Windows 11 Cloud-Ready Image Creation Master Guide for EVE-OS (using proxmox)

Windows 11 Cloud-Ready Image Creation Master Guide

This document defines the standard operating procedure (SOP) for creating, refining, and publishing a production-grade Windows 11 Cloud-Init image on Proxmox.

Target Image Name: `windows-11-cloud-init_20092025-autoresize.qcow2`

Phase 1: VM Preparation (Inside Reference VM)

VM Requirement: A Windows 11 VM (e.g., VM 113) with VirtIO SCSI controller, VirtIO Network, and QEMU Agent enabled in Proxmox options.

1.1 Install Drivers & Agent

1. **VirtIO Drivers:** Download and install `virtio-win-gt-x64.msi` from the stable VirtIO ISO.
2. **Verify Services:** Ensure "QEMU Guest Agent" and "Balloon Service" are installed and running.
3. **Install Cloudbase** (cloudbase/cloudbase-init) - Search for **Downloads** section in main README.md

1.2 Enable Auto-Resize (CRITICAL)

Cloudbase-Init can only resize the partition if it is at the physical end of the disk.

1. Open **Command Prompt (Admin)**.
2. Run `diskpart`.
3. Execute:

```
select disk 0
list partition
select partition <N>   REM Select the Recovery Partition (usually the last one, ~500MB)
delete partition override
exit
```

Result: C: drive should be the last partition on the disk.

1.3 Deep Optimization & Cleanup

Reduce image size before capture.

1. **Disk Cleanup:** `cleanmgr /sageset:1` (Select all) → `cleanmgr /sagerun:1`.
2. **Ensure Hybernation is off**:
   Check if Hibernation is enabled. The hiberfil.sys file is usually equal to the RAM size (e.g., 8GB or 16GB) and compresses poorly. Disable it inside the VM before capturing
   `powercfg /h off`
3. **Component Store:** `Dism.exe /online /Cleanup-Image /StartComponentCleanup /ResetBase`.
4. **Zero Free Space:**
   - Download SDelete.

- Run: `sdelete64.exe -z c:` (Wait for 100%).

5. **Zero the free space (Crucial Step):**
   a. From PowerShell: `Optimize-Volume -DriveLetter C -ReTrim -Verbose`

Phase 2: Cloudbase-Init Configuration

File Location: `C:\\Program Files\\Cloudbase Solutions\\Cloudbase-Init\\conf\\`

2.1 cloudbase-init.conf

Use this exact content to ensure compatibility with NoCloud (ISO) and ConfigDrive (OpenStack), and robust plugin execution.

```
[DEFAULT]
username=Admin
groups=Administrators
inject_user_password=true
first_logon_behaviour=always
bsdtar_path=C:\Program Files\Cloudbase Solutions\Cloudbase-Init\bin\bsdtar.exe
mtools_path=C:\Program Files\Cloudbase Solutions\Cloudbase-Init\bin\
verbose=true
debug=true
log_dir=C:\Program Files\Cloudbase Solutions\Cloudbase-Init\log\
log_file=cloudbase-init.log
default_log_levels=comtypes=INFO,suds=INFO,iso8601=WARN,requests=WARN
logging_serial_port_settings=
mtu_use_dhcp_config=true
ntp_use_dhcp_config=true
local_scripts_path=C:\Program Files\Cloudbase Solutions\Cloudbase-Init\LocalScripts\
check_latest_version=true

# Metadata Services (Order matters)
metadata_services=cloudbaseinit.metadata.services.nocloudservice.NoCloudConfigDriveService,cloudbaseinit.metadata.services.osconfigdrive.windows.WindowsConfigDriveManager

# Plugins (Use 'windows' namespace for OS specific plugins)
plugins=cloudbaseinit.plugins.common.mtu.MTUPlugin,cloudbaseinit.plugins.common.sethostname.SetHostNamePlugin,cloudbaseinit.plugins.windows.extendvolumes.ExtendVolumesPlugin,cloudbaseinit.plugins.common.userdata.UserDataPlugin,cloudbaseinit.plugins.windows.createuser.CreateUserPlugin,cloudbaseinit.plugins.windows.setuserpassword.SetUserPasswordPlugin,cloudbaseinit.plugins.common.localscripts.LocalScriptsPlugin

# Robustness Settings
retry_count=10
retry_count_interval=5
allow_reboot=true
stop_service_on_exit=false

[config_drive]
raw_hdd=true
cdrom=true
vfat=true
```

2.2 cloudbase-init-unattend.conf

Copy content from above, but set `log_file=cloudbase-init-unattend.log` and `check_latest_version=false`.

`[DEFAULT]`
`username=Admin`
`groups=Administrators`

```
inject_user_password=true
first_logon_behaviour=always
bsdtar_path=C:\Program Files\Cloudbase Solutions\Cloudbase-Init\bin\bsdtar.exe
mtools_path=C:\Program Files\Cloudbase Solutions\Cloudbase-Init\bin\
verbose=true
debug=true
log_dir=C:\Program Files\Cloudbase Solutions\Cloudbase-Init\log\
log_file=cloudbase-init.log
default_log_levels=comtypes=INFO,suds=INFO,iso8601=WARN,requests=WARN
logging_serial_port_settings=
mtu_use_dhcp_config=true
ntp_use_dhcp_config=true
local_scripts_path=C:\Program Files\Cloudbase Solutions\Cloudbase-Init\LocalScripts\
check_latest_version=true
```

Metadata Services (Order matters)

metadata_services=cloudbaseinit.metadata.services.nocloudservice.NoCloudConfigDriveService,cloudbaseinit.metadata.services.osconfigdrive.windows.WindowsConfigDriveManager

Plugins (Use 'windows' namespace for OS specific plugins)

plugins=cloudbaseinit.plugins.common.mtu.MTUPlugin,cloudbaseinit.plugins.common.sethostname.SetHostNamePlugin,cloudbaseinit.plugins.windows.extendvolumes.ExtendVolumesPlugin,cloudbaseinit.plugins.common.userdata.UserDataPlugin,cloudbaseinit.plugins.windows.createuser.CreateUserPlugin,cloudbaseinit.plugins.windows.setuserpassword.SetUserPasswordPlugin,cloudbaseinit.plugins.common.localscripts.LocalScriptsPlugin

Robustness Settings

retry_count=10
retry_count_interval=5
allow_reboot=true
stop_service_on_exit=false

[config_drive]
raw_hdd=true
cdrom=true
vfat=true

Metadata Services

metadata_services=cloudbaseinit.metadata.services.nocloudservice.NoCloudConfigDriveService,cloudbaseinit.metadata.services.osconfigdrive.windows.WindowsConfigDriveManager

Plugins - Verified against disk structure

Note: ExtendVolumes and CreateUser are critical here if they run during specialize

plugins=cloudbaseinit.plugins.common.mtu.MTUPlugin,cloudbaseinit.plugins.common.sethostname.SetHostNamePlugin,cloudbaseinit.plugins.windows.extendvolumes.ExtendVolumesPlugin,cloudbaseinit.plugins.common.userdata.UserDataPlugin,cloudbaseinit.plugins.windows.createuser.CreateUserPlugin,cloudbaseinit.plugins.windows.setuserpassword.SetUserPasswordPlugin

allow_reboot=true
stop_service_on_exit=false

[config_drive]
raw_hdd=true
cdrom=true
vfat=true

2.3 Service Hardening

To prevent "Device Not Ready" or credential errors during first boot:

1. **Service Account:** Set `Cloudbase-Init` service to run as **LocalSystem**.
2. **SetupComplete Hook:**
   Create `C:\\Windows\\Setup\\Scripts\\SetupComplete.cmd`:

```
sc config cloudbase-init obj= LocalSystem
net start cloudbase-init
```

Phase 3: Generalization (Sysprep)

WARNING: Once this command runs, the VM will shut down and is ready for capture. Do not boot it back up attached to the source disk.

1. Open **Command Prompt (Admin)**.
2. Run:

```
C:\\Windows\\System32\\Sysprep\\sysprep.exe /generalize /oobe /shutdown /unattend:"C:\\Program Files\\Cloudbase Solutions\\Cloudbase-Init\\conf\\Unattend.xml"
```

Troubleshooting: If Sysprep fails with "Reserved Storage" error, run `DISM /Online /Set-ReservedStorageState /State:Disabled`, reboot, and retry.

Phase 4: Capture & Publish (Proxmox Host)

4.1 Convert to Qcow2

Locate the VM disk (e.g., `/dev/Corsair1TB/vm-113-disk-1`).

- **For Development (Fast, Large):**

```
qemu-img convert -p -O qcow2 /dev/Corsair1TB/vm-113-disk-1 /mnt/pve-files/images/windows-11-dev.qcow2
```

- **For Production (Compressed, Small):**

```
qemu-img convert -p -c -O qcow2 /dev/Corsair1TB/vm-113-disk-1 /mnt/pve-files/images/windows-11-cloud-init_20092025-autoresize.qcow2
```

4.2 Publish to File Server

Ensure the file server (CT 200) can read the file.

```
# Set Permissions for Nginx (www-data)
chown 100033:100033 /mnt/pve-files/images/windows-11-cloud-init_20092025-autoresize.qcow2
chmod 644 /mnt/pve-files/images/windows-11-cloud-init_20092025-autoresize.qcow2
```

4.3 Verify

Download link: `<http://192.168.0.190/images/windows-11-cloud-init_20092025-autoresize.qcow2>`