GWN76xx Firmware Release Notes

IMPORTANT UPGRADING NOTE

1. [12/14/2018] [All APs 1.0.8.17] In order to enable your AP’s capability of connecting GWN Cloud EU server, AP needs to be upgraded to 1.0.8.17 or above.

2. [6/15/2018] [GWN7600&7600LR 1.0.6.41] Starting from 1.0.6.x, GWN7600 and GWN7600LR will share same firmware file name gwn7600fw.bin. As a result, when GWN7600LR upgrades from pre-1.0.6.x to latest firmware, it will still retrieve firmware with name gwn7600lrfw.bin, and when GWN7600LR upgrades from 1.0.6.x or post-1.0.6.x to other firmware, it will retrieve firmware with name gwn7600fw.bin. So, when your GWN7600LR upgrades from pre-1.0.6.x firmware, you will need to manually modify the target firmware name to gwn7600lrfw.bin.

3. [1/26/2017] [All APs 1.0.5.15] For firmware 1.0.5.15 (GWN7610) and 1.0.5.13 (GWN7600& GWN7600LR), this is only for GWN7610/GWN7600/GWN7600LR master deployment. All users with GWN7000 as master are NOT encouraged to upgrade until 1.0.5.x matching firmware is available for GWN7000, due to the compatibility of new features.

4. [8/11/2017] [All APs 1.0.4.22] Please upgrade to 1.0.4.12 or higher version to get the patch for WPA2 4-way handshake vulnerability.

5. [8/11/2017] [GWN7610 1.0.3.21] Before starting to upgrade to latest firmware, please make sure your GWN7610’s firmware version is 1.0.2.108 or higher. Also, please make sure your GWN7000 master (if any)’s firmware version is 1.0.2.71 or higher.
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FIRMWARE VERSION 1.0.9.13

PRODUCT NAME
GWN7610; GWN7600; GWN7600LR;

DATE
6/24/2019

FIRMWARE FILE INFORMATION

- GWN7610 Firmware file name: gwn7610fw.bin
  MD5 checksum: 1aefac86dc272944c05d2557c63dd190

- GWN7600/7600LR Firmware file name: gwn7600fw.bin
  MD5 checksum: f411e92c88a0ede5a48329963ac96682

CHANGES/ENHANCEMENT

- Added new OUI “C0:74:AD” support for GWN7610, GWN7600, and GWN7600LR. GWN7630LR already supported it on 1.0.9.12.
FIRMWARE VERSION 1.0.9.12

PRODUCT NAME
GWN7610; GWN7600; GWN7600LR; GWN7630

DATE
6/11/2019

FIRMWARE FILE INFORMATION

- GWN7610 Firmware file name: gwn7610fw.bin
  MD5 checksum: a1c0e58525efa9513c0581dab3059496
- GWN7600/7600LR Firmware file name: gwn7600fw.bin
  MD5 checksum: 05fcb911ef517b1ab6e423e7abee5de8
- GWN7630 Firmware file name: gwn7630fw.bin
  MD5 checksum: 5cd325ecc1278d547e4643fe00e19330

CHANGES/ENHANCEMENT

- Added feature of **Slave AP Transfer**
- Added feature of **Client Negotiate Speed Display**
- Added feature of **One Key Debugging**
- Enhanced Captive Portal by feature of **HTTPS Portal Trusted Certificate with Auto Update**

NEW FEATURE OVERVIEW

- **Slave AP Transfer**

  This is an enhancement feature upon **Failover Master**

  . Now, when a master fails, even there is no failover master configured, Admin can still bring up a new Master and uses the old master key (admin password) to take over old slaves.
When admin add a new master into the master-failed network. New master will be able to discover the paired old slave as below.

By Clicking on the “Takeover the selected device”, admin will be asked for the takeover key, which is the old master admin password.

Once takeover key is validated, slave AP will be transferred to the new master.
• **Client Negotiate Speed Display**

This is displayed as **Link Rate** under Clients page.

• **One Key Debugging**

For better local troubleshooting data collection, now slave APs all have their own web page login.
Once login, you will see Debug page as below

Besides original debugging methods. Now you have new method as One Key Debug.

Once activated, in 30 minutes, this AP will generate local debug core file.
• HTTPS Portal Trusted Certificate with Auto Update

This feature will solve the untrusted certificate warning reported by web browser in your HTTPS enabled captive portal deployment.
FIRMWARE VERSION 1.0.8.18

PRODUCT NAME
GWN7610; GWN7600; GWN7600LR

DATE
1/10/2019

FIRMWARE FILE INFORMATION
- GWN7610 Firmware file name: gwn7610fw.bin
  MD5 checksum: 0057d240a1dee02e126d80308f5395c4
- GWN7600/7600LR Firmware file name: gwn7600fw.bin
  MD5 checksum: f116de7f2a1a51ca96f242c8da518f2

IMPORTANT UPGRADING NOTE
- In order to enable your AP’s capability of connecting GWN Cloud EU server, AP needs to be upgraded to 1.0.8.17 or above. Otherwise, your AP will always be offline from your EU server portal.

CHANGES/ENHANCEMENT
- Added feature of Advertisement\(^1\) for Captive Portal
- Added feature of Custom Field\(^1\) for Captive Portal Splash Page
- Added feature of ARP Proxy
- Added feature of Clear client data\(^1\)
- Enhanced Event log by WiFi authentication event\(^1\)
- Enhanced Bandwidth Rules by adding option to limit bandwidth Per-Client and adding Total Bandwidth Usage\(^1\) on Overview Bandwidth Chart
- Added EU Server support\(^1\)

\(^1\) This feature is only available on GWN Cloud, and local master does not have it.
NEW FEATURE OVERVIEW

- Advertisement

Marketing feature to play advertisement upon captive portal login for WiFi users.

Configurations are available at Cloud menu: Captive Portal → Splash Page → Advertisement

- Custom Field

By adding customizable field to your captive portal splash page to collect user information.
• **ARP Proxy**

This feature will enable GWN AP to answer the ARP requests from its LAN for its connected WiFi client. This is mainly to reduce the airtime consumed by ARP packets.

To enable this feature, configuration is available at

Cloud:

NETWORK → SSIDs → Configuration → Wi-Fi Settings → ARP Proxy

Local Master:

SSIDs → Configuration → Wi-Fi → ARP Proxy

• **Clear client data**

This feature will allow admin to clear collected data from Wi-Fi clients. This is mainly for certain data security regulation compliance.

• **WiFi authentication event**

This is an enhancement for WiFi troubleshooting.

<table>
<thead>
<tr>
<th>Time</th>
<th>MAC Address</th>
<th>SSID</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018-12-13 16:30:19</td>
<td>74:DA:EA:CD:28</td>
<td>gs_internal</td>
<td>WPA-PSK de-authentication (four-way handshake failure)</td>
</tr>
<tr>
<td>2018-12-13 16:30:10</td>
<td>74:DA:EA:CD:28</td>
<td>gs_internal</td>
<td>WPA-PSK authentication failure</td>
</tr>
</tbody>
</table>
- **limit bandwidth Per-Client**
  This is an enhancement for bandwidth control upon all the other available types.

- **EU Server support**
  User now will be able to choose US server or EU server to store their data at. This is mainly for GDPR regulation compliance.
FIRMWARE VERSION 1.0.8.9

PRODUCT NAME
GWN7610
GWN7600
GWN7600LR

DATE
11/21/2018

FIRMWARE FILE INFORMATION
- GWN7610 Firmware file name: gwn7610fw.bin
  MD5 checksum: e35fdb2803278d2305cee46c1c436deb
- GWN7600/7600LR Firmware file name: gwn7600fw.bin
  MD5 checksum: f934883870b24d911b604fedfc7a5fed

CHANGES/ENHANCEMENT
- Added feature of URL Logging\(^1\)
- Added feature of Dynamic Transmit Power Control as WP820 RF enhancement
- Enhanced Mesh by adding feature of Switching RE & CAP according to network
- Enhanced Core File Debugging by adding feature of OopsTrack
- Fixed the bug that manual configured Mesh topology may change after reboot
- Fixed a memory leak

NEW FEATURE OVERVIEW
- URL Logging\(^1\)
  GWN AP now can log user URL visiting history onto GWN server, and report to Admin on timely schedule.

\(^1\) URL Logging is only available at GWN Cloud, and local master configuration does not support this feature.
To enable configuration, option is available at Cloud menu: **System → Settings**

![Configuration options](image)

- **Dynamic Transmit Power Control**
  This feature will enhance the RF performance of WP8xx Grandstream WiFi handset. No configuration is needed.

- **Switching RE & CAP according to network**
  This is enhancement to GWN Mesh setup. Now mesh topology will be more precise on identifying the CAP or RE APs. System will not only detect the network cable connection for CAP election, but also check the IP address acquiring.

- **OopsTrack**
  This is enhancement on the core file debugging. It will collect and save kernel stack information for debugging when AP crashes.
FIRMWARE VERSION 1.0.7.13

PRODUCT NAME
GWN7610&GWN7600&7600LR

DATE
10/18/2018

FIRMWARE FILE INFORMATION

- GWN7610 Firmware file name: gwn7610fw.bin
  MD5 checksum: c13f4e003ff70e6b4e37627b0e7d2013

- GWN7600 Firmware file name: gwn7600fw.bin
  MD5 checksum: c425a264b8053aac9cef33644db23477

- GWN7600LR Firmware file name: gwn7600fw.bin
  MD5 checksum: c425a264b8053aac9cef33644db23477

IMPORTANT UPGRADING NOTE

Facebook and Twitter captive portal authentication backend changed. This change will lead to following result:

1. If Facebook authentication is configured on older GWN Cloud version. You will need to log in your Facebook account of https://developers.facebook.com/apps, and set the OAuth redirect URI to https://cwp.gwn.cloud:8443/GsUserAuth.cgi?GsUserAuthMethod=3

2. If Twitter authentication is configured on older GWN Cloud version. You will need to log in your Twitter account of https://apps.twitter.com/app, and set the callback URLs to http://cwp.gwn.cloud:8080/GsUserAuth.cgi?GsUserAuthMethod=5

3. Also, you will need to make sure your AP is upgraded to 1.0.7.x, since the older AP firmware will not work with new GWN Cloud for Facebook Login or Twitter Login only.
CHANGES/ENHANCEMENT

- Added feature of **RRM**Beta
- Added feature of **Mesh** for GWN7610
- Added feature of **External Captive Portal Support**
- Added feature of **AP Scheduling Reboot**
- Added feature of **Change Log**
- Added feature of WiFi **Statistic Report**
- Added feature of **Configuration Quick Navigation**
- Added feature of Captive Portal Guest **Summary**
- Changed **SSID** limit
- **Enhanced Access Point Status**
- Enhanced WiFi Service by adding configurable options of **Beacon Interval**, **DTIM Period**, and **Convert IP multicast to unicast**.
- **Enhanced Client Information**
- **Enhanced Captive Portal features**
- **Enhanced GWN Cloud mobile app**

NEW FEATURE OVERVIEW

- **RRM**Beta

  Radio Resource Management (RRM), includes three major features below. This feature is only available

  Local Master: **Access Point** → **Edit** → **Configuration**

  - **Dynamic Channel Assignment**

    Once enabled, AP will try to allocate and move to the best channel during operation, unlike Auto Channel Selection (ACS) which online scan and assign channel when WiFi interface goes up for one.

  1 Local Master only
  2 **Mesh is already supported on GWN7600 and GWN7600LR in previous feature pack**
  3 **GWN Cloud only**
  4 **Dynamic Channel Assignment is not supported on GWN7610**.
- **Transmit Power Control**  
  TPC algorithm runs every 10 minutes. AP acquires the RSSI information of the neighbor by wireless scanning and establishes the neighbor table. The algorithm requires that there must be at least 3 neighbor APs with larger than -70dbm in RSSI. Otherwise, power will not be adjusted.

- **Coverage Hole Detection**  
  CHD enables AP to decide whether to increase the AP power by the current SNR and SNR threshold of the connected clients.

- **External Captive Portal Support**  
  Linkyfi¹ and Purple² as external captive portal are supported now on GWN APs for both local master and GWN Cloud.

  Configurations now are available at Captive Portal → Policy List → Add/Edit → Splash Page

  Choose **External**, and then choose platform to configure.

- **AP Scheduling Reboot**  
  You can schedule reboot for your APs. Configuration is available at:

  - Local Master: System Settings → Maintenance → Basic → Reboot Schedule

  - GWN Cloud: NETWORK → System → Settings → Reboot Schedule

  You will need to have a time schedule defined for this feature to adopt.

- **Change Log**  
  Change log is now recorded on GWN Cloud. You can access the log from [Your account] on top right corner → **Change Log**.

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Note:  
¹ Linkyfi [https://www.avsystem.com/products/linkyfi/](https://www.avsystem.com/products/linkyfi/)  
² Purple [https://purple.ai/](https://purple.ai/)
• **Statistic Report**

On GWN Cloud, you can configure server to send report to you periodically. Configuration is available at:

[Your account] on top right corner → Report → Schedule → Create Report

![Create Report](image)

• **Configuration Quick Navigation**

Now on GWN Cloud support Configuration Quick Navigation. This feature will help to quick move to prerequisite settings during configuration. For example, when you configure a AP scheduling reboot, but you don’t have a time schedule reconfigured. Then you will see an option as **Add New Schedule**.

![Reboot Schedule](image)
- Captive Portal Guest **Summary**

GWN Cloud now gives a summary of captive portal login Guest Summary as below:

- **SSID limit** changes

  In previous GWN Cloud version, every Network has limit of 16 SSID. In FP6 GWN Cloud version, limit in Network has been removed, but when any AP has reach to its limit of 16 SSID, it will be shown in grey in the new SSID’s available devices, and cannot be added to new SSID anymore.

- **Access Point Status** Enhancement

  CPU and Memory information is added in Access Points **Status**.

  For Email Alert, feature is enhanced for AP offline event to report when AP goes back online.

- **WiFi Service** Enhancement

  Three configurable options, as **Beacon Interval**, **DTIM Period**, and **Convert IP multicast to unicast**, are available at
- Local Master: **SSID → Add/Edit → Beacon Interval / DTIM Period / Multicast to Unicast**
- GWN Cloud: **NETWORK → SSID → Add/Edit → Advanced → Beacon Interval / DTIM Period / Convert IP Multicast to Unicast**

- **Client Information** Enhancement

  More WiFi client’s information is collected on GWN AP. And statistic is shown in graphic on GWN Cloud and text only format on Local Master.

  - Local Master: Information is available at Clients → Clients, and information can be checked to display at the top right gear icon.

  - GWN Cloud:

    ![GWN Cloud Screen]

    And now, admin can name the clients not only on local master but also on GWN Cloud page NETWORK →

    Clients → Status → 🔄 → Hostname

- **Captive Portal features** Enhancement

  - **Failsafe mode:** AP will grant access to STA if AP can’t reach to external authentication server. This feature only available in radius authentication and voucher authentication.
- **Byte limit** and **Daily limit**: Captive portal now can limit user connection by measuring data amount and times of a day.

- **Twitter authentication** enhanced: Twitter splash page has been redesigned, and **Force To Follow** option added. By enabling **Force To Follow** option, admin can request login WiFi user to follow his Twitter account when getting authenticated.

**• GWN Cloud mobile app** enhancement

- Dashboard, on GWN Cloud Mobile app, now allow admin to select different Network to display, while all Networks’ information is combined to display.

- Deleting AP, on GWN Cloud Mobile app, now allow admin to delete APs from Networks.
PRODUCT NAME

GWN7610

DATE

6/15/2018

FIRMWARE FILE INFORMATION

- GWN7610 Firmware file name: gwn7610fw.bin
  MD5: ae52aea470e6bf0fdcca95b1537df8e9

ENHANCEMENT

- Added support for **GWN.Cloud**
- Added support Outdoor/Indoor **Scene** WiFi channel configuration
- Added feature for **Transfer AP** and **Transfer Network Group** to Cloud
  Newly designed

- **Feature Scheduling**
- Split **Network Group** into separate **SSID** and **DHCP server** configurations
NEW FEATURE OVERVIEW

- **GWN.Cloud**
  Since FP5, GWN AP can be managed by your GWN.Cloud account. GWN.Cloud web interface now can be accessed at https://www.gwn.cloud. Please refer to GWN Cloud User Guide for how to add your GWN AP to GWN.Cloud.

- **Outdoor/Indoor Scene configuration**
  This configuration is available on your Master web, when your country has different outdoor/indoor WIFI channel regulations.
- **Transfer AP and Transfer Network Group**

  **Transfer AP** feature will allow you to easily transfer your AP from local master to your GWN.Cloud account. When you already have network/WiFi configurations on your cloud account, use this feature will let you to choose cloud existing network/SSID to adopt your local AP. Note: local configurations will not be transferred.

  **Transfer Network Group** feature will allow you to transfer your local configurations to your cloud account.

- **Feature Scheduling**

  We have newly designed feature scheduling. Please refer to user manually for configuration details.
• **SSID and DHCP server** configurations

Now the original **Network Group** configuration is split into **SSID** and **DHCP server** configurations.

**SSID** is located at below menu bar.

**DHCP server** configuration is moved to **System settings**.
[GWN7600&7600LR] FIRMWARE VERSION 1.0.6.41

PRODUCT NAME
GWN7600&7600LR

DATE
6/15/2018

FIRMWARE FILE INFORMATION
- GWN7600&7600LR Firmware file name: gwn7600fw.bin
  MD5: 8659930c6fe9601f551d87df9ae381ed
- GWN7600LR Firmware file name: gwn7600lrfw.bin
  MD5: 61784977a1a698e3d85f376200124010

ENHANCEMENT
- Added support for GWN.Cloud
- Added support Outdoor/Indoor Scene WiFi channel configuration
- Added feature for Transfer AP and Transfer Network Group to Cloud
  Newly designed
- Feature Scheduling
- Split Network Group into separate SSID and DHCP server configurations

IMPORTANT UPGRADING NOTE
1. Starting from 1.0.6.x, GWN7600 and GWN7600LR will share same firmware file name gwn7600fw.bin. As a result, when GWN7600LR upgrades from pre-1.0.6.x to latest firmware, it will still retrieve firmware with name gwn7600lrfw.bin, and when GWN7600LR upgrades from 1.0.6.x or post-1.0.6.x to other firmware, it will retrieve firmware with name gwn7600fw.bin. So, when your GWN7600LR upgrades from pre-1.0.6.x firmware, you will need to manually modify the target firmware name to gwn7600lrfw.bin.
NEW FEATURE OVERVIEW

- **GWN.Cloud**

  Since FP5, GWN AP can be managed by your GWN.Cloud account. GWN.Cloud web interface now can be accessed at [https://www.gwn.cloud](https://www.gwn.cloud). Please refer to GWN Cloud User Guide for how to add your GWN AP to GWN.Cloud.

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**SSID** is located at below menu bar.

**DHCP server** configuration is moved to System settings.
[GWN7610]FIRMWARE VERSION 1.0.5.15

PRODUCT NAME

GWN7610

DATE

1/26/2017

IMPORTANT UPGRADING NOTE

• For firmware 1.0.5.15, this is only for GWN7610/GWN7600/GWN7600LR master deployment. All users with GWN7000 as master are NOT encouraged to upgrade until 1.0.5.x matching firmware is available for GWN7000, due to the compatibility of new features.

ENHANCEMENT

• Added support for New Firmware Reminder on Master Web

• Added support for Sequential Upgrade

  Added support for

  • Feature Scheduling
  • Added support for Master Direction
  • Added support for Master Transfer
  • Added support for Airtime Fairness
  • Added support for Social login/Voucher

BUG FIX

• Wifi client may fail to connect if SSID uses 2.4G only with WEP authentication.

• The Bandwidth Rules schedule configurations require a reboot to take effect.

NEW FEATURE OVERVIEW
• **New Firmware Reminder on Master**

Once a different OFFICIAL firmware than current running firmware is detected on Grandstream Network website by master GWN7610, a “NEW” icon will appear to remind network administrator to upgrade. Clicking on the “NEW” icon will open the new firmware’s release note.

• **Sequential Upgrade**

Now if you choose multiple slave devices to upgrade their firmware, two options as “All-at-Once” and “Sequential” are available. “All-at-Once” will trigger the traditional way that all checked slaves will try to retrieve and change their firmware at the same time, while “Sequential” upgrade will let the slaves to
upgrade one by one in order to 1) avoid entire wifi service interruption by full system firmware upgrade; 2) reduce network stress caused by firmware downloading.

Access Points 1 / 2

Once you choose sequential upgrade, the number with beside the green upgrading icon will tell you how many slaves have done its upgrading.

- **Feature Scheduling**

Scheduled bandwidth control or client access control is available now under System Settings→Schedule
Please be noted that you will need a Bandwidth rule (can be created in Bandwidth Rules) or a Client Access list (can be created under Client→Client Access), in order to create a schedule.

- **Master Direction**

  When GWN7610 slave is not in the same broadcast domain with its master, this feature is available for all factory configured GWN7610 to find its master IP address offered by local DHCP option 43. GWN7610 accepts option 224 encapsulated in option 43, and the syntax is in TLV format. So, the for a simple example of DHCP 43 configuration would be:

  224(Type)12(Length)10.157.0.234(Value) translated into Hex as e0c31302e3135372e302e323334

  For DHCP server configuration on GWN7000, which translates the values automatically, is as follows:

  ![DHCP Configuration](image)

- **Master Transfer**

  ![Master Transfer](image)
Now an easier way to transfer your master authority from one unit to another available unit is available on Access Point management page. By clicking the Transfer to Master button above in red circle, the designated slave unit will be upgraded to master and current master will be downgraded to slave accordingly.

- **Airtime Fairness**
  
  Turning Airtime Fairness ON or OFF options can be found under Access Point→Edit→Configuration→Airtime Fairness.

- **Social login/Voucher**
  
  As an enhancement of Captive Portal, social Login as Wechat/Facebook/Twitter have been added.

<table>
<thead>
<tr>
<th>Add</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>Authentication Type</td>
</tr>
<tr>
<td>Expiration</td>
</tr>
<tr>
<td>WeChat</td>
</tr>
<tr>
<td>Facebook</td>
</tr>
<tr>
<td>Twitter</td>
</tr>
<tr>
<td>Use Default Portal Page</td>
</tr>
<tr>
<td>Portal Page Customization</td>
</tr>
<tr>
<td>Landing Page</td>
</tr>
</tbody>
</table>
Also, Voucher is added as another Captive Portal authentication option.

Voucher management interface is available under Captive Portal → Vouchers
[GWN7600&7600LR]FIRMWARE VERSION 1.0.5.13

PRODUCT NAME
GWN7600/GWN7600LR

DATE
2/12/2018

FIRMWARE FILE INFORMATION

• GWN7600 Firmware file name: gwn7600fw.bin
  MD5: 0e02717ca35b7563df41091fbd861d2c

• GWN7600LR Firmware file name: gwn7600lrfw.bin
  MD5: 9acb5a9db5ce4f179ec7bb5c4be596cd

IMPORTANT UPGRADING NOTE

• For firmware 1.0.5.13, this is only for GWN7610/GWN7600/GWN7600LR master deployment. All users with GWN7000 as master are NOT encouraged to upgrade until 1.0.5.x matching firmware is available for GWN7000, due to the compatibility of new features.

ENHANCEMENT

• Added support for New Firmware Reminder on Master Web

• Added support for Sequential Upgrade

• Added support for Feature Scheduling

• Added support for Master Direction

• Added support for Master Transfer

• Added support for Airtime Fairness
- Added support for **Social login/Voucher**
- Added support for **Mesh Network**

**BUG FIX**
- There is low probability that auto pop-up portal page of the iOS couldn't be displayed normally.
- “Hostname” on client page and the “Top AP” “Top SSID” “Top Clients” on overview page may show empty occasionally.

**KNOWN ISSUE**
- Configuring Radius server address with domain name instead of IP will cause the WIFI under configuration become open without authentication. Note: issue will be addressed in next feature packet release.
- After clicking on the reset button in maintenance page, there is chance to prompt "Reset failed!" wrongly.

**NEW FEATURE OVERVIEW**
- **New Firmware Reminder on Master Web**
  
  Once a different OFFICIAL firmware than current running firmware is detected on Grandstream Network website by master GWN7610, a “NEW” icon will appear to remind network administrator to upgrade.

  Clicking on the “NEW” icon will open the new firmware’s release note.

- **Sequential Upgrade**
Now if you choose multiple slave devices to upgrade their firmware, two options as “All-at-Once” and “Sequential” are available. “All-at-Once” will trigger the traditional way that all checked slaves will try to retrieve and change their firmware at the same time, while “Sequential” upgrade will let the slaves to upgrade one by one in order to 1) avoid entire wifi service interruption by full system firmware upgrade; 2) reduce network stress caused by firmware downloading.

Once you choose sequential upgrade, the number with beside the green upgrading icon will tell you how many slaves have done its upgrading.

- **Airtime Fairness**
  
  Turning Airtime Fairness ON or OFF options can be found under Access Point → Edit → Configuration → Airtime Fairness.

- **Feature Scheduling**
Scheduled bandwidth control or client access control is available now under System Settings → Schedule

Please be noted that you will need a Bandwidth rule (can be created in Bandwidth Rules) or a Client Access list (can be created under Client → Client Access), in order to create a schedule.
• **Master Direction**

When GWN7610 slave is not in the same broadcast domain with its master, this feature is available for all factory configured GWN7610 to find its master IP address offered by local DHCP option 43.

GWN7610 accepts option 224 encapsulated in option43, and the syntax is in TLV format. So, the for a simple example of DHCP 43 configuration would be:

224(Type)12(Length)10.157.0.234(Value) translated into Hex as e0c31302e3135372e302e323334

For DHCP server configuration on GWN7000, which translates the values automatically, is as follows:

![DHCP Configuration Example](image)

• **Master Transfer**

Now an easier way to transfer your master authority from one unit to another available unit is available on Access Point management page. By clicking the Transfer to Master button above in red circle, the designated slave unit will be upgraded to master and current master will be downgraded to slave accordingly.
• **Social login/Voucher**

As an enhancement of Captive Portal, social Login as Wechat/Facebook/Twitter have been added.

![Add](image)

- **Name**: Name should not be empty
- **Authentication Type**: Social Login Authentication
- **Expiration**: The field should not be empty
- **WeChat**, **Facebook**, **Twitter**: 
- **Use Default Portal Page**: 
- **Portal Page Customization**: /social_auth.html
- **Landing Page**: Redirect to the Original URL

Also, Voucher is added as another Captive Portal authentication option.

Voucher management interface is available under Captive Portal → Vouchers
- **Mesh Network**

Mesh feature is now available for your GWN7600/7600LR wireless deployment!

With Mesh setup, APs can connect wirelessly to each other and cooperate with one another to efficiently route data from/to clients.

To use Mesh feature, here is some basic instructions:

1) Add all APs you want to use to form a mesh network in to a same network group.

2) Configure mesh under System Settings → Mesh

3) Disconnect network of those APs, except the root AP or APs for uplink internet access, and power those back on at the location you want to install.

4) Wait... The process of forming Mesh network may take several minutes. Once one AP has allocated itself into the Mesh network, its status will change from “online” to

5) At this moment, you can check the Mesh topology by clicking

6) Mesh topology is automatically calculated; however, you still can modify it manually by specifying each AP’s wireless uplink in AP edit page tag “Uplink”.
[GWN7610]FIRMWARE VERSION 1.0.4.22

PRODUCT NAME

GWN7610

DATE

11/14/2017

BUG FIX

- Fixed the WPA2 4-way handshake vulnerability*
- Fixed the WPA2 802.11r vulnerability*

*Note: Please refer to our white paper of “WPA Security Vulnerability” here:

[GWN7610] FIRMWARE VERSION 1.0.4.20

PRODUCT NAME
GWN7610

DATE
10/31/2017

IMPORTANT UPGRADING NOTE

• Before starting to upgrade, please make sure your GWN7610’s firmware version is 1.0.2.108* or higher.
• Before starting to upgrade, please make sure your GWN7000 (the master device)’s firmware version is 1.0.2.71* or higher.

*GWN7610 firmware 1.0.2.108 package is available for downloading at
http://firmware.grandstream.com/Release_GWN7610_1.0.2.108.zip

*GWN7000 firmware 1.0.2.75 package is available for downloading at
http://firmware.grandstream.com/Release_GWN7000_1.0.2.75.zip

ENHANCEMENT

• Added support for Timed Client Disconnect and Enhanced Client Blocking
• Added support for Client Bridge
• Added support for Syslog Server
• Added support for Configurable web UI access port
• Added support for E-mail notifications

BUG FIX

• Internal bug fixes.
• Banned Band steering feature does not affect wireless Black/White/Banned client list feature anymore.
KNOWN ISSUE

- After blocking wireless client, blocked client will be displayed as wired in the clients list instead of showing in the Blocked client list. The client can still be unblocked from Global Blacklist under Client Access.

NEW FEATURE OVERVIEW

- Timed Client Disconnect and Enhanced Client Blocking

  The Client Connection Permissions Management enhanced client blocking provides a more manageable method for Wi-Fi client whitelist and blacklist configuration. It allows any combination of globally-maintained connection access control lists to be applied to network groups as desired for blacklisting and whitelisting WIFI clients. The timed client disconnect feature allows the system administrator to set a fixed time for which clients should be allowed to connect to the access point, after which the client will no longer be allowed to connect for a user configurable cooldown period.

  1) New Client bar (See picture on the right)
  2) Client Access

<table>
<thead>
<tr>
<th>Name</th>
<th>MAC Address</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Blacklist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access List 1</td>
<td>4: 00:00:12:34:56, 00:00:00:12:34:57, 00:00:00:12:34:58, 00:00:00:12:34:59</td>
<td></td>
</tr>
</tbody>
</table>

  3) Time Policy

<table>
<thead>
<tr>
<th>Name</th>
<th>Enabled</th>
<th>Connection Time</th>
<th>Recreated Type</th>
<th>Recreated Time</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST_POLICY</td>
<td>✓</td>
<td>2h</td>
<td>Fixed Daily</td>
<td>23:00</td>
<td></td>
</tr>
</tbody>
</table>

  4) Banned Client   This list is moved from original Client page to a separate page now.

- Client Bridge
The Client Bridge feature allows an access point to be configured as a client for bridging wired only clients wirelessly to the network. When an access point is configured in this way, it will share the wifi connection to the LAN ports transparently. This is not to be confused with a mesh setup. The client will not accept wireless clients in this mode.

Once a Network Group has an Client Bridge Support enabled, the AP adopted in this Network Group can be turned in to Bridge Client mode by click the Bridge button:

Please be noted that once an AP it turned into Client Bridge mode, it cannot be controlled by a Master anymore, and a factory reset is required to turn it back into normal AP mode.

- **Syslog Server**

  Syslog Server is now available on GWN7000. Configuration page is as below:

- **Configurable web UI access port**

  Under System →Maintenance, following configuration is available now:
1) Web WAN Access; 2) Web HTTP Access; 3) Web HTTPS Port

- **E-mail notifications**

  Email notification allows the administrator to select a predefined set of system events and to send notification upon the change of the set events.

  Email notification configuration is under System → Email/Notification.

  Selectable system events are listed as below:
[GWN7600&7600LR] FIRMWARE VERSION 1.0.4.12

PRODUCT NAME
GWN7600, GWN7600LR

DATE
10/31/2017

ENHANCEMENT
• Added support for **Timed Client Disconnect and Enhanced Client Blocking**
• Added support for **Client Bridge**
• Added support for **Syslog Server**
• Added support for **Configurable web UI access port**
• Added support for **E-mail notifications**

BUG FIX
• Fixed the WPA2 4-way handshake vulnerability*
• Fixed the WPA2 802.11r vulnerability*

*Note: “Out of the box” Grandstream Access Points are not affected by this issue. APs with old firmware are only affected after changing into client-bridge mode. Please refer to our white paper of “WPA Security Vulnerability” here:

• Fixed the issue that “Band Steering” option requires a system reboot to take effect.
• Fixed the issue that "Gateway MAC address" options and requires a system reboot to take effect.
• Fixed the issue that when Facebook and WeChat authentication are enabled at the same time, client cannot redirect to landing page after Facebook auth success.
• Fixed the issue that after many times of enabling and disabling Captive Portal, there is chances that WIFI clients can access to Internet without authentication challenge.

**KNOWN ISSUE**

• Configuring Radius server address with domain name instead of IP will cause the WIFI under configuration become open without authentication.

• “Hostname” on client page and the “Top AP” “Top SSID” “Top Clients” on overview page may show empty occasionally.

• After clicking on the reset button in maintenance page, it may prompt “Reset failed!”.

**NEW FEATURE OVERVIEW**

• **Timed Client Disconnect and Enhanced Client Blocking**

The Client Connection Permissions Management enhanced client blocking provides a more manageable method for Wi-Fi client whitelist and blacklist configuration. It allows any combination of globally-maintained connection access control lists to be applied to network groups as desired for blacklisting and whitelisting WIFI clients.

The timed client disconnect feature allows the system administrator to set a fixed time for which clients should be allowed to connect to the access point, after which the client will no longer be allowed to connect for a user configurable cooldown period.

5) New Client bar (See picture on the right)

6) Client Access

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<thead>
<tr>
<th>Name</th>
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<td>Access List 1</td>
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<td>[X]</td>
</tr>
</tbody>
</table>

7) Time Policy

<table>
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<tr>
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<th>Recomnect Type</th>
<th>Recomnect Time</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Policy</td>
<td>[X]</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>[X]</td>
</tr>
</tbody>
</table>
8) **Banned Client**  This list is moved from original Client page to a separate page now.

- **Client Bridge**

  The Client Bridge feature allows an access point to be configured as a client for bridging wired only clients wirelessly to the network. When an access point is configured in this way, it will share the wifi connection to the LAN ports transparently. This is not to be confused with a mesh setup. The client will not accept wireless clients in this mode.

  Once a Network Group has an Client Bridge Support enabled, the AP adopted in this Network Group can be turned in to Bridge Client mode by click the Bridge button:

  Please be noted that once an AP is turned into Client Bridge mode, it cannot be controlled by a Master anymore, and a factory reset is required to turn it back into normal AP mode.

- **Syslog Server**

  Syslog Server is now available on GWN7600 and GWN700LR. Configuration page is as below:
• **Configurable web UI access port**

Under System → Maintenance, following configuration is available now:

2) Web WAN Access; 2) Web HTTP Access; 3) Web HTTPS Port

• **E-mail notifications**

Email notification allows the administrator to select a predefined set of system events and to send notification upon the change of the set events.

Email notification configuration is under System → Email/Notification.

Selectable system events are listed as below:
PRODUCT NAME
GWN7600, GWN7600LR

DATE
9/20/2017

IMPORTANT UPGRADING NOTE
This is the initial official release of GWN7600LR

BUG FIX
• Fixed issue that GWN7600's 5G radio power won't take effect after select frequency to only 5G.
• Fixed issue that WiFi client cannot connect to the 802.11g AP WIFI when it uses the 802.11b protocol.
• Fixed issue that WeChat authentication for Captive portal sometimes behaves abnormal and it will be hard for WIFI client to authenticate when issue happens.
• Fixed issue that Captive Portal Policy changes require a reboot to take effect.
• Fixed issue that device cannot catch packet if a value is set in “File Size” option.
• Fixed issue that 2.4GHz mode need to be enabled for changing Channel Width and Active Spatial Streams.
• Fixed issue that WeChat authentication of Captive portal does not work, when adopting WIFI has WEP security mode.
• Fixed issue that If only 802.11r is enabled, Voice enterprise feature will not take effect.
• Fixed issue that iPhone does not work with current Minimum RSSI design.
• Internal bug fixes

KNOWN ISSUE
• "Band Steering" and "Gateway MAC address" options and requires a system reboot to take effect.
- Configuring Radius server address with domain name instead of IP will cause the WIFI under configuration become open without authentication.

- “Hostname” on client page and the “Top AP” \ “Top SSID” \ “Top Clients” on overview page may show empty occasionally.

- After clicking on the reset button in maintenance page, it may prompt "Reset failed!".

- When Facebook and WeChat authentication are enabled at the same time, client cannot redirect to landing page after Facebook auth success.

- After many times of enabling and disabling Captive Portal, there is chances that WIFI clients can access to Internet without authentication challenge.
[GWN7610] FIRMWARE VERSION 1.0.3.21

PRODUCT NAME
GWN7610

DATE
8/11/2017

IMPORTANT UPGRADING NOTE
- Before starting to upgrade, please make sure your GWN7610’s firmware version is 1.0.2.108 or higher.
- Before starting to upgrade, please make sure your GWN7000 (the master device)’s firmware version is 1.0.2.71 or higher.

ENHANCEMENT

BUG FIX
- Fixed the issue that beacon frame has a random information element

KNOWN ISSUE
- Banned Band steering feature still affect wireless Black/White/Banned client list feature. Please use Band steering or Black/White/Banned client list feature exclusively.
[GWN7600&7600LR]FIRMWARE VERSION 1.0.3.19

PRODUCT NAME

GWN7600

DATE

7/14/2017

ENHANCEMENT

- Added support for Captive Portal
- Added support for 802.11k/r/v (Enable Voice Enterprise)
- Added support for Failover Master
- Added support for VLAN assignment via RADIUS
- Added support for Select Band per SSID Added support for Exact Radio Power Configuration in dBm
- Added support for AP Locating by Blinking LED
- Added support for Per-Client/Per-SSID Bandwidth Management
- Added support for Limit Client Count per SSID
- Added support for WIFI schedule
- Added support for LED control
- Added support for Enabling/Disabling DHCP option 66 for firmware upgrade

BUG FIX

- Internal bug fixes
KNOWN ISSUE

- "Band Steering" and "Gateway MAC address" options and requires a system reboot to take effect.
- Configuring Radius server address with domain name instead of IP will cause the WIFI under configuration become open without authentication.
- "Hostname" on client page and the “Top AP” \ “Top SSID” \ “Top Clients” on overview page may show empty occasionally.
- GWN7600's 5G radio power won’t take effect after select frequency to only 5G.
- Client cannot connect to the 802.11g AP WIFI when it uses the 802.11b protocol.
- After clicking on the reset button in maintenance page, it may prompt "Reset failed!".
- WeChat authentication for Captive portal sometimes behaves abnormal and it will be hard for WIFI client to authenticate when issue happens.
- When Facebook and WeChat authentication are enabled at the same time, client cannot redirect to landing page after Facebook auth success.
- After many times of enabling and disabling Captive Portal, there is chances that WIFI clients can access to Internet without authentication challenge.
- Device cannot catch packet if a value is set in "File Size" option.
- Captive Portal Policy changes require a reboot to take effect.
- 2.4GHz mode need to be enabled for changing Channel Width and Active Spatial Streams.
- WeChat authentication of Captive portal does not work, when adopting WIFI has WEP security mode.
- If only 802.11r is enabled, Voice enterprise feature will not take effect.
- iPhone does not work with current Minimum RSSI design.

NEW FEATURE OVERVIEW

- Captive Portal
  
  You can configure different portal policies with names and adopt one policy while configuring your Network groups. Captive portal now also supports authentication by Radius and WeChat/Facebook.
802.11k/r/v (Enable Voice Enterprise)

• **Failover Master**

Failover Master is supported on GWN7600LR now. You can specify a slave AP as failover master. Whenever it detects the master is down, it will promote itself to be as failover master. After then, if master comes back, failover master will automatically go back to slave mode, or if the master doesn’t come back to alive, Administrator can login to turn the failover master to true master and take over all controls.

![Failover Master Configuration](image)

• **AP Locating by Blinking LED**

Now, when you can’t match your AP list on web with your real AP deployment in the field. This feature will help you to find your AP.

![AP Locating LED](image)

• **Select Band per SSID**

Configuration available at Network Group->Add/Edit->WIFI-> **SSID band**.

![Select Band per SSID](image)
• Exact Radio Power Configuration in dBm

Configuration available at Access Point->Edit->Configuration-> **Custom 2.4GHz Wireless Power** (dBm).

- Network Group->Add/Edit->WIFI-> **Upstream Rate** / **Downstream Rate**.

- Per-Client: Client->Edit->Bandwidth Rules-> Add new item.

- Per-Client/Per-SSID Bandwidth Management

Configuration available at

Per-SSID: Network Group->Add/Edit->WIFI-> **Upstream Rate** / **Downstream Rate**.
General configuration: **Bandwidth Rules** on left root menu bar.

![Bandwidth Rules Configuration Screen]

- **Limit Client Count per SSID**
  Configuration available at Network Group->Add/Edit->WIFI->**Wireless Client Limit**.

![Wireless Client Limit Configuration Screen]

- **WIFI schedule**
  User can configure WIFI on/off schedule under Network Group->Edit->**Schedule**.
- **LED control**

  User can define the LED on/off schedule in following page.

- **Enabling/Disabling DHCP option 66 for firmware upgrade**

  Configuration available at System Settings->Maintenance->Upgrade-> **Allow DHCP options 66 and 43 override.**
[GWN7610]FIRMWARE VERSION 1.0.3.19

PRODUCT NAME
GWN7610

DATE
6/20/2017

IMPORTANT UPGRADING NOTE

- Before starting to upgrade, please make sure your GWN7610's firmware version is 1.0.2.108 or higher.
- Before starting to upgrade, please make sure your GWN7000 (the master device)'s firmware version is 1.0.2.71 or higher.

ENHANCEMENT

- Added support for Captive Portal
- Added support for 802.11k/r/v (Enable Voice Enterprise)
- Added support for Failover Master
- Added support for VLAN assignment via RADIUS
- Added support for Select Band per SSID
- Added support for Selectively Enable b/g/n
- Added support for Exact Radio Power Configuration in dBm
- Added support for AP Locating by Blinking LED
- Added support for Per-Client/Per-SSID Bandwidth Management
- Added support for Limit Client Count per SSID
- Added support for Enabling/Disabling DHCP option 66 for firmware upgrade

BUG FIX

- Internal bug fixes
KNOWN ISSUE

- Banned Band steering feature still affect wireless Black/White/Banned client list feature. Please use Band steering or Black/White/Banned client list feature exclusively.

NEW FEATURE OVERVIEW

- Captive Portal Enhancement
  1. Now you can configure different portal policies with names and adopt one policy while configuring your Network groups.
  2. Now captive portal starts to support authentication by Radius and WeChat.

- Failover Master

  Failover Master is supported on GWN7610 now. You can specify a slave AP as failover master. Whenever it detects the master is down, it will promote itself to be as failover master. After then, if master comes back,
failover master will automatically go back to slave mode, or if the master doesn’t come back to alive,
Administrator can login to turn the failover master to true master and take over all controls.

- **AP Locating by Blinking LED**
  
  Now, when you can’t match your AP list on web with your real AP deployment in the field. This feature will help you to find your AP.

- **802.11k/r (Enable Voice Enterprise)**
  
  Configuration available at Network Group->Add/Edit->WiFi-> **Enable Voice Enterprise**.

- **Select Band per SSID**
  
  Configuration available at Network Group->Add/Edit->WiFi-> **SSID band**.

- **Selectively Enable b/g/n**
  
  Configuration available at Access Point->Edit->Configuration-> **Mode** (2.4G).

- **Exact Radio Power Configuration in dBm**
  
  Configuration available at Access Point->Edit->Configuration-> **Custom 2.4GHz Wireless Power** (dBm).

- **Per-Client/Per-SSID Bandwidth Management**
  
  Configuration available at
  
  Per-SSID: Network Group->Add/Edit->WiFi-> **Upstream Rate / Downstream Rate**.
  Per-Client: Client->Edit->Bandwidth Rules-> Add new item.

- **Limit Client Count per SSID**
  
  Configuration available at Network Group->Add/Edit->WiFi-> **Wireless Client Limit**.
- Enabling/Disabling DHCP option 66 for firmware upgrade
  
  Configuration available at System Settings->Maintenance->Upgrade-> **Allow DHCP options 66 and 43 override.**
[GWN7610]FIRMWARE VERSION 1.0.2.108

PRODUCT NAME
GWN7610

DATE
4/19/2017

IMPORTANT UPGRADING NOTE
• Controller protocol security enhancement is important for secured provision from Master to Slave. So once a master with 1.0.2.108 found a slave with 1.0.2.15, it will disable the slave’s wifi and show the slave’s firmware version in RED BOLD to remind user to upgrade the slave. (This is implemented on GWN7000 version 1.0.2.71 too)

ENHANCEMENT
• Controller protocol security enhancement
• LED control
• Captive Portal
• Additional SSID
• WIFI schedule
• Client Isolation enhancement
• Syslog stored on unit and displayed on web is available now
• Few web enhancement.

KNOWN ISSUE
• Banned Band steering feature still affect wireless Black/White/Banned client list feature. Please use Band steering or Black/White/Banned client list feature exclusively.
NEW FEATURE OVERVIEW

• LED control

User can define the LED on/off schedule in following page.

• Captive Portal

Configurations are is available under System settings. Now user can customize the portal web page including their service terms by uploading splash.html and related web files in "Files" tag. (The blank window below is left for the service term to be customized)

• Additional SSID
Now user can add additional SSID to any network group by configuring the following page.

- **WIFI schedule**
  
  User can configure WIFI on/off schedule under Network Group->Edit->Schedule

- **Client Isolation enhancement**
  
  Now, 3 client isolation modes (Radio/Internet/Gateway MAC) are available now. Please refer to user manual for the detailed features.
PRODUCT NAME
GWN7600

DATE
3/15/2017

IMPORTANT UPGRADING NOTE
This is the initial official release of GWN7600
[GWN7610]FIRMWARE VERSION 1.0.2.15

PRODUCT NAME
GWN7610

DATE
1/31/2017

IMPORTANT UPGRADING NOTE
This is the initial official release of GWN7610