

3CX Session Border Controllers (SBCs)

Architecture, Sizing & High Availability Guidance: SBC Device vs. Router Phone

DataPath Perspective: For cloud-hosted 3CX deployments with physical IP phones, the SBC is an important edge component. It simplifies remote-site connectivity and provisioning while giving DataPath a consistent, supportable architecture across customer locations.

What the 3CX SBC Does

The 3CX Session Border Controller is a software service that runs inside the customer LAN and connects IP phones to a 3CX instance located in the cloud or at another site. It aggregates SIP signaling and RTP media from the site and sends that traffic to 3CX, helping reduce common NAT, firewall, and remote-provisioning issues.

- Provides a controlled path between local IP phones and the remote 3CX instance.
- Simplifies phone provisioning at branch offices and remote locations.
- Reduces exposure to common NAT and firewall-related VoIP problems.
- Provides a practical architecture for centrally hosted 3CX with distributed offices.

Recommended Deployment Model

The following ranges are DataPath design guidance. 3CX specifically recommends a dedicated SBC for networks with more than 10 phones and a router phone for smaller sites.

Site Size	Recommended Approach	DataPath Design Notes
1-5 phones	Router phone	Best for home offices and very small branches.
5-10 phones	Multiple router phones or dedicated SBC	Dedicated SBC sooner when a site is operationally important.
10-25 phones	Dedicated SBC or multiple router phones	Preferred DataPath baseline for a traditional branch office.
25-50 phones	Dedicated SBC or Dual SBC HA Cluster	Use appropriately sized, wired, UPS-protected hardware.
50-100 phones	Dual SBC HA Cluster	Size to 3CX hardware guidance and BLF usage.
Mission-critical site	Dual SBC HA cluster	Active/passive SBC pair with floating LAN IP.

Design Principle: A router phone may be perfectly appropriate for a very small site. For a larger or business-critical office, a business should avoid making a single employee desk phone the infrastructure dependency for every other phone at that location.

Dedicated SBC Hardware

3CX publishes the following baseline specifications for SBCs serving cloud-hosted 3CX environments. The device counts assume approximately 10 BLFs per device, so heavily populated BLF configurations may require additional consideration.

Capacity	Platform	vCPU	Memory	Storage
Up to 50 devices	Linux Debian-based	2	2 GB	30 GB
Up to 50 devices	Windows-based	4	4 GB	30 GB
Up to 100 devices	Linux Debian-based	4	4 GB	30 GB
Up to 100 devices	Windows-based	6	8 GB	30 GB

Linux vs. Windows

For a dedicated SBC appliance, Debian Linux is generally the cleaner default because it minimizes operating-system overhead and aligns well with a purpose-built appliance model. Windows remains supported where a customer-specific operational requirement justifies it.

Windows version of 3CX SBC **does not** support an HA configuration.

NOTE: As of the date of this document, DataPath Solutions, Inc.'s standard deployment for a dedicated SBC is a Debian Linux virtual machine hosted on a Windows 11 computer. The host system may be a repurposed business-class desktop equipped with a minimum of 16GB of RAM and SSD or NVMe storage, provided the hardware is reliable and appropriately sized for the environment.

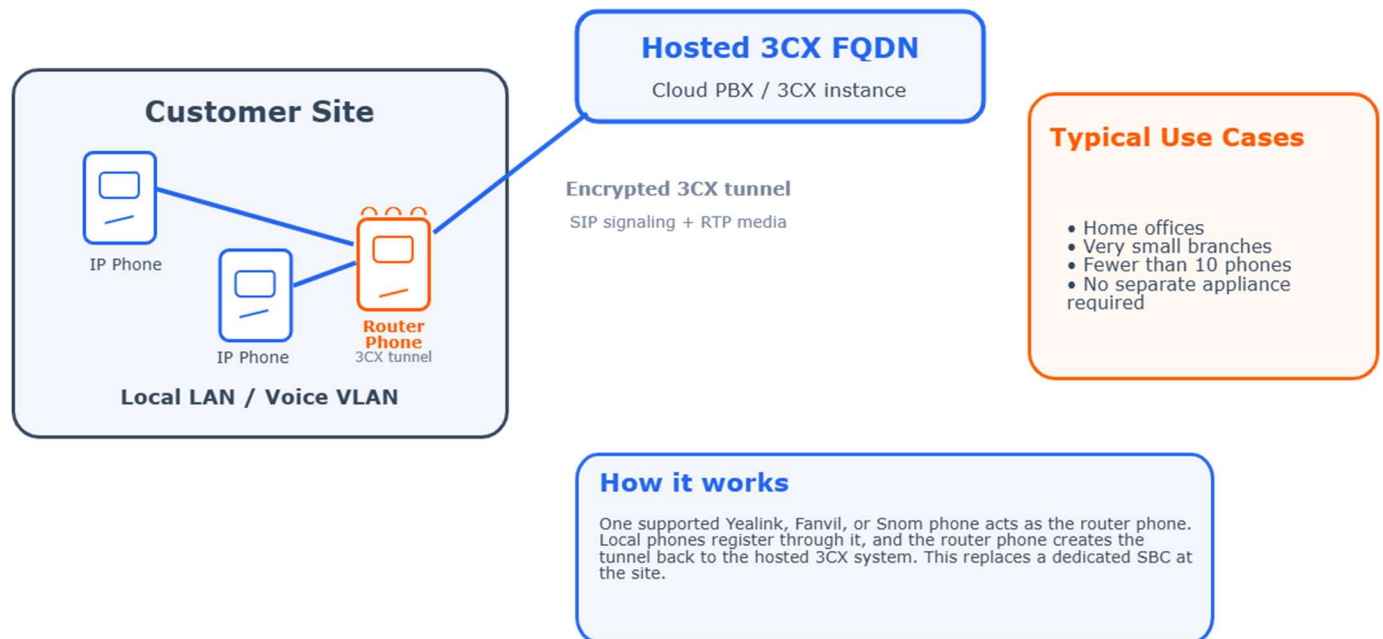
Router Phones

Router phones are an excellent fit for home offices and very small branches; DataPath will use dedicated SBC infrastructure instead where business continuity requirements justify it. DataPath validates the phone model against the current 3CX supported-phone list before deployment.

For a client site with approximately 18 phones or devices, DataPath may deploy three router phones: two (2) active router phones, each supporting roughly 50% of the device population, plus a third configured as a cold spare for use in the event of a primary router phone failure. While this is not DataPath's preferred or optimal architecture, it can be a technically viable option for smaller sites where budget and overall project cost are significant considerations.

Router Phone Architecture

The following diagram shows a small-site design that uses a supported router phone in place of a dedicated SBC. One compatible phone creates the tunnel back to the hosted 3CX system, and the other local phones register through it.



Use only current 3CX-supported router-phone models.

Router Phone vs. Dedicated SBC

Both approaches use the 3CX tunnel to connect a customer site to the hosted 3CX system. The difference is where the tunnel service runs: on a supported IP phone at a small site, or on a dedicated SBC appliance.

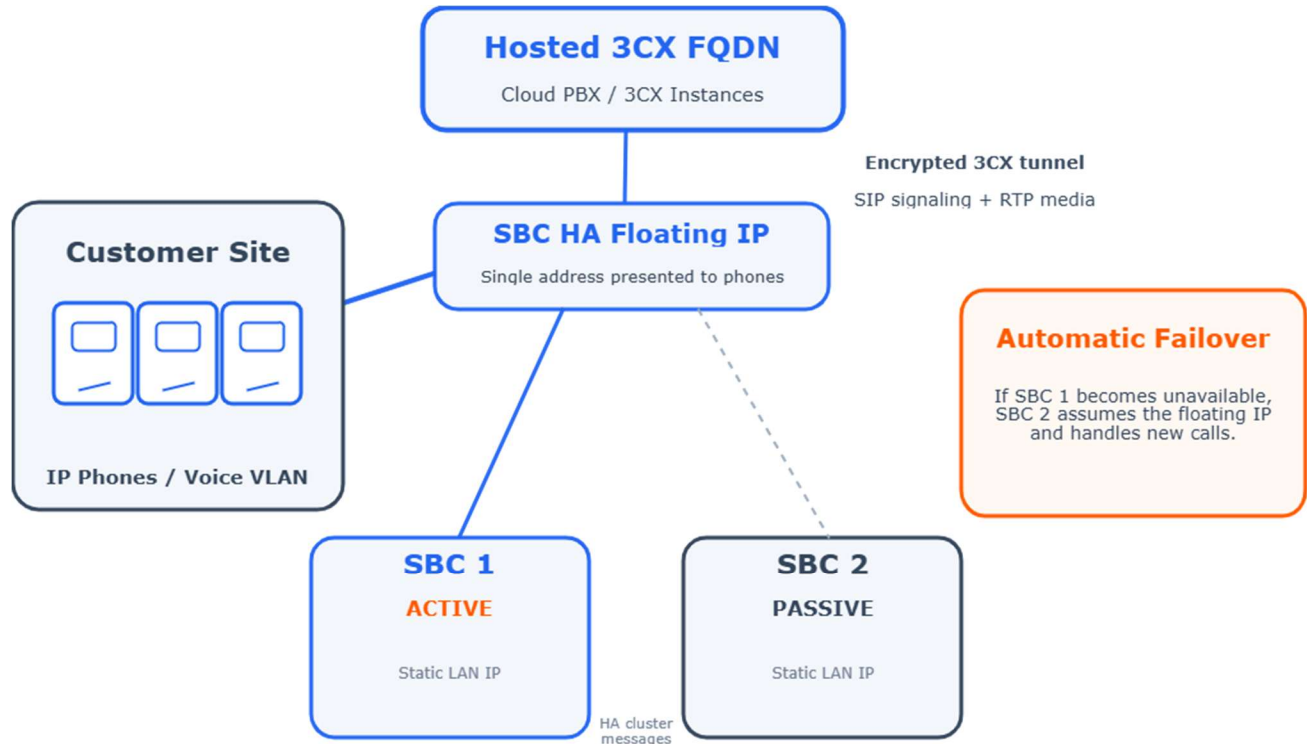
Consideration	Router Phone	Dedicated SBC
Typical site size	Home offices and very small branches, generally fewer than 10 phones.	Larger offices, traditional branches, and operationally important sites.
Hardware	No separate appliance; one supported IP phone performs the router/SBC function.	Dedicated Linux, Windows, or supported Raspberry Pi system running the 3CX SBC service.
Site dependency	The site depends on the designated router phone remaining powered, connected, and operational.	The SBC role is separated from individual user phones and can be UPS protected.
Resilience	Best where simplicity matters more than local redundancy.	Can be standalone or deployed as a two-node HA cluster.

Consideration	Router Phone	Dedicated SBC
Scale & management	Simple to deploy and maintain, but avoid making a desk phone the dependency for a larger office.	Better suited to higher endpoint counts, centralized monitoring, replacement, and lifecycle control.
Best fit	Remote workers, home offices, satellite offices, and very small branches.	Headquarters, larger branches, call-intensive offices, and business-critical sites.

DataPath Design Guidance: Use a router phone when a small site benefits from simplicity. Use a dedicated SBC when phone count, uptime expectations, monitoring needs, or future growth justify separating the SBC function from a desk phone.

3CX SBC High Availability

A standalone SBC can become a single point of failure for the phones that depend on it. DataPath and 3CX address this by supporting an active/passive SBC HA cluster. The two SBC nodes share a floating LAN IP, and the currently active node manages that address. If the active host fails, the passive node can assume the floating IP and service new calls.



Architecture redrawn by DataPath Solutions, Inc. from the 3CX SBC High Availability documentation.

HA Requirements

- Two PCs running the same Debian/Raspbian Linux version and updates.
- This may be run in Hyper-V environment on a local Windows 11 host computer.
- Static LAN IP addresses on the same subnet and the same time zone.
- Matching network-interface names for the SBC service on both nodes.
- Unrestricted communication between the two cluster members.
- A dedicated static LAN address to serve as the cluster floating IP.
- The same 3CX Authentication Key ID used for both SBC nodes.

Important Failover Behavior

Critical Limitation: Active calls are not restored across an SBC failover. After failover, the newly active SBC can handle new calls within a few seconds, while some management functions such as phone provisioning may take up to approximately two minutes to return.

Recommended DataPath Standard

DataPath can standardize 3CX edge connectivity into three practical tiers. This gives customers a consistent deployment model and gives the DataPath support team predictable components to monitor, document, replace, and troubleshoot.

Tier	Architecture	Best Fit
Small Office	3CX router phone or multiple router phones with (cold-spare) redundancy	Home offices and small branches where simplicity is the priority.
Small/Medium Business	Single SBC or two-node SBC HA cluster	Default architecture for traditional branch offices and operationally important sites.
Enterprise	Two-node SBC HA clusters for	Headquarters, contact centers, healthcare, and other continuity-sensitive locations.

Operational Standards for a DataPath-Managed SBC

- Assign and document a static LAN IP for each SBC and the floating IP where HA is used.
- Use wired Ethernet only and place the SBC on stable, business-grade switching infrastructure.
- Protect dedicated SBC appliances with UPS power whenever practical.
- Monitor SBC availability and enable 3CX notifications for SBC/trunk status changes.
- Document the 3CX authentication relationship, network interface, VLAN, gateway, and DNS settings.
- Include SBC replacement and recovery procedures in the client runbook.
- Validate router-phone and endpoint compatibility against the current 3CX supported-phone list before deployment.

Why This Matters to the DataPath 3CX Offering

A well-designed 3CX deployment is more than licensing and SIP trunks. The SBC architecture is part of the end-to-end communications design: cloud hosting, carrier diversity, local network readiness, remote-site connectivity, resilience, monitoring, and support. Standardizing the edge architecture allows DataPath to deliver a more predictable, fully managed experience.

DataPath Positioning: Fully managed 3CX - designed, hosted, secured, monitored, and maintained by Your Expert Technology Team.

Technical References

[3CX - Installing a 3CX SBC](#) | [3CX - Recommended Hardware Specifications](#) | [3CX - Create an SBC HA Cluster](#)