

NUUO Crystal™ Performance Guide

The Performance Guide provides performance test result of individual Recording Server, Metadata Server, IVS Server, and NuClient display; this guide shall help users to design system architecture. NUUO Calculator (<http://www.nuuo.com/nucalculator/>) is also a great tool for project design.

This guide is only for reference. The real server performance on the field depends on video source, network environment and all kind of variables.

Recording Server

The following is the performance result for system with single volume in RAID 5. The system is operating live view, playback, recording and recycling simultaneously, but not doing backup.

Below table provides the detail of Crystal Titan's optimal use case.

H.264

Without Local Display

TR-0400CT/ R1-0400CT

Camera Parameter: H.264, high quality, and moderate traffic.

Volume Group: 1 Volume Group

HDD Spindle Speed (RPM): 7200 RPM*

Resolution	FPS (NTSC)	Remote Connections (Stream out)		Optimal Recording (ch)
		Playback	Live view	
2M	30	4 ch	128 ch	36 (recommended)
2M	30	1 ch	128 ch	48
2M	30	0 ch	128 ch	64
2M	30	1 ch	64 ch	64

With Local Display (Complicated Scene)

TR-0400CT/ R1-0400CT

Camera Parameter: H.264, high quality, and moderate traffic.

Volume Group: 1 Volume Group

HDD Spindle Speed (RPM): 7200 RPM*

Resolution	FPS (NTSC)	Remote Connections (Stream out)		Optimal Recording (ch)	Local display(ch)
		Playback	Live view		
2M	30	4 ch	128 ch	32	1X1
2M	30	4 ch	64 ch	32	2X2*2

3M/5M/10M	Not Recommended
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* The total throughput of 7200 RPM HDD is 250 mbps for single Volume Group. If the HDD spindle speed is 5900 RPM, the recording throughput will become 200 mbps for 1 Volume Group.

*2 No Auto-Scan

H.265

With Local Display (Complicated Scene)

TR-0400CT/ R1-0400CT

Camera Parameter: H.265, high quality, and moderate traffic.

Volume Group: 1 Volume Group

HDD Spindle Speed (RPM): 7200 RPM*

Resolution	FPS (NTSC)	Remote Connections (Stream out)		Optimal Recording (ch)
		Playback	Live view	
2M	30	4 ch	128 ch	36

Metadata Server

TR-0400CT/ R1-0400CT

Transaction frequency	Playback (Metadata+Video)	Live View (Metadata+Video)	Total Metadata channel
1 transaction/5 sec	70 ch	140 ch	70 ch

IVS Server

Below is the performance test result of IVS services.

IVS shall get 2nd or 3rd streaming for analysis in order to allow server to have more IVS channels.

Frame rate is crucial; lower frame rate could increase IVS channels.

All network services enabled in one server

Condition: CPU below 90%; Liveview/playback - difference ± 1.5 fps

H.264

TR-0400CT/R1-0400CT

Record Resolution/ FPS(NTSC)	IVS Resolution /FPS(NTSC)	Remote Connections (Stream out)	Optimal Recording (ch)	IVS Channel	Total Bitrate (mbps)	IVS Bitrate
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		Playback	Live view				
2M/30fps	VGA/30ps	3ch	32ch	16	2	64 mbps	1 mbps
2M/30fps	VGA/15ps	2ch	32ch	16	3	64 mbps	1 mbps
2M/30fps	QVGA/30fps	3ch	32ch	16	2	64 mbps	0.5 mbps

H.265

TR-0400CT/R1-0400CT

Record Resolution/ FPS(NTSC)	IVS Resolution /FPS(NTSC)	Remote Connections (Stream out)		Optimal Recording (ch)	IVS Channel	Total Bitrate (mbps)	IVS Bitrate
		Playback	Live view				
2M/30fps	VGA/30fps	3ch	32ch	16	1	64 mbps	1 mbps
2M/30fps	VGA/15fps	2ch	32ch	16	2	64 mbps	1 mbps
2M/30fps	QVGA/30ps	3ch	32ch	16	1	64 mbps	0.5 mbps

Pure IVS server (only IVS/MDS enabled)

Condition: CPU below 90%; Liveview/playback - difference ± 1.5 fps

H.264

TR-0400CT/R1-0400CT

Resolution	FPS (NTSC)	Bitrate per ch	IVS Channel
VGA	30fps	1 mbps	2
VGA	15fps	1 mbps	4
QVGA	30fps	1 mbps	2

H.265

TR-0400CT/R1-0400CT

Resolution	FPS (NTSC)	Bitrate per ch	IVS Channel
VGA	30fps	1 mbps	2
VGA	15fps	1 mbps	3
QVGA	30fps	1 mbps	1