



# Influência do 5G na Infraestrutura de TIC



# ➤ Quem sou?



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- Graduado em Sistemas da Informação – Unicarioca/RJ
- MBA em Serviços de Telecomunicações – UFF/RJ
- Especialização em Comunicações Móveis – UFF/RJ
- + de 20 anos em Telecom
- + de 70 Certificações Profissionais (Sendo 22 da Huawei – Incluindo HCSI-HCIE-Datacom)



# Pilares do 5G

10Gbit/s  
**eMBB**  
(Enhanced MBB)



**mMTC**  
(Massive Machine Type  
Communication)

1 million  
connections per  
square km

**uRLLC**  
(Ultra-Reliable Low-  
Latency  
Communication)

1ms

Source: ITU R. M.[ IMT.VISION]

**eMBB** (1000X traffic)



**uRLLC**



**mMTC**



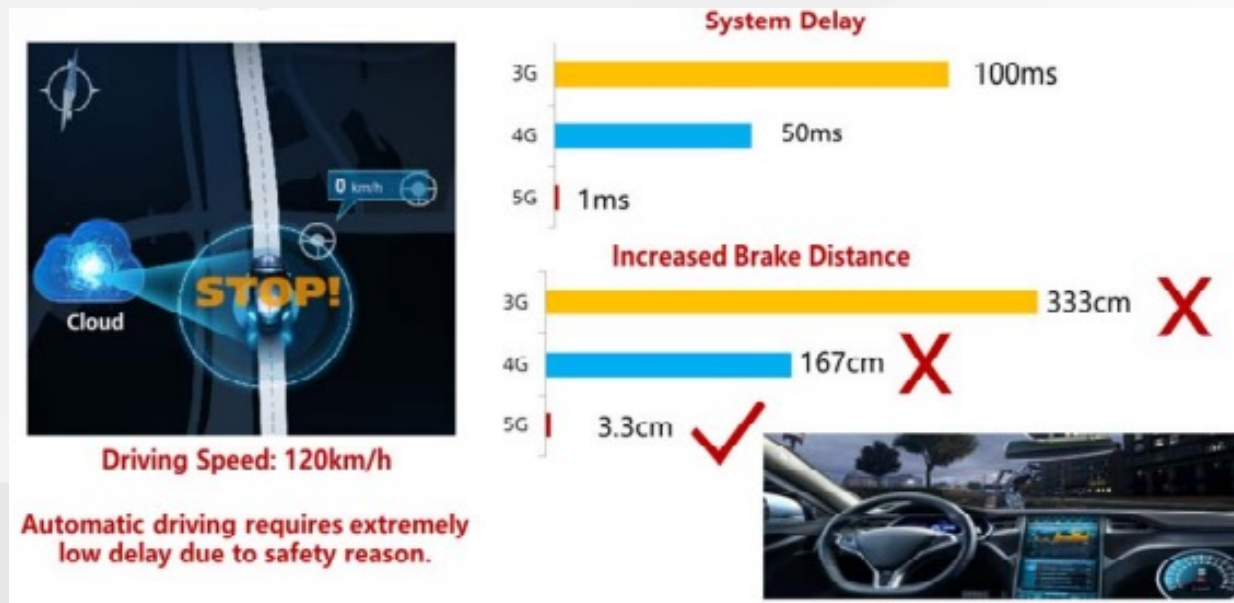
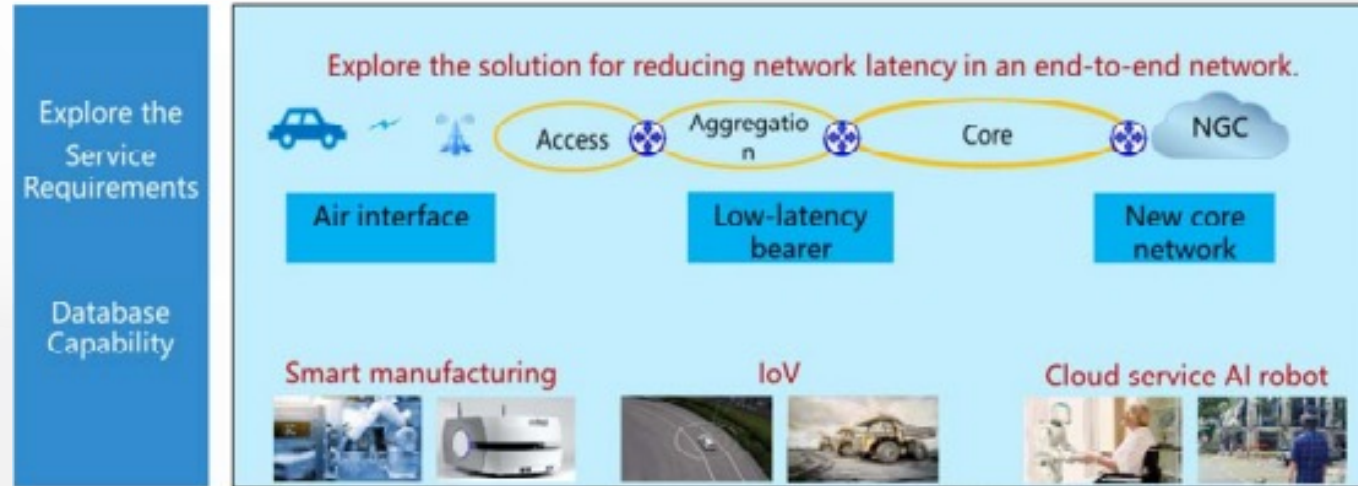
# Pontos Chave do 5G

	Latency	Throughput	Number of Connection	Network Architecture
<b>5G</b>	<b>1ms</b> End-to-end Delay	<b>10Gbps</b> Every connection speed	<b>1,000K</b> Number of Connection every square km	<b>Slicing</b> capability
<b>GAP</b>	<b>30~50x</b>	<b>100x</b>	<b>100x</b>	<b>NFV/ SDN</b>
<b>LTE</b>	30~50ms	100Mbps	10K	Agile

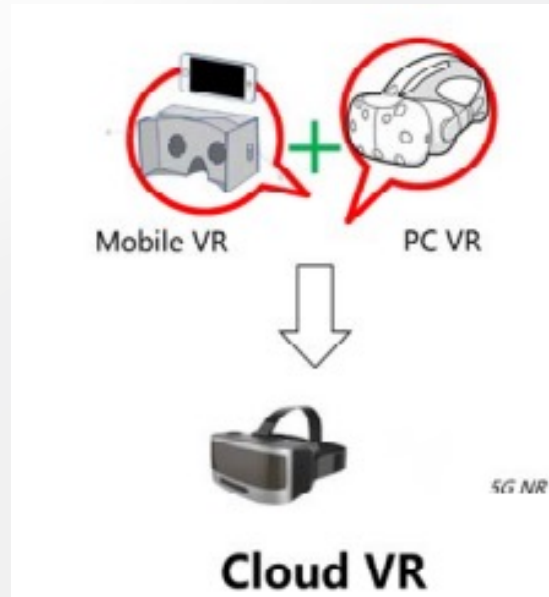
➤ 4G cannot fulfill the requirements of the future applications



# Aplicações de Baixa Latência



# Aplicações de Largura de Banda



VR: Oculus Rift and Touch



Everything you see is virtual

**VR: Virtual Reality**

AR



You can see the virtual messages over the real image

**AR: Augmented Reality**

MR: Magic Leap/HoloLens



You can't distinguish between true and virtual image

**MR: Mixed Reality**

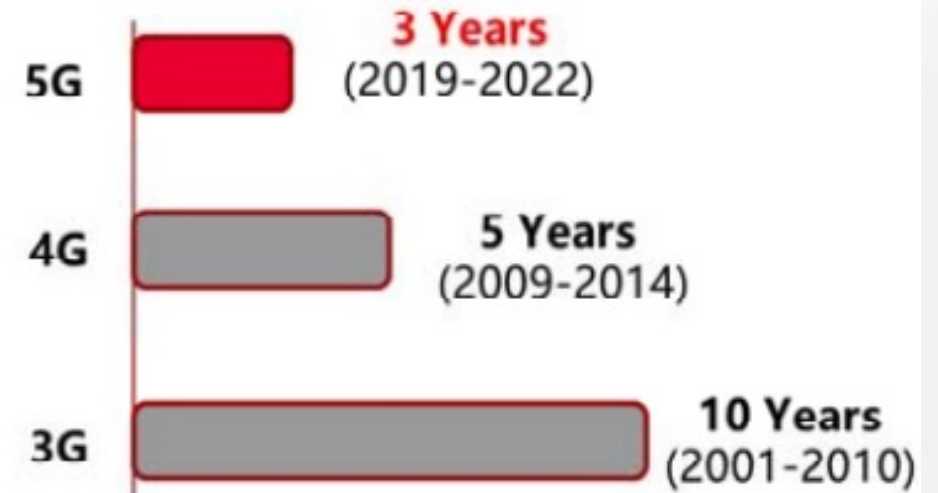


# Velocidade de Implementação

The large-scale commercial use of network devices and terminals is mature, and the ecosystem is ready.



Development speed of 5G will be beyond expectation



\*Time required to reach 500 million users globally



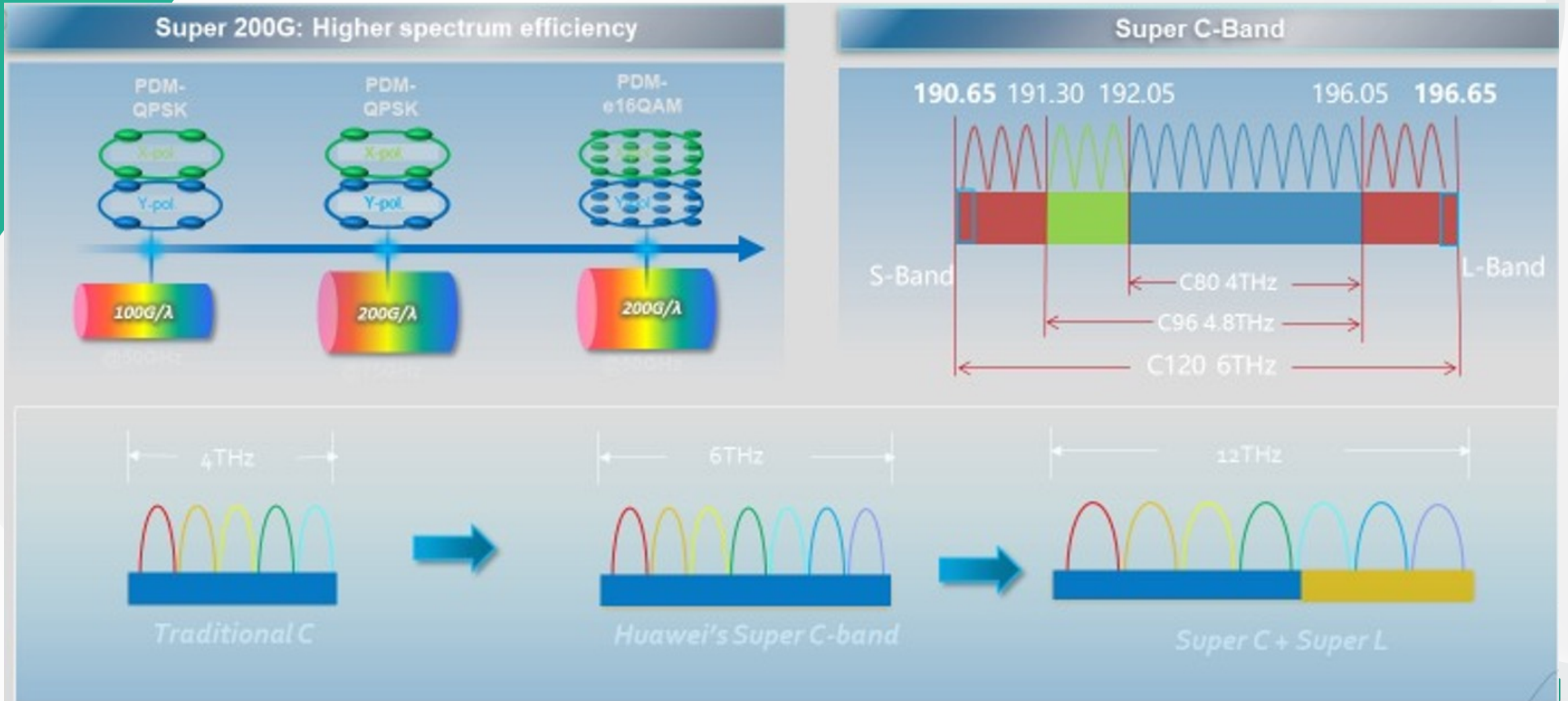


# **Como Suportar Isso Tudo?**

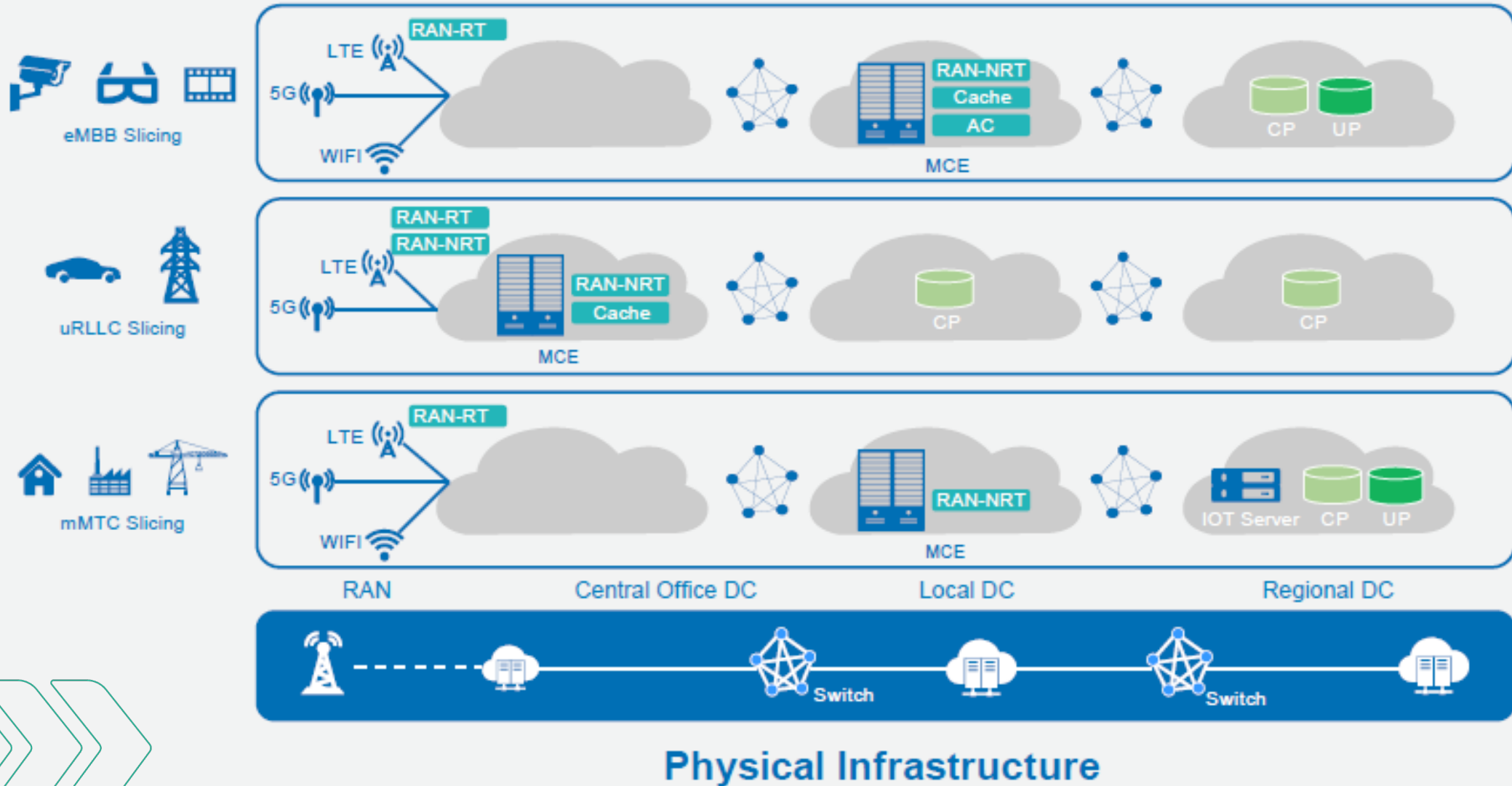




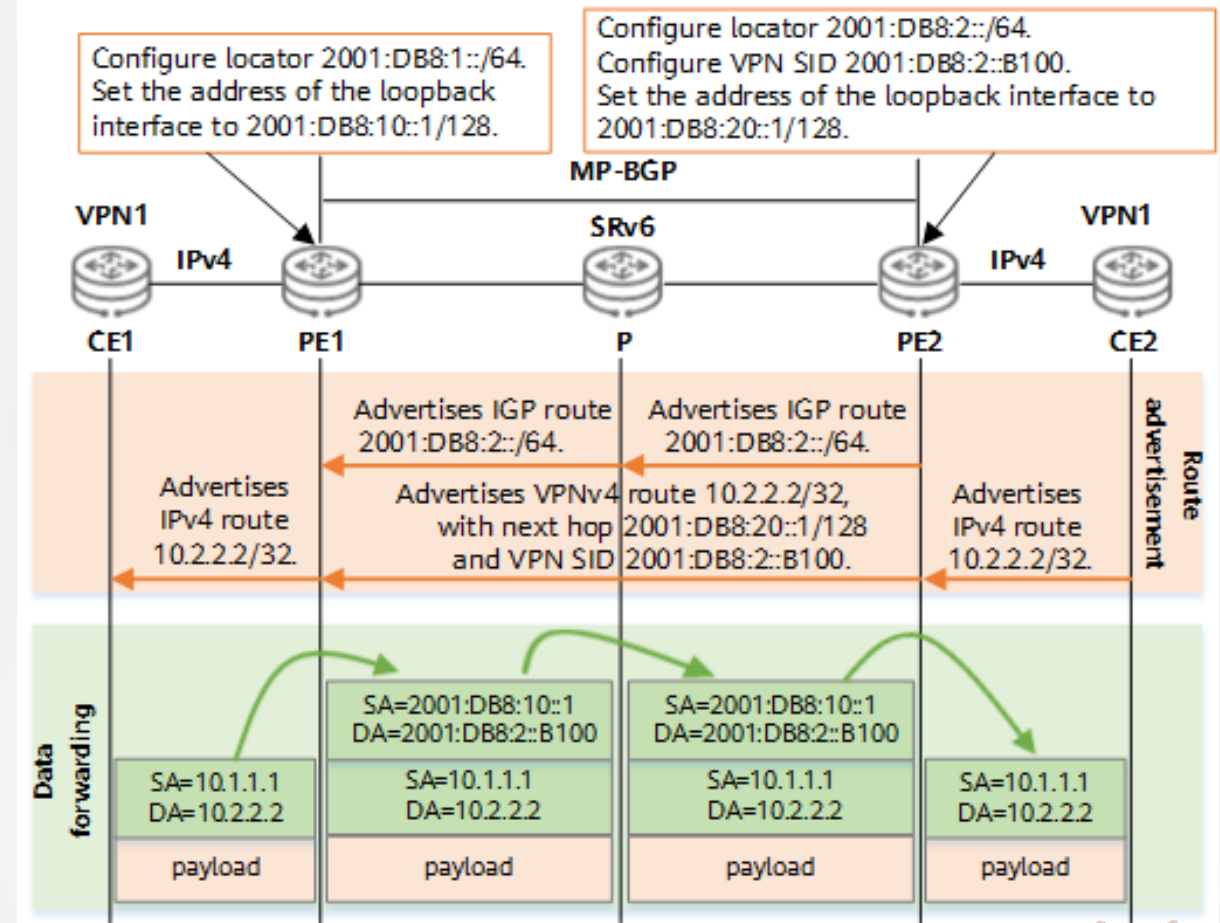
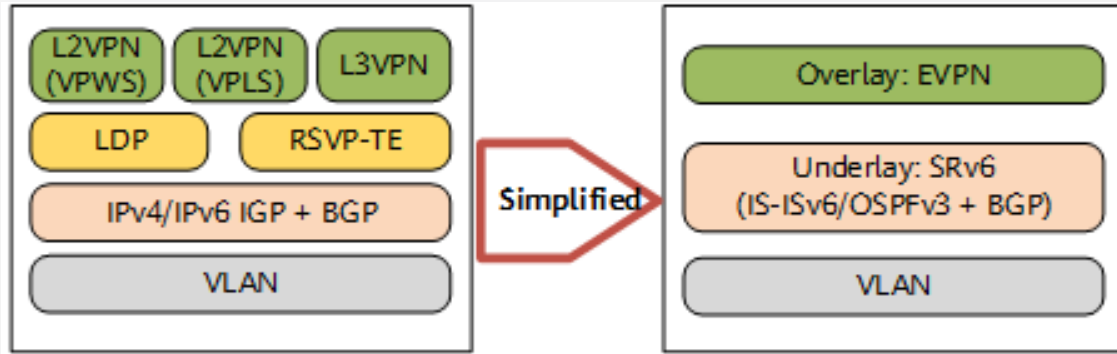
# Evolução do DWDM



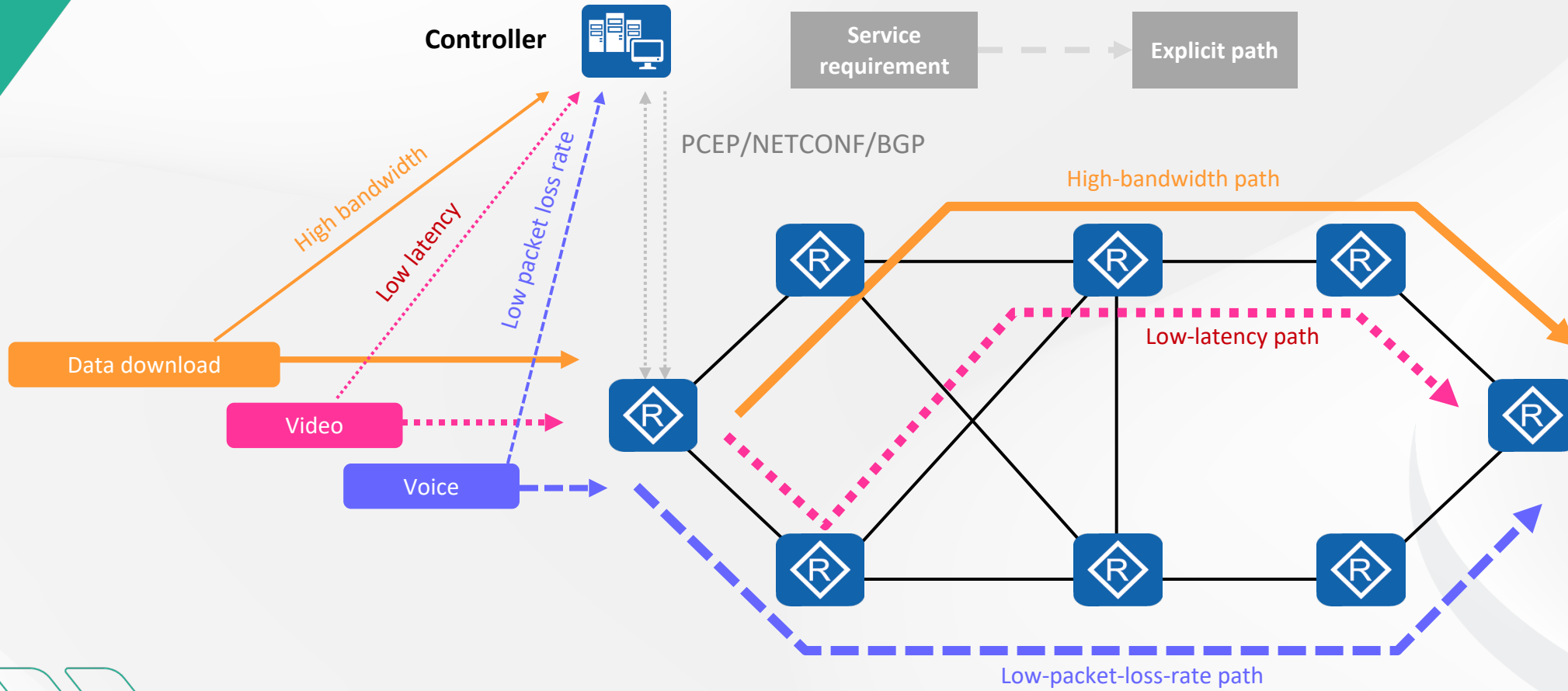
# Network Slicing



# Segment Routing



# SRv6 / SDN



# Evolução em Baterias

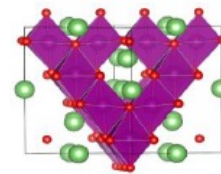
## Highly Stable Lithium Cell, Ensuring the Safety Performance



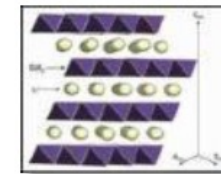
(LFP)

Olive-like 3D  
**More stable**

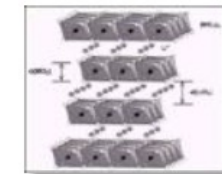
VS



Cubic crystal 3D  
**Stable**



Layered 2D  
**Fragile**



Layered 2D  
**Fragile**

## LFP decomposition does not generate $O_2$ , reduce the explosion risk

LFP

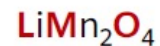


(270°C)

Thermal Run Away →



LMO



(180°C)

Thermal Run Away →



LCO



(150°C)

Thermal Run Away →

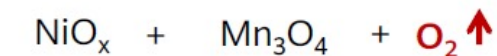


NCM



(180°C)

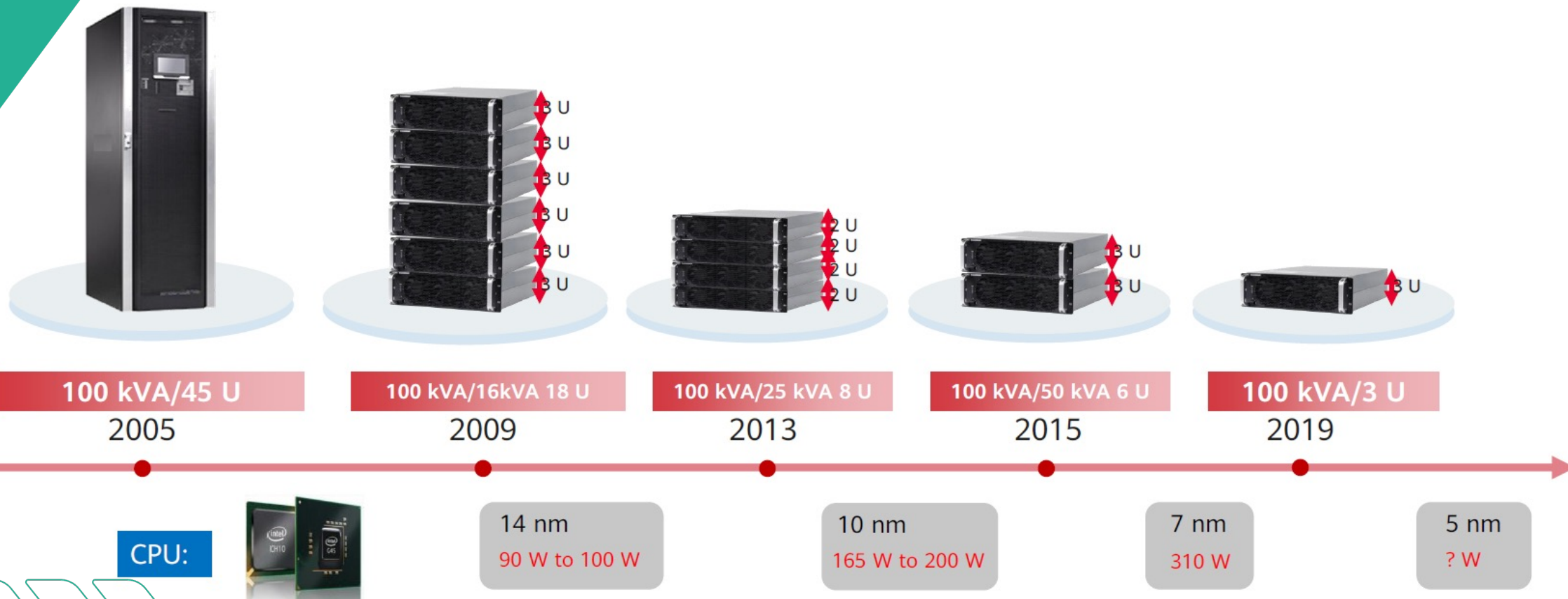
Thermal Run Away →



Remark: Overcharge, over discharge, and high temperature may cause heat loss



# Evolução em UPS



# DataCenter Modular



# Carência Profissional

Home > Carreira

## Estas 11 tecnologias vão criar mais de 790 mil empregos em cinco anos

Até 2025, estudo aponta que o Brasil deve ter uma demanda por 797 mil profissionais de tecnologia

1. **Big Data & Analytics – 26,1%**
2. **Nuvem – 16,8%**
3. **Web mobile e outras – 16,4%**
4. **Inteligência artificial – 13,8%**
5. **Internet das Coisas – 12,8%**
6. **Blockchain – 6,3%**
7. **Segurança da informação – 5,2%**
8. **Redes sociais – 1%**
9. **Realidade virtual – 0,8%**
10. **Robótica – 0,5%**
11. **Impressão 3D – 0,3%**

Por **Luísa Granato**

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Tempo de Leitura: 3 min de leitura







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# Obrigado



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