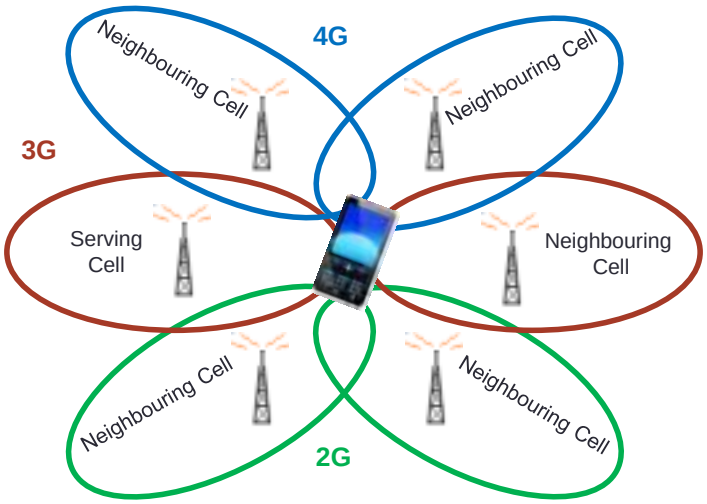
Porosity

Introduction

The ability of a cellular radio device to reselect to an optimal cell under mobile conditions has an understated impact on the user experience when it comes to utilising mobile services and achieving long battery life.



The device in addition to being able to make optimal reselections within a RAT such as UMTS, also needs to avoid making unnecessary reselections to another RAT, only to return from the original RAT shortly afterwards.

The efficiency with which a device remains on the best RAT over the course of idle mode reselections in various mobile environments can be thought of as *Idle Mode Porosity*.

End User Experience

Poor device Porosity will lead a device to make too many cell resections, resulting in higher than required power use, or too few cell resections resulting in loss of service.

It could also lead a device to make a reselection to a cell on a RAT for which the radio conditions – and the connectivity – will be poor.

Proposed Testing Solution

IOTAS have developed a solution based around a commercially available automated field test and measurement platform.

The testing compares the performance of a Device Under Test (DUT) against that of a competitor or reference device

- Logged details for each cell reselection

  Time of cell reselection; Cell ID and RAT of previous serving cell; Cell ID and RAT of new serving cell; GPS co-ordinates.

- Tested environments

  Urban low mobility; Sub-urban medium mobility; Rural high mobility

Test Metrics

For each scenario of Porosity testing measurement data is gathered and analyzed to obtain the following data sets:

- Idle Mode Porosity Statistics
  - Time spent in service on each RAT and breakdown of all cell reselection types for all tested devices
- Cell Reselection Divergences
  - Instances of one device type reselecting to a destination cell different from that reselected to by another device type from a common originating cell
- Cell Reselection Matches
  - Time lag between device types for reselections between common originating and destination cells
- Ping-Pong Cell Reselections
  - A ping-pong cell reselection is defined as an individual reselection during which a device is moving back and forth between two cells

Test Reporting

A summary for each combination of scenario will include the following:

- Idle Mode Porosity Statistics table
- Map plots for Cell Reselection Divergences between DUT and reference devices
- Summary of observations

Tables accompanying each summary of Porosity used to generate statistic tables and histograms

An overall assessment of measurement data gathered upon completion of all testing

