PREVIEW DECK – More to come AppWorld 2025
Questions? businessdevelopment@f5.com

AI / ML Reference Architecture Overview

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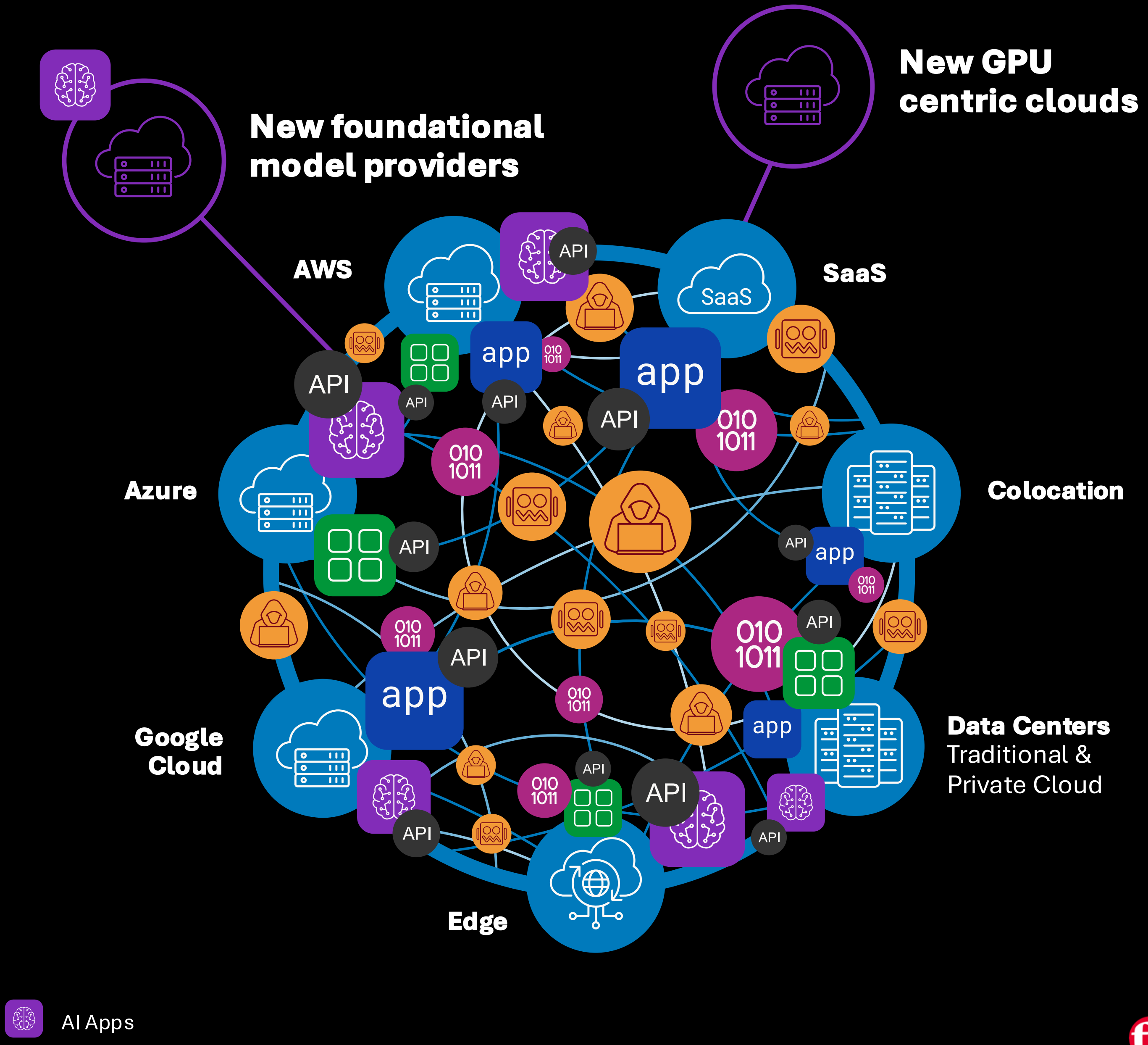
Generative AI threatens to make this scary complexity even more acute

1. Generative AI app experiences will be **multi-modal**

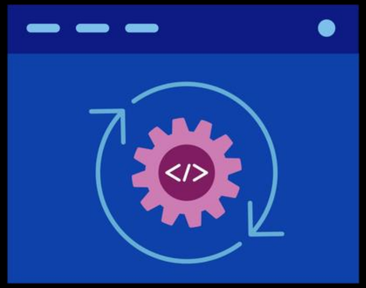
2. Generative AI apps will be highly **decomposed**

3. **“Data gravity”** will significantly influence placement of apps and models

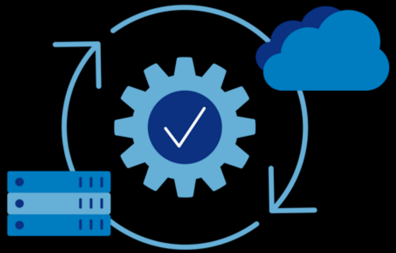
4. Generative AI apps will be especially dependent on **APIs**



What are your **objectives?**



Are you building an **AI Product** or delivering **Operational Efficiency**?



Do you want to **build, buy**, or **out-source** the solution?

How mature is your AI practice? Are you **exploring, integrating**, or **transforming**?

Four Deployment Models

SaaS AI

The AI solution is provided as a **fully managed service** by a third-party provider. Customers can access and use the AI capabilities over the internet without worrying about the underlying infrastructure, maintenance, or updates, making it a **convenient and scalable option.**

Cloud-Hosted AI

The AI solution runs on cloud infrastructure provided by cloud service providers such as AWS, Google Cloud, or Azure. It offers **flexibility, scalability, and ease of integration** with other cloud services, while the **customer maintains control** over the configuration and management of their AI systems.

Self-Hosted AI

The AI solution is **deployed on the customer's own infrastructure**, such as on-premises servers or private data centers. This provides maximum control and customization options but **requires significant resources** for setup, maintenance, and management of the hardware and software components.

Edge-Hosted AI

The AI solution in an edge environment, **outside traditional cloud or data center infrastructure.** An example is a machine learning solution operating on a device like a kiosk in a retail storefront. This model **reduces latency, enhances privacy, and ensures real-time processing** by bringing the computation closer to the data source or end-user.

AI Ecosystem Considerations

OWASP LLM Top Ten

Educate developers, designers, architects, managers, and organizations about the potential security risks when deploying and managing LLM and Generative AI applications.

F5 Application Delivery Top Ten

The top unforeseen challenges that arise in today's hybrid multicloud application delivery model cause by too many point solutions, a lack of interoperability, multiple management consoles and manual complexity.

Design Requirements

Define the essential capabilities, technologies, and principles needed to address technical challenges and ensure effective solution implementation.

Seven AI Building Blocks

In this deck we will be showing two of the seven building blocks.

For access to the full deck, please reach out to your F5 account team or email **businessdevelopment@f5.com**

Web Apps & APIs

Inference

Retrieval-Augmented Generation

Focus Area

Agentic External Services Integration

Hybrid Multicloud & Data Ingest

RAG Corpus Management

Focus Area

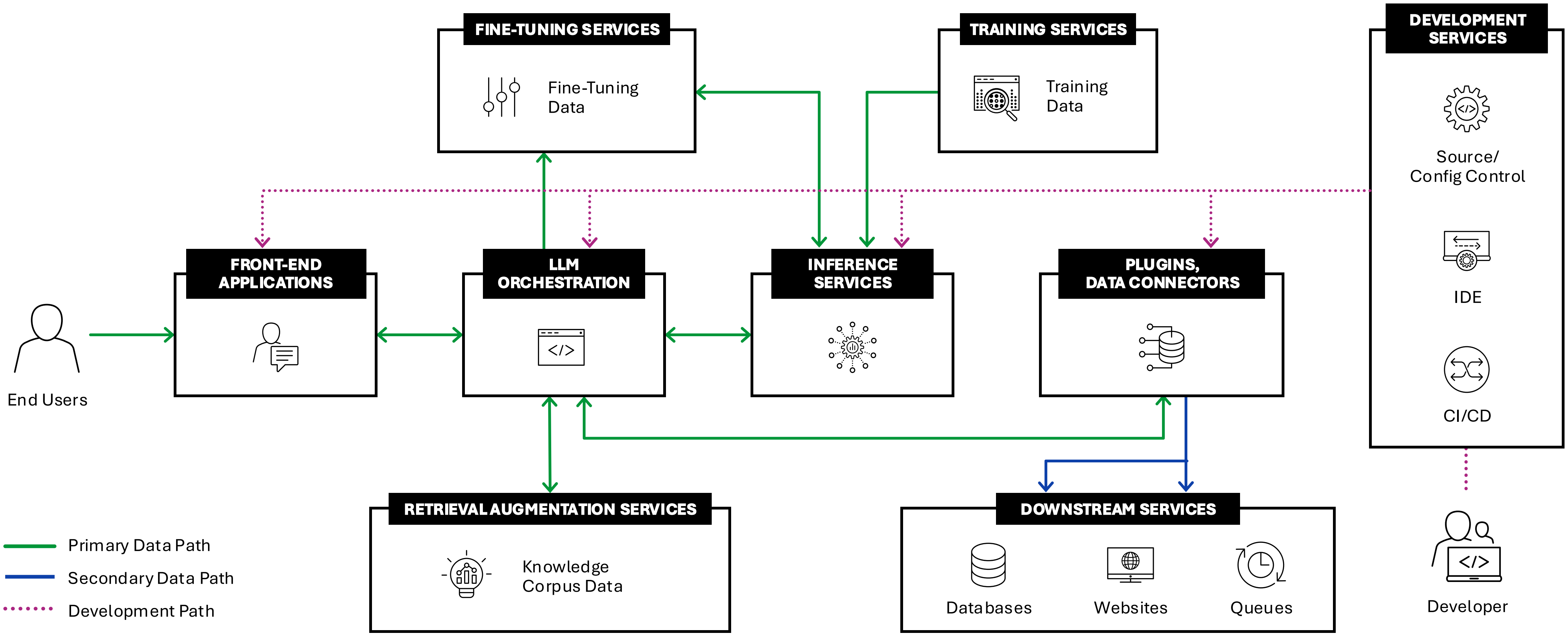
Fine-Tuning

Training

App Development

Development

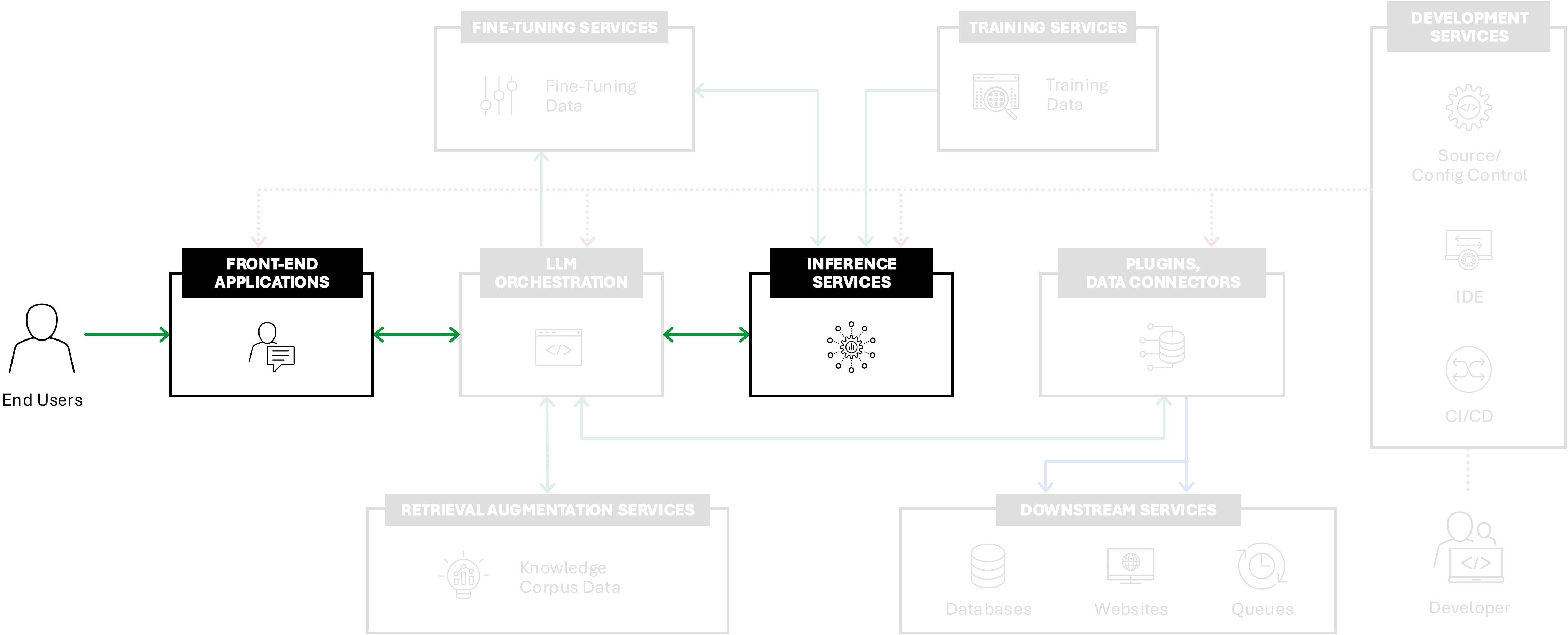
AI Component Architecture



Seven AI Building Blocks

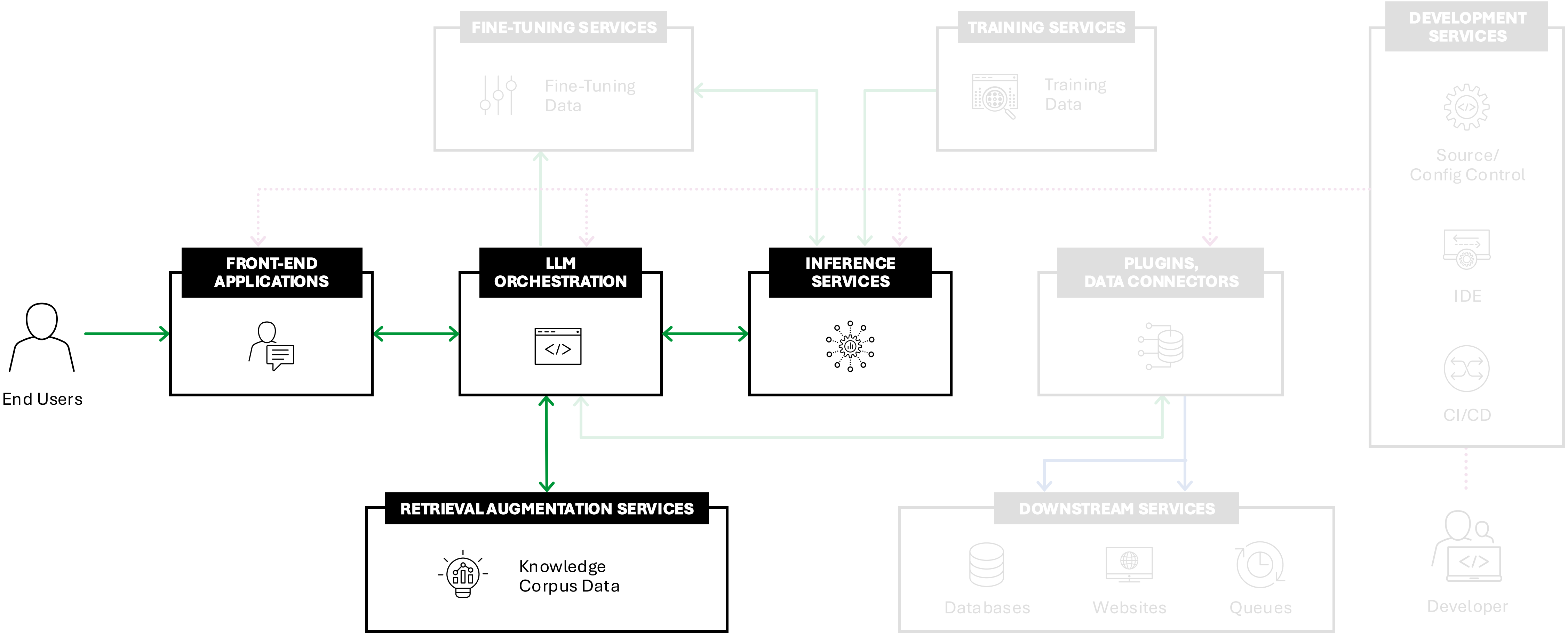
Inference

This building block involves the process of making predictions or generating outputs based on input data using pre-trained AI models. It's the core function where the AI system applies its learned knowledge to new, unseen data.



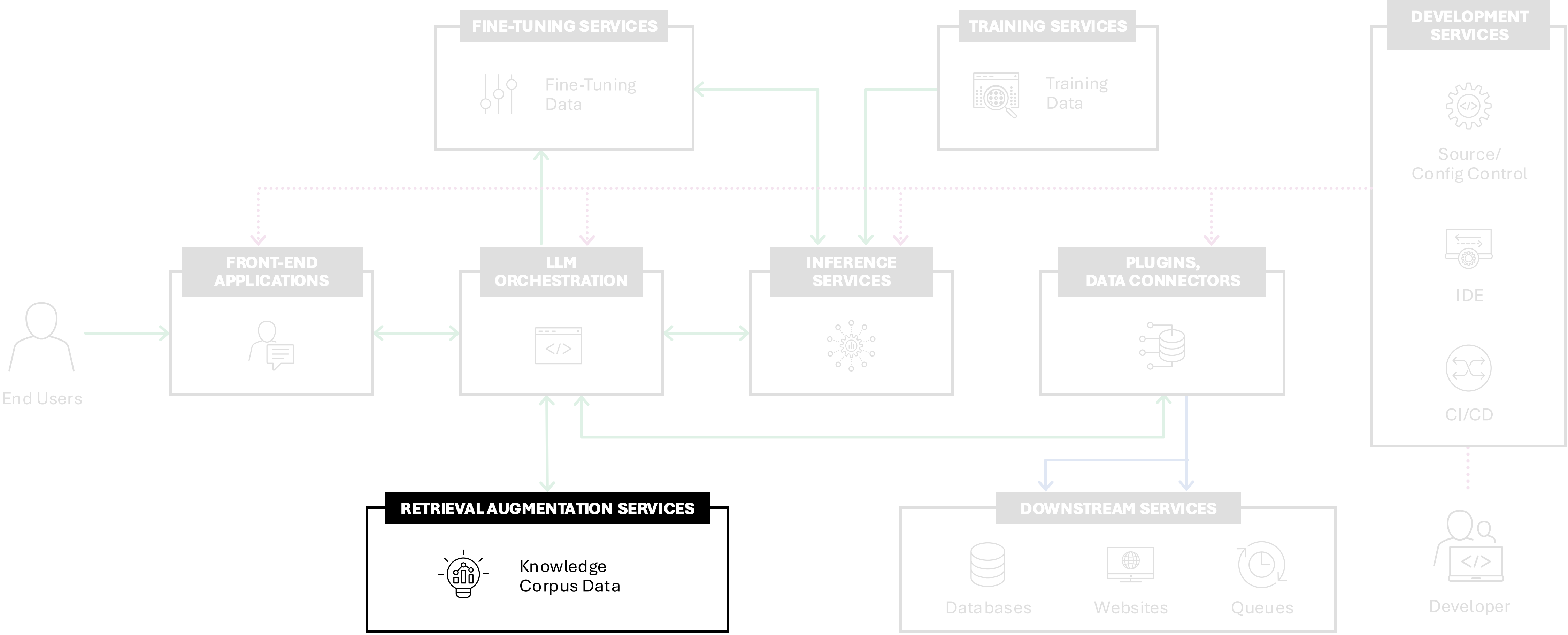
Inference with Retrieval Augmented Generation (RAG)

RAG combines the capabilities of retrieval and generation models to produce more informed and accurate responses. It retrieves relevant information from a predefined corpus and uses it to enhance the generation process, resulting in more contextually appropriate outputs.



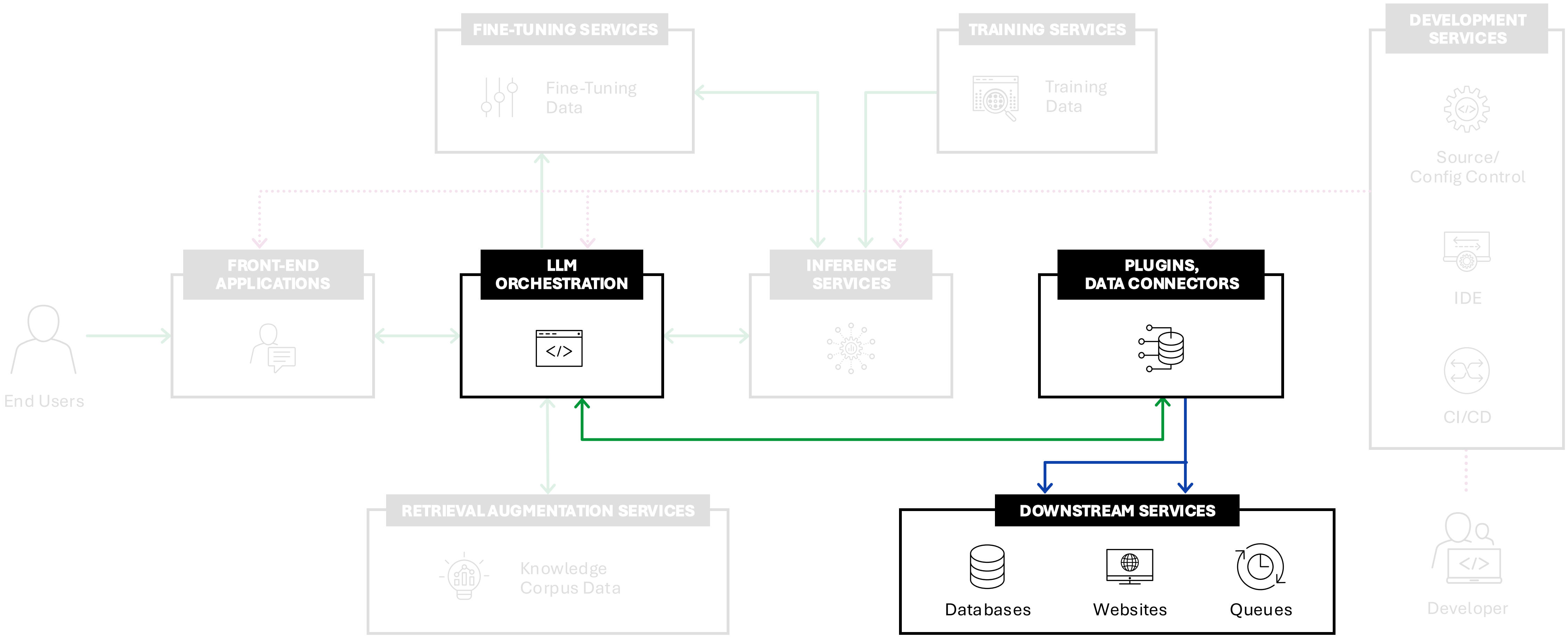
RAG Corpus Management

This focuses on maintaining and curating the database or corpus of information that the AI system uses for Retrieval-Augmented Generation. It includes updating, organizing, and ensuring the quality of the data to support accurate and relevant retrieval.



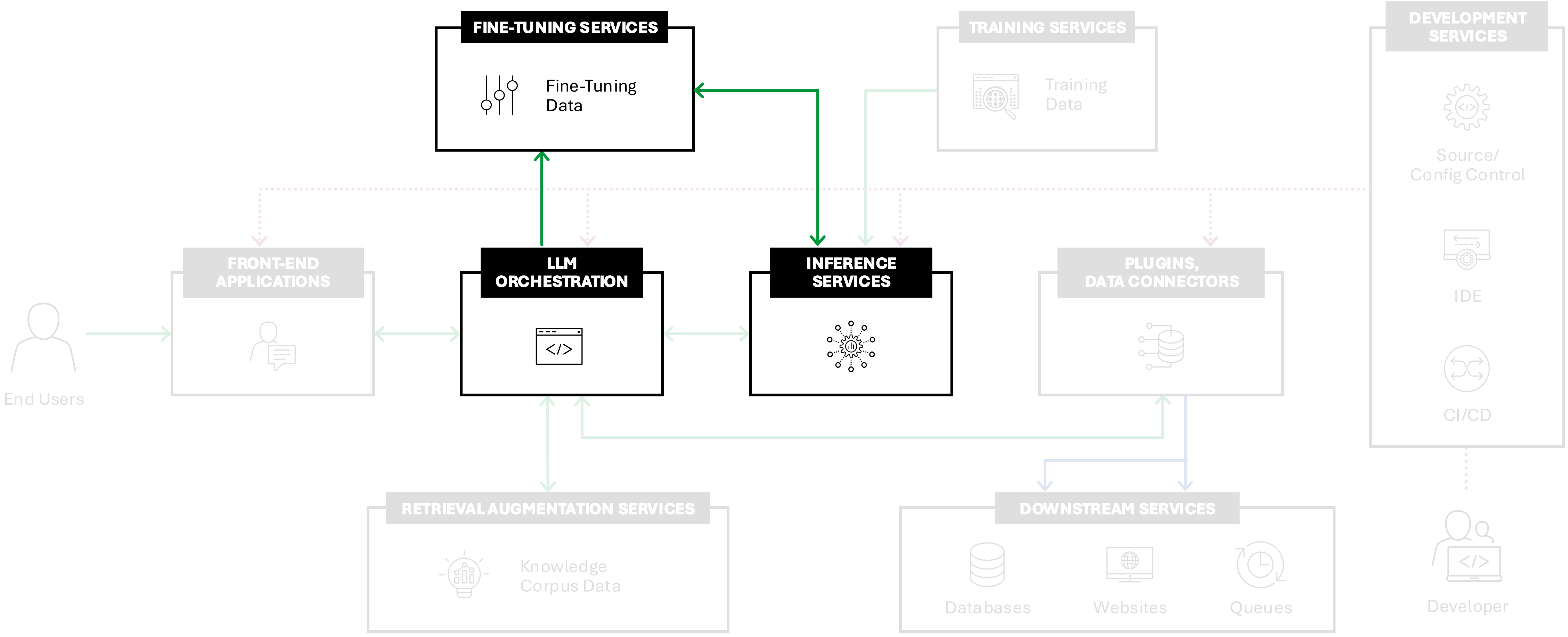
External Services Integration

This involves connecting the AI system with external services and APIs, enabling it to interact, retrieve data, or perform actions based on user requests or model inference. It allows the AI to leverage external tools and databases to extend its functionality and autonomously make decisions or take actions as necessary.



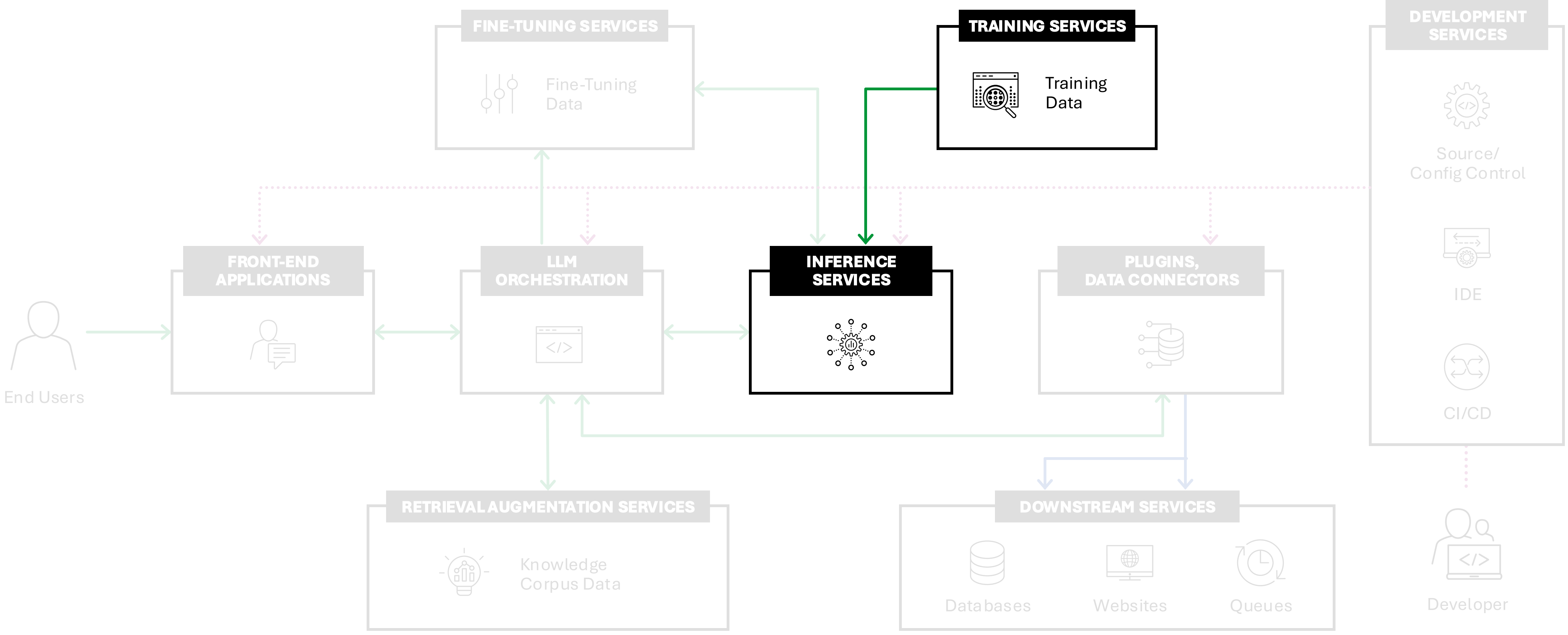
Fine-Tuning

This process involves adjusting a pre-trained AI model on specific datasets to improve its performance for a particular task or domain. Fine-tuning helps tailor the model's capabilities to better meet the unique needs of specific applications or industries.



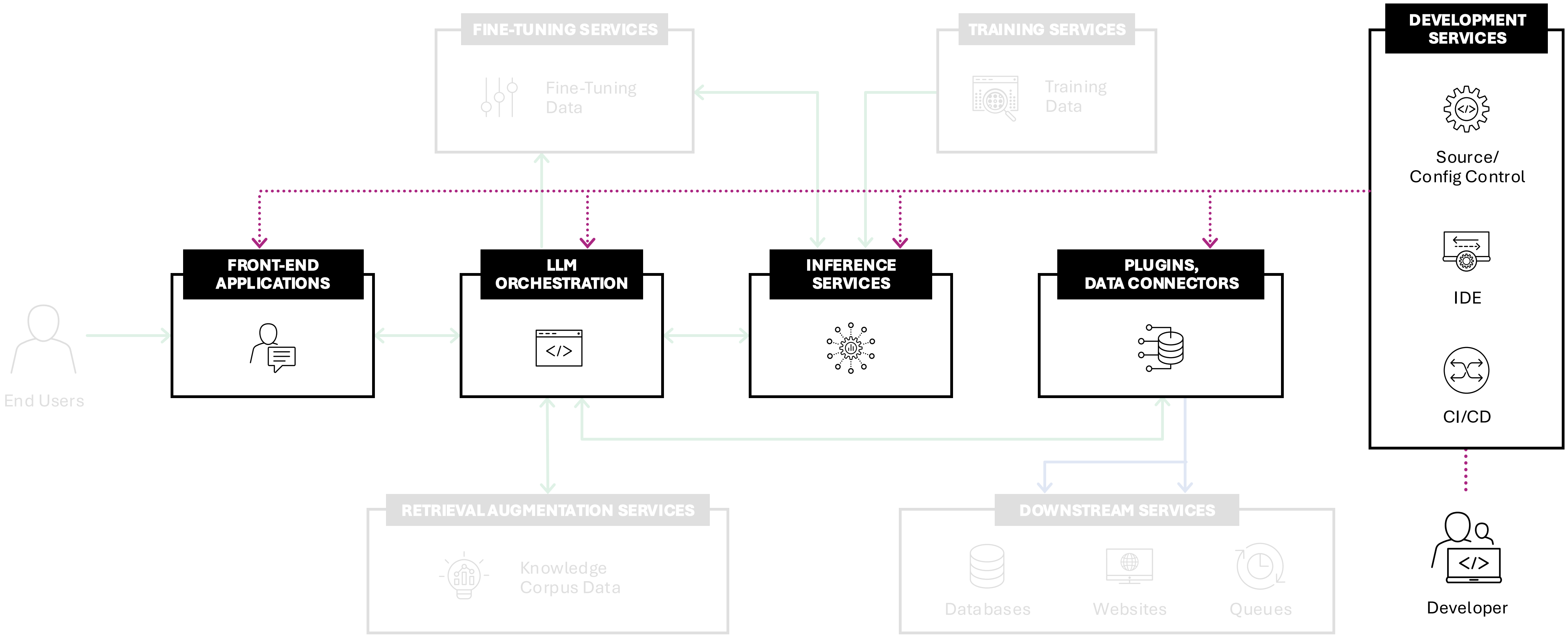
Training

This is the process of teaching an AI model by exposing it to large amounts of data and allowing it to learn patterns and features. Training involves multiple iterations and optimizations to develop a model that can generalize well to new, unseen data.



Development

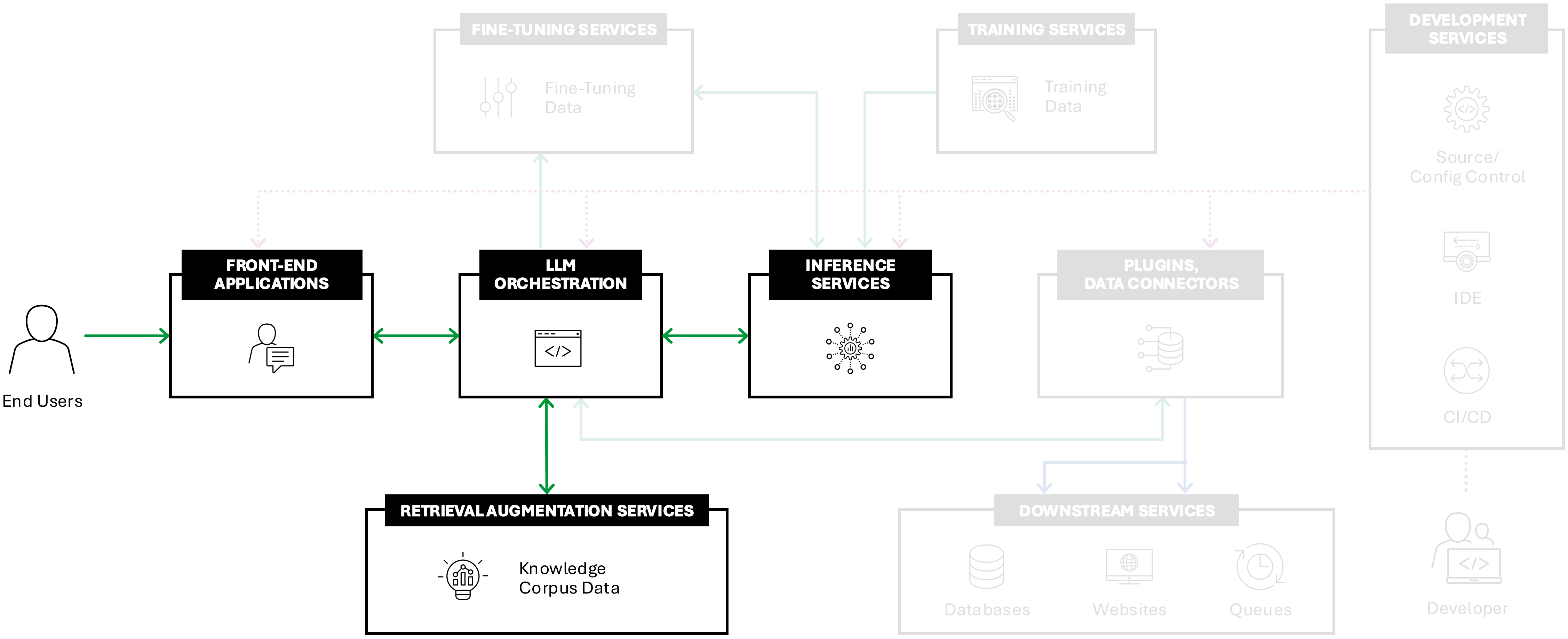
This encompasses the overall creation, testing, and deployment of AI solutions. It involves coding, integrating various AI components, and ensuring that the system is robust, scalable, and ready for production use.



Inference with Retrieval Augmented-Generation (RAG)

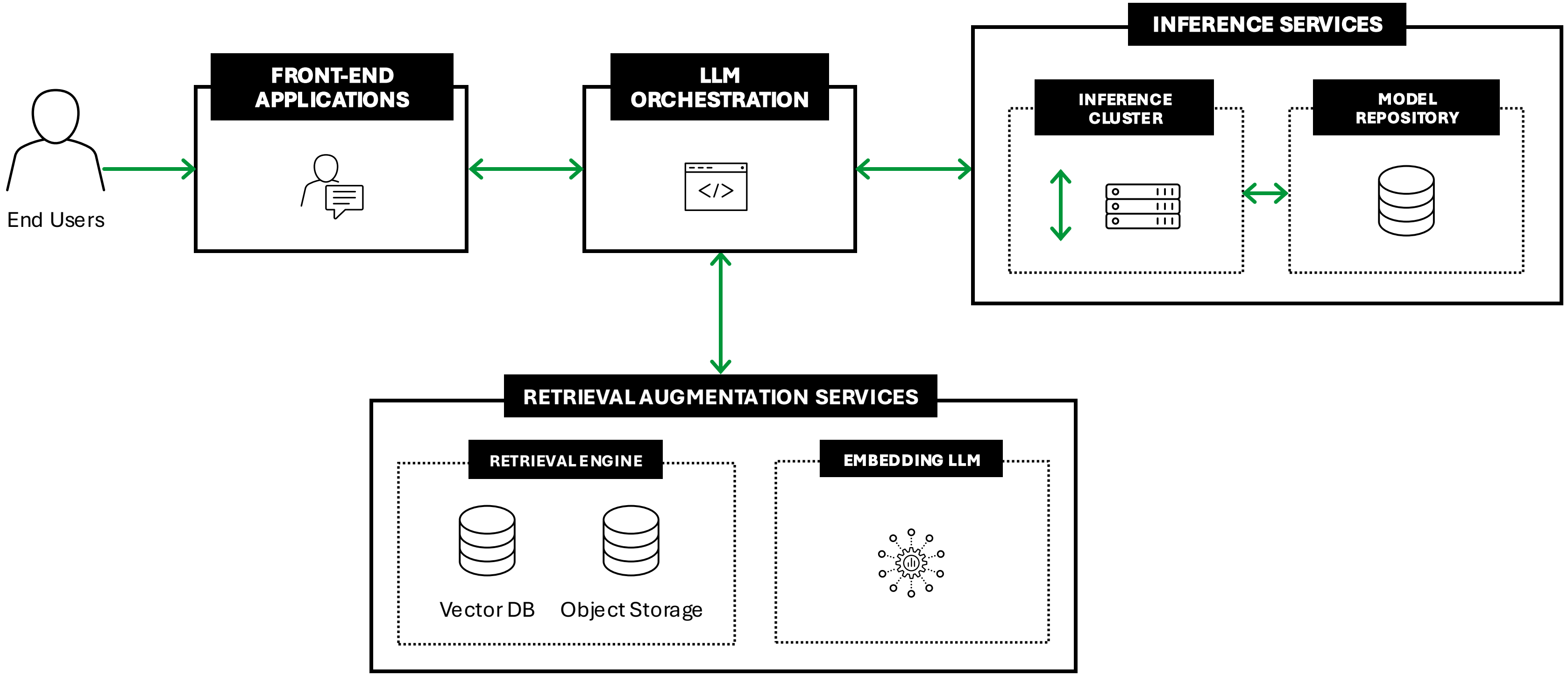
INFERENCE WITH RAG

Featured AI Building Block



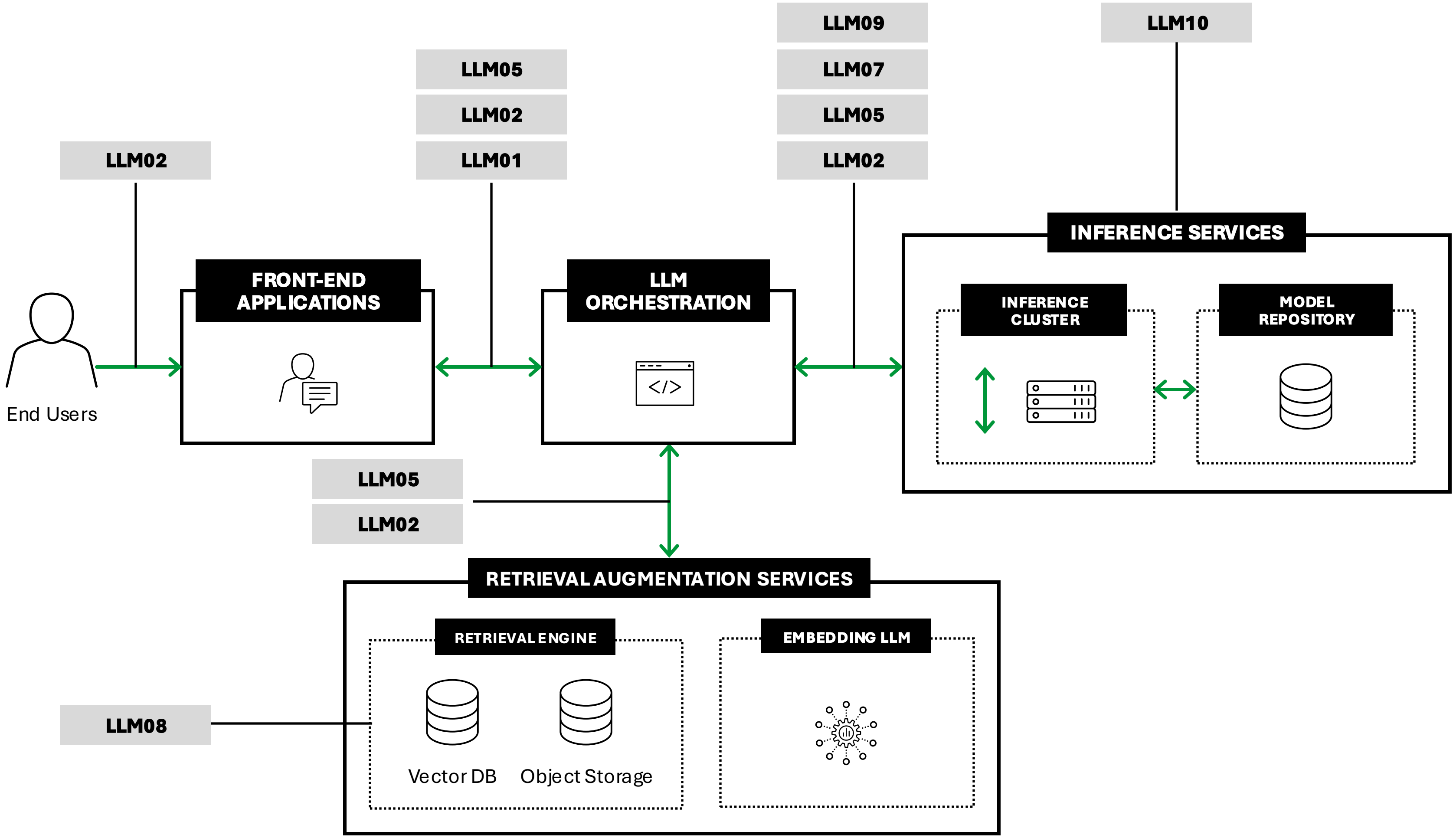
INFERENCE WITH RAG

Detailed Component Architecture



INFERENCE WITH RAG

OWASP LLM Top Ten Insights

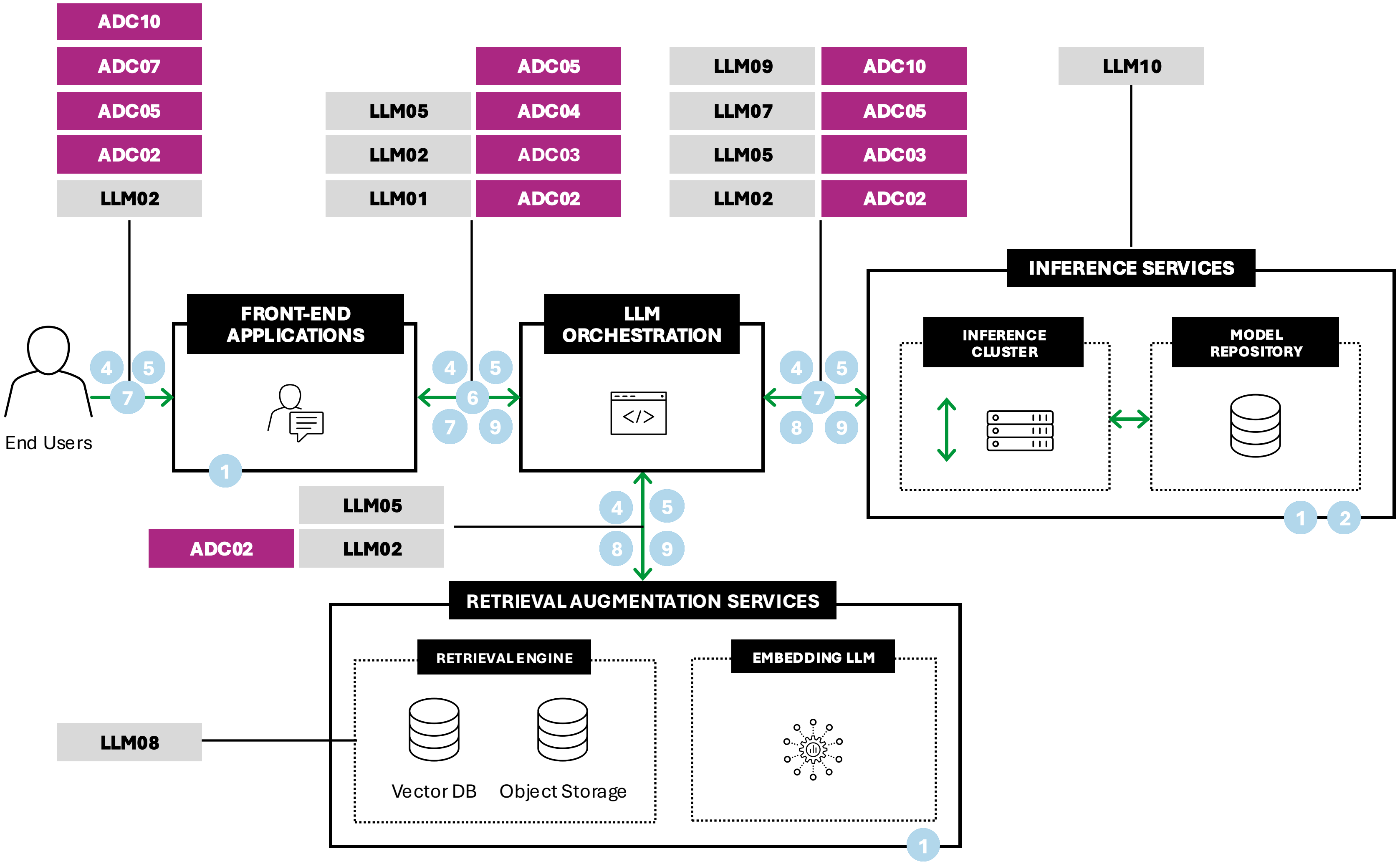


OWASP LLM Top Ten

LLM01	Prompt Injection
LLM02	Sensitive Information Disclosure
LLM03	Supply Chain
LLM04	Data and Model Poisoning
LLM05	Improper Output Handling
LLM06	Excessive Agency
LLM07	System Prompt Leakage
LLM08	Vector and Embedding Weakness
LLM09	Misinformation
LLM10	Unbounded consumption

INFERENCE WITH RAG

F5 ADC Top Ten Insights



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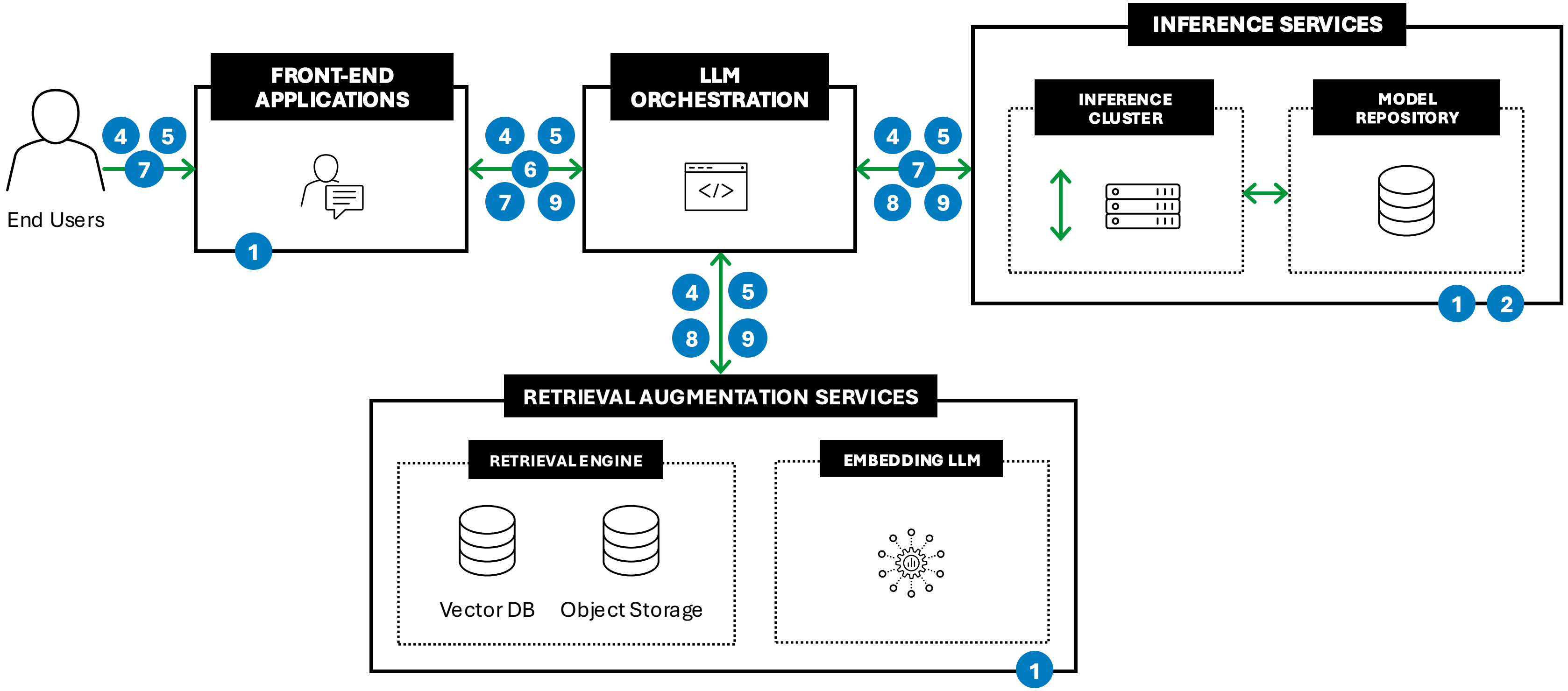
F5 Application Delivery Top Ten

ADC01	Weak DNS Practices
ADC02	Lack of Fault Tolerance & Resilience
ADC03	Incomplete Observability
ADC04	Insufficient Traffic Controls
ADC05	Unoptimized Traffic Steering
ADC06	Inability to Handle Latency
ADC07	Incompatible Delivery Policies
ADC08	Lack of Security & Regulatory Compliance
ADC09	Bespoke Application Requirements
ADC10	Poor Resource Utilization

INFERENCE WITH RAG

Design Requirements



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2 AI Compute Resources

3 Centralized Networking Management

4 Distributed App & API Security Services

5 Centralized Security Policy Management

6 AI/ML Data Loss Prevention

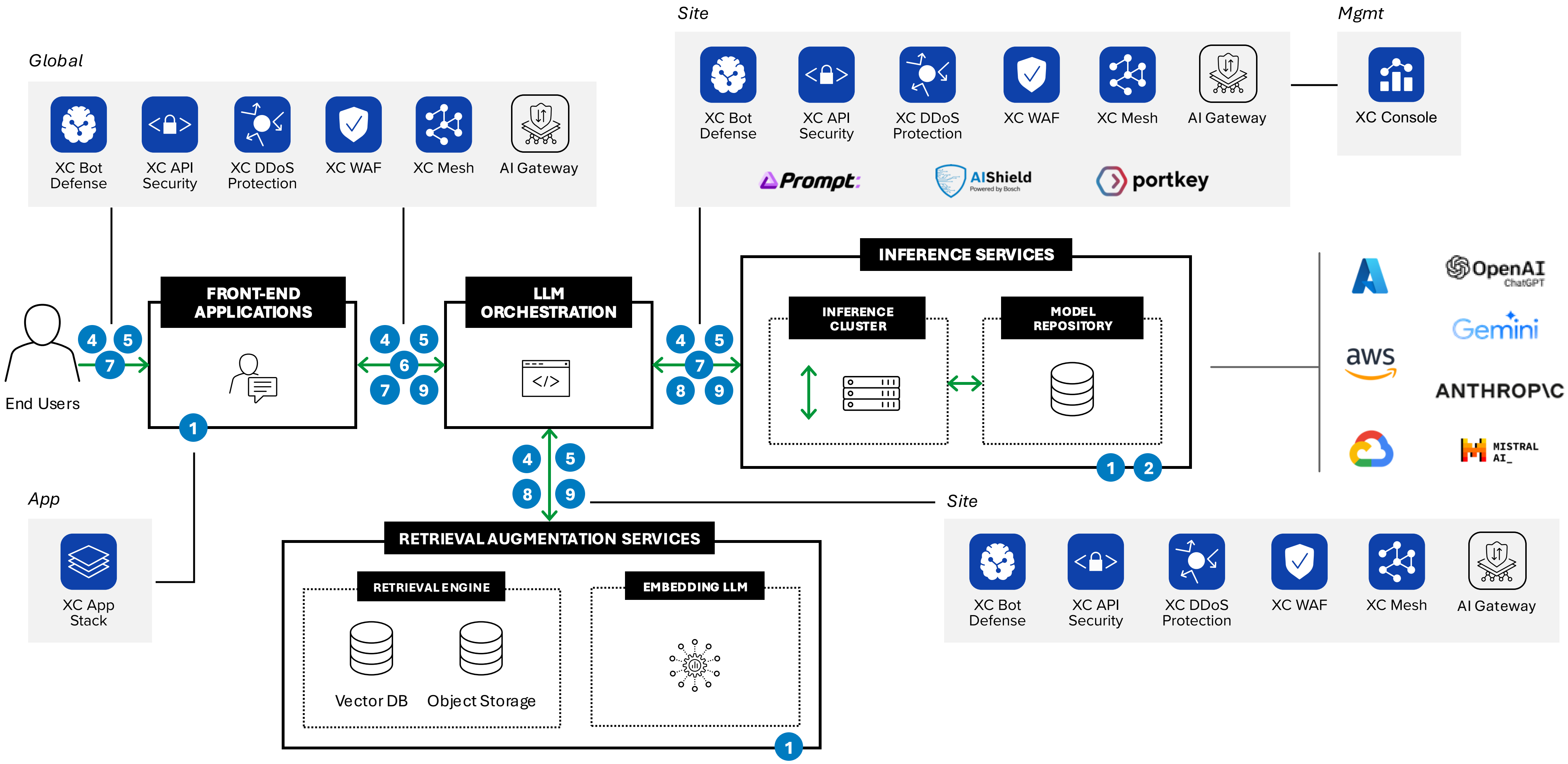
7 AI/ML Security

8 AI/ML Observability

9 Inter-Cluster Traffic Management

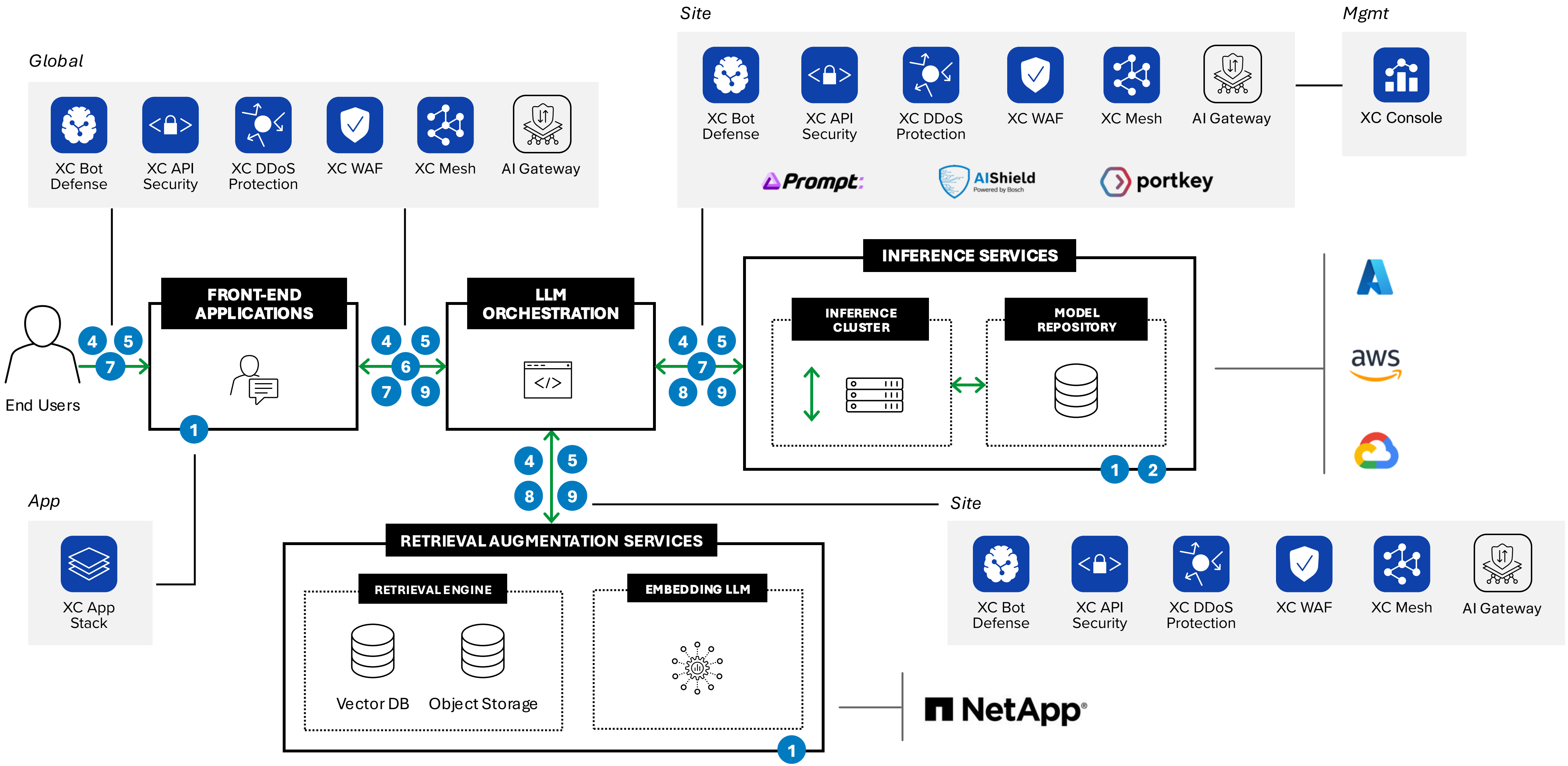
INFERENCE WITH RAG

SaaS Deployment



INFERENCE WITH RAG

Cloud-Hosted Deployment



Global

XC Bot Defense

XC API Security

XC DDoS Protection

XC WAF

XC Mesh

AI Gateway

Site

XC Bot Defense

XC API Security

XC DDoS Protection

XC WAF

XC Mesh

AI Gateway

Prompt:

AIShield Powered by Bosch

portkey

Mgmt

XC Console

End Users

FRONT-END APPLICATIONS

LLM ORCHESTRATION

INFERENCE SERVICES

INFERENCE CLUSTER

MODEL REPOSITORY

aws

App

XC App Stack

RETRIEVAL AUGMENTATION SERVICES

RETRIEVAL ENGINE

Vector DB

Object Storage

EMBEDDING LLM

Site

XC Bot Defense

XC API Security

XC DDoS Protection

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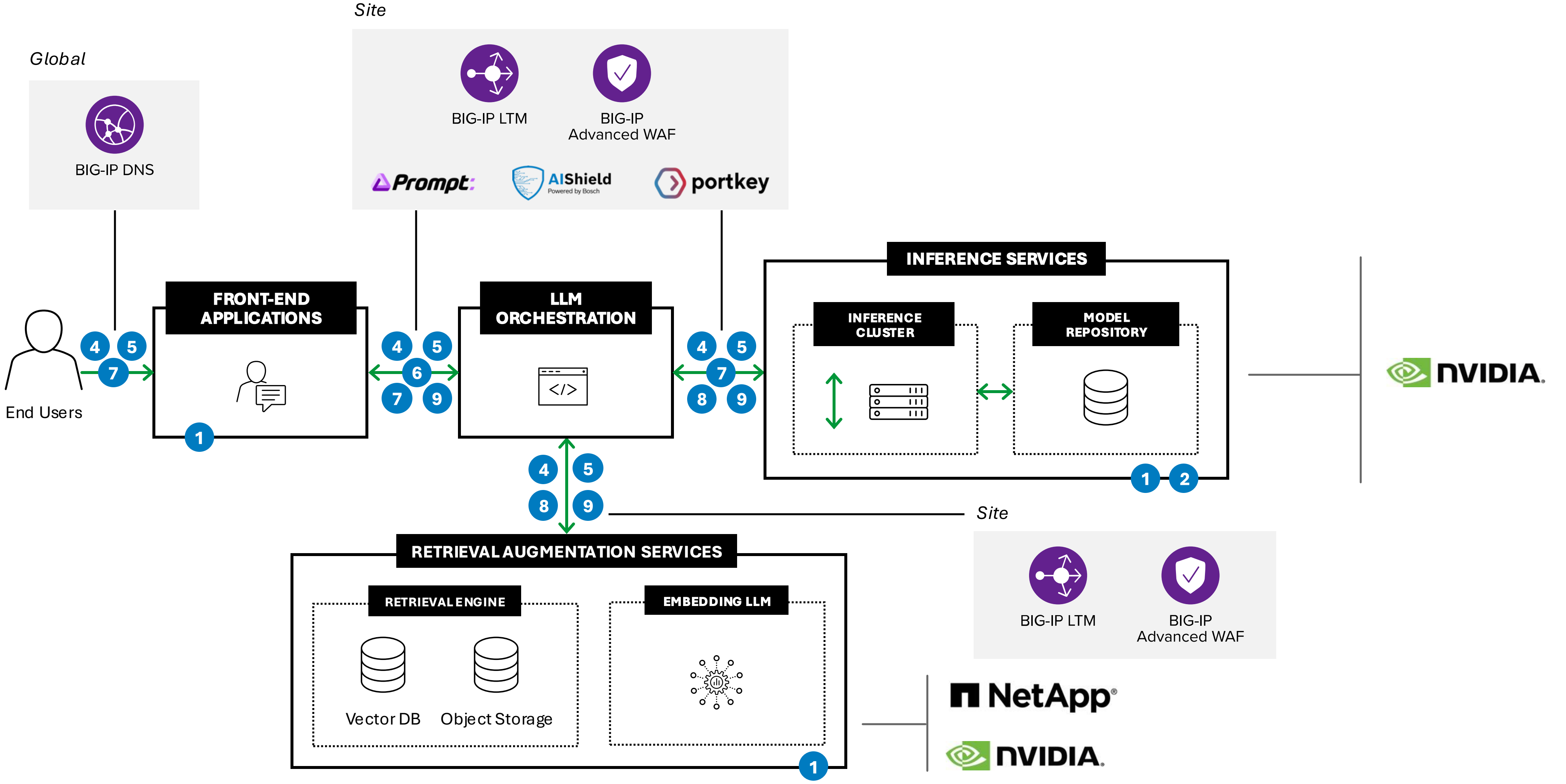
XC Mesh

AI Gateway

NetApp®

INFERENCE WITH RAG

Self-hosted Deployment



RAG Corpus Management

RAG CORPUS MANAGEMENT

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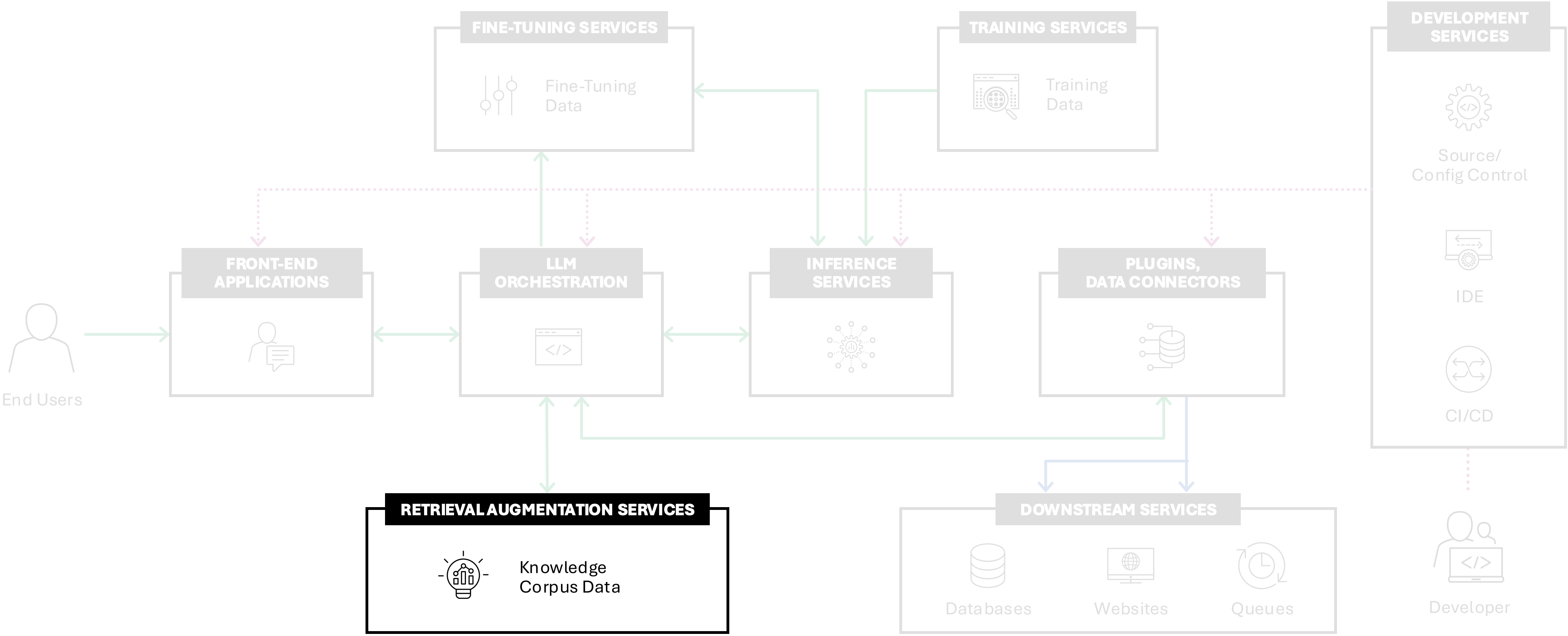

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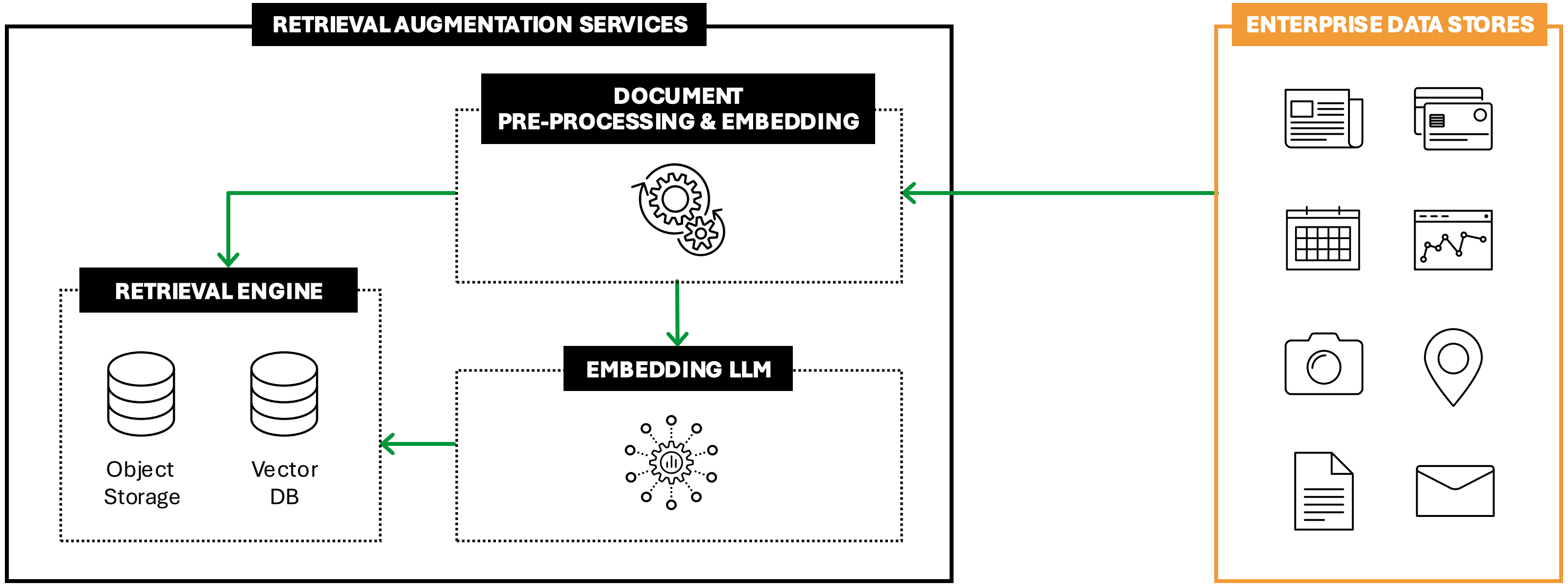

— External Data

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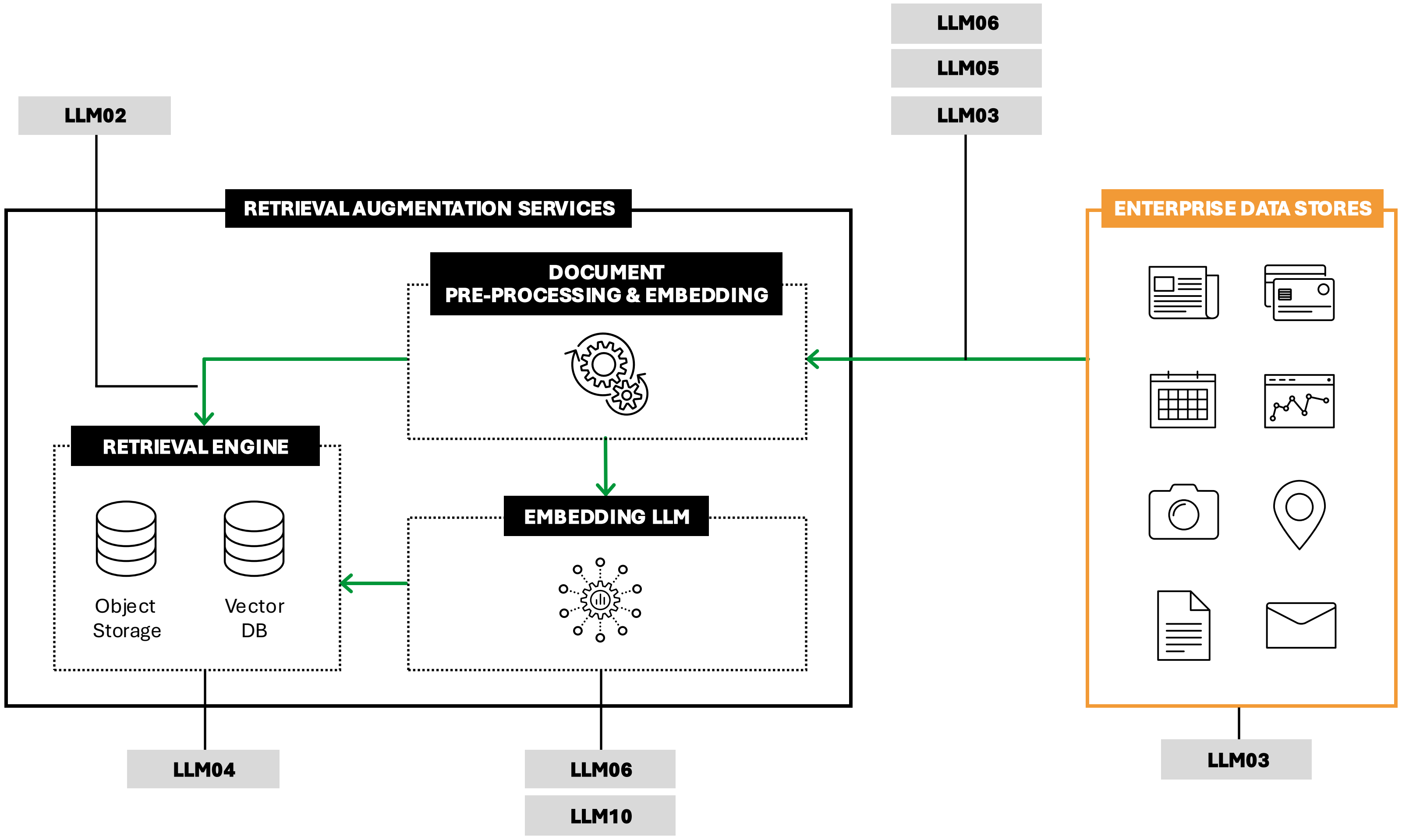

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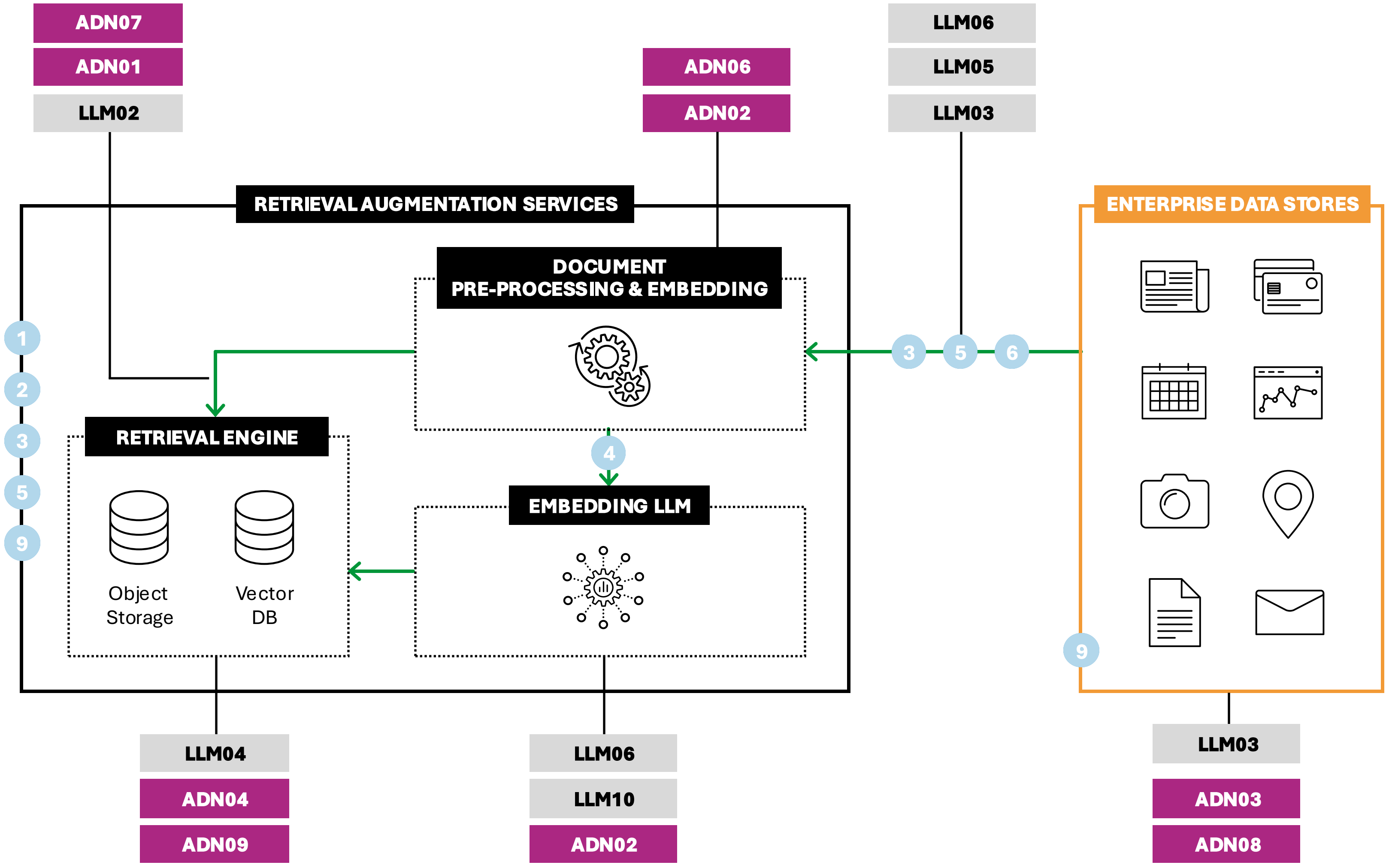

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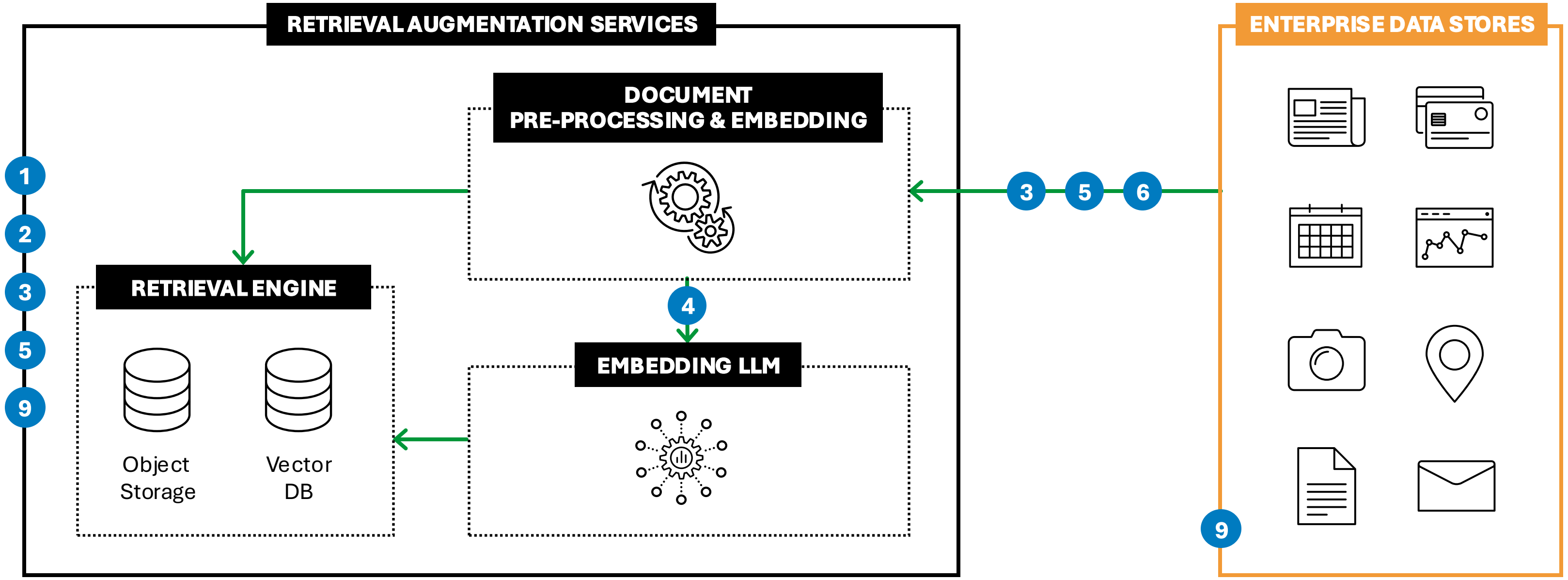

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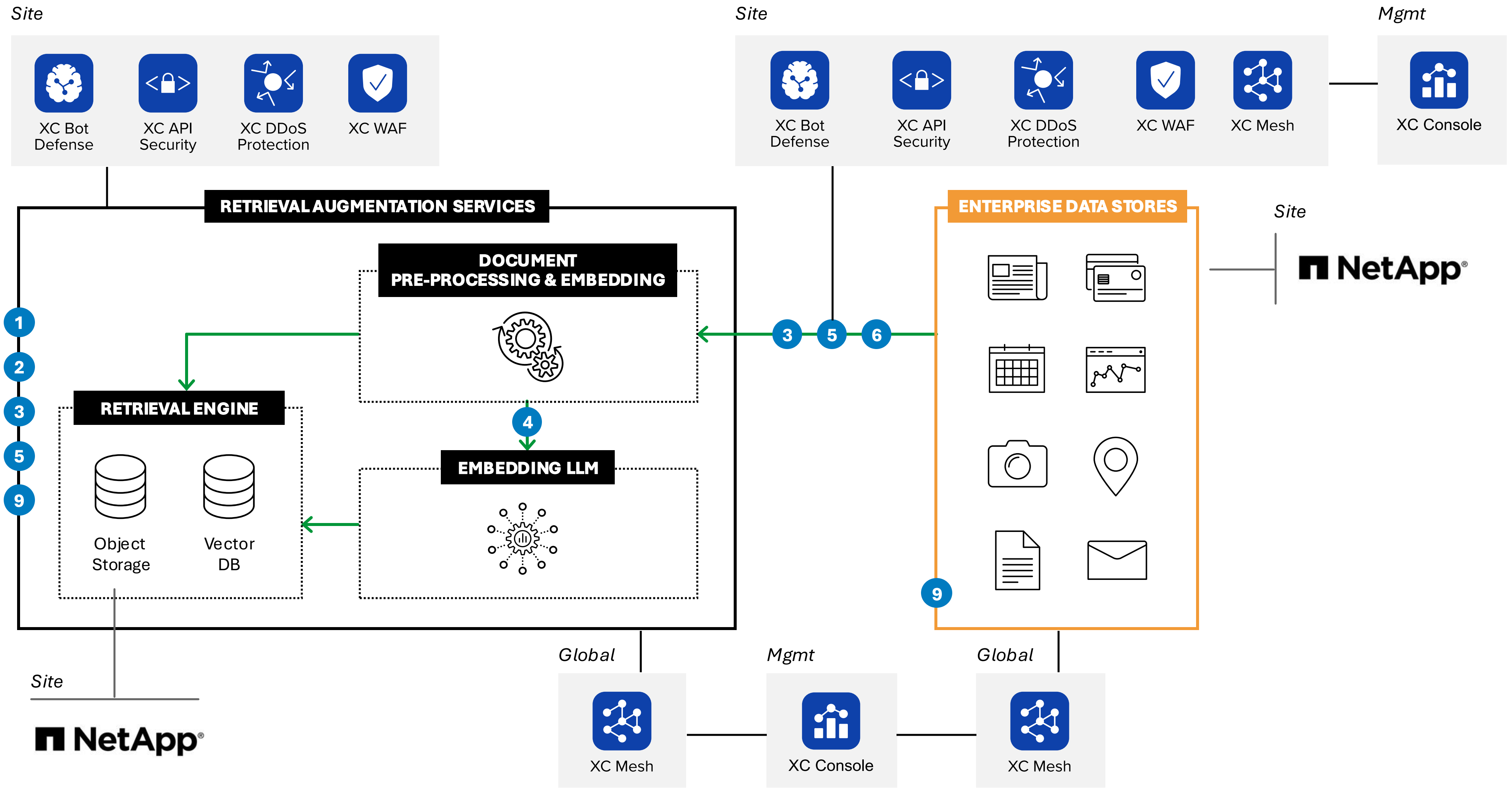
RAG CORPUS MANAGEMENT

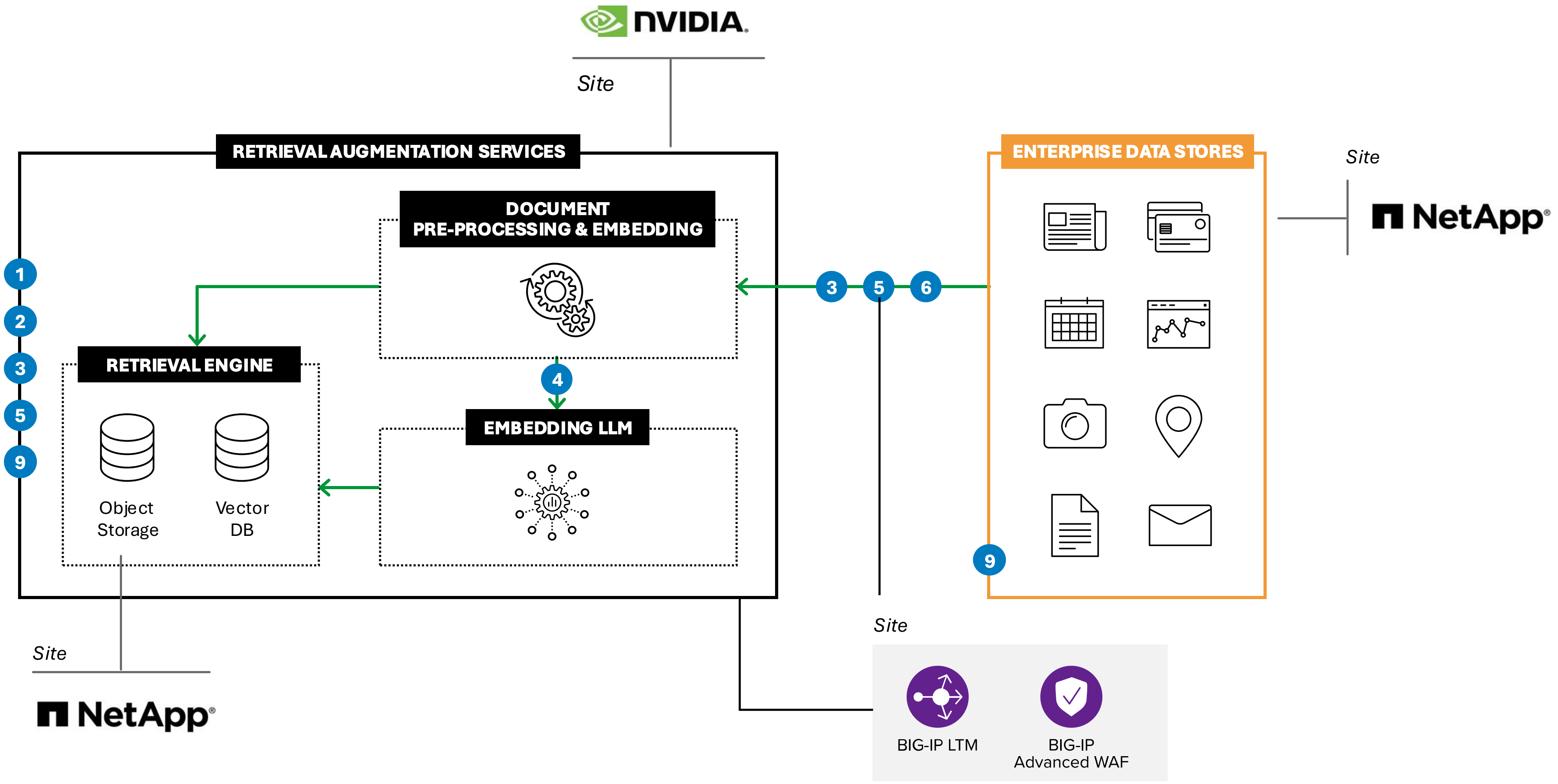
Cloud Deployment



External Data

RAG CORPUS MANAGEMENT

Self-Hosted Deployment



— External Data