



NUSANTARA

Nusantara Data Center Tech Landscape 2024

Deputy for Green and Digital Transformation,
Nusantara Capital City Authority

Smart City Investment Package
Nusantara Capital City Authority

Market Briefing, March 2024



Key Performance Indicator (KPI) IKN



Comfortable and Efficient through Technology

7.1 Achieve a very high ranking in the E-Government Development Index (EGDI) by the UN

7.2 100% digital and ICT connectivity for all residents and businesses

7.3 >75% Business Satisfaction with Digital Services rating

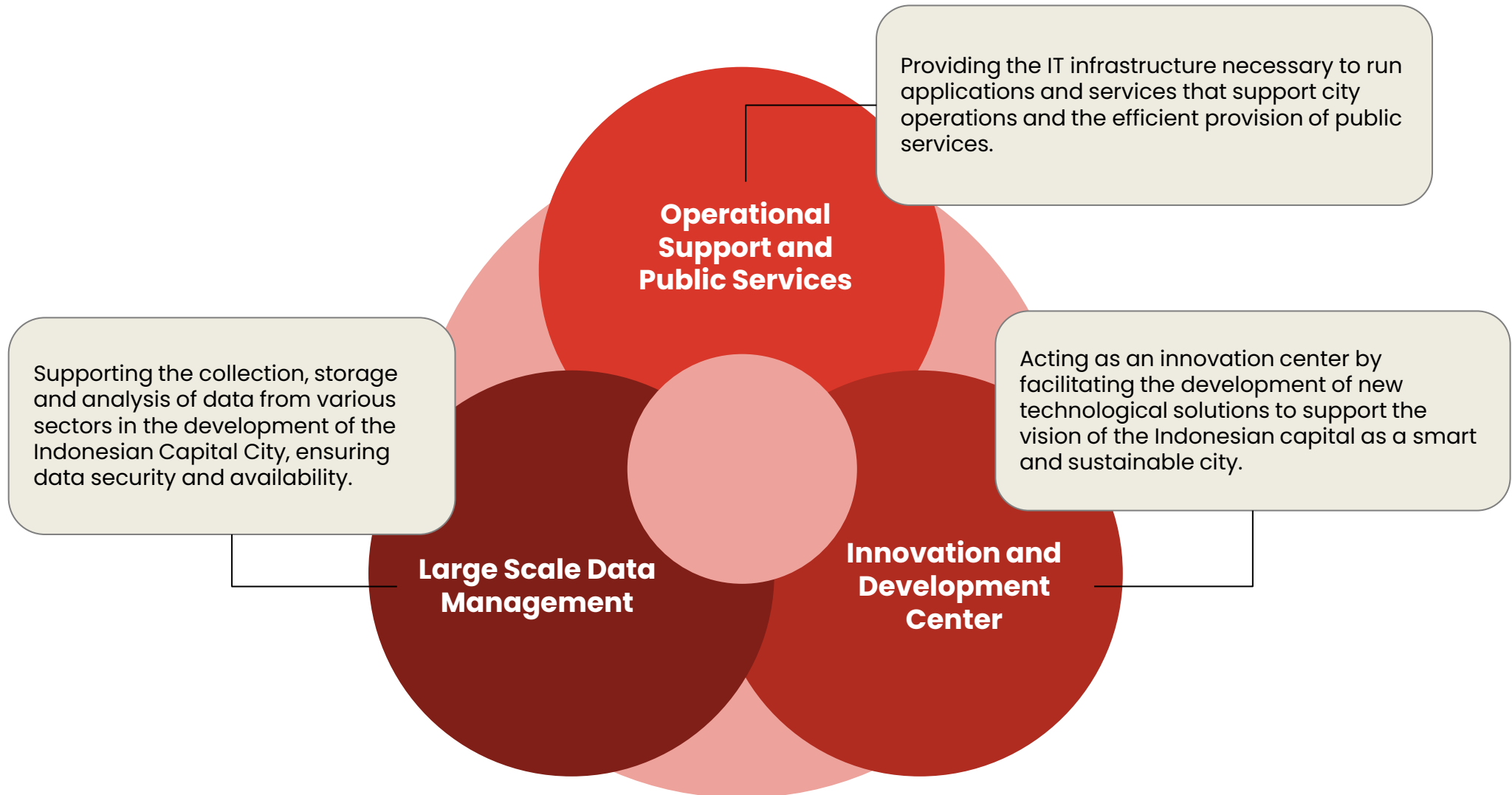


Objective of Market Briefing



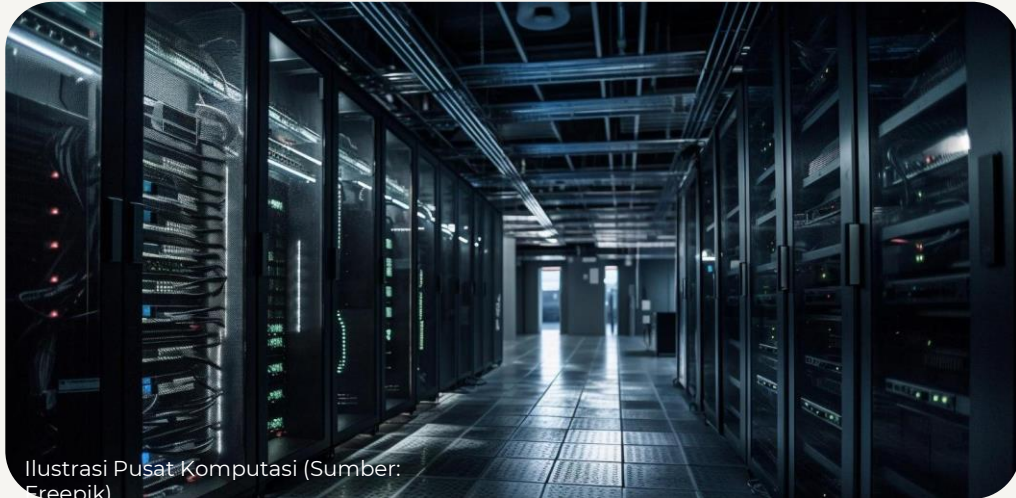
A Glimpse about Data Center

The Computing Center is a data storage and processing center that is vital for effective analysis and decision making within the development progress of IKN



Data Center Technologies

A computing center that provides all computing and storage needs for every technology supporting smart cities



Ilustrasi Pusat Komputasi (Sumber: Freepik)

Functionalities

1

Data Storage and Smart City Applications

2

Computing & Analytics (AI/ML, Big Data)

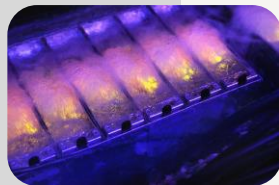
3

Low Latency IoT Processing

Concept

Green Data Center

- Immersion Cooling (>90% more energy efficient)
- Energy efficient computing architecture
- Use of renewable energy



High Tech

- Big Data
- Artificial Intelligence and Machine Learning
- Low Latency



Smart

Secure

Scalable

Modular

Tech Specs of Nusantara Data Center

Planning

Location	OIKN's Headquarter
Area	1650 m2 (2 floors)
Standard	Minimum Tier-3 TIA and SNI

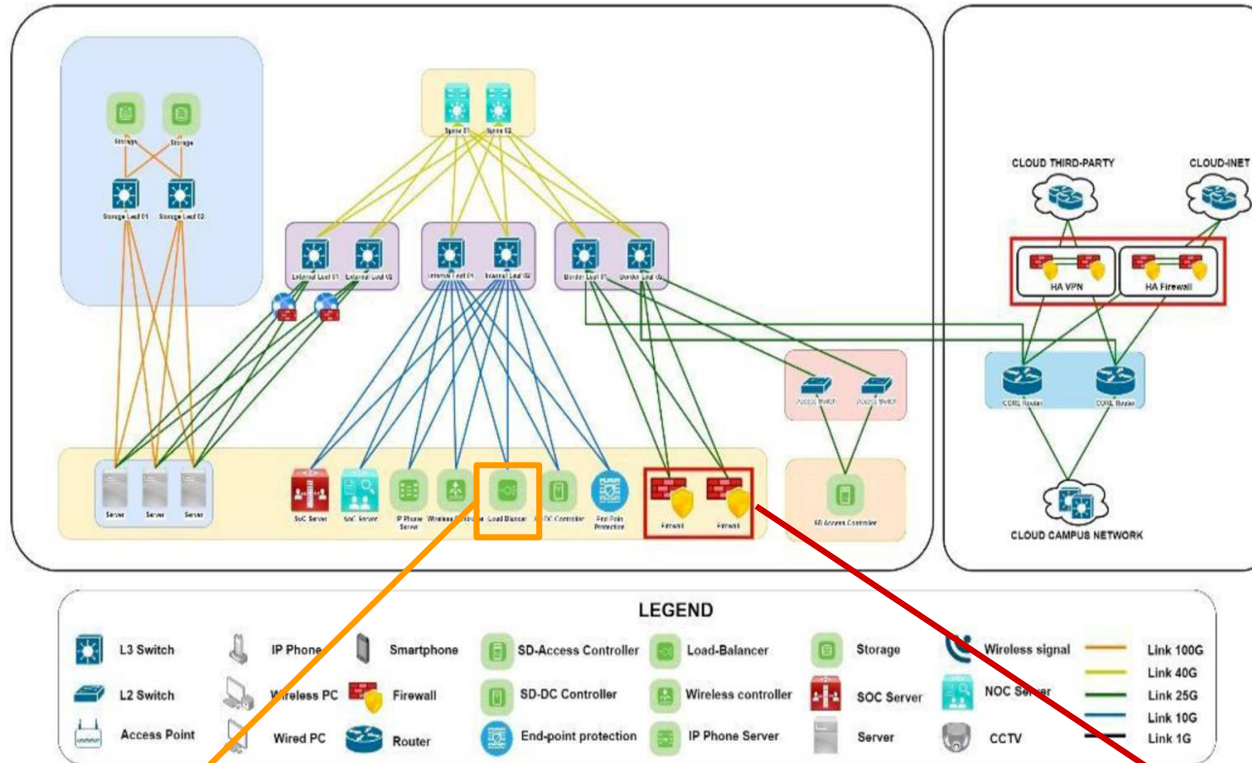
Estimated Capacity

CPU	Memory	Storage	GPU AI
10.000 Cores	78 Tera Byte	17 Peta Byte	76x Nvidia H100 80GB

Architecture Technology

Business Application	67 Smart Feature (Smart City Services) Smart Governance – Smart Transportation & Mobility – Smart Living – Smart Natural Resources & Energy – Smart Industry & Human Resource – Smart Built Environment & Infrastructure				
	App	AI/ML	Big Data	IoT	API
Platform Layer	Cloud Operation			Database	Security
Infrastructure Layer	CPU	GPU	Memori	Storage	Network

Computing Center Firewall & Load Balancer Design Criteria



Load Balancers can be deployed in the form of an appliance:

- Asymmetric Load feature
- Activity feature based on priority to distribute load.
- Protection feature from DDoS (Distributed Denial of Service) attacks.
- TCP Buffering feature.
- HTTP Caching feature.
- Content Filtering feature.
- HTTP Security feature.
- Priority Queuing feature
- Web Application Firewall (WAF) feature

The proposed solution should be in the leaders quadrant of the Gartner Magic Quadrant Enterprise Network Firewall in the last 3 years.

- Intruder Detection and Prevention System (IDPS)
- Anti-Spyware
- Botnet Detection
- Web/URL Filtering
- DNS Security
- Zero-day malware protection
- Application ID based filtering
- Threat Analyzer

Room and Area Requirements

#	Room Name	Total Room	Remarks	Metrics	Area (m2)	Total area (m2)
1	Main Distribution Area Room	1	1	room	50.00	50.00
2	Horizontal Distribution & Equipment Distribution Area Room	4	1	room	150.00	600.00
3	Network Operation Center dan HVAC Control	1	1	room	100.00	100.00
4	Staging and Testing Room	1	1	room	30.00	30.00
5	Access Entry Room	1	1	room	30.00	30.00
6	Telecommunication Room	1	1	room	30.00	30.00
7	Storage Room	2	1	room	30.00	60.00
8	Loading Dook	1	1	room	30.00	30.00
9	Electrician and Mechanics Room	1	1	room	40.00	40.00
10	Fire Extinguishment Room	1	1	room	50.00	50.00
11	Battery Room	1	1	room	50.00	50.00
12	UPS Room	1	1	room	100.00	100.00
13	Secondary Generator Room	1	1	room	100.00	100.00
14	Lobby and Inspection Room	1	1	room	50.00	50.00
		Total staff		Effective Area	Sub-Total	1320.00
				% Circulation + SP/ME	25%	330.00
				Total GFA		1650.00

Hardware Requirements (1/2)

No.	Deskripsi Item	Spesifikasi Umum	Volume	Satuan
A. Kelompok Perangkat Server Storage				
1	Server Kinerja Tinggi	Multi node Nvidia Grace Hopper Superchip 144 core dan Nvidia H100 80 Gb GPU, Memory 512 GB, 2xDual Port 100Gbe (total permode 4x100Gbe)Smartnic/DPU, 1xIPMI port gigabit Ethernet, 1xM.2 NVMe 480 GB for os, 2x1 gigabit ethernet 10/100/1000Mbps, 6x30T NVMe 32 Gbps	28	unit
2	Server Kinerja Menengah	ARM 2U, Dual CPU Ampere Altra Max 128 core, 2x GPU Nvidia H100 80 GB, Memory 2 TB, 4 X 30 TB NVMe, 2 x 480 GB M.2 NVMe for OS, 2xDPU 2x100 Gbps	24	unit
3	Server Kinerja Rendah (A)	Multi node with dual CPU @96 core, 512 GB RAM, 2xDual port 100GB, 2x 1GB, 2xM.2 480 GB storage, 2x 7,8 TB, NVMe 32 Gbps	12	unit
4	Server Kinerja Rendah (B)	Multi node with Dual CPU ARM Ampere @ 128GB, 512GB RAM, 2xDual port 100GB, 2x 1GB, 2x M.2 480 GB storage, 2x 7,8 TB, NVMe 32 Gbps	12	unit
5	Stroage Server	Single node Storage Server with 16 core 256 GB RAM, DPU 2xDual port 4x100 GBe, Redundant PSU dan GPU Raid Controller, 24 x 30 TB NVMe	12	unit
B. Kelompok Perangkat Network Security				
1	Spine Switch	Data Center Switch 64 x 100 GB QSFP28 and 16x400GBe	2	unit
2	Leaf Switch	1U Leaf Switch 32 Port 100 Gbps uplink 400 Gbps	50	unit
3	Firewall	Unified Firewall with max throughput 52Gbps, with 4x100 Gbps port,	2	unit
4	Core Router	Core Router with 12 port 1/10GE, 2 port 40/100GE	2	unit
5	Anti DDOS	Anti DDOS System Appliance	2	unit
6	Border Switch	1U Leaf Switch 32 Port 100 Gbps uplink 400 Gbps	4	unit
7	Load Balancer	minimal port 40 Gbps	2	unit
8	Management Switch (OOB)	48 x 1GBe with 10 GBe uplink with switch L3	15	unit

C. Kelompok perangkat tools Operasional dan Monev				
1	VMS	VMS Software for 50 Access Control Unit: - Dashboard Monitoring - Attendance Reporting - Passrecord Reporting - Log - Up to 100.000 User - Real time door status monitoring - Alarm door status monitoring - Email Notification - Telegram Notification - Whatsapp Notification - On Premise - Employee Administration - Visitor Administration - Support from Single Site to Multi Site/Branch - Remote Unlock - Elevator (Lift) add-ons included - Memiliki SDK / API - Dapat diakses melalui web - Memiliki kemampuan untuk running pada sistem operasi Linux/ Unix/ Windows/ MacOS	1	lot
2	DCIM	"DCIM Asset Management & Rack Monitoring dengan kapasitas maksimum sampai 22 Rack a) General • All data center physical assets and their configuration • Maintenance/lease information • Add unlimited Custom Fields • Available power, space, network ports, and power connectors • Search for and reserve capacity • Find stranded power, space, and cooling capacity b) Change Management • Workflow for change requests • Request approvals, status, and history • Connect to ticketing system c) Connectivity • Build power and data circuits, including structured cabling • Visual trace routes of port-level power and network paths d) 3D Visualization • 3D color-coded, floor map overlays show power, cooling, and capacity data • Drilldown from floor map view to contents inside cabinets e) BI & Analytics • Over 80 preconfigured chart widgets • Filter, print, and export raw data to CSV and PDF • Support for custom SQL and HTML widgets f) Ticketing Management • Connect to VMS • Memiliki Dual Power Input Redundancy • Memiliki Dual Active Redundant Ethernet Ports • Memiliki High-Resolution Color Display • Mendukung sampai dengan 200 Sensor • Mendukung Sensor Temperature, Humidity, Air Flow, Air Pressure, Water Leak, Dry Contact Closure (e.g. Door, Smoke, Status, Switch, Relay, etc.), Vibration, Proximity • Mendukung USB Camera yang dapat melakukan Alarm Image Capture • Mendukung Access Control menggunakan Smart Lock, Handles, Card Readers, Keypad • Mendukung protokol komunikasi SNMP, BACNet, Modbus • Unlimited user accounts • LDAP dan Active Directory integration • Dukungan vendor agnostic untuk semua perangkat yang dimonitoring	1	lot

Hardware Requirements (2/2)

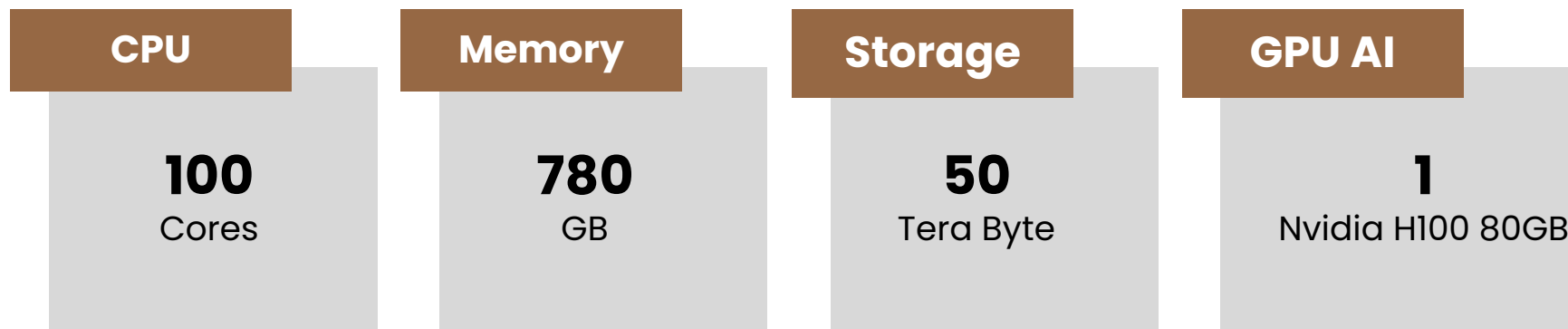
D. Kelompok Perangkat Mekanikal				
1	Dry Cooler / Radiator	Radiator Pipa Controller Fan Aksesoris	1	lot
2	Condenser Air Cooled Chiller		1	lot
3	FCU	Kapasitas 5 kW , ESP 50Pa	10	unit
E. Kelompok Perangkat Elektrikal				
2	Genset 300 kVA	Silent Type 380/220Volt 50Hz 1500 rpm 4 Stroke	3	unit
4	Trafo 630 kVA	Dry type enclosure Up to 36 kV	1	unit
5	Panel ATS	Breaker 630 A (3 unit)	4	unit
6	Panel MV MDP	Incoming CB cubicle Arrester Cubicle Outgoing Cubicle	1	unit
7	Panel LV MDP	Breaker 63 A (1 unit) Breaker 160 A (1 unit) Breaker 400 A (3 unit)	4	unit
8	Panel Synchron	Breaker 630 A (9 unit)	1	unit
9	Panel PKG	Breaker 630 A (2 unit)	3	unit
10	Panel I/O UPS (1A & 1B)	Breaker 100 A (1 unit) Breaker 160 A (2 unit) Breaker 400 A (1 unit)	4	unit
11	Panel PDU Immersion	Breaker 63 A (3 unit) Breaker 250 A (1 unit)	4	unit
12	UPS modular 250 kVA + Baterai	40Hz to 70Hz 380V/ 400V/ 415V, 3 phase + N IP42 <95% non-condensing	2	unit
13	UPS 10 kVA	Spesifikasi pada UPS 10 kVA Frequency Range 40Hz - 70Hz input current 57A max input connection terminal block backup time >5 mins Rated Frequency 50Hz / 60Hz ±0.5% Input & output 380/400/415Vac Include internal battery 1Ph in - 1Ph out	1	Unit
14	AHF (125 A)	- 125 A - AHF 100 A x 2 set - cabinet top entry z 1 set - HMI 7 inch	6	unit
15	Kabel dan atau bus way		1	lot

F. Kelompok Perangkat Keamanan dan Elektronik				
1	CCTV LT 1 + LT 2	IP Dome Camera CCTV 2MP dilengkapi Infrared tipe Indoor, 25 FPS Patch Panel 24 Port, blank include cableing	41	unit
2	NVR	NVR 32 channel + HDD (perekaman 90 hari)	2	unit
3	Access Door LT 1 + LT 2	Access control system yang digunakan minimal mampu menggunakan Face Recognition, Finger Print, CARD Exit button yang digunakan merupakan tipe touchless Memiliki kunci elektromagnetic bisa menggunakan tipe magnetic lock atau drop bolt lock menyesuaikan kondisi pintu Memiliki alarm/horn jika pintu terbuka lama Menyediakan SDK/ API	22	unit
4	PoE Switch	Akses Switch POE 24 port untuk CCTV & Access door, included SFP & cofiguration	2	unit
5	Wallmount Rack	Wallmount Rack 12U, Include 1 Horizontal PDU 6 Outlet, Fan, cable management & Accessories lainnya	2	unit
6	Wall Display	3x3 video wall 55 inch Controller Breaket	1	lot
G. Rack / Tanki				
1	Immersion Tank 25 U	- Tank 25 U - CDU - Liquid	12	unit
2	RDHx	- Rack - RCU - CCB - Piping	1	lot
3	Rack 42 U	- 19"Close rack 42U Depth 1100 mm - 1 pcs Perforated Front Door with Swing Handel lock - 2 pcs Perforated Rear Door with Swing Handel lock - PDU Standard PDU with 12 Outlet of IEC320 (12xC13) digital meter 32 A	2	unit
4	Wall mount rack 8U		2	unit
5	Sistem bahan bakar Genset	- Tanki Solar 500 liter - Valve - Pipa - Dudukan - Panel Konstrol - Solar 350 liter	2	sistem

Proof of Concept Requirements

PoC System Functional Requirements

Data Center Cloud Management Platform with 1% from Ultimate Computation Resources



Main Indicators for Data Center Cloud Management Platform





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