

Antares: Agenti AI per l'Analisi e il Troubleshooting della Rete dei Data Center GARR

Francesco Lombardo

GARR

Agenda

- Context and Goals
- Concepts - AI Agents and Tools
- What is Antares?
- Architecture and Tech Stack
- Demo
- Current Status and Roadmap

Context and Motivation

WORKSHOP GARR 2025

NET MAKERS

Why Antares



Classic Automation

Rigid & Imperative

Is **powerful** but it doesn't understand *intent*

Limited structured input

Unable to process unstructured data

Limited scenarios

Incapable of handling unexpected scenarios

Fixed workflows

No adaptability or learning ability



AI Agent

Flexible

We can state the goal , not the command

Autonomous Reasoning

It decides which tools to run. It synthesizes the results into a human-readable answer

Unified Conversational Interface

A single "co-pilot" that orchestrates all underlying tools (automation, RAG, APIs).



Our Goals



ENHANCE our existing automation with a powerful intelligence layer



SHIFT network troubleshooting operations from imperative commands to intent-based conversations.



BUILD a true "Network Co-pilot" that assists and reasons, not just executes.

Concepts – AI Agents & Tools

WORKSHOP GARR 2025

NET MAKERS

The Building Blocks of Antares



What is an AI Agent?

It's more than just an LLM. It's a system that **reasons (the brain)** and **acts (the hands)**.

- **Brain (LLM):** Understands intent, plans steps, analyzes data.
 - **Hands (Tools):** Executes code, calls APIs, runs scripts, searches docs.
-

This moves us from **imperative execution** ("Run this exact script") to **intent-based reasoning** ("Figure out why this BGB session id down").



What is RAG?

A technique to "ground" an LLM in specific, private knowledge. It's like giving the agent a private library to consult before answering.

It ensures Antares' answers are based on **GARR's reality** (our topology, our procedures), not the public internet. It reduces "hallucinations".



Why LangGraph?

A framework for building complex, stateful agents. Network troubleshooting isn't a simple line (A → B → C)

It allows Antares to **reason step-by-step**:

1. Run a tool (e.g., `check_port_status`).
2. Analyze the result.
3. **Decide the next tool** to run (e.g., `check_acis`).

What is Antares?

WORKSHOP GARR 2025

NET MAKERS 7

What is Antares? A "Team of Agents"



The Supervisor:

- Is the core of Antares.
- It acts as the "project manager".
- It understands your **intent**.
- It **plans** the task and **routes** the query to the correct specialist agent.



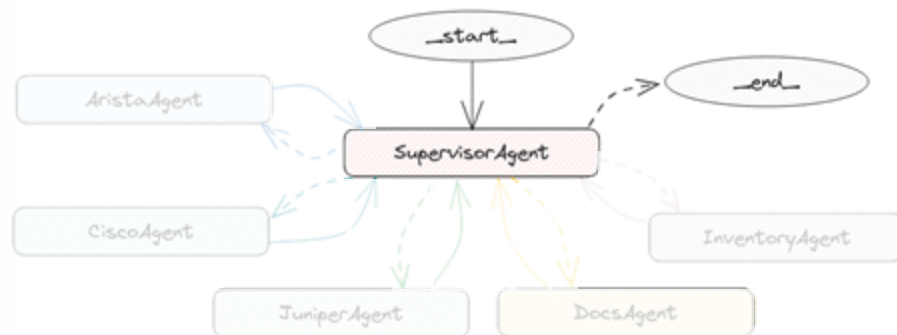
The Specialists:

- **Network Agents** (Arista, Cisco, Juniper)
- **Docs Agent** (RAG for GARR docs)
- **Inventory Agent** (e.g., NetBox)



The Process:

- **LangGraph** enables complex, step-by-step diagnosis
- It's a **cycle**, not a simple script.

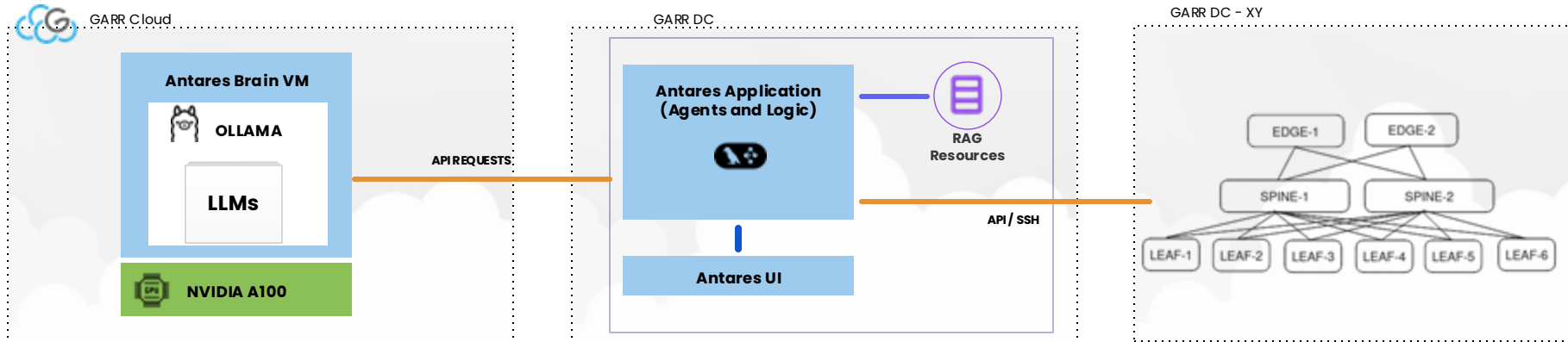


Architecture & Tech Stack

WORKSHOP GARR 2025

NET MAKERS

Deployment Architecture



SECURITY: Antares operates within the data center's secure network, providing direct access to infrastructure devices.

PERFORMANCE: Its "brain" (LLM) runs on a GPU-powered cloud VM and is consumed as an on-demand API service.

Our Tech Stack

Core Logic & State



LangGraph
Multi Agent Orchestration



REDIS
State Management and
Conversational Memory

LLM & RAG Stack



Ollama
LLM Serving (Self-hosted)



OpenAI GPT-OSS:120b
Generative model



nomic-embedding
embedding model - RAG



ChromaDB
Vectorstore (Internal Docs)



OpenWebUI
User Interface

Agent Integrations (Tools)



NetBox (GraphQL)
Inventory: devices, sites, etc

Arista (eApi)
API based integration

Juniper/Cisco (SSH libs)
CLI-based integration

Platform & IaC



**Terraform
IaC (GARR Cloud)**



Docker
Containerization



Ansible
Configuration VM

Demo

WORKSHOP GARR 2025

NET MAKERS

VIDEO

Key Benefits & Impact



Reduction MTTR

The agent performs in seconds an analysis that would take a human much longer.



From Automation to AIOps

Moving from simply running scripts (automation) to delegating reasoning (intelligence).



Empowerment & Consistency

Makes advanced diagnostics accessible to the entire team (not just senior engineers) while ensuring consistent, repeatable analysis.



Dynamic Knowledge Base

The RAG-powered DocsAgent turns static documentation into an interactive, always up-to-date expert.

Current Status & Roadmap

WORKSHOP GARR 2025

NET MAKERS

Current Status & Roadmap



Current Status

Working Prototype in GARR DC

Core Agents Deployed (Arista, Juniper, Cisco, Docs, Inventory)

LLM Stack Self-Hosted (Ollama + Models OSS)

First Use Cases Validated



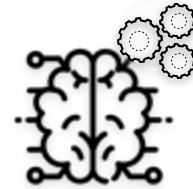
Roadmap

- **Proactive agent:** Antares identifies problems before they are reported.
- **Automated resolution:** The agent proposes solutions autonomously.
- **Security Hardening & Guardrails**
- **Optimize Inference (es. migrate to vLLM)**
- **Extend Data Sources (True AIOps):** Integrating Log Aggregators, Integrating Monitoring. This will correlate network faults with system logs and metrics.

Conclusion: Toward True AI-Driven Operations



Antares



- We're moving from imperative **commands** (“do this”) to an **intent-driven dialogue** (“understand this”).
- Antares doesn't replace network engineers; it acts as a **“Co-Pilot”**, helping them work faster and more efficiently.
- This is our first step in turning complexity into clarity, freeing time for higher-impact innovation

Thank you

Please use Wooclap:

Scan the QRCode

OR

Go to: wooclap.com and enter code: WSGARR25



WORKSHOP GARR 2025

NET MAKERS