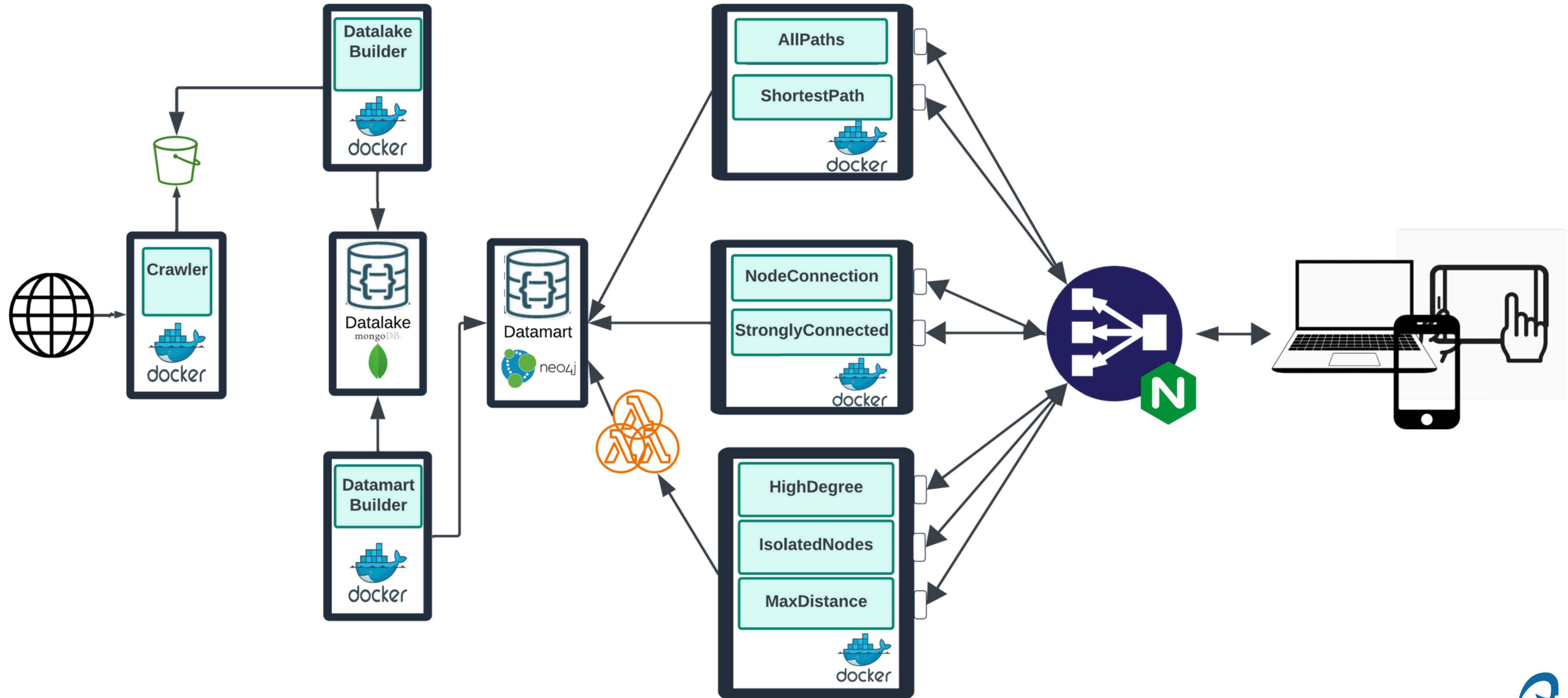
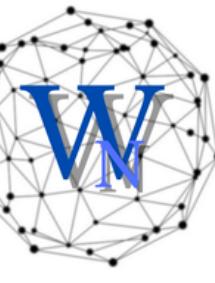


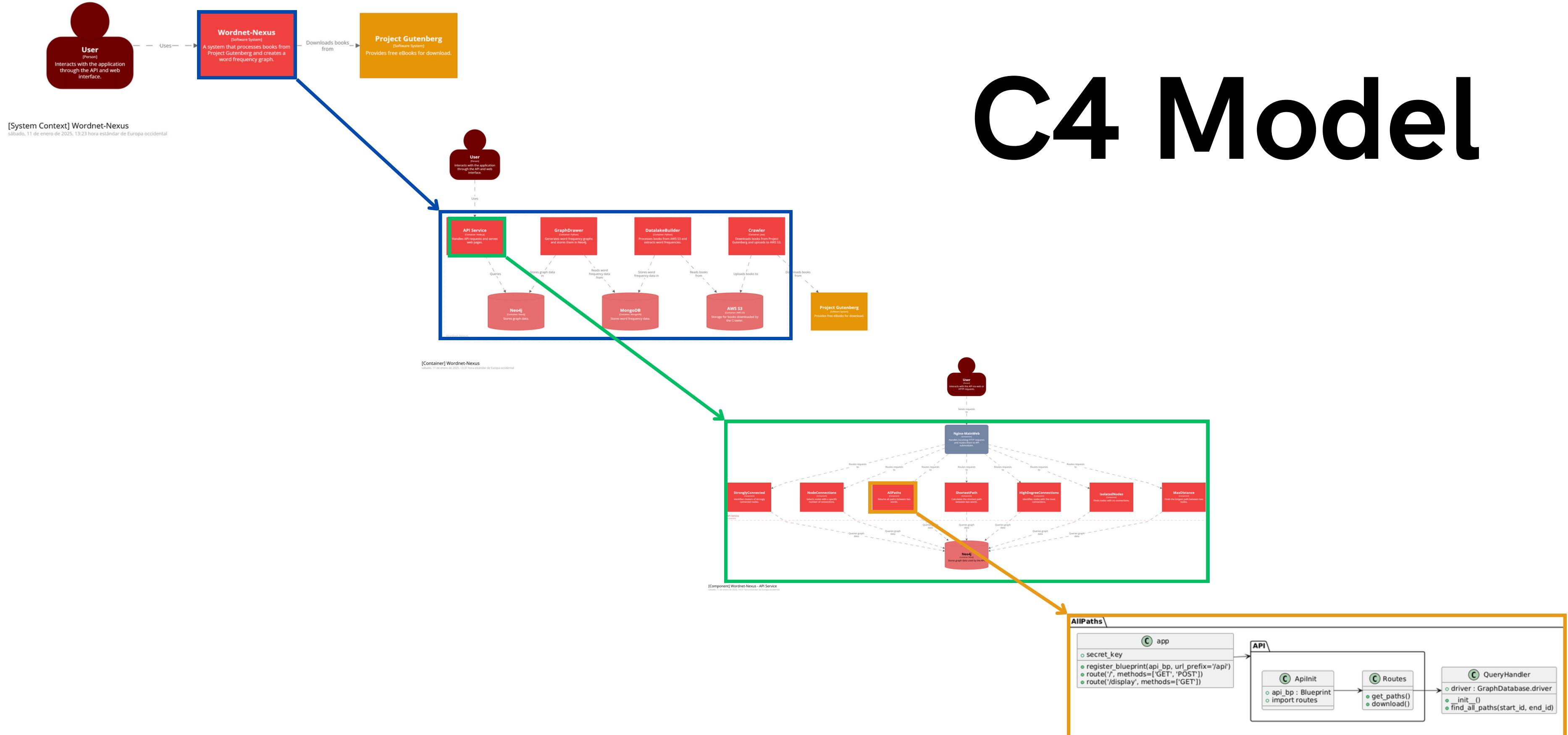


Wordnet-Nexus



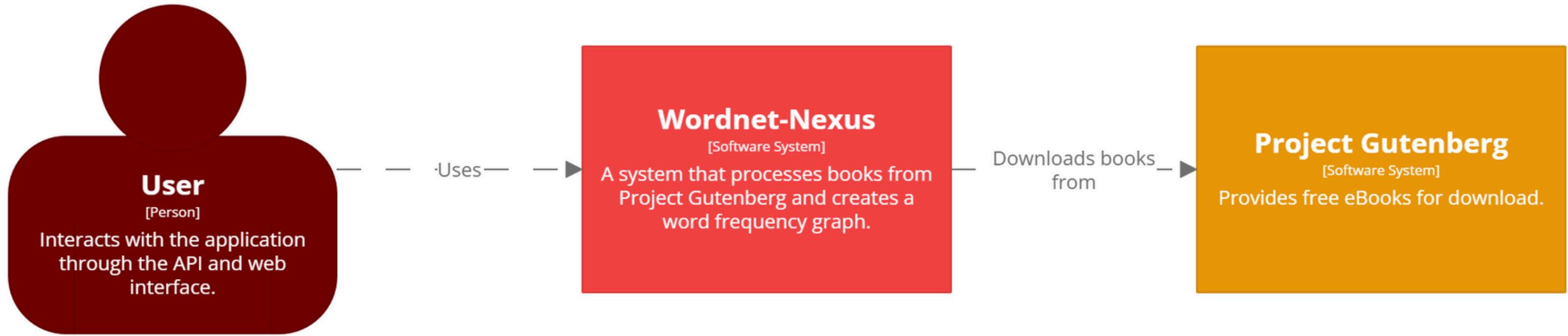


C4 Model





Level 1: - System context diagram

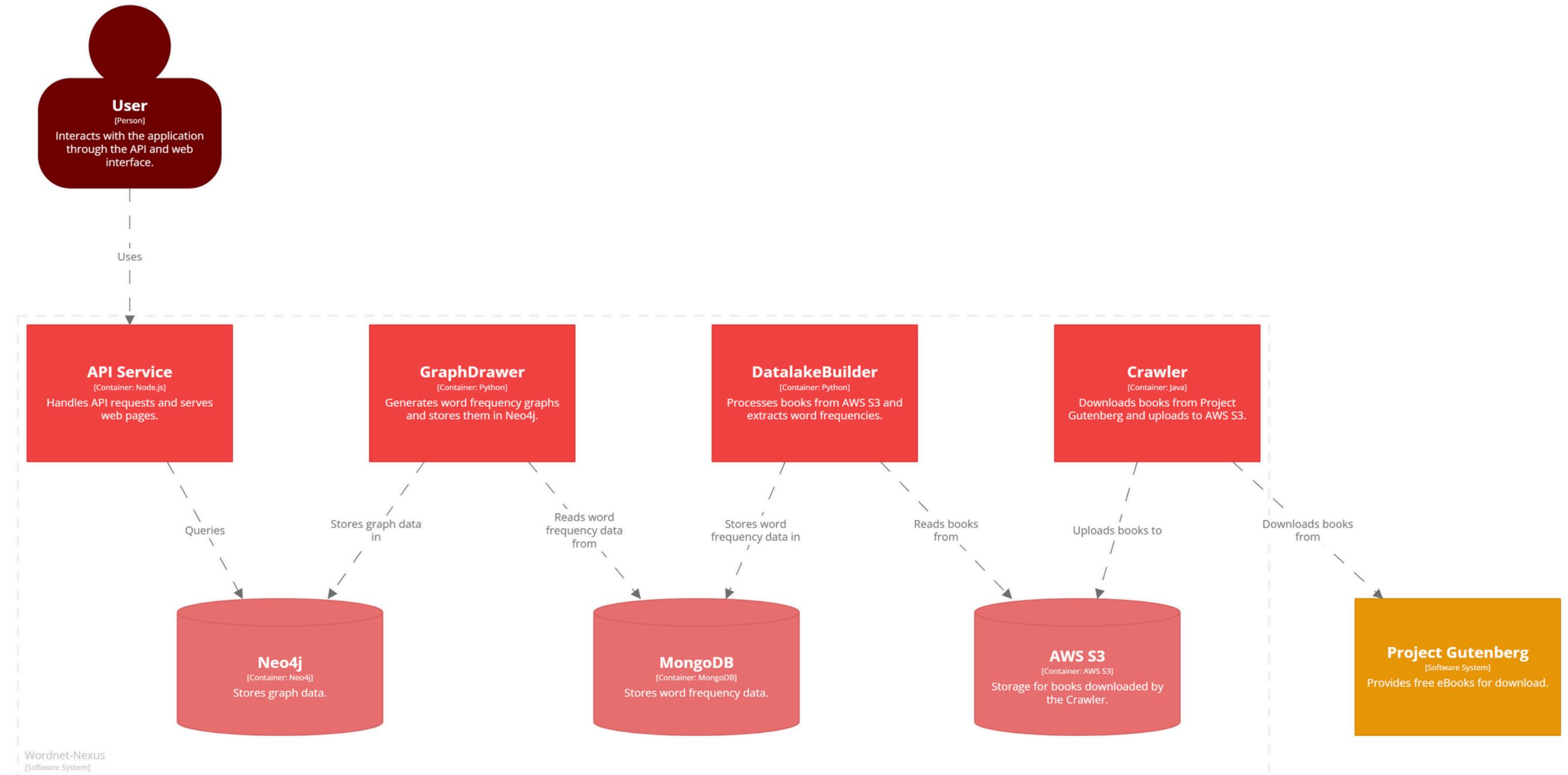


[System Context] Wordnet-Nexus

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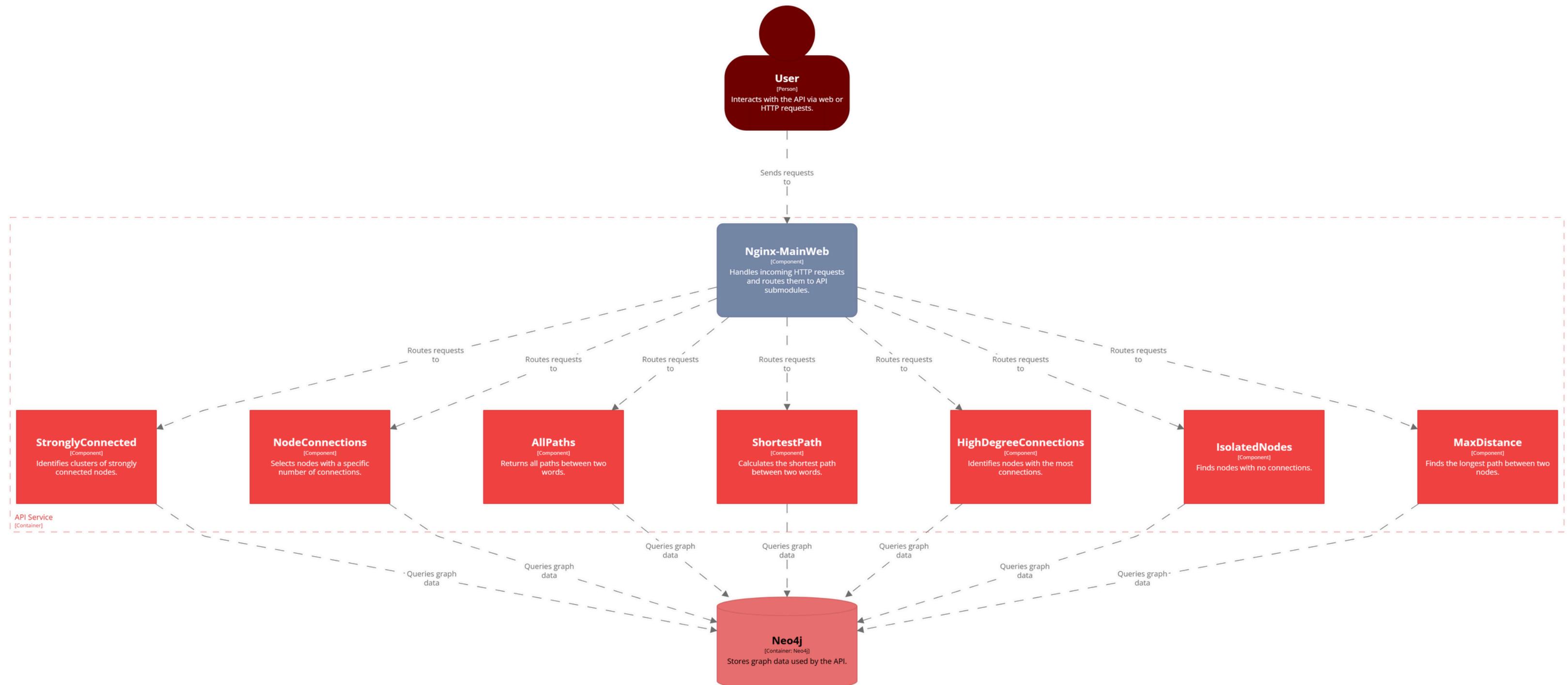


Level 2 - Container diagram

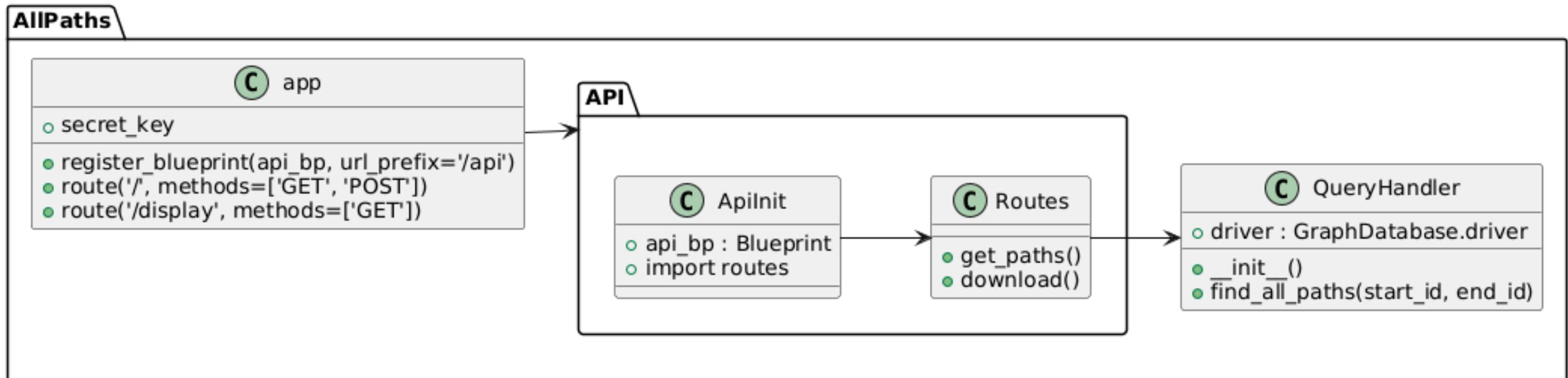


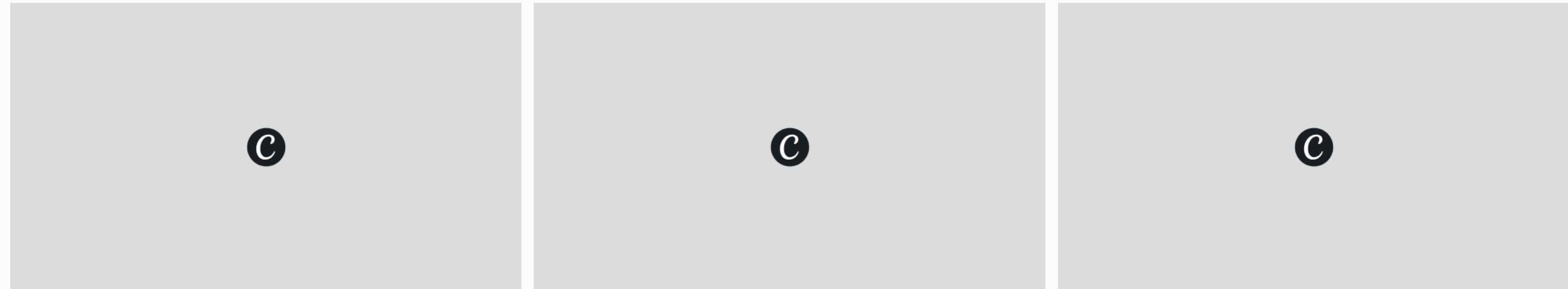
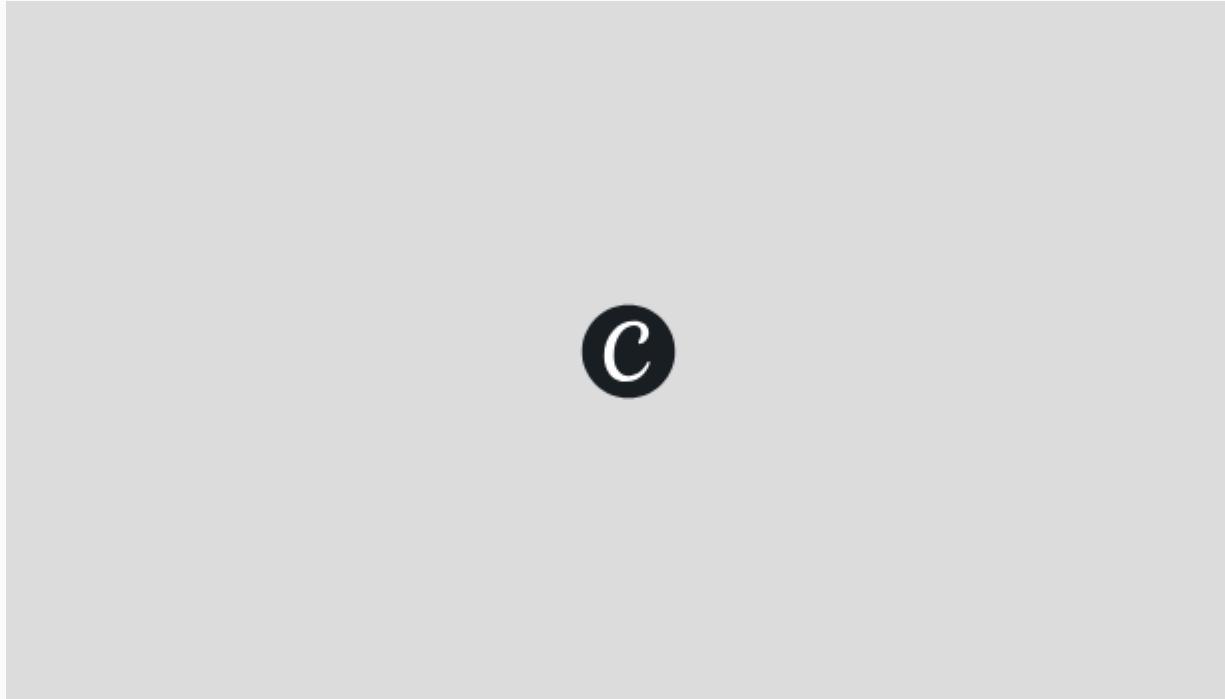
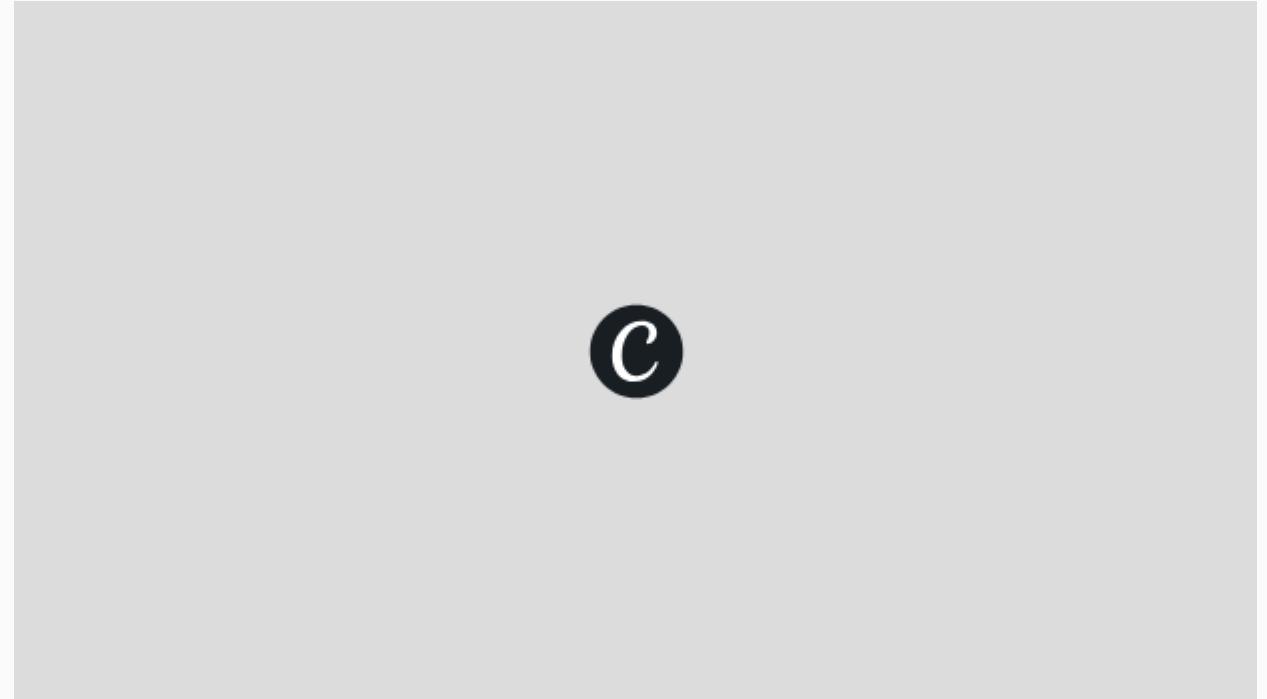


Level 3 - Component diagram



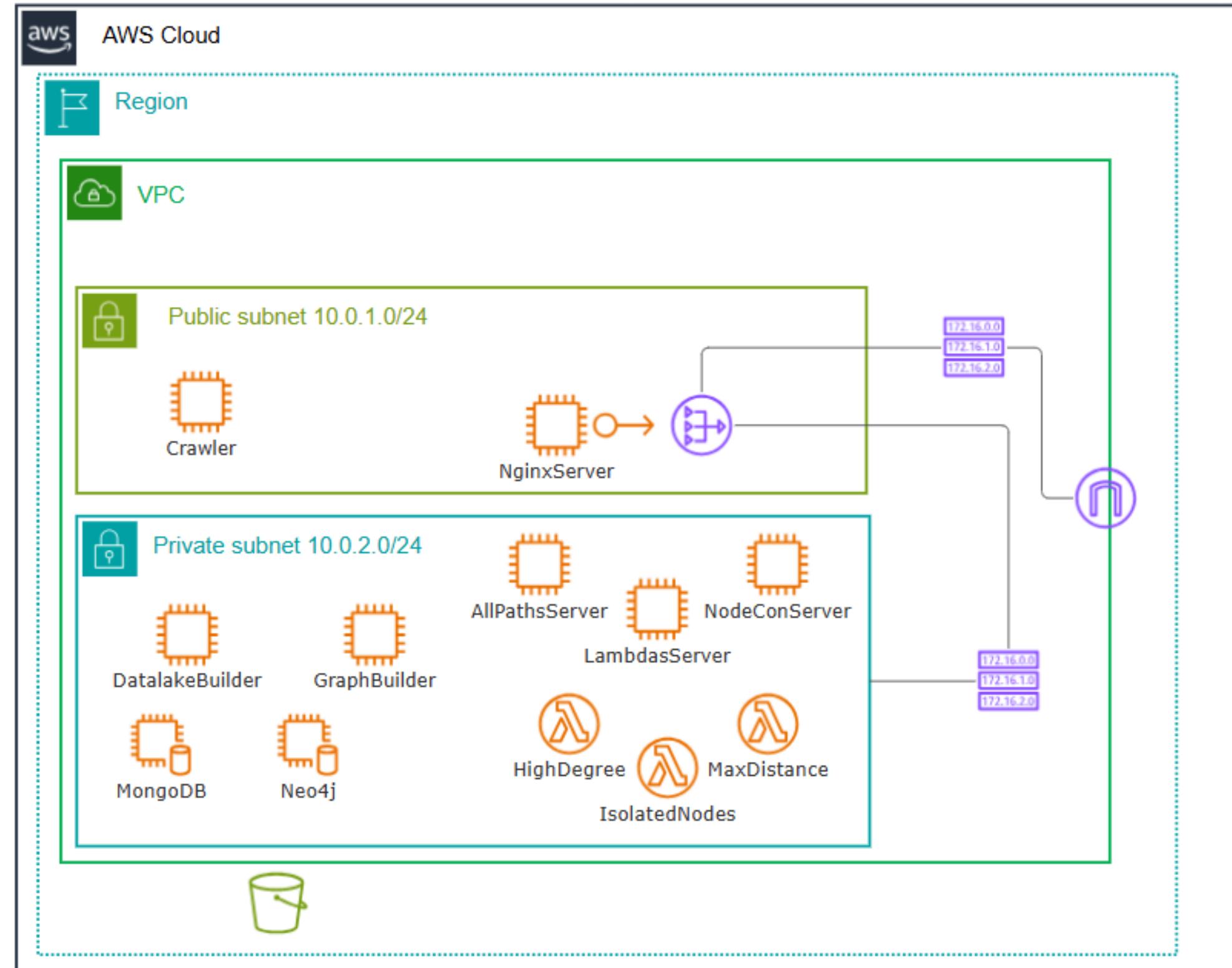
Level 4 - Code diagram







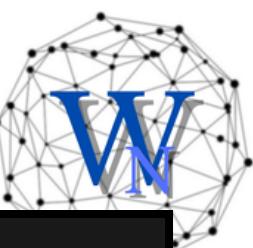
Infrastructure layer





Budget: 763.48 USD/month - 9,161.76 USD/year

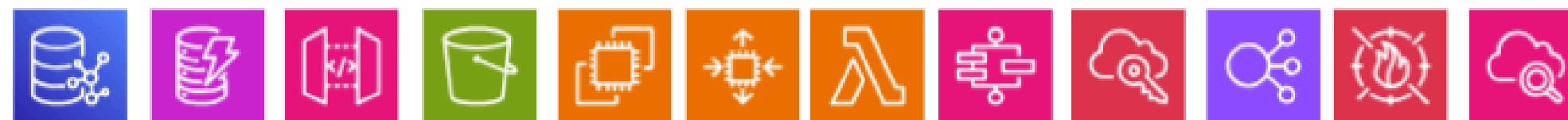
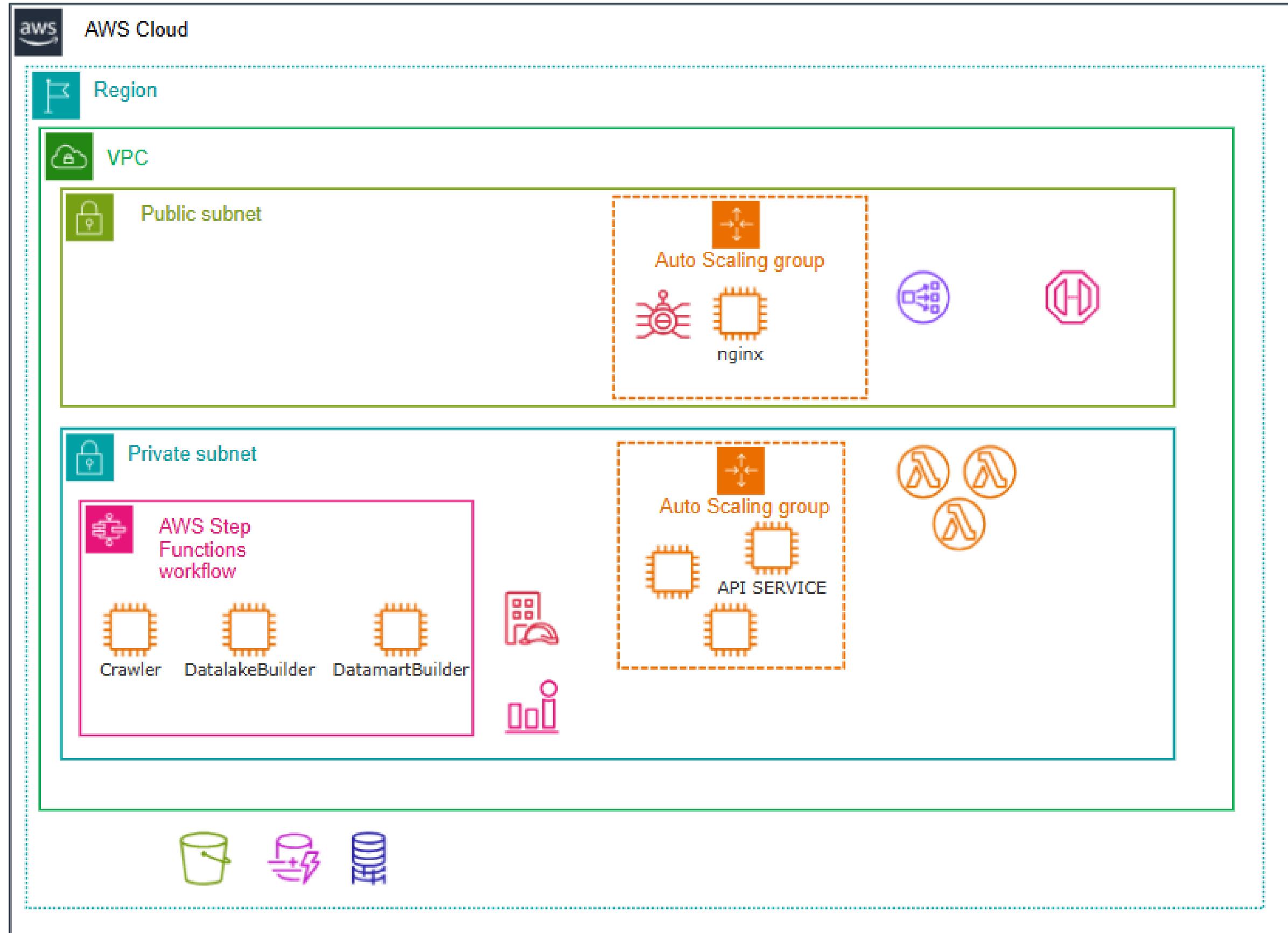
Service	Montly Cost	Description
EC2	0.00 USD	Crawler
EC2 (x2)	71.54 USD	Datalake y Datamart
EC2 (x2)	15.04 USD	Build Datalake and Datamart
EC2 (x3)	107.31 USD	API
EC2	22.72 USD	NGINX
S3	0.00 USD	Book Bucket
VPC	524.45 USD	NAT, Public IP, VPC, Data Transfer
AWS Lambda (IsolatedNodes, HighDegree, MMaxDistance)	0.00 USD - 3.53 USD - 3.85 USD	Lambda Functions



Budget: 1,119.56 USD/month - 14,393.76 USD/year

Service	Montly COst	Description
EC2	0.00 USD	Crawler
EC2 (x2)	71.54 USD	Datalake y Datamart
EC2 (x2)	15.04 USD	Build Datalake and Datamart
AWS Lambda (AllPaths, ShortestPath, NodeConnection, StronglyConnected)	543,39 USD	API
EC2	22.72 USD	NGINX
S3	0.00 USD	Book Bucket
VPC	524.45 USD	NAT, Public IP, VPC, Data Transfer
AWS Lambda (IsolatedNodes, HighDegree, MAxDistance)	0.00 USD - 3.53 USD - 3.85 USD	Lambda Functions

Infrastructure Improvements





Continuous Integration (CI) : Unit Testing

Module	Tests	Descripción
Crawler	Tests: 8 (Éxitos: 8)	Valida descarga de libros, escritura en AWS, manejo de metadatos y filtros de idioma.
DatalakeBuilder	Tests: 6 (Éxitos: 6)	Verifican limpieza de texto, inicialización de descargadores y conexión a MongoDB.
GraphDrawer	Tests: 5 (Éxitos: 5)	Prueban descarga de palabras desde MongoDB, validación de diferencias entre palabras, y carga de grafos en Neo4j y Neptune mediante mocks.
AllPaths	Tests: 3 (Éxitos: 3)	Validan rutas de la API y manejo correcto de solicitudes.
HighDegreeConnections	Tests: 4 (Éxitos: 4)	Evalúan consultas de nodos de alto grado y robustez ante entradas inválidas.
StronglyConnected	Tests: 3 (Éxitos: 3)	Verifican inicialización y lógica de consultas en componentes fuertemente conectados.



Continuous Integration (CI) : Unit Testing

Module	Tests	Descripción
IsolatedNodes	Tests: 4 (Éxitos: 4)	Verifican limpieza de texto, inicialización de descargadores y conexión a MongoDB.
main_web	Tests: 1 (Éxitos: 1)	Evalúan la carga de la aplicación y manejo básico de rutas.
MaxDistance	Tests: 4 (Éxitos: 4)	Prueban consultas de distancias máximas y manejo de errores.
NodeConnections	Tests: 5 (Éxitos: 5)	Verifican rutas y manejo básico de conexiones.
ShortestPath	Tests: 4 (Éxitos: 4)	Evalúan cálculos de rutas más cortas y validación de configuraciones.



Continuous Integration (CI) : Code coverage

Module	Coverage	Module	Coverage
Crawler	83%	IsolatedNodes	33%
DatalakeBuilder	81%	MaxDistance	82%
GraphDrawer	82%	NodeConnections	58%
AllPahs	64%	ShortestPath	82%
HighDegreeConnections	80%	StronglyConnected	58%

Continuous Deployment (CD) : Locust - Load Testing Results



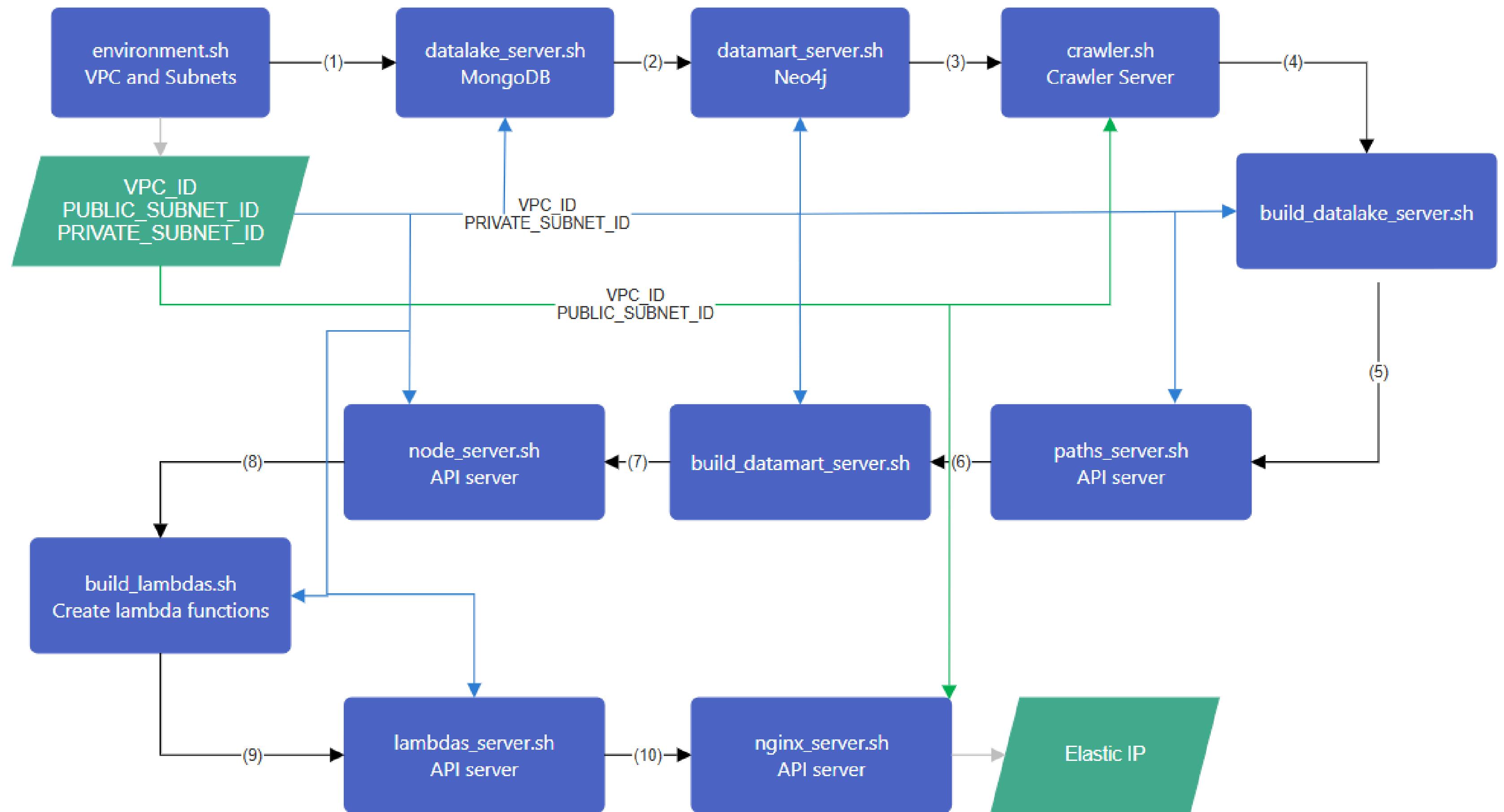
Endpoint	Total Requests	Failures	Avg. Response Time (ms)	Failure Rate	Success Rate	Quality Gates Passed
AllPaths	1970	0	609.99	0.00%	100.00%	✓ Yes
ShortestPath	1956	84	42.05	4.29%	95.71%	✓ Yes
IsolatedNodes	1910	0	52.60	0.00%	100.00%	✓ Yes
MaxDistance	1134	0	1783.78	0.00%	100.00%	✓ Yes
NodeConnections	746	0	4162.75	0.00%	100.00%	✓ Yes
StronglyConnected	880	216	3926.70	24.55%	75.45%	✓ Yes
TopConnections	1900	0	50.65	0.00%	100.00%	✓ Yes

Continuous Deployment (CD) : Locust - StressTesting Results



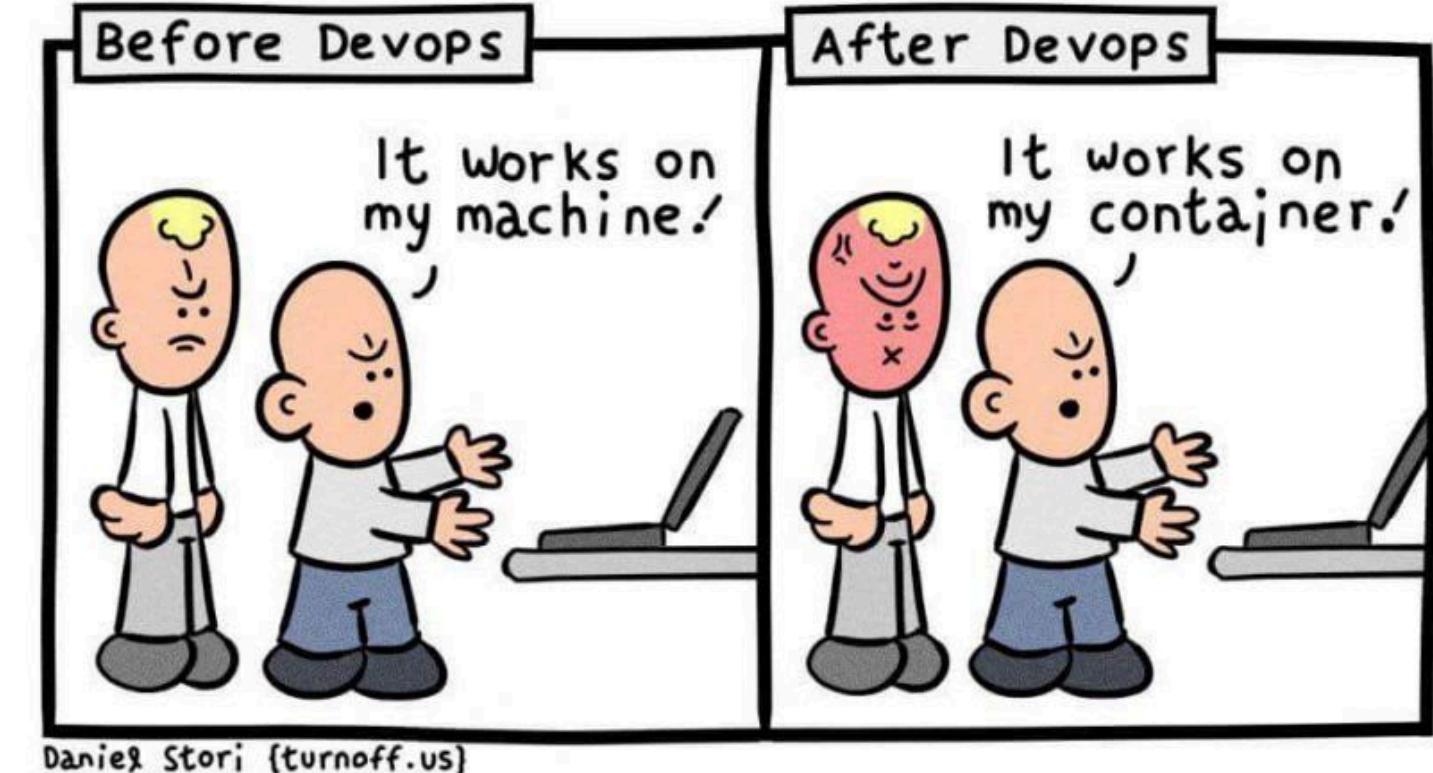
Endpoint	Total Requests	Failures	Avg. Response Time (ms)	Failure Rate	Success Rate	Quality Gates Passed
AllPaths	4594	0	2405.26	0.00%	100.00%	✓ Yes
ShortestPath	2778	480	2900.23	17.28%	82.72%	✓ Yes
IsolatedNodes	6982	2226	1331.93	31.88%	68.12%	✓ Yes
MaxDistance	3920	0	2146.90	0.00%	100.00%	✓ Yes
NodeConnections	802	0	12523.99	0.00%	100.00%	✗ No
StronglyConnected	618	118	17033.55	19.09%	80.91%	✗ No
TopConnections	11338	16	765.52	0.14%	99.86%	✓ Yes

Continuous Deployment (CD) : Automate infrastructure deployment

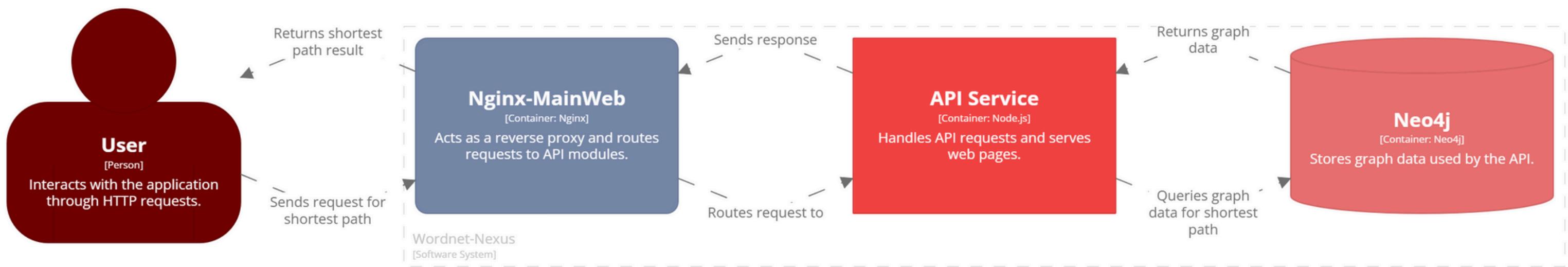




Beta Demo: Wordnet-Nexus



Dynamic diagram

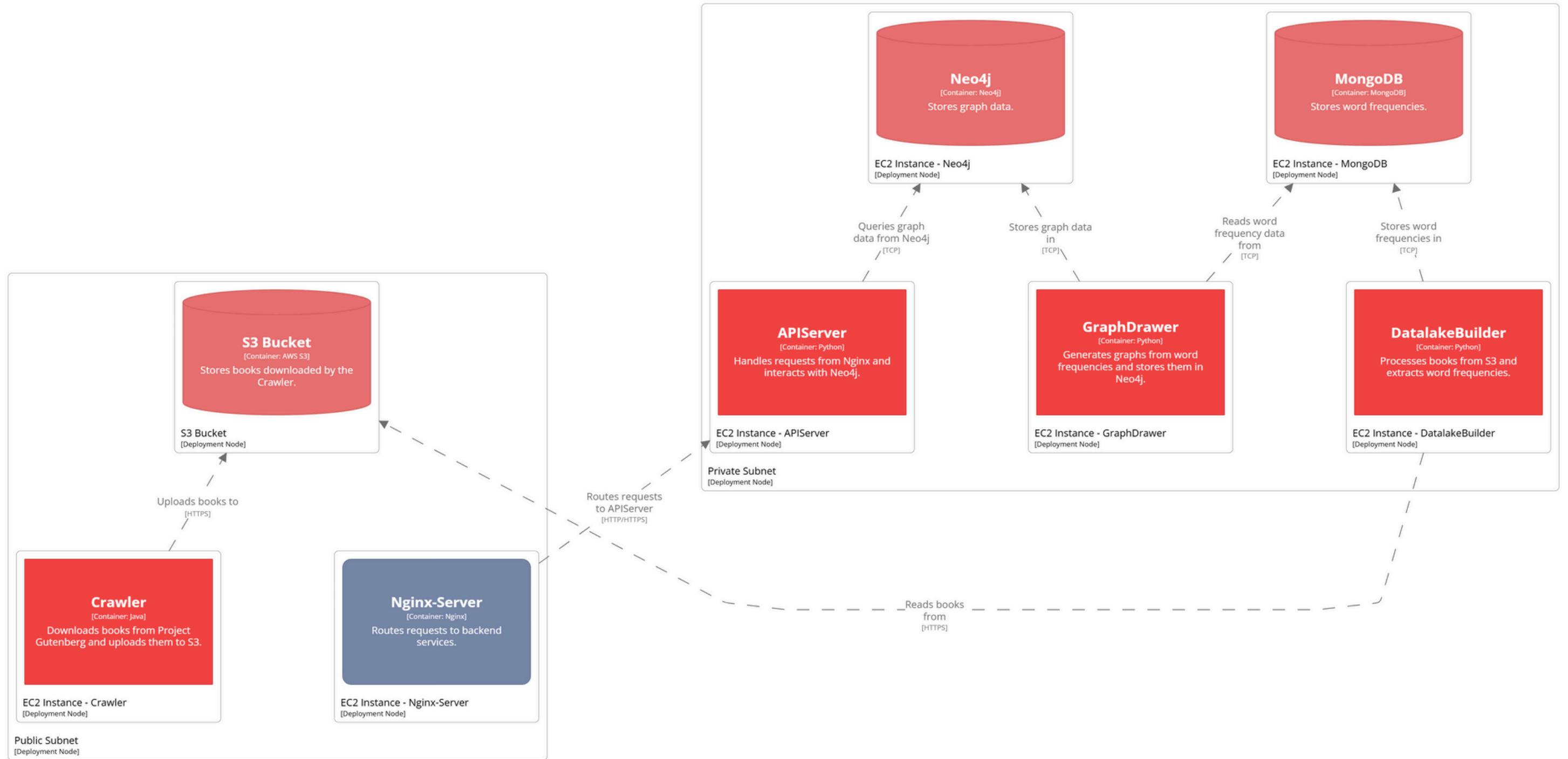


[Container] Wordnet-Nexus

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Deployment Diagram

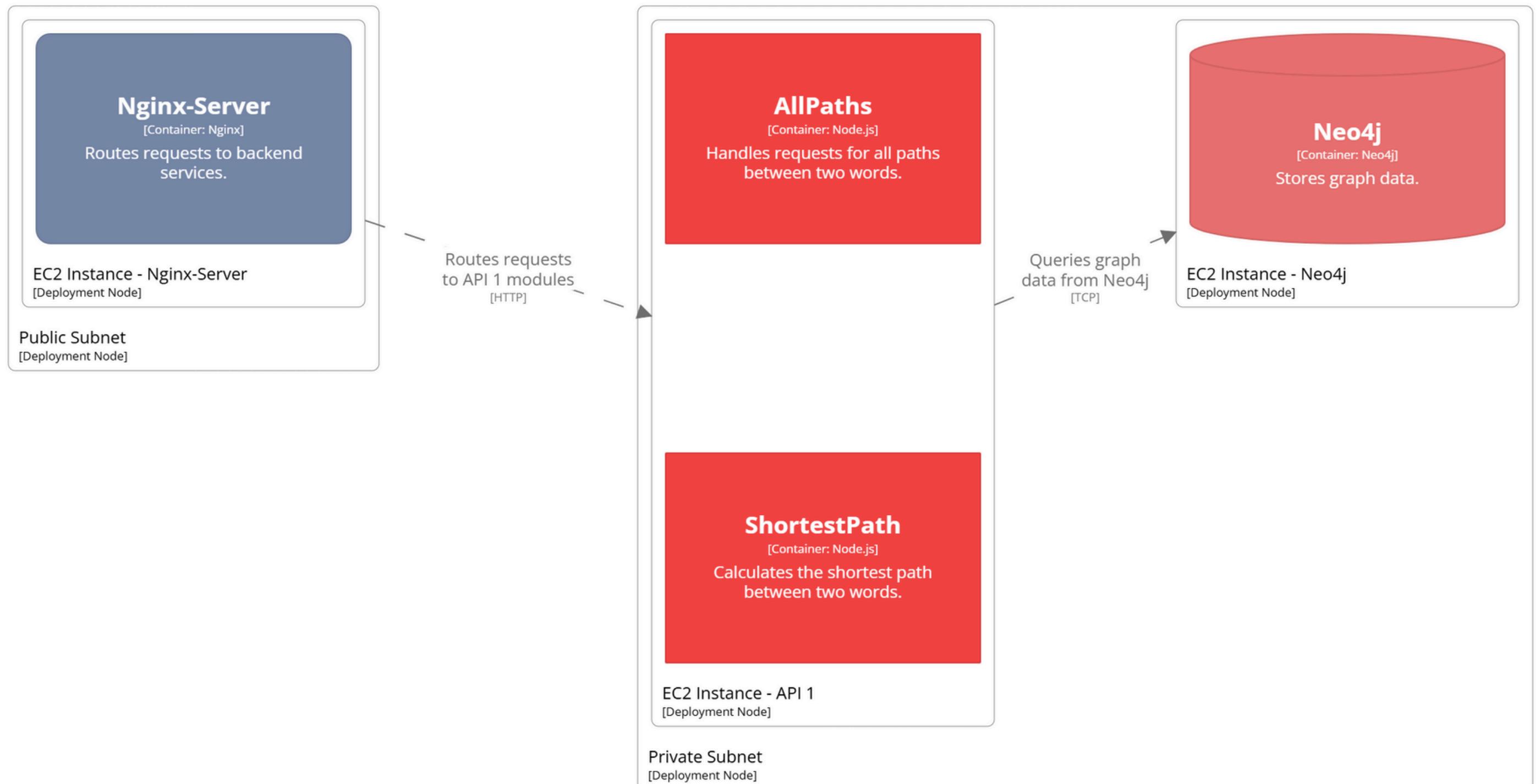


Deployment Diagram for Wordnet-Nexus

Shows the deployment of Wordnet-Nexus components across AWS public and private subnets, with relationships.
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Deployment Diagram



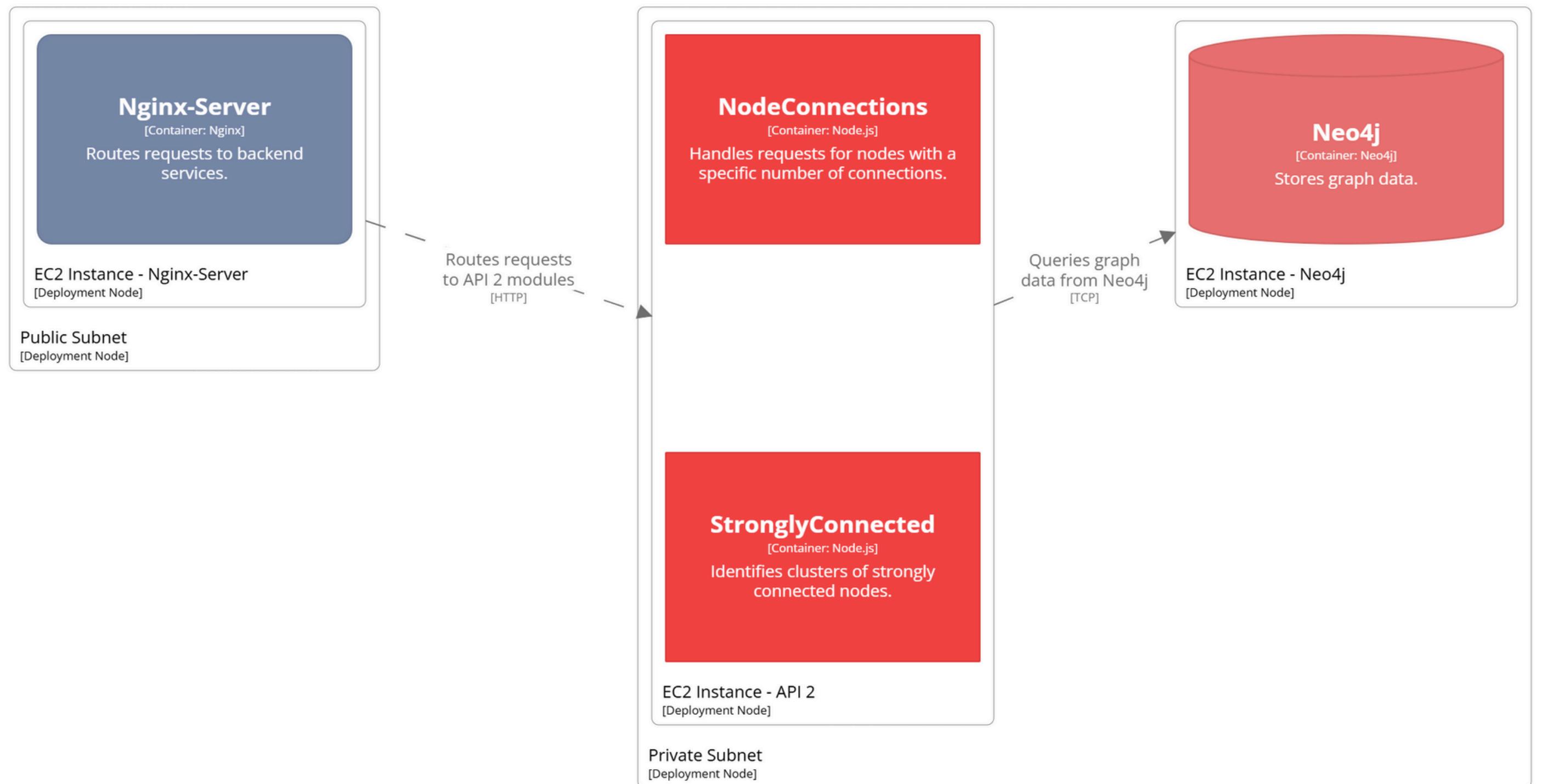
Deployment Diagram for API 1 (AllPaths, ShortestPath)

Shows Nginx, Neo4j, and API 1 modules deployed on AWS.

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Deployment Diagram



Deployment Diagram for API 2 (NodeConnections, StronglyConnected)

Shows Nginx, Neo4j, and API 2 modules deployed on AWS.

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Deployment Diagram





Deployment Diagram

