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PROBLEM

The Windows Cloud Experiences Product Management (PM) team diagnoses virtual machine connection failures mostly ad hoc and manually.

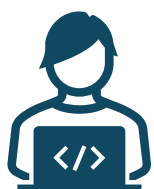


Dashboards



Database queries

Engineer outreach



Tribal knowledge

~2.7B

annual connectivity attempts*

~343M

annual downtime minutes*

Multimillion

-dollar annual diagnostic spend*

*Fiscal year 2026

Goal | Streamline the root cause analysis (RCA) process by **visualizing** every hop in an end-to-end connection and **scaling RCA** across Windows 365 and Azure Virtual Desktop products and all cloud networking transport protocols.

DATA PIPELINE

For scalability, telemetry data is spread across **multiple** Azure Data Explorer Kusto tables, none of which carry a failure root-cause label. To enable a machine learning solution for root cause diagnosis, we built a data pipeline that extracts, reconstructs and aggregates these tables.

EXTRACT

Kusto Query Language



Data extracted into date-partitioned parquet files

RECONSTRUCT

Single session

Link 1

Link 2

Link 3

Every connection fans out into many retry attempts

AGGREGATE

Unified View

Collapse fan-out into a unified feature vector

ROOT-CAUSE CHALLENGE

No 1:1 error code to root cause

Upstream behavior

Downstream error

Downstream error

Reported error code

Logged, not the true cause

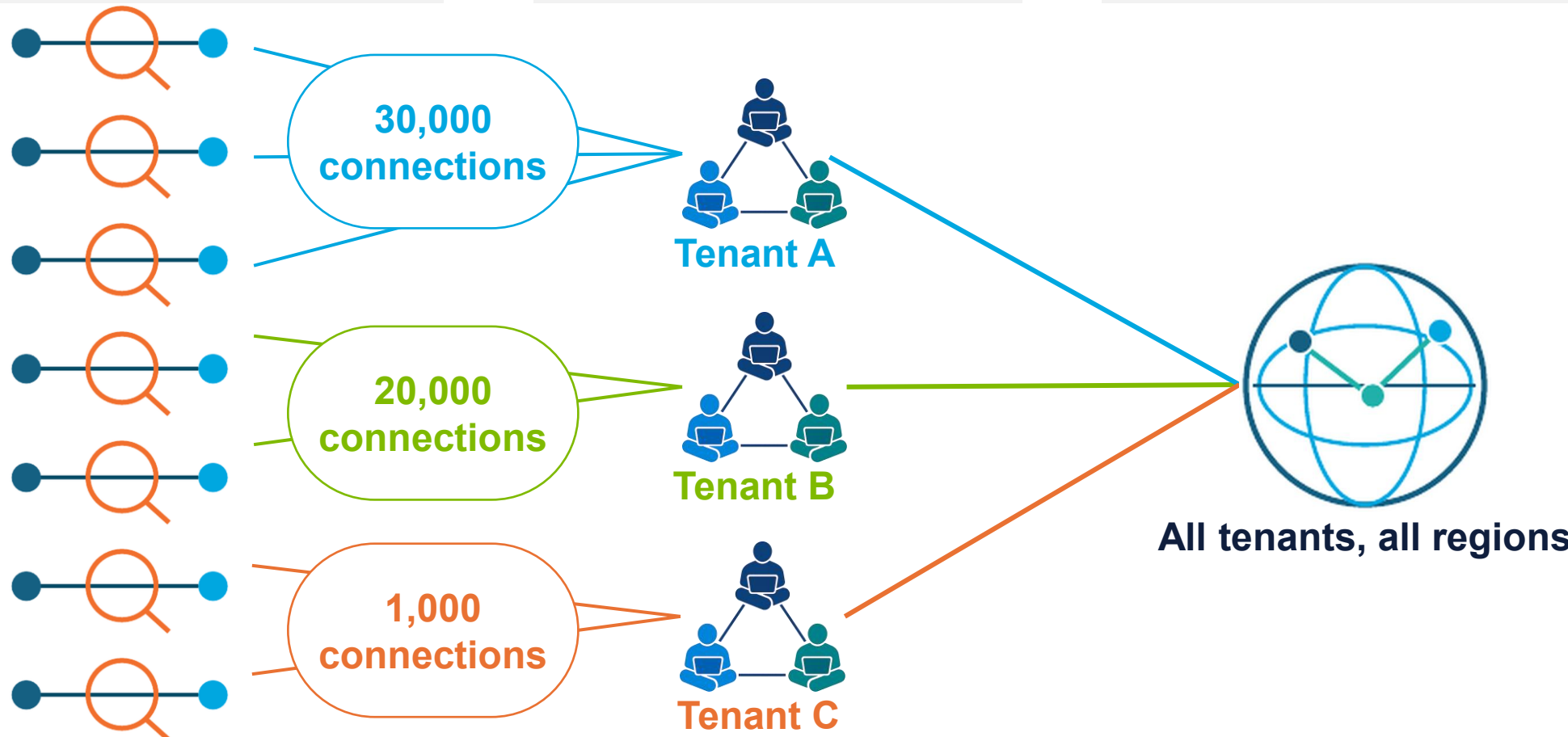
METHODOLOGY

VISUALIZATION | From individual connections to regional patterns

Connection-level

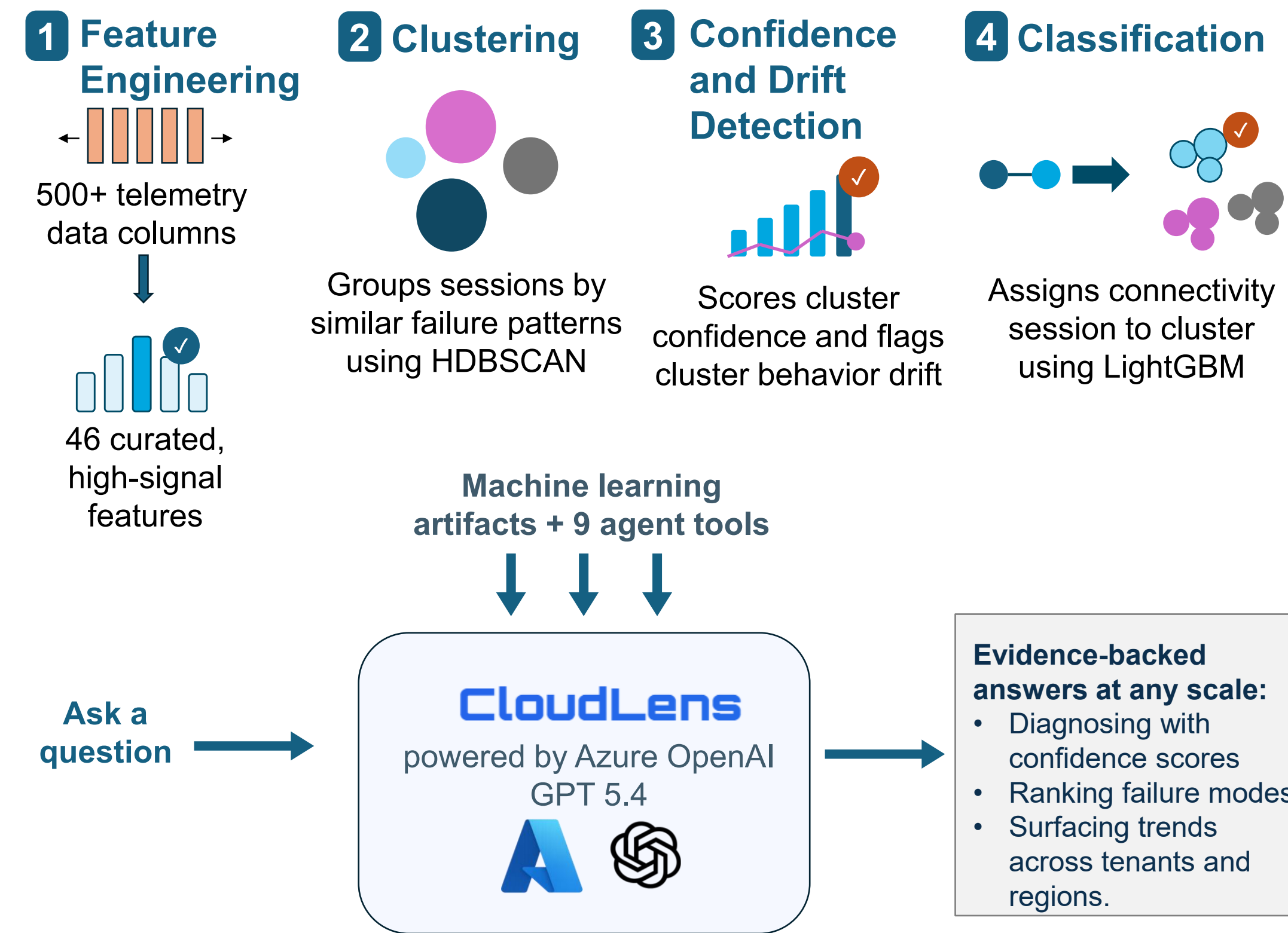
Tenant-level

Regional-level



ROOT CAUSE ANALYSIS PIPELINE | From signals to diagnostics

Runs on new data and re-trains when meaningful shift in clustering is detected.



SOLUTION

CLOUDLENS APP

Fig. 1 CloudLens illustrating connections involving India that use TURN servers

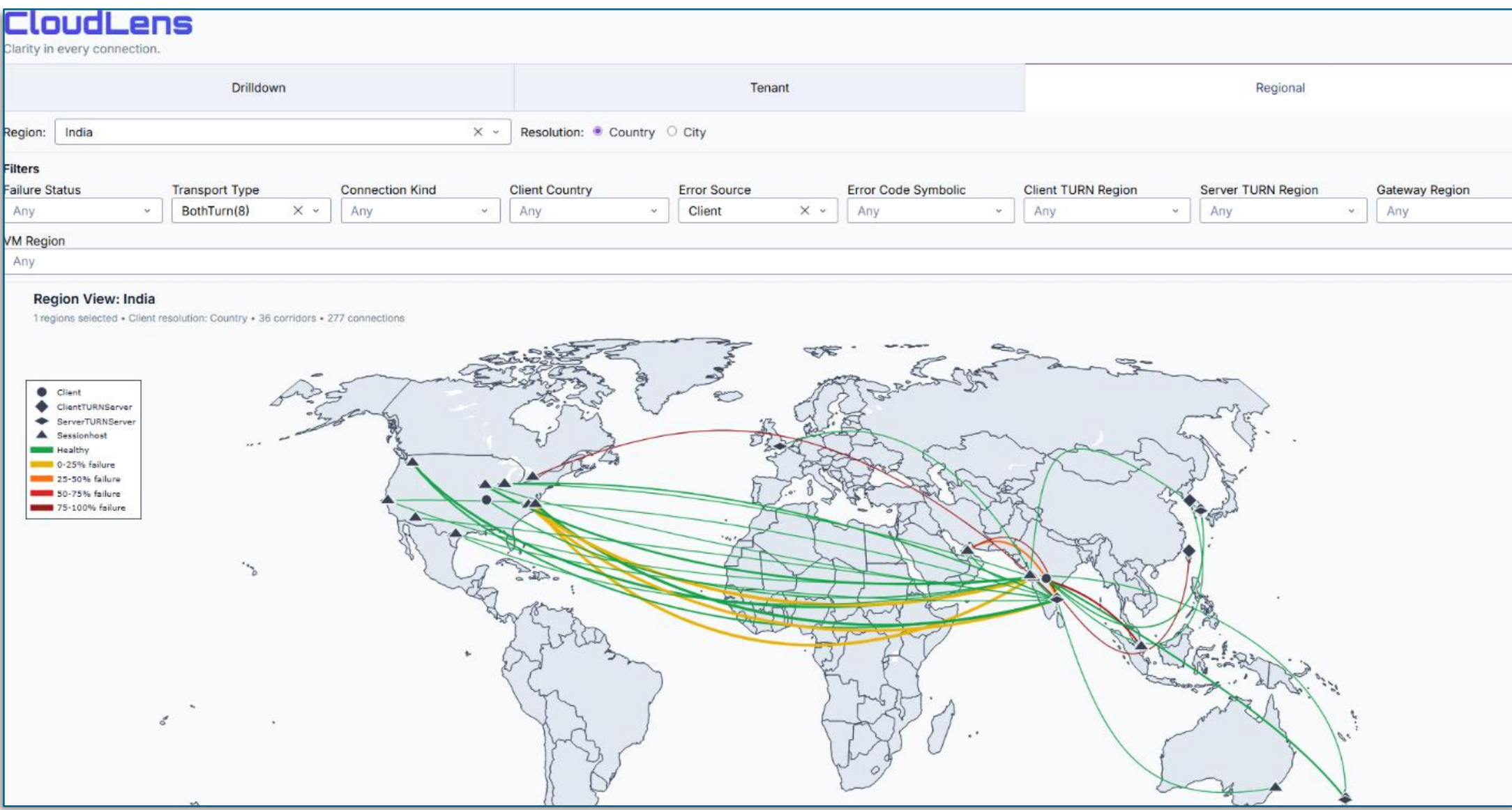
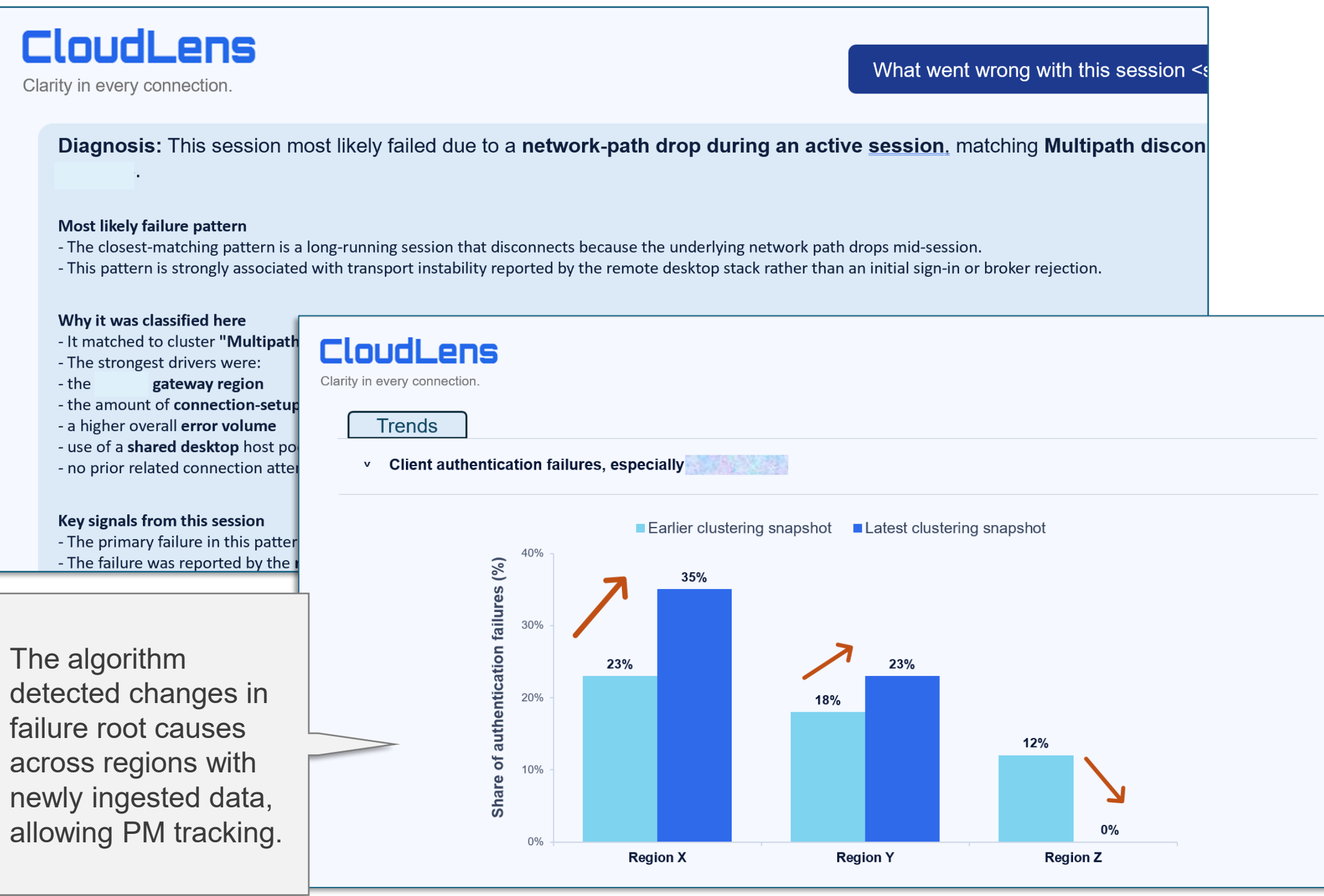


Fig. 2 CloudLens diagnosing a session and detecting trends



PERFORMANCE

100% Diagnosis Accuracy
60 testing questions

21 Clustered Failure Modes
100,000 observations

84% Cluster Confidence
Mean across 21 clusters

98% Classifier Accuracy
In reproducing clustering