About this Intro

Owned by David Cherney DISH •••
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Advice

Keep the MSS list of acronyms open while you read.

The hardest part of this intro is dealing with the acronyms. If you google acronyms you will be distracted and spend time on material that is off topic or lacks context. The purpose of this intro is to save your from that time wasting experience. If an acronym needs to be added to the list, either add it yourself or leave an inline comment via text bubble in the upper right of the page; help to make this page progressively more useful.

Purpose

As MSS works toward the long term goals of DISH Wireless, it needs to keep in mind the reasons that 5G systems are specified as they are; to enable telecommunications in the cloud.

The author

- hopes to stimulate conversations within MSS about 5G
- hopes to stimulate ideas about research projects that can lead DISH wireless into a leadership role in a new era of connectivity technology
- does not claim to be an expert, will make many mistakes, and hopes for feedback on
  - errors
  - where presentation can be clarified
  - where MSS can benefit from deeper understanding
  - where the presentation does not adhere to the following design choices

Design Choices

Material from early sections in the introduction

- glosses over details presented later
  - readers are intended to read sections as ordered
- covers topics more likely to be familiar to a reader that is unfamiliar with the inner workings mobile telecommunications. e.g. ideas about user plane sessions are presented before ideas about control plane mechanisms.

Links are uncommon, reducing the cognitive load on the reader that comes with deciding if links should be followed at this time. Citations are listed on this page.

Page length is kept short to emphasize navigation by topic over searchability in page.

Short sentences are favored over careful qualifications of statements.

Images are inserted approximately once per screen.

Citations

Books with reviews (in recommended reading order):

1. *5G Wireless: A Comprehensive Introduction*, by Stallings
    a. This book is good for beginners because it doesn't use technical terms or acronyms without introducing them first, and it does not assume any knowledge of 4G or 5G. However, many of the chapters are long relative to the level of motivation provided. e.g. reading at length about software defined networking before seeing how it is used in 5G vs previous generations lacks motivation. On the other hand, Stallings's writing is careful and clear. He clearly aimed to make the definitive introduction to 5G, and was well equipped to do so.
2. *5G Core: Networks Powering Digitalization*, by Rommer et al.
    a. This book gets to the technical meat of 5G quickly. However, it assumes basic familiarity with technical aspects of 4G, and frequently uses acronyms without introducing them. There are several authors of varying writing skill; some sections are clear and bring a smile, others seem to be sloppily copied from 3GPP specs.
3. *5G Mobile Core Network Design, Deployment, Automation, and Testing Strategies,* by Shetty
    a. This book aims to quickly go beyond interaction and into options for how to create and maintain a core. However, the writing is clumsy making reading quite a chore. On the other hand, once one has an intermediate understanding of 5G quite a bit of wisdom can be extracted from Shetty.
4. *Fundamentals of 5G Mobile Networks*, edited by Rodriguez
    a. This book was written before the first 3GPP release on 5G was finalized, so it contains speculation about what 5G will be. It makes no assumption that the reader in new to telecom, and presents an enormous array of ideas.

Academic Articles:

1. *Tutorial on communication between access networks and the 5G core*, by Silveira et al.
    a. The nature of the connections between UE and core through NAS and NGAP is well described here.
2. *RESTful APIs for the 5G Service Based Architecture*, by Mayer
    a. The motivation for service based architecture described by one of its designers.
3. *Private 5G Networks: Concepts, Architectures, and Research Landscape*, by Wen et al.
    a. A description of non-public network options, advantages over other technologies, together with hypothetical and current use cases.
4. *Dynamic multi-cell selection for cooperative multipoint (CoMP) using (multi-agent) deep reinforcement learning,* by Schneider et al.
    a. Used for its GIF visualizing handoff between cells.
5. *A Tutorial on Trusted and Untrusted Non-3GPP Accesses in 5G Systems—First Steps Toward a Unified Communications Infrastructure*, by Lemes et al.

Misc:

1. ITU signatory Nations
2. Nokia's press release about deploying DISH Wireless's 5G core
3. Article about AT&T's 5G core
4. Source for the 10-Pillars of 5G (behind paywall. David Cherney has the book.)
5. A 15-min video that briefly reviews "everything 5G"
6. Article on various 5G deployment options available
7. Links to additional articles describing SBA, Standalone 5G
8. Review on Network Slicing in the world of 5G
9. 49 min Video Overview of the 5G Core Reference Architecture
10. Slick 18 minute video about 5G core components

11. The Evolution of HTTP (The story of HTTP/2)
12. Enterprise Evolution with 5G Adoption, by 5G Americas