



# University of Granada - RedUGR-

“RedUGR-NOC, an end-user oriented network”

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ANTONIO RUIZ MOYA

NATALIA GENARO GARCÍA

SERVICIO DE REDES Y COMUNICACIONES

CENTRO DE SERVICIOS DE INFORMÁTICA Y REDES DE COMUNICACIÓN

ARUIZ@UGR.ES

NATALIAG@UGR.ES

NOC@UGR.ES

WWW.UGR.ES

CSIRC.UGR.ES



# Agenda

1. RedUGR-NOC'S main goals
2. What is RedUGR?
3. Infrastructures
4. Core of the RedUGR Network
5. NOC Management



# 1. RedUGR-NOC's main goals

**Network infrastructures** that are aimed to universal services

**Automation** of Network Operations aimed to a less HR intervention

**Centralised Network Management** for a better resource optimization

**Single Network Policy** for cost savings

**Network services** that are open to UGR and the rest of the national and international community.

**Technological Innovation of the Network** focused on the improvement of the ICT Services within the University



## 2. What is RedUGR? Infrastructures

Infrastructures and global network services

7 Physical University Campuses, 5 in Europe y 2 in Africa

1 Virtual University Campus: CVI-UGR

83 Buildings

33,000 physical network nodes

85,000 users

3,000Km own fiber optics cables deployed in Granada and african Campuses

HA Core network (160Gbps, 80Gbps y 20Gbps)

HA Internet Access (10Gbps)

## 2. What is RedUGR? Services

University Wireless Network with 1,500 AP's (connectivity and soon location-oriented), eduroam-oriented

Corporate **Videoconference** Network with 30 physical rooms and 20 virtual rooms

**Multimedia Control Network** with 230 classes with automated management

**Help-Desk** aimed to real-time attention

144 classrooms with **4,200 desktop computers**

**Virtual PC classrooms** for student work at home

**VoIP network** with 8,000 telephone extensions

**Supercomputing** services through alhambra.ugr.es

Etc.



## 2. What is RedUGR? Extra services

University Load Balancing Systems. 50 Server Farms

LUCIA-NA Network Management System (Control & Monitoring)

Network Security Management HERMES-NA:

- NG-FW
- NG-NAC
- Global network flow management
- Traffic capture in the core network
- VPN for outdoor connectivity
- ODBM system: PROC + PROG

LUCIA-NA

HERMES-NA



## 2. What is RedUGR? Extra services

University Load Balancing Systems. 50 Server Farms

LUCIA-NA System of Network Management (Control & Monitoring)

**Cisco PRIME, Cisco MSE, Cisco CMX, HP-IMC, SRC-UGR own software development (ODBM+SINO)**

**Open source (Dude, Cacti, MRTG, OSTicket,...)**

Network Security Management HERMES-NA:

- NG-FW
- NG-NAC
- Global network flow management
- Traffic capture in the core network
- VPN for outdoor connectivity
- ODBM System: PROC + PROG

**PALOALTO NETWORKS**

**SRC-UGR OWN SW DEVELOPMENT (ODBM)**

**SCRUTINIZER-Plixer**

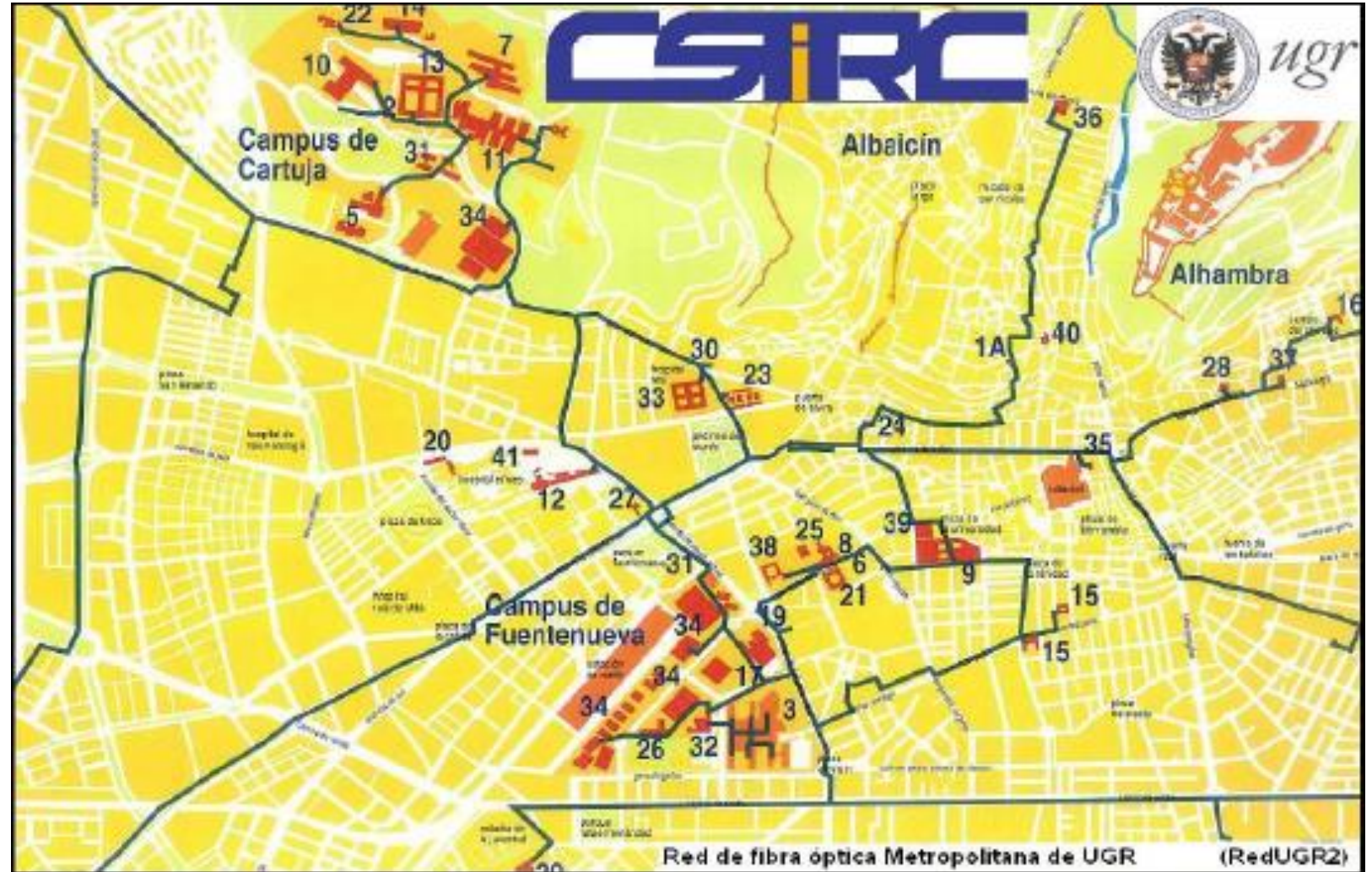
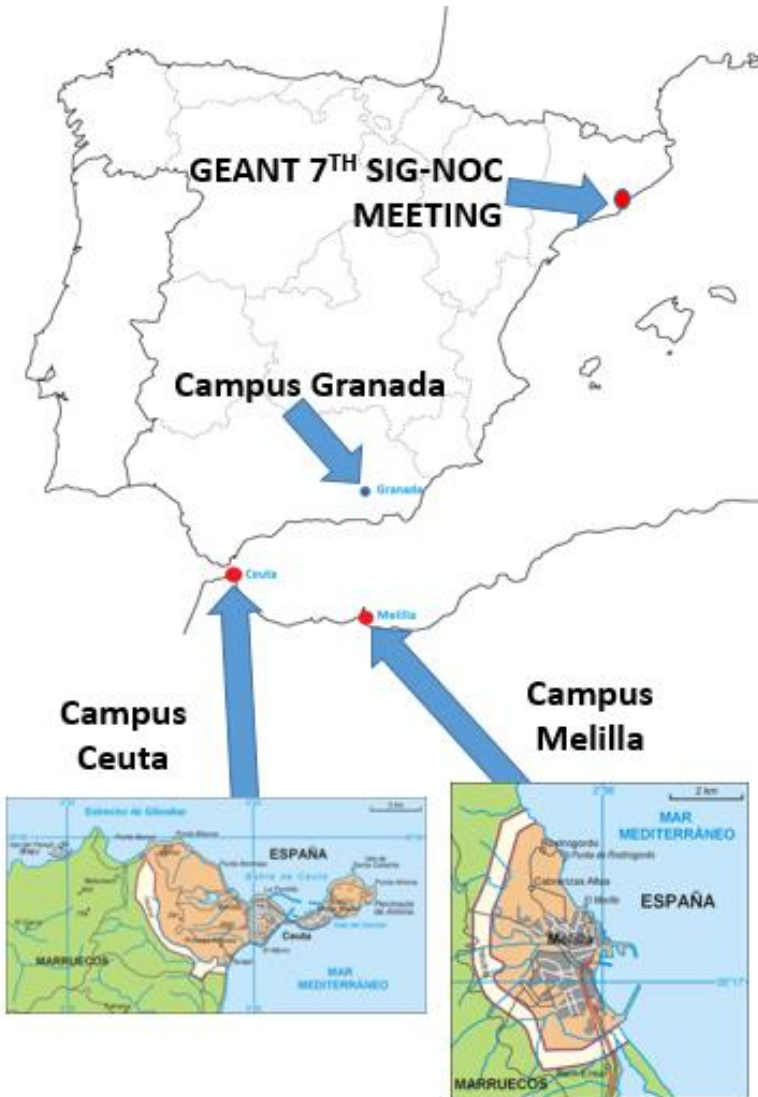
**CISCO NAM2**

**CISCO Anyconnect**

**SRC-UGR OWN SW DEVELOPMENT (ODBM)**

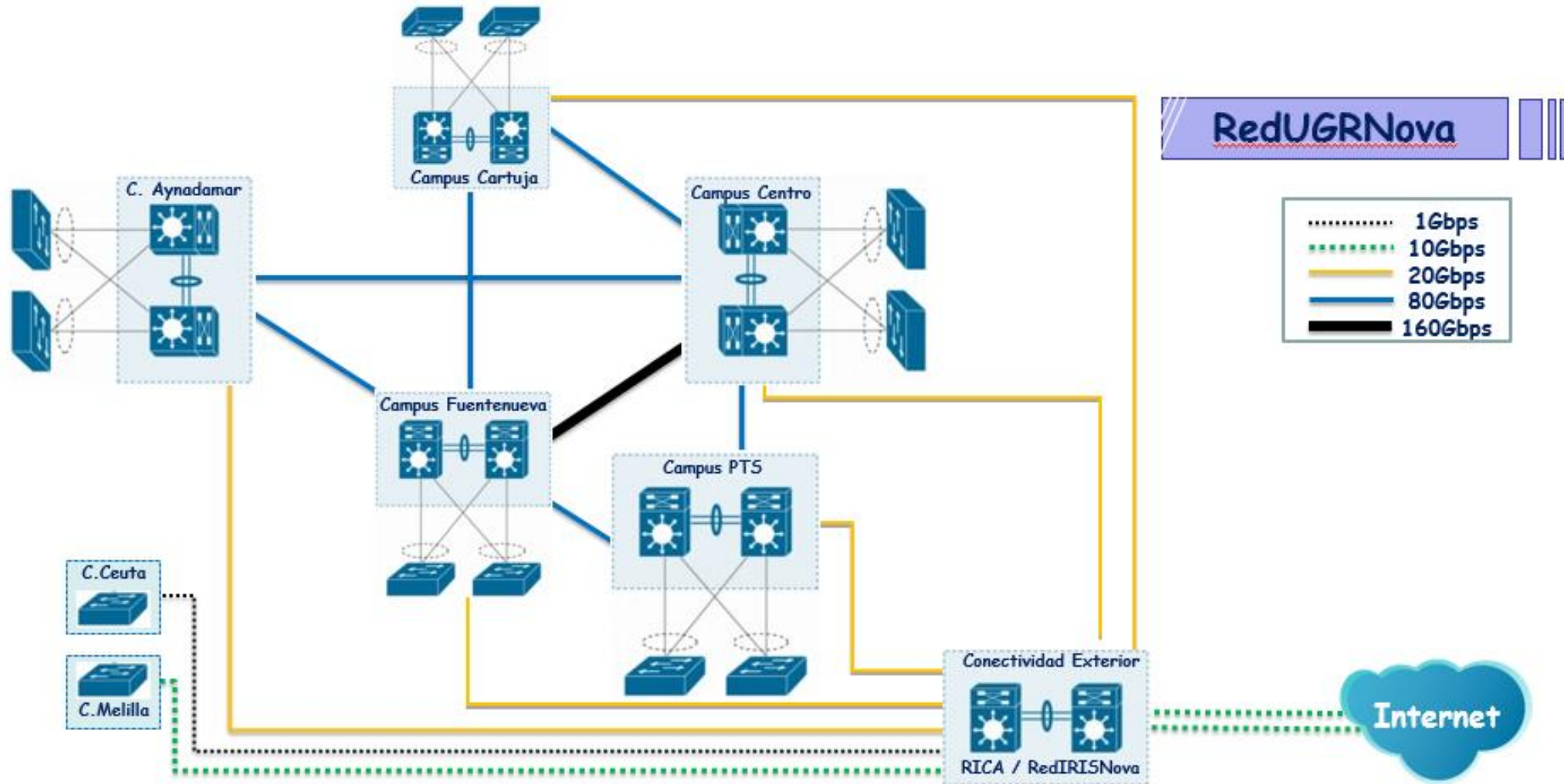


# 3. RedUGR Fiber Optics

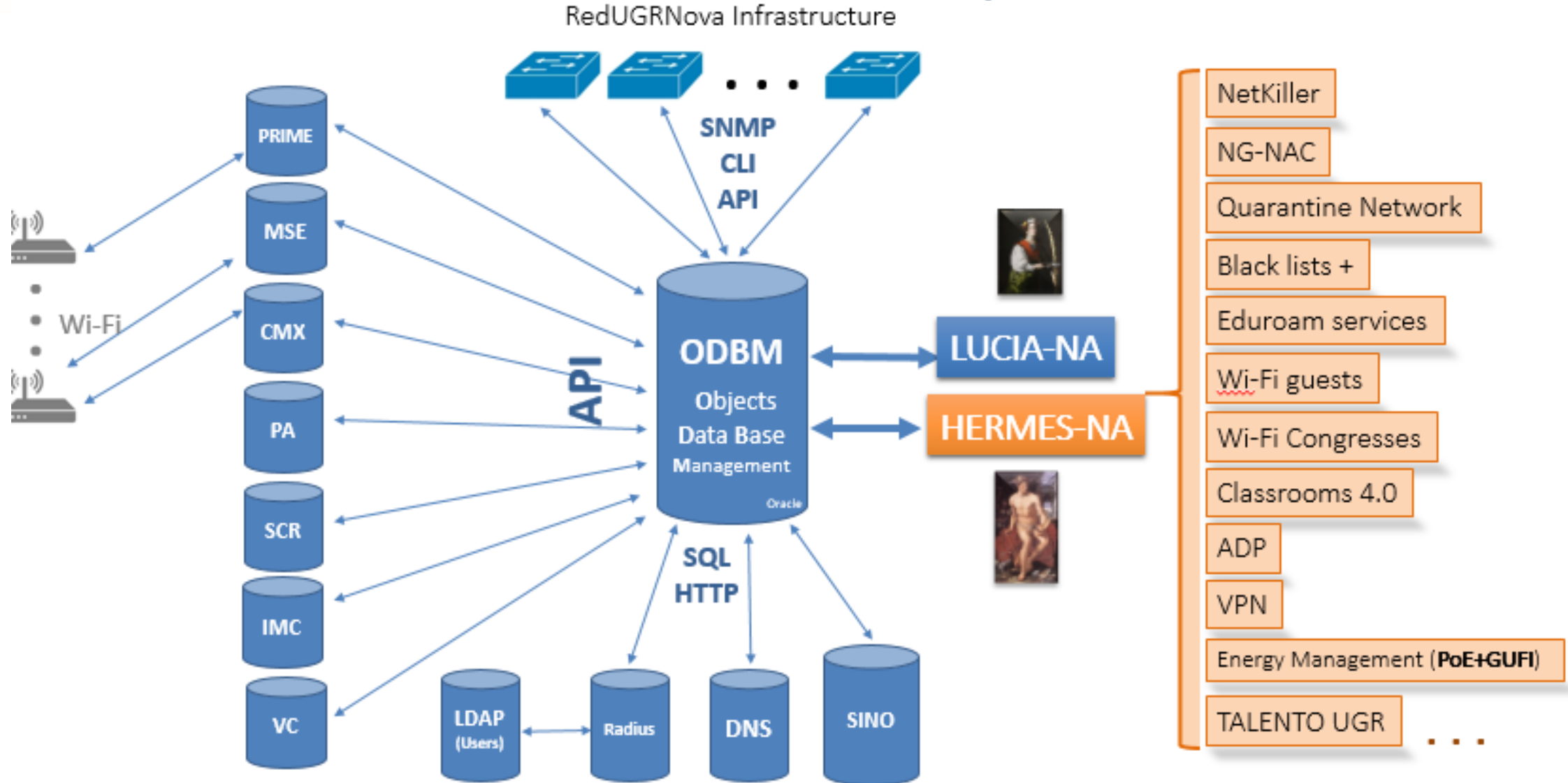




# 4. RedUGR Network Core

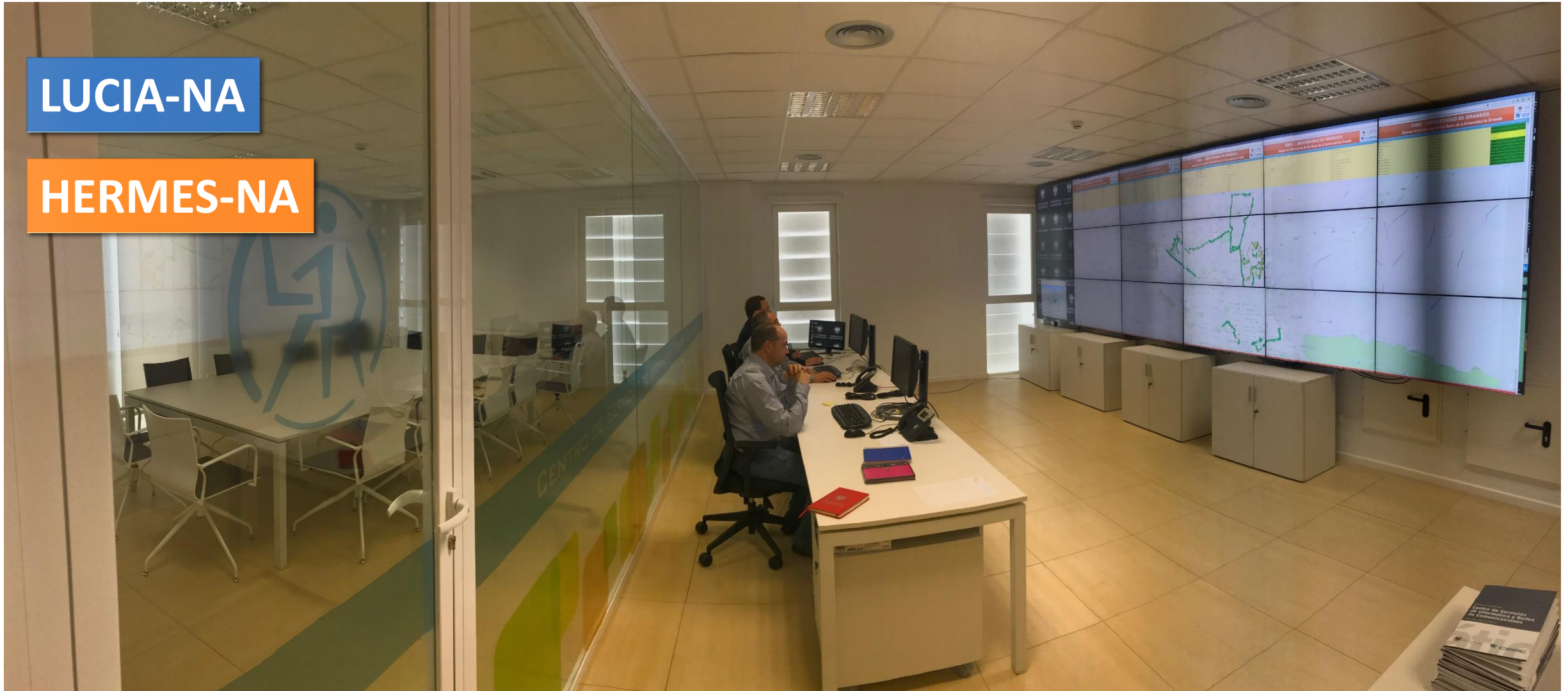


# 5. RedUGR NOC Management





# 6. RedUGR Management Centre



LUCIA-NA

HERMES-NA



# 6. RedUGR Management Centre



LUCIA-NA

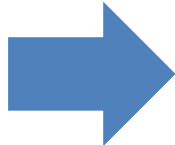
HERMES-NA



# 7. RedUGR Core Network – Physical Management

LUCIA-NA

SINO



UNIVERSIDAD DE GRANADA **Acceso Identificado**

Usuario: ANTONIO RUIZ MOYA - Perfil: Personal

[Inicio](#) [Cambiar Clave](#) [Contacto](#) [Ayuda ?](#) [Salir](#)

### Aplicaciones

Aplicación	Área	Favorito
[RedUGR-ODBM] Plataforma de Gestión de Red de UGR	Trámites CSIRC	★
[RedUGR-SINO] Plataforma de Gestión Redes Ópticas	Trámites CSIRC	★
Sistema de Seguimiento de Actividad Docente (SSAD)	Grado y Posgrado	★
Administración de Acceso Identificado	Trámites CSIRC	★
Adquisición software	Trámites CSIRC	★
Alumnos IN	Movilidad	★
Alumnos OUT	Movilidad	★
Alumnos Visitantes	Movilidad	★
Apoyo a Docencia	Grado y Posgrado	★
Automatricula Enseñanzas Propias	Grado y Posgrado	★

Página 2 de 10 | Mostrando 11 - 20 de 92

**Novedades**

No hay novedades

**Avisos**

Última Conexión a AI

Datos de su última conexión a Acceso Identificado:

- Fecha: 06/04/2018 12:02
- Máquina: 150.214.35.122

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Página segura



# 7. RedUGR Core Network – Physical Management

LUCIA-NA

SINO

SINO - UNIVERSIDAD DE GRANADA  
Sistema de información de Red Óptica de la Universidad de Granada

Inicio | Administración | Operación | Procedimientos | Usted está accediendo a SINO como ADMINISTRADOR

Mapa | Seleccionar todo | Eliminar Selección | PDF | Mostrar/Ocultar cols | Validar | Invaldar

Página 1 de 2 | 100 | Mostrando 1 - 100 de 137

Mostrar/ocultar arquetas

Administración | Operación | Procedimientos

- MAN
- LAN
- WLAN
- Elementos de registro
- Tramos
- Cables
- Enlaces
- Edificios
- Mapa Zonas





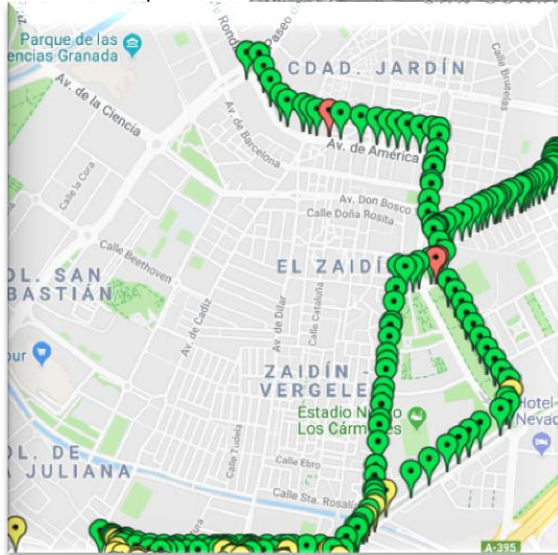
# 7. RedUGR Core Network – Physical Management

**SINO - UNIVERSIDAD DE GRANADA**  
Sistema de información de Red Óptica de la Universidad de Granada

Imágenes asociadas a la arqueta ALB026



SINO



Codig	Acciones	Nombre	Edificio 1	Edificio 2	SM	MM	Modelo	Tipo F/O	Tipo Conect	Fecha instala	Long. Est.	Long. Reflect
1209		STA.LUCIA-ALMIRANTE	EDIFICIO SANTA LUCIA	PALACIO DEL ALMIRANTE	24	12	PRYSMIAN OPS OS2 + OM1 0	SC verde y beige		23-01-2009	1002.4914	1157.0

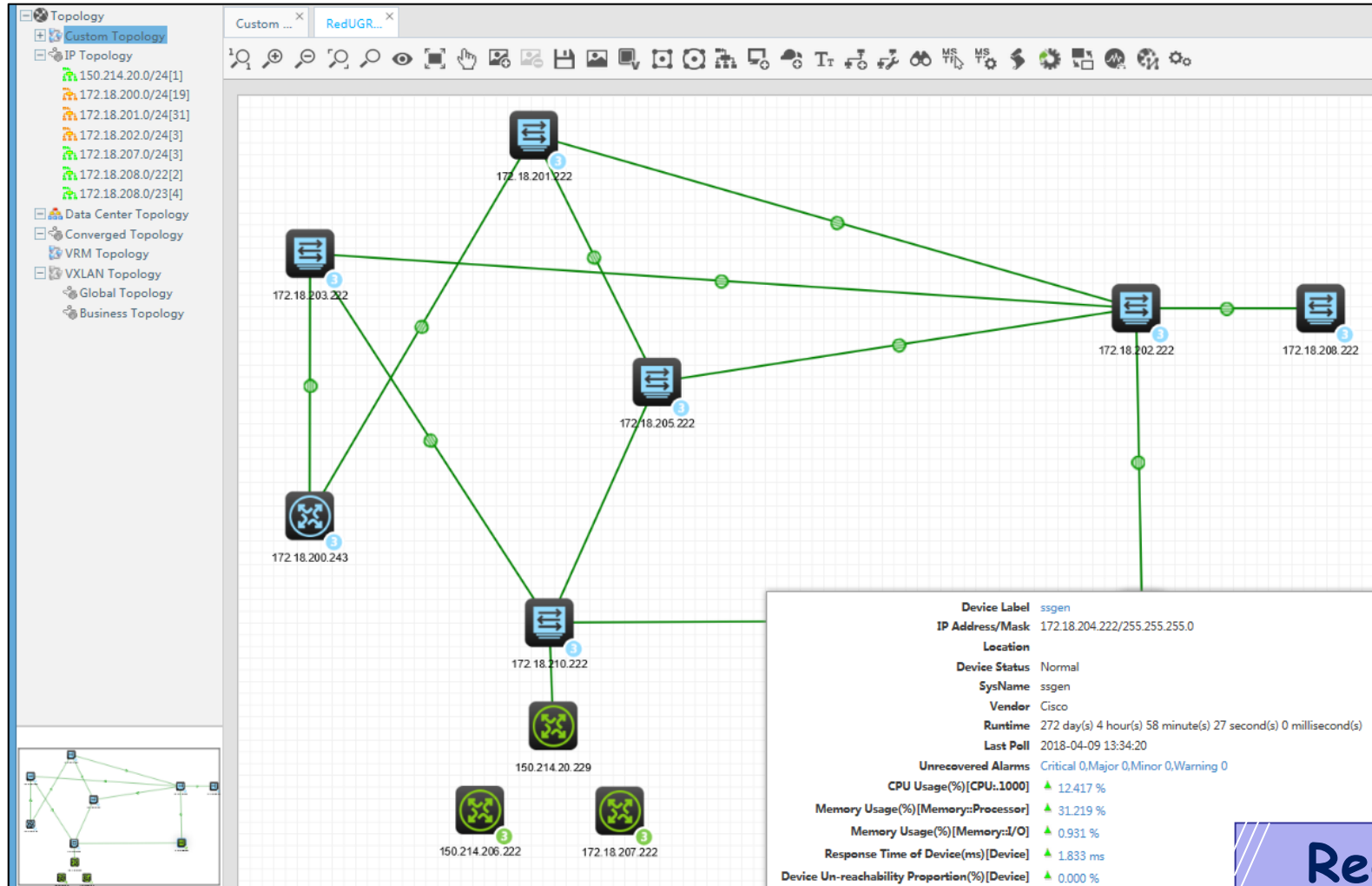
Hilos del cable												
Acciones	Num	Tipo	Estado E1	Conectado en	Puerto/Hilo	Comentarios E1	Estado E2	Conectado en	Puerto/Hilo			
				Panel en EDIFICIO SANTA LUCIA				Panel en PALACIO DEL ALMIRANTE				
	1	MM	LIBRE				LIBRE					
	2	MM	LIBRE				LIBRE					
	3	MM	LIBRE				LIBRE					
	4	MM	LIBRE				LIBRE					
	5	MM	LIBRE				LIBRE					
	6	MM	LIBRE				LIBRE					
	7	MM	LIBRE				LIBRE					
	8	MM	LIBRE				LIBRE					
	9	MM	LIBRE				LIBRE					
	10	MM	LIBRE				LIBRE					
	11	MM	LIBRE				LIBRE					
	12	MM	LIBRE				LIBRE					
	1	SM	OCUPADO	GVIA	1/3G8		OCUPADO	CPAPBPC001	1G1			
	2	SM	OCUPADO	GVIA	1/3G8		OCUPADO	CPAPBPC001	1G1			
	3	SM	OCUPADO	GVIA	1/3G9		OCUPADO	F/O ALMIRANTE-C.VICTORIA	1 SM			
	4	SM	OCUPADO	GVIA	1/3G9		OCUPADO	F/O ALMIRANTE-C.VICTORIA	1 MM			

LUCIA-NA



# 8. RedUGR Core Network – Logical Management

LUCIA-NA



RedUGRNova

# 8. RedUGR Core Network – Logical Management

LUCIA-NA

The screenshot displays the HPE Intelligent Management Center interface. At the top, there is a navigation bar with tabs for Home, Resource, User, Service, Alarm, Report, and System. A search bar labeled 'Query Devices' and a user profile 'Anto...' are also visible.

**Device State Overview:** This section provides a high-level summary of device health. It shows 11 Routers, 78 Switches, and 0 Servers. A large green progress indicator shows 100% overall health. A legend indicates the following status counts: 0 Unmanaged, 7 Unreachable, 67 Normal, 0 Warning, 1 Minor, and 25 Major.

**Important Devices:** This section focuses on a specific device, 'ugr.es(172.18.210)'. It features a gauge for CPU Usage (Last Hour) at 50% and a line chart for Memory Usage (Last Hour) with a highlighted peak of 30.15%. Below this, an alarm summary shows 0 Critical, 1 Major, 0 Minor, 0 Warning, and 0 Event alarms. The device status is 'Unreachable: 0%' and 'Device Status: Unreachable'. Run Time is 1963 days 18 hrs, and the last poll time was 2018-04-09 14:09:01.

**Unrecovered Alarm Statistics:** A bar chart shows the total number of unrecovered alarms, with a total of 95. A breakdown shows 0 Critical, 93 Major, 2 Minor, 0 Warning, and 0 Info alarms.

**CPU Utilization (%) - Top5:** A line chart showing the top 5 devices by CPU utilization over the last hour. The y-axis ranges from 0 to 100%. The x-axis shows time from 13:30 to 14:00.

**Memory Utilization (%) - Top5:** A circular gauge chart showing the top 5 devices by memory utilization over the last hour. The y-axis ranges from 0 to 100%. The x-axis shows time from 13:30 to 14:00. The top 5 devices are: <106.ugr... (83.941%), sfc-mec (79%), 2pc1 (78.445%), cicpbpc (78.004%), and cinp1 (76.755%).

**Real-Time Alarms:** This section is currently empty.

# 9. RedUGR Core Network – Wi-Fi

Dashboard / Network Summary

Overview Incidents Site Summary +

Metrics



Last Updated: Monday, April 9, 2018 at 6:58:09 PM GMT+02:00

Filters Time Frame Past 1 Month Apply

Coverage Area | View Maps

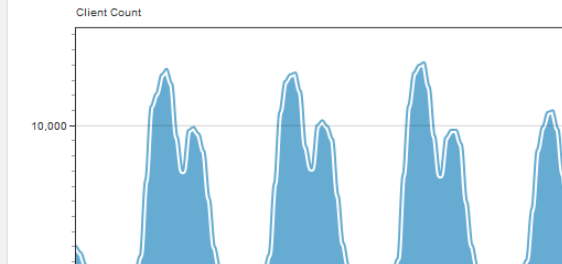
Total APs not yet assigned to maps-Unified:61 | Autonomous:0

Name	Total APs	Radio			Alarms	Clients	
		5 GHz	2.4 GHz	Wireless		Wired	
Centro	298	298	298	2	2719	0	
Ceuta	39	43	39	2	305	0	
Aynadamar	89	89	89	1	1038	0	
Cartuja	338	338	338	0	2850	0	
PTS	207	207	207	0	666	0	
Fuentenueva	188	188	188	0	1747	0	
Melilla - Enfermeria/Humanida...	15	15	15	0	98	0	

Client Count By Association/Authentication | View Details

Associated | Authenticated

Zoom: 1h | 6h | 1d | 1w | 2w | 4w | 3m | 6m | 1y From: 4/2/2018, 6:58 PM To: 4/9/2018, 6:58 PM



LUCIA-NA

Connectivity oriented

eduroam Wi-Fi use:

- \* 1 typical day:
  - 40K different devices
  - 30K different users
  - 17K simultaneous users
- \* Since 01/01/2018:
  - Users from 60 TLD/countries (1308 domains/organisations) have been connected to eduroam in UGR

Home admin

Version 8.0.140.0

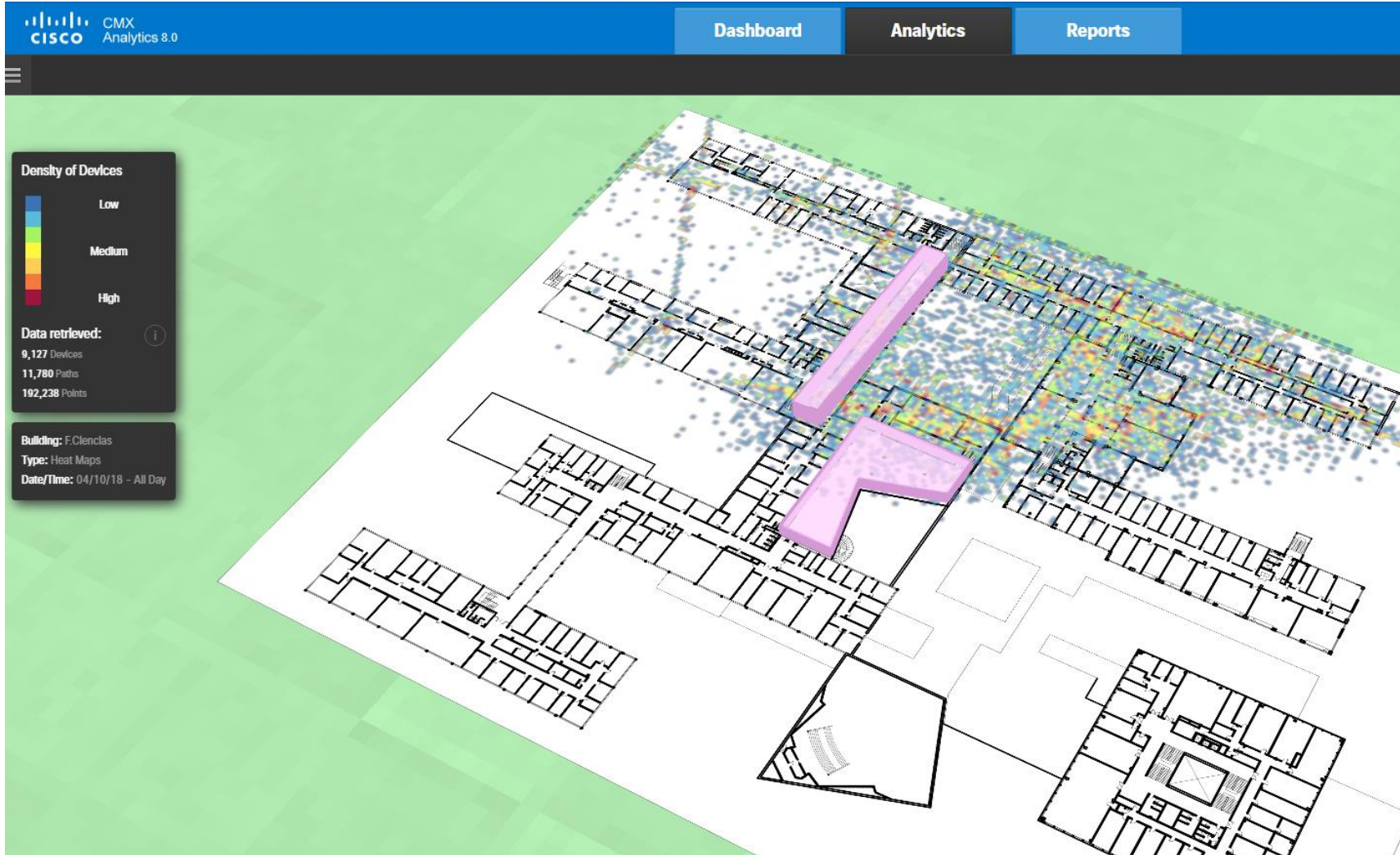
Active Clients 21276	Memory Utilization 74.22%	CPU Utilization 63.80%	Location Calculation Latency N/A
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# 9. RedUGR Core Network – Wi-Fi

LUCIA-NA

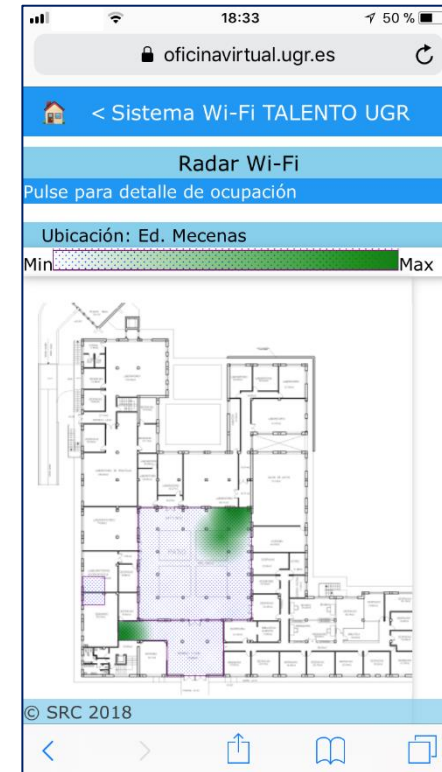
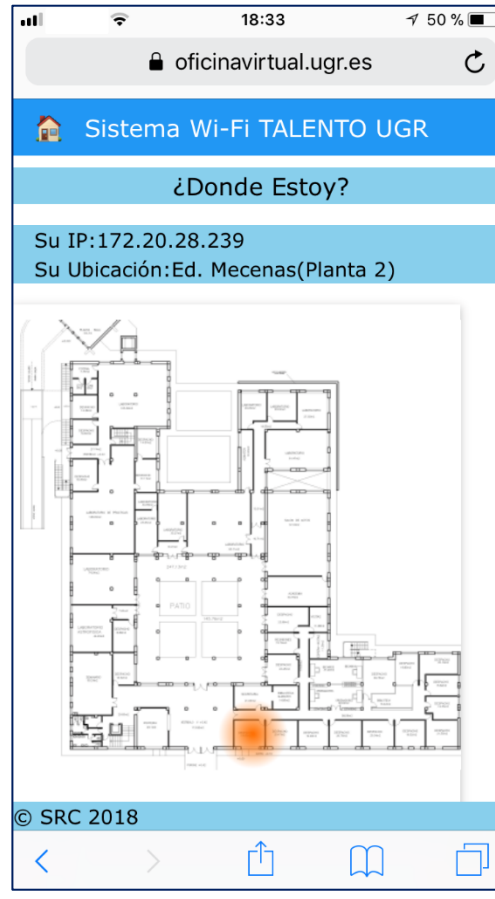
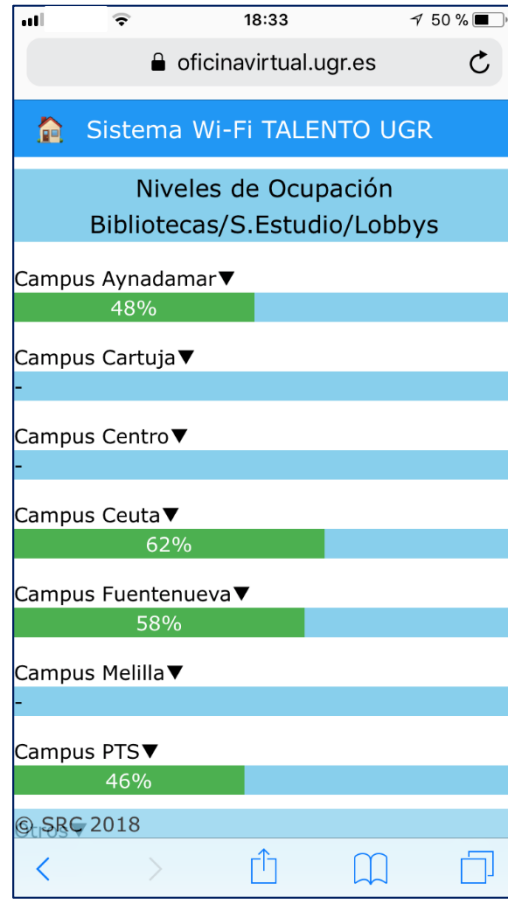
Location oriented



# 9. RedUGR Core Network – Wi-Fi

LUCIA-NA

Location oriented







# 10. RedUGR Core Network - NG-NAC

HERMES-NA

Automated Network Access Control (via ODBM):

- MAC
- IP
- User (802.1X)

Remote management of network nodes (up, down, reset, diagnostic cable, VLAN, ...)

Remote access via VPN

Quarantine networks for security incident management

Private cloud for research services

# 10. RedUGR Core Network - NG-NAC

**HERMES-NA**

CONEXION (-)

ETHERNET 00:1B:21:00:90:90 ↓ IP 172.18.126.111 ↓ NOMBRE CMA126111 ↓ VLANID 626

TOIP(MAC) ↓ TELEFONO ↓

FECHA 11/08/2004

[HUB/SWITCH](#) CPTPCEAAU02 ↓ MODELO WS-C2950G-48-EI

PUERTO 19 ↓ Sin Uso Desde 22/03/2018 01:18:31

TOMA PS. TOMA AE-D7.23 ↓ PARCHEADO ↓ CABLE -1 ↓ HILOS ↓

SOLICITUD ↓ CABLE (Descripción) INEXISTENTE

CONFIGURACION AVANZADA

DATOSIP

- Activado: [NO | ] shutdown
- Modo Access: switchport mode [ACCESS | trunk]
- Acceso a Red de Datos: switchport access vlan
- Puerto Seguro: [ | no] switchport port-security
- NetKiller Activado: switchport port-security violation [RESTRICT | protect]
- Acceso a Red de Voz: [ | no] switchport voice vlan
- Filtrado IP: [ | no] ip access-group XXX in
- EN CUARENTENA: switchport access vlan
- Autoconfiguración diaria

COMENTARIO PS. toma AE-D7.23

CONEXIONES (EDICION)

CONEXION(-)

ETHERNET 00:1B:21:00:90:90 ↓

IP 172.18.126.111 ↓

NOMBRE CMA126111 ↓

VLANID 626

PUERTO 19 ↓

TOMA PS. TOMA AE-D7.23 ↓ CABLE -1 ↓

HILOS ,

SOLICITUD SOLICITUD ↓

CABLE INEXISTENTE (Descripción)

CONFIGURACION AVANZADA

DATOSIP

- Activado: [NO | ] shutdown
- Modo Access: switchport mode [ACCESS | trunk]
- Acceso a Red de Datos: switchport access vlan [XXX | 666]
- Puerto Seguro: [ | no] switchport port-security
- NetKiller Activado: switchport port-security violation [RESTRICT | protect]
- Acceso a Red de Voz: [ | no] switchport voice vlan 301
- Filtrado IP: [ | no] ip access-group XXX in
- EN CUARENTENA: switchport access vlan [667 | xxx]
- Acceso a Portátiles registrados
- Autoconfiguración diaria

ESTADO(-)

ACCIONES FORZAR CONFIGURACIÓN

LINK STATUS UP PoE <--->

ADMIN STATUS RESTRICT DATOSIP



ESTADO (-)

ACCIONES FORZAR CONFIGURACIÓN COMPROBAR CONFIGURACIÓN VLAN VOZ

LINK STATUS UP PoE <---> COMPROBAR DIAGNOSTICO DE CABLE

ADMIN STATUS RESTRICT DATOSIP ACTIVAR DESACTIVAR LIBERAR MAC

REAL: ETHERNET 00:1B:21:00:90:90 ↓ NOMBRE CMA126111 IP 172.18.126.111 ToIP NO COMPROBADO ↓ NO COMPROBADO

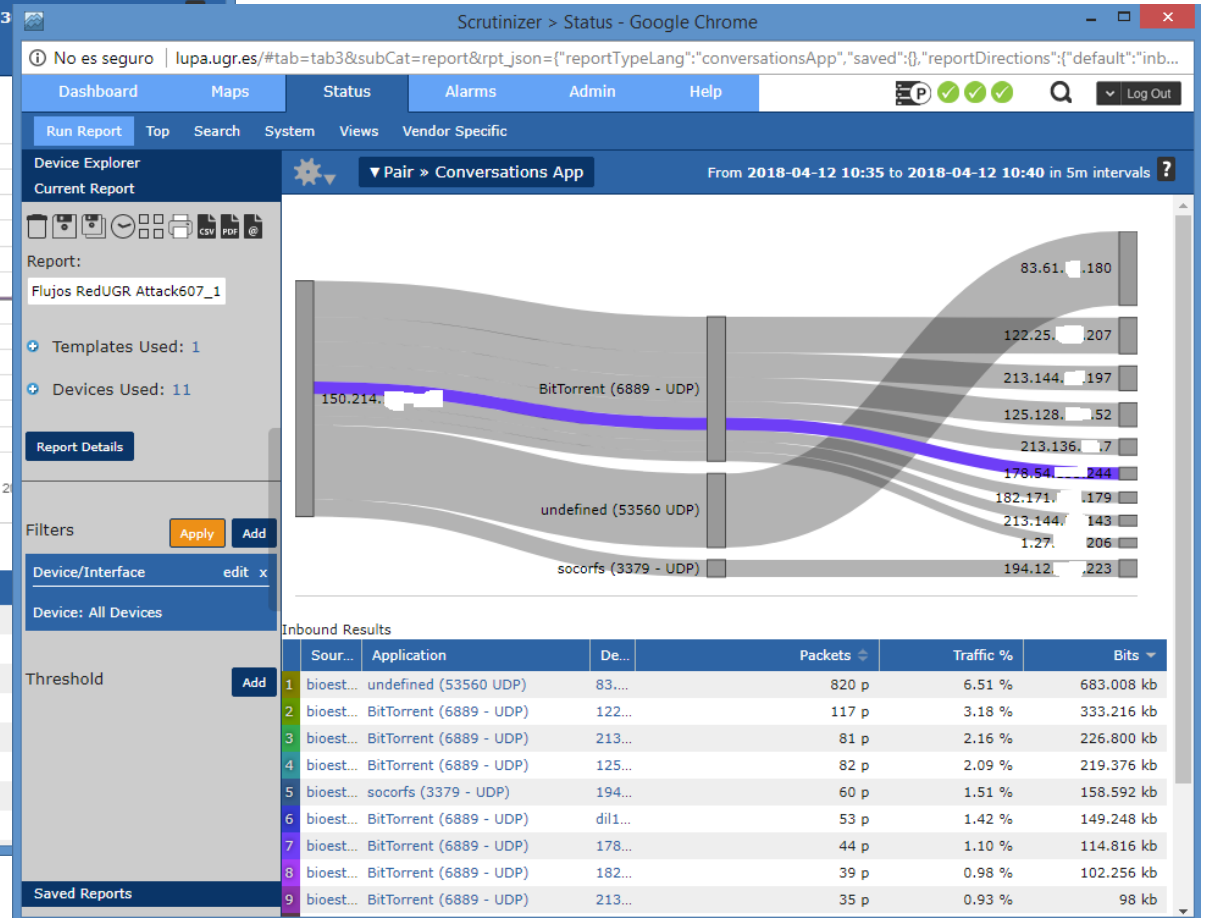
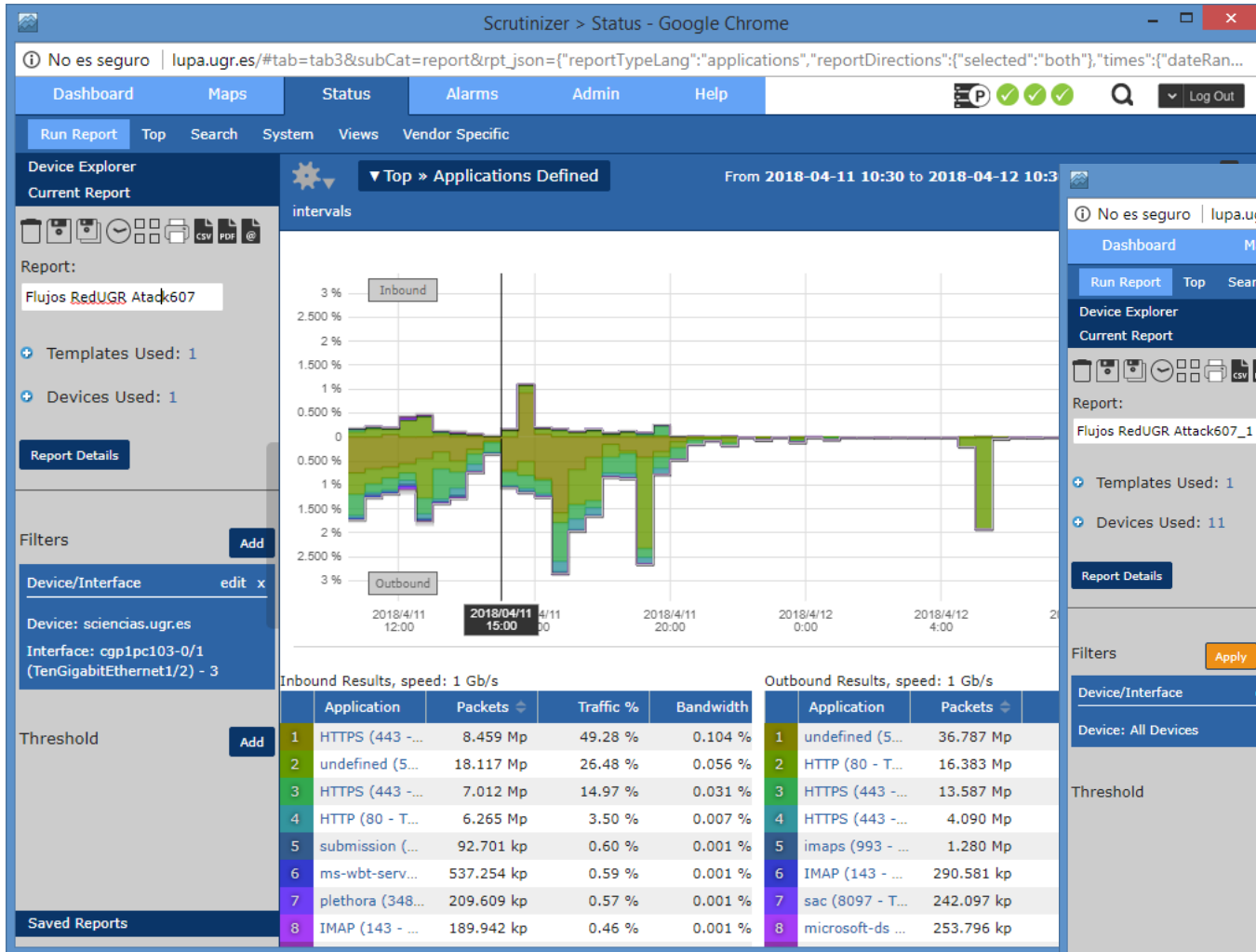
REAL: IP (Filtrada) 172.18.126.111 VLAN POLITECNICO-AUL - 626 ASIGNAR VLAN



# 10. RedUGR Core Network - NG-NAC



HERMES-NA





# 11. RedUGR Core Network - NG-FW

HERMES-NA

UNIVERSIDAD DE GRANADA

Dashboard ACC Monitor Policies Objects Network Device

Layout: 3 Columns Widgets Last updated: 19:06:11

Threat Logs

Name	Severity	Time
Adobe PDF File With Embedded Javascript	informational	04/09 19:06:07
ZeroAccess.Gen Command and Control Traffic	critical	04/09 19:06:05
ramnit.Gen Command And Control Traffic	critical	04/09 19:06:00
HTTP OPTIONS Method	informational	04/09 19:05:59
ZeroAccess.Gen Command and Control Traffic	critical	04/09 19:05:55
ZeroAccess.Gen Command and Control Traffic	critical	04/09 19:05:53
ramnit.Gen Command And Control Traffic	critical	04/09 19:05:52
HTTP GET Requests Long URI Anomaly	low	04/09 19:05:50
generic:c2r.dynu.net	medium	04/09 19:05:48
generic:c2r.dynu.net	medium	04/09 19:05:48

High Availability

Mode: Active-passive

- Local: Active
- Peer (172.18.208.92): Passive
- Running Config: Synchronized
- App Version: Match
- Threat Version: Match
- Antivirus Version: Match
- PAN-OS Version: Match
- GlobalProtect Version: Match
- HA1: Up
- HA1 Backup: Up
- Heartbeat Backup: Up
- HA2: Up
- HA2 Backup: Up

ACC Risk Factor (Last 60 minutes)

3.5

Top High Risk Applications

Interfaces

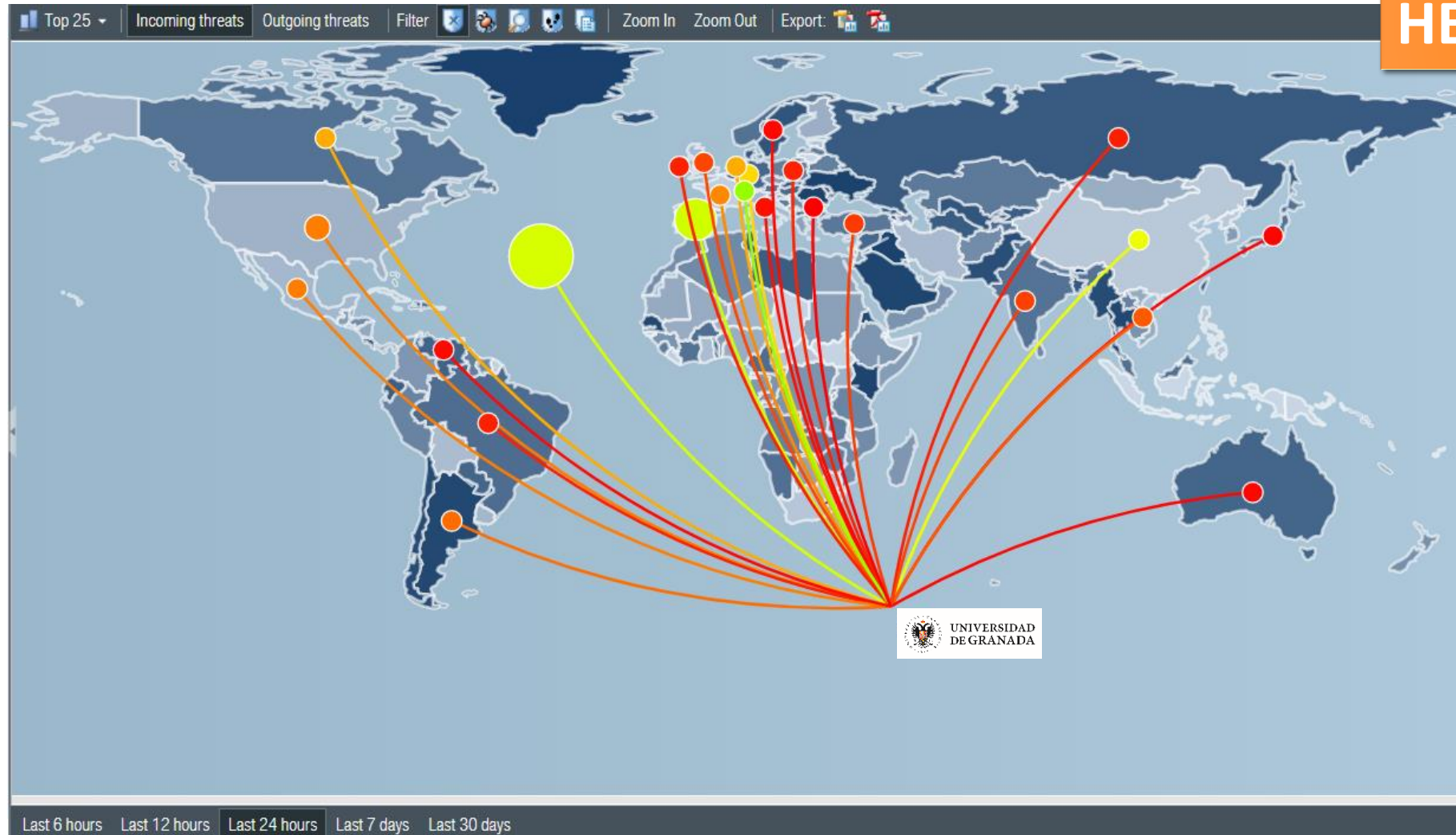
System Resources

- Management CPU: 41%
- Data Plane CPU: 43%
- Session Count: 565891 / 4194302



# 11. RedUGR Core Network - NG-FW

HERMES-NA





# 12. RedUGR – Help Desk

**Servicios de Red Ofertados**

- RedUGRNova
- Conexiones a RedUGR
- Campus Virtual Inalámbrico (CVI-UGR)
- Aulas de Docencia Presencial (ADP)
- Aulas de docencia 4.0
- Red de Control Multimedia
- RedUGR2
- Acceso VPN a RedUGR
- Videoconferencia Profesional
- Normativa Cableado Estructurado
- Toma Multiservicios (TM)
- Sistema GUF1 de Encendido Remoto

**De interés ...**

**La Universidad de Granada aporta nuevos servicios mediante la actualización de red**

La Universidad de Granada se prepara para satisfacer las necesidades mejorando la Infraestructura Cisco

La Universidad de Granada presenta instalaciones flexibles basadas en...

**iris.ug.es**

Authentication Required

e-mail o nombre de usuario

Contraseña

Inicia sesión

Copyright © CSIRC (Nodo Fuentenueva)

Sistema de Gestión de Tickets - Nodo Fuentenueva  
Centro de Servicios de Informática y Redes de Comunicaciones

**Help-Desk**

**Help Desk SRC-UGR**

Gabriel  
Servicio Redes y Comunicaciones

Yo: Buenos días. 10:19

Gabriel se ha unido al chat

Gabriel: Gracias por usar el chat piloto del Servicio de Redes y Comunicaciones del CSIRC. 10:20

Gabriel: ¿En qué puedo ayudarle? 10:20

Les rogaría información sobre...

Get Free live chat by SmartSupp

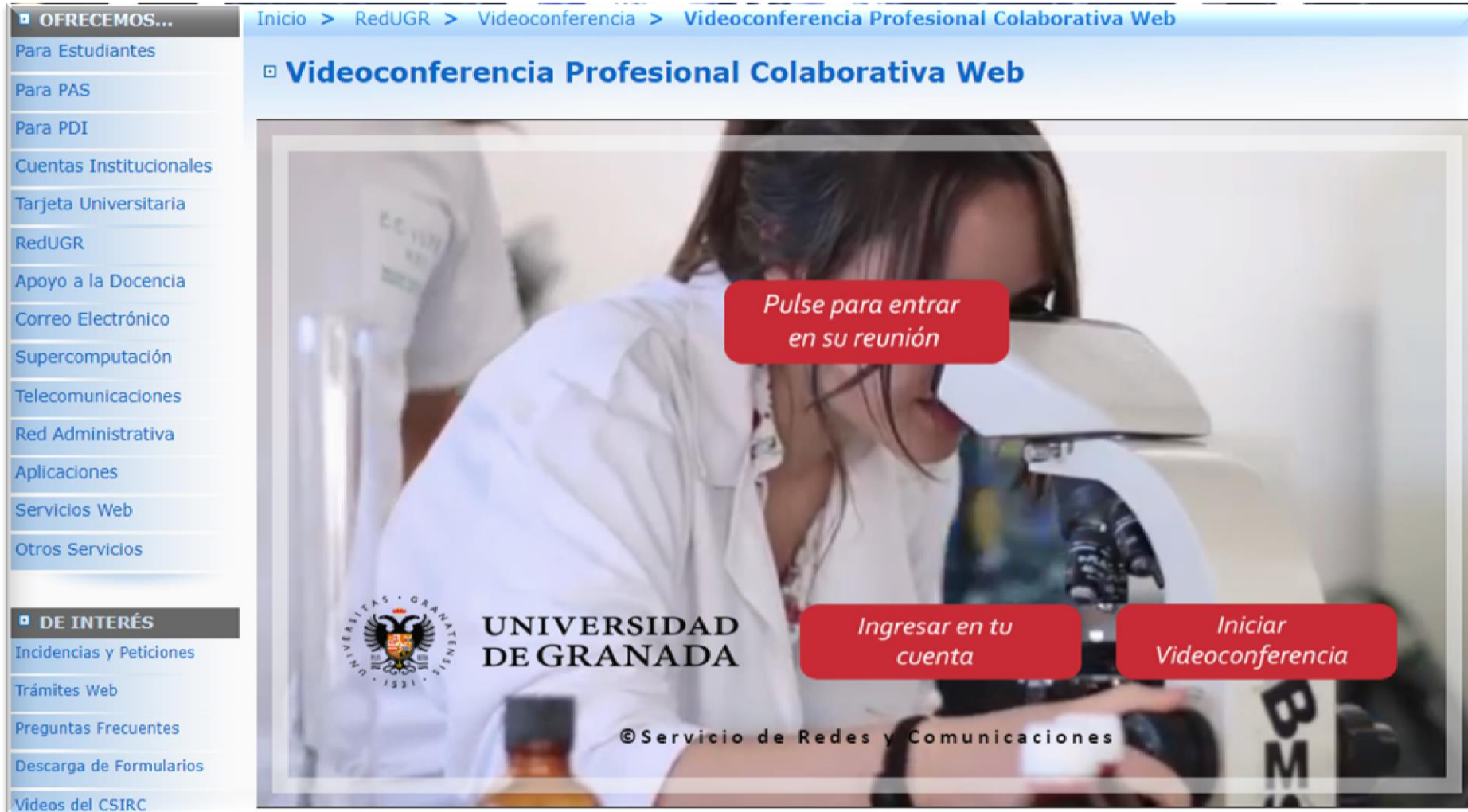
Enviar

**Historial** Número de chats: 1.074

ID	Usuario	Fecha	Duración	Estado	Contador	Detalle
1521798765618	Gabriel	23/3/2018 10:53	20 min	😊	15	Hola, vemos que est...
1521796981018	Gabriel	23/3/2018 10:41	18 min	😊	24	Hola, al introducir m...
1521793868295	Gabriel	23/3/2018 9:33	3 min	😊	9	buenos días tengo c...
1521723572035	Gabriel	22/3/2018 13:59	28 min	😊	39	Hola, como puedo p...
15116385466139	Gabriel	22/3/2018 12:49	33 min	😊	86	Hola: Gracias por us...
1521718987254	Gabriel, Elvira	22/3/2018 12:44	3 min	😊	7	Hola, vemos que est...
1521633222005	Elvira	22/3/2018 12:43	1 min	😊	3	Estimados, favor not...
1521715950478	Gabriel	22/3/2018 11:53	10 min	😊	20	Hola, vemos que est...
1521715629536	Gabriel	22/3/2018 11:48	2 min	😊	7	Hola, vemos que est...
1521711310509	Gabriel	22/3/2018 11:31	43 min	😊	108	buenas gabriela: he ...



# 13. RedUGR - Videoconferencia



The screenshot shows a web interface for videoconferencing. On the left is a navigation menu with two sections: 'OFRECEMOS...' and 'DE INTERÉS'. The main content area has a breadcrumb trail: 'Inicio > RedUGR > Videoconferencia > Videoconferencia Profesional Colaborativa Web'. Below the breadcrumb is the title 'Videoconferencia Profesional Colaborativa Web'. The central part of the page features a large image of a person in a white lab coat looking through a microscope. Overlaid on this image are three red buttons: 'Pulse para entrar en su reunión' (top center), 'Ingresar en tu cuenta' (bottom left), and 'Iniciar Videoconferencia' (bottom right). At the bottom of the image, there is the University of Granada logo and the text '© Servicio de Redes y Comunicaciones'.

OFRECEMOS...

- Para Estudiantes
- Para PAS
- Para PDI
- Cuentas Institucionales
- Tarjeta Universitaria
- RedUGR
- Apoyo a la Docencia
- Correo Electrónico
- Supercomputación
- Telecomunicaciones
- Red Administrativa
- Aplicaciones
- Servicios Web
- Otros Servicios

DE INTERÉS

- Incidencias y Peticiones
- Trámites Web
- Preguntas Frecuentes
- Descarga de Formularios
- Videos del CSIRC

Inicio > RedUGR > Videoconferencia > Videoconferencia Profesional Colaborativa Web

Videoconferencia Profesional Colaborativa Web

Pulse para entrar en su reunión

Ingresar en tu cuenta

Iniciar Videoconferencia

UNIVERSIDAD DE GRANADA

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## “RedUGR-NOC, an end-user oriented network”



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CENTRO DE SERVICIOS DE INFORMÁTICA Y REDES DE COMUNICACIÓN

ARUIZ@UGR.ES

NATALIAG@UGR.ES

NOC@UGR.ES

WWW.UGR.ES

CSIRC.UGR.ES