

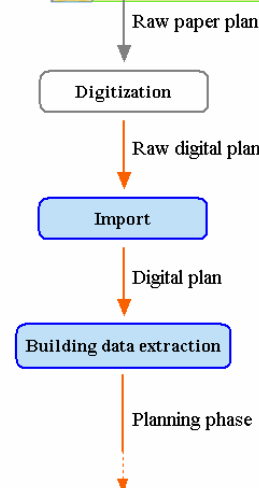
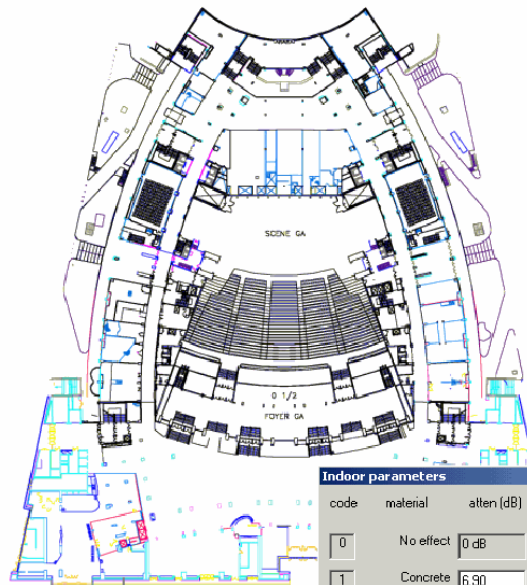
INDOOR NETWORK DESIGN

ICS Telecom incorporates Indoor network deployment functions for WiFi applications. It integrates new design and coverage analysis functions in order to perform any indoor network design, including W-LAN (WiFi, 802.11-b).

The building data can be manually extracted using ICS Telecom from a **basic digitized floor plan**. Based upon the material crossed (walls in concrete, separators in brick on the same floor...) standard or manual attenuations can be applied, as well as an attenuation when a ceiling/floor is crossed. From this model, Indoor coverage analysis can be performed taking into account a network located on the same floor, or on a different one: find the best location for the stations, use the frequencies available the best way as possible (detailed **frequency assignment** in order to **minimize interference areas**).

Extract building data from a basic floor plan

A digitized floor plan can be easily integrated into ICS Telecom. The shape of the floor can be manually extracted from this raw data in vector format, taking into account the material used for the walls, the cubicles... For each one of the different classes (up to 10, standard IMT-2000 specification or user defined), a standard (ITU R-1225) or a user defined attenuation can be applied.



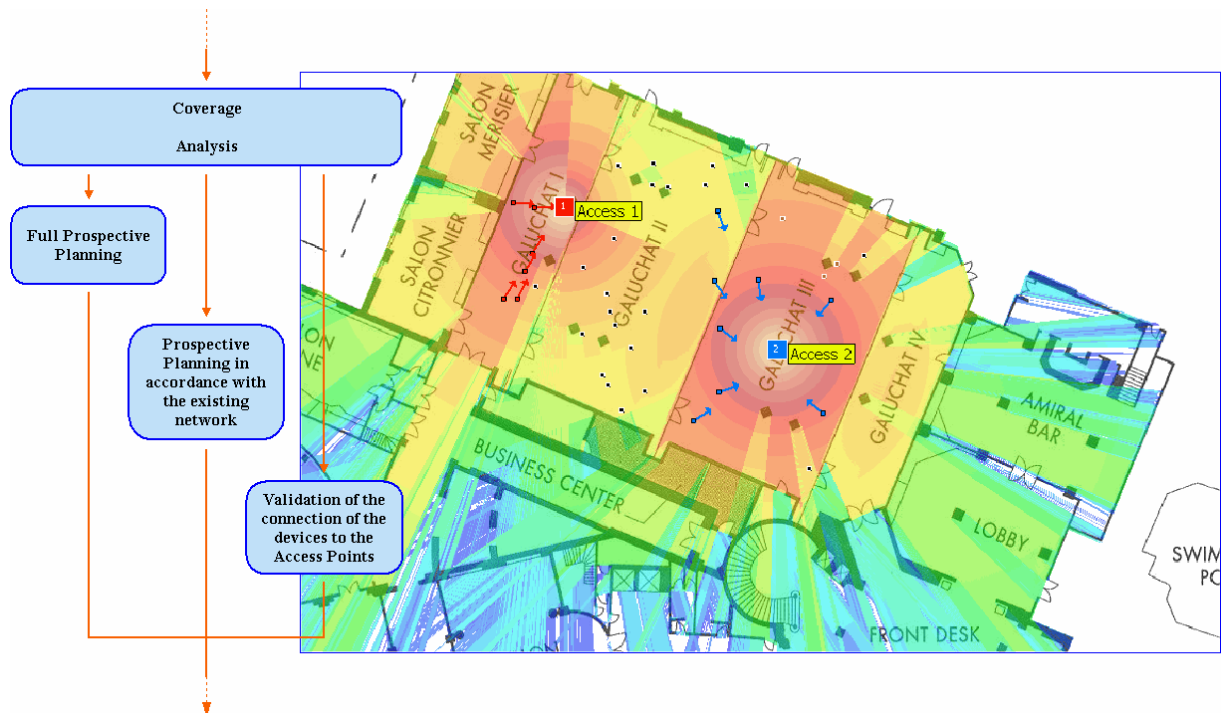
code	material	atten (dB)	w
0	No effect	0 dB	
1	Concrete	6.90	Wall
2	Brick	6.90	Wall
3	Plaster	3.40	light wall
4	Glass	3.40	light wall
5	Metal	3.40	light wall
6	Wood	3.40	light wall
7	Furniture wood	0.00	furniture
8	Furniture metal	0.00	furniture
9	Other	0.00	other

ITU R-1225 model* user attenuations: atten*factor
 IMT 2000 Thickness factor: 1.0000
 Floor factor (dB): 18.30 Reference floor: 0

Buttons: Close, Load, Save

Coverage analysis

Once the technical parameters of one or several Access Points has been defined, the user can calculate the coverage area, based upon a proper propagation model. The coverage areas can easily be analyzed : covered/non covered, shadowed area, composite coverage, best server coverage ...



Connection of Wireless devices to Access Points

Three deployment steps can be analyzed :

- Full Automatic Network deployment

ICS Telecom performs automatically a coverage analysis from the handset database. The best locations are found, placed in dedicated locations defined by the user or not.

- Completion of an existing network

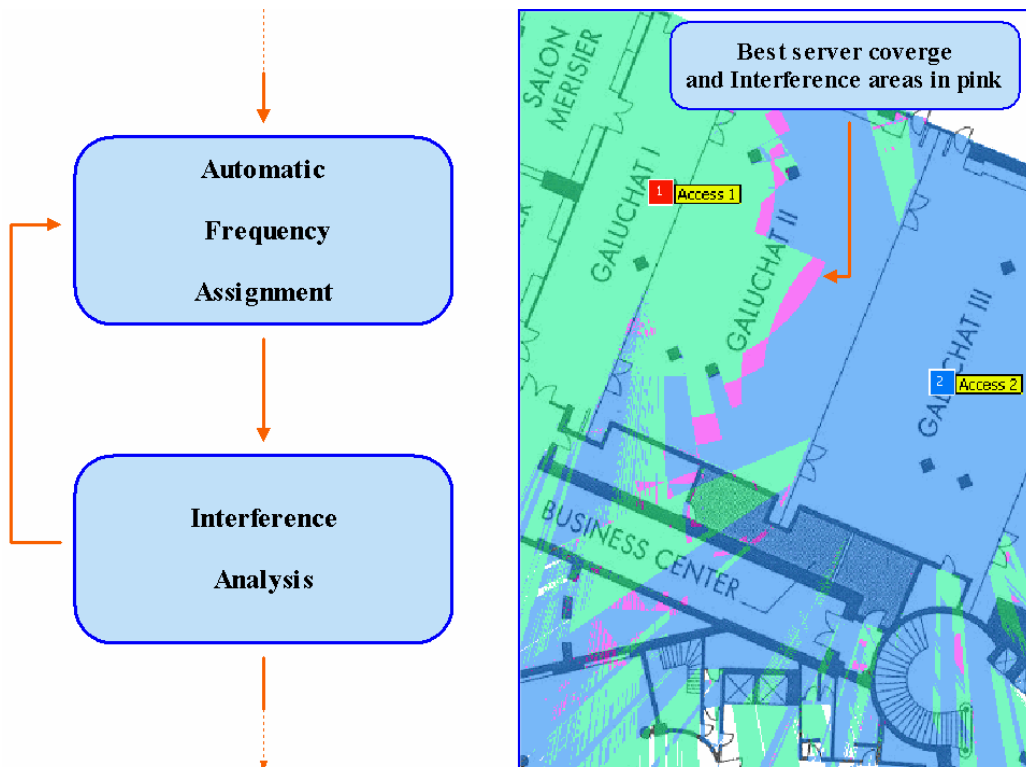
Part of the network already exists, but it needs to be completed in order to extend the coverage area. ICS Telecom can setup automatically the extension in accordance with the already existing access points : new locations (placed if wanted in preferred areas like walls, hidden places, closets...), interference minimized for the entire network...

- Connection validation

ICS Telecom allow you to validate the connection of handsets to the already existing network, based upon several rules (limited or not to the number of lines available, bit rate...).

Frequency assignment

Once the locations of the access points are defined, the tool can help you to optimize the usage of the frequencies available, while attaining the maximum area coverage by the resulting station configuration. According to the frequency plan and the spectrum occupancy, ICS Telecom assigns interference free frequency to the access point. The function optimizes the re-use of frequencies as much as possible.



Interference analysis

Once the frequency plan has been validated, remaining interference areas can be located, analyzed, and removed (or minimized to areas of non-interest) if possible by adjusting the network configuration.