# Networking the phtsical world notes

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# Chapter 2

# Network deployment

## 2.1 Overview

Coverage: Coverage pertains to the application-specific quality of information obtained from the environment by the neworked sensor devices.

Connectivity: Connectivity pertains to the network topology over which information routing can take place.

### 2.1.1 basic consideration

#### Structured versus randomized deployment

The randomized deployment approach is appealing for futuristic applications of a large scale.

However, many small-medium-scale WSNs are likely to be deployed in a structured manner via careful hand placement of network nodes.

Randomized sensor deployment can be even more challenging since there is no way to configure a priori the exact location of each device. Additional post-deployment self-configuration mechanisms are required.

Random Graph Theory in Section 2.4.

Power-based topolgy control techniques in Section 2.5

#### Over-deployment versus incremental deployment

Robustness vs arising needs. Refer to chapter 7.

#### Network topology

Single-hop star Multi-hop mesh and grid Two-tier hierarchical cluster [width=12cm][topology.jpg]

Figure 2.1: topology

#### Homogeneous versus heterogeneous deployment

Are all sensor nodes of the same type? If not, there may be multiple gateway/sink devices.

#### Coverage metrics

What is the kind of sensor information desired from the environment and how is the coverage measured?

## 2.2 Connectivity in geometric random graphs

A random graph model is essentially a systematic description of some random experiment that can be used to generate graph instances.

The Bernoulli random graphs G(n,p) are formed by taking n vertices and placing random edges between each pair of vertices independently with probability p.