Unified Communications and Networking Converged

Grandstream GCC Series

Deployment Guide

Value proposition, deployment scenarios, technical breakdown, and model selection for the GCC6000 all-in-one convergence solution.

PART 1

Why a GCC Convergence Solution

Grandstream's **GCC Convergence Solutions** bring together multiple devices from multiple brands into a single, effective, and efficient all-in-one solution.

The Multi-Product Problem

Most small- to medium-sized businesses need to install at least 4 core system devices, such as a router, firewall, PBX, and switch, to create the networking and collaboration capabilities they need. However, different equipment often means increased costs, support contracts, different licensing, and multiple management platforms.

Different components from different brands also mean slower deployment times, complicated troubleshooting, and an overall worse experience for both the end user and the system integrator.

One Device, One Vendor

The GCC series solves those problems with its all in-one solution. GCC models include a built-in IP PBX, Firewall, Layer 2 Switching, and Router. The GCC6010W supports a Wi-Fi 6 access point for Wi-Fi-focused deployments.

The GCC series is perfectly suited for small- to medium-sized businesses (SMBs) and high-tech small offices/home offices (SOHOs). It can integrate seamlessly with other Grandstream devices to create a one-vendor total solution.

3

YEAR WARRANTY

All GCC devices come with a three-year warranty. In case a system integrator or IT team needs support with their GCC device, they would only need to contact Grandstream for support. This singlechannel support stream vastly speeds up the trouble-shooting process.

> **Instead of having 4 different components from different brands, the GCC series contains all components in one device from one vendor. The GCC series and other Grandstream devices can all be managed through our free cloud management platform, Grandstream Device Management System (GDMS).**

View the GCC Product Page

Flexibile and Easy Deployments

Form-fit to the way each site is run

The GCC series offers significant advantages with its flexibility and ease of deployment. The GCC series is not only managed through our cloud management platform (GDMS) but can also be managed through a local web GUI, GWN Manager, CLI, and SNMP. With these options, the GCC series can be form-fit to different SMB/SOHO environments, depending on their requirements.

All GCC models have a simple one-device design structure allowing all built-in features to seamlessly work together, without the intensive cross-brand configurations required of other solutions. This frees up a lot of space during deployment and makes it easier for installers to implement in their SMB/SOHO spaces.

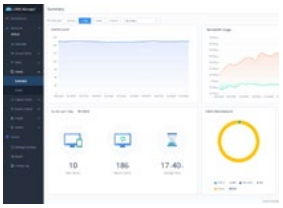
Five Ways to Manage a GCC Deployment

GDMS

Free centralized platform

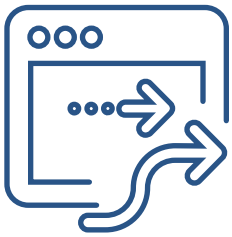
Local Web UI

Full on-device interface



GWN Manager

On-prem software controller



Command Line Interface (CLI)

Console, Telnet, SSH

SNMP

Network monitoring only

BEFORE

Four devices, four configurations

IP PBX

Firewall

Layer 2 Switch

VPN Router

AFTER

One GCC6000 device, one complete solution

- **IP PBX**
- **Firewall**
- **Layer 2 Switch**
- **VPN Router**

One firmware image, one interface, one support contact.

PART 2

Deployment Scenarios

Four example environments where a single GCC device fulfills the communications, networking, and security needs of the deployment.

01 Small / Medium Office

Core-layer backbone for UC, Network, and Security

02 Hospitality

Smaller hotels, motels, and B&B properties

03 Retail / Commercial

Single store or small multi-store deployment

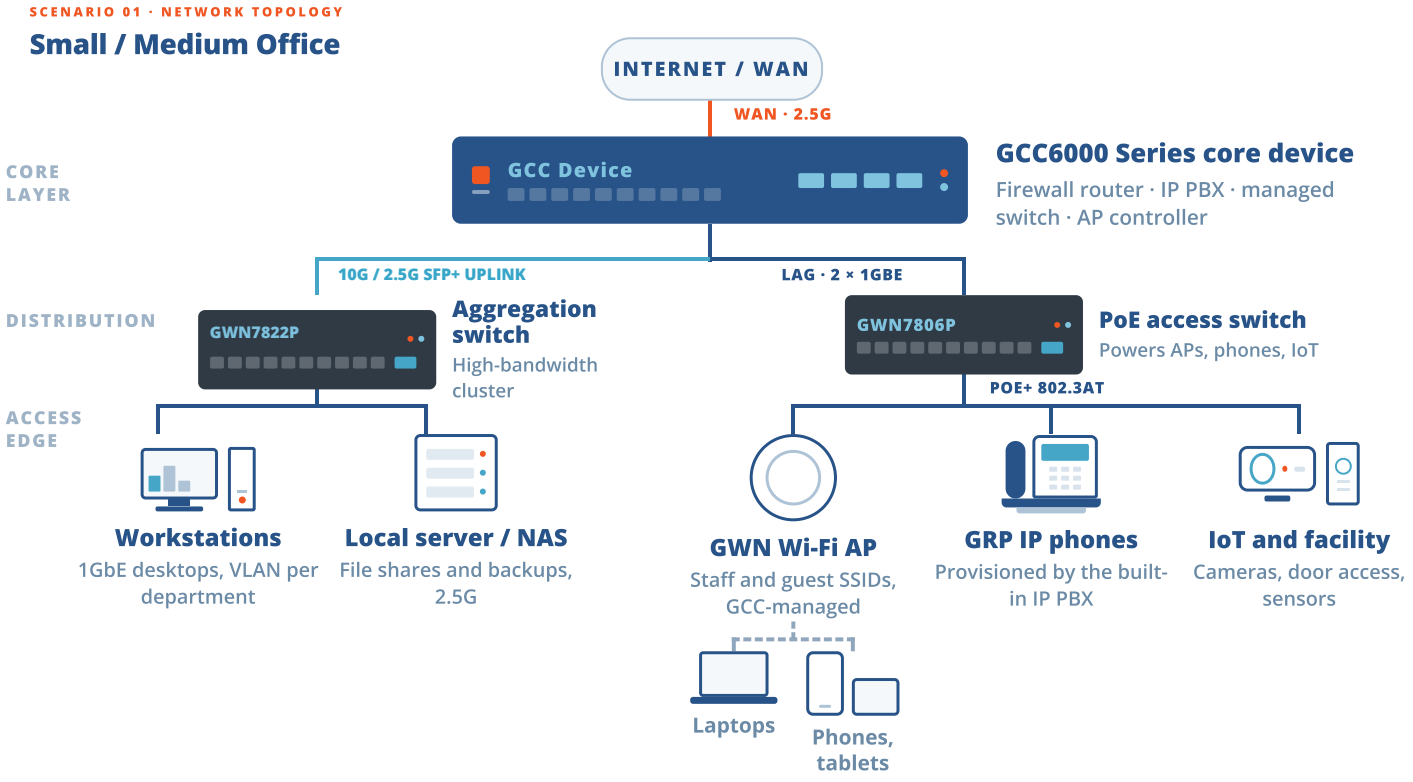
04 Education / School

Single solution that separates faculty and student networks

Small / Medium Offices

In a small/medium office, a reliable IT infrastructure is crucial to maintain productivity and collaboration. When there is a slow Wi-Fi connection, a lack of collaboration tools, or an inefficient backend network foundation, these smaller setbacks turn into larger issues of poor management of resources, time, and money. With the GCC series solution, small/medium offices are protected from these setbacks and can proactively take control of their communication and networking infrastructure.

In a GCC series deployment scenario for small/medium offices, the GCC device would be deployed in the core layer of an office's network and serve as the backbone for unified communications, network, and security operations. The device's 2.5 Gigabit SFP+ ports or 10 Gigabit SFP+ ports, depending on model, would connect to distribution/access layer switches. This connection would ensure support for a group of higher bandwidth devices such as a cluster of workstations or local servers. The device's gigabit ports can be organized in a LAG configuration, which would support higher bandwidth distribution and access switches like Wi-Fi access points. A LAG configuration could also be connected to lower-bandwidth distribution switches that connect to devices such as IP phones and IoT hardware.



Advantages the GCC Series Provides

IP PBX

COMMUNICATIONS

The IP PBX function provides substantial communication and collaboration features including audio and video meetings, calls, conferences, instant messaging, file sharing, recording, webinars, and more. The function integrates with our voice and video collaboration tool, Grandstream Wave, and allows offices to direct calls through comprehensive inbound and outbound routing customization and to create a configurable IVR with up to 5 layers, including ring groups and call queues.

Networking

NETWORK

GCC series networking capabilities enable offices to have a secure central administrative interface to manage the organization's entire network in real time. The dashboard interface allows IT admins or system integrators to oversee the network from a high level all the way down to a low level, such as looking at specific network nodes, endpoint devices, or applications. The GCC series also includes VPNs, VLANs, policy-based routing, and Quality of Service (QoS) configurations for offices to use advanced network optimization features such as voice prioritization and network segmentation. With its compatibility with Grandstream Wave and support for client-to-site VPN, the GCC device allows SMBS to create a remote/hybrid office environment for their workers.

Firewall

SECURITY

The GCC series has enhanced firewall capabilities that elevate an office's network security. The firewall features include VB100 Grade-A anti-malware certification, advanced attack defense, intrusion detection/protection, perimeter security, and content filtering and application control. These capabilities provide IT admins with end-to-end security protection against cyber threats.

Hospitality

Smaller hotels, motels, and B&B properties

For businesses in the hospitality industry, such as smaller hotels, motels, and B&B properties, rapid communication and work operations are essential to provide guests the best experience. In hospitality deployments, staff and guests all require a strong network connection to ensure facilities run smoothly and guests are satisfied.

However, Wi-Fi connections intended for staff vs one intended for guests can interfere with each other and cause network difficulties. Each room also requires its own phone to connect to the Wi-Fi network. Furthermore, the network needs to connect with the hotel's management platform and allow guests to call staff without any interruptions. With the GCC series solution, small hotels can stay connected with guests without compromising their own data privacy.

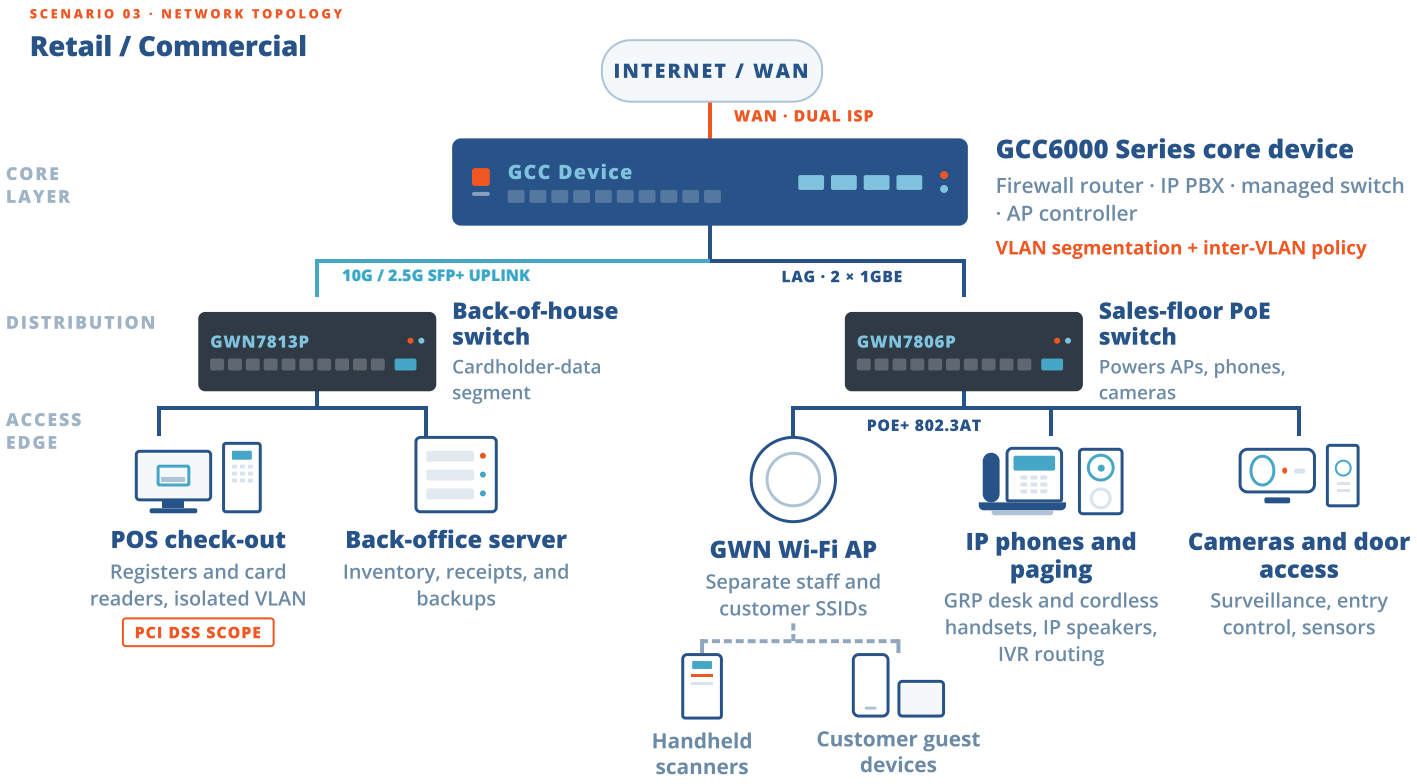
Advantages the GCC Series Provides

Front Desk & PMS COMMUNICATIONS	The GCC's IP PBX function provides front desk call routing and PBX–PMS integration. This function can be used to create inbound and outbound route customization for guests or staff and a configurable IVR with up to 5 layers, allowing guests to place calls directly from their room to predefined staff members, such as the front desk or housekeeping, or for staff to	communicate with each other. Our GHP Series of Hotel Phones can be utilized in hotel rooms to place calls. Additionally, managed service providers (MSPs) can integrate GCC's IP PBX with the hotel's property management software (PMS) to automate guest check-in notifications, billing, and housekeeping updates.
Guest / Staff Isolation NETWORK	The GCC series includes VLAN segmentation, which enhances security for smaller virtual networks and forces data and traffic to stay within its own group. Networking capabilities also include the ability to create captive portals when paired with GWN Wi-Fi access points for more security and protection. Hotels can also set up Private	Pre-Shared Keys (PPSKs) with VLAN segmentation, a Wi-Fi security feature allowing guests to have their own unique wireless password and bandwidth allocation while sharing the same SSID. The guest password is issued at check-in, and once their stay is over, it is revoked.
Firewall SECURITY	The firewall capabilities include VB100 Grade-A anti-malware certification, advanced attack defense, intrusion detection/ protection, perimeter security, and content filtering and application control. This ensures that the IT admins can automatically filter content within their guest networks	without being overwhelmed with ongoing network security management and maintenance. These features also ensure security protection against cyber threats and protects guests' private information.

Retail / Commercial

In a retail and commercial environment, a strong communications and networking infrastructure is important to keep a store running. Retail employees, such as cashiers, managers, support, and back-of-house admin, all require communication and networking tools to keep stock inventory, track purchases, and issue receipts to customers. With a GCC series solution, smaller retail and commercial environments can keep customers satisfied and employees productive while efficiently managing store operations.

The GCC device would be in the core layer of a commercial network. The GCC acts as an anchor for distribution/access layer switches, Wi-Fi access points, IP phones, paging devices, check-out stations, item scanners, and more. The device can be used for a single commercial environment or for a multi-store deployment such as a small outlet mall. The GCC's IP PBX features can streamline internal organizational communication and external customer calls. This allows integrators to create inbound and outbound route customization for employees who have cordless or desktop IP phones and IP speakers across the store. Customer calls can also be routed this way and by using IVRs to specific departments or employees without the need for a receptionist.



Advantages the GCC Series Provides

Networking

NETWORK

This includes VLAN segmentation based on device types within the store, resulting in a network that is easier to manage and providing separate network traffic for different departments and devices. The GCC device also supports network segmentation, a common approach to reducing PCI DSS assessment scope, which is the separation between systems that store, process,or transmit cardholder data from the rest of the store's IT network. This is vital for store operations because it allows businesses to continue selling and receiving cardholder payments without interfering with the store's own network and data. Additional features such as policy routing and load balancing pool help guarantee smooth network performance throughout all hours of operation.

Firewall & InterVLAN Policy

SECURITY

The GCC device's firewall features can protect important data from malicious attacks, especially in back-of-office Point-of-Sale (POS) systems. The device not only provides VLAN segmentation but also an inter-VLAN firewall policy on the same device, the set of rules that control network traffic between different VLANs. This is critical for retail environments because there are several network traffic flows, such as POS payment, back of house inventory, Wi-Fi for staff vs customers, and security cameras, that cannot interfere with one another. The GCC device provides both the segmentation and rules each flow of network traffic should follow, which serves as a safeguard for retail and commercial businesses.

Education / School

In education and school environments, a reliable IT infrastructure is incredibly important for teachers and faculty to create curriculum and materials to educate students and maintain school operations.

Similarly to the issues in the hospitality industry, Wi-Fi connections meant for faculty vs ones intended for students can cause network interference if they are not separated. Schools and education facilities require stable connections for desktop and mobile devices to educate students. With a GCC series solution, MSPs can ensure students' education while managing back-end operations to keep schools functioning.

Advantages the GCC Series Provides

Communication

COMMUNICATIONS

The GCC's IP PBX capabilities allow schools to place internal and external organizational calls to parents or other organizations for faculty and teachers. These calls can include configurable IVRs so parents or community members are routed to the appropriate department within the school. Additionally, a full range of multi-cast paging settings enables the creation of a customized paging environment throughout the building. The IP PBX can also be integrated with Grandstream Wave as an audio, conferencing, and collaboration platform for faculty and staff.

Stable Connections

NETWORK

With VLAN segmentation, smaller virtual networks are better protected so that school data and private information can remain separated from network traffic that is available to students. The networking features also include a built-in QoS that allows for customized prioritization of network traffic, which keeps important terminals and networks uncongested during busier network usage throughout the school day.

Content Control

SECURITY

The firewall can filter content by source, destination, protocol, and port, and includes intrusion detection and protection. These firewall capabilities can safeguard and protect against malicious cyberattacks that target the school's data and reputation. This feature can also be heavily utilized to prevent students from accessing noneducational apps and websites on student-accessible terminals.

PART 3

Technical Breakdown

As covered, the GCC Series is used in a variety of deployment scenarios, and each of the unified communication and networking capabilities within the device contributes to creating the all-in-one solution different organizations need. Built-in features such as the VPN/router, Firewall, IP PBX, and Switch/PoE are essential for an organization's operations.

VPN / Router

VPN (Virtual Private Network) is a protocol that creates secure, encrypted connections over shared and public networks. The GCC Series supports five VPN protocols: WireGuard, OpenVPN, L2TP, PPTP, and IPSec.

WireGuard	High performance and simple configuration. Supports site-to-site and client-to-site.
OpenVPN	Widely used in enterprise environments; flexible and customizable. Site-to-site and client-to-site.
L2TP	Client-to-server; pairs with IPSec for greater security, as it cannot encrypt traffic on its own.
PPTP	An older, obsolete protocol retained for legacy compatibility.
IPSec	A set of protocols securing IP communications for both site-to-site and client-to-site configurations.
Routing speed	GCC6010 / 6011: 2.5 Gbps · GCC6010W: 3 Gbps · GCC6020: 6.5 Gbps · GCC6021: 10 Gbps

MULTI-WAN AND QOS

Along with the capabilities of VPN, the GCC Series has multi-WAN and networking capabilities with NAT, VLAN, performance based WAN link selection and monitoring, load balancing, and WAN link failover. WAN link selection and monitoring ensure that the best wide-area connection is chosen based on performance and priorities. Load balancing and WAN link failover make sure the connection is continuous even if the primary line is interrupted or disconnected. The VPN router also includes advanced QoS mechanisms such as VLAN, ToS, multiple traffic classes, App QoS, and VoIP prioritization that can assess priority levels for different data packets and network traffic.

Server and Client Roles

VPNs create a centralized network by establishing encrypted tunnels and authentication methods to ensure secure and private connections. In a site-to-site configuration, two GCC models would be used, with one model acting as the VPN server and the other as a client. A client-to-site configuration allows remote users to securely access the LAN outside of the office, where the GCC model becomes the server, and the remote device becomes the VPN client.

On the interface, the configuration allows different authentication modes between server and client. In a site-to-site configuration with OpenVPN, SSL (Security Sockets Layer) for encryption, combined with user authentication, is the recommended choice to make sure the connection and identity of users are secured.

SECURE CONNECTIVITY

Site-to-site vs. client-to-site VPN

Firewall

The GCC series' firewall is VB100 Grade-A anti-malware certified and can act as a safeguard against malicious attacks because of methods and features such as DPI, IPS/IDS, and many others.

900 Mbps	6 Gbps	9 Gbps
IDS/IPS throughput GCC6010 series	DPI + IPS throughput GCC6020	DPI + IPS throughput GCC6021

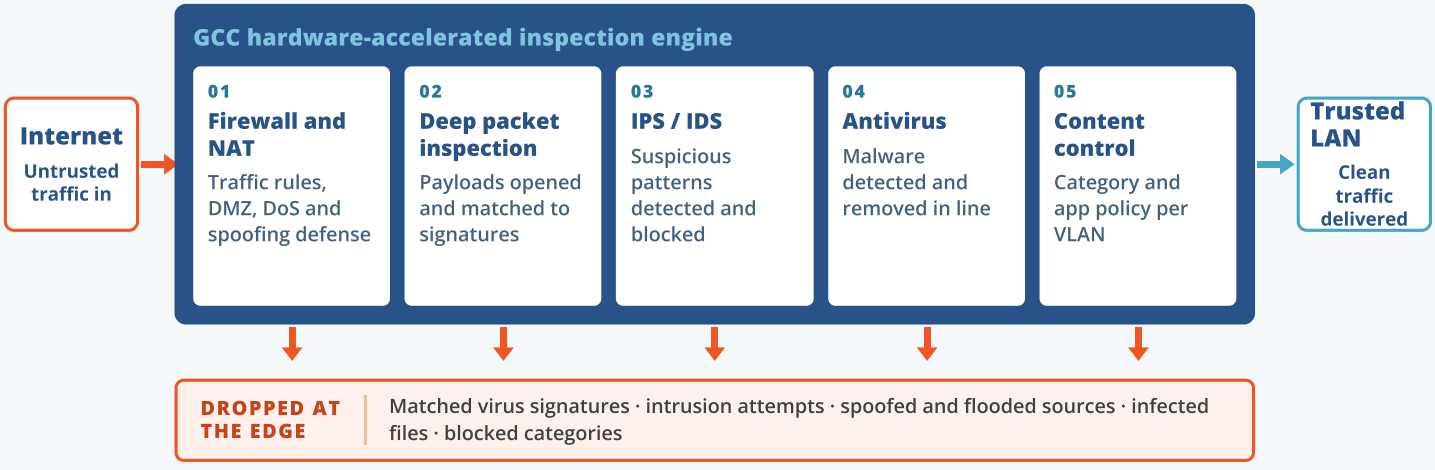
PERIMETER AND TRAFFIC CONTROL

In the GCC series, the firewall monitors the internet, and when the IP address changes, it automatically updates a fixed domain name through DDNS (Dynamic Domain Name System). The firewall includes a DMZ, a buffer network that sits between the internal and external networks, such as the internet.

DoS and spoofing defense features are included to block network traffic overload and require source validation to prevent fake source addresses from entering the network. The firewall is equipped with its own traffic rules and NAT to allow or block network traffic and change IP addresses accordingly.

INSPECTION AND DETECTION

DPI (Deep Packet Inspection) opens data packets and compares them against known virus signatures and malware specifications to spot any dangerous similarities. IPS/IDS are detection and prevention systems that spot suspicious patterns and block malicious packets. The GCC series all utilize hardware and firewall acceleration to offload packet processing and create more robust security. Antivirus is also installed, so if malware is present, the antivirus system is able to detect and remove it.



Firewall - Content Control

The firewall contains content control settings such as DNS filtering, web/URL/class/keywords filtering, and application identification and control to create extra security measures for businesses. DNS filtering checks website name requests and blocks unwanted domains before devices connect to them.

With application identification and control, system integrators can identify, allow, block, or limit network traffic based on application names, categories, and behaviors. The GCC series all contain email security and geo-IP filtering, which allows or blocks network traffic based on the geographic location of an IP address.

SUBSCRIPTIONS

Besides what is already included in the device, the GCC series has firewall subscription plans available that can extend to 1-year, 3-year, and lifetime renewals* with updated signature libraries.

**Lifetime runs through one year after EOL*

IP PBX

The GCC Series IP PBX capabilities allow businesses to handle demanding calls and keep the organization afloat. There are a suite of features like call forwarding, transfer, parking (holding), intercom/paging, IVR, emergency calls, and more.

CAPACITY BY MODEL

GCC6010 · 6010W · 6011

24	8	50 / 12
users, standard	concurrent calls	upgraded package

GCC6020 · 6021

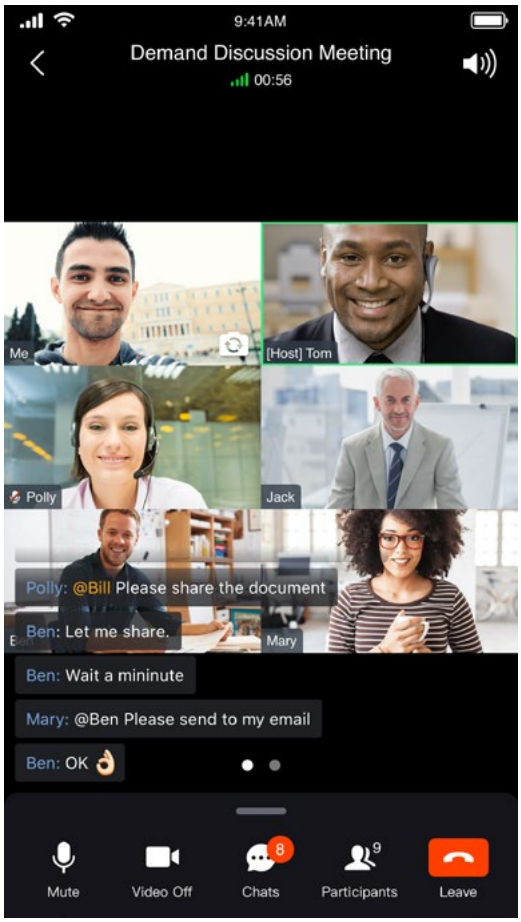
50	16	200 / 48
users, standard	concurrent calls	upgraded package

WAVE AND THIRD-PARTY INTEGRATION

As seen in the deployment scenarios, the GCC series IP PBX features can integrate with Grandstream Wave to provide a built-in audio and video conferencing platform for businesses to use. Grandstream Wave is accessible through desktop, web, Android, or iOS.

The GCC series can also integrate with other third-party platforms and applications, such as CRM platforms, PMS (Property Management Systems), and call centers. These integrations allow businesses to use the GCC IP PBX features on additional platforms and create a seamless interconnected system.

It supports multiple audio and video encodings and numerous protocols that run voice sessions.

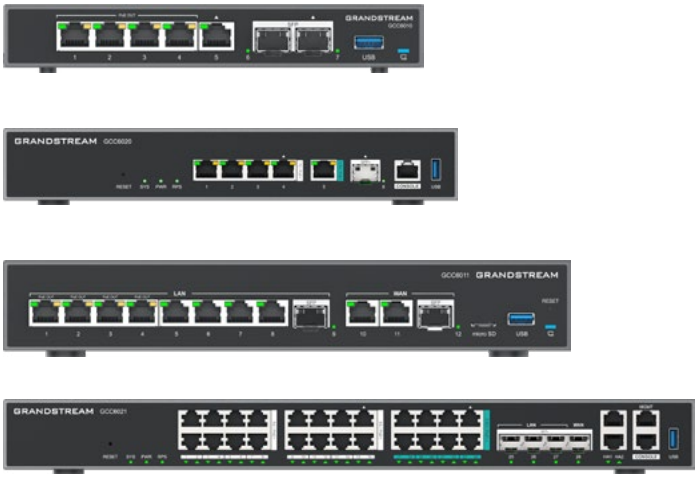


FEATURE SET					
Call forwarding	Transfer	Parking / hold	Intercom & paging	IVR, up to 5 layers	Emergency calls
Ring groups & queues	Recording	Inbound routing	Outbound routing	Voicemail	Webinars

Switch / PoE

PORTS BY MODEL

GCC6010	2× 2.5G SFP+ · 5× GbE
GCC6011	2× 2.5G SFP+ · 10× GbE
GCC6010W	5× GbE only; no SFP, no PoE support
GCC6020	1× 10G SFP+ · 1× 2.5G · 4× GbE
GCC6021	4× 10G SFP+ · 8× 2.5G · 16× GbE



Smart Power Control

POE

Smart power control lets admins manage PoE allocation per port from the web UI. The GCC6020 provides a 120 W budget across five PoE/PoE+ ports; the GCC6021 provides 370 W, including eight IEEE 802.3bt (PoE++) ports.

High Availability

RESILIENCE

The GCC6021 model has dedicated physical high availability ports. In case the device fails, the ports can connect to active or standby GCC6021 units, and the devices can achieve seamless failover through heartbeat signaling and real-time data synchronization, without consuming primary LAN/WAN bandwidth.

REDUNDANT POWER

CONFIDENCE

Both GCC6020 series models support a redundant power supply (RPS) input, so if the main power supply fails, a backup unit automatically takes over.

One Brand, One Full Stack Solution

Grandstream Ecosystem Integration

While the GCC Series' VPN/router, NGFW, IP PBX, and Switch capabilities are significant, the GCC series stands out because of its centralized management system and ability to connect with other Grandstream devices. GDMS is a free centralized platform with an easy-to-use user interface and a device management center, where the GCC device can seamlessly integrate with other Grandstream devices such as GWN access points, switches, and UC endpoints. In the graphical interface, managed service providers can control all the different devices and nodes with just one click. They can utilize SNMP (Simple Network Management Protocol) to manage and monitor the GCC device; v1, v2c, and v3 versions are all available. Moreover, the centralized management allows businesses to have IP-phone auto-provisioning or quick provisioning for thousands of devices, making it easier for businesses to maintain their networks and get support from just one vendor.

PART 4

Which GCC device is right for my deployment?

Deployment size, bandwidth, and auxiliary features needs can be used to guide the GCC that is ideal for the solution you're crafting

1 What is the size of the deployment?

Count the IP endpoints, Wi-Fi access points, and IP PBX users the site must support. The GCC6010 series manages up to 150 GWN APs, 500 clients, and 24 PBX users (50 with the upgraded package). The GCC6020 series scales to 300 APs, up to 1,000 clients, and 50 PBX users (up to 200 upgraded).

Choose between the GCC6010 or GCC6020 Series

2 What are the bandwidth requirements?

Within the series, match ports and throughput to the network. In the GCC6010 series, the GCC6011 doubles the GCC6010's gigabit ports to ten. In the GCC6020 series, the GCC6021 steps up from 6.5 to 10 Gbps, with four 10G SFP+ and eight 2.5G ports for fiber uplinks and multi-switch sites.

Narrows the model choices within a series.

3 What auxiliary features are needed?

PoE budgets run from 36 W (GCC6010, GCC6011) to 120 W (GCC6020) and 370 W 802.3bt (GCC6021). The GCC6020 series adds redundant power; the GCC6021 adds dedicated HA ports. The GCC6010W builds in a Wi-Fi 6 AP but drops SFP and PoE, every model manages GWN APs.

Key deployment needs may change model required.

PART 4

Specification by model

To better understand which GCC best fits your deployment, the outline below best compares each GCC model.

SPECIFICATION	GCC6010	GCC6011	GCC6010W	GCC6020	GCC6021
PoE budget	36 W	36 W	N/A	120 W	370 W · 802.3bt
IP PBX, standard package	24 users 8 concurrent calls	24 users 8 concurrent calls	24 users 8 concurrent calls	50 users 16 concurrent calls	50 users 16 concurrent calls
Maximum network bandwidth	2.5 Gbps	2.5 Gbps	3 Gbps	6.5 Gbps	10 Gbps
APs / clients	150 GWN APs 500 clients	150 GWN APs 500 clients	150 GWN APs 500 clients	300 GWN APs 500 clients	300 GWN APs 1000 clients
NAT sessions	160 K	160 K	160 K	1 M	1 M
Ports	2× 2.5G SFP+ 5× GbE	2× 2.5G SFP+ 10× GbE	5× GbE Wi-Fi 6 AP	1× 10G SFP+ 1× 2.5G · 4× GbE	4× 10G SFP+ 8× 2.5G · 16× GbE
NGFW throughput	900 Mbps IDS/IPS	900 Mbps IDS/IPS	900 Mbps IDS/IPS	6 Gbps DPI + IPS	9 Gbps DPI + IPS
Resilience	—	—	—	Redundant PSU	Redundant PSU dedicated HA ports

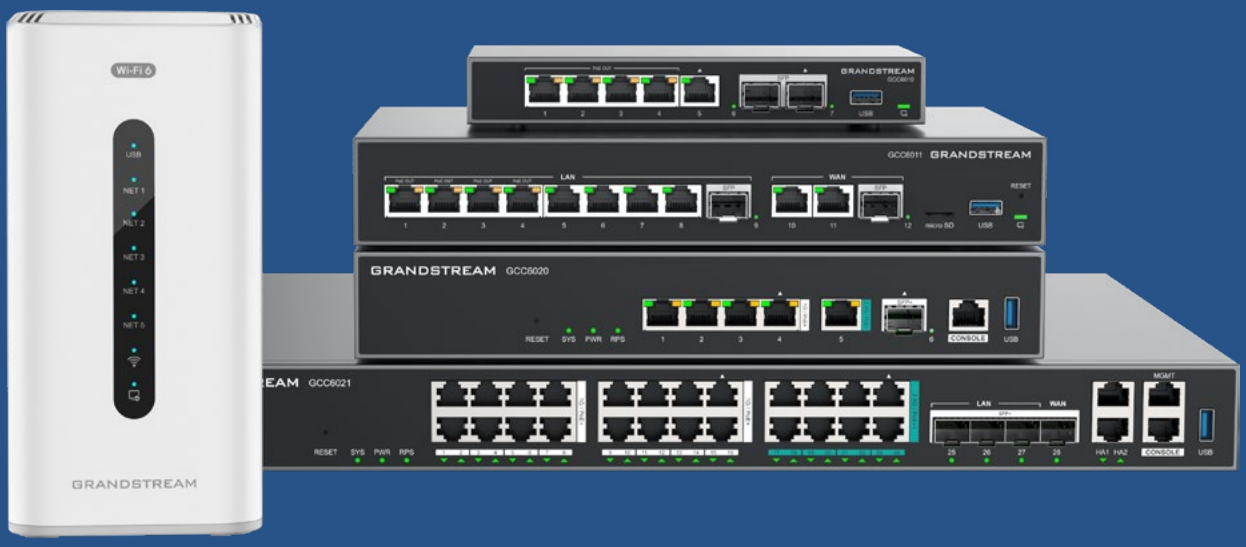
Upgraded IP PBX packages: GCC6010 series up to 50 users and 12 concurrent calls; GCC6020 series up to 200 users and 48 concurrent calls.

GRANDSTREAM
CONNECTING THE WORLD

Grandstream GCC Series

One device. One vendor. One ecosystem.

Built-in IP PBX, next-generation firewall, Layer 2 switching, and routing.
All configured, managed, and deployed together.



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