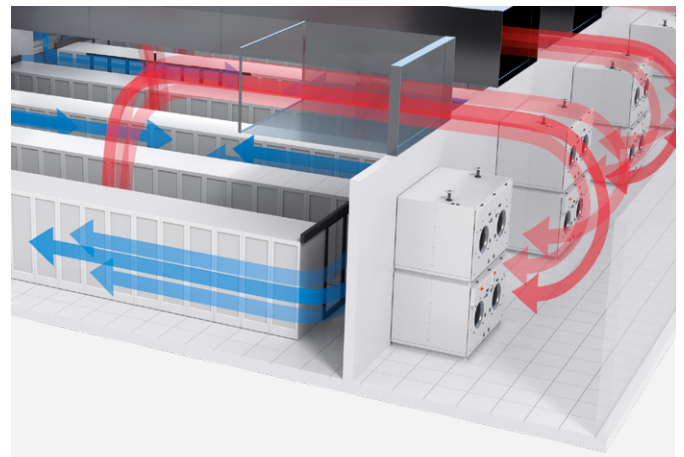
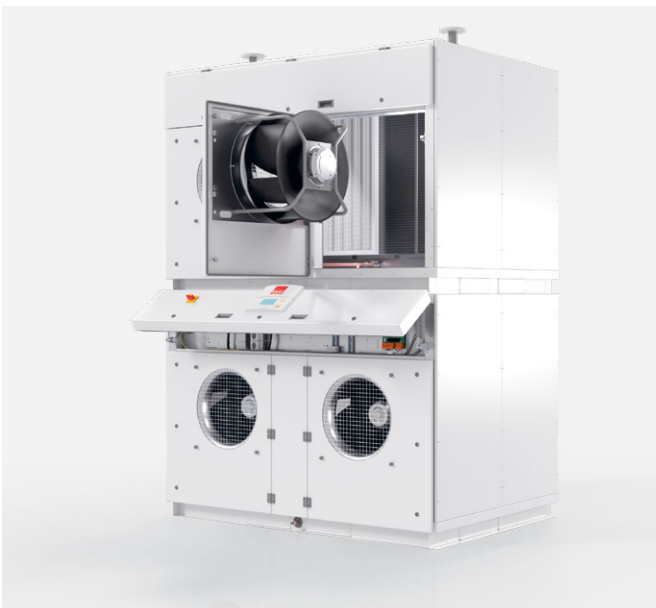


STULZ

CLIMATE. CUSTOMIZED.



Air Handling Units for indoor installation

STULZ solutions for large and hyperscale data centers

The complete range of air conditioning technology – from one source.

For over 40 years, the STULZ family-run company has been synonymous with precision air conditioning at the highest level.

Our solutions for the air conditioning of business-critical applications and sensitive systems have made us a leading company in our industry.

Whether for data centers, industry or communication technology, the STULZ portfolio has a tailor-made cooling solution to suit your requirements.

We guarantee adherence to our uncompromisingly high requirements and quality standards both at our factory in Hamburg and all our production sites around the globe. Moreover, we work hard not only to satisfy our customers' individual wishes, but also to make sure our air conditioning solutions offer maximum energy efficiency and a minimal CO₂ footprint.

Our portfolio extends from traditional room cooling and High Density Cooling to chillers, air handling units and container modules, all the way to micro data centers, service, and our self-developed monitoring software. An all-embracing quality assurance system monitors all the details in development, production, implementation, and service.

Today, STULZ has a presence in more than 140 countries. STULZ GmbH has 21 subsidiaries and eleven production sites in Europe, India, China, and North and South America. We also have partner agreements with numerous sales and service partners on every continent. Our network of highly qualified specialists is a reliable guarantee of the highest standards.

The combined wealth of our experience, values, performance and service is what defines us and is especially valued by our customers. Air conditioning solutions – custom tailored and from one source:
ONE STULZ. ONE SOURCE.

ONE STULZ.

ONE SOURCE.



Air Handling Units for indoor installation – for greater performance, energy efficiency and redundancy



Custom-made, energy-efficient Air Handling Units with Direct or Indirect Free Cooling

Breaking new ground

When it comes to large and hyperscale data centers, conventional air conditioning systems are up against their limits. Restricted space, electricity consumption and high heat loads are some of the challenges that need to be overcome. STULZ offers solutions to these challenges and guarantees efficient, demand-based and reliable air conditioning of your mission-critical equipment.

Our solutions' unique design allows space for taller server racks with greater IT load densities, therefore enabling air conditioning of the maximum heat load.

Solutions from scratch

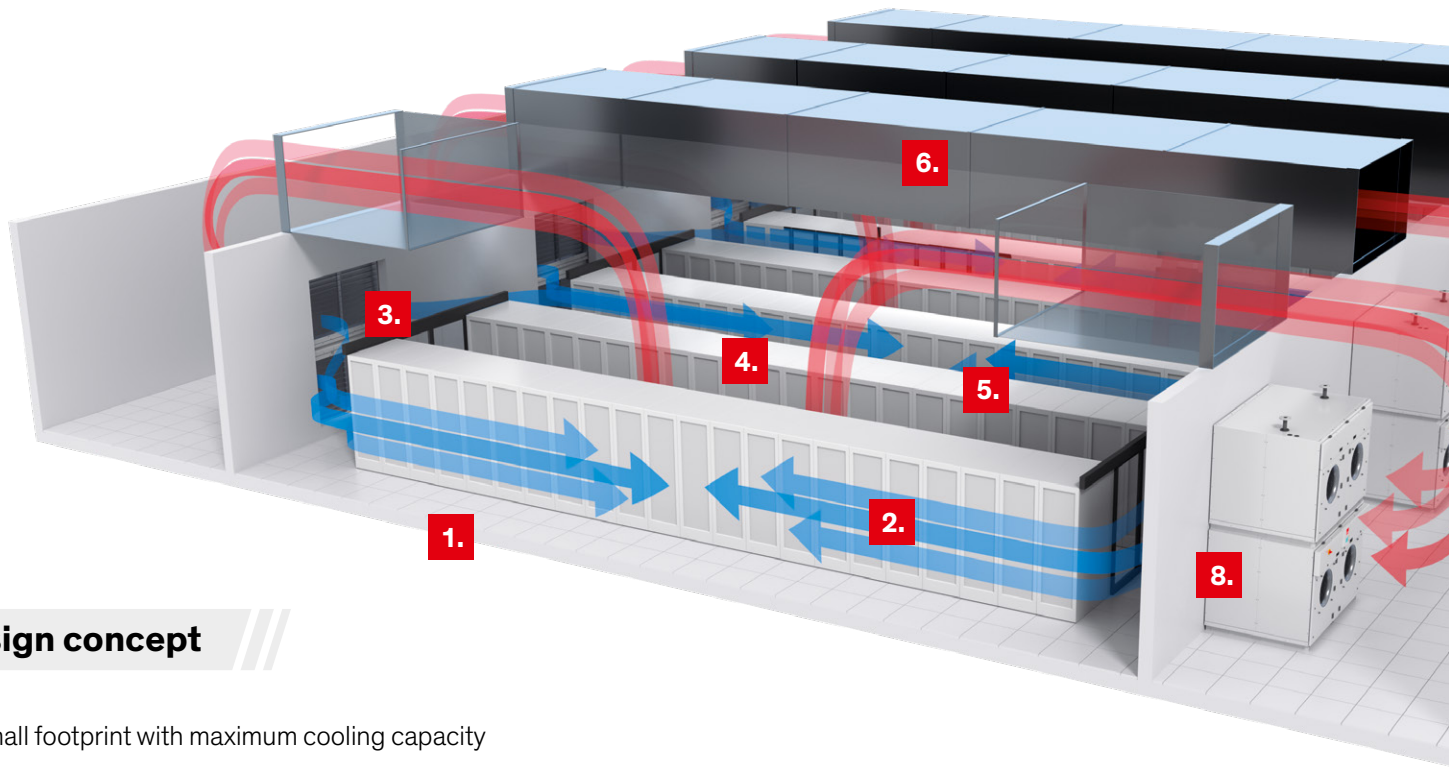
We work with our customers to develop the optimum individual solution for their needs. Size, cooling capacity, air conduction or the control system: our solutions can be precisely adapted to your individual requirements.

+ Advantages of our solutions

- Reliable air conditioning of taller racks and higher heat loads
- Large air throw for uniform cooling of large server rooms
- Units with Free Cooling option enable maximum potential savings
- Low pPUE values achievable
- Extremely low AER (Airflow Efficiency Ratio) values thanks to minimal pressure drops
- Small footprint with maximum cooling capacity
- Low noise level
- Modular design ensures redundancy
- Easy access for maintenance purposes
- Comprehensive service in over 140 countries worldwide



A new cooling concept for air conditioning maximum heat loads



Design concept

- Small footprint with maximum cooling capacity
- Taller racks and higher heat loads are possible, as no raised floor is required
- Larger supply air area for a high air flow rate at low air velocity and uniform air conditioning along the entire cold aisle
- Optional dampers prevent air recirculation
- Low noise level thanks to optimized air conduction and low pressure drops

Modularity

- Systems can be adapted to the project-specific room size and different site conditions
- Modular design enables efficient utilization of space and increases operational reliability through redundancy
- Higher cooling capacity per wall length: thanks to the design concept, units can be positioned directly next to each other

Installation and service

- Modular design for fast and easy installation
- All maintenance can be performed from the service corridor
- Experienced sales and service partners with in-house training are located in over 140 countries



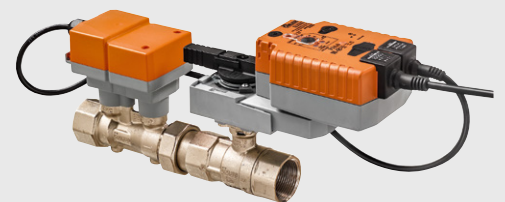
1. No raised floor required
2. The entire cold aisle is air conditioned
3. Wall-mounted installation with horizontal air conduction
4. Hot aisle containment
5. Taller racks
6. Return air duct
7. Service corridor
8. Air Handling Units

Energy efficiency

- Low pPUE values achievable
- Designed for high supply and return air temperatures within the range recommended by the ASHRAE-TC-9.9 guidelines
- Exceptionally low AER (Airflow Efficiency Ratio) values and therefore maximum efficiency in terms of air conduction
- Maximized heat exchanger surfaces for high chilled water temperatures and minimal pressure drops
- Hot aisle containment for physically separating the hot and cold air, to completely prevent the airflows from mixing
- EC fan technology for maximum efficiency
- Lowest total cost of ownership (TCO)

Perfect hydraulic coordination of chilled water systems thanks to pressure independent control (PIC) valve

- Automatic hydraulic compensation
- Precise, stable operation whatever the heat load
- Reduced energy consumption of pumps in the chilled water system



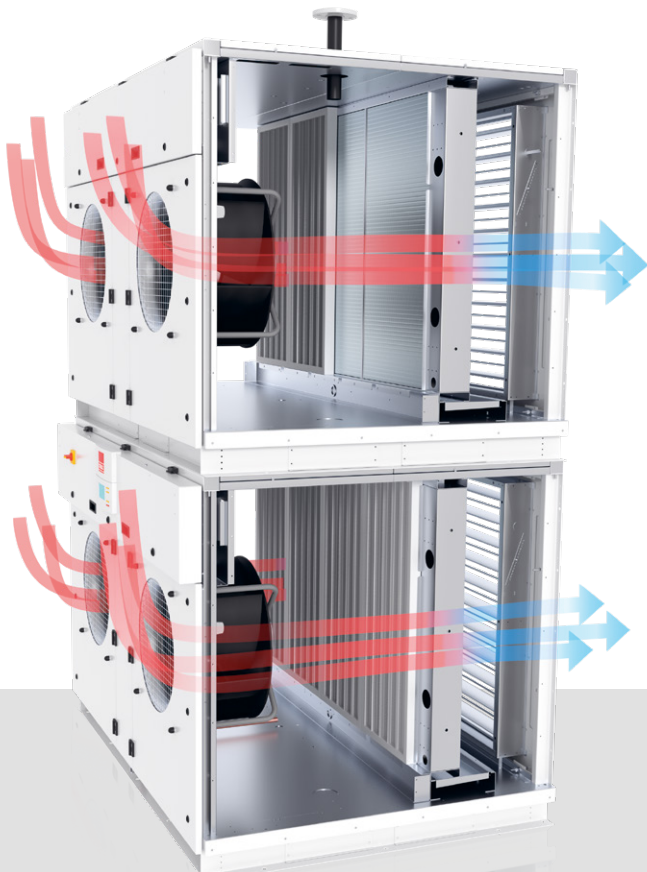
CyberWall – standard unit with rapid availability

CyberWall units engineered and produced in Hamburg are compact and easy to transport. The unit design has been tested and optimized to guarantee efficient and reliable cooling of your entire server room.

The unit with chilled water system is specially designed for indoor installation and, as a standard unit, offers shorter delivery times.

+ Advantages of the CyberWall

- Maximum cooling capacity with minimum power consumption
- Airflow optimized using CFD analyses to ensure uniform distribution
- Baseframe and panel design optimized for indoor installation
- Space-saving, cost-effective transport in a standardized shipping container
- Easy handling and installation
- Various control options based on Delta T, differential pressure control, and room air and return air



Intelligent positioning of components ensures a flow-optimized design

Thanks to their flow-optimized design, our CyberWall units have the lowest pressure drops and therefore achieve the greatest possible energy savings, which are immediately noticeable.

Components are arranged to ensure maximum utilization of the heat exchangers and uniform air distribution along the entire length of the aisle.

Options

- Filter classes according to ISO 16890:
ISO Coarse 90 % (G4) or ISO ePM10 70 % (M5)
 - Just undo the clamping screw for rapid filter replacement
 - Filter pressure monitoring
- Aluminum air dampers
- Various heat exchangers available
- Pressure independent control (PIC) valve
- Pressure independent control valve for indicating cooling capacity and EER values
- Dual power feed with automatic switchover



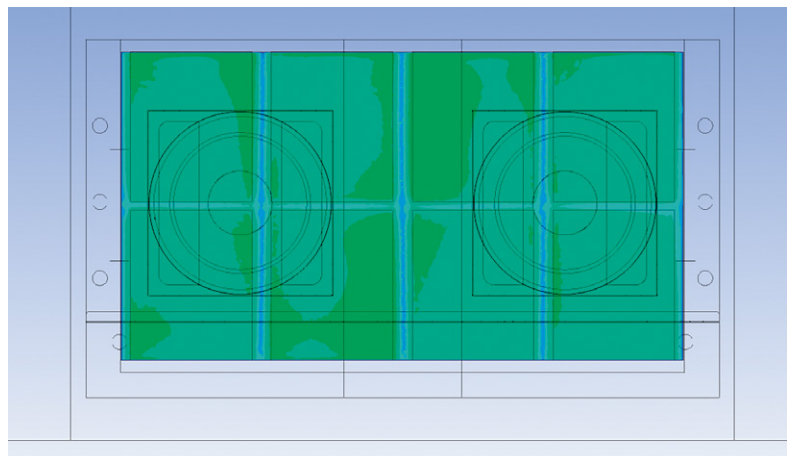
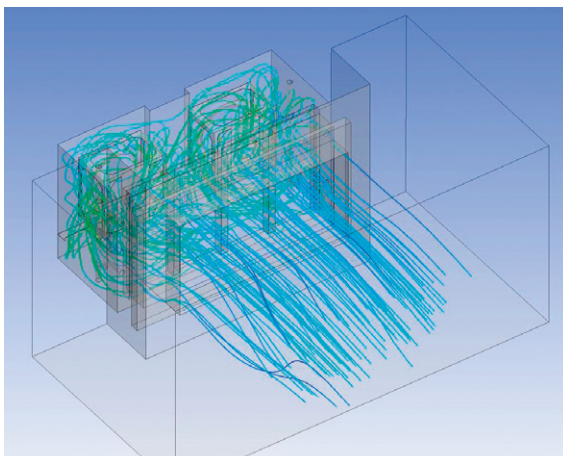
Technical data for WBF 2000 CW		
Cooling capacity	kW	221
Airflow	m ³ /h	55,000
Dimensions (W x H x D)	mm	2,200 × 3,000 × 1,600

* Return air conditions: 37 °C; 25 % r. h.; supply air temperature 25 °C; chilled water: 16/26 °C

Optimum air conduction along the entire length of the aisle.

CFD analysis for optimizing operation

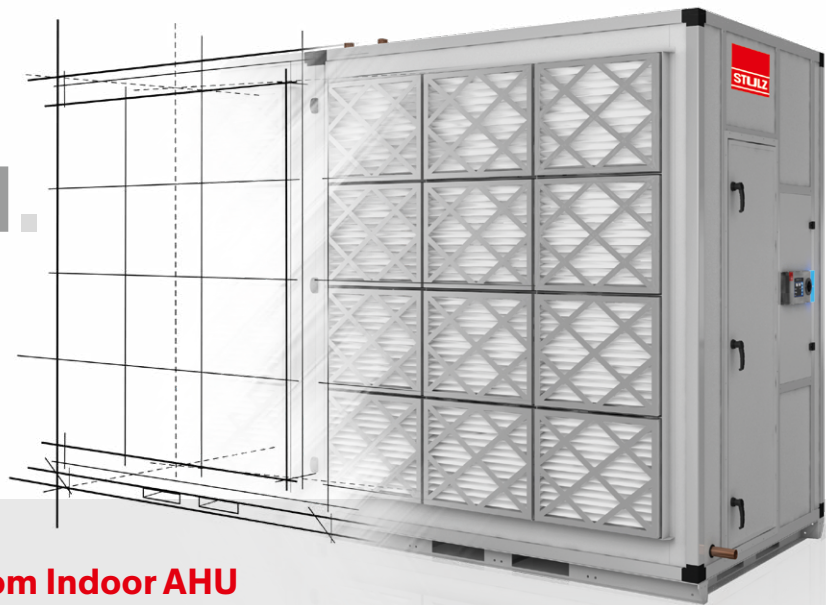
To prevent pressure drops and ensure uniform temperature distribution, an exhaustive CFD analysis was performed during the development of the CyberWall. The results enabled us to test and optimize the flow in all areas of the CyberWall. The outcome is a perfectly uniform flow through the heat exchanger, which maximizes cooling capacity while simultaneously minimizing fan power input.



STULZ Custom Indoor AHU – tailored to your individual requirements

STULZ offers the ideal solution for individual requirements – from a comprehensive range of cooling capacities and unit configurations to a variety of different cooling systems. With the STULZ Custom Indoor AHU, you have a custom-tailored solution that has been engineered and ideally configured for your application in consultation with you.

WE WORK WITH THE CUSTOMER
TO DEVELOP A PROJECT-SPECIFIC
CONCEPT, SO THAT WE CAN
DELIVER THE
IDEAL
SOLUTION.



+ Advantages of the Custom Indoor AHU

- Customized versions thanks to a variety of design options and cooling systems:
 - Direct evaporative method
 - Chilled water
 - Direct Adiabatic Cooling
 - Free Cooling
- Software is adapted to specific customer requirements
- Various unit configurations:
 - Horizontal or vertical airflow
 - Standalone or with duct connection
- Flexible unit dimensions for individual space and customer requirements
- Unit is designed to suit the customer's service strategies
- Various heat exchangers available

Climate. Customized. Air Handling Units to your specifications



- Location
- Room planning
- Local climate
- Environmental protection
- Noise protection
- Generation of heat
- Peace of mind
- Integration and connectivity
- In-house engineering
- In-house software development

Whether standalone or intelligently connected, units from STULZ satisfy all your requirements for long-lasting, perfectly adapted air conditioning solutions.

From hardware to software, from design to production through to installation, we can supply complete air conditioning systems with maximum energy efficiency that respond to your individual requirements exactly, intelligently, and reliably. With STULZ you can be sure of operational reliability, while at the same time significantly lowering your equipment's energy costs and CO₂ emissions.



1 Climate. Customized. Standard units

Make the most of the very large choice of accessories and options available with our standard units to adapt them to your individual requirements.

2 Climate. Customized. Standard units with special options

Above and beyond our standard units, our engineers offer you numerous further options for personalizing our standard units to the maximum extent.

3 Climate. Customized. Custom-made air conditioning solutions

Make your desired concept a reality: working with you, we plan, implement and provide support for your perfect, custom-made air conditioning solution. This way, you have an individual system in which every detail is the ideal match for your project right from the start.

Solutions achieved with customers

Every project has its own requirements, and together we develop the optimum air conditioning solution for you. In cooperation with our customers, we have already developed numerous customized air conditioning solutions. Work with us to achieve your desired concept, where all details fit your project perfectly.



Horizontal AHU

Requirements:

- ✓ Maximum capacity with a minimal footprint
- ✓ Redundancy concept for maximum availability
- ✓ Easy service access to all components

Solution:

Thanks to the large heat exchanger surfaces, this solution ensures a high cooling capacity in a single module. The maintenance-friendly design allows side access to the unit. The redundancy concept is ideally implemented by assigning the units in pairs to a cold aisle and by using counterbalanced fan inlet backdraft dampers to minimize air recirculation.



Horizontal Stackable AHU

Requirements:

- ✓ Large air throw for particularly long aisle lengths
- ✓ Maximum utilization of the room height
- ✓ Modular design for simple handling and transport
- ✓ No maintenance work in the data center

Solution:

This solution allows easy handling for simple and secure stacking of the units to reduce on-site installation time and cost. Despite the minimal footprint, the unit is particularly easy to maintain and offers a large air throw thanks to the use of axial fans.



Horizontal Split Sectional AHU

Requirements:

- ✓ Direct Free Cooling
- ✓ Minimal noise emissions into the data center
- ✓ Modular design for container transport

Solution:

Due to its dimensions and design, this solution fits into a standardized shipping container. The unit can be re-assembled and rewired on site using minimal labor. An integrated module for combining outside air and recirculated air allows efficient use of Direct Free Cooling. Air discharge sound attenuators reduce noise emissions.



Modular Split AHU

Requirements:

- ✓ Maximum cooling capacity in a single unit
- ✓ Addition of modules while the data center is in operation
- ✓ Dimensions and weight optimized for service elevators and transport routes

Solution:

Due to the vertical center split, the unit fits into service elevators and can be maneuvered within confined spaces. The modular design allows easy on-site expansion with minimum effort.



CAH 2000 CW

Requirements:

- ✓ Optimized for especially high heat loads
- ✓ Maintenance during operation
- ✓ Earthquake-proof

Solution:




This successful design is used at numerous locations. The unit consists of two modules, is earthquake-proof, and the design means that several units can be positioned directly next to each other. The filters can be changed during operation and foldaway fans allow very easy maintenance.



The complete solution

Our Air Handling Unit solutions for indoor installation are more than just products. We offer you a complete service portfolio – a turnkey solution for cooling your data center.

For the success of your project, make use of our perfectly trained and well-practiced team of consultants with many years of experience, **every step of the way:**

Consulting 	We will give you all the necessary calculations, plus information on relevant standards and directives.
Implementation 	Our project managers utilize their in-depth expertise and wide-ranging experience to ensure the smooth technical implementation of your project.
Service 	Upon request, our trained specialists will take care of your dependent applications and ensure trouble-free and efficient operation worldwide.
Future-proof systems and solutions	<ul style="list-style-type: none">• Highly reliable products• Low operating costs• Flexibility for future expansion• Individual optimization for your operations



Maximum added value with our self-developed control system

We strive to bring you added value. Perfect coordination of the controller, software and air conditioning units brings you additional reliability and efficiency. We therefore develop our own hardware and software in a holistic and integrated overall process – to exploit the maximum possible benefits for you.

- **Built-in added value:** Our controllers are designed for controlling and monitoring air conditioning systems and for the parallel operation of several machines.
- **Intelligent control system:** Optional sequencing with standby functions enables individual air conditioning modules of a group to be used to a greater or lesser extent with the utmost flexibility.
- **Reliable documentation:** Monitoring and reporting in addition to recording the indoor climate
- **Maximum flexibility:** Compatible with all common BMS protocols
- **Maximum performance:** The controllers enable the centralized control of up to 20 air conditioning modules per group.



CLOSE TO YOU AROUND THE WORLD

As a company with sites around the globe, we are able to offer everything that data center operators, planning engineers and businesses in the extremely dynamic ICT and IT world require – plus professional advice at the right time and the right place.

Our trained and experienced sales and service partners are available in over 140 countries. The resulting proximity to our customers enables rapid reaction times. What's more, regular training sessions and a lively exchange of information ensure high quality and a comprehensive knowledge of all our products.

This way, you can be sure that your products are in the best hands and receive the right service – **anywhere in the world.**

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Close to you around the world

With specialist, competent partners in 140 countries, 21 subsidiaries,
11 production sites and exclusive sales and service agents around the world.

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