


Link Test to Multiple LUIDs (Flood Test)

In a Link Test with Multiple LUIDs also known as a Flood Test, all data queues for all Subscriber Modules (SMs) connected to the AP are filled with flood packets. The flood packets are added to the queues in such a way that regular user traffic (non-flood packets) will be sent first. This has the effect of maxing out the link to each SM without affecting user traffic. Note, if specific LUIDs are specified for the test then only the data channels for those LUIDs are filled with flood packets.


Examples

Case 1




Data queue is empty – flood packets fill the queue

Case 2



User traffic generated at low rate – user traffic transferred to data queue when available, and queue filled with flood packets

Case 3



Queues full with user traffic – no room for additional flood packets

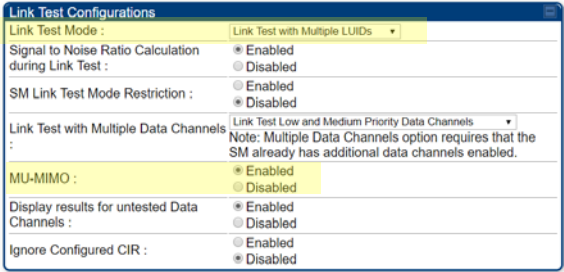
Flood Data

User Data

Link Test Configuration Options

(Under Tools > Link Capacity Test > Link Test Configurations)

List Test Mode and MU-MIMO

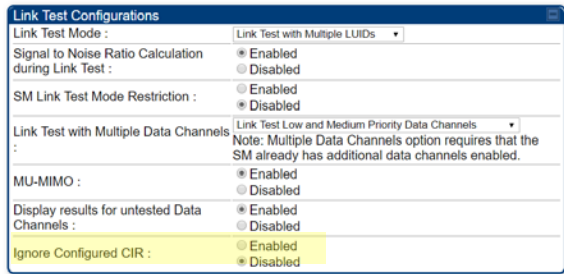


Set **Link Test Mode** to **Link Test with Multiple LUIDs** and **MU-MIMO** to **Enabled** to group traffic and evaluate grouping capability of the sector.

When MU-MIMO is **Disabled** the traffic not grouped. This is used for comparing performance to a 450/450i AP or to have a baseline to evaluate MU-MIMO performance.

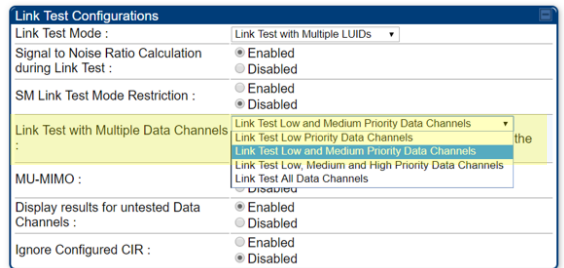
Ignore Configured CIR and Link Test with Multiple Data Channels

The output of the Link Test depends on how you set the **Ignore Configured CIR** and **Link Test with Multiple Data Channels** values



This setting applies both to user data and flood data. If a flood test is performed to evaluate the grouping capability of the SMs in the sector, “Ignore Configured CIR” should be Enabled.

Enabled	CIR is ignored during scheduling
Disabled	CIR is honored during scheduling

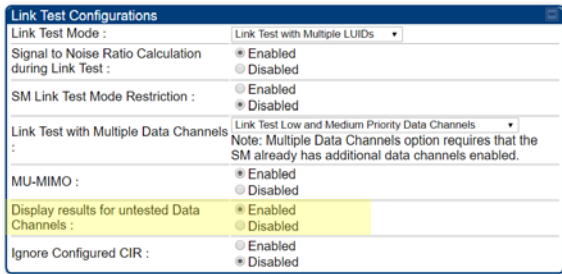


This setting selects the QoS levels to be included in the flood test when the **Ignore Configured CIR** is set to **Disabled**.

To test the grouping capability of the sector, select **Link Test with Multiple Data Channels** to **Link Test Low Priority Data Channels** and set **Ignore Configured CIR** to **Enabled**.

Enabled	<ul style="list-style-type: none">Only data at the highest selected QoS level is sent during flood testIf highest QoS level selected is groupable, the grouping capability of the sector can be testedIf highest QoS level selected is non-groupable, flood test data is sent not groupedLow and Medium Priority levels are groupableNote that not all QoS levels may be enabled on all SMs: SMs may be excluded from the test if they don’t have the selected QoS level enabled <p><i>See Examples on next pages</i></p>
Disabled	<ul style="list-style-type: none">CIR at each QoS level is honoredResults vary according to highest selected QoS level for flood test and individual SM’s CIRs

Display results for untested Data Channels

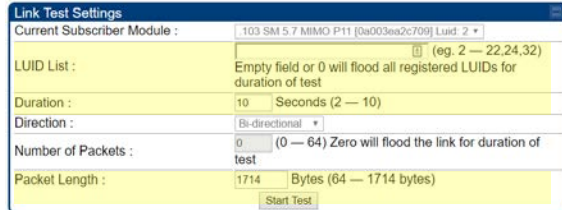


The screenshot shows the 'Link Test Configurations' window. It has several sections with checkboxes and dropdown menus. The 'Link Test Mode' is set to 'Link Test with Multiple LUIDs'. Under 'Signal to Noise Ratio Calculation during Link Test', 'Enabled' is selected. Under 'SM Link Test Mode Restriction', 'Enabled' is selected. The 'Link Test with Multiple Data Channels' section has a dropdown set to 'Link Test Low and Medium Priority Data Channels' and a note: 'Note: Multiple Data Channels option requires that the SM already has additional data channels enabled.' Under 'MU-MIMO', 'Enabled' is selected. The 'Display results for untested Data Channels' checkbox is checked and highlighted in yellow. Under 'Ignore Configured CIR', 'Enabled' is selected.

When **Enabled**, displays an additional table listing all user traffic to data channels not included in the flood test.

This feature is useful when traffic to the data channels selected for the test is not the only traffic in the sector by showing the full picture. For example, when a subset of LUIDs have been selected (see below), when the *Link Test with Multiple Data Channels* selection does not include all data channels, or when there is user traffic at higher priority channels.

Link Test Settings



The screenshot shows the 'Link Test Settings' window. It has fields for 'Current Subscriber Module' (103 SM 5.7 MIMO P11 [0a003ea2c709] Luid 2), 'LUID List' (Empty field or 0 will flood all registered LUIDs for duration of test), 'Duration' (10 Seconds (2 — 10)), 'Direction' (Bi-directional), 'Number of Packets' (0 (0 — 64) Zero will flood the link for duration of test), and 'Packet Length' (1714 Bytes (64 — 1714 bytes)). There is a 'Start Test' button at the bottom right.

Under Link Test Settings you can set LUID Test, Duration and Packet Length.

LUID List	List all SMs to be included in the test. To test all SMs in the sector, leave the field empty.
Duration	Since the test does not stop user traffic, longer tests can be run when the lowest priority level is selected for <i>Link Test with Multiple Data Channels</i>
Packet Length	Larger packets give the best results

Interpreting Results

Display results for untested Data Channels

Link Test with Multiple LUIDs

Subscriber Module	LUID	VC	Data Channel Priority	Throughput	Efficiency	Fragments		Downlink Rate		Grouping Ratio
						Transmit	Received	SU-MIMO	MU-MIMO	
				194.74 Mbps	96%	789735	760719			
Medusa SM4 - [0a-00-3e-a2-88-75]	003	19	Low	57.80 Mbps	99%	227316	225786	8X/4X MIMO-B	8X/4X MIMO-B	100%
Medusa SM5 - [0a-00-3e-a2-63-7b]	005	21	Low	78.99 Mbps	91%	335671	308567	8X/6X MIMO-B	8X/6X MIMO-B	100%
Medusa SM3 - [0a-00-3e-a2-82-bd]	008	24	Low	57.94 Mbps	99%	226748	226366	8X/6X MIMO-B	8X/4X MIMO-B	100%

Slot Grouping

Group Size	% Distribution	Average Slot Count
1 (ungrouped)	0.0	0
2	0.0	0
3	0.0	0
4	100.0	69
5	0.0	0
6	0.0	0
7	0.0	0

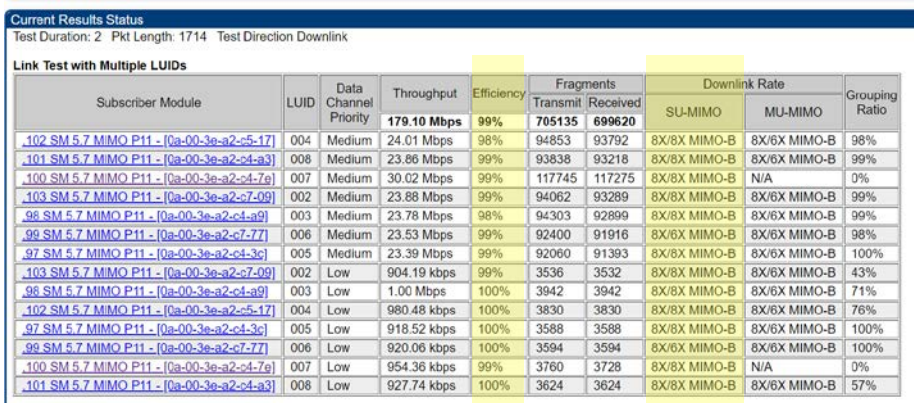
Aggregate Throughput: 214.94 Mbps

Unicast Traffic to Untested Data Channels

VC	Subscriber Module	LUID	Data Channel Priority	Throughput
				20.19 Mbps
249	Medusa SM1 - [0a-00-3e-a2-76-e2]	006	Ultra High	6.91 kbps
240	Medusa SM3 - [0a-00-3e-a2-82-bd]	008	High	1.02 kbps
22	Medusa SM1 - [0a-00-3e-a2-76-e2]	006	Low	10.09 Mbps
23	Medusa SM2 - [0a-00-3e-a2-71-c5]	007	Low	10.09 Mbps

- Flood test to Low Priority data channels of SMs 3, 5 and 8
- Flood test shows results for selected SMs only
- Additional table shows user traffic to data channels not included in the flood test
 - High and Ultra High Priority data channels
 - Low Priority data channels for SMs 6 and 7, which have 10 Mbps of user traffic each

What to check: Efficiency and SU-MIMO



The screenshot shows the 'Current Results Status' window. It has a header bar with 'Current Results Status' and a sub-header with 'Test Duration: 2 Pkt Length: 1714 Test Direction Downlink'. Below this is a table titled 'Link Test with Multiple LUIDs'. The table has columns for Subscriber Module, LUID, VC, Data Channel Priority, Throughput, Efficiency, Fragments (Transmit, Received), Downlink Rate (SU-MIMO, MU-MIMO), and Grouping Ratio. The table contains 17 rows of data. The 'Efficiency' column is highlighted in yellow. The 'Downlink Rate' section is also highlighted in yellow.

Subscriber Module	LUID	VC	Data Channel Priority	Throughput	Efficiency	Fragments		Downlink Rate		Grouping Ratio
						Transmit	Received	SU-MIMO	MU-MIMO	
				179.10 Mbps	99%	705135	699620			
102 SM 5.7 MIMO P11 - [0a-00-3e-a2-c5-17]	004		Medium	24.01 Mbps	98%	94853	93792	8X/8X MIMO-B	8X/6X MIMO-B	98%
101 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a3]	008		Medium	23.86 Mbps	99%	93838	93218	8X/8X MIMO-B	8X/6X MIMO-B	99%
100 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-7e]	007		Medium	30.02 Mbps	99%	117745	117275	8X/8X MIMO-B	N/A	0%
103 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-09]	002		Medium	23.88 Mbps	99%	94062	93289	8X/8X MIMO-B	8X/6X MIMO-B	99%
98 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a9]	003		Medium	23.78 Mbps	98%	94303	92899	8X/8X MIMO-B	8X/6X MIMO-B	99%
99 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-77]	006		Medium	23.53 Mbps	99%	92400	91916	8X/6X MIMO-B	8X/6X MIMO-B	98%
97 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-3c]	005		Medium	23.39 Mbps	99%	92060	91393	8X/8X MIMO-B	8X/6X MIMO-B	100%
103 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-09]	002		Low	904.19 kbps	99%	3536	3532	8X/8X MIMO-B	8X/6X MIMO-B	43%
98 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a9]	003		Low	1.00 Mbps	100%	3942	3942	8X/8X MIMO-B	8X/6X MIMO-B	71%
102 SM 5.7 MIMO P11 - [0a-00-3e-a2-c5-17]	004		Low	980.48 kbps	100%	3830	3830	8X/8X MIMO-B	8X/6X MIMO-B	76%
97 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-3c]	005		Low	918.52 kbps	100%	3588	3588	8X/8X MIMO-B	8X/6X MIMO-B	100%
99 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-77]	006		Low	920.06 kbps	100%	3594	3594	8X/6X MIMO-B	8X/6X MIMO-B	100%
100 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-7e]	007		Low	954.36 kbps	99%	3760	3728	8X/8X MIMO-B	N/A	0%
101 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a3]	008		Low	927.74 kbps	100%	3624	3624	8X/8X MIMO-B	8X/6X MIMO-B	57%

Values **below 90% Efficiency** may indicate possible issues with the radio channel

SU-MIMO Downlink rate is the highest possible rate used to communicate to the SM.

- Expected high at short range and low at large range
- Low modulation at short range may indicate possible issues with the radio channel

What to check: MU-MIMO and Grouping Ratio

Current Results Status

Test Duration: 2 Pkt Length: 1714 Test Direction Downlink

Link Test with Multiple LUIDs

Subscriber Module	LUID	Data Channel Priority	Throughput	Efficiency	Fragments		Downlink Rate		Grouping Ratio
					Transmit	Received	SU-MIMO	MU-MIMO	
.102 SM 5.7 MIMO P11 - [0a-00-3e-a2-c5-17]	004	Medium	179.10 Mbps	99%	705135	699620	8X/8X MIMO-B	8X/6X MIMO-B	98%
.101 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a3]	008	Medium	23.86 Mbps	99%	94853	93792	8X/8X MIMO-B	8X/6X MIMO-B	99%
.100 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-7e]	007	Medium	30.02 Mbps	99%	117745	117275	8X/8X MIMO-B	N/A	0%
.103 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-09]	002	Medium	23.88 Mbps	99%	94062	93289	8X/8X MIMO-B	8X/6X MIMO-B	99%
.98 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a9]	003	Medium	23.78 Mbps	98%	94303	92899	8X/8X MIMO-B	8X/6X MIMO-B	99%
.99 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-77]	006	Medium	23.53 Mbps	99%	92400	91916	8X/6X MIMO-B	8X/6X MIMO-B	98%
.97 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-3c]	005	Medium	23.39 Mbps	99%	92060	91393	8X/8X MIMO-B	8X/6X MIMO-B	100%
.103 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-09]	002	Low	904.19 kbps	99%	3536	3532	8X/8X MIMO-B	8X/6X MIMO-B	43%
.98 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a9]	003	Low	1.00 Mbps	100%	3942	3942	8X/8X MIMO-B	8X/6X MIMO-B	71%
.102 SM 5.7 MIMO P11 - [0a-00-3e-a2-c5-17]	004	Low	980.48 kbps	100%	3830	3830	8X/8X MIMO-B	8X/6X MIMO-B	76%
.97 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-3c]	005	Low	918.52 kbps	100%	3588	3588	8X/8X MIMO-B	8X/6X MIMO-B	100%
.99 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-77]	006	Low	920.06 kbps	100%	3594	3594	8X/6X MIMO-B	8X/6X MIMO-B	100%
.100 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-7e]	007	Low	954.36 kbps	99%	3760	3728	8X/8X MIMO-B	N/A	0%
.101 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a3]	008	Low	927.74 kbps	100%	3624	3624	8X/8X MIMO-B	8X/6X MIMO-B	57%

Grouping ratio is how often the SM is part of a group.

Low values on multiple SMs may indicate a geographical region with clustered SMs.

MU-MIMO Downlink rate is the modulation used when grouped. Value of N/A means the SM cannot be grouped and happens if:

- An SM that does not support sounding (on an old release or PMP 430) is never assigned a spatial frequency (SF) and cannot be grouped
- This is a 450 SM at a new release, not having a SF assigned may indicate possible issues with the radio channel and/or installation: reflections near the SM, no line-of-sight to the AP, SM not installed properly

Slot Grouping

Slot Grouping

Group Size	% Distribution
1 (ungrouped)	33.3
2	10.5
3	45.6
4	10.5
5	0.0
6	0.0
7	0.0

Considering all groups formed during the test, **Slot Grouping** shows the distribution of the group size. If a large % is ungrouped (group size of 1), check how many SMs are not groupable (N/A in MU-MIMO modulation and 0% grouping ratio). Traffic to these SMs is always ungrouped. Compare average group size with LINKPlanner predictions.

Example of “Link Test All Data Channels”

Link Test with Multiple LUIDs

Subscriber Module	LUID	Data Channel Priority	Throughput	Efficiency	Fragments		Downlink Rate		Grouping Ratio
					Transmit	Received	SU-MIMO	MU-MIMO	
.102 SM 5.7 MIMO P11 - [0a-00-3e-a2-c5-17]	004	Ultra High	97.79 Mbps	99%	1914131	1910128	8X/8X MIMO-B	8X/6X MIMO-B	0%
.101 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a3]	008	Ultra High	14.00 Mbps	99%	274203	273603	8X/8X MIMO-B	8X/6X MIMO-B	0%
.100 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-7e]	007	Ultra High	13.68 Mbps	99%	268920	267359	8X/8X MIMO-B	N/A	0%
.103 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-09]	002	Ultra High	14.02 Mbps	99%	274227	273970	8X/8X MIMO-B	8X/6X MIMO-B	0%
.98 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a9]	003	Ultra High	14.04 Mbps	99%	274640	274364	8X/8X MIMO-B	8X/6X MIMO-B	0%
.99 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-77]	006	Ultra High	14.02 Mbps	99%	274184	273910	8X/8X MIMO-B	8X/6X MIMO-B	0%
.97 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-3c]	005	Ultra High	14.02 Mbps	99%	274280	273834	8X/8X MIMO-B	8X/6X MIMO-B	0%
.102 SM 5.7 MIMO P11 - [0a-00-3e-a2-c5-17]	004	High	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%
.101 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a3]	008	High	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%
.100 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-7e]	007	High	0 bps	0%	0	0	8X/8X MIMO-B	N/A	0%
.103 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-09]	002	High	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%
.98 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a9]	003	High	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%
.99 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-77]	006	High	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%
.97 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-3c]	005	High	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%
.102 SM 5.7 MIMO P11 - [0a-00-3e-a2-c5-17]	004	Medium	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%
.101 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a3]	008	Medium	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%

Slot Grouping

Group Size	% Distribution
1 (ungrouped)	100.0
2	0.0
3	0.0
4	0.0
5	0.0
6	0.0
7	0.0

- Assume **Ignore Configured CIR is Enabled**.
- Even if MU-MIMO is enabled, flood traffic to Ultra-High Priority data channels takes precedence. Traffic to lower priority data channels (Low, Medium and High) is not scheduled.
- Ultra-High priority traffic is not grouped.
 - Grouping ratio equal to 0% for all data channels
 - Group size of 1 equal to 100% of the groups

Example of test to Low and Medium Priority data Channels with and without CIR

Link Test with Multiple LUIDs

Subscriber Module	LUID	Data Channel Priority	Throughput	Efficiency	Fragments		Downlink Rate		Grouping Ratio
					Transmit	Received	SU-MIMO	MU-MIMO	
			185.61 Mbps	99%	3649096	3625385			
.102 SM 5.7 MIMO P11 - [0a-00-3e-a2-c5-17]	004	Medium	24.50 Mbps	99%	479352	478607	8X/8X MIMO-B	8X/6X MIMO-B	99%
.101 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a3]	008	Medium	24.62 Mbps	99%	481600	480868	8X/8X MIMO-B	8X/6X MIMO-B	99%
.100 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-7e]	007	Medium	31.96 Mbps	99%	627536	624295	8X/8X MIMO-B	N/A	0%
.103 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-09]	002	Medium	24.43 Mbps	99%	481136	477155	8X/8X MIMO-B	8X/6X MIMO-B	99%
.98 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a9]	003	Medium	30.97 Mbps	98%	616498	604884	8X/8X MIMO-B	8X/8X MIMO-B	99%
.99 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-77]	006	Medium	24.58 Mbps	99%	481580	480197	8X/8X MIMO-B	8X/6X MIMO-B	99%
.97 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-3c]	005	Medium	24.54 Mbps	99%	481394	479379	8X/8X MIMO-B	8X/6X MIMO-B	99%
.103 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-09]	002	Low	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%
.98 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a9]	003	Low	0 bps	0%	0	0	8X/8X MIMO-B	8X/8X MIMO-B	0%
.102 SM 5.7 MIMO P11 - [0a-00-3e-a2-c5-17]	004	Low	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%
.97 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-3c]	005	Low	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%
.99 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-77]	006	Low	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%
.100 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-7e]	007	Low	0 bps	0%	0	0	8X/8X MIMO-B	N/A	0%
.101 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a3]	008	Low	0 bps	0%	0	0	8X/8X MIMO-B	8X/6X MIMO-B	0%

Ignore Configured CIR Enabled

Link Test with Multiple LUIDs

Subscriber Module	LUID	Data Channel Priority	Throughput	Efficiency	Fragments		Downlink Rate		Grouping Ratio
					Transmit	Received	SU-MIMO	MU-MIMO	
			178.84 Mbps	98%	3535182	3493102			
.102 SM 5.7 MIMO P11 - [0a-00-3e-a2-c5-17]	004	Medium	23.85 Mbps	99%	466202	465931	8X/8X MIMO-B	8X/6X MIMO-B	97%
.101 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a3]	008	Medium	24.00 Mbps	99%	470006	468805	8X/8X MIMO-B	8X/6X MIMO-B	99%
.100 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-7e]	007	Medium	29.64 Mbps	99%	582201	578997	8X/8X MIMO-B	N/A	0%
.103 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-09]	002	Medium	24.09 Mbps	99%	472966	470616	8X/8X MIMO-B	8X/6X MIMO-B	99%
.98 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a9]	003	Medium	22.97 Mbps	93%	481711	448820	8X/8X MIMO-B	8X/6X MIMO-B	99%
.99 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-77]	006	Medium	23.70 Mbps	99%	463282	462987	8X/8X MIMO-B	8X/6X MIMO-B	98%
.97 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-3c]	005	Medium	23.62 Mbps	99%	462828	461495	8X/8X MIMO-B	8X/6X MIMO-B	99%
.103 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-09]	002	Low	988.36 kbps	99%	19402	19304	8X/8X MIMO-B	8X/6X MIMO-B	39%
.98 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a9]	003	Low	996.50 kbps	99%	19474	19463	8X/8X MIMO-B	8X/6X MIMO-B	69%
.102 SM 5.7 MIMO P11 - [0a-00-3e-a2-c5-17]	004	Low	1.00 Mbps	100%	19612	19612	8X/8X MIMO-B	8X/6X MIMO-B	80%
.97 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-3c]	005	Low	990.82 kbps	100%	19352	19352	8X/8X MIMO-B	8X/6X MIMO-B	91%
.99 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-77]	006	Low	968.75 kbps	98%	19152	18921	8X/8X MIMO-B	8X/6X MIMO-B	100%
.100 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-7e]	007	Low	983.70 kbps	98%	19408	19213	8X/8X MIMO-B	N/A	0%
.101 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a3]	008	Low	1.00 Mbps	100%	19586	19586	8X/8X MIMO-B	8X/6X MIMO-B	65%

Ignore Configured CIR Disabled

- If CIR is ignored, only Medium Priority data channels are scheduled
- If CIR is honored, Low Priority data channels are scheduled up to their CIR, and the remaining resources are allocated to Medium Priority Data channels
- If CIR is ignored the scheduler has fewer constraints resulting in a better grouping ratio and slightly higher throughput

Example of test to a subset of SMs

Link Test with Multiple LUIDs

Subscriber Module	LUID	Data Channel Priority	Throughput	Efficiency	Fragments		Downlink Rate		Grouping Ratio
					Transmit	Received	SU-MIMO	MU-MIMO	
			147.73 Mbps	99%	679905	677085	8X/8X MIMO-B	8X/6X MIMO-B	
.103 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-09]	002	Low	36.75 Mbps	99%	143988	143571	8X/8X MIMO-B	8X/6X MIMO-B	100%
.98 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a9]	003	Low	73.57 Mbps	99%	289546	287391	8X/8X MIMO-B	8X/6X MIMO-B	100%
.102 SM 5.7 MIMO P11 - [0a-00-3e-a2-c5-17]	004	Low	37.40 Mbps	99%	146371	146124	8X/8X MIMO-B	8X/6X MIMO-B	100%

Group Size	% Distribution
1 (ungrouped)	0.0
2	100.0
3	0.0
4	0.0
5	0.0
6	0.0
7	0.0

Test to check if SMs 2, 3 and 4 are groupable. SM 3 is groupable with both 2 and 4, but 2 and 4 are not groupable together. SM 3 achieves 2x more throughput than SMs 2 and 4.

The group size is always 2 (group of SM2 and SM3 followed by group of SM3 and SM4)

Link Test with Multiple LUIDs

Subscriber Module	LUID	Data Channel Priority	Throughput	Efficiency	Fragments		Downlink Rate		Grouping Ratio
					Transmit	Received	SU-MIMO	MU-MIMO	
			220.33 Mbps	99%	861990	860694	8X/8X MIMO-B	8X/6X MIMO-B	
.103 SM 5.7 MIMO P11 - [0a-00-3e-a2-c7-09]	002	Low	73.42 Mbps	99%	287410	286805	8X/8X MIMO-B	8X/6X MIMO-B	100%
.98 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a9]	003	Low	73.39 Mbps	99%	287408	286717	8X/8X MIMO-B	8X/6X MIMO-B	100%
.101 SM 5.7 MIMO P11 - [0a-00-3e-a2-c4-a3]	008	Low	73.51 Mbps	100%	287172	287172	8X/8X MIMO-B	8X/6X MIMO-B	100%

Group Size	% Distribution
1 (ungrouped)	0.0
2	0.0
3	100.0
4	0.0
5	0.0
6	0.0
7	0.0

Test to check if SMs 2, 3 and 8 are groupable. Since they are groupable, a group of size 3 is formed 100% of the time with all SMs having the same throughput.