

## 11) Configure VLAN Parameters

Virtual LAN (VLAN) implementation in the Tsunami MP.11 products:

- Lets the BSU and SU be used in a VLAN-aware network.
- Processes IEEE 802.1Q VLAN-tagged packets.

Network resources behind the BSU and SU can be assigned to logical groups.

### *VLAN Modes*

#### *Transparent Mode*

Transparent mode applies to both the SU and the BSU. This mode is equivalent to NO VLAN support and is the default mode. It is used when the devices behind the SU and BSU are both VLAN aware or unaware. The SU/BSU transfers both tagged and untagged frames received on Ethernet or WORP interface. Both tagged and untagged management frames can access the device.

#### *Trunk Mode*

Trunk mode VLAN applies to both the SU and the BSU. It is used when all devices behind the SU and BSU are VLAN aware. The SU and BSU transfer only tagged frames received on Ethernet or WORP interface.

#### *Access Mode*

Access mode applies only to the SU. It is used when the devices behind the SU are VLAN unaware. Frames to and from the Ethernet interface behind the SU map into only one VLAN segment.

Frames received on the Ethernet interface are tagged with the configured Access VLAN ID before forwarding them to the WORP interface. Only management frames so tagged can access the device from the WORP interface; however, untagged management frames can access the device from Ethernet Interface.

### *VLAN Forwarding*

The VLAN Trunk mode provides a means to configure a list of VLAN IDs in a Trunk VLAN Table. The SU and BSU only forward frames (between Ethernet and WORP interface) tagged with the VLAN IDs configured in the Trunk VLAN Table. Up to 256 VLAN IDs can be configured for the BSU and up to 16 VLAN IDs can be configured for the SU (depending upon the capabilities of your switching equipment).

### *VLAN Relaying*

The VLAN Trunk mode for BSU operation provides an option to enable and disable a VLAN relaying flag; when enabled, the BSU shall relay frames between SUs on the same BSU having the same VLAN ID.

### *Management VLAN*

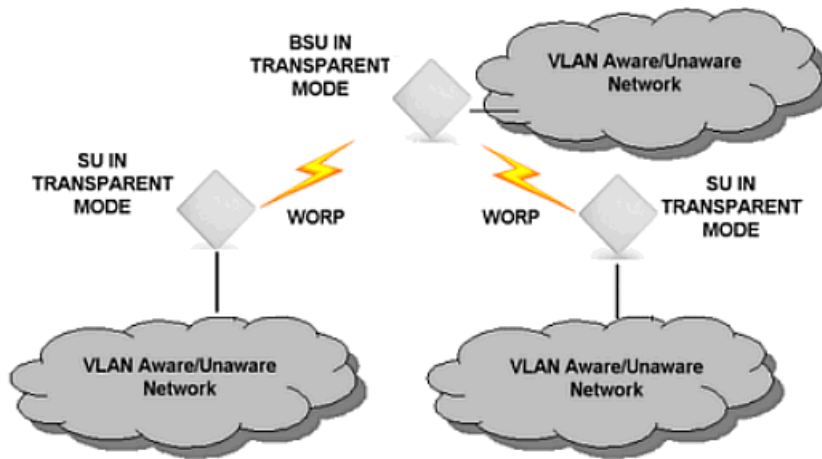
The BSU and SU allow the configuration of a separate VLAN ID and priority for SNMP, ICMP, Telnet, and TFTP management frames for device access.

The management VLAN ID and management VLAN priority apply in both **Trunk** and **Access** mode. The management stations tag the management frames they send to the BSU or SU with the management VLAN ID configured in the device. The BSU and SU tag all the management frames from the device with the configured management VLAN and priority.

- BSUs and SUs in **Trunk** mode let only management frames tagged with the configured management VLAN ID access the device from both WORP and Ethernet interfaces.
- SUs in **Access** mode let management frames tagged with the configured management VLAN ID access the device from WORP interface; untagged management frames can access the device from Ethernet Interface.

## BSU in Transparent Mode

When the BSU is in Transparent mode, all associated SUs must be in Transparent mode.



How the BSU and SUs function in Transparent mode is described in the following table.

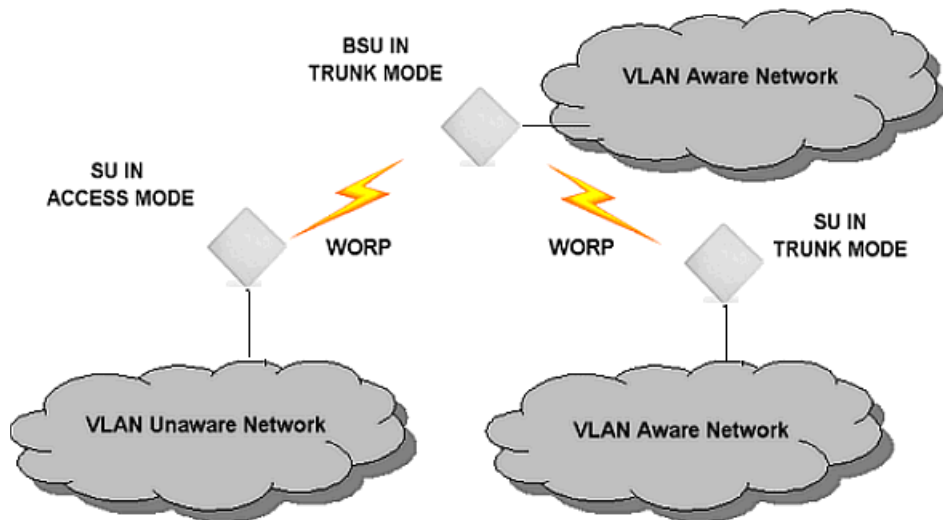
- BSU and SU forward both tagged and untagged frames received on the WORP interface or on the Ethernet Interface.
- BSU and SU let both tagged and untagged management frames access the device.

### BSU in Trunk Mode

When the BSU is in **Trunk** mode, all associated SUs must be in either **Access** mode or **Trunk** mode. When an SU associates to a BSU that is in Trunk mode, it gets the VLAN mode from the BSU.

How the BSU and SUs function in Trunk mode is described in the following table.

BSU Function Trunk Mode	SU Function	
	Trunk Mode	Access Mode
<ul style="list-style-type: none"> <li>Up to 256 VLAN IDs can be configured on a BSU</li> <li>The BSU discards all untagged frames received from the Ethernet interface or from any of the associated SUs.</li> <li>The BSU forwards only VLAN-tagged frames received from the Ethernet interface, or any of the associated SUs that are tagged with the configured VLAN IDs, and discards all other tagged frames.</li> <li>The BSU allows only management frames tagged with the configured management VLAN ID to access it.</li> <li>The BSU tags all management frames generated by the BSU with the configured management VLAN ID and priority.</li> </ul>	<ul style="list-style-type: none"> <li>Up to 16 VLAN IDs can be configured on SUs.</li> <li>SUs discard all untagged frames received from the Ethernet interface or from the BSU (unexpected).</li> <li>SUs forward only VLAN-tagged frames received from the Ethernet interface or from the BSU that are tagged with the configured VLAN IDs; it discards all other tagged frames.</li> <li>SUs allow only management frames tagged with the configured management VLAN ID to access them.</li> <li>SUs tag all management frames generated by them with the configured management VLAN ID and priority.</li> </ul>	<ul style="list-style-type: none"> <li>SUs discard all tagged frames received from the Ethernet interface (unexpected).</li> <li>SUs allow untagged management frames to access the device from the Ethernet interface .</li> <li>SUs tag all untagged frames received from the Ethernet interface with the configured Access VLAN ID and forwards them to the BSU.</li> <li>SUs untag all tagged frames received from the BSU that are tagged with the configured Access VLAN ID and forwards them to the Ethernet interface, and discards all other tagged frames from the BSU.</li> <li>SUs tag all management frames generated by the SU with the configured management VLAN ID and priority.</li> </ul>



BSU in Trunk Mode

## BSU VLAN Configuration

The HTTP Interface to configure SU VLAN parameters is shown in the following figure.

The screenshot shows the web interface for configuring BSU VLAN parameters. The interface is divided into several sections:

- Navigation Tabs:** System, Network, Interfaces, SNMP, RIP. Under Network, there are sub-tabs: Management, Security, Filtering, Intra-Cell Blocking, and VLAN (selected).
- Configuration Section:**
  - BSU Table:**
    - BSU VLAN Mode: Transparent (dropdown)
    - Management VLAN ID: -1 (text input)
    - Management Priority: 0 (text input)
    - Relaying Flag: Disable (dropdown)
    - Note: Changes take effect immediately after clicking Ok Button.
    - Buttons: OK, Cancel
- BSU VLAN Table:**

Index	VLAN ID	Status
1	10	Enable
2	1	Enable

Buttons: Add Table Entries, Edit/Delete Table Entries

The BSU **Trunk VLAN Table** applies when the BSU is in **Trunk** mode. The VLAN ID values for the Trunk VLAN Table range from **1** to **4095**; the default value is **-1**. The maximum number of VLAN IDs that can be configured in the Trunk VLAN Table for the BSU is 256. An SU in Trunk mode is assigned VLAN IDs from this table.

The following VLAN parameters must be configured for the BSU:

### VLAN Mode

The **BSU VLAN mode** can be either **Transparent** mode or **Trunk** mode. By default, the BSU is in **Transparent** mode.

### Management VLAN ID

The **Management VLAN ID** applies when the BSU is in **Trunk** mode. The management VLAN ID has a default value of **-1** in Transparent mode and must be configured with a value in the range of **1** to **4095** to change the BSU VLAN mode to **Trunk** mode.

### Management VLAN Priority

The **Management VLAN priority** values range from **0** to **7** and the default priority is **0** (zero).

### Relaying Flag

When this flag is enabled, the BSU relays frames between SUs on the same BSU

### Add BSU Table Entries

To add entries to the BSU table, click the **Add Table Entries** button on the **BSU Table** tab. Enter a **VLAN ID** and select a **Status**, then click **Add** to add your entry to the table.

The screenshot shows the 'BSU Table' configuration page. At the top, there are tabs for Management, Security, Filtering, Intra-Cell Blocking, and VLAN. The 'BSU Table' tab is active. Below the tabs, there are two sub-tabs: 'BSU Table' and 'SU Table'. The 'BSU Table' sub-tab is selected. A table displays the current entries:

Index	VLAN ID	Status
1	10	Enable
2	1	Enable

Below the table, there are input fields for 'VLAN ID' and 'Status'. The 'VLAN ID' field contains '10' and the 'Status' dropdown is set to 'Enable'. A note below the fields reads: "Note: Additions to this table take effect immediately after clicking Add Button. Maximum 256 VLAN IDs can be added." At the bottom, there are three buttons: 'Add', 'Cancel', and 'Back'.

### Edit or Delete BSU Table Entries

To edit or delete entries in the BSU Table, click the **Edit/Delete Table Entries** button on the **BSU Table** tab, make your changes, then click **OK** for your changes to take effect.

The screenshot shows the 'BSU Table' configuration page, similar to the previous one. The 'BSU Table' sub-tab is selected. The table displays the current entries:

Index	VLAN ID	Status
1	10	Enable
2	1	Enable

Below the table, there are input fields for 'VLAN ID' and 'Status'. The 'VLAN ID' field contains '10' and the 'Status' dropdown is set to 'Enable'. A note below the fields reads: "NOTE: Changes to this table take effect immediately after clicking OK Button." At the bottom, there are three buttons: 'OK', 'Cancel', and 'Back'.

### Restrict Unit Management

Management access to the unit can be secured easily by making management stations or hosts and the unit itself members of a common VLAN. Simply configure a non-zero management VLAN ID; management of the unit will be restricted to members of the same VLAN.

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**CAUTION** *If a non-zero management VLAN ID is configured, management access to the unit is restricted to hosts that are members of the same VLAN. Ensure your management platform or host is a member of the same VLAN before attempting to manage the unit.*

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1. Click the **Configure** button and the **VLAN** tab.
2. Set the **Management ID** to a value between 1 and 4095.
3. Click **OK**.

## Provide Access to a Host in the Same VLAN

The VLAN feature lets hosts manage the unit. If the VLAN **Management ID** matches a VLAN **Access ID**, those hosts who are members of that VLAN will have management access to the unit.

**CAUTION** Once a VLAN Management ID is configured and is equivalent to one of the VLAN User IDs on the unit, all members of that VLAN will have management access to the unit. Be careful to restrict VLAN membership to those with legitimate access to the unit.

1. Click the **Configure** button and the **VLAN** tab.
2. Set the VLAN **Management ID** to the same value as the wireless client VLAN User ID.
3. Click **OK**.

## SU VLAN Configuration

The HTTP Interface to configure SU VLAN parameters is shown in the following figure.

Index	MAC	VLAN Mode	Access VLAN ID	Access VLAN Priority	Management VLAN ID	Management Priority	VLAN-1 2	3	4	5	6
1	00:20:A6:56:46:CA	Access	10	0	10	0	-1	-1	-1	-1	-1
2	00:20:A6:63:56:1E	Trunk	10	0	10	0	-1	-1	-1	-1	-1

The **Trunk VLAN table** applies when the SU is in **Trunk** mode. The VLAN ID values for the Trunk VLAN Table range from **1** to **4095**; the default value is **-1**. A maximum of 16 VLAN IDs can be configured in the Trunk VLAN Table for each SU. The VLAN IDs must be in the Trunk VLAN Table that corresponds to the BSU.

The following VLAN parameters must be configured for each SU associated to the BSU.

### VLAN Mode

The **SU VLAN mode** can be either **Transparent** mode, **Trunk** mode, or **Access** mode.

By default, the BSU is in **Transparent** mode.

- When the BSU is in **Transparent** mode, the SU must be in **Transparent** mode.
- When the BSU is in **Trunk** mode the SU must be in either **Access** mode or **Trunk** mode.
- When the BSU is changed to **Trunk** mode from **Transparent** mode, all the configured SUs are changed to **Trunk** mode by default.

### Access VLAN ID

The **Access VLAN ID** applies when the SU is in **Access** mode.

The Access VLAN ID values range from **1** to **4095**; the default value is **1**.

### Access VLAN Priority

The **Access VLAN Priority** applies when the SU is in **Access** Mode. The Access VLAN priority values range from **0** to **7**; the default priority is **0**. For voice frames, the priority field is set to the VoIP configured value (**5** according to latest IETF draft, or **6** according to IEEE 802.1D) regardless of the priority value configured.

### Management VLAN ID

The **management VLAN ID** applies when the SU is in **Trunk** mode or **Access** mode. The management VLAN ID values range from **1** to **4095**; the default value is **1**.

### Management VLAN Priority

The Management VLAN Priority applies when the SU is in **Trunk** mode or **Access** mode. The management VLAN **priority** values range from **0** to **7**; the default priority is 0.

### Adding SU Table Entries

To add entries to the SU Table, click the **Add Table Entries** button. Enter the **VLAN ID** and select a **Status**, then click **Add** to add and save the entry.

The screenshot shows the 'VLAN' configuration page with the 'SU Table' tab selected. Below the tab is a 'VLAN Table' with the following data:

Index	MAC	VLAN Mode	Access VLAN ID	Access VLAN Priority	Management VLAN ID	Management Priority	VLAN-1	2	3	4	5	6
1	00:30:F1:AE:EC:3B	Transparent	1	0	1	0	-1	-1	-1	-1	-1	-1

Below the table are input fields for: MAC, SU VLAN Mode (set to Transparent), Access VLAN ID, Access VLAN Priority, Management VLAN ID, Management Priority, and VLAN 1 through VLAN 14.

### Editing SU Table Entries

To edit SU table entries, click the **Edit/Delete Table Entries** button; make your changes on the window displayed, then click **OK** to save your changes. (You may need to scroll to the right to see the **Edit/Delete Table Entries** button.)

The screenshot shows the 'VLAN Table' configuration window with two entries:

Index	MAC	VLAN Mode	Access VLAN ID	Access VLAN Priority	Management VLAN ID	Management Priority	V1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Status	
1	00:20:A6:56:46:CA	Access	10	0	10	0	10	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	Enable
2	00:20:A6:56:63:1E	Trunk	10	0	10	0	10	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	Enable

A note below the table states: "Note: Changes to this table take effect immediately after clicking OK Button." Buttons for 'OK', 'Cancel', and 'Back' are visible at the bottom.