



Deploying Avaya IP Office Servers as Virtual Machines

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Part 1: IP Office Virtual Servers

Chapter 1: IP Office Virtual Servers

Avaya supports the installation of its Linux-based IP Office servers as virtualized servers. Using a virtual software platform allows the customer's IT staff flexibility to maximize the use of the platform's hardware to meet the individual needs of each virtual machines it hosts. It also provides them with access to various tools that ease maintenance and monitoring processes.

- For IP Office R11.1 FP1, IP Office is supported on the following virtual server platforms:
 - VMware
 - Microsoft Hyper-V
 - Amazon Web Services (AWS)
 - Microsoft Azure
- Avaya does not provide or support the virtual server software and hardware chosen by the customer.
- Use this document in conjunction with the documentation for standard IP Office deployments, see [Related Documentation](#) on page 8. This document only provides notes for the initial deployment of the server software as a virtual machine.
- Avaya only supports virtual machines using the virtualized server images supplied by Avaya. Resellers and customers who create their own image files for virtual deployment are solely responsible for the support and maintenance of those products.
- In addition to certified IP Office training, the installer and system maintainer must have certified training on the specific virtual platform type or supported by someone who has the required certification.

Related links

[Duplicate IP address issue](#) on page 7

[IP Office Anywhere](#) on page 8

[Related Documentation](#) on page 8

Duplicate IP address issue

The virtual machine deploys by default with two virtual network interfaces and two IP addresses, LAN1 and LAN2. At the start of deploying, if a duplicate IP address is detected, that is the address that is already in use, then IP Office application stops.

For example, if you deploy two IP Office virtual machines and only configure the LAN1 address on each, the matching default LAN2 addresses (192.168.43.1) on each causes the IP Office application on both virtual machines to stop.

During deployment, you must ensure that the deployment of one IP Office virtual machine has completed, including setting the LAN1 and LAN2 IP addresses to the required values, before starting the deployment of any other IP Office virtual machine.

If the LAN2 port of an IP Office virtual machine is not required, you can disable it. This reduces the risks of conflicts. Disabling a port is detailed as an optional step in the deployment process in this manual. See [Disabling a VMware network port](#) on page 42

Related links

[IP Office Virtual Servers](#) on page 7

IP Office Anywhere

IP Office Anywhere is a special version of the Linux-based IP Office service intended for product demonstrations and evaluation. It includes a pre-built and pre-licensed IP Office configuration.

Anywhere can be installed on a physical server or any of the virtual platforms listed above, it is also supported on VMware Player and Oracle VirtualBox virtual server platforms. See *Installing the IP Office Anywhere Demonstration Software* manual for installation procedure.

Related links

[IP Office Virtual Servers](#) on page 7

Related Documentation

This section lists the related documents for the products and solutions referenced in this document.

In addition, you should also refer to the VMware documentation. This is available from [VMware Support Offerings](#).

Application Server

- [Avaya IP Office™ Platform Solution Description](#)
- [Avaya IP Office™ Platform Server Edition Reference Configuration](#)
- [Deploying IP Office Server Edition](#)

Application Server

- [Installing and Maintaining an IP Office Application Server](#)

IP Office

- [Administering Avaya IP Office™ Platform with Manager](#)
- [Administering Avaya IP Office™ Platform with Web Manager](#)

Voicemail Pro

- [Administering IP Office Voicemail Pro](#)
- [Voicemail Pro Example Exercises](#)

one-X Portal for IP Office

- [Administering Avaya one-X Portal for IP Office](#)
- *Using one-X Portal for IP Office*

Related links

[IP Office Virtual Servers](#) on page 7

[Downloading documents](#) on page 9

Downloading documents

Procedure

1. Browse to <http://support.avaya.com> and log in.
2. Select **Downloads & Documents**.
3. In the **Enter Your Product Here** box, type `IP Office`.
4. Use the **Choose Release** drop-down to select the required IP Office release.
5. Select the content type you want included in the list of documents.
6. Click **Enter**.

Related links

[Related Documentation](#) on page 8

Chapter 2: Virtual server licensing

IP Office systems use licenses to enable various IP Office applications and features. IP Office also use licenses to enable each Server Edition or IP Office Select server.

For applications and feature, virtualized IP Office servers use the same licenses as used on non-virtual server deployments. However, for the server's themselves, Virtualized Server Edition and IP Office Select servers consumes specific Virtualized Server Edition or Virtualized Server Edition Select licenses respectively rather than standard Server Edition or Server Edition Select licenses.

PLDS licenses can be hosted in the network in one of two ways:

- **WebLM Centralized Licensing:** A `PLDS` file containing the licenses is uploaded to the WebLM service running on the network's primary server. The licenses are issued or validated against the host ID of the WebLM service. The host ID is automatically generated from various initial configuration settings of the server but does not subsequently change. Through the license menus, the servers in the network, including the primary, request licenses from those available. Due to its flexibility this is the recommended method of licensing.
- **Local Nodal Licensing:** A `PLDS` license containing the licenses is uploaded to the IP Office running on the server. The licenses are issued or validated against the **PLDS Host ID** of the server. The host ID is automatically generated from various initial configuration settings of the server. When the system configuration changes, the host ID also changes.

Related links

[Nodal PLDS Host ID Restrictions](#) on page 10

[Nodal License Grace Period](#) on page 11

Nodal PLDS Host ID Restrictions

If the server is hosting its own licenses, then Avaya validates each license against the server's unique **PLDS Host ID**. For an IP Office virtual machine, the IP Office generates the **PLDS Host ID** based on several factors:

- **Deployment Specific Factors:** The **PLDS Host ID** is partially based on several factors relating to the particular virtual machine's deployment. Redeploying the virtual machine changes its **PLDS Host ID**, thus existing licenses in IP Office configuration becomes invalid. To move to another virtual server platform without requiring new licenses, use **vMotion**.

- **Configuration Specific Factors:** The **PLDS Host ID** is also partial based on the following parameters of the virtual machine. Changing any of these parameters changes the virtual machine's **PLDS Host ID**:
 - Host Name
 - LAN1 IP Address
 - LAN2 IP Address
 - Timezone
 - DHCP Mode

Related links

[Virtual server licensing](#) on page 10

Nodal License Grace Period

If the virtual machine already contains nodal licenses and the **PLDS Host ID** changes, the licenses remain valid for a 30-day grace period. During those 30 days, if you make more than five further changes to the configuration parameters existing licenses become invalid immediately. Therefore, it is recommend that you finalize all these parameters before acquiring any licenses from Avaya

Related links

[Virtual server licensing](#) on page 10

Chapter 3: Differences in operation

Largely, the operations of virtual version of Server Edition match that of the non-virtual Server Edition installations.

Related links

[Original RPM files not installed](#) on page 12

[No USB support](#) on page 13

[VMware tools](#) on page 13

[Media Manager archiving](#) on page 13

[Primary cannot upgrade other servers](#) on page 14

Original RPM files not installed

The installation of a non-virtual machine includes copying the original RPM files used for each component's installation onto the server. Go to **Updates** menu and click **Uninstall** to uninstall the component before reinstalling. The presence of the copied original RPM files allows reinstallation on a non-virtual machine.

In order to reduce the size of the Avaya OVA file, by not including the original RPM files has the following effects:

- You cannot reinstall the uninstalled components: You cannot reinstall a component if you delete the RPM file it from the server's **Updates** menu. Instead you need to transfer the appropriate RPM files to the server first.
- You cannot upgrade other servers from the Primary: If the server is a Primary Server, it cannot be used to upgrade any Secondary Server or Expansion System (L) servers to match its software level. However, it can be used to upgrade Expansion System (V2) servers.

You can resolve the issues by: Following the server upgrade process to upload an ISO image to the server. This involves transferring a copy of the full ISO to the server, that automatically unpacks a full set of RPM files necessary to upgrade both Primary and other servers.

Related links

[Differences in operation](#) on page 12

No USB support

Avaya does not support features that require access to the virtual machine's USB port. This includes using the USB port for upgrades and for external music on hold.

Related links

[Differences in operation](#) on page 12

VMware tools

VMware tools is used by the virtual machine management software such as the vSphere client and vCenter to complete requested administrative tasks.

Avaya packages a specific version of VMware Tools as part of the IP Office OVA. This version is tailored for the IP Office operating system.

You should not upgrade the IP Office virtual machine version of VMware Tools except when advised by Avaya. Doing so could destabilize operation of the virtual machine and affect its performance.

Related links

[Differences in operation](#) on page 12

Media Manager archiving

When the Media Manager application is configured and during the operation, when the disk partition reaches full capacity, the older recordings are archived onto a Blu-Ray-R or DVD+RW disk. However, while running on a virtual machine, this method of archiving is not supported. Instead Media Manager deletes the oldest recordings when required to create space for new recordings.

Note that archiving of recordings onto other devices such as Network Attached Storage (NAS) is still supported.

Related links

[Differences in operation](#) on page 12

Primary cannot upgrade other servers

In a Server Edition network, the Primary Server can upgrade its connected Secondary Server and Expansion System (L) servers to the same software level as itself. However, this does not work if the Primary Server is a newly installed virtual machine.

This issue is related to the fact the OVA deployment does not include a set of the original RPM files required for reinstallation of IP Office components. See [Original RPM files not installed](#) on page 12

The solution is to first upgrade the Primary Server using any of the documented methods, see [Transferring the ISO File](#) on page 89. The upgrade process includes loading all the original RPM files onto the server which it can then use to upgrade other servers.

Related links

[Differences in operation](#) on page 12

Chapter 4: Profiling

The standard IP Office virtual machine assumes four CPUs, 3072 MB RAM and a 100 GB hard disk (see [Default virtual machine](#) on page 16). However, the resources allocated should be adjusted to meet the intended role of the virtual machine and to optimize the use of the virtual server platform's available resources, especially if it is supporting multiple virtual machines.

The IP Office virtual machine requirements are outlined in the following tables. Depending on the type of virtual server, the stage at which these can be adjusted may vary.

Some restrictions are:

- **Network Ports:** You must configure all IP Office virtual machines with two Ethernet ports. If you are using vMotion, additional network port requirement will apply, see [vMotion requirements](#) on page 24.
- **Hard disk:** Regardless of the IP Office virtual machine's role, it requires a minimum of 100 GB of allocated hard drive space. However, if required additional hard disk space can be added. See [Adjusting the VMware disk space](#) on page 39.
 - If it is planned to run the Media Manager service on the virtual server, the requirement for an additional hard disk for Media Manager still applies.
- **Disk Storage IOPS Requirements:** To maintain acceptable performance, the number of virtual machines using the same disk storage and the total throughput of those machines must be within the capacity of that storage. See [Disk IOPS requirements](#) on page 24.
- **Profiling Other Virtual Machines:** It is good practice to monitor the resource utilization of all the virtual machines running in their infrastructure. Profile all virtual machines running on the virtual server platform to fine-tune the hardware resources allocated and used. This will improve performance by allocating resources where they are needed and optimize the use of their virtual infrastructure.
- **Multiple IP Office Servers:** If deploying servers with the intention of using resiliency, then the hardware resources and profiling applied to each server must include allowance for the scenarios where users re-register from one server to the other, effectively increasing the server's user requirements. If there is a mix of non-virtualized and virtualized machines, then the assignment of resources to the virtual machine must match the hardware resources available in the non-virtualized machine.

Related links

[Default virtual machine](#) on page 16

[Primary and secondary servers](#) on page 16

[Server Edition Expansion Server \(L\)](#) on page 18

[Server Edition Application Server](#) on page 18

[IP Office Application Server](#) on page 19

Default virtual machine

The IP Office virtual images install a default virtual machine that matches the profiling values for a typical 200 user Primary Server.

Hardware configuration	Resource Allocation	Memory	Hard Disk
<ul style="list-style-type: none"> vCPU: 4 RAM: 3072MB HDD: 1x 100 GB 	<ul style="list-style-type: none"> CPU: 5 GHz Shares: High Reservation: 8000 Mhz Limit: Unlimited 	<ul style="list-style-type: none"> Shares: High Reservation: 2765 MB Limit: Unlimited 	<ul style="list-style-type: none"> Shares: High Limit: Unlimited

After deployment of a virtual machine, you should optimize the resources allocated to meet the actual requirements of the virtual machine. See [Profiling](#) on page 15. For example, if the virtual machine supports only 50 users, you can reduce the allocated processors and RAM memory. This allows for the best use of the overall resources provided by the virtual server platform.

Related links

[Profiling](#) on page 15

Primary and secondary servers

The following table displays the minimum supported profile values for different IP Office virtual machine roles in primary and secondary servers:

Server Type		Primary and Secondary servers										
Users ^[2]		20	100	20	50	100	200	500	1000	2000	3000	
one-X Portal Users ^[2]		-		5	16	20	40	88	175	351	703	1500
Voicemail Channels ^[2]		2	12	3	7	12	24	49	98	196	248 ^[3]	
Web Collaboration users ^{[1] [2]}		-		2	3	5	10	21	42	84	216	512
RAM (MB)	Allocated	768	2048	2684 ^[6]	2684 ^[6]	3072	3072	4096	5120	6144	10240	14336
	Reserved	625	1551	2416 ^[6]	2416 ^[6]	2624	2765	3358	4198	5376	8192	11909
CPUs		1	2-3	2-3	2-3	2-4	3-5	3-5	4-7	5-8	7-10	11-14

Table continues...

Server Type		Primary and Secondary servers										
Users ^[2]		20	100	20	50	100	200	500	1000	2000	3000	
one-X Portal Users ^[2]		-		5	16	20	40	88	175	351	703	1500
Voicemail Channels ^[2]		2	12	3	7	12	24	49	98	196	248 ^[3]	
Web Collaboration users ^{[1] [2]}		-		2	3	5	10	21	42	84	216	512
CPU Cycles (GHz)	Limit	3	5	4	5	7	10	10	14	18	20	25
	Reserved	3	4	3	4	6	8	8	12	15	17	21
Hard Disk (GB) ^[8,9]		100	100	100	100	100	100	130	140	150	160	160
IOPS ^[7]		15	31	17	18	26	41	71	129	248	338	346
AWS Machine Instance ^[10]		m5.large		m5.xlarge			m5.2xlarge			m5.4xlarge		

1. Web Collaboration is only supported on the Primary Server.
2. If there is any profile misalignment between the user and channel quantities, use the highest-profile that meets all requirements.
3. More than 250 recording channels with Media Manager requires approximately 12 vCPU or 30 GHz CPU cycles in total.
4. Each connected one-X Portal client counts as one load. For example, Avaya IP Office Lync plugin using Avaya Communicator for Windows for calls counts as two clients.
5. The CPU values shown apply to all virtualization platforms. However, for Hyper-V, the CPU values should be increased by 20%.
6. If Media Manager is enabled, add 250MB RAM and increase the typical IOPS values.
7. Typical IOPS is the average HDD I/O transactions per second during normal operation. When backup, intense logging or Media Manager are in use, more IOPS are required; 40 to 200 IOPS depending on backup data size, logging rate or recording channels.
8. Voicemail Pro requires 0.5 MB per minute for messages, prompts and announcements. Each user and group mailbox is limited to up to 30 MB (1 hour).
9. Media Manager requires 60 KB per minute for non-authenticated VRL files and 120 KB per minute for authenticated VRLA files. Media Manager also reserves 1 GB of space for the call details database and other operations. Note that more than 250 channels of recording requires at least 12 vCPUs and 30 GHz CPU cycles.
10. The quoted AWS machines instances are recommendations only. The range of machine instances and the capabilities of existing instances change frequently. Therefore, other instances can be used so long as their capabilities match the profiling resource requirements.

Related links

[Profiling](#) on page 15

Server Edition Expansion Server (L)

Server Type		Server Edition Expansion Server (L)					
Users		10	50	100	200	500	750
RAM	Allocated	1024	1024	1024	1024	1024	1024
	Reserved	887	896	900	900	903	906
CPUs		2–3	2–3	2–3	2–3	2–3	2–3
CPU Cycles (GHz)	Limit	3	3	5	5	5	6
	Reserved	2	2	4	4	4	5
Hard Disk (GB)		100	100	100	100	100	100
IOPS ^[1]	Typical	5	5	6	7	9	11

Notes

1. Typical IOPS is the average HDD I/O transactions per second during normal operation. When backup, intense logging or Media Manager are in use, more IOPS are required; 40 to 200 IOPS depending on backup data size, logging rate or recording channels.

Related links

[Profiling](#) on page 15

Server Edition Application Server

These profiling values are for an IP Office Application server being used to provide one–X Portal service support to a Server Edition/Select server that has had its own portal service switched-off in order to increase its supportable user capacity.

Server Type		Server Edition Application Server						
one-X Portal Users ^[1]		50	100	200	500	1000	2000	3000
Web Collaboration users ^[1]		9	18	35	86	171	342	512
RAM (MB)	Allocated	3072	3072	3072	4096	6144	10240	14336
	Reserved	2703	2703	2703	3548	5386	8555	12272
CPUs		2–3	2–3	2–4	3–5	4–6	4–6	4–6
CPU Cycles (GHz)	Limit	6	6	7	10	11	11	11
	Reserved	5	5	6	8	9	9	9
Hard Disk (GB)		100	100	100	100	100	100	100
IOPS ^[2]		10	10	11	16	18	20	21

Notes

1. If there is any profile misalignment between the user and channel quantities, use the highest-profile that meets all requirements.
2. Typical IOPS is the average HDD I/O transactions per second during normal operation. When backup, intense logging or Media Manager are in use, more IOPS are required; 40 to 200 IOPS depending on backup data size, logging rate or recording channels.

Related links

[Profiling](#) on page 15

IP Office Application Server

These profiling values are for an IP Office Application Server being used provide services to an IP500 V2 running in IP Office Preferred Edition mode. This can be used to provide Voicemail Pro, Media Manager and or one-X Portal support to the IP500 V2.

Server Type		IP Office Application servers			
one-X Portal Users ^[1]		50	100	200	750
Voicemail Channels ^[1]		20	50	100	150
Web Collaboration users ^[1]		20	50	100	300
RAM (MB)	Allocated	3072	3072	4096	7168
	Reserved	2739	2739	3420	6144
CPUs		2–3	2–3	3–5	4–7
CPU Cycles (GHz)	Limit	5	5	9	13
	Reserved	4	4	7	11
Hard Disk (GB) ^[3, 4]		100	100	100	100
IOPS ^[5]		34	49	162	318

Notes

1. If there is any profile misalignment between the user and channel quantities, use the highest-profile that meets all requirements.
2. Each connected one-X Portal client counts as one load. For example, Avaya IP Office Lync plugin using Avaya Communicator for Windows for calls counts as two clients.
3. Voicemail Pro requires 0.5 MB per minute for messages, prompts and announcements. Each user and group mailbox is limited to up to 30 MB (1 hour).
4. Media Manager requires 60 KB per minute for non-authenticated VRL files and 120 KB per minute for authenticated VRLA files. Media Manager also reserves 1 GB of space for the call details database and other operations. Note that more than 250 channels of recording requires at least 12 vCPUs and 30 GHz CPU cycles.

Profiling

5. Typical IOPS is the average HDD I/O transactions per second during normal operation. When backup, intense logging or Media Manager are in use, more IOPS are required; 40 to 200 IOPS depending on backup data size, logging rate or recording channels.

Related links

[Profiling](#) on page 15

Part 2: VMware

Chapter 5: VMware Features

The following VMware features are supported.

Supported Virtual Servers

Avaya supports the IP Office virtual machine on the following virtual server platforms:

- **VMware vSphere:** The vSphere support is:
 - Supported with VMware vSphere ESXi 6.0, 6.5, 6.7 and 7.0.
 - Support includes the Standard, Enterprise and Enterprise Plus variants. Also support for Essentials Kit and Essentials Plus Kit variants.

Supported VMware Virtual Server Features

- **vCenter:** VMware vCenter server, is the centralized management tool for the vSphere suite. It allows the management of multiple host servers and virtual machines on different hosts through a single console application.
- **vMotion:** vMotion allows you to move an existing virtual machine from one virtual server platform to another with minimal interruption to the operation of the virtual machine. For example, this may be necessary if the existing server platform resources become exhausted. see [vMotion requirements](#) on page 24.
- **Snapshot:** The virtual machine must be powered off before taking or deleting a snapshot. Note that running a virtual machine with snapshots degrades its performance. Similarly, deleting snapshots can take some time to complete and can impact performance.

The virtual machines disk size cannot be changed if any snapshot is taken from the virtual machine. Any existing snapshots must be deleted first.

- **OVA Deployment**
- **Soft Power Off**
- **High Availability:** Enables the automatic re-establishment of the virtual machine on a new host server during a failure on or of the original host. See [High availability](#) on page 26.
- **VMware Tools:** Note however that an IP Office specific version of VMware tools is included as part of the IP Office OVA. See [VMware tools](#) on page 13.

vSphere Clients

Traditional host management used the vSphere desktop client installed on a client PC. For vSphere 5.0 onwards, VMware introduced the vSphere web client. The vSphere desktop client is still supported, however new features released with vSphere 5.1 and higher are only managed using the vSphere web client.

Also, using vSphere desktop client to connect to the ESXi 5.5 host and deploy the OVA will fail. When the 5.x ESXi host version is managed by a virtual center, the vSphere desktop client's management capabilities are restricted.

Related links

[Hardware, software and virtual machine requirements](#) on page 23

[vMotion requirements](#) on page 24

[Disk IOPS requirements](#) on page 24

[Alarms](#) on page 25

[High availability](#) on page 26

Hardware, software and virtual machine requirements

Refer to the following:

- For a searchable list of hardware platforms, refer to [VMware Compatibility Guide](#). The platform must support at least 2 Ethernet interfaces.
- [ESXi Hardware Requirements](#).
- [VMware Lifecycle Product Matrix](#) for current supported VMware software.

Avaya provides IP Office virtualization software in an OVA format. The following are high-level software and hardware requirements:

- Latest VMware vSphere software. See [VMware Features](#) on page 22.
- VMware vSphere desktop client software. vCenter is supported but not required unless using vSphere web client.
- VMware compatible hardware platform.
- Intel-based CPUs from the Xeon family with 2 GHz clock speed or better. 2.4 GHz recommended.
- The RAM size must satisfy the ESXi requirements in addition to the specific RAM requirements of the virtual machines deployed. The profiling section lists the requirements for IP Office virtual machines. 6 GB and higher is recommended.
- 2 Ethernet interfaces (more recommended if using vMotion)

To determine the required virtual server platform:

- Refer to the [Default virtual machine](#) on page 16 section to assess the total requirements for the IP Office virtual machines.
- Add in the requirements for any other virtual machines.
- Add in the underlying requirements for the virtual server software itself.
- Note the minimum requirements above.
- Note the requirements for vMotion. See [vMotion requirements](#) on page 24.

- Assess the compatibility of potential server platforms using the VMware site.

Related links

[VMware Features](#) on page 22

vMotion requirements

vMotion allows you to move an existing virtual machine from one virtual server platform to another with minimal interruption to the operation of the virtual machine. For example, this may be necessary if the existing server platform resources become exhausted.

For IP Office virtual machines, using vMotion allows you to move the virtual machine without changing its System Identification and requiring new IP Office licenses. If the virtual machine is running one-X Portal, any existing sessions may have to log in again after the move.

To use vMotion:

- Each server platform requires 2 Gigabit Ethernet ports with one port dedicated to vMotion traffic.
- The server platform CPUs must be similar, that is, from the same manufacturer and using similar processor architectures.
- The Ethernet switch connecting the two servers must be minimum 10Gbps.
- vMotion imposes specific storage requirements. Several options exist including iSCSI and local storage, among others. See VMware vMotion documentation for detailed requirements.
- To decrease chances of one-X Portal connectivity interruptions, it is recommended that vMotion operation is done at times of low IP Office use.

Related links

[VMware Features](#) on page 22

Disk IOPS requirements

Input/Output Operations Per Second (IOPS) is a measurement of the traffic between a virtual machine and the disk storage it is using. The following factors should be considered when assessing the IOPS aspect of the virtual platform:

- The number of virtual machines running on an ESXi host should not exceed the IOPS of the disk storage divided by 30. For example, a datastore with an IOPS of 150 should only support up to 5 virtual machines.
- The total maximum IOPS of all the virtual machines must be within the IOPS capacity of the datastore. To compute how many IOPS the storage supports, you need to know the hard disk type, RAID configuration, number of drives, connection method, and so on. See [Poor performance and high disk latency with some storage configurations](#)

- By default, no IOPS limit is set for each virtual machine disk. If limits are set, it is important to understand how the limits are used for all virtual machines using the same datastore. The limits are aggregated to set an overall limit for the datastore as follows:
 - **Example:** 4 virtual machine disks using the same datastore, each disk set to 100 IOPS.
 - As each disk is limited to 100, the total IOPS for the datastore is 400. If disks 1, 2 and 3 are currently using 10 IOPS each, disk 4 could use 370 IOPS without being restricted.
 - **Example:** One disk set to Unlimited (the default), all other disks are set to 100 IOPS.
 - As one of the disks is set to unlimited, the potential IOPS for the virtual machine disks using that datastore are also unlimited.

Exceeding the IOPS capacity of the datastore will lead to unpredictable results for virtual machine applications using that storage. Whilst a maximum IOPS limit can be applied to each virtual machine disk, that approach is not recommended for IP Office virtual machines as once again it will lead to unpredictable behavior.

Related links

[VMware Features](#) on page 22

Alarms

The vSphere clients **Performance** tab displays performance information for individual virtual machines and for the whole ESXi server. vCenter further extends the capabilities of monitoring this performance on long term basis.

In addition to the above performance monitors for any virtual machines, for IP Office virtual machines a number of specific alarms are available that can be output to other applications. The alarms are warning alarms, critical alarms and OK alarms for when usage returns to below the alarm threshold.

Alarm	Alarm Threshold	
	Warning Alarm	Critical Alarm
CPU Clock Cycles	90%	95%
RAM Memory	85%	97%
Hard Disk Input/Output	15%	25%
Network	15%	25%

You can view and or receive the alarms in a number of ways:

- They appear in the alarms shown by the server's web control menus. see *Server Edition* documentation.
- Within the configuration of the IP Office application on the virtual machine, you can select to output alarms to SNMP, Syslog and or email. IP Office Manager manual.

- System Status Application displays the alarms when connected to the virtual machine.

Related links

[VMware Features](#) on page 22

High availability

VMware High Availability (HA) allows a virtual machine to be automatically re-established on another host machine if its normal host fails or detects a potential failure. For example:

- Host failures include power failure and ESXi kernel panic.
- A Linux operating system crash on the host server.

Backup is started up after a failure has been detected and takes a approximately 10 minutes to complete. During the switch any unsaved data and active calls are lost.

Use of this feature is only supported for IP Office Select systems. It requires the customer data center to include multiple host servers and for those hosts to have access to the same separate datastore.

HA cannot be combined with IP Office resiliency as the two mechanisms conflict. For example, if HA is enabled for a Primary Server, no primary resources (phones, hunt groups, voicemail server) can be supported using IP Office resilience fallback to a Secondary Server.

Related links

[VMware Features](#) on page 22

Chapter 6: VMware deployment

This section outlines the steps required to deploy an IP Office server as a virtual machine. If deploying several virtual machines, the order of deployment and configuration is the same as per the *Server Edition deployment* documentation. see [Related Documentation](#) on page 8.

In addition to certified IP Office training, the installer and system maintainer must have certified training on the specific virtual platform type or supported by someone who has the required certification.

During deployment, you must ensure that the deployment of one IP Office virtual machine has completed, including setting the LAN1 and LAN2 IP addresses to the required values, before starting the deployment of any other IP Office virtual machine.

Related links

[Confirm the system settings](#) on page 27

[Downloading software](#) on page 28

[Deploying the VMware OVA file \(vSphere web client\)](#) on page 29

[Deploying the VMware OVA file \(vSphere desktop client\)](#) on page 30

[Adding an additional VMware hard disk](#) on page 30

[Virtual machine profiling](#) on page 32

[Powering On a VMware virtual machine](#) on page 44

Confirm the system settings

Any duplication of IP addresses, even the temporary default IP addresses, causes the IP Office application to not start and any existing IP Office service to stop.

If using local nodal licensing (see [Virtual server licensing](#) on page 10), the virtual server bases the **PLDS Host ID** its uses for license validation on several server configuration settings. Hence, before deploying the virtual machine and obtaining any licenses, you must confirm with the customer the final values for the following:

- Host Name
- LAN1 IP Address
- LAN2 IP Address
- Timezone

- DHCP Mode

This does not apply if using WebLM centralized licensing.

Related links

[VMware deployment](#) on page 27

[Hyper-V deployment](#) on page 46

Downloading software

About this task

Avaya make a number of different file available for each IP Office release. For a VMware deployment, select the following files:

- **OVA file:** You use this type of file for the initial deployment of a VMware virtual machine. The file is an full machine image.
- **TTS ISO:** The images used to deploy new virtual machines do not include text-to-speech (TTS) prompts. To add TTS languages, you need to download and install the additional ISO files for TTS languages. These are provided as 3 ISO files:
 - **DVD 1:** English, Spanish, French, German, Italian.
 - **DVD 2:** Swedish, Norwegian, Finnish, Dutch, Danish, Portuguese, Greek.
 - **DVD 3:** Chinese, Polish, Russian.

Procedure

1. Browse to <http://support.avaya.com> and log in.
2. Click **Support by Product** and select **Downloads**.
3. In the **Enter Product Name** box, enter `IP Office` and select the displayed match.
4. Use the **Choose Release** drop-down to select the required release.
5. From the listed **Downloads**, select the particular version of the release required (there may be multiple versions of a release depending on the number of service and feature packs that have been made available).
6. Click on the required files and follow any further instructions shown by the website and your browser..
7. Also download and read any documents shown under **Related Documents**

Next steps

- Proceed to deploying the new virtual machine using the VMware desktop client (see [Deploying the VMware OVA file \(vSphere desktop client\)](#) on page 30) or web client (see [Deploying the VMware OVA file \(vSphere web client\)](#) on page 29).

Related links

[VMware deployment](#) on page 27

Deploying the VMware OVA file (vSphere web client)

About this task

Deploying the OVA file to the virtual server platform creates a new virtual machine. Note that, depending on the speed of the link between the client PC and the virtual server host, this process can take several hours.

Procedure

1. Using the vSphere Web Client, connect to the host server onto which you want to deploy the OVA.
2. Select **Action > All vCenter Actions > Deploy OVF Template**.
3. Enter the location of the OVA file. If on your PC, click **Browse**, select the OVA image file and click **Open** and then click **Next**.
4. A summary of the OVA is displayed. Click **Next**.
5. The installer displays the license agreement. Click **Accept** and then click **Next**.
6. Enter a name for the virtual machine. This name appears in the VMware server inventory of virtual machines it is hosting. Click **Next**.
7. Set the type of disk space usage to **Thick Provision Eager Zeroed**. Also select the datastore that the virtual machine should use. Click **Next**.
8. Select the network connections for the virtual machine. The virtual interfaces should not be on the same LAN. Click **Next**.
9. Set the network addresses for the network interfaces. Click **Next**.
10. The install wizard displays a summary of the deployment settings. Do not select **Power on after deployment** check box.
11. Click **Finish**.

Next steps

Once the deployment is complete, the new virtual machine appears in the inventory of virtual machines.

- If deploying a virtual machine to run Media Manager, you now need to add an additional hard disk. See [Adding an additional VMware hard disk](#) on page 30.
- Otherwise, you can now adjust the resource allocation of the virtual machine. See [Virtual machine profiling](#) on page 32.

Related links

[VMware deployment](#) on page 27

Deploying the VMware OVA file (vSphere desktop client)

About this task

Deploying the OVA file to the virtual server platform creates a new virtual machine. Note that, depending on the speed of the link between the client PC and the virtual server host, this process can take several hours.

Procedure

1. Using the VMware vSphere Client, connection go virtual server.
2. Select **File** and then select **Deploy OVF TemplateDeploy OVF Template**.
3. Click **Browse** and select the OVA image file and click **Open** and click **Next**.
4. The installer displays the license agreement. Click **Accept** and then click **Next**.
5. Enter a name for the virtual machine. This name appears in the VMware server inventory of virtual machines it is hosting. Click **Next**.
6. Set the type of disk space usage to **Thick Provision Eager Zeroed**. Also select the datastore that the virtual machine should use. Click **Next**.
7. Select the network connections for the virtual machine. The virtual interfaces should not be on the same LAN. Click **Next**.
8. Set the network addresses for the network interfaces. Click **Next**.
9. The install wizard displays a summary of the deployment settings. Do not select **Power on after deployment** check box.
10. Click **Finish**.

Next steps

Once the deployment is complete, the new virtual machine appears in the inventory of virtual machines.

- If deploying a virtual machine to run Media Manager, you now need to add an additional hard disk. See [Adding an additional VMware hard disk](#) on page 30.
- Otherwise, you can now adjust the resource allocation of the virtual machine. See [Virtual machine profiling](#) on page 32.

Related links

[VMware deployment](#) on page 27

Adding an additional VMware hard disk

To run the Media Manager application on the same IP Office server as Voicemail Pro, it must be provided with and configured to use an additional hard disk. This requirement applies even is running on a virtual machine. This process must be performed before initial server ignition.

The minimum supported size is 30 GB. However, the recommended size is 300 GB or higher. Remember that for a virtual machine installation of Media Manager, archiving to Blu-Ray/DVD disk is not supported. See [Media Manager archiving](#) on page 13.

- Media Manager typically requires 60 KB per minute for non-authenticated files and 120 KB per minute for authenticated files.
- Media Manager also reserves 1 GB of space for the call details database and other operations.

Related links

[VMware deployment](#) on page 27

[Adding an additional VMware hard disk \(vSphere web client\)](#) on page 31

[Adding an additional VMware hard disk \(vSphere desktop client\)](#) on page 31

Adding an additional VMware hard disk (vSphere web client)

Procedure

1. Using the vSphere web client, select the virtual machine. For example, select **vCenter Management** and in the navigation tree on the left select the virtual machine.
2. Right-click a virtual machine in the inventory and select **Edit Settings**.
3. On the **Virtual Hardware** tab, from the **New device** drop-down select **New Hard Disk** and click **Add**. The hard disk appears in the virtual hardware devices list.
4. Expand **New hard disk**.
5. Set the hard disk size and select the units (MB or GB) from the drop-down menu.
6. Select the datastore location where you want to store the virtual machine files.
7. For the format select **Thick Provision Eager Zeroed** and click **Next**.

Next steps

- You should now adjust the resource allocation of the virtual machine. See [Virtual machine profiling](#) on page 32.

Related links

[Adding an additional VMware hard disk](#) on page 30

Adding an additional VMware hard disk (vSphere desktop client)

Procedure

1. Using the vSphere desktop client, select the **Inventory** view.
2. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**.
3. Click on the virtual machine.

4. Right-click on the virtual machine and select **Edit Settings**.
5. On the **Virtual Hardware** tab, click on **Add** and select **Hard Disk** and click **Next**
6. Select **Create a new virtual disk** and click **Next**.
7. Set the **Disk Size**.
8. Set the **Disk Provisioning** to **Thick Provision Eager Zeroed**.
9. Select the **Datastore** to use. This can be the same datastore or a different one from that used during the OVA deployment.
10. Click **Next**.
11. Check the settings are as required. Click **Finish**.

Next steps

- You should now adjust the resource allocation of the virtual machine. See [Virtual machine profiling](#) on page 32.

Related links

[Adding an additional VMware hard disk](#) on page 30

Virtual machine profiling

After deploying a virtual machine, you should optimize its allocated resources to meet the requirements of the virtual machine's role, see [Profiling](#) on page 15. For example, if the virtual machine will only support 50 users, you can reduce the allocated processors and RAM memory. This allows for the best use of the overall resources provided by the virtual server platform.

Attribute	Description
Memory	You can set the maximum amount of RAM memory that the virtual machine can use. You can also set how much of that RAM memory the platform guarantees for the virtual machine. See Adjusting the VMware RAM memory on page 34
CPU	You can configure multiple virtual processor (vCPUs) for a virtual machine. A virtual machine cannot have more vCPUs than the maximum number of logical CPUs on the host virtual server platform. The number of logical CPUs is the number of physical processor cores. See Adjusting the VMware CPU Cores on page 36

Table continues...

Attribute	Description
CPU Clock Cycles	You can set the maximum number of CPU clock cycles that the virtual machine can use. You can also set the number of CPU clock cycles guaranteed for the virtual machine. Multiply the clock cycle of the CPU with the number of allocated virtual CPU processors to determine the aggregate value and compare it with recommended profiling values. See Adjusting the VMware CPU Cycles on page 37
Hard Disk	By default the virtual machine is allocated a 100 GB virtual disk. However, this can be increased if required. Note however that the size cannot be decreased at a later stage. See Adjusting the VMware disk space on page 39.
IOPS	Input/Output Operations Per Second (IOPS) is a measurement of the traffic between a virtual machine and the disk storage it is using. See Disk IOPS requirements on page 24
Network Ports	The IP Office virtual machine deploys with two network interfaces. By default these configure as LAN1 (192.168.42.1/255.255.255.0) and LAN2 (192.168.43.1/255.255.255.0) when the virtual machine starts. If the LAN2 port is not required, it can be disabled, see Disabling a VMware network port on page 42. This reduces the chances of IP address duplication which causes the IP Office application to not start, see Duplicate IP address issue on page 7.

After profiling, you can power on the virtual machine. See [Powering On a VMware virtual machine](#) on page 44.

- **Profiling Other Virtual Machines:** It is good practice to monitor the resource utilization of all the virtual machines running in their infrastructure. Profile all virtual machines running on the virtual server platform to fine-tune the hardware resources allocated and used. This will improve performance by allocating resources where they are needed and optimize the use of their virtual infrastructure.
- **Multiple IP Office Servers:** If deploying servers with the intention of using resiliency, then the hardware resources and profiling applied to each server must include allowance for the scenarios where users re-register from one server to the other, effectively increasing the server's user requirements. If there is a mix of non-virtualized and virtualized machines, then the assignment of resources to the virtual machine must match the hardware resources available in the non-virtualized machine.

Related links

- [VMware deployment](#) on page 27
- [Adjusting the VMware RAM memory](#) on page 34
- [Adjusting the VMware CPU Cores](#) on page 36
- [Adjusting the VMware CPU Cycles](#) on page 37
- [Adjusting the VMware disk space](#) on page 39
- [Adjusting the VMware IOPS limits](#) on page 40
- [Disabling a VMware network port](#) on page 42

Adjusting the VMware RAM memory

You can set the maximum amount of RAM memory that the virtual machine can use. You can also set how much of that RAM memory the platform guarantees for the virtual machine. Set these values to match the virtual server's profile requirements. See [Profiling](#) on page 15.

Warning:

- The following processes can be used on a new virtual machine that has not been powered on/started.
- To perform the same actions on an existing virtual machine, it must first be powered off/stopped before making the adjusting and then powered on/started again. That will interrupt all services provided by the virtual machine.

Related links

[Virtual machine profiling](#) on page 32

[Adjusting the VMware RAM memory \(vSphere web client\)](#) on page 34

[Adjusting the VMware RAM memory \(vSphere desktop client\)](#) on page 35

Adjusting the VMware RAM memory (vSphere web client)

Procedure

1. Using the vSphere web client, select the virtual machine. For example, select **vCenter Management** and in the navigation tree on the left select the virtual machine.
2. Right-click a virtual machine in the inventory and select **Edit Settings**.
3. Expand the **Memory**.
4. In the **RAM** text box, type the amount of RAM to assign to the virtual machine. See [Profiling](#) on page 15. Select whether the memory is specified in MB or GB.
5. Select the required values for reservations and shares:
 - **Reservation** – This value sets the guaranteed minimum available RAM for the virtual machine. You cannot set the reservation higher than the maximum memory value. For IP Office virtual machines, the recommended value is 75-80% of the maximum.
 - **Shares** – Select the virtual machine's relative priority for sharing the server platform memory. The values are **Low**, **Normal**, **High** and **Custom**. The more shares a virtual machine has, the more often it gets a time slice of a memory when there is no memory idle time. Shares represent a relative priority for the allocation of memory capacity between virtual machines. For more information about share values, refer to the VMware Resource Management Guide.

Select **Normal** only if the IP Office virtual machine has exclusive use of the ESXi host. However, if other virtual machines utilizing the share mechanism present on the host, it is imperative that IP Office virtual machine is set to **High**. IP Office is a real-time telecommunication software that requires immediate access to hardware resources.

6. Click **OK**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Powering On a VMware virtual machine](#) on page 44).

Related links

[Adjusting the VMware RAM memory](#) on page 34

Adjusting the VMware RAM memory (vSphere desktop client)

Procedure

1. Using the vSphere desktop client, select the **Inventory** view.
2. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**.
3. Click on the virtual machine.
4. Right-click on the virtual machine and select **Edit Settings**.
5. Select **Memory**.
6. Adjust the maximum memory size for the virtual machine. See [Profiling](#) on page 15.
7. Click the **Resources** tab and select **Memory**. Allocate the RAM for the virtual machine. See [Profiling](#) on page 15.

- **Reservation** – This value sets the guaranteed minimum available RAM for the virtual machine. You cannot set the reservation higher than the maximum memory value. For IP Office virtual machines, the recommended value is 75-80% of the maximum.
- **Shares** – Select the virtual machine's relative priority for sharing the server platform memory. The values are **Low**, **Normal**, **High** and **Custom**. The more shares a virtual machine has, the more often it gets a time slice of a memory when there is no memory idle time. Shares represent a relative priority for the allocation of memory capacity between virtual machines. For more information about share values, refer to the VMware Resource Management Guide.

Select **Normal** only if the IP Office virtual machine has exclusive use of the ESXi host. However, if other virtual machines utilizing the share mechanism present on the host, it is imperative that IP Office virtual machine is set to **High**. IP Office is a real-time telecommunication software that requires immediate access to hardware resources.

8. Click **OK**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Powering On a VMware virtual machine](#) on page 44).

Related links

[Adjusting the VMware RAM memory](#) on page 34

Adjusting the VMware CPU Cores

You can configure multiple virtual processor (vCPUs) for a virtual machine. A virtual machine cannot have more vCPUs than the maximum number of logical CPUs on the host virtual server platform. The number of logical CPUs is the number of physical processor cores.

Note that the CPU core clock speed affects the range selection. When the CPU is at the low end toward 2 GHz, use the higher number of CPUs. When the CPU speed is higher, for example 3.6 GHz, use the lower number of CPUs.

The CPU core clock speed multiplied by the number of cores, must meet the aggregate CPU cycle requirements of the virtual machine. See [Profiling](#) on page 15.

Related links

[Virtual machine profiling](#) on page 32

[Adjusting the VMware CPU Cores \(vSphere web client\)](#) on page 36

[Adjusting the VMware CPU Cores \(vSphere desktop client\)](#) on page 36

Adjusting the VMware CPU Cores (vSphere web client)

Procedure

1. Using the vSphere web client, select the virtual machine. For example, select **vCenter Management** and in the navigation tree on the left select the virtual machine.
2. Right-click a virtual machine in the inventory and select **Edit Settings**.
3. Expand the **CPU**.
4. Select the number of virtual processors for the virtual machine. See [Profiling](#) on page 15
5. Click **OK**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Powering On a VMware virtual machine](#) on page 44).

Related links

[Adjusting the VMware CPU Cores](#) on page 36

Adjusting the VMware CPU Cores (vSphere desktop client)

Procedure

1. Using the vSphere desktop client, select the **Inventory** view.
2. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**.
3. Click on the virtual machine.
4. Right-click on the virtual machine and select **Edit Settings**.

5. Click the **Hardware** tab and select **CPU**.
6. Select the number of virtual processors for the virtual machine. See [Profiling](#) on page 15
7. Click **OK**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Powering On a VMware virtual machine](#) on page 44).

Related links

[Adjusting the VMware CPU Cores](#) on page 36

Adjusting the VMware CPU Cycles

You can set the maximum number of CPU clock cycles that the virtual machine can use. You can also set the number of CPU clock cycles guaranteed for the virtual machine.

Multiply the clock cycle of the CPU with the number of allocated virtual CPU processors to determine the aggregate value and compare it with recommended profiling values. See [Profiling](#) on page 15.

Related links

[Virtual machine profiling](#) on page 32

[Adjusting the VMware CPU Cycles \(vSphere web client\)](#) on page 37

[Adjusting the VMware CPU Cycles \(vSphere desktop client\)](#) on page 38

Adjusting the VMware CPU Cycles (vSphere web client)

Procedure

1. Using the vSphere web client, select the virtual machine. For example, select **vCenter Management** and in the navigation tree on the left select the virtual machine.
2. Right-click a virtual machine in the inventory and select **Edit Settings**.
3. On the **Virtual Hardware** tab, expand **CPU**.
4. Allocate the CPU cycles for the virtual machine's vCPUs. See [Profiling](#) on page 15
 - **Reservation** – This value sets the guaranteed minimum available RAM for the virtual machine. You cannot set the reservation higher than the maximum memory value. For IP Office virtual machines, the recommended value is 75-80% of the maximum.
 - **Shares** – The more shares a virtual machine has, the more often it gets a time slice of a CPU when there is no CPU idle time. Shares represent a relative priority for the allocation of memory capacity between virtual machines. For more information about share values, refer to the *VMware Resource Management Guide*.
 - Select **Normal** only if the IP Office virtual machine has exclusive use of the ESXi host. However, if other virtual machines utilizing the share mechanism present on the

host, it is imperative that IP Office virtual machine is set to **High**. IP Office is a real-time telecommunication software that requires immediate access to hardware resources.

5. Click **OK**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Powering On a VMware virtual machine](#) on page 44).

Related links

[Adjusting the VMware CPU Cycles](#) on page 37

Adjusting the VMware CPU Cycles (vSphere desktop client)

Procedure

1. Using the vSphere desktop client, select the **Inventory** view.
2. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**.
3. Click on the virtual machine.
4. Right-click on the virtual machine and select **Edit Settings**.
5. Click the **Resources** tab and select **CPU**.
6. Allocate the CPU cycles for the virtual machine's vCPUs. See [Profiling](#) on page 15
 - **Reservation** – This value sets the guaranteed minimum available RAM for the virtual machine. You cannot set the reservation higher than the maximum memory value. For IP Office virtual machines, the recommended value is 75-80% of the maximum.
 - **Shares** – The more shares a virtual machine has, the more often it gets a time slice of a CPU when there is no CPU idle time. Shares represent a relative priority for the allocation of memory capacity between virtual machines. For more information about share values, refer to the *VMware Resource Management Guide*.
 - Select **Normal** only if the IP Office virtual machine has exclusive use of the ESXi host. However, if other virtual machines utilizing the share mechanism present on the host, it is imperative that IP Office virtual machine is set to **High**. IP Office is a real-time telecommunication software that requires immediate access to hardware resources.
7. Click **OK**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Powering On a VMware virtual machine](#) on page 44).

Related links

[Adjusting the VMware CPU Cycles](#) on page 37

Adjusting the VMware disk space

By default the virtual machine is allocated a 100 GB virtual disk. However, this can be increased to meet the virtual server's profiling requirements. See [Profiling](#) on page 15.

Note however:

- The disk size cannot be decreased at a later stage.
- The virtual machines disk size cannot be changed if any snapshot have been taken of the virtual machine. Any existing snapshots must first be deleted.

The process for increasing the disk size takes two parts:

- Using a vSphere client, increase the virtual machine's disk size and then restart the virtual machine.
- Using the server's IP Office web management menus, indicate to use the additional space and restart the server.

Related links

[Virtual machine profiling](#) on page 32

[Adjusting the VMware disk space \(vSphere web client\)](#) on page 39

[Adjusting the VMware disk space \(vSphere desktop client\)](#) on page 40

Adjusting the VMware disk space (vSphere web client)

Procedure

1. Using the vSphere web client, select the virtual machine. For example, select **vCenter Management** and in the navigation tree on the left select the virtual machine.
2. Right-click a virtual machine in the inventory and select **Edit Settings**.
3. Click the **Hardware** tab and select the hard disk to modify.
4. Select a **Virtual Device Node** type from the drop-down menu.
5. To change the size of the disk, enter a new value in the **Provisioned Size** text box. See [Profiling](#) on page 15.
6. Click **OK**.
7. Right-click on the virtual machine and select **Power > Power Off**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Powering On a VMware virtual machine](#) on page 44).

Related links

[Adjusting the VMware disk space](#) on page 39

Adjusting the VMware disk space (vSphere desktop client)

Procedure

1. Using the vSphere desktop client, select the **Inventory** view.
2. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**.
3. Click on the virtual machine.
4. Right-click on the virtual machine and select **Edit Settings**.
5. Click the **Hardware** tab and select the hard disk to modify.
6. Select a **Virtual Device Node** type from the drop-down menu.
7. To change the size of the disk, enter a new value in the **Provisioned Size** text box. See [Profiling](#) on page 15.
8. Click **OK**.
9. Right-click on the virtual machine and select **Power > Power Off**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Powering On a VMware virtual machine](#) on page 44).

Related links

[Adjusting the VMware disk space](#) on page 39

Adjusting the VMware IOPS limits

Input/Output Operations Per Second (IOPS) is a measurement of the traffic between a virtual machine and the disk storage it is using.

The following factors should be considered when assessing the IOPS aspect of the virtual platform:

- The number of virtual machines running on an ESXi host should not exceed the IOPS of the disk storage divided by 30. For example, a datastore with an IOPS of 150 should only support up to 5 virtual machines.
- The total maximum IOPS of all the virtual machines must be within the IOPS capacity of the datastore. To compute how many IOPS the storage supports, you need to know the hard disk type, RAID configuration, number of drives, connection method, and so on. See [VMware Knowledge Base](#).
- By default no IOPS limit is set for each virtual machine disk. However, an IOPS limit can be set. If limits are set, it is important to understand how the limits are used for all virtual

machines using the same datastore. The limits are aggregated to set an overall limit for the datastore as follows:

- Example: 4 virtual machine disks using the same datastore and each disk set to 100 IOPS. As each disk is limited to 100, the total IOPS for the datastore is 400. If disks 1, 2 and 3 are currently using 10 IOPS each, disk 4 could use 370 IOPS without being restricted.
- Example: One disk set to Unlimited (the default), all other disks are set to 100 IOPS. As one of the disks is set to unlimited, the potential IOPS for the virtual machine disks using that datastore are also unlimited.

Exceeding the IOPS capacity of the datastore will lead to unpredictable results for virtual machine applications using that storage. Whilst a maximum IOPS limit can be applied to each virtual machine disk, that approach is not recommended for IP Office virtual machines as once again it will lead to unpredictable behavior.

Warning:

- The following processes can be used on a new virtual machine that has not been powered on/started.
- To perform the same actions on an existing virtual machine, it must first be powered off/stopped before making the adjusting and then powered on/started again. That will interrupt all services provided by the virtual machine.

Related links

[Virtual machine profiling](#) on page 32

[Adjusting the VMware IOPS limits \(vSphere web client\)](#) on page 41

[Adjusting the VMware IOPS limits \(vSphere desktop client\)](#) on page 42

Adjusting the VMware IOPS limits (vSphere web client)

Procedure

1. Using the vSphere web client, select the virtual machine. For example, select **vCenter Management** and in the navigation tree on the left select the virtual machine.
2. Right-click a virtual machine in the inventory and select **Edit Settings**.
3. Click the **Virtual Hardware** tab and expand **Hard Disk**.
4. Select a virtual hard disk from the list.
5. Under **Shares**, click the drop-down menu and select the relative amount of shares to allocate to the virtual machine (**Low**, **Normal** or **High**). You can select **Custom** to enter a user-defined shares value. Higher shares allow a virtual machine to keep more concurrent I/O operations pending at the storage device or datastore compared to a virtual machine with lower shares.
6. Under **Limit — IOPS**, click the drop-down menu and enter the upper limit of storage resources to allocate to the virtual machine. By default, IOPS are unlimited. You can select **Low** (500), **Normal** (1000), or **High** (2000), or you can select **Custom** to enter a user-defined number of shares.

7. Click **OK**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Powering On a VMware virtual machine](#) on page 44).

Related links

[Adjusting the VMware IOPS limits](#) on page 40

Adjusting the VMware IOPS limits (vSphere desktop client)

Procedure

1. Using the vSphere desktop client, select the **Inventory** view.
2. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**.
3. Click on the virtual machine.
4. Click the **Resources** tab.
5. Select **Hard Disk**.
6. In **Limit — IOPS** set the required IOPS limit for each disk the virtual machine uses. See [Profiling](#) on page 15. By default, the limits are set to **Unlimited**.
7. Click **OK**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Powering On a VMware virtual machine](#) on page 44).

Related links

[Adjusting the VMware IOPS limits](#) on page 40

Disabling a VMware network port

The IP Office virtual machine deploys with two network interfaces. By default these configure as LAN1 (192.168.42.1/255.255.255.0) and LAN2 (192.168.43.1/255.255.255.0) when the virtual machine starts. If the LAN2 port is not required, it can be disabled. This reduces the chances of IP address duplication which causes the IP Office application to not start, see [Duplicate IP address issue](#) on page 7.

Warning:

- The following processes can be used on a new virtual machine that has not been powered on/started.

- To perform the same actions on an existing virtual machine, it must first be powered off/stopped before making the adjusting and then powered on/started again. That will interrupt all services provided by the virtual machine.

Related links

[Virtual machine profiling](#) on page 32

[Disabling a VMware network port \(vSphere web client\)](#) on page 43

[Disabling a VMware network port \(vSphere desktop client\)](#) on page 43

Disabling a VMware network port (vSphere web client)

Before you begin

- The following processes can be used on a new virtual machine that has not been powered on/started.
- To perform the same actions on an existing virtual machine, it must first be powered off/stopped before making the adjusting and then powered on/started again. That will interrupt all services provided by the virtual machine.

Procedure

1. Using the vSphere web client, select the virtual machine. For example, select **vCenter Management** and in the navigation tree on the left select the virtual machine.
2. Right-click a virtual machine in the inventory and select **Edit Settings**.
3. Select **NIC 2**.
4. Deselect **Connect at power on**.
5. Click **OK**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Powering On a VMware virtual machine](#) on page 44).

Related links

[Disabling a VMware network port](#) on page 42

Disabling a VMware network port (vSphere desktop client)

Before you begin

- The following processes can be used on a new virtual machine that has not been powered on/started.
- To perform the same actions on an existing virtual machine, it must first be powered off/stopped before making the adjusting and then powered on/started again. That will interrupt all services provided by the virtual machine.

Procedure

1. Using the vSphere desktop client, select the **Inventory** view.

2. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**.
3. Click on the virtual machine.
4. Right-click on the virtual machine and select **Edit Settings**.
5. Select **NIC 2**.
6. Deselect **Connect at power on**.
7. Click **OK**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Powering On a VMware virtual machine](#) on page 44).

Related links

[Disabling a VMware network port](#) on page 42

Powering On a VMware virtual machine

About this task

Following profiling of the virtual machine, you can power on the virtual server.

Procedure

1. Right-click on the virtual machine.
2. Select **Power > Power On**.

Next steps

- You can now use a web browser to access the virtual machine. See [Connecting to the uninitialized virtual machine](#) on page 71.
- As part of the deployment of a new virtual machine, you now need to complete the initial server configuration processes.

Related links

[VMware deployment](#) on page 27

Part 3: Microsoft Hyper-V

Chapter 7: Hyper-V deployment

IP Office server's are supported as Hyper-V virtual machines.

- Supported virtual machine platforms are Hyper-V running on Windows 2012 R2 and Windows 2016 servers and Microsoft Hyper-V Server 2012 R2 and 2016.
- The installation is performed using a Hyper-V disk image file (VHDX) downloaded from the Avaya support website.
- Virtual Server Edition/IP Office Select servers require Virtualized Server licenses. See [Virtual server licensing](#) on page 10.

This section outlines the steps required to deploy an IP Office server as a virtual machine. If deploying several virtual machines, the order of deployment and configuration is the same as per the *Server Edition deployment* documentation. see [Related Documentation](#) on page 8.

In addition to certified IP Office training, the installer and system maintainer must have certified training on the specific virtual platform type or supported by someone who has the required certification.

During deployment, you must ensure that the deployment of one IP Office virtual machine has completed, including setting the LAN1 and LAN2 IP addresses to the required values, before starting the deployment of any other IP Office virtual machine.

Related links

- [Confirm the system settings](#) on page 27
- [Downloading the software](#) on page 47
- [Copying and renaming the disk image file](#) on page 48
- [Expanding the file hard disk size](#) on page 48
- [Creating a new Hyper-V virtual machine](#) on page 49
- [Adding an additional hard disk](#) on page 50
- [Hyper-V virtual machine profiling](#) on page 51
- [Starting the virtual machine](#) on page 54

Confirm the system settings

Any duplication of IP addresses, even the temporary default IP addresses, causes the IP Office application to not start and any existing IP Office service to stop.

If using local nodal licensing (see [Virtual server licensing](#) on page 10), the virtual server bases the **PLDS Host ID** its uses for license validation on several server configuration settings. Hence, before deploying the virtual machine and obtaining any licenses, you must confirm with the customer the final values for the following:

- Host Name
- LAN1 IP Address
- LAN2 IP Address
- Timezone
- DHCP Mode

This does not apply if using WebLM centralized licensing.

Related links

[VMware deployment](#) on page 27

[Hyper-V deployment](#) on page 46

Downloading the software

About this task

Avaya make a number of different file available for each IP Office release. For a Hypervisor deployment, select the following files:

- **VHDX file: (Hypervisor)** This file is actually downloaded as a zipped file from which you can then extract the `.vhdx` file. The file is a hard disk image. In the process of creating a new virtual machine, the file becomes the virtual machine's hard disk.
- **TTS ISO:** The images used to deploy new virtual machines do not include text-to-speech (TTS) prompts. To add TTS languages, you need to download and install the additional ISO files for TTS languages. These are provided as 3 ISO files:
 - **DVD 1:** English, Spanish, French, German, Italian.
 - **DVD 2:** Swedish, Norwegian, Finnish, Dutch, Danish, Portuguese, Greek.
 - **DVD 3:** Chinese, Polish, Russian.

Procedure

1. Browse to <http://support.avaya.com> and log in.
2. Click **Support by Product** and select **Downloads**.
3. In the **Enter Product Name** box, enter `IP Office` and select the displayed match.
4. Use the **Choose Release** drop-down to select the required release.
5. From the listed **Downloads**, select the particular version of the release required (there may be multiple versions of a release depending on the number of service and feature packs that have been made available).

6. Click on the required files and follow any further instructions shown by the website and your browser..
7. Also download and read any documents shown under **Related Documents**

Next steps

- Copy and rename the VHDX file. See [Copying and renaming the disk image file](#) on page 48.

Related links

[Hyper-V deployment](#) on page 46

Copying and renaming the disk image file

About this task

The file used when creating a new virtual machine becomes the hard disk of that virtual machine. It cannot then be used to create another new virtual machine. Therefore, it is important to use a copy of the downloaded file, especially if you are planning to create several virtual machines.

Procedure

1. Download the zipped file for the required software release. See [Downloading software](#) on page 28.
2. Unzip the VHDX file and copy the file to a personal folder. Keep this file as your master copy for that software release.
3. Save a copy of the file and rename it.
4. Move the renamed file to the folder on the Hyper-V server used to store virtual machine disks. By default it is C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks.

Next steps

- Now adjust the disk size. See [Expanding the file hard disk size](#) on page 48.

Related links

[Hyper-V deployment](#) on page 46

Expanding the file hard disk size

About this task

The default hard disk size set in the downloaded file is 100 GB. This may need to be expanded depending on planned role of the virtual machine. See [Profiling](#) on page 15.

Procedure

1. In Hyper-V Manager, select **Action > Edit Disk**.
2. In the **Locate Disk** menu, enter the file path of the VHDX file or browse to the file and click **Next**.
3. In the **Choose Action** menu select **Expand** and click **Next**.
4. In the **Configure Disk** menu set the new size required and click **Next**.
5. In the **Summary** menu check the settings. If okay click **Finish**.

Next steps

- You can now proceed with using the file to create a new virtual machine. See [Creating a new Hyper-V virtual machine](#) on page 49.

Related links

[Hyper-V deployment](#) on page 46

Creating a new Hyper-V virtual machine

About this task

After preparing a new VHDX file for the virtual machine it can be used to create a new virtual machine.

Before you begin

- Copy and rename and the download VHDX file, see [Copying and renaming the disk image file](#) on page 48. The file used for the following process becomes the hard disk of the new virtual machine and so cannot be reused for other virtual machines.

Procedure

1. Prepare a VHDX file for the new virtual machine . Use the new file for the installation and not the original file downloaded for the Avaya support site. The file used becomes the hard disk of the new virtual machine.
2. From the Hyper-V Manager menu bar, select **Action > New > Virtual Machine**. Alternatively, you can go to **Actions** panel, and select **New > Virtual Machine**.
3. Click **Next**.
4. Rename the virtual machine you are creating and click **Next**.
5. Select **Generation 1** and click **Next**.
6. In **Assign Memory** menu, you can set the memory to match the recommend settings for the server's planned role, see [Profiling](#) on page 15. However, you can accept the default and adjust the memory later during the virtual machine profiling stage and click **Next**.
7. In **Configure Networking** menu, select the network connection that the new virtual machine should use. Note that the IP Office image expects to obtain an initial IP address

from that network using DHCP. That address can then be changed once the virtual machine has been started, then click **Next**.

8. In the **Connect Virtual Hard Disk** menu select **Use an existing virtual hard disk**.
9. Browse to and select the `VHDX` file that you prepared for this new virtual machine and click **Next**.
10. In the **Summary** menu, click **Finish**. The new virtual machine should now appear in the list of virtual machines.
11. Do not start the virtual machine at this stage.

Next steps

- Do not start the virtual machine at this stage. If intending to support Media Manager, see [Adding an additional hard disk](#) on page 50, otherwise perform any required virtual machine profiling, see [Virtual machine profiling](#) on page 32.

Related links

[Hyper-V deployment](#) on page 46

Adding an additional hard disk


About this task

To run the Media Manager application on the same IP Office server as Voicemail Pro, it must be provided with and configured to use an additional hard disk. This requirement applies even if running on a virtual machine. This process must be performed before initial server ignition.

The minimum supported size is 30 GB. However, the recommended size is 300 GB or higher. Remember that for a virtual machine installation of Media Manager, archiving to Blu-Ray/DVD disk is not supported. See [Media Manager archiving](#) on page 13.

- Media Manager typically requires 60 KB per minute for non-authenticated files and 120 KB per minute for authenticated files.
- Media Manager also reserves 1 GB of space for the call details database and other operations.
- Media Manager typically requires 60 KB per minute for non-authenticated files and 120 KB per minute for authenticated files.
- Media Manager also reserves 1 GB of space for the call details database and other operations.

Procedure

1. In the list of virtual machines, select the required virtual machine.
2. Right-click and select **Connect**.
3. If the virtual machine is already running, stop it by clicking the . This stops the services provided by the virtual machine.

4. In the virtual machine connection window, select **File > Settings**.
5. Select **IDE Controller 0**.
6. Select **Hard Drive** and click **Add**.
7. Select **Virtual hard disk** and click **New**.
8. See the location and name for the file that will be the additional virtual for the virtual machine.
9. In the **Locate Disk** menu, enter the name for the new virtual hard disk file and click **Next**.
10. In the **Summary** menu check the settings. If okay, click **Finish**.

Next steps

- Do not start the virtual machine at this stage, instead first perform any required virtual machine profiling, see [Virtual machine profiling](#) on page 32.

Related links

[Hyper-V deployment](#) on page 46

Hyper-V virtual machine profiling

After deploying a virtual machine, you should optimize its allocated resources to meet the requirements of the virtual machine's role, see [Profiling](#) on page 15. For example, if the virtual machine will only support 50 users, you can reduce the allocated processors and RAM memory. This allows for the best use of the overall resources provided by the virtual server platform.

Attribute	Description
Memory	You can set the maximum amount of RAM memory that the virtual machine can use. You can also set how much of that RAM memory the platform guarantees for the virtual machine. See Adjusting the virtual machine's RAM memory settings on page 52.
Processors	You can configure multiple virtual processor (vCPUs) for a virtual machine. A virtual machine cannot have more vCPUs than the maximum number of logical CPUs on the host virtual server platform. The number of logical CPUs is the number of physical processor cores. See Adjusting the virtual machine's processors on page 53.

After profiling, you can start the virtual machine.

- **Profiling Other Virtual Machines:** It is good practice to monitor the resource utilization of all the virtual machines running in their infrastructure. Profile all virtual machines running on the virtual server platform to fine-tune the hardware resources allocated and used. This will improve performance by allocating resources where they are needed and optimize the use of their virtual infrastructure.

- **Multiple IP Office Servers:** If deploying servers with the intention of using resiliency, then the hardware resources and profiling applied to each server must include allowance for the scenarios where users re-register from one server to the other, effectively increasing the server's user requirements. If there is a mix of non-virtualized and virtualized machines, then the assignment of resources to the virtual machine must match the hardware resources available in the non-virtualized machine.

Related links

[Hyper-V deployment](#) on page 46

[Adjusting the virtual machine's RAM memory settings](#) on page 52

[Adjusting the virtual machine's processors](#) on page 53

Adjusting the virtual machine's RAM memory settings


About this task

You can set the maximum amount of RAM memory that the virtual machine can use. You can also set how much of that RAM memory the platform guarantees for the virtual machine. Set these values to match the virtual server's profile requirements. See [Profiling](#) on page 15.

Before you begin

- The following processes can be used on a new virtual machine that has not been powered on/started.
- To perform the same actions on an existing virtual machine, it must first be powered off/stopped before making the adjusting and then powered on/started again. That will interrupt all services provided by the virtual machine.

Procedure

1. In the list of virtual machines, select the required virtual machine.
2. Right-click and select **Connect**.
3. If the virtual machine is already running, stop it by clicking the . This stops the services provided by the virtual machine.
4. In the virtual machine connection window, select **File > Settings**.
5. Select **Memory**.
6. Adjust the memory settings to match the recommended settings for the server role. See [Profiling](#) on page 15
7. Click **Apply**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Starting the virtual machine](#) on page 54).

Related links

[Hyper-V virtual machine profiling](#) on page 51

Adjusting the virtual machine's processors

About this task

You can configure multiple virtual processor (vCPUs) for a virtual machine. A virtual machine cannot have more vCPUs than the maximum number of logical CPUs on the host virtual server platform. The number of logical CPUs is the number of physical processor cores.


Note that the CPU core clock speed affects the range selection. When the CPU is at the low end toward 2 GHz, use the higher number of CPUs. When the CPU speed is higher, for example 3.6 GHz, use the lower number of CPUs.

The CPU core clock speed multiplied by the number of cores, must meet the aggregate CPU cycle requirements of the virtual machine. See [Profiling](#) on page 15.

Before you begin

- The following processes can be used on a new virtual machine that has not been powered on/started.
- To perform the same actions on an existing virtual machine, it must first be powered off/stopped before making the adjusting and then powered on/started again. That will interrupt all services provided by the virtual machine.

Procedure

1. In the list of virtual machines, select the required virtual machine.
2. Right-click and select **Connect**.
3. If the virtual machine is already running, stop it by clicking the . This stops the services provided by the virtual machine.
4. In the virtual machine connection window, select **File > Settings**.
5. Select **Processor**.
6. Adjust the settings to match the recommended settings for the server role. See [Profiling](#) on page 15.
7. Click **Apply**.

Next steps

- If doing as part of installing a new virtual machine, continue with any further profiling required. When completed, start the virtual machine (see [Starting the virtual machine](#) on page 54).

Related links


[Hyper-V virtual machine profiling](#) on page 51

Starting the virtual machine

About this task

Having installed and profiled the new virtual machine, it can be started. This will boot it from the virtual hard disk file after which the initial IP Office server configuration can be started. See [Initial server configuration](#) on page 71.

Procedure

1. In the list of virtual machines, select the required virtual machine.
2. Right-click and select **Connect**.
3. In the virtual machine connection window click on the  icon or alternatively select **Action > Start** to start the virtual machine.
 - For a new virtual machine, the virtual machine now goes through the standard Linux start up process seen on physical servers. This includes partition resizing and other processes and can take approximately 15 minutes to complete.
 - The server displays the address details for further configuration of the server.

Next steps

Use the address to start the initial server configuration process. See [Initial server configuration](#) on page 71.

Related links

[Hyper-V deployment](#) on page 46

Part 4: Amazon Web Services

Chapter 8: Amazon deployment

IP Office server's are supported as AWS virtual machines, referred to as 'instances'. Each AWS instance is created using a combination of parts:

- **Machine Instance:** This defines the processor and memory and other factors of the platform on which the virtual machine is run. AWS provide a range of different machine instances (<https://aws.amazon.com/ec2/instance-types>). The machine instance selected should match the profiling requirements of the server's intended IP Office role. See [AWS profiling](#) on page 57.
- **Disk Storage:** Storage can be associated with the virtual machine. AWS supports several different types of storage, however for IP Office it is assumed that a drive or drives using EBS (Elastic Block Storage) are used.
- **Amazon Machine Image (AMI):** This is a file that contains the initial image for the virtual machine.
 - The name of the file indicates the release of IP Office software. Note that separate files exist for Powered By Avaya IP Office (Virtualized) deployments and those that are not. The later, covered in these notes, include **cpe** in the AMI file name.
 - The same image is used to create the different types of IP Office server. The server type is decided during initial server configuration.
- **Virtual Private Cloud (VPC):** This is the customer's private network within an AWS cloud. It defines the private IP addresses you can use for the instances launched in the network and provides a range of features for controlling the traffic between the VPC and the public internet; route tables, internet gateways, public IP addresses, etc. This documentation does not cover the configuration of the customer's VPC.
- **Security Group:** A security group controls external internet access to a particular virtual machine. Each security group consists of a set of rules defining the allow access based on protocol, port and source address. You can define multiple security groups and then select which one is currently used by a particular instance.

The process of combining the instances to create a new virtual IP Office server is referred to as 'launching an instance'. During that process, the AWS menu request details of the components to use and the settings to be applied to those components.

This section outlines the steps required to deploy an IP Office server as a virtual machine. If deploying several virtual machines, the order of deployment and configuration is the same as per the *Server Edition deployment* documentation. see [Related Documentation](#) on page 8.

In addition to certified IP Office training, the installer and system maintainer must have certified training on the specific virtual platform type or supported by someone who has the required certification.

During deployment, you must ensure that the deployment of oneIP Office virtual machine has completed, including setting the LAN1 and LAN2 IP addresses to the required values, before starting the deployment of any other IP Office virtual machine.

Related links

[AWS profiling](#) on page 57

[Creating security groups](#) on page 57

[Launching a new instance](#) on page 58

[Changing the security group](#) on page 60

[Changing the machine instance](#) on page 60

AWS profiling

The AWS machine instance <https://aws.amazon.com/ec2/instance-types> and storage specified when launching a new instance should match the requirements of the virtual server's intended role. See [Profiling](#) on page 15.

Related links

[Amazon deployment](#) on page 56

Creating security groups

Prior to launching any IP Office instances you should create several security groups. A security group consists of a set of rules for what access is allowed based on a set of selected protocols, ports and source address settings. When launching a new instance, you can select the security group that it should use.

- When launching a new instance you should use a highly restricted security group you have created that allow access from as few hosts and protocols as possible. For example, one that only allows access from your IP address and using HTTPS access to ports 7070/7071. This is necessary since the new instance boots with default passwords until initial configuration is completed.
- Once the instance is ignited and initial configuration utility completed, you can then switch the virtual machine's security group to one you have created for operational systems. For example, one that allows access from customer addresses using the ports/protocols of the IP Office services that have been configured on the server. See [Changing the security group](#) on page 60.

Related links

[Amazon deployment](#) on page 56

Launching a new instance

About this task

The following is a general example for launching a new virtual instance. The exact process may vary depending on the requirements of the customer VPC network and external site networks.

Procedure

1. Sign in to your AWS account. Click **Services** and select **EC2**.
2. From the top-right corner, select the zone **US East (N. Virginia)**.
3. Click **Launch Instance** and select **Community AMIs** and enter `Avaya` as the search string.
4. Locate the AMI required and click **Select**. Make sure you select the correct AMI file
 - The name of the file indicates the release of IP Office software. Note that separate files exist for Powered By Avaya IP Office (Virtualized) deployments and those that are not. The later, covered in these notes, include **cpe** in the `AMI` file name.
 - The same image is used to create the different types of IP Office server. The server type is decided during initial server configuration.
5. Select a machine instance that matches the profiling requirements of the virtual machine's intended role. See [AWS profiling](#) on page 57.
6. Click **Next**.
 - a. In **Configure Instance Details** page, select the customer's VPC and the subnet in which the virtual machine should operate.
 - b. To support `eth1`, under **Network interfaces**, click **Add Device**.

If this option is used, AWS will not automatically assign IP addresses to the ports. After launching the instance, you can obtain the `eth0` interface ID and assign a Elastic IP public IP address which can then be used for ignition and initial configuration.
7. Click **Next**.
8. In **Add Storage** page, set the size of the disk to match the profiling requirements of the virtual machine's intended role. See [AWS profiling](#) on page 57.

Note that currently adjusting the disk size following server ignition is not supported.

If the server is supporting Media Manager, it will require an additional separate storage volume. To add this, click **Add New Volume** and specify the size required.
9. Click **Next**.

10. In **Add Tags** page, enter any tags that you want associated with this instance.

Tags can be displayed and used in other EC2 menus to display, sort and group matching resources. . Each tag consists of name and value pairs. For example, you might find it useful to have tags that indicate the server type, the location it serves and the customer

- Server is Primary
- Site is Paris
- Customer is Example.com

11. Click **Next**.

12. In **Configure Security Group** page, select the system installer's security group that you previously created. See [Creating security groups](#) on page 57.

 **Important:**

When launching a new instance you should use a highly restricted security group you have created that allow access from as few hosts and protocols as possible. For example, one that only allows access from your IP address and using HTTPS access to ports 7070/7071. This is necessary since the new instance boots with default passwords until initial configuration is completed.

If you don't select a previously created group, the install process automatically creates a launch wizard group which only allows SSH access on port 22.

13. Click **Review** and **Launch**. Check that the details shown match the requirements for the server being created. If so, click **Launch**.
14. Create a new key pair or choose an existing key pair. This provides a security certificate for secure SSH access to the virtual machine.
15. If creating a new key pair, click **Download Key Pair** and ensure that you store the downloaded PEM certificate file in a safe place.
16. Click **Launch Instances**.
17. If no problems are reported, scroll down the summary form and click **View Instances**.

 **Tip:**

Alternatively, select **Services** > **EC2** and from the navigation tree select **Instances** > **Instances**.

The list of your instances displays the new virtual machine.

18. The machine starts by performing initial formatting and partitioning of the storage. This takes approximately 15 minutes to complete.

Next steps

Proceed with the initial server configuration process. See [Initial server configuration](#) on page 71.

Related links

[Amazon deployment](#) on page 56

Changing the security group

About this task

You can change the security group assigned to an instance. This allows you to maintain a set of security groups for different purposes and to flexible switch which security group an instance is currently using. See [Changing the security group](#) on page 60.

Procedure

1. Sign in to your AWS account. Click **Services** and select **EC2**.
2. In the navigation tree on the left select **Instances > Instances**.
3. Select the instance for which you want to change the security group.
4. Click **Actions** and select **Change Security GroupsNetworking**.
5. Select the security group that you want the virtual machine to use and click **Assign Security Groups**.

Related links

[Amazon deployment](#) on page 56

Changing the machine instance

About this task

If necessary, you can change the machine instance on which the virtual machine is running.

Important:

This processes requires the server to be stopped and restarted and so ends any calls and operations currently in progress.

Procedure

1. Sign in to your AWS account. Click **Services** and select **EC2**.
2. In the navigation tree on the left select **Instances > Instances**.
3. Select the instance for which you want to change the machine instance it uses.
4. Click **Actions** and select **Instance State > Stop**. When prompted, select **Yes, Stop**.
5. Wait until the **Instance State** has changed to **stopped**.
6. Click **Actions** and select **Instance Settings > Change Instance Type**.
7. Select the type of machine instance required and click **ApplyApply**.
8. Click **Actions** and select **Instance State > Start**. Click **Yes, Start**.

Related links

[Amazon deployment](#) on page 56

Part 5: Microsoft Azure

Chapter 9: Azure virtual machine deployment

IP Office server's are supported as virtual machines within Microsoft's Azure environment.

This section outlines the steps required to deploy an IP Office server as a virtual machine. If deploying several virtual machines, the order of deployment and configuration is the same as per the *Server Edition deployment* documentation. see [Related Documentation](#) on page 8.

In addition to certified IP Office training, the installer and system maintainer must have certified training on the specific virtual platform type or supported by someone who has the required certification.

During deployment, you must ensure that the deployment of one IP Office virtual machine has completed, including setting the LAN1 and LAN2 IP addresses to the required values, before starting the deployment of any other IP Office virtual machine.

Related links

- [Downloading the Software](#) on page 62
- [Logging in to Azure](#) on page 63
- [Creating a Resource Group](#) on page 64
- [Creating a Virtual Network](#) on page 64
- [Uploading the VHDX File to Azure](#) on page 65
- [Creating a New Azure Virtual Server](#) on page 65
- [Adding an Additional Disk for Media Manager](#) on page 66
- [Starting an Azure Virtual Machine](#) on page 67
- [Creating a Copy of an Azure VHDX File](#) on page 68

Downloading the Software

About this task

Avaya make a number of different file available for each IP Office release. For a Azure deployment, select the following files:

- **VHDX file: (Azure)** This file is actually downloaded as a zipped file from which you can then extract the .vhdx file.

- **TTS ISO:** The images used to deploy new virtual machines do not include text-to-speech (TTS) prompts. To add TTS languages, you need to download and install the additional ISO files for TTS languages. These are provided as 3 ISO files:
 - **DVD 1:** English, Spanish, French, German, Italian.
 - **DVD 2:** Swedish, Norwegian, Finnish, Dutch, Danish, Portuguese, Greek.
 - **DVD 3:** Chinese, Polish, Russian.

Procedure

1. Browse to <http://support.avaya.com> and log in.
2. Click **Support by Product** and select **Downloads**.
3. In the **Enter Product Name** box, enter `IP Office` and select the displayed match.
4. Use the **Choose Release** drop-down to select the required release.
5. From the listed **Downloads**, select the particular version of the release required (there may be multiple versions of a release depending on the number of service and feature packs that have been made available).
6. Click on the required files and follow any further instructions shown by the website and your browser..
7. Also download and read any documents shown under **Related Documents**

Next steps

- Create a resource group for the IP Office virtual machines. See [Creating a Resource Group](#) on page 64.

Related links

[Azure virtual machine deployment](#) on page 62

Logging in to Azure

About this task

For information on Microsoft Azure, see <https://docs.microsoft.com/en-us/azure>.

Procedure

1. In your web browser, enter <https://portal.azure.com>.
2. In the **Email**, **Phone** and **Skype** fields, enter your the registered email.
3. In the **Password** field, type your password.
4. Click **Sign In**. The web browser displays the Microsoft Azure portal.

Related links

[Azure virtual machine deployment](#) on page 62

Creating a Resource Group

About this task

A resource group is used to contain sets of related servers. In this case, that can be an IP Office virtual server or several such servers.

Procedure

1. In the Azure portal, search for **resource groups**.
2. Click **Add** to create a new resource group.
3. Complete the required details and click on **Review + Create**.

Next steps

- Having created a resource group, define the virtual network used by the group. See [Creating a Virtual Network](#) on page 64.

Related links

[Azure virtual machine deployment](#) on page 62

Creating a Virtual Network

About this task

Once a resource group has been created for the virtual IP Office servers, a virtual network can also be created.

Before you begin

- Create a resource group for the IP Office virtual machines. See [Creating a Resource Group](#) on page 64.

Procedure

1. In the Azure portal, search for **Virtual Network**.
2. Click **Add** and select the resource group.
3. Enter the virtual network name in **Name** and select the default **Region**.
4. Click **Next**.
5. Under the **IP address** tab, add the required IP addresses.
6. Click **Next**.
7. Under the **Security** tab, select the default security.
8. Click **Review + Create**.
9. Click **Subnets** to assign IP to the virtual machines.

Next steps

- Upload the IP Office .vhdx file. See [Uploading the VHDX File to Azure](#) on page 65.

Related links

[Azure virtual machine deployment](#) on page 62

Uploading the VHDX File to Azure

Before you begin

- Define the virtual network for use by servers in the resource group. See [Creating a Virtual Network](#) on page 64.

Procedure

1. In the Azure portal, select **Storage Accounts**.
2. Select the storage account to which you want to upload the .vhdx file.
 - If you do not have a storage account, click **Add** to create one.
 - Note that the selected storage location dictate where subsequent image can be created and deployed.
3. Under **BLOB SERVICE**, select **Containers**.
4. Select the container to which you want to upload the .vhdx file.
 - If you do not have a storage container, click **Add Container** to create one.
5. Click **Upload** and select the .vhdx file to upload.
6. Set the **Blob type** to **Page Blob**.
7. This process might take a long time depending on your network connection and the location of your Azure storage account.

Next steps

- The uploaded file can now be used to create virtual machines. See [Creating a New Azure Virtual Server](#) on page 65.

Related links

[Azure virtual machine deployment](#) on page 62

Creating a New Azure Virtual Server

About this task

Follow this procedure to create a new virtual machine from the .vhdx file.

Before you begin

- Upload the IP Office .vhdx file. See [Uploading the VHDX File to Azure](#) on page 65.

Procedure

1. Under **Settings > Disks**, click **Create managed disk**.
 - a. Select the **Resource group**.
 - b. Enter the disk name in **Disk name**.
 - c. Select the **Region**.
 - d. Select **Source type**.
 - e. Select **Source blob**. Browse to and select the previously uploaded .vhdx file.
 - f. Select the **OS type**.
 - g. Select the required disk size.
 - h. Click **Review + Create**.
2. Under **Settings > Disks**, click **Create VM**.
 - a. Select the **Resource group**.
 - b. Enter the virtual machine name in **Virtual machine name**.
 - c. In the **Image** text box, browse and select the previously uploaded **iposerver** file.
 - d. Select the required virtual machine size.
 - e. In the **Authentication type**, select **Password**.
 - f. Verify the network subnets and click **Review + Create**.
 - g.

Next steps

- If intending to support Media Manager, see [Adding an Additional Disk for Media Manager](#) on page 66.
- Otherwise, start the server. See [Starting an Azure Virtual Machine](#) on page 67.

Related links

[Azure virtual machine deployment](#) on page 62

Adding an Additional Disk for Media Manager

About this task

To run the Media Manager application on the same IP Office server as Voicemail Pro, it must be provided with and configured to use an additional hard disk. This requirement applies even if running on a virtual machine. This process must be performed before initial server ignition.

The minimum supported size is 30 GB. However, the recommended size is 300 GB or higher. Remember that for a virtual machine installation of Media Manager, archiving to Blu-Ray/DVD disk is not supported. See [Media Manager archiving](#) on page 13.

- Media Manager typically requires 60 KB per minute for non-authenticated files and 120 KB per minute for authenticated files.
- Media Manager also reserves 1 GB of space for the call details database and other operations.
- Media Manager typically requires 60 KB per minute for non-authenticated files and 120 KB per minute for authenticated files.
- Media Manager also reserves 1 GB of space for the call details database and other operations.

Procedure

1. In the Azure portal, search for and select **Virtual Machines**.
2. Select the virtual machine from the list.
3. On the **Virtual machine** page, select **Disks**.
4. On the **Disks** page, select **Add data disk**.
5. In the drop-down for the new disk, select **Create disk**.
6. In the **Create managed disk** page, type in a name for the disk and adjust the other settings as necessary.
7. Click **Create**
8. In the **Disks** page, select **Save** to save the new disk configuration for the VM.
9. After Azure creates the disk and attaches it to the virtual machine, the new disk is listed in the virtual machine's disk settings under **Data disks**.

Next steps

- Start the server. See [Starting an Azure Virtual Machine](#) on page 67.

Related links

[Azure virtual machine deployment](#) on page 62

Starting an Azure Virtual Machine

Procedure

1. In the Azure portal, click **Virtual Machines**.
2. Select the virtual machine(s) to be started.
3. Click **Start**.

Next steps

- If this is a new server, proceed to initial server configuration. See [Initial server configuration](#) on page 71.

Related links

[Azure virtual machine deployment](#) on page 62

Creating a Copy of an Azure VHDX File

About this task

Microsoft recommend that number of concurrent virtual machines deployed using the any particular snapshot or VHD file is limited to 20.

If more than 20 virtual machines are required, an additional disk can be created for the additional virtual machines.

Procedure

1. In the Azure portal, select **All Services**.
2. In the **All Services** search box, enter **disks** and then select **Disks** to display the list of available disks.
3. Select the disk that you would like to use. The page for that disk appears.
4. From the menu at the top, select **Create snapshot**.
5. Enter a **Name** for the snapshot.
6. Choose a **Resource group** for the snapshot. You can use either an existing resource group or create a new one.
7. For **Account type**, choose **Standard (HDD)** or **Premium (SSD)** storage.
8. When you're done, select **Create** to create the snapshot.
9. After the snapshot has been created, select **Create a resource** in the left menu.
10. In the search box, enter **managed disk** and select **Managed Disks** from the list.
11. On the **Managed Disks** page, select **Create**.
12. Enter a **Name** for the disk.
13. Choose a **Resource group** for the disk. You can use either an existing resource group or create a new one. This selection will also be used as the resource group where you create the virtual machines from the disk.
14. For **Account type**, choose **Standard (HDD)** or **Premium (SSD)** storage.
15. In **Source type**, select **Snapshot**.
16. In the **Source snapshot** drop-down, select the snapshot created earlier.

17. Make any other adjustments as needed and then select **Create** to create the disk.

Related links

[Azure virtual machine deployment](#) on page 62

Part 6: Server Configuration

Chapter 10: Initial server configuration

Once a new virtual machine has been started, it requires initial configuration to set the servers' role and complete other key configuration settings. Once these have been complete, it should be possible to license, configure and manage the virtual machine in the same way as a normal physical IP Office server.

Related links

[Connecting to the uninitialized virtual machine](#) on page 71

[Performing server ignition](#) on page 73

[Adding a certificate to the browser](#) on page 78

[IP Office initial configuration](#) on page 81

[Configuring the server applications](#) on page 81

Connecting to the uninitialized virtual machine

About this task

Using a browser, use the process below to login and proceed to Performing Server Ignition. See [Performing server ignition](#) on page 73.

Procedure

1. From a client PC, start the browser and enter `https://` followed by the IP address of the server and `:7071`. For example `https://192.168.42.1:7071`
 - The virtual machines eth0 IP address is shown in the console window. By default the IP address for initial configuration is `192.168.42.1/255.255.255.0`. If you cannot connect to the virtual machine using the default IP address, you need to assign the virtual machine a valid browseable address. See [Setting the virtual machine's IP address](#) on page 72.
2. The login page is displayed. Enter the user name as `root` and the password `Administrator`.
3. Click **Login**.

Next steps

- Once connected, the server ignition menus are displayed. See [Performing server ignition](#) on page 73.

Related links

[Initial server configuration](#) on page 71

[Setting the virtual machine's IP address](#) on page 72

Setting the virtual machine's IP address

A newly deployed IP Office virtual machine uses the following default IP settings: LAN1 192.168.42.1, LAN2 192.168.43.1, Mask 255.255.255.0.

If the default IP settings are incompatible with the existing network where the virtual machine is being deployed, follow the steps described to change them. Once the settings are correct and the virtual machine can be accessed with a browser, proceed to perform server ignition.

Before you begin

Warning:

- If using local nodal licensing, the virtual machine uses its IP address as part of the unique **PLDS Host ID** used for licensing. Changing the IP address can change the host ID, invalidating any existing licenses. See [Virtual server licensing](#) on page 10. Therefore, you must ensure that you have confirmed the final IP address settings before setting these values.

Procedure

1. To open console page:
 - Using the vSphere desktop client:
 - a. Select **Inventory** view.
 - b. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**.
 - c. Click on the virtual machine.
 - d. Click on the **Console** tab. All cursor and keyboard action are now applied to the console window.
 - Using the vSphere web client:
 - a. On the **Summary** tab, in the Guest OS Details pane, click **Launch Console**.
 - b. The virtual machine console opens in a new tab of the Web browser.
 - c. Click anywhere inside the console window to enable your mouse, keyboard, and other input devices to work in the console.
2. In the console display, enter the command **login**.
3. Enter user id `root` and password `Administrator`.

4. Once logged in **nano /etc/sysconfig/network-scripts/ifcfg-eth0** or **ifcfg-eth1**, edit the network settings.
 - a. Change the **BOOTPROTO** to **static**.
 - b. Set the IP address, mask and default gateway as required.

```
File: /etc/sysconfig/network-scripts/ifcfg-eth0
DEVICE="eth0"
BOOTPROTO=static
IPADDR=192.168.0.222
NETMASK=255.255.255.0
ONBOOT=yes
TYPE=Ethernet
IPV6INIT=no
IPV6_AUTOCONF=no
```

5. To save the file, press **Ctrl+X** and enter **y**.
6. Press **enter** to save the edited file over the existing file.
7. Enter **systemctl restart network**.
8. Enter **ip a s eth0** or **ip a s eth1** to check the address.
9. Power off and then power on the virtual machine again.

Next steps

- Using a browser, connect to the server using the new address. See [Connecting to the uninitialized virtual machine](#) on page 71.

Related links

[Connecting to the uninitialized virtual machine](#) on page 71

Performing server ignition

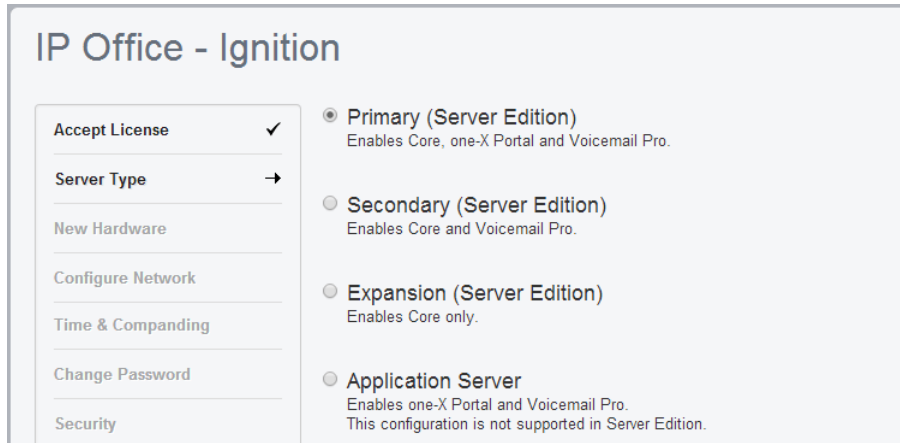
About this task

Server ignition is used to set the server's role and other key settings.

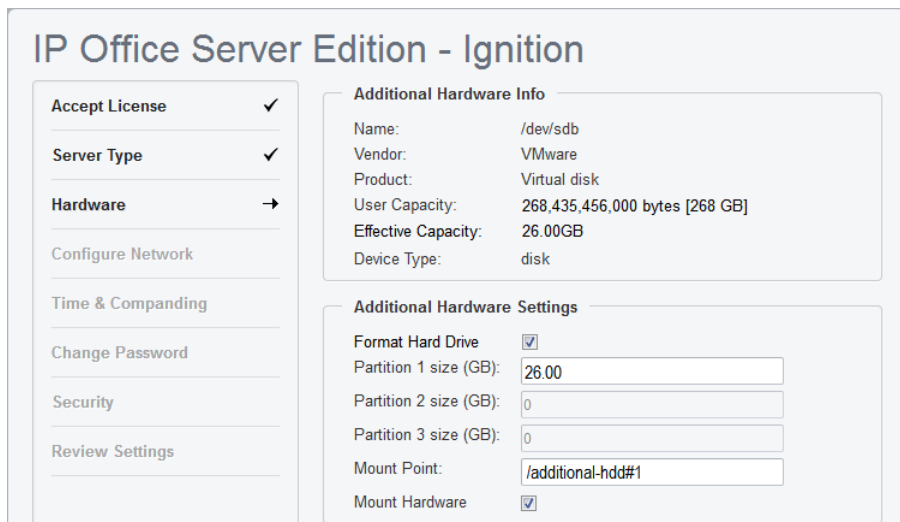
Procedure

1. Using a browser, connect to the virtual machine. See [Connecting to the uninitialized virtual machine](#) on page 71.
2. If you accept the license, select **I Agree** and click **Next**.

3. Select the role that the server should perform and click **Next**. The subsequent menus vary depending on the chosen server type.



4. If an additional hard disk was added during the virtual server deployment, details of the additional hardware appear. Otherwise the menu displays `No new hardware available`.



For Media Manager support, it is recommended to accept the defaults. These are:

- a. Leave **Format Hard Drive** checked.
- b. Create a single partition for the whole disk. You can create up to 3 logical partitions on the physical disk.
- c. Leave the **Mount Point** name as `/additional-hdd#1`. The full mount path name for each partition is automatically configured by the system adding `/partition1`, `/partition2` and so on, as a suffix.

For example `/additional-hdd#1/partition1`. Note that it is this partition name, including `/partition1`, that should be used for Media Manager settings.

- d. Select **Mount Hardware** to have the additional disk automatically mounted.
5. Click **Next**. Enter the server's network settings.

- Remember that the LAN1 and LAN2 IP addresses and DHCP mode selections affect the virtual machine's **PLDS Host ID** used for licensing . Therefore, if using or planing to use local nodal licensing, we strongly recommended that before obtaining any licenses, you ensure that these are set to their final values.
 - The ignition process allows you to set the IP address for the LAN1 port only. The LAN2 port initially uses the default address 192.168.43.1. To avoid the duplicate IP address issue you should set the LAN2 address after ignition. This can be done using IP Office Manager or IP Office Web Manager.
 - For AWS virtual machine these settings affect the private IP address settings of the instance. They do not alter the public IP address values assigned by AWS.
 - **Hostname** is used as the DNS host name of the server.
 - For internal applications, this value must be reachable by DNS within the customer network. If the server is also supporting external applications, the host name also needs to be reachable by external DNS. Consult with the customers IT support to ensure that the host name is acceptable and that routing to the host name has been configured correctly.
6. Click **Next**.

7. Set the time source for the server.

The screenshot shows the 'IP Office Server Edition - Ignition' configuration interface. On the left is a navigation menu with options: 'Accept License' (checked), 'Server Type' (checked), 'New Hardware' (checked), 'Configure Network' (checked), 'Time & Companding' (selected with a right arrow), and 'Change Password'. The main area is divided into two sections. The top section is for time source configuration: 'Use NTP:' is checked, 'NTP Server:' is '0.pool.ntp.org', 'Date/Time:' is '2014-07-30 / 10 : 28', and 'Timezone:' is 'Europe/London'. The bottom section is for 'Companding' with radio buttons for 'μ-law' and 'A-law'.

- Remember that the virtual machine uses the **Timezone** for licensing. Therefore, we strongly recommended that this is set to its final value before obtaining any licenses.
- Select to use the time provided by an NTP server.
- For a virtual server, if not using NTP, the server takes its time from the virtual server's host platform rather than allow manual configuration through the server menus.
- By default, Secondary Server and Expansion System (L) servers automatically get their time from the Primary Server and you can only change the **Timezone**.
- Select the companding setting to use. For telephone systems in North American locations and Japan, select **μ-Law** (also referred to as U-Law or Mu-Law). For most other locations, select **A-Law**.

8. Click **Next**.

9. Enter and confirm a new password.

The screenshot shows the 'IP Office Server Edition - Ignition' configuration interface for password setup. A message states: 'Default account passwords are required to be changed.' The interface is divided into three sections for password creation: 1. '"root" and "security" password' with 'New Password:' and 'New Password (verify):' fields and a 'View password policy' link. 2. '"Administrator" password' with 'New Password:' and 'New Password (verify):' fields and a 'View password policy' link. 3. '"System" password' with 'New Password:' and 'New Password (verify):' fields and a 'View password policy' link. The left navigation menu is updated: 'Change Password' is selected with a right arrow, and 'Security' and 'Review Settings' are new options.

These are the passwords for various IP Office service accounts and also for the Linux accounts created on the server. Ensure that you note the passwords set.

10. Click **Next**.
11. If the selected **Server Type** was **Application Server**, select the services provided by the server.

Unselected services remain installed but not running unless manually started.

12. Click **Next**.

The menu prompts which security certificate the server should use. This option is not used for Secondary Server and Expansion System (L) servers.

- If you select **Generate CA automatically**, you must download the certificate from the next screen.
- If you select **Import CA**, click **Browse** and locate the security certificate file that the server should use and click **Upload**.

13. Select whether you want the server to be supported by Avaya through their **EASG** service and click **Next**.
14. Check the displayed summary. Use the **Previous** and **Next** options to readjust settings if necessary.
15. Click **Apply**.
16. The browser menu will attempt to redirect you to the server IP address you configured during ignition. Click **OK** when displayed to access the server's IP Office Web Manager menus.

AWS: For an AWS virtual machine the browser is redirected to the private IP address of the server. You need to manually change the browser address back to the instance's public IP address.

Next steps

- Add the downloaded certificate to our browser, see [Adding a certificate to the browser](#) on page 78. Then proceed to initial configuration, see [IP Office initial configuration](#) on page 81.

Related links

[Initial server configuration](#) on page 71

Adding a certificate to the browser

Browser access to the server uses secure access. The browser used therefore needs to have a copy of the same CA certificate as used to sign the virtualized server's own identity certificate.




- If the server is using its own auto-generated certificate, you can download the certificate from the **Certificates** section of the **Settings > General** menu. Download the **DER-encoded certificate** (a CRT file).
- If the server is using an identity certificate generated elsewhere and then uploaded to the server, obtain a copy of the CA certificate from the same source.

Related links

- [Initial server configuration](#) on page 71
- [Adding a certificate to Firefox](#) on page 78
- [Adding a certificate to Internet Explorer](#) on page 79
- [Adding a certificate to Google Chrome](#) on page 79
- [Adding a certificate to Windows Edge](#) on page 80
- [Adding a certificate to Mac Safari](#) on page 80

Adding a certificate to Firefox

Procedure

1. Click the  icon and select . Alternatively, click on the  icon if shown on the browser home page.
2. Click **Advanced** and select **Certificates**.
3. Click **View Certificates**.
4. Click **Authorities**.
5. Click **Import**. Browse to the location of the CRT or PEM file downloaded from the server. Select the file and click **Open**.
6. Select all the check boxes to trust the certificate.
7. Click **OK** twice.

Next steps


- If adding the certificate from a newly initialized server, proceed to initial configuration. See [IP Office initial configuration](#) on page 81.

Related links

- [Adding a certificate to the browser](#) on page 78

Adding a certificate to Internet Explorer

Procedure

1. Click **Tools** or the options  icon and select **Internet Options**.
2. Select the **Content** tab and click **Certificates**.
3. Click **Import**.
4. Click **Next** and **Browse** to the location of the downloaded certificate. Select it and click **Open**.
5. Click **Next**.
6. Click **Place all certificates in the following store**.
 - If using the server's own generated certificate, select the **Trusted Root Certification Authorities**.
 - If using a certificate from another source, select **Intermediate Certification Authorities**.
7. Click **Next** and then **Finish**.
8. Click **OK, Close**.
9. Click **OK**.

Next steps


- If adding the certificate from a newly initialized server, proceed to initial configuration. See [IP Office initial configuration](#) on page 81.

Related links

[Adding a certificate to the browser](#) on page 78

Adding a certificate to Google Chrome

Procedure

1. Click the  icon and select **Settings**.
2. Click **Show** advanced settings. Scroll to **HTTP/SSL** and click **Manage certificates**.
3. Click **Import**.
4. Click **Next** and browse to the location of the downloaded certificate. Select it and click **Open**.
5. Click **Next**.
6. Click **Place all certificates in the following store**.
 - If using the server's own generated certificate, select the **Trusted Root Certification Authorities**.

- If using a certificate from another source, select **Intermediate Certification Authorities**.
7. Click **Next** and then **Finish**.
 8. Click **OK, Close**.

Next steps

- If adding the certificate from a newly initialized server, proceed to initial configuration. See [IP Office initial configuration](#) on page 81.

Related links

[Adding a certificate to the browser](#) on page 78

Adding a certificate to Windows Edge

Procedure

1. From the file browser, open the directory containing the certificate file.
2. Right-click the file and select **Install Certificate**. You may be prompted for admin credentials and/or a confirmation prompt.
3. On the first wizard screen, click **Next**.
4. On the **Certificate Store** screen select **Place all certificates in the following store**.
 - If using the server's own generated certificate, select the **Trusted Root Certification Authorities**.
 - If using a certificate from another source, select **Intermediate Certification Authorities**.
5. Click **OK**.

Next steps

- If adding the certificate from a newly initialized server, proceed to initial configuration. See [IP Office initial configuration](#) on page 81.

Related links

[Adding a certificate to the browser](#) on page 78

Adding a certificate to Mac Safari

Procedure

1. From the browser, open the directory containing the certificate file.
2. Double-click the certificate.
3. You are prompted to store the certificate in the **login keychain** or the **system keychain**. To make the certificate available to all users of this system, select **system keychain**.

Next steps

- If adding the certificate from a newly initialized server, proceed to initial configuration. See [IP Office initial configuration](#) on page 81.

Related links

[Adding a certificate to the browser](#) on page 78

IP Office initial configuration

About this task

The IP Office service running on the server requires some initial configuration. This is done using the initial configuration utility (ICU) menu. This menu is automatically shown the first time you login using either IP Office Web Manager or IP Office Manager.

Procedure

1. Log in to IP Office Web Manager.
 - a. Enter `https://` followed by the server address. Click on the IP Office Web Manager Web Manager link.
 - b. Enter the user name `Administrator` and the password that was created for that user during ignition.
2. Web manager displays the initial configuration menu for the IP Office service. If this does not appear, click **Solution**. Most of the settings are automatically completed using the values you entered during module ignition.
3. Check the values are as expected. If the module is under centralized management from Avaya System Manager, select the **Centralized Management** checkbox. Enter the details required for Avaya System Manager.
4. Click **Apply**.

The service is restarted using the values set in the menu. After the restart the browser is redirected to the normal web management menus.

Related links

[Initial server configuration](#) on page 71

Configuring the server applications

The services provided by the virtual machine can now be configured in the same way as for non-virtual installations. Refer to the appropriate documentation for Voicemail Pro, one-X Portal and Media Manager. See [Related Documentation](#) on page 8.

Initial server configuration

Related links

[Initial server configuration](#) on page 71

Chapter 11: Adding TTS languages

The Voicemail Pro application can use Text-to-speech (TTS). However, the IP Office image file used to create virtual machines does not include the TTS languages. The TTS languages are downloadable as three separate DVD's. See [Downloading software](#) on page 28.

To use TTS languages, you need to upload and install the additional languages on the virtual machines running the Voicemail Pro application. In a Server Edition network, that applies to the Primary Server and Secondary Server servers.

Warning:

- TTS files from pre-11.1 releases are not compatible with R11.1.
- During this process, the server needs to restart the voicemail service each time it installs a new TTS language.

Related links

[Checking the TTS languages installed](#) on page 83

[Downloading the TTS languages](#) on page 84

[Adding a new language](#) on page 84

Checking the TTS languages installed

Procedure

1. Access the server's web control/platform view menus.
2. Select **Updates**.
3. In the list of **Services**, each TTS language is shown with the prefix **TTS**.

Related links

[Adding TTS languages](#) on page 83

Downloading the TTS languages

About this task

Avaya make a number of different file available for each IP Office release. For TTS, select the following files:

- **TTS ISO:** The images used to deploy new virtual machines do not include text-to-speech (TTS) prompts. To add TTS languages, you need to download and install the additional ISO files for TTS languages. These are provided as 3 ISO files:
 - **DVD 1:** English, Spanish, French, German, Italian.
 - **DVD 2:** Swedish, Norwegian, Finnish, Dutch, Danish, Portuguese, Greek.
 - **DVD 3:** Chinese, Polish, Russian.

Procedure

1. Browse to <http://support.avaya.com> and log in.
2. Click **Support by Product** and select **Downloads**.
3. In the **Enter Product Name** box, enter `IP Office` and select the displayed match.
4. Use the **Choose Release** drop-down to select the required release.
5. From the listed **Downloads**, select the particular version of the release required (there may be multiple versions of a release depending on the number of service and feature packs that have been made available).
6. Click on the required files and follow any further instructions shown by the website and your browser..
7. Also download and read any documents shown under **Related Documents**

Related links

[Adding TTS languages](#) on page 83

Adding a new language

About this task

Note that this process causes the voicemail service to restart, ending all calls currently being handled by the voicemail service.

Procedure

1. Access the server's web control/platform view menus.
2. Select **Settings > General**.
3. In the **Software Repositories** section, click on the **Browse** button for **Application**. Browse to and select the RPM file for the required language and click **OK**.

4. Click **Add**.
5. Select **Updates**.
6. In the **Services** section, locate the newly added TTS language and click **Install**.

Related links

[Adding TTS languages](#) on page 83

Part 7: Upgrading

Chapter 12: Upgrading a virtual machine

Server Edition software supports several methods for upgrading. For virtual machines, the supported method is to upload the new ISO file to the virtual server, using one of the methods below, and then select upgrade within the IP Office Web Manager menus.

Method	Summary
Transfer from a virtual DVD	Upload the ISO file from a virtual DVD drive. You can connect an ISO file to the virtual machine's DVD drive in several ways.
Transfer from a remote file server	Upload the ISO file to the server from a file server (http, https, ftp, sftp or scp).
Transfer via SSH/SFTP to the virtual machine	Upload the ISO file directly to a folder on the server using SFTP.
Direct transfer	Upload the ISO file to the server using the IP Office Web Manager browser session.

Warning:

- **Not Supported for Upgrades from Pre-R11.1:** This method of upgrading is not supported for upgrading from pre-R11.1 releases. For example, from R11.0 to R11.1. The sever must be upgraded using the processes in the *Upgrading Linux-Based IP Office Systems to R11.1* manual.
- **WARNING: Boot from DVD Upgrades:** For non-virtual IP Office servers, the server can boot from a DVD copy of the ISO. The menu presented includes an option to upgrade. However, for virtual machines this method of upgrading is not supported.

In a Server Edition network consisting of several servers, you can use IP Office Web Manager to first upgrade the primary server. The files on the primary are then used to upgrade its associated secondary, expansion and application servers. Note that this is not possible from a newly installed virtual primary server.

The VMware Snapshot feature can be used to provide a more robust upgrade process by providing a fall back point to the previous instance of the virtual machine. See [VMware Features](#) on page 22.

Related links

[Downloading the software](#) on page 88

[Backing up applications](#) on page 88

[Transferring the ISO File](#) on page 89

Downloading the software

About this task

Virtual server upgrades use the same ISO file as used for non-virtual servers.

- **ISO file:** You can use this type of file to upgrade a previously deployed virtual machine, see [Upgrading a virtual machine](#) on page 87. Before using an ISO file, you must backup all applications data and check that you have understood any additional requirements mentioned in the IP Office Technical Bulletin for the IP Office release. IP Office Technical Bulletins are downloadable from the same website as the software.

Procedure

1. Browse to <http://support.avaya.com> and log in.
2. Click **Support by Product** and select **Downloads**.
3. In the **Enter Product Name** box, enter `IP Office` and select the displayed match.
4. Use the **Choose Release** drop-down to select the required release.
5. From the listed **Downloads**, select the particular version of the release required (there may be multiple versions of a release depending on the number of service and feature packs that have been made available).
6. Click on the required files and follow any further instructions shown by the website and your browser..
7. Also download and read any documents shown under **Related Documents**

Next steps

- Backup the existing servers. See [Backing up applications](#) on page 88.

Related links

[Upgrading a virtual machine](#) on page 87

Backing up applications

You can configure IP Office Web Manager to backup the servers in a Server Edition network to a another servers. Refer to the *Deploying Avaya IP Office Server Edition Manual* manual.

Next steps

- Once you have backed up the servers, proceed with transferring the new ISO file to the server. See [Transferring the ISO File](#) on page 89.

Related links

[Upgrading a virtual machine](#) on page 87

Transferring the ISO File

Having backed up the applications, the next stage is to transfer the ISO file to the Primary Server. As previously stated, there are number of different methods supported for a virtual machine.

- **Transfer from the virtual machine DVD:**

- For a physical server, this method uses an ISO file burnt to DVD and placed in the server's DVD drive. For a virtual machine, there are several methods to connect an ISO file to the virtual machine's DVD drive. See [Transfer from a virtual machine DVD](#) on page 98.

- **Transfer from a remote file server:**

- Thorough the IP Office Web Manager menus, you can configure the server with the details of remote file servers from which it can upload an ISO file. See [Transfer from a Remote File Server](#) on page 90.

- **Transfer from a primary server path:**

- Using SFTP, you can upload the ISO file directly to the server. Within IP Office Web Manager, you can then use the server file path to download the file. See [Transfer from a primary server path](#) on page 93.

- **Transfer from the Web Manage client PC:**

- You can transfer an ISO file during a connected IP Office Web Manager session. See [Transfer the ISO from the IP Office Web Manager client PC](#) on page 96.

Related links

[Upgrading a virtual machine](#) on page 87

Chapter 13: Transfer from a Remote File Server

You can upload an ISO file to the virtual server from a previously configured file server. The process for this is the same for virtual and non-virtual machines. See *Server Edition documentation* for full details.

Related links

[Configuring a remote file server source](#) on page 90

[Transferring the ISO from a remote server path](#) on page 90

[Upgrading using the Transferred ISO file](#) on page 91

Configuring a remote file server source

Procedure

1. Login to IP Office Web Manager.
2. Click on the **Solution Settings** drop-down and select **Remote Server Options**.
3. IP Office Web Manager lists the currently configured remote servers.
4. Click **Add Remote Server**.
5. Enter details for the remote file server hosting the ISO file. The details required vary depending on the protocol used by the server.
6. Click **OK**. The new remote server is now included in the list of remote servers.
7. Click **Close**.


Related links

[Transfer from a Remote File Server](#) on page 90

Transferring the ISO from a remote server path

Procedure

1. Login to IP Office Web Manager.

2. Click **Solution**.
3. Click on the **Actions** drop-down and select **Transfer ISO**.
4. Click **Transfer from** and select **Remote Location**.
5. Click **Select Remote Server** and select the previously configured remote file server from the list.
6. In the **File Path** field, enter the path to the ISO file on that server.
7. Click **OK**. The menu shows the progress of the download.
8. The servers listed in the Solution overview show an  icon and **Upgrade Available**.

Next steps


- Proceed with upgrading from the uploaded file. See [Upgrading using the Transferred ISO file](#) on page 91.

Related links

[Transfer from a Remote File Server](#) on page 90

Upgrading using the Transferred ISO file

About this task

Having downloaded an ISO file to the server, IP Office Web Manager indicates those servers it can upgrade. It does this by showing an  icon and **Upgrade Available** next to the server's details on the **Solution** menu.

Warning:

- **Not Supported for Upgrades from Pre-R11.1:** This method of upgrading is not supported for upgrading from pre-R11.1 releases. For example, from R11.0 to R11.1. The sever must be upgraded using the processes in the *Upgrading Linux-Based IP Office Systems to R11.1* manual.

Procedure

1. Login to IP Office Web Manager.
2. Select **Solution**.
3. Select the checkbox next to each server to upgrade. Upgrades require the primary server upgraded before any other servers.
4. Click on the **Actions** drop down and select **Upgrade**.
5. The upgrade process typically requires the IP Office server to restart, ending the current web browser connection. If this occurs, login to IP Office Web Manager again to check on the status of the upgrade.

Transfer from a Remote File Server

Next steps

If necessary, repeat the process to upgrade all the servers.

Related links

[Transfer from a Remote File Server](#) on page 90

Chapter 14: Transfer from a primary server path

SFTP/SSH can be used to upload an ISO file directly to a folder on the virtual machine. The upload process is typically slow, several hours, but reliable.

Related links

[Uploading an ISO file using SSH/SFTP](#) on page 93

[Transferring the ISO from a primary server path](#) on page 94

[Upgrading using the Transferred ISO file](#) on page 94

Uploading an ISO file using SSH/SFTP

Procedure


1. Start your SFTP or SSH file application and connect to the IP Office Application Server PC. The exact method depends on the application you are using.
 - a. Enter the details for the IP Office Application Server:
 - The **Host Name** is the IP address of the IP Office Application Server.
 - The **User Name** is **Administrator**.
 - The **Protocol** is **SFTP/SSH**.
 - The **Port** is **22**. If this is the first time the application has connected to the server, accept the trusted key.
 - b. If this is the first time the application has connected to the IP Office Application Server, accept the trusted key.
 - c. When prompted, enter the user password.
2. The default folder displayed after logging in is `/home/Administrator`.
3. Upload the ISO file to the server.

Related links

[Transfer from a primary server path](#) on page 93

Transferring the ISO from a primary server path

Procedure

1. Login to IP Office Web Manager.
2. Click **Solution**.
3. Click on the **Actions** drop-down and select **Transfer ISO**.
4. Click **Transfer from** and select **Primary Server Path**.
5. In the **File Path** field, enter the path to the previously uploaded ISO file. For example, /home/Administrator/Downloads/abe-11.1.1-209_e16.iso.
6. Click **OK**. The menu shows the progress of the download.
7. The servers listed in the Solution overview show an  icon and **Upgrade Available**.

Next steps


- Proceed with upgrading from the uploaded file. See [Upgrading using the Transferred ISO file](#) on page 94.

Related links

[Transfer from a primary server path](#) on page 93

Upgrading using the Transferred ISO file

About this task

Having downloaded an ISO file to the server, IP Office Web Manager indicates those servers it can upgrade. It does this by showing an  icon and **Upgrade Available** next to the server's details on the **Solution** menu.

Warning:

- **Not Supported for Upgrades from Pre-R11.1:** This method of upgrading is not supported for upgrading from pre-R11.1 releases. For example, from R11.0 to R11.1. The sever must be upgraded using the processes in the *Upgrading Linux-Based IP Office Systems to R11.1* manual.

Procedure

1. Login to IP Office Web Manager.
2. Select **Solution**.
3. Select the checkbox next to each server to upgrade. Upgrades require the primary server upgraded before any other servers.
4. Click on the **Actions** drop down and select **Upgrade**.

5. The upgrade process typically requires the IP Office server to restart, ending the current web browser connection. If this occurs, login to IP Office Web Manager again to check on the status of the upgrade.

Next steps

If necessary, repeat the process to upgrade all the servers.

Related links

[Transfer from a primary server path](#) on page 93

Chapter 15: Upgrade by Transfer from Your Client PC

This method of upgrade uses an `.iso` file transferred directly from your PC through the browser.

Related links


[Transfer the ISO from the IP Office Web Manager client PC](#) on page 96

[Upgrading using the Transferred ISO file](#) on page 97

Transfer the ISO from the IP Office Web Manager client PC

We do not recommend this method of uploading an `ISO` file to the server for remote maintenance of servers not located on the same local network as the PC. The file transfer is slow and does not continue or automatically resume if the IP Office Web Manager session disconnects during the transfer.

Procedure

1. Login to IP Office Web Manager.
2. Click **Solution**.
3. Click on the **Actions** drop-down and select **Transfer ISO**.
4. Click **Transfer from** and select **Client Machine**.
5. For the **Select ISO** field, click **Browse**. Locate and select the `ISO` file and click **Open**.
6. Click **OK**. The menu shows the progress of the download.
7. The servers listed in the Solution overview show an  icon and **Upgrade Available**.

Next steps

- Proceed to upgrading from a downloaded ISO. See [Upgrading using the Transferred ISO file](#) on page 97.

Related links

[Upgrade by Transfer from Your Client PC](#) on page 96

Upgrading using the Transferred ISO file

About this task

Having downloaded an ISO file to the server, IP Office Web Manager indicates those servers it can upgrade. It does this by showing an ▲ icon and **Upgrade Available** next to the server's details on the **Solution** menu.

Warning:

- **Not Supported for Upgrades from Pre-R11.1:** This method of upgrading is not supported for upgrading from pre-R11.1 releases. For example, from R11.0 to R11.1. The server must be upgraded using the processes in the *Upgrading Linux-Based IP Office Systems to R11.1* manual.

Procedure

1. Login to IP Office Web Manager.
2. Select **Solution**.
3. Select the checkbox next to each server to upgrade. Upgrades require the primary server upgraded before any other servers.
4. Click on the **Actions** drop down and select **Upgrade**.
5. The upgrade process typically requires the IP Office server to restart, ending the current web browser connection. If this occurs, login to IP Office Web Manager again to check on the status of the upgrade.

Next steps

If necessary, repeat the process to upgrade all the servers.

Related links

[Upgrade by Transfer from Your Client PC](#) on page 96

Chapter 16: Transfer from a virtual machine DVD

One of the options for downloading an ISO image used by IP Office Web Manager is to download the ISO file from the primary server's DVD drive. To use this option for a virtual machine, you must first connect the virtual machine's DVD drive to the ISO file.

The VMware client supports the following options for connecting the virtual machine's DVD drive to a source. This section lists the different methods in order of preference based on speed and reliability:

- **Connect to an ISO file on the client PCs hard disk** – This method connects the virtual machine's DVD drive to an ISO file on the hard disk of the VMware client PC. The time to complete the upgrade depends on the speed between the vSphere host and the client PC. See [Connect to an ISO File on the client PCs hard disk](#) on page 99.
- **Connect to the client PC DVD drive** – This method connects the virtual machine's DVD drive to the DVD drive of the PC running the VMware client PC. The time to complete the upgrade depends on the speed between the vSphere host and the client PC. See [Connect to the client PCs DVD drive](#) on page 100.
- **Connect to an ISO file in the virtual server datastore** – This method connects the virtual machine's DVD drive to an ISO file previously uploaded to the virtual server datastore. For remote upgrades, this method is the most reliable. In addition, if multiple virtual machines use the same datastore, they can access the same ISO file. See [Connect to an ISO File in the virtual server datastore](#) on page 101.
- **Connect to the VMware server's DVD drive** – This method connects the virtual machine's DVD drive to a DVD drive on the VMware server PC. This method requires physical access to a DVD drive on the VMware server. See [Connect to the host server's DVD drive](#) on page 104.

Related links

[Connect to an ISO File on the client PCs hard disk](#) on page 99

[Connect to the client PCs DVD drive](#) on page 100

[Connect to an ISO File in the virtual server datastore](#) on page 101

[Connect to the host server's DVD drive](#) on page 104

[Downloading the ISO from the primary DVD](#) on page 106

[Upgrading using the Transferred ISO file](#) on page 106

Connect to an ISO File on the client PCs hard disk

This method maps the DVD drive of the virtual machine to an ISO file on the PC running the VMware client.

Related links



[Transfer from a virtual machine DVD](#) on page 98

[Mapping the virtual machine's DVD to a local PC ISO file \(vSphere desktop client\)](#) on page 99

[Mapping the virtual machine's DVD to a local PC ISO file \(vSphere web client\)](#) on page 99

Mapping the virtual machine's DVD to a local PC ISO file (vSphere desktop client)

Procedure

1. Place the ISO file in a folder on your client PC.
2. Using the vSphere client, select the **Inventory** view.
3. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**
4. Click on the virtual machine.
5. Click on the  **Connect/disconnect the CD/DVD device of the virtual machine** icon in the toolbar.
 - If already connected to a source, the details are shown and the option to disconnect. Select disconnect and then click the  icon again.
6. From the drop-down, select **CD/DVD drive 1** and then select **Connect to ISO image on local disk**.
7. Select the ISO file and click **Open**.

Next steps

- You can now download the ISO to the virtual server using the **DVD Primary Server** option in the IP Office Web Manager menus. See [Downloading the ISO from the primary DVD](#) on page 106.


Related links

[Connect to an ISO File on the client PCs hard disk](#) on page 99

Mapping the virtual machine's DVD to a local PC ISO file (vSphere web client)

Procedure

1. Place the ISO file in a folder on your client PC.

2. Using the vSphere web client, select the virtual machine. For example, select **vCenter Management** and in the navigation tree on the left select the virtual machine.
3. Click on the  icon in the toolbar.
4. From the **CD/DVD** drive drop-down, select **CD/DVD drive 1** and then select **Connect to ISO image on local disk**.
5. Select the ISO file and click **Open**.
6. You can now download the ISO to the virtual server using the **DVD Primary Server** option in the IP Office Web Manager menus.

Next steps

- You can now download the ISO to the virtual server using the **DVD Primary Server** option in the IP Office Web Manager menus. See [Downloading the ISO from the primary DVD](#) on page 106.

Related links

[Connect to an ISO File on the client PCs hard disk](#) on page 99

Connect to the client PCs DVD drive

This method maps the DVD drive of the virtual machine to the DVD drive of the PC running the VMware client.

On some Windows operating systems, access to the client PC DVD drive requires vSphere to run with local administrator rights. For details refer to the [VMware Knowledge Base](#).

Related links

[Transfer from a virtual machine DVD](#) on page 98



[Mapping the virtual machine's DVD to the local PC drive \(vSphere desktop client\)](#) on page 100

[Mapping the virtual machine's DVD to local PC drive \(vSphere web client\)](#) on page 101

Mapping the virtual machine's DVD to the local PC drive (vSphere desktop client)

Procedure

1. Insert the DVD into the PC's DVD drive.
2. Using the vSphere client, select the **Inventory** view.
3. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**
4. Click on the virtual machine.

5. Click on the  **Connect/disconnect the CD/DVD device of the virtual machine** icon in the toolbar.
 - If already connected to a source, the details are shown and the option to disconnect. Select disconnect and then click the  icon again.
6. From the drop-down, select **CD/DVD** and then select the appropriate drive letter for the PC drive containing the DVD.

Next steps

- You can now download the ISO to the virtual server using the **DVD Primary Server** option in the IP Office Web Manager menus. See [Downloading the ISO from the primary DVD](#) on page 106.

Related links

[Connect to the client PCs DVD drive](#) on page 100

Mapping the virtual machine's DVD to local PC drive (vSphere web client)

Procedure

1. Insert the DVD into the PC's DVD drive.
2. Click **Virtual Machines** and select a virtual machine from the list and click it.
3. Click the **Manage** tab, and click the **CD/DVD** connection icon.
4. Select an available drive to connect to, and browse for the CD/DVD media.
5. An **Access Control** dialog box opens. Click **Allow** to proceed. To change your selection, click the connection icon, select Disconnect, and select a different option.
6. Click **OK**.

Next steps

- You can now download the ISO to the virtual server using the **DVD Primary Server** option in the IP Office Web Manager menus. See [Downloading the ISO from the primary DVD](#) on page 106.

Related links

[Connect to the client PCs DVD drive](#) on page 100

Connect to an ISO File in the virtual server datastore

This method uses an ISO file uploaded to the file datastore used by the virtual machine.

Related links

[Transfer from a virtual machine DVD](#) on page 98

[Uploading an ISO file to the datastore \(vSphere desktop client\)](#) on page 102


[Uploading an ISO file to the datastore \(vSphere web client\)](#) on page 102

[Mapping the virtual machine DVD to an ISO file in the datastore \(vSphere desktop client\)](#) on page 103

[Mapping the virtual machine DVD to an ISO file in the datastore \(vSphere web client\)](#) on page 104

Uploading an ISO file to the datastore (vSphere desktop client)

Procedure

1. Place the ISO file in a folder on your client PC.
2. Using the vSphere client, select the **Inventory** view.
3. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**
4. Click on the virtual machine.
5. Select the **Summary** tab on the right.
6. In the **Resources** section, right click on the datastore and select **Browse Datastore**.
7. Click on the  and select **Upload File**.
8. Browse to the location of the ISO image and click **OK**.
9. Once the upload has finished, close the **Datastore Browser**.

Next steps



- You can now map the virtual machine DVD drive to the ISO file. See [Mapping the virtual machine DVD to an ISO file in the datastore \(vSphere desktop client\)](#) on page 103.

Related links

[Connect to an ISO File in the virtual server datastore](#) on page 101

Uploading an ISO file to the datastore (vSphere web client)

Procedure

1. Using the vSphere web client, select the virtual machine. For example, select **vCenter Management** and in the navigation tree on the left select the virtual machine.
2. In the inventory, click **Datastore** and on the **Objects** tab, select the datastore to which you will upload the file.
3. Click the  icon.
4. Select the folder that you created or select an existing folder, and click the  icon.
5. If the **Client Integration Access Control** dialog box appears, click **Allow** to allow the plug-in to access your operating system and proceed with the file upload.

6. On the local computer, find the ISO file and upload it.
7. Once the upload has finished, refresh the datastore file browser to see the uploaded file in the list.

Next steps

- You can now map the virtual machine DVD drive to the ISO file. See [Mapping the virtual machine DVD to an ISO file in the datastore \(vSphere web client\)](#) on page 104.

Related links



[Connect to an ISO File in the virtual server datastore](#) on page 101

Mapping the virtual machine DVD to an ISO file in the datastore (vSphere desktop client)

Before you begin

- Upload the ISO file. See [Uploading an ISO file to the datastore \(vSphere desktop client\)](#) on page 102.

Procedure

1. Use the process above to upload the ISO file to the datastore.
2. Using the vSphere client, select the **Inventory** view.
3. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**
4. Click on the virtual machine.
5. Click on  **Connect/disconnect the CD/DVD device of the virtual machine** in the toolbar.
 - If already connected to a source, the details are shown and the option to disconnect. Select disconnect and then click the  icon again.
6. From the drop-down, select **CD/DVD drive 1** and then select **Connect to ISO image on datastore**.
7. Select **Datastore ISO File** and click **Browse**.
8. Select the ISO file and click **OK**.

Next steps

- You can now download the ISO to the virtual server using the **DVD Primary Server** option in the IP Office Web Manager menus. See [Downloading the ISO from the primary DVD](#) on page 106.

Related links

[Connect to an ISO File in the virtual server datastore](#) on page 101

Mapping the virtual machine DVD to an ISO file in the datastore (vSphere web client)

Before you begin

- Upload the ISO file. See [Uploading an ISO file to the datastore \(vSphere web client\)](#) on page 102.

Procedure

1. Use the process above to upload the ISO file to the datastore.
2. Right-click the virtual machine and select **Edit Settings**.
 - a. To locate a virtual machine, select a datacenter, folder, cluster, resource pool, host, or vApp.
 - b. Click the **Related Objects** tab and click **Virtual Machines**.
3. Expand **CD/DVD**, and select **Datastore ISO File** from the drop-down menu.
4. Browse to select the file and click **OK**.
5. Click **Edit** and select **Connected** next to the datastore ISO file to connect the device.
6. Click **OK**.

Next steps

- You can now download the ISO to the virtual server using the **DVD Primary Server** option in the IP Office Web Manager menus. See [Downloading the ISO from the primary DVD](#) on page 106.

Related links

[Connect to an ISO File in the virtual server datastore](#) on page 101

Connect to the host server's DVD drive

This method uses an ISO file burnt to DVD and then placed into the physical DVD drive of the VMware server platform. Whilst this method is fast, it requires access to the physical virtual server platform.

Related links



[Transfer from a virtual machine DVD](#) on page 98

[Mapping the virtual machine DVD to the host DVD drive \(vSphere desktop client\)](#) on page 105

[Mapping the virtual machine DVD to the host DVD drive \(vSphere web client\)](#) on page 105

Mapping the virtual machine DVD to the host DVD drive (vSphere desktop client)

Procedure

1. Insert the DVD into the host server's DVD drive.
2. Using the vSphere client, select the **Inventory** view.
3. Locate the required virtual machine in the inventory navigation tree on the left. If not shown, select **View > Show VMs in Inventory**
4. Click on the virtual machine.
5. Click on the  **Connect/disconnect the CD/DVD device of the virtual machine** icon in the toolbar.
 - If already connected to a source, the details are shown and the option to disconnect. Select disconnect and then click the  icon again.
6. From the drop-down, select **CD/DVD** and then select **Connect to host device**.
7. From the drop-down list, select the host device to use. For example, a typical entry for a CD/DVD drive is `/vmfs/devices/cdrom/mpx.vmhba0:C0T0L0`.
8. Click **OK**.

Next steps

- You can now download the ISO to the virtual server using the **DVD Primary Server** option in the IP Office Web Manager menus. See [Downloading the ISO from the primary DVD](#) on page 106.

Related links

[Connect to the host server's DVD drive](#) on page 104

Mapping the virtual machine DVD to the host DVD drive (vSphere web client)

Procedure

1. Insert the DVD into the host server's DVD drive.
2. Right-click the virtual machine and select **Edit Settings**.
 - a. To locate a virtual machine, select a datacenter, folder, cluster, resource pool, host, or vApp.
 - b. Click the **Related Objects** tab and click **Virtual Machines**.
3. On the **Virtual Hardware** tab, expand **CD/DVD** and from the drop-down menu select **Host Device**.

4. If more than one type of CD/DVD media is available on the host, select the media.
5. Click **OK**.

Next steps

- You can now download the ISO to the virtual server using the **DVD Primary Server** option in the IP Office Web Manager menus. See [Downloading the ISO from the primary DVD](#) on page 106.

Related links


[Connect to the host server's DVD drive](#) on page 104

Downloading the ISO from the primary DVD

About this task

Having connected the virtual server's DVD to an ISO source as above, you can now use IP Office Web Manager to download that ISO source to the server.

Procedure

1. Login to IP Office Web Manager.
2. Click **Solution**.
3. Click on the **Actions** drop-down and select **Transfer ISO**.
4. Click **Transfer from** and select **DVD Primary Server**.
5. Click **OK**. The menu shows the progress of the download.
6. The servers listed in the Solution overview show an  icon and **Upgrade Available**.

Next steps


- Proceed with upgrading from the uploaded file. See [Upgrading using the Transferred ISO file](#) on page 106.

Related links

[Transfer from a virtual machine DVD](#) on page 98

Upgrading using the Transferred ISO file

About this task

Having downloaded an ISO file to the server, IP Office Web Manager indicates those servers it can upgrade. It does this by showing an  icon and **Upgrade Available** next to the server's details on the **Solution** menu.

 **Warning:**

- **Not Supported for Upgrades from Pre-R11.1:** This method of upgrading is not supported for upgrading from pre-R11.1 releases. For example, from R11.0 to R11.1. The server must be upgraded using the processes in the *Upgrading Linux-Based IP Office Systems to R11.1* manual.

Procedure

1. Login to IP Office Web Manager.
2. Select **Solution**.
3. Select the checkbox next to each server to upgrade. Upgrades require the primary server upgraded before any other servers.
4. Click on the **Actions** drop down and select **Upgrade**.
5. The upgrade process typically requires the IP Office server to restart, ending the current web browser connection. If this occurs, login to IP Office Web Manager again to check on the status of the upgrade.

Next steps

If necessary, repeat the process to upgrade all the servers.

Related links

[Transfer from a virtual machine DVD](#) on page 98

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