Application Note

KGS-2423 Stack Port Operation

Stack Port Specifications

The number of stack ports per unit: 2

Connector: HDMI Type A

Stack Cable: HDMI 1.4 compliant High speed cable

Data Rate: 5Gbps (full duplex)

The maximum number of switches in a stack: 5

In management UI, Port 25 represents Stack port SB and Port 26 represents Stack port SA. To make a stack link between two switches, make sure SA to SB rule is followed.

Scenario 1 – Two switches in a stack with one stack cable link
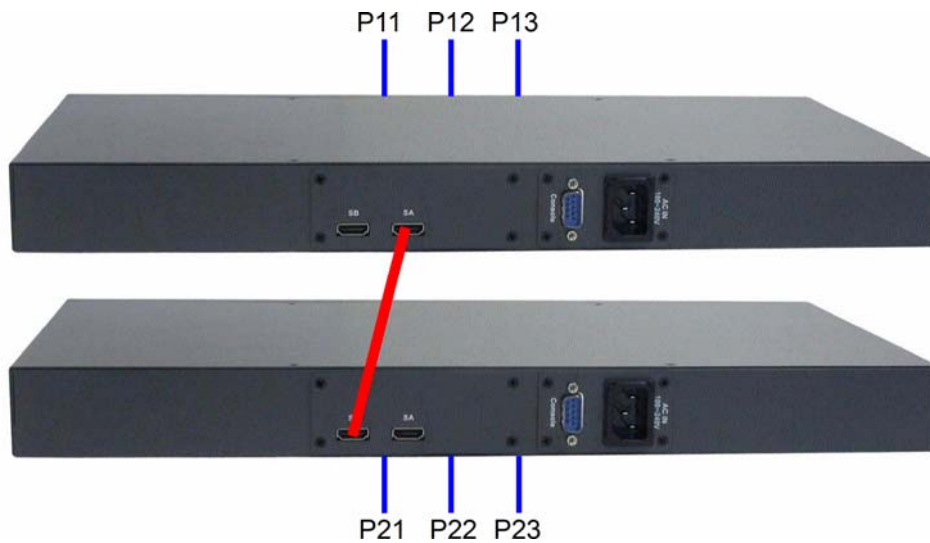
Stack Topology

Back to back (SA to SB connection rule is not required.)

Rated Stacking bandwidth between switches with single stack link

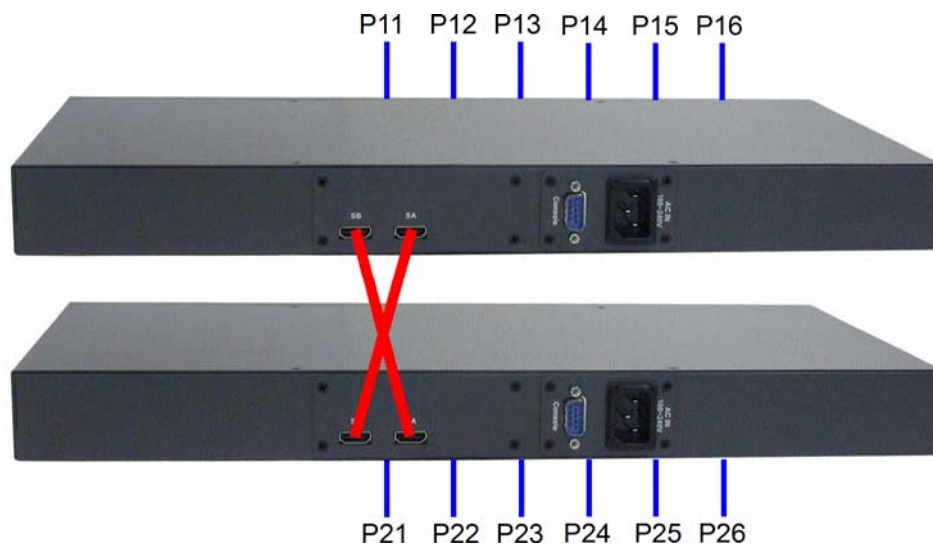5Gbps

Benchmark test

The stacking is able to support wire-speed transmission between two switches with up

to 3 ports each. They are P11 to P21, P12 to P22 and P13 to P23. Each has throughput 2Gbps.

Scenario 2 – Two switches in a stack with two stack cable links

Stack Topology
Back to back

Rated Stacking bandwidth between switches with two stack links
10Gbps

Benchmark test
The stacking is able to support wire-speed transmission between two switches with up to 6 ports each in best case. They are P11 to P21, P12 to P22, P13 to P23, P14 to P24, P15 to P25, and P16 to P26. Each has throughput 2Gbps.

Operation
Actually, two stack ports are aggregated as one trunk with throughput up to 10Gbps. As any failure occurs in one link, the stacking is still working by using the valid link and the throughput is down to 5Gbps as operation in Scenario 1.

The selection of the stack link for each frame flow over stacking is based on a hash code calculation by using the contents of the frame. The global link aggregation setting available for ordinary network ports as shown below is also applied to the stack links in this scenario.
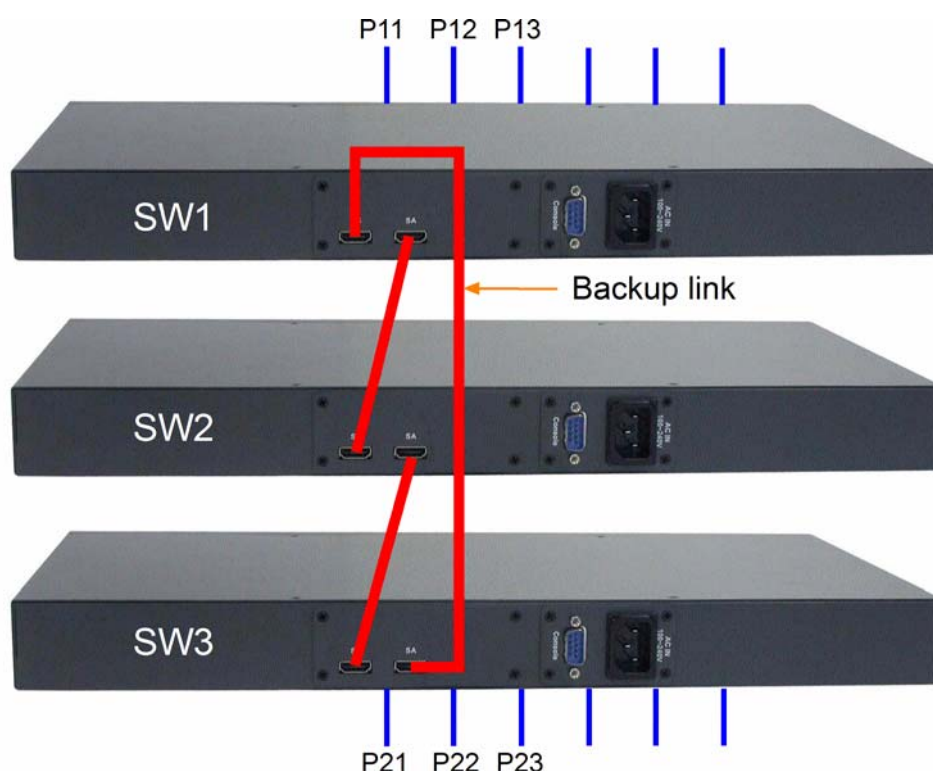
2.4.1 Static

Aggregation Mode Configuration

Stack Global Settings

Hash Code Contributors	
Source MAC Address	☑
Destination MAC Address	☐
IP Address	☑
TCP/UDP Port Number	☑

Scenario 3 – Three switches in a stack with 3 stack links as a ring

P11 P12 P13

SW1

Backup link

SW2

SW3

P21 P22 P23

Stack Topology between switches

Ring with backup for failover

All links are active except one as backup link in case of any failure.

Rated bandwidth of every stack link

5Gbps, every link can perform 5Gbps independently at the same time except the backup link.
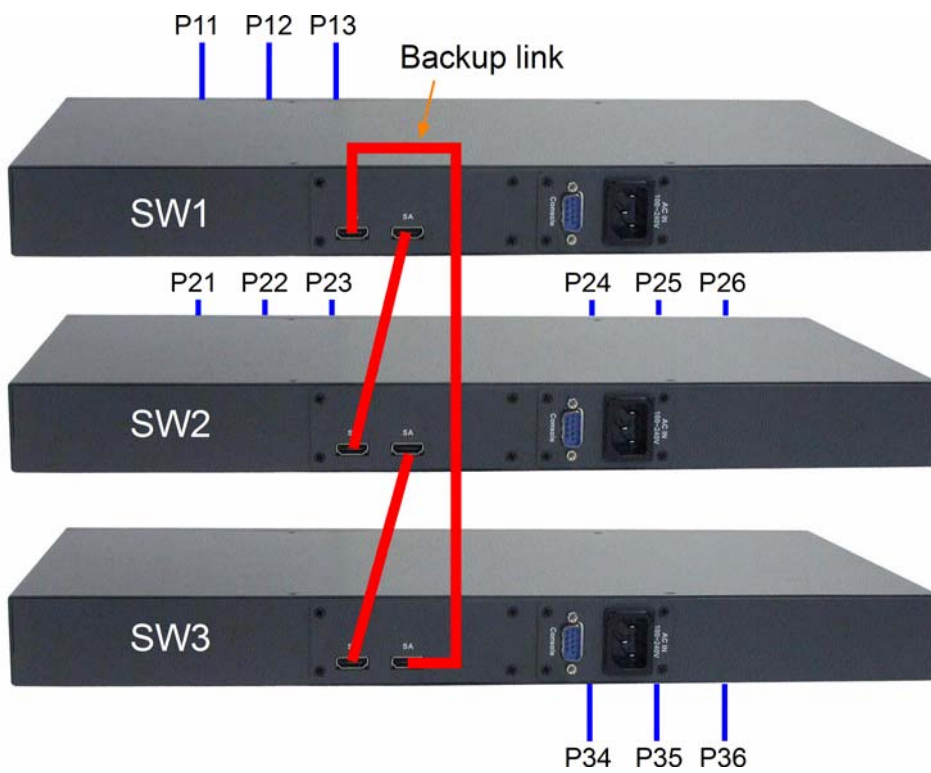
Benchmark test

In this scenario, the stacking is able to support wire-speed transmission between Switch 1 and Switch 3 with up to 3 ports each.

Full wire speed TX/RX between two ports		Throughput
P11	P21	2Gbps
P12	P22	2Gbps
P13	P23	2Gbps
Total throughput passing through stacking		6Gbps

Operation

In the test case, all data flow through one link chain, the maximum bandwidth 6Gbps.

Scenario 4 – Three switches in a stack with 3 stack links as a ring case 2

Stack Topology between switches

Ring with backup for stack link failover

All links are active except one as backup link in case of any failure.

Rated bandwidth of every stack link

5Gbps

Every link can perform 5Gbps independently at the same time except the backup link.

Benchmark test

In this scenario, benchmark test performs wire-speed transmission between SW1 and

SW2 with 3 ports each and also between SW2 and SW3 with 3 ports each.

| Full wire speed TX/RX between ports		Throughput
P11	P21	2Gbps
P12	P22	2Gbps
P13	P23	2Gbps
P24	P34	2Gbps
P25	P35	2Gbps
P26	P36	2Gbps
Total throughput passing through SW2 stack		12Gbps

Operation

In this test case, it is obvious that SW2 stack ports perform an aggregated bandwidth of up to 12Gbps in best case. Both stack ports of SW2 are performing transmission at the same time.

Stack Link Failed

In case of any link failure, the backup link is activated immediately. The failover time is within 40ms.

Scenario 5 – Three switches in a stack with 3 stack links as a chain
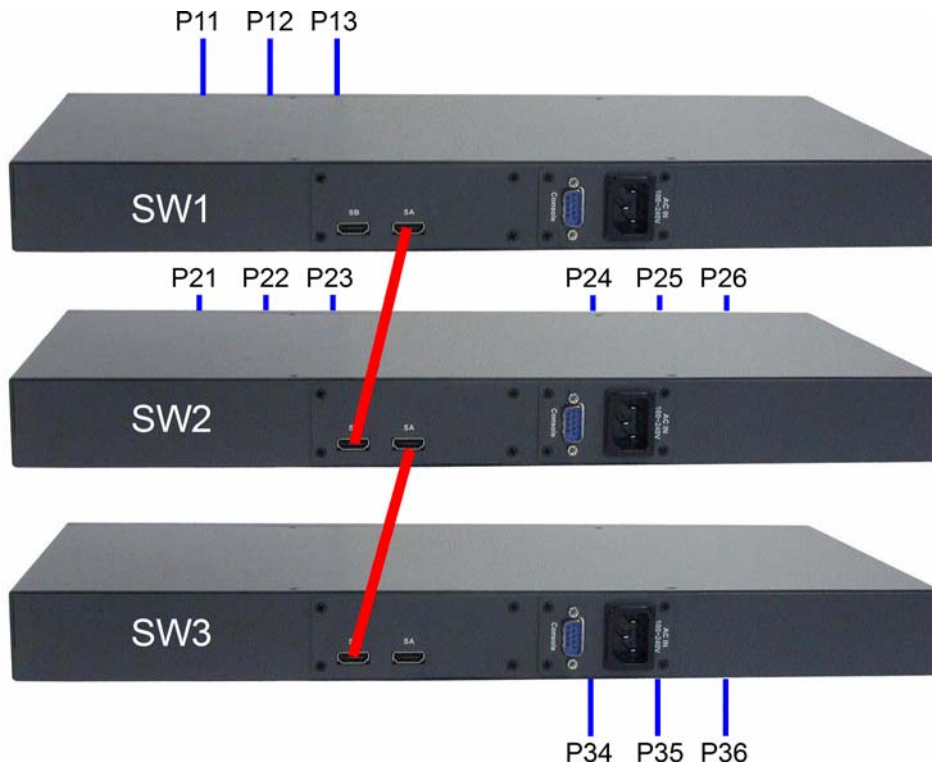
Stack Topology between switches

Chain with no backup link

Rated bandwidth of every stack link

5Gbps

Every link can perform 5Gbps independently at the same time except the backup link.

Throughput

The performance and throughput which the stack performed in this case are exactly same as those in Scenario 4.

<u>**Conclusions**</u>

1. The rated bandwidth for single stack link is 5Gbps, 6Gbps in a benchmark test.
2. The stacking bandwidth of a stack composed of two switches with two stack links is up to rated 10Gbps, 12Gbps in benchmark test in best case. The selection of stack port used for transmission for each data frame is based on hash calculation with the contents of the transmitted frame. The chosen contents can be specified in [Stack Global Setting] of Aggregation Configuration via management UI.
3. In stacks composed of more than two switches, the stacking topology is a ring structure with fast failover backup mechanism. Every stack link can provide rated 5Gbps bandwidth independently at the same time.