



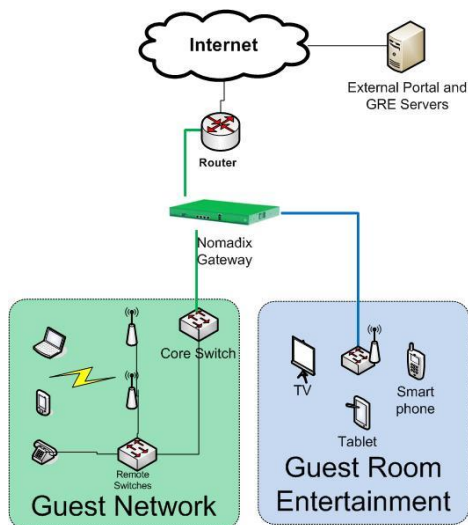
Distribution of Unused Bandwidth (DUB) Deployment Options

The Distribution of Unused Bandwidth (DUB) feature gives property owners and MSP’s the opportunity to remove artificial bandwidth caps normally imposed on guests, and instead give their guests access to all the bandwidth that is currently available at the property. Not only has this been proven to create an enhanced user experience and increased satisfaction scores, it also gives the property owner the ability to maximize the utilization of their valuable bandwidth circuit.

Special attention needs to be given to networks using DUB with GRE. This paper will cover the options available to ensure GRE is minimally impacted.

Option 1: Guest Room Entertainment (GRE) and guest network behind the Nomadix with Class Based Queueing (CBQ)

GRE is composed of multiple devices including Set Top Boxes (STB) and the possibility of Chromecast, Apple TV, or other devices passing traffic. These devices all need access to the internet and the ability to have bandwidth available to them.



Simplified Network Diagram



The network outlined above represents the most effective solution for managing the bandwidth for both the GRE and the guest network. By using Class Based Queuing, properties are able to prioritize one “class” over another, ensuring that each class has access to a configured minimum, while at the same time allowing the lower classes to use any bandwidth not in use by the higher classes.

The Purpose of this design is to manage the bandwidth according to priority and the need of each network. As it relates to the interplay between GRE and the guest network, GRE would be prioritized over the guest network, and be configured with a minimum throughput to ensure the guest network is never able to “starve” GRE. This is no different than the priority applied to conference rooms in the GPNS conference room specification.

When setting up a network where all the guest devices and GRE are configured behind the Nomadix Gateway there are only a few settings that need to be assigned.

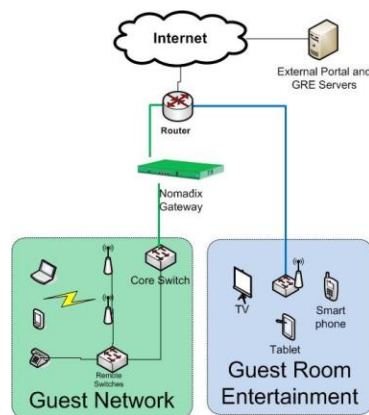
1. Establish the minimum bandwidth throughput desired for GRE via monitoring, or establishing universal, per STB minimums.
2. Enable Class Based Queuing on the Nomadix gateway
3. Set minimum bandwidth requirements for GRE and for the guest network
4. Enable Distribution of Unused Bandwidth.
5. Configure GRE network:
 - a. Scenario 1 - all GRE devices all on the same VLAN
Set VLAN to “No Charge” and assign CBQ priority to this VLAN
 - b. Scenario 2 - Each GRE device on individual VLAN’s.
When the GRE devices are on the same VLAN as guest devices then each GRE device should be added into the Nomadix as a device with the proper bandwidth weight settings and CBQ priority.
In some cases when these devices are placed behind the Nomadix gateway there is a need for increased device counts on the Nomadix gateway, but this should not be a problem when determining the best way forward for guests and their bandwidth. This is just adding an additional device or two per room for device calculation. (contact Nomadix Sales if a license change is required)

This option prioritizes the traffic while also providing the ability to access the full network circuit when there are only a small number of users utilizing that circuit. This moves the Nomadix device closer to a true edge device with the ability to manage the bandwidth for both GRE and the guest network at the site.



Guest Room Entertainment (GRE) network parallel to Guest network behind the Nomadix

In this design the Nomadix gateway only manages the guest specific devices and does not manage the GRE devices or their bandwidth. Similar to Option 1, a determination will need to be made as to the minimum amount of bandwidth that will be needed for GRE. However, unlike Option 1 above, this will be a fixed minimum throughput, meaning the bandwidth reserved for GRE will not be dynamically available to the guest network as it is with CBQ.



Simplified Network Diagram

1. Establish the minimum bandwidth throughput desired for GRE via monitoring, or establish universal, per STB minimums.
2. Set bandwidth cap on the Nomadix WAN interface, ensuring GRE has required minimum (ISP circuit minus GRE minimum throughput. See example below).
3. Enable Distribution of Unused Bandwidth.

Example: Assume the property has 100Mbps circuit, and the GRE required a minimum 20Mbps in this case the WAN port on the Nomadix gateway should be set to 80mb.
 $(100\text{Mbps} - 20\text{Mbps} = 80\text{Mbps})$