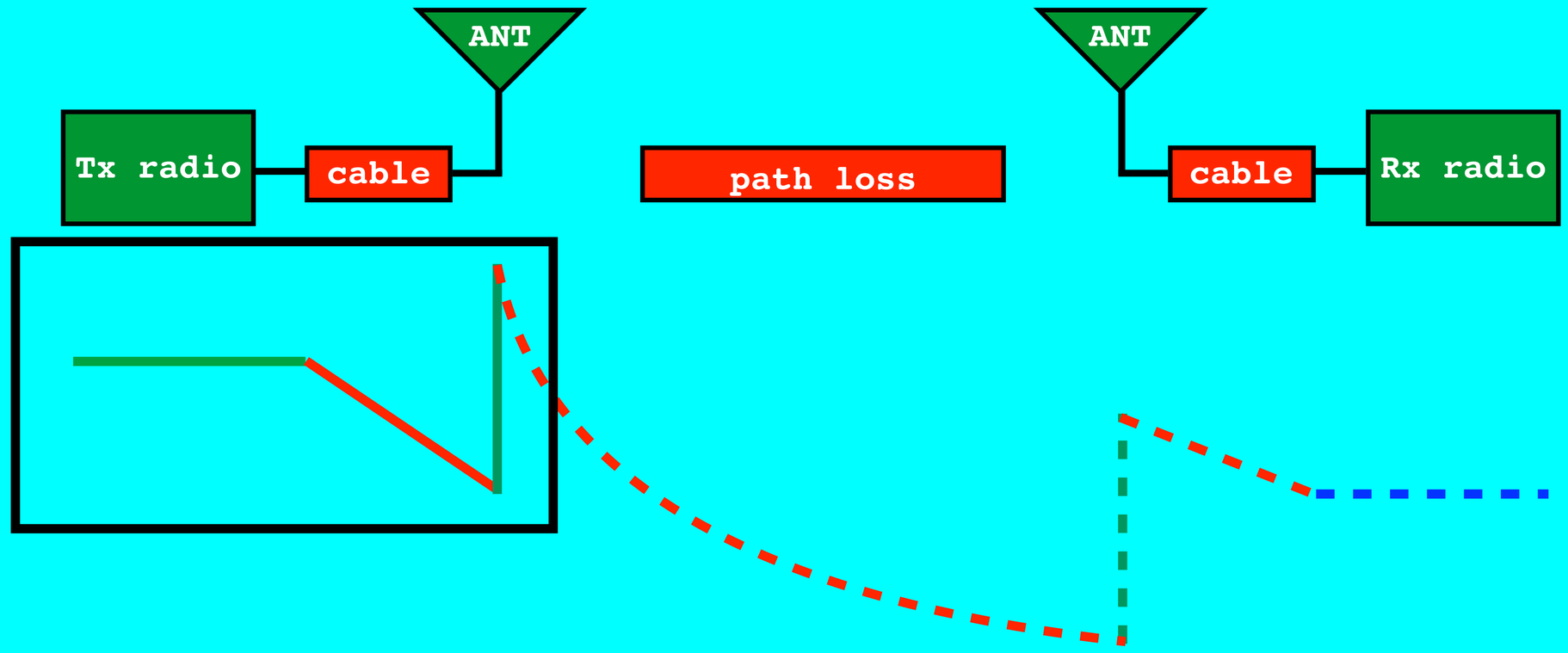
LORA / LORAWAN TUTORIAL 9

EIRP & ERP

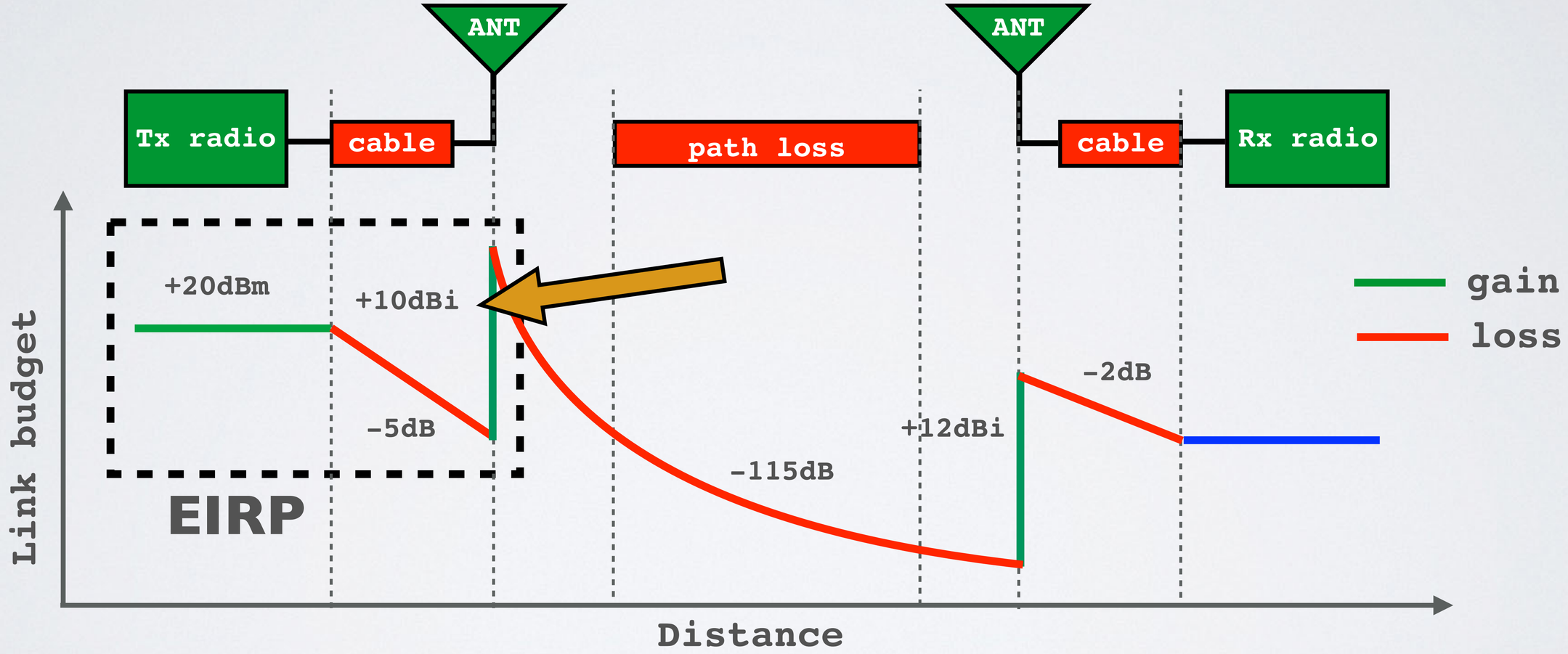


INTRO

- In this tutorial I will explain what EIRP and ERP are.

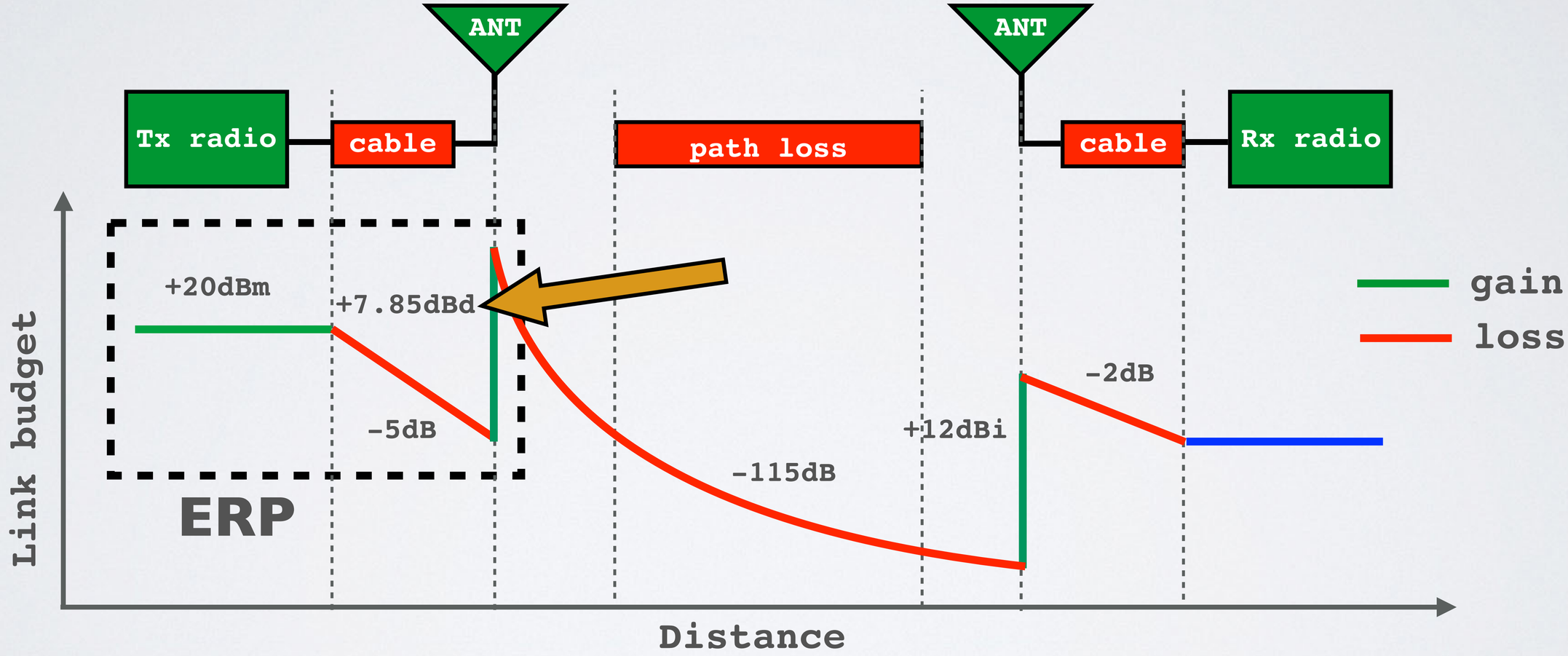
EIRP

- The Effective Isotropic Radiated Power (EIRP) is the total power radiated by a hypothetical isotropic antenna in a single direction.



ERP

- The Effective Radiated Power (ERP) is the total power radiated by an actual antenna relative to a half-wave dipole rather than a theoretical isotropic antenna.



EIRP VS EIRP

- **EIRP= Tx power (dBm) + antenna gain (dBi) - cable loss (dBm)**

- For example:
  EIRP = 20 + 10 - 5 = 25 dBm

- **ERP= Tx power (dBm) + antenna gain (dBd) - cable loss (dBm)**

- For example:
  ERP = 20 + 7.85 - 5 = 22.85 dBm

- Relationship EIRP and ERP: **EIRP (dBm) = ERP (dBm) + 2.15**

PURPOSE EIRP AND EIRP

- What is the purpose of ERP and EIRP?
  - RF transmitting systems must adhere to certain rules set by the regulatory bodies such as FCC or ETSI.
  - One of these rules: radio devices must not exceed certain ERP or EIRP values set by these regulatory bodies.