SafeDX

Company Profile

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SafeDX Introduction

Prague Data Center Overview

Key features

- Site: Prague, Czech Republic
- Built according to Tier III standard
- RC3 security according to EN 1627:2011 standard
- Total capacity: 200+ racks
- 4 independent data halls
- 12 PODs (cold aisles)
- Floor bearing capacity: 2000 kg/1 m²
- Environmentally friendly building (PUE 1,35)
- 99.982% planned availability

Facility security

- Security perimeter – 3.3m fence with barbed wire and infrared detection
- Surveillance camera system both inside and outside the building
- Section doors secured using PIN and biometric readers
- Building intrusion detection systems
- 24/7 physical protection by a professional security agency

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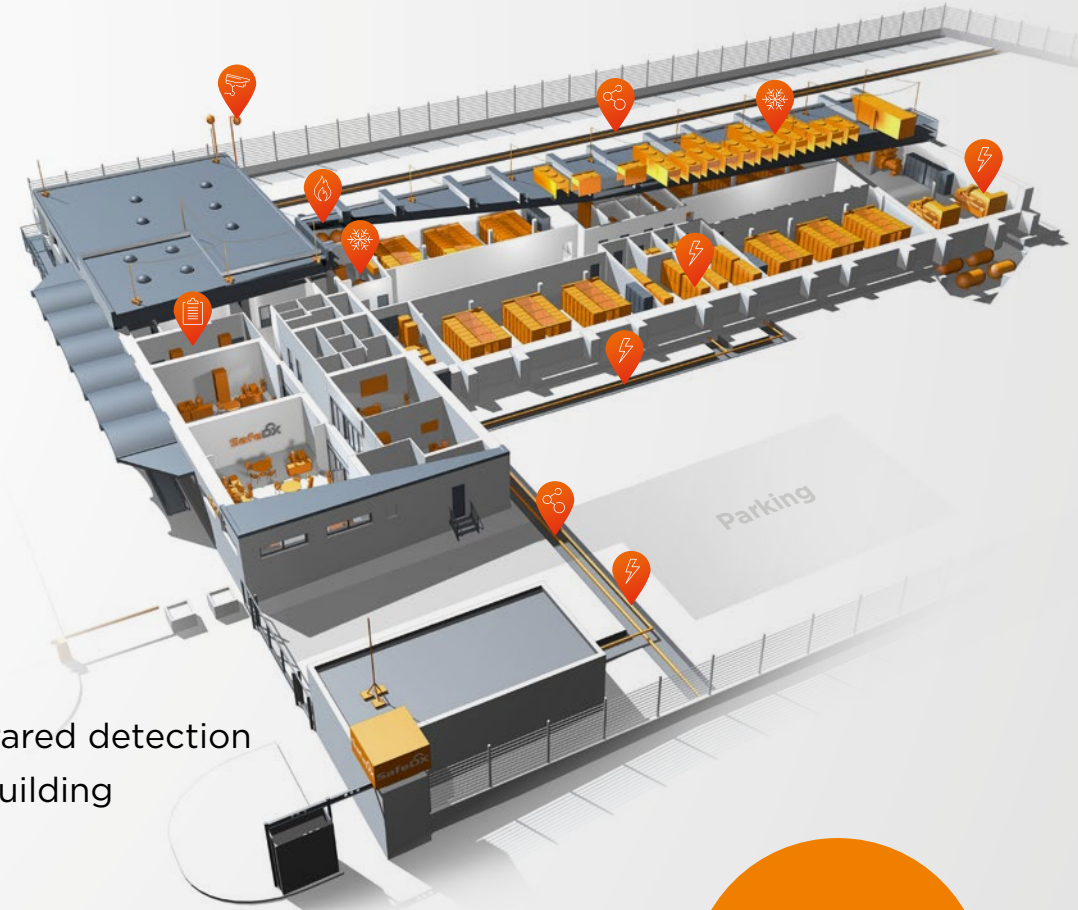
Prague Data Center Overview

❄ Cooling

- N+1 redundancy
- Twin floors and covered cold aisles
- Relative humidity: 0% to 60%
- Temperature: 20-24°C
- Unit power up to 12 kW/rack
- DX direct cooling
- Free cooling on days with lower outdoor temperatures

Data connectivity

- CETIN, ČDT and T-Mobile redundant optical connectivity
- Two independent internet nodes connectivity – CeColo and TTC
- IP interconnect with COGENT and CETIN
- DDoS protection of the data center connectivity
- Connection provider neutrality

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Prague Data Center Overview

⚡ Power supply

- Multi-Feed – 4 independent power supply branches with separate backup UPSs and diesel generators to ensure uninterrupted operations
- Total allocated power 3 MW
- The data center is powered from two directions
- 4x 1250-kVA transformers
- UPS performance 4x 600 kW
- 4x 1206-kVA backup generators covering 12 hours of operation for the entire data center

🔥 Fireproofing

- Electronic fire protection system
- Optical/thermal fire sensors
- Divided in 6 fire sections and 8 extinguishing sections
- Laser-based smoke suction detectors
- Stable fire-extinguishing system based on inert gas
- 60-minute fire resistance of each section

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SafeDX as Intel EMEA RSD Demo Zone

- SafeDX deploying a **cluster of Intel Rack Scale Design** racks using Foxconn HW in Prague DC

- Adopting **Software-defined Data Center architecture**

- Looking for partners that can benefit from this innovation

- **Wholesale Cloud Services** offering

Connectivity Services to Asia

- Connection established from Prague DC to Hong Kong

- Cooperation with China Telecom and Foxconn for coverage of Asian locations

- Local DC connectivity sharing DataSpring architecture

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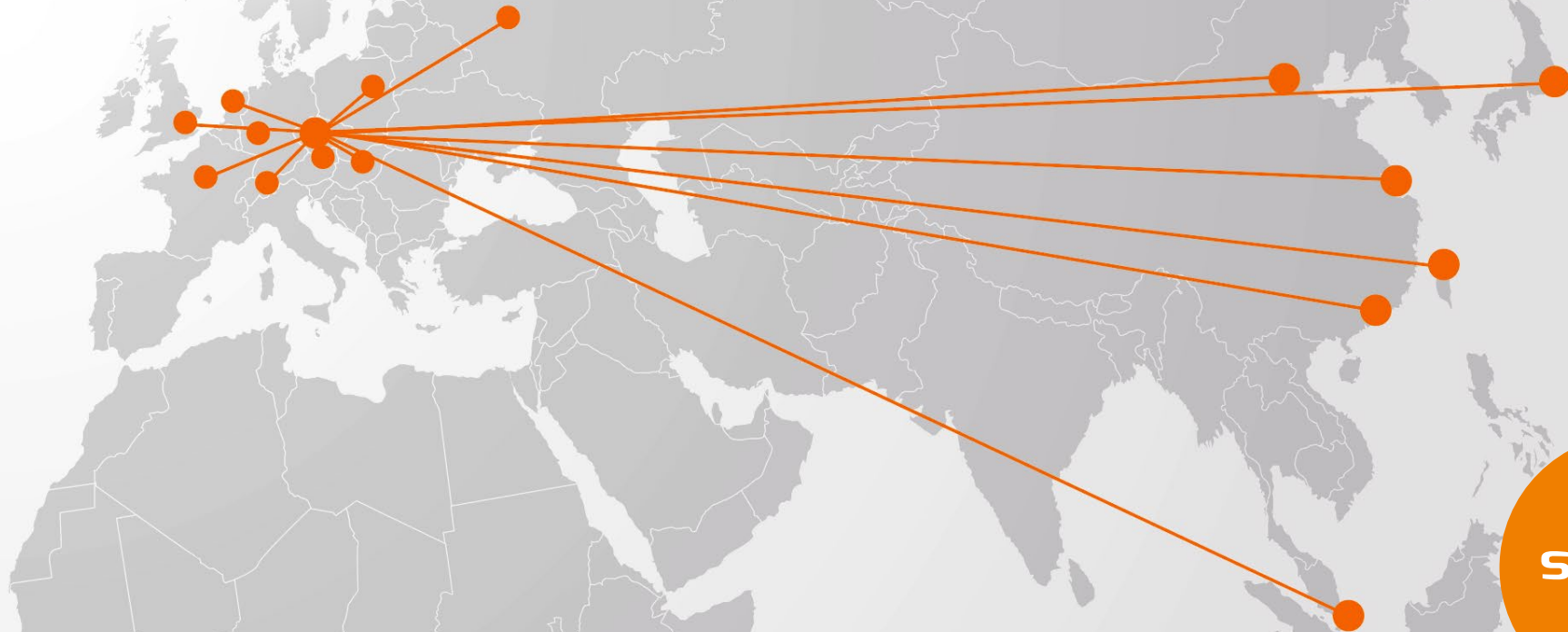
Wholesale Cloud Services

Value Proposition to Partners

- Competitive price/performance ratio

- Quick Time to market

- Flexibility

Service Options

- Rack housing

- Connectivity

- Dedicated physical servers

- OpenStack platform to provision virtual network, servers and storage

- Customisation of HW configuration (RAM, HDD, GPU expansion)

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Inovative technology

Foxconn® R-5211 2U Purley Server

System

Chassis	2U server
Dimensions	711x446x87mm
Max Weight	30 kg

Storage

Front	24x 2.5" SATA/SASHDD
	24x NVME U.2 SSD
Rear	2x 2.5" SATA/SAS/NVME
Internal	2x SATA M.2 2280 slot

Expandability

PCIe slots	1xLow Profile,PCIe3.0 x16
	2xFHFL, PCIe 3.0 x16
	2xFHFL, PCIe 3.0 x8
	2xSATA M.2 2280

Processor/Chipset

Processor	Intel Xeon Gold 5120
Socket	LGA 3647
Design Power	205 W Max
Chipset	Intel PCH C622

Memory

Quantity	24x DIMM slots
Type/Speed	DIMM DDR4-2666MHz/
	24000MHz
Capacity	Up to 768 GB
ECC	Support

Networking

Main	2x1G RJ45; 2x10G SFP+.
	Support PXE, WOL.
	Support shared NIC
IPMI	1x Independent RJ45, 1G

BIOS and Firmware

BIOS	Customized AMI UEFI BIOS
BMC	IPMI 2.0, Support Virtual Media and KVM over IP functions. Monitor input voltage of CPU/DIMM/chipset, fan speed and temperatures of system/CPU/DIMM
TPM	Support TPM 2.0 on board solution

Power

Type	HVDC PSU, 100-240VAC 50/60Hz, &240VDC support PMBus 1.2
Rating	550W/800W/1300W

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Intel® Rack Scale Design v2.2

Advantages

- Single source of data for servers monitoring

- Rack based data for asset management

- Real-time data for cooling adjustment

PSME
Pooled System Management Engine) fully describes all disaggregated components in its domain.

RMM
Describes Rack Level specific data for Power & Thermal Zones.

POD Manager
assembles and configures pooled assets within a POD.
Racks drawers, sleds, components and infrastructure.

Cloud or Data Center Manager

ISV/OSV/DIY

RSD POD Management API

POD Manager Functionality

RSD POD Manager – Foundation Services

Redfish   RSD PSME FW API   Redfish

PSME Compute	PSME Network	PSME Storage	RMM
PSME common code	PSME common code	PSME common code	PSME common code

Generic Assets Mgmt Interface (JSON-RPC)   RMM Interface (JSON-RPC)

Mgmt Drvrs ▶

| IPMI | SPMF | SNMP | Netlink /NOS | Stg Svc | PCIe Stg | PMBUS /PWR/ FAN | IPMI/ Serial |

| Compute Assets | Network Assets | Storage Assets | Rack Assets |

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Connectivity

- High availability of local and international connectivity. Georedundancy, carrier neutrality.

- 3 physically independent fiber pathways into the building

- Provider of public IP adresses

Praha

Lužice

NIX·CZ

| Telehouse 1 TTC Teleport | 10 Gbit/s | Telehouse 2 CE Colo |

1 Gbit/s
10 Gbit/s
10 Gbit/s
1 Gbit/s
10 Gbit/s
10 Gbit/s
10 Gbit/s
10 Gbit/s
10 Gbit/s
10 Gbit/s
10 Gbit/s

DC Praha

DC Lužice

CISCO

f5

F⊖RTINET

DDoS
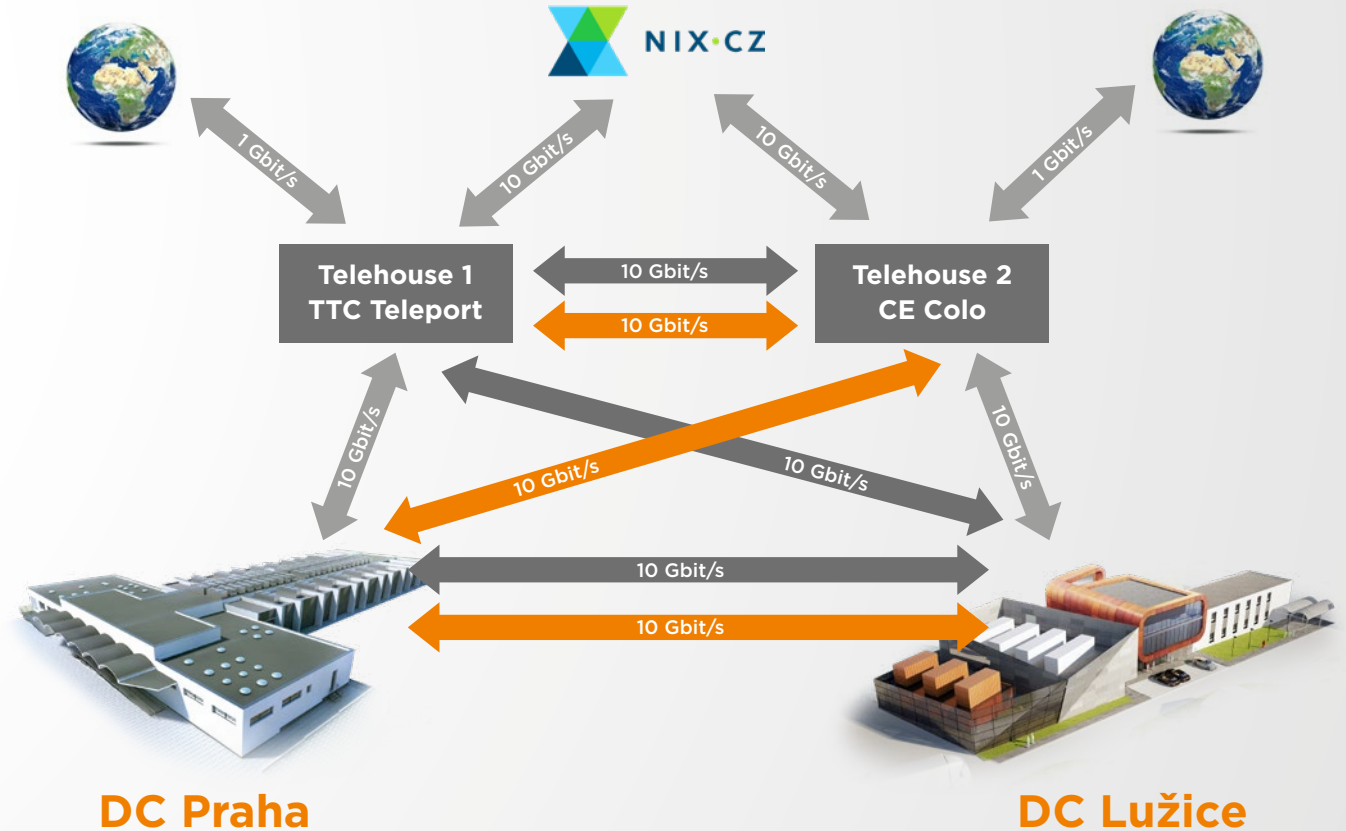
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LAN Topology

- Fast network with Spine-leaf architecture allows scalability and readiness for High Performance Computing

- Indipendent network for servers management and provisioning

100Gb Spine   **10Gb Management Aggregation**

100Gb   100Gb   10Gb   10Gb

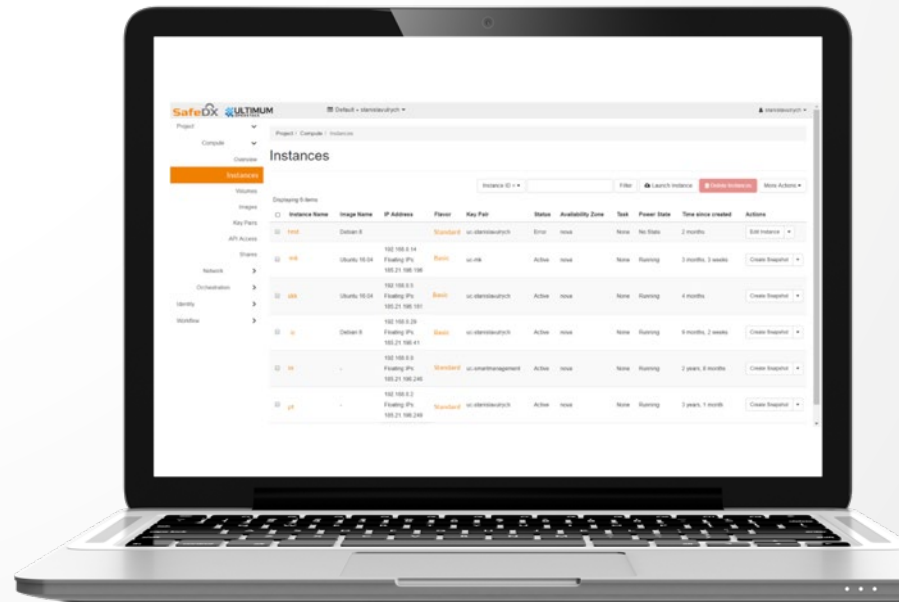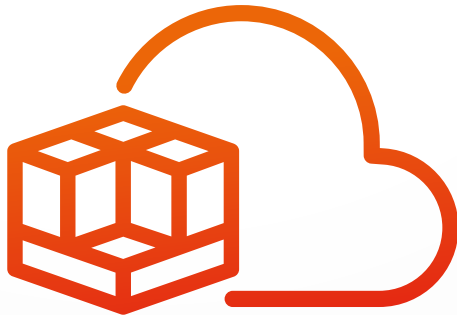**25Gb Leaf**   **Border stack**   **1Gb Management**
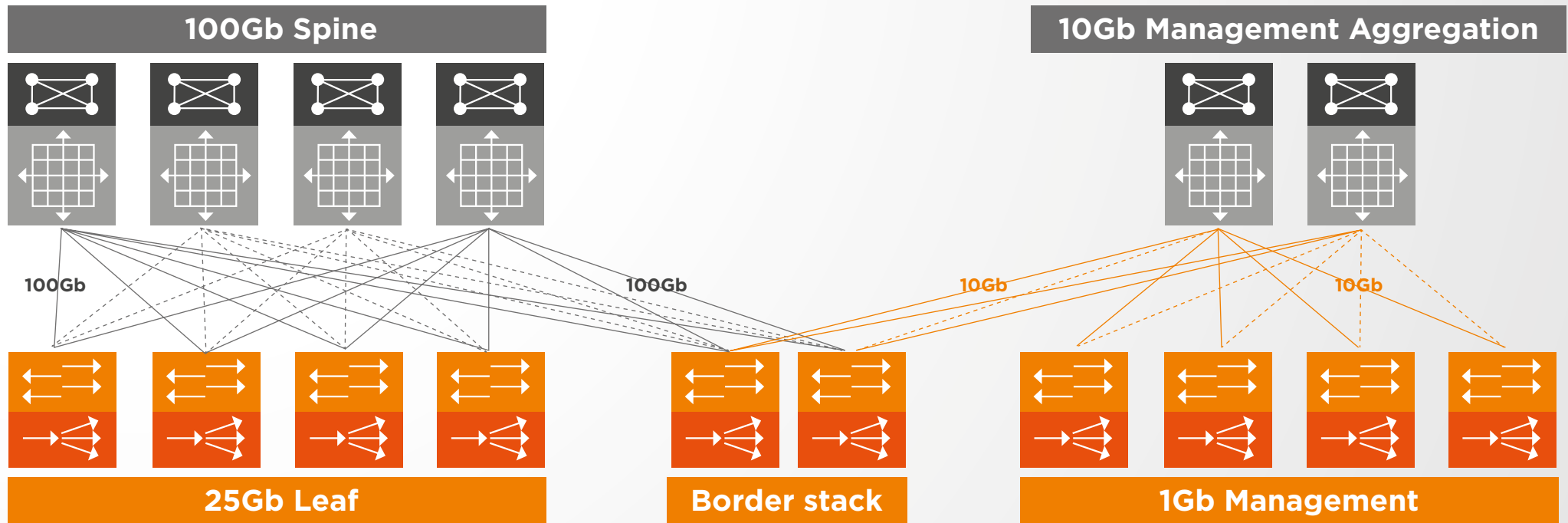
SafeDX Services

Software Defined Data Center

- Brings benefits of Software Defined Infrastructure
- Not chained by licensing building OpenSystems environment
- Uses Intel Xeon Gold Scalable processors to cover performance-sensitive requirements
- Large scale, wholesale cloud concept
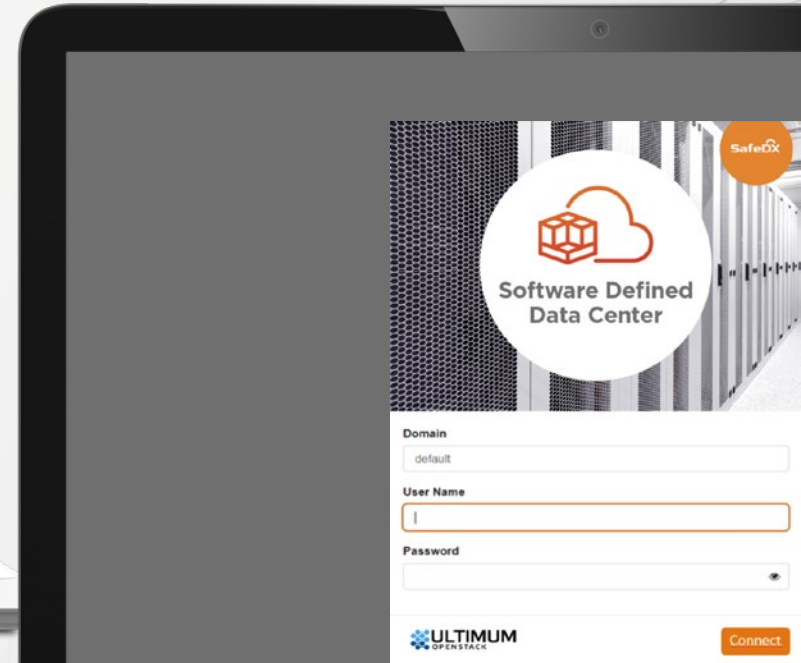
OpenStack platform distribution

Platform certified by OpenStack Foundation*

- OpenStack Powered Platform 2017.09 certification
- Guarantee of compatibility with other certified platforms
- Verified security patches
- Verified OpenStack functionality completeness
- OpenStack source code contribution**
- OpenStack release used: Qeens

Active contribution to Debian packaging

- https://ultimum.io/services/repositories/

Used OpenStack projects

Orchestration

Heat
Orchestration Service

Mistral
Workflow Service

Watcher
Optimization Service

Murano
Application catalogue

Verification

Congress
Policy

Vitrage
Root Cause Analysis

Containers

Zun
Policy

Magnum
Container orchestrat.

Infrastructure

Nova
Compute Service

Neutron
Software define network

Cinder
Block storage

Manila
Shared Filesystems

Swift
Object Storage

Ironic
Bare met. server prov.

Designate
DNS as a service

Shared Services

Keystone
Identity Service

Glance
Image service / snapshot

Ceilometer
Usage data & reporting

Horizon
Web dashboard

Monasca
Monasca Monitoring as a service

Freezer
Backup as a service

Services

Virtual servers and containers

- Large selection of supported OS including Windows Server, CentOS, Ubuntu - 3 versions back
- Docker containers

docker   CentOS   ubuntu

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Services

Software Defined Storage

- File Storage
- Block Storage
- Distributed storage space for higher security and performance
- Data blocks triplication using CEPH

Services

Software Defined Networking

- vFW (iptables)
- VPN (strongswan)
- Load Balancer (haproxy)
- VRouters
- Floating IP
- Multiple private IP ranges

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Benefits

Flexibility

- Automation of environment creation using pre-defined orchestration templates.
- Wide range of integration and customization options
- Unified API and user environment interface
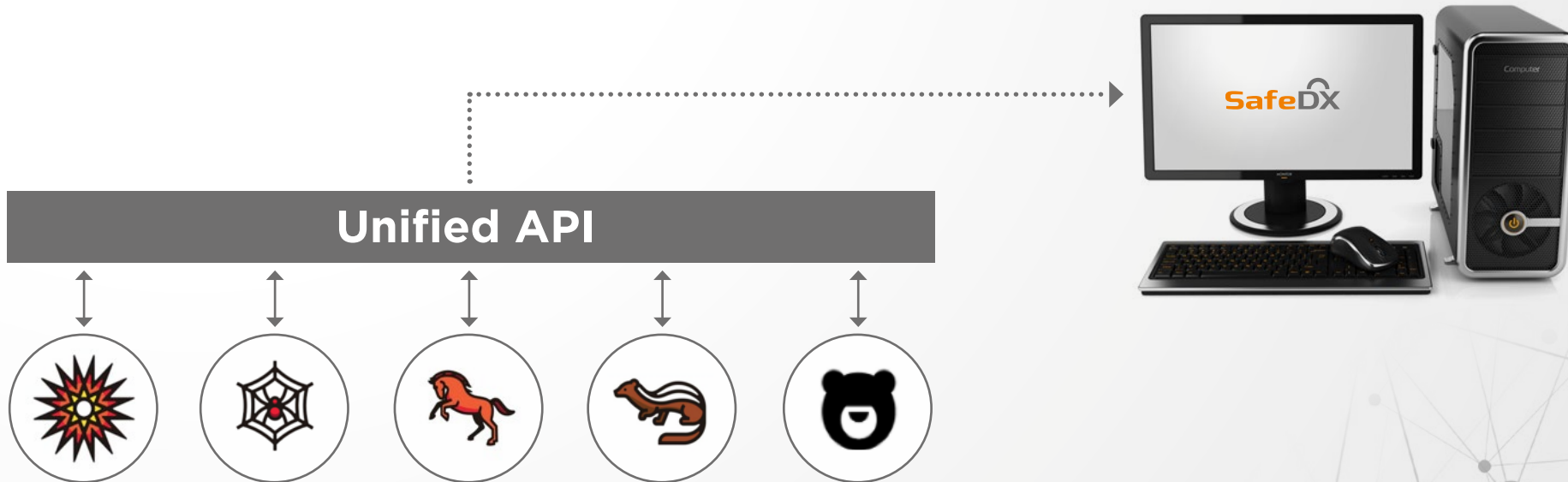
Benefits

High Performance and Capacity

- Service runs on a homogenous cluster containing 250+ physical servers with **7000+ physical cores, 90+ TB RAM and Petabytes of usable storage space**

- Powered by **Intel Xeon Gold Scalable** processors with **AVX-512** instruction set supporting up to **2x FLOPS per core** per cycle

- Performance boost options using add-in datacenter GPUs.

- Expansion options for extreme capacity storage – up to dozens of Petabytes.

intel® **XEON** **GOLD** inside™

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Service Models

	Private Cloud*	Public Cloud Dedicated*	Public Cloud Shared**
Service management			
User account management	■	■	■
User access management	■	■	■
User account management	■	■	■
User access management	■	■	■
User account management	■	■	■
User access management	■	■	■
User account management	■	■	■
User access management	■	■	■
Performance			
vCPU performance guarantee	yes	yes	no
IOPS guarantee	yes	no	no
Customization			
User authentication with customer LDAP or AD	■	■	■
Whitelabeling (dashboard, login portal)	❑	■	■
User authentication with customer LDAP or AD	■	■	■
Whitelabeling (dashboard, login portal)	❑	■	■
User authentication with customer LDAP or AD	■	■	■
Whitelabeling (dashboard, login portal)	❑	■	■
Terms and Conditions			
Minimal time commitment	yes	yes	no
Pay-as-you-go (On-Demand)	no	no	yes

■ Client

■ SafeDX

❑ Optional

* Project pricing

** Standard price list

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Rack Housing

- Secure rack housing in a state of the art Tier III compliant, provider neutral data center in Prague (99,982% DC availability), trusted by renown foreign clients working in the banking area.

- Highly reliable N+1 redundant non-IT technologies, 4x data halls and a total capacity of 192 racks.

- Premium lockable Conteg 48U 19" racks in 600x1200mm or 800x1200mm width. Racks installed in lockable (personal entry card) PODs with cold and warm aisles. Power from 4KW as standard, and up to 11KW per rack.

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