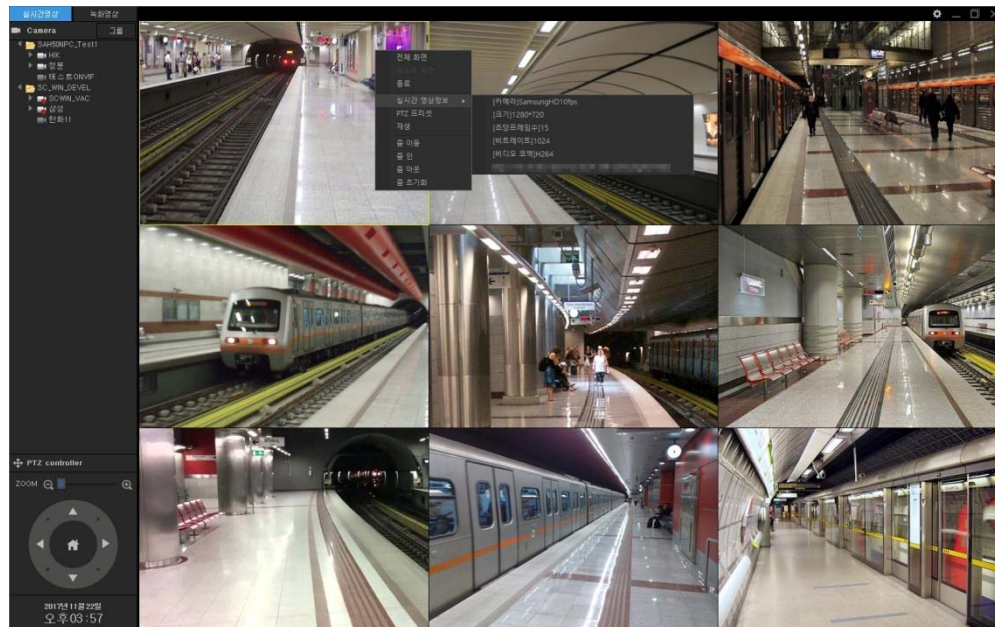


# H.265 HEVC Overview



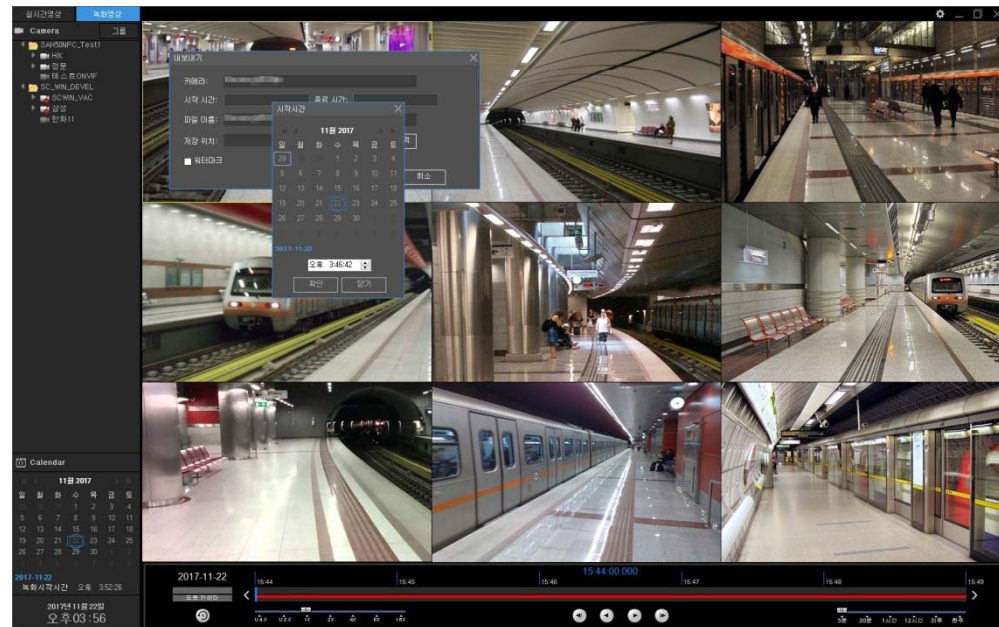
**AddPac**

**AddPac Technology**

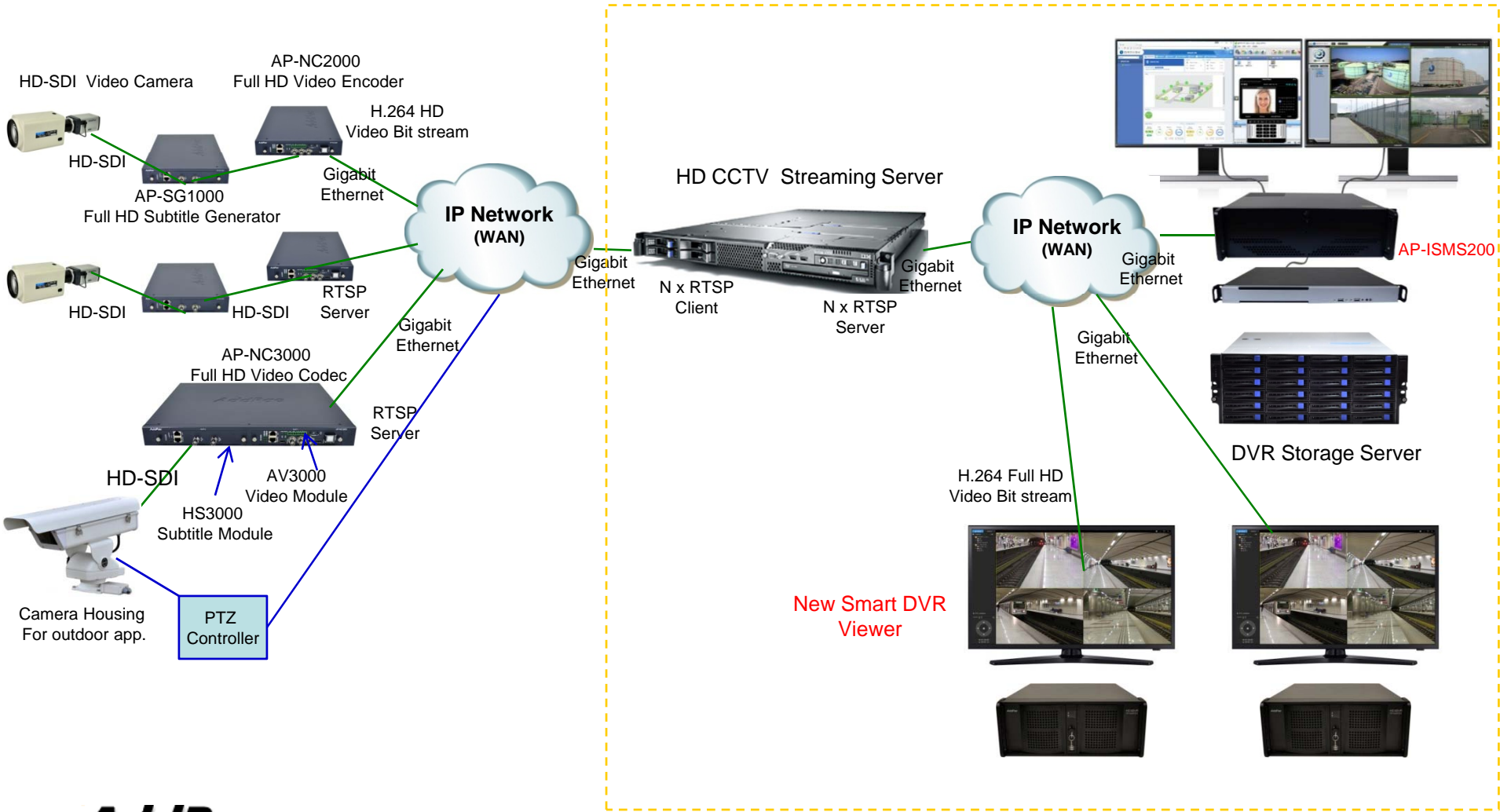
Sales and Marketing

# Contents

- Network Service Diagram
- New Smart DVR Viewer Overview
- H.265 HEVC Overview



# Network Service Diagram



# New Smart DVR Viewer Overview

- IP based Multi-Channel Video Streaming Displayer (Live, Recording)
- **Onvif Protocol Support**
- RTSP/RTP Video Streaming Protocol Support
- H.264(1080P, 720P) HP/MP/BP Video Codec Support
- **H.265 Video Codec Support (Option)**
- MPEG4, MJPEG Video Codec Support (Option)
- Full HD (1080P), HD(720P), D1 Video Resolution Support
- Four(4) or One(1) Channel Video Layout (Video Splitter)  
Option : Nine(9) Channel Video Layout (Video Splitter)
- 4ch Layout , 1ch Layout Display (Round Robin Display)
- **UHD Display Support (Option)**
- Video Solution with Outstanding Network Service Capability
- MS-Window based Software Platform
- Dark and Black Design Concept



# H.265 Video Codec Overview

# H.265 vs H.264 Comparison

	H.264	H.265 (HEVC : high efficiency video coding)
Technical Update	8-pel Motion Vector Resolution Adaptive Interpolation Filter Motion Vector Competition Adaptive Prediction Error Coding in Spatial and Frequency Domain Adaptive Quantization Matrix Selection	Extended Macroblock Size (EMS) Large Transform Size (LTS) Internal Bit Depth Increasing (IBDI) Sample Adaptive Offset (SAO) context-adaptive binary arithmetic coding (CABAC)
Key Point	Macro Block Size (16 x 16)	Macro Block Size (64 x 64)
Complexity, Compression Ratio	—	<b>Complexity</b> 50% Increase <b>Compression Ratio</b> Up to 50% Increase, 30% increase (Same PSNR)
Advantage	—	In case of High Resolution or Very Low Bit, H265 HEVC has advantage over H.264.
Resolution	4K UHD	8K 128fps

# H.265 Profile (cont.)

H.265 Profile		
Version 1 (2013)	Main Main 10 Main Still Picture	- 8 Bit Color, Start from Main Profile, No Baseline Profile -10 Bit Color - Still Image
Version 2 (2014)	Main 12 Main 4:2:2 10 Main 4:2:2 12 Main 4:4:4 Main 4:4:4 10 Main 4:4:4 12 Main 4:4:4 16 Intra Main 4:4:4 Still Picture Main 4:4:4 16 Still Picture High Throughput 4:4:4 16 Intra Monochrome Monochrome 12 Monochrome 16 Scalable Main Scalable Main 10 Multiview Main	-Monochrome Profile for Black&White Image -Main Intra Profile for Intra frame Only Image -Scalable Profile for Internet Streaming & Broadcasting -Multiview Profile for Multiple Camera View & Image Synthesis -High Throughput Profile Same as H.264 High Profile -Various Color Depth, Color Format Support

# H.265 Profile

H.265 Profile		
Version 3 (2015)	High Throughput 4:4:4 High Throughput 4:4:4 10 High Throughput 4:4:4 14 3D Main Screen-Extended Main Screen-Extended Main 10 Screen-Extended Main 4:4:4 Screen-Extended Main 4:4:4 10 Screen-Extended High Throughput 4:4:4 Screen-Extended High Throughput 4:4:4 10 Screen-Extended High Throughput 4:4:4 14 Scalable Monochrome Scalable Monochrome 12 Scalable Monochrome 16 Scalable Main 4:4:4	-Added Several High Throughput Profile -3D Profile for 3D Image -Screen-Extended Main Profile for Graphic and Animation -Profiles for Screen-Extended + High Throughput -Scalable Monochrome Profile for Monochrome + Streaming -Scalable Main Profile for Streaming Video with Color Format 4:4:4
Version 4 (2016)	Screen Content Coding(SCC) Extensions Scalable Range Extensions	



# H.265 Level & Tier

H.265 Level & Tier			
Level	Maximum Bit Rate		Maximum Resolution & Frame Rate
	Main Profile, Main 10 Profile		
	Main Tier	High Tier	
1.0	128kbps	-	128x96 33.7fps 176 x 144 15.0fps
2.0	1.5Mbps		176 x 144 100.0fps 352 x 288 30.0fps
2.1	3Mbps		352 x 288 60.0fps 640 x 360 30.0fps
3.0	6Mbps		640x360 67.5fps 720x576 37.5fps 960x540 30.0fps
3.1	10Mbps		720 x 576 75.0fps 960 x 540 60.0fps 1280 x 720 33.7fps
4.0	12Mbps	30Mbps	1280 x 720 68.0fps 1920 x 1080 32.0fps 2048 x 1080 30.0fps
4.1	20Mbps	50Mbps	1280 x 720 136.0fps 1920 x 1080 64.0fps 2048 x 1080 60.0fps
5.0	25Mbps	100Mbps	1920 x 1080 128.0fps <b>3840 x 2160 32.0fps</b> 4096 x 2160 30.0fps
5.1	40Mbps	160Mbps	1920 x 1080 256.0fps <b>3840 x 2160 64.0fps</b> 4096 x 2160 60.0fps
5.2	60Mbps	240Mbps	1920 x 1080 300.0fps <b>3840 x 2160 128.0fps</b> 4096 x 2160 120.0fps
6.0			3840 x 2160 128.0fps <b>7680 x 4320 32.0fps</b> 8192x4320 30.0fps
6.1	120Mbps	480Mbps	3840 x 2160 256.0fps <b>7680 x 4320 64.0fps</b> 8192x4320 60.0fps
6.2	240Mbps	800Mbps	3840 x 2160 300.0fps <b>7680 x 4320 128.0fps</b> 8192x4320 120.0fps



# Thank you!

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