

# **Intel<sup>®</sup> Ethernet Controller Products**

**Release 26.3 Release Notes** 

**Intel Corporation** 



# **Revision History**

Revision	Date	Comments
1.0	May 2021	Initial release.



## 1.0 Overview

This document provides an overview of the changes introduced in the latest Intel<sup>®</sup> Ethernet controller/ adapter family of products. References to more detailed information are provided where necessary. The information contained in this document is intended as supplemental information only; it should be used in conjunction with the documentation provided for each component.

These release notes list the features supported in this software release, known issues, and issues that were resolved during release development.

# 1.1 Supported Intel® Ethernet Controller Devices

**Note: Bold Text** indicates the main changes for Software Release 26.3.

Controller Family	Windows* Driver Version	Linux* Driver Version	FreeBSD Driver Version	NVM Version
Intel® Ethernet 800 Series	1.8.39	1.5.8	0.29.4	2.5x
Intel <sup>®</sup> Ethernet 700 Series Intel <sup>®</sup> Ethernet Network Connection X722	1.15.51.x	2.15.x	1.12.x	8.2
Intel <sup>®</sup> Ethernet 500 Series Intel <sup>®</sup> Ethernet Controller X550	4.1.229.x	5.11.x	3.3.x	3.1
Intel <sup>®</sup> Ethernet 300 Series	12.18.12.x	5.5.x	2.5.x	N/A
Intel® Ethernet 200 Series	12.19.1.x	5.5.x	2.5.x	N/A
Intel® Ethernet 225 Series3	1.02.x	N/A	N/A	N/A
Intel® Ethernet Controller 825983	2.4.36.x	5.10.x	3.3.x	N/A
Intel® Ethernet Controller 8257x3	9.16.10.x	5.5.x	2.5.x	N/A

For help identifying a specific network device as well as finding supported devices, click here:

https://www.intel.com/content/www/us/en/support/articles/000005584/network-and-i-o/ethernet-products.html

#### 1.2 New Features

## 1.2.1 Hardware Support

Release	New Hardware Support
• 26.3	Support for Intel <sup>®</sup> Ethernet Network Adapter E810-XXV-4 for OCP 3.0

## 1.2.2 Software Features

Release	New Software Support
• 26.3	<ul> <li>Base drivers for Intel<sup>®</sup> Ethernet 800 Series devices now support health status messages to report abnormal NIC issues</li> <li>Added switchdev support</li> </ul>



## 1.2.3 Removed Features

Release	Hardware/Feature Support	
• 26.3	No features have been removed from this release.	

## **1.2.4** Firmware Features

Release	New Firmware Support
• 26.3	Added support for higher power modules on select Intel Ethernet Network Adapters.



## 2.0 Fixed Issues

## 2.1 Intel<sup>®</sup> Ethernet 800 Series

#### 2.1.1 General

• In 8x10G mode link may not be established on some ports if the link is not connected at power on.

#### 2.1.2 Linux Driver

- Ethtool was incorrectly reporting supported and advertised auto-negotiation settings. This has been fixed.
- The driver is incorrectly flagging egressing packets which causes LLDP packets to be dropped from interfaces.
- Driver rebuild may be failing due to vLAN add/delete failures. This has been fixed.
- The call trace due to the use of WQ\_MEM\_RECLAIM flag has been fixed.
- Unloading the ICE driver after a PCI reset causes an error in dmesq.
- Server may perform reboot after adding VxLAN filter.
- On an Intel Ethernet E810 2CQDA2 adapter in single VLAN mode, users might see packets with S-tag being dropped. This isn't seen with double VLAN.

### 2.1.3 Windows Driver

- VxLAN and RDMA stays active when Intel<sup>®</sup> Ethernet Network Adapter E810 is in Safe Mode.
- When updating from Release 25.6 to Release 26.1 using LANConf, the error "Shared flash write failed!" might be displayed at the end of the update. This does not indicate an update failure. Reboot the system to load the latest firmware.

#### 2.1.4 Linux RDMA Driver

- If setting the device MTU to either 4096 or 2048, applications using RoCEv2 UD might hang. **Workaround**: Set the MTU values to 4097 instead of 4096 and 2049 instead of 2048.
- RDMA vLAN may not be supported in the current release.

## 2.1.5 NVM Update Tool

• Reboot might fail after an update if the PRESERVATION entry has NONE or SELECTIVE in the configuration file. To workaround this issue, remove the entry and let the tool update using the default full preservation option.

#### 2.1.6 NVM

None for this release.

#### 2.1.7 FreeBSD Driver

None for this release.



## 2.1.8 Manageability

None for this release.

## 2.1.9 Application Device Queues (ADQ)

- When Traffic Classes (TCs) are created, deleted, then re-created, the Intel<sup>®</sup> Flow Director may not work as expected. To recover, reload ice driver and reapply ADQ configuration.
- ice driver version 1.1.x can create unnecessary Linux kernel (kworker) threads, under certain workloads with an un-cabled port on an E810 Network Interface Card (NIC) port. This can increase CPU utilization, which might impact ADQ performance.
  - Workaround Use ice driver version 1.2.1 or later.

**Note:** There are no fixed issues for the Intel<sup>®</sup> Ethernet 700, 500, 300 and 200 Series in the 26.3 release.



## 3.0 Known Issues

## 3.1 Intel<sup>®</sup> Ethernet 800 Series

#### 3.1.1 General

- If single VLAN traffic is active on a PF interface and a CORER or GLOBR reset is triggered manually, PF traffic will resume after the reset whereas VLAN traffic may not resume as expected. For a workaround, issue the ethtool command: "ethtool -K PF\_devname rx-vlan-filter off" followed by "ethtool -K PF devname rx-vlan-filter on" and VLAN traffic will resume.
- E810 currently supports a subset of 1000BASE-T SFP module types, which use SGMII to connect back to the E810. In order for the E810 to properly know the link status of the module's BASE-T external connection, the module must indicate the BASE-T side link status to the E810. An SGMII link between E810 and the 1000BASE-T SFP module allows the module to indicate its link status to the E810 using SGMII Auto Negotiation. However 1000BASE-T SFP modules implement this in a wide variety of ways, and other methods which do not use SGMII are currently unsupported in E810. Depending on the implementation, link may never be achieved. In other cases, if the module sends IDLEs to the E810 when there is no BASE-T link, the E810 may interpret this as a link partner sending valid data and may show link as being up even though it is only connected to the module and there is no link on the module's BASE-T external connection.
- Bandwidth/throughput might vary across different virtual functions (VFs) if VF rate limiting is not applied. **Workaround:** To avoid this situation it is recommended to apply VF rate limiting.
- If the PF has no link then a Linux VM previously using a VF will not be able to pass traffic to other VMs without the patch found here

https://lore.kernel.org/netdev/ BL0PR2101MB093051C80B1625AAE3728551CA4A0@BL0PR2101MB0930.namprd21.prod.outlook.c om/T/#m63c0a1ab3c9cd28be724ac00665df6a82061097d

This patch routes packets to the virtual interface.

**Note:** This is a permanent 3rd party issue. No expected action on Intel's part.

- Some devices support auto-negotiation. Selecting this causes the device to advertise the value stored in its NVM (usually disabled).
- VXLAN switch creation on Windows Server 2019 Hyper V might fail.
- Intel does its best to find and address interoperability issues, however there might be connectivity issues with certain modules, cables or switches. Interoperating with devices that do not conform to the relevant standards and specifications increases the likelihood of connectivity issues.
- When priority or link flow control features are enabled, traffic at low packet rates might increment priority flow control and/or packet drop counters.
- In order for an Intel<sup>®</sup> Ethernet 800 Series-based adapter to reach its full potential, users must install it in a PCIe Gen4 x16 slot. Installing on fewer lanes (x8, x4, x2) and/or Gen3, Gen2 or Gen1, impedes the full throughput of the device.
- On certain platforms, the legacy PXE option ROM boot option menu entries from the same device are pre-pended with identical port number information (first part of the string that comes from BIOS).

This is not an option ROM issue. The first device option ROM initialized on a platform exposes all boot options for the device, which is misinterpreted by BIOS.

The second part of the string from the option ROM indicates the correct slot (port) numbers.



- When having link issues (including no link) at link speeds faster than 10 Gb/s, check the switch configuration and/or specifications. Many optical connections and direct attach cables require RS-FEC for connection speeds faster than 10 Gb/s. One of the following might resolve the issue:
  - Configure the switch to use RS-FEC mode.
  - Specify a 10 Gb/s, or slower, link speed connection.
  - If attempting to connect at 25 Gb/s, try using an SFP28 CA-S or CS-N direct attach cable. These cables do not require RS-FEC.
  - If the switch does not support RS-FEC mode, check with the switch vendor for the availability of a software or firmware upgrade.

### 3.1.2 Firmware

• When using RDE operation status might return operation failed after a second update of a property.

#### 3.1.3 Linux Driver

- Enabling switchdev on any port may break reporting random MAC address on the Physical Function (PF) on all ports.
- Rapid unloading and loading of the irdma and ice drivers may cause a kernel panic.
- Interrupt Moderation settings reset to default when the queue settings of a port are modified using the "ethtool -L ethx combined XX" command.
- Adding a physical port to the Linux bridge might fail and result in Device or Resource Busy message
  if SR-IOV is already enabled on a given port. To avoid this condition, create SR-IOV VFs after
  assigning a physical port to a Linux bridge. Refer to Link Aggregation is Mutually Exclusive with SRIOV and RDMA in the ICE driver README.
- When double VLAN or Queue in Queue feature is enabled, the inner most traffic source might need to be limited to an MTU size of 1496 or less to avoid connection issues.
- If a Virtual Function (VF) is not in trusted mode and eight or more VLANs are created on one VF, the VLAN that is last created might be non-functional and an error might be seen in dmesg.
- When using a Windows Server 2019 RS5 Virtual Machine on a RHEL host, a VLAN configured on the VF using iproute2 might not pass traffic correctly when an ice driver older than version 1.3.1 is used in combination with a newer AVF driver version.
- It has been observed that when using ISCSI, the ISCSI initiator intermittently fails to connect to the ISCSI target.
- When the Double VLAN Mode is enabled on the host, disabling then re-enabling a Virtual Function attached to a
  Windows guest might cause error messages to be displayed in dmesg. These messages will not affect
  functionality.
- With the current ice PF driver, there might not be a way for a trusted VF to enable unicast promiscuous and multicast promiscuous mode without turning on ethtool --priv-flags with vf-true-promisc-support. As such, the expectation is to not use vf-true-promisc-support to gate VF's request for unicast/multicast promiscuous mode.
- Repeatedly assigning a VF interface to a network namespace then deleting that namespace might result in an unexpected error message and might possibly result in a call trace on the host system.
- Receive hashing might not be enabled by default on Virtual Functions when using an older lavf driver in combination with a newer PF driver version.



- When Double VLAN is created on a Virtual Machine, tx\_tcp\_cso [TX TCP Checksum Offload] and tx\_udp\_cso [TX UDP Checksum Offload] statistics might not increment correctly.
- When changing the RSS queue value in VM while Double VLAN is configured, rx\_vlano [rx-vlanoffload] might stop incrementing correctly.
- When using Double VLAN configuration with a specific non-Intel link partner, TCP traffic might fail to
  pass through the inner VLAN interface when the MTU of this interface matches the MTU of the outer
  VLAN interface. Workaround: change MTU of inner VLAN to be 4 bytes less than the MTU of the
  outer VLAN.
- If a VLAN with an Ethertype of 0x9100 is configured to be inserted into the packet on transmit, and the packet, prior to insertion, contains a VLAN header with an Ethertype of 0x8100, the 0x9100 VLAN header is inserted by the device after the 0x8100 VLAN header. The packet is transmitted by the device with the 0x8100 VLAN header closest to the Ethernet header.
- A PCI reset performed on the host might result in traffic failure on VFs for certain guest operating systems.
- On RHEL 7.x and 8.x operating systems, it has been observed that the rx\_gro\_dropped statistic might increment rapidly when Rx traffic is high. This appears to be an issue with the RHEL kernels.
- When ICE interfaces are part of a bond with <code>arp\_validate=1</code>, the backup port link status flaps between up and down. **Workaround:** It is recommended to not enable <code>arp\_validate</code> when bonding ICE interfaces.
- Changing a Virtual Function (VF) MAC address when a VF driver is loaded on the host side might result in packet loss or a failure to pass traffic. As a result, the VF driver might need to be restarted.
- Current limitations of minimum Tx rate limiting on SR-IOV VFs:
  - If DCB or ADQ are enabled on a PF then configuring minimum Tx rate limiting on SR-IOV VFs on that PF is rejected.
  - If both DCB and ADQ are disabled on a PF then configuring minimum Tx rate limiting on SR-IOV VFs on that PF is allowed.
  - If minimum Tx rate limiting on a PF is already configured for SR-IOV VFs and a DCB or ADQ configuration is applied, then the PF can no longer guarantee the minimum Tx rate limits set for SR-IOV VFs.
  - If minimum Tx rate limiting is configured on SR-IOV VFs across multiple ports that have an aggregate bandwidth over 100Gbps, then the PFs cannot guarantee the minimum Tx rate limits set for SR-IOV VFs.

## 3.1.4 Windows Driver

- The visibility of the iSCSI LUN is dependent upon being able to establish a network connection to the LUN. In order to establish this connection, factors such as the initialization of the network controller, establishing link at the physical layer (which can take on the order of seconds) must be considered. Because of these variables, the LUN might not initially be visible at the selection screen.
- When a VM is running heavy traffic loads and is attached to a Virtual Switch with either SR-IOV enabled or VMQ offload enabled, repeatedly enabling and disabling the SR-IOV/VMQ setting on the vNIC in the VM may result in a BSOD.
- When a SR-IOV enabled Virtual Switch is assigned to 8 VMs and bi-directional traffic is ran continuously, it is possible that SR-IOV degradation might occur.
- Small performance limitations have been seen for some workloads on Windows when stressing both ports of the E810-2CQDA2 adapter.



- Intel<sup>®</sup> Ethernet Controller E810 devices are in the DCBX CEE/IEEE willing mode by default. In CEE mode, if an Intel<sup>®</sup> Ethernet Controller E810 device is set to non-willing and the connected switch is in non-willing mode as well, this is considered an undefined behavior. **Workaround:** Configure Intel<sup>®</sup> Ethernet Controller E810 devices for the DCBX willing mode (default).
- In order to use guest processor numbers greater than 16 inside a VM, you might need to remove the \*RssMaxProcNumber (if present) from the guest registry.
- If the link is disabled on the link partner the Intel<sup>®</sup> Ethernet Controller E810 might not report the link is down after running Powershell or DMIX. This issue can be resolved by disabling and then enabling the Windows driver.

### 3.1.5 Windows RDMA Driver

- The Intel<sup>®</sup> Ethernet Network Adapter E810 might experience an adapter-wide reset on all ports. When in firmware managed mode, a DCBx willing mode configuration change that is propagated from the switch removes a TC that was enabled by RDMA. This typically occurs when removing a TC associated with UP0 because it is the default UP on which RDMA based its configuration. The reset results in a temporary loss in connectivity as the adapter re-initializes.
- With a S2D storage cluster configuration running Windows Server 2019, high storage bandwidth
  tests might result in a crash for a BSOD bug check code 1E (KMODE\_EXCEPTION\_NOT\_HANDLED)
  with smbdirect as the failed module. Customers should contact Microsoft via the appropriate
  support channel for a solution.

### 3.1.6 Linux RDMA Driver

- After a system reboot, an Intel<sup>®</sup> Ethernet Network Adapter E810 RDMA device in RoCEv2 mode might occasionally become active with a missing or incorrect GID. To correct the GID value, unload and reload the irdma driver.
- When using Intel MPI in Linux, Intel recommends to enable only one interface on the networking device to avoid MPI application connectivity issues or hangs. This issue affects all Intel MPI transports, including TCP and RDMA. To avoid the issue, use ifdown <interface> or ip link set down <interface> to disable all network interfaces on the adapter except for the one used for MPI. OpenMPI does not have this limitation.



In order to send or receive RDMA traffic, the network interface associated with the RDMA device
must be up. If the network interface experiences a link down event (for example, a disconnected
cable or ip link set <interface> down), the associated RDMA device is removed and no longer
available to RDMA applications. When the network interface link is restored, the RDMA device is
automatically re-added.

## 3.1.7 NVM Update Tool

- Updating using an external OROM (FLB file) and opting for delayed reboot in the configuration file is not supported.
- There may be loss of traffic after NVM upgrade/downgrade until reboot. Rebooting the system will resume traffic.
- In some cases when the Physical Function (PF) recovers from a PF Reset (PFR), one or more Virtual Functions (VFs) could fail to receive some multicast packets.

## 3.1.8 Application Device Queues (ADQ)

The code contains the following known issues:

- The latest RHEL and SLES distros have kernels with back-ported support for ADQ. For all other OS
  distros, you must use the latest out-of-tree driver to use ADQ. See Section 4.1 of the Install OS for
  more details.
- If the application stalls for some reason, this can cause a queue stall for application-specific queues for up to two seconds.
  - Workaround Recommend configuration of only one application per Traffic Class (TC) channel.
- DCB and ADQ are mutually exclusive and cannot coexist. A switch with DCB enabled might remove the ADQ configuration from the device.
  - Workaround Do not enable DCB on the switch ports being used for ADQ. Disable LLDP on the interface by turning off firmware LLDP agent using:

```
ethtool --set-priv-flags $iface fw-lldp-agent off
```

- Note (unrelated to Intel drivers): The 5.8.0 Linux kernel introduced a bug that broke the interrupt affinity setting mechanism.
  - Workaround Use an earlier or later version of the kernel to avoid this error.
- The lavf driver must use Trusted mode with ADQ: Trusted mode must be enabled for ADQ inside a VF. If TC filters are created on a VF interface with trusted mode off, the filters are added to the software table but are not offloaded to the hardware.
- VF supports Max Transmit Rate only: the iavf driver only supports setting maximum transmit rate (max\_rate) for Tx traffic. Minimum transmit rate (min\_rate) setting is not supported with a VF.
- A core-level reset of an ADQ-configured VF port (rare events usually triggered by other failures in the NIC/iavf driver) results in loss of ADQ configuration. To recover, reapply ADQ configuration to the VF interface.
- VF errors occur when deleting TCs or unloading iavf driver in a VF: ice and iavf driver error messages might get triggered in a VF when TCs are configured, and TCs are either manually deleted or the iavf driver is unloaded. Reloading the ice driver recovers the driver states.
- Commands such as to qdisc add and ethtool -L cause the driver to close the associated RDMA interface and reopen it. This disrupts RDMA traffic for 3-5 seconds until the RDMA interface is available again for traffic.



- When the number of queues is increased using ethtool -L, the new queues will have the same
  interrupt moderation settings as queue 0 (i.e., Tx queue 0 for new Tx queues and Rx queue 0 for
  new Rx queues). This can be changed using the ethtool per-queue coalesce commands
- To fully release hardware resources and have all supported filter type combinations available, the ice driver must be unloaded and re-loaded.

## 3.2 Intel<sup>®</sup> Ethernet 700 Series

#### 3.2.1 General

- OID\_GEN\_RCV\_ERROR doesn't increment when stream has not allowed preamble.
- NCSI version advertised during MCTP discovery has been changed.
- Devices based on the Intel<sup>®</sup> Ethernet Controller XL710 (4x10 GbE, 1x40 GbE, 2x40 GbE) have an expected total throughput for the entire device of 40 Gb/s in each direction.
- The first port of Intel<sup>®</sup> Ethernet Controller 700 Series-based adapters display the correct branding string. All other ports on the same device display a generic branding string.
- In order for an Intel<sup>®</sup> Ethernet Controller 700 Series-based adapter to reach its full potential, users must install it in a PCIe Gen3 x8 slot. Installing on fewer lanes (x4, x2) and/or Gen2 or Gen1, impedes the full throughput of the device.
- Some odata.id properties are wrong.

## 3.2.1.1 Intel® Ethernet Controller V710-AT2/X710-AT2/TM4

• Incorrect *DeviceProviderName* is returned when using RDE *NegotiateRedfishParameters*. This issue has been root caused and the fix should be integrated in the next firmware release.

### 3.2.2 Windows Driver

• OID\_GEN\_RCV\_ERROR doesn't increment when stream has not allowed preamble.

#### 3.2.3 Linux Driver

- On Kernel version 5.0.9 and higher, setting promiscuous mode on trusted VF leads to a periodic and endless update of this mode.
- When two VF interfaces are in balance-tlb bonding mode, the ICMP traffic might be interrupted for a few sequences.

## 3.2.4 PROSet

• It is not possible to modify a VLAN using IntelNetCmdlets. The Set-IntelNetVLAN command does not display an error.

#### 3.2.5 EFI Driver

• In the BIOS Controller Name as part of the Controller Handle section, a device path appears instead of an Intel adapter branding name.



## 3.3 Intel<sup>®</sup> Ethernet 500 Series

#### 3.3.1 General

• VXLAN switch creation on Windows Server 2019 Hyper V might fail.

#### 3.3.2 EFI Driver

• In the BIOS Controller Name as part of the Controller Handle section, a device path appears instead of an Intel adapter branding name.

### 3.3.3 Windows Driver

• OID GEN RCV ERROR doesn't increment when stream has not allowed preamble.

## 3.4 Intel<sup>®</sup> Ethernet 300 Series

#### 3.4.1 EFI Driver

• In the BIOS Controller Name as part of the Controller Handle section, a device path appears instead of an Intel adapter branding name.

### 3.4.2 ESXi Driver

• Not all ports of Intel<sup>®</sup> Ethernet Server Adapter I350 log information about unsupported thermal sensor functionality in vmkernel.log

## 3.5 Intel<sup>®</sup> Ethernet 200 Series

None for this release.

## 3.6 Legacy Devices

Some older Intel<sup>®</sup> Ethernet adapters do not have full software support for the most recent versions of Microsoft Windows\*. Many older Intel Ethernet<sup>®</sup> adapters have base drivers supplied by Microsoft Windows. Lists of supported devices per operating system are available at:

http://www.intel.com/support/go/network/adapter/nicoscomp.htm



# 4.0 NVM Upgrade/Downgrade 800 Series/700 Series and X550

Refer to the Feature Support Matrix (FSM) links listed in Related Documents for more detail. FSMs list the exact feature support provided by the NVM and software device drivers for a given release.

# **5.0** Languages Supported

**Note:** This only applies to Microsoft Windows and Windows Server Operating Systems.

This release supports the languages listed in the table that follows:

Languages	
English	Spanish
French	Simplified Chinese
German	Traditional Chinese
Italian	Korean
Japanese	Portuguese

## 6.0 Related Documents

Contact your Intel representative for technical support about Intel<sup>®</sup> Ethernet Series devices/adapters.

## **6.1** Feature Support Matrix

These documents contain additional details of features supported, operating system support, cable/ modules, etc.

Device Series	Support Link
Intel® Ethernet 800 Series	https://cdrdv2.intel.com/v1/dl/getContent/630155
Intel® Ethernet 700 Series:  — X710/XXV710/XL710  — X722  — X710-TM4/AT2 and V710-AT2	https://cdrdv2.intel.com/v1/dl/getContent/332191 https://cdrdv2.intel.com/v1/dl/getContent/336882 https://cdrdv2.intel.com/v1/dl/getContent/619407
Intel® Ethernet 500 Series	https://cdrdv2.intel.com/v1/dl/getContent/335253
Intel® Ethernet 300 Series	N/A
Intel® Ethernet 200 Series	N/A



## **6.2** Specification Updates

These documents provide the latest information on hardware errata as well as device marking information, SKU information, etc.

Device Series	Support Link
Intel <sup>®</sup> Ethernet 800 Series	https://cdrdv2.intel.com/v1/dl/getContent/616943
Intel <sup>®</sup> Ethernet 700 Series:  — X710/XXV710/XL710  — X710-TM4/AT2 and V710-AT2	https://cdrdv2.intel.com/v1/dl/getContent/331430 https://cdrdv2.intel.com/v1/dl/getContent/615119
Intel <sup>®</sup> Ethernet 500 Series  - X550  - X540	https://cdrdv2.intel.com/v1/dl/getContent/333717 https://cdrdv2.intel.com/v1/dl/getContent/515715
Intel® Ethernet 300 Series	https://cdrdv2.intel.com/v1/dl/getContent/333066
Intel <sup>®</sup> Ethernet 200 Series  — I210  — I211	https://cdrdv2.intel.com/v1/dl/getContent/332763 https://cdrdv2.intel.com/v1/dl/getContent/333015

## **6.3** Software Download Package

The release software download package can be found at:

https://www.intel.com/content/www/us/en/support/products/36773/network-and-i-o/ethernet-products.html

# **6.4** Intel Product Security Center Advisories

Intel product security center advisories can be found at:

https://www.intel.com/content/www/us/en/security-center/default.html



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