How to Install FreePBX on a Synology NAS to Build a Home Intercom

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Quick answer

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FreePBX is a web-based interface that makes it easier to manage Asterisk, the open-source telephony engine. It can run on a Synology NAS, but this setup isn't officially encouraged for production. Think of it as a solid learning path, a lab build, or a small internal phone system-especially if you already own a capable Synology.

System Requirements for FreePBX

- CPU: Dual-core minimum (Intel i5-class recommended)
- RAM: 4 GB minimum (8 GB recommended)
- Storage: 50-100 GB per VM/container (SSD preferred)
- Network: Stable connection for VoIP traffic
- Synology Features: Your model should support Virtual Machine Manager (VMM) or Docker

Check Your Synology NAS Compatibility

Confirm that your NAS supports VMM or Docker. Not all models do-entry-level J-series often lack these features. Use Synology's official compatibility pages to verify support.

Important Considerations and Warnings

Why Running FreePBX on Synology Can Be Tricky

- Performance trade-offs: Synology NAS units are designed for storage first. Adding a PBX alongside other apps can impact both call quality and NAS responsiveness.
- Resource contention: Background services on the NAS compete with Asterisk for CPU, RAM, and I/O.
- "One box for everything" risk: A NAS isn't a general "run all the things" server. Cramming too much into it leads to instability.
- Limited official support: This isn't a standard, vendor-supported production design.
- Backups and snapshots: Telephony systems are stateful; snapshot timing and restores can be sensitive.

When Installing on a Synology NAS Still Makes Sense

- Small setups (roughly 4-20 extensions) where top-tier call quality isn't mission critical.
- Testing, labs, and hands-on learning.
- Internal calling focus, with mobiles as fallback for outside calls.
- You already own a strong Synology NAS and want to get more value from it.

Bottom line: It works best for modest, internal use. For internet-facing, business-critical systems, a dedicated VPS or server is better.

Installation Methods

You can run FreePBX on Synology using either a virtual machine (VMM) or a Docker container. VMM aligns with the standard ISO installation and usually produces the most predictable results.

Method: Virtual Machine Manager (VMM) | Pros: Runs the official FreePBX ISO; better isolation; widely understood | Cons: Heavier on CPU/RAM; needs a capable NAS | Difficulty: Medium

Method: Docker | Pros: Lighter footprint; convenient lifecycle | Cons: Limited upstream support; networking & config can be tricky | Difficulty: Medium-Hard

Recommended: Use Virtual Machine Manager for this project unless you have a strong reason to choose Docker.

Method 1: Virtual Machine Manager Installation

Step 1: Download Required Files

1. Go to the official FreePBX downloads page and grab the latest ISO (e.g., FreePBX 15/16 on Asterisk 18+).
2. Save the 2-2.5 GB ISO to your computer.
3. In Synology File Station , create or use a shared folder like ISO_Images and upload the ISO.

Step 2: Install and Open Virtual Machine Manager

1. In Package Center , install Virtual Machine Manager .
2. Launch VMM and complete the initial wizard. Choose the storage volume for VMs.

Step 3: Create a System Image

1. In VMM, open the Image tab -> Add .
2. Select the ISO from your NAS and confirm the storage location.

Step 4: Create the Virtual Machine

1. Virtual Machine tab -> Create -> Create virtual machine with system image .
2. CPU: 2-4 cores (4 recommended). RAM: 2-4 GB (4 GB recommended).
3. Disk: 50-100 GB on your chosen volume.
4. Network: Use the default virtual switch (LAN) so phones on your network can see the PBX.
5. Boot ISO: Point to the FreePBX ISO image.
6. Check Power on virtual machine after creation , then finish.

Step 5: Install FreePBX

1. Choose FreePBX -> Graphical Installation -> FreePBX Standard .
2. Set the root password , choose your time zone , and configure networking (static IP recommended). Note the IP.
3. Let the installer complete. This may take 30-45 minutes.
4. After reboot, eject the ISO in VMM (Edit VM -> set ISO to Unmounted) and reboot the VM again.

Step 6: Access the Web Interface

1. Find the VM's IP in VMM or inside the console via 'hostname -I' .
2. Open 'http://<VM-IP>' and log in (default 'admin/admin' -change this immediately).

3. Complete the FreePBX setup wizard.

Method 2: Docker Installation

Prerequisites

- Docker installed from Package Center .
- 20-30 GB free for data volumes.
- Basic Docker concepts (images, containers, volumes, and port mapping).

Step 1: Install Docker on Synology

1. Open Package Center -> search Docker -> Install .

Step 2: Pull the FreePBX Image

1. Open Docker -> Registry -> search ‘freepbx‘ (e.g., ‘tiredofit/freepbx‘).
2. Download the latest tag.

Step 3: Create Storage Volumes (Critical)

1. In Docker -> Volume , create:
    - ‘freepbx_data‘ (config)
    - ‘freepbx_mysql‘ (database, if embedded)
    - ‘freepbx_recordings‘ (call recordings)
    - ‘freepbx_logs‘ (logs)

Step 4: Create and Run the Container

1. In Docker -> Image , double-click the FreePBX image and name the container ‘freepbx‘ .
2. Open Advanced Settings : ADMIN_PASSWORD=YourSecurePassword DB_EMBEDDED=TRUE
    - General: Enable "Run after the wizard" and "Auto-restart".
    - Port Settings:
        - HTTP: ‘80:80‘
        - HTTPS: ‘443:443‘
        - SIP UDP: ‘5060:5060‘ (UDP)
        - SIP TCP: ‘5160:5160‘ (TCP)
        - RTP: ‘18000-18100:18000-18100‘ (UDP)
        - FOP: ‘4445:4445‘
    - Volume:
        - ‘freepbx_data‘ -> ‘/data‘
        - ‘freepbx_mysql‘ -> ‘/var/lib/mysql‘
        - ‘freepbx_recordings‘ -> ‘/var/spool/asterisk/monitor‘
        - ‘freepbx_logs‘ -> ‘/var/log‘
    - Environment:
3. Apply and start the container.

Step 5: Access the UI

1. Get the container’s IP from Docker -> Container details.
2. Visit ‘http://<NAS-IP>:80‘ or ‘https://<NAS-IP>:443‘ (accept the self-signed certificate warning).
3. Log in and complete the wizard (change default credentials right away).

Common Issues and Troubleshooting

1) Can’t Reach the Web Interface

Symptoms: Timeouts or "Connection refused."

- Confirm the VM/container is running.
- For Docker, re-check port mappings (80/443/5060).
- Review Synology firewall rules (Control Panel -> Security).
- Ping the VM/container IP from a LAN device to verify connectivity.

2) Web UI Is Slow or Freezing

- Increase VM resources (4 cores / 4 GB RAM if possible).
- Reduce other heavy NAS apps competing for resources.
- Restart Asterisk: asterisk -r core restart now

3) Docker Container Won’t Stay Up

- If you see iptables or Fail2Ban-related errors, try privileged mode.
- Check logs from the Docker UI for specific messages.
- Recreate the container with the correct ports/volumes; keep volumes so data persists.

4) Phones Can’t Register (SIP Unreachable)

This is the most common stumbling block. SIP and NAT don’t always play nicely behind a NAS.

- Same-LAN phones: Point phones to the PBX’s local IP (e.g., ‘192.168.1.100‘).
- Remote phones: Avoid open port forwards if you can. Use a VPN (WireGuard/OpenVPN) to bring phones into the LAN.
- Advanced NAT config: (if you must) edit ‘/etc/asterisk/sip_nat.conf‘ : externip=YOUR.PUBLIC.IP localnet=192.168.1.0/255.255.255.0 Then: asterisk -r core restart now

5) Call Recordings Disappear After Restart

- Ensure the volume is mounted at ‘/var/spool/asterisk/monitor‘ .
- Fix permissions if needed: ‘chmod 777 /var/spool/asterisk/monitor‘ .

6) "Connection attempt to AMI failed"

- Restart Asterisk and confirm it’s running (‘ps aux | grep asterisk‘).
- Check ‘/etc/asterisk/manager.conf‘ and ‘/etc/amportal.conf‘ credentials.
- Restart FreePBX: ‘fwconsole restart‘ .

Post-Installation Configuration

1) Change the Admin Password (Critical)

1. Log in at ‘http://<your-ip>‘ .
2. Administration -> Users -> Administrators -> edit ‘admin‘ and set a strong password.

2) System Basics

1. Administration -> System Admin : set hostname, static IP, DNS.
2. Set the correct time zone and enable NTP.

3) Add Extensions (Internal Numbers)

1. Administration -> Extensions -> Add Extension .
2. Choose Chan_PJSIP , then fill:
    - Extension: e.g., 100
    - Display Name: Your user
    - Secret/Password: A strong phone password
3. Submit and Apply Config .

4) Configure a SIP Trunk (Optional)

1. Gather SIP credentials from your VoIP provider.
2. Administration -> Connectivity -> Trunks -> Add Trunk -> Chan SIP Trunk .
3. Fill Trunk Name, outbound proxy/SIP server, registration string, and port (often 5060/5061).
4. Submit and Apply Config .

5) Inbound and Outbound Routes

- Inbound: Connectivity -> Inbound Routes -> choose trunk, set destination (extension/IVR).
- Outbound: Connectivity -> Outbound Routes -> select trunk sequence.

6) IVR (Auto-Attendant)

1. Administration -> IVR -> Add IVR .
2. Name it, upload/record an announcement, map digits (1/2/3...) to destinations.
3. Submit and Apply Config .

7) Music on Hold

1. System Settings -> Music on Hold Classes -> select default class.
2. Upload audio or use the provided options.

8) Call Recording (Optional)

1. System Settings -> Asterisk SIP Settings -> Advanced .
2. Enable auto-recording if you need it, then Apply Config .

User Feedback and Community Experiences

Success Stories

One notable setup used a DS920+ with 8 GB RAM (about 2 GB for the FreePBX VM), serving 70+ extensions with conference rooms. It focused on internal office calling, snapshot backups to a secondary NAS, and cell phones for external calls if needed.

Common Pain Points

- Docker complexity: Repeated reinstall attempts and long configuration cycles are common; VMM is often simpler.
- Call quality hiccups: One-way audio or drops after several minutes due to resource contention or networking.
- UI freezes: Temporary AMI timeouts that improve after allocating more RAM.
- Remote extensions: NAT traversal and port forwarding challenges; VPN usually wins.
- Backups: Snapshots aren’t everything-use configuration backups too.

Expert View (Community Consensus)

Running a production PBX on a NAS or in a container is generally seen as a hobbyist move. The usual advice: keep serious phone systems on dedicated hardware or a VPS with official images and support.

Better Alternatives, Depending on Your Needs

- Small business: A $5-$10/month VPS (DigitalOcean, Vultr, Linode) with a one-click install.
- Testing: An old mini-PC (e.g., ThinkCentre) idles at ~10-15 W and runs FreePBX well.
- Enterprise: Certified, supported FreePBX appliances.

These take the strain off your NAS and simplify networking, NAT, and SIP registration. :contentReference[oaicite:2]{index=2}

Maintenance and Monitoring

Backups

- Monthly config backup: Administration -> Backup and Restore -> create and download a backup. Keep an off-NAS copy.
- VM snapshots (VMM): Right-click the VM in VMM -> Take Snapshot , name with a date, and (ideally) replicate to a second NAS.

Health Checks

- Asterisk status: ssh root@<VM-IP or Container-IP> asterisk -rvvvvv sip show peers core show calls
- Memory/CPU: DSM Resource Monitor shows whether FreePBX is starving for resources.
- Logs: On the VM: ‘/var/log/asterisk/full‘ . In the UI: Administration -> Tools -> System Log .

Final Recommendations

Before You Begin

- Be realistic about your goals. If you need rock-solid, internet-facing calling, a VPS or appliance is usually simpler.
- Consider alternatives (3CX, bare Asterisk, or a hosted PBX).
- Have a recovery plan if the NAS fails.
- Think about growth over the next few years.

If You Proceed on Synology

- Prefer Virtual Machine Manager over Docker for stability.
- Allocate enough resources (2-4 cores, 2-4 GB RAM).
- Keep it local-only ; use a VPN for remote devices.
- Back up weekly (snapshots + config exports).
- Monitor the system regularly.
- Know how to migrate to dedicated hardware if your needs grow.

Disclaimer: This setup reflects community experience and best practices. Your results will depend on your hardware, network, and configuration. Proceed with regular backups and test thoroughly.