



## • IT Infrastructure Maintenance and Support for Maximum Operational Productivity

A container terminal's IT architecture and infrastructure is the backbone to any terminal operation and is a critical component to the overall performance of the terminal operating system (TOS). As such, it is critical for the terminal to have a comprehensive understanding of its IT architecture and the impact it has on terminal operations. This includes the hardware (servers, computers, and wired and wireless networks), software (operating systems and applications) and container handling equipment (CHE).

Navis Professional Services helps terminals to design, develop and maintain an IT architectural model that reflects a clear understanding of all of the components of the IT architecture and how they connect and interact with one another. To ensure that your infrastructure supports your business, the entire IT system should be maintained, evaluated and tested frequently.

### • IT Infrastructure Services include:

- IT Architecture Workshop
- IT Infrastructure Integration Support
- IT Change Control
- System Monitoring
- Pre and Post Go-Live Health Checks

## Benefits of Navis IT Infrastructure Services

- 1 Navis is the developer and provider of the global technology standard terminal operating system and has unparalleled knowledge of these systems.
- 2 Navis has the experience with the performance characteristics and best practices at more than 250 terminals globally.
- 3 Navis has a dedicated team to ensure your IT systems are set to meet operational requirements.
- 4 Navis understands the terminal operator needs and can apply deep and specialized knowledge of hardware systems to customer's architectural designs.

## Navis IT Infrastructure Services include:

### ○ IT Architecture Workshop

Navis IT Infrastructure Services begin with a workshop that helps our customers to understand the use of their terminal operating system (TOS), and the types of load on the system while making sure the IT infrastructure is adequately sized for a TOS go-live as well as longer term growth milestones. This workshop can be completed during site visits (such as the O&A) or off-site, depending on complexity and the overall IT landscape.

The IT Architecture Workshop will also help customers to understand and plan the following aspects of their IT Infrastructure:

- Bill of Materials for Procurement
- Scaling for Multiple Terminals or Phased Approach
- Disaster Recovery Planning and Design
- Test System Planning and Design
- Virtualization, Database and Hardware Decisions and Requirements
- Physical and Wireless Network Requirements
- Load Balancing and Infrastructure Segregation
- Architecture Overview Diagram

### ○ IT Infrastructure Integration Support

Navis Professional Services can help to ensure that the IT infrastructure configuration supports the terminal's business requirements, including the individual applications and the interaction between applications, infrastructure and the container handling equipment (CHEs). Configuration support is especially important when the TOS is integrated with other sub-systems that automate or streamline operational processes, such as Gate Operating Systems (GOS) and / or Position Detection Systems (PDS).

### ○ IT Change Control

Navis Professional Services helps ensure terminals have robust, agile and thoroughly tested IT change control processes in place before a go-live. These cover all aspects of the technology changes including configuration of applications, networks, servers, and databases. An audit trail of **implemented** changes made are provided, which is key to understanding and resolving downstream issues that may arise.

### ○ System Monitoring

Navis Professional Services can help make ensure effective and comprehensive systems monitoring tools are in place for the entire TOS IT Infrastructure. The ability to pro-actively monitor your applications, servers, networks and other devices within an IT infrastructure will be critical in ensuring rapid issue identification and resolution. Systems monitoring will also provide invaluable information to assist in monitoring the general health and ongoing sizing requirements of the entire IT environment. Navis can assist in the implementation and configuration of Hyperic HQ (a pre-requisite for N4), delivered as 2 workshops:

1. Hyperic installation and training
2. Configuration adjustment and setting alerts and escalation procedures

### ○ Pre & Post Go-Live Health Checks

Navis Professional Services can also assist in making sure an IT infrastructure, software installation and configuration will support a go-live by performing an audit of the IT landscape, cross referencing design documents, checking application configuration and checking monitoring for any potential issues. Health checks will also need to be completed to prepare for infrastructure changes, upgrading N4 release versions and to improve specific or overall performance of the TOS.

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#### About Navis Professional Services

For more than 25 years, Navis has provided operational technologies that unlock greater performance and efficiency for our customers, the world's leading terminal operators. Backed by the experience of working with more than 250 customer sites, the Navis Professional Services Team is uniquely qualified to help address terminal operational challenges with comprehensive implementation and optimization services. The Navis Professional Services team is comprised of former terminal operators, MBAs, operations research PhD's, and Navis N4 experts with decades of experience helping terminals to implement their TOS and optimize operations. As a result, Navis Professional Services helps terminals to maximize investments in advanced technology solutions, new business processes and operational optimization initiatives by aligning them with our customers' highest-level strategic goals.

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