



6.2.3.1 探索校企共育人才培养机制

6.2.3.1.8 企业标准与华为技能证书融通材料

我校计算机网络技术专业与福建鸿官通信广东分公司深度合作，对 20 计网 2 班学生进行企业标准培训，经培训考核，全班 53 人均通过考核，并颁发符合企业标准与行业认可的华为中国大区 EHS、无线硬装和通信基础工程师技能证书。

材料目录	
1	5G 无线硬装、EHS、通信基础操作标准
2	学生花名册
3	学生证书佐证
4	学生现场实训照片

1、5G 无线硬装、EHS、通信基础操作标准

安全生产

- 安全帽
- 安全带/绳 (高空作业时)
- 安全鞋/靴
- 个人安全防护用品 (PPE)
- 持证上岗
- 高空作业时，必须设置工作区域，设置工作牌及看护人员
- 高空作业时，必须穿安全带，工具等必须系牢
- 必须使用工作平台，如梯子等时，必须安全，严禁人爬

5G网络总体拓扑

网络结构：

- 5GC: 5G Core Network (5G核心网)
- NG-RAN: NG Radio Access Network (5G无线网)
- AMF: Access and Mobility Management Function (无线接入网移动性管理功能)
- UPF: User plane function (负责于5G网+PC端侧网，负责用户面数据转发)
- gNB: gNB mode providing NR user plane and control plane protocol terminations towards the UE, and connected via the NG2 interface to the 5GC (5G基站模式)
- ng-eNB: mode providing E-UTRA user plane and control plane protocol terminations towards the UE, and connected via the NG2 interface to the 5GC (5G基站模式)

5G网络总体拓扑

网络结构：

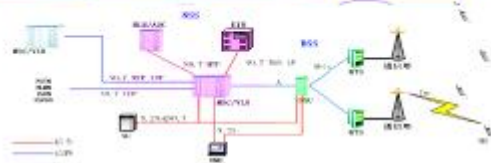
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BBU-V9200接线介绍

AAU/AAU+PPTT 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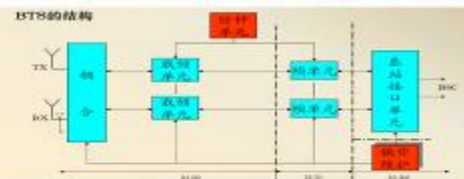


GSM系统结构



- GSM是MS和MS之间的标准，主要完成无线资源管理和无线收发功能。GSM主要包括基站控制器BSC和基站收发台BTS两部分。
- BSC：位于MSC与BTS之间，具有对一个或多个BTS进行控制和管理的功能，主要完成无线资源的分配、BTS和MS收发功率的控制以及越区切换等功能。BSC也是一个小交换机，它把局部网络汇集后通过A接口与MSC相连。
- BTS：基站子系统的无线收发设备，由BSC控制，主要负责无线传输功能，完成无线与有线转换，无线分频、无线信道加密、跳频等功能。BTS通过A接口与BSC相连，通过空中接口UM与MS相连。
- 此外，BSC系统还包含码速转换和速率适配单元TRAU，TRAU连接位于BSC和MSC之间，主要完成16 kbps的RTPC-LTP编码至64 kbps的A律PCM编码之间的码型变换。

BTS结构



- 按制式分类：GSM基站、CDMA基站、PHS基站
- 按频段分类：900M、1800M
- 按站型分类：宏站、微站、直放站
- 按用途分类：覆盖站、容量站、容量覆盖站
- 按天线分类：全向站、定向站、全向+定向站

基站图例



铁塔+铁塔 自建房+升空架 杆杆基站 三角杆基站

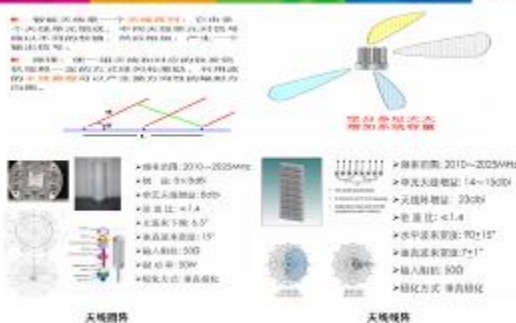
宏基站作为主要覆盖方式：

- 混合两相覆盖模式，每个小区的覆盖半径大多为400m—200m
- 发射功率较强，一般在10W以上
- 一般需要机房，配有电源等辅助设备

微基站作为宏基站的补充和延伸，应用于：

- 宏蜂窝覆盖不到又有较大业务量的地点
- 作为热点区域的补充一般部署在路边、广场、车站等
- 对配套设施的要求较低；
- 相对于宏站，功率低，能严格控制天线增益、发射功率。

智能天线——基本原理



天线阵列

天线阵列



2、学生花名册

华材职校 & 鸿官通信订单式培养人才培训考勤表

班级: 2021级

学号	姓名	11.8上午	11.9号上午	11.9号下午	11.10号上午	11.10号下午
1	白子恒	白子恒	白子恒	白子恒	白子恒	白子恒
2	蔡曜楠	蔡曜楠	蔡曜楠	蔡曜楠	蔡曜楠	蔡曜楠
3	陈浩源	陈浩源	陈浩源	陈浩源	陈浩源	陈浩源
4	陈炜	陈炜	陈炜	陈炜	陈炜	陈炜
5	陈晓武	陈晓武	陈晓武	陈晓武	陈晓武	陈晓武
6	陈卓骏	陈卓骏	陈卓骏	陈卓骏	陈卓骏	陈卓骏
7	邓梓辉	邓梓辉	邓梓辉	邓梓辉	邓梓辉	邓梓辉
8	方洪	方洪	方洪	方洪	方洪	方洪
9	方世杰	方世杰	方世杰	方世杰	方世杰	方世杰
10	冯杰诚	冯杰诚	冯杰诚	冯杰诚	冯杰诚	冯杰诚
11	关富昌	关富昌	关富昌	关富昌	关富昌	关富昌
12	何嘉杰	何嘉杰	何嘉杰	何嘉杰	何嘉杰	何嘉杰
13	胡锦洋	胡锦洋	胡锦洋	胡锦洋	胡锦洋	胡锦洋
14	黄凯峰	黄凯峰	黄凯峰	黄凯峰	黄凯峰	黄凯峰
15	霍嘉耀	霍嘉耀	霍嘉耀	霍嘉耀	霍嘉耀	霍嘉耀
16	霍展豪	霍展豪	霍展豪	霍展豪	霍展豪	霍展豪
17	赖胜华	赖胜华	赖胜华	赖胜华	赖胜华	赖胜华
18	黎卓恒	黎卓恒	黎卓恒	黎卓恒	黎卓恒	黎卓恒
19	李昊	李昊	李昊	李昊	李昊	李昊
20	李磊	李磊	李磊	李磊	李磊	李磊
21	李展鹏	李展鹏	李展鹏	李展鹏	李展鹏	李展鹏
22	梁健来	梁健来	梁健来	梁健来	梁健来	梁健来
23	梁锦鸿	梁锦鸿	梁锦鸿	梁锦鸿	梁锦鸿	梁锦鸿
24	梁贤聪	梁贤聪	梁贤聪	梁贤聪	梁贤聪	梁贤聪
25	梁鑫	梁鑫	梁鑫	梁鑫	梁鑫	梁鑫
26	廖宇涵	廖宇涵	廖宇涵	廖宇涵	廖宇涵	廖宇涵
27						
28	刘伟浩	刘伟浩	刘伟浩	刘伟浩	刘伟浩	刘伟浩
29	刘奕麟	刘奕麟	刘奕麟	刘奕麟	刘奕麟	刘奕麟

华材职校 & 鸿官通信订单式培养人才培训考勤表

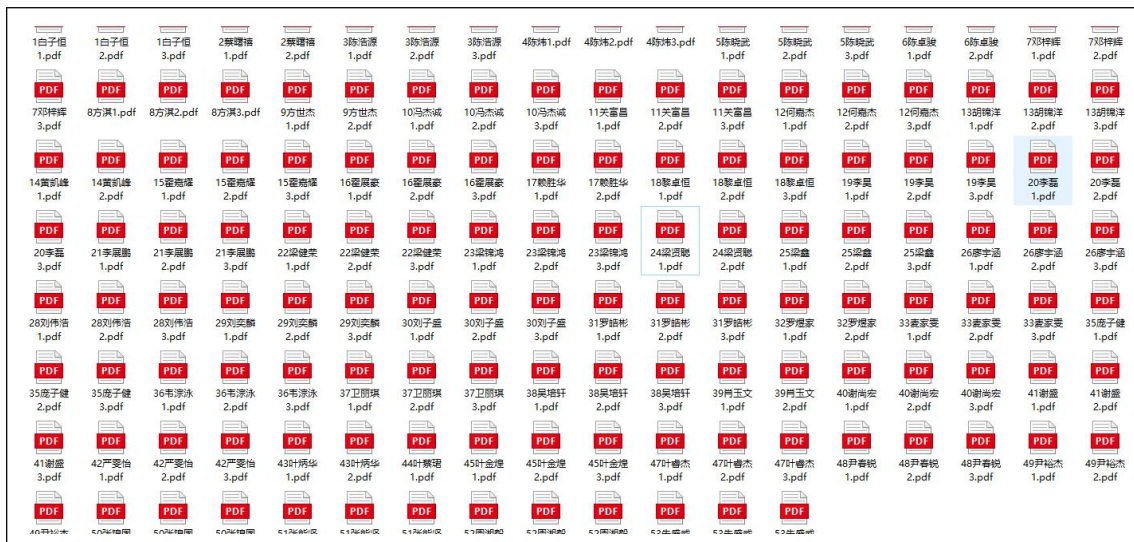
班级: 2021级

学号	姓名	11.8上午	11.9号上午	11.9号下午	11.10号上午	11.10号下午
30	刘子盛	刘子盛	刘子盛	刘子盛	刘子盛	刘子盛
31	罗皓彬	罗皓彬	罗皓彬	罗皓彬	罗皓彬	罗皓彬
32	罗煜豪	罗煜豪	罗煜豪	罗煜豪	罗煜豪	罗煜豪
33	麦家豪	麦家豪	麦家豪	麦家豪	麦家豪	麦家豪
34	欧健	欧健	欧健	欧健	欧健	欧健
35	庞子健	庞子健	庞子健	庞子健	庞子健	庞子健
36	韦添添	韦添添	韦添添	韦添添	韦添添	韦添添
37	卫阳琪	卫阳琪	卫阳琪	卫阳琪	卫阳琪	卫阳琪
38	吴培轩	吴培轩	吴培轩	吴培轩	吴培轩	吴培轩
39	肖玉文	肖玉文	肖玉文	肖玉文	肖玉文	肖玉文
40	谢尚宏	谢尚宏	谢尚宏	谢尚宏	谢尚宏	谢尚宏
41	谢盛	谢盛	谢盛	谢盛	谢盛	谢盛
42	严奕怡	严奕怡	严奕怡	严奕怡	严奕怡	严奕怡
43	叶炳华	叶炳华	叶炳华	叶炳华	叶炳华	叶炳华
44	叶懿珊	叶懿珊	叶懿珊	叶懿珊	叶懿珊	叶懿珊
45	叶金耀	叶金耀	叶金耀	叶金耀	叶金耀	叶金耀
46						
47	叶嘉杰	叶嘉杰	叶嘉杰	叶嘉杰	叶嘉杰	叶嘉杰
48	尹容锐	尹容锐	尹容锐	尹容锐	尹容锐	尹容锐
49	尹裕杰	尹裕杰	尹裕杰	尹裕杰	尹裕杰	尹裕杰
50	张锦国	张锦国	张锦国	张锦国	张锦国	张锦国
51	张能坚	张能坚	张能坚	张能坚	张能坚	张能坚
52	周湘毅	周湘毅	周湘毅	周湘毅	周湘毅	周湘毅
53	朱盛威	朱盛威	朱盛威	朱盛威	朱盛威	朱盛威



3、学生证书佐证





4、学生现场实训照片



