# Conference System Architecture Documentation

## Table of Contents

1. System Overview
2. Component Architecture
3. Flow Diagram
4. Technical Specifications
5. Implementation Guidelines

## 1. System Overview

The conference system integrates RGI server with a bot-enabled intelligent calling system using Asterisk PBX for conference bridging. This enables automated customer interaction with voice processing capabilities.

## 2. Component Architecture

### Core Components:

* **RGI Server**: Primary call handler
* **Asterisk PBX**: Conference bridge system
* **Bot Server**: Voice processing and business logic
* **Backend Services**: API and database systems

### Technologies Used:

1. **Communication Protocols**
   * SIP/RTP for voice
   * IPSec for tunnel security
   * REST/HTTPS for API communication
2. **Voice Processing**
   * Speech-to-Text (STT)
   * Text-to-Speech (TTS)
   * Natural Language Processing

## 3. Flow Diagram

flowchart TD  
 %% Colors and styles  
 classDef customerNode fill:#4285f4,color:white,stroke-width:2px  
 classDef serverNode fill:#34a853,color:white,stroke-width:2px  
 classDef asteriskNode fill:#7B1FA2,color:white,stroke-width:2px  
 classDef botNode fill:#ea4335,color:white,stroke-width:2px  
 classDef apiNode fill:#fbbc05,color:black,stroke-width:2px  
   
 subgraph Customer ["🏢 Customer Environment"]  
 C["📞 Customer Call"]  
 end  
   
 subgraph RGI ["🖥️ RGI Server"]  
 R["RGI Server<br>Call Handler"]  
 end  
   
 subgraph AsteriskPBX ["☎️ Conference System"]  
 A["Asterisk PBX<br>Conference Bridge"]  
 end  
   
 subgraph BotSystem ["🤖 Intelligent Bot System"]  
 B["Voice Processing"]  
 S["Speech-to-Text"]  
 L["Logic Controller"]  
 T["Text-to-Speech"]  
 end  
   
 subgraph Backend ["⚙️ Backend Services"]  
 V["Customer Verification"]  
 W["Warehouse Validation"]  
 D["Database"]  
 end  
  
 C -->|"Incoming Call"| R  
 R -->|"IPSec Tunnel"| A  
 A -->|"Conference Bridge"| B  
 B -->|"Voice Input"| S  
 S -->|"Text"| L  
 L -->|"Verify"| V  
 L -->|"Check"| W  
 L -->|"Response"| T  
 T -->|"Voice Output"| A  
 V -->|"Query"| D  
 W -->|"Query"| D  
  
 class C customerNode  
 class R serverNode  
 class A asteriskNode  
 class B,S,L,T botNode  
 class V,W,D apiNode

## 4. Technical Specifications

### Connection Requirements:

1. **IPSec Tunnel**
   * Protocol: IPSec
   * Encryption: AES-256
   * Authentication: SHA-256
2. **Voice Communication**
   * Protocol: SIP/RTP
   * Codec: G.711
   * Quality: HD Voice
3. **API Integration**
   * Protocol: HTTPS
   * Format: REST/JSON
   * Authentication: OAuth 2.0

### Hardware Requirements:

1. **RGI Server**
   * CPU: 8+ cores
   * RAM: 16GB+
   * Storage: SSD 256GB+
2. **Asterisk Server**
   * CPU: 4+ cores
   * RAM: 8GB+
   * Network: 1Gbps
3. **Bot Server**
   * CPU: 16+ cores
   * RAM: 32GB+
   * GPU: Optional for ML processing

## 5. Implementation Guidelines

### Setup Steps:

1. **Network Configuration**
   * Configure IPSec tunnel
   * Setup firewall rules
   * Enable required ports
2. **Asterisk Configuration**
   * Install Asterisk PBX
   * Configure SIP trunks
   * Setup conference bridge
3. **Bot Integration**
   * Deploy voice processing server
   * Configure STT/TTS services
   * Implement business logic
4. **Testing**
   * Network connectivity
   * Voice quality
   * Bot response accuracy
   * API integration

### Security Considerations:

1. Encrypted communication
2. Access control
3. Call recording compliance
4. Data protection
5. Audit logging

### Monitoring:

1. Call quality metrics
2. System performance
3. Bot accuracy
4. API response times
5. Error rates

## Contact Information

For technical support or questions: - Email: support@example.com - Phone: +1-XXX-XXX-XXXX