

System Architecture Diagrams V2

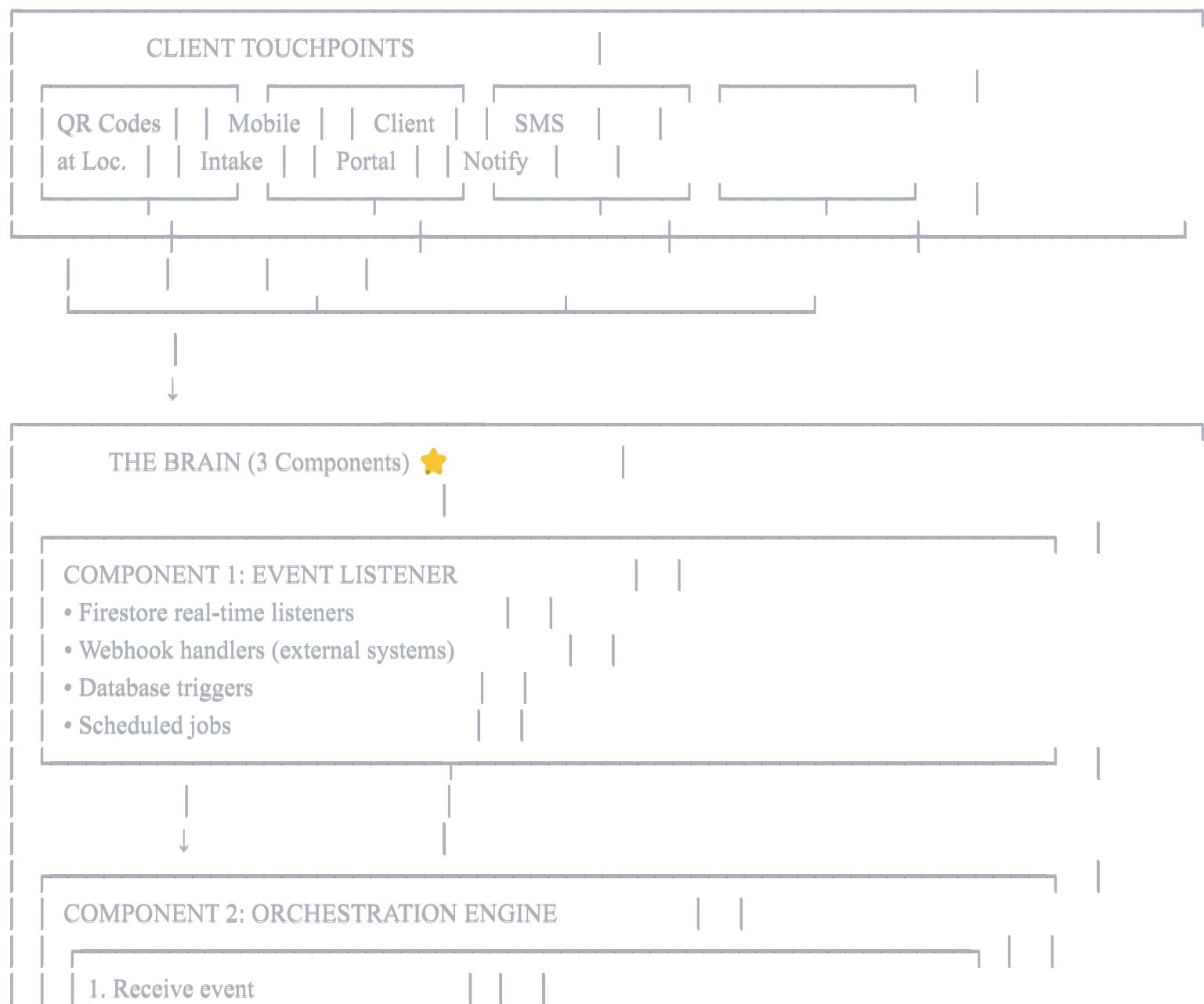
First Contact E.I.S. - Visual Reference for Development

Use these diagrams to regenerate flowchart images

DIAGRAM 1: COMPLETE SYSTEM OVERVIEW

FIRST CONTACT E.I.S.

The Brain for Human Services Coordination



2. Query context (full client history)

3. Make decision:

- Rules (95% of cases)
- AI (5% complex cases)

4. Plan coordination (multi-step)

5. Format recommendation

6. Present to caseworker

7. Store pattern for learning

COMPONENT 3: EXECUTION SERVICE

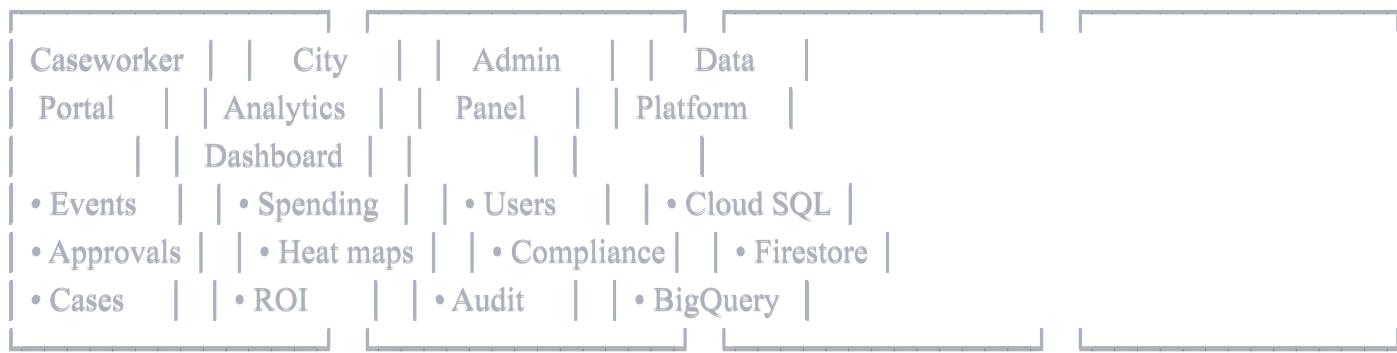
- Execute approved plans
- Call external APIs
- Send notifications
- Update all systems
- Track completion
- Handle errors/rollbacks

INTEGRATION LAYER (8+ Systems)

Doctor Offices Medi-Cal (IHSS) DPSS Transport Providers Housing

Employment Services Food Banks Mental Health Other Services

For Demo: Mock with fake API responses



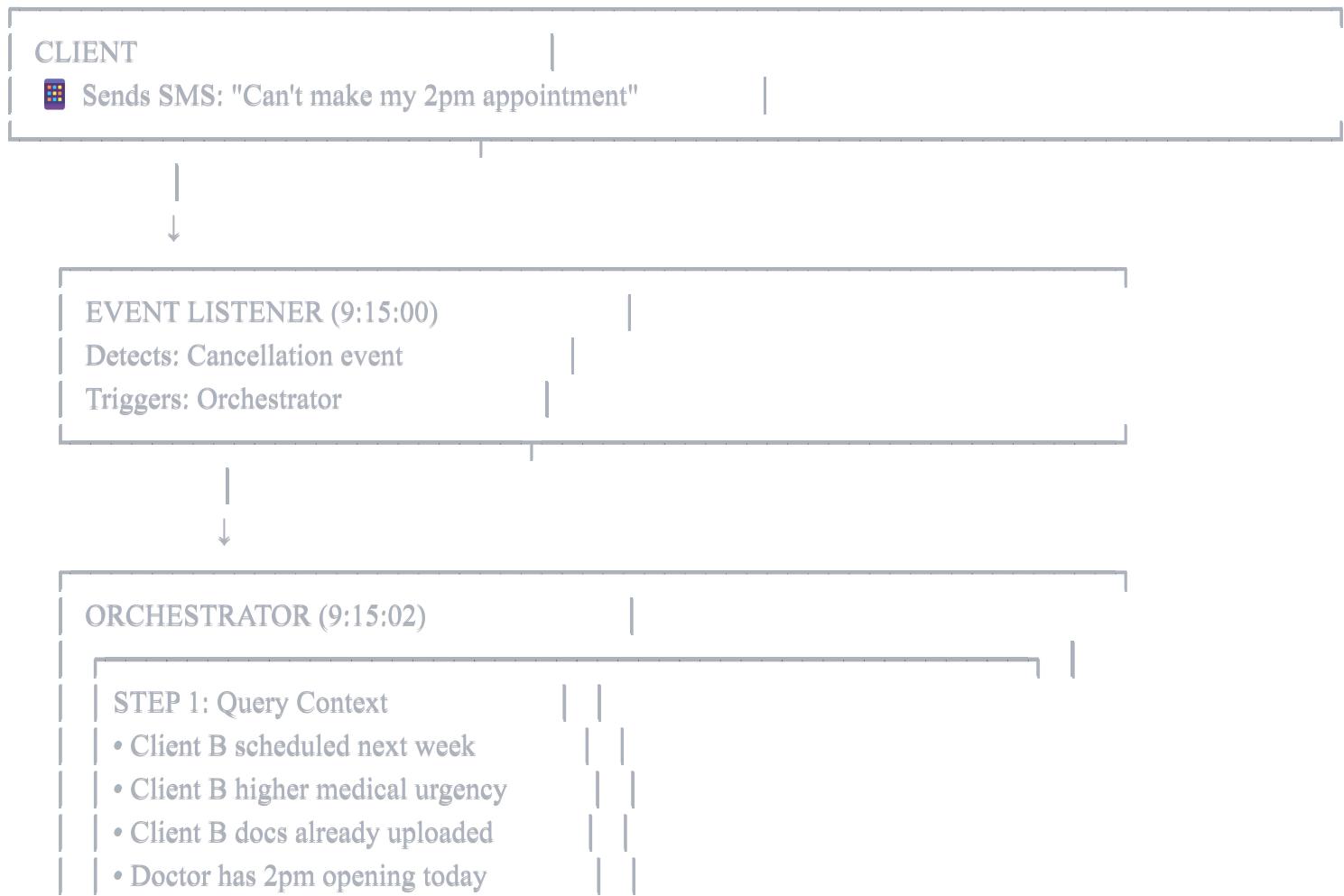
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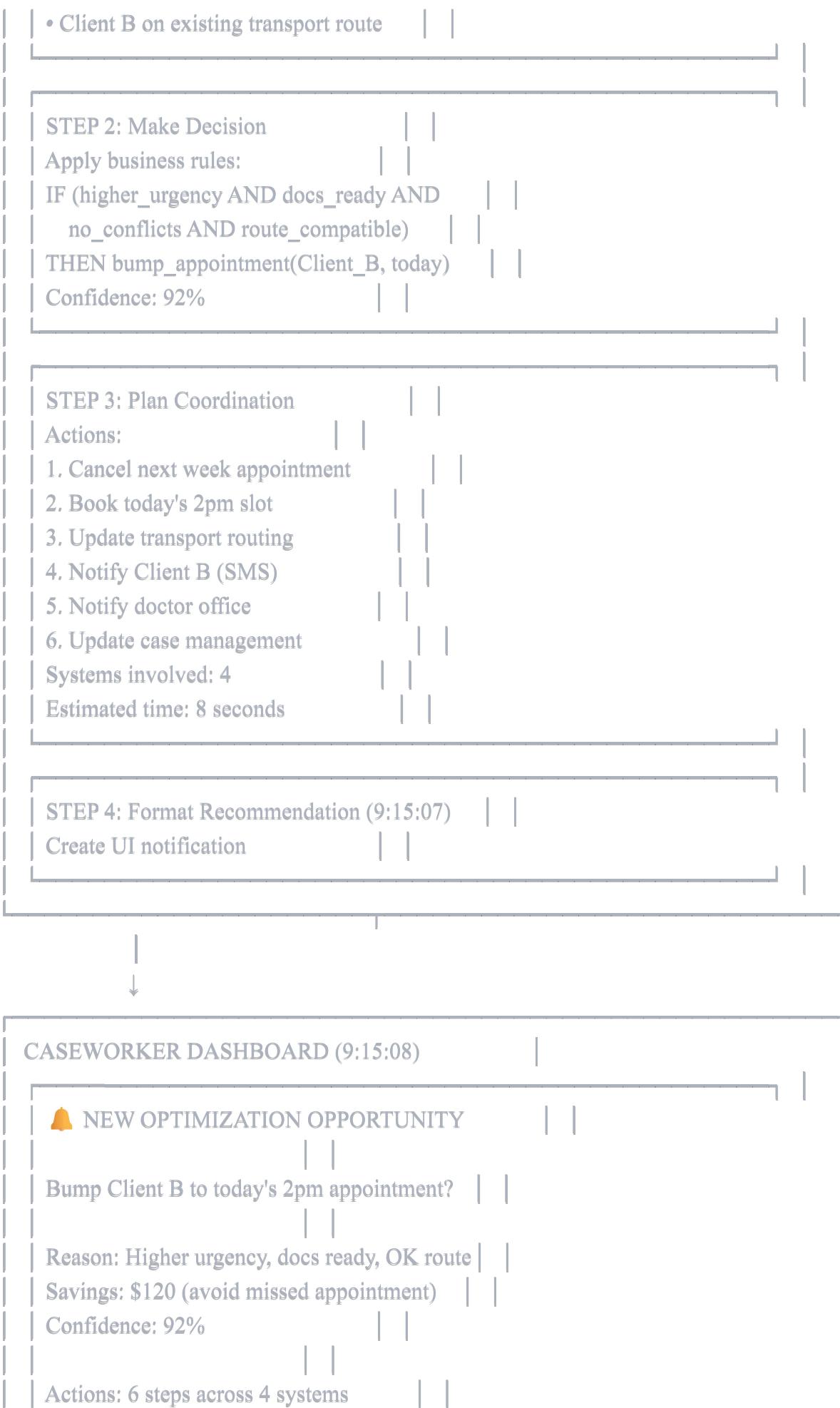
DIAGRAM 2: "CALLING AN AUDIBLE" - DETAILED FLOW

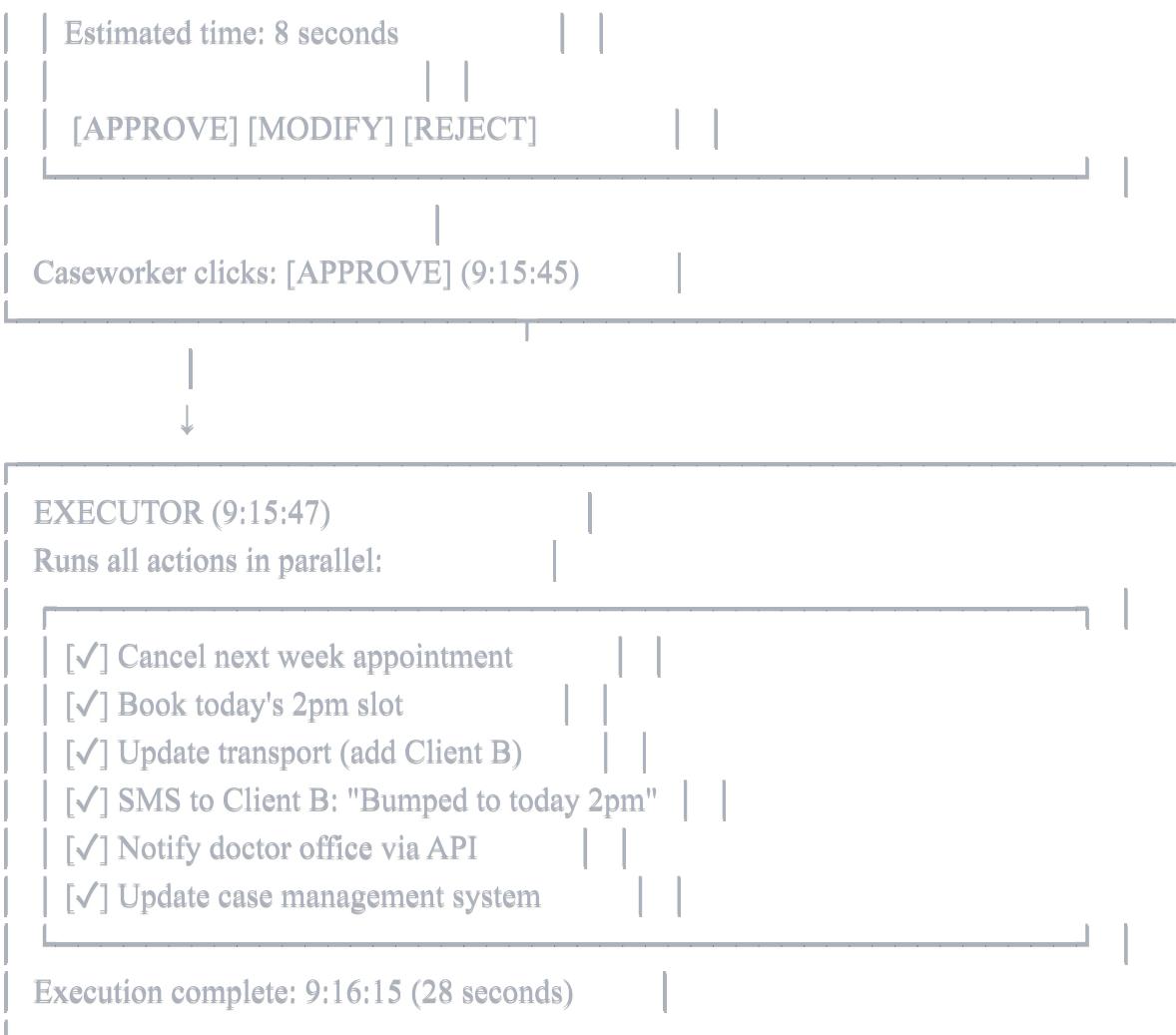
THE KILLER FEATURE: Real-Time Optimization

TIME: 9:15 AM

EVENT: Client cancels appointment







TOTAL TIME: 60 seconds (detect to complete)

AI WORK: 95% (context, decision, planning, execution)

HUMAN WORK: 5% (one click approval)

RESULT: Zero wasted appointments, better care for urgent client

Traditional system: 2-4 hours of manual work, often unfilled slot

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DIAGRAM 3: DATA FLOW ARCHITECTURE

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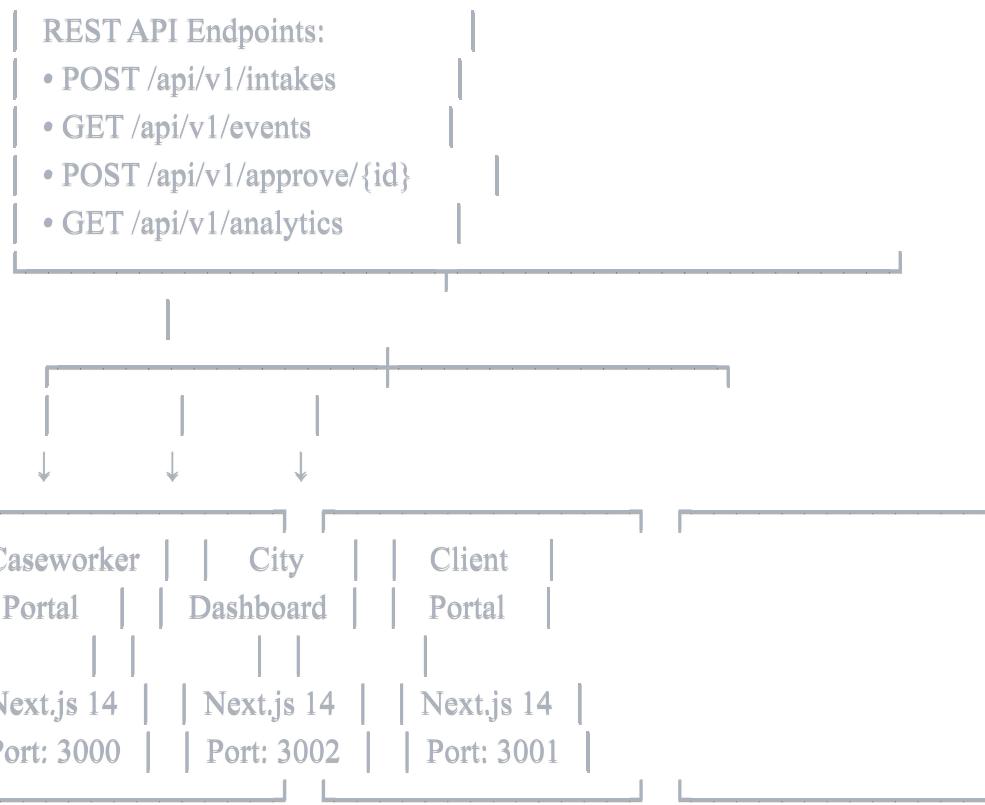
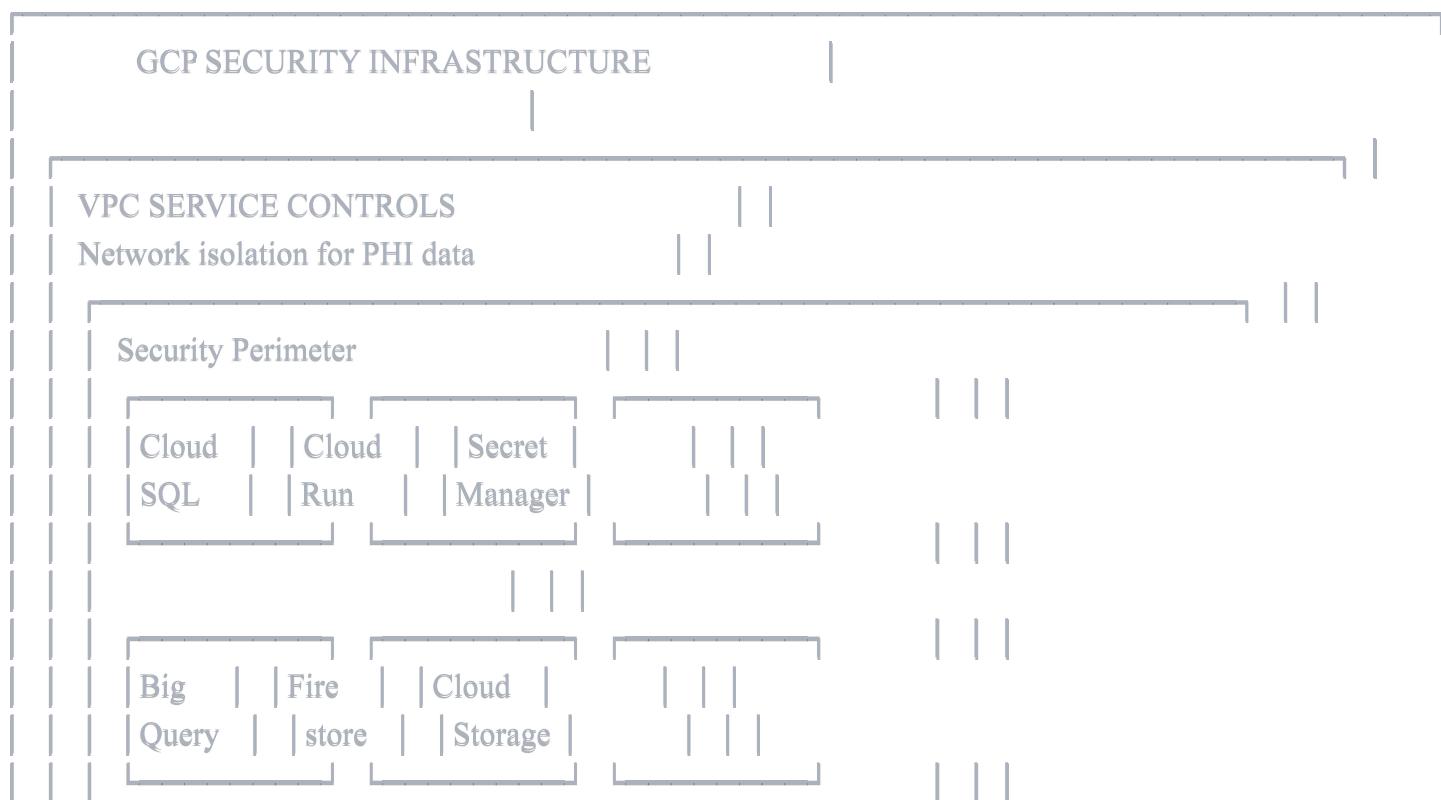


DIAGRAM 4: SECURITY & COMPLIANCE ARCHITECTURE



CLOUD ARMOR (DDoS Protection)

- Rate limiting
- IP filtering
- Bot protection

CLOUD IDENTITY & IAM

- Single sign-on (SSO)
- Multi-factor auth (MFA)
- Role-based access control (RBAC)

CLOUD KMS (Key Management)

- Encryption keys
- Rotation policies
- HSM backing

CLOUD AUDIT LOGS

- Admin activity logs
- Data access logs
- System event logs
- Retention: 400 days

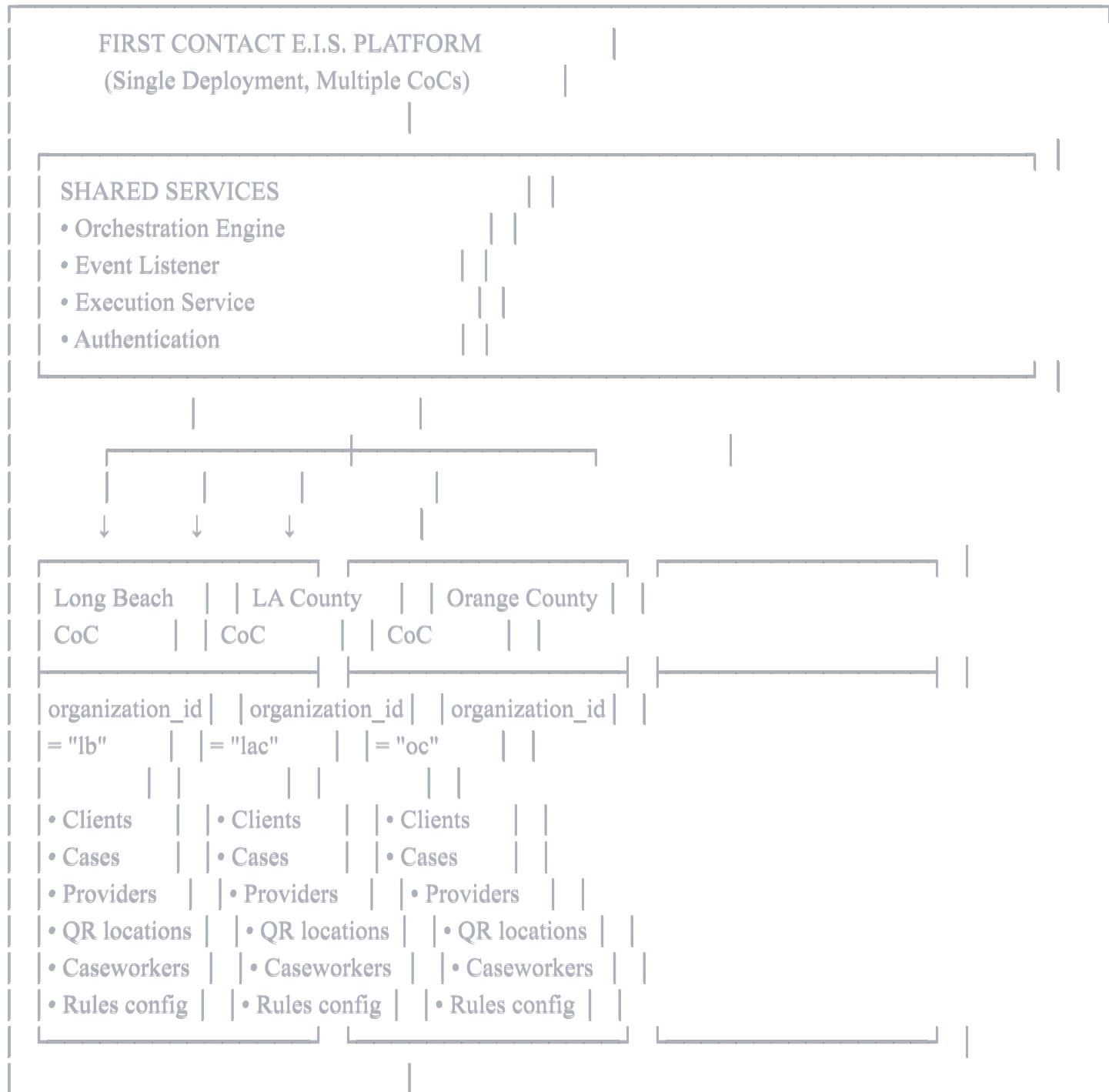
DATA LOSS PREVENTION API

- PII detection
- PHI scanning
- Automatic redaction

COMPLIANCE STANDARDS:

- HIPAA (PHI protection)
 - HUD HMIS Data Standards FY 2026
 - SOC 2 Type II (security controls)
 - WCAG 2.1 AA (accessibility)
- ...
-

DIAGRAM 5: MULTI-TENANT ARCHITECTURE



DATA ISOLATION:

- All queries filtered by organization_id
- Row-level security in Cloud SQL
- Separate Firestore collections per org
- BigQuery partitioned by organization

CUSTOMIZATION:

- QR codes specific to geographic locations
- Business rules configurable per CoC
- Branding/white-labeling
- Feature flags per organization

SCALABILITY:

- Single codebase serves 400+ CoCs
- Marginal cost per new CoC: ~\$50/month
- Revenue per CoC: \$1,200-1,500/month
- Margins: 95%+

...

DIAGRAM 6: DEPLOYMENT ARCHITECTURE

GOOGLE CLOUD PLATFORM

Project: einharjer-valhalla

Region: us-east5

CLOUD RUN (Serverless Containers)

Backend API | Caseworker | City

(FastAPI) | Frontend | Dashboard

| (Next.js) | (Next.js)

Min: 1 | Min: 0 | Min: 0

Max: 10 | Max: 5 | Max: 3

| | | | | | | | | |

CPU: 2 | CPU: 1 | CPU: 1

RAM: 2GB | RAM: 512MB | RAM: 512MB

~\$50/month | | | ~\$20/month | | | ~\$15/month | | |

Client | Admin

Portal | Panel

(Next.js) | (Next.js)

Min: 0 | Min: 0

Max: 3 | Max: 2

CPU: 1 | CPU: 1

RAM: 512MB | RAM: 512MB

~\$15/month | | | ~\$10/month | | |

CLOUD SQL (PostgreSQL 15)

- Instance: db-n1-standard-1
- Storage: 10GB SSD (auto-grow)
- Backups: Daily automated
- HA: Regional (auto-failover)
- Cost: ~\$80/month

FIRESTORE (Native Mode)

- Real-time notifications
- Event streaming
- Chat messages
- Cost: ~\$50/month (est)

BIGQUERY

- Analytics queries
- ML model training
- Reporting

- Cost: ~\$100/month (query-based)

VERTEX AI

- Claude 4.5 Sonnet
- Model: claudе-sonnet-4-5@20250929
- Usage: ~5% of decisions (ambiguous cases)
- Cost: ~\$200/month (estimated)

CLOUD STORAGE

- Documents, backups
- Cost: ~\$20/month

OTHER SERVICES

- Secret Manager: ~\$5/month
- Cloud Build: ~\$20/month
- Artifact Registry: ~\$10/month
- Load Balancing: ~\$20/month
- Cloud CDN: ~\$30/month

TOTAL OPERATIONAL COST: \$575-850/month

(Scales efficiently with multi-tenant architecture)

DIAGRAM 7: CASEWORKER DASHBOARD MOCKUP

First Contact E.I.S. - Caseworker Dashboard

 Sarah Johnson | City of Long Beach |  3 new events

NEW OPTIMIZATION OPPORTUNITY

9:15am

Bump Client B to today's 2pm appointment?

Reason:

- Client B has higher medical urgency
- All required documents already uploaded
- Lives on existing transport route
- No scheduling conflicts

Impact:

- Avoid \$120 wasted appointment slot
- Better care for higher-urgency case
- Optimal resource utilization

Actions (6 steps across 4 systems):

1. Cancel next week's appointment
2. Book today's 2pm slot
3. Update transport routing (add Client B)
4. Send SMS notification to Client B
5. Notify doctor office via API
6. Update case management system

Estimated execution time: 8 seconds

Confidence: 92%

[APPROVE] [MODIFY] [REJECT]

INFO: Document Uploaded

8:43am

Client B uploaded medical records
Status: Verified ✓ | All documents complete
[View Documents]

COMPLETED: Housing Application Yesterday 3pm

Client A: Submitted application to Pine Street Housing
Next step: Wait for provider response (3-5 days)
[View Details]

TODAY'S METRICS

Recommendations approved: 4
Time saved: 3.2 hours
Cost savings: \$480
Active cases: 23

Use these diagrams to:

1. Regenerate flowchart images (use Figma, Lucidchart, draw.io)
2. Reference during development
3. Explain architecture to stakeholders
4. Create pitch deck visuals
5. Train new team members

Remember: Simple architecture = easier to explain = easier to sell