Task Execution Flow: Complete Technical Deep Dive

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Overview

This document provides a complete technical deep dive into how task execution works in the AI-Agent-API, from HTTP request to Claude Code CLI subprocess and back.

What Happens When You Execute a Task

```
HTTP POST /api/v1/tasks/{id}/execute
    ↓
Task Service creates execution record
    ↓
Session Service creates dedicated session
    ↓
Claude SDK Client Manager spawns Claude Code CLI subprocess
    ↓
Message sent to Claude via subprocess stdin/stdout
    ↓
Claude Code CLI executes in isolated working directory
    ↓
Responses streamed back and persisted
    ↓
Optional report generated
    ↓
HTTP 202 Accepted returned to client
```

Complete Execution Flow

Phase 1: API Request Handling

File: `app/api/v1/tasks.py:258-312`

```python
@router.post("/{task_id}/execute")
async def execute_task(
```

```
    task_id: UUID,
    request: TaskExecuteRequest,  # Contains variables dict
    current_user: User,
    db: AsyncSession,
):
```

Steps:

1. **Authentication** via JWT token (line 262)
2. **Get Task** from database (line 281)
3. **Ownership Check** (line 289-294)
4. **Call TaskService.execute_task()** (line 297-301)

HTTP Request:

```
POST /api/v1/tasks/75318f39-9feb-4ff6-a381-f377d38fd1be/execute
Authorization: Bearer eyJhbGciOiJIUzI1NiIs...
Content-Type: application/json

{
  "variables": {
    "cluster_name": "production"
  }
}
```

Phase 2: Task Service Execution

File: app/services/task_service.py:138-334

Step 2.1: Validate Task (lines 176-186)

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```
task = await self.task_repo.get_by_id(task_id)
if not task:
    raise TaskNotFoundError()
if not task.is_active:
    raise ValidationError("Task is not active")
```

Database Query:

```
SELECT * FROM tasks
WHERE id = '75318f39-9feb-4ff6-a381-f377d38fd1be'
  AND is_deleted = false;
```

Step 2.2: Create Task Execution Record (lines 189-211)

```
execution = TaskExecution(
    id=uuid4(),
    task_id=task.id,
    user_id=task.user_id,
    trigger_type="manual",
    variables={"cluster_name": "production"},
    status=TaskExecutionStatus.PENDING,
)
```

Database Insert:

```
INSERT INTO task_executions (
    id, task_id, user_id, trigger_type,
    variables, status, started_at
) VALUES (
    '660e8400-e29b-41d4-a716-446655440001',
    '75318f39-9feb-4ff6-a381-f377d38fd1be',
    '94d9f5a2-1257-43ac-9de2-6d86421455a6',
    'manual',
    '{"cluster_name": "production"}',
    'pending',
    NOW()
);
```

Step 2.3: Create Dedicated Session (lines 215-244)

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```
session_service = SDKIntegratedSessionService(...)

session = await session_service.create_session(
    user_id=task.user_id,
    name=f"Task: Kubernetes Cluster Health Check (manual)",
    description="Automated execution of task 'Kubernetes Cluster Health
Check'",
    sdk_options=task.sdk_options,  # Contains MCP config, allowed_tools,
model, etc.
)
```

What This Creates:

- New session record in `sessions` table
- Isolated working directory: `/workspace/me/repositories/ai-agent/ai-agent-api/data/agent-workdirs/active/{session_id}/`
- Session status: `CREATED`

Database Insert:

```
INSERT INTO sessions (
    id, user_id, name, description, mode, status,
    working_directory_path, sdk_options, created_at
) VALUES (
    '770e8400-e29b-41d4-a716-446655440002',
    '94d9f5a2-1257-43ac-9de2-6d86421455a6',
    'Task: Kubernetes Cluster Health Check (manual)',
    'Automated execution...',
    'interactive',
    'created',
    '/workspace/.../data/agent-workdirs/active/770e8400...',
    '{...}',
    NOW()
);
```

Step 2.4: Update Execution Status to RUNNING (lines 237-244)

```
execution.session_id = session.id
execution.status = TaskExecutionStatus.RUNNING
await self.task_execution_repo.update(
    str(execution.id),
    session_id=session.id,
    status="running",
)
```

Database Update:

```
UPDATE task_executions
SET session_id = '770e8400-e29b-41d4-a716-446655440002',
    status = 'running',
    updated_at = NOW()
WHERE id = '660e8400-e29b-41d4-a716-446655440001';
```

Step 2.5: Render Prompt Template (lines 247-250)

```
rendered_prompt = self._render_prompt_template(
    task.prompt_template,
    variables={"cluster_name": "production"},
)
```

Template Rendering:

```
Input Template:
"IMPORTANT: This is a READ-ONLY health check...
Perform a comprehensive Kubernetes cluster health check
using ~/.kube/config for the {cluster_name} cluster:..."

Variables:
{"cluster_name": "production"}

Rendered Output:
"IMPORTANT: This is a READ-ONLY health check...
Perform a comprehensive Kubernetes cluster health check
using ~/.kube/config for the production cluster:..."
```

Step 2.6: Send Message Through Session (lines 254-257)

```
message = await session_service.send_message(
    session_id=str(session.id),
    message_content=rendered_prompt,
)
```

This triggers the most complex part of the system...

Phase 3: SDK Integrated Session Service

File: `app/services/sdk_session_service.py:83-255`

Step 3.1: Validate Session State (lines 128-140)

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```
session = await self.get_session(session_id, user_id)

if session.status not in [SessionStatus.CREATED, SessionStatus.ACTIVE,
SessionStatus.CONNECTING]:
    raise SessionNotActiveError()
```

Step 3.2: Session State Transitions (lines 143-170)

Transition 1: CREATED → CONNECTING (lines 149-152)

```
session.transition_to(SessionStatus.CONNECTING)
await self.session_repo.update(session_id, status="connecting")
await self.db.commit()
```

Database Update:

```
UPDATE sessions
SET status = 'connecting', updated_at = NOW()
WHERE id = '770e8400-e29b-41d4-a716-446655440002';
```

Setup SDK Client (lines 155-160)

```
if not self.sdk_client_manager.has_client(session_id):
    await self._setup_sdk_client(session, user_id)
```

Transition 2: CONNECTING → ACTIVE (lines 162-165)

```
session.transition_to(SessionStatus.ACTIVE)
await self.session_repo.update(session_id, status="active")
await self.db.commit()
```

Transition 3: ACTIVE → PROCESSING (lines 172-175)

```
session.transition_to(SessionStatus.PROCESSING)
await self.session_repo.update(session_id, status="processing")
await self.db.commit()
```

Step 3.3: Setup SDK Client (lines 256-373)

File: `app/services/sdk_session_service.py:256-373`

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3.3.1: Build MCP Configuration (lines 279-303)

```
from app.mcp import MCPConfigBuilder

mcp_config_builder = MCPConfigBuilder(mcp_server_repo)
mcp_config = await mcp_config_builder.build_session_mcp_config(
    user_id=user_id,
    include_sdk_tools=True,  # Includes kubernetes_readonly, database,
monitoring
)
```

What This Does:

- Loads SDK MCP servers from `app/mcp/mcp_servers.py`

    - `kubernetes_readonly` - 3 tools (get_pods, get_deployments, get_namespaces)
    - `database` - 2 tools (query_database, list_tables)
    - `monitoring` - 2 tools (check_health, get_metrics)
- Loads user's personal MCP servers from `mcp_servers` table
- Loads global MCP servers from `mcp_servers` table where `is_global=true`
- Merges all into single MCP config dict

MCP Config Structure:

```
{
    "kubernetes_readonly": {
        "command": "npx",
        "args": ["-y", "@modelcontextprotocol/server-kubernetes"],
        "env": {"KUBECONFIG": "/home/msalah/.kube/config"}
    },
    "database": {
        "command": "python",
        "args": ["/path/to/mcp_database_server.py"],
        "env": {}
    },
    # ... more servers
}
```

3.3.2: Merge MCP Config into Session (lines 305-326)

```
sdk_options_dict = session.sdk_options.to_dict()
sdk_options_dict["mcp_servers"] = mcp_config

session.sdk_options = SDKOptions.from_dict(sdk_options_dict)

await self.session_repo.update(
    str(session.id),
    sdk_options=sdk_options_dict
)
await self.db.commit()
```

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Database Update:

```
UPDATE sessions
SET sdk_options = '{
    "model": "claude-3-5-sonnet-20241022",
    "max_tokens": 16384,
    "allowed_tools": ["Read", "Write", "Bash"],
    "mcp_servers": {
        "kubernetes_readonly": {...},
        "database": {...}
```

```
    }
}',
updated_at = NOW()
WHERE id = '770e8400-e29b-41d4-a716-446655440002';
```

3.3.3: Create Permission Callback (lines 328-332)

```
permission_callback =
self.permission_service.create_permission_callback(
    session_id=session.id,
    user_id=user_id,
)
```

What This Creates:
A Python callable that gets called BEFORE each tool use:

```
async def permission_callback(tool_name: str, args: dict) -> bool:
    # Check if tool is in allowed_tools list
    # Log permission decision to audit_logs table
    # Return True/False
```

3.3.4: Create Hooks (lines 334-361)

```
hooks = {
    "PreToolUse": [
        HookMatcher(hooks=[
            create_audit_hook(session.id, audit_service),
            create_tool_tracking_hook(session.id, db, tool_call_repo),
        ]),
    ],
    "PostToolUse": [
        HookMatcher(hooks=[
            create_audit_hook(session.id, audit_service),
            create_tool_tracking_hook(session.id, db, tool_call_repo),
            create_cost_tracking_hook(session.id, db, session_repo),
        ]),
    ],
}
```

Hook Functions:

- **Audit Hook**: Logs to `audit_logs` table
- **Tool Tracking Hook**: Creates records in `tool_calls` table with status, args, results
- **Cost Tracking Hook**: Updates session cost metrics (input_tokens, output_tokens, total_cost)

3.3.5: Create SDK Client (lines 363-372)

```
await self.sdk_client_manager.create_client(
    session=session,
    permission_callback=permission_callback,
    hooks=hooks,
)
```

This calls into `ClaudeSDKClientManager`...

Phase 4: Claude SDK Client Manager

File: `app/claude_sdk/client_manager.py:56-139`

Step 4.1: Build ClaudeAgentOptions (lines 102, 209-260)

```
options = self._build_options(session, permission_callback, hooks)
```

Converts to Official SDK Format:

```
ClaudeAgentOptions(
    allowed_tools=["Read", "Write", "Bash"],
    disallowed_tools=[],
    permission_mode="default",
    model="claude-3-5-sonnet-20241022",
    max_turns=None,
    cwd="/workspace/.../data/agent-workdirs/active/770e8400.../",
    mcp_servers={
        "kubernetes_readonly": {...},
        "database": {...},
    },
    system_prompt=None,
    env={},
    add_dirs=[],
    settings=None,
    can_use_tool=<permission_callback function>,
    permission_prompt_tool_name="stdio",
    hooks={...},
)
```

Step 4.2: Create Official SDK Client (line 105)

```
client = ClaudeSDKClient(options=options)
```

What This Is:

- Official `claude-agent-sdk` package client
- NOT our custom code
- Installed via `pip install claude-agent-sdk`

Step 4.3: Connect to Claude Code CLI (lines 108-126)

```
await client.connect(prompt=None)
```

What This Does (Inside Official SDK):

1. Spawns subprocess: `claude-code` CLI
2. Sets working directory to `cwd` option
3. Passes MCP config via env variables or config file
4. Opens stdin/stdout pipes for communication
5. Waits for "ready" signal from CLI

Actual Command Executed:

```
cd /workspace/.../data/agent-workdirs/active/770e8400.../

claude-code \
  --model claude-3-5-sonnet-20241022 \
  --mcp-servers '{"kubernetes_readonly": {...}}' \
  --allowed-tools "Read,Write,Bash" \
  --permission-mode default
```

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Environment Variables Set:

```
ANTHROPIC_API_KEY=sk-ant-...
KUBECONFIG=/home/msalah/.kube/config
```

Step 4.4: Store Client in Pool (line 129)

```
self._clients[session_id] = client
```

Client Pool State:

```
```

```
{
    UUID('770e8400-e29b-41d4-a716-446655440002'): <ClaudeSDKClient
object>
}
```

Phase 5: Send Message to Claude

File: `app/services/sdk_session_service.py:180-226`

Step 5.1: Get Client from Pool (line 180)

```
client = await self.sdk_client_manager.get_client(session_id)
```

Step 5.2: Send Query to Claude (line 190)

```
await client.query(message_text)
```

What This Does (Inside Official SDK):

1. Writes message to Claude Code CLI stdin:

```
{
  "type": "user_message",
  "content": "IMPORTANT: This is a READ-ONLY health check...\nPerform a
comprehensive Kubernetes cluster health check..."
}
```

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2. Claude Code CLI receives message
3. Sends to Anthropic API
4. Starts streaming response

Step 5.3: Process Response Stream (lines 194-226)

```
message_processor = MessageProcessor(
    db=self.db,
    message_repo=self.message_repo,
    tool_call_repo=self.tool_call_repo,
    session_repo=self.session_repo,
    event_broadcaster=self.event_broadcaster,
)
```

```
async for message in message_processor.process_message_stream(
    session=session,
    sdk_messages=client.receive_response(),  # Stream from Claude Code
CLI stdout
):
    yield message
```

Stream Format from Claude Code CLI:

```
{"type": "assistant_message_start", "id": "msg_123"}
{"type": "content_block_delta", "delta": {"text": "I'll check the
Kubernetes cluster health..."}}
{"type": "tool_use", "name": "Bash", "input": {"command": "kubectl get
nodes"}}
{"type": "tool_result", "tool_use_id": "tool_123", "output": "NAME
STATUS  AGE\nnode1   Ready   10d"}
{"type": "content_block_delta", "delta": {"text": "The cluster has 1
node in Ready state..."}}
{"type": "message_done", "usage": {"input_tokens": 1500,
"output_tokens": 800}}
```

What MessageProcessor Does:

1. Converts SDK messages to domain `Message` entities
2. Persists each message to `messages` table
3. Persists tool calls to `tool_calls` table
4. Updates session metrics (message_count, total_tokens)
5. Broadcasts to WebSocket subscribers (if any)

Database Inserts:

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```
-- User message
INSERT INTO messages (
    id, session_id, message_type, role, content, sequence_number,
created_at
) VALUES (
    uuid_generate_v4(),
    '770e8400-e29b-41d4-a716-446655440002',
    'user',
    'user',
    'IMPORTANT: This is a READ-ONLY health check...',
    1,
    NOW()
);

-- Assistant message
INSERT INTO messages (
    id, session_id, message_type, role, content, sequence_number,
```

```
created_at
) VALUES (
    uuid_generate_v4(),
    '770e8400-e29b-41d4-a716-446655440002',
    'assistant',
    'assistant',
    'I''ll check the Kubernetes cluster health...',
    2,
    NOW()
);

-- Tool call
INSERT INTO tool_calls (
    id, session_id, message_id, tool_name, tool_input, tool_output,
status, created_at
) VALUES (
    uuid_generate_v4(),
    '770e8400-e29b-41d4-a716-446655440002',
    <message_id>,
    'Bash',
    '{"command": "kubectl get nodes"}',
    'NAME    STATUS  AGE\nnode1   Ready   10d',
    'completed',
    NOW()
);
```

Step 5.4: Update Session Status (lines 228-231)

```
session.transition_to(SessionStatus.ACTIVE)
await self.session_repo.update(session_id, status="active")
await self.db.commit()
```

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Phase 6: Mark Execution Complete

File: app/services/task_service.py:259-270

```
execution.status = TaskExecutionStatus.COMPLETED
execution.completed_at = datetime.utcnow()
execution.result_message_id = message.id

await self.task_execution_repo.update(
    str(execution.id),
    status="completed",
    completed_at=execution.completed_at,
    result_message_id=message.id,
)
```

Database Update:

```
UPDATE task_executions
SET status = 'completed',
    completed_at = NOW(),
    result_message_id = <final_message_id>,
    duration_seconds = EXTRACT(EPOCH FROM (NOW() - started_at)),
    updated_at = NOW()
WHERE id = '660e8400-e29b-41d4-a716-446655440001';
```

Phase 7: Generate Report (Optional)

File: `app/services/task_service.py:272-295`

```
if task.generate_report:
    report_service = ReportService(...)

    report = await report_service.generate_from_session(
        session_id=session.id,
        user_id=task.user_id,
        title=f"Task Execution Report: {task.name}",
        format=task.report_format,  # "markdown"
        auto_generated=True,
    )

    execution.report_id = report.id
```

What This Does:

1. Fetches all messages from session
2. Fetches all tool calls from session
3. Aggregates session metrics
4. Formats content based on `report_format` (markdown/html/json/pdf)
5. Saves report file to `/workspace/.../data/reports/{report_id}.md`
6. Creates record in `reports` table

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Database Inserts:

```
INSERT INTO reports (
    id, session_id, user_id, title, format,
    file_path, auto_generated, created_at
) VALUES (
    '880e8400-e29b-41d4-a716-446655440003',
    '770e8400-e29b-41d4-a716-446655440002',
    '94d9f5a2-1257-43ac-9de2-6d86421455a6',
    'Task Execution Report: Kubernetes Cluster Health Check',
```

```
    'markdown',
    '/workspace/.../data/reports/880e8400.../report.md',
    true,
    NOW()
);

UPDATE task_executions
SET report_id = '880e8400-e29b-41d4-a716-446655440003'
WHERE id = '660e8400-e29b-41d4-a716-446655440001';
```

Phase 8: Audit Logging

File: app/services/task_service.py:299-306

```
await self.audit_service.log_task_executed(
    task_id=task.id,
    execution_id=execution.id,
    user_id=task.user_id,
    trigger_type="manual",
    status="completed",
)
```

Database Insert:

```
INSERT INTO audit_logs (
    id, user_id, action_type, resource_type, resource_id,
    action_details, ip_address, user_agent, created_at
) VALUES (
    uuid_generate_v4(),
    '94d9f5a2-1257-43ac-9de2-6d86421455a6',
    'task.executed',
    'task_execution',
    '660e8400-e29b-41d4-a716-446655440001',
    '{
        "task_id": "75318f39-9feb-4ff6-a381-f377d38fd1be",
        "trigger_type": "manual",
        "status": "completed",
        "session_id": "770e8400-e29b-41d4-a716-446655440002"
    }',
    '192.168.1.100',
    'curl/7.68.0',
    NOW()
);
```

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Phase 9: HTTP Response

File: app/api/v1/tasks.py:303-312

```
response = TaskExecutionResponse.model_validate(execution)
response._links = Links(
    self=f"/api/v1/task-executions/{execution.id}",
    task=f"/api/v1/tasks/{task.id}",
    session=f"/api/v1/sessions/{execution.session_id}",
    report=f"/api/v1/reports/{execution.report_id}",
)

return response  # HTTP 202 Accepted
```

HTTP Response:

```
HTTP/1.1 202 Accepted
Content-Type: application/json

{
  "id": "660e8400-e29b-41d4-a716-446655440001",
  "task_id": "75318f39-9feb-4ff6-a381-f377d38fd1be",
  "session_id": "770e8400-e29b-41d4-a716-446655440002",
  "status": "completed",
  "trigger_type": "manual",
  "variables": {"cluster_name": "production"},
  "created_at": "2025-10-24T02:00:00Z",
  "started_at": "2025-10-24T02:00:01Z",
  "completed_at": "2025-10-24T02:00:45Z",
  "duration_seconds": 44,
  "report_id": "880e8400-e29b-41d4-a716-446655440003",
  "_links": {
    "self": "/api/v1/task-executions/660e8400-e29b-41d4-a716-
446655440001",
    "task": "/api/v1/tasks/75318f39-9feb-4ff6-a381-f377d38fd1be",
    "session": "/api/v1/sessions/770e8400-e29b-41d4-a716-446655440002",
    "report": "/api/v1/reports/880e8400-e29b-41d4-a716-446655440003"
  }
}
```

Claude Code CLI Integration

Official SDK Architecture

```
Our API Service
    ↓ uses
claude-agent-sdk (Python package)
    ↓ spawns
```

```
claude-code (CLI subprocess)
    ↓ calls
Anthropic API
```

How Messages Flow

```
1. API → SDK Client
   client.query("Check cluster health")

2. SDK Client → Claude Code CLI stdin
   {"type": "user_message", "content": "Check cluster health"}

3. Claude Code CLI → Anthropic API
   POST https://api.anthropic.com/v1/messages
   Headers: x-api-key: sk-ant-...
   Body: {model: "claude-3-5-sonnet-20241022", messages: [...]}

4. Anthropic API → Claude Code CLI (streaming)
   data: {"type": "content_block_start"}
   data: {"type": "content_block_delta", "delta": {...}}
   data: {"type": "message_delta", "delta": {...}}

5. Claude Code CLI → SDK Client stdout (streaming)
   {"type": "assistant_message_start"}
   {"type": "content_block_delta", "delta": {...}}
   {"type": "tool_use", "name": "Bash", "input": {...}}

6. SDK Client → MessageProcessor (our code)
   Converts JSON to domain Message entities
   Persists to database
   Broadcasts to WebSockets
```

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Claude Code CLI Command

What Gets Executed:

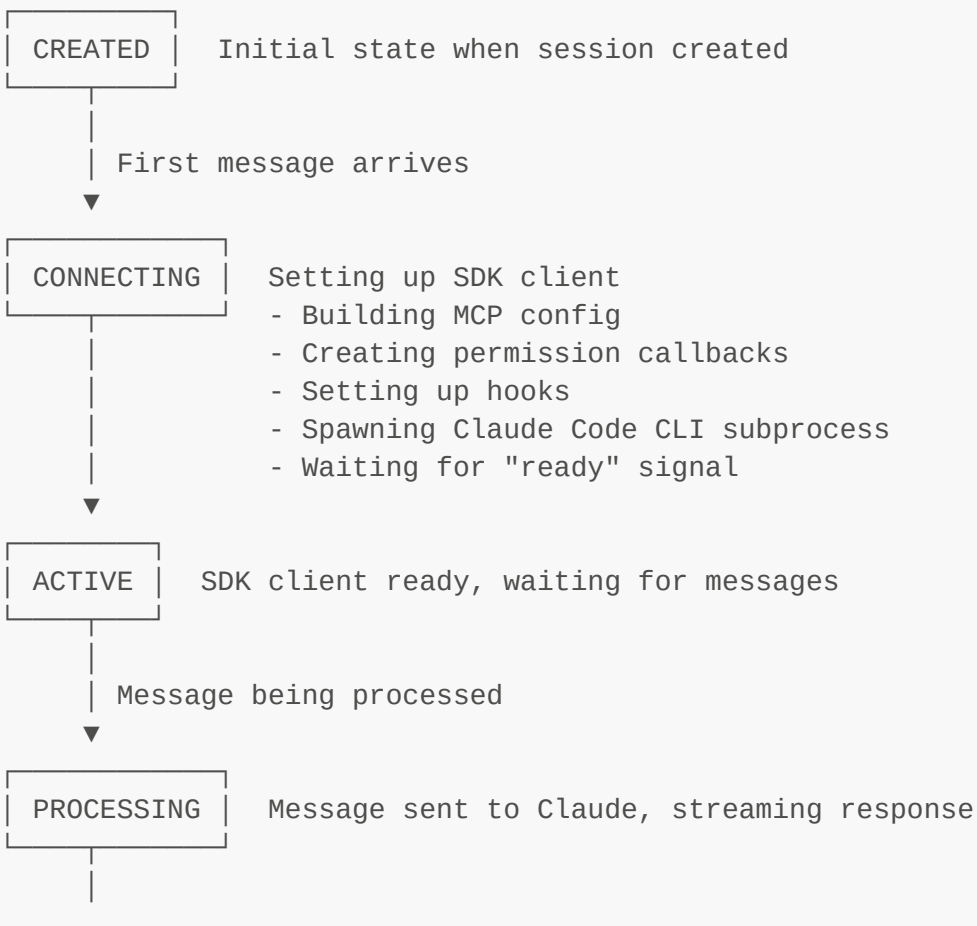
```
# Working directory
cd /workspace/me/repositories/ai-agent/ai-agent-api/data/agent-
workdirs/active/770e8400-e29b-41d4-a716-446655440002/

# Environment
export ANTHROPIC_API_KEY="sk-ant-..."
export KUBECONFIG="/home/msalah/.kube/config"

# Command (simplified - actual has more args)
claude-code \
  --model claude-3-5-sonnet-20241022 \
  --mcp-servers-config /tmp/mcp-config-770e8400.json \
```

```
  --allowed-tools "Read,Write,Bash" \
  --permission-mode default \
  --working-directory .
```

MCP Config File (`/tmp/mcp-config-770e8400.json`):

```
{
  "kubernetes_readonly": {
    "command": "npx",
    "args": ["-y", "@modelcontextprotocol/server-kubernetes"],
    "env": {
      "KUBECONFIG": "/home/msalah/.kube/config"
    }
  },
  "database": {
    "command": "python",
    "args": ["/path/to/mcp_database_server.py"],
    "env": {}
  }
}
```

Session State Transitions



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```
     | Response complete
     ▼
┌──────────┐
│ ACTIVE │  Ready for next message
└──────────┘

(On error: → FAILED)
(On terminate: → TERMINATED)
```

File Locations and Logs

Working Directories

Active Sessions:

```
/workspace/me/repositories/ai-agent/ai-agent-api/data/agent-
workdirs/active/{session_id}/
```

Archived Sessions:

```
/workspace/me/repositories/ai-agent/ai-agent-api/data/agent-
workdirs/archives/{session_id}/
```

Claude Code CLI Session Logs

Location Pattern:

```
/home/msalah/.claude/projects/{project_hash}/{session_id}.jsonl
```

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Project Hash Calculation:

```
working_directory = "/workspace/me/repositories/ai-agent/ai-agent-
api/data/agent-workdirs/active/770e8400-e29b-41d4-a716-446655440002"
project_hash = base64url_encode(working_directory)
             = "-workspace-me-repositories-ai-agent-ai-agent-api-data-
agent-workdirs-active-770e8400-e29b-41d4-a716-446655440002"
```

Full Path Example:

```
/home/msalah/.claude/projects/-workspace-me-repositories-ai-agent-ai-
agent-api-data-agent-workdirs-active-770e8400-e29b-41d4-a716-
```

```
446655440002/770e8400-e29b-41d4-a716-446655440002.jsonl
```

Log Format (JSONL):

```
{"type":"user_message","content":"Check cluster
health","timestamp":"2025-10-24T02:00:01.123Z"}
{"type":"assistant_message_start","id":"msg_123","timestamp":"2025-10-
24T02:00:02.456Z"}
{"type":"content_block_delta","delta":{"text":"I'll
check..."},"timestamp":"2025-10-24T02:00:02.789Z"}
{"type":"tool_use","name":"Bash","input":{"command":"kubectl get
nodes"},"timestamp":"2025-10-24T02:00:03.012Z"}
{"type":"tool_result","tool_use_id":"tool_123","output":"NAME...\nnode1.
..","timestamp":"2025-10-24T02:00:05.345Z"}
```

Generated Reports

Location:

```
/workspace/me/repositories/ai-agent/ai-agent-
api/data/reports/{report_id}/report.{format}
```

Example:

```
/workspace/me/repositories/ai-agent/ai-agent-api/data/reports/880e8400-
e29b-41d4-a716-446655440003/report.md
```

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API Server Logs

Location:

```
/workspace/me/repositories/ai-agent/ai-agent-api/logs/api.log
```

Format:

```
2025-10-24 02:00:00,123 - app.services.task_service - INFO - Starting
task execution {"task_id": "75318f39...", "trigger_type": "manual"}
2025-10-24 02:00:01,456 - app.services.sdk_session_service - INFO -
Setting up SDK client {"session_id": "770e8400..."}
2025-10-24 02:00:02,789 - app.claude_sdk.client_manager - INFO - Claude
SDK client connected successfully {"session_id": "770e8400..."}
```

Monitoring and Debugging

Key Database Tables

1. Task Execution Status:

```
SELECT id, task_id, session_id, status,
       started_at, completed_at, error_message
FROM task_executions
WHERE id = '660e8400-e29b-41d4-a716-446655440001';
```

2. Session Details:

```
SELECT id, status, working_directory_path,
       message_count, total_tokens, sdk_options
FROM sessions
WHERE id = '770e8400-e29b-41d4-a716-446655440002';
```

3. Messages in Session:

```
SELECT id, message_type, role, content, sequence_number, created_at
FROM messages
WHERE session_id = '770e8400-e29b-41d4-a716-446655440002'
ORDER BY sequence_number;
```

4. Tool Calls:

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```
SELECT id, tool_name, tool_input, tool_output, status,
       started_at, completed_at
FROM tool_calls
WHERE session_id = '770e8400-e29b-41d4-a716-446655440002'
ORDER BY created_at;
```

5. Audit Trail:

```
SELECT id, action_type, resource_type, action_details, created_at
FROM audit_logs
WHERE user_id = '94d9f5a2-1257-43ac-9de2-6d86421455a6'
  AND resource_type IN ('task', 'task_execution')
ORDER BY created_at DESC
LIMIT 50;
```

Finding Claude Code CLI Logs

Step 1: Get session working directory from database

```
SELECT working_directory_path
FROM sessions
WHERE id = '770e8400-e29b-41d4-a716-446655440002';
-- Result: /workspace/.../data/agent-workdirs/active/770e8400.../
```

Step 2: Convert to project hash

```
# Replace / with - and remove leading /
# /workspace/... becomes -workspace-...
PROJECT_HASH="-workspace-me-repositories-ai-agent-ai-agent-api-data-agent-workdirs-active-770e8400-e29b-41d4-a716-446655440002"
```

Step 3: Find log file

```
CLAUDE_LOG="/home/msalah/.claude/projects/$PROJECT_HASH/770e8400-e29b-41d4-a716-446655440002.jsonl"

# View log
cat "$CLAUDE_LOG" | jq .

# Watch log in real-time
tail -f "$CLAUDE_LOG" | jq .
```

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Related Documentation

- Tasks API Documentation - Complete API reference
- Session Management - Session lifecycle details
- Claude SDK Integration - SDK architecture
- MCP Configuration - MCP server setup

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