Agentes IA en redes
Model Context Protocol (MCP) como Catalizador de las AIOps

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ESNOG – Barcelona 2025

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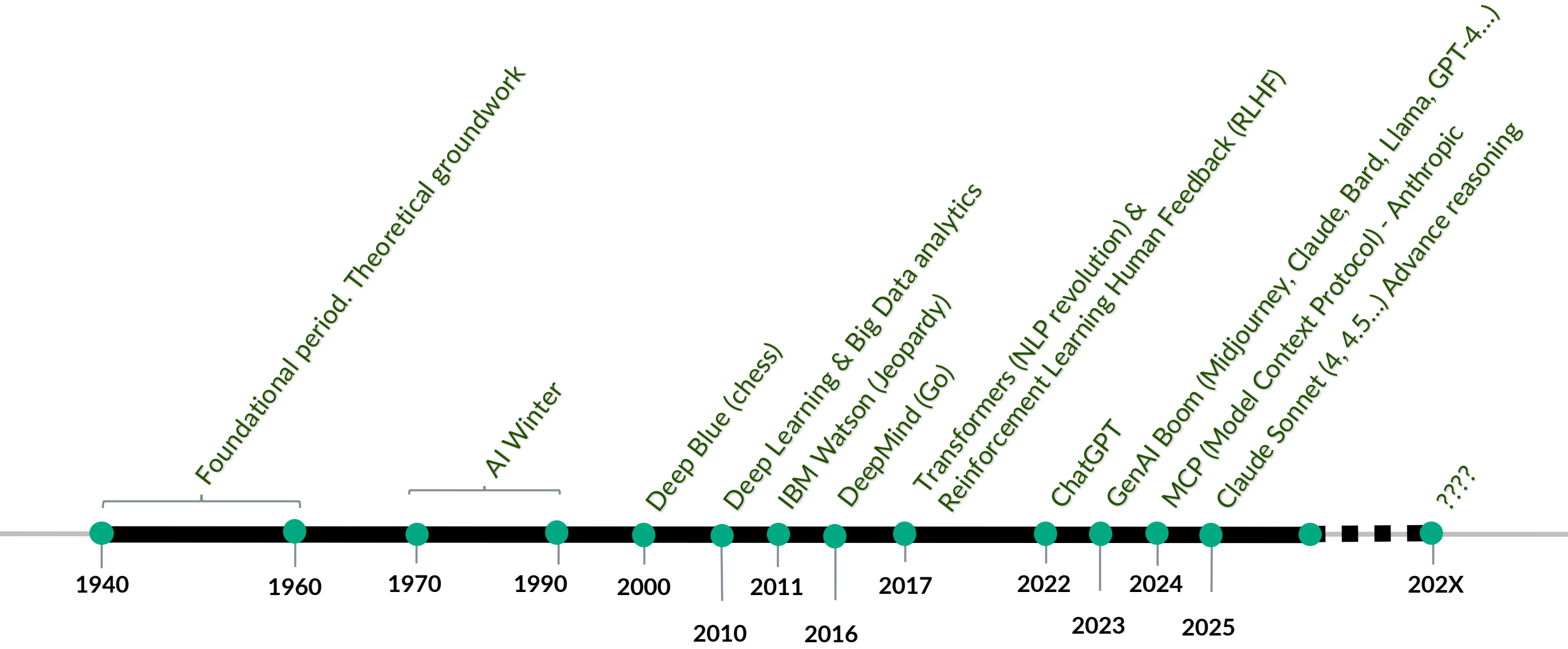
- system integration
- AI LLMs/MCP
- automating on junos
- routing director

Agenda

01	AI evolution
02	AI systems [Predictive, Generative, & Agentic AI]
	Predictive AI
	Generative AI
	Agentic AI
03	MCP (Model Context Protocol)
04	Junos MCP server
05	AI use cases for Networking
06	Demo

Timeline



The different types of AI systems

Predictive

- Analyzes historical data to make future predictions
- Example: Bandwidth utilization in your network

Generative

- Creates original content based on patterns in training data
- Example: Configuration or code generation

Agentic

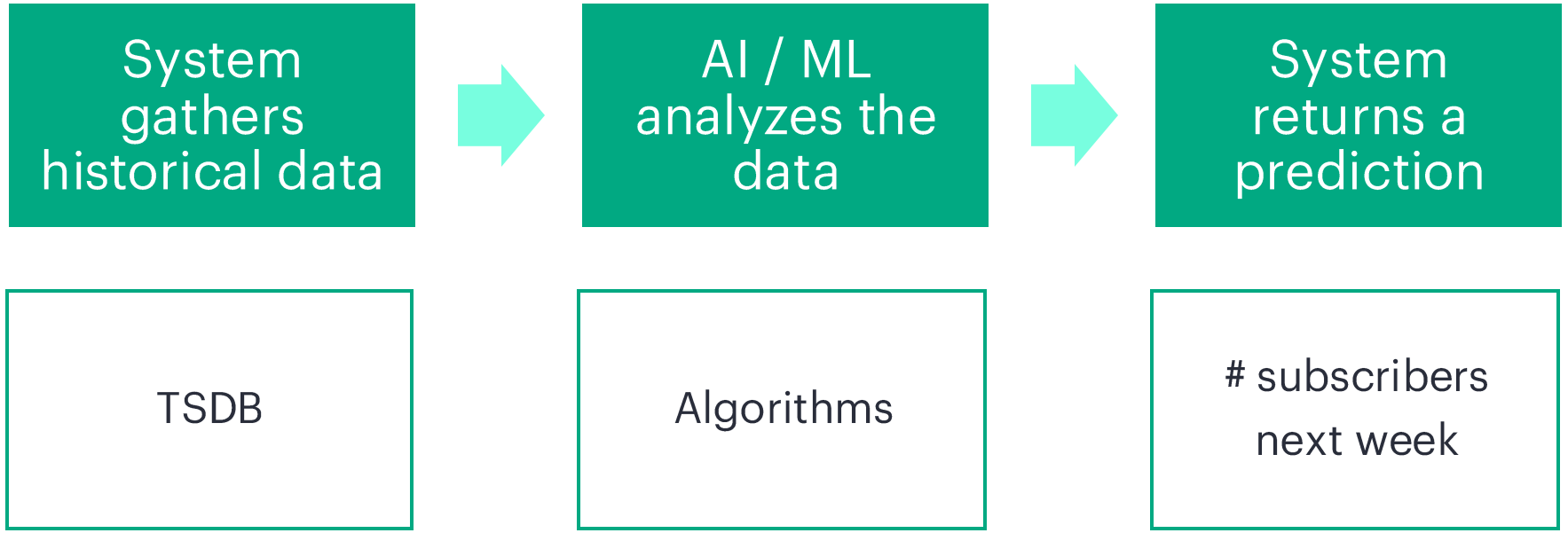
- Accomplish complex goals through planning and execution
- Example: Manage your end-to-end network

Prediction → Creation → Action

Predictive AI

Learns from the past and forecasts outcomes

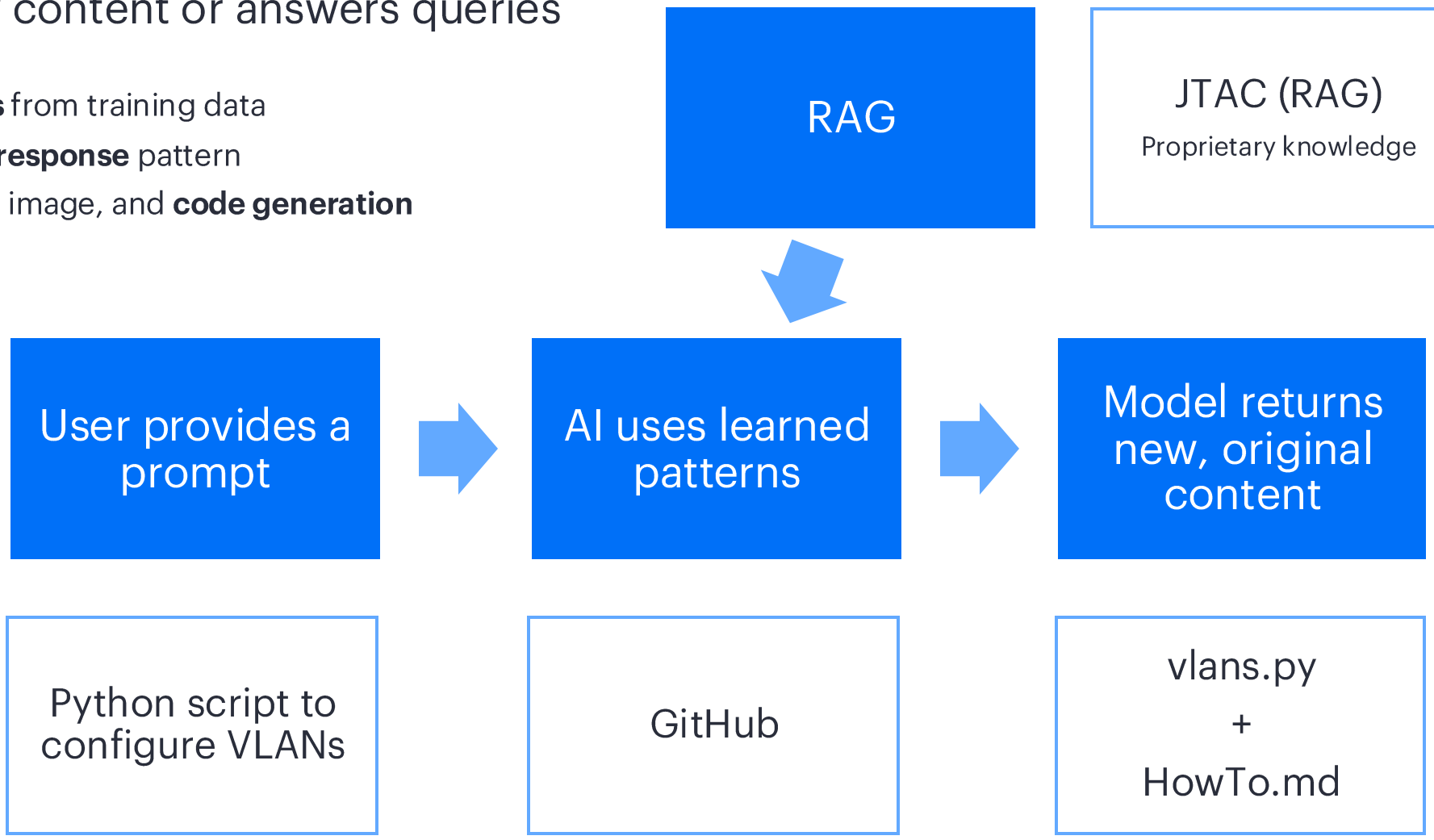
- **Analyses** historical and trending data, **identifies patterns/correlations**, and makes **data-driven predictions**
- Good for **risk assessment** and optimization
- Can use dynamic thresholds for **anomaly detection**
- **Examples:** Forecasting demand (retail or network bandwidth), predicting failures (automobiles or networking hardware), fraud detection



Generative AI

Creates new content or answers queries

- Learns **patterns** from training data
- Single **prompt-response** pattern
- **Examples**: text, image, and **code generation**



Generative AI

Creates new content or answers queries

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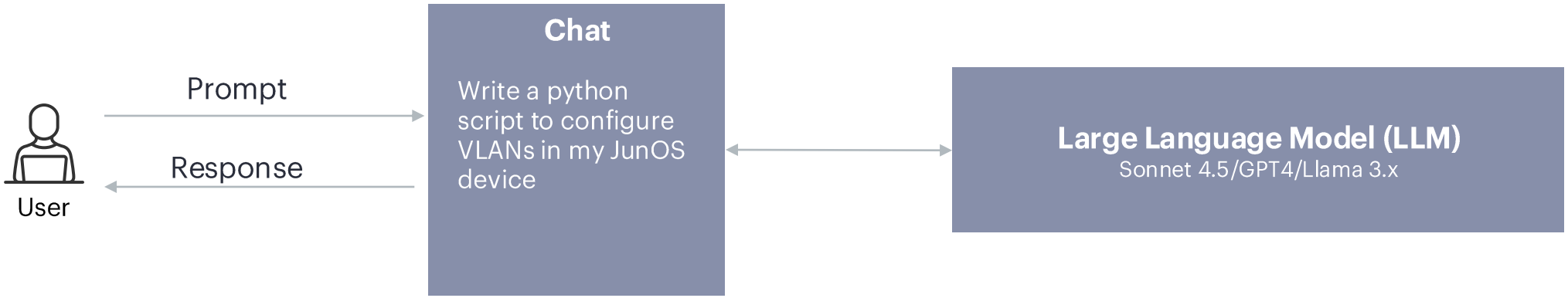
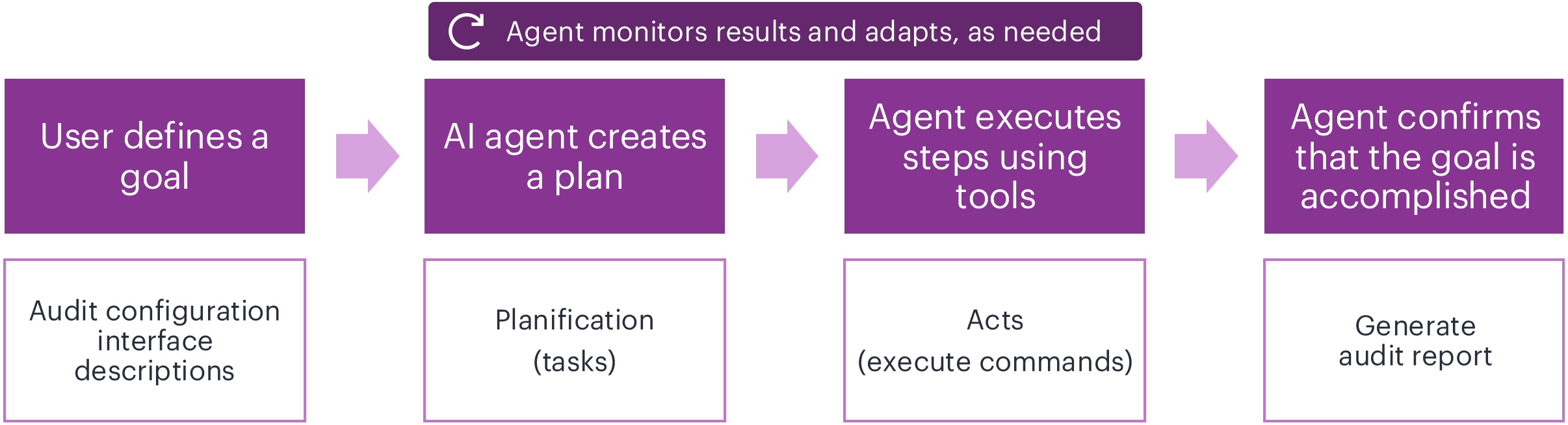
- **Examples**: text, image, audio or **code generation**



Agentic AI

Autonomous, adaptive, and goal-oriented AI that can execute multi-step tasks

- Identifies the **user's high-level intent** to create and execute on a plan
- Selects the **right tool and APIs** to gather data and take action
- **Maintains context** across multiple interactions; learns from experience and iterations to improve over time
- **Examples:** Research features on products, develop code for network automation, create health check reports



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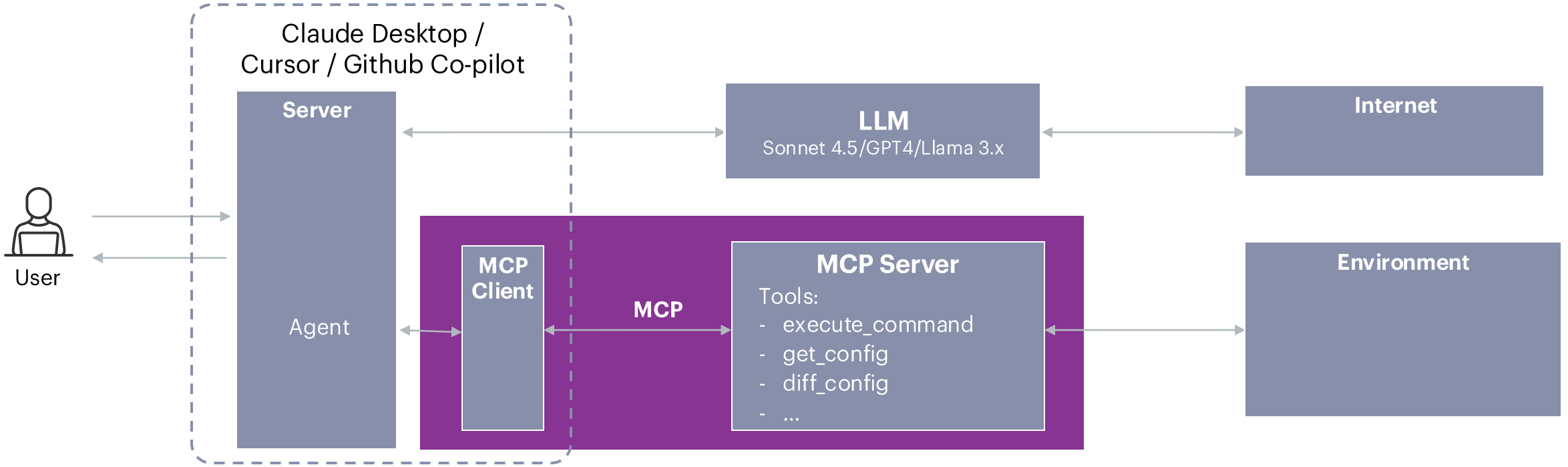
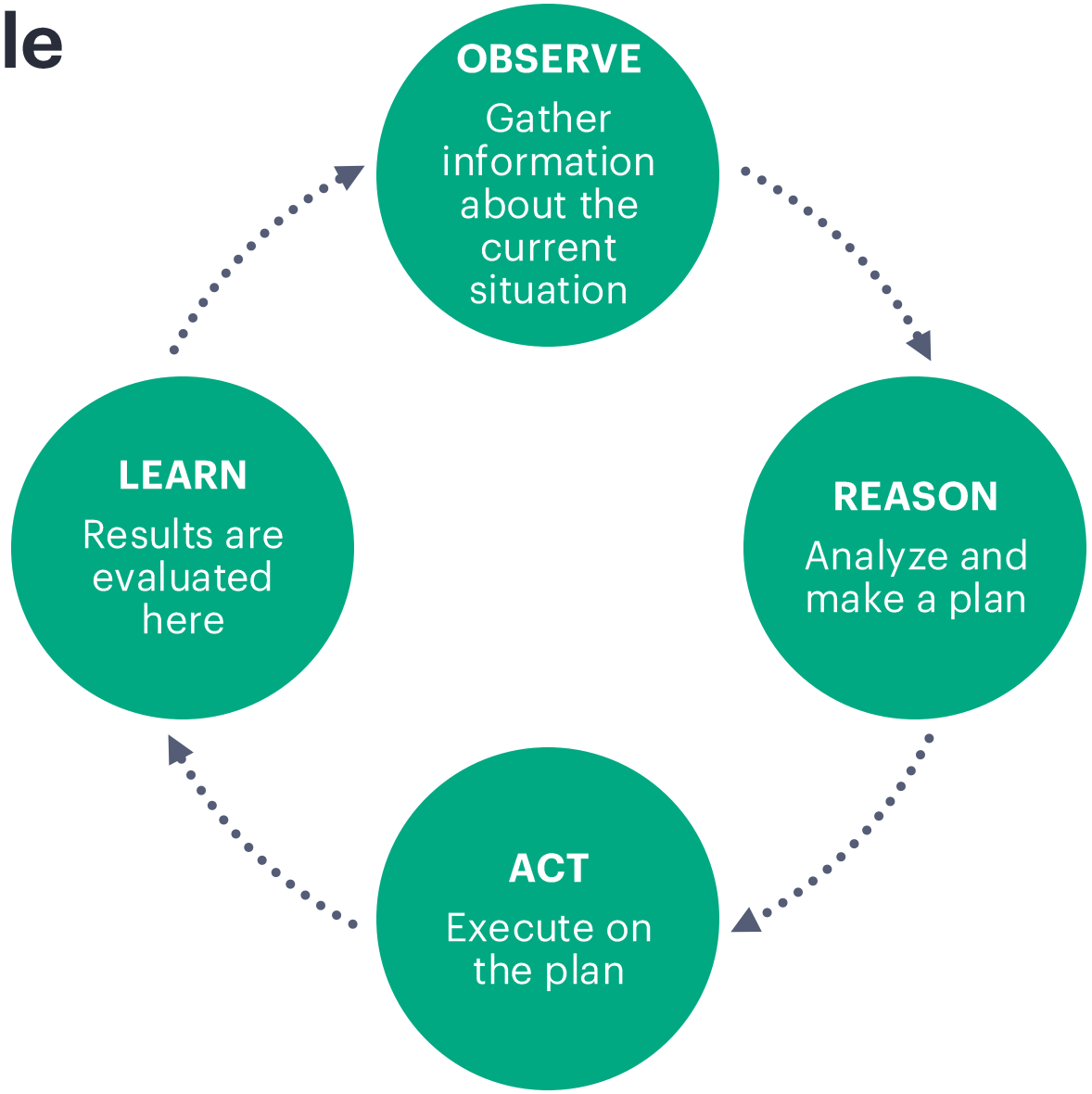


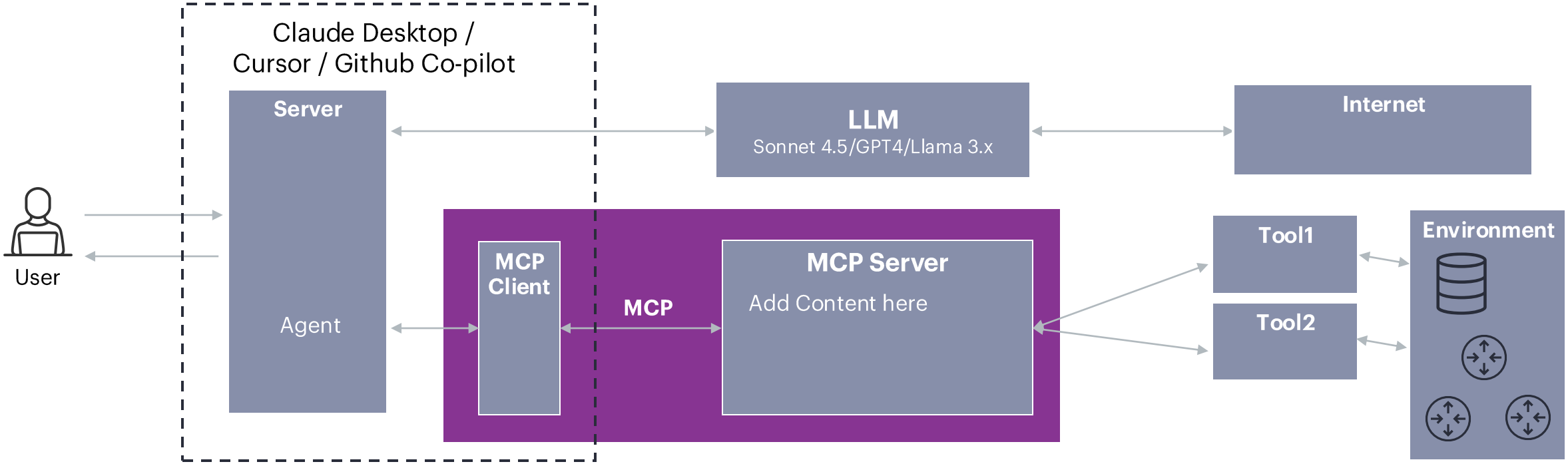
Agentic AI's continuous cycle



Model Context Protocol (MCP)

Adapter that lets AI connect to the user's world to accomplish tasks

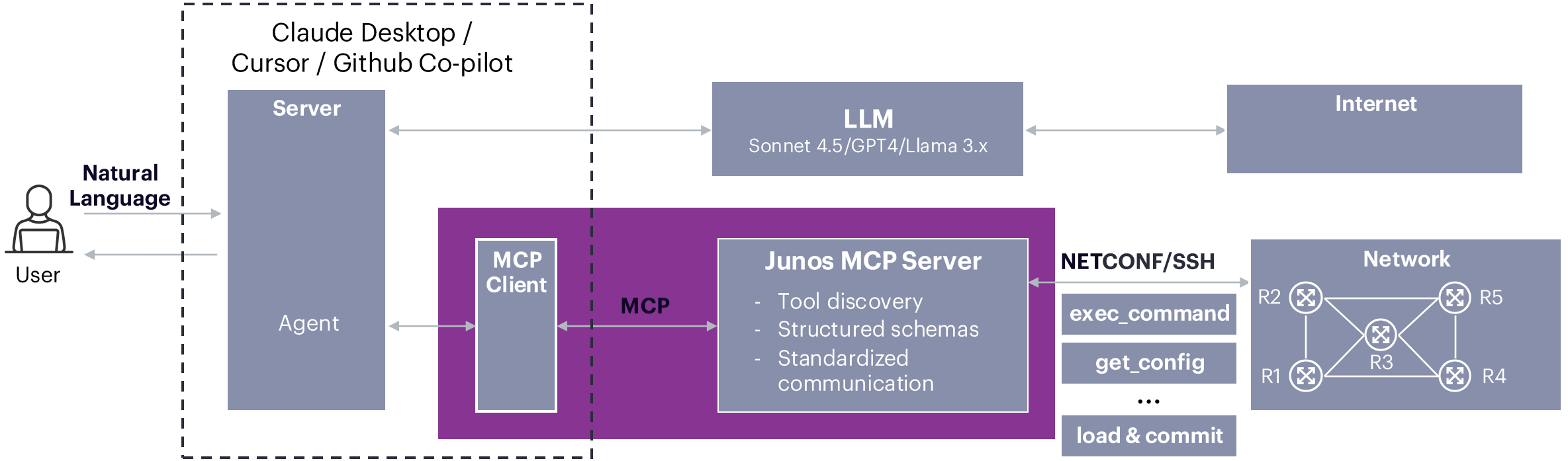
- MCP is a standardized protocol that allows AI models to connect and **interact** with different environments
- Removing the need for custom code speeds up time to market and makes Agentic AI practical
- **Examples:** Search knowledge bases, pull from databases, utilize APIs, gather analytics, run scripts, interact with code repositories, connect to workflow engines…



Junos MCP server

MCP server for physical, virtual, and containerized platforms that run Junos

- **Provides tools, schema, and standards** for monitoring, configuration management, and more
- Hosted on Juniper's Github Organizational Account: https://github.com/**Juniper/junos-mcp-server**
- **Open-source**, Apache license 2.0



Junos MCP Server: Tools

Device Management

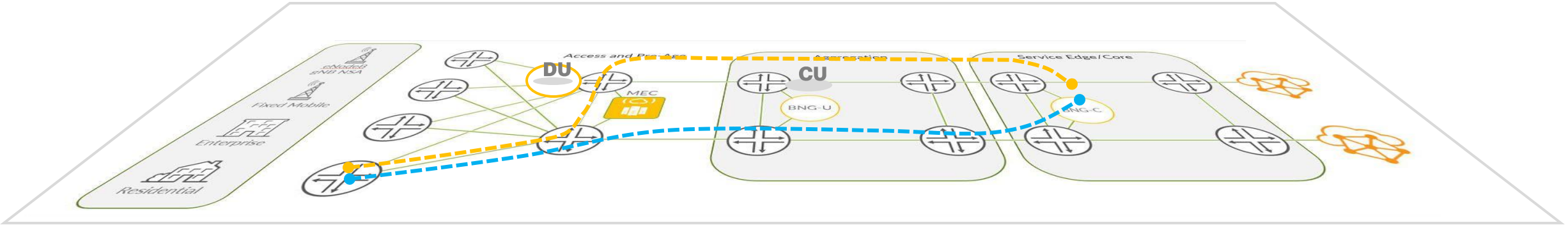
- add_device
- get_router_list

Operational

- gather_device_facts
- execute_junos_cmd

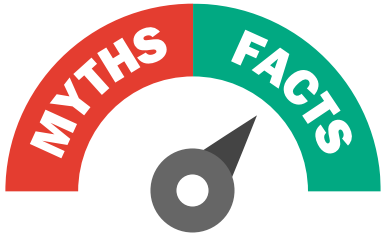
Configuration

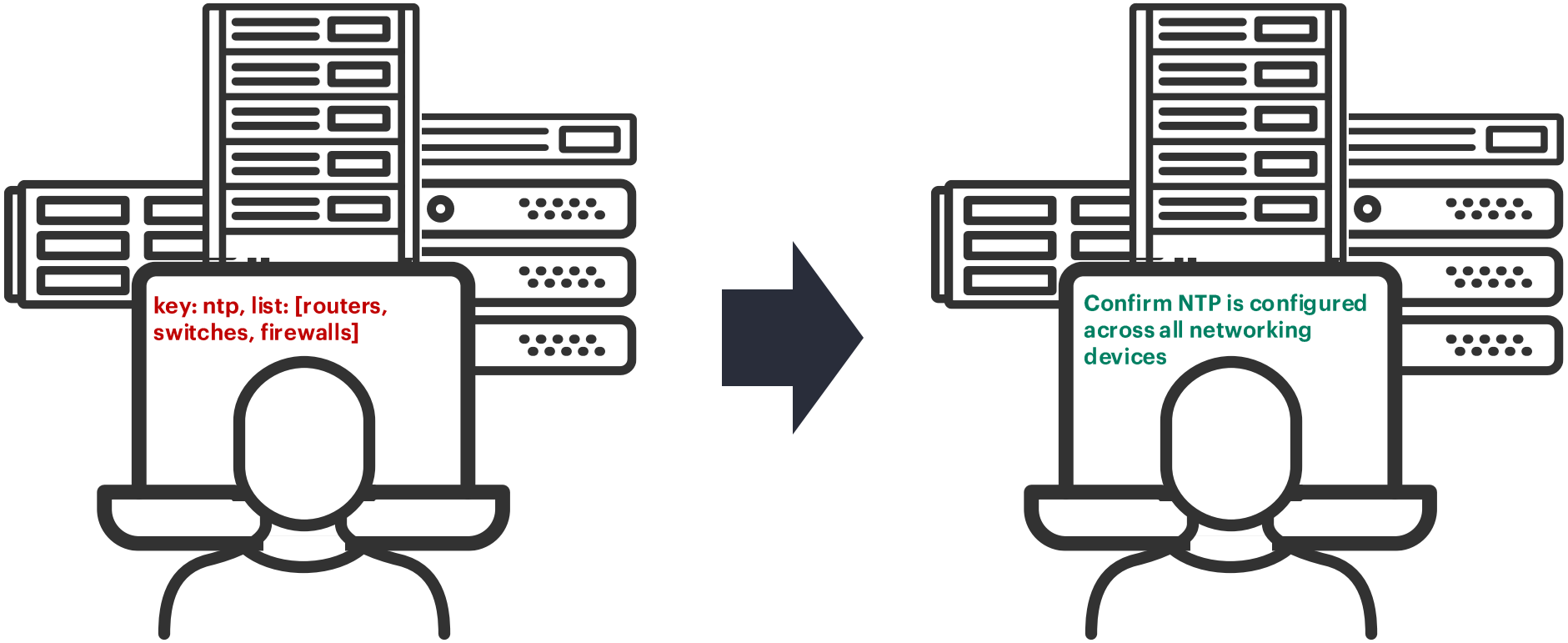
- get_junos_config
- junos_config_diff
- **load_and_commit**
- **render_and_apply_j2**



Natural Language

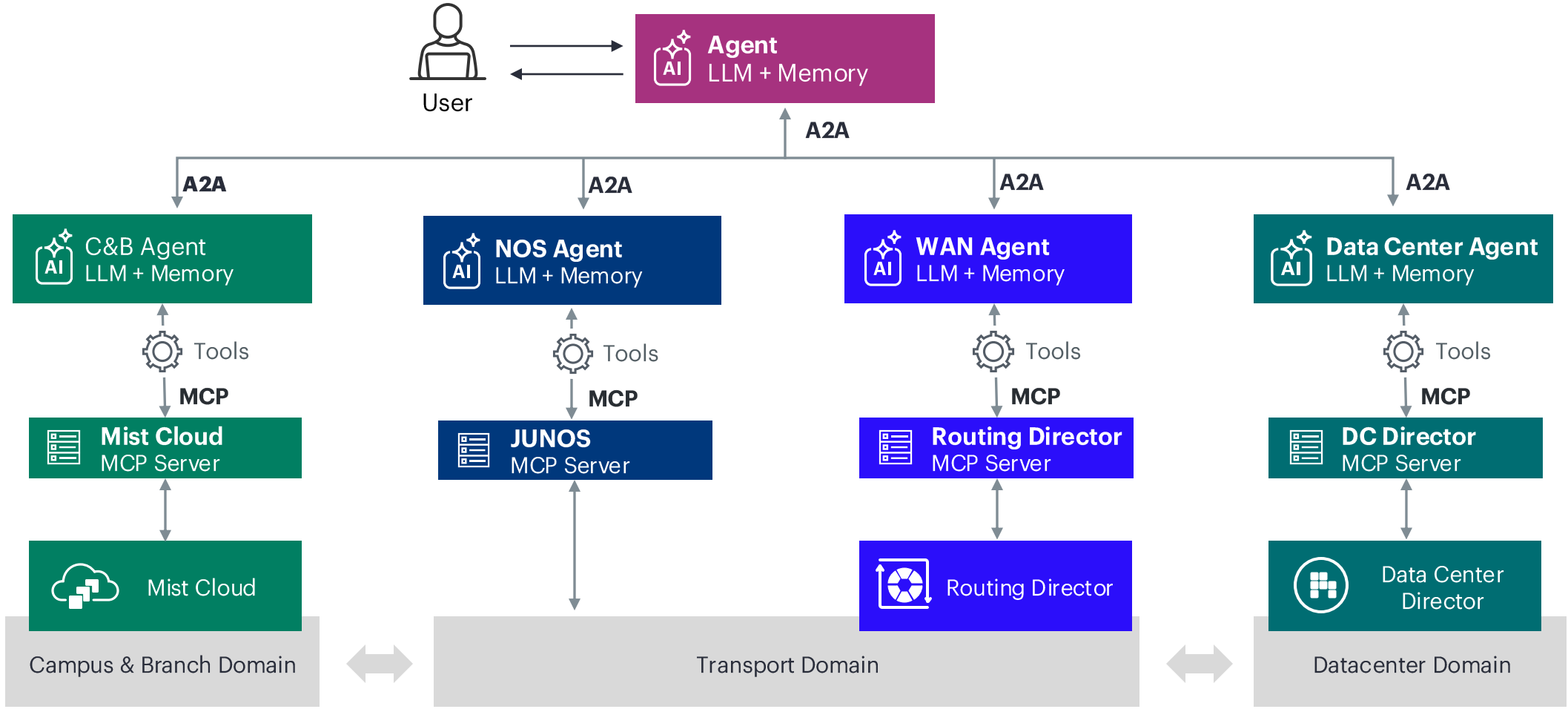
Removes the need to learn how to code or anything do anything code-like





End-to-end Juniper Architecture with A2A and MCP

Agent-to-Agent is an open standard that enables different AI agents to communicate and work together directly



Agentic AI use-cases for the network

SHORT TERM	MEDIUM TERM	LONG TERM
Low risk, read only	**Moderate risk**	**High risk, multi-domain**
• Automated document generation • Network assessment and compliance • Troubleshooting & RCA • Monitoring • Planning (analyze trends) • Configuration management	• MOP generation • Digital twin creation and simulation • Network provisioning and configuration • SW upgrades • Automated network testing and validation • Multivendor integration	• Multi-domain orchestration • Network cost optimization • Predictive maintenance • Network Design • **Self Driving Network**

Demo

Thank you

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