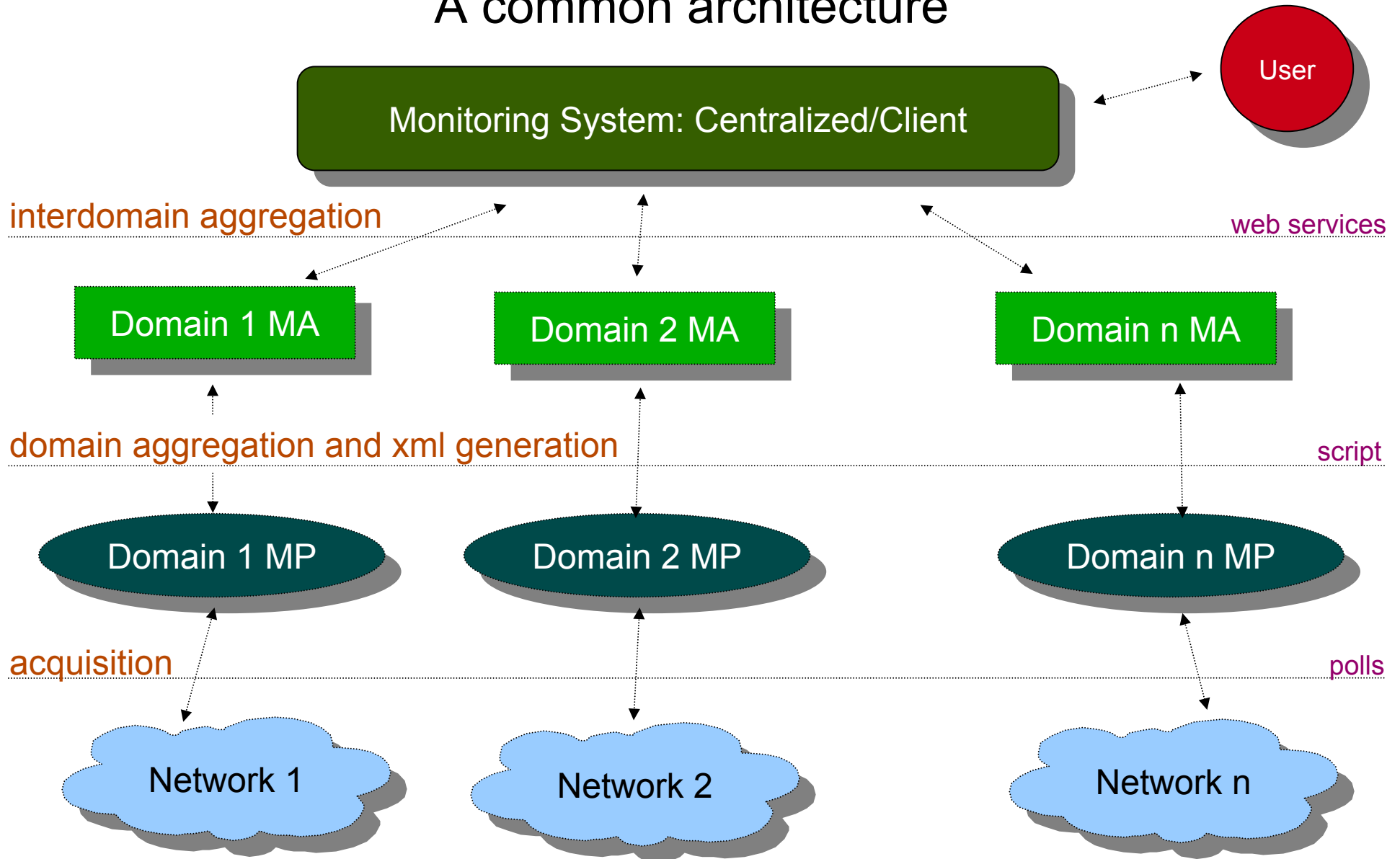
- perfSONAR:

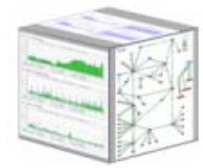
Interdomain traffic statistics, interdomain performance measurement & Co

Activity: GN2:JRA1



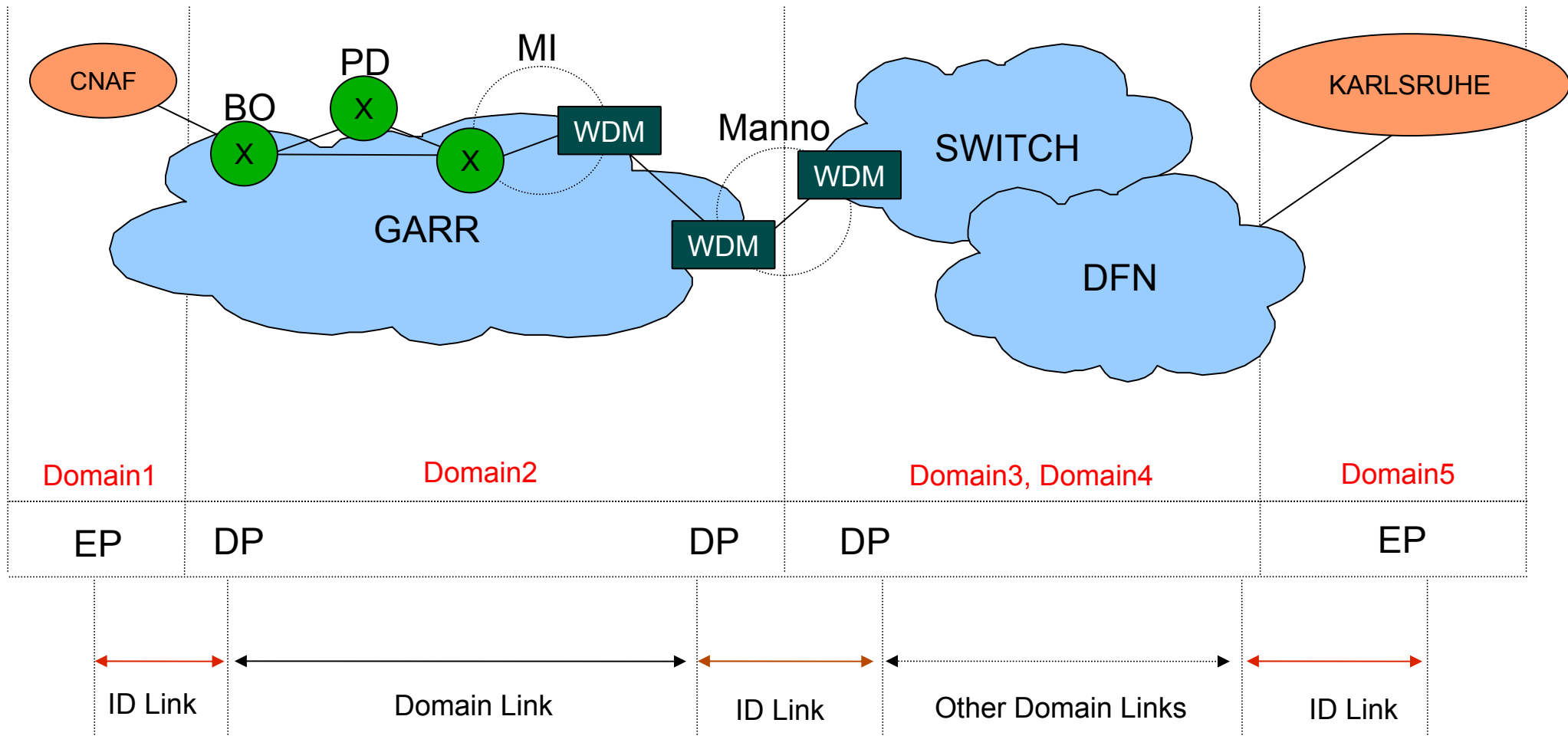
# A common architecture

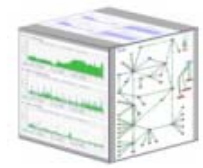




# LHC-OPN: e2e Monitoring

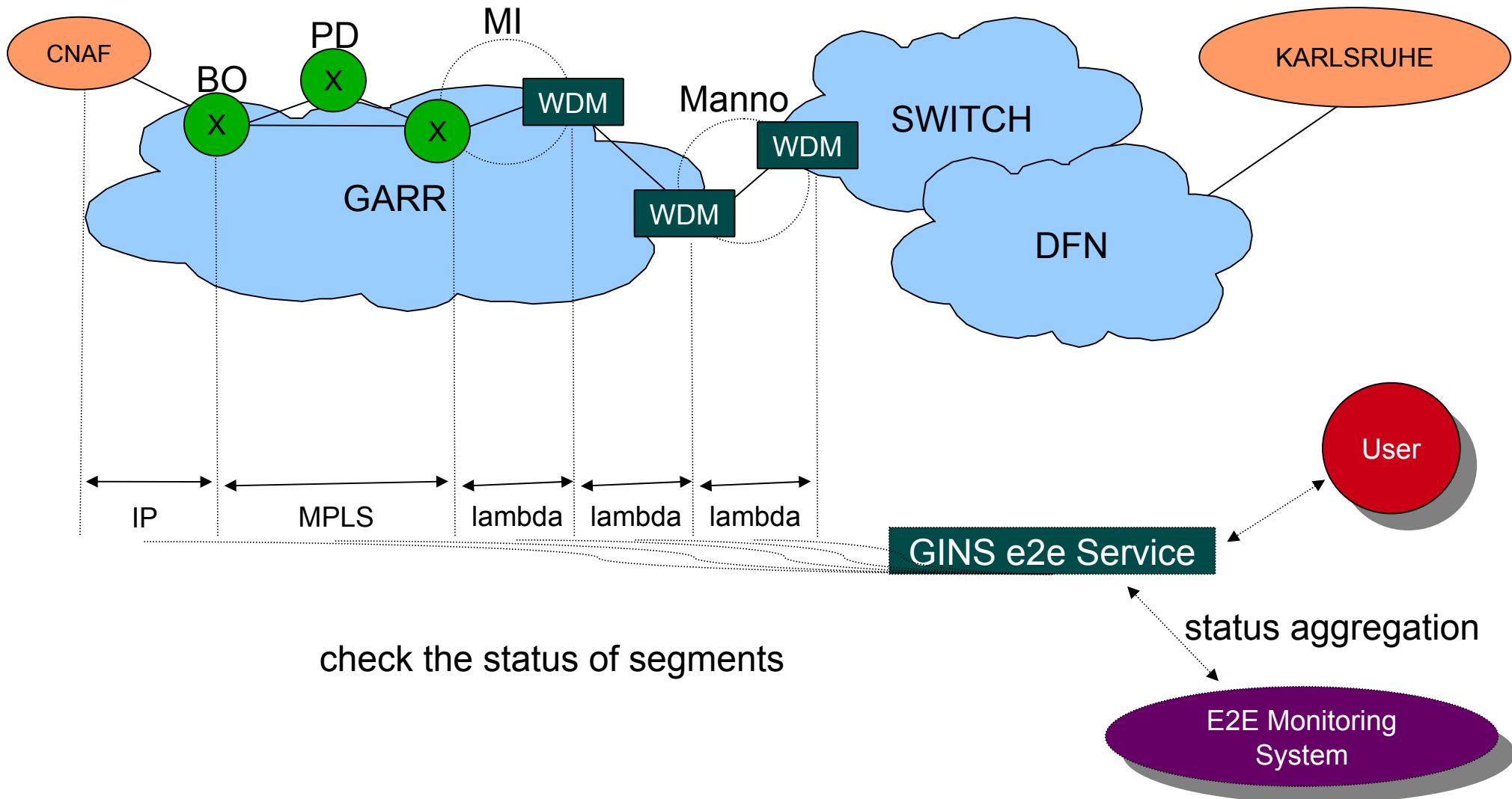
e2e CNAF – KARLSRUHE, **Monitoring Domains and Abstraction:**

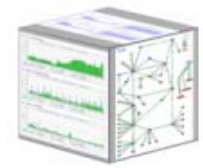




# LHC-OPN: e2e Monitoring

e2e CNAF – KARLSRUHE, **GARR Domain Monitoring (MP)**:



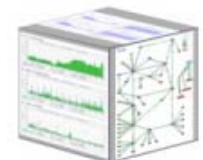


# LHC-OPN: e2e Monitoring

e2e CNAF – KARLSRUHE, **GIN S UI**:

CNAF-GRIDKA-LHCOPN-001

<b>E2E Segments</b>														
<b>Segments Names</b>	CNAF	CNAF - B01	rt1.bo1	B01 - MI1	rt1.mi1	RT1.MI1 - ADVA	wdm.mi1	MI1 - MANNO	wdm-ch.mi1	GARR->Switch	DWDM Switch	Switch->DFN->	KARLSRUHE	
<b>Segments Description</b>	End User	Link IP	Router	Link: MPLS	Router	Link: L1	DWDM	Link: L1	DWDM	Link: L1	DWDM	Other Domains	End User	
<b>Segments Info</b>	Tier1	P2P Link	Juno M320	LSP: B01-MI1-direct	Juno M320	Status from: wdm.mi1.garr.net: FA70061001314 Port: local	ADVA FSP3000	Status from: wdm.mi1.garr.net: FA70061001314 Port: remote	ADVA FSP3000	Status from: wdm-ch.mi1.garr.net: FA70061001314 Port: remote	Sorrento	-	Tier1	
<b>Segments Staus</b>	-	<b>UP</b>	-	<b>UP</b>	-	<b>UP</b>	-	<b>UP</b>	-	<b>UNKNOWN</b>	-	-	-	
<b>E2E Monitor</b>														
<b>E2E Description</b>	End Point	NREN Link								Demarcation Point	ID Link (Partial)	Demarcation Point	Other Domains	End Point
<b>E2E Status</b>	-	<b>UP</b>								-	<b>UNKNOWN</b>	-	-	-



# LHC-OPN: e2e Monitoring

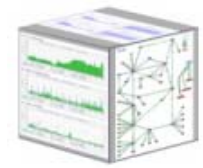
e2e CNAF – KARLSRUHE, e2e UI, link view:

GARR				SWITCH				DFN				
EP	↔	DP	?	↔	DP	↔	DP	↔	DP	↔	EP	
EndPoint	Domain Link	Demarc	ID Part.Info	ID Part.Info	Demarc	Domain Link	Demarc	ID Part.Info	ID Part.Info	Demarc	Domain Link	EndPoint
<b>GARR-CNAF</b>	CNAF-MAN	<b>GARR-MAN</b>	GARR-SWITCH	mMA13-c4	<b>SWITCH-MAN</b>	mMa13-c4 to mBA13-c3	<b>SWITCH-BAS</b>	mBA13-c3	DFN-ID_LinkPartialInfo_53814	<b>DFN-BAS3</b>	DFN-DOMAIN_Link-53814	<b>DFN-FZK24</b>
-	<b>Up</b>	-	<b>Unknown</b>	<b>Up</b>	-	<b>Up</b>	-	<b>Up</b>	<b>Up</b>	-	<b>Up</b>	-
-	<b>Normal Oper.</b>	-	<b>Unknown</b>	<b>Normal Oper.</b>	-	<b>Normal Oper.</b>	-	<b>Normal Oper.</b>	<b>Normal Oper.</b>	-	<b>Normal Oper.</b>	-
-	2006-11-15T14:35:44Z	-	2006-11-15T14:35:44Z	2006-11-15T14:32:38+01:00	-	2006-11-15T14:32:38+01:00	-	2006-11-15T14:32:38+01:00	2006-11-15T13:40:00+01:00	-	2006-11-15T13:40:00+01:00	-

e2e CNAF – KARLSRUHE, e2e UI, Domain view:

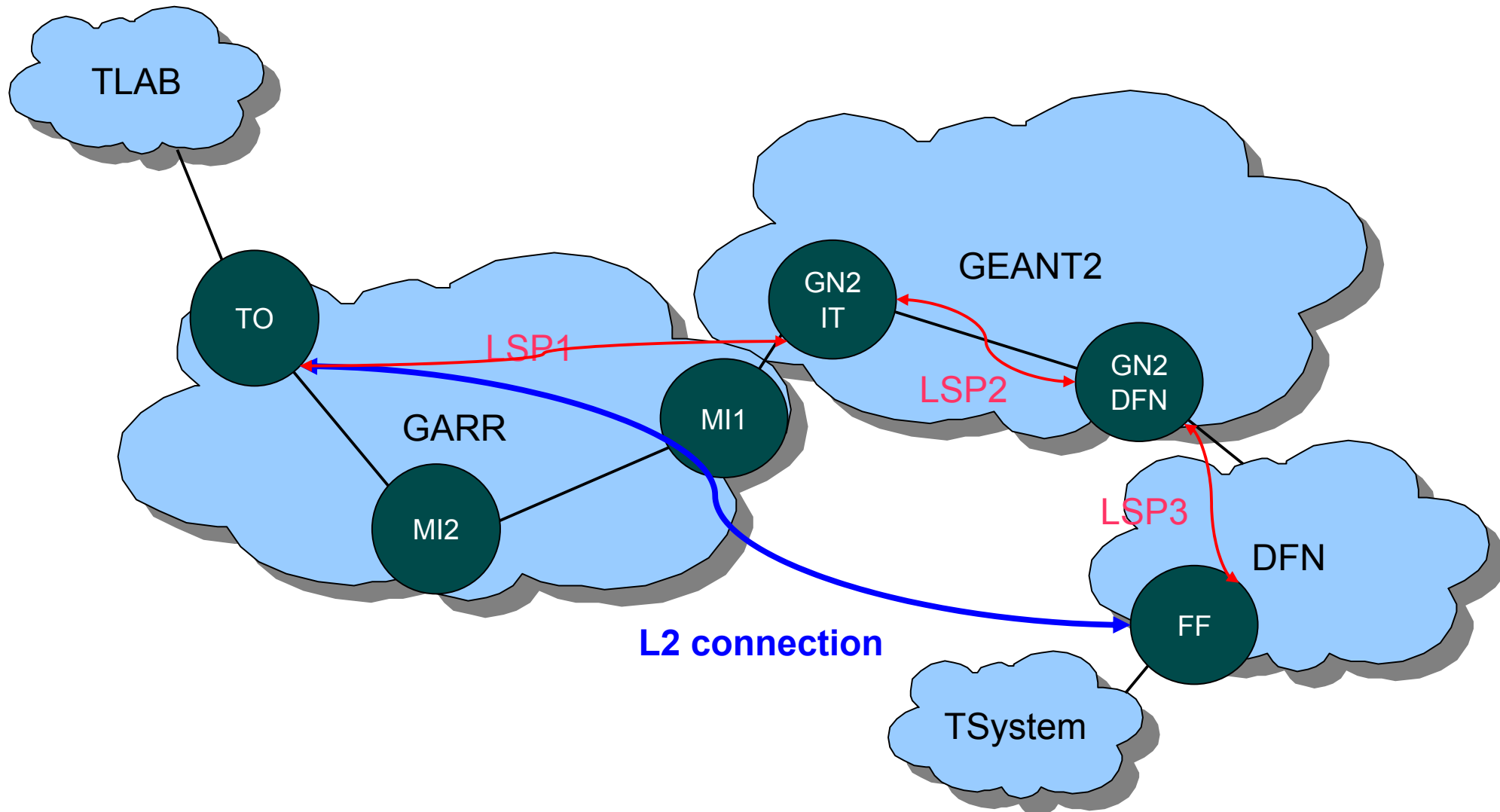
E2E Link ID	Topology Point A	Role	Topology Point B	Role	(Domain) Local Name	Link Type	Oper. Status	Admin. Status	Time Stamp
<a href="#">CERN-CNAF-LHCOPN-001</a>	GARR-CNAF	E	GARR-MIL	D	CNAF-MILAN	Domain Link	<b>Up</b>	<b>Normal Oper.</b>	2006-10-23T18:50:44Z
<a href="#">CERN-CNAF-LHCOPN-001</a>	GARR-MIL	D	GEANT2-MIL	D	MILAN-GEANT2	ID Part.Info	<b>Up</b>	<b>Normal Oper.</b>	2006-10-23T18:50:44Z
<a href="#">CNAF-GRIDKA-LHCOPN-001</a>	GARR-CNAF	E	GARR-MAN	D	CNAF-MAN	Domain Link	<b>Up</b>	<b>Normal Oper.</b>	2006-10-23T18:50:44Z
<a href="#">CNAF-GRIDKA-LHCOPN-001</a>	GARR-MAN	D	SWITCH-MAN	D	GARR-SWITCH	ID Part.Info	<b>Unknown</b>	<b>Unknown</b>	2006-10-23T18:50:44Z

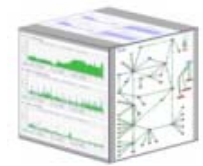




# MUPBED: MPLS Monitoring

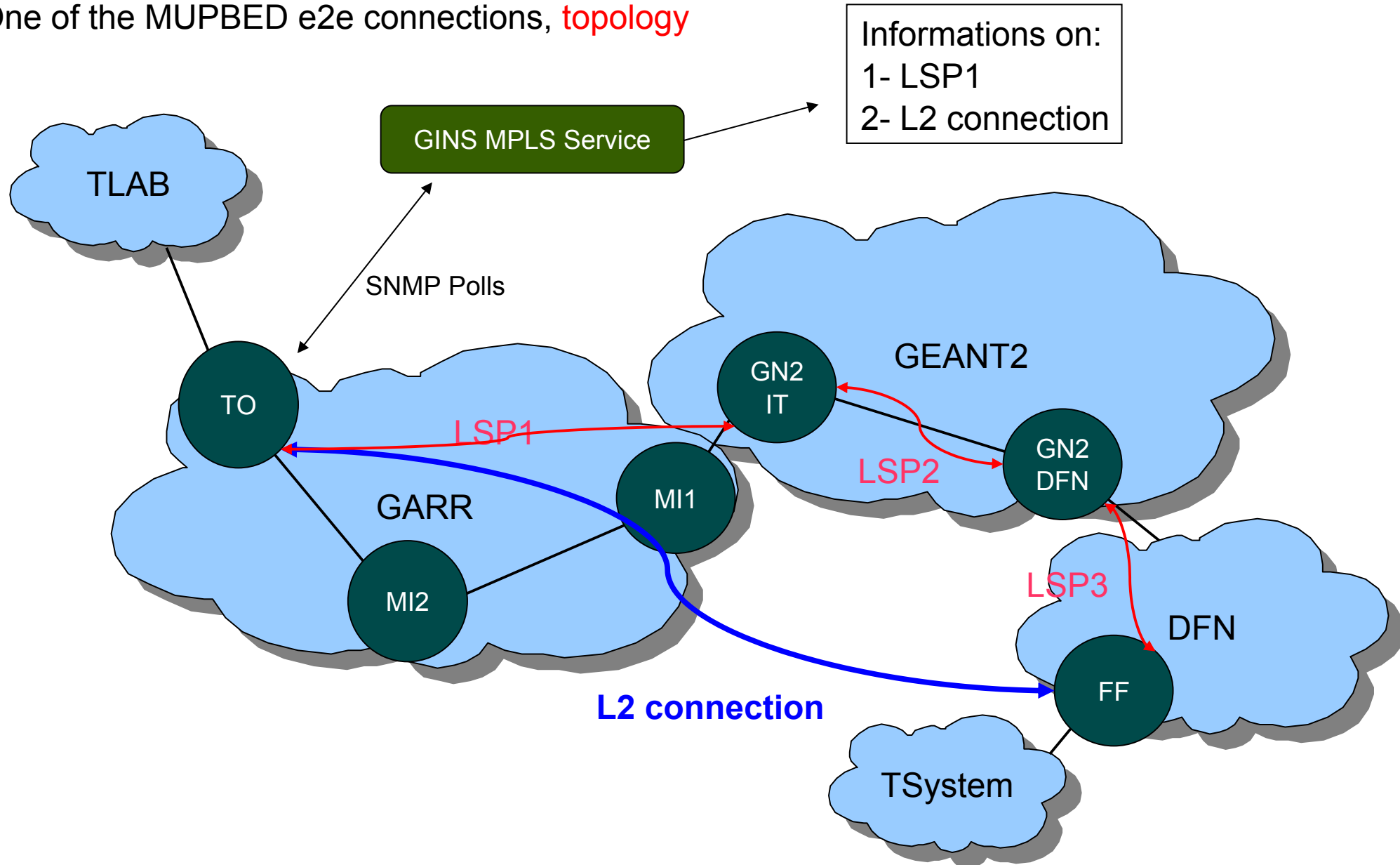
One of the MUPBED e2e connections, **topology**

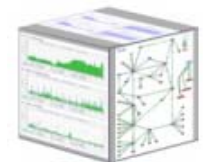




# MUPBED: MPLS Monitoring

One of the MUPBED e2e connections, **topology**





# MUPBED: MPLS Monitoring

GINs MPLS Monitor UI:

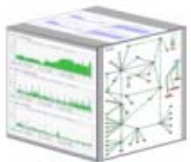
MPLS Layer 2 circuits and Label-Switched-Path Monitor:

Domain						InterDomain			
Domain Circuit	Equipment	Domain Circuit Path	Domain Circuit Status	Source	Destination	Bytes Counter	E2E Circuit Name	E2E Circuit Status	Remote End Destination
BO1-MI1-VPN	rt1.bo1.garr.net	LSP: BO1-MI1-direct	up	193.206.128.252	193.206.129.3	5453960146407		Not configured	-
G2MUPBED_TILAB_TID_Tur_Mil	rt.to1.garr.net	LSP: TO1-MI2-MI1	up	193.206.132.188	62.40.114.25	66888532	L2-VPN-TID-TILAB	up	130.206.206.248:617
G2MUPBED_TILAB_Acreo_Tur_Mil	rt.to1.garr.net	LSP: TO1-MI2-MI1	up	193.206.132.188	62.40.114.25	55433024	L2-VPN-Acreo-TILAB	up	62.40.114.9:616
G2MUPBED_TILAB_TSI_Tur_Mil	rt.to1.garr.net	LSP: TO1-MI2-MI1	up	193.206.132.188	62.40.114.25	8510	L2-VPN-TSI-TILAB	up	188.1.16.1:611
G2MUPBED_TILAB_PSNC_Tur_Mil	rt.to1.garr.net	LSP: TO1-MI2-MI1	up	193.206.132.188	62.40.114.25	147938	L2-VPN-PSNC-TILAB	up	62.40.114.35:614

## Legenda

<b>Domain Circuit</b>	Intradomain MPLS Lable Switched Path
<b>Domain Circuit Path</b>	LSP Active Path
<b>E2E Circuit</b>	Interdomain Layer 2 Circuit

The next step:  
Integration in the JRA4 framework.



## perfSONAR: Intredomain Traffic Statistics

PerfSONAR UI v0.08

MeasurementArchive Help

RRD MA Hades MA

Search by interface IP

```

1 rc-ct1-rt-ct1-1.ct1.garr.net (193.206.134.17) 0 msec
rc-ct1-rt-ct1-2.ct1.garr.net (193.206.134.241) 0 msec
rc-ct1-rt-ct1-1.ct1.garr.net (193.206.134.17) 0 msec
2 rt-ct1-rt-na1.na1.garr.net (193.206.134.9) 16 msec 16 msec 16 msec
3 rt-na1-rt-ba1.ba1.garr.net (193.206.134.38) 16 msec 16 msec 20 msec
4 rt-ba1-rt-bo1.bo1.garr.net (193.206.134.77) 24 msec 28 msec 24 msec
5 rt1-bo1-rt-pd1.pd1.garr.net (193.206.134.90) 28 msec 28 msec 28 msec
6 ts-pd-g.garr.net (193.206.134.182) 32 msec * 32 msec

```

PerfSONAR

Endpoints

Retrieve ...

last 90 min

last day

last week

last month

last year

Search

Select Interface

No.	hostName	ifAddress	ifName	ifDescription	Capacity, b...	Inbou...	Out...	Inbound uti...	Outbound ...
1	rt.ct1.garr.net	193.206...	AT3/1.371	RC.CT1 -- RT.CT1 Link 1	155000000	1.0	1.0	1212299	1379460
2	rt.ct1.garr.net	193.206...	AT4/1.471	RC.CT1 -- RT.CT1 Link 2	155000000	2.0	1.0	2159093	1205525
3	rt.na1.garr.net	193.206...	so-2/0/0.0	PoP-CT1 -- PoP-NA1	2488000...	1.0	1.0	4899806	1747649
4	rt.ba1.garr.net	193.206...	so-0/0/0.0	PoP-BA1 -- PoP-NA1	2488000...	6.0	6.0	140208527	127269949
5	rt1.bo1.garr.net	193.206...	so-0/3/0.0	PoP-BA1 -- PoP-BO1	2488000...	7.0	6.0	153624629	144611271
6	rt.pd1.garr.net	193.206...	so-1/0/0.0	PoP-PD1 -- PoP-BO1	2488000...	2.0	4.0	42681536	84904355
7	rc.ts.garr.net	193.206...	AT5/0/0.1...	PoP-TS -- PoP-PD1	155000000	1.0	2.0	826898	2992954

Refresh

Clear

Summary for all interfaces (last 90 min)

Utilization, %

inbound outbound

Page 1 / 1

1-7

First

Prev

Next

Last

193.206.134.38 so-0/0/0.0 PoP-BA1 -- PoP-NA1 (last week)

Utilization, Mb/s

last 90 min

last 8 hours

last day

last 3 days

last week

last month

last 3 months

last year

193.206.134.38 so-0/0/0.0 PoP-BA1 -- PoP-NA1 (last week) data retrieved in 172 ms.

Measurement archives

Select MA(s)

Use	Measurement Archive	URL
<input checked="" type="checkbox"/>	GARR	http://srv4.dir.garr.it:8080/ax...
<input type="checkbox"/>	GEANT	http://mu.dante.org.uk:8090/...
<input type="checkbox"/>	CARNET	http://noc-mon.srce.hr:8090/...
<input type="checkbox"/>	CESNET	http://perfmon1.cesnet.cz:80...
<input type="checkbox"/>	GRNET	http://gridmachine.admin.grne...
<input type="checkbox"/>	ISTF-Java	http://selena.acad.bg:8080/a...
<input type="checkbox"/>	ISTF-Python	http://selena.acad.bg:8090
<input type="checkbox"/>	MREN	http://perfsonar.cg.ac.yu:808...
<input type="checkbox"/>	PIONIER-RRD	http://loco4.man.poznan.pl:8...
<input type="checkbox"/>	PIONIER-SQL	http://loco4.man.poznan.pl:8...
<input type="checkbox"/>	SEEREN	http://admin.seeren.org:8080...
<input type="checkbox"/>	SWITCH	http://archive.sonar.net.switch...
<input type="checkbox"/>	UNINETT	http://mi6.uninett.no:8090
<input type="checkbox"/>	ESNET	http://mea1.es.net:8080/axis...
<input type="checkbox"/>	Internet2	http://thunderbird.internet2.e...
<input type="checkbox"/>	RNP	http://rnp-rrd-ma.gt-med.ufs...

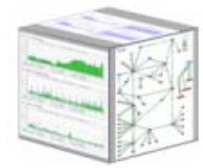
OK

Output di un traceroute da Catania a Trieste

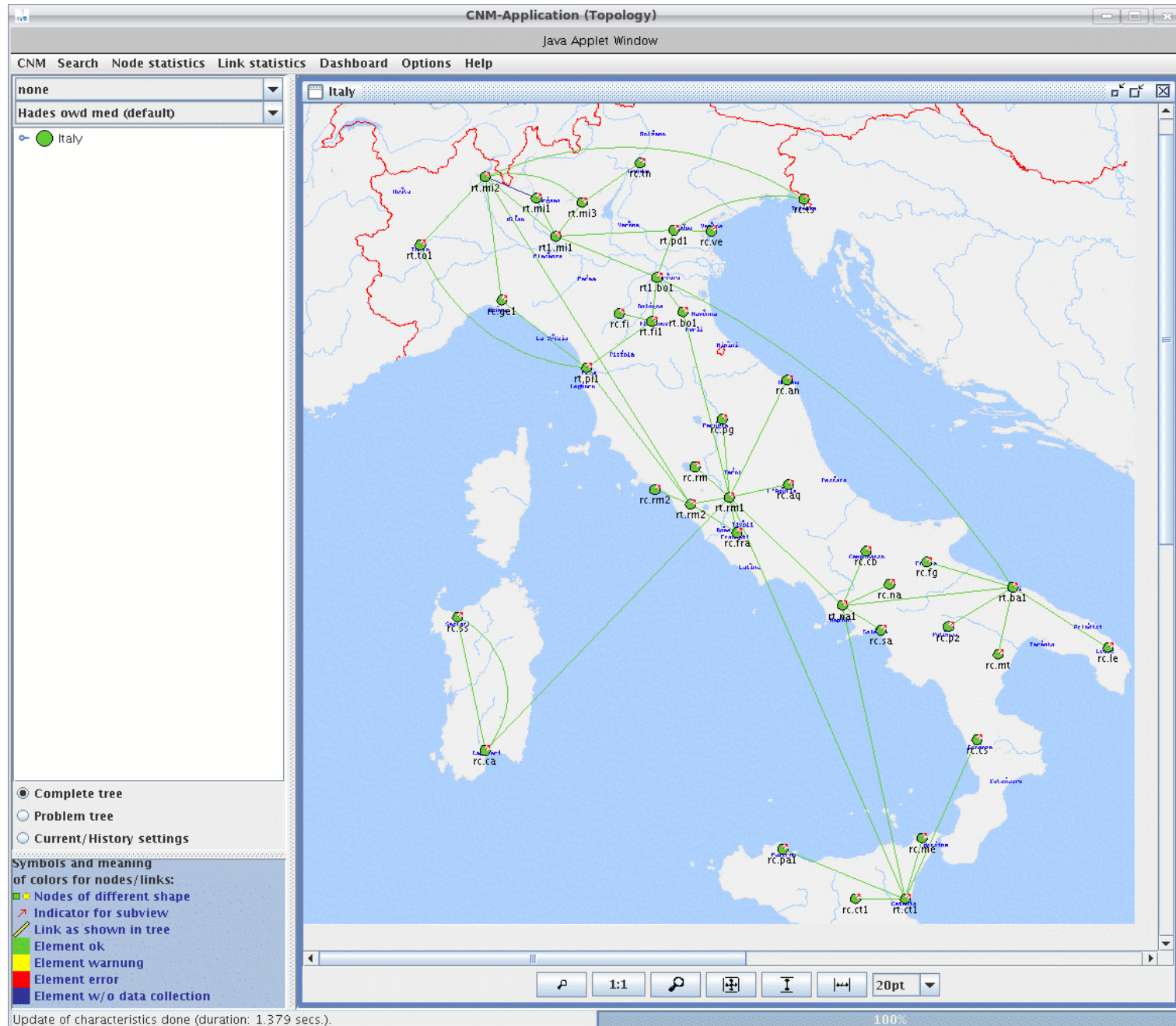
Dati traffico hop per hop

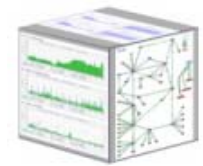
Occupazione di banda hop per hop

Grafico del traffico del hop selezionato, relativo al periodo scelto



# perfSONAR CNM: Intredomain Traffic Statistics





## Next steps

- Sviluppo e integrazione di ulteriori sistemi di monitoring
  - per i nuovi servizi
  - per l'infrastruttura di rete
- Sviluppo e integrazione di ulteriori UI
- Collaborazione con le attività di sviluppo di architetture di monitoring dei progetti europei