



DATACENTER MUNICH 2
Munich's Number One Address for Your Data

We Use the Latest
Technology for the
Security of Your Systems

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Being Aware of the Risks Today

The challenges for IT are continuously changing through new technical developments and the new possibilities which are offered by the communications and network infrastructure – and therefore the requirements and goals of your organization. To be able to achieve these goals, not only are financial means required, but also adequate planning to be well positioned for the future. That is why recognizing, evaluating and minimizing risks is vital.

We can offer you the possibility of ensuring your IT systems are continuously available in an optimum environment – whether for short term projects or for a scheme that will be implemented in a few years' time. This brochure shows the possibilities and advantages of outsourcing IT and network systems to an external data center, whilst retaining full control of your IT – we simply provide the best possible environment.



Built on Solid Ground

The Munich 2 data center is situated in the north of Munich, in Unterschleißheim approx. 25 km as the crow flies from e-shelter's Munich 1 site. The Munich 2 data center was planned as a dedicated data center new build and is being developed in several building stages. On a plot which is more than 18,000 sqm large, about 6,200 sqm of data center space is being developed in two building stages. The first building stage was completed in May 2017.

The site was selected on the basis of an extensive risk analysis to satisfy the high requirements for security and availability. The provision of electricity, connection to data networks and protection against natural hazards were all given particular consideration here. In Munich 2, a cooling by ground-water is also used, which has been developed for maximum energy efficiency.

When planning the e-shelter data centers we draw from 17 years experience in the field of managing data centers:

- The planning by our in-house planning department is based on the experience and know-how we have gained from the daily operation of over 90,000 sqm of data center space in the e-shelter portfolio
- The buildings are planned and built for use as data centers only
- We use proven technologies to enhance our levels of energy efficiency and develop these ourselves in cooperation with the manufacturers
- The planning follows the principle of attaining the correct balance between availability and energy and cost efficiency
- The basic concept of the building is flexible to be able to respond to the requirements of changing future circumstances and to be able to guarantee scalability
- All external and internal installations are completed with high quality materials in accordance with industry standards
- The structural and technical security are tailored to meet the high security demands of our tenants. Even special requirements for your IT areas can be considered



Security and Operations in the Best of Hands

The security of the buildings and systems is one of the key risks that need to be managed properly. For this reason, we do not entrust this task with anyone but our own operation and security personnel. Around the clock e-shelter technicians and security personnel manage our data centers on-site. 24 hours a day, 7 days a week.

OVERALL PERFORMANCE FEATURES

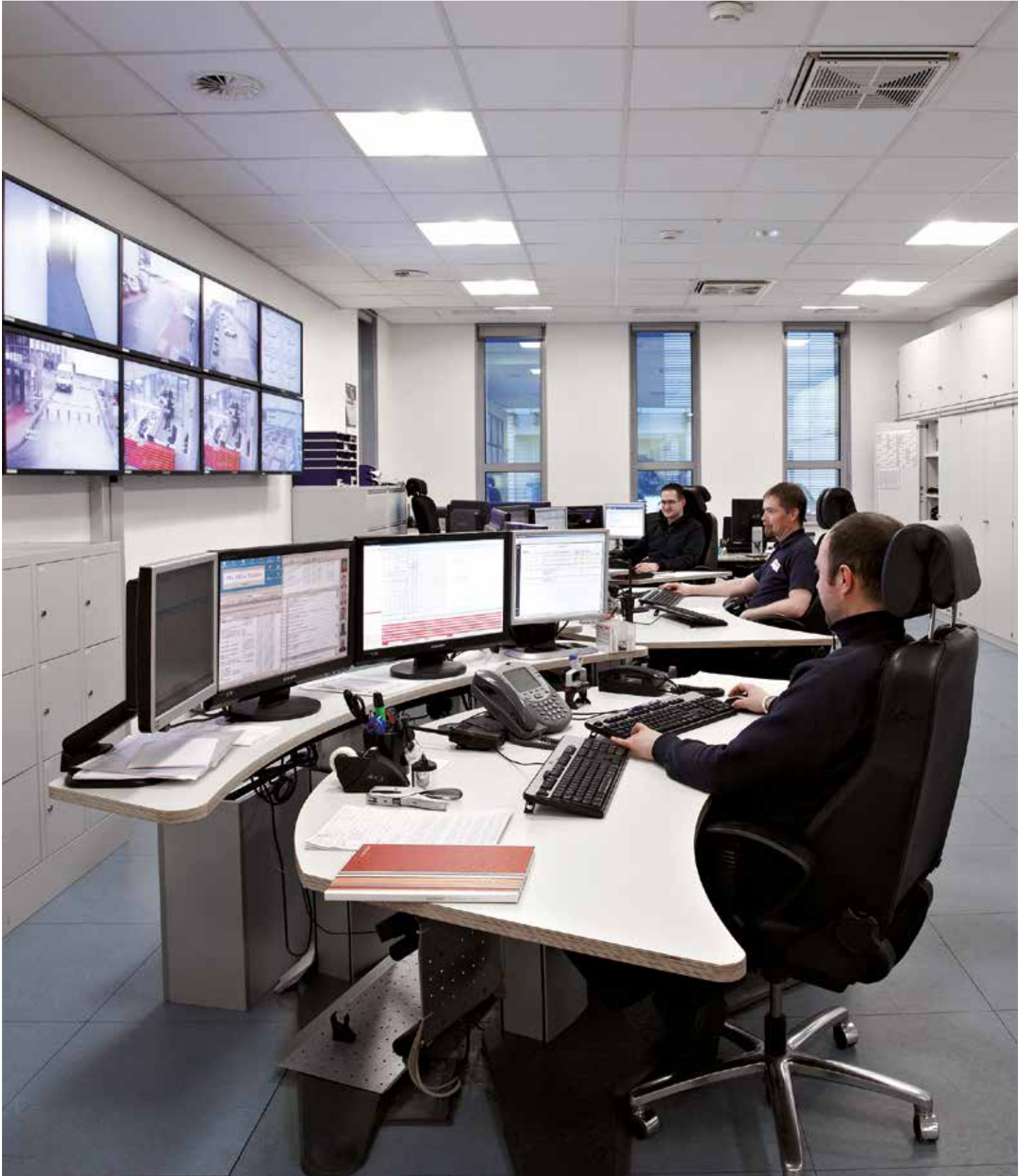
- Monitoring by e-shelter own 24/7 control centers
- Security staff from e-shelter security GmbH
- Redundant monitoring of all critical functions
- Risk management for all critical processes
- Four-eyes-principle for all critical and security relevant processes

PERFORMANCE FEATURES OF TECHNICAL OPERATIONS

- Standardized operation processes with amplified technical systems redundancy in order to ensure maximum reliability
- Preventive risk evaluation as well as continuous examinations and training of the e-shelter operations staff
- Monitoring of all critical breakdown infrastructure systems

PERFORMANCE FEATURES OF SECURITY

- e-shelter standardized security processes and a multi-level security concept secure the tenant's zone and the technical operations
- Integrated alarm management
- Consistently documented access management
- Access control via non-contact chip and PIN or optional biometrics signature
- Video surveillance of all access points
- Secured perimeter zones with electronically monitored security fencing system, incorporating anti-climb and anti-tunneling protection
- Vehicular access through hydraulic barrier system incorporating gates and barrier pass-through



Systems that You Can Count on

The technical infrastructure, particularly the power supply, is the heart of every data center. e-shelter has developed and implemented a comprehensive concept to ensure the highest degree of availability of the power supply facilities.

POWER SUPPLY

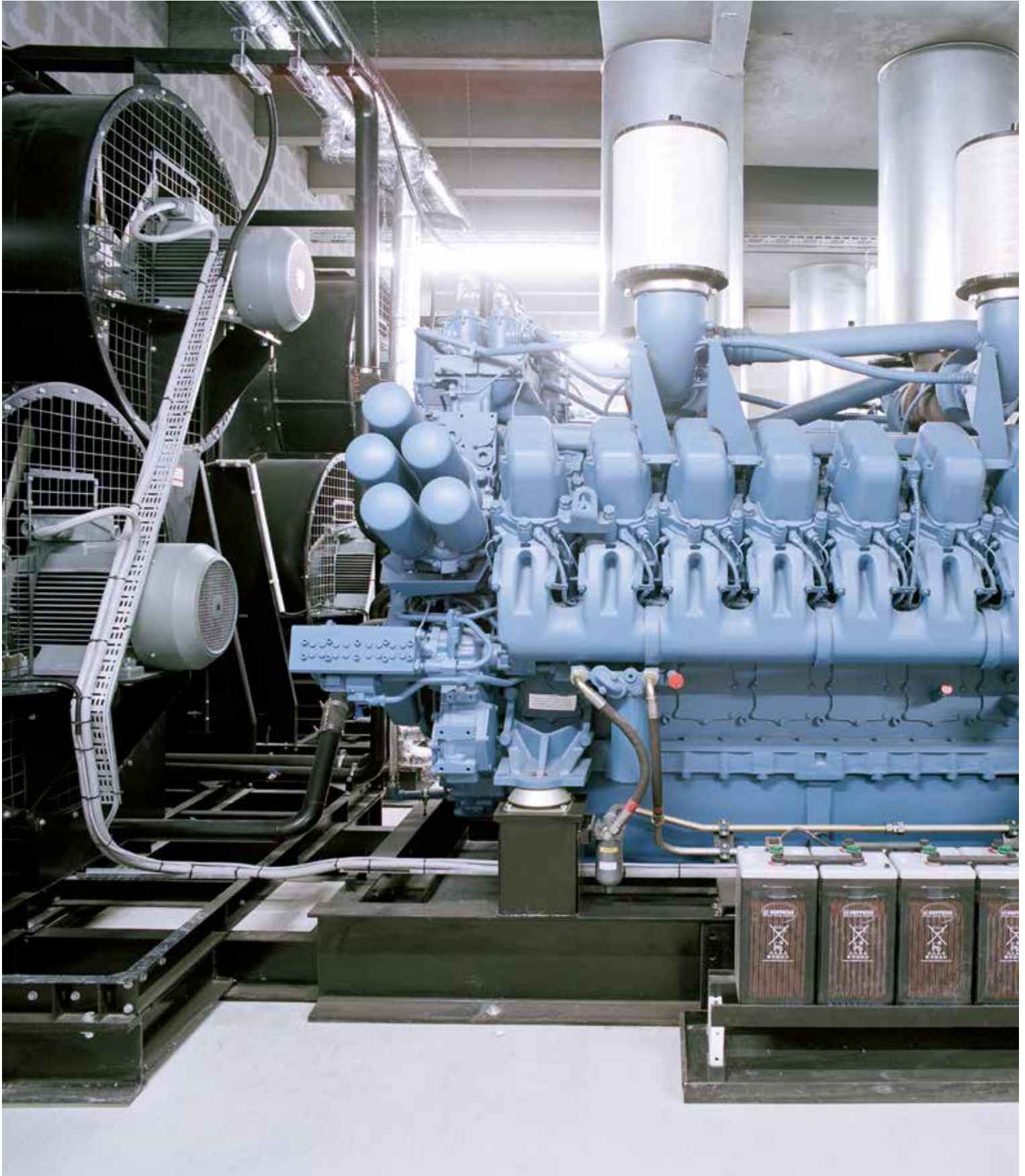
The entire power supply to the site is designed as a dual power and emergency power supply with uninterrupted A- and B-power supply for the tenants' IT systems and an additional redundant supply for all critical building engineering systems such as air-conditioning, cooling, ventilation and security systems.

Power supply takes place by two substation on 20 kV level. The power supply for the tenants' IT systems is ensured by an active A- and B-power supply from the substations server racks. Maximum reliability is guaranteed by providing A- and B-UPS-systems in 2n configuration. Both sides can therefore assume 100 percent of the load, independent of each other. All the critical building infrastructure systems are also based on UPS.

In addition, there are emergency power systems available with diesel generators to bridge any long-term power failures, which are designed in n+1 and take over the data center's entire supply. The diesel provision is designed for 72 hour autonomous operation.

Overall, the e-shelter power supply system meets all requirements of high availability:

- Power supply at 20 kV level from two substations from two separate feeds
- Two separate UPS systems (A- and B-supply)
- Redundant emergency power system with diesel generators



FIRE SAFETY AND FIRE EXTINGUISHING SYSTEMS

Physical fire protection, fire detection and fire extinguishing systems are designed for the greatest level of safety. For the interior configuration of the rental units, specialist non-combustible and/or fire-resistant materials were used only. The individual data center areas are divided into separate fire safety zones.

Comprehensive fire protection and fighting systems are installed in each tenant zone.

Early smoke detection systems (smoke extraction systems), which are integrated into the fire alarm system, guarantee the earliest possible detection even before fire and smoke fumes or fire develop. The fire fighting system is based on an argon gas extinguishing system.

The building fire zones are configured to fire resistance class F 90, and all technical hardware locations feature F 90 fire-fighting sections with fire protection walls to fire resistance class F 90. The rooms are monitored with automatic digital fire alarm system.

CARRIER CONNECTION

The e-shelter data center will be connected by at least ten carriers from several, redundant feeds. It has two Carrier-Meet-Me-Rooms (CMMR), from which you can use the services of the carrier of your choice. There is an intersection-free A- and B-duct system for fiber optic cabling on the premises and in the building. Cross connects from the carrier rooms to your equipment can be realized in accordance with your requirements via dedicated, redundant designed pipelines. Internet connections from 1 up to 10 Gbit/s can be provided as an additional service.



Cool and Ecological

Increasing energy costs and customer demand for high energy efficiency of the cooling and climate control infrastructure are the reasons why the optimization of these elements has become increasingly important – especially for facilities with a high level of availability. This is why e-shelter has developed new systems to save energy in the cooling systems. The programming of these systems are coordinated in-house to ensure high availability and optimal performance.

- Utilization of adaptive reciprocating chillers with superior control as “Cooling Manager”
- Innovative chilled water distribution and transport systems such as stratified storage tanks and special hydraulic points, pump management systems and automatically adjusted hydraulics
- Free cooling with integrated EC fans and own-programmed, weather-dependent energy management systems
- Peripheral ventilation and de-ventilation systems with energy-optimized operating points (rotation speed control, humidity-dependent control etc.)
- Peripheral humidifying and de-humidifying systems with low energy expenditure managing the humidity of IT areas
- Adiabatic support of cooling and air conditioning (humidification and condensation)
- Heat recovery for heating (pre-heating) the emergency standby power system, use of rainwater and chemical-free hot-water treatment of all air-conditioning units
- Own programming and visualisation of building management systems and electrical infrastructure to determine the detailed consumption data and the targeted energy management



A Solution for Every Requirement

Your requirements are the most important aspect of our service offering. We offer space that ranges from commercial property to completely configured, high availability data center space as well as all the services for planning, design, operation and security. You choose, we deliver. Whether you choose a building shell which you configure yourself, or which we configure according to your brief, or you decide on a fully configured suite with pre-installed racks: we will ensure the space is available to you on schedule and at consistently high standard of quality.

Overview of main e-shelter's product offerings:

Fully fitted:	e-rack™ e-power-rack	Separate space, Server and network cabinet including infrastructure
	e-cage™	Separate lockable space from 20 sqm
	e-suite	Separate locked room with a size from 300 sqm
Shell and Core:	e-area™	Provision of constructed shell and core space from 1,000 sqm
Land:	e-site	Provision of land with upstream grid connection and planning

e-rack™/e-power-rack

Lockable 19" standard server and network cabinet, 800 x 1,200 mm, 47 height units, including redundant power connection (A- and B-supply). Standard server power available from 2 to 6 kW per e-power-rack.

e-cage™

Lockable steel mesh security unit. The individual steel mesh units are equipped with sneak-by protection in the raised floor. Available space from 20 sqm to be built according to your individual needs and operated within a larger data center space with other e-cages™.

e-suite

Self-contained, locked and monitored space with an area from 300 sqm. Each e-suite represents a separate fire fighting section in the F 90 class. Layout, operational parameters and security features can be customized to your needs.



Good Reasons for Security with e-shelter

e-shelter currently employs over 350 staff. They are drawn from an exceptionally wide range of sectors and they all have one goal: finding the best possible solutions for your challenges at all times.

SUSTAINABILITY AND ENERGY EFFICIENCY

We continually strive to enhance the energy efficiency of our data centers. We gain the know-how to master these challenges from the empirical analyses of existing data centers. We familiarize ourselves with the latest technologies on the basis of a close collaboration with research institutes and industrial associations. We already use optimized and coordinated cooling technologies such as free cooling, newly developed high temperature heat pumps, adiabatic cooling and cold aisle containment systems. Exhaust heat is used to heat the adjacent buildings.

EXPERIENCE AND SUSTAINABILITY

With 15 years of experience operating data centers that run over approx. 90,000 sqm of space, our engineers have considerable experience in the development of new, and always more efficient, systems. You will benefit from the know-how and experience of our specialists: we plan, build and operate data centers using all of our energy and dedication.



Additional Services at the Datacenter Munich 2:

To ensure the on-time and cost-effective configuration of your rental units, and that your relocation proceeds smoothly, we offer you a range of additional services at our Datacenter Munich 2:

CONSTRUCTION OF DATA CENTER SPACE

- Consulting and analyses for development concepts
- General and execution planning
- Project management
- Construction work
- Quality control

TECHNICAL SERVICES

- Plan and optimize data center space
- Plan and realize data center moves
- Setup and development of tenants space
- Plan and execute data center moves
- Reporting and supporting audits
- Connection to internet and/or carrier of choice
- 24/7 remote hands services

SECURITY SERVICES

- Staffed security services
- Technical surveillance services
- Data medium services
- Development of customized security services

PROPERTY MANAGEMENT SERVICES

- Property maintenance and operation
- Building equipment maintenance group
- Cleaning services
- Waste disposal services
- Transport services



About e-shelter

e-shelter designs, builds and operates high-availability data centers, whose infrastructure guarantees the highest standards of physical security and operational reliability. e-shelter operates approximately 90,000 sqm of data center space, on eight sites. 60,000 sqm space alone are located at e-shelter's main site in Frankfurt, Germany, making it Europe's largest single data center site. Additional sites are located in Berlin, Frankfurt, Hamburg, Munich as well as in Zurich, and Vienna. Among e-shelter's clients are financial services companies, telecoms operators and IT service providers as well as cloud service providers.

As a part of NTT Communications Corporation e-shelter provides access to a network of 140 data centers around the world.

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The information in this brochure contains only general descriptions which may not apply for each individual case or may change as products and service levels are adapted to new technological development. The required service elements are only binding when explicitly stated in a service contract. Technical specifications may be subject to alterations.

05/2017

