

ComputerVault IoT Edge to Core Management



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ComputerVault IoT Edge to Core

ComputerVault HCI has integrated IoT Edge to Core Management embedded in every ComputerVault HCI deployment. ComputerVault IoT Edge to Core replaces the public cloud infrastructure used for IoT deployments, providing a private alternative.

ComputerVault also supports the Edge to Core Management as part of the software license, from the ComputerVault Network Operations Center, so customers do not need to hire software administrators. ComputerVault IoT Edge to Core Management delivers:

1. Backbone Network, Security, Virtual Machines
2. Provisioning of Edge Devices (IoT Gateways and Edge Servers)
3. End-to-end Encryption for all Connections with Zero Trust Security
4. Support for any Windows or Linux-based device
5. Hosting of Management and Analytical software

ComputerVault IoT Edge to Core

- End-to-End Encryption
- Windows/Linux
- Plug 'n Play
- Any Application

The Plug 'n Play functionality does not require the use of API's, coding, customization or firmware upgrades to deploy edge devices. A lightweight software client installed on edge devices is preprogrammed to connect to a central location.

An unlimited number of devices may be connected in any network topology, with support for data, voice, video, mobile, and Wi-Fi. ComputerVault IoT Edge to Core scales up to any sized IoT deployment, offering organizations a private, less expensive alternative to public cloud IoT platforms.

ComputerVault IoT Edge to Core Architecture

Every ComputerVault deployment has built-in Virtual Networking, which connects any Windows, Android, iOS or Linux-based device, i.e., phone, tablet, laptop, PC, Mini-PC, thin client, etc., to the ComputerVault central cluster.

The central cluster of servers hosts virtual machines, for installation of IoT applications and IoT analytical software. In turn, the central cluster may be connected to any other corporate resource or location and to the ComputerVault Network Operations Center, ("NOC") for support of the IoT Edge to Core technology stack.

This Virtual Networking capability of ComputerVault easily deploys and scales up. The IoT Edge to Core consists of:

1. **Central Cluster:** ComputerVault HCI which hosts virtualization servers and Central Gateway Controllers
2. **Edge Devices:** ComputerVault IoT Gateways and Edge Servers

The ComputerVault IoT Gateway connects to sensors and other devices, via Wi-Fi, USB, etc., that measure and gather data, such as temperature, or other devices such as microphones, still cameras, video cameras, etc.

Both ComputerVault IoT Gateways and Edge Servers, used for Edge Computing, are capable of remotely deploying and managing the entire WAN. Any telecom circuit may be used to build the WAN to provide for the scale and throughput needs of the Edge Devices.

The ComputerVault IoT Edge Devices may then communicate with other IoT Edge Devices and one or more ComputerVault Gateway Controllers, located in the central cluster. As is the case with any ComputerVault deployment, multiple Central Gateway Controller Clusters may be deployed in a distributed hierarchal network.

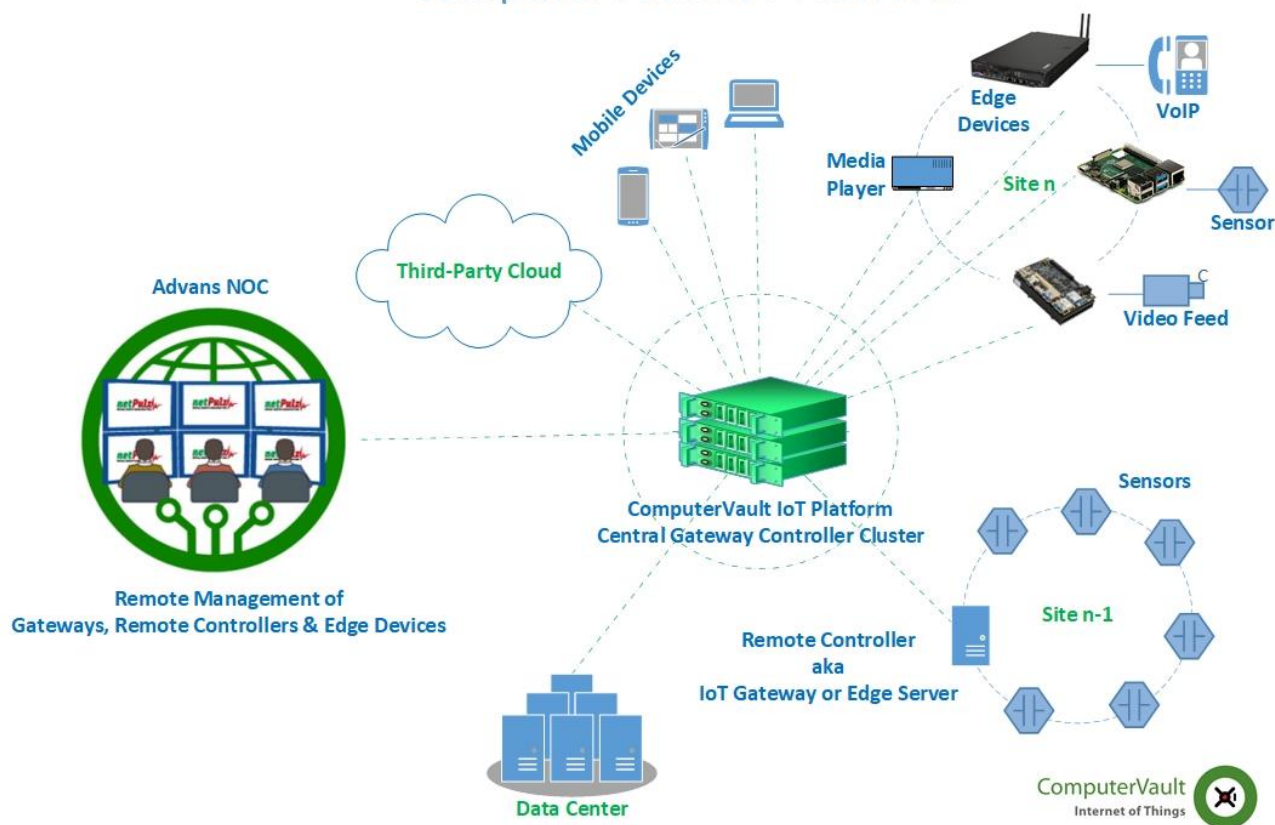
Alternatively, a single central cluster may be used as well. Regardless of the network topology, the ComputerVault NOC is connected to all the centralized clusters and Edge Devices providing centralized management of all the devices in the network,

This architecture allows for failover and load balancing capabilities across the entire global IoT network.

Whether a single central cluster is used or several central clusters are deployed in a distributed fashion, any network topology may be deployed depending upon the application requirements, Edge Device specifications, bandwidth availability, etc. This includes mesh networks. ComputerVault automatically resolves all network collisions, even when IoT Edge Devices are connected to each other.

A ComputerVault software client installed on the ComputerVault IoT Edge Devices makes encrypted connections without coding or API's. To ComputerVault, IoT Edge Devices are just like any other Windows or Linux-based device. It's no different that connecting a laptop to the ComputerVault network to access a virtual desktop. The advantage is, that the software client is lightweight, consumes little power, is deployed without coding or API's and the software license includes support for the entire ComputerVault Infrastructure including Central Clusters and Edge Devices, (see, diagram below).

ComputerVault IoT Platform



Edge Devices

Most edge devices, or ComputerVault IoT Gateways and Edge Servers, are Linux-based devices connected to the sensors gathering data, e.g., Raspberry Pi, industrial grade Edge Device. The IoT Edge Devices often have an application installed on them for communicating with, receiving and storing the data from, the sensors, i.e., thermometer, video camera, etc., if the data is not simply streamed back to the Central Gateway Controller Cluster.

To create the network connecting the IoT Edge Devices to the Central Gateway Controller, with end-to-end encryption, a ComputerVault Software Client is installed on every IoT Edge Device. The ComputerVault Software Clients are programmed to connect to one or more ComputerVault IoT Gateways, without coding, API's or firmware upgrades.

Central Location

The ComputerVault Central Gateway Controllers are a cluster of servers hosting ComputerVault Hyper-converged Infrastructure software. This cluster



of servers also faces the Internet so the cluster may be connected to any other ComputerVault Gateway Controllers in a different location, corporate resources, corporate locations and the ComputerVault NOC. Like every ComputerVault HCI cluster, virtual desktops and virtual servers also may be hosted on them.

These Gateway Controllers receive the data from the IoT Edge Devices. Virtual servers deployed on the ComputerVault central cluster, may have any IoT application installed on them for storing and analyzing the data sent by the IoT Edge Devices, as well.

As with any ComputerVault Hyper-converged Infrastructure deployment, the built-in Administrative Console provides support for all the devices in the network, including the IoT Edge Devices. The virtual networking capabilities of ComputerVault HCI provide load balancing, failover and the ability to span multiple networks.

Networking and Roaming

Again, as with any ComputerVault Hyper-converged Infrastructure deployment, any telecom circuit may be used for carrying data, voice and video traffic. Any network topology, including mesh networks is supported.

With support for both wired and wireless connections, ComputerVault IoT may be used for mobile applications, e.g., a video camera mounted on a vehicle streaming back to the central cluster in real time. A ComputerVault IoT Edge Devices with wireless connectivity can hop from one cell tower to another as the IoT Gateway moves, with no loss of connectivity.

Conclusion

The goal of ComputerVault IoT Edge to Core Management is to deploy private IoT applications with:

- No API's
- No Coding
- No Firmware modifications
- No Administrative Support
- No Public Clouds

Simply install and configure IoT applications, on both edge devices and at centralized locations. ComputerVault software clients and ComputerVault HCI clusters provide the networking and infrastructure to deliver rapid deployment of IoT applications without having to use an expensive public cloud and sacrificing data privacy.

References

1. “ComputerVault Hyper-converged Infrastructure (HCI)”, ComputerVault Inc., Paul Angelo, Peo Nathan, and Shanmugha Bharathy Balasubramaniam



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