VIDEOLINQ ENTERPRISE

Technical Architecture & Systems Integration

Multilingual Video Infrastructure

Prepared by the Videolinq Technical Team

www.videolinq.com

Systems Architecture & Integration Reference

Logical workflow and customer integration boundaries



Processing domain

- Media contribution and source routing
- Caption and multilingual text workflow

Engineering review

- Input/output interface contracts
- Deployment-specific trust boundaries

Reference logical view; physical topology and supported profiles are integration-specific.

System Boundaries & Data Ownership

Separate customer environment, processing services and audience delivery

CUSTOMER ENVIRONMENT

- Source encoders / VOD assets
- Network and identity ownership

PROCESSING DOMAIN

- Caption and translation services
- Speech and timed-text data

DELIVERY ENVIRONMENT

- Downstream players / CDN
- Subtitle routing and access

Review custody, retention, encryption, and third-party service connectivity before deployment.

Customer-Controlled Deployment Topology

Customer cloud and on-premises implementation options

CUSTOMER CLOUD

VPC / VNet boundary

- Compute and storage
- IAM / secrets
- Ingress and egress policy

ON-PREMISES

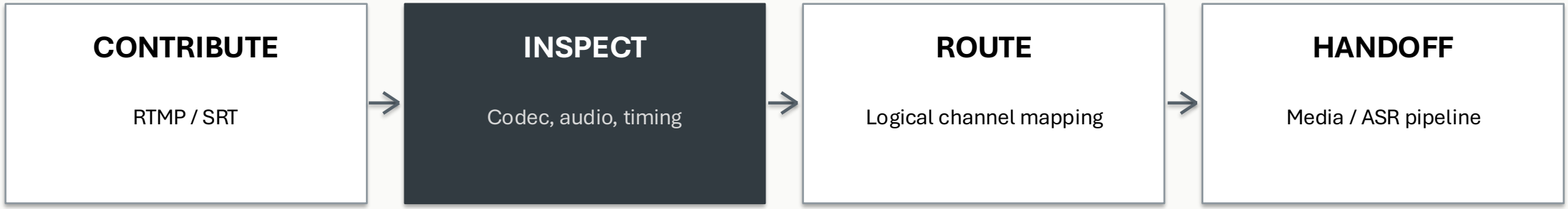
Customer data center

- Network and firewall rules
- Dependency management
- Restricted-network review

An isolated network does not imply an air-gapped or offline installation without validation.

Media Contribution Interface

Source-side transport, codec profiles and routing handoff



Input contract

- Source address / authentication
- Container and codec profile

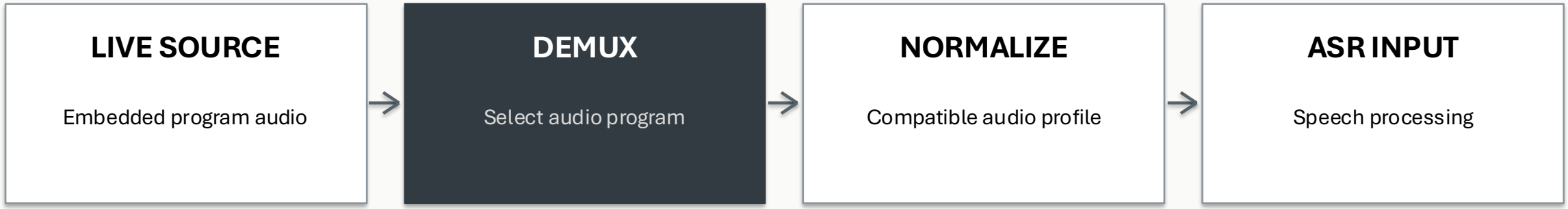
Network validation

- Bandwidth, loss and jitter
- Reconnect and source recovery

Exact transport, codec, and container profiles require integration testing.

Audio Extraction & Source Profile

Establish the media characteristics before recognition



Inspect

- Sampling / channel layout
- Timebase and source timestamps

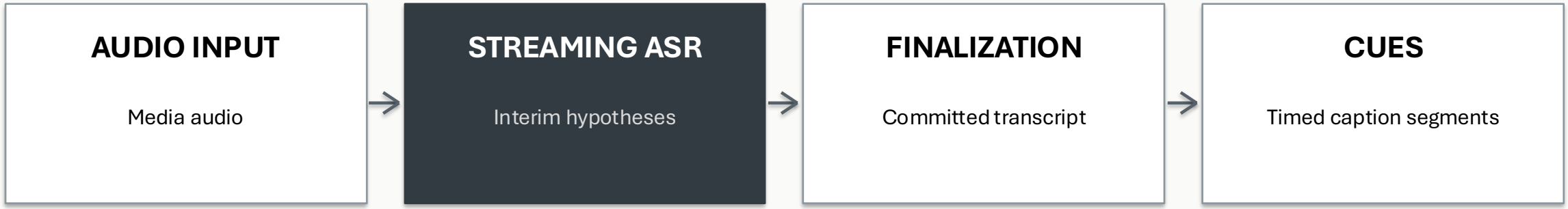
Confirm

- Language selection
- Audio quality / noise profile

Audio handling is a logical stage; exact codec support must be confirmed with the target source.

Streaming ASR Processing

Interim hypotheses, finalized recognition and caption cue assembly



Caption states

- Interim text may be revised
- Final text used for stable cues

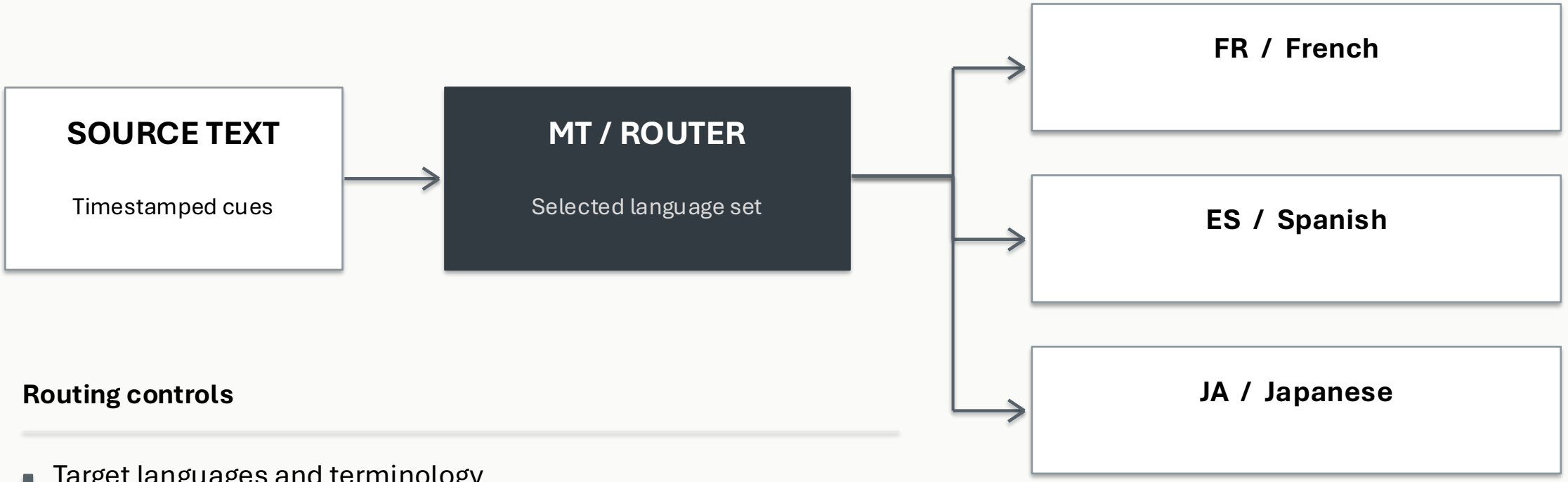
Review

- Language model configuration
- Timestamp and segmentation policy

Interim output and finalized captions have different latency and stability properties.

Multilingual Translation Fan-Out

Source captions routed into configured target languages



Routing controls

- Target languages and terminology
- Track identifiers and cue timing

Configured language availability and translation behavior depend on the deployment workflow.

Caption Segmentation & Timing

Speech timing, finalized cues and downstream synchronization

t_0	t_1	t_2	t_3	t_4
Source speech	ASR interim	Final caption	Translated cue	Viewer output

Measure

- Interim and finalized latency
- Subtitle-to-video alignment

Specify

- Timestamp basis and clock domains
- Target playback / buffering policy

Do not publish a universal latency SLA from a reference processing pipeline.

Subtitle Output Formats

Timed-text interfaces are selected by downstream endpoint

CEA-608 / 708

Broadcast caption insertion

Validate playout integration

WebVTT

Player and HLS subtitle tracks

Validate cue and playlist mapping

TTML

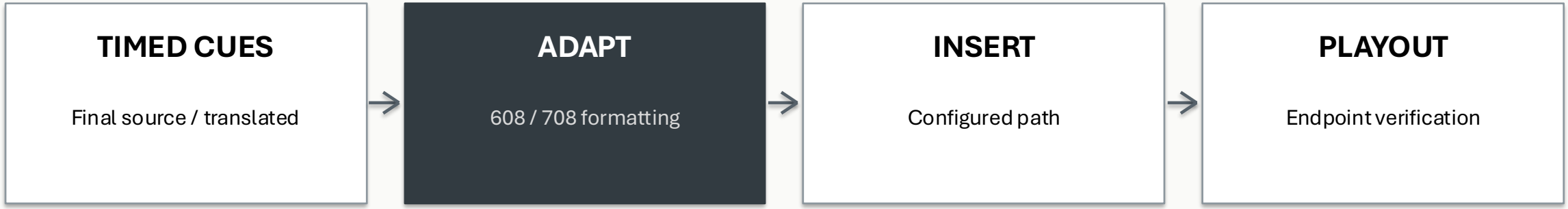
Timed Text Markup Language

Validate XML/profile compatibility

The insertion mechanism and supported output variant must be confirmed for each integration.

Broadcast Caption Integration

Embedded caption paths and downstream playout compatibility



Validate

- Caption character set / service
- Player or encoder compatibility

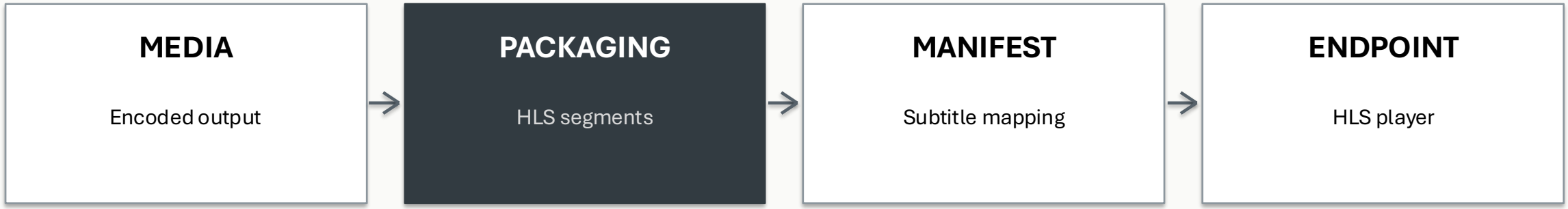
Confirm

- Caption carriage / insertion point
- Subtitle-to-program sync

Broadcast insertion is workflow-specific; diagram is not a universal 608/708 compatibility claim.

HLS Packaging & Track Mapping

Video renditions, media playlists and timed-text delivery



Inspect

- Playlist / rendition compatibility
- Track metadata and language tags

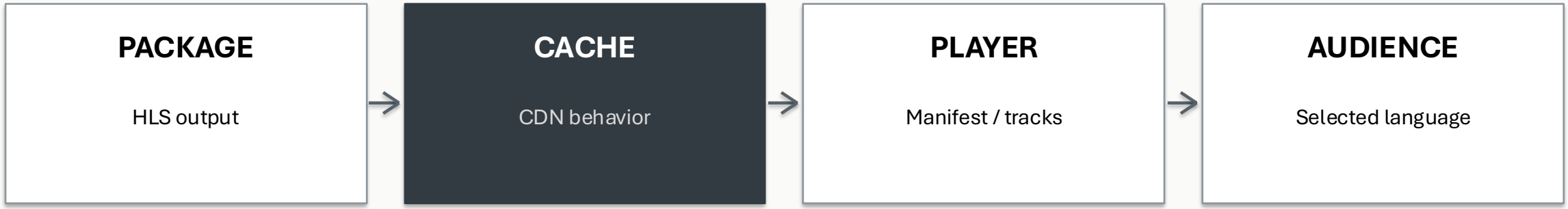
Verify

- Subtitle discovery and switching
- Live playback edge cases

HLS track behavior depends on the packaging profile, player and selected integration.

Distribution & Player Integration

CDN, player clock alignment and multilingual audience access



Integration tests

- Manifest refresh and live edge
- Track switching and device support

Clock behavior

- Audio/video versus caption drift
- PDT optional / alternative sync

CDN and player deployment dependencies must be tested in the customer environment.

Recorded Media Processing

Asynchronous VOD processing and subtitle asset generation



Input contract

- File / audio profiles
- Processing and job lifecycle

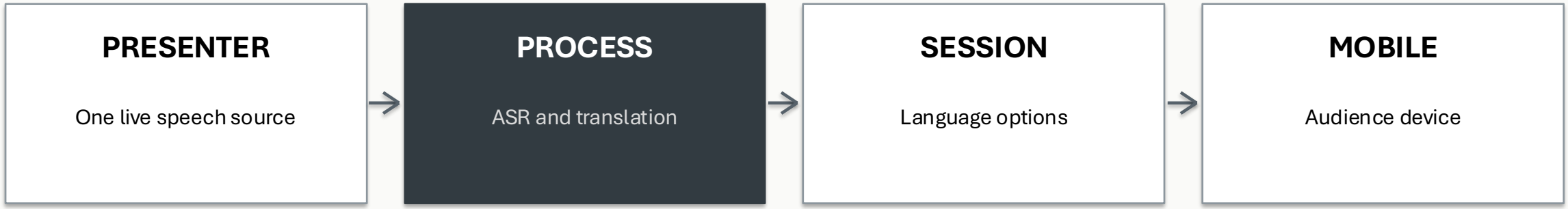
Output handoff

- Subtitle asset ownership
- Library metadata / indexing

Search and library indexing may be supplied by customer systems rather than the processing pipeline.

VL Mobile Live — Audience Access

One-to-many event captions and language selection on mobile devices



Session design

- Audience access and language choice
- Mobile-browser compatibility

Scope boundary

- One-to-many distribution
- Not interactive meeting translation

Do not position the workflow as bidirectional Zoom / Teams / Meet translation.

Security Boundaries & Governance

Map actual media and text data paths and access ownership

INPUT ZONE

- Contribution sources
- Transport security

PROCESSING ZONE

- ASR / MT service path
- Access and retention

OUTPUT ZONE

- CDN / endpoint access
- Caption data exposure

Data sovereignty, encryption, residency and external dependencies require deployment evidence.

Integration Interfaces & Dependencies

Determine which components the customer supplies and operates

CUSTOMER TEAM

- Source endpoint / access
- Identity and firewall policy
- Player / distribution endpoint

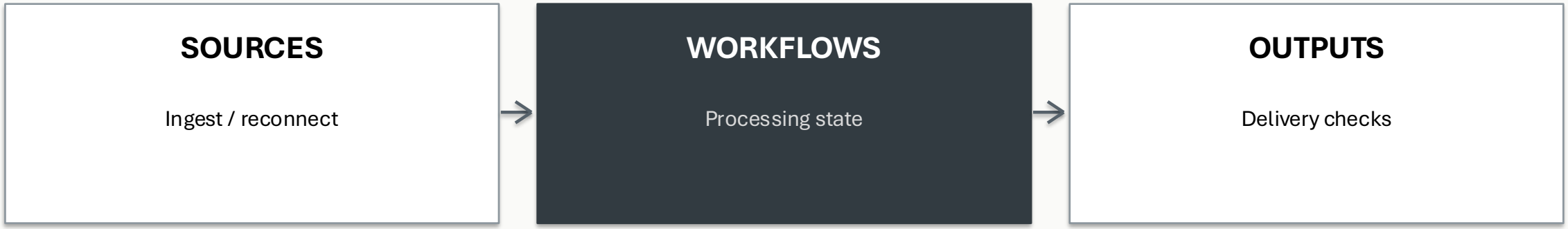
VIDEOLINQ INTEGRATION

- Media processing configuration
- Caption / translation workflow
- Output contract validation

Ownership of storage, monitoring and deployment operations is set in the integration plan.

Operations & Observability

Inspect contribution health, workflow state and delivery outcomes



Operational signals

- Source and session health
- Logs and alert ownership

Service response

- Incident routing and recovery
- Data retention / handoff

Monitoring availability and operational responsibility are confirmed in deployment review.

Failure Modes & Recovery Policy

Design for media loss, processing errors and downstream outages

SOURCE LOSS

Reconnect / backoff

Escalation and replacement

ASR / MT ERROR

Quality / service failure

Operator notification

OUTPUT FAILURE

Manifest or endpoint issue

Fallback / recovery procedure

These are review scenarios, not claims of automatically implemented failover behavior.

Performance Validation & Test Matrix

Agree measurable conditions before defining pass/fail criteria

TEST DOMAIN	EVIDENCE	ACCEPTANCE
Media ingest	Source profile log	Compatible / stable
Timing / latency	Timestamp and playback traces	Agreed thresholds
Subtitle output	Player and cue capture	Language / format correct
Recovery	Simulated service failure	Agreed response

Thresholds are project-specific; no universal measured performance figures are asserted.

Engineering Review — Open Decisions

Close specification gaps before production deployment

Interfaces and timing

- Supported input and output profiles
- Caption clock and sync method
- Player and playout compatibility

Deployment and operations

- Network and service dependencies
- Monitoring, storage and retention
- Incident and support ownership

Open design decisions remain project-specific until verified through engineering review.

Engineering Acceptance & Handover

Evidence-based verification, risk closure and controlled release

01 / INTERFACES

Accepted source and output contracts

02 / TIMING

Measured synchronization and latency

03 / OPERATIONS

Recovery, support and ownership

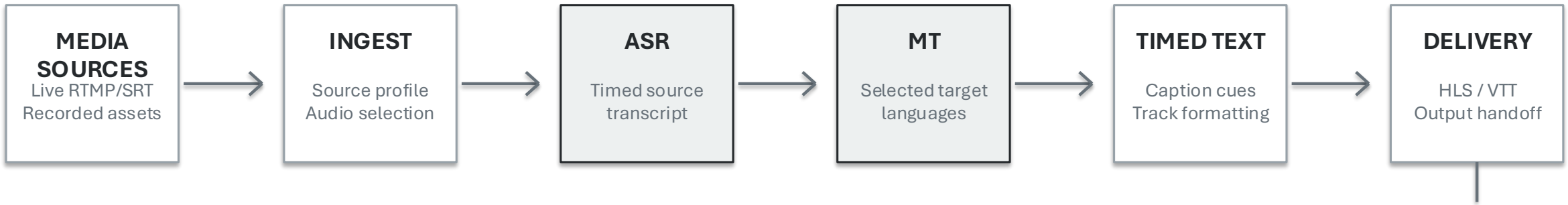
Release gate

- Agree test matrix and measurable thresholds
- Record defects, residual risks and engineering/customer sign-off

Reference review: production acceptance requires customer-approved criteria and evidence.

End-to-End System Operation

How live and recorded media move through the Videolinq processing workflow



OUTPUT CONTRACTS

LIVE	**HLS delivery / player integration**	WebVTT tracks; CEA-608/708 insertion where supported by the output workflow
VOD	**Recorded media / caption assets**	Timed-text files and library handoff; indexing depends on customer systems

CROSS-CUTTING: workflow orchestration · access controls · status / monitoring · deployment boundaries

Logical view only. Verify codecs, transport profiles, dependencies, latency, data flows and output compatibility per deployme nt.

Engineering Summary & Next Steps

Integration readiness requires verified interfaces, deployment assumptions, and acceptance evidence.

01

INTERFACES

Confirm source profiles, subtitle formats and delivery endpoints.

02

DEPLOYMENT

Agree network dependencies, security boundaries and ownership.

03

VERIFICATION

Measure synchronization, test recovery and document acceptance.

NEXT STEP

Define a customer-specific integration test plan and agree the criteria for technical sign-off.