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**Virtual Router – Modeling**

<https://virtualrouter.codeplex.com/>

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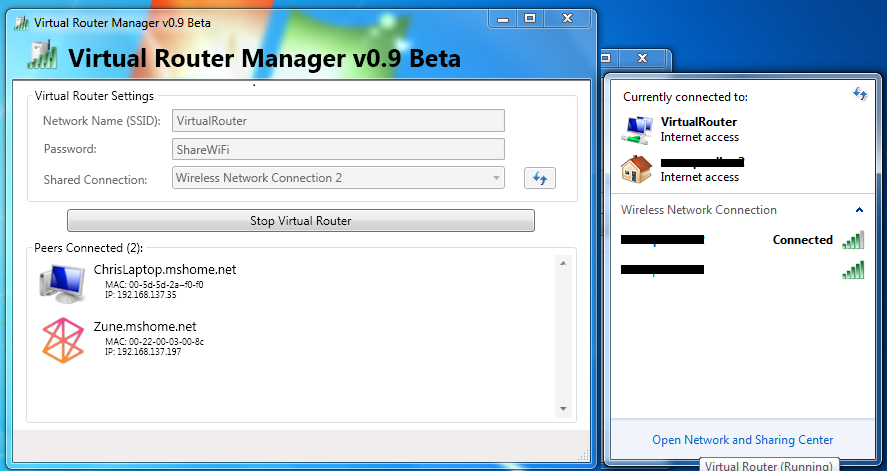
**What is Virtual Router?**

* Virtual Router is a free, open source software based router for PCs running Windows 8, Windows 7 or Windows Server 2008 R2.
* Using Virtual Router, users can wirelessly share any internet connection (Wifi, LAN, Cable Modem, Dial-up, Cellular, etc.) with any Wifi device (Laptop, Smart Phone, iPod Touch, iPhone, Android Phone, Zune, Netbook, wireless printer, etc.)
* These devices connect to Virtual Router just like any other access point, and the connection is completely secured using WPA2 (the most secure wireless encryption.)

**How it works ?**

* The Wireless Network create/shared with Virtual Router uses WPA2 Encryption, and there is no way to turn off that encryption. This is actually a feature of the Wireless Hosted Network API's built into Windows 7 and 2008 R2 to ensure the best security possible.
* You can give your "virtual" wireless network any name you want, and also set the password to anything.

**Demo:**

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**Modeling**

In order to understand the modeling part we have asked some questions:

1. What classes do we have?
2. What is the responsibility part of every class?
3. Which class is the “manager”?
4. What are the relations between the classes?

**We will answer the questions one by one.**

1. **Let’s present the different solutions:**

ICS

WLAN

Client

Host

Host Console

Installer

Service

1. **Classes responsibility**

Virtual router ICS

The ICS solution deal with the connection status.

Also managing the device connections

Virtual router WLAN

The WLAN solution is basically includes all network issue and protocols such as Mac Address , connection mode , security ….

Virtual router client

Since the solution works as Server Client platform we need usually to install client side.

Here we use the default way of client side to create connection .

The Client solution deal with the connection to the server.

Virtual router Host

This is the solution that turn the host wifi card to work as router.

Also take care of sharing issues , such as witch nic will do the Routing .

Virtual router Host Console

This is the GUI part.

Virtual router Installer

This solution contains the msi files , dlls that go onto registry ….

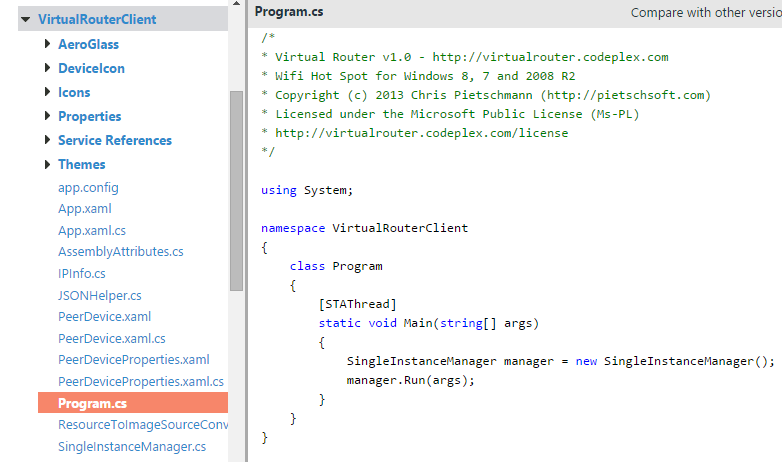
Virtual router service

This solution gives the ability to work at background service .

1. **The “manager” class is client**

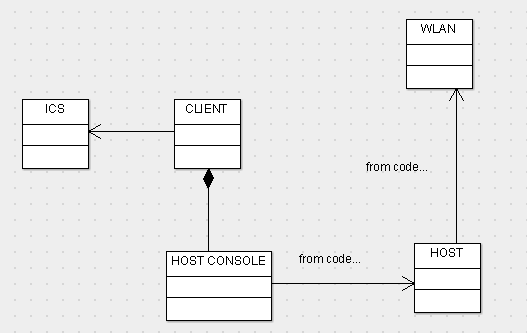
(which means that when the program starts running, the first instance is client type).

We can see it in the client main program:



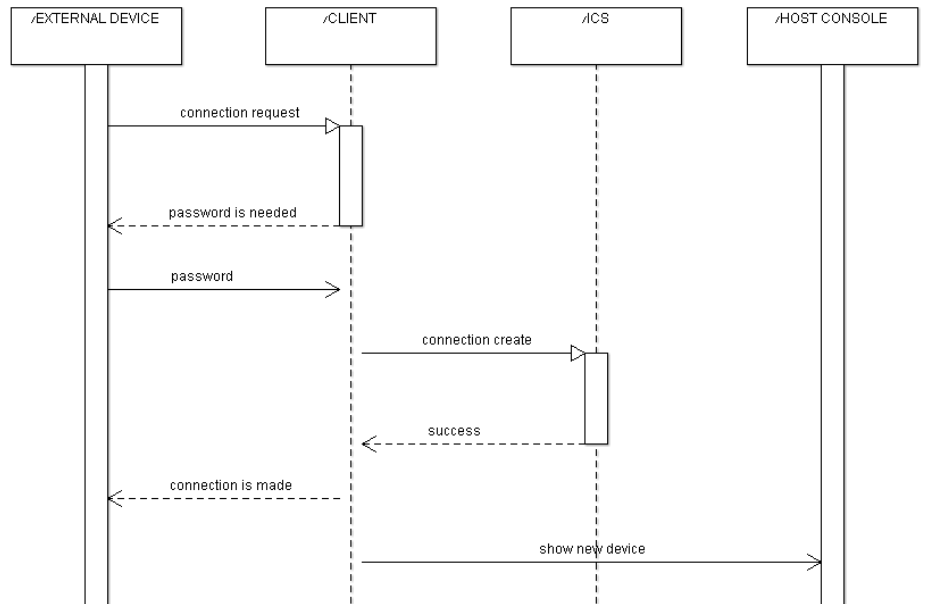
1. **Relations between the classes**

UML Diagram



* Client and Host Console have an aggregation relation, because when the application is turned on, they both are created at the same time.
* Host Console and Host have an association relation, because the Host Console solution uses the Host solution functions.
* Host and Wlan have an association relation, because the Host solution uses the Wlan solution to create the router.
* Client and ICS have an association relation, because the Client solution uses the ICS solution to create new connections.

Sequence Diagram for connection scenario



* When an external device is trying to connect the VR, the CLIENT manager asks for password.
* When the correct password is entered, CLIENT manager uses the ICS class to create the connection.
* Then the user can see that the connection was made and GUI class present the new device.