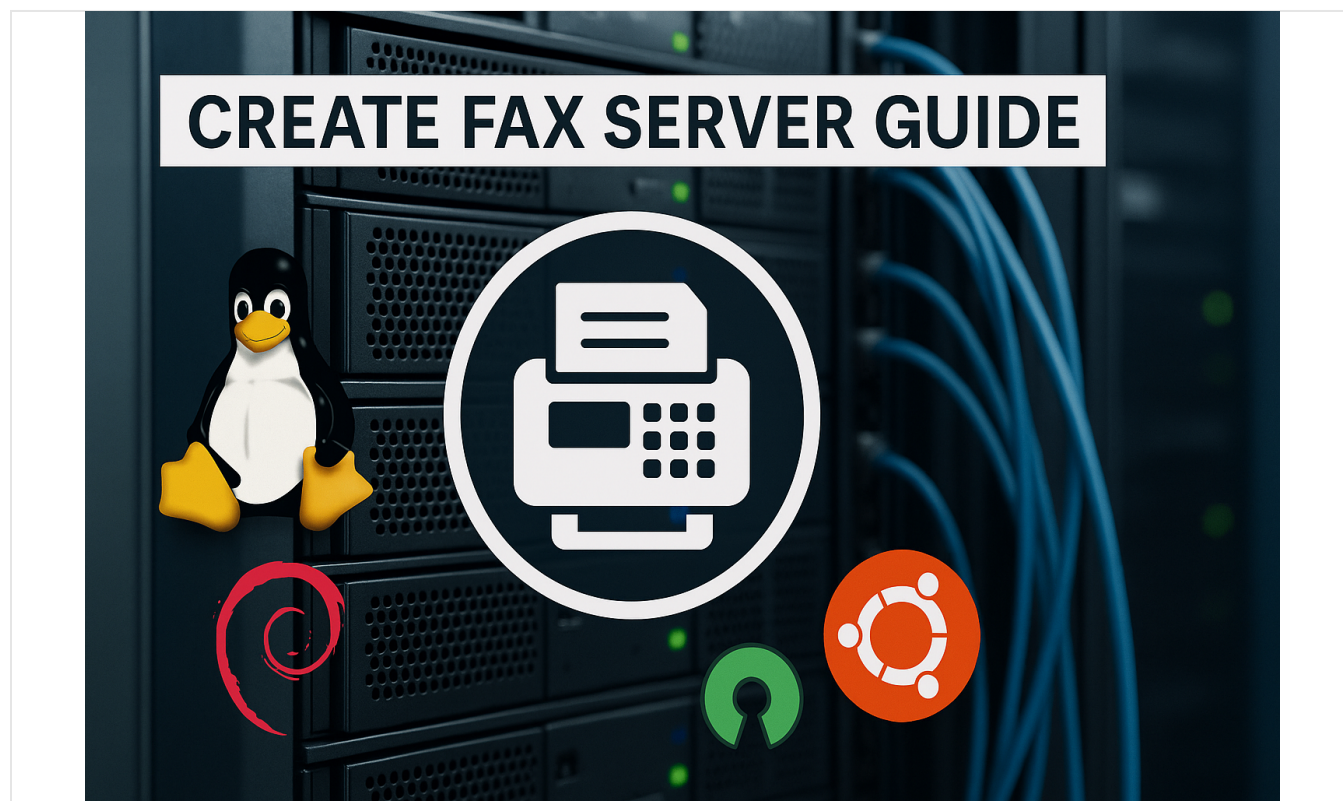


Building Open-Source Fax Servers: Setup & Best Practices

By ClearlyIP Published May 20, 2025 15 min read



Building an Open-Source Fax Server from Scratch: Software, Setup, and Best Practices

Introduction to Fax Technology and Modern Use Cases

Fax (facsimile) technology transmits scanned documents over telephone lines using standardized protocols. Traditional Group 3 fax (ITU-T T.30/T.4) sends analog signals via modems, while modern systems often use Fax-over-IP (FoIP) standards such as ITU-T T.38 for real-time fax over [IP networks](#) [dialogic.comdocumentation.media5corp.com](#). Despite the rise of email and digital

communication, fax remains vital in regulated industries (healthcare, government, finance) where secure, auditable document transmission is required. For example, a healthcare survey found that 50% of patient information was still sent by fax (56% “paperless”/electronic, 44% on paper) opentext.com. Fax’s continued use is attributed to legal acceptance, integration with electronic record systems, and compliance (e.g. HIPAA) opentext.com icomictfax.com. In modern infrastructure, fax servers bridge legacy phone networks and digital workflows: they can send faxes from email or web apps, convert documents into fax formats, and log transmissions centrally for audit.

Open-Source Fax Server Software Options

Several open-source fax server packages exist, each with distinct features:

- **HylaFAX+ (Community Edition):** A long-established, enterprise-grade fax server. It is explicitly “designed to be very robust and reliable”, guarding against failures and ensuring no jobs are silently lost hylafax.org. HylaFAX supports Class 1/2 fax modems natively (i.e. most analog modems) and can manage multiple modems in parallel hylafax.org. It uses a client-server model: a central `hfaxd` daemon and schedulers, with utilities like `faxsetup`, `faxaddmodem`, and `faxgetty` to configure modems and queues hylafax.org/wiki.debian.org. Features include fax-to-email integration, multi-channel queuing, and scripting hooks for attachments; it is highly configurable via plain-text parameters hylafax.org/icomictfax.org. HylaFAX’s strengths are its stability, high-volume throughput, and broad modem support icomictfax.org/hylafax.org. Limitations include a relatively manual setup and lack of built-in modern GUI (though third-party frontends exist).
- **ICTFax:** An open-source, web-based multi-tenant fax solution built on FreeSWITCH/ICTCore. ICTFax provides email-to-fax, fax-to-email, and web portal interfaces out of the box icomictfax.com. It is designed for service providers or large organizations: it supports isolated user accounts (white-label/multi-tenant) and bulk faxing, and includes security features like SSL/TLS, multi-factor auth, and extensive logging for HIPAA compliance icomictfax.org. ICTFax’s advantages are its polished web UI and out-of-box integration with VoIP (T.38 via FreeSWITCH) and email, making it easy to deploy fax services over IP or the Internet. On the downside, it has heavier dependencies (Apache, MySQL/MariaDB, FreeSWITCH) and a complex setup compared to HylaFAX icomictfax.org.
- **Asterisk Fax (Spandsp/res_fax or Sangoma Fax for Asterisk):** Asterisk can act as a fax server using its fax modules. The open-source `res_fax_spandsp` and `app_fax` modules allow sending/receiving faxes through analog or G.711 audio channels (with lower reliability) community.asterisk.org asteriskguru.com. Sangoma’s commercial **Fax For Asterisk** (formerly

Digium Fax) adds enhanced fax handling, including full T.38 support, error correction, and call-center style functions asterisk.org. This option integrates fax directly into an existing [Asterisk PBX](#) environment, which is ideal if the organization already uses Asterisk for telephony. Its advantages are tight [VoIP integration](#) and programmability via dialplan; limitations include reliance on Asterisk and (for Sangoma) licensing costs.

- **Other options:** Simple setups can use Unix tools like *mgetty+sendfax* or *efax*, which are lightweight for very basic fax needs (usually one line). For graphical management, front-ends like *AvantFAX* (a PHP web GUI for HylaFAX) or ICTCore can be added. Commercial/forked editions (e.g. HylaFAX Enterprise) exist but are beyond the open-source scope.

In comparison, HylaFAX excels at stability and volume, ICTFax at ease-of-use and multi-user, and Asterisk at integration with VoIP. Table-style summaries from vendors note HylaFAX's robust multi-modem performance and security hylafax.orgictfax.org, while ICTFax highlights its web interface and HIPAA compliance ictfax.comictfax.com.

Hardware and System Requirements

Fax Modems and Channels

A fax server needs telephony interfaces: either analog fax modems or digital VoIP gateways. For analog lines, you can use PCI/PCIe multi-port fax modem cards or external serial/USB modems. HylaFAX in particular supports "multiple modems and a heavy traffic load" hylafax.org. Common analog modems include Class 1/2 PSTN modems (such as MultiTech or older US Robotics models). Note that many USB "Winmodems" are not suitable; full hardware-modem USB devices (e.g. using FTDI chips) or proper serial modems are preferred. Specialized telephony boards (e.g. Dialogic or Brooktrout fax cards) can handle dozens of simultaneous faxes, but are proprietary/hardware solutions outside the open-source stack.

For FoIP, T.38 is the standard for [fax over IP](#). T.38 gateways (on-premises or from [SIP providers](#)) allow a fax server to send fax data packets over the network in real time documentation.media5corp.com. For example, Asterisk's Fax module and ICTFax (via FreeSWITCH) support T.38 and fall back to audio if needed asterisk.orgictfax.com. Alternatively, HylaFAX can connect to Asterisk via a virtual modem (`IAXmodem`), treating an Asterisk IAX channel as a "line" for faxing hylafax.org. (The HylaFAX **IAXmodem** connector emulates a modem over IAX, letting HylaFAX use Asterisk as the gateway to [SIP/T.38](#).)

Recommendation: Use at least Class 2 fax modems or better. For analog fax, a modern multiport PCIe card (or USB modems on serial adapters) provides multiple lines. For IP fax, configure Asterisk/FreeSWITCH with T.38 support and use IAXmodem or ICTCore to route calls.

System Prerequisites and Dependencies

A Linux server (Debian, Ubuntu, CentOS/RHEL, etc.) is recommended. Processing faxes (image conversion, encryption) can be CPU-intensive, so a server-class machine with several CPU cores and plenty of RAM is advisable for high volume. Note: fax operations are time-sensitive (real-time signal processing), so virtual machines can have timing issues; if possible, use a dedicated physical server or a robust real-time virtual setup (see Debian wiki: *"Hylafax may have problems running in a virtual environment... Fax sending is very time critical."* wiki.debian.org).

Software prerequisites depend on the chosen fax solution. For HylaFAX+ built from packages: on Debian/Ubuntu one can simply `apt-get install hylafax-server hylafax-client` and required libraries (libtiff, ghostscript) will be pulled in wiki.debian.org. For building from source, ensure you have a C++ compiler (gcc) and image libraries (at least libtiff v3.4+, Ghostscript, NetPBM, etc.) installed legacy.hylafax.org. HylaFAX's build wiki lists the dependencies; key ones include libtiff (for TIFF images) and Ghostscript (for converting PostScript/PDF to image) legacy.hylafax.org. ICTFax requires a full LAMP stack and FreeSWITCH: e.g., CentOS 7–9 or Amazon Linux 2, Apache, MariaDB/MySQL, PHP, and Freeswitch (ICTCore) ictfax.org. Ensure SELinux/AppArmor are configured permissively or disabled for fax services, as they may block modem access or network calls by default.

Installation and Configuration

Installing the Fax Software

HylaFAX (Debian/Ubuntu):

pgsql

Copy

```
sudo apt-get update sudo apt-get install hylafax-server
```

This installs HylaFAX and its client tools. After install, run the `faxsetup` utility as root to configure the system wiki.debian.org. `faxsetup` writes base config files, configures init scripts, and then prompts to run `faxaddmodem`. Use `faxaddmodem` to detect and configure each attached modem (it will ask for the serial device, speed, etc.) wiki.debian.org. After setup, HylaFAX daemons (`hfaxd`, `faxq`, `faxgetty`) run in the background.

HylaFAX (CentOS/RHEL): HylaFAX may be available in EPEL or third-party repos. Alternatively, download the source or RPMs from hylafax.org. Install dependencies (`gcc`, `libtiff-devel`, `ghostscript`, etc.) then compile or use the yum `epel-release` followed by `yum install hylafax-server`.

ICTFax: Follow the ICTFax installation guide ictfax.org. In summary: install a supported OS (CentOS 7/8/9 or Rocky Linux), enable EPEL, install Apache, PHP, MariaDB, and the "okay" repo for FreeSWITCH ictfax.org. Then download the ICTFax package (or clone from GitHub) and run its setup scripts. You will create a MariaDB schema and configure Apache virtual hosts. The details are lengthy, but the official guide walks through each step ictfax.org.

Asterisk Fax Modules: For a fax server integrated with Asterisk, enable `res_fax` and `res_fax_spandsp` when building Asterisk. Configure Asterisk dialplan with `FaxDetect()` and `SendFAX()` / `ReceiveFAX()` applications. For Sangoma Fax for Asterisk, obtain the package from Sangoma/Digium and follow their installation; it installs as an Asterisk add-on that hooks into the dialplan asterisk.org.

Configuring Modems and Dialing

After installation, configure each fax line: in HylaFAX this means editing `/var/spool/hylafax/etc/config.<modem>` or using `faxaddmodem`. You'll specify device paths (e.g. `/dev/ttyS0` or `/dev/ttyUSB0`), low-level command strings, and dialing options (e.g. dialing prefixes). HylaFAX supports Class 2 dialing (DIAL tone, pulse/tone, etc.). Use the HylaFAX FAQ or Debian guide for specifics. For FoIP, configure your gateway (Asterisk or Freeswitch) to route certain DID numbers to HylaFAX's IAXmodem extensions.

Integration with Email (Fax-to-Email / Email-to-Fax)

Most modern fax servers support email gateways. In HylaFAX, the `faxmail` utility can be used to send a fax by piping an email message into it. One common setup is an **Email-to-Fax gateway**: users send an email (with PDF/TIFF attachments) to a special address (e.g. `` where the name contains the destination fax number), and `faxmail` processes the attachments

and submits them as fax jobs legacy.hylafax.org. (HylaFAX's `faxmail` can decode common formats or you can write custom MIME converters.) Incoming faxes can similarly be emailed out via scripts triggered by the `faxrcvd` program.

ICTFax has built-in email integration: out-of-box it will send received faxes as email attachments (PDF/TIFF) and allow sending faxes by email or web-form. It uses SSL/TLS for email transport to secure PHI ictfax.com. For any email setup, ensure you configure Postfix/Sendmail to allow local submission and use authenticated TLS to your SMTP relay.

Integration with Web Interfaces and Applications

A web GUI can simplify fax operations. *AvantFAX* is a popular open-source PHP front-end for HylaFAX that provides a user interface for sending/receiving faxes, address books, and status displays. It requires Apache/PHP and can run on the same or separate server. ICTFax includes its own web portal with dashboards and user management. Other options: *ICTCore* (also by ICT) offers a unified communications API (though typically ICTFax alone suffices).

Asterisk/IAXmodem: If using Asterisk, configure `iax.conf` on the HylaFAX host to accept connections from the Asterisk server. Start the `iaxmodem` service (from HylaFAX connectors) with the same extension numbers as the Asterisk dialplan. In the Asterisk dialplan, calls to fax numbers are routed to an IAX channel that HylaFAX then handles as a "fax modem". The Debian HylaFAX wiki and forums have example configurations (e.g. using `Dial(IAX2/iaxfax/1001)`) hylafax.org.

Network and Security Best Practices

- **Firewall and Access Control:** Expose only necessary ports. HylaFAX uses port 4559 (TCP) for client connections; permit this on internal networks only. Block all unused ports and restrict access to management interfaces (e.g. SSH should be limited or use key-based login). For email and web frontends, use TLS (HTTPS) and strong auth. If the fax server answers outside calls (VoIP), limit which carriers or IPs can reach its SIP/IAX/T.38 endpoints.
- **Encryption and Compliance:** Ensure data is encrypted in transit and at rest for sensitive documents. Configure SMTPS/IMAPS for email relay, and HTTPS for any web UI. If storing faxes on disk, use filesystem encryption or secure access controls. Many HIPAA guides note that fax servers should log all transmissions and enforce user authentication ictfax.com. ICTFax explicitly advertises SSL/TLS on all channels ictfax.com.

- **Authentication and Audit:** Use strong passwords and change default pins. Limit HylaFAX client accounts so only authorized users can submit or retrieve faxes. Enable HylaFAX's activity logging (through `hylafax.log`) and consider central logging with syslog for audit trails hylafax.sourceforge.io. Keep track of user activity – ICTFax and HylaFAX can both log sender/recipient info in detail, which is critical for troubleshooting and compliance.
- **Protect Against Fax Spam:** As with email, fax servers can be targeted by nuisance calls. Implement dialplan rules or HylaFAX scripts to reject repeated calls, unknown numbers, or faxes with suspicious content. The FCC and industry suggest blacklists or manual rejection policies for junk faxes. At minimum, monitor incoming calls and adjust filters (e.g. using `RingCount` thresholds, or custom scripts via `DynamicConfig`).
- **Regular Updates and Hardening:** Keep the OS and fax software patched. Since many fax servers run on Linux, follow standard Linux security hardening (disable root SSH, use firewalls, enforce SELinux/AppArmor policy exceptions for fax, etc.). Disable any unneeded services to reduce attack surface.

Logging, Monitoring, and Troubleshooting

HylaFAX and similar servers produce detailed logs and status output:

- **HylaFAX Logs:** By default, each modem's calls are logged in `/var/spool/hylafax/log` (one file per call). Additionally, overall server messages go to syslog (facilities `daemon` or `local0`) as controlled by the modem config's `LogFacility` and `ServerTracing` settings hylafax.sourceforge.io. Inspect these logs when faxes fail: HylaFAX advises *"review the log file for any failed fax ... If you do not know how to correct the problem, it is a good idea to post the log"* to forums hylafax.sourceforge.io.
- **Queue Status:** The `faxstat` command (part of HylaFAX) reports queue status, showing how many faxes are pending, sending, or done. It can indicate backlog or stuck jobs (e.g. jobs in the send directory) hylafax.org. For proactive monitoring, tools like **OpenSMART** can watch the HylaFAX processes (faxq, hfaxd, faxgetty) and alert if they stop legacy.hylafax.org.
- **Automated Monitoring:** Consider a system monitor (Nagios, Zabbix, etc.) to check the fax service. HylaFAX doesn't publish SNMP by default, but you can monitor process health, log patterns (e.g. scanning for repeated errors), or queue lengths. For example, OpenSMART

provides a configuration snippet that verifies `faxq`, `hfaxd`, and `faxgetty` are running, restarting them if they crash legacy.hylafax.org.

- **Troubleshooting Tools:** Use `faxq` (with `faxq -vx`) to manage the queue (view, resubmit, remove jobs). `faxstat -sd` shows detailed status. If using an Asterisk/IAXmodem setup, Wireshark or Asterisk's verbose logs can help debug T.38/IAX negotiation issues. Always verify the physical layer (line quality, dial tone) by testing modems with `minicom` or `faxstat -p`.

Scalability and Performance Optimization

For low to moderate fax volumes (tens of pages per day), a single-server HylaFAX with one modem is sufficient. For higher throughput (hundreds to thousands of pages), plan for parallel lines and powerful hardware:

- **Multi-Modem Scaling:** HylaFAX scales by adding more modems. Its scheduler assigns jobs to any available modem by priority hylafax.org. You can install multiple PCIe fax modem cards, or multiple USB modems, to create a bank of lines. Ensure the CPU and I/O (disk, CPU for image conversion) can keep up with simultaneous sessions.
- **Distributed/Clustered Fax:** In very large deployments, you might deploy multiple fax servers (each with a few modems) behind a load-balancing telephone system. Incoming calls can use automatic routing (DNIS) to distribute loads. HylaFAX Enterprise (commercial) offers clustering features; in open source, this is usually custom (e.g. SIP calling multiple HylaFAX nodes).
- **Performance Tuning:** Some tips include disabling debug logging (to reduce I/O overhead) hylafax.sourceforge.io, using fast storage for spool directories, and optimizing Ghostscript if used for conversion. On multi-core systems, HylaFAX spawns separate processes per call, so it benefits from more CPU cores. Prioritize fax processes in the OS scheduler if needed (e.g. using `nice` or `chrt`) since timely handling of signals is important. For email integration, use a queue or batching (so that transient mail delays don't block fax flow).
- **High-Availability:** For enterprise reliability, consider redundancy. This might mean a hot-standby fax server (with replicated configs and queues) and failover PSTN/SIP provider entries. Database-backed systems (like ICTFax) can also be clustered via MySQL replication and mirrored file systems for storage.

Case Studies and Real-World Implementations

While specific open-source fax deployments are not always publicized, many organizations rely on fax servers:

- **Healthcare:** Hospitals and clinics often deploy fax servers (open-source or commercial) to meet HIPAA requirements. The OpenText study noted that **56% of healthcare faxing is paperless** and that secure digital faxing improves information flow opentext.com. For example, a major New York healthcare provider reportedly replaced aging fax machines with a secure IP fax solution to meet HIPAA, highlighting cost and compliance drivers.
- **Government and Legal:** Regulatory bodies and courts frequently require signed documents, making fax a legal necessity. State agencies may run HylaFAX servers to handle building permit fax submissions, or public defender offices might use fax for case files.
- **Service Providers:** Companies offering hosted fax services sometimes use ICTFax or HylaFAX as a backend. (ICTFax's multi-tenant support is aimed at this market.)

Even in sectors moving toward "paperless", fax survives as the trusted vehicle for certain document exchanges. The cited healthcare survey concludes fax will remain integral *"in the future"* as a secure, integrable channel opentext.com.

Conclusion

Building an open-source fax server is a multi-layered task involving legacy telephony and modern IT integration. The best practice is to choose software suited to your scale and environment: for raw reliability and volume, HylaFAX+ on Linux is proven hylafax.org; for integrated web/email solutions, ICTFax or Asterisk-based systems may be preferable. Ensure you have the right hardware (fax modems or VoIP infrastructure) and fully secure the system (use TLS, strict access controls, and logging) to meet regulatory requirements icthfax.com. Throughout, refer to the official documentation (e.g. HylaFAX manuals hylafax.org hylafax.sourceforge.io) and community resources.

In summary, a well-designed open-source fax server can reliably handle modern fax needs. Key takeaways: **use robust, community-supported software; plan for security (encryption, authentication, audit); monitor faxes and system health continuously; and scale by adding lines and servers as volume grows.** With careful setup and maintenance, fax can remain a secure and efficient part of an organization's communication infrastructure opentext.com hylafax.org.

Sources: Authoritative project documentation, industry whitepapers, and technical resources were consulted, including HylaFAX manuals hylafax.org hylafax.sourceforge.io, ICTFax installation guides ictfax.org, Asterisk product pages asterisk.org, and industry analyses opentext.com/documentation.media5corp.com.

Tags: fax server, open source, voip, foip, t.38, telephony, networking, system administration, compliance

About ClearlyIP

ClearlyIP Inc. — Company Profile (June 2025)

1. Who they are

ClearlyIP is a privately-held unified-communications (UC) vendor headquartered in Appleton, Wisconsin, with additional offices in Canada and a globally distributed workforce. Founded in 2019 by veteran FreePBX/Asterisk contributors, the firm follows a "build-and-buy" growth strategy, combining in-house R&D with targeted acquisitions (e.g., the 2023 purchase of Voneto's EPlatform UCaaS). Its mission is to "design and develop the world's most respected VoIP brand" by delivering secure, modern, cloud-first communications that reduce cost and boost collaboration, while its vision focuses on unlocking the full potential of open-source VoIP for organisations of every size. The leadership team collectively brings more than 300 years of telecom experience.

2. Product portfolio

- **Cloud Solutions** – Including *Clearly Cloud* (flagship UCaaS), **SIP Trunking**, **SendFax.to** cloud fax, **ClusterPBX OEM**, **Business Connect** managed cloud PBX, and **EPlatform** multitenant UCaaS. These provide fully hosted voice, video, chat and collaboration with 100+ features, per-seat licensing, geo-redundant PoPs, built-in call-recording and mobile/desktop apps.
- **On-Site Phone Systems** – Including CIP PBX appliances (FreePBX pre-installed), ClusterPBX Enterprise, and Business Connect (on-prem variant). These offer local survivability for compliance-sensitive sites; appliances start at 25 extensions and scale into HA clusters.
- **IP Phones & Softphones** – Including CIP SIP Desk-phone Series (CIP-25x/27x/28x), fully white-label branding kit, and *Clearly Anywhere* softphone (iOS, Android, desktop). Features zero-touch provisioning via Cloud Device Manager or FreePBX "Clearly Devices" module; Opus, HD-voice, BLF-rich colour LCDs.

- **VoIP Gateways** – Including Analog FXS/FXO models, VoIP Fail-Over Gateway, POTS Replacement (for copper sun-set), and 2-port T1/E1 digital gateway. These bridge legacy endpoints or PSTN circuits to SIP; fail-over models keep 911 active during WAN outages.
 - **Emergency Alert Systems** – Including **CodeX** room-status dashboard, **Panic Button**, and **Silent Intercom**. This K-12-focused mass-notification suite integrates with CIP PBX or third-party FreePBX for Alyssa's-Law compliance.
 - **Hospitality** – Including **ComXchange** PBX plus PMS integrations, hardware & software assurance plans. Replaces aging Mitel/NEC hotel PBXs; supports guest-room phones, 911 localisation, check-in/out APIs.
 - **Device & System Management** – Including **Cloud Device Manager** and **Update Control (Mirror)**. Provides multi-vendor auto-provisioning, firmware management, and secure FreePBX mirror updates.
 - **XCast Suite** – Including Hosted PBX, SIP trunking, carrier/call-centre solutions, SOHO plans, and XCL mobile app. Delivers value-oriented, high-volume VoIP from ClearlyIP's carrier network.
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3. Services

- **Telecom Consulting & Custom Development** – FreePBX/Asterisk architecture reviews, mergers & acquisitions diligence, bespoke application builds and Tier-3 support.
 - **Regulatory Compliance** – E911 planning plus **Kari's Law**, **Ray Baum's Act** and **Alyssa's Law** solutions; automated dispatchable location tagging.
 - **STIR/SHAKEN Certificate Management** – Signing services for Originating Service Providers, helping customers combat robocalling and maintain full attestation.
 - **Attestation Lookup Tool** – Free web utility to identify a telephone number's service-provider code and SHAKEN attestation rating.
 - **FreePBX® Training** – Three-day administrator boot camps (remote or on-site) covering installation, security hardening and troubleshooting.
 - **Partner & OEM Programs** – Wholesale SIP trunk bundles, white-label device programs, and ClusterPBX OEM licensing.
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4. Executive management (June 2025)

- **CEO & Co-Founder: Tony Lewis** – Former CEO of Schmooze Com (FreePBX sponsor); drives vision, acquisitions and channel network.
- **CFO & Co-Founder: Luke Duquaine** – Ex-Sangoma software engineer; oversees finance, international operations and supply-chain.
- **CTO & Co-Founder: Bryan Walters** – Long-time Asterisk contributor; leads product security and cloud architecture.

- **Chief Revenue Officer: Preston McNair** – 25+ years in channel development at Sangoma & Hargray; owns sales, marketing and partner success.
 - **Chief Hospitality Strategist: Doug Schwartz** – Former 360 Networks CEO; guides hotel vertical strategy and PMS integrations.
 - **Chief Business Development Officer: Bob Webb** – 30+ years telco experience (Nsight/Cellcom); cultivates ILEC/CLEC alliances for Clearly Cloud.
 - **Chief Product Officer: Corey McFadden** – Founder of Voneto; architect of EPlatform UCaaS, now shapes ClearlyIP product roadmap.
 - **VP Support Services: Lorne Gaetz** (appointed Jul 2024) – Former Sangoma FreePBX lead; builds 24x7 global support organisation.
 - **VP Channel Sales: Tracy Liu** (appointed Jun 2024) – Channel-program veteran; expands MSP/VAR ecosystem worldwide.
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5. Differentiators

- **Open-Source DNA:** Deep roots in the FreePBX/Asterisk community allow rapid feature releases and robust interoperability.
 - **White-Label Flexibility:** Brandable phones and ClusterPBX OEM let carriers and MSPs present a fully bespoke UCaaS stack.
 - **End-to-End Stack:** From hardware endpoints to cloud, gateways and compliance services, ClearlyIP owns every layer, simplifying procurement and support.
 - **Education & Safety Focus:** Panic Button, CodeX and e911 tool-sets position the firm strongly in K-12 and public-sector markets.
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In summary

ClearlyIP delivers a comprehensive, modular UC ecosystem—cloud, on-prem and hybrid—backed by a management team with decades of open-source telephony pedigree. Its blend of carrier-grade infrastructure, white-label flexibility and vertical-specific solutions (hospitality, education, emergency-compliance) makes it a compelling option for ITSPs, MSPs and multi-site enterprises seeking modern, secure and cost-effective communications.

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