Virtual Data Centre
Public Cloud Simplicity
Private Cloud Security

interoute
from the ground to the cloud

www.interoute.com

Interoute Virtual Data Centre

Virtual Data Centre (VDC) is Interoute's Enterprise class Infrastructure as a Service (IaaS) solution. Providing on-demand computing, storage and applications integrated into the heart of your IT infrastructure.

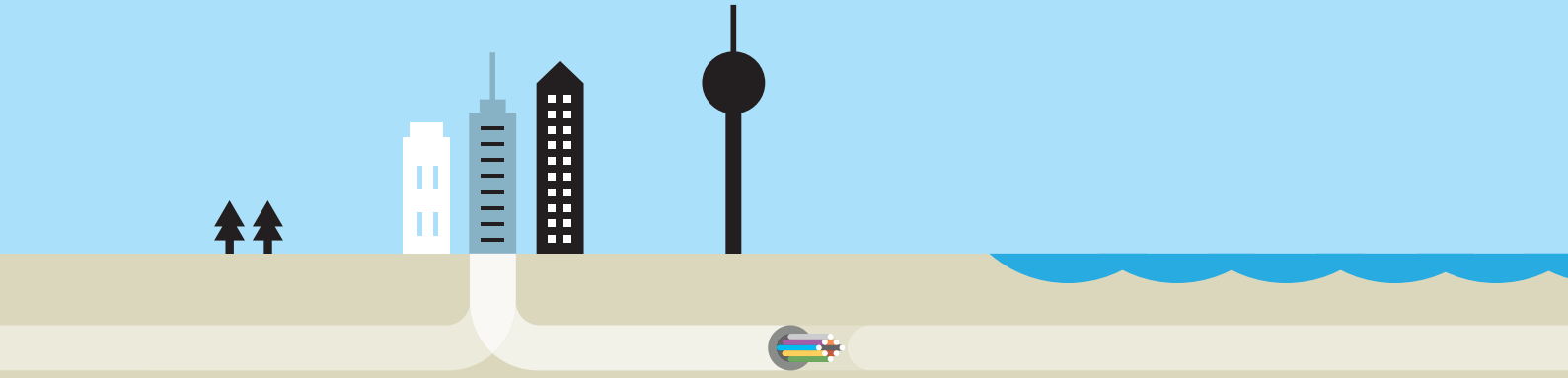
The Interoute VDC platform is the first cloud computing solution that can be deployed to meet private, public and hybrid cloud demands. It offers a flexible and a cost effective way to build your ICT infrastructure using Europe's largest ICT services platform.

The Interoute VDC has all the characteristics of a public cloud; the ability to burst, pay as you go pricing and real-time deployment. It is the integration of Interoute's MPLS/IP network that enables VDC to be a cloud delivered using the Internet, or a part of your corporate ICT infrastructure eliminating the cost and resource constraints of a private cloud. MPLS has been trusted for the past 10 years by the world's largest corporations as a technology that provides "Internet any-to-any access" but with label separated security. MPLS is routinely used in the most sensitive of environments given its absolute separation from the public Internet. By combining scalable elastic computing with the most trusted network technology Interoute has created a truly unique enterprise-computing platform, the first without compromises.

Public Cloud Simplicity, Private Cloud Security

The Virtual Data Centre is designed for the demands of Enterprise ICT and addresses the critical factors necessary for success when choosing whether to build a private or public cloud.

- **Security** – built into the fabric of Interoute's MPLS network and secured within Interoute's Certified European Data Centres, Interoute's ownership of the physical network, combined with MPLS technology ensures a secure VDC cloud environment.
- **Privacy and Compliance** – The Data Centre and network platform that supports VDC is Europe's largest. Owned and operated by Interoute this ensures location and access control can be selected to suit European businesses legislation.
- **Integration** – VDC is built into the Interoute network so it easily integrates into customer connectivity and networking solutions.
- **Open architecture** – Interoute VDC is hypervisor independent and open standards based, ensuring as technology changes VDC can change with your business.
- **Connectivity included** – Interoute is able to offer the connectivity other public cloud providers charge for, at no extra cost. Connectivity between VDC environments in Geneva, Amsterdam and London and connectivity between any Interoute customer's VPN site and VDC is free.



The Interoute Virtual Data Centre replaces the need to buy equipment, power, colocation, network and people.

- **On demand self-service:** Via the Interoute customer self-service portal, customers can provision entire ICT solutions in their own Virtual Data Centre environment. The automated provisioning of the compute, storage and network resources are all achieved at the click of a button.
- **Easy access:** Europe's most trusted network platform allows access to the virtual environment via both IP VPN, Ethernet and Public Internet access.
- **Resource pooling:** The VDC service is based on a multiple partitioned platform, managed by software based allocation business rules and policies, meaning the IaaS resource pools created by the virtualization of the physical underlying infrastructure can be shared by multiple users, or dedicated to single enterprise.
- **Elastic:** The compute, storage and network resources used to create your ICT service within the VDC environment can all be used in a truly elastic way. Use only what you need and retain the flexibility to grow your VDC to an almost limitless level.
- **Measured service:** The VDC control centre on the Interoute customer web portal allows you to monitor the usage of the VDC service, reporting and controlling the allocation of resources.
- **Customise your machine** – Each Virtual Machine can be customised with varied, CPU, RAM and block storage to allow bespoke system builds and reduce over-spending on unused resources commonly found in fixed-specification cloud servers.
- **Real not emulated IT.** Transferring your ICT infrastructure to VDC doesn't require re-writing applications or compromising them for the cloud. Interoute's VDC allows you to create a cloud network to match your physical network.

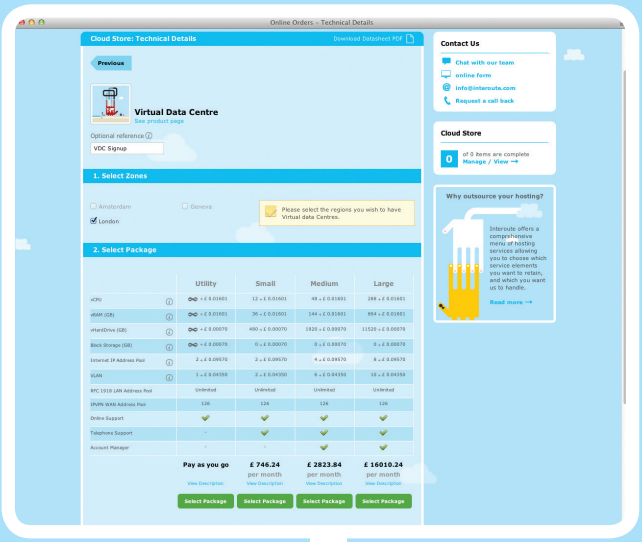
Built for Business

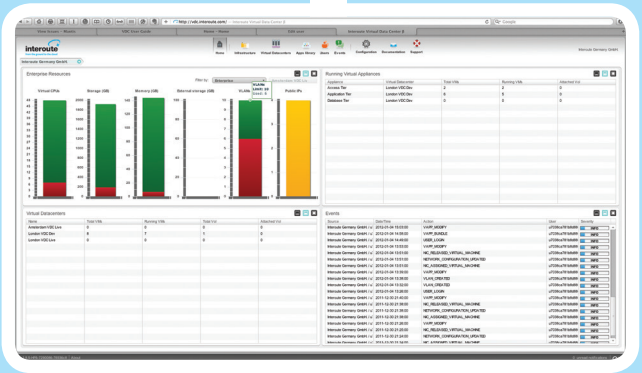
- **Interoute knows what it means to be trusted** by an Enterprise so operates a dual centre 24/7/365 operations model.
- **No additional costs to get to the cloud** Computing, storage and applications into the heart of your IT infrastructure avoiding additional bandwidth charges.
- **Block level, mountable, persistent storage in locations that you chose** – complete data transparency means that you can create cloud based services and stay compliant to regional data regulations.
- **Complete control** of your appliances; root access, the ability to access storage directly, mount storage, reboot, power on and off the box and delete it.
- **Size from one just server** for one hour to 100,000 machines across multiple countries. Virtual Data Centre can be sized to precisely as small or as large as you need. Or you can simply let it grow and shrink as your business changes.
- **Create your own Appliances or use prebuilt templates.** Interoute has created the most popular appliances to get you started or you can simply create or upload your own and build a service catalogue for your business.
- **End to End SLA** Through our end-to-end service ownership and the ability to offer and integrate end-to-end connectivity, Interoute is able to offer a complete end-to-end SLA for customers, avoiding complex disputes and troubleshooting.
- **Role Based Administration** IT managers can use their own controlled builds creating and controlling cost of a service catalogue – your community can get up and running fast.

Build your IT infrastructure in an Instant

The beauty of the VDC service is that it offers cloud based enterprise class Infrastructure as a Service with the simplicity and convenience of the public cloud combined with the security and confidence that a private cloud brings.

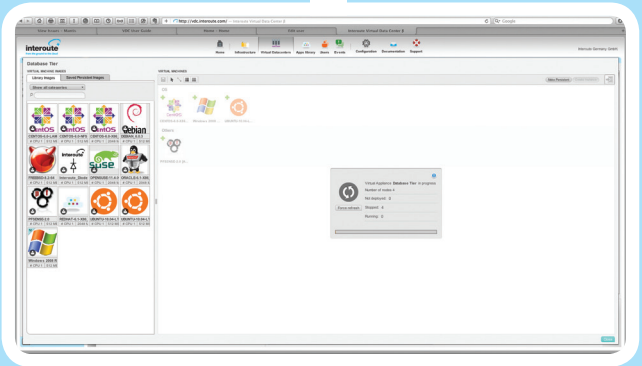
1. Order the Virtual Data Centre Service online.
2. Choose the VDC package and city location (zone(s)).
3. Launch the VDC Control Centre.
4. Create Virtual Appliance, Storage and Network elements.
5. Upload your own or use Interoute supplied templates to create one or more Virtual Machines.
6. Specify the CPU, RAM, Storage and Network configuration of each Virtual Machine.
7. Deploy your Virtual Machines.
8. Manage your machines using the web Console, RDP or SSH.
9. Create your ICT service using your VDC environment and access it over integrated IPVPN or Internet connection.





Order

Create



Deploy

Enterprise Class IaaS

The challenge for enterprises in the cloud is how to combine the speed and flexibility of the public cloud with the certainty and predictability a private cloud.

To support this choice Interoute offers two purchasing models; *Utility* and *Commit*.

- **Utility** is a zero commit model based on pay-as-you-go charging; each virtual resource has a charge per hour of allocation. The total amount of resource allocated is chargeable at the end of each month.
- **Commit** is a fixed monthly charge based on an assigned set amount of resources committed solely for each Commit customer's use. Customers are still able to burst beyond their committed resource as needs demand. Usage beyond these levels is charged according to the associated rate card. Customers can upgrade their committed resource level at any point.

VDC Commercial Packages				
	Utility Model	Commit: Small	Commit: Medium	Commit: Large
Resource	Included amount of virtual resource per hour			
vCPU	0	12	48	192
vRAM (GB)	0	36	144	576
vHard Drive (GB)	0	480	1920	7680
Block Storage (GB)	0	0	0	0
Storage i/o	∞ FREE	∞ FREE	∞ FREE	∞ FREE
VLAN	1	2	6	10
Internet IP Addresses	2	2	4	8
Data Intra VDC environment	∞ FREE	∞ FREE	∞ FREE	∞ FREE
Data Inter VDC environments	∞ FREE	∞ FREE	∞ FREE	∞ FREE
Data VPN <-> VDC environments	∞ FREE	∞ FREE	∞ FREE	∞ FREE

Table 1: Models and packages available for Interoute Virtual Data Centre Service

Appliance Market Place

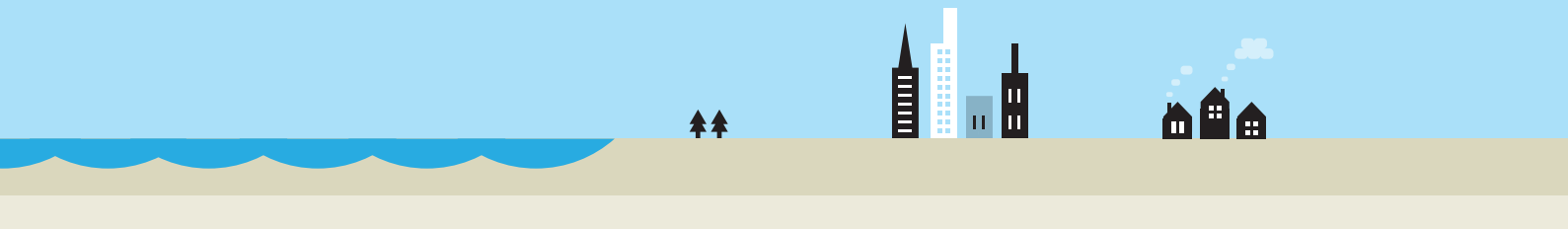
Interoute have created a set of the most popular appliances, (appliances are virtual machine images or groups of images, ranging from virtual servers e.g. Windows or Red HAT, to virtual network functions e.g. firewall or load balancer). These appliances are available via the Interoute cloud store www.interoute.com or customers can create and upload their own, creating their own internal appliance marketplace for their own use.

All appliances are built, deployed and managed through the secure web portal at the click of a button. The image's CPU and RAM can be modified and then saved as a new image. The speed of the deployment is dependant on the properties of the Virtual Appliance (e.g. size of image's virtual disk); a Firewall can be deployed in under a minute and a 20GB windows server in 5 minutes. When the computing requirement is no longer there, resources can be decommissioned and released back to the central pool.

Made for Migration - Import Your Own Virtual Images

To address the issue of service provider and technology lock in Interoute's VDC works with any hypervisor technology, supports the Open Virtual Framework (OVF) and facilitates the import and export of Virtual Machine images.

Whether migrating from a private cloud or a 3rd party public cloud any Virtual Machine disk Image can be uploaded to VDC. Plus you can easily port your Virtual Machine Images away from VDC by downloading the image direct from the Appliance Library.



Storage

Interoute provides a flexible storage infrastructure that allows customers to deploy only the storage their systems need, avoiding the cost of unused disk space. Each virtual machine has a fixed system disk , sized to contain the Operating System (OS) and common server applications. Best practice will dictate the allocation of a separate file system or drive for application data. This is achieved, the same way as in the enterprise data center, by use of external block storage to the servers.

Block Level Storage

Block level storage is available to customers as self-defined volumes that may be attached to a designated virtual machine. The size of each volume is defined by the customer at the time of creation. It is possible to attach multiple volumes to a single virtual machine. As with any block storage device, customers can format the attached volumes with the preferred OS/file system variant or use the device raw.

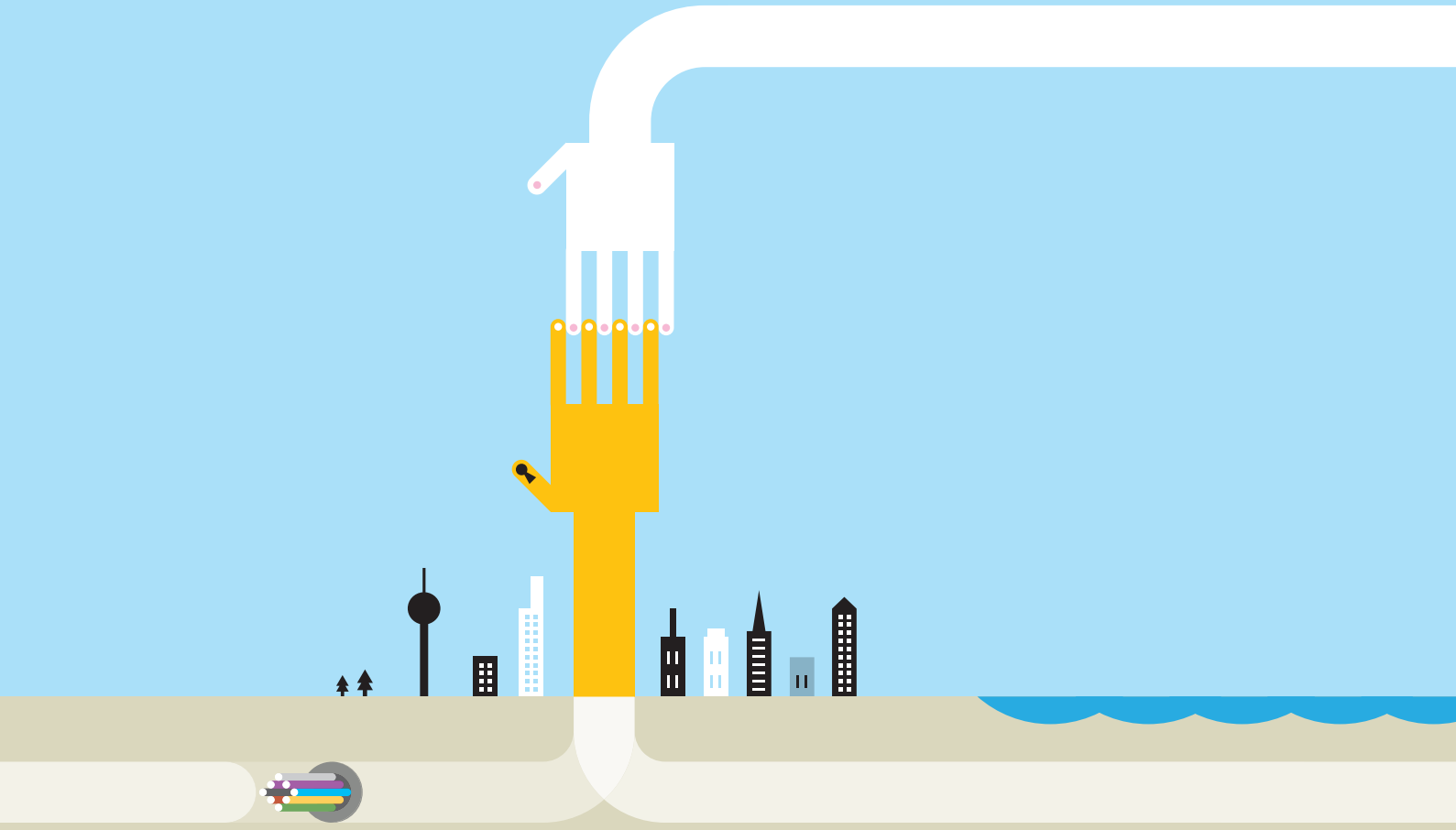
Once attached and the virtual machine powered on, application data can then be written to these volumes. When the machine is undeployed, the data will persist on the volume and may, if required, be mounted onto a alternative machine.

Backup & Disaster Recovery

Local disks may be replicated across VDC zones to provide off-site backup, with no inter-data centre traffic costs. Customers may also use this free inter-data centre traffic to schedule application level backups (e.g. database replication) across VDC zones. Any software can be used to support backup. This enables the files to be kept in accordance with data retention policy and replicated out to another data centre for archiving if necessary.

Interoute VDC gives customer architects the ability to build the most appropriate disaster recovery solution for their system, dependent on RTO and RPO requirements. Interoute provides the infrastructure to apply application level and SAN based replication across data centers.

Application level replication across the IP network is free and most commonly used to asynchronously replicate databases across the VDC zones. A customer can then provision the entire supporting infrastructure around the data quickly and efficiently.

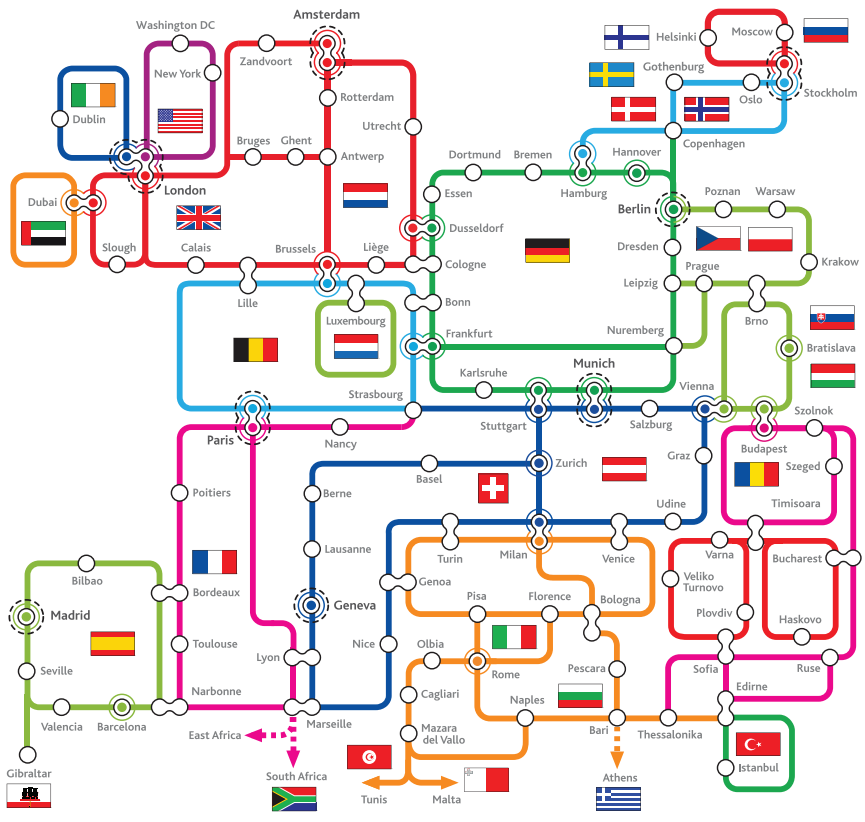


Service Support and SLA

The VDC virtual resources, compute, network and storage are fully managed and supported by Interoute's operations centres. Interoute operates two fully diverse European operation centres, each with a Customer Support Centre (CSC) and Network Operating Centre (NOC). These facilities are operational 365 days a year, 24 hours a day, 7 days a week.

Interoute's end-to-end ownership of the platform allows us to offer a complete end-to-end SLA (99.99%) covering network, compute and storage availability.

The VDC service secure web support portal (http://hub.interoute.com/access/vdc/help/) features video and written content covering user guides, frequently asked questions and "how to..." articles. Users can also request further information on any of the VDC features and benefits through the VDCsales@interoute.com email.



Our Network

- Ring Interconnector & MAN
- Ring Interconnector
- City Network/MAN
- Pop
- Datacentres
- Off-net locations

Network statistics

- 60,000 kms lit fibre
- 8 hosting data centres
- 32 colocation centres
- 21 MANs
- 100 cities
- 29 countries
- 9 subsea landing stations
- 15 languages supported

Security and Compliance

Interoute is a member of the Cloud Security alliance and has a track record of providing leading enterprises across the world with private cloud solutions that have the necessary security controls required to protect their critical data across all technology platforms.

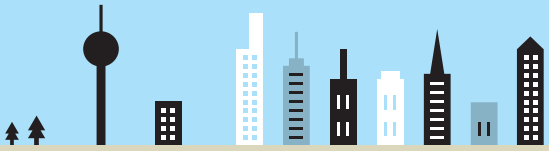
Interoute platform ownership, advanced technology and independent certification means you can be assured that your Virtual Data Centre solution is secure. The platform is built into our MPLS network; MPLS is inherently secure, offering address and routing separation of each customers VPN. Interoute wholly owns and manages every aspect of the infrastructure associated with the service. The physical data centres are owned, not leased, by Interoute. Interoute's VDC centres are physically constructed in London, Geneva and Amsterdam with more cities being announced in 2012. Each Tier 3 Data Centre has achieved ISO 27001 Certification and PCI-DSS for Information security and data integrity.

Full Control over Data Location, Governance and Transparency

Unlike many public cloud services Interoute's Virtual Data Centre allows users to specify physically where their data is held enabling enterprise customers to be assured of data compliance and control.

When provisioning the VDC service you are invited to select the geographic zone for your data.. This ability to offer fully transparent data governance allows customers to comply with most regional regulatory variations. In addition to this, as a European cloud service provider, data stored in Interoute's cloud is not susceptible to the US Patriot Act.

Find out how VDC can support your business. For more information about Interoute Virtual Data Centre visit the Cloud Store at www.interoute.com or email VDCsales@interoute.com.



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