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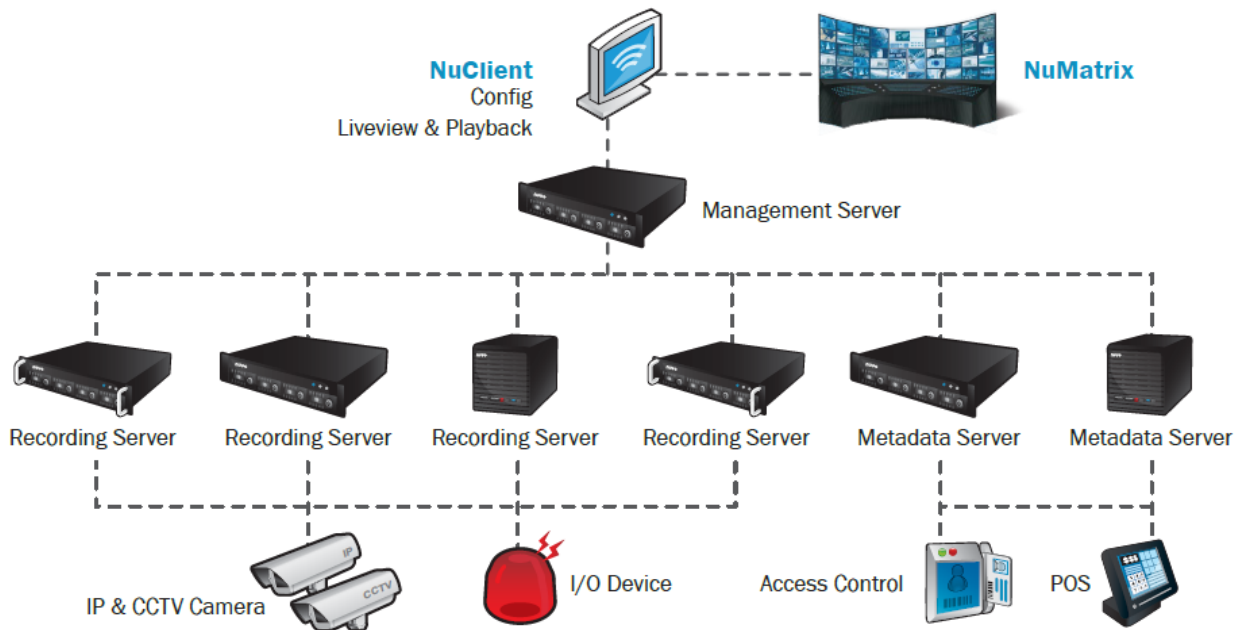
Crystal Series

Product Overview:

NUUO Crystal Titan is an advanced Linux-based enterprise solution that targets the needs of large projects and high numbers of megapixel channel recording.

Unlimited number of servers, cameras, POS, access control, and I/O devices can be efficiently managed and monitored under NUUO Crystal's unified interface-- NuClient and the video wall application-- NuMatrix.

Built on cross platform structure, NUUO NuClient and NuMatrix can operate on both Windows and Mac OSX. In addition, by utilizing advanced File Ring and Volume Group storage design, Crystal Titan guarantees optimized and constant megapixel recording throughput.

Technical Details:

System, Setting, Management and Integration:

Linux-based:

Crystal Titan series employs a Linux-based solution for the OS. Linux is a very stable OS and immune to virus attacks.

Centralized Management:

Crystal Titan Management Server maximizes management efficiency and transparency by allowing the configuring and viewing of an unlimited number of devices, users, and licenses on one unified interface-- NuClient.

The central Management Server supports unlimited cameras, 3rd party access control systems, POS and I/O devices. (System tested: 1024 channels of cameras, within 32 pcs of Recording Server)

- Centralized device management with unlimited cameras, 3rd party access control systems, POS and I/O devices
- Centralized user Management with unlimited users
- NTP time synchronization by Internet time server -- WAN and LAN

Third party integration:

NUUO Crystal Titan Metadata Server integrates third party data and video on a unified management platform. The Metadata system is flexible base on the plugin modules for each of the custom integrations. This allows faster development cycles from field requests to a finished tested product. When integrated to 3rd party products like POS and access control products, NUUO platform becomes a seamless interface to allow

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intelligent search and data filtering to monitor and handle events.

* A list of 3rd party integration solutions can be found at NUUO website. www.nuuo.com

Modularized System Design:

Crystal Titan solution allows the deployment of different Crystal Titan servers to perform different tasks within the total management solution. Metadata Server is optional products used to perform special functions as part of a total system solution.

User Authorization:

Crystal Titan system provides powerful authority level management. Combining function privilege control and device access permission, the system allows management to control accessibility to certain functionality. It supports unlimited roles, users and user groups to maximize accessibility management.

* Authorization roles-- control user access to devices and function privileges.
* Customized login period by users.
* PTZ control priority for different users.
* Prioritizing Video Wall control.

Schedule-based Architecture:

Time scheduled events, user login duration, recording schedules, and 3rd party streaming for complicated environments and user requirements can be defined within the system. Pre-set schedule profiles allows users to set different frequently-used profiles and apply them to different functions to improvement setup efficiency and synchronization.

Camera Integration:

Open platform support multiple camera brands, models and RTSP stream, UPnP search and Onvif ProfileS. Centrally configure camera parameters including video format, resolution, frame rate, and lens setting.

Camera parameters including video format, resolution, frame rate, and lens settings can also be configured from a single control location.

Multiple and High Channel Streaming:

Every Crystal Titan Recording Server has the ability to stream up to 256 camera connections to multiple clients simultaneously for live viewing.

The Recording Server can receive multiple stream profiles from the cameras simultaneously. This allows displaying images across the LAN in lower resolution to help

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prevent network bandwidth issues but still recording locally with maximum quality.

NuClient can automatically switch stream profile base on the grid layout to fulfill both need of best quality of viewing and the loading of client computer.

Multiple Video Codec Support:

Crystal Titan supports H.264, MJPEG, MPEG4 and MxPEG for best quality and storage usage.

Friendly GUI Recording Scheduler:

The graphical user interface is intuitive to the user and requires minimal amount of training time to get the system operational. Unique features like the special day mode and weekly mode recording schedules adds to the automation capability of the system to help relieve task overload to the operator.

Event/Action Management:

Crystal Titan centrally manages all events from system. This includes camera supervision, 3rd party events and direct I/O events. With the automated schedule-based events notification, operators can easily manage complex systems with little effort. Event and boost recording capabilities reduce storage usage but ensure the vital images are captured. Moreover, the system supports 5 instant alert responses including automatic go to camera preset point, on screen notification upon event trigger, output triggering, email notification, and localized client audible alerts.

Automatic Crystal Titan Search:

Automatically search for all Crystal Titans in the network. Users can set the network, hardware information, and assign servers to Management Server.

Automatic Camera Model Detection:

Automatically search for IP cameras in the network (camera should support UPnP protocol) or manually insert it. The auto detection function will help the user to find the brand and model of the camera after specifying its IP address.

Dual Gigabit Ethernet Ports:

Crystal Titan is equipped with 2x gigabit ports. User can separate the recording stream port from viewing stream port to ensure the lowest possible impact to network bandwidth.

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Online RAID Capacity Expansion and Level Migration:

Supports RAID 0,1,5 and 10 for maximum capacity or data protection at the HDD level.

I/O Event Control:

Supports an unlimited number of connected I/O devices. It can be connected through I/O modules or camera inputs.

License Management:

Licenses are centrally activated on Management Server for better control. Each Recording Server can assign up to 64 channels of camera licensing. Licenses can be activated online or offline and can be transferred from one server to another effortlessly. Upgrading the system from Enterprise Class to Ultimate Class is done through upgrade the licenses. No need to reinstall the entire system.

Time Synchronization:

The system can interface to Internet Time Server (NTP server) for time synchronization at each location. Even in LAN environment, Crystal Titan Management Server can be a NTP server as a closed LAN network option. Cameras and servers in the system can synchronize time with Management server.

Log System:

The system automatically logs including camera status change, user access, configuration update, and special events. Users can export log records to a CSV file as a record or for chain of custody evidence.

Watchdog:

Crystal Titan system supports software watchdog and hardware watchdog (CT-8000R and CT-8000RP only) to system stability.

Recording, Recycle and Storage:

High recording throughput (250Mbps for single volume):

Crystal Titan utilizes a custom recording engine known as the File Ring. File Ring storage solution was developed because of the necessity to handle high megapixel recordings by changing the way hard drives store and retrieve video data. It can process large amounts of data throughput boosting Crystal Titan's recording performance to 250 Mbps for single volume, with 64 channel of 5 - Megapixel cameras (H.264, 15 fps, moderate traffic) connected.

* Consult NUUO Calculator to confirm hard drive usage: http://www.nuuo.com/calculator/

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Volume load balance (Volume Group):

By Volume Group mechanism, which distributes cameras to assigned volumes, Crystal Titan can optimize camera recording throughput and set up different RAID levels to different volumes base on the camera importance. It also distributes camera loading

to multiple volume groups, and allows for a managed approach for traditional throughput problems.

* Consult NUUO Calculator to confirm hard drive usage: http://www.nuuo.com/calculator/

Individual Recycle Condition (IRC) per camera:

Crystal Titan system provides individual recycle condition (IRC) for each video. Users can assign retention days for each server based on the importance of the critical storage needs. Video within retention days has lower priority to be recycled and footage outside of the retention time will be deleted for private protection.

Multiple Recording Modes:

Crystal Titan supports multiple event-based and schedule-based recording modes, including continuous record, record on event, manual record, event-based and schedule-based boosting record. It also supports pre-event and post-event recording for continuous record to make sure ensure that the event is captured.

External Storage:

Supports SAN (iSCSi) and DAS(eSATA).

Edge Motion:

Supports camera edge motion detection to reduce server loading and ensure stability. With event-action management and recording modes within Crystal Titan, the user can make adjustments for optimal performance.

Audio:

Supports camera audio and audio recording.

Watermark:

Crystal Titan system makes an internal watermarking within video and allows users to validate the authenticity of the chain of custody by the Verification Tool for the evidentiary video footage.

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Remote Operation:

Twin client for application and browser:

NUUO NuClient allows workstations to log into the Management Server to configure, view live video or query video from all servers on the system. If loading NuClient is not possible on the workstation, the same capabilities can be obtained through a browser connection.

Cross Platform:

NuClient and Video Wall support is available for both Windows and MAC iOS. The web client supports both IE browser and Windows Firefox.

NuMatrix- Video Wall Application (Ultimate version)

NUUO NuMatrix supports an unlimited number of Video Walls and video displays, with up to 100 channels displayed per monitor. Easily drag and drop views and cameras to video wall, user can control and browse through stream profiles, PTZ/Preset/Patrol controls, control of 360° ImmerVision Lens, VIVOTEK fisheye, and NUUO Generic Fisheye Dewarp.

Matrix profile is designed for video wall to easily manage multiple monitors and views on NuMatrix.

Unlimited Channels of Live View

The system supports an unlimited number of client connections, unlimited live viewing display with video wall(Ultimate level). It can also manage up to 400 channels live view per NuClient to manage different devices from Recording Servers.

NUUO Image Fusion Technology:

NUUO Image Fusion Technology can manipulate camera views by changing its viewing angle and image size to allow for a seamless multi-pane panoramic view. Up to 10 independent cameras can be set up as single view.

Customized layout

Users can merge and unmerge the grid to multiple layouts to meet image fusion layout, camera corridor mode or panorama view.

Centralized I/O Management:

Manage all I/O devices on one I/O panel. Control I/O for event detection, instant action

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and digital output.

Centralized Event Management:

View and search all events on one event panel. Video will pop up by double clicking the event.

Centralized E-Map:

Tree structured E-Map provides unlimited map layers. Supports intuitive GUI indicators of cameras, I/O devices, POS, Access Control and all server locations to have real-time system overview and monitor. The device indicator allows for notification with a graphical indicator when an event has occurred, double clicking on the indicator will popup live video and instant playback.

NUUO Fisheye Camera Dewarp technology

Crystal Titan has an internal Generic Fisheye Dewarp engine to process most types of fisheye-warped video streams. It is not necessary to wait for specific fisheye integration when encountering newly launched fisheye cameras in the field. It supports Original mode, PTZ mode, Quad mode and Perimeter mode.

Panorama 360˚ PTZ:

For ImmerVision and Fisheye lens, several modes are supported on live view and playback.

ImmerVision: Original mode, PTZ mode, Quad mode and Perimeter mode. (Refer to ImmerVision's website for supported camera models.)

VIVOTEK Fisheye: Original mode, Rectilinear mode, Single-view panorama mode and Dual-view panorama mode. Refer to VIVOTEK website for supported camera models.

PTZ Control:

Supports physical Pan/Tilt/Zoom, camera preset points and Patrol (PTZ preset group). Powerful PTZ/Preset/Patrol control privileges and priority by device is also supported.

Crystal Titan supports digital PTZ and it can display multiple camera views of the digitally zoomed image. Event triggering can be defined to go to camera preset points.

View Management:

Including View for camera group and View tour, Crystal Titan supports public view for all users and private view for each user. Users can access Public View or setup its own customized view list for private access. It also supports View Tour to loop through

different selected Views on a timed interval.

Instant Playback:

Operator can play the last few minutes of video channel on NuClient. User can view instant playback via double clicking event, on E-Map notification, or video tool bar. The intuitive GUI enables users to easily export instant playback video or synchronized to Playback for further checking.

Multi-View:

Crystal Titan can duplicate the same live view video onto multiple channels and digitally zoom in to see the details of different spots on cloned channels without losing the original live view video.

Joystick:

Utilize joystick to control cameras physical PTZ and software enabled digital PTZ functions.

Snapshot:

Easily take a snapshot in BMP/JPG formats during live viewing or playback. User can also take snapshot for the whole monitor view.

Playback, Search, Export and Secure Data:

Intuitive interface:

Browse video with GUI timeline and intuitive interface of playback, reverse playback, skip forward/backward, speed up/down, and play by speed shuttle.

Intelligent Search:

Intuitive post-event motion search for suspicious areas on video and post-event 3rd party data keyword search then query related camera recording.

The system can also search events and double clicking query associated recording.

Evidence Export:

Export video or third party device data in ASF/AVI/Original AVI/ MOV; Snapshot and print video image in BMP/ JPG.

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Backup:

Supports automatically scheduled backup to FTP. Also supports manual backup video of any Recording Servers.

Post-Recording Processing:

It support post-record motion search, digital PTZ, and Panorama 360˚ PTZ on playback.

External Device:

Remote I/O Modules:

Analog devices that are connected to NUUO I/O Modules are converted to Ethernet through a media converter which enables Crystal Titan to starting recording when inputs are triggered, or trigger outputs when an event occurred.

Redundant Power Supply:

Crystal Titan CT-8000RP model supports internal redundant power supplies. This ensures seamless operation even when the primary power supply has failed. Failed power supplies can be replaced while system is still operating.

APC UPS:

Crystal Titan support external UPS (Uninterrupted Power Supply) power supplies which provide clean uninterruptable power.

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Crystal Titan Spec Sheet

Crystal Titan v2.0 / 2013.12

Hardware Specifications				
Model	**CT-4000**	**CT-4000R**	**CT-8000R**	**CT-8000RP**
Type	Tower	Rack-mount 1U	Rack-mount 2U	Rack-mount 2U
CPU	Intel Atom	Intel Atom	Intel Core i5	Intel Core i5
Number of Drives	4xSATA II	4xSATA II	8xSATA II	8xSATA II
Max Storage Per Drive	4TB	4TB	4TB	4TB
Max internal storage	16TB	16TB	32TB	32TB
RAID Level	RAID 0,1, 5, 10	RAID 0, 1, 5, 10	RAID 0,1, 5, 10	RAID 0,1, 5, 10
I/O Interface	6xUSB 2.0 (for mouse, UPS); 1xeSATA (for DAS)	4 x USB 2.0 (for mouse,UPS), 1x eSATA (for DAS)	2xUSB3.0, 2xUSB2.0, 1xeSATA (for DAS)	2xUSB3.0, 2xUSB2.0, 1xeSATA (for DAS)
LAN Transmission Speed	2x 10/100/1000 Mbps (RJ45x2)			
Voltage	100-240V	100-240V	100-240V	100-240V
Power Consumption	200W	200W	400W	400W (With redundant power)
Device Dimension (HxWxD)	212 x 200 x 318 mm	45 x 447 x 429 mm	88 x 447 x 583 mm	88 x 447 x 583 mm
Device Weight (Without Drive)	5.3 kg (11.7 lbs)	6.0 kg (13.2lbs)	11.4 kg (25.1lbs)	13.2 kg (29.1lbs)
Temperature	Operating: 0°C-40°C			
Humidity	Operating: 5%-95%			

Client PC Minimum Requirements		
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 10.6/10.7/10.8/10.9(64-bit)
RAM	1GB	2GB
LAN Transmission Speed	10/100/1000 Mbps (RJ45)	
Web Client	Internet Explorer 8, 9, 10, 11 Firefox 29 or above (Windows version)	

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

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