Network Camera Integration Guide

V0.1.5.0
11/13/2012

Revision History

Version	Date	Remark
0.1.0.0	2012/2/7	Initial
0.1.1.0	2012/3/15	
0.1.2.0	2012/9/13	
0.1.2.1	2012/9/27	Modified
0.1.3.0	2012/10/15	Modified
0.1.4.0	2012/10/18	Modified
0.1.5.0	2012/11/13	Modified

Contents

1. General Description

This document describes how to integrate LevelOne WCS-6020/6050. The following sections are about the topics: searching camera, camera streaming, and CGI files.

2. Searching Camera

1. Bonjour
    a. Client sends DNS query to 224.0.0.251:5353
    b. DNS query for the domain name “_http._tcp.local”
    c. Cameras which belong to the domain name “_http._tcp.local” sends DNS response to 224.0.0.251:5353
    d. Clients receive response from 224.0.0.251:5353 to get information
    - Catch the packets, the information as following example will be found
      brand=LevelOne
      model=WCS-6050

2. UPnP
    a. The client sends SSDP “search” packets to 239.255.255.250:1900.
    b. Cameras response SSDP “notify” packets to 239.255.255.250:1900.
    c. The “location” field at notify packet is the XML document for device information.
    d. In the XML document, the “manufacture” field is for the brand name, and the “modelName” field is for the model name.

3. LevelOne
    a. Client sends UDP packet to 255.255.255.255 port 49160. The UDP packet format is as below.

```
typedef struct _SEARCH_HEAD_
{
      unsigned int magic_number; // magic number to identify search
      unsigned int type; // type: request 0x01 or reply 0x02
} SEARCH _HEAD;
```

- magic_number is 16177572 for request type

    b. Cameras that understand the packet send response to 255.255.255.255 port 49160. The reply packet format is as below.

```
typedef struct _ SEARCH _SOCK_REP_
```

```
{
    SEARCH _HEAD  head;        //  head
    SEARCH _DATA  data;        //  data
} SEARCH _SOCK_REP;

typedef struct _ SEARCH _DATA_
{
    unsigned char mac[8];
    unsigned int ip;
    unsigned int web_port;
    unsigned char string[256];
    unsigned int s_port;
} SEARCH _DATA;
```

- magic_number is 18180614 for reply type
- The first sub string at string[256] is the model name.
  The second sub string is the serial number.
  The third sub string is value “ethernet” or “wireless”.
  The fourth sub string is the brand name.

c. Client receives response from 255.255.255.255 port 49160 to get cameras information.

3. Camera Streaming

1. JPEG SnapShpot

http://<*servername*>/imagep/picture.jpg

(Please refer “**LevelOne IP Camera CGI Specification**” section “**Capture Picture**” for more information)

2. Video MJPEG/MPEG4/H.264 and audio AAC/AMR via RTSP

(Please refer RFC 2326, RFC 2327 and HTTP protocol)

Support RTP embedded RTSP mode and HTTP tunnel mode

rtsp://<servername>/liven.sdp (n: stream number, 1~n)

3. MJPEG via Server Push

http://<*servername*>/video4.mjpg

Return:

```
HTTP/1.1 200 OK\r\n
Content-Type: multipart/x-mixed-replace;boundary=myboundary\r\n
Server: Vivotek Video Server\r\n
Date: Thu, 15 Mar 2012 02:23:49 GMT\r\n
Cache-Control: no-store\r\n
Pragma: no-cache\r\n
Connection: close\r\n
\r\n
--myboundary\r\n
Content-Type: image/jpeg\r\n
Content-Length: 45779\r\n
\r\n
<JPEG image data>\r\n
--myboundary\r\n
Content-Type: image/jpeg\r\n
Content-Length: 45779\r\n
\r\n
<JPEG image data>\r\n
--myboundary\r\n
.
```

4. Audio Post (G.711 μ-law)

```
GET /goform/2WayAudio HTTP/1.0\r\n
```

```
User-Agent: ai2wa-1.0.1\r\n
\r\n
<Audio data>
<Audio data>
<Audio data>
<Audio data>
.
.
.
```

4. CGI Files

Please refer the document “**LevelOne IP Camera CGI Specification**” for details.

5. Event Trigger Notification

1. Trigger by motion
    a. Set motion window parameter (Please reference "Motion Configuration" part at CGI specification)

       For example: (set motion window 0)

       http://<*servername*>/cgi-bin/config_motion.cgi?Act=2&MotEn0=on&MotLeft0=100&MotTop0=100&MotWidth0=150&MotHeight0=75&MotSensity0=90&MotObjsize0=18

    b. Set HTTP server parameter (Please reference "Http Configuration" part at CGI specification)

       For example: (www.nvr.com.tw:8080)

       http://<*servername*>/cgi-bin/config_http.cgi?Act=2&HttpUrl=http://www.nvr.com:8080/event/eventtrigger.cgi&Message=<message>

    c. Set application parameter (Please reference "Application Configuration" part at CGI specification)

       For example:

       http://<*servername*>/cgi-bin/config_application.cgi?Act=2&AppEvent=1&Event=1&Selection=3&SbaDate=32&SbaSchaf=2&SbaReYH=2012&SbaReYM=10&SbaReYD=15&SbaReFH=13&SbaReFM=30&SbaReFS=25&EbaSeYH=2012&EbaSeYM=10&EbaSeYD=15&SbaReTH=15&SbaReTM=40&SbaReTS=15&Delay=30&NotiType=6&TriggerT=0

    d. When event trigger, the message sent to Http server (www.nvr.com:8080) is

GET /event/eventtrigger.cgi?Message=<message>,Time:1234567890 HTTP/1.1\r\n\r\n

<message> is set at "config_http.cgi".

"Time" is event time. (UTC time)

2. Trigger by DI

    a. Set HTTP server parameter (Please reference "Http Configuration" part at CGI specification)

For example: (www.nvr.com.tw:8080)

http://<*servername*>/cgi-bin/config_http.cgi?Act=2&HttpUrl=http://www.nvr.com:8080/event/eventtrigger.cgi

b. Set application parameter (Please reference “Application Configuration” part at CGI specification)

For example:

http://<*servername*>/cgi-bin/config_application.cgi?Act=2&AppEvent=1&Event=0&Selection=3&SbaDate=32&SbaSchaf=2&SbaReYH=2012&SbaReYM=10&SbaReYD=15&SbaReFH=13&SbaReFM=30&SbaReFS=25&EbaSeYH=2012&EbaSeYM=10&EbaSeYD=15&SbaReTH=15&SbaReTM=40&SbaReTS=15&NotiType=6&SnapSuffix=0&TriggerT=2&DiTriggType=1&DiDelay=30

c. When event trigger, the message sent to Http server (www.nvr.com:8080) is

```
GET /event/eventtrigger.cgi?Message=<message>,Time:1523678904 HTTP/1.1\r\n
\r\n
```

<message> is set at “config_http.cgi”.

“Time” is event time. (UTC time)

3. Motion notification by stream

The motion trigger information is hidden at rtp stream. At the return SDP of “DESCRIBE” command, you can find the third track which media name is “application”. After setup, you can receive the motion data of XML format as below.

```
<?xml version="1.0"?>
<wsnt:NotificationMessage
xmlns:wsnt="http://docs.oasis-open.org/wsn/b-2"
xmlns:tns1="http://www.onvif.org/ver10/topics"
xmlns:tt="http://www.onvif.org/ver10/schema"
xmlns:vat="http://www.vatics.com/ver10/schema">
<wsnt:Topic
Dialect="http://docs.oasis-open.org/wsn/t-1/TopicExpression/Concrete">
tns1:RuleEngine/MotionDetector/StatusReport
</wsnt:Topic>
<wsnt:Message>
```

```
<tt:Message UtcTime="06:59:35.318">
<tt:Source>
<tt:SimpleItem Name="MDConfigurationToken" Value="MDConfig1"/>
</tt:Source>
<tt:Data>
<tt:ElementItem Name="MotionData">
<vat:MotionData>
<vat:Transformation>
<tt:Translate x="-1.00" y="1.00"/>
<tt:Scale x="0.00104167" y="-0.00185185"/>
</vat:Transformation>
<vat:IncludeWindow id="0">
<vat:Percent>89</vat:Percent>
<vat:Threshold>0</vat:Threshold>
<vat:BoundingBox left="282" top="270" right="456" bottom="625"/>
</vat:IncludeWindow>
<vat:IncludeWindow id="1">
<vat:Percent>0</vat:Percent>
<vat:Threshold>0</vat:Threshold>
<vat:BoundingBox left="1002" top="243" right="1680" bottom="472"/>
</vat:IncludeWindow>
<vat:IncludeWindow id="2">
<vat:Percent>89</vat:Percent>
<vat:Threshold>0</vat:Threshold>
<vat:BoundingBox left="684" top="634" right="1134" bottom="1016"/>
</vat:IncludeWindow>
</vat:MotionData>
</tt:ElementItem>
</tt:Data>
</tt:Message>
</wsnt:Message>
</wsnt:NotificationMessage>
```

6. Release Notes

0.1.0.1

2012/2/20 Add brand and model information for all search algorithms.

0.1.1.0

2012/3/15 Add “MJPEG via Server Push” for camera streaming

0.1.2.0

2012/9/13 Add “Audio Post”

0.1.2.1

2012/9/27 Add audio encode description to “Audio Post”

0.1.3.0

2012/10/15 Add “Event Trigger Notification”

0.1.4.0

2012/10/18 Add HTTP server setting “Event Trigger Notification”

0.1.5.0

2012/11/13 Add Message at “config_http.cgi”.