

GSM Data Support for Container Ships

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Contact

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Background

- ◆ TriaGnoSys is a spin-off from DLR
- ◆ WirelessCabin project (DLR coordinator), successful developments until prototype for GSM in Aircraft



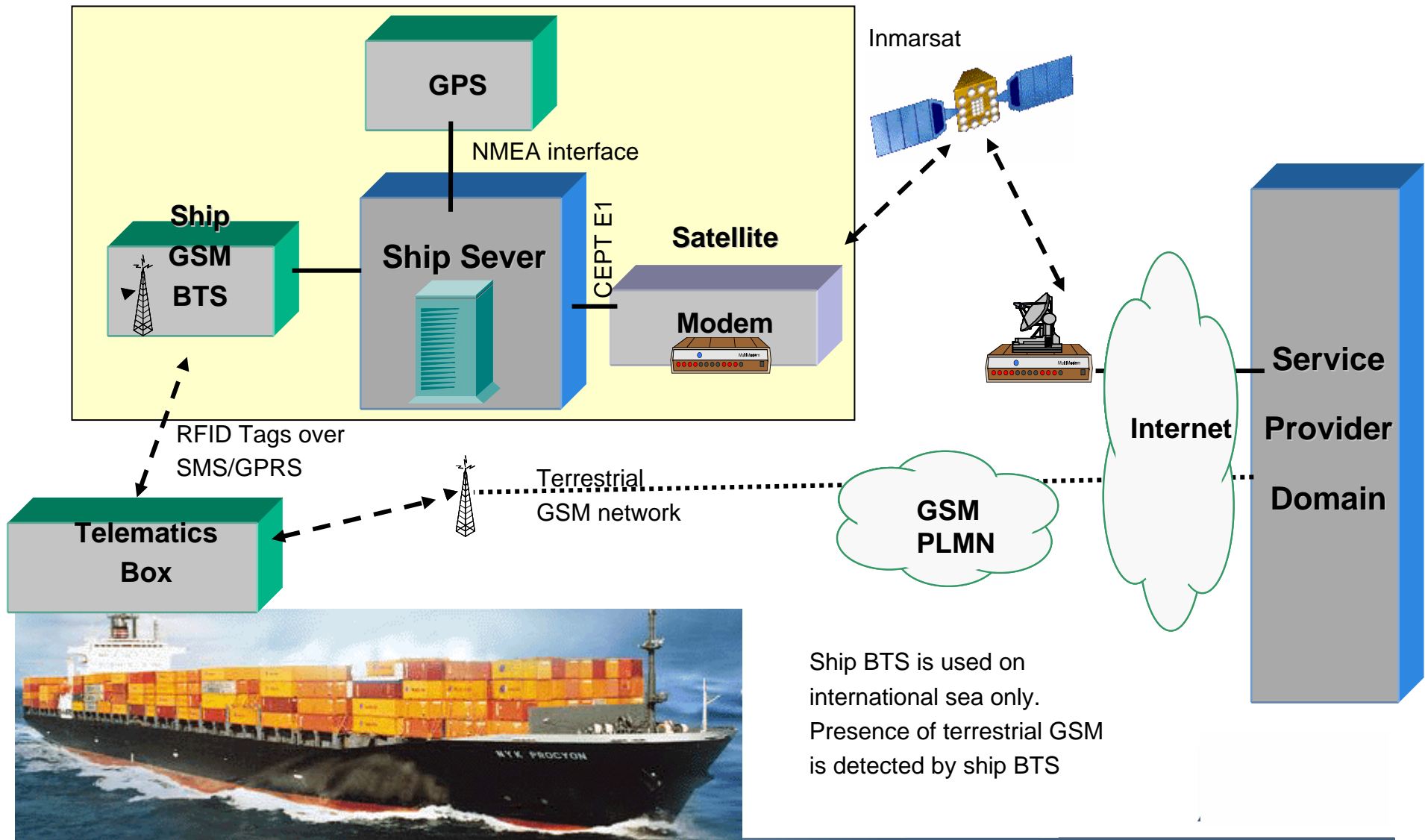
- ◆ GSM picocell and aeronautical satellite gateway is available
- ◆ Maritime GSM picocell for container ships is a light version of the aircraft equipment

Services and Functions

- ◆ **BTS access station: GSM 1800/1900 services**
 - ◆ Voice (and Data), GPRS, SMS, WAP
- ❑ **BSC and GGSN/SGSN core net software functions**
- ❑ **SMS Gateway**

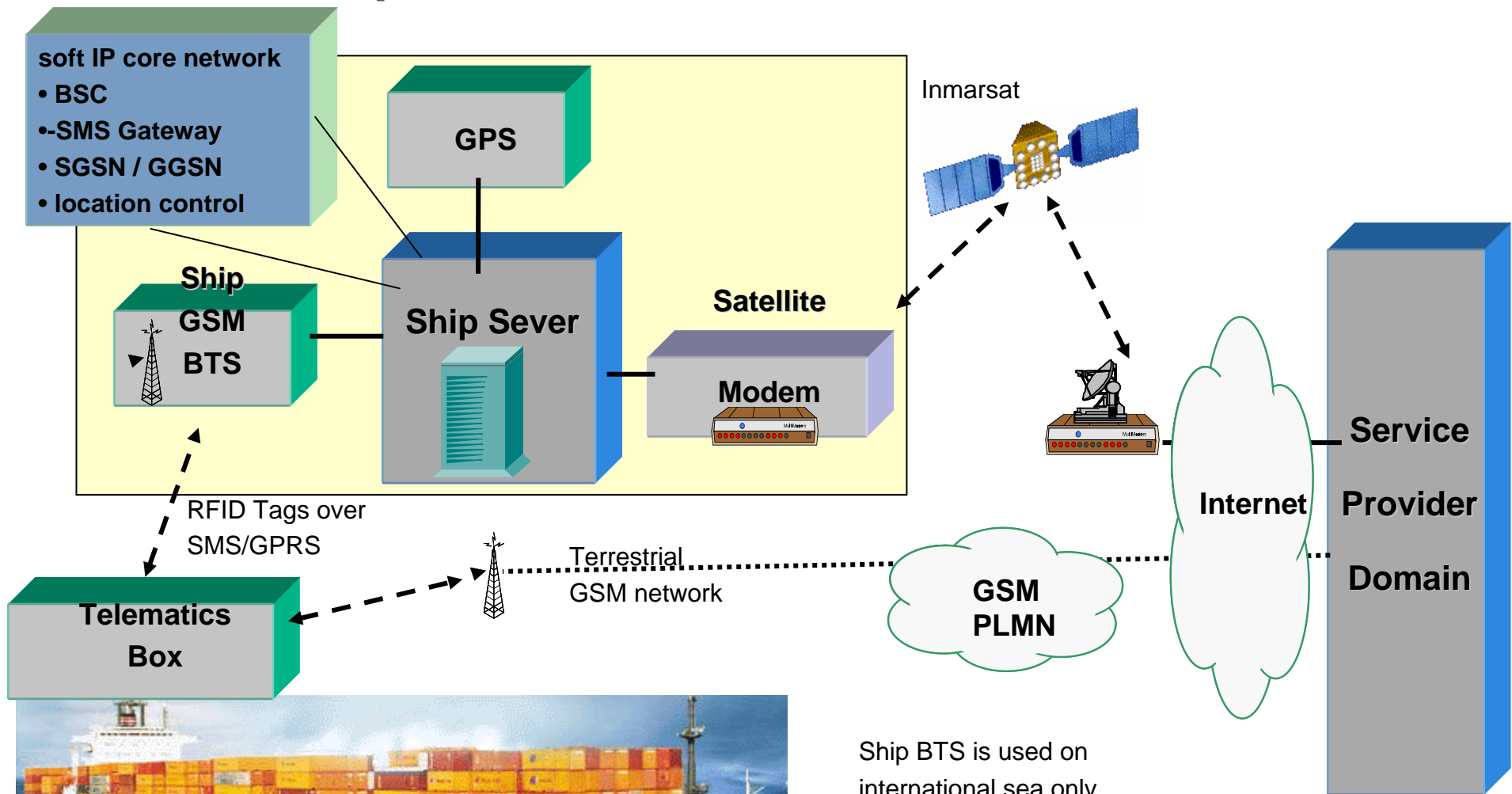
- ❑ **Routing of data over satellite (all transparent, dial-in or packet services)**
- ❑ **Location monitoring, mapping of allowed zones (international sea)**
- ❑ **Monitoring of terrestrial network access possible**

Container Ship Communications Architecture



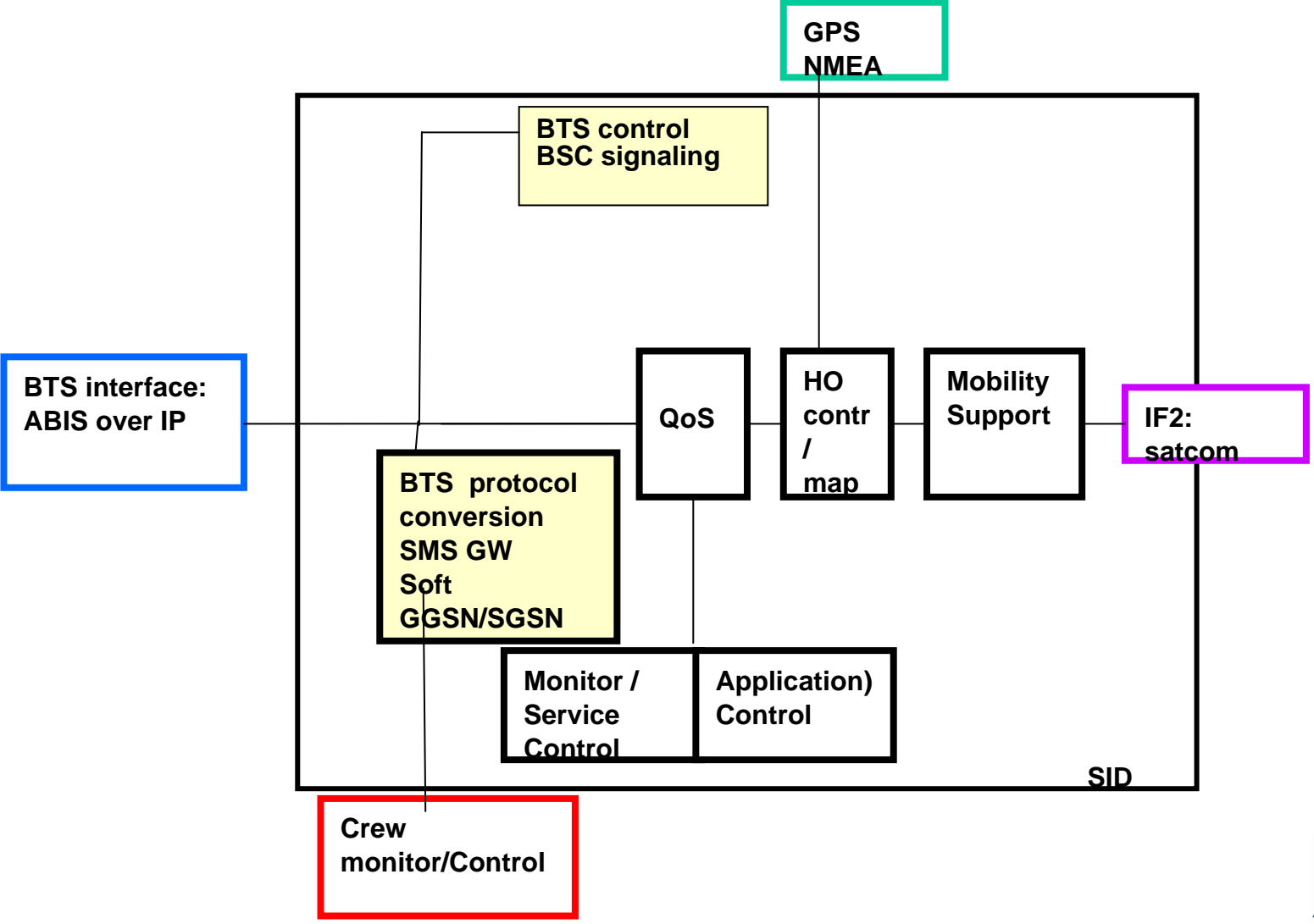
Ship BTS is used on international sea only.
Presence of terrestrial GSM is detected by ship BTS

Container Ship Communications Architecture -2-



Ship BTS is used on international sea only. Presence of terrestrial GSM is detected by ship BTS

Ship Sever Block Diagram



Ship Server

Communication Management functions:

- ▶ Remote Network Control
- ▶ Crew Monitor
- ▶ GPS interface, location control with map
- ▶ BTS/BSC
- ▶ Soft GGSN/SGSN and SMS Gateway
- ▶ Routing / application mapping
- ▶ Quality of Service (QoS) support
- ▶ Interface adaptation to satellite modem (dial-up service on demand)

Equipment Design Goals

- ▶ **Bandwidth Efficiency: 9.6 kbps / GSM call**
- ▶ **Service Control by operator / crew**
 - ▶ **Voice / SMS / data**
 - ▶ **Inbound / outbound**
- ▶ **Network management interface to be compliant with GSM networks**

- ▶ **Scalability:**
 - ▶ **Modules for GSM 1800/1900 @ 7 channels**
 - ▶ **CDMA2000 / UMTS modules planned for later release**
- ▶ **TX Control (intelligent mode) for GSM 900/1800/CDMA2000/UMTS**

- ▶ **Planned satellite interfaces:**
 - ▶ **CEPT E1**
 - ▶ **IP**
 - ▶ **RM and signalling interworking functions for BGAN (multi-user capabilities)**