Cybermedia Center IT core Annex

OSAKA UNIVERSITY
Cybermedia Center

Purpose

IT Core Annex is an energy-efficient data center that houses supercomputers, PC clusters, and general-purpose servers. Its aim is to reduce environmental loads and operating costs campus-wide. We are striving for stable operation by expanding cooling facilities with PUE (Power usage effectiveness) in mind and introducing automatic control settings to maintain cooling capacity in the event of a breakdown.

Building specifications

- Completed in September 2014
- First floor area: 990 ㎡ , Second floor area: 1048 ㎡ , Total floor area: 2038 ㎡
- 2F server room floor area: 558 ㎡ (fully raised floor)
- 24 standard server racks (width 60 cm) per block
- 240 racks can be installed in total (10 blocks)

Power-supply facility

In addition to the table on the right, the main building is equipped with an electrical generator (200 kVA) capable of distributing power through a generator circuit to withstand long-term power failures.

Type	Capacity
Single-phase three-wire 200-100 (V)	300 kVA
Three-phase three-wire 400 (V)	500 kVA
Three-phase three-wire 200 (V)	2,800 kVA
Three-phase four-wire 415 (V)	3,000 kVA

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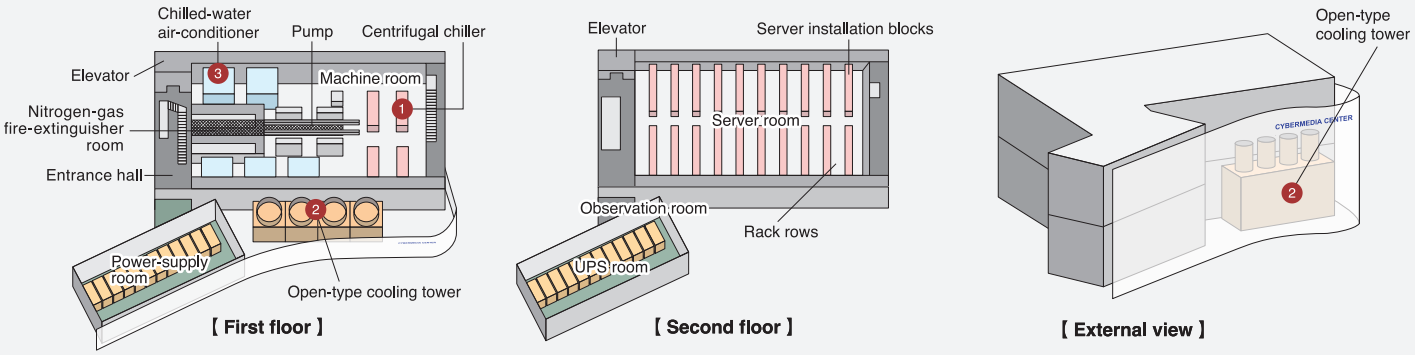
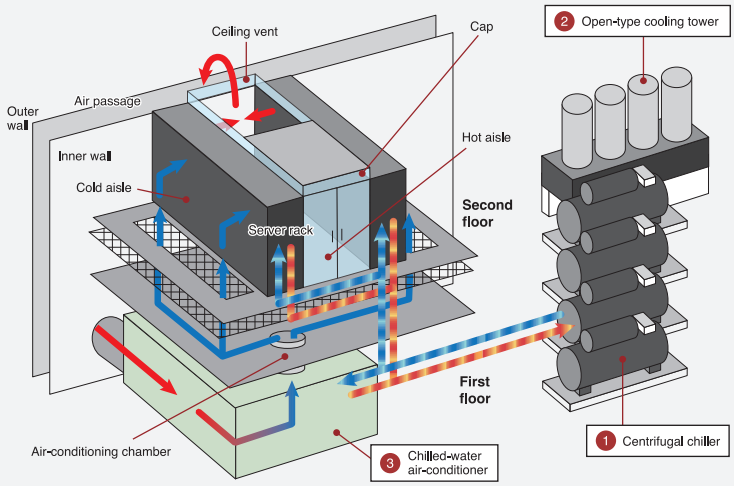
Building image



Cooling mechanism

- The chilled-water air-cooling facility on the first floor cools the air by using the cold water supplied by centrifugal chillers. The cooled air is then sent to the air-conditioning chamber between the first and second floors, where it is distributed and supplied to the server room.
- For each block, server racks are sectioned by a cold aisle (stream of cold air) and a hot aisle (stream of hot air). The server draws cold air from the cold aisle and exhausts warm air to the hot aisle. The aisles are capped to prevent the hot and cold air from being mixed.
- The warm air in the hot aisle is exhausted via the vent in the ceiling and flows through the air passage in the wall. It then circulates back into the chilled-water air-cooling facility on the first floor.
- The air is cooled by the ambient air and the heat of evaporation before being sent back to the air passage.
- The supercomputer receives a supply of chilled water from centrifugal chillers for direct liquid cooling.
- The water-cooling and air-cooling can handle a heat load of up to 1,950 kW.



 Chilled-water pump piping	 1	 2	 3
Equipment name	Centrifugal chiller x 4 units	Open-type cooling tower x 4 units	Chilled-water air-conditioner x 5 units
Location	1F Machine room	1F outdoor	1F Machine room
Cooling capacity (per unit)	703.3 kW	798.8 kW	238 kW Air volume 70,800 ㎥ / h
Type	Water-cooling facility		Air-cooling facility