

# MCP Server Autodiscovery & Kagent Integration Agent

## Overview [🔗](#)

Build a Google Python ADK agent that automatically discovers MCP servers on LAN, authenticates dynamically using OAuth 2.1, and converts configurations to Kagent-compatible format.

## Technical Goals [🔗](#)

- **Network Discovery:** Multi-protocol discovery (mDNS, SSDP, ARP scanning)
- **Authentication:** OAuth 2.1 + PKCE with dynamic client registration
- **Schema Conversion:** Bidirectional MCP ↔ Kagent format mapping
- **ADK Integration:** Production-ready agent with Vertex AI deployment
- **Scalability:** Concurrent discovery with connection pooling

## Architecture Components [🔗](#)

1. **Discovery Engine:** Multi-protocol network service detection
2. **MCP Client:** Full JSON-RPC 2.0 implementation with auth
3. **Schema Mapper:** Intelligent conversion with validation
4. **ADK Agents:** Hierarchical agent system for orchestration
5. **Production Runtime:** Vertex AI integration with monitoring

## Success Criteria [🔗](#)

- Automatic discovery of MCP servers on local network
- Secure authentication with modern OAuth flows
- Accurate schema conversion maintaining semantic integrity
- Production deployment on Google Cloud with monitoring
- Comprehensive test coverage and documentation

## Timeline Estimate [🔗](#)

- **MVP (P0):** 3-4 weeks
- **Feature Complete:** 6-8 weeks
- **Production Ready:** 10-12 weeks