MODULAR DATA CENTER
Innovative • Sustainable • Cost Efficient

Infographics

University of Michigan
MODULAR DATA CENTER
Innovative • Sustainable • Cost Efficient

Higher Density, Smaller Footprint

More focused cooling allows greater power/equipment density

High Performance Research Computing
25,000-Core HPC Cluster

<table>
<thead>
<tr>
<th></th>
<th>MACC*</th>
<th>MDC</th>
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<tbody>
<tr>
<td># of Racks Necessary (Based on Expected Core Density)</td>
<td>95</td>
<td>24</td>
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Average US Home
5kW avg peak load

2kW avg load

MACC 6kW max per rack
(6 servers)

MDC 24kW max per rack
(18-24 servers)

Expandable Capacity, When We Need It

MACC
10,000 sq. feet
1.8 MW compute
300 racks

MDC (EcoPOD)
1,000 sq. feet
1 MW compute
44 racks

Additional EcoPOD (future)
1,000 sq. feet
1 MW compute
44 racks

*MACC = Michigan Academic Computing Center, a highly secure and reliable data center at U-M

NextGen
Office of Research
cyberinfrastructure

flux-support@umich.edu
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Power Usage Effectiveness (PUE)

Brick & Mortar
$1 invested in computing cycles & processing power was met with $1.50 spent on cooling costs

MDC
$1 invested in computing cycles & processing power was met with $0.23 spent on cooling costs

Very inefficient

PUE 3.5 3.0 2.5 2.0 1.5
Industry average

MDC

Very efficient

Efficiency goal: PUE = 1.23

MDC Reduces the Carbon Footprint*

CO₂ Emissions: 6,022 Tons saved = 1,136 Fewer cars on the road

*Annual projected savings based on U.S. traditional data center (1MW)

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Building Costs

The cost to build MDC was $6.2 million, half as much as a brick and mortar data center.

$12M
Typical brick and mortar data center

$6.2M
MDC

$4.5M
MDC future expansion*
*Double the capacity for much less

Cooling Costs

Saving $600,000 per year*
*Compared to running a typical data center

For 75% of the year outdoor air cools computing equipment

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Airflow

- Adaptive cooling technology adjusts cooling based on IT load and environmental criteria
- Ambient air is used 75% of the year - no cooling required
- During the hot summer months (25% of the year), outside air is pulled in and cooled
- Hot air from equipment is exhausted by fans in the ceiling