

B-LAN Security System

Open Source & Local Deployment Guide for Apple iMac (macOS)

Architecture: Edge Vision & Node Security **Inference Engine:** YOLO Computer Vision / **Cost:** \$0 / Open Source (Air-Gapped)
Local Ollama

This installation guide outlines the procedure for configuring and deploying the **B-LAN Security** system on an Apple iMac. Built to run 100% locally and offline, this setup processes camera feeds, computer vision detection, and security telemetry without requiring cloud API keys, paid subscriptions, or external network access.

1. System & Hardware Prerequisites

Hardware & OS Requirements

- **Hardware:** Apple Silicon (M-Series recommended for GPU-accelerated video decoding/detection) or Intel iMac
- **OS:** macOS Ventura 13.0 or higher
- **Peripherals:** Built-in FaceTime HD Camera, USB Webcams, or Local RTSP Security Stream feeds
- **Storage:** Minimum 10 GB SSD space for local OpenCV models, YOLO weights, and lightweight LLM layers

Core Runtime Dependencies

Open Terminal on your iMac and run the following command to install Homebrew, Python, OpenCV build tools, and Ollama:

```
# Install Homebrew if not installed
/bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/HEAD/install.sh)"

# Install runtime tools, FFmpeg for video streams, OpenCV, and Ollama
brew install python@3.11 node git ffmpeg opencv ollama
```

2. Local Inference & Vision Engine Setup (Zero API Cost)

B-LAN Security pairs local computer vision (YOLO/OpenCV) with local open-weights language models for automated incident analysis and alert triage, completely bypassing cloud APIs.

```
# Start local Ollama service in the background
brew services start ollama

# Pull local open reasoning model (e.g., Gemma 2 2B)
ollama pull gemma2:2b
```

Zero-Trust & Local Video Privacy

All video frames, detection logs, and threat assessments are evaluated entirely on your iMac's Apple Silicon GPU/Unified Memory. No video feeds or telemetry data ever leave the local neighborhood mesh.

3. Local Directory & Environment Configuration

Workspace Setup

```
# Create dedicated project directory
mkdir -p ~/blan-security
cd ~/blan-security

# Initialize isolated Python virtual environment
python3 -m venv venv
source venv/bin/activate
```

Environment Variable Configuration

Create a local `.env` file configured strictly for offline localhost execution:

```
cat << 'EOF' > .env
# B-LAN Security Open Source Configuration
BLAN_SECURITY_NODE_ID="imac-security-node-01"
BLAN_SECURITY_PORT=8090
OFFLINE_MODE=true

# Video & Detection Settings
CAMERA_INDEX=0
RTSP_STREAM_URL="rtsp://localhost:8554/live"

# Local AI Models (No API Key Required)
LOCAL_LLM_PROVIDER="ollama"
LOCAL_LLM_ENDPOINT="http://localhost:11434"
LOCAL_LLM_MODEL="gemma2:2b"
EOF
```

4. Application Setup & Python Packages

```
# Upgrade pip package manager
pip install --upgrade pip

# Install local vision, security pipeline, and web UI dependencies
pip install opencv-python ultralytics ollama python-dotenv fastapi uvicorn streamlit requests
```

5. Executing B-LAN Security

Launch the security monitoring service or interactive dashboard on your iMac:

```
# Ensure virtual environment is active
source ~/blan-security/venv/bin/activate

# Launch primary Python vision and security engine
python3 main.py

# Alternatively, run Streamlit dashboard UI for camera feeds & logs
streamlit run app.py --server.port 8090
```

Access the local security portal in Safari or Chrome at: `http://localhost:8090`

6. macOS Auto-Start Security Daemon (`launchd`)

Configure your iMac to continuously run the B-LAN Security monitoring engine in the background upon system boot:

```
cat << 'EOF' > ~/Library/LaunchAgents/com.blan.security.plist
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE PLIST PUBLIC "-//Apple//DTD PLIST 1.0//EN" "http://www.apple.com/DTDs/
PropertyList-1.0.plist">
<plist version="1.0">
<dict>
  <key>Label</key>
  <string>com.blan.security</string>
  <key>ProgramArguments</key>
  <array>
    <string>/Users/SHARED_USER/blan-security/venv/bin/python3</string>
    <string>/Users/SHARED_USER/blan-security/main.py</string>
  </array>
  <key>RunAtLoad</key>
  <true/>
  <key>KeepAlive</key>
  <true/>
  <key>WorkingDirectory</key>
  <string>/Users/SHARED_USER/blan-security</string>
</dict>
</plist>
EOF
```

Note: Replace `/Users/SHARED_USER/` with your actual home directory path (check using `echo $HOME`).

```
# Load security daemon into macOS launch system
launchctl load ~/Library/LaunchAgents/com.blan.security.plist
```

7. System Health & Feed Check

```
# Check active camera devices & local model status
ollama list

# Test local security response endpoint
curl http://localhost:11434/api/generate -d '{
  "model": "gemma2:2b",
  "prompt": "B-LAN Security system health check",
  "stream": false
}'
```