### Use Case: Multi-Agent System for Mortgage Application Processing

As a Gen AI engineer in a mortgage company, a strong POC for IBM's Agent Communication Protocol (ACP) and Anthropic's Model Context Protocol (MCP) could focus on building a collaborative AI agent system to automate mortgage loan approvals. These protocols enable standardized communication: MCP handles agent-tool interactions (e.g., calling APIs or data processors), while ACP facilitates agent-to-agent (A2A) collaboration. This fits mortgage workflows, which involve data extraction, analysis, and decision-making across siloed steps.

#### POC Overview

- \*\*Objective\*\*: Demonstrate how ACP and MCP streamline multi-agent orchestration to process a mortgage application faster, reducing manual reviews by 50-70% (based on typical automation benchmarks in finance).

- \*\*Scope\*\*: Simulate 3-4 agents handling a sample application. Use open-source implementations (ACP is a draft protocol from IBM Research; MCP from Anthropic).

- \*\*Tech Stack\*\*: Python-based agents (e.g., via LangChain or custom scripts), integrated with IBM watsonx.ai for Gen AI capabilities, MCP for tool calls, and ACP for inter-agent messaging. No need for full production; focus on protocol interoperability.

- \*\*Duration/Complexity\*\*: 1-2 weeks for a basic POC, assuming access to protocol specs and sample code from IBM/Anthropic repos.

#### Step-by-Step Workflow in the POC

1. \*\*Input\*\*: User uploads a mock mortgage application (PDFs: income proof, ID, property details).

2. \*\*Document Agent\*\*:

- Uses MCP to invoke tools like OCR (e.g., via Google Cloud Vision API or local library) for data extraction.

- Extracts key fields: applicant income, debt-to-income ratio, property value.

- Outputs structured JSON.

3. \*\*Credit & Risk Agent\*\*:

- Receives data from Document Agent via ACP (e.g., sends a query: "Assess credit for applicant with income $X and debt $Y").

- Uses MCP to call a mock credit API (e.g., simulate Equifax/TransUnion query) and risk models (e.g., simple ML for fraud detection).

- Computes scores and flags issues (e.g., high risk if DTI > 43%).

4. \*\*Compliance & Approval Agent\*\*:

- Communicates with others via ACP to gather all insights (e.g., "Confirm compliance for loan amount $Z").

- Uses MCP for regulatory checks (e.g., tool to query against CFPB rules or internal DB).

- Finalizes decision: Approve, Reject, or Escalate.

5. \*\*Output\*\*: Generate a report with decision rationale, audit trail of agent interactions, and metrics (e.g., processing time).

#### Benefits for Mortgage Company

- \*\*Efficiency\*\*: Agents collaborate in real-time, mimicking human teams but faster (e.g., handle 100+ apps/day).

- \*\*Gen AI Integration\*\*: Embed LLMs (e.g., IBM Granite) for natural language summaries or chat-based queries.

- \*\*Scalability\*\*: ACP/MCP make it easy to add agents (e.g., for underwriting or customer Q&A).

- \*\*POC Success Metrics\*\*: Measure agent communication latency, accuracy of decisions on test data, and protocol adherence.

To implement, start by reviewing ACP specs from IBM Research and MCP from Anthropic. If you need code snippets or setup guidance, provide more details on your environment!