

AI in Media Services

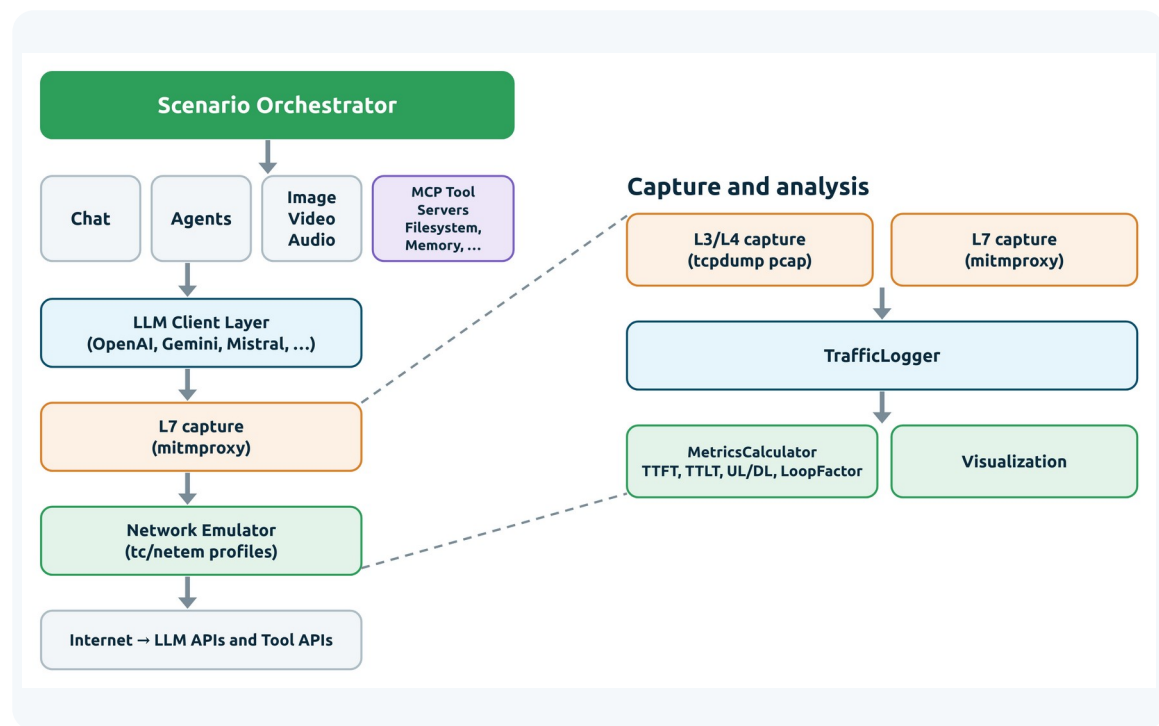
6G testbed and AI-driven traffic characterization



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About the project

The testbed SA4 uses to measure the traffic of AI media services



Testbed architecture, from the 6G-Testbed repository

[FIND OUT MORE](#)

Technical Analysis

Specifications

Testbeds

More information at 5g-mag.com/tech/6g

3GPP TR 26.870

V0.6.1, draft

Study on Media Aspects for 6G System (Release 20). Its annexes B to E describe the testbed; its results are initial.

3GPP TR 22.870

V20.0.0

Study on 6G Use Cases and Service Requirements, whose AI traffic use cases the test scenarios are checked against.

3GPP TR 26.934

clause 5

Test platform for media delivery technologies: the common test platform the testbed builds on.

Annexes of TR 26.870

Where the testbed, the method and the results are documented in the study

Annex B

The testbed: purpose, architecture and code structure, and how to use it.

Annex C

The method, the initial results, and the five assumptions on AI traffic with their conclusions.

Annex D

The scenarios and their procedures, the network profiles, the metrics and the real-time video results.

Annex E

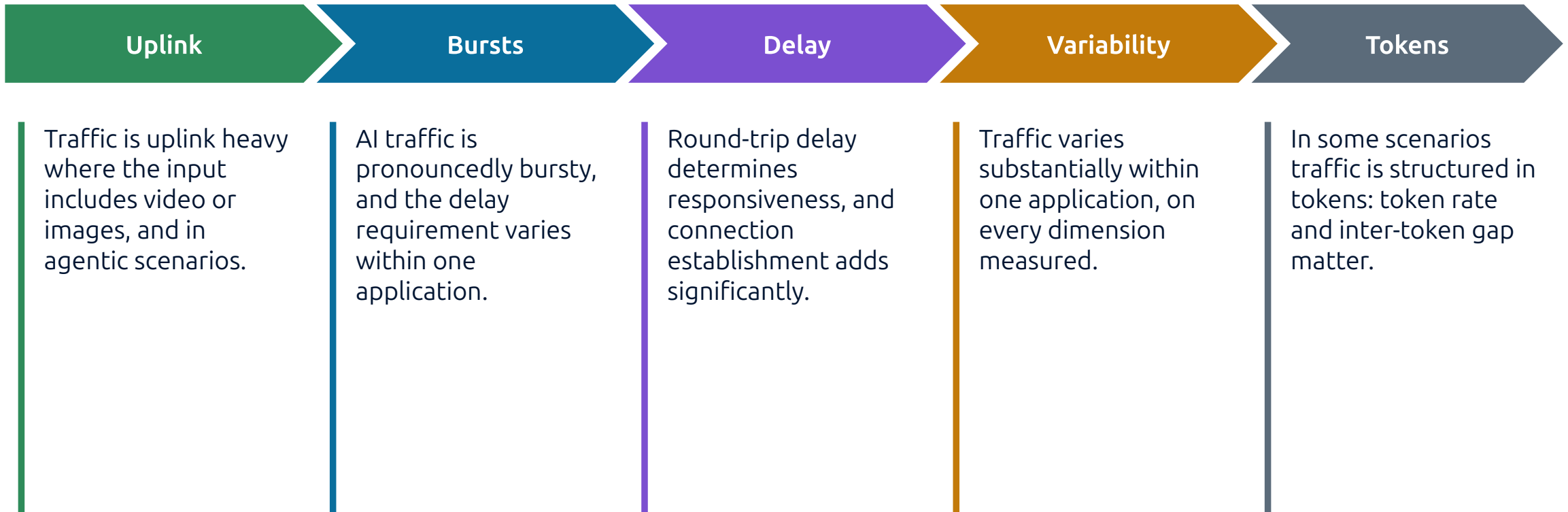
The network emulator, a temporary annex: usage, profile data model, packages and packet metrics.

4

annexes of a draft study document the testbed. AI traffic is one of the seven work topics of the 6G media study; it is the one with findings so far.

AI traffic characteristics

The five initial findings of the 6G media study, measured with the testbed

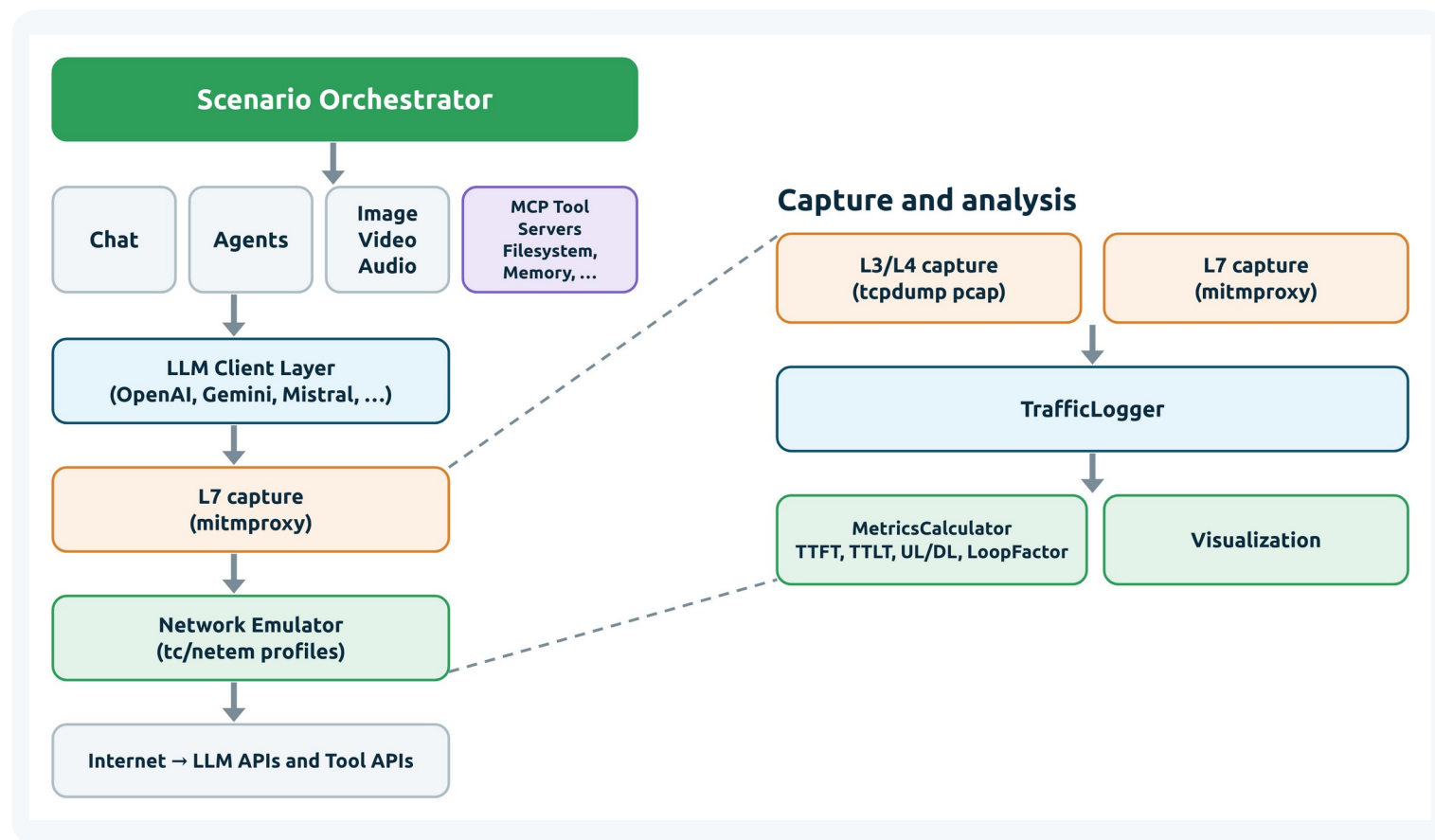


Clause 7.1 of TR 26.870 V0.6.1. The findings are to be updated as more measurement results become available.

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The testbed

How an interaction runs and how its traffic is measured



ORCHESTRATOR

Drives the scenarios (chat, agents, image, video and audio) and the MCP tool servers.

NETWORK EMULATION

The tc/netem profiles shape the traffic on its way to the LLM and tool APIs on the Internet.

CAPTURE AND ANALYSIS

L3/L4 capture with tcpdump and L7 capture with mitmproxy feed the TrafficLogger, the MetricsCalculator and the visualization.

What it measures

Eleven scenario types, run over network profiles, reported in four metric categories

Scenarios table D.1.1, from chat to agent-to-agent collaboration

- Chat
- Agent with MCP
- Image generation
- Multimodal analysis
- Multimodal analysis, live AI mode
- Video understanding
- Real-time text and audio
- Direct web search
- Computer use
- Personal assistant agent
- Agent-to-agent collaboration

Network profiles table D.3.1-1, deployment conditions plus a lossy profile that finds where a scenario breaks

- ideal
- 6g_itu_hrlc
- 5g_urban
- wifi_good
- cell_edge
- satellite_leo
- satellite_geo
- congested
- 5qi_7
- 5qi_80
- lossy

Metrics table D.4.1-1

- A. Traffic characteristics
- B. Response time and HTTP errors
- C. Service metrics
- D. Task QoE metrics

A test run takes one scenario, one network profile and one execution mode (remote or local), repeated, and produces a metric record.

Results so far

Three of the measurements behind the findings, from a draft study

DIRECTIONALITY

Stated per scenario

The UL/DL ratio spans about five orders of magnitude, from about 0.000 for image generation to about 840 to 990 for video understanding with local inference.

AGENTS ON THE WIRE

Close to symmetric

An agent turn looks downlink heavy at the application layer (144 bytes up, 20,230 down), but on the wire the UL/DL ratio is 0.50: each agent step re-uploads the accumulated context.

CONNECTION SETUP

Before any data

Connection and security establishment take about 171 ms at the median and about 1.46 s at the 95th percentile before any application data is exchanged.

The values for real-time video understanding are those of one implementation and will be aligned when more results and implementations are added.

IMPLEMENT

Repositories

The repositories of the 6G AI Traffic Characterization testbed

REPOSITORY	WHAT IT IS	COVERS	LATEST RELEASE
6G-Testbed	a framework for measuring and analysing AI/LLM service traffic under various network conditions	AI traffic testbed Network emulation	none yet GitHub
netemu-dashboard	a web dashboard and REST API for network impairment profiles, with the 6G-Testbed's netemu	Network emulator control	none yet GitHub

FIND OUT MORE

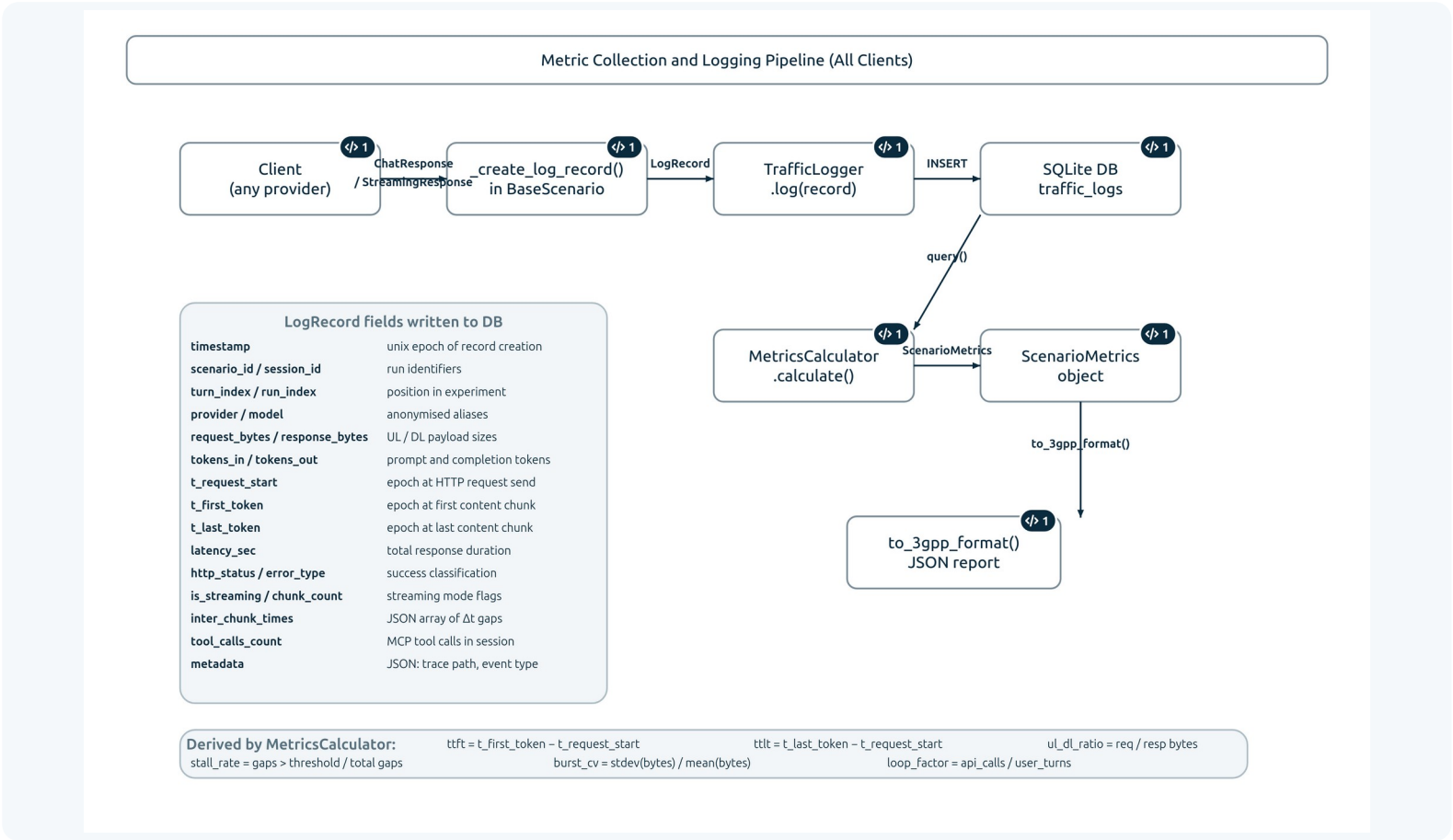
- Technical Analysis
- Specifications
- Testbeds

released

no release yet

Repositories in the architecture

The Reference Tools on the specification figure, as the figure generator draws them



PROVIDED BY THE REFERENCE TOOLS

1 6G-Testbed

All seven pipeline boxes are in the 6G-Testbed repository (aitestbed).

Latest updates and roadmap

Status on 23 October 2026

FOR FURTHER STUDY

- **Metrics**
Whether and how TTFT, TTLT and tool-call latency can be used for AI traffic evaluation is for further study in TR 26.870.
- **Agentic uplink**
Whether the retransmitted context that explains the uplink-heavy agentic traffic occurs in agentic applications is for further study.
- **AI gateway**
The test scenario of the AI gateway, and the source code of its call flow, are still to be provided.

IN DEVELOPMENT

- **Agentic scenarios**
Pull request 10 adds the agentic measurement scenarios agreed for the 6G media study and separates network measurement into the standalone netemu package.
- **Video analysis scenarios**
Scenario configurations for video-traffic analysis.
- **Chat with token IDs**
A chat scenario configuration in which the client sends token identifiers.



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