



# **storage array commands**

## ONTAP 9.6 commands

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# storage array commands

## storage array modify

Make changes to an array's profile.

**Availability:** This command is available to *cluster* administrators at the *admin* privilege level.

### Description

The `storage array modify` command lets the user change several array parameters.

### Parameters

**-name <text> - Name**

Storage array name, either generated by Data ONTAP or assigned by the user.

**[-prefix <text>] - Prefix**

Abbreviation for the named array.

**[-vendor <text>] - Vendor**

Array manufacturer.

**[-model <text>] - Model**

Array model number.

**[-options <text>] - options**

Vendor specific array settings.

**[-max-queue-depth <integer>] - Target Port Queue Depth (privilege: advanced)**

The target port queue depth for all target ports on this array.

**[-lun-queue-depth <integer>] - LUN Queue Depth (privilege: advanced)**

The queue depth assigned to array LUNs from this array.

**{ [-is-upgrade-pending {true|false}] - Upgrade Pending (privilege: advanced)**

Set this parameter to *true* if the array requires additional Data ONTAP resilience for a pending firmware upgrade. Keep this parameter *false* during normal array operation. This value can not be set to *true* if `-path-failover-time` is greater than zero.

**[-path-failover-time <integer>] - Path Failover Time (sec)**

The time delay (in secs) before switching the I/O path when the path is deleted. The maximum time delay is 30 sec. The default is 0. This value can not be greater than zero if `-is-upgrade-pending` is *true*.

**[-all-path-fail-delay <integer>] - Extend All Path Failure Event (secs)**

Use this parameter to increase the delay before Data ONTAP declares an "all path failure" event for an array. Delaying the "all path failure" event allows Data ONTAP to suspend I/O operations for a longer period of time before declaring a data access disruption, allowing for I/O operations to resume if any path comes back online within the specified duration. A valid delay is any value between 30 and 90 seconds. A value of

0 will reset the delay, resulting in default actions being taken whenever an "all path failure" event is detected.

## Examples

This command changes the model to FastT.

```
cluster1::> storage array modify -name IBM_1722_1 -model FastT
```

## storage array remove

Remove a storage array record from the array profile database.

**Availability:** This command is available to *cluster* administrators at the *admin* privilege level.

### Description

The `storage array remove` command discards array profile records for a particular storage array from the cluster database. The command fails if a storage array is still connected to the cluster. Use the [storage array config show](#) command to view the array connectivity status. The array target port can be removed using the [storage array port remove](#) command.

### Parameters

**-name <text> - Name**

Name of the storage array you want to remove from the database.

## Examples

```
cluster1::> storage array remove IBM_1722_1
```

### Related Links

- [storage array config show](#)
- [storage array port remove](#)

## storage array rename

Change the name of a storage array in the array profile database.

**Availability:** This command is available to *cluster* administrators at the *admin* privilege level.

### Description

The `storage array rename` command permits substitution of the array profile name which Data ONTAP assigned during device discovery. By default, the name that Data ONTAP assigned to the storage array during discovery is shown in Data ONTAP displays and command output.

## Parameters

### **-name <text> - Name**

Storage array name either generated by Data ONTAP or assigned by the user.

### **-new-name <text> - The new name to assign to this array profile. (28 chars max)**

New name to assign to the storage array.

## Examples

```
cluster1::> storage array rename -name HITACHI_DF600F_1 -new-name MyArray
```

## storage array show

Display information about SAN-attached storage arrays.

**Availability:** This command is available to *cluster* administrators at the *admin* privilege level.

## Description

The `storage array show` command displays information about arrays visible to the cluster. If no parameters are specified, the command displays the following information about all storage arrays:

- Prefix
- Name
- Vendor
- Model
- Options

To display detailed information about a single array, use the `-name` parameter. The detailed view adds the following information:`

- Serial Number
- Optimization Policy
- Affinity
- Errors
- Path Failover Time
- Extend All Path Failure Event

## Parameters

**{ [-fields <fieldname>,...]**

If you specify the `-fields <fieldname>, ...` parameter, the command output also includes the specified field or fields. You can use `'-fields ?'` to display the fields to specify.

**[ `-instance` ] }**

If you specify the `-instance` parameter, the command displays detailed information about all fields.

**[ `-name <text>` ] - Name**

Selects the arrays that match this parameter value.

**[ `-prefix <text>` ] - Prefix**

Abbreviation for the named array.

**[ `-vendor <text>` ] - Vendor**

Array manufacturer.

**[ `-model <text>` ] - Model**

Array model number.

**[ `-options <text>` ] - options**

Vendor specific array settings.

**[ `-serial-number <text>` ] - Serial Number**

Array product identifier.

**[ `-max-queue-depth <integer>` ] - Target Port Queue Depth (privilege: advanced)**

Selects the arrays that match this parameter value.

**[ `-lun-queue-depth <integer>` ] - LUN Queue Depth (privilege: advanced)**

Selects the arrays that match this parameter value.

**[ `-optimization-policy {iALUA|eALUA|symmetric|proprietary|mixed|unknown}` ] - Optimization Policy**

Selects the arrays that match this parameter value.

**[ `-affinity {none|aaa|ap|mixed|unknown}` ] - Affinity**

Selects the arrays that match this parameter value.

**[ `-error-text <text>,...` ] - Error Text**

Selects the arrays that match this parameter value.

**[ `-is-upgrade-pending {true|false}` ] - Upgrade Pending (privilege: advanced)**

Selects the arrays that match this parameter value.

**[ `-path-failover-time <integer>` ] - Path Failover Time (sec)**

Use this parameter to list arrays that have path failover time set to the value you specify.

**[ `-all-path-fail-delay <integer>` ] - Extend All Path Failure Event (secs)**

Use this parameter to list arrays that have the all path failure event delay set to the value you specify.

## Examples

The following example displays information about all arrays.

```
cluster1::> storage array show
Prefix          Name      Vendor      Model Options
-----
                HITACHI_DF600F_1  HITACHI      DF600F
                IBM_1722_1        IBM          1722
2 entries were displayed.
```

The following example displays detailed information about a specific array:

```
cluster1::> storage array show -name HITACHI_DF600F_1
Name: HITACHI_DF600F_1
                Prefix: abc
                Vendor: HITACHI
                Model: DF600F
                options:
                Serial Number: 4291000000000000
                Optimization Policy: iALUA
                Affinity: aaa
                Error Text:
                Path Failover Timeout (sec): 30
                Extend All Path Failure Event (secs): 50
```

## storage array config show

Display connectivity to back-end storage arrays.

**Availability:** This command is available to *cluster* administrators at the *admin* privilege level.

### Description

The `storage array config show` command displays information about how the storage arrays connect to the cluster, LUN groups, number of LUNS, and more. Use this command to validate the configuration and to assist in troubleshooting.

### Parameters

{ [-fields <fieldname>,...]

If you specify the `-fields <fieldname>`, ... parameter, the command output also includes the specified field or fields. You can use `'-fields ?'` to display the fields to specify.

| [-switch ]

If you specify this parameter, switch port information is shown.

| [-instance ] }

If you specify the `-instance` parameter, the command displays detailed information about all fields.

**[-node {<nodename>|local}] - Controller Name**

Selects the arrays that match this parameter value.

**[-group <integer>] - LUN Group**

Selects the arrays that match this parameter value. A LUN group is a set of LUNs that shares the same path set.

**[-target-wwpn <text>] - Array Target Ports**

Selects the arrays that match this parameter value (the World Wide Port Name of a storage array port).

**[-initiator <text>] - Initiator**

Selects the arrays that match this parameter value (the host bus adapter that the clustered node uses to connect to storage arrays).

**[-array-name <array name>] - Array Name**

Selects the arrays that match this parameter value.

**[-target-side-switch-port <text>] - Target Side Switch Port**

Selects the arrays that match this parameter value.

**[-initiator-side-switch-port <text>] - Initiator Side Switch Port**

Selects the arrays that match this parameter value.

**[-lun-count <integer>] - Number of array LUNs**

Selects the arrays that match this parameter value.

**[-ownership {all|assigned|unassigned}] - Ownership**

Selects the arrays that match this parameter value.

## Examples

```
cluster1::> storage array config show
      LUN  LUN
Node   Group Count          Array Name      Array Target
Port Initiator
-----
vnv3070f19a    0    20          DGC_RAID5_1
5006016030229f13      0d
5006016130229f13      0c
5006016830229f13      0b
5006016930229f13      0a
      1    21          HITACHI_OPEN_1
50060e80034fe704      0c
```



0d

50060e80034fe714 0a

0b

50060e80034fe715 0b

50060e80034fe716 0c

0d

2

8

EMC\_SYMMETRIX\_1

50060482cb1bce1d 0a

0b

5006048acb1bce0c 0c

0d

3

10

IBM\_UniversalXport\_1

202600a0b8322d10 0c

0d

204700a0b8322d10 0a

0b

vnv3070f19b 0

20

DGC\_RAID5\_1

5006016030229f13 0d

5006016130229f13 0c

5006016830229f13 0b

5006016930229f13 0a

1

21

HITACHI\_OPEN\_1

50060e80034fe704 0c

0d

50060e80034fe714 0a

0b

50060e80034fe715 0b

```

50060e80034fe716      0c
0d
                2      8      EMC_SYMMETRIX_1
50060482cb1bce1d      0a
0b
5006048acb1bce0c      0c
0d
                3      10     IBM_UniversalXport_1
202600a0b8322d10      0c
0d
204700a0b8322d10      0a
0b
38 entries were displayed.

```

Warning: Configuration errors were detected. Use 'storage errors show' for detailed information.

## storage array disk paths show

Display a list of LUNs on the given array

**Availability:** This command is available to *cluster* administrators at the *admin* privilege level.

### Description

The `storage array disk paths show` command displays information about disks and array LUNs. Where it appears in the remainder of this document, "disk" may refer to either a disk or an array LUN. By default, the command displays the following information about all disks:

- Disk Unique Identifier
- Controller name
- Initiator Port
- LUN ID
- Failover optimization type
- The Use State of the LUN on this path
- Target Port
- Target IQN

- TPGN
- Port speeds
- Kbytes/sec on Disk (Rolling Average)
- Number IOPS per second on disk (Rolling Average)

To display detailed information about a single disk, use the `-disk` parameter.

## Parameters

**{ [-fields <fieldname>,...]**

Displays the specified fields for all disks, in column style output.

**| [-switch ]**

Displays the switch port information for all disks, in column style output.

**| [-instance ] }**

Displays detailed disk information. If no disk path name is specified, this parameter displays the same detailed information for all disks as does the `-disk` parameter. If a disk path name is specified, then this parameter displays the same detailed information for the specified disks as does the `-disk` parameter.

**[-uid <text>] - Disk Unique Identifier**

Selects the disks whose unique id matches this parameter value. A disk unique identifier has the form:  
`20000000:875D4C32:00000000:00000000:00000000:00000000:00000000:00000000:00000000`

**[-disk <disk path name>] - Disk Name**

Displays detailed information about the specified disks.

**[-array-name <array name>] - Array Name**

Selects information about the LUNs presented by the specified storage array.

**[-diskpathnames <disk path name>,...] - Path-Based Disk Names**

Selects information about disks that have all of the specified path names.

**[-nodelist {<nodename>|local}] - Controller name**

Selects information about disks that are visible to all of the specified nodes .

**[-initiator <text>,...] - Initiator Port**

Selects information about disks that are visible to the initiator specified. Disks that are not currently in use by that initiator are included.

**[-lun <integer>,...] - LUN ID**

Selects information about the specified LUNs.

**[-target-wwpn <text>,...] - Target Port**

Selects information about disks that are visible on target ports identified by their World Wide Port Name.

**[-initiator-side-switch-port <text>,...] - Initiator Side Switch Port**

Selects information about disks visible to an initiator that is connected to the specified switch port.

**[-lun-path-use-state <text>,...] - The Use State of the LUN on this path**

Selects information about LUNs reporting the specified in-use state.

**[-tpgn <integer>,...] - Target Port Group Number**

Selects information about disks that belong to the specified Target Port Group Number.

**[-port-speed <text>,...] - Port Speed**

Selects information about disks served by a Host Bus Adapter that is running at the specified port speed.

**[-lun-io-kbps <integer>,...] - Kbytes/sec on Disk (Rolling Average)**

Selects information about the LUNs that have reached the specified I/O throughput.

**[-lun-iops <integer>,...] - Number IOPS per second on disk (Rolling Average)**

Selects information about the LUNs that have reached the specified number of IOPs.

**[-target-side-switch-port <text>,...] - Target Side Switch Port**

Selects information about disks that are visible on target ports identified by the switch port to which they are connected.

**[-target-port-access-state <text>,...] - Failover optimization type**

Selects information about disks visible on target ports that have the specified access state.

**[-initiator-io-kbps <integer>,...] - Kbytes of I/O per second on Initiator (Rolling Average)**

Selects information about disks visible to an initiator that has executed I/O at the specified throughput.

**[-initiator-iops <integer>,...] - Number of IOPS on Initiator (Rolling Average)**

Selects information about disks visible to an initiator that has executed the specified number of IOPs.

**[-target-io-kbps <integer>,...] - Kbytes of I/O per second to Target (Rolling Average)**

Selects information about disks visible on target ports that have reached the specified I/O throughput.

**[-target-iops <integer>,...] - Number of IOPS to Target (Rolling Average)**

Selects information about disks visible on target ports that have performed the specified number of IOPs.

**[-path-link-errors <integer>,...] - Link Error count on path**

Selects information about disks with paths that have incurred the specified number of FC link errors.

**[-path-io-kbps <integer>,...] - Kbytes of I/O per second on Path (Rolling Average)**

Selects information about disk with paths that have reached the specified I/O throughput.

**[-path-iops <integer>,...] - Number of IOPS on Path (Rolling Average)**

Selects information about disks on those paths that have reached the specified number of IOPs.

**[-path-quality <integer>,...] - Percentage of weighted error threshold**

Selects information about disks on paths that have incurred the specified number of errors. The value displayed is a measure of the health of a path expressed as a percentage of an error threshold. Once a

path has reached or surpassed the error threshold, another path will be selected for I/O transfer, if there is one available.

**[-path-lun-in-use-count <integer>,...] - Number of LUNs in the in-use state on this path**

Selects information about disks with paths that have the specified in-use-count.

**[-initiator-lun-in-use-count <integer>,...] - Number of LUNs in the in-use state on this initiator**

Selects information about disks with a path through an initiator that has the specified in-use-count.

**[-target-lun-in-use-count <integer>,...] - Number of LUNs in the in-use state on this target**

Selects information about disks with a path through a target port that has the specified in-use-count.

**[-preferred-target-port {true|false}] - Whether or not target port group is preferred**

Selects information about disks that match the specified parameter value indicating whether the backing storage is ALUA (Assymetric Logical Unit Access) capable and has specified the array target port on this path to be a preferred target port for I/O.

**[-vmdisk-device-id <integer>,...] - Virtual disk device ID**

Selects information about disks that have the specified virtual disk device ID.

**[-host-adapter <text>] - Primary Path Host Adapter**

Selects information about disks that are currently using the specified Host Bus Adapter.

**[-primary-port <text>] - Primary Path Disk Port**

Selects information about disks that use the specified primary port.

**[-secondary-name <disk path name>] - Secondary Path Name**

Selects information about disks that use the specified secondary path name, for multipath configuration.

**[-secondary-port <text>] - Secondary Path Disk Port**

Selects information about disks that use the specified secondary port.

## Examples

The following example displays information about all disks:

```
cluster1::> storage array disk paths show
Disk Name: 1.0.20
UID:
5000C500:0979E09F:00000000:00000000:00000000:00000000:00000000:00000000:00
000000:00000000
                                LUN
Link      Disk I/O
Controller      Initiator      ID  Acc  Use  Target Port
TPGN    Speed      (KB/s)      IOPS
node2                3a                0  AO   INU   5000c5000979e09d
80   9 Gb/S                0                0
node2                3c                0  AO   RDY   5000c5000979e09e
```

```

12  9 Gb/S          0          0
node1              3a          0 AO  RDY  5000c5000979e09e
12  9 Gb/S          0          0
node1              3c          0 AO  INU  5000c5000979e09d
80  9 Gb/S          0          0
Disk Name: 1.0.22
UID:
5000C500:0979E3C3:00000000:00000000:00000000:00000000:00000000:00000000:00
000000:00000000

```

LUN

Link	Disk I/O	Controller	Initiator	ID	Acc	Use	Target Port
TPGN	Speed		(KB/s)			IOPS	
node2			3a	0	AO	INU	5000c5000979e3c1
83	9 Gb/S		0		0		
node2			3c	0	AO	RDY	5000c5000979e3c2
15	9 Gb/S		0		0		
node1			3a	0	AO	RDY	5000c5000979e3c2
15	9 Gb/S		0		0		
node1			3c	0	AO	INU	5000c5000979e3c1
83	9 Gb/S		0		0		

Disk Name: 1.0.19

UID:

```

5000C500:0979E3F3:00000000:00000000:00000000:00000000:00000000:00000000:00
000000:00000000

```

LUN

Link	Disk I/O	Controller	Initiator	ID	Acc	Use	Target Port
TPGN	Speed		(KB/s)			IOPS	
node2			3a	0	AO	RDY	5000c5000979e3f1
86	9 Gb/S		0		0		
node2			3c	0	AO	INU	5000c5000979e3f2
18	9 Gb/S		0		0		
node1			3a	0	AO	INU	5000c5000979e3f2
18	9 Gb/S		0		0		
node1			3c	0	AO	RDY	5000c5000979e3f1
86	9 Gb/S		0		0		

Disk Name: 1.0.16

UID:

```

5000C500:0979EBEB:00000000:00000000:00000000:00000000:00000000:00000000:00
000000:00000000

```

LUN

Link	Disk I/O	Controller	Initiator	ID	Acc	Use	Target Port
TPGN	Speed		(KB/s)			IOPS	
node2			3a	0	AO	INU	5000c5000979ebe9

```

71  9 Gb/S      283      3
node2          3c          0 AO   RDY  5000c5000979ebea
3  9 Gb/S      0          0
node1          3a          0 AO   RDY  5000c5000979ebea
3  9 Gb/S      0          0
node1          3c          0 AO   INU  5000c5000979ebe9
71  9 Gb/S      3          0
[...]
```

## storage array port modify

Make changes to a target port record.

**Availability:** This command is available to *cluster* administrators at the *admin* privilege level.

### Description

The `storage array port modify` command lets the user change array target port parameters.

### Parameters

**-name <text> - Name**

Selects the array ports that match this parameter value. The storage array name is either generated by Data ONTAP or assigned by the user.

**-wwnn <text> - WWNN**

Selects the array ports that match this parameter value.

**-wwpn <text> - WWPN**

Selects the array ports that match this parameter value.

**[-max-queue-depth <integer>] - Target Port Queue Depth**

The target port queue depth for this target port.

**[-utilization-policy {normal|defer}] - Utilization Policy**

The policy used in automatically adjusting the queue depth of the target port based on its utilization.

### Examples

This command changes the maximum queue depth for this target port to 32.

```

cluster1::> storage array port modify -name HITACHI_DF600F_1 -wwnn
50060e80004291c0 -wwpn 50060e80004291c0 -max-queue-depth 32
```

## storage array port remove

Remove a port record from an array profile.

**Availability:** This command is available to *cluster* administrators at the *admin* privilege level.

### Description

The `storage array port remove` command removes a port from the array database. You might want to remove ports that are no longer connected to the clustered node. Port information can change after hardware replacement, rezoning, or similar configuration activities. The database retains the records about previous ports unless you remove the information.

### Parameters

**-name <text> - Name**

Selects the array ports that match this parameter value. The storage array name is either generated by Data ONTAP or assigned by the user.

**{ [-wwnn <text>] - WWNN**

Selects the array ports that match this parameter value.

**[-wwpn <text>] - WWPN**

Selects the array ports that match this parameter value.

**[ [-target-iqn <text>] - Target IQN**

Selects the array ports that match this parameter value.

**[-tpgt <integer>] - TPGT }**

Selects the array ports that match this parameter value.

### Examples

This command removes a port record from the array profiles database.

```
cluster1::> storage array port remove -name HITACHI_DF600F_1 -wwnn
50060e80004291c0 -wwpn 50060e80004291c0
```

## storage array port show

Display information about a storage array's target ports.

**Availability:** This command is available to *cluster* administrators at the *admin* privilege level.

### Description

The `storage array port show` command displays all the target ports known to the cluster for a given storage array (if an array name is specified) or for all storage arrays if no storage array name is specified.



Target ports remain in the database as part of an array profile unless you explicitly remove them from the database.

## Parameters

**{ [-fields <fieldname>,...]**

If you specify the `-fields <fieldname>`, ... parameter, the command output also includes the specified field or fields. You can use `'-fields ?'` to display the fields to specify.

**| [-instance ] }**

If you specify the `-instance` parameter, the command displays detailed information about all fields.

**[-name <text>] - Name**

Selects the array ports that match this parameter value. The storage array name is either generated by Data ONTAP or assigned by the user.

**[-wwnn <text>] - WWNN**

Selects the array ports that match this parameter value.

**[-wwpn <text>] - WWPN**

Selects the array ports that match this parameter value.

**[-max-queue-depth <integer>] - Target Port Queue Depth**

Selects the array ports that match this parameter value.

**[-node {<nodename>|local}] - Controller Name**

Selects the array ports that match this parameter value.

**[-initiator-port <text>,...] - Initiator Port**

Selects the array ports that match this parameter value.

**[-average-dynamic-queue-depth <integer>,...] - Average Dynamic Queue Depth (privilege: advanced)**

The average value of the dynamic target port queue depth.

**[-average-latency-per-iop <integer>,...] - Average Latency Per IOP**

Selects the array ports that match this parameter value (average latency per I/O performed in microseconds).

**[-average-pending <integer>,...] - Average Pending (privilege: advanced)**

Selects the array ports that match this parameter value (average over time of how many commands are on the outstanding queue).

**[-average-waiting <integer>,...] - Average Waiting (privilege: advanced)**

Selects the array ports that match this parameter value (average over time of how many commands are on the waiting queue).

**[-connection-type {direct|fabric|ISCSI}] - Connection Type**

Selects the array ports that match this parameter value (type of connection between the controller and the back end storage).

**[-dynamic-queue-depth <integer>,...] - Dynamic Queue Depth (privilege: advanced)**

Current dynamic target port queue depth, the maximum number of commands allowed outstanding.

**[-max-pending <integer>,...] - Max Pending (privilege: advanced)**

Selects the array ports that match this parameter value (largest number of commands observed on the outstanding queue).

**[-max-waiting <integer>,...] - Max Waiting (privilege: advanced)**

Selects the array ports that match this parameter value (largest number of commands observed on the waiting queue).

**[-path-link-errors <integer>,...] - Link Error count on path**

Selects the array ports that match this parameter value.

**[-percent-busy <integer>,...] - Percent Busy**

Selects the array ports that match this parameter value (percentage of time I/Os are outstanding on the port).

**[-percent-waiting <integer>,...] - Percent Waiting**

Selects the array ports that match this parameter value (percentage of time there are I/Os waiting on the throttle list on the target port).

**[-switch-port <text>] - Switch Port**

Selects the array ports that match this parameter value (for fabric attached connections, the switch port the array target port is connected to; N/A for direct attached).

**[-target-io-kbps <integer>,...] - Kbytes of I/O per second to Target (Rolling Average)**

Selects the array ports that match this parameter value.

**[-target-iops <integer>,...] - Number of IOPS to Target (Rolling Average)**

Selects the array ports that match this parameter value.

**[-target-lun-in-use-count <integer>,...] - Target LUN In Use Count**

Selects the array ports that match this parameter value (number of IN-USE disks on this target port).

**[-target-port-speed <text>] - Target Port Speed**

Selects the array ports that match this parameter value (speed that the target port has negotiated with its connected switch port, or initiator port if direct attached).

**[-utilization-policy {normal|defer}] - Utilization Policy**

The policy used when sending I/O to an array target port when it reaches maximum queue depth. Possible values are:

- normal - This policy aggressively competes for target port resources, in effect competing with other hosts. (default)
- defer - This policy does not aggressively compete for target port resources, in effect deferring to other hosts.

## Examples

The example below displays the port information for a single port.

```
cluster1::> storage array port show -wwpn 50060e80004291c0
Array Name: HITACHI_DF600F_1
WWNN: 50060e80004291c0
WWPN: 50060e80004291c0
Connection Type: fabric
Switch Port: vgbr300s89:9
Link Speed: 4 GB/s
Max Queue Depth: 1024
Utilization Policy: normal
```

Link		LUN				
Node	Initiator	Count	IOPS	KB/s	%busy	%waiting
Errs						
-----	-----	-----	-----	-----	-----	-----
----						
0	vnv3070f20a	0b	2	0	0	0
0	vnv3070f20b	0b	2	0	0	0
0						

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