



## USH Support in BNG

Unified Session History (USH) is a flow based event logging and correlating framework. This chapter provides information about USH support in BNG.

**Table 1: Feature History for USH Support in BNG**

Release	Modification
Release 6.5.1	This feature is introduced.

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## Overview of USH

Unified Session History (USH) is a flow based event logging and correlating framework. It provides the infrastructure to store the events that occurs on a subscriber session lifecycle in a central storage, correlating multiple keys of the subscriber, such as, subscriber label, MAC address, IPv4 address, IPv6 address, interface handle etc. It also identifies the normal or errored events in show commands and thereby helps narrow down the reason behind problematic subscriber sessions.

For BNG, MAC address of the subscriber is the primary key. The secondary keys used are:

- Interface handle
- Subscriber label
- IPv4 address and VRF id
- IPv6 address and VRF id

USH enables processing and storing the events on a per-subscriber basis. New show commands have been introduced to display the events based on the key provided.

## Restrictions for USH in BNG

The following restrictions are applicable to this feature:

- This feature will not work for routed subscribers as the subscriber MAC address is not unique in the case.
- When the subscriber is successfully disconnected, only the key events are saved to reduce memory footprint.

## Configure USH for BNG

### Configuration Steps

The USH feature for BNG is not enabled by default. This is enabled on demand by the following configuration:

```
Router# configure terminal
Router(config)# subscriber ush enable
Router(config)# interface Bundle-Ether 1.1
Router(config)# interface Bundle-Ether 1.2
Router(config)# commit
```



**Note** The maximum number of access interfaces configured as filter for USH is two. Configuring more than two interfaces shows the following error:

```
!!% Max number of monitored interfaces reached: exceeded USH_MAX_FILTER_COUNT interfaces
```

### Verification

In order to view the event history for an active subscriber, use the show command **show subscriber session history subscriber-mac** command as shown below:

```
Router# show subscriber session history subscriber-mac 0020.9400.000c
/oper/ush/%%/key path mac/0020.9400.000c/0
```

```

          STAF event history

Subscriber state: Active

SubscriberMAC:0020.9400.000c

ifhandle: 0x0000cba0

sublabel: 0x00000052

ipv4 Address:192.168.1.42

ipv6 Address: No IPv6 address

vrf:0x60000000 (default)

Time stamp                comp_name                event
```

```

-----
11/07/2018 16:34:52:743135      dhcp      Discover pkt procsd
11/07/2018 16:34:52:743135      iedge     IPv4 Start
11/07/2018 16:34:52:747135      aaa       Radiusd recieved Authorization request
11/07/2018 16:34:52:748134      aaa       Radiusd successfully built Access-Request
packet
11/07/2018 16:34:52:750134      aaa       Radiusd Successfully sent packet and started
timeout handler
11/07/2018 16:34:52:753134      aaa       Radiusd recieved Access-Accept
11/07/2018 16:34:52:753134      aaa       Decode radius packet success
11/07/2018 16:34:52:753134      aaa       Radiusd sending reply back to client
11/07/2018 16:34:52:759133      dhcp      Session Created      - Init state
11/07/2018 16:34:52:760133      dhcp      IP allocated         - Init state
11/07/2018 16:34:52:764132      dhcp      Request pkt procsd  - Post Offer sent
11/07/2018 16:34:52:764132      ipsub     IPSub intf creation started
11/07/2018 16:34:52:764132      ipsub     IPSub init callback from Ifmg
11/07/2018 16:34:52:764132      ipsub     IPSub session start event to iEdge
11/07/2018 16:34:52:764132      ipsub     IPSub init to Ifmgr
11/07/2018 16:34:52:884114      ipsub     IPSub received VRF details
11/07/2018 16:34:52:951103      iedge     SUBDB produce done
11/07/2018 16:34:52:976099      ipsub     IPSub RIB details added
11/07/2018 16:34:53:078084      ipsub     IPSub session up
11/07/2018 16:34:53:079084      iedge     IPv4 Up
11/07/2018 16:34:53:079084      dhcp      Session DPM success

```

Information about the last instance of the subscriber session can be displayed using the **show subscriber session history subscriber-mac *subscriber MAC address* disconnected** command.

Router# **show subscriber session history subscriber-mac 0010.9400.0094 disconnected**

```

STAF event history
Subscriber state: Successfully disconnected
SubscriberMAC:0010.9400.0094
ifhandle: 0x00000260
sublabel: 0x000025d7
ipv4 Address:200.0.0.29
ipv6 Address:
vrf:0x60000000 (default)
Time stamp                comp_name      event
-----
05/12/2016 12:45:35:328697  dhcp          Discover pkt procsd
05/12/2016 12:45:35:328697  iedge         IPv4 Start
05/12/2016 12:45:38:412225  ipsub        IPSub session up
05/12/2016 12:45:38:417224  iedge        IPv4 Up

```

```
05/12/2016 12:45:38:422223    iedge    SUBDB produce done
06/12/2016 07:07:12:330971    dhcp     Lease expired for client
```

If the subscriber session is errored, the complete event information is stored for further reference. This information can be retrived by using the **show subscriber session history subscriber-mac *subscriber MAC address* errored** command.

```
Router# show subscriber session history subscriber-mac 0020.9400.000c errored
```

```
/oper/ush/%%/key path mac/0020.9400.000c/2
```

```
STAF event history
```

```
Subscriber state: Errored
```

```
SubscriberMAC:0020.9400.000c
```

```
ifhandle: 0x00000000
```

```
sublabel: 0x00000051
```

```
ipv4 Address: No IPv4 address
```

```
ipv6 Address: No IPv6 address
```

Time stamp	comp_name	event
11/07/2018 16:32:28:386225	dhcp	Discover pkt procsd
11/07/2018 16:32:28:386225	iedge	IPv4 Start
11/07/2018 16:32:28:389225	aaa	Radiusd recieved Authorization request
11/07/2018 16:32:28:391224	aaa	Radiusd successfully built Access-Request packet
11/07/2018 16:32:28:392224	aaa	Radiusd Successfully sent packet and started timeout handler
11/07/2018 16:32:33:783399	aaa	Radiusd Successfully sent packet and started timeout handler
11/07/2018 16:32:38:790633	aaa	Radiusd Successfully sent packet and started timeout handler
11/07/2018 16:32:43:801866	aaa	Radiusd Successfully sent packet and started timeout handler
11/07/2018 16:32:48:808100	aaa	Radius packet sending failed Reason: 'RADIUS' detected the 'fatal' condition 'No server information is available'
11/07/2018 16:32:48:808100	iedge	policy rule failed Reason: 'AAA_BASE' detected the 'fatal' condition 'Invalid state (aaa base lib error)'
11/07/2018 16:32:48:809100	iedge	Disconnect session

When USH is enabled, it keeps track of the statistics of sessions that are created, destroyed and errored in the system, over a 10 minute interval. This can be viewed using the command **show subscriber session history analytics**.

```
Router# show subscriber session history analytics
```

```
+++++  
[28/01/2017 00:46:15:716111 - 28/01/2017 00:46:58:576552]
```

```
-----  
Flows Created :      43  
Flows Completed:    42  
Error Summary:  
-----
```

```
[ 0]: 0x45349600 - 'qos-ma' detected the 'warning' condition 'Multiple policies configured  
on an interface/direction without specifying the merge option'  
Count:      42  
Last Instance:      28/01/2017 00:46:58:162811  
MAC:0000:0000:0001, SUBLBL:0x61, IFH:0x2c10
```

