# The evolution of the Digital Ship

Maritime information technology market developments in 2016

Rob O'Dwyer Editor, Digital Ship



#### Digital Shiñ The Mantime Cyber Resilience Forum Bottendam, 31 Jan 2017

#### Maritime satcom revenues continue to climb in difficult market

While the merchant shipping sector continues to struggle is an unforgiving sconomic climate, the maritime schrifts communications market is prospering - with combined annual satellite operator and service provider revenues climbing into the billions



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Satcom Global launches Ku-band VSAT service

Fleet-wide ITC deal for Zeabern Group

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Fleet-wide ITC deal for Zeaborn Group Thursday, 24 November 2014 19:06

Maritime Satellite Communications

The Zeaborn Group has agreed a deal with Pronautas to supply a complete. IT and communications system to all of the vessels in its feet, including Sealink VSAT connectivity and the XChange platform from Martink, dual ECDIS, and Pronaulas' ship-board witualised client server system.

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# What is a Digital Ship?



- What's happening on my ship?
- What's happening outside my ship?
- What will happen if I take this course of action?



# What is a Digital Ship?

### Data Flow



# Applications



# What kind of progress in maritime satcom have we seen in 2016?





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IN THIS ISSUE

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### Significant trends:

- Growth in maritime VSAT capacity and user base
- Mergers and Acquisitions consolidation and cross sector diversification



#### March - Epic era begins

# **Epic era begins**

Intelsat has successfully launched the first in its EpicNG series of high throughput satellites, adding tens of gigabits of capacity for vessel traffic between Europe and the Americas. With a second launch scheduled in a matter of months, the availability of maritime broadband is set to change in a big way

The maritime communications revolution is well and truly gathering paos, with Intelsat completing the successful launch of the first in its EpicNG series of next generation high throughput satellites, promising to offer a massive increase in capacity for major shipping routes over the next couple of years as the fleet of spacemath is put into orbit.

The Intelast 29e satellite was launched from French Guiara aboard an Ariane 5 vehicle and signal aquisition was reported as confirmed shortly afterwards. Manufactured by Boeing, Intelast 29e will bring high throughput capacity in both C-band



Intelsat 29e, the company's first Epic satellite, was successfully launched in January. Photo: ESA



March - Epic era begins June/July - Telenor Ka-band satcom service is made commercially available

#### Telenor Ka-band service now commercially available

www.telenomat.com

Telenor Satellite has announced the commercial availability of services on its THOR 7 Ka-band satellite. The Ka-band payload offers highthroughput regional coverage over major

European shipping lanes, with Telenor third of world shipping traffic within the THOR 7 coverage area.

Since the commercial handever of the THOR 7 satellite in June 2015, Telenor Satellite says that it has been carrying out a testing programme prior to this commercial launch

The final testing phase involved 18 cus-

tomers manning sea trials on about 30 yearsels, in sectors including yachting, tankers and ferries, with up to 50 remote terminals testing the service at various points under THOR 7s footprint.

Ships tested the service in the 18 main beams that will be used for manitime traffic, with terminals connecting in 21 out of the 24 total available during the test phase. One of the test ships, the Color Line passenger vessel Color Fantasy, recorded a 61.8 Mbps download speed from the satellite in an Ookla test on board the yes-

"Telenor Satellin's THOR 7 Ka-band integrate. It's relatively open architecture mobility service has been designed specifically for the maritime market, providing the reliability and availability our customers expect at sea."

One somewhat surprising new customer already signed up for THOR 7 is Inmarset, which has agreed a deal to acquire Ka-band Satellite noting that it can serve about one- capacity from Telenor Satellite to supplement its own Ka-band Global Xpress coverage in Northern Europe.

> Speaking during Inmanat's Q1 eamings-call, Inmarsat/CEO Rupert Pearce-confirmed that a deal was in place to procure what he described as "substantial" Kaband-capacity on THOR 7.

"It's an ideal satellite for us to use to



THOR 7 only In Jaunch in 2015

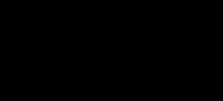
into GX. Other Ka-band networks could be very, very difficult to do that and require very substantial investment, essentially creating parallel structures alongside each other so that the beams themselves aren't interoperable; they just operate in parallel alongside each other." he said

"We're very happy with the prospect of partnering with Telenor around this Kaband capability, which has been built and developed with integration with Global Xpress in mind, because we use a common tacheology have."

In a statement to Digital Ship, Talamor Satellite also confirmed that it had signed a contract with Inmarvat for the supply of

> capacity and related services or THOR 7, which is "subject to satisfactory completion and testing of the technical solution provided by Telenos."

The anticipated start date for Inmanat to start using this apacity and related services will be in the second half of 2016 "This contract will provid connectivity for manual ever the North Sec exton and represents a small centage of the total capacity evailable on Telenor's THOR 7 Kalhand platform," the compa



March - Epic era begins June/July - Telenor Ka-band satcom service is made commercially available

June/July - SES adds maritime Ka-band VSAT service

#### SES adds maritime Ka-band VSAT service

#### www.ses.com

SES has unveiled its first regional maritime Ka-band service, which will be offered under the SES Maritime+ brand to customers operating in Europe.

This new service for the maritime and inland shipping mobility sector will use ASTRA 2E's and ASTRA 2G's Ka-band beams to provide satellite communications to the maritime industry.

The new Ka-band service will be launched in Q2 2016 and combines SES Kaband spot-beams, EPAK's DSi9 maritime antenna and Gilat Satellite Networks' broadband technology.

The offering is based on SES Techcom Services' Astra Connect solution and will provide coverage over Europe, including the North Sea, the Irish Sea and inland waterways. It will target customers such as offshore wind farms, inland shipping companies, and supply ships for oil platforms.

"Our new offering for the mobility market is a highly cost-effective maritime Kaband service, which is designed to deliver communications on the move and allows a wider range of customers to profit from maritime connectivity," said Norbert Willems, commercial vice president at SES Techcom Services.

"Providing connectivity at sea has become increasingly crucial. This new service not only meets this need, but also does so economically, thanks to the attractive price per megabit of our Ka-band offering,"

# <u>Digital Ship</u>

March - Epic era begins June/July - Telenor Ka-band satcom service is made commercially available June/July - SES adds maritime Ka-band VSAT service August/September - Fleet Xpress boosted by summer deals

#### Fleet Xpress boosted by summer deals

With full global commercial service introduction having only come online in the second quarter of 2016, Inmarsat's new Fleet Xpress service has received a major boost through the announcement of two new contracts and, more significantly, major sales commitments from some of its main VSAT rivals

Inmarsat has announced that it has signed up two new costoreses for its Fleet Xpress (FX) service during summer 2016, shortly after securing commitments freen Kuband service providers Marlink and SpeedCast to bring some 4000 ships on to the Ka-band system over the next five years and prior to a further deal with Navarino promising to add a further 1,200 ships on FX.

Inmanut partner JSAT MOBILE Communications has signed an agreement with Mitsui O.S.K. Lines (MOL) to introduce Fleet Xpress across the majority of its car carrier fleet, while



The Aquamarine Ace, one of the MOL vessels soon to be fitted with Fleet Xpress

# <u>Digital Ship</u>

March - Epic era begins June/July - Telenor Ka-band satcom service is made commercially available

June/July - SES adds maritime Ka-band VSAT service

August/September - Fleet **Xpress boosted by summer** deals

August/September - The silver anniversary of maritime VSAT

#### The silver anniversary of maritime VSAT

Twenty-five years ago, in 1991, the first mobile mustime VLAT installation was completed abourd a vessel operating in the North Sea. Digital Ship visited Elk taleport in Western Norway, the station which carried the signal for that first installation and is still carrying terabutes of traffic to and from ships today, to learn about the history of VSAT at sea

ended monitor in properties for the space and disand share ing the landscape for second. Also has used that uses als marked or norm Mor many years of fixed animous. TO at 1 degree Hint: That had a service the next operation. That sees in 19827 terrey in 181 Rays Publicum layer a Name & ' and Mr Dylored reget to trial an installation of a VANT when on proving connected specifics of the temperature of the technology and you had a manual rise of 1. No. and its 1999. in the FINC Parsaul 1

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October - VSAT deals for approx. 200 Teekay, MOL LNG and Reederei NSB ships

#### Reederei NSB agrees fleet VSAT deal

#### www.marlink.com

NSB Niederelbe Schiffahrtsgesellschaft (Reederei NSB) has agreed a deal with Marlink to roll out fully managed VSAT services to its entire fleet of more than 50 vessels, including connectivity and selected related applications.

Marlink says that crew welfare was a key component of the contract, and that Reederei NSB seafarers will be provided with internet, phone, social media and messaging services as part of the 5GB data allowance per vessel.

Access will be managed via the Marlink XChange communications management system, which will be installed on board all of the ships, and the vessel e-mail systems will be migrated to Marlink's SkyFile Mail.

Reederei NSB crews will also be among the first users of the new XChange Media securing operational efficiency and business sustainability using an integrated package of solutions," said Tim Ponath, managing director of Reederei NSB.

"Our vessels already provide a comfortable environment for crew members to work and live in, but it is important for us to continue to meet the changing requirements of our people. Marlink is helping us to do this."

News of the deal came shortly after Marlink announced that it was doubling the burst speed on its Sealink VSAT services (from which Reederei NSB will benefit), enabling up to 3 Mbps for users on its data allowance packages as well as adding new 40, 60 and 80 gigabyte data allowances.

The Sealink Allowances can be used to combine up to four voice lines with eight data allowance plans, which now range from 1 GB up to 80 GB per month.

**October - VSAT deals for** approx. 200 Teekay, MOL LNG and Reederei NSB ships

**October - Second Intelsat** Epic satellite successfully launched

Second Intelsat Epic satellite prepares for service

The launch of Intelsal's 33e EpicNG satellite in August will significantly boost the bandwidth available on major shipping routos across the globe when it goes live early next year. Digital Ship speke to inteleat's Chris insall about the lipic impact on the maritime sector

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October - VSAT deals for approx. 200 Teekay, MOL LNG and Reederei NSB ships

October - Second Intelsat Epic satellite successfully launched

December - Maritime satcom revenues continue to climb in difficult market

#### Maritime satcom revenues continue to climb in difficult market

While the merchant shipping sector continues to struggle in an unforgiving economic climate, the maritime satellite communications market is prospering – with combined annual satellite operator and service provider revenues climbing into the billions

new report from analysts Euroconsult has daimed that the value of the martime satellite communications market has reached almost \$1 billion in annual revenue at the satellite openator level, and is dosing in on \$2 billion in annual revenue at the service provider level.

Specifically, the 'Prospects for Maritime Statellite Communications' report says that in 2025 the maritime market of approximately 338,000 terminals created 5953 million in statellite operator revenues, and Skr.2 billion for service providers.

With a growth rate of 5 per cent in terminals and revenue predicted over the rest len years, that would mean that satellite operator revenues will surpass \$1 billion by the end of 2016, and service providers will pass \$2 bilion annually before the end of 2018.



Combined revenues for satellite operators and service providers should hit \$3 billion from maritime in 2018. Photo: Tony Webster, Oreative Commons 2.0

main driver a few years ago. less than 2: Even though crew communications still represents the vast majority

less than 2 Gbps in 2010; according to icathe report.



In short:

- Gigabits of additional satellite capacity are available to maritime – shifting Supply v Demand
- Installation of maritime VSAT is accelerating and providers are betting billions on further growth
- So whatever you're paying for satcoms now, you should be getting more for your money in the near future



# Jan/Feb - Airbus commercial satcoms sold to Apax

A irbus Group has announced that it has signed an agreenent with French private equity firm, Apax Partners, for the sale of 100 per cent of its commercial stellite communication business, including direct sales arm Marlink and all reseller contracts.

The final closing of the transaction based on this share purchase agreement (SPA) – subject to regulatory approvals – is expected to take place in the next few months. The cost of the transaction has not been disclosed.

Airbus Defence and Space announced in September of 2014, following an assessment of its business strategy, that it had defined military aircraft, space, missiles and related systems and services as its future core businesses.

As such, its commercial satcoms business, including serviors to the maritime industry, did not fit those strategic goals, The maritime and land commercial satcom business has a presence in 14 countries across Europe, Asia, the Middle-East and the Americas, with a distribution network of approximateby 400 re-sellers workdwide.

Airbus commercial satcoms

sold to Apax Partners

After protracted negotiations, Airbus Defence and Space has agreed a deal to sell back its commercial satcoms business to Apax Partners, from whom it originally purchased Vizada in 2011

> The deal represents a significant turnaround for Airbus, which had highlighted growing demand for maritime satellite services as a significant driver for its original purchase of Vizada, describing the market as "a perfect cornerstore for Astrium to





Apax has agreed to buy back part of the Vizada business sold in 2011 overall revenues not enough to convince management that commercial satcoms should be a core focus.

#### New VSAT contracts

As if to demonstrate the ongoing solid performance of its maritime business over the course of these discassions, Airbus Defence and Space announced a wide range of new VSAT contracts and system deployments towards the back-end of 2015 which will carry over to Apax following the acquisition.

Among them is BP Shipping, which has agreed a new global multi-band VSAT deal with Marlink covering its entire tanker fleet.

Under the new contract, Marlink will deliver primary communications capabilities to the BP ships via its Sealink VSAT service, and also include an L-band back-up service.

BP Shipping was one of the first operators to adopt mar-



Jan/Feb - Airbus commercial satcoms sold to Apax June/July - GEE buys EMC for \$550m

#### Global Eagle Entertainment buys EMC for \$550m

Another major maritime satcom acquisition has been announced, with Emerging Markets Communications set to be taken over by aviation connectivity and media delivery specialists Global Eagle Entertainment, in a deal worth half a billion dollars

G lobal Eagle Entertainment (GEE) has signed a definitive agreement to acquire Emerging Markets Communications (EMC), a provider of communications services to maritime and other mobility markets.

The combined company will offer global satellite-based communications and media content to both the maritime and aviation markets, as well as selected land-based sectors.

Under the agreement, GEE will pay \$550 million for IBAC in cash and shares, with payments to be spread between this year and 2017. IBAC is projected to reach \$290-200 million in 2016 revenue, with \$55-65 million in

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EIIC

The combined company will serve some 1,600 vessels



Jan/Feb - Airbus commercial satcoms sold to Apax

June/July - GEE buys EMC for \$550m

June/July - Panasonic begins maritime play

#### Panasonic begins maritime play

http://maritime.panasonic.aero

Panasonic Avionics Corporation (Panasonic) has announced that it is to begin offering its broadband communications and digital entertainment services to passenger vessels across the maritime market.

Panasonic already delivers communications to a range of mobility markets via its Ku-band network, which it says covers more than ninety-eight per cent of maritime traffic routes.

"Panasonic, in close cooperation with ITC Global, is dedicated to delivering the best in digital entertainment and enterprise quality broadband communications to the maritime industry," said David Bruner, vice president, global communications services at Panasonic Avionics.

"We believe our network strategy sets a new standard in connectivity across a wide range of markets including yachts, river cruises and other passenger vessels."

In February, Panasonic announced multi-year contracts with satellite fleet operators, SES and Telesat, for high-powered HTS spot and wide beam Ku-band capacity to supplement its existing HTS capabilities and cover customers across the US, Canada, Mexico and the Caribbean, as well as the Mediterranean, Europe and the Middle East.

Over the next few years the company says that the network will continue to evolve as it rolls out extreme highthroughput (XTS) capacity in the densest of traffic areas – across North America, Europe and Asia – where these regions will be seeing multiple gigabits of capacity.

Panasonic's maritime entertainment options will leverage the experience gained in delivering approximately 8,000 inflight entertainment systems to global airlines, to make the same entertainment platform available to the shipping market.

Jan/Feb - Airbus commercial satcoms sold to Apax

June/July - GEE buys EMC for \$550m

June/July - Panasonic begins maritime play

Aug/Sept – Summer of love for maritime IT marriages

#### Summer of love for maritime IT marriages

The summer of 2016 has seen a slew of new maritime IT relationships consummated through a variety of acquisition deals, with some substantial cash changing hands for businesses in various shipping technology sectors

acquisitions the leading worldwide servicing company ported during the nummer of which will be the partner of chains to Fernescusics Marine Electronics business and eta acquisitions. He will build strate that are likely to impact the enable the digital iterationnation of all our unit has its origins in the founding of gir partnerships, inner are with start-op munity the most cash rich maritime chasts." had to-down was the panchase of CHII-Net-

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manning by by 2021. SBS also alma to or said-date USBE 3 fall. send Officiality and almost constructure it to our family," and SpeedCast CBO, and any second state.

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Marlink and Telemar Staring in the untellite space, Marlink has

Banal is the UK. the Lemants. the Manzoni International Maritime SpeedCast and WINS Coglishee Marcesi in 1988, More reported, experted, Digitalization offers significant to a receiver of many VAT providen to Another new maritime autors marriage in 202 the unit was incorporated into growth potential for our outcomes and came in light shortly after the accessory. Soles: Communications (new aresther mant of the Markok and Tolemar deal, Lamande-Fernescusica-company) The former Leonardy Remarance

marine business has \$4 offices in major how \$5% also new the coprovider of anillite communications and British ports and a network of over 60 sup- Digital Marine Solutions (DMS) doal to IT services for the maritime sector and part pert tacheidane. Its diest base includes angelse the marine detains of juppeners now then 2000 comparison generating a pathology compares, first previous SpeedCast will appoint Residual's 70 per transver of about 622 million, a specificant in March. whip of CDb from 48.1 per user to 500 per annt explar in WDO for a constderation person of which is derived from non-UK

> 160% provides nervices to some 100 ing the acquisition expects to generate a CAMP portfolio self-continue to speech parameter carrying watch, such as cruiter tumous of approximatily 60 million, as a separate entity under the CAMA tors address, as well a approximately SEM says, through the supply of 2,00 mechant ships, from its postfolio of equipment for newspation, security and resources and management team ind by VIAT, L-hand, interruptional maritime intradiand untillite new text to the sup-Kine market.

CPM and accounting authority services. "We are very pleased to sed some WINS "We are particularly planed to have unit from Leonardo," axid Loca De Casare, "This acquisition is further affirmation CEO or SIRM.

"The integration of these articities withpt and expressive standpoint, in addition to significant indications for us, WDM brings a in SERDIWER allow untropacity ensurings a MAP, and onjoy continued access to an sending SEVs invaduant hards news, strong local presence in Company, a major strongly market such as the UK market and subsected range of high-quality electronic maritime market, any dias experime in the to plan the subsequent expansion into other Remptan and som Remptan markets." orate industry in Europe, a fast growing "This spengies is hilly ashealded in the

"Insuface, we are well point in middless of our basiness plan, with the expand our network to apport the grougrowth option for acquisition of its smach ing demand of VSAT services in the mardated companies in specific markets and upply capability integrand into that of In anneurating the deal SpeedCast also SRM, making it even more distinctive,"

Wartsilä and Eniram Group, with Marlink owner Apex Partners - sensing with WIN coloridary DIE-INTER- Our next deal is an all-Resold affair, with

eremparies and continuously recruit Communication company, nd up by new people to strengthen our digital the Milsteille." DMS and Joppesen

"But up it many proving

Digital Marine Solutions is moved by the Alter 2008 Fund. Under the terms of The sendy combined company follow- the agreement the Jappanes Marine and band same with its own dationed

"The completion of the deal is at news for C-MAP, our engineers, our staff finalized the acquisition of the business and the marine industry," said by Anniad "Our wide pariate of main name will an continuity in supply and improvements it the standards of occiliance debrared by C sprighternal display information and places and added value support."

#### ChartCo and Kelvin Hughes

age which will see ChartCo leave the Refeits Haghes Group, following an injectoo of what it describes as "equilibrium new funding itom Equitors Pattern Respects data for contrast growth of it



also are reproduced a dual to take over the basis on off much the signing of a contract to pro-

nas of maritime autom provider Tripmar while Kushand VAAT to 50 wearth in party

Jan/Feb - Airbus commercial satcoms sold to Apax

June/July - GEE buys EMC for \$550m

June/July - Panasonic begins maritime play

Aug/Sept – Summer of love for maritime IT marriages

December – SpeedCast buys Harris CapRock for \$425m

SpeedCast buys Harris CapRock for \$425m

Hong Kong-beadquartered SpeedCast has been on an extended shopping spree that has now seen it acquire a dozen companies in just four years - and the latest deal, to buy American satcom provider Harris CapRock, is the biggest of them all

edCat has entered into a definiagrament to acquire Namia pany on the Australian Securities in a cash transaction cal-Exchange that same August at UB455 million, with the aim of In 2015, Speed-Gest acquired Harman politonis for make and Datacomers, Gallok fundite ferrice, Nordet, SAT Communications and ST

The conditional antity will service more has 6.207 canada, as well as hundrads of based NewCon International as well as ip and plattering in addition to both. WDB Limited (WDR), a Turopean sparsies' estepsite and government

will also expand part of the Rashar Group. - 20global infrastruction to more - 140 Cale releases around the world. or 18 months all'at use that the transaction is anterdrive complete by the end of QL 2017 dusing conditions. anti-tand and regulatory panel. The company separate to prose prosingely UND4 million in genual ate Specificant's future rgies within the first two years. the the deal is completed by consolidatcombining of from and melacing costs. Funding will be parily underwritten by

appity raising on the Australian study scharge (where SpeedCart is listed). which aims to generate approximately AURISM colline (general UNED) colline). Shopping spree

he acquisition of Harris Capillock is just for latest move in an extended shapping one that has seen Mona-Hone headcoartnal ResultCast purchase a host of compaconversionalized (AAC) in December 1011. The way followed by deals to account Australia's Pacial International in April of all plagar, which means we ware not invite a different level where we will have a water

an around the world over the last from was about acquiring a presence in flumps, are starting with Australian Satellite where we had nothing "He wan doing way sell in our man-

controls in Max 2014 should believe an American unclosed in Roberton, the beart, he alled

initial public othering of durate in the const of the obigoing same in Tarope, and mally parts on that presence and no started gatting insided to global tenders - and us started winning glabel Londers." "Compaighted" has been a constant them in adaptant applicitions in the maritime

Telepost, and this year brought Floridaunits, galling territory when Specificat had little or recentiting passence "He sequired, last year, \$4.5 provider of satellite communications and. Communications to early have a strong Trysters for the maritime sector that was market share and presence in the Grach market, at a time when the persentation of Add Harris/Capillack to the list and that VEAT is still low but so expect the adopmakes an over down an quisitions in fact tion of VSAT to accelerate," and

years, eight of which have taken place Mr Boylins since the start of 2015, at a cost of around "We brought WING and improved with half a billion dollars - a remarkable spand- DH (Rutchat subsidiary DH-bitamon). ing run by anybody's standards. Digital which has a presence in farm any, the se-Ship upoke to Specificant CBD Parrockers and largest shipping madent in Europe Befor about his long term manage, and a shortlyness, and an interesting proce here these new firms will combine to one. the cruite argment, where we dolo?) have arothing but is a segment phase the Amount of the baseline in the sector of the "The acquisitions have name been

alout just building scale, such arguinition "Hart's Capitock mally makes up the strong hader in the main basiness comhas been throught of an filling a pap in our capabilities, incour approach to the market. bining Harris Capillack and WINE which The scholard tree behind these acquisitions further emoghers our global scale service ing the merchant shipping and off-base hardware warmer synangias," he told on "Combing these companies with making to and makes? frankfort will give us around to opport or

In short onlier Mr Beyler says that the ities, to contorners, to previous, and officer acculations have allowed the company to us to do a number of things that ware not fill three page in its capabilities it had idenpossible on our own. When you look at tilled by buying up additubligs and a such of these acquisitions, The failtons was contained have, along with technologies our use first maritime arguinition, that and infestmenture, moning from its home in AsiaPacific through Barrya and the

America, and into Africa as well. "It has not have driven by work, then all

More business in heir Parific as had some as a result of these accountings as have blockon faultie farvice in The partners in Europe hat we didn't have a citricusly reached a applicant scale and infrariance in January 2013, and preserve entraneous-being agints, with Harts Capillock we have blee that to

the more your, before adding furthermore and to global tenders. Belithermore further advertising or over over comparision,"



Specifical CED Parts Jack Bryle

tions are have learned and discounted stong the way some of the scale baselinsometimes beyond what we want extent ing. We understand now what we can achieve by being a bigger player and will knowings that an use integrate Harris Gollah and Smallet

While Marris Cannuk has stangly inits of and parand only hadsame. My Beyline periods and that discovering tion is not one of the one goals of the Speed at applitude strategy, with care party wandrandy prevent to some educed in mail of the sectors seried.

"I wouldn't say it's discriftation brane directly is part of Spanifard's between we're alwares here diversified and will continue to be discussibled We was The network force of course or two index. trian and had to diversity. We are making expandious in sectors where we are affine and alternate wait to stangthenous pair tion." he table as

In short:

- Scale is important in maritime satcom sharing costs across sectors while increasing buying power
- Consolidation will continue, most likely leaving just a handful of satcom providers – fewer options, but fierce competition
- So a small group of big players, with deep pockets, will be looking for your money



### To take away...

- Exponentially greater supply of VSAT capacity
- A few big players will dominate having spent billions
- Maritime can benefit from cross-industry scale

### Cheaper data is coming. Success will be had by those who use it to create value from their 'Digital Ship'



# Thank you