Release Plan

ATCS-NG: Next Generation Air Traffic Control System | Document ID | Version | Status | Classification | |-------------|---------|--------|----------------| | RP-ATCS-2024-001 | 2.5.0 | Approved | Internal | | Author | Reviewers | Approvers | |--------|-----------|-----------| | Release Manager | Engineering, QA, Product | VP Engineering | | Created | Last Updated | Review Cycle | |---------|--------------|--------------| | 2024-12-01 | 2024-12-22 | Per Release |

Table of Contents

1. Release Overview

1.1 Release Information

```
                    RELEASE SUMMARY

    VERSION:          2.5.0
    CODENAME:         "Crisis Showcase"
    RELEASE TYPE:     Feature Release
    TARGET DATE:      December 22, 2024
    STATUS:           RELEASED

    DEPLOYMENT URL:   https://ui-client-595822882252.us-central1.run.app
```

1.2 Release Highlights

Category	Highlights
New Features	Cloud TTS integration, Hero Mode, ATC Command Display
Improvements	Slower pacing, extended crisis scenarios, autopilot tracking
Bug Fixes	Fixed dual audio issue, demo interruption bug
Technical	Google Cloud TTS API, improved state management

1.3 Target Audience

- ATC Training Instructors
- Aviation Demonstration Staff
- Product Stakeholders
- Internal Engineering Teams

2. Release Timeline

2.1 Milestone Timeline

```
                     RELEASE TIMELINE

DECEMBER 2024
_____

Week 1 (Dec 1-7)
    ┌──────────────────────────────────────────┐
    │   Cloud TTS API integration              │
    │   Multi-accent voice configuration       │
    │   Initial crisis scenarios drafted       │
    └──────────────────────────────────────────┘

Week 2 (Dec 8-14)
    ┌──────────────────────────────────────────┐
    │   Hero Mode implementation               │
    │   ATC Command Display component          │
    │   Demo pacing adjustments                │
    └──────────────────────────────────────────┘

Week 3 (Dec 15-21)
    ┌──────────────────────────────────────────┐
    │   Extended crisis scenarios with ATC commands │
    │   Autopilot status tracking              │
    │   Bug fixes (dual audio, demo interruption) │
    │   QA testing and validation              │
    └──────────────────────────────────────────┘

Week 4 (Dec 22)
    ┌──────────────────────────────────────────┐
    │   Final build and deployment             │
    │   Production verification                │
    │   Documentation update                   │
    │   RELEASE COMPLETE                       │
    └──────────────────────────────────────────┘
```

2.2 Key Dates

Milestone	Date	Status
Feature Freeze	Dec 20, 2024	Complete
Code Freeze	Dec 21, 2024	Complete
QA Sign-off	Dec 22, 2024	Complete
Production Deploy	Dec 22, 2024	Complete
Post-Release Review	Dec 29, 2024	Scheduled

3. Feature Summary

3.1 New Features

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+---------------------------------------------------------------+
|                         NEW FEATURES                          |
|---------------------------------------------------------------|
|                                                               |
|  FEATURE 1: CLOUD TTS INTEGRATION                    STATUS:   |
|  ————————————————————————————————                             |
|                                                               |
|  Description:                                                 |
|  Google Cloud Text-to-Speech API integration with Chirp3-HD   |
|  voices for multi-accent character voices in demo scenarios.  |
|                                                               |
|  Technical Details:                                           |
|  • 9 character voices (narrator, ATC, international pilots)    |
|  • Languages: en-US, en-GB, en-AU, en-IN, nb-NO, sv-SE         |
|  • Radio effects applied to ATC voice                         |
|  • Browser fallback for unsupported environments              |
|                                                               |
|  Files Changed:                                               |
|  • src/audio/CloudTTS.ts (new)                                |
|  • src/demo/components/NarratorPanel.tsx (modified)           |
|                                                               |
|  _____        |
|                                                               |
|  FEATURE 2: HERO MODE                                STATUS:   |
|  —————————————————————                                        |
|                                                               |
|  Description:                                                 |
|  Interactive emergency guidance feature for scenarios where   |
|  passengers must control aircraft due to crew incapacitation. |
|                                                               |
|  Technical Details:                                           |
|  • Step-by-step instruction overlay                           |
|  • Triggered via scenario events                              |
|  • Integration with demo state machine                        |
|  • Success/failure tracking                                   |
|                                                               |
|  Files Changed:                                               |
|  • src/components/HeroMode/HeroModePanel.tsx (modified)        |
|  • src/demo/scenarios/showcase-demo.ts (modified)             |
|                                                               |
|  _____        |
|                                                               |
|  FEATURE 3: ATC COMMAND DISPLAY                      STATUS:   |
|  ——————————————————————————————                              |
|                                                               |
|  Description:                                                 |
|  "YOU:" typing effect that shows ATC commands being issued,   |
|  with voice synthesis.                                        |
|                                                               |
|  Technical Details:                                           |
|  • Character-by-character typing animation (40ms/char)        |
|  • Cloud TTS integration for ATC voice                        |
|  • Status indicators (TYPING / TRANSMITTING)                  |
|  • Radio static visual effect during transmission            |
|                                                               |
|  Files Changed:                                               |
|  • src/demo/components/ATCCommandDisplay.tsx (new)            |
|  • src/demo/components/index.ts (modified)                    |
|  • src/demo/index.ts (modified)                               |
|  • src/App.tsx (modified)                                     |
|                                                               |
|  _____        |
|                                                               |
|  FEATURE 4: AUTOPILOT STATUS TRACKING                STATUS:   |
|  ————————————————————————————————————                        |
|                                                               |
|  Description:                                                 |
|  Track and display autopilot status for each aircraft,        |
|  showing mode and state.                                      |
|                                                               |
+---------------------------------------------------------------+
```

```
Technical Details:
• New Track fields: autopilotStatus, autopilotMode
• Status values: engaged, disengaged, manual, remote_guided
• Mode values: LNAV, VNAV, APP, HDG, AUTOLAND
• Visual indicators in flight strips and detail panels

Files Changed:
• src/types/index.ts (modified)
• src/demo/scenarios/showcase-demo.ts (modified)
```

3.2 Bug Fixes

Bug ID	Description	Root Cause	Fix
BUG-001	Dual audio playing	Both CloudTTS and browser TTS active	Disabled browser TTS during demo
BUG-002	Demo interrupted by clicks	setTimeout calling openMenu after 500ms	Removed problematic setTimeout
BUG-003	TTS not working in some browsers	AudioContext blocked	Added manual fallback button

3.3 Improvements

ID	Improvement	Details
IMP-001	Slower demo pacing	Doubled autoAdvance times (6-10s → 10-18s)
IMP-002	Extended scenarios	Added divert attempts, autopilot commands, ATC guidance
IMP-003	ATC phraseology	Authentic ATC language in all commands

4. Rollout Strategy

4.1 Deployment Process

```
                    DEPLOYMENT PROCESS

DEPLOYMENT STAGES
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Stage 1: Build

  ┌────────────────────────────────────────────────────┐
  │ • TypeScript compilation: npx tsc                  │
  │ • Production build: npm run build                  │
  │ • Output verification: Check dist/ size and structure │
  └────────────────────────────────────────────────────┘

Stage 2: Container Build

  ┌────────────────────────────────────────────────────┐
  │ • Cloud Build: gcloud builds submit                │
  │ • Image tag: us-central1-docker.pkg.dev/PROJECT/atcs-ng-repo/ui-client │
  │ • Build verification: Check image digest           │
  └────────────────────────────────────────────────────┘

Stage 3: Production Deploy

  ┌────────────────────────────────────────────────────┐
  │ • Deploy: gcloud run deploy ui-client              │
  │ • Configuration: port 8080, allow-unauthenticated  │
  │ • Health check: Verify new revision serving        │
  └────────────────────────────────────────────────────┘

Stage 4: Verification

  ┌────────────────────────────────────────────────────┐
  │ • Access production URL                            │
  │ • Run demo scenarios                               │
  │ • Verify TTS playback                              │
  │ • Test Hero Mode                                   │
  └────────────────────────────────────────────────────┘
```
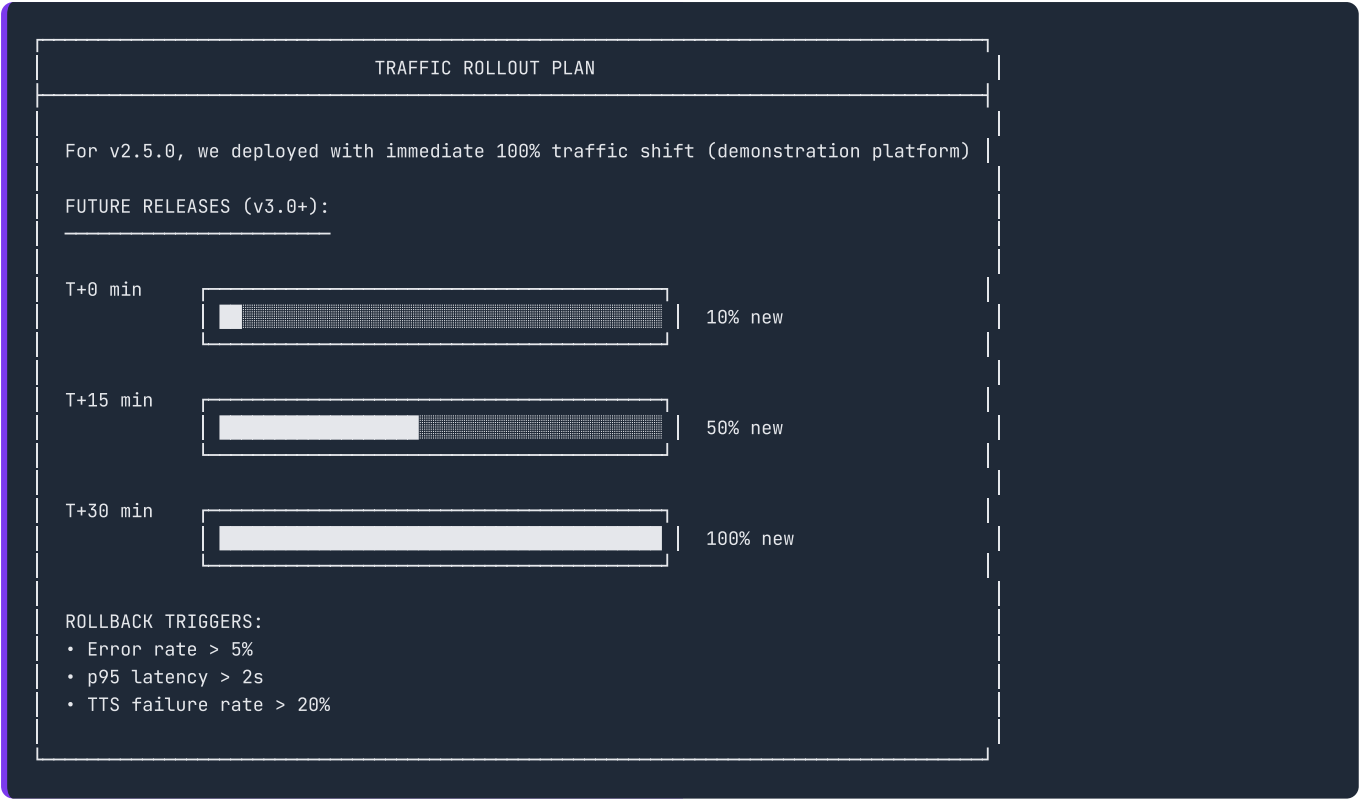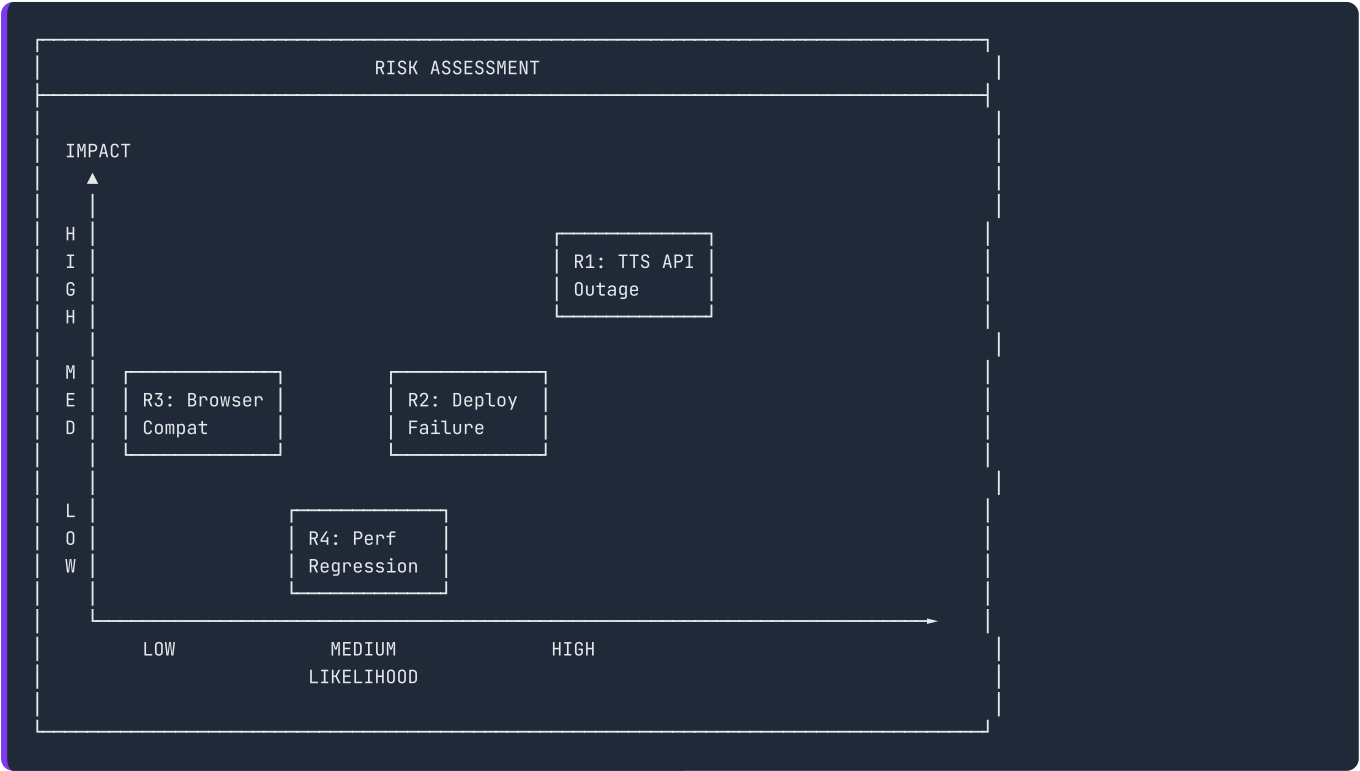
4.2 Traffic Rollout

```
┌─────────────────────────────────────────────────────────────┐
│                     TRAFFIC ROLLOUT PLAN                      │
├─────────────────────────────────────────────────────────────┤
│                                                               │
│  For v2.5.0, we deployed with immediate 100% traffic shift (demonstration platform) │
│                                                               │
│  FUTURE RELEASES (v3.0+):                                     │
│  ────────────────────────                                     │
│                                                               │
│  T+0 min                                                      │
│            ┌──────────────────────────────────┐              │
│            │ ▓░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░ │   10% new     │
│            └──────────────────────────────────┘              │
│                                                               │
│  T+15 min                                                     │
│            ┌──────────────────────────────────┐              │
│            │ ░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░ │   50% new     │
│            └──────────────────────────────────┘              │
│                                                               │
│  T+30 min                                                     │
│            ┌──────────────────────────────────┐              │
│            │ ░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░ │   100% new    │
│            └──────────────────────────────────┘              │
│                                                               │
│  ROLLBACK TRIGGERS:                                           │
│  • Error rate > 5%                                            │
│  • p95 latency > 2s                                           │
│  • TTS failure rate > 20%                                     │
│                                                               │
└─────────────────────────────────────────────────────────────┘
```

5. Success Criteria

5.1 Launch Criteria (Go/No-Go)

```
┌─────────────────────────────────────────────────────────────┐
│                       LAUNCH CRITERIA                         │
├─────────────────────────────────────────────────────────────┤
│                                                               │
│  MANDATORY (ALL MUST PASS)                                    │
│  ─────────────────────────                                    │
│                                                               │
│   ┌───────────────────────────────────────────────────────┐  │
│   │ Criterion               │ Target    │ Actual    │ Status │
│   │─────────────────────────┼───────────┼───────────┼───────│
│   │ Build succeeds          │ Pass      │ Pass      │        │
│   │ TypeScript compilation  │ 0 errors  │ 0 errors  │        │
│   │ Demo scenarios load     │ 100%      │ 100%      │        │
│   │ Cloud TTS functional    │ Working   │ Working   │        │
│   │ Browser TTS fallback available │ Working │ Working │     │
│   │ Hero Mode triggers correctly │ Working │ Working │       │
│   │ No P0 bugs open         │ 0         │ 0         │        │
│   └───────────────────────────────────────────────────────┘  │
│                                                               │
│  RESULT:    ALL CRITERIA MET - PROCEED WITH LAUNCH            │
│                                                               │
└─────────────────────────────────────────────────────────────┘
```

5.2 Post-Launch Success Metrics

Metric	Target	Measurement Period
Demo completion rate	> 90%	First 7 days
TTS success rate	> 95%	First 7 days
Hero Mode completion	> 80%	First 7 days
Error rate	< 1%	First 7 days
User satisfaction	> 4/5	First 30 days

6. Risk Assessment

6.1 Risk Matrix

6.2 Risk Mitigation

Risk	Impact	Likelihood	Mitigation	Owner
R1: TTS API Outage	High	Low	Browser fallback + fallback timer	Eng
R2: Deploy Failure	Medium	Low	Tested deploy process, rollback ready	Ops
R3: Browser Compat	Medium	Low	Cross-browser testing done	QA
R4: Perf Regression	Low	Medium	Performance budget monitored	Eng

7. Rollback Plan

7.1 Rollback Procedure

```
                    ROLLBACK PROCEDURE


ROLLBACK TRIGGERS
────────────────

Initiate rollback if ANY of the following occur:
• Error rate exceeds 5% for 5+ minutes
• p95 latency exceeds 3 seconds
• Critical functionality broken (demo won't start)
• Security vulnerability discovered

ROLLBACK STEPS
──────────────


Step 1: Identify Previous Revision

  # List revisions
  gcloud run revisions list --service=ui-client --region=us-central1

  # Note the previous stable revision (e.g., ui-client-00016-xyz)


Step 2: Route Traffic to Previous Revision

  gcloud run services update-traffic ui-client \
      --to-revisions=ui-client-00016-xyz=100 \
      --region=us-central1


Step 3: Verify Rollback

  • Access production URL
  • Verify previous version is serving
  • Monitor error rates


Step 4: Notify Stakeholders

  • Post in #engineering-alerts channel
  • Email release-team@company.com
  • Create incident report


TIME TO ROLLBACK: < 5 minutes
```

8. Launch Checklist

8.1 Pre-Launch Checklist

```
              PRE-LAUNCH CHECKLIST


 CODE & BUILD
 ─────────────

     All features merged to main branch
     TypeScript compilation passes with 0 errors
     Production build succeeds
     Bundle size within budget (< 2MB)
     No console errors in production build

 TESTING
 ───────

     All demo scenarios play through completely
     Cloud TTS voices working for all characters
     Browser TTS fallback tested
     Hero Mode triggers and completes
     ATC Command Display typing effect works
     3D/2D view toggle functional
     Cross-browser testing (Chrome, Firefox, Safari, Edge)

 INFRASTRUCTURE
 ───────────────

     Docker image built and pushed to Artifact Registry
     Cloud Run service configured correctly
     TTS API credentials configured
     Nginx configuration updated for SPA routing

 DOCUMENTATION
 ──────────────

     PRD updated for v2.5.0
     Design document updated
     Technical specification updated
     Release notes drafted

 MONITORING
 ──────────

     Cloud Logging accessible
     Error alerting configured
```

8.2 Launch Day Checklist

```
                    LAUNCH DAY CHECKLIST

    T-30 MINUTES
    ─────────────

        Final code review completed
        Build verified in staging
        Rollback plan reviewed
        On-call engineer available

    T-0 DEPLOY
    ─────────────

        Execute deployment command
        Wait for deployment to complete
        Verify new revision is serving

    T+5 MINUTES
    ─────────────

        Access production URL
        Run Crisis Showcase demo end-to-end
        Verify TTS playback
        Check error logs

    T+15 MINUTES
    ─────────────

        Monitor error rates
        Monitor latency
        Confirm no rollback needed

    T+30 MINUTES
    ─────────────

        Announce release in team channel
        Update deployment status
        Begin post-launch monitoring
```

9. Post-Launch Monitoring

9.1 Monitoring Dashboard

```
POST-LAUNCH MONITORING


KEY METRICS TO MONITOR (First 24 Hours)
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  Metric                 │ Threshold  │ Check Frequency
  ──────────────────────────────────────────────────────
  Error rate             │ < 1%       │ Every 5 minutes
  p50 latency            │ < 200ms    │ Every 5 minutes
  p95 latency            │ < 500ms    │ Every 5 minutes
  TTS API success rate   │ > 95%      │ Every 15 minutes
  Container restarts     │ 0          │ Every 30 minutes
  Memory usage           │ < 70%      │ Every 30 minutes


ALERT THRESHOLDS
──────────────


⚠  WARNING:  Error rate > 1%
   CRITICAL: Error rate > 5%
⚠  WARNING:  p95 latency > 500ms
   CRITICAL: p95 latency > 2s
   CRITICAL: Container restart detected


LOGS TO REVIEW
──────────────


# Check for errors
gcloud logging read "resource.type=cloud_run_revision AND severity>=ERROR" \
   --limit=50 --project=PROJECT

# Check TTS requests
gcloud logging read "textPayload:CloudTTS" --limit=50 --project=PROJECT
```

9.2 Monitoring Schedule

Time Period	Focus Areas	Escalation
T+0 to T+1h	Errors, latency, TTS	Page on-call for any critical
T+1h to T+24h	Error trends, usage patterns	Slack alert for warnings
T+24h to T+7d	User feedback, completion rates	Daily summary

10. Communication Plan

10.1 Stakeholder Communication

```
┌─────────────────────────────────────────────────────────────┐
│                    COMMUNICATION PLAN                        │
├─────────────────────────────────────────────────────────────┤
│                                                              │
│  RELEASE ANNOUNCEMENT                                        │
│  ──────────────────                                          │
│                                                              │
│  Channel: #engineering-releases                             │
│                                                              │
│  ┌────────────────────────────────────────────────────┐    │
│  │                                                     │    │
│  │     ATCS-NG v2.5.0 "Crisis Showcase" Released!     │    │
│  │                                                     │    │
│  │  **What's New:**                                    │    │
│  │  • Cloud TTS with multi-accent international voices  │    │
│  │  • Hero Mode for incapacitated crew scenarios       │    │
│  │  • "YOU:" ATC command display with typing effect    │    │
│  │  • Extended crisis scenarios with autopilot tracking│    │
│  │                                                     │    │
│  │  **Try it:** https://ui-client-595822882252.us-central1.run.app │
│  │                                                     │    │
│  │  **Docs:** See updated PRD and Design Document       │    │
│  │                                                     │    │
│  └────────────────────────────────────────────────────┘    │
│                                                              │
│  ESCALATION CONTACTS                                        │
│  ──────────────────                                          │
│                                                              │
│  ┌────────────────────────────────────────────────────┐    │
│  │                                                     │    │
│  │  Severity    │ Contact          │ Channel           │    │
│  │  ────────────────────────────────────────────       │    │
│  │  P0 Critical │ On-call Engineer │ PagerDuty         │    │
│  │  P1 High     │ Tech Lead        │ Slack DM + Phone  │    │
│  │  P2 Medium   │ Engineering Team │ #engineering-alerts│   │
│  │  P3 Low      │ Engineering Team │ GitHub Issue      │    │
│  │                                                     │    │
│  └────────────────────────────────────────────────────┘    │
│                                                              │
└─────────────────────────────────────────────────────────────┘
```

11. Appendix

11.1 Release Artifacts

Artifact	Location
Docker Image	`us-central1-docker.pkg.dev/PROJECT/atcs-ng-repo/ui-client:latest`
Production URL	`https://ui-client-595822882252.us-central1.run.app`
Source Code	`main` branch
Build Logs	Cloud Build History

11.2 Version History

Version	Date	Major Changes
2.5.0	Dec 22, 2024	Cloud TTS, Hero Mode, ATC Commands
2.0.0	Oct 15, 2024	Initial MVP with demo system
1.0.0	Sep 1, 2024	Internal prototype

11.3 Related Documents

- Product Requirements Document
- Design Document
- Technical Specification

This document is maintained by the Release Manager and updated per release.

hanaML

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