# HIGH SPEED
WIRELESS MOBILITY

Purpose

This document serves as a reference guide for the mobility network designers to plan and design a mobility network that suits their requirement.

Mobility Overview

The mobility feature helps a mobile SU to preserve the established layer-2 connection to the backbone network when it moves away from the current BSU coverage area and enters into another BSU coverage area. For an SU to roam to a better BSU, the SU must scan other channels while maintaining connection with the current BSU. As the scan process affects the performance, scanning is performed only when the connection with current BSU becomes weak and cannot maintain the required data rate. The data rate thresholds are configurable*. The BSU coverage area can be split into three regions as depicted in the following figure.
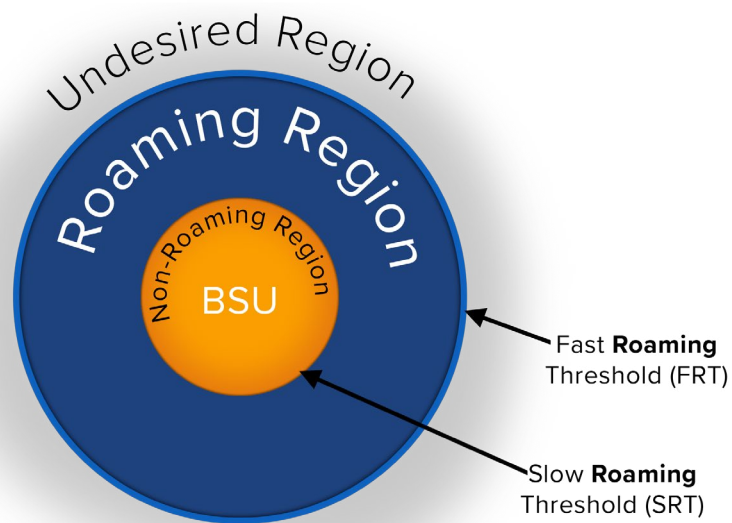
BSU Coverage Area

- Non-Mobility Region: The area covered by the green circle is the Non-mobility Region, where no scanning/mobility occurs. Hence, in this region, desired throughput is achievable.

- Mobility Region: The middle region covered by yellow circle is the mobility Region, where the signal quality deteriorates. Hence, in this region, an SU scans and roams to a better BSU. Due to scanning and mobility, a drop in throughput is expected in this region.

- Undesired Region: The region covered by red is the Undesired Region. When an SU enters this region, the wireless link may drop. Therefore, while designing the mobility network, the designer should ensure that an SU does not enter this region.

Mobility Parameters

The data rate thresholds configurable* on an SU (SU > ADVANCED CONFIGURATION > Wireless > Interface 1 > mobility) are,

- Rx Slow/Fast mobility Rate Thresholds
- Tx Slow/Fast mobility Rate Thresholds

In addition to the mobility thresholds, the configurable* parameters (BSU > ADVANCED CONFIGURATION > Wireless > Interface 1 > mobility) on a BSU that influence the mobility timings and throughput are,

- **Announce Period:** Shorter announce period results in faster mobility and impacts throughput.
- **Max. Packets Per Burst:** Less number of packets per burst results in faster mobility and impacts throughput.
- **Mobility Preferred Channels:** A list of channels where the adjacent BSUs operate

Mobility Network - Installation Metrics

The mobility Calculator serves as a means to optimize the mobility network designs. The Network Designers can input details such as Speed, Tx Rate, Antenna Gain and mobility Thresholds to the calculator and derive at,

- Overlap Coverage
- Distance between adjacent BSUs
- Average Throughput

To open the calculator, click mobility Calculator.

Maximum Overlap Coverage Design

Figure 2 depict the design of a Maximum Overlap Network. This design will have maximum overlap region (less distance between adjacent BSUs) and less time is spent for scanning and mobility when compared to other designs. This design is recommended if the primary goal is performance or the application cannot tolerate drop in throughput. In this design, Fast mobility Threshold is not relevant.
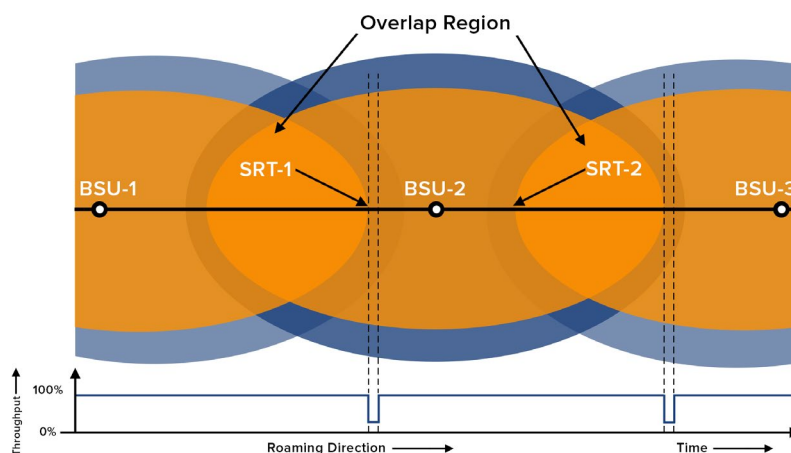

Figure 2 - Maximum Overlap Network

Minimum Overlap Coverage Design

Figure 3 depicts the design of a Minimum Overlap Network. This will have less overlap region (more distance between adjacent BSUs) but more time is spent for scanning and mobility compared to other designs. This design is recommended if the primary goal is to install less number of base stations and the application can tolerate a drop in throughput for longer duration.
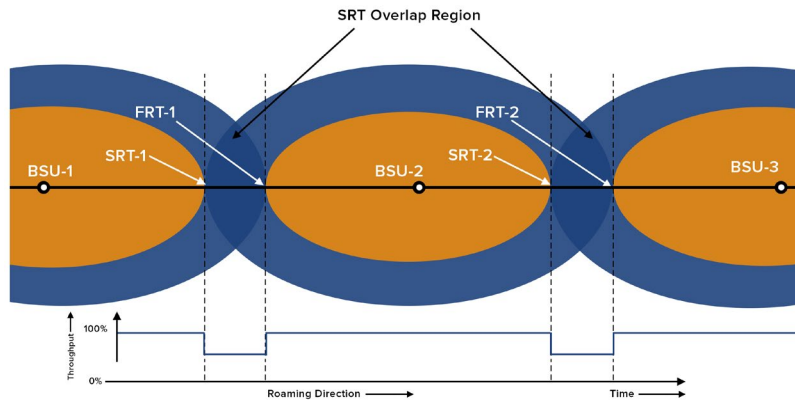

Figure 3 - Minimum Overlap Network

Typical Overlap Coverage Design

Figure 4 depicts the Typical Network Design that is a trade off between other two designs in terms of performance and number of base stations.
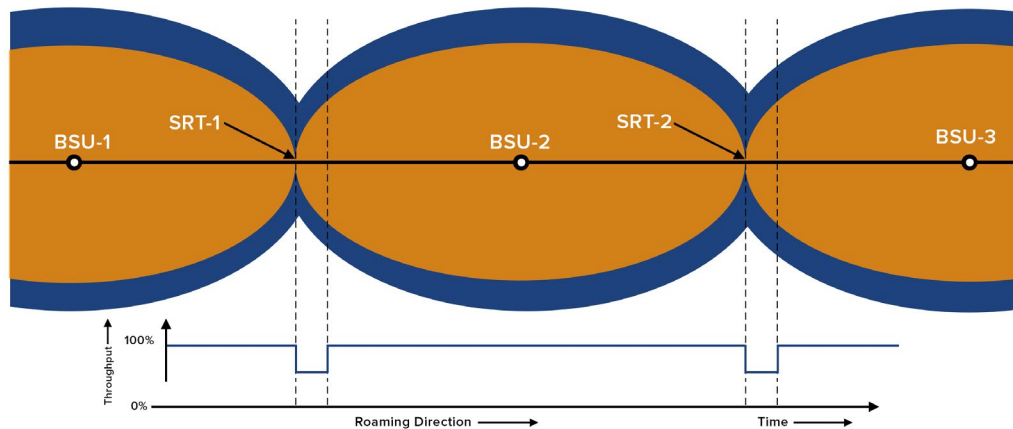

Figure 4 - Typical Network Design

Recommended Configuration

- Disable DDRS and configure appropriate fixed data rate.

- Based on user's throughput needs, determine appropriate data rates for Rx/Tx Slow mobility Threshold and Fast mobility Threshold.

- Example: If the acceptable data rates for the desired performance are between 26 Mbps to 52Mbps rates, Slow mobility Threshold shall be 52 Mbps and Fast mobility Threshold shall be 26 Mbps.

- Use only two channels for mobility network and these two channels shall be configured in mobility Channel List of BSU.

- Avoid DFS frequencies.

- Disable ACS feature on the BSU.

- Use a single stream if it meets the throughput requirement.

- Modify the Announcement Period and Number of Packets per Burst to suit the application requirements.

- Design a mobility network such that at any point of time an SU does not trigger fast mobility.

- Design the network up to 50% of the full throughput.

Limitations

- While mobility, the traffic from the current BSU to SU (downlink) is dropped. Whereas, the traffic from an SU to a BSU (uplink) is buffered and delivered after transition.

- During transition, a drop in throughput may be noticed.

* For configuration, refer to the latest Tsunami® Software Management Guide available at http://support.proxim.com