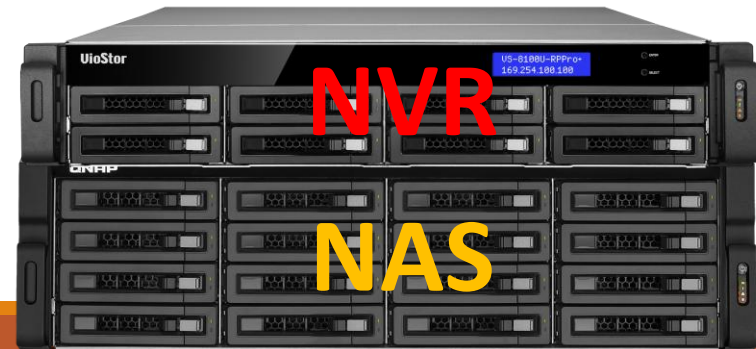# Storage Expansion Choose Guide

GUIDE: HOW TO CHOOSE NVR & STORAGE EXPANSION

VIOSTOR NVR + TURBO NAS

Perquisite: Storage Expansion Introduction Slide

Agenda

1. How long the system can record
   ◦ Know how does a system record from a example with one NAS and one NVR

2. How to calculate the capacity

3. Real example to select proper VioStor NVR and Turbo NAS

The Concept:
How long the system can record

Now you have one NVR and one NAS (as the expansion of NVR), how long it can record?

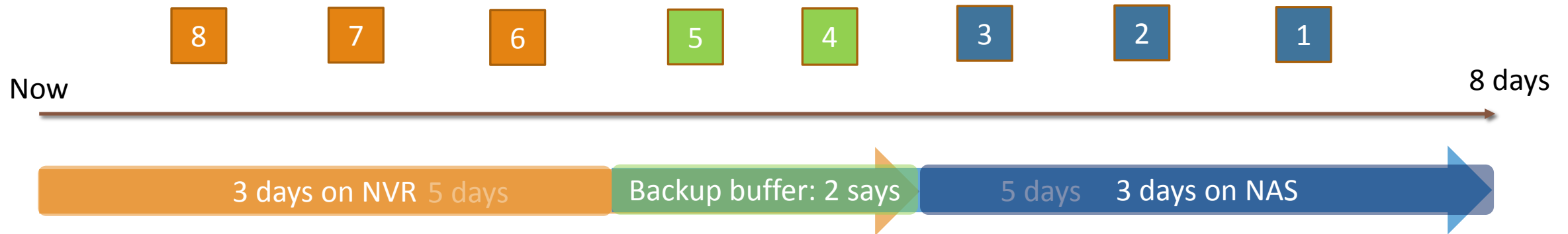1. One NVR: Assume it is able to record for 5 days

2. One NAS: Assume it is able to record for 5 days

3. Backup buffer: 2 days (2 - 48 hours *it can be set on NVR page*)

The Concept:
How long the system can record

| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |

Now   8 days

3 days on NVR 5 days | Backup buffer: 2 says | 5 days 3 days on NAS
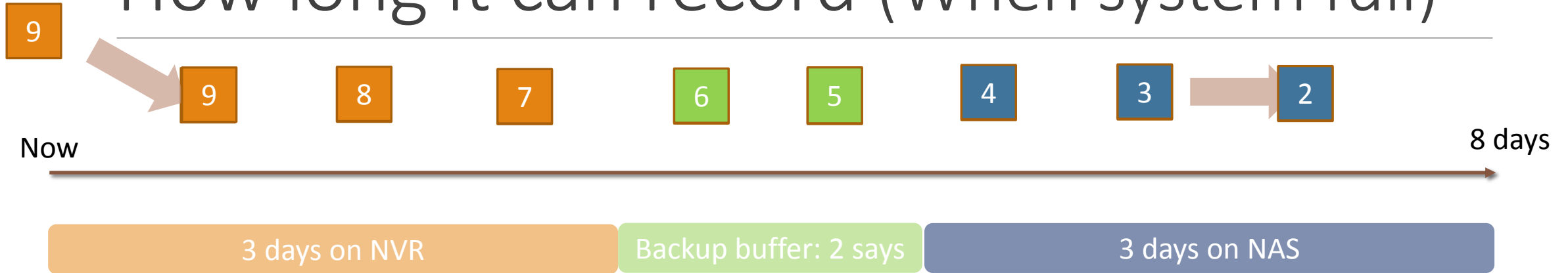
NVR   NAS - Expansion of NVR

Total days to record: 3 + 2 + 3 = (5 + 5) -2 = 8 days

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The Concept:
How long it can record (When system full)

9

9   8   7   6   5   4   3   2

Now   8 days

3 days on NVR   Backup buffer: 2 says   3 days on NAS

NVR   NAS - Expansion of NVR

Total days to record: 3 + 2 + 3 = (5 + 5) -2 = 8 days

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How to Calculate the capacity

1. Know the Requirement
   ◦ How many channels, recording resolutions, frame rate, days to store, backup buffer (2 - 48) hours.

2. Go to QNAP NVR Calculator

3. Calculate the total capacity of recording videos and backup buffer.

4. Plus total capacity of recording videos and of backup buffer.

5. Select the units to match capacity

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Real Example - Requirement

Scenario:

32 Cameras record with
- **1080P** Resolution
- **25** Frame Rate
- **H.264** Video Format
- **Medium** Quality
- **60** days
- **24** Hours a day

- **How much capacity the system need?**

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Real Example – Calculate the capacity

Total Space Needed

#	Channels	Multi-stream	Type	Resolution	Frame Rate	Video Format	Quality	Hours (per day)	Days	Bandwidth (Mbps)	Disk Space (TB)	
1.	32	☐	☑ Recording ☐ Live - view	Full HD (1920 x 1080) ▾	25 ▾	H.264 ▾	Medium ▾	24 ▾	60 ▾	174.83	113.2908	✖

Backup Buffer Space Needed

#	Channels	Multi-stream	Type	Resolution	Frame Rate	Video Format	Quality	Hours (per day)	Days	Bandwidth (Mbps)	Disk Space (TB)	
1.	32	☐	☑ Recording ☐ Live - view	Full HD (1920 x 1080) ▾	25 ▾	H.264 ▾	Medium ▾	24 ▾	2 ▾	174.83	3.7764	✖

* http://www.qnapsecurity.com/calculate_nvr/en/pro/index.php?hf=nvr

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Real Example - Add it all

Total Space Needed

#	Channels	Multi-stream	Type	Resolution	Frame Rate	Video Format	Quality	Hours (per day)	Days	Bandwidth (Mbps)	Disk Space (TB)	
1.	32	☐	☑ Recording ☐ Live - view	Full HD (1920 x 1080) ▼	25 ▼	H.264 ▼	Medium ▼	24 ▼	60 ▼	174.83	113.2908	✖

Backup Buffer Space Needed

#	Channels	Multi-stream	Type	Resolution	Frame Rate	Video Format	Quality	Hours (per day)	Days	Bandwidth (Mbps)	Disk Space (TB)	
1.	32	☐	☑ Recording ☐ Live - view	Full HD (1920 x 1080) ▼	25 ▼	H.264 ▼	Medium ▼	24 ▼	2 ▼	174.83	3.7764	✖

113.2908 TB + 3.7764 TB = 117.0672 TB

* http://www.qnapsecurity.com/calculate_nvr/en/pro/index.php?hf=nvr

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Real Example – Select units to match capacity

One recommendation **– 120 TB (up to 132 TB)**

- One 12 bay NVR *VS-12140U-RP* with RAID 5, 12 x 4TB drives - **44 TB**
- Two 12 bay NAS *TS-1269U-RP* with RAID 5, 21 x 4 TB drives - **76 TB**
- **44TB + 76 TB = 120 TB > 117.06 TB**

OR **– 120 TB (up to 128 TB)**

- One 12 bay NVR *VS-12140U-RP* with RAID 5, 12 x 4TB drives - **44 TB**
- Three 8 bay *TS-869U-RP* NAS with RAID 5, 22 x 4 TB drives - **28 TB + 24 TB + 24 TB = 76 TB**
- **44 TB + 76 TB = 120 TB> 117.06 TB**

* Each project will be vary depends on the project requirements, such as "the need of future capacity" or "prefer tower models". Please recommend the combination based on the various requirements.

Thank you

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