Technology Brief...

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Research, Analysis, Strategy, Insight

Qualcomm pushes into servers

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Recently Qualcomm announced it is entering the server chip market with its ARM-based Centriq 2400, a 10nm 48 core device that compliments and leverages its mobile Snapdragon devices. But why is Qualcomm attempting to enter a market that is dominated by Intel and in which other ARM-based offerings have been unsuccessful?

There is a new market opportunity in servers that has been born of the substantial uptake in cloud systems and cloud hosting. Massive server farms that primarily act as data services are being created. Although Intel currently owns 95%+ of all servers, there is a growing "custom" solution market where cloud service providers specify their own products and have them build by ODMs, rather than purchase off the shelf hardware from the big enterprise server suppliers (e.g., Dell, HPE) where Intel dominates. Indeed, Qualcomm's design center was the Intel Skylake Xeon processor.

With so many cloud-based servers needed to power the Internet services we've grown accustomed to, and a highly competitive marketplace, its imperative that service providers aim for the lowest cost of operations. This is affected in large part not by the cost of HW and SW, but by the continuing costs of powering the tens of thousands of servers in data centers. Reducing power requirements not only lowers the overall cost of operations, but also allows expansion of data centers in areas with less abundant and/or more costly power supply – typically larger densely populated metropolitan areas.

ARM technology has been a source for low power chips that enabled the mobile ecosystem to thrive - where low power operation and long battery life are key criteria. Qualcomm has been at the forefront of making ARM-based chips ubiquitous in mobile devices. Leveraging this capability to produce server chips that take advantage of the lower power per compute cycle benefits are attractive to many cloud data centers.

Others have tried to move ARM based devices into the server realm with limited (or even no) success. What may allow Qualcomm to be successful is its scale, and its ability to leverage much of its already existing IP (DSP, CPU cores, GPU cores, specialized processors and now even AI processors) as well as leverage ecosystem partners like Xilinx, Mellanox, etc.

It took Qualcomm 5 years to develop its Centriq devices, and they run at as much

as 10 times the total power dissipation (maximum of 120W TDP) of its mobile chips due to the many more cores (48) and higher frequencies (2.2 GHz – 2.6 GHz) involved. But it's the substantial experience they gained in creating powerful and heterogeneous functions for mobile that they can now leverage in bringing a server platform to market. While starting with a very limited offering (one product) aimed at larger server farms, we expect Qualcomm to wider its offerings over the next 2-3 years to encompass many more server market sweet spots (e.g., edge servers, autonomous vehicle embedded servers, etc.).

Although the Qualcomm server chips claim a major power advantage over Intel for their targeted market, it will take a large number of significant deployments before the dominant share Intel now holds will be affected. But even a 10% impact will have major positive implications for Qualcomm, and we would not be surprised to see this happen in the next 3-4 years, particularly in the niche of high density, large server farms powering cloud services. Qualcomm is a major contributor to the Open 19 project that looks to define a standard form factor server to allow more diversity in deployments. And Qualcomm is working with Microsoft, Cloudware, LinkedIn and others to qualify the performance of their new devices.

Bottom Line: it's important to note that it's unlikely that Intel will sit still and not react to this threat to its dominance. It's unwise to sell Intel short, but given the size and scale of Qualcomm, as well as the partnerships it has established with manufacturers, Qualcomm is in a prime position to take a significant share of the expanding server market (unlike the many much smaller players in the ARM server space who have had minimal success). There are really only two companies at this point with the scale and capabilities in design and manufacturing to compete in this space – Intel and Qualcomm. With Qualcomm's entry into servers, the race is on.

The race to 5G starts with current tech

"…many of the foundational technologies necessary to make 5G a reality are being implemented now, and will be incorporated into the final product. Although the potential to over-hype the improvements are there, with misnomers alluding to 5G networks when they're not, the reality is that any improvements should be seen as important steps to 5G and that these improvements can also be taken advantage of by users today.…

Many talk about 5G as the panacea for all things wireless. With high bandwidth, low latency and massive scale of users/devices, it heralds a new era in wireless communications. Yet with this focus on 5G, many lose sight of the fact that there is already a partial move towards this new capability with upgrades of existing systems, particularly in creating Gigabit LTE products and networks being upgraded to embrace this capability. And GB LTE will become a foundational piece of the new 5G ecosystem that will emerge in the next 3-4 years.

In reality, 5G is not one technology. Rather it is a mix of many existing and new technologies like millimeter wave, carrier aggregation, high density microcells, beam forming, etc. And most networks that get upgraded to 5G will encompass existing services and technologies. Indeed, moves by many carriers to transform their networks to foundations like Network Function Virtualization (NFV) and Software Defined Networks (SDN) are precursors to enabling the transformation necessary to fully deploy the variety of services available with 5G. Anything that can be done to improve existing systems will automatically benefit 5G as it becomes part of the core 5G capabilities.

In addition to the behind the scenes network operations work, much is being done to improve the radio front ends as well to increase speed and obtain better bandwidth utilization. With wider channels, carrier aggregation, 256 QAM data compression and 4 x 4 MIMO antennas, Gigabit LTE is being rolled out now in many markets and by nearly all carriers.

Qualcomm recently demonstrated devices powered by its Snapdragon 835 SoC (such as the Samsung Galaxy S8 and Galaxy Note 8) which already have the capability to operate on Gigabit LTE networks with speeds of 1.2 GB. Currently only Android powered devices offer such capability. T-Mobile is now upgrading its systems and expects to have network wide capability in the next 12-18 months. But even in those areas where GB LTE is not yet available, the smartphones powered by GB LTE capable modems and 4 x 4 MIMO antennas can offer improved throughput and less "dropped at the edge" effect in marginal signal areas than phones equipped with older LTE technology. Indeed, devices with the newer GB LTE modems exhibited 27% faster access to cloud files, 43% fewer drops for file downloads in weak signal areas, and 2.5X better immersive experiences over a Cat 12 (Advanced LTE) modem equipped phones (based on testing done by Signals Research Group). These improvements are large enough to offer significantly noticeable enhanced experiences to users in many situations.

Bottom Line: We expect 5G technology to offer many benefits to end users and carriers alike, with higher speeds, better bandwidth utilization, more diversity in service offerings (e.g., low cost IoT, high speed fixed, etc.), and improved user satisfaction. But many of the foundational technologies necessary to make 5G a reality are being implemented now, and will be incorporated into the final product. Although the potential to over-hype the improvements are there, with misnomers alluding to 5G networks when they're not, the reality is that any improvements should be seen as important steps to 5G and that these improvements can also be taken advantage of by users today. Newer devices with current generation modems and antennas can significantly improve the user experience and should be obtained now. Future fully capable 5G devices will be more capable, but there is no reason to wait until full 5G rollout to take advantage of the advances being made.

BlackBerry: the Security/Safety Company

BlackBerry has spent the past several years transitioning from its historic position as a communications and smartphone manufacturer, into one who's primary DNA has been leveraged to grow into a security products and services company. Although the transition is not yet complete, we expect BlackBerry's IP and acquired capabilities in this space to set it apart from many companies wanting to play in many security-conscious vertical markets.

"…Blackberry is in a prime position to take advantage of its pivot from device maker, to a security and safety company. We expect to see Blackberry expand into many vertical markets over the next 2-3 years, and to see it become a dominant player in the Enterprise of Things (EoT) world....."

BlackBerry already has a primary supplier position in automotive, with QNX powering infotainment systems in a majority of vehicles currently on the road. However, the emergence of automated driverless vehicles in the next 3-4 years will need far more capability, and the primary challenge is making these cars safe to operate. To do so, all of the operational systems be fully secured. Some cars already have 100M lines of code and as many as 700 electronic control units (ECU) embedded encompassing all aspects of the power train, environmental systems, infotainement and operational systems. With the coming age of autonomous vehicles, we expect this will increase by a factor of 10 or more (although many ECUs will be consolidated into central processing units rather than fully distributed stand alone controllers). And the number of mission critical systems that power operations, rather than systems for convenience such as infotainment, will increase dramatically. Any failures in these systems won't just cause inconvenience, they could cause a catastrophe. Security/safety will be paramount and companies will need to utilize proven secured systems.

Autonomous vehicles is a great expansion point for BlackBerry as it already has relationships with many auto manufactures, like Ford where QNX displaced Microsoft technology, Audi, etc. And it has relationships with the primary compute platform vendors, running on both Intel x86 and ARM based architectures (e.g. Harmon). But in the next 2-3 years, we expect BlackBerry to extend well beyond its current focus in auto to other safety conscious markets. Indeed, we expect similar security concerns to lead BlackBerry into markets such as large machines/tools, aerospace, medical equipment, and delivery/transportation (where it's already established a foot hold with its radar products). When complex systems fail in these markets, it not only causes inconvenience, but can cause property and human casualties and/or major economic loss. In such cases, security capability morphs into a safety capability where failures are not an option.

The above is not to say that BlackBerry is moving away from its focus on systems management. Indeed, BlackBerry has a strong play currently in EMM, and will continue to do so, as it moves into the world of the Enterprise of Things (EoT). This is a major opportunity as EoT must also have managed systems that can be safely operated and easily upgraded. In fact, the lessons learned in mobile EMM will serve BlackBerry well as it extends its reach into mission critical markets where an ability to secure, manage and control is paramount.

Bottom Line: Now that it's stabilized its markets and begun to create profits again, Blackberry is in a prime position to take advantage of its pivot from device maker, to a security and safety company. We expect to see Blackberry expand into many vertical markets over the next 2-3 years, and to see it become a dominant player in the Enterprise of Things (EoT) world. Companies that still think of BlackBerry as a vendor of devices should seriously look at the new BlackBerry as a purveyor of safety and security in the world of EoT that will affect nearly every enterprise over the next few years.

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Whitepapers
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- MDM- Where Do We Go From Here?

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