

Research on Securing the Internet of Things (IoT)

Konrad-Felix Krentz

A large, horizontal rectangular box with a gradient from dark red on the left to yellow on the right, serving as a background for the title. The word 'Introduction' is centered within this box in a white, sans-serif font.

Introduction

The Internet of Things



Smart Parking



Precision Agriculture



Predictive Maintenance

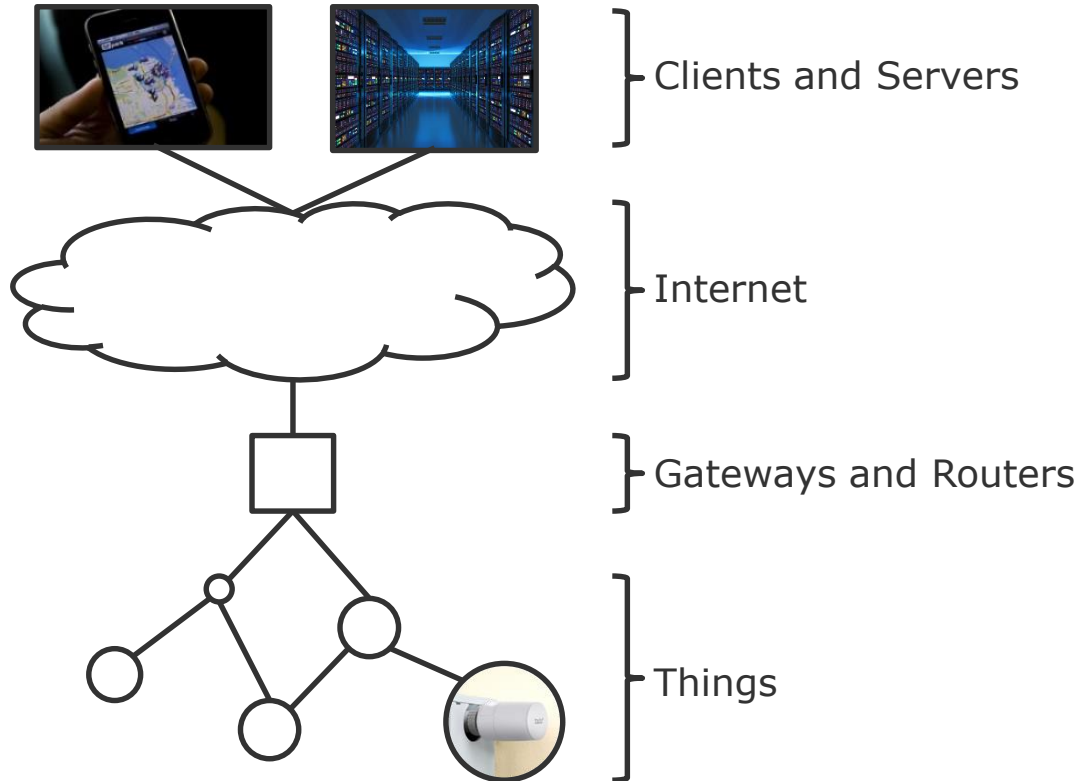


Smart Thermostats



Smart Dumpsters

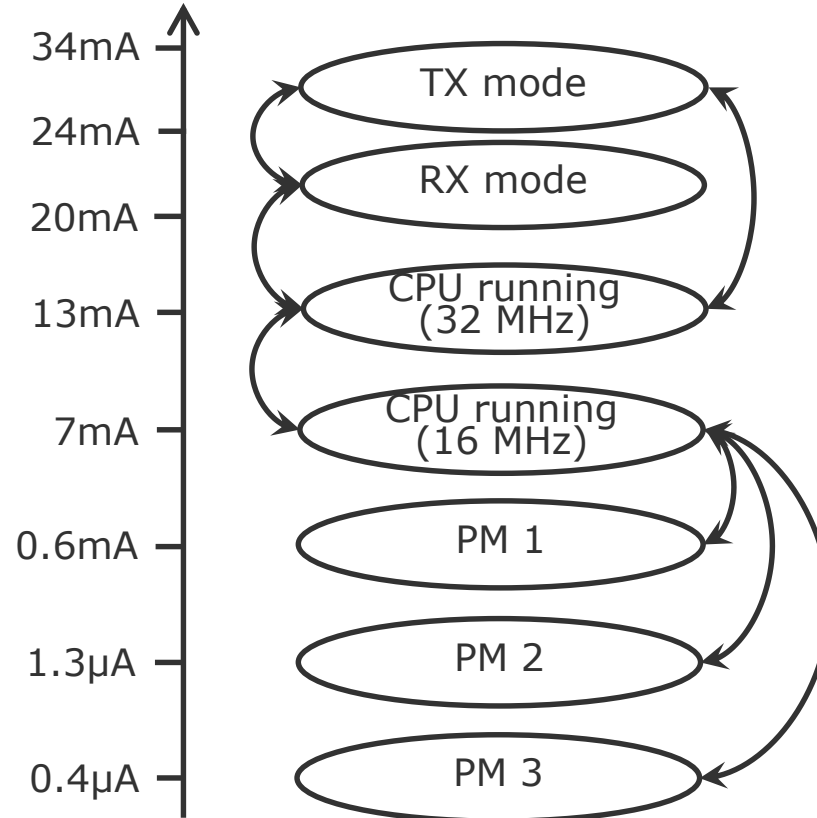
Bird's Eye View on the Internet of Things



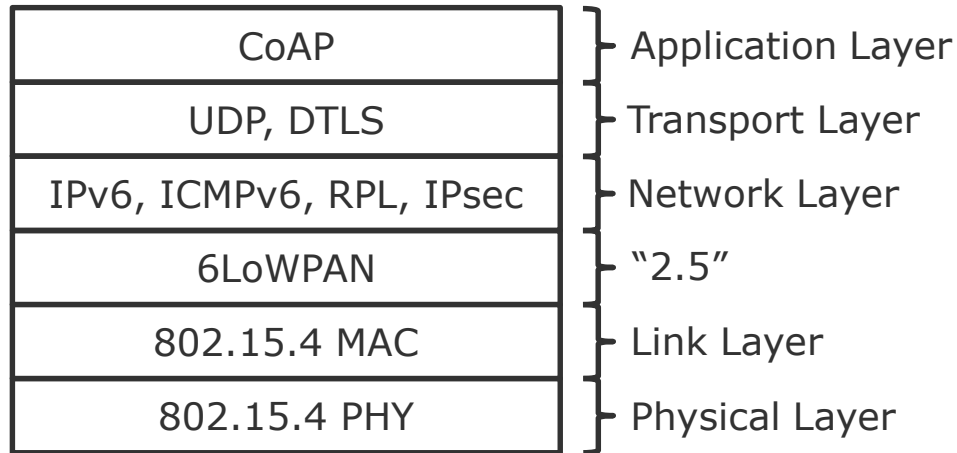
Energy Efficiency is Key



OpenMote



The 6LoWPAN Protocol Stack



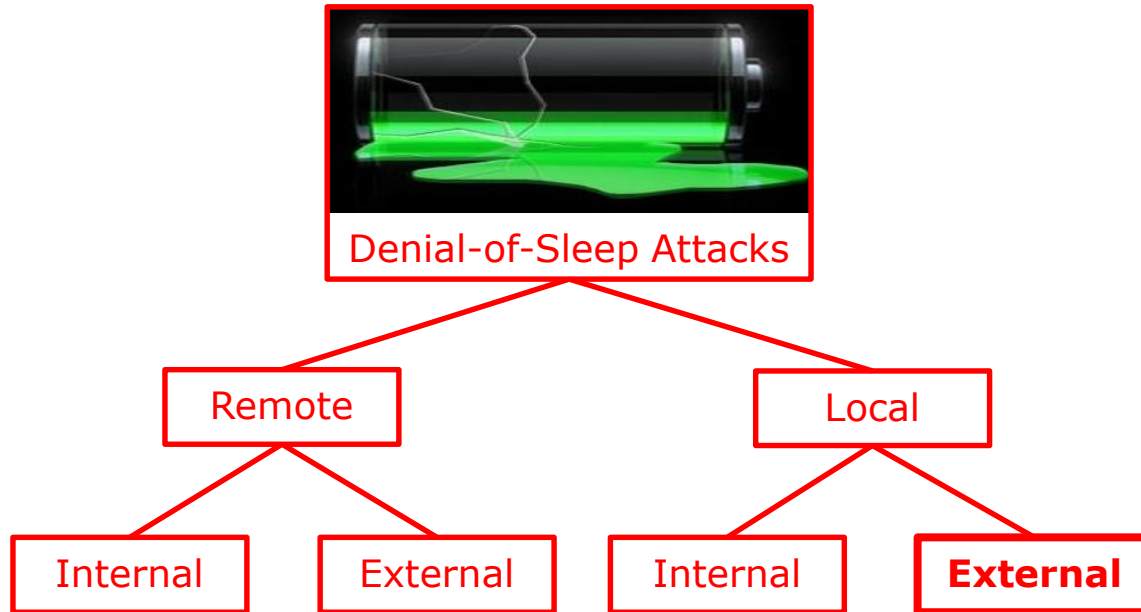
Denial-of-Sleep Attacks – An Open Issue



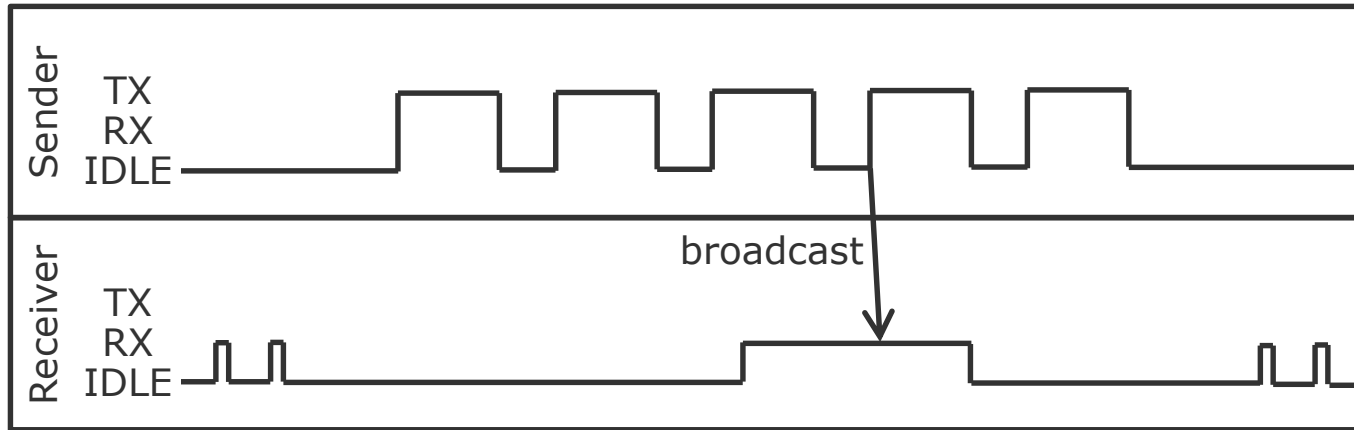
The title 'Denial-of-Sleep Attacks' is centered within a large, horizontal rectangular box. The box has a dark red background and is framed by a thick yellow border. The text is white and uses a clean, sans-serif font.

Denial-of-Sleep Attacks

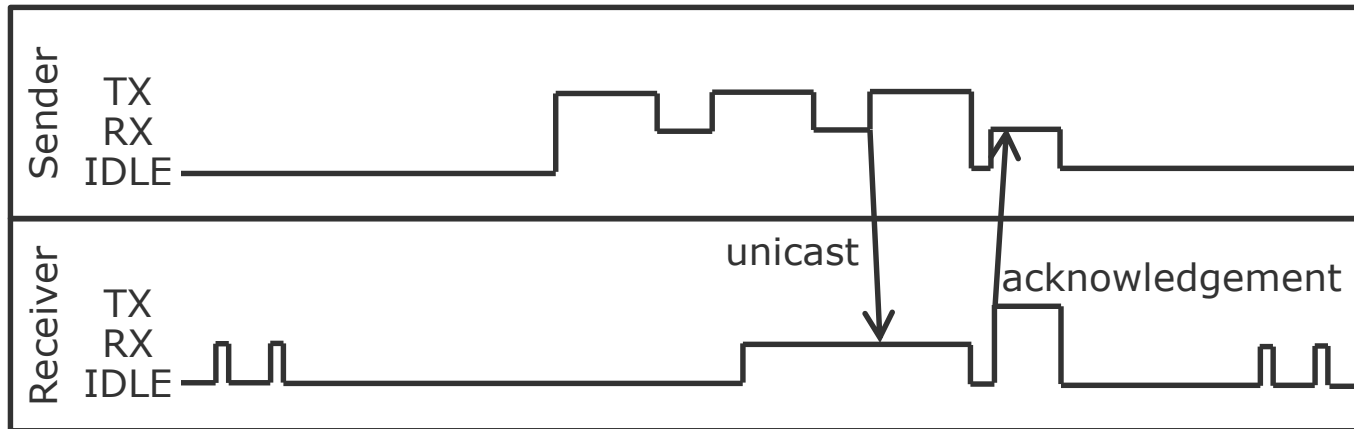
Categorizing Denial-of-Sleep Attacks



Excursus: Broadcast Transmissions in ContikiMAC



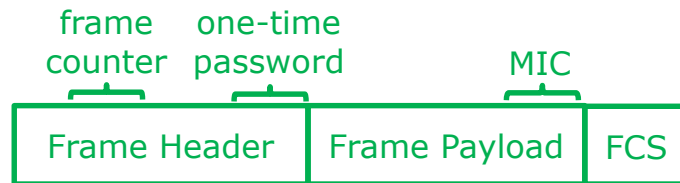
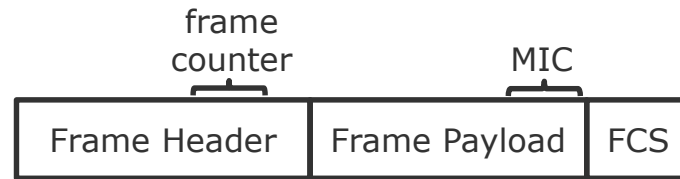
Excursus: Unicast Transmissions in ContikiMAC



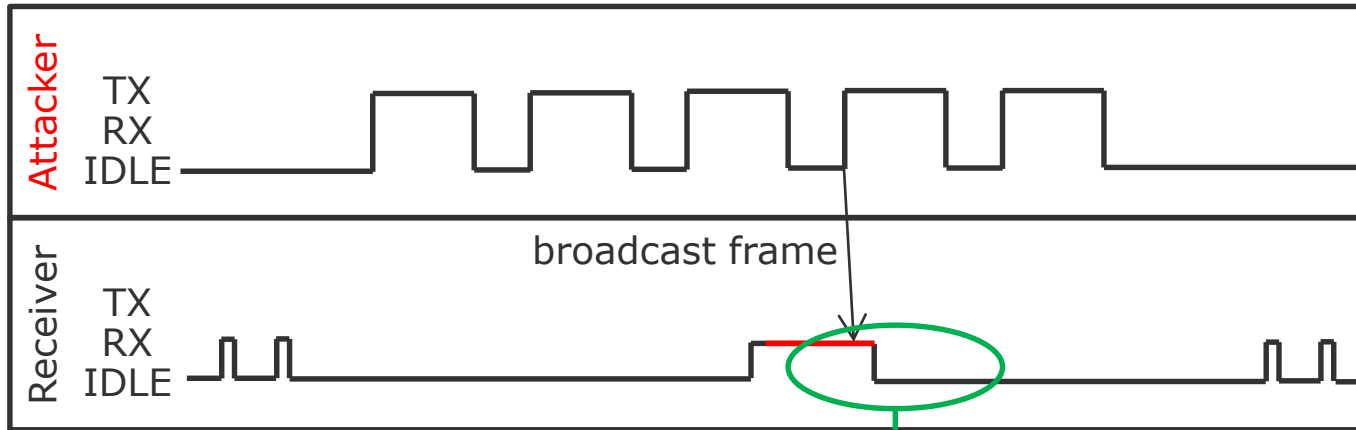
The title 'Denial-of-Sleep Defenses' is centered within a large, horizontal rectangular box. The box has a dark orange background and is framed by a thick, dark red border on the left and bottom sides, and a yellow border on the top and right sides.

Denial-of-Sleep Defenses

Defense 1: Practical On-The-fly Rejection (POTR)

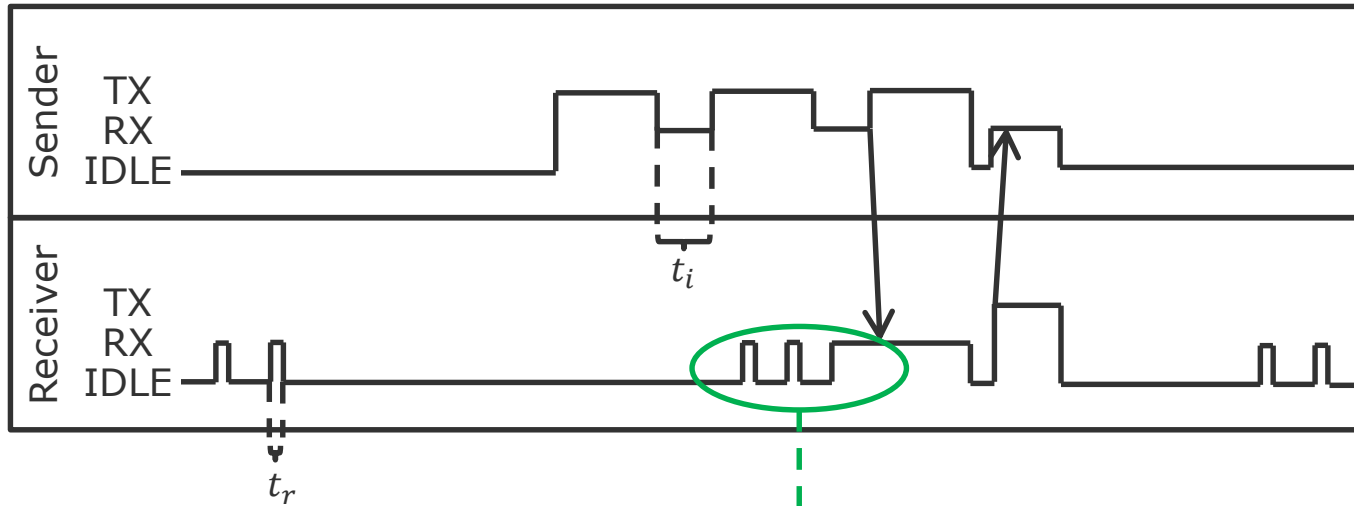


POTR in Action



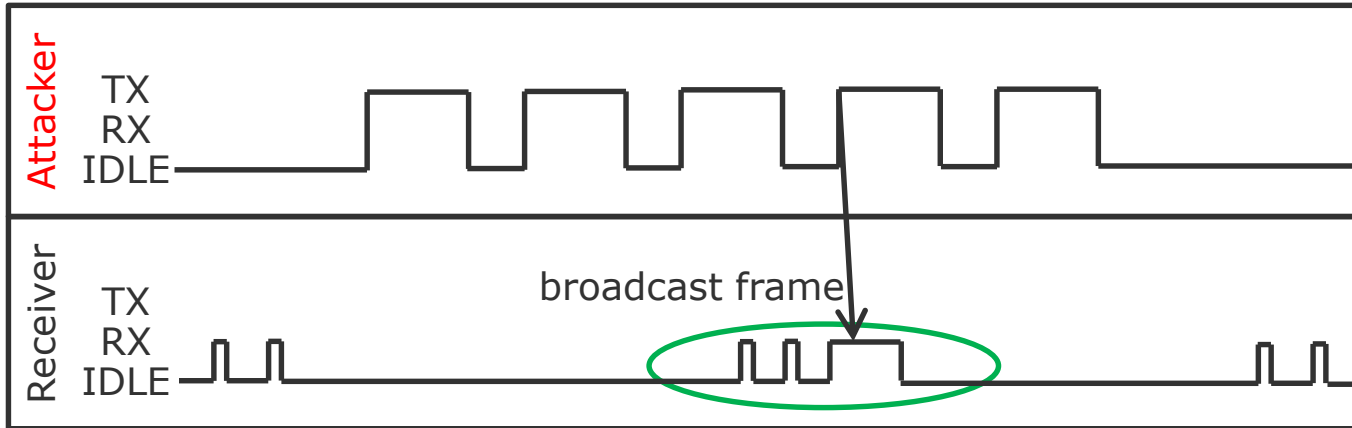
POTR rejects injected and replayed 802.15.4 frames early during receipt

Defense 2: The Dozing Optimization

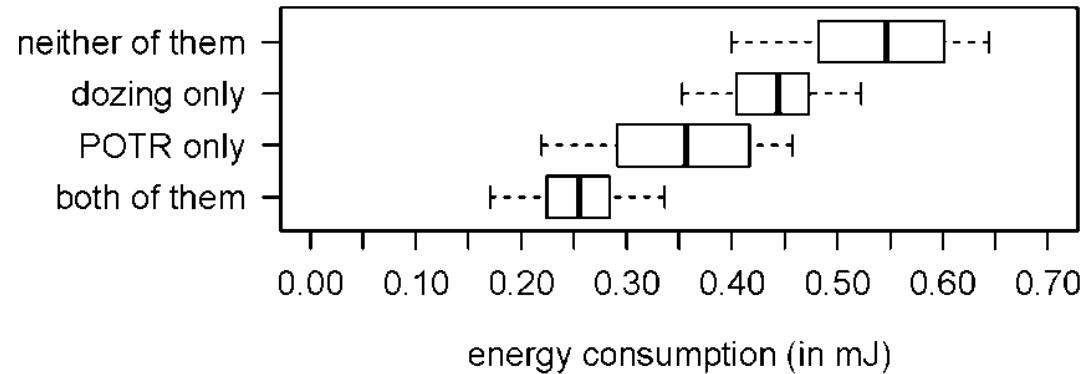


the dozing optimization sleeps after negative CCAs for $t_i - t_r$

Defense 1 und 2 Combined



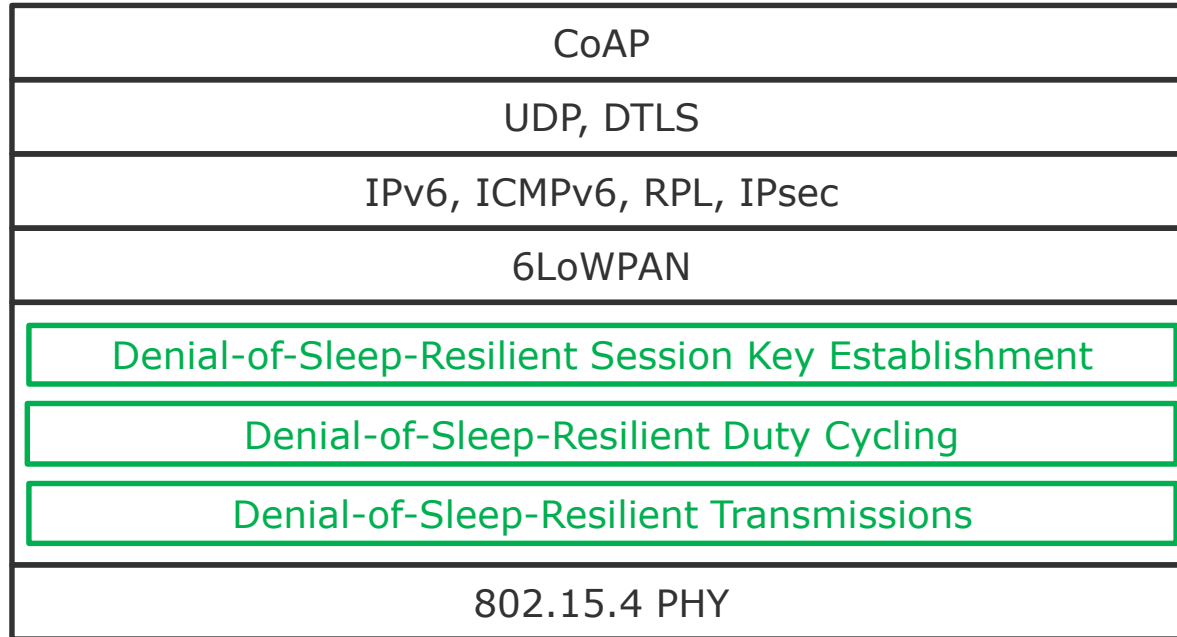
Energy Consumption under Broadcast Attacks



A large, horizontal decorative bar spans the width of the slide. It features a central orange rectangle with a yellow border on top and a dark red border on the bottom. The word 'Outlook' is centered within the orange area in white text.

Outlook

Our Denial-of-Sleep-Resilient Link Layer



Questions

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