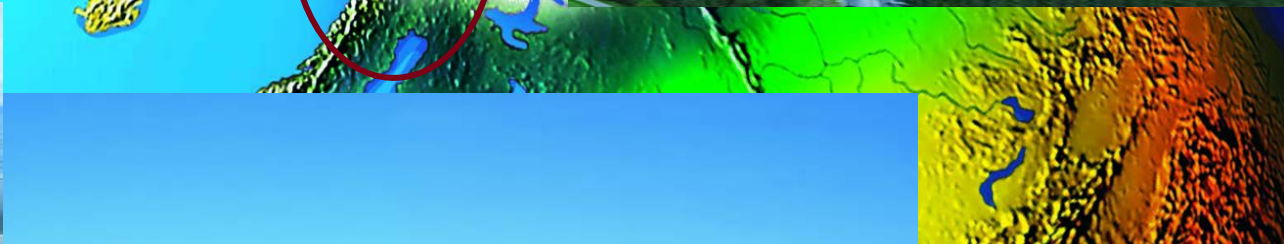


Europaort 2005

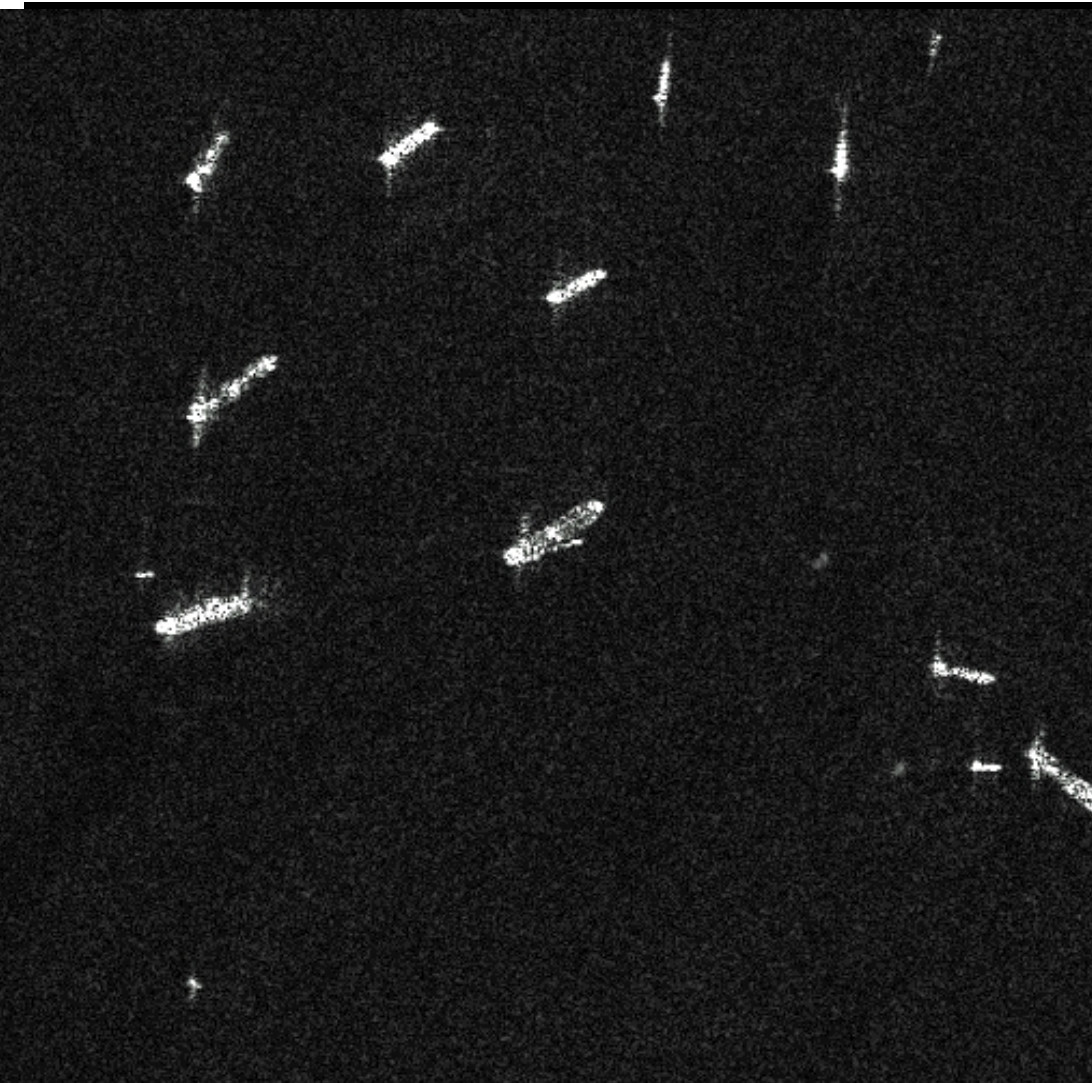
Migration from narrow bandwidth to broadband

How can shipowners step by step include their ships into the internet world without complete re-investments?".

by
Morten Lind-Olsen
CEO DIALOG AS



The Arctic Arena: Space surveillance and communication

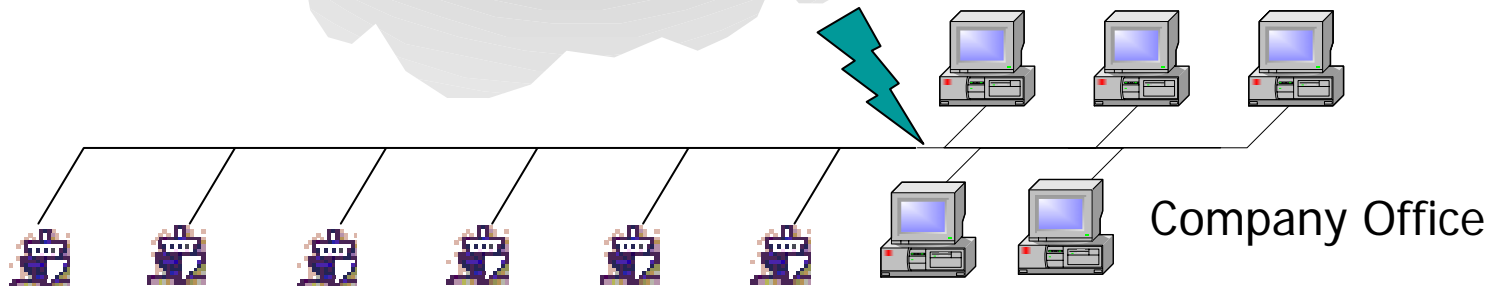
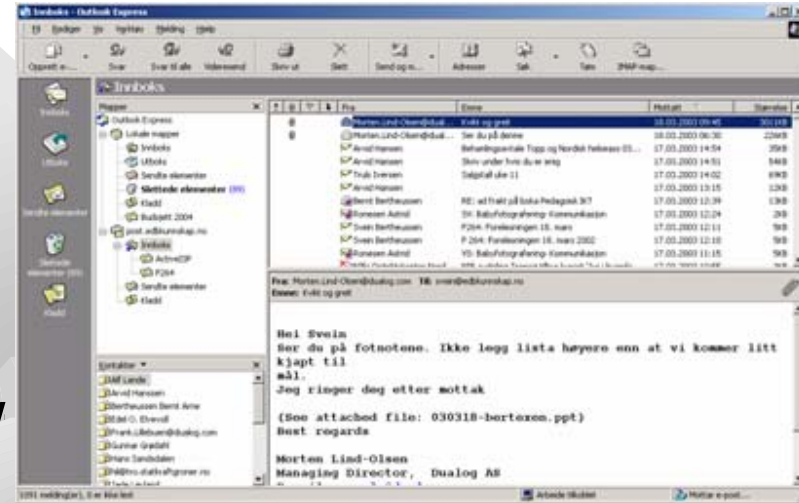




Maritime goal: Closer to the ideal situation



The Internet/
Intranet



Trends

- From Land to Sea
 - New developments are first land-based, even Inm-4 products have landbased user equipment first
 - marine in 2007
- People are "closer", but less dependent on voice
 - Younger people use SMS, Messenger etc.
- Always connected
 - Always available, but lost focus, looking at the screen
- More business-critical communication is moving to email, file transfers and WEB based information.
 - Voice, Telex and Fax is less used
- More accessible more vulnerable

What's all this fuss about Internet ?

- All new Terrestrial services are made for it
 - Like ADSL and Cable Modems.
 - Even the telephone(VoIP)
- All new Terrestrial Mobile services are made for it
 - UMTS, GPRS, EDGE
- All new Satellite services are made for it
 - Inmarsat 4, Connexion, Thuraya DSL

Connecting to the Internet

- PSTN “Phone line” (Analogue)
 - Unstable quality, the only “fixed” was \$ per minute
 - Initially low speed, has been creeping up to 56 kbps
- Packet switched
 - Easy and instant access, fixed monthly rate -or pay for the volume of data transferred
 - Strange way of pricing, if we don't subscribe for a fixed bandwidth, we share...



Terrestrial vs Satellites

- Different frameworks

- Terrestrial:
 - Cables can be laid in parallel, and every where, faster than anyone ever dreamed about
 - Large concentrations of users
- Satellites need:
 - Orbital position
 - Frequency allocation
 - Lots of expertise
 - Even more funding
 - More expensive mobile equipment at sea
 - Coverage/less potential users

Satellite Bandwidth will have to be more expensive

Today's Broad Band at sea

Usually thought of as a VSAT-solution:

- 64kbps and upwards is the norm in marine communication
- Symmetrical Bandwidth
- Always on
- Fixed price, including voice
- C band for global coverage (2.5m antenna)

On the horizon, and beyond

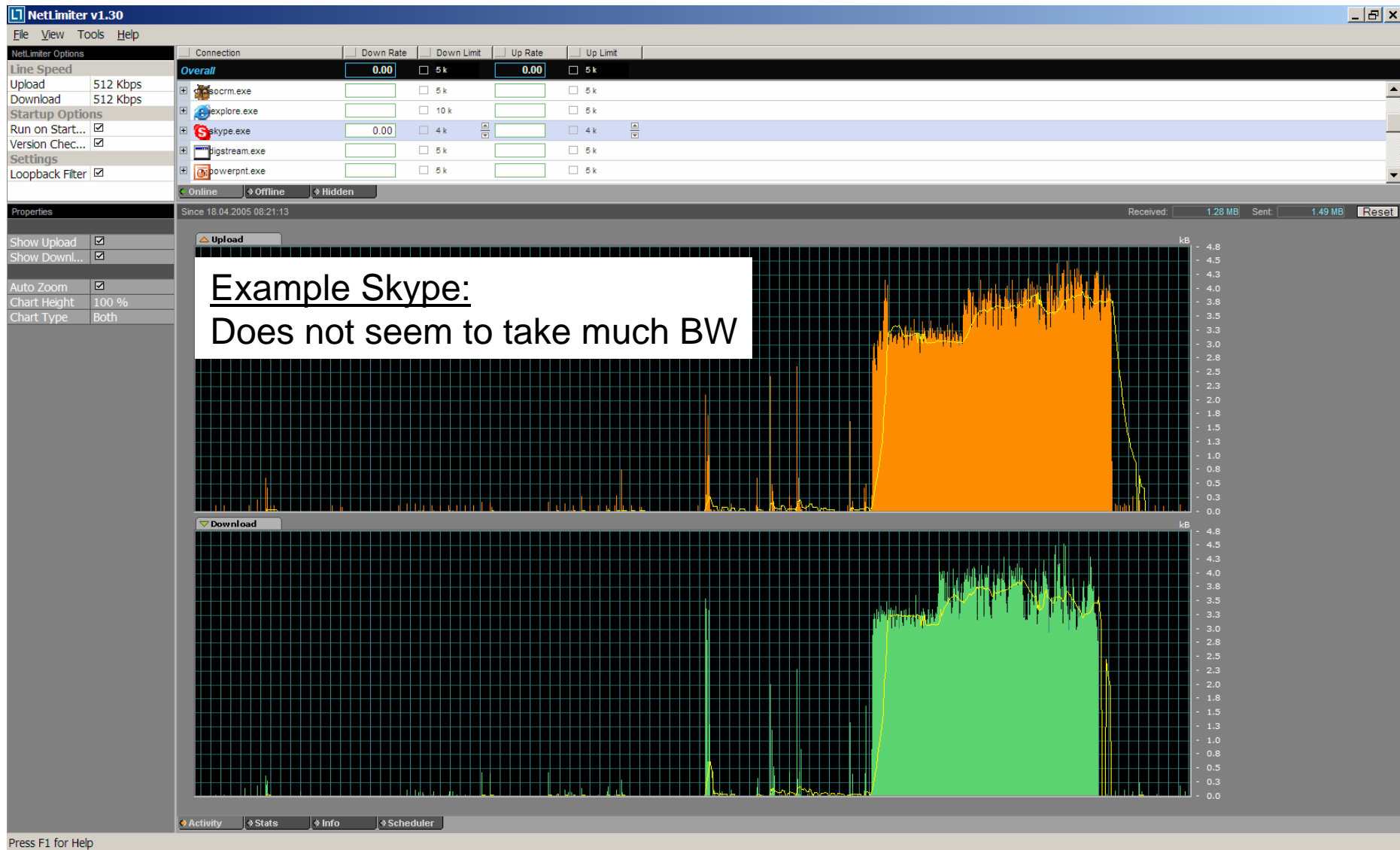
System	Max. BW kbps	Always on	Coverage	Fixed price	Available
VSAT	2000	✓	"Global" Regional	✓	Now
Connexion by Boeing	128	✓	<u>"Near Global"</u>		2006
Thuraya DSL	144	✓	Regional	✓	Now
DVB-RCS	2000	✓	Regional	✓	Now
DVB-IP	2000		Regional	✓	Now
Inmarsat Fleet	128 MPDS	✓	"Global"		Now
Maritime BGAN (Inmarsat 4)	492	✓	"Global"		2007
WiFi, WiMAX	> 2000		In ports		2005 ?
GSM, UMTS	384 / 64		Terrestrial	✓*	Now

Investing in Bandwidth - Consider your needs

- BroadBand / Always on / Bandwidth on demand
- High voice needs
- Do you need symmetrical Bandwidth
- Geographical coverage

👍 Cost sharing, Can you charge somebody else ?

How much Bandwidth is needed?



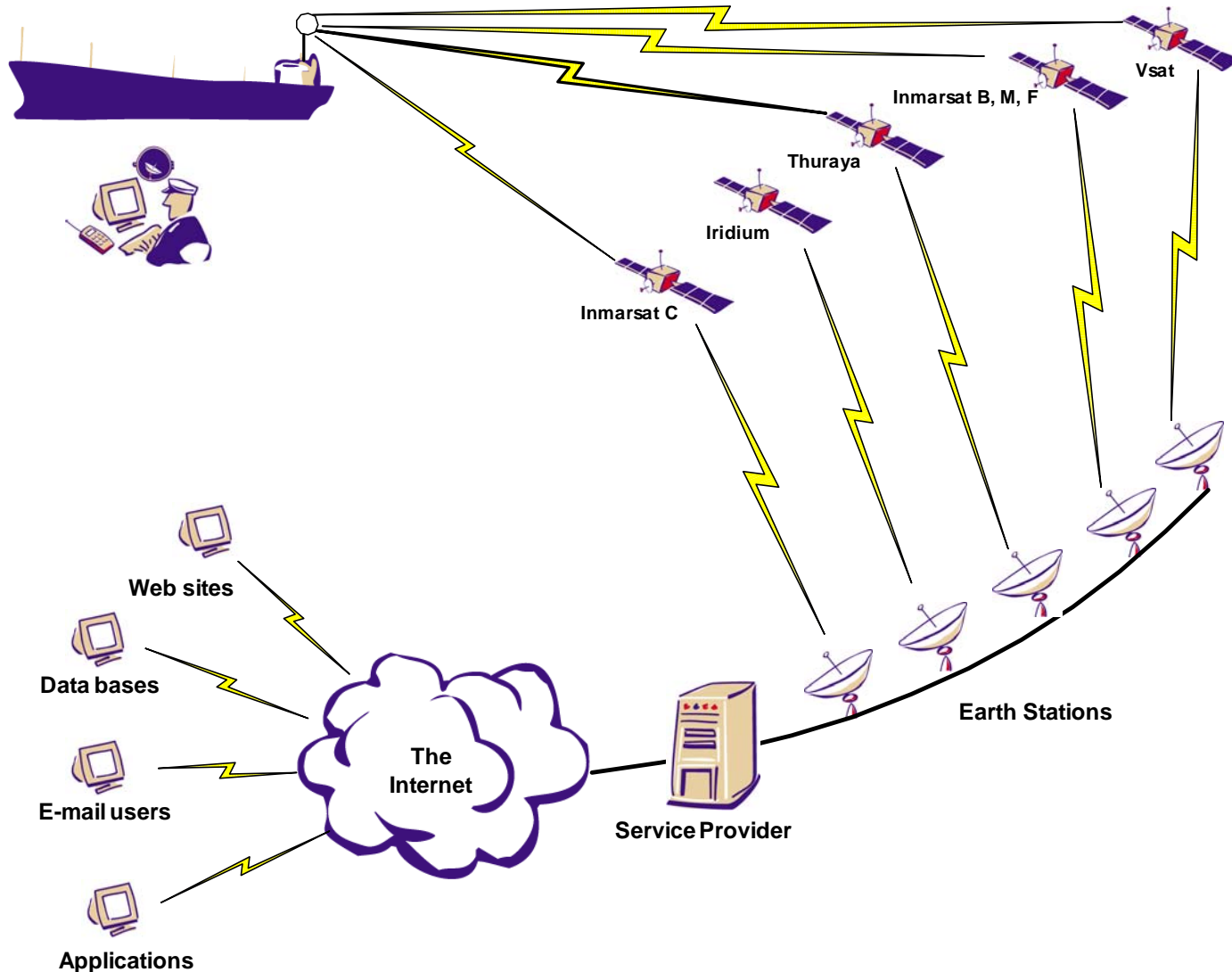
Even the Broadest Band will be filled

By profit generating communication, or by other activities disturbing work and taking focus?



The picture is fragmented

Many players – different roles

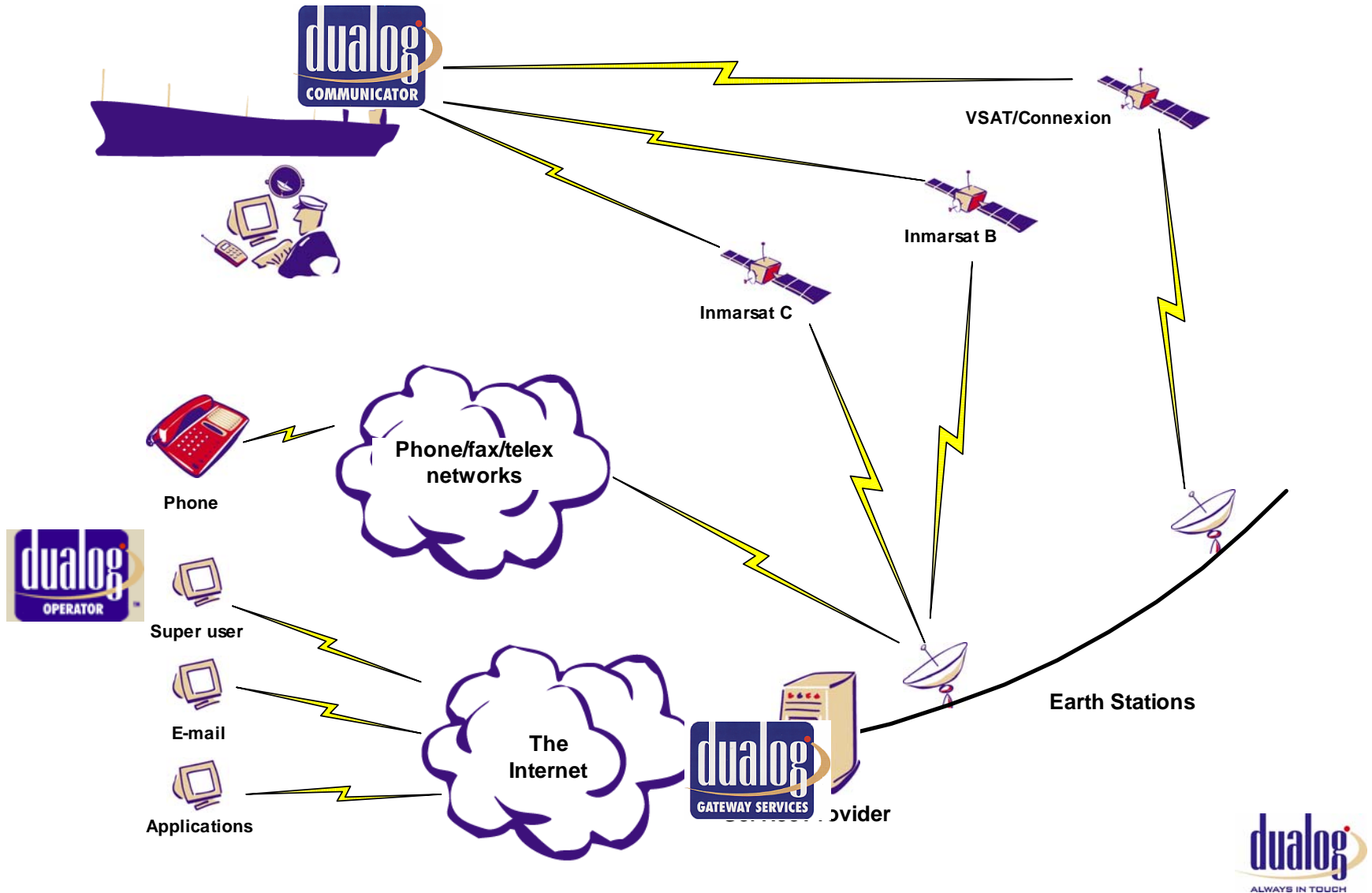


Summary

Don't paint yourself into a corner

- The most important choice is your strategy and to have the freedom to choose.
- Think integrations and solutions - rather than technology.
- Remember, the most expensive part is to change business communication pattern (e-mail addresses, on-board SW, replicating, training, etc)
- Choosing your knowledge partner is as important as choosing your technology

Migration strategy



Advantages

- Keep all your carriers connected and integrated.
- Use the best in each situation. (Least cost routing principle)
- Even if you have VSAT you will need an integrated backup, when you least wanted to...
- Don't need to change business communication pattern (e-mail addresses, on-board SW, replicating, training, etc)
- Keep your e-mail address and IP connection – even when you change technology or provider
- Ensures focus on your core business



Generation 4™

- Utilizing old technology
- Adding today's modern technology
- Constantly seeking non-invented technology

Thank you

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