

12/20/2018

Outperform

Price: \$1.47

Price Target: \$7.50

Industry

CSaaS

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Stock Data

| | |
|-------------------------|---------------|
| 52-Week Range | \$0.86/\$3.59 |
| Avg. Daily Volume | 1,043,245 |
| Market Cap. (MM) | \$143 |
| Shares Out. (MM) | 97.4 |
| Float | 91.4% |
| Cash Per Share | \$0.19 |
| Debt-to-Capital | 0.3% |
| Book Value Per Share | \$0.46 |
| Dividend Yield | 0.00% |
| Shares Short | 5,525,422 |
| Insider Ownership | 8.6% |
| Institutional Ownership | 9.9% |
| FY End | Dec |

Source: Factset

Revenue Estimates (\$M)

| | 2018 | 2019 | 2020 |
|-----|-------|-------|--------|
| 1Q | 4.1A | 14.4E | -- |
| 2Q | 6.0A | 16.7E | -- |
| 3Q | 8.0A | 19.9E | -- |
| 4Q | 13.3E | 24.9E | -- |
| FY | 31.4E | 75.9E | 105.1E |
| P/S | 4.6x | 1.9x | 1.4x |

Adjusted EPS Estimates (\$)

| | 2018 | 2019 | 2020 |
|-----|---------|-------|-------|
| 1Q | (0.02)A | 0.01E | -- |
| 2Q | 0.04A | 0.01E | -- |
| 3Q | 0.01A | 0.02E | -- |
| 4Q | 0.01E | 0.03E | -- |
| FY | 0.04E | 0.08E | 0.14E |
| P/E | 36.8x | 18.4x | 10.5x |

EBITDA (\$M)

| | 2018 | 2019 | 2020 |
|----|------|-------|-------|
| 1Q | 0.3A | 2.4E | -- |
| 2Q | 1.3A | 2.7E | -- |
| 3Q | 1.8A | 3.5E | -- |
| 4Q | 2.1E | 4.5E | -- |
| CY | 5.5E | 13.0E | 21.0E |

Pareteum Corporation (TEUM)

Initiating Coverage with an Outperform Rating and \$7.50 Target

Summary

We are initiating coverage of CSaaS company Pareteum, which enables agile mobile operators and enterprises to quickly develop and sell mobile and IoT services. TEUM has a best-in-class Rule of 40 metric (pro forma organic SaaS growth plus EBITDA margin in FY19) at 69. Initiating coverage with a \$7.50 target based on 7.5x FY20 revenue. TEUM is a component of the Northland CSaaS Stock Index, which has appreciated 244% over the past three years.

Key Points

Pareteum. Pareteum sells SaaS which enables agile communications operators and enterprises to quickly develop and offer mobile and IoT services. The company has a highly experienced management team, who has orchestrated a material turnaround, leading to accelerated contract signings and rapid revenue growth over the past year, all while greatly improving EBITDA margins. Management is also quickly scaling the business with complementary and accretive acquisitions, including Artium and iPass. Organic 3Q18 results included 129% revenue growth and 22% EBITDA margins.

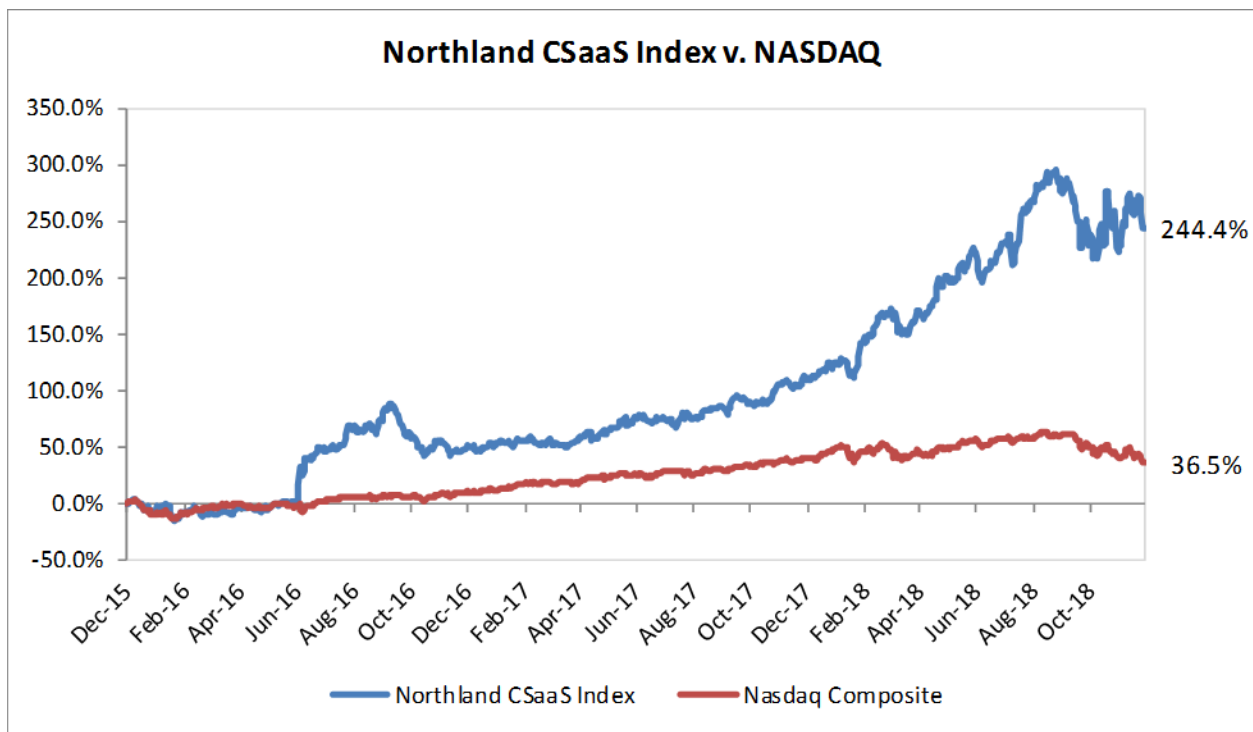
The Opportunity. Mobile virtual network operators (MVNO) and enterprises (which represent about 1/10th of all mobile subscribers) see opportunities to compete with (and sometimes complement) traditional mobile network operators on features, brand and price. Such entities are increasingly looking to SaaS platforms, such as from Pareteum, which are easy to consume and enable fast time to market. Pareteum's business and operations support systems and mobile network core SaaS replaces on-premises software in most instances. We believe 90% of the addressable market is still served by legacy on-premises software today.

Estimates and Valuation. We estimate \$31.4 million in FY18 revenue, and \$75.9 million in FY19 (pro forma organic growth of 52% including Pareteum and Artium). FY18 adj. EBITDA of \$5.5 million and FY19 of \$13.0 million (margin 17.2%). We use the SaaS Rule of 40 analysis to value Pareteum; TEUM's metric is 69, which is best-in-class and warrants a 7.5x revenue multiple based on comps, leading to a \$7.50 target.

Investment Summary

The **Northland CSaaS stock index** has appreciated 244% over the past three years. The inexorable move of communications software to the cloud from on-premises is driving substantial revenue growth and strong stock performance among CSaaS (communications software-as-a-service) companies. Key software categories that have been moving to the cloud include unified communications, contact center infrastructure, video conferencing, quality monitoring, session border controllers, knowledge management, and local and long distance switching. We believe market **penetration of CSaaS is under 10%**, offering a substantial runway for new leaders.

Figure 1: Northland CSaaS Index



Source: Bloomberg, NCM

Companies that have over 40 on the Rule of 40 metric (organic SaaS growth plus EBITDA margin) are **garnering a 7.6x FY19 revenue multiple today**. Based on our estimates, TEUM is trading at 2.1x FY19 revenue and has a Rule of 40 metric of 69. Hence, we view TEUM as a highly attractive stock.

Other major on-premises software categories moving to the SaaS model are **communications-centric CRM, business and operations support systems (B/OSS) and mobile network core software**.

Communications-centric CRM includes customer and administrator portals. B/OSS software provides several capabilities to mobile service providers, such as billing, user provisioning, monitoring and management, product catalogues, and customer portals. Mobile network core technologies provide routing and network intelligence, and control flow across radio access networks.

Pareteum offers a CSaaS platform that encompasses comm CRM, B/OSS and mobile network core SaaS. We believe these software categories represent over \$20 billion per year in on-premises software spend, and the addressable market is under 10% penetrated by a SaaS model. The target market is usually the mobile virtual network operator (MVNO), which is an independent mobile service provider that

wants to compete on brand, unique flexible services and cost, but does not own the radio access network. Enterprises and wireline companies, such as cable companies, and even large mobile operators wanting to quickly offer something new (such as Vodafone) can leverage the Pareteum platform to get to market quickly.

The benefit of the Pareteum platform is similar to the benefit of SaaS versus on-premises systems in most enterprise software categories: no upfront capex, no need to hire tons of IT people to run the system, and frequent feature updates via the cloud. As with most emerging SaaS categories, smaller entities tend to use SaaS before larger entities do. This trend was highly evident with Five9 (FIVN, OP), RingCentral (RNG, OP), Twilio (TWLO, OP), and salesforce.com (CRM, OP), among many others.

Because mobile virtual network operators and enterprises desiring to sell mobile services tend to be more agile and flexible than incumbent mobile network operators, such entities have been more aggressive in leveraging such cloud capabilities we believe. Large tier 1 mobile network operators desire a shift to cloud architectures, but have a propensity to buy software and run it in their data centers so far.

Pareteum's principal executive officer, Hal Turner, joined the company in Nov. 2015 and immediately cut costs and returned the company to positive EBITDA. From Nov. 2016 on, he hired new senior people. About 1.5 years ago, he hired several senior sales people, with the intent to accelerate bookings. **Over the past 12 months, Pareteum has won 90+ deals. In the prior 3.5 years, the company had signed no new deals.** The company has also been adding **\$10+ million in ACV per quarter**, and 3-year backlog has also grown dramatically to several hundred million dollars.

The combination of a strong platform, the greatly improved management team, the increased sales head count, and the market need for a SaaS platform enabled Pareteum to win the contracts and accelerate sales. We believe about 50% of backlog relates to customers moving subscribers to Pareteum and off legacy platforms (mainly on-premises), and 50% relate to customers and their expected new subscriber growth. Such activity has also enabled strong revenue and EBITDA improvements, including **129% revenue growth in 3Q18** to \$8.0 million and **\$1.78 million in adj. EBITDA**.

Pareteum developed the core SaaS platform, leveraging work it did for Vodafone. Vodafone did not want to spend millions of dollars extra and two years of work on its internal billing and OSS systems, so it leveraged the more flexible, cost effective Pareteum SaaS. The SaaS supports over one million subscribers for mobile and TV bundles at Vodafone Spain (service is called Lowi) today. We estimate Vodafone to be about 20% of revenue in FY19 (and 13% post iPass close), down materially from the 80% in FY17 and 48% in FY18.

In addition to strong organic growth, Pareteum recently closed the acquisition of Belgium-based Artidium. **Artidium offers similar technology to Pareteum**, but has more enterprise and customer-facing applications as well. We estimate Artidium will be 28% of revenue in FY19 (ex-iPass).

Recently, Pareteum announced the **intent to acquire iPass**. The deal should close in 1Q19. iPass provides Pareteum with a global WiFi network of 68 million hotspots, and intelligent management SaaS, which enables subscribers to automatically migrate to the best and most cost-effective network available, cellular or WiFi. iPass also now offers significant data analytics, including location information and network quality by user and location.

Pareteum can clearly cross-sell iPass services to Pareteum's customers, in addition to lowering costs for Pareteum. iPass can sell unlimited, global mobile services to large enterprises leveraging Pareteum. Large enterprises can visibly lower their mobile communications costs and improve reliability with a

combined Pareteum/iPass offering. We expect Pareteum to grow modestly off the 4Q18 base given more resources and cross-sale opportunities.

We estimate FY18 revenue of \$31.4 million and FY19 of \$75.9 million (representing 52% pro forma organic growth with Artium; all growth comes from Pareteum in our model). Management is highly cost conscious, and thus we expect strong EBITDA margins; much higher than the average SaaS company. We estimate \$5.5 million in FY18 and \$13.0 million in FY19 (EBITDA margin of 17.2%). iPass is incremental to our estimates. **Initiating coverage with a \$7.50 target based on 7.5x FY20 revenue, and leveraging SaaS comps.** We believe TEUM should be trading at \$5.50 today.

Financial Outlook

Revenue

Pareteum had a handful of customers until 4Q17. Over the past year the company has **signed 90+ contracts**, leading to an organic \$400 million 3-year backlog at the end of 3Q. The number went higher with additional organic wins since 3Q18 end and the acquisition of Artium Oct. 1. Pareteum has been booking **\$10+ million in ACV each quarter**. Pareteum hired several senior people in 2016 and more sales people in mid-2017. These hires were a major catalyst for the success, enabling the organization to leverage the core technology foundation in place and capture ample market opportunity as core communications software categories migrate to the SaaS model.

We like that revenue growth going forward is heavily **tied to deploying deals already won**. Pareteum has also established a strong track record of implementing quarterly backlog at the pace expected entering quarters. Pareteum has commented it expects to recognize 10-15% of a deal in year 1, about 1/3 in year 2, and the rest in year three. We believe about 50% of backlog relates to customers migrating subscribers to Pareteum, and the other 50% is customers with a visible path to subscriber growth. Pareteum has stated its 3-year backlog is haircut from likely levels as well. The main variable in revenue recognition is the pace of deployment we believe.

Furthermore, current customers have ordered more, leading to a **147% revenue expansion rate** in 3Q18, and **churn is extraordinarily low at 0.1% per month**. Customers rely on Pareteum SaaS to run their overall business, leading to low churn. The wins, implementation and strong metrics have produced

Pareteum typically gets paid \$0.50-\$1.00 per subscriber, but that can vary depending on volumes and elements of software purchased. An emerging opportunity is where Pareteum can sell a prepackaged service including airtime, in which case Pareteum can see several dollars per subscriber per month. Pareteum's application development business, largely based on the core technology foundation, is about **5% of revenue today, but management sees that tripling over the next year+** given IoT wins in particular.

Pareteum proved out its technology at **Vodafone**, one of the world's largest mobile operators, over five years ago. This foundation and reference has enabled the recent wins, along with the improved management team. Vodafone remains an important customer, but concentration is diminishing quickly to 20% of revenue in FY19 (13% with iPass) from 80% in FY17.

Pareteum acquired Artium Oct. 1. Artium provides Pareteum with more technology depth across core areas, new applications and more European network coverage. Artium had limited resources to expand S&M, but should see benefits and synergies with Pareteum. Pareteum will lose about \$1.2 million in

deferred Artilium revenue for normal purchase accounting we believe, and could scale back non-core services.

Overall, then, we estimate FY18 revenue of \$31.4 million, up 132%, including one quarter of Artilium. We estimate FY19 revenue of \$75.9 million, representing 52% pro forma organic growth. We are not including **iPass** in our estimates until it closes. Our preliminary estimates with iPass would lead to FY19 pro forma organic growth of 27% and EBITDA margins of 15% (Rule of 40 of 42).

Figure 2: Pro Forma Analyses

| (\$thousands) | FY18E | FY19E | FY20E |
|---------------------------------|--------|------------|------------|
| Pareteum | | | |
| Revenue | 27,124 | 54,933 | 81,646 |
| Growth | 100% | 103% | 49% |
| Artilium | | | |
| Revenue | 22,934 | 21,000 | 23,500 |
| Growth | | -8% | 12% |
| TOTAL | | | |
| Revenue | 50,058 | 75,933 | 105,146 |
| Pro Forma Organic Growth | | 52% | 38% |
| EM | | 17% | 20% |
| Rule of 40 | | 69% | 58% |
| iPass | | | |
| Revenue | 40,175 | 38,500 | 41,500 |
| Growth | -26% | -4% | 8% |
| TOTAL with iPass | | | |
| Revenue | 90,233 | 114,433 | 146,646 |
| Pro Forma Organic Growth | | 27% | 28% |
| EBITDA | | 17,034 | 26,462 |
| EM | | 15% | 18% |
| Rule of 40 | | 42% | 46% |

source: NCM, company reports

Furthermore, Pareteum has a stated goal of reaching a \$200 million revenue run rate in FY19. This would likely require another acquisition.

Gross Margin

Pareteum had a strong SaaS gross margin of 73% in 3Q18. Artilium's gross margin is lower, in the 55% range for FY18, given more messaging and usage-based revenue. As Pareteum deploys its organic backlog and the overall company scales, Pareteum sees the ability to reach 70% gross margin again on the combined Pareteum/Artilium business.

iPass expected total gross margin for FY18 is about 40%. Over the long-run, Pareteum sees an ability to have overall corporate gross margin in the 60% range.

EBITDA Margin

Pareteum management has shown great diligence in controlling costs. The company posted 22% EBITDA margins in 3Q18 despite being in a high growth phase and below full revenue scale. Management also has an aggressive cost synergy plan for both Artillium and iPass, with some of the synergies complete pre-acquisition. Based on Pareteum and Artillium combined, we estimate \$5.5 million of adjusted EBITDA in FY18 and \$13.0 million in FY19. While iPass was EBITDA negative pre-acquisition, management sees it adding several million to FY19.

Cash Flow

We expect Pareteum to post strong operating and free cash flow given the EBITDA it generates, low capex model (single digit percent of revenue) and no debt. Pareteum also has about \$40 million in NOLs. We expect Pareteum to exit the year with \$4-\$5 million in cash and no debt, and for the company to be FCF positive from there excluding 1-time items.

Valuation

We compare Pareteum to other SaaS companies. We use a Rule of 40 analysis, which looks at the sum of SaaS growth and EBITDA margin to determine appropriate valuations. Below is a summary of valuations by Rule of 40 groupings: 0-20 garner 2.7x FY19 revenue, 20-30 5.0x, 30-40 7.3x and 40+ 7.6x.

Figure 3: Rule of 40 Multiples Summary

| Rule of 40 | EV/'19 Sales |
|------------|--------------|
| > 40 | 7.6x |
| 30-40 | 7.3x |
| 20-30 | 5.0x |
| < 20 | 2.7x |

Source: Bloomberg, NCM

The CSaaS category is a subset of SaaS overall. SaaS metrics largely drive CSaaS values now. CSaaS stocks historically were valued below overall SaaS multiples, but they are now in line. Investors have realized the value of CSaaS is similar to any SaaS category, and that the CSaaS opportunity is larger than any individual SaaS vertical. Also, penetration remains very low at 10% or less in most CSaaS categories. Given those factors, and the complexity in managing real-time communications, we believe CSaaS multiples could continue to expand and achieve a premium to other SaaS multiples.

We estimate TEUM to have a pro forma organic growth rate of 52% in FY19 and EBITDA margin of 17.2%, which equates to a 69 reading on the Rule of 40 matrix. Pareteum's organic Rule of 40 metric in 3Q18 was 151. All the FY19 growth is tied to Pareteum backlog deployments, which gives us great confidence in the overall growth rate. This produces a 7.5x FY20 target revenue multiple given the comps in our view. As such, we are establishing a \$7.50 12-month target using 7.5x FY20 revenue.

We will update our model when the iPass acquisition closes. A preliminary estimate would have pro forma organic growth of 27% in FY19 with 15% EBITDA margin (Rule of 40 of 42); FY20 pro forma organic growth of 28% (almost all growth from Pareteum organic) and 18% EBITDA margins (Rule of 40 of 46).

Company Description

Pareteum offers a SaaS platform that enables agile communications operators and enterprises to develop and sell mobile and IoT services. The current principal executive officer joined the company in Nov. 2015 as executive chairman, cutting costs and positioning the company for a return to growth. He began to hire senior managers in 2016. Pareteum had a strong technology foundation (via \$75 million invested in R&D by the original Elephant Talk organization, which was renamed Pareteum) as proven by Vodafone's use of the platform. However, prior management did not manage the company effectively.

In 2017 Pareteum began hiring sales people and started to win new contracts for the first time in several years. This has led to material acceleration in contract signings, bookings, backlog and revenue growth. The company is further adding sales feet on the street and regional support, which should help overall growth.

Pareteum is using acquisitions to fulfill its vision as well. The Artilium (Belgium based) acquisition adds more depth to the technology platform and diversity to revenue. Artilium closed Oct. 1. Pareteum recently announced it will acquire Redwood Shores-based iPass, which adds more WiFi network coverage and subscriber/network management. iPass will also help with US coverage as Pareteum and Artilium have been heavily international.

Unlike many SaaS companies that grow at any cost, Pareteum has shown great discipline in generating strong EBITDA margins.

After the Artilium acquisition, total headcount was 145. Once iPass closes, and after headcount reductions, total headcount should be in the 245 range.

Product Overview

Pareteum sells CSaaS which enables agile mobile operators and enterprises to develop and sell mobile and IoT services. At a high level, Pareteum's platform provides **cloud-based communications-centric CRM, business and operations support system, and mobile network core capabilities**. The technologies enable customers to develop, sell, provision and manage mobile and IoT services. Closely aligned with those functions is Pareteum's global network, which provides its customers access to the best cellular and WiFi networks available. Pareteum's mobile network core SaaS and network connections enable customers to switch among the best radio access and WiFi networks available.

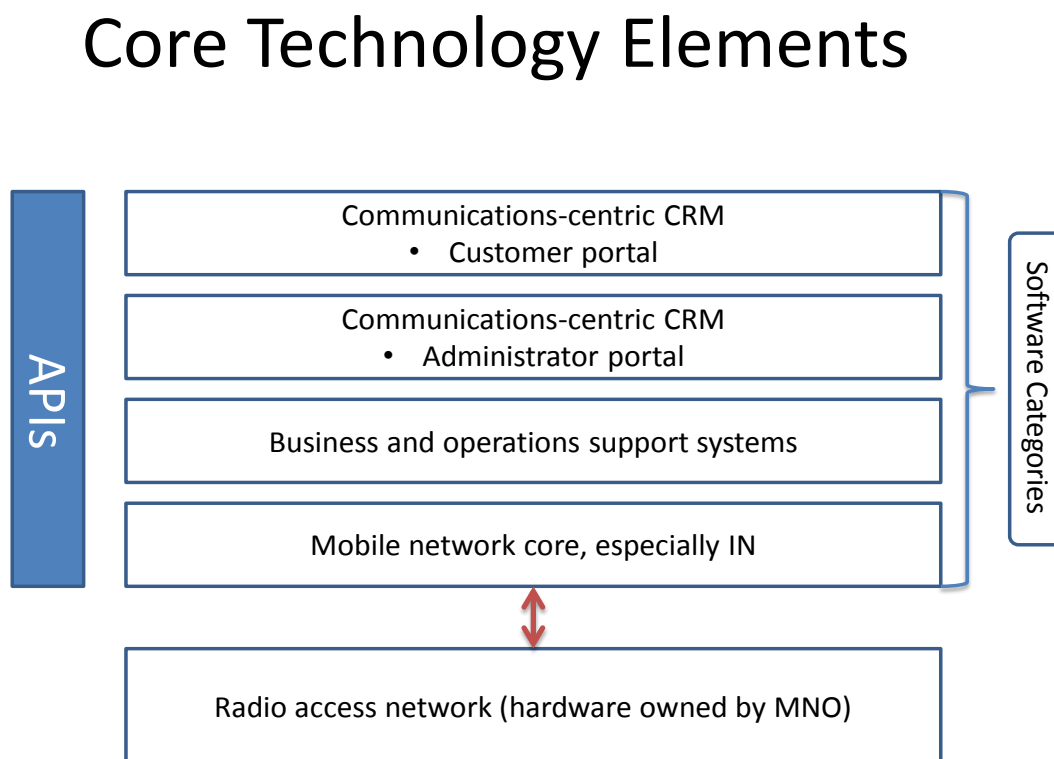
The chart below provides an **overview of the important technology layers** involved in providing mobile and IoT services. The comm-centric CRM includes a customer portal, which is the website customers use to buy services, pay bills and manage accounts, and the administrator portal, which the operator uses to manage customer data and accounts. Business and operations support systems are widely-used mobile operator technology, providing billing, provisioning and network management functions. Mobile network core is the routing and network intelligence software needed to route traffic among cellular and

WiFi networks. Pareteum specializes in the intelligent network software function (within the mobile core), which effectively sits above communications network functions (such as SS7, CAMEL, Diameter, GGSN (backhaul), HLRs and STPs). Furthermore, customers can quickly and easily access all the platform functions via APIs.

Pareteum's software offers a comprehensive suite and includes virtualized versions of a few third party functions (such as the NetNumber STP). A key value-add is that the customer gets one bill for all these functions. We expect internal development and acquisitions to enable the SaaS platform to become more streamlined and efficient over time as well. The ability to offer WiFi is in big demand we believe.

Pareteum's SaaS offers all functions except for the radio access networks, which mobile network operators offer and Pareteum leverages via its mobile network core software and numerous direct connections around the globe. The Pareteum software stack underpins Pareteum's three main offerings: **Global Software-Defined Cloud, Managed Services, and Application Development Environment.**

Figure 4: Core Technologies



Source: NCM

The **Artium** acquisition further enhanced Pareteum's capabilities in the four main areas above. Artium also added more European presence, and new customer-facing and enterprise applications, such as IVR, messaging and contact center. The **iPass** acquisition, to close in 1Q19, enhances subscriber network management and data analytics and expands the network reach.

Most new contracts involve Pareteum's Global Software-Defined Cloud, which is a pure SaaS offering encompassing all technology layers typically. Pareteum sells a managed service to a few large customers, where the technology effectively sits behind the large operator's firewall. Pareteum also offers an application development environment that software developers can use to make new services. A big focus here is around IoT. Pareteum has a model here similar to Twilio (TWLO, OP), where a developer can make an IoT application and deploy quickly, globally and securely via the Pareteum network.

iPass, which should close in 1Q19, expands Pareteum's capabilities in network management, data analytics and global connectivity. iPass technology directs the subscribers phone to connect to the best network available. The iPass network covers 68 million hotspots around the globe (last mile connectivity), more than doubling Pareteum's organic reach. iPass also has unique data analytics, which can help enterprises understand user activity based on location. Joint wins via the Pareteum partnership have been for WiFi offload so far. We see 5G driving even more demand for WiFi offload business. The original partnership started in 1Q18.

Customer Feedback

We recently spoke and met with Pareteum customers. Here are examples of feedback.

Retail Brand. The organization sells mobile and fixed line communications services in addition to other consumer goods, and views tier 1 mobile operators as the competition. In total the company has about 100k communications subscribers. The company had several on-premises systems (back office, billing, provisioning), including an internally developed one. Such systems were costly to maintain and prevented the company from quickly addressing new opportunities. The retailer looked at several alternatives and found Pareteum to be the best option given its SaaS foundation, strength across both billing and OSS, and global reach. Others had billing or OSS but not both, or did have both but were weak across both. Another didn't scale as needed. Our contact noted the legacy on-premises vendors like Amdocs have cloud offerings, but they have limitations inherent in their on-premises foundation. Pareteum has customized a few applications for the retailer as well. This retailer has a separate contract for network connectivity directly with the mobile operators. He liked the acquisition of Artium as it gives more European coverage.

Combined MVNO and MVNO Enabler. This organization uses Pareteum as the core system to support an MVNO as well as itself being an MVNO enabler for other MVNOs. Total subscribers supported are 1.3 million, and growing rapidly. The company uses the full Pareteum suite of comm-centric CRM, B/OSS and mobile network core services. This Pareteum customer found Pareteum's technology was more agile than traditional MNO on-premises systems, and more robust than more directly competitive cloud offerings. Price per subscriber varies based on services supported, such as higher for the full MVNO service versus being an enabler to other MVNOs. Pareteum has customized a few services as needed, such as supporting wireline in the retail offering. The customer noted that a core need was an ability to quickly address emerging and changing markets, and Pareteum's platform fit such a need. The customer believes Pareteum's platform could support more than a doubling of subscribers. While one

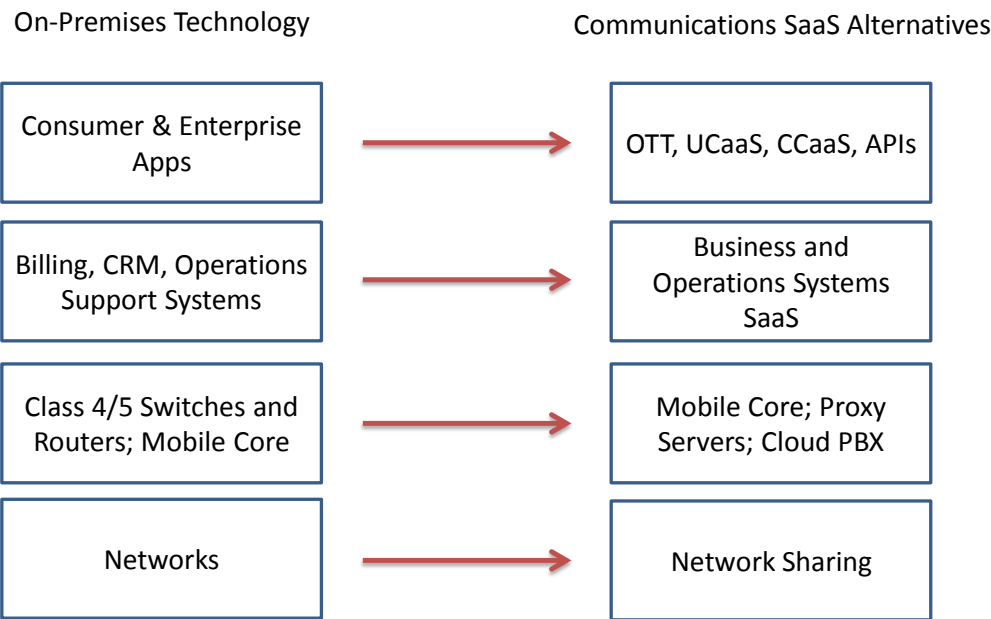
MVNO using the customer's MVNE services is being acquired, the core retail offering is growing rapidly and more MVNOs could become customers of the Pareteum customer. Pareteum has always met its service level agreement with the customer. The customer likes the Artilium and iPass acquisition as it gives Pareteum more resources overall.

Communications SaaS (CSaaS)

Several multi-billion dollar communications software categories are now evolving to the CSaaS model. Large categories include phone and contact center systems via companies such as Five9 (FIVN, OP), RingCentral (RNG, OP) and Twilio (TWLO, OP). While CSaaS emerged later than some enterprise SaaS categories (because of the involvement of real-time communications embedded in daily business processes), the move to CSaaS and disruption of on-premises systems is well underway. We list most CSaaS companies in figure 9 below. Growth rates for leaders have been 30%+.

Figure 5: Communications Software & SaaS Categories

Communications Software Categories



Source: NCM

This market evolution has benefited the growth and stocks of public CSaaS companies, leading to 244% appreciation in the Northland CSaaS stock index over the past three years.

A Large On-Premises Software Category Moving to the SaaS Model

Figure 4 above outlines the technologies that enable mobile and IoT services. The typical model (representing 90% of the market still) is on-premises B/OSS and mobile network core software. This is software that a mobile operator or MVNO would buy and run in their own data centers. The radio access network is still hardware. As with most software categories, the portals (customer relationship and interaction software), business and operations support systems and mobile network core (routing and intelligence) can all be provided via a SaaS model. This is what Pareteum offers.

The software categories are large. Heavy Reading estimates the B/OSS market alone at \$18 billion per year. Large vendors here include Amdocs, Huawei, and Ericsson among others. The mobile network core is also in the multi-billion range, including companies such as Ericsson and Affirmed. (Comm-centric CRM is sometimes included in the B/OSS category.)

As with any on-premises software category, the customer of the software must spend capex upfront, hire IT people to run the software, and hope for updates to come every 1-2 years. This is an inherently unattractive model and the reason so many software categories have moved to SaaS. We believe only **10% of B/OSS and mobile network core have evolved to SaaS**, and even some that claim to be cloud-based are massaged versions of on-premises software.

Pareteum offers a SaaS version of comm-centric CRM, B/OSS and mobile network core. Similar to other SaaS value, Pareteum's SaaS enables customers to pay with opex over capex, minimize IT hires, and get more frequent feature updates. The platform is also easy to consume and cost effective. We believe these inherent advantages will further propel Pareteum's growth just as SaaS models have in other enterprise software categories, such as UCaaS and CCaaS have versus on-premises UC and contact center software.

Furthermore, telecom technologies often have proprietary flavors and require substantial integration work to ensure all elements work together. This is why professional services are such a big part of the B/OSS market. Various groups, such as the TM Forum, have tried to develop standards to ensure better interoperability, and some progress has occurred around NFV. However, substantial obstacles exist for smooth operation and integration. These impediments **further provide an impetus for a fully-integrated cloud service** that overcomes interop and integration hurdles in the B/OSS and mobile core space.

While large mobile network operators are heavily tied to on-premises systems, savvy emerging operators and enterprises see ways to quickly get to market with B/OSS and mobile network core SaaS. There is a **parallel here** with many SaaS categories where small companies adopt a SaaS category first, and then the SaaS model moves up market. RingCentral (RNG, OP) is a great example of that in the UCaaS space and salesforce.com in the CRM market.

As with many enterprise software categories, the **legacy software players** often try to build and offer their own SaaS offerings. This strategy frequently doesn't work as the original software does not migrate to a multi-tenant cloud version smoothly. Hence, while legacy on-premises B/OSS companies have cloud offerings, they tend to be managed services or custom service projects.

Pareteum is one of the leading and early players in cloud-based B/OSS and mobile network core. Their mobile network core intelligence, combined with direct connections among numerous wireless operators, further enables Pareteum to pick and choose the best cellular network for customers. And now with iPass soon in the fold, Pareteum's service will have a global WiFi network and enable use of the best cellular or WiFi network available.

Pareteum's customers can benefit from the best network options in any region without having to invest in the underlying network towers and switches. **This is akin to an Uber or Airbnb model**, where the service and customer experience exists because of the software, leveraging physical assets owned by others.

MVNO Market

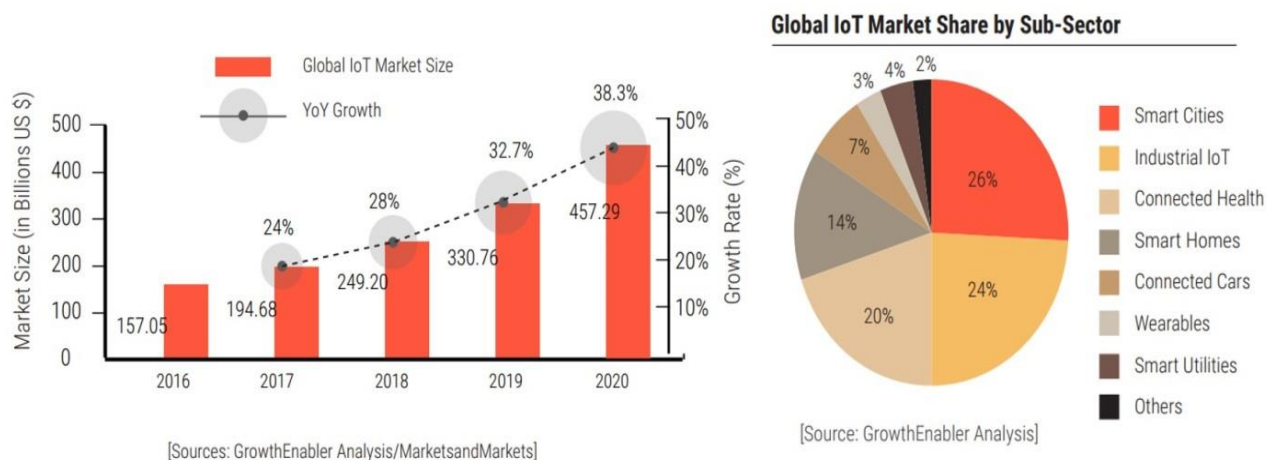
While multiple entities are prospects for Pareteum (such as enterprises, retailers, cable cos), one of the main target customer categories for Pareteum is the mobile virtual network operator (MVNO). We believe over half of Pareteum's backlog is in the MVNO category. There are about 1,000 MVNO's globally, representing about **10% of all mobile subscribers**. Global MVNO revenue is about \$50 billion per year, growing in the high single digit percent range.

At a high level, an MVNO is a wireless communications service provider that does not own the wireless network infrastructure over which it provides services. **An MVNO focuses on brand, applications and marketing**. They buy minutes from a mobile network operator (MNO which owns the radio access networks and towers) on a wholesale basis, or via an entity such as Pareteum. MVNOs can offer a full mobile plan competitive with an MNO, or they can specialize in certain areas such as IoT, media, business, and roaming. The discount model is the largest segment of the overall MVNO market, but IoT is growing rapidly.

MVNOs often buy B/OSS and elements of mobile network core software to support their initiatives. However, more **MVNO's are realizing a cloud version** of those technologies add speed and flexibility to their operations in our view.

IoT as a Driver

IoT has been a disruptive technology across numerous verticals and use cases. We believe the diversity of IoT models and rapid growth have created **numerous niches large mobile network operators cannot effectively or cost effectively address**. Such dynamics create openings for entrepreneurial organizations to create services around applications such as smart cities, connected cars, smart homes and buildings, and mobile payments. Furthermore, given many of the IoT offerings are new and via new entities, such entities are more likely to use a cloud CRM, B/OSS and mobile network core.

Figure 6: IoT Growth

Source: Markets and Markets

We recently met with a Pareteum customer, the manager of the **city of Kyiv** (aka Kiev). The city has a smart city initiative, which uses the Pareteum platform as the core communications and operations infrastructure. IoT applications such as smart parking and snow removal monitoring run on top of the Pareteum platform.

Figure 7: Kyiv Smart City Event

Source: NCM

Another Pareteum customer has outfitted lamp posts with digital signage, water monitoring, light monitoring and video cameras. This IoT MVNO charges \$20 per lamp post per month. Another Pareteum IoT customer monitors taxis in Las Vegas. Pareteum's application development environment is well-suited for IoT service development. We believe Pareteum's application development business (largely around IoT) **could triple to 15% of revenue in 12-18 months.**

Management

Executive chairman and principal executive officer Hal Turner joined the company in Nov. 2015, dedicated to turning the company around and returning it to growth. Mr. Turner hired most senior management listed below in 2016.

Robert Hal Turner, Founder, Executive Chairman and Principal Executive Officer. Mr. Turner brings over 40 years of experience in establishing thought leadership and strategy for software, telecom and technology companies. He began his career at AT&T (he was president and COO of BellSouth Communications), and subsequently worked in various telecom and tech companies that include Pac-West (chief executive), Panterra Networks and Telecom Netherlands (now KPN).

Denis McCarthy, President. Mr. McCarthy joined Pareteum from Mosaic Networkx Inc., a cloud-based data and telephony service provider, where he was SVP of finance and operations. He was previously CFO of AP Telecom, a global sales channel manager for Undersea Cable Installations, and CFO and COO of Pac-West.

Vic Bozzo, Co-Founder, CEO. Mr. Bozzo has been the CEO since November 2016. He was previously SVP of worldwide sales and marketing at Telarix, a B/OSS company in the interconnect market. His previous engagements include Pac-West where he served as President and GM of its Technologies division. He previously ran a start-up, Factor Communications, offering an innovative portfolio of cloud-based communication solutions. He sold Factor prior to joining Pac-West.

Bart Weijermars, CEO – EMEA (CEO of Artilium). Following the Artilium acquisition, erstwhile CEO of Artilium joined Pareteum as its CEO of EMEA region. Before Artilium, Mr. Weijermars was CEO of T-Mobile Netherlands and held several executive positions for T-Mobile Macedonia and KPN.

Rob Mumby, Chief Revenue Officer. Mr. Mumby joined Pareteum from Twilio (TWLO, OP) where he held the role of Director of Global Connectivity. His previous career positions include senior sales positions in several mobile and VoIP companies including TELUS, Qwest Communications and ITXC Corp.

Ali Davachi, CTO and COO. Mr. Davachi brings over 20 years of experience in managing complex technology architecture and delivery across multiple verticals and technology including big data, analytics, blockchain and security. He was previously serving Scivantage as its Chief Information Security Officer and SVP of Technology. He was a founder and CEO of enterprise IT and development company, Realware LLC. Previously, he served Transactis as its CTO and Wenger Swiss Army as Chief Information Officer and Global VP of Process.

Edward O'Donnell, CFO. Mr. O'Donnell was previously CFO of Ameri100, a SAP service provider. He earlier served as VP of Finance of Augme Technologies, CFO of AudioEye and Carlyle Capital Group and SVP of Finance and Investor Relations at ACTV, Inc. which was later acquired by OpenTV, a subsidiary of Liberty Media.

Amy Love, CMO. Ms. Love joined Pareteum in 2018 following her leadership position for statewide programs for the Georgia Institute of Technology Advance Technology Development Center. In early 2000s, she completed a business rotation for Deutsche Telekom and its mobile line of business, T-Mobile, where she worked across Europe to build corporate communication channels and tools to support the company's expansion.

Gary A Griffiths, President and CEO of iPass. Mr. Griffiths joined iPass after serving Trapit Inc. as its co-founder and CEO. He was previously President of Products and Operations at WebEx (one of the first CSaaS companies) and also served as Co-Founder and CEO of Everdream Corp, a SaaS company and as CEO of HEAT Inc. which was acquired by Sega.

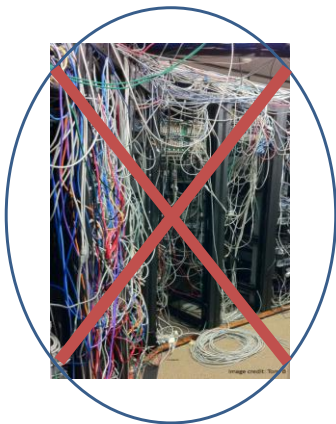
Competition

The typical competition is **on-premises software vendors** in the comm-centric CRM, B/OSS and mobile network core space. As we mentioned above, such companies (Amdocs, IBM, Ericsson, Oracle, Huawei) have inherent difficulties migrating their software platforms to a multi-tenant SaaS offering. These vendors often can't quickly address emerging needs given their cumbersome customization processes.

Figure 8: Competitive Overview

TEUM Differentiation

Legacy on-prem telco systems



Pareteum SaaS

V.



Source: NCM

Emerging SaaS competitors include Plintron, Effortel and i-New. They tend to excel in elements of the software stack, but typically don't support all layers. Pareteum offers a comprehensive platform, and uniquely includes mobile network core capabilities.

Effortel. Effortel is a Mobile Virtual Network Enabler (MVNE) providing platform-based transaction processing and management services for Mobile Virtual Network Operators (MVNO). It helps companies to build an MVNO business and assist in setting up various functionalities. It provides end-to-end service from designing, running and launching to maintaining an MVNO. Customers include Vodafone Malta, Equitel Kenya, TotalErg Italy, Globe Mobile, Carrefour Mobile Belgium and Voo Belgium.

I-New. I-New offers B2B customers a full-service technology platform to operate an MVNO. With I-New's platform, MVNOs can fully focus on their core competency in marketing, branding and acquisition of customers. I-New's Business Support System enables MVNOs to launch mobile business offerings at an affordable cost and assists in monetizing services over value added applications. Customers include Flash mobile, Uff movil , Simpati, Virgin Mobile, Media Market Mobile, Saturn Mobile, Maz Tiempo, weex, simpliTV, Compass, Bluesky, Albafone, Spark, Skinny Mobile, Z Mobile and T2.

Plintron. Plintron is a multi-country Cloud Communications-as-a-Service (CaaS) provider and a Virtual Network Operator, offering cloud communications solutions to consumer businesses, devices businesses and enterprise telephony businesses globally. Plintron's platform provides business and operational support catering to all MVNO requirements, irrespective of MVNO business model. Telecom operator ecosystem includes Vodafone, Telefonica, Orange, Telenor, O2, Telia, T-Mobile, BSNL, KPN, and Telstra.

Risks

In addition to competition, we see the following risks to investors in TEUM:

Revenue concentration. Vodafone was 80% of Pareteum revenue in 2017. Vodafone will continue to be an important customer. We expect they will be about 20% of FY19 revenue pre iPass, and 13% with iPass.

Light balance sheet. TEUM will likely exit the year with about \$4 million in cash and no debt. The company is FCF positive excluding 1-time items and thus, can fund growth. However, additional capital may be warranted.

Acquisition integration. With iPass closing in 1Q19, Pareteum will more than quintuple its revenue in a year. Pareteum is highly cost conscious as well, and reduces headcount post acquisitions. These are major organizational changes that need to be carefully managed. Pareteum minimizes acquisition risk by having strategic partnerships and co-selling with companies prior to the acquisition.

Global operations management. Pareteum sells and deploys globally, which has its own execution risks.

Deployments. Given the large amount of backlog at Pareteum, the major gating factor for FY19 growth is timing of deployments. We like that the imminent iPass acquisition brings about 50 software developers and engineers, which can help with deployments. Many customers need software refinements for their specific use cases. Large managed services deals can take a relatively long-time to deploy, and some countries require software to run behind firewalls.

Catalysts

We see the following events helping to drive the stock to our price target:

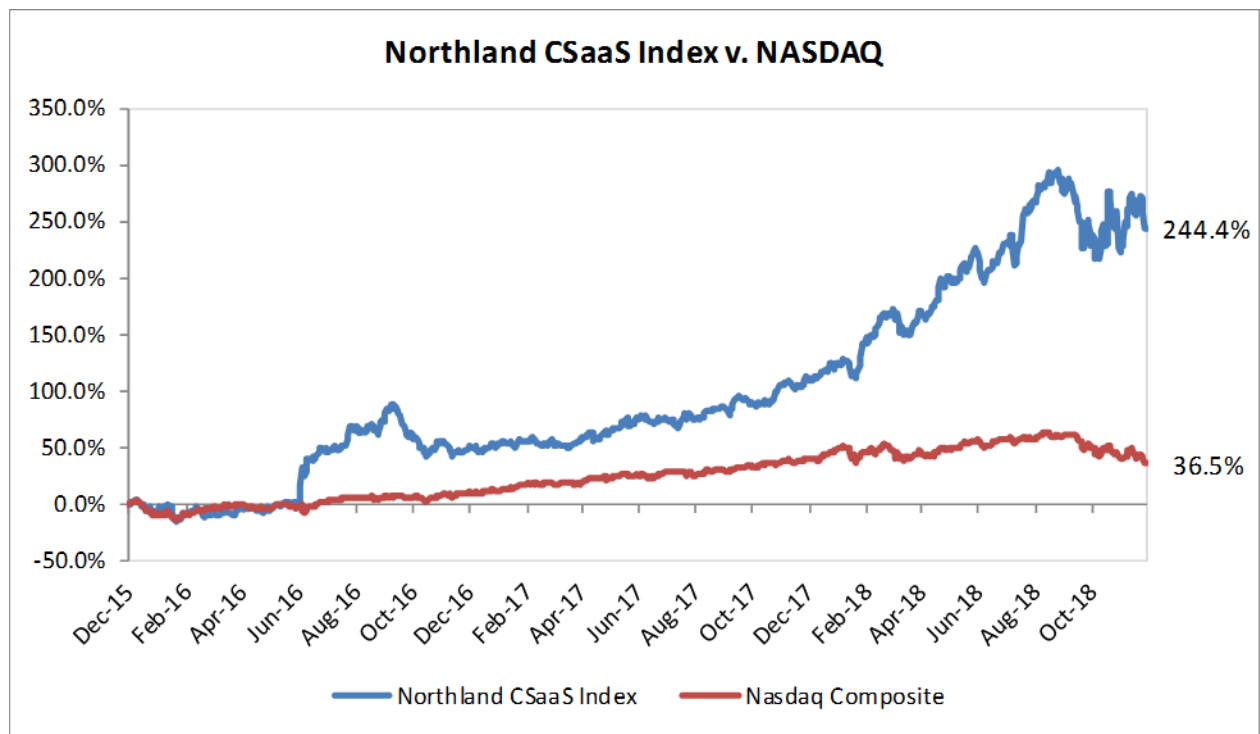
- Accelerating deployment of Pareteum's large backlog leading to strong revenue growth.
- Further contract wins, including in the US.
- Smooth integration of Artilium and iPass.
- Visible cross-sales among acquisitions, helping pro forma organic growth rates.
- More application development and IoT growth.
- Material upside from traveler SIM sales or more fully-packaged offerings.
- Consistently positive FCF.

Figure 9: CSaaS Master Metrics

| CSaaS Metrics Master Sheet | | | | | | | | |
|-----------------------------------|-----------|-----------|-----------|---------|-----------|---------|---------|--|
| | 1Q17 | 2Q17 | 3Q17 | 4Q17 | 1Q18 | 2Q18 | 3Q18 | |
| 8x8 | | | | | | | | |
| SaaS Revenue | 62,654 | 65,091 | 68,123 | 71,891 | 75,325 | 78,121 | 81,346 | |
| Growth | 24% | 21% | 18% | 20% | 20% | 20% | 19% | |
| Mid-Market Revenue | 34,836 | 37,093 | 39,155 | 42,345 | 44,900 | 47,478 | 49,621 | |
| Growth | 38% | 33% | 28% | 28% | 29% | 28% | 27% | |
| SMB Revenue | 27,818 | 27,998 | 28,755 | 29,546 | 30,300 | 30,658 | 31,725 | |
| Growth | 8% | 5% | 6% | 9% | 9% | 10% | 10% | |
| Mid-Market Bookings Growth | -7% | 14% | 0% | 40% | 10% | 25% | 50% | |
| Contact Center Revenue | | 13,800 | N/A | N/A | N/A | | | |
| Growth | 25% | 20% | | | | | | |
| Gross Margin | 83% | 82% | 82% | 83% | 82% | 81% | 81% | |
| Operating Margin | 7.0% | 3.5% | 4.8% | 1.3% | -4.4% | -5.0% | -5.0% | |
| Revenue Churn | 0.5% | 0.6% | 0.4% | 0.4% | 0.3% | 0.3% | 0.3% | |
| Avaya | | | | | | | | |
| Cloud Revenue | 70,000 | 70,000 | 70,000 | 70,000 | 78,000 | 80,000 | 82,000 | |
| Bandwidth.com | | | | | | | | |
| CPaaS Revenue | 31,600 | 31,500 | 33,400 | 35,000 | 38,900 | 39,800 | 41,500 | |
| Growth | | | 10% | 16% | 23% | 26% | 24% | |
| BroadSoft | | | | | | | | |
| SaaS Revenue | 15,000 | 15,500 | 16,000 | N/A | N/A | | | |
| Growth | 25% | 21% | 26% | N/A | N/A | | | |
| Software Billings | 25,643 | 30,647 | 30,000 | N/A | N/A | | | |
| Growth | 0% | -6% | 24% | N/A | N/A | | | |
| Operating Margin | 8.2% | 14.8% | 14.3% | N/A | N/A | | | |
| CLX Communications | | | | | | | | |
| Total Revenue | 69,700 | 84,700 | 96,000 | 109,400 | 105,800 | 115,000 | 112,264 | |
| Organic Growth | 20.0% | 18.0% | -2.0% | 7% | 13% | 18% | | |
| Everbridge | | | | | | | | |
| Total Revenue | 22,844 | 25,021 | 27,312 | 29,175 | 30,519 | 35,822 | 38,900 | |
| Growth | 34% | 35% | 37% | 37% | 34% | 43% | 43% | |
| ARPU (Monthly) | \$2,335 | \$2,468 | \$2,601 | \$2,675 | \$2,705 | | | |
| Growth | 12% | 16% | 19% | 18% | 16% | | | |
| Five9 | | | | | | | | |
| Revenue | 47,014 | 47,727 | 50,081 | 55,403 | 58,905 | 61,120 | 65,300 | |
| Growth | 24% | 23% | 22% | 25% | 25% | 28% | 30% | |
| Enterprise % of TTM | 70% | 71% | 73% | 74% | 75% | 76% | | |
| Enterprise TTM Growth | 40% | 39% | 36% | 37% | 38% | 37% | 37% | |
| SMB % of TTM | 30% | 29% | 27% | 26% | 26% | 24% | | |
| SMB Growth | 10% | 11% | 8% | 7% | 6% | 10% | 16% | |
| Gross Margin | 62% | 62% | 63% | 64% | 62% | 64% | 64% | |
| EBITDA Margin | 6% | 6% | 10% | 12% | 13% | 16% | 15% | |
| Fuze (cloud phone systems) | | | | | | | | |
| Revenue | | ~25,000 | N/A | ~30,000 | N/A | | | |
| Growth | | 51% | N/A | 50% | N/A | | | |
| Jive Communications (LOGM) | | | | | | | | |
| Revenue | | | | ~19,000 | | 24,200 | 27,000 | |
| Growth | | | | 20% | 24% | 26% | 30% | |
| LivePerson | | | | | | | | |
| Revenue | 50,919 | 54,074 | 56,493 | 57,390 | 58,241 | 61,660 | 64,200 | |
| Growth | -8% | -5% | 4% | 2% | 14% | 14% | 14% | |
| Mitel | | | | | | | | |
| SaaS Revenue | 31,000 | 30,900 | 36,000 | 77,800 | 68,100 | 69,800 | 71,700 | |
| Growth | 10% | 10% | 24% | NA | 18% | 18% | 13% | |
| NICE Systems | | | | | | | | |
| Cloud Revenue | 78,749 | 84,568 | 98,100 | 101,972 | 106,000 | 110,000 | 117,000 | |
| Growth (mainly acquired) | 584% | 570% | 589% | 110% | 33% | 28% | 20% | |
| Cloud Margin | 60% | 60% | 62% | 62% | 50% | 50% | 48% | |
| Ooma | | | | | | | | |
| SMB SaaS revenue | 4,700 | 5,350 | 5,883 | 6,510 | 7,194 | 7,913 | 8,309 | |
| Growth | 63% | 62% | 59% | 55% | 53% | 48% | 41% | |
| Pareteum | | | | | | | | |
| Total Revenue | 2,795 | 3,239 | 3,499 | 4,015 | 4,113 | 6,003 | 8,008 | |
| Growth | -15% | -1% | 10% | 28% | 47% | 85% | 129% | |
| RingCentral | | | | | | | | |
| SaaS Revenue | 103,687 | 110,413 | 119,401 | 129,662 | 136,960 | 145,959 | 158,000 | |
| Growth | 30% | 28% | 30% | 32% | 32% | 32% | 32% | |
| Total ARR | 450,500 | 478,000 | 513,700 | 546,000 | 589,000 | 630,000 | 674,000 | |
| Growth | 32% | 31% | 32% | 32% | 31% | 32% | 31% | |
| Office ARR | 373,000 | 399,000 | 433,700 | 466,000 | 509,000 | 548,000 | 592,000 | |
| Growth | 39% | 37% | 37% | 36% | 36% | 37% | 36% | |
| Mid-Market & Ent ARR | 115,000 | 131,000 | 153,000 | 178,000 | 205,000 | 237,000 | 270,000 | |
| Growth | 85% | 80% | 77% | 76% | 78% | 80% | 75% | |
| SMB ARR | 258,000 | 269,000 | 281,000 | 288,000 | 304,000 | 311,000 | 322,000 | |
| Growth | 24% | 23% | 22% | 20% | 18% | 15% | 15% | |
| Office Bookings | 34,500 | 26,000 | 34,700 | 32,500 | 43,000 | 39,000 | 44,000 | |
| Growth | 44% | 15% | 39% | 32% | 36% | 50% | 27% | |
| SaaS Gross Margin | 81% | 81% | 82% | 82% | 83% | 83% | 83% | |
| Operating Margin | 1.9% | 2.9% | 3.7% | 3.9% | 8.6% | 8.8% | 8.2% | |
| SendGrid (email API) | | | | | | | | |
| Revenue | \$24,831 | 27,012 | 28,316 | 31,729 | 32,600 | 35,675 | 37,200 | |
| Growth | 45% | 42% | 37% | 38% | 31% | 32% | 31% | |
| ShoreTel | | | | | | | | |
| CSaaS Revenue | 38,272 | 39,654 | N/A | N/A | N/A | | | |
| Growth | 17% | 17% | N/A | N/A | N/A | | | |
| Cloud Bookings Growth | 7% | N/A | N/A | N/A | N/A | | | |
| Non-GAAP Hosted GM | 57% | 55% | N/A | N/A | N/A | | | |
| Twilio | | | | | | | | |
| Revenue | 87,372 | 95,870 | 100,542 | 115,236 | 129,116 | 147,754 | 168,900 | |
| Growth | 47% | 49% | 41% | 41% | 48% | 54% | 68% | |
| Developers | 1,600,000 | | 1,900,000 | | | | | |
| Growth | 59% | 57% | 53% | 53% | 55% | 55% | 55% | |
| Operating Margin | -4.3% | -4.9% | -8.0% | -3.4% | -3.6% | 1.5% | 2.5% | |
| Vonage | | | | | | | | |
| CSaaS Revenue | 101,000 | 109,000 | 116,224 | 121,400 | 124,200 | 135,100 | 141,200 | |
| Growth | 24% | 26% | 25% | 23% | 24% | 24% | 22% | |
| Cloud Phone Revenue | 70,900 | 74,000 | 77,860 | 81,600 | 82,200 | 82,800 | 86,100 | |
| Growth | 17% | 19% | 16% | 17% | 17% | 13% | 12% | |
| API Revenue | 29,600 | 35,200 | 38,364 | 39,885 | 42,000 | 52,300 | 55,100 | |
| Growth | 33% | 44% | 44% | 36% | 42% | 49% | 44% | |
| Developers | 249,000 | 309,000 | 374,000 | 430,000 | 485,000 | 546,000 | 696,000 | |
| CSaaS Gross Margin | 58% | 53% | 54% | 55% | 55% | 53% | 55% | |
| Revenue Churn | 1.4% | 1.4% | 1.2% | 1.2% | 1.2% | 1.2% | 1.1% | |
| Zoom (video SaaS) | | | | | | | | |
| Revenue | | ~\$25,000 | N/A | N/A | ~\$43,000 | | | |
| Growth | | 150% | N/A | N/A | 100%+ | 100%+ | | |

Source: Company Reports, NCM

Figure 10: Northland CSaaS Index



Source: NCM, Factset

Figure 11: SaaS Comps

| | Ticker | Name of the Company | Current Market Price | Market Capitalization (\$ mil) | Enterprise Value (\$ mil) | Revenue Growth CY18 | Revenue Growth CY19 | EBITDA Margin CY18 | EBITDA Margin CY19 | CY18 EBITDA Margin + Growth | CY19 EBITDA Margin + Growth | EV/Sales CY18 | EV/Sales CY19 | EV/EBITDA CY18 | EV/EBITDA CY19 |
|------------------------------------|---------|--------------------------------|----------------------|--------------------------------|---------------------------|---------------------|---------------------|--------------------|--------------------|-----------------------------|-----------------------------|---------------|---------------|----------------|----------------|
| Growth plus EBITDA Margin: >40% | APPF | Appfolio Inc | 56.04 | 1,919 | 1,874 | 30.6% | 27.4% | 22.1% | 24.8% | 52.7% | 52.2% | 10.0x | 7.8x | 45.1x | 31.6x |
| | TEAM | Atlassian Corp PLC | 79.85 | 19,016 | 18,049 | 37.8% | 30.2% | 11.8% | 25.2% | 49.6% | 55.4% | 17.6x | 13.5x | 149.6x | 53.7x |
| | TEUM | Pareteum Corp | 1.47 | 143 | 125 | 132.0% | 52.0% | 18.0% | 17.0% | 150.0% | 69.0% | 3.9x | 1.6x | 31.3x | 11.2x |
| | PAYC | Paycom Software Inc | 123.35 | 7,230 | 7,180 | 29.3% | 24.2% | 41.8% | 41.7% | 71.1% | 65.9% | 12.8x | 10.3x | 30.7x | 24.7x |
| | PCTY | Paylocity Holding Corp | 60.29 | 3,183 | 3,098 | 24.4% | 19.9% | 16.5% | 28.9% | 40.9% | 48.8% | 7.5x | 6.2x | 45.3x | 21.5x |
| | PFTT | Proofpoint Inc | 84.75 | 4,631 | 4,441 | 38.0% | 23.1% | 18.7% | 17.9% | 56.7% | 41.0% | 6.2x | 5.1x | 33.4x | 28.4x |
| | QLYS | Qualys Inc | 71.26 | 2,806 | 2,418 | 20.9% | 18.9% | 39.7% | 38.4% | 60.5% | 57.3% | 8.7x | 7.3x | 21.8x | 19.0x |
| | RP | RealPage Inc | 46.92 | 4,406 | 4,724 | 30.1% | 14.9% | 26.6% | 28.5% | 56.7% | 43.4% | 5.4x | 4.7x | 20.4x | 16.5x |
| | CRM | salesforce.com Inc | 130.83 | 100,085 | 100,311 | 26.3% | 20.8% | 24.2% | 24.6% | 50.6% | 45.3% | 7.6x | 6.3x | 31.3x | 25.5x |
| | NOW | ServiceNow Inc | 171.47 | 30,745 | 29,933 | 35.0% | 29.1% | 25.7% | 27.3% | 60.7% | 56.3% | 11.5x | 8.9x | 44.6x | 32.6x |
| | SHOP | Shopify Inc | 129.66 | 14,320 | 12,741 | 56.6% | 39.3% | 3.5% | 6.6% | 60.2% | 45.9% | 12.1x | 8.7x | 340.8x | 132.1x |
| | TTD | Trade Desk Inc/The | 124.48 | 5,383 | 5,216 | 50.8% | 32.9% | 31.5% | 30.4% | 82.3% | 63.3% | 11.2x | 8.4x | 35.6x | 27.8x |
| | TYL | Tyler Technologies Inc | 180.92 | 7,024 | 6,752 | 12.3% | 10.4% | 29.2% | 30.1% | 41.5% | 40.6% | 7.2x | 6.5x | 24.5x | 21.5x |
| | ULTI | Ultimate Software Group Inc/Th | 234.83 | 7,343 | 7,214 | 20.8% | 19.9% | 24.3% | 24.2% | 45.2% | 44.1% | 6.3x | 5.3x | 26.1x | 21.9x |
| | VEEV | Veeva Systems Inc | 86.02 | 12,499 | 11,447 | 25.0% | 18.9% | 36.6% | 35.7% | 61.6% | 54.7% | 13.4x | 11.2x | 36.5x | 31.4x |
| | WDAY | Workday Inc | 153.76 | 33,520 | 33,128 | 31.0% | 25.2% | 16.7% | 18.6% | 47.8% | 43.8% | 11.8x | 9.4x | 70.6x | 50.8x |
| | Average | | | | | | | | | 26.2% | 61.7% | 9.6x | 7.6x | 61.7x | 34.4x |
| | Median | | | | | | | | | 26.2% | 56.7% | 9.3x | 7.6x | 34.5x | 26.7x |
| Growth plus EBITDA Margin: 30%-40% | TWOU | 2U Inc | 52.98 | 3,069 | 2,602 | 43.6% | 32.8% | 4.3% | 2.3% | 47.9% | 35.1% | 6.3x | 4.8x | 147.7x | 209.4x |
| | AYX | Alteryx Inc | 57.79 | 3,547 | 3,219 | 52.9% | 35.3% | 0.9% | 2.3% | 53.8% | 37.6% | 16.0x | 11.8x | 1691.4x | 507.4x |
| | ASUR | Asure Software Inc | 5.32 | 81 | 175 | 62.5% | 18.0% | 20.8% | 21.5% | 83.2% | 39.5% | 2.0x | 1.7x | 9.5x | 7.8x |
| | ATHN | athenahealth Inc | 132.08 | 5,364 | 5,318 | 10.1% | 9.2% | 27.6% | 28.5% | 37.7% | 37.6% | 4.0x | 3.6x | 14.4x | 12.7x |
| | BL | Blackline Inc | 38.61 | 2,110 | 1,985 | 28.2% | 23.2% | 7.2% | 8.6% | 35.4% | 31.9% | 8.7x | 7.1x | 121.8x | 82.1x |
| | EPAY | Bottomline Technologies DE Inc | 46.69 | 2,012 | 2,032 | 13.0% | 7.8% | 14.4% | 24.1% | 27.4% | 31.9% | 4.9x | 4.6x | 34.2x | 18.9x |
| | CARB | Carbonite Inc | 25.29 | 874 | 790 | 26.7% | 10.6% | 31.2% | 27.9% | 57.9% | 38.5% | 2.6x | 2.4x | 8.3x | 8.4x |
| | COUP | Coupa Software Inc | 60.14 | 3,575 | 3,340 | 35.7% | 23.8% | 7.7% | 7.4% | 43.4% | 31.1% | 13.2x | 10.6x | 171.3x | 144.7x |
| | FINV | Five9 Inc | 40.74 | 2,394 | 2,322 | 25.9% | 17.2% | 16.4% | 17.3% | 42.3% | 34.5% | 9.2x | 7.9x | 56.1x | 45.5x |
| | HUBS | HubSpot Inc | 125.54 | 4,925 | 4,677 | 34.7% | 25.6% | 10.4% | 11.8% | 45.1% | 37.3% | 9.2x | 7.4x | 88.9x | 62.5x |
| | MIME | Mimecast Ltd | 31.90 | 1,916 | 1,873 | 32.3% | 20.2% | 8.6% | 17.1% | 40.9% | 37.3% | 5.9x | 4.9x | 68.2x | 28.6x |
| | NEWR | New Relic Inc | 80.28 | 4,573 | 4,237 | 33.9% | 26.5% | 6.1% | 11.6% | 40.0% | 38.1% | 9.6x | 7.6x | 156.8x | 65.1x |
| | RNG | RingCentral Inc | 77.49 | 6,225 | 6,013 | 32.8% | 23.7% | 10.6% | 11.3% | 43.4% | 35.0% | 9.0x | 7.3x | 85.2x | 64.3x |
| | SEND | SendGrid Inc | 42.16 | 1,997 | 1,827 | 29.0% | 25.6% | 12.7% | 13.6% | 41.7% | 39.3% | 12.7x | 10.1x | 99.3x | 74.0x |
| | SPSC | SPS Commerce Inc | 79.62 | 1,406 | 1,212 | 12.0% | 9.6% | 20.8% | 22.8% | 32.7% | 32.4% | 4.9x | 4.5x | 23.6x | 19.7x |
| | TWLO | Twilio Inc | 87.45 | 8,645 | 8,328 | 57.8% | 31.9% | 2.0% | 3.4% | 59.8% | 35.3% | 13.2x | 10.0x | 675.3x | 298.3x |
| | ZEN | Zendesk Inc | 55.91 | 5,985 | 5,626 | 37.6% | 31.5% | 5.9% | 8.2% | 43.4% | 39.8% | 9.5x | 7.2x | 161.5x | 87.7x |
| | ZS | Zscaler Inc | 38.27 | 4,679 | 4,364 | 52.2% | 31.2% | -7.8% | 3.6% | 44.4% | 34.8% | 18.6x | 14.2x | NA | 394.7x |
| | Average | | | | | | | | | 45.6% | 35.9% | 8.9x | 7.1x | 212.6x | 118.4x |
| | Median | | | | | | | | | 43.4% | 36.3% | 9.1x | 7.3x | 88.9x | 64.7x |
| Growth plus EBITDA Margin: 20%-30% | EGHT | 8x8 Inc | 17.82 | 1,700 | 1,571 | 18.7% | 19.8% | -11.6% | 1.2% | 7.1% | 21.0% | 4.7x | 3.9x | NA | 336.8x |
| | BNFT | Benefitfocus Inc | 51.86 | 1,657 | 1,736 | 0.1% | 15.8% | 3.4% | 7.4% | 3.5% | 23.2% | 6.8x | 5.8x | 199.2x | 78.8x |
| | CLX | CLX Communications AB | 9.01 | 483 | 541 | 22.0% | 17.0% | 8.5% | 10.1% | 30.6% | 27.1% | 1.2x | 1.1x | 14.5x | 10.5x |
| | CSOD | Cornerstone OnDemand Inc | 50.19 | 2,942 | 2,839 | 10.6% | 6.4% | 18.2% | 23.3% | 28.7% | 29.7% | 5.3x | 5.0x | 29.3x | 21.5x |
| | EVBG | Everbridge Inc | 50.51 | 1,498 | 1,488 | 39.9% | 26.6% | -2.0% | 1.6% | 37.9% | 28.2% | 10.2x | 8.1x | NA | 490.8x |
| | GWRE | Guidewire Software Inc | 80.27 | 6,504 | 5,728 | 26.3% | 5.2% | 10.9% | 17.8% | 37.3% | 23.0% | 7.9x | 7.5x | 71.9x | 41.9x |
| | LPSN | LivePerson Inc | 18.64 | 1,182 | 1,116 | 13.9% | 13.5% | 7.6% | 8.5% | 21.5% | 22.0% | 4.5x | 3.9x | 58.7x | 46.5x |
| | MB | MINDBODY Inc | 23.93 | 1,147 | 1,071 | 34.2% | 21.2% | 0.9% | 4.1% | 35.1% | 25.3% | 4.4x | 3.6x | 472.2x | 87.9x |
| | MDB | MongoDB Inc | 82.88 | 4,443 | 4,134 | 58.4% | 41.6% | -28.9% | -15.4% | 29.5% | 26.2% | 16.9x | 11.9x | NA | NA |
| | OKTA | Okta Inc | 60.45 | 6,676 | 6,398 | 50.3% | 32.1% | -10.3% | -3.8% | 40.0% | 28.3% | 16.4x | 12.4x | NA | NA |
| | YEXT | Yext Inc | 14.52 | 1,465 | 1,358 | 33.8% | 30.8% | -15.1% | -10.5% | 18.7% | 20.3% | 6.0x | 4.6x | NA | NA |
| | Average | | | | | | | | | 26.3% | 24.9% | 7.6x | 6.2x | 141.0x | 139.3x |
| | Median | | | | | | | | | 4.1% | 29.5% | 6.0x | 5.0x | 65.3x | 62.7x |
| Growth plus EBITDA Margin: <20% | AMBR | Amber Road Inc | 8.25 | 229 | 241 | 7.2% | 7.1% | 5.9% | 6.4% | 13.1% | 13.5% | 2.8x | 2.7x | 48.4x | 41.3x |
| | APPN | Appian Corp | 25.13 | 1,600 | 1,493 | 25.7% | 14.7% | -13.6% | -10.3% | 12.1% | 4.4% | 6.7x | 5.9x | NA | NA |
| | BCOV | Brightcove Inc | 7.35 | 268 | 241 | 5.8% | 6.1% | 0.7% | 3.6% | 6.5% | 9.6% | 1.5x | 1.4x | 211.5x | 38.6x |
| | ECOM | ChannelAdvisor Corp | 10.03 | 274 | 226 | 6.9% | 7.0% | 6.2% | 7.8% | 13.1% | 14.8% | 1.7x | 1.6x | 28.0x | 20.7x |
| | CLDR | Cloudera Inc | 11.36 | 1,744 | 1,294 | 23.2% | 18.9% | -10.3% | -6.5% | 12.9% | 12.4% | 2.9x | 2.4x | NA | NA |
| | HDP | Hortonworks Inc | 14.83 | 1,249 | 1,148 | 30.5% | 23.2% | -9.2% | -7.7% | 21.3% | 15.5% | 3.4x | 2.7x | NA | NA |
| | INST | Instructure Inc | 37.01 | 1,298 | 1,126 | 31.6% | 23.9% | -7.8% | -4.5% | 23.8% | 19.4% | 5.4x | 4.3x | NA | NA |
| | TLND | Talend SA | 33.27 | 1,001 | 912 | 38.3% | 21.9% | -6.8% | -3.2% | 31.5% | 18.7% | 4.4x | 3.6x | NA | NA |
| | WK | Workiva Inc | 34.68 | 1,521 | 1,442 | 16.9% | 14.8% | -6.7% | -3.0% | 10.2% | 11.8% | 5.9x | 5.2x | NA | NA |
| | Average | | | | | | | | | -1.9% | 16.1% | 3.9x | 3.3x | 96.0x | 33.5x |
| | Median | | | | | | | | | -3.2% | 13.1% | 3.4x | 2.7x | 48.4x | 38.6x |

Source: NCM, Factset

Figure 12: Pro Forma Analysis

| (\$thousands) | 1Q18 | 2Q18 | 3Q18 | 4Q18E | FY18E | 1Q19E | 2Q19E | 3Q19E | 4Q19E | FY19E | FY20E |
|---------------------------------|--------|--------|--------|--------|--------|------------|------------|------------|-------------|------------|------------|
| Pareteum | | | | | | | | | | | |
| Revenue | 4,113 | 6,003 | 8,008 | 9,000 | 27,124 | 9,912 | 11,706 | 14,414 | 18,900 | 54,933 | 81,646 |
| Growth | 47% | 85% | 129% | 124% | 100% | 141% | 95% | 80% | 110% | 103% | 49% |
| Artidium | | | | | | | | | | | |
| Revenue | 6,184 | 6,184 | 6,317 | 4,250 | 22,934 | 4,500 | 5,000 | 5,500 | 6,000 | 21,000 | 23,500 |
| Growth | | | | | | -27% | -19% | -13% | 41% | -8% | 12% |
| TOTAL | | | | | | | | | | | |
| Revenue | 10,297 | 12,187 | 14,325 | 13,250 | 50,058 | 14,412 | 16,706 | 19,914 | 24,900 | 75,933 | 105,146 |
| Pro Forma Organic Growth | | | | | | 40% | 37% | 39% | 88% | 52% | 38% |
| EM | | | | | | 17% | 16% | 18% | 18% | 17% | 20% |
| Rule of 40 | | | | | | 57% | 53% | 57% | 106% | 69% | 58% |
| iPass | | | | | | | | | | | |
| Revenue | 11,400 | 10,500 | 9,275 | 9,000 | 40,175 | 9,000 | 9,500 | 10,000 | 10,000 | 38,500 | 41,500 |
| Growth | -20% | -22% | -31% | -32% | -26% | -21% | -10% | 8% | 11% | -4% | 8% |
| TOTAL with iPass | | | | | | | | | | | |
| Revenue | 21,697 | 22,687 | 23,600 | 22,250 | 90,233 | 23,412 | 26,206 | 29,914 | 34,900 | 114,433 | 146,646 |
| Pro Forma Organic Growth | | | | | | 8% | 16% | 27% | 57% | 27% | 28% |
| EBITDA | | | | | | 2,393 | 3,686 | 4,992 | 5,964 | 17,034 | 26,462 |
| EM | | | | | | 10% | 14% | 17% | 17% | 15% | 18% |
| Rule of 40 | | | | | | 18% | 30% | 43% | 74% | 42% | 46% |

source: NCM, company reports

Figure 13: Income Statement

| FY Ending Dec 31; \$ thousands | 1Q17 | 2Q17 | 3Q17 | 4Q17 | FY17 | 1Q18 | 2Q18 | 3Q18 | 4Q18E | FY18E | 1Q19E | 2Q19E | 3Q19E | 4Q19E | FY19E | FY20E |
|-----------------------------------|----------------|----------------|----------------|----------------|-----------------|----------------|--------------|----------------|----------------|-----------------|----------------|---------------|---------------|---------------|---------------|----------------|
| Revenue | 2,795 | 3,239 | 3,499 | 4,015 | 13,548 | 4,113 | 6,003 | 8,008 | 13,250 | 31,374 | 14,412 | 16,706 | 19,914 | 24,900 | 75,933 | 105,146 |
| Cost of Revenue | 842 | 946 | 791 | 1,105 | 3,684 | 1,195 | 1,780 | 2,129 | 5,035 | 10,139 | 5,333 | 6,014 | 6,970 | 8,466 | 26,783 | 34,386 |
| Gross Profit | 1,953 | 2,293 | 2,708 | 2,910 | 9,864 | 2,918 | 4,223 | 5,879 | 8,215 | 21,235 | 9,080 | 10,692 | 12,944 | 16,434 | 49,150 | 70,759 |
| Product Development | 285 | 274 | 497 | 424 | 1,480 | 727 | 754 | 766 | 1,590 | 3,837 | 1,729 | 2,005 | 2,191 | 2,739 | 8,664 | 11,011 |
| Sales and Marketing | 319 | 371 | 413 | 472 | 1,575 | 689 | 652 | 843 | 1,458 | 3,642 | 1,513 | 1,754 | 2,091 | 2,615 | 7,973 | 10,515 |
| General and Administrative | 2,365 | 1,491 | 1,579 | 4,662 | 10,097 | 2,297 | 2,214 | 8,128 | 4,638 | 17,277 | 5,044 | 5,847 | 6,771 | 8,217 | 25,879 | 35,472 |
| Restructuring and Acq Charges | 129 | 459 | 253 | 125 | 966 | 74 | 6 | 1,995 | 2,000 | 4,075 | 1,200 | - | - | - | 1,200 | - |
| Depreciation and Amortization | 844 | 873 | 1,433 | 1,384 | 4,533 | 965 | 994 | 999 | 1,050 | 4,008 | 1,050 | 1,050 | 1,050 | 1,050 | 4,200 | 4,200 |
| Operating Income | (1,989) | (1,175) | (1,467) | (4,157) | (8,787) | (1,834) | (397) | (6,852) | (2,520) | (11,603) | (1,457) | 36 | 842 | 1,814 | 1,234 | 9,562 |
| Adj. EBITDA | (198) | 462 | 604 | 708 | 1,576 | 283 | 1,297 | 1,780 | 2,130 | 5,490 | 2,393 | 2,686 | 3,492 | 4,464 | 13,034 | 20,962 |
| Other Non-Operating Income | 698 | (237) | (694) | (3,335) | (3,569) | (301) | 2,072 | (150) | (150) | 1,471 | (150) | (150) | (150) | (150) | (600) | (600) |
| Pre-tax Income | (1,291) | (1,412) | (2,161) | (7,492) | (12,356) | (2,135) | 1,675 | (7,002) | (2,670) | (10,132) | (1,607) | (114) | 692 | 1,664 | 634 | 8,962 |
| Tax | 1 | (68) | 148 | 26 | 107 | - | 19 | 20 | (27) | 12 | (16) | (1) | 7 | 17 | 6 | 90 |
| Net Income | (1,292) | (1,344) | (2,309) | (7,518) | (12,463) | (2,135) | 1,656 | (7,022) | (2,643) | (10,144) | (1,591) | (113) | 685 | 1,647 | 628 | 8,872 |
| Restructuring Charges | 129 | 459 | 253 | 125 | 966 | 74 | 6 | 1,995 | 2,000 | 4,075 | 1,200 | - | - | - | 1,200 | - |
| Stock Based Compensation | 818 | 305 | 409 | 2,780 | 4,289 | 1,078 | 694 | 5,638 | 1,600 | 9,010 | 1,600 | 1,600 | 1,600 | 1,600 | 6,400 | 7,200 |
| Pro Forma Net Income | (345) | (580) | (1,647) | (4,613) | (7,208) | (983) | 2,356 | 611 | 957 | 2,941 | 1,209 | 1,487 | 2,285 | 3,247 | 8,228 | 16,072 |
| Diluted EPS - GAAP | (0.14) | (0.10) | (0.16) | (0.26) | (0.76) | (0.04) | 0.03 | (0.12) | (0.03) | (0.16) | (0.01) | (0.00) | 0.01 | 0.02 | 0.01 | 0.08 |
| Diluted EPS - Pro Forma | (0.04) | (0.04) | (0.12) | (0.16) | (0.44) | (0.02) | 0.04 | 0.01 | 0.01 | 0.04 | 0.01 | 0.01 | 0.02 | 0.03 | 0.08 | 0.14 |
| Weighted Average Shares - Diluted | 9,322 | 12,911 | 14,304 | 28,613 | 16,338 | 50,062 | 64,741 | 104,437 | 105,437 | 81,169 | 106,437 | 107,437 | 108,437 | 109,437 | 107,937 | 111,937 |

Growth Analysis

| | | | | | | | | | | | | | | | | |
|--------------------|--------|-------|-------|-------|------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
| Revenue growth y/y | -14.6% | -0.9% | 10.3% | 27.7% | 5.4% | 47.2% | 85.3% | 128.9% | 230.0% | 131.6% | 250.4% | 178.3% | 148.7% | 87.9% | 142.0% | 38.5% |
| Revenue growth seq | -11.1% | 15.9% | 8.0% | 14.7% | | 2.4% | 46.0% | 33.4% | 65.5% | | 8.8% | 15.9% | 19.2% | 25.0% | | |
| Adj. EBITDA y/y | | | | | | NM | 180.7% | 194.7% | 200.8% | 248.4% | 745.5% | 107.1% | 96.2% | 109.6% | 137.4% | 60.8% |

Margin Analysis

| | | | | | | | | | | | | | | | | |
|----------------------------|--------|--------|--------|---------|--------|--------|-------|--------|--------|--------|--------|-------|-------|-------|-------|-------|
| Gross Margin | 69.9% | 70.8% | 77.4% | 72.5% | 72.8% | 70.9% | 70.3% | 73.4% | 62.0% | 67.7% | 63.0% | 64.0% | 65.0% | 66.0% | 64.7% | 67.3% |
| Product Development | 10.2% | 8.5% | 14.2% | 10.6% | 10.9% | 17.7% | 12.6% | 9.6% | 12.0% | 12.2% | 12.0% | 12.0% | 11.0% | 11.0% | 11.4% | 10.5% |
| Sales and Marketing | 11.4% | 11.5% | 11.8% | 11.8% | 11.6% | 16.8% | 10.9% | 10.5% | 11.0% | 11.6% | 10.5% | 10.5% | 10.5% | 10.5% | 10.5% | 10.0% |
| General and Administrative | 84.6% | 46.0% | 45.1% | 116.1% | 74.5% | 55.8% | 36.9% | 101.5% | 35.0% | 55.1% | 35.0% | 35.0% | 34.0% | 33.0% | 34.1% | 33.7% |
| Operating Margin | -71.2% | -36.3% | -41.9% | -103.5% | -64.9% | -44.6% | -6.6% | -85.6% | -19.0% | -37.0% | -10.1% | 0.2% | 4.2% | 7.3% | 1.6% | 9.1% |
| Adjusted EBITDA | -7.1% | 14.3% | 17.3% | 17.6% | 11.6% | 6.9% | 21.6% | 22.2% | 16.1% | 17.5% | 16.6% | 16.1% | 17.5% | 17.9% | 17.2% | 19.9% |
| Effective Tax Rate | -0.1% | 4.8% | -6.8% | -0.3% | -0.9% | 0.0% | 1.1% | -0.3% | 1.0% | -0.1% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% |
| Net Income | -46.2% | -41.5% | -66.0% | -187.2% | -92.0% | -51.9% | 27.6% | -87.7% | -19.9% | -32.3% | -11.0% | -0.7% | 3.4% | 6.6% | 0.8% | 8.4% |

source: NCM, company reports

Figure 14: Balance Sheet

| FY Ending Dec 31; \$ thousands | 1Q17 | 2Q17 | 3Q17 | 4Q17 | FY17 | 1Q18 | 2Q18 | 3Q18 | 4Q18E | FY18E | 1Q19E | 2Q19E | 3Q19E | 4Q19E | FY19E | FY20E |
|--|----------------|----------------|----------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Cash and Cash Equivalents | 1,409 | 742 | 700 | 13,538 | 13,538 | 15,759 | 19,205 | 18,435 | 4,001 | 4,001 | 4,086 | 6,344 | 9,282 | 13,642 | 13,642 | 28,303 |
| Restricted Cash | 670 | 700 | 699 | 200 | 200 | 230 | 229 | 430 | 430 | 430 | 430 | 430 | 430 | 430 | 430 | 430 |
| Accounts Receivables | 617 | 249 | 335 | 2,058 | 2,058 | 1,954 | 3,853 | 7,200 | 13,250 | 13,250 | 12,811 | 13,922 | 15,489 | 16,600 | 16,600 | 20,506 |
| Prepaid Expenses and Other Current Assets | 1,162 | 681 | 797 | 900 | 900 | 1,154 | 1,175 | 943 | 769 | 769 | 829 | 961 | 1,105 | 1,357 | 1,357 | 1,646 |
| Total Current Assets | 3,858 | 2,372 | 2,531 | 16,696 | 16,696 | 19,097 | 24,462 | 27,008 | 18,449 | 18,449 | 18,155 | 21,656 | 26,306 | 32,029 | 32,029 | 50,884 |
| Other Long Term Assets | 131 | 80 | 80 | 91 | 91 | 94 | 89 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 | 39 |
| Notest Receivable | 1,019 | 1,022 | 594 | 595 | 595 | 602 | 596 | 588 | 582 | 582 | 576 | 570 | 564 | 558 | 558 | 534 |
| Property and Equipment | 8,093 | 7,736 | 7,078 | 4,714 | 4,714 | 4,176 | 4,680 | 3,945 | 3,557 | 3,557 | 3,228 | 3,013 | 2,959 | 3,154 | 3,154 | 4,211 |
| Intangibles | - | 354 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Long Term Investments | - | - | - | 3,230 | 3,230 | 3,230 | 3,230 | 3,230 | 3,230 | 3,230 | 3,230 | 3,230 | 3,230 | 3,230 | 3,230 | 3,230 |
| Total Assets | 13,101 | 11,563 | 10,283 | 25,326 | 25,326 | 27,199 | 33,057 | 34,809 | 25,857 | 25,857 | 25,228 | 28,508 | 33,097 | 39,010 | 39,010 | 58,898 |
| Accounts Payable and Customer Deposits | 2,680 | 2,783 | 2,591 | 1,979 | 1,979 | 2,286 | 2,569 | 2,796 | 5,594 | 5,594 | 4,740 | 6,014 | 7,744 | 9,407 | 9,407 | 12,030 |
| Net Billings in Excess of Revenue | 873 | 563 | 434 | 243 | 243 | 316 | 259 | 123 | 133 | 133 | 128 | 139 | 155 | 166 | 166 | 205 |
| Deferred Revenue | 180 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Accrued Expenses and Other Payables | 5,589 | 4,968 | 4,700 | 5,250 | 5,250 | 4,841 | 3,698 | 3,891 | 3,074 | 3,074 | 3,315 | 3,842 | 4,421 | 5,428 | 5,428 | 6,582 |
| Senior Secured Loan - Short Term | 3,250 | 1,750 | 2,000 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 9% Unsecured Subordinate Convertible Notes | - | - | 559 | 66 | 66 | 119 | 134 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Total Current Liabilities | 12,571 | 10,063 | 10,283 | 7,538 | 7,538 | 7,562 | 6,659 | 6,901 | 8,891 | 8,891 | 8,273 | 10,086 | 12,411 | 15,091 | 15,091 | 18,908 |
| Derivative Liabilities | - | - | 471 | 1,598 | 1,598 | 1,911 | - | - | - | - | - | - | - | - | - | - |
| Other Long Term Liabilities | 181 | 177 | 166 | 151 | 151 | 137 | 118 | 95 | 75 | 75 | 55 | 35 | 15 | - | - | - |
| Net Billings in Excess of Revenue | 30 | 97 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Senior Secured Loan - Long Term | 3,494 | 5,039 | 4,151 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Unsecured Convertible Promissory Note | 62 | 75 | 89 | 618 | 618 | 601 | 622 | - | - | - | - | - | - | - | - | - |
| Total Liabilities | 16,338 | 15,452 | 15,161 | 9,905 | 9,905 | 10,212 | 7,400 | 6,996 | 8,966 | 8,966 | 8,328 | 10,121 | 12,426 | 15,091 | 15,091 | 18,908 |
| Preferred Stock | 385 | 385 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Common Stock | 289,865 | 290,540 | 292,242 | 321,271 | 321,271 | 324,866 | 331,959 | 341,158 | 341,158 | 341,158 | 341,158 | 341,158 | 341,158 | 341,158 | 341,158 | 341,158 |
| Accumulated Other Comprehensive Income | (5,114) | (5,098) | (5,095) | (6,307) | (6,307) | (6,202) | (6,281) | (6,303) | (6,303) | (6,303) | (6,303) | (6,303) | (6,303) | (6,303) | (6,303) | (6,303) |
| Accumulated Deficit | (288,373) | (289,716) | (292,025) | (299,543) | (299,543) | (301,677) | (300,021) | (307,041) | (317,964) | (317,964) | (317,955) | (316,468) | (314,183) | (310,936) | (310,936) | (294,864) |
| Total Stockholders' Equity | (3,237) | (3,889) | (4,878) | 15,422 | 15,422 | 16,987 | 25,657 | 27,814 | 16,891 | 16,891 | 16,900 | 18,387 | 20,672 | 23,918 | 23,918 | 39,990 |
| Total Liabilities and Equity | 13,101 | 11,563 | 10,283 | 25,326 | 25,326 | 27,199 | 33,057 | 34,809 | 25,857 | 25,857 | 25,228 | 28,508 | 33,097 | 39,010 | 39,010 | 58,898 |

Figure 15: Cash Flow Statement

| FY Ending Dec 31; \$ thousands | 1Q17 | 2Q17 | 3Q17 | 4Q17 | FY17 | 1Q18 | 2Q18 | 3Q18 | 4Q18E | FY18E | 1Q19E | 2Q19E | 3Q19E | 4Q19E | FY19E | FY20E |
|--|----------------|--------------|--------------|----------------|----------------|---------------|----------------|----------------|-----------------|-----------------|--------------|--------------|--------------|----------------|----------------|----------------|
| Net Income | (1,293) | (1,343) | (2,309) | (7,518) | (12,463) | (2,134) | 1,656 | (7,020) | (2,643) | (10,141) | (1,591) | (113) | 685 | 1,647 | 628 | 8,872 |
| Depreciation and Amortization | 844 | 873 | 1,433 | 1,384 | 4,533 | 965 | 994 | 999 | 1,050 | 4,008 | 1,050 | 1,050 | 1,050 | 1,050 | 4,200 | 4,200 |
| Provision for Doubtful Accounts | 4 | 2 | - | (4) | 3 | - | - | - | - | - | - | - | - | - | - | - |
| Stock Based Compensation | 818 | 305 | 385 | 2,780 | 4,289 | 1,078 | 694 | 5,638 | 1,600 | 9,010 | 1,600 | 1,600 | 1,600 | 1,600 | 6,400 | 7,200 |
| Change in Fair Value of Warrant Liability | (1,921) | - | - | 1,126 | (795) | 314 | (1,598) | - | - | (1,284) | - | - | - | - | - | - |
| Amortization of Deferred Financing Costs | 196 | 27 | 26 | 93 | 341 | 6 | 6 | 9 | - | 21 | - | - | - | - | - | - |
| Interest Expense - Debt Discount and Conversion | 1,049 | 293 | 206 | 1,860 | 3,409 | 30 | 30 | 115 | - | 175 | - | - | - | - | - | - |
| Unrealized Foreign Currency Transaction Loss | - | (470) | 470 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Shares Issued for Services | - | 474 | 51 | 260 | 784 | - | 87 | 163 | - | 250 | - | - | - | - | - | - |
| Gain on Extinguishment of Debt | (463) | - | 300 | 164 | - | - | - | - | - | - | - | - | - | - | - | - |
| Changes in Operating Assets and Liabilities | | | | | - | | | | | - | | | | | - | - |
| Accounts Receivable | 4 | 355 | (86) | (1,719) | (1,446) | 111 | (1,962) | (3,227) | (6,050) | (11,128) | 439 | (1,111) | (1,567) | (1,111) | (3,350) | (3,906) |
| Prepaid Expenses and Other Current Assets | (209) | 653 | 311 | (115) | 640 | (320) | (31) | 323 | 181 | 153 | (54) | (126) | (139) | (246) | (565) | (265) |
| Accounts Payable and Customer Deposits | 370 | 96 | (192) | (623) | (349) | 308 | 299 | 192 | 2,798 | 3,597 | (854) | 1,274 | 1,730 | 1,662 | 3,812 | 2,624 |
| Net Billings in Excess of Revenue and Deferred Rev | (7) | (406) | (227) | (191) | (830) | 55 | (32) | (150) | 10 | (118) | (4) | 11 | 16 | 11 | 34 | 39 |
| Accrued Expenses and Other Payables | (632) | (430) | (965) | 1,295 | (732) | (383) | (1,125) | 87 | (817) | (2,239) | 241 | 528 | 579 | 1,007 | 2,354 | 1,154 |
| Cash Flow from Operating Activities | (1,238) | 427 | (598) | (1,207) | (2,616) | 29 | (981) | (2,871) | (3,872) | (7,696) | 826 | 3,113 | 3,954 | 5,621 | 13,513 | 19,918 |
| Purchase of Property and Equipment | (31) | (302) | (206) | (184) | (722) | (434) | (1,444) | (312) | (663) | (2,852) | (721) | (835) | (996) | (1,245) | (3,797) | (5,257) |
| Acquisition - Artillum | - | - | - | - | - | - | - | - | (9,879) | (9,879) | - | - | - | - | - | - |
| Acquisition - iPass | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Cash Flow from Investing Activities | (31) | (302) | (206) | (184) | (722) | (434) | (1,444) | (312) | (10,542) | (12,731) | (721) | (835) | (996) | (1,245) | (3,797) | (5,257) |
| Exercise of Warrants and Options | - | - | 1,150 | 3,900 | 5,050 | 2,489 | 581 | 2,613 | - | 5,683 | - | - | - | - | - | - |
| Repayments on Other Long Term Loans | - | - | (11) | 11 | - | (17) | (16) | (28) | (20) | (81) | (20) | (20) | (20) | (15) | (75) | - |
| Increase in Short Term Loans | - | - | - | - | - | 53 | (53) | - | - | - | - | - | - | - | - | - |
| Principal Repayment of Senior Secured Loan | (1,500) | (250) | (250) | (8,082) | (10,082) | - | - | - | - | - | - | - | - | - | - | - |
| Reclassify Accrued Interest to Principal | - | - | - | (84) | (84) | - | - | - | - | - | - | - | - | - | - | - |
| Financing Related Fees | (369) | 4 | (228) | 365 | (228) | - | (653) | 20 | - | (633) | - | - | - | - | - | - |
| Gross Proceeds from Public Offering | 3,500 | - | - | 17,702 | 21,202 | - | 6,100 | - | - | 6,100 | - | - | - | - | - | - |
| Cash Flow from Financing Activities | 1,631 | (246) | 662 | 13,812 | 15,859 | 2,525 | 5,959 | 2,605 | (20) | 11,070 | (20) | (20) | (20) | (15) | (75) | - |
| Effect of Exchange Rate | 221 | (516) | 99 | (83) | (279) | 131 | (89) | 8 | - | 50 | - | - | - | - | - | - |
| Net Change in Cash and Cash Equivalents | 584 | (637) | (43) | 12,339 | 12,242 | 2,251 | 3,446 | (570) | (14,434) | (9,307) | 85 | 2,258 | 2,938 | 4,361 | 9,641 | 14,661 |
| Cash at the Beginning of the Period | 1,495 | 2,079 | 1,442 | 1,398 | 1,495 | 13,738 | 15,989 | 19,434 | 18,864 | 13,738 | 4,430 | 4,516 | 6,773 | 9,711 | 4,430 | 14,072 |
| Cash at the End of the Period | 2,079 | 1,442 | 1,398 | 13,738 | 13,738 | 15,989 | 19,434 | 18,864 | 4,430 | 4,430 | 4,516 | 6,773 | 9,711 | 14,072 | 14,072 | 28,733 |

Company Description

Pareteum sells CSaaS which enables agile mobile operators and enterprises to develop and get to market quickly with mobile and IoT services.

Valuation

\$7.50 target is based on 7.5x FY20 revenue.

Upside: Pareteum converts backlog to revenue faster than expected, and acquisition synergies play out quickly. TEUM gets a 9x revenue multiple on much higher revenue, pushing stock to \$15.

Downside: Large customers slow spend, acquisition integrated is complicated, and backlog conversion is protracted, TEUM gets 3x revenue, putting stock in \$1.50-\$2 range.

Risks to the achievement of price target

In addition to competition, we see the following risks to investors in TEUM: revenue concentration at Vodafone, a light balance sheet, acquisition integration and complexity in reporting, managing global operations and fast growth, deployment timeframes. This list is not exhaustive.

Analyst Certification

I, Michael Latimore, certify that (1) the views expressed in this report accurately reflect my personal views about all of the subject companies and securities and (2) no part of my compensation was, is or will be directly or indirectly related to the specific recommendations or views expressed in this report.

Important disclosures

Important disclosures are available by calling (800) 851-2920 or writing to Northland Securities- Equity Research, 150 South Fifth Street, Suite 3300, Minneapolis, MN 55402.

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| Rating Category | Count | Percent | IB Serv./ Past 12Mos. | |
|-----------------|-------|---------|-----------------------|---------|
| | | | Count | Percent |
| Buy [OP] | 156 | 76.47% | 32 | 20.51% |
| Hold [MP] | 39 | 19.12% | 2 | 5.13% |
| Sell [UP] | 9 | 4.41% | 0 | 0.00% |

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12/20/2018

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