NAME

mdevctl, lsmdev − Mediated device management utility

SYNOPSIS

mdevctl {COMMAND} [OPTIONS...]

DESCRIPTION

mdevctl is a utility for managing and persisting devices in the mediated device device framework of the Linux kernel. Mediated devices are sub-devices of a parent device (ex. a vGPU) which can be dynamically created and potentially used by drivers like vfio-mdev for assignment to virtual machines.

OPTIONS

The following options are understood:

--addattr=ATTRIBUTE
Add an attribute *ATTRIBUTE*. Valid for the **modify** command.

-a|--auto
Automatically start the device on parent availability. Valid for **define** and **modify** commands.

-d|--defined
List all defined devices, even if not active. Valid for the **list** command.

--delattr
Delete an attribute entry. Valid for the **modify** command.

--dumpjson
Dump the configuration for a device in JSON format when filtered to as single device and used with the **list** command. When used with the **types** command, output machine readable type information.

-i|--index=INDEX
Act on the attribute *INDEX*. Valid for the **modify** command.

--jsonfile=FILE
Read the configuration for a device from a JSON file *FILE*. Valid for the **define** and **start** commands.

-m|--manual
Do not start a device automatically on parent availability. Valid for the **modify** command.

-p|--parent=PARENT
Specify or identify the device by its parent device.

-t|--type=TYPE
Specify or identify the device by its type.

-u|--uuid=UUID
Specify or identify the device by its UUID.

--value=VALUE

Set an attribute to *VALUE*, in the format accepted by the attribute. Valid for the **modify** command.

-v|--verbose
Increase output verbosity, currently only adds attribute output to the **list** command.

COMMANDS

The following commands are understood:

define *DEVICESPEC*
Define a config for an mdev device, identified either by an UUID (if the device already exists), or by the parent device and either the type or a JSON configuration file, and, optionally, the UUID. If no UUID is specified, one is autogenerated and printed. If no file is used, *-a|--auto* may be used to specify that the device should be started automatically.

list
List mdev devices. With no options, currently running devices are listed. With **-d|--defined**, previously defined devices are listed. Can be restricted to list only devices for a given parent or UUID. With **--dumpjson** output is provided in machine readable JSON format. When a UUID is provided and the output results in a single device, the JSON output format is compatible with the configuration file format.

modify *DEVICESPEC*
Modify the configuration for an mdev device, identified via its UUID and optionally its parent. Type and startup mode (auto or manual) can be modified by this command. Attributes can be added or deleted. Attributes to be deleted must be specified by their index; if an attribute is specified without an index, it is appended at the end of the attribute list. Running devices are unaffected by this command; changes in the configuration are applied the next time the device is started.

start *DEVICESPEC*
Start an mdev device, identified by its UUID and optionally its parent, or its parent and type and optionally its UUID, which is generated if not given. If specified via its parent and optionally its UUID, the type may be specified in a JSON configuration file, alongside additional parameters.

stop *DEVICESPEC*
Stop an mdev device, specified via its UUID.

types
List the mdev device types known to the system by parent device. Output may be limited to a single parent device with the **-p|--parent** option. JSON output format is used with the **--dumpjson** option.

undefine *DEVICESPEC*
Undefine, or remove the configuration for an mdev device, specified by its UUID and optionally its parent. If a UUID exists for multiple parents, all of them will be removed unless restricted to a single parent. Running devices are unaffected by this command.

version
Print mdevctl version.

NOTE ON DEVICE SPECIFICATION

For a given UUID, only one device with that UUID may be running at the same time. However, it is possible to define multiple devices with the same UUID under different parent devices. Therefore, it is sometimes necessary to specify the parent device alongside the UUID to uniquely identify a device.

EXIT STATUS

On success, 0 is returned, a non-zero failure code otherwise.

EXAMPLES

List running mdev devices:

```
# mdevctl list
85006552-1b4b-45ef-ad62-de05be9171df 0000:00:02.0 i915-GVTg_V4_4
83c32df7-d52e-4ec1-9668-1f3c7e4df107 0000:00:02.0 i915-GVTg_V4_8 (defined)
```

List defined mdev devices:

```
# mdevctl list -d
83c32df7-d52e-4ec1-9668-1f3c7e4df107 0000:00:02.0 i915-GVTg_V4_8 auto
b0a3989f-8138-4d49-b63a-59db28ec8b48 0000:00:02.0 i915-GVTg_V4_8 auto
5cf14a12-a437-4c82-a13f-70e945782d7b 0000:00:02.0 i915-GVTg_V4_4 manual
```

List mdev types supported on the host system:

```
# mdevctl types
0000:00:02.0
  i915-GVTg_V4_2
    Available instances: 1
    Device API: vfio-pci
    Description: low_gm_size: 256MB high_gm_size: 1024MB fence: 4 resolution: 192
  i915-GVTg_V4_1
    Available instances: 0
    Device API: vfio-pci
    Description: low_gm_size: 512MB high_gm_size: 2048MB fence: 4 resolution: 192
  i915-GVTg_V4_8
    Available instances: 4
    Device API: vfio-pci
    Description: low_gm_size: 64MB high_gm_size: 384MB fence: 4 resolution: 1024x
  i915-GVTg_V4_4
    Available instances: 3
    Device API: vfio-pci
    Description: low_gm_size: 128MB high_gm_size: 512MB fence: 4 resolution: 1920
```

Modify a defined device from automatic start to manual:

```
# mdevctl modify --uuid 83c32df7-d52e-4ec1-9668-1f3c7e4df107 --manual
# mdevctl list -d
83c32df7-d52e-4ec1-9668-1f3c7e4df107 0000:00:02.0 i915-GVTg_V4_8 manual
b0a3989f-8138-4d49-b63a-59db28ec8b48 0000:00:02.0 i915-GVTg_V4_8 auto
5cf14a12-a437-4c82-a13f-70e945782d7b 0000:00:02.0 i915-GVTg_V4_4 manual
```

Stop a running mdev device:

```
# mdevctl stop -u 83c32df7-d52e-4ec1-9668-1f3c7e4df107
```

Start an mdev device that is not defined:

```
# uuidgen
6eba5b41-176e-40db-b93e-7f18e04e0b93
# mdevctl start -u 6eba5b41-176e-40db-b93e-7f18e04e0b93 -p 0000:00:02.0 --type i9
# mdevctl list
85006552-1b4b-45ef-ad62-de05be9171df 0000:00:02.0 i915-GVTg_V4_4
6eba5b41-176e-40db-b93e-7f18e04e0b93 0000:00:02.0 i915-GVTg_V4_1
```

Promote the new created mdev to a defined device:

```
# mdevctl define --uuid 6eba5b41-176e-40db-b93e-7f18e04e0b93
# mdevctl list -d
83c32df7-d52e-4ec1-9668-1f3c7e4df107 0000:00:02.0 i915-GVTg_V4_8 manual
6eba5b41-176e-40db-b93e-7f18e04e0b93 0000:00:02.0 i915-GVTg_V4_1 manual
b0a3989f-8138-4d49-b63a-59db28ec8b48 0000:00:02.0 i915-GVTg_V4_8 auto
5cf14a12-a437-4c82-a13f-70e945782d7b 0000:00:02.0 i915-GVTg_V4_4 manual
```

ADVANCED EXAMPLES (ATTRIBUTES AND JSON)

```
# mdevctl list -d
783e6dbb-ea0e-411f-94e2-717eaad438bf matrix vfio_ap-passthrough manual
```

Add some attributes:

```
# mdevctl modify -u 783e6dbb-ea0e-411f-94e2-717eaad438bf --addattr=assign_adapter
# mdevctl modify -u 783e6dbb-ea0e-411f-94e2-717eaad438bf --addattr=assign_adapter
# mdevctl modify -u 783e6dbb-ea0e-411f-94e2-717eaad438bf --addattr=assign_domain
# mdevctl modify -u 783e6dbb-ea0e-411f-94e2-717eaad438bf --addattr=assign_control
# mdevctl modify -u 783e6dbb-ea0e-411f-94e2-717eaad438bf --addattr=assign_domain
# mdevctl modify -u 783e6dbb-ea0e-411f-94e2-717eaad438bf --addattr=assign_control
# mdevctl list -dv
783e6dbb-ea0e-411f-94e2-717eaad438bf matrix vfio_ap-passthrough manual
  Attrs:
    @{0}: {"assign_adapter":"5"}
    @{1}: {"assign_adapter":"6"}
    @{2}: {"assign_domain":"0xab"}
    @{3}: {"assign_control_domain":"0xab"}
    @{4}: {"assign_domain":"4"}
    @{5}: {"assign_control_domain":"4"}
```

Dump the JSON configuration:

```
# mdevctl list -d -u 783e6dbb-ea0e-411f-94e2-717eaad438bf --dumpjson
{
  "mdev_type": "vfio_ap-passthrough",
  "start": "manual",
  "attrs": [
    {
      "assign_adapter": "5"
    },
    {
      "assign_adapter": "6"
    },
    {
```

```
      "assign_domain": "0xab"
    },
    {
      "assign_control_domain": "0xab"
    },
    {
      "assign_domain": "4"
    },
    {
      "assign_control_domain": "4"
    }
  ]
}
```

Remove some attributes:

```
# mdevctl modify -u 783e6dbb-ea0e-411f-94e2-717eaad438bf --delattr --index=5
# mdevctl modify -u 783e6dbb-ea0e-411f-94e2-717eaad438bf --delattr --index=4
# mdevctl list -dv
783e6dbb-ea0e-411f-94e2-717eaad438bf matrix vfio_ap-passthrough manual
  Attrs:
    @{0}: {"assign_adapter":"5"}
    @{1}: {"assign_adapter":"6"}
    @{2}: {"assign_domain":"0xab"}
    @{3}: {"assign_control_domain":"0xab"}
```

Define an mdev device from a file:

```
# cat vfio_ap_device.json
{
  "mdev_type": "vfio_ap-passthrough",
  "start": "manual",
  "attrs": [
    {
      "assign_adapter": "5"
    },
    {
      "assign_domain": "0x47"
    },
    {
      "assign_domain": "0xff"
    }
  ]
}
# mdevctl define -p matrix --jsonfile vfio_ap_device.json
e2e73122-cc39-40ee-89eb-b0a47d334cae
# mdevctl list -dv
783e6dbb-ea0e-411f-94e2-717eaad438bf matrix vfio_ap-passthrough manual
  Attrs:
    @{0}: {"assign_adapter":"5"}
    @{1}: {"assign_adapter":"6"}
    @{2}: {"assign_domain":"0xab"}
    @{3}: {"assign_control_domain":"0xab"}
e2e73122-cc39-40ee-89eb-b0a47d334cae matrix vfio_ap-passthrough manual
```

```
  Attrs:
    @{0}: {"assign_adapter":"5"}
    @{1}: {"assign_domain":"0x47"}
    @{2}: {"assign_domain":"0xff"}
```

FILES

*/etc/mdevctl.d/**

Configuration files are in one subdirectory per parent device and named by UUID.

CONFIGURATION FILE FORMAT

Configuration files are in JSON. Attributes in "**attrs**" are optional.

```
{
  "mdev_type": "TYPE",
  "start": "auto|manual",
  "attrs": [
    {
      "attribute0": "VALUE"
    },
    {
      "attribute1": "VALUE"
    }
  ]
}
```

SEE ALSO

udev(7) **udevadm**(8) **driverctl**(8)