

## CASE STUDY

# SETI's Data-Intensive Hunt for Alien Intelligence Turns to Western Digital for Solution to Capacity Constraints



## A Galaxy of Data

For over three decades, SETI (Search for Extraterrestrial Intelligence) has actively worked towards discovering extraterrestrial life. During this time, SETI has continually refined the way they gather and process massive amounts of data and sought to maximize the hundreds of thousands of volunteer hours at their disposal. As part of this fine-tuning, SETI turned to Western Digital in order to scale their storage system while maintaining their data analytics process. Project SETI@home was able to seamlessly increase server capacity by adding 36 Ultrastar® DC HC520\* 12TB<sup>1</sup> helium-filled hard disk drives (HDDs) in RAID 6 formation, resulting in over 150TB of incremental capacity.

SETI searches for extraterrestrial intelligence by collecting data from two telescopes. They then transmit that data to SETI@home and store it on local servers. The data remains on these servers until analyzed by volunteers. Only once volunteers receive the data, analyze the data, and return the results to SETI, is the organization able to clear the data from the local servers and use that space to collect more data. Figure 1 shows how the data moves through the SETI process.

Project SETI helps to illustrate the vital nature of data that has evolved in recent years. The group's volunteers are working against both time and space to find any signs of life since all of the data they collect is time-dependent. SETI cannot afford to lose any of the data they collect—each bit of data has the potential to be the key to detecting extraterrestrial life.

## No Second Chances

In the data collection process, SETI doesn't have the option for a second chance: if the server doesn't have the capacity to store data, the data is lost. To help illustrate the time-dependent nature of the data, imagine a river flowing: it is impossible to observe the exact same moment twice. Even one second removed, it is impossible to collect the data exactly as it was the second prior. To avoid any data loss, SETI requires an efficient and reliable storage system. When the old system reached peak capacity and the team was unable to collect data from new telescopes, they turned to Western Digital to increase their storage capacity.

SETI@home installed 36 Ultrastar DC HC520 HDDs into their system. Referencing the reliability and ease of use, Eric Korpela, the director of SETI@home, commented, "It is amazing to see over 150TB of free space available to us now. For the first time in the history of the project we are able to collect data from the Southern Hemisphere. We are no longer capacity-constrained and it feels great." Western Digital hard drives offer the ability to seamlessly expand storage and allow for the continuation of a tried and true process. Ultrastar DC HC520 has given SETI the confidence and capacity to expand their collection and advance their mission.

\*Formerly known as Ultrastar He12

## Challenge

Capacity constraints of the local storage servers is limiting Project SETI's ability to collect and analyze data from telescopes.

## Solution

Increase the server capacity to allow for increased data collection and analysis from new telescopes by installing 36 Western Digital Ultrastar DC HC520 HDDs in RAID 6.

## Key Results

Increased capacity enables SETI to expand their mission without altering their process for data transfer and analysis. For the first time, they are now able to collect data from the Southern Hemisphere.

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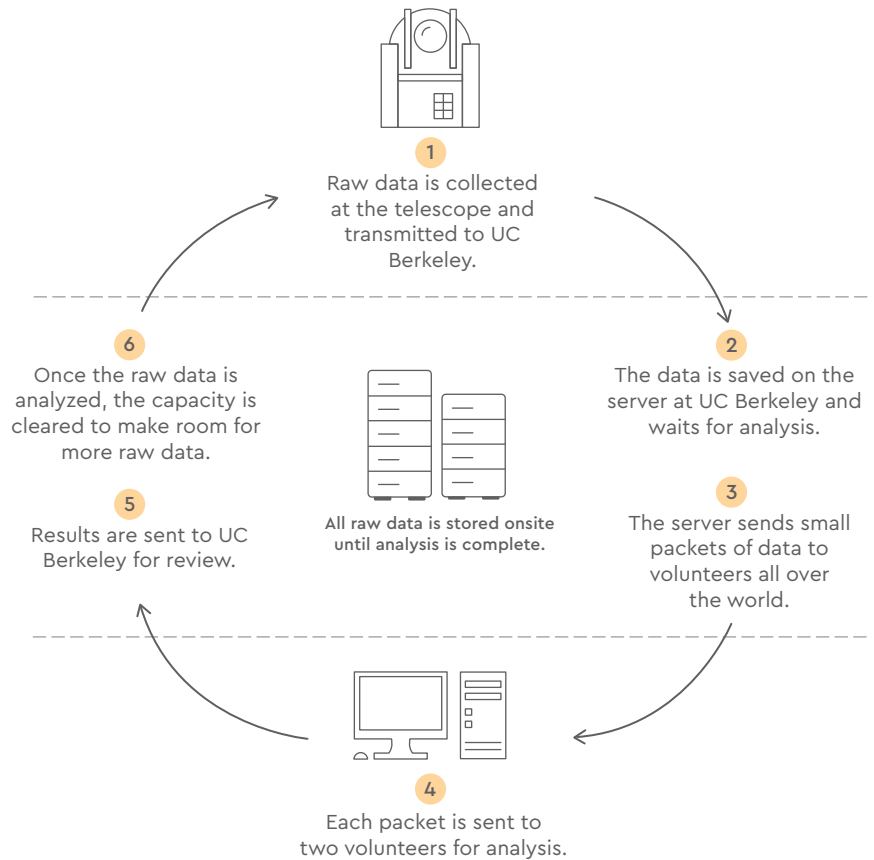


Figure 1: How data moves through the SETI process

## Improving Their Odds

During the analysis stage, SETI looks for small disturbances or anomalies in the data each telescope collects. It is vital to their operations that they collect and save all the data possible: every bit has the potential to lead them to success. Since data protection is crucial to the success of the project, Ultrastar DC HC520 drives were the drive of choice. Building on previous generations, the Ultrastar DC HC520 drives offer an unsurpassed MTBF rating for an HDD at 2.5M hours. The Ultrastar DC HC520 drives also come with ISE and SED security features. Ultrastar DC HC520 HDDs are also built with the fourth generation HelioSeal® technology which gives them the dependability and reliability that SETI needed.

In partnering with Western Digital, SETI was able to significantly increase their ability to store valuable data. This increased capacity has allowed the SETI team to grow the data collection rate as they are now able to gather data from a third telescope. This is a major benefit for the project since each additional telescope greatly increases the possibility of finding alien intelligence. Most significantly, SETI was able to add another telescope to the process without the need to alter their volunteer contributions nor their data analysis process. They were able to achieve this thanks to the Ultrastar DC HC520 drive's CMR technology, allowing for seamless integration and the ability to expand server capacity without interruption.

## Western Digital.

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<sup>1</sup>One megabyte (MB) is equal to one million bytes, one gigabyte (GB) is equal to 1,000MB (one billion bytes), one terabyte (TB) is equal to 1,000GB (one trillion bytes) and one petabyte (PB) is equal to 1,000TB when referring to storage capacity. Total accessible capacity varies depending on operating environment. Please visit our website, www.westerndigital.com for additional information on product specifications.