Merit LILIN Application Note

NVR and IP camera connection via HTTPs

Document Number : A00142 Date : 2021/04/19 Dept: Technical Support, Taipei

Subject: This document describes how to configure a LILIN NVR or an IP camera using HTTPs accessed via Internet.

Device: LILIN IP camera and NVR



The issue:

A user's login credential, ID and password, could be exposed in a network packet when using standard HTTP connections to a LILIN NVR and IP camera when using the Basic authentication type. This is potentially an unsafe way to access devices on the network. To enhance NVR security, a user can connect the NVR via HTTPS.

How to enhance access security for NVR via self-signed HTTPs

Method 1: Change the authentication method from Basic to Digest (less secured).

| 9LILINI | o general | advanced | 🖂 E-MAIL | 🖫 FTP 👙 | DDNS | ther | admin | ۵ | × |
|-------------|-----------|-----------------|--------------------|-----------------|---------|------|-------|---|---|
| | GENERAL | IP Mode | Static | Port Forwarding | 179.179 | | | | 1 |
| S CAMERA | | IP Address | 192.168.3.118 | IP Test | invr) | | | | |
| | | Subnet Mask | 255.255.255.0 | | | | | | |
| RECORD | | Default Gateway | 192.168.3.254 | | | | | | |
| alarm | | Primary DNS | 8.8.8.8 | | | | | | |
| 💻 DISPLAY | | Secondary DNS | 8.8.4.4 | | | | | | |
| | | Video Port | 3101 | | | | | | |
| | | HTTP Port | 80 | Basic | Diges | | | | |
| SYSTEM | | HTTPS Port | 443 | Certificate | | | | | |
| 🛋 PTZ | | FTP Port | 12321 | | | | | | |
| 💼 meta data | | RTSP Port | 554 | RTSP URI | | | | | |
| | | MAC Address | 00:0F:FC:10:12:AB | | | | | | |
| -0. | | PPPoE Account | ADMIN Max lengt | | | | | | |
| | | PPPoE Password | •••• May lengt | Show | word) | | | | |
| | | PPPoE IP | Uniteriet | | | | | | |
| | | Hot-spot IP | | | | | | | |
| | | | | | | | | | |
| | | | Apply | Reset | | | | | |



Method 2: Connect to NVR via HTTPS (more secured).

Step1: Create a HTTPS certificate. (If you already have a HTTPS certificate, you can import it directly.)

| 9LILINI | 🏀 GENERAL | 🐻 ADVANCED | 🖾 E-MAIL 🛛 🦉 | 🔓 FTP 🌐 DC | DNS 💼 OTHER | admin | ۵ | × |
|-----------------------------|-----------|-----------------|------------------------|------------------------------------|-------------|-------|---|---|
| STREAM | GENERAL | IP Mode | Static | Port Forwarding Option Support | | | | |
| 🗫 camera | | IP Address | 192.168.3.115 | IP Test | | | | |
| | | Subnet Mask | 255.255.255.0 | | | | | |
| RECORD | | Default Gateway | 192.168.3.254 | | | | | |
| alarm | | Primary DNS | 8.8.8.8 | | | | | |
| 💻 DISPLAY | | Secondary DNS | 8.8.4.4 | | | | | |
| | • | Video Port | 3100 | | | | | |
| | | HTTP Port | 80 (1~655 | Basic - | | | | |
| SYSTEM | | HTTPS Port | 443 | Certificate | | | | |
| 📥 PTZ | | FTP Port | 12321 | | | | | |
| 📴 МЕТА ДАТА | | RTSP Port | 554 (1~6553 | RTSP URI | | | | |
| OTHER | | MAC Address | 00:0F:FC:10:E5:51 | | | | | |
| -0. | | PPPoE Account | User (Max. length f | | | | | |
| | | PPPoE Password | (Max. length 6 | Show (Display password) | | | | |
| | | PPPoE IP | (maxing m | | | | | |
| | | Hot-spot IP | | I | | | | |
| | | | | | | | | |
| Version: 1.0.00 B1803012008 | | | Apply | Reset | | | | |

Step 2: Fill out all the required information, and then click Self-signed Certificate.

| HTTPS Certificate | | × | HTTPS Certificate | | | × |
|-------------------------------|-------------------|----------------------------|--------------------------|-------------------------------|---------|----------------------------|
| Country Code | | | Country Code | тw | | |
| State or Province | | | State or Province | (Max. length 2) TAIPEI | | |
| Locality | | | Locality | (Max. length 64) TAIPEI | | |
| Organization | (Max. length 64) | | | (Max. length 64) | | |
| Organization Unit | | | Organization Unit | (Max. length 64) Project Dept | | |
| Common Name | | | Common Name | FAE | | |
| Validity | (Max. length 64) | | Validity | 999 (1 = 3650 Dav(s)) | | |
| Croate Self-right Cortificate | (1 ~ 3650 Day(s)) | Export Cartificate Request | Create Self-signed Certi | ificate Create Certificate | Request | Export Certificate Request |
| Import Signed Certificate | | CSR not created | Import Signed Certific | cate | | CSR not created. |
| import signed certainate | | | | | | |
| | | Exit | | | | Exit |

Step 3: Type in the IP address of NVR by starting the URL with <u>https://192.168.0.111</u> via a browser.

When the page loads click on 'Go on to the webpage (not recommended)'. It is ok to click the 'Go on to the webpage (not recommend)' link. The reason you are seeing this is due to using a self-signed HTTPS certificate. The HTTPS certificate is still secure, this just means it was not issued by a certified certificate authority.





Step 4: After the above steps have been taken, you will then connect to the NVR via https.



How to enhance access security for NVR via HTTPs wild card

The example, we use the SSL wild card service of LILIN's ddnsipcam.com to show trusted certificate installed on a DVR/NVR,

In Network ->DDNS, enable DDNS service on ddnsipcam.com with your hostname.



| 🅲 GENERAL | 🗑 ADVANCED | E-MAIL | 🖶 FTP | |
|-----------|----------------|-----------------------|-----------------------|-----------------------|
| DDNS | Server | ddnsipcam.com | | |
| | | | | |
| | Hostname | yes6216ok | http://yes6216ok.c | <u>ldnsipcam.com/</u> |
| | | | | |
| | Account | - | | |
| | | | | |
| | Password | ••••• | Show | |
| | | | | |
| | WAN IP | | | |
| | | | | |
| | Check Interval | 4 | | |
| | | ularly update the DDN | IS service. (Hour(s)) | |
| | Status | Status: Update Succ | ess. | |

Switch to Network -> General tab on the NVR and click Certificate button.

| 9LILINI | o general | advanced | E-MAIL 🖶 | FTP 💮 DDNS |
|----------------------|-----------|-----------------|-----------------------|--------------------------------|
| STREAM | | IP Mode | PPPoE | |
| CAMERA | | IP Address | 192.168.4.55 | (Router Supported UPNP) |
| QLO RECORD | | Subnet Mask | 255.255.255.0 | |
| ்ன் _{ALARM} | | Default Gateway | 192.168.4.254 | |
| | | Primary DNS | 8.8.8.8 | |
| L DISPLAY | | Secondary DNS | 8.8.4.4 | |
| ွဲတို့ NETWORK | | HTTP Port | 80 (1~65535 | Basic - Authentication Type |
| ξÔ҈} SYSTEM | | HTTPS Port | 443 (1~65535 | Certificate |
| | | FTP Port | 12321 | On - |

Then click "Using Wild Card" to apply ddnsipcam.com's wild card.

| HTTPS Certificate | | * |
|--------------------------------|------------------------------|------------------------------------------------|
| Country Code | | |
| State or Province | | |
| Locality | | |
| 0 | | |
| Organization | | |
| Organization Unit | (Max. length 64) | |
| Common Name | (May Ing the 64) | |
| Validity | | |
| | | |
| Create Self-signed Certificate | e Create Certificate Request | Export Certificate Request CSR not created. |
| Using Wild Card | Import Signed Certificate | |
| | | |
| | | Exit |

Connect to your DVR/NVR by HTTPs protocol with your hostname.

You shall be informed that a secured connection is established in the browser as below.





Click Certificate to see details about the certificate.

| Certificate | Х |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| General Details Certification Path | |
| Certificate Information | - |
| This certificate is intended for the following purpose(s): Proves your identity to a remote computer Ensures the identity of a remote computer 2.23.140.1.2.1 1.3.6.1.4.1.44947.1.1.1 | |
| * Refer to the certification authority's statement for details. Issued to: ".ddnsipcam.com | |
| Issued by: R3 | |
| Valid from 4/15/2021 to 7/14/2021 | |
| Issuer <u>S</u> tatement | : |
| ОК | |

How to enhance access security for NVR importing signed certificate

If you have a signed certificate, you are able to use the SSL certificate and import to the DVR/NVR to use.

| 9LILIN | OGENERAL | C ADVANCED | E-MAIL | Se FTP | 🖶 DONS | COTHER . | admin 🗘 |
|-------------------|----------|-------------------|-----------------|------------------------|-------------------|-------------|---------|
| STREAM | | | tificate | | | * | |
| C GAMERA | | Country Code | | | | | |
| QLO RECORD | | State or Province | | | | | |
| 🖄 ALARM | | Locality | | | | | |
| DISPLAY | | Organization | | | | | |
| He network | | Organization Unit | | | | | |
| () system | | Validity | | | | | |
| T PTZ | | Create Self-sign | ned Certificate | Create Certificate Rec | 2. Sport Certific | ale Request | |
| META DATA | | M. Using W | ild Card | Import Signed Certif | cate | | |
| CTHER | | | | | Exit | | |
| | | PPI PPPoE IP | | | | | |
| | | | | | | | |
| | | | | | | | |
| and a service set | | | | | | | Inte |

Step #1. Fill out HTTPS Certificate information.

- Step #2. Create Certificate Request.
- Step #3. Export Certificate Request.
- Step #4. Send NVR5832.csr to Certificate Authorities (CAs) to sign a SSL certificate.

Step #5. Import Signed Certificate.

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How to enhance access security for IP Cam via HTTPs trusted certificate

Method 1: Update the camera firmware to the latest version shown below. Once updated Digest will become the default authentication method after the update has been successfully installed:

Method 2: Connect to devices via HTTPS.

Step 1: Enable the HTTPS Service within the camera.

| | 192.168.3.200/new/set | up.htm | | | | ▼ 〇 搜尋… | |
|-----------|-----------------------|----------------------|---------------|-----------------|----------------|--------------------------------|--|
| □1 MD2242 | × 📑 | | | | | | |
| | | 9LILIN | | | Live Basic | Mode Advance Mode Language | |
| | | System V | /ideo / Audio | Network | Event | Notification Mainte | |
| | | General | Advance >> | Network >> HTTP | PS Service | | |
| | | General IPv6 | | | | | |
| | | HTTP/RTSP Service | HTTPS Servic | e 🛛 Enabl | Enable Disable | | |
| | | HTTPS Service | | | | | |
| | | Multicast | | S | ave | | |
| | | IP Address Filtering | | | | | |
| | | DDNS | | | | | |
| | | UPnP | | | | | |
| | | | | | | | |

Step 2: Create a HTTPS certificate, select Self-signed Certificate and fill in all required information, then click Create certificate button. (If you already have a HTTPS certificate, you can import it directly.)

| × | GLILIN | , | Live Basic Mode Adv |
|---|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | System | Video / Audio | Network Event Notifi |
| | General General IPv6 | Advance >> | Network >> HTTPS Service |
| | HTTP/RTSP Service HTTPS Service Multicast IP Address Filtering | HTTPS Service HTTPS Port Status | e Enable Disable 443 Not installed |
| | DDNS UPnP SDDP / Heartbeat | Method Country | Create self-signed certificate |
| | | State or provin Locality | Taiwan Taipei |
| | | Organization Organization u | LILIN LILIN |
| | | Common name Validity | e www.meritlilin.com 365 |
| | | General General General IPv6 HTTP/RTSP Service HTTPS Service Multicast IP Address Filtering DDNS UPnP SDDP / Heartbeat | System Video / Audio General Advance >> General IPv6 AftTrPS Service HTTP/RTSP Service HTTPS Service HTTPS Service HTTPS Port IP Address Filtering Status DDNS Method UPnP Country SDDP / Heartbeat State or provin Locality Organization U Organization N Validity |

Step 3: Key in the IP address of camera using https:// and then click Go on to the webpage.





Step 4: After the above steps have been taken, you will then connect to the camera via https.



Note: LILIN NVR's SSL certificate format is in PEM format.

Contact:

For more information, please contact your LILIN sales representative. You can also submit a support ticket at https://LILIN.zendesk.com