



# **Saga d.o.o. Beograd**

**Sistem objedinjenih komunikacija  
baziran na Cisco Mega Cluster arhitekturi**

**Jelena Bukelić, Saga**

**Bojana Pavlica, Saga**

**Ljiljana Čapalija, EPS**



[www.saga.rs](http://www.saga.rs)

# AGENDA

- Saga - Cisco Solution Innovation Partner za 2008. godinu
- Projekat EPS
- Mega Cluster arhitektura
- Razvoj servisa iz oblasti objedinjenih komunikacija



[www.saga.rs](http://www.saga.rs)

# Saga d.o.o. Beograd

## Cisco Solution Innovation Partner Of the Year 2008



[www.saga.rs](http://www.saga.rs)

# Solution Innovation Partner

## Veliki projekti u 2008-2009

- NIS
- Prva pametna zgrada na Balkanu,
- Cisco TelePresence Telekom Srbija
- EPS Projekat

## June 3, 2009 Cisco Partner Summit, Boston

- Nagrada na globalnom nivou
- Saga medju 60,000 Cisco partnera osvojila nagradu
- U društvu sa najboljima



[www.saga.rs](http://www.saga.rs)

# Saga, dobitnik globalne Cisco nagrade



[www.saga.rs](http://www.saga.rs)

# AGENDA

- Saga - Cisco Solution Innovation Partner za 2008. godinu
- **Projekat EPS**
- Mega Cluster arhitektura
- Razvoj servisa iz oblasti objedinjenih komunikacija



[www.saga.rs](http://www.saga.rs)



# Mega Cluster arhitektura

- Rešenje
- Znanje i ekspertiza



# Jedinstveno inovativno rešenje


- Zahtevi korisnika
- Odabir rešenja baziran na IP SIP okosnici
- Cisco MegaCluster
- Visok stepen redundanse
- Jednostavna proširivost sistema i mogućnost povezivanja novih lokacija
- Jedinstvena platforma za Voice i Data servise
- Sprezanje sa drugim centralama i povezivanje korisnika




[www.saga.rs](http://www.saga.rs)




# Cisco Mega Cluster arhitektura




TFTP, MCS7845,  
5000 users




Backup1, MCS7845,  
5000 users license



Backup2, MCS7845,  
5000 users license




Backup3, MCS7845,  
5000 users license




Backup 6,8,9,MCS7835,  
2500 users license


**TS Obrenovac A**




Primary1, MCS7845, 5000 users license




Publisher, MCS7845,  
5000 users license




Primary2, MCS7845, 5000 users license



TFTP, MCS7845,  
5000 users license




Primary3, MCS7845,  
5000 users license




Backup 4,5,7,MCS7835,  
2500 users license

**NDC**




Primary4, MCS7835,  
500 users license

**RDC Novi Sad**




Primary5, MCS7835,  
500 users license

**TENT A**




Primary6, MCS7835,  
500 users license

**TENT B**




Primary7, MCS7835,  
500 users license

**TE Kolubara A**



Primary8, MCS7835,  
500 users license

**TE Morava**



Primary9, MCS7835,  
500 users license

**NDC**



# Cisco Mega Cluster arhitektura

## Elementi IP sistema

- Broj servera u klasteru:  
17 (+ 1 cold backup Publisher server)
- Broj voice gatewaya: 26 (13x2)
- Broj access rutera: 22 (11x2)



[www.saga.rs](http://www.saga.rs)

# Dial Plan

- Plan upućivanja poziva
- Broj dial-peereva  $> 200$  po gatewayu
- Broj route patterna  $> 400$
- Broj translation patterna  $> 150$
- Kompleksnost konfiguracije  $> 100$  kucanih strana u Wordu
- Mehanizmi zaštite od petlji



[www.saga.rs](http://www.saga.rs)

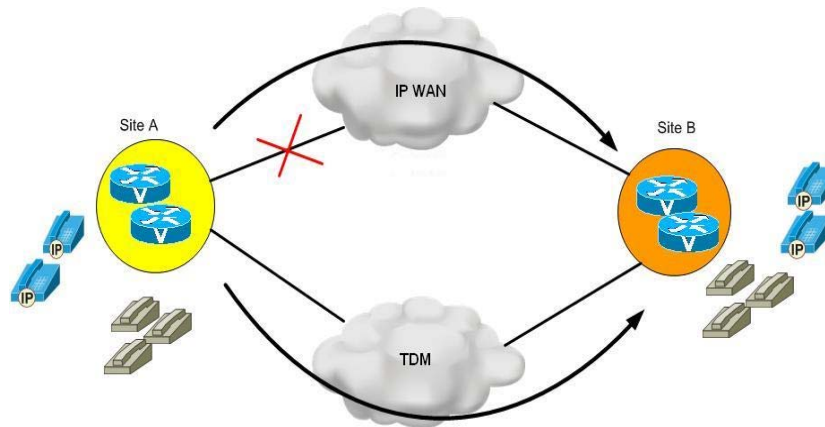
# Krajnji stepen redundanse



## SRST

Glavni zahtev: poziv mora da se ostvari!

- Funkcionisanje poziva prilikom nedostupnosti centralnih SoftSwitch-eva
- Dva Voice Gateway-a se ponašaju kao jedinstvena telefonska centrala
- Pozivanje preko TDM oboda mreže
- Poslednja alternativa: PSTN



[www.saga.rs](http://www.saga.rs)

# Network management sistem

## Kompleksno mrežno rešenje

- Data i Voice servisi
- Različiti proizvođači opreme
- Integracija u jedinstven sistem

## Projektni zadatak za NMS

- Opšti zahtevi - zadovoljavanje OSI, TMN i RFC preporuka
- Zahtevi koji se odnose na sigurnost i pouzdanost rešenja
- Funkcionalni zahtevi specifični za Data i Voice NMS - Fault, Configuration, Performance management
- Funkcionalni zahtevi specifični za Softswitch, Voice Routers, Gateways, IP Exchange Management

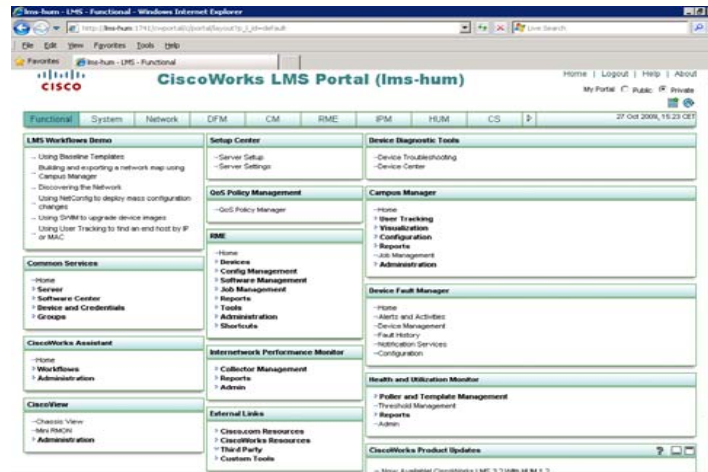


[www.saga.rs](http://www.saga.rs)

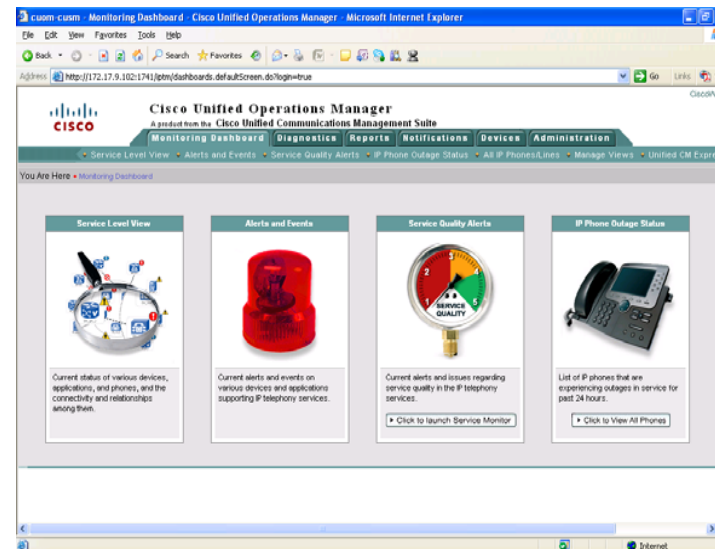
# Element Management layer



- CiscoWorks LAN Management Solution & Health and Utilization Monitor



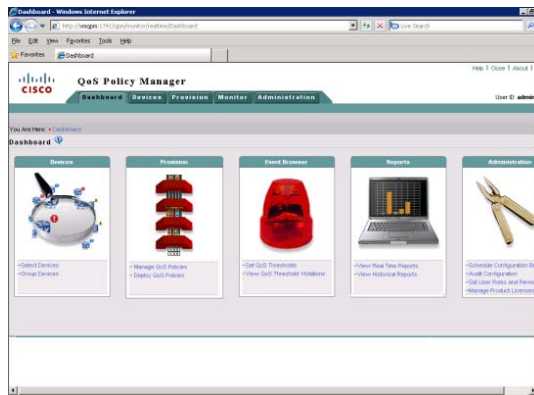
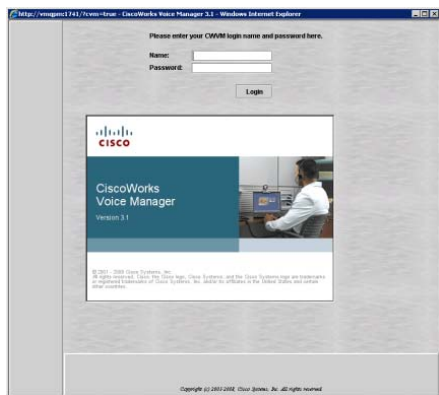
- Cisco Unified Operations Manager & Service Monitor



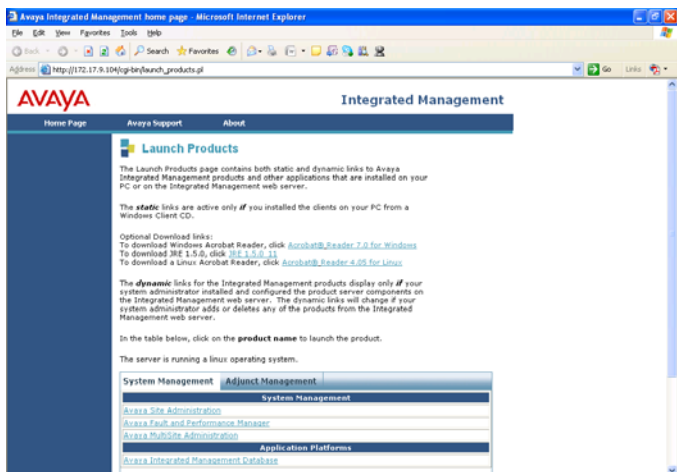
# Network management sistem aplikacije



## CiscoWorks Voice Manager & QoS Policy Manager



## Avaya IP Exchange Management



## Security&Identity Management – CiscoSecure Access Control Server



www.saga.rs

# NMS Cisco Info Centar



Netcool/OMNIBUS Event List: Filter="All Events", View="Default"

Node	Alert Group	Summary	Last Occurrence	Count	T
cic	c@xxxxxxxx@xxxxxxxx	Attempt to login as root from host cic failed	26.10.09. 16.43.04	1	Problem
172.16.1.242	Gateway Status	Gateway Failed to Communicate with CallManager, Unknown ( Gateway: AN22	26.10.09. 16.46.17	1	Problem
172.16.1.244	Gateway Status	Gateway Failed to Communicate with CallManager, Unknown ( Gateway: AN22	26.10.09. 16.42.11	2	Problem
cic	Probe Status	Probe Heartbeat Message ( Probe: mtrapd, Host: cic, ObjectServer: NDC )	26.10.09. 16.46.11	6	Problem
cic	Unix Conductor	A c@xxxxxxxx@xxxxxxxx:0.0 process c@xxxxxxxx@xxxxxxxx:0.0 running on ci	26.10.09. 16.43.42	1	Resolved
cic	Unix Conductor	A c@xxxxxxxx@xxxxxxxx:0.0 process c@xxxxxxxx@xxxxxxxx:0.0 running on ci	26.10.09. 16.43.39	1	Problem
cic	Unix Conductor	A c@xxxxxxxx@xxxxxxxx:0.0 process c@xxxxxxxx@xxxxxxxx:0.0 running on ci	26.10.09. 16.43.39	1	Resolved
cic	Unix Event List	A e@AC11096A@0A0A0DEB:0.0 process e@AC11096A@0A0A0DEB:0.0 running o	26.10.09. 16.43.38	1	Resolved
cic	Unix Event List	A e@AC11096A@0A0A0DEB:0.0 process e@AC11096A@0A0A0DEB:0.0 running o	26.10.09. 16.43.15	1	Problem
cic	Unix Conductor	A c@xxxxxxxx@xxxxxxxx:0.0 process c@xxxxxxxx@xxxxxxxx:0.0 running on ci	26.10.09. 16.43.07	1	Problem

Summary: 6 (Green), 0 (Purple), 1 (Blue), 2 (Yellow), 1 (Orange), 0 (Red)

10 row(s) matched. 26.10.09. 16.46.27 root NDC[PRI]



www.saga.rs

# Razvoj servisa

---

- Saga sistem integrator



[www.saga.rs](http://www.saga.rs)

# Proizvodi Sage u Elektroprivredi

## Servisi dispečerskih konzola

### Touch screen servisi:

- brzo biranje
- praćenje zauzetosti pozvane destinacije
- rezervacija veze
- upad u vezu
- davanje prioriteta dispečerskim pozivima



[www.saga.rs](http://www.saga.rs)

# Proizvodi Sage u Elektroprivredi



**Cisco Unified IP Phone 7975**

**Razvoj servisa**



[www.saga.rs](http://www.saga.rs)

# Proizvodi Sage u Elektroprivredi

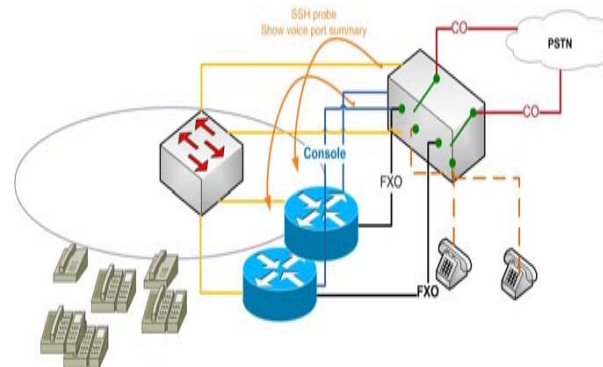
- Korektor signalizacije – za potrebe prilagodjavanja obliku signalizacije u Elektroprivredi
- 6 ulaznih i izlaznih E&M portova



[www.saga.rs](http://www.saga.rs)

# Proizvodi Sage u Elektroprivredi

- Emergency panel – za povezivanje CO, fxo, fxs i telefonske linije
- Siguran pristup dispečera PSTN-u u svakom trenutku!
- Kontrola rada voice porta putem ssh i konzolnog pristupa na oba rutera
- Web administracija korisničkog interfejsa



[www.saga.rs](http://www.saga.rs)

# Saga dodeljuje nagradu

Kako se zove nagrada koju je Saga dobila u Bostonu?

064 8606280



[www.saga.rs](http://www.saga.rs)

KADA POŽELITE USLUGU...



**Hvala na pažnji!**

---



[www.saga.rs](http://www.saga.rs)