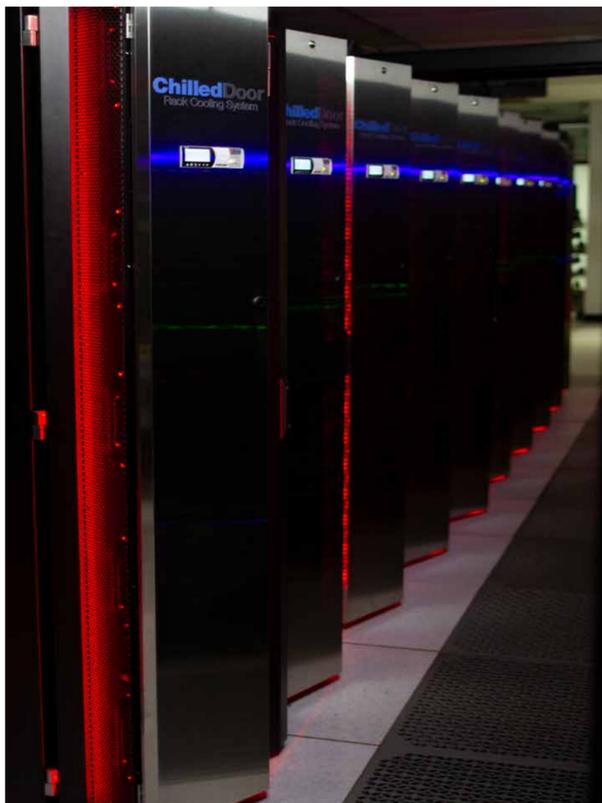




Scalable Compute Unit 15 (SCU15) is part of the Discover supercomputer cluster at the NASA Center for Climate Simulation (NCCS). SCU15 was installed in July 2019. It is an expansion to the Skylake and Omni-Path portion of the Discover cluster. *Chris Meaney, NASA/Goddard*



This view shows the back side of SCU15, revealing the rear-door heat exchangers that keep the system cool. These doors are capable of returning colder air to the room than was pulled into the servers, thus augmenting the cooling of the computer room. *Chris Meaney, NASA/Goddard*



Pictured is the chilled water distribution manifold for SCU15. The variable control valves allow the doors to automatically regulate the flow of water through the doors, improving the efficiency of the overall cooling solution. *Bruce Pfaff, NASA/Goddard*

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What Could Possibly Go Wrong? — The Myth of the Smooth Install

The high-performance computing (HPC) systems team at the NASA Center for Climate Simulation (NCCS) has upgraded the Discover supercomputer cluster 18 times in the last 13 years. We have grown Discover from 130 compute nodes, 520 CPUs, and a total capacity of 3.3 teraflops to a cluster with over 4,100 compute nodes, over 129,000 CPUs, and a total capacity of 6.7 petaflops.

Each Scalable Compute Unit (SCU) installation has come with its own unique challenges. We have learned many lessons over the years that were applied to subsequent upgrades. We installed SCU15 in July 2019, consisting of many components that were similar or identical to existing hardware. With 13 years of experience, this sounds pretty easy. What could possibly go wrong?



Bruce Pfaff, NASA Goddard Space Flight Center

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