TC	Title	Priority	Status
TC-01	Windows UEFI Secure Boot VM - VirtIO persistence with skip.force.disk.controller=true	Critical	PASSED
TC-02	Verify skip.force.disk.controller detail is available for KVM	High	PASSED
TC-03	Windows UEFI Secure Boot VM - Default behavior (SATA enforced)	High	PASSED
TC-04	Linux UEFI Secure Boot VM - Default behavior (VirtIO enforced)	High	PASSED
TC-05	Data disk attachment with skip.force.disk.controller=true	High	PASSED
TC-06	Windows BIOS VM - Verify no regression	High	PASSED
TC-07	Template-level skip.force.disk.controller setting	Medium	PASSED
TC-08	Detail priority - Instance vs Template	High	PASSED
TC-09	VM migration with skip.force.disk.controller=true	Medium	PASSED

TC-10	**Different disk bus types with skip.force.disk.controller=true**	**Medium**	**PASSED**
TC-11	**Null/empty details map handling**	**High**	**PASSED**

TC-001: Windows UEFI Secure Boot VM - VirtIO persistence with skip.force.disk.controller=true

Objective: Verify that Windows UEFI Secure Boot VMs with rootDiskController=virtio maintain VirtIO disk controllers after stop/start when skip.force.disk.controller=true

Test Result: Disk controller persisted as VirtIO through stop/start cycle. The PR fix works as expected.

Status: PASSED

Test Steps:

1. Deploy a Windows Server 2022 VM with UEFI Secure Boot, rootDiskController=virtio, and skip.force.disk.controller=true
2. Check virsh dumpxml - disk shows <target dev='vda' bus='virtio'/>

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm1 ~]# virsh dumpxml i-2-5-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/20fc851c-bd13-4170-b503-7add62291ab8'
index='2'/>
      <backingStore type='file' index='3'>
        <format type='qcow2'/>
        <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/22ee2a4e-8324-480d-9052-a3e082f62a36'/>
        <backingStore/>
      </backingStore>
      <target dev='vda' bus='virtio'/>
      <serial>20fc851cbd134170b503</serial>
      <alias name='virtio-disk0'/>
--
    <disk type='file' device='cdrom'>
      <driver name='qemu'/>
```

```
      <target dev='sdd' bus='sata'/>
      <readonly/>
      <alias name='sata0-0-3'/>
      <address type='drive' controller='0' bus='0' target='0' unit='3'/>
    </disk>
    <controller type='usb' index='0' model='qemu-xhci'>
      <alias name='usb'/>
      <address type='pci' domain='0x0000' bus='0x03' slot='0x00' function='0x0'/>
    </controller>
```

3. Stop VM and check state:

```
(localcloud) 🐱 > list virtualmachines id=b6669733-126d-466c-b871-27cbaf47d6b2
filter=id,name,state
{
  "count": 1,
  "virtualmachine": [
    {
      "id": "b6669733-126d-466c-b871-27cbaf47d6b2",
      "name": "Win2022-UEFI-SkipForce",
      "state": "Stopped"
    }
  ]
}
```

4. Start the VM and check it's started:

```
(localcloud) 🐱 > list virtualmachines id=b6669733-126d-466c-b871-27cbaf47d6b2
filter=id,name,state
{
  "count": 1,
  "virtualmachine": [
    {
      "id": "b6669733-126d-466c-b871-27cbaf47d6b2",
      "name": "Win2022-UEFI-SkipForce",
      "state": "Running"
    }
  ]
}
```

5. Check disk controller again on KVM host

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm1 ~]# virsh dumpxml i-2-5-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/20fc851c-bd13-4170-b503-7add62291ab8'
```

```
index='2'/>
      <backingStore type='file' index='3'>
        <format type='qcow2'/>
        <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/22ee2a4e-8324-480d-9052-a3e082f62a36'/>
        <backingStore/>
      </backingStore>
      <target dev='vda' bus='virtio'/>
      <serial>20fc851cbd134170b503</serial>
      <alias name='virtio-disk0'/>
--
    <disk type='file' device='cdrom'>
      <driver name='qemu'/>
      <target dev='sdd' bus='sata'/>
      <readonly/>
      <alias name='sata0-0-3'/>
      <address type='drive' controller='0' bus='0' target='0' unit='3'/>
    </disk>
    <controller type='usb' index='0' model='qemu-xhci'>
      <alias name='usb'/>
      <address type='pci' domain='0x0000' bus='0x03' slot='0x00' function='0x0'/>
    </controller>
```

TC-002: Verify skip.force.disk.controller detail is available for KVM

Objective: Verify the new VM detail skip.force.disk.controller is available in the API and can be set on VMs/templates.

Test Results: detail IS listed with values ["true", "false"]

Status: PASSED

```
(localcloud) 🐱 > list detailoptions resourcetype=uservm
resourceid=e727a8a4-5f4f-480e-97f4-0ceae0ba5ce7
{
  "detailoptions": {
    "details": {
      "UEFI": [
        "LEGACY",
        "SECURE"
      ],
      "cpu.corespersocket": [],
      "cpu.threadspercore": [],
      "dataDiskController": [
        "osdefault",
        "ide",
        "scsi",
        "virtio",
```

```
      "virtio-blk"
    ],
    "guest.cpu.mode": [
      "custom",
      "host-model",
      "host-passthrough"
    ],
    "guest.cpu.model": [],
    "io.policy": [
      "threads",
      "native",
      "io_uring",
      "storage_specific"
    ],
    "iothreads": [
      "enabled"
    ],
    "keyboard": [
      "uk",
      "us",
      "jp",
      "fr"
    ],
    "nic.multiqueue.number": [],
    "nic.packed.virtqueues.enabled": [
      "true",
      "false"
    ],
    "nicAdapter": [
      "e1000",
      "virtio",
      "rtl8139",
      "vmxnet3",
      "ne2k_pci"
    ],
    "rootDiskController": [
      "osdefault",
      "ide",
      "scsi",
      "virtio",
      "virtio-blk"
    ],
    "rootdisksize": [],
    "skip.force.disk.controller": [
      "true",
      "false"
    ],
    "video.hardware": [
      "cirrus",
      "vga",
      "qxl",
      "virtio"
```

```
      ],
      "video.ram": [],
      "virtual.tpm.model": [
        "tpm-tis",
        "tpm-crb"
      ],
      "virtual.tpm.version": [
        "1.2",
        "2.0"
      ]
    }
  }
}
```


TC-003: Windows UEFI Secure Boot VM - Default behavior (SATA enforced)

Objective: Verify that the default behavior (SATA for Windows UEFI Secure Boot) is preserved when skip.force.disk.controller is not set.

Test Result: Default behavior preserved - Windows UEFI Secure Boot VMs use SATA disk controller when the skip flag is not set.

Status: PASSED

Test Steps:

1. Deploy a Windows Server 2022 VM with UEFI Secure Boot only (no rootDiskController, no skip.force.disk.controller)

2. Verified VM details show only UEFI: SECURE


```
(localcloud) 🐱 > deploy virtualmachine name="Win2022-UEFI-Default"
templateid=22ee2a4e-8324-480d-9052-a3e082f62a36
serviceofferingid=b974443d-d3de-4dd0-a6be-813725ee4d2a
zoneid=d4b02923-8436-4cec-84d0-00341b732875 networkids=35e575bd-e040-438d-9090-ae7f61c23130
details[0].UEFI=SECURE
{
  "virtualmachine": {
    "account": "admin",
    "affinitygroup": [],
    "arch": "x86_64",
    "bootmode": "secure",
    "boottype": "Uefi",
    "cpunumber": 2,
    "cpuspeed": 2000,
    "created": "2026-01-09T08:17:30+0000",
    "deleteprotection": false,
```

```
    "details": {
      "UEFI": "SECURE",
      "cpuOvercommitRatio": "2.0"
    },
    "displayname": "Win2022-UEFI-Default",
    "displayvm": true,
    "domain": "ROOT",
    "domainid": "1a81b5a5-ecb0-11f0-9768-1e00d50002bf",
    "domainpath": "/",
    "guestosid": "522e2d61-ecb0-11f0-9768-1e00d50002bf",
    "haenable": false,
    "hasannotations": false,
    "hostcontrolstate": "Enabled",
    "hostid": "0452441b-092a-4454-b063-94706a49abd6",
    "hostname": "ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm2",
    "hypervisor": "KVM",
    "id": "d238c05f-93df-4d13-b6ef-f19d6a5b8ce1",
    "instancename": "i-2-6-VM",
    "ipaddress": "10.1.1.150",
    "isdynamicallyscalable": false,
    "jobid": "cb9ae155-3816-45ca-9f49-5b4003c95aad",
    "jobstatus": 0,
    "lastupdated": "2026-01-09T08:18:41+0000",
    "memory": 4096,
    "name": "Win2022-UEFI-Default",
    "nic": [
      {
        "broadcasturi": "vlan://3203",
        "deviceid": "0",
        "extradhcpoption": [],
        "gateway": "10.1.1.1",
        "id": "18c2b8f6-88d4-4c71-826c-2dbe5cbe6fe6",
        "ipaddress": "10.1.1.150",
        "isdefault": true,
        "isolationuri": "vlan://3203",
        "macaddress": "02:01:00:cc:00:04",
        "netmask": "255.255.255.0",
        "networkid": "35e575bd-e040-438d-9090-ae7f61c23130",
        "networkname": "PR11750-TestNet",
        "secondaryip": [],
        "traffictype": "Guest",
        "type": "Isolated"
      }
    ],
    "osdisplayname": "Windows Server 2022 (64-bit)",
    "ostypeid": "522e2d61-ecb0-11f0-9768-1e00d50002bf",
    "passwordenabled": false,
    "pooltype": "NetworkFilesystem",
    "receivedbytes": 0,
    "rootdeviceid": 0,
    "rootdevicetype": "ROOT",
    "securitygroup": [],
```

```
    "sentbytes": 0,
    "serviceofferingid": "b974443d-d3de-4dd0-a6be-813725ee4d2a",
    "serviceofferingname": "Large-4GB",
    "state": "Running",
    "tags": [],
    "templatedisplaytext": "Windows Server 2022 UEFI for PR11750",
    "templateformat": "QCOW2",
    "templateid": "22ee2a4e-8324-480d-9052-a3e082f62a36",
    "templatename": "Windows-2022-UEFI",
    "templatetype": "USER",
    "userid": "69f1dc7b-ecb0-11f0-9768-1e00d50002bf",
    "username": "admin",
    "zoneid": "d4b02923-8436-4cec-84d0-00341b732875",
    "zonename": "ref-trl-10567-k-Mol9-rositsa-kyuchukova"
  }
}
```


3. Checked virsh dumpxml - disk shows <target dev='sda' bus='sata'/>

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm2 ~]# virsh dumpxml i-2-6-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/53fb81d1-e421-464f-ba83-f61fbdd44790'
index='2'/>
      <backingStore type='file' index='3'>
        <format type='qcow2'/>
        <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/22ee2a4e-8324-480d-9052-a3e082f62a36'/>
        <backingStore/>
      </backingStore>
      <target dev='sda' bus='sata'/>
      <serial>53fb81d1e421464fba83</serial>
      <alias name='sata0-0-0'/>
--
    <disk type='file' device='cdrom'>
      <driver name='qemu'/>
      <target dev='sdd' bus='sata'/>
      <readonly/>
      <alias name='sata0-0-3'/>
      <address type='drive' controller='0' bus='0' target='0' unit='3'/>
    </disk>
    <controller type='usb' index='0' model='qemu-xhci'>
      <alias name='usb'/>
      <address type='pci' domain='0x0000' bus='0x03' slot='0x00' function='0x0'/>
    </controller>
```

TC-004: Linux UEFI Secure Boot VM - Default behavior (VirtIO enforced)

Objective: Verify that non-Windows UEFI Secure Boot VMs use VirtIO by default (as per docs PR #616).

Test Result: Default behavior confirmed - Linux UEFI Secure Boot VMs use VirtIO disk controller.

Status: PASSED

Test Steps:

1. Deployed Ubuntu 24.04 VM with UEFI Secure Boot (no skip.force.disk.controller)

```
(localcloud) 🐱 > deploy virtualmachine name="Ubuntu24-UEFI-Default"
templateid=ee98b1b6-8d45-43d3-acc2-6efeba129ad3
serviceofferingid=8e2af31d-946c-41a1-b129-1b69ab14dec0
zoneid=d4b02923-8436-4cec-84d0-00341b732875 networkids=35e575bd-e040-438d-9090-ae7f61c23130
details[0].UEFI=SECURE
{
  "virtualmachine": {
    "account": "admin",
    "affinitygroup": [],
    "arch": "x86_64",
    "bootmode": "secure",
    "boottype": "Uefi",
    "cpunumber": 1,
    "cpuspeed": 500,
    "created": "2026-01-09T08:24:51+0000",
    "deleteprotection": false,
    "details": {
      "UEFI": "SECURE",
      "cpuOvercommitRatio": "2.0"
    },
    "displayname": "Ubuntu24-UEFI-Default",
    "displayvm": true,
    "domain": "ROOT",
    "domainid": "1a81b5a5-ecb0-11f0-9768-1e00d50002bf",
    "domainpath": "/",
    "guestosid": "599705e4-ecb0-11f0-9768-1e00d50002bf",
    "haenable": false,
    "hasannotations": false,
    "hostcontrolstate": "Enabled",
    "hostid": "0452441b-092a-4454-b063-94706a49abd6",
    "hostname": "ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm2",
    "hypervisor": "KVM",
    "id": "acfb4b17-9e2f-463a-8df4-cfc0ea6ce9ca",
    "instancename": "i-2-7-VM",
    "ipaddress": "10.1.1.243",
```

```
    "isdynamicallyscalable": false,
    "jobid": "8408e5d3-fc70-4596-a27c-525b9bf2196a",
    "jobstatus": 0,
    "lastupdated": "2026-01-09T08:24:57+0000",
    "memory": 512,
    "name": "Ubuntu24-UEFI-Default",
    "nic": [
      {
        "broadcasturi": "vlan://3203",
        "deviceid": "0",
        "extradhcpoption": [],
        "gateway": "10.1.1.1",
        "id": "9d41e689-4be2-45be-84cc-3b1426be29fb",
        "ipaddress": "10.1.1.243",
        "isdefault": true,
        "isolationuri": "vlan://3203",
        "macaddress": "02:01:00:cc:00:05",
        "netmask": "255.255.255.0",
        "networkid": "35e575bd-e040-438d-9090-ae7f61c23130",
        "networkname": "PR11750-TestNet",
        "secondaryip": [],
        "traffictype": "Guest",
        "type": "Isolated"
      }
    ],
    "osdisplayname": "Ubuntu 24.04 LTS",
    "ostypeid": "599705e4-ecb0-11f0-9768-1e00d50002bf",
    "password": "eZce6T",
    "passwordenabled": true,
    "pooltype": "NetworkFilesystem",
    "receivedbytes": 0,
    "rootdeviceid": 0,
    "rootdevicetype": "ROOT",
    "securitygroup": [],
    "sentbytes": 0,
    "serviceofferingid": "8e2af31d-946c-41a1-b129-1b69ab14dec0",
    "serviceofferingname": "Small Instance",
    "state": "Running",
    "tags": [],
    "templatedisplaytext": "Ubuntu 24.04 for PR11750",
    "templateformat": "QCOW2",
    "templateid": "ee98b1b6-8d45-43d3-acc2-6efeba129ad3",
    "templatename": "Ubuntu-24.04",
    "templatetype": "USER",
    "userid": "69f1dc7b-ecb0-11f0-9768-1e00d50002bf",
    "username": "admin",
    "zoneid": "d4b02923-8436-4cec-84d0-00341b732875",
    "zonename": "ref-trl-10567-k-Mol9-rositsa-kyuchukova"
  }
}
```


2. Checked virsh dumpxml - disk shows <target dev='vda' bus='virtio'/>

```
root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm2 ~]# virsh dumpxml i-2-7-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/3288f570-860e-4d3f-9b60-ccd475995989'
index='2'/>
      <backingStore type='file' index='3'>
        <format type='qcow2'/>
        <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/ee98b1b6-8d45-43d3-acc2-6efeba129ad3'/>
        <backingStore/>
      </backingStore>
      <target dev='vda' bus='virtio'/>
      <serial>3288f570860e4d3f9b60</serial>
      <alias name='virtio-disk0'/>
--
    <disk type='file' device='cdrom'>
      <driver name='qemu'/>
      <target dev='sdd' bus='sata'/>
      <readonly/>
      <alias name='sata0-0-3'/>
      <address type='drive' controller='0' bus='0' target='0' unit='3'/>
    </disk>
    <controller type='usb' index='0' model='qemu-xhci'>
      <alias name='usb'/>
      <address type='pci' domain='0x0000' bus='0x03' slot='0x00' function='0x0'/>
    </controller>
```

TC-005: Data disk attachment with skip.force.disk.controller=true

Objective: Verify data disk attachment respects the configured disk bus type when skip.force.disk.controller=true

Test Result: Data disk uses VirtIO and persists through stop/start cycle.

Status:PASSED

Test Steps:

1. Created and attached a volume to the Windows VM with skip flag (Win2022-UEFI-SkipForce):

```
(localcloud) 🐱 > attach volume id=cfdfdd71-f9e3-4379-9b73-fa2055c0d085
virtualmachineid=b6669733-126d-466c-b871-27cbaf47d6b2
```

```
{
  "volume": {
    "account": "admin",
    "attached": "2026-01-09T08:31:05+0000",
    "clusterid": "71d8a3af-a042-4d58-8dbe-2af965085eac",
    "clustername": "p1-c1",
    "created": "2026-01-09T08:29:59+0000",
    "deleteprotection": false,
    "destroyed": false,
    "deviceid": 1,
    "diskioread": 0,
    "diskiowrite": 0,
    "diskkbsread": 0,
    "diskkbswrite": 0,
    "diskofferingdisplaytext": "Small Disk, 5 GB",
    "diskofferingid": "aee5cb52-fa83-442e-ab5e-e6b1fc278c16",
    "diskofferingname": "Small",
    "displayvolume": true,
    "domain": "ROOT",
    "domainid": "1a81b5a5-ecb0-11f0-9768-1e00d50002bf",
    "domainpath": "/",
    "hasannotations": false,
    "hypervisor": "KVM",
    "id": "cfdfdd71-f9e3-4379-9b73-fa2055c0d085",
    "isextractable": true,
    "jobid": "02d7d9c7-1fd7-4484-81c2-a62cb06b1171",
    "jobstatus": 0,
    "name": "TestDataDisk",
    "path": "cfdfdd71-f9e3-4379-9b73-fa2055c0d085",
    "podid": "5d077870-8d22-4f9e-bb06-c2d4a7279b76",
    "podname": "Pod1",
    "provisioningtype": "thin",
    "quiescevm": false,
    "size": 5368709120,
    "state": "Ready",
    "storage": "ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm-pri1",
    "storageid": "0679e50b-b7e7-3b2c-bd49-348d3c03216b",
    "storagetype": "shared",
    "supportsstoragesnapshot": false,
    "tags": [],
    "type": "DATADISK",
    "virtualmachineid": "b6669733-126d-466c-b871-27cbaf47d6b2",
    "vmdisplayname": "Win2022-UEFI-SkipForce",
    "vmname": "Win2022-UEFI-SkipForce",
    "vmstate": "Running",
    "vmtype": "User",
    "zoneid": "d4b02923-8436-4cec-84d0-00341b732875",
    "zonename": "ref-trl-10567-k-Mol9-rositsa-kyuchukova"
  }
}
```

2. Checked the disk controllers - both root and data disk should be VirtIO:

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm1 ~]# virsh dumpxml i-2-5-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/20fc851c-bd13-4170-b503-7add62291ab8'
index='2'/>
      <backingStore type='file' index='3'>
        <format type='qcow2'/>
        <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/22ee2a4e-8324-480d-9052-a3e082f62a36'/>
        <backingStore/>
      </backingStore>
      <target dev='vda' bus='virtio'/>
      <serial>20fc851cbd134170b503</serial>
      <alias name='virtio-disk0'/>
--
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/cfdfdd71-f9e3-4379-9b73-fa2055c0d085'
index='4'/>
      <backingStore/>
      <target dev='vdb' bus='virtio'/>
      <serial>cfdfdd71f9e343799b73</serial>
      <alias name='virtio-disk1'/>
      <address type='pci' domain='0x0000' bus='0x07' slot='0x00' function='0x0'/>
    </disk>
    <disk type='file' device='cdrom'>
      <driver name='qemu'/>
      <target dev='sdd' bus='sata'/>
      <readonly/>
      <alias name='sata0-0-3'/>
      <address type='drive' controller='0' bus='0' target='0' unit='3'/>
    </disk>
    <controller type='usb' index='0' model='qemu-xhci'>
      <alias name='usb'/>
      <address type='pci' domain='0x0000' bus='0x03' slot='0x00' function='0x0'/>
    </controller>
```

3. Stopped VM and checked state

```
(localcloud) 🐱 > list virtualmachines id=b6669733-126d-466c-b871-27cbaf47d6b2
filter=name,state
{
  "count": 1,
  "virtualmachine": [
    {
```

```
      "name": "Win2022-UEFI-SkipForce",
      "state": "Stopped"
    }
  ]
}
```

4. Started VM and checked state

```
(localcloud) 🐱 > list virtualmachines id=b6669733-126d-466c-b871-27cbaf47d6b2
filter=name,state
{
  "count": 1,
  "virtualmachine": [
    {
      "name": "Win2022-UEFI-SkipForce",
      "state": "Running"
    }
  ]
}
```

5. Checked disks again

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm1 ~]# virsh dumpxml i-2-5-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/20fc851c-bd13-4170-b503-7add62291ab8'
index='3'/>
      <backingStore type='file' index='4'>
        <format type='qcow2'/>
        <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/22ee2a4e-8324-480d-9052-a3e082f62a36'/>
        <backingStore/>
      </backingStore>
      <target dev='vda' bus='virtio'/>
      <serial>20fc851cbd134170b503</serial>
      <alias name='virtio-disk0'/>
--
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/cfdfdd71-f9e3-4379-9b73-fa2055c0d085'
index='2'/>
      <backingStore/>
      <target dev='vdb' bus='virtio'/>
      <serial>cfdfdd71f9e343799b73</serial>
      <alias name='virtio-disk1'/>
      <address type='pci' domain='0x0000' bus='0x06' slot='0x00' function='0x0'/>
```

```
    </disk>
    <disk type='file' device='cdrom'>
      <driver name='qemu'/>
      <target dev='sdd' bus='sata'/>
      <readonly/>
      <alias name='sata0-0-3'/>
      <address type='drive' controller='0' bus='0' target='0' unit='3'/>
    </disk>
    <controller type='usb' index='0' model='qemu-xhci'>
      <alias name='usb'/>
      <address type='pci' domain='0x0000' bus='0x03' slot='0x00' function='0x0'/>
    </controller>
```

TC-006: Windows BIOS VM - Verify no regression

Objective: Verify that Windows VMs with BIOS boot continue to work correctly (no regression from the PR changes).

Test Result: BIOS VMs honor rootDiskController setting and persist through stop/start without needing the skip flag. No regression.
Status: PASSED

Test Steps:

1. Deployed Windows Server 2022 VM with BIOS (non-UEFI) template
2. Set rootDiskController=virtio (no skip.force.disk.controller needed)
3. Verified virsh dumpxml - disk shows <target dev='vda' bus='virtio'/>
4. Stopped and started the VM
5. Verified virsh dumpxml again - disk still shows <target dev='vda' bus='virtio'/>

```
root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm1 ~]# virsh dumpxml i-2-9-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/5688ea83-a13e-4725-8893-1382a7256728'
index='2'/>
      <backingStore type='file' index='3'>
        <format type='qcow2'/>
        <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/317d8895-146d-4c9d-80b0-77c83a6f38f5'/>
        <backingStore/>
      </backingStore>
      <target dev='vda' bus='virtio'/>
      <serial>5688ea83a13e47258893</serial>
      <alias name='virtio-disk0'/>
```

```
--
    <disk type='file' device='cdrom'>
      <driver name='qemu'/>
      <target dev='hdc' bus='ide'/>
      <readonly/>
      <alias name='ide0-1-0'/>
      <address type='drive' controller='0' bus='1' target='0' unit='0'/>
    </disk>
    <controller type='usb' index='0' model='piix3-uhci'>
      <alias name='usb'/>
      <address type='pci' domain='0x0000' bus='0x00' slot='0x01' function='0x2'/>
    </controller>
```

TC-007: Template-level skip.force.disk.controller setting

Objective: Verify skip.force.disk.controller can be set at template level and is inherited by VMs.

Test Result: VMs inherit skip.force.disk.controller and rootDiskController from template.

Status: PASSED

Test Steps:

1. Updated Windows UEFI template with skip.force.disk.controller=true and rootDiskController=virtio

```
(localcloud) 🐱 > update template id=22ee2a4e-8324-480d-9052-a3e082f62a36
details[0].skip.force.disk.controller=true details[0].rootDiskController=virtio
{
  "template": {
    "account": "admin",
    "bits": 0,
    "bootable": true,
    "created": "2026-01-08T18:46:13+0000",
    "crossZones": false,
    "details": {
      "rootDiskController": "virtio",
      "skip.force.disk.controller": "true"
    },
    "displaytext": "Windows Server 2022 UEFI for PR11750",
    "domain": "ROOT",
    "domainid": "1a81b5a5-ecb0-11f0-9768-1e00d50002bf",
    "domainpath": "/",
    "format": "QCOW2",
    "hasannotations": false,
    "hypervisor": "KVM",
```

```
    "id": "22ee2a4e-8324-480d-9052-a3e082f62a36",
    "isdynamicallyscalable": false,
    "isfeatured": false,
    "ispublic": false,
    "isready": false,
    "name": "Windows-2022-UEFI",
    "ostypeid": "522e2d61-ecb0-11f0-9768-1e00d50002bf",
    "ostypename": "Windows Server 2022 (64-bit)",
    "tags": [],
    "templatetype": "USER"
  }
}
```


2. Deployed new VM from template with only UEFI=SECURE at VM level

Note: UEFI=SECURE is only set at VM level - the skip.force.disk.controller and rootDiskController should be inherited from the template.

3. Verified VM details show inherited settings: skip.force.disk.controller: "true" and rootDiskController: "virtio"


```
(localcloud) 🐱 > list virtualmachines filter=name,id,details,template
{
  "count": 2,
  "virtualmachine": [
    {
      "details": {
        "Message.ReservedCapacityFreed.Flag": "false",
        "cpuOvercommitRatio": "2.0",
        "rootDiskController": "virtio"
      },
      "id": "29be8000-4ec0-4af8-b61a-9c9f99fd1a3a",
      "name": "Win2022-BIOS-Test"
    },
    {
      "details": {
        "UEFI": "SECURE",
        "cpuOvercommitRatio": "2.0",
        "rootDiskController": "virtio",
        "skip.force.disk.controller": "true"
      },
      "id": "6c251464-ca4c-4c81-a029-de4b9e2fbae1",
      "name": "Win2022-FromTemplate"
    }
  ]
}
```

4. Verified virsh dumpxml - disk shows <target dev='vda' bus='virtio'/>

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm1 ~]# virsh dumpxml i-2-9-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/5688ea83-a13e-4725-8893-1382a7256728'
index='2'/>
      <backingStore type='file' index='3'>
        <format type='qcow2'/>
        <source
file='/mnt/0679e50b-b7e7-3b2c-bd49-348d3c03216b/317d8895-146d-4c9d-80b0-77c83a6f38f5'/>
        <backingStore/>
      </backingStore>
      <target dev='vda' bus='virtio'/>
      <serial>5688ea83a13e47258893</serial>
      <alias name='virtio-disk0'/>
--
    <disk type='file' device='cdrom'>
      <driver name='qemu'/>
      <target dev='hdc' bus='ide'/>
      <readonly/>
      <alias name='ide0-1-0'/>
      <address type='drive' controller='0' bus='1' target='0' unit='0'/>
    </disk>
    <controller type='usb' index='0' model='piix3-uhci'>
      <alias name='usb'/>
      <address type='pci' domain='0x0000' bus='0x00' slot='0x01' function='0x2'/>
    </controller>
```

TC-008: Detail priority - Instance vs Template

Objective: Determine and verify which detail takes priority when set at both template and instance level (raised by @sureshanaparti in docs PR #616).

Test Result: Instance-level detail takes priority over template-level detail. When VM sets skip.force.disk.controller=false, the default SATA enforcement is applied despite template having true.

Documentation note: Instance details override template details for skip.force.disk.controller.

Status: PASSED

Test Steps:

1. Template has skip.force.disk.controller=true and rootDiskController=virtio
2. Deployed VM with explicit skip.force.disk.controller=false override

3. Verified VM details show skip.force.disk.controller: "false" (instance override applied)

```
(localcloud) 🐱 > list virtualmachines id=7b3ca6df-26d6-4a90-a657-7d3d3a18e622
filter=name,instancename,details
{
  "count": 1,
  "virtualmachine": [
    {
      "details": {
        "UEFI": "SECURE",
        "cpuOvercommitRatio": "2.0",
        "rootDiskController": "virtio",
        "skip.force.disk.controller": "false"
      },
      "instancename": "i-2-13-VM",
      "name": "Win2022-Override"
    }
  ]
}
```

4. Verified virsh dumpxml - disk shows <target dev='sda' bus='sata'/>

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm2 ~]# virsh dumpxml i-2-13-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/a2a58082-3980-44c2-86b0-34f4ab8ecc4b'
index='2'/>
      <backingStore type='file' index='3'>
        <format type='qcow2'/>
        <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/22ee2a4e-8324-480d-9052-a3e082f62a36'/>
        <backingStore/>
      </backingStore>
      <target dev='sda' bus='sata'/>
      <serial>a2a58082398044c286b0</serial>
      <alias name='sata0-0-0'/>
--
    <disk type='file' device='cdrom'>
      <driver name='qemu'/>
      <target dev='sdd' bus='sata'/>
      <readonly/>
      <alias name='sata0-0-3'/>
      <address type='drive' controller='0' bus='0' target='0' unit='3'/>
    </disk>
    <controller type='usb' index='0' model='qemu-xhci'>
      <alias name='usb'/>
      <address type='pci' domain='0x0000' bus='0x03' slot='0x00' function='0x0'/>
    </controller>
```

TC-009: VM migration with skip.force.disk.controller=true

Objective: Verify disk controller settings persist through live migration.

Test Result: Disk controller settings persist through live migration.

Status: PASSED

Test Steps:

1. Used Windows UEFI VM with skip.force.disk.controller=true and rootDiskController=virtio

```
(localcloud) 🐱 > list virtualmachines id=7b3ca6df-26d6-4a90-a657-7d3d3a18e622
filter=name,instancename,hostname,state,details
{
  "count": 1,
  "virtualmachine": [
    {
      "details": {
        "UEFI": "SECURE",
        "cpuOvercommitRatio": "2.0",
        "rootDiskController": "virtio",
        "skip.force.disk.controller": "true"
      },
      "hostname": "ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm2",
      "instancename": "i-2-13-VM",
      "name": "Win2022-Override",
      "state": "Running"
    }
  ]
}
```

2. Verified disk shows bus='virtio' on kvm2 before migration

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm2 ~]# virsh dumpxml i-2-13-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/a2a58082-3980-44c2-86b0-34f4ab8ecc4b'
index='2'/>
      <backingStore type='file' index='3'>
```

```
        <format type='qcow2'/>
        <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/22ee2a4e-8324-480d-9052-a3e082f62a36'/>
        <backingStore/>
      </backingStore>
      <target dev='vda' bus='virtio'/>
      <serial>a2a58082398044c286b0</serial>
      <alias name='virtio-disk0'/>
--
    <disk type='file' device='cdrom'>
      <driver name='qemu'/>
      <target dev='sdd' bus='sata'/>
      <readonly/>
      <alias name='sata0-0-3'/>
      <address type='drive' controller='0' bus='0' target='0' unit='3'/>
    </disk>
    <controller type='usb' index='0' model='qemu-xhci'>
      <alias name='usb'/>
      <address type='pci' domain='0x0000' bus='0x03' slot='0x00' function='0x0'/>
    </controller>
```

3. Live migrated VM from kvm2 to kvm1

4. Verified disk still shows bus='virtio' on kvm1 after migration

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm1 ~]# virsh dumpxml i-2-13-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/a2a58082-3980-44c2-86b0-34f4ab8ecc4b'
index='2'/>
      <backingStore type='file' index='3'>
        <format type='qcow2'/>
        <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/22ee2a4e-8324-480d-9052-a3e082f62a36'/>
        <backingStore/>
      </backingStore>
      <target dev='vda' bus='virtio'/>
      <serial>a2a58082398044c286b0</serial>
      <alias name='virtio-disk0'/>
--
    <disk type='file' device='cdrom'>
      <driver name='qemu'/>
      <target dev='sdd' bus='sata'/>
      <readonly/>
      <alias name='sata0-0-3'/>
      <address type='drive' controller='0' bus='0' target='0' unit='3'/>
    </disk>
    <controller type='usb' index='0' model='qemu-xhci'>
```

```
    <alias name='usb'/>
    <address type='pci' domain='0x0000' bus='0x03' slot='0x00' function='0x0'/>
  </controller>
```

TC-010: Different disk bus types with skip.force.disk.controller=true

NOTE: virtio was already tested in previous test cases.

Objective: Verify skip.force.disk.controller works with various disk bus types (virtio, scsi, sata).

Test Result: Each configured disk bus type is honored when skip.force.disk.controller=true.

Status: PASSED

Test Steps:

1. Tested rootDiskController=virtio - verified bus='virtio'
VM details:

```
(localcloud) 🐱 > list virtualmachines id=7b3ca6df-26d6-4a90-a657-7d3d3a18e622
filter=name,instancename,state,details
{
  "count": 1,
  "virtualmachine": [
    {
      "details": {
        "UEFI": "SECURE",
        "cpuOvercommitRatio": "2.0",
        "rootDiskController": "virtio",
        "skip.force.disk.controller": "true"
      },
      "hostname": "ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm2",
      "instancename": "i-2-13-VM",
      "name": "Win2022-Override",
      "state": "Running"
    }
  ]
}
```

Virsh output:

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm2 ~]# virsh dumpxml i-2-13-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/a2a58082-3980-44c2-86b0-34f4ab8ecc4b'
index='2'/>
      <backingStore type='file' index='3'>
        <format type='qcow2'/>
        <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/22ee2a4e-8324-480d-9052-a3e082f62a36'/>
        <backingStore/>
      </backingStore>
      <target dev='vda' bus='virtio'/>
      <serial>a2a58082398044c286b0</serial>
      <alias name='virtio-disk0'/>
```

2. Updated VM to rootDiskController=scsi - verified bus='scsi'
VM details:

```
(localcloud) 🐱 > list virtualmachines id=7b3ca6df-26d6-4a90-a657-7d3d3a18e622
filter=name,instancename,state,details
{
  "count": 1,
  "virtualmachine": [
    {
      "details": {
        "UEFI": "SECURE",
        "cpuOvercommitRatio": "2.0",
        "rootDiskController": "scsi",
        "skip.force.disk.controller": "true"
      },
      "instancename": "i-2-13-VM",
      "name": "Win2022-Override",
      "state": "Running"
    }
  ]
}
```

Virsh output:

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm1 ~]# virsh dumpxml i-2-13-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none' discard='unmap'/>
      <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/a2a58082-3980-44c2-86b0-34f4ab8ecc4b'
index='2'/>
      <backingStore type='file' index='3'>
```

```
        <format type='qcow2'/>
        <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/22ee2a4e-8324-480d-9052-a3e082f62a36'/>
        <backingStore/>
      </backingStore>
      <target dev='sda' bus='scsi'/>
      <serial>a2a58082398044c286b0</serial>
      <alias name='scsi0-0-0-0'/>
```

3. Updated VM to rootDiskController=sata - verified bus='sata'
VM details:

```
(localcloud) 🐱 > update virtualmachine id=7b3ca6df-26d6-4a90-a657-7d3d3a18e622
details[0].skip.force.disk.controller=true details[0].UEFI=SECURE
details[0].rootDiskController=sata
{
  "virtualmachine": {
    ...
    "details": {
      "UEFI": "SECURE",
      "rootDiskController": "sata",
      "skip.force.disk.controller": "true"
    },
    "instancename": "i-2-13-VM",
    "name": "Win2022-Override",
    "state": "Stopped",
    ...
  }
}
```

Virsh output:

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm1 ~]# virsh dumpxml i-2-13-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/a2a58082-3980-44c2-86b0-34f4ab8ecc4b'
index='2'/>
      <backingStore type='file' index='3'>
        <format type='qcow2'/>
        <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/22ee2a4e-8324-480d-9052-a3e082f62a36'/>
        <backingStore/>
```

```
      </backingStore>
      <target dev='sda' bus='sata'/>
      <serial>a2a58082398044c286b0</serial>
      <alias name='sata0-0-0'/>
```

TC-011: Null/empty details map handling

Objective: Verify VM deployment works when no details are provided (null/empty details map handling).

Test Result: VM deploys successfully without details, code handles null/empty details gracefully (uses MapUtils.getBoolean with default false).

Status: PASSED

Test Steps:

1. Deploy a VM without any details to verify no errors occur:

```
(localcloud) 🐱 > deploy virtualmachine name="NoDetails-Test"
templateid=ee98b1b6-8d45-43d3-acc2-6efeba129ad3
serviceofferingid=8e2af31d-946c-41a1-b129-1b69ab14dec0
zoneid=d4b02923-8436-4cec-84d0-00341b732875 networkids=35e575bd-e040-438d-9090-ae7f61c23130
{
  "virtualmachine": {
    "account": "admin",
    "affinitygroup": [],
    "arch": "x86_64",
    "cpunumber": 1,
    "cpuspeed": 500,
    "created": "2026-01-09T11:41:31+0000",
    "deleteprotection": false,
    "details": {
      "cpuOvercommitRatio": "2.0"
    },
    "displayname": "NoDetails-Test",
    "displayvm": true,
    "domain": "ROOT",
    "domainid": "1a81b5a5-ecb0-11f0-9768-1e00d50002bf",
    "domainpath": "/",
    "guestosid": "599705e4-ecb0-11f0-9768-1e00d50002bf",
    "haenable": false,
    "hasannotations": false,
    "hostcontrolstate": "Enabled",
    "hostid": "0452441b-092a-4454-b063-94706a49abd6",
    "hostname": "ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm2",
    "hypervisor": "KVM",
```

```
  "id": "d0ac8bea-79ec-42a5-baee-f45c0c016c2a",
  "instancename": "i-2-14-VM",
  "ipaddress": "10.1.1.247",
  "isdynamicallyscalable": false,
  "jobid": "b4c473fe-e5ca-4f7f-8b90-609739d93a92",
  "jobstatus": 0,
  "lastupdated": "2026-01-09T11:41:58+0000",
  "memory": 512,
  "name": "NoDetails-Test",
  "nic": [
    {
      "broadcasturi": "vlan://3203",
      "deviceid": "0",
      "extradhcpoption": [],
      "gateway": "10.1.1.1",
      "id": "937c73d1-3c5d-4dc7-82eb-3fc870f458ec",
      "ipaddress": "10.1.1.247",
      "isdefault": true,
      "isolationuri": "vlan://3203",
      "macaddress": "02:01:00:cc:00:0c",
      "netmask": "255.255.255.0",
      "networkid": "35e575bd-e040-438d-9090-ae7f61c23130",
      "networkname": "PR11750-TestNet",
      "secondaryip": [],
      "traffictype": "Guest",
      "type": "Isolated"
    }
  ],
  "osdisplayname": "Ubuntu 24.04 LTS",
  "ostypeid": "599705e4-ecb0-11f0-9768-1e00d50002bf",
  "password": "Rhj4Ex",
  "passwordenabled": true,
  "pooltype": "NetworkFilesystem",
  "receivedbytes": 0,
  "rootdeviceid": 0,
  "rootdevicetype": "ROOT",
  "securitygroup": [],
  "sentbytes": 0,
  "serviceofferingid": "8e2af31d-946c-41a1-b129-1b69ab14dec0",
  "serviceofferingname": "Small Instance",
  "state": "Running",
  "tags": [],
  "templatedisplaytext": "Ubuntu 24.04 for PR11750",
  "templateformat": "QCOW2",
  "templateid": "ee98b1b6-8d45-43d3-acc2-6efeba129ad3",
  "templatename": "Ubuntu-24.04",
  "templatetype": "USER",
  "userid": "69f1dc7b-ecb0-11f0-9768-1e00d50002bf",
  "username": "admin",
  "zoneid": "d4b02923-8436-4cec-84d0-00341b732875",
  "zonename": "ref-trl-10567-k-Mol9-rositsa-kyuchukova"
}
```

```
}
```

Note:

- details only contains cpuOvercommitRatio (system-added)
- No skip.force.disk.controller or rootDiskController
- VM is Running on kvm2, instance i-2-14-VM

2. Verified no NullPointer errors in management server logs:

3. Verified disk uses default bus type:

```
[root@ref-trl-10567-k-Mol9-rositsa-kyuchukova-kvm2 ~]# virsh dumpxml i-2-14-VM | grep -A10
'<disk'
    <disk type='file' device='disk'>
      <driver name='qemu' type='qcow2' cache='none'/>
      <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/fa800071-8ea7-4244-a535-0376abd3a792'
index='2'/>
      <backingStore type='file' index='3'>
        <format type='qcow2'/>
        <source
file='/mnt/e860075b-ad65-3475-9a10-994f1ebd844a/ee98b1b6-8d45-43d3-acc2-6efeba129ad3'/>
        <backingStore/>
      </backingStore>
      <target dev='vda' bus='virtio'/>
      <serial>fa8000718ea74244a535</serial>
      <alias name='virtio-disk0'/>
--
    <disk type='file' device='cdrom'>
      <driver name='qemu'/>
      <target dev='hdc' bus='ide'/>
      <readonly/>
      <alias name='ide0-1-0'/>
      <address type='drive' controller='0' bus='1' target='0' unit='0'/>
    </disk>
    <controller type='usb' index='0' model='piix3-uhci'>
      <alias name='usb'/>
      <address type='pci' domain='0x0000' bus='0x00' slot='0x01' function='0x2'/>
    </controller>
```