SIM NETWORKS A DIVISION OF Netversor

Case studies

Practical cases from real world scenarios

Let’s Get Started

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Remote office for a business

Setting up remote access to a terminal server in the cloud IaaS. Cloud data storage deployment

Remote office for a business

Customer’s requirements

- **to build an IT infrastructure with a minimal budget for a company with 40 employees;**
- **to design low-cost and compact employee workstations;**
- **to provide employees with access to the network using mobile devices.**

Project requirements

The client’s main goal is to organize work using a terminal connection to the cloud so that all information is stored remotely.

User applications must run on the server in the provider’s data center. There shouldn't be any storage (disks and other drives) that contain work documents and archives in the company’s office.

Employees' computers must operate using remote access to the terminal server.

Project implementation

The company’s local network is designed with consideration of the bandwidth requirements and the limited budget:

1. Passive network hardware:

- 100 Mbit/s Structured Cabling System:
- 6U server cabinet;
- 48 ports patch panel (one link per user);
- single module sockets and patch cords for each user (total cable length 960 m).

2. Active network hardware:

- one unmanaged switch with 48 ports;
- MikroTik RB2011UIAS-RM router;
- wireless Wi-Fi access point for personal user devices MikroTik cAP (RBcAP2nD).

Remote office for a business

Project implementation

Employee workplaces are equipped with microcomputers – diskless thin clients, standard peripherals and 19” monitors:

- a thin client (Raspberry Pi 3B single board microcomputer in a compact plastic case Raspberry Pi 3B+/3B/2B);
- HDMI signal cable:
- 2Gb micro USB memory card;
- HDMI/D-SUB adapter;
- hardware peripherals: wireless keyboard/mouse kit:
- monitors: affordable Philips 193V5LSB2/10.

Server:

- server rental with the required resource capacity.

Remote office for a business

Project Summary

The entire office infrastructure for 40 employees was created and put into operation in 5 work days.

The infrastructure was built with minimal expenses: the implementation of diskless thin clients allowed the company to reduce the cost of workplaces by 3 times, compared to the cost of an ordinary office computer.

The thin client does not contain any parts that may wear out, such as disks, ventilation systems, power supplies etc. **This eliminates the need for updating personal computers every 3-5 years.** This way, the client saves on workplace maintenance.

The terminal cloud server provides employees with a familiar working environment. Access to the server from any place in the world makes it possible to work remotely.

Thanks to the implementation of a terminal connection system, **there is no longer a need to purchase licenses for office software and operating systems** (MS Windows).

The configuration described in this case will be interesting for small companies with a limited budget.

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High-performance cloud solution

We moved the client’s infrastructure to the cloud to the cloud for higher performance and data protection and set up BaaS Remote

High-performance cloud solution

Customer’s requirements

- **to transfer corporate services to the cloud to increase performance:**
- **to guarantee scalability options:**
- **to organize backups;**
- **to ensure that systems comply with modern data security requirements;**
- **to increase the availability of the mail server.**

Project requirements

The company's staff consists of more than 40 employees, whose infrastructure in based two outdated physical servers.

The client has a few basic corporate services: ERP, corporate email and file sharing server.

In order to create virtual machines on a physical server, we used a high-tech VMware ESXi hardware hypervisor.

The resource pool in the cloud should consist of specialized powerful server hardware with high workloads.

Project implementation

We suggested that the client deploy 5 virtual machines on the Windows Server 2016 platform:

- domain controller for users and access rights management:
- database server on MS SQL 2016 + ERP server;
- terminal server for the ERP client;
- access to files and work with Microsoft Office 2016;
- file server for folder structure organization and file storage;
- Microsoft Exchange 2016 mail server for corporate mail and calendar maintenance.

High-performance cloud solution

Project implementation

Hardware configuration of the cloud solution:

Server role	SATA volume	SSD volume	RAM	CPU
Domain controller Active Directory	50 GB	0 GB	4 GB	1 Core 3.6 GHz
Terminal server	200 GB	60 GB	48 GB	8 Core 3.6 GHz
Database server	0 GB	150 GB	16 GB	4 Core 3.6 GHz
File server	400 GB	0 GB	4 GB	1 Core 3.6 GHz
Mail server	300 GB	0 GB	16 GB	4 Core 3.6 GHz

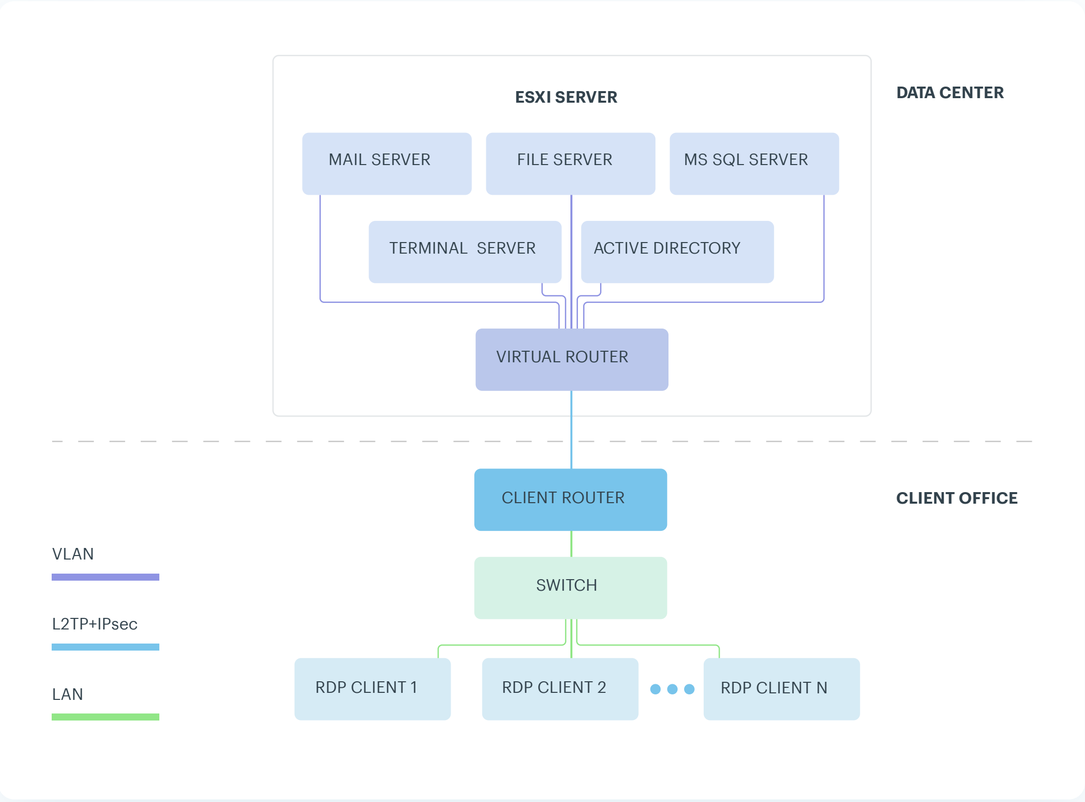
All virtual machines are located in the same local network. Access to servers from the office is accomplished using a secure encrypted VPN tunnel which uses L2TP + IPsec technology. The tunnel connects the company’s router (network router) and the cloud router. External connections are available through the client’s VPN connections (also L2TP + IPsec).

The terminal server on the Windows Server 2016 platform is the user's working environment. It provides up access to corporate resources: ERP, files, and folders (according to access rights), mail client and Microsoft office suite.

We transferred file databases to MS SQL and placed them on a separate virtual server with SSD disks to improve the performance of the client’s ERP.

We chose Microsoft Exchange 2016 as a mail server to implement additional functionality (calendars, mail archiving, etc.). The entire server part is deployed on the Microsoft platform using an Active Directory domain controller.

High-performance cloud solution



Project implementation

For corporate documents, we used a separate virtual server that serves as a file server. We created a folder structure and distributed rights for employees.

Reserve copies are made every night, without any downtime or performance issues. Using the backup copies in the course of 14 days, it is possible to restore data or the entire server from any period. Estimated server recovery time is up to 6 hours, depending on the amount of data.

The high availability of corporate resources was achieved through the implementation of the best practices of server architecture and their deployment in the cloud. The infrastructure is located in a German Tier III data center with guaranteed availability of 99.9%.

High-performance cloud solution

Project Summary

We selected the hardware configuration based on the results of the service usage intensity audit and possible scalability, as well as on our experience in implementing such projects.

If necessary, the client can easily increase or decrease hardware resources with minimal server downtime. We have added SSD drives on some servers (such as terminal and database servers) to significantly improve performance.

The project was implemented in 5 work days with slight downtime of operating services.

After we completed the settings, the servers were transferred to the client's system administrator.

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Dedicated server cluster

A redundant, high-performance cluster of dedicated servers for large volumes of data

Dedicated server cluster

Customer’s requirements

- **to build a redundant cluster from a set of dedicated servers in order to combine their resources and dynamically redistribute loads in case of equipment failure;**
- **to organize the internal LAN of a cluster with a bandwidth of 10 Gbit/s;**
- **to ensure the cluster’s connection to WAN at a speed of 1 Gbit/s.**

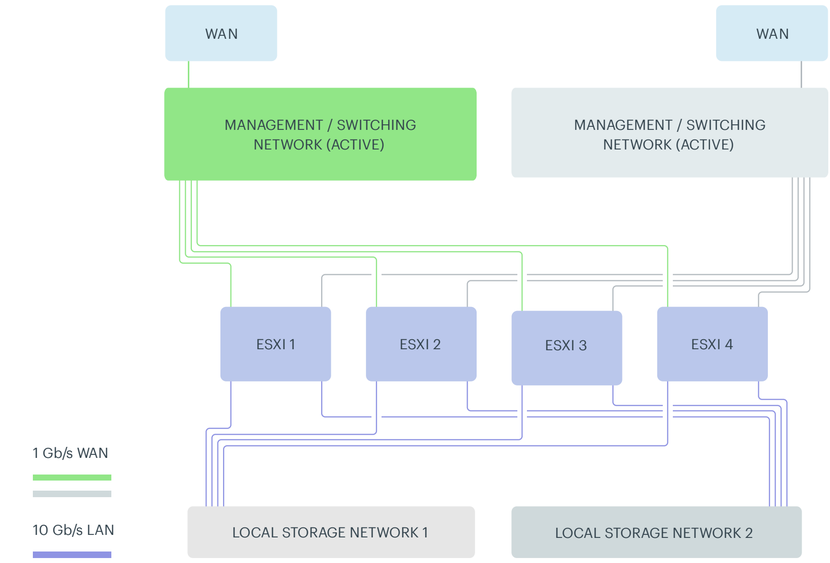
Project requirements

The company works with large amounts of data; the client’s main requirement was to ensure the redundancy and global availability of dedicated servers.

The client has already had a negative experience with a low-cost provider: constant issues, regular failures and no flexibility in the settings all had a negative impact on the business. Therefore, in search of a fail-safe and reliable solution, the client chose SIM-Networks.

Project implementation

We designed the cluster structure based on the company's workload and network bandwidth requirements:



Dedicated server cluster

Project implementation

The **redundant cluster** is deployed on four Enterprise servers with the following parameters:

- 2 Intel Xeon E5-2620 V4 2100 MHz 20 M Cache 8 Core processors;
- 8 slots for HDD/SSD drives;
- 2 power supply units in the server case;
- 256 GB of RAM;
- 4 SSD drives of 2 TB each:
- 2 network ports 10 Gbit/s;
- 2 network ports 1 Gbit/s;
- 1 port IPMI remote control.

We deployed the necessary number of virtual machines and provided users with access to the storage system using the native **VMware ESXi hypervisor** software. The servers were organized in a connected cluster mode as a redundant resource pool.

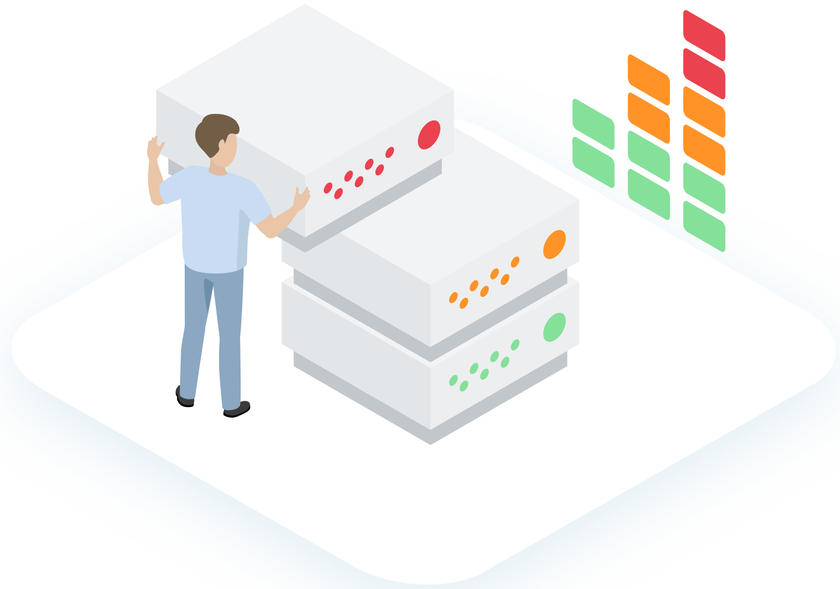
The cluster's local network/data storage uses two 12-port Netgear 10 Gbit switches.

For network control, we chose two HP 1 Gbit 24-port switches.

To create a firewall, we chose the specialized router solution from Cisco.

SIM-Networks engineers assembled and launched the IT infrastructure of this project in a data center in Germany within a few working days.

Dedicated server cluster



Project Summary

Thanks to our cloud solution, the client's business runs smoothly and efficiently.

The native VMware ESXi hypervisor ensured high performance and high stability of virtual machines in the cluster.

The client's employees can now focus on their main tasks; infrastructure management and support is the responsibility of our qualified staff.

Remote professional server and network equipment deployment in a German data center with constant monitoring significantly reduced the equipment costs and infrastructure maintenance, as well as provided a higher level of data security for clients.

Private cloud for a large company

We deploy the client’s infrastructure in a private cloud hosted in German data center to protect confidential data

Private cloud for a large company

Customer's requirements

- **to build a redundant cloud cluster from dedicated servers with separate storage and data storage in a remote data center;**
- **to organize a cluster LAN with a bandwidth of 10 Gbit/s:**
- **to ensure the cluster's connection to WAN at a speed of 1 Gbit/s.**

Project requirements

The client wanted to increase data privacy and improve the efficiency of its core IT infrastructure.

This is why the client was interested in our Tier III+ class data center in Germany with a multi-level security system, redundant power supply, and round-the-clock technical support.

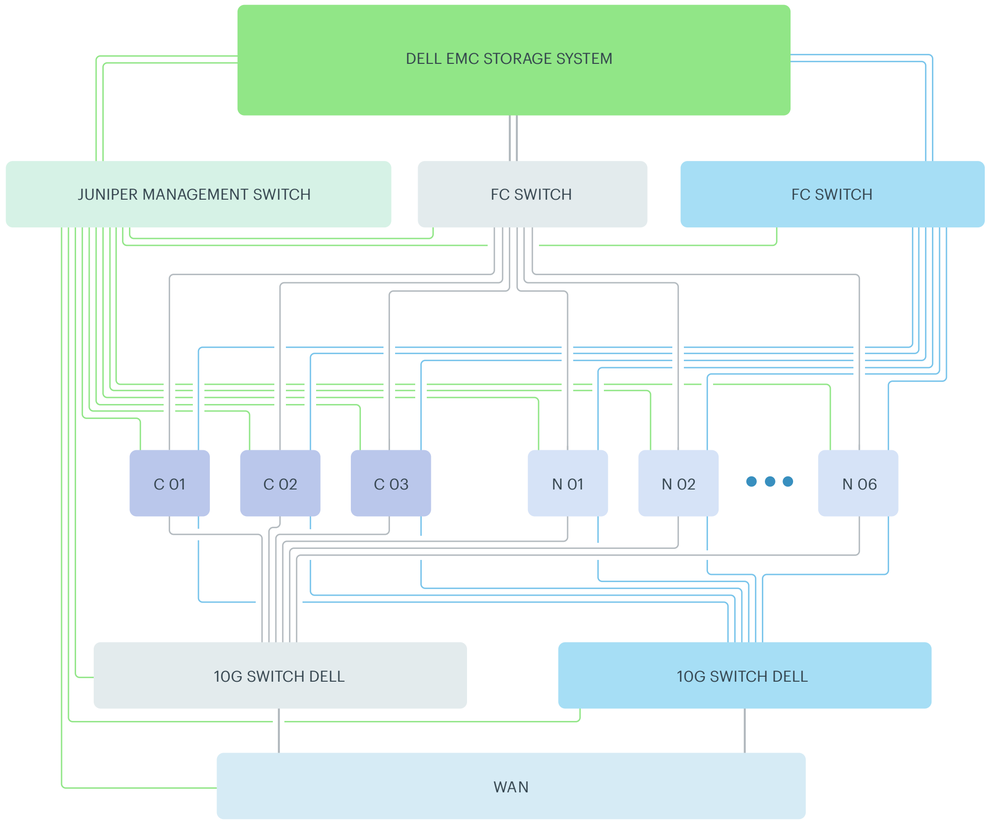
The key requirement for the project is to ensure business security and reliable data protection for the players of the client's game.

Project implementation

Considering the high workloads with high peaks of activity and the specifics of the client's industry, we offered to build a redundant private cloud based on a cluster of dedicated servers with separate data storage.

Based on the technical requirements for the workloads and network bandwidth, we suggested cluster based on Dell servers located in a separate 47U rack.

Private cloud for a large company



Cluster structure configuration:

Dell PowerEdge R330 Server – 3 pcs. (C01, C02, C03), with the configuration:

- Intel Xeon E3-1220 v6 processor (3.0 GHz, 4C/4T, 8 MB Cache, 72 W, Turbo);
- 32 GB RAM (DDR4);
- 4 SATA Datacenter HDDs of 1 TB each;
- Perc H370 Hardware RAID controller;
- 4 network ports 1 Gbit/s;
- 2x 16 Gbit/s fiber network ports;
- 2 power supply in the server housing;
- iDRAC remote monitoring controller.

Private cloud for a large company

Cluster structure configuration:

Dell PowerEdge R640 – 6 pcs. (N01, N02, N03, N04, N05, N06), with the configuration:

- 2 INTEL Xeon Gold 5118 processors (2.3 G, 12 C/24 T, 10.4 GT/s 2 UPI, 16 MB Cache, Turbo, HT, 105 W);
- 256 GB RAM (DDR4);
- 2 SATA Datacenter HDDs of 1 TB each;
- Perc H73OP RAID controller;
- 2 network ports 1 Gbit/s;
- 2 network ports 10 Gbit/s;
- 2x16 Gbit/s fiber network ports:
- 2 power supply units in the server housing;
- iDRAC remote monitoring controller.

Dell SCV3020 storage:

- 10 SAS SSD-drives with a capacity of 3.84 TB each;
- Dual Controller;
- 4x16 Gbit/s fiber network ports.

Juniper EX22OO-24T-4G (SWO3) switch was used in the control network.

Dell Networking N4032 switches, 24x 1OGBase-T Ports (SW01, SWO2), 2 pcs. were used in the cluster's local area network.

Brocade 6505, 16 Port FC16 Switch 16 Gbit/s (SW04, SWO5), 2 pcs were used in fiber-optic storage.

Private cloud for a large company

Project Summary

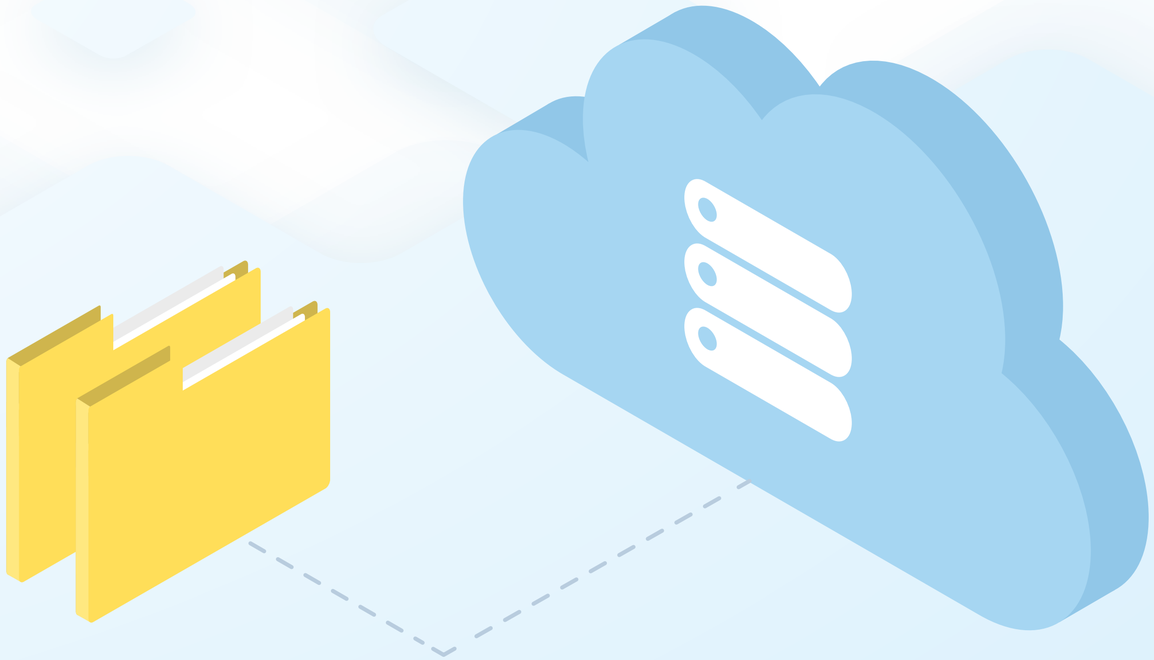
We prepared an individual project for the client based on his wishes and the specifics of the business.

The redundant **high-performance cluster provided the client with the required level of data privacy**, and the players with stable access to the company's services.

The IT infrastructure maintains excellent efficiency in peak load mode.

Migration to the Cloud

We have transferred the client’s infrastructure from virtual servers to the cloud and set up a regular backup



Migration to the Cloud

Customer’s requirements

- **To increase the disk space of the virtual servers;**
- **To recreate the directory tree for each user and file permissions:**
- **To restore the VPN connections.**
- **To create a backup mechanism with the possibility of quick automated recovery , keeping the option of user files self-recovery from the backup storage on an FTP server;**
- **To organize and configure a VPN service for the resources that users actively work with.**

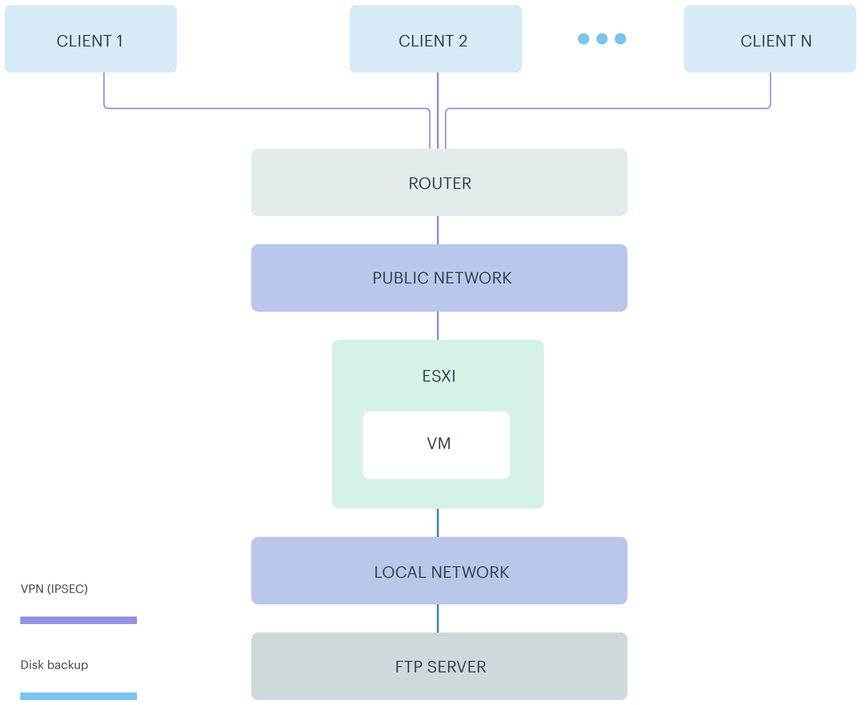
Project requirements

The client already had a file server and other Windows virtual servers deployed using VMware ESXi. Backup copies were sent to an external FTP server.

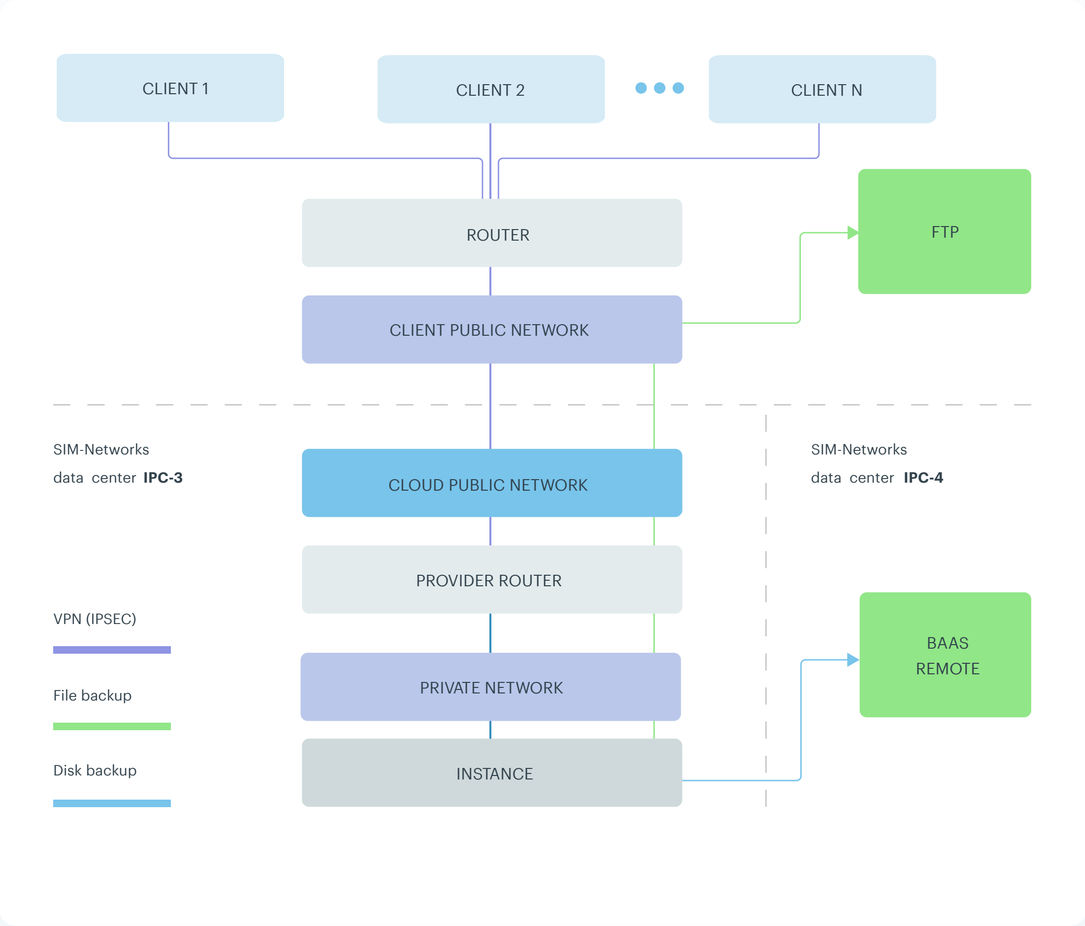
The client already had a negative experience with system crashes before. Damage control took a lot of time. Specifically, the client had to:

- Reinstall the OS and current updates;
- Install and update the whole stack of programs that were operating before the crash (antivirus, etc.).

The client's IT infrastructure before the start of the project



Migration to the Cloud



Project implementation

Our specialists moved the client's data from virtual servers to the SIM-Cloud: we quickly performed the preparatory work, converted the disk, installed a set of additional drivers. The migration was performed from a running ESXi VMware service. The drive space was extended and the file system was recreated.

After the cloud migration, we quickly set up a VPN tunnel; the network connection to the client’s office and the connections of all users were resumed.

We set up the SIM-Cloud BaaS service for the client for more efficient and secure backups. Users can still use the external FTP server has preserved its operability to restore selected files that were deleted or updated erroneously.

Migration to the Cloud

Project Summary

Our comprehensive solution satisfies the client's requirements for security, flexibility and convenience.

One of the key wishes was to connect users via VPN after transferring the service to the cloud. The downtime was minimal; our team worked at night when the client’s staff wasn’t working.

The client is planning on ordering a virtual router based on PfSense for more flexible resource management.

SIM-Cloud as an estimation tool

We used the SIM-Cloud IaaS to estimate the IT resource demands before creating a private cloud for a business

SIM-Cloud as an estimation tool

Customer’s requirements

- **To deploy instances (VMs) in the public cloud with consideration of infrastructure scaling as our client's business grows;**
- **Adapt special operating systems images which are not included in the standard OS pool allowed by SIM-Networks for implementation in the cloud;**
- **Dedicate an IP addresses pool (IPv4 + IPv6);**
- **To organize backups using Backup-as-a-Service;**
- **To migrate the customer’s business infrastructure to the private cloud from the public cloud.**

Project requirements

One of our customers was interested in creating a private cloud and migrating his business infrastructure to it. However, before creating the cloud, our customer wanted to estimate the required resources necessary for efficient work.

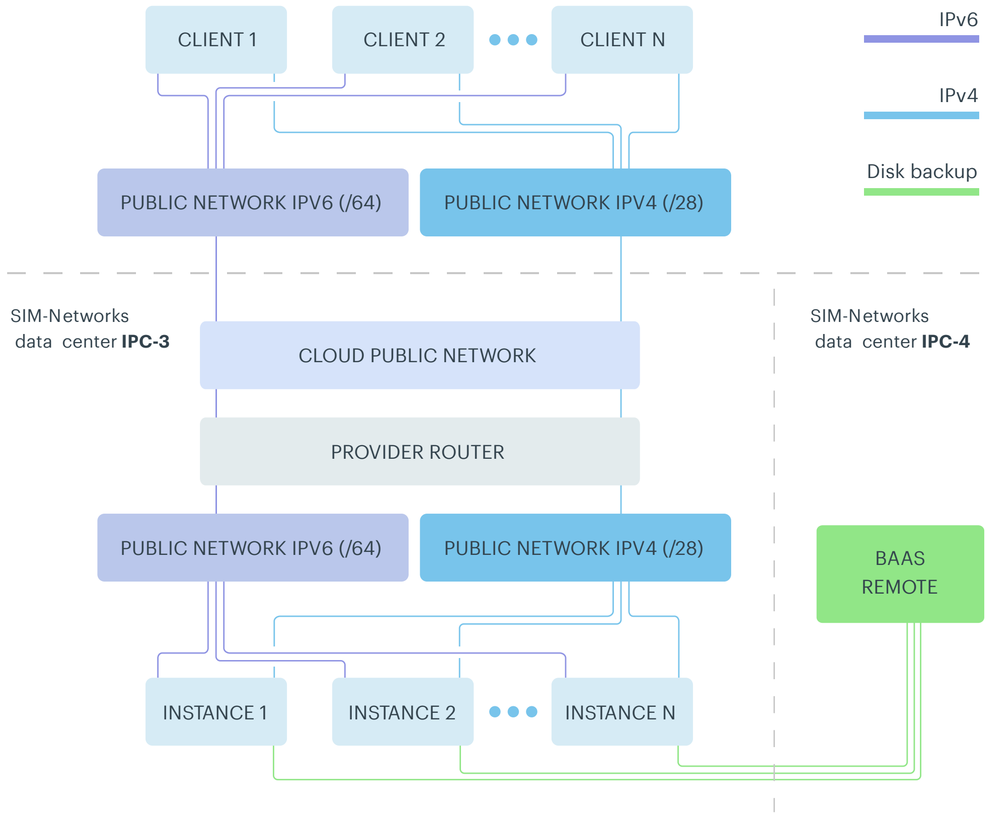
Project implementation

SIM-Networks offered to use the scalability of cloud solutions as an estimation tool to test and measure the required computing power. For this purpose, we decided to deploy the client’s IT infrastructure in the public SIM-Cloud IaaS to measure the required capacities. This way, our customer could prevent unreasonable expenses while ordering server and communication equipment, as well as software for the private cloud.

The project stages were the following:

- Deploy the client’s infrastructure in the public IaaS.
- Scale the cloud according to the growth of the business and its client base.
- Stabilize the business and audit the resources.
- Collect the specifications, order resources for the private cloud and migrate the client’s infrastructure.

SIM-Cloud as an estimation tool



Project implementation

As the business grows, the private cloud can be scaled and optimized. Dedicated IT capacities, flexible infrastructure operation, high-level physical and legal data protection and remote backups in Germany are just some of the key benefits of the private cloud noted by our client.

Our engineers learned the specifics of the customer's business processes and carried out an audit of both current and planned services. As a result, our tech experts prepared a detailed work plan for creating the cloud IT infrastructure.

The first stage of the project: we deployed the customer's infrastructure from scratch in public IaaS SIM-Cloud. The customer resumed his routine working processes while we were testing the computing load.

Usually, SIM-Cloud uses Floating IP to get access to the instance, as it works with NAT (network address translation) which transforms the clients' private IP addresses into public ones when connected to the internet. In this case, our client wanted to use specific communication software, the SIP telephony, based on the Session Initiation Protocol. However, this solution cannot work correctly with NAT. We made the decision to dedicate a pool of direct IPv4 + IPv6 addresses to this infrastructure project.

SIM-Cloud as an estimation tool

Project implementation

The second stage of the project: we scaled the cloud infrastructure, following the customer's business growth and the expansion of his client base. We added additional computing capacities on-demand, taking them from the SIM-Networks cloud resource pool – CPU cores, RAM, drive space, virtual local network IP addresses. We also set up BaaS for the reserve copies according to the client’s request.

The third stage: all of the work processes of the customer's business in the public cloud are stable, and the customer is satisfied with the new corporate infrastructure deployed in the cloud. We reviewed the actual usage of the capacities. Based on the results of the review, we estimated the maximal amount of necessary resources for the short-term to guarantee stable services to the clients without downtime. We also offered the customer a few data analysis options and secure storage to reduce IT infrastructure costs.

The fourth stage: we created the private cloud using the specification data sheet, which included information about equipment and software based the results of the 3rd stage. We migrated the IT infrastructure to the private cloud from the public SIM-Cloud IaaS.

Essential benefits of the private cloud pointed by the customer:

- Flexible management and full functionality due to single-tenancy.
- Isolation and full inaccessibility to other users.
- High quality of data processing and storage.

SIM-Cloud as an estimation tool

Project Summary

We used the SIM-Cloud as an estimation tool for the preliminary estimation of required IT capacities before building a private cloud. Testing the infrastructure in the public cloud allowed our customer to get reliable information about the actual infrastructure loads and predict the capacities that will be needed as the business grows.

Our experts analyzed the results of the scaling of the temporary IT infrastructure and prepared a configuration that took business growth into account in terms of both hardware and software. This configuration allowed the customer to build a private cloud infrastructure without extra financial costs.

Backups in remote data storage using SIM-Cloud BaaS are a great solution for data safety. **IT infrastructure migration to the private cloud from the public IaaS was performed with almost no downtime in the business process of the client.**

User interfaces to manage public and private cloud infrastructure are identical, so, after the migration to the private cloud, the staff of the customer's company didn't waste time to training.

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Cloud infrastructure from scratch

Cloud infrastructure built on Windows OS servers. Software licenses rental. Secure network connections with VPN

Cloud infrastructure from scratch

Customer’s requirements

- **deploy IT infrastructure and conduct personnel training connected to the use of the SIM-Cloud:**
- **set up network connections between client instances:**
- **create and configure VPN tunnels between the client's office and its cloud infrastructure, as well as between the cloud infrastructure and a separate development platform (stage).**

Project requirements

The customer was focused on the fact that infrastructure management after migration to the SIM-cloud will be concentrated in the hands of his technical staff. Therefore, the SIM-Networks technical support specialists taught the client’s staff the basic skills for working with the OpenStack platform.

Preferring to keep his usual proprietary Windows server OS, the client asked SIM-Networks experts to be involved in software licensing.

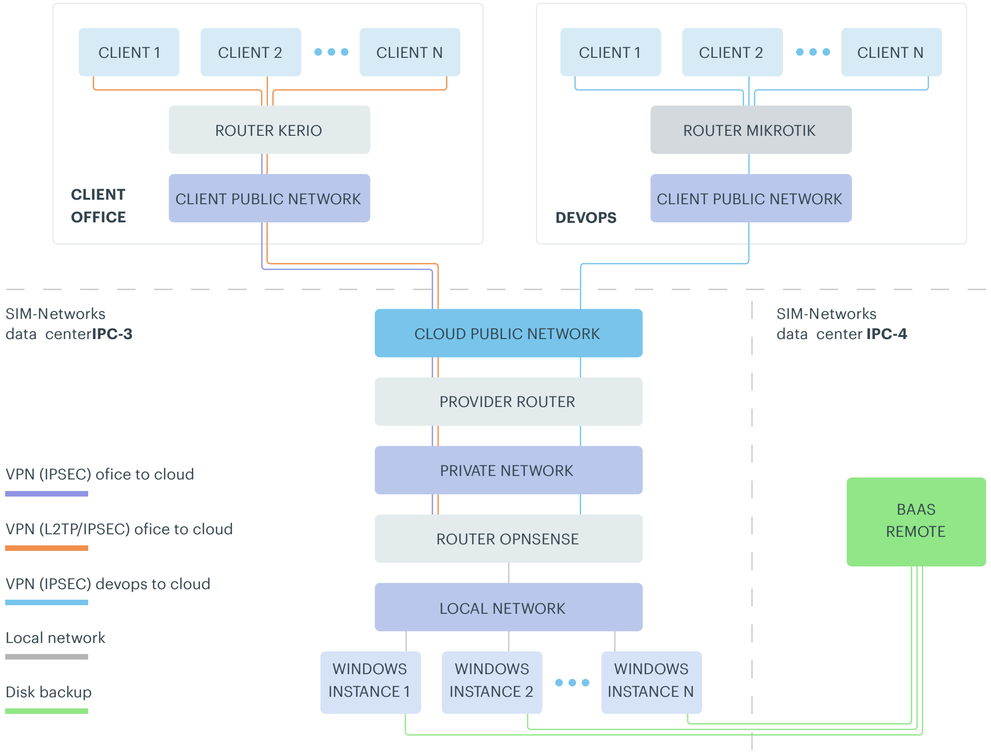
Project implementation

Having started the project, we estimated the degree of complexity, taking the need to configure an IPsec VPN between the OPNsense cloud virtual router and the Kerio client router in site-to-site mode into account.

The customer did not give us access to the nodes. Configuring the L2TP tunnel between the router and client instances was done in order to bypass the limitations of Windows OS with the features of NAT taken into account. As a result, we found an effective way to enable permissions to connect to the L2TP/IPSec server, if it is behind NAT.

We conducted comprehensive training connected to cloud infrastructure management, where we taught the customer's technical staff to create new disks, set their volume depending on the selected operating systems, and run instances on disks.

Cloud infrastructure from scratch



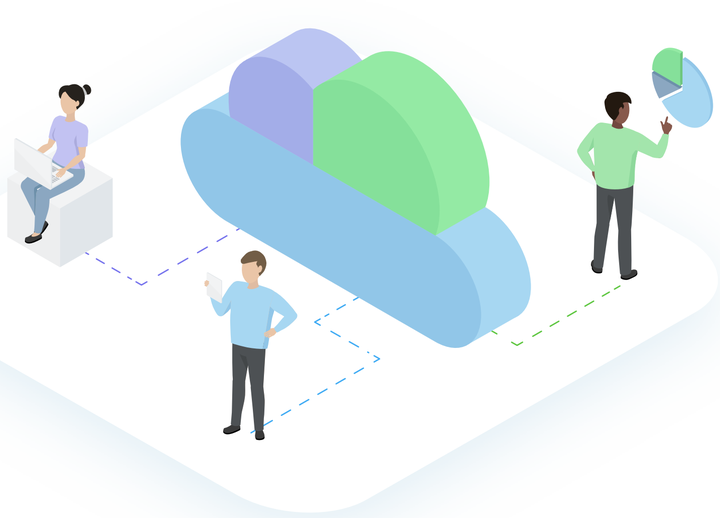
Project implementation

With the help of our technical experts, the customer's employees were able to configure interactions between instances in the network, taking into account the separately located DevOps site. They were also able to set permissive rules for incoming traffic and restrictions on the instance ports using security groups.

The client received practical recommendations on how to configure VPN, firewall, routing and optimal organization of NAT for internet access.

The possibility of switching from a trial version of Windows to a licensed one without losing custom settings was very important for the customer. We familiarized the client's staff with the features of licensing and leased the necessary software.

Cloud infrastructure from scratch



Project Summary

We built an IT infrastructure in SIM-Cloud from scratch based on our experience and the customer’s wishes. During the project, the network connection between customer's instances was set up; network tunnels are configured between the client's office and the cloud infrastructure, as well as between the cloud infrastructure and the devops site.

The customer's staff received comprehensive training with regards to the basics of working with the cloud and made the primary settings on their own.

The customer received a license for all distributions necessary for the infrastructure’s operation.

Thank you

for getting interested

Contact us right away!

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Customer Care

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