

## Release Version v3.4.0 (2016/10/12)

### Modules:

Type	Item	Version
<b>VM Image</b>	Compatible with vSphere 5.5 and above	03.04.0000.0017
<b>FW</b>	All in One Firmware	03.04.0000.0017
	Device Pack	05.00.0000.0022
<b>Application</b>	Crystal NuClient - Windows	3.4.0.5

### New Feature:

- A. Support Windows 10
- B. Support interconnect Mainconsole (v6.4.0 and above)– Playback
- C. Support IVS license online transfer, offline activation and offline transfer
- D. Support search and export IVS counting events
- E. Support watermark on exported videos
- F. Support customized default stream profile (auto)
- G. Support font size adjustment in Client Configuration

### Enhancement:

- A. Enhance web security
- B. Enhance firmware upgrade mechanism
- C. Enhance recording mechanism
- D. Enhance IVS stability

## Release Version v3.3.0 (2016/08/22)

### Modules:

Type	Item	Version
<b>VM Image</b>	Compatible with vSphere 5.5 and above	-
<b>FW</b>	All in One Firmware	03.03.0000.0009_20160810_1131
	Device Pack	v04.08.0000.0032
<b>Application</b>	Crystal NuClient - Windows	v3.3.0.50

### Enhancement:

- A. Enhance server security
- B. Enhance server log recycle mechanism to ensure stability
- C. Upgrade Diagnostic Tool

## Release Version v3.2.0 (2016/06/04)

### Modules:

Type	Item	Version
VM Image	Compatible with vSphere 5.5 and above	-
FW	All in One Firmware	03.02.0000.0086_20160602_1443.bin
	Device Pack	v04.08.0000.0032
Application	Crystal NuClient - Windows	v3.2.0.24

### New Feature:

- A. Support Interconnect Mainconsole (v6.4.0 and above)– Liveview only

### Enhancement:

- A. Failover server could take over recording task while recording server is fixing Database.
- B. Better memory management for Recording Module.
- C. Enhance log recycling algorithm to enhance stability of system.
- D. Enhance client connection mechanism to increase tolerance of multi-connection.
- E. Enhance server shut down procedure to increase server stability and server initial time.

### Issue Solved:

- A. Fix the compatibility issue with v3.1 and before.
- B. Fix the inaccurate usage display of volume group if volume size exceeds 41.9T.
- C. Fix inaccurate playback calendar display while switching recording server.
- D. Fix Nuclient random crash while user continuously operates on playback tab.

## Release Version v3.2.0 (2016/04/07)

### Modules:

Type	Item	Version
VM Image	Compatible with vSphere 5.5 and above	-
FW	All in One Firmware	03.02.0000.0083_20160330_1005.bin
	Device Pack	v4.8.0
Application	Crystal NuClient - Windows	v3.2.0

### New Feature:

- A. Support H.265 codec in Crystal Servers and NuClient
- B. Embedded TeamViewer for remote help
- C. Manually close event action in NuClient - play alarm sound, video pop-out and video edge display
- D. Camera network failover (support 2<sup>nd</sup> IP address)
- E. Web Bookmark Editor
- F. APP Launcher Editor
- G. Upgrade Access Control Gallagher plugin
- H. Default LPR VIT plugin

### Enhancement:

- A. Embedded browser for hardware setting
- B. IVS counting report - counting log and report setting
- C. Export the result of searching event/ metadata
- D. Add IP address in the camera overview tabbed page
- E. Maximize the window of E-map/ Image Fusion/ Device Group/ Web Bookmark/ APP Launcher editor to full screen

### New Known Issue:

- A. Counting report only supports single IVS server data collection
- B. Management Server could not send out counting report if report includes any disabled IVS server
- C. Manually close event action cannot be used in NuMatrix
- D. Web Bookmark may not support HTML5 and CSS3 web pages

- E. Web Client cannot be directly displayed in Firefox (Please refer to the document: [Crystal Web Client login Management Server](#) in Firefox for work around)
- F. Config client may not correctly display IVS preview image (little chance)
- G. User need to re-login NuClient if deleting/adding IVS channel behavior caused abnormal IVS preview
- H. **Management Server v3.2 is not compatible with Recording/Metadata Server v3.1 and before.**

## Release Version v3.1.0 (2015/10/16)

### Modules:

Item		Version
<b>VM Image</b>	Compatible with vSphere 5.5 and above	-
<b>FW</b>	All in one firmware	CT-03.1.0.0095_1714.bin
	VM	-
	Device Pack	V4.5
<b>Application</b>	Crystal NuClient - Windows	V3.1.0.25
	Crystal NuClient - Mac	V3.1.0.25

### New Feature:

1. IVS license type: support 4 IVS license type:
  - IVS Presence
  - IVS Counting
  - IVS Surveillance
  - IVS Advance
2. IVS features:
  - Counting/Tamper/Calibration/Object classification/shake elimination/Presence/Enter/Exit/Appear/Disappear/Dwell/Tailgating/Stop/Direction/Abandoned object/ Removed Object
3. Device Group - apply to Nuclient content list and joystick control
4. IVS & Metadata display on NuMatrix

### Enhancement:

1. Backup/Export in playback.
2. Multi-channel export
3. Thumbnail enable/disable and seek/zoom in
4. Multi-Metadata display on Nuclient/NuMatrix

## Release Version v3.0.4 (2015/08/26)

### Modules:

	Item	Version
<b>VM Image</b>	Compatible with vSphere 5.5 and plus	None
<b>FW</b>	All in one firmware	CT-03.00.0047_20150824_1131.bin
	VM	none
	Device Pack	V4.0
<b>Application</b>	Crystal NuClient - Windows	V3.0.4.5a
	Crystal NuClient - Mac	V3.0.4.5a

### New Feature:

1. Device Group.

### Enhancement:

1. Backup/Export in playback.
2. Multi-channel export
3. Thumbnail enable/disable and seek/zoom in

## Release Version v3.0.0 (2015/05/08)

### Modules:

Item		Version
<b>VM Image</b>	Compatible with vSphere 5.5 and plus	CT-VM_2.2.0.0035_1445.ova
<b>FW</b>	CT-4000/ CT-4000R	CT-4000(R)_3.0.0.0023_1924.bin
	CT-8000R/ CT-8000RP	CT-8000R(P)_3.0.0.0023_1927.bin
	VM	CT-VM_3.0.0.0023_1900.bin
	Device Pack	V4.0
<b>Application</b>	Crystal NuClient - Windows	V3.0.0.20a
	Crystal NuClient - Mac	V3.0.0.20a

### New Feature:

1. Crystal Nuclient Interconnect NVRTitan series.
2. 2 in one : Nuclient + Installation Wizard
3. Video Device Utility: Auto setup & bulk import
4. Thumbnail in Playback Timeline
5. Server upgrade to 64 bit
6. Support NFS network storage

### Enhancement:

1. Video device overview; allow user directly modify camera setting in overview page
2. IO device overview
3. The limitation of 16TB as maximum size of single Volume has been removed
4. UI enhancement (Event Filter, Metadata search indicator, language switch)

### Issue solved:

1. Memory leak of DevicePack 3.10 - solved.
2. Config client crash in Axis setting page - solved.
3. NTP server upgraded to prevent DoS attack.
4. C31A Plugin crash issue - solved



## Version Compatibility Notice:

1. It is recommended that servers and clients should be with identical version.
2. NVRTitan should be v.1.6.x .
3. Crystal 3.0 and later will be backward compatible to v2.2.

## Known Issue:

### New known issue of v3.0.0

#### [Server]

1. The disconnection between Recording server and Storage server would cause recording server failed to record in storage even if the storage server get reconnected.
2. Memory leak issue when applying metadata customized event.

#### [Client]

1. Backup Player may not function on OSX10.10.x
2. Client has issues with Vivotek fisheye dewarp, please apply NUUO Generic Dewarp for vivotek fisheye camera.

#### [NuMatrix]

1. Auto-start of NuMatrix does not work if name of matrix is not in English
2. NuMatrix may crash on Mac.

## Release Version v2.2.1 (2015/1/8)

### Modules:

Item		Version
<b>VM Image</b>	Compatible with vSphere 5.5 and plus	CT-VM_2.1.8_0063_1115.ova
<b>FW</b>	CT-4000/ CT-4000R	CT-4000(R)_2.2.1_0027_1726.bin
	CT-8000R/ CT-8000RP	CT-8000R(P)_2.2.1_0027_1722.bin
	VM	CT-VM_2.2.1_0027_1731.bin
	Device Pack	v3.10
<b>Application</b>	Crystal NuClient - Windows	v2.2.1.0
	Crystal NuClient - Mac	v2.2.1.0

### Special Notice:

1. Crystal v2.2.1 solves two issues found after release of Crystal v2.2.0. There is no new feature added in Crystal v2.2.1, and its specification and compatibility list are totally identical to those of Crystal v2.2.0.
2. Crystal v2.2.1 and Crystal v2.2.0 are fully compatible to each other.

### Issue Solved:

1. TitanNVR 4-ch embedded license is not functional after upgrading to Crystal v2.1.8 and later.
2. Several temporary folders were created under "C:\\" after executing "Test connection" in System Navigator Configuration of NuClient, which is annoying to users.

## Release Version v2.2.0 (2014/12/30)

### Modules:

Item	Version	
<b>VM Image</b>	Compatible with vSphere 5.5 and plus	CT-VM_2.1.8_0063_1115.ova
<b>FW</b>	CT-4000/ CT-4000R	CT-4000(R)_2.2.0_0025_1939.bin
	CT-8000R/ CT-8000RP	CT-8000R(P)_2.2.0_0025_1942.bin
	VM	CT-VM_2.2.0_0025_1945.bin
	Device Pack	v3.10
<b>Application</b>	Crystal NuClient - Windows	v2.2.0.19
	Crystal NuClient - Mac	v2.2.0.19

### New Feature:

1. New **CT-PRO** license (Crystal Professional) is introduced, and Video Wall is supported by enterprise-level license. Crystal VM does not support professional-level license.

License Level \ Function	Ultimate:	Enterprise:	Professional:
	CT-ULT CV-ULT (VM)	CT-ENT CV-ENT (VM)	CT-PRO
Recording Failover	0		
Video Wall	0	0	

**Table 1: License level specification**

2. NUUO Crystal™ allows having hybrid licenses (both CT and CV) in one management server. Please see release note of v2.1.8 for details.
3. One video server only charges 1-ch license.
4. Multi-site support by **System Navigator**: cameras from different management servers can be watched in one NuClient. Configuration among multiple management servers can be achieved in one NuClient.
5. **Fisheye Dewarp Calibration**: each fisheye camera can be calibrated manually for precise dewarp result.
6. **Diagnostic Service**: collect important server and client logs from NuClient to improve troubleshooting process, especially when NUUO Crystal™ is deployed in a closed LAN environment.
7. **Multi-stream Settings**: configure each stream of camera in NuClient.
8. Support **Videotec DCZ Keyboard** and **CH Products VM Desktop** joystick.

## Enhancement:

1. Motion Search enhancement: found motion events are listed while motion search is carrying on.
2. PTZ enhancement: support joystick control mode with speed.
3. Support auto-pan.
4. WAN enhancement: reduce possibility of login failure due to unstable network environment.
5. Support multiple PTZ-motor for multiple channel video servers.
6. Context-sensitive user manual.

## Issue solved:

1. Recording server crashed due to large amount concurrent event log querying operations.
2. System hanged when activating license.
3. Hotfix of ShellShock vulnerability.
4. Red recording indicator was not triggered due to very long key-frame interval.
5. Metadata search failed for special characters like æ, ø and å.
6. Daylight-saving process crashed due to integer overflow.

## Version Compatibility Notice:

1. It is recommended that servers and clients should be with identical version.
2. Backward compatibility will be fulfilled since NUUO Crystal™ v3.0.

## Known Issue:

### New known issue of v2.2.0

#### [Server]

1. CPU temperature from CT-4000 series will be displayed as (<50°C) due to new behavior of driver of CT-4000 series mainboard.
2. NIC may crash and recover in a short time due to TSO of network driver. Disable TSO can prevent this.

## [NuClient]

1. Avoid login identical management server multiple times when configuring **System Navigator**.
2. Control privilege is dominated by user who login the main management server when using **System Navigator**.
3. Default fisheye calibration parameters are not retrievable when connecting v2.1.4 server by v2.2 NuClient.
4. Using Vivotek Dewarp for Vivotek FE8174 Fish Eye Mode is poor in performance. Please use NUUO Generic Dewarp instead.

## [NuMatrix]

1. In a rare case, NuMatrix kept disconnected after connecting for a long time. This issue will be solved in NUUO Crystal™ v3.0.

## Known issue from previous version

### [Server]

1. C31A plugin v2.0.1.1 embedded with Crystal v2.1.4 did not function. Please downgrade C31A plugin to v2.0.0.9 (POS\_C31A\_2.0.0.9.nmp).

### [NuClient]

1. Digital PTZ is not compatible with Vivotek Dewarp. Please use NUUO Generic Dewarp instead.
2. Playback on Mobotix Q24M-Sec on MxPEG is not smooth.

### [NuMatrix] N/A

## Release Version v2.1.8 (2014/12/08)

### Modules:

Item	Version	
<b>VM Image</b>	Compatible with vSphere 5.5 and plus	CT-VM_2.1.8_0063_1115.ova
<b>FW</b>	CT-4000/ CT-4000R	CT-4000(R)_2.1.8_0063_1646.bin
	CT-8000R/ CT-8000RP	CT-8000R(P)_2.1.8_0063_1643.bin
	VM	CT-VM_2.1.8_0068_1157.bin
	Device Pack	v3.8
<b>Application</b>	Crystal NuClient - Windows	v2.1.8.6
	Crystal NuClient - Mac	v2.1.8.6

### New Feature:

1. Support pure software distribution on VMware vSphere hypervisor.
2. Support VMWare's HA, FT, vMotion, and HA-App capabilities.
3. New CV-ENT and CV-ULT licenses are required when deploying recording server on virtual machine. The detailed license requirements are shown in Table 1. NUUO Crystal™ allows having hybrid licenses (both CT and CV) in one management server.

<b>Recording Server</b> <b>Management Server</b>	<b>On CT-4000 or CT-8000</b>	<b>On VM</b>
<b>On CT-4000 or CT-8000</b>	CT-ENT or CT-ULT	CV-ENT or CV-ULT
<b>On VM</b>	CT-ENT or CT-ULT	CV-ENT or CV-ULT

**Table 1: License requirement for different deployment**

4. Sixty-four (64) 30 days free-trial licenses (Ultimate-level) are included in the VMware distribution.
5. Features only available in VMware distribution:
  - a. Allow local configuration of network IP address.
  - b. Local display window now includes:
    - NVR and device pack firmware version information,
    - Network address information,
    - System integrator contact information.

### Enhancement:

1. Boost network connection speed between NVR and all IP cameras.
2. Update sensor drivers for both fan and CPU temperature indicators to handle Intel's bug which may result in wrong temperature readouts.

## **Issue solved: N/A.**

## **Version Compatibility Notice: N/A.**

## **Known Issue:**

### **New known issue from v2.1.8**

#### **[Server] N/A**

#### **[NuClient]**

1. Possible text overlaid problem when displaying trial license expiration information. (Low replication rate)

#### **[NuMatrix]N/A**

### **Known issue from previous version**

#### **[Server]**

1. It will export a period without video and metadata of the exported file if the period doesn't have video.
2. When multiple servers log in one LUN in iSCSI, sometimes the volume in iSCSI can't be identified correctly.
3. [Arecont] If the connection of some Arecont 4-lens cameras is not stable, please upgrade to Device pack v3.7.

#### **[NuClient]**

1. Sometimes display of the device status is not synchronized on Liveview/Playback/Config/System Overview tab.
2. Sometimes when user import configuration or update device update on IE 11, web client will stop.
3. When choose ASCII encoding on Metadata string filter setting, and there are some special text sending from Metadata device, NuClient might stop.
4. When there are huge event send to NuClient (>850 event/second), NuClient might need to wait for a long time to keep operation.

## [NuMatrix]

1. Sometimes when operating digital PTZ of fisheye camera on NuMatrix, the video won't update.



## Release Version v2.1.4 (2014/8/25)

### Modules:

Item	Version	
<b>FW</b>	CT-4000/ CT-4000R	CT-4000(R)_2.1.4_0047_1507.bin
	CT-8000R/ CT-8000RP	CT-8000R(P)_2.1.4_0047_1511.bin
	Device Pack	v3.6
<b>Application</b>	Crystal NuClient - Windows	v2.1.4.14
	Crystal NuClient - Mac	v2.1.4.14

### New Feature:

- A. Support Video Popup-- a new action for events (available on NuClient and NuMatrix)
- B. NUUO Dewarp v2.0 for fisheye cameras:
  - a. GPU acceleration to improve the dewarp performance and quality
  - b. Generic dewarp for Onvif-integrated fisheye cameras
  - c. Dewarp pre-calibration for integrated fisheye camera\*
- C. Support new event: IO box connection lost
- D. New language supported: Germany

\* Supported camera: ACTi E96, Axis M3007, Brickcom 30xN, Mobotix Q25M\_Secure, Sony SNC\_HM662, Vivotek FE8174, FE8174

### Enhancement:

- 1. Add new actions for recording related events (Fail to write to drive, Volume operation error, Volume group no functional volume, Recording module error, Metadata DB error)
  - New Action for the event:**
    - a. DO trigger
    - b. Play alert sound on NuClient
- 2. Enhance smart fan mechanism
- 3. Improve NuClient login lead time and error handling
- 4. Improve PTZ response time
- 5. Improve Recording Server initialization time to speed up the time period of Recording Failover to Recording Server

6. Enhance string translation of Russian

## Issue solved:

1. Solve the issue that when Management Server doesn't connect to Internet, the NTP server function will be disabled.
2. Solve the issue that when Crystal operates over 49 days, the daylight-saving function and NTP time synchronization function might stop work.

## Version Compatibility Notice:

1. Please use Installation Wizard v2.1 to search v2.1 or above Crystal server; use Installation Wizard v2.0 to search v2.0 server.
2. Once upgrading system to Crystal v2.1.4, it is not supported to downgrade to Crystal v2.1.0 or previous version.
3. Please ensure all servers and clients(Management Server/ Recording Server/ Metadata Server/ NuClient/ NuMatrix) in the system are in the same product version(v2.0.0 or v2.1.0, or v2.1.4).

### Suggested upgrade SOP:

- 1) Backup all configuration in the system
- 2) Upgrade Management Server
- 3) Upgrade Recording Server and Metadata Server
- 4) Upgrade NuClient and NuMatrix application
- 5) Make sure all servers and clients are in the same version

## Known Issue:

### New known issue from v2.1.4

#### [Server]

1. It will export a period without video and metadata of the exported file if the period doesn't have video.
2. When multiple servers log in one LUN in iSCSI, sometimes the volume in iSCSI can't be identified correctly.
3. [Arecont] If the connection of some Arecont 4-lens cameras is not stable, please upgrade to Device pack v3.7.

#### [NuClient]

1. Sometimes display of the device status is not synchronized on

Liveview/Playback/Config/System Overview tab.

2. Sometimes when user import configuration or update device update on IE 11, web client will stop.
3. When choose ASCII encoding on Metadata string filter setting, and there are some special text sending from Metadata device, NuClient might stop.
4. When there are huge event send to NuClient (>850 event/second), NuClient might need to wait for a long time to keep operation.

## [NuMatrix]

1. Sometimes when operating digital PTZ of fisheye camera on NuMatrix, the video won't update.

## Known issue from previous version

### [Server]

1. [License] The maximum number of license serial number activation is 178 serial numbers.  
Ex. If one the system has 200ch camera, it is suggest activating one 200ch serial number, rather than 200 1ch licenses.
2. [Recording Failover Server] When Recording Server activate manual record and then server disconnected, the Recording Failover Server taking over the Recording Server will keep the target Recording Server original recording settings, rather than manual record operating.
3. Please shut down Crystal server before plug out hard drive from hardware.
4. Sometimes, switch between Recording Server "Recording" mode and "Recording Failover" type and then commit immediately, "commit fail" message will popup but it succeed.
5. Some languages not supported will still be able to choose on web client entrance page and display string in English.
6. [Mobotix] Camera resolution width more than 2560 pixel or height more than 1536 pixel from Mobotix camera is not supported.
7. [Web] When "modifying" HDD and the bandwidth is not enough, it is possible to popup "modify fail" message, but the modification is success.
8. [Management Server] Users shall export/ import whole system configuration into new system, or "associated camera" configuration can't be copy to the target server.
9. [Management Server] If pull out HDD suddenly when system operating, some system event will not be triggered normally.

10. For “DO trigger” and “camera go to preset” action, it doesn’t not support system automatically close these actions after assigned time period.
11. [Web][Firefox] The web port should be “80”. (Firefox limitation)
12. [Camera] [Sony\_SNC\_DS60] Motion event won’t be triggered
13. [Camera] [Sony\_SNC\_DS60] When trying to trigger camera DO2, the DO1 will be triggered, rather than DO 2.

## [NuClient]

1. After upgrading device pack, please re-login NuClient so that the device pack version on system overview will be refreshed.
2. [VIVOTEK FE8174] When NuClient dewarp the camera by VIVOTEK SDK in full-view panorama mode, motion on the video will cause broken video frame.
3. On Playback timeline, all events available to set up in the system will display event log line on timeline, even the event is not assigned by user or not in event schedule.
4. If camera video frame is 1 fps, sometimes the live viewing of the video will stop.
5. Some nVIDIA VGA card(9600GSO, 9800GT) will cause NuClient CPU loading increase.
6. [Mac] Sometimes if editing and then committing a lot of view on Mac, the commit will fail.
7. [WAN] On WAN environment, sometimes NuClient will popup RPC error when logging in Management Server due to the network connection is not stable or the bandwidth is not enough. The issue will happen more frequently in Windows XP.
8. [WAN] On WAN environment, sometimes live view will stop due to the network connection is not stable or the bandwidth is not enough.
9. When the network connection is not stable, sometimes the video exists but video timeline/event sign on timeline/calendar view will not display video record sign.
10. [Metadata] Need to wait for a while for metadata timeline display when there are a lot of channels of metadata.
11. Not support metadata export as mov and original AVI file.
12. If video is recycled, users shall re-login so that the timeline on playback will be clear.
13. Not support cross resolution export. Please export video cross resolution into different videos.

14. It can't export video in H.264 format with SPS/PPS header to .mov file. Honeywell\_HD3MDIH/ Sony-SNC\_RX530 utilize this format, so on Mac OS, the video cannot be exported in H.264 because Mac only supports .mov export.
15. When the network connection is not stable, and commit multiple Views to server, it might fails and popup RPC error (-1) message.
16. If using joystick to control optical PTZ on popup video, sometimes the NuClient might automatically close.
17. [Web Client] On web NuClient, after installing metadata plugin in the first time, users should press "F5" to refresh the interface to view the plugin.
18. [Mac] When event triggering audio notification on NuClient, and manual stop the audio or change audio file, NuClient might be closed on Mac OS.
19. [Mac] The number of total connection per Mac client shall be under 500ch.
20. [Camera] When rename preset point for some camera, it might add another preset point, rather than modify the assigned one. (Camera preset point settings format limitation.)
21. [Camera] [Axis\_P1354/ Axis M1054] In AAC audio codec, the voice can't be heard.
22. [Camera] [Santec] In H.264, AAC audio codec, the voice is not clear.
23. [Camera] [Sony\_SNC-CH280/ Sony\_SNC-EP52] When using G.711\_64K, the voice might be lag or not clear.
24. [Camera] [LG\_LW352] G.726 24K audio codec doesn't work.
25. [Camera] [LG\_LW130W] Audio codec "G.711 PCMA" and "G.726 24K" is not clear.
26. [Camera] [Everfocus\_EMN 2220/Messoa\_NCR875PRO] Audio on playback is not smooth.
27. [Camera] [Zavio\_P5116] The H.264 format is not smooth on Playback.
28. [Camera] [Fine\_TCP-VM559] H.264 can't be export as .mov.
29. [Language] Some words on the interface will display in English, not the chosen language.
30. [Language] Installation wizard not support Thai.

## **[NuMatrix] (Available in Ultimate level)**

1. When camera disconnect and then automatically connect, users need to manually disconnect and then connect the camera on NuMatrix tool bar to update the status. (Video live viewing will operate normally.)

## Release Version v2.1.0 (2014/5/28)

### Modules:

Item	Version	
<b>FW</b>	CT-4000/ CT-4000R	CT-4000(R)_2.1.0_0024_1823.bin
	CT-8000R/ CT-8000RP	CT-8000R(P)_2.1.0_0024_1826.bin
	Device Pack	v3.3
<b>Application</b>	Crystal NuClient - Windows	v2.1.0.19
	Crystal NuClient - Mac	v2.1.0.19

### New Feature:

1. Support N+M Recording Failover group
2. Support system status monitoring (System Overview)
3. Support NUUO A08 IO box
4. Support new system event
  - Volume operation error (Recording Server)
  - Volume Group no functional volume (Recording Server)
  - Recording Module error (Recording Server)
  - Power Failed (Redundant power CT-8000RP model)
  - No available Failover Server for disconnected Recording Server (Ultimate level)
5. New language supported: French, Swedish, Simplified Chinese
6. Support Recording Server local display

### Enhancement:

1. Handle SSL heartbleed security issue
2. Volume Group Self-Failover: In the unlikely event of volume group failure, cameras are automatically distributed across the remaining volume groups, providing volume group failover
3. Support selecting channel on Backup Player
4. Improve error handling in hard disk failure issue

### Issue solved:

1. [FAE] Solve the issue that on the calendar of NuClient Playback, sometimes the date with video record will not be highlighted.
2. [FAE] Solve the issue that on the "Normal" status of boosting record (record in low frame rate), audio from the camera is not recorded.

3. Solve the issue that sometimes Metadata Search by regular expression will cause Metadata Server stop receiving data for several minute.

## Version Compatibility Notice:

1. Please use Installation Wizard v2.1 to search v2.1 Crystal server; use Installation Wizard v2.0 to search v2.0 server.
2. Once upgrading system to Crystal v2.1, it is not supported to downgrade to Crystal v2.0.
3. Please ensure all servers and clients(Management Server/ Recording Server/ Metadata Server/ NuClient/ NuMatrix) in the system are in the same product version(v2.0 or v2.1).

### Suggested upgrade SOP:

- 6) Backup all configuration in the system
- 7) Upgrade Management Server
- 8) Upgrade Recording Server and Metadata Server
- 9) Upgrade NuClient and NuMatrix application
- 10) Make sure all servers and clients are in the same version

## Known Issue:

### New known issue from v2.1.0

#### [Server]

1. [License] The maximum number of license serial number activation is 178 serial numbers.  
For example, if one the system has 200ch camera, it is suggest activating one 200ch serial number, rather than 200 1ch licenses.
2. [Event Action] DO trigger action is not supported on disk abnormal event but it available on Config tab for setup.
3. [Recording Failover Server] When Recording Server activate manual record and then disconnect, the Recording Failover Server taking over the Recording Server will keep the target Recording Server original recording settings, rather than manual record operating.
4. Please shut down Crystal server before plug out hard drive from hardware.
5. Sometimes, switch between Recording Server "Recording" mode and "Recording Failover" type and then commit immediately, "commit fail" message will popup but it succeed.
6. Some languages not supported will still be able to choose on web client

entrance page and display string in English.

7. [Mobotix] Camera resolution width more than 2560 pixel or height more than 1536 pixel from Mobotix camera is not supported.

## [NuClient]

1. After upgrading device pack, please re-login NuClient so that the device pack version on system overview will be refreshed.
2. [VIVOTEK FE8174] When NuClient dewarp the camera by VIVOTEK SDK in full-view panorama mode, motion on the video will cause broken video frame.
3. On Playback timeline, all events available to set up in the system will display event log line on timeline, even the event is not assigned by user or not in event schedule.
4. If camera video frame is 1 fps, sometimes the live viewing of the video will stop.
5. Some nVIDIA VGA card(9600GSO, 9800GT) will cause NuClient CPU loading increase.
6. [Mac] Sometimes if editing and then committing a lot of view on Mac, the commit will fail.
7. [WAN] On WAN environment, sometimes NuClient will popup RPC error when logging in Management Server due to the network connection is not stable or the bandwidth is not enough. The issue will happen more frequently in Windows XP.
8. [WAN] On WAN environment, sometimes live view will stop due to the network connection is not stable or the bandwidth is not enough.

## Known issue from v2.0.4

### [Server]

1. [Web] When "modifying" HDD and the bandwidth is not enough, it is possible to popup "modify fail" message, but the modification is success.
2. [Management Server] Users shall export/ import whole system configuration into new system, or "associated camera" configuration can't be copy to the target server.
3. [Management Server] If pull out HDD suddenly when system operating, some system event will not be triggered normally.
4. For "DO trigger" and "camera go to preset" action, it doesn't not support system automatically close these actions after assigned time period.
5. [Web][Firefox] The web port should be "80". (Firefox limitation)



6. [Camera] [Sony\_SNC\_DS60] Motion event won't be triggered
7. [Camera] [Sony\_SNC\_DS60] When trying to trigger camera DO2, the DO1 will be triggered, rather than DO 2.

## [NuClient]

1. When the network connection is not stable, sometimes the video exists but video timeline/event sign on timeline/calendar view will not display video record sign.
2. [Metadata] Need to wait for a while for metadata timeline display when there are a lot of channels of metadata.
3. If system only has one volume but shared by Recording Server and Management Server, sometimes on NuClient Properties widget, the volume name will show "volume 2".
4. Not support metadata export as mov and original AVI file.
5. If video is recycled, users shall re-login so that the timeline on playback will be clear.
6. Not support cross resolution export. Please export video cross resolution into different videos.
7. It can't export video in H.264 format with SPS/PPS header to .mov file. Honeywell\_HD3MDIH/ Sony-SNC\_RX530 utilize this format, so on Mac OS, the video cannot be exported in H.264 because Mac only supports .mov export.
8. When the network connection is not stable, and commit multiple Views to server, it might fails and popup RPC error (-1) message.
9. If using joystick to control optical PTZ on popup video, sometimes the NuClient might automatically close.
10. [Web Client] On web NuClient, after installing metadata plugin in the first time, users should press "F5" to refresh the interface to view the plugin.
11. [Mac] When event triggering audio notification on NuClient, and manual stop the audio or change audio file, NuClient might be closed on Mac OS.
12. [Mac] The number of total connection per Mac client shall be under 500ch.  
\*If one camera utilizes multiple stream, each stream will count for one connection, so the total number of device connected shall be lower than 500ch.
13. [Camera] When rename preset point for some camera, it might add another preset point, rather than modify the assigned one. (Camera preset point settings format limitation.)
14. [Camera] [Axis\_P1354/ Axis M1054] In AAC audio codec, the voice can't be heard.

15. [Camera] [Santec] In H.264, AAC audio codec, the voice is not clear.
16. [Camera] [Sony\_SNC-CH280/ Sony\_SNC-EP52] When using G.711\_64K, the voice might be lag or not clear.
17. [Camera] [LG\_LW352] G.726 24K audio codec doesn't work.
18. [Camera] [LG\_LW130W] Audio codec "G.711 PCMA" and "G.726 24K" is not clear.
19. [Camera] [Everfocus\_EMN 2220/Messoa\_NCR875PRO] Audio on playback is not smooth.
20. [Camera] [Zavio\_P5116] The H.264 format is not smooth on Playback.
21. [Camera] [Fine\_TCP-VM559] H.264 can't be export as .mov.
22. [Language] Some words on the interface will display in English, not the chosen language.
23. [Language] Installation wizard not support Thai.
24. [Language] The system only support 12 languages, but some other languages() are available to be chosen and display in English.

## **[NuMatrix] (Available in Ultimate level)**

1. When camera disconnect and then automatically connect, users need to manually disconnect and then connect the camera on NuMatrix tool bar to update the status. (Video live viewing will operate normally.)

## Release Version v2.0.4 (2014/2/25)

### Modules:

Item	Version	
<b>FW</b>	CT-4000/ CT-4000R	CT_4000(R)_2.0.4_0086_1450.bin
	CT-8000R/ CT-8000RP	CT_8000R(P)_2.0.4_0086_1453.bin
	Device Pack	2.20
<b>Application</b>	Crystal NuClient - Windows	2.0.4.7
	Crystal NuClient - Mac	2.0.4.7

\*For WAN project suggestion, please refer to <http://www.nuuo.com/wiki.php#>

### New Feature:

1. Support Windows 8.1 and IE 11
2. Support NUUO Retail Gateway (wide POS software support, US only)
3. Support Spanish
4. Support device pack upgrade independently from server firmware

### Enhancement:

1. Speed up PTZ send command speed
2. Improve NUUO generic fisheye dewarp quality by enhancing algorithm
3. Video playback will be switch to i-frame mode when bandwidth is not enough
4. Built in NUUO C31A as default metadata plugin
5. Improve redundant power signal control

### Support Language: (12 languages)

- Czech
- Chinese (Traditional)
- English
- Finnish
- Japanese
- Korean
- Polish

- Portuguese (Brazil)
- Russian
- Spanish
- Thai
- Turkish

## Issue solved:

1. Solve the issue that if cameras use specific audio codec, the audio playback might be not smooth, e.x Samsung SND-5080N.
2. Solve the issue that NuClient and NuMatrix might disconnect when operate View Tour on NuMatrix
3. Solve the issue that NuMatrix may disconnect with NuClient matrix control console
4. Solve the issue that on Backup Player, when reverse playback in more than 2x speed and then reverse playback in 1x speed, the AP will stop.
5. [Mac] On Mac OS, when snapshot and print it from NuClient's interface, NuClient might be possible to stop for a while.
6. Solve the issue that after importing configuration to the system, sometimes the Metadata Server needs to restart to connect.

## Known Issue:

### [Server]

1. [Web] When upgrading firmware, the network bandwidth should be more than 4 mbps.
2. [Web] When "modifying" HDD, it is possible that the modification time out so display modify fail, but the modification is success due to not enough network bandwidth.
3. [Management Server] Users shall export/ import whole system configuration into new system, or "associated camera" configuration can't be copy to the target server.
4. [Management Server] If pull out HDD suddenly when system operating, some system event will not be triggered normally.
5. For "DO trigger" and "camera go to preset" action, it doesn't not support system automatically close these actions after assigned time period.
6. [Web][Firefox] The web port should be "80". (Firefox limitation)

7. [Camera] [Sony\_SNC\_DS60] Motion event won't be triggered
8. [Camera] [Sony\_SNC\_DS60] When trying to trigger camera DO2, the DO1 will be triggered, rather than DO 2.

## [NuClient]

1. When the connection status is not stable, sometimes the video exists but video timeline, event sign on timeline, and calendar view will not display video record sign.
2. [Metadata] Need to wait for a while for metadata timeline display when there are a lot of channels of metadata.
3. If system only has one volume but shared by Recording Server and Management Server, sometimes on NuClient Properties widget, the volume name will show "volume 2".
4. Not support metadata export as mov and original AVI file.
5. If video is recycled, users shall re-login so that the timeline on playback will be clear.
6. Not support cross resolution export. Please export video cross resolution into different videos.
7. It can't export video in H.264 format with SPS/PPS header to .mov file. Honeywell\_HD3MDIH/ Sony-SNC\_RX530 utilize this format, so on Mac OS, the video cannot be exported in H.264 because Mac only supports .mov export.
8. When the network connection is not stable, and commit multiple Views to server, it might fails and popup RPC error (-1) message.
9. If using joystick to control optical PTZ on popup video, sometimes the NuClient might automatically close.
10. [Web Client] On web NuClient, after installing metadata plugin in the first time, users should press "F5" to refresh the interface to view the plugin.
11. [Mac] When event triggering audio notification on NuClient, and manual stop the audio or change audio file, NuClient might be closed on Mac OS.
12. [Mac] The number of total connection per Mac client shall be under 500ch.  
\*If one camera utilizes multiple stream, each stream will count for one connection, so the total number of device connected shall be lower than 500ch.
13. [Camera] When rename preset point for some camera, it might add another preset point, rather than modify the assigned one. (Camera preset point settings format limitation.)
14. [Camera] [Axis\_P1354/ Axis M1054] In AAC audio codec, the voice can't be heard.

15. [Camera] [Santec] In H.264, AAC audio codec, the voice is not clear.
16. [Camera] [Sony\_SNC-CH280/ Sony\_SNC-EP52] When using G.711\_64K, the voice might be lag or not clear.
17. [Camera] [LG\_LW352] G.726 24K audio codec doesn't work.
18. [Camera] [LG\_LW130W] Audio codec "G.711 PCMA" and "G.726 24K" is not clear.
19. [Camera] [Everfocus\_EMN 2220/Messoa\_NCR875PRO] Audio on playback is not smooth.
20. [Camera] [Zavio\_P5116] The H.264 format is not smooth on Playback.
21. [Camera] [Fine\_TCP-VM559] H.264 can't be export as .mov.
22. [Language] Some words on the interface will display in English, not the chosen language.
23. [Language] Installation wizard not support Thai.
24. [Language] The system only support 12 languages, but some other languages() are available to be chosen and display in English.

## **[NuMatrix] (Ultimate only)**

1. When camera disconnect and then automatically connect, users need to manually disconnect and then connect the camera on NuMatrix tool bar to update the status. (Video live viewing will operate normally.)

## Release Version v2.0.3 (2013/11/4)

### Modules:

Item		Version
<b>FW</b>	CT-4000/ CT-4000R	CT-4040_2.0.0_0074_1042.bin
	CT-8000R/ CT-8000RP	CT-8000R_2.0.0_0074_1044.bin
	Device Pack	v2.18
<b>Application</b>	Crystal NuClient	MAC: Crystal_2.0.3_AP_MacOSX.zip Windows: Crystal_2.0.3_AP_Windows.zip

### Main Features:

#### [Server]

1. Centralized management to manage unlimited devices and events on unified NuClient.
2. Built-in Management Server, Recording Server and Metadata Server in one Crystal Titan
3. 3rd party integration for Metadata Server—POS via TCP client or C31A, Falco Access Control
4. Onvif ProfileS compatible
5. Record up to 64 megapixel cameras per recording server
6. High throughput (250Mbps) supporting up to 64x 5-Megapixel cameras (based on H.264, 10 fps, moderate traffic)  
\*Please refer to NUUO calculator: <http://www.nuuo.com/calculator/>
7. Volume group to distribute cameras to assigned volumes
8. Individual recycle condition (IRC) per device
9. Support RAID 0,1, 5, and 10
10. Camera multiple stream support
11. Stream up to 256ch live viewing connections per server to multiple clients simultaneously
12. Camera edge motion detection
13. Support continuous, scheduled, event based and I/O based recording
14. Synchronized audio and video recording
15. Dual gigabit Ethernet ports

16. Centralized I/O and event respond systems
17. PTZ control priority
18. Powerful authorization for device permission and function privilege
19. Schedule-based user management
20. Scheduled Backup video to FTP location
21. Multiple codec support : H.264, MJPEG, MPEG4 and MxPEG
22. Watermark for video verification
23. Support NTP (Internet Time Server)
24. Support hardware watchdog (CT-8000R and CT-8000RP)and software watchdog
25. Support redundant power (CT-8000RP)
26. Support up to 256 NUUO I/O boxes per server (SCB-C24/C26/C28)
27. Support APC Uninterrupted Power Supply

## **[Client]**

1. All in one NuClient for remote configuring and viewing
2. Unlimited channels of NuMatrix Video Wall (Ultimate)
3. Up to 400CH of video live view for each NuClient application  
\*Refer to <http://www.nuuo.com/calculator/>
4. Centralized E-map
5. Centralized I/O Panel and Event Panel
6. NUUO Image Fusion Technology – stitch up to 10 cameras together
7. Generic Fisheye Dewarp technology for all fisheye cameras
8. Support digital and optical PTZ
9. Support preset and patrol
10. Support multiple stream profile
11. Support automatically and simultaneously switch stream profile for View
12. Public and private view/ view profile for each user
13. Instant Playback on live view, e-map and event list
14. Save video clips into Original AVI, AVI ASF, and MOV.
15. Export video on AVI format with 3rd part data overlay
16. Intelligent Search in playback



## Support Language: (11 languages)

- Czech
- Chinese (Traditional)
- English
- Finnish
- Japanese
- Korean
- Polish
- Portuguese (Brazil)
- Russian
- Thai
- Turkish

## Known Issue:

### [Server]

1. [Web] When upgrading firmware, the network bandwidth should be more than 4 mbps.
2. [Web] When “modifying” HDD, it is possible that the modification time out so display modify fail, but the modification is success due to not enough network bandwidth.
3. [Management Server] Users shall export/ import whole system configuration into new system, or “associated camera” configuration can’t be copy to the target server.
4. [Management Server] During hot swap HDD, some system event will not be triggered.
5. When assign one volume for recording, and then go to the Metadata Sever in the same Crystal Titan soon, it is possible that the volume can be assign as metadata volume, and record both of video and metadata stream in one volume and affect the throughput and recycle.
6. Automatically close action after n sec. function is not supported on “DO trigger” and “camera go to preset” action.
7. It is possible that after import configuration to the system, Metadata Server need to restart to connect.
8. [Web][Firefox] The web port should be “80”. (Firefox limitation)

9. [Camera] [Sony\_SNC\_DS60] Motion event won't be triggered
10. [Camera] [Sony\_SNC\_DS60] When trying to trigger camera DO2, the DO1 will be triggered, rather than DO 2.

## [NuClient]

1. [Metadata] Need to wait for a while for metadata timeline display when there are a lot of channels of metadata.
2. Not support metadata export as .mov and original AVI file, so on Mac environment, it cannot export metadata stream because it only supports .mov export. (Format decode limitation)
3. After recycle, users shall re-login so that the timeline on playback will be clear.
4. When server throughput or CPU loading is high, or bandwidth is not enough, Playback will not smooth.
5. Not support cross resolution export. Please export video cross resolution into different videos.
6. Crystal not supports export H.264 SPS/PPS format as .mov file. Honeywell\_HD3MDIH/ Sony-SNC\_RX530 utilize this format, so on Mac OS, the video cannot be exported in H.264 because Mac only supports .mov export.
7. When the network connection is not stable, and commit multiple Views to server, it might fails and popup RPC error (-1) message.
8. If using joystick to control optical PTZ on popup video, the NuClient might close sometimes.
9. On Backup Player, it not supports reverse playback in more than 2x speed and then reverse playback in 1x speed.
10. [Web Client] On web NuClient, after installing metadata plugin in the first time, users should press "F5" to refresh the interface to view the plugin.
11. [Mac] When "print" snapshot from NuClient's interface, NuClient might be possible to hang on Mac OS.
12. [Mac] When event triggering audio notification on NuClient, and manual stop the audio or change audio file, NuClient might be closed on Mac OS.
13. [Mac] When using joystick to control next or previous grid on playback, it might be possible to focus to other grid first, and then the assigned grid on Mac OS.
14. [Mac] It is suggested that the number of total connection per Mac client shall be under 500ch.

\*If one camera utilizes multiple stream, each stream will count for one connection, so the total number of device connected shall be lower than 500ch.

15. [Camera] When rename preset point for some camera, it might add another preset point, rather than modify the assigned one. (Camera preset point settings format limitation.)
16. [Camera] [Axis\_P1354/ Axis M1054] In AAC audio codec, the voice can't be heard.
17. [Camera] [Santec] In H.264, AAC audio codec, the voice is not clear.
18. [Camera] [Sony\_SNC-CH280/ Sony\_SNC-EP52] When using G.711\_64K, the voice might be lag or not clear.
19. [Camera] [LG\_LW352] G.726 24K audio codec doesn't work.
20. [Camera] [LG\_LW130W] Audio codec "G.711 PCMA" and "G.726 24K" is not clear.
21. [Camera] [Everfocus\_EMN 2220/Messoa\_NCR875PRO] Audio on playback is not smooth.
22. [Camera] [Zavio\_P5116] The H.264 format is not smooth on Playback.
23. [Camera] [Fine\_TCP-VM559] H.264 can't be export as .mov.
24. [Language] Some words on the interface will display in English, not the chosen language.
25. [Language] Installation wizard not support Thai.

## **[NuMatrix] (Ultimate only)**

1. When camera disconnect and then automatically connect, users need to manually disconnect and then connect on NuMatrix tool bar to update the status. (Live view will operate normally.)
2. It's not recommend to use View tour on NuMatrix.

## Remote Client PC Requirement:

<b>Client PC Minimum Requirements</b>		
Operating System	Windows XP (32-bit)/Windows 7 (32/64-bit)/Windows 8(32/64-bit) Mac OSX (v10.6/10.7/10.8)	
CPU	Intel Core 2 Duo, 2.6GHz	
Display Card	nVidia or ATI with 1GB memory (OpenGL 2.0 and later)	
OS Supported	Windows XP 32 bit	Windows 7 32/64 bit Windows 8(32/64-bit) Windows 8.1(32/64-bit) Mac OS X 10.6/10.7(64-bit)
RAM	1GB	2GB
LAN Transmission Speed	10/100/1000 Mbps (RJ45)	
Web Client	Internet Explorer 8, 9, 10, 11 Firefox 4.0-9.0 (Windows version)	

\*It is suggested to use 64 bit system for best system performance.