An Introduction to Kamailio

Kamawhat???

- Kah-mah-illie-oh

- Hawaiian word

- "To communicate"

Who am I?

- Fred Posner
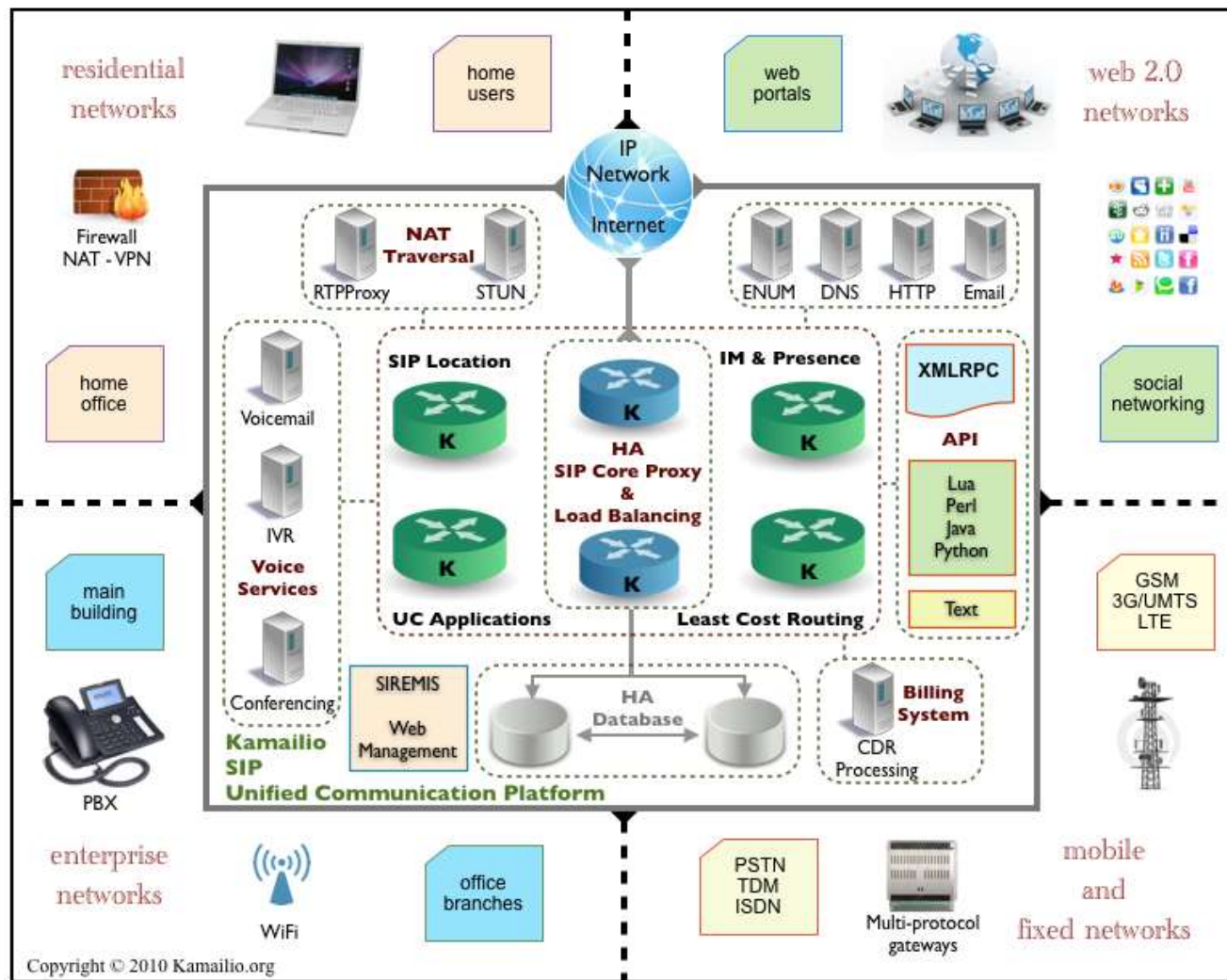
- VoIP Consultant

- Contact:
  → qxork.com

Agenda

- What is Kamailio?
- What *isn't* Kamailio?
- Why Kamailio?
- Key Features

- Deployment Examples
- Scaling SIP/RTC
- Securing SIP/RTC
- APIBAN

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What is Kamailio?

What is Kamailio?

- SIP proxy server
- SIP registrar server
- SIP location server
- SIP application server
- SIP dispatcher server
- SIP websocket server

residential networks

home users

web portals

web 2.0 networks

Firewall NAT - VPN

IP Network Internet

home office

social networking

NAT Traversal
RTPProxy   STUN

ENUM DNS HTTP Email

SIP Location

IM & Presence

XMLRPC

API

Voicemail

K

K

K

Lua
Perl
Java
Python

main building

IVR

Voice Services

HA
SIP Core Proxy
&
Load Balancing

K

K

Text

GSM
3G/UMTS
LTE

Conferencing

UC Applications

Least Cost Routing

SIREMIS
Web Management

HA Database

Billing System

CDR Processing

PBX

Kamailio SIP
Unified Communication Platform

enterprise networks

WiFi

office branches

PSTN
TDM
ISDN

Multi-protocol gateways

mobile and fixed networks

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What *isn't* Kamailio?

Kamailio cannot be...

- SIP phone
- Media server
- B2BUA

Why Kamailio?

Why Kamailio?

- A topic in of itself…

- Kamailio World 2017
  Why I Love Kamailio

- https://youtu.be/J204OGgZ51M

- Open Source

- Small Footprint

- Fast

- Modular

- Plays well with others

Key Features

Key Features

- Robust and Performant SIP (RFC3261) Server

  – Registrar

  – Location

  – Proxy

  – SIP Application

  – Redirect

- SIP Routing Capabilities

  – stateless and transactional stateful SIP Proxy processing

  – serial and parallel forking

  – NAT traversal support

  – Load balancer

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Key Features

- Transport Layers
  - UDP, TCP, TLS and SCTP
  - IPv4 and IPv6
  - Transport layer gatewaying (tls → udp, etc)
  - SCTP multi-homing and multi-streaming

- Asynchronous Processing
  - asynchronous TCP handling
  - asynchronous SIP message processing
  - asynchronous inter-process message queues

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Key Features

- Secure Communication
  - Digest SIP User authentication
  - ACL
  - TLS for SIP
  - Handling for SRTP
  - Many authentication

- IP and DNS
  - SRV and NAPTR DNS lookups
  - SRV DNS failover
  - DNSsec support
  - ENUM
  - Internal DNS Cache
  - IP level blacklists

Key Features

- Accounting
  - event based accounting
  - configurable accounting data details
  - multi-leg call accounting
  - storage to database

- And much much more...
  - RPC control interface
  - Rich Communication Services
  - Remote monitoring
  - APIs
  - Multiple Database

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Kamailio HTABLE

- Hash Table Module

- Stored in shared memory
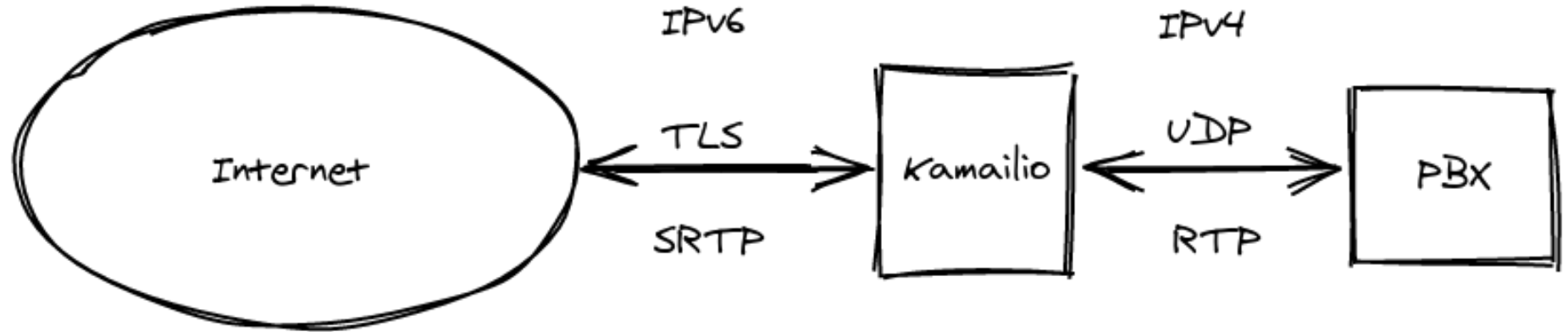
- Custom cache system

- Replication via DMQ

KEMI

- https://kamailio.org/docs/tutorials/devel/kamailio-kemi-framework/

- Use other scripting languages to write SIP routing

- Python

- LUA

- JavaScript

- Ruby

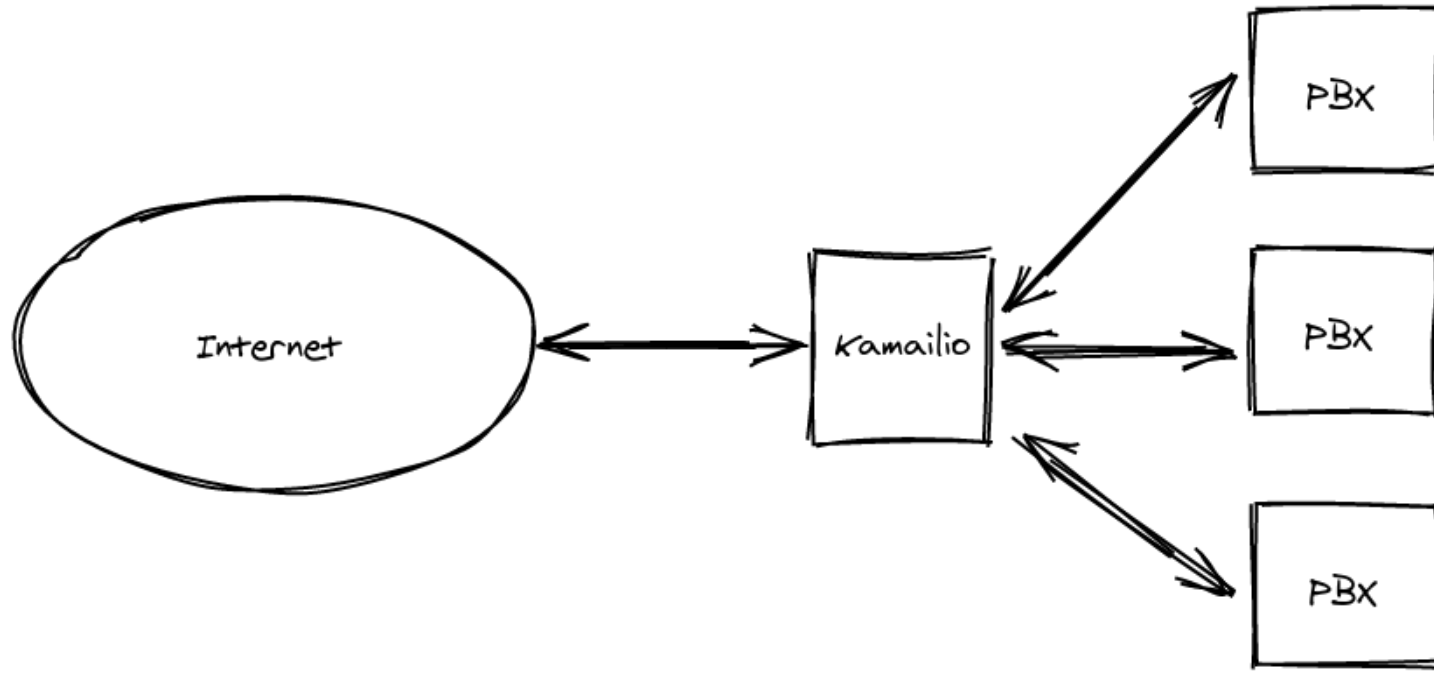- Squirrel
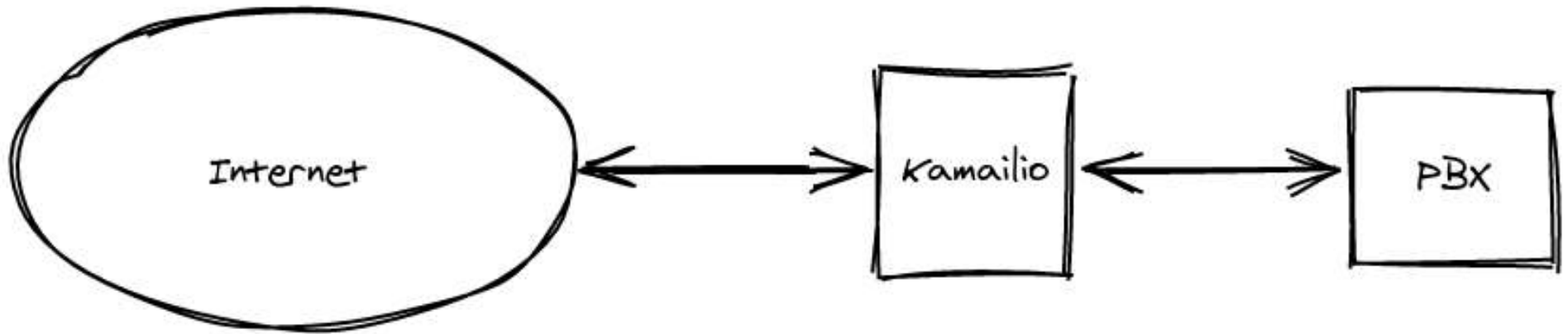
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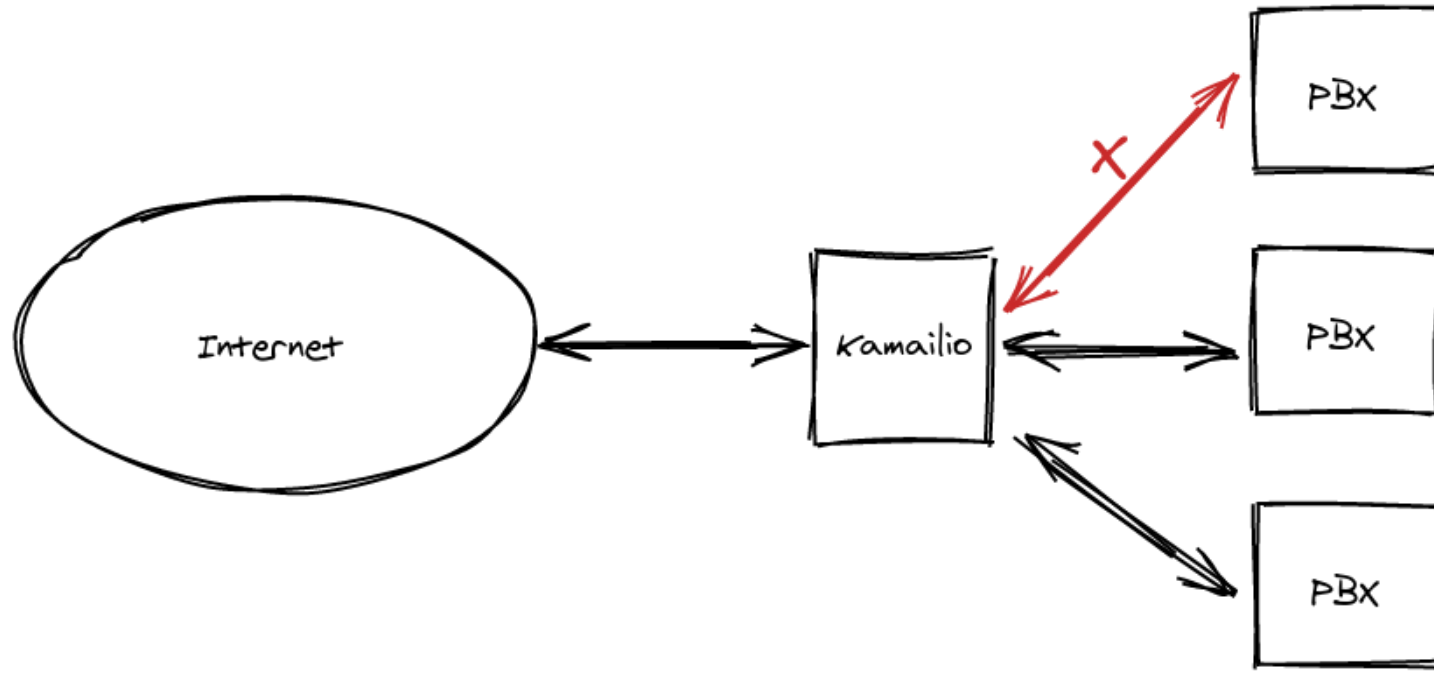# Deployment Examples

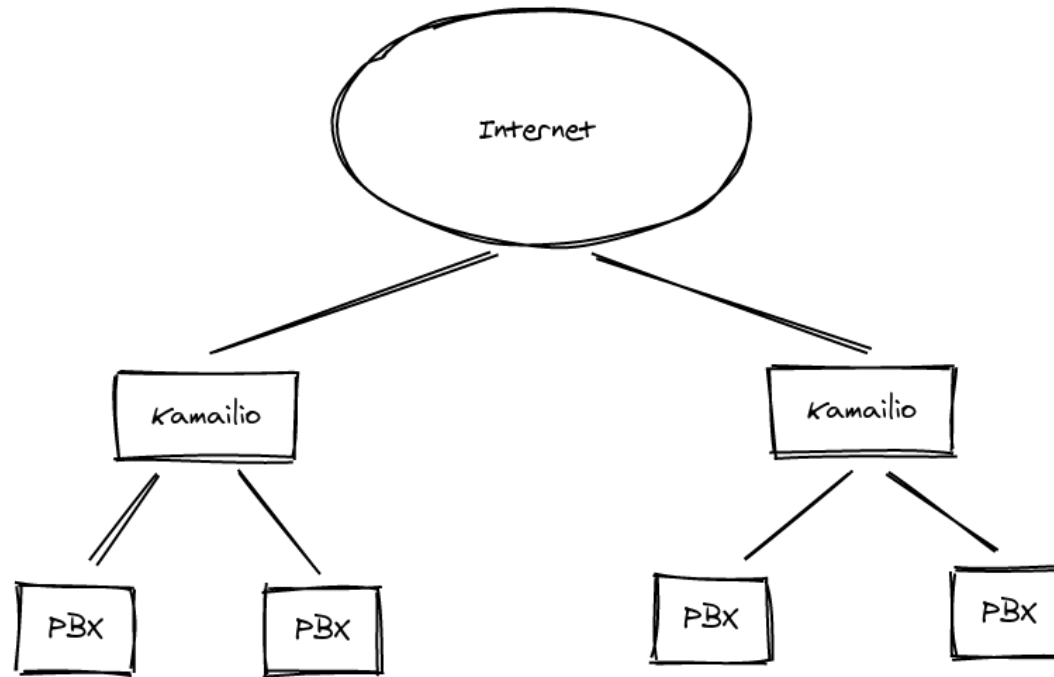# Deployment Examples
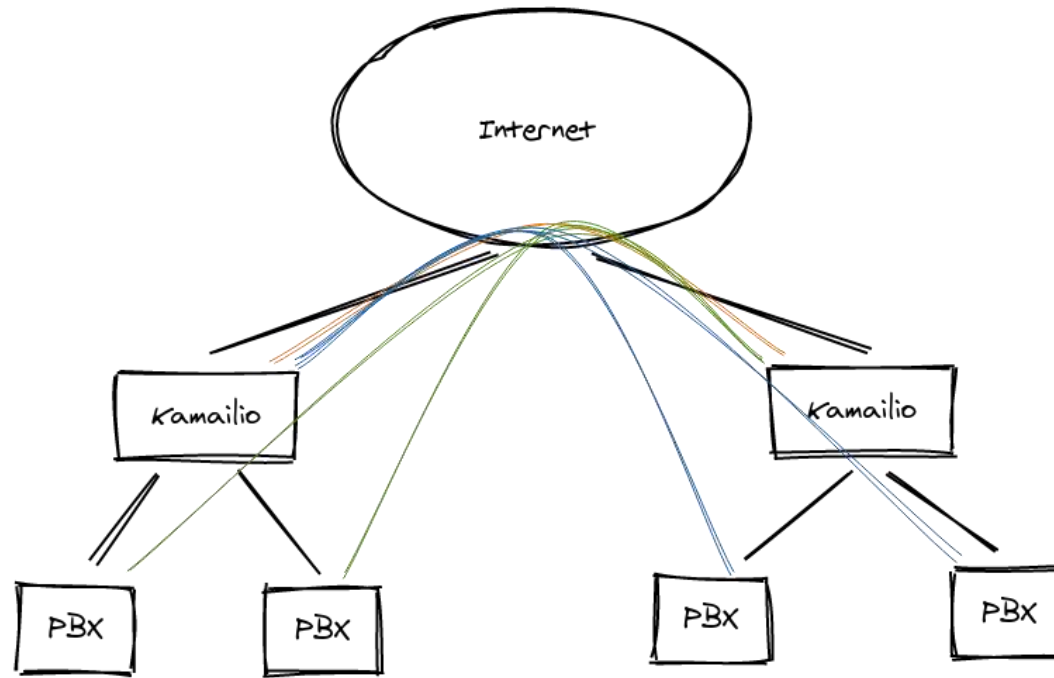
Deployment Examples

Deployment Examples

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Deployment Examples

Deployment Examples

Scaling

Scaling

- HTABLE module

- DISPATCHER module

- REDIS

- DMQ

- on systems with 4GB memory, Kamailio can serve a population over 300 000 online subscribers

- used as load balancer in stateless mode, Kamailio can handle over 5000 call setups

Security

Security

- PERMISSIONS module

- PIKE module

- SIP inspection

- GEO IP

- Block by User Agent

- Block by CPS

- Block SQL injection

- Block by anything you need =)

APIBAN

APIBAN

- https://apiban.org

- FREE API Key

- Kamailio Integration

- Open Source Go client (asterisk, freeswitch, freepbx, netsapiens, etc)

Thank you!

- Questions?

- Learn more: **kamailio.org**

- **Contact me: qxork.com**