

I. Small- and medium-sized business IT infrastructure base template

Typical IT-infrastructure of a small-to-medium business (SMB) includes two elements: a demilitarized zone (DMZ) and an internal corporate network (Intranet), see fig. 1.

All the IT services of an SMB can be divided into two major groups:

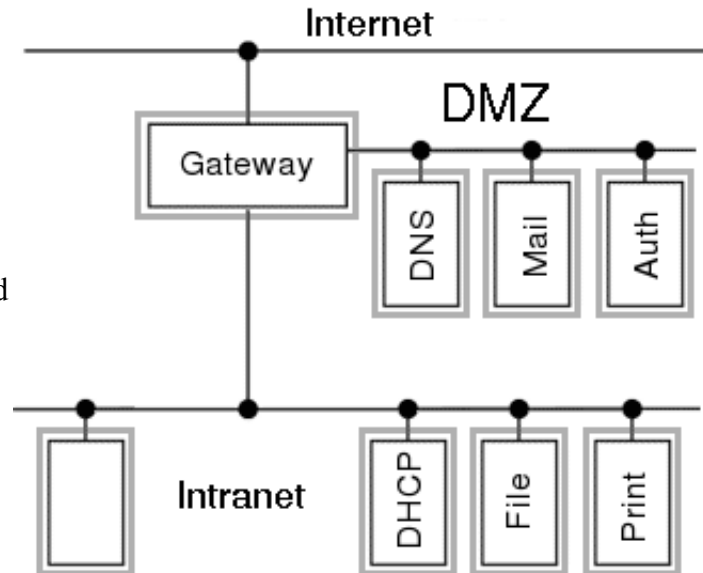
- 1) Services that can be used internally or externally.
- 2) Services that can be used only internally.

DMZ contains the following services:

- DNS service
- Mail service
- Authorization service
- VPN service (optional)
- Web service (optional)

Intranet contains internal-only services and workstations:

- DHCP service
- File service
- Print service
- Application (Terminal) service (optional)
- Proxy service (optional)
- Database service (optional)
- Other services (optional)



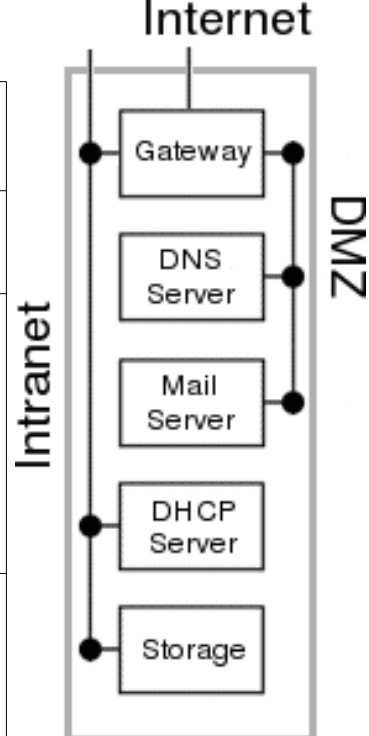
This structure contains about ten servers, each intended for different service. Different services requires different server resources. All servers can be replaced by one powerful server that will host several Parallels Virtual Appliances. Below, we consider several possible virtual IT Infrastructures (VITI) that can be built this way.

II. Small VITI

Base VITI architecture can be useful to small offices, that don't have enough office space for several servers. A Small VITI is composed of 5 virtual appliances: Gateway, DNS Server, Mail Server, DHCP Server and Storage. All of them are hosted on the same physical server.

There are three network segments in the configuration of the VITI, see the table below. The Internet and Intranet segments are real and are connected to physical network interfaces. The third segment, DMZ, is virtual and exists in virtual machine only. The network segments are completely isolated from each other and do not interfere.

<i>Network segment, type</i>	<i>Address</i>	<i>VA located in (network interface, IP address)</i>
The Internet (real)	any public IP assigned	Gateway (eth0, public IP)
Intranet (real)	10.0.0.0/8	Gateway (eth1, 10.0.0.1), DHCP Server (eth0, 10.0.0.2), Storage (eth0, 10.0.0.3)
DMZ (virtual)	192.168.0.0/24	Gateway (eth2, 192.168.0.1), DNS Server (eth0, 192.168.0.2), Mail Server (eth0, 192.168.0.3)



For all the external connections from DMZ and Intranet the same public gateway IP address is used. By default, access from Intranet to the Internet is granted for standard ports of WEB, ICQ, FTP, SSH and DNS. Any access to DMZ from Intranet is allowed. The type of external connections to DMZ services (from the Internet) is specified for each single VA. For example, all SMTP packets are delivered to the Mail Server VA. Any access from DMZ to the Internet is allowed.

Types of external connections supported by VA services.

VA Service name	Protocol name	Port numbers
DNS Server	UDP	53
Mail Server	TCP	25, 110, 143, 993, 995

VA hardware resources requirements

<i>VA</i>	<i>Memory, Mb</i>	<i>HDD min, Mb</i>	<i>HDD max, Mb</i>
Gateway	128	1024	1536
DNS Server	32	512	576
Mail Server	256	512	8704
DHCP Server	32	512	576
Storage	256	512	131584
Total	704	3072	142976

Hardware requirements for this configuration:

- Intel Core 2 Duo processor with VT-X technology enabled;
- 1 Gb DDR2 memory;

- The required capacity of hard disks depends on the number and types of VAs you plan to install;
- 2 network cards.

III. How to Build a Small VITI

1. Assemble or purchase a physical server of the required configuration and install the operating system.
2. Install Parallels Workstation or Parallels Desktop for Mac. It is strongly recommended that you use some fault tolerance mechanism for your storage management, as RAID1 (mirroring) for example.

It is recommended to configure the DHCP server on your network to make VA's network configuring easier. Otherwise, you will need to configure the network settings for each single VA using a console.

3. Download the following PVAs from [Parallels Virtual Appliances Directory](#)
 - Gateway PVA
 - DNS Server PVA
 - Mail Server PVA
 - DHCP Server PVA
 - Storage PVA
4. Copy these VAs into a partition of the required capacity (3Gb is a minimum).
5. In the Gateway VA: connect the first virtual network adapter to a physical one that is connected to the Internet, and the second virtual adapter to a physical one that is connected to Intranet.
6. Change the networking modes to «host-only networking» in both DNS Server and Mail Server VAs.
7. Run all the VAs and wait until the boot process is completed.
8. Start DNS Server VA on the physical server. Follow the link that appears when the booting process is complete to access the Administrator Interface by secure protocol. Change the following settings on the Administrator Interface:
 - IP address: to 192.168.0.2
 - Network mask: 255.255.255.0
 - Broadcast: 192.168.0.255
 - Default gateway: 192.168.0.1
 - DNS server: 127.0.0.1

WARNING. Remember that your virtual network adapter is configured for «host-only networking». This means you should log onto the Administrator Interface directly from the physical server.
9. On the Administrator Interface of the Mail Server VA change the following settings:
 - IP address: 192.168.0.3

- Network mask: 255.255.255.0
- Broadcast: 192.168.0.255
- Default gateway: 192.168.0.1
- DNS server: 192.168.0.2

10. Change the following settings on the Administrator Interface of the Storage VA:

- IP address: 10.0.0.3
- Network mask: 255.0.0.0
- Broadcast: 10.255.255.255
- Default gateway: 10.0.0.1
- DNS server: 192.168.0.2

11. Start the DHCP Server VA. On the Administrator Interface of the DHCP Server VA set a range of IP addresses starting from 10.0.0.0/8, with default gateway at 10.0.0.1 and DNS server at 192.168.0.2. Also change the following settings of the DHCP Server VA on its Administrator Interface:

- IP address: 10.0.0.2
- Network mask: 255.0.0.0
- Broadcast: 10.255.255.255
- Default gateway: 10.0.0.1
- DNS server: 192.168.0.2

12. The VITI is built! You can test it using any workstation that receives IP-address from DHCP server in the Intranet.

Using any browser you can log on to:

Gateway VA – <https://10.0.0.1:8443>;

DNS Server VA – <https://192.168.0.2:8443>;

Mail Server VA – <https://192.168.0.3:8443>;

DHCP Server VA – <https://10.0.0.2:8443>;

Storage VA – <https://10.0.0.3:8443>.

Configure the Firewall, the DHCP network, the DNS zones, Mail domains and mail boxes as you like!