

Surveillance Storage Sizing Calculator

One formula sizes any system. Figures are illustrative; pair with the article and your vendor's bitrate.

The storage formula

Storage (GB) = bitrate (Mbps) × 10.8 × cameras × retention days × recording factor. 1 Mbps continuous = 10.8 GB/day. GB / 1,000 = TB. Then × ~1.5 for RAID + headroom = provisioned TB.

Bitrate by resolution and codec (continuous, H.265 ≈ half of H.264)

Resolution	H.264	H.265	Storage/day (H.265)
1080p / 2 MP	2.5-5 Mbps	1.5-3 Mbps	~16-32 GB
4 MP / 2K	3.2-8 Mbps	2.2-4.2 Mbps	~24-45 GB
4K / 8 MP	8-12 Mbps	4-10 Mbps	~43-108 GB

Worked example - 40 cameras, 4 MP, 2 Mbps, H.265, continuous

$2 \times 10.8 = 21.6$ GB/camera/day. $\times 40 \times 30$ days = 25,920 GB ≈ 26 TB raw. $\times \sim 1.5 = \sim 39$ TB provisioned. Retention swings it: 7 days ~6 TB, 90 days ~78 TB, 1 year ~315 TB.

Retention - the two limits

MUST keep (floor): retail/office 30-90 days; gaming and banking longer. MAY keep (ceiling): GDPR Art. 5(1)(e); EDPB norm ~72 hours, erase when no longer necessary. Size for the shortest lawful, adequate period.

Levers, ranked by impact

1. Retention days - linear on storage, the biggest lever. 2. Codec - H.265 ≈ half of H.264. 3. Recording mode - motion/event cuts 50-80%. 4. Resolution + frame rate. 5. RAID level + headroom (added after, not a saving).

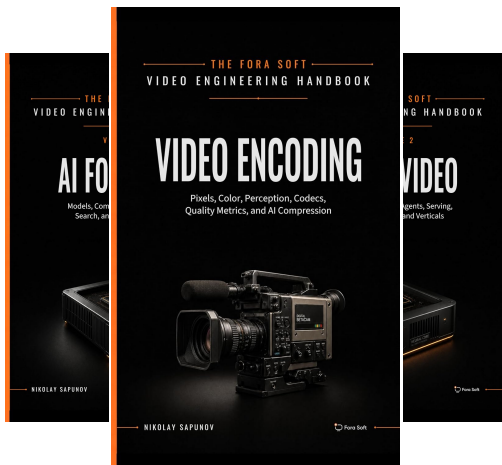
Your site - fill in and multiply

A. Cameras	_____
B. Bitrate per camera (Mbps)	_____
C. Recording factor (1.0 cont. / ~0.2 motion)	_____
D. Retention (days)	_____
Raw GB = B × 10.8 × A × D × C	_____
Raw TB = Raw GB / 1,000	_____
Provisioned TB = Raw TB × ~1.5	_____

Illustrative arithmetic on 2026 ranges. Bitrate moves with scene and motion; the ~1.5x provisioning factor depends on RAID level and array size. This is engineering guidance, not legal advice - confirm retention rules with counsel.

Companion to: 'How Surveillance Storage Works'

www.forasoft.com/learn/video-surveillance/articles-vms/surveillance-storage-retention-math



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This calculator sizes storage from bitrate, cameras, retention and recording mode, with a worked 40-camera example. Our seven-volume handbook goes under each input: Volume 1 for H.264, HEVC and AV1 bitrate behaviour, Volume 6 for motion and event analytics that cut recording, Volume 7 for running cost at scale.

WHAT YOU WILL FIND INSIDE

- How H.265 and AV1 cut bitrate per camera
- Rate control and scene complexity in surveillance video
- Event-based recording driven by detection
- Cost per stream-hour for storage and compute

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