

Video is eating the world ...

... and Video Virtualization can monetize it efficiently

Video currently accounts for more than 70% of internet traffic and this number is only expected to grow in the next few years. However, while web pages, documents and pictures can all be searched and handled quite efficiently on the internet, video is quite a different beast. Video files are closed containers that can be very large and cumbersome to work with. For instance, they can't be searched, cut and spliced based on specific search criteria. This is where Linius Technologies (ASX:LNU) comes in.

LNU treats video files radically different...as data files

LNU's Video Virtualization Engine™ (VVE) "unwraps" and indexes video files, based on key frames within the video stream. This process reduces a large, cumbersome video file to a fraction of its original size. Using Artificial Intelligence (AI) for facial and object recognition as well as user-generated tags, virtual video files can now also be searched based on highly specific search criteria. Furthermore, elements such as payment gateways, personalized ads, Digital Rights Management (DRM) features as well as other video clips can be added to the video stream on the fly.

Commercialisation strategy focused on four key verticals

LNU is focusing the commercial roll out of its technology on companies that it expects will see the most pronounced revenue uplift from VVE implementation. These are concentrated in four industry verticals: Personalized Advertising (TV broadcasters and media companies), Anti-Piracy (movie studios and sports), Search (Media & Entertainment, higher education, corporate, sports) and Security & Defense (including intelligence agencies).

Infrastructure built to scale quickly

LNU has built its organisation and technology such that the company can scale up quickly, through channel partners, such as IBM, Microsoft and AWS as well as through third-party developers in a Twilio-like model. IBM was recently signed as a collaboration partner to roll out VVE among IBM's customers. We expect LNU to close similar deals in the near future as well as direct deals with Enterprise customers, like Media companies.

Commercial roll out with Village Roadshow

In early October LNU announced its first commercial roll out of the VVE Anti-Piracy solution with Roadshow Films, a division of Village Roadshow (ASX:VRL). VRL is an entertainment and media company and as such is confronted with content piracy on a daily basis. The company has chosen to initially deploy LNU's anti-piracy solution when it launches a new miniseries early in 2018. We believe this agreement is great validation of

	A\$ M		FY17A	FY18E	FY19E	FY20E
Number of shares (m)	794.2	Revenues	0.0	0.0	1.7	3.3
Number of shares FD (m)	909.7	EBITDA	-3.7	-7.7	-7.0	-6.4
Market capitalisation (A\$ m)	99.3	NPAT	-4.2	-8.1	-7.3	-6.7
Market cap fully dil (A\$ m)	113.7	EPS FD	-0.005	-0.009	-0.007	-0.007
12 month high/low A\$	0,135 / 0,036	EV/EBITDA	N/M	N/A	N/A	N/A
Average daily volume (tr)	970	EV/Sales	N/A	N/A	62.5	35.4

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Linius Technologies (ASX:LNU)

Software & IT Services

Australia

Risk: High

Linius Technologies Ltd. (ASX:LNU) provides a patented enterprise grade software technology that virtualizes video files. It transforms cumbersome, static video files into agile, dynamic files that can be easily manipulated on the fly, in order to deliver an enhanced, custom experience for both broadcasters and end-users. Application areas the valuable personalized TV advertising market, Anti-Piracy, Security & Defense and online Video Search.

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BUY

Current price: A\$ 0.125

(closing price 20 December 2017)

21 December 2017

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LNU's technology, which should provide a great showcase for LNU in its conversations with other movie studios and media companies struggling with content piracy.

Integration with Comcast's OTT platform readies VVE for quick deployment

LNU has also recently integrated VVE into Comcast's Over-The-Top (OTT) platform for Personalized Advertising applications.

Comcast is the largest cable company in the United States and owns a range of different assets including NBC, Telemundo (Spanish language cable operator), Universal Studios, CNBC, Plaxo, hockey team Philadelphia Flyers and DreamWorks Animation.

Integration into Comcast's OTT platform gives LNU access to Comcast's customers, such as Disney and Turner Broadcasting, the owner of CNN.

This integration enables LNU to quickly deploy across such assets in addition to providing further credibility and validation of LNU's technology.

High-leverage model partly captures customers' revenue uplifts

LNU charges customers on a price per unit, in which the unit can be anything from a personalized ad, a video payout, a video search result, an API call, a payment etc. Typical prices are a fraction of a cent per event, which can add up very quickly due to the sheer number of events LNU will be managing through its technology, e.g. millions of video searches per day.

Additionally, in some business cases, such as Security & Defense, customers pay a recurring monthly license fee, based on a tiered pricing structure, depending on volume and number of users.

Given the near-zero marginal cost of these VVE transactions, this revenue model is highly scalable and can potentially lead to very strong revenue growth with high operating margins. This revenue model also partially captures customers' revenue uptick from VVE implementation.

LNU's four addressable verticals are very significant in their own right

It's hard to predict in which market segment LNU will see the strongest traction and fastest commercial roll out. However, each of LNU's four target markets (Personalized Advertising, Anti-Piracy, Search and Security & Defense) is very substantial in its own right, i.e. billions of dollars each.

And while Personalized Advertising presents the largest revenue opportunity, the recent commercial win with VRL in the Anti-Piracy segment could prove to be a trigger for rapid deployment with other movie companies.

Very strong potential, BUY rating reiterated

In addition to VRL, we're anticipating rapid commercial deployment with other customers in the near term, which may be the prelude to a rerating of the shares. In our view, the commercial opportunity for LNU is massive, which is reflected in our fair value calculations.

Using LNU's theoretical WACC of 11.2%, our DCF model suggests a fair value of A\$ 0.23 per share. Consequently, we reiterate our Buy recommendation for LNU.

ASX:LNU

FY-end June (A\$ M)

Profit & Loss account	2017A	2018E	2019E	2020E
Revenues	0.0	0.0	1.7	3.3
EBITDA	-3.7	-7.7	-7.0	-6.4
EBITDA %	N/A	N/A	-401%	-196%
Depreciation & Amortisation	-0.5	-0.5	-0.4	-0.4
EBIT	-4.3	-8.1	-7.4	-6.8
EBIT %	N/A	N/A	-424%	-207%
Interest income & expense net	0	0	0	0
Other items	0	0	0	0
Profit before Tax	-4.2	-8.1	-7.3	-6.7
Taxes	0.0	0.0	0.0	0.0
Net earnings	-4.2	-8.1	-7.3	-6.7
Ordinary shares outstanding	632.8	816.7	909.2	956.7
Fully diluted # shares	782.2	932.2	1025	1072
Earnings per share	-0.007	-0.010	-0.008	-0.007
Earnings per share fully diluted	-0.005	-0.009	-0.007	-0.007

Cash Flow Statement	2017A	2018E	2019E	2020E
Net income P&L	-4.2	-8.1	-7.3	-6.7
Depreciation & amortisation	0.5	0.5	0.4	0.4
Impairments	0	0	0	0
Change in working capital	0.3	-0.5	-0.2	-0.1
Other items	0	0	0	0
Cash flow from operations	-3.0	-8.1	-7.0	-6.5
Net cash flow from investments	0.0	0.0	0.0	0.0
Dividend paid	0	0	0	0
Change in equity	0.7	11.0	5.5	5.0
Change in debt	0	0	0	0
Other items	0	0	0	0
Cash flow from financing	0.7	11.0	5.5	5.0
Net cash flow	-2.3	2.8	-1.5	-1.6

Balance Sheet	2017A	2018E	2019E	2020E
Current assets				
Cash and marketable securities	1.0	3.8	2.2	0.7
Accounts receivable	0.1	0.0	0.3	0.5
Inventories	0	0	0	0
Other current assets	0	0.0	0.2	0.3
Total current assets	1.0	3.8	2.7	1.5
Fixed assets				
Net property, plant & equipment	0	0	0	0
Goodwill	0	0	0	0
Other intangible assets	4.5	4.1	3.7	3.3
Other assets	0	0	0	0
Total fixed assets	4.6	4.1	3.7	3.3
Total assets	5.6	7.9	6.4	4.9
Current liabilities				
Short-term debt	0	0	0	0
Accounts payable	0.6	0.0	0.1	0.3
Dividends payable	0	0	0	0.0
Other current liabilities	0.0	0.0	0.2	0.3
Total current liabilities	0.6	0.0	0.3	0.6
Long-term debt	0	0	0	0
Total provisions	0	0	0	0
Total group equity	5.0	7.9	6.1	4.3
Total liabilities and equity	5.6	7.9	6.4	4.9

Valuation	2017A	2018E	2019E	2020E
Relative valuation				
P/E (reported)	N/M	N/M	N/M	N/M
P/B	15.7	12.9	17.7	26.5
P/CF	N/A	N/A	N/A	N/A
Price to sales	N/A	N/A	62.0	34.7
EV / sales	N/A	N/A	62.5	35.4
EV / EBITDA	N/M	N/A	N/A	N/A
Dividend yield	0%	0%	0%	0%
ROIC / WACC	-310%	-402%	-249%	-192%

Discounted Cash Flow
Assumptions

Long term interest rate	3%
Risk premium	5.75%
Marginal tax rate	30%
Long term growth	3%
Leveraged Beta	1.47
Implied WACC	11.2%

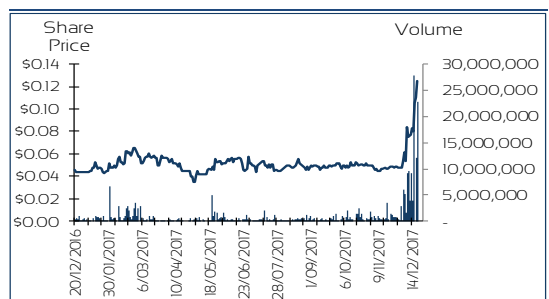
DCF fair value per share A\$ 0.23

Profitability ratios	2017A	2018E	2019E	2020E
Return on Equity	-84%	-103%	-120%	-157%
Return on Assets	-76%	-103%	-114%	-139%
Return on Invested Capital	-46%	-152%	-170%	-160%
EBITDA margins	N/A	N/M	-401%	-196%
EBIT margins	N/A	N/M	-424%	-207%
Net margins	N/M	N/M	-419%	-205%

Financial Strength	2017A	2018E	2019E	2020E
Net debt	-1.0	-3.8	-2.2	-0.7
Net debt / Equity	-0.2	-0.5	-0.4	-0.2
Net debt / EBITDA	-0.3	-0.5	-0.3	-0.1
Interest coverage	N/M	N/M	N/M	N/M

Capital Structure

Ordinary shares	794.2
Performance shares	0
Options and warrants	115.5
Fully diluted	909.7
Market capitalisation (A\$ m)	99.3
Market cap. fully diluted (A\$ m)	113.7
Free float %	51%
12 month high/low A\$	0,135 / 0,036
Average daily volume (r)	970



Source: Factset, TMT Analytics

New revenue opportunities drive broad industry interest

Given the unique opportunities that video virtualization creates, on which we will elaborate below, LNU has experienced very substantial interest from companies in a range of different sectors, including media, technology and security.

For instance, media companies and movie studios are interested in video virtualization given the opportunities the technology provides to fight content piracy, amongst other things. Broadcasters can use video virtualization to drive revenues from personalized advertising, while security and surveillance companies see applicability of the VVE to live monitoring of CCTV streams.

Very substantial revenue opportunity for LNU

Because of the many commercial and technical applications of video virtualization and the additional revenues it can generate for broadcasters, media companies etc, we believe there is a very substantial revenue opportunity for LNU to tap into. The revenue models LNU aims to employ are flexible and can vary from industry to industry and from business case to business case. We will elaborate on this in the Financials section.

Video virtualization is a radically new way to handle video files

LNU’s core technology enables video files to be searched, extracted, spliced, merged and manipulated on-the-fly. The company’s Video Virtualization Engine (VVE) treats video files for what they are, i.e. data files rather than singular streams, by opening up the video file container.

Essentially, LNU’s VVE “unwraps” and indexes video files, based on key frames within the video stream (Figure 1). The VVE can thus break down a large video file into smaller segments or clips and insert other elements, such as advertising, other video clips, payment gateways, Digital Rights Management features etc.

Additionally, VVE output can be paired with smart features, such as facial and pattern recognition, and be applied to video surveillance, for instance.

FIGURE 1: THREE STEPS IN VIDEO VIRTUALIZATION



Source: TMT Analytics, Linius

The VVE can be applied to video streams, such as TV broadcasts, as well as stored footage, e.g. Instagram, YouTube and copyright protected content, such as TV content and films.

The details of LNU’s video virtualization technology are explained in detail in Appendix A, but the key take-away’s are twofold:

- LNU’s VVE provides the ability to search video fragments, clips and scenes, in addition to entire videos;
- The technology enables content owners to insert various elements into video stream, such as ads, DRM, payment gateways etc

Instagram video library indexed as demonstration of technology

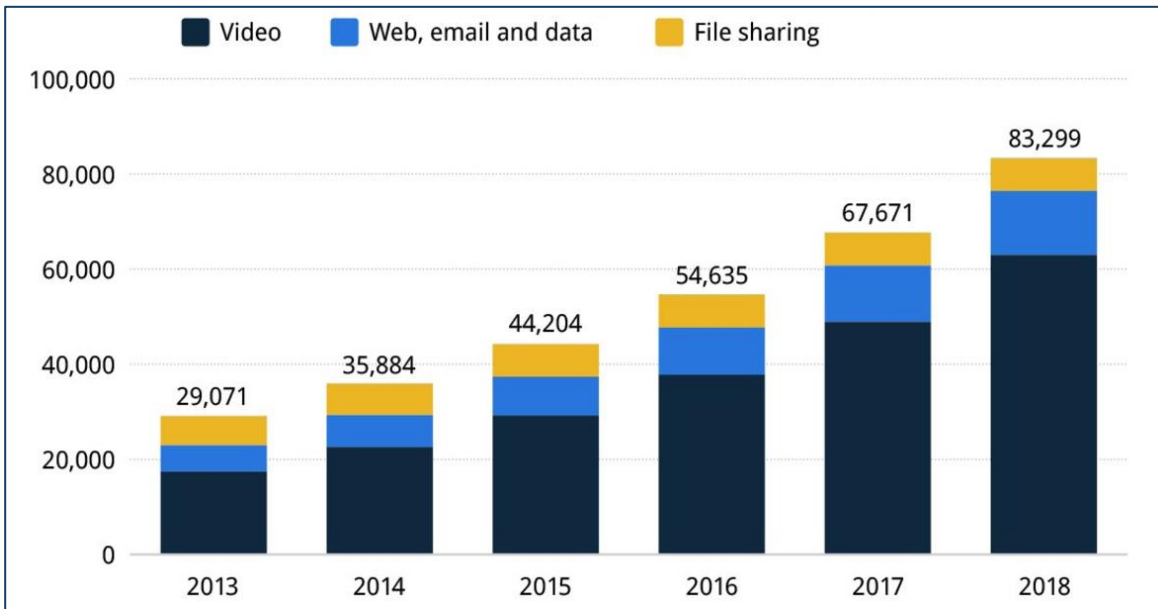
As a demonstration of its technology, LNU recently indexed millions of videos posted on Instagram and published an online tool, VVE Play, through which users can search and splice these video clips and scenes themselves.

In our view, VVE Play (www.vveplay.com) provides a straightforward way for investors to get an initial understanding of the technical and commercial possibilities facilitated by video virtualization.

Video is eating the world

One of LNU’s key drivers, or opportunities, is the massive growth of online video traffic. Cisco estimates online video traffic will amount to more than 83k Petabytes per month in 2018 (Figure 2), representing an average growth of nearly 25% since 2013 (IPB = 1M GB).

FIGURE 2: MONTHLY CONSUMER INTERNET TRAFFIC BY USAGE TYPE (IN PETABYTE)



Source: Cisco

Video uploads, OTT, piracy and remote monitoring are driving video consumption

This video content consists of uploads to YouTube, Instagram, Facebook etc, pirated video content downloaded through torrent sites, OTT video streaming through Netflix, Amazon Prime etc, as well as newly emerging remote video monitoring applications, e.g. remote monitoring of infrastructure, security cameras etc.

While some of this video traffic, such as illegally downloaded movies, constitutes revenue losses, e.g. for movie studios and media companies, much of this traffic also presents substantial revenue opportunities.

Key application areas define LNU's strategic direction

LNU focuses on four business areas where video virtualization is likely to have a substantial impact, both from an industry disruption point of view and from a revenue perspective, i.e. Personalized Advertising in video streams, Security & Defense, Anti-Piracy and Video Search.

1. Personalized Advertising in streaming video

As opposed to static, online ads that are placed on individual's web browsers based on their online search history and Facebook engagements etc, viewer-specific advertising inside video streams is virtually non-existent. Even in online advertising, ads in video streams specifically targeted at individual viewers are still very rare.

There are two main reasons for this:

1. Advertisers don't know the individual viewers and/or their detailed personal profiles. This is particularly true in situations where Facebook profiles, Google search histories etc are not available and/or can't be linked directly to a specific user. For instance, a cable company may roughly know the composition of a subscriber's household, but it will likely not know who in that household is watching TV at a certain time of day.
2. Even if an individual user is identified e.g. watching video streams online or on regular cable TV, current technologies don't allow ads to be placed inside these sorts of video streams on-the-fly.

LNU's technology is ideally suited to tap this market through engagement with TV networks and broadcasters. The company is in discussions with a range of different actors in this space and should be able to build a solid client base, given that the value of personalized ads for advertisers is nearly three times higher than generically targeted ads. In other words, the ability on the part of broadcasters and TV networks to offer personalized advertising should be a major revenue driver for them, and thus for LNU as well.

Changing traditional video workflows is a key challenge

Looking at today's professional video workflows, i.e. the entire process from post-production, transcoding, storage, hosting, asset management etc, it is clear that video virtualization works very differently compared to this traditional process. Therefore, we believe one of LNU's key challenges will be to fit its VVE technology into today's processes. To this end, LNU aims to partner with companies in the advertising eco system and 3rd party software providers who service broadcasters and OTT companies. Pricing models are likely to be based on upfront software license fees in addition to usage fees, such as fees per ad.

While the Australian and North American markets are immediate targets for LNU's Personalized Advertising division, given existing relationships in the movie, broadcasting and OTT markets, the addressable market is essentially a global one. Furthermore, with a different attitude towards new models and business risk, we believe Asia may also prove to be fertile hunting ground for LNU's video virtualization technology.

LNU recently hired Ken Ruck, with a background in advanced development of video image recognition and artificial intelligence systems as well as video monetization as Executive Vice President to run the Personalized Advertising division.

LNU's largest opportunity

Overall, we believe viewer-specific advertising in video streams is LNU's largest revenue opportunity. In the United States alone, between 9 and 12 trillion ads are watched annually. According to our calculations LNU's addressable market will amount to approximately US\$ 79BN in 2017, based on the current global TV advertising market, technical capabilities to

insert personalized ads per distribution vertical (e.g. terrestrial, Over-The-Top etc) and advertising growth rates per distribution vertical (Figure 3).

FIGURE 3: THE MARKET OPPORTUNITY FOR PERSONALIZED ADVERTISING

(in US\$ BN)	2017F	2018F	2019F	2020F	2021F
Global TV advertising	188.3	199.5	211.6	224.5	238.5
- Online TV	7.7	9.1	10.9	12.9	15.4
- Multichannel	45.9	49.0	52.4	56.0	59.9
- Terrestrial	134.8	141.4	148.3	155.5	163.2
% of industry able to provide personalised ad streams					
- Online TV	95%	95%	95%	95%	95%
- Multichannel	51%	54%	57%	60%	63%
- Terrestrial (incl. Free-to-air)	36%	39%	42%	45%	48%
LNU addressable market	79.2	90.3	102.5	115.9	130.7

Source: TMT Analytics, PWC

Revenues model based on price per ad served

LNU’s revenue model is based on a price per personalized ad served up to viewers, which is paid by the broadcaster. We are assuming a price of US\$ 0.01 per ad served. While this price may seem low, when multiplied by the number of ads played annually to consumers, the numbers can add up quickly.

Approximately 9 to 12 trillion ads are viewed in the United States alone every year. A very small market share for LNU would generate very substantial revenue numbers. The company is currently in discussions with several prospective customers for its VVE technology.

Generally speaking, in each division pricing per customer will vary substantially based on volume, file sizes etc.

2. Security & Defense: searching, indexing and flagging suspicious activity

LNU’s offering in this market enables surveillance footage to be automatically searched, indexed and red-flagged for any suspicious activity using specific tools, such as facial recognition and video scanning algorithms. Subsequently, these video streams, which may originate from different sources, can be spliced together for further analysis and distribution, e.g. to security analysts and agencies.

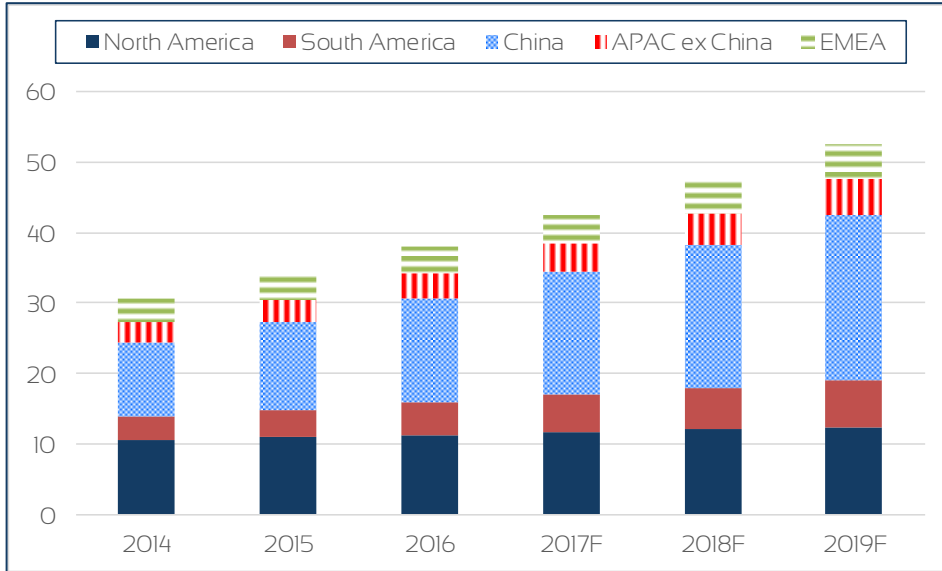
The application areas for this sort of capability are vast and comprises airports, stations and other public places as well as private and military facilities. Therefore, when assessing the market opportunity, we tend to look more to the overall size of the market, i.e. US\$ 53BN by 2019, rather than market growth. We would expect LNU to far outpace market growth in the next several years, as it starts to launch commercial solutions in these markets.

The Security & Surveillance market is growing by >11% CAGR

Government and private spending on video surveillance is growing by double digit numbers. Especially markets in South America and Asia are growing fast, with China taking the cake at a 17.4% CAGR from 2014 through 2019 (Figure 4).

) Additionally, China is expected to remain the single largest market for video surveillance at US\$ 23.4BN by 2019. The EMEA and North America regions are expected to grow more modestly, at mid-single digit numbers through 2019. The total video surveillance market is expected to amount to US\$ 53BN by 2019.

FIGURE 4: GLOBAL VIDEO SURVEILLANCE ADDRESSABLE MARKET BY REGION (US\$ BN)



Source: TMT Analytics, Statista

Pricing model based on license fees plus price per search

LNU is addressing the Security & Defense markets using a combination of license fees plus a price per search. A typical license fee may be US\$ 10,000 per seat for the first year and US\$ 2,500 for subsequent years. We are assuming an additional price per search of 0.0075 cents.

Typical use cases include Homeland Security, emergency services, such as police departments and infrastructure protection (airports etc).

Some very large players to partner with in this market

This market segment includes companies such as market leaders Hikvision (SZSE:002415), with anticipated revenues of A\$ 7.9BN in 2017, and Dahua Technology, with A\$ 2.5BN in revenues in 2016. Both companies have a particularly strong presence in the fast-growing Chinese market.

The world's number 3 player is Axis Communications (OM:AXIS), with revenues totaling A\$ 1.1BN in 2016. We believe the latter would be a natural partner for LNU in the Security & Defense market given its more modest size when compared to the large Chinese players. Additionally, given ongoing IP security issues in China, we believe software companies in general should cautiously weigh the pro's and con's of partnering in China.

Apart from these industry behemoths there are many smaller players in this space, focused specifically on the software components of video surveillance systems, such as Milestone, Genetec, OnSSI and March Networks. Most likely, these companies are able to set up partnerships with companies such as LNU, much faster than the large industry leaders.

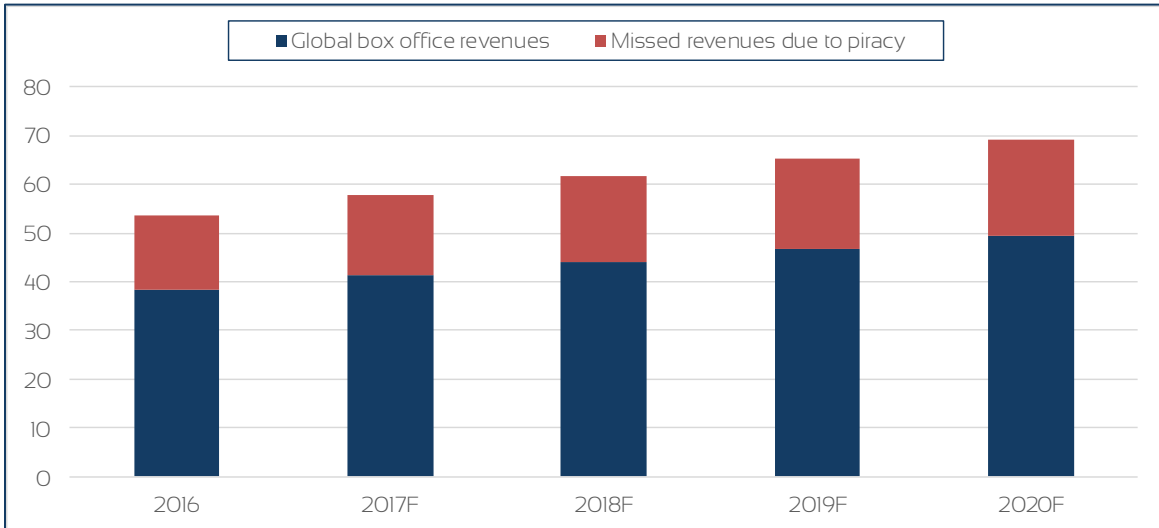
Heavy hitter hired to head up Security & Defense division

In early December LNU announced it hired Tom Slowe as EVP to head up the Security & Defense division. Mr. Slowe has extensive experience selling AI-driven video solutions into the US government, including the Department of Defense and intelligence agencies.

3. Anti-Piracy solution for video content

Piracy of video content through torrent sites is a major issue for movie studios and media companies given that billions of dollars in potential revenues from movies and TV shows are lost each year. Academic research (Ma, Montgomery and Smith, Carnegie Mellon University, 2016) has shown that for each dollar cashed at the box office, approximately 40 cents are lost due to content piracy. Furthermore, it is estimated that if piracy could be eliminated in movie theatres, box office revenues would increase by 15% (Figure 5).

FIGURE 5: GLOBAL BOX OFFICE REVENUES



Source: TMT Analytics, Statista

LNU’s video virtualization technology enables studios and media companies to create virtual video files from their original content and subsequently add viewing rights, payment mechanisms, security keys and data security features to the virtual file. The video will only be played out when certain security rules have been satisfied.

Substantial validation of the video virtualization technology in the media industry

Given the high financial stakes for movie studios, and media companies in general, LNU is gaining serious traction with its anti-piracy solution in this industry. In, what we believe is, the strongest validation of LNU’s technology to date, the Kirby family, who is associated with Village Roadshow (ASX:VRL), took a substantial financial stake in LNU. VRL is an entertainment and media company, whose activities include film production and distribution. As discussed below, VRL will be launching LNU’s VVE technology commercially in the next few months.

Pricing based on license fee plus fixed price per play out / piracy interception

Similar to Security & Defense, LNU charges a license fee, which can be flexible based certain metrics, such as size, type of content etc. Additionally, we assume LNU may charge a fixed price of 0.075 cents per API call, i.e. a situation where someone attempts to play out pirated content, which triggers a call from the play out device to LNU’s servers.

LNU estimates a minimum US\$ 10M annual revenue opportunity for this division, based on high-value content from movie studios being protected through VVE technology.

4. Video Search: A must-have for tier 2 players to keep up with Google

Unlike text on webpages, which can be searched at a highly granular level using search engines, such as Google and Bing, online video currently can't be searched in a similar way, i.e. searched for specific scenes, people, content, objects etc.

Video files can only be searched in their entirety based on titles and tags, but cannot be served up to users in individual scenes. LNU's VVE provides just that; search-ability of videos based on individual scenes, tags, user-generated tags and AI engines that can run facial and object recognition algorithms.

YouTube searches, but much more granular

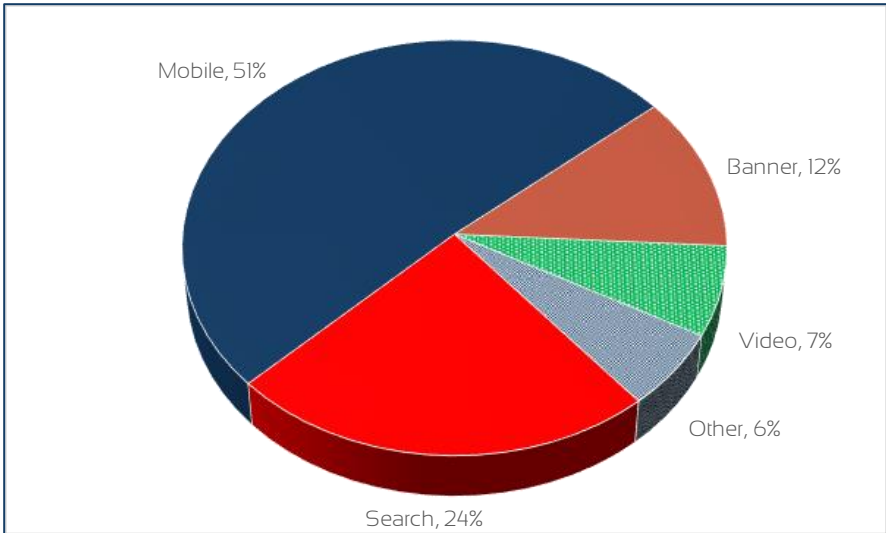
The VVE indexes video files that were returned in a video search result and subsequently extracts only the scenes within these videos that are relevant to the search. These clips are then spliced together into a seamless video stream that can be played out by the user.

Targeting public and private search engines

Given that video virtualization provides much better search results, monetization opportunities for search engines will also be substantially better. Therefore, LNU is targeting the top 30 largest search engines globally, such as Bing, Google, Yandex, Yahoo, ASK, AOL, etc.

In 2016 revenues from online ad spending totaled US\$ 72.5BN, with Paid Search (i.e. paid-for listings on search engines) on desktops accounting for 24% (Figure 6), or roughly US\$ 17BN. However, within the Mobile format, Paid Search accounted for 47% of online ad spending (US\$ 17.5BN) and is growing extremely fast.

FIGURE 6: GLOBAL ONLINE AD SPENDING BY FORMAT 2016 (US\$ 72.5BN TOTAL)



Source: IAB/PwC, TMT Analytics

Mobile Paid Search outpacing Desktop Paid Search

Overall, the value of Paid Search globally totaled nearly US\$ 35BN in 2016, with Paid Search on Mobile devices showing explosive growth. E.g. in the US Google achieved 135% y-o-y growth in Paid Search on Mobile in the middle of 2016. While that growth rate has come down since, it still far outstrips Desktop Paid Search growth of around 15% on average.

Bing and Yahoo's overall growth in US Paid Search remains in negative territory at -/-14% in 1Q17.

Strong incentive to adopt video search for tier 2 Search Engines

In the US Google accounted for 97% of mobile phone search in 1Q17, according to Merkle's Digital Marketing report with Bing and Yahoo accounting for most of the rest. But given the strong growth of Mobile versus Desktop, we'd expect Google to remain dominant in Paid Search overall.

So, Bing and Yahoo are not only lagging Google in terms of ad spending growth, but are also substantially smaller. Therefore, we believe it's in their best interest to adopt new, disruptive search features, such as granular video search, that can potentially break the status quo in the world of Paid Search.

But it's also important for market leader Google to innovate and adopt new features that provide more relevant search results, as this drives ad spending and helps the company to preserve its lead in Paid Search globally.

Video Search highly relevant for news and media companies as well

In addition to search engines, we believe Video Search is also highly relevant for news agencies, such as Reuters and Associated Press, and media companies, such as the BBC and ABC. These companies typically have very substantial video libraries that are not optimally monetized. For instance, the BBC may have older news footage that is highly relevant to a newly emerging story, potentially covered by another broadcaster or news agency rather than the BBC itself. In both situations, having granularly searchable video archives will help drive monetization of these archives.

Newly hired EVP to run the Search division

LNU recently hired Kevin Kyer as Executive VP to head up LNU's Search division. Mr. Kyer has substantial background in Search, having worked at Yahoo for ten years where he was also involved in streaming ads on mobile devices.

In Search, LNU is targeting three verticals;

- Search engines, such as Bing, Yahoo, Google, Yandex etc,
- Integrators, such as IBM, that can combine LNU's VVE with proprietary search and AI technology and,
- Enterprise Software and Cloud Service providers that can include the VVE into their existing product offering for their customers.

Pricing per search and ad insertion

Similar to the Security & Defense division, we assume LNU may charge a price per search of 0.075 cents and 0.1 cent for each ad inserted into a video stream. For a small search customer with 10M video searches per day, this would translate into approximately US\$ 3M in revenues to LNU annually.

However, the video search market is extremely large. YouTube plays out an average of 5BN videos per day, most of which contain at least one ad, while Snapchat plays out 10BN videos per day.

Depending on the number and size of customers LNU will be able to attract, we believe the company's market opportunity in video search is very substantial.

Gaining very significant traction with large industry players

As mentioned earlier, we believe the fact that the CEO of Village Roadshow took a personal financial stake in LNU is a very strong validation of the VVE technology. This is further reinforced by LNU's recently announced collaboration with IBM to jointly market the technology to IBM's client base and to build it onto Bluemix, IBM's cloud solution.

Collaboration with IBM enables LNU to cast a very wide net

IBM will be marketing the VVE across the four spearhead verticals LNU has defined. Additionally, IBM will promote video virtualization to other relevant client groups within its client base as well, such as Government agencies. Apart from promoting applications for LNU's VVE, IBM will also integrate video virtualization technology onto its cloud platform Bluemix. This will allow customers to gain easy access to the many different applications of video virtualization and will also facilitate easy integration with Watson, IBM's proprietary AI technology.

LNU's initial deal with IBM focuses on Australia and New Zealand. However, we believe there is a very high likelihood IBM will take VVE to other geographies as well, especially if video virtualization gains traction early on.

Industry players coming on board as strategic investors

LNU recently announced Village Roadshow Ltd. (ASX:VRL) have come on board as investors in LNU through a A\$ 1M private placement. VRL is an Australian entertainment and media company. Additionally, Robert Kirby, Co-Executive Chairman and Co-CEO of VRL, has invested A\$ 0.5M through a private placement to the Kirby family. The latter investment comes on top of another A\$ 0.5M investment in LNU by the Kirby family in September 2016.

Village Roadshow first to deploy VVE technology commercially

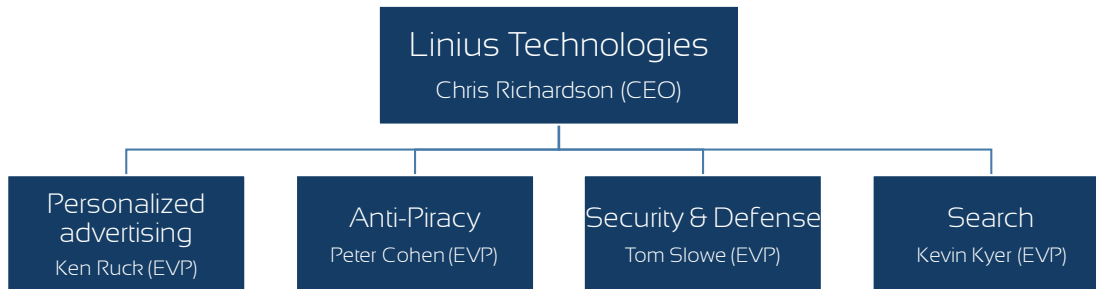
In early October LNU announced its first commercial roll out of the VVE Anti-Piracy solution with Roadshow Films, a division of VRL. The company is confronted with content piracy on a daily basis and has chosen to initially deploy LNU's anti-piracy solution when it launches a new six-part miniseries early in 2018.

We believe this commercial agreement and the strategic investments by VRL and the Kirby Family provide great validation of LNU's technology, which should provide a great showcase for LNU in its conversations with other movie studios and media companies struggling with content piracy.

Organisation being aligned with market opportunities

Given the traction LNU is getting in the four distinct verticals described above, the company has aligned its organizational structure (Figure 7) with these verticals in order to maximize the capture of commercial opportunities.

FIGURE 7: LNU ORGANISATION CHART



Source: TMT Analytics, Linus

LNU has set up four divisions that will each be headed by their own Executive Vice President (EVP) with specific experience and background. EVP's have now been hired for all divisions. Given the specialized nature of each vertical, we anticipate that this level of focus per vertical will help LNU drive engagement and commercial penetration.

Business model is highly flexible

The prospects LNU is targeting employ a wide variety of business models, tailored to their specific industries. Consequently, LNU's own business and pricing models need to be flexible as well in order to align well with customers' models.

However, the essence of LNU's pricing model is a price per unit, where the unit can be anything from a file, a transaction, a subscriber, a search etc. For instance, within the Security & Surveillance vertical, LNU may charge a price per compiled incident video. In Personalized Ads, LNU may charge per cable TV subscriber or per placed ad or a combination of both and in Search, LNU may charge customers based on ad placements.

In terms of go-to-market strategy, LNU prefers to work with channel partners, such as IBM. Channel partners can sell video virtualization solutions into their existing client base, which substantially reduces the need for LNU to set up a full-fledged network of sales reps of its own. However, the company also uses a more direct sales model if more appropriate, for instance in Search, where the list of prospects is relatively short.

Contracts with built-in revenue upside

In every commercial discussion, LNU aims to include revenue upside in its contracts. I.e. LNU aims to benefit proportionately when the customer is successful, for instance if a cable company can charge more for an ad when it's personalized or when Anti-Piracy measures result in more revenues through payment gateways built into a movie studio's virtualized videos.

We believe the highly scalable nature of LNU's Video Virtualization Engine combined with pricing models that, in part, capture customers' revenue upside from VVE implementation, can potentially lead to very strong revenue growth, especially given the large enterprises LNU is targeting.

Revenue model illustrates high leverage potential

While the exact timing of new commercial agreements as well as LNU's revenue ramp up are uncertain and depend on a number of factors, including the speed at which prospective customers can move forward, we believe one thing is very clear; the company's revenue model shows a very high leverage potential. Given the near-zero marginal cost of a VVE transaction (display of a personalized ad, a video payout, a search result, an API call, a payment etc), we believe LNU should be able to achieve EBITDA margins above 50% from 2022, and substantially higher once the company achieves sufficient scale.

FIGURE 8: LNU REVENUE PROJECTIONS

A\$ M	2017A	2018E	2019E	2020E	2021E
Revenues	0.0	0.0	1.7	3.3	12.9
EBITDA	-3.7	-7.7	-7.0	-6.4	2.4
EBITDA margins	N/A	N/A	N/M	N/M	18%
NPAT	-4.2	-8.1	-7.3	-6.7	1.3
EPS fully diluted (c)	-0.005	-0.009	-0.007	-0.007	0.00

Source: TMT Analytics

Fair value based on Discounted Cash Flow

We have abstained from using a peer group valuation for LNU and instead have valued LNU based on a DCF model, which we believe more accurately captures LNU's long term potential when compared to a peer group analysis.

Our assumptions include a long interest rate of 2.5%, an equity risk premium of 5.75%, a marginal tax rate of 30%, a levered beta of 1.47x and long-term growth of 3%. These assumptions lead to a theoretical Weighted Average Cost of Capital (WACC) of 11.2%, used to discount future cash flows.

Using a discount rate of 11.2% yields a fair value for LNU of A\$ 0.23 per share.

In Figure 9 we have provided a range of discount rates and resulting fair values to account for individual investors' risk appetites, e.g. to accommodate for the early-stage nature of LNU, which is still pre-revenue.

FIGURE 9: DCF-BASED FAIR VALUE RANGE PER SHARE BASED ON DIFFERENT DISCOUNT RATES

10%	0.27
11.2%	0.23
12%	0.21
13%	0.18
14%	0.16
15%	0.14
16%	0.13
17%	0.11
18%	0.10
19%	0.09
20%	0.08

Source: TMT Analytics

Conclusion: On the cusp of revenue generation

LNU is starting to show very promising deal flow, as illustrated by the recent collaboration with IBM, that should result in near term contract wins. We expect similar deals to follow near term.

While we refrain from issuing a price target, given that our financial projections are preliminary and are likely to change based on LNU's actual pricing model per deal/contract, we believe our preliminary revenue indications do signal very promising upside for the shares.

We reiterate our BUY recommendation

Our DCF model, based on these preliminary numbers, indicates a fair value of A\$ 0.23 per share, i.e. well in excess of the current share price. Therefore, we reiterate our BUY rating for LNU.

Near to medium term catalysts

- First commercial wins from its new partnership with IBM, which are expected in the near term, should drive investor interest.
- We expect LNU to be able to sign additional channel partners, similar to IBM, which would expand the company's commercial reach.
- The company should be able to directly attract multiple enterprise customers, such as media companies and movie studios, rather than through channel partners, allowing for higher revenues per customer in the absence of revenue sharing agreements in these cases.

SWOT Analysis

Strengths

- First-to-market with a patented technology that has the potential to revolutionize business models in Streaming Media and Film, Broadcasting, Search and Security as well as video workflow segments, such as Content Delivery Networks and Transcoding.
- The technology can be integrated into third-party relatively easily, allowing for many different channel partner models.
- LNU's asset-light revenue model is flexible and over time should yield EBITDA margins in excess of 60%, resulting in highly attractive ROIC's.

Weaknesses

- The company's operating track record is still limited, which may limit the speed of commercialization.
- Unfamiliarity with the technology and integration into existing work flows may limit adoption and acceptance by potential customers.
- LNU will likely require additional funding to facilitate full-scale roll out, i.e. for marketing, sales and additional developers to maintain and further develop its technology, likely diluting existing shareholders.
- Equity funding may not be available on favorable terms, e.g. only at substantial discounts, or in limited amounts.

Opportunities

- Video currently accounts for more than 70% of internet traffic and is extremely static in terms of search-ability, e.g. YouTube can only be search at the file level, not at the clip or scene level within the videos. In other words, video search presents a very substantially opportunity for LNU and its prospects, such as Bing, Yahoo and Google.
- Content piracy is a major issue for most Media companies and film studios, which presents LNU with tremendous opportunities to roll out its VVE in this plagued industry.
- In addition to the current four, high priority, segments, there are several more, large, market segments in the video work flow space that LNU can address in the medium term, such as Transcoding and CDN, substantially expanding the company's addressable market.
- Established players in various segment, similar to IBM, may be keen to partner with companies, such as LNU, given that such agile partnerships often provide a quick way to generate additional revenues from existing customers.

Threats

- Large, incumbent Tech companies developing similar technologies and selling into their installed base of customers may inhibit LNU's growth.
- Incumbents will likely defend their market share through various means, including discounts, bundled sales, cross subsidies etc, potentially limiting the speed of LNU's commercial roll out.
- While LNU's patent family provides a certain layer of protection against competitors copying the company's intellectual property, any legal defense against potential infringements will likely require substantial funds, which LNU may not have available if and when required, potentially inhibiting the company's future growth prospects.

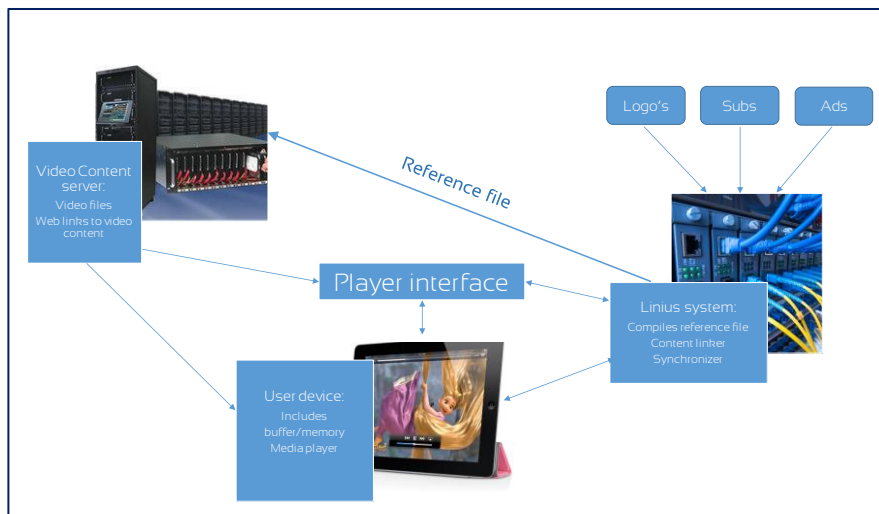
Appendix A

Dissecting LNU's technology

The process to compile a user-specific video stream through LNU's technology is fairly straightforward. Let's say a user accesses an on-demand video service over the Internet through his iPad 2 to watch a movie in HD quality. The iPad's media player contacts the Linus-supported server where a reference file is compiled based on the parameters of the media player on the iPad and the user's preferences. For instance, the media player may be QuickTime version 7.7.9 and the user may want to view the movie with Spanish subtitles.

The reference file being compiled will not only contain user preferences and information regarding the type of media player, but can also include information regarding the device's memory and buffer sizes, access and processor speeds, network capabilities as well as information around billing, DRM, customer feedback, interactivity with the content and executable scripts that control what happens if play is paused or when the movie has ended.

FIGURE 10: COMPILING THE VIDEO STREAM IN LINIUS' WORK FLOW



Source: Company patent filing, TMT Analytics

Reference file can include advertisement markers on timeline

Additionally, the reference file may include markers on the timeline of the video file where advertisement can be inserted into the video stream, for instance in case of free video streams, such as YouTube. In this example, where video is streamed to an iPad, the ad feed may be based on cookies and other user specific information gathered by tracking software on the iPad.

Once the reference file is completed, uploaded to the video content server and accessed by the player interface on the Linus system, the player interface communicates with the media player on the iPad and starts to stream the movie into the buffer or memory of the iPad. But instead of streaming a movie that has been specifically transcoded, i.e. to be played out on an iPad 2 in HD quality, using QuickTime 7.7.9 with Spanish subtitles, the video stream is simply the master file that is stored on the content provider's server.

Specific features added to video stream on-the-fly

The player interface ensures that the video is played out according to all of the user's personal preferences and that all the individual elements, such as subtitles, ads etc are added to the video

stream as different layers at the right time through a content linker and synchronizer on the Linius server. The fact that the individual content components are reassembled on the play out device rather than content that has been morphed into one stream at the server prior to streaming, provides tremendous flexibility for content providers.

They are now able to dynamically change individual content components at the user level, such as advertising, instead of having a bulky content stream with no means to make the video stream user specific.

No need to store different file formats

A key element of LNU’s technology is that it enables the video content to be translated into a different structure, i.e. file format, based on the information in the reference file. This enables video to be played out in a format that may be different from the format in which the master file is stored on the video content server by the content provider. This substantially reduces storage costs as only one file (the master file) now needs to be stored in various locations rather than many.

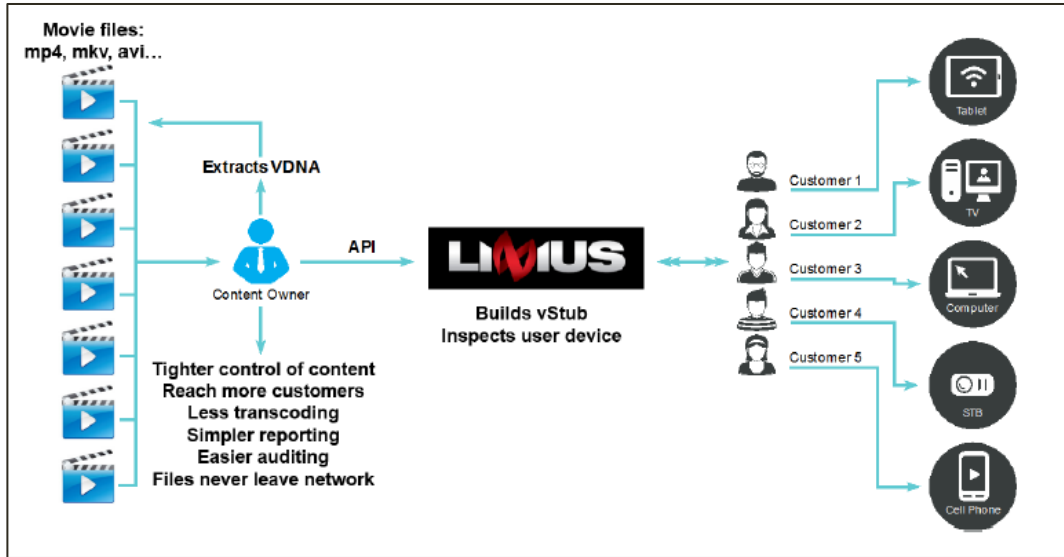
LNU enables optimized asset usage

LNU’s technology also allows different parts of the video feed to be streamed from different servers, which is important from a cost savings perspective. For instance, a content provider such as Netflix may choose to have the first few minutes of a movie streamed to a viewer from a fast, but relatively expensive server, to make sure viewers can start viewing a movie immediately after hitting play. After the first few minutes have been buffered on the play out device, the content provider may switch to streaming the rest of the movie from a slower, less expensive, server.

How it’s done: smart video processing behind the scenes

When video is streamed across networks, such as the Internet or a cable network, it is compressed to limit the file size and save bandwidth. Compression of video essentially means leaving out as much unnecessary information as possible. This is accomplished by only including information in the video that changes from one frame to the next.

FIGURE 11: LNU’S MADE-TO-ORDER VIDEO PLAY OUT MODEL



Source: Company, TMT Analytics

As an example, movements in a video of an interview are usually limited to facial movements, i.e. the mouth, eyes and head. The background may not change for many seconds, which means that the background only needs to be streamed once until it changes, for instance when the shot changes from the interviewee to the interviewer, which requires a new frame to be sent that includes the new background.

In the meantime, all the facial changes are streamed as they occur. As a consequence of this streaming protocol, encoding software can substantially reduce the amount of data that needs to be sent across the network.

Keyframes are set as reference points

In today's video streams the number of frames per second typically varies from 16 to more than 30 depending on the video quality that is required; more frames per second mean a higher video quality. In order to determine which frames need to be streamed in their entirety, the encoding software uses so-called keyframes as reference points to determine if something has changed in the video stream, e.g. a scene change. Keyframe frequency in a video stream can range from less than 2 seconds to more than 10 seconds. Keyframes are always streamed in full with non-keyframes being streamed only partially or not at all.

Indexing the keyframes provides a "virtual video"

LNU's technology indexes all the keyframes in a video stream, leaving all other frames untouched. In a next step, LNU's technology indexes these keyframes using pointers, which are very small data blobs pointing to the individual keyframes. The total file size of such an index is less than 100kb.

So instead of the full-size video file, this virtual video, also known as the vStub, can now be used to manage the video stream. The vStub itself does not contain any video or audio data, only references to the keyframes of the original video file.

The combination of virtual video on the content servers and the earlier-discussed, viewer-specific reference files created for individual play outs, enables LNU's data-light video processing model.

Appendix B

Board of Directors

Christopher Richardson (Executive Director and CEO): Mr. Richardson is an accomplished internet video executive with more than 20 years' experience leading tech companies in the US, Europe and Asia. He has served in managerial roles for several Silicon Valley start-ups including U4EA Wireless and NextHop Technologies. Prior to founding NextHop, Mr. Richardson helped to build the early internet as a software engineer at MERIT Networks and taught Routing at St Petersburg State Technical University in Russia.

Gerard Bongiorno (Chairman, Non-Executive Director): Mr. Bongiorno is Principal and Co-CEO of Sapien Capital Partners, a merchant banking operation and has over 25 years of professional experience in capital raisings and corporate advisory. Some of the extensive experience Mr. Bongiorno brings to the Linus Board includes his roles in Challenger Limited (ASX: CGF), a diversified financial services firm, Village Roadshow and KPMG Corporate Finance and his ongoing work as CEO of Sapien, rising capital both in Australia and internationally.

Stephen McGovern (Non-Executive Director): Mr. McGovern has more than 20 years' experience as an executive in telecommunications, media sales and pay TV and is managing director of cloud call recording company Dubber Corporation Ltd (ASX: DUB). He has led several established companies, both domestically and internationally, which have penetrated new and emerging markets and have required a strong sales and solutions focus.

Appendix C

Patents

LNU owns more than a dozen granted and pending patents in several geographies, including the United States, Australia, China, Europe, Singapore and Hong Kong. LNU's method and system for content delivery is described in the international patent PCT/AU2008/001190.

The company was recently granted continuations of its core US patent (8,893,203) through patent numbers 9,516,392 and 9,544,657 (Method and System for Content Delivery) in the US. These refer to playing a virtual video file, in particular the ability to play out a single stream from multiple original sources. Additionally, they refer to indexing, the creation of the virtual video file and inclusion in the virtual video file of support elements for extended features, such as billing, customer feedback, interactivity, or digital rights management (DRM).

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